
MarFlex
Troubleshooting
Guide

Dear Customer,

To better support you, we have developed a practical handout to assist your crew with resolving common issues on board your vessels. The most frequently asked questions have been compiled and explained in a concise and easy-to-use format.

The cards are divided into three categories, each indicated by a specific colour:

- Stripping pump / air cylinder
- Pump heads
- Electric motor

The front of each card contains key questions and explanations, while the back side often provides practical examples.

Of course, we remain available to support you. If preferred, we can arrange for a service engineer to attend on site or provide assistance by phone.

Kind regards,
Service Team MarFlex

Our Service Department is available at:

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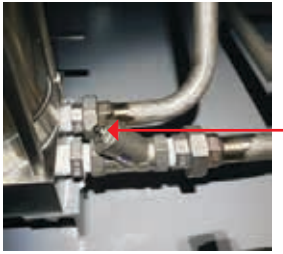
More information can be found on our website:
www.marflex.com

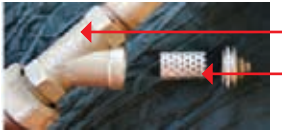
Why isn't my stripping pump/aircylinder working?

Still delivering output?	Yes	Ok
		But low performance and making mechanical noise • Usually worn suction springs / valves **Solution:** replace head & piston (or valves)
	No	Is the filter in the tank clean? *see backside page* **Yes** > Replace head & piston.
Air cylinder issues		
Is the air cylinder functioning properly?	Yes	LC works with load > Strippump in the tank
		No load > Strippump in the tank
	No	Filter cleaned in the tank ? *see backside page* **Yes** > Swap head & piston

Why isn't my stripping pump/aircylinder working?



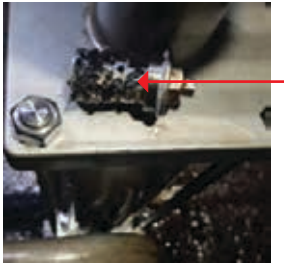
Open the nut to check the small filter



Located on the piping, not on the stripping pump

#486907 Item nr.: Strainer

#486907 Item nr.: Filter

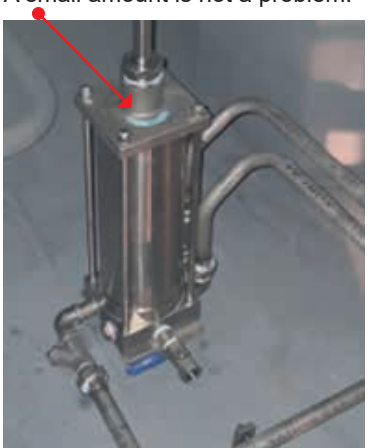


Filter dirty

The stripping pump is leaking into the tank, what is going wrong?

A stripping pump should always leak a small amount before the gland packing, but if it leaks excessively, see the photos below.

A small amount is not a problem.



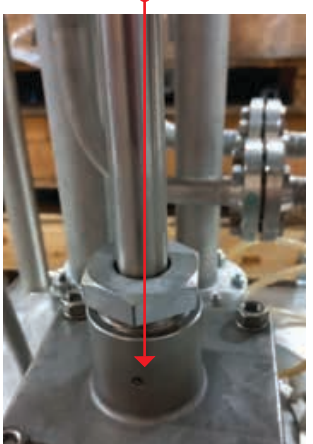
Leaking a lot into the tank

The stripping pump is leaking into the tank, what is going wrong?

If the Nut/Gland cannot be tightened:

- Long shaft may be under tension, loosen it and reinstall it possibly with Coppa sludge or grease
- If the Gland gasket has possibly been replaced, remove the old gaskets #669324 (3x) Gland Gaskets
- Loosen head 4 x M12 bolts > when we do that we replace all gaskets #669312 Gland

Loosen Allen wrench number 3



Tighten with wrench number 55

Why isn't my stripping pump / air cylinder working?

