



# 42 Draft Designs

## Gauge Solution Installation Instruction Manual

**\* Stewart Warner Gauges / VW Vehicles \***

The following guide contains guidelines, tips and tricks for installing your 42 gauge solution. Note the index below to begin!

As always, read all instructions prior to installation. Do not deviate from basic wiring or mounting instructions. Always disconnect battery ground before making any electrical connections. If in doubt, please email 42 Draft Designs [sales@42draftdesigns.com](mailto:sales@42draftdesigns.com) or seek professional help.

### Mounting

- Mk4 Triple Gauge Panel 2-3
- Mk4 Aluminum Double & Triple Gauge Panel 4
- Mk4 A-Pillar Gauge Pods 4-5
- B5 A-Pillar Gauge Pods 7-9
- Single Gauge Panel 10

### VDO Gauge Wiring

- VW Tips and Tricks 11-12
- Perfect Match LEDs 12-13
- Boost Gauges 14
- Air-Fuel Ratio Gauges 15-17
- Oil and Water Temp Gauges 18-19
- Oil and Fuel Pressure Gauges 20-21
- Voltmeters 22-23
- EGT (Pyrometer) Gauges 24-25

### Tubing and Sending Units

- Boost Tubing Kits 26-28
- Oil Sender Placement
  - 1.8T 29-30
  - 2.0 31-32
  - VR6 33-35
  - TDI 36-37
- Oil Pressure Relocation Kit Instructions 38-39
- Water Temp Sending Units 40
- EGT probe mounting 40-41
- Fuel Pressure Sending Units 41-42
- Boost Gauge Troubleshooting 42-43

## Jetta IV, Golf IV Triple Gauge Panel Installation Instructions

### Tools Recommended: Radio Removal Keys

1. Prior to installing gauge panel, have all wires and tubing run to gauges and tested. It is recommended that all wires be left long to free workspace behind the panel.
2. Remove radio using radio removal keys. Snap keys in. Pull up and out. With radio hanging out, cover climate controls with a soft cloth to avoid scratches. Push in tabs on side of radio to remove keys.
3. Remove storage bin by pulling straight out.
4. Install center gauge into panel using standard U brackets included with most aftermarket gauges. If your 2 1/16 gauges did not come with mounting brackets, fabricate some, or order the standard brackets. Tighten center gauge tight by hand. Over tightening gauge will cause panel to bend.
5. The outer mounting brackets must be modified to install the triple gauge panel. There are two ways to modify the brackets to secure the panel.

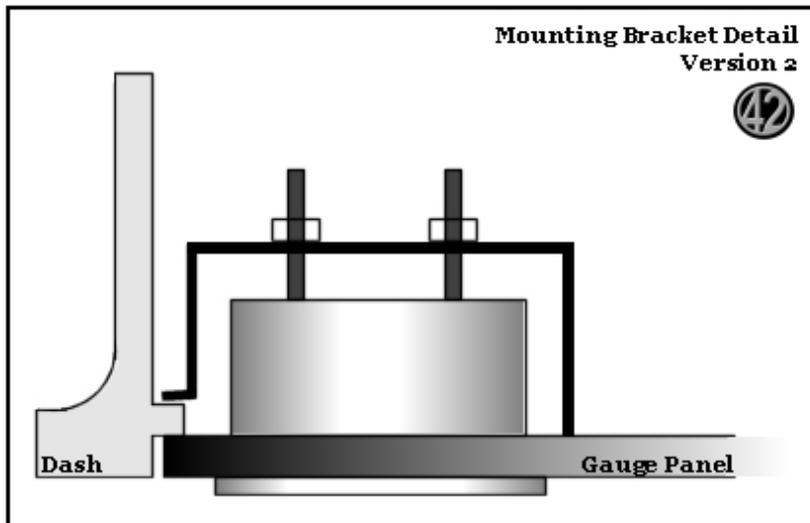
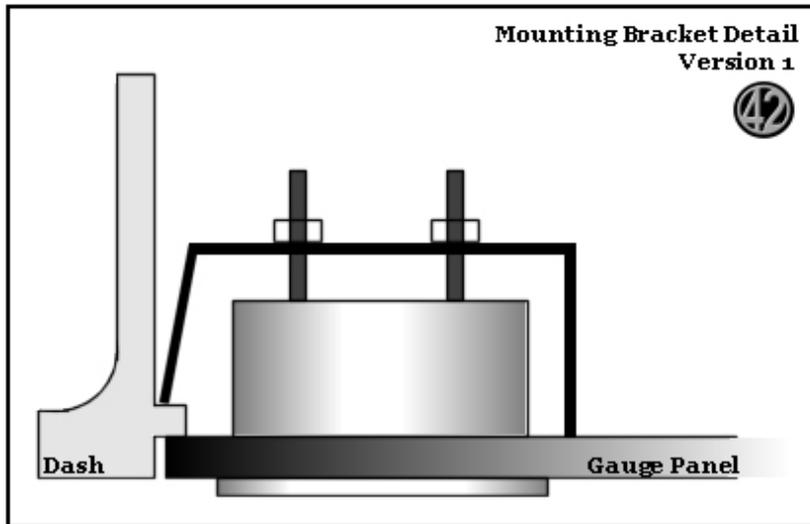
As illustrated to the right, you can simply use the outer leg of the mounting bracket to secure the gauge panel in place. To do this, you will need to cut the outer leg 1/8" shorter than the inner leg, and bend outward to extend beyond the side of the gauge panel. When installing, you will need at least 1/4" of slack between the mounting bracket legs and the appropriate ribs along the inside of the center console. If need be, cut the bottom of the legs proportionally to allow enough slack.

Similar to the above method, version 2 uses a modified outer bracket. In this case, instead of cutting 1/8" off the outer leg, a 1/8" long 90° bend is made to secure the gauge panel to the center console. When installing, you will also need 1/4" of slack between the mounting bracket and the rib of the center console. Modify accordingly.

6. Install modified brackets and leave loose, allowing at least 1/4" slack between panel and brackets. Install all wires and sit panel in place. Once again, test all connections and gauges.
7. Reaching up from the radio slot, position either modified bracket onto the inner rib of the center console, and tighten the corresponding nut. Repeat for other side. Center panel, and align so the cup holder opens freely. Tighten nuts on outer brackets tight, by hand. Replace radio and push gauge panel down against radio face. When positioning gauge panel into place, it helps to work one side at a time aligning the panel, and working the brackets into place. Good luck and have fun!

## Jetta IV, Golf IV Aluminum Double & Triple Gauge Panel Installation Instructions

### Tools Recommended: Radio Removal Keys



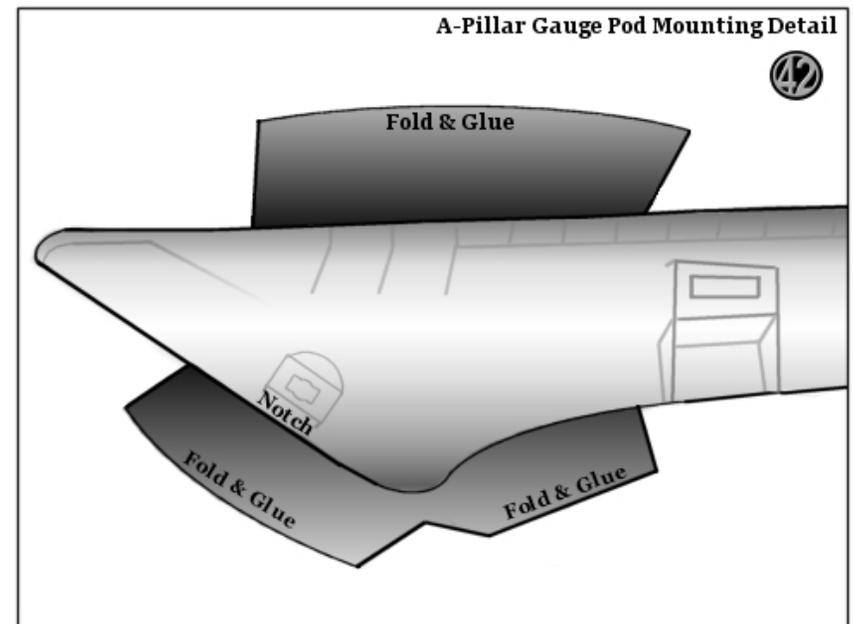
8. Prior to installing gauge panel, have all wiring and tubing run to gauges and tested. It is recommended that all wires be left long to free workspace behind the panel.
9. Remove radio using radio removal keys. Snap keys in. Pull up and out. With radio hanging out, cover climate controls with a soft cloth to avoid scratches. Push in tabs on side of radio to remove keys.
10. Remove storage bin by pulling straight out.
11. Notice the ribs on the left and right of the open DIN slot. The gauge panel will sit flat against these ribs. The backplate will sit flat against the back of the ribs. The backplate has been machined for clearance. The larger notches should be oriented downwards. The smaller notches and thinner top contour should be oriented upwards.
12. Install backplate in the correct orientation. Hold the backplate in place and install the gauge panel.
13. Insert your center gauge through both panels and secure by hand tightening the gauge's mounting bracket against the backplate. It may be necessary to trim the mounting brackets if they are too long. All gauges differ.
14. With the center gauge in place, make any adjustments to the fitment of the gauge panel. If it seems the panel is sitting too low, you may have the backplate installed upside down. The top of the backplate has been machined so that the gauge panel will sit at the correct height.
15. Install the remaining gauges by inserting them through both panels and hand tightening the mounting brackets. Go back over all the gauges and tighten them up – by hand! Tools should not be necessary for tightening the gauges in place.
16. Connect any wiring or tubing to the gauges at this time. Be sure to test all lighting and gauge functions. Route any extra wiring or tubing up high and push back into the dash. No wiring should hang down and interfere with the radio. Replace radio by sliding back into place.

## A-Pillar Gauge Pod Installation Instructions Jetta IV, Golf IV

Some 2001 and later Volkswagen vehicles use A-pillar mount airbags. A-pillar pods should **NOT** be used on these vehicles.

1. Remove A-pillar trim by locating upper seam and prying outward. Use clean hands and avoid using any type of tool to pry. Once a small opening is created at the pillar top, use some force to release the 3 plastic mounting clips. With A-pillar cover pulled out, lift upwards remove completely.
2. On a clean surface, test fit gauge pod on pillar trim. Notice the pod will only fit in the lowest position. Line edges up and wrap the fabric tabs over pillar trim. Use sharp scissors to precisely notch the tabs where any protrusions of the pillar trim exist.
3. Fit gauge and secure using the gauge's supplied mounting hardware. Decide on a wiring route. Wire and tubing can be run under the molded wire trail on the bottom of the pod. Install any tubing or wiring at this point. The gauge and lighting (LEDs have polarity!) should be tested prior to permanent installation.
4. With gauge secured, mount pod on the A-pillar trim. The three fabric tabs should be wrapped **tightly** and secured to the back of the A-pillar trim. For a permanent installation, use contact cement or glue of choice. For a temporary installation, use foil tape or duct tape to secure the fabric tabs to the back of the trim. During mounting, hold pod tightly against trim to assure a flawless seam between pod and trim. Consider using tape to hold tabs in place if gluing tabs one by one. Remember, tabs should be wrapped **tight** and glued to the **back** of the stock trim. This installation should make no permanent modification to the visible area of the stock A-pillar trim.
5. With pod mounted and glue dry, route wires and tubing down the side of the dashboard. Install wires and tubing based on manufacturer's instructions.
6. Reinstall A-pillar trim by inserting bottom section between the frame, dashboard, and weather stripping. Fold in and position based on the location of the upper seam. When in position, push trim back into place. Use force to snap mounting clips in securely. Good luck and have fun!

