

## PTO GENERAL GUIDELINES

- The Ram 3500/4500/5500 Chassis cab models equipped with diesel engines that have the PTO prep option (LBN) have the capability of mounting and controlling a PTO.
- The gasoline powered models do not have PTO capability.
- The Aisin AS69RC automatic transmission can use devices up to 45HP and 250 ft lbs torque. While the model, the number, and HP/torque capability of the transmission have increased, the Chelsea 270 and Muncie CS6 models continue to mount to the right side of the transmission as in previous years.
- The G56 manual transmissions are limited in power output only by the PTO manufacturers' maximums. Chelsea 442 (deep mount) series fit this transmission, however on 4x4 models this PTO is very close to the front driveshaft. Muncie Alpha series fits this transmission.
- For 2012 a left hand side PTO (option code LBV) will be available as a factory option on 4x2 chassis cab models (diesel only). This should allow for easier PTO installation on 4x2 models and allow for the shaft driven applications. In this position, Muncie model FA6B is the only PTO that fits. However Chelsea is creating a model as well so contact them for the latest information.

### Pump sizes

- The automatic transmission models have been test fit with 19 GPM rated single pumps and tandem 13GPM rated pumps. While these larger pumps have limited clearance to the exhaust system and it has been mentioned as a concern, it should be noted that the exhaust in the PTO area is a double wall pipe which provides significant insulation. In fact, in our testing in over 100 degree Fahrenheit ambient temperatures we never exceeded 200 degrees F on the PTO pump or hoses.
- The manual transmission models are as follows: The 4x2 models have no particular packaging limitations with respect to direct mount pumps. The 4x4 models are limited by the location of the front driveshaft to approximately a standard 11 GPM rated pump (although larger pumps may have been successfully fitted in the field). However, some customers have had success using bent axis piston pumps (mounted forward) to get substantially higher flows.
- If you have specific PTO and pump fitment questions and can provide the actual PTO and pump combination, we can test fit it and provide pictures and instructions on how to install your specific combination.

### PTO Limitations

**Please read this information carefully and call us with any questions before you order a vehicle so you understand the specific capabilities of our PTO system.**

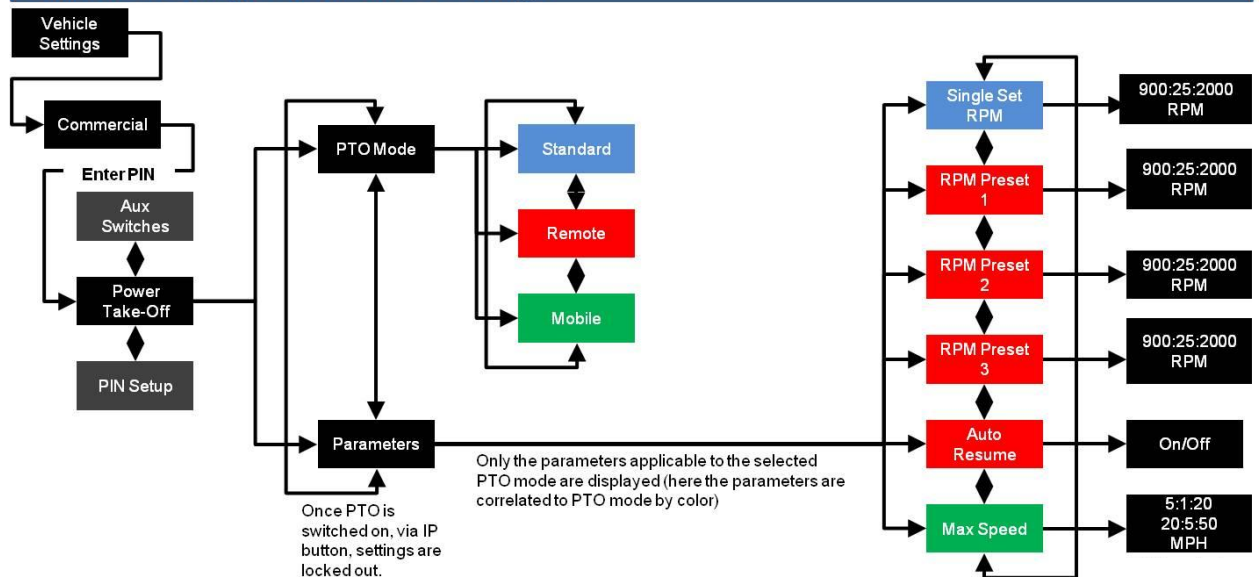
- The Automatic transmission PTO is turbine driven not engine driven. What this means is that the PTO will work only with the stationary mode in park, or in mobile mode with the vehicle moving at approximately 7 mph and above or in neutral. Because of this the PTO system is not a suitable system for vehicles like: snow plows, autoloader wreckers, or dump trucks if they are used to dump and spread at a crawling speed. These vehicles are more effective with an engine driven 'clutch pump' type hydraulic pump. Alternatively, Parker-Chelsea makes a product called Stored Energy Management System (SEMS) that allows such applications to function.
- The manual transmission currently has the capability to support a split shaft PTO. Approximately, mid -year the automatic also will have this capability. The EVIC screen in the center of the instrument cluster will have a split shaft programming function that will program the vehicle to shift to direct drive (4<sup>th</sup> gear) and hold without upshifting. This mode will require an electrical connection to the split shaft unit confirming that the rear driveshaft is disconnected.



Below is the new PTO programming menu contained within the Electronic Vehicle Information Center (EVIC). The EVIC is located between the Speedometer and Tachometer. You will be able to access the PTO functions by scrolling to the commercial settings and then to PTO.

