MCN
MOTORCYCLE CONSUMER NEWS
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STRAIGHTENING THE Curves

BMW R NINE T RACER

PLUS

YAMAHA FZ-09 VS. KAWASAKI Z900

YAMAHA STAR VENTURE

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> If you have a question burning a hole in your brain about bikes, skills, industry or products, send us an email and we'll share the answer with everyone.

MCN HAS BEEN my favorite magazine, in any genre, for two decades. Nearly six years ago, I contacted Editor Searle about a managing editor position, which didn't work out at the time, but we remained in contact through the next three managing editors (Rousseau, Steever and Buchanan). The understanding, from the very beginning, was that Dave was grooming a replacement. It was unfortunate that for one reason or another, none of these potential candidates, including myself, was able to manage MCN through last year's untimely transition period.

Publishing this 48-page monthly magazine is too much work for a solitary editor, let alone none at all, leaving readers wondering what was going on after Dave retired. I had helped out with bike tests and photo shoots in between the various managing editors, as well as after Dave left, but the timing had never been right for me to come on board. When Dave's retirement left MCN with no editorial staff, I too wondered what would become of this fantastic magazine. Reaching out to the publisher with that query started a chain of events that led to the current reimaging of MCN.

MCN (ROAD RIDER) was originally published by Fancy Publications, which later became Bowtie, Inc. and was subsequently sold to Fry Communication (our printer and distributor), who first rebranded the media division I-5 Publishing, and again as Lumina Media. The fact is, MCN is still in the same house that published Road Rider, alongside Cat Fancy and Dog Fancy, over 40 years ago. It's been a good, long run.

Lumina Media is currently divesting its media assets, which simply means that the dozens of diverse titles we've always published are being sold to publishers that are more aligned with the niches those individual titles represent. As one of only two automotive titles in the portfolio (alongside Auto Restorer), we've been reaching out to contacts in various industries, including publishing, automotive and motorsports, trying to find the best home for MCN.

MCN WILL BENEFIT immensely from someone who truly understands the value of the brand and its extensive history, is well versed in the motorcycle industry and has a high tolerance for risk. Does that sound like anyone you know? Until we find a new home, it's business as usual.

Rest assured that Russell and I are committed to MCN's continued editorial excellence and have even considered taking MCN private and publishing it ourselves. We've tossed around the idea of a Kickstarter (reader supported!) to fund marketing and improve our online presence if that ever came to pass. Would you still be interested in supporting MCN if it required an additional investment or an increased subscription rate?

LIFE COMES FULL circle. I was raised in Wisconsin and my wife recently accepted a position with Harley-Davidson (managing the fit of the company's apparel). We are relocating to Milwaukee this month. She requested that I take it easy on the Motor Company, but I plan to continue reviewing their products with the same thoroughness and honesty as always. She's been asked not to discuss any insider information with me, so there should be no conflict of interest. H-D is a very proud and traditional company that has been known to rest on its laurels, so it can only benefit from journalists being a thorn in its side from time to time.

WE ARE THANKFUL to every single reader for the commitment and support that has allowed MCN to exist for more than 40 years. As we continue to plan for bigger and better things, we're aiming to last 40 more. Please do not hesitate to connect us with anyone who might have skills or resources we could use; we absolutely cannot continue MCN without readers like you. MCN

LETTERS

AS A TALL rider on a tall KLR, I'm like a big sail. Riding in gusting crosswinds is a vexing challenge (MCN 6/17). Here are some personal observations for riding in high winds. At slower speeds, you won't travel as far in an unintended direction. Take longer breaks. Wait until the winds taper down or ride another day. Be prepared for winds to change directions. Mountain passes, road cuts and passing vehicles amplify gusts. Gauge the strength of wind by looking at the tops of tall trees or grass. Heavy wind creates flying debris. Heavy, low-profile bikes are more stable than tall, high-profile bikes.

—Howie Reese

GOING FASTER DOES not help riding in the wind, as the bike will drift more. Once, on a KLR, I was forced to decrease speed significantly when 30 mph side blasts moved the bike several feet laterally on the Trans Canada Hwy. As Walt suggests, crouching helps; but knocking off 10 mph helps a lot more. Reducing the side profile by crouching and removing the top bag also helps.

—Bill Dutcher

THE DYNAMICS AND steering inputs required to stabilize a bike in a crosswind interest me, as I have crossed the Great Plains numerous times and experienced strong winds each time.

It is counter-intuitive, but after spending many hours experimenting, I determined that to go straight while leaning the bike into a steady wind, a pull on the windward handle grip, rather than a push is required. In other words, countersteer with the wind, not into the wind, to go straight. I spent many hours traveling across Kansas verifying this observation. As a complementary experiment, I took both hands off the handlebars and, sure enough, the bike dove into the wind.

There are many aerodynamic issues that come into play. For instance, a bar- or fork-mounted fairing or shield catching wind will wreak havoc on steering. Frame-mounted shields don't impact steering as heavily. Go slower, reduce your profile, ride a heavier bike and learn to adapt quickly.

—David Hilgendorf

TEACHING RESPONSIBILITY

I WANT TO commend Lee Parks for a thoughtful column about the balance between risk and responsibility, self-sufficiency and self-restraint, cost and reward. Learning these things as a child is almost certainly a necessity and simply cannot be accomplished if parents and "responsible adults" are always in charge of a kid's actions. The love of motorcycling might be the catalyst a child needs to find his way to living a life with enthusiasm. There are risks, certainly; but to acknowledge them, accept them, and act prudently towards a desired goal is a great opportunity for growth. To give a child no responsibility is to keep him irresponsible. To guide him into a life motivated by his own enthusiasm might be a unique chance to helping form a full, satisfying life.

—Robert Ljungquist

MY SPOUSE AND I are re-entering the world of motorcycling after having been away for 17 years and need advice on safety equipment. I have a near-new Shoei Rf-1000 that fits tightly as it's been stored in our climate-controlled home in a closet on the side of the house, away from the extreme afternoon heat. I've only used it five times for short rides and it feels to me to be nice and snug. Do I need to discard this beautiful helmet? Also, which gloves? Where do we go to get properly informed? Past issues of MCN? The Internet? At thousands apiece we have to be smart as foxes to buy the right thing.

—Susan Milka

Several recent helmets were reviewed last month (MCN 7/17). If your helmet is more than five years old, regardless of wear, you should replace it. Gloves are a combination of protection and control, so fit should be a high priority. Seams are the most important part, as they greatly impact comfort and tend to fail first.

Customers who write online reviews offer unbiased opinions, but take them with a grain of salt, as only the happiest and unhappiest users will take the time. Generally, higher-priced apparel is better quality, but that's not always the case. Sometimes you're paying up front for branding (advertising), or a lifetime warranty for replacement, which is only valuable if you like the product.

Skills courses are always the best investment in your safety, as they are all about prevention. Gear is to keep you comfortable, protect from weather and low-speed mishaps. Nothing but luck can save us from high-speed impacts, so learn to avoid them.

If budget is a concern, start by filling in the gaps. You want gear that covers your whole body, before replacing a slightly used helmet. Selection of riding gear is a very personal choice that balances price, comfort, durability, protection, style, ease of use and weatherproofness (do you need to stay cool, warm, dry?). If you don't like your gear, you'll be less likely to wear it, so pick what feels right to you and don't rely entirely on other people's opinions. A full set of the best gear on the planet is cheaper than one ambu-

lance ride and a visit to the ER, and insurance frequently pays to replace damaged gear as part of a claim.

—David Hilgendorf

IN REFERENCE TO damage compensation from striking a deer versus a cow (MCN 6/17), the motives of the question made me contemplate the personal responsibility assumed by some riders. There is never a "better way" to strike anything. He chose to ride a motorcycle. He is responsible to not strike wildlife. He bears total responsibility for the incident occurring. No one owes him recompense for "scars, suffering, and lost wages." It is a blessing that he has medical coverage to offset some of his bills and that insurance companies haven't found a way to exclude covering motorcyclists. I'm in favor of personal responsibility. Let's put on our big boy pants. Enjoy the sport, but assume the risk.

—Jeff Scott

THE IMPORTANCE OF "all the gear all the time" was demonstrated to me four weeks ago. While enjoying a beautiful afternoon ride, the dirt road I was on crossed an old stone arch bridge over a significant waterfall. I jumped off to get a picture from streamside. Unfortunately, the bank collapsed, I fell in, was pushed over backwards by the force of the water and went over the falls (55 feet) headfirst. Although I broke two vertebrae in my back, I did not break my head! All the gear all the time is good advice, even when off the bike.

—Bob Ljunquist

SEND LETTERS TO THE EDITOR

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I TAKE UMBRAGE with editor Hilgendorf's opinion of the Polaris Slingshot (MCN 6/17). To call it impractical is an insult to thousands of Slingshot owners who use this vehicle similarly to any other trike. Then, comparing it to a car, when all trikes are open to the elements and the seats are more comfortable than any motorcycle or trike I've ever sat on. Finally, the Slingshot is not that fast, it only looks fast. I'm convinced that if asked, the vast majority of the lay public would choose the Slingshot over the other vehicles in this comparison.

—Rick Gilberg

I liked the Slingshot very much, for what it is. There are many reasons a three-wheeled vehicle is impractical, and the Slingshot nails almost every one of them. It's not that fast, because it can't hold traction. The seats don't breathe and made me sweaty. You are strapped into it and would be compacted inside instead of ejected on impact.

That doesn't mean it's not fun, or not a car. It has a steering wheel, so non-motorcyclists will almost always choose the Slingshot. My motorcyclist money would be put on the Spyder, but not until I give up two wheels. There are options for everyone, and that's all we were trying to convey. It wouldn't be much of a review without criticisms, and I didn't dislike any of the "trikes," which was surprising.

—David Hilgendorf

AS I'VE BEEN getting up there in age, my balance has been in question and three wheelers are in my sights, especially the Tilting Motor Works. It's all about the lean; otherwise it's just a three-wheeled open car. I'll take exception with the front end, the "nose" looks like an attempt to mix Harley nostalgia with a '36 Ford front end, not my cup of tea. I would love to see the Gold Wing variant with a Can-Am Spyder nose, for extra luggage space or fuel.

—Mitch X

"A GOOD STORY is Like a Good Ride" (MCN 6/17), made me think about my own method of story telling as another way to enjoy my favorite pastime. I film and creating videos of some rides and when editing I try to tell a story. In doing so, I am able to re-live my ride, adding to my enjoyment. Publishing on YouTube allows others to enjoy my ride, as well. Another aspect of my hobby is making instructional videos of bike projects that I believe would be of use to other riders.

—Loren Powers Jr.

Electrical Gremlins

GOT PROBLEMS? MCN DOWNTIME
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or email questions with JPEG images to:
editor@mcnews.com Subject: Downtime

I'VE OWNED A 1998 Ducati ST2 since new; it's now shy of 60K miles. While reliable overall, it has had a number of electrical issues over the years from a few bad regulator/rectifiers to starter grounding and a dim headlight. I seem to go through batteries if not charged frequently and burn out the H3 low beam quickly. The bulb pigtail gets very hot as soon as the ignition is turned on. Too hot to touch and hot enough to melt the plastic connector. I checked the left bar switch wires and connector for resistance and they measure generally well under 1ohm. The battery is fully charged and under 1 year old, ground is solid and there is no battery terminal corrosion. I did a few voltage drop measurements; with battery at 12.2V, across the bulb is 9.5V. Positive bulb end to negative battery is 10.32V. Negative bulb side to negative battery is 0.3V. Is the hot pigtail normal? Should any voltage be lost at the bulb, or is a circuit ideally at full voltage end to end? The bike starts and runs normally, but unsure if this is as expected.
—Sean Tompkins

GREAT TROUBLEHOOTING.

Considering you've had battery, regulator/rectifier and bulb problems, start by looking for bad connections causing resistance, heat, low voltage, bulb and charging system failures.

THE BULB

If a halogen bulb is burning out too quickly, it could be due to over/under voltage caused by charging problems. The purpose of halogen bulbs is to create brighter light, prevent darkening of the clear crystal bulb, reduce filament thinning and extend the bulb's useful life through what is called the halogen cycle.

When a normal incandescent bulb is energized, some of the tungsten evaporates, attaches to the crystal and thins the filament. Over time, the glass darkens and the filament breaks from thinning, usually at the ends. Halogen in a bulb reacts to the tungsten at about 250°C (482°F), and forces it to displace back on the filament, where it is coolest, usually at the ends.

If a halogen light receives too little voltage, the temperature drops, the bulb drops out of the halogen cycle and operates as a normal incandescent light. The light output will drop, tungsten will begin to coat the bulb and the filament will break, usually at the ends.

A halogen that is working appropriately will usually break in the center of the filament and the bulb will be fairly clear. Fingerprints on the crystal will create hot spots on the surface and can cause the bulb to fail sooner from overheating. Check the failed bulb's condition. Where the filament is broken and how the crystal looks may tell you what the problem is.

I'm seeing a low voltage condition based on your voltage tests. You have 12.2V at the battery but only 10.3V at the bulb. Most moto switches should not consume more than .2V. Let's assume you have two switches between the bulb and battery, (ignition and stop) 12.2 –.2 –.2 =11.8V. So, 11.8V should be reaching the bulb. Where did the other 1.5V go? Another load or resistance is consuming it. At about 70-80 percent of the rated voltage, halogens drop out of the halogen effect. At 10.3V we're pretty close.

Next, let's look at your voltage drop readings at the bulb. Voltage drop after the bulb is good. A reading of .3V indicates the bulb (an electrical load) is consuming most of the voltage. If the voltage drop were higher at this point, it would indicate there was resistance after the load that was consuming too much voltage, but .3V is reasonable for a bulb ground.

What doesn't make sense is the difference between the voltage-in (10.3V) and the voltage-out (.3V). Voltage drops across the load always equal the voltage-in minus the voltage-out reading. 10.3V -.3V= 10V. Your voltage drop across the load was 9.5V. Where did the other .5V go? At 9.5V the bulb may not produce the halogen cycle.

It sounds like you have resistance right around the bulb, and considering the pigtail is getting hot, that would be the first place to check, as resistance creates heat. Then backtrack through the system to find out where you are losing 1.7V between the battery and bulb connections. Bring that voltage up and you will probably have fewer bulb problems. Vibrations could also be a problem, but get the voltage right, then see how the bulbs act.

THE BATTERY

In Arizona, we have temperatures above 110˚F for several months of the year. Depending on where you live, you may have several months of below-freezing temperatures. In extreme areas like these, it is not uncommon to change batteries yearly on motorcycles and every 2-3 years on autos. In more temperate areas, batteries tend to last twice that. Premature battery failures can be caused by low vehicle use, faulty charging systems or an improper initial battery service.

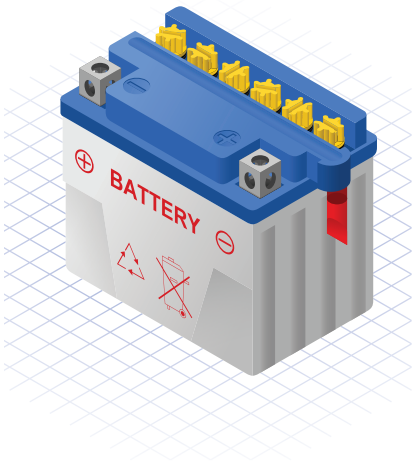
Batteries are electrochemical reactors. When they aren't reacting to charging, sulfur molecules in the electrolytes (sulfuric acid) get lazy and collect into a crystalline sulfate structure. This is similar to the sugar crystal experiments you played with in grade school. If you dissolve sugar in hot water then let it

sit, eventually the sugar will revert back to crystal form and climb up the side of the cup or string. A similar process happens in a battery that is not being charged. Sulfur will climb up the lead plates and create resistance. The more this happens, the less charge you can get to the electrolytes. The problem becomes progressively worse, until eventually there is not enough charge to start the bike. At this point, no matter how much you charge it, the sulfates will not return to liquid form. As soon as you turn off the engine, this process begins.

Why doesn't this occur on your car or truck? It does, but typically they are driven more often (charged) and they are bigger with larger lead plate surface areas. They can take larger sulfate deposits before having starting problems. To be safe, if you don't plan to run the vehicle for more than a week, or are not running long enough to charge the battery, (estimate less than 15 minutes per start) put a trickle charger on the battery.

If you are running the bike enough to keep it charged, you probably have a charging system problem or a battery that was not serviced correctly the first time. If you are plugging it into a trickle charger and still having excessive battery failures, you probably have a battery that was incorrectly serviced the first time. This has been a problem in shops and scourge of the vehicle and battery manufacturers. Some shops try to squeeze money out of cutting corners, but someone ultimately pays. The whole process of filling and charging a battery initially should take several hours. Some shops just fill them and hand them to you. This doesn't give the plates enough time to saturate.

If installed and ridden at this point, they are overcharged too quickly and damage the plates. I prefer to buy batteries with separate electrolyte bottles



and do it myself. All you need is a cheap trickle charger, then follow the simple step-by-step directions included in the kit. Get an AGM-type battery to save time and simplify servicing. Separate electrolyte battery kits can be ordered within a couple of days from Parts Unlimited or Tucker Rocky through your local motorcycle shop.

CHARGING

Judging by the multiple regulators and batteries you replaced, I'd guess you have a charging system fault. It may or may not be major components. First, check the big coupler between the regulator/rectifier and stator. These are high-output wires and if they get any amount of corrosion on them, they will begin to create resistance, which will create heat, which will cause more corrosion.

Eventually the coupler will get so hot it will melt and the wires will begin fusing or grounding. This can lead to stator failure, overcharging or undercharging depending on how your regulator controls voltage.

Check all other connections in your charging system, including the battery (which you did). Clean connectors with a wire brush or emery cloth, blast them off with electrical contact cleaner and finally coat contacts lightly with dielectric grease or silicone spray. Next, do a running voltage check across the battery terminals with a digital multimeter. When running, you should see 13-14.5V.

Over voltage indicates the regulator has gone bad. Under voltage indicates the regulator, stator or connectors between are causing problems. If this is the case, you'll need to follow a service manual's flow charts to isolate the problem.

Regulator/rectifiers are high heat producers. When regulating, they create enough heat to bake the electronic components. Eventually the traces and semiconductors get brittle, fuse together or break circuits and fail.

Most motorcycles use three-phase Permanent Magnet Charging Systems (PMS) which are always grounding at just above idle (approx. 5,000 rpm), so it's just a matter of time before they fail. A cheap regulator/rectifier will fail sooner than a high quality one.

Part of this is system design. If the system is designed to regulate voltage by grounding only one phase, it will create a lot of heat in a small area and fail sooner. If it is a more sophisticated system that bleeds all three phases proportionally, then the heat is distributed over a larger area and the regulator will last much longer.

Unfortunately, this would be a design problem that would require some engineering understanding to identify and, excuse the pun, rectify. Start by making sure the system is healthy. Make sure your regulator/rectifier is in a location where it gets plenty of air when riding. This is why many high amp cruisers and touring bikes run regulator/rectifiers toward the front of the vehicle, designed in a wind tunnel at speed.

