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MOTORCYCLE CONSUMER NEWS
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Z650
PLUS
STREETMASTERS
MOTO GUZZI
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Editorial, Production and Corporate Office
2030 Main Street, Suite 1400, Irvine, CA 92614
949-855-8822; fax: 949-855-0654
editor@mcnews.com
mcnews.com

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Brands

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MARKETING IS A tricky devil. Manufacturers must inform customers about the availability and benefits of products and services to entice consumer action. Corporations do everything in their power to manage and sustain positive momentum.

The Automotive industry, through growth and merger, has had an overwhelming number of brands, many of which are now retired. GM currently markets 12 brands worldwide, four actively in the U.S.—Pontiac, Oldsmobile, Buick, Saab, Hummer and Saturn have all been retired. Other U.S. casualties include Ford's Edsel and Mercury and Chrysler's AMC, Plymouth, Eagle and DeSoto brands. Toyota recently retired the Scion brand.

Motorcycles follow a similar pattern, brands come and go, but an oddity in our world, they often rise from the grave. For every resurrection like Ariel, Brough Superior, Indian, MV Agusta, Norton and Triumph, there is a defunct BSA, Buell, Excelsior-Henderson, Vincent and … Victory.

A Polaris press release on Jan. 9 announced immediate divestiture of the Victory marque and indicated the decision was due to a struggle establishing market share, which affected profitability. Polaris made a valiant effort to market the brand for nearly two decades, yet Victory likely never matched the results achieved by Indian in six short years. Polaris' 2015 annual report indicates that 65 percent of revenues come from off-road vehicles like the Ranger and RZR, 17 percent come from parts, accessories and apparel, while only 8 percent come from motorcycles, including Victory, Indian and Slingshot. Polaris Industries Inc. actively markets more than 20 brands (six have Polaris as part of the name). Perhaps culling the herd was easier than renaming them Polaris Indian, Polaris Victory and Polaris Slingshot.

Shuttering brands while a company remains viable is not unprecedented in motorsports. Harley-Davidson killed Buell. Yamaha rolled out Star motorcycles in 1994, only to roll them back into the Yamaha brand in 2016. Supporting multiple brands not only increases marketing costs but often dilutes brand identity. How many motorcyclists can identify that Aprilia, Moto Guzzi and Vespa are the same company? Want a Derbi, Gilera or Scarabeo? Parent company Piaggio owns and markets all six, plus their eponymous brand. Consumer confusion due to lack of brand unification may be the primary reason Piaggio products aren't better recognized or represented in America.

In 2014, Polaris notified dealers that Victory and Indian were the only brands allowed in their "boutique" stores—like Harley dealerships. Victory was not to be mixed with European and Japanese bikes. In 2016, similarities between the Indian Scout and Victory Octane caused many brows to rise. In August 2016 Polaris announced it would not be exporting 2017 bagger and touring models to Europe, Middle East and Africa (EMEA), indicating they weren't planning to update Victory platforms to Euro4. Brammo didn't announce any 2017 models. At the close of 2016, Polaris abruptly changed external marketing partners for the motorcycle division. The signs were everywhere.

It doesn't make any sense for a multibillion dollar company like Polaris to throw out Victory, Brammo and the associated investment. More likely, it is a write-down to reduce the tax liability for 2017 and a reappropriation of staff and technology to other platforms and projects. Brammo electrics would make sense in the Slingshot and off-road platforms. Several Victory models could be easily rebadged as Indians. In fact, the 2017 models slated to go to EMEA were the "Modern American Muscle" Octane, Judge, Gunner and High-Ball. These would slot nicely into the Indian lineup, with little cannibalism of the heritage baggers—similar to how V-Rod is a more modern, performance-oriented Harley. Polaris could market a combined 15 motorcycles under the well-known Indian brand by simply moving six bikes across.

Watch for an even bigger marketing push and further growth from Indian very soon. MCN

LETTERS

THE MEGOLA ENGINE (MCN 1/17) spins with the wheel and the crankshaft is stationary. This is technically a "rotary" and not a "radial" engine, as stated. Rotaries were, by design, notorious oil slingers.

—Michael Gordon Knight

Correction: Megola is rotary, not radial.

—David Hilgendorf

AS A VIETNAM veteran exposed to Agent Orange, I was diagnosed with Acute Peripheral Neuropathy, i.e., numb feet, making shifting painful. I thought I had to quit riding or buy an automatic. I came across Bates "combat boots." Above the ankle, laced front, side-zippered, oil resistant sole and, best of all, steel toed. The zipper makes them easy to put on and with steel toes I can shift without pain. If foot trouble makes shifting difficult, get comfortable steel-toe boots.

—Frank C. Cooper

IT'S INTERESTING that a 2004 Suzuki V-Strom 650 (MCN 5/04) can equal or best the Africa Twin (MCN 1/17) in the quarter-mile. Maybe that's the price to pay for a SOHC?

—Jacques Eicher

The power-to-weight ratios are very similar on these two bikes, as the V-strom is a good 60 pounds lighter. There's a good chance the tester in 2004 weighed considerably less than my 200 pounds, geared up. There are many other factors in the equation as well, such as the knobby tires on the Africa, and testing environment variables.

—David Hilgendorf

DAVID HOUGH'S ARTICLE suggests "being seen" is a worthless tactic to employ in surviving the risk laden world of motorcycling (MCN 1/17). The example of Foveal vision—to debunk "being seen" as a worthy strategy—is interesting and no doubt, relevant. However, your message that "being seen" holds no relevance makes the assumption all drivers are operating at the same level all the time.

A fire truck in the distance, with lights and sirens engaged, will appear much smaller than vehicles in the immediate area, yet the loud, brightly colored engine will still gain the attention of some drivers, even at a distance. The lights and noise attempt to "steal" the attention of drivers in the area.

A motorcyclist wearing hi-viz clothing, utilizing a modulating light or running the high beam is also attempting to steal the driver's attention away from larger, more common vehicles in the immediate area. As with the fire truck, it need not steal the attention of all, but simply the one driver who is about to violate the rider's path.

From time to time, these attention-grabbing tactics actually work! A long and safe riding career requires multiple safety strategies employed simultaneously. While attempting to "Make other drivers stay out of your way" is not the best strategy, it is still a useful strategy. The high-viz helmet Mr. Hough holds in photos suggests he also employs strategies beyond situational awareness.

—Brian Buck

I don't think it is helpful to risk our lives and limbs on pseudo-science. The real issue is that motorcycling appears to be much more dangerous than the public has been informed.

If we don't have useful danger mitigation tactics in our toolboxes, we might conclude that motorcycling is more dangerous than we're willing to accept. Over the past couple of years, I have suggested tactics that I believe can help manage the danger.

What I said about conspicuity is that it's unreliable as a tactic for reducing the danger. What I mean by that is, thanks to the way a humans' eyes and brain work, many other drivers won't comprehend a motorcycle, even if it's in plain view. Scientists have not addressed this issue specific to motorcycling, but I suspect approximately half of the drivers in traffic won't "see" you, regardless of your conspicuity tactics.

It's like having a front brake that works half of the time. It might work correctly three times in a row, then the next time the lever flops into the grip.

JUSTICE

My experience with Harry Deitzler was excellent (MCN 12/16). He took time to speak with me about the issues facing my club and gave clear and concise advice. His column is unique, he is an excellent resource and I recommend anyone needing legal advice should contact him.

—Ira Sessler

Harry has the ability to translate legalese into something a layman can understand. I would like to see more space for the topic, including techniques lawyers use to beat insurance claims. Lineup (MCN 1/17) did not call out Justice, but I found it in Strategy on Page 12.

—Paul Klein

All of our writers bring interesting and often divisive perspectives from different points in the industry. Our uncommon voices make MCN unique.

You are correct, we relocated Harry's legal advice to lead the new Strategy section. Rest assured, it will be in the same place moving forward.

—David Hilgendorf

You can't say the brake is worthless, because sometimes it works. A good introduction to this is the "Invisible Gorilla Experiment" (aka "Gorillas in our midst") developed by Chabris and Simons.

—David Hough

WIRING DIAGRAMS, Part One (MCN 12/16), in figure 5, why not eliminate relay 2 and put the panel switch in the same location on relay 1, with the 2 power inputs remaining the same as in the diagram? The gain is obvious, but what would the downside be?

—Don Hevier

Your observations are correct and relay #2 could be eliminated from the driving light circuit. I used two relays in my example to stimulate the thought process of people learning to read wiring diagrams. When faced with a wiring diagram that has multiple relays, one has to determine what each relay does, how they are controlled and what would be the effect if one or more of them malfunctioned. The use of multiple relays for the same circuit is common in automotive electrical circuit designs but less so on power sports vehicles. While my example makes it clear how the relays are used in the circuit, a real motorcycle or automotive wiring diagram, spread out over many pages and/or electrical systems, would be more challenging to figure out. People that are just learning about wiring diagrams need the confidence that they can understand how a circuit works—then apply their newly learned skills to more complex diagrams.

—Tracy Martin

SEND LETTERS TO THE EDITOR

MCN Letters c/o Lumina Media
2030 Main St., Ste. 1400
Irvine, CA 92614
editor@mcnews.com

I CHANGE MY brake fluid at least once a year. The first time I had to do any repair to the hydraulics was after more than 300,000 miles and 34 years of daily use. When I disassembled the master cylinders and calipers, they were clean inside. They had the appearance of having been machined just that morning at the factory. I have seen my share of mud and crud that accumulates in brake systems.

The repair was easy, just pop in the new soft parts and bleed the system. I change the fluid by removing the master cylinder cover, rolling up a paper towel and soaking up the old fluid. I then replace with clean fluid and open the bleeders on the calipers, allowing gravity to drain the fluid through a clear hose until clean fluid appears, never allowing the master cylinder to run out.

—Tim Rauscher

Maintenance is something many riders tend to neglect (myself included). It's simply not the most glamorous part of owning a motorcycle, though it is vital to keeping one in good working order. Fortunately, we've got some of the best mechanics writing to raise awareness and help owners do it themselves. We encourage readers to perform regular inspections and maintenance on their motorcycles, even if they can't afford to pay a dealer to do it every time.

—David Hilgendorf

ABS IS MISUNDERSTOOD, even among some of the experienced instructors. With ABS becoming more common on smaller bikes, we will eventually encounter ABS-equipped training bikes. Our instructors need to be up to speed and able to intelligently answer questions students may pose. What is your testing process when establishing stopping distances with ABS?

—Dusty Powers

Technology is rapidly improving in every area of our lives, including ABS. Most streetbike-oriented braking systems no longer allow ABS to be disabled, and it will not engage until absolutely necessary to prevent locking. Riders can still maximize braking at the threshold of lockup and even perform a stoppie with ABS enabled on many bikes. That's pretty spectacular, technologically speaking.

It doesn't matter how fast a bike can stop in an ideal test environment with a dozen tries to optimize the results. What matters is how a bike reacts on impulse braking, when rider skill and conditions are less than perfect, i.e., in the real world. In that regard, the capability of ABS to prevent lockups is more likely to reduce the risk of crashing than any moderate increase in stopping distance it might cause. We are firmly committed to encouraging manufacturers to include ABS and riders to depend on it—it's that valuable.

I'd much rather impact upright at a lower speed and in control than lose traction and go down hard, impacting at high speed and out of control. ABS allows a much greater chance of braking recovery and obstacle avoidance if the rider maintains control. Riders should practice threshold braking with ABS, which is relatively low risk.

In our testing, several stops are made engaging ABS immediately and several more are made at the threshold. We publish the best number achieved, regardless of whether ABS engaged or not. Surface irregularities affect stopping distances much more than ABS engagement on most bikes. Our advice is to focus on controlled braking—easier with ABS as a failsafe—rather than the shortest possible stop, which is an unrealistic expectation with very inconsistent results in everyday riding.

—David Hilgendorf

DOWNTIME

Wobbles, Grease and Unobtainium

GOT PROBLEMS? MCN DOWNTIME
2030 Main St., Suite 1400, Irvine, CA 92614
or email questions with JPEG images to:
editor@mcnews.com Subject: Downtime

A FOLLOW-UP to my Bonneville high-speed wobble (MCN 10/16). I have done everything except the front fork rebuild. The wobble is less, but still noticeable. There is much mention of it online. I was wondering if this particular design has some sort of weakness?

—Dave Mentzer

IT SOUNDS LIKE you have a frequency problem (MCN 2/17), which needs to be interrupted—some bikes are incidentally built that way. The OEM may have addressed it with certain tires or suspension settings, but once changed they are no longer viable, unless you return to the baseline. My VTR1000 had similar problems on non-stock tires, causing a tank slapper that high-sided me at 85mph. Putting stock tires on fixed the problem.

More suspension damping front and rear may help—a steering damper may also. Suspension companies have equipment that accurately measures rake, trail, offset and wheelbase. They also have a huge database of chassis measurements, used to detect geometry anomalies, that may be inducing the frequency. Let them know your priority is to dampen the frequency rather than optimizing turning characteristics, though they may accomplish both.

—Kevin O'Shaughnessy

KEVIN'S ARTICLE about long-term winter storage (MCN 10/16) included the recommendation to put dielectric grease on electrical connectors. Silicone- based dielectric grease is an electrical insulator. It's purpose is to prevent the flow of electricity and the only appropriate place to use it on a motorcycle is a small amount inside the rubber boot of a spark plug, where it helps prevent high voltage tracking across the porcelain.

Too many people spend years chasing electrical gremlins due to use of dielectric grease on connectors in an attempt to prevent corrosion of the contacts. Petroleum jelly does a very good job, without disrupting the flow of electricity.

—Howard Rhinehart

YOU ARE CORRECT, dielectric grease is nonconductive. I suggest using a tube and applicator (finger, screwdriver, etc.), rather than a spray, to keep it local. It can be used to prevent oxidation of electrical components when specifically intended to prevent electrical flow.

Dielectric grease is recommended by electrical engineers and OEMs as the primary medium to use on electrical connectors of combustion engines for specific reasons. In the case of multipin connectors, conductive grease cannot be used, because it could arc to other wires, causing a voltage leak, generate heat or a "thermal event" (fire!). As a silicone-based oil and insulator, it resists freezing temperatures as low as -40 degrees F and won't melt until reaching 392 degrees, making it ideal for electrical connectors on hot engines and use in frigid regions.

The grease is slightly tacky and doesn't migrate from the connector. This is one of the benefits over petroleum jelly, which will melt at just over 100 degrees and expose the connector over time. It is also water, soap and solvent resistant, which is why it's so resilient and hard to clean up. Silicone is inert to motorcycle components. Simply blast the connector with compressed air and wipe it off, leaving the connectors shiny.

When a connector is put together, the electricity flows through the areas where the metal contacts meet. The areas not passing voltage (gaps) are exposed to the elements and prone to oxidation over time. Applying dielectric grease to these areas creates a protective barrier that is extremely resistant to migration from heat and resistant to chemical reactions. When couplers are connected, the contact points simply push the silicone out of the way and flow without problems.

I measured resistance through a set of identical contacts with petroleum jelly on one and dielectric grease on the other with no difference in resistance. If there were a loose connector, I'd expect the grease to prevent flow if a gap was present; however, in that case the connector would not flow electricity anyway, and would need to be replaced. Dielectric grease is an often misunderstood, but valuable agent for our vehicles.

—Kevin O'Shaughnessy

I HAD TROUBLE getting firm rear brake response on my '09 Triumph Speed Triple after changing the fluid. After using a MityVac type tool and going through a bottle of fluid, I saw a FAQ about removing the bleeder screws and putting Teflon tape on the threads. It worked, now I have a firm brake pedal.

Do you recommend Teflon tape for brake bleeder screws? Does this indicate that the screw is damaged?

—James Donath

THAT'S AN INNOVATIVE way of fixing the problem, but could create another complication. It is likely the original issue was that the bleed screw was out too far or vacuum was too high (or both), causing air to be drawn around the threads.

It wasn't filling the system with air, but it wasn't being productive either. The Teflon tape reduced air bleeding by the threads and allowed a larger volume of fluid to be drawn through. Either way, a replacement screw is cheap insurance.

My concern with the solution is tape working its way past the threads when opening and closing the bleed valve. If residue ends up in the line, it could cause the master cylinder to fail, so I'd recommend against it.

I like to use a vacuum tool initially to get fluid into the line, then use the lever method to bleed out the air. The challenge is when there is a high point in the line that traps air. If you don't move enough volume through, it will stay at the high point and cause a mushy feel or no pressure at all. You have to pump quickly while keeping the reservoir full. There are brake syringes that push fluid from the caliper up to the master (my preference) or the opposite direction, which work well also.

—Kevin O'Shaughnessy

I'M RESTORING A **'95 Honda ACE Shadow, VT1100C2 with low-speed rear end damage. My dealer would not quote this repair work, because Honda quit sourcing many parts for this 21-year-old machine. The biggest concern is the engine Ignition Control Module or "brain" (made by United Telecom in GA) and the associated HES harness, both of which are no longer available.**

The brain, Honda P/N: 30410-MAH-671, failed before the accident. The HES Harness appears serviceable, as I see millivolt pulses via an oscilloscope. The brain has two output transistors, one for the coil primary output to drive the spark (which functions) and one for the fuel cutout relay (no function).

Fuel flowed fine via gravity until the tank was about half empty. I had to bypass the fuel cutout relay and wire the fuel pump directly to the key switch, which leaked gas after I was rear-ended.

The electrical controls are near impossible to find. What options do I have to replace or repair the brain? Why has Honda given up on this bike? Is that common? I'd like to get it running again.

—Erik Hoet

YOU HAVE MORE ability than the average technician using an oscilloscope to troubleshoot your ignition. This type of fault is not easy to find. It sounds like you may have a Transistor Controlled Ignition (TCI) with a bad transistor or an SCR (thyristor) if it is a Capacitor Discharge Ignition (CDI). I would do the same for the fuel relay, but you're dead in the water if the ignition portion goes out.

This fault is not uncommon—fuel pump relays on EFI units can lose the transistorized ground through the ECU. This usually happens when a battery is connected or disconnected with the ignition switch on. The spark during contact (or separation) surges the system and cooks the first path to ground. The fuel pump is one of the first things to activate on EFI systems with the key on.

Unfortunately, vehicle manufacturers are only required to make parts for seven years after the last model is built. There are circuit board specialists that might be able to fix it, but it would probably cost more than it's worth.

Check out *dynaonline.com* (Dynatek), which has an aftermarket ignition box for a '97 VT1100C, which should be similar (P/N: D3K1-2), but call them and make sure the system is compatible with yours. They retail for $300, probably a couple of hundred dollars less than what you'd pay from the OEM. There is a bonus: This box has several ignition curve maps you can tune with.

