

VFR Discussion → VFR TECH → Modifications



5th Gen Frankenviffer

Started by redmarque, Jul 27 2007 08:35 AM

Page 1 of 7

redmarque

Posted 27 July 2007 - 08:35 AM



Hi all, Just thought I'd see what's your opinion on my frankenviffer. In the process of Jigging the engine. frontends going to be hossack based.

redmarque

Posted 28 July 2007 - 03:34 AM

tok tokkie, on Jul 28 2007, 09:12 AM, said:

Hossack front end. This is going to be fascinating. I hate front end dive under braking. I presume you have 'Motorcycle Handling and Chassis Design - the art and science' by Tony Foale - he covers Hossack. I have a BMW Dakar now & it dives terribly - would love to do a Hossack front for it.

I concur about side radiators spoiling a semi-naked bike. There will be three outstanding things about your bike when it is finished - SSSA, V4 engine & Hossack front end & I would want to accentuate all three. Since Hossack makes the front wheel rise vertically there is plenty of space for the radiator behind the wheel (though there is lots of Hossack stuff up around the steering stem).

Good luck with the conversion and keep us informed with blow-by-blow descriptions like Toro1 has been doing. You too can have more than 30 000 hits on this thread.

How did you guess? Yes I read - or tried to read as best i could, Tony Foales book. i'm trying to emulate his construction methods as they seem to work. He did some great experiments with rake and trail which is where I got the 15 degrees from. apparently the trail is the most contributing factor on stability. The nice thing about a hossack frontend is being able to change the geometry more easily.

Tony has also produced FFE software which makes calculating upright and link lengths a doddle.

on another point - I like your beetle sound idea was thinking of calling the bike scarab but your beetle sounds better!

tok tokkie

Posted 28 July 2007 - 10:04 AM



<http://www.vfrdiscussion.com/forum/index.php?automodule=gallery&req=si&img=10944>

scarab 13.jpg

I have used the Scarab name too. Triple I made for my Frankenviffer project.

redmarque

Posted 29 July 2007 - 06:02 AM

sesand, on Jul 29 2007, 05:54 AM, said:

VFR4Lee, on Jul 28 2007, 11:45 PM, said:

You frankenviffer fakkers make me wish I had some mechanical skills. 😊

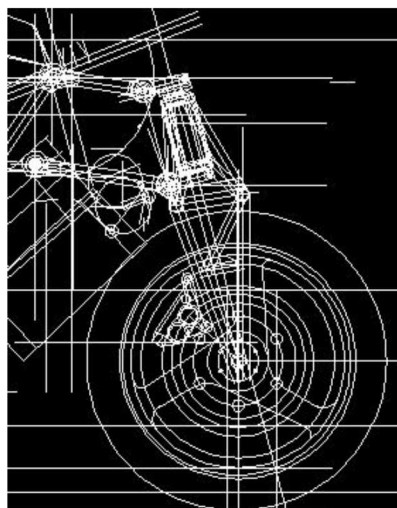
Carry on then, and don't forget the pictures. :thumbsup:

I'll stick to oil changes, chain lubing, and bike cleaning. :joystick:

Just have the cleanest bike out there to make up for it! Its what I do!

Man, if that Hossack front end is invisible, sign me up for one 😊

Yeah OK, invisible in real life just not in CAD! whole bikes just a load of parts at the monent 'just have to piece them together ! 😊



tok tokkie

Posted 29 July 2007 - 11:15 AM

redmarque, on Jul 29 2007, 01:09 PM, said:

tok tokkie, on Jul 28 2007, 04:04 PM, said:



(<http://www.vfrdiscussion.com/forum/index.php?automodule=gallery&req=si&img=19944>)

scarab 13.jpg

I have used the Scarab name too. Triple I made for my Frankenviffer project.

Very nice! I could do with a milling machine! do you think I can borrow yours? lol 😊

Need to get the hossack front bearing holders made. Using small bike wheel bearings - hopefully they will be up to the job!

have you any links to your franenviffer? :thumbsup:

Yes. But don't follow my example.

