

Adventure Rider

RIDE THE WORLD.



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Crash in Destruction Bay, YT

WOZZUPPP WayneC1?

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Page 10 of 16 << First < 6 7 8 9 **10** 11 12 13 14 > Last >>

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09-15-2008, 07:29 PM

136

kwh

Fat Hairy Git



Joined: Jan 2005
Location: SA31, United Kingdom
Odometer: 98



Quote:

Originally Posted by **Benesesso**

>"Most importantly, I'd like to be able to add further proof to BMW that there is a serious defect that need to be addressed."<

My first post here. All of the broken pieces should be rounded up and sent/taken to a good metallurgical lab. Probably too late, but do not let the broken surfaces touch (or be touched by) anything hard. These fork failures are probably fatigue cracks, and aluminum retains the evidence very well. The lab. will use a scanning electron microscope (SEM) on the fractured surfaces, and probably be able to find the origin of the crack. They will also be able to see where the sudden, final fracture started (the surfaces will look completely different in the SEM). The will probably be able to find any evidence of damage caused by a previous accident. If the fatigue crack started at a point with no previous sudden cracking, they should be able to state in their report that in their opinion, any previous accident did NOT cause the subsequent development of the fatigue crack.

The next step would be for your lawyer to find out if BMW was aware of all this, and how many forks have cracked.

I'm not a metallurgist or a lawyer, but as a person who rides motorcycles and thus entrusts his life daily to the skills of the person who designed the bike he is riding, I'd like to believe that no incident insufficient to cause visually detectable or measurable front end damage (like creased sliders, a warped wheel, tweaked geometry or even a dented rim) should be capable of starting a chain reaction that can cause a sudden and unheralded structural failure 'n' thousand miles later. Who would want to believe that if they had hit a big pothole at speed on their bike, but that after a good look-see it had apparently sustained no damage, that meant that when castings finally fell apart 3,000 miles down the road and tossed them down the freeway/motorway, that was just 'one of those things'?

mjg had some thoughts on the point in your last paragraph, unfortunately...

Ken Haylock
BMW K1200GT SE & Triumph TT600
<http://www.cix.co.uk/~kwh>

09-16-2008, 04:10 PM

137

Uthor

Gnarly Adventurer



Joined: Jul 2007
 Location: Peoria, IL
 Odometer: 247

Unfortunately, that's not how metals work. It's why the aviation industry spends so much money testing critical components like turbine blades. With the high forces those parts see, an invisible defect will quickly turn to destructive failure. A motorcycle sees significantly less forces, so the time to failure is longer.

The only thing you can do is ensure the parts are strong enough so that a crack will become large enough to be seen before failure. It sounds like this design doesn't allow for that. That or have the part fail gracefully (eg, have a pressurized tank leak before exploding), which is kinda difficult to achieve on a critical motorcycle component.

09-16-2008, 08:38 PM

138

kwh

Fat Hairy Git



Joined: Jan 2005
 Location: SA31, United Kingdom
 Odometer: 98



Quote:

Originally Posted by **Uthor**

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That would seem to be what the redesigned parts achieve, then. There are pictures earlier in this thread of the revised castings that BMW started using on bikes built from June 2003 onwards, and there is a very great deal more metal all round the suspect areas!

Edit: Also, re. graceful failure, it occurs to me that if Red-Baroness had been able to come out to her motorcycle on the morning where she crashed and say "Why is all my fork oil in a puddle on the floor round the front wheel?" then she wouldn't have been very happy, but her day would have ended for her a whole lot better than it actually did!

Ken Haylock
 BMW K1200GT SE & Triumph TT600
<http://www.cix.co.uk/~kwh>

09-17-2008, 03:54 AM

139

Benesesso

Gnarly Adventurer

Uthor]>"Unfortunately, that's not how metals work. It's why the aviation industry spends so much money testing critical components like turbine blades. With the high forces those parts see, an invisible defect will quickly turn to destructive failure."<



Joined: Jul 2008
 Location: Litchfield Park,
 Arizona
 Odometer: 499

Having spent years in that industry, I've seen many highly stressed parts that had visible cracks which hadn't yet fractured.

>"A motorcycle sees significantly less forces, so the time to failure is longer."<

Apparently not the case for some of these forks.

>"The only thing you can do is ensure the parts are strong enough so that a crack will become large enough to be seen before failure. It sounds like this design doesn't allow for that. That or have the part fail gracefully (eg, have a pressurized tank leak before exploding), which is kinda difficult to achieve on a critical motorcycle component."<

Chances are that the cracking WAS visible if someone knew just where to look. Given the method of attachment, I'd suspect the cracking started on the bottom of the lug and traveled upwards. It's likely that only one fork cracked via fatigue, and when the crack got long enough (wouldn't have to be real long) before the remaining alum. snapped right off. That could account for the momentary tank-slapping the OP wrote about. The other fork probably then failed via gross overload.