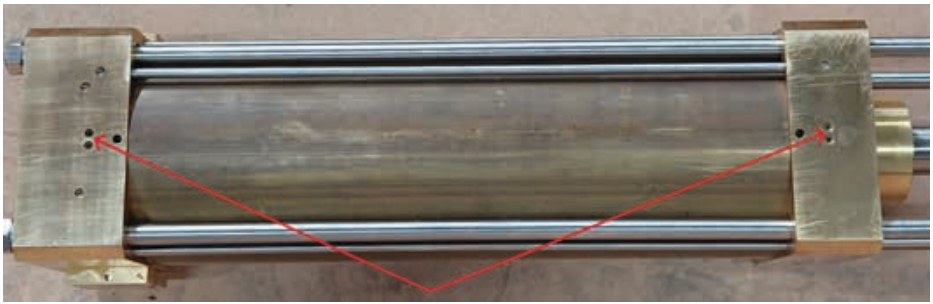
Is the air cylinder functioning properly?	No	Bouncing > Manual > Yes with product **Solution:** Remove filters from the LC > *see backside page* or replace the LC > according to technician's advice
Is the air cylinder functioning Manual ?	Yes	No output **Solution:** Strip pump in the tank
	No	Loosen LC mounting and pull it upward Long drive shaft > possibly disconnected Are all valves in the stripping system open? no blockages or clogging? Could be the LC or the strippump in the tank

Self-installation correct distance:

There must be 32.5 cm between the deck trunk and the LC. Pull the pipe out properly (sometimes a piece remains in the flange).

Look out for Diagnosis based on symptoms *(see last page for page no.27)*

Why isnt my stripping pump / air cylinder working?



Remove filters 2 holes next to each other

Note: Not the hole underneath

How can I operate the air cylinder manually?

Operating the air cylinder manually *see backside page*

Put air on it.

Unscrew one of four bolts partly, and remove three bolts completely. In that case you can slide the square plate to access the push buttons. You can never make a mistake to install the square plate in the wrong position. (related to the small hole in the plate). Another advantage is that the plate will also not fall on the ground (deck)

AIR CYLINDER > 13 beats per minute.

Strokes good but lower output:

- Clean small filter in the tank
- Cylinder head and piston worn
- Cylinder head and piston, valves in the block worn

How can I operate the air cylinder manually?

After manual operation, place the cover back.

Check that it is placed back correctly

Why is oil coming out of the air cylinder exhaust? *See backside page*

- The lubricator is set incorrectly

  Too much oil > readjust it > older type lubricators will likely need to be replaced.

- LC only needs a tiny drop of oil

  Keep the lubricator closed and open it slightly every few cycles, then close it again.
  First close the lubricator, then open it slightly (about a quarter turn).

Which oil goes in the lubricator? *See backside page*

Pneumatic oil / Acid-free oil for air cylinders (air tool oil)/Lubrication oil

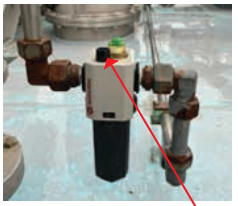
Why is product coming out of the pipe on top of the air cylinder? *See backside page*

- The non-return valve in the tank likely needs to be replaced

  Check all air cylinders to ensure there is no product in the air lines.
  It may also be coming from a stripping pump in another tank.

Air cylinder often defective *(see last page for page no.27)*

Why is oil coming out of the air cylinder exhaust?



Refill via the black cap

If a lot needs to be refilled and it needs to be done quickly, press the red button and push the black part slightly upwards while turning it

Product from the Pipes

Replace non-return valve #485016

Why do I need to purge regularly? Why is oil discolored ?

Purging is important for monitoring the condition of the pump.

Before loading: You can assess the condition of the pump

After unloading: You can monitor how the pump performs with different cargoes

Purge result: Up to half a liter is OK, after that replacement is required

A large amount, cargo seals are damaged

Double seal failure, cargo or tank wash water in the oil

Difference in purge results: higher viscosity leaks less than lower viscosity.

e.g. naphtha/gasoline has low viscosity

Purge result: Lubricating oil level halfway > OK

Too low or too high > refill or drain via the deck hatch

Oil level rising > no purge result > something broken in the pipe stack

Oil level rising > purge result > both seals are damaged

Contaminated oil > large purge result > if not purged for years,

purge may continue for years

Advice: Purge every time and check the oil after loading & before starting pumping operations.

