

# COOLINGMIST CMGS-FS WRX/STI SETUP



This instruction book is designed to be a guide to enhance your installation. There are some things that may vary from your actual setup. You may have a different tank, different intercooler or something different on your vehicle. In many cases you can deviate from this document. Call tech support if you have any questions regarding setup.



## CONTENTS:

Install the pump and route the hose.....	2
Route the boost/MAF and wiring .....	3
Wire the failsafe.....	4
Install injector, valve, flow sensor, filter.....	5
WRX/STI Diagram with failsafe .....	6
Tank/float switch setup.....	7-8
Configuring your injection mode.....	9
Configuring your failsafe.....	10

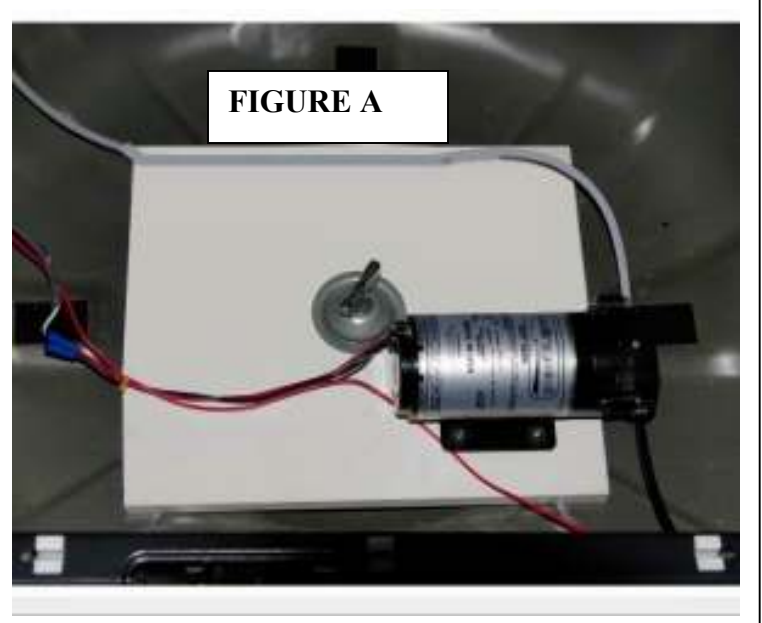
This is a **“GUIDE”** that you can use to install the **CMGS-FS** kit on your **WRX/STI**. Its important to note that there are differences from vehicle to vehicle so there are going to be cases you will need to fill in the blanks or make some decisions out side the scope of this document. We do our best to give you the most accurate data possible. You must take all risks when installing this or any accessory on your vehicle. **Coolingmist** will not be responsible for any damage done to your vehicle due to improper setup or faulty component. Always use common sense and check your setup and test your system so you know what is doing.

**INSTALL YOUR PUMP:**

**FIGURE A**

If you do not use your spare, you can install your pump in this area. There are 4 screws included in your kit that you can fasten the pump down with. You will need to connect the clear (white) hose to the high pressure side of the pump. In the next step we will route the hose. Please note: We will discuss mounting of the tank later in this document.

**NOTE: There are arrows on the pump indication point of flow. The arrows always point toward the injector. Also note that in figure A we did not install the flow sensor yet. See figure D.**



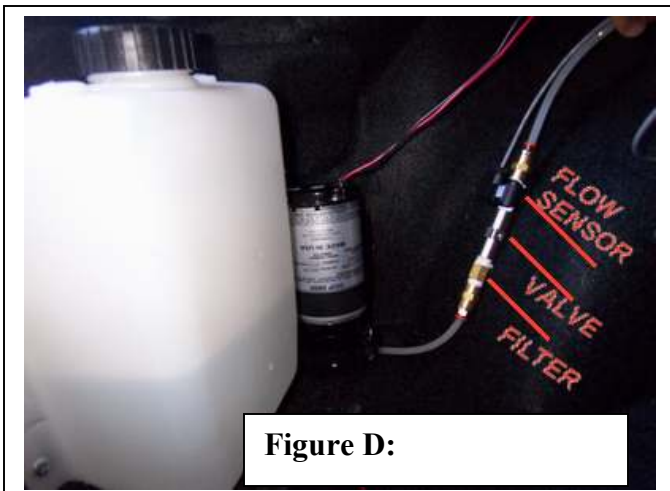
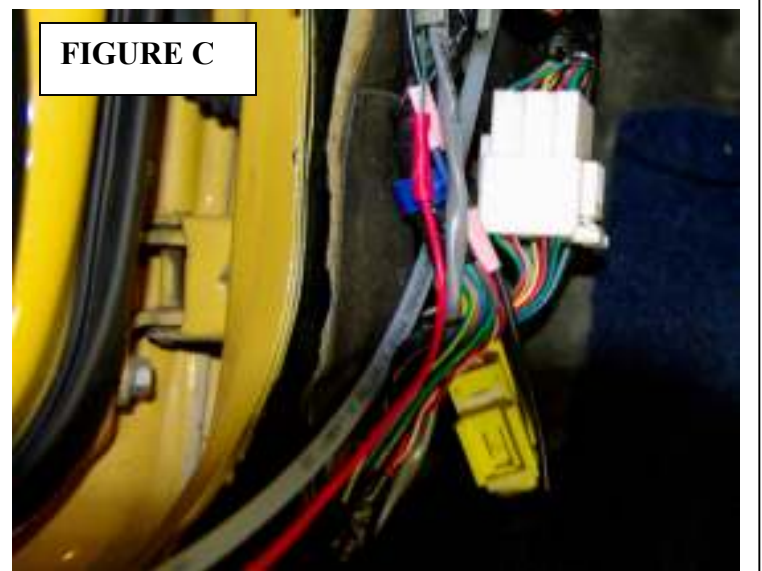
**FIGURE B AND C**

