

HEATEC TEC-NOTE

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SETTING UP ASPHALT CALIBRATION TANKS

This document covers setting up asphalt calibration tanks manufactured by Heatec. These tanks function as weight scales for liquid asphalt.

ADVANTAGES

A calibration system using a Heatec calibration tank provides a convenient way to calibrate the asphalt metering system. It is more accurate than using tanker trucks and truck scales. Moreover, it is faster, and safer. The digital weight indicator of the calibration tank is in one-pound increments. By comparison, truck scales show 20-pound increments. Thus, weight indications from the calibration tank are inherently more accurate.

VARIETIES OF TANKS

Heatec makes a variety of calibration tanks. Two examples are shown in **Figures 1 and 2**. The tanks include a weight measuring system that consists of transducers (commonly known as load cells) and a digital weight indicator (**Figures 3, 6 and 7**). Horizontal tanks have two load cells with a combined capacity of 10,000 pounds. Vertical tanks have three load cells with a combined capacity of 15,000 pounds.

When empty the tanks weigh approximately 1,000 pounds. The tanks can hold slightly more than 1,000 gallons of liquid, which weighs approximately 8 pounds per gallon. Thus, the total weight of the tank when filled with asphalt is approximately 9,000 pounds.

AVOIDING DAMAGE

The load cells are installed at the Heatec factory and are subject to damage during setup unless appropriate precautions are followed. Handle the tank gently when installing it at the asphalt plant. Do not subject the load cells to shock loads when unloading the tank from the delivery truck and setting it into place where it will be operated.

Use special precautions if any welding is to be performed on the tank or lines connected to the tank. Electrical currents passing through a load cell will damage it beyond repair. To avoid this problem connect the ground wire of the welding equipment as close as possible to where the welding will be done. Make sure that a load cell is never located between the ground connection and the places being welded.

When the calibration tanks are shipped from our factory the load cells are blocked to prevent shock loads. The blocks must be removed when the tanks are setup for operation. **Figures 4 and 5** show two ways load cells are blocked



Figure 1. Vertical calibration tank.



Figure 2. Horizontal calibration tank (portable).

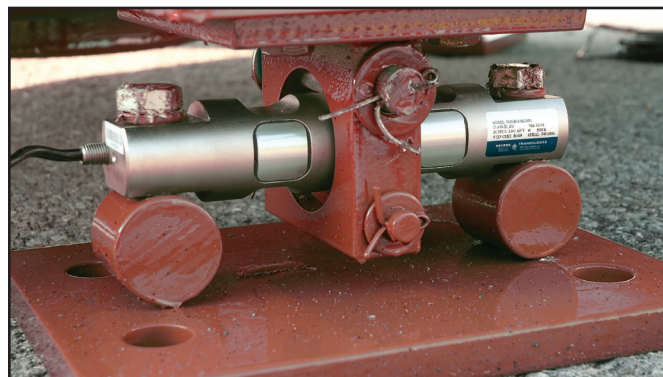


Figure 3. Load cell (transducer).

on portable calibration tanks. In the event that you need to transport a calibration tank to a new location be sure to re-install the blocks, shipping supports or shipping bolts to protect the load cells from shock loads.

INSTALLATION

The calibration tanks are pre-wired at the Heatec factory. However, it will be necessary to connect a source of 120 VAC electrical power to the panel (Figure 6) on the calibration tank. Hot oil lines, asphalt lines and valves will also have to be installed for operation of the calibration system (Figures 6 and 8).

The piping system will need to divert asphalt from the metering package to the calibration tank. The system will then need to return the asphalt to the storage tank. The ideal piping system for the calibration system is shown in Figure 8. A piping drawing is normally provided with new plants.

Make sure all piping connected to the tanks has flexible lines that do not restrain the weight of the tank and interfere with operation of the load cells. Moreover, do not allow any other piping or equipment to rest on the tank or to be in contact with the tank.

The digital weight indicator should be calibrated before the tank is filled with asphalt.

SPECIALISTS NEEDED

Calibration of the digital weight indicator (Figures 6 and 7) should be performed by people who specialize in this type of service. As a rule they will use standard calibration weights equal to 10 percent of the combined load cell capacity.

After the digital weight indicator has been calibrated, the tank can be used to calibrate the asphalt metering system. Calibration of the metering system involves filling the tank with a known weight of asphalt as indicated by the digital weight indicator and adjusting controls for the metering system to agree with the digital weight indicator.

Use care not to over-fill the calibration tank. Use the digital weight indicator to determine when the asphalt filling the tank has reached the target level. There is no automatic shutoff system to prevent overfilling the tank.

