



# PTO INSTALLATION

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**2007 & Later Dodge and Sterling Bullet Chassis with Automatic Transmission**



Supplement instructions; read Muncie Power PTO instructions found in IN84-03 PTO Operator's Manual completely before beginning work. Do not work on the vehicle with hot exhaust, let cool several hours before beginning PTO installation. See additional WARNINGS inside front cover of IN84-03 PTO Operator's Manual.

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**Muncie Power Products, Inc.**



## FOR RAM TRUCK 2013 AND LATER WITH AS69RC (A467) AISIN AUTOMATIC TRANSMISSION

The 2013 Ram Chassis Cab with Aisin Automatic transmission model AS69RC (Aisin #A467) is offered with a right side 6-bolt PTO opening. Chassis needs to be ordered with option code LBN (PTO mounted on the right side of the transmission). Installation of the Muncie CS6 Series PTO is available for this opening. The installation process for the PTO is the same as the installation on the previous model years with the exception of the wiring. Ram Truck order option XXS is required for PTO operation with the Vehicle System Interface Module (VSIM), and is included when ordering the PTO options.

Also, for model year 2013 and later there is an option for a left side PTO opening. This opening requires the special order option code LBV (PTO mounted on the left side of the transmission), when the chassis is ordered and cannot be added after vehicle build. When the left is opening is ordered the right side opening is not available.

Additional information on this chassis and PTO options is available from Ram Truck website: <http://www.rambodybuilder.com/2014/cc/ccmo.pdf>

### CS6B-184 SERIES PTO INSTALLATION FOR THE RIGHT SIDE OPENING

1. The PTO opening can be accessed by removing the rear package tray behind the seat. The seat can be unbolted and slid rearward. Remove the sill guards from passenger side and lift the floor mat. Locate the access panel under the floor mat.



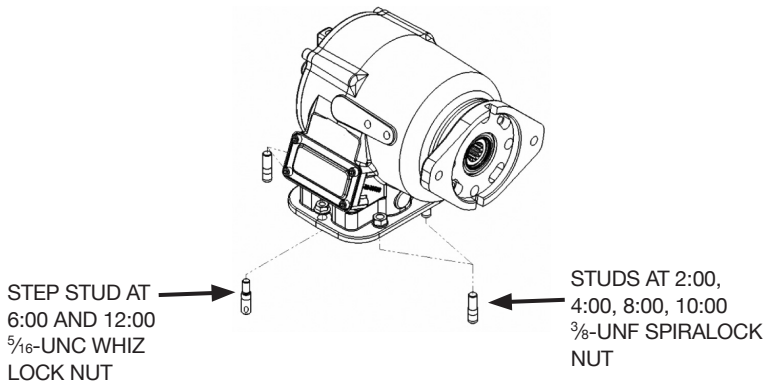
2. Remove this access panel to reveal the right side PTO opening. If you are installing a large pump, then insert it first into the hole and rest it on the exhaust until the PTO is installed.



Remove the cover plate from the transmission taking care to avoid possible hot oil coming from the plate and opening.

Clean the pad of any debris or sealing material.

Locate the PTO mounting kit and install the two step studs into the 6 and 12 o'clock mounting holes. Install the 4 other studs into the transmission pad taking care to limit the depth of the stud installation.

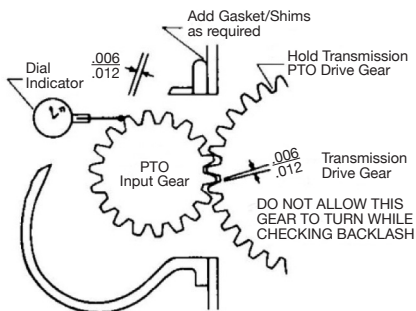


Place the PTO gaskets over the studs  
 Place the PTO onto the studs and the PTO pad. Using the wiz lock nuts mount the nuts onto the step studs as shown in above. Torque to 18 ft.lb.  
 Using the spirallock nuts install the nuts onto the 4 remaining studs.  
 Tighten the nuts to 40 ft.lb.

3. Remove the inspection cover, as shown.



4. Check the backlash between the transmission gear and the PTO input gear. The backlash should be between .006 and .012". If not then remove nuts and remove gaskets or add gaskets until the proper backlash is achieved.

