JEEP GRAND CHEROKEE & DODGE DURANGO-2012-2021

PWM Fuel System Controller

Important! Must Read First

Congratulations on the purchase of the KPM PWM Fuel System Controller for your 2012-2021 Jeep Grand Cherokee and Dodge Durango.

To ensure your PWM Fuel System Fuel Controller is fitted correctly and 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 PWM Fuel 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 continuous current draw.

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 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

*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 purchased.

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

Vehicle and fuel system specific operation and function

Vehicles without a Factory Fuel Pressure Sensor 2012-2021 Jeep Grand Cherokee and Dodge Durango

Jeep and Dodge 2012-2021 models were not fitted with a factory fuel pressure sensor. This means that the KPM PWM Fuel Controller requires an alternative input signal for pump control.

KPM have supplied a Bosch Fuel Pressure Sensor Kit required to give the KPM 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 the pumps may be running at approx. 40% duty cycle and 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 increases and decreases while keeping fuel pressure at a constant pre-programmed 400 kPa.

KPM2200/2700 - Primary and Secondary Module

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

Primary module fuel pumps are always running and duty cycle input will vary on load demand. As an example, at idle both the pumps may be running at approx. 40% duty cycle and at part load they may be at 55%.

When the primary module reaches 90% duty cycle, the fuel controller will then turn on a *duty cycle signal* to the secondary module fuel pump and continue to ramp duty cycle up or down accordingly as required.

When load decreases and the controller see's the primary module requiring a duty cycle of only 80% it will then slowly ramp down the *duty cycle signal* to the secondary module and eventually turn it off.

This cycle will continue as load increase and decreases while keeping fuel pressure at a constant pre-programmed 400 kPa.

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 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)
3) 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.

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
   a) If the vehicle has already been fitted with a KPM 1500HP Fuel Module, you will find the KPM fuel module wiring loom and connector coming through the large rubber grommet on the LH rear floor area. Disconnect the wiring at the fuel module by unplugging the grey Anderson connectors.
      a. Proceed to remove and discard the rest of the previous KPM wiring and relay that leads to the battery (this will be replaced with the new KPM #Th4 PWM wiring supplied).

   b) If the vehicle is now being fitted with the KPM Fuel Module/s you will need to see the fitment instructions on your relevant KPM 1500HP or 2200/2700HP Fuel System.

PWM Fuel Controller Mounting

1) Place your PWM controller in the correct position on the centre rear seat floor (as pictured). While doing so, use a marker pen to mark the 4 drilling holes required.

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.

Fuel Pressure Sensor Mounting

The Bosch Fuel Pressure Sensor is mounted under 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 to fuel rail connection. Simply connect the fuel pressure sensor into this fitting and route the electrical loom (#JD2) from the fuel pressure sensor to the PWM controller.

1) Release fuel system pressure.

2) Disconnect the quick release hose fitting under 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 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 (#JD2) to the Bosch Fuel Pressure Sensor 4-Pin connector.

7) Route the (#JD2) wiring loom section into the vehicle cabin towards the PWM. Connect the #JD2 4-Pin connector to the PWM 4-Pin connector marked *Fuel Pressure Sensor*.

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

PWM Fuel System Controller Wiring

1) Depending on the level of KPM Fuel system you have installed – either KPM1500 HP or KPM2200 / 2700 HP you will need to follow the appropriate wiring diagram below.