—Kevin O'Shaughnessy

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

Pipeline

> Edited by **Russell Evans**

YAMAHA

» WITH THE UNVEILING of the Star Venture heavyweight touring bike, the folks at Yamaha say they've found a niche among the myriad choices, a notion that's difficult to argue.

The first segment of the 113-ci., V-twin cruisers will appear at dealerships this month. Demand could be high.

"This is a segment of the market we have been absent from for quite some time," Motorcycle Product Line Manager Derek Brooks said at the unveiling in Santa Ana, California. "We wanted to make sure we got it right."

At first glance, it appears that Yamaha has done just that. The Star Venture is a big, comfy bagger that can go coast to coast. The company calls it a 'Transcontinental Tourer.' The 1,854cc, air-cooled, overhead valve engine is the largest stock V-twin of any major motorcycle manufacturer, topping the Indian 111 Thunder Stroke. Until now, Yamaha could only offer up the FJR1300 sport tourer to compete with Honda's iconic Gold Wing (1,832cc, 6-cylinder).

The Star Venture has a low center of gravity, accentuated by a 27.4-inch-high driver's seat. The engine's narrow profile further aids in helping riders get both feet on the ground at stops. Rocking the bike side to side, it feels well planted, and a bit heavier than the Harleys and Indians, but that may be a product of the low COG.

The styling is quite distinctive, starting with the scowling brow over the four powerful LED headlights, flowing over swooping, uninterrupted body panels with gleaming paint, and finishing with large, chrome-framed taillights evocative of a 1960s muscle car—think 1965 to 1968 Thunderbirds or 1968 Camaro. Yamaha says the styling was indeed

DUCATI

» VOLKSWAGEN IS CONSIDERING a possible sale of Italian motorcycle maker Ducati as Europe's largest carmaker streamlines operations to help fund a strategic overhaul following its emissions scandal, two people familiar with the matter said.

Volkswagen is reining in spending across the group, including cutting thousands of jobs at its core passenger-car brand, to pay for a multibillion-euro shift to electric cars and new mobility services.

VW has tasked investment banking boutique Evercore with evaluating possible options including a sale of the Ducati brand, which its Audi division acquired for about 860 million euros ($935 million) in 2012, the sources said.

While Wolfsburg-based VW has started reaching out to potential

RUSSELL EVANS, DUCATI

Yamaha Star Venture

muscle car inspired.

The bike also has the largest trunk storage compartment on the market, with room for two full face helmets. It is the most spacious of eight compartments that offer more than 38 gallons of storage space, also tops among current baggers on the market.

Just below, the Bridgestone Exedra G852 200/55-R16 radial tire is the largest in the category as well. There's an Exedra G835 130/70-R18 radial up front.

Yamaha spent "thousands" of hours tuning the dual exhaust, to get just the right note, and the deep growl is impressive, without being annoying.

The 6.6-gallon fuel capacity is tops in the full dress bagger class and the company says that gives the Star Venture a range of more than 220 miles.

The Star Venture, which comes in Granite Gray and Raspberry Metallic, also comes with an infotainment system with a 7-inch LCD touch screen.

Pricing starts at $24,999, which is comparable to the Gold Wing at $24,699 and the Harley-Davidson Electra Glide Ultra Classic ($24,194). An additional $2,000 buys GPS navigation, Sirius XM satellite radio, Dual-Zone audio, CB radio, two high-performance rear speakers, LED fog lights and a security alarm. *yamahamotorsports.com*

—Russell Evans

RUSSELL EVANS

buyers to sound out their interest, no decision has been taken on whether the brand will be sold, they added.

VW referred to Audi for comment. Audi and Evercore declined to comment.

One of the sources said Ducati made annual earnings before interest, taxes, depreciation and amortization (EBITDA) of roughly 100 million euros and could fetch a valuation of up to 1.5 billion euros, or 15 times its core earnings—a multiple similar to that of Italian supercar maker Ferrari.

A banker close to the industry said potential buyers were likely to offer VW an earnings multiple of more than 10.

Ducati may appeal to peers in China, India's Hero or investors such as the consortium that bought British sports car maker Aston Martin in 2007, the sources said.

"It is an asset for trophy buyers with bigger interest in the brand than in the technology," one of the people said.

Private equity firms could also be attracted to a brand whose motorcycles have won the Superbike racing competition 17 times, the sources said. It remained unclear whether large competitors such as Polaris, Harley Davidson, Suzuki, Honda or Kawasaki might be interested, they added. If VW does not attract sufficient interest, it may also consider a stock market flotation for Ducati, the people said.

Analysts questioned Audi's purchase of Ducati when it was announced in April 2012, saying the deal had no economic or industrial logic and just reflected former VW Chairman Ferdinand Piech's passion for the Italian company's expertise on design and light engines.

Triumph Street Triple

» TRIUMPH

TRIUMPH HAS ANNOUNCED that it will take over from Honda as the sole supplier of Moto2 spec engines starting in 2019.

It's a step up in capacity for the Moto2 class, which until now has used a modified CBR600RR engine. The new engine will be based on the 765cc motor from Triumph's 2017 Street Triple, which is much narrower than Honda's 600cc 4-cylinder.

It's an interesting choice—the Street Triple isn't even a sportbike; it's a naked roadster developed for real-world torque, rather than top-level racetrack horsepower. That will all change, with ExternPro preparing to work the engine over for Moto2 use.

The Triumph engine will have revised inlet and exhaust ports for optimized gas flow, titanium valves and stiffer valve springs to lift the rev limit, a lower output race kit alternator, a taller first gear, a tuneable slipper clutch, a Magneti Marelli race ECU, narrower engine covers and a slightly modified sump for improved header routing.

Final power figures haven't been announced, but current Moto2 bikes make upward of 140 horsepower. Spirit Motorcycles has succeeded in squeezing more than 180 hp out of a stroked-out Triumph 675 for its ludicrous GP Sport R.
triumphmotorcycles.com

» MV AGUSTA

THOSE LOOKING FOR stoplight or dragstrip dominance might consider MV Agusta's 800 RC Dragster, a three-cylinder beast with a claimed 140 hp at 13100 rpm. The aesthetics are amazing, as is to be expected from the high-performance Italian manufacturer, with gleaming red exposed frame, triple pipe exhaust, single-sided swingarm and a meaty 200mm rear tire.

The lightweight engine employs a racing-derived counter-rotating crankshaft to reduce inertia in corner entry, designed to give the RC Dragster cornering dynamics that are the equal of its straight-line performance. Digital Traction control is offered on eight levels, or entirely disengaged.

Complete adjustability is also available on the Sachs rear suspension that joins the swingarm with a fulcrum point between aluminum alloy plates united to the tubular steel trellis frame. The braking system composed of 320 mm diameter front discs and Brembo four piston radial calipers are aligned to the tame the savage power.
mvagusta.com

LATEST RECALLS

Make: Polaris
Model: 2015-2017 Slingshot
Component: Brakes, Hydraulic, Traction Control
NHTSA #: 17V357000

Make: Harley-Davidson
Model: 2017 FLHTCU, FLHTP, FLHP, FLHR, FLHRXS, FLHX FLHXS, FLTRX, FLTRXS
Component: Engine, Engine Cooling
NHTSA #: 17V333000

Make: Ducati
Model: 2016-2017 Multistrada 1200 Enduro
Component: Suspension
NHTSA #: 17V274000

Make: Yamaha
Model: 2015-2017 FJ-09, FZ-09, XSR900
Component: Steering
NHTSA #: 17V221000

Make: KTM
Model: 1290 Super Duke GT
Component: Fuel system
NHTSA #: 17V194000

Make: Zox
Model: Nano
Component: Helmets
NHTSA #: 17E016000

Make: Polaris
Model: 2017 Slingshot
Component: Steering, Suspension
NHTSA #: 17V158000

Make: Tegol
Model: Outlaw V-5
Component: Helmets
NHTSA #: 17E015000

Make: Zero
Model: 2017 S, DS, FXS
Component: Brakes, Hydraulics
NHTSA #: 117V145000

Make: Yamaha
Model: 2015-16 YZF-R3
Component: Fuel system
NHTSA #: 17V112000

Make: Yamaha
Model: 2015-16 YZF-R3
Component: Electrical
NHTSA #: 17V112000

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

Strategy

STREET *BY WALT FULTON*

Protect Yourself From the Heat—Inside and Out

Riding season is in full swing for most of us. Besides polishing the rust off our skill set to start the riding season at our best, there are two extremely important aspects to our well-being that are often overlooked: proper hydration and riding gear.

It is extremely important to keep our bodies functioning at a very high level with ample amounts of water and/or sports drinks with electrolytes and minerals. Dehydration is an insidious condition that quickly develops and can have grave, even deadly consequences.

Former Friction Zone Magazine editor Amy Holland once recounted an encounter with dehydration. Blazing through the Nevada desert after several days of heat, late nights and little sleep, she became tired, hot, thirsty and nauseated. She stopped to cool off with air conditioning and drink liquids. Unfortunately, her choice of drink was her downfall! Iced tea. Why? Caffeine. Caffeine is a diuretic which causes you to urinate more frequently, thus drying you out from the inside out.

Back on her bike, Amy became more nauseated and unfocused by the mile. After 30 miles, she found shade and rested under an overpass. After hydrating with water and lowering her core temperature, she was able to continue her trip, though several hours later than planned.

The wind and sun dry us out. As this happens, your body sends signals, and you must recognize them and act quickly. If you are thirsty— the first sign—you are already heading down the dehydration path. Do not ignore this sign! You may also feel slightly nauseated and light-headed. When you get to this stage, pull over and stop. Once you've reached this point, you aren't far away from losing consciousness. Your body will just stop functioning, and speeding down the road on a motorcycle is the last thing you want to be doing if this happens. Fortunately, water, electrolytes and rest will rejuvenate your body quickly.

Wearing the right gear also offers an advantage.

Some think that the right gear in extreme heat is a T-shirt and shorts. On the contrary, the less protective clothing, the faster the elements drain your fluids. In addition, your skin is exposed to the sun's harmful rays and subject to sunburn. Mesh gear isn't much better, offering minimal protection from the drying effects of the wind, again, putting you at risk of dehydration.

The right gear can help you retain that much-need moisture. When we get hot we sweat; this is the first step to staying cool. Next, add a jacket that allows you to open and close vents, as needed. In so doing, you have just created your own personal swamp cooler (evaporative cooling). But remember, the more you sweat, the more water loss to the body. Keep drinking water!

There are also a number of cooling vests available for motorcyclists that can be soaked in or filled with water and worn under a jacket to aid in the cooling effect. These products will keep your body cooler. The vests that require soaking may leak excess water into your jacket and down into your pants—perhaps not a bad thing on a very hot day. The other type of cooling vest has a filling port for the water. It doesn't leak, but you must make sure the water saturates the inside of the vest. The instructions may direct you to go shirtless under the vest, or wear a polypropylene shirt. This is certainly more complex, but not as messy.

Full coverage helmets are a good investment, as they protect your face from wind, which can reduce evaporation. Let the internal venting on full coverage helmets do what they are designed for: cool your head. Vented gloves are a good investment for summer riding. Forget the fingerless gloves and choose full-fingered gloves that are vented.

As for pants, there are few that do a satisfactory job of cooling. This is one time that a mesh pant might be the best option.

Managing your body heat and physical condition is essential in extreme heat, and while proper gear can go a long way to making your ride more comfortable, you will still need to drink plenty of water. A personal hydration system is a great tool to ensure you have plenty of water to drink by maintaining a steady intake of fluids without having to stop as often. There are hydration systems that you can wear on your back, or ones that fit in a tank bag or elsewhere on your bike. Be sure the mouthpiece is easy to operate with one hand, so you can keep one hand on the handlebars, and that the mouthpiece fits between your mouth and the helmet. And remember, if you aren't urinating on a regular basis (at least every gas fill-up) you need to drink more water. Consider drinking one or more sports drinks per day to replenish the essential salts and minerals depleted by perspiration.

Walt Fulton is a retired roadracer, product specialist at Kawasaki and proprietor of Streetmasters Motorcycle Workshops.

ADVENTURE *BY GREGORY W. FRAZIER*

Be Prepared to Go It Alone

Abandoned.

Your riding pal has backed out of your joint adventure or possibly crashed out and you are left with a quandary: "Go on alone or go back home?" It's a tough decision.

This is not a new quandary. In 1913, the first man to ride a motorcycle around the world was faced with the tough decision. Carl Stearns Clancy, a 21-year-old adventurer, was abandoned by his riding pal, Walter Storey, in Paris. The two had started out in 1912 to "girdle the globe," selling Henderson motorcycle dealerships along the way to support their travel expenses. After a short but arduous ride from Dublin, Ireland, to Paris, the pair had holed-up for several months to sit out the winter weather. In February, Storey was "imperatively called home," leaving Clancy to soldier on alone or stop his adventure and do the same.

Well-known global motorcycle adventurer Dave Barr wrote about Clancy's decision to go on alone in the book, "Motorcycle Adventurer."

"What I do see as being devastating was when Clancy got used to traveling with Storey, you know for better or worse, he would have been used to him, and it's like the devil you know. When Storey left, there's a part of Clancy that was gone, and he was truly on his own. We have all traveled with people we got along well with and we've been through some hard stuff—the weather, the road, living conditions, border crossings, a lot of uncertainty, and we come to learn how much we can depend on the other person, how much of the load they can carry. Then one day you say goodbye, and you never see each other again. A part of you goes with them, and then you're traveling differently. We have to learn to handle that emptiness well because that is who we are, but it still would have been tough for Clancy to soldier on alone once Storey left. But at the same time, we have had it happen to us a number of times and we just carry on alone, no problem, whereas he didn't start out to be a lone traveler. He had to make an incredible adjustment."

In another scenario, your riding pal has crashed out, been hospitalized, or worse, shipped home in a pine box.

Tips: Part of making the decision to soldier on alone is to have not only the grit, gumption and determination to be an achiever, but also having a Plan B for going solo at the start of the adventure. This includes being flexible in route planning, having the financial ability to afford forward movement and the necessary parts, tools and paperwork to travel independent of your riding pal or wingman.

I was once abandoned by my two traveling pals on the first day into a ride across Russia, in Moscow. When they turned around and went back to America they took with them the GPS, credit cards and wad of cash we were going to drain across Russia. Foolishly, I thought I could purchase a paper map at a gas station, only to learn maps were not sold at gas stations, nor anywhere else I could find for the next seven times zones eastward. What map I did have was one of the three-page foldout airline maps of the world I had earlier ripped out of an airline magazine. I also had a cheap plastic compass given to me by travel-guru Andy Goldfine from Aerostich, more as a bit of humor before I left. Sleeping and eating became budget adventures, camping in the wilderness of Siberia versus staying in upscale hotels the wad of cash and credit cards was to afford, and eating at roadside food markets instead of sitting in restaurants. I followed the only road across Russia, knowing the sun rose in the east, my direction of travel.

My learning curve from that experience taught me to always carry paper maps before I started an adventure, whether on a one-day, off-road ride or a several-months continent crossing. Too often, I had seen or heard of a GPS dying, leaving the digitally addicted rider without a map to follow. I have also learned to carry sufficient cash and credit cards to soldier on alone, or a way of securing the funds needed, whether by begging or borrowing or calling my safety net person in the United States. I also carry my own set of tools and spare parts, not wanting to be without them when or if my riding pal and I are separated. There is no advantage to sharing the carrying of one set of tools or spares when they go a separate way.

By preparing a back-up or Plan B before starting, one has already started to think solo, so to soften, as Dave Barr said, "the incredible adjustment," when and if it has to be made.

Dr. Gregory W. Frazier has authored four global motorcycle adventure books, logged five circumnavigations and a million miles.

GREGORY W. FRAZIER

» **LEGAL** *BY HARRY DEITZLER*

Getting the Guilty Party to Pay

I am a resident of New York and was hit by a vehicle that made an illegal turn, veered into my lane and hit me. I was injured: small cuts, four stitches, bruises. In the police report the driver admitted to making illegal turn and it was noted that it was his fault. The other driver's insurance company assumed 100 percent liability for the damage to my bike and paid for parts and repairs.

The other driver's insurance adjuster told me to use my own personal medical insurance card for my injuries. He said my health insurance pays first and that his company is only liable for my out-of-pocket costs.

Months later, when I finished my follow-ups, CAT scans and therapy for the injuries, I got bills from the hospital stating my medical insurance company retracted payment, claiming they are not primary.

Now the hospital says I will be turned over to a collection agency which will ruin my credit! Isn't the other driver's insurance company liable to pay the hospital?

— Chad M.

YOUR MOST DIRECT insurance claim is against your health insurance company for failing to honor its contract. You paid premiums and your health insurance company has a contract with you that requires it to pay your hospital bills. It may have a subrogation (repayment) right against the other driver or his insurance, but your health insurer's first obligation is to you. In addition to its contractual obligation to pay your medical bills, your health insurer also owes you a duty of good faith and fair dealing. If you have to sue to get the medical bills paid, the company may owe you reimbursement of attorney fees after you prevail.

Request in writing that your health insurance company respond in writing and explain to you specifically why the hospital payments are being denied. Demand that theresponding representative include reference to your insurance policy language and applicable state law. That language will tell the insurance person that you have checked with an attorney, and it should make them nervous enough to pay the medical bills that are rightfully covered under your policy. If the representative contends that if any of the bills are not covered, the company is required to show you the language in the policy that excludes the coverage.

The other driver's insurance company may not have any direct obligation to you. Its primary duty is to defend and indemnify its own policyholder. Nevertheless, the adjuster is totally wrong in saying that his company is only liable for your "out of-pocket" costs. If the offending driver caused your injury, his insurance owes payment for all of your bills.

Harry Deitzler is a partner at Hill, Peterson, Carper, Bee and Deitzler, PLLC. Submit questions at *motorcyclejustice.com*

» **DIRT** *BY GARY LAPLANTE*

Let It Slide

Want to learn how to slide a motorcycle? Use a dirt bike tool. Stick your left foot out if you want to power slide a motorcycle! Of course you can learn to slide a motorcycle by using many different bikes on a variety of surfaces, but like any job there is a better or worse tool that you can use. This story is about using the best tool (dirt bikes) on the best surface (dirt) to learn how to slide a motorcycle.

We've all seen motorcycle road racers leaving black rubber lines as they exit corners sideways and maybe wish we could experience that too. Fact is most good road racers cut their teeth on a dirt bike and that's why they're so comfortable sideways on a road race bike. With a dirt bike, anyone can experience sliding, which is one of the most thrilling and fun things you can do on a motorcycle, right up there with jumping.

Sliding is one of the next-level skills that many riders are seeking soon after they learn the basics. Besides turning the handlebars or leaning the bike, sliding is a third way to turn. Of course you don't need instruction to practice sliding, but you do need instruction to be safer, to speed up the process and to avoid getting bad habits. You also need the key components of the right surface and the right bike or tool for the job.

At MotoVentures, we teach first how to perform a rear brake slide (for turn entrances) then we teach how to perform a power slide (for turn exits). Lean is the key to both.

