There isn’t a racer alive that doesn’t want more horsepower and chassis reliability. Motorsports is propelled by operational brutality, but off-road racing is contested in severe environmental conditions that teams must routinely beat down while simultaneously sticking eye-popping power to the ground.

They recognize that no matter how much money is put into a racing program something is bound to go wrong, which means off-road parts are being manufactured for ever-more extreme levels of durability. This has long been true for tires and shock absorbers, although lighting and, even more recently, tracking and communications have joined the list of late.

“The shock technology over the past decade is probably the most significant factor in traction control and handling,” offered Bob Hummel of Race Ready Products, Chula Vista, California. “Tire companies have developed new compounds and offer sizes up to a staggering 42 inches tall, but now the latest trend in off-road equipment is lighting.”

High Intensity Discharge (HID) light bulbs have become increasingly outdated. Today, the Light Emitting Diode (LED) 50-watt bulbs offer multiple patterns that can be programmed to flash, strobe and more. “It seems that every light company is introducing new product in the LED market,” said Hummel. “The lights are smaller and brighter, more reliable, and utilize less power to operate.”

Jeff Furrier of UPR Racing Supply in Tucson, Arizona, has noticed a battle building among tire manufacturers for market share, because durability testing sells retail tires to the recreational user. Being able to claim “race-proven” is a pedigree sales tool. “BF Goodrich has always been the staple because it is a great product,” he observed. “It says a lot when teams will pay for a BFG tire when they could get free ones from other manufacturers.”

Justin Smith of Shock Therapy in Wittmann, Arizona, also sees tires trending in Trophy Truck, Class 1 and Class 10, with promises of greater traction and tire life. “This is being accomplished through taller tires in the lower classes,” he said. “We’re seeing 35-inch tires in Class 10, where 33-inch tires were once the norm.”

Off-road trends typically start in Trophy Trucks, where boosting reliability is just as, if not more, important than speed. Some trucks are pinging the $1 million mark now that race teams employ top fabricators, try fresh technology, sign professional management, and use exotic materials to ensure success.

“The top fabricators are innovative, creative, and fully aware of function and purpose for every part on the vehicle. Somehow they manage to balance strength, function, reliability, comfort and style,” said Hummel.

Generally, Hummel noted that “innovative new ideas are shared quickly within the racing community when advances are made, or materials are introduced. Anything new that works is quickly copied, altered or further developed to fit the needs of the industry.”

Looking at reliability, some companies develop products that support differing performance requirements on multiple...
vehicle systems. Lubrication is high on the list, as it is a critical partner throughout powertrain and suspension componentry.

Chris Schell of Maxima Racing Oils in Santee, California, explained that the firm has developed 220 active formulations in-house—each one tested in real world racing situations before ever being commercialized.

“Our primary focus in off-road is with the engine and drivetrain builders,” he explained. “We had developed our 30WT ATF with Tony Selva at Rancho Drivetrain Engineering (RDE). I see a future for thinner-weight lubricants that protect like thick-weight lubricants.”

Schell also noted an ongoing gear oil battle between a 140WT being too thin and a 250WT being too heavy in sequential style gearboxes that prompted Maxima to develop a multi-viscosity 75W-190 Pro Gear.

To aid in engine efficiency and assist in the battle of races like the Baja 1000 and Vegas-to-Reno, Maxima commercialized “Off-Road Ultra Coolant,” a hybrid of its “Cool-Aide” that was formulated for the heat of the desert but is crossing over into other racing segments such as sprint car and other oval dirt track racing.

**Ground Breakers**

These days, the performance buzz is all about delivering available horsepower right down to the tire’s contact patch.

“The unlimited class racers are trying to perfect an all-wheel-drive (AWD) system that will stand up to hundreds of miles of abuse,” explained UPR Racing Supply’s Furrier.

“AWD has never been reliable. Geiser Brothers seems to have it figured out and is currently building all-wheel Trophy Trucks for customers.”

