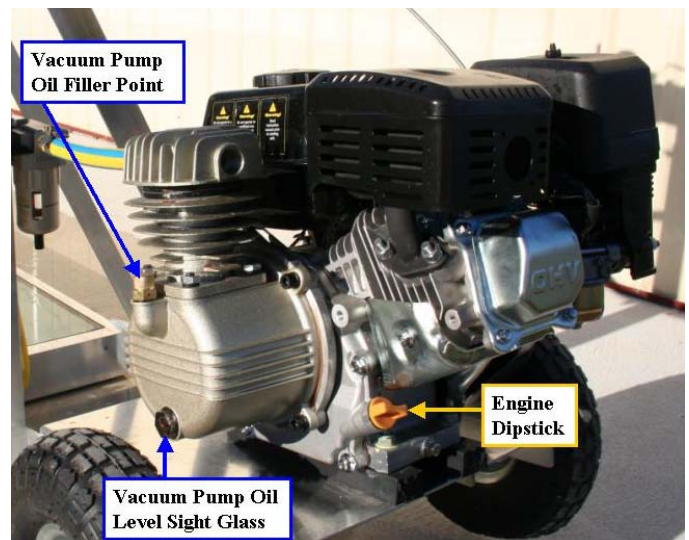


Vacuum Box Joint Leakage Tester – Operations Manual

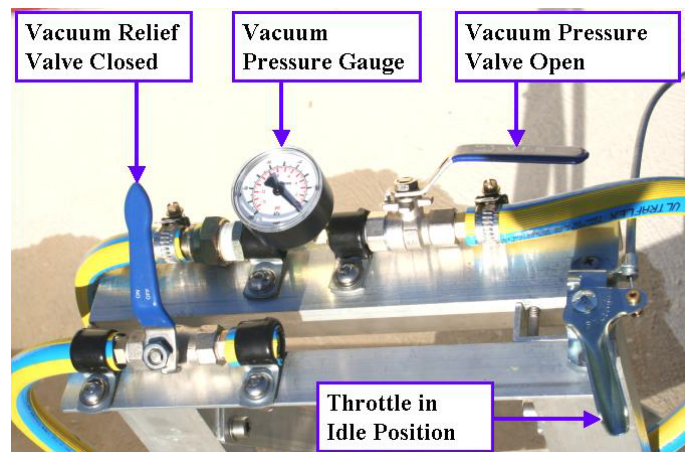
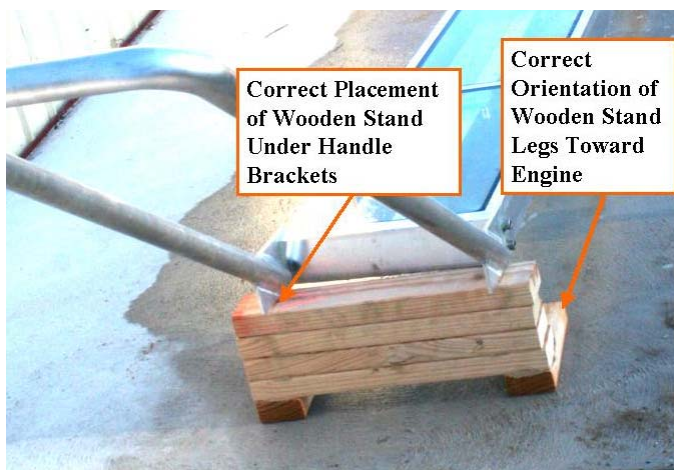
Introduction

The vacuum box is a testing apparatus for assessing whether joints are sealed. Units are built to order. This manual covers a standard unit for testing 2.5m lengths of expansion and construction joint. It is configured to test joint sealants and Hypalon joint bandages to 200mm wide. This unit is driven by a petrol engine powered vacuum pump.

The principle of testing is to pour some liquid foaming indicator over the joint for about a 2.5 meter length at a time. The vacuum box is placed over the joint where liquid foaming indicator has been applied and a suction pressure applied by the vacuum pump. The vacuum box gasket creates a seal with the concrete and across the joint. As the vacuum is applied if there is a leak in the joint air will be pulled up through the leaking section of joint and create visible air bubbles in the liquid foaming indicator. The position and extent of the leak is noted, and if required the concrete marked to correspond with the leaking section of joint. More indicator is poured over the next 2.5m of joint, the vacuum box is moved along to this location and the testing procedure repeated.