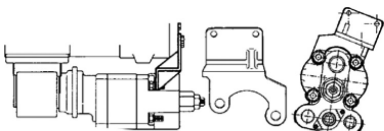


5. Replace the inspection cover and tighten the cap screws to 9 ft.lb.

6. The right side opening is for hydraulic pump mounting only.

7. Install the hydraulic pump.

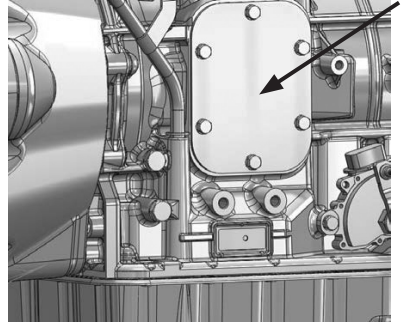
8. Pump systems over 40 lbs. total weight require a support for the pump. The support needs to be a rigid bracket with 4 attachment points.



## FA6B SERIES PTO INSTALLATION FOR THE LEFT SIDE OPENING

The left side PTO opening (only available with LBV option code, will only accept the Muncie FA6B Series PTO. This PTO has clearance to the floorboard. The PTO is available with a hydraulic mount or driveshaft output.

1. Remove the cover plate from the left side opening from underneath the vehicle.



2. Use caution as there might be hot oil on the plate or dripping from the PTO opening.

3. The FA6B Series PTO is provided with a mounting kit.

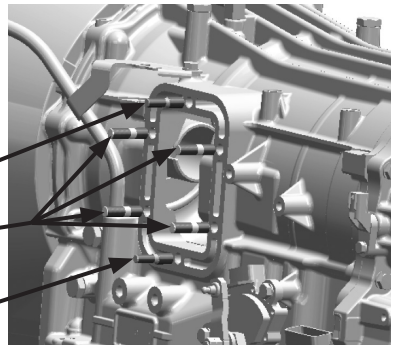
PART NUMBER 20TK5169

4. Install the mounting kit as shown in the diagram.

STEP STUDS 6 & 12 o'clock positions

1½" METRIC STUDS

STEP STUDS 6 & 12 o'clock positions



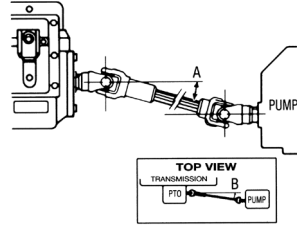
Using the gaskets provided with the PTO place the gasket over the studs and onto the PTO mounting pad. Using the whiz lock nuts on the step stud and the spirallock nuts on the remaining 4 studs, tighten the PTO to mount. Torque whiz lock to 18 ft.lb. and tighten the spirallock nuts to 40 ft.lb.

5. The PTO with hydraulic pump mounting can mount the pump at this time.

The FA6B Series has a maximum pump system limit of 40 lbs. Pump systems weighing more than 40 lbs. requires a support bracket

6. 4 × 2 Chassis Only. The FA6B with “B” option output shaft allows for mount of a 1000 Series drive shaft to remote drive devices. If your system utilizes a driveline between the PTO and another device and if you have noise in your system that was not there before, the angularity or phasing of your driveline may be the cause. Check driveline angularity and reduce total angularity per recommendation on chart and be sure the PTO shaft is parallel within 1.5° to the pump shaft (or driven unit). Drivelines must be in phase, that is, the yoke ears on the PTO and pump shafts must be in alignment, as illustrated here.

Max Speed (RPM)	Max TJA “A”
3,500	5°
3,000	5°
2,500	7°
2,000	8°
1,500	11°
1,000	12°



\* For speeds over 2,500 RPM contact Muncie Power Products for Approval.

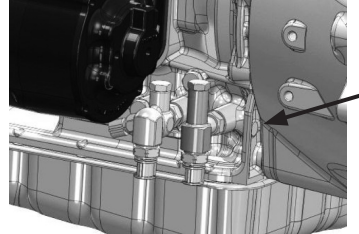
For Installations with angles in the top and side views, use this formula to compute the true joint angle (TJA):  $TJA = \sqrt{A^2 + B^2}$ .

## ACTIVATION KIT INSTALLATION

(Instructions for “D” Shift option only are shown here)

Activation kits for CS6 Series and FA6B Series are similar. There is a remote mounted solenoid valve which is connected to the PTO using activation hoses provided.

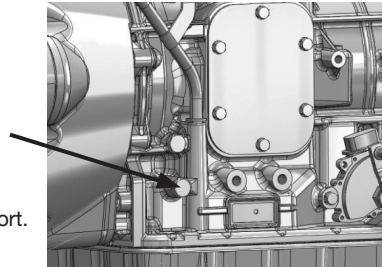
1. Locate and remove the plug from the transmission tee fitting on the Right side of the transmission. The port shown here is the lubrication port and is forward of the PTO pad.



