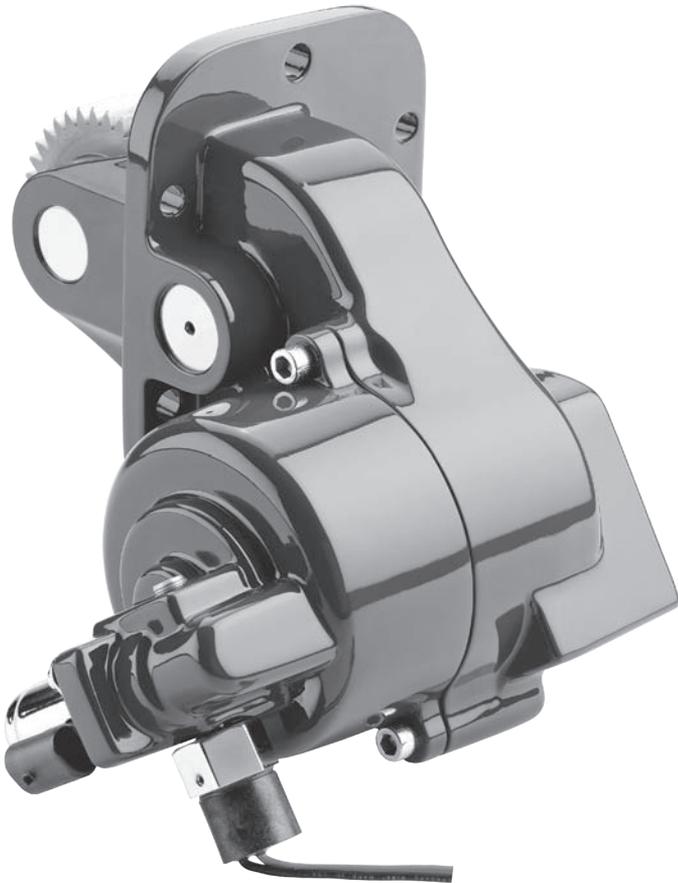




**KEEP IN VEHICLE**  
READ OPERATING INSTRUCTIONS  
INSIDE BEFORE OPERATING PTO

# FR66 INSTALLATION and OWNER'S MANUAL



# **WARNING**

Always read and understand the entire manual completely before installation or operation of pto and driven equipment including these warnings and operator's instructions in section 3!

-  **ALWAYS** disengage the PTO when the driven equipment is not in operation.
-  **NEVER** attempt to install or service any power take-off with the truck engine running. Put ignition keys in your pocket before getting under truck.
-  **NEVER** allow truck engine to be started while workers are under truck.
-  **ALWAYS** place transmission in neutral or park, set brakes, and immobilize truck wheels with suitable chocks, before working on a vehicle.
-  **ALWAYS** block any raised body or mechanism before working on or under equipment.
-  **NEVER** shift any installed power take-offs in or out of gear by any means except by the controls in the cab of the truck.
-  **ALWAYS** stay clear of spinning driveshafts to avoid becoming entangled and injured.
-  It shall be the responsibility of the installer of a Muncie power take-off to decide whether to install guards in the PTO and/or driveline area because of potential exposure to danger. This is because most Muncie PTOs are installed by equipment distributors or manufacturers and therefore, the responsibility of the installation is beyond the control of Muncie Power Products.
-  **ALWAYS** obtain proper training before operating this machinery.
-  **NEVER** install or operate equipment which has not been properly specified for your vehicle
-  Installers are to ensure that PTO components do not interfere with any chassis components, including but not limited to vehicle crossmembers, frame rails, driveshafts, exhausts, converters, fuel lines, etc. while vehicle is stationary or mobile.
-  **ALWAYS** allow the vehicle, PTO and driven equipment to warm up when operating in weather where temperatures are near or below freezing 32° f (0° c)
-  **Install separate controls for pto and driven equipment.**
-  **ALWAYS** install the safety labels provided and place the owner's manual in the vehicle glove compartment.

The PTO is supplied with a packet containing warning labels. If you did not receive any, or if you need extra, you may order them, no charge, by phone, email or mail. They are available through your nearest Muncie® distributor or at the number and address below:

1-800-FOR-PTOS (1-800-367-7867)  
Muncie Power Products, Inc.  
P.O. Box 548  
Muncie, IN 47308-0548  
info@munciepower.com



THIS SYMBOL WARNS OF  
PERSONAL INJURY OR DEATH.



# FR66 INSTALLATION and OWNER'S MANUAL

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# SECTION - 1

## PTO INSTALLATION

***ALL INSTALLERS MUST READ THE FOLLOWING***

### **PTO AND ACTIVATION KIT INSTALLATION INSTRUCTIONS**

*Always wear safety glasses. Read entire manual before starting installation.*

**IMPORTANT: Disconnect vehicle battery prior to installing electrical and electric/hydraulic activation kits.**

- A. Vehicle manufacturers may have specific locations for accessing electrical power and activating hydraulics. The body builder manual or company representative for the vehicle chassis should be contacted prior to installing electrical or hydraulic systems.
- B. Route wires and activation lines away from rotating and high temperature components. Use appropriate looms and bulk head pass-thru's wherever possible to avoid rubbing through insulation or tubing and causing an electrical short or oil leak.
- C. Follow all Federal Motor Vehicle Safety Standards (FMVSS) for your vehicle.
- D. Where electrical grounds are indicated, be sure that they are good grounds, with straight paths to the vehicle battery ground. (Many vehicle cabs are insulated from the vehicle frame and a weak ground is a very common cause for malfunctions).
- E. When installing hydraulic components, be certain to follow common installation and testing procedures. If you are not familiar with acceptable installation procedures request instructions and guidance from the hydraulic equipment supplier.
- F. Caution should be taken by installer with any PTO installation to ensure components do not interfere with any chassis component during installation or when vehicle is operated.
- G. Cold weather start conditions require that the transmission be started and warmed prior to engaging PTO and using equipment. Hydraulic pumps should be run at idle and under no load conditions to allow oil to warm before activating hydraulic system.

