

ARIZONA DRIVER

THE ENTHUSIAST'S GUIDE TO LIFE BEHIND THE WHEEL

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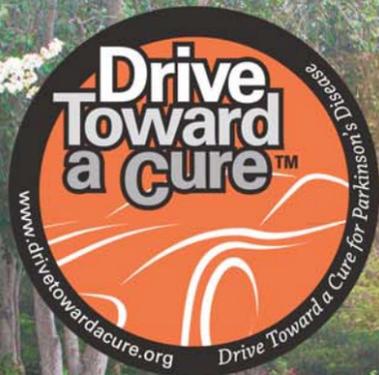
**NEW BRONCO!
MERCEDES-EQS 580 EV
F-150 HYBRID / BMW 230i
VALERIE THOMPSON UPDATE
PUERTO PEÑASCO BIKE RALLY
ARIZONA AUCTION WEEK INFO
NEWS FROM PHOENIX RACEWAY,
ADOT, ATLAS, JET CENTER
AND MUCH MORE!**



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4-Door 4x4 Badlands
with Sasquatch Package**

VEHICLES • EQUIPMENT • TECHNOLOGY • PEOPLE • EVENTS • DESTINATIONS • ATTRACTIONS





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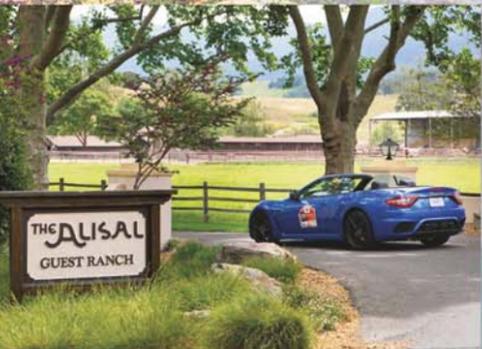
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ARIZONA DRIVER

THE ENTHUSIAST'S GUIDE TO LIFE BEHIND THE WHEEL

news & features January-February 2022

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COVER: Making waves—or recreating waves it has made for legions of fans in the past—is the all-new Ford Bronco. We gave it quite a workout, and it came out with all “As.”
Photo: Joe Sage



When we receive a vehicle to drive for a week for review (not technically a test drive, by instrumentation and analysis standards, though called that by many), we may or may not get the top model. (If you skim through this issue and check the red triangles indicating our sample's spot in the lineup, you'll see how this varies.) Each level has something to teach us—we love the power of a bigger engine, all-wheel drive when it's an option, heated seats and power mirrors and so on; but we often could do without a lot of the drive control and creature feature electronics that are piled on. Without those—increasingly included on all levels—this would truly be a golden era in automotive design, engineering and manufacturing, with stunning progress in power, efficiency and safety. Our logbook notes are often dominated by experiences with many of the extras, easily lampooned as efforts to turn a complex operational machine into a smartphone on wheels or a near-self-driving experience-robbing robot. This frequently detracts from the experience, though in most cases we tone down our take, as more time with any should resolve most issues. (But what about those times someone has to jump in and drive someone else's vehicle, perhaps even in an emergency?) As we've taken to including quick info on the whole lineup in most cases, you can get a feel for the price range and fundamental variables. And you can speculate about what may be lost and what may be gained in a vehicle stripped of some of that excess.

Widely reported supply chain issues and a computer chip shortage, spinning off two years of pandemic lockdowns, have resulted in two things. Model years have been impacted and delayed in many cases, hence we still have a couple of 2021 models in this issue, received at the very end of the year. And a number of these vehicles were identified as "pre-production" builds, made as ready as possible, perhaps shy of a few chips and functions. In all cases, the fundamentals are in place and the experiences useful.

Enjoy the ride!

Joe Sage - Publisher/ Executive Editor



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SturgisSturgis Motorcycle Museum & Hall of Fame
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USMAUnited States Motorsports Association

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RIP, BOB BONDURANT

Bob Bondurant's story is well known all around the world. His list of accomplishments is filled with victories, punctuated by many an exciting tale. Bob raced Corvettes in the mid-1950s, winning the West Coast SCCA B Production National Championship in 1959 with a remarkable 18 out of 20 wins. During SCCA competition from 1960 to 1963, he won 30 of its 32 races. During the 1965 FIA World Championship season, Bondurant won seven of his 10 races to score the win for Shelby American over previously dominant Ferrari. His is still the only American team to do ever so. After capturing the title, Ferrari invited Bondurant to be one of their Formula 1 drivers. Bob also served as a stunt driver for the 1966 film *Grand Prix*.

Bondurant's racing career ended in 1967 after a steering arm snapped at the Watkins Glen track. While in the hospital, he sketched his vision for a racing school and began building that dream after he recovered. He created the only purpose-built

facility of its kind in the world, where he and his team trained nearly 500,000 people. Professional racers, executives, law enforcement officers, military specialists, performance enthusiasts and teen drivers have learned to be safer and more proficient on the track, street and highway.

And he made countless friends along the way.

In a prior life, your publisher was on the organizing committee for, and did the marketing and advertising for, the Steamboat Vintage Auto Race & Concours d'Élegance, in Steamboat Springs, Colorado. We met Bob when Ford was title sponsor, and they invited him to participate as a VIP racer. We became fast friends, as Bob did with all he met.

Bob has influenced the course of many people's lives, and we have our own story.

He invited us out to Sears Point Raceway (now Sonoma Raceway), in Northern California, the prior location of his Bob Bondurant School of High

Performance Driving. We of course took him up on that and flew out. Our visit included many highlights, including our first right-seat hot laps with a world champion, and memorable they were!

Bob told us then that he was planning to move the whole Bondurant School operation to Phoenix. He told us that we should move there, too, so we could work together all the time.

A few years later, we did pack up and make the move. Thus, with a few lane changes along the way, Bob Bondurant led directly to the magazine you hold in your hands today.

The Bob Bondurant School of High Performance Driving was sold last year, with the existing facility and its programs and gear transformed into the Radford Racing School. Radford, however, did not keep the Bondurant name as part of the sale. The Bondurant family and team have stated, including at Bob's comprehensive and well-attended funeral, that the Bondurant School will return, better than ever. Stay tuned. ■



Torva

Fine Art of Fine Automobiles



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Radford Lotus Type 62-2 interior

▼ The Lotus Type 62-2 coachbuilt by British luxury coachmaker **Radford**—a mid-engined two-seater coupe with luxurious appointments—will be the world’s first modern Radford. The sports car’s completely bespoke interior was revealed in an exclusive showcase at Bremont Watch Company’s new 35,000-sq.ft. manufacturing and technology center in Henley-on-Thames, UK. Fulfilling the promise that every Radford will be bespoke—built to clients’ precise customization requirements—Radford has partnered with world-renowned British mechanical timepiece maker Bremont to integrate exquisite analog dials in the instrument panel—beautiful Bremont clock and stopwatch dials. Within blacked-out window tinting, the interior has carbon fiber accents throughout, paying homage to Lotus’s lightweighting philosophy. All in-car controls are physical toggles and switches, reflecting the same milled and turned finish from the body of the clocks. The interior features a sweeping line that tracks from the back of the driver’s shoulders through and around the screen display, a key element that can be customized in any finish desired, from precious metals through to carbon fiber, as on the reveal car. The door opening is a design element from the original Lotus Type 62, with a high sill and cut-out roof. Inside, the driver has the feel of being in the cockpit of a Le Mans prototype. For purists, Radford pays homage to the manual transmission era with fully exposed gear linkage. The start-stop button is set in

a console housing that echoes the double ducktail exterior. The classic Type 62-2 produced 430 bhp. Powered by a 3.5-liter supercharged V6 shared with Lotus’s new Emira sports car, Radford Gold Leaf models are upgraded to 500 bhp, and limited-edition John Player Special models with an upgraded supercharger take output to 600 bhp. The perfectly balanced 2.5 percent blacked-out cabin also reflects elements of its JPS livery with subtle accents of gold.



2022 Mustang Shelby GT500 in Ford Performance-only Code Orange

Founded in 1948 by Harold Radford, the eponymous coachbuilder went on to create bespoke vehicles for ’60s icons such as the Beatles. In addition to buying the legendary Bob Bondurant School of High Performance Driving in Chandler last spring and renaming it Radford Racing School, the Radford name has been revived as a coachbuilder for the 21st century by leading British car designer Mark Stubbs, TV

presenter and mechanical engineer Ant Anstead, businessman Roger Behle and former Formula One world champion Jenson Button, with Dan Burge recently appointed as CEO. Radford aims to bring a modern version of coachbuilding to a new clientele, creating contemporary luxury commissions true to timeless classic designs. Potential buyers are invited to register their interest at www.radford.co (not .com).

▼ The Mustang **Shelby** GT500 has built on the legacy of Shelby performance since the first 1967 model, when American racer and entrepreneur Carroll Shelby, with a reputation for transforming Ford Mustangs into dominant road racing machines and inspired by his team’s 1-2-3 finish at Le Mans, advanced the foundation of his Mustang GT350 to craft the first Shelby GT500, bearing a modified 428-cu.in. V8. Shelby called the original GT500 “the first real car I’m really proud of.” Still the most powerful and advanced Mustang ever, a limited run of 2022 Mustang Shelby GT500 Heritage Edition fastbacks designed and engineered by Ford Performance will be fin-

ished in a classic Brittany Blue paint with two different Wimbledon White stripe options. The car has a first-in-class 7-speed dual-clutch transmission, race-bred control strategies and drive modes, at a price of \$72,900 plus \$2,140 for the GT500 Heritage Edition package, or \$12,140 with hand-painted stripes. Like the Ford F-150 Raptor, new Bronco Raptor and Ford GT supercar, the 2022 Mustang Shelby GT500

is now available in an exclusive Ford Performance Code Orange paint, as well as eight other new colors.

▼ For years, **Legacy Classic Trucks** has



Legacy Classic Trucks 1951 921 Diamond T

made a business out of finding and restoring the great vintage trucks that did the tough, dirty jobs that made the Great Western Expansion possible. With a particular affinity for old school Power Wagons from the 1930s and ’40s, Legacy has restored WWII military trucks, heavy logging rigs, ambulances, dam builders, fire engines and many more historic vehicles. Legacy’s passion is in restoring these hardworking, often abandoned trucks with modern day modifications and getting these pieces of moving history back on the road where they can be enjoyed. “Growing up in Chicago, Diamond T is a company that is near and dear to my heart,” says Legacy founder Winslow Bent, “the only major auto manufacturer located in Chicago, Illinois. The Diamond T was incredibly ahead of its time. The trucks were known for their rugged, do-it-all-and-more power, durability and a brutish yet oddly refined presence that was unlike anything else on the road or off it. I had never driven a Diamond T before and wanted to experience the truck to see if it might make for a new restoration series at Legacy Classic Trucks. What a drive, just amazing, and the story behind the 921 Diamond T was just as special.” Bent came across a 1951 921 Diamond T owned by Holst Truck Parts in Ucon, Idaho. The Holst family had inherited it from a house mover and truck enthusiast named Reid Lemons, who had recovered the rig from a ditch while on a house moving job. Realizing its full potential, he restored it and, just before passing away,

left it to the Holst family. Mike Holst completed the work to get the rig ready for modern day hauling. While the trucks were originally equipped with four- or six-cylinder engines, this rig now features an

8.3-liter Cummins C Series diesel bus engine paired with a 4-speed automatic and 3-speed Browning auxiliary transmission, good for 250 hp. Outfitted with front and rear air suspension, this Diamond T is the perfect heavy duty vintage truck for hauling light to heavy loads, all in a super comfortable cruiser of a truck that can hit 70 mph. Diamond T was founded in 1905 by C.A. Tilt in Chicago, initially making four-cylinder cars, then transitioning to light-to-



NAWA Racer electric motorbike

heavy-duty trucks and military vehicles powered by Buda, Continental and Hercules engines. In 1940, they introduced a series of powerful six-cylinder gas and diesel engines good for up to 118 hp alongside a 200-hp Cummins. During World War II, the company specialized in tank transporters often featuring a low gear 185-hp DFXE diesel engine that could haul up to 115,000 pounds. Other military vehicles

included cargo trucks, wreckers and dump trucks. Dubbed the “Cadillac of Trucks” 48 years before the 1999 debut of Escalade, the 1951 921 Series Diamond T as rebuilt features striking fire truck red and white two-tone paint and its original interior. To see it in action, visit Legacy Classic Trucks’ new YouTube channel, *This Old Truck*.

▼ **NAWA** Technologies, pioneers in using revolutionary 3D nanotechnology to unleash efficient, green mobility, showed its new NAWA Racer electric motorbike concept at the world’s biggest two-wheeled show, EICMA 2021, in Milan in November, to show how their NAWACap next-gen nano-based ultracapacitors can be applied to a real-world EV powertrain, combined with conventional lithium-ion cells to create a hybrid battery system. Optimizing both energy sources, the innovation opens up new possibilities for all e-powertrains, greatly improving efficiency, reducing the size of the lithium-ion battery, shortening charging times, potentially doubling range and extending entire system life. Entirely modular and scalable, the system is well suited for two-wheelers but also applicable to any electric vehicle. For the NAWA Racer concept, NAWA was supported by expert design and engineering services provider Envisage Group of Coventry UK and

KEEP RIGHT >>

range of up to 300 km in an urban environment. The bike brings a modern twist to its retro looks with smooth, lightweight composite panels and rear arm, and an in-wheel motor. NAWA Racer will also focus



on customization, with multiple ways to tailor and futureproof its design.

▼ This year marks the 40th anniversary of the **Lamborghini** Jalpa, originally presented at the Geneva Motor Show in 1981. In keeping with Lamborghini tradition, the car took its name from a breed of fighting bulls—the Jalpa Kandachia. The final development of the Urraco and Silhouette project, Jalpa retained that general architecture, but was equipped with a larger 3.5-liter engine. The car, with targa opening roof, was designed by Frenchman Marc Deschamps, style director of Carrozzeria Bertone, directly influenced and partially designed by Giulio Alfieri, general manager and technical director of Lamborghini at the time. Jalpa's most significant technical innovation was the final evolution of the 90-degree V8 engine, made completely of aluminum, with four chain-controlled overhead camshafts, originally installed on the Urraco and Silhouette. Thanks to the increased 3.5-liter bore, it was fed by four Weber 42 DCNF twin carburetors, with a compression ratio of 9.2:1, for 255 hp at 7000 rpm and a maximum speed of 155 mph. The Jalpa prototype presented in Geneva was based on a Silhouette that was produced but never sold, so it went back to the factory and was used as the basis for this new model. The production Jalpa, from 1982, had a semi-supporting steel body, black bumpers and engine air intakes, horizontal rear lamps and 16-inch alloy wheels taken from the Athon proto-

type, with Pirelli P7 low-profile tires. The opening roof could be stashed behind the rear seats. A “second series” Jalpa was presented at Geneva 1984, with some aesthetic modifications. The commercial life

of the Jalpa—the last Lamborghini grand touring sedan with a V8 engine and the last sports car of this class with this particular engine displacement and placement—ended in 1988 after production of 420 cars. Jalpa is the direct conceptual predecessor of the 2003 Gallardo, one of the best selling cars in Lamborghini history.

