



## DUEL HIGH PRESSURE FUEL KIT

2004.5 - 2007 5.9L CUMMINS | 451003

INSTALLATION GUIDE

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# DUEL HIGH PRESSURE FUEL KIT

5.9L CUMMINS



## TROUBLESHOOTING

Please read and understand all installation instructions before proceeding with the installation. If you have questions during the installation of this product, please contact H&S Motorsports support at [tech@hs-motorsports.com](mailto:tech@hs-motorsports.com) or **(855) 623-4450**.

## INCLUDED PARTS

- |                            |                                       |
|----------------------------|---------------------------------------|
| 1 - New Bosch CP3 Pump     | 1 - Pump Control Module               |
| 1 - HSM Pulley             | 1 - High Pressure Fuel Lines/Fittings |
| 1 - Serpentine Belt        | 1 - Upper Radiator Hose               |
| 1 - Pump Brackets/Hardware |                                       |

**NOTE:** An aftermarket low pressure fuel system is required but is not included with this kit. It is the responsibility of the end user to supply and route an appropriate low pressure fuel system in order for the dual high pressure fuel system to function properly. A basic diagram is included on the last page of this instruction manual to outline a correct low pressure fuel supply and return configuration. This kit may not work with some factory parts installed.

## STEP 1

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Disconnect the negative terminal from both batteries. Drain approximately 3-4 gallons from the cooling system and remove the factory upper radiator hose.

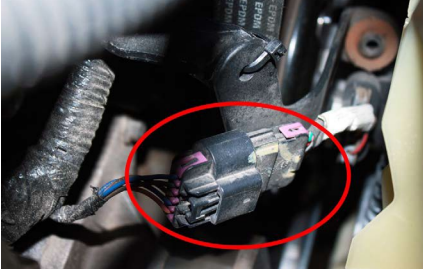


**NOTE:** The kit can be installed without removing the engine cooling fan, but it can be very difficult to access some of the fasteners during installation.

## STEP 2

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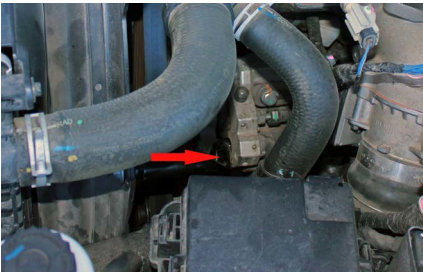
Disconnect the engine cooling fan electrical connection near the bottom-driver side of the fan shroud. Using a cooling fan wrench tool, loosen the cooling fan hub nut. Remove the 4 nuts (2 upper, 2 lower) that anchor the fan shroud to the engine supports and remove the cooling fan/shroud assembly from the vehicle.



## STEP 3

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Remove the bolts holding the driver side upper fan shroud support bracket to the front engine cover and remove the bracket. You may set these parts aside as they will not be re-installed.



## STEP 4

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Using a 1/2" drive ratchet or breaker bar, release the serpentine belt tensioner and slide the belt off of one of the accessories before releasing the tensioner. Remove the tensioner mounting bolt. Remove the tensioner and serpentine belt from the vehicle.

## STEP 5

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Locate the supplied main dual pump mounting plate, supplied idler pulley and spacer, (1) 3/8x16x2.25 bolt, (2) 3/8 flat washers, and (1) 3/8" nyloc nut. Install the spacer into the idler pulley (small end of the spacer will slide into the bearing). Using the 3/8 bolt, two 3/8 washers, and 3/8 nyloc nut, install the idler pulley onto the main dual pump mounting plate as shown and torque the hardware to 35 ft-lbs.



