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</tr>
<tr>
<td>Throttle Ready Panel (Operator’s Panel)</td>
<td>18</td>
</tr>
<tr>
<td>Shift Components and Wiring</td>
<td>19</td>
</tr>
<tr>
<td>Wiring Schematic</td>
<td>20</td>
</tr>
</tbody>
</table>
## Safety Information

Read through and communicate safety information to the end user of this Waterous Fire Pump, Transmission or Power Take-Off (PTO) Unit.

### OEM Installation Warnings

<table>
<thead>
<tr>
<th>![WARNING]</th>
<th>![WARNING]</th>
</tr>
</thead>
</table>
| **Unexpected Truck Movement. May result in serious personal injury or death.**  
**Fire Pump Applications**  
Failure to properly install the pump shift control and pump shift indicator system in the apparatus or failure to incorporate in the Pump Operator’s Panel Engine Speed Interlock System may result in unexpected truck movement which may result in serious personal injury or death.  

**Power Take-Off (PTO) Applications**  
Failure to properly install the PTO shift control and PTO shift indicator system in the apparatus or failure to incorporate in the PTO Operator’s Panel Speed Control or Automatic Engine Speed Control system may result in unexpected truck movement which may result in serious personal injury or death. | **Inability to Pump Water. May result in serious personal injury or death.**  
**Fire Pump Applications**  
Failure to properly install the pump shift control and pump shift indicator system in the apparatus or failure to incorporate in the Pump Operator’s Panel Engine Speed Interlock System may result in the inability to pump water which may result in serious personal injury or death. |
Introduction

This instruction covers the installation of shift units on Waterous fire pump transmissions and power take-off (PTO) units.

Before proceeding with the installation of the shift unit, read the following instructions carefully.

Pneumatic Shift Unit Installation

C20 Series Transmissions / TC20 Series PTO's Only

Important Notice

Engine Speed Control Interlock System

Fire Pump Applications:
The pump transmission shift control and pump shift indicator system must be installed in the apparatus in accordance with NFPA 1901 Standard for Automotive Fire Apparatus and incorporated in the Pump Operator's Panel Engine Speed Control Interlock System (ESCIS).

Power Take-Off (PTO) Applications:
For apparatus with electronically controlled engines and automatic chassis engines, an interlock system must be provided to prevent advancement of the engine speed at the PTO operator's panel or by an automatic speed control system unless the following conditions are satisfied:
- Parking brake is engaged
- PTO is engaged, and
- Chassis transmission is in PTO gear

WARNING

Unexpected Truck Movement. May result in serious personal injury or death.

Fire Pump Applications
Failure to properly install the pump shift control and pump shift indicator system in the apparatus or failure to incorporate in the Pump Operator's Panel Engine Speed Interlock System may result in unexpected truck movement which may result in serious personal injury or death.

Power Take-Off (PTO) Applications
Failure to properly install the PTO shift control and PTO shift indicator system in the apparatus or failure to incorporate in the PTO Operator's Panel Speed Control or Automatic Engine Speed Control system may result in unexpected truck movement which may result in serious personal injury or death.

WARNING

1. Route the OEM supplied shift wiring harness to the desired mounting location. Secure the wiring to prevent chaffing or damage due to vibration (see Pages 5 & 6).
2. Install In-cab and "Throttle Ready" panels (see Pages 3 & 4).
3. Connect panel wiring to OEM supplied wiring harness (see Pages 5 & 6).
4. Install air lines between in-cab panel and shift unit.
   a. Requires 80 to 120 psi operating air pressure and a minimum air capacity of 5 cubic inches.
   b. 1/4 in. or 3/8 in. SAE J844 air brake hoses recommended for air lines (see Page 7).
5. If desired, a manual override control can be installed to be used in the event of a loss of air pressure (see Page 8).

Clearance Required for Maintenance:
3.000 in. / 76.20 mm open space must be provided behind the shift unit to allow for removal of shift unit. See diagram below.