#### **IMPORTANT INFORMATION:**

There is valuable information contained in the Ford "Super Duty F-Series Body Builders Layout Book". You can obtain a copy of this book by faxing your request to "Body Builder Coordinator" at 1-734-414-2971. Include your street address and desired vehicle and model year. It can also be found on the Ford website at: <http://www.fleet.ford.com/truckbbas/>

## INSTALLATION INSTRUCTIONS

Always wear safety glasses. Read entire manual before starting installation.

1. There is a packet with the FR66 PTO which contains four (4) warning labels. Before adhering the labels, make sure the surfaces are free of dirt and grease. Place the labels supplied with the FR66 as follows:

### TRUCK FRAME LABELS

The two (2) Truck Frame Labels, which measure approximately 4" x 8", are to be placed on the outside of the vehicle frame rail. These labels are to be easily seen by anyone who might go under the truck or near the FR66 PTO. One label is to be placed on each side of the vehicle. See figure 1.

*Note: Should the vehicle body installed on the chassis cover the frame rail, place the label on the body in a position easily visible by anyone who might go under the vehicle or near the FR66 PTO.*

**DO NOT PAINT OVER THE LABELS.**

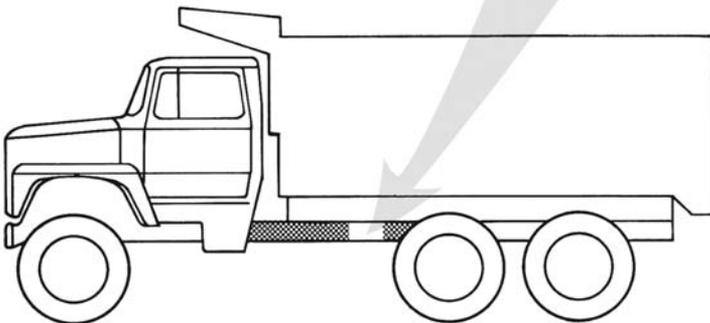
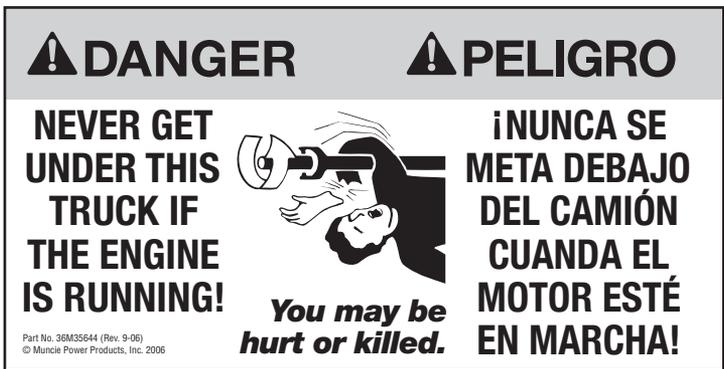


Figure 1

## VISOR AND DASH LABELS

The PTO Equipped Caution Label, which measures approximately 2" x 3", is to be placed within the cab of the vehicle and in easy view of the vehicle operator. It should be located near the PTO control, when the control is installed in the vehicle dash (see figure 2). This label directs the operator to read the PTO operating instructions on the Visor Label. The Visor Label, which measures approximately 4" x 6 1/2", is to be placed on the visor on the operator's side of the vehicle. See figure 2 below.

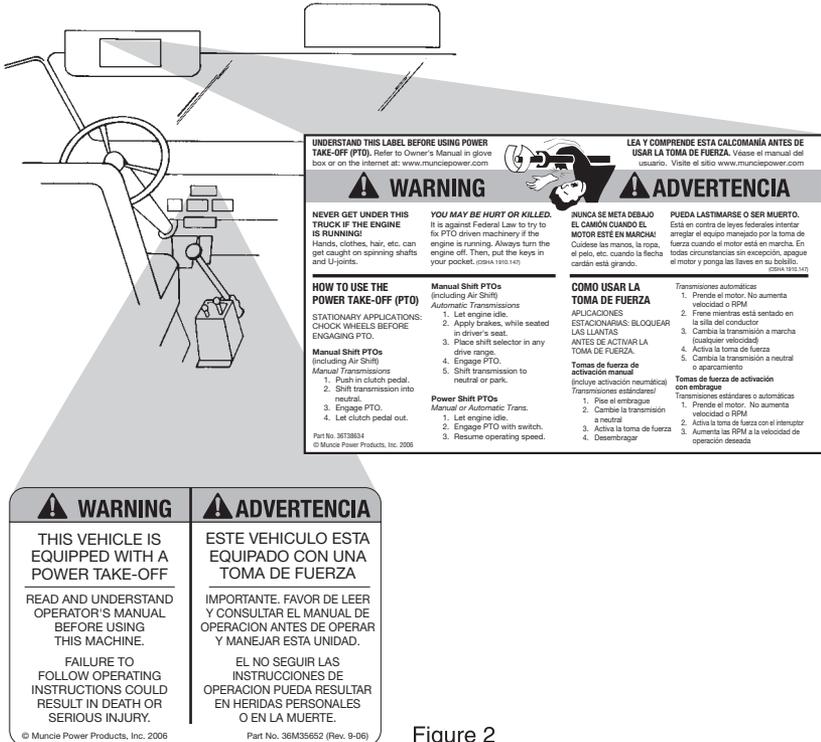
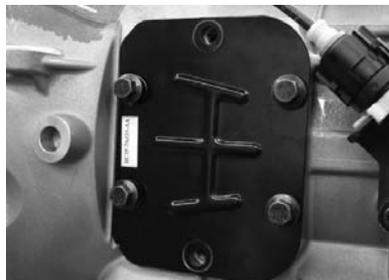