▼ You can find the story of our week with the **Rolls-Royce** Ghost—a new model



more accessibly sized than Phantom—in our previous (November-December 2021) issue. Just as that went to press, we had received word of this new iteration, as “the dark side of Post Opulent design” arrives in the Black Badge Ghost. Its 6.75-liter V12 is boosted to 591 hp and 664 lb-ft of torque, preserving Wraith's position as horsepower king, while meeting or exceeding those figures for the regular Ghost

and for Phantom. The drivetrain and chassis are accordingly also tweaked for higher performance. Black Badge alloy wheels feature a carbon fiber barrel. Turquoise leather and technical carbon veneer enrich the interior. And an infinity lemniscate symbol codifies noir expression. Rolls-Royce Motor Cars says they have always attracted “subversive clients—rebellious women and men who built their success by breaking rules, taking risks and challenging conventions. In the 2020s, these women and men engage with luxury products on their own terms. They reject suits for streetwear, use blockchain not banks and influence the analog world through their digital endeavors. In doing so, they have created new codes of luxury that resonate with their sensibilities: darker in aesthetic, assertive in character and bold in design.” The brand has responded with new color palettes, more technical surface treatments and more powerful driving experiences, “without ever compromising the effortless sensibilities that have drawn this bold group of clients to the Rolls-Royce brand.” Black Badge debuted with Wraith and Ghost in 2016, followed by Dawn in 2017, then Cullinan in 2019. This “alter ego” now represents more than 27 percent of commissions worldwide. It is codified by the lemnis-

cate—the familiar mathematical symbol for infinity, as well as a symbol for eternal development and balance—an element of the Black Badge's interior. Originally applied to Sir Malcolm Campbell's record-breaking Rolls-Royce-powered Blue Bird K3 hydroplane, the lemniscate was nominated by the marque's designers to reflect Black Badge models' own unrelenting pursuit of power. ■

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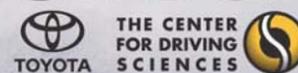
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EVERYTHING THEY PROMISED by Joe Sage

The new Ford Bronco needs almost no introduction—it's been on everybody's wish list, in the rumor mill and through the concept stage for years. And now it's in production. For a refresher, see our comprehensive reveal feature in the September-October 2020 issue.

The big Bronco is body-on-frame, on the Ranger platform. There is also a Bronco Sport, a small unibody on the Escape and now Maverick platform. Bronco Sport arrived to market first, creating some room for confusion as to what's been seen to date.

Our sample is the Badlands, a serious off-roader toward the upper end of the series, with the Sas-

quatch package, making it even more serious.

It's a 4-Door, while there is also a 2-Door. Broncos in the past were all two-doors, but today's market shows a four-door is likely to be the bigger seller. Both are well executed, giving new life to that same pure Bronco character. The 4-Door's gas tank is about four gallons larger, a nice plus.

Also defining Bronco is its open top, rare among rugged off-roaders. You can opt for a ragtop or the removable hardtop on ours. The doors are also removable—you can go as open-air as you desire.

Specifications for ours are at right; the full lineup and its pricing, plus key comparatives between

the 4-Door and 2-Door, are on the next page. (Note that this sample is a 2021; full lineup pricing on the following page is for the 2022 model year.)

The entire Bronco range runs from about \$30k to about \$50k, from its most basic through its most luxe-and-tech-appointed to its most heavy-duty and special-duty models, each with either door count.

Wildtrak, a high-speed dune runner more akin to the F-150 Raptor, is tops in price. Shy of having that special goal, the Badlands is arguably the top dog off-roader. Sasquatch is a package available on several models, and a great way to add focused enhancements—also see sidebar—all in one nice-

ly priced, fully Ford-engineered bundle.

Our Bronco followed a week in the F-150. As in its platform partner, the Ranger, its cab experience feels basically as generous as the big pickup's—with about the same headroom and legroom, a little narrower overall, but also with a narrower console. The spacious cabin is nice, while the character, layout and feel of the Bronco remain appropriately completely different from the pickups.

All are 4x4s, while engines include your choice of a 2.3L EcoBoost four or a 2.7L EcoBoost V6, with 7-speed manual and 10-speed automatics available. The V6 requires the 10-speed auto, a tough choice for a manual fan—the difference between 275 and 315 horsepower might seem justifiable to gain hand shifting, but the torque difference is more dramatic, 410 vs 315 lb-ft. Give both a test drive, if you're on the fence—also paying atten-

tion to their somewhat different gear ratios.

Much about the Badlands build is strictly business. Despite sitting a few grand above the luxe-tech Outer Banks model, it has more rugged touches such as manual seat controls and a washout-ready rubberized floor with drain plugs.

Tech is there when you turn the proverbial key, of course, from an entertaining logo-and-tumbling-boulders screen animation, to extensive interfaces and controls for off-roading attitudes and stats.

Ours has a 4A-2HI-4HI transfer case with crawl feature, as well as Bronco's G.O.A.T. Modes (Goes Anywhere Over Any Type of Terrain). Being solid all-wheel-drive fans, we used 4A around town, though 2HI could bump up fuel economy on a long, dry highway run (or every day, if you prefer).

The high-torquing V6 powertrain has a powerful grunt that underlines its character nicely. The

(cont'd)



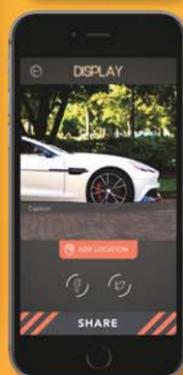
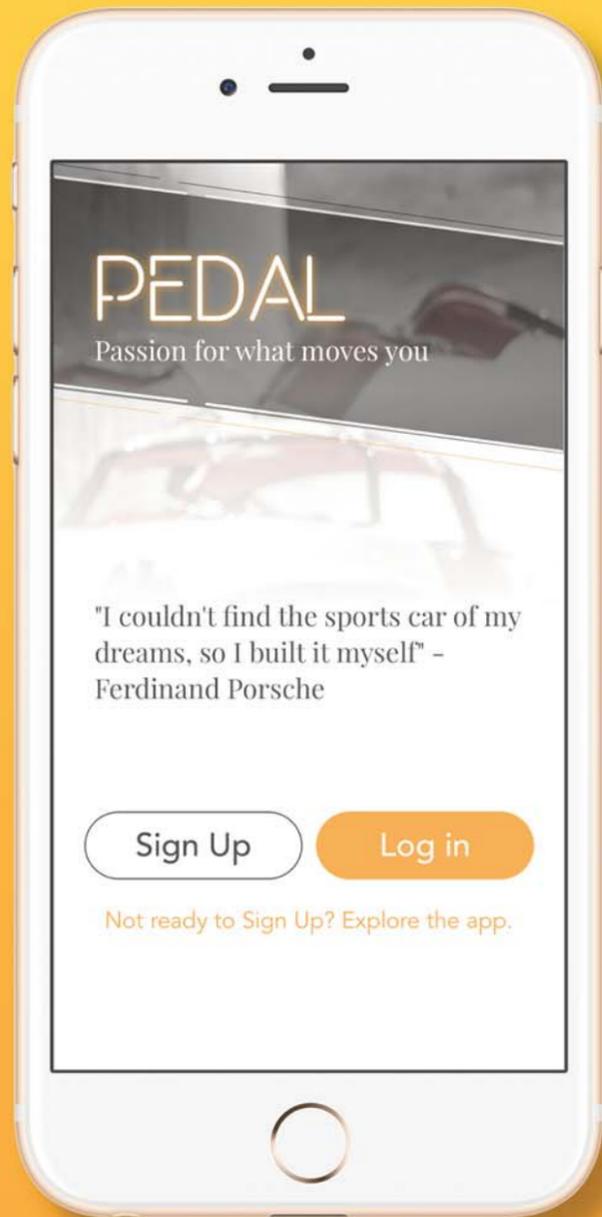
SPECIFICATIONS

2021 Badlands w Sasquatch Pkg

ASSEMBLY	.....Michigan Assembly, Wayne MI
DOORS / ROWS / SEATS	.....two / two / five
ENGINE	.....(opt) 2.7 EcoBoost twin-turbo V6
HP/TORQUE	.....310 hp / 400 lb-ft
TRANSMISSION	.....10-spd automatic
DRIVETRAIN	.....4x4
TRANSFER CASE	.....(STANDARD) part-time selectable engage, electronic shift-on-fly, 2.72:2 low ratio; (OPTIONAL) advanced w auto on-demand 4H engage, 2-spd electromechanical transfer, 3.06:1 low ratio
DIFFERENTIALS	.....F: Dana 44 AdvanTEK indep w available Spicer Performa-Trak electronic lock; R: Dana 44 AdvanTEK solid w available Spicer Performa-Trak
FINAL DRIVE RATIO	.....(Sasquatch) 4.70:1
CRAWL RATIO	.....auto / elec shift-on-fly: 57.19:1
CHASSIS / SUSPENSION	.....H.O.S.S. System F: indep twin alloy A-arms & coil-overs; (Sasq) Bilstein position sensitive dampers; R: solid five-link rear axle w coil-overs, (Sasq) Bilstein position sensitive dampers
SUSPENSION TRAVEL (F/R)	.....240/261 mm
STEERING	.....3-mode rack-and-pinion via Terrain Mgmt System w G.O.A.T. Modes
BRAKES	.....four-wheel disc; F: 311x34mm vented, 51mm twin-piston floating; R: 308x24mm, 54mm single-piston floating
WHEELS	.....17x8.5 black high-gloss-painted forged alum warm alloy trim ring, beadlock
TIRES	.....(Sasquatch) 35" 315/70R17 Goodyear Territory M/T
LENGTH / WHEELBASE	.....190.5 / 116.1 in
HEIGHT / WIDTH	.....73.9 / 76.3 in
TRACK (F/R)	.....65.0 / 65.0 in
GROUND CLEARANCE	.....11.5 in
TURNING CIRCLE	.....39.86 ft
APPR / BRKVR / DEPART	.....43.2 / 26.3 / 37.0°
MAX WATER FORDING	.....(Sasquatch) 33.5 in
RAMP TRAVEL INDEX (Badlands only)	.....500 / 620 Sta-Bar connected/disconn
WEIGHT	.....5109 lb
PAYLOAD / TOW CAPACITY	.....1370 / 3500 lb
FUEL	.....87 oct reg unl (hp boost w 91 prem)
FUEL CAPACITY	.....20.8 gal
MPG	.....17/18/17 (city/hwy/comb)
BASE PRICE	.....\$44,590
BADLANDS SERIES EQUIP GRP 334A:	powder coated bumpers, steel bash plates, carbonized gray paint grille w white Bronco name, rock rails, LED headlamps, LED taillamps, LED signature lighting, 17" wheels (w 33" tires), full size spare, 2 ea F/R tow hooks, Badlands suspension, front stblzr bar disconnect, Terrain Mgmt System w G.O.A.T. Modes
2.7L ECOBOOST V6	.....1895
10-SPD AUTOMATIC TRANS	.....1595
SASQUATCH PKG:	diff 17" beadlock capable wheels, 4.7 final drive ratio w electronic-lock axles F/R, high clearance susp, high clearance fender flares, 35" M/T tires, position-sensitive Bilstein shocks
HARD TOP:	molded in color
STORAGE BAGS FOR TOP	.....350
TOWING CAPABILITY UPGRADE595
KEYLESS ENTRY KEYPAD110
DESTINATION CHARGE1495
TOTAL\$58,905



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PEDAL

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big Bronco can be a little awkward in tight parking lots or gauging curbs while parallel parking with the fender flares, in urban-suburban use, and the gearing is optimized for other uses than competitive boulevards or freeway ramps. But you knew that, and you'll still love it. In a high country town, it will be perfect close to 100 percent of the time. Tight maneuvers are also mitigated by a stellar set of cameras with very accurate guidelines—indispensable on the trail and often useful in town.

And it's the trails we headed for.

How can a vehicle be this tough and this comfortable all at the same time? we asked ourselves as we got underway at a big off-highway vehicle park. The combination of suspension and wheel and tire fitment is masterful on this Badlands and Sasquatch build. We had been driving in 4HI and had already gone farther than we have ever gone there, a testament not only to its nothing-will-stop-us capability, but to the why-would-we-ever-want-to-stop thrills of the Bronco's drive.

We realized we not only had had superb capability just in out-of-the-box 4HI, but that we had made many a seemingly radically tight U-turn despite a fairly average turning circle spec in the four-door format. Imagine what the two-door can do.

We found ourselves traversing some of the most challenging terrain—a shifting dry river bed with dramatic rock outcroppings, all of which we tackled in turn—as the sun was going down, glad

to have the confidence of everything about this vehicle, notably the beadlock rims. We had eased into the river bed well upstream, to be sure what we were getting into. But to get back out, and with the last of the setting sun in our eyes, we took the steepest, narrowest, gnarliest route there was, a washed-out, brush-lined trough—the up-and-out direction of an “is this a good idea?” route down that we had opted against earlier. We popped it into 4LO here, because we wanted to take it slowly, as we gauged its limits. This was the roughest stretch we ran that day, and in the Bronco, again feeling smaller than it is, it was a piece of cake.

All this, and we never even disconnected the sway bar, but that's another dimension of capability on top of all the rest, if and when needed. In fact, we had tackled slippery, mud/ruts, sand and rock-crawl conditions without using the G.O.A.T. Modes, which include exactly those, by name, among others. Imagine the edge these provide, atop a vehicle that already delivers to the max.

