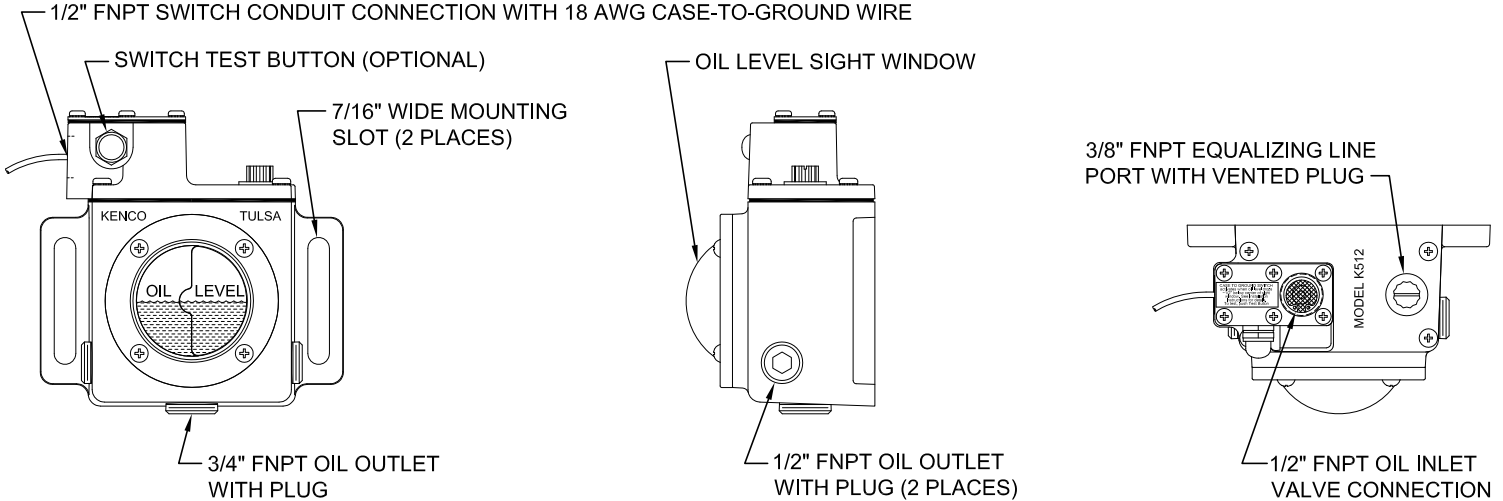




P.O. Box 470426 • Tulsa, Oklahoma 74147
 Phone: 918-663-4406 • Fax.: 918-663-4480
 www.kenco-eng.com • Email: info@kenco-eng.com

INSTALLATION INSTRUCTIONS FOR K512 / K512-TB / K512HL / K512HL-TB OIL LEVEL CONTROLLERS



SWITCH CONTACT RATING: 2 AMPS, 30 VAC/VDC

SWITCH CIRCUITRY: Normally Open Case-to-Ground

SWITCH WIRING NOTE: Attach the wire from the controller to the low tension terminal on the magneto or other source of grounding.

SWITCH SETTING (K512 / K512-TB): Switch is factory set to close when the oil level inside the controller drops approximately 1/2" below the center of the sight window.

SWITCH SETTING (K512HL / K512HL-TB): Switch is factory set to close when the oil level inside the controller drops approximately 1/2" below the center of the sight window or when the oil level inside the controller rises approximately 1/2" above the center of the sight window.

SWITCH ADJUSTMENT (K512 / K512-TB): Switch adjustment is not recommended. Improper setting may result in damage to engine. If adjustment is necessary, refer to FIGURE 1 and the following instructions:

- Ensure that switch circuit is not energized.
- Remove the switch terminal cover plate (A) by unscrewing six screws (B).
- Remove wire terminal and hexagon nuts from slotted set screw (C).
- Rotate the slotted set screw (C) clockwise to raise the switch trip point and counterclockwise to lower the switch trip point. (Note: One complete revolution of set screw changes its height 1/32").
- Replace wire terminal, hexagon nuts, and switch terminal cover plate.
- Test circuit to ensure that desired switch set point was achieved.

SWITCH ADJUSTMENT (K512HL / K512HL-TB): Switch is not adjustable. Refer to FIGURE 2.

SWITCH TEST BUTTON OPERATING INSTRUCTIONS:

- To check wiring circuit or system response to an improper oil level condition, Press and Hold Test Button. This will close the switch case-to-ground circuit.

SWITCH TEST BUTTON / CONTROLLER COVER PLATE REMOVAL INSTRUCTIONS:

- If the oil level controller cover plate assembly has to be removed for any reason, the Test Button assembly must be removed to allow access to the oil level controller cover plate assembly mounting screw that is located on the corner underneath the Test Button.
- Unscrew the Test Button using a deep 5/8" socket. Make sure the socket completely covers the Test Button and not just the rubber boot. If the rubber boot is inadvertently removed, care must be taken to ensure that the return spring and actuation pin are not lost.

SWITCH TEST BUTTON REPLACEMENT INSTRUCTIONS:

- Before installing the Test Button, check the O-ring seal for any damage. If damaged, replace the O-ring seal.
- Install the Test Button using a deep 5/8" socket. Do not over tighten. A snug fit is all that is required to retain the Test Button and provide a watertight seal.