Continued on next page…

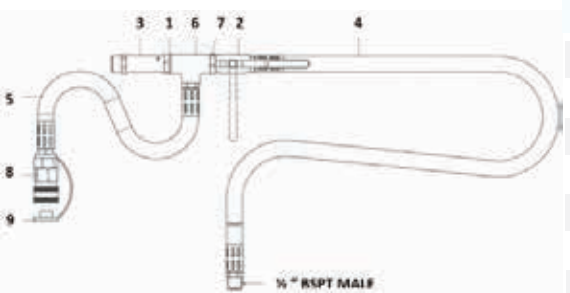
Why do I need to purge regularly?

At how many bar should I purge? Purge up to 3 bar.

Alarm: Low oil level (system is blocked) → Check whether the vessel is in balance

Too little oil → test float/sensor → in the white junction box, use a screwdriver to lift the float (sometimes the alarm disappears) → add a small amount of oil

Note: Make sure everything is switched off.



New > ATEX Purging hose #901767

Pos	Item	Title	Qty.
1	083157	BONDED SEAL	1
2	480151	BALL VALVE	1
3	486211	SAFETY RELIEF VALVE	1
4	508113	AIR HOSE ASSY 5M	1
5	508114	AIR HOSE ASSY 0,5M	1
6	520333	T-PIECE	1
7	526533	HEXAGON DOUBLE NIPPLE	1
8	508113	QUICK COUPLING FEMALE	1
9	532424	DUST PLUG	1

Why has my oil discolored?

Oil discoloration can have several causes: **Milky appearance,** water contamination present in:

Tank washwater: Possible double seal failure > Cargo may be in the oil

Certain cargoes > stack bearings affected >pipe stack

Deck water: Hatch gaskets may be damaged

Condensation: Hatch gaskets may be damaged or if the oil has not been changed for a long period

Brown colour: Oil likely not changed for a long time *See backsite page*

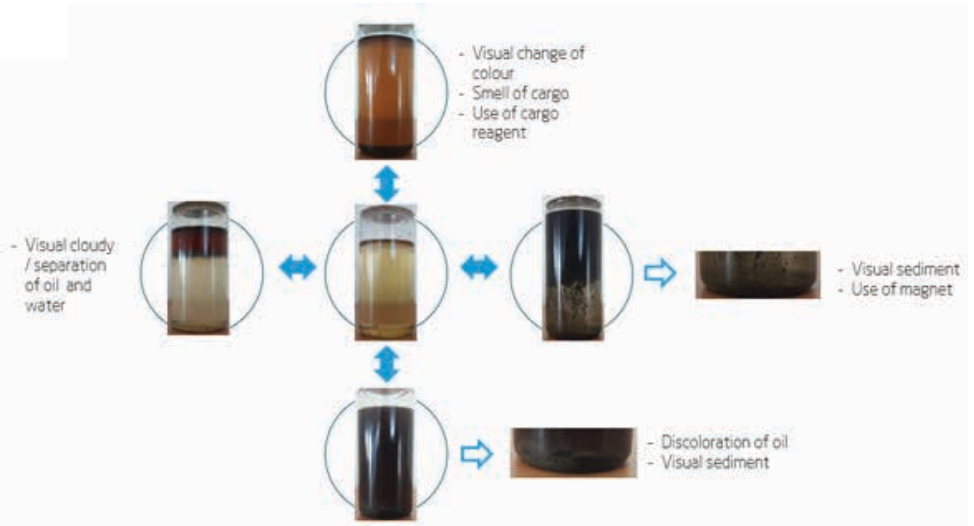
Guides/bearings may handover at a new vessel

The oil is indeed discoloured, but not yet alarming. Change the oil (after approx. 1 year of operation) or if the oil becomes cloudy.

Drain the oil → flush with approx. 5 liters of gas oil → preferably flush again with 1–2 liters of hydraulic oil → then refill with fresh oil.

When changing the cargo pump: PURGE UP TO 3 BAR

OIL SAMPLING



How does cargo end up on deck via the purge line?

Lower double cargo seal and/or ceramic sleeve damaged > upper single cargo seal may still be intact.

Cargo on deck via the top cover / inspection hatch / in the oil?

First clean and wash the tanks.

Then inspect the pump > check whether all seals, including the upper seal, are damaged. If so, wash water can enter through the pipe stack and cause the shaft to corrode > If the pump is in good condition, the issue lies with the stack > remove the pipe stack.

Heavy fuel oil: During loading and unloading, heat the bottom and then blow throughimmediately, otherwise it will solidify > If it has solidified, heat the line using water.