Figure 2

- While seated in the vehicle and with the transmission in "Park", start the engine and listen to the sounds of both the transmission and the engine before installing the FR66 PTO. A noise in the transmission gear may be more noticeable after the FR66 PTO is installed. Next, we will begin the installation of the FR66 PTO. **STOP ENGINE!**
- Remove the cover plate and the cover gasket from the transmission (on the 4x4 chassis, the forward drive shaft is to be removed in order to gain access to the PTO opening).



Set the cover gasket aside for reuse when mounting the FR66 PTO (do NOT discard the gasket; it MUST be used to install the FR66 PTO).

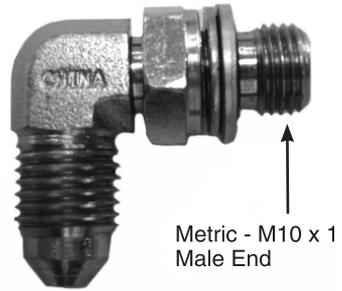


*NOTE: DO NOT drain the transmission fluid, but be prepared for a small amount of oil to escape from the PTO opening (avoid contact with this oil because it may be HOT).*

4. Clean the mounting pad and inspect the bolt holes in aperture for thread sealant used on OEM bolts. Clean these internal threads with a wire brush to clear out any material.



5. Check the transmission for proper PTO driver gear and location. Also, check the FR66 PTO driver gear for condition. A nick or blemish may cause excessive noise when the FR66 PTO is mounted.



6. Remove the installation kit (43TK5209) components from the FR66 PTO carton. Included in this kit is a 90° elbow for the main pressure port on the transmission.



7. Install the elbow into the main pressure port located directly below the PTO opening. Install this elbow as far as it will go while positioning the port towards the FRONT of the vehicle. Tighten the jam nut to lock it into this position.

*NOTE: The 90° elbow is an SAE - 37 male on one end and a Metric - M10 x 1 male on the other end. The M10 x 1 male end will be inserted into the transmission pressure port as shown.*



8. Locate the JIC-JIC swivel hose and install one end of the hose into the SAE – 37 male end of the 90° elbow that was installed in the previous step. Route this hose assembly to clear any moving components that the transmission may possess.



*Whiz-Lock Nuts (4)*



*Step Studs (4)*



*SpiraLock Nuts (2)*

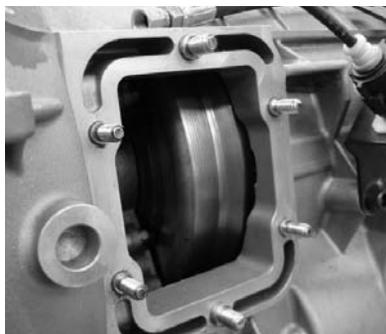


*Shoulder Studs (2)*

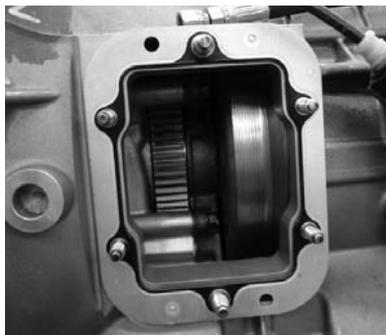
9. Locate (2) shoulder studs, (2) spiralo-lock nuts, (4) step studs and (4) whiz-lock nuts.



10. The (2) shoulder studs should be placed in these locations. The (2) spiralo-lock nuts are included and will be used in these locations once the PTO has been mounted.

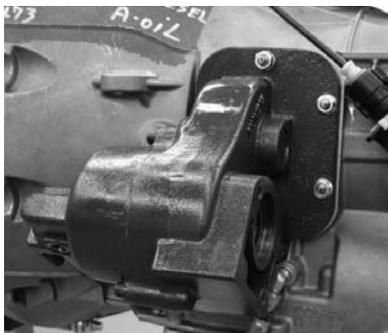


- 11a. The (4) step studs should be placed in these locations. The (4) whiz-lock nuts are included and will be used in these locations once the PTO has been mounted.



- 11b. Place the transmission gasket (that was removed in step 3) onto the transmission as shown.

