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For performance, restyling & customization professionals

The way Forward
Identifying opportunities for the coming year

PRECISION ENGINE
PART III

SEMA SHOW
REPORT

ON THE COVER

Like airline travelers bracing for expected turbulence, retailers are preparing for a tricky operating environment in 2024. Overall, the specialty auto aftermarket looks to be in good shape, but plenty of unknowns should make it an interesting year. Our writers offer forecasts and best practices to steer you through the coming months. (Photo courtesy American Expedition Vehicles - AEV)

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Jef White
Editor

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ADAS Trust Continues to Rise

Automotive technology is again in the news, as a recent report shows drivers are putting more and more faith into systems that help them pilot their vehicles.

With the advanced driver-assistance systems (ADAS) market projected to reach \$191 billion globally by 2030, a majority of respondents to a survey of more than 3,200 consumers in China, the U.S. and Germany conducted by global consulting firm AlixPartners say they trust ADAS features, even if those drivers have had a negative experience or no experience at all with the options in the past.

The technology ranges from basic Society of Automotive Engineers (SAE) Level 1 collision warnings to Level 4/5 full control of steering, braking and emergency autonomous driving.

The good news for aftermarket shops that have the ability to add these features is that consumers assign thousands of dollars of value to even relatively basic versions of ADAS technology and are increasingly willing to utilize subscription services to acquire the features they want.

A majority of surveyed consumers identified key offerings that they value and will place importance on in their next vehicle purchase, including adaptive cruise control, automated emergency braking, highway hands-free driving, lane following in stop-and-go traffic and automated parking.

Additionally, those with prior ADAS experience are 12-52% more likely to endorse and expect these features.

"The willingness to embrace ADAS technology follows a broader trend," says Mark Wakefield, global co-leader of the automotive and industrial practice at AlixPartners. "Customers value 'CASE' (connected, autonomous, shared-mobility, electric/electrified) technologies more than horsepower, handling or other nonvisible vehicle attributes."

Among the other key findings in the survey and report:

- 60-82% of consumers trust ADAS systems, depending on the level of automation offered in the vehicle and previous experience with the technology
- Customers with prior ADAS systems average a 31-40% higher willingness to pay for full Level 5 vehicle autonomy
- 37% of the \$191 billion in automaker ADAS revenue that AlixPartners forecasts by 2030 will come from subscriptions
- Level 2 and Level 3 ADAS system costs will decline 38% by 2030, driven by hardware cost reductions
- For advanced ADAS systems (Level 3 and higher), 43% of consumers prefer pay-per-use or subscriptions, while only 41% prefer upfront payment

"The future of the automotive industry is increasingly new-tech-driven by consumers who value features that are apparent in everyday driving—whether they be safety-oriented or the type of connectivity they experience on a smartphone," Wakefield says. "Buyers tell us that automakers should get ahead of the curve on ADAS technology, and that those willing to stake a leadership claim with new feature offerings and innovative pricing models will be rewarded as the industry gradually moves toward increased connectivity and increasingly autonomous driving." **TS**

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Shops can expect to navigate tricky economic terrain.//////////By Phillip M. Perry

Fasten your seat belts and enjoy the ride.

Like airline travelers bracing for turbulence, retailers are preparing for a tricky operating environment in 2024.

On the plus side, the economy will continue to grow, although at a slower pace. Shoppers and business owners are feeling fairly optimistic as unemployment remains low, capital investments are plugging along at a healthy pace and the all-important housing market is burgeoning.

Throwing cold water on the good times, however, is a significant downer that no one can control: Higher interest rates established by the Federal Reserve to control inflation that are putting some downward pressure on business activity and shoppers' buying habits.

Economists are taking note by lowering expectations for the next 12 months.

"The coming year will continue to be a difficult environment for retailers," says Scott Hoyt, senior director of consumer economics for Moody's Analytics (economy.com). "We're expecting 2.5% retail sales growth for 2024, slower than the 4.7% growth expected when 2023 numbers are finalized."

When adjusted for inflation, he notes, retail sales are expected to be flat for both years.

The slowdown comes on the heels of a healthy 9.3% retail sales increase seen in 2022, a time when pandemic-era shoppers were still loading up on goods for the home. Those days are gone, and retailers should expect shoppers to continue to spend more on services rather than merchandise.

Hoyt feels that spending on categories such as recreation, travel and entertainment is still below pre-pandemic levels.

"I think we have another year in which

the shift toward services is going to be something retailers need to deal with."

ECONOMY SLOWS

Retail's current position reflects a deceleration in the larger business environment.

"We expect real GDP to grow 1.4% in 2024," says Bernard Yaros Jr., assistant director and economist at Moody's Analytics.

That's slower than the 2.1% increase expected when 2023 numbers are finally tallied, and below the 2-3% growth considered emblematic of normal business growth.

(Gross Domestic Product, the total value of the nation's goods and services, is the most commonly accepted measurement of economic growth. "Real" GDP adjusts for inflation.)

Slowing commercial activity will affect bottom lines. Moody's Analytics expected a decline of 4.5% in corporate profits for

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U.S. Gross Domestic Product (GDP) Annual % Change

2014: 2.3%
2015: 2.7%
2016: 1.7%
2017: 2.2%
2018: 2.9%
2019: 2.3%
2020: -2.8%
2021: 5.9%
2022: 2.1%
*2023: 2.1%
*2024: 1.4%

Economists predict slowing growth for 2024.

Sources: World Bank;

* = projections by Moody's Analytics.

2023 and only a modest recovery of 0.3% in 2024.

Reports from the field confirm the economists' readings.

"Our members are experiencing a business slowdown, due largely to the effect of increasing interest rates," says Tom Palisin, executive director of The Manufacturers' Association, a York, Pennsylvania-based regional employers' group with more than 370 member companies (mascpa.org).

While businesses understand the need for higher interest rates, they nevertheless hope for early relief.

"If inflation does not continue to drop, interest rates will have to be increased further, which will be a big problem," Palisin predicts.

Are the Federal Reserve's efforts paying off? There's some good news there, as well as a sunny forecast. Moody's Analytics expects year-over-year consumer price inflation to average 3.2% when 2023 numbers are finalized, down from over 6% a year earlier.

Moreover, the number should continue to drop until it reaches the Fed's target rate of 2% late in 2024. (These figures represent the "core personal consumption expenditure deflator (PCED)," which strips out food and energy prices and is the Federal Reserve's preferred measure of inflation.)

Indeed, Moody's Analytics believes the Fed will start to lower interest rates around June of this year, although more slowly

than previously anticipated because of persistent inflation and ongoing labor market tightness. Cuts of about 25 basis points per quarter are expected over the next few years until the Federal Funds Rate reaches 2.75% by the fourth quarter of 2026 and 2.5% in 2027.

For retailers, declining inflation is a double-edged sword. On the plus side, it encourages shoppers to spend more. On the negative side, it gives retailers less power to raise prices.

And, once inflation is taken into consideration, retail sales are expected to be virtually flat for both 2023 and 2024.

FEELING GOOD

Shoppers will open their wallets sooner when they feel good. And they seem to feel basically positive about the future at the moment.

"Consumer confidence has been trending higher, and I think prospects are good for it to improve this year," says Hoyt. "Things should normalize as the economy continues to grow and gas prices stabilize."

The healthy state of the job market is a major driver of consumer confidence.

"The unemployment rate has been very low, bouncing around between 3.5-3.8% for some time," says Hoyt.

A slowdown in job growth orchestrated by the Federal Reserve's interest rate hikes should moderate things.

"We think unemployment will trend upward a bit, ending 2023 around 3.9% and 2024 around 4.2%," says Hoyt. (Many economists peg an unemployment rate of 3.5-4.5% as the "sweet spot" that balances the risks of wage escalation and economic recession.)

Low unemployment may fuel happy sentiments among workers, but it presents retailers with two practical challenges. The first is the need to raise wages to attract workers.

"Wage and salary income growth has been strong, fueled by a tight labor market," Hoyt notes. "We're expecting it to increase just a shade over 5% both for 2023 and 2024."

In 2022 the growth was a little over 8%.

Reinforcing the estimates of the economists, Palisin says his members have had to hike their compensation to remain competitive among themselves and other economic sectors. The group's entry level hourly wages increased an eye-popping 8-10% in both 2022 and 2023, far higher than the historic average of 2.5-3.0%.

Problem No. 2 is a scarcity of workers. An inability to hire enough people—particularly of the skilled variety—can affect the bottom line.

Two problems contributing to a labor shortage are the retirement of baby boomers and a post-pandemic reordering of life goals by many people.



Consumer confidence has been trending higher.

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AFTERMARKET COMPANIES EXPECT TO GROW IN 2024

The specialty automotive aftermarket industry is facing the new year with a smile.

Even amid the economic uncertainty of the last year, 55% of automotive aftermarket manufacturers are reporting expected growth in 2024, up from only 44% last fall, according to the new SEMA State of the Industry-Fall 2023 Report.

“Our latest SEMA State of the Industry report shows that despite inflation and economic unpredictability, including the UAW strike, aftermarket sales continue to grow,” says Gavin Knapp, SEMA market research director. “While there has been softening sales for some firms, two-thirds of industry companies are reporting stable or growing sales over the last year.”

The report is the latest in the SEMA State of the Industry biannual series conducted by the Specialty Equipment Market Association that explores the current state of the automotive specialty equipment industry, including how businesses are doing, key industry trends and metrics, challenges and opportunities, along with an outlook for 2024 and beyond.



Other key findings from the report include:

- Even with inflation and other uncertainty in the market, one-third of manufacturers report double-digit growth over the last year
- Inflation continues to impact the industry, with more than half of manufacturers indicating their prices have increased in the last year. Nearly 90% of companies say that increased supplier costs are the key driving factor
- New-vehicle sales continue to rebound and are projected to exceed 16 million in 2024
- The truck sector continues as the top market for the industry, with the majority of manufacturers and retailers viewing the off-road segment as a growth opportunity

SEMA Business Members can download the State of the Industry report for free at: sema.org/market-research.

“Some demographic structural things happening in the U.S. mean we just don’t have, in many cases, the number of workers needed to meet demand,” Palisin says. “That’s not going to change.”

It’s little wonder then that employers are turning their attention to retaining the talent they do have.

HOUSING MARKETS

Given the generally upbeat consumer sentiment, prospects are good for the housing sector. That favors retailers, since home buyers tend to load up their shopping carts at stores.

“New home sales are running at the top end of the range set in the decade preceding the pandemic,” says Yaros. “One reason is that a lack of existing inventory is pushing buyers to consider new homes. The construction industry is stepping in to close

the gap, and housing starts have exceeded expectations.”

New home construction is being fueled by a cold, hard fact: There aren’t enough existing homes to meet demand.

“The 3.1 months’ supply of existing homes remains well below the four to six months of inventory that is considered a balanced housing market,” notes Yaros.

Strong demand caused a 10.3% increase in the median price for existing homes in 2022, and a 0.6% increase in 2023. A correction of 1.1% is expected in 2024.

For an explanation of the scarcity, look no further than the run-up in mortgage rates. The ultra-low interest rates of existing mortgages amount to a strong financial incentive for existing homeowners to stay put.

“Current homeowners had refinanced their investments at 3% or 4%,” notes

Bill Conerly, principal of his own consulting firm (conerlyconsulting.com) in Lake Oswego, Oregon. “Replacing what they had with better homes would require walking away from those mortgages to take on new ones at 7%. I think we’ll see this trend continue for another year, but I think we’ll also see a lot of strength in remodeling, and that will be financed probably with home equity lending or second mortgages.”

BUSINESS CONFIDENCE

High interest rates, an inflationary environment and rising worker wages—a trilogy of challenges that in normal times would dampen business confidence. And there are other threats to corporate well-being, such as high energy costs resulting from the Russia-Ukraine war and an appreciation in the U.S. dollar that hampers export activity.

Despite all this, companies don’t seem to be planning any dramatic adjustments to their operations, in marked contrast to their cautious attitudes of a year earlier.

“While our members have moderated their expectations for the future, they are still feeling slightly positive,” says Palisin. “One reason is that we seem to have avoided the recession that many were predicting.”

Moody’s Analytics believes that the nation will avoid a recession in 2024, mainly thanks to resilient labor markets and confident consumers.

Businesses looking to borrow funds to fuel capital investments, though, should prepare for a tougher negotiating environment.

“The banking sector is in retrenchment and lenders are becoming more risk averse,” says Anirban Basu, chairman and CEO of Sage Policy Group (sagepolicy.com). “As a result, developers are having more difficulty lining up financing.”

Fueling the concern among financial institutions is a recent spate of loan delinquencies and bankruptcies. Banks are looking at their portfolios and seeing where they can tighten up. Companies holding inexpensive pre-pandemic loans will see an earnings hit when they need to refinance at 6-7%.

KEEPING WATCH

In the opening months of 2024, Hoyt suggests retailers look at employment levels



Retailers are preparing for a tricky operating environment in 2024.

to get an early read on how the year will likely go.

“The first thing retailers should always watch is the state of the labor market, especially with job growth slowing,” he says. “An increasing number of analysts think the Fed can pull off its mission of getting job

growth to slow but not stop. That’s vitally important for retailers because consumers need job growth to have the income growth that results in retail sales growth.”

The second important key indicator, particularly for specialty aftermarket retailers, are trends in oil and gasoline prices.

“If fuel prices stay in their recent range, that’s good news for retailers,” Hoyt continues. “If they spike again, which is not inconceivable given everything going on in Russia and the Middle East and elsewhere in the oil producing world, that would be a severe problem for retailers because it would force consumers to spend more of their budgets on energy and less on goods.”

Whatever the condition of the tea leaves, retailers will encounter a tougher overall operating environment in 2024.

“In the coming year we will face uncertainty about inflation and interest rates, shortages of labor, higher energy costs, a slowdown in China’s economy, and recurring threats of a federal government shut-down,” Palisin predicts. “There are a lot of spinning plates in the air, and some of them may fall and crack.” **TS**



New York City-based journalist **PHILLIP M. PERRY** publishes widely in the fields of business management and law.

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Another SEMA Show is in the books, having welcomed more than 2,200 exhibitors and approximately 160,000 attendees to the Las Vegas Convention Center campus the first week in November.

REPORT: 2023 SEMA SHOW

Another SEMA Show is in the books, having welcomed more than 2,200 exhibitors and approximately 160,000 attendees to the Las Vegas Convention Center campus the first week in November to network and discover the next-generation products that will drive business success, industry growth and the future of the aftermarket in the coming year.

Awards and recognitions were also handed out, celebrating the innovative companies and dedicated individuals driving the specialty aftermarket industry to new heights.