—Kevin O'Shaughnessy

YOU EXPLAINED **how service costs are formulated (MCN 1/17) and why a junior tech isn't paid market rate (MCN 11/16). New techs can usually perform simple maintenance without being injured or breaking equipment, but are "carried" until the shop owner determines they are competent and safe. Of course they won't be paid a going wage until they bloom into solid employees. Technicians must put in the hours as a trainee and journeyman before becoming a master, with commensurate pay—this takes time. Nobody graduates school as a master of their craft.**

—Mike

THIS IS A big concern for automotive industries, and the trend is not good. Trade schools have had a drastic reduction in enrollment from the millennial generation, while the elder generation is leaving this world and the X and Y generations are moving primarily into management and owner positions.

Apprenticeship is rare these days, and often ineffective, thanks to proprietary digital technologies. There is an ugly gap approaching where there will not be enough techs to fill the needs. Imagine the day when a service technician makes as much as a doctor or lawyer.

The trend may bust if the next generation finds opportunity as the wages increase, but as costs increase, owners will pay for it.

—Kevin O'Shaughnessy

Kevin O'Shaughnessy is curriculum developer at Motorcycle Mechanics Institute, formerly R&D at Race Tech.

Pipeline

> Edited by **Russell Evans**

»REACTION TO POLARIS' decision to pull the plug on Victory motorcycles was immediate, both across the industry and among owners—many of whom were left wondering what this meant in the long run.

Some members of Victory owners group forum *thevog.net*, vowed to keep riding their Victory, while others vowed never to buy an Indian, to which Polaris will now devote the bulk of its motorcycle resources.

Victory became expendable with Polaris' acquisition of Indian in 2011 and subsequent development of the Indian 111ci. "Thunder Stroke" engine, which was built into Indian motorcycles beginning in 2013.

Polaris' January 9 announcement stated, "Victory has struggled to establish the market share needed to succeed and be profitable. The competitive pressures of a challenging motorcycle market have increased the headwinds for the brand. Given the significant additional investments required for Victory to launch new global platforms that meet changing consumer preferences, and considering the strong performance and growth potential of Indian Motorcycle, the decision to more narrowly focus Polaris' energy and investments became quite clear."

Victory parts will continue to be manufactured for 10 years and Polaris said it would assist dealers in liquidating stock.

polaris.com

Vanguard Roadster

» THERE'S A NEW American motorcycle company on the block, one with a look that may be familiar to ultra-high-end customs fans. New York-based Vanguard Moto, will release three models built around a 117ci. (1917cc) S&S v-twin motor. Visitors to the New York Motorcycle Show in January were able to catch a glimpse of the company's Roadster model, which looks like it was milled out of a single block of steel.

Edward Jacobs, former head of design for Confederate Motorcycles, from 2005-2011, designed the Roadster. Jacobs' partner in Vanguard, CEO Francois-Xavier Terny, was a board member at Confederate for many years, as well.

From the giant triple clamps back to the monstrous single-sided swingarm and curved aluminum disc that serves as the 240-section rear wheel, the hulking form exudes raw, naked strength.

The motor is a modified S&S X-Wedge, a 56-degree v-twin that has been built around as the central structural unit of the bike. The cylinders themselves form a kind of cradle frame, and that whopping swingarm/shaft drive bolts right on behind the rear cylinder.

The upper half of the bike sits firmly on top of the cylinder heads, with the lower line of the seat and carbon tank forming a flat aluminum platform.

Completing the unique design is a slim 5.5-gallon fuel tank that tapers down to a single-seat tail unit with minimal seat padding. The exhaust is fully integrated, exiting below the bike. On the dash is a tablet-sized color screen that also serves as a mirror, thanks to a rear-facing camera integrated into the tail unit.

The overall target weight for the bike is 550 pounds, which is about 110 pounds overweight compared to most naked bikes.

Pricing is set at $29,995, with production slated for 2018. The company will also produce a cruiser and a sportbike on the same platform. Read Glynn Kerr's take on the new Vanguard Roadster in his column on Design in this issue, starting on page 34.

vanguard.nyc

Suzuki V-Strom 650

» **SUZUKI HAS ANNOUNCED** pricing, colors and availability dates for its newest model releases.

V-Strom: The 2017 650 is now in showrooms, in Pearl Glacier White, with an MSRP of $8,799. The 2017 650XT will be available in March, in Champion Yellow No. 2 and Glass Sparkle Black, with an MSRP of $9,299. The 2018 1000 will be available in April in Pearl Glacier White, with an MSRP of $12,699. The 2018 1000XT will be available in May in Champion Yellow No. 2 and Glass Sparkle Black, with an MSRP of $12,999.

GSX: The 2018 S750 becomes available in April, in Metallic Triton Blue/Glass Sparkle Black and Pearl Mira Red, with an MSRP of $8,299.The 2018 S750Z, in Metallic Matte Black, will be available in May, with an MSRP of $8,899. The 2017 GSX-R1000 will be out in April, in Metallic Triton Blue, Pearl Mira Red and Metallic Matte Black No. 2/Glass Sparkle Black, with an MSRP of $14,599.

The 2017 R1000 ABS, with Suzuki's Motion Track Anti-Lock Brake System, will be out in April, in Pearl Mira Red and Metallic Matte Black No. 2/Glass Sparkle Black, with an MSRP of $14,999. Suzuki's flagship racer, the 2017 GSX-R1000R, will be available in May, in Metallic Triton Blue MotoGP motif and a Glass Sparkle Black finish that features Suzuki racing heritage striping and color-coordinated suspension components. MSRP is set at $16,999.

suzuki.com

» **LOS ANGELES-BASED** Divergent 3D, creator of Blade, the world's first 3D-printed supercar, has extended its clean construction techniques into the two-wheel realm. Built around Kawasaki's 1000cc, 200-plus horsepower H2 engine are a 3D-printed tank, swingarm and trellis frame. The frame's geometry is similar to the Kawasaki tube frame, but is a single printed metal piece instead of welded tubing. It is part of Divergent's mission to clean up not just vehicle emissions, but the manufacturing process as well.

"Society has made great strides in its awareness and adoption of cleaner and greener cars. The problem is that while these cars do now exist, the actual manufacturing of them is anything but environmentally friendly," the company's website states.

One way Divergent 3D approaches this problem is with its trademarked NODE technology, in which carbon fiber structural materials are connected in a matter of minutes to create an industrial-strength chassis. The Dagger's frame is a sculpture of pinpoint structural precision with crossover joints providing maximum torsional strength. The digital manufacturing process gives engineers unprecedented control over material density, even variable thicknesses where deemed necessary.

divergent3d.com

Divergent Dagger

LATEST RECALLS

Make: Indian
Model: 2014-2017 Touring models
Component: Fuel system
NHTSA #: 16V877000

Make: KTM
Model: 2013-2016 1190 Adventure
Component: Hydraulic, brakes
NHTSA #: 16V854000

Make: KTM
Model: 2015-2016 Super Adventure
Component: Hydraulic, brakes
NHTSA #: 16V854000

Make: CSC
Model: 2015-2016 Cyclone
Component: Brakes
NHTSA #: 16V864000

Make: Suzuki
Model: 2012-2016 DL650
Component: Alternator/Stator
NHTSA #: 16V878000

Make: Yamaha
Model: 2015 SMAX Scooter
Component: Speed Sensor
NHTSA #: 16V892000

Make: Ducati
Model: 2015-2016 Scrambler
Component: Sidestand
NHTSA #: 16V891000

Make: Suzuki
Model: 2013, 2015, 2017 GW 250
Component: Wiring
NHTSA #: 16V808000

Make: Yamaha
Model: 2014-2016 WR 250R
Component: Clutch Seal
NHTSA #: 16V800000

Make: Zero Motorcycles Inc.
Model: 2015 SR, S, DS, and FX
Component: ABS
NHTSA #: 16V610000

Make: Vega Helmet
Model: XTA, XTA Touring Helmets
Component: Impact Protection
NHTSA #: 16E081000

Make: Ivolution Helmets
Model: IV2 JX-SKY 3/4 helmet
Component: Equipment
NHTSA #: 16E80000

Make: Polaris
Model: 2015-2017 Slingshot
Component: Fuel system
NHTSA #: 16V754000

For more information, contact the NHTSA Safety Hotline: 888.327.4236 or *safercar.gov*

World

> Edited by **Russell Evans**

SPIRIT GP SPORT R

Newly formed British company Spirit Motorcycles has just unveiled an exquisite bike it believes is the closest thing possible to a Moto2 bike with headlights. The Spirit GP Sport R packs 180 hp into a 309-pound package, for an incredible power-to-weight ratio.

The GP Sport R engine starts its life as a Triumph Daytona 675. The Spirit team leaves the 76mm bore the same, but increases its stroke from 49.5 to 55 mm, giving a total displacement of 749 cc and raising the compression ratio to 13.8:1, and blueprinting it in the process. This stroked-out triple leaps from 128 horsepower all the way to 180 with the help of a raised redline.

The frame is chromoly steel tube, braze welded, with each tube's diameter and thickness set for optimum torsion and flex. The GP Sport's handmade lightweight aluminum swingarm has a quick-release mechanism, vertically adjustable pivot position, adjustable wheelbase and another adjustable linkage to change ride height and the rising rate of the suspension linkage. Suspension is by K-Tech, which is creating a series of Moto2-spec forks that will ship with the production Spirit GP bikes this month. The GP Sport's bodywork is entirely carbon fiber, including a self-supporting monocoque subframe and seat unit. Pricing starts at $85,738. *Spirit-mc.*

LSL CLUBMAN ROADSTER GT

German custom bike juggernaut LSL-Motorradtechnik's Clubman Roadster GT looks mild-mannered, but the classic lines and simple lacquer work belie a tiger underneath. This game roadster was built around an 803cc parallel twin, 88.0 x 66.0mm bore & stroke. Handling is managed through a LSL triple tree with fully adjustable Öhlins Upside down fork FG 43, and 24.8-degree rake and 3.74 inches of trail on a 58-inch wheelbase. There is a single disc 330mm braking system with 4-pot Brembo radial caliper, LSL brake fluid box and stainless steel braided brake hose The 80s-style headlight is fitted with stainless wire head lamp mountings, and adjustable LSL brake and clutch levers, Clubman CNC-machined mirrors, and LED indicators, front and rear, are mounted on a 30.1-inch wide LSL X-Bar. Spoke wheels (3.50 x 17 front/5.50x17 rear) with black aluminum-rims are equipped with sports profile Pirelli Diablo Rosso III tires, 120/70ZR17 front/180/55ZR17 rear. *www.lsl.eu*

Strategy

STREET *BY DAVID L. HOUGH*

Riding The Rails: Train Crossings

Railroad tracks have caused more than a few motorcycle crashes. That may be because steel rails don't look especially dangerous. The crashes are rarely fatal, but any crash can be painful and expensive. Even if you don't have any railroad crossings in your hometown, you're likely to encounter them in your travels.

Let's consider a few hazards created by rails in the road surface, and offer some tactics for keeping the plastic side up.

Shiny surfaces are a specific problem for motorcycles because balancing a bike is mostly a matter of steering the front wheel to adjust the position of the contact patch. If your front tire slides for more than a second or two, you can lose control of steering, and not be able to keep the bike upright. A polished steel rail or groove can allow the front tire to slide.

There are usually "aprons" at the sides of the rails to help vehicle tires more easily roll over the rails. Aprons used to be constructed of wooden planks, but these days it's more and more common to find black plastic. Sometimes bricks are used to level the street surface with the rails. Wood, plastic, or brick surfaces have less traction than pavement, and can all be very slippery when wet.

Many cities have industrial areas once served by railroad sidings. Today most commercial shipments are by truck, but often the old abandoned rails remain, creating surface hazards for the unwary motorcyclist. In addition, new passenger railway lines are being constructed thanks to a renewed interest in public transportation.

Where two tracks join or cross each other, there will be V or X shaped slots shaped to allow train wheels to roll

through. There are often thin plates lining the slots to help prevent pavement and debris from clogging the train wheel grooves. The slots and grooves can easily capture your front tire, wresting steering from your control. It may not be obvious, but if your front tire drops into a V-slot it can jam tight, bringing the front wheel to a sudden stop.

If you don't have to cross the slippery rails, just stay away from them. But when you must cross the tracks, it helps to cross at a maximum angle, with the bike as vertical as possible. If there are multiple tracks converging or crossing, plan a line that provides the best traction and keeps your tires out of any V or X grooves.

Not every rail line crossing is dangerous, but there are lots of grade crossings where motorcycle crashes are frequent. It's best to plan a path that crosses any shiny steel or slippery aprons at an angle of 45 degrees or greater. Getting the bike vertical helps reduce side loads on the tires that might contribute to a slideout. And, maintaining a steady throttle helps manage traction.

Be cautious when the road rises up to meet the railway grade. When the bike goes over the hump, traction will momentarily decrease as the bike lifts up on the suspension. That isn't a big problem if your path is a straight line across the tracks, but it is a problem if you're leaned over into a curve.

As with any surface hazard, it will help to keep your weight on the pegs when crossing railroad tracks. If your tires don't have sufficient traction to keep the bike upright, your boot soles probably won't do any better. And if the tires do lose traction and the bike falls, it's better to not have a foot or ankle trapped under the hard parts. There's another danger: Dragging your feet on the surface can allow a raised edge to snag your toe and bend your foot back under the peg, with results that aren't likely to be enjoyable.

Don't forget about rail traffic. It's easy to get so focused on the rails, slots, grooves, and slippery aprons that you forget to watch for trains or streetcars. Where there are traffic controls such as warning signals or crossing gates, the situation is obvious, but there are many grade crossings with only a warning sign. It's up to you to avoid a collision. When you do see a train coming, it's never smart to try beating it to the crossing. Even if the engine you see is moving slowly, there can be other hazards, such as a second train approaching on a different track at a higher speed.

David L. Hough authored *Proficient Motorcycling* and *Street Strategies*. He has contributed to MCN for 20 years.

DAVID L. HOUGH

STRATEGY

LEGAL *BY HARRY DEITZLER*

Motorcycle Ban Looks a Bit Shaky

I reside in a co-op apartment in New York City. I have been using our garage space for my motorcycle for 10 years with no issue. My Harley has factory pipes and does not set off car alarms. Today I received a letter from the management company stating that garage spaces are only to be used for private passenger automobiles—motorcycles are not permitted. The letter further stated that NYC building or fire department inspectors could fine for improper use and that I would be liable. This seems illogical and unfair. How can I determine the exact letter of the law? Does long-term failure to notify or enforce such restrictions have any bearing on the matter?

— Norman A.

THERE SHOULD BE *a way to check the municipal code online. If not, you may need to call the city clerk or go to the municipal building to review paper copies of city ordinances. Usually, the clerk will point you in the right direction if you ask graciously. I cannot imagine a law that makes it illegal to park a motorcycle in a privately operated parking garage that also contains other gasoline-powered motor vehicles, but it would be prudent to verify that fact.*

Next, ask the co-op management for a copy of the law to which they refer. To avoid any ambiguity as to your question, or denial that you have asked for documentation of the law that designates motorcycle parking as an improper use of the garage, send written confirmation of your request. If management produces a copy of the law, and if the law prohibits motorcycle parking in the garage, it probably is of no help to you that nobody has enforced the law until now.

Assuming that there is no law that prohibits motorcycle parking in the garage, resolution of the question will ultimately depend upon the language of your co-op shareholder agreement. Carefully review the document to be sure there is nothing that enables management to place the motorcycle restriction. Knowing that you would bring the motorcycle to your new residence, I assume you would have spotted any motorcycle-related restrictions when you originally bought shares for your co-op unit.

If you do not have a copy of the sale, lease, share, or rental agreement that you signed for the apartment, you should request a copy from the co-op management. They (the management) will be hard-pressed to deny that request. When you receive the document, if you find that there is a motorcycle restriction, find out when it was enacted. If your co-op share ownership pre-dates the restriction, you may be protected by the absence of restriction in your original contract language.

I suspect that your inquiries will confirm that there is no law or lease prohibition as to motorcycle parking in the co-op garage, and management will likely back down when you press the issue. Alternatively, if the restriction is in the co-op documents and has always been there, you may have a valid point that the restriction has been waived by the management's failure to enforce for the past 10 years.

— Harry Deitzler

Harry Deitzler is a partner in law firm Hill, Peterson, Carper, Bee and Deitzler, PLLC. Submit inquiries at *motorcyclejustice.com*

DIRT *BY GARY LAPLANTE*

The Lite Side of Dual-Sport World

The popularity of big adventure bikes (650cc engines or larger) in America is not surprising. We drive huge motorhomes, SUVs, ATVs and now UTVs. It is easy to understand the incredible appeal of a big dual sport bike that can hold over 75 pounds of cargo and a passenger, can travel in relative comfort for hundreds of miles at 80 mph and still take a dirt road or trail that's not too rugged.

The opposite approach to dual sport adventuring would be to ride a 500cc or smaller bike that is 90 percent dirt bike and barely street legal. These bikes can't carry much, aren't very comfortable, don't go that fast or travel that far, but they thrive on dirt back roads and rugged trails where their high power-to-weight ratio makes them thrilling to ride. These bikes are usually ridden solo and many people love this minimalist approach, which delivers a vastly different kind of motorcycle adventure. Let's call them Adventure Lites.

There's almost nothing more fun than a street legal dirt bike. Some U.S. states will grant a license plate for your bike without even confirming it has proper mirrors, tires, lights, horns, turn signals, etc. They figure it is between you and law enforcement after that.

Many Lite riders push the legality of their bikes and don't exactly meet the DOT standards, but many Lites are used in rural and remote areas, where off-road motorcycles are common. To get pulled over by law enforcement, you would have to pop a wheelie right in front of them, otherwise they are likely to turn away the minute they see the license plate on your bike.

Adventure Lites have been around a

» **ADVENTURE** *BY DR. GREGORY W. FRAZIER*

Setting a Travel Budget

The budget for motorcycle adventure travel is an economic conundrum with an answer similar to that of knowing "How long is a piece of string?"

What differentiates adventure travel from generic motorcycle touring is the risk factor that is incorporated in the definition of adventure. While calculating a travel budget for a week of touring may use strictly hard numbers like the price of gas, sleeping and eating, the adventurist has to factor in the element of the unknown, such as what might be the costs of having a broken motorcycle collected from some distant point where few venture to tread or costly repairs due to extreme riding conditions.

For example, when I rode my motorcycle on the beach out of Nome, Alaska, to a gold camp, and then over a mud track for some miles to the gravel road that eventually took me to Teller, I was 72 miles from the nearest gas station and two small motorcycle repair shops. A breakdown in Teller could have cost me hundreds of dollars for the rental of a pickup truck, if I could find one in Teller, or twice as much to have one come out from Nome to collect me and return.

When planning a budget for adventure travel one can be overwhelmed with the expert advice offered on internet forums or chapters in travel guides. The hard numbers to arrive at an estimate of the cost of the adventure can be gleaned from those sources. The elusive number attached to the element of risk is the same as the answer to the length of the piece of string, twice as long as half its length.

