Repair Manual Pumps

P100 /P120

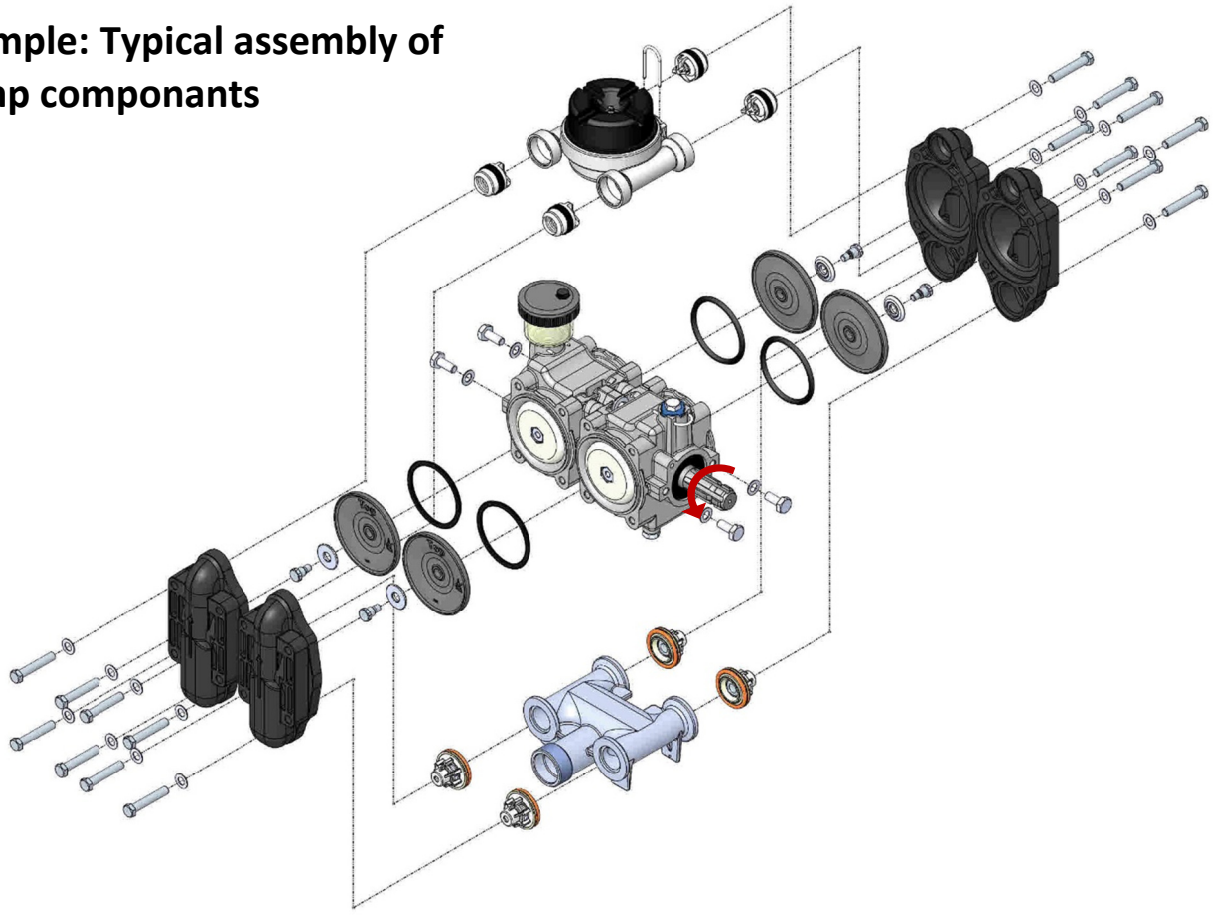
P150 / P200 / P260

Hydraulic Drive

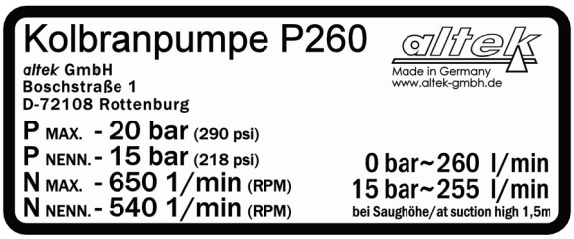
P300 / P260

P500

Example: Typical assembly of pump componants



EXAMPLE: Pump Labels "Technical Data"