TOP HONORS

Top honors were awarded at the annual SEMA Industry Awards Banquet by the Specialty Equipment Market Association (SEMA), the trade association representing the \$51.8 billion automotive specialty equipment industry.



Top honors were awarded at the annual SEMA Industry Awards Banquet. (Photo courtesy SEMA)



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REPORT: 2023 SEMA SHOW



A variety of Ford, Toyota and Nissan models were named Vehicles of the Year at the 2023 SEMA Show. (Photo courtesy SEMA)



Chuck Graf, owner of Auto Sunroof and Leather in New York, accepted the PRO Cup Challenge award for his shop's pet-themed package for the 2024 Subaru Crosstrek Premium. (Photo courtesy SEMA)

This year's winners were:

- *SEMA Person of the Year:*
Ian Lehn, BOOSTane
- *Gen-III Innovator of the Year:*
Jon Delgado, Repairify
- *Content Creator of the Year:*
Vin Anatra, Hoonigan

Lehn, founder of BOOSTane in Cincinnati, was recognized for his industry volunteerism. He has served in leadership positions for two different SEMA councils, works with the SEMA PAC and supports various charities, officials note.

His company also received the SEMA LaunchPad product of the year award in 2014.

The 2022 Gen-III Innovator of the Year award was presented to Delgado, chief technology officer at Repairify. He led engineering of the patented asTech Rules Engine, according to a press release, which uses empirical data to present users with an accurate and cost-effective diagnostic scan option specific to a given vehicle.

Delgado is also a key contributor and leader in ADAS calibration identifications with his adasThink solution, the release states.

Finally, Anatra is Hoonigan's vice president of business development and has more than 200,000 followers on his personal Instagram page.

Beginning as an inexperienced kid from New York with a passion for cars, he helped build the company into one of the most notable and influential brands in the automotive apparel and media space.

Meanwhile, Dee Zee was named SEMA

Manufacturer of the Year and Summit Racing Equipment was named SEMA Channel Partner of the Year, the organization announced.

PRO CUP CHALLENGE

Auto Sunroof and Leather, an automotive restyling shop in Chester, New York, won the 2023 SEMA PRO Cup Challenge, a program that raises awareness for new vehicle accessorization packages.

The shop's pet-themed 2024 Subaru Crosstrek Premium features:

- 4Knines rear seat & cargo protection package
- Avery Dennison hood stripe with paw print design
- Champion 321 large power topslider sunroof
- Katzkin custom leather interior with paw print design
- LP Adventure 1.5-inch lift kit
- LP Adventure wheel & tire package
- Squatch custom emblem package

"My team did a great job," said Chuck Graf, owner of Auto Sunroof and Leather. "I'm a dog person. I have lots of dogs and I know that people relate to it, so it's something that's definitely sellable. It should be something that's marketable to everybody. I hope that other restylers pick up on it and do the same thing."

Meanwhile, VIP Distributing of St. Louis won the PRO Cup Challenge People's Choice Award, a separate honor voted on by SEMA showgoers.

The shop customized a 2023 GMC Yukon XL Denali that showcases a No More Chrome premium blackout package, LLumar window and windshield tint, ERA Paints painted brake calipers and Cardinal Paints powder-coated exhaust tips.

The competition challenges automotive restylers across the country to develop an attractive, easily replicable accessory package for a new-model vehicle. The winning vehicle is voted on by industry judges based on the package's mass appeal and



Ford Mustang was named Car of the Year.



Ford F-Series was named Full-Size Truck of the Year.



Toyota Tacoma was named Mid-Size Truck of the Year.



Ford Bronco was named 4x4/SUV of the Year.



Nissan Z was named Sport Compact Car of the Year.



Ford Lightning was named Electric Vehicle of the Year.

potential profitability.

The package must be completed with no more than 40 hours of labor and have a wholesale cost of no more than \$12,500.

"We had a great variety of vehicles with different feels and accessories, and it really encompasses what the PRO Cup Challenge is supposed to be," said PRO Chair Colby McLaughlin. "It was difficult to choose the winner, but the Subaru, as far as being marketable, replicable and profitable for the dealer, is the reason why the judges selected it."

Additional companies that competed in the PRO Cup Challenge were: Apex Customs (2024 Ford Mustang GT); RDM Builds (2023 Jeep Gladiator Willys); Restylers Aftermarket Specialist Inc. (2023 GMC Sierra 1500); and Top Coverage LTD (2023 Ford F-150).

VEHICLES OF THE YEAR

Vehicle awards are presented annually to exhibiting OEMs, recognizing the automakers for supporting the aftermarket with platforms that encourage customization.

The SEMA Awards were voted on by exhibiting manufacturers in six categories. Winners were:

- *Car of the Year:*
Ford Mustang
- *Full-Size Truck of the Year:*
Ford F-Series
- *Mid-Size Truck of the Year:*
Toyota Tacoma
- *4x4/SUV of the Year:*
Ford Bronco
- *Sport Compact Car of the Year:*
Nissan Z
- *Electric Vehicle of the Year:*
Ford Lightning

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REPORT: 2023 SEMA SHOW



More than 1,300 parts were entered into 18 different categories to be considered for a SEMA New Product Award.

“SEMA Award-winning vehicles are setting worldwide trends in the automotive enthusiast industry,” said Warren Kosikov, SEMA vice president of sales. “The awards recognize the best new vehicles on the market that offer the greatest opportunities for customization.”

PRODUCT AWARDS

Many shop owners attend the SEMA Show simply to see the new products. More than 1,300 parts were entered into 18 different categories to be considered for a SEMA New Product Award.

The winners were:

Advanced Driver Assistance System (ADAS) Product

- 🏆 Winner: Ultimate ADAS, Hunter Engineering Company
- Runner-up: National CDS 360 OEM Laptop, National Calibration and Diagnostic Solutions, Pro Mobile Scan, ADAS Targeting Solutions
- Runner-up: AiDN, Diagnostic Network

Collision Repair & Refinish Product

- 🏆 Winner: Goliath Test Weld Stand, Goliath Carts
- Runner-up: GUNI X Series, GUNI-WHEEL LLC
- Runner-up: KECO GPR+ System, KECO Body Repair Products

Electric Vehicle Product

- 🏆 Winner: 16-21 Tesla Model S NOVA-Series LED Projector Headlights, AlphaRex

- Runner-up: Venom EV Conversion Kit, Scorpion EV
- Runner-up: Plug-N-Play Digital Sound Processor Solution for Tesla Model Vehicles, Metra Electronics

Engineered New Product

- 🏆 Winner: Holley Easy Level Fuel Sender, Holley
- Runner-up: BoostGate50, Turbosmart USA
- Runner-up: Orangetop Hypercore Lithium Marine/RV Deep Cycle Batteries, OPTIMA Batteries

Exterior Accessory Product

- 🏆 Winner: BAK Industries - X4ts Truck Bed Cover, RealTruck
- Runner-up: 2018-2020 Ford F-150 Sequential Turn Signal Animated Red LED Bar Taillight, Spec-D Tuning
- Runner-up: RADIANCE+ POD RGBW, Rigid Industries

Interior Accessory Product

- 🏆 Winner: 1978-88 RGB LED Monte Carlo/El Camino Gauge Cluster w/IQ Signal Installation Module, Intellitronix
- Runner-up: CURT Discovery NEXT Time-Delay Brake Controller, Lippert/Curt/Luverne/Ranch Hand/Aries/UWS
- Runner-up: Fanttik DynamicClean V10 Apex Pivoting Car Vacuum Cordless, Fanttik

Merchandising Display

- 🏆 Winner: NACHO POP Dealer Display, ARB 4x4 Accessories

- Runner-up: HitchMount LED Pod Display, Diode Dynamics
- Runner-up: Green Filter Legendary Performance now in Vibrant Colors, Green Filter

Mobile Electronics Product

- 🏆 Winner: DroneMobile XC Dash Cam with Remote Start Alarm Integration, Firstech LLC
- Runner-up: OPSIS by Stinger, AAMP Global
- Runner-up: AI Dash Cam 4K + 1080p, Horizon Brands

Off-Road/4-Wheel Drive Product

- 🏆 Winner: 2022-2023 Toyota Tundra 6-inch Stage 9 Suspension System Billet with Subframe Kit, ICON Vehicle Dynamics
- Runner-up: Advance Adapters Atlas Adapter for Ram, Jeep, Dodge 8HP Transmissions Part # 50-990X, Advance Adapters
- Runner-up: Universal Recovery Mount, SeaSucker

Packaging Design

- 🏆 Winner: Formula Drift Premium Comfort Seat Cover, Horizon Brands
- Runner-up: Katana Plus HVLP Spray Gun, Anest Iwata Americas Inc.
- Runner-up: RetroSound Europa Radio, Retro Manufacturing

Performance-Racing Product

- 🏆 Winner: Team Plus Wheel Turtle Pro, Team Plus
- Runner-up: Dart Machinery Toyota 2JZ Engine Block, Race Winning Brands
- Runner-up: Carbon TRc Intake Manifold, Performance Design

Performance-Street Product

- 🏆 Winner: Hyperformance Pistons, United Engine & Machine
- Runner-up: Universal Hydroelectric Power Steering System, EPAS Performance
- Runner-up: GM A/F/X Body Tall Hub Spindle, Ridetech

Powersports Product

- 🏆 Winner: NACHO Quatro Combo, ARB 4x4 Accessories
- Runner-up: AMSOIL ATV/UTV Oil Change Kits, AMSOIL Inc.

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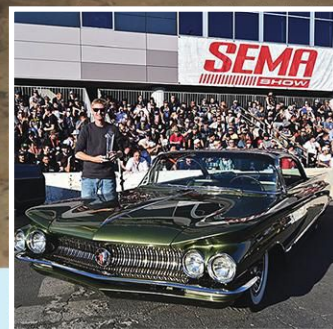
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REPORT: 2023 SEMA SHOW



Andy Leach won the SEMA Battle of the Builders Presented by Mothers Polish competition with his 1960 Buick Invicta Custom X-60 built at Cal Automotive Creations in Nebraska. (Inset photo courtesy SEMA)



The new SEMA Fest added a festival element to the end of show week, with consumers getting to check out some of the fun on Friday night and Saturday at the LV Festival Grounds. (Photo courtesy SEMA Fest)

- Runner-up: 19+ Honda Talon UTV6 Front Brake Kit, Wilwood Disc Brakes

Street Rod/Custom Car Product

- Winner: 4-, 6- and 8-Position Relay Panels, American Autowire

- Runner-up: RnR Modular Drop Knuckle, Pyramid Optimized Design
- Runner-up: Radiator/Water Pump Clamp on Compression -AN Fitting (-16AN or -20AN), CVF Racing

Tire & Related Product

- Winner: Fanttik X9 Pro Portable Tire Inflator with Accessories All-In-One, Fanttik
- Runner-up: Cooper Cobra Instinct, Cooper Tire & Rubber Co.
- Runner-up: Baja Boss XS, Mickey Thompson Tires & Wheels

Tools & Equipment Product

- Winner: SoloSwap Big-Block Chevy Mock-Up Engine Swap Dummy Blocks, Speedway Motors Inc.
- Runner-up: TRAC TireJack/Roller Accessory Plate, TRAC/Tire Rotation Assistance Cart-Tire Jack
- Runner-up: WheelWise Wheel Fitment Tool, Tire Fit Size Measuring Mock-Up, 5-Lug Metric, Speedway Motors Inc.

Van/Pickup/Sport-Utility Product

- Winner: Aeroleaf for Chevy 1500, Universal Air Suspension
- Runner-up: Exhaust Manifold Kit Dodge/Ram 5.7L Hemi 1500 DS/2500 DJ/3500 D2 2009-18 & Ram 1500 Classic DS 2019-22, BD Diesel
- Runner-up: Shellz 2023 Ford Super

Duty Trim Blackout Kit, ECOOLOGICAL

Wheel & Related Product

- Winner: Defiant Wheels DF06 20x10 Dark Satin Charcoal, 4PLAY Wheels
- Runner-up: TR29, Voxx Products
- Runner-up: ICON Alloys | 17x8.5 ANZA, ICON Vehicle Dynamics

BATTLE OF THE BUILDERS

Andy Leach won the 10th anniversary SEMA Battle of the Builders Presented by Mothers Polish competition with his 1960 Buick Invicta Custom X-60.

It took Leach nine years to build the Invicta out of his Cal Automotive Creations shop in Bennington, Nebraska, as he worked to maintain the car's original intentions, including details originally lost to budget constraints.

"I'm very honored to be the 2023 Battle of the Builders winner. It's a dream come true. I've been chasing this award for nearly a decade," said Leach. "The Buick was a labor of love, and I'm glad all our hard work and effort has been recognized, especially against all the stiff competition we faced. The Buick Invicta Custom X-60 embodies every inch of its potential and evokes emotions in the spirit of what this car stood for in 1960."

Inspired by the Jet Age B-52 (or Boeing B-52 Stratofortress), the X60 Invicta features sleek lines perfected after countless



SEMA Fest highlights included project vehicle displays, demonstrations by Hoonigan, Nitro Circus and Formula Drift, and concerts by Incubus, Imagine Dragons, AJR, Third Eye Blind and more. (Photos courtesy SEMA Fest)

hours of thoughtful reengineering, Leach said. Its refined lines and bodywork are highlighted to give the illusion of driving fast and forward.

Wedged sections are present only at the front of the car, giving it the look of running downhill. Its brass trim is CAD designed and precision machined, and its one-piece, precision-machined rear bumper delivers a refined and polished flow.

Designing the interior, the goal was to keep the look and feel of the 1960 Buick while elevating and polishing the visual experience. The interior is built around the iconic Invicta hardback bucket seats and center console, featuring custom logos and pockets. Custom-made, pearlized leather and woven aircraft carpeting brings everything together.

The X60 Invicta stays true to its roots, outfitted with the same factory-correct 401 Nailhead engine block found in the 1960 Buick. Featuring a crank-driven supercharger with custom-made bracketry for the blower, as well as power-steering, A/C and an alternator with a custom made front drive, it delivers a powerful driveline.

The vehicle was chosen from a top-12 field that included:

Hot Rod/Hot Rod Truck

- Jonathan Goolsby — 1969 Ford Mustang
- Andy Leach — 1960 Buick Invicta Custom
- Tyler Nelson — 1968 Chevrolet Camaro

Sport Compact/Import Performance

- Allen Bischofberger — 1990 Porsche 911/964
- Jordan Henke — 1987 Merkur XR4TI
- Dom Tucci — 1989 Mercedes-Benz 190E

Off-Road

- Jared Hancock — 1978 Jeep Cherokee Chief S
- Andy Leach — 1968 Jeep Wagoneer
- Cort Sessions — 1970 Travel All



Young Guns

- Ryan Dyer — 1953 Ford F100
- Carson Hendershott — 1998 Chevrolet C1500
- Charles D. Spencer — 1969 Chevrolet C10

The final four category winners were Leach, Henke, Hancock and Spencer. Leach's winning build will be featured in the "SEMA: Battle of the Builders" TV special that will air in January on the History Channel.