**Please view diagram on the following page!**



Some 2001 and later Volkswagen vehicles use A-pillar mount airbags. A-pillar pods should **NOT** be used on these vehicles.

### Adhesives

Contact cement offers the best adhesion, but is difficult to remove. To change the gauge or lighting LED the pod will need to be removed. Keep this in mind when choosing an adhesion method. Many customers have found duct tape and foil tape to hold well while offering a removable adhesion.

## A-Pillar Gauge Pod Installation Instructions Passat B5

Some 2001 and later Volkswagen vehicles use A-pillar mount airbags. A-pillar pods should **NOT** be used on these vehicles.

17. Remove a-pillar trim by locating upper seam and prying outward. Use clean hands and avoid using any type of tool to pry. Once a small opening is created at the pillar top, use some force to release the 4 plastic mounting clips. With a-pillar cover pulled out, lift upwards and remove completely.
18. On a clean surface, lay out gauge pod and a-pillar trim. There will be a faint imprint on the a-pillar trim outlining the top of the dashboard. The bottom (plastic) edge of the gauge pod should be positioned to follow this line and rest on the dashboard. The dashed line in the drawing below represents the top of the dashboard.
19. Line edges up and wrap the fabric tabs over the a-pillar trim. Use sharp scissors to precisely notch the tabs where any protrusions of the pillar trim exist. Use masking tape to secure fabric tabs during test fitment. With gauge pod positioned, test fit the assembled gauge pod and a-pillar trim to check fitment. Adjust as required.
20. Once you have the pod positioned correctly, begin to mark the a-pillar trim for drilling. \* See diagrams below for approximate positioning of the hole to be drilled. The hole should be at least 3/8" in diameter to accommodate tubing and wiring. The position of the hole should be such that the tubing can easily route from the gauge without any sharp bends. Before drilling the hole, be sure you are happy with the positioning of the gauge pod and have test fitted the assembled unit in the car with gauge and fittings installed. The hole should not be visible with gauge pod installed. **Measure twice, drill once.**
21. Fit gauge and secure using the gauge's supplied mounting hardware. Some gauges' u-brackets may need to be modified to fit within the tight constraints of this installation. Simply bend the u-bracket to clear the a-pillar trim. Install any fittings, tubing or wiring at this point. **The gauge and lighting (LEDs have polarity!) should be tested prior to permanent installation.** This is also a good time to be sure your gauge is clocked correctly.
22. With gauge secured, mount pod on the a-pillar trim. The three fabric tabs should be wrapped **tightly** and secured to the back of the a-pillar trim. For a permanent installation, use contact cement or glue of choice. For a temporary installation, use foil tape or duct tape to secure the fabric tabs to the back of the trim. During mounting, hold pod tightly against trim to assure a

flawless seam between pod and trim. Consider using tape to hold tabs in place if gluing tabs one by one. Remember, tabs should be wrapped **tight** and glued to the **back** of the stock trim. No adhesive or screws should be used to fasten the gauge pod to the visible area of the stock A-pillar trim.

### Adhesives

Contact cement offers the best adhesion, but is difficult to remove. To change the gauge or lighting LED the pod will need to be removed. Keep this in mind when choosing an adhesion method. Many customers have found duct tape and foil tape to hold well while offering a removable adhesion.

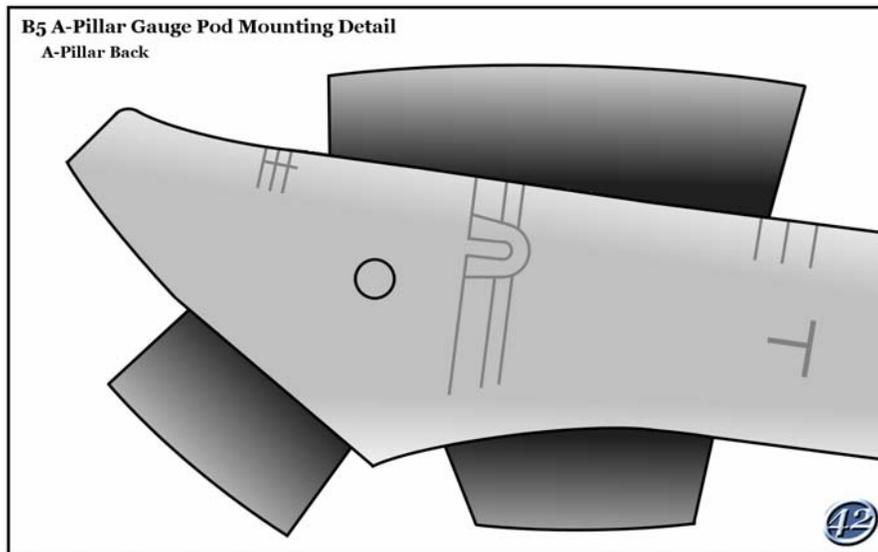
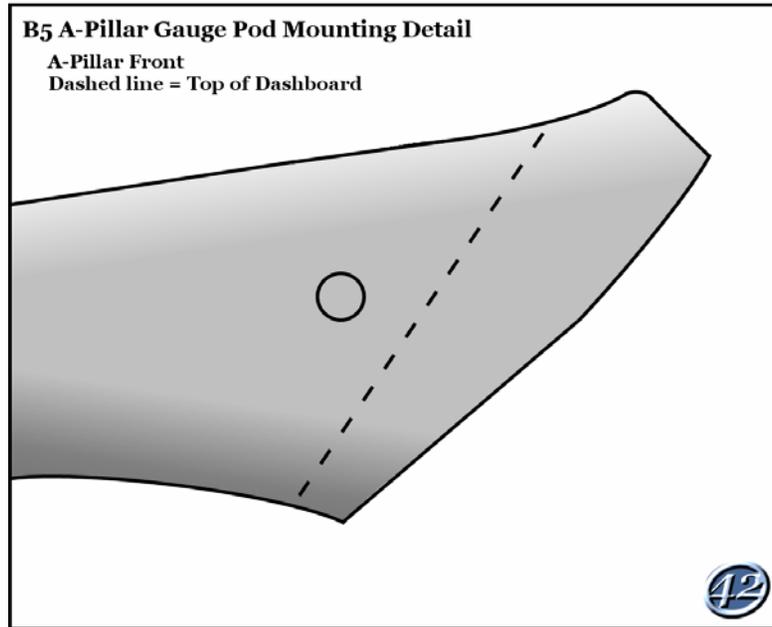
23. With pod mounted and glue dry, route wires and tubing down the side of the dashboard. Install wires and tubing based on manufacturer's instructions.
24. Reinstall A-pillar trim by inserting bottom section between the frame, dashboard, and weather stripping. Fold in and position based on the location of the upper seam. When in position, push trim back into place. Use force to snap mounting clips in securely. Good luck and have fun!

### \*Drilling

Fitment between the dashboard and a-pillar trim in the B5 is extremely tight. Boost gauge tubing cannot be routed between the pod and pillar trim. It is physically impossible to squeeze anything extra in this area. In order to run tubing to a boost gauge, a hole must be drilled in the stock pillar trim.

If installing a gauge other than boost, it may be possible to run wires without drilling a hole in the a-pillar trim. If running only wires to the gauge, installation can be attempted by routing the wires between the pod and the pillar trim. Any extra wires in this area will cause a tighter fitment in the area between the a-pillar trim and dashboard.

**Please view diagrams to the right!**



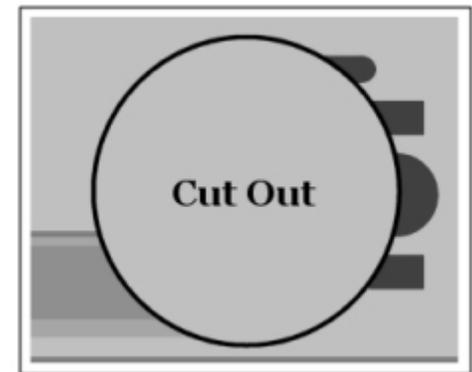
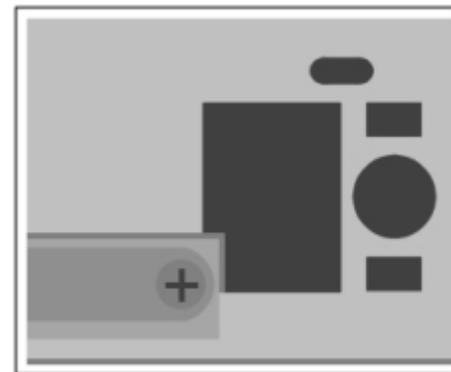
## Jetta III, Golf III Single Gauge Panel Installation Instructions

**Tools Recommended:** Flat head screwdriver, Phillips head screwdriver, Rotary cutting tool (Dremel®)

1. Remove heated seat blank panels by prying out from the bottom. They will snap out when released.
2. Test fit gauge panel by inserting the long tab into the corresponding hole below the air vent. Push tab fully into the air vent hole and pop the bottom of panel into place. Using a permanent marker, trace the gauge hole. Remove panel.
3. Remove the gauge cluster screw using a phillips head screwdriver. Also remove the metal clip behind the screw by prying out with a flathead screwdriver. Using a Dremel or other cutting device, cut the traced circle approximately 1/8" larger in diameter.

If you are using a mounting bracket on your gauge you will need to cut the majority of the console area out. With the gauge installed in the panel you will need room to clear the mounting bracket and snap in the assembled unit. This is only recommended if your gauge fits loose in the panel.

4. Route wires from the gauge to below the dash. Assemble the gauge and panel test all electrical connections. Refer to VDO manual for individual gauge wiring instructions.
5. Install the panel by again fitting the upper tab into the corresponding hole and popping into place. Align gauge and press into panel.



MK3 Single Gauge Panel – Cutting Detail

## SW Gauge Wiring – Volkswagen Specific Tips & Tricks

Always test your connections using a test light or multimeter before connecting any wires! Disconnect battery ground before making any connections! Your car may differ from the given instructions!

### Lighting Circuit

When wiring the lighting circuit of your gauges, it's best to wire them into your car's existing lighting circuit. This way the gauges will illuminate and dim with the rest of the dash. To do this, you'll need to tap into the dimmer switch.

In the mk4 chassis the dimmer switch wiring harness consists of 3 wires. The brown wire is ground, gray wire is incoming power and the white/blue wire is outgoing power. Tap the white/blue wire using a wiretap or by stripping a small portion of the wire and soldering in your power wire. Using 42's wiring kit you'll be connecting the white wire to the white/gray wire of the dimmer switch.

In the mk3 chassis the dimmer switch is built into the headlight switch. The gray/blue wire located in position 1 is outgoing power. Tap this wire and connect it to the white wire of your 42 lighting harness.

### Switched 12v Power

To power your gauges you'll need a switched 12 volt source. When connected to the correct power source your gauges will be active only with the ignition on and your battery will not be drained.

In the mk4 chassis a switched 12v power source can be found on the relay block under the dash. To access this block, remove the left dashboard trim panel and the rubbery panel above the pedal cluster. Above the clutch pedal you'll find a relay block consisting of 5-6 relays. Each relay has a studded terminal with a 10mm nut. The relay labeled 75X should be hot with the ignition on or engine running. You may connect your red power wires to this relay using the included ring terminals.