## STEP 6

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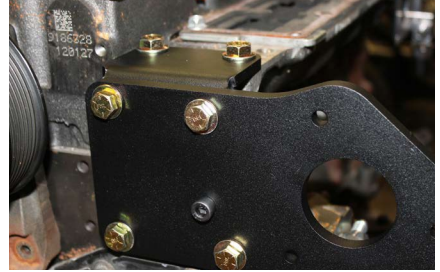
Using one of the supplied M8x1.25x30mm socket head bolts, loosely install the main dual pump mounting plate to the engine timing cover before using the supplied (4) 3/8x16x2.25 bolts, (8) 3/8 flat washers, and (4) 3/8" nyloc nuts to fasten the main pump mounting plate to the engine timing cover also as shown. Leave all hardware finger tight at this time.



## STEP 7

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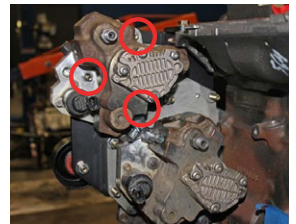
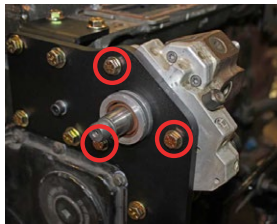
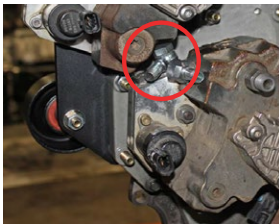
Locate the supplied angle support bracket, (2) 3/8x16x1.25 bolts, (4) 3/8 flat washers, (2) 3/8 nyloc nuts, and (2) M10x1.5x20mm flange head bolts. Loosely install the angle support bracket to the main pump mounting plate and cylinder head as shown (the M10 bolts will be used for the cylinder head side). Torque all (6) 3/8 mounting plate hardware to 35 ft-lbs first, torque the front 8mm socket head bolt to 25 ft-lbs, and torque the (2) 10mm bolts on the cylinder head last to 35 ft-lbs.



## STEP 8

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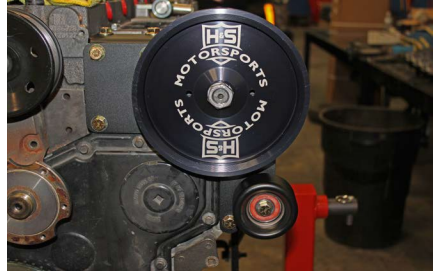
Install the supplied 12mm banjo 3/8" barb fitting on the factory (lower) CP3 as shown to provide clearance for the secondary CP3 pump installation. Using the supplied Bosch CP3 pump, (3) 5/16x18x2.0 bolts, (6) 5/16 flat washers, and (3) 5/16 nyloc nuts, mount the CP3 pump to the main fuel pump mounting plate as shown. Torque the hardware to 25 ft-lbs.



## STEP 9

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Locate the supplied dual fuel pump pulley, pulley retaining nut, and lock washer. Install the pulley onto the CP3 pump using the supplied hardware. Carefully hold the pulley in place by using the holes machined in the pulley or by using another pulley holding tool and torque the nut to 75 ft-lbs.



## STEP 10

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High pressure fuel line instructions: Locate T50 Torx plug on OEM CP3 pump. Remove plug, be very careful that check ball does not fall out. (they will usually remain in place) pressure spring should stay attached to plug. See image. Remove spring from plug and install onto provided Bosch discharge fitting. Double check that check ball remained in pump discharge port and install discharge fitting into OEM pump. Torque fitting to 45ft lbs. Locate HSM high pressure fuel line. Place a dab of clean oil on each end of the line where it seats into the fitting and install it onto both CP3 pump discharge ports. Torque line nuts to 38ft lbs.