SEMA FEST

Finally, the new SEMA Fest added a festival element to the end of show week, with consumers getting to check out some of the fun on Friday night and Saturday at the LV Festival Grounds.

Highlights included project vehicle displays, demonstrations by Hoonigan, Nitro Circus and Formula Drift, and concerts by Incubus, Imagine Dragons, AJR, Third Eye Blind, Walk The Moon, Bush and more. **TS**



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Restyling

AFTERMARKET ACCESSORIES

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Familiarity with step products is important, as not all components offer the same levels of utility or protection. (Photo courtesy aFe POWER)

A LEG

Running boards & steps are still on the rise. **By Jef White**

When customers are looking for a leg up, top shops have them covered with the latest running boards and steps.

Offering styling, protection and convenience, today's step products are as functional and versatile as the vehicles they fit.

Different looks, materials and configurations require shops to do their homework, understanding the specific features and benefits of the boards and steps they carry.

To help you rise above the competition, product suppliers answer questions regarding market trends, sales techniques and hot new models for the new year.

WATCH YOUR STEPS

The first thing to note is that carmakers are beginning to recognize the market for boards and steps and take matters into their own hands.

This attention from the factory can serve as a double-edged sword for the aftermarket.

John Gray, VP – exhaust & exterior product for aFe POWER, sees the trend as limiting some opportunities.

“Many vehicle manufacturers are supplying OE steps as an option from the dealerships, not allowing the customer a choice to fit aftermarket products to suit their needs best,” he explains.

However, more vehicles coming from the factory with boards or steps already included can help raise awareness for aftermarket products in general, notes Joey Scelza, regional sales manager for RealTruck Inc.

“The market for running boards, steps and sliders is always evolving,” says Scelza. “The markets are set by region, and it depends on where you live as to what step or what style you need/want. Consumers with families are usually the first to get a set of steps installed on their vehicles.”

Demand is strong, says Mike Stickney, vice president of sales for Westin Automotive Products.



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Educate yourself on preferred products recommended for specific vehicle platforms. (Photo courtesy aFe POWER)

RUNNING BOARDS & STEPS

■ **HOT PRODUCTS:** New Terra Guard Trail Steps & Off-Road Sliders

■ **FEATURES & BENEFITS:** Patented products fit fourth-, fifth- and sixth-gen Subaru Outbacks without drilling or modifications to the vehicle; easy roof access; all-steel construction matches the rocker panel contour; non-slip platform; install using factory mounting points; made in USA.

aFe POWER
John Gray

VP – Exhaust & Exterior Product

■ **HOT PRODUCT:** Jeep JL Board

■ **FEATURES & BENEFITS:** Strong design for rock crawling.

ICON Vehicle Dynamics
Dylan Evans
Lead Engineer

■ **HOT PRODUCT:** Carnivore Brute Strength Side Steps

■ **FEATURES & BENEFITS:** Affordable, durable and functional steps for Jeeps; trail-proven steel tubing and aluminum panels on the top and bottom provide a lightweight footprint; bolt-on installation utilizes factory mounting locations; raised dimples on landing pad for secure grip.

Quadratec
Matthew Konkle
Managing Editor – Creative Content

■ **HOT PRODUCT:** Legend Series Running Board

■ **FEATURES & BENEFITS:** Unveiled at the 2023 SEMA Show, the running steps combine the features of nerf bars and running boards; 3-inch top pipe made from thick, 14-gauge mild carbon steel tube; steps are styled like standalone hoop steps; 4- and 6-step options available.

Ranch Hand
Jonny Matranga
Copywriter

■ **HOT PRODUCTS:** Aluminum 5-Inch, OEM-Style Full Tread Running Boards

■ **FEATURES & BENEFITS:** Constructed from strong, lightweight, corrosion-resistant aircraft-grade aluminum; equipped with a track system that works with any of our vehicle-specific brackets; easy, no-drill installation; adjust positioning along the vehicle for a tailored fit.

Raptor Series
Jesse Brown
Director of Marketing

■ **HOT PRODUCT:** Go Rhino Dominator Xtreme D1

■ **FEATURES & BENEFITS:** Provides a continuous drop step that runs the length of the running board, allowing for ease of stepping into lifted or non-lifted vehicles; offers rocker protection similar to a slider; powder-coated steel; easy installation with vehicle-specific, no-drill brackets.

RealTruck Inc.
Joey Scelza
Regional Sales Manager

■ **HOT PRODUCT:** DRP Running Board System

■ **FEATURES & BENEFITS:** Height-adjustable system that allows the shop to install the boards at four different settings—0 for a factory look and then 1-3 inches lower than factory; answers the age-old question of, “Can you lower my running boards just a little more?”

Romik
Hugo Baeza
Executive Director

■ **HOT PRODUCTS:** New Overland Running Boards

■ **FEATURES & BENEFITS:** Popular for off-road and overlanding vehicles; robust solutions designed to safeguard rocker panels from damage caused by road or trail obstacles; offer a secure stepping surface; constructed from Q235A steel and finished with a matte black powder-coat.

TrailFX
Sara Ford
Marketing Manager

■ **HOT PRODUCTS:** All-New Westin Pro-E Electric Running Boards

■ **FEATURES & BENEFITS:** Electronically deploy and retract when a door is opened or closed; high-quality all-aluminum construction; full-length large, non-slip surface; vehicle-specific fit; LED lights; dual motor on every application; easy, straightforward installation.

Westin Automotive Products Inc.
Mike Stickney
Vice President of Sales

■ **HOT PRODUCTS:** E1 Electric Running Boards

■ **FEATURES & BENEFITS:** A flex-free step design coupled with dual motors and stainless steel internal gears for dependability in all climate conditions.

Go Rhino
Dave Williams
Director of Sales

“Customers are looking for quality products from brands they can trust. They also want products that look great, fit great and function properly.”

With lingering uncertainty about the economy, it pays to have a plan for board and step sales, explains Jesse Brown, director of marketing for Raptor Series.

“The current economic conditions have really had an impact on consumer spending. Aftermarket upgrades aren’t necessarily at the forefront of consumers’ minds when they’re not really a necessity for their vehicles,” he says. “When closing a sale on running boards or steps, focus on how they will benefit the consumer in their day-to-day lives versus just how they will improve the look of their vehicle.”

Hugo Baeza, executive director at Romik, identifies “high prices of vehicles and high finance rates” as main market challenges.

Sara Ford, marketing manager for TrailFX, agrees the economy is always a major factor in purchasing decisions.

“Current economic conditions significantly impact the running board and step bar market,” she says. “Economic downturns can lead to decreased consumer spending on nonessential items, affecting demand for these accessories.”

The effects of the pandemic linger.

“Manufacturers are continuing to work through supply chain issues and a reliable stream of products remains a concern,” says Matthew Konkle, managing editor – creative content for Quadratec. “You can work hard to match a product to a customer’s needs, but it is impossible to close a sale when you don’t have it in stock.”

Meanwhile, difficulties obtaining materials are affecting suppliers, says Jonny Matranga, copywriter for Ranch Hand.



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The Sierra Grande concept is AEV's one-of-one overlanding rig on a GMC Sierra HD AT4X platform. (Photo courtesy American Expedition Vehicles)

SIERRA GRANDE CONCEPT TRUCK

The Sierra Grande concept represents the creative vision of how American Expedition Vehicles (AEV) would further elevate the adventure-ready foundation of the GMC Sierra HD AT4X into a one-of-one overlanding rig.

"The idea behind this concept stems from our team envisioning the most adventure-capable truck possible. With that in mind, we needed the best platform to build upon which, of course, led us to the GMC Sierra HD as the foundation," says Matt Feldermann, AEV marketing manager. "AEV was thrilled to collaborate once again with GMC, and this new Sierra Grande concept vehicle is a testament to what two storied brands can create when working together."

For the Sierra Grande concept, AEV sourced the stamped steel front bumper from the Sierra HD AT4X AEV Edition and added a prototype brush guard, AEV snorkel, four 7000 series

off-road lights and a GM Performance/ComeUp winch up front.

Underbody protection includes a stamped steel front skid plate, IFS skid plate and transfer case skid plate from the Sierra HD AT4X AEV Edition. For the suspension, AEV worked directly with the GMC engineering team to incorporate a variety of Sierra HD AT4X components, such as control arms, steering knuckles, rear suspension and Multimatic DSSV dampers.

Thanks to the additional lift height gained from the AT4X components and a pair of AEV HighMark fender flares, the builder installed a set of 40-inch BFGoodrich tires mounted on a set of AEV Salta XD wheels. Next, an 8-foot aluminum tray bed was installed, along with an AEV vertical tire mount, custom AEV rear bumper, ComeUp 9.5k rear winch and an ARB on-board air system.

A custom green paint package adds the finishing touches.



Step customers want it all—products that look great, fit great and function properly. (Photos courtesy Westin Automotive Products)

"The supply chain for steel has been pinched and the ability to source steel for many companies has become more difficult, as many manufacturers source their steel from overseas," Matranga notes. "Ranch Hand sources all our steel from U.S. steel foundries."

In response to the fluctuating market, Dylan Evans, lead engineer for ICON Vehicle Dynamics, recommends shop owners pay attention to two key components of the boards and steps they offer: "exposure and distribution."

STEP IN THE RIGHT DIRECTION

Offering a combination of functionality and style, it's important to fit each step product to the customer's personality.

"Use a display with a few price point and style choices," says Dave Williams, director of sales at Go Rhino. "Don't just push what you as a store owner personally like. Let consumers vote with their wallets. They may want enhanced access for their family, like an electric step can provide, or maybe they want a rugged, off-road look."

A mistake, Baeza explains, is "not giving the customer choices." If you don't, "customers will walk away and go online looking for options."



Have the answers to your customers' step-related questions or know where to find them. (Photo courtesy Quadratec)

it can be very confusing to someone who is not used to purchasing or using steps on their vehicle," says Scelza. "Providing too

many options confuses the customer and ultimately leads to a lower-end sale or no sale."

A steady supply of new designs means shops need to constantly monitor local preferences, Brown notes.

"Market trends and technologies are constantly evolving. Make sure you're staying up to date with the latest relevant styles and product trends, so you can make sure you're offering the right products your customers are seeking."

That comes from aligning with the right suppliers and selling quality, Stickney says.

"Customers will often find a cheap brand on the internet that often doesn't come close to matching products from brands like Westin that have been designed and engineered for each specific vehicle. Be sure the running boards or steps will fit and function the way the customer is expecting, as well as making the installation process as smooth as possible. I can't emphasize enough that not all steps and running boards are made equally."

Familiarity with the products themselves is also important, Gray says, as not every component offers the same performance or protection.

"Running boards and steps are not rock sliders and bash guards. Verify with the product manufacturer how they are installed, what they are constructed of and their recommended uses," he says. "We design, engineer and manufacture our products in the U.S. to ensure quality fitment and durability."

The goal is to fit the right type of step on each vehicle.

"Sometimes shops may not understand the customers' needs when selling a running step and this can lead to dissatisfaction. If the customer is sold an inferior product that is not designed for work and longevity, they may return unhappy with their purchase," Matranga says. "When consulting the customer prior to the pur-



Quality products ensure happy customers. (Photo courtesy Ranch Hand)



Knowing the products well helps your clients best. (Photo courtesy Ranch Hand)

Konkle calls it "trying to shoehorn people into a certain side step or running board without taking the time to figure out exactly what the customer needs."

When considering the proper product for each application, Evans says an important consideration is "frame mount versus body mount."

But, while choices are good, be careful about going overboard.

"A common mistake is confusing the customer with too many options. There are a lot of styles of steps out there and

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Utility and versatility are important factors when choosing a running board or step. (Photos courtesy RealTruck/Go Rhino)



Ensure that your sales and installation teams have sufficient knowledge of the running boards and steps you carry. (Photo courtesy Raptor Series)

chase, be sure to ask what they expect to use their truck or SUV for before selling a running board or step. If they plan to use their truck for work or at the jobsite, or if they prefer a robustly built, quality product, then a standard nerf bar will not hold up—they'll need something heavier that's built to last."

HIGH-STEPPING

When it comes to successfully selling step products, knowledge is power.

"Ensure that your sales and installation teams have sufficient knowledge on the running boards and steps that your company offers," says Raptor Series' Brown. "This will ensure that you are providing

accurate answers for customer questions as well as allow you to give proper recommendations based on your customers' specific needs and preferences."

It may mean a little bit of homework for you and your sales staff.

"Know what the OE manufacturer offers and recommends and educate yourself on preferred products recommended for each specific vehicle platform and usage," says Gray from aFe POWER.

Ford from TrailFX notes that "inadequate product knowledge can result in shops recommending the wrong products for specific vehicle models or failing to provide customers with the information they need to make informed choices. To avoid this mistake, it's crucial to stay well-informed about the running boards and steps they offer and current fitments available to provide accurate guidance to customers based on their preferences and vehicle requirements."

Matranga puts it this way:

"The best advice is to have your staff well-versed in the products you offer. This way you can truly help the customer find the best running board or step for their truck or SUV based on what they need and what you offer. If you know the product well, you can help your customer best. Likewise, having our pamphlets and signage in your store and on your website allows the customer to know that you offer Ranch Hand products and gives you the opportunity to consult the customer, provide information and answer their questions. This is where the opportunity rests for increasing sales."

It also results in one important task for shop owners.

"Training. Training. And training," says Quadratec's Konkle. "A shop doesn't need to have an immediate answer to every specific question a customer may ask,



Showcase the diversity of the products you carry to attract new customers. (Photos courtesy Romik)

ROMIK "DRP" SYSTEM.





The economy always affects purchasing decisions, so make sure the products you carry deliver value. (Photo courtesy TrailFX)

but employees should have above-average product knowledge about their running board/side step lineup. Stuff like how it installs, what type of material it is made of, weight rating, durability, functionality, etc. If something more is needed, then employees should have a resource to get that more technical answer.”

Serving as an educator builds a strong relationship, he continues.

“The more a customer learns from a shop about that product, the more he or she will trust it for future purchases.”

Patiently educating buyers is usually worth the time investment, Stickney agrees.

“Use the manufacturer website and any product videos that are available to help illustrate and show customers the differences in the products,” he states. “Also, compare the products from quality of material and warranty standpoints to ensure customers get the best products for their vehicles.”

As part of any showroom display, Evans from ICON advises to “show the benefits of frame-mount strength and sell quality.”