In the mk3 chassis you may find switched 12v power at the fuse box. Use a test light or multimeter to locate a fuse which is powered with the engine running and not powered with the engine off. Tap the powered wire as it exits the fuse box.

### Ground

Ground is a simple connection in any VW. Because they use a common chassis ground, all you have to do is locate a screw that connects to the chassis. In the mk3 and mk4 chassis, a convenient location is the dashboard support. With your lower dash panels removed, locate a screw which connects the plastic dash panels to the metal dashboard support. Remove the screw and sand any paint of corrosion off the metal

to ensure a good connection. Then, ground your wire using the included ring terminal.

### Firewall

In the mk4 chassis there are 2 options for running wires through the firewall. On throttle by cable cars you'll need to run your wires through the firewall with the main wiring harness. You can poke through using a long metal rod or coat hanger. On throttle by wire cars there is an empty grommet above the throttle pedal. This grommet is located where a throttle cable would typically be located. Running wires through this grommet is ideal.

Also, you may choose to run wires through where the hood release cable enters the rain tray. If you do run wires through this grommet, be sure to poke a hole in the grommet and feed the wires through the grommet. Rainwater will enter the cabin if the grommet is not installed correctly.

In the mk3 chassis there is an empty grommet above the clutch pedal. Running wires through this grommet is ideal.

### SW Perfect Match LED Installation Instructions

- \* Perfect Match LEDs should **NEVER** be powered without a 42 Draft Designs Power Regulator!
- \*\*Power Regulator 12 volt input **MUST** be vehicle dimmer switch!
- \*\*\*Any other connection to power voids warranty immediately!

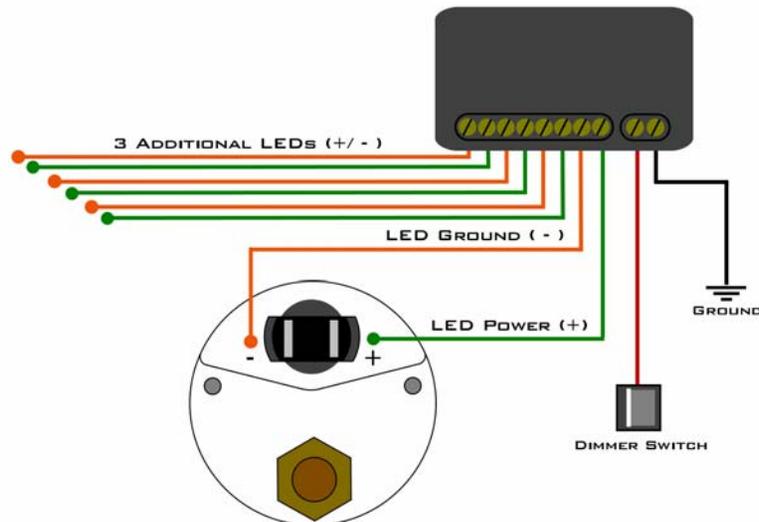
**Tools Recommended:** Wire Cutter, Wire Stripper, Terminal Crimper, Small Flat-Head Screwdriver

1. Remove any interior panels necessary to access the dimmer switch, common ground, and gauge mount. Locate the output wire of your dimmer switch and a common ground.
2. Using the included 22 gauge wire, tap the output wire of your dimmer switch and connect to the appropriate terminal of the power regulator.
3. Using the included 22 gauge wire and 'red' ring terminal, connect the power regulator to a common ground.
4. Remove SW light bulb socket and remove light bulb. Install PM LED by pushing directly into lamp socket.
5. Using 2 pieces of included 22 gauge wire and 2 'red' butt connectors connect one LED & lamp socket to the power regulator. Positive and negative power terminals are clearly labeled.

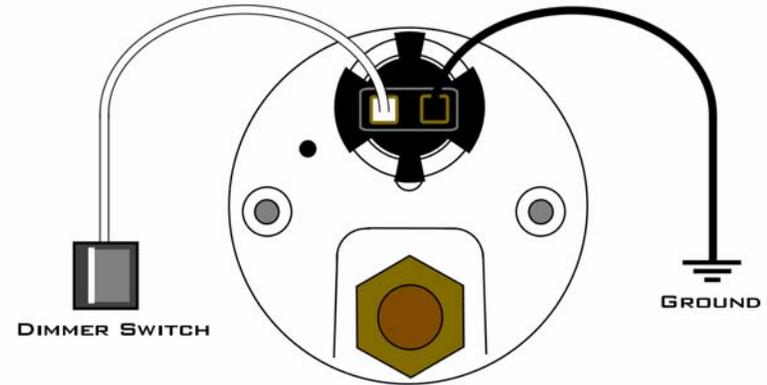
6. Apply power to the regulator by turning on the vehicle's lights. LED should light immediately. If not lit, remove the bulb from the lamp socket and rotate 180°.
7. Install up to 3 more LEDs as needed.
8. Mount power regulator in a solid location to ensure the best electrical connection. It is recommended that the power regulator be isolated from the gauge panel / pod.

### Installation Tips & Precautions! :

- For best results, we recommend the connection to the dimmer switch output wire be soldered. Simply wrapping wires together is far from ideal.
- Never connect power regulator to vehicle common 12 volt power. The dimmer switch provides the regulator with a clean 12 volt power source. Vehicle common 12 volt is typically 14+ volts and will destroy this product!
- Never connect more than one LED to a set of +/- terminals. This regulator will power 4 LEDs – no more! Each set of terminals provides one LED with regulated power.
- Do not over tighten the power regulator screw terminals. Screw terminals are not head studs, they are just electrical connections! Last but not least, please **follow these instructions and pay attention to the warnings!** We don't provide these instructions for our health – we write them to ensure you, the customer is able to install our product flawlessly the first time and avoid common mistakes. Good Luck and Have Fun!



### Stewart Warner Boost Gauge Wiring



### Tools & Materials Required:

- 42 Draft Designs Wiring Kit
- Wire Cutters
- Wire Strippers
- Terminal Crimper
- Soldering Iron or Wire Taps

Always test your connections using a test light or multimeter before connecting any wires! Disconnect battery ground before making any connections! Your car may differ from the given instructions!

To begin, remove any interior panels necessary to access your dimmer switch and ground. Route the white 18 gauge wire from your dimmer switch to the gauge. Connect the white and black wires to the light socket using the two included butt connectors. Install your bulb or LED.

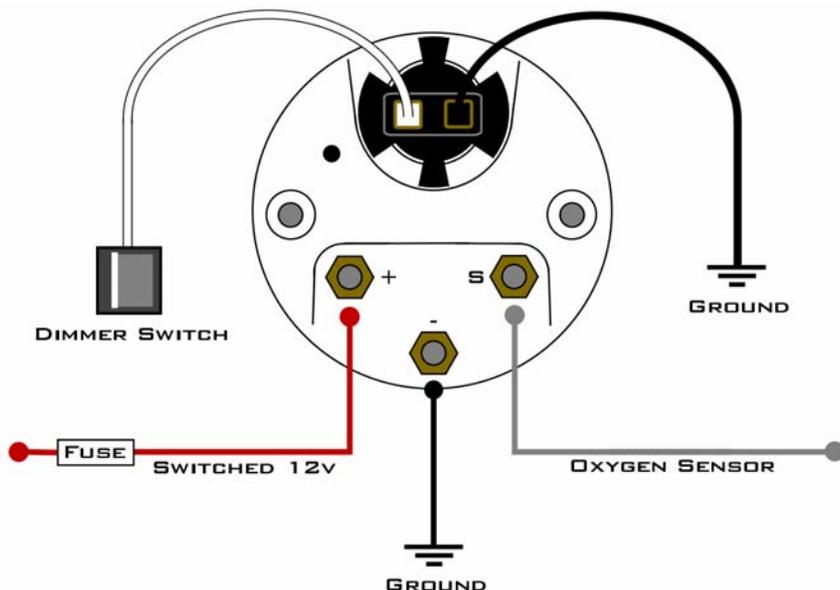
Locate the output wire on your dimmer switch and strip the insulation from a ¼" section. Connect the white wire from your 42 wiring harness to the stripped section using a wire tap or solder. Be sure to shrink wrap or tape any bare wires.

Locate a suitable common ground and connect using the included ¼" ring terminal. Be sure to strip back enough wire and securely crimp.

With both wires connected and bulb installed, turn on the vehicle's lights and test the gauge lighting. If using an LED, be sure to check for polarity. If the LED doesn't light, remove and rotate the bulb 180°.

**For tubing kit instructions see pages 26-28**

## Stewart Warner Air-Fuel Gauge Wiring



### Tools & Materials Required:

42 Draft Designs Wiring Kit  
Wire Cutters  
Wire Strippers  
Terminal Crimper  
Soldering Iron or Wire Taps

Always test your connections using a test light or multimeter before connecting any wires! Disconnect battery ground before making any connections! Your car may differ from the given instructions!

To begin, remove any interior panels necessary to access your dimmer switch and ground. Route the white 18 gauge wire from your dimmer switch to the gauge. Connect the white and black wires to the light socket using the two included butt connectors. Install your bulb or LED.

Locate the output wire on your dimmer switch and strip the insulation from a ¼" section. Connect the white wire from your 42 wiring harness to the stripped section using a wire tap or solder. Be sure to shrink wrap or tape any bare wires.

Locate a suitable common ground and connect both the lighting circuit ground and the gauge ground using the included ¼" ring terminals. Be

sure to strip back enough wire and securely crimp. Connect the gauge ground wire to the gauge using a ring terminal.

Locate your switched 12v source and connect the positive gauge wire using a ring terminal or soldered connection. Be sure to use an inline fuse of 10amps or greater on any positive power source. Connect the positive wire to the gauge using a ring terminal.

Locate an empty grommet in your firewall and route the sender wire into the engine bay. Connect the sender wire to the gauge using a ring terminal. Locate the output wire on your 1 volt oxygen sensor and strip the insulation from a ¼" section. Connect the gray wire from your 42 wiring harness to the stripped section using a wire tap or solder. Be sure to shrink wrap or tape any bare wires.

With all wires connected and bulb installed, turn on the vehicle's lights and test the gauge lighting. If using an LED, be sure to check for polarity. If the LED doesn't light, remove and rotate the bulb 180°. Start the engine to power the gauge and test the unit.

### Which wire do I tap for my air-fuel gauge?

The black one. On all VW/Audi oxygen sensors and most others there will be four wires - one black, one gray, and two white. The two white wires are the heater wires. The gray wire is incoming power. The black wire is signal output. You need to tap the black wire of your sensor after it crosses over to the ECU wiring harness. Don't tap the black wire itself or you will have to remove your tap every time you need to take the sensor off.

### I have a wideband front O2 sensor, what do I do?

Many mk4 VWs and other factory turbo cars have a 5 volt wideband oxygen sensor in the front position of their exhaust. The wideband sensor can be identified by having 6 or 8 wires. The rear sensor should always be a 0-1 volt narrowband sensor, identified by 4 wires. If you find that you have a wideband front o2 sensor, you have two options:

First option – tap the rear o2 sensor. Tapping the rear o2 sensor will result in slightly delayed readings due to its presence behind the catalytic converter.

