

Installation of Lube Level Maintainer

Models LM500 / LM500-TF

Please read the following instructions and warnings before installation. Visually inspect the product for any damage that may have occurred during shipping.

WARNINGS	<p>Before installation of this product:</p> <ul style="list-style-type: none"> • It is your responsibility to ensure that qualified mechanical and electrical technicians install this product. • Disconnect all electrical power to the machine. • Make sure the machine cannot operate during installation. • Follow all safety warnings of the machine manufacturer. • Read and follow all installation instructions. • Please contact FW Murphy Production Controls immediately if you have any questions.
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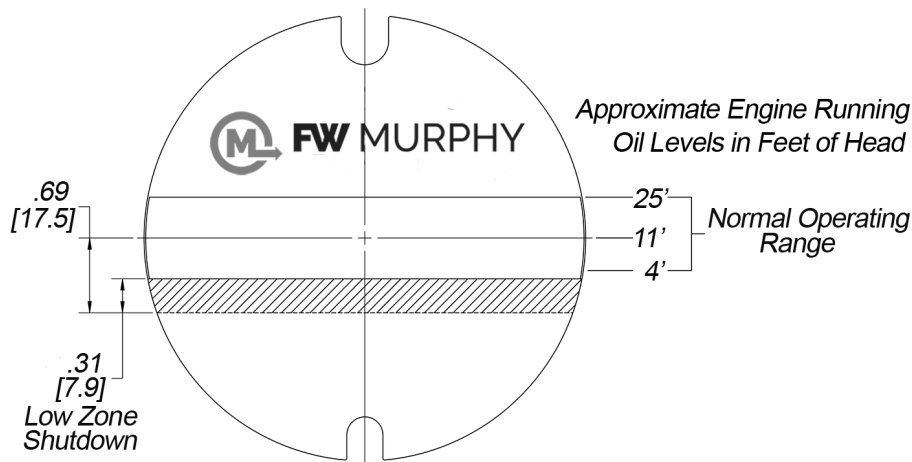
The FW Murphy LM500 model maintains the crankcase oil level of an engine, pump or compressor. Adjusted to the correct running oil level, the LM500 will replenish oil as it is used. The low level switch will alarm and/or shut down the equipment if the supply oil is lost and the equipment continues to use oil. The LM500-TF model includes a test feature that confirms both the float and switch are operating correctly with a single press of the test button.



Range of the Snap-Switch

This illustration shows the LM500 dial and the operating range of the switch. If level is within the designated zones, the switch will activate.

The switch activates approximately 1/4 in. (6 mm) from the bottom of the low zone. If the level continues to drop into the low-low zone, a shutdown will occur.



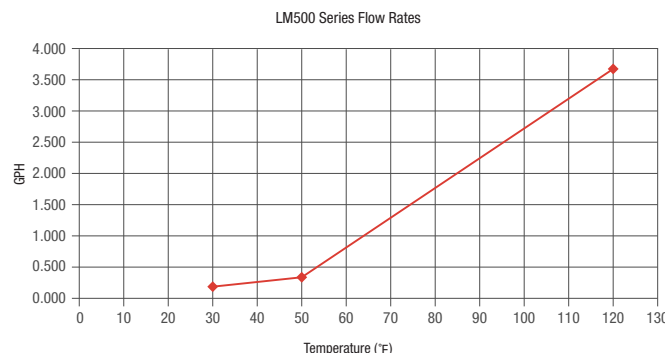
NOTE: Color zones on dial face show approximate normal operating zones. Actual conditions may vary depending upon operating characteristics of the engine. Placement of the LM500 according to these instructions will compensate for these conditions.

Test Feature

The form C (3-wire) contact allows a controller/annunciator to be wired as a closed loop system, resulting in a reliable fault-sensitive circuit.

NOTE: Holding test button for a prolonged period of time could cause crank case to overfill.

LM500 Series Flow Rates

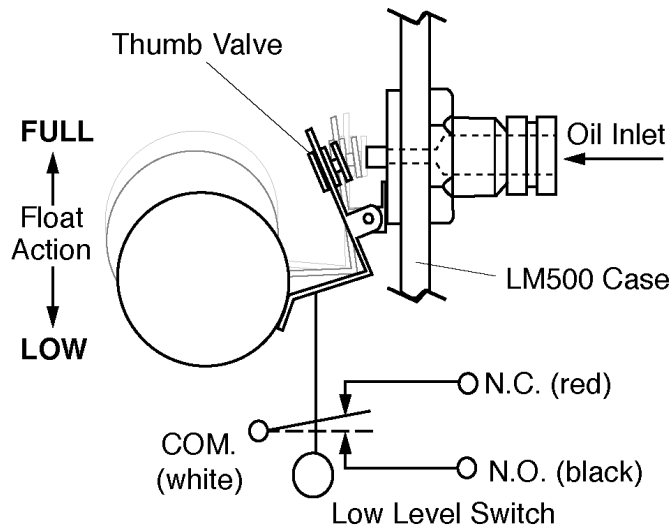


The LM500 Series Flow Rates are based on SAE 40 motor oil @2 ft. head pressure. Friction losses due to piping are not considered.

