

COSBER



USER MANUAL

Car Play Detector

COSBER C-PD3x Serie

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1 Specifications

1.1 Mechanical Unit

Type		C-PD3x
Dimensions of the test plates (WxDxH)	Pit-Version (P-Version)	600x500x56 mm
	Lift-Version (L-Version)	500x500x56 mm
Dimensions of friction plates		500x270 mm
Maximum axle weight		2,600 kg
Recommended track width		1000 - 2000 mm
Coefficient of Friction of Friction Plate		$\mu = 0.5$
Movement laterally (left – right, counter-rotating)		80 mm
Movement longitudinal (forward – backward, counter-rotating and parallel)		50 mm
Speed		50 mm/sec.
Maximum horizontal force from each plate		8,000 N
Corrosion protection		galvanized

1.2 Hydraulic unit

The hydraulic power unit must be mounted near the test plates.

Maximum line length of hydraulic hoses: < 10 m.

Built-in remote control with lamp for visual inspection

Type	C-PD3x
Maximum hydraulic pressure	240 bar
Menge Hydrauliköl	5.8 liters
Quality Hydraulic Oil	Hydrokomol U32
Alternatively	ISO-L-HM 32 or DIN-HLP 32

For an operating environment where the temperature can drop below 0°C for a long period of time (outdoor mounting), the U10 quality is recommended.

1.3 Electrical Dating

Type	C-PD3x
Bus bar	3x400 V, 50 Hz/PE, 10 A
Protection class of the electrical control cabinet	IP 54
Motor protection class	IP 55
Protection class of the lamp	IP 23
Control voltage	24 V DC

Voltage / Power Halogen Lamp		12 V 20 W
Hedge	Primer	2 x 800 mA (6.3x32)
	Secondary	2 x 2A (5x20)
Electric motor power		1.1 kW
Lamp type		PHILIPS 12 V 20W 360

1.4 Transport

Type	C-PD3x
Transport weight (net / gross)	110/130 kg
Packaging dimensions (WxDxH)	1200x800x450 mm
Packaging	Transport box on EU pallet

2 Construction

2.1 Test plates

The axle play tester was developed for testing the steering and wheel suspension parts of passenger cars and trucks with an axle load of up to 2600 kg (1300 kg per wheel). The mechanical parts were designed for industrial testing operations.

The test is carried out with two separate plates. The surface consists of two interchangeable tear plate plates. If installed correctly, vehicles with track gauges of 1000 to 2000 mm can be tested.

The welded steel structure contains hydraulic cylinders, movable test plates, side cover plates and all other components for efficient chassis testing.

There are two different versions:

- Model C-PD32L has side-mounted hydraulic ports on the exterior. This setup is recommended for mounting on 4-post lifts
- The Model C-PD32P has downward-facing hydraulic ports on the inside. This setup is recommended for mounting next to a working pit.

For installation **on the ground**, the optionally available access ramps are recommended.

However, we recommend that you coordinate the exact selection of the design with your COSBER partner before ordering and installation: This decision is also subject to local conditions.

The base plate is equipped with a variety of different mounting holes. This makes it easy to select the fastening on the lifting platform or for pit assembly.

2.2 Controller

The control unit is combined with the hydraulic power unit in one unit.

The control unit contains all the necessary control and protection equipment. The remote control with the indicator light is connected there.

The appendix to the instruction manual contains the electrical and hydraulic connection diagram.

Installation is recommended as follows:

- 4-post lift: At the column closest to the vehicle steering
- Scissor lift: Close to the stage control
- Pit: On the pit wall near the test plates
(max. hydraulics – note hose length of < 10 m)

Depending on the agreement with our sales and service partners, 4 x 1.8 m and 4 x 4 m pre-assembled hydraulic hoses are included in the scope of delivery.

3 Installation



WARNING!

PLEASE BE SURE TO FOLLOW THESE INSTALLATION INSTRUCTIONS. IF THE SYSTEM IS SWITCHED ON WITH THE POWER SUPPLY AND HYDRAULIC HOSES CONNECTED, THE TEST PLATES MAY AUTOMATICALLY RETURN TO THE STARTING POSITION – DEPENDING ON THE SETTING OF THE REMOTE CONTROL.



ATTENTION!