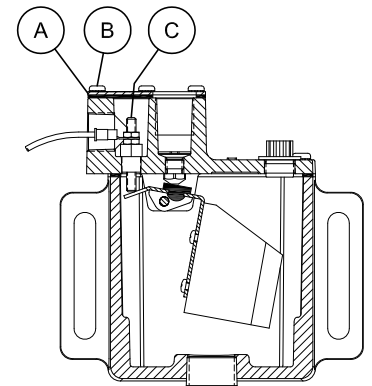


FIGURE 1
(K512 / K512-TB)

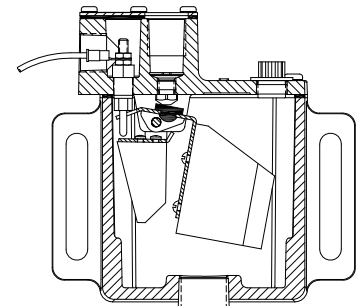


FIGURE 2
(K512HL / K512HL-TB)

CONTROLLER OIL INLET INSTALLATION AND MAINTENANCE INSTRUCTIONS:

- Connect the oil supply line to the oil inlet connection on the oil level controller. The minimum recommended supply line inside diameter is 3/4". The inside of the line must be clean before installation.

Caution: Controller housing is made from cast aluminum and over tightening oil inlet connection can crack the housing.

- Connect the oil supply line to the oil supply tank. If there is no shutoff valve at the existing oil supply outlet, one should be installed in the line to prevent oil loss while performing maintenance.

CONTROLLER OIL INLET VALVE SPECIFICATIONS: For proper operation, controller requires a minimum of 2 ft. of oil inlet head pressure and a maximum of 12 ft. of oil inlet head pressure. See chart below for approximate oil levels maintained at various head pressures.

MAINTAINED OIL LEVEL AT VARIOUS HEAD PRESSURES	
(Values are approximate only and are based on tests using SAE 30 wt. mineral oil with API gravity of 29)	
Head Pressure	Maintained Oil Level
2 Feet (0.76 PSI)	1/8" Below Center of Sight Window
4 Feet (1.53 PSI)	1/16" Below Center of Sight Window
6 Feet (2.29 PSI)	At Center Of Sight Window
8 Feet (3.06 PSI)	1/16" Above Center of Sight Window
10 Feet (3.82 PSI)	1/8" Above Center of Sight Window
12 Feet (4.59 PSI)	5/32" Above Center of Sight Window

INSTALLATION TROUBLE SHOOTING TIPS:

Low or high oil levels are often caused by the following:

- Improper equalization pressure between the crankcase and the oil level controller. See "OIL LEVEL CONTROLLER BASICS" on Kenco website for a more in-depth explanation.
- Not enough oil inlet pressure, which will cause the unit to underfill. This can be caused by an obstructed controller oil inlet screen, which should be inspected routinely if oil supply is at risk of contamination.
- Excessive oil inlet pressure, which will cause the unit to overfill.

MOUNTING ADAPTERS

"-1" (Clark MA & CFA), "-2" (Clark HMB & TMP), "-3" (Clark RA, HRA, HBA, HCA, HLA, & TLA), "-6" (Cooper-Bessemer GMW), "-7" (Cooper-Bessemer GMV), "-8" (Cooper-Bessemer GMX), AND "-16" (Cooper-Bessemer BMV & 275) MOUNTING ADAPTERS:

- Remove the existing visual oil gauge assembly from the engine and replace it with the oil level controller and adapter assembly using supplied gasket(s) and mounting bolts where applicable.

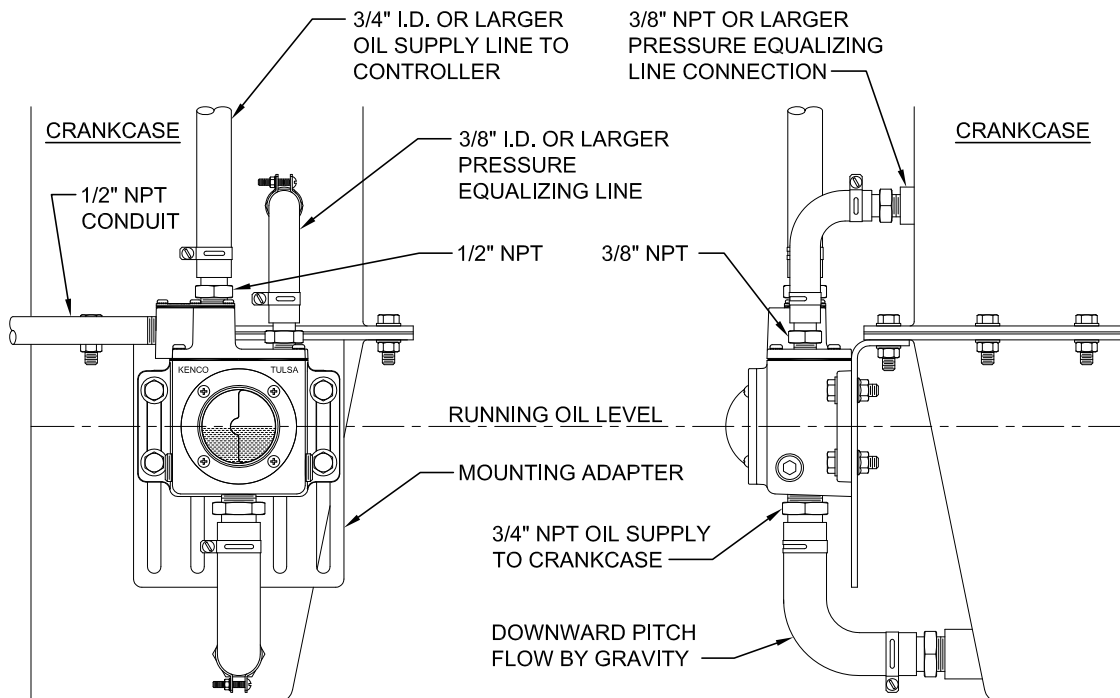
"-4" (Ingersoll-Rand SVG & KVS) AND "-5" (Ingersoll-Rand KVG) MOUNTING ADAPTERS:

- Remove the existing visual oil gauge assembly from the engine and replace it with the oil level controller and adapter assembly using supplied gasket and mounting bolts where applicable.
- If the visual oil gauge was vented back to the engine crankcase, remove the plug from the top of the Kenco mounting adapter and tie it back to the crankcase with an equalizing line. See "-9U" or "-12" mounting adapter installation instructions below for equalizing line recommendations.

"-9U" (Universal) MOUNTING ADAPTER:

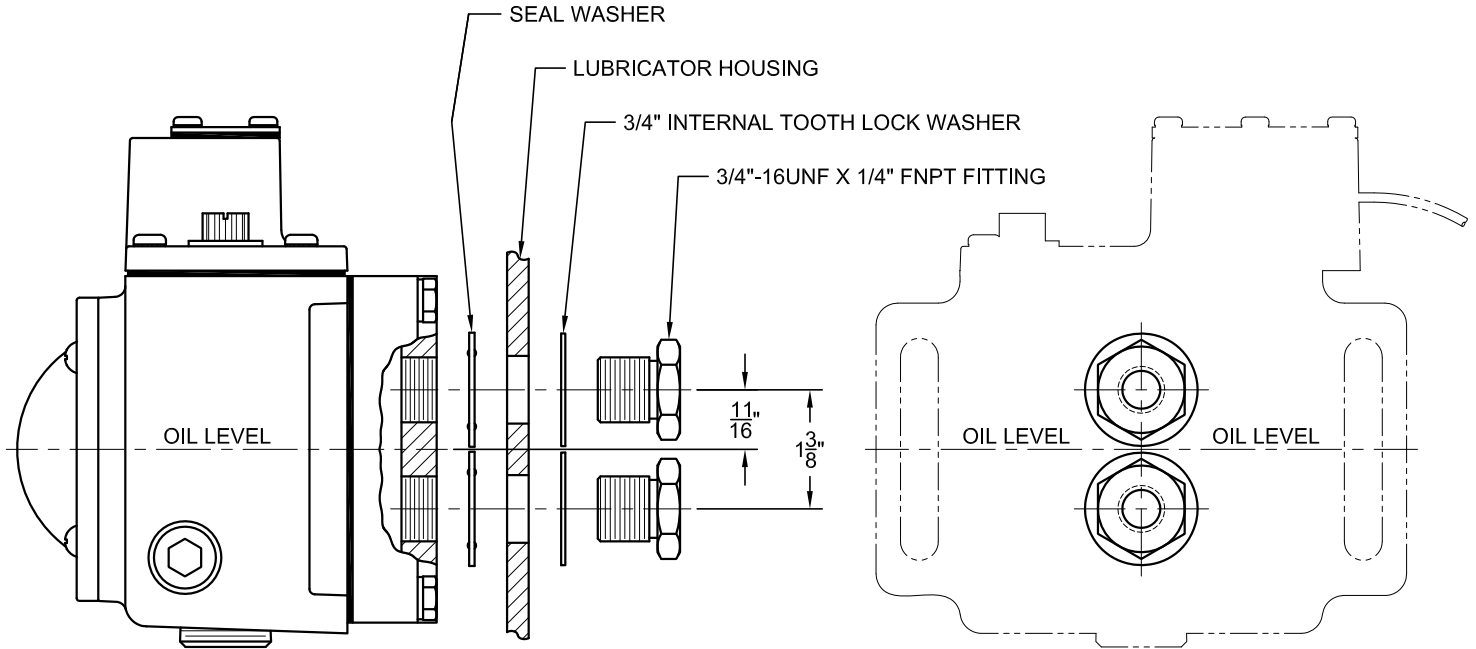
- Install the universal mounting adapter close to the crankcase at elevation required to allow center of oil level controller sight window to be positioned at running oil level inside crankcase.
Note: Vertical face of mounting adapter must be plumb to ensure that proper running oil level in the crankcase is maintained by controller.
- Using hardware provided, mount the controller to the adapter so that the centerline of the sight window corresponds to the desired running oil level in the crankcase.
Note: Make sure controller housing is level to ensure that proper running oil level in the crankcase is maintained by controller.
- Connect hose from the 1/2" FNPT or 3/4" FNPT controller outlet to the crankcase.
Note: The outlet port on the oil level controller must be located below the oil level in the crankcase.
- An equalizing line must be used between the controller and crankcase in order to equalize the pressure. It is recommended that the line be 3/8" I.D. or larger, as short as possible, and should run from the crankcase to the controller at a downhill angle all along the run. At NO POINT should the line run horizontally or uphill after it has been running downhill! This can create an oil trap in the line, blocking it and prevent proper equalization. It is okay if the line runs uphill straight out of the crankcase and then makes one downhill turn to the controller. In fact, this is sometimes the preferred method as it allows the oil that may splash into the vent line to flow back into the crankcase.

