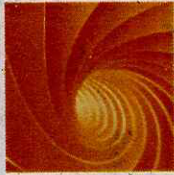


SCANNED

980



Vacuum Truck Supplies

QUALITY - INTEGRITY - COMMITMENT

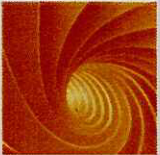
*Vacuum Pump - unleaded
Plant No. 1448001.*

VTS 581



This Folder contains important
information about your portable
vacuum unit.

Please keep it in a safe place.



Vacuum Truck Supplies

QUALITY - INTEGRITY - COMMITMENT

INTRODUCTION

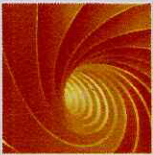
Congratulations on choosing your new portable vacuum unit.

To ensure the greatest safety and performance of this unit, please do not operate this equipment until all manuals have been read and are fully understood by management, maintenance and operations personnel.



FOLDER CONTENTS

1. Operating Instructions for the Conde Super 6 Unit
2. Owner's Manual – Honda
3. VTS Operations and Maintenance Manual

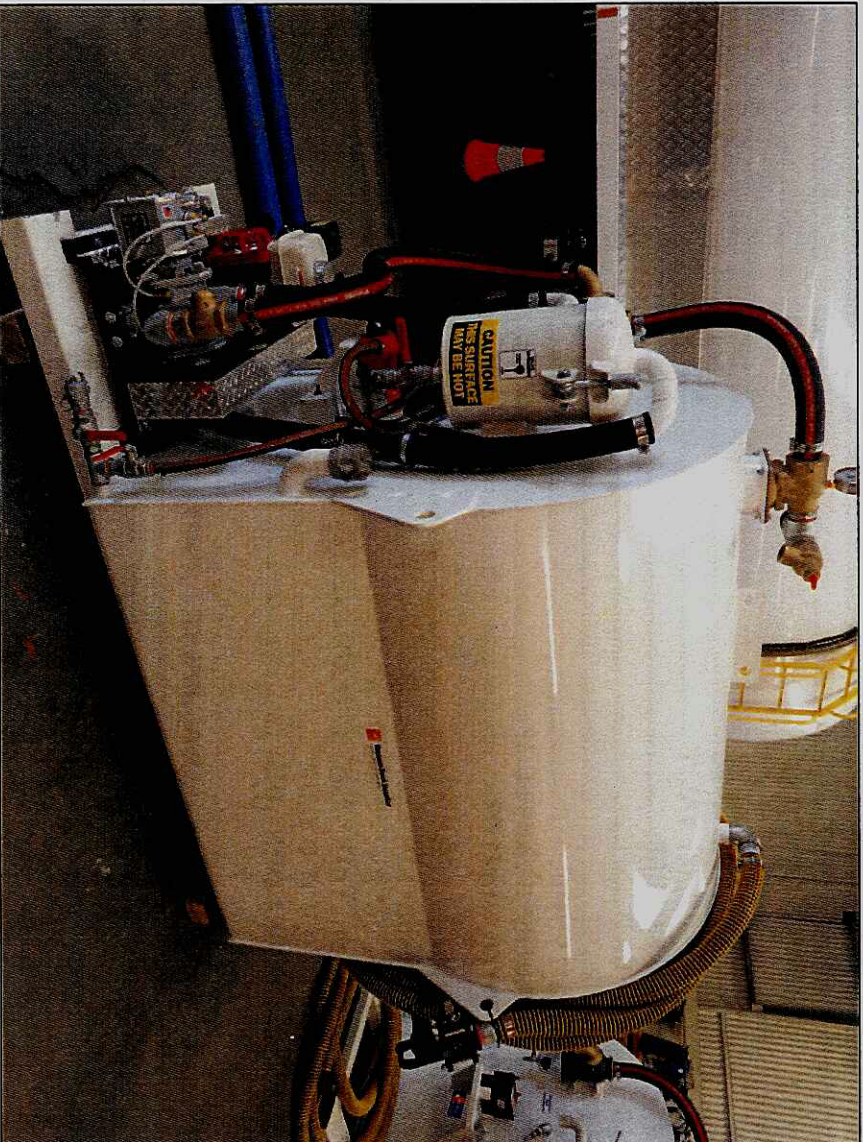


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1600lt PORTABLE VACUUM UNIT

OPERATIONS AND MAINTENANCE MANUAL



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SECTION 1: GENERAL

1.1 USING THIS MANUAL

Instructions and advice contained within this manual apply to the following types of equipment supplied by Vacuum Truck Supplies Pty Ltd.

- **1600lt PORTABLE VACUUM UNIT**



All information and specifications in this manual are current at the time of printing. However, due to VTS' policy of continual product improvement, we reserve the right to make changes at any time without notice.

This manual is intended as a guide only. Each unit, its design, its operation and the work it does will have different operational and maintenance needs. Vacuum Truck Supplies will not accept any responsibility for failure of its manufactured or modified equipment that is the result of improper use or improper maintenance.

The pump manual, engine manual and any other relevant manuals should be read in conjunction with this manual. Specific manufacturers' manuals of products not manufactured by Vacuum Truck Supplies override any details of this manual if there is an inconsistency in information.

Contact Vacuum Truck Supplies immediately if in doubt about any information in this manual.

