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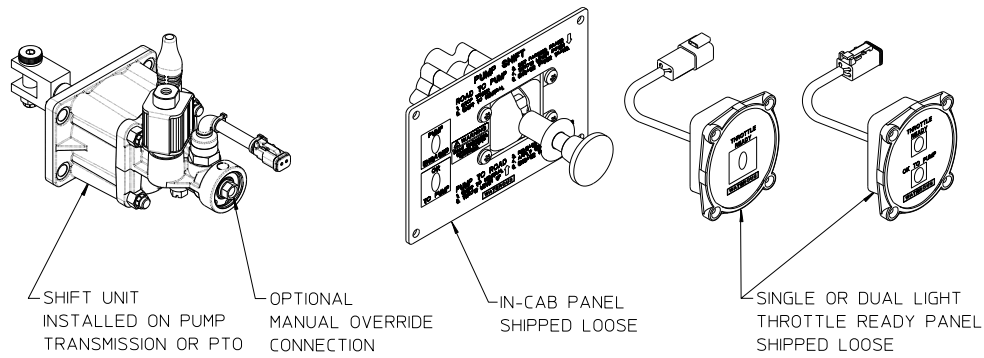
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**Read through the installation  
instructions carefully before  
installing your Waterous  
Shift Unit.**

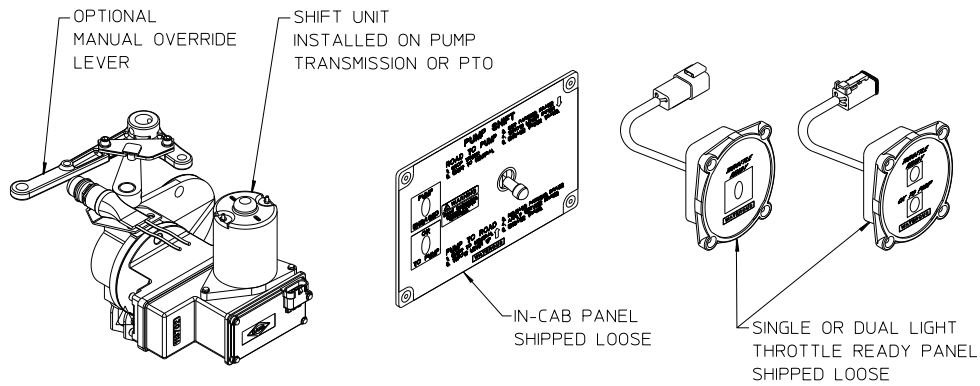
NOTE: Instructions subject to change without notice

# Component Identification



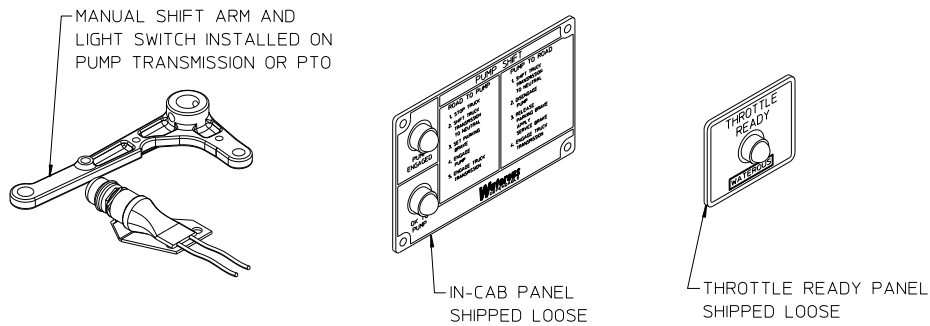
IL4364

## PNEUMATIC OPERATION



IL4364

## ELECTRIC OPERATION



IL4364

## MANUAL OPERATION

## 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.

## 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



### 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.

# Pneumatic Shift Unit Installation

## C20 & C21 Series Transmissions / TC20 & TC21 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

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

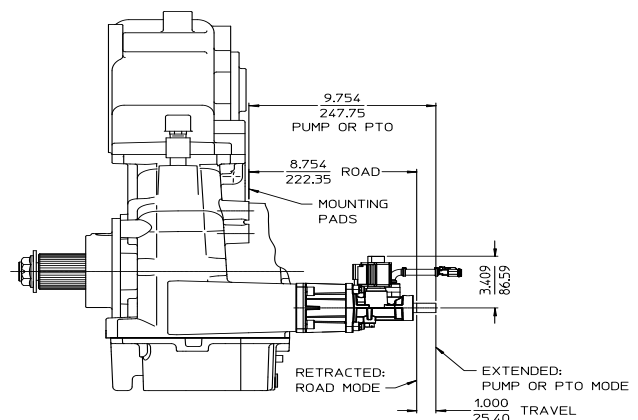
#### Fire Pump Applications

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 OEM supplied shift wiring harness to the desired mounting location. Secure the wiring to prevent chaffing or damage due to vibration (see Pages 7 & 8).
2. Install In-cab and "Throttle Ready" panels (see Pages 5 & 6).
3. Connect panel wiring to OEM supplied wiring harness (see Pages 7 & 8).
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 11).
5. If desired, a manual override control can be installed to be used in the event of a loss of air pressure (see Page 12 and 13).