- The vehicle will be factory set to stationary single mode with driver adjustable PTO speed. If this is the mode that is needed no change in settings is required.
- The factory (default) pin setting is 0000
- If you require a single set speed, scroll through the PTO/Standard menu to Single Set RPM and set your speed.
- If you require this speed or other settings to be 'locked' so that only approved people can reset the settings. Change the 4 digit PIN code by entering the PIN setup menu. Now only people who have the PIN code can change the settings.
- Once you have the correct modes programmed, you can proceed to the quick start menu on the next page.
- Settings must be made with the key in the run position but with the engine off
- **NOTE: You must use remote mode with an aftermarket switch when using Hard Wired Remote Start/Stop**

### Commercial Settings: Power Take-Off Settings

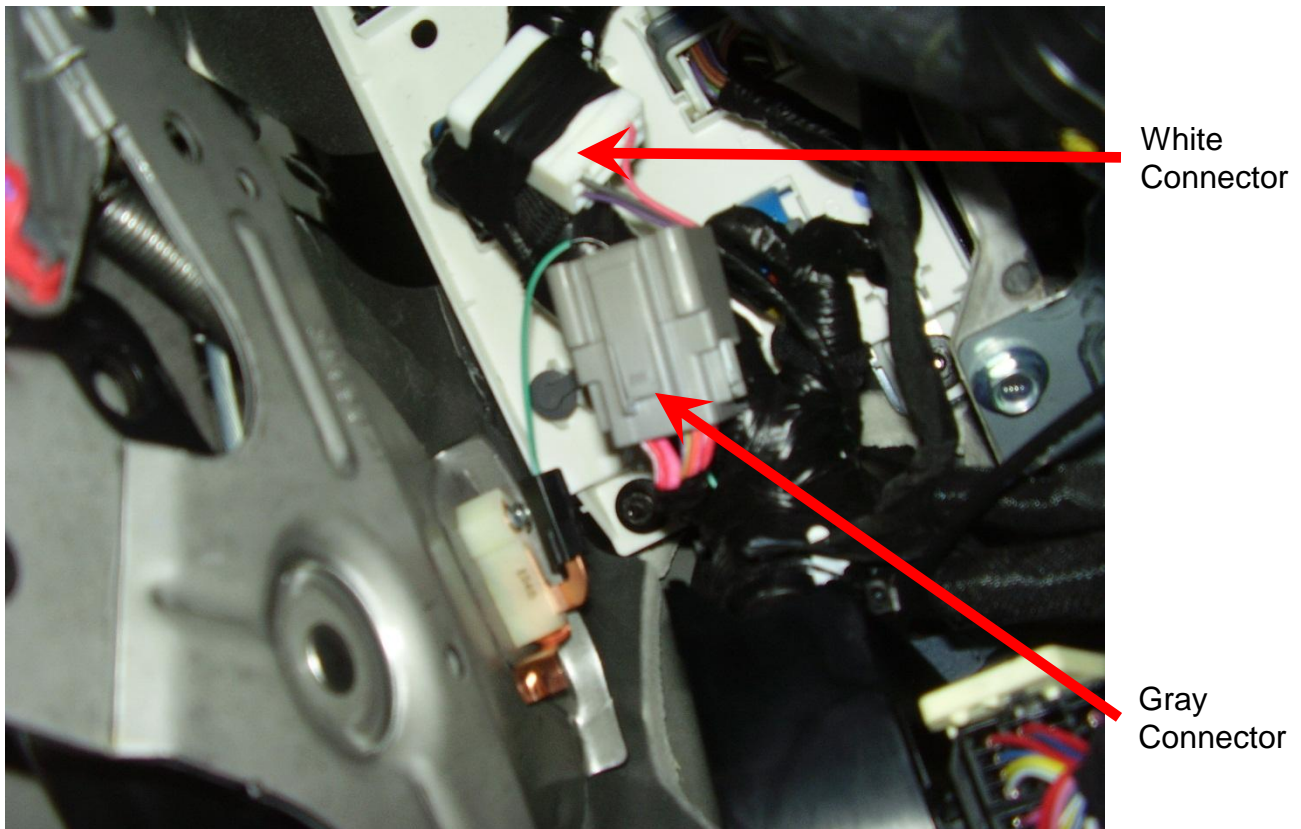


## PTO Quick Start Information

This section will give you specific instructions on how to wire a PTO on the 2013 3500/4500/5500 models. The information is tailored toward those familiar with PTO installation on the 2007 to 2012 but can be equally helpful to anyone installing a PTO.

### Wire Locations

There are two connectors under the dash which are used. They are the same connectors as previous years, but their locations are altered.



Both of these connectors are located behind the VISM module towards the front of the vehicle. The VISM module is the black plastic module next to the park brake bracket. The view above shows the connectors on a vehicle that does not have a VISM module as it would block the view of these connectors. The white connector is 'tear taped' in place and can be accessed by pulling the connector and tearing the tape without pulling on the wires themselves. The gray connector is tie wrapped in place so the tie wrap must be cut to access the gray connector.

The white connector contains the following circuits:

1. Z907 (Black) PTO switch return **Note: V937 (Violet/brown) does not function for 2013.**
2. F425 (Pink) Remote PTO switch. Connects to Z907 via the upfitter added switch. For remote/multi-speed mode only.

The mate to this connector is the smaller black connector that comes in the upfitter kit plastic bag.