*Note: It is important to check the gaps between the PTO and the transmission and make sure the gear teeth are properly meshed before tightening the nuts.*

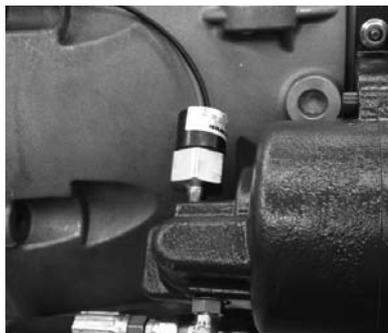


12. Hold the PTO in position and install the (4) whiz-lock nuts onto the (4) step studs. Next, position and install the (2) spirallock nuts onto the (2) shoulder studs. Tighten the (4) whiz-lock nuts for the step studs to **17 Ft. Lb.** and the (2) spirallock nuts for the shoulder studs to **40 Ft. Lb.**

*Note: Checking the backlash is not required when using the approved Ford furnished gasket. Never use silicone type sealant on PTO/transmission mounting surface, as proper backlash cannot be attained.*



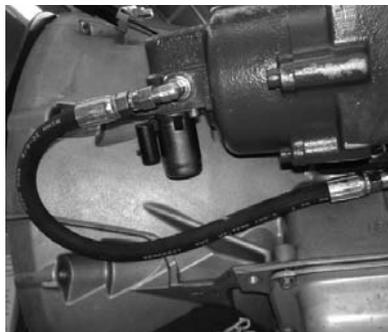
13. Remove the red plastic plug and locate the 90° straight thread elbow (included with the FR66 PTO). Install and position the elbow as shown.



14. Remove the red plastic plug and locate the pressure switch. Install and position the pressure switch as shown.



15. Install the JIC swivel end onto the 90° elbow as shown.

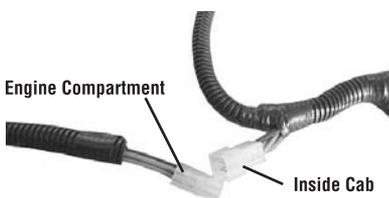


16. Use cable ties to route the hose away from the exhaust and away from any rotating components. Route the wiring harness from the vehicle front passenger compartment to the solenoid valve.



17. Make the connections to the pressure switch and the solenoid valve. Refer to page 14 for more details.

*Note: The solenoid and pressure switch connectors are both Metri-Pack.*



18. The wire harness separates at a 4-wire connector. The connector is designed to fit through the 5/8" grommet provided. Separate the harness end through the grommet in the passenger barrier.

*Note: Feed this side through the grommet and the wall in the engine compartment.*

19. Located at the 4-wire connector is a ground lead. Route this lead directly to the battery or the battery terminal and ground this terminal.
20. When routing the wire harness, be sure to tie the harness away from heat sources (exhaust, manifold, etc.) and away from rotating components (driveshaft's, belts, etc.).



21. Remove the access panel located below the steering wheel.
22. Locate the 4-wire connector that was fed through the passenger barrier and connect this connector to the interior half of the FR66 PTO wire harness.

## DIESEL "D" SHIFT OPTION

23. In the cab, near the parking brake pedal, you will find the Ford blunt cut wires for connection to the FR66 PTO wiring harness. Easier access to the wires can be obtained once the access panel has been removed and by removing the screws holding the fuse box.

*Note: The wire harness is supplied with five color coded wires and a butt splice attachment. Strip the Ford wires and crimp the matching wire butt splices located on the FR66 PTO wire harness. Please refer to the Diesel "D" shift option diagram on page 14 for a pictorial representation.*



24. Connect the Muncie Blue/White wire to the Ford Blue/White wire; circuit PTO\_RELAY.

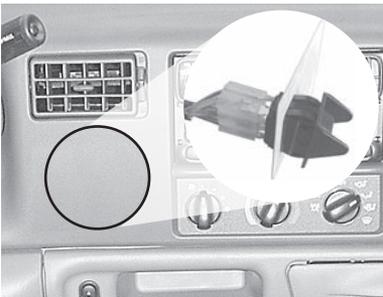
25. **For Stationary Operation:** Requires Muncie FR66 special feature "X" with wire harness 34T41671. Connect the Muncie Yellow/Green wire to the Ford Yellow/Green wire; circuit PTORS1.

**For Mobile Operation:** Requires Muncie FR66 special feature "M" with wire harness 34T41896. Connect the Muncie Blue/Gray wire to the Ford Blue/Gray wire; circuit PTORS2.

26. Connect the Muncie White/Brown wire to the Ford White/Brown wire; circuit PTOREF.

27. Connect the Muncie Green wire to the Ford Green wire; circuit PTO\_RPM.

28. Connect the Muncie Gray/Violet wire to the Ford Gray/Violet wire; circuit PTORTN.

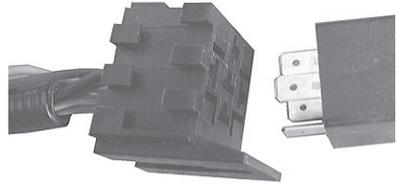


29. Install the Muncie switch into the Muncie switch bracket or the vehicle dash. This picture above shows an area(circled) where the

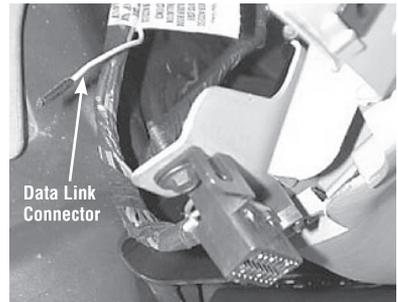
Muncie switch may be installed.

*Note: Green wire at the top of the switch.*

30. Route the wire harness to the bracket or switch location. Push the rocker switch through the face plate and into the bracket or dash. Attach the switch connector block to the switch. Be sure that the Green wire in the connector is at the top of the switch.



31. Plug relay into socket provided on the wiring harness (the relay comes standard plugged into the harness provided from Muncie).



32. Find the "Data Link Connector" located below the access panel and follow the wire behind the panel. Next, locate the Ford Violet 12V ignition switch power source and connect that wire to the Muncie Violet wire.