Second option – install another o2 sensor. Any generic 0-1volt o2 sensor will do the job. You can use any VW o2 sensor or any domestic o2 sensor. There are 1 wire and 4 wire 0-1v o2 sensors available. The 1-wire sensor is a GM part. It is grounded to the exhaust, so all you will need to do is

connect the wire to the air-fuel gauge. This sensor will take longer to read when the car is first started because it relies on the exhaust gases to heat it up. The 4 wire sensor will have 4 connections – incoming 12v power, outgoing signal, and two heater wires. The sensor is also grounded to the exhaust. To connect this correctly, you will need to connect switched 12v power to the incoming power wire and the two heater wires. You will need to connect the outgoing power wire to the air-fuel gauge.

### Air-Fuel Gauge Behavior

An air-fuel gauge is basically a voltmeter attached to a 1 volt narrowband oxygen sensor. Narrowband oxygen sensors measure the amount of oxygen in the exhaust gases within a very narrow range. The useable data range of a 1 volt oxygen sensor is 0.00 -1.00 volt which represents approximately 14.4 – 15.0 AFR.

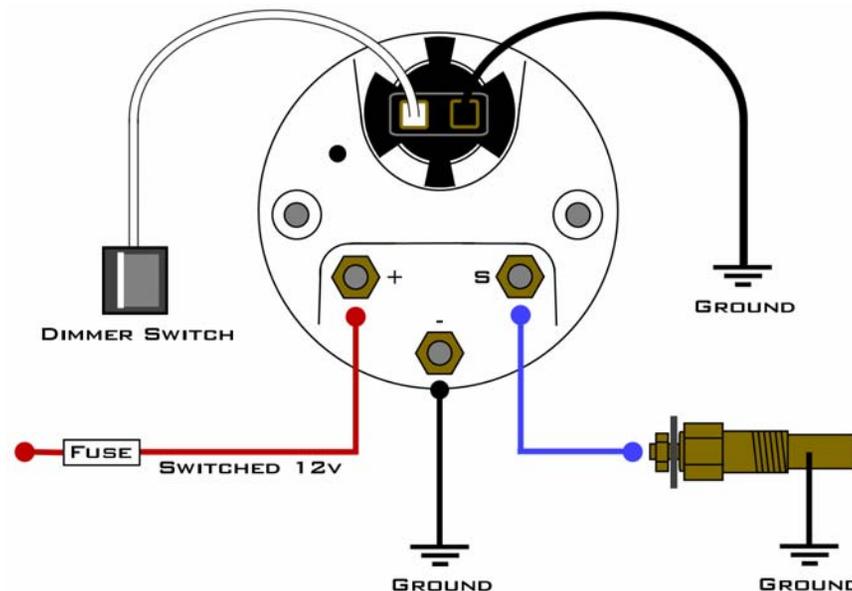
The basic operation of an air-fuel gauge demonstrates the communication between the ECU and the engine. In order to fuel the engine at a perfect stoichiometric air-fuel ratio of 14.7 whenever possible, the ECU adjusts fuel injection from rich to lean until an average of 14.7 is achieved. This results in the gauge sweeping from left to right, lean to rich.

When the engine is first started, the sensor must heat up before any useable data is transmitted to the ECU. This can take 2-3 minutes and often corresponds with the water temperature reaching 190°. During this time the gauge will read full rich.

Once the engine and oxygen sensors are warmed up the gauge will behave correctly. At idle, the gauge should sweep from lean to rich. During cruising and low throttle driving, the gauge will also sweep from lean to rich. As the throttle is opened up to ½, the gauge should stop sweeping and begin reading more rich. When the throttle is opened more than ½ the gauge should read full rich. Under boost, the gauge should read full rich. When the throttle is closed completely and the car is rolling in gear, the gauge should read full lean.

Remember, air-fuel gauges are only as accurate as the sensor they are attached to. Narrowband oxygen sensors only measure air-fuel ratios in a narrow range. This results in readings ranging from 14.4 – 15.0. Under normal operation, a typical fuel injected engine will produce air-fuel ratios in the range of 12.0 – 25.0. In order to measure outside the range of a narrowband sensor, a wideband air-fuel ratio system is needed. At this time, 42 does not offer any wideband air-fuel ratio systems.

### SW Gauge Wiring – Oil Temp & Water Temp Gauges



#### Tools & Materials Required:

- 42 Draft Designs Wiring Kit
- Wire Cutters
- Wire Strippers
- Terminal Crimper
- Soldering Iron or Wire Taps

Always test your connections using a test light or multimeter before connecting any wires! Disconnect battery ground before making any connections! Your car may differ from the given instructions!

To begin, remove any interior panels necessary to access your dimmer switch and ground. Route the white 18 gauge wire from your dimmer switch to the gauge. Connect the white and black wires to the light socket using the two included butt connectors. Install your bulb or LED.

Locate the output wire on your dimmer switch and strip the insulation from a ¼" section. Connect the white wire from your 42 wiring harness to the stripped section using a wire tap or solder. Be sure to shrink wrap or tape any bare wires.

Locate a suitable common ground and connect both the lighting circuit ground and the gauge ground using the included ¼" ring terminals. Be

sure to strip back enough wire and securely crimp. Connect the gauge ground wire to the gauge using a ring terminal.

Locate your switched 12v source and connect the positive gauge wire using a ring terminal or soldered connection. Be sure to use an inline fuse of 10amps or greater on any positive power source. Connect the positive wire to the gauge using a ring terminal.

Locate an empty grommet in your firewall and route the sender wire into the engine bay. Connect the sender wire to the gauge using a ring terminal. With sending unit installed, connect the sending unit wire using a ring terminal.

With all wires connected and bulb installed, turn on the vehicle's lights and test the gauge lighting. If using an LED, be sure to check for polarity. If the LED doesn't light, remove and rotate the bulb 180°. Start the engine to power the gauge and test the unit.

### Troubleshooting

Gauges may be installed without the engine sensors connected. A SW temperature gauge will show no reading if the sending unit is not installed. If the needle pegs to the right when under power, the sending unit wire has been shorted to ground. The wire connections on the back of the gauge could also be reversed or backwards. If the gauge shows little or erratic readings, be sure the temperature sender is well grounded to the engine block through the threads.

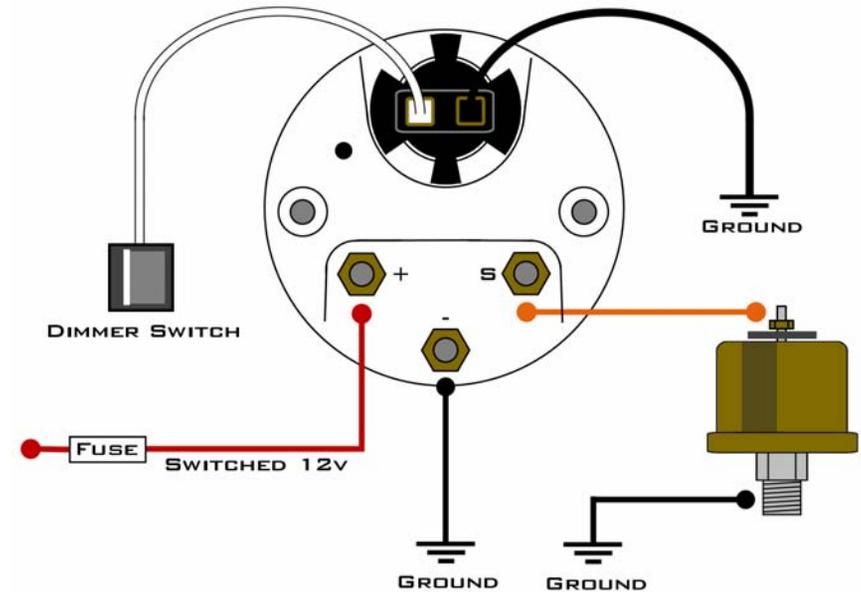
For specific instructions regarding sending units see the following pages:

### Oil Sender Placement

1.8t	29-30
2.0	31-32
VR6	33-35
TDI	36-37

### Water Temperature Sending Units – 40

### SW Gauge Wiring – Oil Pressure & Fuel Pressure Gauges



### Tools & Materials Required:

- 42 Draft Designs Wiring Kit
- Wire Cutters
- Wire Strippers
- Terminal Crimper
- Soldering Iron or Wire Taps

Always test your connections using a test light or multimeter before connecting any wires! Disconnect battery ground before making any connections! Your car may differ from the given instructions!

To begin, remove any interior panels necessary to access your dimmer switch and ground. Route the white 18 gauge wire from your dimmer switch to the gauge. Connect the white and black wires to the light socket using the two included butt connectors. Install your bulb or LED.

Locate the output wire on your dimmer switch and strip the insulation from a ¼" section. Connect the white wire from your 42 wiring harness to the stripped section using a wire tap or solder. Be sure to shrink wrap or tape any bare wires.

Locate a suitable common ground and connect both the lighting circuit ground and the gauge ground using the included ¼" ring terminals. Be

sure to strip back enough wire and securely crimp. Connect the gauge ground wire to the gauge using a ring terminal.

Locate your switched 12v source and connect the positive gauge wire using a ring terminal or soldered connection. Be sure to use an inline fuse of 10amps or greater on any positive power source. Connect the positive wire to the gauge using a ring terminal.

Locate an empty grommet in your firewall and route the sender wire into the engine bay. Connect the sender wire to the gauge using a ring terminal. With sending unit installed, connect the sending unit wire using a ring terminal.

With all wires connected and bulb installed, turn on the vehicle's lights and test the gauge lighting. If using an LED, be sure to check for polarity. If the LED doesn't light, remove and rotate the bulb 180°. Start the engine to power the gauge and test the unit.

### Troubleshooting

Gauges may be installed without the engine sensors connected. A SW pressure gauge will show no reading if the sending unit is not installed. If the needle pegs to the right when under power, the sending unit wire has been shorted to ground. The wire connections on the back of the gauge could also be reversed or backwards. If the gauge shows little or erratic readings, be sure the temperature sender is well grounded to the engine block through the threads.

For specific instructions regarding sending units see the following pages:

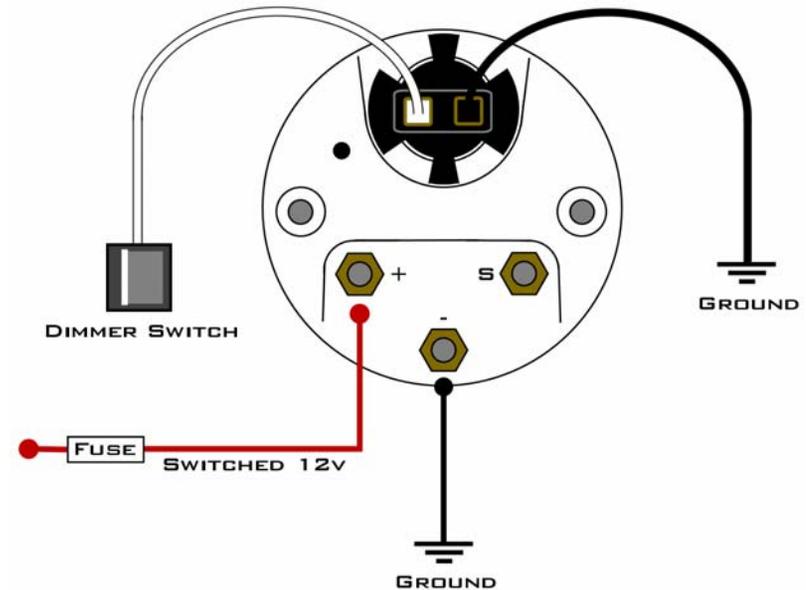
### Oil Sender Placement

1.8t	29-30
2.0	31-32
VR6	33-35
TDI	36-37

### Oil Pressure Relocation Kit Instructions – 38-39

### Fuel Pressure Senders – 41-42

### SW Gauge Wiring – Voltmeters



### Tools & Materials Required:

- 42 Draft Designs Wiring Kit
- Wire Cutters
- Wire Strippers
- Terminal Crimper
- Soldering Iron or Wire Taps

Always test your connections using a test light or multimeter before connecting any wires! Disconnect battery ground before making any connections! Your car may differ from the given instructions!