Shock Therapy’s Smith commented, “Parts durability through CNC designs and metallurgy improvements now deliver robust, reliable four-wheel-drive systems that can handle 900 horsepower and 40-inch tires without failure. This allows for better traction and acceleration, as well as quadrupling tire life from 150 miles per rear set of tires to 600–700 miles per set.”

Retailers are seeing an upheaval in GPS systems, too. Many in use today were purposed for off-road racing from marine systems. “The marine industry has gone to touchscreen technology, which isn’t as easy to use at 100 mph in the desert as it is while steering a boat,” Smith said, “and we don’t need a ‘man overboard’ button.”

Tracking systems, similar to those used in over-the-road trucking, have garnered the attention of several companies looking to adapt their products to race vehicles. “Desert races are being followed live online by the fan base, so the races are being tracked, timed and scored by tracking devices. But the challenges of transmitting the information for 300 race cars in real time from remote areas has been the challenge,” said Smith.

Better communications are key in off-road racing, where competitions spread over hundreds of miles and across multiple mountain ranges, and line-of-sight radio systems
fail. “New satellite communications have brought about new radios that allow chase trucks, pits, race cars and even guys back at the shop 2000 miles away to communicate at any time with no issues,” added Smith, who sees it as an absolute race changer for most teams. “Your team can manage the race much better.”

Many products similarly find an off-road niche, or prove a useful option in other motorsports segments, as well as enter the commercial realm. Seating and safety equipment, like head-and-neck restraints, lead the way.

“We’ve been showing the racers the benefits of a purpose-built racing seat over the traditional off-road suspension seat over the past dozen years,” said Furrier.

Shock Therapy’s Smith reminds that if a racer wins with a new shock absorber cooling system, it will sell to the public right away. “That cooling system for a Fox shock on the UTV may end up on next year’s mountain bike shocks that Fox produces,” he explained.

To keep the engine’s power to the ground, especially in off-road racing, the driveline needs to be set up in a reliable manner that minimizes power loss while doing everything possible to take advantage of how the engine makes its power, according to Nick Ito from Weddle Industries, Goleta, California. “In off-road racing, driveline survival seems to take

While suspension components receive much attention in the off-road market due to the jumps and terrain these vehicles traverse in both open desert and dirt closed-course events, technological advances have also occurred in lighting, tires, transmissions, oil, communication systems and more. Photo courtesy of the TORC Series.
precedence, and the transaxle has to be very robust to finish races," he explained. “Weddle Industries has a wide selection of transmissions to choose from, and we do our best to match the unit to the car and engine.”

For specific off-road applications, the ability to shift without a clutch has opened the door for a type of hybrid transmission, which would be a manual transmission with a torque converter rather than a clutch, Ito noted. “The torque converter works to absorb some of the huge torque spikes seen in off-road racing and greatly increases the longevity of the transmission and driveline. The trick is to keep the converter system cool, as it’s generating a lot of heat when it’s slipping to absorb those loads.

“As the North American distributor for Albins, we have been introducing the ST6-I transmission for use in the truck classes,” Ito continued. “This unit is a six-speed sequential transmission that includes a drop gear. The close ratio gears are a huge improvement over the usual three-speed automatic used in most trucks. The built-in drop gears mean that the overall ratio coming out of the trans is lower, like a built-in under drive. This means that the rearend gear can be higher, which also means stronger.”

As Class 10 has grown over the last couple years, Weddle has been selling several of the six-speed Albins AGB10 transaxles. “Many drivers feel like the six-speed gearbox helps take advantage of the limited engine in Class 10, helping keep the engine in its power band better,” Ito explained. “The release of our updated Mendeola S5 five-speed sequential transaxle has been great for Class 10 as well.

“Weddle Industries recently released the Weddle HV24 and HV25 transaxles,” he stated, acknowledging that these entry-level units addressed some of the shortcomings of what was previously used.

**Beyond Utilitarian**

There is no dismissing that UTVs have created an industry within the industry. Although some racers may not consider UTVs “real” race cars, the market segment
is nonetheless exploding, filtering scores of new competitors into the sport.

