



Pump Motor Assembly

Replacement Instructions

Manual #	Revision	Date	Changes from Previous Revision
400289002	10	Oct. 2014	Added note about IST-VFC false Tank Empty alarm

Important Safety Messages

FE Petro equipment is designed to be installed in association with volatile hydrocarbon liquids such as gasoline and diesel fuel. Installing or working on this equipment means working in an environment in which these highly flammable liquids may be present. **Working in such a hazardous environment presents a risk of severe injury or death if these instructions and standard industry practices are not followed. Read and follow all instructions thoroughly before installing or working on this, or any other related equipment.**

As you read this guide, please be aware of the following symbols and their meanings:

Warning  This symbol identifies a warning. A warning sign will appear in the text of this document when a potentially hazardous situation may arise if the instructions that follow are not adhered to closely. A potentially hazardous situation may involve the possibility of severe bodily harm or even death.

Caution  This is a caution symbol. A caution sign will appear in the text of this document when a potentially hazardous environmental situation may arise if the instructions that follow are not adhered to closely. A potentially hazardous environmental situation may involve the leakage of fuel from equipment that could severely harm the environment.

Warning  **Follow all applicable codes governing the installation and servicing of this product and the entire system. Always lock out and tag electrical circuit breakers while installing or servicing this equipment and related equipment. A potentially lethal electrical shock hazard and the possibility of an explosion or fire from a spark can result if the electrical circuit breakers are accidentally turned on during installation or servicing. Do not smoke while working on or near this equipment, and use only non-sparking tools.**

Warning  **Before entering a containment sump, check for the presence of hydrocarbon vapors. If these vapors are inhaled they could cause dizziness or unconsciousness, and, if ignited, hydrocarbon vapors could explode causing serious injury or death. Electronic and electrical petroleum monitoring equipment is often housed in containment sumps designed to trap hazardous liquid spills and prevent contamination of the environment, and, as a consequence, containment sumps can trap dangerous amounts of hydrocarbon vapors. If these vapor levels reach unsafe amounts, ventilate the sump with fresh air. While working in the sump, periodically check the atmosphere in the sump, if vapors reach unsafe levels, exit the sump and ventilate it before continuing work. Always have a second person standing by for assistance when working in, or around, a containment sump.**

Warning  **Follow all federal, state, and local laws governing the installation of this product and its associated systems. When no other regulations apply, follow NFPA codes 30, 30A, and 70 from the National Fire Protection Association. Failure to follow these codes could result in severe injury, death, serious property damage, and/or environmental contamination.**

Warning  **Always secure the work area from moving vehicles. The equipment in this manual is usually mounted underground, so reduced visibility puts service personnel working on this equipment in danger from moving vehicles entering the work area. To help eliminate these unsafe conditions, secure the area by using a service truck to block access to the work environment, or by using any other reasonable means available to ensure the safety of service personnel.**

FE Petro's PMAs are designed for use with motor fuels and are UL listed for blend concentrations of:

Standard Models	AG (Alcohol/Gasoline) Models
0% - 10% ethanol with gasoline	0% - 85% ethanol with gasoline
20% MTBE with 80% gasoline	20% MTBE with 80% gasoline
20% ETBE with 80% gasoline	20% ETBE with 80% gasoline
17% TAME with 83% gasoline	17% TAME with 83% gasoline
100% Diesel	0-20% Biodiesel Blend or 100% Biodiesel

Other motor fuels that may be used with the PMA are diesel, fuel oil, avgas, jet fuel, or kerosene. The maximum liquid viscosity for a product is 70 S.S.U. at 60° F.

Using our PMA in liquids other than those mentioned above has not been tested. The reaction of other liquids with seals and wetted surfaces of the pump is unknown. A hazardous situation may result from using other liquids with our pump.

Note: Schedule 40 riser pipe will not work with our MagShell™ PMAs because of an enlarged outside diameter (4.050"). Our standard shell PMAs have a maximum outside diameter of 4.014" (3.922" for AG models).

Procedure

1. Disconnect power to the submersible pump at the electrical supply box.
2. Tag and lock out electrical circuit breakers so they are not turned on accidentally.

Note: See Figure 1 to identify the particulars of a STP.

