



**KPM Fuel Systems Jeep Trackhawk 2018-2022**

**PWM Fuel System Controller**





## Important! Must Read First

Congratulations on the purchase of the KPM Fuel System PWM Fuel Controller for your [2018-2022 Jeep Trackhawk](#).

To ensure your KPM PWM Fuel System Controller is fitted correctly and operates perfectly and reliably we advise that this kit is to be fitted by a KPM Fuel Systems Dealer workshop.

If you are unable to access a KPM Fuel Systems dealer, we strongly recommend a professional and experienced fully qualified technician to install your new fuel system.

Ask your qualified installer to contact KPM Fuel Systems on any aspect not clear in the instructions provided.

Email: [support@kpmfuelsystems.com](mailto:support@kpmfuelsystems.com)

As a wide variety of skills, procedures, special tools, and workshop equipment is needed to install this kit:

- KPM will take NO responsibility or give NO guarantees on the operation of this product for fitment not carried out by a KPM Fuel Systems dealer or experienced qualified technician.
- KPM will take NO responsibility or give NO guarantees on the operation of this product due to not fitting this kit exactly as per the instructions provided.
- Ensure correct workshop safety procedures are carried out in fitment of this kit.
- Please read ALL instructions before commencing fitment

## Guarantee

On satisfaction that **ALL** instructions have been followed as per this document, KPM Fuel Systems will warrant this KPM PWM Fuel System Controller against any defects or faults for 12 months from the date of purchase.



## Operation and Functions

The KPM Pulse Width Modulated (PWM) Fuel System Controller has been specifically designed to support up to 80 amps of current draw continuously.

This gives it the capability of running up to 4x high flow Bosch motorsport fuel pumps simultaneously and continuously.

The controller is programmed to run the fuel system at a pre-determined fuel pressure. The fuel pumps will only be run at the duty cycle required and when required. This ensures less current draw, which means less heat, improved reliability and precise tune-ability.

With this amount of control over fuel flow, we now have the ability to support extreme horsepower with OE level functionality and legality.

The KPM Fuel System Controller is fully programmed from factory to perfectly suit all vehicle models and the many combinations of fuel delivery required.

The PWM Fuel System Controller has the following functions:

- 80-amp continuous current support
- Fully programmable to control up to 4 fuel pumps by means of one or all of the following inputs - Fuel pressure, MAP, MAF, Throttle position. \*
- Fully programmable OE factory PWM input, piggy back control.
- Fully programmable pump output and pump staging. \*
- Fully programmable system pressure settings. \*
- Multiple options for safety settings and pump control. \*
- Multiple gauge and warning light outputs. \*
- Advanced low temperature electronic circuits for robust motorsport and long-term reliability.
- Supplied with EMI shielded high amperage wiring and connector kit to block out interference with other vehicle electronic modules and devices.
- LED on controller for visual system pass and fault code readout.
- Fully modular fitment to all KPM Fuel Systems

\*For accessibility to re-program this function please contact KPM Fuel Systems.

The KPM PWM Fuel System Controller will be supplied pre-programmed to exactly suit the model of your vehicle and the level of KPM Fuel System you have purchased.

There is nothing else to do, just follow the wiring instructions, plug in the connectors and start the car. Simple!

The KPM Fuel Systems Fuel Controller will do the rest.



The KPM PWM Fuel System Controller comes complete with wiring to be connected to the vehicles factory Fuel Control Module (FPCM) to read the OE signals.

The KPM PWM Fuel System Controller uses the OE signals from the FPCM to calculate the correct current required to run the secondary pumps accordingly. The KPM PWM can also be programmed utilizing the OE fuel system programming tables.

## Operation

### OE or KPM1500 – Primary Module only:

Primary module fuel pumps are controlled by a duty cycle input given out by the OE Fuel Pump Control Module (FPCM).

This duty cycle will vary on load demand. As an example, at idle both pumps may be running at approx. 40% duty cycle, at part load may be at 55% and then ramping up to full load at 80% duty cycle. This cycle will continue as load increases and decreases while keeping fuel pressure as per OE settings.

