AWE Tuning 2000-2002 Audi S4
RS4 K04 Fueling Kit

The **AWE Tuning RSK04 Fueling Kit** picks up where the Audi RS4 leaves off! AWE Tuning worked very closely with GIAC to establish the proper mechanical parameters which would overcome limitations in the RS4 that GIAC documented during chip development. The RS4 Mass Air Flow (MAF) sensor and fuel injectors are inappropriate for use on an S4, and we also had our sights set even higher than chipped RS4 territory with the RSK04 kit.

Important System Requirements:

The AWE Tuning RSK04 Fueling Kit is designed to work only with the RS4 K04 turbos installed. The requested boost pressure from the GIAC chip is beyond the safety level of the S4 K03 turbos.

The AWE Tuning RSK04 Fueling Kit is also designed to work only with high flow downpipes installed (no pre-cat), as well as a cat back exhaust system.

The AWE Tuning/GIAC chip program is designed only to work with the secondary O2 sensors located behind the main catalysts. If your downpipes do not have the secondary O2 sensors located behind the main catalysts, the fuel injection ECU will log a catalyst efficiency code and illuminate the check engine light after 50 miles of driving, and drivability issues can begin to develop.

Parts list:

6	Balanced Bosch fuel injector
4	Aluminum spacer
4	M6x20x1 socket head bolt
4	M6 washer
2	40-60mm hose clamp
1	AWE Tuning MAF housing with sensor adaptor
1	MAF laminar flow screen
2	3mm socket head bolt
1	Engine coolant temp sensor
1	Silicone 3-way MAF hose
1	Aluminum plug
1	16-25mm hose clamp
1	80-100mm hose clamp
1	90-110mm hose clamp
1	AWE Tuning/GIAC engine chip order form
6	NGK PFR6Q spark plug
1	Intake system Pressure Tester kit

Required specialty tools:

1	Torx T20 Security tool
1	5mm Allen head tool
1	3mm Allen head tool
1	Brake Cleaner Spray
1	Blue Loctite
1	Superglue
1	Scan tool

Install time:

Approximately 2.5 hrs

We highly recommend scanning the engine ECU of your S4 before starting this procedure. If you have fault codes stored in the ECU, be sure to address their causes first.

Pre-existing problems will result in poor operation after installing the RSK04 fueling kit.

See our troubleshooting guide on Page 5 for help on fixing common problems found both before and after install of our fueling kit.

Step 1:

With the engine fully cool, remove the OEM MAF and plastic transition hose at Point B in Figure 1. Then remove the three decorative engine covers and the Y-pipe from the engine. You will have to cut the crimp type hose clamps where the Y-pipe attaches to the rubber outlet hoses at Points A in Figure 1. Use the included 40-60mm hose clamps when reassembling.

On late 2001 and all 2002 S4s, there will be a PCV tube that attaches to the plastic transition hose from below. This hose simply pops out of the rubber bung in the transition hose.

With the Y-pipe removed, take care not to let any items fall into the intake hoses.

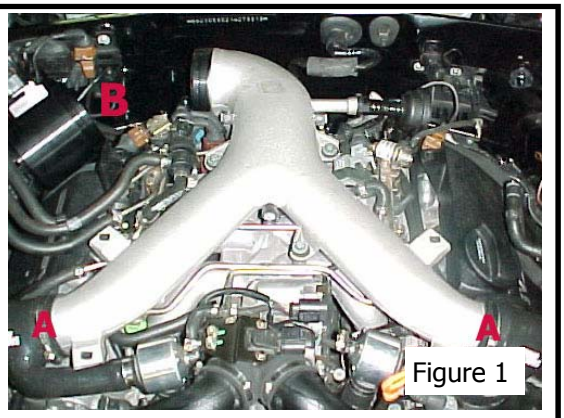

Figure 1

Step 2:

Relieve any residual fuel tank vapor pressure by loosening the gas cap. Retighten after venting.

Unbolt the four 5mm socket head bolts holding the fuel rail assembly to the intake manifold at Points A in Figure 2.

You will then be able to carefully lift up the rail assembly enough to access all six fuel injectors. The fuel injectors will stay attached to the fuel rail as it is lifted. You may have to wiggle the rail a little bit to pop the injectors free from the intake manifold. Unclipping the hoses at Point B in Figure 2 will allow you to raise the rail for further access if needed.