2. Install a straight adapter 43T39222 into this port.

3. Connect the 15" hydraulic line to this port.

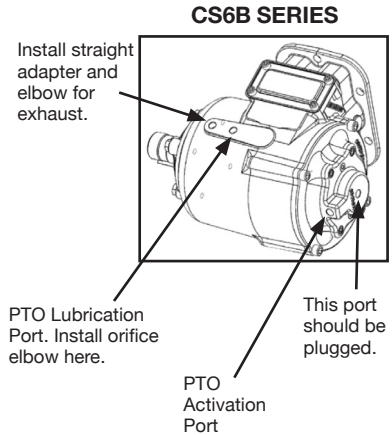
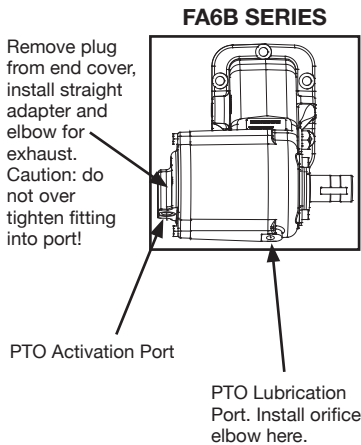
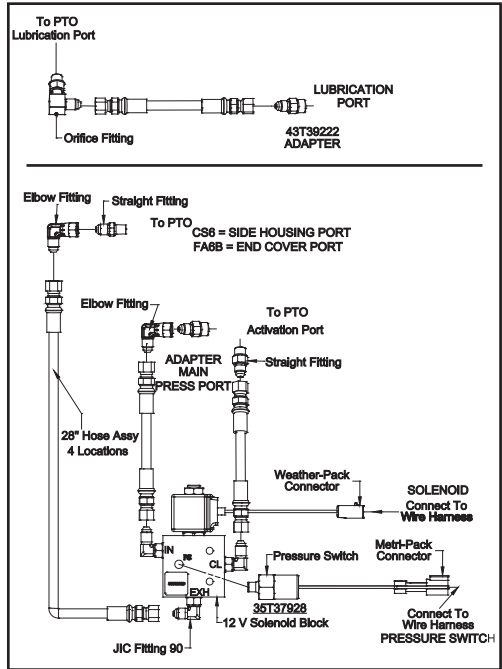
4. Locate and remove the transmission plug for PTO activation and install the straight thread adapter. The AS69RC (A467) activation port is locate on the left side of the transmission and is the lower plugged port. *On the older Aisin model transmission used in Ram Truck prior to 2013 model year the port is midway up the transmission, it is important to use the correct port.* Install a straight adapter 43T39222 into the activation port and install a 90 degree elbow 43T36445 into this port. Connect a hydraulic line to this port.



5. Connect the activation pressure port to the fitting installed in the IN port of the solenoid valve. (as shown in the diagram on page 8).



6. Connect the lubrication line into the orifice elbow installed in the side of the PTO.
7. Install a fitting in the CL port and connect a hose to this port.
8. Install a fitting in pressure port on the end cover of the PTO and connect a hose to this port and to the "CL" port of the solenoid block.
9. The EXH port on the solenoid block will also get a fitting and hose. On the CS Series PTO this line is connected to the side port of the PTO. Note that this is NOT the lubrication port with an orifice fitting. On the FA Series PTO this line is connected to a port in the end cover. This is done by removing a pipe plug in the end cover and installing an adapter fitting. Note that when using this port on the FA Series or if using the same location on the CS6 Series care must be taken that the fitting is not bottomed out against the bearing inside the PTO. Use pipe thread sealant for the pipe thread fittings used in this installation.



## ELECTRICAL CONNECTIONS

The electrical connections for the 2013 and later chassis is different than the previous model years. The PTOs, both the CS6 Series and the FA6B Series for 2013, require the shift code "D" to insure the correct wiring harness and these instructions. (For models prior to 2013 follow the instructions for the "B" shift code found in kit 48TK5082.)

The 2013 and later chassis are provided with a PTO switch on the dash panel located with the other auxiliary switches.



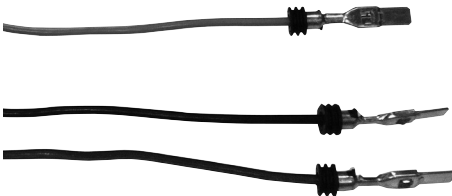
Using the Ram Truck provided switch allows for PTO operation with throttle advance options. The throttle advance is programmed through the Electronic Vehicle Information Center (EVIC) located in the center display. The 2013 & later vehicle is equipped with an electronic control system called the Vehicle System Interface Module (VSIM). The VSIM can be programmed for a single set speed.