DO NOT TURN ON THE SYSTEM DURING INSTALLATION WORK ON THE PANELS

3.1 Test Plates / Mechanics

- Position the test plates according to the marking – "L" for "left plate" and "R" for "right plate" at the installation site (pit, lifting platform) at the same height and at right angles to the direction of travel.
- The distance from the center of the road must be adjusted according to the vehicles to be tested and their wheel spacing.
- For installation, the covers must be removed beforehand. At least 2 holes, preferably 4 in both test plates, should be used for fastening. Please use the best fitting existing mounting holes in the base plate of the mechanism. For exact drilling, the base plate can be used as a marking template.
- When drilling, use an extraction device for drilling dust. To fasten the plates, please use dowels in the holes and spring washers with screw nuts.
- After moving the test plates to the rear position, the front screws can be inserted and tightened.

3.2 Controller

- Mounting location:
 - For 4-post lifts, it is recommended to mount them at the column closest to the vehicle steering.
 - For scissor lifts, it is recommended to install them next to the stage control.
 - When mounting in a working pit, it should be done either on the end wall in the pit or outside it on the wall.
- Drill the mounting holes at the desired position and a 12 mm masonry drill bit
- Mounting on the wall is done with 4 pieces of wall dowels 12 x 60 mm and 4 pieces of self-tapping hexagon screws for wood and spring washers. Connect the power supply from above through the stuffing box. 8 x 60

3.3 Routing of hydraulic hoses

- Connect all high-pressure hoses to the hydraulic unit.
- Connect the opposite ends of A1, A2, A2, A3 to the opposite terminals B1, B2, B2, B3 using the connectors.
- Run the hydraulic power unit and check the correct rotation of the pump motor.
- Let the pump run for about 1 minute.
- Remove the A1 B1 hoses from the connectors and connect them to the appropriate connections on the test plates.
- Repeat this procedure with all connecting hoses.
- Check the pressure and the pressure adjustment device.
- After the correct connection of all hydraulic connections, the hoses can be professionally laid on the wall.



FOR INSTALLATION ON A LIFT, PLEASE READ AND OBSERVE THE FOLLOWING INSTRUCTIONS

WARNING!

- The permission of the stage manufacturer is required.
- Installation is recommended on 4-post or scissor lifts.
- Mounting on special 2-post lifts with roadways is possible but not recommended.
- When mounting on scissor lifts or lifts with roadways, make sure that the roll-off protection and the crossbars are attached at the back and front between the two separate lanes of the lift.
- When the axle play testers are activated, lateral and longitudinal forces of up to 8000 N occur. The absence of crossbars thus increases the bearing load and the attachment of the platform to / in the ground.

4 Safety

- The use of the safety instructions in this instruction manual prevents dangerous situations and injuries to people and equipment.
- The test bench may only be operated by trained personnel.
- The statutory accident prevention regulations must be observed.
- Use the test bench and its parts only for their original purpose and in accordance with the operating instructions.
- The work on the electrical part of the system may only be carried out by trained electricians.
- When the device is switched on, the test plates can move to the starting position depending on the position of the remote-control lamp.
- Moving test plates and vehicle parts is dangerous. Touching during operation is therefore prohibited.
- Do not remove any covers, mechanical or electrical, during operation.
- Close all doors of the vehicle to be tested.
- If the vehicle is on the axle play tester, no repairs may be carried out on the vehicle.
- Lock the vehicle in the test position with the handbrake.
- The noise emission value caused by the test bench is less than 70 dB (A) around the operating personnel.
- The axle play tester contains hydraulic oil. When operated in accordance with the regulations, there is no contact with the oil. If the user nevertheless meets hydraulic oil, e.g. in the event of an accident or defect, first aid must be provided in accordance with DIN 52900.

Enclosed is an excerpt:

- Skin: Wash oil-wet skin areas with soap and water
- Eyes: Rinse with plenty of water for at least 10 minutes. Possibly see a doctor
- Ingestion: Do not induce vomiting! Give about 25-50 g of medical charcoal and 5 to 10 g of Parafinum Liquidum. Do not induce artificial vomiting!

5 Preparations

5.1 Mechanical test plates

Check the mechanical plates, fittings, hydraulic hoses and covers for integrity. Ensure the obstacle-free exit and entry of the vehicle to be tested. Have the brake pedal lock ready.