You need to remove the rear seat and driver side panel to pass the hose, the pump wires and low level fluid wire. You will see in figures 2 and 3 we have routed the hose and wires. Routing the hose/wires under the carpet will make for a very clean install.



**FIGURE D**

If installing the pump in the trunk as we suggest, please install the flow sensor close to the pump like in the picture below.



**Figure D:**

**HOSE AND WIRING:**

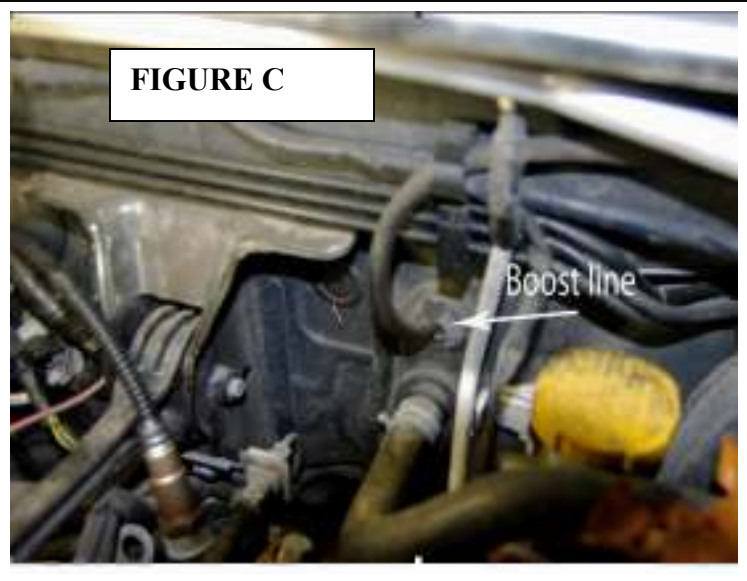
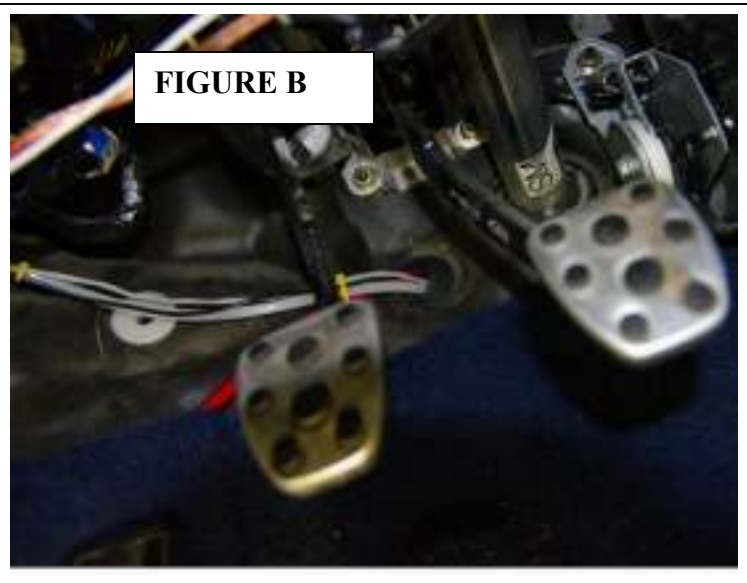
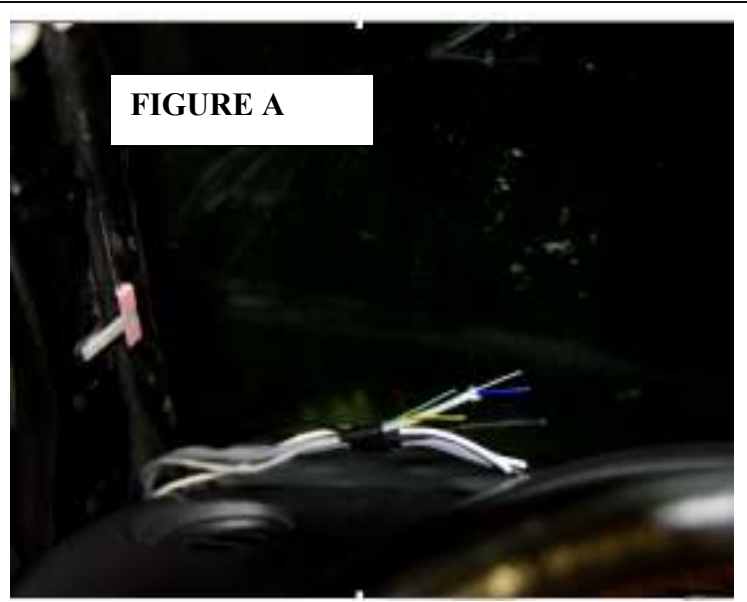
**FIGURE A:**

Route the hose/wiring from the carpet to where you decide to mount your gauge. In this case we will mount to the left near the pillar. Route the hose in a way that you can make the cleanest installation.