Connections to the wiring are made with the Muncie Power wiring harness PN 34T43149. Connection to Muncie Power's harness is made by using the Ram Truck provided wire leads found in the kit located in the glove box. Three wire leads are used from their kit. These have terminals and seals attached for use in the light gray connector. The gray connector is found in the engine compartment as shown in the photo. Remove the half of the connector with the blanking seals installed. The terminal locations are marked on this connector, remove the blanking seals installed in pin locations 2, 3, & 4 and push the following wire leads into this connector.

Pin #2 Pink/Tan  
Pin #3 Black/Brown  
Pin #4 Violet/Yellow  
Pin #1 is not used.

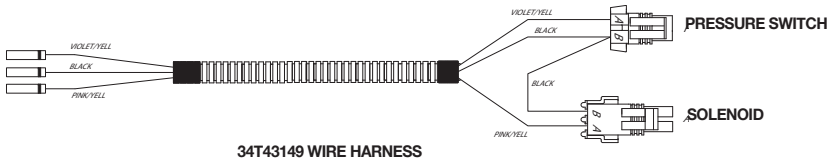


Strip the insulation on these leads 1/2" for connection to the butt splice. Using the Muncie Power wire harness, connect the wire leads to the appropriate butt splice.



Pin #2 Pink/Tan to Muncie Power Pink/Yellow  
Pin #3 Black/Brown to Muncie Power Black  
Pin #4 Violet/Yellow to Muncie Power Violet/Yellow

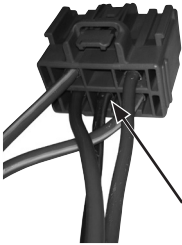




Crimp the butt splice and heat with gun to complete the heat shrink.

The Muncie Power harness has the plug for the PTO solenoid and the PTO pressure switch. The wires are connected as shown.

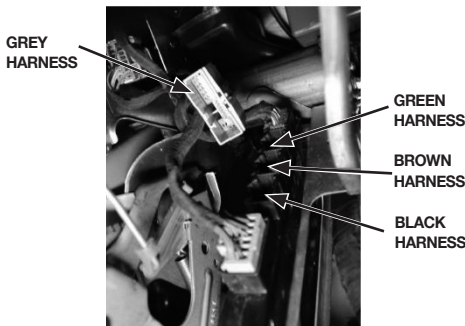
On the inside of the cab locate the gray connector shown here. It is located behind the VSIM module which is a black plastic module next to the park brake bracket. The gray connector is tie wrapped in place.



From the Ram Truck wire and harness kit use the 6 terminal gray connector with wires already located in the cavities. Pin# 5 has a Violet/Yellow wire which is to be connected to the Ram Truck VSIM control.

The VSIM comes with 3 harnesses Green, Brown, and Black. The 16 pin brown harness has an Orange/Brown wire located in Pin #8. This wire is to be connected to the Violet/Yellow wire from the gray connector.

Make sure that the brown connector and gray connector are firmly connected to their respective receptacles.

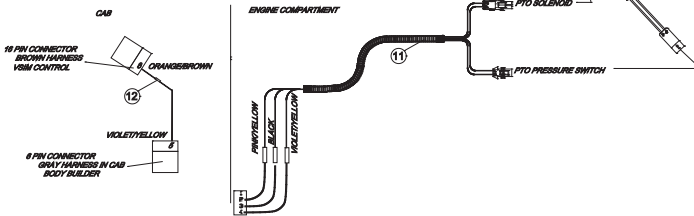
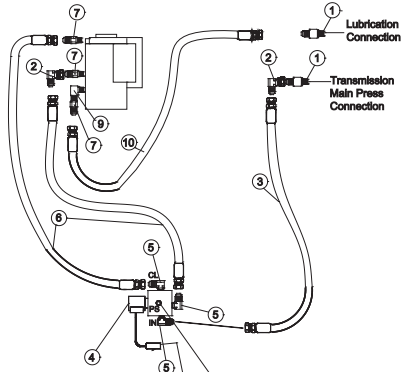


Firmly plug in the connectors for the solenoid and pressure switch found on the Muncie Power wiring harness.