TYPICAL INSTALLATION OF "-9U" MOUNTING ADAPTER



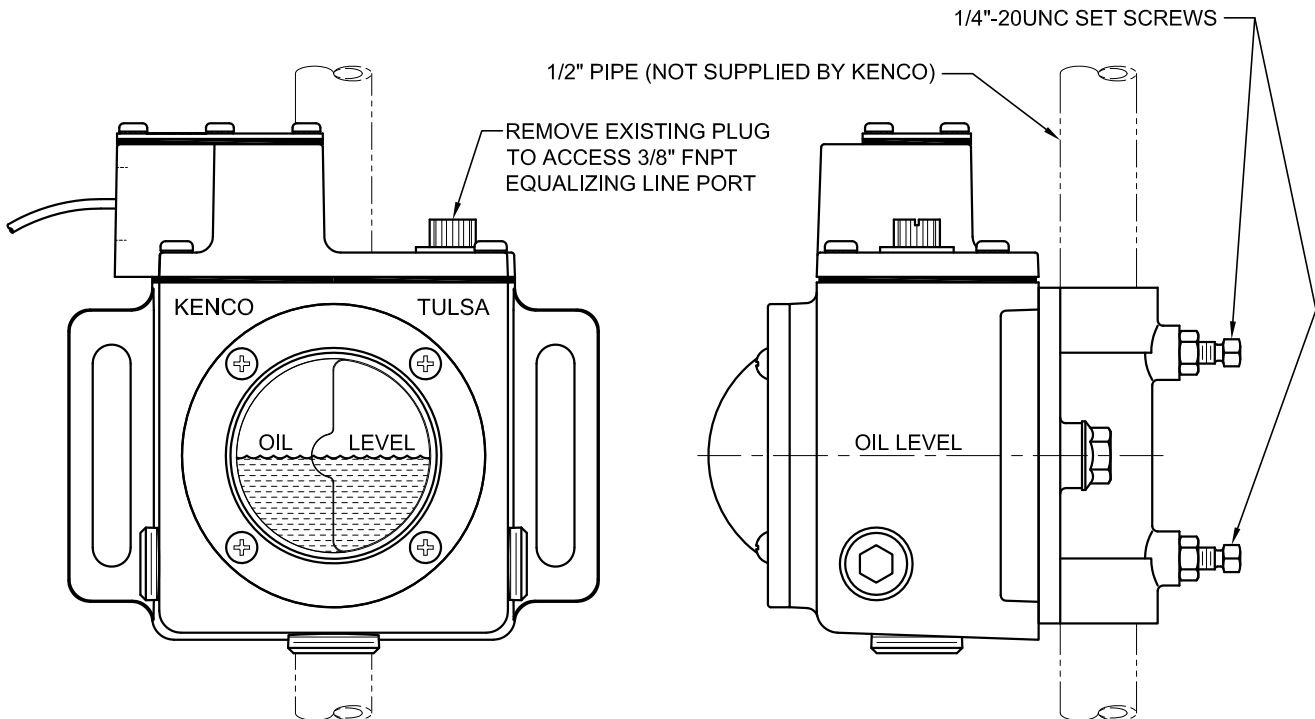
"-11" (Mechanical Lubricator) MOUNTING ADAPTER:

- Drain and properly dispose of existing oil from lubricator housing.
- Drill 25/32"Ø holes in lubricator housing at desired oil level using drilling dimensions shown below.
- Clean out all metal shavings created during drilling process from inside lubricator housing.
- Mount the controller to the lubricator housing as shown below using the seal washers and fittings provided.



"-12" (Post Mount For 1/2" Pipe) MOUNTING ADAPTER:

- Install 1/2" pipe as required to equipment sub frame as close as possible to crankcase.
 Note: Pipe must be plumb and as short as possible to minimize vibration.
- Loosen controller mounting adapter set screws and hexagon nuts as required to allow installation of mounting adapter onto pipe.
- Slide the controller assembly onto the pipe so that the centerline of the sight window corresponds to the desired running oil level in the crankcase.
- Tighten set screws against pipe while ensuring that controller housing remains level from front to back.
- Tighten hexagon nuts against bosses on back side of mounting adapter.
- Connect hose from the 1/2" FNPT or 3/4" FNPT controller outlet to the crankcase.
 Note: The outlet port on the oil level controller must be located below the oil level in the crankcase.
- An equalizing line must be used between the controller and crankcase in order to equalize the pressure. It is recommended that the line be 3/8" I.D. or larger, as short as possible, and should run from the crankcase to the controller at a downhill angle all along the run. At NO POINT should the line run horizontally or uphill after it has been running downhill!! This can create an oil trap in the line, blocking it and prevent proper equalization. It is okay if the line runs uphill straight out of the crankcase and then makes one downhill turn to the controller. In fact, this is sometimes the preferred method as it allows the oil that may splash into the vent line to flow back into the crankcase.