Spritzdruck (spraying pressure)	1 – 10 bar (15 – 145 psi)	5 – 15 bar (73 – 218 psi)
Speicherdruck (accumulator pressure)	4 bar (58 psi)	6 bar (87 psi)
Optimaler Druck wenn / optimal pressure when Speicherdruck = Spritzdruck (accumulator pressure = spraying pressure)		

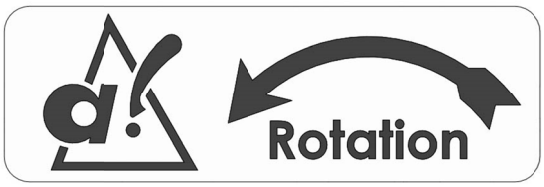


Table of Contents:

1.) Changing oil / Oil level checking

CHANGING OIL

The pump can be drained by removing both front and rear drain plugs (fig1). This is very important to ensure all oil is removed from the pump. Failure to do so will cause contamination of the new oil.

Removal of the reservoir cap and the vent plug (fig 2) will speed up the draining of the old oil.

Before refilling ensure both drain plugs (fig1) are refitted using new sealing washers.

The pump can be refilled through the reservoir (fig 2). Leaving the vent plug (fig2) out to prevent air lock. When oil appears through the vent port the pump is full.

The vent plug and reservoir cap (fig 2) should be replaced and the pump should now be run and the level checked as above.

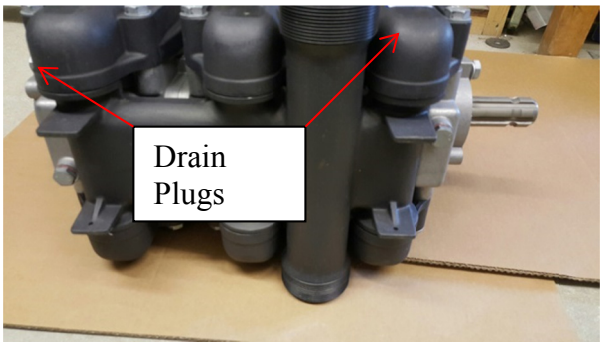


Fig 1

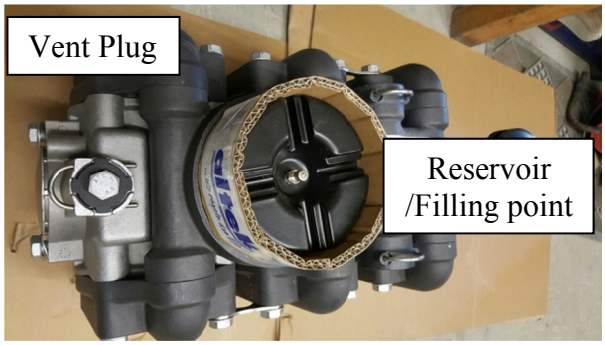


Fig 2

LEVEL CHECKING

If the pump has been stopped for some time it is not unusual that the reservoir is empty. To prevent overfilling oil should NOT be added at this point.

Checking that the pump has the correct level should be carried out after the pump is running for minimum of 1 minute.

