Solenoïd Logic Card IC3645TMM4A

Application

The solenoid logic card controls the functions and fluid flow of the hydraulic system of the industrial truck in which it is installed. While the hydraulic control or contactor controls the actual speed at which a function is completed, the solenoid logic card directs the flow of hydraulic fluid to perform the desired function, in response to switch inputs. Addition of the solenoid logic card to the system enables the elimination of complicated latches and relays, simplifying the system and providing possible cost savings to the user.

Functions and Features

- The five switch inputs of the card must be switched to battery positive.
- The five switch outputs of the card complete the path to battery negative and can be controlled independently.
- As a safety feature, the card monitors outputs for open circuits when they are in the off or neutral state to prevent operation of the hydraulic system when an open circuit is detected.
- Another safety feature prevents operation of the hydraulic system when excessive current is detected in the outputs.
- To prevent unpredictable responses, the card views an invalid input as no input, and does not respond.
- The card provides an interface to the lift interrupt function of the traction control.
- The card provides hydraulic system diagnostics information to the user via two LED’s (located beneath cover, labeled as RH4 and RH5). If either LED is lit, the card will not operate.
  - RH4 lights when there is an invalid input switch condition, i.e. a state not defined by the truth table (pins 10, 11, 12, 13 or 14).
  - RH5 lights when the BDI interrupt input is not 12V (pin 7), or if one of the output terminals is open. The check of the outputs is made when they are off. The card verifies that battery volts are present at pins 3, 4, 5, 6 and 8.
  - RH4 and RH5 will both light if an internal solenoid driver transistor is shorted.
- Reverse battery protection prevents needless component damage from an incorrect battery connection.
- Internal coil suppression for all solenoids eliminates the need for external suppression.

Typical Connection Diagram
## Truth Table

### IC3645TMM4A

<table>
<thead>
<tr>
<th>Terminal Board</th>
<th>Input/Output</th>
<th>Switch Inputs</th>
<th>Solenoid Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Raise #1</td>
<td>#1 Pump</td>
<td>#4 S3</td>
</tr>
<tr>
<td></td>
<td>Lower #2</td>
<td>#2 S1</td>
<td>#5 S5+S6</td>
</tr>
<tr>
<td></td>
<td>Reach #3</td>
<td>#3 Latch</td>
<td>#6 S7+S8</td>
</tr>
<tr>
<td></td>
<td>Tilt #4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aux 2 #5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<th>Switch Inputs</th>
<th>Solenoid Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>#2</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>#3</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>#4</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>#5</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

### Function

- **Neutral**: OFF OFF OFF OFF OFF OFF OFF OFF OFF OFF OFF
- **Lift**: ON OFF OFF OFF OFF ON OFF OFF OFF OFF OFF
- **Lower**: OFF ON OFF OFF OFF OFF ON OFF OFF OFF OFF
- **Retract**: OFF OFF ON(M) OFF OFF OFF OFF OFF OFF OFF
- **Extend**: OFF OFF ON(M) OFF OFF OFF OFF OFF OFF OFF
- **Tilt Back**: OFF OFF OFF ON(M) OFF OFF OFF ON ON ON
- **Tilt Forward**: OFF OFF OFF ON(M) OFF OFF OFF ON ON ON
- **Aux2 Back**: OFF OFF OFF OFF OFF ON(M) ON ON ON
- **Aux2 Forward**: OFF OFF OFF OFF OFF ON(M) ON ON ON

**Legend**

- **ON** = Switch Closed
- **OFF** = Switch Open
- **ON(M)** = Momentary Switch Closure

Momentary switches must always be actuated prior to LIFT/LOWER switch.

### Outline (for Reference Only)

![Diagram of Terminal Board](attachment:image.png)