<table>
<thead>
<tr>
<th>Inability to Pump Water. May result in serious personal injury or death.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Pump Applications</td>
</tr>
<tr>
<td>Failure to properly install the pump shift control and pump shift</td>
</tr>
<tr>
<td>indicator system in the apparatus or failure to incorporate in the</td>
</tr>
<tr>
<td>Pump Operator's Panel Engine Speed Interlock System may result in the</td>
</tr>
<tr>
<td>inability to pump water which may result in serious personal injury or</td>
</tr>
<tr>
<td>death.</td>
</tr>
</tbody>
</table>

1. Route the OEM supplied shift wiring harness to the desired mounting location. Secure the wiring to prevent chaffing or damage due to vibration (see Pages 5 & 6).
2. Install In-cab and "Throttle Ready" panels (see Pages 3 & 4).
3. Connect panel wiring to OEM supplied wiring harness (see Pages 5 & 6).
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   a. Requires 80 to 120 psi operating air pressure and a minimum air capacity of 5 cubic inches.
   b. 1/4 in. or 3/8 in. SAE J844 air brake hoses recommended for air lines (see Page 7).
5. If desired, a manual override control can be installed to be used in the event of a loss of air pressure (see Page 8).

Clearance Required for Maintenance:
3.000 in. / 76.20 mm open space must be provided behind the shift unit to allow for removal of shift unit. See diagram below.
Pneumatic Shift
Panel Plate Dimensions and Panel Cut-outs
In-Cab Panel

Installation

NOTE: PANEL CUT-OUT MUST BE SIZED AS SHOWN BELOW TO ENSURE PROPER FUNCTION OF AIR VALVE.

Panel Cut-Out

REMOVE (4) 10-32 x 1/2 IN. TORX HEAD SCREWS FROM AIR CONTROL VALVE AND USE TO MOUNT VALVE TO BACK SIDE OF IN-CAB PANEL.

Plate Dimensions

ALL DIMENSIONS SHOWN AS INCH/MILLIMETER

Panel Cut-Out

ALL DIMENSIONS SHOWN AS INCH/MILLIMETER
# Pneumatic Shift

## Panel Plate Dimensions and Panel Cut-outs

### Throttle Ready Operator's Panel

#### Installation

- **Panel Cut-Out**: See detail below
- **THROTTLE READY PANEL**
- **4 (6-32 x 3/4 in) Mounting Screws and Nuts Included with Panel**

#### Plate Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throttle Ready</td>
<td>2.750</td>
</tr>
<tr>
<td>Waterous</td>
<td>3.250</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throttle Ready</td>
<td>69.85</td>
</tr>
<tr>
<td>Waterous</td>
<td>82.55</td>
</tr>
</tbody>
</table>

---

#### Panel Cut-Out

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>THROTTLE READY</td>
<td>2.000</td>
</tr>
<tr>
<td>Waterous</td>
<td>2.500</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>THROTTLE READY</td>
<td>63.50</td>
</tr>
<tr>
<td>Waterous</td>
<td>2.000</td>
</tr>
</tbody>
</table>

---

Notes:
- All dimensions shown as inches/millimeters.
Pneumatic Shift

Shift Components and Wiring

**Shift Unit on Transmission or PTO**
Male Deutsch Plug DT06-2S
(Mates with Female Deutsch DT04-2P Plug)

<table>
<thead>
<tr>
<th>Wire Contact</th>
<th>Wire Size</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AWG 18</td>
<td>12 or 24 VDC from ESCIS</td>
</tr>
<tr>
<td>2</td>
<td>AWG 18</td>
<td>Output to ESCIS</td>
</tr>
</tbody>
</table>

Note: Ensure wiring is clear of all obstructions and moving parts.