NEED FOR RECALIBRATION

The digital weight indicator should be re-calibrated every month unless customers require more frequent calibration. Keep in mind that over time a coating of asphalt can build up on the interior surfaces of a calibration tank. Although the weight of the coating is relatively small, it can cause errors in the weight indications. Recalibrating the digital weight indicator accounts for the coating weight and should restore the original accuracy.

CALIBRATING PLANT CONTROLS

The exact procedures for calibrating the plant controls may differ according to the control system installed at your plant. In any case, calibration is checked by filling the calibration tank and comparing the amount of weight indicated on its digital weight indicator with the amount of weight indicated by the plant controls. The difference between the

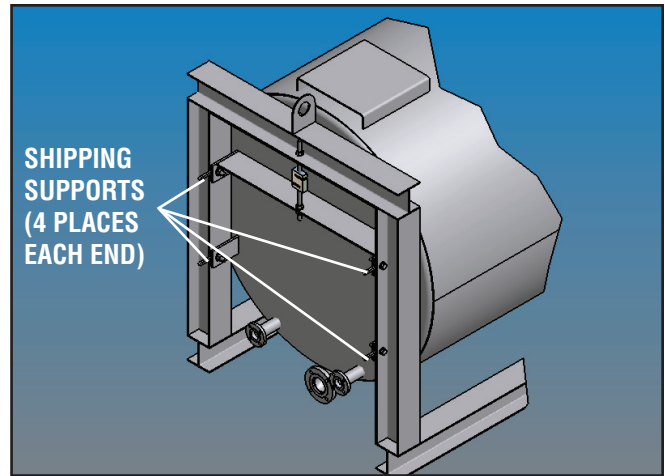


Figure 4. Load cell shipping supports

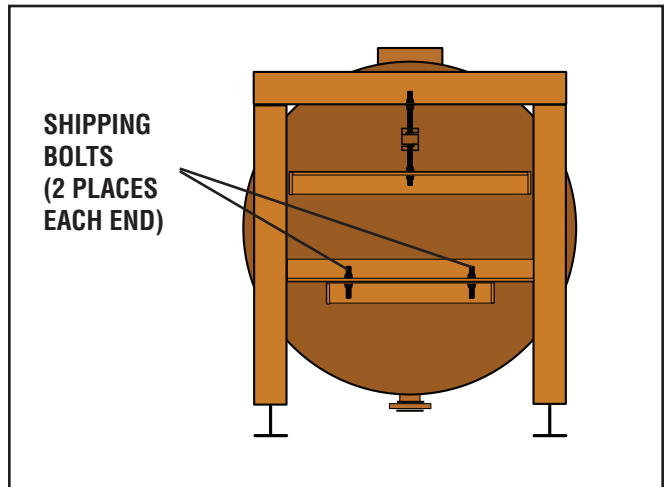


Figure 5 Load cell shipping bolts

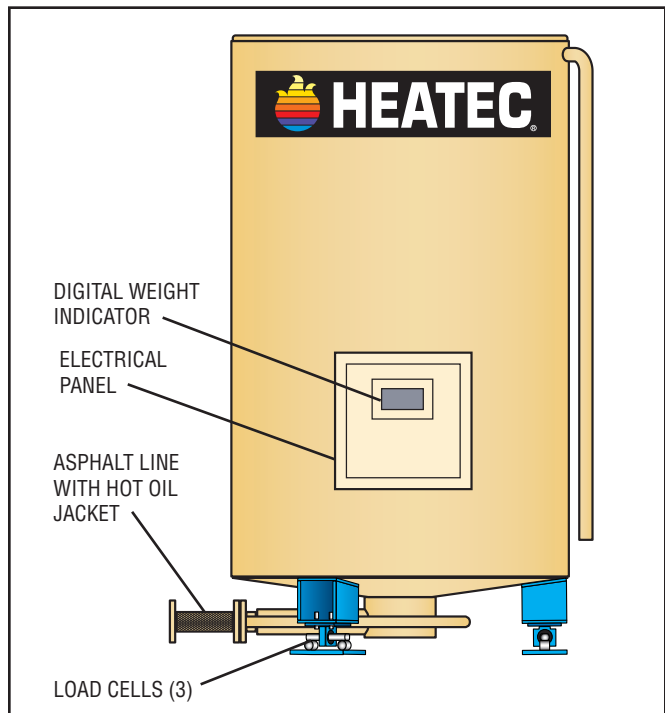


Figure 6. Key components.

two indicates the amount of error in the metering system. If the error is more than allowable, you need to adjust plant controls to compensate for the error.

Each time the metering system is calibrated it should be done while running the system at slow speed then repeated while the system is running at fast speed. The accuracy should remain the same at both speeds. Otherwise the metering pump may be worn out or there may be air leaks in the piping system.

When you adjust plant controls to compensate for error, you should empty the calibration tank and repeat the calibration procedure to verify that the error is satisfactorily corrected.