5.2 Electronics

Check all connections and covers of the electronics box, the remote control with lamp and all electrical cables for integrity. Turn on the main switch and test the remote control with the lamp by turning on the switch on the lamp.



DANGER!

ALL HYDRAULIC VALVES ARE MONOSTABLE. AFTER SWITCHING ON THE LAMP AND THE PUMP, THE MOVABLE PLATES RETURN TO THE HOME POSITION.

THEREFORE, THE PLATES MUST NOT BE TOUCHED DURING AND WHEN SWITCHED ON.

5.3 Preparation of the vehicle test

Carefully enter the test area (pit or lift) and make sure that the centre of the vehicle is in line with the centre of the pit / lift. The vehicle to be tested must be positioned so that both wheels are in the middle of the test plate. Set the gearbox to the neutral position and turn off the vehicle's engine!

Apply the handbrake and use the pedal lock to press down on the service brake pedal. For the test, the pedal brake keeps all wheels of the vehicle in the braked state via the service brake.

Check the tire pressure and, if necessary, adjust it correctly according to the manufacturer's instructions!

Turn on the test lamp (the hydraulic power unit will start working). This prepares the vehicle, and the axle play tester for the test.



HINT!

DO NOT KEEP THE HYDRAULIC POWER UNIT IN OPERATION LONGER THAN NECESSARY. HYDRAULIC OIL CAN OVERHEAT AND ENERGY IS ALSO CONSUMED UNNECESSARILY.

6 Operation / Test Functions

COSBER axle and articulation play testers are designed for testing the wheel suspension and steering elements of road vehicles. The test movements on the split plates are asymmetrical: the test movements each comprise 80 mm transverse movement and 50 mm longitudinal movement forward and backward on both sides. Longitudinal movements can also be carried out in parallel.

The test plates with the ribbed steel cover have a friction coefficient of approx. 0.5. For wet tires, this design increases the efficiency of the test.

The axle and joint play tester is operated via a special remote control with a built-in test lamp (see also Figure 1).

Description of the controller:

No.	Kind	Image	Description
(1)	Press stud		Starts the movement of the test plate
(2)	Switch		Pre-selection of the three different test movements
(3)	Switch		
(4)	Switch		Switches the hydraulic power unit and the lamp on and off.
			

After completing the test, we recommend switching off the tester with switch no. 4 to prevent possible overheating of the hydraulic oil and to reduce energy consumption.

Only one type of test movement can be set at a time.

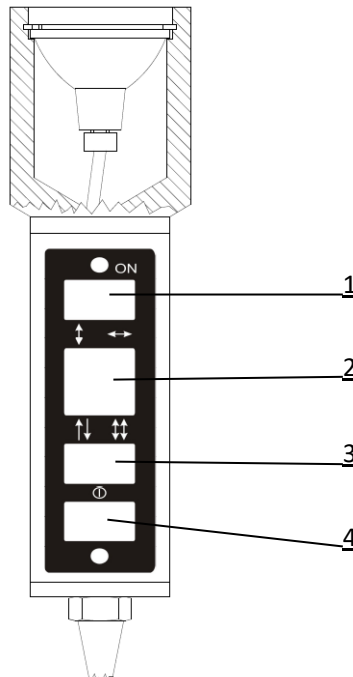


Image 1. Remote control with test lamp

6.1 Longitudinal movement (parallel) on the left and right side

Selection of longitudinal movement (parallel) via switch 3 () and switch 2 (). Button 1 is used to start the parallel movement. The plates move to the end position. By releasing the button, both disks move parallel back to the starting position.

