

## 5.01 Fahrhydraulik - Drive Hydraulics

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## 5.01 Fahrhydraulik - Drive Hydraulics

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## 5.01 Fahrhydraulik - Drive Hydraulics

### Safety Regulations!

- **Hydraulic systems are under high pressure!**



High-pressure fluids (fuel, hydraulic oil) issuing under high pressure can penetrate the skin and cause severe injuries. Therefore, even with the smallest wounds, consult a doctor since otherwise severe infections can arise!

- Use suitable aids when tracing leaks because of the risk of injury!
- Before working on the hydraulic system, imperatively relieve this of pressure and lower attached tools!
- In work on the hydraulic system imperatively switch off the engine and secure the vehicle against rolling away (parking brake, wedge)!
- Ensure the specified connection of the hydraulic hoses when connecting hydraulic cylinders and motors!
- If the connections are swapped, reversed functions (e.g. raise/lower) – risk of accidents!

Check hydraulic hoses regularly and replace them if damaged or aged!

The replacement hoses must comply with the technical requirements of the tool manufacturer!



Dispose of oils, fuel and filters correctly!

## 5.01 Fahrhydraulik - Drive Hydraulics

### Basics of troubleshooting on hydraulic systems

A good work plan for diagnosing hydraulic systems must have 7 points:

1. **Knowing the system and understanding the functions:**  
This means understanding the operation of the hydraulic system with the aid of the training documents, the hydraulic circuit diagram and the hydraulic function circuit diagrams.
2. **Ask the driver or operator. Only the driver or operator can reliably describe the details of the fault or malfunction.**
  - Which fault or malfunction occurs?
  - When did the fault occur?
  - Under what conditions did the fault occur?
  - After how many operating hours did the fault occur the first time?
  - After how much time in use did the fault occur (e.g. after 30 minutes working time, at which hydraulic oil temperature did the problem occur, etc.)?
  - Was maintenance or repair work done on the system before the fault occurred?
3. **Put the hydraulic system into operation.**
4. **Check all functions of the hydraulic system, if possible start up the work hydraulics and duplicate the fault.**
5. **Make a list of the possible causes (hydraulic problem, electrical problem, engine problem)**
6. **Draw your conclusions.**
7. **Check these conclusions.**

## 5.01 Fahrhydraulik - Drive Hydraulics

### Basics of troubleshooting on hydraulic systems

To be able to help you in problem cases, we imperatively require the results of the 7 points of the fault diagnosis. Please send us your results by telephone or email in the order of point 1 to point 7.

Re point 1: Did you use the technical documents, training documents, hydraulic circuit diagrams, hydraulic function circuit diagrams and the electrical circuit diagrams?

Re point 2: Could you reconstruct the fault that was described by the customer?

Re point 3: Did you put the hydraulic system into operation?

Re point 4: Could you duplicate the fault described by the customer (driver/operator) yourself when starting up and testing the system?

Re point 5: What possible causes have you detected?

Re point 6: What conclusions (fault causes) have you drawn?

Re point 7: Which tests have you performed (electrical, hydraulic), how are the measured values that you have determined with the pressure gauge or flow meter?

## 5.01 Fahrhydraulik - Drive Hydraulics

### Basics of troubleshooting on hydraulic systems

Check before starting all work:

- That the hydraulic system is sufficiently filled with hydraulic oil, top up with hydraulic oil if necessary!
- That the hydraulic oil filters are clean. Check the hydraulic oil filters for chips or metallic parts. Immediately replace soiled hydraulic oil filters.

The function of the component to be tested must be safely recognised before the tests are started. It is essential to use the hydraulic circuit diagram and the hydraulic function circuit diagrams for this!

Perform the further tests in the following order:

- Always first check the electrical system in the case of electrically actuated components (e.g. solenoid valves)!
- It is essential to use the hydraulic circuit diagram and the hydraulic function circuit diagrams for this!
- Operate the solenoid valves mechanically in the case of functions that are controlled by solenoid valves.  
Push in the pin in the centre of the solenoid valve with the aid of a screwdriver or another suitable tool to do this.
- Check the hydraulic oil pressure with a suitable pressure gauge.
- In the case of hydraulic functions operated with a double acting hydraulic cylinder (example: steering, raise/lower dirt hopper), always test the hydraulic cylinders for internal leaks.

Note: It is essential that suitable pressure gauges (e.g. hydraulic measuring case; Hako spare part number 0350 183) are available for testing hydraulic systems. A flow meter (measuring turbine) (e.g. hydr. flow meter set, Hako spare part number 03501840) is necessary for measuring flow rates.

## 5.01 Fahrhydraulik - Drive Hydraulics

### Cause of damage to hydraulic systems in mobile hydraulics

#### 1. Contaminated hydraulic oil!

The main cause of faults in hydraulic systems is **contaminated hydraulic oil**. Dirt particles lead to malfunctioning of valves and diaphragms. Dirt particles in the hydraulic oil increase the wear of components such as hydraulic pumps, hydraulic motors and other components. The life of the hydraulic components drops to 50 % of the normal life!

#### How do dirt particles get into the hydraulic system?

- Due to defective maintenance, the hydraulic oil and the hydraulic oil filters are not changed or not changed on time.
- Due to dirt in the hydraulic oil casks.
- Due to refilling hydraulic oil with dirty oil cans and funnels.
- Due to repairs in which sufficient attention was not paid to cleanliness.
- Due to damage to components and valves.

#### Remedy:

- Maintenance intervals for changing hydraulic oil and filters must be complied with imperatively.
- Check the hydraulic oil filters for cleanliness in the case of faults. Check hydraulic oil filters for chips or metallic parts. Replace dirty hydraulic oil filters immediately.
- Pay attention without fail to cleanliness when filling or refilling hydraulic systems. Use no dirty containers, oil cans or funnels!
- Pay attention without fail to cleanliness when repairing hydraulic systems!
- Use the portable filter unit (Hako spare part number 03502040) and the associated filter element (Hako spare part number 01081470).

## 5.01 Fahrhydraulik - Drive Hydraulics

### Cause of damage to hydraulic systems in mobile hydraulics:

#### 2. Mixing different hydraulic oils or engine oil!

A further cause of faults in hydraulic systems is mixing different hydraulic oils, above all mixing plant-based hydraulic oils with mineral hydraulic oils or mixing with engine oil.

How do other oils get into the hydraulic system?

By refilling with unsuitable hydraulic oil or refilling with engine oil!

Foaming of the hydraulic oil in the hydraulic oil tank occurs frequently in hydraulic systems in which oil mixing has occurred due to refilling with the wrong hydraulic oil. Increased noise in the hydraulic system is frequently found as a further factor.

Remedy:

Completely drain off mixed hydraulic oil. Replace the hydraulic oil filter. Fill the machine with the correct specified hydraulic oil (see operating instructions and technical documentation).

Drive the machine and operate all work functions. The process should last at least 30 minutes.

Then completely drain off and refill the hydraulic oil. Replace the hydraulic oil filter. Fill the machine with the correct specified hydraulic oil. Drive the machine and start up all work functions. If faults now no longer occur, the machine can be put back into normal service.

**Important: The process must be performed two times as described, since if the hydraulic oil is replaced once only, a high proportion of mixtures is still in the hydraulic system.**

Later failures of hydraulic pumps and hydraulic motors cannot be excluded in hydraulic systems that have been operated for a long time with mixed hydraulic oil, even if the hydraulic oil and the hydraulic oil filter have been replaced two times as described.



## 5.01 Fahrhydraulik - Drive Hydraulics

### Cause of damage to hydraulic systems in mobile hydraulics

#### 3. Overheating of the hydraulic system!

A further cause of faults is overheating of the hydraulic system. Hydraulic systems in mobile hydraulics should not be operated permanently above 75 °C.

Oil losses at hydraulic pumps, hydraulic motors, valve blocks and O-ring connections occur frequently in hydraulic systems that have been overheated, since the O-rings become hard due to the high temperatures and can no longer seal correctly.

Remedy:

Clean the hydraulic oil radiator. Check the fan speed, tension V-belt of the radiator fan. Replace leaking seals (O-rings, gaskets). Replace the hydraulic oil and hydraulic oil filters since the hydraulic oil is damaged by the thermal stresses.

Later failures of hydraulic pumps and hydraulic motors and valve blocks cannot be excluded in hydraulic systems that have been operated for a longer time at too high a temperature.

If there is suspicion of contaminated hydraulic oil, mixed hydraulic oil, too much water in the hydraulic oil or overheated hydraulic systems, oil samples of the hydraulic oil should be taken without fail before and after the repairs.

Send these oil samples to a laboratory for evaluation. Such examinations are performed by Oil Check in Brannenburg, for instance.

## 5.01 Fahrhydraulik - Drive Hydraulics

### Cause of damage to hydraulic systems in mobile hydraulics

#### 4. Too much water in the hydraulic oil!

How does water get into the hydraulic oil?

Circulating air gets into the hydraulic oil tank through the ventilation and de-airing filter according to temperature. The circulating air has an amount of water that is absorbed by the hydraulic oil. This effect is intensified when a water hose or high-pressure cleaner is held directly on the ventilation and de-airing filter when the machine is washed.

Hydraulic oils with too much water can be detected frequently by the milky colour of the hydraulic oil.

Remedy:

Change the hydraulic oil and the hydraulic oil filters.

Later failures of hydraulic pumps and hydraulic motors and valve blocks cannot be excluded in hydraulic systems that have been operated for a long time with too much water in the hydraulic oil.

If there is suspicion of contaminated hydraulic oil, mixed hydraulic oil, too much water in the hydraulic oil or overheated hydraulic systems, oil samples of the hydraulic oil should be taken without fail before and after the repairs.

Send these oil samples to a laboratory for evaluation. Such examinations are performed by Oil Check in Brannenburg, for instance.

