

# DC Solenoids for Diesel Engines

## One solenoid for push or pull operation

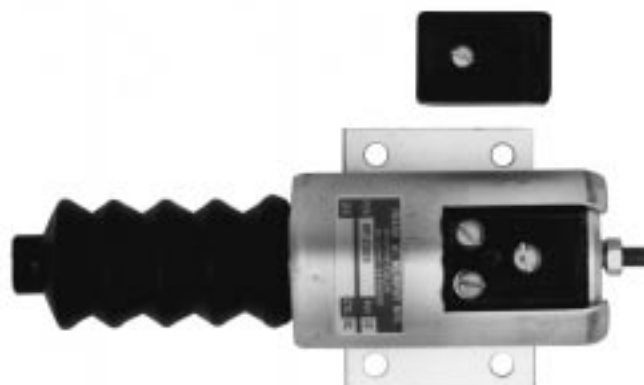
Murphy push/pull DC Solenoids provide single unit versatility for engine applications, such as shutdown.

Unlike most existing solenoids, this line features three-wire circuitry, which reduces the chance for burned up coils due to incomplete seating of the plunger.

If the plunger does not "seat" due to improper linkage adjustment, the solenoid coil will release the plunger. This allows it to return to the "tripped" position, thus overcoming coil burnout.

A choice of two models and two voltages is available. All models come complete with return spring and rubber seal boot. See the next page for specifications and options.

- No internal switches
- Reduce coil burnout
- Boost reliability
- Reduce adjustments
- High force-small size
- Can be used with most engine start systems
- Reduce cost



**Models RP2307B and RP2308B** give a full one inch (25 mm) stroke at 11 pounds (49 N) and hold up to 23 pounds (102 N) at full voltage, continuous duty. They will operate at any stroke less than maximum; refer to the chart shown on page 2.

**Models RP2309B and RP2310B** pull 14 pounds (62 N) with a one-and-a-half inch (38 mm) stroke. They hold up to 34 pounds (151 N) at full voltage, continuous duty. See the chart on page 2 for holding force at any stroke less than maximum.

| MODEL & PART NUMBERS: | DC SOLENOIDS & ACCESSORIES  | SHIPPING WEIGHT   |
|-----------------------|---|-------------------|
| <b>Model No.</b>      | <b>Description</b>  | <b>ozs (kg)</b>   |
| RP2307B               | 12 VDC, 1 in. (25 mm) stroke, 11 lbf (49 N) pull, 23 lbf (102 N) hold     | 24 ozs (0.7 kg)   |
| RP2308B               | 24 VDC, 1 in. (25 mm) stroke, 11 lbf (49 N) pull, 23 lbf (102 N) hold     | 24 ozs (0.7 kg)   |
| RP2309B               | 12 VDC, 1-1/2 in. (38 mm) stroke, 14 lbf (62 N) pull, 34 lbf (151 N) hold | 48 ozs (1.4 kg)   |
| RP2310B               | 24VDC, 1-1/2 in. (38 mm) stroke, 14 lbf (62 N) pull, 34 lbf (151 N) hold  | 48 ozs (1.4 kg)   |
| 65-01-0108            | Clevis yoke assembly  | 1 ozs (.03 kg)    |
| 65-01-0110            | Clevis yoke chain assembly  | 2 ozs (.04 kg)    |
| 40-05-0315            | Threaded rod (1-1/2 in.)  | .05 ozs (.001 kg) |
| 00-00-2457            | RPS in-line ball joint  | .05 ozs (.001 kg) |
| 00-00-2458            | RPS 90° ball joint  | 1 ozs (.03 kg)    |