If no oil is seen in the reservoir after 1 minute running oil can be added by removal of the reservoir cover.
DO NOT OVERFILL

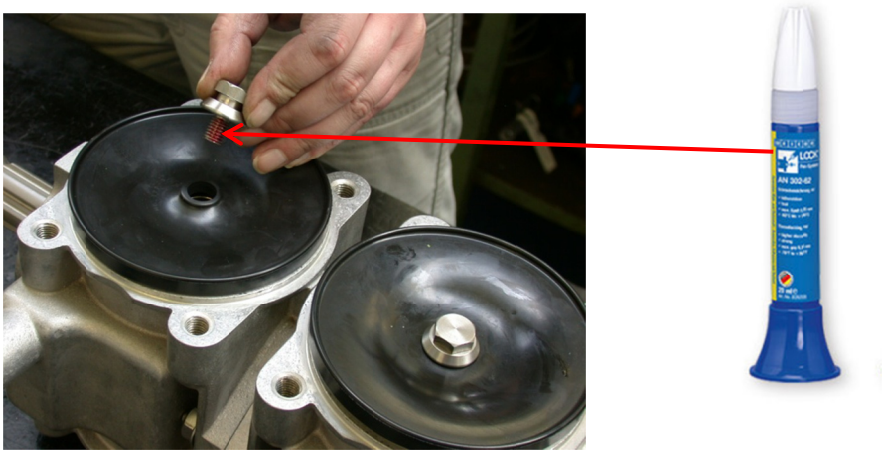
2.) Water in the Pump case (Oil turns white)

Cause: Diaphragm is leaking.

Disposal: Drain the oil, unbolt the valve cover/s and remove, check diaphragm (or diaphragms).
[Picture 1]

-Picture1-

Loosen diaphragm bolt of the damaged diaphragm with 17mm socket. Proceed with caution since the diaphragm bolts are glued. Insert new diaphragm and assemble with the diaphragm bolt and diaphragm plate. The diaphragm bolt (M10) should be applied with moderately strong mounting adhesive (Loctite 262 or Loxeal 55.04) (tightening torques page 12).



-Picture 2-

Replace valve cover again, the bolts (M12) need to be hand tight up to the spring washers then tightened crosswise (tightening torques page 12). Test the drive shaft. Fill in with new oil remember to open the air bleed screw at the opposite end of the pump to the reservoir. Do not overfill. For oil type and quantity refer to the Label on the pump.

⇨ For details regarding the proper mounting of the diaphragms and valve cover, refer to pages 9-11 under Diaphragm change.

3.) Water/Spray leaking at the suction port or pressure manifold

Cause: Damaged O-Ring in the suction valve or pressure accumulator.

Disposal: Drain the oil, then unbolt the valve cover, test the O-Ring. [Picture 3]

-Picture 3-

Take the suction valve and pressure accumulator from the seat, replace the damaged O-Ring and insert the valves again. Replace valve cover again, the bolts (M12) are to be hand tightened up to the spring washers and then tightened crosswise (tightening torques page 12). Test the drive shaft. Fill in with new oil, for oil type and quantity refer to the oil sticker.

⇨ For details regarding the proper mounting of the diaphragms and valve cover, refer to pages 9-11 under Diaphragm change.

4.) Loss of Oil from the front drive seal

Cause: Defective oil seal.

Disposal: Remove the damaged oil seal with a suitable tool, be careful not to damage the sealing surface [Picture 4].

-Picture 4-

Grease a new shaft seal ring and mount it with mounting aid [Picture 5].

-Picture 5-

5.) Pump is loud and pumping is irregular

1. Cause: Pressure in the accumulator is either too low or missing.

Disposal: Adjust the pressure in the accumulator according to the instructions.

2. Cause: Defective pressure accumulator diaphragm.

Disposal: Possibly due to deflation or water penetrating in the pressure accumulator, unbolt the cover, replace defective diaphragm and check if the accumulator is damaged. After, proceed to cover threads with graphite grease, put the cover back on and tighten it. Fill with air again.

3. Cause: Clogged suction filter.

Disposal: Clean suction filter, replace if necessary.