The flow lags behind other pumps?

Is the amperage also different? → Yes: There may be something stuck inside the impeller. This is often not noticeable by checking by hand.

Discharge (valve) may be clogged, located on deck. *See backside page*

- If all pumps are on one line (e.g. 1 through 8) and it concerns the outermost pump, it has to work harder than the others. The manifold is located in the center, where all pumps come together. The outer pump can then have backflow, caused by the other pumps closer to the manifold.

Continued on next page…

- If the pump has a worn wear ring, it will probably also have backflow. It is best to throttle the valve; with back pressure, pumping improves. Increase the pressure on the under performing pump

Pinch off:

By squeezing the valve, cargo can still be discharged despite a lower speed or lower pressure. This is monitored via a pressure sensor (which can be digital or analog) on the discharge line.

If the discharge pressure drops and the valve is almost fully closed, a large amount of air will be drawn into the pump, causing insufficient cargo to be lifted. In that case, close the valve and switch to stripping.

Discharge (valve) clogged: located on deck (see photo: black wheel) / blocked suction inlet.

What is a Dry Run?

When frequency converter driven pumps are running without cargo, this dry run protection prevents them from overheating due to lack of lubrication/cooling by the cargo.

They will trigger a dry-run alarm (this is measured based on the current drawn by the motor).

- Dry-run starts, after 5 minutes: Dry-run alarm
- 3 minutes later: Dry-run stop
- 1 minute later: Pump Stops

Can I clean/replace the level gauges?

Cleaning is not really possible. You can unscrew it and possibly clean the back with a cotton swab. We do not recommend this.

Loosen it using a hook spanner (we do not sell these; Gedore is a good brand). You place the hook spanner in the two holes on the front *See backside page*

Pump Head Maintenance Advice *(see last page for page no.28)*

#442533 Itemnr. Level Gauge

Hook spanner

We hear/have a noise/vibration pump isntallation?

Disconnect the coupling: to determine whether it is the electric motor or the pump

At the inspection hatch *See backside page*

Electrically isolate the motor (switch off the generator or the main switch). Place a cloth in the top cover around the shaft to prevent bolts/nuts from falling into the shaft opening. Disconnect the coupling and check the parts separately. Make sure the coupling is fully disengaged and that the shaft drops slightly. It is also possible that the coupling is loose!! Do not run the motor in that case (otherwise it may be damaged). Check whether the bolts are still tight.

- Remove the motor cover to check whether everything is still in good condition inside.
- If it is not the motor, then it is the pump or the pipe stack (could be the shaft).
- Enter the tank to inspect the pump. It could be a piece of metal causing the issue.

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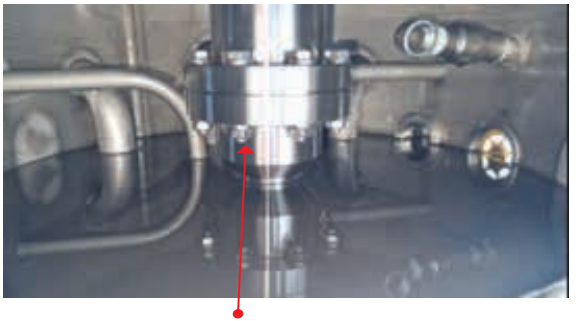
We hear/have a noise/vibration pump isntallation?



Loosen the bolts.

- Disconnect electric power to convertors
- Place a cloth in the top cover around the shaft to prevent bolts/nuts from falling into the shaft opening
- Disconnect coupling bolts (2) in topcover the shaft have to drops slightly
- Rotate long shaft coupling (3) and electric motor coupling
- Non-rotating part has to be checked

What is thermal protection?

Electric Motor: Must be ATEX certified.

Thermal protection is a safety feature that prevents equipment (such as an electric motor/pump head) from overheating. It works by monitoring the temperature of the motor. If the temperature gets too high, the protection system will either trigger an alarm or automatically shut down the motor to prevent damage.

- Check the shaft via the inspection hatch: can it be turned easily by hand? See pump instruction 5
- Are all 3 fuses still OK (measure if necessary)
- Are all settings still correct, compare with the unit next to it
- Remove the motor cover and turn the fan: if it rotates, the issue is electrical, call an electrician

If the fan does not rotate, the motor or pump is seized, then disconnect the coupling (see: noise/vibration pump installation)

Or Remove the motor and inspect it; it will be megger tested (insulation tested) by an electrical engineer.