Tips: Compute the hard costs of the adventure, and when done, double that amount. It is better to overestimate the cost of an adventure and return to your start point with some excess money than to come up short and end up pushing your gasless motorcycle and eating sand as you cross Africa.

Doubling your adventure cost does not mean having twice the needed funds available in cash on hand, but having it available to access through a credit card with a high limit versus a debit card with limited funds available.

If using the credit card as a safety net, have more than one available in case of a disaster where the card does not work, is eaten by an unfriendly ATM or is not honored for a variety of reasons.

Included in my double-needed funds budget is an amount deposited in a trust account with my lawyer, who can get money to me if needed in a number of different ways.

Dr. Gregory W. Frazier is author of four global adventure books, has ridden five circumnavigations and over a million miles.

long time and were once the most popular category of motorcycles in America. Back then, if you wanted more performance in the dirt, you took the lights off your "dual purpose" motorcycle and raised the front fender. Today, as the dual sport category becomes more segmented with big adventure bikes, maybe it's time to reconsider the virtues of riding a Lite again?

Lites are relatively inexpensive to purchase, repair and upgrade. They are lightweight and easy to ride, easy to pick up if crashed and easy for a city dweller to load into a truck for transport to a favorite mountain range hundreds of miles away. Some people have no choice but to ride a Lite, as modern adventure bikes are simply too big for them.

Modern Adventure Lite: 2017 Yamaha WR250R.

GREGORY W. FRAZIER, GARY LAPLANTE

But the best reason to ride a Lite may be to explore places and see sights you couldn't experience except on a small and rugged motorcycle.

So, which bike is better? Adventure bike or Adventure Lite? To answer this, you must determine exactly how and where you will ride. Personally, I like both, so the solution for me is to own one of each!

Gary LaPlante is the author of *How to Ride Off-Road Motorcycles* and owner of *MotoVentures.com* Dirt First training.

REVIEWS

» Aerostich ROADCRAFTER TWO-PIECE SUIT

At a recent daylong motorcycle school session, I spotted one of the instructors wearing an Aerostich Roadcrafter suit. The high-visibility yellow had faded a bit and it was easy to see that the company's signature suit had staunchly protected him for thousands and thousands of miles of exposed travel. Aerostich gear is not cheap; but those who plunk down the $1,334.00 for a Roadcrafter Classic two-piece suit get what they pay for. These rugged suits are heavy duty, constructed with a material called Mil-spec 500 Denier Cordura Gore-Tex, yet feel surprisingly light once you've got it on.

Aerostich has been at this since 1983, and has gone to great lengths to ensure your custom-ordered suit fits right and is ready to rip as soon as you zip. I placed my entire order online with the tested and thorough fitting system. The fit on mine was right on the money, and I was amazed at how easy it was to walk and ride in this surprisingly flexible two-piece suit. Wear the jacket by itself, wear just the pants, or zip them together to form a one-piece suit in which the jacket overlaps the pants by about six inches. This is why the Roadmaster two-piece is Aerostich's most versatile suit.

In addition to the high-visibility Scotchlite™ reflective strips, there are six strategically placed pockets, plus arm and thigh map window pockets. The knees, shoulders and elbows are generously padded and stitched into the lining beneath extra-tough Aerostich "Ballistic" panels. There is also optional hip and back impact armor. The water-resistant underarm and back vents enhance air flow, an ultrasuede collar adds comfort, and an impressive array of adjustable tabs and zippers fine-tune the fit. Once everything is cinched down, the fit is snug, nothing flapping around in the breeze, and comfortable. There is no binding behind the knees or around the groin or elbow areas. The pants come slightly pre-curved at the knees, giving you a little head start on the break-in, which is minimal.

The pants, worn over jeans, are plenty warm. The jacket is not a parka, and for extra cold weather, you'll want a few thin, thermal layers underneath.

(800) 222-1994, *aerostich.com*

—Russell Evans

» Fasst FLEXX BARS

A recent ride through the Rocky Mountains on my stiffly sprung Honda CR250 aggravated some elbow tendinitis. This sent me in search of help. The Flexx bar uses a pivot that allows a flex in only one direction. The flexible elements are rubber "donuts." Each side has one for compression and one for rebound. When you hit a sharp bump or have a harsh landing, the bars flex significantly. This isolates your hands from the movement of the triple clamp, like a second suspension. The rubber also absorbs and dampens a small amount of energy.

The pivots are perpendicular to the plane of the forks, forcing the bars to flex only in the direction of the front wheel suspension travel. Fasst Company claims this helps the isolation, but what it really does is it puts the pivot (flex) direction perpendicular to the steering stem so that the bars are rigid in the direction of turning the bike—an important characteristic to maintain precise control.

The Flexx bars ($359.99, adapters and handguards) were easy to install on my Honda with 1-1/8 inches (fat)

Protaper-style bars. If you have standard 7/8-inch bars, you will need to buy an adapter. You can definitely feel the flex if you push hard on the bars, but they never feel strange in actual riding. The bars come with different stiffness rubber donuts and after starting out with the stiffest ones per Fasst Company's recommendation, I switched to soft for compression (up) and medium for rebound (down).

Fasst Company offers different models to clear triple clamp-mounted steering dampers like those made by Scotts and multiple bends are available.

(877) 306-1801, fasstco.com

—Jim Stanley

AEROSTICH, JIM STANLEY

» California Heat

GAUNTLET HEATED GLOVES

A series of "Artic Blasts" across the eastern U.S. provided the perfect subfreezing backdrop in which to test California Heat's Gauntlet heated gloves.

The dorsal side of the conventionally styled exterior shell as shown in Figure 1 is dominated by a Cordura textile section covering the forearm and wrist, with cowhide accordion paneling leading from the upper knuckles to the pre-curved fingers. The entire ventral side is cowhide, with a rubbery synthetic material stitched across the thumb and upper palm for added grip on the controls. Six small squares of integrated gel padding on the outer edge of the palm help to quell handlebar vibrations. The left thumb features an integrated squeegee. A single adjustable Velcro strap on the wrist keeps the glove firmly in placed once donned, while an elastic string with stop-adjuster pulls the cuff tight against the forearm. A small plastic hook allows both gloves to be conveniently clipped together when not in use.

Inside, the gloves feature a "Hipora" breathable/windproof/waterproof membrane between the exterior shell and the soft inner lining, shielded by a layer of 3M Thinsulate. The "Finewire" ultrathin heating elements run down each fingertip and the back of the hand. Connectors are industry-standard 90-degree coaxial type, with zippered pockets for storage when not in use. The interior is plush and luxurious, offering warmth even before the elements are activated.

On the road, the Gauntlets impressed, with excellent overall quality. The cavernous 5-inch wide opening easily fit over even the bulkiest of winter jackets, while its neoprene lip completely eliminated draftiness (even without using the elastic string on the cuffs). Each glove draws 13.5 watts at full blast, which shouldn't be an issue for all but the most ancient charging systems. To objectively test performance, I attached temperature probes to all fingers, plus the back of the hand and applied full power. The results indicated a jump from room temperature to ~95F average within 100 seconds; to 113F at 200 seconds; and stabilizing at ~120F at the 300-second mark, with a gradual rise thereafter, peaking at 600 seconds and clustered around +125F surface temperature. In real-world use, the fingers warm up in seconds. Within two minutes, my hands were already comfortably warm in subfreezing temperatures. Heat was evenly distributed, with no hot spots, and the elements were completely undetectable—not like the old days, with spaghetti wires bunched up under the liner!

Heated gear is no longer the novelty it was when I started riding in the late 1990s. Now, serious riders understand that staying warm in extreme temperatures is not just a matter of convenience, but of safety. California Heat's Pakistani-made Gauntlets are helping to extend my riding season well past when most have hung up their helmets here in the east, and carry an MSRP of $170.00.

—Moshe K. Levy

(360) 490-9198, *californiaheatllc.com*

MOSHE K. LEVY, ARTHUR J. TREFF

» Motion Pro

RIM SHIELD II

Motion Pro has developed a capable rim protector tool called Rim Shield II. Sold in pairs, they are molded in blue DuPont Zytel, a tough polyamide nylon resin.

We tested them while changing the tires on a vintage bike, using a tire model that has tight-fitting beads—a worthy challenge for our product test. Once the bead was broken, the Rim Shields went to work under the levers. Removal of the old tires was easily accomplished, no rims were scratched and the apron with finger holes allowed us to keep one tire iron in place and, with the other hand, reposition the second rim shield.

Installing the new tires and tubes was where the Rim Shield IIs really excelled. The Rim Shield II is always visible, with its long apron. Additionally, the two raised beads on the backside create a small air gap between the tire and the protector, facilitating the insertion of the tire levers.

Repositioning was again a single-hand operation. The tool's light weight and stiffness provide enough feedback to feel when the Rim Shield is firmly installed on a rim but away from the tube.

A post-op inspection of the protectors revealed numerous gouges on their surfaces from the tire tools, but no cracks were visible, even through a magnifying glass—an indication the set has many more tire changes ahead of them.

The Rim Shield II is manufacturer-recommended to work with any size or brand of motorcycle wheel, except Harley-Davidson cast rims. The product's price of $14.99 for two, is less than half what a typical shop charges to swap one tire on a rim. Then, when someone asks who mounted your gnarly adventure tires you can say, "I did," and ride off with tires and ego fully inflated.

—Arthur J. Treff

(650) 594-9600, *motionpro.com*

LIGHT IS ALL RIGHT

KAWASAKI'S Z650 PACKS A PUNCH

Nimble, with plenty of power, the Kawasaki Z650 is an amazing tool for carving up the backroads or the morning commute.

> By **Russell Evans**

Some say they are all about the ride. Then, they mount bags, a fairing, a stereo and take it off road. They want—we want—one motorcycle to do it all.

For those strictly about the ride, the experience of engaging power, joyful cornering, light and nimble maneuvering, a little wind in the face, this little 650 delivers.

The Z650 is a pretty simple-looking naked bike, no bags, no screen, hardly any room for a passenger. Yet, it has ABS, an assist and slipper clutch, dual throttle body precision fuel injection, a trick swingarm form and linkage, gear and programmable upshift indicators and several other high-tech features. The stout and sturdy parallel twin is instrumental in making this a very enjoyable bike to ride.

ENGINE

Kawasakis are known for get-up-and-go and this bike is no exception. The mildly upgraded 649cc liquid-cooled parallel twin packs plenty of punch—in fact, it feels perfect in this package.

The engine casting was updated to include the mechanical gear position indicator. Improved midrange torque and a smoother power curve come from a new camshaft design with improved overlap, a shorter operating angle and duration. Slimmer intake ports, smaller 36mm Keihin (previously 38mm) throttle bodies with dual throttle valves, a new airbox and a short header exhaust system allow finer atomization of fuel and better airflow.

Throttle response is crisp and delivery is immediate—robust thrust for a midsize package. Kawasaki credits ECU-controlled sub-throttles for the precise response. An onboard, digital microprocessor reads various inputs from the engine, like ignition timing, rpm and throttle position, and from the environment, i.e., air temperature and pressure. It uses the information to determine the precise amount of fuel that the engine needs at that moment, and injects it into the intake air headed for the intake valve.

KEVIN WING

Our dyno recorded 52 hp and 42 lb.-ft. torque, which sounds meager, but there is no shortage of power in practice.

TRANSMISSION

It's great to see a midrange bike receive an assist and slipper clutch, which does an amazing job of easing clutch lever effort and reducing wheel hop on downshifts. A six-speed cassette-style transmission keeps the shafts and shift drum compact. The linkage-type shifter is as smooth as silk thanks to the assist function, which requires fewer and lighter clutch springs. Neutral is easy to find with Kawasaki's Positive Neutral Finder.

BRAKES AND WHEELS

The optional ($400) ABS is controlled by a small Bosch 9.1M unit and only adds 4 pounds, well worth the money. The Nissin brake calipers have large 27mm pistons mated to brake-specific pads. The front provides excellent feel with strong initial bite and the rear offers optimum control. Twin petal design 300mm discs up front aid cooling, reducing fade and resisting warping. In practice, the brakes offer exactly the right amount of force and feedback for the targeted entry-level rider. Improvements should be as simple as upgrading the lines and swapping the pads.

The sporty five-spoke wheel design is consistent with the minimalistic naked bike theme. The black alloy wheels look equally dramatic on either the Pearl Flat Stardust White model or the Metallic Flat Spark Black. The Dunlop Sportmax D214 tires are top-notch.

KEVIN WING

SUSPENSION

The new hollow steel, gull-wing style swingarm creates a straight line from pivot to rear axle, increasing the strength and leverage of the preload adjustable horizontal rear shock. The 41mm KYB forks are not adjustable, but overall the bike is well balanced with moderate dive only under heavy braking.

ERGONOMICS AND HANDLING

This bike is highly adept at locking in on a tight corner and pulling through with complete confidence. Replacing the former double-pipe frame is a high-tensile steel trellis frame engineered with variable wall thickness that integrates the engine as a stressed member and minimizes bends to reduces stress points. The rear section is twin-tube for added rigidity. These are fantastic trickle-down upgrades from the sportbike line, resulting in a lighter bike with more responsive handling.

Rake and trail are decreased from the older Ninja platform, now 24 degrees and 3.9 inches (down from 25 and 4.3), while wheelbase remains at 55.5 inches, offering superior agility.

Handlebars are positioned slightly forward to improve leverage and are rubber-mounted to reduce vibration, but we still felt noticeable buzz in the bars, seat and pegs. Footpeg placement is comfortable, but folds up longer legs. The fuel tank is positioned relatively low on the chassis, its resin fuel cap eliminating the presence of mounting bolts, for a more stylish design.

The ignition location and design can capture water and our key bent beyond repair during a simple fuel stop, though likely due to the soft-metal key (make a few spares). Five-way adjustable brake and clutch levers accommodate a variety of hand sizes for comfort. The exhaust is tucked below the engine, lowering the center of gravity and improving weight centralization, yet another handling aid.

The seat is low and central to the mass, making the rider more a part of the bike than simply being perched atop, which inspires a feeling of effortlessly floating over the road.

INSTRUMENTS AND CONTROLS

The compact dash features just the right amount of high-tech instrumentation, in an easy-to-read-layout. Analog tachometer numbers on a brushed-aluminum panel are indicated with sweeping LCD "needles" that take some getting used to. There is no eyeballs-only glance at the gauges;

TESTERS LOG

There is a lot to like about this bike, starting with big boy power not always found in a 650. Acceleration is always there, immediate but friendly—no wheelies or anything like that. Cornering? This little beauty corners and corners and corners and so easily, you just can't wait to lean it over again.

Steering is quick and light, and maneuverability is excellent, both at low speeds and high. The sunken seat gives you a feeling of sitting down in the bike, which really adds to the sensation of being in constant, total control. The Z650 also cruises nicely at freeway speed, doesn't get too buzzy and suspension soaks up most of the bumps. No frills, big-time fun.

—Russell Evans

The new Z650 is both welcome and worthy competition for the SV650 and FZ-07, with many features typically reserved for bigger, more expensive bikes.

I enjoyed the superb handling, strong power delivery and low, forward riding position, which made the bike disappear from under me.

I didn't care for the buzzy bars, pegs and seat—the new stressed-member engine isn't an improvement over the older 650 powerplant in that regard.

The combination of ergonomics and vibration was more than a match for my 32-inch inseam, making the Z fun only in short spurts.

—David Hilgendorf

the rider must look almost straight down at the speedometer, which means away from what's going on ahead. The gear selected is the most prominent feature on the clock.

The LCD display of white letters on a black background for speedometer carries over to all the indicators, including a programmable shift light and Economical Riding Indicator (ECO) as well. The system continuously monitors fuel consumption, regardless of vehicle speed, engine speed, throttle position and other riding conditions. When fuel consumption is low for a given speed (i.e., fuel efficiency is high), "ECO" appears on the instrument panel.

ATTENTION TO DETAIL

The Z650's design mandate continues the sugomi styling of the recent Z series. Sugomi describes the intense aura or energy given off by a person or object of greatness and felt by the viewer. Someone, or something, possessing sugomi inspires awe, leaves an indelible impression, is daunting in stature or ability, and commands respect.

Everything about the Z650 serves the minimalist dual purpose of reducing weight and improving performance and handling. Rarely does an entry-level bike exhibit this level of both form and function.

The headlight cowl and meter visor form a slim, flowing line from the top of the fuel tank for an aggressive appearance. Engine shrouds are chiseled and minimal, which fall in line with the condensed, lightweight, naked look. The LED taillight even blazes in a Z shape.

VALUE

Undercutting both the FZ-07 and SV650 by $100, the $7,399 Z650 (all with ABS) delivers a satisfying riding experience to those looking for a peppy commuter or to tear up backroads on weekends.

This naked bike is best suited for a single rider looking for short, spirited bursts of freedom, although a 30-liter top case and a tank bag are available.

There are few bikes out there that can match the Z650's torquey low-end power, smooth midrange and pinpoint maneuverability. This is a fun, user-friendly and confidence-inspiring motorcycle that might make you feel like a better rider. What's that worth? MCN

KEVIN WING

2017 KAWASAKI Z650

CycleStats™

QUICK HITS

MSRP: $7,399 (as tested)
Category: Naked/Standard
Displacement: 649cc
Engine Type: 4-Stroke, Liquid-Cooled, Parallel Twin
Warranty: 1 year
GVWR: 853 lbs.
Wet Weight: 412 lbs.
Carry Capacity: 441 lbs.
Seat Height: 30.25 in.
Colors: Metallic Spark Black; Pearl Flat Stardust White.