# Watts Power/Cold Force in Pounds at 100% Voltage/Inches Stroke

| Solenoid Model Number | Maximum Stroke In. (mm) | Power in Watts |        | Force* in Pounds [Kilograms] at 100% Voltage** |                                |                           |                           |                          |                         |                         |                        |
|-----------------------|-------------------------|----------------|--------|--|--------------------------------|---------------------------|---------------------------|--------------------------|-------------------------|-------------------------|------------------------|
|                       |                         | Seated         | Inrush | Continuous Hold                                | Stroke in Inches (Millimeters) |                           |                           |                          |                         |                         |                        |
|                       |                         |                |        |  | 1/8 (3)                        | 1/4 (6)                   | 1/2 (13)                  | 3/4 (19)                 | 1 (25)                  | 1-1/4 (32)              | 1-1/2 (38)             |
| RP2307B               | 1 (25)                  | 12             | 624    | 25 [11.34]<br><13> [5.90]                      | 22 [9.98]<br><12> [5.44]       | 21 [9.53]<br><11> [4.99]  | 17 [7.71]<br><10> [4.54]  | 14 [6.35]<br><8> [3.63]  | 10 [4.54]<br><6> [2.72] | —                       | —                      |
| RP2308B               | 1 (25)                  | 12             | 696    | 27 [12.25]<br><15> [6.80]                      | 25 [11.34]<br><14> [6.35]      | 23 [10.43]<br><13> [5.90] | 19 [8.62]<br><12> [5.44]  | 15 [6.80]<br><9> [4.08]  | 11 [4.99]<br><7> [3.18] | —                       | —                      |
| RP2309B               | 1-1/2 (38)              | 12             | 1029   | 32 [14.52]<br><19> [8.62]                      | 30 [13.61]<br><18> [8.16]      | 27 [12.25]<br><16> [7.26] | 22 [9.98]<br><14> [6.35]  | 18 [8.16]<br><11> [4.99] | 13 [5.90]<br><9> [4.08] | 8 [3.63]<br><6> [2.72]  | 6 [2.72]<br><4> [1.81] |
| RP2310B               | 1-1/2 (38)              | 12             | 960    | 35 [15.88]<br><20> [9.07]                      | 34 [15.42]<br><19> [8.62]      | 31 [14.06]<br><17> [7.71] | 26 [11.79]<br><15> [6.80] | 22 [9.98]<br><12> [5.44] | 17 [7.71]<br><9> [4.08] | 12 [5.44]<br><7> [3.18] | 7 [3.18]<br><4> [1.81] |

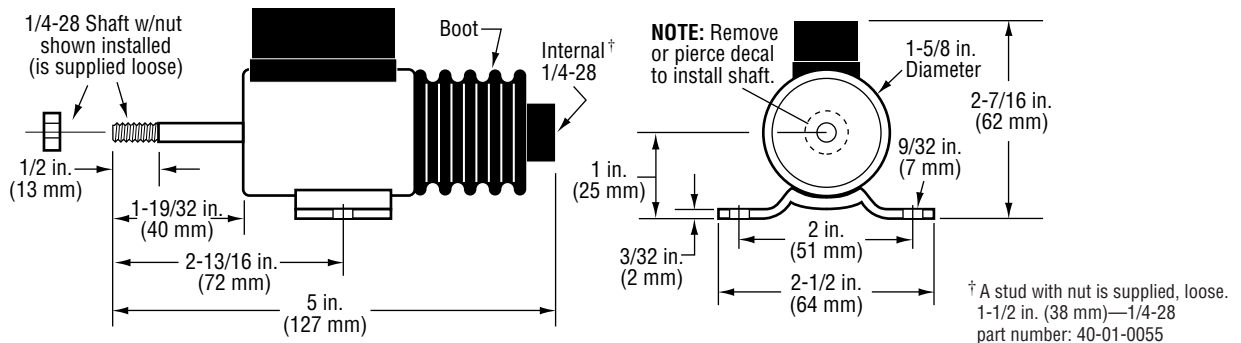
\*Forces shown are without return spring. Forces shown < > are with return spring. Forces shown in [ ] are in kilograms.

\*\*To determine the operating current, divide the power (watts) indicated in the above table by the applied voltage.

Solenoids will operate at any stroke less than maximum.