You'll learn faster on a bike like Yamaha's TTR125, upon which you can explore lean angle limits and the effects of your weight placement on the bike.

Remember to lean the bike plenty because it's far better to lean it too much and crash to the low side than to not lean enough and crash to the high-side.

Learning how to slide a motorcycle is easy and fun if you start with a small bike at slow speeds then move up to a larger bike and higher speeds as your control and confidence grows.

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

The stock screen on Yamaha's 2015 FJ-09, above, is quite stylish, but doesn't do much to fend off wind blast and noise, a hot topic on a few of the FJ-09 enthusiast websites. Madstad's 24-inch high screen is nearly twice the size as the stock screen. It took a few test runs, but soon, the cockpit was much more calm and quiet than before and with an angle adjustment—easily done with two knobs—the buffeting was gone.

The outer handguard is removed, above, the holes plugged with inserts provided by Madstad, but the bars still bumped the shield at full lock. Adjusting knobs on Madstad's own brackets allow for easy height and angle adjustments.

» Madstad WINDSCREEN
YAMAHA FJ-09

Stock windscreens can be useless or, worse, actually deflect the wind blast right to your head and shoulders. So, I set out in search of a replacement for the weak stock shield on my 2015 Yamaha FJ-09. The stocker is, shall we say, minimalistic. Its jagged silhouette does match up fairly well with the bike's generally angular outlines, so I get it. But when it comes to shielding wind and noise, forget it.

I checked out some FJ-09 forums online and discovered that replacement windshields are a hot topic. Reading through all of the posts, there was a lot of support for Madstad windscreens. Owners talked about ease of installation and fit and finish. What a concept: an aftermarket windshield that is easy to install and shields a rider from wind and noise. The biggest knock was apparently that this comes at a cost of bulk; the Madstads were larger than pretty much all of the "sporty" windscreens, and too bulky-looking for some.

Doing some comparison shopping, I noticed the Madstad brand was also among the most expensive of several options, priced at about $250. This did not deter me. I don't mind paying more to get more, if cost is not prohibitive. I placed my order. The online fitment guide directed me to a 24-inch high screen for my 6-foot-2 inch frame. The top edge would be level with a point somewhere between my nose and chin.

The package arrived within two weeks, pretty much standard, I figured. I set aside three hours for installation and began, resolved to take it slow and enjoy the experience. I was done in 45 minutes. The instructions were so well written and complete that I could see installation taking only 15 to 20 minutes if I were to do it again.

The key movements were removing the stock Yamaha windshield bracket and tossing it, then removing the outer of the two-layer handguards and tossing them. The stock mounting bracket bolts would be used to secure the Madstad mounting bracket and "stiffening plate." The outer handguards were removed to give the new shield more clearance at full turn, though it still bumped a little.

It took about three test rides to get the new shield's height and angle to its optimal position, for me: full height and 55 degrees of lean—five degrees flatter than the more upright 60-degree baseline setting. Adjustments are simple with twin adjustment knobs that loosen and tighten.

Once I got to the optimal position, I realized an estimated 50 to 70 percent reduction in wind blast and noise. Not completely calm, not silent, but a vast improvement over stock. Like getting seat height right or suspension dialed in perfectly, this is a quality of life modification that is well worth the money.

—Russell Evans

●●●●● **Madstad Engineering, *madstad.com***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MODEL
EVALUATION

LEAN MACHINE

BMW R NINET RACER TAMES THE TIGHTEST CURVES, INSPIRES CONFIDENCE.

> By **Russell Evans**

With BMW squeezing out so many variations in its R nineT platform, created to commemorate the company's 90th anniversary, it was getting hard to keep track.

The original R nineT was born of a bit of tradition, with minimalistic retro styling and no-nonsense performance emanating from the 1200cc flat twin motor. Then came the Scrambler, with a bit of 50s and 60s nostalgia, and the Pure, sort of a R nineT light, with several less expensive downgrades intended to put it within financial reach of a larger buyer segment.

Line them all up, they look pretty similar.

Then the company rolled out the Racer, which won't be confused with any of the others. With its bright and vibrant paint scheme, its aggressive, forward riding position, clip-ons and its bullet (Avon-type nose cone) fairing is squarely aimed at yet a newly coveted BMW market segment: young riders.

"The average age of our buyers is 49," BMW Motorrad U.S. Product Manager Brian Carey said. "Sixty-two percent of our customers say style and design is the reason for the purchase. We call this our Heritage line and it is all about visual appeal."

The Racer is a visual delight, distinctive among its sibling models. It is the wild pony of the Heritage stable. Hold on tight and you'll be rewarded with an exciting ride.

For those who like to hug their bike as it hugs the road, BMW has created the R nineT Racer, which excels at turning a tight, twisting traverse into a joyride.

GINA CIOLI

ENGINE

Though built on the same R nineT platform, with the same BMW boxer engine tuned the same as the other Heritage models, the Racer rides and feels noticeably different. The air/oil-cooled, 180-degree, DOHC opposed twin engine with four radially-positioned valves is peppy, churning out 89 hp and 66 lb.-ft. of torque, and throttle response is snappy.

The engine, identical on all five R nineT models, is designed to meet the requirements of the Euro4 pollutant class. Twin-spark ignition coils provide precise digital engine management for smooth, constant power, and there was just the right amount of compression braking during roll-off while scooting along tight, winding mountain roads—no braking, no downshifting. Just enough speed scrubbed off to set up the next turn, without compressing the suspension, which is nice when you've got your hands full in the twisties.

TRANSMISSION

The Cardan shaft drive nimbly transmits power from the bevelled gears of the Racer's constant-mesh six-speed gearbox. The hydraulically activated dry clutch on our test bike was flawless in advancing through the gears.

GINA CIOLI

SUSPENSION

The Racer is built around a modular steel tubular space frame that consists of front main frame and rear main frame. A third passenger frame segment is an accessory and bolts on to support two-up riding and a larger seat, also an accessory. This is in line with BMW's new obsession with customization—which other manufacturers have embraced as well.

While the top-of-the-line R nineT comes with upside-down forks in its premium suspension package, the Racer is equipped with traditional front forks that provide an ample 4.9 inches of travel. In the rear, the BMW Paralever works with a central spring strut to give 4.7 inches of travel and minimize downward force of the shaft drive at the rear wheel.

ERGONOMICS & HANDLING

The Racer is not a particularly comfortable bike to ride, by design. It requires a much more aggressive, forward riding position, dictated by the clip-ons and minimal seat. This places the rider in a position to get down and dirty in the curves and this is where the Racer excels. Handling is superb. When you need the bike to turn, it turns. Set it on a line and it does not deviate.

Traction is excellent, even without optional Automatic Stability Control (ASC)—a $400 upgrade that is highly recommended if regularly encountering wet road conditions. The ASC is traction control that limits rear wheel slip on wet or slick surfaces and provides front wheel lift-off detection and intervention. BMW calls it the natural counterpart to ABS.

BRAKES & WHEELS

Twin 320 mm discs are hydraulically activated through four-piston calipers and ably handle braking up front. There is a lone floating 265 mm disc brake with dual calipers in the rear. All BMW vehicles have anti-lock braking systems, which makes slowing and stopping predictable, but this system screamed and smoked under heavy engagement.

Five-spoke, light alloy cast wheels come stock, 3.5-in. x 17-in up front and 5.5-in. x 17-in. rear (wire-spoked wheels are a $500 option). Our test model was fitted with Metzeler Roadtec Z8 tires, 120/70 ZR 17 front, 180/55 ZR 17 rear, which held the road most excellently.

INSTRUMENTS & CONTROLS

The instrument cluster has classic dual circular analog dials with side-by-side speedometer and tachometer, both with integrated indicator lamps, housed in a high-quality metal casing. There are additional LCD display windows with time, date, trip-ometers, distance, mileage, engine temp. All switches—start/stop, heated grips, ABS, info, hazard—are within easy reach of a thumb.

ATTENTION TO DETAIL

It appears that BMW didn't miss a trick with its design and engineering of a motorcycle that arouses and emotional response and romantic connection to some of the race bikes found in its heritage, especially the R 90 S.

In the cockpit, in race posture, the rider feels every bit of the machine, every millimeter of the contact patch. The presentation is fun and nostalgic, from the nose cone fairing to the rear cowl over the single-sided swingarm and the 1970's paint job—red and blue stripes on white. Other details such as the aluminum silver frame's contrast with the black drivetrain, fork bridges and footrests finished in clear, anodized aluminum. There's even storage: enough for registration and insurance papers, and maybe a medium-sized wallet, inside the cowl. Minute, but a nice touch for otherwise unused space.

VALUE

The quality of the R nineT Racer shines through a little more with every ride. It is a purpose bike, one for gobbling up the twisties, and if this is your purpose as well, the Racer does everything exceptionally well. The performance alone might be worth the price, but BMW's fit and finish are second to none and go well beyond that. The $13,295 base price requires a commitment. It is aimed at a younger segment, with money to spend and a thirst for a dynamic ride. **MCN**

TESTERS LOG

Once again, BMW gets it just right. The Racer was not designed for everybody, nor for every purpose. But for those seeking an exciting combination of retro and modern style, precise steering, snappy throttle response and white-knuckle horsepower, this is a great choice.

I loved the engine's exhaust note, the throttle snap, the pure power delivery. It also has great café racer looks, with its nose cone fairing and gleaming paint job. I took it up to the mountains and really leaned it over for about 20 miles of winding road and the bike easily handled everything I could throw its way. This is the bike I would choose for 50 miles of twisties.

—Russell Evans

I'm a fan of twins and sportbikes. I'm even a fan of retro. I had a lot of fun riding this bike, in short canyon stints.

Accelleration is mediocre. The riding position is too aggressive for my aging joints. The suspension did not provide the feedback or adjustability I would expect from a sportbike. The turning radius was annoyingly short and there's no room for a passenger. Since when does anyone race with a shaft drive?

All that being said, this bike has style points galore. Everything from the dual clocks, to the vintage race-inspired fairing, tail cowl and paint striping. This is a very enjoyable ride that is also great garage or parking lot candy.

—David Hilgendorf

GINA CIOLI

2017 BMW R NINE T RACER

CycleStats

QUICK HITS

MSRP: $13,295 ($14,400 as tested)
Category: Sportbike
Displacement: 1170cc
Engine Type: Air/oil-cooled, four-stroke, flat-twin
Warranty: 1 year, unlimited mi.
GVWR: 948 lbs.
Wet Weight: 487 lbs.
Carry Capacity: 461 lbs.
Seat Height: 31.7 in.
Colors: White

SPECIFICATIONS

Valvetrain: 8-valve, DOHC
Bore & Stroke: 101.0 x 73 mm
Comp. Ratio: 12.0:1
Transmission: Constant-mesh six-speed gearbox; hydraulically activated dry clutch
Final Drive: Universal Shaft
Fueling: PGM-FI, 4-mode, TCS
Tank Capacity: 4.5 gallons
Fuel Grade: 91 octane
Exhaust: 2-into-1
Ground Clearance: 6.25 in.
Wheelbase: 58.7 in.
Rake & Trail: 26.4°/ 4.1 in.
Tires: (tested) Metzeler Roadtec Z8, 120/70 ZR 17 front; 180/55 ZR 17 rear
Brakes: BMW Motorrad ABS, hydraulic 4-piston dual-disc, 320mm front; 2-piston single disc, 265mm rear
Suspension: 43mm, 4.9-in. travel telescopic front; 4.7-in. travel Paralever rear, preload and rebound adjust

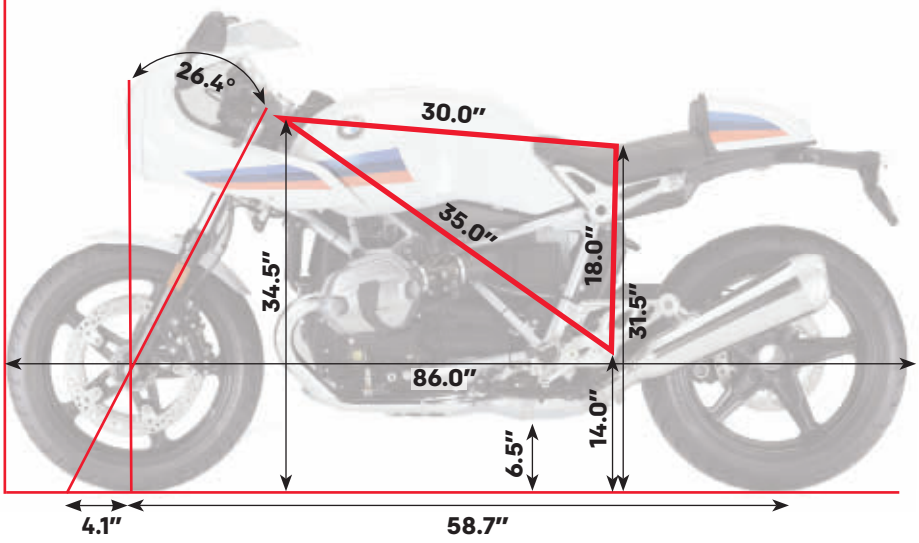
ELECTRICS

Battery: 12V, 14Ah maintenance free
Ignition: Electronic
Alternator Output: 720W
Headlight: 60/55W H4
Instruments: (analog) speedo, tach, (digital) odo, trip, clock, temp., fuel
Indicators: engine, oil, neutral, signal, high-beam, gear, mode, TC, ABS

MAINTENANCE

($100/hr.)	Miles	Labor	Parts	Total
Routine	6,000	$300	$175	$475
Valves	12,000	$110	$120	$230

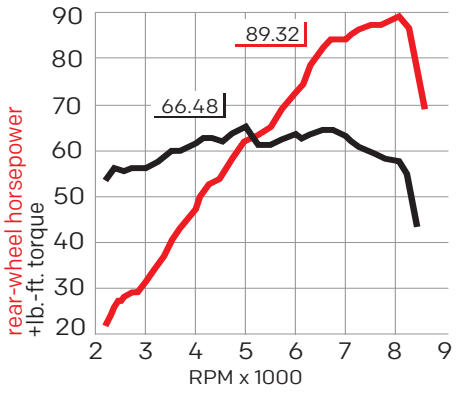
GEOMETRY



PERFORMANCE

Fuel Economy (MPG)
High: 42; **Low:** 37; **Average:** 39
Estimated Range: 175 mi.
60-0 mph: 124.35 feet
0-60 mph: 3.9 seconds
1/4 mile: 12.37 sec./113.19 mph
Power to Weight: 1:6.49
Speed @ 65 mph: 64 mph
RPM @ 65 mph: 3,700
RPM @ limit: 8,400

HORSEPOWER & TORQUE



SMILES
1. Eye-catching styling
2. Excellent handling
3. Snappy boxer engine

FROWNS
1. Hunched riding position
2. Price might scare some
3. Rock-hard seat

EVALUATION

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

Naked AGGRESSION

900 STREETFIGHT: YAMAHA VS. KAWASAKI

> By **David Hilgendorf**

This is the year of model updates, and both of these near-liter-class standards are taking different approaches to replacing their forebearers. Kawasaki's Z900 aims to create the technologically simplest, lightest, most powerful sport standard, which is meant to sit at the top of the Z lineup by simultaneously replacing both the Z800 and Z1000 in one fell swoop.

Yamaha takes a different tack, heavily revising their already excellent FZ-09 into an even more palatable, tech-heavy, and 10 percent more expensive, version 2.0.

Both model lines have a storied history as performance innovators. The Kawasaki Z originated as the 903cc Z1, way back in 1972. At the time it was the most powerful four-stroke, four-cylinder bike to come out of Japan, and it quickly dominated on racetracks and the street.

Yamaha's first performance based FZ was the five-valve 1985 FZ750 Genesis, another Japanese import that outperformed the competition and became the basis for the YZF-R1 supersport

platform, introduced in 1998. Needless to say, the Z and FZ monikers are not slapped on any old standard; these bikes are built to perform.

The FZ-09 was introduced in 2014 and received it's first major overhaul this year, many features trickle down from the recent the FZ-10 (MCN 1/17), including ABS, traction control and a slipper clutch. There's even an optional quick-shifter, pulled from the YZF-R1.

The FZ-10 inspired styling updates include new plastics, a dual headlight with four LED lamps (two high, two low) and an LED taillight, plus a swingarm mounted fender and license-plate bracket. The seat is also a bit flatter and higher in the front to prevent sliding into the tank.

ENGINE

Yamaha's 847cc crossplane crankshaft triple is the identical plant found in the original FZ-09 as well as the FJ-09 and XSR900, which also share the same throttle maps. It hasn't been tweaked at all, because it was already the best part of this package. The beast rolls power to the rear wheel agressively, sometimes abruptly. Version 1.0 was known to have throttle delivery problems, and while the maps have been improved over the last four years, version 2.0 can still kick you in the pants if you aren't paying attention, especially in YCC-T (throttle control) mode A (aggressive). Mode B (subdued) response felt like a tame 600cc, so we mostly left the bike in Standard mode, which was the best compromise of aggression when desired and passivity when required.

Kawasaki's 948cc inline-four is heavily based on the outgoing Z1000, including a counterbalancer shaft, but reduces weight by becoming a five-point stressed member of an all-new 30-pound trellis frame. Thus, the Z900 is lighter than both the outgoing Z800 and Z1000 by 46 and 25 pounds, respectively. The bike tends toward buzzy in the upper rev ranges, but it was never overwhelming.

Though boasting a 101cc displacement advantage over the FZ, both are marketed as 900s. Riders who prefer top end will like the delivery of Kawasaki's four, but those seeking more off-the-line punch will likely favor the thrust of Yamaha's triple. Both engines offer excellent power delivery, but the Kawasaki feels smoother overall, has a better intake howl and more top end, despite including zero electronic aids.

TRANSMISSION

Both vehicles offer six-speed assist-and slipper clutches that shift without challenge, making lever pulls painless and errant downshifts unremarkable, finding neutral was also easy. There is good reason this technology shows up on more bikes every year, and in both bikes it really takes rough shifting out of the equation, making for a more pleasant ride all-around.


Z900


FZ-09

The Z900 is fitted with shorter gearing through fifth and an overdrive sixth, for economic cruising at speed (more likely to help meet emissions), the FZ has more standard gear ratios. With redine peaking at five-digits on either bike, you'll never want for more gears. Two-level traction control on the FZ allows for heavy interference for slick surfaces (mode 2), or minimal interference for aggressive riding (mode 1), even allowing power wheelies; it can also be turned off.

BRAKES & WHEELS

Both bikes sport budget dual-disc four-piston calipers, squeezing 300mm discs on the Z and 298mm on the FZ. ABS is new to and standard on the FZ and optional on the Z, though modern ABS works so well, we don't know why anyone would try to save $400 by excluding it. Brake engagement was decent, if a bit soft on initial bite for the Z, but the levers are adjustable. The feeling is very linear however, and never overwhelming. The FZ brake feel is excellent, even with ABS engaged, a smooth and progressive squeeze on the adjustable levers will bring the rear wheel right off the ground, which is remarkable technology.