People have learned to be apprehensive about concept vehicles or about the reinvention of treasured heritage vehicles in a new era, in some past cases with good reason. The Bronco delivers everything you would hope and expect. It's faithful to the spirit and mission of the originals, and it satisfies 15 or more years of well-received concept builds, all properly and extensively updated to modern build parameters. We loved it. ■



2022 BRONCO MODELS / TRIMS

Base

The essential Bronco
2-DOOR Starts at \$29,300
4-DOOR 33,450

Big Bend

Mainstream off-road w comfort, tech upgrades
2-DOOR \$33,785
4-DOOR 36,110

Black Diamond

Adventure off-roading, washout interior
2-DOOR \$36,450
4-DOOR 38,795

Outer Banks

Off-roading in style: leather, tech upgrades
2-DOOR \$39,355
4-DOOR 41,700

Badlands

Extreme off-road model
2-DOOR \$42,495
4-DOOR 44,840

Wildtrak

High-speed off-road desert runner
2-DOOR \$47,780
4-DOOR 49,475

PLUS PACKAGES AVAILABLE:

Standard, Mid, High, Lux, Sasquatch

BRONCO 2-DOOR vs 4-DOOR

LENGTH / WHEELBASE
2-DOOR 173.7 / 100.4 in
4-DOOR 189.4 / 116.1 in

HEIGHT / WIDTH
2-DOOR 71.9-75.2 / 75.9-79.3 in
4-DOOR 72.9-75.3 / 75.9-79.3 in

TRACK ... (varies by model, same F/R) 65.0-66.9 in

GROUND CLEARANCE
2-DOOR base 8.4 / 35" tires 11.6 in
4-DOOR base 8.3 / 35" tires 11.5 in

APPR / BRKVR / DEPART
2-DOOR base 35.5 / 21.1 / 29.8°
w 35" tires 43.2 / 29.0 / 37.2°
4-DOOR base 35.5 / 20.0 / 29.7°
w 35" tires 43.2 / 26.3 / 37.0°

MAX WATER FORDING
BOTH (based on Sasquatch pkg) 33.5 in

RAMP TRAVEL INDEX (Badlands only)
2-DOOR 560 / w 35" 700
4-DOOR 500 / w 35" 620

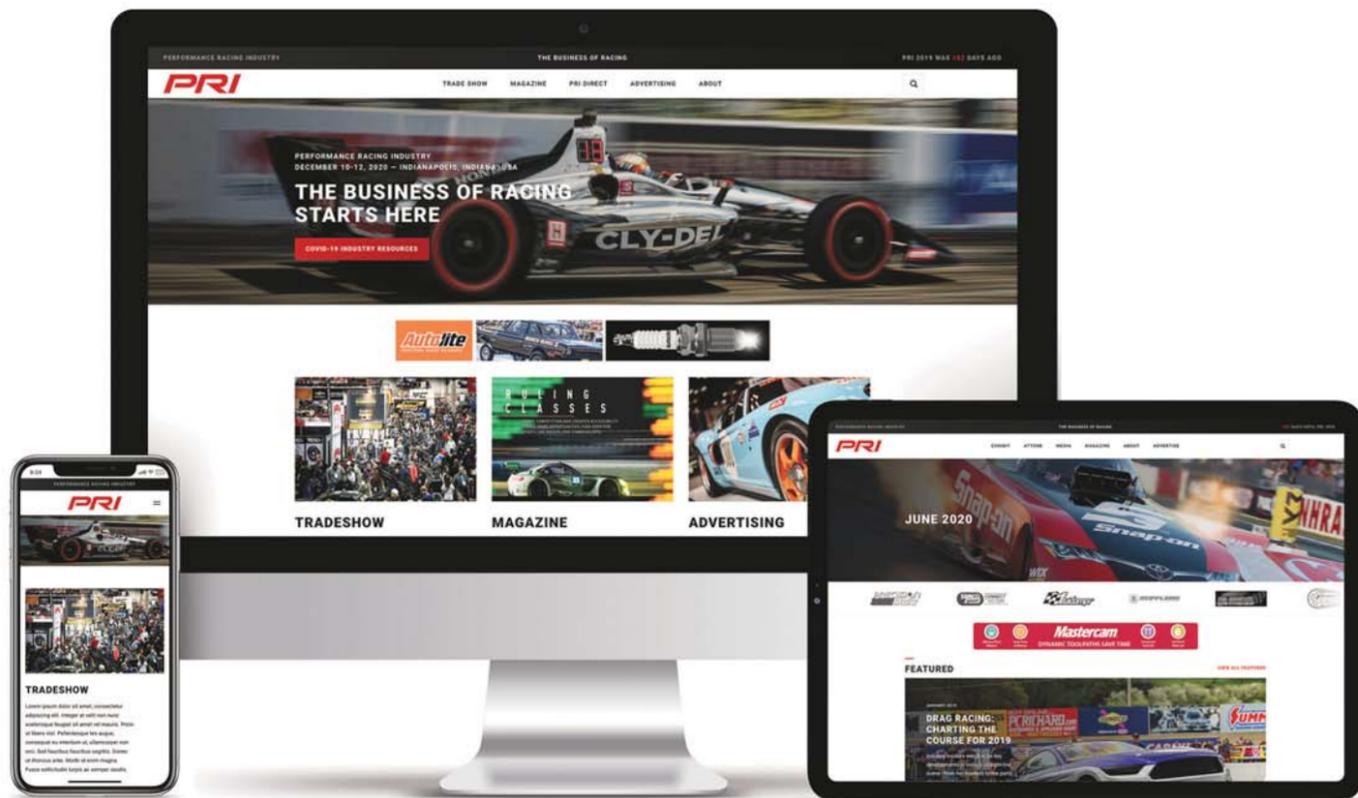
PAYLOAD / TOW CAPACITY
2-DOOR 1170 / 3500 lb
4-DOOR 1370 / 3500 lb





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SPECIAL EVENTS : TASTE OF MOTORSPORTS

Taste of Motorsports announces trifecta of 2022 automotive enthusiast events

RADFORD RACING SCHOOL, CHANDLER AZ, MARCH 19-20 — PLUS TWO OTHERS

Sponsored by some of the most famous automotive marques in the world, Taste of Motorsports will show the public the future of automotive experiences through a trio of events in 2022.

Three weekends at famous racetracks in Arizona, California and Oregon will combine gourmet food, performance and luxury vehicle displays, and demonstration rides in some of the most exciting cars in the world.

Over two days, the art of motoring will be celebrated by automakers, dealers, clubs and enthusiasts. Celebrities and motorsports royalty will mingle with fellow enthusiasts on and off the track.

A key feature of Taste of Motorsports is the "Demo Experience," giving the public the perfect environment to evaluate their next performance car. Attendees can learn about the vehicles from an insider's perspective, within the safe environment of a proper racetrack.

Such brands as Ferrari, Shelby, Porsche, Corvette, Aston Martin, Bentley and Lamborghini are typically part of the events.

"Taste of Motorsports Experience is a weekend filled with fast cars, fine food, fantastic scenery and fabulous friends," says Taste of Motorsports, Inc. CEO Stephanie Floyd. "The first day is a pri-

vate affair where automakers and dealers invite their patrons for thrill rides in high performance cars, vehicle introductions and personal presentations at the track. That evening, we will have a VIP reception at a very special location.

"The following day is open to the public with General Admission tickets available. From exotics to performance sedans, SUVs and the latest electric vehicles, guests will have the opportunity to experience a wide range of activities in them. They will enjoy 'high G' thrill rides on the big track and breathtaking short course blasts. There is no better way to experience the features of today's automotive offerings."

Events this year will take place at:

March 19-20

Radford Racing School
Chandler, Arizona

July 30-31

Auto Club Speedway, Fontana Speedway
Southern California

August 27-28

Portland International Raceway
Portland, Oregon

For additional information or registration, visit tasteofmotorsports.com. ■



It takes a Two to tango by Joe Sage

Meet generation two of the BMW 2 Series. Not just "one size smaller" than a 3 Series, this model is intended to evoke the classic 2002 of half a century ago. The first 2 Series, in 2014, had looked a little stubby to our eye at the time, but as norms, comparatives and the car itself have evolved, this new styling completely nails it.

As of now, there will be no convertible in this generation, only a coupe. (There is also no manual transmission available.) The car comes with two engines: a 255-hp turbo-4 in the 230i Coupe as

driven here, and a 382-hp turbo-6 in an M model (see lower sidebar), which also upgrades suspension and other bits. Both will ultimately be available as rear-drivers or with BMW xDrive all-wheel drive. A rear-drive 230i and an xDrive M240i are being released first, adding the inverse—an xDrive 230i and a rear-drive M240i—by year's end.

Our sample was a preproduction unit, meaning several things. We were among the first to drive it. Some specifications could still change (which in this case is doubtful). And some technical imple-

mentations may not be final (in this case likely, as the computer chip crisis continues). That last point is cautionary as we experience and report (or skip over) some details in the user interface or electronic driver assistance in particular.

Our use of drive modes varies, but in this we went with Sport all the time—for the win-win of better power curves and defeat of auto start-stop, both. What's more, it's well implemented, fine and peppy either way, just a nice little kick in the pants (with no undue sound effects added) in Sport.

We miss the manual in its own right, but also due to the implementation of Park on the automat-

ic, a button on the rear face of the lever, awkward to reach even with our seat back. A second button on the side, not uncommon, lets you shift.

The 2 Series has electric steering, in this case a variable sport version, part of the M Sport Package. Either the steering itself, or the driver assist packages taking precedence over it, were our sore points during our week. Despite all efforts to defeat any ill-tempered lane-keeping electronics, the car sometimes wavered around between freeway lines like a front-driver, resisted crossing them even with the turn signal on, and in one instance tried to dart across them all on its own, with a car next to us. Even at its most neutral, it kept us from the gentle curve-hugging pleasures this car should be known for. On a related note, it was more diffi-

cult than average to dig for lane-keep settings, and once in there, they seemed limited and/or in disagreement with what we held in our hands.

It's here that we refer back to chip challenges and wonder whether this is preproduction behavior or engineered behavior, so you (and we) will want to give it another try.

On the plus side, its steering circle feels and acts even tighter than its spec, always a big plus.

The new 2 Series benefits from keeping evolution of the kidney grille tame, where other BMW models have gone extreme. We can confirm the car's styling success by the heads it turns, even in jaded supercar neighborhoods. (Its Melbourne Red Metallic paint was surely \$550 well spent.) Conquer its steering, and it should be a great drive. ■



SPECIFICATIONS

ASSEMBLY	San Luis Potosi, Mexico
PARTS CONTENT	40% Germany, 17% Mexico, 9% US/Canada
ENGINE/TRANSMISSION	both Germany
DOORS / SEATING CAPACITY	two / four
ENGINE	2.0L 4-cyl 16v TwinPower turbo, electrically operated cooling air intakes
HP/TORQUE	255 hp / 295 lb-ft
COMPRESSION RATIO	10.2
DRIVETRAIN	RWD
TRANSMISSION	8-spd sport automatic
0-TO-60 / TOP SPEED	5.5 sec / 155 mph (w perf tires; top 130 mph w std tires)
SUSPENSION	lightweight steel and aluminum; dual-elastic bearing; lift-related shocks (firmer with M Sport pkg); F: two-joint spring strut; anti-vibration element in shocks; R: five-link
STEERING	electric power steering
BRAKES	F: four piston fixed calipers; R: single-piston, floating calipers. Calipers in blue or red, with M logo.
WHEELS	19-in light alloys
TIRES	(opt) F: 255/40R19; R: 255/35R19 perf
LENGTH / WHEELBASE	179.0 / 107.9 in
GROUND CLEARANCE	5.0 in
TURNING CIRCLE	36.4 ft
HEADROOM (F/R)	39.8 / 35.0 in
LEGROOM (F/R)	41.8 / 32.2 in
CARGO CAPACITY	10.0 cu.ft
WEIGHT / DISTRIB	3519 lb / 51.6/48.4%
FUEL / CAPACITY	prem unl / 13.7 gal
MPG	26/35/29 (city/hwy/comb)

BASE PRICE	\$36,350
MELBOURNE RED METALLIC	550
DYNAMIC HANDLING PKG: M Sport differential, M Sport brakes w red calipers	1900
M SPORT PKG: 19" M dbl spoke bi-color wheels, M sport suspension, variable sport steering, Shadowline black high gloss exterior trim, ambient lighting, M steering wheel, anthracite headliner	3250
PREMIUM PKG: heated steering wheel, heated front seats, adaptive full LED lights, heads-up display, Live Cockpit Pro (incl nav)	2650
AUDIO: Harman Kardon surround sound	875
DESTINATION CHARGE	995
TOTAL	\$46,570

M240I COUPE KEY VARIANCES

ENGINE	3.0L 6-cyl 24v TwinPower turbo
HP/TORQUE	382 hp / 369 lb-ft
0-TO-60	4.1 sec / (top speed the same)
SUSPENSION	addtl front struts
BRAKES	M Sport brakes standard
VITAL DIMENSIONS	same wheelbase, body 0.4" longer, a little taller, less headroom, almost 2' larger turning circle, almost 400 lb heavier, tighter steering ratio, different wheel-tire options.

2022 BMW 2 SERIES COUPE

230i Coupe (RWD)	255-hp... ▼ \$36,350
M240i xDrive Coupe	382-hp... 48,550
TO FOLLOW:	
230i xDrive Coupe	255-hp... TBD
M240i Coupe (RWD)	382-hp... TBD



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Traveling this winter? Make sure you “Know Snow”

ADOT partnering with NWS to better inform drivers of storm severity

Winter is here, and that means snow in Arizona’s high country. To help travelers this winter, the Arizona Department of Transportation (ADOT) has partnered with the National Weather Service to create graphics that use their color code for storm severity to better inform drivers of what to expect from winter storms.

ORANGE is a moderate-impact snowstorm. With this type of storm, drivers should slow down when roads are slick with snow and ice and prepare to spend longer on the road. Leave extra room behind the vehicle ahead.

RED is a high-impact snowstorm. In this scenario, drivers should avoid travel if possible. If delay is not possible, strongly consider using 4x4 or snow chains, and prepare to spend extended amounts of time in the vehicle.

PURPLE is an extreme-impact storm with 2 to 3

inches of snowfall per hour. Drivers should avoid travel altogether during this type of storm, due to dangerous travel conditions.

In each case, drivers should pack an emergency kit that includes blankets, warm clothing, a fully charged cell phone, food and water, medication, and sand or kitty litter.

ADOT will use these graphics on its social media accounts to help drivers know what intensity of snowstorm to expect, so drivers can make informed decisions about travel. ADOT’s Twitter account (@ArizonaDOT) and Facebook page (facebook.com/AZDOT) provide real-time information and interaction.

Drivers can also check road conditions by calling 511 or visiting az511.gov. And the free ADOT Alerts app available at azdot.gov/ADOTAlerts will send critical information, including alternate routes,



should snow and ice close a major highway.

ADOT is also ready to help keep highways clear of snow and ice this winter with its fleet of 200 snowplows. Many of these plows include auxiliary cab heaters to keep drivers warm while not idling and wasting fuel; heated windshields to prevent wipers from freezing and getting stuck; backup cameras and a camera and laser guidance system to help guide operators; state-of-the-art lighting packages; and front flex plows that can bend in different configurations to remove snow.

If you come across a snowplow working to clear the road, always help out the plow driver by staying back until the driver pulls over to let traffic pass. Also, never assume a snowplow operator knows your vehicle is nearby. If you can’t see the plow driver, there’s a good chance the driver can’t see you.

Check out more safety tips before traveling this winter season by visiting azdot.gov/KnowSnow. ■



SPECIAL EVENTS: JANUARY AUCTIONS

Arizona Auction Week 2022

REVISED MID-LATE-JANUARY. Despite signs that reactions to the lingering pandemic could affect events everywhere, the calendar solidified into six of the usual eight familiar events. All events have phone and online components. References here to online are for events where a live local event is replaced by a specific online alternative event.