It also helps to make the purchase fun and exciting, says Williams from Go Rhino.

“Curate a selection of steps and boards at different price points for consumers to see, touch and feel,” he suggests. “Covering different price points and styles will give the vehicle owner an opportunity to make an informed purchasing decision on the spot in real time.”

Shops can significantly enhance their running board and step sales by featuring actual products in their showrooms for

customers to see, touch and compare, Ford agrees.

“Having physical samples on display allows potential buyers to experience the product’s quality, design and functionality firsthand. This tangible interaction helps customers make more informed decisions, instills confidence in the products and can lead to increased sales.”

Meanwhile, out in the parking lot, Baeza says since shop trucks showcasing products have proven to be effective marketing tools, why not consider adding a company SUV or even a CUV to highlight this growing portion of the market?

“To attract a new audience, especially those with high-end trucks and SUVs, shops need to show diversity in their work,” he explains.

It’s a world of show, not just tell.

“Place signs that indicate that the shop also works on SUVs, foreign and domestic. Display Romik products on the wall and showcase our European-made running boards. Once they see the modern designs, the shop will gain new customers.” **TS**

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MARKET WATCH: *Restyling*

By
Josh
Poulson

Forecasting the future of retail & dealership work.

None of us know the future, which is why forecasting it can be difficult. Still, with plenty of hard work and a little innovation, restyling shops are likely to survive and thrive in the coming year.

A panel of market experts gathered at the 2023 SEMA Show to tackle the major issues facing restyling shops and highlight some opportunities. Presented by the SEMA PRO (Professional Restylers Organization) council, the Forecasting the Future of Restyling session offered helpful tips and tricks for companies serving dealership clients, retail customers or a mix of both.

The moderator was Kevin Gillis from Integrity Customs (Tulsa and Oklahoma City), who was joined on stage by two supplier representatives and two shop owners including:

- Chris Ierardi (Eastman/LLumar Films)
- Chelsea Allen (Crush Customs, Atlanta)
- Dino Perfetti (Automotive Concepts, Minneapolis)
- Aron Demers (Vox International)

The group helped attendees understand what we do know at the moment, and how we can make plans to address future challenges. Opinions and ideas covered a range of topics, from supply chain and staffing concerns to hot product categories.

CARS & PARTS

The group discussion started by acknowledging recent difficulties with obtaining parts, and more importantly the lack of new car dealer inventories due to the pandemic and recent UAW strike. These issues



The 2023 SEMA Show featured a Forecasting the Future of Restyling seminar that included panelists Chris Ierardi (Eastman/LLumar Films), left, Chelsea Allen (Crush Customs, Atlanta), Dino Perfetti (Automotive Concepts, Minneapolis) and Aron Demers (Vox International).

have been especially hard on restylers that rely on new car sales and/or preloading products on dealer lots as their main sources of revenue.

Vehicle inventories do seem to be growing, though it was agreed that they will probably never return to pre-COVID levels. So, how can restylers still take advantage of preloading?

One way is to create packages consisting of readily available parts.

Now, many restylers understand the importance of packages; however, the panelists discussed new ways to determine what types of product combinations make the most sense. A proven winner is to look for vehicle models with large gaps in trim levels and technology suites.

One example: It was reported that many OEMs are deleting some standard electronic equipment just to get the cars finished and to the dealer lots. Honda, for instance, stopped installing blind spot monitoring systems on many of its 2023 models for a while, simply delivering the vehicles with a \$700 credit off the MSRP.

This created an opportunity for restylers to add a product that consumers want and expect. So, keep your ear to the ground and eyes open, and ask your dealers where they see gaps or issues right now and work together to capitalize on them.

Speaking of dealerships, the panelists also noted how car sales professionals have changed over the past few years. Perfetti talked about the importance of



Packaged products make sense to dealers and consumers.



From wraps to window tint to PPF, films are hot right now.



Powersports is a new category featuring many traditionally popular restyling accessories such as wheels and tires, electronics and more.



Fresh opportunities such as fleet upfitting are entryways to new product categories as older markets start to shrink.

explaining your products and services to dealer salespeople and getting them the training they need to feel comfortable suggesting desirable aftermarket upgrades to their customers.

A Katzkin study was highlighted that showed when new car buyers were asked after the sale if they were given the option of adding leather, or even told it was a possibility, 97% said no, they hadn't.

The positive news for restylers is that, out of that 97% who weren't told about leather, 65% said they would have seriously considered upgrading their interiors if given the opportunity to add the cost into their financing at the time of sale.

This highlights the constant need for restylers to train, train and retrain dealer salespeople on what's available and what they need to know to make more money while making their customers happier.

OPPORTUNITIES ARISE

Film offerings including window tint, paint protection film and color change wrap film were identified as current market favorites when it comes to hot new products.

A new segment of hybrid colored paint protection film is becoming extremely popular, the panel revealed. It mixes the colors of vinyl with the durability of PPF.

And don't feel like you have to stick with the most affordable options. Recent trends show a strong demand for higher grades of film such as ceramic window tint and top-end PPF, with drivers seeking products that match and maintain the value of their new vehicles.

Other segments restylers should be looking into, according to the panelists, include fleet upfitting and the powersports/ATV markets. Use them as entryways to new product categories as older markets start to shrink.

Finally, restyling shops face the difficult task of finding and retaining quality technicians and employees in general. Demers outlined the importance of getting the next generation introduced to our industry.

It was recommended that when you do find potential top technicians, be sure to partner with your manufacturers to get them properly trained. Demers and Ierardi discussed how their companies spend large

amounts of money on trainers who put on workshops or can come directly to shops to help technicians learn best practices and increase their knowledge and efficiency.

Suppliers obviously have a vested interest in making sure shops are successful, so look for them and others to continue to work hard at helping as they can.

The consensus was that, even though there have been challenges, the future looks bright for restyling shops that are willing to diversify their products and services, train and support their employees, and take advantage when opportunities come their way. **TS**



*Named the 2022-23 SEMA Person of the Year, **JOSH POULSON** is the principal of Auto Additions in Columbus, Ohio, which was named Restyler of the Year, 2012-13. Auto Additions offers a complete line of product upgrades including 12V and appearance packages with a specific focus on the dealership segment. Josh is immediate past-chairman of the SEMA PRO council.*

NEW VEHICLE REPORT

A sampling of the latest models, special editions & updates.

Carmakers are busy rolling out new models, special editions and notable updates as 2024 vehicles begin appearing nationwide. Here's a sampling of what restylers may soon encounter on dealer lots.

2024 HYUNDAI SANTA FE

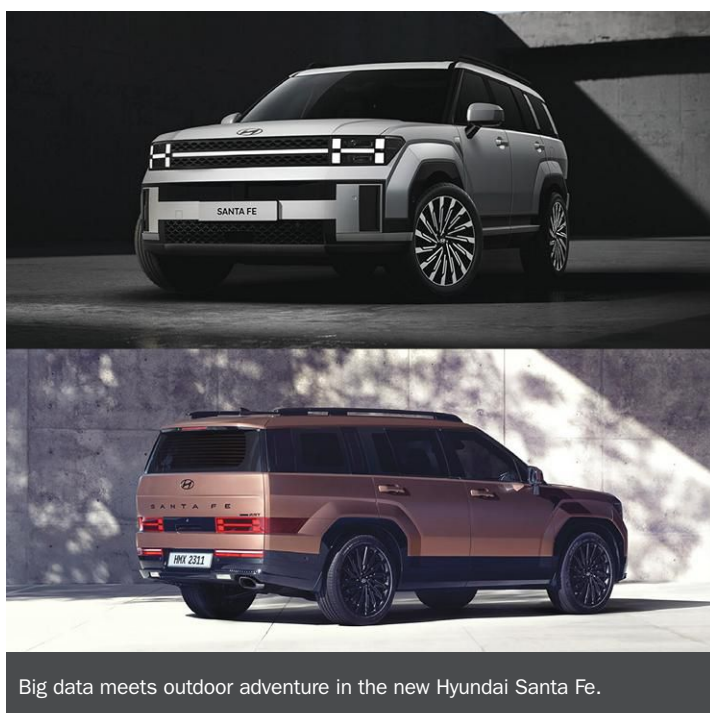
Hyundai Motor Co. has radically transformed the all-new Santa Fe. The fifth-generation midsize SUV carries forward its signature nature-meets-city appeal while implementing major updates shaped by big data around the latest outdoor lifestyle trends.

For Santa Fe's first full model change since 2018, Hyundai took an unconventional approach with a lifestyle-based design typology to maximize rear cargo capacity and better accommodate outdoor and urban activities. As a result, the powerful new model boasts a robust yet delicately detailed exterior design and spacious, versatile interior that flows from the openness of its enlarged tailgate, providing users with a terrace-like space.

The SUV's boxy shape and distinctive silhouette are derived from its long wheelbase and wide tailgate area. The front of the vehicle features a high hood, H-shaped headlamps and bold, sharp fenders.

The headlamps harmonize with the H-motif lower front design to enhance visual completeness. The H-shaped design elements reinterpret Hyundai's "H" emblem.

Seen from the side, the lengthened wheelbase accommodates a bold roofline, powerful volume around the fenders, sharply defined wheel arches, shortened front overhang and 21-inch wheels.



Big data meets outdoor adventure in the new Hyundai Santa Fe.

2024 TOYOTA LAND CRUISER

Built on the TNGA-F global truck platform, the 2024 Toyota Land Cruiser is designed, engineered and tested to survive in the harshest environments.

For this new generation, Land Cruiser is exclusively available with the range-topping i-FORCE MAX hybrid powertrain producing 326 hp and 465 pound-feet of torque.

It's slightly smaller and narrower than the outgoing 200 Series model, making it nimble on the trails.

A newly developed double-wishbone front suspension with twin-tube shocks is paired with a multi-link rear suspension with coil springs. To provide improved steering feel and facilitate the incorporation of additional safety and convenience features, Land Cruiser will feature electric power steering, and all models include 17-inch disc brakes front and rear.

With a trailer hitch standard on all grades, Land Cruisers can tow up to 6,000 pounds.

All Land Cruisers are equipped with a



The 2024 Toyota Land Cruiser is engineered to survive in the harshest environments.

full-time four-wheel drive system with a center locking differential and an electronically controlled two-speed transfer case with high/low range. The system also features vehicle stability control (VSC) and an automatic limited-slip differential (Auto LSD).

An electronic locking rear differential is also standard and can help split power 50/50 to the rear wheels for improved traction.

The trail-ready SUV will be available in three grades: Land Cruiser 1958, Land Cruiser and the limited-run Land Cruiser First Edition. An available premium package adds power heated and ventilated leather-trimmed seats with lumbar support, a 14-speaker JBL audio system, head-up display, digital rearview mirror, moonroof and more.

2024 PORSCHE CAYENNE S E-HYBRID SUV & COUPE

Porsche is expanding its hybrid range of luxury utility vehicles. As the third plug-in model of the series, the new Cayenne S E-Hybrid mixes finely balanced driving dynamics, comfort and efficiency.

Positioned between the Cayenne E-Hybrid and the Cayenne Turbo E-Hybrid models, the Cayenne S E-Hybrid is available in SUV and Coupe body styles and offers improved electric range and shorter charging times due to its intelligent energy management. The 174-hp electric motor is paired with a revised 3.0L, 348-hp turbo V-6 engine.

The standard adaptive air suspension contributes to the combination of increased performance and greater driving comfort. Innovative two-chamber, two-valve technology enables a particularly wide spectrum of spring rates and dynamic behavior that range from comfort-oriented to high performance.

The vehicle comes equipped with 20-inch Cayenne S wheels and an exhaust system with two twin-tailpipes in brushed stainless steel standard.

The SUV features a Silver exterior package, while the Coupe comes standard with a Black exterior package.

Matrix Design LED headlights with automatic high beams and Lane Change Assist are included.

Factory interior amenities include eight-way seats, Sport Chrono package including

a mode switch on the steering wheel for selecting between driving modes, Comfort Access keyless entry and start, stainless steel pedal pads, and the Diamar interior package painted in Silvershade.



The new Porsche Cayenne S E-Hybrid mixes driving dynamics, comfort and efficiency.

2024 SUBARU WRX RALLY CAR

The all-new 2024 Subaru Motorsports USA WRX rally car is designed for competition in the Open 4WD class of the American Rally Association (ARA) Championship. The No. 180 team of driver Brandon Semenuk and co-driver Keaton Williams piloted the car in its racing debut in August at Ojibwe Forests Rally. It was also announced that extreme sports legend Travis Pastrana will join in a second car in the 2024 ARA season.

Built for competition by technical partner Vermont SportsCar, the new rally car has been engineered from the inside out.

It is powered by a custom-built, turbo-charged and intercooled 2.0L 4-cylinder boxer engine that meets the requirements of its class, including a mandated 33mm restrictor and 22 psi boost limit. To spec, the engine produces 320 hp and 380 pound-feet of torque, while a SADEV six-speed close-ratio transmission sends the power to all four wheels.

Springs and dampers are from R53 Sus-



The all-new Subaru Motorsports USA WRX rally car debuted in August.

pension, working with VSC-designed cross-members, links and hubs to manage wheel movement on any surface the Yokohama 15-inch ADVAN A053 gravel rally tires encounter.

Much of the development of the new car focuses on the safety of the driver and co-

driver, starting with a fully seam-welded body shell and an FIA/USAC-spec roll cage constructed from T45 steel.

The carbon fiber widebody was designed from a blank sheet with the latest ARA aerodynamics ruleset in mind, with a giant carbon-fiber rear wing.

2024 LUCID AIR SAPPHIRE

The electric Lucid Air Sapphire is designed as the ultimate fusion of leading-edge technology, refined design and on-road versatility.

Achieving an EPA-estimated 427 miles on a single charge, the Air Sapphire houses a three-motor powertrain that produces a total of 1,234 hp and 1,430 pound-feet of torque. Thanks to the enhanced power delivery provided by the twin rear-drive unit, it can travel 0-60 mph in 1.89 seconds with a quarter-mile time of 8.95 seconds at 158 mph.

The Sapphire's four drive modes—Smooth, Swift, Sapphire and Track—are optimized for various conditions and styles, influencing the character of the car and behavior of the suspension, steering, brakes, torque vectoring, peak power and torque, and thermal controls.

The exterior is optimized for downforce and efficiency at high speeds, and includes an exclusive Sapphire Blue exterior paint combined with Lucid's Stealth Look trim. The Aero Sapphire wheels wear specially designed Michelin Pilot Sport 4S tires, complemented by removable carbon fiber aero disc wheel covers.