If you have an issue with your equipment that cannot be solved by reading this manual and acting on its recommendations, please contact Vacuum Truck Supplies on (03) 5775 7300. Before contacting Vacuum Truck Supplies, please have the serial number ready to quote. The serial number will be in the form VTS-XXX, where X will consist of numbers allocated to the particular unit. The identification plate is located on the right hand side rail at the front of the unit.

This is Version 2 of this document, revised in August 2014. If you make any enquiries to VTS about its contents, please ensure you quote this version number.

Vacuum Truck Supplies P/L welcomes comments regarding this publication. We value your feedback and would incorporate worthwhile additions into future versions.



1.2 CAUTION

Do not operate this equipment until all manuals have been read and are fully understood by management, maintenance and operations personnel.

This piece of equipment is brand new and as such will need to be checked over after 2 hours of operation and after any initial travel.

- Check all fluid levels
- Check all nuts and bolts
- Check all the drivebelt between the pump and engine is tight and correctly tensioned.

Contact VTS immediately if in doubt about any aspect of the operational procedure relating to this piece of equipment.

1.3 SYMBOL EXPLANATIONS

1.3.1 WARNING NOTES



WARNING

...highlights a potentially dangerous situation, which could result in death or serious injuries if the situation is not avoided.



CAUTION

...highlights a potentially dangerous situation, which may result in equipment damage if the situation is not avoided.

1.3.2 HINTS AND RECOMMENDATIONS



NOTE

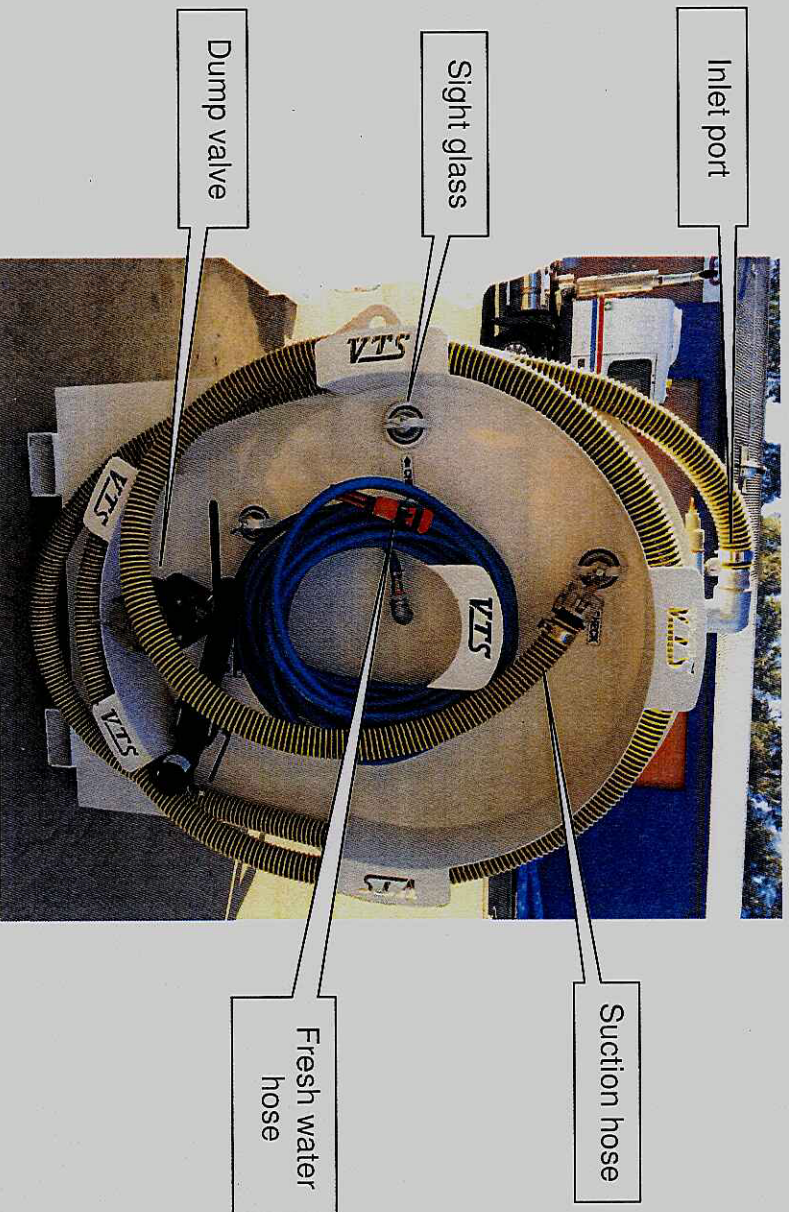
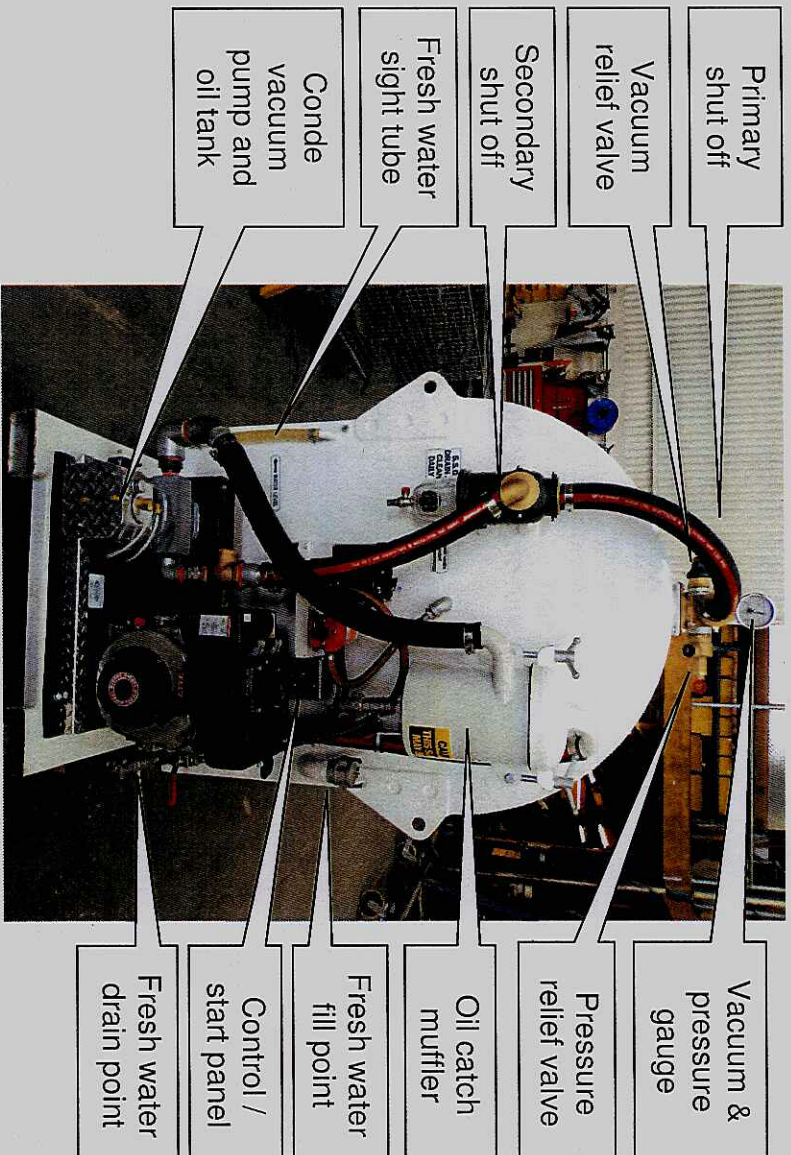
...highlights useful hints and recommendations as well as information for an efficient and trouble-free operation.

