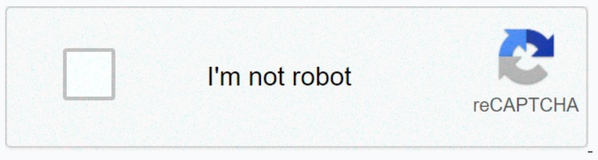

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How to play chase the ace

The chase is a small, enclosed space that is used to accommodate pipes, sewer work, or other utilities for home or building construction. The chase is usually built on a wall or ceiling and is not visible to the eye, although sometimes a chase sticks out of the wall due to structural necessity. The most common use of the chaseA chase is most commonly used plumbing applications, since the pipeline must go all over the home. Where power lines can be snaked through spaces at home, pipes often need to be in their hallway, or chase, to accommodate them. The chase often goes through the wall and has an access panel, so that the pipes can be repaired where there are closures or drainage faucets. For sewer work, the chase should be created similarly, the whole house, similar to the plumbing chase. The canal chase should be larger and often comes up with the above dropped ceiling. The chase is also necessary for putting a chimney. This type of chase is unsurprisingly called chimney chase. The 1920 Ace motorcycle was developed by brothers Tom and William Henderson, who began building their famous four-cylinder motorcycles in 1912. After their financial troubles, the brothers sold Excelsior, the motorized arm of schwinn bicycle company, in 1918. Still, within two years, William had founded Ace to make a similar four-cylinder motorcycle, although no parts were interchangeable with the Hendersons. Motorcycle Photo Gallery Advertising Ace has produced a great product, but has proven to be a short-lived offer. The company suffered a financial downturn when William died in a motorcycle accident in 1922, and two years later production ceased. The Indian Motorcycle Company bought Ace in 1927 and continued to offer ace four until World War II - wearing Indian logos, of course. The ace is driven by an F-head inline with four displacing 77 cubic centimeters. The power was carried to a three-speed gearbox with a manual transmission via a single-footed, multi-disc wet clutch. The driver-link front fork compressed cartridge type inner coil spring, but the rear wheel was fixed to a rigid frame. Weighing about 395 pounds, the 1920s ace was not particularly easy, but it proved to be both strong and durable. In 1923, the hopped up version, called XP4, set a record speed of 129 km/h. The fact that this motorcycle has continued production for more than two decades is little more than suspension and brake upgrades are further testament to its endeaing design. Check out the next page for more pictures of the 1920 Ace motorcycle. For more great motorcycle articles and pictures, check out: Classic MotorcyclesHow Motorcycles WorkOther Classic Motorcycles Photo: ShutterstockThis week we're improving our public speaking skills using expert Gallo, author of Talk Like TED: The 9 Public-Speaking Secrets of the World's Top Minds, who tells us about the importance of story and emotion when it comes to presenting. Then I hear Lifehacker's Food Editor, Claire Lower, tell her own story about how she went from being a homeschooler to a stage awesome to a speech team champion. Listen to the update above or you'll find us in all the usual places where podcasts serve, including Apple Podcasts, Google Play, Spotify, iHeartRadio, Stitcher, and NPR One.Highlights from this week's episode The Carmine Gallo InterviewA are important for emotions and storytelling performances: Aristotle said without emotion, people can't decide and they're not going to lead the argument. You're not going to convince him, you're not emotionally attached to people. Well, what's interesting is that he wrote this 2,000 years ago. What we're studying in the lab today, and in scientific experiments with MRI machines, is that... no one can make a decision without being influenced by emotion. So if you can't connect with people emotionally, you lose a big part of your persuasion, and you become much less influential and effective. G/O Media can receive commissionon how to overcome public speaking anxiety: You need to exercise for stress. That's what psychologists, especially people who work in sports psychology, people who work in field goal kickers and football, or golfers staring through a two-foot putt putt to win the championship. The reason why they can remain quite calm in these situations is that they practiced a thousand times and exercised under mild stress. When it comes to public speaking, you have to get up, get yourself up, and there's a group in front of you. How about a couple of people in front of you, maybe friends or partners. That's how you practice, again under a little stress. For more Carmine's public speaking tips and to hear Claire's story about overcoming her own stage fever, we recommend listening to the podcast. This is fun! If you want to be featured on the show, call us at 347-687-8109 or send us a voice upgrade@lifehacker.com. Next week we'll talk about how to live longer, so if you have any feelings on the subject, share them! Ten cars have been invited to this three-day test. Six people showed up, and four survived. On the first day, we had lunch at a Taco Bell, on the second day we were stuck in a raging desert sandstorm, and we had to rent a U-Haul to drag one of the cars back to Los Angeles on the third day. Our ambitious test has been taken over from the start. But we got through the frustration and found some enlightenment. The idea was simple enough: collect hot-rodded four-cylinder series cars to gauge the evolution of rapid production. On the West Coast, where it seems all Honda is a ham size tip, zero suspension suspension and the driver's seat is permanent tilt, the current mania is obvious. This was even more evident at last November's SEMA aftermarket commercial show in Las Vegas, where corridors were clogged with tiny cars sporting everything from exotic turbo systems and carbon fiber bodywork to absurdly oversized brakes and startlingly tasteless graphics. In the aftermarket, at least small cars dominate the land. Since they're so popular, we could have invited 10 tweaked Hondas to the test. But the depth of this madness goes beyond this one make, from Dodge Neons to Mercedes SLK. So recruited from a diverse field, invites companies both familiar and obscure vehicles ranging from accessible to exotic. Then as our test approached, the cars started to fall out. Greddy Performance couldn't have either a turbocharged Honda Civic or Acura Integra available for our test in early December. Jackson Racing pulled the super super-compressor Honda Prelude out when owner Oscar Jackson felt he needed more time to optimize the fuel map. Just a week into the test, DC Sports was working on bugs out of the Honda S2000 at Willow Springs off the track in Los Angeles when the S2000 was punted on the left rear wheel of a Formula Ford. And the Borla turbocharged Ford Focus chose the morning of the event to give its computer a nervous breakdown. Hey, we're going to have a six-car test. That's enough, isn't it? The plan was to