6.) Pump rattles, pumping is irregular and insufficient flow

1. Cause: Either one of the suction or pressure valves is defective or the valve is contaminated with foreign object.

Disposal: Drain the oil, unbolt the valve cover, check both suction and pressure valves. Take damaged valve from the seat and replace or remove/clean any contamination. Replace valve cover again, tighten the bolts (M12) with the spring washers and tighten crosswise (tightening torques page 12). Test the drive shaft. Fill in with new oil, for oil type and quantity refer to the oil sticker.

2. Cause: Air entry due to defective hose or inadequately attached hose clamps.

Disposal: Replace suction hose and suction hose clamps.

7.) Pump overheats

1. Cause: Oil level too low.

Disposal: When oil level is too low, refill with more. Check oil level regularly. [Picture 6] Refer to oil changing / checking in section 1

-Bild 6-

2. Cause: Defective Component in the Power train.

Disposal: Drain oil and completely dissemble the pump.
Check components for damage. Replace defective components with new ones and install the pump again in accordance with the instructions manual.

8.) Diaphragm Change

⇨ Mounting Tip:

Put the Piston pump on its side to remove the valve cover. TIP, change one diaphragm at a time, when all changed on one side of pump, repeat on the opposite side. This avoids the leaking of oil from the pump. Be cautious if all valve covers are removed from one side of the pump the suction and pressure accumulator will be inadequately secured.
Only one valve cover should be opened when changing one diaphragm, this is to be installed and completely mounted before the next valve cover is opened to avoid oil leaking (if possible, the oil should be previously drained. The suction and pressure accumulator may fall out, so ensure to proceed with caution).

Set the Pump to the side in order to avoid leaking of oil in the engine block. [Picture 7]

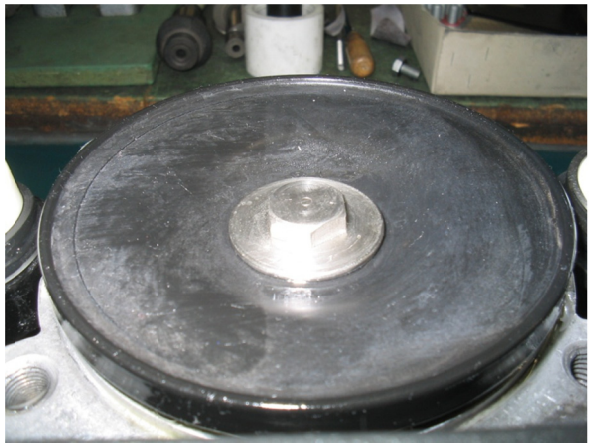
Bolt the valve cover off and lift it.
[Picture 8 und Picture 9]

Loosen Diaphragm bolt. [Picture 10]

- Picture 7-

- Picture 8-

-Picture 9-



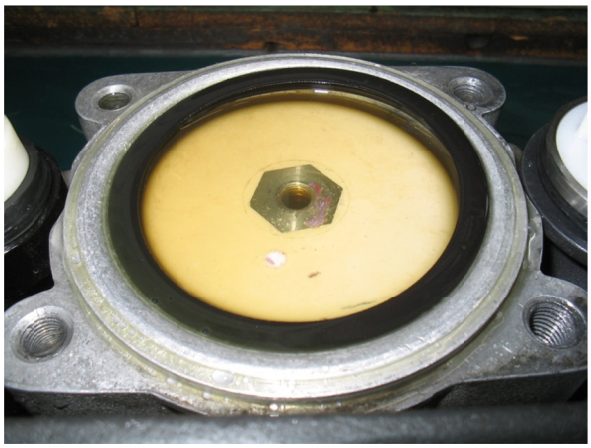
- Picture 10-

Remove diaphragm bolt and disc. [Picture 11]