**WIRING FROM ENGINE:**

**FIGURE B**

In the engine we got our *MAF* signal wire, switched ground wire and flow sensor signal wire and routed them where you see in the picture to the right up to the gauge. If you choose to use *MAF*, the *MAF* signal wire is the shielded wire.



**BOOST LINE:**

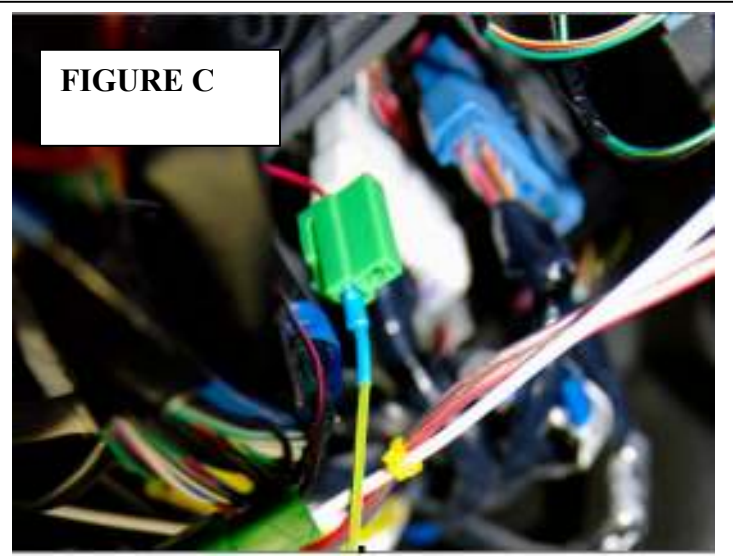
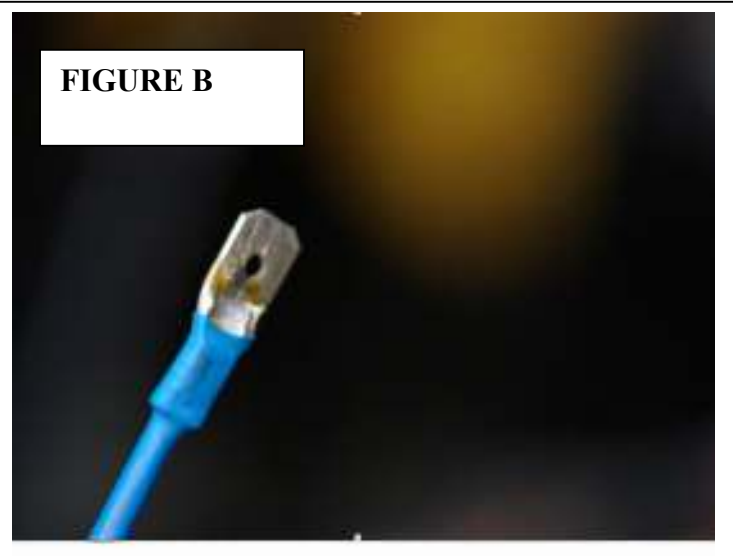
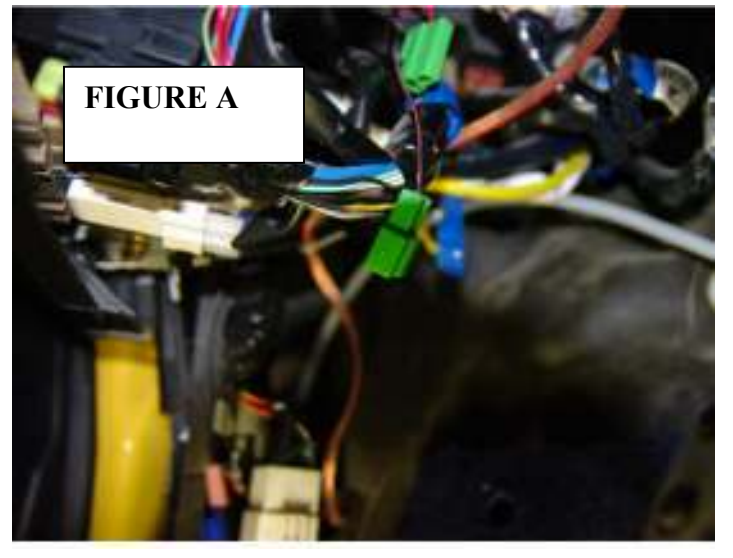
**FIGURE C**

Locate your boost line as in the picture in figure C. Tee in your boost hose. And route into your engine the same way you routed the *MAF* and *Flow sensor* wire. Use the black hose that was provided with the kit.

**INSTALL THE FAILSAFE:**

Locate your test connectors as pictured in *Figure A*. In *figure B* you will see the male spade connector. Take this connector and connect to the CMGS yellow wire and then ground the female side of the connector as in *figure C*.

When the CMGS is setup to perform the failsafe, if the flow is not within acceptable range OR the fluid level is low the CMGS will ground this connector causing the ECU to go into test mode. This will turn boost to wastegate, reduce timing to 0 and restore default map.



