



Breaking the Law **FOR THREEDOM**



Shootout of the Tri Kind

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Certain laws of physics dictate how we experience life on this planet. Things like gravity, what goes up, once in motion stays in motion and centrifugal force. Although we humans don't seem to pay much attention to these laws, builders

of rockets to the moon, planes, trains, automobiles and trikes do. The geometry of three wheels mock the physics of two wheels. With no lean angles, unbalanced mass and a side to side motion nonexistent in traditional motorcycling trikes challenge the laws of nature.

Exactly what is the design theory behind trikes, what's headshake, rake and trail? Dampeners, solid axle versus independent suspension and how do the various manufacturers of conversions and three wheeler's differ in design approach? First, a few definitions.

CENTRIFUGAL FORCE:

The reluctance of a body to change either its speed or direction, we feel a force pushing us to the outside of the curve.

HEADSHAKE: A wiggling of the front wheels/handlebars at slow speeds caused in part by the stationary rear wheels.





RAKE: The angle in degrees of the steering neck from the vertical cord.

TRAIL: The distance defined by the vertical line from axle to ground and the intersection of centerline of the steering neck and ground.

STEERING DAMPENERS/STABILIZER: Linear dampers resemble a telescoping shock absorber and operate in a similar manner, one end of the damper mechanism is mounted to the steering yoke, the other to the frame.

SOLID AXLE: Sometimes called a live axle, is a type of beam axle suspension system that uses the drive shafts that transmit power to the wheels to connect the wheels laterally so that they move together as a unit.

INDEPENDENT SUSPENSION: A broad term for any suspension system that allows each wheel on the same axle to move vertically (i.e., reacting to a bump in the road) independently of each other.

The Gods of Triking Strike with their trident and the trinity of tires converged. Suddenly before me sat Lehman's stunning Crossbow built on the



Victory Vision platform, Champion's new independent suspension Harley Electra Glide Ultra Classic, Harley's own Tri Glide Ultra Classic, an outrageous Boss Hoss V-8 powered '57 Chevy, and the Can Am RT touring Spyder. What's a writer to do! I needed to ride them all and playing musical Trikes was the solution. Rounding up the usual suspects (some of Southern California's most notorious riders/trikers) I mapped out a route with stops incorporating freeways, mountains, hill'n'dale and at each stop we'll play musical trikes, swap bikes, fill out a checklist of observations and start again. Sure there may be personal biases but compiling an objective review from the data will be my job.

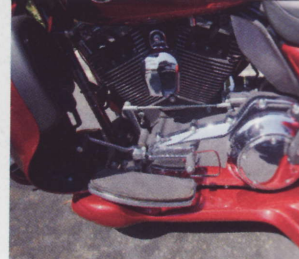
Meeting at Westminster



Harley-Davidson on a perfect California day it was an impressive gathering of repeat offenders and these heavy hitters commanded the parking lot. With coffee in hand we prowled about checking out each others machines like convicts in a prison yard. Both female riders have to bow out of riding the 5,700cc Boss Hoss V8. Not that they were intimidat-

ed, at barely 5 feet tall they couldn't comfortably reach the controls and their legs actually made contact with the crackling hot exhaust manifold. Mug shot's taken, legal disclaimers filled out, route in place and riders at the ready we were off to break some laws. Taking a delta formation we dominated all lanes of the freeway... just because we could.





Champion's Independent Suspension Harley Electra Glide Ultra

Riding Champion's Comfort Ride Trike (CRT) Harley-Davidson Electra Glide Ultra I was immediately impressed at how forgiving the suspension was. Changing lanes at high speed, cornering and hitting rough freeway patches the Champion CRT seemed more tolerant of the inherent side to side motion associated with three wheels. This observation was later confirmed when I got another chance to spin her through parking lot speed bumps and slow speed maneuvers. CRT features high pressure gas shock absorbers, forged upper and lower control arms, and high pressure cast components, all adding strength and reliability while reducing weight. Champion Trike also employs its EZ-Steer, a raked triple tree kit, that adds between 4.5 and 6 degrees (depending on the motorcycle model) to the rake of the motorcycle. This accessory significantly lightens steering, making it "quicker," by reducing trail. A Variable Sway control (VAC) systems allows the rider the ability to change the handling characteristics of the trike. Therefore, adding to the performance for curves or comfort for highways and city driving Champion also chose to increase the width of the rear wheelbase to 57.75 inches



as opposed to the Tri Glide's 43.88 inches. Champion claims this geometry also improves stability. Champion also states that using automotive type brake calipers and rotors improves braking but we didn't do any braking distance tests. My only criticism has nothing to do with the Champion conversion, that

was exemplary, but the TC96 powerplant is underpowered for that much mass. Harley owners are quite familiar with this and a multitude of aftermarket products such as stage one and stage two upgrades address this issue. Overall the aesthetic, storage, paint, and fitment of the Champion conversion received very positive reviews by all the riders.

