

PFM OPERATION INSTRUCTIONS

Gas

Run 100 octane with a Castrol Mix of 1 ounce for every one gallon. In a pinch 93 octane can be used but ensure that the fuel mixture is set to rich setting (8 or better).

Fuel Mixture

Fuel mixture will set the injector pulse width. The starting setting of 0 on the knob will start the injectors with 13.00. The highest setting will move the injectors to 14.5. Remember that 0 is the leanest and turn up injectors pulse width richens the mixture.

The default setting for the knob should be 3 or 4. Watch you lambda and EGTs to ensure that you're running the correct values.

Traction Control Setting

The default should be 0 or TC Disabled as reported by your ECU. Any setting of 1 – 15 will enable TC. The only practical requirement for using this is setting is when there is wet or damp conditions.

When TC is engaged by the ECU, ignition is pulled to ensure torque doesn't exceed grip.

Brake System Installation and Maintenance

1) Installation:

The placement of the master cylinders is important to the proper plumbing of the car. Facing the master cylinder mounting placement on the front of the car, the order of placement is: rear on the left, front in the middle, and clutch on the right. If you swap the front and rear, the plumbing to the front of the car won't reach.

Which master cylinders you use depends on the drivers preferences. The only requirement is that the rear is larger than the front. The typical pairing is $\frac{3}{4}$ " (.75) for the rear and $\frac{7}{8}$ " (0.875) for the front. This is the factory default. For more pedal feel but longer travel an alternate is the pairing of the $\frac{7}{8}$ " (0.875) rear and $\frac{13}{16}$ " (0.8125) front.

The clutch is set for $\frac{3}{4}$ " (.75) to allow the correct travel distance of 2" for drive line disengagement.

Brake bias bar should be installed on the right of the pedal set so as not to interfere with the throttle cable. In most cases it is best to install a 90 degree adaptor Pegasus Parts 72-560 to make the adjustment easier while the car is operating.

The brake pedal should be adjusted so that the pedal stops vertically when engaged at 800 – 1000 PSI depending on what your driver can reliably sustain. Adjusting the pedal travel is done through a $\frac{5}{16}$ threaded rod and coupler. They must be cut to fit the pedal box distance. This requires proper pedal box and master cylinder installation to determine the proper length of the threaded adjustment rod.

2) Brake Bias Front to Rear

Setting the front to rear the bias is important for proper braking balance. Through years of testing professional races team usually operates within the range of 51 – 59 % front bias. Using brake

transducers will help make sure you land within that range. Typically, the higher vehicle speed to more that you'll front bias the car. For Circuit of Americas or Indy GP road courses the front bias ends up being close to 59 %. A good starting point is usually 56%. Rolling in more front bias will also help when engaging the lowest gear starts causing rear chatter and irregular blip engagement.

Gear Position Sensor (GPos)

The GPos is a rotary sensor on the rear gearbox cover. It is a simple system that uses voltage to determine the gear position of the gearbox. The default voltage for Neutral is 0.90 Volts.

To set the GPos correctly first put the car in Neutral. Ensure that when turning one wheel the other wheel does not counter turn; then you know you're in Neutral. Next, check that a value of Neutral is reading on the ECU Sensors page for your data logger and/or dash. If you have a reading of 4 when the car is in Neutral that means the rotary pot is turned 180 degrees out of phase. Remove the GPos and turn either clockwise or counter-clockwise (it doesn't matter). Reinstall and check that 0 is now the reading. Once this has been verified the best course of action is to read in the ECU Sensors for G Volts. Rotate the GPos until it reads 0.90 Volts. Then lock it in with the screws. You can now verify that your work is correct by rowing the gears on high stands or during a test drive.

Gearbox Oil

To measure the gearbox oil simply place a tape measure down the fill port 7.0inches. Oil should start at 6.5 inches so you should show ½ inch of oil. Half an inch in either direction is OK.

Use Redline 75 / 90. It will be about 2 – 2.5 bottles.

Fan Wiring

The *Shift ECU* Bosch DTM 6 pin Connector will be used to turn on the Fan Relay. Power will come from the battery. The pin red should be pin 1 and blue is pin 6. When the engine coolant temperature (ECT) exceeds 185F the fan will be turned on.



Lambda

Reading should be .89 and .90.

