From: gmclist-bounces@temp.gmcnet.org on behalf of Mike O"Connell
To: gmclist@temp.gmcnet.org
Subject: Re: [GMCnet] IMPROVING GMC BRAKES
Date: Tuesday, March 17, 2009 1:40:17 AM

Here's a few thoughts I've had since buying my GMC and examining Chuck's system.

Motorcycles also have rear-facing swingarms and most of the available braking force is at the front wheel as the weight transfers forward and is exacerbated by fork dive. To combat front-end dive some designs employ a front forward facing swingarm to mount the front wheel. This is quite similar to what we have on the GMC. In fact it may be useful to think of the GMC as a pair of very short wheelbased, extraordinarily heavy motorcycles (middle and rear wheels) with a stabilizing caster wheel way out in front. Ok maybe that's a little far-fetched but look at the design of the bogies and compare that to the chassis of a ELF/RADD-Parker design like the Yamaha GTS1000:http://www.motorcyclespecs.co.za/model/yamaha/yamaha_gts1000_abs.htm.
Perhaps the GMC middle wheel has more in common with the front wheel than the rear.

I know that they can adjust front swingarm geometry in these bikes to allow control of the degree of front-end "dive" that's generated under braking. The GMC appears to have a negative amount of"anti-dive" so that the front end (of the rear-end) is trying to pole-vault and raise the rear of the vehicle,On a bike this would would raise the front-end which actually help keep load the rear wheel but on the GMC it's just lifting the whole rear end and the rear wheel can't keep up. (Chuck am I on the right path here?) Its also apparent that in single bag systems the extension (or less compression) of the middle wheel suspension subtracts from the downward force exerted on the rear wheel.

Chuck's approach is also seen in many sport oriented motorcycles where the caliper is uncoupled from the arm and would rotate freely around the brake rotor except for a sturdy link that secures it to a point on the chassis. Therefore when the brakes are applied the caliper is pulling on the link and also pulling the rear arm downward. (which I find way easier to draw than to talk about) In sportbikes this help keep the wheel on the road and avoids "chatter" while braking when setting up for a corner or making mid-corner corrections.

So now I have a question: If my analysis is correct (?) in the case of the GMC, would altering the geometry of the front arm to allow for less anti-dive keep weight on the rear wheel? Like I said this wouldn't be true on motorcycles but because the front swingarm is between two other wheels it's acting like a rising fulcrum on a seesaw and all the weight is headed to the front wheel's end, thus lifting the rear.

An even more far-fetched question: Is there any way to link the front and rear swingarms in a way that would allow the front arm's downforce to be transmitted to the rear arm to affect a down fore there too? Maybe not while still allowing actual suspension to happen but it has been the topic of some cocktail napkin drawings around here lately.

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