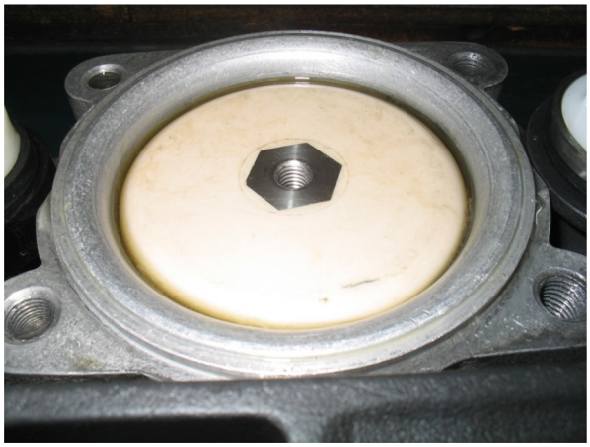
Remove diaphragm and kell ring. [Picture 12 und Picture 13]

Clean Kell ring and check, if OK this can be reassembled. [Picture 14]

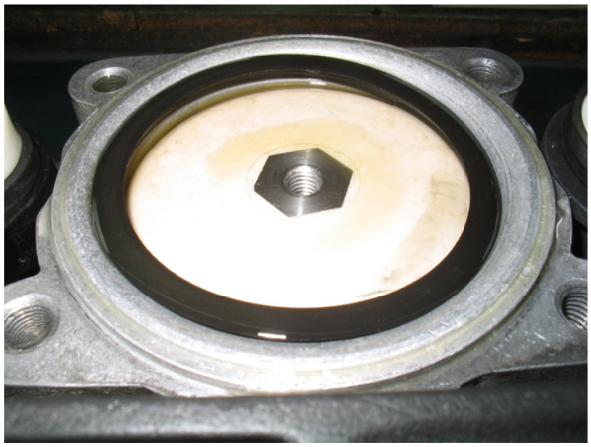
-Picture 11-



- Picture 12-



- Picture 13-



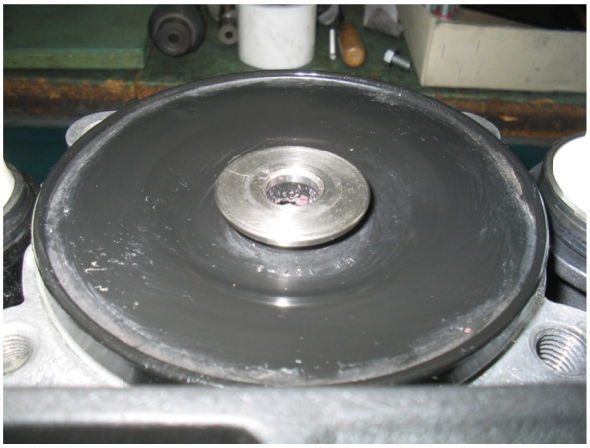
- Picture 14-

Fit in the new diaphragm in the diaphragm disc at the bead of the diaphragm. [Picture 15]

Clean diaphragms bolt (M10) and glue it with Loctite or Loxeal (tightening torques Page 12). [Picture 16]

Caution: When putting in the valve covers, set the Diaphragm with the fingers on top of the valve cover in order to avoid crushing it. [Picture 17 und Picture 18]

Replace bolts (M12) and valve covers with washers and tighten (Tightening torques Page 12). [Picture 19]