SUSPENSION

The original FZ-09 was rightly panned for having cheap, soft, nonadjustable suspension. Included in the upgrade package for version 2.0 is a fully adjustable 41mm KYB fork, now with 83 percent firmer compression damping. Resultant feel is solid all-around, maintaining front-end stability in corners as well as on the brakes. The rear still sports a relatively vanilla gas-charged KYB shock, but it get's the job done with only preload and rebound adjustability.

The Z900 has a 41mm fork and a horzontal back-link shock, both are rebound and preload adjustable. They are on the sportier side of handling, though far less aggressive than the


Z900

outgoing Z1000, and tuned for a more comfortable street ride for the average rider of about 180 pounds.

We were very happy with the stock offerings and didn'trequire anything more out of the suspension on either bike, which is fantastic for budget entries.

ERGONOMICS & HANDLING

Both bikes have a comfortable, relaxed upright riding posture. One consistant negative on standards is the lacking wind protection at speed, which was more noticeable on the Kawasaki.

Both bikes are narrow in the center allowing shorter riders an easier reach to the ground at stops. A 31.3-inch seat on the Z900 is good for the short of inseam, and it's wider in the rear to prevent fatigue, though we still found both the stock seat and the one-inch taller "comfort" seat to be uncomfortable after only an hour of riding. We'd also like a windscreen.

The slightly taller 32.3-inch seat on the FZ was more long-distance comfortable,with more room for at 32-inch inseam, less aggressive cupping and softer padding. It should be more comfortable for passengers, putting them lower and closer to the pilot, with a wider pillion perch.

As far as naked bikes are concerned, handling really doesn't get any better than this pair. Both feel planted and well suspended, with ample ground clearance and wide bars that make steering changes easy at any speed.


Z900


FZ-09

FZ-09

INSTRUMENTS & CONTROLS

Both bikes have adjustable levers and the instrument clusters are large and easy to read, but the FZ's clock is more svelte and better integrated into the overall bike.

The Z has a busier, angular, aggressive looking dash, thats best feature is the programmable shift lights and analog rpm indicator with a digital needle. The variable electronics settings on the FZ-09 are easy to manipulate on the fly from the handlebars, which is about all we could ask for.

ATTENTION TO DETAIL

Overall, both bikes are well put together and have similar, but distinct styling cues. The Z900 is more raw and brutish, with an aggressive stance and blacked out colorways. The FZ-09 is a more approachable bike that dials down the Transformer look of the FZ-10 to just shy of obnoxious.

Looking at both bikes as a whole, we think the FZ will appeal to a wider demographic of rider, particularly because it offers technology that could save a new rider's bacon at a similar price to the more fundamental Z. It also comes in friendlier colors. Experienced riders will only need to look at styling and and engine configuration to decide which bike excites them more, either is a solid choice.

VALUE

The FZ-09 adds a lot of technology and performance improvements from the first generation model, making the $800 price increase to $8,999 nothing to complain about. It's simply a better bike than the original.

The Z900 starts at the same $8,399 base price as the outgoing Z800, which also makes it a no-brainer. Adding ABS (and you should) brings the price up to $8,799, which is sneezing distance from the FZ-09. That $200 buys a lot of additional technology, which some riders will appreciate and some will not.

Either way, these bikes look and perform similarly, but are considerably less expensive than the outgoing Z1000 at $11,999 or the incoming FZ-10 at $12,999, and that's money in the bank. MCN

FZ-09

Z900

TESTERS LOG

Standards are a rapidly growing segment; they are comfortable, affordable and fun. There are diminishing returns when it comes to size, and the best bang for the buck tends to fall somewhere between 650 and 1000cc. These two bikes are very well equipped and priced for naked sportbikes, streetfighters, or whatever you want to call them.

I really liked the Z900, and it's a perfect bike for the rider who likes the top end burst of an inline-four, or those who abhor all the new technology ruining the "purity" of their ride. Oh, it sounds awesome too. Personally, I prefer the low-end grunt of a triple, plus the FZ has a technology package that actually works. You can turn it off, or simply dial it down so it only interferes when things go bad. The seat is more comfortable, too. For what is essentially the same price, my money's on the FZ.

—David Hilgendorf

Both of these bikes got the adrenaline pumping hard, each with a great power-to-weight ratio, but the Kawasaki feels noticeably more powerful, thanks to its extra 100cc. While many models round up their displacement numbers, the Z900 rounded down, from 948cc. Its thrust is intoxicating, its horsepower climbing steep and straight as the rpm increase, and it was often difficult to keep the front wheel on the pavement.

I liked the Kawasaki's ergonomics, as if you're sitting down in the bike. The Yamaha is a bike you sit on top of, giving a feeling of always being in control. Cornering was magical on the FZ and the turbo-like whirr of the inline triple is the best in the business.

—Russell Evans

2017 KAWASAKI Z900

CycleStats™

QUICK HITS

MSRP: $8,399 ($8,799 ABS)
Category: Naked
Displacement: 948cc
Engine Type: 4-Stroke, Liquid-Cooled, DOHC, 4 Valve Cylinder Head, Transverse In-Line 4-Cylinder
Warranty: 1 year
GVWR: 855 lbs.
Wet Weight: 459 lbs.
Carry Capacity: 396 lbs.
Seat Height: 34.0/33.25 in.
Colors: Metallic Flat Spark Black, Pearl Mystic Gray

SPECIFICATIONS

Valvetrain: ECU-controlled dual sub-throttle valves, four per cylinder
Bore & Stroke: 73.4mm x 56.0 mm
Comp. Ratio: 11.8:1
Transmission: 6-speed with assist and slipper clutch
Final Drive: Sealed Chain
Fueling: DFI with Mikuni 36mm Throttle Bodies (4)
Tank Capacity: 4.5 gallons
Fuel Grade: 91 octane
Exhaust: 4-into-1
Ground Clearance: 5.25 in.
Wheelbase: 57.1 in.
Rake & Trail: 25.0°/ 4.1 in.
Tires: Dunlop Sportmax D214 120/70ZR17 front and Dunlop Sportmax D214 180/55ZR17 rear.
Suspension: 41mm inverted fork with adjustable preload and rebound damping, front; horizontal back-link with adjustable preload and adjustable rebound damping, rear.

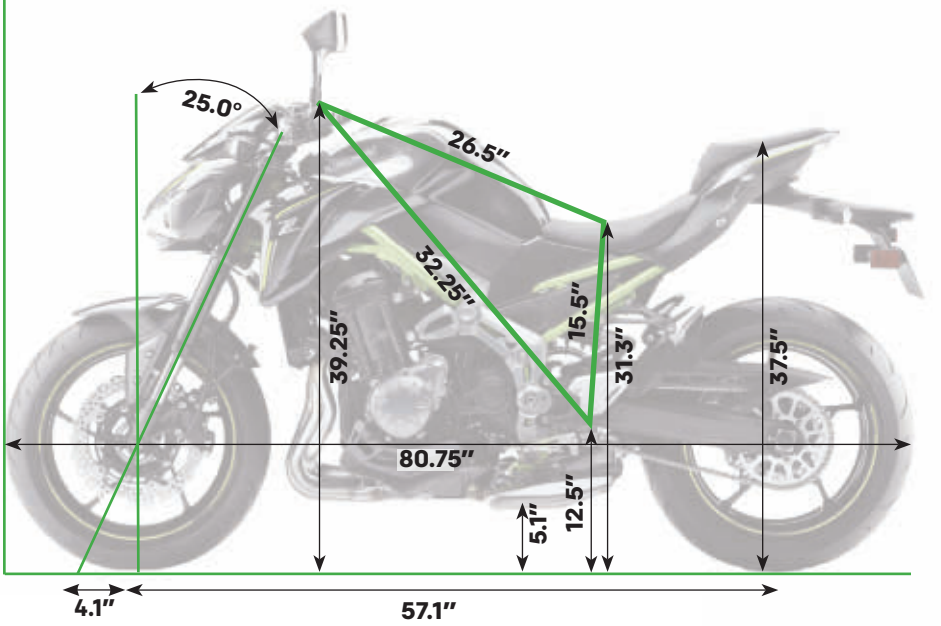
ELECTRICS

Battery: 12V, 10Ah
Ignition: Transistor-Controlled Breakerless Ignition with Digital Advance
Alternator Output: N/A
Headlight: Dual LED, 55/55W
Instruments: (Digital) speedo, tach, odo, trip, clock, temp, fuel consumption.
Indicators: engine, oil, neutral, signal, high-beam, gear, low fuel, ABS, ECO

MAINTENANCE

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

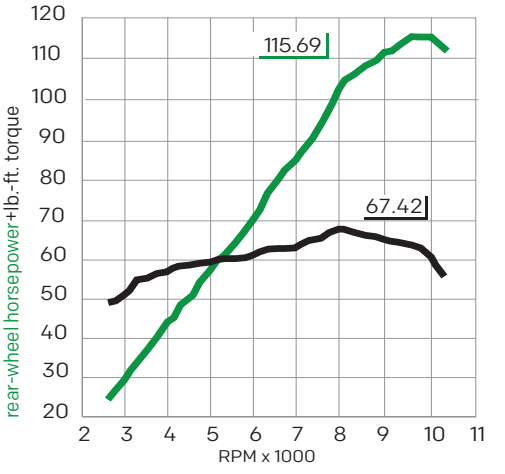
GEOMETRY



PERFORMANCE

Fuel Economy (MPG)
High: 30; **Low:** 30; **Avg:** 30
Estimated Range: 135 mi.
60-0 mph: 128.21 feet
0-60 mph: 3.66 seconds
1/4 mile: 12.16 sec. @ 113.82 mph
Power to Weight: 1:3.96
Speed @ 65 mph: 65 mph
RPM @ 65 mph: 4,500
RPM @ limit: 10,500

HORSEPOWER & TORQUE



SMILES
1. Power feels unlimited
2. Impressive handling
3. Power-to-weight: 1:3.96

FROWNS
1. Sparse instrumentation
2. Confined seating position
3. Little wind protection

EVALUATION

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

2017 YAMAHA FZ-09

CycleStats™

QUICK HITS

MSRP: $8,999
Category: Naked
Displacement: 847cc
Engine Type: Liquid-cooled, DOHC, inline 3-cylinder
Warranty: 1 year (limited factory warr.)
GVWR: 809 lbs.
Wet Weight: 425 lbs.
Carry Capacity: 384 lbs.
Seat Height: 32.0 in.
Colors: Candy Red; Matte Silver, Intensity White

SPECIFICATIONS

Valvetrain: DOHC, four valves per cylinder
Bore & Stroke: 78.0mm x 59.1 mm
Comp. Ratio: 11.5:1
Transmission: 6-speed, multiplate assist and slipper wet clutch
Final Drive: O-ring chain
Fueling: EFI with Yamaha Chip Control Throttle system (YCC-T)
Tank Capacity: 3.7 gallons
Fuel Grade: 91 octane
Exhaust: 3-into-1
Ground Clearance: 5.0 in.
Wheelbase: 56.7 in.
Rake & Trail: 25.0°/ 4.1 in.
Tires: Dunlop Sportmax D214 120/70ZR17 front and Dunlop Sportmax D214 180/55ZR17 rear.
Suspension: Fully adjustable inverted 41mm telescopic fork, 5.4 inches travel, front; Adjustable preload and rebound damping, horizontal Monocross shock, 5.1 inches travel, rear.

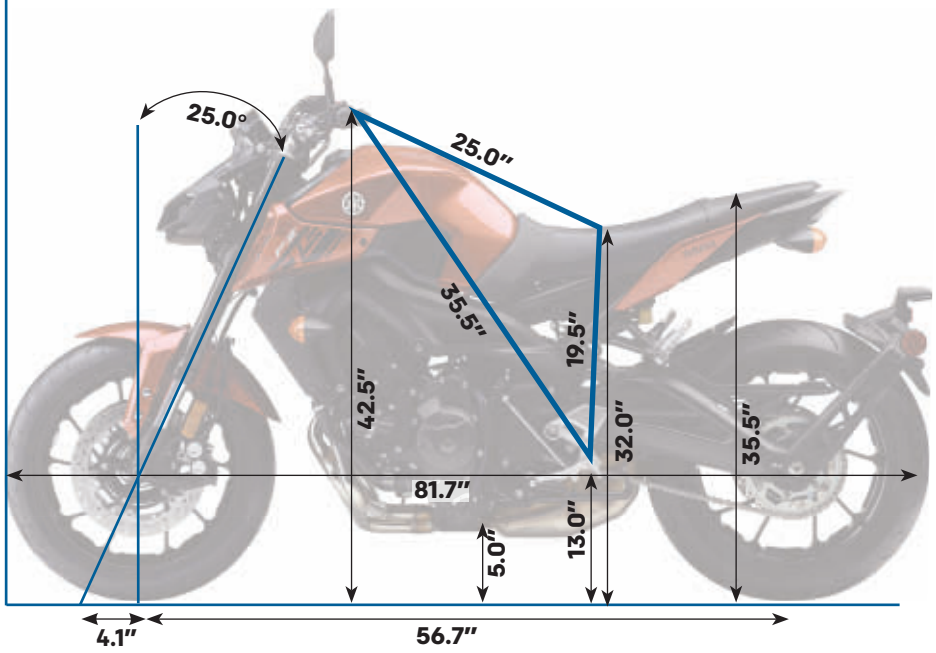
ELECTRICS

Battery: 12V, 9.1Ah
Ignition: Transistor Controlled Ignition
Alternator Output: 415W @ 5000 rpm
Headlight: x1 LED high; 1x LED low
Instruments: (Digital) speedo, tach odo, trip, tach, clock, temp, fuel, average mpg, tire pressure.
Indicators: engine, oil, neutral, signal, high-beam, gear, mode, TC, ABS

MAINTENANCE

($100/hr.)	Miles	Labor	Parts	Total
Routine	4,000	$600	$121	$721
Valves	26,600	$250	$75	$325

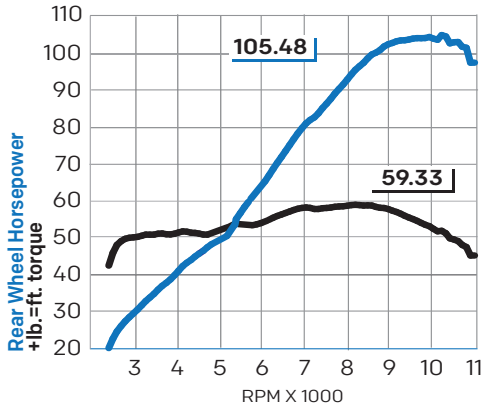
GEOMETRY



PERFORMANCE

Fuel Economy (MPG)
High: 40; **Low:** 33; **Average:** 36
Estimated Range: 133 mi.
60-0 mph: 138.57 feet
0-60 mph: 4.48 seconds
1/4 mile: 12.1 sec. @ 112 mph
Power to Weight: 1:6.49
Speed @ 65 mph: 65 mph
RPM @ 65 mph: 4,500
RPM @ limit: 9,000

HORSEPOWER & TORQUE



SMILES
1. Exceptional handling
2. Strong engine
3. Rider high in saddle

FROWNS
1. A little buzzy at speed
2. Throttle modes jumpy
3. Not big on comfort

EVALUATION

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

You come out of the store or restaurant and are greeted with this chilling sight. Do you have your portable mini-compressor with you?

Now, What?

ONE OF THESE MINI AIR COMPRESSORS COULD HELP GET YOU ROLLING AGAIN. HERE'S HOW THEY RATE.

> By **Jeremy C. Willard**

I live by the mantra that "luck favors the well prepared." While it's overkill to bring enough tools to completely disassemble your bike anytime you run to the store for a gallon of milk (you know who you are), packing a selection of "just in case" tools is sound advice. The key is striking a balance based between the odds of something going wrong, how far away from help you will be traveling and the space you have on your bike.

When looking at the odds of something going wrong, I would wager the most common issue faced by riders today is a low or flat tire. A flat tire, even when only a couple of miles from help, means that you are stuck. The difference of a couple of pounds of pressure can have a profound impact on your bike's handling and overall safety. The odds grow even greater for the ADV rider who goes farther "off the grid," faces terrain that's more prone to punctures and is constantly needing to change the tire's psi based on the surface type.

Lucky for us, there are several choices of compact air compressors available. But how do you know what's the best choice for you? To answer that question, I put seven compact compressors through a battery of testing to provide you with the information needed to select the compressor that will work best for you. As a note, to make for an apples to apples comparison, the review focuses on electric compressors. I did this because compact bicycle-style hand pumps do not have the capacity to efficiently inflate the typical street bike tire to the appropriate psi.

Here's a little more about how the compressors were tested: In addition to collecting the various attributes of each compressor, I also wanted to provide more scientific data on their performance. So, I drilled and tapped a 17" aluminum rear motorcycle wheel and mounted a pressure gauge. I then ran each compressor for three consecutive runs to inflate the 140/70/17 tire to 40 psi, capturing the times at 10 psi increments. An average time was then calculated from the three test runs. The results help to illustrate the strength of each compressor tested. It also worked as a mild

SHUTTERSTOCK

torture test by doing three consecutive runs. In addition, to test each compressor's ability to set the bead of a tire, I used a 150/70/18 tubeless tire mounted on an aluminum rim. I completely broke the tire's bead and then attempted to reset the bead with each mini compressor. For consistency, all testing used an Acopian power supply to provide a steady 12 volts. The following results are listed in alphabetic order.

» Cycle Pump ●●●●◖

The CyclePump air compressor is made in the United States and sold through BestRest Products at a list price of $115. The CyclePump is housed in a stout aluminum case with rubberized end caps that give a Sherman tank-like esthetic to its diminutive 2-¼-in. x 4-¼-in. x 5-⅝-in.(H x W x L) size. The beefy unit tipped the scales at 1.78 pounds—the heaviest of the seven models tested. The CyclePump comes with a 19-inch air hose with a robust, brass locking chuck, and connects to power with a 116-¾-inch cord. It also comes with two separate pigtails—one with an SAE connection and alligator clips for direct battery connection, the other with an SAE connection and a male cigarette lighter-type adapter. The compressor is activated by a sturdy sliding switch. A Velcro strap attached to the compressor secures the cord and hose, and all fit in a simple textile case with Velcro closure. The cord and air hose on the outside of the compressor does make it a little bulkier than some of the other models, with their inboard storage. A major plus for the CyclePump is that it comes with a lifetime warranty, by far the best in the test.

The first thing I noticed when testing the CyclePump was how its solid feel exudes quality. The results showed that the CyclePump backed it up with performance. During our three runs to 40 psi, the CyclePump hummed along effortlessly to the second quickest average time of 4:04.34 minutes, though after the third run, the aluminum casing had become quite warm. The locking chuck made connecting to the Schrader valve of our test wheel a snap. During our bead setting test, I noted that the CyclePump was able to reset the bead of our test wheel very quickly.

