

# Quick guide for hydraulic motors

INSTALLATION POSITIONS  
ROTATION  
CONNECTION  
BEFORE START-UP



**MODELS:**  
Truck Master Series

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# 1 Digital services

Samson Pumps offers a number of digital services to help our customers gain the best possible output from our products.

## Calculate



Solution Finder

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How to build

## 2 Bosch Rexroth

### 2.1 Installation positions

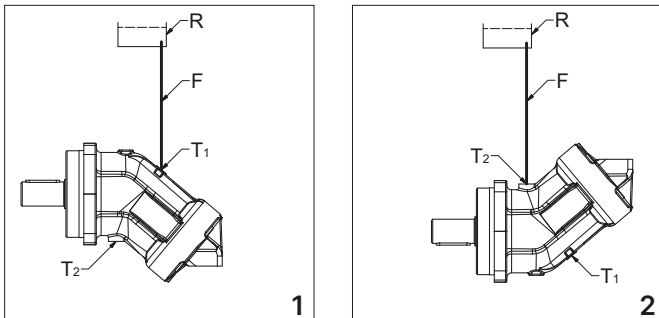
The leakage in the housing area must be directed by a drain line (F) to the reservoir (R) via the highest drain port (T1, T2). Filling/air bleeding on above-reservoir installation by port L1 placed on highest point on drain line (F).

Important to completely drain the hydraulic motor before installation in order not to mix the internal motor oil with oil inside the installed hydraulic system.

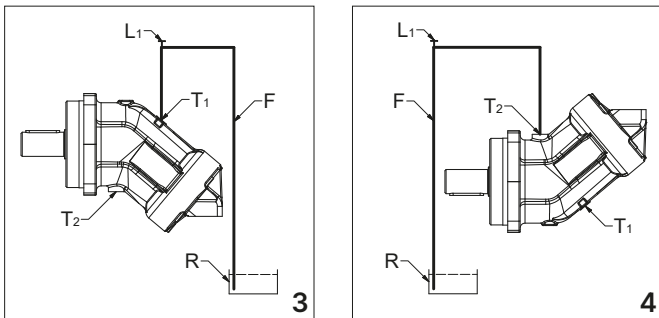
Only use hydraulic fluids rated by Bosch Rexroth, refer to document RE 90245 (download from link below).

Further information regarding hydraulic fluids from link below:  
[www.boschrexroth.com/en/xc/products/product-support/hydraulic-fluids/index](http://www.boschrexroth.com/en/xc/products/product-support/hydraulic-fluids/index)

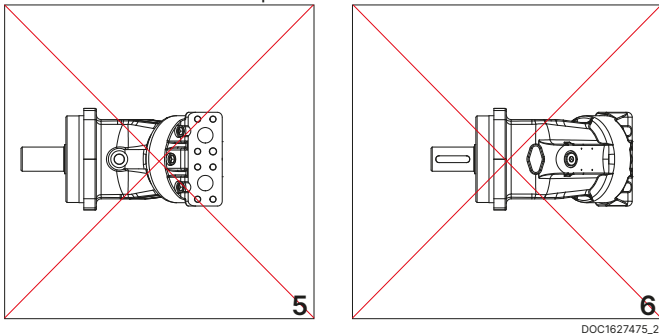
Installation positions 1 to 4 are permissible. Positions 1 and 2 shows installation of hydraulic motor below the minimum fluid level of the reservoir (R).



Positions 3 and 4 shows installation of hydraulic motor above the minimum fluid level of the reservoir (R).



Positions 5 and 6 are not permitted.