SPECIFICATIONS

Valvetrain: DOHC 4-valve head
Bore & Stroke: 83.0 x 60mm
Comp. Ratio: 10.8:1
Transmission: 6-Speed, Positive Neutral Finder; Assist and Slipper Clutch
Final Drive: Sealed Chain
Fueling: DFI® with Keihin 36mm Throttle Bodies (2)
Tank Capacity: 4.0 gallons
Fuel Grade: 91 octane
Exhaust: 2-into-1
Ground Clearance: 5.25 in.
Wheelbase: 56 in.
Rake & Trail: 24.0°/ 3.9 in.
Tires: Dunlop Sportmax D214, 120/70/ZR17 front; 160/60/ZR17 rear
Brakes: ABS, dual 300mm disc with 2-piston caliper front; 220mm rear
Suspension: 41mm, 4.9-in. travel, front; 5.1-in. travel, preload adjust rear

ELECTRICS

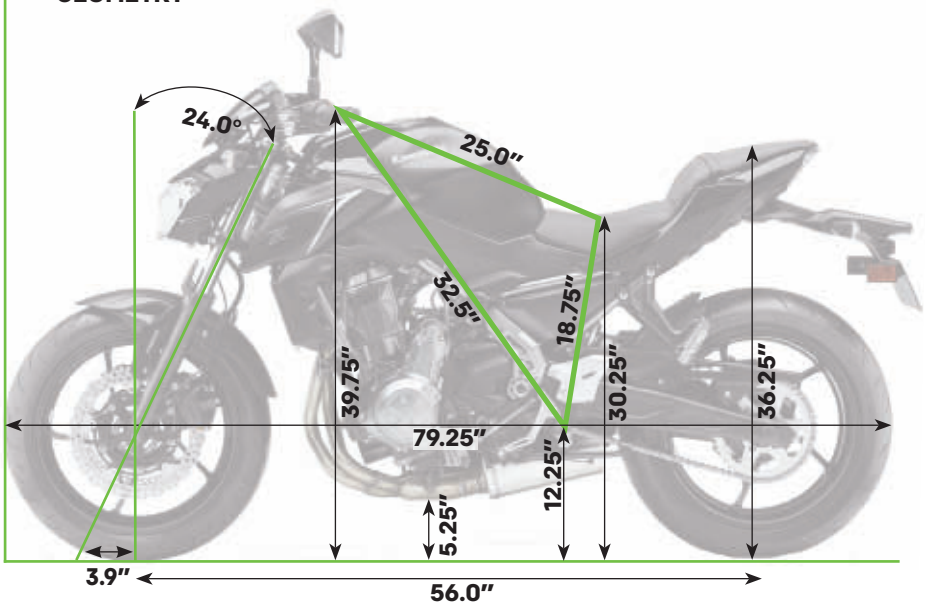
Battery: 12V, 10Ah
Ignition: Digital CDI
Alternator Output: 336W @ 5000 rpm
Headlight: 55/55W
Instruments: (digital) speedo, odo, trip, clock, fuel, consumption, temp, ECO,
Indicators: engine, oil, neutral, signal, high-beam, low-fuel, TC, ABS, gear

MAINTENANCE

($100/hr.)	Miles	Labor	Parts	Total
Routine	7,500	$410	$110	$520
Valves	15,000	$230	$90	$320

KAWASAKI

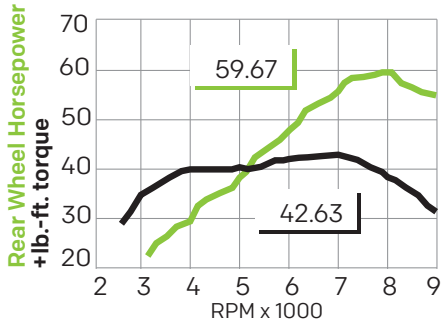
GEOMETRY



PERFORMANCE

Fuel Economy (MPG)
High: 54; **Low:** 40; **Average:** 47
Estimated Range: 188 mi.
60-0 mph: 120 feet
0-60 mph: 4.59 seconds
1/4 mile: 13.53 sec@ 97.7 mph
Power to Weight: 1:6.90
Speed @ 65 mph: 62 mph
RPM @ 65 mph: 5,000
RPM @ limit: 9,000

HORSEPOWER & TORQUE



EVALUATION

Engine:	●●●●●
Transmission/Clutch:	●●●●●
Brakes:	●●●●○
Suspension:	●●●●○
Handling:	●●●●●
Riding Impression:	●●●●●
Ergonomics:	●●●◐○
Instruments/Controls:	●●●○○
Attention to Detail:	●●●●○
Value:	●●●●○
Overall:	●●●●◐

SMILES

1. Strong twin-cylinder engine
2. Corners as though on rails
3. Light, nimble at any speed

FROWNS

1. Minimal wind protection
2. Seating ergos are hit-or-miss
3. Ignition key bends easily

MGX-21 and namesake: A WWII-era B-17 Flying Fortress

MOTO GUZZI FLYING FORTRESS

SMOOTH, POWERFUL, ITALIAN-STYLED CRUISING

> By **David Hilgendorf**

Moto Guzzi displayed the concept MGX-21 at EICMA in 2014, its brash take on a blacked-out American bagger. Not even the MGX team believed it would reach showroom floors. The production model remains true to the original vision, with extensive use of carbon fiber covering the tank, saddlebags and front fender. The original design included a solid front wheel, replaced with carbon fiber covers, and an enclosed rear section, which transformed into saddlebags.

ENGINE

The Flying Fortress is a platform update to the Moto Guzzi California 1400, using the same 90-degree transverse-mounted 1380cc V-twin engine. Ample torque and horsepower are managed by a three-mode ride-by-wire EFI system (rain, tour and sport) with three-level switchable traction

GINA CIOLI

control (plus off) and electronic cruise control.

A unique mounting system was designed to reduce motor vibration and the frame was modified with thicker steel tubing and a reinforced swingarm to accommodate the larger front wheel and greater overall weight.

Power delivery is smooth, but the tach needle doesn't keep pace with heavy throttle in sport (Veloce) mode, requiring early shifts at an indicated 5,000 rpm to avoid bouncing hard off the 7,300-rpm limiter. A tight window as the bike is screaming rapidly forward.

TRANSMISSION

The six-speed gearbox shifts flawlessly, and requires an average amount of clutch effort. Once engaged, power is delivered smoothly via shaft to the rear wheel throughout the rev range. Switching to reduced-power Pioggia (rain) mode and maxing traction control at level three results in compliance in all conditions, though engagement bogs the engine when surfaces are slippery. In Veloce (sport) mode with traction control off, skill is requisite, because this fortress flies—quite happily without its operator.

SUSPENSION

Undersprung dual-rear suspension means this cruiser is comfortable for barely as far as a tank of gas will take you, with every jut of the road ramming straight up the spine. Thankfully, the rear spring is preload adjustable, but three bolts must be removed from the left bag to reach it. The front is spongy with limited feedback, exacerbating handling concerns.

BRAKES & WHEELS

When it comes to brute force, the four-piston Brembo brake calipers with ABS are the real deal. These binders put the kibosh on momentum, halting the massive Fortress smoothly and efficiently. ABS is noticeable, but does a fantastic job maintaining composure.

Wheel flop is a behavior where single-track two-wheeled vehicles turn in more than expected due to a lowering of the front end when rotated off straight—propensity to flop is measurable in direct correlation to rake and trail. The force of gravity against this lowering creates an increased rotational velocity on the handlebars, which makes steering quick to lean and heavy to return to straight.

When style overrides function, bikes may end up with an oversized 21-inch front wheel (like this one) which looks menacing, but creates noticeable geometry and handling challenges via the increased wheelbase, rake and trail, which then requires stabilization.

GINA CIOLI

ERGONOMICS & HANDLING

To counteract the effect of increased front-end mass, a spring-loaded steering damper is hidden behind the fork and under the fairing.

The weight is manageable in motion, but the MGX never felt entirely planted. In slow turning situations, perfect throttle response allows focus entirely on handlebar position, keeping the bike on course. Flipping from side to side for a figure-eight requires substantial manual leverage, however.

The wheel tracks road surface irregularities and more than once wiggled itself into a speed wobble around 90 mph—maintaining velocity in the legal realm is prudent. In loose traction, the rear also tends to step sideways, which resulted in a low-speed tank slapper on one hard launch and some skipping about on wet pavement. None of these foibles is confidence-inspiring, which caused frequent second-guessing when pushing the bike's limits.

This is a big boy bike and weight sits relatively high—even lofting the beast off its sidestand requires herculean effort. The riding position is typical bagger, feet forward, weight on the coccyx and a long reach to the bars. Footpegs, instead of floorboards, provide ample cornering clearance, appreciated only after the squirrelly handling has been adapted to.

INSTRUMENTS & CONTROLS

The audio system's 50-watt AM/FM radio with USB and Bluetooth inputs for MP3 and smartphones are all, most likely, the product of market research. The speakers are useless above neighborhood speed. The navigation joystick is troubling, with vertical axis controlling volume, horizontal changing the stations and depress to select—thumb presses often get crossed.

Engineers included an analog speedo on the left clock and digital speedo on the right—digital wins, making the redundant gauge a waste of space.

The ignition immobilizer functions via microchipped keys or a 5-digit code that allows bypass for starting if the system is disabled—it still requires the key. The code also allows programming new keys and changing the ignition module without replacing the instrument panel.

Self-canceling signals don't feel like it, requiring a third of a mile or 40 seconds without stopping (which resets both counters) to shut off. Moving the "lights" switch on the right grip toward the rider activates daytime running lights, which shuts off the headlight inexplicably.

The fuel gauge drops rapidly to two bars, hitting reserve at around 100 miles. Claimed at 1.3 gallons, we rode 45 miles and fit 4.9 gallons in the tank, indicating reserve is 2.3 gallons, over 40 percent of the 5.4 gallon capacity.

In typical Piaggio dare-to-be-different fashion, the engine cutoff switch is actually a pushbutton, depressed to start and raised to kill power. The starter switch below counterintuitively doubles as the ride-mode selector. This machine even has an ice warning indicator, displayed when temperatures are below 39.2°F.

ATTENTION TO DETAIL

Stylish, key-matched, side-loading removable rigid bags provide 58 liters of cargo space, but the awkward interior shape makes it challenging to stuff anything other than a pliable jacket and gloves inside. A storage cubby in the fairing and deeper, top-loading saddlebags would be preferred.

The batwing-style fairing includes a short screen, which deflects most wind at the rider's head, and won't be confused for Harley's similarly named fairing. The halogen headlight cluster includes bright LED daytime running lights, incorporated in a clean forward appearance.

Red accents on the brakes, cylinder head covers and nameplate visually break up an overwhelmingly dark profile.

VALUE

The MGX-21 requires a $21,990 commit, alignment priced to the Harley Street Glide, which starts $1,000 less, but costs more when ABS and security are added.

If practicality is more important than showiness, Moto Guzzi's own California 1400 Touring is $3,400 less and the 1400 Custom $6,400 less than the MGX-21.

The Flying Fortress stands out, which will move units, but it's not an overall platform improvement. MCN

TESTERS LOG

There's appeal in owning something different from the crowd, and in that regard Moto Guzzi knocked this bike out of the park. The Flying Fortress is unusual enough that owners will want to memorize the spec sheet to share the details with gawkers.

Power is admirable and the technology package is impressive, making straight-lining a lot of fun. Unfortunately, handling was frequently erratic and rarely confidence inspiring—that's unacceptable.

The bags are too small, stereo of no importance, seat uncomfortable, and I'm docking points for redundant speedometers. A fun styling effort that will appeal to a certain demographic, but not me.

— David Hilgendorf

This is a big, soft, dreamboat of a bike. I found it to be comfortable, fairly quiet and a smooth runner on the freeways. On the backroads, the big MG glides.

The 21-inch front wheel facilitates easy turning and, coupled with the 16-inch rear setup, handled nicely. Of course, the looks are striking, and the "Bat-cycle" drew a fair amount of attention among the many Harleys at one of Southern California's most popular hog pens.

The radio worked just OK, and couldn't be heard over 60 mph. I blame the fairing, which is stylish, but funnels wind right into your face. While cruising suspension was good overall, running across small items, like lane dividers, yielded a disproportionately large jolt.

— Russell Evans

GINA CIOLI

2017 MOTO GUZZI MGX21

Cycle Stats™

QUICK HITS

MSRP: $21,990
Category: Cruiser/Touring
Displacement: 1380cc
Engine Type: 90-degree air/oil cooled transverse V-twin
Warranty: 2 year, unlimited mi.
GVWR: 1215 lbs.
Wet Weight: 797 lbs.
Carry Capacity: 418 lbs.
Seat Height: 29.25 in.
Colors: Black/carbon fiber

SPECIFICATIONS

Valvetrain: SOHC, 4-valves/cylinder
Bore & Stroke: 104.0 x 81.2mm
Comp. Ratio: 10.5:1
Transmission: 6-Speed, overdrive
Final Drive: Compact Reactive Shaft Drive
Fueling: Single 52mm throttle body, Weber-Marelli 3 mode EFI
Tank Capacity: 5.4 gallons
Fuel Grade: 91 octane
Exhaust: 2-into-2
Ground Clearance: 6.25 in.
Wheelbase: 66.7 in.
Rake & Trail: 27.0°/ 4.3 in.
Tires: Dunlop Elite 3; 20/70-R21 front; 180/60-R16 rear.
Brakes: ABS, Brembo dual 320mm, 4-piston front; 282mm 2-piston rear
Suspension: 45mm, 4.2 in. travel front; dual rear shocks, 4.6 in. travel preload adjustable

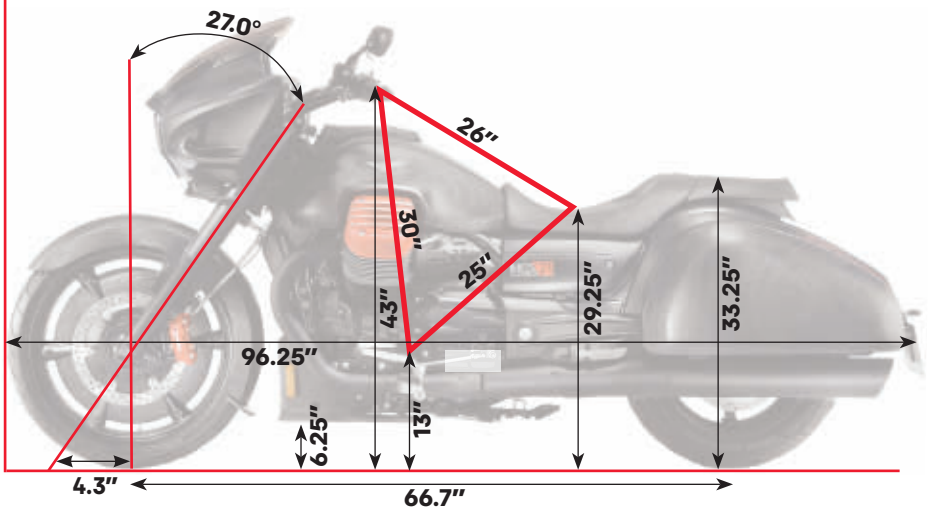
ELECTRICS

Battery: 12V, 18Ah
Ignition: electronic
Alternator Output: 550W
Headlight: 55/55W halogen, LED DRL
Instruments: (analog) speedo, tach, (digital) speedo, odo, trip, clock, fuel, mpg, temp, AM/FM radio
Indicators: engine, oil, neutral, signal, high-beam, low-fuel, gear, TC, ABS, BT, USB, ice, radio preset, cruise

MAINTENANCE

($100/hr.)	Miles	Labor	Parts	Total
Routine	6,200	$260	$105	$365
Valves	6,200	$200	$25	$225

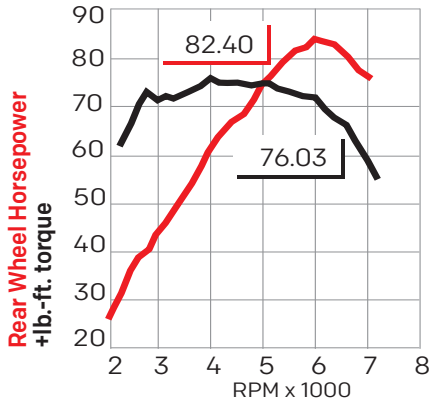
GEOMETRY



PERFORMANCE

Fuel Economy (MPG)
High: 30; **Low:** 27; **Average:** 29
Estimated Range: 156 mi.
60-0 mph: 127.66 feet
0-60 mph: 4.56 seconds
1/4 mile: 13.55 sec. @ 128 mph
Power to Weight: 1:9.67
Speed @ 65 mph: 63
RPM @ 65 mph: 3,500
RPM @ limit: 7,300

HORSEPOWER & TORQUE



SMILES
1. Unique styling
2. Good technology package
3. Great brakes

FROWNS
1. Unstable geometry
2. Weak audio system
3. Poor saddlebag design

EVALUATION

Engine:	●●●●●
Transmission/Clutch:	●●●●●
Brakes:	●●●●●
Suspension:	●●○○○
Handling:	●●○○○
Riding Impression:	●●●○○
Ergonomics:	●●●◐○
Instruments/Controls:	●●○○○
Attention to Detail:	●●●●○
Value:	●●●○○
Overall:	●●●◐○

Former racer Walt Fulton conducts a Streetmasters session at Willow Springs Raceway's Horsethief Mile in Rosamond, California.

BETTER LATE

STREETMASTERS TEACHES BETTER TURNING TECHNIQUES, IMPROVED CONTROL AND INCREASED SAFETY WITH ITS UNCONVENTIONAL, YET PROVEN METHOD OF CORNERING.

> By **Russell Evans**

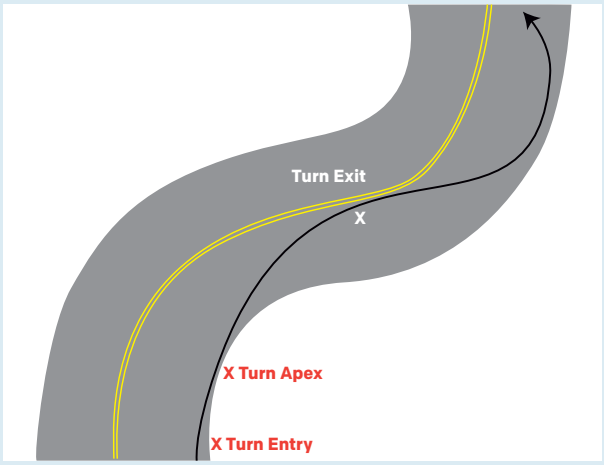
As a boy, riding the twisties of the Sierra Nevada, Walt Fulton happened upon late apex turning just as a matter of course and logic.

He sensed early on that he was on to something that could make riding a motorcycle easier, safer, more fun. More than a half century later, his roadracing career behind him, Fulton teaches his simple—and, he believes, better—cornering technique through Streetmasters.

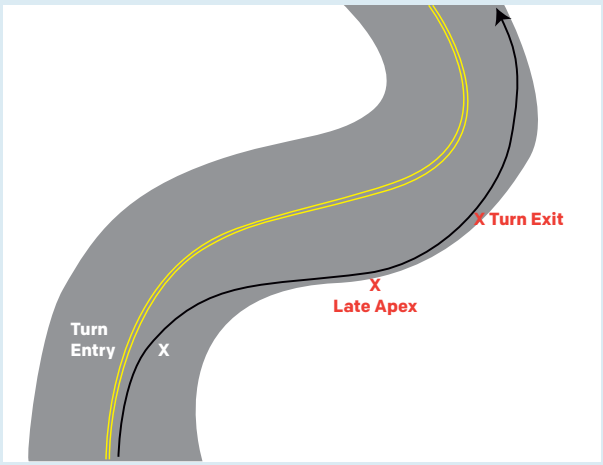
At Streetmasters, which Fulton operates with longtime partner and companion Nancy Foote, it's all about the turn. The geometry is scientifically broken down and disseminated in a classroom setting before any motorcycle is fired up. Then the learning moves to the track, a closed course, where techniques and lines are strictly monitored by Streetmasters teachers,

Walt Fulton and Nancy Foote operate their Streetmasters cornering school at racetracks in California and other select western states.