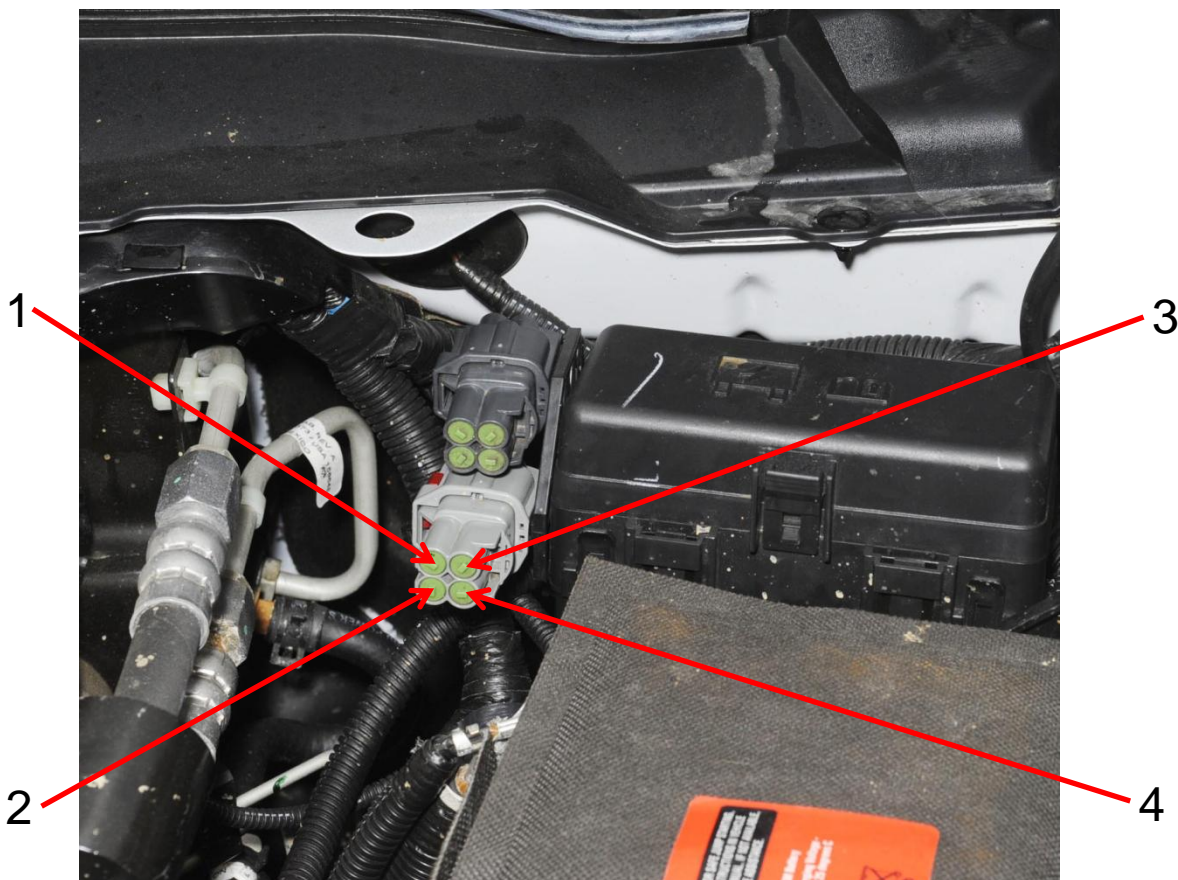
The gray connector contains the following circuits.

1. F922 (Pink/yellow). This typically used for 12V+ ignition feed power for a PTO indicator light if you are not using the in dash switch.
2. G425 this is the pass through wire that comes from the under hood wire you will connect to the pressure switch.

There is a gray mating connector also in the upfitter kit plastic bag.

**Note: The ground signal from the pressure switch must be connected to circuit W708 (orange/brown) located on the brown connector of the VISM. If circuit W708 does not see a ground signal, the PTO will turn off in 30 seconds.**

See the VISM section for additional instructions.





The light gray connector under the hood shown in the figure above (below the dark gray connector) behind the auxiliary PDC contains the following connections. The Pin numbers below are molded into the surface of the connector. The wires that plug to this connector are also in the upfitter kit plastic bag.

1. Not used for 2013.
2. F928 (pink /yellow) Switched 12 v output that connects to the hot shift solenoid.
3. Z907 (Black) ground
4. G 425 (violet/yellow) PTO indicator light feed. This wire connects to the PTO pressure switch and feeds through the dash to the gray under dash connector mentioned above.



**PTO Operation**

The 3500/4500/5500 Ram Chassis Cab vehicle, when equipped with either the automatic Aisin 6spd or manual G-56 6spd transmissions, will allow for an aftermarket upfit with a transmission driven PTO (power take off). The customer will have the ability to operate the PTO in either a “stationary” or “mobile” mode. Under normal operation the vehicle will go to a 900 rpm when PTO is engaged. By utilizing the cruise switches the idle speed can then be adjusted to between 900 and 2000 rpm’s.

**Stationary Mode**

This feature interacts with the transmission to utilize an auxiliary PTO to drive equipment. Activated by a switch inside the cab, this feature operates only when the vehicle is stationary.

Once active, the engine speed increased by holding the RES ACCEL button on the steering wheel or decreased by holding the COAST button.

This is the factory programmed setting. If you need a single set speed, you will now be able to program it (and disable the cruise switches) via the Electronic Vehicle Information Center (EVIC) screen in the center of the cluster.