## 5.01 Fahrhydraulik - Drive Hydraulics

### Drive, technical data

Drive pump Bosch Rexroth A10VG63EP5DT1/10R-NSC10F043SP-S (R92014976)

High pressure: 330 bar

Feed pressure (Charge pressure): 26 bar

Output: 63 ccm per revolution (63 x 2700 = 170100 ccm/minute = 170 l/minute)

Front axle wheel motors Bosch Rexroth, with disc brakes and the tacho generators B13 (on the left) and B14 (on the right)

Rear axle wheel motors Bosch Rexroth, with integrated parking brake (multi-disc brake)

Suction volume when transporting: 199 ccm per revolution, max. 40 km/h at 2700 rpm engine speed

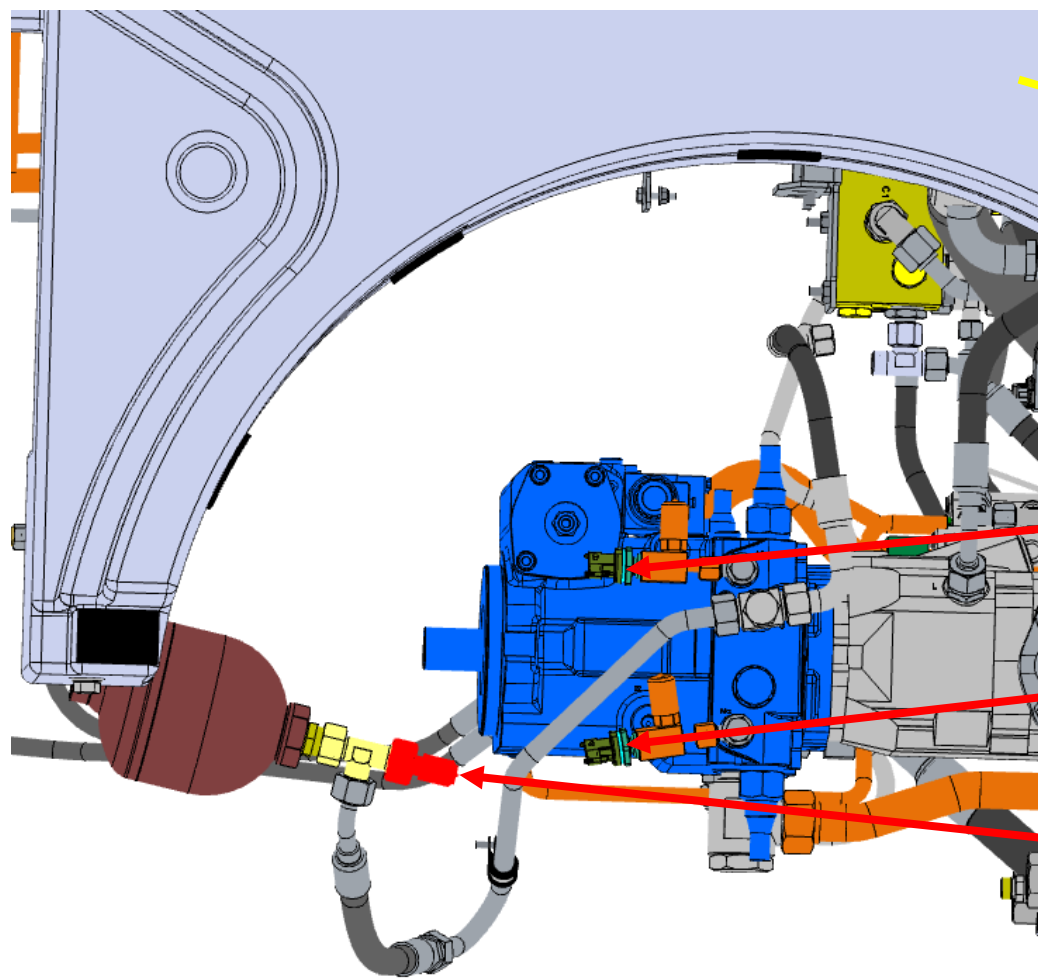
Suction volume when working: 398 ccm per revolution, max. 24 km/h at 2400 rpm engine speed

Pressures the in drive hydraulics

Feed pressure (at 2000 rpm)	28bar
max. drive pressure forward	330bar
max. drive pressure reverse	330bar

# 5.01 Fahrhydraulik - Drive Hydraulics

## Measuring Points Drive System



**Measuring point drive pump reverse (B- MB)**  
 330 +/- 10 bar (wheels blocked)

**Measuring point drive pump forward (A- MA)**  
 330 +/-10 bar

**Messpunkt Speisedruck, Fahrtrieb**  
**Measuring point feeding pressure**  
 (charge pressure), drive hydraulic  
 18- 28 bar

## 5.01 Fahrhydraulik - Drive Hydraulics

### Functional description, drive forwards

#### Prerequisites for driving:

The seat contact switch of the driver's seat B08 must be closed.

The parking brake must not be operated, i.e. the switch S15 (NO) for the parking brake may not be operated.

The parking brake of the CM 1600 is free when the solenoid valve Y05 for the parking brake is not energized. The parking brake is located in the wheel motors of the rear axle.

When the accelerator pedal is operated forward, a voltage signal is sent from potentiometer B09 to the drive controller A03 depending on the pedal position.

A voltage signal is sent from the drive control unit A03 to the solenoid valve Y03 forwards drive pump.

In addition the signals from the brake pressure sensor B03 and from the hall sensor B11 (operating brake pedal) are evaluated for the drive controller.

The speed is monitored by the tachosensors B13 (on the left) and B14 (on the right).

The tachosensor B13 is located in the wheel motor on the front axle on the left (in driving direction).

The tachosensor B14 is located in the wheel motor on the front axle on the right (in driving direction).

## 5.01 Fahrhydraulik - Drive Hydraulics

### Functional description, drive reverse

#### Prerequisites for driving:

The seat contact switch of the driver's seat B08 must be closed.

The parking brake must not be operated, i.e. the switch S15 (NO) for the parking brake may not be operated.

The parking brake of the CM 1600 is free when the solenoid valve Y05 for the parking brake is not energized.  
The parking brake is located in the wheel motors of the rear axle.

When the accelerator pedal is operated revers, a voltage signal is sent from potentiometer B10 to the drive controller A03 depending on the pedal position.

A voltage signal is sent from the drive control unit A03 to the solenoid valve Y04 revers drive pump.

In addition the signals from the brake pressure sensor B03 and from the hall sensor B11 (operating brake pedal) are evaluated for the drive controller

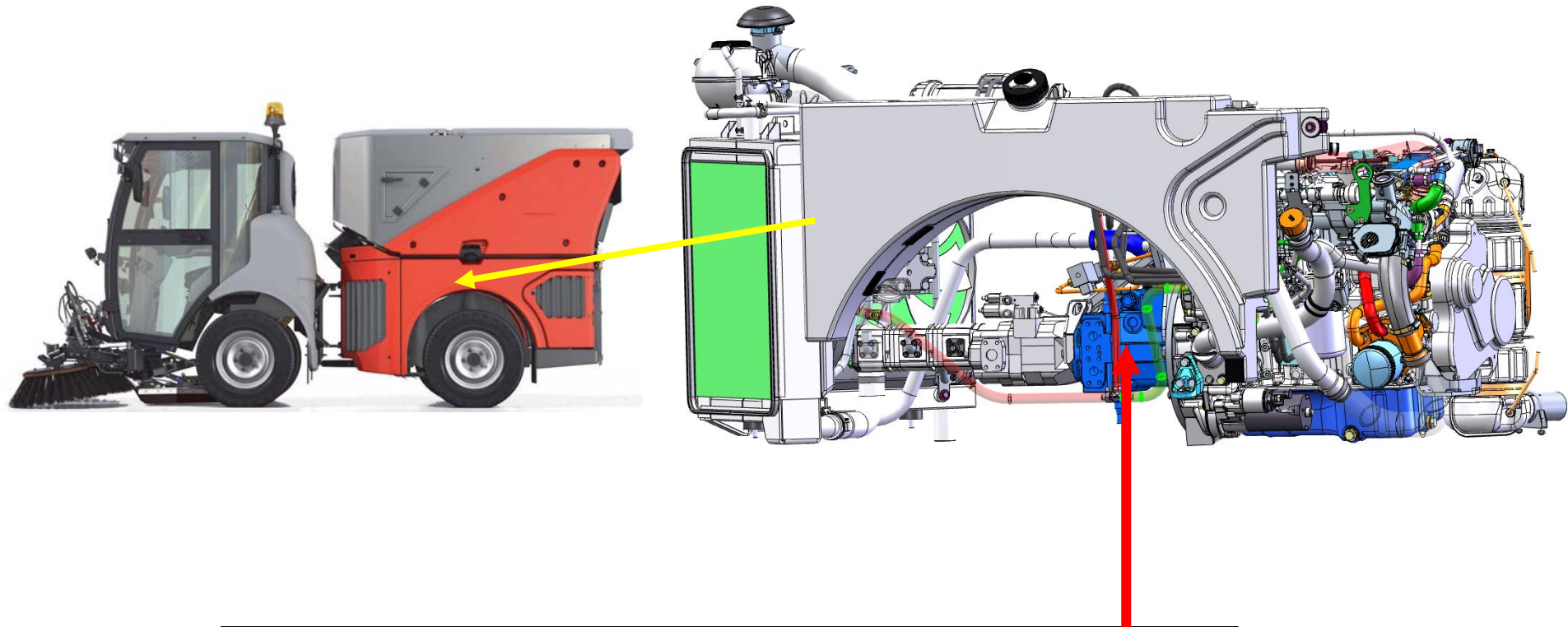
The speed is monitored by the tacho sensors B13 (on the left) and B14 (on the right).

The tacho sensor B13 is located in the wheel motor on the front axle on the left (in driving direction).

The tacho sensor B14 is located in the wheel motor on the front axle on the right (in driving direction).

## 5.01 Fahrhydraulik - Drive Hydraulics

Anordnung der Bauteile für den Fahrtrieb im Hinterwagen  
Location of components for the drive system in the rear wagon

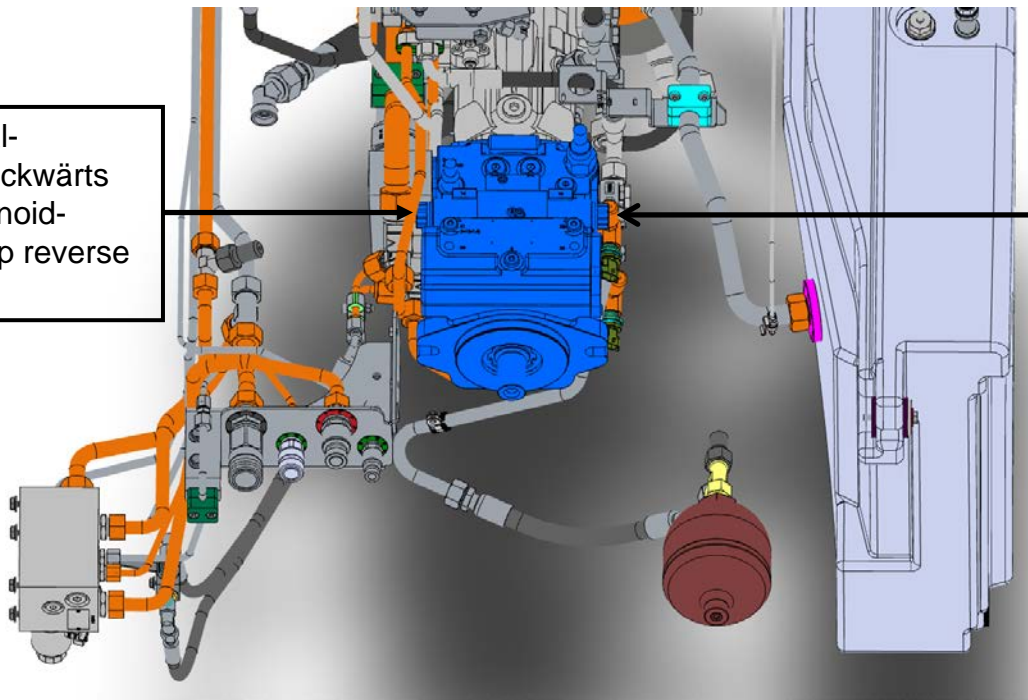


Fahrpumpe Bosch Rexroth A10VG63EP3DT1/10R-NSC10F043SP (R902204880)  
Drive pump Bosch Rexroth A10VG63EP3DT1/10R-NSC10F043SP (R902204880)

### 5.01 Fahrhydraulik - Drive Hydraulics

Y04 Proportional-  
Magnetventil Rückwärts  
Y04 Prop.- Solenoid-  
Valve drive pump reverse

