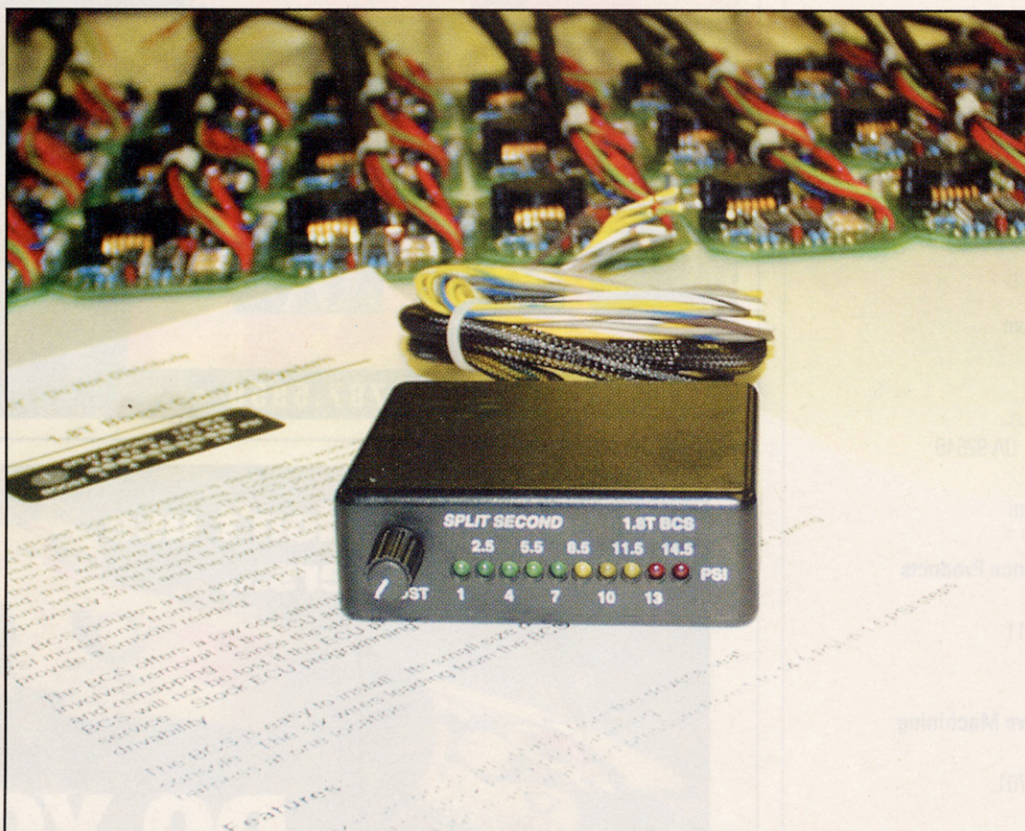


Split Second 1.8T Boost controller

by James Sly PHOTOS BY THE AUTHOR



The only thing better than power is... a whole bunch more power. That's one reason why you might be tempted to buy a VR6 Passat with 172 bhp instead of a 150-bhp 1.8T. You would be shortsighted, of course. It's downright easy to tune a 1.8T to match the horsepower of a VR6. And it's not all that complicated to make a 1.8T crank out far more power than even a tuned VR6. The reason? It's simpler to crank up the boost with a turbo than it is to improve the airflow any other way on a VR6—or any other engine, for that matter. That's what makes the 1.8T an absolute star for the hot-rodding set.

Traditionally, upping the boost on a modern computer-controlled engine like the 1.8T has been a matter of changing the chip. (A chip, of course, is the bit of silicon that holds the software maps and instructions that the engine uses to set boost, timing, fuel and myriad other engine-operating parameters.) Once someone has gone to the trouble to analyze the maps and spend the time, a reprogrammed chip can tune the engine to provide a big boost in power, torque and generally bump up the fun factor in a big way. Here's a way to do that without a chip.

Like chips, the 1.8T Boost Control System (BCS) deals with the software maps and instructions the engine uses to set boost, timing, fuel and those myriad other engine-operating parameters. BCS attacks tuning, however, from an entirely different point of view. The BCS is essentially a signal conditioner: It simply reads input from the engine sensors, thinks about them and then spits out revised data, tricking the computer into allowing more boost—and thus more torque and more power.