Stationary PTO is available only when the vehicle is stationary. When the truck is equipped with an automatic transmission, it must be in Park and the service brake must be released and functional. When the truck is equipped with a manual transmission, the Parking Brake must be Set and the service brake must be released and functional

To operate the PTO in this mode the vehicle must meet the following conditions:

- Be in “park” position ( vehicles equipped with automatic transmission)
- PTO switch has been activated
- Parking brake applied (vehicles equipped with manual transmission)
- Clutch not depressed (clutch interlock switch)
- Vehicle must be running
- No transmission, engine, accelerator, brake or clutch switch faults present
- PTO must be correctly installed using the vehicle provided circuits

To operate the PTO via a remote switch the customer must make sure the above conditions are met. It is vital for proper operation that the PTO and remote have been installed correctly paying special attention to ensure the vehicle provided wiring has been connected properly. This is the responsibility of the installer of the PTO and switches/remote system. It is the responsibility of the PTO manufacturer to ensure that their electrical (switches and remote) system is compatible with the vehicle’s electrical architecture and software functionality.

**Mobile Mode**

Mobile mode allows for use of the PTO when the vehicle is in motion. This feature, when activated by the menu available on the Electronic Vehicle Information Center (EVIC) screen in the center of the cluster, will allow you to enter mobile PTO mode when you press the PTO switch on the dash.

When this feature is selected stationary PTO and Remote PTO features are not available.



To operate the PTO in this mode the vehicle must meet the following conditions:

- PTO switch has been activated
- Vehicle must be in “park” position (vehicles equipped with automatic transmission)
- Parking brake must not be applied
- Clutch not depressed (clutch interlock switch)
- No transmission, engine, accelerator, brake or clutch switch faults present
- Vehicle must be running
- PTO must be correctly installed using the vehicle provided circuits

The customer may choose to use the PTO while the vehicle is moving. To do so the PTO function must be activated prior to taking the vehicle out of “park”. This is accomplished by activating the PTO on/off switch. At this point the customer may place the vehicle in a forward or reverse gear and have PTO operation.

The PTO will also function in park and neutral but without an increase in idle speed. However, the accelerator pedal can be used to increase PTO speed. Mobile mode does not provide the exact same capability as a ‘live drive’ i.e. you cannot have PTO capability at zero vehicle speed in drive. However some customers have had success with shifting the vehicle into neutral and allowing the vehicle to coast.

To disengage PTO operation and return to “standard vehicle operation” simply turn the up fitter provided on/off switch to the off position.

### **Remote Mode Features**

Remote mode allows the use of an aftermarket auxiliary switch to actuate the PTO. Presumably this will be from a location other than the cab of the truck, or some automated/relay driven method to turn on the PTO is required.

Remote PTO can be calibrated for one to three selectable engine speeds.

Remote mode also is the only method that accommodates multiple PTO speeds. Up to three different PTO speeds can be programmed. These speeds are programmed via the Electronic Vehicle Information Center (EVIC) screen in the center of the cluster (see page 2). The circuits that enable these multiple speeds are contained in the Vehicle System Interface Module (VSIM). The VSIM module is located under the dash on the driver’s side. The connecting wires are contained in the upfitter wiring kit and VSIM wiring kit. Click here for VSIM section.

Remote PTO feature has a higher priority than Idle Up. If the Remote PTO feature is active the Idle Up switches are ineffective. The Idle Up or Stationary PTO feature cannot be activated until the Remote PTO relinquishes control

To operate the PTO in this mode the vehicle must meet the following conditions:

- Be in “park” position ( vehicles equipped with automatic transmission)
- Upfitter provider (on/off) switch has been activated
- Parking brake applied (vehicles equipped with manual transmission)
- Clutch not depressed (clutch interlock switch)
- Vehicle must be running
- No transmission, engine, accelerator, brake or clutch switch faults present
- PTO must be correctly installed using the vehicle provided circuits



**Various features provided by the Cummins module**

**NOTE:** these features must be enabled by the dealer

Remote Throttle and Remote Throttle Switch

This feature allows the use of a 0-10K or 0-100K potentiometer to function as a remote throttle. By connecting the circuits K400, F856, and K128 to the each end and the movable center leg respectively, the potentiometer will function as a remote throttle. These circuits are located on a connector on the driver's side of the transmission bellhousing area. The wiring and for this and two functions below as well as schematics are contained in the upfitters wiring kit delivered with every vehicle. The dealer must enable this feature. Circuit K129 must be connected to circuit V937 to turn on this feature.

Accelerator interlock

This allows the accelerator to be locked out when activated. This feature is often used in conjunction with remote PTO or remote throttle. While active it disables the vehicles accelerator pedal typically for safety reasons. This feature is activated by connecting circuit K 810 to V937 and must be enabled by the dealer.

Switched Max Operating Speed

This feature selects a lower maximum engine speed when the switch is on (closed to ground). The lowered engine speed is can be changed. This feature is enabled by the dealer who also will set the maximum speed you require.

Switch Return

Electrical return/ground for switch circuits.

J1939 Interface

Cummins provides this interface to "gate" certain CAN messages for customer use. It is an industry standard three way connector located underhood, on the driver's side of the engine near the connection to the intake manifold. Messages included are vehicle speed, engine speed, park brake on/off, system voltage – filtered, brake switch status, clutch switch engaged, wait to start lamp status and coolant temp.