“There are hundreds of new suppliers and thousands of new racers,” said Furrier. “UTV owners are spending lots of cash learning to race inexpensively. The largest classes at many races is UTV, where car counts are solid—upwards of 300 entries.”

Particularly strong-selling UTV items include shock mods, spring kits and sway bar systems. Interestingly, the plethora of bolt-ons increases the vehicle’s weight and drops performance.

“Factory suspension systems are improving with each model, but they are not set up to work well, as the UTV gains 300 pounds or more,” noted Smith. “Having suspension systems that can account for this and improve the ride quality over stock significantly at the same time is a huge advantage.”

Heavily marketed for their exceptional handling off-road, UTVs with upgrades in this area pay special dividends in dirt competition. “We know suspension improvements to any part of the UTV’s ride quality, or turning abilities, are huge, because customers know that if the car handles better they will beat their competition in the race,” explained Smith.

Larger shocks with better cooling and external adjustments are first on many racers’ list of upgrades. Spring packages that use two or three per shock are becoming the norm, as are adjustable sway bar systems for both front and rear.

Smith has also seen UTV tires bumped up from 30 inches to 32 inches in 2016. “Taller tires tend to break weak drivelines and suspensions, so the UTV trends are larger axles, CVs and drive systems such as CVT belt systems and paddle-shifted transmissions next year,” he predicted.

“None of this is made by the OEM, so these parts are being innovated and tested by private companies, creating markets that didn’t exist a year or two ago,” he added.

Digital monitoring and dash systems are transforming radically. Gone are the mechanical “clock face” gauges, replaced by lighter, digital dashboards like MoTeC, or iPads loaded with all the apps needed to use GPS, monitoring, and systems managing the entire race car.

“Two things are driving this innovation,” Smith continued. First, “racers who can afford to pay for expensive prototype advancements,” and second, “as functionality improves, it lowers pricing because more racers need the products to keep up. The price falls further as the general public market comes into play.”

While the product focus in off-road racing is on advancing technology, surprisingly, vintage off-road racing showed up in 2010, which marked a significant milestone in the sport’s history. “Vintage race cars are being pulled out of the woodwork, restored and raced,” said Furrier. “I’ve been personally involved with and am currently restoring a couple of very significant cars: Budweiser Honcho truck driven by Roger Mears and the Mickey Thompson Challenger IV buggy.” Furrier added that vintage classes are a welcome part of the NORRA Mexican 1000 and The Mint 400 (renamed the Polaris RZR Mint 400 presented by BFGoodrich Tires).

**How They Play**

Every successful sanctioning organization supports its teams by providing engaging live events, some type of broadcast package, marketing, social media, and public relations to maximize exposure that gives sponsors the confidence to make marketing investments that pay off. Some also offer media training together with team and

UTVs serve as an ideal entry into off-road racing, offering a lower price point to attract new competitors. In addition, numerous suppliers have already begun offering upgrades for these vehicles to make them race worthy—upgrades that are available to stock today on retail shelves.

Photo courtesy of UPR Racing Supply.
Fresh leadership arrived at TORC: The Off-Road Championship presented by AMSOIL for the 2016 season from new owner Mountain Sports International (MSI) in Salt Lake City, Utah. Dave Swanwick explained, “Under our leadership, racers and fans can expect the TORC Series to offer excellent live events and a strong media package. Our broadcast arm, MSI Live, is producing television and high-definition digital programming for the series.”

TORC added another new category of racing to the PRO series with its PRO UTV (PRO Mod UTV and PRO Stock UTV) classes, as well as another venue with ERX Motorpark in Elk River, Minnesota, as part of the 13-race championship season. TORC’s Ben Nelson noted, “The facility added a brand new truck racing track that is separate from existing snowmobile circuits on the property. This top-notch facility is designed for racers, by racers.”