### KPM2200/2700 - Secondary Modules only:

On every start-up, the secondary module pump/s are primed for 10 seconds only. This ensures the circuit is tested and that the secondary module pump/s are always ready and primed when required for high load operation.

The OE FPCM will continue to run the primary module fuel pumps which are always running and duty cycle input will vary on load demand. As an example, at idle both pumps may be running at approx. 40% duty cycle, at part load they may be at 55%. When the primary module reaches 90% duty cycle, the KPM PWM Fuel System Controller will then turn on a duty cycle signal to the secondary module fuel pumps, and continue to ramp duty cycle up or down accordingly as load requires.

When load decreases and the KPM Fuel Controller sees the primary module returning to a duty cycle of only 80%, it will slowly ramp down the duty cycle signal to the secondary fuel module and eventually turn it off. This cycle will continue as load increases and decreases while keeping fuel pressure at a pressure controlled by the OE program.



## Important

This KPM PWM Fuel System Controller is engineered to operate perfectly as a complete system, when used with all components as supplied only by KPM Fuel Systems.

Depending on the level of KPM Fuel System you have purchased, included in the kit will be the following;

### **KPM 2200HP / 2700HP Fuel Systems**

- 1) KPM PWM Fuel System Controller - (for precise electronic control over fuel module operation)
  - 2) KPM Plug and Play EMI safe wiring kit (for correct, reliable and safe current supply)
- KPM Fuel Systems will take NO responsibility for the operation of this fuelsystem if any of the components listed are not utilized with this package.
  - KPM Fuel Systems will take NO responsibility for the operation of this fuel ssystem if any of the components listed are replaced with a non-KPM approved component.

## **Dismantle Vehicle for Fitment**

- 1) Remove the rear seat to access the rear seat floor.
- 2) Remove the RHF seat.
- 3) Remove the battery cover to access the battery.

## **PWM Fuel Controller Mounting**

- 1) Place your PWM controller in the correct position on the centre rear seat floor as pictured and while doing so use a marker pen to mark the 4 holes required for drilling.
- 2) Drill the 4 marked holes carefully with a 3.5mm drill bit and use the supplied screws to mount into position.



- 3) Be sure to mount the PWM controller small black earth wire/eyelet and screw down into one of the appropriate holes.