1.4 SUPPLIED DOCUMENTS

- Piping and Instrumental Diagrams (internal document)



1.5 1600LT PORTABLE VACUUM UNIT OVERVIEW





SECTION 2: OPERATION

2.1 LOADING PROCEDURE

1. Ensure unit is on even, stable ground, (if unit is trailer mounted ensure the centre of gravity of the unit or centre of load is sitting in the middle of the trailer)
2. Ensure all vacuum seals are tightened adequately
3. Carry out pre-start maintenance checks
4. Start up the engine, via the control panel
5. Use rear 2" hose for product suction
6. Monitor primary and secondary shut-off for any product contamination during loading
7. When full primary will shut off
8. Shut down the engine
9. Release pressure from tank via the vacuum relief valve mounted on the back of the primary (green cap valve), monitor on vacuum gauge to zero

2.2 UNLOADING PROCEDURE

1. Ensure pressure is zero
2. Open valve at bottom of Secondary Shut off
3. Position unit ready for unloading
4. Stand to the side of the rear of the unit
5. Open the ball valve at the rear of the unit, will release all product from the tank

2.3 WATER PUMP PROCEDURE

1. Ensure the ball valve for the water pump inlet is open
2. Engage the water pump via the switch located near the water pump
3. Use the hose at the rear of the unit, for washing purposes



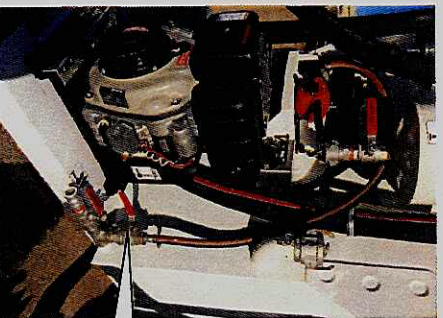
NOTE

This water pump operates on demand. Flow will not start until the nozzle at the end of the delivery hose is opened



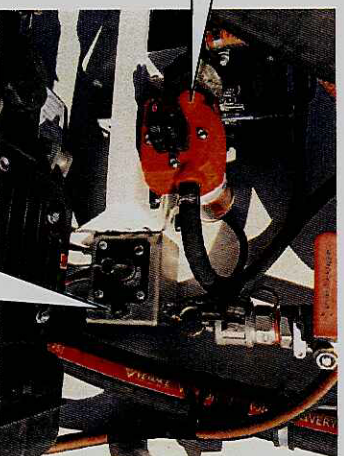
WARNING

Prolonged use of the 12V water pump without the engine running will cause the battery to lose charge.



Water pump inlet

12v water pump



Water pump switch



SECTION 3: VACUUM SYSTEM

3.1 SYSTEM OPERATION PARAMETERS

The unit is designed to vacuum light waste - typically portable toilet waste and well diluted septic, grease trap and sewerage. It is not designed for vacuum or storage of dirt, sand, gravel, mud, and heavier sludges.

3.2 AIR FLOW

Air flow is the path the air travels in either the vacuum or pressure. The air flow is generated by the vacuum pump and is set to vacuum only.



