Service instruction for axial piston pumps type V60N

1. Installation notes

The V60N-090 mobil pump will be mounted with its driving side on the PTO according to ISO 7653 or via SAE-C flange. The other interfaces are:

- pressure line
- suction line
- leakage line
- signal line LS

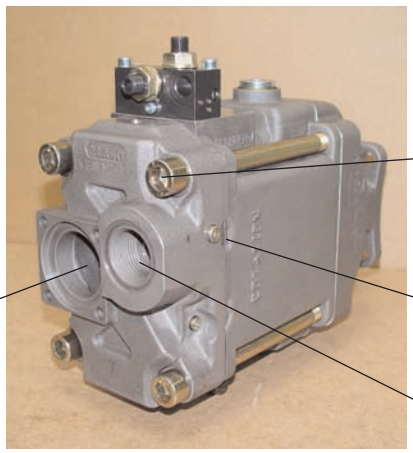
1. The size of the pressure line is determined by the G 1" pressure-port of the pump. In the following pressure line for example 25x3.5 mm tube the flow velocity is up to 14.2 m/sec at 2400 rpm.
2. The suction port shows an internal diameter of 36 mm with flange version and big size suction nipple or with tapped port G 1 1/2" and fitting 42 L). That means a suction flow velocity up to 3.5 m/sec at 2400 rpm. The suction flow velocity shall be kept within the limit of 1 m/sec. That means in any case a widening of the suction line by a conical interpart near to the pump. A speed of 1500 rpm requires an inner diameter of 55 mm, at 2000 rpm the i.d. must be 63 mm at 2400 rpm the min diameter is 70 mm. If the suction line is longer than 2 m the inner diameter must grow 10 mm by every m extension.
3. The tank shall be positioned near to the pump but above it. The end of the suction tube in the tank should be cut off at an angle of 45°. The distance from tube end to tank bottom should be a minimum of 50 mm and to oil level 400 mm. A built in shut-off valve must not reduce the inner diameter of the suction tube. The suction line should go from tank to pump in a descend way for possible air can go up to tank and disappear. It would be wrong to have one or more vaulted arches because then the air would collect in the vertices. This would lead to noise and cavitation for some time.

   The tank should have several (min 2) chambers which are divided by bulkheads. This is to ensure that the return- and leakage oil can be separated from the suction inlet. The advantages are that the dirt can settle down and the air bubbles can rise to the surface. Oil filter and cooler should be positioned in the return line or in a secondary circuit. The amount of oil in the tank should be the maximum pump flow during 2 minutes. A sufficiently dimensioned air filter should be available to ensure the airing of the tank, i.e. the air flow at 0.1 bar diff. pressure should be the same as the maximum oil flow (meaning 200 lpm).
4. The pump housing has two ports G 1/2" for leakage and control oil. In standard pump positions with a horizontal shaft the drain port in the highest position should be used. The flow there may be rather significant depending on the adjustment velocity, both ports may be used in parallel to minimize the back pressure. The leakage line has to show a internal diameter of min. 14 mm (with no bottle necks) and has to be increased when several lines are joined. Low pressure range fittings are sufficient. The end of the leakage line in the tank has to be halfway between oil level and the bottom of the tank.
   Before setting the hydraulic pump to work the pump housing must be filled with clean oil.
5. The LS signal line capacity has to be adjusted according to each pressure system. The signal velocity resp. the signal dampening is optimal when the capacity of the LS signal line has 10 % of the main pressure line capacity between pump and directional valve. In case both lines have the same length the inner diameter of the LS signal line should be 1/3 of the inner diameter of the main pressure line. The signal line should preferably be a hose.

2. Reversing the rotation direction

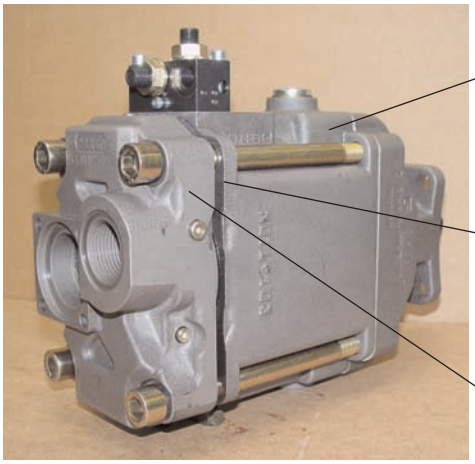
2.1 Diassembly end cover

- Loosen all 4 tierod bolts them.



V60N-060	M12x170	a/f 10
V60N-090	M14x190	a/f 12
V60N-110	M14x190	a/f 12

Attention!
A clearance of 4-5 mm opens automatically when loosening the bolts, between the end cover and the center housing.



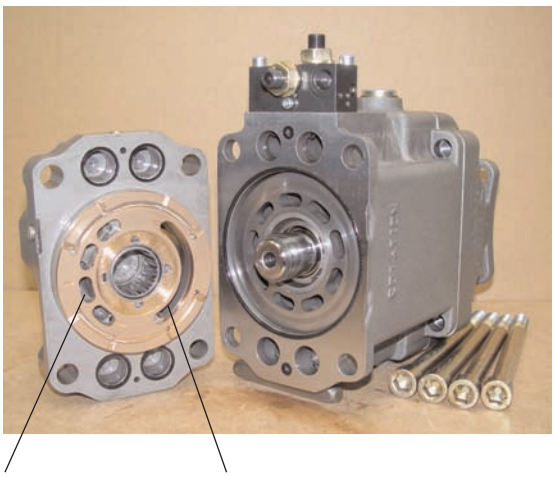
- Front and center housing must not be separated.
  Attention!
  Disassemble end cover completely from center housing, best for dismantling is with shaft directing downwards.