3. Loosen the two junction box mounting bolts, but **don't** remove them. This will make disconnecting the wire connector assembly easier.
4. Carefully disconnect the wire connector assembly, by backing out the hex head bolt and swinging the wire connector assembly aside (see Figure 1).
5. Remove the two discharge head mounting bolts, which hold down the discharge head.
6. Using a hoist, carefully lift the extractable portion of the pump from the tank, being careful not to jam the PMA against the bottom of the riser on the way out. Lay the assembly down.
7. Using a 1/4 inch hex key, remove the four cap screws and washers. Using a rocking motion, remove the old PMA and discard the old flange joint gasket, cap screws, and washers*. Inspect flange surface, recess wall, and electrical connector. Make sure that they are clean and undamaged. DO NOT assemble the new PMA to a damaged flange!
8. Measure and compare the length of the old PMA with the new PMA. Make certain after installing new PMA there will be 4 to 5 inches clearance between the bottom of the PMA and the tank for best operation. Figure 1 shows a list of PMA models with length.
9. Verify proper capacitor for new PMA from table below. The new PMA may require the installation of a different size capacitor (3 phase models do not use capacitors).

PMA Model	Capacitor	Voltage Rating
33, 75	15 to 17.5 μ F	370 V (Minimum)
150, H150	15 to 25 μ F	370 V (Minimum)
200, H200	40 to 50 μ F	370 V (Minimum)
VS2, VS4, 75C, 150C, H150C, 200C, H200C	None	None
75B	15 to 17.5 μ F	440 V (Minimum)
150B, H150B	15 to 25 μ F	440 V (Minimum)
200B, H200B	40 to 50 μ F	440 V (Minimum)

* 4 screws, 4 washers, a flange gasket, and a pack of grease are included in the PMA kit.

10. Remove the 4 cap screws and washers from the new PMA kit, leaving the new gasket in place on the PMA.

Note: Be sure the new gasket is used, because the gasket on some competitive PMA's will block the flow of product through the motor. This blockage will prevent proper cooling and lubrication of the motor and bearings, and lead to shorter motor life.

11. Apply grease (from the small grease tube provided) to the mating pieces on the PMA and the motor discharge head casting, to make assembly easier. If the supplied grease tube isn't used, **DO NOT use a conductive lubricant** (i.e. Anti-seize) because this would cause a direct short and motor failure.
12. Align the positioning dowel of the new PMA into the hole in the motor discharge head casting, and make sure that the metal and gasket surfaces are free of any dirt or foreign particles, carefully push (**using hand force only**) the new PMA with the new gasket as far as possible against the discharge casting. If hand force will not close the gasket joint, determine and correct the cause. Do not alter the metal recess or nose diameters, or use screws to pull into place.
13. Assemble a new screw with a lockwasher finger-tight in each mounting hole, then gradually tighten all screws in a cross pattern until all are tightened at 6-7 foot-pounds torque.

Note: Failure to push the PMA up snug against the discharge casting prior to tightening the cap screws, or failure to use a cross-pattern while tightening the bolts could break the discharge casting or strip the threads in the PMA.

14. Apply a multi-purpose grease to the three o-rings on the manifold discharge head. Make sure that any sand or gravel that might have been picked up on the entire unit is cleaned off, and using a hoist, reinstall the extractable portion of the pump.
15. Replace the hex head cap screws in the discharge head and finger-tighten. Be sure the discharge head is down flush on the manifold.
16. Reconnect the wire connector assembly and tighten the hex head bolt.
17. Tighten hex head cap screws in the discharge head, and junction box mounting bolts to approximately 30 foot-pounds.
18. Follow system manufacturer instructions to reassemble the system.
19. Connect power to the submersible pump at the electrical supply box.
20. Test proper operation by dispensing product into calibration can.
21. Turn off the dispenser switch. Feel the submersible pump, to make sure that the pump has stopped running.