DAVID HILGENDORF, RUSSELL EVANS



Standard outside-inside-outside turns are more direct, but can leave a sharp entry into the next turn that requires hard braking or razor-sharp turning skills.



Streetmasters teaches a later entry point, late turn apex and later exit, in the right half of the lane, to better set up the next turn.

including Fulton, who is out on the track with the students.

While pro racers take the fastest line—enter a turn wide, hit the apex in the middle of the arc and then exit wide—Streetmasters has a different approach with a different aim. The goal is to put the rider in the optimum position to enter the next turn by entering late, visually pushing the apex to the end of the turn and exiting on the inside of the turn arc.

"Growing up in the mountains, I rode a lot of winding roads," Fulton said. "I had been thinking about it for years—stay out wider, enter late, see the apex. We get a lot of comments from people, things like, 'You saved my life today. You have changed my whole outlook.' "

What Streetmasters training tends to do is make the rider more aware. In the classroom training, students are shown slide images of approaching turns in the road. Which way does it turn? How sharp is it likely to be? Are there any visual cues, such as banks, tree lines or power poles, to help gauge entry speed? On the track, students are constantly guided to keep their eyes up, their heads turned to look ahead and quickly visualize the shape of the turn and find the late apex.

"It's one thing to tell someone about it," Fulton said. "We show you, out on the track, the late apex."

Foote, Fulton's partner in the Streetmasters operation since 2008, is a convert as well.

"I grew up in Grand Junction, Colorado, and I was one of those who would dive into the turn for the apex," Foote said. "It took quite a while for it to become second nature."

Fulton and Foote, both based in California, have full-time jobs, Fulton as a product specialist at Kawasaki who investigates crashes, and Foote a testing operations manager for Los Angeles Unified School District. Fulton started Streetmasters in 2003 with a partner, Bob Reichenberg. When Reichenberg left in 2008, Foote came in as a partner and handles much of the administration, while Fulton leads instruction.

Fulton says his idea for Streetmasters came from a gap he perceived in instruction. There were classes for beginning riders, there were track days and racing schools for expert-level riders. But there was nothing in-between that would help everyday riders who may be experienced, but could certainly benefit from sound instruction and proven techniques.

Home base is the Horsethief Mile track at Willow Springs Raceway in Rosamond, California. The short track was built into a hillside, with hardly a

In off-track exercises, students are taught to turn their heads and look ahead to the next turning point, a fundamental carried over to the track.

RUSSELL EVANS, MEGAN STEWART

COURSE OBSERVATION: NOVICE

Every rider has that one moment when everything just clicks, where the passion for the ride is finally there. For me, it was during the Streetmasters course with Walt Fulton. Never have I experienced so much fun behind the handlebars. Before this course, I was always cautious and lacking confidence. Now? I feel empowered, excited, and invigorated whenever I grip those handlebars.

The class itself was broken up into two parts: in-class and on-track. Going over the basics and what was expected of us helped me visualize what i would need to do to make the day a success. I was by far the most inexperienced rider in the group, but I feel that only benefited me more in the end. I was open to coaching; I was open to advice and new techniques; I wasn't closed off to any guidance offered.

Being coachable is a big thing when you're learning anything new. If you can't take advice or constructive comments, how are you expected to get better?

Streetmasters was a first for me in many ways. I had never ridden on the freeway before the class, and had to ride from the meeting hotel to the track at Willow Springs Raceway. Luckily, there were plenty of helpful and encouraging coaches, and my coach, Rocky, helped me ease into it. He positioned me right behind him in our group, which helped me relax enough to ride.

Once we arrived at the track, we rode over to Horsethief Mile and started off the class by practicing basic skills in the lot. The slower I'm going, the more I feel like I'm going to fall. It's hard for me to retain a steady slow speed without jerking forward or overcorrecting, and for this portion, it showed. Despite my frustration, this part was perhaps what I needed most. It's difficult to not only find the time, but also a big enough area to set up a course to practice slow-speed riding, including braking, U-turns, sharp turns, slaloms and the like.

After this, it was time to hit the track and put all the skills we just practiced to the test. The Horsethief Mile not only challenges riders with tight turns, but also elevation changes—steep elevation changes. At first, I didn't know how I'd handle the course, but after the lead-follow laps, I got the hang of it and was rather impressed with myself. I was much better on the track than I thought.

The entire course was designed to teach new and seasoned riders a new way to corner that is not only safer, but provides a better view of the entry and exit of a turn. The track provided the perfect safe, controlled environment to try out this new way of completing a turn. Taking things one step at a time, only reaching certain speeds and going around the course without using brakes pushed every rider in the class to understand more about motorcycles and, ultimately, make them better riders.

—Megan Stewart

COURSE OBSERVATION: EXPERIENCED

OK, let's get right to it: Riding on a real race track for the first time was SO cool. By the end of the day, with all of the great instruction and a feel for the turns, I felt like a better, more confident rider. I felt different, like I had kicked up my skill level a few notches.

As one who has ridden motorcycles most of his life, I didn't think there would be a whole lot for me to learn or improve on—I was wrong. The daylong Streetmasters class was a great experience, one that helped me sharpen my skills and think differently about turning a motorcycle. Everybody can go straight just fine; it's the turns that get you. Where should my line be? Where do I brake? Where should I be looking? What am I looking for? These questions were all answered.

Now, I can go ride and not even think about that stuff. The sound fundamentals taught by Walt and his staff made me a faster rider, but I also feel safer on the road. The low speed drills off the track—many done without being able to use our brakes—helped us focus on turning our heads and looking to the next turn, speed control and entry, apex and exit points. Now, every time I ride, I have a plan, I have a method and riding is easier, safer and more enjoyable.

Going into a class this way, there is always a little anxiety about how our skills are going to stack up against the others and how they will be judged by the instructors.

It reminded me of a snow ski class, where everyone showed up thinking they were real hotshots, but quickly found out how sloppy their technique was. With some tightening up of fundamentals and application of proper technique, it was amazing how much everyone improved.

I was on a sportbike, so turning came easily, but there were several Harleys and other big, heavy bikes. I can see where Streetmasters' techniques would be especially helpful for those on touring bikes.

—Russell Evans

Former roadracer Walt Fulton, right, has given up-close, in-depth instruction to Streetmasters students since he founded the school in 2003.

The graduation exercise is a free ride around the Horsethief Mile track—in the opposite direction as training—giving students immediate opportunities to apply techniques.

flat or straight stretch to be found. It's uphill, downhill, hairpin right, expanding radius left—the perfect place to perfect turning technique. Most Streetmasters sessions are held in Southern California, at Willow Springs, or in Northern California, in the Bay Area. Fulton and Foote also travel to Oregon, Washington and Utah, occasionally.

While there is potential for growth, Fulton approaches expansion as he would a blind turn—with caution.

"We believe in what we're doing," Fulton said. "We don't have franchises because we have an aversion to trusting just anybody with our reputation. That's why we won't ever get big. We're not in it for the money." MCN

COURSE OBSERVATION: EXPERT

I have trained or coached over 6,000 riders, many of whom had never sat on a bike before. I have also completed many track days, where I've focused on my own skill improvement. My personal strategy on the track is to pick one skill and spend the entire day working on it. If I feel like my shift timing is off, it becomes my main concentration. If I'm not braking adequately, expect to breathe a lot of smoking rubber that day. I once spent an entire day practicing body movement, when a coach suggested I wasn't moving around enough. Of course, on the track, spending an entire day focused on cornering is expected—it's the primary reason most riders go.

Perfect cornering is an art form, and there are an infinite number of ways to get from one side to the other. However, the outside-in-side-outside cornering line is one most riders are familiar with, as it's taught by the MSF. The primary benefit is that it's the straightest route through the turn—you don't have to lean as far. The downside is that it doesn't always leave room for corrective actions at the exit of the turn.

Streetmasters teaches late-apex cornering, which delays entry into the turn. The goal is to see the exit of the turn before initiating the lean. While I was familiar with this technique, I had not spent much time practicing it.

There is a good chunk of the course spent in classroom and a parking lot, ensuring the participants have adequate basic understanding and control skills to handle their motorcycles. Most attendees were longtime riders who rolled in on cruisers, touring rigs and adventure bikes. This demographic of rider (in my experience) has frequently ridden for tens of thousands of miles without proper training and often lacks correct technique. The greatest benefit for 'experienced' riders in any advanced riding course is always the watchful eye and encouraging feedback of the instructors. I was excited to witness these old dogs learning some new tricks.

After spending my day focused entirely on late-apexing at progressively increasing speeds—up to 40 mph—I was happy to enjoy a few victory laps. Late-apexing gives you more visibility through the turn and a greater ability to correct errors later in the arc, but requires mental fortitude and practice. As anything, if you want to master a new skill, it's best to do it under the watchful guidance of pros like Walt and his team. This class could save your life.

—David Hilgendorf

DAVID HILGENDORF, STREETMASTERS

A passion for riding motorcycles is what motivated Kevin and Karilea Rhea to leave the fashion industry to produce riding gear.

MATERIAL WORLD

KEVIN AND KARILEA RHEA HAVE MADE IT THEIR BUSINESS TO PRODUCE TOP-QUALITY, AFFORDABLE GEAR.

While visitors see vibrant rows of product at Olympia's warehouse facility, the Rheas see their future draped on hangers and a need to move the merchandise quickly.

KEVIN AND KARILEA RHEA

> By **Arthur J. Treff**

For many riders, donning gear is de rigueur—we put great faith in our protective apparel to mitigate potential bodily damage. The heart of this story is the entrepreneurial journey of a couple of motorcyclists, Kevin and Karilea Rhea. They started a little company called Olympia Motosports, and have been producing affordable, high-performance motorcycle gear for 16 years.

BEFORE OLYMPIA, Karilea was a prominent fashion designer, buyer and importer. Kevin, a motorcyclist since age 13, was also a highly successful designer and retail business developer.

While attending trade shows,

The Rheas have traveled the world looking for the best deals on fabric and manufacturing with the goal of selling high quality gear at affordable prices in the U.S.

Kevin noticed that European garment companies made stylish gear using the highest quality materials at premium prices, while U.S. companies were vastly chasing low prices with less crashworthy materials.

"I saw a need in the U.S. market for high quality, safe, motorcycle apparel at reasonable prices," says Kevin. "I decided to leave the fashion industry, to help save lives and be my own boss." Their combined 38 years experience in the fashion industry would aid in the creation of their new venture.

The comprehensive strategy:

- Sell direct to retailers.
- Word-of-mouth marketing.
- Source highest quality materials.
- Manufacture with a trusted factory.
- Keep overhead costs under control.

BRAND RECOGNITION is hard to build, so the Rheas accelerated the process by licensing the name and logo from a well-known motorcycle glove company—Olympia Sports, which opened in 1941.

"Co-marketing is common in the fashion industry," Kevin said. "Unknown clothing lines will license logos from established designers or brands to gain market share. It provides instant credibility."

The Olympia booth was busy during the Rheas' first trade show. Motorcycle retailers were eager to see the newly expanded Olympia product line.

The journey to the customer's closet is long. Each time the garment changes hands (manufacturer, importer, wholesaler, distributor and retailer), there is added cost. Kevin chose to keep prices down by bypassing traditional distribution and selling directly to retailers.

In addition to attending trade shows, creating advertising, production forecasting, designing new products and personally answering calls and emails from dealers and customers, the Rheas also battled distributors for shelf space in dealerships.

Twice a year, they loaded a large van with the entire product line and toured the U.S. for six weeks, training all their dealers and signing new ones. A quarter of each year was dedicated to marketing and sales, away from home.

QUALITY GARMENTS are designed to look and feel great. Motorcycle gear also needs to keep the rider comfortable, withstand the elements, keep padding in place and protect from the impact and abrasions of a crash—materials and manufacturing determine the results.

"When we started, one of the best fabrics on the market was Cordura, a proprietary nylon thread invented by DuPont," Kevin said. According to the manufacturer, Cordura is up to 14 times stronger than generic nylon blends and scores a close second to leather in abrasion tests. He adds, "Safety has always been our primary concern. We still use Cordura, even though the cost has doubled in the past 10 years."

Low overhead enabled Olympia to design products with Cordura, CE-certified armor (all jackets ship with back protectors) and YKK zippers—all crucial elements. An Olympia jacket requires 10 to 20 pages of schematics.

Fabrics such as Cordura require a highly trained workforce using specialized machinery and a culture of quality control. The Rheas attempted to source domestic manufacturing, but found no U.S. factories capable of producing such technical, labor-intense motorcycle apparel.

A strong sense of family has carried over from the Rheas' personal lives to their employees.

KEVIN AND KARILEA RHEA

Kevin Rhea's routine monitoring of the manufacturing process has helped Olympia build a reputation for producing clothing that allows customers to walk away from crashes.

Kevin relied on his experience working with foreign manufacturing to find a qualified factory and DuPont pointed them to the largest worldwide manufacturer of Cordura garments.

THE FIRST PROTOTYPE is a single garment hand-built by technicians, following Olympia's drawings. A finished sample is sent to Kevin for feedback and corrections are communicated via email. For second-run prototypes, Kevin flies to the factory to inspect the build, a days-long process of identifying errors and processing corrections. This results in third prototype or 'pre-production' samples, shipped to Olympia for final approval. These are photographed for advertising and used as product samples for sales reps and trade shows.

Before final production commences, Karilea decides how many garments to purchase—not a trivial matter when selling jackets, pants and suits in several designs for men and women, summer and winter weights and multiple colors.

Manufacturing turnaround is four to five months. An inventory estimate is made for the first six months of the following season and a big check is written—with no knowledge if sales to the fickle motorcycling public will cover the costs.

"When visitors looked at all the inventory," Karilea said, nodding toward Olympia's warehouse, "they saw a colorful display of new products. We saw our future, draped on those hangers. If we didn't empty the stock every year, we knew we could tack another few years onto our working lives."

Olympia grew 80 to 100 percent annually, and within a decade, sales surpassed the multimillion-dollar mark, with good profitability. One might conclude the company has a sizable workforce, but the Rheas accomplished all of this growth with a minimal warehouse staff and 16 independent sales reps. The Rheas' financial stress and daily workload were substantial.

The Rheas have always taken employment responsibility seriously, never hiring unless the position could be permanent. Those employees are compensated with a real living wage and full health insurance benefits

MARKET SUCCESS and a loyal customer base are reflected by testimonials on the company's website, thanking Olympia for comfortable clothing that has allowed them to walk away from some significant crashes.

These impressed Motovan Corporation, Canada's largest distributor of off-road motorcycle and ATV products, which reached an agreement to purchase Olympia in July 2015. The deal was signed three months later.

In terms of day-to-day work, nothing has changed in the 18 months since the sale except employees now work for Motovan. The acquisition allowed Olympia to reach more customers in the U.S. (via sister company MTA) and in Canada (via Motovan), and required an additional manufacturing site to handle the increased volume.

Motovan brings established manufacturing and marketing skills, which means that Kevin and Karilea no longer have to drive the company van around the U.S., selling to dealers directly. This gives the Rheas more time to concentrate on manufacturing and new product designs.

KEVIN RHEA'S ADVICE to anyone thinking of turning their motorcycle passion into employment is simple: "Whatever business you start, you'd better love it, because the ups are lovely, but the downs are devastating."

He added, "Be prepared to work hard and be well capitalized, so you can keep the doors open until you're profitable. Be smart. Pay attention to everything, because you never know what comes next. You must be willing to change direction if the need arises."

Perhaps these moto-entrepreneurs will finally find a little more time to ride. MCN

KEVIN AND KARILEA RHEA

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KING OF THE WHEELIES

> By **Joe Michaud**

DOUG DOMOKOS WOWED CROWDS WITH AMAZING STUNTS

Before there were motorcycle stunts like "flying Jesus" or "highchair endos" or "biscuit eaters," packaged with corporate logos and served up on ESPN in primetime, there was Doug Domokos.

Domokos became known as "King of the Wheelie" by keeping his stunts on the ground, on one wheel. In 1984, he rode a single wheelie around the track at Talladega Raceway for 145 miles—more than 58 laps.

He once wheelied up San Francisco's steep, twisty Lombard Street. Then he wheelied down it and, encountering a large sedan blocking his path at the bottom, wheelied up the rear bumper, over the roof, down the hood and kept going. Such stunts are now commonplace, but they weren't in the 1970s. Domokos was among the first to do them.

Born and raised in Niles, Michigan, in 1955, Domokos spent much of his childhood on Schwinn Stingrays and other bicycles on which he could easily ride wheelies. Vacant lots, dirt mounds, and scrap plywood ramps entertained an entire adolescent generation in the 1970s. Tug 'em up and ride.

Like many kids, Domokos got his first motorized rides on bikes borrowed from friends. Then, when he was 15, he got his own: a Yamaha Enduro 175. After he saw Bruce Brown's movie, *On Any Sunday,* Domokos rode his motorcycle relentlessly around an abandoned rail yard near his house. He got better and better and was soon competing in local amateur drag races, hill climbs and motocross. Motocross was fairly new, but Domokos loved it and dreamed of a racing career.

After high school, he took a job at a motorcycle shop owned by Gene Ritchie, the man who promoted the MX National event at Red Bud MX track in Buchanan, Michigan. Domokos worked his way up to mechanic and while testing customer bikes, he would loft the front wheels. He found he could keep many of them up a long time.

Domokos was able to bring his own bike with him while traveling the motocross circuit with racer Ray Ritchie, son of Gene Ritchie, and he performed his on-track stunts whenever he got the chance. He quickly impressed the racers with his wheelie control on twisted and rutted motocross tracks. He developed a following and earned the moniker, "The Wheelie King."

After a chance meeting with a factory Kawasaki mechanic, Domokos was introduced to Bryon Farnsworth, then a Kawasaki research and development manager.

Some of Doug Domokos' jaw-dropping wheelie stunts were done on a three-wheeler in sort of a high-wire act, 20 feet up.

DOMOKOS FAMILY

"Domokos hung around at the Red Bud track when Steve Johnson was traveling with the factory Kawasaki race team," Farnsworth said. "Johnson saw him wheelie the full length of the track."

Domokos had an agreement to do some exhibitions between races at a few of the National events, but needed a dedicated bike. Farnsworth was interested in giving the kid a break but needed to check him out.

"We met at the National, at Sears Point," Farnsworth said. "Doug came out and jumped on a bike equipped with a little

electric motor on the front wheel for gyro balance and wheelied around the entire track. It was pretty awesome. So I got him a little 250 MX'er; but once you do that, it's often just the tip of the iceberg."

Domokos also talked Farnsworth out of a Toyota pickup from Kawasaki's promotional fleet.

"Then he got a free camper shell from some guy in San Bernardino," Farnsworth said with a laugh. "He was quite a promoter. As a matter of fact, he had no place to stay for a while and he lived with me and my family in Irvine (California)."