Operation

As the equipment uses oil, the float falls, providing immediate level compensation. At the FULL position, the float holds the valve closed. If the clean oil supply is depleted and oil level continues to fall, the low level switch will operate an alarm or equipment shutdown.

NOTE: Holding test button for a prolonged period of time could cause crank case to overfill.

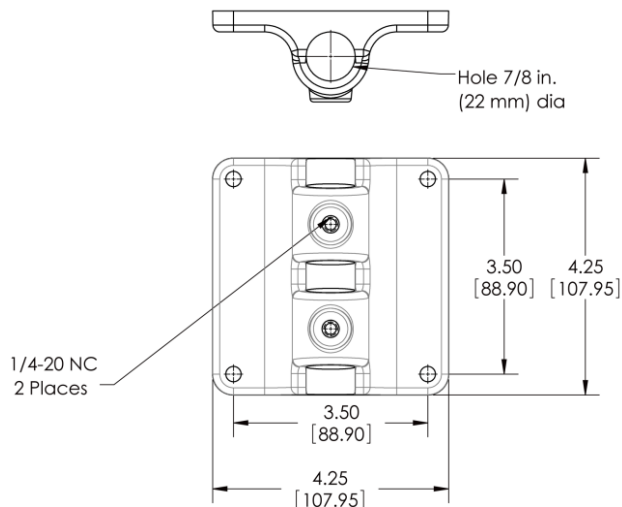


Recommended Use

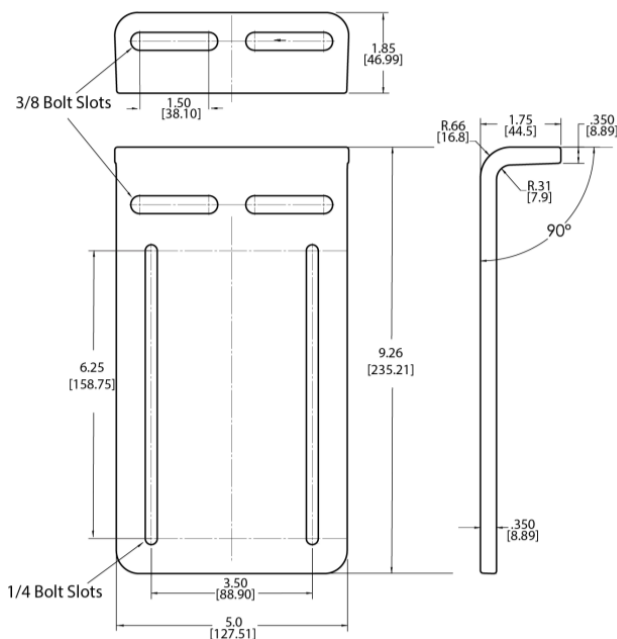
This device is a passive mechanical switch for use in non-hazardous areas. It may be used in hazardous areas with an FW Murphy Controller approved for hazardous areas equipped with a non-incendive or intrinsically safe digital input circuits, when Installation Diagrams are followed for that Controller. This device will meet the intent of a general-purpose passive mechanical switch associated with the Controller's hazardous area approvals. When used in an intrinsically safe circuit, the end device and associated wiring must meet the entity parameters for the circuit.

Dimensions, Mounting Brackets (Optional)