33. Start the truck engine (with transmission and the FR66 PTO in neutral) for a few seconds and listen for unnatural noises. Always stay clear of rotating components.

*Note: Should an unnatural noise occur, SHUT OFF the engine and place the ignition keys in your pocket. Remove the FR66 PTO and examine both the FR66 PTO and transmission for any defects. Always keep the FR66 PTO and transmission run time to a minimum.*

34. Check transmission oil level and fill to proper level per instructions found in the vehicle owner's manual. Adding a PTO will require the addition of transmission fluid. Re-install the 4x4 drive shaft if removed in step 3. Run engine for 5 to 10 minutes to check for leaks. Always stay clear of rotating components.



35. SHUT OFF engine and place the ignition keys in your pocket. Inspect the cap screws to make sure they are properly tightened. Mounting bolts should be checked on a regular basis for tightness.

## **MUNCIE PF PUMP INSTALLATION**

36. The FR66 requires the use of a special hydraulic pump mounting which is found on the Muncie PF4-\*\*\*-16QSRL pumps. This pump uses thru-bolts to mount to the FR66 PTO. This is the only pump to be used on the FR66.

*Note: The 1-1/4" round keyed shaft is available on the FR66 PTO for mounting to a 4x2 chassis.*



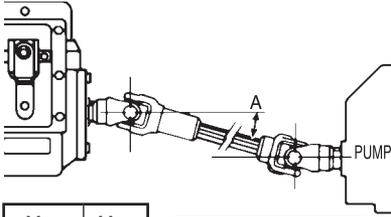
37. The PF4 series pump is supplied assembled and does not require disassembly. The proper mounting capscrews and flat washer are provided with the pump. It is critical that the proper mounting capscrews be used. If you did not receive capscrews, then contact Muncie Power Products, Inc. for the correct mounting hardware.
38. Before installation, place the flat washers over the shaft of the capscrew (there should be 1 or 2 washers used depending on the size of the pump being used).



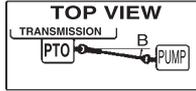
39. Place the pump into the PTO output mounting by aligning the splines as well as the pilot. Align the thru-bolt mounting holes and insert the capscrews with flat washers and torque both capscrews to 40-42 ft. lbs.

*Note: The pump orientation is with the pump body offset pointing down.*

40. On a 4x2 chassis, if your system contains a driveline between the FR66 PTO and another product and if are experiencing noise in your system that was not heard before, the angularity or phasing of your driveline may be the cause. Check the driveline angu-



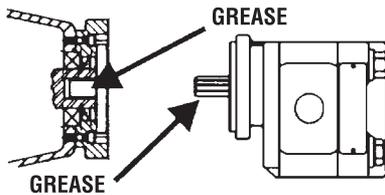
| Max Speed RPM | Max TJA "A" |
|---------------|-------------|
| 3500          | 5°          |
| 3000          | 5°          |
| 2500          | 7°          |
| 2000          | 8°          |
| 1500          | 11°         |
| 1000          | 12°         |



larity and reduce the total angularity recommended by the chart and be sure that the PTO shaft is parallel within 1.5° to the pump shaft (or driven unit).

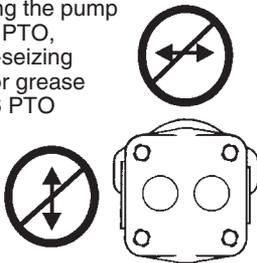
*Note: For installations with angles in the top and side views, use this formula to compute the true joint angle (TJA):*  
 $TJA = \sqrt{A^2 + B^2}$

### FR66 PTO WITH DIRECT COUPLE HYDRAULIC PUMP INSTALLATION



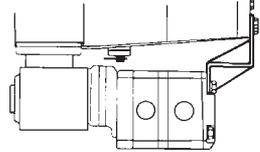
The Muncie PF series hydraulic pumps installed on the FR66 are of special design. This design allows for interference problems to be minimized.

Before bolting the pump to the FR66 PTO, place a non-seizing compound or grease on the FR66 PTO shaft and pump shaft. Muncie supplied pumps



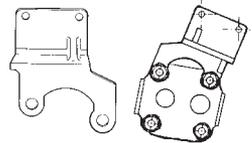
are pre-lubricated and do not require lubrication at installation.

The use of a bracket will be necessary when mounting hydraulic pumps weighing over 20 lbs., exceeding 12" in length, or with tandem or multiple sections.



These pumps should be mounted using a bracket attached to the rear of the pump and to the transmission to support the pump and to inhibit movement in all directions.

A bracket attached to two or more transmission bolts is preferred.



The bracket design should assure that there is no stress or force exerted on the pump or FR66 PTO shaft during the installation of the bracket.

If vertical supports are greater than 20° off of perpendicular with the transmission main shaft then a reinforced "Z" bracket must be used. Reinforce horizontal members to prohibit flexing at bend or weld. Attach the bracket to the pump bolt closest to the center of gravity of the pump.