- Picture 15-

- Picture 16-

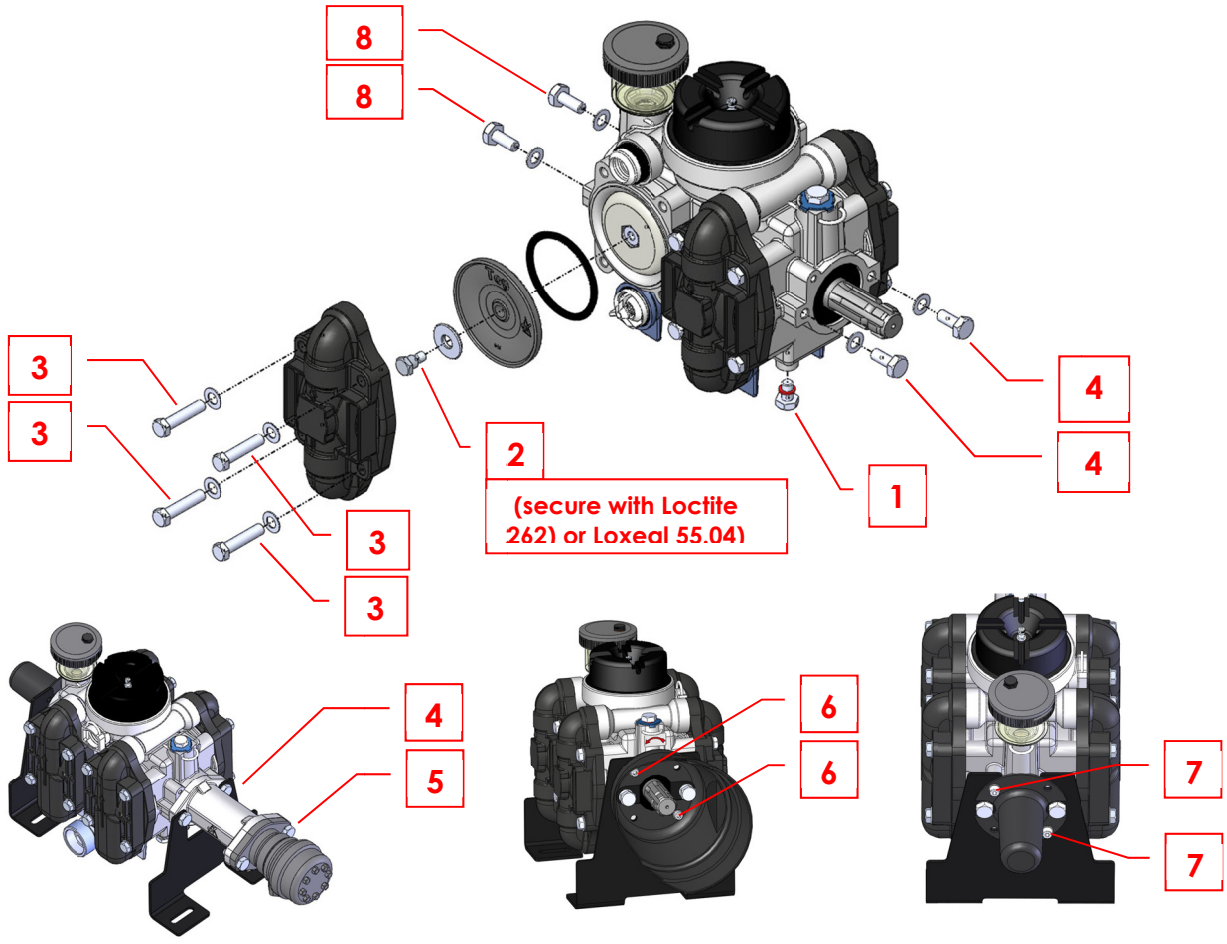
- Picture 17-

- Picture 18-

- Picture 19-

9.) Specifications for tightening torques for bolts for the Piston pump: P70/P100/P120/P150/P200/P260/P300/P380/P500

No.	Type	Anzugsdrehmoment	
		(N·m)	(lbf·ft)
1	Oil drain plug	60	44
2	Diaphragm centre bolt	35	26
3	Valve cover bolts	70	52
4	Bolts for connector + bracket	70	52
5	Bolts for hydro motor	70	52
6	Bolts for protective pot	10	7
7	Bolts for P.t.o. shaft guard	10	7
8	Bolts for bracket	70	52



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