#### 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.

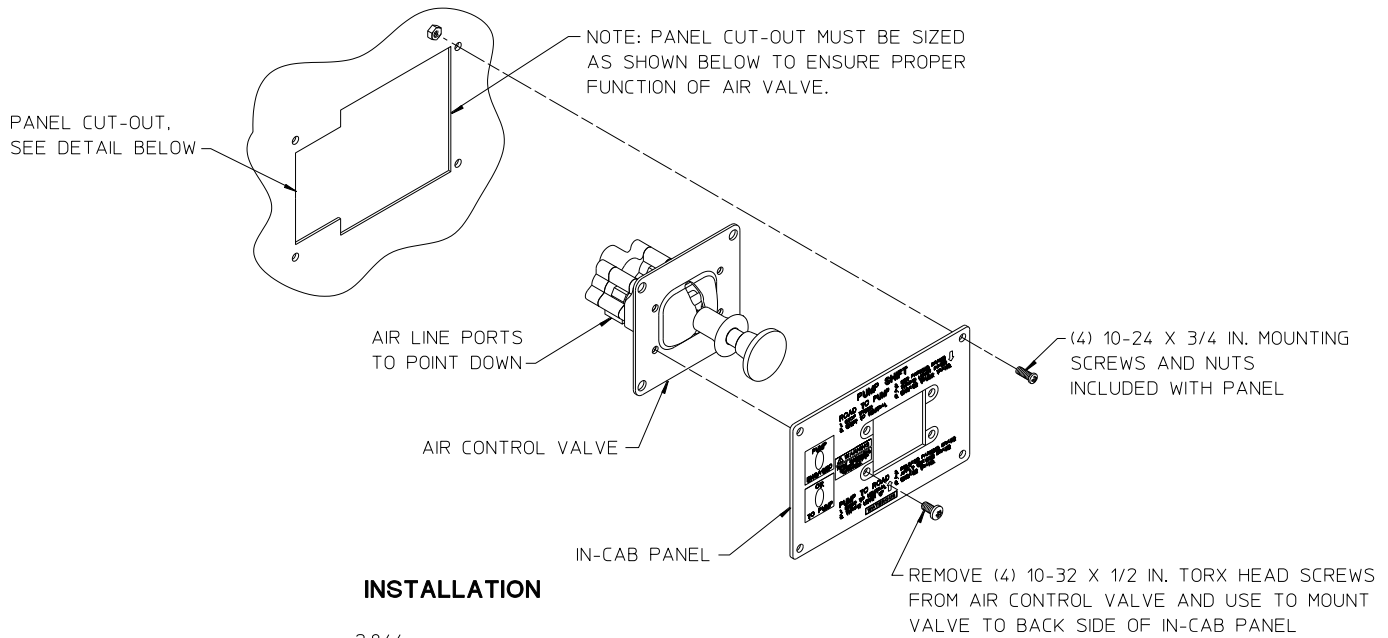


IL3125

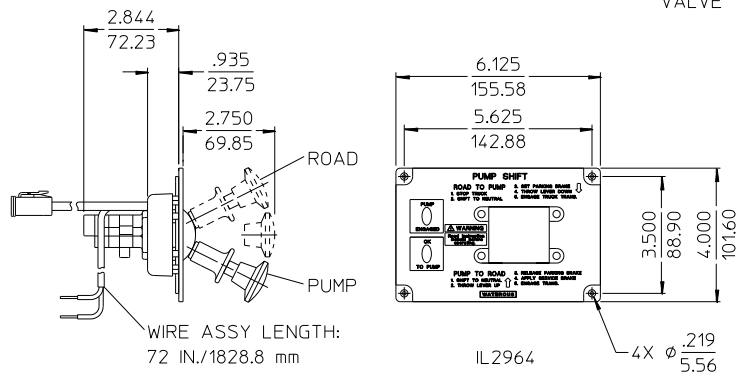
IL3125

# Installation – In-Cab Panel

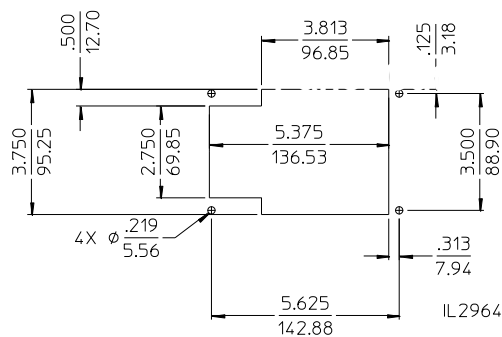
## Pneumatic Operation



### INSTALLATION



### DIMENSIONS



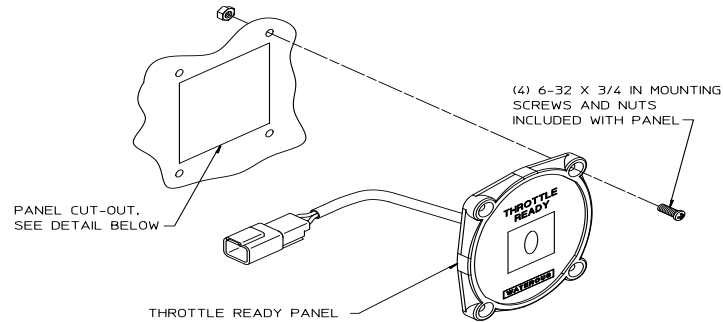
### PANEL CUT-OUT

ALL DIMENSIONS SHOWN AS INCH/MILLIMETER

( $\frac{\text{INCH}}{\text{MILLIMETER}}$ )

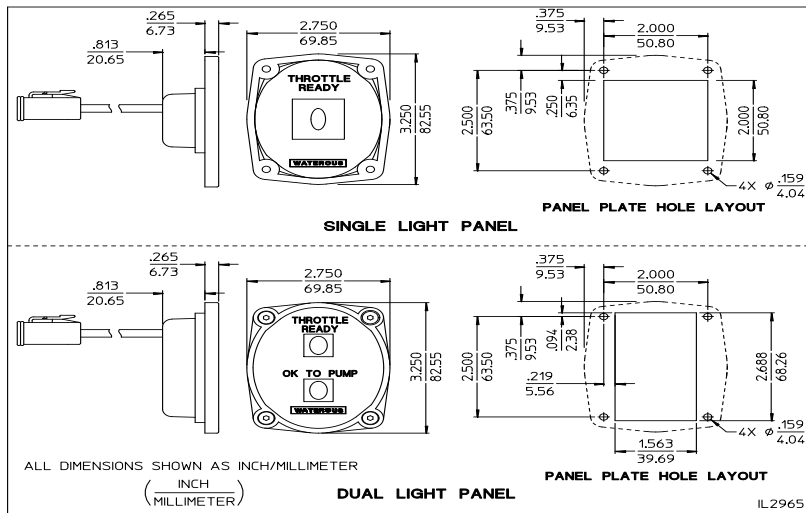
# Installation – In-Cab Panel

## Pneumatic Operation (On Operator's Panel)



### INSTALLATION

IL2965



# Wiring Connections – Shift Unit and In-Cab Panel

## Pneumatic Operation

(See next page for Throttle Ready Panel)

Interlock Solenoid on Shift Unit		
Female Deutsch DT04-2P Receptacle Mates with Male Deutsch Plug DT06-2S		
Wire		Function
Contact	Size	
1	AWG 18	12 or 24 VDC from ECSIS
2	AWG 18	Output to ESCIS

Switch on Shift Unit		
Male Deutsch DT06-2S Plug Mates with Female Deutsch DT04-2P Receptacle		
Wire		Function
Contact	Size	
1	AWG 18	12 or 24 VDC from ECSIS
2	AWG 18	Ground

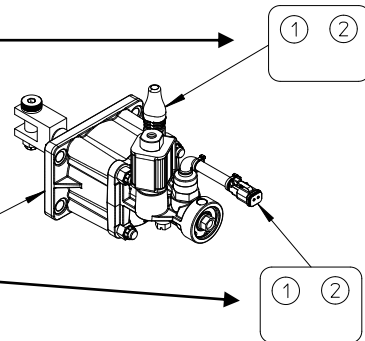
In-Cab Panel		
Male Deutsch DT06-4S Plug Mates with Female Deutsch DT04-4P Receptacle		
Wire		Function
Contact	Size	
1	AWG 18	To Green LED "Pump or PTO Engaged" (See Note 3)
2	AWG 18	To Green LED "OK to Pump" (See Note 3)
3	AWG18	From 12 or 24 VDC (See Note 2)
4	AWG18	From 12 or 24 VDC (See Note 2)

**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

**SHIFT  
UNIT**



IL4365

**IN-CAB  
PANEL**

TO 12 OR 24 VDC  
(RED OR WHITE) AWG 18

TO GROUND  
(BLACK) AWG 18

## NOTES:

- For installations with Allison 3000 and 4000 Product Family Automatic Chassis Transmissions with 4<sup>th</sup> 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.
- These 12 or 24 VDC power connections provided for potential optional use by truck manufacturer in ESCIS design.
- Each LED draws 20mA. Size wires accordingly.

# Wiring Connections – Throttle Ready Panel

## Pneumatic Operation

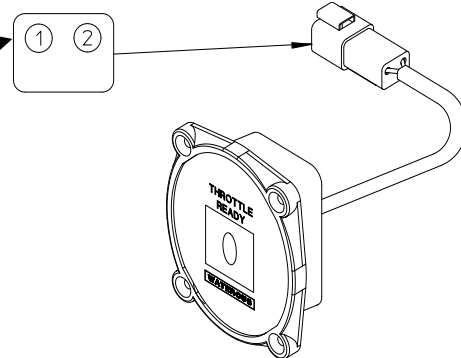
Single Light Panel		
Female Deutsch DT04-2P Receptacle Mates with Male Deutsch DT06-2S Plug		
Wire		Function
Contact	Size	
1	AWG 18	To Green LED "Throttle Ready" (See Note 2)
2	AWG 18	Ground

Dual Light Panel		
Male Deutsch DT06-4S Plug Mates with Female Deutsch DT04-4P Receptacle		
Wire		Function
Contact	Size	
1	AWG 18	To Green LED "Throttle Ready" (See Note 3)
2	AWG 18	To Green LED "OK to Pump" (See Note 3)
3	AWG18	Ground
4	AWG18	Not Used

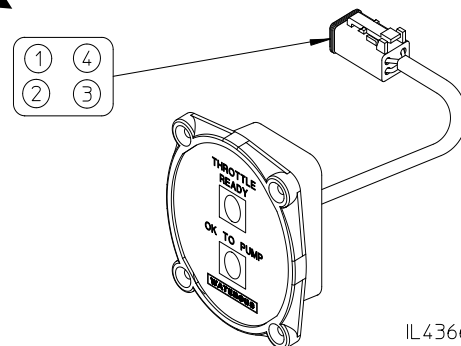
Engine Speed Control  
Interlock System (ESCIS)  
Provided by the Truck  
Manufacturer