## PTO Circuit Definition Chart

### Location E Transmission Bellhousing Drivers Side

The following chart is provided to assist in correctly interfacing the PTO with the vehicle:

Circuit Name	Type/Gauge/Color	Circuit Functionality	Description	Usage
F856	18T - YL/PK	5V engine sensor feed	5 volt pwr supply to the remote potentiometer (remote's control power circuit). Supplied by the engine controller	Remote throttle control
K400	18T - BR/VT	accel pedal position sensor	Remote's ground (ground to the potentiometer of remote). Supplied by the engine controller. Do not hook to other grounding location	Remote throttle control
K128	18T - DB/LG	remote throttle signal	Remote signal sent to the engine controller. Signal from the remote's potentiometer.	Remote throttle control
K129	18T - DB	remote throttle switch	On/Off switch provided by customer to "turn on/off remote function. Remote switch closes to ground.	Remote throttle control
K119	18T - LG/BK	maximum operating speed switch	Feature selects a lower maximum engine speed when switch is "on". Switch closes to ground. Customer supplied switch.	Max operating speed switch
K810	18T - VT/DG	Accelerator interlock switch	Disable accelerator control of engine by closing an operator installed switch. This switch closes to ground.	Customer supplied switch
F425	18T - PK	Remote PTO Switch	Customer supplied remote PTO on/off switch. Switch closes to ground.	Remote PTO
V937	18T - VT/BR	Non-Functional for 2013		



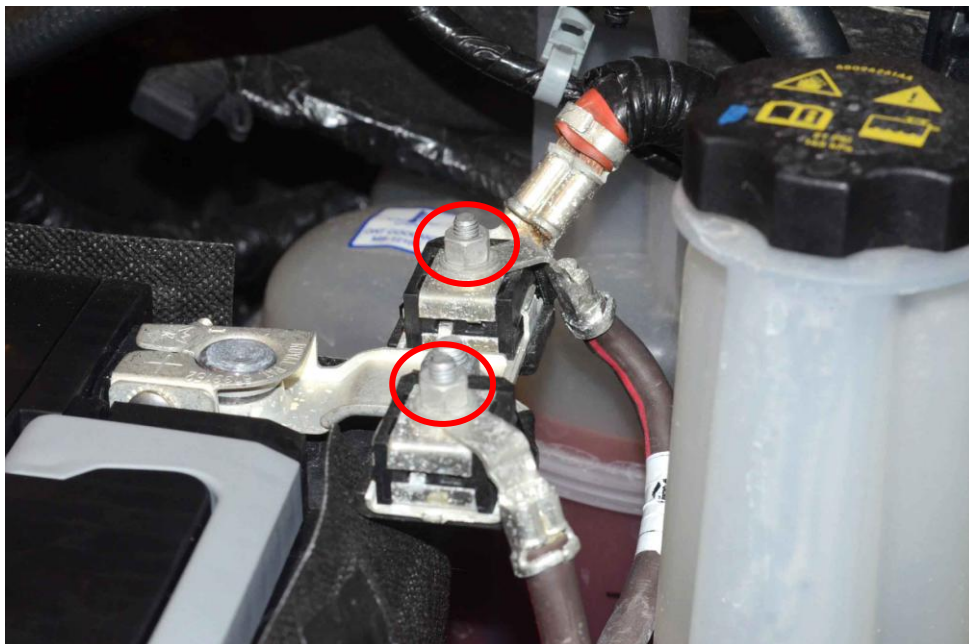
## Left (Driver) Side Battery

Do not install wiring / terminals of any kind at this location



## Right (Passenger) Side Battery

Do not install wiring / terminals of any kind at these locations



DRAW PER FUSE RATING	
FUSE RATING	MAX ALLOWABLE CONTINUOUS CURRENT
20A	14A
25A	17.5A
40A	28A

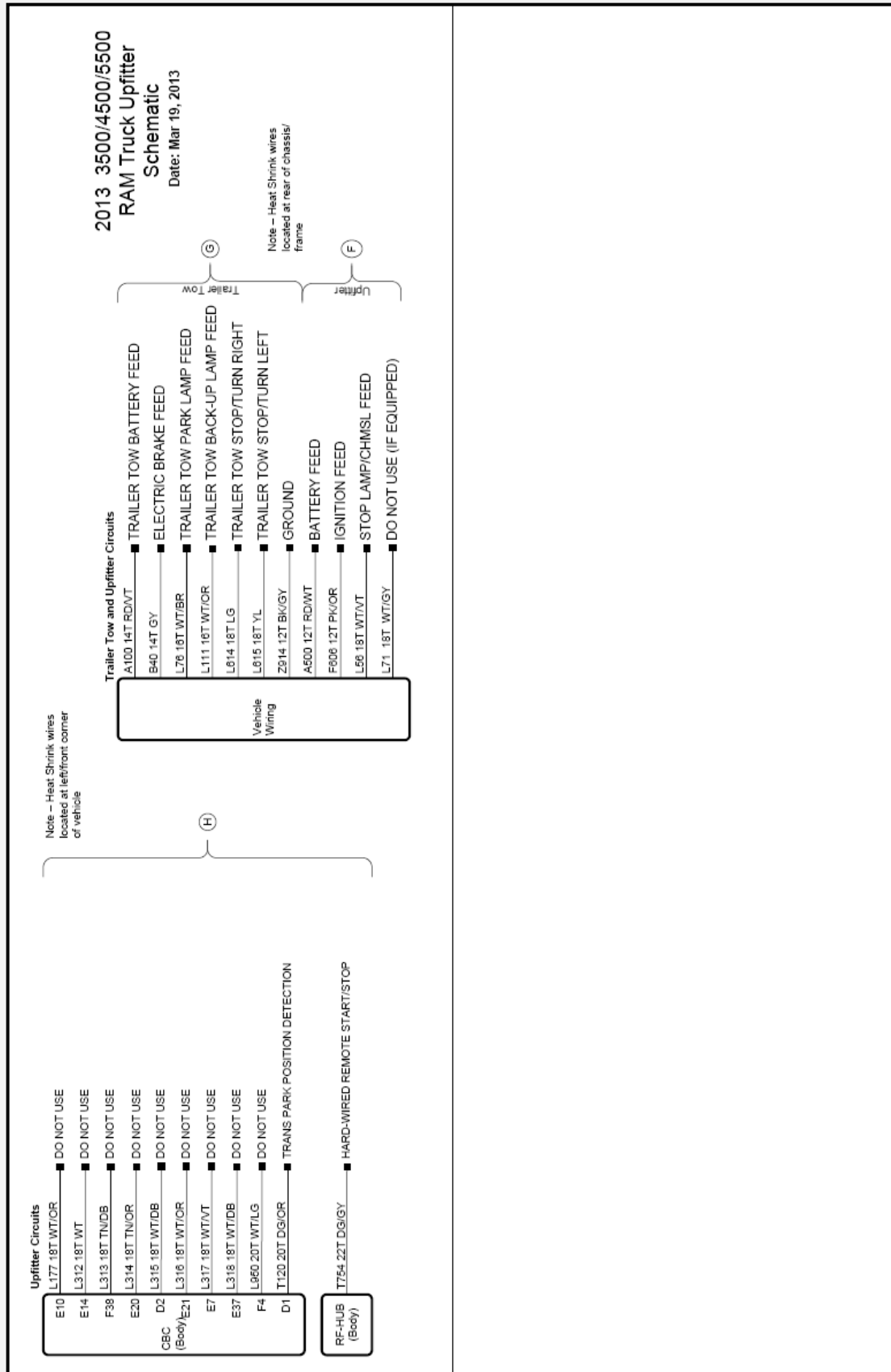
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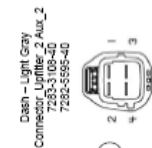
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## Upfitter Jumper Kit 68049501AB