2.2 Change the port plate

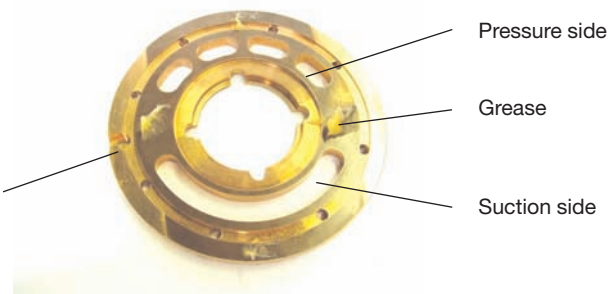
- The separate the port plate from the rear housing / cylinder block.

V60N -060	R	7940846.00
	L	7940847.00
V60N -090	R	7940518.00
	L	7940519.00
V60N -110	R	7929763.00
	L	7929765.00

R = port plate for clockwise rotation
L = port plate for counter rotation



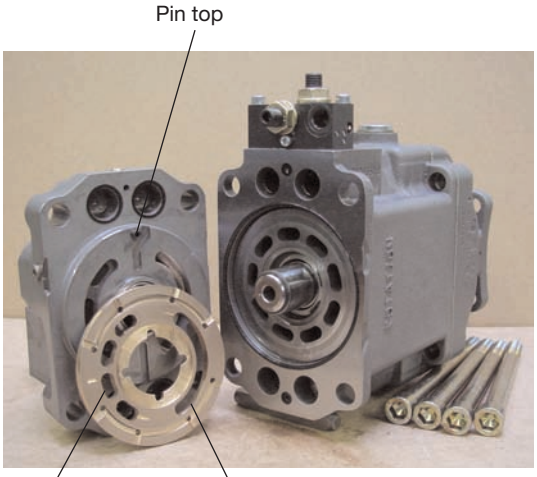
- The new port plate should be mounted with a few spots of grease.



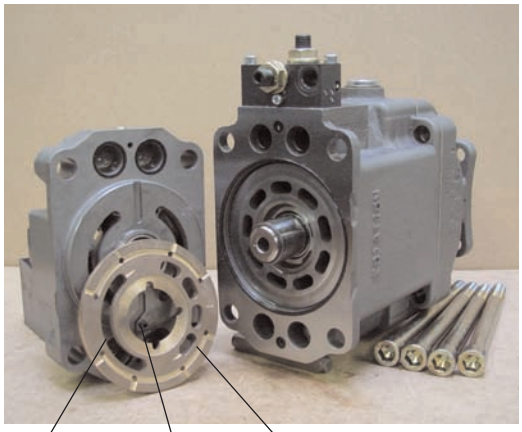
- The guide pin in the end cover must fit into the groove of the port plate. The pressure slot (intermittend) has to be placed over the pressure groove of the rear housing (P-port side)

- The end cover with the new port plate has to be turned around the bearing center for reversing the rotation direction.
  Attention!
  The half of an arrow is applied to both center housing and end cover. The new rotation direction is indicated when both halfs from a complete arrow (the one half on the opposite housing side does not apply).

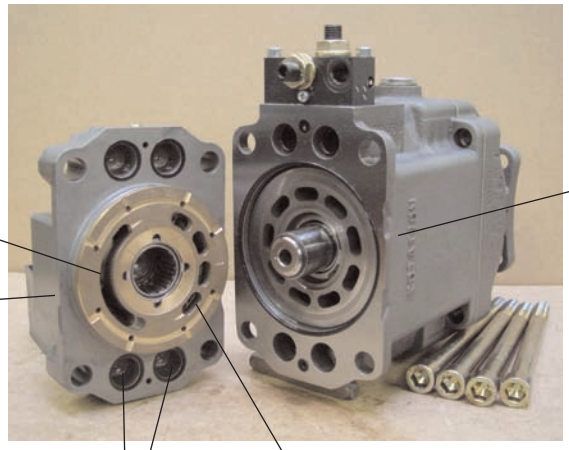
Rotation version: Clockwise



Rotation version: Counter-clockwise



Rear housing rotated by 180° (up-side down).



2.3 Preassembly of end cover to center housing

- Check correct fit of all seals and O-rings.
- The end cover should be carefully centered over the shaft end and springs of the setting pistons and pushed together by hand force. There remains a clearance of 4-5 mm.

  Attention!
  All parts should be kept in position **with hand** force only.

- Assemble all 4 tierod bolts and tighten **crosswise** with a torque wrench in 3 steps.

	1. step	2. step	3. step	Tierod bolts	a/f
V60N-060	40 Nm	80 Nm	110 Nm	M12x170 DIN 912-10.9	10
V60N-090	70 Nm	110 Nm	150 Nm	M14x190 DIN 912-10.9	12
V60N-110	70 Nm	110 Nm	150 Nm	M14x190 DIN 912-10.9	12