In 2021, there were cancellations, postponements, remote events, live events here but for bidders only, and such. None were cancelled or postponed this year, once solidified, though one remained online-only and a couple tightened up their schedules. Check with each for the latest details.



Barrett-Jackson "Celebrating 50 Years!" 51st Annual Nine days: Sat Jan 22 - Sun Jan 30, 2022

LIVE: Fifty years of Barrett-Jackson's now 10-day-long event speaks for itself, but it is also the reason for all the others that have joined this world-famous week over the years. This 51st event marks the completion of 50 calendar years, so with the 50th in 2021 disrupted by the pandemic, Barrett-Jackson is now celebrating "50 years." After a March rescheduling in 2021, the multi-pronged event returns to its normal slot this year, at its normal location, as it has been throughout.

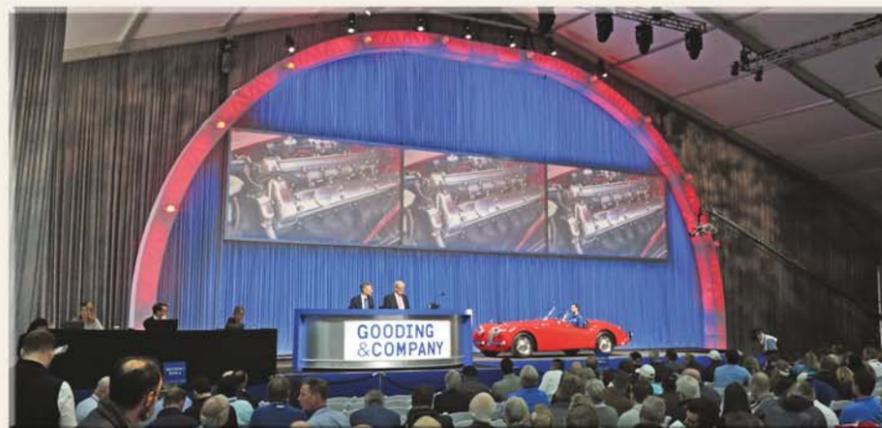
WestWorld of Scottsdale (AZ Loop 101 & FLWright Blvd)
16601 N Pima Road, Scottsdale AZ 85260
www.barrett-jackson.com



Bonhams 11th Annual Scottsdale Auction Thursday, January 27, 2022, 10am (viewing Tuesday-Thursday, Jan 25-27)

LIVE: After a more complex mix of a limited in-person and extensive online event last year, Bonhams returns to normal operations at the Westin Kierland, ready to set many world records, as is their norm. Phone vs web vs in-person bidding creates major excitement here, as with or without the local event fully live, Bonhams boasts the largest worldwide audience in the business.

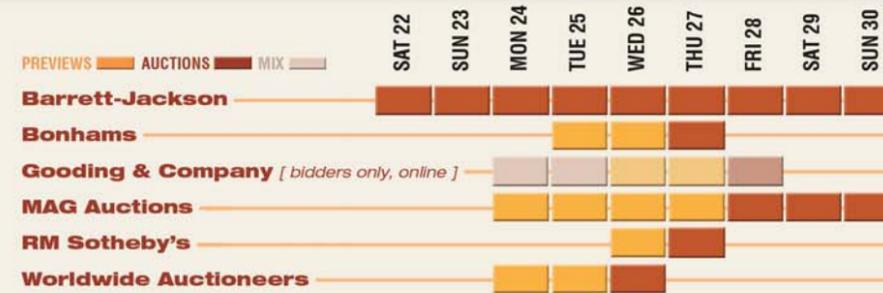
Westin Kierland Resort & Spa
6902 E Greenway Pkwy, Scottsdale AZ 85254
www.bonhams.com



Gooding & Company 15th Annual Scottsdale Auction Monday-Friday, January 24-28, 2022 (bid Mon-Fri, view Weds-Fri, lots close on Friday)

LIMITED ACCESS / ONLINE: Last year, Gooding ran their nominal Scottsdale auction as a "Geared Online" event with lots available for viewing and inspection at their Southern California offices, by appointment. This year, they are following that same formula, but with cars here in town for viewing, at a special location and for bidders only. (Photo shows live event in a more typical year.) Check online for the latest detailed info.

[for registered bidders only] Scottsdale Hangar One
15220 N 78th Way, Scottsdale AZ 85251
www.goodingco.com



MAG Auctions January 2022 Collector Car Auction Friday-Sunday, January 28-30, 2022 (vehicle check-in, bidder registration Jan 24-27)

LIVE: After a disrupted 2021, MAG Auctions (the direct descendant of long-running Silver Auctions) returns to normal options this year, with a general admission gate and live auction at their longstanding venue, the We-Ko-Pa Casino Resort outside Fountain Hills. This remains one of the simplest, most accessible and most down-to-earth events, with plenty of accessible, down-to-earth and drive-home-if-you-want vehicles generally available. It's a don't-miss.

We-Ko-Pa Casino Resort, Fort McDowell AZ 85264
(Arizona 87 Beeline Highway northeast of Fountain Hills)
www.motorsportauktiongroup.com



RM Sotheby's 23rd Annual Automobiles of Arizona Thursday, January 27, 2022, 5pm (preview Weds 26 9am-7pm, Thurs 27 9am-5pm)

LIVE: RM Sotheby's is returning to its familiar long-standing Arizona Biltmore location, with all operations on track to be normal, including festive preview days. Joining a range of supercars crossing the block are immaculate American pre-war classics, including Andy Granatelli's 1931 Duesenberg Model J Tourster, emerging from over 20 years in a noted private collection.

Arizona Biltmore Resort and Spa
2400 E Missouri Ave, Phoenix AZ 85016
www.rmsothebys.com



Worldwide Auctioneers 6th Annual Arizona January Auction Wednesday, Jan 26, 2022, 5pm (preview Monday-Wednesday, Jan 24-26)

LIVE, LIMITED SEATING: Worldwide returns to its most recent live local location, on the Scottsdale-Tempe line. Seating is limited to consignors, bidders, ticket holders and guests. Public admission to the auction and preview, including a printed catalog, is \$100, without the catalog \$25, or for the auction only \$15. Worldwide is headquartered in Auburn, Indiana, home of the world famous Auburn-Cord-Duesenberg Museum.

Singh Meadows, 1490 E Weber Drive, Tempe AZ 85281
(southwest of Hayden/McClintock and McKellips)
www.worldwideauctioneers.com

ROCKIN' THE BOAT

BY JOE SAGE

EQ is the new Mercedes-Benz EV lineup, being presented as a Mercedes-EQ sub-brand, the same approach taken with Mercedes-AMG and Mercedes-Maybach in recent years. (It's a bit ironic to us after years of pointedly using the full Mercedes-Benz name, rarely just Mercedes. But now add a hyphen, and they're all official.)

The new lineup is defining itself by starting at the top in the US, with an S model (letters follow suit to the Mercedes-Benz lineup, at least so far). This large luxury cruiser is the first to be built upon a new all-electric modular platform, this one to

also be used for an executive-class (E) model. The overall goal is to have a completely carbon-neutral lineup within 20 years, with half of those by 2030.

There is some redundancy in an individual vehicle name. Rather than an S 580 with a full name of Mercedes-EQ S 580 (following suit to a Mercedes-AMG S 65, for example), this is an EQS 580, thus a Mercedes-EQ EQS 580. We may see some more evolution on this before all is said and done.

This rockin' super-high-tech big luxury yacht is sure to rock the boat in the industry overall, where it may be fair to say luxury has been defined to

date purely by a high price. While entries in the entire EV marketplace are growing exponentially, Mercedes-EQ heads straight to the high ground.

Despite the parallel naming, the EQS is immediately recognizable by its own distinct wind-swallowing profile, or "one-bow cab forward design." They have totally nailed the styling, telegraphing exactly what it is: a big luxury electric Mercedes.

Inside, a single combined instrument and touchscreen panel—the MBUX Hyperscreen—sweeps the full 56-inch width. (Beneath the visually dominant single glass panel live three conventionally

rectangular OLED screens.) Instruments include the latest generation of MBUX with augmented reality navigation. Actuators and pressure sensors provide haptic-reminiscent touch.

The cabin is full of beyond-the-norm creature comforts—"health and wellness" features that seem tailor-made for an autonomous cocoon, but are intended to boost real live drivers' attentiveness and reduce behind-the-wheel stress. These include forest, ocean and rain background sounds (fed through a Burmester 3D sound system) and an "energizing" filtered air supply. Programs involved are said to "intelligently combine comfort and vehicle functions," which suggests many possibilities for driver and/or vehicle tech intervention.

The headrests bear billowy pillows, very comfortable for a passenger, though sometimes somewhat in the way for a driver.

Many controls—seats and mirrors on the door, others on the steering wheel—are set under multi-switch smooth membranes, slick, but harder to use without looking and, in our experience, sometimes making it harder to pinpoint a selection.

All in all, this layout makes everybody else's rectangle-in-the-center-stack seem quite dated. Any existing high-dollar EV maker is going to have a run for its money with this in the marketplace.

All that said, and as with anything, the proof is when you punch the pedal. Now, this isn't the only EV we've driven, and much of the experience is fairly universal among them. Then again, even the universal aspects are clearly overlaid with Mercedes' technical grace and this model's 516-horsepower equivalent and 631 lb-ft of torque.

Within a block, we had noted that this car could make it hard to go back to internal combustion.

(cont'd)



SPECIFICATIONS

ASSEMBLY	.....Sindelfingen, Germany
LAYOUT	.....four-door five-passenger sedan
MOTOR	.....dual permanently synchronous
OUTPUT	.....385 kW
BATTERY	.....lithium-ion hard case 216 cells
ON-BOARD CHARGER	.....9.6 kW
RANGE	.....350 miles
CHARGE TIME:	
240V/32A (10-100%)	.....11.25 hrs
DC Fast Charge 110kW (10-80%)	.....31 min
HP/TORQUE	.....516 hp / 631 lb-ft
DRIVETRAIN	.....4MATIC all-wheel drive w Torque Vectoring
TRANSMISSION	.....single stage
0-TO-60 / TOP SPEED	.....4.1 sec / 130 mph
SUSPENSION ..F/R:	AIRMATIC Air Suspension
STEERING	.....electro-mech speed dependent rack & pinion; 10-degree rear-axle steering
BRAKES	.....F: 15.35"; R: 14.88"
WHEELS	.....22-in 5-twin spoke, black accents (standard: 9.5x21 cast)
TIRES	.....22-in range-optimized summer (standard: 265/40 R21)
LENGTH / WHEELBASE	.....207.28 / 126.38 in
GROUND CLEARANCE	.....5.28 in
TURNING CIRCLE	.....35.76 ft
HEADROOM (F/R)	.....40.35 / tba in
LEGROOM (F/R)	.....41.7 / tba in
CARGO CAPACITY	.....22 / 63 cu.ft.
WEIGHT	.....5888 lb
MPGe	.....91/98/94 (city/hwy/comb)
BASE PRICE	.....\$119,110
PAINT, UPHOLSTERY, TRIM	
Graphite Grey Metallic	
Neva Grey / Sable Brown leather	
Natural grain Anthracite Linden wood	
Neva Grey headliner	.....nc
CABLE: emergency use 110v charging	.....250
AIR BALANCE PKG	.....350
ENERGIZ. AIR CONTROL PLUS, HEPA filter	.....450
TIRES: range-optimized, summer	.....nc
WHEELS: 22" 5-twin spoke, black accents	.....1350
HEATED STEERING WHEEL	.....250
HEADS-UP DISPLAY	.....1100
GLASS: laminated safety, infrared protect.	.....1010
ACTIVE AMBIENT LIGHTING	.....590
RAPID HEATING FRONT SEATS	.....450
EXCLUSIVE TRIM: front multicontour seats with massage, four-zone climate control	.....1575
CREDIT: x- standard valet/beginner mode	.....(50)
CREDIT: x- standard AMG Line exterior	.....(2200)
DESTINATION CHARGE	.....1050
TOTAL	.....\$125,285

2022 MERCEDES-EQ EQS LINEUP

EQS 450+ Sedan	
Premium	.....\$102,310
Exclusive	.....105,710
Pinnacle108,510
EQS 580 4MATIC Sedan	
Premium▼ \$119,110
Exclusive122,510
Pinnacle125,310





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We contemplated our fundamental desire to be able to hop in and go anywhere, any time and any distance, and how that might fare against EV range. As it turns out, we would have a way to compare this as the week wore on.

As we are often inclined to do, we popped the car into sport mode. A rough response crossing a rain trough inspired us to change that—we went into the custom profile and gave ourselves sport driving and steering, but comfort suspension, then never thought about it again.

Downsides included that regenerative drive-train feeling of no gradation in the pedals between full stop and full go—it takes some getting used to, to not be able to eeeease into motion as we're all familiar with, even on a nanosecond scale, and get more of a feel for a vehicle's heft and power.

Other downsides had to do with charging challenges, surprising in our EV-rich neck of the woods, but that's another more general EV factor. A full-time owner will probably have their own charger at home, and they'll be more familiar with options for top-offs in the region. We do drive EVs regularly and have all the apps and accounts, but due to various technical issues and inoperable stations, we felt as though we spent as much time charging (or trying to charge) as driving.

Things that did impact our drive as the week went on, that were specific to this car, all came down to the interface. We had a running list of key settings that had turned themselves on or off—from a disappearing heads-up display, to seat preferences, to audio—an hour digging for this, an hour digging for that—for which we never found corrections or mitigations (even if we had earlier). But each item that felt as though it was beyond our own control was disquieting. Imagine a home with controls you could not predict, but that an engineer had intended to be intuitive. We've been

there, in hotels, where just turning the lights all on or off would take a week or two of training and learning, not one hotel night. As features themselves, they can surely sooner or later be solved—but many seemed too clever for their own good. Try as many as you can, and see what you think.

Just a couple of days into our time with the EQS, it turns out we had to run to California, just to pick up an obscure but very necessary computer part that someone would not ship. Fifteen hours of drive, 90 seconds of "hi and thanks." We had a prohibition against taking the electric Mercedes out of state, so we would take a car of our own—which gives us the partly EVs-in-general and partly this-one-in-particular perspectives at right.

But it sheds light on the real world ownership experience, subject to variables of lifestyle and experience—as with our charging experience.

We had started the week with high praise for the design and interface of the car's instruments and features. That wore off pretty quickly, as we did repeated dives into the system, trying and often failing to find or correct many key functions.

Thus it's too bad we couldn't drive this to LA, for that reason in particular. Perhaps moreso than average, this vehicle experience would benefit from a longer cruise like that, with a co-pilot in the right seat, digging through the manuals and screens for the duration, investigating and solving all the loose ends and sometimes overly complex mysteries we were tallying. Once all are solved, the pure driving experience should come through loud and clear—and that is magnificent, indeed.