CAUTION

Minimum pressure must NOT exceed - 65kPa

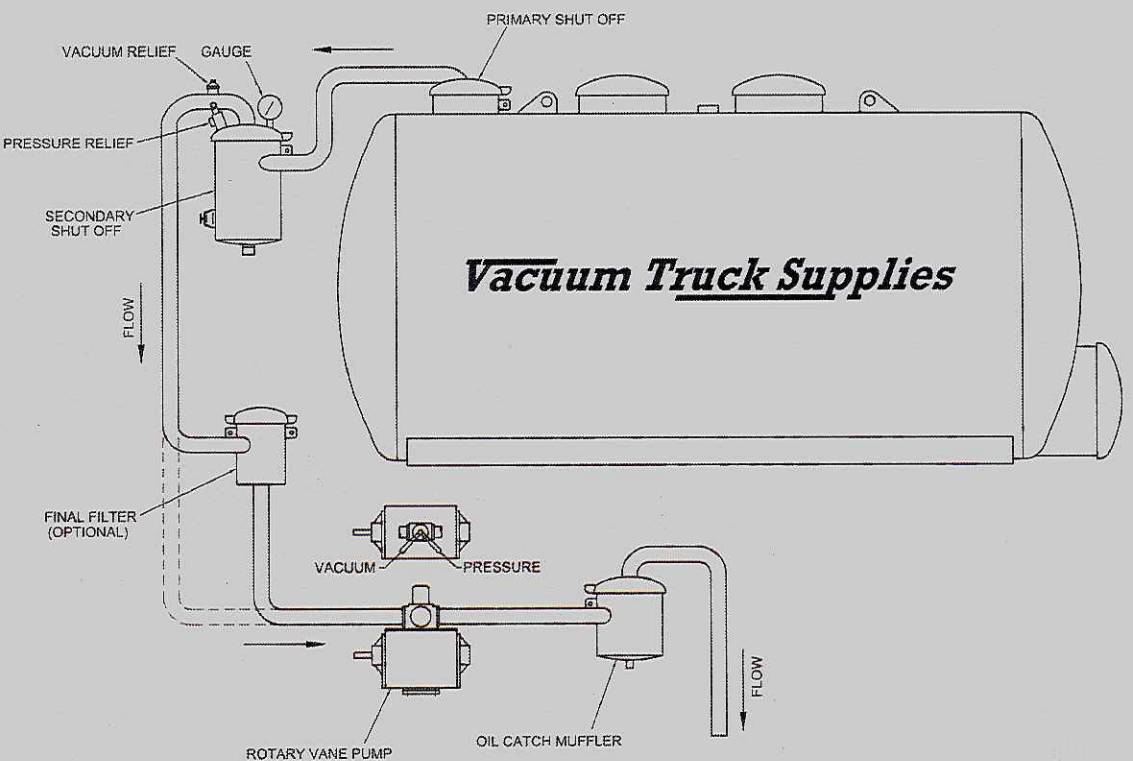


Figure 5. Airflow Schematic – Vane Pump Vacuum Mode
Note: Representation Only, Not Actual. Unit not equip with pressure capability.



3.3 SYSTEM PLUMBING

All system plumbing on vacuum system is constructed of stainless steel manifolding and petrol/oil suction hose.

Carry out the following checks to ensure prolonged successful operation of the equipment.

- Ensure all hoses and manifolds are securely mounted or fastened to the appropriate position.
- Periodically check to see that all hose clamps are tight and in place.
- Check to see if any perishing has occurred - replace any perished hose immediately.

3.4 PRIMARY SHUT OFF

The Primary Shut Off (PSO) is the first line of defence against product contamination and debris entering the vacuum pump. Some product debris by-pass will occur during day to day operation. This is normal and the reason a secondary shut off is fitted in line with the vacuum system.

The PSO will work when the product level within the tank reaches such a level that the rubber float ball is pulled up to the seat by the pumps suction.

- Check the ball for any product build up that will accumulate over time. It is recommended that the primary shut off ball be checked regularly.
- Clean the ball with a solvent cleaner and check for any imperfections - replace if necessary.
- Check the pipe seat for any signs of deterioration or debris - clean if necessary.

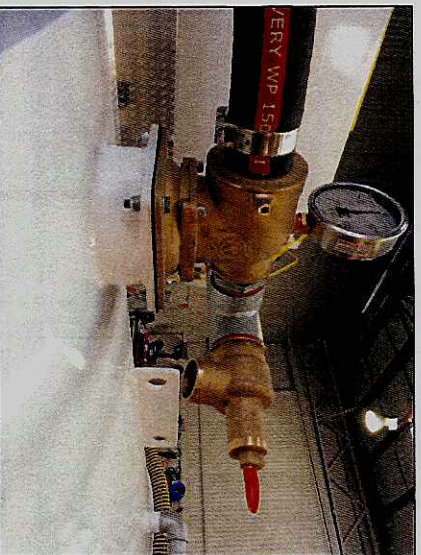
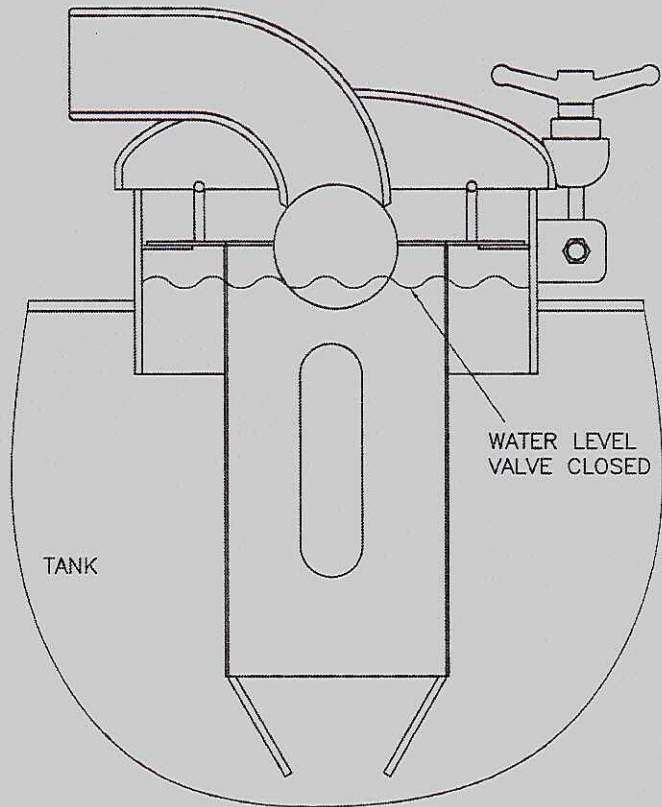