**In-Cab Panel**

Male Deutsch Plug DT06-2S
(Mates with Female Deutsch DT04-2P Plug)

<table>
<thead>
<tr>
<th>Contact</th>
<th>Wire Size</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AWG 18</td>
<td>To Green LED “Pump or PTO Engaged” (See Note 3)</td>
</tr>
<tr>
<td>2</td>
<td>AWG 18</td>
<td>To Green LED “OK to Pump” (See Note 3)</td>
</tr>
<tr>
<td>3</td>
<td>AWG 18</td>
<td>From 12 or 24 VDC (See Note 2)</td>
</tr>
<tr>
<td>4</td>
<td>AWG 18</td>
<td>From 12 or 24 VDC (See Note 2)</td>
</tr>
</tbody>
</table>

To 12 or 24 VDC (Red or White) AWG 18
(See Note 2)

To Ground (Black) AWG 18

**Throttle Ready Panel (On Operator’s Panel)**

Female Deutsch Plug DT04-2P
(Mates with Male Deutsch DT06-2S)

<table>
<thead>
<tr>
<th>Contact</th>
<th>Wire Size</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red or White AWG 18</td>
<td>To Green LED “Pump or PTO Engaged” (See Note 3)</td>
</tr>
<tr>
<td>2</td>
<td>Black AWG 18</td>
<td>To Ground</td>
</tr>
</tbody>
</table>

Notes:

1. For installations with Allison 3000 and 4000 Product Family Automatic Chassis Transmissions with 4th Generation Controls:
   - Allison announced that transmissions shipped after June 27, 2008 with MY09 software include enhancements that improve engagement and disengagement of split-shaft (pump) transmissions (Reference Allison Watch #373, dated October, 2008).
   - In order to ensure that these enhancements are invoked, the pump/PTO engagement switch provided on the Waterous split-shaft transmission must be incorporated into both the Engine Speed Control Interlock System (ESCIS) control circuit and the Allison Fire Truck Pump Mode Input Function J1 control circuit or Allison Pump Mode Input Function AJ1 control circuit for other PTO applications.

2. These 12 or 24 VDC power connections provided for potential optional use by truck manufacturer in ESCIS design.

3. Each LED draws 20mA. Size wires accordingly.

Dashed lines indicate wiring not furnished by Waterous.

IL3123

NOTES:

IL2785
Pneumatic Shift

NOTES:

1. Number following color code is the wire size (AWG) (I.E. BK-16 is a black 16 AWG wire).

2. ESCIS - Engine Speed Control Interlock System.

ENGINE SPEED CONTROL INTERLOCK SYSTEM (ESCIS)
PROVIDED BY THE TRUCK MANUFACTURER

WIRE KEY
COLOR CODE
BK BLACK
R RED
G GREEN
W WHITE

ALLISON 3000 AND 4000 PRODUCT FAMILY AUTOMATIC TRANSMISSIONS

INDICATES WIRING NOT FURNISHED BY WATEROUS

12 OR 24 VDC POWER CONNECTION PROVIDED FOR POTENTIAL OPTIONAL USE BY THE TRUCK MANUFACTURER IN THE ESCIS DESIGN

SWITCH ON PUMP TRANSMISSION OR PTO SHIFT UNIT (CLOSES WHEN PUMP OR PTO IS ENGAGED)

12 OR 24 VDC FROM ESCIS

OUTPUT TO ESCIS

MALE PLUG
DEUTSCH: DT06-2S

1 2

OUTPUT FROM ESCIS

OPERATOR'S PANEL

IN-CAB PANEL

THROTTLE READY LED

THROTTLE ENGAGED LED

PUMP ENGAGED LED

GROUND

FEMALE PLUG
DEUTSCH: DT04-2P

1 2

MALE PLUG
DEUTSCH: DT06-4S

1 2 3 4

G LED

G LED

12 OR 24 VDC OR 24 VDC

G LED

12 OR 24 VDC POWER CONNECTION PROVIDED FOR POTENTIAL OPTIONAL USE BY THE TRUCK MANUFACTURER IN THE ESCIS DESIGN

IL2910
Pneumatic Shift

Air Line Connection

1/8 in. NPT, Connect to vehicle air supply. Requires 80 to 120 PSI operating air pressure and a minimum air capacity of 5 cubic inches.