### 2.2 Rotation

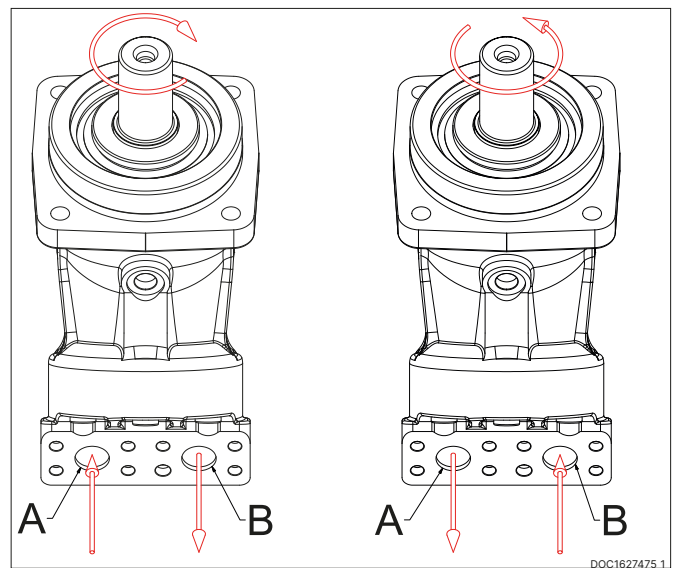
Direction of rotation and flow direction:

Clockwise rotation: A to B  
 Counter-clockwise rotation: B to A

Note:

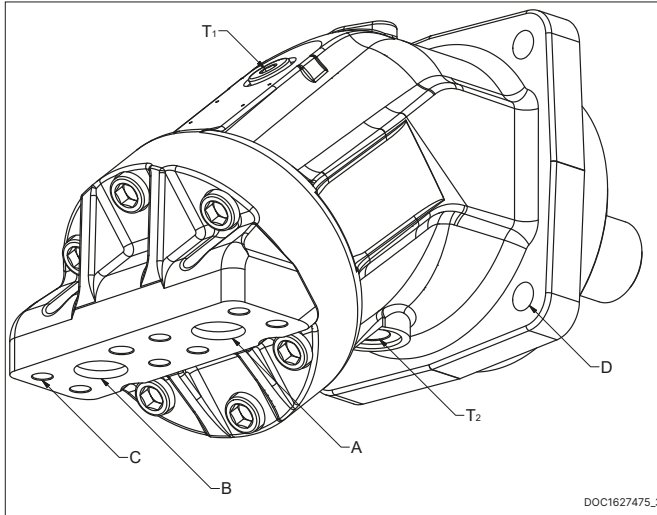
Clockwise rotation hydraulic motor used for counter-clockwise rotation liquid ring pump!

Counter-clockwise rotation hydraulic motor used for clockwise rotation liquid ring pump!



### 2.3 Connections and tightening torques

Make sure that the respective hydraulic motor is tighten by below given tightening torques:



| Pos                             | Description            | Size | Tightening torque |
|---------------------------------|------------------------|------|-------------------|
| T <sub>1</sub> / T <sub>2</sub> | Plug / Drain           | M16  | 50 Nm             |
|                                 |                        | M18  | 60 Nm             |
|                                 |                        | M22  | 80 Nm             |
| C                               | Fastening thread A / B | M8   | 15 Nm             |
|                                 |                        | M10  | 30 Nm             |
|                                 |                        | M12  | 50 Nm             |
|                                 |                        | M14  | 80 Nm             |
| D                               | Ø11                    | M10  | 45 Nm             |
|                                 | Ø13.5                  | M12  | 80 Nm             |
|                                 | Ø17.5                  | M16  | 190 Nm            |

### 2.4 Before start-up

Proceed as follows before start-up of the hydraulik motor:

Place a drip tray under the hydraulic motor to collect any hydraulic fluid that may leak.

The hydraulic motor must be filled with hydraulic fluid and air bled.

Fill and air bleed the axial piston unit via the appropriate ports; see chapter „Installation positions“. Also fill the hydraulic lines of the system.

**NOTICE!** Contaminated hydraulic fluid!

The cleanliness levels of commercial hydraulic fluid are usually insufficient for Rexroth hydraulic motors. Use a suitable filter system to filter hydraulic fluids during filling to minimize solid particle contamination and water in the hydraulic system.

For additional information about the respective hydraulic motor, see [www.boschrexroth.com](http://www.boschrexroth.com)

## 3 Parker

### 3.1 Installation positions

The leakage in the housing area must be directed by a drain line (F) to the reservoir (R) via the highest drain port (T1, T2). Filling/ air bleeding on above-reservoir installation by port L1 placed on highest point on drain line (F).