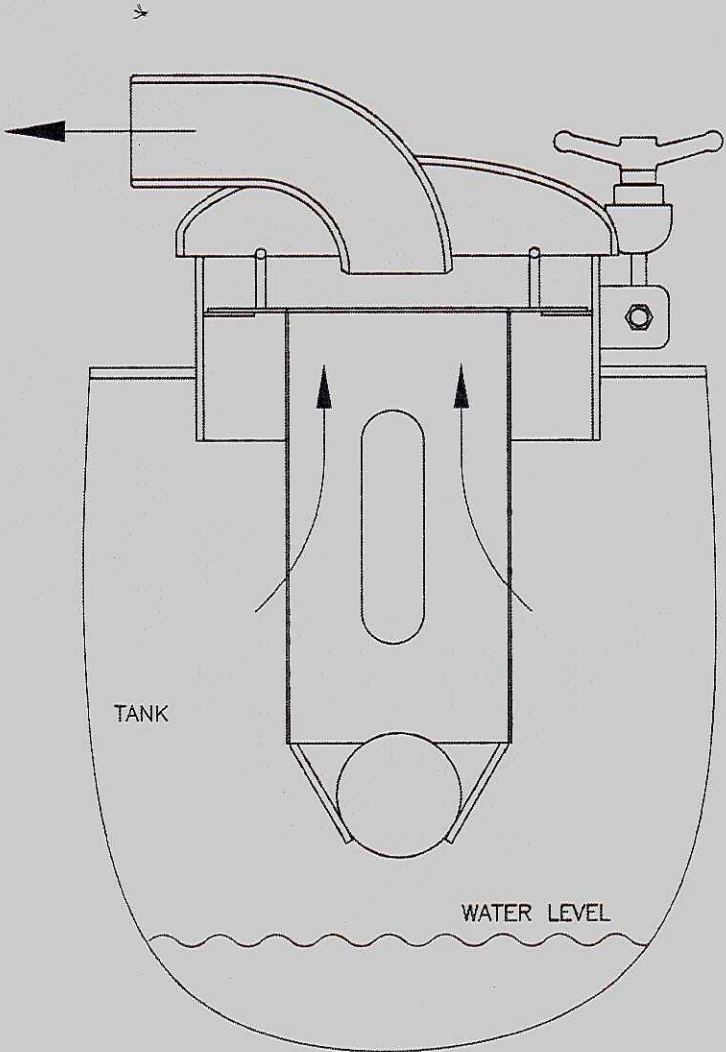
Figure 6: Primary shut off



**Figure 7:
Secondary shut
off**



PRIMARY SHUTOFF – CLOSED



PRIMARY SHUTOFF – OPEN

Figure 8. Primary Shut Off Schematic
Note: Representation Only, Not Actual.



3.5 SECONDARY SHUT OFF

The Secondary Shut Off (SSO) is the second line of defence against product contamination and debris entering the vacuum pump.

The SSO will work when the product level within the body reaches such a level that the rubber float ball is pulled up to the seat by the pumps suction. The SSO must only be used as a back up shut off and should not fill under normal operation. If the secondary is continually filling during normal operation, cut off vacuum system and inspect primary shut off.

- Check the ball for any product build up that will accumulate over time. It is recommended that the secondary shut off ball be checked regularly.
- Clean the ball with a solvent cleaner and check for any imperfections - replace if necessary.
- Check the pipe seat for any signs of deterioration or debris - clean if necessary.
- The Secondary Shut Off (SSO) requires daily draining.



WARNING Ensure the pump is disengaged and the vacuum tank neutralised before operating drain valve or removing sight bowl.

3.6 CAMLOCKS

When removing Camlocks, ensure the vacuum tank is neutral, that is free of vacuum and also of pressure. Do this by opening the drain valve on the SSO or by operating the vacuum relief valve. Ensure all pressure gauges read zero.

3.6.1 REMOVING CAMLOCKS



WARNING When carrying out this work, it is considered a safe work practice to stand aside (out of the way) rather than over or in front of the Manway or Camlock to be opened or removed.