Note that the intake manifold in Figure 2 will look differently on a 2000 S4.

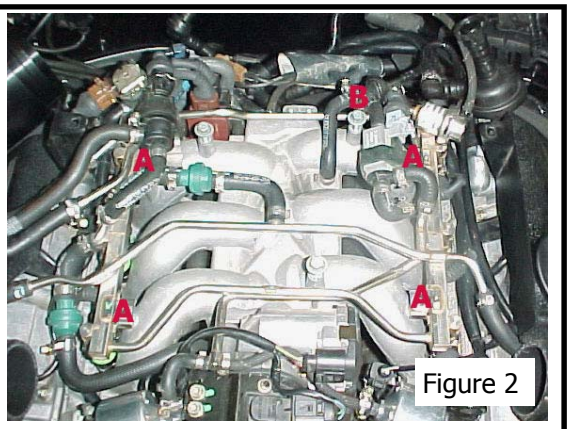

Figure 2

Step 3:

With the fuel rail assembly free from the intake manifold, unclip the OEM fuel injectors from the rail and unplug each injector from its wiring harness.

Once the injectors are unclipped, some fuel will be released, so take care not to smoke or have any open flames in the area at this time.

Spray a little brake cleaner on the AWE Tuning injector o-rings to make insertion into the fuel rail easier. Make sure the injectors are fully seated into the rail and **do not reinstall the retainer clips** (once bolted down, the fuel rail will hold the injectors in place). Reattach the wiring harnesses at this time.

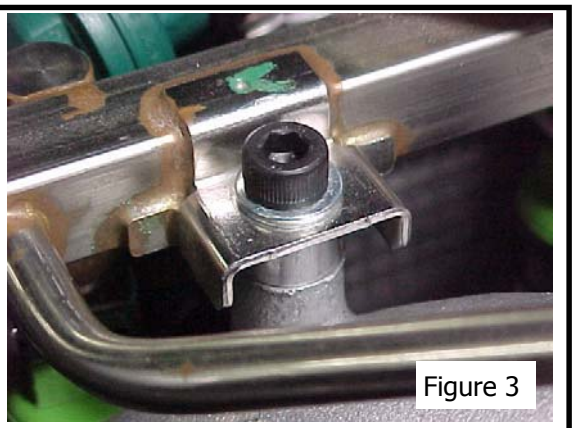
Figure 3

Before reattaching the fuel rail to the intake manifold, insert the included spacers under the rail mounting points as in Figure 3. Use the included longer 5mm socket head bolts and washers to refasten the rail to the manifold.

Install spark plugs at this time.

Step 4:

2000 S4 owners, see enclosed instructions at this point for converting your Bosch MAF to a Hitachi MAF.

Swap the sensor from the OEM housing into the AWE Tuning housing.

Use a Torx T20 security wrench to unbolt the sensor from the OEM housing, at Points A in Figure 4. Gently wiggle the sensor free from the housing. Be careful not to touch the sensor's element while it is removed from the housing.

Apply a small amount of blue Loctite to the 3mm socket head bolt threads. Carefully insert the sensor into the AWE Tuning MAF hous-

Figure 4

Step 5:

Note the orientation of the MAF screen in Figure 5.

Insert the MAF screen in the AWE MAF housing as shown in Figure 6. A couple small dabs of superglue around the edge of the screen will keep it from rotating or falling out during reinstallation.

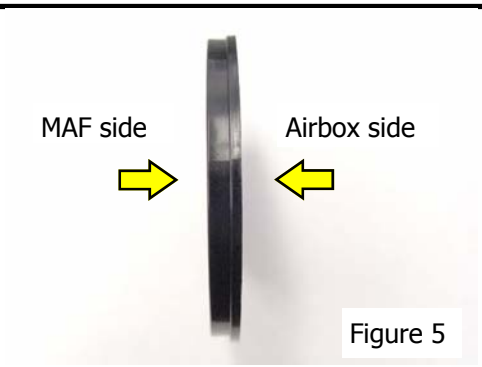

Figure 5

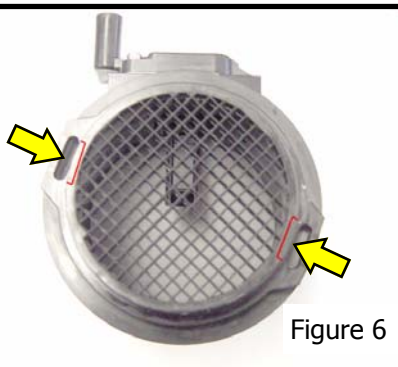
Figure 6

Align the notches on the screen's perimeter (at arrows in Figure 6) with the MAF housing slots for the airbox clips.