## INJECTOR INSTALLATION:

In **figure A** you see a good location for the injector. You may have a different intercooler, on this top mount or any top mount this general area is great. If you have a front mount intercooler install in the IC exit pipe going to the TB. PLEASE NOTE: Always use the white hose for fluid, not the black. Picture in figure A was just for illustration.

The injector is a 1/8<sup>th</sup> NPT male thread. (See **figure B**) Find the location where you are going to install the injector and drill with a 11/32 drill bit and then tap with a 1/8<sup>th</sup> NPT (27 threads per inch). You should remove your IC or pipe so you can clean it out after. You can rinse with water. The injector will then hand screw in the tapped pipe and should seat to the oring. If for any reason you cant get the injector to tap all the way so the oring is sealed, you will need to use pipe tape. In most cases you will not need to use pipe tape

## FLOW SENSOR INSTALLATION

Figure C shows the flow sensor assembly. This is one of the most important part of the installs. The water filter, checkvalve and flow sensor must be installed in the correct order and with the arrows pointing toward the injector.

***This GUIDE FOCUSES HEAVILY ON A TRUNK INSTALL DUE TO THE FACT THAT THERE IS LITTLE SPACE UNDER THE HOOD. IF YOU DECIDE TO MOUNT THE PUMP UNDER THE HOOD YOU CAN LOOK AT FIGURE D FOR THE CHECKVALVE/FLOW SENSOR INSTALL***

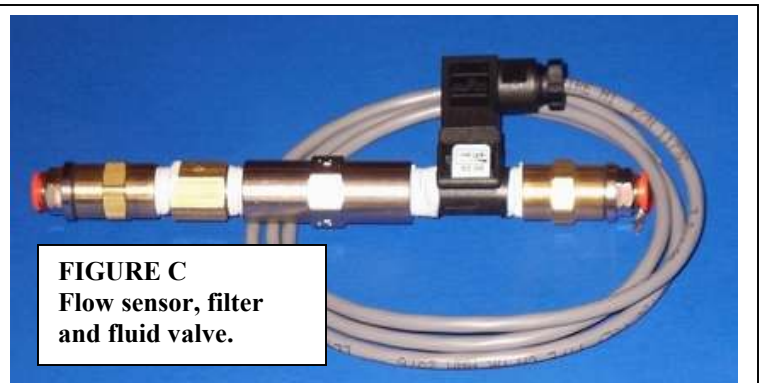
**FIGURE E:** If you are going to mount your pump/tank in the trunk, mount the flow sensor as close to the pump as possible. The assembly should remain the same (filter, valve, flow sensor). By mounting the flow sensor closer to the pump the response time will be reduced significantly and the life fo the flow sensor will be extended due to less heat.