1. Undo the Camlock arms by pushing them away from you.
2. Once loose, remove the Camlock.
3. If it is "stuck" try tapping it with a rubber mallet to loosen it (sometimes the seal becomes seated on the corresponding camlock).
4. Once "free" remove the Camlock and fit hose or clean as required.

3.6.2 REFITTING CAMLOCKS

1. Prior to refitting the Camlock, clean seal and opposing face, grease the seal and the cam arms.
2. Refit the Camlock and pull both arms towards you at the same time to engage each cam at the same time.



3.7 VACUUM RELIEF VALVE

The purpose of a vacuum relief valve (VRV) is to allow cool air to enter the vacuum pump. The valve must be checked and cleaned monthly. The VRV is located at the back of the primary shut off (PSO) Replacing the valve annually is recommended.

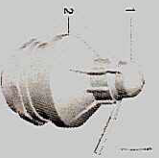
Vacuum relief has been set to -65kPa.



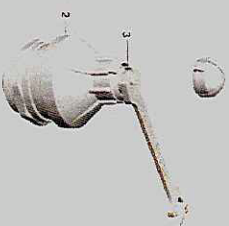
CAUTION

Minimum pressure must not exceed -65kPa. Failure may occur to equipment if minimum pressure is exceeded.

PROCEDIMENTO DI TARATURA VALVOLA DI DEPRESSIONE (ART. 0810) SETTING METHOD DEPRESSION VALVE (ITEM 0810)



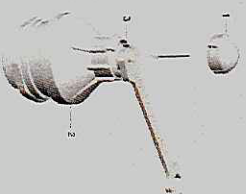
Togliere il tappo (1) dalla campana di regolazione (2) facendo leva con la punta di un cacciavite nell'apposito intaglio.
Take off the cover (1) from the adjusting bell (2) by using the point of a screwdriver in the special incision



Tenendo ferma la campana di regolazione (2) allentare il controdatto di arresto (3)
Loosen the stop set nut (3) by holding firm the adjusting bell (2)



Regolare la pressione sulla molla, ruotando la campana di regolazione (2). Ruotare in senso orario per aumentare la pressione, ruotare in senso antiorario per diminuirla. Durante tale operazione non è necessario mantenere ferma l'asta con il cacciavite, in quanto la spinta della molla è sufficiente a non fare ruotare l'asta stessa.
Regulate the pressure on the spring by turning the adjusting bell (2). Turn in clockwise for increase the pressure and turn in anti-clockwise for reduce it. During this operation, it is not necessary hold stem with the screwdriver, as the spring power is sufficient to not rotate the stem



A regolazione completata, riavvitare il controdatto di arresto (3) tenendo ferma la campana di regolazione (2). Il controdatto deve essere avvitato con una coppia di serraggio di 10 Nm (min).
Inserire a pressione il tappo (1) sulla campana di regolazione (2)
As soon as the regulation will be completed, screw again the stop set nut (3) by holding firm the adjusting bell (2). The set nut must be screwed with a screwing torque of 10 Nm (at least). Insert the cover (1) with pressure on the adjusting bell (2)



Posizionare il sigillo di taratura legando il con filo metallico (4) il tappo (1) e la campana di regolazione (2), applicando infine la piombatura.
Put the setting seal by tying with a wire (4) the cover (1) and the adjusting bell (2), and apply finally the plumbing

Figure 10:

3.8 PRESSURE RELIEF VALVE

The purpose of a pressure relief valve (PRV) is to allow the vacuum/pressure tank from coming under undue stress when the tank is under pressure. This is caused in some situations by the product in the tank expanding due to heat or chemical reaction.

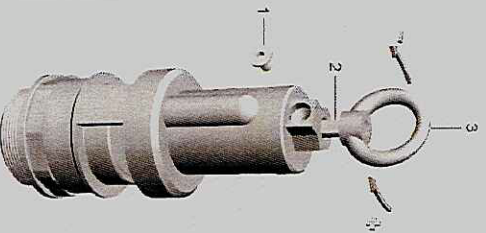
Pressure relief has been set to 30kPa.



CAUTION

Maximum pressure must not exceed 0kPa. Failure may occur to equipment if minimum pressure is exceeded.

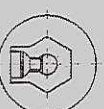
PROCEDIMENTO DI TARATURA VALVOLE DI SICUREZZA (ART. 0860-0870) SETTING METHOD SAFETY VALVES (ITEMS 0860-0870)



Dopo aver allentato la vite antirrotazione (1), è sufficiente ruotare l'anello superiore (3) per aumentare (rotazione in senso orario) o diminuire (rotazione in senso antiorario) la pressione di taratura.

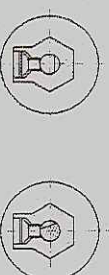
After having released the anti-rotation screw (1) is sufficient to wheel the upper ring (3) to increase (clockwise rotation) or decrease (anti-clockwise rotation) the setting pressure

SI! / YES!



Raggiunta la pressione desiderata, occorre verificare che il piano ricavato sull'asta (2) si trovi in corrispondenza della vite antirrotazione (1). In caso contrario sarà necessario ruotare leggermente l'anello superiore, fino a raggiungere l'esatta corrispondenza. Infine si ravvita completamente la vite antirrotazione (1) e la taratura è completata. When you have reached the desired pressure, you must verify that plane obtained on the stem (2) finds corresponding to anti-rotation screw (1). On the contrary, it is necessary to wheel lightly the upper ring till to reach the exact correspondance. At last you have to screw completely the anti-rotation screw (1) and the setting is completed

NO! NO!