To begin, remove any interior panels necessary to access your dimmer switch and ground. Route the white 18 gauge wire from your dimmer switch to the gauge. Connect the white and black wires to the light socket using the two included butt connectors. Install your bulb or LED.

Locate the output wire on your dimmer switch and strip the insulation from a ¼" section. Connect the white wire from your 42 wiring harness to the stripped section using a wire tap or solder. Be sure to shrink wrap or tape any bare wires.

Locate a suitable common ground and connect both the lighting circuit ground and the gauge ground using the included ¼" ring terminals. Be

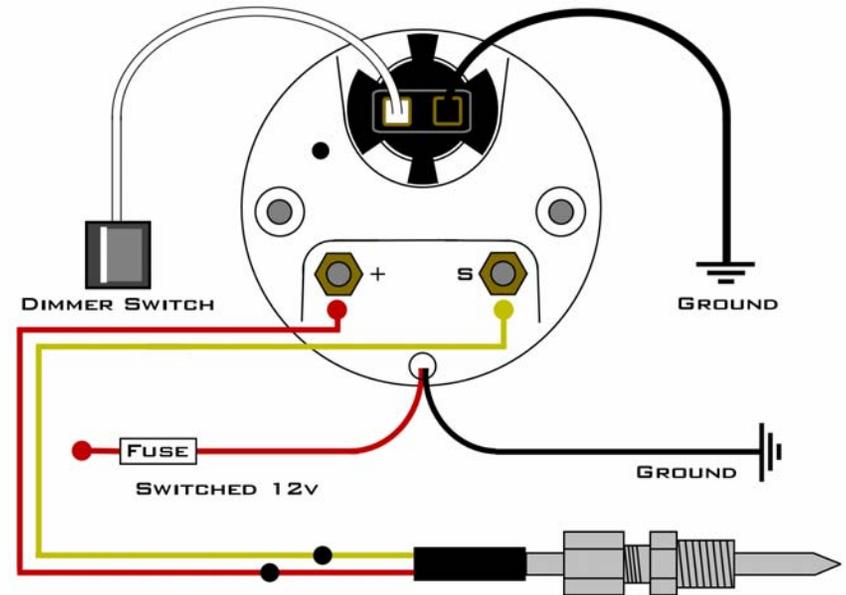
sure to strip back enough wire and securely crimp. Connect the gauge ground wire to the gauge using a ring terminal.

Locate your switched 12v source and connect the positive gauge wire using a ring terminal or soldered connection. Be sure to use an inline fuse of 10amps or greater on any positive power source. Connect the positive wire to the gauge using a ring terminal.

No connection to the sender terminal of the gauge is made.

With all wires connected and bulb installed, turn on the vehicle's lights and test the gauge lighting. If using an LED, be sure to check for polarity. If the LED doesn't light, remove and rotate the bulb 180°. Start the engine to power the gauge and test the unit.

### SW Gauge Wiring – EGT Gauges



#### Tools & Materials Required:

- 42 Draft Designs Wiring Kit
- Wire Cutters
- Wire Strippers
- Terminal Crimper
- Soldering Iron or Wire Taps
- Phillips Head Screwdriver
- Small Adjustable Wrench

Always test your connections using a test light or multimeter before connecting any wires! Disconnect battery ground before making any connections! Your car may differ from the given instructions!

To begin, remove any interior panels necessary to access your dimmer switch and ground. Route the white 18 gauge wire from your dimmer switch to the gauge. Connect the white and black wires to the light socket using the two included butt connectors. Install your bulb or LED.

Locate the output wire on your dimmer switch and strip the insulation from a ¼" section. Connect the white wire from your 42 wiring harness to the stripped section using a wire tap or solder. Be sure to shrink wrap or tape any bare wires.

Locate a suitable common ground and connect both the lighting circuit ground and the gauge ground using the included ¼” ring terminals. Be sure to strip back enough wire and securely crimp. Connect the gauge ground wire to the black wire on the EGT gauge using a butt connector.

Locate your switched 12v source and connect the positive gauge wire using a ring terminal or soldered connection. Be sure to use an inline fuse of 10amps or greater on any positive power source. Connect the positive wire to the red wire on the EGT gauge using a butt connector.

Locate an empty grommet in your firewall and route the thermocoupler wire into the engine bay. Connect the red and yellow thermocoupler wires to the gauge using the pre-installed ring terminals. Connect the red wire to the terminal labeled + and the yellow wire the terminal labeled S.

**DO NOT CUT** the thermocoupler wire to length. Doing so will result in altered temperature readings. In the engine bay, connect the thermocoupler wire to the probe using the included hardware. Be sure to connect red – red and yellow – yellow. Using a wire tie, be sure the exposed connections do not short out on any metal in the engine bay.

With all wires connected and bulb installed, turn on the vehicle’s lights and test the gauge lighting. If using an LED, be sure to check for polarity. If the LED doesn’t light, remove and rotate the bulb 180°. Start the engine to power the gauge and test the unit.

### Troubleshooting

Gauges may be installed without the engine sensors connected. A SW EGT gauge will show max reading if the sending unit is not installed. Be sure the sending unit connections are correct. If the red and yellow signal wires are reversed the gauge will show no reading. Also, be sure the screw terminal connection between the sending unit and the thermocoupler wire does not touch any metal in the engine bay and short to ground.

**DO NOT CUT** the thermocoupler wire to length. Doing so will result in altered temperature readings.

**For specific instructions regarding the installation of the EGT probe see pages 40-41**

### Boost Tubing Kit – Installation Instructions

**Tools Recommended:** 17mm open end wrench, sharp knife or scissors

1. Route tubing through firewall and position ends in their respective locations. Tubing route & length are your choice.
2. To tap into the vacuum system, locate engine’s fuel pressure regulator. The braided vacuum line which runs from the intake manifold to the fuel pressure regulator may be tapped for an accurate reading. Using a sharp knife or scissors, cut the line in half. Use the included T-fitting to join the vacuum line back together.
3. Use the third barb to connect the boost tubing to the vacuum system. Push the tubing all the way down over the barb. No wire ties or hose clamps are needed. To remove any tubing from the T-fitting, use a sharp knife to cut back the tubing which covers the barb.
4. Thread the included push-in fitting onto the back of the gauge and tighten using a 17mm open end wrench. Do not over tighten, as plastic threads will strip.
5. With gauge in hand, press the boost tubing into the push-in fitting. To prepare tubing, cut the tube squarely (if not already) and mark the tubing 11/16” (17mm) from the end of the tube. Insert tube straight into fitting until it bottoms out on the interior shoulder and insertion mark is no longer visible.
6. To remove tubing, push collet toward body and pull on tubing to release.

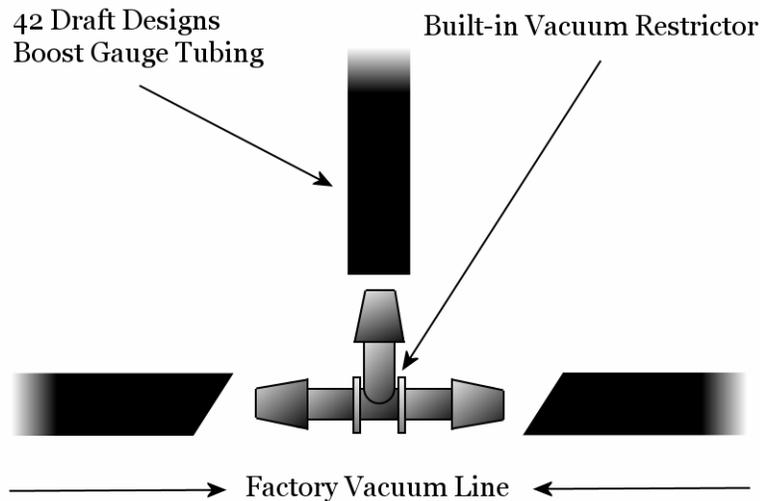
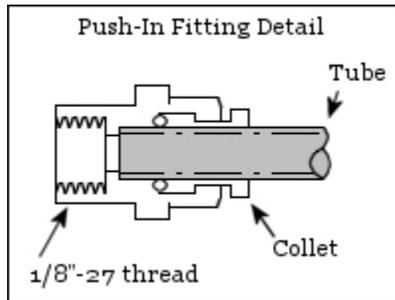
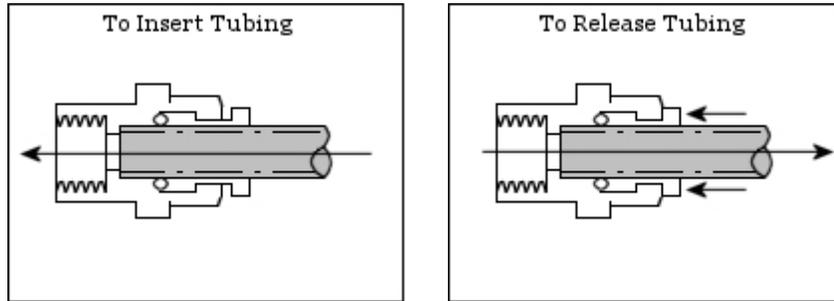
### Restrictor T Fitting

The T-fitting included with our boost tubing kit has a built in restrictor to prevent vibrations in the boosted air stream from reaching the gauge. Vibrations produced by the turbocharger will vibrate the internals of the gauge and produce a ‘buzz’ sound. In order for the T-fitting to work properly, the center barb of the fitting must connect to the boost gauge tubing. To test the fitting, notice the center barb is not a through-hole.

Located inside the bottom of the barb is a tiny hole.

**Please view diagram to the right!**

## TDI Boost Tubing Kit – Installation Instructions



Tubing must be installed as shown!

### Tools Recommended:

17mm Open End Wrench  
#21 (.159") Drill Bit  
#10-32 Tap

Sharp Knife or Scissors  
Portable Drill  
Plastic Thread Sealant

1. Route tubing through firewall and position ends in their respective locations. Tubing route & length are your choice.
2. To tap into the boost system, locate engine's plastic intercooler plumbing. The lower or upper intercooler pipes may be tapped. Remove the tube which you wish to tap and find an ideal location to install the barb. The location should be thick and discrete, but easy to locate.
3. With the tube installed, be sure the chosen location does not interfere with any engine components. Mark and remove. Carefully drill a hole in the marked location using a #21 (.159") drill bit. Using a #10-32 tap, lightly tap the drilled hole. Tapping plastic requires very little force – the tap should thread the hole easily and back out easily. Be careful not to use excessive force and strip the hole.
4. Thread the included barb into the tapped hole. Use some thread sealant to assure no leaks. Super glue or hobby cement will offer a permanent seal on ABS plastic. Simple Teflon® tape will also offer a good seal.
5. With the pipe installed, push the tubing all the way down over the barb. No wire ties or hose clamps are needed. To remove any tubing from the T-fitting, use a sharp knife to cut back the tubing which covers the barb.
6. Thread the included push-in fitting onto the back of the gauge and tighten using a 17mm open end wrench. Do not over tighten, as plastic threads will strip.
7. With gauge in hand, press the boost tubing into the push-in fitting. To prepare tubing, cut the tube squarely (if not already) and mark the tubing 11/16" (17mm) from the end of the tube. Insert tube straight into fitting until it bottoms out on the interior shoulder and insertion mark is no longer visible.
8. To remove tubing, push collet toward body and pull on tubing to release.