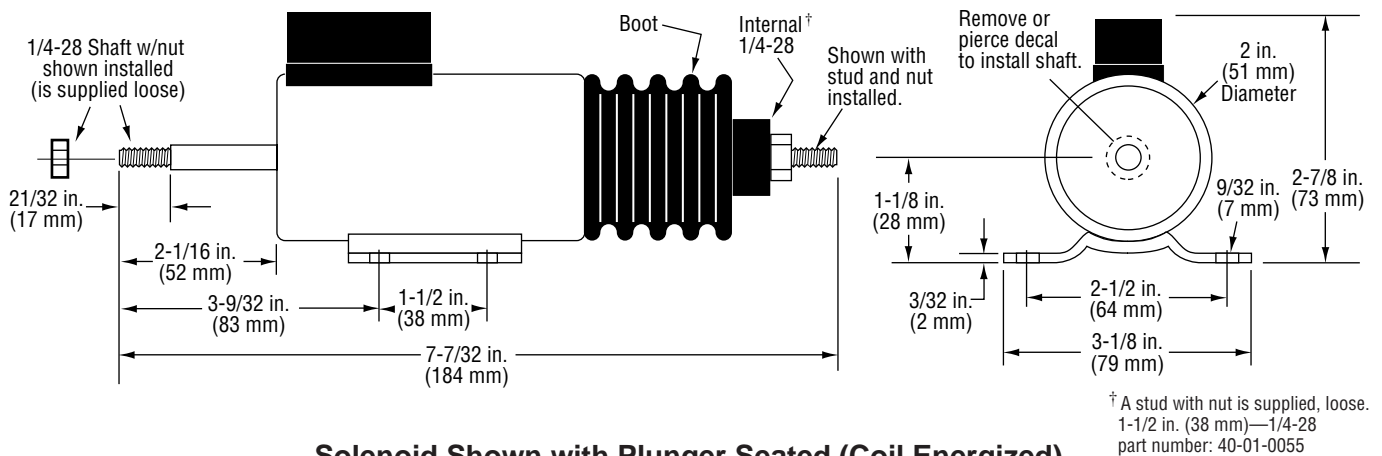
## Solenoid Dimensions

### RP2307B and RP2308B



### Solenoid Shown with Plunger Seated (Coil Energized)

### RP2309B and RP2310B



### Solenoid Shown with Plunger Seated (Coil Energized)

**Note 1.** *Typical* operating temperature is:

140°F(60°C) ± 10°F (6°C) for 1 in. (25 mm) Stroke Solenoids (70°F/21°C Rise above ambient)

120°F(49°C) ± 10°F (6°C) 1-1/2 in. (38 mm) Stroke Solenoids (50°F/10°C Rise above ambient)

See **CAUTION** statement on next page and note maximum housing temperature is 185°F (85°C).

**Note 2.** The energize-coil should not be activated for more than 15 seconds.

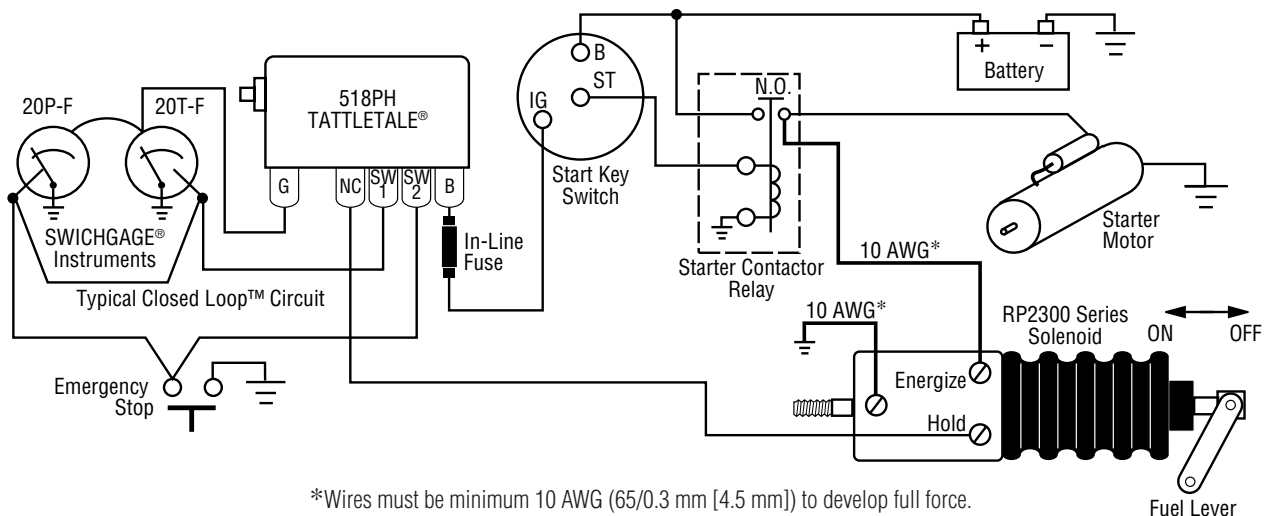
Longer energize-coil activation times will damage the solenoid.