IMPORTANTE: a taratura completata, verificare che l'asta non sia in grado di ruotare, ma possa scorrere verticalmente, **NON SOSTITUIRE** per nessun motivo la vite antirrotazione standard con altre viti o sistemi di arresto; utilizzare esclusivamente ricambi Metaltecnica srl

ATTENTION: when setting is over, please verify that the stem can not wheel, but can only slide vertically.

DO NOT REPLACE for no motivations, the standard anti-rotation screw with other types or blocking systems; use exclusively Metaltecnica srl spare parts

Figure 11:



3.9 PRESSURE GAUGE

The pressure gauge is mounted on the top of the PSO. Monitor pressures at all times when in operation. Remove rubber plug at top if gauge is not resetting to zero when vacuum tank is neutralised.

3.10 LOAD PORT

The load port is located at the top rear of the vacuum tank. A 2" spiral helix hose is supplied or loading of waste. Attached is a 2" ball valve with a handle for easy manoeuvring.

3.11 DUMP PORT

The dump port is located at the rear of the vacuum tank in the lowest point for full drainage. The dump port is fitted with a 3" ball valve for unloading the vacuum tank.

3.12 VACUUM PUMP

There are two options available for this vacuum unit:

- Petrol powered engine with Conde vacuum pump
- Diesel powered engine with Conde vacuum pump

Refer to specific manual provided for operation details and maintenance.

3.12.1 FLUSHING VANE PUMP

Always refer to the vacuum pump operations manual for specific information. However here are two extremely important points to observe.

Always flush all vane pumps on a regular basis pending the work load the pump has carried out.

- If the pump is running for over 6 hours continuously then flush daily.
- If the pump is running in dust conditions continuously, flush once for every hour of operation

Follow the procedure as outlined:

1. Mix 500ml vacuum pump oil and 500ml diesel in a suitable container. This is the only flush mixture to use
1. Remove the flush port fitting.
2. Position air flow control handle in Vacuum mode.
3. Start vacuum pump set RPM range to idle if possible.
4. Tip flush mixture into flush port.
5. Allow pump to continue spinning for 3-5 minutes after flushing.
6. Switch pump off.
7. Drain flush mixture from Oil catch muffler.

Successful flushing should only take ten minutes if you are prepared. Ideally mix 20 litres of flush mixture and have it in your workshop. Carry 2 x 1 litre containers in the trailers tool box as part of your portable unit first aid kit.



3.13 OIL CATCH MUFFLER

The purpose of the oil catch muffler (OCM) is to separate the pumps lubricating oil from the airflow prior to being exhausted to atmosphere.

If the OCM is not cleaned, unnecessary back pressure will build up resulting in loss of vacuum and potential damage to the vacuum pump. The OCM should be drained daily if high vacuum levels are used and oilers are turned up, otherwise every second day or as required. Failure to drain the OCM will result in oil vapour escaping from the outlet. This will cause oil pollution on the ground around the outlet.

Drain as required through 25mm ball valve on bottom of OCM.

1. Ensure the pump is turned off and the OCM is cool to touch.
3. Undo the two wingnuts. Disconnect hose if required and remove the lid, placing it upside down so you can access the filter after cleaning the OCM.
4. Open the ball valve on the bottom of the OCM and drain out any residual oil into a container for responsible recycling after the cleaning process is completed.
5. Flush the OCM with diesel to remove oil scum or grit build up from the perforated mesh floor. Capture spent diesel and dispose/recycle responsibly.
6. After flushing, use an air blower to further clean and remove any debris from the perforated mesh filter and the base of the OCM.
7. Close the ball valve. The OCM is now cleaned.
8. Clean the OCM filter which is contained in the lid by undoing the two wingnuts.
9. Remove the two stage filter element and submerge it in diesel.
10. Remove the element from the diesel and clean with compressed air, ensuring that all particle build up is dissolved and removed prior to re-installing.
11. Inspect and clean the OCM outlet pipe prior to re-installing the element.
12. Re-install the element.
13. Check the rubber seal is in good condition and refit the OCM lid to the OCM.
14. Coat eyebolt threads with an anti-seize product to ensure easy removal in the future. Tighten wingnuts by hand - **never** use a wrench.

SECTION 4: TROUBLESHOOTING

4.1 LACK OF SUCTION

Run the vacuum pump and build -50kpa vacuum and then shut it and the aux engine off to conduct the following checks:

- Check to see if vacuum relief is correctly set - reset if necessary.
- Check to see that sight glasses are in place and sealed correctly - refit if incorrectly fitted.
- Check to see that all valves are closed - close or unblock.
- Check to see that all camlocks on hoses are correctly locked - lock correctly.
- Check to see the SSO has not filled and has shut off - drain if necessary.
- Check to see that SSO drain valve is open - close if necessary.
- Check PSO is fully sealed.
- Check to see that PSO has not shut off - drain SSO if necessary.
- Check all system hosing to ensure fully sealed, check hose clamps, friction areas.
- Check to see that load port/suction hoses not blocked - clear blockages.
- Check to see that load port valve handle has not closed or is not partially closed, open and secure handle.
- Check if the system hose has delaminated internally. Replace hose if necessary.
- Check to see that suction hose not stuck to sides or floor of tank.
- Check OCM to ensure it is cleaned thoroughly, back pressure build up will cause significant vacuum loss.
- Check the inline check valve is working correctly and assembled the correct way.

