

# CLEMCO

## CLEMVAC Mk III

### Vacuum Recovery System

## OWNER'S MANUAL

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# CLEMVAC MK III VACUUM RECOVERY SYSTEM

**N.B. The maximum recommended air pressure for this unit is 150 p.s.i. under no circumstances must it be connected to an air supply of greater pressure.**

## 1.0 SETTING UP INSTRUCTIONS

**1.1** Start the compressor (min. capacity—250 c.f.m.) and run for a period of 5 to 10 minutes to allow it to reach operating temperature.

**1.2** Connect a suitable length of 1½" i.d. air hose to the main compressor air outlet.

**1.3** Carefully turn ON the air to "blow out" any dirt or moisture from the air hose.

**1.4** Turn OFF the air supply.

**1.5** Insert the adjustable gulper (CV-15 Mk3) into an appropriate length of 2½" (62 mm) i.d. vacuum hose and secure with a hose clip.

**N.B. Although a maximum length of 100 ft. (30 m) of 2½" hose is recommended, the unit will still operate, with reducing efficiency, up to 200 ft. Performance varies according to site conditions such as horizontal or vertical recovery, etc.**

**1.6** Connect the open end of the 2½" hose to the suction hose coupling insert (CV-3 Mk3) and secure with a hose clip.

**1.7** Connect an appropriate length of 4" (100 mm) i.d. discharge hose on to the discharge hose coupling (CV-2) and secure with a hose clip.

**N.B. The maximum recommended length of discharge hose is 40 ft. (12 m).**

**1.8** Locate the discharge end of the 4" hose into a suitable hopper or waste skip etc.

**1.9** Turn off the air valve (CV-11) i.e. with the handle at 90° to the valve.

**1.10** Connect the air hose to the air valve (CV-11) using a 1½" male/male nipple.

**N.B. It is essential that the air hose couplings are secure and that any sealing gaskets required are in position. Escaping air can be a danger and will reduce the efficiency of the operation.**

## 2.0 OPERATING INSTRUCTIONS

**2.1** Turn on the air at the compressor.

**2.2** Turn on the air valve (CV-11).

**2.3** With the adjustable gulper (CV-15 Mk3) drawing free air only ensure that the pressure gauge (CV-7) is reading a minimum of 80 p.s.i. and the vacuum gauge (CV-8) is reading between 1·8" and 2·2" Hg. If either gauge does not read as above—see fault analysis (section 4).

**2.4** Insert the adjustable gulper into the abrasive ensuring that the air inlet on the rear shoulder is not buried.

**2.5** If an intermittent flow of abrasive is observed, slowly open the adjusting ring on the gulper after releasing the allen screw with the key provided. When a smooth flow is obtained lock the ring in position with the allen screw.

**2.6** If the rate of recovery is too slow the adjusting ring can be closed slightly as above, to increase the flow.

**2.7** When work has been completed or the Clemvac is left unattended always turn off the air at the compressor, then air valve (CV-11) before disconnecting the hoses etc.

## 3.0 MAINTENANCE

**N.B. Ensure that the air supply at the compressor is turned off and that the air line is purged of pressure before maintenance work is carried out.**

**In order to keep the Clemvac operating at maximum efficiency and keep wear to a minimum it is imperative that the following maintenance procedures are carried out:**

**3.1** After 8 working hours. Remove the venturi sheath (CV-6) from the main body by turning anti-clockwise. Turn the venturi tube (CV-1 Mk3) one eighth of a full turn within the sheath and refit the assembly to the body.

**3.2** Where the unit is not fitted with a primary air filter immediately adjacent to the air valve (CV-11) the nozzle (CV-10 Mk3) should be removed frequently and checked. This is carried out by:

- Removing the venturi sheath and mixing chamber (CV-5) together thus giving access to the nozzle.
- Using the nozzle key (CV-25) in the radial by-pass slots, unscrew the nozzle by turning anti-clockwise.
- The nozzle radial slots should be cleaned and examined for uneven wear. Inspect the 7 nozzle ports and clear any obstructions taking care not to damage the surfaces which are machined to fine tolerances to ensure optimum operating efficiency. Should any of the nozzle ports be worn or damaged the nozzle should be discarded and a new one fitted.
- Before replacing the nozzle clean out any foreign matter remaining in the manifold ports and clean the threads of both the aerofoil (CV-17) and nozzle. Replace the nozzle using the key provided taking care to start the finely pitched thread correctly then tighten until the machined shoulders of the aerofoil and nozzle are firmly mated.

**N.B. A blocked or damaged nozzle will cause not only a drop in performance but turbulence which will cause rapid wear of both the pump body and the venturi tube.**

- Inspect the mixing chamber (CV-5) for excessive wear and replace if necessary. Refit the mixing chamber and venturi assembly ensuring that the identification groove is towards the pump end.