Step 6:

To ensure that the intake hose from the MAF housing to Y-pipe does not collapse under high rpm full throttle, you must cut out the bottom of the airbox as shown in Figure 7.

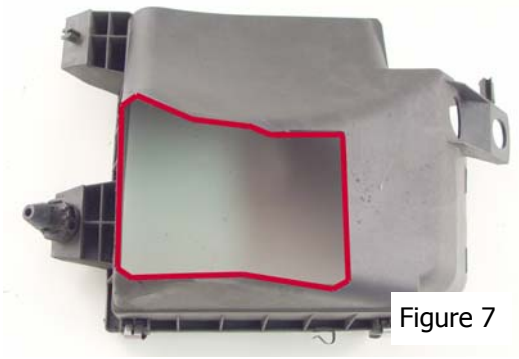
Figure 7

Step 7:

Place a drain pan on the floor, and remove the coolant temp sensor, at arrow in Figure 8. This sensor is located under the MAF housing area. Install new coolant temp sensor and o-ring.

Make sure to perform this procedure on a cold engine, as coolant will be expelled when removing the temp sensor.

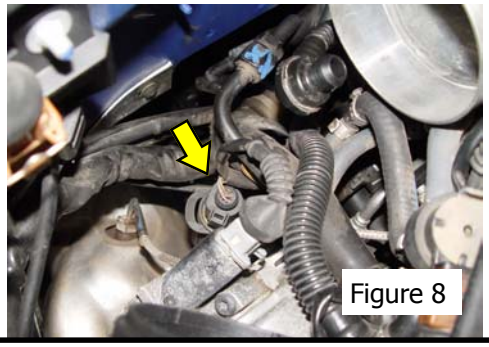
Figure 8

Step 6:

The AWE Tuning MAF housing installs just like the OEM unit.

Apply a little brake cleaner to the airbox outlet o-ring to allow the housing to slide in easier.

The large increase in horsepower is beyond the spec of the air filter used with our S-Flo intake kit. Please install a panel air filter for use with the fueling kit.

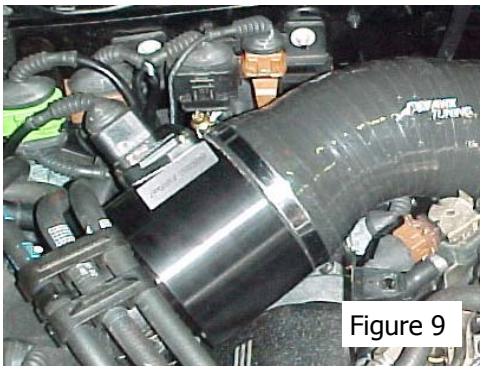

Figure 9

Step 7:

2000 and early 2001 S4s do not have the PCV system tube routed to the intake hose after the MAF. Insert the included aluminum plug into the small outlet port of the AWE Tuning silicone MAF hose for these cars. Insert as in Figure 10, and tighten down the 16-25mm hose clamp snug.

Install the MAF hose using the included 80-100 and 90-110mm hose clamps. On late 2001 and 2002 S4s, do not forget to insert the PCV tube into the small hose port and tighten down the 16-25mm clamp.

Figure 10

Step 8:

A critical step in installing our fueling kit is the pressure testing of the intake system. We have found that the majority of drivability and performance issues that customers encounter are from leaks in the intake system, which causes the ECU to maladapt. Follow the procedure as outlined on the enclosed pressure tester instructions.

Step 9:

The components of the AWE Tuning RSK04 Fueling Kit are designed to work with a specifically tuned GIAC engine chip. Please send your engine ECU to us for installation of this chip, using the enclosed order form.

