



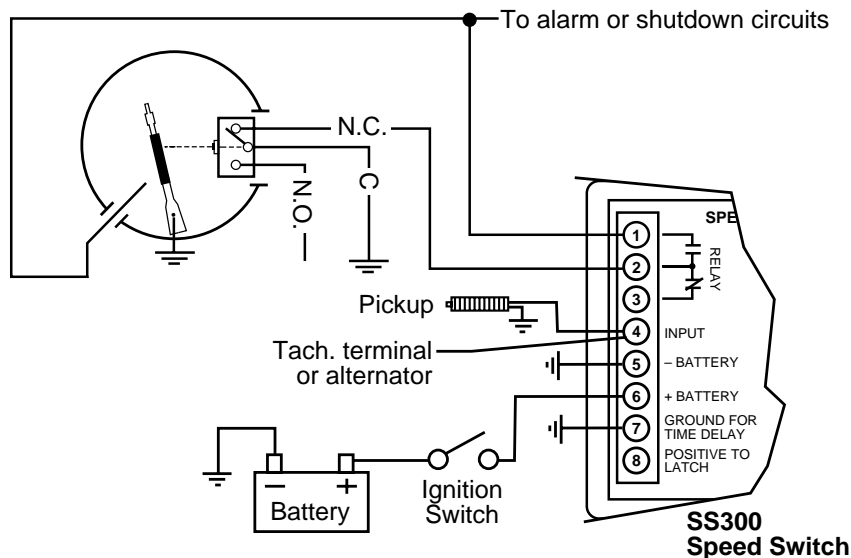
# APPLICATION TIP

## Dual set point pressure SWICHGAGE® instruments for lube pressure protection of variable speed engines and transmissions.

Some diesel engines, notably Detroit Diesel, Cummins and some marine transmissions, have a low oil pressure reading at idle speed relative to that at rated speed. In variable speed applications an alarm or shutdown contact set low enough to prevent nuisance alarm or shutdown at idle speed doesn't provide adequate oil pressure protection at rated speed. Murphy's pressure SWICHGAGE®, with alarm before shutdown (ABS) feature, has 2-set points that provide the required protection by automatically switching the contact set point according to the speed of the engine. Thus, the engine or transmission is protected from low oil pressure situations at both running speed and idle speed at a pressure setting which provides adequate lubrication.

For example, an engine may develop only 4–5 psi

(28–34 kPa) [.28–.34 bar] oil pressure at hot idle and 50–60 psi (345–414 kPa) [3.45–4.14 bar] at rated speed. If the low pressure contact is set to operate at or below 4–5 psi (28–34 kPa) [.28–.34 bar], the engine is not adequately protected when running at rated speed. On the other hand, if the pressure contact is set to operate at 20–30 psi (138–207 kPa) [1.38–2.07 bar], the alarm or shutdown device will activate when the engine is at idle. Several devices can be used to sense engine speed and provide the switching signal for the ABS SWICHGAGE®. The most accurate and easily installed device is the SS300 speed switch. The SS300 can operate from either a magnetic sensor or from the AC (tachometer) terminal of the battery charging alternator. Wiring is shown below.



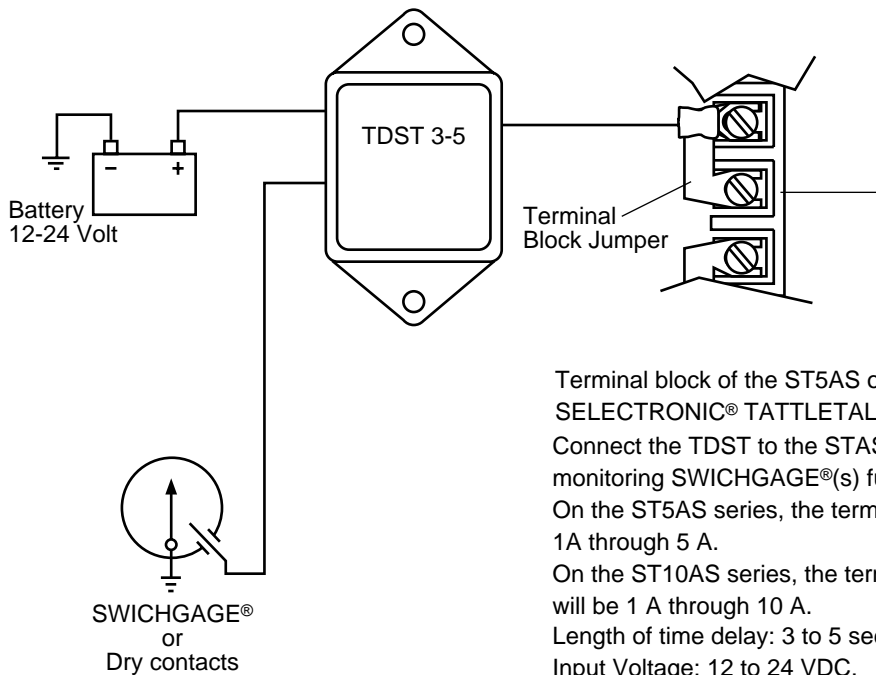
**NOTE:** Relay contacts transfer above speed setting after 4 seconds delay for idle and running speed oil pressure.

The SS300 speed switch is a solid-state device with relay outputs on terminals 1, 2 and 3. As engine speed increases to the pre-determined set point of the speed switch, the N.O. contact closes thus arming the alarm/shutdown circuit at the RUNNING speed pressure setting. When the N.C. contact, set 20-30 psi, (138 –207 kPa) [1.38 –2.07 bar], in the oil pressure SWICHGAGE® closes on falling pressure, the alarm or shutdown device will operate. If the engine speed is reduced below the speed switch set point, the N.O. contact in the speed switch, will open thus disarming the 20–30 psi (138–207 kPa) [1.38 –2.07 bar] set point. Now, oil pressure must fall to 4–5 psi (28–34 kPa)

[.28–.34 bar] for the alarm or shutdown device to operate. Thus, low lube pressure is provided according to the load (speed) of the engine.

Nuisance alarms or shutdowns due to momentary drops in lube pressure such as occurs when shifting from forward to reverse and vice versa in marine applications, can be overcome by using a short time delay in the alarm/shutdown circuit. Model TDST 3-5 requires that the contact be maintained for 3–5 seconds before the circuit will be completed. However, it does not allow for the two set point arrangement shown above.

The TDST 3-5 is also commonly used to delay bilge alarm signals to compensate for roll and pitch of marine vessels.



Terminal block of the ST5AS or ST10AS SELECTRONIC® TATTLETALE®.

Connect the TDST to the STAS terminal(s) monitoring SWICHGAGE®(s) functions.

On the ST5AS series, the terminals will be 1A through 5 A.

On the ST10AS series, the terminals will be 1 A through 10 A.

Length of time delay: 3 to 5 seconds.

Input Voltage: 12 to 24 VDC.

Output current: sink 200 mA @ 24V max.



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