- **Grease for life:** Most motors are grease-for-life. Motors that are not have a grease nipple. The grease reservoir is often located under the fan.
- **Re-greasing**: *see backside page.*Let the motor run at low speed for 2–3 minutes, then apply 2–3 shots of grease.

What is thermal protection?

Conditions for entering the tank

The following conditions apply before and during our presence on board:

- The last three cargoes must be known to MarFlex.
- The tank to be entered must be clean and gas-free and must have a gas-free certificate from a gas doctor.
- Assistance from a crew member on board.

Tank ventilation:

- Mechanical ventilation via a Butterworth hatch with a hose to the bottom of the tank.
- Mechanical ventilation via the dropline.
- The lid must be open during ventilation and work.

Work on the pumping system in the tank:

- The exterior of the pump head and stack must be cleared of cargo.
- The pump head must be flushed.

Work on the stripping system in the tank:

- The stripping pump must be flushed and purged to remove any cargo.
- The exterior of the stripping pump must be cleared of cargo.

If any of the above points cannot be met, no work may be performed!

We drain the stack but do not supply oil.

Item Number with Deatils

Item Number	Description
910301	Toolbox Oil filling complete: Filling #668915 & Draining #668896
668915	Oil filling pump air driven without Toolbox
668896	Draining hose pumphead oil/draining plug
668097	Draining plug without hose
668106	Gasket blind plug
442533	Level Gauge
669000	Draining pump valve non return (4 pieces in a block)
485016	Non Return valve > complete on stripline
486907	Strainer for filter
486910	Filter
931072	Spare Parts Set drainingpomp > gaskets > for inspection
952300	Complete Spare Parts Set drainingpomp - Peek
952303	Complete Spare Parts Set drainingpomp - PFTE/Teflon-Oleum

Diagnosis based on symptoms

• Stroke frequency OK, but low capacity	Worn seal
• Low stroke frequency and low capacity	Inlet filter blocked
• 1 stroke then the strip pump stops	Adjustment of the long shaft
• Long time between strokes	Discharge valve closed
• Air cylinder hesitates or bounced	LC dirty or worn
• Air cylinder stuck (in winter)	Low lubrication oil level in the lubricator
• Air cylinder freezes	LC runs too long, occurs when the well is empty & stroke speed increases > this damaged the LC

Air cylinder often defective

• Use a good air dryer	No, Excess condensation is harmful to the air cylinder
• Properly refill the lubricator	See image in page 24 (What is thermal protection?)
• Frozen	Pour a bucket of warm water over it

If the deck penetration is leaking, the air cylinder can also fail due to gases/cargo affecting the cylinder through the leakage.

Pump Head Maintenance Advice

- Keep pump dry running to a minimum;
- Flush as soon as possible after discharging solidifying or acidic products;
- Keep tanks clean to prevent issues with pump heads and stripping pumps;
- By purging regularly, it is possible to monitor the condition of the pump head, allowing quicker
- Action to prevent major damage;
- In case of unusual noise and/or vibrations in the pump installation, take action as soon as possible to inspect or replace the pump.

AIR CYLINDER > 13 beats per minute.

Strokes good but lower output

- Clean small filter in the tank
- Cylinder head and piston worn
- Cylinder head and piston, valves in the block worn

Trouble shooting the drain pump

Malfunction	Cause	Solution
Drain pump stroke rate ok, but low capacity	Worn out seal in drain pump	Replace seals
Drain pump low stroke rate, low capacity	Inlet filter blocked	Clean or replace inlet filter
One stroke than drain pump stops	Adjustment long shaft	Adjustment done on deck
Long time between strokes	Discharge valve closed	Open valves
Air cylinder bounces / trips	Air cylinder dirty or worn	Remove silencer nuts / Replace cylinder
Air cylinder stuck (in wintertime)	Frozen	Apply warm water and reduce speed
Air cylinder freezes	Air cylinder running for too long	Reduce speed (max 13 strokes/minute)

MarFlex

Don’t hesitate to call us if you have any questions

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+31 (0)186 890 200 (office hours)
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