Just as you don't see a butcher use Swiss Army Knife, you won't see a lot of extras such as LED light or built-in pressure gauge on the CyclePump. It just flat-out excels as a compressor. The best in class warranty coupled with an impressive build quality and performance justifies the cost and makes the CyclePump our top choice.
bestrestproducts.com

JEREMY C. WILLARD

» Double Tough ●●●◖

The Double Tough air compressor is sold through Cycle Gear at a list price of $39.99. The unit measures a compact 2-½-in. x 4-½-in. x 5-⅞-in. and weighs less than a pound (0.83-lb.). The Double Tough has a 12-inch air hose with a screw-type chuck and connects to an electrical source via an SAE connection. It comes with an additional pigtail that has an SAE connection and alligator clips to allow for direct connection to a battery. The compressor has a built-in, non-illuminated 0-80 psi pressure gauge and a recessed cavity in its plastic housing to allow for the power cord and air hose to be tucked away. The compressor is activated by a push-button switch that has a cheap feel. Made in China, the Double Tough comes in a nice textile carrying case with zippered closure. The packaging contained no implied warranty.

During testing, the shorter air hose —the second shortest of the compressors tested—made connecting the compressor to the wheel's Schrader valve a little difficult. I also noted that the plastic-threaded connection used on the air hose seemed flimsy and a potential weak spot. During the three timed runs to 40 psi, the Double Tough labored much harder than the other compressors tested and its average time of 7:04.69 minutes to fill the tire to 40 psi was the slowest in this group. During the bead setting test, the compressor again labored, but was able to set the bead on the test tire.

I liked the look and price of the Double Tough, but its laboring and slow test results left me feeling that some of the other compressors tested are a better choice.
cyclegear.com

» MotoPressor ●●●

The MotoPressor's package states that it is designed in Australia, and I deemed this the "Mad Max" air compressor. Just one look at its naked, steampunk design shows how it earned this nickname. Its unique shape makes the MotoPressor a little tricky to measure, but I recorded a size of 1-⅝-in. x

3-½-in. x 4-⅞-in. and a weight of 1.3 pounds. The unit has a 25-inch air hose with a screw-on chuck. It also has a 84.5-inch power cord with an SAE connection. It is packaged with a battery lead with SAE connection, and has a separate pigtail with an SAE connection and alligator clips for direct battery connection. The compressor is activated via a small rocker switch with a nice feel. The MotoPressor stores in a neoprene bag with a Velcro enclosure. The MotoPressor can be purchased in the U.S. through AltRider.com at a list price of $49.95. The compressor is made in China and comes with a 5-year warranty.

Like the apocalyptic hot rods from Mad Max, the MotoPressor loudly ripped its way to the fastest average time to 40 psi, needing only 3:41.75 minutes, on average. During testing, however, a real negative brought by the lack of casing quickly became apparent. After the first run, the MotoPressor was hot, and by the time the third run had concluded I abandoned the idea of picking it up. I also noted that the minimalist packaging means that the gears that link the electric motor to the compressor are exposed. This has the potential of allowing access for dirt and debris to cause problems. Oddly, when it came time for the bead setting test, I had to coax the tire a bit to get the bead to set. Based on the quick performance in the timed test, I expected setting the bead to be easier.

The MotoPressor's performance is notable. However, the unit's packaging is a real detractor, one that presents a tradeoff not fully offset by its smaller size.

» MotoPumps Airshot ●●●●◖

The MotoPumps Airshot can be purchased directly from MotoPumps for the list price of $59.95. The blow dryer-shaped compressor measures 1-½-in. x 3-⅝-in. x 4-½-in., has a 24-inch coiled air hose and 80-½-inch power cord with SAE connections at each end. At 0.71 pounds, it is the smallest and lightest tested. The unit is activated by push of a button. Both the air hose and power cord are detachable, for better stowage—the only such compressor in the group. The Airshot also has a small LED light that comes on as soon as the compressor is plugged into a power source, which is a handy touch.

There's a pigtail with SAE and alligator clips for direct battery connection, a pigtail with SAE and a male cigarette lighter connection and a fused SAE-to-battery connection. The package includes a pencil-type pressure gauge. All of this is smartly designed to fit into a very nice textile case with a netted top pocket and zipper closure. The Airshot is made in China and comes with a 5-year warranty.

When testing the Airshot, I noted that the knurled brass screw type chuck on the air hose eased connection to the test wheel's Schrader valve. The coiled hose, however, coupled with the unit's light weight, meant that the Airshot was left to spring about more than I would like. The inflation test validated the saying that there is no replacement for displacement—the diminutive Airshot had the second-slowest time: 6:38.63 minutes. Interestingly, the Airshot's quickest run to 40 psi was its last, meaning it was actually getting better as the test progressed; the other compressors' times either stayed consistent or increased in subsequent tests. Expectations were low for the tiny Airshot in the bead-setting test, but I was pleasantly surprised that it was able to set the bead on our test tire with little fuss.

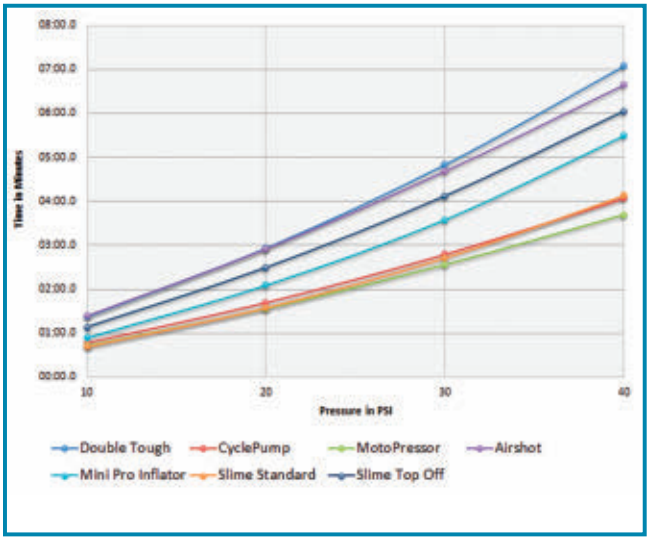
The MotoPumps Airshot is a smartly packaged piece of kit that is available at reasonable price. For those who are tight on space, this may be the compressor for you.
motopumps.com

» MotoPumps Mini Pro ●●●●◖

Another MotoPumps offering, the Mini Pro is neatly packaged and compact at 2-in. x 4-¾-in. x 5-⅞-in. The unit has a 79-¼-inch power cord with SAE connector, and a 43-inch coiled air hose with a lovely knurled brass screw on chuck. Both the air hose and the power cord neatly stow inboard the compressor's plastic housing. The compressor is activated via rocker switch. The Mini Pro also has a built-in, illuminated, 0-50-psi pressure gauge and an LED light housed in the same recessed area where the coiled air hose is stored—a nice touch. The Mini Pro is available in two different packages: the "standard" which lists for $69.95 and comes with an additional pigtail with a mail cigarette-style plug; and the "deluxe" which retails for $79.95 and adds a neoprene carrying case as well as alligator clips for direct battery connection and a fused SAE-to-battery connection. The Mini Pro Inflator is made in China and comes with a 5-year warranty.

When testing the Mini Pro, I was impressed by its well thought-out packaging. When conducting the inflation test, the compressor filled the test tire with a low-frequency hum that never waivered as the pressure climbed. Vibration was minimal. During our inflation test, the compressor scored a solid mid-pack average of 5:29.54 minutes. While its stablemate's coiled air hose created some difficulty with connec-

JEREMY C. WILLARD



tion and operation, the Mini Pro's longer coiled hose worked seamlessly. The Mini Pro also set the bead in our test tire with relative ease.

Its performance, combined with the smartly integrated LED light and illuminated pressure gauge, make it quite user-friendly. The air hose and power cord are neatly stored away within the compressor itself, making it so easy to pack that I would suggest buying the standard version, as the carrying case really isn't needed. One final note: During the time I had all of the compressors at my house for testing, I went on a 500-plus mile ride. The MotoPump Mini Pro was the compressor I grabbed on the way out the door.
motopumps.com

» Slime Standard ●●◖

The Slime Standard Tire Inflator is available at your local big box stores for $14.88, making it a real bargain. This was the largest compressor in the test, at 3-¼-in. x 6-in. x 7-in. and second heaviest at 1.71 pounds. It has a 25-¾-inch air hose with a screw-type chuck. It also has a 120-inch power cord with only a male cigarette lighter connection.

The compressor has a plastic casing with a cutout at the top that forms a handle, a recessed area to stow the air hose and power cord, a light that comes on when powered, and a non-illuminated, 0-100 psi pressure gauge. The compressor is turned on by a push-button switch, and its three LED lights were handy. The Slime Standard Tire Inflator is made in China and comes with a 1-year warranty.

JEREMY C. WILLARD

While the unit labored during its second and third inflation runs to 40 psi, the Slime Standard averaged 4:08.4 minutes, placing it just behind the CyclePump to claim third place. It also aced the bead-setting test. However, the Slime Standard was the bulkiest compressor tested.

With big power and low price, the Slime Standard is worth a look, although with cigarette lighter-only power, some sort of female cigarette lighter receptacle adapter would need to be purchased. While the price is tempting, I'd spend the extra money for a compressor geared more toward motorcyclists.
slime.com

» Slime Top Off ●●

Like its bigger brother, the Slime Top Off is available at big box stores for an almost too good to be true price of $9.88, making it the cheapest of all compressors tested. The Top Off measures 2-in. x 3-¾-in. x 4-¼-in. and weighs 0.74 pounds— second lightest. The Top Off has a laughably short air hose—just 4-¼ inches—with a screw-type chuck, but does have more than 10-feet of power cord (121-¼ inches). Much like its auto-focused sibling, the Top Off comes only with a male cigarette connector. The compressor is turned on by a very small push button. It also has an LED light and a non-illuminated 0-50 psi pressure gauge. A very flimsy clear plastic carrying case with a zippered closure comes with the compressor. The Top Off is made in China and comes with a 1-year warranty.

When testing the Slime Top Off, I first noted that the LED light was on the opposite side of the short air hose, making it useless in practical applications. The short air hose made connecting to and filling the test wheel difficult. It also means that the compressor just kind of hangs by the Schrader valve when filling. Finally, because there is less hose to dissipate heat, after the third run, the heat had traveled into the chuck making it impossible to remove without gloves. The Top Off was able to fill the test tire to 40 psi, with an average time of 6:03.27 minutes. While able to reseat the bead of our test tire, it required a lot of coaxing, which was further complicated by the short air hose.

If you don't have a mini compressor and want to spend little, the Slim Top Off unit is better than nothing. It is compact, has a pressure gauge and pumped air into a tire. But when compared to the motorcycle-focused compressors in this test, the Top Off's shortcomings emerged. As the saying goes, spend a little more and only cry once.
slime.com MCN

A RARE BIRD

THE QUAIL GATHERING IS MORE MASHUP THAN UPPER CRUST

> Text and photos by **Jeff Buchanan**

As vintage and custom motorcycle shows go, all too often many of the entrants are trailered in and then fawned over by zealous owners with endless polishing and dusting, the admiring spectators kept safely at bay behind velvet ropes. Sadly, as a result, the relationship between collectors and fans at some events can be cold and distant. This isn't the case with the Quail Motorcycle Gathering. Celebrating its 9th year, The Quail earns kudos by presenting a carefully balanced pool of machines from past and present, covering an impressive realm of motorcycle evolution through the years, and they manage to do it without cordoning off the motorcycles on display (or with intimidating security personnel ready to pounce should a hand reach out to touch). From priceless Broughs to one-off Mondial grand prix racers, the estimated 400 machines and their owners tend toward the accessible, eager to engage in conversation anyone who appreciates all things two-wheeled.

Set against the lush backdrop of Carmel Valley, with the grass in front of the storied Quail Lodge as its stage, the Quail event plays host to a beautiful and eclectic grouping of machines that are certain to satiate the most ardent enthusiast. The featured brand at this year's Quail was the Norton Commando. Several healthy rows of the iconic bikes were parked alongside one another in an awe-inspiring display that included virtually every model and color that made up this legendary motorcycle's life. The Commandos were just one brand of British steel on hand, with a

Trevor Franklin, winner of this year's Cycle World Tour Award, rode his 1980 Suzuki GS1000S the 1,200 miles from his home in British Columbia.

The Quail has a bit of the Concours feel, like the event up the road in Pebble Beach, but this is more of an everyman motorcycle show.

generous number of Triumphs, BSAs, Vincents, an entire row of Velocettes, and one particularly stunning 1939 Brough Superior SS100 all sharing the grass. Italy was well represented with Ducati, Benelli, Mondial, Moto Guzzi, and Lambretta. BMW aficionados, always a force at The Quail, held court with a range of machines that beautifully chronicled the progression of the German brand's stalwart Boxer design. American brands Indian and Harley-Davidson had a strong presence in the form of old hillclimbers, flat trackers and board trackers—as well as a 1973 Indian ME 100 Enduro that has never had gas or oil in it. From the big four Japanese were an offering of Kawasaki Triples and Enduros, Honda CBs of all displacements, Yamahas, from Mini Enduros to DT2s. Mixed in were hand-built customs, sentimental scooters, and bold concept bikes. The Quail is a love fest honoring all aspects of motorcycling.

The unique atmosphere of The Quail is the unsystematic placement of the motorcycles. Although there are specific sections for various brands and disciplines, in general you will find an entertaining randomness to the layout. For example, in one area, a 1970 CB 350 sat alongside a twin-engine Triumph drag bike from the 60s, and next to that was a perfectly restored 1975 Maico. One of only 10 Brittens ever built shared a patch of grass with a showroom clean Penton. 1982 500cc Motocross World Champion Brad Lackey brought out a pristine CZ twin pipe motocross machine from his personal collection, which was alongside regular Quail participant Michael Taggart who was showing a 1957 Springfield Mile-winning BSA flat tracker.

Sprinkled throughout the restored icons of motorcycling are oddball machines, which—much like the Edsel in the automotive world—have achieved a kind of grandeur over the years despite somewhat dubious reception when initially launched. My personal favorite, appropriately rusting around the edges, was a 1955 Maico Typhoon street bike. It all works to remind of the many machines that have been dreamed up and created over the past hundred years. And to think, for each one present, there are hordes that met with demises of neglect and other sad ends. These remaining examples become all the more important not necessarily out of preservation of their mechanical ingenuity, but simply by virtue of still being in existence—each motorcycle, regardless of how homely or strange, having captured the fancy of a collector. As the saying goes; like old buildings and prostitutes, if you stick around long enough you eventually get respect. It begs the question; why does a machine move one person, and not necessarily another?

This year's featured motorcycle was the Norton Commando. They were out in force, with virtually every year and paint scheme (top). Above, a showroom-perfect 1973 Penton 250 Hare Scrambler.

Although the grounds of the Quail have a bevy of immac-

ulately restored machines, looking as if they just rolled out of the factory yesterday, there are always a number of motorcycles that are unashamed to show their age. You can usually count on several well-rusted board trackers and various barn finds placed on the grass, basking in the ravages of time. These machines often attract equal numbers as those attending the pristine restores. The psychology behind this may be that the rusted and tarnished metal is a more pertinent reminder as to the age of the machines, adding to their provenance. In their untouched presentations, these aged beauties exude inexplicable magic.

The concept of collecting—whether you're talking cars, planes, or motorcycles—has historically been impacted by a wave of wealthy individuals who enter the field more out of status-seeking than genuine passion. This has been the criticism of the Concours d'Elegance—held annually right up the road at Pebble Beach—where increasingly the cars that are taking top honors are owned by wealthy individuals who often don't have a true love or history with the cars. In some cases, the owners hire out the duties of acquisition, restoring, and presentation, merely showing up on the day of the event to collect their prize.

The Quail doesn't suffer this disingenuousness. The event attracts truly impassioned aficionados. If an owner is wealthy, there is usually a story about being broke when young and in love with motorcycles that could only be lusted after, and now, finally, there is money to fund this lifelong passion. This heartfelt and authentic interest in motorcycles is reflected in the tacit understanding among the collectors: To be legit, the motorcycle has to run. If a bike isn't capable of being kicked over at The Quail, it's simply because the owner hasn't yet acquired the necessary parts to do so.

Speaking with owners, it is surprising how many not only regularly run these rare treasures, but actually take them for long jaunts. Proof to this was a number of vintage machines proudly displaying their Cannonball Run number plates—indicating their recent participation in the famed cross-country run—testament to the types of demands some owners still put on their cherished works. A good example of the general mindset of the Quail participant is Trevor Franklin, winner of this year's Cycle World Tour Award. Franklin rode his 1980 Suzuki GS1000S from his home in British Columbia to attend, picking up the award with his gem still swathed in the accumulated dirt and grime of the 1,200-mile journey.

Within that mindset of the ardent collector who believes that motorcycles shouldn't be mothballed away behind closed doors, is the approach to restoring that entails no custom machining of missing parts. Many collectors believe that a true restoration must possess all the actual parts of the original bike. This leads to a lot of stories about arduously

A 1936 Moto Guzzi proudly shows its age, unpolished and untouched, as some collectors say it should be, right down to the splitting leather of the seat (inset).

Perhaps the most infamous racing motorcycle of all time, the TZ 750-laden flat tracker, was on display. The bike was ridden and raced just once, by Kenny Roberts, to win the Indy Mile in 1975, and was then immediately retired due to being, "too powerful to ride."

A 1955 Maico Typhoon, left, with just the right amount of rust, bears a fender blimp ornament (inset). Above, this stunning 1957 Mondial 250 Grand Prix racer earned the big prize: Best of Show.

chasing down authentic parts. The internet has helped tremendously, allowing access to a global network of bikes and parts. It seems every collector has a tale about locating a specific piece.

This reminds me of a story collector Guy Webster once told me. He had been restoring a rare Mondial for years, carefully ensuring all replacement parts were authentic. In the end the only thing missing was an original seat. He traveled to Italy to attend a major annual swap meet for vintage motorcycles and stumbled upon an old Italian man who, sure enough, had an original seat. When Guy inquired as to how much he wanted for it, the old guy answered; the amount in Lire equivalent to about $100. Guy immediately countered with $75. Guy laughed and said, "What was I thinking? The trip to Italy was costing me a fortune, but I automatically switched into haggle mode."

One bike in particular that was receiving a good amount of attention was an untouched 1936 Moto Guzzi, its leather saddle split with age. One collector admiring the severely weathered bike said he admired that the accumulation of years wasn't hidden away beneath fresh paint. It grants the machines a rarefied badge of honor, reminding us of the many stories these motorcycles hold deep in their metal. Ultimately it's personal choice as to whether someone prefers to leave a motorcycle to its slow decay of years or restore them to pristine show quality. But virtually all the collectors and presenters I spoke with said vintage motorcycles should be ridden.

In addition to the sensory overload of brilliant motorcycles being showcased on the Quail's grass, the event honors individuals who have had a significant influence on the sport of motorcycling. This year's Legend of the Sport honoree was three-time MotoGP World Champion Kenny "The King" Roberts. Roberts was joined on-stage by three-time MotoGP World Champion Wayne Rainey and legend Mert Lawwill (of "On Any Sunday" fame) to talk about The King's near mythical racing career. Roberts' personal contribution to the event was one of his 500cc championship-winning Yamahas and the infamous TZ750 flat tracker.