**Note 3.** Allow 15 minutes for cooling between activations of energize-coil to retain full pulling force.

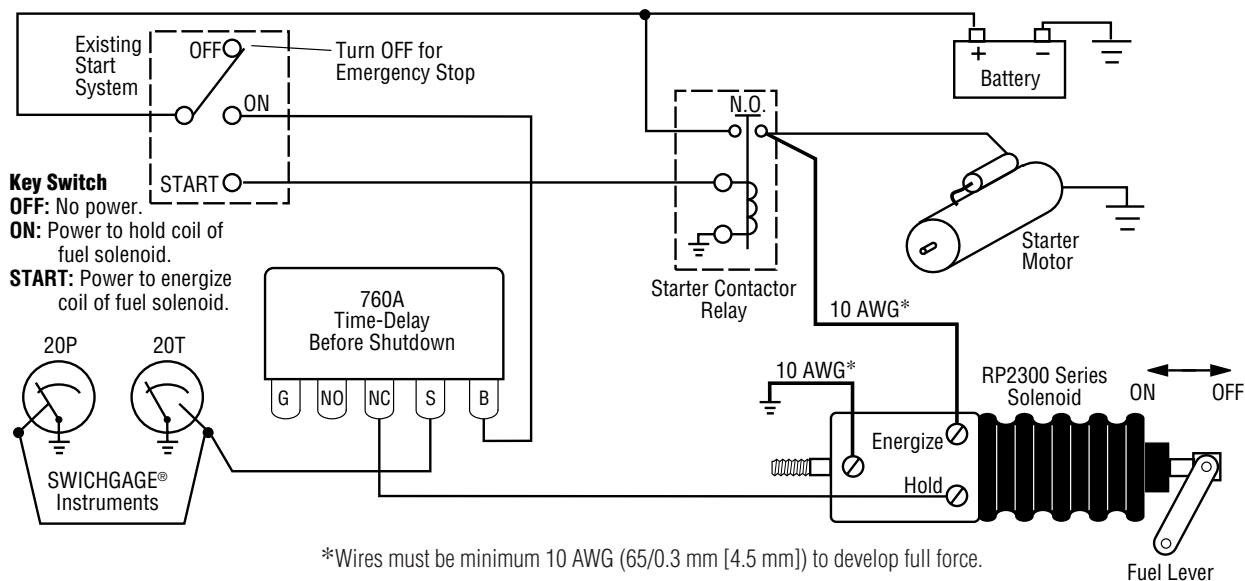
**Note 4.** The energize-coil must fully seat the plunger to allow the hold-coil to function properly.

# Typical Wiring Diagrams

## Typical auto-shutdown system using a 518PH magnetic switch



## Typical time-delayed shutdown using a 760A magnetic switch



## Mechanical Installation

1. Bolt the solenoid securely to the mounting bracket.
2. Connect linkage and check for binding. Plunger should move freely throughout the complete stroke and be allowed to "bottom" at the internal stop of the solenoid.

**DO NOT MOUNT WITH BOOT DOWN.**

**DO NOT APPLY ANY GREASE OR LUBRICATION TO PARTS.**

**IMPORTANT:** If the plunger does not seat, it will release prematurely when shifted to the "holding" mode of operation. Readjust linkage to shorten the plunger stroke. Adjust the yoke in increments of 1/2 turn until plunger will remain in hold position.