An aluminum roof reduces total vehicle weight and lowers the center of gravity. Inside, stylish sports seats cradle passen-

gers with considerable support while maintaining comfort with heating, cooling and massage functionality.



The electric Lucid Air Sapphire achieves an EPA-estimated 427 miles on a charge.

2024 LEXUS LC 500 INSPIRATION SERIES

The Lexus LC 500 Inspiration Series makes a roaring return, bringing back its iconic and elegant styling for the new model year.

Building on the flagship coupe and convertible, the 2024 models showcase a unique aesthetic that thoughtfully blends design with performance, including front bumper canards and a carbon fiber rear wing (coupe).

Only 125 units will be made available in North America.

The special edition debuts a LC-first color combination of Polar Surge Satin (exterior) and Deep Blue (interior) on coupe models. The convertible mirrors these colors and adds a Blue fabric top.

Standard 21-inch forged wheels with matte black paint carry the aerodynamic enhancements including the canards to balance lift and a coupe-exclusive carbon fiber fixed rear wing spoiler to assist with handling stability.

Additional performance highlights include a standard Torsen limited-slip differential and rear performance dampers. The coupe adopts the convertible's front and rear underfloor braces and a standard carbon fiber roof.



The Lexus LC 500 Inspiration Series blends design with performance.

The interior features Alcantara-trimmed sport seats and headliner (coupe) or semi-aniline trimmed seats and Lexus Climate Concierge with upper body heating (convertible).

The Inspiration Series scuff plate door accents are in carbon fiber with a serialized

badge on the center console to recognize the limited production.

A Mark Levinson 13-speaker, 915W Reference Surround Sound audio system, SmartAccess key card and head-up display are standard for the interior, offering drivers comfort and control.

2024 JEEP GLADIATOR

The 2024 Jeep Gladiator adds greater capability, more refinement, new technology and more standard safety features to a mid-size pickup designed as both 100% truck and 100% Jeep.

Ranked No. 1 for new vehicle quality among midsize trucks in the J.D. Power 2023 U.S. Initial Quality Study (IQS), the Gladiator offers towing power and a best-in-class 4x4 payload.

It includes a standard 12.3-inch touchscreen and available power seats tested for water fording, standard side-curtain airbags and a fresh exterior with a new seven-slot grille, seven new wheel designs and a windshield-integrated, trail-ready antenna.

Highlights include the folding windshield, three roof choices and two door options plus complete door removal.

The 2024 Jeep Gladiator is available in Sport, Willys, Mojave and Rubicon models. **TS**

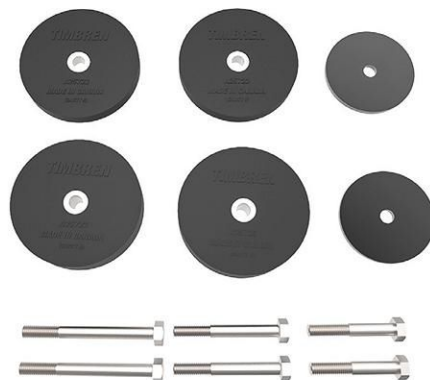


The 2024 Jeep Gladiator adds greater capability, new technology and more safety features.



Tundra Suspension Kit

Ironman 4x4, Sherwood, Oregon, presents its Foam Cell Pro Suspension Kit for 2022-up Toyota Tundra applications. The kit uses the company's Foam Cell Technology to provide increased performance on and off road while providing 2.5 inches of lift for extra ground clearance and articulation.



Short-Box Silverado/Sierra Tonneau

EGR USA, Ontario, California, presents its RollTrac Electric Retractable Bed Cover, now available for 2023-newer Chevrolet Silverado 1500/GMC Sierra 1500 short-box (5-foot-9-inch bed) pickup models. Designed to work with the vehicle's central locking system and operate with the use of the truck's key fob, the cover includes the same OE fit and black powder-coat finish as the company's original electric RollTrac for the Jeep Gladiator. Its all-aluminum slat construction is weather-resistant and easy to maintain.



Ram 1500 Spacer Kit

Timbren Industries, Whitby, Ontario, presents its Spacer Kit SPCRDR15D-QDS for lifted Ram 1500 pickup models. The kit makes it possible for Timbren kits DR1500DS and DR1500DQ to work on lifted trucks. Each spacer kit comes with two 1-inch and two 1/2-inch spacers along with all the necessary hardware to allow customers to mix and match to achieve a desired ride height, without sacrificing function for style.



Wrapping Film

Avery Dennison Graphics Solutions, Mentor, Ohio, presents its Supreme Wrapping Film ColorFlow film series, featuring three new color additions. ColorFlow Satin Solar Dawn, ColorFlow Satin Moonstone and ColorFlow Satin Frozen Ocean are the latest pigment-rich

films created with wrap designers in mind. The new Celestial Satin films are available in 60-inch rolls for greater coverage.

Corolla Front & Rear Air Kits

Air Lift Performance, Lansing, Michigan, presents new Front and Rear Air Suspension Kits for the 2019-23 Toyota Corolla Hatchback and 2020-23 Corolla Sedan FWD and AWD applications. Designed to provide maximum drop, superior handling, sharp steering response and a comfortable ride, the front kit features progressive-rate, double-bellows air springs over a high-performance monotube and threaded body shocks. The rear kit includes double-bellow air springs with vehicle-specific mounting brackets paired with threaded-body shocks.



Truck Bed Panel Kit

Kuat, Springfield, Missouri, introduces its new IBEX Panel Kit that mounts directly to the IBEX Truck Bed Rack Frame and is designed to help protect gear from the elements and theft. The all-metal panels are fully locking while still allowing easy access to the truck bed with gas-spring-operated side and rear doors. A third brake light increases visibility and safety, and the system provides access to the crossbars for mounting to the top of IBEX.



Saddle Brown Vinyl Seats

TMI Automotive Products, Corona, California, presents its Cruiser Collection of automotive seats, now available in all-new Saddle Brown vinyl material. Offered in two distinct bucket seat styles—the Cruiser Pro-Classic and the Cruiser Low Back—the seats are crafted in-house and come fully assembled and ready for installation. The Cruiser Pro-Classic Bucket Seat offers moderate bolstering and a slightly wider design, while the Cruiser Low Back Bucket Seat is engineered with aggressive bolstering.

Bronco Suspension Systems

ICON Vehicle Dynamics, Riverside, California, presents Complete Suspension System Stages 3-8 for 2021-up Ford Bronco applications. Designed to improve on- and off-road performance and ride quality, the systems feature custom-valved ICON 2.5-inch-diameter coil-over shocks with custom front coil springs and triple-rate rear coil springs, yielding 2 to 3 inches of lift over stock, depending upon the model. The replacement front upper control arms utilize the patented Delta Joint PRO, and higher stages include additional shock technology and performance.



Truck Tops

LTA Manufacturing, Kansas City, introduces its all-new Venturous Truck Tops brand of truck toppers. The tops are manufactured using all-new, patent pending PolyFuse Technology, a distinctive injection molding process that utilizes a closed-mold system to create products that are lighter, stronger and sleeker. The tops can withstand up to 1,500 pounds of static weight and up to 750 pounds dynamic weight.



Mustang Headlights

ORACLE Lighting, Metairie, Louisiana, presents its new DYNAMIC RGB+A Black Series Headlights for 2018-23 sixth-generation Ford Mustang models. The headlights feature a matte black housing, satin black bezel and smoked marker lights for meaner, more athletic styling while incorporating safety, functionality and durability. The systems include more than 200 pre-programmed moving patterns, allowing for multiple color patterns through the daytime running lights, controlled via a free smartphone app.

Recovery Winch

Quadrtec, West Chester, Pennsylvania, presents its next-generation Teton Series Winch, part of the Res-Q recovery product lineup. The powerful, reliable recovery option is designed for improved durability, faster line pull speed and quicker heat dissipation, with an IP68 waterproof rating. The winch is equipped with a solid-state wireless remote for safer, longer-range use, integrated solenoid housing for added strength, reliable gearing and a 4.9-hp, series-wound waterproof motor. A patented clutch handle is removable when not in use.



LED Light Bar

KC HiLITES, Williams, Arizona, presents its FLEX ERA LED Light Bar. Designed for performance and flexibility, the FE Bar offers high-output lighting with 7,912 lumens of power per 10-inch segment.

Its superior visibility and beam quality are ideal for demanding, high-speed conditions, while a flexible design makes it linkable, with the ability to form curves. Optic changeability adapts to the needs of each project, and a light bar master kit bundles lights, both beam pattern lenses, spare O-rings, black and yellow KC logo covers and a complete wiring kit.



High-Clearance Jeep Bumpers

Artec Industries, North Salt Lake City, Utah, presents its Bantam Series High-Clearance Front and Rear Bumpers. Crafted to pay homage to the iconic Jeep legacy, the bumpers are engineered for durability and added ground clearance. They are crafted from 1/4- and 3/16-inch CNC laser-cut steel with CNC machined 3/4-inch shackle mounts. The series flows with the lines of the grille and matches the rounded edges of the hood, and the 1/4-inch-thick steel winch mount is recessed deep in the bumper, providing a lower location that optimizes cooling airflow.

Expandable Tonneau Cover

Sawtooth Tonneau, Heber City, Utah, presents its line of Expandable Tonneau Covers for a variety of pickup models. The tonneaus lay flat and then stretch to cover large gear when needed. They also support snow loads while laying flat. The covers are built in the USA with military-grade materials and thoroughly field-tested for quality.



Hitch Step

GEN-Y Hitch, Nappanee, Indiana, presents the PHANTOM Heavy-Duty XL Hitch Step. Made in the USA and designed for sure footing with zero slip, the serrated step also acts as a boot scraper, making it easy to scrape off dirt, rocks and mud before getting into the truck. Measuring 42 inches wide, the XL step allows easy access to all sides of the truck bed and offers a 600-pound weight capacity.

Solar Roof Cab Light System

Race Sport Lighting, Ringwood, Illinois, presents its patented Solar Roof Cab Light System. With no wires and no holes or drilling required, the system is made in an ISO 9000 factory in the USA and is completely run by solar power and vibration sensors. Highlights include a 30-minute installation time and a choice of white or amber lights.



Four-Wheeled Beach Cart

Great Day Inc., Tallulah, Louisiana, presents its High Sands Beach Buddy 350 Four-Wheeled Beach Cart. Based on the company's Hitch-N-Go Cart platform and made in the USA, the HSBB-350 features 12-by-7-inch pneumatic beach tires, a removable bait cutting station and a removable five-rod holder. Users can load their gear into the cart, strap it down, hook it to a vehicle, drive to their favorite fishing spot, lower it down and roll it to the pier, lake or beach without unloading and reloading.



Bronco Lighting

D&C Designs, Ogden, Utah, presents a new Lucid VSL Auxiliary Light Set for late-model Ford Bronco models. The lights replace the tie-down hooks for a clean, factory-designed look. Custom colors can be ordered to match Bronco paint codes. Rated at 2,500 lumens, the lights integrate with the vehicle's blinkers to be more noticeable when making a turn.



Detailing Products

303 Products, Australia, a **Gold Eagle Co.** brand, presents its expanded line of Automotive Detailing products, offering durable protection for tires and trim. The line now includes Graphene Tire Gloss, Graphene Trim Coating, Slick Shine Ceramic Detailer and Spray and Rinse Ceramic Sealant.

Bronco Cargo Solutions

Tuffy Security Products, Cortez, Colorado, presents Cargo Solutions for new Ford Broncos, including a Cargo Drawer for four-door models and a Security Trunk Lockbox for two-door models. The welded steel cargo drawer attaches behind the rear seat using OEM mounting points and can be securely locked to protect tools, equipment and valuables. The security trunk lockbox mounts to the cargo floor and offers over 3.5-cubic-feet of lockable storage space. The trunk lockbox lid is supported by gas lifts and the door can be latched closed without being locked.



Commercial Lighting Products

Lumileds, Farmington Hills, Michigan, presents an expanded **Philips**-branded Commercial Lighting portfolio with nine aftermarket incandescent and halogen bulb offerings. The line includes OE replacement halogen headlight bulbs, halogen and incandescent sealed beam headlamps, and miniature bulbs for interior and exterior vehicle applications for popular passenger vehicles from Buick, Cadillac, Chevrolet, Chrysler, Dodge, Ford, GMC, Jeep and Lincoln. The program is supported with point-of-sale tools.

lar passenger vehicles from Buick, Cadillac, Chevrolet, Chrysler, Dodge, Ford, GMC, Jeep and Lincoln. The program is supported with point-of-sale tools.



Premium Car Tire

Pirelli, Rome Georgia, introduces the P Zero AS Plus 3 Ultra-High-Performance Tire, designed specifically for premium cars. The tire combines the sporty performance of the Pirelli iconic P Zero range with the comfort and durability of the Pirelli Plus line, creating an all-season tire capable of covering many miles with sure handling. The new tire is available in 31 sizes, from 17 to 20 inches. Key fitments include the Ford Mustang, Genesis G80, BMW 3 series and Mercedes-Benz C-Class.

BMW Custom Wheels

BBS, Braselton, Georgia, presents its CI-R Unlimited wheels, available with a unique adapter system that allows them to fit on all BMW vehicle models. Manufactured in a 5x117.5 bolt circle, the BBS CI-R Unlimited base wheels are available in 19-, 20- and 21-inch sizes, nine rim widths from 8 to 12 inches, and four concavities. Ten bolt circles ranging from 5x100 to 5x130 can be mapped using hub adapters, and the offset can be altered using a hub adapter. Centering rings in 18 hub diameters are available to ensure proper fit.



Truck Fuel Tanks

JohnDow Industries, Barberton, Ohio, introduces three Low-Profile Fuel Carrytanks: the 40-Gallon Gasoline Carrytank, the 40-Gallon DEF Carrytank and the 58-Gallon Diesel Carrytank. Designed to seamlessly fit in the bed of a pickup below the height of standard truck bed sides, the Carrytanks offer a durable, portable refueling solution for a wide range of applications including farm, construction, recreation, industrial and fleet vehicles. **TS**

PERFORMANCE

Workplace Safety p. 42

Performance Products p. 46



As the lifeblood of engines, performance oils and fluids are a vital category for speed shops looking to protect builds and maximize sales.

Whether choosing them for your own projects or offering them to customers for street and track use, it pays to know all you can about this product flow.

Quality oils and fluids can help find and maintain horsepower while keeping things cool and calm under the hood and throughout the drivetrain. Suppliers have thoughts when it comes to choosing the right blends and selling them to eager drivers.

SPECIAL BLENDS

Is oil just oil? Not these days.