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

----- Dashed lines indicate wiring not  
furnished by Waterous



SINGLE LIGHT PANEL



IL4366

DUAL LIGHT PANEL

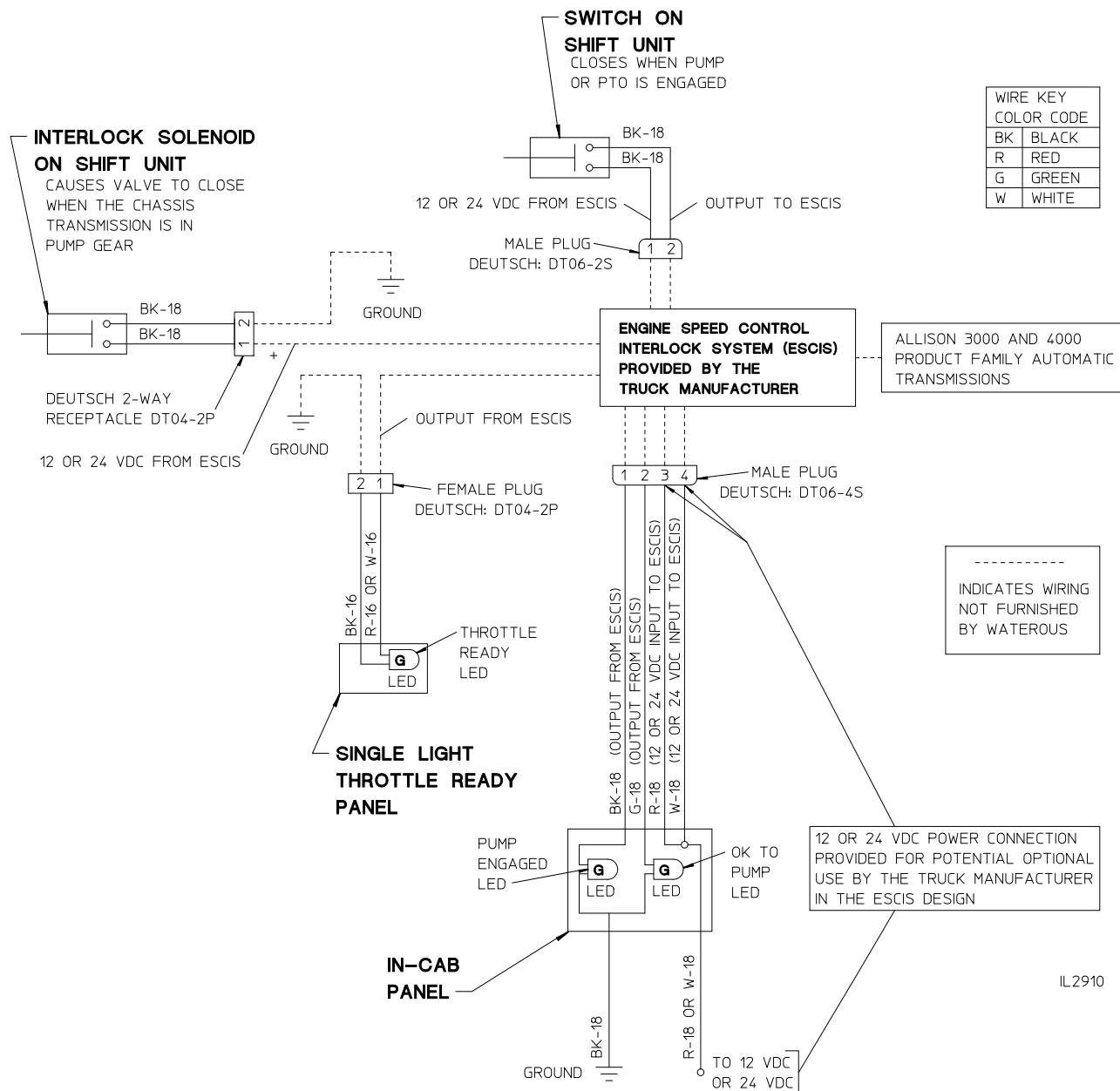
## NOTES:

- For installations with Allison 3000 and 4000 Product Family Automatic Chassis Transmissions with 4<sup>th</sup> 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.
- Each LED draws 20mA. Size wires accordingly.



# Wiring Schematic – Single Light Operator's Panel

## Pneumatic Operation

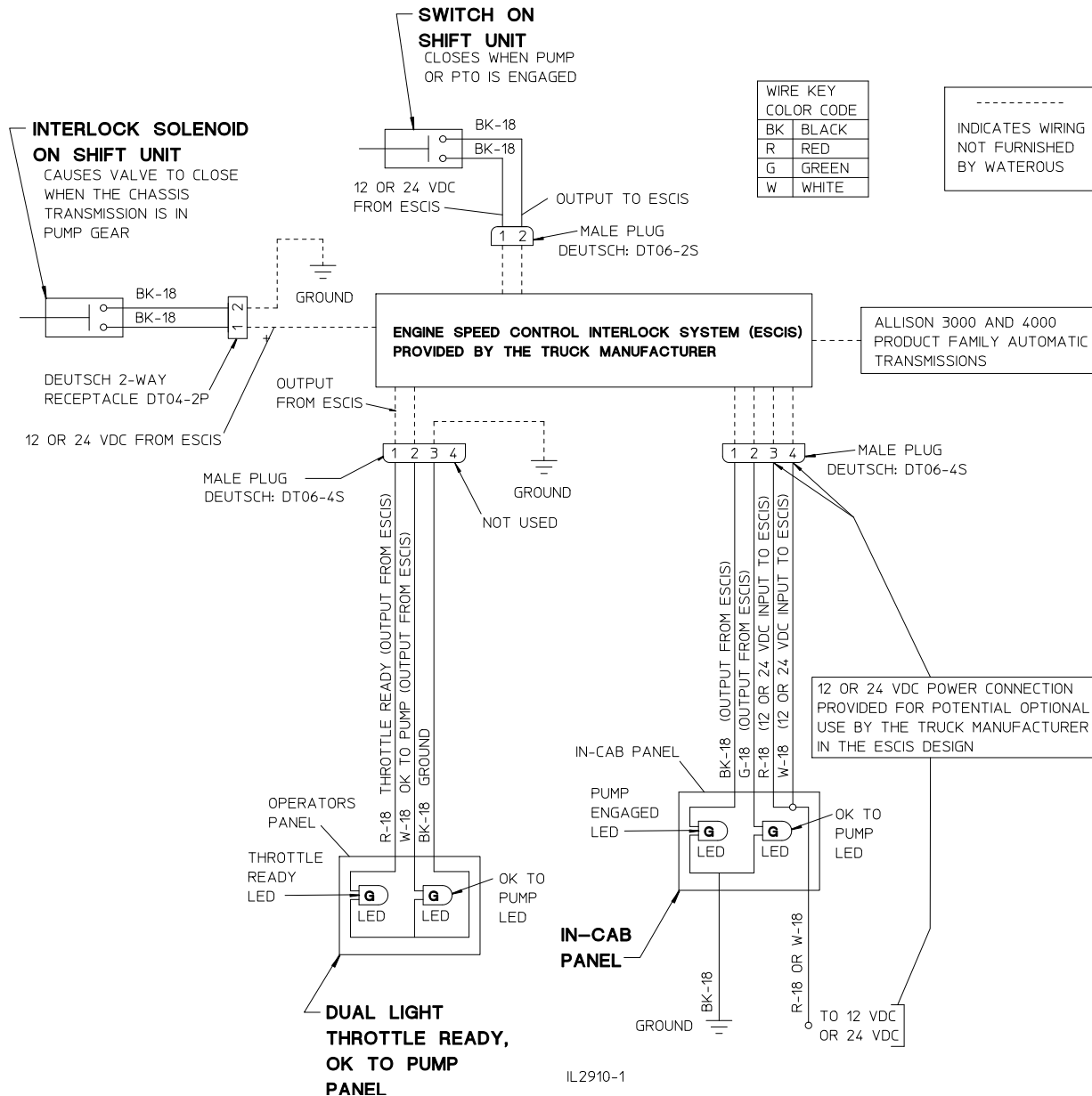


### NOTES:

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 Schematic – Dual Light Operator's Panel

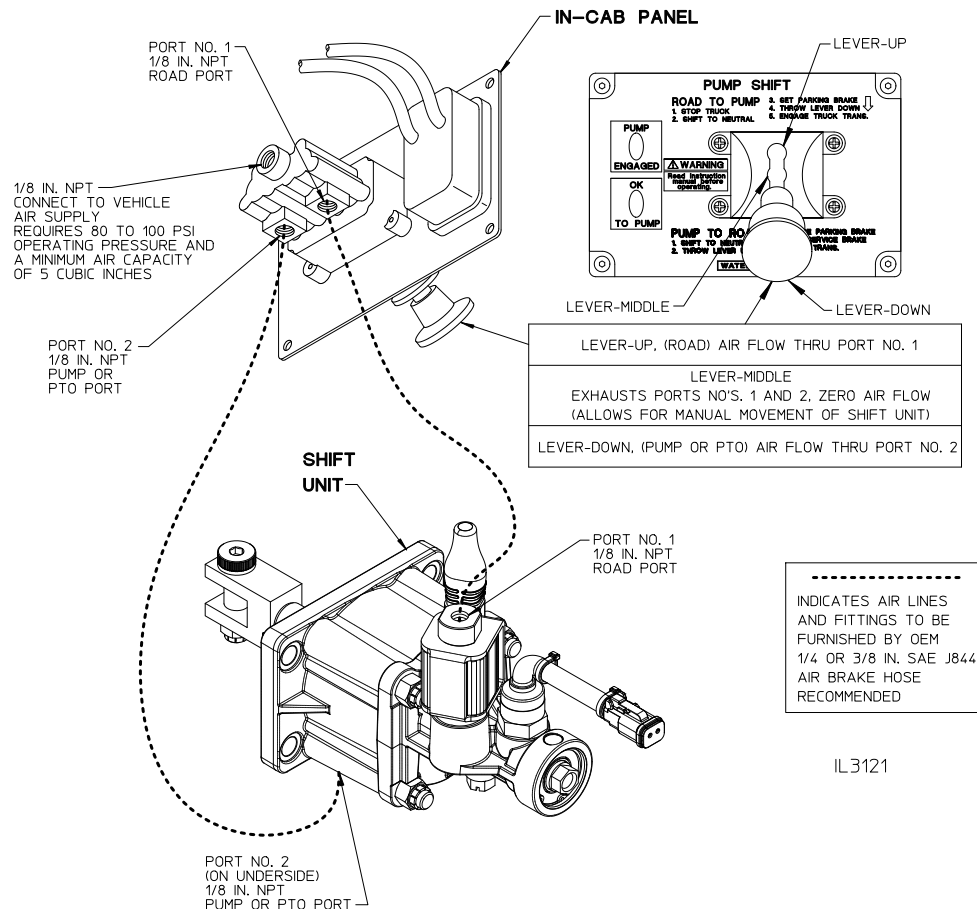
## Pneumatic Operation



### 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.

## Air Line Connections – Pneumatic Operation



IL3121

# Manual Override – Pneumatic Operation

(Use is Optional)