Domokos met some influential AMA folks and was soon traveling the circuit, performing his tricks. He would ride wheelies for 10, 20 miles. He developed the "Fender Bender," in which he would lean back so far, the rear fender would drag and the front wheel pointed almost straight up. He performed in more than two dozen countries and earned a spot in the Guinness Book of Records for his 145-mile wheelie at Talladega.

"He was a helluva talent," Farnsworth said. "He once wheelied a Kawasaki KZ1300 six-cylinder across the 23-mile-long Ponchartrain Bridge in New Orleans. He could wheelie anything."

Not surprisingly, Hollywood people came calling and Domokos performed stunts for some classic gearhead films, including Cannonball Run. He reportedly passed the motorcycle test in the state of Georgia on one wheel. He also freely donated his time and skills in charity event performances.

Domokos' daring extended beyond the motorcycle realm.

"He had a bar trick where he'd bite a glass," Farnsworth said. "It was wild. He'd bet guys. We could hear it crunching."

Former motocross star Brad Lackey witnessed it as well.

"He was pretty wild," said Lackey, who met Domokos at a Trans-Am race in 1978. "We were hanging out at a hotel bar and he bet us that he could bite a beer mug. A big, thick mug. And he did it."

Farnsworth says that when the party moved from the bar to a fourth floor hotel room, Domokos announced to Farnsworth, Lackey and the rest that he was going to jump from the balcony into the pool. Lackey says he talked him out of it.

Many who knew him say Domokos could wheelie on anything, such as this Buell. He once rode a 145-mile wheelie.

"It was a suicide stunt," Lackey said. "But after we saw him eat the glass, we figured he was probably gonna try to do it."

Lackey, who rode for Kawasaki at the time, helped Domokos acquire bikes occasionally, and their paths often crossed.

"We hung out with him, here and there, and had some fun," Lackey said. "In those days, stunting on a motorcycle usually involved guys standing on the seats of Harleys, so we were amazed at what he would do. I saw him rip the taillight off a Kawasaki KZ1300 six-cylinder at Road Atlanta. Nobody wheelied big bikes in those days. Certainly, nobody was doing stunts like Doug's famous Fender Bender."

There were lots of stunt jumpers then: Gary Davis, Rex Blackwell, "Super Joe" Einhorn and, of course, Evel Knievel. Domokos broke new ground, moving away from the simple physics of ramps, launch speed and distance.

"Jumping was easier, in some ways," Lackey said. "You didn't need a lot of talent to go ramp to ramp; you just needed speed and conviction, so a lot of guys took up with that. But not many guys copied The Wheelie King because it was way more difficult."

Domokos' talent really shone when riding slow-speed wheelies around a rutted, bermed, dirt clod-studded motocross track replete with tabletops, jumps, dropoffs, rubble and whoops.

"It was very difficult to do at the slow speeds he rode," Lackey said. "The faster you go, the easier it is to wheelie. But he had to go as slow as he did, virtually walking speed, to go over the ruts, up and down hills, and off the drops."

Lackey and his racer buddies initially thought the trick was the front wheel motor until they tried to duplicate the maneuvers themselves.

"It was at Sears Point and one of my friends tried to do it, and failed," Lackey said. "Then Doug jumps on my stock bike and does the same stunts without the gyro assist. Everyone kinda shut up after that. He could do it on anything. The motor was for long stunts, with the front wheel giving gyroscopic stabilization."

In July 1979, Domokos lapped a half-mile track 20 times in a nonstop, non-drop wheelie that was filmed for *On Any Sunday II*. The stunt was submitted for a Guinness World Record.

Domokos' legend grew when he got on a three-wheeler and wheelied up a pair of tensioned cables that supported only the two rear tires. When he got to the top, he continued across the span between two support columns, still in a wheelie. Domokos would often pause midspan and climb over the handlebars while delicately balanced, front wheel in the air, 20 feet above the ground.

Tragically, Domokos died in an ultra-light aircraft accident in Murrieta, California, in 2000. Some of his stunts can be found on YouTube. He delighted crowds, especially the children, and loved performing.

His instructional book, "Wheelyin' With the King" is long out of print and hard to find. When one does pop up, mostly on eBay, it usually sells for $60-$100. The book ends with this Domokos quote:

"I know that my wheelie shows aren't going to cure the world's ills, but if they give some people some pleasure, that makes it all worth it to me." MCN

DOMOKOS FAMILY

Even with naked bikes, there is an immediately recognizeable difference in the styling lines of Honda (right) and Yamaha (below, right).

JUST ONE LOOK

WHEN IT COMES TO EFFECTIVE PRODUCT BRANDING, FORM SHOULD SPEAK FOR ITSELF

> By **Glynn Kerr**

In an ideal world, one should be able to look at an unfamiliar vehicle and immediately identify its manufacturer. Doesn't matter if you're seeing it from the front, side or back, it should be instantly apparent. If you have to look at the badge, or read the inscription, the designers and product development managers haven't done their job.

Motorcycles have a more difficult job than cars, especially from the front and rear angles, because there isn't much width for designers to play with. Certainly on naked bikes there's a limit to the number of variations on headlights and instruments available.

Some companies have it easier than others. When the majority of the products are painted red, with few alternatives, and they're predominantly sporty, it isn't difficult to spot a Ducati at a hundred paces. At one stage, BMW also had an instantly recognizable look (which a clay modeler there once told me was achieved by simply running huge radii over all the edges once the main shape was finalized), although that has diminished as the product line has diversified over the years. The wider the range of products, the harder it is to maintain a common design language, although it's no less important if a company is trying to present a universal image of quality, desirability or innovation.

Honda has an enormously diverse product range. From generators to lawnmowers to motorcycles to aircraft, Honda has it pretty much covered. Nonetheless, the company maintains a strong identity across the board—an image of quality and consistency that is vital for sales

GLYNN KERR

confidence, which fetches top dollar among Asian manufacturers. As a business model, simply being cheaper than all your competitors has its limitations.

Comparing both companies' two-wheel lineups at this year's EICMA, the wildly different design languages these two local competitors have imposed on their current products is interesting to analyze. On the one hand, Honda has developed a design language of fairly conservative perfection. Even its top-of-the-regular-line CBR 1000RR is restrained for a hyper-sport model, and as I noted earlier, even the $184,000 homologation RC213V-S doesn't scream its abilities on the outside. This is all quite deliberate. The emphasis is always on quality, and, for a Japanese manufacturer, refined understatement emphasizes that point.

Moving over to Yamaha, the motivation-to-buy message is very different. Despite having owned six of them, and having worked exclusively for the company as design consultant for four years in the 1980s, I still have difficulty pinning down the image. It's younger, sportier and more radical than Honda's, and the designs give the impression of being more cutting-edge. But that also demands being more extreme, which is less predictable from a sales viewpoint. It also encourages buyers to select on a model-by model basis, rather than establishing a consistent brand loyalty that reaps long-term benefits. The advantage is that Yamaha can turn on a dime and follow—or create—any new direction it desires. Honda, by defining its destination, is committing itself to a set course. But, as if to destroy my argument, Honda occasionally throws us a model like the Rune or the Vultus, just to prove the Japanese hate to let a niche go unfilled.

While Honda has large, unbroken surfaces, and just a few strong features that define each design, Yamaha's approach is much more complex, with intricate changes in line and surface everywhere to be seen. There's barely an area that's flat enough to take a decal—a fact that is reflected in Yamaha's simpler graphic designs. Parts are colored differently to give detail, rather than by applying stickers. Honda does the opposite, with more adventurous graphic designs to pep up the sportier models. Each company goes its own way. Each has its reasons, but each has its own corporate identity, clearly visible through its products.

It is easy to see the influence of Edward Jacobs in the designs of both a Confederate motorcycle, left, and the new Vanguard, above. He has served as design chief for both manufacturers.

By contrast, there are plenty of examples where companies have made no attempt to create a unique design language, or, worse still, where they have hooked on to someone else's to try to cash in on their success. One recent example I have an issue with is a new U.S. company that has hit me with press communications for the past few months.

The Vanguard Roadster, which debuted in New York in December, certainly generates a strong impression. The overall balance is reminiscent of a 1960s Triton, with classic horizontal lines and an emphasis on polished metal. The frame tubes, which look like huge DESMO shaft covers, are a really nice touch. OK, once street legal components such as mudguards and mirrors are added, the prototype will lose some of its bad-ass looks, but that's not my main gripe. All the design language—the cold, steampunk, no-human-interface, all-billet approach—screams, "Confederate."

Now consider that Vanguard was pioneered by ex-Confederate board member Francois-Xavier Terny, and design engineer Edward Jacobs, also previously with Confederate. And here we come to the big question: How much of a company's design language belongs to the company, and how much to the designer who helped create it?

Either way, I have a feeling Vanguard will have difficulty producing its Roadster in anything like its current form for the promised $30,000. That's a lot of cash for a motorcycle, but a fraction of what Confederate is asking for its own products, so maybe undercutting their previous employer is the goal. Let's see what the final model looks like when it reaches production in 2018.

In the meantime, I hope they revise the laptop-style 7-inch touch-screen, which acts as the instrument binnacle. Right now, it points at the sky and will be unreadable to the rider at its current position. It looks to be hinged, but lowering it would gouge a chunk out of the tank once the steering is turned. Please tell me someone checked that before releasing it to the press—the forks look well and truly locked in the company's publicity photos. MCN

VANGUARD MOTO INC., CONFEDERATE MOTORCYCLES

FINAL DRIVE 101

PROPER MAINTENANCE HELPS ENSURE LONG LIFE AND A SAFE RIDE

> Text and photos by **Kevin O'Shaughnessy**

Proper chain tension should be maintained at all times. A chain that is too loose can come off the sprockets easier. If it's too tight, it could cause parts to wear prematurely.

The final drive is the last portion of a drive train to deliver power to the wheel. In this issue, we'll discuss the advantages of different types of final drive, plus chain maintenance. Next month, we'll look at servicing belt and shaft drives.

Most motorsport final drive systems consist of either a chain drive, belt drive or shaft drive. The type of system used varies, though there are some standards. Since the 1990s, Harley-Davidsons have typically used belt drives, BMWs a shaft, and KTM and Ducati chain. Japanese manufacturers use all three.

ADVANTAGES AND DISADVANTAGES

For maximum performance and horsepower, chain drive is the way to go. While a chain is fairly heavy, the overall system is lightest and frictional power losses lowest. That means more power to the rear wheel and a lighter bike. A belt is lighter than a chain but the supporting structures are heavier. We also lose more energy from friction due to the tension needed to prevent a belt from slipping. Shafts are the heaviest drive mechanisms and supporting components are vastly heavier than the other two systems. They have the most frictional loss from bevel or hypoid gears changing the direction of rotation.

Chains are the least expensive components to design and manufacture. Belts systems cost slightly more to design and produce because of more complicated sprocket design and additional support bearings. Shaft drives require vastly higher design and component costs. This is why you see the same or similar shaft drives on a series of vehicles such as the Suzuki Boulevard, Yamaha V-Star and BMW GS. OEMs design the same assembly to run on multiple models for many years before making significant changes.

Shaft drives typically outlast the vehicle and are nearly maintenance free. Belt drives are next on longevity and have low maintenance needs (mostly visual checks and tension). Since a chain drive is essentially an exposed metal gearbox, it requires constant maintenance and has the lowest life span. This has improved considerably with the addition of O-ring sealed chains but there is constant exposure to the elements and their sticky lubricants make them dirt and rust sponges.

CHAIN MAINTENANCE

Chains need to be cleaned with a stiff plastic brush and O-ring-safe cleaner. If dirt is allowed to accumulate it acts as an excellent rubbing compound that deteriorates the chain prematurely. Chain brushes save on cleaning time and can be found online for $5 to $10. Check intervals depend on the riding conditions.

Adventure riders may need to clean their chain after a rough and tough week.

To align the rear axle, measure from the center of the swingarm pivot point to the center of the axle on both sides. The length should be the same.

Commuters may only need to check every couple of months. Dirt riders should clean the chains every ride. You are the judge. If the chain looks dry or caked with dirt, it should be cleaned and lubricated. The better you do this, the longer your chain and sprockets will last.

After cleaning, inspect the chain for damage and kinks. All links should move with similar resistance. If you find one that is binding significantly, it is an indication of damage or internal corrosion and the chain should be replaced. Perform a quick wear check by squeezing the top and bottom of the chain together firmly. Then, tug on a link at the back of the rear sprocket. If you can see light between the chain and sprocket, the chain is worn and the pin count should be checked. If not, it's probably good.

The pin count is found in the service manual. You perform this check by straightening the chain, counting the pins, then measuring the distance between the first and last pin. If it is too long, the chain is worn past limits and should be replaced. Chains and sprockets should be changed as a set to prevent premature wear. As a note, chain wear is sometimes inaccurately called "stretch." When wear is compounded over a couple of hundred interlinked pins and rollers, the length increases and gives the impression of stretching.

Sprockets are basically external transmission gears. They connect to the transmission output shaft and wheel. The output shaft uses a much smaller sprocket than the wheel to increase mechanical leverage. The nice thing about chain sprockets is the plethora of aftermarket sizes available to change final gear ratios.

If you want more leverage to pop a wheelie, go with a smaller gear on the transmission shaft and/or larger gear on the wheel. The down side is you'll lose top speed and will need to shift sooner. Go with a larger transmission output sprocket and/or smaller wheel sprocket and you'll gain top speed, but lose the grunt to get there. In racing, this method may be used to reduce wheel spin in corners by reducing the mechanical leverage.

While I enjoy adjusting final gear ratios for road race and dirt bikes, I usually find the stock setup to be the best overall power and shift points for street riding. Sprocket teeth should be an equidimensional tent shape. If they are bent, broken or look like a shark fin, replace the chain and sprocket set. If you want to save a ton of money, use steel sprockets. The additional reciprocating mass of the steel sprockets would not be measureable and will last many times longer than an aluminum sprocket.

Check for chain slack and rear axle alignment. This should be done after inspections, any time a chain is replaced or any time the wheel is removed. Slack indicates the amount of free play the chain has to allow for swingarm pivoting. As the swingarm moves, the distance between the sprockets changes. Too much slack can cause a chain to derail. Not enough slack will cause binding and excessive wear to the sprockets, chain, wheel bearings and transmission bearings.

Slack is measured by throw or distance. Throw is when you push up and down on the middle of the chain and measure the distance between. Distance is measured by pulling the chain away from the chassis and measuring from chain to chassis. In both cases, the key is to apply light pressure to the chain. You don't want to spring load the chain by pressing too hard. This will result in overtightening the chain. If the slack is out of specification, loosen the axle, adjust the chain adjusters equally on both sides to prevent axle misalignment, then tighten the axle and recheck the slack. It's common for swingarms to expand when the axle is loose. This eases rear wheel installation. When tightened, the axle is pulled back and reduces the slack. If this is the case, add 5-10 mm before tightening the axle, then measure it.

Align the rear axle by measuring from center of the axle to center of the swing arm pivot point. If the distance is the same from center to center, the axle is parallel to the pivot and considered straight. This gets tricky if there is an offset or something in the way so you may have to straighten a metal hanger and make 90° bends at the centers of the axle and pivot to bypass the obstruction. Then, compare the hanger to the other side. If more than 1/8 inch off, loosen the axle, adjust the axle angle with the chain adjusters, tighten the axle then recheck alignment and slack. Making this adjustment usually requires resetting slack.

Finally, use a chain lube after inspections. Light and dry lubricants don't do well as chain lubricants. They migrate away or wipe off high-wear areas. A high-tack, high-viscosity spray wax seems to do the best job at lubricating, resistance to fling-off and preventing dirt accumulation. I've had long life and low wear from Maxima and Bel-Ray chain lubes.

We'll look at belts and shafts in next month's issue. MCN

Check sprockets for broken teeth or abnormal wear. All teeth should have a uniform, equidimensional, tent-like shape.

Motorcyclists can improve their odds of avoiding a crash by increasing braking distance required and staying alert for sudden hazards.

BE SAFE

BE ALERT, BE PREPARED

CONTROLLING YOUR MACHINE IS ONLY HALF THE BATTLE

> text and photo by **David L. Hough**

In the 1980s, we could lay blame for motorcycle crashes on car drivers. The famous "Hurt Report" concluded that almost three of four "accidents" in the late 1970s were collisions with cars, whose drivers often failed to yield to motorcyclists. "Damn blind cager!" riders could mutter when a driver made a sudden turn across their path.

Things have changed.

Collisions with cars now constitute only about half of motorcycle crashes in the U.S. That means that at least half of today's motorcycle crashes are a matter of the rider losing control of the bike or the situation.

Over the past year, I've given you uncomfortable doses of fatality statistics, which show a person is 35 times more likely to die riding a motorcycle than driving a car. We generally evaluate the danger of motorcycling by fatalities, because fatalities are so well documented. However, for every fatal crash there are around 19 "morbid" crashes where someone got maimed but survived. The Centers for Disease Control (CDC) estimated that there were about 1.2 million injured riders who required treatment at hospitals between 2001 and 2008—750,000 of them with life-threatening injuries.

DAVID L. HOUGH

Let's note that these numbers are for all motorcyclists, so your personal odds of crashing or spending time in the ER aren't necessarily close to the averages. For instance, riding a motorcycle while intoxicated or otherwise impaired is an invitation to a crash. So, separating drinking or taking drugs from motorcycling should improve your odds.

TOO FAST FOR CONDITIONS

There are unending streams of motorcycle crash videos online, and I suggest that we can learn from others' mistakes. One common error is riding too fast for conditions. Increasing speed shortens reaction time, and increases the time and space it takes to maneuver. In the videos, riders speed into dangerous situations oblivious to danger.

There are different interpretations of "fast." At a sport bike rally a few years ago, a famous road racer/track school guru stated that riding really fast on public roads was not as enjoyable as riding a brisk but reasonable pace. In describing the previous day's ride with companions, he noted they seldom exceeded 85 mph. For a veteran road racer on a closed track, 85 mph is just dawdling along; on public roads, it is a different matter. Motorcyclists need to be in control of the situation as well as in control of their bikes. Out on public roads, there are wild animals, gawking tourists, left-turning vehicles, edge traps, loose gravel, fallen trees and other hazards not found on a race track.

LOSING CONTROL OF DIRECTION

One common error that results in a crash is going too wide in a corner. Doing so in a left-hander, might lead to taking a soil sample or even colliding with an immovable object such as a rock or tree. But going wide in a right-hander can lead to a collision with an oncoming vehicle.

How does a rider lose control in a curve? I sometimes ask people how they make a motorcycle change direction, and I often get the answer, "I don't know. I just do it." Normally, that's fine, since much of what we do is subconscious. But what if the pavement slants the wrong way ("off camber") or tightens up at mid turn ("decreasing radius") or a sudden crosswind bounces off a cliff face? It is critical to recognize a change in conditions and control the bike. Taking an advanced training course or even reading up on techniques can help.