Split Second's strategy works, and it works well. There are no "check engine lights," no driveability issues, no stumbles—nothing but hard acceleration when you dial up the boost and put down your right foot. Off boost, it drives like stock, essentially



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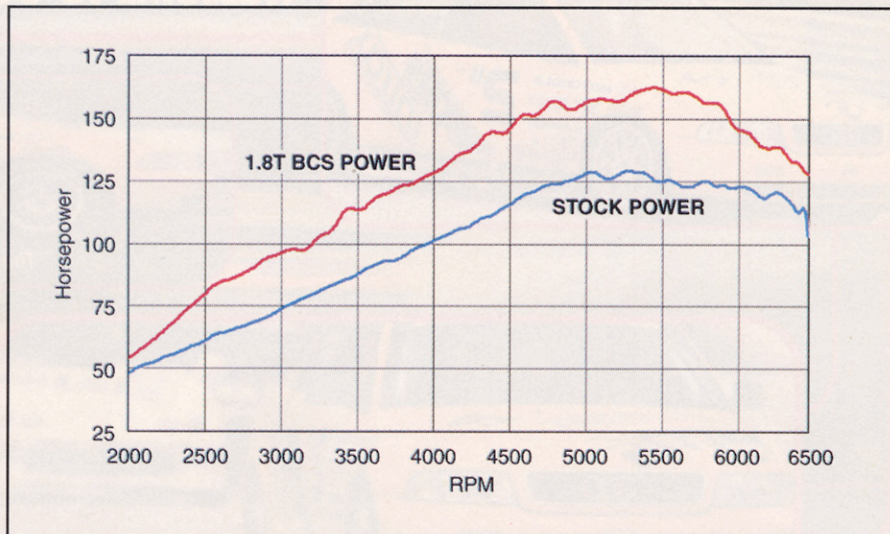
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Power

• Tests performed on an Passat Tiptronic on a DynoJet 248 Dyno, "at the wheels" horsepower. Hook up a few wires, twist a dial, and here's what you get. Stock output at the wheels was a corrected 126 hp. With the 1.8T BCS, that jumped to well over the 160-hp mark. Keep in mind that these are dyno figures corrected for temperature and weather conditions, not massaged by some mystery "correction factor." And if the stock output looks low at the wheels, remember that this is an automatic, whose torque converter tends to soak up a few extra ponies. This output may not equal that of the best chips, but the 1.8T BCS isn't winding the turbo up too tight. Your stock control box remains unmodified.

because it is stock. The system has been well tested, and fuel and spark all adjust to work perfectly with the added boost. You'll need premium fuel, of course, but you would expect that. What you might not expect is the addition of 30-percent more power from a simple black box. You get that amount of power, perhaps a bit more, with Split Second's BCS.