Next on tap for the Mercedes-EQ lineup are the aforementioned EQE sedan and an EQB SUV, both already revealed for other markets. And the Mercedes-Benz C, E, S, B and-so-on naming convention is set aside with a VISION EQXX being revealed in early January. The future is here. ■

OUR UNPLANNED EV-IC COMPARO

With a necessary dash to greater LA and back on our hands, but not allowed to take the EQS out of state, we spent most of two days instead in our own gasoline V8 sport coupe. That's okay. There are long stretches between things on I-10 west, and we wouldn't have to stop to charge an EV. Hitting gas pumps right is tricky enough.

But as we cruised, we got to thinking and to running the numbers, for gasoline-vs-EV, or for our-car-vs-the-EQS more specifically.

The EQS 580 has a stated range of 350 miles, healthy for the big three-ton vehicle it is, but there are a lot of EVs coming out now, even big pickups and SUVs, stating 500.

In most efficient 6th gear (manual), our relatively thirsty V8 read between 18-21 mpg on this run. Its tank is about 17 gallons. We had left with about 5/8 of a tank and refilled at more like 12 or 13 gallons, grabbing gas stations where they exist on a long stretch like that. We stopped three times total, round trip—Blythe, Pasadena and Quartzsite on the return. Seventeen gallons at 20 mpg gives the car 340 miles of range, about the same as the EQS. Realistically, a driver will run neither a gasoline vehicle nor an EV to the end of its range. On either, 70-80 percent of range is about 240-280 miles. Figure we would have stopped just as often to charge the EQS, same-same, three times.

However, each charge takes about an hour, compared with a few minutes to fill the tank. That adds three hours to our roughly 17.5-hour drive time.

And around town, an EV owner may have the charging ritual down pat. But on a longer drive, it may take any of us another hour to locate chargers in unfamiliar places, more if we have to wait for someone who's already charging. We may encounter chargers that are out of service or otherwise failing, as we did here. Another hour for all that, times three, now adds six hours to the trip in total.

Our trip had one overnight. Adding three hours for charging, or six or more with hunting and waiting, would add a hotel night.

Much of this is general EV thinking, and it's all on a fast track to improvement, though these numbers are specific to the EQS. All in all, this partly theoretical but basically dead-on comparison seems useful to note today. ■



VALERIE THOMPSON VACATES PILOT SEAT IN BUB 7 STREAMLINER MOTORCYCLE, REMAINS PRINCIPAL DRIVER OF DUAL-ENGINE TARGET 550 STREAMLINER

“America’s Queen of Speed,” ten-time land speed record holder Valerie Thompson, has announced her separation from Denis Manning and the BUB 7 Streamliner Motorcycle team, citing loss of confidence in the streamliner and designer Manning. Thompson has been piloting the former world-title holding streamliner since 2016 and was Manning’s top funding source for the team.

Considered the “World’s Fastest Female Motorcycle Racer,” after inking a 328-mph speed record, Thompson is an independent team owner/driver who competitively drag raced before focusing on land speed racing, eventually earning ten Land Speed Records on two continents.

“We lost some essential crew members over the last few months,” said Thompson about her eroding confidence in the project. “The remaining crew contacted me (in December) with the sad news they had quit and removed all their tools from the Team 7 Racing shop. Without this ‘super crew,’ I’m highly doubtful about the performance potential of the BUB 7 to recapture the World’s Fastest Motorcycle title. More importantly, I’m concerned for my safety. These are not just my teammates, they’re my guardian angels.”

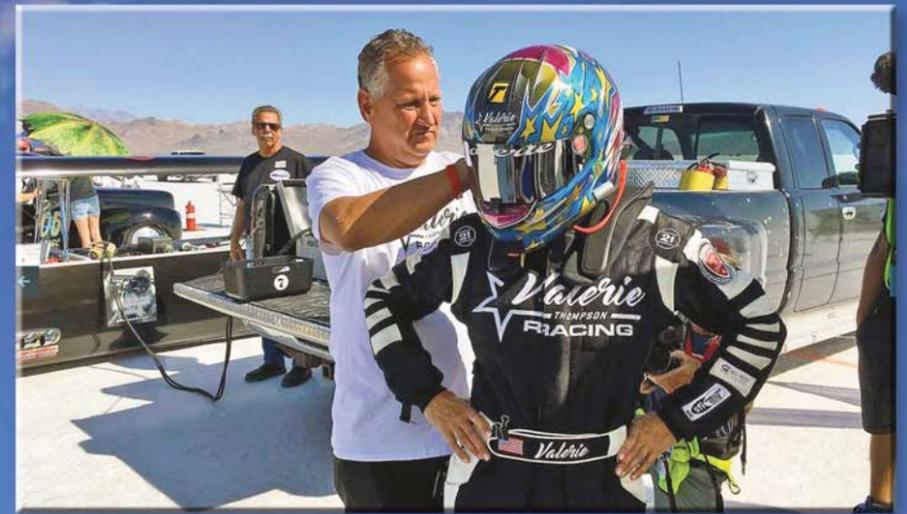
Each of the departing team members helped extract Thompson from the BUB 7 wreckage after a devastating 363-mph crash on Australia’s Lake Gairdner salt flats in 2018. “While I’m disappointed I won’t be setting the fastest motorcycle record with Team 7 Racing, I’m heartbroken the crew won’t see the results of

their 36 months of painstaking rebuilding work. Each of them has volunteered countless hours in this quest. They deserve better,” added Thompson.

Thompson remains the principal driver of the dual-engine Target 550 streamliner owned by Oregonian and veteran land speed race team owner Marlo Treit. Treit’s 43-foot, 9,000-pound, four-wheeled speed machine is vastly different from the BUB 7 motorcycle. The team’s goal is to break Tom Burkland’s 415-mph World Record set in 2008. Thompson exceeded the team’s testing goals on her first three test runs, clocking 218, 270 and 291 mph.

Scottsdale resident Valerie Thompson is the World’s Fastest Female Motorcycle Racer and 10X Land Speed Record holder, with membership in the Sturgis Motorcycle Hall of Fame. She is a member eight 200 MPH Clubs, one 300 MPH Club and the only female in the World’s Top 10 Fastest Motorcycle Racers rankings.

In addition to her relentless pursuit of new speed records, Valerie’s goals include earning a professional rating in her favorite sport, pickleball. She started playing less than a year ago and has already collected six medals in her first five tournaments, playing women’s singles, women’s doubles and mixed doubles. ■



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NASCAR NEXT GEN CARS FIRST LOOK!

FANS ARE INVITED TO WATCH NASCAR CUP SERIES TEAMS TEST NEXT-GEN CARS ON JANUARY 25, AHEAD OF 2022 DEBUT

Fans can visit Phoenix Raceway on January 25, 2022, for a free first look at the new NASCAR Next Gen race cars in action. It's the first day of a two-day test session for NASCAR Cup Series teams as they prepare to debut their new cars for the 2022 season.

A portion of the grandstands will be open to fans from 10 am to 5 pm (times subject to change). Parking and admission are free of charge, and food will be available for purchase.

NASCAR, along with its manufacturers and teams, developed the Next Gen car to put the stock back into stock car racing, with new Toyota TRD Camrys, Chevrolet Camaro ZL1s and Ford Mustangs designed to more closely resemble the models available in showrooms nationwide.

The new cars utilize the latest technology to maximize performance, improve safety and increase connectivity to enrich the overall fan experience.

For details and the latest information on this event, or to secure tickets for March NASCAR Weekend—highlighted by the Ruoff Mortgage 500—or November NASCAR Championship Weekend—with four championship races in three days—visit online:

www.PhoenixRaceway.com.

TRACK TIME!

A DRIVING 101 NASCAR RACING EXPERIENCE PUTS YOU BEHIND THE WHEEL OF A REAL NASCAR RACE CAR—ALL BY YOURSELF!

Motorsports' leading fan driving experience partners—Driving 101, which operates NASCAR Racing Experience, Richard Petty Driving Experience and Mario Andretti Racing Experience—have announced their schedule of event dates at major speedways across the nation, including Phoenix Raceway.

Their program lets race fans drive the same tracks as their favorite drivers—including Phoenix Raceway, as well as Atlanta Motor Speedway, Auto Club Speedway, Charlotte Motor Speedway, Daytona International Speedway, Dover International Speedway, Homestead Miami Speedway, Kansas Motor Speedway, Kentucky Motor Speedway, Homestead Miami Speedway, Las Vegas Motor Speedway, Michigan International Raceway, Nashville Superspeedway, New Hampshire Motor Speedway, Richmond Raceway, Talladega

Superspeedway and Texas Motor Speedway.

It's as real as it gets—you get to drive a real NASCAR Race Car by yourself. After a crew chief meeting, training and instruction, you get behind the wheel and drive a NASCAR Race Car for timed racing sessions. There's no lead car to follow, and no instructor rides with you, as you drive five to 48 minutes of track time. Get one-on-one instruction from a spotter over two-way in-car radio. In between every eight minutes of track time, you get a brief pit stop, then head back out to work on driving faster speeds. And YES, passing is allowed.

Prices for the NASCAR Racing Experience start at \$249.99 to drive a NASCAR race car, or \$129.99 for NASCAR Ride Alongs. Advance reservations are encouraged, as track times fill up quickly. Driving 101, with its three trusted racing brands, now runs at 16 nationwide speedways for NASCAR Racing Experience and 14 nationwide speedways for Mario Andretti Racing Experience.

The event comes to Phoenix several times during 2022. You can check dates and book reservation by calling 704-886-2400, or online at:

www.NASCARRacingExperience.com.



SPORT-ECONOMY BALANCE

BY JOE SAGE

ES, Lexus's midsize top-selling sedan, was new for gen seven in 2019, with a few style points refreshed in 2021. For 2022, big news is the car we are driving here—the first-ever ES 300h hybrid to also receive the Lexus F SPORT treatment.

The Lexus ES lineup has 250, 300 and 350 models, but these are not in sync with a price staircase. The 350 and 250 are priced exactly the same (see sidebar), one with a bigger engine and front-wheel drive, one with a smaller engine and all-wheel drive—for apples-to-oranges specs at apples-to-apples prices. You might want an AWD V6 or a FWD four, but Lexus is banking on having created the fewest roadblocks to a simple yes-no purchase decision.

The ES 300h, however, uses the smaller engine and simpler FWD build, keeping it close to the same prices while adding a hybrid system. Its particular advantage is notably higher fuel mileage.

Ours was a pre-production unit. Many logbook notes were about improved controls and switches—simpler options, tighter feel, firmer clicks—but these possibly included early placeholder parts.

Electronics were probably closed to complete, with nice touches such as animated graphics in the heads-up display. The touchpad continues its slow improvement from the finicky joysticks, then pads, of a few years ago, now also often able to be bypassed via the main touchscreen.

On the power side of the eco-plus-sport equation, performance felt stronger and quicker than its 215-horsepower might suggest (specs do not state a hybrid add-on). Perceptions may flatter, as zero-to-60 time is over eight seconds. Then again, the instant torque of the electric component likely does help the feel at the lower end of the curve.

The car starts up in eco mode by default, with a full-EV mode also available. There are also normal and sport modes. With high stated fuel mileage headroom, we drove mostly in sport. In addition to a no-doubt richer power curve, sport also provides a tach among the contextual binnacle instruments, always useful (even with a CVT, as on this).

We received the car with a 26.7-mpg average in

its readout, which we reset. We drove mostly in town, but with fuel mileage numbers about the same across the board, usage shouldn't make much difference. Our readouts remained similar—which means they are in the range of stated mpg for the other powertrains. We never saw 40s. Then again, we were in sport a lot, not hypermiling.

We also thought we'd see how far we could go in pure EV mode—which switched off after just a mile or two, as we hit 50ish speeds. Back at parking lot speeds, it was available again, though only briefly. Our total EV mode driving miles were just a couple, at best. Pure electric usage seems unlikely, overall, in our rapid local culture and traffic.

Pure EVs often give us an inadequately cooled cabin in summer, but the ES 300h in EV mode still

delivered effective AC on a hot day, presumably a bonus of having a liquid-cooled engine in the mix, even when not delivering power at the moment.

The F SPORT treatment is largely cosmetic, no powertrain boosts, though suspension is tweaked a bit. In the V6 350 or the AWD 250, this should be a welcome boost in handling, for the power of the one and the traction of the other. In the hybrid, it seems less pertinent—but is still nice to have. Best of all, you have the same trim options with all powertrains, with surely a distinctively cool personality factor from having a hybrid bearing an F SPORT badge and looks. ■



SPECIFICATIONS

ENGINE	2.5L DOHC 16v with VVTiE
HP/TORQUE	215 hp / 176 lb-ft
COMPRESSION RATIO	14.0:1
BATTERY	244.8 V, 29.1 kW
HP	39 hp
DRIVETRAIN	FWD
TRANSMISSION	electronic CVT
0-TO-60 / TOP SPEED	8.1 sec / 112 mph
SUSPENSION	F: MacPherson strut-type indep, F Sport tuning; R: trailing arm multi-link indep; F/R: front/rear performance dampers
STEERING	rack-mntd elec rack & pinion
BRAKES	F: 12.0 vented; R: 11.1 solid
WHEELS / TIRES	19x8J split-five-spoke alloy w gloss black finish / 235/40 R19 A/S
LENGTH / WHEELBASE	195.9 / 113.0 in
GROUND CLEARANCE	na
TURNING CIRCLE	38.0 ft
HEADROOM (F/R)	(w mnrf) 37.5 / 37.4 in
LEGROOM (F/R)	42.4 / 39.3 in
CARGO CAPACITY	13.9 cu.ft
WEIGHT / DISTRIBUTION	3682 lb / 58/42%
FUEL / CAPACITY	reg 87 octane / 13.2 gal
MPG	43/44/44 (city/hwy/comb)

This vehicle was a prototype, with no Monroney sticker. Pricing information here is assembled from media resources for model pricing, content information provided with sample, and best match of option pricing from Lexus consumer materials.