meet in Willow Springs on the first day and then play catch the cars along the road at the foot surrounding Tehachapi. The second day would be spent producing power figures on the 7.5-mile oval at Honda Proving Center of California (HPCC) in the Mojave Desert. And on the third day, we returned to Willow Springs to do the timed laps of the Willow circuit. Simple. All we asked participants was that each car wear enough equipment to pass a visual inspection, run on 92 octane fuel and have a fairly quiet exhaust and 5/32nds of an inch tread on each tyre. What was prepared for our test, it was a treatment-intensive Mazda Miata from Racing Beat, Neuspeed's first shot modification of the Audi TT Quattro coupe, King Motorsports' nearby race Acura Integra Type R, the Honda Civic Si, on which Vortech develops its compresscharger system, HKS turbocharger Subaru Impreza 2.5RS, and T.C. Kline ProSpec massage Honda S2000. There was no limit to what could be done to any car, as it was not a comparison test, but none of the cars were built into a bottomless bank account. These are not exotic machines; They are within reach of the average car nut for a few extra dollars, a reasonable collection of tools, and weekend burn. Each company brought a car that felt represented its talents and products as well. Theoretically, we would end up with a survey of Out there. No No very wide-ranging survey, but also a survey. Except for the chalupa-induced gurglings, the first day went well. The cars were impressive and the roads were perfect except for the occasional sloppy cattle trip and the only damage he sustained was a dinged wheel on the Quattro when some doofus freelancers drove over a cliff. Optimism has spread that mechanically fragile cars have been winnowed in the field, and the rest of the test would go well. The next morning, he left for the HPCC. Straight-line performance measurements are carried out on the Honda track, but the first test would be the toughest: top speed. Aftermarket tuners almost always test on a pull plane, but few have access to facilities where they can run flat. And running at wide-open accelerators for an extended period often reveals unexpected stress points. Example: Insufficient fuel flow burned a dugatta at the Vortech Civic Si, and suddenly we were down to five cars. Then came the wind, large cross-Mojave sandblasts that got us cuddled up in a building on the track waiting for them to subside. A few hours stuck in that room that began to feel like a setting for an Outer Borders episode. At any moment, someone's going to take off a baseball cap to reveal the third eye on their forehead, or a feared tail would twist someone's dockworkers. Fortunately, the wind died before anyone started a crying jaguar. On day three in Willow Springs, HKS Subaru flatly refused to move under his own power. A proper diagnosis of the problem proved elusive. There's only four more cars! Perfect! To their credit, these four cars would survive the street laps and get home on their own at the end of the day. We decided to write about all six cars that were released, although little or no measured performance data are available for the Vortech Civic or HKS Impreza. The kids were born in the mid-'80s. They'll never own a new car with a carburetor, they grew up to be ferryed to Camrys and Accords, and they're unencumbing to loyalty to archaic concepts of performance like gut-busting V-8s. In an era of relaxed consumer credit, at a time when kids get signing bonuses from a part-time pizza chauffeur, a new small car often doesn't mean too much. So, of course, you have an obsession with improving small engine performance. After all, these are their cars. But getting this performance is always at a cost above the cost of the parts. Maybe it's just a little more ride roughness or a louder exhaust note. Or it can be fragile in a car whose warranty has been voided. If you want to make the most of making a small car faster with aftermarket parts, the challenge is to balance youthful enthusiasm and adult expectations. So with that in mind, we don dont the baggiest pants, and headed for the high desert. Here, in alphabetical order, are our results. Only two shows in Speedvision are truly mesmerizing: the ancient car and track series by Bud Lindeman and coverage of the FIA World Rally Championship. You'll need a séant to hang out with Lindeman, but HKS will help you approximate Subaru series-killing WRX WRC car for you screwing turbo system with the Impreza 2.5RS. I wish he'd been an outpatient on the third day of the test. Fitting the HKS T-25 turbo to the 2.5RS engine is no small thing. There's the turbo itself and the xylophone-like air-to-air intercooler that stretches out like the 2.5-liter flat-four. Then there's the additional waste gate, the two injectors that squirt extra fuel into the throttle body, and add-on controllers to both systems. Throw in a new clutch, high-flow intake and exhaust systems, and enough plumbing fluoride for Lake Superior, and a full powertrain ear for a hefty $7,626 including $2,000 in labor. But for two days, the Subaru all-wheel drive system worked well. Chassis tweaks are limited to $3599 worth of 12.1-inch diameter Brembo front disc brakes, HKS drain springs, and P215/45ZR-17 Toyo Proxes T1 Plus tires with 7.5 x 17-inch Volk Racing wheels. The interior received Sparco racing seats, Schroth's five-point harnesses, and a gauge pack suitable for Colin McRae. As for the driving experience, the blow-off valve is certainly not quiet, but the engine gracefully carries the turbo with a progressive throttle reaction, few apparent delays and a distinctive flat engine exhaust sound. With its wheeled manners, the car remained steadfast on mountain roads, almost without bickering over tires, and gentle understeer when diving into corners. Some additional rear coil stiffness would force the chassis a little better, but it is a light car in which it goes very fast. At Honda's oval, the Impreza towed itself to 135 mph - a hefty 8 mph faster than the kit, suggesting that there may be some truth to HKS's claim of 195 horsepower from the turbo engine. HKS says that for more than a year, with few problems, he put this car in his hands with few problems, but on the third test day in Willow Springs, he didn't move, but he didn't move on his own. HKS explained that the mass air sensor spontaneously committed hara-kiri during the cold night; the problem says unrelated to the modifications and not uncommon in the virginal Subarus. Anyway, it ruined our day. A new Impreza is due next year, and rumor has it that North America will finally get turbocharged models. If they run, as the HKS car does on the first and second days it will be exciting.