

BREAKING THE LAW OF THREEDOM

Story by Gary Koz Mraz Photos by Ron Sinoy



Certain laws of physics dictate how we experience life on this planet. Things like gravity, what goes up, a body in motion stays in motion and centrifugal force. However, we humans don't seem to pay much attention to these laws, building rockets to the moon, planes, trains, automobiles, and Trikes. 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, they challenge the laws of nature. Exactly what is the design theory behind Trikes, what's Headshake, rake and trail? Dampeners, solid axle vs. 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/handle bars 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- is 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 converge. Suddenly before me sat Lehman's stunning Crossbow built on the Victory Vision platform, Champion's new Independent Suspension Harley Electra Glide Ultra, Harleys own Tri Glide, an outrageous Boss Hoss V-8 powered '57 Chevy and the new Can Am RT touring Spyder. What's a writer to do! I need 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 observa-

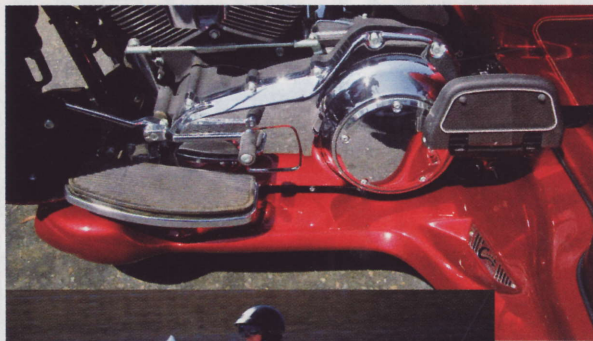
tions and start again. Sure there may be personal biases but compiling an objective review from the data will be my job.

Meeting at Westminster Harley-Davidson on a perfect California day it's an impressive gathering of repeat offenders and these heavy hitters command the parking lot. With coffee in hand we prowl about checking out each other's machines like convicts in a prison yard. Both female riders have to bow out of riding the 570cc Boss Hoss V8. Not that they're intimidated, but at 5 and 5.2 feet tall they couldn't comfortably reach the controls and their legs actually make contact with the crackling hot exhaust manifold. Mug shots taken, legal disclaimers filled out, route in place and rider's at the ready were off to break some laws. Taking a delta formation we *dominate* all lanes of the freeway... just because we can.



Champion's Independent Suspension Harley Electra Glide Ultra

Riding Champion's CRT (Comfort Ride Trike) Harley-Davidson Electra Glide Ultra, I am immediately impressed at how forgiving this suspension is. 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 is later confirmed when I get 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 employ their EZ-Steer, a rake kit (a triple tree change out) that adds between 4.5 and 6.0 degrees (depending on the motorcycle make) to the stock rake of the motorcycle. This accessory significantly lightens steering, making it "quicker", by reducing trail. VAC (Variable Sway control) systems allow 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 say the H-D Tri Glide's 43.88 inches, claiming this geometry also improves stability. Champion also claims that using automotive type brake calipers and rotors improves braking but we didn't perform any braking distance tests. My only criticism has



nothing to do with the Champion Conversion, that's exemplary - the TC-96 power plant is underpowered for that much mass. Harley owner's are quite familiar with this and a multitude of aftermarket products such as and stage one and stage two upgrades address this. Overall the esthetic, storage, paint and fitment of the Champion Conversion received very positive review's 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

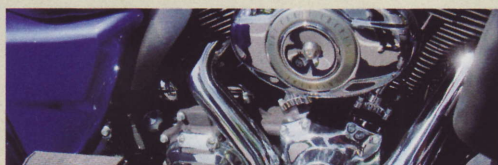
on a Honda Goldwing but unfortunately the battery on the Wing died, nada, nix, nay, nothing. Fortunately we could push start it with the help of three grown men but nevertheless this disqualified it from the shootout. We received tutoring in the use Champion's true mechanical reverse gear. The Champion 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).