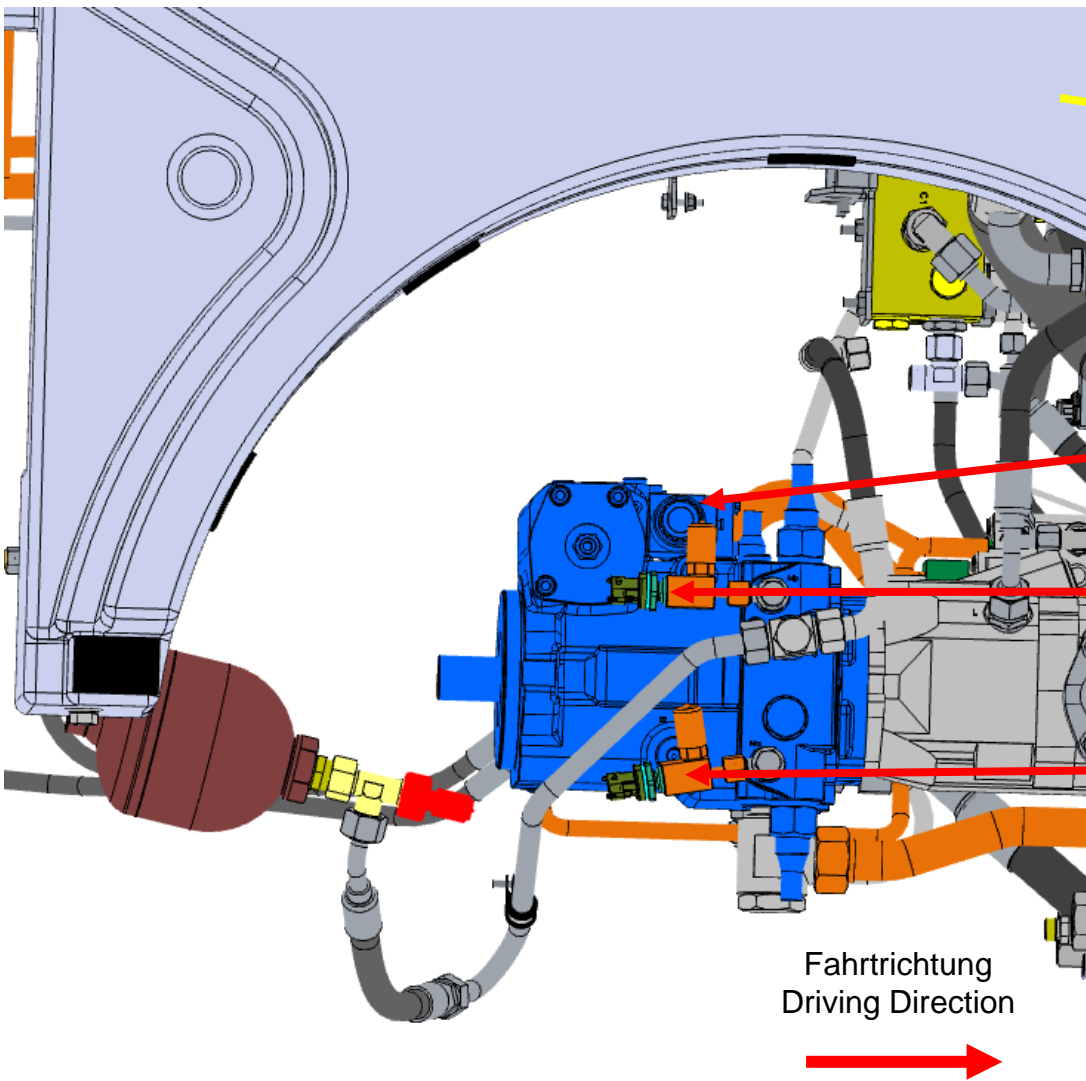
Y03 Proportional- Magnetventil  
vorwärts  
Y03 Prop.- Solenoid- Valve  
drive pump forward



Fahrtrichtung  
Driving Direction



# 5.01 Fahrhydraulik - Drive Hydraulics



Y03 Proportionalventil Fahrpumpe vorwärts  
 Y03 Prop.-Solenoid Valve drive pump forward

B02 Druckgeber Fahrpumpe rückwärts (B - MB)  
 B02 Pressure sensor reverse – MB)

B01 Druckgeber Fahrpumpe vorwärts (A - MA)  
 B01 Pressure sensor forward (A- MA)

Fahrtrichtung  
 Driving Direction

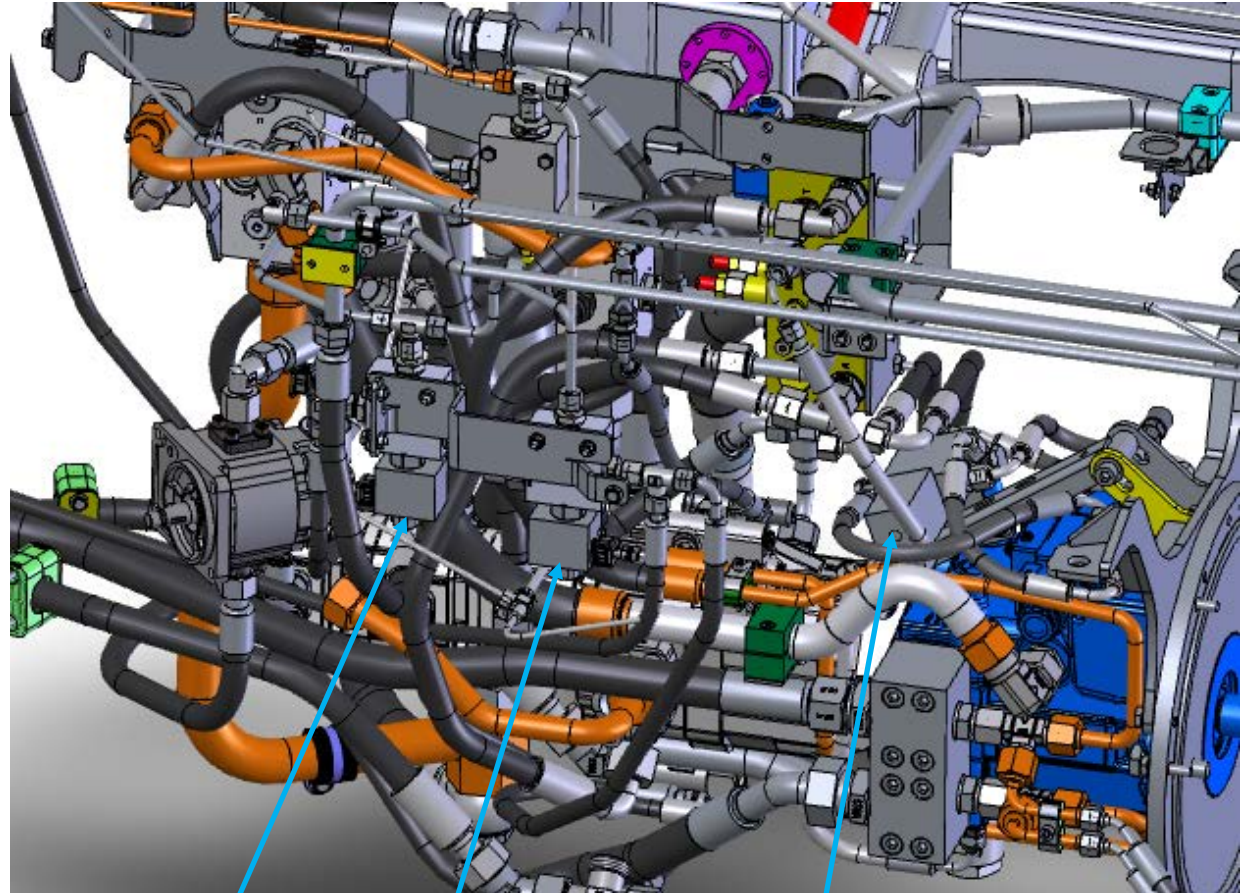


## 5.01 Fahrhydraulik - Drive Hydraulics

Y01 Solenoid valve overrun function

Y02 Solenoid valve drive stage change  
(max. 24 km/h)

Y05 Solenoid valve parking brake



Y05

Y02

Y01

## 5.01 Fahrhydraulik - Drive Hydraulics

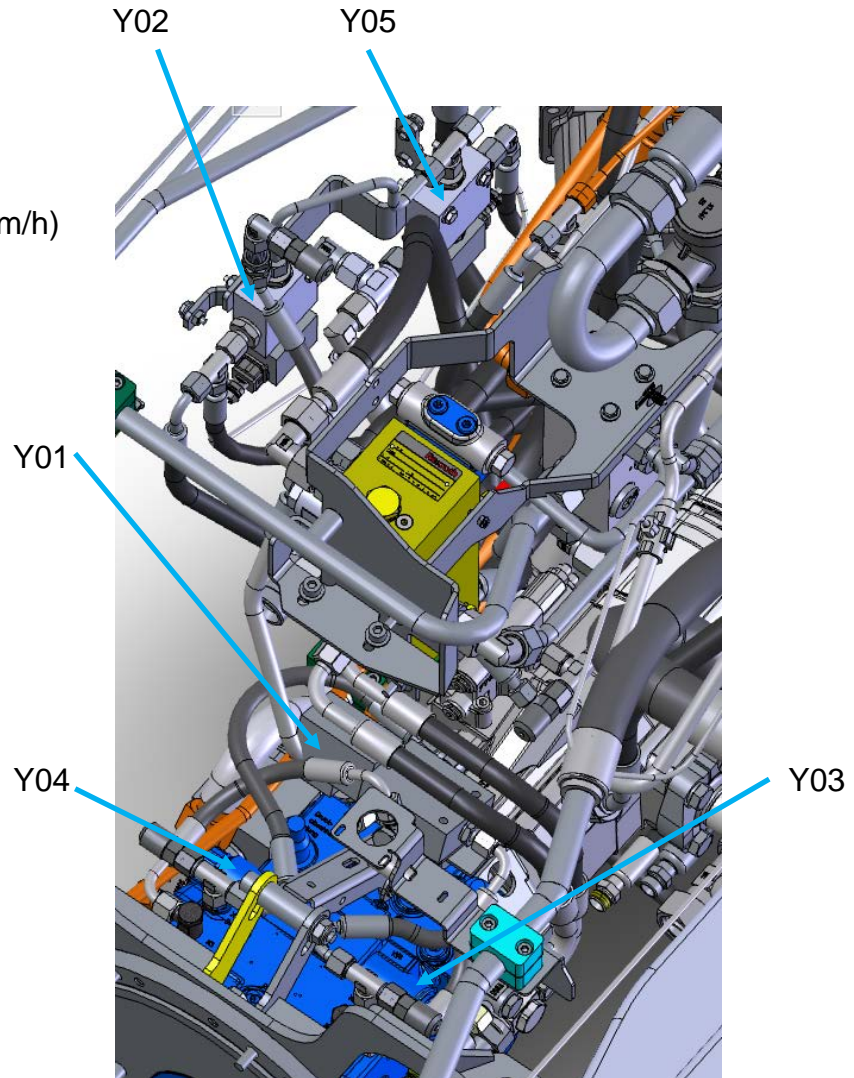
Y01 Magnetventil Ausrollfunktion  
Y01 Solenoid valve overrun function