**3.3** Remove the suction hose coupling (CV-4) by releasing the kamlocks and remove any debris which may be trapped in the rear of the pump. Examine aerofoil (CV-17) for excessive wear and blockages, suction hose coupling insert (CV-3 Mk3) for excessive wear and where necessary replace worn parts.

**3.4 Replacement of Venturi Tube (CV-1 Mk3)**—remove the venturi sheath (CV-6) from the mixing chamber (CV-5) by unscrewing it in an anti-clockwise direction. Place the protruding outlet of the venturi tube on the floor and push down the sheath. Pull up on the venturi tube by pulling against the CAM levers. Fit the new venturi tube after cleaning the location recess. Fitting is the reverse operation.

**3.5 Replacement of the Suction Hose Coupling Insert (CV-3 Mk3)**—remove the suction hose coupling insert by opening the CAM locks on the body coupler (CV-20). Slacken the socket screws on the suction hose coupling (CV-4) approximately 4 full turns and knock out the coupling insert. Clean location shoulder and fit new insert. Tighten each screw until the insert is retained in the coupling but can still be rotated inside it. Tighten socket screws evenly until tight, observing inward pull of insert onto sealing face of coupling. Replace suction hose coupling into Body Coupler, ensuring seal ring (CV-26) is in position.

**3.6 Replacement of the Aerofoil**—remove the venturi tube and the mixing chamber together, nozzle and suction hose coupling as previously described.

Remove the four socket head screws (CV-23) securing the manifold assembly (CV-12) to the pump body (CV-18). Remove the two central screws in the pump body either side of the inlet port and also the two remaining screws diametrically opposite (CV-21 and CV-22). Using a piece of timber suitably notched tap the aerofoil out in the direction of the venturi.

Clean any remaining gasket material from the manifold, inlet flange and pump interior. Offer the new aerofoil to the body and check that only light tapping will be required to fit in place. If the aerofoil is obviously a tight fit trim down the new aerofoil on the side opposite the air inlet only by rubbing with wetted P120 wet and dry paper.

When the aerofoil is correctly trimmed smear the air inlet side of both the body and the aerofoil with the gasket

compound provided and immediately tap the aerofoil into place in the body using a wooden dowel inserted in the nozzle port. Align the inlet ports of both body and aeofoil then insert and tighten the two long countersunk screws on either side of the inlet port. Leave the gasket material to harden for 1 hour then replace the two short countersunk screws on the side opposite the air inlet and tighten. With the remaining rubber compound make a fillet round the aerofoil where it touches the body on both sides and using a spreader smooth into any crevices particularly on the side opposite the air inlet.

Apply gasket compound to both body and manifold flanges and fit new manifold gasket (CV-12) taking care to align the central hole correctly. Replace the manifold assembly securing with the four socket head screws and replace the nozzle in the aerofoil. Allow 1 hour for gasket compound to cure then connect pump to air supply and check for leaks around aerofoil and manifold joint faces. Refit inlet body coupler and mixing chamber venturi tube and test.

## 4.0 FAULT ANALYSIS

Symptom	Probable Fault	Action Required
<b>4.1</b> Pressure Gauge (CV-7) reads below 80 p.s.i.	Air valve (CV-11) or outlet valve on compressor not fully open	Open valves fully
	Airline couplings not tight or gaskets missing	Tighten couplings, check and replace gaskets if required
	Compressor operating below pressure	Check compressor N.B. Compressor maintenance should only be carried out by a competent person
	Nozzle (CV-10 Mk3) worn Aerofoil (CV-17) worn	Check and replace if necessary Check and replace if necessary
<b>4.2</b> Vacuum Gauge (CV-8) reads below 1.8 Hg	Pressure gauge (CV-7) reads below 80 p.s.i.	See 4.1
	Air leaks at suction hose coupling (CV-4)	Check action of camlock, check and replace seal ring (CV-26) if necessary
	Air leaks around aerofoil (CV-17)	Check, reseal or replace as necessary
	Nozzle (CV-10 Mk3) worn or not seating correctly	Check and replace as necessary
	Venturi Tube (CV-1 Mk3) worn	Remove 2½" suction hose, place flat blanking plate over end of suction hose coupling insert (CV-3 Mk3). If vacuum gauge reads below 13.5 Hg, replace venturi tube
	Excessive length of 4" discharge hose fitted (max. recommended—40 ft.)	Reduce length as necessary
<b>4.3</b> Intermittent flow of abrasive	Insufficient air flow through recovery hose	Slowly open adjusting ring on gulper head (see 2.5) until smooth flow achieved
<b>4.4</b> Very poor recovery rate	Excessive air flow through recovery hose	Slowly adjust ring on gulper head (see 2.6) to restrict air flow
	Blockage in pump body (CV-18)	Remove suction hose coupling, check and clear blockages around aerofoil
	Blockage in suction hose	Remove and clear blockages