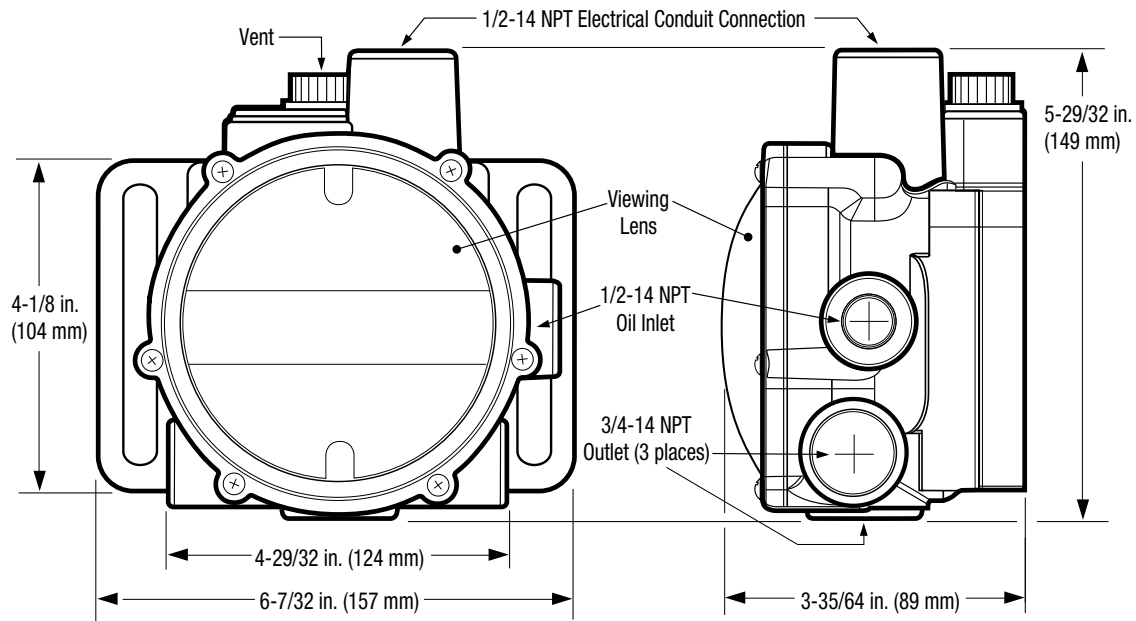
Pipe Mount Bracket



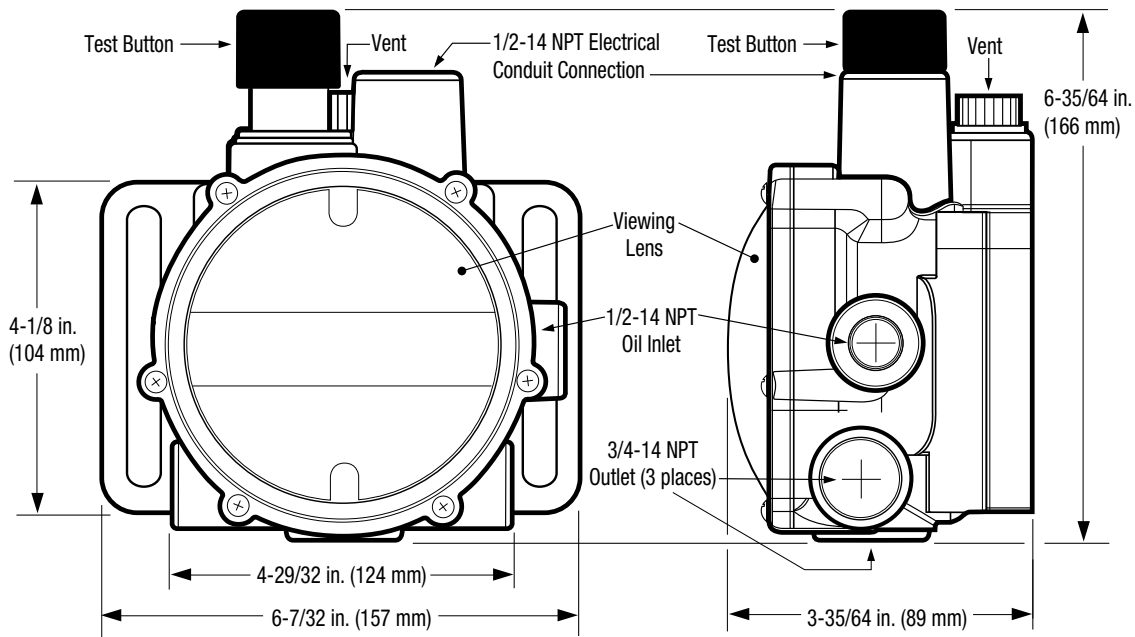
Universal Mount Bracket



LM500



LM500-TF

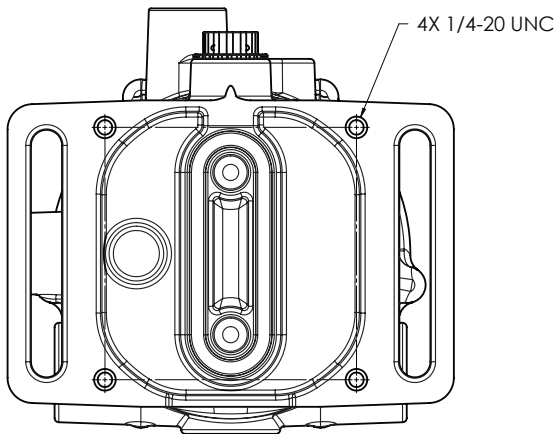


Typical Installation

WARNING

Perform this installation using appropriate protection. Trapped air and hot oil may cause burns.