## **PWM Fuel System Controller Wiring**

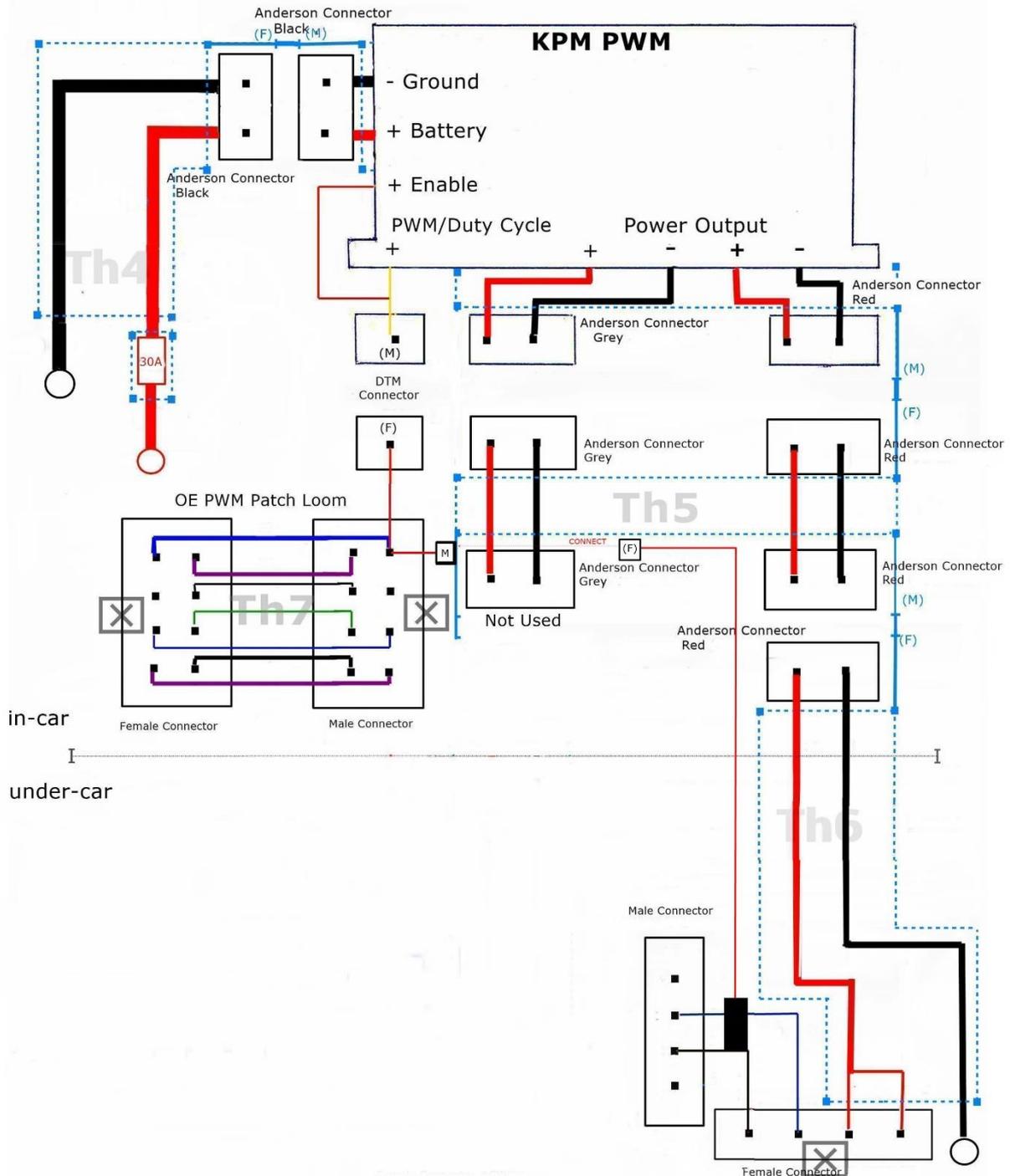
- 1) There are 2 combinations of KPM Fuel Systems you can install – either:
  - KPM 2200HP / 2700HP **utilizing the OE primary fuel module**
  - KPM 2200HP / 2700HP **utilizing the KPM1500 primary fuel module**
- 2) You will need to follow the appropriate wiring diagram below.
- 3) All Anderson wiring connectors are color coded to ensure correct connection orientation as per wiring diagram.
- 4) Route the supplied wiring as per your specific fuel kit and as per appropriate wiring diagram and pictures listed below.

**\*Note – The KPM Fuel Systems PWM Fuel Controller wiring is made with a stainless-steel shielding incorporated. This is to prevent EMI (electro-magnetic interference) from disrupting other vehicle systems and control modules.**

**It is very important that the grounding wire connectors that link together every section of the supplied wiring are connected as per wiring diagram.**