<http://www.vfrdiscussion.com/forum/index.p...f+frankenviffer> (<http://www.vfrdiscussion.com/forum/index.php?showtopic=29004&hl=son+of+frankenviffer>)

redmarque

Posted 06 August 2007 - 03:30 AM

Top of frame coming together - turned bushes hold tubes in place on threaded rod - airbox wil need a little diet to fit.
Has anyone tried ram air modification with a VFR?



redmarque

Posted 06 August 2007 - 11:11 AM

The Phantom, on Aug 6 2007, 04:25 PM, said:

Wow. You were serious. 😊

Some of the OzVFR crew tried a fairly rudimentary ram-air on a 4th Gen trackbike, they lost a lot of the top end so removed it. I

haven't seen any other serious attempts at ram-air. It takes a lot of tuning... but hey, you certainly don't seem to be afraid of a challenge :thumbsup:

Quote

Have you guys seen lazareth's vfr800 at www.lazareth.fr? engine looks very cool - like the 'fake' cam endcaps

Yep it's special. There was some conjecture about it, as the motor looks more V-Max than VFR800...

I thought about using 2 vacuum cleaner hoses, (bit like a Kwak ZXR750) porting it though the existing snorkel hole and flapper valve - as you can see there should be enough room without the standard headstock. surely a bit more clean air can only help! Were the Oz guys using a power commander?



redmarque

Posted 07 August 2007 - 03:29 AM

The Phantom, on Aug 6 2007, 06:38 PM, said:

4th Gen - carbs. I had a hunt for the link but no joy. I did find a mention from zRoYz who did the mod - he said the bike simply wouldn't rev when they got a bit of speed up.

Cheers for that. I think that a power commander 3 is the way to go, although this looks very interesting?
<http://www.bgsoflex.com/megasquirt.html> (<http://www.bgsoflex.com/megasquirt.html>) DIY fully programable fuel injection system.

redmarque

Posted 07 August 2007 - 04:04 AM

Alot of posts about seats flying around...

Here's my frankenviffers seat - 2 inches taken out of middle section and 3 from the back. leather is from an old horse saddle.

i'm liking the look of the sargent though might take some more foam off the sides?



redmarque

Posted 01 October 2007 - 08:06 AM

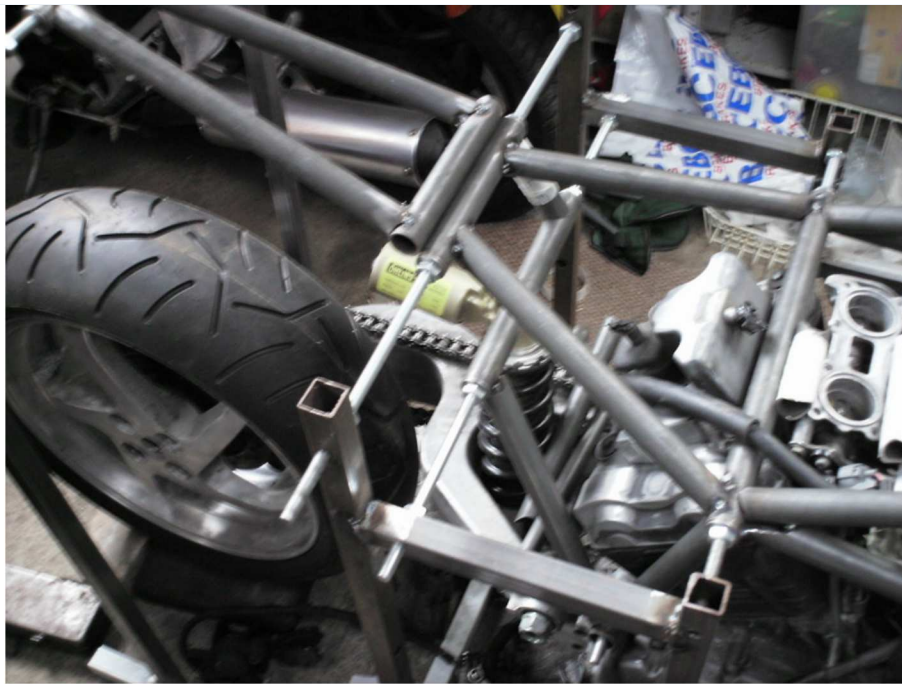
Hi all!

Another installment in the development of a frankenviffer.

it's been a while but i've made some progress...

most of the frame tubes are tacked together.