Y02 Magnetventil Umschaltung 1. Fahrstufe (max. 24 km/h)  
Y02 Solenoid valve drive stage change (max 24 km/h)

Y03 Magnetventil Fahrpumpe vorwärts  
Y03 Solenoid valve drive pump forward

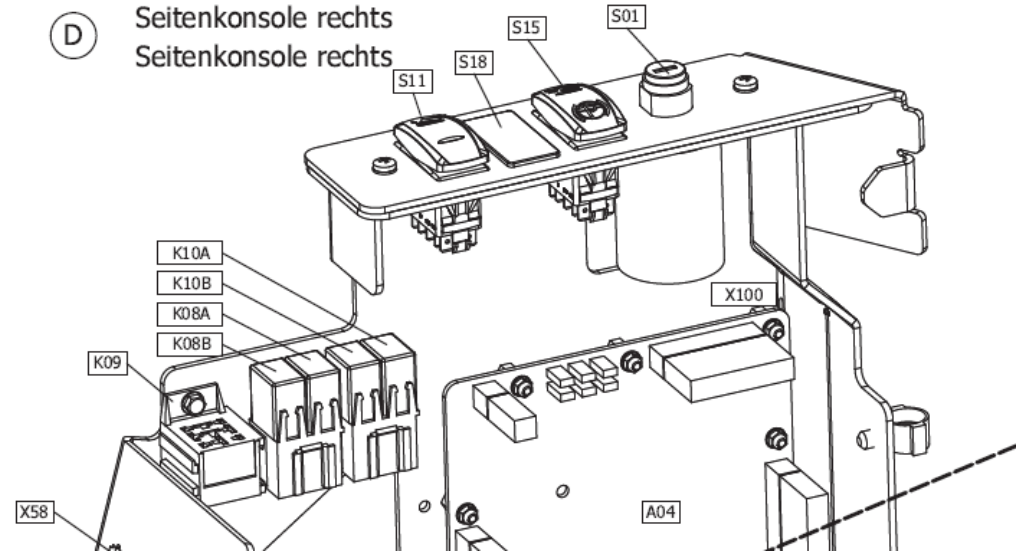
Y04 Magnetventil Fahrpumpe rückwärts  
Y04 Solenoid valve drive pump revers

Y05 Magnetventil Haltebremse  
Y05 Solenoid valve parking brake



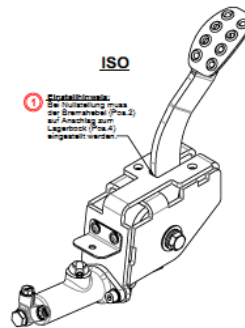
## 5.01 Fahrhydraulik - Drive Hydraulics

S01 Key Switch  
S15 Switch Parking Brake

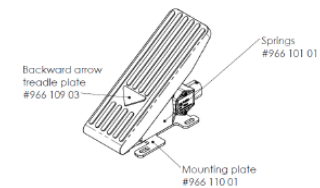


B03 and B11

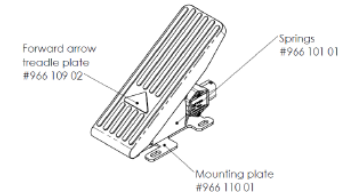
B03 Pressure sensor brake pressure  
B11 Hall sensor (operating brake pedal)  
B09 Potentiometer pedal forward  
B10 Potentiometer pedal revers



B10



B09

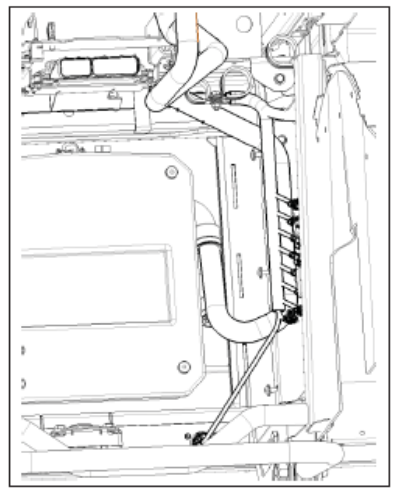
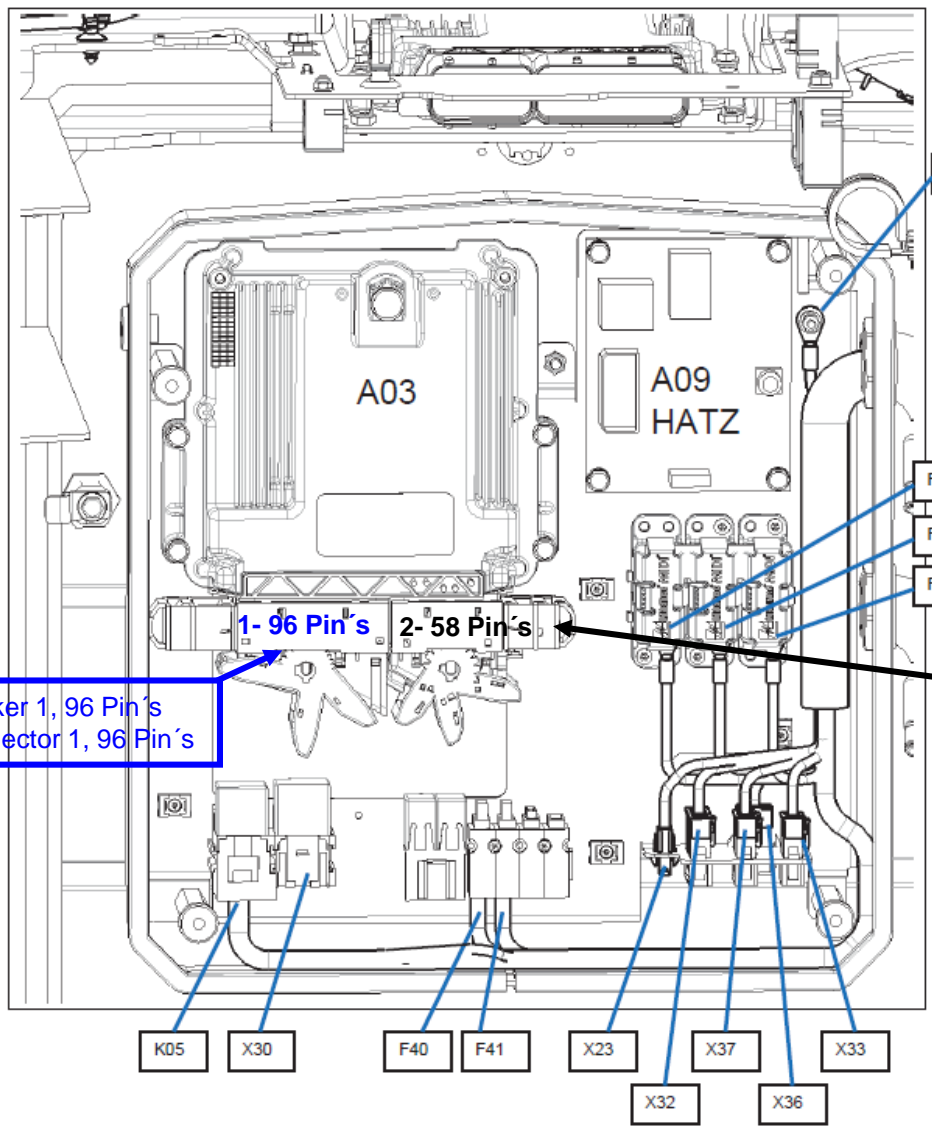


# 5.01 Fahrhydraulik - Drive Hydraulics

9104

Elektrokasten ohne Abdeckung

Kabelbaum W1 (Knick)

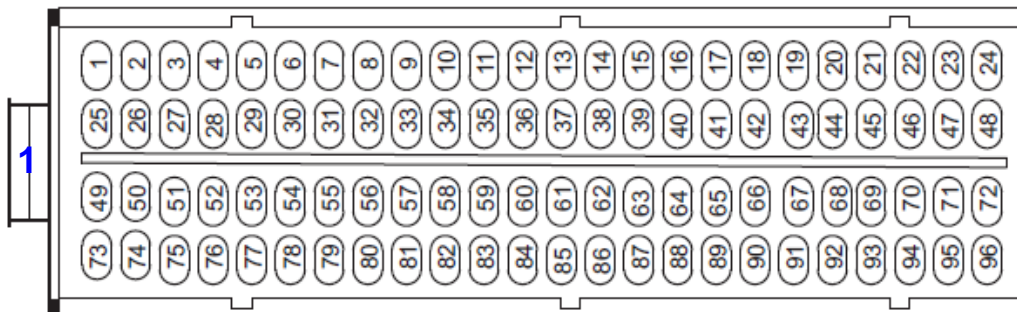


A03, Stecker 1, 96 Pin's  
 A03, Connector 1, 96 Pin's

A03, Stecker 2, 58 Pin's  
 A03, Connector 2, 58 Pin's

## 5.01 Fahrhydraulik - Drive Hydraulics

Steuergerät Fahren (Hydostat) A03, Stecker 1, 96 Kontakte  
Control Unit Drive (Hydrostat) A03, Connector 1, 96 Pin´s



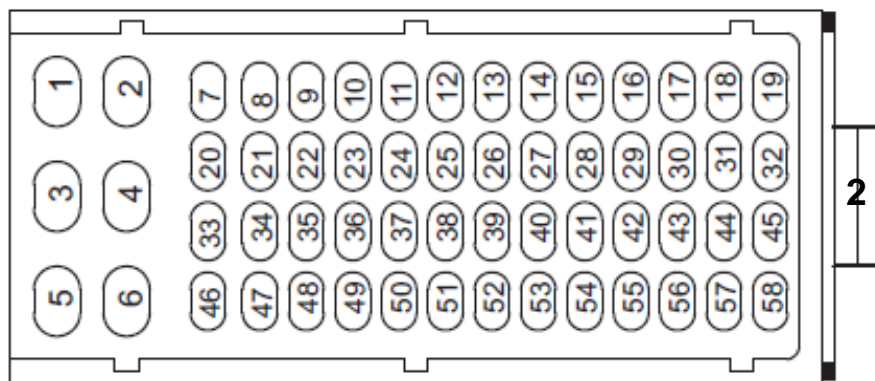
**Spannungsversorgung Steuergerät A03- Stecker 1**

B- (Masse, 31) von X41 an Kontakt- Nr. 22,23,24,  
Kabel- Nr. 3101

**Power supply Control Unit A03- Plug 1**

B- (GND, Ground, Terminal 31) from X41  
to contact no.22,23,24, cable no. 3101.

Steuergerät Fahren (Hydrostat) A03, Stecker 2, 58 Kontakte  
Control Unit Drive (Hydrostat) A03, Connector 2, 58 Pin´s



**Spannungsversorgung Steuergerät A03- Stecker 2**

B+ von Sicherung F18 (50A), Sicherung F42 (30A) an  
Kontakt- Nr. 1,3,4,5,6, Kabel- Nr. 3042.