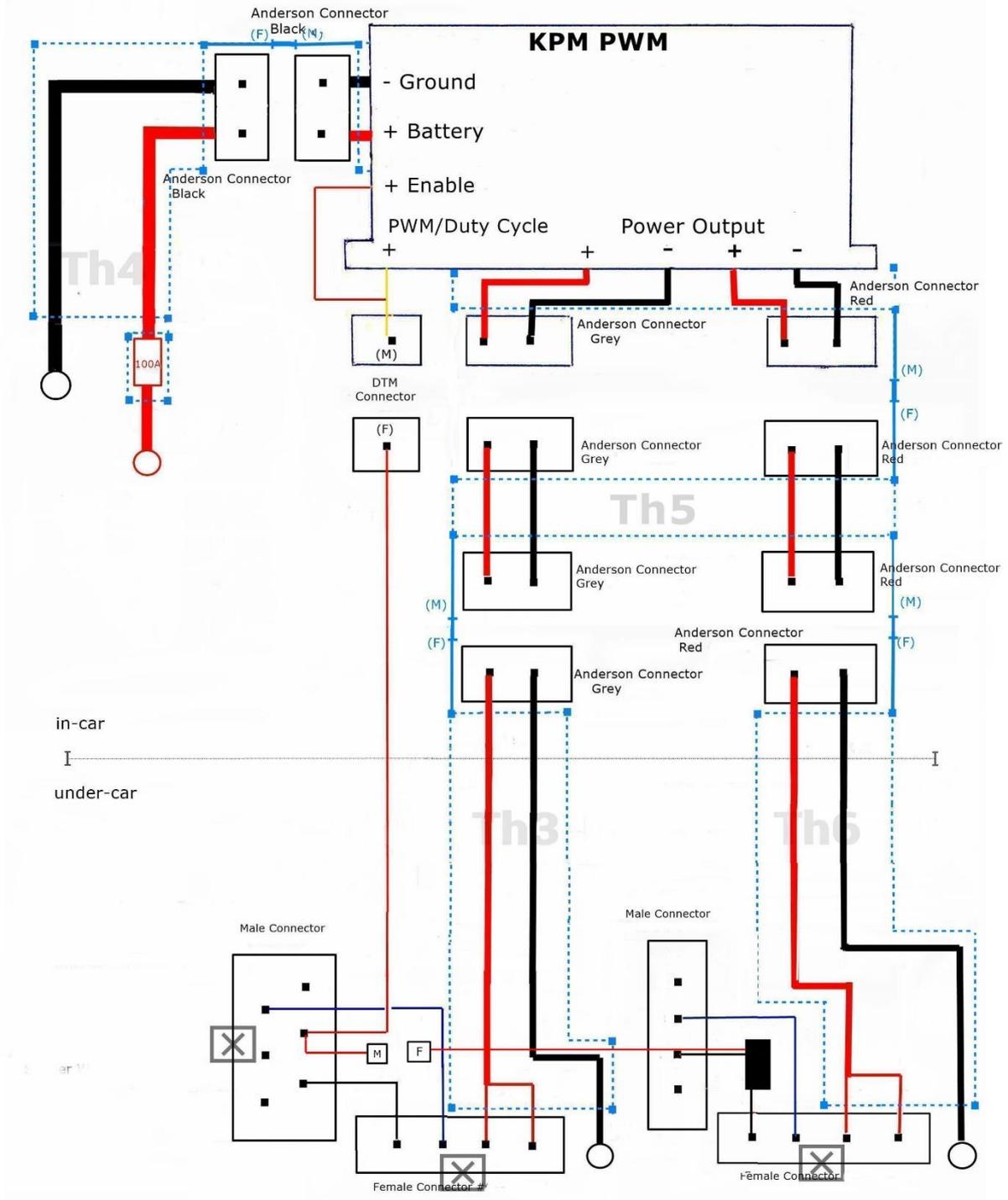
## 2200HP/2700HP- OE PRIMARY FUEL MODULE

Jeep Trackhawk 2018-2021  
PWM and Wiring Schematic



## 2200HP/2700HP-KPM1500 PRIMARY FUEL MODULE

Jeep Trackhawk 2018-2021  
PWM and Wiring Schematic



## Wire and Cable Routing

Depending on the of fuel system you have installed there are 2 separate wiring combinations.