2013 3500/4500/5500  
RAM Truck Upfitter  
Schematic  
Date: Mar 19, 2013



(B)

**Note** - Eaton Circuit can handle maximum continuous current of 25A. Maximum continuous load for AUX Switches is 133A. The Upfitter Jumper Kit is responsible for passing the current in the correct location depending on the actual load.



(B)



(E)

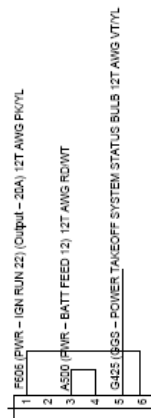
K400 (ENG - ACCEL PEDAL EGS SWR RTN) 20T AWG BRVT  
F555 (ENG - SV ENGINE SNIER FEED SEC) 20T AWG YLPK  
K128 (ENG - REMOTE THROTTLE SWITCH SIGNAL) 20T AWG DBLG  
K103 (ENG - REMOTE THROTTLE SWITCH RTN) 20T AWG DBLG  
K119 (ENG - MAXIMUM OPERATING SPEED SWITCH) 20T AWG LGSK  
K510 (ENG - ACCELERATOR INTERLOCK SWITCH) 20T AWG VTGG  
F425 (PWR - POWER TAKEOFF SWITCH) 20T AWG PK  
V937 (SCS - SPEED CTRL SW RTN) 20T AWG VTBR



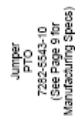
(D)

V937 (SCS - SPEED CTRL SW RTN) 20T AWG VTBR - DO NOT USE V937 CIRCUIT  
F425 (PWR) 20T AWG PK

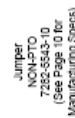
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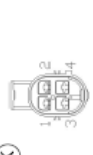
(D)



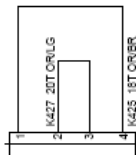
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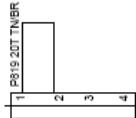
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(K)



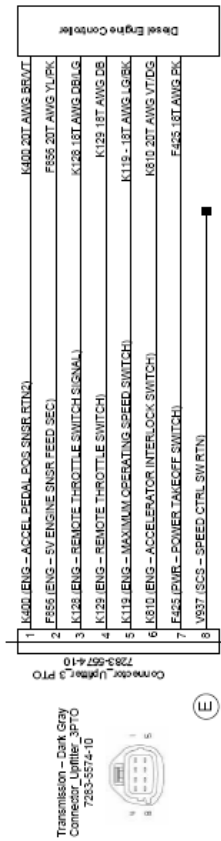
(K)



(K)

2013 3500/4500/5500  
RAM Truck Upfitter  
Schematic  
Date: Mar 19, 2013

Circuit Definition  
**PTO Connector and Pin-Out**  
(Transmission Bellhousing, Driver's Side)



Exterior Lighting Modifications/LED

If the rear stop/turn incandescent bulbs are to be replaced with LED's, the rear bulb out detection must be disabled. Refer to the "Exterior Lighting Modifications/LED's" chapter for complete instructions.

[www.rambodybuilder.com/2013/docs/cc/dddpextitmod.pdf](http://www.rambodybuilder.com/2013/docs/cc/dddpextitmod.pdf)



## Cab Chassis Upfitter Kit Detail 68209998AB

2013 3500/4500/5500  
RAM Truck Upfitter  
Schematic  
Date: Mar 19, 2013

KIT PN 68209998AB

- \*Upfitter Connection Jumper
- \*8 – 12 GA Circuits for AUX Connectors 1 & 2
- \*8 – 20 GA Circuits for the Transmission PTO Connector
- \*2 – PTO/Non-PTO Jumper Connectors

The Vehicle has been equipped to ease the insulation of a PTO by allowing convenient access to circuits needed without having to splice into the main harness. Two (2) of the upfitter connections are beneath the steering wheel near the engine compartment groundmet (LT Side).