Crossing the centerline can be intentional. Some use the entire road as their personal racetrack, jacking up speed, and cutting corners to straighten out their line. This is prevalent among those who own a high performance motorcycle.

For me, riding at 85 mph on a public road is scary dangerous. It's not that I am concerned about controlling the bike; I'm concerned about not being able to control the situation. Even at reasonable speeds, I'll transition to the brakes when the vanishing point of the road suddenly retracts. When sight distance closes, we have a limited window in which to scrub off speed. Rolling off the gas slows engine rpm, but that only slows the rear wheel. To slow down safely, use the brakes.

In an emergency situation, reaction is often subconscious. Parts of our brains are devoted to such situations. It's an "emergency" when it's a surprise. You spot a hazard—say an oncoming car making a left turn into a driveway—and your brain commands the muscles to take evasive action. Of course, what we do in surprise situations is based on whatever we've been practicing—what some people call "muscle memory." If you cruise the back roads using only the throttle to control speed, it's very likely that, in an emergency, you will roll off the throttle (but not apply the brakes). To keep the situation under control, good habits must be practiced on every ride.

STOPPING DISTANCE

We also must predict distance required to slow the bike. Let's say you are approaching a blind corner at 60 mph and realize the vanishing point is shrinking quickly. You ease off the throttle, reducing speed to 50 mph. If you round the corner at 50 mph and then suddenly realize there's a fallen tree blocking the road, you may not be able to stop in time. Our average reaction time is perhaps 1.25 seconds. After that, add braking distance. Total stopping distance in real-world conditions is typically much longer than we might predict.

So, if you're not already on the brakes as you round a blind corner and find, say, a wrecker pulling a car out of the ditch, you might not be able to avoid a crash. Even famous track school gurus with quick responses going 85 mph are unlikely to beat the laws of physics.

STACK THE ODDS

Here are some suggestions to enjoy the ride more: First, hone your balancing/steering/braking skills. It's a lot more satisfying when you are proficient at controlling the bike. You should be skilled enough to brake aggressively—even when leaned over. Once you have mastered the basics, your goal should be to develop the muscle memory to control the bike "automatically," so that you can focus on the future, including that which may be hiding over the hill or around the bend.

Second, plan your cornering line entirely within your own lane, even if that means a speed reduction. Drifting across the centerline can be fatal; oncoming vehicles can appear suddenly and quickly.

Third, when sight distances shorten up, immediately transition from throttle to front brake to get the bike slowed smoothly and quickly. When the view opens up, it doesn't take long to get back up to speed.

Finally, avoid group rides. Riding in a group jacks up the odds of ruining your day. If you do join a group and the leader (or the other participants) don't seem to have the right stuff, separate yourself. It's polite to announce to the leader that you're dropping out. If that becomes an issue, remember that it's amazingly easy to get "lost." MCN

CYCLE ANALYSIS > By **Mark Barnes, Ph.D**

Crazy Deals

AS A CONSUMER-SERVING magazine, MCN is concerned with value. Of course, value can be a slippery concept. One rider's trash is another one's treasure, and the relationship between any item and how much it costs can be very loose, indeed. Not only may the same thing be found for a wide range of prices from different sources simultaneously, but also sellers may change their prices repeatedly over time.

Retailers adjust pricing based on seasonal trends, inventory fluctuations, and what sacrifices they're willing to make for cash flow. Private sellers often have wildly imaginative ideas about the worth of their wares, either way above or way below what an "objective" assessment suggests (more on that in a moment). And they may be driven by acute concerns completely unrelated to the item for sale, such as sudden medical expenses or an unexpected layoff.

AMIDST ALL THIS arbitrary chaos, buyers must make decisions about how much to spend on their purchases. In reality, such choices are usually determined by what funds they have available and the immediate intensity of their desire, maybe even more than by any specific aspects of the item in question. Because all of the above non-vehicular factors play such large roles in determining the price at which any motorcycle ultimately sells, it's somewhat misleading to talk about National Automobile Dealers Association (NADA) or Kelly Blue Book values as objective reflections of a particular bike's worth. They only tell us about an aggregate of subjective human interests, rather than anything about the object, itself. Such valuations are objective only in that they are quantified measures of crowd behavior.

Obviously, ideas about supply and demand, along with other market forces, are nothing new. But sometimes truly profound realities hide in plain sight and we miss the amazing-ness of the familiar. This was impressed upon me recently when my friend Bruce bought his second bike, a 2003 BMW R1150RT ABS, on eBay for an amount no reasonable person could deem anything but patently absurd. This immaculate, meticulously maintained motorcycle, built to endure decades of cross-country travel, had a mere 16,500 miles on its odometer. BMW's faithful would call it "barely broken-in."

Averaging the two aforementioned sources' estimates of this magnificent machine's worth yields about $5,000. What could you buy off the showroom floor right now for that price? KTM's 390 Duke is frequently reviewed as a great value at its 2016 MSRP of $4,999. As neat a bike as it is, there's simply no sane way to equate this admittedly exotic, agile and spirited starter bike with Bruce's Beemer, an iconic, sophisticated, decked out, plush and nimble powerhouse in virtually brand-new condition. Oh, and Bruce ended up snagging the RT for 25 percent less than that book value average!

MARKET FORCES ARE nowhere more purely displayed than at an auction. In its undiluted "wisdom," the Used Motorcycle Market—an apparently delusional subset of the population—decreed on a particular day in early December, 2016, that Bruce's BMW had a cash value of $3,754.

Really?

That is a genuinely crazy conclusion. Yes, December isn't the best month to extract maximum cash out of a street bike sale in the northern hemisphere. Yes, the buyer must risk paying for potentially expensive repairs on an non-warranted vehicle. Yes, this model has evolved since 2003 in ways some would consider worth the additional cost of a newer version. And, yes, the market is the final arbiter of reality when it comes to what anything is worth at any given moment, if that worth is defined solely as what a buyer and seller agree upon in their negotiations. Yes, yes, yes, to all that and more.

But this spectacularly engineered motorcycle retailed for more than $16,000 when new. Adjusted for inflation, that figure becomes $21,000. Nobody can convince me this BMW is now able to deliver only 18 percent ($3,754's portion of $21,000) of its original functionality and joy of ownership. To assert that would be not only grossly inaccurate, but insane. The case is much more easily made that this bike holds every bit of the experiential value it held in 2003, albeit without the confidence of a warranty. In fact, for Bruce—a mature and as-yet unjaded motorcyclist who prioritizes real-world capabilities over theoretically superior tech, a newer RT would offer very little advantage of any concern.

DEPRECIATION, WHILE understandable in the abstract, is really nonsensical in the context of what a good used motorcycle can concretely do for its buyer. This is tragic for sellers, especially if they bought new. But it's a win of absolutely epic proportions for careful buyers. The market, while undeniably in control, is just ridiculous. (I've been the victim and beneficiary of its whims many times, too.)

Take a moment to let this all sink in. You may have more room in your garage than you thought. MCN

Mark Barnes is a clinical psychologist, in private practice since 1992. He has written extensively for MCN for more than 20 years.

> By **Dr. Cary Tanner**

Shoulder Pain? Might Be Rotator Cuff

MOTORCYCLISTS OF ALMOST all ages are susceptible to rotator cuff injuries that can result in painful shoulder motion. In young racers, a fall on the outstretched arm can result in an acute rotator cuff tear. Older riders may experience similar trauma, but are also susceptible to a degenerative tearing of the rotator cuff from repetitive overhead lifting.

As previously discussed (MCN 1/17), the rotator cuff is composed of four muscles that stabilize the humeral head (the ball of the ball-and-socket shoulder joint) while larger muscles of the chest and back move the upper extremity. Both groups of muscles are necessary for normal, pain-free shoulder motion.

When a motorcyclist reports shoulder pain, the orthopedic surgeon will investigate the history of the discomfort and conduct an examination. After this, an X-ray will be done to rule out either bone injury or arthritis. A magnetic resonance imaging (MRI) is typically done as well. Like X-rays, an MRI scan produces an image using magnets instead of X-rays and is believed to be less harmful to human tissue. The MRI study is one in which the patient is placed in a narrow tube for about 20 minutes. The confinement can make this a difficult procedure for very large patients and for the claustrophobic. Open MRI's are available, but the image quality may not be as good.

A regular X-ray produces good images of bone and is the best way to assess arthritis and rule out a fracture, but it cannot capture details about muscles or tendons. The MRI will show both muscle and tendon. Armed with both imaging studies, a recommendation can then be made about treatment.

In the young racer who has experienced shoulder trauma, once X-ray rules out a fracture, an evaluation of the injury will determine whether arthroscopic surgery is necessary, or if just a rehabilitation program is required.

In the older patient, the treatment algorithm generally begins with whether or not there is arthritis in the shoulder, the severity of the arthritis and the size of the rotator cuff tear. Small tears in shoulders with minimal arthritis are treated conservatively with therapy and possibly injections. If this is not successful, an arthroscopic repair of the rotator cuff is generally possible and good outcomes are expected.

When more significant arthritis of the shoulder accompanies a rotator cuff tear, treatment is dependent on the size of the tear and the severity of the arthritis. There may be small, repairable tears or massive, unrepairable tears. Therapy and injections are often done first. If this is not successful, there may be a role for either arthroscopic debridement (clean-up) of the arthritis with attempted rotator cuff repair or even shoulder replacement. Large tears and significant arthritis do not necessarily spell the end of motorcycling, but in such cases, shoulder function is not expected to return to normal. MCN

Dr. Cary Tanner is a surgeon, chairman of the board at Fresno Surgical Hospital and medical director of Summit Surgery Center.

REHABILITATION OF ROTATOR CUFF

> By Rick Lembo A.T.C.

Setting appropriate expectations for a rider or racer who has undergone rotator cuff repair is often the most important job of the athletic trainer or physical therapist.

Many aspects of motorcycling place significant physical demands on the shoulder. Beyond actual riding, a healthy shoulder is essential for maintenance and transportation (e.g., moving bikes and equipment). For recovery from a rotator cuff repair, patients need to have patience!

Two definitions used in rotator cuff rehabilitation are:

Passive Range of Motion (PROM)
The movement of a joint without exertion by the patient. The trainer or therapist manually moves the joint with the patient relaxed.

Active Range of Motion (AROM)
Patient moves the joint by muscle, without assistance.

A rough timeline for post-op recovery:

First Four Weeks
Sleep in recliner. Most patients are more comfortable sleeping upright.

First Six Weeks
Arm in a sling. Trainer will do PROM.

From Sixth to Eighth Week
AROM and PROM. No lifting.

From Eighth to 12th Week
AROM with resistance (weight lifting).

Three Months
12 weeks is usually when a patient regains a sense of normalcy and is capable of most daily activity.

Six Months
Return to normalcy usually occurs between six and nine months, depending on strength. Some facilities use a Biodex machine to measure shoulder performance against the uninjured side, to help decide if a return to racing is advisable.

18-24 Months
Most patients report that they can sense improvement for 18-24 months post-op as they regain strength and freedom of motion.

YOUR RIGHTS > By **Megan Ekstrom**

We Gained Back Legal Ground in 2016

IT CAN BE difficult to prove your worth as a lobbyist. At board meetings, conferences and seminars, folks want to know: What did you achieve on our behalf? That was easy to answer in 2016, a remarkable year for the motorcycle community. Here are some motorcyclist rights victories won this past year:

THE FAST ACT: This act, in effect Jan. 1, addresses surface transportation issues and improves safety, maintains infrastructure condition, reduces traffic congestion, improves efficiency and reduces project delays. Roughly $4 million of the allocated $245 million—in Section 402 and 405(f)—was earmarked to fund state motorcyclist education, training and safety programs.

The other $241 million can be used to improve motorcycle safety, school bus safety, pedestrian and bicycle safety, enforcement of traffic laws, etc. Individual states will apply for money and propose how they would use it.

Some funds may be used for education and awareness campaigns like "Share the Road" and "Look Twice, Save a Life," which are designed to raise awareness of motorcyclists. Additional money could be used to beef up state motorcyclist training and licensing programs. The FAST Act was a big win for the motorcycle community.

MOTORCYCLE CHECKPOINTS: One of the key achievements in 2016 for the Motorcycle Riders Foundation (the nonprofit organization for which I work) and its partners in Washington was the inclusion of language in the highway bill that expressly prohibited federal dollars to be used to fund motorcycle-only checkpoints.

Though some states have expressly outlawed checkpoints due to concerns over legality and the Fourth Amendment, for years, others set up checkpoints to target motorcyclists and enable police searches. Naturally, many motorcyclists objected.

A section in the new highway bill clearly states that federal funds may not be used to conduct these checkpoints. States that still conduct checkpoints cannot use federal funding to do so. The inclusion of the language sends a clear message – riding a motorcycle does not make me a criminal.

ADVISORY COUNCIL: Since 2009, motorcyclists have lacked a formal mechanism to engage with officials within the Federal Highway Administration (FHWA) to discuss motorcycle-related issues. In 2016, with the enactment of the FAST Act, there was a provision that re-established the Motorcyclist Advisory Council.

This ensures motorcyclists a 'direct connect' to our nation's top highway safety officials when it comes to issues like driverless cars, road barriers and general highway safety issues that impact motorcyclists.

The process for establishing the Council should get underway in 2017 with a call for volunteers to serve as representatives for the motorcycle community to discuss autonomous vehicles, lane splitting and other issues.

EMISSIONS MODIFICATION: In 2015, the Environmental Protection Agency (EPA) prohibited individuals from modifying motorcycles or cars for track racing due to concerns over air emissions.

In April, 2016, under pressure from industry and Congress, the EPA withdrew the section on modified race cars and bikes within the proposed regulation. Though a major victory for the amateur racing industry, the EPA maintains that emissions modifications to street legal vehicles even for use on the track only is illegal. Consequently, any business that makes or supplies parts or services to modify emissions systems is subject to enforcement.

Legislation was introduced in 2016 to rectify this in order to provide clarity to both industry and the racing community. Ultimately the bill was not taken up for a vote, but the measure will be pursued again this year.

MOTORCYCLIST PROFILING: In 2015 and 2016, there was a sharp increase motorcyclists voicing concerns over incidents where they felt profiled or singled out by law enforcement because of their appearance, apparel, or because they are simply riding a motorcycle.

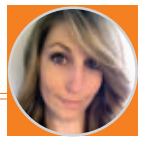
A 2016 national survey, the Motorcycle Profiling Project, found that nearly a third of respondents felt they had been pulled over not for committing any sort of traffic infraction, but just because they were riding a motorcycle.

This led to activity at the state level, but in 2016 federal authorities took notice and introduced a bill to promote public awareness and urge state law enforcement officials to condemn the practice in written policies and training materials. This was a major step in making this issue a national discussion.

Though the bill was only introduced and never progressed, the Motorcycle Riders Foundation will pursue a similar measure in 2017. At the state-level, similar efforts are being pursued and intelligence suggests that more than 10 states will introduce anti-profiling bills this year.

In 2017, hot topics affecting motorcyclists are likely to be increasingly higher blends of ethanol and self-driving cars. Whatever the government throws our way, we stand ready and willing to take on the challenge. MCN

Megan Ekstrom is vice president, government affairs and public relations for the Motorcycle Riders Foundation - mrf.org



> By **Megan Stewart**

So, You Want To Ride A Motorcycle?

WHEN YOU MAKE the decision to get into motorcycling, there will be people everywhere throwing advice your way. There will be those who try to sway you in one direction or the other, from street bikes to cruisers, or to not ride at all. It can be difficult to sift out the good advice from the bad when you're just starting out, and even harder to know which advice might one day save your life.

I was lucky enough to grow up with a seasoned rider in the family. My dad has been riding for decades and has picked up some great advice along the way, which he's passing on. At times, not all of it made sense, or didn't seem relevant to my situation, but as I gain more experience and time on two wheels, it's all starting to click.

This got me thinking: What's the best advice an experienced rider could give to a beginner?

My dad said, "Start learning to ride on the lightest, smallest, cheapest bike you can. Use it to gain experience and plan to grow out of it. Don't start with your dream bike, Wear the gear: helmet, gloves, boots and jacket. You'll need it even more as a beginner. When riding, look where you want to go. Don't look at the bike or the ground. Keep your head up and look through the turns,"

He added, "Practice braking and stopping, a lot! Proficient braking will keep you out of trouble. Keep your hands over the brake and clutch levers. Be prepared for the hard stop. Be on the defensive rather than the offensive; it'll keep you safer."

WHILE PRACTICE IS certainly one of the most important factors to becoming a successful rider, the bike you ride can help. I've known individuals who have gone on from their training programs, bought their dream bike and totaled it within weeks of the purchase. I know what I want, and starting out with something on which I'm not completely sold would be difficult.

The merit to starting off with a bike knowing you'll outgrow it, gives a sense that it doesn't matter what happens to it. Obviously nobody wants to crash; but if you drop or otherwise damage the bike, it's not the end of the world.

I asked my friend, Austin, what was the best advice that he had received as a beginner, and it was along the same lines as above.

"The best advice I got was from my MSF rider course instructor, when we asked about what size of bike to get first," Austin said. "The instructor said the most important thing is to remember the connection between your brain and your right wrist. If you keep it under control, a 600 is fine for a beginner, instead of getting a 250 and almost immediately upgrading once you're comfortable in a few weeks. With that in mind, I got a Honda CBR600 F3 and never dropped it, crashed it, or even got a speeding ticket."

This makes a lot of sense; many beginning motorcyclists opt for the 250 or 300cc bikes and, within a year, trade up for more power. I feel I'm going against the grain to say that my dream bike is a Kawasaki Ninja 300.

I don't need something with insane power; I don't need a bike that I can't handle. I've had many people tell me that I'll lose interest in a short amount of time with that bike, but when I had the opportunity to ride it, even for a short few days, everything seemed to click. It was comfortable; it was powerful enough; it was exciting. It was everything I thought it would be.

BUT BEGINNER ADVICE isn't all about finding the right bike, wearing your gear and practicing; it's about learning from different situations. In a previous column (MCN 12/16), I shared the story of my first accident. It was traumatic at the time, but didn't sway me in the slightest from wanting to continue riding. It did make me seek out more training and additional tips and tricks to use when out on the road.

MCN reader Jon D. offered support.

"Riders often believe that being rear-ended wasn't their fault," Jon wrote. "In Megan's case, this statement is true, she was sitting at a stoplight. It's the belief that absolutely nothing can be done to avoid being rear-ended that is untrue.

"Consider stopping in the extreme left or right of your lane. I call them 'edge lanes.' This position gives riders a forward escape path. It provides a better view ahead and in mirrors to check traffic behind. Most importantly, it places the rider off to the side, giving a distracted driver a better chance of avoiding the collision."

No matter our level of experience, we should keep sharing knowledge and accepting advice from others. MCN

Megan Stewart is a creative writer, journalist and former editor and contributor at Motor Trend and Automotive.com.