BASE PRICE	\$45,450
PAINT: Cloudburst Gray	500
BE: intuitive parking assist w auto brake	na
GF: heads-up display	500
HL: premium triple beam LED headlights	1215
HM: power rear sunshade	210
NL: navigation and Mark Levinson 1800-watt, 17-spkr, premium audio package	*1820
OT: power open/close trunk w kick sensor	550
RF: color-keyed rear spoiler	na
WE: F Sport perforated NuLuxe-trimmed steering wheel w windshield wiper de-icer and fast-response interior heat	180
KC: key card	100
DESTINATION CHARGE	1075
TOTAL	*\$51,600

*BE: no cost info located
 *NL: stated \$1820 for nav option does not mention audio upgrade, so presumably should be more
 *RF: no cost info located
 *TOTAL: may be more per those missing items

2022 LEXUS ES LINEUP

ES 350	
302-hp 3.5L V6, FWD	
.....(base)	\$40,800
.....F Sport	45,450
.....Luxury	46,200
.....Ultra Luxury	49,980
ES 250 AWD	
203-hp 2.5L 4-cyl, AWD	
.....(base)	\$40,800
.....F Sport	45,450
.....Luxury	46,200
.....Ultra Luxury	49,980
ES 300h	
215-hp 2.5L 4-cyl + hybrid, FWD	
.....(base)	\$41,900
.....F Sport	45,450
.....Luxury	47,300
.....Ultra Luxury	51,080

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VISION, AMBITION AND ACTION

Checking all the boxes: Atlis Motor Vehicles, headquartered in Mesa, recaps progress made in 2021 and goals for 2022.

2021 MILESTONES BATTERY

- ATLIS and Clemson University began a three-year research partnership to advance development of Atlis Motor Vehicle battery cells. (February)
- ATLIS signed two memorandums of understanding. (February)
- Media Tech Co., Ltd. (Media Tech) will be ATLIS' sole supplier for the design, development, manufacturing, installation, and calibration of all machinery comprising the electrode, assembly, and formation lines required for ATLIS to create a limited-run prototype battery cell production line.
- Greatech will supply all parts, equipment, and machinery required to form ATLIS' limited-run prototype battery pack assembly line.
- ATLIS began production of the AMV battery cell at its headquarters. (June)
- ATLIS signed of a Memorandum of Understanding (MOU) with Elettricar's Motor Company (Elettricar's), an Italian/American-based electric vehicle manufacturer, interested in purchasing ATLIS's battery packs and cells in bulk for installation into its lightweight electric vehicles. (July)

- ATLIS entered into an agreement with Li-Cycle Corp. (Li-Cycle), an industry leader in lithium-ion battery resource recovery, and the leading lithium-ion battery recycler in North America. (November)

CUSTOMER EXPERIENCE

- ATLIS signed of a Memorandum of Understanding (MOU) with WhipFlip to handle customer vehicle trade-ins as part of the vehicle purchasing experience. (May)

XT TRUCK

- ATLIS announced strategic partnership with PowerBand Solutions Inc. ATLIS will be using their DRIVRZ™ technology to develop a bespoke, white-labelled marketplace for customers to purchase, lease, and insure their XT Truck from any digital device. (May)
- ATLIS revealed the prototype XT pickup, a purpose-built 100% electric truck designed to power work. This is the first electric work truck in development with a 300, 400 or 500-mile battery that will recharge in less than 15 minutes. (September)
- ATLIS signed a Collaboration Agreement with Australian Manufactured Vehicles Pty Ltd (AusMV) in which AusMV will buy ATLIS XT pickups and complete right-hand drive production in Australia. AusMV will purchase over 19,000 XT pickups through 2025. (September)
- ATLIS announced the signing of a Memorandum of Understanding with Schwab

Industries (Schwab) to engage Schwab's capabilities for Body-in-White manufacturing for the XT pickup truck. (October)

FINANCIAL ANNOUNCEMENTS

- ATLIS announced a \$300 million capital commitment from GEM Global Yield, LLC SCS (GGY), a Luxembourg-based private alternative investment group. (July)
- ATLIS closed its Regulation A+ offering which generated investments of almost \$15 Million from 9,000+ individuals at \$8.24 per share. (July)
- ATLIS announced the launch of a \$5 million equity crowdfunding campaign. (August)
- ATLIS closed its \$5 million Regulation CF crowdfunding campaign after just three weeks and securing \$2 million within 24 hours. (September)
- ATLIS successfully oversubscribed and closed its \$5 million equity crowdfunding campaign. (October)

2022 OUTLOOK

- Plans to scale deliveries of batteries to customers
- Ramp up to 10,000 battery packs delivered to customers in 2022
- Complete production intent design for XP platform and XT truck
- First salable trucks on the road
- Become a publicly traded company ■



Celebrating 50,000 miles with a ride to Mexico

Story and photos by Randall Bohl

An ice cream sandwich costs 30 pesos, I learned while in Puerto Peñasco—important knowledge.

It was November, and my '95 Honda Nighthawk was in the garage just 58 miles shy of its 50,000 mile odometer reading, when my friend Linda said I was welcome to stay at her place during the Rocky Point Rally. It was the perfect excuse to ride close to 700 miles, when I really only needed to go 58 miles for a photo of the odo.

I arrived at Linda's just before dusk on a Thursday, opening day of the rally. I found that Diane, a mutual friend, and Shawn, a new friend, were staying at Linda's, also. Sharing a house with three ladies for the weekend what could go wrong? Don't say.

The four of us walked a block to the beach next to Manny's Beach Club for sunset. I had a second story bedroom/bath with balcony overlooking Manny's—pret-

ty cool until that night, as I listened to live bands and Harleys until almost 3 am. This would not be a sleeping trip.

Friday morning, I rode over to the Malecón, ground zero of the rally. By 10 am, the streets were lined with bikes and packed with people. I found old friends Brenda and Jamie at the Tekila Bar, and we watched the festivities from the balcony until early afternoon. We then rode out to Cholla Bay and the much quieter JJ's Cantina for the afternoon. Dinner was Carne Asada from a street vendor in front of Manny's.

Saturday morning, with Shawn on the back the bike, we rode through Las Conchas, east of Rocky Point, admiring the beachfront homes. In the afternoon, Linda and Shawn headed to the Malecón to party, I did some riding around town, now filled with bikers, and landed at Las Palmas Resort, hanging poolside with Brenda and Jamie at their rented beachfront home.

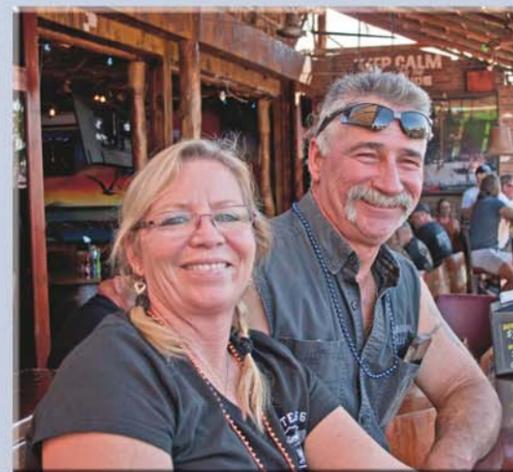
Arizona-based photographer-writer-rider Randall Bohl's 50,000 miles on the 1995 Honda Nighthawk have covered 25 states, from west of the Continental Divide to South Carolina and from North Dakota to Mexico.



Nobody was home at Linda's upon my return, so I walked a couple of blocks to a restaurant above the American Legion (yes, in Mexico) for a shrimp basket. Linda and Shawn came home with stories of rally debauchery I won't share here, but all true, I'm sure!

Sunday morning, we could hear the exodus of Harley-Davidsons headed north. We were staying until Monday, to avoid the inevitable backup at the border.

Linda put Shawn and me in her Polaris Ranger and took us for the same ride we'd done through Las Conchas, only this time beyond road's end over a giant sand dune to a fantastically lonely section of beach. We spent hours following the receding tide out hundreds of yards on the sandy ocean floor. It was tough leaving Monday morning. ■



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SPRINGTIME AT PHOENIX RACEWAY!

NASCAR WEEKEND RETURNS IN MID-MARCH

Phoenix Raceway's one-mile oval is fired up and ready to go this spring, as March race weekend kicks off with the third race of NASCAR's 2022 season here.

Grandstand seats, suite and club options, hillside general admission viewing (bring a folding chair or blanket), RV camping, and complete event and travel packages are all available, as well as the FanShield Infield Experience Pass for unequalled access to the pit area.

The weekend kicks off on Friday, March 11 with the ARCA Menards Series (time tba).

Saturday, March 12, don't forget your tank top and sunglasses as you watch up and coming drivers in the NASCAR Xfinity Series, at 2:30 pm.

And Sunday, March 13, brings Speed Fest fun for the entire family, as NASCAR heads West with drivers like Chase Elliott and Martin Truex Jr taking on the desert jewel.

TICKETS & INFO: Check ticket availability online at PhoenixRaceway.com, or call the Phoenix Raceway ticket office at 866-408-RACE (7223).

For 2022 NASCAR Cup Series information and other tickets, visit nascar.com/tickets. ■

MARCH NASCAR WEEKEND

FRIDAY, MARCH 11
ARCA MENARDS SERIES
GENERAL TIRE 150
time TBA

SATURDAY, MARCH 12
NASCAR XFINITY SERIES RACE
2:30 pm

SUNDAY, MARCH 13
RUOFF MORTGAGE 500
12:30 pm

Details subject to change



Easily compared. Or is it?

BY JOE SAGE

The 2022 Genesis G70 arrived here just two weeks after the GV70 crossover, a vehicle winning many accolades and which we liked so well, we put on our cover—one point of comparison now for the G70.

With the presence of a \$70,000 European or Japanese premium brand, this car has solid horsepower, tuned suspension, Brembo brakes and a performance-oriented rear- or all-wheel-drive platform, yet costs from the upper \$30s to the lower-to-mid \$50s—another point of comparison.

Genesis has been a bit slow to gain traction and build out its infrastructure as an independent brand since spinning off Hyundai six years ago. They seem to be following the Korean automakers' handbook of 15 to 20 years ago, whereby tremendous value is

affirmed and promoted via favorable pricing. Sales follow, and the brand builds.

Ours has the upper of two engines, a 365-hp 3.3-liter twin-turbo V6, base price \$42,100. Trim levels above that are achieved as option packages, and ours has both—Sport Advanced and Sport Prestige (see sidebar)—making this the top model (bar a special Launch Edition), but without AWD.

Genesis is a lower volume brand (increasing from 7,000 units in 2016 to 40,000 in 2021, thanks to a growing crossover lineup). Evolution is thus gradual, but brand identity has been solidifying around what they call an Athletic Elegance design aesthetic—strong, distinctive and readily noticeable by the newer V-bottomed grille, Quad Lamps front and rear, and a tip-to-tail Two Lines suggestion as front and rear lamps echo each other.

Our sample joins a trend of subtly color-shifting

paints. One of three whites available for the G70, this one is called Siberian Ice, vivid white turning a shadowy pale blue in certain conditions or depending upon what it's parked next to.

As is common, the key to our enjoying the vehicle was turning off a lot of its special features—the auto-sliding seat and its little song, and as many of the overly argumentative driver assist features as practical and/or safe. Some settings were in unusual places—for example, the seat override was in the binnacle with service intervals—and some were persistent even after our mission.

Once the obstructions were defeated, the drive was great. These were our wheels for NASCAR weekend—long freeway runs, ramp acceleration, stop-and-go surface streets and more. The twin-turbo V6 is quick and powerful. We started with a sport setting, which has great engine acoustics, and stuck with it. The eight-speed transmission is smooth, well-spaced and generally transparent.

Steering was accurate, but did fight us for auto-

control between the lines even after we thought we had turned its opinion off. Brakes were strong and smooth, though we noted an unusual feel, as though there may be a regenerative feature not spoken of, with a drag at slower speeds. Though we didn't use it, eco mode has a coasting mode, decoupling engine and transmission for better fuel economy (something we were trained as teens to never do, though this kicks back in if needed).

The interior was comfortable and spacious for our hour-long runs, from a driver's position (specs confirm generous front legroom, less so in the rear, though headroom is low-slung for ingress-egress).

The interior is nicely laid out and cleanly presented in the continuum of premium feel, though compared with those European or Japanese lines, seems in some ways closer to a \$35,000 mainstream brand than a \$70k luxury cousin. Features are plentiful, but surfaces and finishes are generally a lot plainer than we might expect.

This suggested to us one more point of comparison: its own cousins at Hyundai, where Sonata is

the closest model. The Genesis G70 offers more powerful drivetrains and rear- or all-wheel drive versus Hyundai's front-drivers. G70 prices start just above where Sonata leaves off. Together, they form their own smooth continuum, with Genesis in the upper range largely due to its powertrain.

We generally avoid looking at others' reviews, but with a little digging, we found we were not the only ones to contemplate that last point. The newest Hyundai has received high praise for styling, technology, finishes and materials, notably on the interior, remarkable partly due to its lower pricing and expectations, but viewed objectively. Genesis surely aims to be the more prestigious name, and the vehicles are rarer on the road. But while they are firmly knocking on the doors of the premium Europeans and Japanese, Hyundai may be knocking firmly on theirs. It's one more intriguing comparative we hadn't been expecting, but in the end, we could not ignore. ■



SPECIFICATIONS

ASSEMBLY	.....Ulsan, South Korea
CONTENT	.....5% US/Canada, 85% S Korea
ENGINE/TRANSMISSION	.....S Korea
ENGINE	.....3.3L single-scroll twin-turbo V6, mid-position lock CVT, dual-stage variable oil pump, integrated exhaust manifold head
HP/TORQUE	.....365 hp / 376 lb-ft
COMPRESSION RATIO	.....na
DRIVETRAIN	.....RWD (AWD avail)
TRANSMISSION	.....8-spd shift-by-wire auto
SUSPENSION	.....F: MacPherson strut; R: multi-link
STEERING	.....rack-mounted motor-driven pwr
BRAKES	.....Brembo braking system
WHEELS	.....19" sport alloy
TIRES	.....F: P225/40 ZR19 / R: P255/35 ZR19
LENGTH / WHEELBASE	.....184.45 / 111.61 in
GROUND CLEARANCE	.....na
TURNING CIRCLE	.....na
HEADROOM (F/R)	.....(with snrf) 38.5 / 36.9 in
LEGROOM (F/R)	.....42.64 / 34.8 in
CARGO CAPACITY	.....na
WEIGHT	.....na
FUEL / CAPACITY	.....prem / 15.85 gal
MPG	.....18/27/21 (city/hwy/comb)

BASE PRICE	.....\$42,100
SPORT ADVANCED PKG:	19" sport alloy wheels, alum trim w sport pattern, vented front seats, wide sunroof, Lexicon 15-spkr premium audio, wireless device charging (eliminates one front USB port), dark chrome grille & window trim, variable exhaust valves, power driver seat bolster & extension, parking distance warning fwd & rev, Genesis digital key.....4300
SPORT PRESTIGE PKG:	heads-up display, surround view & blind-spot view monitors, Nappa leather, microfiber suede headliner, headed steering wheel, Brembo brakes, limited-slip diff, electronically controlled suspension.....4000
DESTINATION CHARGE	.....1045
TOTAL	.....\$52,445

2022 GENESIS G70 LINEUP

	RWD	AWD
2.0T : inline-4 turbo GDI, 252 hp, 260 lb-ft		
Standard	\$37,525	\$39,625
Prestige	41,525	43,625
3.3T : twin-turbo V6, 365 hp, 376 lb-ft		
Standard	\$42,100	\$44,200
Sport Advanced	46,400	48,500
Sport Prestige	50,400	52,400
Launch Edition	52,500	54,500

2022 HYUNDAI SONATA LINEUP

2.5L : inline-4 GDI, 191 hp, 181 lb-ft.....FWD	
SE	\$24,150
SEL	25,950
1.6T : inline-4 turbo GDI, 180 hp, 195 lb-ft.....FWD	
SEL Plus	\$31,150
Limited	34,100
2.5T : inline-4 turbo GDI, 290 hp, 311 lb-ft.....FWD	
N Line	33,450
N Line Night Edition	34,750

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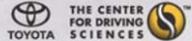
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High flying good times—for a good cause

The AZ Jet Center Event at the Scottsdale Airport is back, returning February 26, with tickets on sale now. Demand has been increasing for the charitable causes the event serves—Wings of Humanity, flying sick children; Sol Dog Lodge, at capacity and breaking ground on a new facility so they can serve more dogs and the people who love them, via their Hearts at Ease programs, service dogs for Veterans, and more; and Donate Life, the Arizona registry for organ and tissue donations.