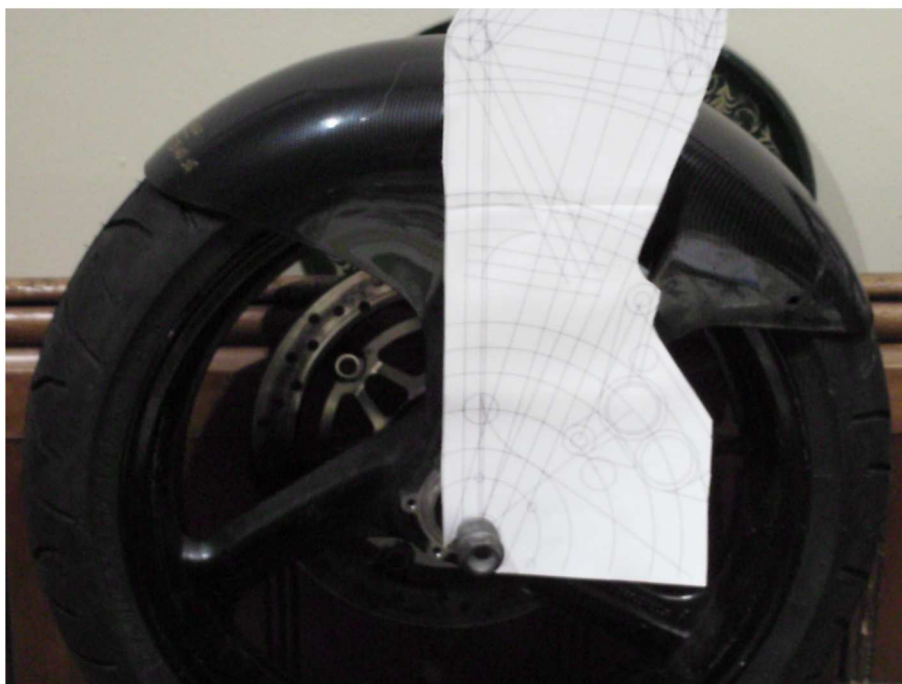


designed and cut/tacked the rear sub-frame





Cut tubes and made a jig for the Hossack forks



Made a wood frame to hold the Sv650 upper fairing in place plus mocked up some 'handle bars to check positioning.



Engineering drawings are at a local engineers.

i'm now waiting on costings for bearing holders, bushes, steering head bearing mounts, more sub-frame bushes and front /rear shock mountings.

Hoping for some encouragement from you guys on the build! :thumbsup:

If you could move the foot pegs on your 5th gen where would you like them? I've been debating 40mm up from stock?



Redmarque 🙄

redmarque

Posted 02 October 2007 - 04:26 AM

Thanks guy's!

Adjustable pegs does seam the most logical way to go. I've been trying to keep the cost down, so cnc machined is out of the question at the moment. http://www.vfrdiscus...tyle_emoticons/ (http://www.vfrdiscussion.com/forum/public/style_emoticons/) default/sad.gif

i've sourced a pair of hangers and pegs from cbr600 f3 which I could fit to an adjustable back plate. Gear linkage might be an issue. as the connector rod hits the sproket cover!

Yep would really love a ToroCharger! I think I better get the machine running first! :D

Guest_vfrider_*

Posted 02 October 2007 - 08:05 PM

Cracks are usually from areas where the welds have cooled hard. 4140 tubing is amazingly resilient to cracking and has a high strength, even hot. I don't know what you're using to connect with (stick, MIG, TIG, brazing) but TIG is the current favored method, plus if you normalize the welds and tubing afterwards, the residual strees, and the tendency to crack should disappear. If in doubt as to the strength, or even the stress under use, gusseting at joints is a good idea.

Just my \$.02 worth.

BTW, Before you put pegs on, I would get measured to you so they're comfortable. In Other word, sit on it and have someone mark where to put them when you're comfortable.

Larry
VFRrider

BTW, absolute fan of advanced frame mechanics. My NEXT project will be a semi frameless design, ala GTS1000.

Parts are here, time is not.

Edited by vfrider, 02 October 2007 - 08:07 PM.

tok tokkie

Posted 03 October 2007 - 02:04 AM

This is good. Very good.

Those cad plots wrapped around the tubes - do you plot the developed shape, tape it to the tube then grind for accurate fit-up? Nice move.

Is that going to be a pivoted tail section? Two crosswise tubes next to each other. I had a Vincent (Comet) so have experienced an articulated tail section - it is not noticeable at all with the Vincent geometry.

I see the full scale plot of the front end legs.

I am retired & have a cnc machining center in my workshop (Haas VF2). I would be happy to machine some rearsets for you. Send me a plot file and an aegis (spelling?). I run Cimatron 9 CAD/CAM but my pre-release version is very flaky about importing aegis (sp?) hence the request for plot file. I won't charge you - I would feel honoured to be associated with this project (& also the ToroCharger project)

Check my gallery for shots of the upper triple I made - plus some informative disasters.