Attach the mounting bracket to the backside of the LM500. If using the Universal bracket, this may be done now or after the bracket is attached to the base or the oil pan.



Supplied in bracket kit;
Mounting bolts 1/4-20 UNC x 3/4
long and washers.

The Pipe bracket uses 4 screws
with a lock washer on each.

The Universal bracket uses 4
screws with a lock washer and flat
washer on each.

Follow instructions for Pipe Bracket Kit (15000518) or Universal Flange kit (15000519). See LM500 Series Kits.

CAUTION

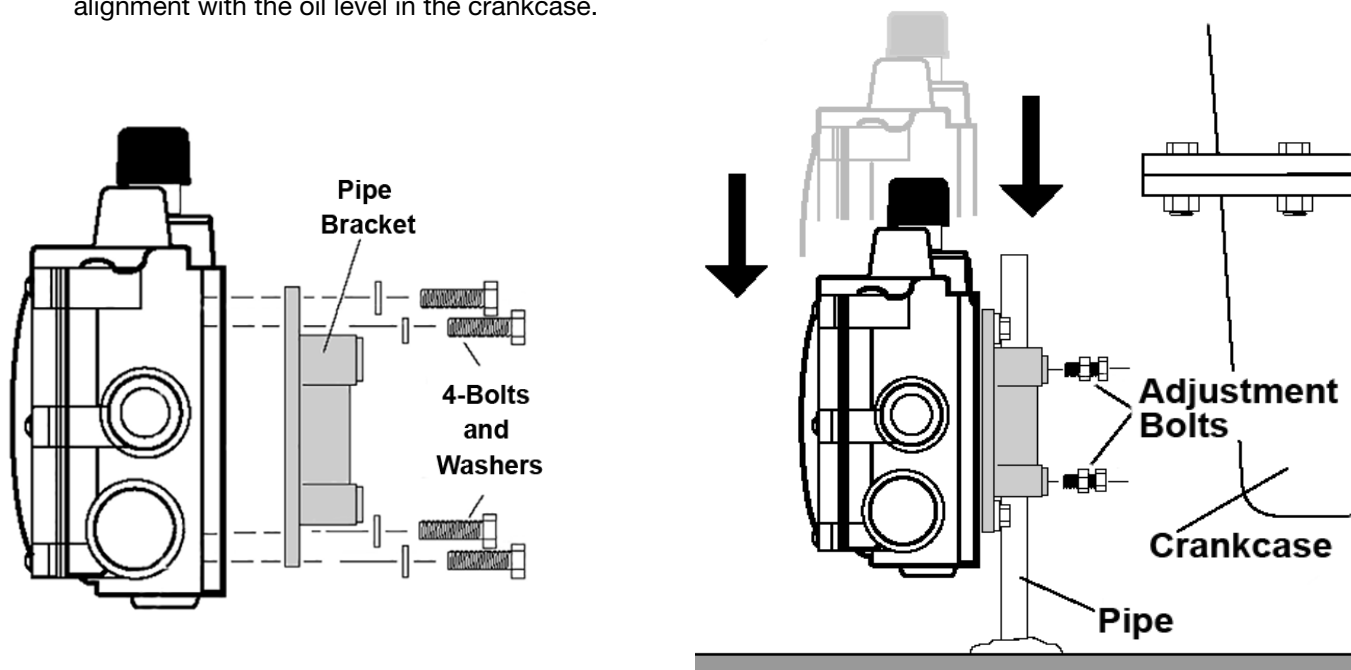
Excessive vibration can cause overfill. Be sure mounting brackets are supported.

IMPORTANT

Mount the LM500 as close as possible to the crankcase.

Pipe Bracket Mount (PM) (P/N 15000518)

1. Mount a nominal 1/2 inch (13 mm) diameter pipe to the base of the skid or fixture.
2. If not already done, install the pipe bracket to the LM500 using the supplied fasteners, four 1/4-20 UNC x 3/4 inch bolts with lock washers on each.
3. Slip the LM500 onto the pipe and install the two adjustment bolts (nuts threaded close to bolt head), 1/4-20 UNC x 1-1/2 inch bolt.
 - a. DO NOT tighten the adjustment bolts too tight, as you will need to adjust the LM500 later in the installation process.
 - a. Refer to Connect Fittings and Hoses for more information regarding height adjustment of the LM500 in alignment with the oil level in the crankcase.