- KPM 2200HP / 2700HP **utilizing the OE primary fuel module**

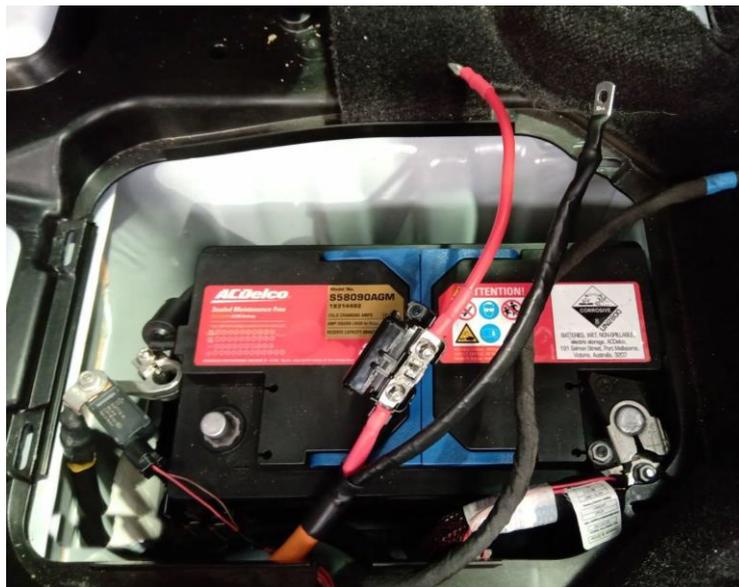
Wiring kit- #Th4, #Th5, #Th6, #Th7

- KPM 2200HP / 2700HP **utilizing the KPM1500 primary fuel module**

Wiring kit- #Th4, #Th5, #Th6, #Th3

The only difference between the two are that they will contain a different cable section that runs from the KPM PWM Fuel Controller to the primary fuel module (either #Th7 or #Th3).

- 1) From in the cabin, connect the #Th4 wiring and fuse section to the battery.



- 2) Attach the loom wires to the battery as per the circuit diagram above.

- 3) Mount the supplied fuse holder securely on an appropriate surface and secure the loom.

# KPM FUEL SYSTEMS

- 4) Route the #Th4 wiring loom under the battery trim along the RH trimming and carpet and run along the backseat floor towards the PWM fuel controller connectors.



- 5) Connect the #Th4 black Anderson connectors together at the PWM.
- 6) Connect the #Th5 grey and red Anderson connectors together at the PWM.



- 7) Route the #Th5 wiring loom to the large rubber grommet at the LH rear seat floor area to

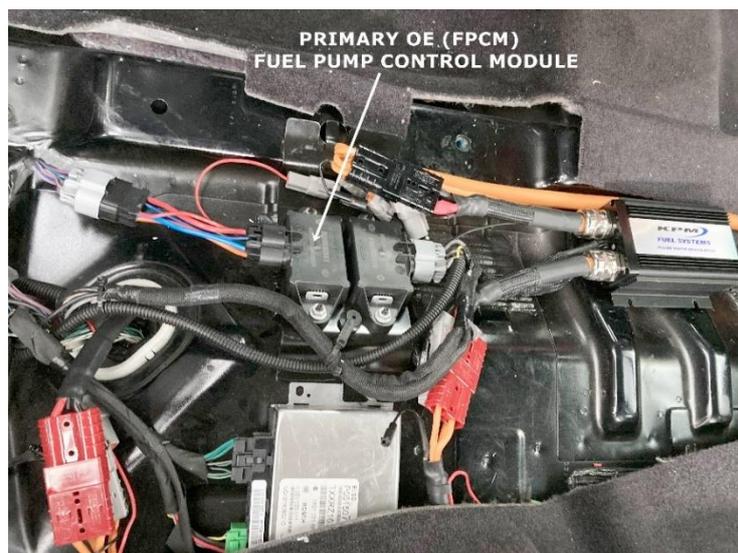
connect to the previously installed #Th6 wiring loom red Anderson connector.



Finish the next section of wiring according to the Primary Fuel Module installed in the vehicle.

## OE Primary Fuel Module ONLY

- 1) Disconnect the connector at the PRIMARY OE (FPCM).
- 2) Connect the patch loom section of the #Th7 wiring section in series with the OE PWM connectors.  
Connect the #Th7 single pin **Deutsch** connector to the KPM PWM Fuel Controller corresponding connector marked PWM/Duty Cycle.