## Electrical Installation

1. Refer to the diagrams above for typical electric wiring.
2. Use minimum 10 AWG [65/0.3 mm (4.5 mm)] wire size, as noted in the wiring diagrams. A smaller wire will reduce the current available and thus the pulling force. Wire length must be kept to a minimum.

## Operation

The solenoid coil is connected to the existing engine starter system or an equivalent circuit. At starting both the Energize and Hold-in coils are energized. In the run mode, the Hold-in coil is continuously energized while the Energize coil is disconnected, reducing the heating effect and power consumption.

**NOTE:** Coils that burn out due to improper electrical hookup or misadjustment are not covered by Murphy factory warranty.



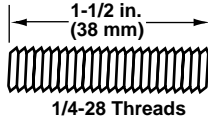
**CAUTION:** The solenoid housing is hot to the touch. A temperature rise to 185°F (85°C) is permissible.

**NOTE:** A cool down period of 2 minutes minimum should be allowed between energized pull in cycles.

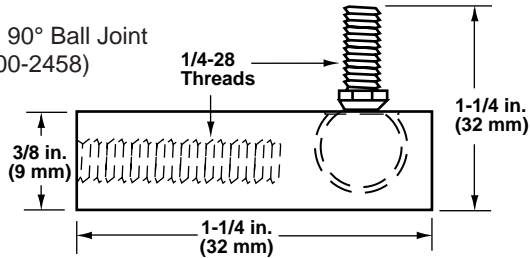
## Accessories

### RPS Linkage Parts and Assemblies

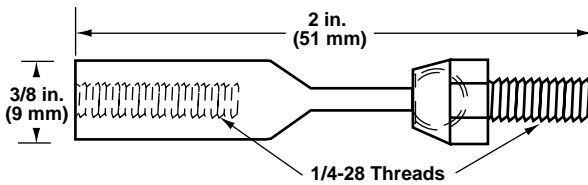
Threaded Rod  
(40-05-0315)



RPS 90° Ball Joint  
(00-00-2458)



RPS In-Line Ball Joint (00-00-2457)

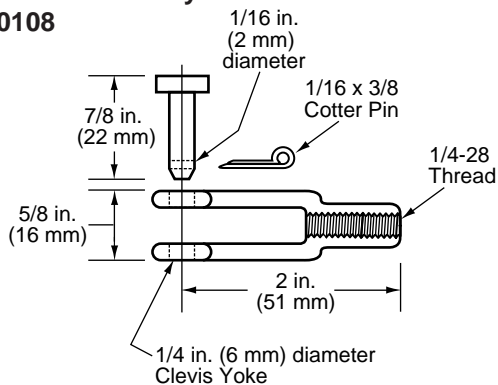


### Clevis Yoke Bead Chain Assemblies 65-01-0110

12 inch  
(300 mm)  
Chain

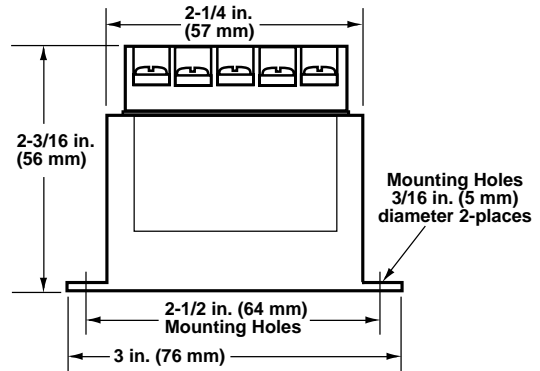


### Clevis Yoke Assembly 65-01-0108



### SD85: Solenoid Drive Time Delay

The SD85 is used when the solenoid is duty cycled for short time periods such as 2-position throttle operation. It also provides enhanced operational control for normal on-off applications. The SD85 activates both coils of the solenoid for a short time then de-energizes the Energize-coil. The Hold-in coil remains energized.



### SD85 Terminal Block

