MUSTANG GT 2015-2017
1500HP PWM FUEL SYSTEM

Important! Must Read First

Congratulations on the purchase of a KPM Fuel System for your 2015-2017 Mustang GT.

To ensure your fuel system is fitted correctly, operates perfectly and reliably, we advise that this kit is 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

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 will warrant this KPM Fuel System against any defects or faults for 12 months from the date of purchase.

Important

This fuel system 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;

1) KPM Fuel Module x1 – Primary (for increased flow and capacity)
2) KPM PWM Fuel System Controller (for precise electronic control over fuel module operation)
3) KPM Plug and Play EMI safe wiring kit (for correct, reliable and safe current supply)
4) Mustang 2015-2017 Bosch Fuel pressure sensor kit

- KPM Fuel Systems will take NO responsibility for the operation of this fuel system 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 system if any of the components listed are replaced with a non-KPM approved component.
- KPM will take NO responsibility for the operation of this fuel system if used on a vehicle NOT fully retrofitted for E85 Ethanol or flex fuel.

Note: E85 Ethanol is highly corrosive on many components.

Please be aware that if your car is NOT built for E85 Ethanol from manufacturer, it may be possible that components **NOT** supplied by KPM Fuel Systems will also need to be replaced or suited for E85 Ethanol. Examples of some possible non-compatible components - are fuel injectors, fuel filters, fuel lines, rubber hoses, fittings etc.

All KPM Fuel System components are 100% Ethanol and Gasoline compatible.

Before Dismantling

- You will need to reduce residual fuel pressure in the fuel system to 0 kPa to enable disconnection of fuel lines.
- You can do this by removing the fuel pump fuse and running the engine until fuel pressure drops to 0 kPa.
- Disconnect the Battery.

Standard Fuel Module Removal

1) Drain fuel tank.

2) Mustang GT- the fuel module can be accessed by a rubber grommet cover under the LH rear seat. Carefully remove the fuel lines from the fuel module (a quick disconnect tool is recommended for disconnecting fuel lines, take extra care in not crimping/damaging the fuel line on removal)

3) Remove the electrical connector from the fuel module

4) Unscrew the retaining ring holding the fuel module to the tank with the correct tool

5) Lift the fuel module from the tank until you can access and remove the crossover pipe connector at the base of the canister.

6) Carefully lift the fuel module completely from the fuel tank.

Internal Fuel Tank Crossover Hose Fitting Replacement

1) Pull the internal crossover hose as far out of the tank opening as possible to access the quick connect straight fitting.

2) Using a heat gun, carefully heat the internal hose at the fitting end to remove the straight factory fitting.

3) Fit the new right angle fitting to the internal fuel hose without tensioning the hose clamp.

4) Fit the hose and fitting to the KPM fuel module and estimate the position of fitment in the tank to give the correct orientation of the internal hose on the fitting.

5) When you have a relaxed fit between the hose and fitting, tighten the clamp to its final position.

KPM Primary Fuel Module Fitment
1500HP

You will need to remove the fuel sender unit from the standard fuel module for fitment to the upgraded KPM Fuel Module.

1) Carefully lower the new fuel module into the tank taking care not to damage the fuel sender and float mechanism while doing so.

2) Ensure that you can access the crossover pipe connector in the fuel tank with plenty of room to reconnect to the base of the canister.

3) Ensure the crossover pipe connector clicks fully onto the fuel pump module canister.

4) Retention the retaining ring to secure the fuel module into the tank with the correct tool.
    a. Ensure module is sitting square and flush on the seal prior to tensioning.

5) Refit fuel lines ensuring they have clicked on properly.
    a. Take extra care in not crimping/damaging the fuel line on removal or replacement.

6) Be sure to read the wiring fitment instructions in the next sections prior to re-fitting the rubber grommet cover and rear seat base.

PWM Fuel System Controller Operation

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 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 currant 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.

The KPM Fuel System Controller is fully programed 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 end user 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, the controller will do the rest.

The 2015-17 Mustang models were not fitted with a factory fuel pressure sensor. This means that the KPM PWM Fuel System Controller requires an alternative input signal for fuel pump control.