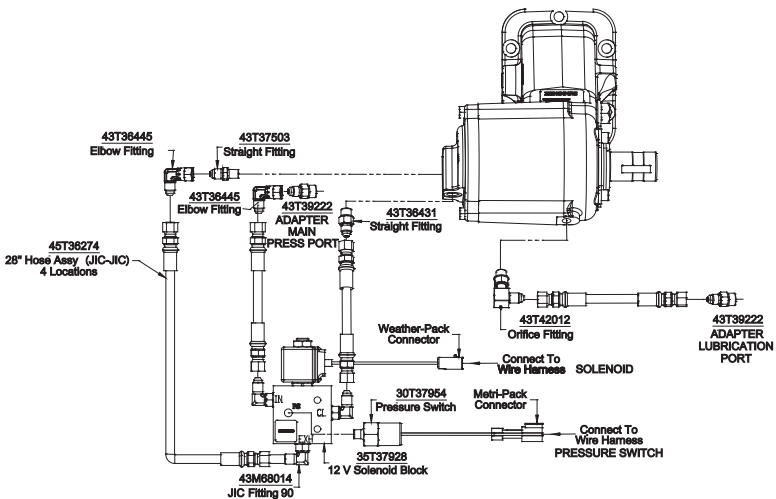
# CS6B-I84 D SHIFT

## 48TK5472 INSTALLATION KIT

ITEM	QTY	P.N.	DESCRIPTION
1	2	43T39222	Adapter
2	2	43T33445	Elbow Fitting
3	1	45T36274	Hose Assy
4	1	35T37928	Solenoid
5	3	43M68014	JIC Fitting
6	2	45T38840	Hose
7	3	43T37503	JIC Fitting
8	1	30T37954	Pressure Switch
9	1	43T37385	Orifice Fitting
10	1	45T35865	Lube Hose Assembly 15"
11	1	34T43149	Wire Harness
12	1	34T36362	Crimp Connector
N.S.	2	19T36623	Cap Screw (mount solenoid)
N.S.	2	21T36448	Washer (mount solenoid)
N.S.	2	22T35140	Hex Nut (mount solenoid)



## LEFT SIDE PTO - FA6B-I8406-D3\*X ACTIVATION KIT 48TK5474



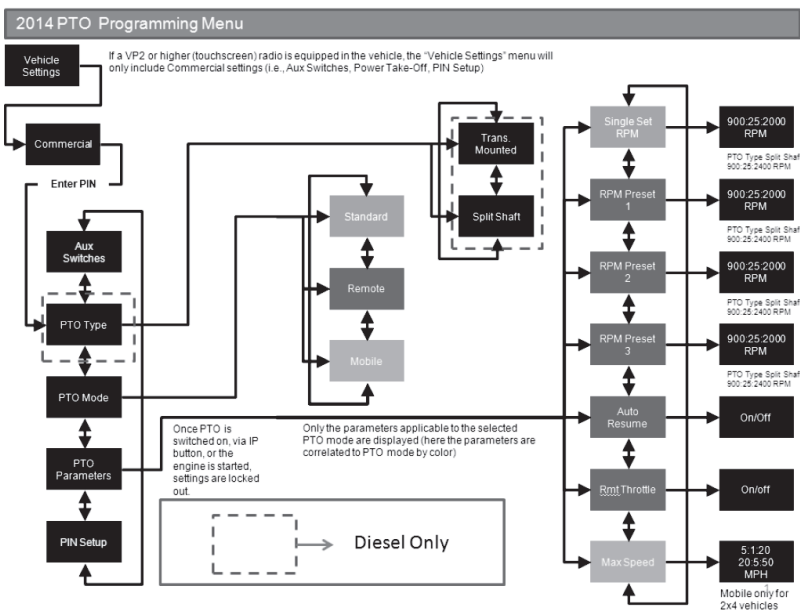
## PTO ACTIVATION – PROGRAMMING MENU



To access the PTO Programming menu, the key FOB must be placed in the Ignition and turned to the run position, but with the engine off. Once this is done, the PTO Programming menu can be accessed by navigating through the Vehicle Settings menu using the controls found on the steering wheel.



After selecting the Commercial Settings menu, a PIN will be required to enter the PTO Programming menu. The factory (default) PIN is 0000.



# PTO MODES

## **STANDARD (Stationary Operation)(EVIC programmed for “Standard” Mode)**

To operate PTO mode the following enablers must be met.

- Be in “Park”
- Service brakes released and functional
- Vehicle running
- No transmission, engine, accelerator, brake switch faults
- PTO must be correctly installed using the vehicle provided circuits
- PTO switch activated

### **PTO OPERATION STATIONARY**

Once PTO is activated by the in cab PTO switch, the throttle can be advanced by pressing the RES ACCEL cruise control button. If you need a single set speed, it can be programmed through the EVIC display in the dash. The PTO drive gear is torque converter driven. With the PTO engaged the torque converter will activate converter lock-up at engine speeds above 1,200 RPM. Below these speeds of the PTO output shaft will be dependent on the torque converter and the PTO may not perform to your specifications.