## 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).

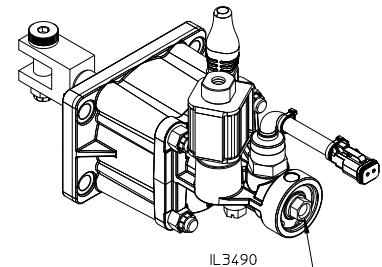
## Connection of Override Cable or Linkage

### CAUTION

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

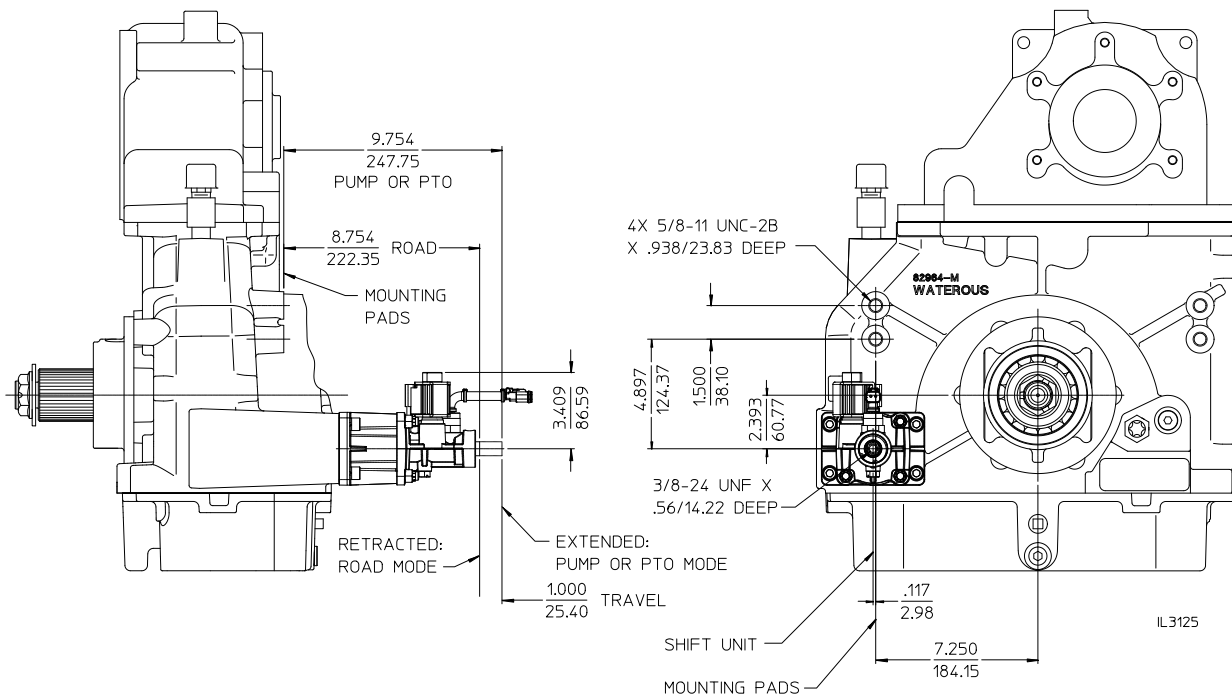
Install linkage or cable so that a maximum force applied to the shift unit will not exceed 100 lbs.

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.



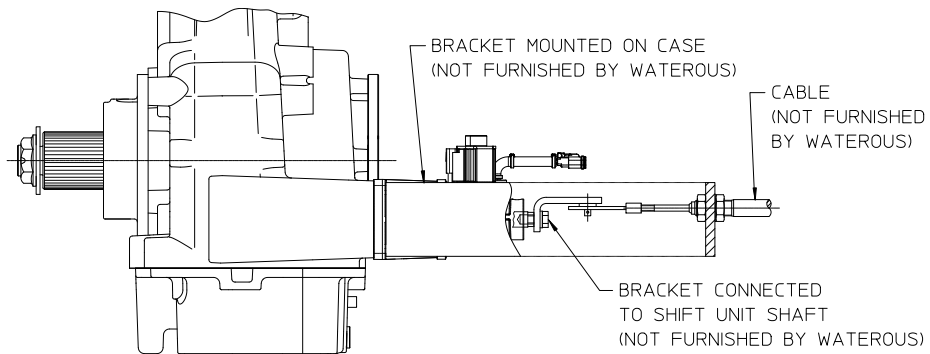
3/8-24 UNF X .56 IN. (MIN) DEEP TAP IN END OF SHAFT MAY BE USED TO ATTACH OVERRIDE CABLE OR LINKAGE

## Override Bracket Connection Points

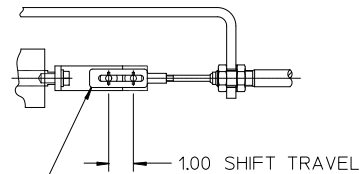


## Manual Override – Pneumatic Operation

(Use is Optional)



IL3330



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.

BOTTOM VIEW

# Electric Shift Unit Installation

## WB Series Transmissions and TML, TMR 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

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

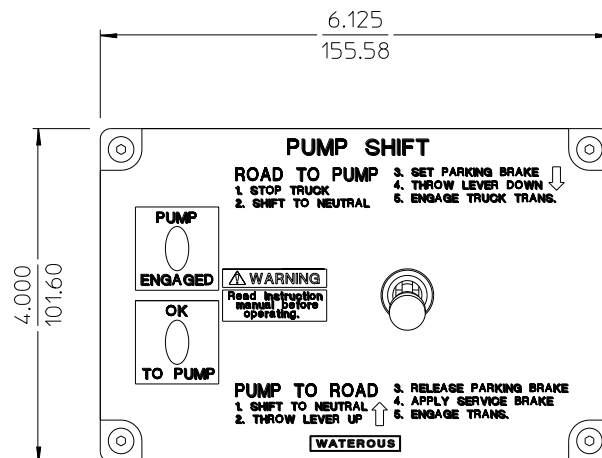
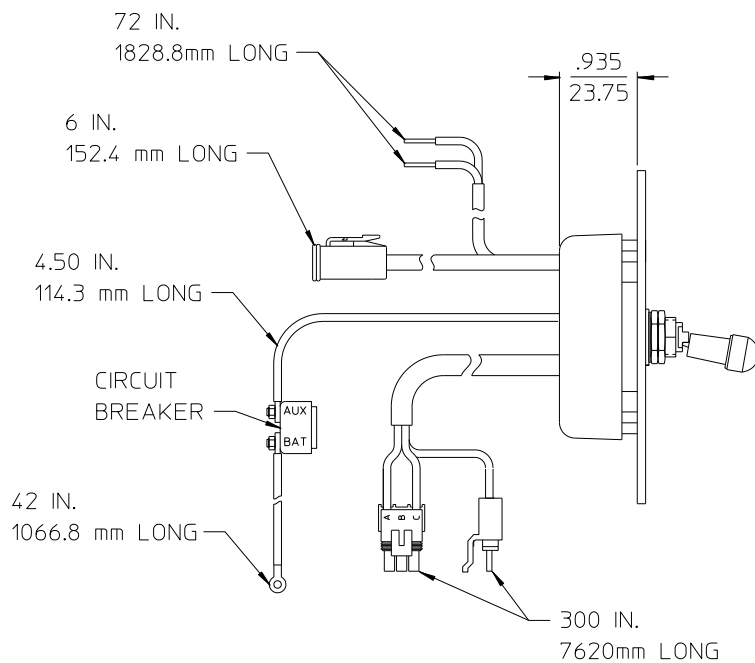
#### **Fire Pump Applications**

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 17 & 18).
2. Install In-Cab Panel and Throttle Ready Panel (see Pages 15 & 16).
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 21).