KPM has supplied a Bosch fuel pressure sensor kit required to give the KPM PWM fuel system controller the fuel pressure input signal it needs to control the fuel pump/s.

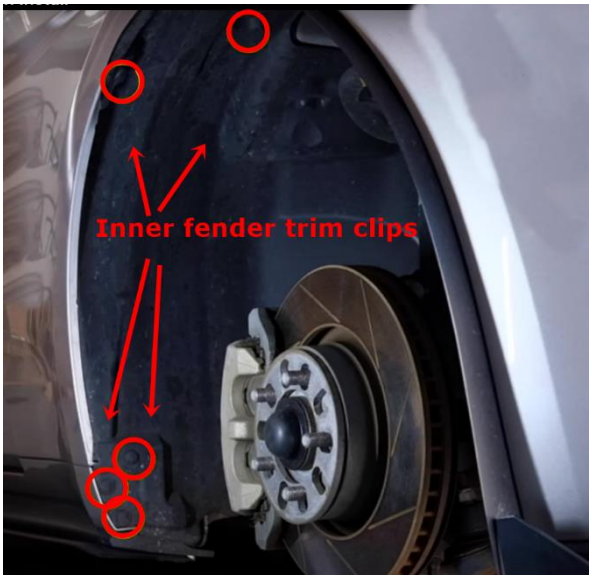
KPM1500 – Primary Module only

Primary module fuel pumps 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, while at part load they may be at 55%, and then ramping up to full load at 80% duty cycle. This cycle will continue as load increase and decreases while keeping fuel pressure at a constant pre-programmed 400 kPa.

Dismantle vehicle for PWM Fuel System Controller fitment

1) Remove the RHF wheel.

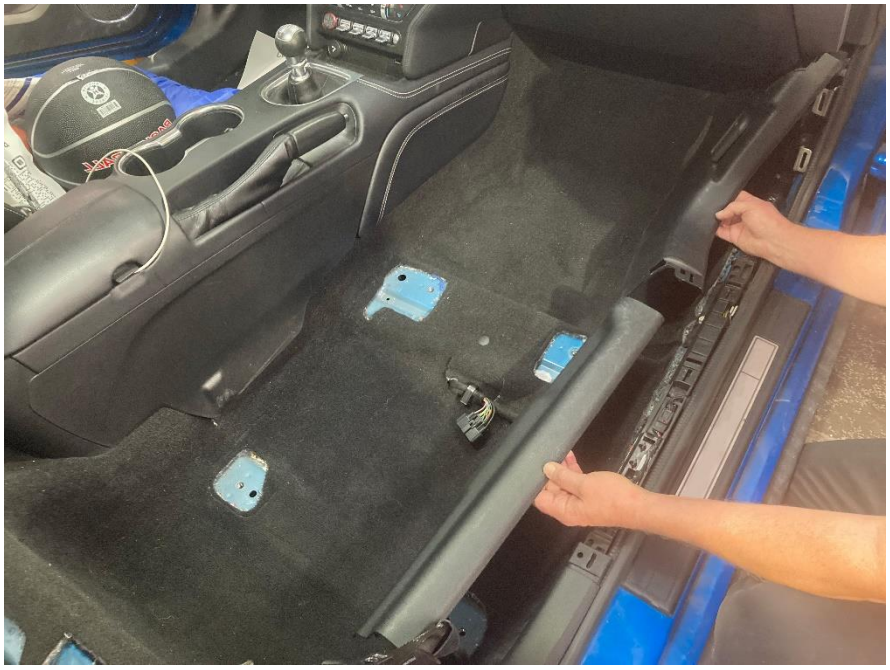
2) Remove the RHF inner fender trim by removing the 5 hold down clips.



3) Remove the RH front seat.

4) Remove the RH footwell panel.

5) Remove the RH inner sill panel trimming.



6) Pull back the RH footwell carpet.

7) Remove the rear seat base.