*Note: When making hydraulic connections to the pump, it is important to route the hydraulic lines away from the front and rear vehicle drive shafts. It is important to route hydraulic lines away from exhaust manifold and pipes.*

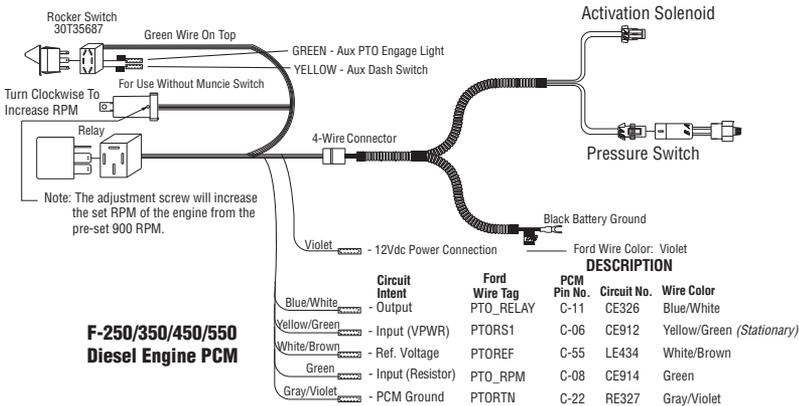
41. Complete installation by placing warning labels as indicated on borders of the decals. Placement examples are found on pages 5-6.

# SECTION 2

## WIRING DIAGRAMS AND AUXILIARY INSTRUCTIONS

### FR66 "D" SHIFT OPTION HARNESS

#### FR66 Wire Harness - 34T41671 (Stationary)



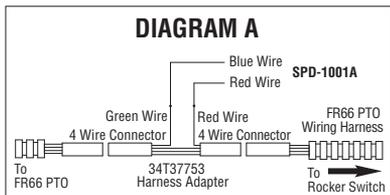
#### FR-250/350/450/550 Diesel Engine PCM

- **NOTE:** Installation above is for Stationary operation with Ford SEIC control. Automatic throttle advance when PTO is installed.
- For Mobile operation with wire 34T41896, connect the Muncie Blue/Gray wire to the Ford PTORS2 circuit (Blue/Gray wire).

### FR66 PTO INSTALLATION WITH SPD-1001A SYSTEM PROTECTION DEVICE

Requires purchase of 34T37753 and SPD-1001A (not included with the FR66 PTO)

1. Make the FR66 PTO installation as described in Steps 1-40.
2. Obtain the 4-wire connector on the FR66 PTO Harness and plug in the wire harness adapter 34T37753 (sold separately). The adapter is designed to assemble in only one direction.
3. Find the Red wire on the wire harness adapter and connect this wire to the SPD-1001A wire harness Red wire as shown in Diagram "A".
4. Find the Green wire on the wire harness adapter and connect this wire to the SPD-1001A wire harness Blue wire as shown in Diagram "A".
5. Locate Ford Blue wire (tag CTO PTOIC-1) and connect the Orange SPD-1001A wire.
6. Connect the Black SPD-1001A wire to a good ground at the fuse panel or battery (not to the cab).
7. Connect the White wire to an overspeed light if required, sold separately. Ground the other terminal of the Light.
8. Mount the SPD-1001A after making the calibration setting as described in the SPD-1001A installation manual.

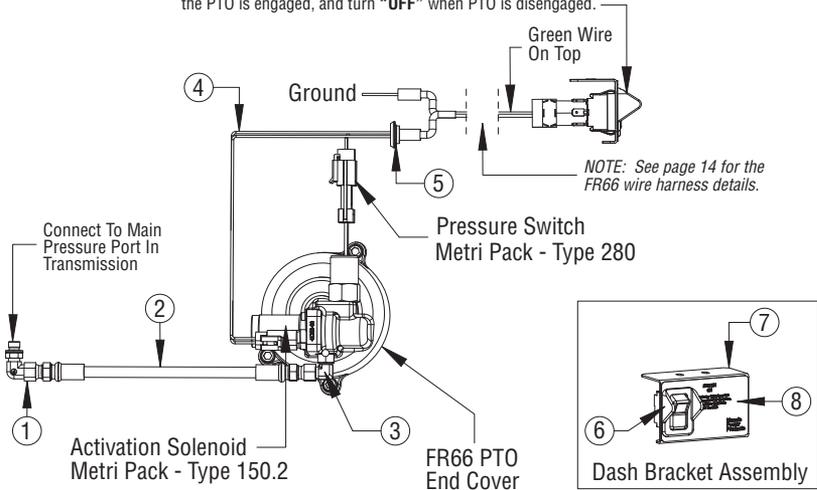


# SECTION 3

## ACTIVATION KIT INSTALLATION

### ACTIVATION KIT DIAGRAM – 43TK5209 (Stationary Operation)

NOTE: Green light in the rocker switch is to turn "ON" when the PTO is engaged, and turn "OFF" when PTO is disengaged.



| ITEM | QTY. | PART NO. | DESCRIPTION                    |
|------|------|----------|--------------------------------|
| 1    | 1    | 43T41572 | 90° Transmission Fitting       |
| 2    | 1    | 45T39186 | 17" Hose Assembly (JIC-JIC)    |
| 3    | 1    | 43M68014 | JIC 90° Fitting                |
| 4    | 1    | 34T41671 | FR66 Wire Harness (Stationary) |
| 5    | 1    | 37T35674 | Rubber Grommet                 |
| 6    | 1    | 30T35687 | Rocker Switch 12V              |
| 7    | 1    | 36MA1005 | Switch Bracket                 |
| 8    | 1    | 36T36271 | Face Plate                     |
| N.S. | 6    | 28T35442 | Cable Ties                     |
| N.S. | 1    | 36MK1007 | Dash Bracket Bolt Kit          |

For Mobile operation, PTO is supplied with kit which includes above components and changes wire harness to 34T41896.