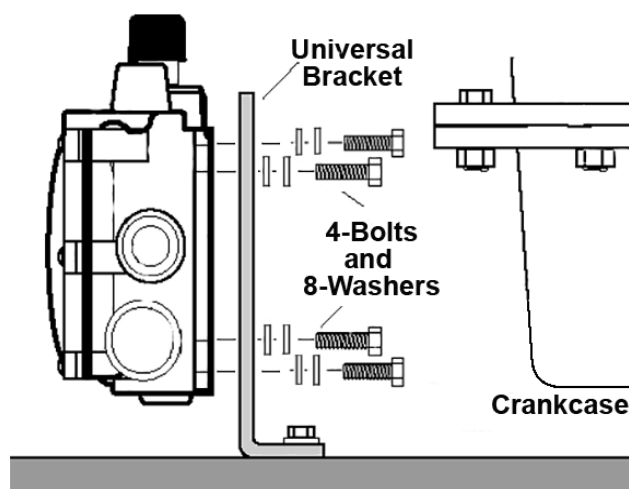
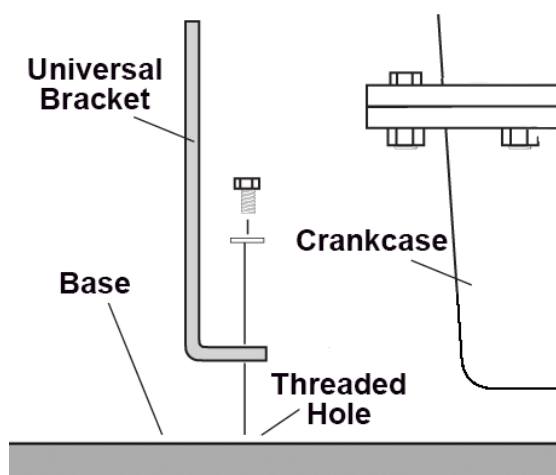


Universal Flange Mount (UB) (P/N 15000519)

The Universal Flange bracket has two mounting methods: base mounting or oil pan mounting.

Base Mounting

1. Install the universal bracket to the base as shown using a 5/16 inch diameter bolt and lock washer, customer supplied.
2. If not already done, mount the LM500 to the universal bracket using the supplied fasteners, four 1/4-20 UNC x 3/4 inch bolts with lock and flat washers.
 - a. DO NOT tighten the bolts too tight, as you will need to adjust the LM500 later in the installation process.
 - b. Refer to Connect Fittings and Hoses, for more information regarding height adjustment of the LM500 in alignment with the oil level in the crankcase.

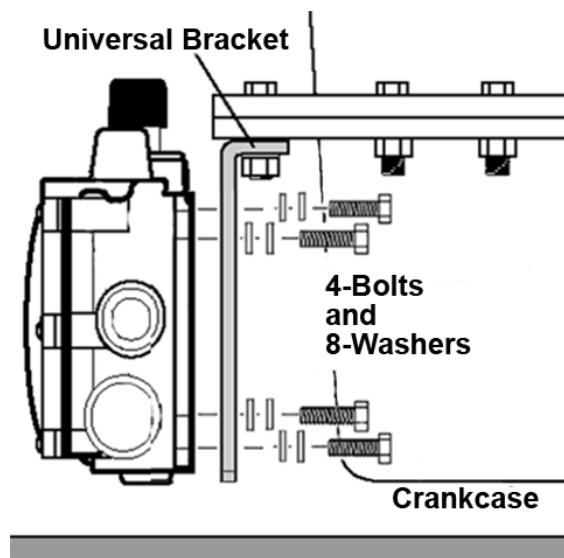
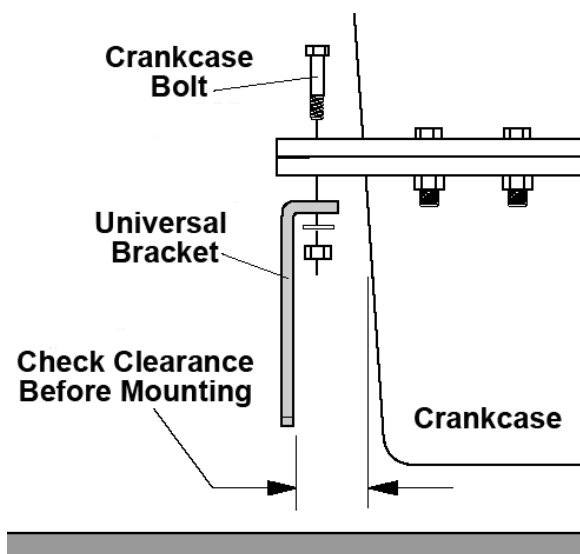


Crankcase (Oil Pan) Mounting

1. Install the universal bracket to the crankcase using an existing crankcase bolt, washer and nut. Crankcase bolt diameter must be no larger than 7/16 inch (11 mm).