## **MOBILE (EVIC programmed for “Mobile” mode)**

To operate PTO mode the above enablers must be met.

Mobile mode can be activated by the menu available on the Electronic Information Center screen the center of the cluster. When this feature is selected Stationary and Remote PTO features are not available. The PTO can only be activated with the transmission in “Park”. Activate the PTO switch and then transmission can be shifted into forward or reverse gear.

### **PTO OPERATON MOBILE**

For PTO operation with the vehicle moving the PTO must be engaged with the vehicle in “Park”. After engagement the vehicle may be placed in a forward or reverse gear and have PTO operation. There is no torque converter lock-up in this option and the PTO will stop operation when the vehicle is stopped and in a drive selection. The PTO will still function in “Neutral or Park”, but will not have elevated idle speed. To return to normal vehicle operation, simply turn the PTO switch OFF.

## **REMOTE (for remote switch operation of PTO)(EVIC programmed for “Remote” mode)**

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 6). 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:

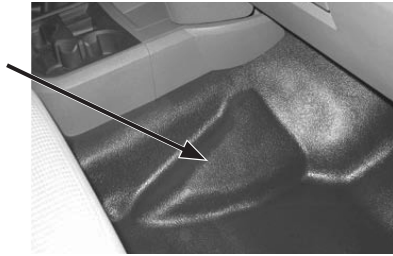
- Be in "park" position (vehicles equipped with automatic transmission)
- Upfitter provider (on/off) switch has been activated
- Parking brake applied (vehicles equipped with manual transmission)
- Clutch not depressed (clutch interlock switch)
- Vehicle must be running
- No transmission, engine, accelerator,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

Additional information on this chassis and PTO options is available from Ram Truck website: <http://www.rambodybuilder.com/2013/cc/ccmo.pdf>

## FOR 2007 TO 2012 DODGE AND STERLING BULLET CHASSIS WITH AISIN AS68RC TRANSMISSION

### PTO INSTALLATION NOTES:

Vehicle without the “PTO Prep Package” will require deformation of the vehicle floor board directly above and rearward of the PTO opening or contact the dealer for a kit to alter your floorboard. Vehicles with the PTO package will find a bulge in the floor board; successful PTO installations have been made by uncovering the floor and removing this added in floor component. These instructions are listed for the typical under vehicle installation.

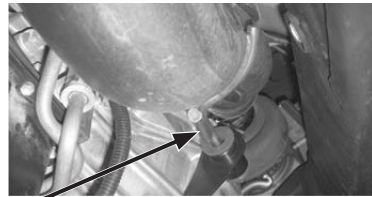


*Factory deformation shown*

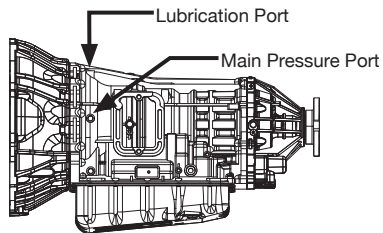
Dodge allows the PTO to mount from inside the cab. This is accomplished by detaching the storage bin from behind the seats and detaching and moving the seats rearward. Pull back the flooring and expose the modified floorboard. Remove the panel in the floorboard to gain access to the PTO opening. This allows the pump and PTO to be installed without removing the exhaust. Go to step 8.

### 1. IF YOU DECIDE TO WORK FROM UNDER THE VEHICLE, THEN BEGIN HERE:

2. Remove exhaust front down pipe attachments at turbo elbow & 3-bolt flange at particulate filter. The front end is held with a V-band clamp and the rear of the pipe is held with M10×1.5 nuts.
3. Disconnect exhaust isolator from hanger and allow rear part of exhaust system to hang down.
4. Push up on the tunnel silencer at the PTO floor patch.
5. Remove PTO cover from transmission.
6. Remove plugs on transmission from the “main pressure” port (left side of transmission in front of PTO opening) and lubrication port (right side of transmission in front of PTO opening) as shown.
7. Unplug temp switch from cooler line. Remove electrical connector from pressure switch on transmission these are located near the PTO opening and can be in the way during PTO installation.



*Bar welded to the exhaust pipe and pushed into rubber bushing*



GO TO STEP 17 to install the PTO

## ALTERNATIVE INSTALLATION METHOD

8. Dodge allows for the floorboard patch to be removed for installation of PTO from above.

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



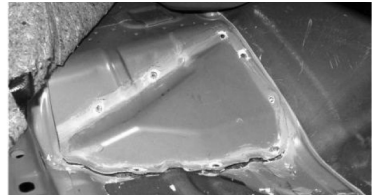
10. Unbolt the seat and move it to the rear of the cabin where the package tray was removed.