You have not blanked off the throttle bodies. Do it now.

redmarque

Posted 03 October 2007 - 05:48 AM

tok tokkie, on Oct 3 2007, 08:04 AM, said:

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Yes Sir Mr tok tokkie!! Your wish is my command! :thumbsup: will cut some card circles and tape up the throttle bodies asap! 😊

FANTASTIC offer to CNC! Tok. That would be ace! I really liked your triple clamp a very professional job!

Can you deal with autocad dxf files? as I don't think i can write G codes! 😊

Is the "aegis" the raw code that will control your CNC mill? Would be very happy to pay for materials and shipping! :D and your guaranteed a ride and a place to stay when it's finished!

The tube profiles in paper (shown on forks) are created using a free piece of software called tubemiter which can be found here <http://www.ozhpy.org...d/tubemiter.htm> (<http://www.ozhpy.org.au/shed/tubemiter.htm>). Just input the size of the tube and wall thickness of both tubes to join plus the angle and it will print the profile on A4 paper using any printer - makes the job much easier! :D

The two tubes you can see joining the sub-frame to main frame still need to be cut. the middle section will be welded to the mainframe with bushes to hold the sub-section. - Will post some more pics when cut to show the idea, so unfortunately it's not articulated but will make changing sub-frames easy. could always do a full touring sub-frame with luggage/rack points built in and a nice coffy seat!

If i'm going to design some hangers and pegs for my project bike, it would be really good to make them as

replacement for standard 5th Gen ones, then everyone can have lovely rear sets? 🙄

tok tokkie

Posted 03 October 2007 - 11:31 AM

Aegis should be iges I think. It is an industry standard for exporting & importing between different cad.cam programs. I just want the wireframe drawing (no solids thanks) so I can re-create it in my Cimatron & generate the toolpaths from there. Using other peoples g-code is really not an option I would like to explore.
A dxf file should be fine - I can have it plotted and then re-create it myself.
I will pm my e-mail to you. I take it there is no rush about this thing.

Guest_vfrider_*

Posted 03 October 2007 - 02:29 PM

redmarque, on Oct 3 2007, 09:59 AM, said:

vfrider, on Oct 3 2007, 02:05 AM, said:

Cracks are usually from areas where the welds have cooled hard. 4140 tubing is amazingly resilient to cracking and has a high strength, even hot. I don't know what you're using to connect with (stick, MIG, TIG, brazing) but TIG is the current favored method, plus if you normalize the welds and tubing afterwards, the residual stresses, and the tendency to crack should disappear. If in doubt as to the strength, or even the stress under use, gusseting at joints is a good idea.

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VFRrider

BTW, absolute fan of advanced frame mechanics. My NEXT project will be a semi frameless design, ala GTS1000. Parts are here, time is not.

Cheers Larry,

frame tubes are going to be TIG welded buy a local engineering firm. I wouldn't trust myself - I've only used MIG to tack the tubes will get the engineering guys to normalise tubes after welding. i went to a Industrial Metal supplier for the Dold Drawn Seamless tubes - I hope they sold me the right stuff?

Do you have any sketches of your project? would be interesting to see? what motor are you thinking of using? :thumbsup:

No sketches, all in my head right this moment, and scattered all over the garage. Motor=GV1400 from Suzuki. 1400 V4. Front end, GTS1000 SSS, rear end, GL1800 SSS, shaft drive, ST1300 tank and seat, 5th gen VFR rear wheels, front and back. Designed as the long distance tourer, no compromise. Even will have luggage, ala Uni cart with Samsonite hard luggage.

To far off right now to take up your thread, we're watching closely.

Now, back to my RC replica.

Larry
VFRwalker

Something wicked this way comes.

Edited by vfrider, 03 October 2007 - 02:29 PM.

redmarque

Posted 04 October 2007 - 04:39 AM

Now I know you guys love pictures....

loft insulation foam has other uses. :joystick: I've had to ditch the projector headlamp for now as i couldn't find enough space!



Next job is to cut air intakes for the ram air system each side. apologies for the state of my garage... i'm not so worried about you seeing the mess after checking out vfriders cool project! :thumbsup:

Promised a while ago to post pic of the front mudguard plug.



Painted it with 'reface' a special polyester high build filler/sealer which won't react with fibreglass gel coat. please don't ever try normal car paint as the chemical reaction makes a right mess!