8) Remove RH rear inner cabin panel

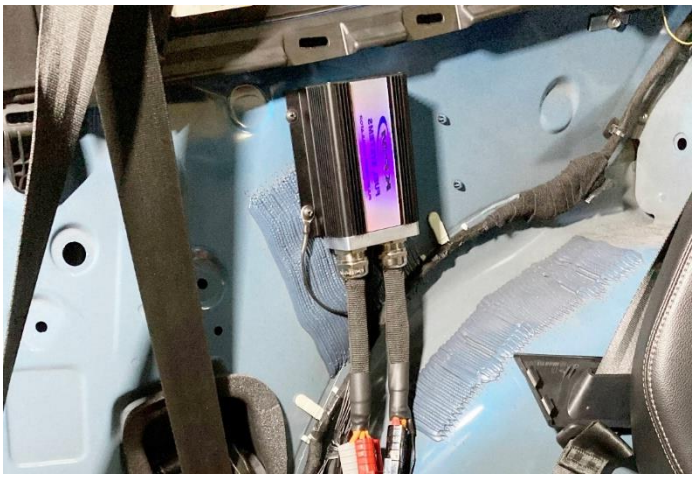
PWM Fuel Controller Mounting

1) Place your PWM controller just below the RH rear ¼ window as with the cables facing downwards as pictured.

2) Use a marker pen to mark the 4 holes required for drilling.

3) Drill the 4 marked holes carefully with a 3.5mm drill bit and use the supplied screws to mount into position.

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



5) You will need to remove the insulator from the RH rear inner cabin panel for cutting as shown.

6) Test fit and check the trim panel and foam insulator fits correctly over the PWM.

7) Finally, fit the foam insulator with the hold down clip and hot glue on one side and totally hot glue the other side of the insulator back onto the trim panel.

8) The trim panel will be fitter later.

Fuel Pressure Sensor Mounting

1500HP Single Fuel Module Systems

The Bosch Fuel Pressure Sensor is mounted under the hood in a suitable location near the fuel supply line.

KPM supply an auxiliary fuel hose and fitting that connects direct to your fuel supply and then to your fuel rail connection. Simply connect the fuel pressure sensor into this fitting, and route the electrical loom (#Mus7) from the PWM to the sensor.

1) Ensure that you have released fuel system pressure.

2) Disconnect the quick release fitting under the hood that leads to the engine fuel rail.

3) Click in the new KPM Fuel Pressure Sensor Fitting between the hard supply line, and the flexible fuel rail supply line.

4) Fit the other end of the supplied fuel line connector to the Bosch Fuel Pressure Sensor fitting.

5) Mount the Bosch Fuel Sensor and fitting in a suitable location.
a. The Bosch Fuel Pressure Sensor must be mounted anywhere from a 90-degree angle to a vertical upright position.

6) Connect wiring connector (#Mus7) to the Bosch Fuel Pressure Sensor 4-pin connector.

7) Route the (#Mus7) wiring into the cabin to the PWM 4-pin connector marked 'Fuel Pressure Sensor' along with the (#Mus4) wiring as described in the **"Wire and Cable Routing"** section.

8) Be sure to check the fuel pressure sensor for any leaks upon first start up.