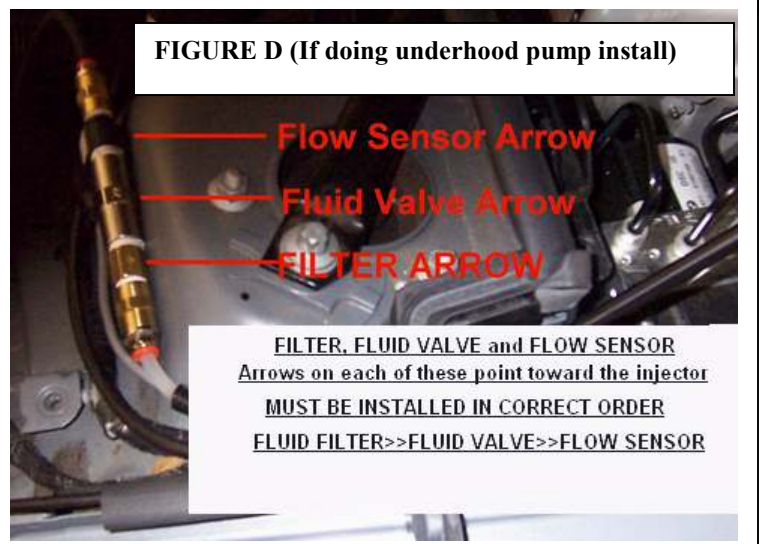
**FIGURE A**



**FIGURE B**



**FIGURE C**  
Flow sensor, filter  
and fluid valve.



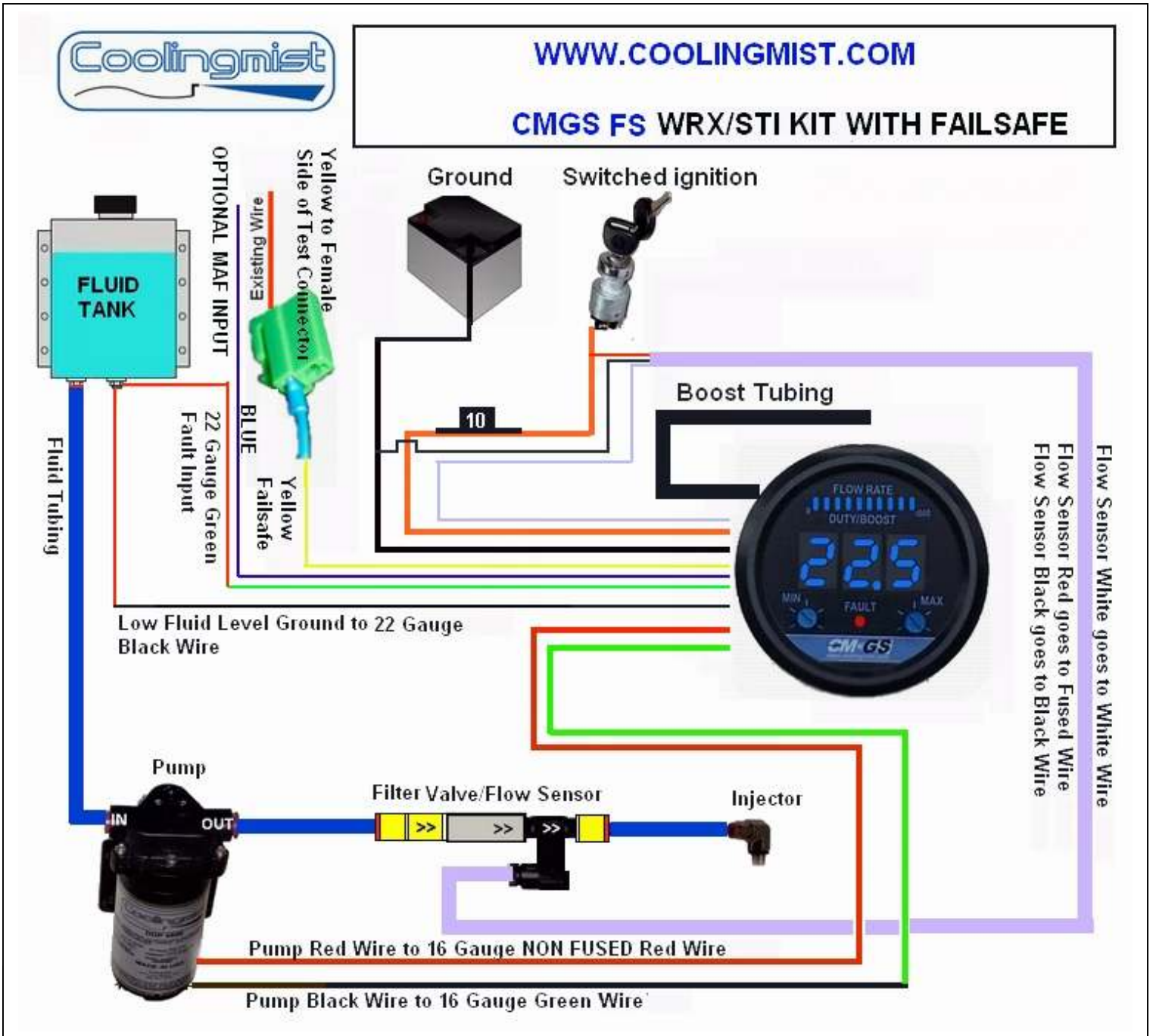
**FIGURE D (If doing underhood pump install)**

**Flow Sensor Arrow**  
**Fluid Valve Arrow**  
**FILTER ARROW**

FILTER, FLUID VALVE and FLOW SENSOR  
Arrows on each of these point toward the injector  
MUST BE INSTALLED IN CORRECT ORDER  
FLUID FILTER>>FLUID VALVE>>FLOW SENSOR



**FIGURE E trunk install**



*You can get your switched ignition source from the 12V ACC as seen in the picture to the right. The fused wire from the CMGS will connect to the 12V + wire from the 12V acc. You can get your power from any switched ignition source, but NEVER from the battery.*



You have several choices of tanks. You can choose a coolingmist tank which range from a 1 gallon wall mount tank or our *1.5 Gallon All in One* trunkmount tank. You can use a 3<sup>rd</sup> party tank or your stock tank or your IC Sprayer tank.

## TANK OPTIONS:

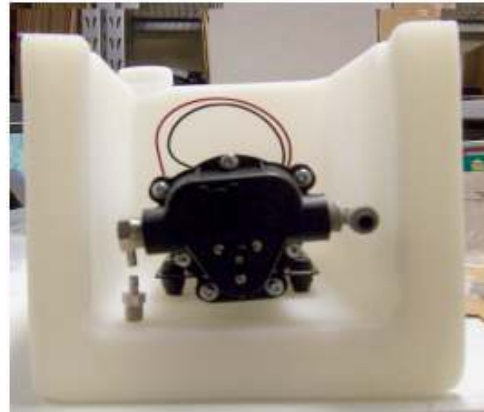
**Figure A** shows our *1 gallon tank*. This can be mounted in the trunk compartment along the wall. The ideal location is to mount so that the pump is lower than the tank or atleast the tank is not below the pump. We supply a fitting that you tap into the bottom of the tank. It's a *1/8<sup>th</sup> NPT*.. The low level float switch also gets installed into the bottom of this tank with a *7/16 drill bit*.