That’s all good news for the short-course off-road truck racing series that creates unique courses on dirt ovals, as well as running a slate of core events on purpose-built tracks. “It’s competitive racing with a great fan base, and for us, it’s about combining a welcoming atmosphere for racers to our professionally run events, with a strong marketing offering that they can sell to their sponsors, including our robust television package on FS2 and HD digital programming available for free online through multiple channels,” added Nelson, who bottom-lined the racing as “a collision between action sport and motorsport.”

The aforementioned UTV classes are an integral part of TORC, and poised for expansion. Beyond the competitive racing for teams and fans, MSI is certain that this is where future stars will develop the skills that will in turn carry them into bigger classes racing. “We’re looking at the growing UTV segment as the best feeder class we can possibly have for short-course off-road racing,” said Swanwick.

Specifically, the new PRO UTV racing classes will compete as a pilot project at Elk River, Bark River and Crandon, with
2017 optimistically seeing UTV racers incorporated into the entire championship calendar. “In addition to our PRO racers, we also invite regional Sportsman classes to compete on a number of our weekends, and that creates a real buzz around the paddock,” said Nelson.

Swanwick added, “A dedicated social media team ensures that we’re everywhere our fans want us to be: Facebook, Twitter, Instagram, Snapchat, etc. And we work with our drivers and teams to help amplify their efforts in social media. Our digital content is a big piece of that, and we’re finding more ways to deliver that free to our fans with every race, including after-hours activities like concerts, and on-site camping. That creates a real festival atmosphere for the whole family to enjoy.”

Mountain Sports International is listening “to teams, sponsors and fans who are incredibly passionate about the sport,” promised Swanwick, who added, “We share their enthusiasm to grow the sport of short-course off-road racing in the United States.”

In 2016, UTVs have been further integrated into side-by-side racing classes at Las Vegas, Nevada-based SNORE in all six of its events, according to John Pellissier.

“Our racers know our land access is limited, but they continue to request new areas, or different tracks to race in,” he volunteered. “SNORE is always looking for ways to preserve the areas on which it holds events, and being on the lookout for...
any potential new areas to use that haven't been swallowed up by conservation or land development."

Pellissier reported that in 2016, SNORE required all race vehicles to carry a tow strap. "At times, racers get stuck in such a way that all that is needed is a simple strap to get them out. It's a small amount of extra weight to ensure cars keep moving and enjoyment remains high," he said.

New for 2016, the Lucas Oil Off Road Racing Series in Corona, California, allowed electronic fuel injection in its Pro 2 and 4 classes, controlled by a new set of corresponding rules. Ritchie Lewis reported the series is building a world-class track in Wheatland, Missouri, at Lucas Oil Speedway to deliver "very exciting, high-flying racing action."

The sanctioning organization works to transform hobbyists into actual competitors, and has three different regional series to feed the national series talent pool. "The regionals use ATVs and UTVs to get people started in hopes of getting them into the national series pro classes," explained Lewis. "We have a willingness to adopt new best practices."

Lewis knows the health of the sport depends on engaging kids by showing them a path to racing. Working with the Boy Scouts of America as well as providing free children's tickets at local schools and clubs has garnered interest, partly because Lucas alerts media outlets that it is working with the local kids. "We also work closely with manufacturers to keep the cutting-edge parts and/or items to a level where the teams can afford to buy their technology," Lewis added.

The fastest-growing class at Las Vegas, Nevada-based Best in the Desert (BITD) is UTV, which further signals an expanding segment. BITD added three new events where this class appeared in 2016: Method Race Wheels Laughlin Desert Classic, in Laughlin, Nevada; 20th Anniversary Vegas to Reno (aka "the Happiest Race on Earth"); and Pahrump Nugget 250 in Pahrump, Nevada.

Also this year, a new deal was struck with RacingTraX and BITD that will eventually fit every truck, buggy and bike with a highly accurate 99-channel GPS and two-way satellite messaging unit that produces a unique Wi-Fi signal with updates every four minutes reporting location and speed, among other metrics. In addition to connecting race officials with racers, teams and fans can watch tracking live at www.racingtrax.com on any computer or smartphone.