The TZ was built by Kel Carruthers with a road race engine to challenge the all-conquering Harleys, and the fire-breathing, irascible beast was raced once—to a victory at the Indy Mile in 1975.

After the upset win, Roberts reportedly said, "Yamaha doesn't pay me enough to ride this thing."

As the day wore on, the gray skies, which had been threatening rain, cleared and the sun came out as the awards were presented. The parade of winning motorcycles taking to the stage grants spectators one last view of the machines in full regalia of thumping and turning internals. Most prominent was when the Britten (the tenth and final Britten ever built, which won the Significance in Racing trophy) was fired up and ridden onto the stage.

The Quail Motorcycle Gathering has earned a rarefied place in motorcycle shows. The class and sophistication of the event's location, the level of quality in its choice of machines, and the pleasant and accommodating atmosphere has elevated it to a unique position. The only critique of note is that the event is over much too soon. MCN

YOU, THE MECHANIC

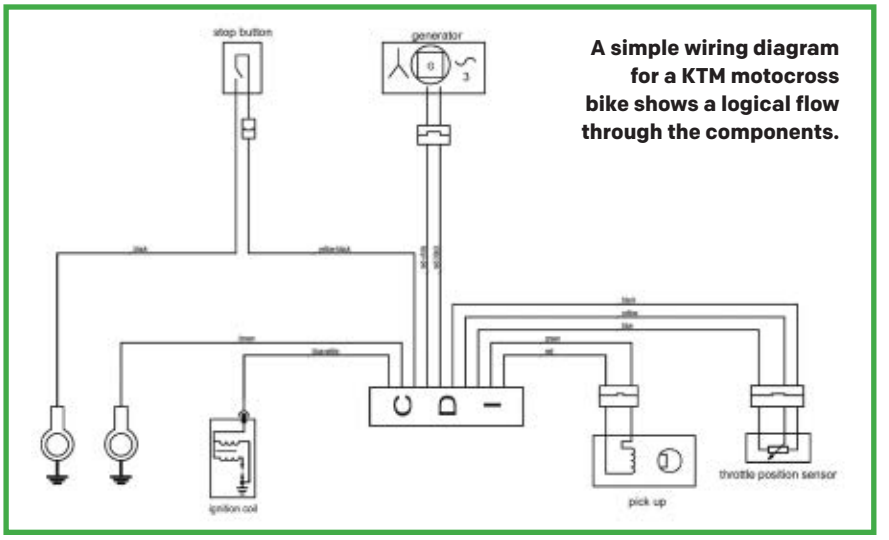
TROUBLESHOOTING IS ALL ABOUT UNDERSTANDING THE SYSTEM AND METHODICALLY FOLLOWING THE CHAIN OF COMPONENTS

> By **Kevin O'Shaughnessy**

Recently, a reader requested an explanation of how to troubleshoot motorcycle problems for the DIYer. That's a tall order. After 25 years of fixing bikes, I have an experience base to know where to start with a few simple checks. But this doesn't help the guy working in the garage on his own bike, who normally grinds a 9-5 desk job.

To gain some perspective, I teach students and instructors troubleshooting methods at the Motorcycle Mechanics Institute in Phoenix and Orlando. Before I train students troubleshooting in factory elective courses, they have already been through 36 weeks, five hours a day, of core training. Instructors have 5-40 years of shop experience and potentially hundreds of hours of factory training. Even the instructors are occasionally stumped by problems. Troubleshooting woes aren't limited to motorsports. I've paid thousands of dollars to have my wife's car fixed, only to find out they were misdiagnosing the problem and charging me to replace perfectly good parts at a well-known automotive dealership.

While I can't give you the thousand words, that represent the thousand pictures in my mind of thousands of experiences, I can give you basic tools to start the learning process and gain your own encyclopedia of troubleshooting knowledge. The process requires research of the systems, but over time, most can learn to be effective troubleshooters. The key is to use a systematic approach. Categorize the systems, isolate the problem and bypass or verify the problem.



A simple wiring diagram for a KTM motocross bike shows a logical flow through the components.

CATEGORIZING SYSTEMS

Machines and devices can be categorized by systems. A desk lamp could be broken down into wire-harness, frame and bulb. A motorcycle is more complicated, with chassis, engine, ignition, charging and fuel systems. Each system has sub-categories.

A charging system has a stator, regulator-rectifier and battery. By categorizing the components or system, we can better isolate the problem, which is the second step to troubleshooting. As we determine which major system is the problem, we can then subcategorize and narrow down the results to more isolated locations until we find the source.

ISOLATING PROBLEMS

Let's say the desk lamp light won't turn on. Being a simple system, most of the issues can be checked through audial or visual inspections. I look down to see if the lamp is plugged in. It is, so I check the switch. It's in the on position and makes a click when turned off and on. I don't want to pull out the volt meter to check yet so I move onto checking the bulb. It is frosted and I can't see inside, so I gently shake the bulb and hear rattling inside. I assume the filament is damaged. Why didn't I check the switch? Financial investment and experience. Time is money and it's a waste of time checking things that aren't broken. I can check the bulb much quicker than testing the switch. Experience tells me that most of the time the bulb is the weak link.

While more complicated, vehicles can be checked similarly. If, for instance, the bike doesn't start, but it cranks, I could assume I have power, but it may not be enough. After checking the battery with a volt meter, I find 13 VDC, which is plenty. It drops down to 12 VDC when turning over, indicating a strong battery. Since the bike turns over, I know the starting system works. I tested a well-charged battery, so I know the charging system works. This tells me I need to isolate further checks to the engine, ignition and fuel systems.

Of course, this requires an under-

KTM SPORTMOTORCYCLE

A simple flow chart such as this one can be useful in organizing your search for whatever component may be causing a problem.

standing of power flow. Engines have a linear power flow from piston to rod, to crank, to primary gear, to clutch to transmission-input to transmission-output. Electrical is always a loop that starts at a power source and typically has a fuse, switch, load and flows back to the power source to complete the circuit. Fuel starts at a fuel cell, and is pumped or gravity fed through a fuel line to the carburetor or injector system to deliver fuel and air to the engine. Each of these systems has a flow direction from one point to another. If we find out at which point the flow stops, we find the problem or a symptom of it.

Most service manuals use flow charts to help technicians walk through the flow in order to find the root problem. To minimize time investment, I start checks somewhere in the middle of the flowchart when possible. It's called "Divide and Conquer." If the components are good up to this point, then I know the issue is further in the flow. If the mid-point is not working, I know the problem is somewhere before. This will isolate where the problem is located and cuts my diagnostic time in half when the problem exists at the end of the circuit.

One of the things you can do to help yourself understand a system is make your own flow chart. Identify the parts and flow of power then write them down in a flow chart with arrows indicating direction of power flow. In electrical training, we call these block diagrams, but it could be used just as well with mechanical items. Once you get more familiar with the system, the block diagram becomes less important for understanding, but is nice for writing notes as you take steps to diagnose the problem. Power train flowcharts are simple. Wire diagrams can be very complex with multiple pathways to check. Even the experienced technician can get lost in the weeds when troubleshooting electrical systems. They may create simplified block diagrams to keep them on track.

BYPASSING OR VERIFYING THE PROBLEM

Once I've isolated the problem, I take steps to verify. If I have a "known good part", I can install it and see if it works. But if there was another problem that caused the component to fail, I may be turning a "known good part" into another failed part. I prefer to bypass the component or circuit to test the source.

If my clutch cable was binding internally, I would feel excessive resistance at the lever. I disconnect the cable and the lever feels fine. Next, I would disconnect the cable from the clutch disengagement mechanism and try the cable by itself. This is one way of bypassing the circuit and checking the component.

The inverse of this is bypass the component. If I believe an electrical switch is preventing a light from turning on, I simply bypass the switch by connecting power across the switch with a wire. If the light turns on then it reinforces that the switch was the problem.

SYSTEMATICAL APPROACH

When working on bikes and ATV's I start by separating the machine into mechanical, electrical and fuel components. Then I go about checking each one with simple tests that operate functions of the vehicle. If the electrical is in question, I turn on the key and see if the lights turn on. I try turning the starter motor as well. I turn on the key and listen for electronic servo motors actuating throttle bodies and fuel pumps whining. I check battery power with the key off, on and running.

Mechanically, I'll check the feel of brake and clutch levers. I roll the bike back and forth in gear with the clutch disengaged. Then do the same in neutral and each gear but with the clutch engaged. I compress the suspension and feel for smooth operation and noises.

For fuel, I'll try starting the bike and listening to how it's running. Is it backfiring/misfiring or running hot, (lean)? Is it running cold, blubbering or eight-stroking (rich)? I'll open the gas tank and listen for air escaping or sucking-in, which could indicate hydraulic lock or venting problems. On fuel pumps, I'd check fuel volume over time and fuel pressure indicating proper volume and flow. Each of these simple checks take seconds or minutes, but answers multitudes of questions.

Experience will tell you what to check and how to check it. Your solutions will come quicker as you expand your knowledge base. I didn't get formal training when I went into this field. I picked up a service manual and just did what it said. Lo and behold, most of the time it worked. You know what I found when reading manuals from different manufacturers? Just about every manufacturer followed the same principle: Use a systematical approach, categorize the systems, isolate the problem and verify the problem. I don't consider myself a rocket scientist and I struggled with many concepts along the way. Perseverance was my friend. If I can do it, I think most people could do the same. If you don't have the time or patience to learn these techniques then you can always support the cause by having your local dealer help you out. MCN

YES, WE CAN (BUT SHOULD WE?)

French innovation? A Maserati-engined one-off from French tuner Ludicrous Lazareth was almost a dead copy of the Dodge Tomahawk—and just as useless.

POWERING BIKES WITH CAR ENGINES AND VICE VERSA, CAN PRODUCE SOME SHOCKING RESULTS

> By **Glynn Kerr**

Motorcycle and car engines each have very different roles to play. Being lighter, and typically more performance-oriented, bikes can focus on high-end horsepower, while cars, with many times the weight penalty, have to first address low-end torque. Not that there aren't some peaky cars, and grunty motorcycles, but everything is relative. For the most-part, these are two different games, and there are two sets of rules.

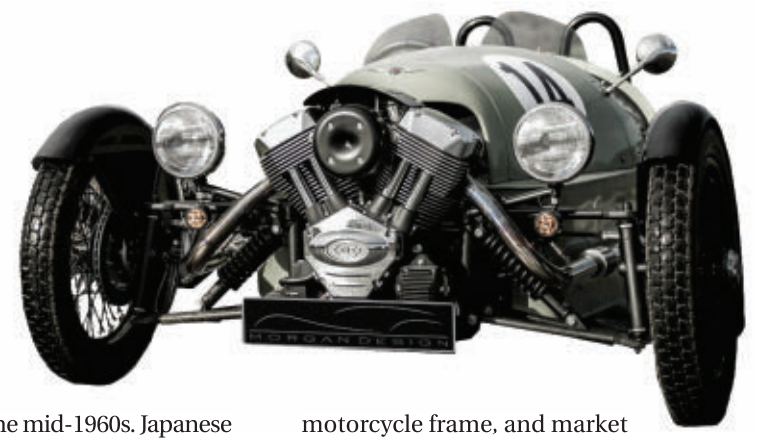
That said, there have been several applications where higher-revving motorcycle technology has benefited the four-wheel world. Yamaha has engineered, and sometimes even built, high performance engines for Toyota and Lexus models, starting with the 2000 GT in 1967 (James Bond famously drove a one-off convertible in the film "You Only Live Twice", and even the regular coupes now fetch well in excess of $1 million). The Lexus ISF, Toyota Celica and MR2 are more common examples. In addition to enjoying a long-running cooperation with Toyota, Yamaha has also helped develop engines for Ford and Volvo.

Over in Europe, the famous Moto Guzzi V-twin was first developed as a more powerful upgrade for the Fiat 500. It was only when the project was ultimately rejected by Fiat that the company decided to build a motorcycle around it. The result formed the origin of every Moto Guzzi model produced today.

There have been numerous examples of car companies utilizing existing motorcycle engines, either for economy or performance reasons, although in either case, lightness of weight has been essential due to the aforementioned lack of torque. The absence of a reverse gear is a further down-side.

On frugality grounds, three- or four-wheelers, such as the British Bond, used singles—in Bond's case, initially a 122cc Villiers 2-stroke in 1949. Performance must have been notable by its absence. The company got around the reverse gear issue by using a solenoid switch which would spin the starter, and therefore the engine, in either direction. Sometimes thrift helps encourage genius.

The Italian manufacturer Iso used a version of its 2-stroke motorcycle engine in its Isetta 'Bubble Car' of 1953, with BMW transplanting its own 250cc 4-stroke from the R25/3 when it took up licensed production two years later. Its subsequent 600 and 700 models used boxer twins, also straight from its motorcycle division. Post-war austerity was the main motivating force behind these diminutive vehicles, although other benefits included different



Morgan boldly mounted a S&S V-twin engine at the front of its redesigned three-wheeler, fully exposed to the elements, as well as to considerable scrutiny.

taxation and driver's license categories. In many cases, these cars could be driven on a motorcycle license, although as with taxation groups, the rules varied from country to country.

Berkeley and Fairthorpe mixed the economical attributes with a more spirited performance, but that was still relative by today's standards. Proprietary engines included Anzani, Excelsior, BSA and Royal Enfield. In addition, there was the famous Morgan three-wheeler. While the others tucked the engine away under the bodywork to deliberately hide their motorcycle ancestry, the Morgan proudly stuck it right up front, and out in the open for all to see, and a glorious sight it was, too. Whether J.A.P. or Matchless, the big, long-stroke V-twins, with their polished heads, were the focal point of the whole design. Later replicas have used Moto Guzzi and Harley-Davidson power, and Morgan itself recently reintroduced the model with a 1983cc S&S unit. Weight is around 550kg (1,213 lbs.), and the company gives a 0-60mph time of 4.5 seconds (0-100 km/h in 4.7 seconds). Other recent, more performance-oriented models include the Suzuki-engined Westfield Megabusa and the Kawasaki ZX6R-powered Scorpion P6, plus the Campagna T-Rex, which uses BMW's 1.6 liter, 6-cylinder unit.

By contrast, the situation has occasionally been reversed, and people—even some corporations—decided it would be a smart move to install a car engine into a motorcycle.

It may be understandable that Boss Hoss just went for it, and decided to build the most outrageous motorcycle you could buy. With Chevrolet 5.7 liter (350 cu.in.) or 8.2 liter (502 cu.in.) V8s, there's little that can overshadow it—unless you count the MTT Y2K, which got its power from a helicopter-sourced gas turbine. The Boss Hoss is big, brash, and loud, in a way that could only come out of America. It's an unapologetic statement of excess. Just don't drop one in the parking lot, unless there's a team of Sumo wrestlers around to help you pick it up.

The Boss Hoss was an exaggeration of Friedel Munch's 'Mammut' (Mammoth) concept from the mid-1960s. Japanese multis were still several years off, so lacking a suitable source to power his beast, he turned to the NSU TT to upstage the competition. The TT had already proven itself in road racing and rallies, so the 1-liter, 55hp, air-cooled transverse 4 was a fairly logical fit. Later developments used NSU's larger TTS motor, and in the Mammut's final fuel-injected 1200 TTS-E form, it produced a healthy 100hp. No wheelbase was ever quoted, but the bike's proportions looked correct in the length, although rather tall. This was due in part to the tall, near-vertical engine, and the 34-liter (9-gallon) fuel tank. Performance was strong, with a quoted 0-60 mph time of around 4.0 seconds (0-100 km/h in 4.2 seconds), although at a quoted 245 kg (540 lbs.) dry, the bike was no lightweight. Munch's last design was the Mammut 2000. True to form, he used a car engine once again, this time a turbo-charged 2-liter Ford Cosworth producing 260hp. 15 units were believed to have been built by the time the re-launched company finally closed its doors.

Continuing the bigger-is-better theme, the Dodge Tomahawk featured a 8-liter, V10 engine lifted from the Dodge Viper. Despite claims that it would be produced in limited numbers, it remained a design study, possibly due to the fact that the paired wheels, which supposedly negated the need to lean through bends, seemed highly unlikely to actually work at speed. This didn't stop French tuner Ludovic Lazareth from creating an almost identical concept using a 454 hp Maserati V8 engine several years later. Sometimes, "Because I can" is not a sufficient answer to the question "Why?"

While we're questioning French sanity, BFG felt it would be entirely logical to wedge a Citroen GSA engine into a motorcycle frame, and market it as a homespun alternative to BMW. The company, whose name was derived from the initials of the three founders, Louis Boccardo, Dominique Favario and Thierry Grange, actually produced 400 of the machines from 1982-1983, before the company was taken over by MBK (later a Yamaha subsidiary). Sales then declined.

Despite the Citroen engine, the rolling chassis of the BFG looked surprisingly convincing, if a little long. Wheelbase was 63.4 inches, compared with 57.7 inches on the BMW R100RT or even 60.8 inches for the Honda Gold Wing GL1000. But the engine, a 4-cylinder water-cooled boxer similar in layout to the Gold Wing, didn't look out of place. It produced 70hp, which was quite respectable for a tourer of the time, and could propel the 267 kg (589 lb., dry) device to a quoted 190 km/h (118mph). Guzzi Le Mans alloy wheels, and Ducati 900SS-esque silencers helped complete the picture. But then awkward French styling (the BFG was one of the contenders for my first "World's Ugliest Bike" award), plus the headlight and instruments from a Renault 5, doomed the bike to failure.

Boccardo went on to create another motorcycle, known as the MF (which I guess doesn't have the same connotation in French), which had a 2-cylinder engine from the Citroen Visa. There was even one with a Peugeot diesel, but not surprisingly, that venture failed too.

There may be some arguments for interchanging engines between cars and motorcycles, but generally they are each designed for a specific purpose, and swapping them around brings inherent issues. It's a matter of horses for courses. And no, I'm not referring to the menu in a French restaurant. MCN

A Henderson Straight 4 in beautiful condition was one of the star attractions at a national AMCA meet in Oley, Pennsylvania.