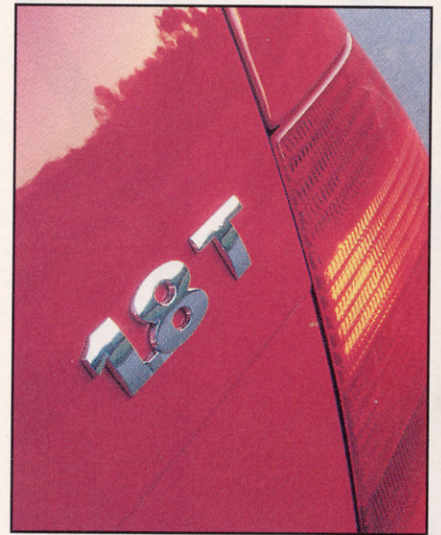
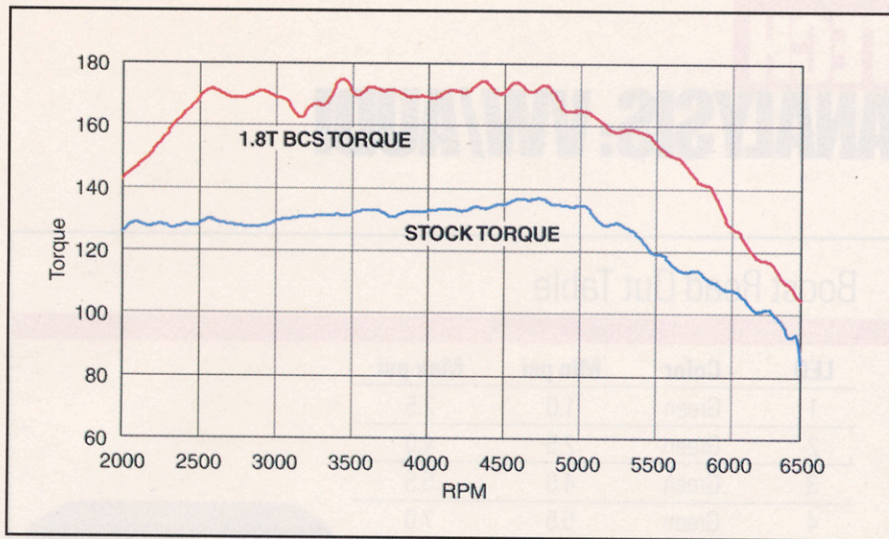
Split Second is in the business of building a line of custom signal conditioners that allow modern emissions-controlled motors to deal gracefully with more power. Some of these units are sold for Split Second and some for customers whose names might surprise you. I first heard the praises of Split Second's devices sung by BMW tuner Al Hafner at

BMP Design. Next it was Mike Levitas at Turbo Performance Center, who strategically incorporated a custom Split Second black box in his awesomely fast supercharged 993. Suffice to say, when Split Second's Eric Nist gave me a call, I couldn't wait to try out the BCS. I wasn't disappointed.

Why Not Just Chip It?

Whether or not to install the Split Second BCS or a chip is a personal decision. Both methods have their pluses and minuses. The BCS has an awful lot going for it. It is adjustable, a feature people seem to really like. It includes an accurate boost gauge, a positive addition. It is simpler to install than a chip, and quicker than





Torque

•Far more important than the nice boost in horsepower is the huge bump in torque across the board. From about 2500 to 4500 rpm, the gain averages about 35 lb-ft—a stout increase in anybody's book. In stock form the flat torque curve of the 1.8T is responsible for the "big-engine" feel—pretty much like a V6. In Split Second modified form, the 28- to 30-percent boost in torque makes the little 1.8 feel even stronger. Pass at ease on the freeway without downshifting, spend a little less time shifting, or just plain accelerate faster—the added torque makes it all possible.

taking out your engine computer and sending it off. BCS works with both automatics and stick shifts; not all chips do.

The downsides? There aren't many. BCS doesn't make quite the power at the big end of a really well-done chip—but, it comes close.

When it comes to power, chipping works. I've popped a Garrett GIAC chip in a 1.8T with a Techtonics 2.5-in. exhaust and found close to 200 bhp, with great driveability and, naturally, a very generous fun factor. BCS came close—very close—with a measured 165 at the wheels on a Tiptronic Passat 1.8T, estimated at about 190 to 195 hp at the crank, with just a stock exhaust.

The downsides of chip tuning? One is that you have to wait for an expert to tune your car, with your engine and transmission models. Another is that you need to remove the engine management control computer, send it to the chip tuner or the shop you're buying from, have your stock chip desoldered and either a new chip or a socket soldered in, wait for the computer to come back, and reinstall it in the car.

That's a bit of a hassle, but it's a tolerable situation. One last downside may be a bigger stumbling block: By having a chip installed, you've modified your car, more or less permanently, and this could cause hassles in the event of a warranty problem with your car down the road.

Recently, Volkswagen dealers have been asked by the factory to upgrade stock chips by "flashing" them, downloading new programs at the dealership. How can you avoid this problem? If the chip is socketed, you can remove the

engine computer and reinstall your stock chip before the car goes to the dealer for servicing, then put it back when the car returns. If the chip is soldered in place, well, your only choice would be to send it in with the modified chip and deal with the hassles if it is discovered, or "flashed." You could have a spare "brain" and swap it out, but with VW's immobilizer system, this isn't as simple as it sounds, either. Since the BCS works with the stock chip, flashing or changing the stock chip out will not cause any problems.