NOTE: Check clearance between crankcase and mounting bracket before installing the mounting bracket. If space between the crankcase and mounting bracket is narrow, attach LM500 to mounting bracket prior to installation on crankcase.

2. If not already done, mount the LM500 to the universal bracket using the supplied fasteners, four 1/4-20 UNC x 3/4 inch bolts with lock and flat washers.
 - a. DO NOT tighten the bolts too tight, as you will need to adjust the LM500 later in the installation process.
 - b. Refer to Connect Fittings and Hoses, for more information regarding height adjustment of the LM500 in alignment with the oil level in the crankcase.



Connect Fittings and Hoses

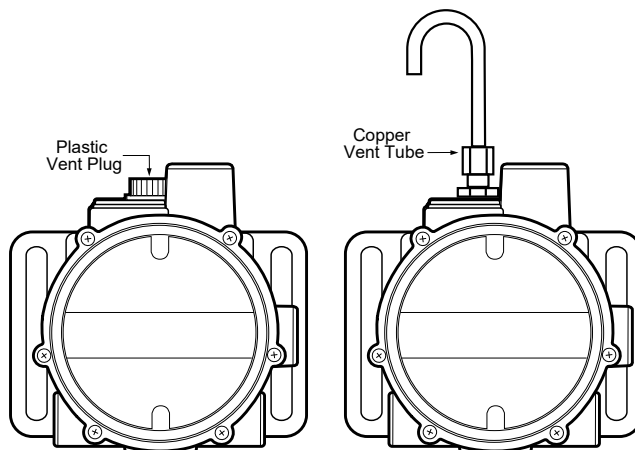
The following instructions start after LM500 is mounted, using Hose Kit (15000355) and Fitting Kit (15000943).

IMPORTANT	If connecting to the drain plug on the crankcase, we recommend adding a T-fitting to allow draining of the oil for service.
IMPORTANT	Apply a sealant such as Teflon® to all threaded connections.

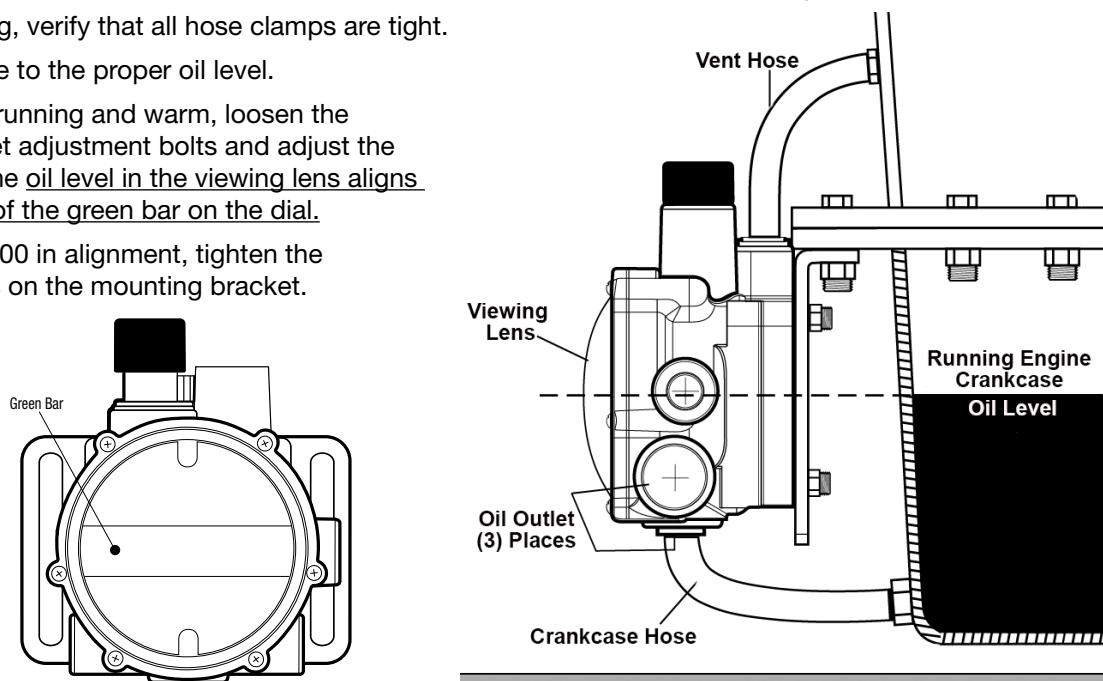
Perform the Operation Test after the unit is installed and wired appropriately.