11. 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.



12. Lift the floor mat and fold it rearward and toward the driver's side to expose the patch panel.

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



14. 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 slide forward to connect to the installed PTO.



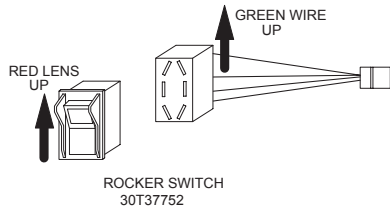
15. To restore the vehicle, reverse the steps above and use RTV to reseat the PTO floor pan patch panel.

16. Follow from step 17 to install PTO.

## PTO INSTALLATION

17. Install PTO mounting studs as described in IN84-03 PTO Operator's Manual.
18. Install gasket/shim onto studs.
19. Install orifice fitting and lube line to PTO.
20. Install activation pressure and exhaust lines to PTO.
21. Lift and slide PTO to transmission opening and mount on studs.
22. Install nuts to studs & torque (see IN84-03) Use caution when installing the stud for the Aisin transmission. The studs provided are a special length and inserting them too far may cause damage to the transmission or limit the thread engagement of the mounting nuts.
23. Locate and install the Muncie Power solenoid shift valve.
24. Install the hydraulic activation lines, as shown in Diagram C, for the standard "H" Shift option. Hoses can be custom made by using the optional 131-2-0001 kit. The CS6B Series PTO is offered with the "B" shift option which includes the activation lines and components. This option is shown in diagram B.
25. Install a Muncie Power PF or PK series pump.

26. For PTO to operate properly and utilize the Dodge speed control, the vehicle computer must be programmed for PTO mode. Contact dealer if this is necessary.



27. Locate the wire harness 34T40691. Route the switch plug from inside the cab through the firewall to the engine compartment. With socket green wire up, install the 30T37752 rocker switch.



28. Locate the blunt cut OEM wires near the power distribution box. Make the splice connections here and anchor the relay in this area.





29. 2008 and later vehicles do not have the connector located next to the transmission.

If the Muncie Power wire harness provided with the PTO has a 10-pin connector on it, do not use the connector. Cut the connector from the harness and make the connections as shown in the diagram for the 34T40691 harness.

Locate the Dodge/Sterling supplied wire harness found in the glove box (Dodge part number 68032518AB). From the rocker switch connector connect the Blue and the Yellow wire to the supplied wire harness found in the vehicle glove box.

Connect the Muncie Power BLUE wire to the Dodge/Sterling VIOLET/BROWN wire located on this harness.

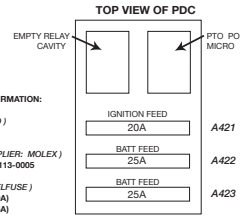
Connect the Muncie Power YELLOW wire to the Dodge/Sterling PINK/YELLOW wire on this harness.

The current harness has both the Blue and Yellow wire connection in the cab and outside.

**NOTE:** ONLY ONE OF THE LOCATIONS NEEDS TO BE USED AND DEPENDS ON WHICH WIRE HARNESS VERSION IS SUPPLIED WITH YOUR VEHICLE.

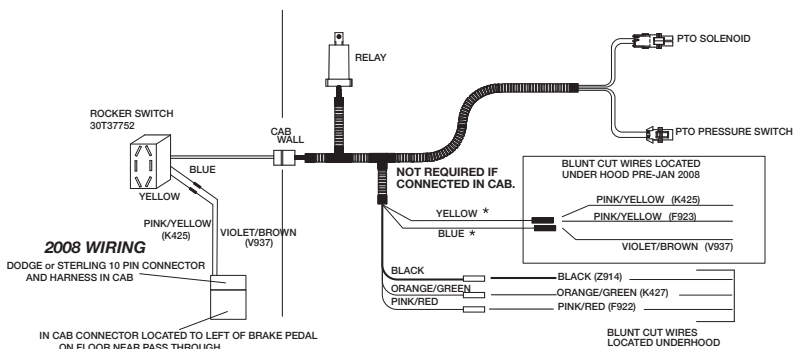
See Diagram A below.

Go To Step 30 on page 17. For the “LEARNED SET SPEED” Hook up, see page 4.



Located in the vehicle glove box are a relay, fuses and a wire harness. For PTO operation, the vehicle must have the relay and fuse installed in the Power Distribution Box located under the hood. The 20A fuse is used by the PTO. The 25A locations are for other Body Builder connections.