# Installation – In-Cab Panel

(Electric Operation)

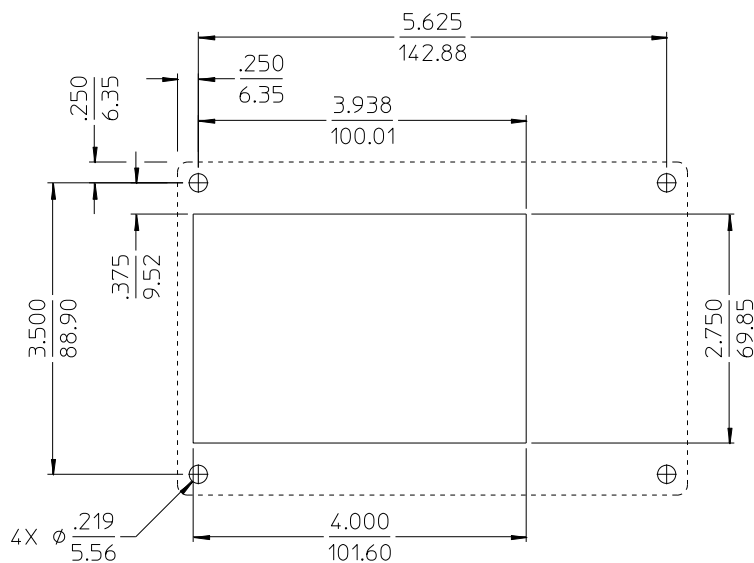


## DIMENSIONS

IL4369

ALL DIMENSIONS SHOWN AS INCH/MILLIMETER

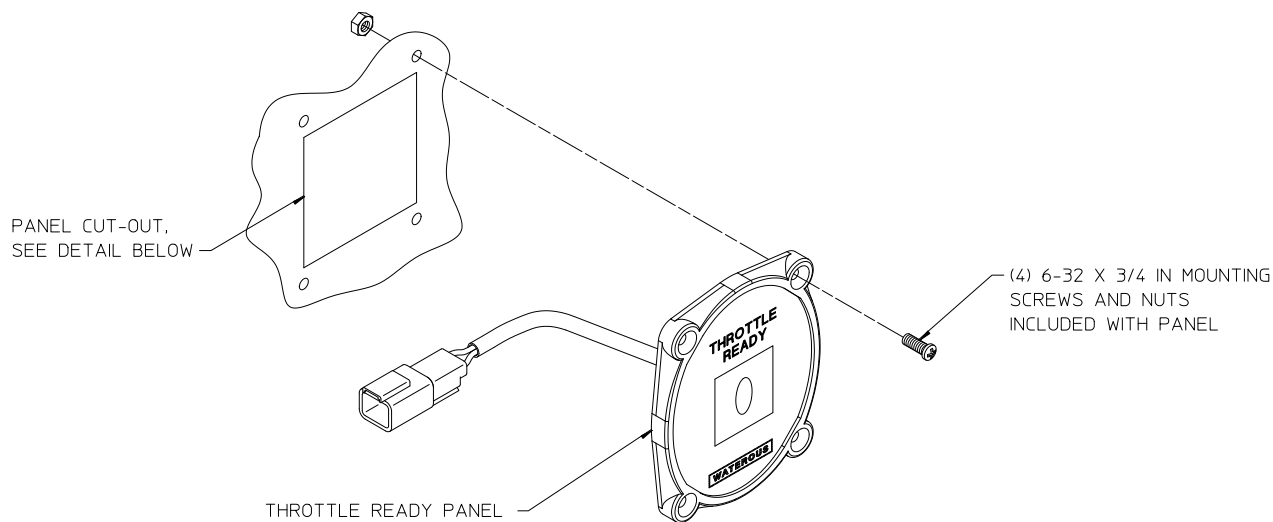
(  
INCH  
MILLIMETER  
)



## PANEL CUT-OUT

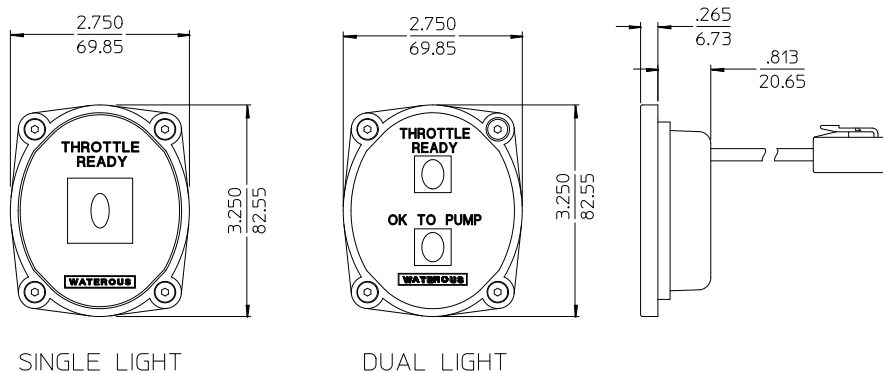
# Installation – Throttle Ready Panel

## Electric Operation



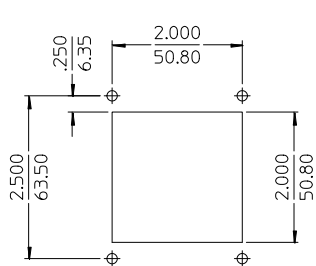
IL2965

### INSTALLATION



IL2965

### DIMENSIONS



ALL DIMENSIONS SHOWN AS INCH/MILLIMETER  
( INCH )  
( MILLIMETER )

IL2965

### PANEL CUT-OUT



## Wiring Connections – Throttle Ready Panel

## Electric Operation

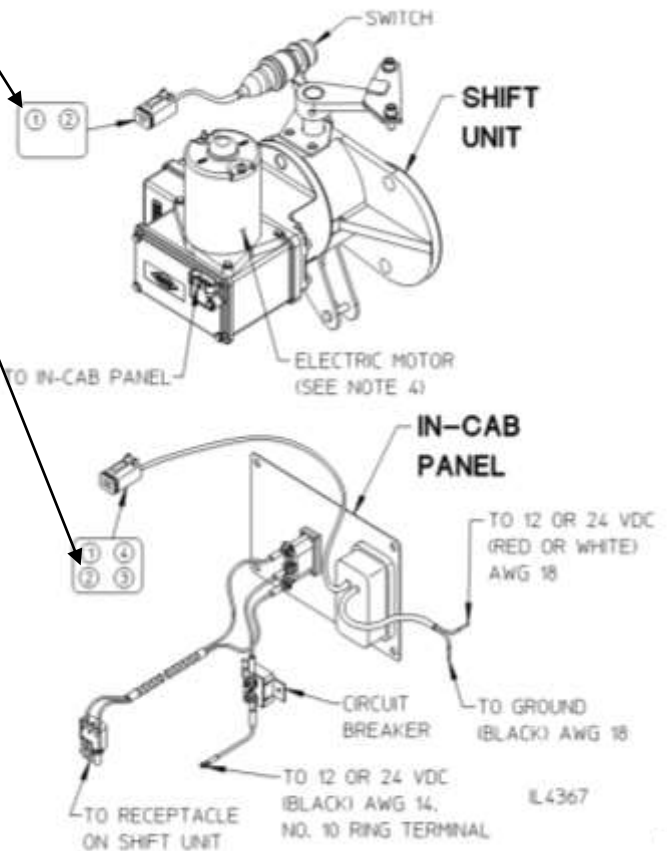
<b>Switch on Shift Unit</b>			
Male Deutsch DT06-2S Plug			
Mates with Female Deutsch DT04-2P Receptacle			
	<b>Wire</b>		<b>Function</b>
<b>Contact</b>	<b>Size</b>	<b>Color</b>	
1	AWG 18	White	12 or 24 VDC from ESCIS
2	AWG 18	Black	Output to ESCIS

In-Cab Panel		
Male Deutsch DT06-4S Plug Mates with Female Deutsch DT04-4P Receptacle		
Wire		Function
Contact	Size	
1	AWG 18	To Green LED “Pump or PTO Engaged” (See Note 3)
2	AWG 18	To Green LED “OK to Pump” (See Note 3)
3	AWG18	From 12 or 24 VDC (See Note 2)
4	AWG18	From 12 or 24 VDC (See Note 2)

	<p><b>Engine Speed Control Interlock System (ESCIS)</b>  <b>Provided by the Truck Manufacturer</b></p>
--	--

	<p><b>Allison 3000 and 4000</b>  <b>Product Family</b>  <b>Automatic Transmissions</b>          (See Note 1)</p>
--	--

----- Dashed lines indicate wiring not  
furnished by Waterous



**NOTES:**

1. For installations with Allison 3000 and 4000 Product Family Automatic Chassis Transmissions with 4<sup>th</sup> 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 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

# Wiring Connections – Throttle Ready Panel

## Electric Operation

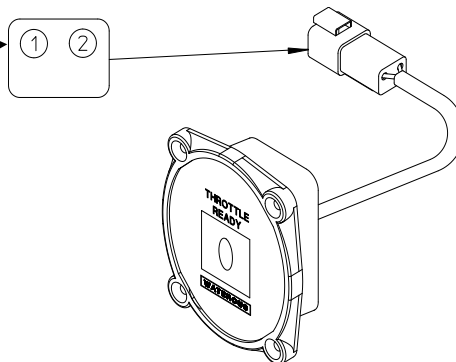
Single Light Panel		
Female Deutsch DT04-2P Receptacle Mates with Male Deutsch DT06-2S Plug		
Wire		Function
Contact	Size	
1	AWG 18	To Green LED "Throttle Ready" (See Note 2)
2	AWG 18	Ground