- JPH VEHICLE TYPE: front engine, 4-wheel drive, 5-way, 2-door sedan PRICE, STOCK/MODIFIED: $19,790/$39,261 ENGINE TYPE: turbocharged and intercooled DOHC 16-valve flat-4, aluminum block and heads, Subaru system with portfuel injected modifications (all components made by HKS, unless otherwise indicated): Engine and transmission: T-25 turbo, $1275; air-to-air interooler, $975; additional throttle body injectors and controller, $795; boost controller, $599; cat-rear exhaust system, $599; light flywheel, $520; Exedy clutch, $458; additional waste gate, $215; input system, $140; race lighters, $50; work, $2000 suspension: 7.5 x 17-in Volk Racing TE37 aluminum wheels, $2260; 215/45ZR-17 Toyo Proxes TI Plus tires, $600; Tokico shocks, $516; roll springs, $275; Work, $600 Brakes: Brembo Front Brake Kit (including stainless steel brake lines, 12.1-inch front calipers, and brembo four-piston calipers), $3,599; labor, $600 Appearance and interior modifications: Sparco seats, $1190; gauges, $850; data logger, $495; Schroth four-point harnesses, $450. turbo timer, $110; labor, $300Displacement: 150 cu in, 2457ccPower (SAE net) stock: 165 bhp @ 5600 rpmPower (SAE net) modified: 195 bhp @ 6000 rpm TRANSMISSION: 5-speed manual DIMENSIONS:Wheelbase: 99.2 in Length: 172.2 inCurb weight: 2890 lb PERFORMANCE: STOCK / MODIFIED Zero to 60 mph: 8.2 sec / DNF Zero to 100 mph: 27.3 sec / DNF Street start, 5–60 mph: 8.9 sec / DNF Standing 1/4-mile: 16.3 sec @ 84 mph / DNF Top-gear passing time, 30–50 mph: 10.0 sec / DNF 50–70 mph: 11.1 sec / DNF Top speed (drag limited): 127 mph / 135 mph Braking, 70–0 mph: 191 ft / DNF Roadholding, 300-ft-dia skidpad: 0.81 g / DNF Emergency-lane-change maneuver, mph: DNFRoad-course lap, min:sec: DNF VEHICLE TYPE: front-engine, 4-wheel-drive, 5-passenger, 2-door sedan PRICE , STOCK / MODIFIED: $19,790/ $39,261 ENGINE TYPE: turbocharged and intercooled DOHC 16-valve flat-4, aluminum block and heads, Subaru engine control system portfuel injection modifications (all components made by HKS unlike: Engine and gearbox: T-25 turbo, $1275; air-to-air interooler, $975; additional throttle-body injectors and controller, $795; boost controller, $599; cat-rear exhaust system, $599; light flywheel, $520; Exedy clutch, $458; additional waste gate, $215; input system, $140; race lighters, $50; work, $2000 suspension: 7.5 x 17-in Volk Racing TE37 aluminum wheels, $2260; 215/45ZR-17 Toyo Proxes TI Plus tires, $600; Tokico shocks, $516; roll springs, $275; Work, $600 Brakes: Brembo Front Brake Kit (including stainless steel brake lines, 12.1-inch front calipers, and brembo four-piston calipers), $3,599; labor, $600 Appearance and interior modifications: Sparco seats, $1190; gauges, $850; data logger, $495; Schroth four-point harnesses, $450. turbo timer, $110; work, $300Displacement: 150 cu in, 2457ccPower (SAE net) stock: 165 bhp @ 5600 rpmPower (SAE net) 195 bhp @ 6000 rpm transmission: 5-speed manual dimensions: Wheelbase: 99.2 lengths: 172.2 inCurb weight: 2890 lb PERFORMANCE: STOCK / MODIFIED Zero to mph: 8.2 sec / DNF Zero 100 mph: 27.3 sec / DNF Street start, 5-60 mph: 8.9 sec / DNF Constant 1/4 mile: 16.3 sec @ 84 mph / DNF Top-gear advanced time, 30-50 mph: 10.0 sec / DNF 50-70 mph: 11.1 sec / DNF Top speed (drag limited): 127 mph / 135 mph Braking, 70-0 mph: 191 ft / DNF Roadholding, 300-ft-slide skidpad: 0.81 g / DNF Emergency-lane-change maneuver, mph: DNFRoad-course lap, min:sec: DNF Today, the name Mugen means as many honda tuners as Holley and Edelbrock once meant to be street bars. Mugen has been building fast Honda parts for years. Last year, Mugen bent her technical know-how on the jordan formula one team's engines. Mugen was founded by Hirotoshi Honda, the son of honda motor company founder, who helps explain his close relationship with Honda. The exclusive distributor of Mugen parts in North America is King Motorsports Unlimited, Sullivan of Wisconsin. The pairing of a Midwestern racing shop and a Japanese tuner has been an unusually successful one. King-built cars spent last summer shaking track records in the SCCA ITA class, and King's Motorola Cup cars are regular frontrunners. For this test, King Motorsports owner Scott Zellner didn't even blink when asked which car he wanted to bring, and after driving the Integra Type R, we can see why. The modifications of the boy-racer type R are a boldly fast street and track car. Starting with the engine, Zellner whipped a beer mugen components to increase available rpm and breathing efficiency. First, he removed the engine and gearbox. The new valve springs and mugen engine computer allow for a hair-raising 9000-rpm redline. While the engine is removed, Zellner checks the correct tolerances and reinstalls the engine with stiffer engine holders. The stock's limited-slip differential will be replaced with a Mugen piece that Zellner says does a better job of getting the power of the wheel in most traction. In the exhaust, a freer breathable Mugen header is attached to the stock catalytic converter and a Mugen exhaust drum. The result: 220 off, from $9,355. Zellner has been replaced by shocks, springs, anti-roll bars, wheels, and tires. He has set up the car with greater rear coil stiffness than can be found on the front, which, he says, takes away the front-drive car prone to push in wide turns and actually allows it to rotate a bit. In total, these changes are tally $19,213, but the converted car is an absolute explosion to drive. The engine rips urgently from the redline, and the stocked rampant, almost harmful-sounding engine attention is replaced by one of the best engine notes on this side of Ferrari. The King/Mugen Integra also slapped the suspenders at 60 mph, performing the feat in 5.8 seconds, nearly a full second faster. Top speed rose to 3 mph, even though the King/Mugen car had a drag-induminating rear wing. On the track, the King/Mugen car certainly isn't push; rather, the back end would predictably exit the turn-in and allow the driver to re-gas sooner. Grip was only 0.04 g, but it should be noted that Zellner chose full tread street tires for our test, while some other cars were wearing DOT-legal racing rubber. Better tires have dramatically reduced lap time and upped skidpad grips. The whole package was just brave enough to make everyday driving exciting - and without a buckboard-stiff ride. If you have to own a car to catch groceries, blast out morning cobwebs, and go on weekend track forays, few do it better.