From Vehicle Air Supply

Port No. 2
1/8 in. NPT
PUMP or PTO Port

Port No. 1
1/8 in. NPT
ROAD Port

Note: Shift Unit Rotated 180° to Show Air Ports

In-Cab Panel

Lever-Up

Lever-Middle

Lever-Down

Indicates Air Lines and Fittings to be Furnished by OEM, 1/4 or 3/8 in. SAE J844 Air Brake Hose Recommended

Lever-Up, (ROAD) Air Flow Thru Port No. 1
Lever-Middle
Exhaust Ports No.'s 1 and 2, Zero Air Flow
(Allows for Manual Movement of Shift Unit)
Lever-Down, (PUMP or PTO) Air Flow Thru Port No. 2

Shift Unit on Transmission or PTO

F-1031, Section 3030
Pneumatic Shift

Optional Manual Override

If desired, manual override controls can be installed so that in the event of a malfunction, the pump transmission or PTO can be operated from the cab, control panel or other location.

To override the pneumatic shift, the air valve must be placed in the center position to exhaust the air pressure. After air pressure is exhausted, the transmission can be manually shifted with the use of a rod or cable.

**CAUTION**

The use of a manual override control must maintain full functional capabilities of the pump or PTO shaft indicator system and the pump or PTO Operator's Panel Engine Speed Control Interlock System (ESCIS).

Connection of Override Cable or Linkage

**CAUTION**

Provisions should be made to lock linkage or cable in PUMP/PTO mode once shift is completed manually.

Install linkage or cable so that a maximum force applied to the shift unit will not exceed 100 lbs.

During normal shift operation with air pressure, the override rod or cable will move. The drag on the rod or cable should be minimized, 10 lb max. drag is recommended.

3/8-24-UNF x .56 in. (min) deep tap in end of shaft may be used to attach override cable or linkage.

Override Bracket Connection Points
Use of a slip joint is recommended so that pneumatic shifting does not cause cable movement. Slip joint should allow for 1 in. / 25.4 mm travel of shift unit shaft. The manual override axis should be in line with the shift unit shaft axis so that a side load is not applied to the shift unit shaft.
Important Notice

Engine Speed Control Interlock System

Fire Pump Applications:
The pump transmission shift control and pump shift indicator system must be installed in the apparatus in accordance with NFPA 1901 Standard for Automotive Fire Apparatus and incorporated in the Pump Operator's Panel Engine Speed Control Interlock System (ESCIS).

Power Take-Off (PTO) Applications:
For apparatus with electronically controlled engines and automatic chassis engines, an interlock system must be provided to prevent advancement of the engine speed at the PTO operator's panel or by an automatic speed control system unless the following conditions are satisfied:

- Parking brake is engaged
- PTO is engaged, and
- Chassis transmission is in PTO gear

**WARNING**

Unexpected Truck Movement. May result in serious personal injury or death.

Fire Pump Applications
Failure to properly install the pump shift control and pump shift indicator system in the apparatus or failure to incorporate in the Pump Operator's Panel Engine Speed Interlock System may result in unexpected truck movement which may result in serious personal injury or death.

Power Take-Off (PTO) Applications
Failure to properly install the PTO shift control and PTO shift indicator system in the apparatus or failure to incorporate in the PTO Operator's Panel Speed Control or Automatic Engine Speed Control system may result in unexpected truck movement which may result in serious personal injury or death.

**WARNING**

Inability to Pump Water. May result in serious personal injury or death.

Fire Pump Applications
Failure to properly install the pump shift control and pump shift indicator system in the apparatus or failure to incorporate in the Pump Operator's Panel Engine Speed Interlock System may result in the inability to pump water which may result in serious personal injury or death.