Dual Light Panel		
Male Deutsch DT06-4S Plug Mates with Female Deutsch DT04-4P Receptacle		
Wire		Function
Contact	Size	
1	AWG 18	To Green LED "Throttle Ready" (See Note 2)
2	AWG 18	To Green LED "OK to Pump" (See Note 2)
3	AWG18	Ground
4	AWG18	Not Used

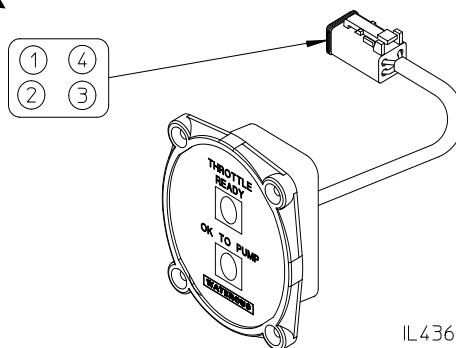
Engine Speed Control  
Interlock System (ESCIS)  
Provided by the Truck  
Manufacturer

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

----- Dashed lines indicate wiring not  
furnished by Waterous



SINGLE LIGHT PANEL



DUAL LIGHT PANEL

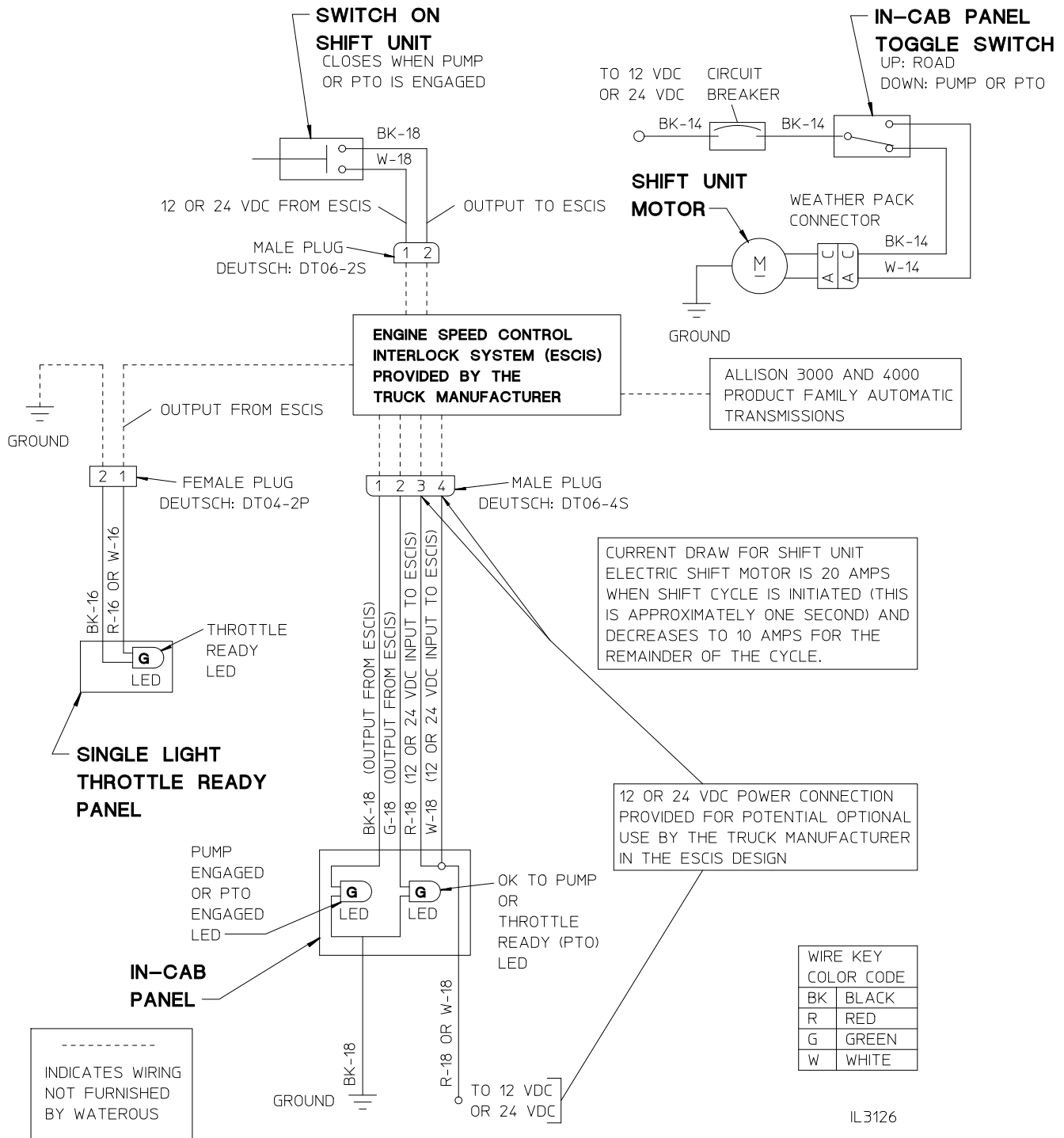
IL4366

## NOTES:

- For installations with Allison 3000 and 4000 Product Family Automatic Chassis Transmissions with 4<sup>th</sup> 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.
- Each LED draws 20mA. Size wires accordingly.

# Wiring Schematic – Single Light Operator's Panel

## Electric Operation

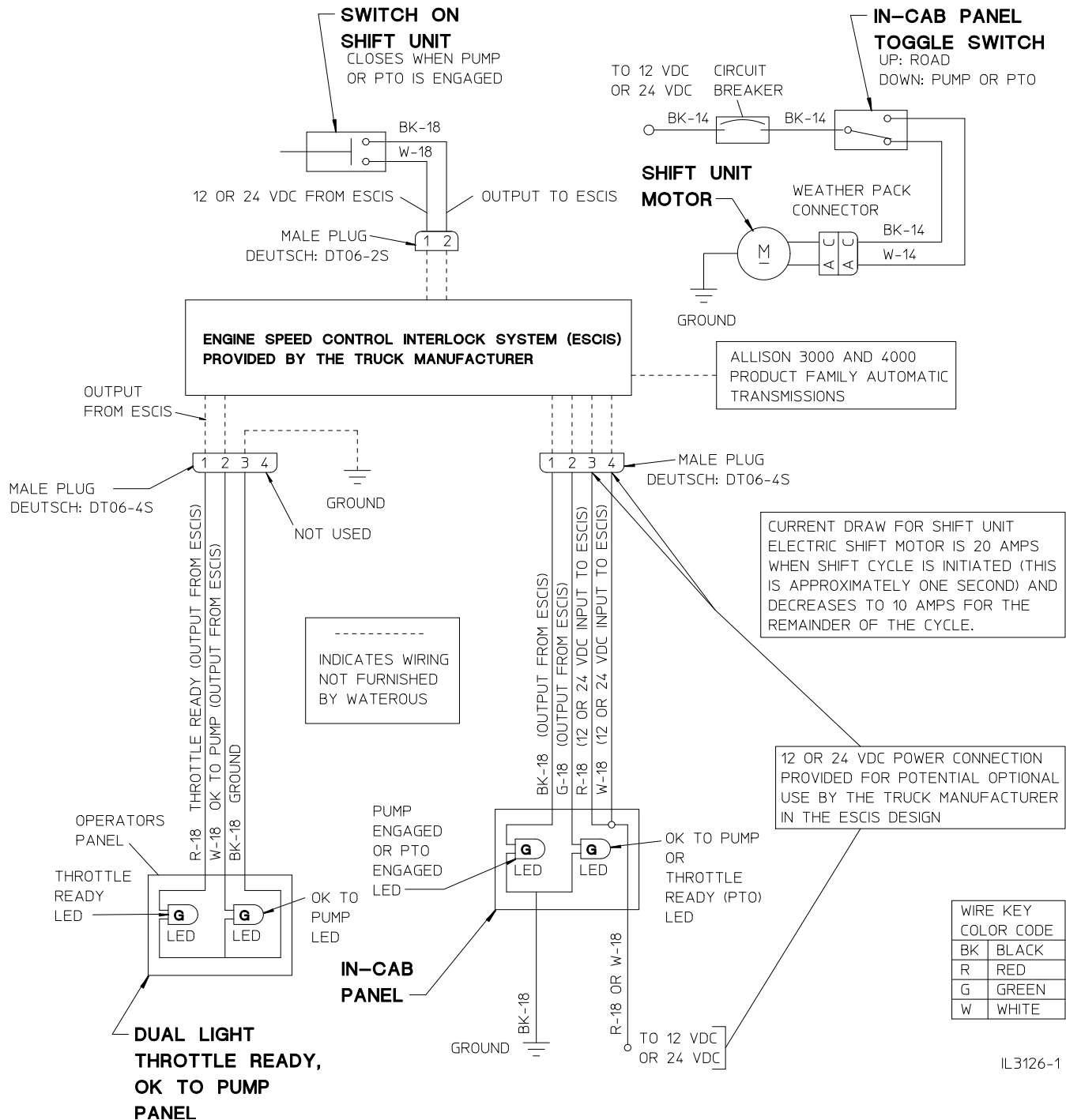


### NOTES:

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 Schematic – Dual Light Operator's Panel