The Jet Center Foundation supports these causes via a good time for all.

This year has a new venue, new live music, new artists and fashion, new gourmet food selections from two restaurants, premium and top shelf spirits and wine, new jets and helicopters to tour, and a spectacular collection of cars.

This year's new host is Sawyer Private Hangars, located at 15035 N 73rd Street (near Scottsdale Quarter). In addition to plenty of parking, the site has a great hangar and tarmac access. Sawyer will feature three of their charter and training aircraft and showcase their newest hangar.

With Sawyer one of the recognized flight services providing professional organ transport, there

is a holistic synergy not typically found at luxury lifestyle events.

"We are thrilled to host the AZ Jet Center Event as one of our first events in the new space." Said Chad Verdaglio, president of Sawyer Aviation. "The synergy with the Jet Center team, and the common values we have with the charities being supported is simply a great match!"

There are also new opportunities for partnership. Donations to the charities are encouraged, and those donating will be eligible for incentive gifts randomly selected from those who donate at prescribed levels. See website and stay tuned for incentive opportunities for donors.

An exceptional hidden gem in the Scottsdale Airpark is the Desert Rock Winery & Distillery, at 7302 E Helm Drive. Owner Paul Hoffman and his wife Shannon are generous souls who have agreed to host the entire bar service for the event—wine, spirits, mixers and special signature cocktails especially for the event.

Desert Rock has expanded over the last several years and produces some simply amazing top shelf spirits, from full taste bourbon whisky and flavored whiskys of cinnamon and chocolate peanut butter,

to smooth vodka, rum and several varieties of tequila including Blue Agave. The tasting room is open to the public with special events exclusively for his Desert Rock Wine Society club members. They often host live music on weekends, and a rotating food truck by their outdoor tiki patio on weekend nights makes for an exceptional evening out with friends, right close to home. Their web site lists the food and artists each week: www.desertrockin.com.

To reserve your tickets to the AZ Jet Center Event on Saturday February 26, 2022, visit: www.jetcenterevents.com. ■



Stepping stone

BY JOE SAGE

It's still big news when a full hybrid powertrain makes its way into the Ford F-150, even as widespread as hybrids have become. Of the various engines available in an F-150 (see lower sidebar), the new 3.5L PowerBoost full hybrid V6 beats all for output, at 430 hp and 570 lb-ft of torque. Its tow capacity is a little less than EcoBoost or V8, but tops the diesel.

No two specific big pickups are ever quite the same, with variables large and small, though this particular one has much in common, as the computer chip shortage ran this model year into a bit of overtime, with another 2021 we had a year ago. The first had the same engine in a high-end ranch-ready King Ranch with FX4 off-road package, while this is a more elegant top-of-the-line Limited—and a hybrid. The first had enough options and packages to end up in the upper \$70s, same as this.

As with any F-150, the hybrid has a knockout interior with systems and features generally well developed. It's the powertrain that differentiates it the most. Fuel mileage was TBD in the prior truck; it now comes in at an unusual but easy-to-remember 24/24/24 mpg city/highway/combined.

There's a riddle in those fuel mileage numbers. With most traditional vehicles, city mileage is lowest, while in most hybrids, city is higher than highway (largely due to energy gained in regenerative braking). But on this one, they're all the same.

We first drove the truck on our regular errands—surface streets and parking lots, freeways and on-ramps (where the hybrid's power and torque

really shine). Our readings ranged from just 10.1 to a brief high of 12.8 mpg. Hmm. We could get that in a Super Duty with the biggest V8. By 50 miles, we were up to 13.6 mpg, better, but we could do 50 miles in an EV while hardly tapping its full range. Our hybrid F-150, on the other hand, had over 400 miles of range left and can be refueled much more quickly than an EV.

Bearing in mind that we drive normally, as you probably do, no painful hypermiling. Not achieving anything like 24 mpg in town, we headed for I-17, at that point reading in the 14s. Zeroing out gave an instant reading of 21.0, and future resets would be similar. This quickly dropped to 17.0, then by Anthem, before serious climbing, was up to 18.9

mpg. Not bad, though we still hadn't seen the 20s and certainly not 24 as rated.

The two-lane climb in Black Canyon brings bottlenecks, slowing and passing, normally inefficient but in this case with benefits likely via regenerative braking. At the top, though, we were back down to 17.0. Idling at the top for 20-30 minutes while taking photos, we dipped to 16.6, not bad.

Heading south, descending then leveling out at New River, we hit 17.6, concluding that any negligible difference between climbing and descending was perhaps attributable to regenerative braking as much as to engine load. Once back on the 101, we finally hit our best—20.4 mpg—evidence that Arizona's aggressive but cooperative freeway traffic is indeed quite efficient.

The results seem counterintuitive, in the face of conventional thinking that hybrids do better in town and despite this truck having the same rating for all. But this offers promise in any usage.

After more local driving, despite red lights, surface street turns and other regenerative opportunities, we ended with

a 15.5 mpg final average.

One behavior we never adjusted to was a feeling at low speed, starting out, or in tight parking lot maneuvers, where you want to ease forward or back. Presumably due to the regenerative brake system, we felt stuck in wet cement, till applying enough pedal and breaking free more abruptly.

We expected the basic takeaway to be that this drives like an f-150, but one that gets really good fuel mileage. Neither, though, seemed quite completely the case. Yet there will be something irresistible about this formula for many—an evolutionary point on the path from EcoBoost to F-150 Lightning full EV. It can also be seen as a destination in its own right—a rock solid proven truck, now specifically engineered to deliver more power, range and tow capacity.

There are many ways to compare F-150 powertrains—towing, price, fuel mileage, even that satisfying V8 growl in some. A regular 3.5L EcoBoost runs \$600, a PowerBoost hybrid engine \$2500. You may get that back quickly at today's fuel prices.

All those statistical or philosophical riddles aside, Ford has hit the nail firmly on the head with this truck—to the point you may be thinking, wait, what, they didn't always make one of these? ■



SPECIFICATIONS

ASSEMBLY	Dearborn, Michigan
ENGINE	3.5L PowerBoost™ twin-turbo/intercooled 60° V6 DOHC, alum/alum, port fuel inj w direct inject
COMPRESSION RATIO	10.5:1
HP/TORQUE	430 hp / 570 lb-ft
DRIVETRAIN	4x4
TRANSMISSION	10-spd modular hybrid electronically controlled hydraulic auto
REAR AXLE	3.73
SUSPENSION	F: indep dbl wishbone w coil-over shocks, stamped lower control arm; HD gas shocks R: leaf spring / solid axle, HD gas shocks Planar Susp System (sidebar, next page)
STEERING	electronic pwr assist
BRAKES	electronically controlled boost; F: vented disc, Nitro Tough Iron, 350 x 34 mm, 2x 51mm sliding caliper R: vented disc, Nitro Tough Iron, 336 x 20 mm, 1x 54mm sliding eIPB
WHEELS	22-in polished aluminum
TIRES	275/50R22 BSW all-season
TRACK (F/R)	67.9 / 68.3 in
LENGTH / WHEELBASE	231.7 / 145.4 in
BED LENGTH	nominal 5.5 ft inside length at floor 67.1 in
HEIGHT / WIDTH	77.2 / excl mirrors 79.9 in
OVERHANG (F/R)	37.6 / 48.6 in
APPR / DEP / BRKOVER	24.3 / 25.3 / 20.0°
GROUND CLEARANCE	9.4 in
TURNING CIRCLE	47.8 ft
HEADROOM (F/R)	40.8 / 40.4 in
LEGROOM (F/R)	43.9 / 43.6 in
WEIGHT	5517 lb
PAYLOAD / GVWR	1830 / 7350 lb
TOW CAPACITY / GCWR	12,400 / 18,400 lb
FUEL / CAPACITY	reg 87 oct / 30.6 gal
MPG	24/24/24 (city/hwy/comb)
BASE PRICE	\$74,250
SMOKED QUARTZ TINTED CC METALLIC	510
3.5L POWERBOOST FULL HYBRID: incl hybrid elec	
10-spd auto trans, 3.73 electronic lock rear axle, 7350# GVWR pkg	1900
FLOOR LINER: tray style w carpet mat	200
INTERIOR WORK SURFACE	165
MAX RECLINE FRONT SEATS	340
TOUGHBED SPRAY-IN BEDLINER	595
DESTINATION CHARGE	1695
TOTAL	\$79,655

(Note: Monroney price varies from prices below.)

FORD F-150 (2021)*	4x2	4x4
XL	\$29,290	+\$4645
XLT	35,400	+1500
Lariat	45,045	+5570
Tremor	na	\$49,505
King Ranch	56,015	+3425
Platinum	58,795	+3425
Raptor	na	64,145
Limited ▼	73,105	+3425

2022 also adds the F-150 Lightning Full EV

*Base configuration for each. Major variables vary by trim; not all are available with all trims; and not all combinations are available, e.g. 4x4 may require diff cab/wheelbase or engine:

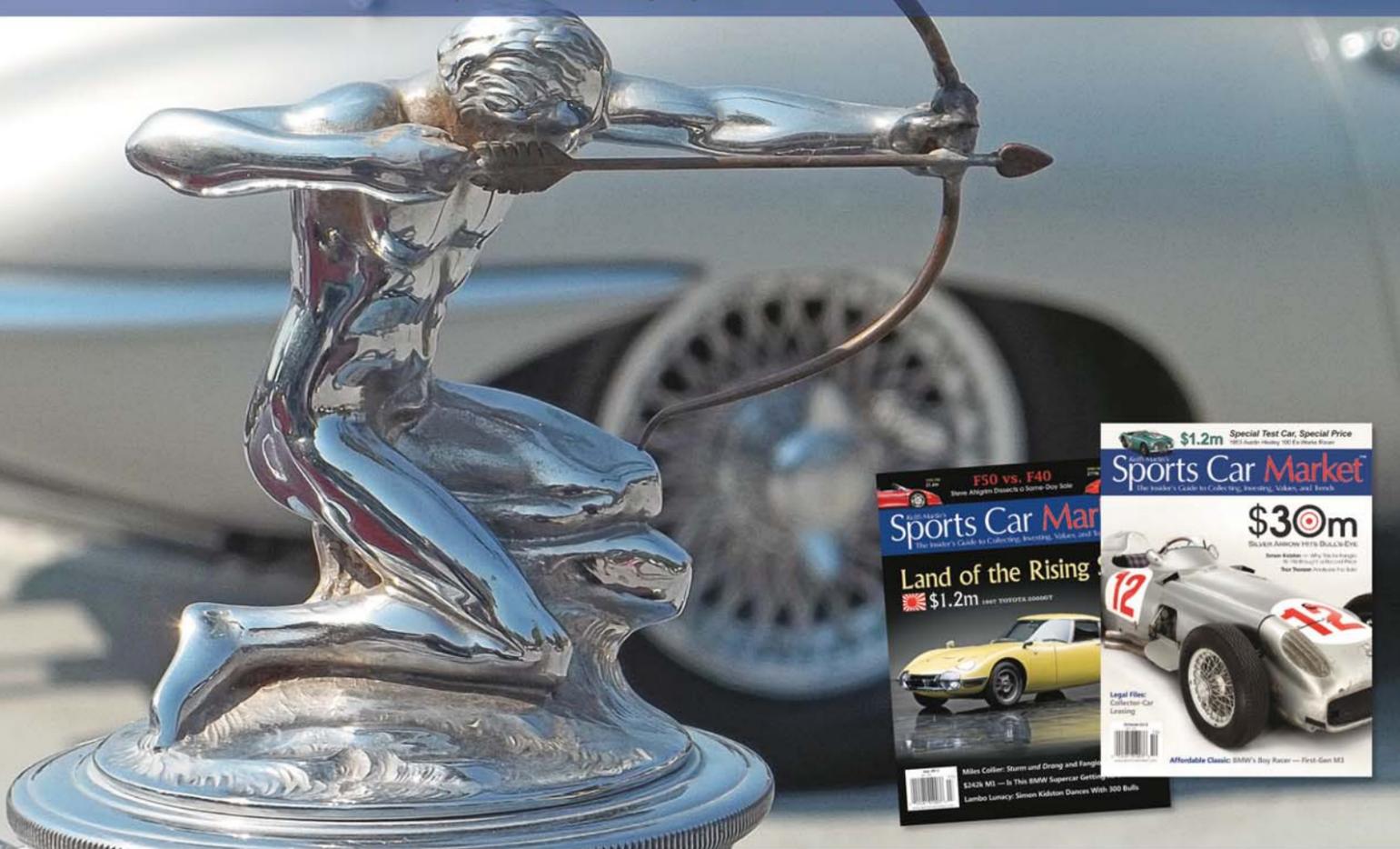
- **POWERTRAIN:** 4x2 or 4x4
- **CAB:** Regular, SuperCab, SuperCrew
- **WHEELBASE:** 122.8, 141.5, 145.4, 157.2, 164.1 in
- **BED LENGTH:** 5.5, 6.5, 8 ft
- **ENGINE:** 3.3L V6, 5.0L V8, 2.7L V6 EcoBoost, High Output 3.5L V6 EcoBoost, 3.5L V6 PowerBoost Full Hybrid

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A WEEK WITH : 2021 ACURA TLX TYPE S / PERFORMANCE WHEEL & TIRE

S, indeed BY JOE SAGE

Acura is clearly proud of this new car. On top of the usual documentation, Acura sent us a comprehensive 43-page technical overview, which has the new TLX Type S falling almost at the top of the entire brand pyramid, above A-Spec models and with only the NSX supercar above it.

The first Type S since a TL in 2008, this is the first application of the badge to the TLX. Its competitive set is stated as Audi S, Mercedes-AMG and BMW M xDrive. We think of those as delivering performance first, but Acura lists that third, after styling/stance and the cockpit experience.

