

1. Empty grease reservoir (error code E15)?

NO YES → **Fill the grease reservoir YES** → **Check the system functionality after empty!**

Disconnect a secondary line, start a multiple test cycle (TEST push button ≥ 6 sec.) and check over a number of cycles whether system supplies grease again at this line. When no grease supply, continue with point 2. (test cycles can be ended by simply switching-OFF ignition).

2. Install test manometers

YES NO → **Install 2 manometers in the system** (minimal 250bar)
Preferable at both pump outlets, using T-couplings.



3. Motor run?

Start a single test cycle by holding the TEST button at the pump in between 2 and 6 seconds (test cycle can be ended by switching-OFF ignition).

YES NO → **Power at pump connector?**

Check voltage at pump connector pin 1(+) and 2 (-).

YES NO

- Ignition switched-OFF → **Switch-ON** and resume at point 3.
- Broken fuse → **Exchange fuse** (see electrical diagram).
- Contact 1 or 2 out of position → **Restore lock clips.**
- **Damaged wiring** → **restore wiring** and resume point 3.



Power at controller-board? *Check power connector on controller board in motor compartment.*

YES NO → **Restore power connection** and resume at point 3.



Pump motor circuit OK? *Shorted or broken motor circuit.*

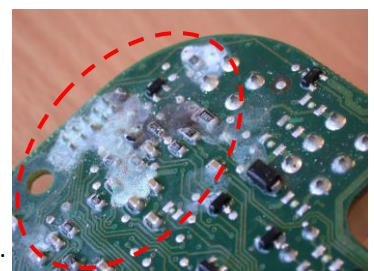
YES NO

- Motor disconnected from controller board → **Connect** and resume point 3. (Error code E22)
- Motor circuit broken → **Exchange pump, or** (Error code E22)
- Motor circuit shorted → **Exchange pump** and resume point 3. (Error code E23)

Controller board corroded? *Check controller board (both sides).*

NO YES → **Exchange pump,** check parameter settings and resume at point 3.

Controller board broken → **Exchange controller board,** check parameter settings and resume at point 3.



4. Sufficient pressure built? *Pump should build pressure in one of the main line channels, until the pressure switch ends the pumping phase. When no PS-signal, the pump phase will be ended after exceeding the max allowed pump run time (approx. 6 to 15min. depending on parameter setting).*
 (error code **E11** or **E12**)

YES **NO** → **External grease leakage?** *Check main-line and distribution blocks.*

NO **YES** → **Repair system** and resume with point 4.

Grease output pump? *Disconnect both main-line hoses from pump and check grease output while performing a single test cycle. Pump should produce steady grease flow without air pockets!*

YES **NO** → **Air pockets in pump?** *Start single test cycles until solid grease stream without air pockets, whilst filling reservoir to max. When still no grease after ±10minutes while pump runs smooth and easy*

YES → **Exchange pump**, check parameter settings and resume at point 4.



5/2 way valve stuck? *Stuck in between outlet-A and B. Pump runs heavily on maximum pressure internally!*

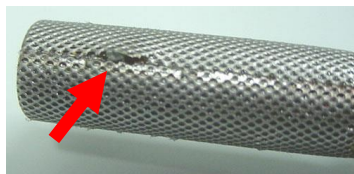
YES → **Exchange pump**, check parameter settings and resume at point 4.

Internal pump leakage? *Internal leakage prevents pump from building sufficient pressure. Connect test manometers directly to the pump outlets (system disconnected) and start a single test cycle (should show 220-250bar in a matter of seconds).*

NO **YES** → Does not reach 220-250bar → **Exchange pump**, check parameter settings and resume at point 4.

Check grease filter on cracks!

Internal leakage can be caused by contaminated piston valves!



Pump pressure hold? *Pump should be able to hold a minimum pressure of 180bar, 1 minute after stopping the pump. Start a single test cycle for outlet-A and disconnect power after reaching the maximum pressure.*

NOTE

Prescribed test does not work for outlet-B, so when started in B > switch-OFF ignition and start new test cycle, which automatically will be executed in A again)

YES **NO** → **Exchange pump**, check parameter settings and resume at point 4.

↓
Check grease filter on cracks!

Internal system leakage?

Internal leakage in one of the distribution blocks.

YES



How to check?

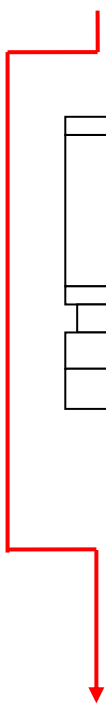
1. Reconnect 1 system hose to the pump outlet B and let the other hose disconnected.
2. Now start a single test cycle (automatically performed in B for last was in A). When grease keeps running from the loose hose this indicates a leakage in one of the distribution blocks in the system.

Note

A small amount of grease is normal, because each injector unit returns a small amount during a pumping phase.

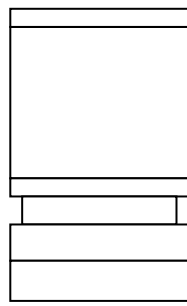
Locate the leaking distribution block!

YES

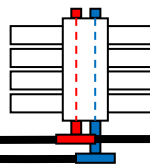


How to locate?

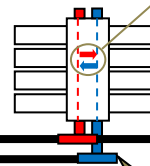
1. In order to locate the leaking block, the above described "check" procedure needs to be repeated after disconnecting the B-hose, just past the first distribution block (like indicated in drawing below).
2. When grease still flows from system hose ahead, repeat procedure with the next block in line.
3. Keep repeating procedure until leaking block is located.