Fork jig still needs stops welded on to position tubes correctly.



More updates and pics soon.... Redmarque 🙄

redmarque

Posted 04 October 2007 - 10:00 AM

I am truly honored! :thumbsup: to my post being moved to "**Featured Modifications!**"

Big thanks to everyone at VFRD! :D

Edited by redmarque, 04 October 2007 - 10:03 AM.

The Phantom

Posted 05 October 2007 - 08:04 AM

redmarque, on Oct 5 2007, 07:52 PM, said:

Note how the VFR engine sits in the frame there's a big gap to the right because of the offset cylinders. left radiator and fan will fit nicely in the space. :D

Uh-oh - where's the ToroCharger drive belt gonna go??? 🙄

Was the projector headlight clearance issue caused by the Hossack set-up (centrally mounted shock)?? Those headlights certainly need some depth. Not only is the assembly quite long (at least 150mm, or 6" for the metrically-challenged) but the lens itself needs some clearance as it will melt anything plastic that's too close. I'm juggling projector lens headlights myself.

One more thing - don't rush it just coz we're so demanding of pictures :salesman: I owe the collective a heap of pics, but I'm having to just go on with things according to plan, although the temptation is there to slap things together just for photos - oh, hi there AB, the pics are on the way!! 🙄

The Phantom

Posted 05 October 2007 - 08:36 AM

redmarque, on Jul 27 2007, 11:35 PM, said:

<http://www.redmarque...ike/itlives.jpg> (<http://www.redmarque.com/bike/itlives.jpg>)

Just going right back to the beginning for a moment... is the front wheel in the pic destined to be there on the final product? If so, may I suggest a Marchesini three-spoke rear wheel to match... (yep, I'm the master of the unlimited budget suggestion http://www.vfrdiscus...tyle_emoticons/ (http://www.vfrdiscussion.com/forum/public/style_emoticons/) default/smile.gif). How gorgeous is this bike??? I'd normally take an RC45 over an RC30 any day, but this bike sure makes me stop and think.

Posted Image

redmarque

Posted 05 October 2007 - 09:02 AM

The Phantom, on Oct 5 2007, 02:04 PM, said:

redmarque, on Oct 5 2007, 07:52 PM, said:

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ToroCharger installs on the right side of the engine if my memory serves? 🙄 so don't worry!

Yep got it in one Projector headlight rear end would get hit buy the hossack fork - headstock supports. a traditional headstock is alot nearer the tank! 🙄

Point taken Phantom, I 'attached' the tubes just to see what it would look like, after a hour of measuring, profile cutting, getting it wrong and remaking - it's nice to see some results :D

redmarque

Posted 05 October 2007 - 09:14 AM

The Phantom, on Oct 5 2007, 02:36 PM, said:

redmarque, on Jul 27 2007, 11:35 PM, said:

<http://www.redmarque...ike/itlives.jpg> (<http://www.redmarque.com/bike/itlives.jpg>)

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Not sure why but finding a VFR 6 spoke at a reasonable price is quite hard in the UK 🙄 , so yes this is a cbr600f4 front. Uses the same 296mm disks and hollow axle. If the design proves a success mr credit card might take a bashing. 🙄 Would be fab to have a lovely set of Marchesini's of any type! :salesman: RC30-45 lovely! Make mine an NR750! :thumbsup:



Edited by redmarque, 05 October 2007 - 09:18 AM.

Arion

Posted 07 October 2007 - 09:23 PM

redmarque, on Jul 29 2007, 04:02 AM, said:

<http://www.redmarque...ike/hossack.jpg> (<http://www.redmarque.com/bike/hossack.jpg>)

Interesting. I'm wondering how the frame geometry was decided, including: wheel base, rake, trail, front/rear weight bias, anti-dive proportion. Judging from the front suspension arm angles (close to parallel), it may produce about 5% anti-dive in initial suspension travel. Was that your aim?

redmarque

Posted 08 October 2007 - 07:07 AM

Arion, on Oct 8 2007, 03:23 AM, said:

redmarque, on Jul 29 2007, 04:02 AM, said:

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Hi Arion, ah the 'magic' numbers! There is no real mystery on how the dimensions came to me.

Firstly i wanted the wheel base as short as possible, the VFR engine and many v-twins are very long front to back so I initially drew the front wheel as close to the forward cylinders as possible allowing for flex under heavy braking. The vfr swingarm length was already decided for me by Mr Honda. So that's the overall wheelbase!