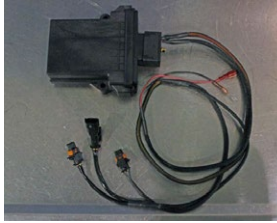


**STEP 10 (CONTINUED)**



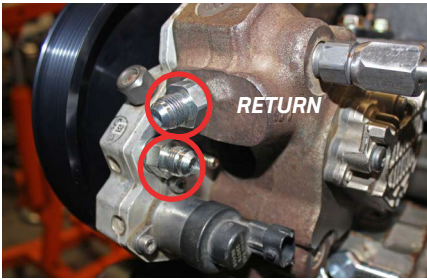
## STEP 11

Unplug the FCA (fuel control actuator) on the factory CP3 pump. Locate the supplied dual pump control module and harness. Find a suitable mounting location for the dual pump control module on the driver side of the engine bay and carefully route the FCA connectors to the FCAs as stated in separate instructions included with the control module. Route and connect power and ground leads as instructed while taking extra care to ensure that none of the control module wiring will come into contact with any hot or moving components.



## STEP 12

Using the supplied rubber coated sealing washers, install the supplied 12mm to 6AN adapter fittings into the CP3 pump as shown. We have supplied 6AN push-lock style fittings to be used when plumbing the secondary CP3 to the vehicle's low pressure fuel supply and return systems. There are many different ways to plumb the secondary CP3 into the low pressure fuel feed and return systems depending on the fuel system configuration. See the last page of this instruction manual for a basic plumbing diagram.

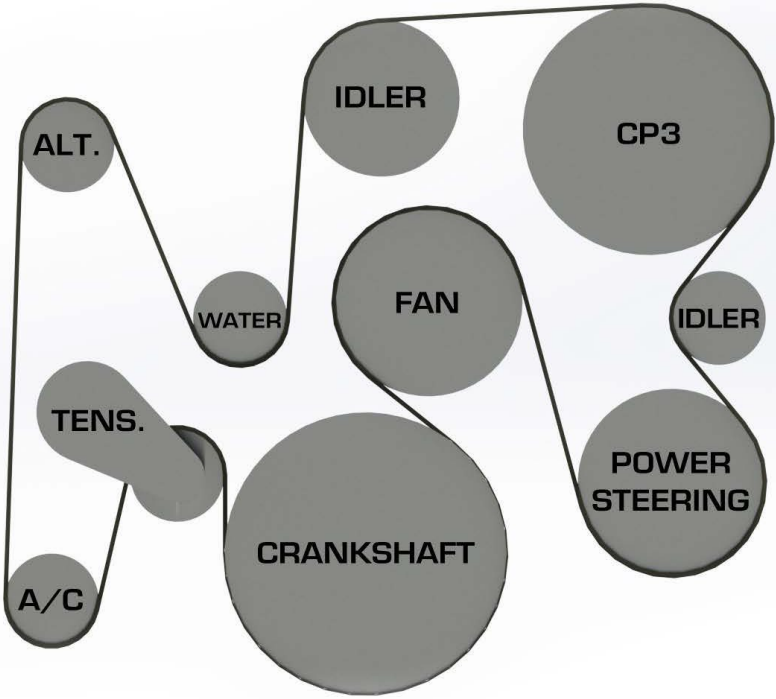




# STEP 13

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Slide the new supplied serpentine belt through the previously removed factory tensioner before re-installing the tensioner and belt on the vehicle. Carefully route the serpentine belt as shown in the diagram below and torque the factory tensioner bolt to 35 ft-lbs. Double-check that the belt is installed properly on all pulleys or damage may occur.



## STEP 14

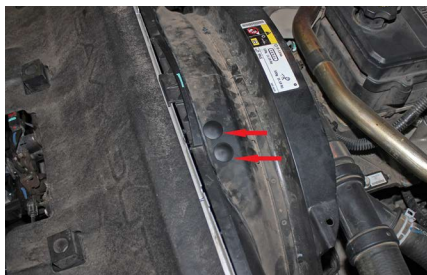
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Re-install the factory cooling fan and shroud in the reverse order of removal. Tighten the cooling fan nut on the fan hub to the factory specification. Re-install the 3 remaining fan shroud nuts (the driver side upper shroud support was removed in a previous step so the 4th nut will not be re-used). Install the supplied HSM Upper Radiator Hose using the factory clamps and re-fill the engine coolant.