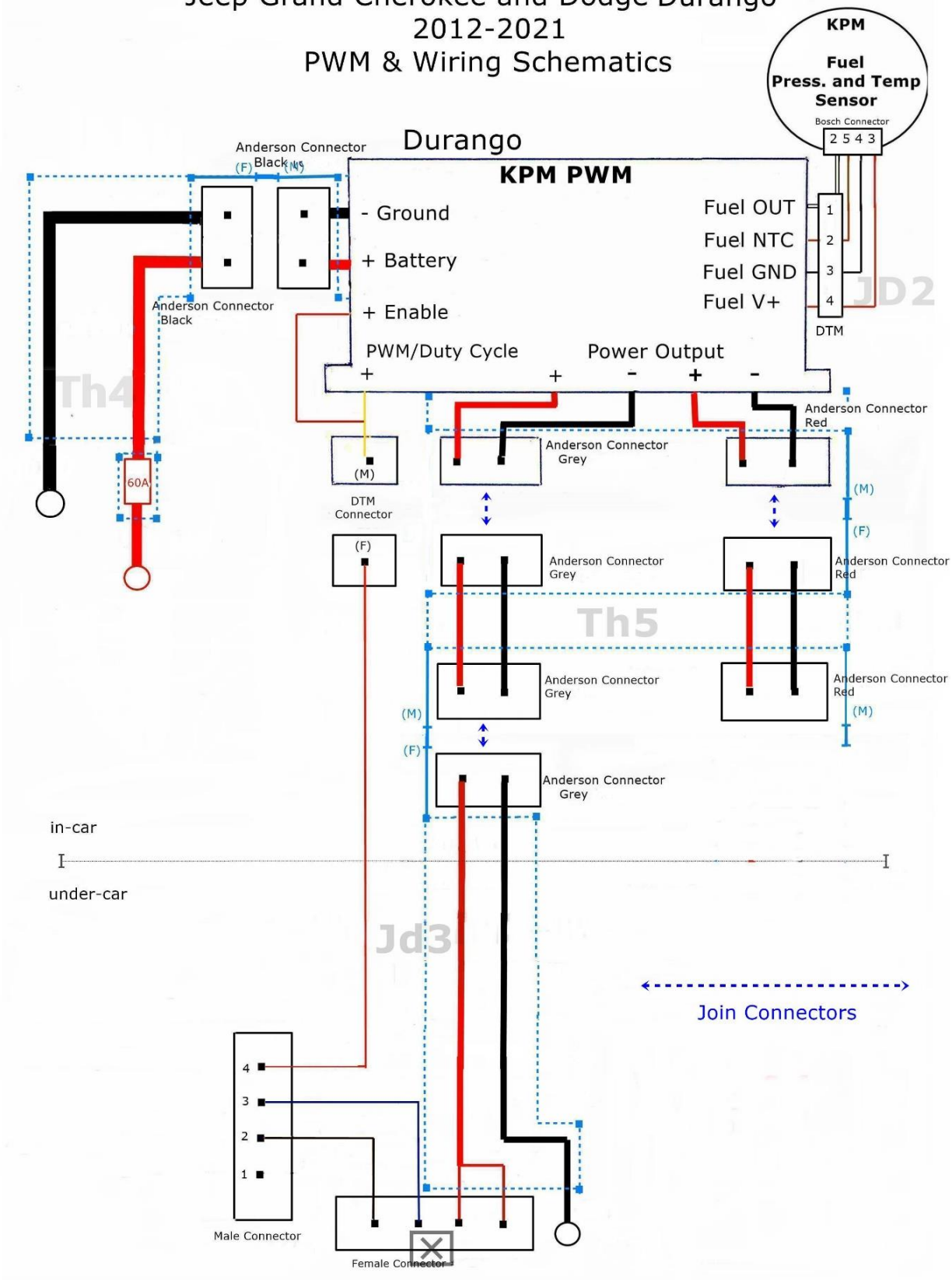
2) All Anderson wiring connectors are color coded to ensure correct connection orientation as per wiring diagram.

3) 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 wiring diagram connectors that link together every section of the supplied wiring are connected as per wiring diagram.