Vacuum Box Components





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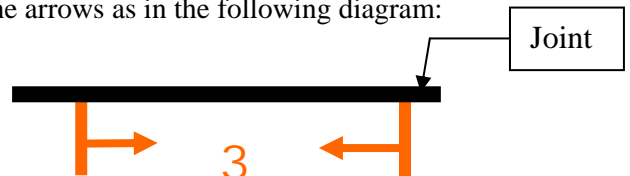
WEBSITE
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Vacuum Box Operations

At the start of each day before testing commences the follow procedure should be followed:

- Prepare a quantity of foaming indicator solution by adding 50ml of the indicator to an 80 litre nylon water tank on wheels.
- Check that the oil level on the yellow dip stick in the petrol engine crank case and if necessary top up with SAE 30 four stroke engine oil.
- Check that the oil level in the sight glass on the vacuum pump is level with the red dot, if not top it up with the bottle of compressor oil.
- Fill the petrol tank on the engine with unleaded petrol.
- While the vacuum box is resting on the wooden stand inspect the gasket to see if there is any damage, like cuts, chunks or gashes in the gasket, if there is any major damage the gasket may need to be replaced.
- Squeeze the tires to ensure that they are firmly inflated.
- Lift the vacuum box handle, remove the wooden stand and stow the stand on the aluminium engine mounting plate in front of the engine and wheel the rig to the first testing site of the day. Be sure to place the rig back on the stand while rig is not in use to minimise damage and permanent set in the gasket.
- When manoeuvring the rig be sure to lift the handle straight up first until the gasket has cleared the ground at the engine end, and then proceed to move forward with the rig. This will prevent any abrasive scrubbing of the gasket against concrete which will wear out the gasket rapidly. **Inadequate lifting and scrubbing of the gasket is the most likely cause of damage to the rig.**
- Open the vacuum pressure valve and the vacuum relief valve.
- Turn the fuel tap to on, apply the choke, adjust throttle to half and start the engine with the pull chord. The throttle may need to be adjusted to get the engine to start, either open or close it marginally, and as soon as the engine starts adjust the throttle to idle speed and allow the engine to warm up for a couple of minutes.
- Once the engine has warmed up, apply some indicator solution to the first section of joint to be tested over a length and width more than the dimensions of vacuum box, then manoeuvre the rig into place over the solution.
- Shut the vacuum release valve, leave the vacuum pressure valve open and increase the engine throttle to high.

- Stand on the vacuum box if necessary to press the gasket firmly against the concrete and over the joint and wait until an adequate suction pressure has been established to hold the rig firmly in place.
- Observe the pressure gauge until it reaches a steady state. While waiting for the gauge to reach steady state also observe the joint through the sight glass to see if there are any bubbles forming through the indicator solution.
- In the process of observing the pressure gauge and sight glass, if bubbles are observed before the gauge reaches a steady state, shut off the vacuum pressure valve and adjust the throttle to idle speed. Then record on paper the static pressure reading on the gauge while bubbles are still being formed. On the record sheet, at instance No. 1, write down the pressure at which the bubbles were observed and also write next to the pressure reading the location along the joint, in meters, where the bubbles were sighted.
- After the record sheet has been filled out to record the pressure and location of the leaking section of joint, use an approved indicator to mark on the concrete a line at 90 degrees to the joint in line with the location of leaking joint. Write the instance number at the base of the line away from the joint. If the joint leaks over some distance mark the length of leak with two lines at each end of the leak distance with an arrow pointing inwards from in line and the instance number in between the arrows as in the following diagram:



- A new record sheet should be labelled to correspond with the start of each new length of joint, and all parallel joints should be started from the same end and a description of the starting end recorded on each new record sheet, like southern end tank 2, or eastern end tank 1.
- Once a section of joint has been tested, adjust the throttle to idle speed and open the vacuum pressure valve if it is closed and open the vacuum release valve.
- Apply foaming indicator to the next section of joint and manoeuvre the rig to the next section ensuring there is a little bit of overlap with the previous section tested and repeat the testing process.

At the end of each day ensure the rig is placed correctly on the wooden stand and turn the fuel off position.