Our first stop at Irvine Lake afforded a break for the first evaluations and time to switch. We started out with another Champion conversion on a Honda Goldwing but unfortunately the battery on the Wing died; nada, nix, nay, nothing. Fortunately we could push start it with the help of three grown men but nonetheless the Wing was disqualified from the shootout. We received tutoring in the use Champion's true mechanical reverse gear. The Champion reverse gear is amazing, actually powered by the engine and could probably back you out of a black hole but procedure must be followed (as we began finding out all day long on several trikes).





Harley-Davidson Tri Glide with TC103 engine

2 On the road again I commanded the 2010 Harley-Davidson Tri Glide. If it sounds and feels like a Harley it must be a Harley. The TC103 powerplant was a very wise choice as the standard engine for the Tri Glide. New owners will be immediately at home on the Tri Glide and it delivers exactly what Harley-Davidson owners would expect. The rake at the neck is 26 degrees and

the fork angle is 32 degrees, as opposed to standard touring two wheelers with a 29.2 degree fork angle. This reduces headshake and creates better slow speed handling. Harley actually added a dampener which helps reduce slow speed headshake but also increases steering resistance. The Tri Glide also carries the proprietary Lehman (H-D's trike partner for '08-09) "No Lean" suspension and was designed and manufactured

to be the most inflexible in the market. The theory behind this is reinforcement of the original motorcycle frame combined with added bracing of the swingarm that reduces sway and body roll. The (optional) electric reverse was simple and easy to use. With the bike running in neutral there is a toggle switch on the handlebars to engage reverse. The reverse does have a circuit breaker which seems sensitive and can be tripped easily.

Craig of Westminster Harley also stated that running a lower tire pressure in the rear wheels to 24-26 psi also increases riding comfort. Aesthetically the Tri Glide looks like a '50s Servicar and I ranked it as the least attractive of the lot. The Tri Glide weighs in at 1174 pounds dry and has passenger handle grips. List price is \$29,999. For 2011 Harley-Davidson will manufacture all of the components of its trike in house.



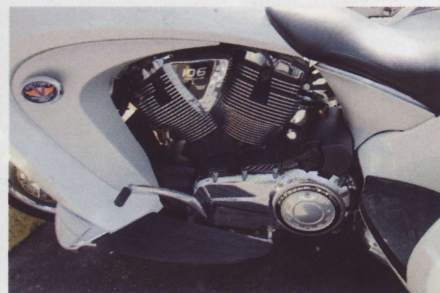
Boss Hoss ZZ4 '57 Chevy

3 At our third stop at Cook's Corner we encountered another problem. The stick shift of the Boss Hoss was stuck in drive. It turns out operators must put the automatic transmission in park before hitting the kill switch and the Boss Hoss won't start unless it's in park. With the combined genius of our criminal minds we were able to massage the B&M ratchet shifter into 1st-gear, then put pressure on it, kicked it up to 2nd-gear while maintaining upward pressure and kicked it back into park.

With a cast iron 355 cubic inch V8 engine the powertrain is more car than a motorcycle as one would expect. I grabbed hold of the beast and we roared to the next destination. This trike is not for the faint of heart, it feels like you could do wheelies and the overall position is akin to wrestling a bear (which isn't far off). The 3-speed automatic transmission was very

responsive and I took a liking to the Boss immediately. This thing looks like its breaking the law standing still, in fact Art was pulled over during the ride (from lack of a license plate) but he was always way ahead of us and I didn't even ask how fast he was going.

Everyone enjoyed riding on and even riding behind this behemoth because of its unusual visage on the road. This bad boy has no amenities like audio system or front fairing and there is certainly no need for heated seats. Sitting directly over a 415hp engine gets hot. With water cooling and fan requisite of a Rolls Royce it still gets toasty. I was a little suspicious of the claimed gas mileage of 18mpg but the Boss Hoss pulls like a dragster and the massive trunk can serve as hotel or hearse. Weighing in at 1,455 pounds this trike is all about big and with a retail price of \$49,850, requires a big bank account. It won flat out across the board in the power and cargo categories.