## PTO TEST PROCEDURE

1. Install the activation kit shown on the previous page.
2. With the ignition switch on (but the engine NOT running), turn on the FR66 PTO rocker switch and listen for the solenoid valve. You should be able to hear the valve snap open. If not, check your ground to make sure there is a good connection (this should be a bare metal contact to the battery ground).
3. Start the engine and engage the FR66 PTO by turning the rocker switch to the "ON" position. If the FR66 PTO fails to operate or will not develop enough torque to operate the equipment, check the pressure as follows.
  - a) Stop engine and place the ignition keys in your pocket.
  - b) Install a 400 PSI pressure gauge at the piston port of the FR66 PTO as shown in figure 1 below.

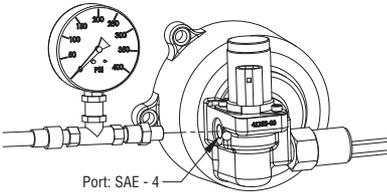


Figure 1 - Piston Port Connection

- c) Remove the pressure switch from the FR66 end cover and place a second 400 PSI pressure gauge in the pressure switch port as shown in figure 2 below.

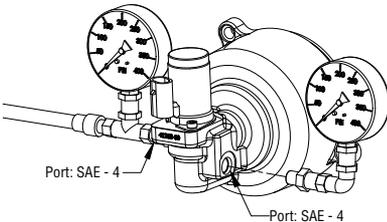


Figure 2 - Pressure Port Connection

- d) Start the engine (staying clear of any rotating components). Engage the FR66 PTO by turning the rocker switch to the "ON" position. Increase the engine speed to 1300 RPM.
    - e) If either gauge registers less than 130 PSI or if there is more than 50 PSI difference between the 2 gauges at any engine speed, check for obstructions in the hose or remove the solenoid and check for contamination.
    - f) If the gauge on the piston port registers 50 PSI or less, you may be connected to the wrong port on the transmission. Recheck the transmission information for the main pressure port location.

# SECTION 4

## OWNER'S MANUAL

### PTO SHIFTING PROCEDURE & PRECAUTIONS

PTO's should not be engaged (turned "ON") under heavy load and/or at engine speeds over 1000 RPM. If your operators are careless or negligent in this respect, you can safeguard your equipment with one or more Muncie protective systems.

**CAUTION:** Do NOT operate hydraulic pumps systems without the hydraulic system completely installed.

### **WARNING! STATIONARY OPERATION REQUIREMENTS**

- **NEVER GO UNDER THE VEHICLE WITH THE ENGINE RUNNING.**
- Parking brake must always be set.
- Vehicle's wheels must always be chocked.
- Transmission must always be in park.

**Important:** An operator must always be in the driver's seat whenever the engine is running and the transmission is in gear, in order to prevent or stop any unexpected movement of the vehicle which may cause injuries to the operator or others in the vicinity.

### PTO OPERATION VEHICLE STATIONARY

1. Vehicle must be wired for Stationary Operation.
2. The PTO drive gear is engine driven and will spin whenever the engine is turning.
3. See warning above. Set parking brake and with foot off of service brake, with the vehicle engine operating at idle, engage PTO by pushing the rocker switch to the engage position.
4. Connection of the FR66 PTO is through the Ford SEIC control. The Muncie harness will allow the throttle settings to range from 900 RPM to 3000 RPM.

The Maximum allowable operating speed is an engine speed of 2000 RPM. Connection to Ford 6.7L diesel computer through the PTO activation circuit will automatically increase engine to a pre-set RPM as set by the PTO installer.

5. The PTO activation system is wired through the vehicle ignition. If you should leave the PTO engaged when you turn off the vehicle the PTO activation will NOT automatically turn on when the

### SEIC ENABLE/DISABLE CONDITIONS

| Vehicle Conditions to Enable SEIC<br>(All are required) | Vehicle Conditions to Disable SEIC<br>(Any one required) | SEIC | Live Drive |
|---|--|------|------------|
| Parking brake applied                                   | Parking Brake disengaged                                 | Yes  | No         |
| Foot off of service brake                               | Depressing service brake                                 | Yes  | No         |
| Vehicle in PARK (automatic trans.)                      | Vehicle taken out of park                                | Yes  | No         |
| Foot off of accelerator pedal                           | Accelerator pedal depressed                              | Yes  | No         |
| Vehicle speed is 0 mph (stationary)                     | Vehicle speed is not 0 mph (stationary)                  | Yes  | No         |
| Engine at a stable base idle speed                      |  | Yes  | No         |
| Transmission oil Temp. above 20° F                      | Transmission Oil Temperature (TOT) Limit exceeds 240° F. | Yes  | Yes        |
| Engine Coolant Temp. (ECT) 120° F min.                  | Engine Coolant Temperature Limit (ECT)                   | Yes  | Yes        |
|   | Catalyst Temperature Limit                               | Yes  | Yes        |

enablers are met and when the engine is re-started. You will need to turn off the PTO and go through the activation process again once the engine is restarted.

*NOTE: Consult your Muncie product literature or call your nearest Muncie Power Center for information on the SPD-1001A System Protection Device. The SPD-1001A is adjustable for maximum engine speed and can also prevent engagement of your PTO at unsafe engine speeds.*

## **PTO OPERATION VEHICLE MOBILE**

1. Vehicle must be wired for mobile operation.
2. With the vehicle engine operating at idle and the selector in Park, engage the PTO by pushing the rocker switch to the “engage” position.
3. Release the parking brake, shift the transmission into a drive or reverse selection.
4. The Torqshift® transmission is designed to allow PTO operation in all gears including over-drive.