I'll have to start paying more attention to the lower fork area on all my bikes--having such a failure like that is something *I* never want to experience.

BTW, all of the aluminum alloys, cast or not, have one huge difference compared with steels. Steels have what is known as an endurance limit, meaning that *if* the cyclic stresses are low enough, fatigue cracks will NOT start. Alum. alloys do NOT have such a limit, meaning that even at very low stresses, they will eventually develop such cracks. Such cracks usually grow at an ever increasing rate, so early detection is essential. A simple dye-penetrant test will find early cracks, provided the test is performed by someone who knows the method well.

IMO the least BMW should offer is free testing every XXX miles for these forks.

[Blame MaddBrit](#)



09-17-2008, 04:22 AM

140

dwayne

Silly Adventurer



Joined: Feb 2006
 Location: wheelie in purgatory,
 Calgary
 Odometer: 1,493

hey bennesso,

it's a pleasure hearing from someone who has a better than average understanding of materials


a fine point from someone who instructs dye inspection. The defect will be visible only if its open to the inspection surface (the outside of the tube). If this crack was caused by an inherent defect (porosity, segregation, hot tears etc), there is a strong possibility that the point of initiation was the inside of the tube. To detect this early reliably would have required X-ray, ultrasonic or possible eddy current inspection.

I have been considering doing just such a thing on my bike (an '02 Dakar), but it is probably just easier, cheaper and more satisfying to upgrade the forks.


I have access to full NDT facilities and am certified by the Government of Canada, and take it from a professional, except for dye (which has the above limitations) and eddy current, it is most likely cheaper to replace the slider. It takes a lot of time to do a proper inspection on a part with a changing cross section. Max has replacement sliders for about \$300 US a piece. An Xray crew cost about \$150 USD an hour plus film, if no one has shot that piece before, to ensure complete coverage would take about 4 hours and would still require full disassembly of the fork. At the end, even if the part was defect free, the possibility of an improper design is still not eliminated and the part still may be subject to catastrophic failure.

[Rum Runners Yukon, NWT & Alaska](#)
[Roads and Ruins Scotland](#)
[Kinbasket Lake Golden B.C.](#)
[A "Day" of Dirt Biking Rockies East Slopes](#)
[High and Dry Colorado and Utah](#)

"When your only tool is a hammer, every problem looks like a nail"

 Blame MaddBrit

 quote

 09-18-2008, 01:32 AM

141

bajadog
Adventurer

Ouch.




Was that a bad casting on the fork?

Joined: Jan 2006
Location: San Diego
Odometer: 12

 Blame MaddBrit

 quote

 09-18-2008, 09:43 AM

142

Nail24
Lighten up this is Fun

Glad that you dressed for the slide and not the ride. This the first time I've seen a failure like this. Not much you can control after a failure like this.



"Misdirected inertia is sure to have dangerous if not catastrophic results" by Nail24


Joined: Dec 2007
Location:
Centerville,GA/Tryon,NC
Odometer: 12

Bubba Edwards
R12S HP2 Sport #39
BMW '04 R11SA Ohlins etc.



 Blame MaddBrit

 quote

 09-18-2008, 11:06 AM

143

hilslamer

Study Adventurer



Joined: Jan 2007
Location: Nice in the "winter",
AZ
Odometer: 574

Quote:

Originally Posted by **NCJ**
Anybody out there with foundry experience see what looks like hydrogen porosity (those little bubbled spots) and unusually large grain size in the casting where the axle bosses sheared off?

I would consider myself amateur at best, having cast a few things from melted-down Al cans and the like, but there is definitely a lot of porosity in those castings...lack of proper flux?

LongPegs

2008 KTM 990 Adventure Black

2009 KTM 450 EXC

...among others...

Last edited by hilslamer : 09-18-2008 at 11:11 AM.

Blame MaddBrit



09-18-2008, 11:55 AM

144

dwayne

Silly Adventurer



Joined: Feb 2006
Location: wheelie in purgatory,
Calgary
Odometer: 1,493

Some aluminum alloys have a porous nature when cast. It also depends on the casting method. Porosity also has a way of looking worse when looking at a fractured edge, in fact some people might interpret the rough fractured edges to be porosity. The photos are not clear enough to tell debris stuck to the fork oil from porosity. I am pretty sure that it is a brittle failure though (the metal did not elongate before breaking), again characteristic of cast Al.

