From: gmclist-bounces@temp.gmcnet.org on behalf of Gary Casey
To: gmclist@temp.gmcnet.org
Subject: Re: [GMCnet] JUST WONDERING
Date: Wednesday, October 07, 2009 4:24:27 AM

I haven't had my oar in this water so far, but let me add another perspective. You can visualize the effect without thinking about the torque reaction. There is a braking load being applied at the road surface, one by the leading wheel and one by the trailing wheel and both are presumably equal. When you push back with the leading wheel (at ground level, remember) it will lift the pivot point because of the angle. Exactly the opposite thing happen at the trailing wheel. There is no net lift - the rear of the coach doesn't rise or fall. However, the leading wheel is being pushed down and the trailing wheel lifted. When the trailing wheel runs out of traction because of the reduced load it slides, after which the loads are no longer equal and the coach will rise if the brake torque continues to increase. Draw a line between the pivot point and the ground contact and you can see it is significant (30 degrees? 40? I haven't measured, but it is not
far from 45). What to do? Could move the pivot further away from the contact, even to infinity with a parallel linkage arrangement. But it would have to be done on both leading and trailing wheels. Do it to only the rear and the reaction at the leading wheel will actually lift the coach, with the effect that the traction on the rear will still drop. In short, I agree with Chuck.

I wonder if the GM engineers realized this was an issue way back when. I would have to think they did, but maybe figured it wasn't worth doing a complete redesign to fix it. the maximum braking effort would occur with all 6 wheels locked, which could still happen, but the trailing wheels would always lock early - way early. Did they just figure "so what?" An obvious solution would be to just make all the wheels "trailing" by putting the pivot for the forward wheel ahead. This would require 4 air bags and maybe they thought the shared air bag was so clever it outweighed the disadvantage. I don't know and I don't remember reading anything in the history of the design where it was considered. One thing for sure, the ride harshness imparted by the leading wheel largely negates the benefit of having 4 wheels back there.

Maybe I've just confused the issue. I think I'll stop now... :-)
Gary