

Evergreen Pump Repair and Maintenance Manual

If the pump stops or delivers less water than usual, it may require adjustment or repair.

Look at the pump and if there is no obvious fault, try and restart it.

Watch the pump and listen for irregular pumping or unusual noises. A worn impulse valve, for example, is usually obvious because water squirts through when the valve is closed. Some parts of the ram pump may need occasional replacement. The frequency of this will depend on how hard the pump is working and on the cleanliness of the drive water.

TOOLS YOU WILL NEED:

2x spanners to disassemble and reassemble the pump

2x adjustable wrenches to loosen a union joint on the delivery pipe (if fitted)

SPARE PARTS TO KEEP ON HAND

Impulse, delivery and snifter valve rubbers

An impulse valve stem, nuts, and washers

TAKING THE PUMP APART

Depending on the fault it may be necessary to disassemble the impulse valve and/or the air vessel before attempting to take the pump apart:

1. Make sure that the drive pipe valve is closed and the impulse valve is open. This will allow you to work on the impulse valve **ONLY**.
2. Depressurize the air vessel.

WARNING: Before attempting to remove the air vessel, always release the pressure in it slowly. An ideal system will have a gate valve or one-way valve and a union fitted between the air vessel and the bottom of the delivery pipe and the optional valve tap fitted to the air vessel.

With the pump stopped, close the gate valve in the delivery pipe to stop it draining back. If a one-way valve is fitted it will close automatically. Then open the valve to release the pressure in the air vessel. If none of the above are fitted the only other way to release the pressure in the air vessel is to loosen each of the air vessel flange bolts one turn at a time until the water and air escapes through the join at the flange. You will certainly get wet this way.

CHECKS

1. Check the delivery valve rubber for wear and blockage of the valve holes. Check that the lock nuts on the valve bolt are tight.
2. Check that the snifter valve is in good condition.
3. Remove the impulse valve and check the impulse valve rubber and the rubber washers for wear. Check that the nuts on the valve stem are tight and check for excessive wear of the stem. Replace parts of necessary.
4. Check the pump body is firmly bolted down, then reassemble the pump ensuring that all bolts are greased.

PUTTING THE PUMP BACK TOGETHER

1. Assembling the delivery valve

Put together the delivery valve plate, the rubber and the bolt. Make sure the side of the plate with the chamfered holes is on the opposite side to the rubber, and that the rubber is on top. Screw on the first nut until it is finger tight and then undo it by one turn. Care must be taken not to over tighten the bolt and nuts as this will affect the performance of the valve. Next screw on the other nut and tighten it up against the first. Use the spanners to tighten them firmly together. This will lock them together, and also allow a small up-and-down movement of the bolt and rubber

2. Assembling the snifter valve

Put the “shaped” bolt and the washer together, feed the bolt through the valve rubber, and then push this through the pump body. Make sure that the shaped curve of the bolt head and washer align with the curvature of the body.

Screw on the first nut until it is only finger tight. If the nut is on too tight the rubber will curl away from the pump body and will need to be slackened off slightly. Then screw on the second nut and tighten the two nuts firmly together using the spanners. Then check that the rubber has not distorted, if it has, slacken the nuts half a turn and tighten the outer one again.

3. Assembling the air vessel/delivery valve/rubber gaskets

Align the delivery valve, air vessel, pump body and rubber gasket mounting holes and feed through the bolts. Make sure the delivery valve is the correct way up (the valve rubber facing upwards) and then tighten the nuts by hand. Use the spanners to tighten each nut and bolt and little at a time, working around the flange. This will draw the assembly together evenly.

4. Assembling the impulse valve

The first part to assemble is the valve stem, discs and rubbers. Screw on a nut to the longer thread end of the stem up to the end of the thread. Push a steel washer on up to the nut, and then add a rubber washer. Follow this with the valve plug disc, with the chamfered side towards the nut. Slide the valve rubber up against this, then the weight disk with the chamfered side facing away from the rubber. Follow this with another rubber washer and a steel washer. Screw a nut up them until it is finger tight. Thread on another nut and use the spanners to tighten the nut together. This part of the assembly is sometimes known as the valve plug.

Hold the impulse valve plate and the valve plug together, with the chamfered side of the plate opposite to the side against which the valve rubber presses. Slide the stop bar onto the top of the stem and thread a nut loosely onto the stem.

Align the valve assembly, pump body and rubber gasket and feed through the flange bolts. The two longer bolts feed through the cross bar as well.

Thread on the 12 nuts by hand, and then use the spanners to tighten the 10 shorter bolts that hold down the valve plate. Again, care must be taken to ensure that these nuts are tightened evenly. The next step is to make sure the closed valve plug is centred in the valve plate hole before tightening down the two remaining nuts that secure the stop bar.

To check the alignment open and close the valve manually [tuning the](#) valve plug to make sure it does not catch on the hole in the valve plate. Now you only have to set the stroke length of the valve for the [pump to be ready to use](#).

TO START THE RAM PUMP

1. Make sure that the valve fitted on the delivery pipe is open and then open the drive pipe valve. Water will flow out of the open impulse valve until it suddenly slams shut. If it reopens automatically the pump should continue to run on its own. If it does not, you must prime the delivery system as described in step 2 alongside.
2. Push down on top of the impulse valve stem with your hand to reopen. Again, water will flow out of the open impulse valve until it suddenly slams shut, then push down immediately to reopen the valve. Keep helping the valve to reopen until it will do so by itself. The pressure gauge will be around 4 PSI when it should start to run on its own.

To stop the pump, hold the impulse valve stem up to close it or shut the valve at the bottom of the drive pipe.

TUNING FOR BEST PERFORMANCE

The G Force Pump can be tuned to adjust performance. This is done by changing the up and down movement of the impulse valve, which is usually set to around 15 mm. Tuning is usually done to achieve either the maximum delivery flow or the most efficient use of the drive water available.

MAXIMUM DELIVERY

When there is plenty of drive water available the pump can be tuned to deliver as much water as possible. To do this, remove all washers from the impulse valve stem so that the valve has as much up and down movement as possible (about 25mm).

ROUTINE MAINTENANCE

While the pump is running normally a visit should be made once a week to check that the bolts are tight and that there are no leaks in the drive pipe.

Once a month, an inspection of the whole system should be carried out. It is also recommended that a Log Book is kept to record the checks and the repairs that have been made.

MONTHLY MAINTENANCE CHECK LIST WITHOUT STOPPING THE PUMP

1. Inspect all the joints to check for leaks
2. Check if there is sufficient air in the air chamber, this can be done by listening carefully to the pump. If there is insufficient air in the air chamber the pump will be much louder than usual. This means that the snifter valve is probably blocked and will need to be cleared. If a bleed valve is fitted when opening it, air, or a small amount of water followed by a rush of air, means the air level is okay. If only water emerges, then again, the snifter valve will have to be checked for blockages.
3. Clean shade cloth filter.
4. Remove excess silt or debris from the tank or from behind the intake dam or weir if necessary.
5. Walk along all pipes looking for damage; also inspect the tank for leaks particularly at all pipe joints.