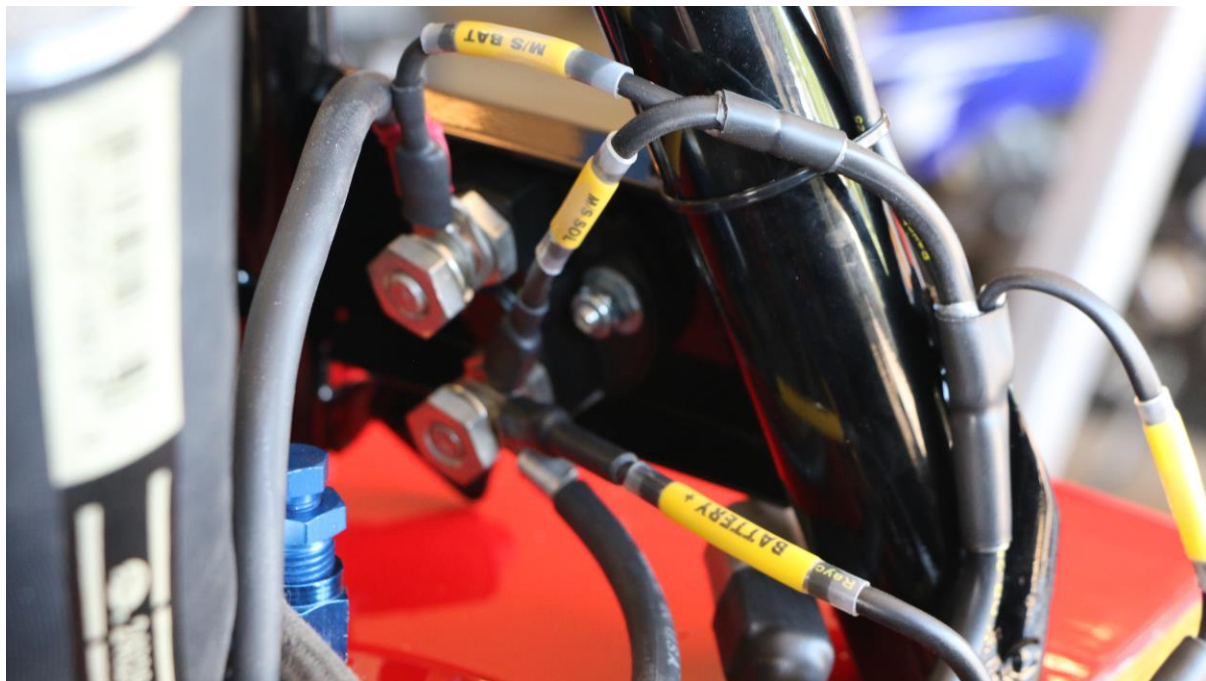
Clutch

Ensure pilot bearing is lubed by either lubing the input shaft or the pilot bearing directly. When you have the clutch removed check the ring gear for wear and the flywheel for hot spots. You can use a billow pad to scuff the flywheel to remove all hot spots and clean surface prior to installing a new clutch.

No Start Issues

- Crank Ref – Check Crank Sync is reporting
- TPS is at 3 % and the butterfly is 1mm
- Fuel is far below 393 kPa
- Battery Voltage is below 11V
- Ground wire not attached to motor