### Inline Restrictor Fitting

The inline fitting included with our boost tubing kit has a built in restrictor to prevent vibrations in the boosted air stream from reaching the gauge. Vibrations produced by the turbocharger will vibrate the internals of the gauge and produce a 'buzz' sound. This fitting may be installed anywhere in the boost tubing. We recommend installing it underneath the dashboard. Simply cut the tubing and install. No hose clamps are necessary.

## SW Oil Sender Placement – 1.8T

Stewart Warner sending units are strictly 1/8" NPT. The installation of oil temperature and pressure senders in the 1.8T differs from VDO sending units. The usual blank plug (#10) cannot be used due to M10x1 threads and tight clearances.

To measure oil pressure, you will need our 1/8" NPT Oil Pressure Relocation Kit, part #42-008. Our kit will allow you to install both the SW 1/8" NPT sender and the OEM oil pressure sender remotely. The oil pressure relocation kit will take the place of the stock oil pressure sender, # 16 as shown on the following page. The stock sender will now be located aside the SW sender 12" away from the oil filter flange where sufficient room exists.

To measure oil temperature, a drain plug adaptor must be used. The drain plug is the only location on a 1.8T motor to install an 1/8" NPT temperature sender. Simply use our universal drain plug adaptor, part# 42-908 to install your SW oil temperature sender.

### Tips

When installing oil sending units it is important to maintain a ground between the sending unit and the engine block. Ground is normally maintained in the threads of the sending unit. Use only 1-2 wraps of Teflon tape on sender threads to assure no leaks or loss of ground.

Our universal oil drain plug adaptor is made from brass. It will not stand up to excessive torque. The stock drain plug is solid steel and will strip the oil pan before it could possibly break. Our adaptor is hollow to allow for the sending unit and will break if over torqued. It is not necessary to over torque the drain plug!

**For specific Oil Pressure Relocation Kit instructions please see pages 38-39**

## SW Oil Sender Placement – 1.8T

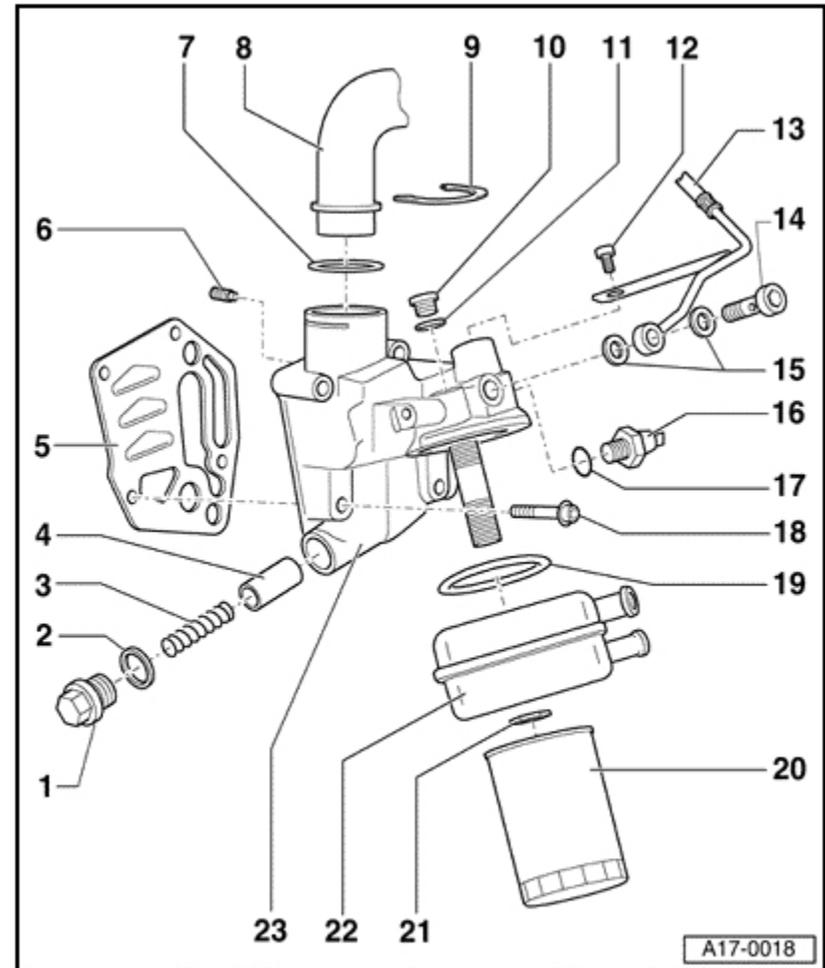


Diagram by Volkswagen of America, from *Volkswagen Jetta, Golf, GTI Service Manual: 1999-2002*,  
© Bentley Publishers.



## SW Oil Sender Placement – 2.0

Stewart Warner sending units are strictly 1/8" NPT. The installation of oil temperature and pressure senders in the 2.0 differs from VDO sending units. The usual blank plug (#10) cannot be used due to M10x1 threads and tight clearances.

To measure oil pressure, you will need our 1/8" NPT Oil Pressure Relocation Kit, part #42-008. Our kit will allow you to install both the SW 1/8" NPT sender and the OEM oil pressure sender remotely. The oil pressure relocation kit will take the place of the stock oil pressure sender, # 11 as shown on the following page. The stock sender will now be located aside the SW sender 12" away from the oil filter flange where sufficient room exists.

To measure oil temperature, a drain plug adaptor must be used. The drain plug is the only location on a 1.8T motor to install an 1/8" NPT temperature sender. Simply use our universal drain plug adaptor, part# 42-908 to install your SW oil temperature sender.

### Tips

When installing oil sending units it is important to maintain a ground between the sending unit and the engine block. Ground is normally maintained in the threads of the sending unit. Use only 1-2 wraps of Teflon tape on sender threads to assure no leaks or loss of ground.

Our universal oil drain plug adaptor is made from brass. It will not stand up to excessive torque. The stock drain plug is solid steel and will strip the oil pan before it could possibly break. Our adaptor is hollow to allow for the sending unit and will break if over torqued. It is not necessary to over torque the drain plug!

**For specific Oil Pressure Relocation Kit instructions please see pages 38-39**

## SW Oil Sender Placement - 2.0

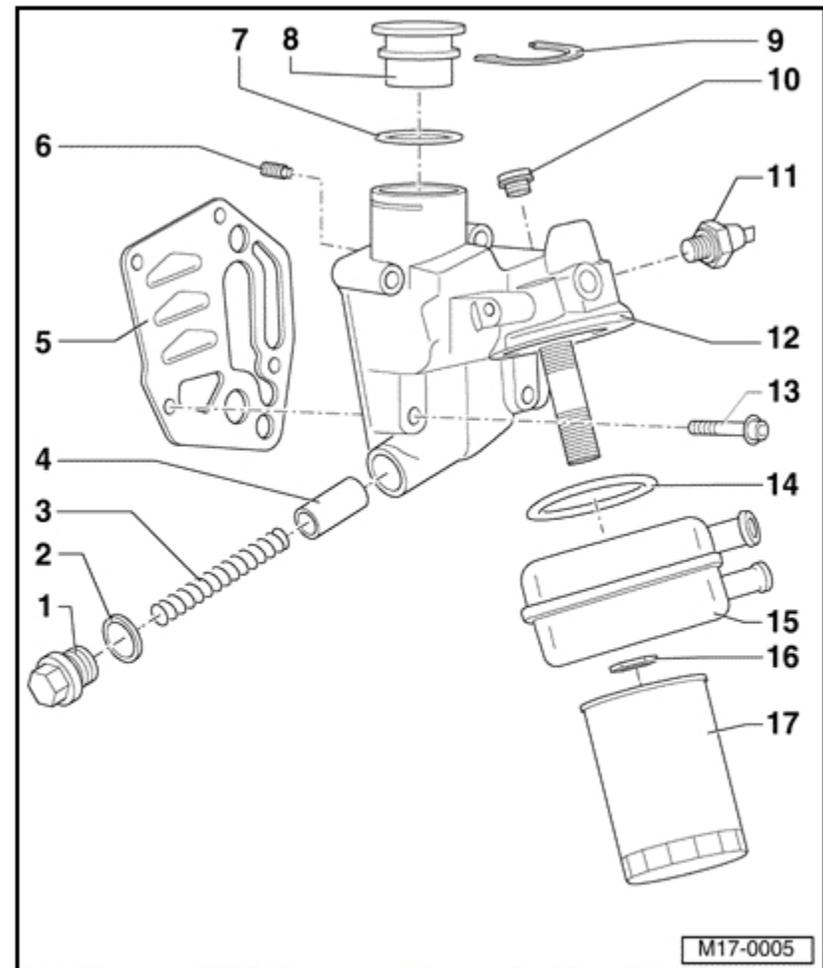


Diagram by Volkswagen of America, from *Volkswagen Jetta, Golf, GTI Service Manual: 1999-2002*,  
© Bentley Publishers.



## SW Oil Sender Placement – VR6

Stewart Warner sending units are strictly 1/8" NPT. The installation of oil temperature and pressure senders in the VR6 differs from VDO sending units. Temperature senders cannot be installed on the oil filter flange due to M10x1 threads. Pressure senders cannot be installed in blank plugs due to tight clearances.

The differences between the three VR6 oil filter flanges make little difference when using SW senders. In all cases, our 1/8" NPT Oil Pressure Relocation Kit, part #42-008 must be used to install an oil pressure sender. In the mk4 VR6, oil temperature must be measured at the oil pan. In the mk3 VR6, there is no plug & play location for an 1/8" NPT oil temperature sender.

### Mk3 VR6 Oil Filter Flanges

The mk3 VR6 oil filter flange has 3 available holes, all filled with OEM sending units. The front two sending units are pressure and the rear sending unit is temperature. When installing an oil pressure gauge, you will need our 1/8" NPT Oil Pressure Relocation Kit, part #42-008. Our kit will allow you to install both the SW 1/8" NPT sender and the OEM oil pressure sender remotely. The oil pressure relocation kit should take the place of one of the stock oil pressure senders located in the front two ports of the oil filter flange. The stock sender will now be located aside the SW sender 12" away from the oil filter flange where sufficient room exists

No plug & play location exists in the mk3 VR6 for installing an 1/8" NPT temperature sender. The angle of the drain plug on the oil pan is too steep to use a drain plug adaptor. The sender would be sheared off the pan when used on even a moderately lowered car. There are no other locations where an 1/8" NPT sender can be installed.

**A solution is currently in development to solve this problem...**

### mk4 12v and 24v VR6 Oil Filter Flanges

Some mk4 VR6 oil filter flanges have a blank plug located next to the stock pressure sender, # 9 as shown below. This plug cannot be used to install an 1/8" NPT temperature sender due to M10x1 threads and tight clearances.

To measure oil pressure, you will need our 1/8" NPT Oil Pressure Relocation Kit, part #42-008. Our kit will allow you to install both the SW 1/8" NPT sender and the OEM oil pressure sender remotely. The oil

pressure relocation kit will take the place of the stock oil pressure sender, # 9 as shown on the following page. The stock sender will now be located aside the SW sender 12" away from the oil filter flange where sufficient room exists.