Please note that return shipping charges are additional.

2000-01 S4 installs, please see page 6 for important information!

GIAC
Garrett Integrated Automotive Corp.

Step 10:

AWE Tuning highly recommends scanning the engine ECU via a scan tool after several minutes of street operation in order to check for fault codes. If you encounter any fault codes, be sure to record them and then contact us for any troubleshooting. In rare situations, our kit can expose a sensor or component that was previously marginal.

Please refer to our Troubleshooting guide on page 5 for addressing common operation issues.

AWE Tuning **1-888-565-2257** **215-658-1670** **sales@awe-tuning.com**

THIS PROCEDURE APPLIES ONLY TO MODEL YEAR 2000 AUDI S4 WITH ENGINE ECU ENDING IN "A" WITH AWE HITACHI MAF CONVERSION INSTALLED AND 2001 AUDI S4 WITH ENGINE ECU ENDING IN "H"

To use the RSK04 GIAC chip installed in your engine ECU, the instrument cluster must be recoded. Re-coding can only be done with a VAG scan tool, such as the Ross-Tech VAG-COM that we distribute.

To recode the instrument cluster:

Step 1: Key off

Step 2: Remove engine ECU

Step 3: Key on

Step 4:

Connect scan tool to car.
Press **Instruments** button.

Step 5:

Press **Adaptation** button for instruments.

Step 6:

Type in Channel Number 60 and press **Read**.
Change Stored Value from 0 to 1025 by entering 1025 in New Value window and pressing **Test**.
Test Value will now read 1025.
Press **Save** and exit scan tool.

Step 7:

Key off.
Install engine ECU with RSK04 chip installed.
Key on.
Clear all codes in engine ECU and Instruments.

If the instuments and engine ECU will not communicate, and value is verified as 1025 in channel 60 of instrument cluster adaptation, turn key off for a few minutes and then turn key on. The instruments ECU may need to fully power down to recognize the new value.

Dyno Testing Notes:

The critical parameter to control when dyno testing any vehicle, especially a turbo-charged one, is the vehicle speed during the dyno test vs the dyno cooling fan speed. It is extremely rare to find a dyno cooling fan system that can simulate anything near 100mph wind, let alone 50mph.

A good cooling fan system is one that produces air *velocity*, not just air volume. Huge diameter fans tend to move a lot of air, but at a slow velocity, which does not produce the immediate cooling effect that the engine needs for optimal power. More often than not, dyno shops use fans that produce less than 20mph air velocities, as they assume high volume (CFM) equals high velocity.

To quickly gauge the air velocity of the fans being used, feel the air coming out of their fans. It should begin to push your hand away. If it does not, be prepared to be extra careful on the dyno in order to obtain meaningful results. Via a scan tool, make sure that your start intake temps are at maximum in the high 30C range (datablock 011 for Bosch ME7 systems), and do not exceed the mid to high 60C range by dyno test end. Putting a fan on top of the engine throughout the test is very helpful in controlling intake air temps, too. Be sure that the actual test time is realistic to the gear that you are in and the start and stop speeds. For example, a 15-20 second test from 35 to 120 mph simulates a realistic condition found in street driving. A 30-40 second test on a car is never something that you will find during street or track driving, and is unnecessarily abusive to the engine, resulting in unrealistic results.

If the dyno shop you choose to use has a poor fan setup, we recommend using 3rd gear in which to do your testing. Dyno testing in 3rd gear will lessen the strain on the engine, and will reduce the excessive intake temps seen from a less than sufficient cooling fan system. The Bosch ME7 fuel injection system is particularly sensitive to intake air temps, and will begin an enrichment routine to "protect" the engine if temps are high, which ultimately hurts your power results on the dyno. The injectors used in our kit are so big, that if this enrichment routine is triggered, fuel mixture goes extremely rich (low 10:1 to high 9:1 ratio). However, this excessively rich mixture is an artifact due to improper test procedure, and is not indicative of what is going on during street driving.

Careful control of dyno testing variables is required, or your results will be meaningless. Also, remember that the more power produced, such as with our RSK04 kit vs a chipped K03 S4, the harder the intercoolers will be working, necessitating even more care and consistency in test methodology.