Rake - don't know if any of you guy's have read Tony Foale's Motorcycle Handling and Chassis Design? Anyway in Tony's book he tried a few experiments with rake and trail on a BMW with various rake angles, Standard - 15 Degrees and zero. He noted that the bike was just as stable with 15 or 0 rake but experienced telescopic fork judder. (tele's were pretty naff then) One thing he did notice is that steering was quicker with a steeper rake.. hence the fashion for GP/Race bikes to have steeper rakes than 5-10 years ago.

I guess I wanted to see what an even steeper rake would handle like? especially with vfr power.

http://www.vfrdiscus...tyle_emoticons/ (http://www.vfrdiscussion.com/forum/public/style_emoticons/)
default/smile.gif

Trail - the most determining factor on stability and a motorcycles self-centering effect. shorter trail - less effect -but less stable. longer - more effect - more stable.

I've design the trail to be 96mm at the moment as this about the same as a CBR600RR - known for impressive

cornering.

Anti-Dive - purchased a copy of Tony's FFE (Funny Front End) Software for this.

I didn't want the first ride to be too dangerous so the current geometry is pro-dive bias so that it didn't feel really unfamiliar (the lengths of suspension arms can be altered to change this later)

disclaimer : I am no expert on this ! it's a trial by fire approach!

Your input would be most appreciated! :thumbsup:

Edited by redmarque, 07 April 2008 - 03:47 AM.

Arion

Posted 08 October 2007 - 10:30 PM

redmarque, on Oct 8 2007, 05:07 AM, said:

I am no expert on this ! it's a trial by fire approach!

Your input would be most appreciated! :thumbsup:

That's alright, I'm pretty sure only Norman Hossack himself and a few engineers at BMW can claim to be experts on this type of suspension system. That said, I'll offer my 2¢ on what I've studied of Hossack suspension systems.



If you examine the image of the BMW K1200S, you'll notice that the front wheel is a long way in front of the engine relative to telescopic fork equipped bikes. That's because both Norman and BMW independently found that these suspension systems work best with a 50:50 front/rear weight bias, just as the best/ideal sports cars do. This is one aspect that is very different from front heavy telescopic fork equipped sports bikes, the VFR800 and CBR600 included.

The positioning and angling of the front suspension arms also indicates that there is significant anti-dive designed into the BMW system, taking advantage of one aspect of Hossack systems.

If you're to use the existing Honda swing arm then you have little choice: shortening the wheelbase will require a higher front weight bias. This will however be even higher than the telescopic fork equipped VFR800, and so even further from the ideal for a Hossack. One option you might consider in getting a shorter wheel base and 50:50 weight distribution is fabricating a new single-sided swing arm from steel tubing, similar to what Ducati has already done on the MH900e and other bikes. Another option would be a conventional double-sided swing arm, but with the associated loss of a VFR identifier.

Whatever you decide, I admire your spirit. Besides, no matter how much analysing and discussing, there is no substitute for prototyping and testing.

Good luck. It would be interesting to see some track test results. The weight loss alone should be significant.

Edited by Arion, 08 October 2007 - 10:42 PM.

redmarque

Posted 09 October 2007 - 08:15 AM

Great Arion! this is just the type of input I've been looking for! hossack suspension is really an unknown quantity.

I agree that to adjust the weight bias using a custom swingarm would be the best solution as I don't really want to increase the wheelbase or rake\trail ☹️

Will just have to see how it works with the VFR swingarm first.

On your advise I am going to re-address the anti-dive situation. Tok Tokkie has suggested 60% anti-dive? I think I will try and calculate how much BMW used by scaling up the pic and entering in FFE software.

On another note.

My copy of the VOSA MSVA Inspection Manual arrived yesterday! ☹️ It's the UK Vehicle & Operator Services Agency Motorcycle Single Vehicle Approval Inspection Manual. (yawn) basically when you build a one-off bike in the UK it has to undergo an engineers report before they will allocate a Identification Number and allow a Registration number to be assigned to it. 29 Chapters of rules and regs about how high the lights are allowed to be, where the number plate can go. if any of the parts will cause injury, brake testing and exhaust noise etc. Great bed time reading!