To measure oil temperature, a drain plug adaptor must be used. The drain plug is the only location on a mk4 VR6 motor to install an 1/8" NPT temperature sender. Simply use our universal drain plug adaptor, part# 42-908 to install your SW oil temperature sender.

### Tips

When installing oil sending units it is important to maintain a ground between the sending unit and the engine block. Ground is normally maintained in the threads of the sending unit. Use only 1-2 wraps of Teflon tape on sender threads to assure no leaks or loss of ground.

Our universal oil drain plug adaptor is made from brass. It will not stand up to excessive torque. The stock drain plug is solid steel and will strip the oil pan before it could possibly break. Our adaptor is hollow to allow for the sending unit and will break if over torqued. It is not necessary to over torque the drain plug!

Access to the VR6 oil filter flange is limited. Most find it easiest to remove the intake manifold. Others choose to remove the entire oil filter flange to install sending units. Some others even pull away the front end of the car. If removing any OEM equipment, be sure to follow manufacturer's removal guidelines and replace all gaskets removed.

**For specific Oil Pressure Relocation Kit instructions please see pages 38-39**

### SW Oil Sender Placement – VR6

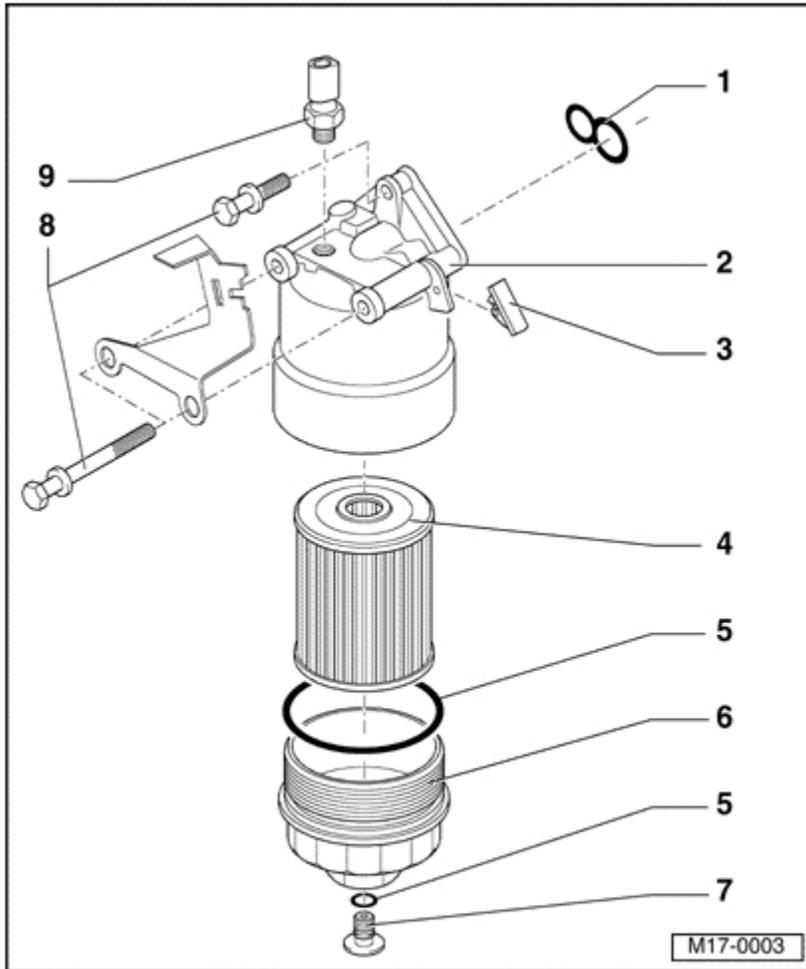


Diagram by Volkswagen of America, from *Volkswagen Jetta, Golf, GTI Service Manual: 1999-2002*,  
© Bentley Publishers.



### SW Oil Sender Placement – TDI

Two varieties of oil filter flanges exist on the TDI. Early TDI models have both a stock oil pressure sender and a blank plug. Many newer TDI oil filter flanges have only a stock oil pressure sender with M10x1 threads. Sender installation information differs between the two known oil filter flanges.

#### Early TDI Oil Filter Flanges

Early TDI oil filter flanges are equipped with a blank plug with M10x1 threads. Plug #15 is an excellent location to measure oil pressure. SW's pressure sender will take the place of plug #10. An 1/8" NPT – M10x1 adaptor, part # 42-901 must be used.

To measure oil temperature, a drain plug adaptor must be used. The drain plug is the only location on a TDI motor to install an 1/8" NPT temperature sender. Simply use our universal drain plug adaptor, part# 42-908 to install your SW oil temperature sender.

#### Late TDI Oil Filter Flanges

Late TDI Oil Filter Flanges do not have the empty plug. To measure oil pressure, you will need our 1/8" NPT Oil Pressure Relocation Kit, part #42-008. Our kit will allow you to install both the SW 1/8" NPT sender and the OEM oil pressure sender remotely. The oil pressure relocation kit will take the place of the stock oil pressure sender, # 1 as shown on the following page. The stock sender will now be located aside the SW sender 12" away from the oil filter flange where sufficient room exists.

To measure oil temperature, a drain plug adaptor must be used. The drain plug is the only location on a TDI motor to install an 1/8" NPT temperature sender. Simply use our universal drain plug adaptor, part# 42-908 to install your SW oil temperature sender.

#### Tips

When installing oil sending units it is important to maintain a ground between the sending unit and the engine block. Ground is normally maintained in the threads of the sending unit. Use only 1-2 wraps of Teflon tape on sender threads to assure no leaks or loss of ground.

Our universal oil drain plug adaptor is made from brass. It will not stand up to excessive torque. The stock drain plug is solid steel and will strip the oil pan before it could possibly break. Our adaptor is hollow to allow for the sending unit and will break if over torqued. It is not necessary to over torque the drain plug!

## SW Oil Sender Placement – TDI

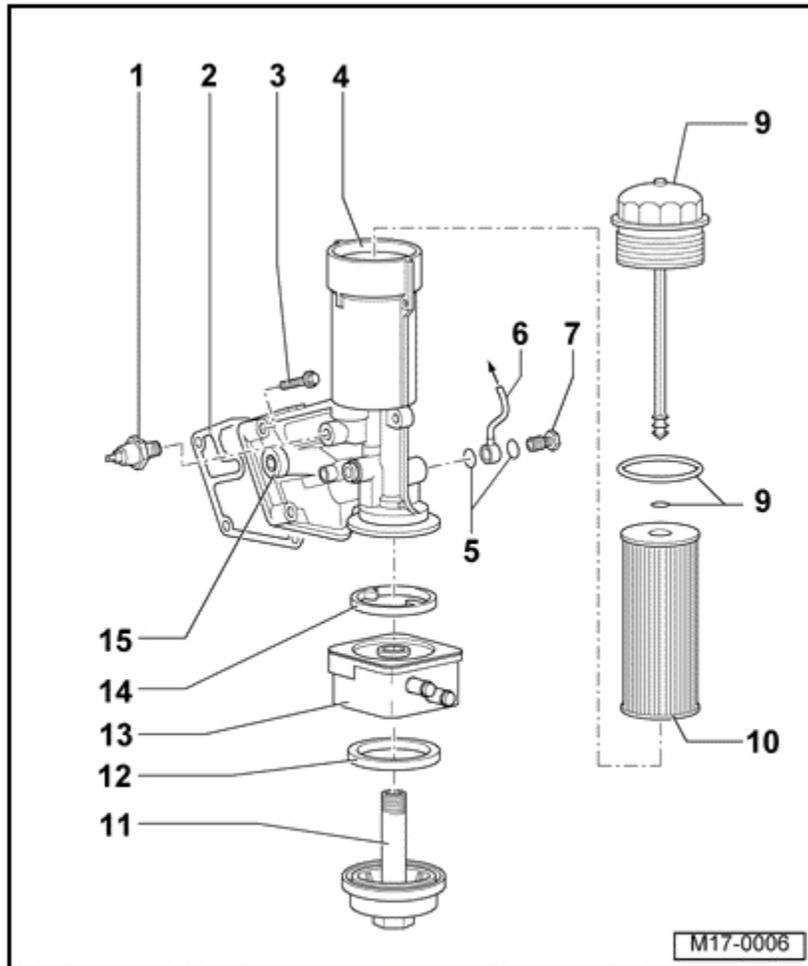


Diagram by Volkswagen of America, from *Volkswagen Jetta, Golf, GTI Service Manual: 1999-2002*,  
© Bentley Publishers.



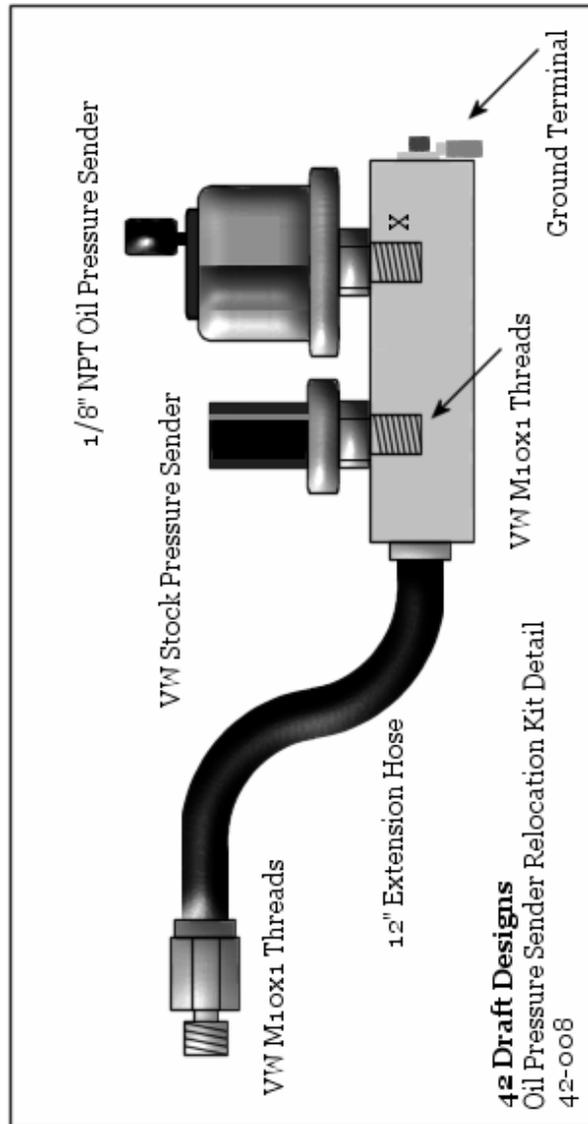
## 1/8" NPT Oil Pressure Relocation Kit - Installation Instructions

**Tools Recommended:** 24mm deep socket, 9/16", 5/8", 11/16" open end wrenches, metric hex wrench set

1. **Never work on a warm motor!** Locate oil filter flange on motor and find the stock oil pressure sender. (pictured below for reference) To access fully, the secondary air injection pump (if equipped) or intake manifold may need to be removed. Remove wiring harness from the stock oil pressure sender and move aside. Using a 24mm deep socket, unscrew the sender.
2. Install brass adaptor using a single wrap of Teflon tape or similar thread sealant to ensure no leaks. Start threads by hand and tighten using a 5/8" socket. Install one end of the 12" extension hose and use a 9/16" open end wrench to tighten. Thread sealant may be used.
3. With oil manifold in hand, locate the hole marked with an **X**. This hole is threaded 1/8" NPT and will accept the aftermarket sending unit. The stock sending unit should be installed in the hole closest to the extension hose. Threads may be sealed with a single wrap of Teflon tape to ensure no leaks and maintain a solid electrical ground. Use appropriately sized wrench to fully tighten aftermarket sending unit. Tighten the stock oil pressure sender using a 24mm deep socket.
4. Using a wrap of Teflon tape, install the assembled oil manifold on the end of extension hose. Tighten using a 9/16" open end wrench.
5. Secure manifold in a logical location. Location and mounting technique are your choice.
6. Remove the ground terminal and install included ground wire using the appropriate Allen wrench. Connect the unassembled end of the wire to a chassis ground or negative terminal of the battery. Length and location are your choice. Connect aftermarket sender wiring and reconnect VW wiring harness. If the VW harness will no longer reach, remove more wire from the appropriate loom or extend using leftover ground wire. Be sure to use solder if extending wire and seal any bare wire.
7. Replace any stock components removed and be sure to reconnect any disconnected wiring. Start motor and watch carefully for leaks. The system may take a few days to bleed any air out of the sending units. Odd gauge behavior is a sign of air bubbles in the sending unit. Air is naturally bled from the system over time.