STILL KICKIN'

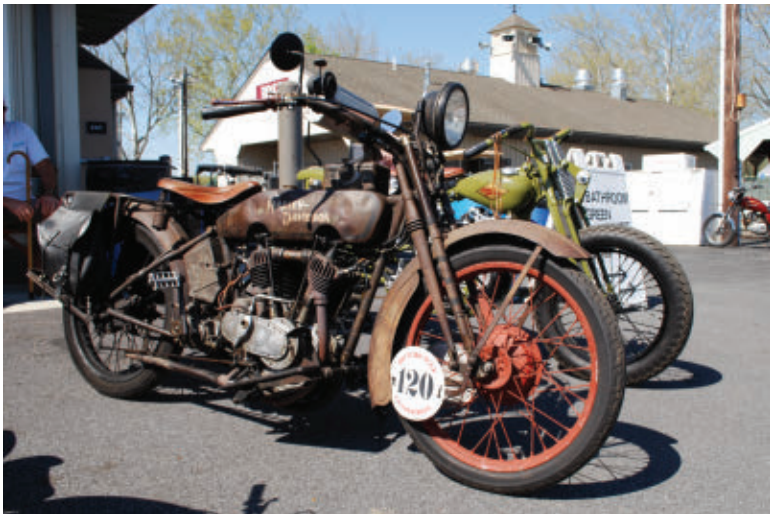
Antique Motorcycle Club of America celebrates the vintage, nationwide, worldwide

> Text and Photos by **Jeremy Willard**

There is something magical about the visceral experience of a richly fueled vintage motorcycle engine popping to life. The puff of smoke and momentary erratic exhaust note that tells the story of pistons, valves, fuel, spark and air struggling to find their timing to unify into a dance of reciprocal motion. The uncertainty of the whole affair, as the rider kicks downward (or pedals), provides a level of drama that seems directly proportional to the number of bystanders. Will it light? Unlike modern machinery, it is the inherent imperfection of old motorcycles that gives them an almost organic aura.

While I am a big fan of the many wonderful museums dedicated to preserving the ghosts of motorcycling past, the one drawback is that the subjects are typically presented in a static form. Much like the difference between going to a museum of natural science to see inanimate, stuffed/mounted animals versus seeing the same animal actually living in its natural habitat, observing old motorcycles in the "wild" allows for an additional layer of appreciation that engages all of the senses. But where do you go to observe such rarities? Keeping with the analogy, if you merely sit on the curb and hope, you have about the same odds of seeing a 1920 Reading Standard happen by as you do a blackpoll warbler, with perhaps a slightly better chance of seeing the bird.

Luckily, there are organizations that serve to connect the



A 1920s Cleveland with sidecar, (left photo) and a 1916 Harley-Davidson, in original condition, that participated in the 2016 Cannonball Run both basked in the Pennsylvania sunshine and brought joy to vintage motorcycle enthusiasts at a recent show.

owners and fans of these rare machines, through newsletters, websites and meets. One such organization was founded 63 years ago by a group of enthusiasts from New England. It is known today as the Antique Motorcycle Club of America (AMCA)(antiquemotorcycle.org).

The AMCA has 75 local chapters throughout the U.S., Australia, Canada, Italy and the United Kingdom. At its core, the AMCA focuses on the preservation, restoration and operation of motorcycles that are at least 35 years old.

I was fortunate to attend a national AMCA meet in Oley, Pennsylvania, a rural town one and a half hours Northwest of Philadelphia. The two-day event was well attended, especially given that I was there on a Friday. The event leaned heavily toward old American iron, but there was also a smattering of Japanese, British and Italian bikes, too. As can be expected, vintage Harley-Davidsons and Indians were the most well-represented marques. That said, the sheer number of rarities was almost overwhelming. At any given time, you would hear, then see, something interesting rumble by. I saw several stunning, straight-four Hendersons, a personal favorite. Another bike that left me spellbound was mid- to later 1920s Cleveland Four with a sidecar. Beautiful!

There were also a large number of bikes that participated in the Cannonball (motorcyclecannonball.com), an annual coast-to-coast vintage endurance ride in which bikes are typically required to be at least 100 years old. Needless to say, a large number of the machines at the AMCA meet were far from trailer queens, which brings up another perk of attending an AMCA event: The owners of the bikes being shown are accessible and always happy to answer questions, tell stories and explain how something works.

In addition to the showcase of vintage motorcycles, there was also a huge swap meet, equally interesting. Much of what was being sold focused on vintage American, but there was a fair representation of parts for other brands too. It was really fun to poke around looking at the bits and bobs from all eras. If you happened to be looking for that hard-to-find part, I'd wager that it was here. There were also bikes for sale in various states of completeness, from "barn fresh" to factory new, and everything in between.

Attending the AMCA National Meet in Oley was the perfect way to spend a sunny Friday. I met lots of great people and got to see several museums worth of bikes. Many of these historic treasures were called upon, with all of their inherent imperfections, to fire up when kicked.

To our delight, most did. MCN

A variety of old carburetors and heads (left) are ready for sale, as are a few rusty bikes (right), waiting for a new owner to get them back on the road.

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

Worth It

WHEN I BOUGHT my first (and only) Porsche, I was sorely afraid. I worried I'd soon discover I had terminal cancer, my house would burn down, or another major calamity would befall me. Then I'd have to deal with not only that disaster, but also my shame and self-loathing for having foolishly spent so much money on something so utterly unnecessary—money I should have saved for real needs.

Those anxieties were eventually put to rest by a friend who insisted that, if life as I'd known it really were to come to a grisly end in the near future, I should instead congratulate and thank myself for having seized the opportunity, however brief, to enjoy that magnificent car on a daily basis. I could argue against his reasoning, but I decided not to; his logic was just as compelling as mine, and it allowed a helluva lot more fun.

I've had similar misgivings when buying motorcycles. Such pangs were never as severe as what I felt early in my short stint as a Porsche owner, partly because bike purchases never involved as large a lump sum (although collectively they've cost me far more). I've also considered motorcycles obvious necessities, not frivolous luxuries. I've gone through several periods wherein I suffered with an old jalopy of a four-wheeler in order to afford a fine bike. But I have, in more recent years, deliberately recited my friend's counsel when surveying my garage full of motorcycles, wondering how differently I'd view them if catastrophe struck.

I don't have to wonder any more.

BY THE TIME you read this, I will have already undergone surgery to remove a brain tumor. In addition to the horror of having my head opened up, I will no doubt face a mountain of medical expenses rejected by my insurer on the basis of inscrutable technicalities in my policy's fine print; certainly, I won't win all the ensuing debates. I'll also be out of work for at least six weeks, assuming everything goes very, very well. Guess how much paid sick leave a psychologist in private practice gets. And said private practice may not be waiting for me in the same shape when I get back. There's also the real, albeit slim, possibility I won't be in the same shape to return to it after having my frontal lobes rearranged during the operation; it would take very little damage to force a career change.

SO, THIS IS the perfect time for me to fret about all the money I've "wasted" on motorcycles, modifications, accessories, gear, racing events, track days, tours, etc., over the past four-plus decades. What I wouldn't give for a fatter financial cushion while staring down all these expenses and uncertainties! Actually, what I wouldn't give is the aforementioned motorcycle stuff. Now that I'm finally contending with a real, live disaster—one that might have provoked vicious self-reproach about squandering my resources on motorcycling—I feel no such regret.

I'm content with the sacrifices made to experience the joys of riding and wrenching and joining the ranks of like-minded enthusiasts. Even if there were some way to trade all that for greater security now, I wouldn't even consider it. I'll just have to make do going forward, really no different than riding into any other unfamiliar territory. The trip is already under way, the machinery has been prepped, the gear selected and plans made, to the extent possible. I'm not advocating anyone court financial ruin by spending all their money on motorcycling. But I am saying that expenditures many would consider unwise (or even irresponsible) can feel nonetheless worthwhile, even when the value of greater prudence seems indisputable.

MY WRITING WON'T appear here for at least several months. Once I have recovered, I'll have to assess what I'm able to do and what risks I'm willing to take. Even if I'm fully functional afterward, it may be a while before I'm ready to shake my cranium on a rocky trail or tolerate the possibility of smacking my (helmeted) head against asphalt. Don't get me wrong—I won't sell a single bike beforehand, and I expect to ride each one again, eventually. But I definitely don't want to end my motorcycling days forever by climbing back in the saddle prematurely.

I also don't want to write for MCN from the sidelines. But once I'm fit for duty as a rider and full of fresh inspiration from returning to action, I hope to contribute again to this uniquely wonderful publication. In the meantime, I am profoundly grateful for this special place where I could talk with you and share our common passion. Of all the many aspects of my motorcycling life I cherish, this one has been especially dear. MCN

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

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> By **Flash Gordon, M.D.**

In Search of a Happy Ending

COMIC ACTOR HARRY Shearer states, "It's a movement. And we all need one, every day!" My pedantic self says, "Though daily bowel movements are common, some folks go four times a day; others (uncommonly), once a week."

Frequency isn't particularly important, but an unexplained change can be a red flag for something serious. Here are some common conditions that'll change your "bowel habits" and ways to treat or prevent problems.

Your gut is a nutrition-processing system. Food and liquids enter, unwanted leftovers exit. Interestingly, most of what we poop is not left over, undigested or non-absorbable food. The majority are live germs that live in our colon, aka "large intestine." That's the last six feet or so, starting on the lower right, near the appendix, going up, across from right to left, then down and (hopefully) out. Those helpful bacteria process some vitamins, ferment fiber for energy and even help regulate what our bodies do. They can influence whether we're fat or slim. Some gut germs even affect behavior! The sheer number of them is astonishing. A single bowel movement has between a one trillion and one quadrillion germs, or about 25-times the number of all the people on earth.

One job of the colon is to absorb water back from the gut contents. As thin liquid is dumped into the colon, it is the colon's job to dry this liquid out to just the right consistency. If it's not dry enough, you get diarrhea; too dry and hard, and you're constipated. Even worse, getting constipated can prevent the colon from drying a stool adequately, leading to what's called "constipation overflow diarrhea." If you have ever been riding out in the middle of nowhere and were in dire need of "relief," you'll understand the need for an ounce of prevention.

TRAVELING HAS MAJOR effects on stool dryness. One difference is diet: at home, we're more likely to have veggies, salads and other fiber, which feed the gut germs. Taking fiber supplements (I like liquid-soluble Benefiber) feeds germs, too, and is a good preventive for a suboptimal diet. More germs equal more gut contents, which means a stool keeps moving and doesn't get too dry and hard. On the road, we may eat more junk food, which doesn't feed our gut germs. Fewer germs equal less gut contents, slower passage, and more chance of it drying out. Also, being active keeps things moving. Sitting on our butts all day lets the colon get clogged. Hot, dry weather dries out our whole body, which then takes more fluid out of the colon. And if we're trying to get an early start, skipping a morning movement leaves the poop in our colon to dry.

Dry and hard is what matters. In the heat, drink enough to fill your bladder in less than four hours, and be sure the urine's not darker than usual. Remember, you can't tell if you're sweating when it's really hot and dry; only salt accumulates on the skin, as the sweat evaporates so fast.

IT'S NOT ENOUGH to put extra water into your system; it needs to stay in your gut. If you sometimes get constipated, a "gut moisturizer" like docusate/Colace helps. It's over-the-counter (OTC), and taking from 100mg to 300mg daily keeps stool soft. Once you're constipated, you'll need PEG 3350 powder (Miralax, OTC). My patients taking narcotic therapy for cancer and other pain use it daily. Not only is it one of the best preventive measures against severe constipation, but also the best treatment I know of. Even if somebody hasn't pooped for a week, they'll typically be back to their basic schedule in a few days. For morning relief, milk of magnesia, followed by a glass of water, is often enough.

I mentioned narcotics as a particular problem for constipation (Imodium & Lomotil, used for diarrhea, have the same effect), but many other OTC products can contribute to constipation concerns. If a medication makes your mouth dry, for example, it's likely drying your stool. OTC antacid pills like Pepcid (famotidine) and Zantac (ranitidine) may do it, as can many allergy medications. Ask the pharmacist if a medication is "anticholinergic," as they tend to constipate. The mnemonic "anti-colon-urge" can help you remember this.

The takeaway message in understanding normal colon function is that we need fiber to feed the bacteria, and moisture to make it malleable and movable. When you've got an adequate amount of bulk and moisture, a bowel movement will happen.

And that's the straight poop. MCN

Dr. Flash Gordon is a primary care physician, author of *Blood, Sweat & Gears,* and former director of Haight-Ashbury Free Clinic..

YOUR RIGHTS > By **Jim Halvorsen**

After the Stop: Police Science, Strategy

THE OFFICER RETURNS your documents to you and says, "Have a nice day." I always hated that. A nice day? Really, after handing you a $105 summons? Traffic enforcement is as much about educating the public as it is public relations. I sugar-coated tickets as best I could with this standard speech:

"Mr. Biker, I stopped you for a non-compliant helmet, 72 mph in a 55 mph zone, and a loud exhaust. You're being cited for only the helmet. It carries an $85 fine but there won't be points on your license and it's not deemed a moving violation, so you shouldn't suffer from your insurance company raising your rates. Still, I don't expect you to be happy about it. If you were, I'd probably think there was something wrong with you. Please drive carefully." Of course, this is a condensed version, but the point is he knows I could have really loaded up the fines but chose the opportunity to educate him about other violations. He rode away saving face. Remarkably his last words to me were usually, "Thank you."

WHETHER YOU ARE pulling away with a warning or a citation, you may be you're asking yourself, "Why me? With all the other vehicles on the road, why me?" Dismissing pure chance as a factor, the simple truth is there was a violation of law. But there are violations everywhere, so assuming you're not law enforcement's poster child (see last month's issue), why were you selected? There could be any number of reasons.

But, as I stated in Part 1, I sought out operators with multiple violations, though sometimes one is serious enough and right in front of me, and it warrants additional investigation. How many times have you been driving, observe a flagrant violation and wonder why the cop nearby didn't do anything about it. I know, "They're never around when you need one… then, when they are, they're lazy."

WE ADDRESSED TRAFFIC problems in a number of ways. The old-fashioned way still works. This is where the officer knows his/her patrol area: where the traffic issues are, the complaints, crashes and common violations can be found. Pin maps of problem areas can still be found in many police departments. These indicate the hot spots of activity where enforcement efforts may need to be stepped up. Any officer new to the area can use this as a guide to targeting enforcement efforts. New software and hardware allow law enforcement to issue citations and crash reports right from a printer inside the patrol car. The aggregate data allow police managers to look at specific kinds of crashes on specific dates, times and locations. Such data, coupled with reports detailing where tickets are being written and when, give police supervisors insight into managing countermeasures.

For instance, a printout might show a large number of speed-related crashes near a sharp turn two miles from a high school on weekdays. A layer of geo-spatial data could be superimposed, showing speed enforcement efforts are out on the interstate, where far fewer crashes occur. Officers can thus be reassigned to target a specific problem at an appropriate time and location. We now put the resources where the problems occur—it's called targeted enforcement, and it works. It's done for commercial vehicles, cars and yes, even motorcycles.

WHICH BRINGS US back to your recent stop. You could have been part of this targeted enforcement. Even if not, enforcement is about keeping the roads safe. From my experience, it's got very little to do with lining the municipality's pockets. In fact, some courts will allow pleas to lesser municipal offenses that generate lower fines with no points. The fines from those pleas may remain with the local jurisdiction and not have to be forwarded to the county or state.

Remaining polite and cordial brings huge benefits both at the scene and later in court. Most courts avoid trials, if possible. Plea bargains may be offered in lieu of trials. When the encounter was amicable, outcomes are generally more beneficial.

FROM MY EXPERIENCE, most officers are far more congenial outside the traffic stop environment—a generally dangerous place at which officers do not want to be any longer than they have to be. More officers are injured or killed by traffic crashes than by being assaulted by violators. The less time they spend on the shoulder of the road, the better.

In court, the officer may have your traffic record. Depending on what it says, the officer may be willing to "negotiate." Or, the officer may not be there at all. Instead, a state's attorney or some other form of prosecutor may be available for some plea-bargaining. Trials tie up the courts, however, if you feel you've been wrongly accused then you'll have to decide whether the plea is better than the potential outcome of a trial.

Of course, if you're passing through Dodge City, Kansas, and you're from New York, you'll probably just mail in the fine. Not that I would know… MCN

Jim Halvorsen is a retired police officer, MSF RiderCoach, police motor instructor and architect of motorcycle checkpoints.

> By **Russell Evans**

HIGH SIDES

Nostalgia, For Sale

I DON'T KNOW squat about motorcycles. That's the first thing I learned watching the most recently televised Mecum Motorcycle Auction.

Do you think you do? Keep an eye out for the next one of these addictive and humbling and nostalgic and wonderful events on television (it will be in January). Unless you're an aficionado, you will be spellbound, as I am every time I watch one of these parades of polished perfection. They are part history class, part Motorcycle Mechanic 101, part beauty pageant and 100 percent addictive motorcycle porn.

When this show is on, the lawn isn't getting mowed, the trash doesn't get taken out, food is meaningless and family members become these meandering, muffled strangers. And God help them if they want to ask me about the leaking pipe upstairs or discuss the overdue electric bill while I'm glued to the TV, breathlessly waiting to see what the 1967 BSA Spitfire MkIII on the block is gonna go for. I didn't even know BSA had made a Spitfire. I thought that was a Triumph thing. I also learned BSA is Birmingham Small Arms; the company once made guns, dating back to 1630. Imagine that.

Four hundred motorcycles. Each one of them special in some way. The variety is staggering. Vincent Black Shadows. Indian board track racers. Hendersons. War bikes. Peace, love and bell bottoms bikes. Street bikes. Dirt bikes. Bikes that look like bicycles. Bikes that look like kitchen appliances. Bikes from collections. Bikes from barns and garages.

Our guides for this trip down memory lane compose a team of motorcycle nerds dispensing maniacal amounts of mechanical, historical and cultural trivia. Host Scott Hoke dishes to motorcycle gurus extraordinaire John Kraman, Stephen Cox and Paul D'Orleans.

Many of these motorcycles are rare, part of someone's collection. Others, such as classic dirt bikes and muscle bikes, have laid low for years, waiting for the market to make an upswing to the point where some money can be made. Honda CB 750 Fours, for example, which sold for $1,495 brand new in 1969, are now going for $6,000-$8,000, in pristine condition. Did you know many of Hollywood's leading men of the 1960s and 1970s—Steve McQueen, Lee Marvin, Charles Bronson, James Coburn—rode Husqvarnas? Some are for sale.

THE CURRENT MARKET also impacts the auction. Everybody is doing the scrambler redux, hence the Triumph and BSA onslaught. Cafe racers are resurgent as well, so buyers are interested in the real thing. Rise in demand, short supply, prices go up. So, we see a gorgeous 1956 MV Agusta café racer, a dreamy patina coating its 60-year-old scarlet red paint job, as one of the featured items. Cox, our roving reporter, points out the oversized head above the single cylinder, for added cooling. Interesting.

But it is clearly nostalgia that pulls in the biggest segment of the crowd. Heck, the first bike on the screen in the telecast is a 1970 Kawasaki Sidewinder 250. Give the purple and white tank a silver glitter paint job and it looks exactly like the 175 Kawi owned by the ace of our group of enduro-riding families back in 1973. That's it. I'm hooked.

There's a 1964 Honda Benly Touring 150, which has a lot of visual similarities to my dad's first bike, a Honda 65. This one is immaculately restored and looks a lot like it did when it sold for $460 brand new. It hammers for $7,250. Dad's couldn't have been more than $300 when he bought it. If only he still had it… Oh well, I wish I still had a lot of those baseball cards I clipped into the spokes of my bicycle to make it sound like a motorcycle.

There's a 1947 Schwinn-Whizzer, which, if you removed the tank and motor would look like, well, just a Schwinn. It's a motorized bicycle, and the gray-haired bidder must really hate pedaling because he buys it for $3,500.