## KPM1500 Primary Fuel module ONLY

- 1) At the large rubber grommet, you will find the previously installed #Th3 wiring grey Anderson connector and the single pin Deutsch connector ([See KPM1500 Fuel Module Fitment Instructions](#)).
- 2) Connect the #Th3 grey Anderson connector to the #Th5 grey Anderson connector.



- 3) Connect the #Th3 single pin [Deutsch](#) connector to the KPM PWM controller corresponding connector marked PWM/Duty Cycle.
- 4) Ensure the large rubber grommet is in position and fitted correctly.
- 5) Secure and tie down your wiring loom fitment with cable ties as neatly as possible.

## ECU Re-Calibration

The standard FPCM settings are set to run the fuel system at a maximum fuel pressure of 550 kPa. The KPM 1500HP, 2200HP and 2700HP fuel systems have been designed to supply maximum fuel at a pressure of 400 kPa.

To ensure you obtain the advertised maximum performance and supply from your KPM Fuel System we recommend running your new fuel system at the suggested pressure.

You will need to have a tuning professional re-calibrate your fuel pump control as per the settings below.

Using HP Tuners software or similar find the settings in **Fuel Systems/ Fuel Pressure/Desired Fuel Pressure/WOT and Normal**

- 1) Change the “Desired Fuel Pressure / “WOT” settings from the factory set 550kPa to 400kPa
- 2) Change the “Desired Fuel Pressure Normal” 2D table from the factory settings all to 400kPa.

The screenshot shows the HP Tuners interface for fuel system configuration. The 'Desired Fuel Pressure' section is set to 400 kPa. The 'Pressure Limits' section shows 'Minimum' set to 'Vapor Lock'. A red circle highlights the '400' value in the 'Desired Fuel Pressure' field, and a red arrow points to it with the text 'CHANGE SETTINGS TO 400kPa'. Below this, a 2D table titled '[ECM] 8190 - Desired Fuel Pressure Normal' is shown. The table has 'Fuel Flow Rate (g/s)' on the y-axis and 'Engine Speed (rpm)' on the x-axis. All values in the table are set to 400 kPa. A red circle highlights the entire table area.

	788	1,149	1,671	2,624	3,855	4,810	6,016
0.5	400	400	400	400	400	400	400
5.0	400	400	400	400	400	400	400
10.0	400	400	400	400	400	400	400
15.0	400	400	400	400	400	400	400
25.0	400	400	400	400	400	400	400
35.0	400	400	400	400	400	400	400
50.0	400	400	400	400	400	400	400

[ECM] 8190 - Desired Fuel Pressure Normal: The desired fuel pressure during normal conditions.

## **Start Up and Checks**

- 1) When you are satisfied your PWM Fuel Controller is fully installed, and you have re-calibrated your ECU, you are now ready to start your vehicle.
- 2) Simply start and run the car as normal.
- 3) On one end face of your KPM PWM Fuel System Controller you should see a green LED flashing approximately once per second. This means that all systems are working normally.

**Note\* If your LED is not flashing green approximately once per second or is flashing any other color, you may have a system problem. Please contact KPM Fuel Systems.**

## **Refit interior**

- 1) You can now refit your rear seat.
- 2) Refit the battery cover.
- 3) Refit your RHF seat.

## **IMPORTANT INFORMATION**

**KPM strongly recommends that you have your engine tune checked by a professional tuning workshop!**

**Depending on the previous fuel system your vehicle has been tuned to, your car may run differently with the new KPM Fuel System pressure and extra supply.**

**This can cause rich or lean fuel mixtures and possibly be detrimental to your engine!**

**It is your responsibility to have your vehicle checked and/or re-tuned by specialist methods to ensure correct fueling and engine safety and reliability.**

**It is your responsibility to have your vehicle checked and/or re-tuned by specialist methods to ensure any fault codes in the vehicles electronic management system/s are corrected.**