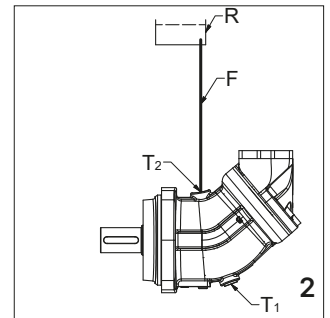
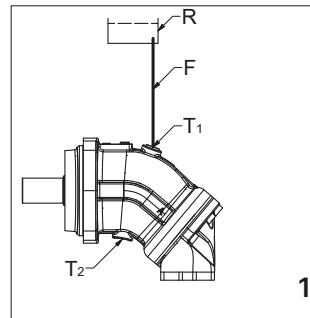
Important to completely drain the hydraulic motor before installation in order not to mix the internal motor oil with oil inside the installed hydraulic system.

**Viscosity:** The ideal operating range is 15 to 30 mm<sup>2</sup>/s [cSt]. At operating temperature, the viscosity (of the drain fluid) should be kept above 8 mm<sup>2</sup>/s [cSt]. At start-up, the viscosity should not exceed 1000 mm<sup>2</sup>/s [cSt]

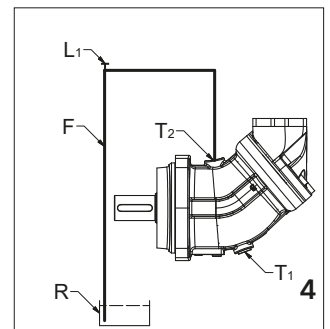
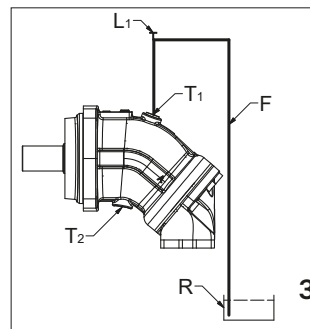
**Filtration:** To obtain the highest service life of the F11/F12, the fluid cleanliness should meet or exceed ISO code 20/18/13 (ISO 4406). During normal operating conditions, a 10 µm (absolute) filter is recommended.

Installation positions 1 to 4 are permissible.

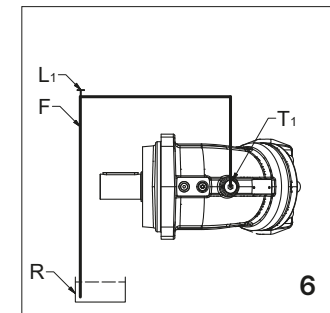
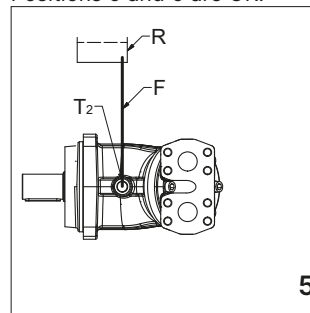
Positions 1 and 2 shows installation of hydraulic motor below the minimum fluid level of the reservoir (R).



Positions 3 and 4 shows installation of hydraulic motor above the minimum fluid level of the reservoir (R).



Positions 5 and 6 are OK.




### 3.2 Speed sensor

The sensor consists of a ferrostat differential (Dual Channel) speed sensor and a seal nut. The sensor installs in a threaded hole in the F10, F12, V12 or V14 bearing housing, and in the F11 barrel housing. The sensor output is a 2 phase shifted square wave signal within a frequency range of 0 Hz to 15 kHz. The sensor detects both speed and direction of rotation. The sensor withstands high as well as low temperatures and is highly moisture protected (IP68).