Finally, there's the matter of cost. Split Second's BCS has an edge here, with a list price of \$295, likely to be less expensive than the list price of most well-designed chips.



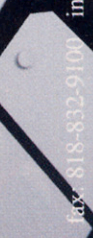
•Even if the Split Second BCS wasn't such a great power add-on, it would be one of the coolest boost gauges out there. As boost builds, a row of brightly colored LEDs illuminate, showing the current boost level. The chart on page 152 details the color changes. This is an extremely accurate gauge—it's using the same sensor output used by your engine control computer, after all—and a simple one to read. Even out of the corner of your eye you can see the changes in color much easier than reading a tiny needle.



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TECH

ANALYSIS: VW/AUDI

Boost Read Out Table

Boost Pressure (PSI)

LED	Color	Min psi	Max psi
1	Green	1.0	2.5
2	Green	2.5	4.0
3	Green	4.0	5.5
4	Green	5.5	7.0
5	Green	7.0	8.5
6	Yellow	8.5	10.0
7	Yellow	10.0	11.5
8	Yellow	11.5	13.0
9	Red	13.0	14.5
10	Red	14.5	-----



About the Black Box

The Split Second 1.8T BCS packs a lot of power in a compact, well-engineered and -constructed package. The unit itself is a tiny black box, 1-in. high, 3-in. across and a compact 2.5-in. deep, far smaller than a pack of cigarettes, and quite simple to mount or tuck away just about anywhere in the interior of the car. A typical installation would probably be at the top of the storage bin in the console. Split Second supplies self-adhesive hook-and-loop fasteners to make mounting the lightweight unit quick and easy.

Wiring for the BCS is color-coded to match the Passat factory color codes. Jetta, New Beetle and Golf IVs have a different color code to their wiring. Still, interfacing is simple—the instructions give a description of the required color match. The harness itself is made of SAE-spec automotive wiring, designed and rated for use inside the engine compartment. A woven Nylon “Techflex” chafe shield is on the harness, making it easy to thread through the firewall and under the dash. There are no messy loose wires flopping around.

Like the wiring harness, the rest of the BCS is carefully made of high-precision components, including a detented Swiss-made potentiometer for the boost adjustment. The boost meter operates on a closed-loop mode, so modify the engine or even the wastegate and the boost will still be accurate. Boost is limited to 14.5 psi, the limits of stock fuel availability on an unmodified system, according to Split Second.

You next need to access the wiring harness of your engine computer, select the correct wires, clip on a non-intrusive Scotch-Lok™ connector and plug in the BCS wires that match. One wire has to be cut to install the BCS, and there are four other connections to make. If you're uncomfortable installing your own stereo, this isn't a job for you. If you're methodical, can follow instructions and pay attention, the average enthusiast should have no problem. If you have any doubts, have a qualified shop install it.

Once the BCS is installed and wired up, you simply start up the car, dial the knob up for more boost or twist it down to stay at the stock level. The BCS is also a functional electronic boost gauge. A row of 10 clearly labeled, colored LEDs progressively light up to show you the boost level your system is reaching as you drive. Very cool.

Performance and Use


Perhaps the coolest feature of the BCS is the user adjustability. Turn it all the way down, and your turbo pumps out box-stock boost levels. Reach down and twist the knob, and it can be adjusted all the way up to the maximum of 14.5 psi. The package looks great—and it feels great, too. Precise detents in the boost-control potentiometer click away as you crank up the boost, making it easy to exactly set the boost level you want. Crank it down for that teen driver or the valet parkers. (Not that most intelligent young valet parkers won't be able to figure this out.) A snowy day or wet roads ahead? Dial down to

stock levels to keep things comfortably in hand.