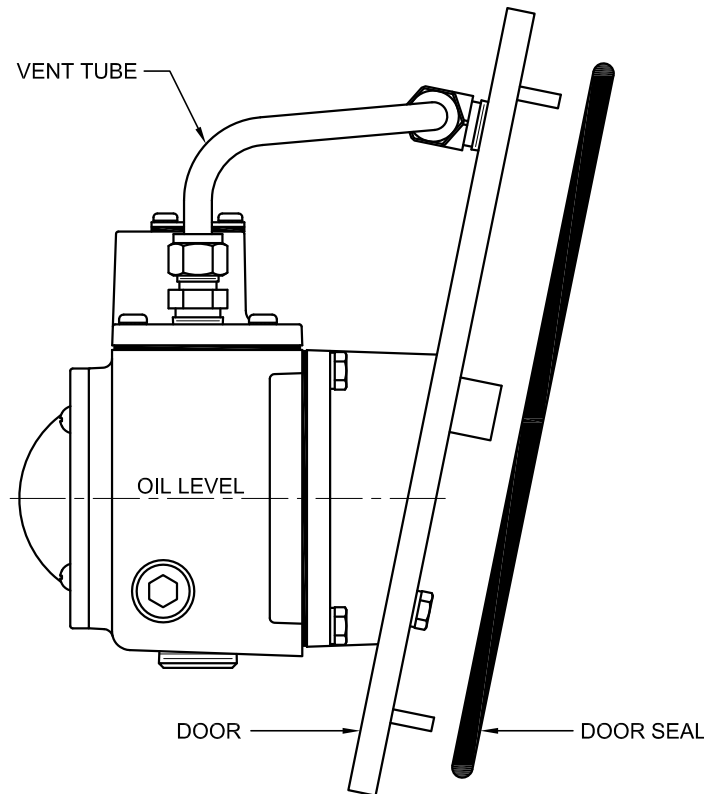
"-14" (Cooper Superior Compressor, formerly White) MOUNTING ADAPTER:

- Remove the existing triangular blind flange located on the compressor and mount the controller assembly in its place using supplied gasket.

"-17" (Waukesha VHP engines F2895, F3251, F5108, L5790, & L7042), "-18" (Same as -17 except with integral Kenco 1618 Low Flow Meter), "-27" (Waukesha VHP engines F2895, F3251, F5108, L5790, & L7042), "-37" (Waukesha P9390 engine), "-38" (Same as -37 except with integral Kenco 1618 Low Flow Meter), "-39" (Same as -37 except with integral Kenco 14308 Low Flow Meter), AND "-40" (Same as -17 except with integral Kenco 14308 Low Flow Meter) MOUNTING ADAPTERS:

Note: -17, -18, -37, -38, -39, and -40 mounting adapters replace crankcase inspection door with single bolt mounting arrangement and -27 mounting adapter replaces crankcase inspection door with two bolt mounting arrangement.

- Remove the existing inspection door from the crankcase.
- Remove the existing clamp bar from the inspection door.
- Install seal into the groove on the back side of the mounting adapter.
- For -17, -18, -37, -38, -39, and -40 mounting adapters with single bolt mounting, install seal washer onto Kenco supplied mounting bolt.
- For -27 mounting adapter with two bolt mounting, install (1) flat washer followed by (1) O-ring seal onto each of (2) Kenco supplied mounting bolts.
- Install mounting bolt(s) through mounting adapter hole(s) from controller side of assembly.
- Using mounting bolt(s) just installed, loosely attach existing clamp bar to back side of mounting adapter.
- Place the controller assembly over the crankcase inspection door port while making sure that clamp bar is in a horizontal position inside crankcase.
- While ensuring that mounting adapter is centered over the crankcase inspection door port, tighten mounting bolt(s).
- Connect oil supply line to the controller oil inlet port or the Low Flow Meter oil inlet port if unit is equipped with a meter. See "CONTROLLER OIL INLET INSTALLATION AND MAINTENANCE INSTRUCTIONS" on page 2 for recommendations.
- For models with a Low Flow Meter, refer to instructions supplied with the Kenco 1618 or 14308 Low Flow meter.



"-24" (Ariel JGE 2/4 throw, JGH 2/4 throw, JGK 2/4 throw, & JGT 2/4 throw compressors), "-25" (Ariel JGU 2/4/6 throw, JGZ 2/4/6 throw, KBB 4/6 throw, & KBV 4/6 throw compressors), "-48A" (Ariel JGB 4/6 throw, JGC 2 throw, JGD 2 throw, & JGV 4/6 throw compressors), "-48B" (Ariel JGC 4/6 throw and JGD 4/6 throw compressors with standard shaft rotation and a single chain drive, & Ariel JGC 6 throw and JGD 6 throw compressors with reverse shaft rotation and a dual chain drive), AND "-48C" (Ariel JGC 4/6 throw and JGD 4/6 throw compressors with reverse shaft rotation and a single chain drive, & Ariel JGC 6 throw and JGD 6 throw compressors with standard shaft rotation and dual chain drive) MOUNTING ADAPTERS:

- Remove the existing visual oil gauge assembly located on the crankcase and replace it with the oil controller assembly using the existing sight glass mounting bolts and Kenco supplied gasket.