I can see why most people use an existing frame and modify it saves loads of hassle! 🙄

redmarque

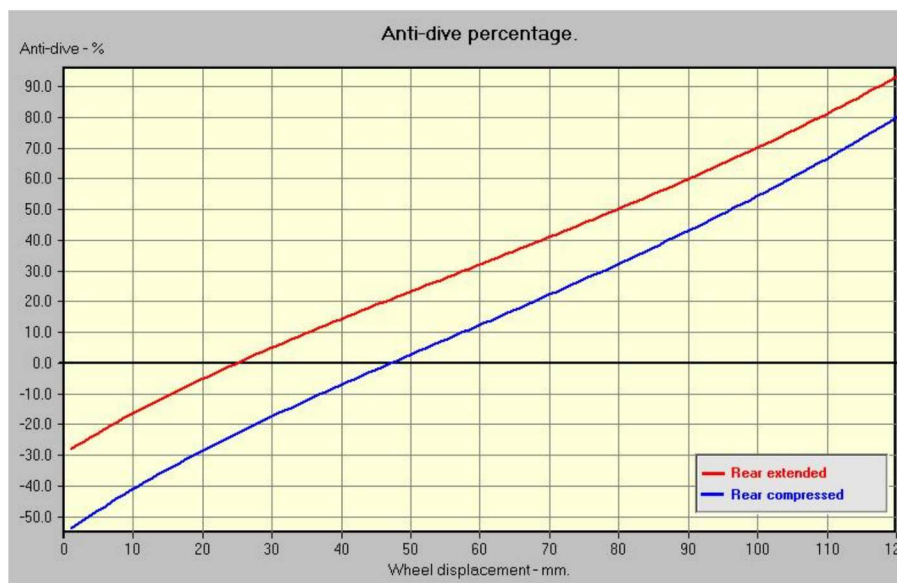
Posted 11 October 2007 - 03:23 PM

Been pondering the anti-dive on my design...

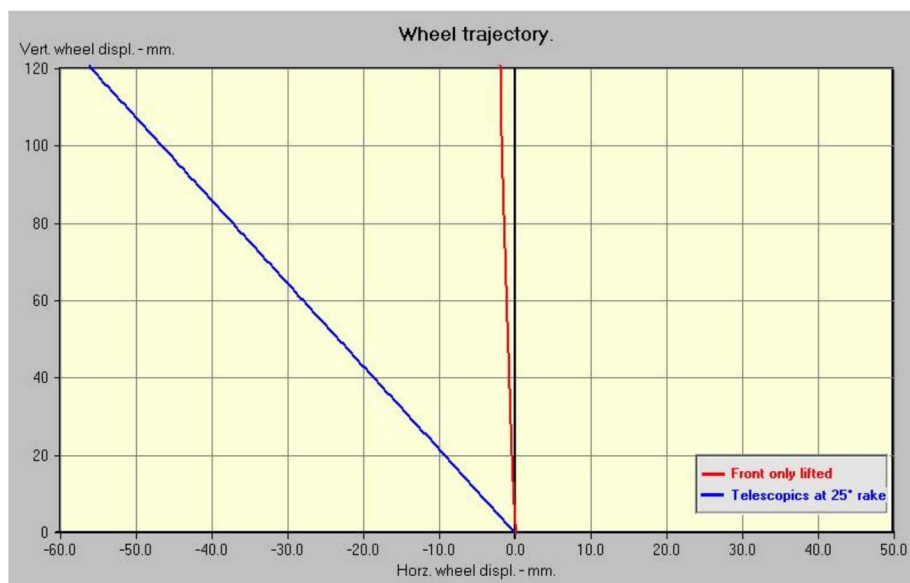
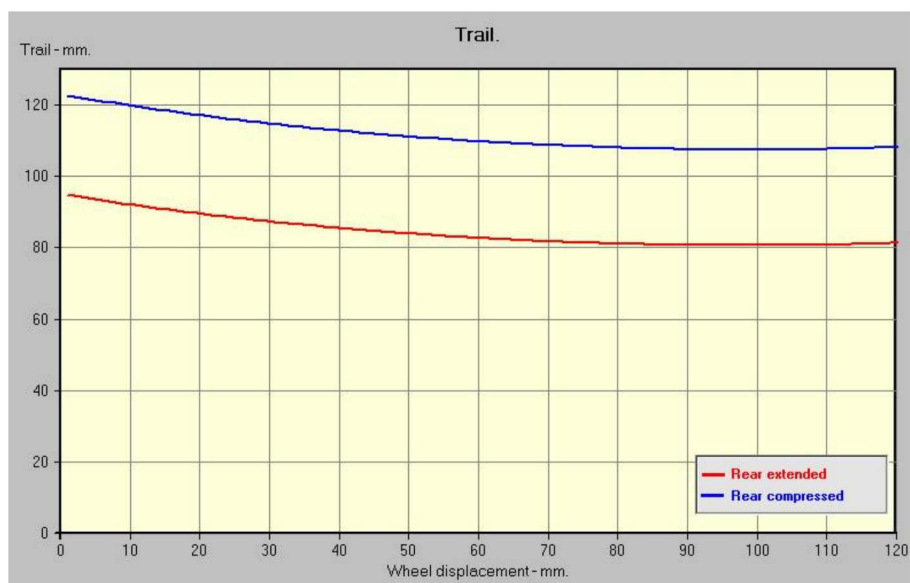
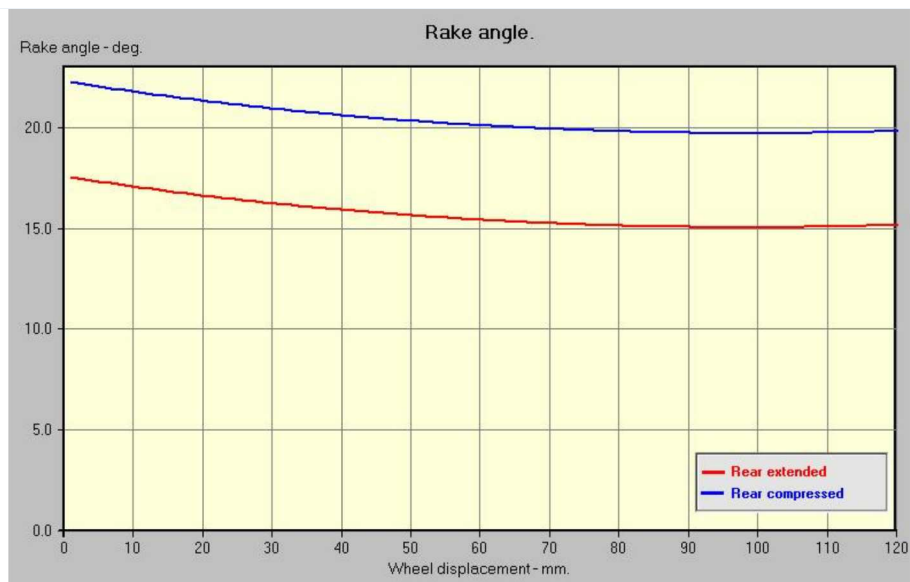
Arion seemed to thing it may produce about 5% anti-dive in initial suspension travel which got me very worried ☹️