*The trunkmount tank (Figure C)* ships with hardware such as straps and brackets and screws. In **Figure B** you can see the pump assembled. The silver quick connect *90 degree fitting* connects to the output side of the pump (use Teflon tape on the threads). On the input side the 90 degree nickel plated fitting is installed (*use Teflon tape*). The *1/8<sup>th</sup> NPT* nickel plated fitting installs on the tank just below where the 90 degree fitting points once installed. Connect the input side *90 degree fitting* and sit the pump on the tank where the pump base mounts. When you do this you will see exactly where to tap for the *1/8<sup>th</sup> NPT fitting*. Take a 1 inch section of the black boost hose and connect the two fittings together. From there you mount the pump and strap the tank down.

**Figure A**



**Figure B**



**Figure C**



Regardless of what tank you use, the concept will be similar. We will demonstrate on our 1 gallon tank.

## Install the pickup fitting

In **Figure A** we tap the bottom of the tank for the pickup fitting just use a 11/32 drill bit and tap 1/8<sup>th</sup> NPT. When you are done it will look like **figure B**. No Teflon tape or sealant is needed unless you made the hole too big or did not tap correct.

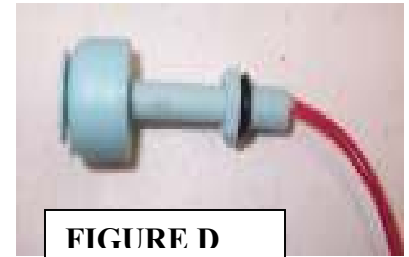
## Install the float switch

In **figure c** we drill a hole slightly larger than the float switch stem. Remove the nut and put the first oring on the inside stem just like **figure D**.

To route the float switch to the hole we just drilled we need to prepare the float switch. Take a 1 foot section of the nylon hose and put the wires inside it just like **figure E**.

Route the plastic hose from the top of the tank into the hole just like **figure F**. Turn the tank on its side and pull the hose through. Just like in **Figure G**. Now put the oring on the step like in **Figure H** and finally put the nut back on like in **Figure I**.

*Don't forget to test your system for leaks! If the tank leaks at the float switch, make sure the nut is tight. If it still leaks you can seal it with epoxy.*



## **CONFIGURING YOUR CMGS INJECTION MODE.....9**

The next 3 pages are very important in setting up your CMGS correctly. Currently, your CMGS will inject based on boost and your failsafe will not be enabled. Infact, by default if you connect the yellow wire to the test connector but do not setup the failsafe configuration, every time your boost reaches the cmgs min setting your failsafe will trip.

### **SET INJECTION MODE:**

By default the CMGS will inject based on boost only. You can choose between Boost only, MAF only or Boost and MAF. There is a 10 second delay on startup, so if you choose MAF only it will not turn on during your vehicle startup. Look at the PARAMS in the next page and see the chart. Parameter #2 is your control mode. Follow instructions below to set it where you want. Its setup for boost only by default.

### **SET FAILSAFE MODE:**

Param #13 is failsafe enabled mode. You must enable this feature to use the failsafe. Each parameter after 13 is important as well. You must read each one carefully to understand what each of them do. You will set the flow window high and low, the injection signal threshold, any delay and other possible calibrations.

### **VIDEOS:**

Visit [www.coolingmist.com/videos.aspx](http://www.coolingmist.com/videos.aspx) to see some examples as to how we set the CMGS up. It helps a lot.

The CMGS FS and VC2 FS are by default setup to inject based on boost, display boost and flow rate with no failsafe. If this is what you want, do not proceed further. Your CMGS is already setup by default. If you want to inject based on voltage or boost and voltage or if you want to display something other than boost or want to activate the failsafe you will need to understand how CMGS FS works. Before anything can happen we must get CMGS into configuration mode. To do this set the **MIN** and **MAX** both the 1 and the CMGS will count down from 5. Once at zero the screen will come back and the fault light will blink steady. This is configuration mode.

Across the top of the CMGS you have 10 flow bars. During injection the flow bars light up telling you how much you are flowing. These same bars are used during configuration mode to indicate what parameter you are on. In figure A, all 10 bars are lit up. In Figure B, 3 bars are lit up. These would be 2 different parameters. There are 18 different parameters that you can set and each parameter can have 2 to 7 different options.

Now we know the number of flow bars that are lit will tell us what parameter we are on, we must know how to change the value and advance to the next parameter. When you first get into configuration mode the first led will be lit up. You are ready to either change this parameter or move to the next. We will discuss what each parameter is in the next section. To move to the next parameter you would turn the MAX dial until the 2<sup>nd</sup> LED is lit up. If you wanted to change that parameter you would turn the MIN knob clockwise until the 3 digit display shows the value you want. Its very important not to accidentally copy the value you just set onto the next parameter. When you advance to the next parameter you have 1 second from the time you turn to the next parameter until the value shows up on the screen. If you are not going to change that parameter you must move to the next one before the screen comes back. If you do not, you will copy your previous value over. This is only a factor when you have changed the previous value. You may have noticed that there are 18 parameters but only 10 bars. How to change the other 8? Its simple. When you advance past #10, the flow bars will wrap around and the fault led will blink rapidly. So the 2<sup>nd</sup> time around when the first bar is lit, that is parameter #11 and so forth. Once you have finished changing any params, to save your changes set the MAX all the way to the right and set the min all the way to the right. You have saved your changes and exited config mode. If you ever need to reset the CMGS/VC2 back to its default setting, just set the MIN to 30, MAX to 30, turn power off and then turn power back on and wait 10 seconds.