"-A" (Arrow C46, C66, C106, & C245 engines), "-FM" (Fairbanks Morse ZC, 118, 208, 346, 503, & 739 engines), "-W" (Witte B, C, F28, F32, & F42 engines), "-W98" (Witte 98 engine with oil gauge bolted to engine) MOUNTING ADAPTERS:

- Drain oil from the crankcase to a level below the oil gauge.

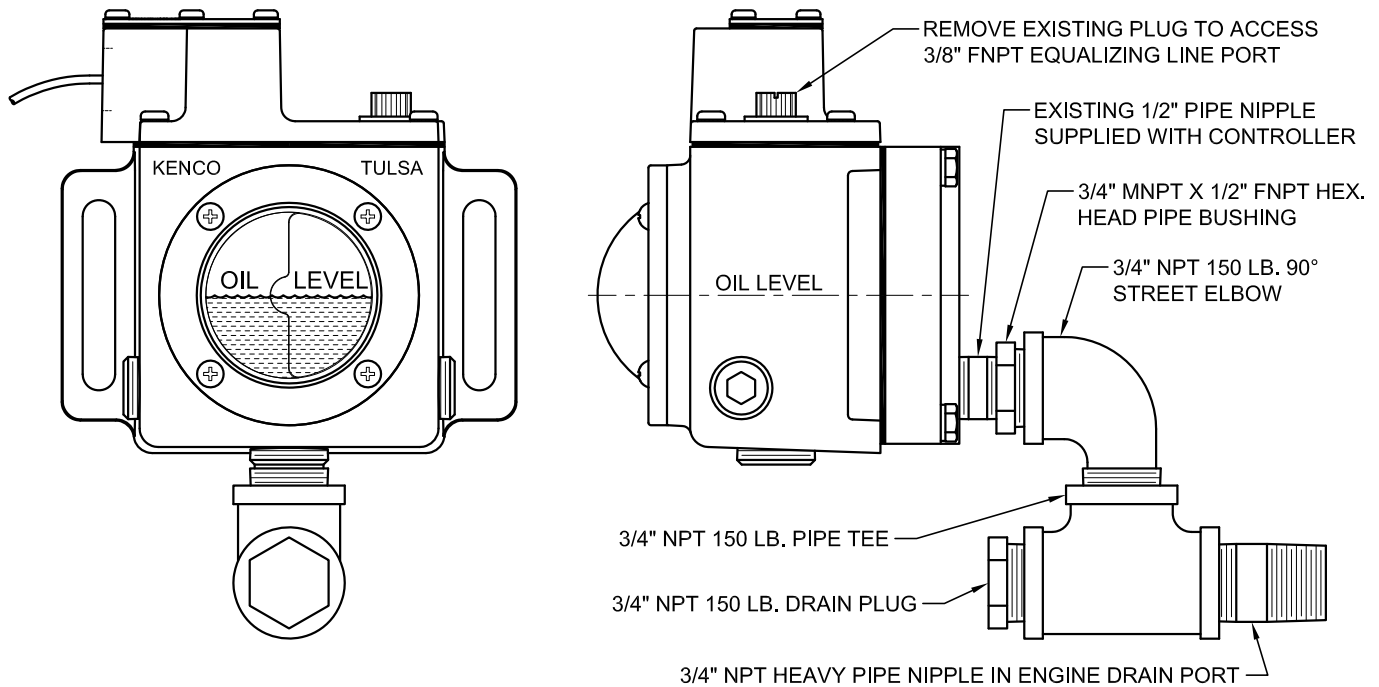
Note: On Fairbanks Morse engines, oil draining can be facilitated by removing the coupling from the engine oil drain and installing a pipe elbow on the nipple. Models 118 and 208 require 1/2" pipe and models 346, 508, and 739 require 3/4" pipe. If a banded elbow is used, it will be necessary to file off part of the gauge boss on some engines.

- Remove all existing parts from the base oil gauge on the engine.
- Remove the mounting adapter from the back of the controller and bolt it in place of the base oil gauge using supplied gasket and bolts.
- Install the controller back onto the mounting adapter with the oil inlet connection on top.
- Connect the oil supply line to the controller oil inlet port. See "CONTROLLER OIL INLET INSTALLATION AND MAINTENANCE INSTRUCTIONS" on page 2 for recommendations.
- On Fairbanks Morse and Witte 98 engines without an oil gauge, it will be necessary to use an equalizing line. See "-9U" or "-12" mounting adapter installation instructions on page 2 for recommendations.
- On some Arrow C-Series engines, it will also be necessary to use an equalizing line. See K512-A SERVICE BULLETIN (A-65946) on Kenco web site for installation instructions.