B+ von Sicherung F22 (5A) an Kontakt- Nr. 45, 58, Kabel- Nr. 3022

B- (Masse, 31) von X41 an Kontakt- Nr. 2,7,20,33,46,  
Kabel- Nr. 3101

**Power supply Control Unit A03- Plug 2**

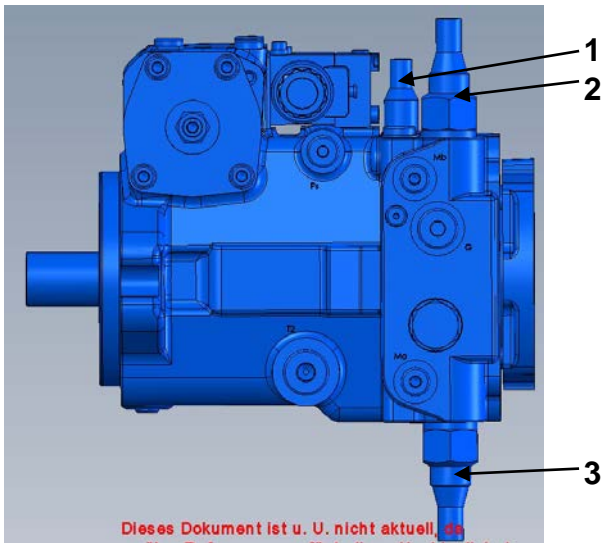
B+ from fuse F18 (50A), fuse F42 (30A) to  
Contact- No. 1,3,4,5,6, cable- No. 3042.

B+ from fuse F22 (5A) to contact no. 45, 58, cable no. 3022.

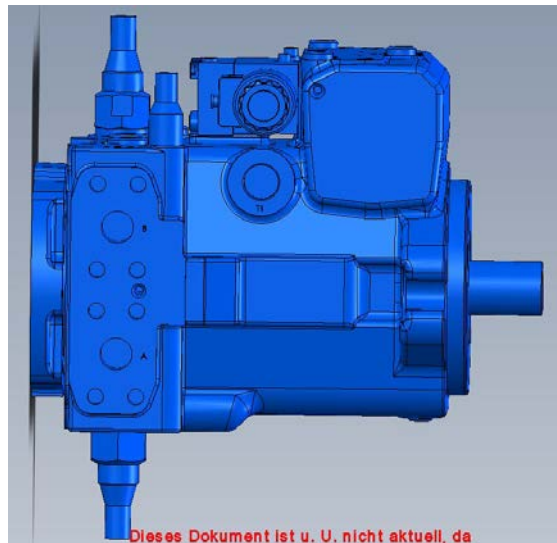
B- (GND, Ground, Terminal 31) from X41 to contact no. 2,7,20,33,46,  
cable no. 3101.



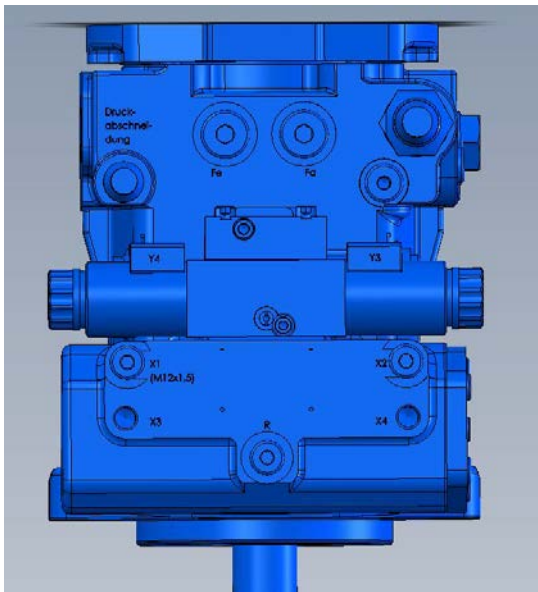
### 5.01 Fahrhydraulik - Drive Hydraulics



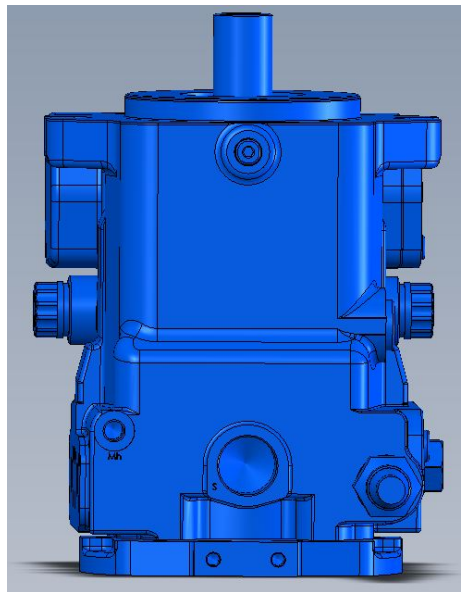
FR →



← FR



FR ↑



↓ FR

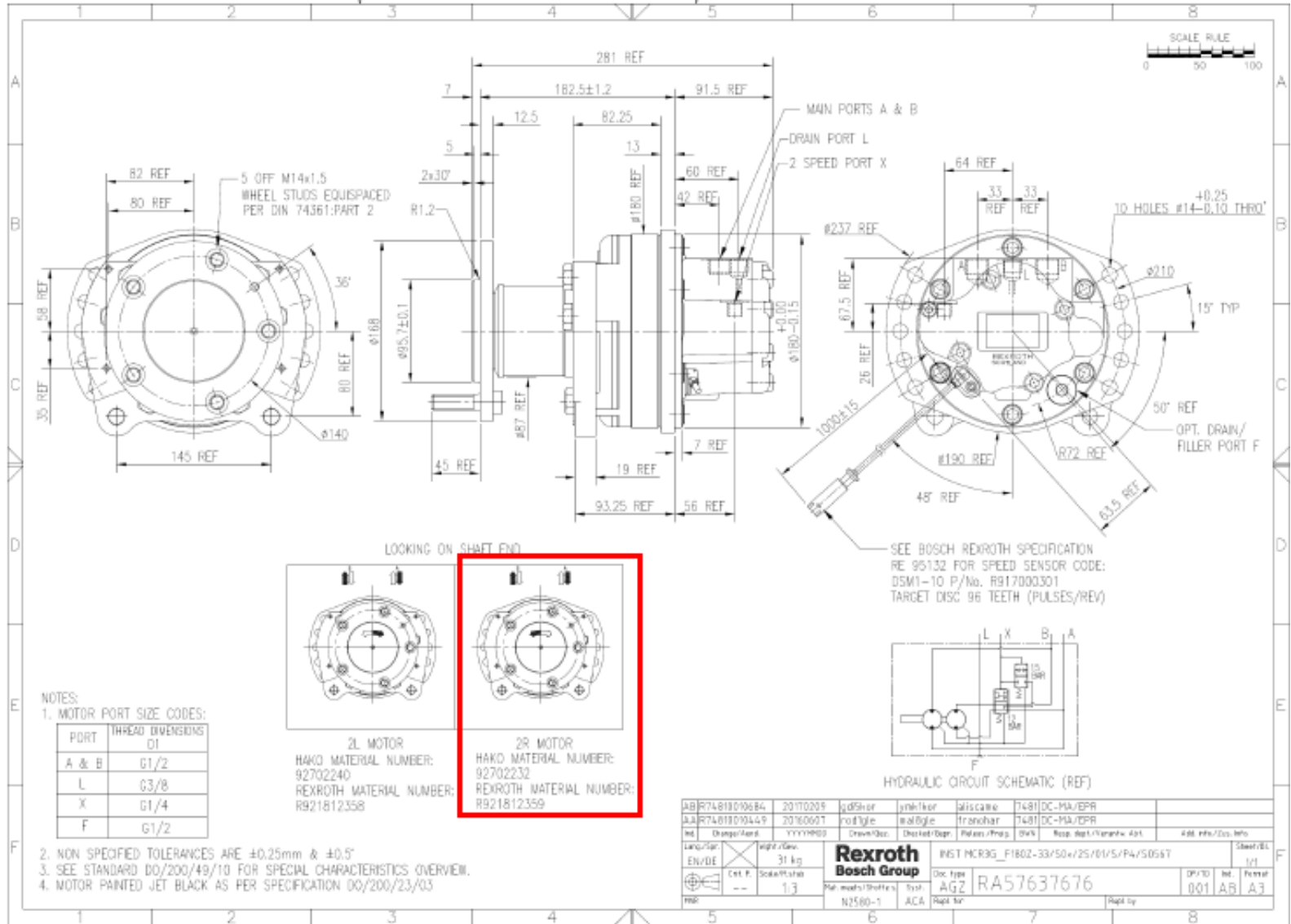
- FR = Drive direction
- Ps = Control pressure (n.c.)
- T2 = Tank connection 2 (n.c.)
- Mb = Mesuring pt. revers
- G = Feed oil outlet
- Ma = Measuring pt. forward
- A = Forward
- B = Revers
- T1 = Tank connection 1
- Fa = Filter feed oil forw. (n.c.)
- Fe = Filter feed oil rev. (n.c.)
- X1 = Y4 to Y1
- X2 = Y3 to Y1
- X3 = Y1 to swivel chamber A
- X4 = Y1 to swivel chamber B
- R = Leak oil (n.c.)
- Mh = Pump to HET
- S = Suction connection
- 1 = Cut-off valve
- 2 = Pressure release forward
- 3 = Pressure release revers

(n.c.) = not connected



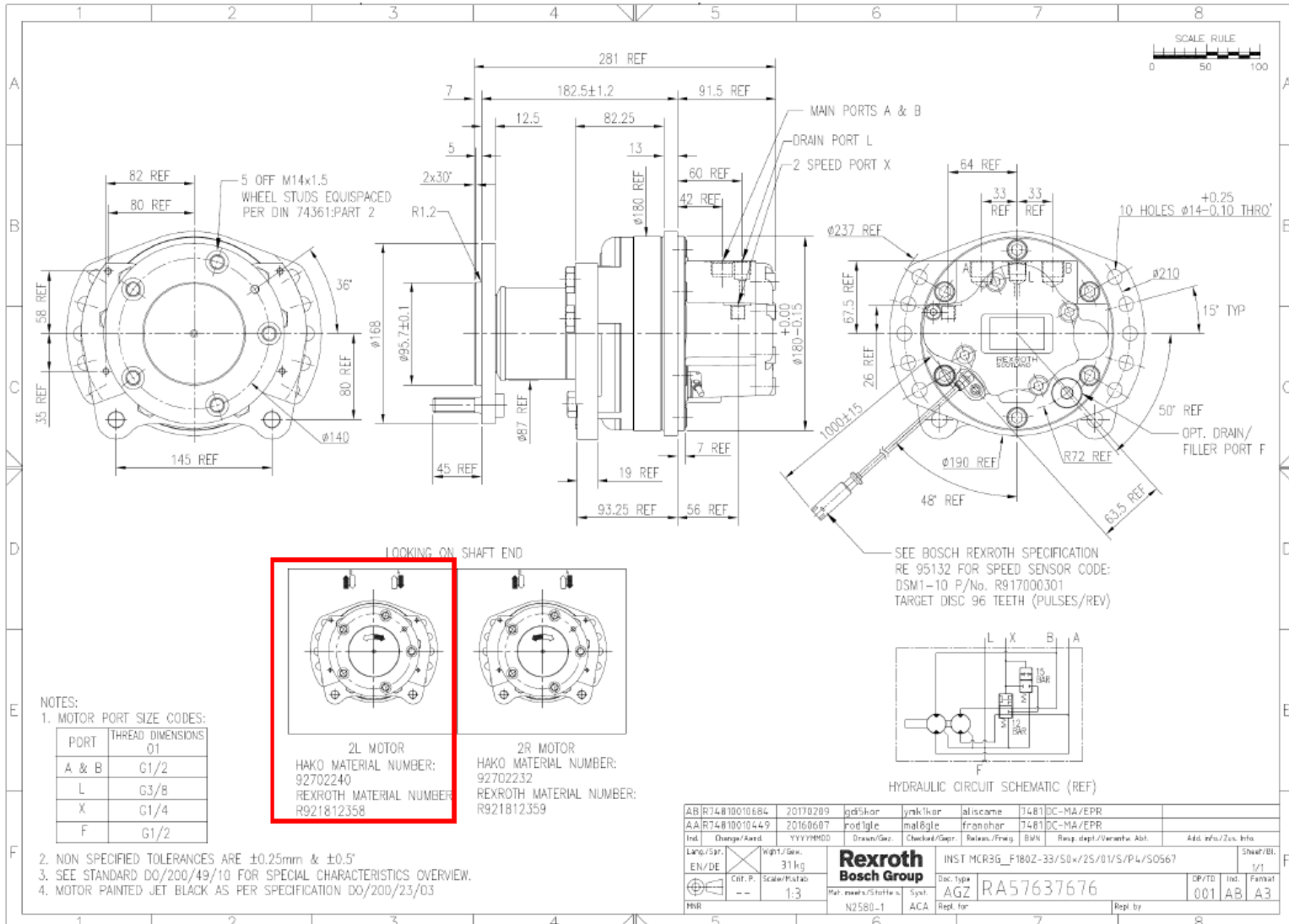
### 5.01 Fahrhydraulik - Drive Hydraulics