Lehman Crossbow Victory Vision

4 Our last switch before lunch put me on the Lehman Crossbow based on the Victory Vision platform. I am a huge fan of the Vision for long distance touring. The comfortable seating, electric windshield, great sounding stereo, incredibly well designed floorboards, and the power of Freedom 106 engine make this trike road ready right off the showroom floor. I think Lehman did an artful fabrication design on the body; the fluid lines make this without question my favorite looking trike. In fact wherever we went similar comments abounded. Easy access to the Victory air ride suspension and the hand pull parking brake was easy to use and worked like a charm. The powerful motor allowed this trike to hit 100mph with a passenger. Unlike all other Lehman conversions however (including the Harley Davidson Tri Glide) the Vision platform from the

passenger seat forward is bone stock, meaning there was no modification of the rake or trail of the forks giving this trike the most headshake of the bunch at slow speeds, but dissipated at higher speeds. Coupled with the solid axle design the treadwear on the front tire was indicative of the considerable upper body strength required to turn the forward momentum of two massive stationary rear wheels and moving mass. Perhaps Lehman will implement their usual rake and trail mods into future incarnations of their Crossbow. Lehman Trikes use a separate electric motor for reverse gear. This is done as a safety feature so riders don't "over accelerate" in reverse and lose control. The Crossbow moved in reverse at a snail's pace and was pathetically underpowered for its 1187 pound dry weight. Morphing from two to three wheels alters the motorcycle's front to rear axis angle which may affect gas tank capacity. Lehman addressed

this with a sticker on the gas tank. The Vision tank holds 5.8 gallons, from dead empty (I ran it out of gas) to completely topped off, while the Crossbow holds 5.3 gallons. Prices start at \$33,995.

Lunch was buzzing with pros and cons, likes and dislikes, more checklists and the final game of musical trikes.

My last mount was The Can Am Spyder RT and the terrain ahead was the most challenging of all. The Ortega highway (CA 74) rises from the Pacific Coast with miles of twisties heading into the mountains. This is what Southern Californians do on weekends riding to Hell's Kitchen and the Lookout Road House. Since 1968 the Lookout has been serving tasty breakfasts, lunches and dinners, a great selection of beer and wine plus the view is stupendous. Its website touts a great ride, great view, great food, great people and lousy service. But hey, who complains in paradise?





Can Am RT BRP

5 Bombardier Recreational Products (BRP) is a Canadian based company. The Spyder qualifies as a trike because it has three wheels, but the configuration is different with two wheels in front and one in the rear. The rear wheel is belt driven and the two front wheels employ a double A-Arm with an antiroll bar with gas shocks and five-position adjustability. Unlike most trikes that are based on existing motorcycle platforms then converted into three wheelers the Spyder was designed from the ground up as a trike. Without question this is the most technologically advanced of the lot employing an stability control system, traction control system, dynamic power steering, and electronic brake distribution to its ABS braking system. Also, this Spyder was the semi-automatic version. The Spyder does not handle anything like a traditional trike and in fact I was surprised by the initial response. The Spyder at first seemed loose and unruly as it would tuck into corners and rebound out. I soon stopped trying to forcibly control the frontend (as I had been doing all day on the

other trikes) and let the bike do its job and suddenly what at first seem disconcerting became natural and intuitive. I realized this bike is without a doubt most akin to traditional motorcycling on three wheels. Conversely the Can Am owner was surprised at the difficulty and force required to pilot the standard trikes (she had never ridden a conventional trike before). Riding position on the Spyder was very erect with a feeling of riding on the trike rather than in the it. The center position pegs for the driver are cramped for riders over six feet tall. The 998cc liquid cooled Rotax twin engine puts out 100hp claiming 28/32 mpg. With a multitude of storage options in front and back the Spyder came second in the storage category. Aptly named with its multi-eyed arachnid demeanor the Spyder weighs in at 929 pounds dry and was the lightest of the bunch. And at \$20,999 also the least expensive. Truthfully, it's not fair to compare the Spyder to other conversions because as stated, it's a totally different geometry designed from the ground up and its only commonality is that it has three wheels.

SPECIAL THANKS TO ALL THE USUAL SUSPECTS PARTICIPATING IN THE SHOOTOUT.



CRAIG FRANZ – Height 5'11", owner Westminster Harley-Davidson (hdwestminster.com) and provided the Harley-Davidson Tri Glide.



MOLLY KIGHT – Height 5'0", freelance moto-journalist enjoyed the Champion Harley-Davidson Courtesy of Jim Pinto of Champion Trikes (championinsidecars.com).



ART HALL – Height 5'10", moto/photo journalist broke all the rules on the Boss Hoss courtesy of California Boss Hoss (californiabosshoss.com).



GREG DARLING – Height 5'9", owner Cycle Dragon Victory (cycledragon.com) provided the Lehman Victory Vision.



KATHLEEN FLETCHER – Height 5'2", of Malcolm Smith Motorsports (malcolmsmith.com) provided the Can Am Spyder RT.



GARY "KOZ" MRAZ – Height 6'1", moto madman and freelance journalist.