1. Route the shift wiring harness to the desired mounting location. Secure the wiring to prevent chaffing or damage due to vibration (see Pages 13 & 14).
2. Install In-Cab Panel and Throttle Ready Panel (see Page 10).
3. If desired, a manual override control can be installed to be used in the event of a malfunction, the pump transmission can be operated from the cab, control panel or other location (see Page 15).
Electric Shift

Panel Plate Dimensions and Panel Cut-outs

In-Cab Panel

NOTE: PUMP SHIFT panel shown.
For PTO applications, panel will be labeled “PTO SHIFT”.

![In-Cab Panel Diagram]

NOTE: Mounting hardware is not furnished by Waterous.

Panel Cut-Out

from DPL82086

Throttle Ready (Operator's Panel)

![Throttle Ready Diagram]

NOTE: Mounting hardware is furnished by Waterous.

Panel Cut-out

from DPL82086
**Electric Shift**

### Shift Components and Wiring

**Shift Unit on Transmission or PTO**

<table>
<thead>
<tr>
<th>Wire</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>AWG 18 12 or 24 VDC from ESCIS</td>
</tr>
<tr>
<td>Black</td>
<td>AWG 18 Output to ESCIS</td>
</tr>
</tbody>
</table>

**In-Cab Panel**

- Male Deutsch Plug DT06-2S (Mates with Female Deutsch DT04-2P Plug)

<table>
<thead>
<tr>
<th>Contact</th>
<th>Wire Size</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AWG 18</td>
<td>To Green LED “Pump or PTO Engaged” (See Note 3)</td>
</tr>
<tr>
<td>2</td>
<td>AWG 18</td>
<td>To Green LED “OK to Pump” (See Note 3)</td>
</tr>
<tr>
<td>3</td>
<td>AWG 18</td>
<td>From 12 or 24 VDC (See Note 2)</td>
</tr>
<tr>
<td>4</td>
<td>AWG 18</td>
<td>From 12 or 24 VDC (See Note 2)</td>
</tr>
</tbody>
</table>

**Throttle Ready Panel (On Operator’s Panel)**

- Female Deutsch Plug DT04-2P (Mates with Male Deutsch DT06-2S)

<table>
<thead>
<tr>
<th>Contact</th>
<th>Wire Size</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red or White AWG 16</td>
<td>To Green LED “Throttle Ready” (See Note 3)</td>
</tr>
<tr>
<td>2</td>
<td>Black AWG 16</td>
<td>To Ground</td>
</tr>
</tbody>
</table>

**NOTES:**

1. For installations with Allison 3000 and 4000 Product Family Automatic Chassis Transmissions with 4th Generation Controls:
   - Allison announced that transmissions shipped after June 27, 2008 with MY09 software include enhancements that improve engagement and disengagement of split-shaft (pump) transmissions (Reference Allison Watch #373, dated October, 2008).
   - In order to ensure that these enhancements are invoked, the pump/PTO engagement switch provided on the Waterous split-shaft transmission must be incorporated into both the Engine Speed Control Interlock System (ESCIS) control circuit and the Allison Fire Truck Pump Mode Input Function J1 control circuit or Allison Pump Mode Input Function AJ1 control circuit for other PTO applications.

2. These 12 or 24 VDC power connections provided for potential optional use by truck manufacturer in ESCIS design.

3. Each LED draws 20mA. Size wires accordingly.

4. Current draw for the shift unit electric motor is 20 amps when the shift cycle is initiated (this lasts for approximately one second) and decreases to 10 amps for the remainder of the cycle.

---

Dashed lines indicate wiring not furnished by Waterous.