#### Wheel motor FR front right 01498350 (SN92702232) MCR3G\_F180Z-33/S0\*/2S/01/S/P4/S0567 (R921812359)



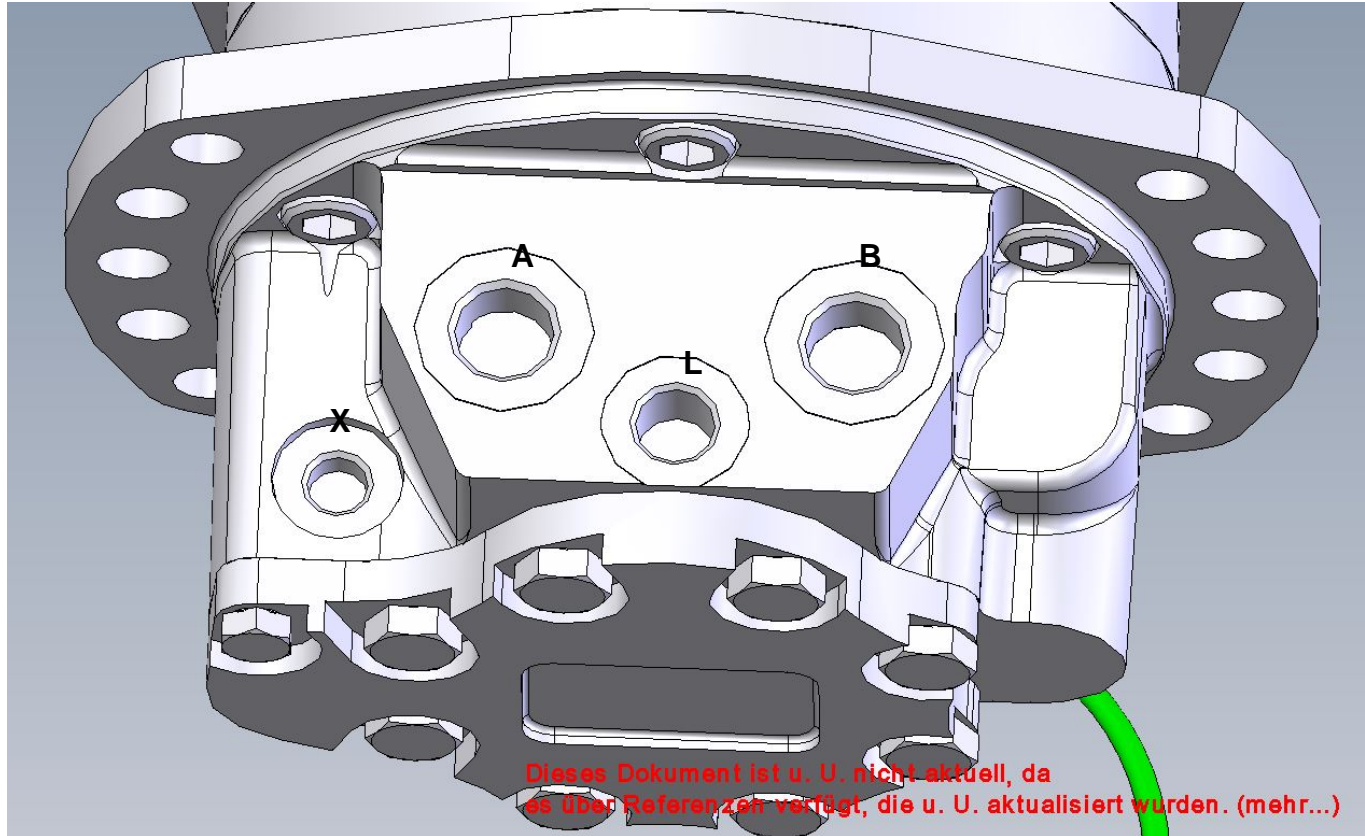
# 5.01 Fahrhydraulik - Drive Hydraulics

## Wheel motor FL front left 01498460 (SN92702240) MCR3G\_F180Z-33/S0\*/2S/01/S/P4/S0567 (R921812358)



## 5.01 Fahrhydraulik - Drive Hydraulics

### Overview of the connections at the front wheel motors

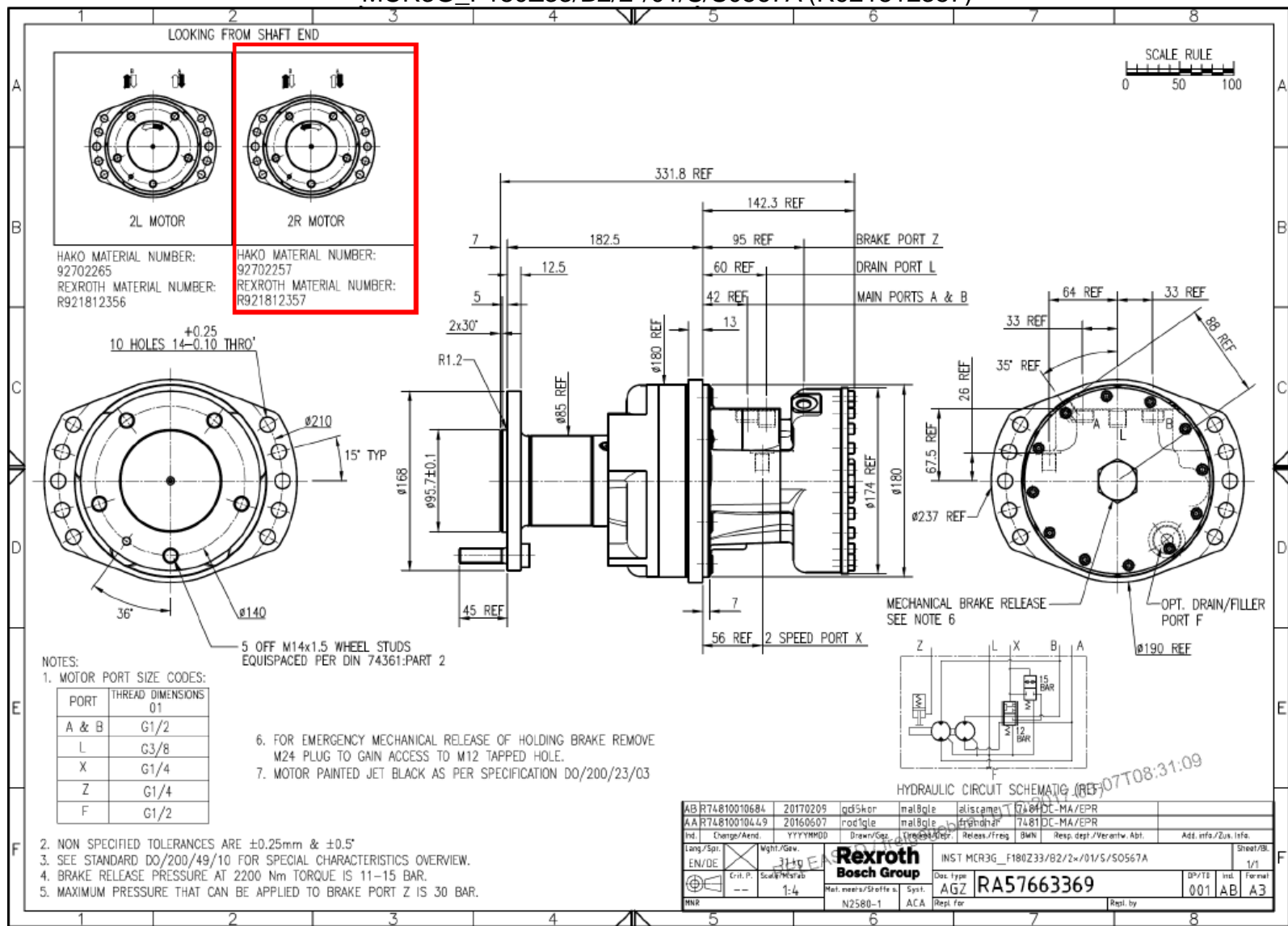


A = Forward    B = Revers    L = Leak oil    X = Switch over 1./2. drive stage

# 5.01 Fahrhydraulik - Drive Hydraulics

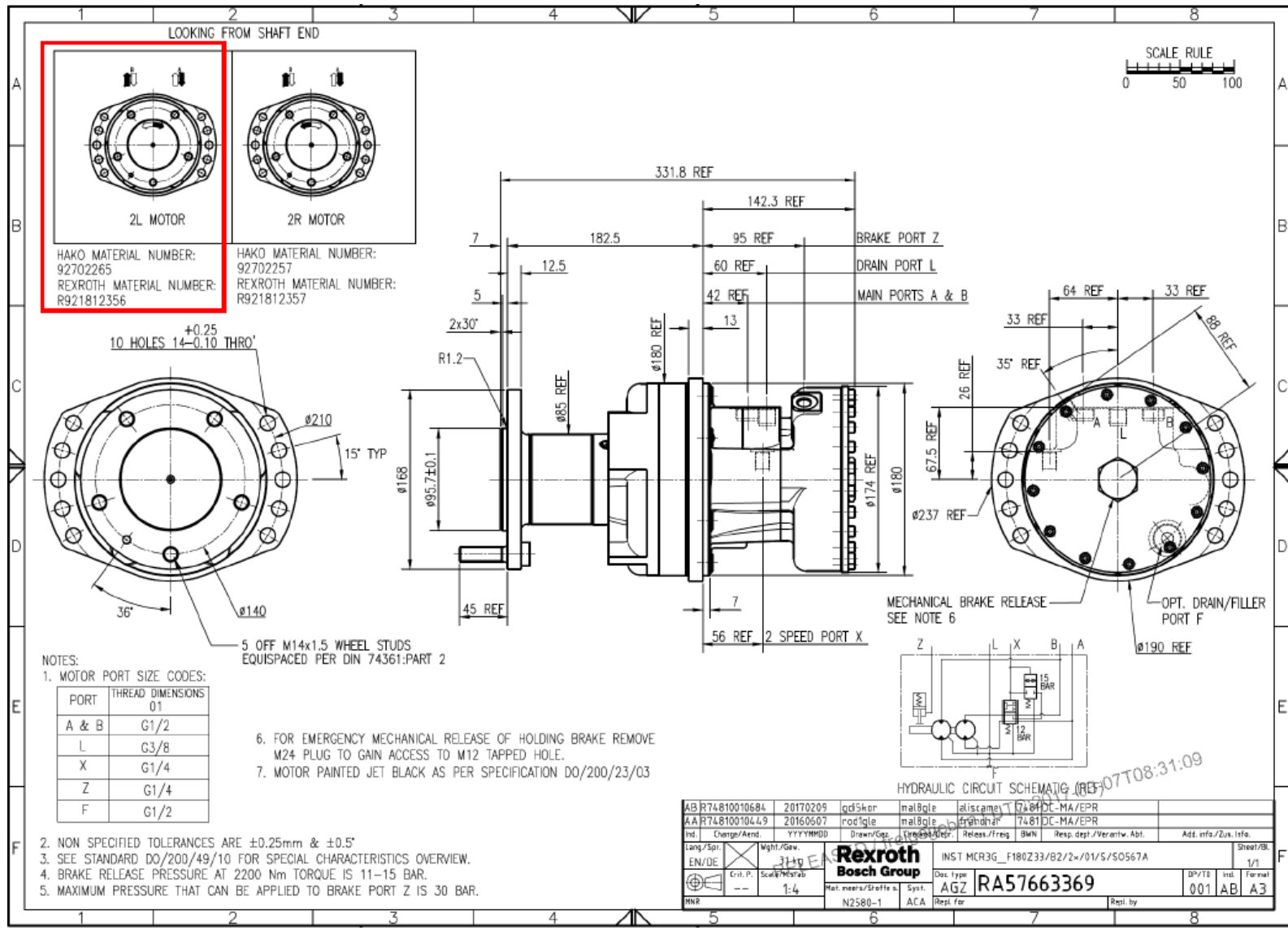
## Wheel motor RR rear right 01498570 (SN92702257)

MCR3G\_F180Z33/B2/2\*/01/S/S0567A (R921812357)



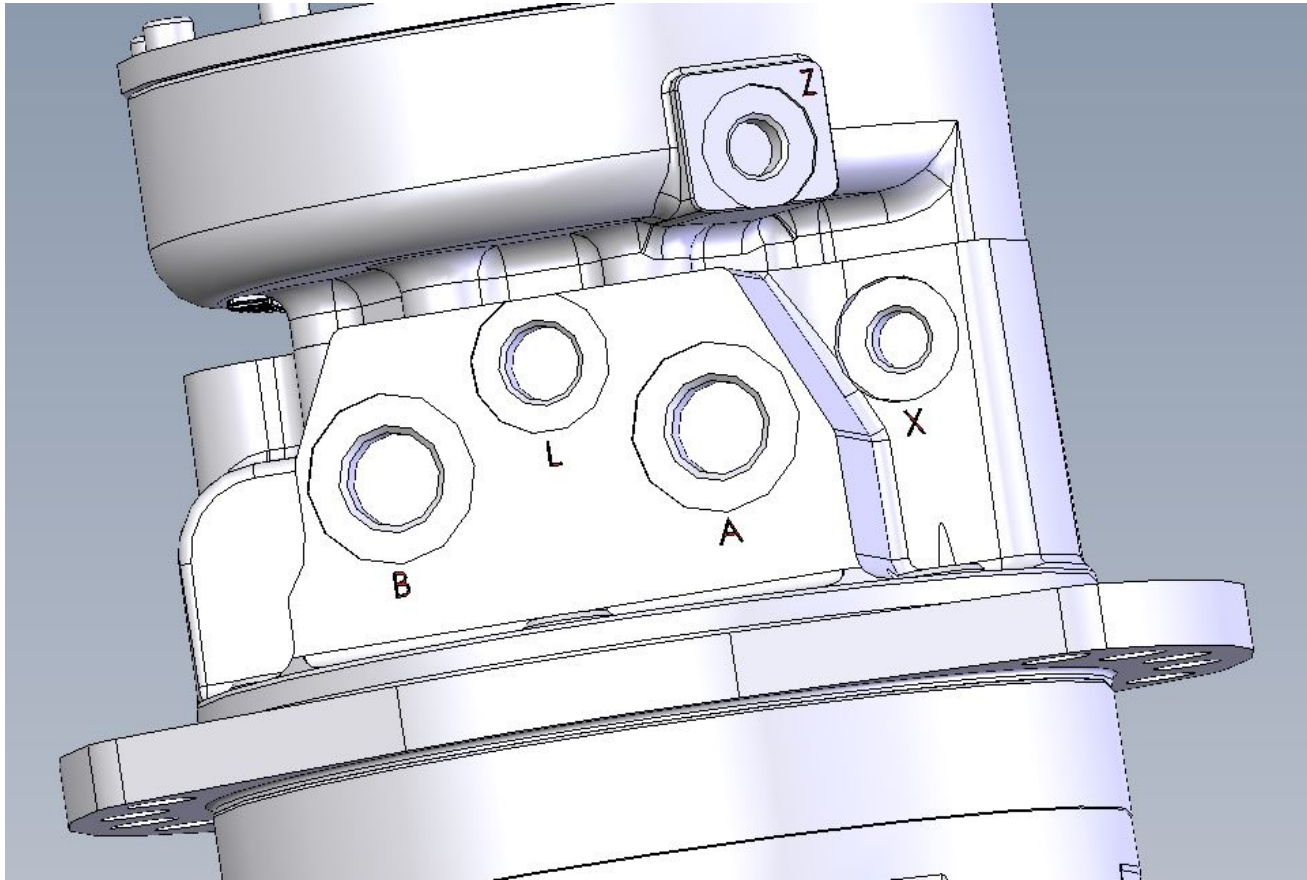
# 5.01 Fahrhydraulik - Drive Hydraulics

## Wheel motor RL rear left 01498680 (SN92702265) MCR3G\_F180Z33/B2/2\*/01/S/S0567A (R921812356)



## 5.01 Fahrhydraulik - Drive Hydraulics

Overview of the connections at the rear wheel motors



**A = Forward    B = Revers    L = Leak oil    X = Switch over 1./2. drive stage    Z = Brake connector**

# 5.01 Fahrhydraulik - Drive Hydraulics

## HET- block with flushing valve 1490110

Bosch- Rexroth Type: OFE19106BS0100

**TECHNICAL DATE**

Max. Pressure	380 bar
Max. Flow	30 l/min
Ports A-B-C1-C2-Flap-Mc	G 1/2 (ISO 1179-1)
Manifold Material	Zinc-Plated Steel
Fluid	Mineral-based or synthetics with lubricating properties of viscosities of 10 to 500 mm²/s (cSt)
Fluid temperature range	-20°C to +80°C (-4°F to +176°F)
Filtration	ISO 4406 13/17/14
Internal Leakage	See catalog for details (PGH3 RT 3014-03)
Sealing Material	NBR / FKM