PWM Fuel Controller Wiring

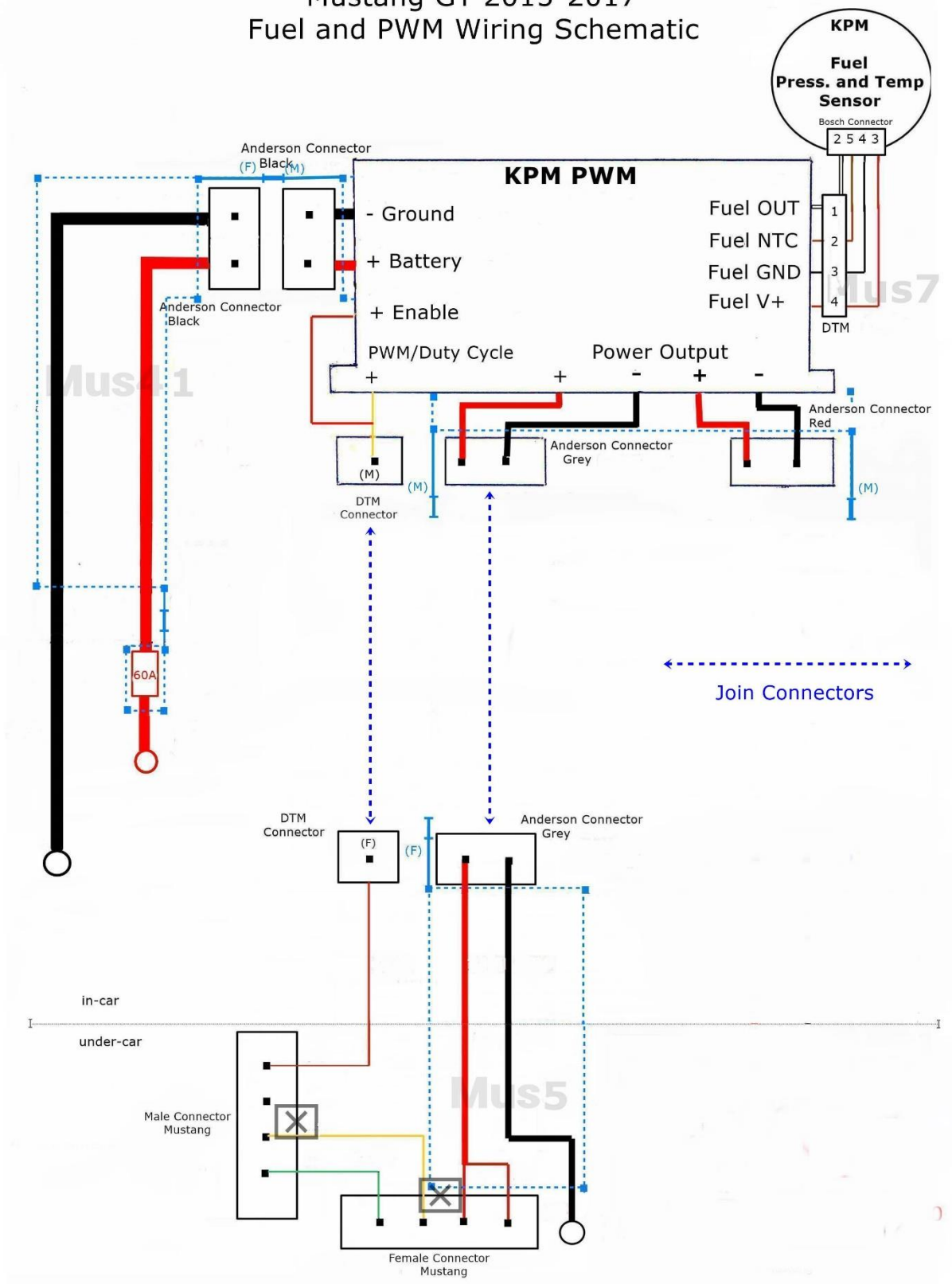
1) All Anderson wiring connectors are color coded to ensure correct connection orientation as per wiring diagram.

2) Route the supplied wiring as per your specific fuel kit, and as per appropriate wiring diagram and pictures listed below.

***Note – The 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.**

PWM 1500 HP

Mustang GT 2015-2017
Fuel and PWM Wiring Schematic



Wire and Cable Routing

1) Remove the black Anderson connector surround from the #Mus41 wiring loom end.

2) From under the hood and using a tracer wire/tool, feed the #Mus41 wiring loom through the hole above the RH chassis rail area below the battery, and out the hole into the RH inner fender cavity area.

3) Pull most of the #Mus41 wiring loom through the chassis hole onto the ground, while leaving enough length under the hood to comfortably connect the other end to the battery.

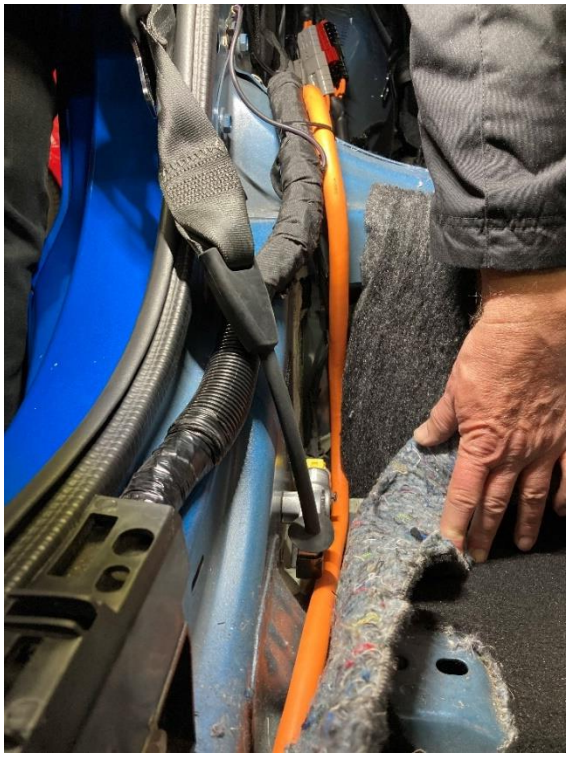
4) Mount the new fuse section in the battery box area in an appropriate position to clear the battery.