TROUBLESHOOTING GUIDE		
ISSUE	**POSSIBLE CAUSE**	**RESOLUTION**
Very unstable idle and unresponsive part throttle	Missing OEM O-ring around MAF housing where it slides into air cleaner box	Install O-ring, part number N90921901
Check engine light on while driving and 16805, 16815 Warm Up Catalyst Efficiency Below Threshold fault codes logged in ECU	Test pipes installed Secondary O2 sensors installed before main catalytic converters	Install catalytic converters Have muffler shop relocate secondary O2 sensors to after main catalytic converters
Check engine light on while driving, misfire fault codes logged in ECU	Worn or incorrect spark plugs Faulty coolant temp sensor for fuel injection	Install new spark plugs, OEM NGK PFR6Q Install new updated coolant temp sensor, part number 059919501A
System Too Rich or System Too Lean fault codes logged in ECU	Leak at MAF Leak in intake system Faulty coolant temp sensor for fuel injection	Double check that all hose clamps at silicone MAF hose are completely tight Pressure check intake system and repair any leaks found Install new updated coolant temp sensor, part number 059919501A
Check engine light on while driving, 17584 and 17585 O2 Sensor Correction Behind Catalyst fault codes logged in ECU	Faulty coolant temp sensor for fuel injection	Install new updated coolant temp sensor, part number 059919501A
Audible pinging during full throttle	Normal initial adaptation Bad tank of fuel Worn or incorrect spark plugs	Pinging may be audible during the first 2-3 full throttle acceleration runs after installing kit. This is normal and the ECU will adapt Drive conservatively until fuel tank is on reserve and refill at national brand service station Install new spark plugs, OEM NGK PFR6Q

AWE Tuning 2000-2002 Audi S4
RS4 K04 Fueling Kit

AWE Tuning/GIAC RSK04 Performance Chip Order Form
Please complete and include this form when sending in an ECU for chipping

Name/Company :_____

Billing address :

_____

_____

_____Zip Code_____

Shipping Address :
(must be a business or a "credit card company approved alternate address" if different from billing address)

_____

_____

_____Zip Code_____

Daytime Phone Number (_____) _____

Is this an upgrade to an existing GIAC chip? (circle one): Yes No

Payment Method: Money Order Credit Card
Name on card:_____
Number:_____
Expiration date:_____

Return Shipping Method: Next Day Second Day Ground
(Return shipping charges are additional and dependent on location)

Special Notes/Instructions: _____
_____

Our Shipping Address:

AWE Tuning
2385-C Maryland Rd
Willow Grove, PA 19090
1-888-565-2257

Any shipping carrier can be used when shipping to us. Please insure the ECU for $1000USD.

AWE TUNING
INNOVATION | DESIGN | COMPETITION

AWE Tuning
2385C Maryland Rd
Willow Grove, PA 19090

215.658.1670
www.awe-tuning.com

Thank you for choosing A.W.E. Tuning as your performance automotive parts supplier. Please remember that a performance car is only as strong as its weakest link. Therefore, it is vital that you maintain your vehicle to factory specifications.

Limited Warranty

The following warranty is valid only in the United States and Canada.

The Manufacturer's full warranty applies to all products sold.

By installing or using the purchased product, the Consumer accepts this warranty.

Secor Ltd. (A.W.E. Tuning) warrants to the original retail purchaser (Consumer) the RSK04 Fueling Kit against defects for 1 YEAR.

Upon verification of warranty coverage, A.W.E. Tuning will replace the defective product without charge. This is the only remedy the Consumer has for any loss or damage, however arising, due to nonconformity in or defect of the product. This warranty does not cover consequential damage, loss of time or revenues, inconvenience, loss of use of vehicle, damage to the vehicle or components, or other incidental or indirect damage.

All warranties are void if the product was not installed by a certified auto mechanic, improperly serviced, modified, or used in a way not intended by the Manufacturer. The Consumer is responsible for ensuring that the product is installed in a safe and proper manner, and should cease usage of the product immediately if an unsafe or improper condition is noted. If an unsafe or improper condition is noted, the Consumer should then immediately contact the facility where the product was installed or A.W.E. Tuning.

Please contact us first for any warranty claims or explanations of this document.