When it comes to the oil market in general, “there have been a lot of changes over the last five years, mainly due to the transition from traditionally high-viscous engine oils to now mainly SAE 0W-x oils,” says Oliver Kuhn, deputy manager of the LIQUI MOLY oil laboratory. “Now we expect to see a plateau for SAE 0W-20 oils for diesel cars and SAE 0W-16 for gasoline cars, and only some OEMs will go lower. For the U.S. market, engine oils

with API SP/ILSAC GF-6A or -6B are widely available, also down to the very low SAE grades.”

Rusty Waples, director of brand and product marketing for Royal Purple Synthetic Lubricants, notes that due to API/ILSAC and OEM licenses, oil companies have been limited on how much anti-wear additives such as ZDDP can be put in certified passenger car motor oils.

“Wear protection is a top priority for racing and performance engine owners, so they are seeking other options, especially in lower-viscosity oils,” Waples says. “We offer racing-focused lubricant solutions that aren’t limited by regulations and warranty requirements for enthusiasts that are looking for that extra level of protection.”

Of course, speed shops are sometimes dealing with even more specialized power plants, meaning they have even more specialized needs.

“One of the bigger changes in the market over the last few years is the need for specific lubricants for specific applications,” says Mark Beatty, director of brand and marketing for Red Line Synthetic Oil. “When you look at the performance gains over the last decade, it takes your breath away. The dyno numbers, the speed of the



Advancements in technology have led to the development of more sophisticated performance oils and fluids. (Photo courtesy Hot Shot's Secret/LSI)



Lubrication regulations are always increasing, making supplier relationships vital. (Photo courtesy LIQUI MOLY)

cars, the ETs in racing—it's an incredible time to be involved. As a lubricants manufacturer, our engineers and chemists need to be working ahead of the curve to be ready for what's next."

Shops must be knowledgeable regarding their selections, says Duane LaFleur, national account manager – high performance for Lucas Oil Products.

"Back in the day, the most common racing oil was the good old 20W-50 conventional-style oil. But over the years, that has changed. Now there are synthetic blends and full synthetics," he says. "Today, we have zero-weight racing oils that will withstand extreme racing conditions. There is performance and horsepower in some of the lighter-weight racing oils in today's performance world."

Science is responsible for many of these changes, notes Josh Steinmetz, brand manager for Hot Shot's Secret/Lubrication Specialties Inc.

"Advancements in technology have led to the development of more sophisticated and high-performance oils and fluids," he says. "These products are designed to enhance the efficiency, performance and longevity of vehicles, leading to increased demand for premium performance fluids."

And the demand comes thanks to powerful, high-tech engines, says Richard Gladly, director of sales, lubricants division for VP Racing.

"Tighter clearances in engines demand lower-viscosity oils that require top-notch base stocks and additive systems for protection," he explains. "In addition, racing

oils need to provide excellent anti-wear protection for some sub-par components in the market."

Also having an effect?

"Higher pricing due to shortages over the past several years," he adds.

SLICK IDEAS

Selling effectively to the Performance Oils and Fluids market includes sidestepping possible wrong moves. One is not truly understanding these products or their intended applications.

"Some shops don't take advantage of educating their front counter staff concerning performance oils and fluids," Gladly says. "VP Racing offers personal training for its race fuels, performance oils and consumer product additives."

Some of that education should center on recent industry advancements.

"Not all performance oils are what they were years ago," LaFleur says. "Not all performance and racing oils are made the same. The additives that go into these oils can make all the difference in the quality of a performance oil. That is why understanding the brand and what is in that product can make a big difference when selling a performance oil."

Beatty agrees that one size doesn't fit all.

"Shops need to understand and know the difference between one product and the next. In our world, just because a bottle says 'synthetic' doesn't mean it's a full synthetic. We only use an ester/PAO base stock in our lubricant products, so there is no doubt we are a full synthetic. In racing and high-performance applications, it matters what you sell a customer—their investment is high and they need protection."

Waples calls it "a mistake thinking all oil brands are the same. Don't rely on hype—do your homework and research what each brand is putting into their formulations."

Even for street vehicles, there are choices to be made.

"We still often hear that garages use SAE 10W-40 engine oils for a wide range of cars; even for the most modern ones," Kuhn notes. "Also, one of the frequently asked questions is about 'the cheapest SAE 5W-30 for all cars,' which definitely does not exist. Today, it is crucial to consider the requirements of each type or model to choose the right engine oil—not only to lubricate the engine correctly, but also



One brand, all solutions



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HOT OILS & FLUIDS

■ **HOT PRODUCT:** Adrenaline PAO Racing Engine Oil
 ■ **FEATURES & BENEFITS:** Engineered to be 100% pure synthetic using only Group IV base oils; features patented nanocarbon technology; formulation extends performance and anti-wear protection; Adrenaline R-Series racing oil increases oxidation and thermal stability.

Hot Shot's Secret/Lubrication Specialties Inc.
 Josh Steinmetz
 Brand Manager

■ **HOT PRODUCT:** Leichtlauf High Tech SAE 5W-40
 ■ **FEATURES & BENEFITS:** Top-class, fully synthetic, all-season motor oil for performance and long engine life; for gasoline and diesel vehicles without particulate filters; exceeds strict test requirements specified by major manufacturers; safe with catalytic converters and turbochargers.

LIQUI MOLY
 Oliver Kuhn
 Deputy Manager, Oil Laboratory

■ **HOT PRODUCTS:** Lucas Oil Break-In Oils & FL-0 Full Synthetic Racing Oil

■ **FEATURES & BENEFITS:** The FL-0 racing oils make power and will not break down in a few runs; depending on what category you are running, the FL-0 will perform very well for a period of time before needing to be changed.

Lucas Oil Products
 Duane LaFleur
 National Account Manager – High Performance

■ **HOT PRODUCTS:** 75W-85 GL-5 Gear Oil, 0W-20 High-Performance Oil & WaterWetter

■ **FEATURES & BENEFITS:** All our products are born in a lab and have been track tested around the globe. Starting with an ester/PAO base stock is a big part of who we are. It's like the old saying: "Build your house on rock, not sand."

Red Line Synthetic Oil
 Mark Beatty
 Director of Brand and Marketing

■ **HOT PRODUCTS:** HPS High Performance Street Oils & XPR Extreme Performance Racing Oils

■ **FEATURES & BENEFITS:** Premium synthetic formulas; improved ZDDP wear protection; oil film strength via Synerlec technology; increased power and torque; superior high-temp performance; compatible with exotic/racing fuels.

Royal Purple Synthetic Lubricants
 Rusty Waples
 Director of Brand & Product Marketing

■ **HOT PRODUCT:** Pro Grade Racing Oil

■ **FEATURES & BENEFITS:** Anti-wear protection and friction reduction to extend laps and passes, as well as increase engine durability; Mark Cronquist, head engine builder for Joe Gibbs Racing, warrants engines only if they use our Pro Grade SAE 15W-50 Racing Oil.

VP Racing
 Richard Gladys
 Director of Sales, Lubricants Division

EVEN FLOW



Not all performance oils are what they were years ago. (Photo courtesy lucasoil.com)



Understand the differences between one product and the next. (Photos courtesy Red Line Synthetic Oil)

to protect the complex aftertreatment systems as well as to work perfectly over the entire service interval, which can be up to 18,000 miles in some cases."

Particularly for performance applications, changeout frequency is key, says Steinmetz.

"Many end-users and shops alike often change performance oil and fluids at the wrong intervals. Many have the misconception that 'my oil will only last X number of times down the track based on the behavior of fluids in the past.'"

Instead, he recommends an oil analysis.

"It's a great tool to understand the fluid's health and longevity. Once the proper drain interval is discovered, care can be taken to find other weak points in the race program."

A FLUID APPROACH

All the talk about education and different blends means shops will want to approach each sale with a plan. It begins with carrying what racers need.

"Have the product available when the consumer walks in to make a purchase," says LaFleur from Lucas. "Having the product on the shelf is crucial. Most consumers know what they are looking for and are there to buy, and if it is not on the shelf when they go to buy it, they will go somewhere else."

Overall, it may take more work than it sounds, says Kuhn from LIQUI MOLY, meaning supplier relationships are vital.

"One of the main challenges today is to be able to supply the market with a wide range of high-quality products in combination with official approvals and licenses from all the well-known OEM and industry bodies like API, ACEA, JASO and others," he explains. "To ensure this, a variety of different base

Recommend premium high-quality synthetics that are purpose-built for each customer's application. (Photo courtesy Royal Purple Synthetic Lubricants)





Tighter engine clearances demand lower-viscosity oils that require top-notch base stocks and additive systems for protection. (Photo courtesy vpracingfuels.com)

oils and additives are necessary, as well as a sophisticated quality control system that monitors all stages of the manufacturing process. The regulations for lubricants are also increasing in many parts of the world regarding labeling, registration, etc., so the challenges are constantly rising.”

Royal Purple’s Waples suggests recommending premium high-quality synthetics that are purpose-built for each application.

“Today’s warranty-compliant engine oils you find on the shelf at big-box retailers don’t have the premium technology that race engines, performance-tuned street cars and hot rods require for optimal performance and longevity,” he says.

It’s also important to not limit your reach when it comes to the markets you serve, says Hot Shot’s Steinmetz.

“Shops can explore various opportunities for business growth. While the market may be competitive, focusing on specific niches and strategies can help your shop stand out and expand your customer base,” he says. “Specializing in specific types of performance oils and fluids or catering to niche markets can set your shop apart. For example, you could specialize in performance fluids for high-performance sports cars, vintage automobiles or tractor pulling. By offering high-quality, proven performance fluids and oils, a shop has

the opportunity to upsell, build a valuable new revenue stream and serve as a trusted advisor for repeat business.”

Among those opportunities are smaller engines.

“If the shop doesn’t handle powersports oils, consider expanding into the growing powersports market,” suggests Gladly. “VP Racing now offers a line of consolidated 4T powersports oils that can be used in four-stroke street bikes, off-road bikes and UTV/ATV applications. In addition, we offer low-smoke, low-ash 2T engine oils for two-cycle engines as well.”

And don’t forget to ask if the client needs anything else.

“We have many customers that package things together and that drives their numbers,” says Red Line’s Beatty. “If you sell a radiator, package it with coolants. Selling brakes? Ask about the last time the fluid was flushed. As mentioned earlier, learn the benefits of the products you carry. We make sure we are always better than the OEM requirements, and that helps customers as well.” **TS**

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Occupational hazards to watch for in an auto shop.

Common occupational hazards can make auto shops dangerous places. While working with heavy machinery or hazardous materials, employees must take the necessary precautions to stay safe.

Some injuries and accidents are more common than others. Here are a few dangers you or your employees might encounter in your shop environment, courtesy of plant-tours.com:

Slips, Trips & Falls

Slips and falls are the most common cause

of severe injuries among workers. They can lead to broken bones, concussions, bruises and other bodily damage.

Oil changes, transmission flushes or other activities that include slippery lubricants can cause workers to slip, trip or fall. When grease or paint coats the floor, it can lead to severe injuries.

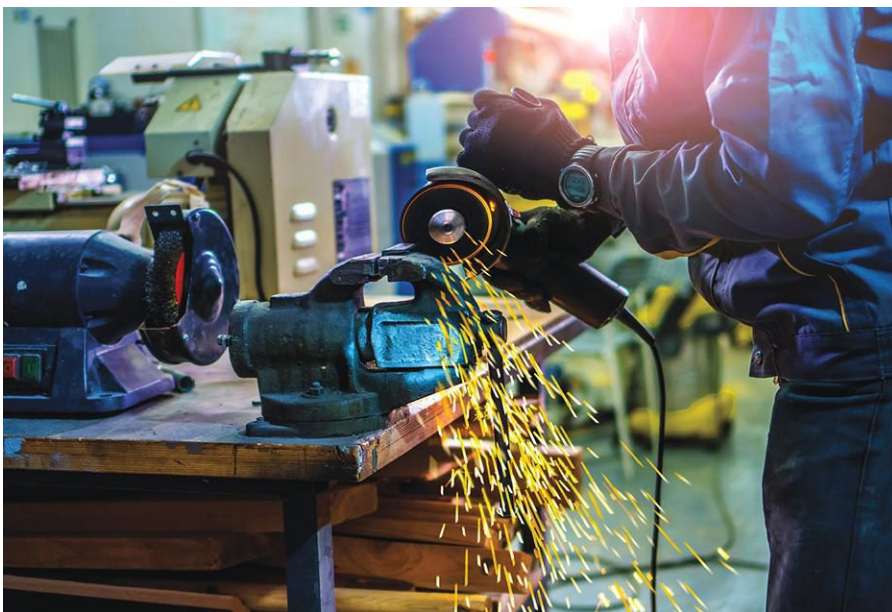
A cluttered workplace can also increase the risk of these types of accidents.

Strains, Sprains & Tears

Auto shop hazards can lead to strains, sprains and tears:

- Strains and related injuries occur through lifting heavy equipment or making repetitive motions like bolt tightening. Symptoms include pain, stiffness or limited movement
- Sprains can happen due to slips, falls or situations that force the body to twist unnaturally
- Tears are due to forceful movement or overuse of muscles

The effects of sprains, strains and tears range from mild to severe. Each can lead to decreased productivity, increased health



Common occupational hazards can make auto shops dangerous places.



Provide the appropriate personal protective equipment (PPE) for your employees to perform their jobs safely.

care costs or even serious long-term health issues if left untreated.

Eye Injuries

In an auto shop, workers are exposed to various hazards that can cause eye injuries, including:

- Flying debris from tools, such as saws or grinders
- Harsh chemicals
- UV rays from welding or brazing, which can cause photokeratitis or “welder’s flash”

Without proper protection, these can result in serious eye injuries. The effects of eye injuries can range from mild irritation to permanent vision loss.

Chemical Burns

Chemical burns are a common safety hazard in the auto shop environment. They can occur through direct contact or by breathing in chemical fumes.

According to Occupational Safety and Health Administration (OSHA) standards, chemicals must be properly labeled. Labels should include signal, hazard and precautionary statements.

Effects of chemical burns range from mild skin damage to lifelong pain and permanent disability.