To get a visual idea of how this all works see us at [www.coolingmist.com/videos.aspx](http://www.coolingmist.com/videos.aspx). We have dozens of videos showing most of these features being setup. We strongly recommend you view them if you have any questions about this. **NOTE: to get your CMGS version #, at startup the version number will flash for about 10 seconds.**

On the next page we will discuss each parameter, what they do and what the values are. Its up to you to decide if you need the functionality of any of these params. **DO NOT JUST CHANGE A PARAM BECAUSE IT SEEMS COOL, ONLY CHANGE IT IF YOU HAVE A REASON TO.**



*TIP: To check your values after you program the unit, go back into confi mode and keep the MIN setting all the way to the left. The first param value will show on the screen. Write that down then move the MAX knob clockwise onto the next led to get the next value and so forth. Write each value down. From there you can compare to the chart to make sure everything is good exit config mode by turning max to 30 and min to 30..*

PARAM (# LEDS lit up)	PARAM FUNCTION	VALUES (DEFAULT IN BOLD)	NOTES:
1	Display Mode	<b>000 Boost Display</b> 001 DutyCycle Display 002 Voltage Display 003 Flow Display	Displays 0.1 to 30.0 PSI of boost Display pump DC % from 0 to 100 Displays the voltage 0.1 to 5.0 or the multiplied calculation if setup Displays flow in CC/M * 100
2	Control Mode	<b>000 Boost Only Injection</b> 001 0-5 Volt only Injection 002 Combined Mode (boost and 0-5V)  IE: If you have a vehicle with a MAF sensor such as STI/WRX you can inject in combined mode if you wish.	Only considers boost for injection Only considers voltage for injection Looks at boost and voltage. Can do boost injection with voltage threshold or do a user defined map between the boost and voltage. System will not turn on until MIN boost, MAX boost, MIN voltage and MAX voltage are reached.
3	Minimum DutyCycle	0 to 100 %. <b>25% default</b>	This is the minimum % the controller sends the pump during initial turn on.
4	Maximum DutyCycle	0 to 100% <b>100% default</b>	This is the maximum % the controller sends to the pump at full boost or signal. For example if you set this to 75%, the system will scale your MIN dutycycle at the initial turn on and when you are at full flow you will only see 75%. If you need to lower the flow rate, this is the ideal way to do it.
5	5 Volt Multiplier	0 to 100. <b>1 is default</b>	If you are injecting based on voltage or combined mode or displaying voltage you can set the multiplier. For example, if you are integrating throttle position or displaying throttle position and 5 volts =100% throttle, you set the multiplier to 20. Your display will show 0 to 100% instead of 1 to 5.
6	Flow Input Pulse Liter	150 to 450 <b>220 is default</b>	If your flow sensor is in the trunk you should adjust this number to around 270 for an average vehicle. If your flow sensor is under the hood, you can leave at its default. This param affects how the flow sensor reads. The further away from the engine the larger the number should be.
7	Flow Bar Configuration	<b>000: Each bar=50 CC/M</b> 001: Each bar=100 CC/M 002: Each bar=200 CC/M	For lower flow rates the default of 50CC per bar (500 CC total) is ideal. This is display purpose only.
8	Flow Bar Dimmer	<b>1-4</b>	<b>4 is the brightest, 1 is the most dim.</b>
9	5 Volt MIN Set Point	0.0 to 5.0 V. <b>1 is default</b> (only avail in combined mode)	If you have combined mode chosen you will get this option. This is the minimum voltage for turn on.
10	5 Volt MAX Set Point	0.0 to 5.0 V <b>5.0 is the default</b> (only available in combined mode)	This is the Max voltage for injection ( <b>COMBINED MODE ONLY</b> )
<b>PARAM #</b>	<b>FUNCTION</b>	<b>VALUES</b>	<b>NOTES</b>