Mounting Position	Unrestricted

**SMONTARE TAPPO PER INSERIRE GRANO D=2,4 (R909444361)**

**N.B. : MARCARE LA SCRITTA "C-SAMPLE"**

**Scheme Hydraulic**

**Typ: OFE19106BS0100**

Pos.	Code/Code	Description/Description	Q. (l/min)	C.B. / I.T.
1	1801031000000	MANIF. TO B. 1.2 L/MIN	2	
2	2300185300000	FILTRAZ. DC/DC 130/15-33-65	1	
3	0100100000000	VALV. 4/3	2	8 Nm
4	05004400000	ORIF. 2.4x0.2 20x12-010-1	1	
5	05000000000	VALV. 4/3 20x12-010-1	1	
6	0431200390000	VALV. 3/2 20x12-010-1	2	34 - 41 Nm
7	0411180390000	VALV. 3/2 20x12-010-1	2	45 - 50 Nm
8	0431200390000	VALV. 3/2 20x12-010-1	2	34 - 41 Nm
9	0411180390000	VALV. 3/2 20x12-010-1	2	45 - 50 Nm
10	0431200390000	VALV. 3/2 20x12-010-1	2	34 - 41 Nm
11	0411180390000	VALV. 3/2 20x12-010-1	2	45 - 50 Nm

**Tabella Distributori**

1801031000000	MANIF. TO B. 1.2 L/MIN	2
2300185300000	FILTRAZ. DC/DC 130/15-33-65	1
0100100000000	VALV. 4/3	2
05004400000	ORIF. 2.4x0.2 20x12-010-1	1
05000000000	VALV. 4/3 20x12-010-1	1
0431200390000	VALV. 3/2 20x12-010-1	2
0411180390000	VALV. 3/2 20x12-010-1	2
0431200390000	VALV. 3/2 20x12-010-1	2
0411180390000	VALV. 3/2 20x12-010-1	2
0431200390000	VALV. 3/2 20x12-010-1	2
0411180390000	VALV. 3/2 20x12-010-1	2

**GRUPPO INTEGRATO ACC.**

Descrizione	Gruppo Integrato Acc.	Disegnato/Disegnato by	PRM / G. Di / G. Di	Disegnato/Disegnato by	PRM / G. Di / G. Di
Disegnato/Disegnato by	PRM / G. Di / G. Di	Disegnato/Disegnato by	PRM / G. Di / G. Di	Disegnato/Disegnato by	PRM / G. Di / G. Di
Disegnato/Disegnato by	PRM / G. Di / G. Di	Disegnato/Disegnato by	PRM / G. Di / G. Di	Disegnato/Disegnato by	PRM / G. Di / G. Di