Lehman/Harley Davidson Tri Glide with TC 103 engine

On the road again I command the Harley-Davidson Tri Glide, and if it sounds and feels like a Harley it must be a Harley. The TC-103 powerplant was a very wise choice as the standard engine for the Tri Glide. Currently, only found on the 2010 Electra Glide Ultra limited and the Tri Glide is my favorite Harley-Davidson

engine, hands down. 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 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 adds a dampener which helps reduce slow speed headshake but also increases steering resistance. The Tri Glide also carries the proprietary Lehman "No Lean" suspension and is 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 swing arm claiming there is little sway or body roll. The (optional) electric reverse was simple and easy to use. With the bike running in neutral and there is a toggle switch on the handlebars. 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 lbs also increases riding comfort. Esthetically the Tri-Glide looks like a 1950s Servi-car and I ranked it the least attractive of the lot. The Tri Glide weighs in at 1174 lbs dry and has passenger handle grips. List Price \$ 29,999.00

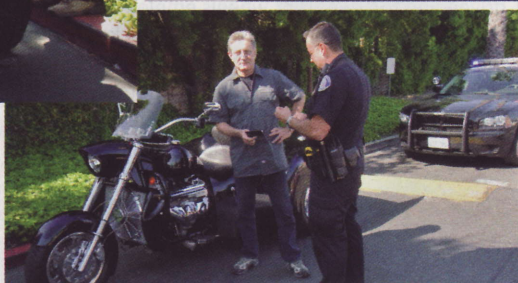


Note: As of 2011 Harley Davidson will be manufacturing all the components of their Trike and as of this printing no official information is available about its construction or design.

Boss Hoss BHC-9 ZZ4 57 Chevy

At our third stop at Cook's Corner we encounter 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 (procedure's must be followed) and the Boss Hoss won't start unless it's in park. With the combined genius of our criminal minds we're able to massage the B&M ratchet shifter into 1st gear, then put pressure on it, kicked it up to 2nd gear maintaining upward pressure and kick it back into park.

With a cast iron 355 cubic Inch V8 engine the power train 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 feel's 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 our ride (because the Trike had no plates) 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, front fairing and there is certainly no need for heated seats. Sitting directly over a 415hp a big block V8 engine gets hot, though water cooled and fan requisite of a Rolls Royce it still gets toasty. I'm 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 1455 lbs this Trike is all about big and with a retail price of \$49,850.00 requires a big bank account. It won flat out across the board in the power and cargo categories

Lehman Crossbow Victory Vision

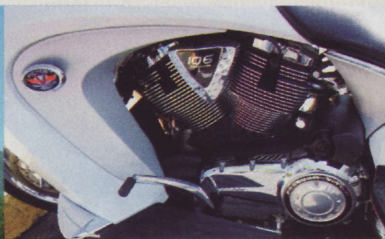
Our last switch before lunch put me on the Lehman Crossbow based on the Victory Vision platform. I am a huge fan of the Vision for long distance touring. The comfortable seating, electric windshield, great sounding stereo, incredibly well designed floorboard and the power of Freedom 106 engine make this 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 ensued. Easy Ac-

cess to the Victory air ride suspension and the hand pull parking brake is easy to use and works like a charm. The powerful Freedom 106 allows this Trike to hit 100 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 is *no* modification of the rake or trail of the forks, giving this Trike the most head shake of the bunch at slow speeds. This of course dissipates at higher speeds. Coupled with the solid axle design the

tread wear 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 & 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 loose control. Generally sufficient but this Victory Crossbow moved at a snails pace and was pathetically underpowered for its 1, 187 lbs dry weight. Finally, an issue that may well affect other Trikes but Lehman addressed with a sticker on the gas tank - morphing from two to three wheels alters the motorcycle's front to rear axis angle which may affect gas tank capacity. The Vision tank holds 5.8 gallons, from dead empty (I ran it out of gas) to completely topped off, the Crossbow holds 5.3 gallons. Price: Starts 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 (Hwy 74) rises from the pacific coast with miles of twisties. This what Southern Californians do on weekends, riding to Hell's Kitchen and The Lookout Road House, and it's a great rider's road.