Porosity may or may not be a serious defect, and may or may not be the cause of the failure. Of the discontinuities that can be present in a casting porosity is not the worst, in fact in some circumstances is unavoidable and even desirable (it lightens the casting, IE magnesium).
Furthermore HYDROGEN porosity, while possible in Al casting is not likely because the final heat is not created by burning hydrocarbons, rather electric induction furnaces.

I'm not a betting man, but if I was I would guess a design flaw, and or and incorrect heat treatment process is to blame.

Rum Runners [Yukon, NWT & Alaska](#)
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Kinbasket Lake [Golden B.C.](#)
A "Day" of Dirt Biking [Rockies East Slopes](#)
High and Dry [Colorado and Utah](#)

["When your only tool is a hammer, every problem looks like a nail"](#)

Last edited by dwayne : 09-18-2008 at 12:09 PM.

Blame MaddBrit



09-18-2008, 01:03 PM

145

Benesesso

Gnarly Adventurer

>"I am pretty sure that it is a brittle failure though (the metal did not elongate before breaking), again characteristic of cast Al."<

Most cast alum. does fracture via brittle mode, but that is not a cause by itself. Cast iron also fails via brittle fracture, but there are



Joined: Jul 2008
Location: Litchfield Park,
Arizona
Odometer: 499


millions of tons of cast iron machinery still working fine and not cracked-e.g., most V8 engines.

>"I'm not a betting man, but if I was I would guess a design flaw, and or and incorrect heat treatment process is to blame."<

I'd bet a bunch that it's a design flaw, but it's *probably* not a HT problem. The main point is that the metal most likely did not itself change, it slowly cracked to the point of sudden, final fracture. Happens all the time on many items.

 [Blame MaddBrit](#)



 10-03-2008, 05:58 PM

146

WayneC1

Adventurer

Joined: Oct 2008
Location: Australia
Odometer: 58

Something is wrong here

Hi there to all

I am an 02 GS Dakar owner down here in Australia

I have also suffered an accident with the axle tearing out of the RHS fork leg

In my case the accident was back in August 2003 24 hours after picking the machine up from the dealer

I was only doing 40 km/h in a grassy vineyard lane with the odd bump here and there.

No photo's unfortunately

BMW sent my lower RHS fork leg to Germany for stress testing and later advised me that they found no fault in the metals, and that I must have hit something which I know I did not. The front wheel is still on the machine to this day and I now have 53,000 kms on it

I felt the front wheel go left and the bars go right as I high sided into a wombat mound head first, destroying a BMW Phase 3 helmet & suffering bruises & the Dr's were worried about bruising to the brain.

I know and respect the BMW Australia rep who advised me of the results of the metal testing but there was something in his voice the day he rang which made me disbelieve the information he provided.

I have now been able to check my curent fork legs today thanks to the photo's posted here.

My RHS replaced fork leg has the extra metal around the axle mount and my original LHS leg is without the extra metal.

It seems to me there is more to this story and a real possibility that there are more failures out there.

It would also appear BMW was aware of the problems and chose not to act to replace units already in the field

It would be interesting to find out when the revision was made in the design & up to which year models have the older fork legs.

[edit](#)[quote](#)

10-03-2008, 08:06 PM

147

mrpete64

Gnarly Adventurer

Joined: Feb 2007
Odometer: 296

I would get a "good" lawyer and take BMW to court. It is clearly a defective part.

Mr. Pete--->

[Blame MaddBrit](#)[quote](#)

10-03-2008, 08:46 PM

148

kwh

Fat Hairy Git

Joined: Jan 2005
Location: SA31, United Kingdom
Odometer: 98

Quote:

Originally Posted by **WayneC1**

Hi there to all

I am an 02 GS Dakar owner down here in Australia

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made in the design & up to which year models have the older fork legs.

Words utterly fail me. The sheer, breathtaking sociopathic cynicism makes my blood run cold. Some failures, as an accountant you can kid yourself that nobody is really going to die or be crippled for life if this thing breaks or that thing catches fire, so "it's not a moral issue, it's a financial one". But this is one that nobody at BMW can possibly have convinced themselves wasn't going to kill and maim people.

Even, worse they had already done the redesign by the time you had your get-off, and yet they just straight out lied to you about it.


Did they actually make you pay for the repairs, the time off work, the gear after telling you that it was your fault?

By the way, the new fork castings were fitted in production to all bikes shipped after June 2003, I'm told. I'm guessing that to find out exactly when and why the redesign was initiated you'd need to subpoena all sorts of stuff from BMW, and that would only work if everything was written down, and hadn't already been shredded. If you had done something as cynical as that, would *you* leave a paper trail that might one day see you convicted of even something like corporate manslaughter in a German court?