5) Make a small incision into the rubber grommet located in the inner fender cavity, and feed the #Mus41 wiring loom through the rubber grommet into the RH footwell and floor area.

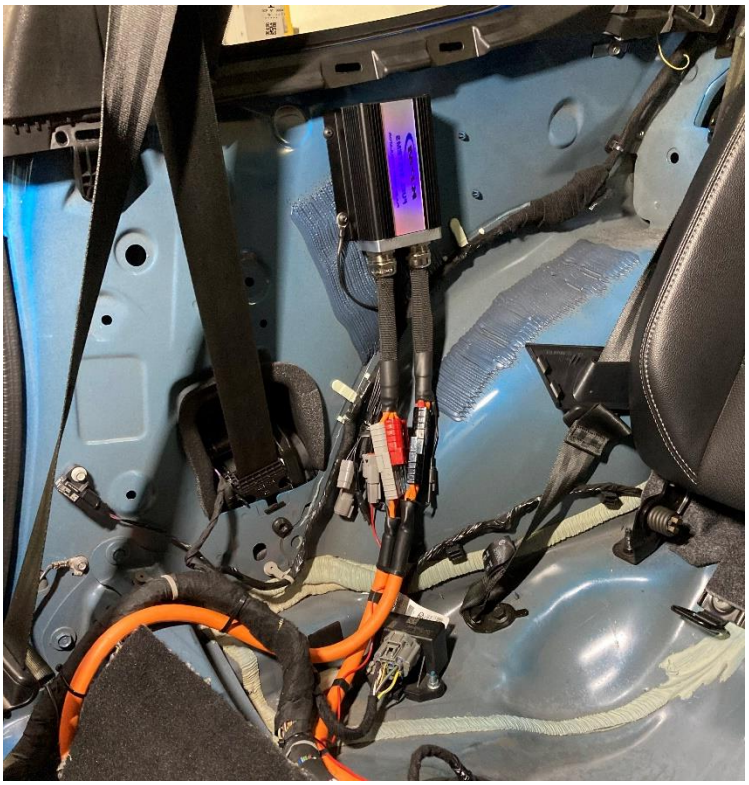
6) You may need to lubricate the wiring loom with some silicone spray to ensure it slides through the grommet easily.

7) You will now have the majority of the orange cable (Mus41) inside the cabin ready to route to the PWM fuel controller.

8) Continue to route the #Mus41 loom from the footwell along the RH sill panel, alongside the existing OE loom towards the PWM.



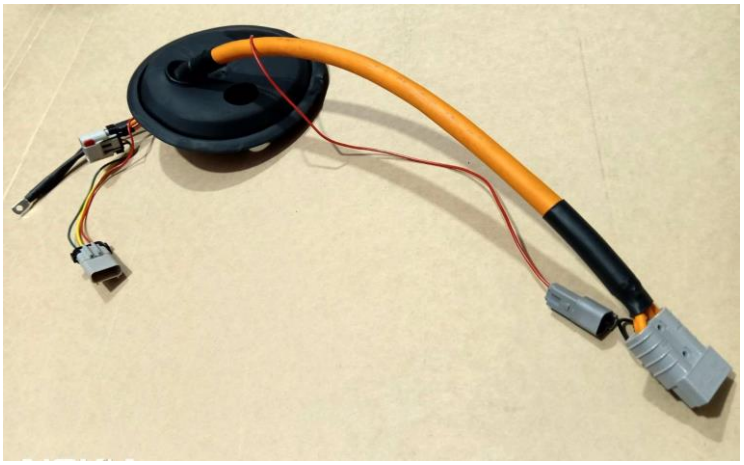
9) Connect the black Anderson connector on cable (Mus41), to the black Anderson connector on the PWM.