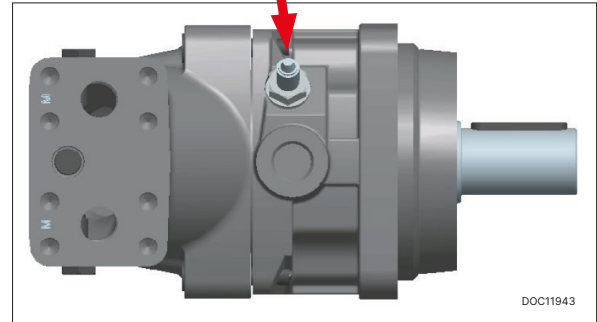
### 3.3 Technical data

|                       |   |
|-----------------------|---|
| Power supply          | 10V to 30V protected against reverse polarity.  |
| Current consumption   | Max 20 mA. (without load)   |
| Signal output signals | <ul style="list-style-type: none"> <li>2 phase shifted square waves</li> <li>Open collector outputs with 10 Kohm pull-up, <math>I_{max} = -20</math> mA.</li> </ul> |
| Frequency             | Min 0 Hz max 15 kHz   |
| Insulation            | Housing and electronics galvanically separated (500V/50Hz/1 min)  |
| Operating temperature | -40 to +125 °C [-40 to +255 °F]   |
| Protection class      | IP68 (DIN 40050)  |


 The outputs are short circuit proof and protected against reverse polarity.

| Frame Size                            | No. of pulses/rev. |
|---------------------------------------|--------------------|
| F10/F11-6, -10, -12, -14, -19         | 5                  |
| F10/F12 (30-125)                      | 35                 |
| F12 (152-182)                         | 40                 |
| F12-250 Up to serial no. 201602230409 | 64                 |
| F12-250 From serial no. 201602230410  | 36                 |
| V12/V14 (ISO, SAE and Cartridge)      | 36                 |
| V12 -060 Cartridge                    | 9                  |

Speed sensor



|                      |  |
|----------------------|--|
| Sensor head pressure | Max 25 bar [360 psi]   |
| Weight (incl. cable) | 0.15 kg [0.33 lb]  |
| Sensing distance     | 0.1 to 2.0 mm; 1.0 recom. [0.004 to 0.08 in; 0.04 recom.]                        |
| Transistor           | NPN  |
| Amplifier variant    | Variant; .02 SHW<br>Output 1: Speed<br>Output 2: Speed<br>Output type: Open Col. |
| Cable                |  |
| Material             | PUR casting  |
| Length               | 1.0 m  |
| No. of wires         | 4 (plus screen; transparent)<br>Wire area $4 \times 0.34$ mm <sup>2</sup>        |
| Screen               | Stranded metal net (insulated from housing)                                      |
| Bending radius       | Min 25 mm [1 in]   |

 NOTE: Screen must be connected to 0 V (zero volt) power supply.

### 3.4 Connection

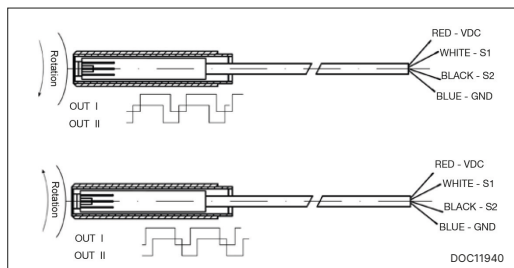
Sensor wires are susceptible to radiated noise. Therefore, the following should be noted:

- Uninterrupted screened 4 wire cable must be used and the screen only connected to the appropriate instrument screen input terminal or 0V. Connections to power earth are not advisable.
- The sensor wires must be installed as far away as possible from electrical machines and must not run in parallel with power cables in the vicinity. The maximum cable length that can be utilized is dependent on sensor voltage, how the cable is installed, and cable capacitance and inductance. It is, however, always advantageous to keep the distance as short as possible.
- The sensor cable supplied can be lengthened via a terminal box located in an IP20 protected connection area (per DIN 40050). Contact Pump & Motor Division Europe for recommendations.