Loss of Limbs or Digits

Workers using power tools such as grinders risk losing limbs or digits if they don’t wear the proper protective equipment, follow



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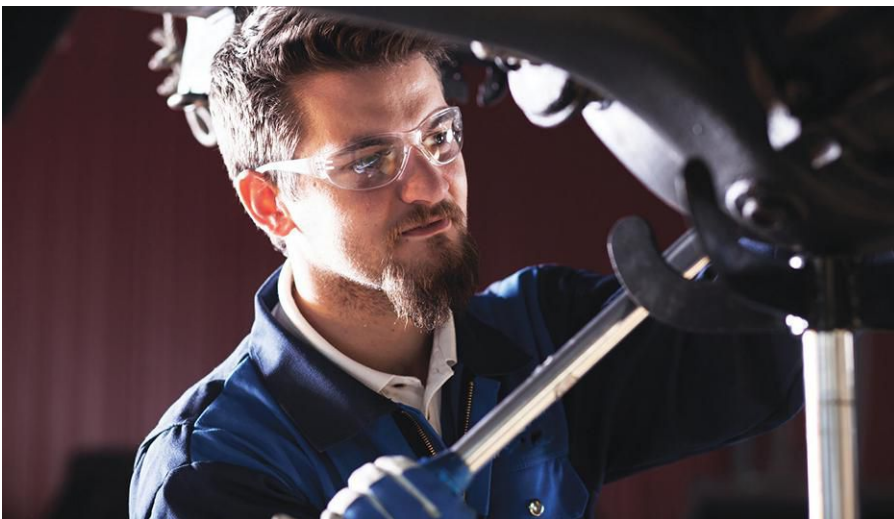
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Keep work areas clean and organized.



While working with heavy machinery or hazardous materials, employees must take all the necessary precautions to stay safe.

the appropriate equipment operating instructions or put guards in place.

Limb damage can lead to permanent disability, increased health care costs and reduced productivity.

AUTO SHOP SAFETY TIPS

To avoid the above listed hazards, here are some safety measures to take when working in or running an auto shop:

Personal Protective Equipment

Wearing personal protective equipment involves putting on gloves, safety glasses, safety boots, hearing protection, coveralls and/or overalls that protect different parts of the body. Mechanics are required to be protected at all times while working.

PPE is designed to protect a person against physical, chemical and biological hazards. Failure to wear properly fitted

equipment can lead to serious bodily injury or death.

Proper Organization & Layout

The following are general tips to keep workplaces organized and eliminate safety hazards:

- Keep work areas clean & organized
- Securely store tools & auto parts in cabinets to prevent clutter
- Have proper fire extinguishers easily accessible
- Test fire alarms regularly
- Use proper lifting techniques

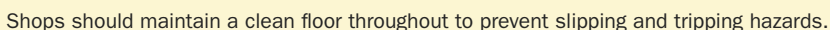
In addition to being organized, auto shops should have a proper emergency exit plan in case of fire.

Floors and work areas should also be kept clean so that workers can reach the exits promptly if needed.

Proper Floor Maintenance

Automotive shops should maintain a clean floor throughout to prevent slipping and tripping hazards.

Develop daily cleaning routines to prevent debris from accumulating in work-places.



*The article originally appeared online at theshopmag.com. Visit today and sign up for the free daily eNewsletter. **TS***

JANUARY 2024 **THE SHOP** 45



Stock Your Shelves With These
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NSX Suspension Kit

KW automotive, Clovis, California, presents its V5 Coil-Over Suspension Kit for 2016-22 Acura NSX and Honda NSX and NSX Type S applications. The system lowers the hybrid sports car up to 25mm and provides enhanced damping characteristics through the use of KW solid piston dampers. The coil-over suspension can be individually adjusted for high- and low-speed compression and rebound force.

Lug-Drive Wide 5 Race Hubs

Wilwood Disc Brakes, Camarillo, California, presents Starlite 55XD Lug-Drive Wide 5 Race Hubs. The dynamic-mount rotor system is designed specifically for the lighter, stronger Starlite 55XD Wide 5 hubs, saving weight through the mounting of the forged aluminum rotor adapter closer to the hub's reinforced center using fewer mounting bolts. The new Lug-Drive system simplifies rotor mounting using a snap ring in place of bolts and safety wire, allowing it to float and heat cycle without distortion for a more consistent pedal feel and longer life.



Vintage Vehicle Sound System

Custom Autosound Mfg., Fullerton, California, presents its USA-740 sound system that combines vintage looks and the latest audio features for classic vehicle applications.

Answer calls and stream music with built-in Bluetooth capability (microphone included), powered by solid, 300W peak power. Features include four-channel RCA pre-outs and a subwoofer RCA pre-out for additional amplifiers, a USB input, front mini-jack auxiliary audio input and a rear RCA auxiliary audio input for options including satellite radio or an iPod or other portable player.

Integra/Civic Si Exhaust System

BORLA Performance Industries, Johnson City, Tennessee, presents its Cat-Back Exhaust System for 2023 Acura Integra/2022-23 Honda Civic Si models that improves horsepower and torque. System 140922CFBA delivers the classic BORLA S-Type sound without any drone or resonance inside the vehicle. The system is made from T-304 stainless steel and features all-welded construction for durability and long life. System 140922CFBA features carbon fiber tips. Systems 140922 with bright chrome and 140922BC with black chrome tips are also available.



C10 Brake Booster Kits

LEED Brakes, Cheektowaga, New York, presents its Power Brake Booster Kits for 1973-87 Chevrolet and GMC C10 trucks. The Compact-10 Series boosters provide increased engine and wheel well clearance compared to stock power brake boosters, fitting directly to the factory firewall. Hand-polished and available in zinc-plated or chrome finishes, the kits work with most disc/drum and four-wheel disc brake applications.



Ford Dual Master Cylinder Assembly

Speedway Motors, Lincoln, Nebraska, presents a 1954-56 Ford Dual Master Cylinder Assembly. The bolt-on dual master cylinder kit updates mid-1950s Ford car single reservoir brake systems for safer operation and is designed to complement front disc brake upgrades by providing a separate reservoir and fluid path for the disc brakes. A Ford-style 1-inch bore master cylinder feeds an OE-style Ford brass proportioning valve for disc/drum brakes, and the complete kit includes braided AN brake hoses, mounting brackets, heat shield and hardware.



2023 BMW M2 Exhaust

Akrapovič, Horsham, Pennsylvania, presents its BMW M2 (G87) Slip-On Line (Titanium) Exhaust System for 2023 models with an available Titanium Short Link Pipe Set. The system's high-grade titanium construction was developed in-house and provides a durable structure and attractive finish, as well as a 32.7% weight savings over stock. Using two valves and two acoustic reflectors, the sound is tailored for a smooth, rich tone when casually cruising, and a deep, sporty growl during spirited driving. Carbon exhaust tips are sold separately.



Industrial Fans

K-Tool International, Lakeland, Florida, presents a waterproof Non-Oscillating Pedestal Fan and a waterproof Oscillating Fan with misting attachment. Both 24-inch fans feature a three-speed IPX4 waterproof-rated motor, and the misting fan attachment distributes a refreshing mist to keep work areas, customers and workers cool and comfortable. With a speed of 7,435 cfm, the fans create powerful airflow.

Corvette Showcase

CarCapsule, Hobart, Indiana, introduces the SC1 Corvette Series ShowCase ultra-premium vehicle storage shelter that dramatically presents a 'Vette in an exciting and aggressive rake design emblazoned with GM Official Licensed Product Corvette logos. The heavy-duty inflatable frame features easy-open zippered back and side panels, allowing the Corvette to be easily driven in and out. No tools are required for setup—simply lay out the ShowCase, attach the patented pump and inflate/assemble the structure in under five minutes.



Kit and install with minimal modifications to the original firewall. Features include higher-torque actuator motors and rubber over-molded blend air doors.

Old Bronco Climate Control

Vintage Air, San Antonio, introduces its all-new Gen 5 SureFit Climate-Control System for 1966-77 Ford Broncos. The kits showcase the all-new Gen 5 electronically controlled climate-control system featuring OEM-quality injection-molded cases and block-type expansion valves. They are available as either a Complete Kit or an Evaporator



Portable Alignment Machine

Atlas Automotive Equipment, Greenfield, Indiana, offers the new TD 2.0 Portable Alignment Machine for automotive shops. Using ultra-fast Wi-Fi communication and a tablet, the system features new wireless sensors to deliver highly accurate results, eliminating the need for a drive-on scissor or four-post alignment lift. The TD 2.0 alignment system can be stored on a wall, eliminating clutter and maximizing floor space. **TS**

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Build, text and photos by Mike Mavrigian



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EDITOR'S NOTE: This is the third installment of a multi-part series highlighting the steps to building an old-school Chevrolet big-block performance engine. Part I appeared in the July 2023 issue of THE SHOP magazine and Part II appeared in the October 2023 issue.

INTAKE MANIFOLD & CARBS

Just for fun we decided to employ an old-school approach with a Weiand high-rise dual-carburetor intake (P/N 1985) mated to a pair of Holley 950-cfm mechanical secondary carburetors.

The intake manifold, featuring rectangular ports, is a two-piece setup. The upper plenum mates to the lower with four 5/6-18 socket head cap screws and mil-spec flat washers.



The timing set is a Cloyes Hex-A-Just double roller, for a stock cam height application.

With the upper in place along with the supplied gaskets, the screws are inserted from top to bottom (the holes in the upper are open with no threads; the lower features female threads). Weiand recommends applying Loctite Pro-Lock (red) thread compound to the screw threads. Each screw was torqued to 18-20 pound-feet.

The Holley 80805-RDX carbs (4150 series) feature aluminum construction for a 38% weight savings over stock, contoured Venturi inlets for balanced airflow, outward-placed air bleeds, integrated idle bypass, dual 30cc accelerator pumps, 20% increased fuel bowl capacity and 8AN O-ring threaded inlets.

And, of course, added bling with red anodized metering plates and baseplate.

Due to a somewhat restricted space at the rear of the Weiand high-rise intake manifold, an HEI-size distributor would not clear. To gain the needed clearance, we chose an MSD 8570 Pro Billet distributor. Since we're running an MSD crank trigger setup, we simply locked out the distributor's advance.

As far as gear-to-gear compatibility, the MSD distributor was already fitted with a cast iron melonized gear, which

is compatible with any cam gear so there was no need to change the distributor gear.

The only issue we ran into was with the carb linkage clearance for the rear carb, as the bottom of the lever arm (for return spring) contacted the top of the plenum. We added a 1-inch spacer between each carb and the manifold. This required using ARP 400-2402 carb studs measuring 2.7 inches in overall length.

The Holley carbs are controlled using a Holley dual-carb linkage kit (P/N 4022).

IGNITION

Our ignition system is 100% MSD, including Pro Billet distributor (P/N 8570), crank trigger kit, plug wires, coil and ignition control.

Since we're running a crank trigger ignition, the distributor required a lockout for advance. While MSD offers a distributor specifically for crank trigger use (P/N 84697) with no mechanical advance, due to the space constraints of our tunnel ram intake, we needed a distributor head that was smaller in diameter to clear the intake manifold.

The 8570 distributor filled the bill nicely. As already noted, we simply had to lock the advance out of the distributor.



Our distributor is an MSD Pro Billet unit.



The Holley carbs mount sideways on the Weiland intake.



The Dart cast aluminum valve covers feature an inverted flange design, providing added clearance for rockers and an optional stud girdle.

Our distributor also features a slip collar, allowing us to fine-tune the height placement for ideal gear mesh to the cam gear.

PISTON RING FIT

The ICON 516 forged piston set included a set of Hastings file-to-fit rings. Top ring gaps were filed to a gap of 0.020-inch, while second rings were set at 0.022-inch.

Rings were checked for axial (side) clearance at a snug 0.0015-inch top and an acceptable 0.0015-inch second, with clearance likely opening up a tad during initial engine run-in. The oil ring package (including support rails) was checked at 0.003-inch.

Back clearance was checked to verify that the rings would not protrude outside of the piston when squeezed. Each piston's top and second rings were adjusted for gap on each cylinder and organized as such, so each bore was assigned a ring package specific to each cylinder.

With pistons assembled to rods (wrist pins lubed with Royal Purple Max Tuff), one spiral lock per side was installed and double-checked for proper seating.

Since the piston pin bores intersect with the oil ring groove, a support rail was installed to the floor of each piston's oil ring groove, with the anti-rotation male dot facing downward, centered to one end of the pin bore.

The oil ring package, second ring and



All main cap bolts were torqued in several steps.



All main journals measured spot-on at 2.749 inches. With standard main bearings, the oil clearance is 0.003-inch.



After installing all main caps to fully seated positions, all bolts were loosened, and the crank was knocked fore/aft to aid in centering cap alignment.



All rod journals were measured at 2.200 inches.

top ring were then installed, (the second ring is a Napier style, with an orientation dot on the top of the ring), with ring gaps clocked to prevent gap alignment.

The cylinder bores were then final-cleaned to remove any trace of contaminants.

As a result of prior test-fitting to determine a rod bearing oil clearance of 0.0025-inch, I installed an upper CB743HN (standard thickness) bearing to the rod big end upper locations and a CB743HXN lower bearing to the rod caps (providing an extra 0.0005-inch clearance).

Both bearing faces were coated with Royal Purple Max Tuff lube. Just as a personal preference side note, my favorite assembly lubes to date are Royal Purple's Max Tuff and Akerly & Childs Xtreme lube. The only assembly aspects where I don't use Max Tuff is for piston, ring and cylinder wall applications, due to its super-slippy synthetic characteristics. I find that either lube works for piston pins and bearings.

Using Akerly & Childs Xtreme assembly lube, the cylinder walls, rings, piston skirts and inside of the 4.500-inch billet ring

compressor were all generously lubed. Using the billet tapered-I.D. ring compressor, each piston easily slid into the bores using hand (fist) pressure.

Once the piston deck was just below the block deck, a Goodson extended-nose plastic piston hammer was used to gently tap the piston until the upper-bearing in the rod made contact with the crank journal. The rod caps (which register onto dowels) were tapped into register prior to installing the bolts.

The 7/16x1.600-inch ARP 2000 rod bolts and female threaded holes in the rods were cleaned, applying fresh low-friction lube to the rod bolts.

Before final rod bolt installation, I "seasoned" each bolt by torquing (with the rod in a proper rod vise) three times at 40 pound-feet (with fresh lube each time), afterward noting a relaxed state that showed about 0.0004-inch stretch.

Addressing one rod at a time, and prior to bolt installation, a pair of ARP and Goodson rod bolt stretch gauges were zeroed to each rod's bolts (with a stretch gauge dedicated to each bolt).

SCAT recommends a final torque of 70



Using a mix of CB743HN standard upper rod bearings and CB743HYN lower bearings, rod bearing oil clearance was set at 0.0025-inch.



The Hastings rings were file fitted, with top rings at 0.020-inch.



In preparation of final assembly, all top and second Hastings piston rings were file-fitted on a per-cylinder basis, using a factor of 0.0045-inch-per-inch-of-bore.



Rod bearings included standard-thickness HN uppers, mixed with HYN (1X) lowers to increase rod bearing oil clearance to 0.0025-inch.