## DIAGRAM A: WIRING – 34T40691

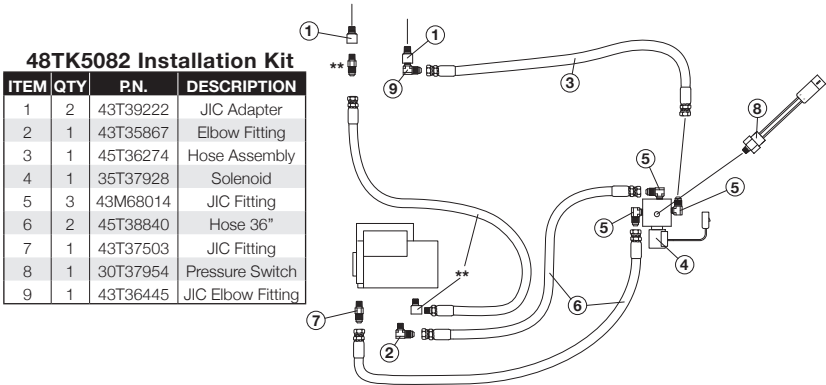


### Note: \* 2008 & Later Chassis

For “Learning a SET Speed”, connect the yellow wire to circuit F425 (pink wire) and blue wire to circuit V937 (violet/brown) at blunt cut wires located at the front of transmission. DO NOT make the yellow and blue wire connections in the cab at the 10-pin connector.

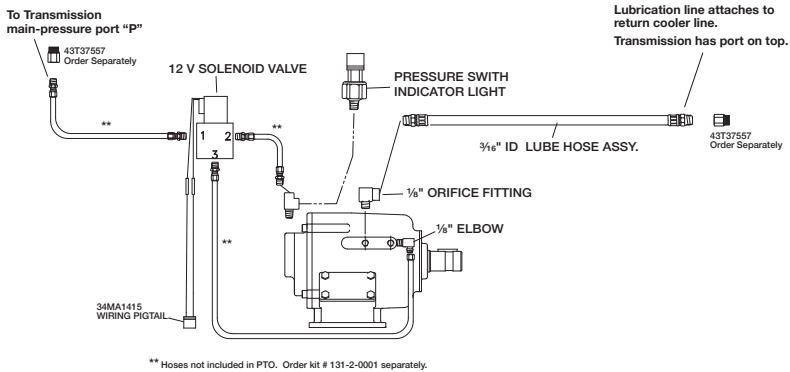
## DIAGRAM B: HYDRAULIC “B” SHIFT OPTION

48TK5082 Dodge Activation Kit Automatic: Included in this kit is the in-cab rocker switch, wire harness shown on page 7 and the hydraulic activation kit with hose assemblies.



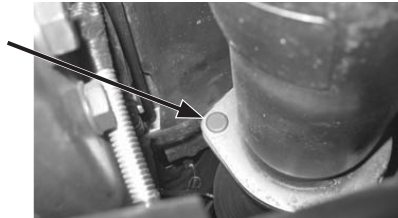
## DIAGRAM C: HYDRAULIC “H” SHIFT OPTION

The “H” does not include activation hoses and will need to be supplied by installer, or can be built with kit# 131-2-0001, available from your Muncie Power supplier.



30. Re-attach the exhaust, DPF tubing, transmission pressure switch, and temperature switch connectors that were removed earlier.

31. The exhaust V-band clamp is tightened to a torque value of 150 in.lb. and the M10 nuts at rear of pipe are torqued to 43 ft.lb.



32. Return to the IN84-03 PTO Operator's Manual, and finish installation.

### LEARNED SET SPEED

**NOTE:** This feature requires engine calibration software released in December 2008. If your vehicle was produced before December 2008, you must have the dealer "Reflash" the engine controller to December 2008 or later engine software.

**In order for this feature to work, the PTO must be wired as "Remote PTO" (PTO switch between F425 and V937) not "Standard PTO."**

- Key ON (Engine not running)
- Press and release Cruise SET button 5 times within 10 seconds.
- Start Engine (Engine Running)
- Go into IDLE UP mode (Cruise ON, then SET to go to 900 RPM)
- Set the desired speed (using Cruise switches)
- Press Cancel
- Turn off engine and remove key.

### UNLEARNING SET SPEED

- Key ON (Engine not running)
- Press and release Cruise SET button 5 times within 10 seconds.

**NOTE: To LEARN a new speed, first UNLEARN the old speed.**

- Once the idle speed is LEARNED, the engine will go to that idle speed whenever the Remote PTO switch is turned on, without additional operator assistance.
- The PTO will engage first, then the idle speed will ramp up to the LEARNED speed, thus not violating the AISN requirement of not allowing PTO engagement above 1,000 RPM.
- The LEARNED speed is saved at power down.



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