Main Wiring at Hoop

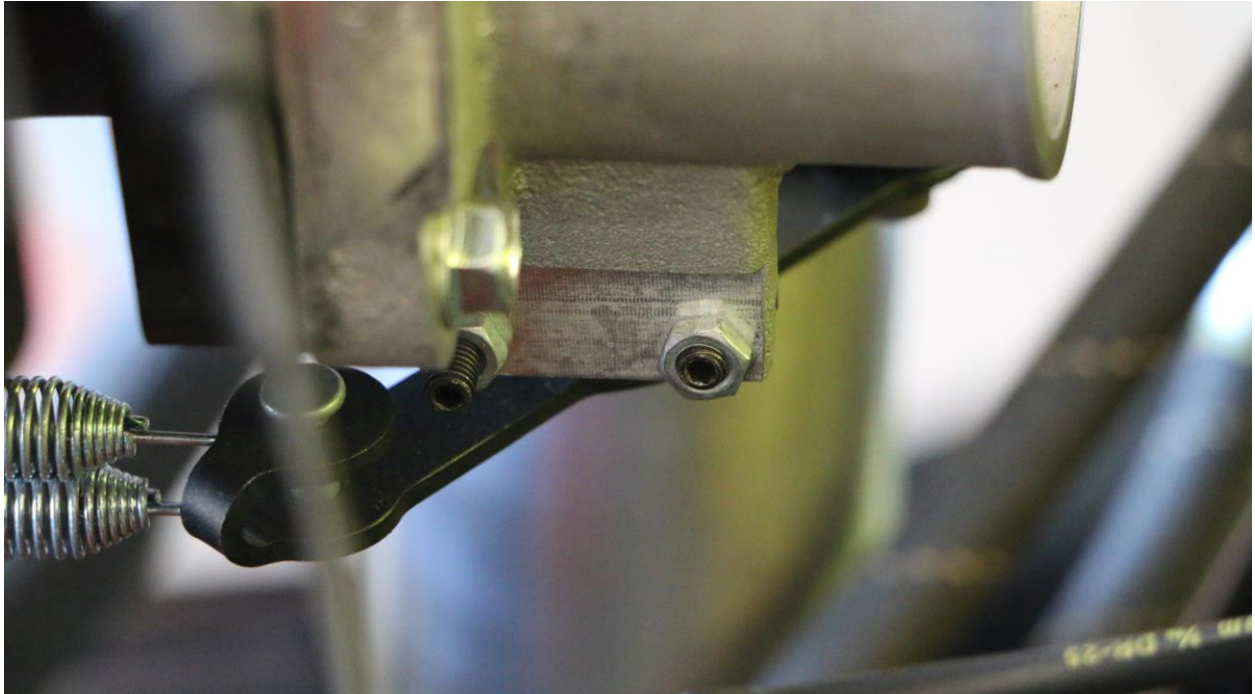


Setting the Throttle

The throttle position should default from 3.5 – 4.5 % when the pedal is not pressed. The pedal fully depressed should report 100%.

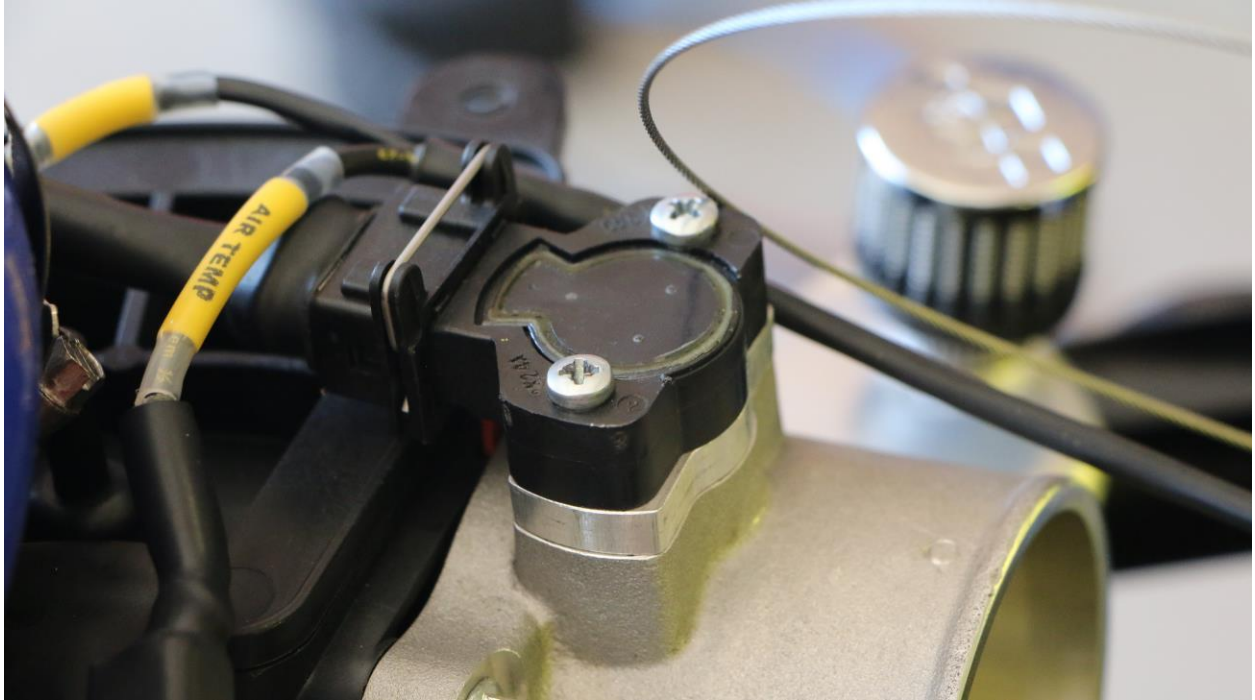
Installing a throttle cable in simple. Ensure that the short end of the cable is on the throttle body side and the long end is on the pedal side.