**Rexroth Bosch Group**

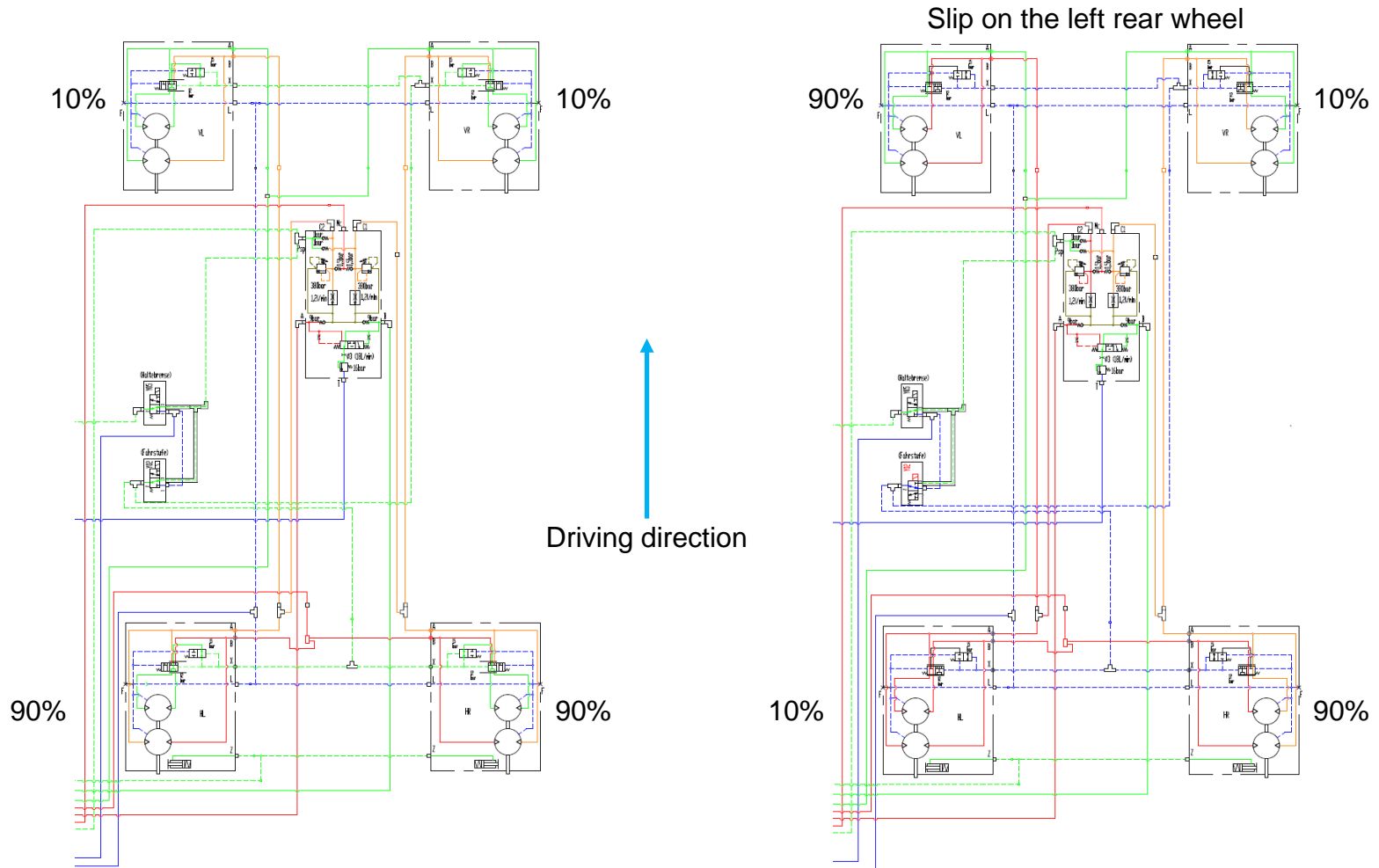
**ISO**

## 5.01 Fahrhydraulik - Drive Hydraulics

### HET- block with flushing valve 1490110

Bosch- Rexroth Type: OFE19106BS0100

The HET valve (highly efficient traction control) is a slip-activated four-wheel drive. The normal distribution is 90% of the torque is used at the rear axle and the remaining 10% is used at the front axle. The right and left drive sides turning independently. If one or both rear wheels slip, the torque transfer to the front wheel(s).





## 5.01 Fahrhydraulik - Drive Hydraulics

**Fault: The vehicle does not drive or only slowly. The vehicle has no tractive power.  
The transport speed of 40 km/h is not reached.**

### Possible cause:

1. The bypass valve for towing is not closed.
2. The air filter is dirty, the Hatz engine does not reach the full engine speed. The dirt indicator on the air filter is in the red range.
3. The fuel filter is dirty, the Hatz engine does not reach the full engine speed.
4. The accelerator pedal angle sensor B09 is not correctly adjusted. The final speed of the Hatz engine is not reached.  
Example: Error code message in the display,  
1.8.1.0
5. Read out the service information (error messages) for the drive control unit A03 with the aid of the diagnosis.
6. Read out the error memory of the Hatz engine control unit.  
In addition check the charge air pressure of the turbocharger and the load condition of the diesel particle filter.

### Remedy:

1. Close the bypass valve for towing.
2. Check the engine speed, check the dirt indicator on the air fan. Check the air fan for dirt, if necessary replace the dirty air filter.
3. Check the engine speed, check the fuel filter for dirt, if necessary replace the fuel filter.
4. Check the adjustment of the accelerator pedal angle sensor B09. Check the power supply of B09. Check the B09, replace if necessary.
5. Evaluate and access the service information, if necessary check components and cables.
6. Evaluate and access the error messages, if necessary check components and cables.

## 5.01 Fahrhydraulik - Drive Hydraulics

**Fault: The vehicle does not drive or only slowly. The vehicle has no tractive power.  
The transport speed of 40 km/h is not reached.**

### Possible cause:

7. The feed pressure (charge pressure) of 20 bar is not reached or is permanently below 20 bar under load.

**Note: If the feed pressure (charge pressure) of 26 bar is not reached or collapses under load, the necessary high pressure of**

**330 bar can also cannot be built up.**

**If the high pressure is not built up, the final speed is not reached and the machine no longer has any tractive power.**

### Remedy

7. Check the drive hydraulic oil pressure at the measuring points for the drive pump.

For the test, apply the parking brake and block the wheels or fix the machine with a chain or wire rope to a fixed point.

Go to forwards drive with the machine and check the hydraulic oil pressure.

Feed pressure 26 bar; must not collapse permanently!

High pressure max. 330 bar

**Caution – risk of accident; observe the safety regulations!**

As a rule, a too low feed pressure indicates worn components of the drive. The leakage oil volume (e.g. of the wheel motors) is so high due to wear that the oil losses of the components can no longer be replaced by the feed pump. The feed pressure then collapses and the high pressure can no longer build up.

## 5.01 Fahrhydraulik - Drive Hydraulics

**Fault: The vehicle does not drive or only slowly. The vehicle has no tractive power.  
The transport speed of 40 km/h is not reached.**

Possible cause:

8. The leakage oil volume in the components such as wheel motors or drive pump is too high.

Remedy:

8. If the necessary feed pressure and the necessary high pressure are not reached, jack the machine up safely on all 4 wheels. Not more than 0,18l hydraulic oil per minute should escape at the leakage oil pipes of the wheel motors with the accelerator pedal pushed down. If the leakage oil volume at one wheel motor is higher, then replace the wheel motors on the affected side in pairs

If no increased leakage oil volume is found at the wheel motors, then close the outputs of the drive pump with plates and check the hydraulic oil pressure of the drive pump.

Feed pressure (charge pressure) 26 bar

High pressure max. 330 bar

If the necessary pressures are now not reached, replace the drive pump.

**Caution! Perform all necessary measurements with warm hydraulic oil (at least 50°C)!**

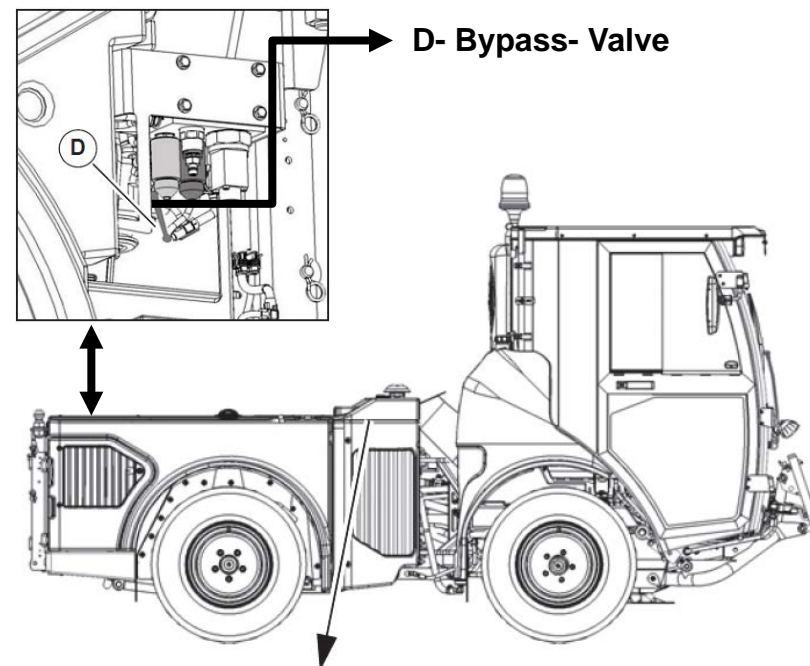
## 5.01 Fahrhydraulik - Drive Hydraulics

### Towing the vehicle

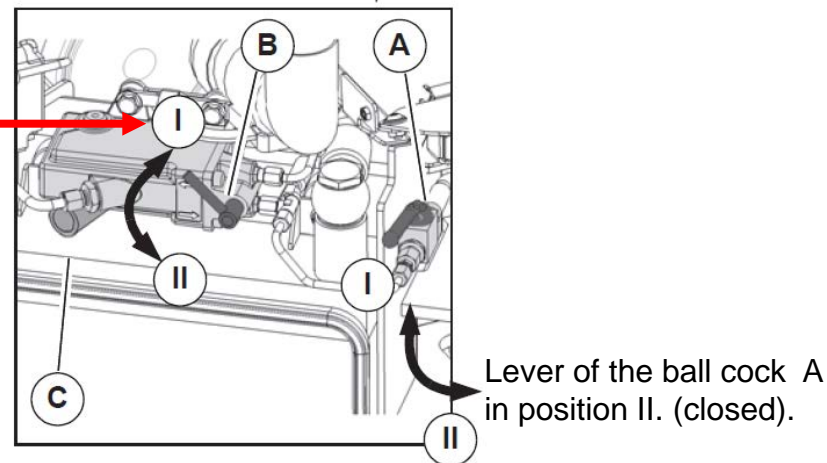
**The parking brake (rear wheels) is blocked, if the engine is off!**

Proceed as follows for towing:

- Lever of the ball cock A in position II. (closed).
- Lever of the hand pump B in position I.
- Insert the tool in the hand pump and pump so long (approx. 20 times) until the parking brake is released.
- Open the travel drive ball cock D (bypass valve) in the rear waggon on the left.



Lever of the hand pump B in position I.



Lever of the ball cock A in position II. (closed).

## 5.01 Fahrhydraulik - Drive Hydraulics

**You will find further information about the drive hydraulics under:**

- 5.0.1 Traction hydraulics (Travel/Drive) CM1650
- 5.0.2 Hydraulic functional circuit diagram (Drive) CM 1650, A3
- 5.0.3 Hydraulic circuit diagram CM1650, A3
- 5.0.4 Initiation of the drive controller CM1650
- 5.0.5 Drive calibration CM1650
- 5.0.6 Error messages Bodas CM1650
- 5.0.7 Process data CM1650
- 5.0.8 Bosch – Rexroth HET- Unit
- 5.0.9 OM drive pump
- 5.0.11 OM wheel motors CM1650
- 5.0.12 Drive pump mounting
- 5.0.13 SPM wheel motors CM1650
- 5.0.14 Symbols in hydraulic circuit diagrams