-Larry Webster VEHICLE TYPE: front-engine, front-wheel-drive, 4-way, 3-door coupe PRICE, STOCK/MODIFIED: $24,805/$44,018 ENGINE TYPE: DOHC 16-valve 4-in-line, aluminum block and head, Honda/Mugen N-1 engine-control system with port fuel injection modifications (all parts made by Mugen, unless otherwise noted): Engine and transmission: limited slip differential, $1320; engine computer, $1300; cat-rear exhaust system, $975; header tube, $975; clutch, $599; valve-spring set, $460; engine mounts, $399; light flywheel, $350; large compression seal, 129 dollars; low temperature thermostat, $69; high pressure radiator cap, $29; lab, $2750 suspension: 7.0 x 16 in forged aluminum wheels, $2200; adjustable shocks and springs, $1450; 225/45ZR-16 Bridgestone S0-2 tires, $800; 21mm front anti-roll bar, $370; 26mm rear anti-roll bar, $370; first shock tower brace, $285; rear shock absorber, $285; labor, $300 Brakes: Carbotech front and rear brake pads, $175; stainless steel brake lines, $159; work, $100 Appearance and interior modifications: S-1 seats and mounting hardware, $2000; rear wing, $680; FG-360 steering wheel, $349; body stripe, $85; labor, $250Displacement: 110 cu in, 1797ccPower (SAE net) stock: 195 bhp @ 8000 rpmPower (SAE net) modified: 220 bhp @ 8000 rpm TRANSMISSION: 5-speed manual DIMENSIONS:Wheelbase: 101.2 in Length: 172.4 inCurb weight: 2500 lb PERFORMANCE: STOCK / MODIFIED: Zero to 60 mph: 6.6 sec / 5.8 sec Zero to 100 mph: 17.9 sec / 15.6 sec Street start, 5-60 mph: 7.1 sec / 6.5 sec Standing 1/4-mile: 15.2 sec @ 93 mph / 14.5 sec @ 97 mph Top-gear passing time, 30-50 mph: 8.9 sec / 10.1 sec 50-70 mph: 8.8 sec / 9.9 sec Top speed (drag limited): 143 mph / 146 mph Braking, 70-0 mph: 164 ft / 159 ft Roadholding, 300-ft-dia skidpad: 0.88 g / 0.92 g Emergency-lane-change maneuver: 67.3 mphRoad-course lap, min: sec: 1:20.0 VEHICLE TYPE: front-engine , front-wheel drive, 4-way, 3-door coupe PRICE, STOCK/MODIFIED: $24,805/$44,018 ENGINE TYPE: DOHC 16-valve 4-in-line, aluminum block and head, Honda/Mugen N-1 engine-control system port fuel injection modifications (all parts made by Mugen, except otherwise not) Engine and transmission: limited slip differential, $1320; engine computer, $1300; cat-rear exhaust system, $975; Header Header $975; clutch, $599; valve-spring set, $460; engine mounts, $399; light flywheel, $350; large compression seal, 129 dollars; low temperature thermostat, $69; high pressure radiator cap, $29; lab, $2750 suspension: 7.0 x 16 in forged aluminum wheels, $2200; adjustable shocks and springs, $1450; 225/45ZR-16 Bridgestone S0-2 tires, $800; 21mm front anti-roll bar, $370; 26mm rear anti-roll bar, $370; first shock tower brace, $285; rear shock absorber, $285; labor, $300 Brakes: Carbotech front and rear brake pads, $175; stainless steel brake lines, $159; work, $100 Appearance and interior modifications: S-1 seats and mounting hardware, $2000; rear wing, $680; FG-360 steering wheel, $349; body stripe, $85; labor, $250Displacement: 110 cu in, 1797ccPower (SAE net) stock: 195 bhp @ 8000 rpmPower (SAE net) modified: 220 bhp @ 8000 rpm TRANSMISSION: 5-speed manual DIMENSIONS:Wheelbase: 101.2 in Length: 172.4 inCurb weight: 2500 lb PERFORMANCE: STOCK / MODIFIED: Zero to 60 mph: 6.6 sec / 5.8 sec Zero to 100 mph: 17.9 sec / 15.6 sec Street start, 5-60 mph: 7.1 sec / 6.5 sec Standing 1/4-mile: 15.2 sec @ 93 mph / 14.5 sec @ 97 mph Top-gear passing time, 30-50 mph: 8.9 sec / 10.1 sec 50-70 mph: 8.8 sec / 9.9 sec Top speed (drag limited): 143 mph / 146 mph Braking, 70-0 mph: 164 ft / 159 ft Roadholding, 300-ft-dia skidpad: 0.88 g / 0.92 g Emergency-lane-change maneuver: 67.3 mphRoad-course lap, min: sec: 1:20.0 As you read this Aaron Neumann is probably in the research garage of his father Bill Neuspeed shop, trying to hack into the Audi TT Quattro's computer. Audi told him that the TT was just fine the way it is and Audi wasn't going to give him any help screwing with it. So we're still trying to figure out how to get the computer to a higher boost level and further taking advantage of the company's P-Flo intake and stainless steel exhaust systems that are hooked up to the turbocharged 20-valve engine. But even faced with such frustration, Aaron managed to summon a sharply focused version of his already much-loved car. The $250 intake and $700 exhaust systems add 10 le - enough to drop from 0 to 60 times per stock in 7.7 seconds to 7.4 - and give the 1.8-liter four-distinctive intake a wailing. But most of the effort went into suspension. Neuspeed's 25mm front and 19mm rear anti-roll bars and sport drain springs (which reduce the car to 1.3 inches) fit into Bilstein shocks and add significant roll stiffness to the otherwise rather softly sprung TT. Combine that grip with the 225/40ZR-18 Y88 BFGoodrich g-Force tires with Volk Racing wheels, and skidpad grip climbs from stock car to 0.86g with an impressive 0.94 -- minimal comfort deterioration and significantly reduced initial understeer. Tight, tight and excellent; strong, sensitive brakes, wrote one tester in the Feel bumps and sidewalk pavement but it's not a rough or uncomfortable feeling. In other words, it's easy to go fast in this car, but it doesn't beat you when it's time to behave. All in all, the chassis mods total $6,810, which doesn't seem out of line for any functional improvements (including $3,160 wheels and $1080 tires). More controversial is the $3400 Cord Design five-part body kit. The front lip and rear-valance spoilers look sharp, but the rear wing reminds us of a urethane feeding trough sitting atop two aluminum doughnuts. This wing is adjustable and might add some downforce to the TT, but it's strictly love or leave. Then again, it's the idiosincratic not-everyone style that makes the TT impressive in the first place. One day, Aaron hacked into his computer and more power was spilling out of the currently understressed engine. But while

the higher performance is always appreciated, it probably doesn't make the Neuspeed car more balanced and easy to drive than it is now.- JPH VEHICLE TYPE: front-engine, 4-wheel-drive, 2+2-way, 3-door coupe PRICE, KIT/MODIFIED: $32,775/$44,435 (est) ENGINE TYPE: turbocharged and intercooled DOHC 20-valve 4-in-line, iron block and aluminum head, Bosch ME 7.5 engine control system port fuel injection (all components made by Neuspeed differently): Engine and gearbox: Engine-rear system exhaust, $700; air intake system, $250; lab, $100 suspension: Volk Racing Volk III aluminum wheels, $3160; Bilstein shock absorbers, $1400; 225/40ZR-18 BFGoodrich g-Force tires, $1080; coil springs, $520; front and rear anti-roll bars, $450; work, $200 Appearance and interior modifications: Cord-design body kit, $3400 (est); lab $400Displacement: 109 cu in, 1781ccPower (SAE net) stock: 180 bhp @ 5500 rpmPower (SAE net) modified: 190 bhp @ 5500 rpm TRANSMISSION: 5-speed manual dimensions:Wheelbase: 1 95.6 length: 159.1 inCurb weight: 3180 lb POWER: STOCK / MODIFIED Zero 60 mph: 7.7 sec / 7.4sec Zero-100 mph: 23.4sec / 23.4sec Street start, 5-60 mph: 8.7 sec / 8.0 sec Standing 1/4 mile: 15.8 sec @ 85 mph / 15.7 sec @ 86 mph Top-gear passing time, 30-50 mph: 11.6 sec / 11.0 sec 50-70 mph: 8.9 sec / 8.7sec Top speed (governor limited): 129 mph / 129 mph Braking, 70-0 mph: 164 ft / 154 ft Roadholding, 300-ft-slide skidpad: 0.86g / 0.94g Emergency lane change manoeuvre: 66.3 mphRoad course lap, minute: 1:22.4 VEHICLE TYPE: front engine, Four-wheel drive, 2+2-way , 3-door coupe PRICE, KIT/MODIFIED: $32,775/$44,435 (est) ENGINE TYPE: turbocharged and intercooled DOHC 20-valve 4-in-line, iron block and aluminum head, Bosch ME 7.5 engine control system port fuel injection (all components made by Neuspeed differently): Engine and gearbox: Engine-rear system exhaust, $700; air intake system, $250; lab, $100 suspension: Volk Racing Volk III aluminum wheels, Bilstein shock absorbers, $1400; 225/40ZR-18 BFGoodrich g-Force tires, $1080; coil springs, $520; front and rear anti-roll bars, $450; work, $200 Appearance and interior modifications: Cord-design body kit, $3400 (est); lab $400Displacement: 109 cu in, 1781ccPower (SAE net) stock: 180 bhp @ 5500 rpmPower (SAE net) modified: 190 bhp @ 5500 rpm TRANSMISSION: 5-speed manual dimensions:Wheelbase: 1 95.6 length: 159.1 inCurb weight: 3180 lb POWER: STOCK / MODIFIED Zero 60 mph: 7.7 sec / 7.4sec Zero-100 mph: 23.4sec / 23.4sec Street start, 5-60 mph: 8.7 sec / 8.0 sec Standing 1/4 mile: 15.8 sec @ 85 mph / 15.7 sec @ 86 mph Top-gear passing time, 30-50 mph: 11.6 sec / 11.0 sec 50-70 mph: 8.9 sec / 8.7sec Top speed (governor limited): 129 mph / 129 mph Braking, 70-0 mph: 164 ft / 154 ft Roadholding, 300-ft-slide skidpad: 0.86 g / 0.94 g Emergency lane-change maneuver: 66.3 mphRoad-course lap, min: sec: 1:22.4 We were surprised by the response of T.C. Kline, owner and operator of ProParts , the company that designed and built the modifications to the S2000 when we asked him which car he wanted to make in our cleanup. After all, Honda was left with few on the desktop aftermarket tuner when it was designed for the S2000. How much more power can you get from an engine that already has the highest horsepower per litre from every suction power plant built today? How can someone repair brakes that puts this car to a full stop at 70 mph at 157 feet and manage to grip the path of 0.90g lateral acceleration? But if you wanted to give us an S2000 to whip for three days, who did we protest? Kline began the car crossing in 1979 and began racing with considerable success. In 1986, he founded T.C. Kline Racing, a shop for building, developing and maintaining all levels of racing cars. By 1997, T.C. Kline Racing had branched out into ProParts, a high-performance parts distributor and retailer. Today, ProParts also has an in-house group known as ProSpec that is dedicated to designing new parts for Honda cars. In short, ProSpec builds and defines the components ProParts sells for Honda cars. Do you understand that? The good thing is that Kline had her hands on new parts gracing the ProSpec S2000. As we suspected, Kline couldn't find much room for improvement under the hood. He only installed a flip pipe, a cat-rear exhaust system and a freer air crate. These mods add 20 le (so the total is 260) and cost $2,680. Kline used limited development time to improve the suspension. I've always had high praise for the S2000 handling of people who are just, maybe, a little more willing to rotate. Kline went through it anyway, banking on her years of experience to unlock a setup that rewards her to drive both on the track and on the street. For shock absorbers, Kline modified a range of $1 Koni double adjustable shocks. The high high buys exceptional control during small wheel movements, resulting in dramatic improvements on the racetrack, says Kline. He also admits that with pure street driving, the shocks are likely to go overboard. The trickiest part of the whole setup is the pair of blade adjustable anti-roll bars Kline tailored to this car. With these pieces, the owner can fine-tune the handling of the car without having to replace anti-roll bars. The pieces have a cool, solid metal appearance of racing parts. Finally, Kline ordered a series of sticky 0.8-inch-wider and 2.0-inch-higher Pirelli P Zero C tires that were only barely DOT-legal. On the track, the engine mods compensate for the increased drag and the difficulty of launching features of these fat, sticky tires. Kline's S2000 accelerated to 60 mph in 5.7 seconds - 0.1 seconds ahead of the warehouse - and moved 1 mph faster. The $2320 Brembo brake work didn't pay off, stopping at 70 mph took 12 extra feet. The problem can be brought back to ABS pumps, which were unable to flow enough fluid to supply the new four-piston caliper. The ProSpec S2000 fumed over the lane-change test, however, posting a 72.6 mph run. In addition, there was plenty of traction -- 1.04g -- and Kline's car was much easier to rotate in the corners. The freight penalty - at least on California roads - was minimal. We didn't think it needed to be improved, but Kline showed us that even the ultimate sports car could be improved.- Larry Webster VEHICLE TYPE: front engine, rear-wheel drive, 2-way, 2-door roadster PRICE, STOCK/MODIFIED: $32,415/$50,339 ENGINE TYPE: DOHC 16-valve 4-in-line, aluminum block and head, Honda PGM-FI engine-control system port fuel injection modifications (all parts made by ProSpec, unless otherwise not)): Engine and transmission: Comptech Sport cat-back system, $1450; Comptech Sport header tube, $850; Comptech Sport High Flow Air Filter, $100; labor, $280 Suspension: Koni double adjustable shock absorbers, $3980; 8.0 x 18-in front, 9.0 x 18-in rear work master RS2 wheels, $2,420; blade-adjustable front and rear anti-roll rods, $1500; 225/40ZR-18 front, 245/35ZR-18 rear Pirelli P Zero C tires, $1200; shock mounts, $400; &H&m R coil springs, $260; Comptech Sports First Shock Tower Brace, $245; Comptech Sport Bottom Frame Brace, $199; Work, $800 Brakes: Brembo Front Brake Kit (including four piston brakes, 13.0-inch rotors, and stainless steel brake lines), $2,100; work, $220 Appearance and interior modifications: Recaro seats and mounting hardware, $1550; Comptech Sport aluminum plug-wire cover, $170; lab, $200Displacement: 122 cu in, 1997ccPower (SAE net) stock: 240 bhp @ 8300 rpmPower (SAE net) modified: 260 bhp @ 8300 rpm transmission: 6-speed manual dimensions: Wheelbase: 94.5 lengths: 162.2 inCurb weight: lb PERFORMANCE: STOCK / MODIFIED Zero to 60 mph: 5.8 sec / / sec Zero to 100 mph: 14.9 sec / 14.6 sec Zero to 130 mph: 31.0 sec / 31.3 sec Street start, 5-60 mph: 6.8 sec / 6.7 sec Standing 1/4-mile: 14.4 sec @ 98 mph / 14.4 sec @ 99 mph Top-gear haladóidő, 30-50 mph: 9,8 mp / 10,2 mp 50-70 mph: 9,1 mp / 9,8 mp Végsebesség (drag limited): 147 mph / 148 mph Fékezés, 70-0 mph: 157 ft / 169 ft Roadholding, 300-ft-dia skidpad: 0,90 g / 1,04 g Sürgősségi sáv-változás manőver: 72,6 mphRoad-pálya kör, perc: 1:18.5 JÁRMŰ TÍPUS: első motor, hátsókerék-meghajtású, 2-utas, 2-ajtós roadster ÁR, STOCK / MÓDOSÍTOTT: $ 32,415/ $ 50,339 MOTOR TÍPUSA: DOHC 16 szelepes 4-in-line, alumínium blokk és a fej, Honda PGM-FI motor-vezérlő rendszer port üzemanyag-befecskendezés módosítások (minden alkatrész által ProSpec, kivéve, ha másként nem jeleztük) : Engine and gearbox: Comptech Sport cat-rear exhaust system, $1450; Comptech Sport header tube, $850; Comptech Sport High Flow Air Filter, $100; labor, $280 Suspension: Koni double adjustable shock absorbers, $3980; 8.0 x 18-in front, 9.0 x 18-in rear work master RS2 wheels, $2,420; blade-adjustable front and rear anti-roll rods, $1500; 225/40ZR-18 front, 245/35ZR-18 rear Pirelli P Zero C tires, $1200; shock mounts, $400; &H&m R coil springs, $260; Comptech Sports First Shock Tower Brace, $245; Comptech Sport Bottom Frame Brace, $199; Work, $800 Brakes: Brembo Front Brake Kit (including four piston brakes, 13.0-inch rotors, and stainless steel brake lines), $2,100; work, $220 Appearance and interior modifications: Recaro seats and mounting hardware, $1550; Comptech Sport aluminum plug-wire cover, $170; munka, $ 200Displacement: 122 cu in, 1997ccPower (SAE nettó) állomány: 240 le @ 8300 rpmPower (SAE net) módosított: 260 bhp @ 8300 rpm átvitel: 6 sebességes manuális méretek: Tengelytáv: 94,5 hossz: 162,2 inCurb súlya: 2778 lb TELJESÍTMÉNY: STOCK / MÓDOSÍTOTT Nulla 60 mph: 5,8 mp / 5,7 mp Nulla-100 mph: 14,9 mp / 14,6 mp Nulla 130 mph: 31,0 mp / 31,3 mp Utcai start, 5-60 mph: 6,8 mp / 6,7 mp Álló 1/4 mérföld: 14,4 mp @ 98 mph / 14,4 mp @ 99 mph Top-gear halad idő, 30-50 mph: 9.8 sec / 10.2 sec 50-70 mph: 9.1 sec / 9.8 sec Végsebesség (drag limited): 147 mph / 148 mph Fékezés, 70-0 mph: 157 ft / 169 ft Roadholding, 300-ft-dia csúszda: 0,90 g / 1,04 g Sürgősségi sáv-változás manőver: 72,6 mph , perc: sec: 1:18.5 Felejtsd el a Miatas eltömődés Amerikai lányszövetség-ház parkolók. Racing Beat Miata makeover for hard-core enthusiasts. It is a Miata trimmed with friendly compromises and distilled down to the core of mechanical attraction. It's strong, its reflexes are instantaneous, and it grabs the corners. Starting with the Miata base, Racing Beat first returned to manual steering, then transferred the six-speed gearbox and torsen's limited-slip differential from the 10th Anniversary Edition Miata. The result is a lightweight Miata (weighs 126 pounds on our last anniversary at Miata) with six-speed tight proportions and excellent grip on Torsen - the combination of Mazda does not offer. That's the way it's supposed to be. Racing Beat optimised the engine with its own K&N-filtered intake and Tri-Y ceramic-coated connector, which went into the exhaust system quieted by the company's Power Pulse exhaust drum. The advantage is promoting a lightweight aluminum flywheel and a new clutch assembly. The company has measured a 14 hp power increase on the rear wheels, but the nature of the newly discovered power improves significantly and torque is higher at all speeds. Figure 158 at the crank. Spinning through shorter gearboxes, the Racing Beat car handles a 6.7 second journey of 0-60 mph (1.1 seconds faster than the set). This 1.8-litre four-inch is like the 2.0-litre old Nissan Sentra SE-R, and that's a big compliment around here. The engine may be slightly modified, but the chassis is snowed over. Koni makes the shocks, but everything else - the front and rear subframe braces, the oversize anti-roll rod, the lower-control-arm reinforcement of the claws, and the coil springs (which reduce the car by an inch) - is built on Racing Beat. The trick, though, may be the modest size but sticky, almost grooveless P205/50ZR-15 Kumho V-700 tires on 6.5-by-15-inch Racing Hart CP-F wheels. For the popular West Coast autocross tyre, it's an open question of how they're going to deliver sloppy weather or hold it up like ordinary commuters, but on a dry track, they're magic. How about 1.03 g on the dynamometer? Or a 1:20.6 lap on the streets of Willow - almost as fast as king/mugen integra, even though he gave that rider 62 horsepower? We'd miss the tonneau cover, the rear wing, the style bar, and the leather seat covers to grip the cost, and we'd add Racing Beat to the $11,066 functional modifications over a longer period of time. On the way this Miata is stiffer than the kit, but the road is hardly brutal, the steering is heavy, and the exhaust gas material is intoxicating. The best is how neutral it remains in the corners - this and the exceptional catch (we want to try the less radical tires). If Colin Chapman had driven the Mazda, it would be the Miata.- JPH VEHICLE TYPE: front engine, rear-wheel drive, 2-way, 2-door roadster PRICE, STOCK/MODIFIED: $21,695/$34,235 ENGINE TYPE: DOHC 16-valve 4-in-line, aluminum block and head, Mazda engine control system port fuel injection modifications (all parts made by Racing Beat, unless otherwise indicated): Engine and gearbox: Mazda six-speed manual transmission, limited-slip rear differential, and 3.91:1 ring and gear gear, $5629; aluminum flywheel, $452; street/strip clutch, $371; header tube, $350; Power Pulse Exhaust, $225; air intake $175; ignition lines, $85; work, $400 suspension: 6.5 x 15 in Racing Hart CP-F wheels, $1,280; Koni single adjustable shocks, $440; 205/50ZR-15 Kumho V-700 tires, tyres, roll springs, $170; first anti-roll bar, $160; front subframe brace, $98; rear subframe brace, $88; rear anti-roll bar, $79; first anti-roll-bar mounts, $65; anti-roll-bar end links, $60; lower-control-arm reinforcement claws, $12; labor, $150 Brakes: stainless steel brake lines, $136; Hawk Brake Front Brake Pads, $130; work, $75 Appearance and interior modifications: Katzkin seat covers, $450; style bar, $299; tonneau cover, $250; rear wing, $225; labor, $250Displacement: 140 cu in, 1839ccPower (SAE net) stock: 140 bhp @ 6500 rpmPower (SAE net) modified: 158 bhp @ 6200 rpm TRANSMISSION: 6-speed manual DIMENSIONS:Wheelbase: 89.2 in Length: 155.3 inCurb weight: 2249 lb PERFORMANCE: STOCK / MODIFIED: Zero to 60 mph: 7.8 sec / 6.7 sec Zero to 100 mph: 23.4 sec / 20.7 sec Street start, 5-60 mph: 8.8 sec / 7.5 sec Standing 1/4-mile: 16.0 sec @ 85 mph / 15.2 sec @ 90 mph Top-gear passing time, 30-50 mph: 9.2 sec / 10.6 sec 50-70 mph: 10.0 sec / 11.2 sec Top speed (drag limited): 124 mph / 129 mph Braking, 70-0 mph: 183 ft / 156 ft Roadholding, 300-ft-dia skidpad: 0.86 g / 1.03 g Emergency-lane-change maneuver: 70.5 mphRoad-course lap, min: sec: 1:20.6 VEHICLE TYPE: front-engine , rear-wheel drive, two-way, two-door roadster PRICE, STOCK/MODIFIED: $21,695/$34,235 ENGINE TYPE: DOHC 16-valve 4-in-line, aluminum block and head, Mazda engine control system port fuel injection modifications (all parts made by Racing Beat, unless otherwise indicated): Engine and gearbox: Mazda six-speed manual transmission, limited-slip rear differential, and 3.91:1 ring and gear gear, $5629; aluminum flywheel, $452; street/strip clutch, $371; header tube, $350; Power Pulse Exhaust, $225; air intake system, $175; ignition lines, $85; work, $400 suspension: 6.5 x 15 in Racing Hart CP-F wheels, $1,280; Koni single adjustable shocks, $440; 205/50ZR-15 Kumho V-700 tires, $436; roll springs, $170; first anti-roll bar, $160; front subframe brace, $98; rear subframe brace, $88; rear anti-roll bar, $79; first anti-roll-bar mounts, $65; anti-roll-bar end links, $60; lower-control-arm reinforcement claws, $12; labor, $150 Brakes: stainless steel brake lines, $136; Hawk Brake Front Brake Pads, $130; work, $75 Appearance and interior modifications: Katzkin seat covers, $450; style bar, $299; tonneau cover, $250; rear wing, $225; work, $250Displacement: 140 cu enter, 1839ccPower (SAE net) stock: 140 down @ 6500 rpmPower (SAE net) modified: 158 bhp @ 6200 rpm transmission: 6-speed manual dimensions: Wheelbase: 89.2 Length: 155.3 inCurb weight : 2249 lb POWER: STOCK / MODIFIED: 0-60 mph: 7.8 sec / 6.7 sec 0-100 mph: 23.4sec / 20.7sec Street start, 5-60 mph: 8.8 sec / 7 .5 sec Constant 1/4 mile: mp @ 85 mph / 15,2 mp @ 90 mph Top-gear haladóidő, 30-50 mph: 9,2 mp / 10,6 mp 50-70 mph: 10,0 mp / 11,2 mp Végsebesség (drag korlátozott): 124 mph / 129 mph mph 70-0 mph: 183 ft / 156 ft Roadholding, 300-ft-slide skidpad: 0.86 g / 1.03 g Emergency lane-change maneuver: 70.5 mphRoad-course lap, min: sec: 1:20.6 Heading the wind down the straight hpcc to the 7.5-mile oval, the Vortech Super super compressor Civic Si was still pulling the fifth towards the 8,000-rpm redline, the speedo needle fixed past the 140-mph markings, and the side windows were bowed slightly. Then it went wrong. One of the pistons evaporated, Vortech informed us after a prolonged high-speed run caused the engine neatly. Too bad, because the Civic Si riding P205/40ZR-17 Yokohama A520s in the redline fifth gear goes to 144 mph. Vortech is a late entrant to tiny-car aftermarket, having previously concentrated on compressor systems for V-8-powered domestics such as the Mustang and the Camaro. The central element of Vortech's arsenal is a series of centrifugal blowers (they work like turbocharger compressors powered by the belt). In Civic's case, Vortech fits a new, smaller V-5 unit powered down by a long axle running through the front of the engine. It seems silly at first, but that fits. Turning about 6.9 times engine revs and blowing through the company's aftercooler air-to-water intercooler, the compressor in the set intake manifold has about eight pounds of momentum. To support this, Vortech adds its own Maxflow bypass valve and Power Rail fuel rail. After throwing a Thermal Research & Development cat-rear exhaust system, Vortech claims that drive-wheel horsepower has increased from 131 le stock (Honda claims 160 in the crank) to a total of 195. Vortech estimates crank !output of this prototype at 225 le. When it goes into production, Vortech expects that the compressor system will run about $4000, which would bring the total engine work to slightly less than $5300. To compensate for this, Vortech installed baer racing's 13-inch diameter PBR front brake kit (installed at $1,095). The suspension has been upgraded to 1.5 inches neuspeed springs and has been further enhanced by Koni shocks and the Neuspeed 19mm rear anti-roll bar. The Enkei NT03 7.0-17 inch wheels provide the finishing touch. The compressor doesn't change the nature of the Si engine as much as it radically exaggerates it. Low end torque is still minimal, but at 6200 rpm when the VTEC cam kicks in, the car feels like a rhinoceros of meth has just head-butted it to the back. This amplified, relentless band of force, combined with limited suspension travel, made this the most challenging car to drive quickly on mountain roads. But it looked spectacularly fast. Vortech is still developing this compressor installation. Now that you know the persistent hyperspeed problem, you have the opportunity to fix it. If we have discussed this, if our tips are accurate, this may prove to be a dominant setting in the drag racing.- JPH VEHICLE TYPE: front engine, front wheel drive, 5-way, 2-door sedan estimated price, stock/modified: $17,960/$27,700 (est)Engine type: supercooled and intercooled DOHC 16-valve 4-in-line, aluminum block and head, Honda PGM-FI engine-control system port fuel injection modifications (all parts made by Vortech, otherwise): Engine and transmission: charging and intercooler system, $400 (est); cat-rear exhaust system, $500; additional waste gate, USD 206; fuel pressure regulator and fuel rail, $188; work, $400 Suspension: 7.0 x 17-in Enkei NT01 wheels, $1200; Koni/Neuspeed one-adjustable shocks, $792; 205/40ZR-17 Yokohama A520 tires, $520; Neuspeed rear anti-roll bar, $400; Neuspeed roll springs, $240; Labor, $200 Brakes: Baer Racing Front Brake Kit (including two-stopper calipers and 13-inch rotors), $895; labor, $200Displacement: 97 cu in, 1595ccPower (SAE net) stock: 160 bhp @ 7600 rpmPower (SAE net) modified: 225 bhp @ 7800 rpm TRANSMISSION: 5-speed manual DIMENSIONS:Wheelbase: 103.2 in Length: 175.1 inCurb weight: 2630 lb PERFORMANCE: STOCK / MODIFIED Zero to 60 mph: 7.6 sec / DNF Zero to 100 mph: 23.0 sec / DNF Street start, 5-60 mph: 7.9 sec / DNF Standing 1/4-mile: 16.1 sec @ 87 mph / DNF Top-gear passing time, 30-50 mph: 10.3 sec / DNF 50-70 mph: 11.1 sec / DNF Top speed (drag limited): 127 mph / DNF Braking, 70-0 mph: 199 ft / DNF Roadholding, 300-ft-dia skidpad: 0.83 g / DNF Emergency-lane-change maneuver, mph: DNFRoad-course lap, min: sec: DNF VEHICLE TYPE: front-engine, front-wheel-drive, 5-passenger, 2-door sedan ESTIMATED PRICE, STOCK/MODIFIED: $17,960/ $27,700 (est)Engine type : Super-compressor and intercooled DOHC 16-valve 4-in-line, aluminum block and head, Honda PGM-FI engine control system port fuel injection modifications (all parts made by Vortech, unless otherwise indicated): Engine and transmission: compressor and intercooler system, $4000 (est); cat-rear exhaust system, $500; additional waste gate, USD 206; fuel pressure regulator and fuel rail, $188; work, $400 Suspension: 7.0 x 17-in Enkei NT01 wheels, $1200; Koni/Neuspeed one-adjustable shocks, $792; 205/40ZR-17 Yokohama A520 tires, $520; Neuspeed rear anti-roll bar, $400; Neuspeed roll springs, $240; Labor, $200 Brakes: Baer Racing Front Brake Kit (including two-stopper calipers and 13-inch rotors), $895; work, $200Displacement: 97 cu enter, 1595ccPower (SAE net) stock: 160 down @ 7600 rpmPower (SAE net) modified: 225 off @ 7800 rpm transmission: 5-speed manual dimensions: Wheelbase: 10 3,0 2 lengths: 175.1 inCurb weight: 2630 lb POWER: STOCK / MODIFIED Zero 60 mph: 7.6 sec / DNF Zero 100 mph: 23.0 sec / DNF Street start, 5-60 mph: 7.9 sec/DNF Constant 1/4-mile: 16.1 sec @ 87 mph/DNF Top-gear passing time, 30-50 mph: mp / DNF 50-70 mph: 11,1 mp / DNF Végsebesség (drag limited): 127 mph / DNF Fékezés, 70-0 mph: 199 ft / / Road-keeper, 300-ft-slide skidpad: 0.83 g / DNF Emergency lane changer manoeuvre, mph: DNFRoad-course lap, min: sec: DNF HKS U.S.A., Inc. 2801 East 208th Street Carson, California 90810 310-763-9600www.hksusa.com King Motorsports Unlimited, Inc. 105 East Main Street Sullivan, Wisconsin 53178 414-593-2800www.king-motorsports.com Neuspeed 3300 Corte Malpaso Camarillo, California 93012 805-388-7171www.neuspeed.com ProParts, Inc. 21417 Ingomar Street Canoga Park, California 91304 818-888-8904www.propartsusa.net Racing Beat, Inc. 4789 Wesley Drive Anaheim, California 92807 714-779-8677www.racingbeat.com Vortech Engineering, Inc. 1650 Pacific Avenue Channel Islands, California 93033 805-247-0226www.vortechsuperchargers.com A C/D adventure high performance tuning. Where nothing can go wrong - trouble - trouble - trouble- One last tired exhale, the Honda Civic Si rolled into a stop, and Barry Winfield exited, cell phone is ready. Winfield is our man in LA, where this Civic has been hidden ever since the ill-featured Civic Si Challenge, and he'd terorded our loaded pocket rocket out of Willow Springs International Raceway, in the high desert near Edwards Air Force Base, to take the car through C/Ds standard performance tests. We wanted to measure the results of our stings. But maybe not. When the Si stopped, Winfield had just completed his first racetrack – a lap – the Skidpad of Willow Springs, the initial, as the first, the first element of his test schedule. He refused to do another one. He refused, in fact, to run at all. It seemed to be ok when I picked it up at Honda headquarters, Winfield reported. But on the way here, he started detonating. I made a premium, but I lost power and quit. And so, as Winfield began wondering how he would get home, about seven months of effort and frustration came to an ignominious end. It began with a challenge for our friends in American Honda. Inspired by california's small shift away from hot-rod phenomenon and hordes of slammed Civics and Acura Integras it spawned-Honda suggested a magazine shootout between C/D, Sports Compact Car, Super Street, and Popular Mechanics. The idea: Each magazine would have to borrow a new Civic Si to be modified as the temporary owners saw good. The only caveat was that the finished car was supposed to meet the California Air Resources Board regs and must pass the CARB emissions sniff test. Then the fighters in two performance showdowns at an Import Drag Racing Association (IDRA) meet where they would have to compete head-to-head running; and later a more balanced race at Las Vegas Motor Speedway, where the menu includes timed laps on the track as well as acceleration and braking ratings. Each magazine was assigned a mythical $10,000 component. because Honda was not sure that part 40 is great to support the practice, and not even the participants. It also contributed most, if not all, of the main post-market components – our own in-store ping list was detailed here – and fictitious costs were calculated on the basis of retail prices. Significantly, labor costs have not been added in full. Even the Honda Si Challenge administrative staff, though uniquely benighted in some other areas trying to organize this event, realized there was no way to accurately evaluate what the four teams were spending (or not spending) to get things done. The cost of the beautiful flame work on the Pop Mechanics car, for example, could have been entered as much as $0. The scoring trolleybus was divided into three categories: cosmetic appeal that was voted for by fans of the IDRA event and employees of Honda Torrance, California, head-quarters; overall power, including acceleration and braking; and management of the Vegas road circuit. This was the last area – management – where we decided to stack the bulk of the chips for a reason or two. First of all, while we are not more immune to power desire than the next guys, we think accurate handling is the element that creates a kind of partnership between man and machine, the car as an extension of the driver's will. Second. Of the three scoring categories, we thought this was what we understood best, especially after years of collective staff racing experience in street car manufacturing. As a strategy, it made a lot of sense to us in the abstract. But he didn't count on the big random variable named Paul Tracy. Yup. That Paul Tracy, selected (as our excuses) by Honda as the designated hotshoe because (a) the Team Kool Green CART race car uses Honda power and (b) he happens to be staying in Las Vegas. Although we're about 2,000 miles from Southern California, where the import-hot-rod phenom is really cooking, we felt comfortable with this project because we wore a capable partner up with King Motorsports, an outfit from Sullivan, Wisconsin, that made our own contribution hastily hondas. In addition to building Sports Car Club of America World Challenge winners in Real Time Racing, and a number of killer club-racing Civics and CRXs, King is also the North American distributor of Mugen products. Mugen is how Honda's supertuner AMG was to mercedes-benz before going in-house, and Mugen's high quality goodies range from cosmetic accessories to suspension bits of engine hard parts. The focus on management was performance as the project's top priority and ate the largest chunk of our budget – $2,800). This amount will buy you an Oscar Jackson compressor kit, complete with a CARB parts number, although it won't buy you King's accompanying engine for work-blueprinting, balancing, and port matching. A exhaust header, the Mugen stainless cat-back cat-back with an AEM cold-air inflow, and R.C. Engineering injectors rounded out the bolt-ons, and 9 psi boost, King manager Scott Zellner measured 198 front wheel horsepower on the store chassis dyno. Since mechanical power outages typically range between 15 and 20 percent, Zellner estimated Si's crank to be about 225 hp, compared with 160 HP stock indices. Mugen's limited-slip differential and sticky Hoosier road-racing radial tires carry power to the ground through 7.0-1 6-inch Enkei aluminum wheels, a setting that has created quarter-mile inns in the 14-second range. My Larry Webster turned the best 14.8 to 94.1 mph in the IDRA shootout held in Palmdale, California (altitude 2,000 feet), and Zellner claimed a 14.1-second run of 98.0 mph on the Wisconsin Union Grove strip. Treatment improvements included reduced thread height; an H&1 R reel shock set with rigid spring-loaded (500 pounds front, 900 rear); a 22mm Mugen rear anti-roll bar (vs. 13mm stock); Mugen hard rubber collection; and modifications to the front of the snob that yielded a 2.5 degree negative inclination. What all these mods have yielded during a trip, apart from an extremely rigid ride, we might never know. With no real warm-up, Tracy pulled the C/D car first and almost immediately lost the compressor's drive belt. We were allowed another run when repairs were made, but an off-course outing messed up that one. We also learned that excessive use of the rev limiter in a super-charged car like this can produce a lean condition that in turn leads to overheating and evaporated spark plug electrodes. All in all, we chalked it up as a learning experience. And while we didn't win, the result was better than the fate of the Sport Compactentry, which suffered a severe overheating during the Vegas runs and was later stolen and stripped outside the Specialty Equipment Manufacturers Association show. Here's how we spent our fictional $10,000 development budget on the Hood Civic Si Challenge. We are grateful to these suppliers and King Motorsports for their support. Part: Retail cost Oscar Jackson compressor set: $2800 Enkei NTO3 7.0-x-1 6-in aluminum alloy wheels (4): $1076 Mugen Limited Slip Differential: $1200 King Motorsports/H& R custom coil-over shock kit: $899 Mugen stainless steel 4-into-i exhaust header: $799 Hoosier DOT road-racing radial (4): $600 Mugen cat-back stainless steel exhaust: $799 Hoosier DOT road-racing radial (4): $4 600 Mugen cat-back stainless steel exhaust: $799 Hoosier DOT road-racing radial (4): $600 Mugen cat-back stainless steel exhaust: $799 Hoosier DOT road-racing radial (4): $600 Mugen cat-back stainless steel $799 Hoosier DOT road-racing radial (4): $600 Mugen cat-return stainless steel exhaust: $799 Hoosier DOT road 599 Honda rear wing: $499 Mugen jaw spoiler: $350 R.C. Engineering Fuel Injector (4): $316 AEM Cold Air Intake: $249 Mugen 22mm Rear Anti-Roll Bar: $24 9 Goodrich Stainless Steel Brake Line Kit: $149 Hawk Blue Racing Brake Pads (4): $129 F-1 Graphics for Race Graphics: $75Total: $9989