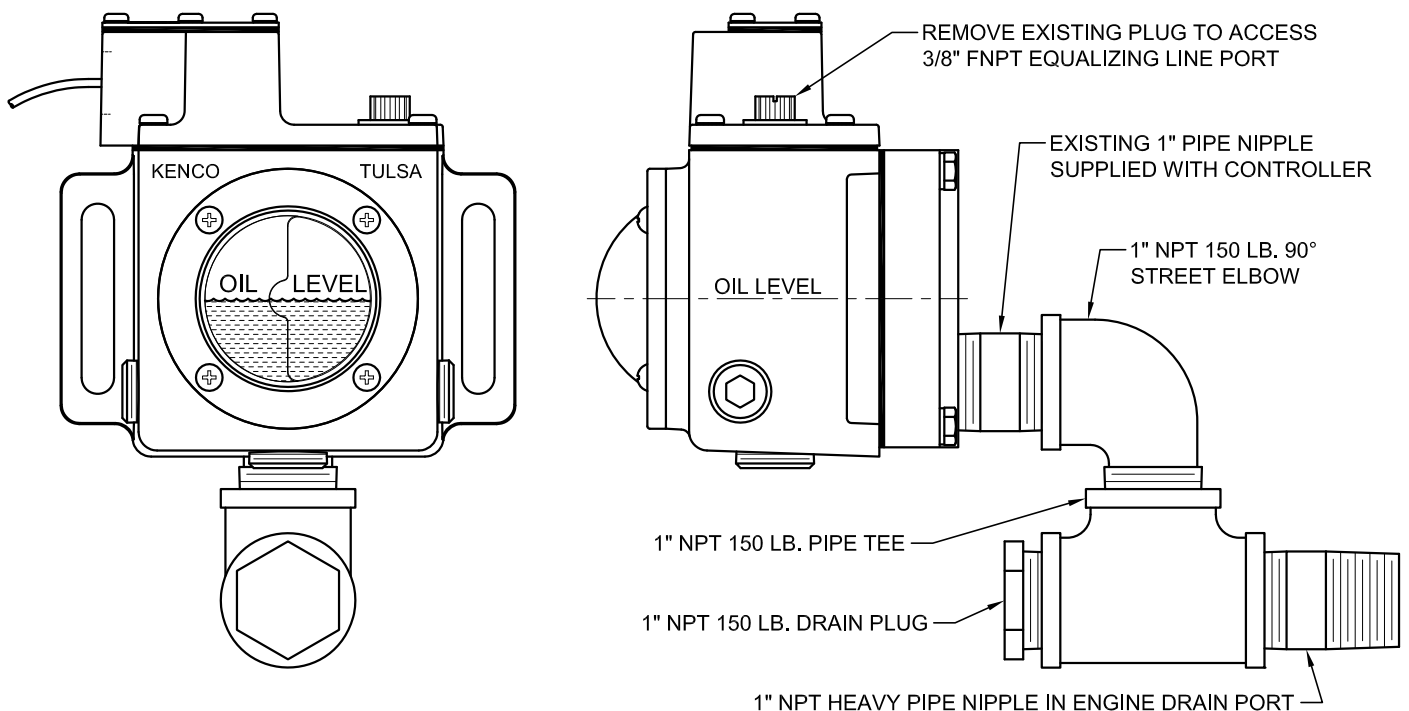
"-AJAX" (Ajax, Lufkin made before 1-1-63, Superior and other Crosshead type engines, and Tri-Plex pumps with 1/2" drains) AND "-L-795" (Arrow L-795) MOUNTING ADAPTERS:

- Remove the crankcase drain plug and drain all of the oil out of the crankcase.
- Mount controller as shown below while ensuring that controller is plumb and level.
- Fill the crankcase to the high level mark on the dipstick.
- Make sure the centerline of the controller sight window corresponds with oil level inside the crankcase. If it does not, make necessary adjustments to mounting adapter piping.
- An equalizing line must be used between the controller and crankcase in order to equalize the pressure. See "-9U" or "-12" mounting adapter installation instructions on page 2 for recommendations.
- Connect the oil supply line to the controller oil inlet port. See "CONTROLLER OIL INLET INSTALLATION AND MAINTENANCE INSTRUCTIONS" on page 2 for recommendations.
- Start the engine and let it run for 30 minutes.
- After the controller has established the running oil level, connect the controller switch wire to the primary ground terminal on the magneto.

K512-AJAX MOUNTING ADAPTER



K512-L-795 MOUNTING ADAPTER



"-ML" (For side mounting on mechanical lubricator when there is no extra pump pocket) MOUNTING ADAPTER:

- Drill holes in the oil controller mounting bracket to match the existing holes on the lubricator cover plate.
- Bolt in place making sure that the cap screws for mounting do not interfere with the lubricator operation.
- Connect a line between the 3/4" FNPT drain connection on the controller to the drain connection on the lubricator.