Preliminary piston-to-valve clearance was checked prior to adding head gaskets and proper-length pushrods, simply to obtain an initial idea of clearance.

pound-feet with these particular ARP bolts, with stretch not to exceed 0.0062-inch. With the rod bolts initially tightened to 35 pound-feet, I used the stretch gauges to check, observing an average bolt stretch of 0.0019-inch.

I then tightened the bolts to 55 pound-feet, noting an average stretch of 0.0035-plus-inch. At the final recommended torque value of 70 pound-feet, stretch was noted at an average of 0.0045-inch. During remaining installations, these numbers were the norm, with the highest stretch recorded at 0.0046-inch.

During assembly, I carefully tapped rod caps into position on the rod's upper dowels, then installed the bolts. (SCAT warns against using the bolts to align onto the rod dowels).

Once the No. 1 piston/rod was installed, I rotated the crank using a beam-type torque wrench, noting perhaps 2 pound-feet of effort. With Nos. 1 and 2 pistons installed, rotation required about 4 pound-feet. With all pistons in place, rotational torque was approximately 19 pound-feet.

With Nos. 1 and 2 pistons/rods installed on their common journal, rod side play was measured at a healthy 0.018-inch. During the remaining assembly, all rod pairs revealed side play from a healthy 0.017-inch to a snug 0.018-inch, a testament to SCAT's crank and rod dimensional control.



Each piston easily slid into the bores.

OIL PUMP & PAN

For this application, we chose Melling's billet aluminum oil pump (P/N 10077-800SS) and Moroso's 20420 road race-style oil pan. The billet pump features an integral pick-up screen, avoiding any potential for pick-up loosening.

The body is CNC-machined from 6061-T6 aluminum and hard anodized. Features include smoother oil flow and less internal drag as compared to conventional pumps, high volume and high pressure—with 25% more volume than a stock unit—plus billet spur gears, chromoly driveshaft with extended support, adjustable screen and multiple pressure settings.

Unlike some currently available pump-to-intermediate-shaft combos, the Melling intermediate shaft snaps onto the pump shaft to secure the shaft-to-shaft connection. (With the intermediate shaft engaged to the pump shaft, a firm tap snap-locks it into place).

Meanwhile, machined stand-offs at the bottom of the pump body surrounding the screen area prevent smothering of the screen in case the pan sump ever touches the pump.

This pump requires an oil pan with an 8-inch sump. The pump includes a mounting stud and nut, but I opted to use an ARP pump stud, as it featured a female hex, handy for installation or removal. The nut was torqued to 65 pound-feet.

The Moroso pan features an 8-inch-deep kick-out sump, with a sump capacity of 6.5 quarts.

Finished in a clear zinc plating, the pan is stroker-clearanced and designed to accommodate up to a 4.250-inch stroke.

A 1/4-inch NPT dipstick bung is located on the right side. Features include a trap-door baffle system, windage tray and crank



A view of the sump baffles. The one-way, lightly spring-loaded baffle doors keep oil from leaving the sump area.

scraper, making it suitable for street, drag or road racing applications.

During test-fitting, I checked for oil-pump-to-pan-sump-floor clearance. The block-pan-rail-to-pump-bottom measurement was 7.750 inches. Pan sump depth was measured at 8 inches, which provided a 0.250-inch clearance.

With the addition of a 0.100-inch crushed pan gasket, we had approximately 0.350-inch pump-to-sump clearance. With the Melling billet oil pump installed, and with no gasket, the only glitch I ran into involved a clearance issue between the oil pump and the lower rear wall area of the sump.

Due to the mass of the billet pump body and a horizontal welded steel baffle shelf in the rear lower wall area of the sump, the pump contacted the baffle, preventing the pan from moving rearward for proper bolt hole alignment. I trimmed the steel baffle for clearance (as the pan was designed for a stock-style pump, which would have cleared fine). Moroso makes pans designed for use with billet pumps for race applications but fitting our street/strip combo posed no big issues.

I secured our pan to the block using ARP oil pan stainless stud kit 435-1902. Once the fit was verified, I installed the studs into the block rails hand-tight with Loctite 242 medium-strength thread locker.

With the Moroso one-piece pan gasket 19353 in place, the ARP 12-point flanged nuts were secured at 12 pound-feet for the 20 5/16-24 nuts and 106 pound-inches for the two front-to-bottom of the timing cover 1/4-inch-28 nuts.

During test-fitting I verified that no crank/rod interference was present. The 5/16-inch nuts required the use of a 12-point 3/8-inch socket, while the front two 1/4-inch nuts took a 12-point 5/16-inch socket.

The Dart block instructions called for a Fel-Pro oil pan gasket (P/N 1863), a



The Moroso oil pan was secured with a one-piece Moroso gasket and an oil pan stud kit from ARP.



We secured the oil pan with ARP stainless studs and 12-point nuts, using stainless mil-spec flat washers between the nuts and the painted surfaces.

four-piece set that fits the block (the Dart block offers multiple bolt hole locations for different pans). However, while our pan also fits the block, the 1863 gasket does not fit this particular Moroso oil pan (rail mounting holes in the Fel-Pro 1863 don't align with the holes in the pan's rail areas).

As a result, we used a Moroso one-piece gasket (P/N 93153), which perfectly accommodated both the Dart block and this particular Moroso pan.

The gasket and pan were secured with 22 fasteners. The thick rubber/silicone gasket featured a stainless core to prevent over-tightening. I added a dab of Permatex Optimum Max Flex RTV to all four corners prior to positioning the gasket and the pan.

HEAD GASKETS

I chose Cometic MLS gaskets due to the fine roughness average (Ra) finish of the decks and this gasket style's exceptional sealing qualities. Our head stud nuts were torqued to Dart's spec of 70 pound-feet, tightened in three stages (30 pound-feet, 50 pound-feet and then 70 pound-feet).

The standard BBC torque sequence was followed (starting at the center in the rocker area followed by the center outside stud nut, spiraling outward in a clockwise pattern).

Our head stud kit (specific for our Dart heads) was ARP 235-4328. These are 7/16-



Head studs were installed during test-fitting. All holes are blind, but lower threads were lightly coated with high-friction lube to avoid future sticking.



All ARP head stud nuts were torqued to 70 pound-feet, following the standard big-block Chevy sequence.

inch studs, in three overall lengths (four at 3-inch length; five at 5-inch length; and seven at 6.112-inch length), for a total of 16 studs per head.

The lower 7/16-14 threads were lightly coated with anti-seize and hand-installed to the block. The upper 7/16-20 threads and nuts were treated with low-friction lube. With washers installed, the 12-point nuts were all torqued to 70 pound-feet, as noted earlier.

The location of the different-length studs is obvious. The 3-inch studs install on the outer exhaust side. The 6.112-inch studs install immediately inboard from the exhaust side (exposed outside the valve cover), and the seven 5-inch studs install in the rocker area.

Next time we'll tackle the water pump, compression ratio and more. **TS**



MIKE MAVRIGIAN owns and operates Birchwood Automotive in Creston, Ohio, where he builds custom engines and street rods and performs vehicle restorations. He has written thousands of technical articles as well as nine books on automotive technology during the past 30 years.

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ENGINE PRODUCTS

The Latest Under-Hood Offerings



RFI/EFI Blocker Line Sleeve

Design Engineering Inc. (DEI), Avon Lake, Ohio, presents its new RFI/EFI Blocker Line Sleeve. Featuring split-design shielding/sleeving for fuel injection wires and cable bundles, the line sleeve easily wraps around wires, reducing EFI and radio interference caused by ignition systems. It is also available in tape form.

Mopar Shaft Rocker Arms

PRW Industries, Perris, California, presents PQx Stainless Shaft Mount Rocker Arms, now available for Mopar modular Hemi engines. The custom castings are manufactured from 17-4 PH stainless steel and have polished top bracing, which has a higher yield strength compared to stock rocker arms. Hardened shafts, hold downs, spacers and shims are included for a professional installation.



Ford Extreme Roller Rocker Arm Set

Speedmaster, Rialto, California, introduces the Speedmaster DNA Shaft Mount Aluminum Roller Rocker Arm set designed for Ford FE 390, 427 and 428 applications. Matched to large, precision-ground trunnions for durability, the optimized rocker arm geometry evenly distributes the load for maximum strength.

The arms also utilize oversized needle roller bearings for better load distribution and longer service life. They are engineered with PCE extruded aluminum and a stainless steel shaft mount with black anodized steel shaft pedestals.



Carbon Intake Manifold

Performance Design, Auburn Hills, Michigan, presents its Carbon TRc (Tunnel Ram compact) intake manifold. An evolution of its Carbon TR naturally aspirated and Carbon TRic (intercooled) boosted intake manifolds, the new TRc is an under-hood, short runner intake manifold optimized for boost that is also at home on naturally aspirated applications where fitment and aesthetics are preferred over peak torque. Features include a one-piece molded carbon fiber plenum, anodized 6061-T6 billet aluminum runners and 103mm throttle body flange.



Tundra Cold Air Intake

advanced FLOW engineering (aFe POWER), Corona, California, presents its Momentum GT Cold Air Intake System with Dual Filters for 2022-23 Toyota Tundra 3.5L V-6 applications. Offering gains of up to 17 hp and 19 pound-feet of torque, system features include a patented housing-to-tube interface made with a heat-resistant XLPE material, allowing maximum high-density cold air for more power. The dual airbox housings include clear-sight windows for inspection of 8-inch-tall, 360-degree radial flow air filters.



LS Custom-Length Push Rods

Elgin Industries, Elgin, Illinois, presents its Elgin PRO-STOCK 500 Series range of push rods with a new 5/16-inch-diameter push rod engineered specifically for GM LS performance engines. The new, 7.450-inch-long Elgin PRO-STOCK PR-515 push rod adds 0.050-inch to the popular stock rod length for LS engines, providing the additional lifter pre-load lash needed for steep ramp-profile performance camshafts used in conjunction with non-adjustable LS rocker arms. The new PR-515 rod features 0.075-inch wall thickness.



2023 F-150 Superchargers

ProCharger, Lenexa, Kansas, offers its Supercharging Systems and Kits for 2023 Ford F-150 pickups. Available in offerings to fit various performance goals, builders start by choosing either the High Output (HO) intercooled product or the higher horsepower-capable Stage II. Features include aluminum charge tubing, silicone couplers and factory connectors, a six-rib shared drive system (HO version), 8/10 rib drives that can achieve up to 1,500 hp (Stage II version) and crank support for ultra-high-horsepower builds.

Oil Pump Upgrade

Aviaid Oil Systems, Chatsworth, California, introduces an upgrade for its Series 2 Oil Pumps. A newly developed, six-tooth gear design increases scavenging through-put by approximately 12% over previous rotor designs. Now in the fourth iteration, all previous Series 2 models can be upgraded to the new design. Six different section widths are available on the pressure side of the pump, ranging from 0.600-inch to 1.750 inches. A variety of regulator sections, pump ends and mounts are employed to configure the pump to most any application.



remote oil filter location is desired. Constructed of high-quality cast aluminum with a billet aluminum look and black powder-coat finish, they accommodate standard-sized oil filters and include multiple inlet and outlet port designs.

Premium Filter Mounts

Derale Performance, Santa Fe Springs, California, presents Premium Filter Mounts. Designed for situations where space constraints or other factors make it challenging to mount the oil filter directly on the engine block, the mounts are suitable for custom and performance applications, off-road vehicles or anywhere a



Cleaner & Degreaser Spray

Tub O' Towels, Cleveland, presents Heavy Duty Cleaner and Degreaser spray, a powerful, heavy-duty cleaner designed to tackle tough grease and grime. Suitable for use on automotive parts and other surfaces, the cleaner and degreaser features a unique formula that combines the power of Tub O' Towels Heavy Duty Cleaning Wipes with the convenience of a spray. It is alcohol- and solvent-free, has a citrus scent and is made in the USA.

Diesel Cleaner

Rislone, Holly, Michigan, presents its new Rislone DPF Clean Diesel DPF, Exhaust & Emissions System Cleaner that cleans the fuel, exhaust and emissions systems of diesel vehicles to restore power and performance, reduce regeneration cycles, extend diesel particulate filter (DPF) life, save fuel and turn off warning lights. The unique formula features high-performing detergents and heavy-duty cleaning solvents to scrub away contaminants, soot, carbon build-up and oily residue from the fuel injectors, combustion chambers, turbo, EGR and more.



10W-30 Full Synthetic Diesel Oil

Shell Rotella, Houston, presents T6 10W-30 Full Synthetic Heavy Duty Engine Oil with Triple Protection Plus technology. Designed to deliver increased wear protection and fuel economy in the fastest-growing viscosity grade for diesel-powered vehicles, the oil also offers improved engine cleanliness, exceeding CK-4 deposit requirements by 33%. It is suitable for use with biodiesel fuel. **TS**



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Sobey Repeats as OPTIMA Ultimate Street Car Invitational Winner

Bob Sobey and his 2013 Nissan GT-R were crowned repeat winners of the 16th annual OPTIMA Ultimate Street Car Invitational (OUSCI).

Sobey, now a four-time competitor and back-to-back OUSCI champion, returned this season and defended his title while also winning the Ultimate Street Car Association (USCA) National Championship, OPTIMA Batteries said in an announcement.

Established in 2008, the contest originally aimed to evaluate the street-worthiness and overall performance potential of cars showcased at the SEMA Show and has evolved into a competitive street car racing series for top Pro-Touring vehicles.

"I couldn't be more happy. I have to thank my friends, family and wife, espe-

cially. I really enjoy coming out and running with everyone. I couldn't have done this without my crew member, Brian. He's the guy who does the majority of the work on everything," Sobey says. "I run this series because it's so fun. If anybody needs help, somebody's going to help them."

Throughout the 2023 OUSCI championship, competitors and their vehicles faced a series of five challenges—the Lingenfelter Design and Engineering Challenge, Road Rally, Peak Performance Challenge, Auto-cross and the Falken Tire Road Course Time Trial.

Competitors received points for each challenge, and scores were totaled to determine the winner in each category.

This year, second place was taken by 2021 Tesla Model 3 driver Jordan Priestly, and Chris Smith finished third with his 1970 Chevrolet Camaro.

"The 2023 season has been truly remarkable, characterized by exceptional competition and impressive performances from all participants. It's a source of great pride to witness the evolution of the series, which has grown into a tight-knit family of racers over the past 16 years," says Cam Douglass, director of marketing for OPTIMA Batteries. "Bob Sobey's consecutive championship wins, becoming only the third in the series' history to achieve this feat, underscore his remarkable dedication to the sport."

All vehicles must be licensed, registered and insured for street use to be eligible to compete.

This article originally appeared online at theshopmag.com. Visit today and sign up for the free daily eNewsletter. TS

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The program has evolved into a competitive street car racing series for top Pro-Touring vehicles.



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