Ken Haylock
BMW K1200GT SE & Triumph TT600
<http://www.cix.co.uk/~kwh>

 Blame MaddBrit

 quote

 10-03-2008, 11:26 PM

149

manfromthetix

Lost in Space



Joined: Dec 2004
Location: Lexington, Virginia
Odometer: 924

Totally agree - something is wrong here...

I'm very sorry about your crash, that is a terrible thing to go through. Best wishes for a quick and total recovery, mentally and physically.

I totally agree - something is wrong here. The forks on these machines shouldn't fail like that! In ~46 years of riding I have thrashed dozens of motorcycles while racing motocross (leaping, flying, bashing bumps and whoops...), riding trials (plonking off a six-foot drop and landing on the front wheel is a little more stressful than riding down the smooth asphalt, for crying out loud), enduros (high speeds across rocks, ruts, desert scrub, whatever), flat-track, trail riding, etc. Even the street riding I've done has been challenging at times what with hitting ruts, potholes, the occasional curb, etc. on much larger/heavier bikes than the F650. I hit a pothole at 75 mph once on my fully-loaded BMW RT that jolted so hard it made both mirrors pop off and the bike never even twitched, much less sustain any damage even to the wheel.

In all that riding I have of course crashed countless times and have done tank-slappers, endos, low and high-sides, gone over the bars (fond memories of my first hernia...), and done some significant damage to myself and the machines. I have bent fork tubes and sliders, bent handlebars, squared off wheels, twisted triple clamps, popped bolt heads off, and crushed gas tanks. But never ever not once in all those miles and crashes have I ever seen any failure

like you (and several others) experienced, on my bikes or anyone elses that I've been around during all that mayhem.


That part should not fail. Something is totally wrong here. I hope you can get some satisfaction from BMW over this.


Again, best wishes on your speedy recovery. I sincerely hope you aren't turned off to the joys of motorcycling after your experience.

Doug

"If it doesn't blow smoke and make noise, it isn't a sport!" - radio ad for shop in Bozeman, MT

 Blame MaddBrit

 quote

 10-04-2008, 12:26 AM

150

WayneC1

Adventurer

Joined: Oct 2008
Location: Australia
Odometer: 58



At the time of my incident I was in a critical phase of a major project and I could only leave the machine with the Dealer and BMW to inspect / repair while I flew out 800 kms west to continue the project, complete with a black and bruised neck (literally) and rather dazed & bruised brain.

The executives I was working with on the project were concerned I would not make it through but we did.

As for the repairs BMW refused to come to the party claiming I hit something which I did not.

In an odd twist BMW footed the bill under their roadside assist program to truck me out of the bush 130 kms back to the dealer & my city base even though under roadside assist accident recovery costs are the owner's costs and mechanical failure costs are BMW's. I understand the cost was \$A1500

This thread though makes the time line rather clear.

The parts were "revised" and into production by June 03, my incident was Aug 03 and the replacement RHS fork leg was the new style so even spare part holdings had been replaced by Sept/Oct when they did the repair.

Yet despite the above timeline they advised me in Sept 03 that, and I quote,

"There are no other failures of this kind anywhere in the world we are aware of"

What annoys me most is not the discovery of a problem, however infrequent it may or not be, It is the fact that they were clearly aware there was a problem and not only denied it but have left me with the old LHS fork leg, not to mention all the other machines out there to potentially cause a problem.

The people we need to find are those who had the problems back in 2000 to 2002 which lead to the changed fork leg.

One other intriguing aspect is that there is a service bulletin with regard to a "front wheel spacer" which BMW admitted to.

I was informed there were some alloy front wheel spacers which had broken up in service and were being replaced with steel ones but that my machines was not one of those affected. yet I do not see any such bulletin in the f650.com listing.

I have now also checked the part No's for all GS & Dakar's both single and dual spark. There is only one Part No for each fork leg across all the year models.

As to putting me off, hell no, have 53000 kms on it now, it is single seat 8 kgs lighter & have done all GS Safari's here in Oz except the 06 to Cape Yorke, the beast has mounted salt bush, been intimate with sand pits and survived a recent break up of the cush drive bearings & is now ready for the next run. Have been riding since 1973 & not likely to stop any time soon

Last edited by WayneC1 : 10-04-2008 at 12:32 AM. Reason: add more information



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Page 10 of 16 << First < 6 7 8 9 **10** 11 12 13 14 > Last >>

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