## STEP 15

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Locate the (2) supplied 5/16 plastic trim retainers. Drill two 1/4" holes in the fan shroud in the approximate location shown and install the plastic trim retainers. Reconnect the cooling fan connector and zip-tie the wiring harness back to the factory support. Make sure that no wiring or other components will come into contact with the fan!



## STEP 16

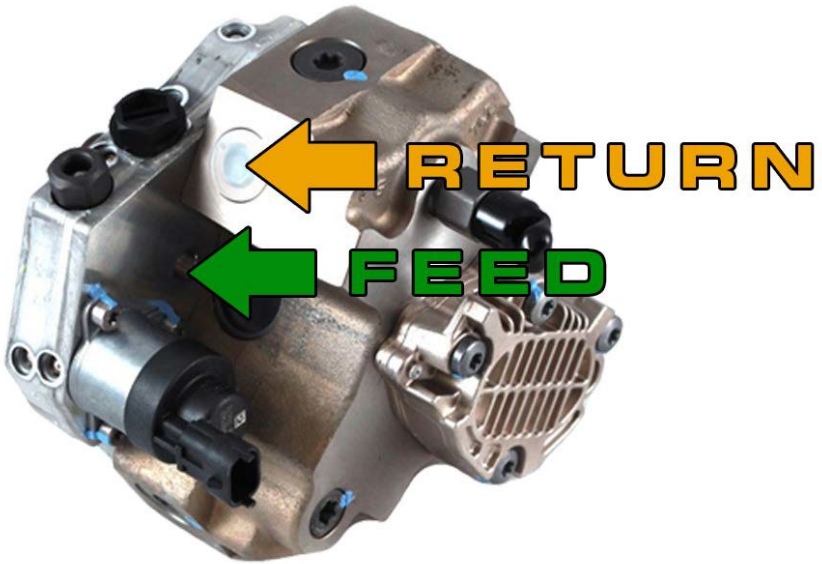
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Double-check that the low pressure fuel supply and return systems are plumbed properly. Reconnect the batteries and turn the key to the RUN position (without starting the vehicle) to prime the low pressure fuel system and check for leaks. After no leaks are detected in the low pressure system, start the vehicle and CAREFULLY check for any high pressure system leaks. Keep in mind that the vehicle may take several cranking attempts before it will start due to the fuel rail being drained during parts installation.

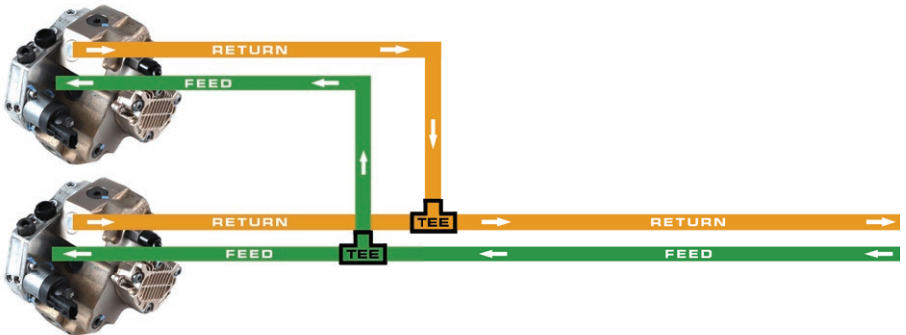
## STEP 17

Bleed and re-fill the cooling system as necessary. Test drive the vehicle to ensure that everything is operating properly. Depending on other vehicle modifications, some custom engine tuning may be required for optimal performance.

Enjoy your H&S Motorsports Dual High Pressure Fuel Kit!



### LOW PRESSURE FUEL SUPPLY AND RETURN BASIC PLUMBING CONFIGURATION





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