At the time i hadn't got my laptop with the FFE software installed.. but I picked it up this evening and went over the design again.

Here are the graphs for anti-dive, rake, trail and wheel trajectory. lets say that sag is 25-30 mm and over all suspension movement is 120mm (same as standard VFR)



As you can see the anti-dive after 30mm goes upto 50% in the next 60mm of travel. If the base link is shorted by 5mm anti-dive goes up to 60% in the same distance. phew! :thumbsup: what a relief! :D



The Phantom

Posted 14 October 2007 - 11:01 PM

Those FFE graphs are way cool!

Good to see more progress, thanks for the update/s.

tok tokkie

Posted 15 October 2007 - 02:39 AM

On the FFE graph of anti-dive percentage:

1. It changes from pro-dive to anti-dive at about 35mm wheel deflection. Is 0 wheel deflection when forks are fully extended (ie front wheel just about airborne)? If so then 35mm is about normal static pre-load so it will be anti-dive under all normal conditions.
2. What does the curve for normal tele forks look like. I appreciate it is pro-dive all the way but it must be progressively less as the spring loads up I would expect.

redmarque

Posted 15 October 2007 - 08:13 AM

tok tokkie, on Oct 15 2007, 08:39 AM, said:

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2. What does the curve for normal tele forks look like. I appreciate it is pro-dive all the way but it must be progressively less as the spring loads up I would expect.

Yes that's right Tok. Zero is fork fully extended. So normal pre-load should be at about 25-30mm. I should be able to change this as the front shock top mounting will be adjustable for ride-hight.

What does the curve for normal tele forks look like?... don't know? Though I imagine pretty disgusting in comparision.. 😊 I'll have to check whether the FFE software can calculate it?

As for progressive - the graph shows a steady increase in anti-dive upto full travel. (If mr foale's maths is correct) also the rising-rate linkage will increase the force on the spring the further it's compressed too.

P.S. if MR Ohlins is reading this, I could really do with a nice pair of shocks to test with? 😊