Engine Speed Control Interlock System (ESCIS) Provided by the Truck Manufacturer

Allison 3000 and 4000 Product Family Automatic Transmissions (See Note 1)
Electric Shift

Wiring Schematic

NOTES:

1. Number following color code is the wire size (AWG.) (I.E. BK-16 is a black 16 AWG wire).

2. ESCIS - Engine Speed Control Interlock System.

---

Wiring Diagram:

- Switch on Pump Transmission or PTO Shift Unit (Closes when Pump or PTO is Engaged)

- 12 or 24 VDC from ESCIS

- Engine Speed Control Interlock System (ESCIS) Provided by the Truck Manufacturer

- In-Cab Panel

- PUMP ENGAGED OR PTO ENGAGED LED

- OK TO PUMP OR THROTTLE READY (PTO) LED

- 12 or 24 VDC Power Connection Provided for Potential Optional Use by the Truck Manufacturer in the ESCIS Design

- Wire Key Color Code
  - BK Black
  - R Red
  - G Green
  - W White

---

IL3126
NOTE: The use of a manual override control must maintain full functional capability of the pump shift indicator system and the Pump Operator’s Panel Engine Speed Control Interlock System (ESCIS).

Two rods are required to override the shift unit: one to disengage the shift unit cam and the other to operate the shift arm on the transmission. Note that the instructions below cover the routing of the control rods to the control panel on the left side of the apparatus.

1. Determine locations for the control rod handles on the control panel or other location. Be sure no obstructions interfere with the rod operation. Drill holes and install rubber grommets (if desired).

2. Install the manual shift rod between the control panel and the shift arm on the transmission. Connect the rod to the shift arm with 3/8 inch ball joint or similar device which will permit the rod to swivel freely on the arm.

NOTE: The rod will move during electric shift operation; therefore, reduce drag on the rod.

3. The cams underneath the electric shift unit swivel with the vertical shift shaft whenever the electric shift is operated. The cams must be rotated in a vertical plane in order to disengage the electric actuator. One of the easiest ways of attaching the rod to the cam is to use a 3/8 inch eyebolt or rod end; since the diameter of the clevis pin is 1/4 inch, the eyebolt or rod end will be enough oversize to permit the cams to swivel horizontally with the shaft when the shift is operated.

NOTE: Install override linkage so that the maximum force applied to the long arm of the lever will not exceed 300 lbs / 136 kg.

**Hole Size for Manual Override Linkage**

<table>
<thead>
<tr>
<th>Size</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2X 0.406</td>
<td>FOR MANUAL OVERRIDE LINKAGE (LINKAGE NOT FURNISHED BY WATEROUS)</td>
</tr>
<tr>
<td>1.500</td>
<td>TRAVEL</td>
</tr>
<tr>
<td>38.10</td>
<td>PUMP OR PTO</td>
</tr>
</tbody>
</table>

**Shift Unit Disengagement Cam**

- 2.13
- 7.45
- 0.250 FOR MANUAL OVERRIDE (LINKAGE NOT FURNISHED BY WATEROUS)

**Manual Override**

- **Manual Override Control**
  - Rod and Handle to Operator’s Panel (Not furnished by Waterous)
  - 1/4 in. Clevis Pin and Cotter Pin (Not furnished by Waterous)

- **Shift Unit Disengagement Control**
  - Rod and Handle to Operator’s Panel (Not furnished by Waterous)
  - 3/8 in. Eyebolt or Rod End (Not furnished by Waterous)
Important Notice

Engine Speed Control Interlock System

Fire Pump Applications:
The pump transmission shift control and pump shift indicator system must be installed in the apparatus in accordance with NFPA 1901 Standard for Automotive Fire Apparatus and incorporated in the Pump Operator's Panel Engine Speed Control Interlock System (ESCIS).

Power Take-Off (PTO) Applications:
For apparatus with electronically controlled engines and automatic chassis engines, an interlock system must be provided to prevent advancement of the engine speed at the PTO operator's panel or by an automatic speed control system unless the following conditions are satisfied:

- Parking brake is engaged
- PTO is engaged, and
- Chassis transmission is in PTO gear

**WARNING**

Unexpected Truck Movement. May result in serious personal injury or death.