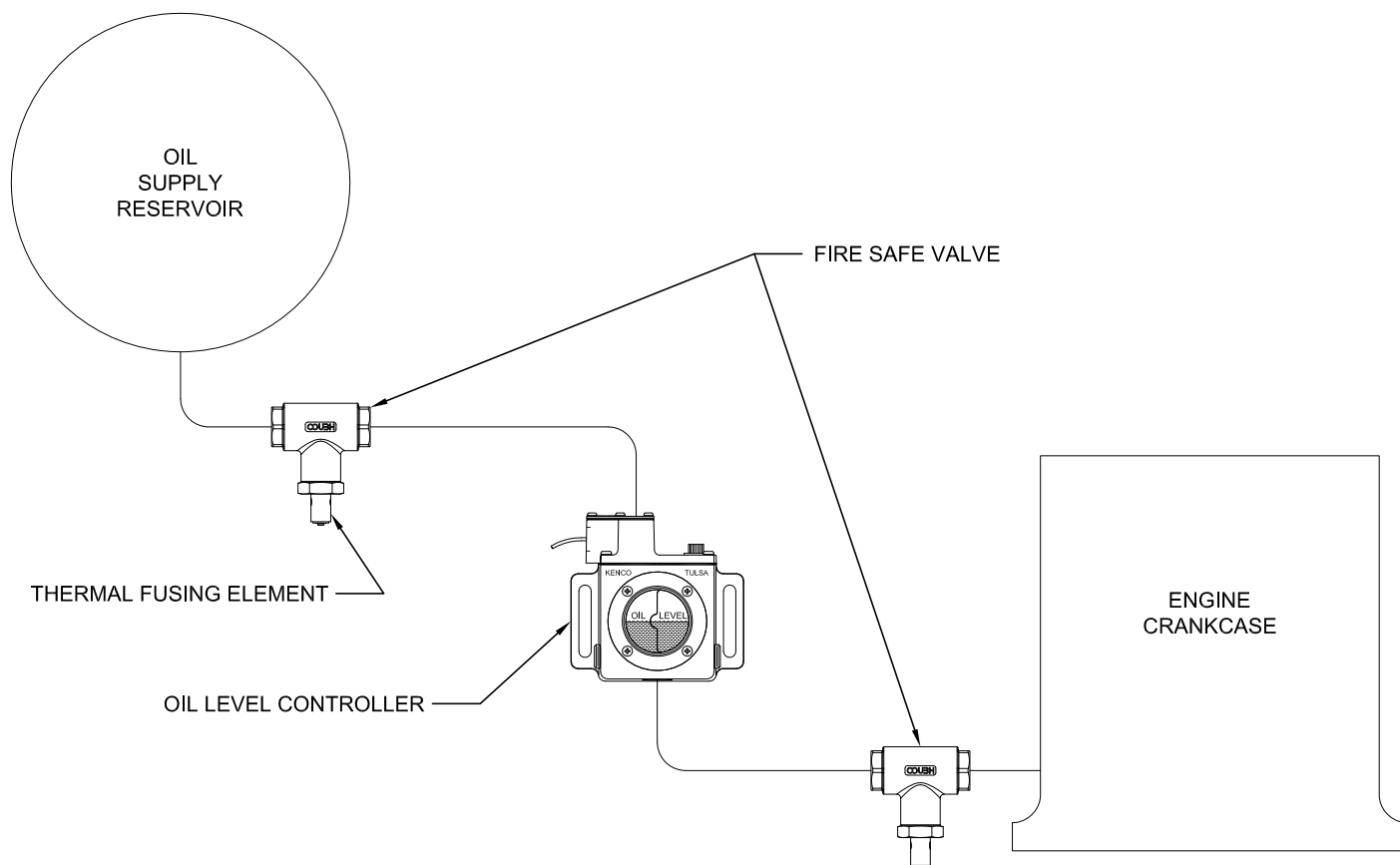
"-SML" (Mounts on the end of the McCord mechanical lubricator next to the filler cap) MOUNTING ADAPTER:

- Remove the (4) screws on the end of the lubricator with the filler cap.
- Bolt the controller in place with (4) cap screws and lock washers.
- Connect a line between the 3/4" FNPT drain connection on the controller to the drain connection on the lubricator.

FIRE SAFE VALVES

"50-KFS" AND "75-KFS" FIRE SAFE VALVES (Patent No. 3,877,476):

- In a Fire Safe controller installation, all lines between the oil supply tank and the crankcase must be made of steel. DO NOT use rubber hose.
 - Some K512 mounting adapters that mount directly to the crankcase are available with an integral Fire Safe valve between the controller and the crankcase. Consult Kenco for specific model features.
 - Controller adapters with an integral Fire Safe valve will only be supplied with the 50-KFS valve.
 - The 50-KFS valve has 1/2" FNPT threads and should be installed in the oil supply line as close to the controller as possible.
- Note: Meters, filters, and pressure regulators should be installed between the 50-KFS and the controller.
- The 75-KFS valve has 3/4" FNPT threads and should be located as close to the crankcase as possible.
 - When installing the 50-KFS and 75-KFS, any orientation of the thermal fusing element is acceptable, but facing downward is preferred. This ensures that the fuse is directly exposed to the heat source in case of a fire.



ENGINE STARTUP AND SUGGESTED MAINTENANCE PLAN

STARTUP PROCEDURES:

- Flush the supply system and supply line with solvent to remove all construction debris.
- Ensure that the oil supply tank is full.
- Check all piping connections for leaks.
- After the engine has been running for 1 hour, visually check the oil level in the controller sight window to be certain it is at the proper elevation.
- With the engine running, check the crankcase oil level. It should be the same as the oil level in the oil controller. If not, check the installation of the equalizing line (if applicable). See "-9U" or "-12" mounting adapter installation instructions on page 2 for equalizing line recommendations.

SIX MONTH SUGGESTED MAINTENANCE PLAN:

- Place a pan under the controller to catch the oil from the oil supply line.
- Close the oil supply valve and disconnect the oil inlet supply line.
- Remove and clean the controller oil inlet valve screen.
- Once the screen is clean, reassemble and open the oil supply valve.
- Dispose purged oil in a proper container.