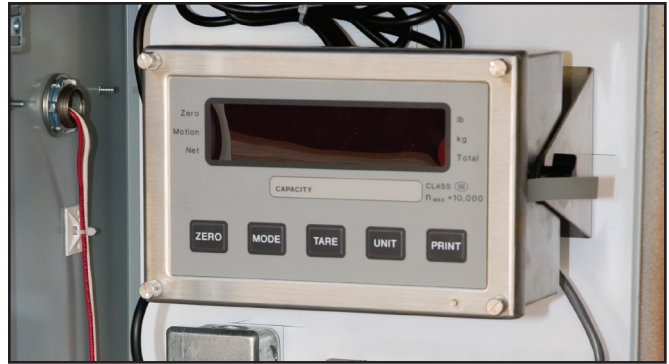


Figure 7. Digital weight indicator.

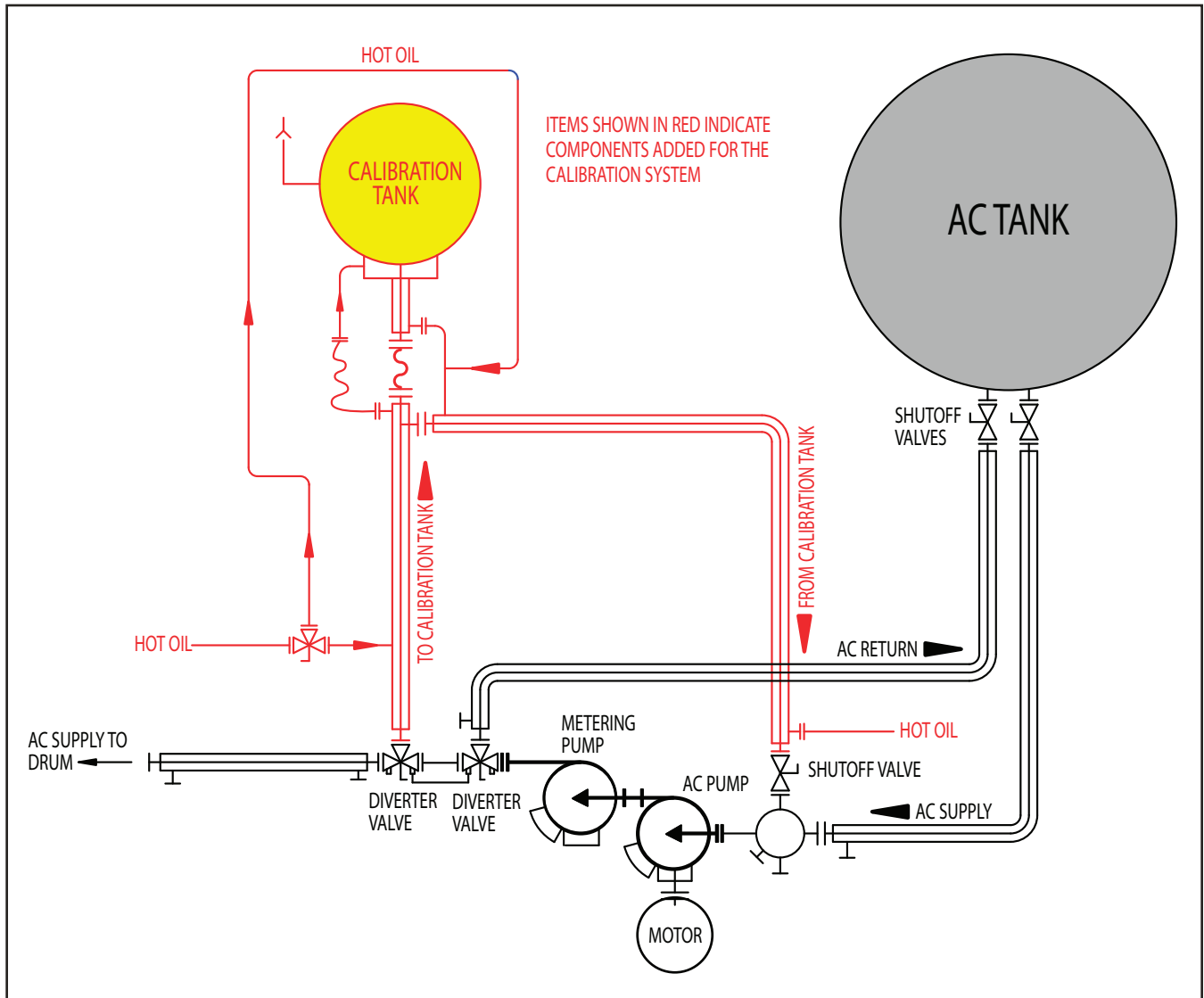


Figure 8. Piping and valves for calibration system.