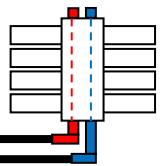
First check at pump indicating internal leakage



Second check past block 1 indicating problem further ahead



Third check past block 2 indicating problem in block 2



Bottom O-ring injector-unit missing or damaged?

Check all injector units in this block on missing bottom O-rings. Often happens when customers switched position of individual injector-units.

NO



YES → Place new O-rings and resume at point 4.



Single bearing extremely over greased?

Missing or damaged O-ring inside injector-unit, allowing grease pressure to pass towards connected bearing. Often happens when customer disassembled injector-units.

NO



YES → Exchange injector-unit, that serves this bearing and resume at point 4.

Leakage in distribution block! →

Exchange distribution block and resume at point 4.

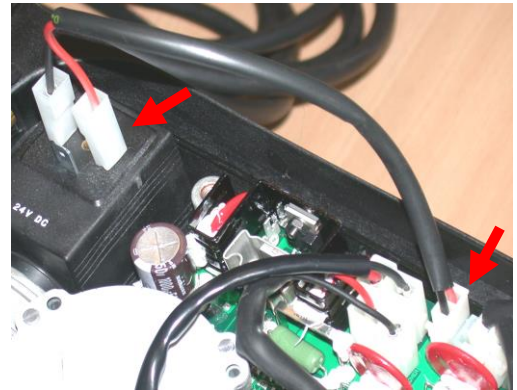


5. Pressure relieve?
(Error code **E13** or **E14**)

Does the pump relieve the build up pressure to the reservoir at the end of the "pressure hold phase", by switching over the integrated 5/2-way valve?

YES **NO** → Valve coil circuit OK? *Shorted or broken valve circuit / check wiring in behind pump bottom cover.*

YES **NO** → Valve cable disconnected (Error code **E24**) → Restore at position of solenoid or controller board and resume at point 4.



Broken circuit in valve coil (Error code **E24**) → Exchange pump, → Check parameters settings and resume at point 4.

Shorted circuit in valve coil (Error code **E25**) → Exchange pump → Check parameters settings and resume at point 4.

Controller board corroded → Check controller board condition (both sides) → Check parameters settings and resume at point 4.

NO **YES** → Exchange pump → Check parameters settings and resume at point 4.

Controller board broken → Exchange circuit board → Check parameters settings and resume at point 4.

Valve stuck → Exchange pump, check parameter settings and resume at point 4.

Check grease filter on cracks!

6. Pressure switch circuit broken?
(Error code **E21**)

Pressure switch cable damaged externally or internally and therefore the pump cannot be stopped after reaching the required pressure. Eventually the controller will stop the pumping phase after exceeding the max. allowed pump run time (default 10min.).

How to check?

1. Locate the pressure switch in one of the distribution blocks.
2. Remove the 2-pole connector.
3. Start a single test cycle with the TEST push button at the pump (hold 2-6 sec.)
4. The moment you bridge both poles in this 2-pole connector at the cable, the pump should stop directly.



NO **YES** → Renew or repair cable harness and resume at point 4?



7. Does the press. switch contact close?
(Error code **E11** or **E12**)
switch).

Contact should close at 100, 125, 150 or 175bar depending on the setting, based on the position in the system (the pressure setting is printed in the side of the switch).

NOTE

At low temperatures the pressure reading at the pump can be significantly higher.

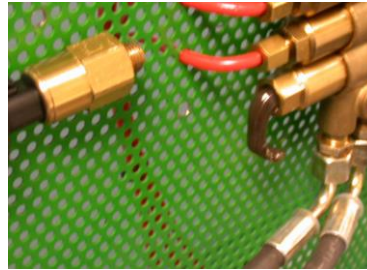
How to check?

1. Remove the 2-pole connector.
2. Start a single test cycle with the TEST push button at the pump (hold 2-6 sec.)
3. Check with Multi-Meter whether contacts at switch close at mentioned pressure.

YES **NO** → Air pockets in pressure switch valve? Air pockets in the valve direct below the switch could cause malfunction of the switch.

NO **YES** → How to solve?

1. Remove the switch from the valve and start a single TEST cycle.
2. Bleed the valve until solid grease flow (end TEST cycle by ignition switch-OFF)
3. Repeat procedure to bleed also the other main-line channel in this valve.
4. Install pressure switch again and start a single TEST cycle to check whether pump is stopped by the pressure switch after exceeding its pressure setting.



Switch broken → **Renew the pressure switch** and start a single TEST cycle to check whether pump is stopped by the pressure switch after exceeding its pressure setting.

8. Does the press. switch contact open?
(Error code **E13** or **E14**)

Switch contact should open as soon the pressure sinks below the pressure setting.

Note

Since 2008 the pressure switches are equipped with a 22kΩ resistor, a value that shows when contact opened.

YES **NO** → **Switch broken** → **Renew the pressure switch** and start a single TEST cycle to check whether pump is stopped by the pressure switch after reaching the set pressure in the block.

9. Problem solved?

10. TEST cycles!

We advise to perform minimal 2 "Single TEST cycles" with the button at the pump, to make sure that the system operates correctly in both main-line channels. When problem not adequate solved, please repeat the procedure starting at 1.

11. Disassemble the TEST manometers!