11  <u>Please note:</u> <u>Param 11 is new in 1.07. V 1.06 does not have this parameter.</u> <u>From this point the sequence is different in 1.06.</u>	5 V Input Weight Pct	0 to 100% <b>50% default</b> (only avail in combined mode)	If you set this value to 0, the system will inject based on only boost, but only when you are above your 5 V min voltage setting. If you set the value to 100, the system will inject based on only Voltage but will use the min boost setting as the boost threshold. The closer you are to 100, the more control you give to the voltage. For example, set it to 50 and boost and voltage have equal weight. Any change in boost or voltage will change the map equally. Set the value to 75 and voltage has 3 times the weight at boost meaning change in boost will not change the flow as much as change in voltage will.
12 This is a new param in 1.07. Sequence changes	5 V Output Mode <b>(Orange wire)</b>	000- 5V Output is scaled to the Flow Rate Input value. (100ml = 0.1V)	Outputs .1 volts for every 100 CC/M of flow. At 2.5 volts you are at 2500 CC/M. <b>Some tuning boxes for the BMW 135I/335I use this output from this.</b> The more CMGS flows the more boost your BMW will safely get.
This param “001” was automatic in 1.06.		<b>001 – 5V Output puts out 5V when the Flow Rate Input satisfies the Fail Safe Flow Rate Min and Max settings.</b>	Outputs 5V when the system is flowing and you are flowing. Newer versions of the JB3 use this function to advance boost to the BMW 135/335I but only when flowing correctly within your setup parameters.
		<b>002 – 5V Output puts out 5V when the Flow Rate Input satisfies the Fail Safe Flow Rate Min and Max settings and the Duty Cycle, Boost, or Voltage exceeds the Min Threshold as configured.</b>	Is exactly the same as 001, except it will look at your boost threshold, voltage or dutycycle threshold as well.
		<b>003 – 5V Output is scaled to the Boost Input value (0 PSI, 0.0V – 30 PSI, 5.0V)</b>	0V=0 boost. 5V=30 psi orange wire
13 If you have 1.06, this is param #11	Failsafe Enable	<b>000- Fail Safe feature is disabled</b>	If failsafe is disabled, all values below are disabled as well. There are default values for each of these, but they are only active if the failsafe is enabled.
		001 – Fail Safe feature is enabled using Duty Cycle	If you are injecting in combined mode, dutycycle is the best way to use the failsafe.
		002 – Fail Safe feature is enabled using Boost	This is the most common setting.
		003 – Fail Safe feature is enabled using 5V Input	
14 for V1.06 this is param #12	Failsafe Min Threshold	<b><i>The Fail Safe Min Threshold value is displayed based on the Fail Safe enable. If Fail Safe is enabled for Duty Cycle the Fail Safe Min Threshold range is 0 – 100% with 60 % as the default. When enabled for Boost, the range is 0 – 30 and default is 12 psi. If enabled for the 5V Input the range is displayed using the current 5V Multiplier configuration setting and 3 v is the default. When the Fail Safe Feature is disabled this configuration setting is not displayed.</i></b>	The threshold is critical. If you the aux output (yellow wire) setup for “000”, “001” or “003” the system looks at your threshold before it will trigger the failsafe. For example, If you set the threshold to 12 PSI, until you reach 12 PSI or beyond the system could care less what your flow rate is. You should set this threshold early enough so that it will catch any flow problem early.
15 for V1.06 this is param # 13	Flow Min Threshold	10 to 200. <b>default 17 (170 ML/M)</b>	From 100 CC/M to 2000 CC/M. Value of 10 = 100, value of 150=1500, etc. If you set this value too high your failsafe can trip before you reach that flow rate. Make sure the value you set is realistic based on your controller settings and jet size.

LED #	PARAM NAME	VALUE	NOTES
16 For V1.06 this is param #14	Flow Max Threshold	0 to 200 <b>default 0</b>	This is optional. This value allows the cmgs to know if your hose bursts or you have an over flow problem. If you don't set this you would never know if you have an over flow.
17 For V1.06 this is param #14	Failsafe Response Time	A pause can be programmed from 0 to 2 seconds. Values are valid from 0 to 200. Pauses before failsafe output wire is triggered . <b>Defaults to 10</b>	The pump takes time to get up to speed and the lines take time to fill with fluid. The further your flow sensor from the pump the longer this needs to be. This is the amount of time for the system to pause prior to tripping the failsafe. If you get a "001" flashing on your CMGS you may need to set this delay. You want this delay as short as possible.
18 For V1.06 this is param #15	Failsafe Aux Output <i>(these settings give or take away a ground to the yellow wire. Use a relay if you want voltage)</i>	000 – Aux Output Normally Open (Aux Output is normally off and activates when fail safe is triggered).	This is great to be used with any device you need to turn on when there is a flow problem. The Subaru WRX/STI uses this feature. The yellow wire connects to the green test connector and its setup with "000". Test connector is grounded when a problem occurs causing boost/timing to retard.
		<b>001 – Aux Output Normally Closed (Aux Output is normally active and deactivates when the Fail Safe is triggered).</b>	This setting can be used for example if you have a boost controller that you always want on until there is a problem and you wan to deactivate it. Can be used for a number of situations. Always has a ground unless you are within your flow window and a problem occurs.
		002 – Aux Output Normally Closed (Aux Output is normally active only when the Flow Rate Input exceeds the Flow Rate Min setting and is less than the Flow Rate Max setting when set. Aux Output deactivates when the previous condition is not satisfied).	This differs from 001 because it does not give the ground output until you are within your flow rate min and flow rate max. It does not care about your threshold of boost, voltage or dutycycle. Looks at min/max flow only.
		003– Aux Output Normally Closed (Aux Output is normally active only when the Flow Rate Input exceeds the Flow Rate Min setting and is less than the Flow Rate Max setting when set, and the Duty Cycle, Boost, or Voltage Min Threshold is exceeded. Aux Output deactivates when the previous conditions are not satisfied).	Same as 002, except it factors in your dutycycle, boost or voltage threshold. If it is not met, it will not give the ground signal even if its within the flow range.
19 For V1.06 this is param #17	Bar Graph Configuration	000-Display Flow Rate (default)	By default the 10 flow bars will show your flow rate (50 cc/m, 100 cc/m or 200 cc/m per bar) when you are injecting. You can however make this display pump dutycycle with each bar equaling 10 % dutycycle. Why would you do this? Lets see you set the display mode to 003 so the 3 digit display shows flow instead of boost, you may not want the bars to show flow as well.
		001-Display Dutycycle	See above ☺