## Electric Operation



### 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.

## Optional Manual Override – Electric Shift

**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

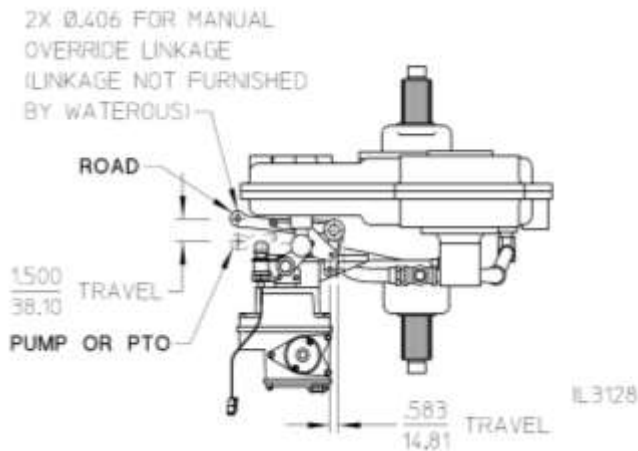
to the shift arm with 3/8 inch ball joint or similar device which will permit the rod to swivel freely on the arm.

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

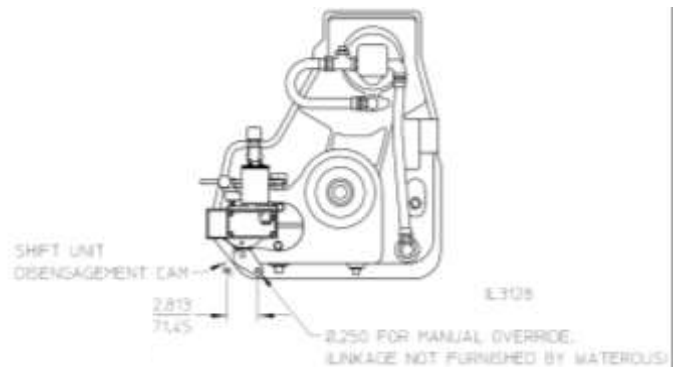
3. The cams underneath the electric shift unit swivel with the vertical shift shaft whenever the electric shift is operated. The cams must be rotated in a vertical plane in order to disengage the electric actuator. One of the easiest ways of attaching the rod to the cam is to use a 3/8 inch eyebolt or 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.**

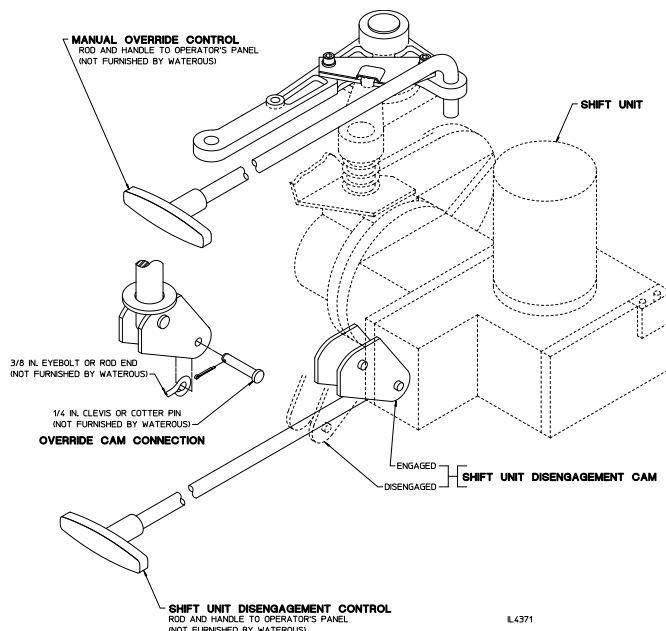
### Hole Size for Manual Override Linkage



### Shift Unit Disengagement Cam



## Manual Override



## 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.**

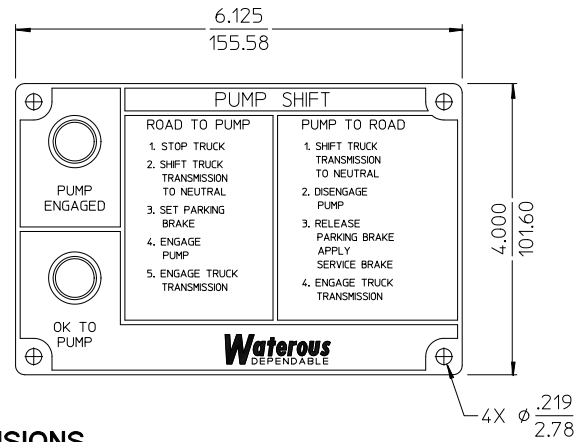
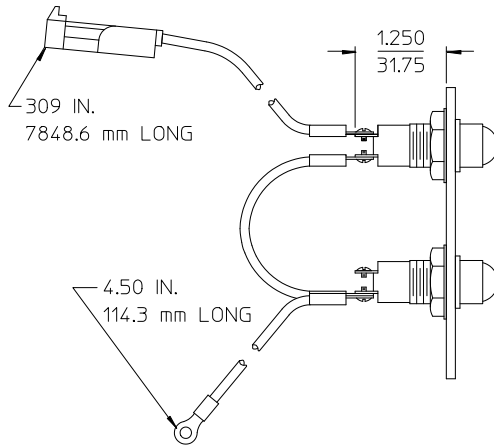
#### **Fire Pump Applications**

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 26).
  - 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 Pages 22 and 23).
4. Connect panel wiring to OEM supplied wiring (see Page 24).

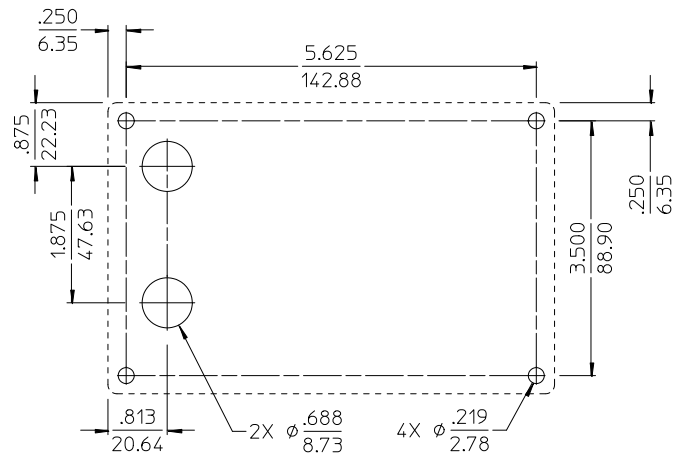
# Installation – In Cab and Throttle Ready Panels

## Manual Operation



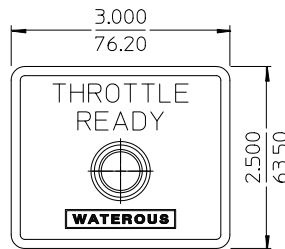
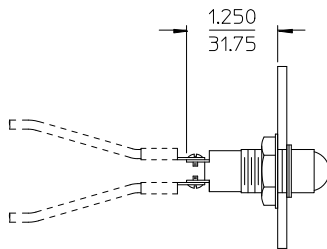
## DIMENSIONS

ALL DIMENSIONS SHOWN AS INCH/MILLIMETER  
( INCH / MILLIMETER )