Can Am RT BRP

(Bombardier Recreational Products) is a Canadian based Company. The Spyder qualifies as a Trike only because it has three wheels, but the configuration is opposite with two wheels in front and one in rear. The rear wheel is belt driven and the two front wheels employ a double A-Arm with anti-roll bar with gas shocks and 5-position cam adjustment. Unlike traditional Trikes that are based on existing motorcycle platforms then converted into three wheels, the Spyder is designed from the ground up. Without question the most technologically advanced of the lot employing an SCS Stability Control system, TCS Traction Control System, DPS Dynamic Power steering and EDB Electronic Brake Distribution to its ABS integrated 3 wheel 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, it would tuck into corners and rebound out. I soon stopped trying to forcibly control the front end (as I had been doing all day on the other Trikes) and let the bike do its job and suddenly what at first seemed dis-



concerting became natural and intuitive. I realized this bike is with out a doubt the most akin to traditional motorcycling on three wheels. Conversely the Can Am owner was surprised at the difficulty and force required to pilot standard Trikes (she had never ridden a conventional Trike prior). Riding position on the Spyder is very erect in both seats, riding on the bike rather than in the bike and center position pegs for the driver are cramped for over 6 footers. The 998cc



liquid cooled V-Twin Rotax engine puts out 100 hp claiming 28/32 mpg. With a multitude of storage options in front, back and hard bags, it came second in the storage category. Aply named with its multi-eyed arachnid demeanor the Spyder weighs in at 929 lbs dry and was the lightest the bunch, also at \$20,999.00 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.

Does the Jury have a Verdict?

First Place - Champion Harley-Davidson Ultra

When the smoke cleared and points tallied in fourteen categories, the Champion Harley Davidson Ultra was THE Champion in this shootout. Riders across the board commented that the suspension feedback was dynamic, responsive and as I called it "forgiving," with the TC-96 being the only weakness. **Comments:** "Fewest idiosyncrasies", "Easiest to Ride", "My favorite bike in the group".

Surprisingly, in **second place** was the **Can Am Spyder**, probably because it felt more like a motorcycle. Every rider purported unusual handling compared to the other standard Trike's yet it received the second highest overall points. Undisputedly the most technologically advanced but ranked low on the riding position and cramped cockpit: **Comments:** "Bumpy steering", "Downshifting (Semi-Automatic) is a bit intimidating", "Overall fun to ride", "Easy to learn".

In **third place** was the **Lehman Harley-Davidson Tri Glide**. It excelled in power with the

standard TC 103 power plant and creature comfort's but Lost points on the esthetics. **Comments:** "Good basic Trike", "Stiff steering", "Overall very good ride", "Outdated look".

The Lehman Victory Vision scored the highest marks across the board for looks, power, comfort and audio but took **fourth place**, really losing points with low speed headshake and handling. **Comments:** "Beautiful bike", "Hard to ride for a small woman, requires lots of upper body strength" "Very comfortable ride", "Heavy steering".

Last, but definitely not least was the fastest, baddest Trike on the block. With the biggest engine, biggest gas tank, biggest trunk and the biggest price tag this bike is not designed for everyone but if big is your bag this trike's for you.

Comments: "Wow!", "Wide stance, noticeable engine heat", "Stiff throttle", "Completely impractical but really fun to ride".

Not Guilty!

Three wheels break convention in the world of motorcycling. Sometime's shunned because



they don't act like motorcycles or command too much space at bike night. Sometimes praised as a godsend to those who want to stay in the wind but duck walking 900 lbs of HarleySapians isn't plausible anymore. Trikes don't require a M1 motorcycle license in some states and are appealing to rider's who want the security of three wheels or added ease of pulling a trailer. Trikes are not a waning fad, in fact statistically have been one of the few growing motorcycle segments the past several years. Next time you hear the distant thunder of approaching motorcycles and a wave of Trikes crest the distant hill, be afraid because these outlaw Trikers show no regard to the laws of physics or geometry. They ride hard... they know their rights and will staunchly defend their Threedoms.



Craig Franz – Height 5'11", Owner Westminster Harley Davidson Westminster Ca. Provided the Champion H-Dn Tri Glide



Molly Kight – Height 5'0" free-lance Moto-journalist riding the Champion Harley-Davidson Courtesy of Jim Pinto Champion Trikes



Art Hall – 5'10" Moto/Photo Journalist Quick Throttle Magazine, riding the Boss Hoss courtesy of California Boss Hoss



Kathleen Fletcher –Height 5'2" Malcolm Smith Motorsports provided the Can Am Spyder RT



Greg Darling – Height 5'9" Owner Cycle Dragon Victory/ Cerritos California provided the Lehman Victory Vision