### 3.5 Connections and Pulse diagram:

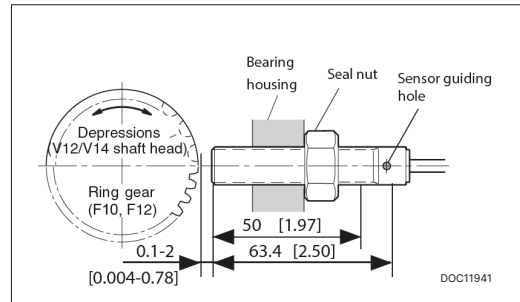
Make sure that the respective hydraulic motor is tightened by below given tightening torques:

Direction of rotation



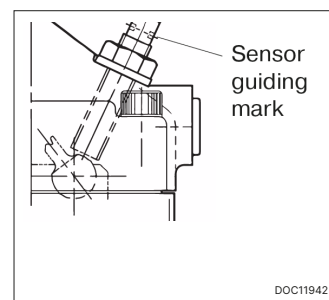
### 3.6 Installation information

As the sensor has a built-in differential Hall effect device, the sensor housing must be aligned according to the drawing of the Speed Sensor Installation picture. If it is not, the sensor may not function properly and noise immunity decreases. The sensor is non-sensitive to oil and the stainless steel housing withstands hazardous environment conditions.



### 3.7 Installation procedure

- Install the sensor in the threaded hole (M12×1) of the F10/ F12/V12/V14 bearing housing; turn the sensor until its head just touches the ring gear teeth (F10/12) or the shaft head (F12-250/V12/V14); refer to the installation drawing above.
- On \*F10/11 the pistons positions must be known before mounting the sensor. Install the sensor in the threaded hole (M12×1) of the F11 barrel housing; turn the sensor until its head just touches the piston.
- When mounting the sensor in the threaded hole be sure that you also rotate the cable so the cable not get twisted.
- Back off the sensor one turn (counter clockwise).
- If required, back it off further until the sensor guiding hole centerline is either as shown in Fig. above & below or 180° opposite.
- Tighten the seal nut; max 12 Nm (100 lb in). Be sure that the position of the guiding hole centerline still is correct.
- Connect the electrical wires as shown in the schematic. Please note the instructions on page 1 regarding screening.
- If you only use one signal, we recommend you to use S2 cable. Cut S1 cable and isolate.



### 3.8 Rotation

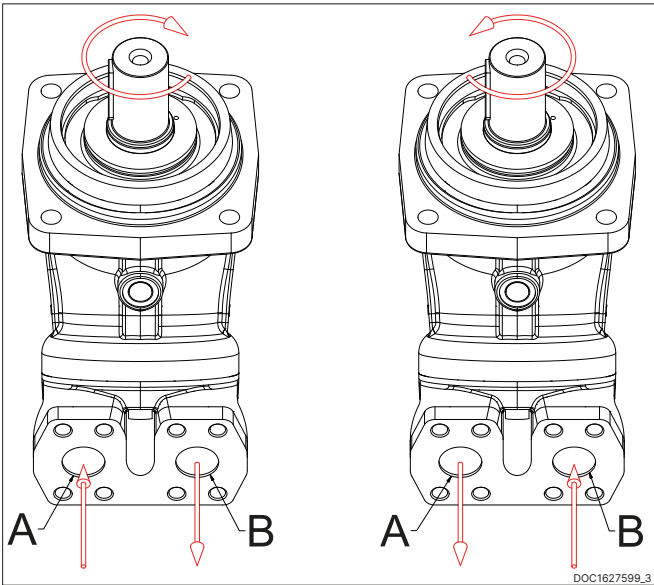
Direction of rotation and flow direction:

Clockwise rotation: A to B  
 Counter-clockwise rotation: B to A

Note:

Clockwise rotation hydraulic motor used for counter-clockwise rotation liquid ring pump!

Counter-clockwise rotation hydraulic motor used for clockwise rotation liquid ring pump!



| Pos                             | Description            | Size | Tightening torque |
|---------------------------------|------------------------|------|-------------------|
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### 3.10 Before start-up

Proceed as follows before start-up of the hydraulic motor:

- Place a drip tray under the hydraulic motor to collect any hydraulic fluid that may leak.
- The hydraulic motor must be filled with hydraulic fluid and air bled.
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### 3.9 Connections and tightening torques

Make sure that the respective hydraulic motor is tightened by below given tightening torques:

