

By Jay Chen lotography by Robert Hallstrom t's tests like this that makes me wonder why we bother with testing at all. It took an entire sleepless weekend of running all over the Southern California with the guys of Advanced Motorsport Solutions (AMS), HPA, SoCal R32 and VF Engineering to test four R32s and we still came out with results I can't completely explain. At least this will give the Internet forum junkies material for months of discussion and argument. Whatever the case, our radar and timers don't lie.

When SoCal R32's Eugene Lee told us he had rounded up 108 of VW's top gun R32s for one event, we jumped on the opportunity to test what we thought were some reasonable examples of modified R32s: one supercharged, one turbocharged and one modified naturally aspirated (NA), all owned by R32 enthusiasts. The operative word is reasonable, so we left out the cars running stage 29 twin-charged kits with anti-lag. We ran the cars on the dyno, drag strip and at the track to see which power-adding setup we liked best and what really made for a faster car. Each R32 was tested back to back along with a stock car for reference. Interestingly, the results reinforce the strengths and weaknesses of the different methods of forced induction and NA tuning.

DYNO QUEENS

The first bit in any automotive mud slinging competition is how much power you make. Not that peak power really tells you how fast a car is, but it's an easy figure to throw out there for simple comparisons. It's the powerband and delivery that really matters. Sadly, you don't see too many forum discussions trading PDFs of dyno charts, but hey, dyno time can be costly.

Even on the dyno, you'd think getting a horsepower number is a pretty straightforward process. This really isn't the case, as every dyno has a different calibration and method of measurement. How

much airflow the fans supply and how much cooling time the cars are allowed also make a huge difference, not to mention most cars run different brands of gas (even if it is all pump gas). Making a fair, apples-to-apples test has long been a dilemma. The only way to have dyno results that make sense is to record as much information and control as many variables as possible. Luckily, with only four cars this is a little bit easier.

We jumped on the last minute opportunity to use AMS's MAHA LPS 3000 awd eddy current dyno. This is one of two units in the U.S. (the other owned by Brabus Newport Beach) and has the most



AMS specially built a dyno room around a MAHA LPS 3000 awd dyno with a mas-sive cold air supply system driven by a variable speed fan.

SoCal4R32

2004 VOLKSWAGEN R32 SUPERCHARGED

Owner: Eugene Lee

Engine

Mods: VF Engineering Stage II supercharger kit, VF motor and transmission mounts, Supersprint cat-back exhaust

Transmission

Mods: Haldex upgrade, HPA short shifter

Suspension Mods: H&R collovers, H&R rear anti-roll bar, Forge adjustable rear control arms, VW Motorsports racing strut

s: Slotted O.E. rotors, Porterfield racing pads

Wheels and Tires BBS RC, 8x18 Dunlop Sport Maxx

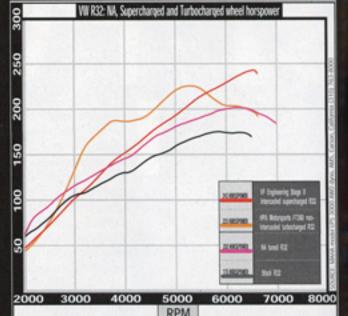


The R32's fuel system made it easy unhook the fuel return line and empty out the fuel tank. With all the tanks dry, we put in some of our local 91 AKI gas for the dyno and quarter mile testing.

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user-friendly whistles and bells I've seen. The LPS 3000 even has a OBD-II plug to allow the user to log four channels from the vehicle's ECU, along with additional channels for wide-band A/F and boost, which helped us tremendously in determining if each car was running properly (i.e., spark, knock, fault modes). My favorite feature was the cooling fans that change with vehicle speed and supplied the appropriate airflow to the car being tested.

To level the playing field even more, we emptied the fuel tanks and filled them with our local 91 AKI excuse for gas before strapping

each down. Each car had three passes to nail a peak horsepower number. It usually turned out to be the second run with the best numbers, as lubricants became less viscous and engines weren't yet heat soaked. The MAHA dyno also has a nifty feature that measures drivetrain drag right after each run as the car coasts down. Based on this drag, which takes into account all pertinent factors for each run, it generates a pretty accurate crank horsepower value. Using a DIN 70020 correction factor (a European equivalent to our SAE correction factor,) the stock car put down a calculated 238 bhp, two

off the advertised 240 bhp. Accurate enough for me. If this nonsense of bragging about crank horsepower is your cup of tea, the MAHA calculated a peak 260, 321 and 289 bhp for the tuned NA, supercharged and turbocharged cars, respectively. The supercharger had a steady climbing boost curve that peaked at 6.54 psi @ 6480 rpm, and the turbo car consistently made more than 11.8 psi above 3000 rpm. The HPA kit could handle this much boost by using a head gasket that dropped the compression ratio to 8.5:1.

The MAHA also recorded ignition timing, A/F, intake air temperatures

(IAT) and ambient air temperatures. Ambient temperatures for all runs were roughly 65 degrees Fahrenheit, and IAT as measured by the ECU hovered near 70. The VF supercharged car was the exception, as its IAT steadily rose to 86 degrees at the end of its run, not that 86 degrees is high for IAT. Since the stock R32 uses an IAT sensor that is integrated into the MAF, these measured values only indicate the temperature of the intake charge and not the temperature in the manifold after compression and intercooling.

Score one for the supercharger, its linear boost and linear powerband.



Owner: George Turner, Jr.

Mods: AEM intake, Magnaflow exhaust, REVO software

Transmission Mods: AASCO lightweight fly-wheel, custom clutch, B&M

Suspension

Mods: H&R collovers, CPP adjustable rear control arms

Wheels and Tires

Factory alloys Dunlop Sport Maxx

Exterior

LSD gullwing doors

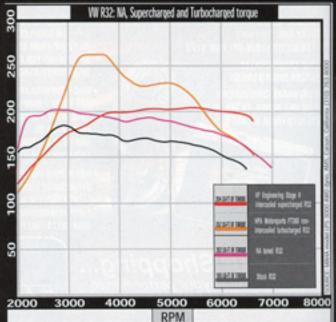
Interior

Momo Net steering wheel





Its scissor doors were probably the easiest way to pick out the NA car out of a parking lot of 70 R32s .



WHO'S REALLY THE FASTEST?

Since SoCal R32 and HPA had rented out the Streets of Willow for the track portion of their shindig, we tagged along to do some quarter-mile testing and hot laps on

the same day. Being the control Nazi that I am, we again arranged for everyone to be on the same pump gas as on the dyno day. For added assurance, we also slapped the same Dunlop SP Sport Maxx

max grip summer tires on each and brought along our own drivers for the quarter mile and the track. We knew who made the most power, and know that NA cars suffered more at altitude than the

types of forced induction cars we were testing. So what does our radar gun tell us? The NA car, at a roughly 40-whp disadvantage and at best a 200-pound weight advantage (no back seat or forced

CAR	E.T.	TRAP	ELEVATION CORRECTED SEA-LEVEL E.T.	ELEVATION CORRECTED SEA-LEVEL TRAP	0-60	LAP
Motor Trend tested (Fontana, CA; 1232 ft)	14.2	97.6	14.02	98.86	5.9	n/a
stock (Rosamond, CA; 2326 ft)	14.81	92.25	14.41	94.86	6.65	1'39"64
NA	13.92	98.3	13.55	101.08	5.68	1'38"06
VF	14.06	96.21	13.68	98.93	5.72	1'37"40
HPA	14.00	100.98	13.62	103.84	5.81	1'36"01



2004 VOLKSWAGEN R32 TURBO

Owner: HPA Motorsports

Engine Mods: HPA Motorsports FT360 DTM turbo kit, custom modi-fied O.E. exhaust

Suspension Mods: KW Variant III collovers

Mods: HPA Stage I upgrade [slotted rotors, sport pads] front and rear

Wheels and Tires BBS RC, 8x18 Dunlop Sport Maxx







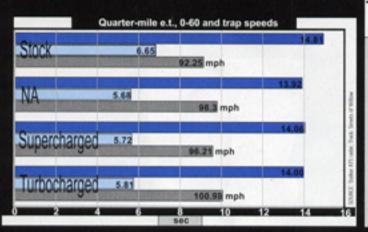




induction hardware) pulled off the fastest e.t., almost a tenth faster than the best runs by the forced induction cars.

Yeah, that's what I said. And since our driver, John Kiewicz, quarter-mile jockey of our sister publication Motor Trend, has unquestionable driving abilities, and each car used the same gas, the same tires and the same infallible radar gun, we were left with the verdict that heat and weight make a big difference. Considering it was only 73 degrees outside at 20% humidity, I'd hate to see what a real summer track session would do to these cars. By the time Kiewicz shifted into third on the quarter mile pull in each force-fed car, the effects of heat and knock could already be felt. We even let the non-intercooled turbo car have a lengthy cool down time for the benefit of the doubt so that it could post its best e.t. of 14 seconds even—almost three tenths faster than its hot runs—to make sure the thin air had not gotten to all of us.

Apply all the correction factors you want, but like the cop said, radar doesn't lie. I will point out for reference's sake that the stock R32 we tested that day under-performed compared to Motor Trend's stock NHRA elevation-corrected e.t. by 0.4 seconds. Next

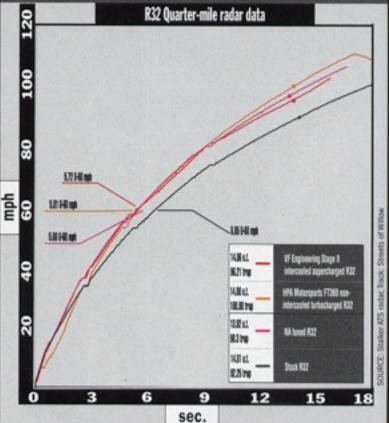




SoCal R32 GTG V

Arecord number of 100 Volkswagen R32s were on hand for SoCal R32's GTG Part V, which culminated at HPA Motorsports' invitational track day at Willow Springs Raceway in Rosamond, Calif. The two-day event kicked off at the Speedzone go-kart facility in City of Industry, Calif., where the parking lot was a colorful sea of no less than 108 R32s. While a handful of the cars were strictly stock, a good many more were modified, showcasing the best of the performance aftermarket.





"It was a large, yet very informal show where everyone had something in common," said Eugene Lee of SoCal R32. "We're all crazy about the R32." Show winners received parts and accessories from a number of tuners, including HPA, VF Engineering, EIP Tuning, Neuspeed and others.

The HPA invitational track day also drew a large number of R32 owners and general VW enthusiasts. Participants drove from all parts of the western United States and in some cases further, as with Doug Neilson, who drove his unique, HPA-modified R28 all the way from Calgary, AB, Canada.

Segmented in groups of varied driving expertise, participants ran the 1.7-mile Streets of Willow road course throughout the day. Nine instructors were on hand to offer advice, training and driving demonstrations. Prizes for the fastest lap times as well as event giveaways were supplied

by HPA, BBS, Dunlop and Recaro.

"This was an opportunity for new and experienced drivers alike to enjoy some time on the track and develop new driving skills," said HPA President Marcel Horn. "What better way to spend the day than at the track with fellow R32 enthusiasts?"

-Robert Hallstrom



time I'll make sure to datalog each car's OBD-II output to better report what each car is doing down the quarter mile. Yeah right, I'd be working for a race team and not a magazine if that were

Point for the NA car without back seats and its lightning-fast short shifter and flywheel.

SETTLING THE MATTER LIKE REAL MEN

With no solid answers, we took the battle to the Streets of Willow in its full 1.7-mile configuration with a coned-off chicane on the straight after turn eight. With James Hickerson of Eibach Springs as our hot shoe, we ripped off some timed hot laps to see which form of power delivery best fit the track. We gave each car five timed laps total, including warm-up and cooldown, but it was pretty clear that by lap three the brakes were cooked and the compressors were blowing hot air.

Probably the biggest difference between the cars was suspension setup, which wasn't our main concern in testing. Wheel travel was the key to fast times, and keeping all four contact patches well planted. Unfortunately, the slower R32s all rode too low and could not take advantage of the grip offered by the SP Sport Maxx tires. The quick-boosting turbo car stood out here, with its on/off throttle steering and aptly tuned suspension. Even the supercharged car, fitted with the Neuspeed/Haldex performance upgrade, couldn't make up for the instant torque advantage enjoyed by the turbo car in the tight corners of the Streets.

Point for the turbo car with its instant torque and broad powerband.

PORING OVER THE DATA

With nothing conclusive, we probably have the best results we could hoped for. Each car came away showing off its own unique strengths and weaknesses, and no one really walked away a loser. I spent the better part of a week scanning the data, burying myself in old thermodynamics and turbomachinery text books, consulting MAHA along with various turbo gurus, and scouring the Internet for NHRA correction factors and meteorological data to offer the best explanation I can. I still have none. So, I'll leave you with the numbers to sort out among yourselves. &

CONTACT

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HPA Motorsports Inc. www.hpamotorsports.com (604) 598-8520

SoCal R32 http://SoCalR32.com (310) 505-4900

VF Engineering www.vf-engineering.com (714) 528-0066

DUNLOP SP SPORT MAXX

Unlop Tire provided a set of new SP Sport Max Max Grip tire for our four R32s. This new SP Sport Maxx replaces the SP 9000 as the company's top gun street tire. It's really the perfect tire for the R32 at the track because it has great grip but doesn't beat you to death with overly stiff sidewalls or ridiculous tire noise. Used with either stock or stiff aftermarket suspension, the Sport Maxx maintained good grip and composure.



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	255/40ZR17	\$160 ea
	235/40R18 91Y	\$189 ea
	235/45ZR18 98W	\$215 ea
	245/45R19 98Y	\$277 ea

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BURE	225/45ZR17 91Y	\$149 ea
EBRE I	205/50ZR17 93Y	\$165 ea
BRE I	245/40ZR17 91Y	\$172 ea
ENEL	245/40ZR17 91W	\$172 ea
BREE	225/40ZR18 88Y	\$191 ea
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116	225/45ZR17 91Y	\$159 ea
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