The next bike I see gives me goosebumps: A 1972 Husqvarna 250 CR. It is the bike I lusted after growing up. And now, here's one at auction. The hammer drops. $2,000. Gasp! I could actually buy one of my dream bikes now.

NEARING THE END of the three-hour broadcast now and a couple of Hondas roll up onto the block, one a XL 350—what we'd call a dual-sport today—the other a TL250 trials bike, both in showroom condition. They are captivating. Seeing such a bike, as it was when brand-new, is an emotional journey, like going back in time. Suddenly, you're 14 years old again. You get that lump in your throat, that deep pounding of your heart, and you realize all those feelings you had about motorcycles way back then are still strong inside you.

I feel this as the final bike of the telecast is wheeled onto the little turntable: a 1980 Yamaha MX 80. There is a strong thread of familiarity between this little gem and the 1972 JT2 Mini-Enduro 60 my younger brother had. It went up in a fire, along with my Yamaha AT2 and my dad's Penton Jackpiner.

What I wouldn't bid to have those bikes now. MCN

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TOTAL CONTROL > By **Lee Parks**

Improvement Begins on Mental Side

IMPROVING YOUR RIDING skills starts between the ears. With all the efforts we spend making our bikes look cool and perform better, a critical part of the riding puzzle gets ignored: It's what my friend, the engineer, likes to call the seat/handlebar interface.

While few would argue the safety benefits of improved riding skills, it's perhaps even more important to have a good handle on what motivates us to do what we do on a bike. In other words, to understand the psychology of riding is one of the best things we can do to improve our odds of arriving in one piece at our favorite destinations. There are three key areas of a rider's mental state: fear, concentration and right attitude.

FEAR

What are you afraid of when riding? Typical responses include falling down, scratching your bike, looking bad in front of your peers, getting hurt, sliding out, etc. While those are all valid fears, interestingly, there is one fundamental fear that underlies all other fears. It is the simple concern that "I can't handle it." Only by acknowledging in verbal language that you can handle the consequences of whatever it is that you are afraid of, will you be in a position to not let the fear control or limit your actions. At that point, the fear will have little power over you as you will "own" it.

You probably remember from biology class that the brain is made up of different parts. The two parts that we are most concerned with are the most primitive part of the brain—the brain stem and cerebellum, or "reptile brain"—and the most advanced part in human beings, the frontal lobes.

Biologists will tell you that the reptile brain concerns itself with the Four "Fs" of survival. They are Feeding, Fleeing, Fighting and, of course, Reproduction. The frontal lobes concern themselves with higher-thinking activities such as imagination, creativity, planning and intuition. The important thing to remember about your brain is that whenever you are utilizing the frontal lobes, you stay out of the reptile brain, which is where fear resides. That is why riding instructors give you one specific thing to work on during each exercise so you can focus on that and not on fear.

Best-selling author and late-night infomercial maven Anthony Robbins talks about exercising your "action muscle." That way, when faced with uncertainty or doubt, you will be in the habit of performing, even in the face of fear. That's why it's important to practice getting outside of your comfort zone while riding. That doesn't mean scaring yourself silly, but getting used to riding in the face of a small amount of fear. If you practice being able to feel some fear and do it anyway, when you find yourself in a really scary situation, you have a much better chance of not freezing up and/or target fixating because you practiced riding with some fear and turned it into a habit.

CONCENTRATION

Motorcycling has often been called the "lazy man's Zen" because there is nothing quite like the fear of death to keep one focused on the moment. Combined with the two-wheeler's constant need for balance, motorcycling forces you to pay attention, which can be both exhilarating and therapeutic at the same time.

Perhaps the best definition for concentration comes from three-time martial arts champion and motorcycle racer Ken Merena. He calls it "relaxed attentiveness." That means being aware of your surroundings without stressing out your body. Not unlike how a fighter must be relaxed in order to throw a punch, the rider must be relaxed to properly execute an input. If your muscles are tense, they must first relax before they can move in a new direction. On a bike, the hesitation required to first relax before executing a new input could mean the difference between a successful maneuver and a crash.

This state of relaxed attentiveness without distractions is what racers and Olympic athletes call "being in the zone." In this state, actions happen without conscious thought. Every adult has experienced this state. For example, I would imagine that in the years you have been walking you have become such a proficient walker that your legs seem to walk themselves.

RIGHT ATTITUDE

In Japanese, shoshin, translates literally as "beginner's mind." This is the attitude of a child during the formative years when the majority of learning takes place. In his landmark book "Zen Mind, Beginner's Mind," Zen Master Shunryu Suzuki states, "In the beginner's mind there are many possibilities, in the experts mind, there are few." Because everyone is to one degree or another an expert in a particular field, it's easy to fall into this trap where you stop learning new things. Because you think you already know a particular subject, you're not really present to what's going on in the moment.

You can therefore define a beginner's mind as one that lives in possibility rather than expectation. In other words, the beginner isn't bound by expectations; he simply stays open to all possibilities and deals with whatever comes his way. With your fear held in check by proper concentration on specific riding practices and the right attitude, you're now ready to work on new skills. MCN

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

Motorcycling in Movies & TV, Part III

IN THE FINAL installment of this series, let's look at how we fared as motorcyclists in the entertainment media as we rolled into the 21st Century:

1970s MOVIES

The Seventies were much kinder to motorcyclists than had been the previous decade. Though a few of the biker-gang exploitation movies were still being made, most of the movies with motorcycles in them were now focused on much softer themes.

> 1970 "CC & Company," starring Joe Namath and Ann-Margret. Yes, friends, Broadway Joe actually made a biker movie, wherein he's a motorcycle mechanic (named "CC Rider," really) who somewhat reluctantly joins a biker gang. But when the gang kidnaps fashion model Ann-Margret, CC turns good guy to rescue her. Not much to see here.

> 1971 "On Any Sunday," a documentary and one of the very few films about motorcycling that had absolutely nothing to do with biker gangs. Nominated for an Academy Award for Best Documentary, it stands virtually unchallenged as the greatest movie about motorcycling ever filmed. Even 46 years later, it's great fun to watch.

> 1973 "Electra-Glide In Blue," starring Robert Blake. A personal favorite, and the movie that started Blake on the road to stardom, it really has little to do with motorcycles other than the fact that Blake plays a Highway Patrol motorcycle cop. Good story and acting, though.

> 1979 "Mad Max," starring Mel Gibson. Not only did "Max" make a star of Gibson, but it created a hugely-successful movie franchise that carries on to this day. How many remember the story of Max begins with him as a cop whose wife and son are killed by a vicious motorcycle gang? Then, it's just Mad Max hunting down and killing all the members of the gang.

1970s TV

> 1977 One of television's longest-running shows (six years) featuring motorcycles prominently in the story line, "CHIPS," starred Larry Wilcox and the timeless heartthrob, Erik Estrada. Our two heroes rode around the scenic byways of Southern California, righting wrongs and solving crimes that no motorcycle cop would ever be involved in. But it was fun, even if you could easily tell that 90 percent of the time they were filmed sitting on their bikes being hauled by a trailer.

1980s MOVIES

The Eighties was a pretty slow decade for motorcycles in both the movies and TV, but bikes still popped up on occasion, even if not in "starring" roles.

> 1985 "Savage Dawn," starring George Kennedy and Karen Black. Kennedy stars as a returning soldier who finds himself caught up in protecting a small Arizona town from takeover by a savage biker gang. Probably the most notable thing about this movie was a quote from Karen Black as the character Rachel, saying, "I can suck-start a Harley." Classic.

1980s TV

> 1985 In an obvious attempt to cash in on the earlier and much more popular "Knight Rider" TV show, "Street Hawk" featured a futuristic combat motorcycle prototype that was supposedly being "tested" by a motorcycle cop who had been disabled in an accident. Capable of speeds in excess of 300 mph and with firepower to match an M1A1 Abrams tank, the Street Hawk bike was pretty awesome. Unfortunately, the stories and acting just weren't.

1990s MOVIES

> 1991 "Harley-Davidson & The Marlboro Man," starring Mickey Rourke and Don Johnson. A somewhat weird combination of biker/cowboy/gangster movies. Great title, so-so film.

> 1991 "Terminator II," starring Arnold Schwarzenegger. Cyborg Arnold riding a stolen Harley Fat Boy was very memorable. The famous scene where he jumps the bike into the concrete Los Angeles River enclosure was actually performed by a stunt man wired to a crane. Robert Patrick's T-1000 rode a Kawasaki KZ1000 Police bike, which was doubled by a lighter Honda XR500 (covered with KZ parts) for stunts. Both bikes are on display at the American Heritage Motorcycle Museum. Edward Furlong rode a Honda XR80, his larger stunt double was on an XR100, for scale.

> 1992 "Beyond The Law," starring Charlie Sheen. Charlie is an undercover cop who infiltrates a "murderous, drug-dealing biker gang" to bring them to justice. Right…..

1990s TV

A very sparse and unassuming decade for motorcycles on TV, featuring:

> 1991 "Time Riders," a four-part British TV series about time-traveling motorcyclists.

> 1996-1999 "Two Fat Ladies," an odd but popular cooking show from Britain that featured two old women traveling about on a sidecar rig, fixing large meals for groups of people.

And I just have to mention that in the iconic "Law & Order" series (1990-2010), ADA Jack McCoy (Sam Waterston) was occasionally seen arriving to work on his BMW motorcycle. It was rarely mentioned in the show that he rode, but at times you could see his leather jacket and helmet hanging in his office. 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**

Future Bike Technology

Although this C0-1 Lotus prototype is not intended as a hybrid, its gorgeous all-enveloping bodywork might have the right style to house a complex hybrid powertrain.

SOMETIME IN THE not-too-distant future, the new motorcycle you just purchased online—without any expensive human interaction—is delivered to your home by a driverless van that automatically unloads its cargo on the street. Notified by a robotic phone call, you eagerly bound down the stairs in anticipation, your approach monitored by sensors that respond to the proximity of your personal cell phone, which has become a kind of de facto passport/credit card/machine interface. At your first touch, a disembodied female voice inside begins to describe the machine's features and controls, waiting after each section to be given an affirmative reply that you understand what you've been told. Although the introductory routine is kind of fun, you already know everything about the motorcycle, and you are eager to go for a ride. But the liability lawyers must be satisfied—some things will never change.

As the windowless truck silently drives away, its rooftop sensors twirling and flashing, you hurriedly finish cinching up your riding suit, completing the process by pressing inflation codes into a touchpad on your wrist. The suit hisses, creating lightweight pneumatic armor under its ballistic fabric that would be the envy of a professional racer in 2017. You feel virtually invulnerable, but at the same time, its strong articulated joints allow your movements to feel easy and unencumbered.

The machine—a state-of-the-art superbike—hasn't changed much in size over the years, but beneath its sharply sculpted bodywork, it could hardly be more different. In the relentless quest for efficiency and pollution reduction, it's no longer powered by what we used to simply call a "motor" but now houses a tightly packed hybrid propulsion system. There's still an internal combustion engine—referred to as the ICE—but it's less than half the displacement of older superbikes'—a twin of just 450cc and very light.

Still a four-stroke, its valve events—lift, duration and timing, are completely independent. There's no mechanical link to the crankshaft—no timing chain, or even camshafts, thanks to Christian von Koenigsegg and FreeValve, which unveiled its breakthrough system in 2016. Almost tiny, FreeValve engines are 20-percent lighter than hard-cam motors and more compact as well.

Its direct fuel injection is derived from the Turbulent Jet Ignition systems created by Mahle for Ferrari's 2016 GP engines, combining the injector with the spark plug in a pre-chamber that facilitates ultra-lean combustion during cruise for a 10 to 20 percent improvement in fuel mileage and 95 percent less NOX emissions.

To develop approximately two-thirds the power of high performance 1000cc naturally aspirated fours, the bike's ICE component is fitted with not one, but two turbochargers—each with a separate function. One turbo, its driveshaft connected to a motor-generator unit (MGU), supercharges the induction system in the usual way, while the other, fitted with a just a generator, continually sends electrical energy to a lightweight electro-mechanical flywheel energy stor-

The World Endurance Championship has been a hotbed of high-performance hybrid technology. Audi had the car to beat from 2000 to 2014, winning the Le Mans 24 Hours 13 times in those years. Its most recent winner was the R18 e-tron quattro. Its ICE was a 4.0-liter, 514 hp V-6 turbocharged diesel and it used a GKN flywheel system for kinetic (braking) energy storage to deliver a combined 1000 hp to all four wheels.

LOTUS ENGINEERING

age device. This delivers torque through a compact continuously variable transmission (CVT) to the ICE's crankshaft, the flywheel slowing when its stored energy is released and then being spun back to full speed during cruise.

FLYWHEEL ENERGY SYSTEMS were frequently employed on such heavy vehicles as trains and buses in the past. The modern configuration, pioneered in racing by Williams Formula One in 2009 for its first KERS-equipped cars (kinetic energy recovery systems), is a compact revelation. Instead of oversized steel wheels spinning at relatively low rpm, the first Williams system used a lightweight rotor said to be less than a foot in diameter and less than eight inches thick, turning at 45,000 rpm.

Think of it as an electro-mechanical battery, the rotor made from a magnetically loaded fiber composite, isolated from the internal stator in a small, tight-fitting case, running in a vacuum and utilizing either air or magnetic bearings to reduce friction and heat to a minimum. As a failsafe, if the unit were to be damaged in an accident, rather than fragging like a grenade, the rotor would burn up on contact with the case. Purchased from Williams and now being commercialized by GKN in England, when fitted to a small production car, the flywheel system and integrated transmission generates 87 hp and up to 1,475 lb.-ft. of torque, weighs just 119 pounds, measures 300mm high and 325mm wide and is said to boost fuel mileage by between 20 and 30 percent.

Unlike batteries, flywheels don't degrade when deeply discharged; they maintain peak performance almost indefinitely and don't create hazardous waste. While a flywheel storage system might seem counter-intuitive on a motorcycle that doesn't need additional gyro stability, your bike's flywheel unit is contained by gimbals to eliminate that issue.

Even with these energy harvesting tricks, a future bike's technology would not be complete without regenerative braking, provided by a motor-generator unit in the front wheel, which, we know, supplies the majority of stopping power on a motorcycle. Referred to as the MGU-K (K for kinetic recovery), this adds both regen and two-wheel drive capability to the picture.

What about that MGU attached to the induction turbocharger? It performs both as an over-boost control, generating electricity when absorbing power that would otherwise be sent to a wastegate, and more importantly, as an under-boost control, to keep the turbo spinning at very high rpm, to eliminate turbo lag and maximize power across the full rpm range.

THE TECHNICAL EXPLANATIONS out of the way, it's time to ride. You plug your cell phone into a cradle between the handlebars, where it functions as an ID card, ignition key, dashboard display, and viewing screen for a back-facing camera, eliminating the need for rear-view mirrors. As the engine starts, you hear the sound of the flywheel spooling up, which takes about a minute to reach full charge speed.

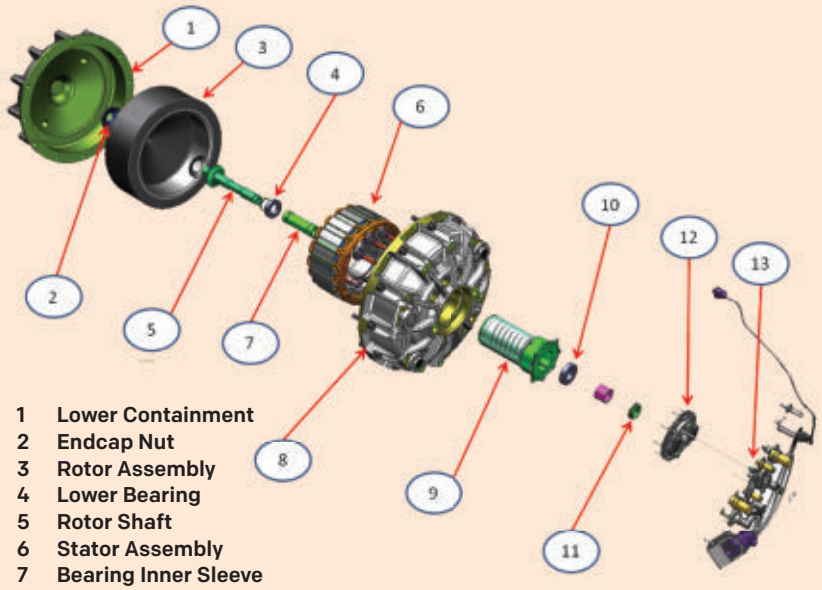
The route to your favorite roads requires about 20 miles of freeway, which is now filled with autonomous vehicles running virtually nose-to-tail across all the lanes but one. Thankfully, your new bike is autonomous certified so you don't need to join the slow-moving traffic in the outside lane. Because you've pre-programmed your freeway route, all you have to do is sit on the seat and wait to be conveyed to your exit.

At last, you're off the controlled highway and ready for fun, hoping you've finally left Big Brother's prying eyes behind. Out on the open road, the combination of the ICE and the flywheel's stored energy is instantly available for dramatic acceleration. The bike is a joy to ride and you revel in its amazing performance. Packing more than 200 hp in its combined hybrid drive train, it averages more than 80 mpg. Its price? Maybe you shouldn't ask.

At the end of the day, you arrive home grinning like a Cheshire cat, only to have your buzz spoiled by a DMV-generated text that reports you've received multiple tickets for speeding. You were so excited to ride, you forgot to hack the state-mandated GPS system that tracks your speeds and routes to determine your road use tax. Aargh! MCN

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

MK4 FLYWHEEL



1 Lower Containment
2 Endcap Nut
3 Rotor Assembly
4 Lower Bearing
5 Rotor Shaft
6 Stator Assembly
7 Bearing Inner Sleeve
8 Upper Containment
9 Bearing Housing Assembly
10 Upper Bearing
11 Clamp Nut Upper Bearing
12 Bearing Housing End Cap
13 FW Sensor Kit

GKN, AUDI, PORSCHE

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Vintage

The Japanese Road King

One of the first motorcycles manufactured in Japan was an American bike. This Rikuo, on display at the Lyon Air Museum in Santa Ana, California, was built in the 1930s under license and name of Harley-Davidson, at Rikuo Motorcycle Company in Hiroshima.

Production of the Rikuo began in 1929. Harley-Davidson was reportedly on the verge of bankruptcy and looked to Japan as a source of revenue as an alternative to paying huge tariffs—as much as 33.3 percent—in the United Kingdom and Australia.

Of course, Japan's attack on Pearl Harbor and the subsequent war in the Pacific changed things a little. But the Rikuo, which means "Road King" continued to be built in Japan with its 74-cubic inch V-twin. The Rikuo had three forward gears and a reverse.

The Rikuo served in the war, with sidecar additions such as the one pictured here, called Type 97. These three-wheelers served in the Phillipines and Manchuria during World War II.

According to sources on Wikipedia, parent company Sankyo sold Rikuo in 1950 to Showa, which still provides parts to Harley-Davidson. The company continued to build Rikuo bikes after the war, until manufacturing stopped in 1959.

RUSSELL EVANS