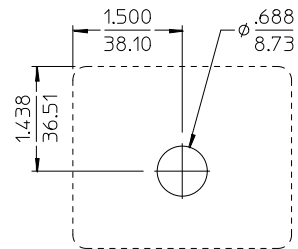


## PANEL CUT-OUT

## IN-CAB PANEL



## DIMENSIONS

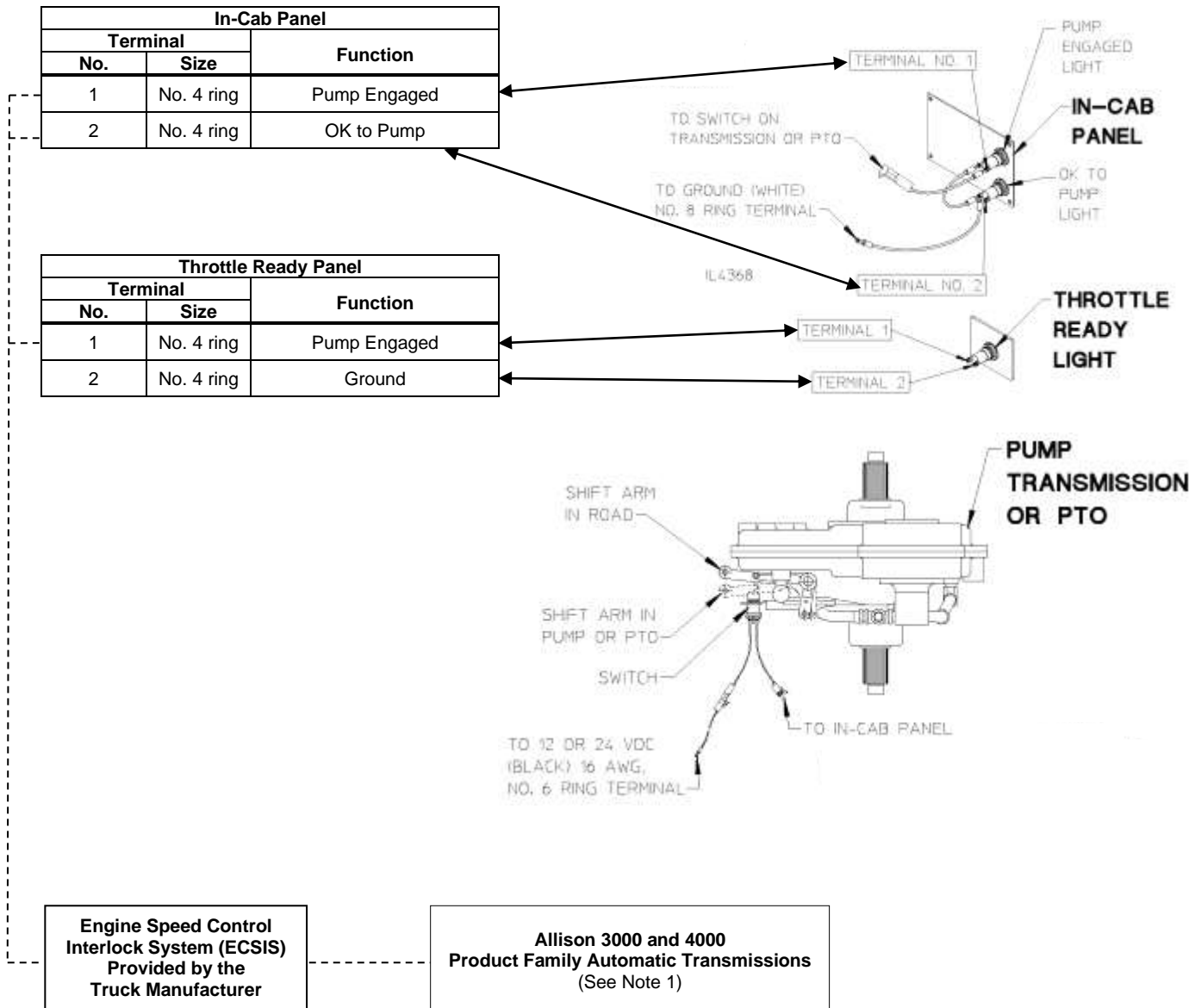


## PANEL CUT-OUT

IL4371

## THROTTLE READY PANEL

## Wiring Connections – Manual Operation

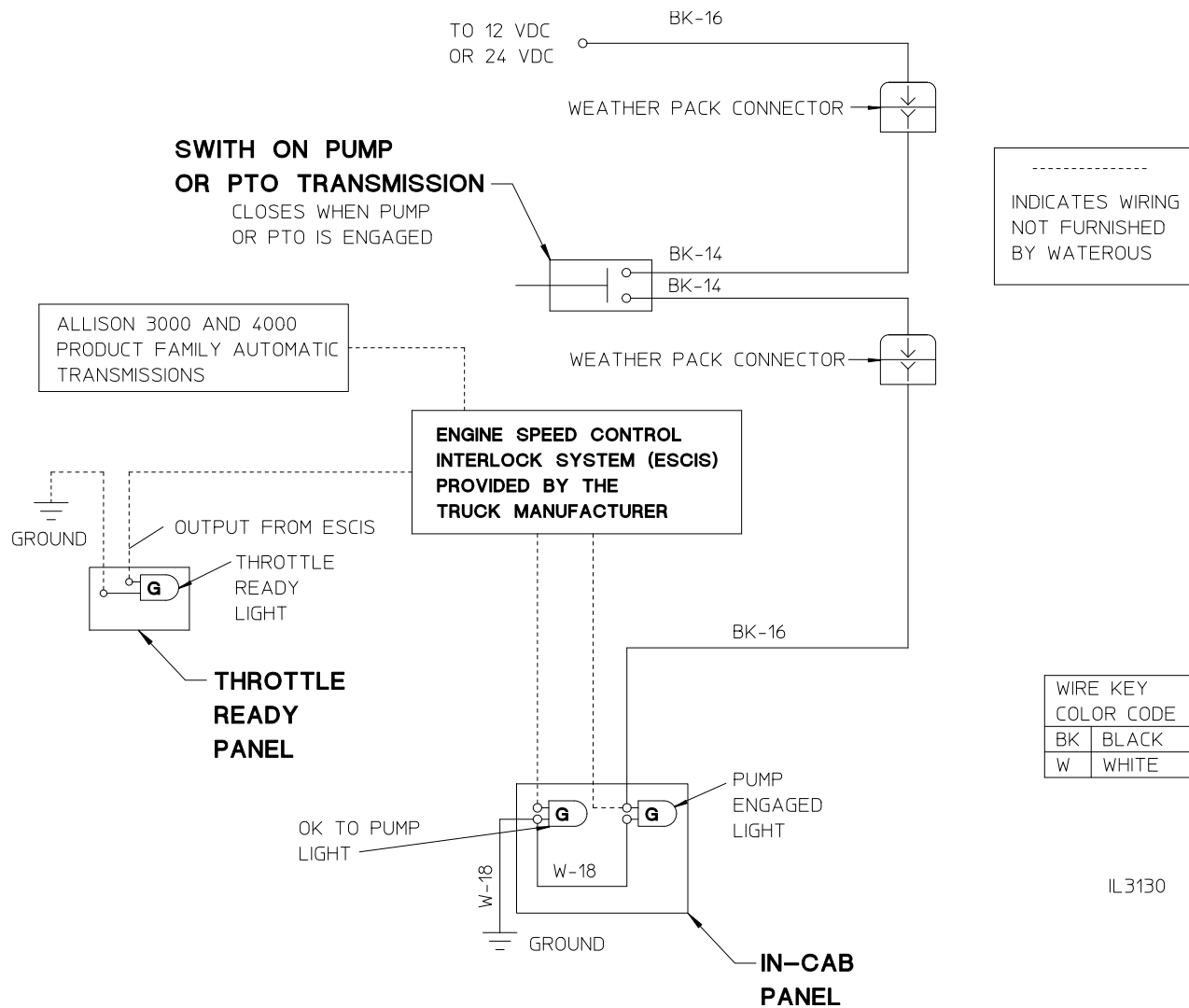


### NOTES:

- For installations with Allison 3000 and 4000 Product Family Automatic Chassis Transmissions with 4<sup>th</sup> 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 (ECSIS) 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.



# Wiring Schematic – Manual Operation



## NOTES:

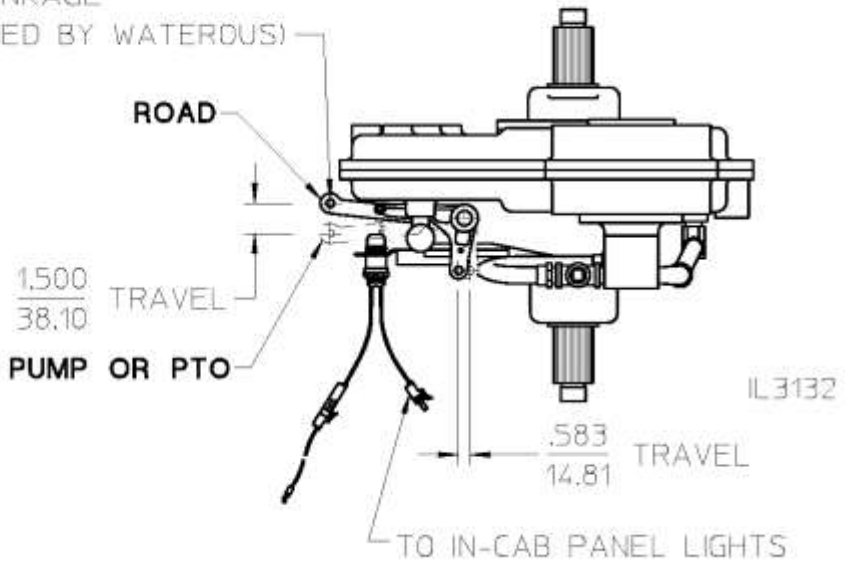
1. Number following color code is the wire size (AWG.) (I.E. BK-16 is a black 16 AWG wire).
2. ESCIS - Engine Speed Control Interlock System.

## Shift Linkage – Manual Operation

SHIFT ARM

2X  $\phi.406$  FOR SHIFT LINKAGE

(LINKAGE NOT FURNISHED BY WATEROUS)



ROD OR CABLE TO CAB

(NOT FURNISHED BY WATEROUS)