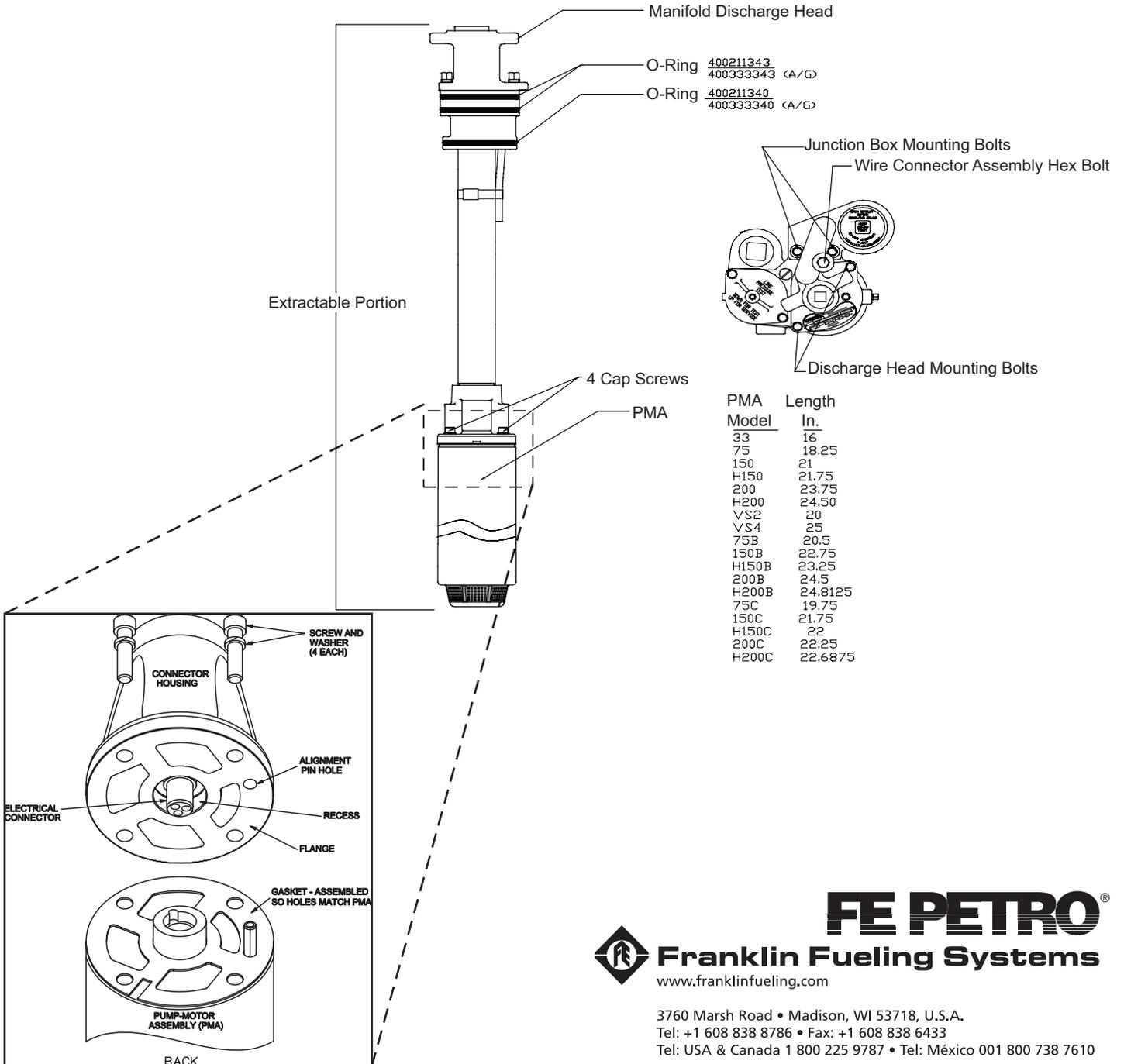
Note: If the pump does not turn off when the dispenser switch is turned off, this may indicate an electrical problem in the dispenser or other wiring error or malfunction. Call this to the immediate attention of a qualified electrician.

22. Visually check for leaks on the manifold head during pump operation and after.

23. To ensure that the STP is providing proper line pressure, install a pressure gauge in the line test port. Turn on the STP and, while it's running, the pressure should be above 24 psi (1.65 bar) (PMA size will affect psi). Turn off the STP and verify that the line pressure is holding. Remove the pressure gauge, replace the plug, turn on the STP and, again, visually check for any leaks.
24. If any leaks are observed, line pressure isn't correct, or any other problems or concerns occur, contact Franklin Fueling Systems Technical Support.
25. Fill out the Warranty Registration Card and return it to Franklin Fueling Systems.

Note: If a STP or an IST does not operate correctly or there are any questions concerning installation or service, please contact Franklin Fueling Systems Technical Services at (800) 984-6266.

Note: PMA VS2 models (date-code 01030634 or earlier) with IST-VFC revision 1.4 or earlier may generate intermittent false "Tank Empty" alarms. This condition may be corrected by increasing SW1, Upgrading IST-VFC to 1.5 software, or by using MagVFC or EcoVFC controllers.



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