10) Remove your primary (OE) fuel pump grommet cover and drill a 30mm hole as shown.

11) Fit the new supplied 30mm grommet as shown.

12) Remove the grey Anderson connector surround from the primary module cable (Mus5), and feed the cable through the new grommet.

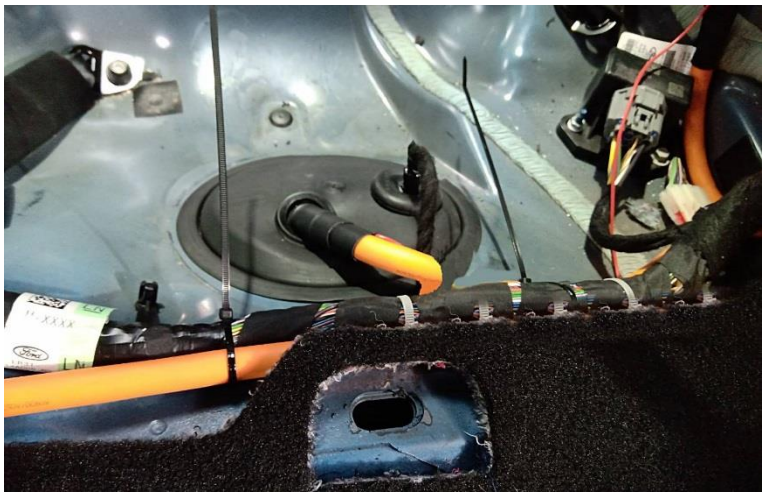


13) Connect all the primary fuel module connectors (1500HP module) as per the wiring diagram. Be sure to securely tension the earth cable eyelet to the pump.

14) Refit the grey Anderson connector surround and route neatly towards the PWM. Connect to the grey Anderson connector on the PWM.

15) You can now go along the cable/s and tidy up and neaten the inside cabin fitment with cable ties securely alongside existing looms and fittings.

16) Refit the RHF wheel.



17) Refit the RHF inner fender trim.

Start up and checks.

1) When you are satisfied your KPM PWM Fuel Controller is fully installed, 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) Refit all your interior sill panel trimmings.

2) Refit you modified rear trim panel.

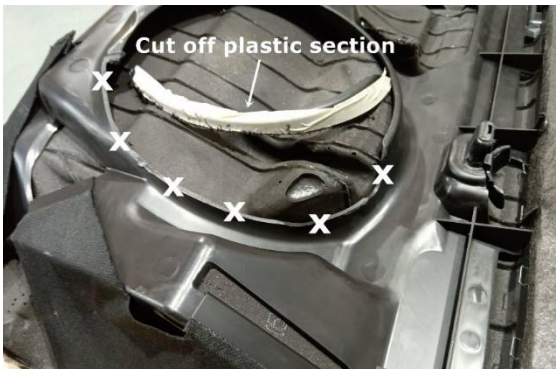
3) Refit your footwell panel.

4) Refit your RH footwell carpet.

5) Rear fit your front seat.

6) Refit your rear seat base.

7) You may need to cut the underside plastic section of your rear seat base as pictures to allow room for the new wire sections.



Engine start up

1) Refit the fuel pump fuse.

2) Reconnect your battery.

3) Ensure you have at least ½ tank of correct clean/fresh fuel.

4) Connect a fuel pressure gauge to the supply line at the fuel rail or read your fuel pressure on you scan tool.

5) Prime fuel system and start engine.

6) Check all fittings at pump and fuel rail for NO leaks.

7) Check pressures are within specifications below.

If not within the specifications below, you will need to check for correct fitment and take the normal course of diagnosis to rectify before proceeding.

Fuel Pressure engine idling 58 PSI

8) Stop engine and relieve fuel pressure.

9) Remove fuel pressure gauge and refit fuel line.

10) Re-start engine and check for NO leaks.

11) Refit large rubber grommet and rear seat base.

Congratulations, you have successfully fit the KPM 1500HP PWM Fuel System.

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.