**Fire Pump Applications**
Failure to properly install the pump shift control and pump shift indicator system in the apparatus or failure to incorporate in the Pump Operator's Panel Engine Speed Interlock System may result in unexpected truck movement which may result in serious personal injury or death.

**Power Take-Off (PTO) Applications**
Failure to properly install the PTO shift control and PTO shift indicator system in the apparatus or failure to incorporate in the PTO Operator's Panel Speed Control or Automatic Engine Speed Control system may result in unexpected truck movement which may result in serious personal injury or death.

---

**WARNING**

Inability to Pump Water. May result in serious personal injury or death.

**Fire Pump Applications**
Failure to properly install the pump shift control and pump shift indicator system in the apparatus or failure to incorporate in the Pump Operator's Panel Engine Speed Interlock System may result in the inability to pump water which may result in serious personal injury or death.

1. Install a suitable linkage which will permit operation from the cab, control panel or other location (see Page 17).
   a. Determine locations for the control rod handles on the panel. Drill holes and install grommets (if desired). Ensure that no obstructions interfere with rod operation.
   b. Install shift linkage so that the maximum force applied to the long arm of the shift lever will not exceed 300 lbs / 136 kg.
   c. Connect the rod to the shift arm with a 3/8 in. ball joint or similar device which will permit the rod to swivel freely on the arm.

2. Route the shift wiring harness to the desired mounting location. Secure the wiring to prevent chaffing or damage due to vibration.

3. Install In-Cab and Throttle Ready panels (see Page 16).

4. Connect panel wiring to OEM supplied wiring (see Page 19 and 20).
Manual Shift

Shift Linkage

NOTE: Install shift linkage so that the maximum force applied to the long arm of the shift lever will not exceed 300 lbs / 136 kg.

Shift Arm
2X Ø.406 FOR SHIFT LINKAGE
(LINKAGE NOT FURNISHED BY WATEROUS)
Manual Shift
Panel Plate Dimensions and Panel Cut-outs

In-Cab Panel

NOTE: Mounting hardware is furnished by Waterous.

Panel Cut-Out

from DPL82086

Throttle Ready (Operator's Panel)

NOTE: Panel is secured with indicating light hex nut.

Panel Cut-out

from DPL82086
Shift Components and Wiring

**Manual Shift**

### Shift Unit on Transmission or PTO

- **Shift Arm in Road**
- **Shift Arm in Pump or PTO**
- **Switch**
- **To In-Cab Panel**

To 12 or 24 VDC (Black) 16 AWG, No. 6 Ring Terminal, 82 in. / 2108 mm Long

Engine Speed Control Interlock System (ESCIS) Provided by the Truck Manufacturer

Allison 3000 and 4000 Product Family Automatic Transmissions (See Note 1)

Dashed lines indicate wiring not furnished by Waterous.

### In-Cab Panel

- **Pump Engaged Light**
- **OK To Pump Light**
- **To Switch on Transmission or PTO**
- **To Ground (White), AWG 18, No. 8 Ring Terminal, 4.50 in. / 114.3 mm Long**

### Throttle Ready Panel (On Operator’s Panel)

- **Throttle Ready Light**

**NOTES:**

1. For installations with Allison 3000 and 4000 Product Family Automatic Chassis Transmissions with 4th Generation Controls:
   - Allison announced that transmissions shipped after June 27, 2008 with MY09 software include enhancements that improve engagement and disengagement of split-shaft (pump) transmissions (Reference Allison Watch #373, dated October, 2008).
   - In order to ensure that these enhancements are invoked, the pump/PTO engagement switch provided on the Waterous split-shaft transmission must be incorporated into both the Engine Speed Control Interlock System (ESCIS) control circuit and the Allison Fire Truck Pump Mode Input Function J1 control circuit or Allison Pump Mode Input Function AJ1 control circuit for other PTO applications.
NOTES:
1. Number following color code is the wire size (AWG.) (I.E. BK-16 is a black 16 AWG wire).
2. ESCIS - Engine Speed Control Interlock System.