Setting the idle is done by turning the set screw closest to the chassis in or out until the throttle body butterfly has a gap of 0.006. This should provide the standard idle of 1750- 2500 RPMs.



Once the idle is set, ensure that that 100% on the pedal also is rotating no more than a perfect 90 degree. That is the second set screw on the throttle body. Turn that in or out to ensure that this setting is achieved.

Finally, adjust may require that the TPS sensor be adjusted. By clocking the TPS clockwise or counter-clockwise a tiny bit you have get the default TPS setting to 3.5 – 4.5%.



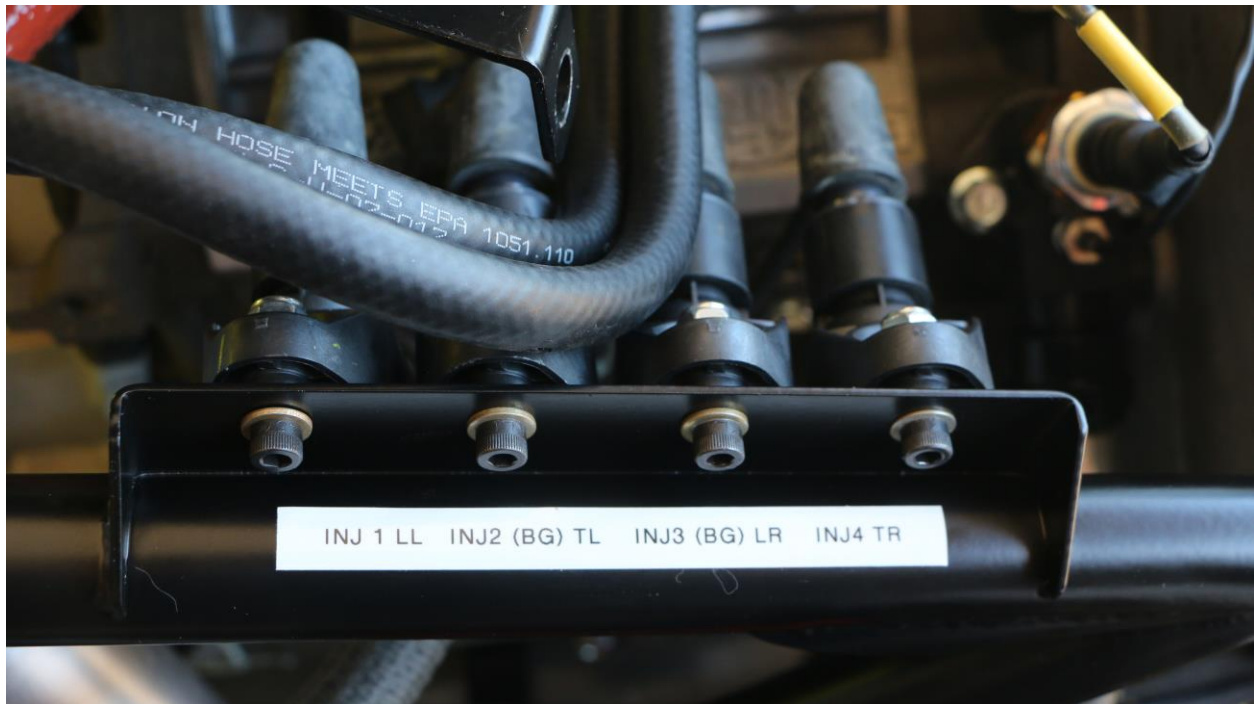
Settings TPS

- 1) Set the butterfly to 1mm. Use the limiting screw on the right.
- 2) Adjust the TPS to read 3 deg (verify the butterfly is still open by 1mm).
- 3) Verify that the TPS reads 100% is 90deg on the butterfly.
- 4) Adjust the throttle cable to ensure that WOT is 100% and not under clocking or over clocking

Spark Plugs

Spark Leading 11 / Trailing 11 or Spark Leading 11 / Trailing 10

Injector and Plug Wiring Installation



Oil Plumbing / Routing