Located left of Main PDC Box and along the fender inner (location K) is a dark gray jumper connector that allows the vehicle function to switch between PTO and non-PTO operation. The required jumpers are located in the Upfitter Kit. Verify proper jumper usage by reviewing jumper design on previous pages.

In the rear of the vehicle, you can find all required T-TOW circuits, and two (2) additional power circuits (1 Battery and 1 Ignition)

In the Engine compartment you will find two (2) (Light Grey and Dark Grey) Upfitter connectors (location B) which allow easy access to the switch bank and fuse box outputs, mating terminated circuits are included in the kit as needed.

On the upper left (driver's) side of the transmission you will find one (1) Upfitter connector (location E) which allows easy access to the PTO functions. Mating terminated circuits are included in the kit. Use as needed.

The Battery line to the AUX PDC is protected by a wire fuse link.

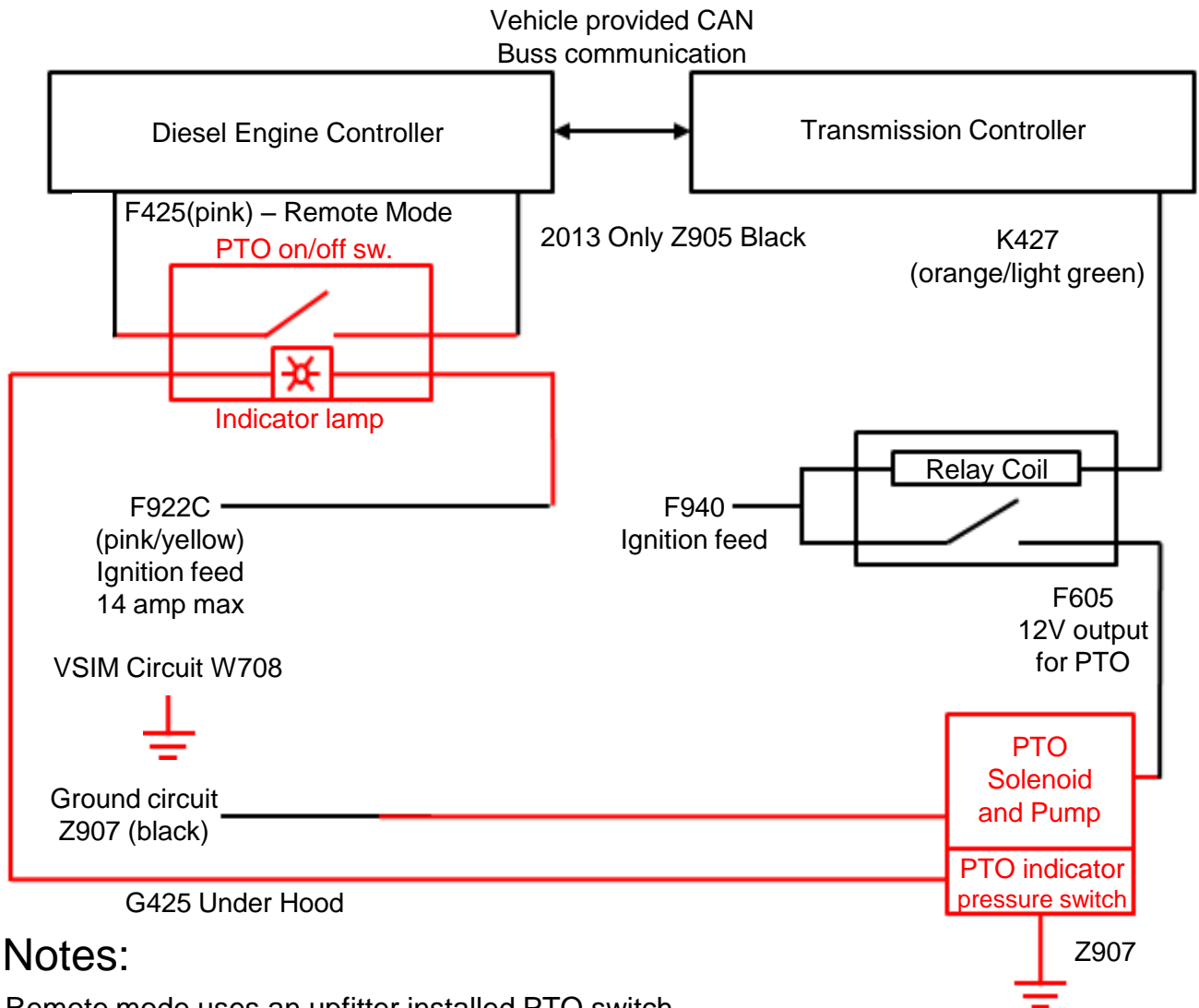
Warning about adding auxiliary batteries:

An auxiliary battery may be used, however a battery isolation unit is not supplied and the auxiliary battery may discharge the truck battery when the engine is not running.