The cabin is so generous, it evokes the feel of a full-size American car. Sure enough, hiproom is almost identical to a Chrysler 300, and the Acura has more front legroom, though less in the second row. The TLX claims the widest stance among a defined set of 16 compact and midsize cars—great inside, though it can make the car feel larger than expected in tight traffic or turns in town.

The powertrain is its core attribute, with up-graded suspension and brakes to support its power and speed. An all-new high-horsepower V6 turbo has roots in both the NSX and Acura motor-

sports. Horses and torque are both bumped up considerably, especially torque, which hits its high almost immediately and sustains it. The transmission is completely retuned, with paddles promising rev-matching downshifts 40 percent quicker than in a standard TLX 2.0L turbo four. This is the first application of a Type S build with Acura's (gen-four) Super Handling AWD, very welcome as an alternative to the front-drive basis of the TLX.

Extensive logbook notes indicate the user interface was more maddening than average in a number of specific cases, counterintuitive when its intent was quite the opposite, and activations of parking and cross-traffic alerts were inconsistent.

The open road experience can be very good. We took the TLX S Type on a long run up the Beeline Highway, most of the way to Payson and back (with lane-keeping and other such interferences long since turned off). One oddity, though. Sweeping through the hills and curves, we'd give that rev-matching transmission a paddle-induced downshift, but rather than gearing down and torquing up, it seemed to do the opposite, on both uphill and downhill trials—which remains a mystery.

Going heavier on performance works well with this car. Working around many of its layers of tech are your best bet to making it the best it can be. ■

SPECIFICATIONS

ASSEMBLY	.....Marysville, Ohio
ENGINE	.....3.0L V6 alum 24v twin-scroll turbo
HP/TORQUE	.....355 hp / 354 lb-ft
DRIVETRAIN	.....Super Handling AWD (SH-AWD)
TRANSMISSION	.....10-spd auto, rev-match downshift
ZERO-TO-60 / TOP SPEED	.....±5.0 sec / 155 mph
SUSPENSION	.....high perf chassis bracing; F: dbl wishbone; R: multi-link, 30.0 / 22.5mm stblzr bar;
STEERING	.....belt-driven variable-ratio elec
BRAKES	.....F: Brembo 4-p 14.3mm vented; R: 13mm solid
WHEELS	.....20x9 shark gray lightwt Y-spoke
TIRES	.....255/35 R20 97Y Pirelli P Zero summer
LENGTH / WHEELBASE	.....194.6 / 113.0
TURNING CIRCLE	.....40.2 ft
HEADROOM (F/R)	.....37.2 / 36.3 in
LEGROOM (F/R)	.....42.5 / 34.9 in
CARGO CAPACITY	.....13.5 cu.ft
GROUND CLEARANCE	.....5.3 in
WEIGHT	.....4200 lb
FUEL / CAPACITY	.....91 oct prem unl / 15.85 gal
MPG	.....19/24/21 (city/hwy/comb)

BASE PRICE (2021)	.....\$53,100
PERFORMANCE RED PEARL	.....500
DESTINATION CHARGE	.....1025

TOTAL **\$54,625**

2022 ACURA TLX LINEUP

(base)	.....2.0T	.....FWD	\$37,700	.....AWD	\$39,900
Technology	.....2.0T	"	41,700	"	43,900
A-Spec2.0T	"	44,450	"	46,650
Advance2.0T	"	"	"	48,700
Type S3.0T V6AWD	52,800		
Type S Perf Tire3.0T V6▼	53,600		



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SHIFT by Joe Sage
QX60 GENERATION TWO

The Infiniti QX60 picks up the brand's subtle but effective styling evolution for generation two, immediately recognizable to our eye by elimination of the pinch in the grille. This trim but surprisingly spacious three-row, seven-seat SUV began its life briefly as the JX, before brandwide QX alphanumeric unification late in its first year.

Four trim levels range from the mid-40s to just above \$60 grand, quite reasonable for a premium-luxe brand, all with the same 295-hp 3.5L V6 and 9-speed automatic. The QX60 is a front-driver, with AWD available on all. Our sample is the top trim, Autograph, in top form with all-wheel drive.

The QX60's interior volume is generous—second row legroom wowed us beyond what its numbers suggest. Infiniti interiors have been notable for some time for multiple tones of leather, exotic woods and metals, almost over the top, but distinctive, appealing and clearly luxurious. This top trim QX60 seems to back off that, for more fundamental value at quite attractive prices, though this tightens the comparison with its Nissan cousin (for QX60, that's the Pathfinder).

In typical Infiniti fashion, general system setup is smoother than average, and cameras have been ahead of the curve for years, in this case enhanced by one of the better implementations we've seen for dipping mirrors in reverse, if and when needed.

Infiniti's SUV lineup has four models versus cousin Nissan's six, or you might almost say three, as the QX55 is a coupe-like variant of the QX50.

We liked the QX55 quite a bit, even with a CVT, a feature some love to hate but we think most people will never notice. The gen one QX60 also had a CVT, and the sound and behavior of the new one's powertrain—lag and surge, lack of precision in tight moves—made us think it was a CVT, too, but no, it's that all-new 9-speed. Sport mode mitigated this (also delivering a much firmer ride).

Steering and perhaps front-drive bias exhibited uninitiated torque behavior between the lines on the freeway when going straight. This was a pre-production unit, though, as the global chip supply crisis continues, so perhaps some elements of shift, steering or lane-keeping were not final.

We had concluded the QX55 delivered a "tidy, attractive, fuel-friendly" premium SUV at a great price. Though it left us with a bigger smile on that round, that is still the case with the QX60. ■

SPECIFICATIONS

ENGINE	Transverse 3.5L V6 alum/alum 24v
HP/TORQUE	295 hp / 270 lb-ft
DRIVETRAIN	Intelligent AWD
TRANSMISSION	9-spd automatic shift-by-wire
SUSPENSION	twin-tube dual-flow path shocks; F: MacPherson strut, 29mm stblzr bar; R: multi-link indep, 28.6mm stblzr bar
STEERING	vehicle speed variable assist
BRAKES	F: 13.78 x 1.18 vented, dual-piston; R: 12.99 x 0.63 solid; single floating caliper
WHEELS / TIRES	20x8 lux machined alum-alloy w charcoal metallic finish / 255/50 R20 a/s
LENGTH / WHEELBASE	198.2 / 114.2
TURNING CIRCLE	38.1 ft
HEADROOM (F/2/3)	40.8 / 37.5 / 35.7 in
LEGROOM (F/2/3)	42.1 / 37.7 / 28.0 in
CARGO CAPACITY	14.5 / 41.6 / 75.4 cu.ft
GROUND CLEARANCE	6.7 in
WEIGHT / TOW CAPACITY	4655 / 6000 lb
FUEL / CAPACITY	.91 oct prem unl / [unknown] gal
MPG	20/25/22 (city/hwy/comb)
BASE PRICE	\$63,250
SUPER PREMIUM PAINT: Deep Bordeaux w Black	900
DESTINATION CHARGE	1025
TOTAL	\$65,175

2022 INFINITI QX60 LINEUP

Pure	\$46,850	AWD	\$48,850
Luxe	\$52,900	AWD	\$54,900
Sensory	\$56,350	AWD	\$58,350
Autograph	\$60,350	AWD	\$63,250

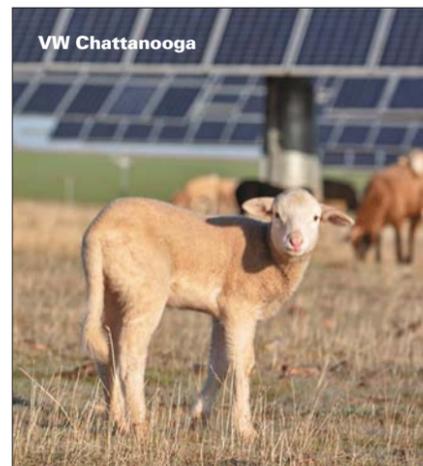




Mercedes-Benz will build ultra-high-performance axial-flux electric motors at its Berlin site, insourcing further electric drive components as they prepare to go all-electric by 2030 where market conditions allow. The portfolio of the Berlin plant already includes electric drive units and the EE Compartment. Mercedes-Benz secured access to unique axial-flux technology by acquiring YASA, a UK-based manufacturer of ultra-high-performance electric motors, last summer. Build-up of their Digital Factory Campus for development, testing and implementation of MO360 software applications has reached an advanced stage. A series of pilot lines will go into operation this year, as Berlin becomes the global competence center for digitalization and the rollout for new releases in the MO360 ecosystem. Mercedes-Benz is investing a low triple-digit-million euros in transformation of the plant over the next six years.

Volkswagen Chattanooga has created more than 4,000 jobs in the region over the last decade. The workforce has now grown to include non-human coworkers—a herd of about 50 sheep—essential to the plant's solar operations. VW's 9.5MW solar park, built in 2013, is one of the largest at a US auto plant, with 33,600 solar modules spread over 33 acres, and provides up to 12.5 percent of the facility's electric needs. Silicon Ranch Corp. of Nashville manages the solar farm, as well as other regenerative energy projects across the country. Silicon Ranch has about 6,000 of

11,000 acres nationwide under its solar panels used as grazing land for sheep (what it calls regenerative management). "Adaptive grazing with sheep is an efficient and cost-effective way to control vegetation and minimize erosion risks on utility scale solar facilities," said Loran Shallenberger, Silicon Ranch project manager. The sheep are reliable workers, munching through grass every day of the year in a range of temperatures. To help keep them



safe, "rescue donkeys" alert the sheep of any threatening wildlife. The solar farm mowed by sheep was key to the VW facility achieving its initial Platinum LEED (Leadership in Energy and Environmental Design) status in 2011, while the plant is a key element of a strategy to make its business carbon neutral worldwide though electrification—in this case, also embracing a natural maintenance solution.

In 2020, **Vredestein Tires**, with over 111 years of heritage including high profile track, off-road and winter racing in Europe, launched a broad expansion into North America, with several all-new products developed for our roads and drivers. The Vredestein Pinza AT is a first-ever foray into America's pickup and SUV segments. Years of focused study into the habits of these owners, with proving ground development spanning climates and weather conditions on three continents, have produced an all-terrain tire promising confident on-road performance in all weather conditions, with the extreme capability and durability required when venturing off-road—a mix they call Comfortably Rugged. Available in both P-metric and LT variants, the Pinza AT has Silent Groove and multi-pitch technology for quieter on-pavement operation than typical all-terrain tires; stone ejectors and three-ply triplex casing engineered for enhanced durability and protection against external damage; an interlocking sipe design for tread stability; an aggressive shoulder de-



sign for both rugged aesthetics and full capability in mud, sand and snow; and a severe snowflake marking meaning it's ready for every winter driving scenario. Vredestein (part of Apollo Tyres Ltd since 2009) backs Pinza AT with a 70,000-mile warranty for P type, 50,000-mile for Light Truck. There are 47 sizes at launch, including 22 Light Truck sizes, with 15 more planned for rollout phase two.

In a first-of-its-kind program launched in 2020, every **Toyota GR Supra** comes with a one-year NASA membership and one complimentary day in NASA's High Perfor-



mance Driving Event program. Now, NASA and Toyota are expanding the program to all buyers of Toyota's GR86. If drivers want more track time that weekend, they can sign up for a second day at 50 percent off the usual rate. And a complimentary year-long NASA membership allows GR Supra and GR86 owners to get more HPDE instruction at tracks near home and around the country. Visit SupraTrackDrive.com.

Honda has successfully run a month-long field test of a prototype fully electric Honda Autonomous Work Vehicle (AWV) at a large-scale Black & Veatch solar energy construction site in New Mexico. The gen-two prototype AWV performed a range of functions, including towing and transporting construction materials, water and other supplies to pre-set destinations within the site. While Honda had performed testing with an earlier generation AWV, this was the first to deploy multiple units working collaboratively. First introduced as a concept at CES 2018 in Las Vegas, the Honda AWV combines a rugged and durable off-road side-by-side platform with a suite of sensors to operate autonomously—GPS for location, radar and lidar for obstacle detection and 3D cameras for remote monitoring. The vehicle can also be operated by remote control. Black & Veatch, a global engineering, procurement and construction company, provided detailed feedback for product and business requirements that will help enhance the Honda AWV's development.

Vianode's industrial pilot for battery materials in Kristiansand, Norway, started production last spring with a capacity of up to 200 metric tons of battery grade syn-



thetic graphite. Norway seeks to increase exports by 50 percent and cut emissions by 55 percent within this decade, while Vianode intends to reduce the CO2 footprint from production of synthetic graphite by 94 percent. Vianode is in advanced dialogs with battery value chain participants and has signed MOUs with customers. They are also planning a fast-track and large-scale plant at Herøya Industrial Park, to be financed in two stages. In addi-



tion to synthetic graphite materials, Vianode continues advanced research on silicon-graphite composite materials for improved battery performance and is participating in Hydra and 3beLiEve research projects on next-gen lithium-ion batteries, coordinated by SINTEF and the Austrian Institute of Technology, both with funding from the EU Horizon program. Vianode is also investing in R&D on battery-grade graph-

ite recycling, supported by the Norwegian Research Council, with grants from Innovation Norway on the pilot plant and Enova for planning the battery materials plant.

Although battery recycling is not a new technology, the innovation space for Li-ion battery recycling is active. By the end of 2020, 17.6 GWh of **Li-ion batteries** had reached end of life; by 2035, this will balloon to over 140 GWh. Existing recycling infrastructure isn't optimized to either handle end-of-life battery capacity nor meet critical recycled materials demands as electrification ramps up. Historically, most battery recycling efforts offered low recovery rates for cathode active materials while consuming unsustainable amounts of energy and chemicals to do so. New data from Lux Research evaluated battery recycling opportunities for chemical and materials companies, cathode manufacturers, and automotive OEMs and examined emerging startups and where they fit along the traditional battery value chain. Developers are concentrating on increasing the recovery rates of battery materials and especially higher-purity materials to maximize the value of recycled products. Each will require its own path to market, as companies developing recycling processes must consider which chemistries can be recy-



clered and what the resulting product will be. The industry has historically been buoyed by high-cobalt-content consumer electronics batteries, but as electric vehicle batteries begin dominating Li-ion waste streams, recyclers will have to process diverse cathode chemistries at higher volumes. This ongoing shift toward battery recycling will impact every player across the Li-ion battery value chain. ■

UPCOMING FEATURES

Hyundai Santa Cruz



Honda Civic Si 6MT / also Civic Hatchback



Toyota 4Runner TRD Sport



Volkswagen Taos



January Arizona Auction Week results/highlights



Artist Lucretia Torva Phoenix Raceway mural



NWAPA "Mudfest" Outdoor Activity Vehicle of the year



Global YouTube sensation Sarah-n-Tuned of Tucson



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