TOTAL CONTROL > By **Lee Parks**

Trail Braking

MANY TRAINING CURRICULUMS teach riders to do all braking before making a turn, which is good advice, but there are times when it is preferable, even necessary, to continuously brake before and while entering a corner. This is commonly known as trail braking, because the brakes are applied before the turn, used beyond the entrance of a turn and are gradually "trailed off" as the rider approaches the middle of the turn.

Under braking, a forward weight transfer causes the front end to dive and the contact patch to increase in size. By uniformly switching from primarily a braking load to a cornering load, the contact patch can stay larger as the downward pressure is replaced with sideways pressure. The more consistent your transition, the better the traction, which requires applying varying levels of throttle and brakes simultaneously.

This may sound strange, preposterous even, but it is amazing how much this settles the suspension and keeps the bike from pitching forward and backward. Virtually every MotoGP and World Superbike racer—as well as every motor cop—uses trail braking; it's a legitimate skill worth adding to any experienced rider's skillset. Many people consider this a racing technique, but there are more benefits to using trail braking on the street than there are on the track.

SINCE THE THROTTLE makes the front suspension lift and the brakes cause it to drop, these two controls have opposite effects on the suspension. We're going to use these opposing forces to help cancel each other out. The end result is that the bike's suspension barely moves and the chassis is significantly more stable when entering and exiting a corner. The technique requires simultaneously rolling off the throttle while applying the brakes going into a corner. Once in the corner we start to slowly roll on the throttle as we slowly trail off the brakes. This can be achieved with only front brakes, only rear or both.

In the first part of this sequence, the partial throttle keeps the brakes from collapsing the front end too quickly. In the second part, the partial brakes keep the throttle from lifting the front end too quickly when exiting a corner. Because safely using the throttle and brakes at the same time is an advanced technique that requires riding experience, as well as a lot of dexterity, trail braking should not be taught to or used by beginning riders.

THE PRIMARY FACTOR in determining whether you should use the front, rear, or both brakes when trail braking has to do with speed. The slower you're going, the more the rear brakes should be used. This is because they are easier to modulate at low speeds, making it more difficult to quickly compress the front suspension, which could cause the bike to fall over in a turn. For these reasons, motor officers do most of their precision maneuvers using the rear brakes.

When the pace rises above posted speed limits, the front brakes are much more effective. This is why many roadracers don't even touch the rear brakes.

At regular street speeds, either one or some combination of both brakes may be appropriate.

Some other factors that might affect the combination choice of front or rear brakes when trail braking include: weight distribution, wheelbase, linked versus integrated versus standard brakes, physical limitations or preferences of the rider, body position, type of bike, etc.

LEE PARKS

IT'S JUST AS IMPORTANT to understand the reasons you should use trail braking as it is to know how to do it properly. There are four important benefits to using trail braking on the street or track:

1. Minimizing the amount and speed of suspension movement.
2. Modifying the bike's front-to-rear attitude for faster and easier steering.
3. Reduction in reaction time for applying either throttle or brakes.
4. Maximizing directional control.

We'll discuss each in further detail next month. MCN

Lee Parks (MCN editor '95–'00) is author of Total Control Performance Street Riding and proprietor of Total Control Training.

Snapshots 2016

I REALIZE THAT you are reading this already well into 2017, but as I am writing it we still have 10 days left in 2016, which brings me to an annual ritual of filing away my mental snapshots of the year past. Each year around this time, I reflect on what are not necessarily my most significant or memorable moments of the year, but those that I deem the most pleasant. These are moments in time when I felt most content, relaxed and happy, as in "all's right with the world." And as usual, and certainly by no coincidence, every year it seems they all come to me by way of motorcycling.

The first moment that comes to mind is admittedly rather boring to tell of, but I'll try. In passing through New Jersey we hooked up with a couple of old and dear friends for a few days that culminated in Cherrie and I being invited to spend a day and night at a private trout fishing club to which the husband belonged. As only club members could stay at the actual lodge, we were put up in an adjacent house kept for visitors.

It was a beautiful old house, the kind with a full-length porch in front, and festooned with flower baskets and looking out on the trout stream. Here we sat for the afternoon, sipping iced tea as we languished in old Adirondack chairs and listened to the serene silence of the surrounding forest broken only by the light murmuring of the stream. We had been on the road for weeks, working long hours at rallies and rushing from one place to another, always surrounded by people and noise. But that afternoon it all faded away as we just sat on the porch and watched as a light summer rain passed through and the sun slowly faded behind the forested mountains. I can't remember ever being quite so relaxed.

THE SECOND SNAPSHOT is a bit more eventful, and one of my wife's favorite stories. We had stopped to visit friends in Laconia, New Hampshire, at the same time as the famous Laconia Bike Week. On opening night of the rally, our friends took us down to the rally for a walk around. If you've never been, Laconia is one of the "rougher" motorcycle rallies, populated with lots of very loud pipes, black leather and gang colors. As we approached the main vendor area around the lake, we needed to walk up a very steep sidewalk that was jammed shoulder-to-shoulder with bikers.

My wife, who is very short and who has problems with an arthritic knee, was having a difficult time climbing the hill when she caught the attention of a tattooed giant in black leather, wearing a Hell's Angels vest. Suddenly in a loud and commanding voice he shouted, "What the hell's wrong with you people? Make way for the lady!" At which point three other Angels appeared and formed a flying wedge around Cherrie, parting the crowd all the way up the hill as if they were the motorcycle escort for the Queen of England. I felt a bit embarrassed following her up the hill, but Cherrie absolutely loved it, and insisted on giving each of the Angels a big hug. Priceless, if you can envision it.

AND I'M CERTAIN we I will never forget our Fourth of July in Rhode Island which started with watching the PawSox (Pawtucket Red Sox) win a 14-inning game at McCoy Stadium, which, coincidentally, is the home of the longest professional baseball game in history, 33 innings, played in 1981. We were hosted by a whole gaggle of old riding friends from Rhode Island, Massachusetts and Connecticut, who would take us riding through the local countryside the next morning, ending at the famous "Ancients & Horribles Parade" in the village of Chepachet, Rhode Island. Started in 1851 as a parody of a parade by the oldest military unit in the U.S., the Ancient & Honorable Artillery Company of Massachusetts. Staged as a chance for locals to make fun of politicians and other famous people, this was one of the weirdest and most fun parades I've ever seen, and we got front-row seating thanks to another riding friend who lives on the route and let us park our bikes in the front yard.

THERE ARE TOO many more to list, including a picnic on the Rideau Canal near Oxford Station in Ontario, Canada, where we watched boats go through locks that are controlled manually on the oldest continually operating canal in North America. Then, it was on to the Bare-Knuckle Boxing Hall of Fame and the Jell-O Museum in New York, and several more wonderful and interesting sights.

All of this and more in a single year of riding around the country. Our motorcycles have brought us the world, in a fashion I truly don't believe can be accomplished with other, more common modes of transport. And much of that is true because of the kindness and camaraderie shown us by other riders, wherever we go. The friendships are priceless.

I hope there's more in store for 2017, not just for us, but also for all of you. Happy New Year! MCN

Fred Rau (MCN editor '91-'95) is author of *Motorcycle Touring Bible* and proprietor of Fred Rau Adventure Tours - FredRau.com

OPEN ROAD > By **Dave Searle**

Action Photography, Part II: Tricks & Tips

LAST MONTH, WE looked at equipment choices—the right camera type, lenses, settings and adjustments—for action photography. This month, we'll examine the when, where and how of arranging your shooting locations for best results.

Shooting outdoors in natural light is a given, so the quality of prevailing conditions will have significant bearing on your photos. Cloudy or overcast days are a poor choice because the temperature of the ambient light is bluish, and the reduction in light intensity requires the camera to compensate with wider lens openings that reduce depth of field.

Remember, your camera should be set in shutter speed priority mode, so you can adjust the camera's shutter speed to the velocity of the motorcycle to control the sharpness of the bike image with some desirable background blur (1/350 to 1/750 of a sec. suggested). Plus, darker conditions will make the camera's internal autofocusing efforts more difficult, reducing success rates.

Very windy days also make hand-held telephoto photography extremely difficult. Exceptionally clear days with low humidity are magic for crisp images but are all too rare, even here in typically balmy Southern California.

The angle of the sun will also make a big difference. Normally, you'd like the sun behind you, but not so directly that your own shadow splits the scene. Time of day is also important. Professionals refer to the times just after sunrise and just before sunset as the "golden hours" because they provide a diffuse, golden light that fills in areas that would ordinarily be shadowed, giving rich, even detail. And while the golden hours are very brief, you should try to take advantage of low-angle light as much as possible, and avoid those times when the sun is directly overhead. If you imagine that you can compensate with a flash to fill-in those dark shadows, you should know that only very powerful (i.e., expensive) flash equipment can function at the high shutter speeds required for shooting action.

This shot's focus is decent, the wheels clearly moving, and the bike is lighted well, but the vertical elements in the fence spoil the flow and the dark background shapes of foliage are distracting.

Without cropping, this tightly framed shot is three-dimensional. The horizontal wire barriers don't detract too much from the flow of the image, the bike's focus is sharp, its wheel rotation isn't frozen.

Ideally, backgrounds should be light and nondescript unless you mean to highlight picturesque locations rather than dramatic movement. Strong vertical elements such as telephone poles should be avoided, as they break up the picture's horizontal flow and invariably end up sprouting out of the rider's head.

Make sure to look at what's behind the motorcycle and take the time to clean trash out of the background before wasting your time. Errant cans, bottles and paper cups can be collected in just a few minutes and will save you a long time using Photoshop or a similar photo editor to repeatedly hide their presence. While nearby neighbors might be irritated to hear motorcycles make repeated passes in front of their homes, making a show of your cleanup efforts might persuade them to not call the cops.

FOR THE MOST dramatic shots, I like to see the motorcycle leaning steeply into the turn at an oblique angle. This doesn't necessarily require a hero rider adept a getting a knee down, but it wouldn't hurt either. Because action photography is a game of percentages—out of a dozen passes, you might get three or four tack sharp images if you are lucky—the rider will also have time to gradually increase speeds as he or she becomes more comfortable with the corner. Slow and steady riders may imagine they are going fast, but the images reveal the truth—and it's boring.

To compensate, remember that while the horizon line is a fact of the Earth's gravity, your camera doesn't have to stay aligned with it. Sometimes, holding the camera at an angle as you pan can create the sense of speed that was missing in the actual scene. Riders may also aid the impression with body language, even when their cornering velocity isn't so great, by leaning forward aggressively

DAVE SEARLE

Here, the ess curve is a dramatic element but the sun is too far to the side, so it fails to light the rider's body adequately. Also, the camera's high shutter speed nearly stops tire rotation.

DAVE SEARLE

and shifting weight to the inside, as if it were actually necessary to achieve higher speeds.

Rider smoothness also plays a role. Some otherwise highly skilled riders simply can't ride smoothly, but instead corner in a series of jerky corrections, making sharp action photos almost impossible. Or they may have other personal quirks. For instance, a rider wearing an open-face helmet might have an unconscious tendency to assume a comical grimace when attempting to charge a corner harder than usual. Of course, full-face helmets avoid this problem, and it's usually best to admonish your photo models to keep the visor down for the fastest-looking results.

Among other details to consider, the bike's mirrors must also be accommodated in your images, and they have a habit of getting in the rider's face. Back in the day, the illustrious Cycle magazine would routinely remove the mirrors from test bikes to avoid this issue. Clean motorcycles also photograph best, and unless the subject was an off-road machine, we'd always try to shoot photos early in the day, before the bike accumulated significant dirt.

Getting a good lean angle from the bike does not require high speeds if you have a fairly tight corner, when something like 35–40 mph is usually plenty, and much faster corners only make panning more difficult. You would like the bike to fill the frame to the greatest extent possible, which creates a much more three-dimensional effect. Using a camera with a high pixel count and counting on the ability to crop the image around the bike will only create a very flat image, even if its detail is adequate. Again, tilting the camera to make the bike fill the frame diagonally can make for dramatic shots, too.

Remember to focus on the rider and pan continuously as the bike approaches, and keep panning for a few moments even after you've taken the shot to improve your framing technique. Check the LCD monitor after each shot to judge your timing. Don't rely on the camera to time the shot by using its motor drive to take multiple images as it passes. Unless the bike is passing directly sideways to the camera, during the moment the DSLR's focusing mirror is out of the way, the autofocus will often lose track of the subject, making subsequent shots out of focus.

SAFETY IS A very important consideration. Because your test rider will need to turn around after each pass, it's very helpful to insure there are safe places for U-turns that are not too distant from your camera position, so the time between passes isn't greatly extended.

Your own position by the side of the road is also important. Seek a wide shoulder where your vehicle can be parked well away from the road surface and where you have a good view in each direction, so you can withdraw from the roadside when traffic approaches from either direction. You should also have a signal to warn your rider of approaching traffic, so he or she isn't riding fast and filling the lane when a vehicle suddenly appears around the corner. And don't even think about using dirty pavement for your photo locations. Action photography can be dangerous enough without risking an unnecessary spill.

The pros that shoot motorcycle action for a living will carefully scout out the routes to be taken by press riders in advance, to find the best-lit and safest photo locations. Ideal spots will have several corners in succession to allow a variety of shooting positions. Be creative, kneeling or sitting on the ground exaggerates the perception of lean angles, and even shooting from the middle of the road is possible if you really trust your test rider and have adequate sight distance to get quickly out of the way if traffic approaches. Another benefit of keeping your images tightly framed is that it disguises that many of them were taken on the same short stretch of road.

If you find yourself shooting a large group of riders, as the pros routinely do, you should have them gather at each end of the turnaround areas, to start out at perhaps 10-second intervals so they don't appear in each others' pictures.

Usually, at least a half-dozen passes in each direction by the whole group at each location will give the hired photographers what they need, and three or four different locations during a daylong test ride event are common. Naturally, this can take a lot of time, so explain the routine to new riders, so they don't become impatient. And it should go without saying that the less traffic on the road, the better, so major roads or regular commuting times should be avoided.

Don't be discouraged if your initial attempt at action photography isn't up to your standards. Practice makes perfect, and the satisfaction of generating exciting images can be worth all the effort. I personally found it one of the most rewarding parts of my 16-year tenure as the editor of MCN. MCN

Dave Searle (MCN editor '00-'16) started freelancing for Road Rider in 1988 and became the technical editor of MCN in 1996.

MCN MOTORCYCLE CONSUMER NEWS

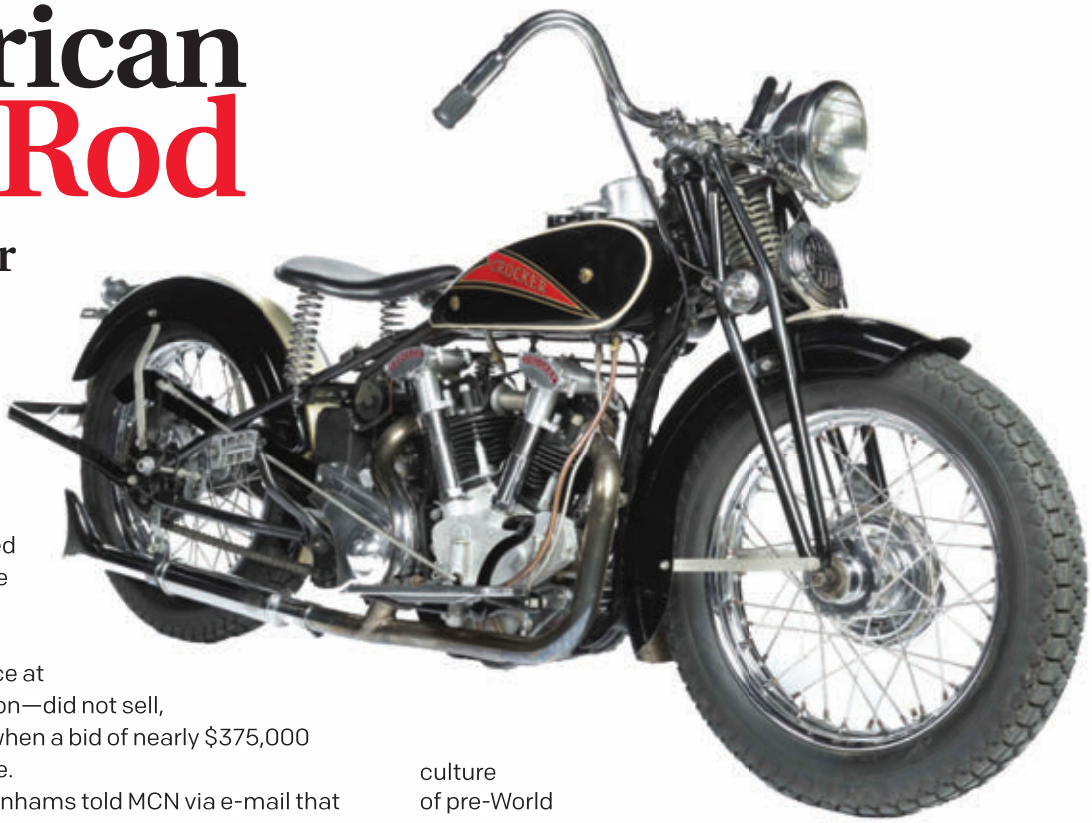
Next Month

» Barber Vintage Festival
» RevZilla Monster Marketplace

Vintage

American Hot Rod

1937 Crocker Small Tank



The lowest numbered Crocker motorcycle to be offered at auction—one expected to fetch a staggering price at a recent Bonhams auction—did not sell, withdrawn by its owner when a bid of nearly $375,000 failed to meet the reserve.

A spokesperson for Bonhams told MCN via e-mail that it was "interesting," since the most paid for a Crocker at auction was $385,000 in 2015. The 1937 Crocker Small Tank—serial number 36-61-8—is from the renowned collection of Dale Walksler's Wheels Through Time Museum. The spokesperson added that another Crocker reportedly traded hands privately for $550,000, but that amount could not be verified because it was a private transaction.

The unsold Crocker is one of seven constructed with hemispherical heads. It was also the earliest made Crocker to ever be offered at public sale.

During the 1930s, Crocker was the definitive American motorcycle—custom made one at a time, powerful and fast. Created by Al Crocker, a former Indian distributor, the bike's strong, classic lines cut a dashing profile in the Hollywood culture of pre-World War II Los Angeles.

When Crocker rolled out this model in 1936, he reportedly challenged Harley-Davidson—the gold standard for motorcycles at the time—claiming his product was superior in technology, handling and power. Crocker advertised that if one of his bikes were beaten by a stock Harley, he would refund the owner's money. No refunds were ever requested. Each Crocker was custom built for its buyer. This expensive and time-intensive approach kept quality high but production output low. Fewer than 125 Crockers were built and then World War II came along and the company shut down. Because only 50 or so of those units are accounted for, Crocker motorcycles are extremely rare.