4.2 LACK OF SUCTION - VANE PUMP

- Check pump speed against recommended - increase if too slow.
- Check for contamination in pump. Stop and clean contamination - refer to pump manual for information on the cleaning process.
- Vanes stuck in rotor - clean and or replace.
- Vanes worn – replace.
- Pump housing worn - rebuild or replace if necessary.
- Pump seizing, operation too hot - recheck operating parameters.
- Drive belt damage – replace



4.3 LACK OF SUCTION - END OF HOSE

- Heavy product being pumped – dilute.
- High lift required - inject air.
- Blockage in hose - shut off pump, clear blockage
- Blockage at valve or load port - shut off pump; clear blockage
- Long distance to pull load, reduce hose diameter – move unit closer to product being pumped.

4.4 PUMP SPEED TOO SLOW

- Pump operating speed too slow - aux motor belts slipping – tighten.
- Pump speed too slow - check for damaged pulleys.

4.5 PUMP OPERATION NOISY

- Sticky, damaged or contaminated vanes in pump - flush, clean or replace.
- Pump housing scored or damaged – replace.
- Pump bearings damaged – replace.
- Contamination in pump - dismantle and clean thoroughly.
- Check to see that manifolding from pump to OCM is secure and intact - replace or repair if necessary.
- Check to see that OCM is correctly assembled - recheck assembly procedure.



SECTION 5: SAFETY

5.1 PERSONAL PROTECTION EQUIPMENT (PPE)

PPE must be worn at all times when operating, maintaining and cleaning this equipment. The appropriate PPE should be sourced from a suitable supplier and can consist of the following pieces;

- Full face clear visor, safety glasses.
- Elbow length rubber coated gloves.
- Hearing protection, plugs or ear muffs.
- Overalls, disposable, vinyl or cotton pending work requirements.
- Rubber boots, steel capped safety toe.
- Appropriate BA equipment where required.



SECTION 6: CLEANING

6.1 GENERAL CLEANING

- Wash the tank regularly using a caustic free cleaner.
- If using a pressure washer, keep away from electrical components, oil seals, signage and any other areas which may be sensitive to high pressure water.
- Sponge or broom wash your tank once it has been rinsed with warm soapy water.
- Rinse immediately with clean fresh water.





SECTION 7: MAINTENANCE SCHEDULE

The following pages outline recommended maintenance operations relevant to specific components and/or time and operations schedules.

Ensure that this document is copied, copies placed in the vehicle and in the servicing workshop for a maintenance log to be kept, followed and maintained for safe working conditions and effective equipment operation.

 **WARNING** Ensure correct protective clothing (PPE) and safety equipment is worn at all times when carrying out maintenance on this equipment.

 **WARNING** Use caution if you are leaning over an open manway, the tank should be checked for presence of gas with a calibrated gas detector prior to the cleaning procedure. This must be carried out by a qualified person.

 **WARNING** Ensure the pump is disengaged and the vacuum tank neutralised before opening lids, free of vacuum and pressure. Do this by opening the drain valve on the SSO slightly or by operating the vacuum relief valve on top of the SSO.

7.1 INITIAL OPERATION

Read vacuum pump operation manual and fully understand prior to using.

Maintenance	Check
Check and tighten every bolt and nut	
Check all hoses, camlocks and hose clamps	
Check primary and secondary shut off internals, including rubber balls	
Check vacuum pump oil reservoir and pump oilers	
Check vacuum pump speed	
Check drive aux. motor, belts and pulleys for alignment & tension	
Check all liquid levels, vacuum pump oil, aux motor [diesel or petrol]	
Check all electrical fittings	
Check all shut offs for vacuum integrity	

7.2 DURING OPERATION

Maintenance	Check
Check and monitor pump operating temperature	
Check and adjust pump oiler working as required for each operation	
Check and monitor vacuum gauge each operation	
Check for increased levels of noise	
Monitor load times and compare	
Check SSO sight for contamination – empty if contamination present	



7.3 DAILY

Maintenance	Check
Empty secondary shut off drain – if contaminated - clean	
Empty oil catch muffler drain	
Check pump oil levels	

7.4 WEEKLY

Maintenance	Check
Check and clean all sight glasses	
Check and clean primary shut off	
Check and clean secondary shut off	
Check and clean oil catch muffler	
Flush vacuum pump or earlier if increased work load	
Check all hoses, camlocks and hose clamps	
Check drive belt tension	

7.5 MONTHLY

Maintenance	Check
Check and clean pressure and vacuum relief valves	
Check all OCM rubber and apply anti seize to swing bolt threads	

7.6 QUARTERLY

Maintenance	Check
Check the inline check valve for integrity	
Check primary and secondary shut off balls for integrity	

7.7 SIX MONTHLY

Maintenance	Check
Conduct end plate inspection / vane inspection/ bearings on vacuum pump	
Check vane wear within manufacturers tolerance – rotate if necessary	
Check housing for general condition	
Disassemble OCM and wash all parts in diesel	
Drain and flush vacuum pump oil tank	



7.8 YEARLY

Maintenance	Check
Replace drive belts	
Replace vacuum relief valve	
Replace pressure relief valve	
Replace vacuum / pressure gauge	
Replace check valve	
Replace shut off balls, primary and secondary	
Vacuum check system plumbing	
Thickness test vacuum tank	