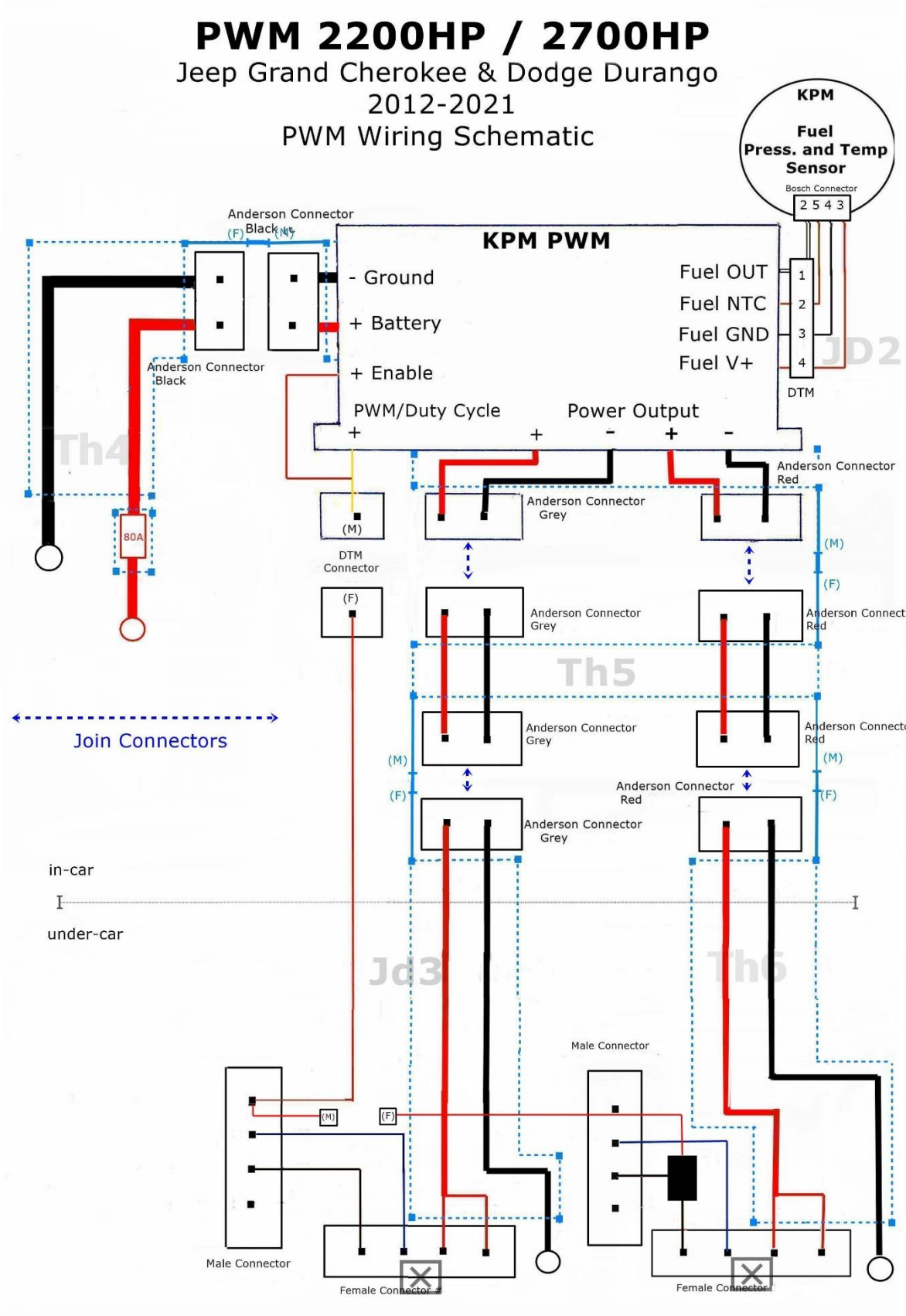
PWM 1500 HP

Jeep Grand Cherokee and Dodge Durango
2012-2021
PWM & Wiring Schematics



PWM 2200HP / 2700HP

Jeep Grand Cherokee & Dodge Durango
2012-2021
PWM Wiring Schematic

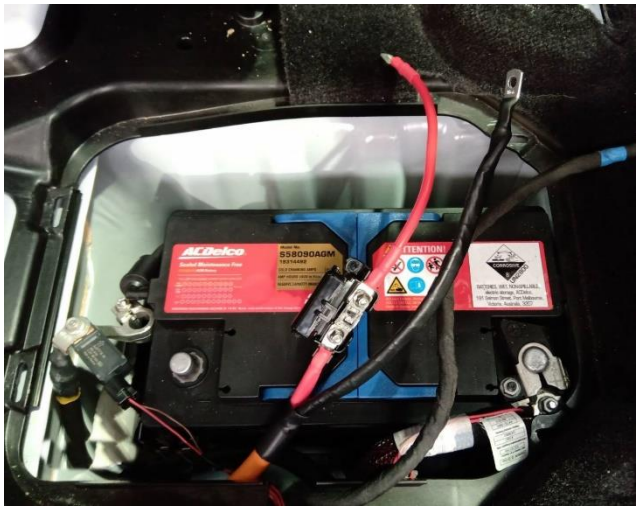


Wire and cable routing

1) Depending on the level of fuel system you have installed you will have either one or two separate fuel modules that require wiring to the battery and PWM Fuel controller.

2) The only difference between a single fuel module wiring and a dual fuel module wiring kit, is that the dual module wiring kit will contain an extra cable (#Th6) which runs from the main cable (#Th5) to the second fuel module.

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



4) Attach the loom wires to the battery as per the circuit diagram below.

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

6) Route the #Th4 wiring loom along the RH trimming and carpet and run along the backseat floor towards the PWM fuel controller connectors.

7) Connect the #Th4 wiring section black Anderson connectors together at the PWM.

8) Connect the #Th5 wiring section grey and red Anderson connectors together at the PWM.

9) Route the #Th5 main wiring loom to the large rubber grommet at the LH rear seat floor area to connect to the appropriate Anderson connector/s as fitted.

10) Connect the #Th5 wiring section Anderson connectors to the corresponding connectors coming out the large rubber grommet.
    - KPM1500 HP Kits - connect grey Anderson only.
    - KPM2200/2700 HP Kits - connect grey and red Andersons.

11) Ensure the large rubber grommet is in position and fitted correctly.

12) Secure and tie down your wiring loom fitment with cable ties as neatly as possible.

Start up and checks.

1) When you are satisfied your 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) 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.