Split Second has adopted an intelligent approach to interfacing the added boost with your applications of the right foot. No matter where you've got the knob set, the boost remains at stock levels until you press the accelerator past about the three-quarter mark. Owners of Tiptronic automatic trans cars will note that this is just about the same point the transmission kicks down. It makes it easy to stay out of the extra boost when you don't want it—and keep stock fuel economy. When you do kick down the automatic and the added boost spools in, the results are downright impressive. This marriage of technologies is enough to make even the hardcore manual trans enthusiast wish he had an automatic.

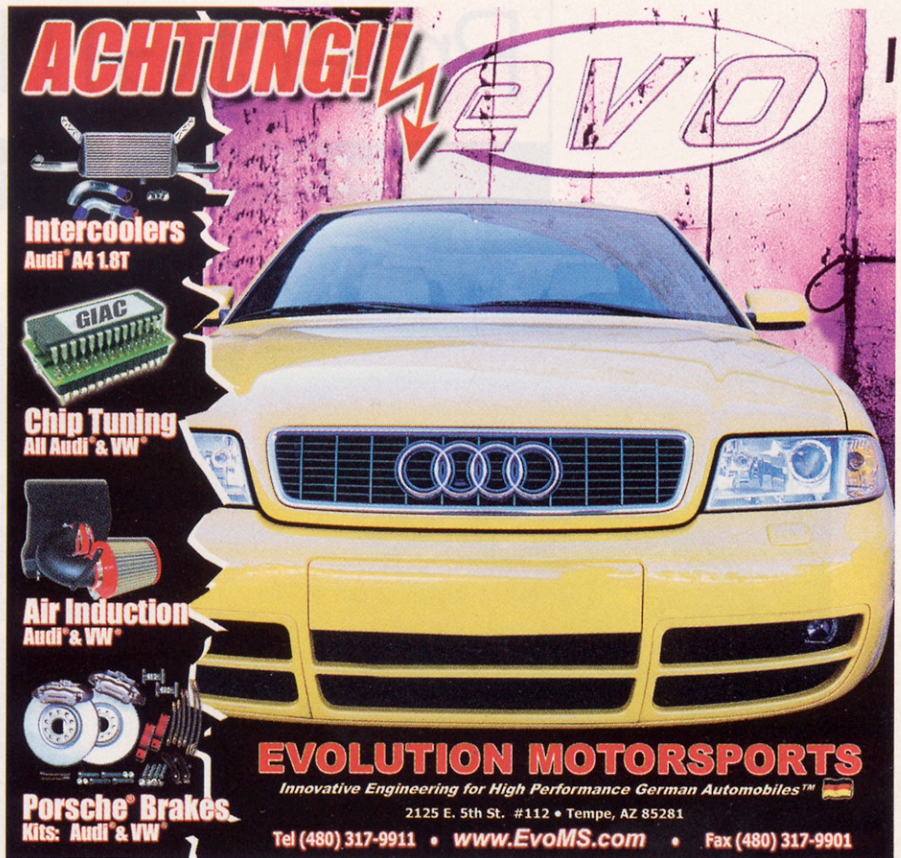
Eric Nist and Mark Amarandos are the partners who make up Split Second. As Eric reported, "We're in the business of manufacturing automotive electronics. I've grown up being a tuner and found that as cars get more and more modern, they've become more and more difficult to tune. Our products—and that includes the 1.8T BCS—are designed to make that process simpler." I can't imagine anything simpler than gaining 30 percent more power by hooking up five wires, so I would have to say that Split Second is successful at meeting its goals.

Will the BCS be "smog legal?" According to Nist, "We're currently in the testing stage for emissions legality, and we're looking forward to getting a clean bill of health from the state of California and having a smog-legal product. We've passed the initial tests and are just waiting on the paperwork."

The 1.8T BCS is designed to fit "drive-by-wire" cars, 1999 and newer (those without throttle cables). The 1999 1.8T Beetle was one of the first. Other electronic-throttle cars the BCS works well on include the base TT with 165 bhp, Golf IV, GTI, Jetta, Passat and A4 Audi. It doesn't matter if it's a Tiptronic or a manual transmission; the Split Second BCS will work equally well with either transmission and, in fact, is an excellent solution with the Tiptronic or other automatics. 

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