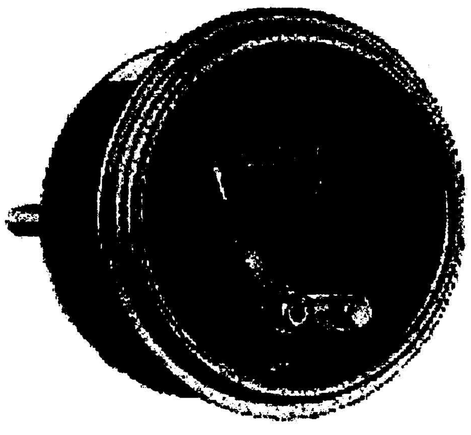
MURPHY CONTROLS

What is a SWICHGAGE?



A SWICHGAGE® is a rugged, highly accurate, industrial quality gage with a built-in electrical switch for operating an alarm and/or a shutdown device circuit.
SWICHGAGE® models are available in various sizes and configurations to fit a variety of applications. Models can be mechanical or electronic.

Murphy's mechanical SWICHGAGE® models feature direct actuated switching using either face adjustable single pole contacts or snap-acting SPDT switches. A unique feature is the wiping action of the face mounted contact(s). As the gage pointer meets the limit contact, a wiping action occurs to keep the contacts clean for positive switching.

State-of-the-art electronic models expand the number and the type of variables that can be monitored. Readings and switch points are digitally displayed alerting the user to changes in operating conditions.

For over a half century we have been designing and building simple, accurate, dependable, and cost effective instrumentation for the control and automation of engines, electric motors, and their driven equipment.

Murphy SWICHGAGE® instruments help protect your equipment, enhance your preventive maintenance program, provide immediate diagnostic data in the form of accurate reading of pressure, temperature, level, vibration, overspeed, etc. Together with Murphy alarms, shutdown devices, and SELECTRONIC® controls they become an effective, multi-point protective system for your equipment.

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Last Updated -- 12/05/2001 13:48:17

Connecting the Pressure SWICHGAGE®

WARNING: Perform mounting operation with power source OFF. Disable the engine so it cannot start. Remove the battery ground cable.

1. Pressure tubing is generally not provided. Use of good quality flexible pressure tubing/hose and fittings, such as Murphy DHK series, is strongly suggested. Use at least 3/16 in. (5 mm) I.D. tubing. If using copper or rigid tubing, install at least 12 in. (305 mm) flexible hose from the pressure SWICHGAGE® to the rigid tubing. This prevents damaging vibration from reaching the SWICHGAGE®.
2. Connect the pressure tubing to the 1/8-27 NPT pressure port of the pressure SWICHGAGE®. Use of a non-hardening thread sealing compound is recommended although the thread is "dry seal". Be sure that thread sealant does not foul the pressure orifice.

NOTE: The orifice can be removed for cleaning.

3. Connect the pressure tubing to the pressure galley of the engine. Generally this is at the oil filter housing. Use of non-hardening thread sealant is recommended. Avoid droops or sink traps in routing of the pressure line. Route tubing away from hot surfaces and sharp edges,

Connecting the Temperature SWICHGAGE®

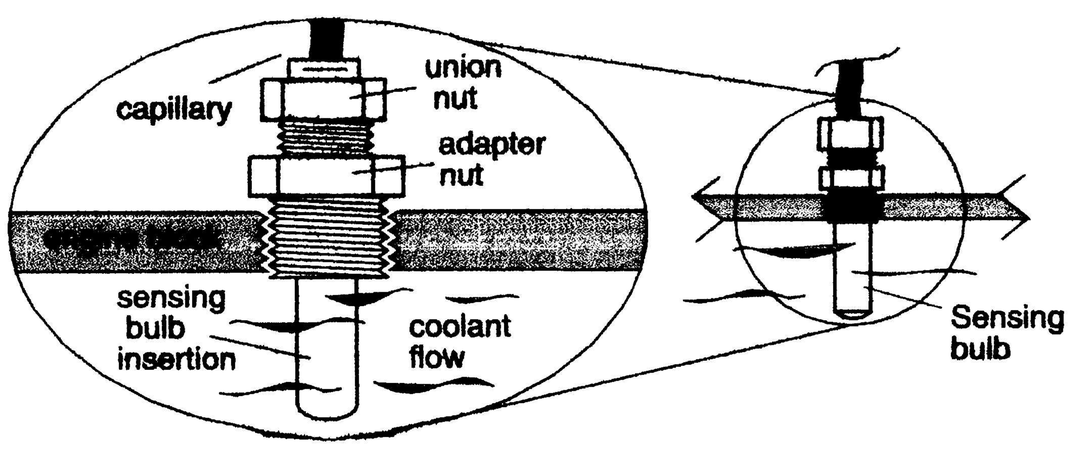
LIQUID COOLED ENGINES:

1. Drain engine coolant to a level below the temperature sensing connection/plug. This connection is on the engine side of the thermostat generally near the thermostat housing. *Consult your engine manual.*
2. Remove adapter nut from temperature sensing bulb and union nut.
3. Apply a non-hardening thread sealant to the adapter nut and screw securely into the water jacket opening on the engine.
4. Route the temperature capillary away from hot surfacesand sharp edges.
5. Place the sensing bulb into the adapter nut and observe that the sensing bulb does not "bottom" in the water jacket nor are there other obstructions in the water jacket opening. Secure sensing bulb into the adapter nut with the 5/8-18 union nut. *See mounting detail below.*

CAUTION: Do **NOT** cut or bend the temperature capillary at a sharp angle. Excess capillary must be carefully coiled and secured. The temperature sensing bulb must be immersed directly into the water jacket flow to sense coolant temperature. Do **NOT** install into a tee or other fitting. Use only Murphy adapter nuts.

6. Coil excess temperature capillary into a 2 in. (51 mm) diameter minimum coil. Tie the coil to prevent excessive movement.

Sensing Bulb Mounting Detail



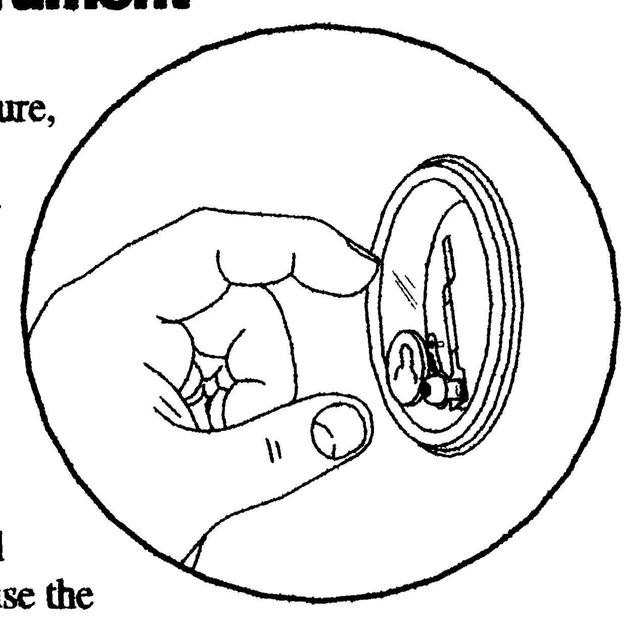
Placing Into Operation

WARNING: Perform this operation using appropriate protection. Trapped air and coolant may cause skin burns.

1. Refill oil and coolant to proper levels.
2. Reconnect electrical power.
3. Service the engine as required by the engine manufacturer before attempting to start the engine.
4. Allow the engine to warm up and the thermostat to open. Slightly loosen the 5/8-18 union nut on the temperature sensing bulb to allow trapped air to escape from the cooling system. Retighten the nut.
5. Loosen the oil line fitting slightly at the pressure SWICHGAGE® to allow trapped air to escape from the tubing. Retighten the fitting.

Procedure for Function Testing a SWICHGAGE® Instrument

1. Start the Engine.
2. Visually observe the Oil Pressure, Coolant Temperature and any other functions you are monitoring with Murphy SWICHGAGE® instruments to determine that you have normal operating pressures and temperatures.



3. When you are starting the engine, you will have a visual and/or audible warning because the pressure SWICHGAGE® pointer is resting against it's low pressure shutdown contact.
4. As soon as the pointer on the pressure SWICHGAGE® rises above the shutdown setpoint, visual and/or audible warning will stop (light and/or siren will go OFF).
5. To test the contact take a small metal devise, such as a coin, and place it on the lens of the SWICHGAGE®. Carefully slide the coin in between the allenhead contact adjustment knob, located at the bottom—center of the SWICHGAGE® and the metal bezel. This procedure does NOT test the contact. This procedure will test the wiring.
6. Visual and/or audible warning will come on, such as a flashing light or a siren. The warning will continue as long as contact is made by the coin. Time delay warning before shutdown will be either 15, 30 or 60 seconds. See your Time Delay Control Relay 760 to determine exact time.
7. After the 760 Control Relay times out (15, 30 or 60 seconds) engine should shutdown completely. Also the light will stop flashing and siren will stop alarming.
8. Turn ignition switch OFF and restart engine. Perform procedures 5, 6, and 7 for each SWICHGAGE® function being monitored such as Oil Pressure, Coolant Pressure loss, Engine Temperature and Transmission Temperature.

NOTE 1. On Transmission Temperature test, the system normally is wired for audible and visual warning only with no shutdown.

NOTE 2. Maintain continuous contact of coin. Any momentary loss of contact will cause the relay to reset.

NOTE 3. Look to see that the setpoint on the SWICHGAGE® is still functional.