Ground Studs on the chassis/frame may be utilized as a grounding point with a 50A Maximum total load, see "Vehicle Ground Locations" section in the RAM Body Builder Guide, Electrical/Wiring Information



## 6.7L Diesel with Aisin Automatic Transmission Remote Mode



## Notes:

Remote mode uses an upfitter installed PTO switch  
Z905 and F425 are circuits that can be found located under the dash just in board of the park brake pedal

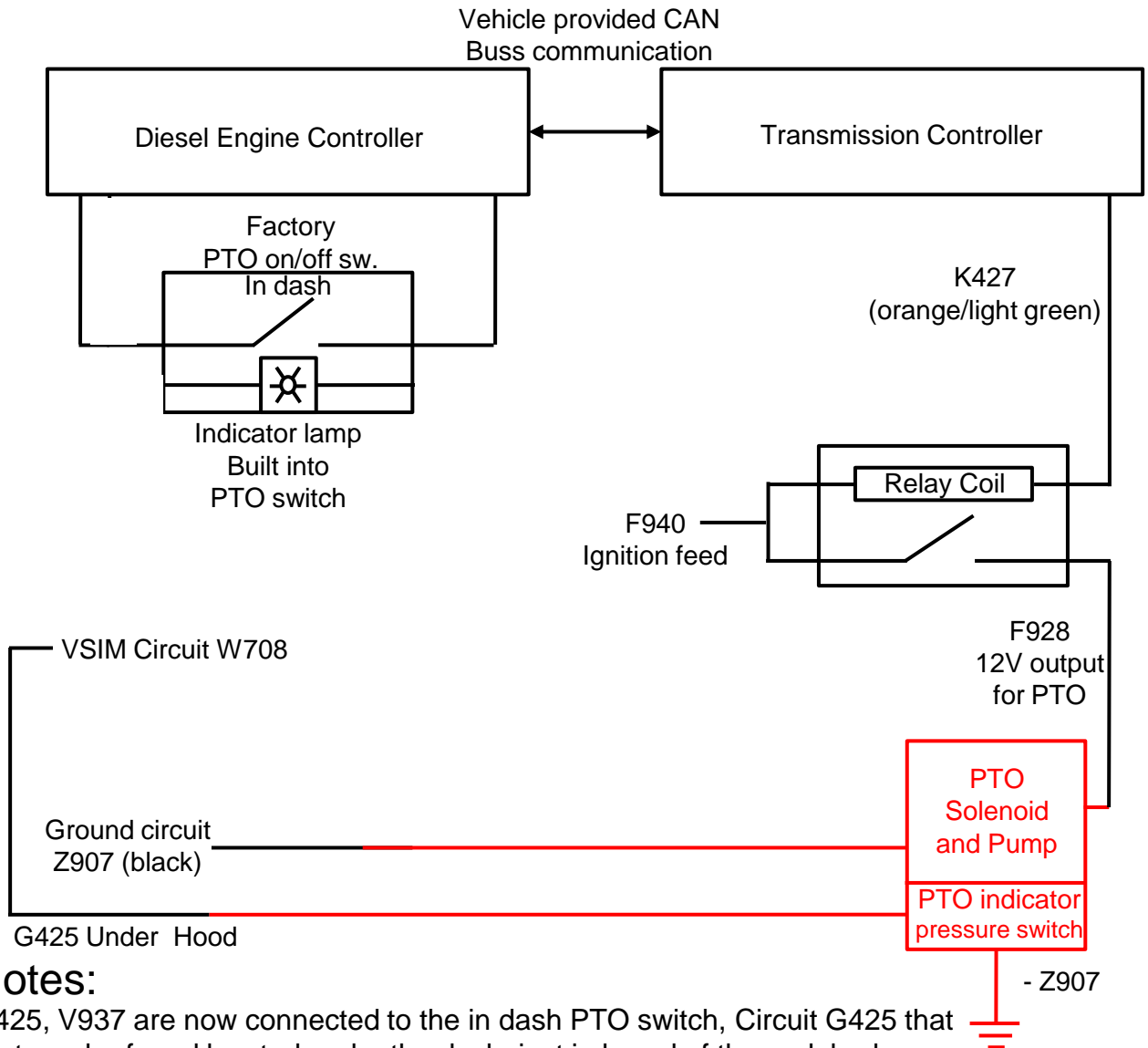
F922C and Z907 can also be found in the same area described above

All other wiring, switches, relays and other components will need to be provided by the PTO installer. Anything in black comes with the truck

Do NOT externally ground circuit V937 to anything

You **MUST** permanently ground VSIM circuit W708  
See the VSIM Circuit Definition for more information

## 6.7L Diesel with Aisin Automatic Transmission in Cab Stationary and Mobil Mode

**Notes:**

K425, V937 are now connected to the in dash PTO switch, Circuit G425 that can be found located under the dash just in board of the park brake pedal. Must be connected to VSIM circuit W708

F922C and Z914 can also be found in the same area described above

All other wiring, switches, relays and other components will need to be provided by the PTO installer. Anything in black comes with the truck

The PTO switch is assumed to be installed inside the cab

Do NOT externally ground circuit V937 to anything

You **MUST** connect circuit G425 to VSIM circuit W708

See the [VSIM Circuit Definition](#) for more information

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## PTO Installation Alternative

In addition to the current method of PTO installation from beneath the vehicle, an alternative method has been developed that allows the installation from above by removing the PTO patch panel in the floor. The instructions are as follows.

1. Remove the rear package tray located behind the seat from the vehicle.



2. Unbolt the seat and move it to the rear of the cabin where the package tray was removed.
3. Remove the sill guards (rocker panel covers) passenger side to allow the vinyl floor mat to be lifted. They are removed by prying straight up to disengage metal clips.



4. Lift the floor mat and fold it rearward and toward the drivers side to expose the patch panel



5. Remove the fasteners and sealer from around the patch panel. Cut away the sound deadener pad to expose the transmission PTO access.



6. You are now able to install and assemble the PTO and pump through the opening. Note: larger pumps must be inserted through the hole and moved toward the rear of the opening before installing the PTO. The pump is then slid forward to connect to the installed PTO.

7. To assemble, reverse the above procedure using RTV to reseal the PTO floor pan patch panel.