1. Ensure the crankcase oil level is below the connections needed for this procedure.
 - a. Start the engine or power up the monitor.
2. Using the barb fittings as needed, attach the 1 inch (25 mm) diameter flexible oil hose to the crankcase and to one of the (3) oil outlet locations on the LM500. Secure with hose clamps.
 - a. The hose must slope slightly downward from the LM500 and without any droops or low spots.
 - b. If crankcase drain plug is used, we recommend installing a T-fitting at the crankcase to assist with routine oil changes.
3. Apply Teflon to threads of the $\frac{3}{4}$ -14 NPT pipe plug fitting. Install pipe plug fittings to the remaining (2) oil outlets. Plugs supplied in LM500's shipping box.
5. For vented crankcase, you may use the plastic vent plug that came installed in the LM500 or install the vent tube (candy cane).
 - a. To install the vent tube, remove the plastic vent plug. Install and tighten the compression fitting connector with the vent tube.
2. For sealed systems, remove the plastic vent plug. Use the barb fittings to install the 1/2 inch (13 mm) I.D. x 3 ft. (914 mm) hose to the vent connection on the LM500 and to the vent connection on the crankcase. Cut hose as needed and secure with hose clamps.
 - a. The vent connection on the crankcase must be well above the regulated oil level.
 - b. The hose must be clear of obstructions, valleys or dips that could create liquid traps or gas/air pockets. The connections should be as straight as possible.
5. Before continuing, verify that all hose clamps are tight.
6. Fill the crankcase to the proper oil level.
7. With the engine running and warm, loosen the mounting bracket adjustment bolts and adjust the LM500 so that the oil level in the viewing lens aligns with the middle of the green bar on the dial.
8. Holding the LM500 in alignment, tighten the adjustment bolts on the mounting bracket.

Vented System, Vent Options



Sealed System and Alignment Illustration



Connect LM500 to Oil Supply Tank

Perform the Operation Test after the unit is installed and wired appropriately.

1. Remove the plug from the oil inlet connection. Be sure the removable screen inside the connection is clear of debris. Install the oil inlet connection.
2. Connect a 1/2 inch I.D. (13 mm) or larger hose to the oil inlet fitting on the LM500 and to the shut-off valve on the oil supply tank.
 - a. Recommended minimum height above the LM500 is 2 feet. (0.6 m); maximum 25 feet (7.7 m).
 - b. The hose must maintain a downward slope and not have low spots or droops.
 - c. Maximum head pressure rating is 9.50 psi or 25-foot oil (head pressure).
3. Before filling the supply tank with oil, be sure the tank is clean and dry and the shut-off valve is closed. Also, be sure all hoses and clamps are tight. Fill the tank with CLEAN oil.

WARNING

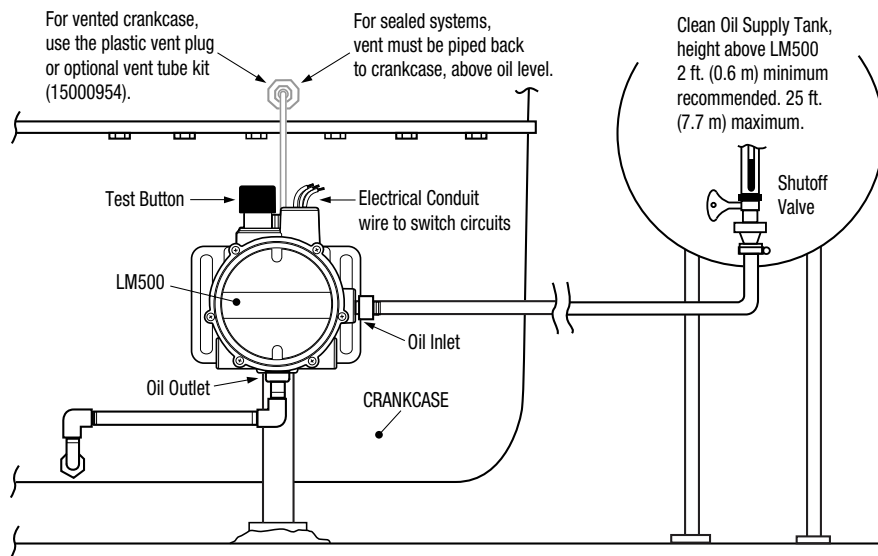
Overfill condition can be caused by excessive inlet pressure and/or improper vent-to-crankcase installation.

4. After oil supply tank is full, open the shut-off valve.
5. Make the proper electrical connections for the application.

LM500 Typical Installation Diagram With Supply Tank

WARNING

Perform this installation using appropriate protection. Trapped air and hot oil may cause burns.