## **PTO MAINTENANCE**

The Power Take-Off, being an integral part of the transmission, should be serviced at the same intervals as the transmission. Changing transmission fluid should follow the interval recommended by the vehicle manufacturer for severe service. Transmission oil level is important. Checking for PTO leaks and checking the transmission oil level should be done on a regular basis.

The Power Take-Off is also part of a system. The PTO system may include the activation control parts, a driveshaft, or hydraulic pump. This PTO system requires periodic checks and service. Typically the interval for maintenance checks of the PTO system depends on the application of the system. Every time the chassis is lubricated or a mechanic is under the vehicle the PTO system should be checked and/or serviced. For severe duty PTO system applications, it is recommended that the system be

checked for service every 100 hours of use (this guideline can be adjusted based on past service history once you have it established).

Service should include checking and lubricating direct mount pump shaft connections. PTO gears can be checked for wear by removing the PTO. If pitting, galling, cracking, or deformation of the gears or splines has occurred, then the PTO needs to be rebuilt or replaced. Within the first week of use, recheck installation of PTO. Check for leaks and loose mounting hardware.

At regular maintenance intervals; check adjustments and lubricate moving parts, tighten and repair connections and mounting hardware. Pumps that are mounted directly to the PTO output require the application of an anti-seize or a high temperature and/or high pressure grease (Muncie PTOs are initially supplied with required grease). The purpose of this grease is to help make PTO easier to service and to reduce the effects of fretting corrosion on the mating PTO and pump shafts. PTO applications under severe duty cycles and/or high torque requirements may require servicing this shaft connection by periodically re-greasing shafts. Fretting corrosion cannot be stopped by applying grease; the grease is only a deterrent.

## **PTO TORQUE & HORSEPOWER RATINGS**

Intermittent service refers to an On-Off operation under load. If maximum horsepower and/or torque is used for an extended period of time, (5 minutes or more), it is considered “Continuous Service” and the horsepower rating of the PTO should be reduced by multiplying the value below by 0.70.

|                            | Stationary | Mobile |
|----------------------------|------------|--------|
| PTO Series                 | FR66       |        |
| Speed Ratio                | 09         |        |
| Intermittent HP @1000 RPM* | 38         | 22.8   |
| Intermittent KW @1000 RPM  | 28         | 17     |
| Torque Ft. Lbs.*           | 200        | 120    |
| Torque N-M                 | 271        | 163    |
| Maximum PTO Speed          | 2500       |        |

*\* Torque & HP limitations are mandated by Ford to limit transmission loading.*

## FR66 - PTO TROUBLESHOOTING GUIDE

| PROBLEM   | POSSIBLE CAUSE                                   | REMEDY   | PREVENTION  |
|---|--|--|---|
| <b>PTO DOES NOT ENGAGE</b>                          | FORD required wiring installation not followed.  | Inspect and reconnect PTO activation wire connection on the PTO harness.                   | Refer to wiring diagram found in Section 2.                 |
|   | Contaminated hydraulic activation lines.         | Remove contaminants from piston area.  | Change transmission oil filter.                             |
|   | Transmission Hydraulic Pressure not high enough. | Hydraulic line connected to the wrong port.  | Review installation diagrams found in section 2.            |
|   | Burned or extremely worn clutch pack.            | Replace worn components.   | Use proper shift procedures.                                |
|   | Rocker switch incorrectly connected.             | Remove connection at rocker switch, check pins and re-install per instructions on Step 30. | Make sure green wire in connector is at top when installed. |
| <b>PTO DOES NOT DISENGAGE</b>                       | Faulty hydraulic solenoid valve.                 | Repair or replace.   | Sometime a result of contamination or dirty valve.          |
|   | Burned or extremely worn clutch pack.            | Repair or replace components.  | Follow proper engagement procedures. See section 3.         |
| <b>PTO ENGAGES LOW/NO OUTPUT SPEED OR PUMP FLOW</b> | FORD required wiring installation not followed.  | Inspect and reconnect PTO activation wire connection on the PTO harness.                   | Refer to wiring diagram found in section 2.                 |

## POWER TAKE-OFF WARRANTY

The Muncie Power Take-Off is warranted to be free of defects in material or workmanship and to meet Muncie's standard written specifications at the time of sale. Muncie's obligation and liability under this warranty is expressly limited to repairing or replacing, at Muncie's option, within one year after date of original installation any defective part or parts or any product not meeting the specifications.

**THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. MUNCIE MAKES NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR PURPOSE. MUNCIE'S OBLIGATION UNDER THIS WARRANTY SHALL NOT INCLUDE ANY TRANSPORTATION CHARGES OR COSTS OF INSTALLATION OR ANY LIABILITY FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OR DELAY. THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE, AND MUNCIE'S LIABILITY WITH RESPECT TO ANY CONTRACT OR SALE OR ANYTHING DONE IN CONNECTION THEREWITH, WHETHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY, OR OTHERWISE, SHALL NOT, EXCEPT AS EXPRESSLY PROVIDED HEREIN, EXCEED THE PRICE OF THE PRODUCT OR PART ON WHICH SUCH LIABILITY IS BASED.**

If requested by Muncie, products or parts for which a warranty claim is made are to be returned transportation prepaid to a Muncie Service Center. Any installation or use not in accordance with catalogue or package instructions, other improper use, operation beyond capacity, substitution of parts not approved by Muncie, use with equipment other than the equipment on which the Power Take-Off is first installed, or alteration or repair made to the Power Take-Off other than at a Muncie Service Center shall void this warranty. No employee or representative of Muncie is authorized to change this warranty in any way or to grant any other warranty.



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