BITD uses its website and social media outlets to keep competitors informed about new trends, while its television package broadcasts all BITD events.

Off-road racing is full of second-generation racers, with a third generation starting to make its presence felt. "We have no minimum age," declared BITD's Casey Folks. "At every event we host welcome parties, which allows for our racers to mingle and get to know each other. It's one of the most exciting sports you can be involved with. Watching a 6000-pound truck with 800 horsepower race across the desert is exciting."

"What we're doing with short-course off-road racing is a real showcase for what manufacturers can do," said TORC's Adam Comey. "We believe the more people who can tune in online or on TV, or come to our events in person, the more people will fall in love with it. That's why it's important for us to offer a robust television and streaming package."

In 2016, TORC will have logged 20.5 hours of HD digital coverage, at 90 minutes per show, delivered by a trio of on-camera reporters calling the action and providing back-stories, along with 2.5 hours of live digital broadcast for each race. The Off-Road Championship airs on FS2 with coverage of PRO Light, PRO 2 (as in two wheel drive), and PRO 4 racing Thursday nights during primetime.

Besides television, TORC has multiple online platforms providing myriad content delivery on torcsseries.com, the FOX Sports GO app, Sony Playstation, and live streaming on Facebook.

SCORE International is best known for the grueling, yet beguiling Baja 1000, which attracts both a global-participant and fan base that will mark 50 years
Running in November 2017, as well as organizing the Baja 500 and the San Felipe 250.

The race series takes place in Mexico, draws participants from more than 20 countries, and boasts media coverage from 40 countries. Racers are attracted to the challenge of the event, which includes film and music celebrities, and extreme sports and Olympic athletes alongside other motorsports professionals.

The series has a history of inventive technology in its truck classes that has fed product development, and yet still generates plenty of activity in entry-level classes like Class 10, UTV stock and stock full.

“From a manufacturer’s perspective, Baja racing has provided the most extreme testing area for product development from new truck, motorcycle, ATV, and now UTV, to all aftermarket products,” observed Roger Norman, “because just finishing this race is an accomplishment! SCORE registered the term ‘Baja Proven’ as a trademark, making it a world-recognized product endorsement.”

Like its US counterparts, SCORE International must work with many levels of private and government groups. “We are aware of the tightening access to available land in California and Nevada to conduct off-road motorsports events,” said Norman. “SCORE has worked closely with all government agencies, cities, land owners and the tourism bureaus to ensure our races take place with the most...
SCORE has partnered with Diamond Bar, California-based SEMA in recent years to further boost exposure of off-road motorsports via the Baja 1000 Experience area, a 70,000-square-foot-area that showcases several dozen vehicles in top-tier classes. Teams later drive out to the Las Vegas Motor Speedway to qualify for their starting positions for the SCORE Baja 1000.

“For the past few years SCORE has heavily invested in developing its marketing and media assets, especially from a technology perspective,” explained SCORE’s Jim Ryan. “The result is access to all SCORE race series coverage, news, history and team spotlights and more, 24 hours a day, seven days a week.”

SCORE’s enviable media coverage includes primetime CBS Sports, international broadcast exposure through ESPN International, live Internet race feed on score-international.com, SCORE Journal magazine, and the “Dust 2 Glory” film in theatrical release, a sequel building on the original that ignited a huge infusion of new teams.

To attract young race fans, SCORE deals heavily in social media with Facebook, Twitter and Instagram, and is now supported by a new SCORE app with video integration.

It is safe to say that off-road desert racing in the United States is heavily dependent on access to public lands. Racers, promoters, parts makers and service providers can’t afford to not engage with this process as they hope to thrive. Of course, stadium racing has its own challenges of capturing the attention of fans who have many choices for entertainment throughout the nation.

Technological developments are a great assist to the “gee whiz” factor that fans want; an undeniable carrot that teams can’t ignore, which propels the sport forward. This “buzz” attracts media attention—in traditional sectors as well as feeding the social media rise as a place more and more eyeballs are going to get content on demand.