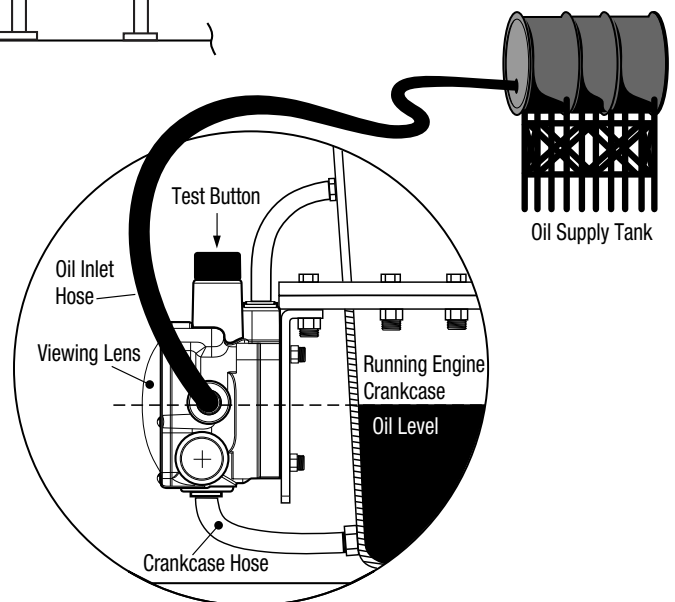


Typical Pipe Mount Installation

In this example, the oil outlet hose is connected to the bottom oil outlet, the (2) side oil outlets are plugged.

Typical Universal Mount Installation

In this example, the oil outlet hose is connected to the bottom oil outlet, the (2) side oil outlets are plugged.



LM500 Series Kits

Pipe Bracket Kit (P/N 15000518)	
Qty	Description
1	Bracket, Mtg, Back Housing, LM500
4	Screw, Hex Head 1/4-20x3/4 Zinc
2	Screw, Set, 1/4-20x1-1/2
4	Washer, Split Lock 1/4 Med
2	Nut, Hex, 1/4-20x7/16 Steel

Universal Bracket Kit (P/N 15000519)	
Qty	Description
1	Bracket, Universal Tall
4	Screw, Hex Head 1/4-20x3/4 Zinc
4	Washer, Split Lock 1/4 Med
4	Washer, 1/4, Flat, SS

Bubble Lens Kit (P/N 15000532)	
Qty	Description
1	Dial
1	O-ring, 0.139 C/S, 4.359 ID
6	Shoulder screw, #8-32 x 0.3125
1	Bubble lens

Fittings Kit (P/N 15000943)	
Qty	Description
1	Tubing vent, soft copper, candy cane
1	Hose barb, 1/2 NPT to 1/2 Hose
1	Hose barb, 1in. I.D. Hose X 3/4 NPT
1	Connector, 1/4 x 1/2 NPT compression fitting

Hose Kit (P/N 15000355)	
Qty	Description
1	Hose, 1/2 in. (13 mm) I.D. x 3 ft. (914 mm) long
1	Hose 1 in. (25 mm) I.D. x 3 ft. (914 mm) long
2	Clamp, 1/2 in. (13 mm) worm gear
2	Clamp, 1 in. (25 mm) worm gear
2	Barbed fitting, 1/2 NPT x 1/2 in. (13 mm)

Vent Fittings Kit (P/N 15000954)	
Qty	Description
1	Tubing vent, soft copper, candy cane
1	Connector, 1/4 x 1/2 NPT compression fitting

Specifications

Crankcase Balance Vent Connection: 1/2 NPTF (top)

Inlet Connection: 1/2 NPTF removable screen (side)

Outlet Connection: 2 x 3/4 NPTF (side)
1 x 3/4 NPTF (bottom)

Thumb-Valve Material: Viton

Snap-switch: SPDT rating 10 A, 125 VAC; 0.5 A, 125 VDC;
10 A, 30 VDC

Wire leads: 18 AWG x 14 in. +/- 2 in. (355 mm) length

Conduit Connection: 1/2 inch conduit (female, top)
(Refer to 00-02-0735 Teflon Tape Wrapping Technique)

Case: Die-cast aluminum

Lens: Clear frog eye non-staining, high impact,
high temperature polycarbonate; UV and heat stabilized

Dial: High visibility white background with solid green band for
normal level indication

Maximum Inlet Pressure: 9.50 psi/25 ft. oil (head pressure)

Maximum Differential: 2 in. (51 mm) between running and stopped

Maximum Ambient Temperature: 250° F (121° C)

Float: 304 Stainless Steel

Flow Rates: Refer to Flow Rate Chart

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