**Thread Warning:** This product uses 2 different but very similar threads. Pay particular attention to the diagram below. The product may only be installed in the manner described. The hole designated for an OEM sending unit has M10x1 female threads. The hole

designed to accept the extension hose has female 1/8"-27NPT female threads. The hole marked **X** in the manifold accepts the 1/8"-27 NPT aftermarket sending unit. The brass adaptor uses M10x1 male threads and is designed to take the place of stock VW oil sending units. Always start threads by hand to avoid cross-threading! Teflon tape may be used as thread sealant to avoid leaks. Never use an excess amount of thread sealant on a sending unit. A ground must be maintained between the sending unit and the manifold. Good luck and have fun!



## SW Water Temp Sending Units

Unfortunately, VW has left no plug and play location for the addition of a second water temperature sender. You have a few options.

Your first option is to install the sender in one of your OEM plastic fittings. To do this, you must remove the fitting and drill / tap a hole to thread the sender. The thread size of your sending unit should be listed on the packaging. Since SW senders require a grounded connection, you'll need to create a ground strap using a piece of copper wire. You will be grounding the base of the sending unit to the engine block. Also, be sure to use Teflon tape to seal the threads.

Your second option is to purchase a Water Temperature Sender Adaptor. Though we don't yet make this part, a few tuners do. AC AutoTechnic ([www.acautotech.com](http://www.acautotech.com)) makes one in 3 sizes and uses a 1/8" NPT sending unit. The product allows you to tap into the radiator hose and install your sending unit inline with the radiator hose. Be sure to measure the inner diameter of your hose to determine the correct size to buy.

**42 Draft Designs will release a mk3 and mk4 specific water temperature sender adaptor mid-late 2006**

## SW EGT Probe Mounting

The SW 1/4" Street Probe Kit includes a temperature probe, thermocoupler wire, and a steel bung. The EGT probe may be threaded 1/8" -27 NPT or 1/4" - 18 NPT. The included steel bung will match the threads of the thermocoupler.

When mounting an EGT probe, you have a few options which vary based on ease of install and accuracy of readings. For optimum accuracy, the probe should be located 1-2" from the head. If your motor uses a cast steel manifold, you may remove the manifold and drill / tap an 1/8" NPT or 1/4" NPT threaded hole for installation of the probe directly into the manifold. In turbocharged applications, like the 1.8t and TDI, the cast manifold **must** be removed to drill and tap. If your motor uses a tubular header, you will need to drill a hole large enough to allow the probe to enter the manifold. Then, you'll need to weld on the included steel bung.

**It is recommended that any welding be done off the vehicle!**

When welding on the steel bung, be sure to test fit the probe first! The probe and bung use a tapered thread. If the bung is welded on upside down, you will not be able to thread in the sender!

Another option offers an easier installation, but less accurate readings. In this case, the probe may be located post-turbo in the exhaust downpipe. Installation will require the removal of the downpipe. You will need to drill a hole large enough for the sender to enter the piping. Then, you'll need to weld on the steel bung. Typically the probe should be mounted within 1-2" of the turbocharger discharge. However, it may be installed anywhere in the downpipe. With the probe mounted 1-2" away from the turbo discharge readings will be 200-300° lower than an installation pre-turbo.

**In most cases, professional help is recommended for EGT probe installations.**

### SW Fuel Pressure Sending Units

As is the case with many other senders, VW has left no location to measure fuel pressure. In order to install a SW fuel pressure sender, a fuel line must be cut and a t-fitting spliced in. Simply use our VW Fuel Pressure Adaptor, part # 42-907 to install your SW fuel pressure sender.

In every fuel injected VW, two fuel lines run from the passenger side strut tower to the fuel rail. These lines connect directly to the fuel rail on the passenger side. In order to measure fuel pressure, the pressure feed line must be tapped. Tapping the return line will result in very low readings. To identify the feed line, you must locate the fuel pressure regulator (FPR). The FPR is a 1" round, shiny steel valve with a vacuum line attached to the top. The FPR will always have plumbing exiting the bottom of the valve. Fuel is often fed through the rail to the side of the valve, but the valve always returns excess fuel from the bottom. By locating the return plumbing on the fuel rail, you should be able to positively identify the return line. The other line is the feed line.

Before tapping this line you must let pressure bleed off! Open the driver's side door, pop the hood, and close the door. **DO NOT** open any doors at any point during this install. Opening a door will prime the fuel pump. If a fuel line is disconnected, this will spray dangerous amounts of fuel and possibly cause a fire or injure someone. After opening the driver's side door, wait 15 minutes before tapping the fuel line. This would be a good time to install your fuel pressure sender in the adaptor. Use two wraps of Teflon tape.

To tap the fuel line, simply cut the de-pressurized line in a location where the sender and t-fitting will physically fit. Slide the fuel line over the barbs in the t-fitting and clamp down using the included hose clamps. Open the driver's side door and check for leaks.

Keep in mind, the sender must be ground to the chassis or engine block in order to function properly. Ground the sender by connecting a piece of black 18 gauge wire to the base of the sender or the adaptor. The wire can be soldered to the body of the sensor. A hose clamp can also be used to clamp a ground wire to the body of the sensor.

Connect your sender wire and test the gauge. The gauge should only show pressure when the pump is primed or engine running. The gauge should read steady pressure, affected only slightly by major changes in throttle position.

Be sure to check for leaks 1-2 weeks after installing the sender and adaptor. Fuel leaks can be dangerous. Be safe, use common sense, and don't be embarrassed to consult professional help if you feel even slightly uncomfortable installing this sender. Better safe than sorry!

### Boost Gauge Troubleshooting

#### Leaks

If you can hear a leak inside the car it's most likely the push-in fitting. Don't panic! Your push-in fitting is **not** defective. These fittings were designed for industrial applications and can handle absolute vacuum and 200psi. If your push-in fitting is leaking, you simply need to insert the tubing all the way. Reference our *Boost Gauge Tubing Kit Installation Instructions* and push the tubing in all the way! It should take some force.

If you feel like you have a leak under the hood, start checking over your OEM vacuum lines. Our fittings fit too tight to leak, so any additional leaks would be from rotten OEM lines. It may be worth your while to replace any braided OEM line that feels dry rotted.

#### Boost / Vacuum Readings – 1.8T

If you feel like your gauge isn't reading correctly, first drive the car. You must put load on the engine for a boost gauge to show any real reading. Simply revving the engine will show vacuum readings only. Drive the car in 3<sup>rd</sup> or 4<sup>th</sup> gear and engage the throttle completely at a low rpm. This will put sufficient load on the motor to make full boost. Don't be alarmed when the gauge spikes and boost drops steadily. This is caused by the undersized OEM turbo running out of breath.

The 1.8T engine will be in vacuum when not boosting. When the engine is warmed up, the engine should pull 16" – 20" of vacuum at idle. When driving around town, the engine should be in vacuum anytime the throttle body is closed or only open slightly. The car will only make boost when there is sufficient load on the motor.

Early 150hp 1.8T motors should boost 8-10psi stock. Later 180hp and 225hp 1.8T motors should boost 12-14psi stock. If you purchase a

performance chip please contact the manufacturer for expected boost readings. Typical 'chipped' 180hp 1.8t engines spike 22+psi and hold 15-16psi in the upper RPMs.

### **Boost / Vacuum Readings – TDI**

If you feel like your gauge isn't reading correctly, first drive the car. You must put load on the engine for a boost gauge to show any real reading. Simply revving the engine will show only slight boost. Drive the car in 3<sup>rd</sup> or 4<sup>th</sup> gear and engage the throttle completely at a low rpm. This will put sufficient load on the motor to make full boost. Don't be alarmed when the gauge spikes and boost drops slightly. TDI turbos are infamous for spiking high when needed.

TDI motors have no throttle body, therefore they pull very little vacuum. A 0-15 or 0-30 boost gauge should be used. If you are using a 30"-25psi boost gauge on your TDI, you will notice that the motor pulls less than 5" of vacuum. This is normal.

### **Buzzing – 1.8T**

The T-fitting included with our boost tubing kit has a built in restrictor to prevent vibrations in the boosted air stream from reaching the gauge. Vibrations produced by the turbocharger will vibrate the internals of the gauge and produce a 'buzz' sound. In order for the T-fitting to work properly, the center barb of the fitting must connect to the boost gauge tubing. To test the fitting, notice the center barb is not a through-hole. Located inside the bottom of the barb is a tiny hole. Blowing through this barb will produce only a small amount of air.

### **Buzzing – TDI**

The inline fitting included with our boost tubing kit has a built in restrictor to prevent vibrations in the boosted air stream from reaching the gauge. Vibrations produced by the turbocharger will vibrate the internals of the gauge and produce a 'buzz' sound. This fitting may be installed anywhere in the boost tubing. We recommend installing it underneath the dashboard. Simply cut the tubing and install. No hose clamps are necessary.

If your gauge is still making a buzzing noise, an additional inline restrictor can be added. You can also experiment with adding an additional buffer at the gauge. Remove the push-in fitting and place a small amount of cotton inside the brass threaded barb on the back of the gauge. Use cotton from a cotton ball or Q-tip. Beware – cotton can be very restrictive. Start small and be sure that the additional restriction has not affected boost and vacuum readings.



[www.42draftdesigns.com](http://www.42draftdesigns.com)

sales@42draftdesigns.com  
1554 Millersville Rd  
Millersville, MD 21108

Second Edition, Volume 1: May 2006

© 2001-2006 42 Draft Designs. All Rights Reserved.

Oil Filter Flange Diagrams by Volkswagen of America, from *Volkswagen Jetta, Golf, GTI Service Manual: 1999-2002* © Bentley Publishers  
Reprinted with Permission

VDO is a registered trademark of Siemens VDO Automotive Corporation

VW is a registered trademark of Volkswagen of America, Inc.

Dremel is a registered trademark of Dremel & Robert Bosch Tool Corporation

Teflon is a registered trademark of E.I. du Pont de Nemours and Company

The contents of this manual may be revised without prior notice. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the expressed written permission of 42 Draft Designs.