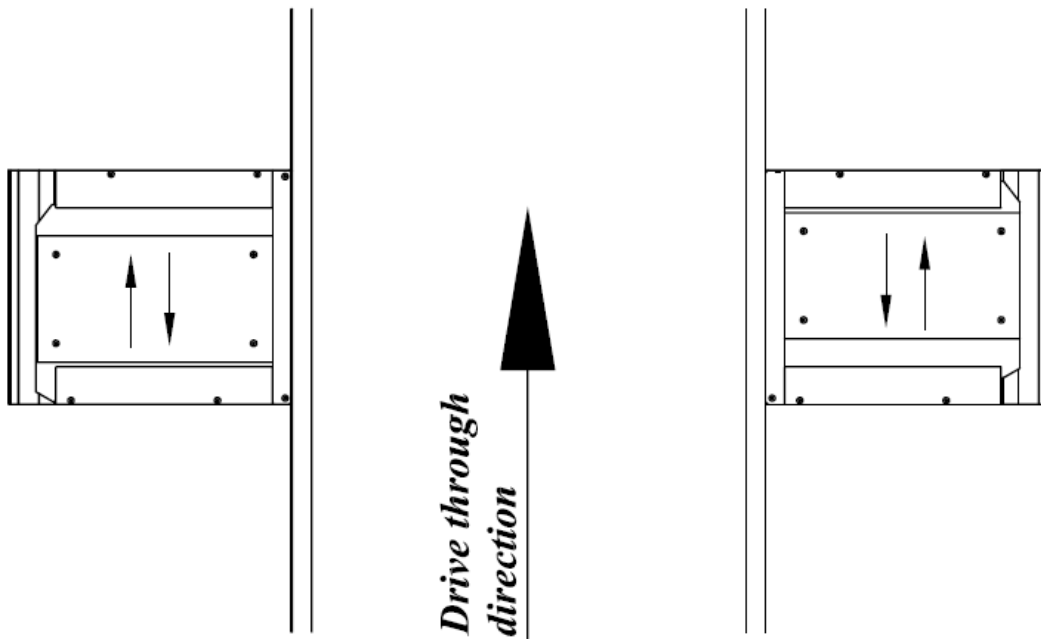


Image 2

6.2 Longitudinal movement (counter-rotating) on the right side and left side

Selection Longitudinal movement (counter-rotating) via switch 3 () and switch 2 (). The right test plate now moves to the end position. Probe 1 starts the counter-rotating movement of the test plates. After releasing the button, both disks move back to the starting position

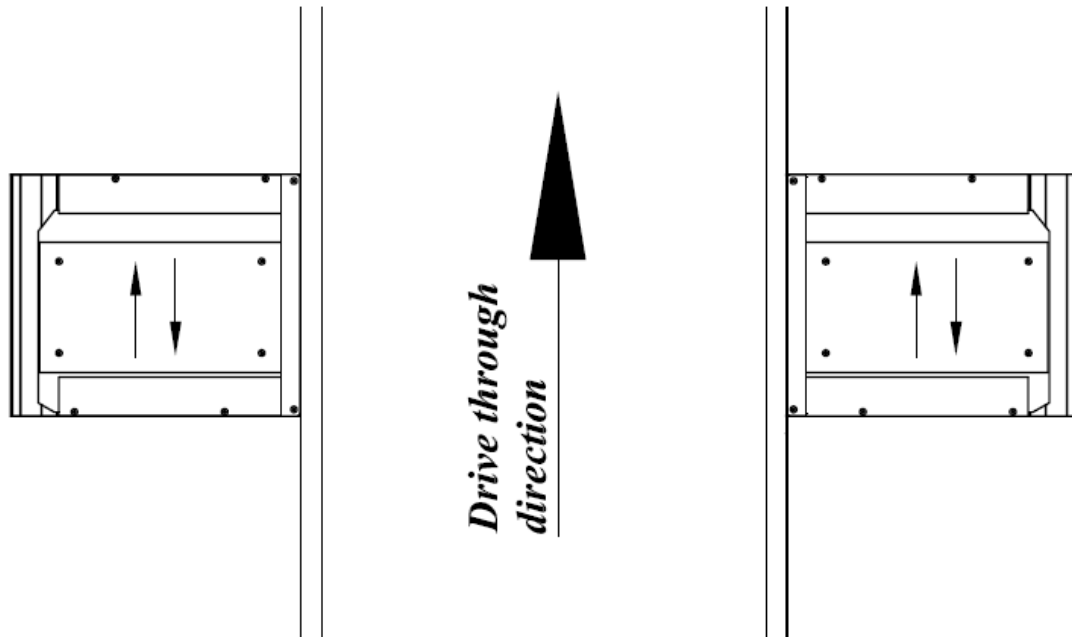


Image 3

6.3 Transverse movement (in opposite directions) on the right and left side

Switch 3 does not affect this movement. Selection of transverse movement via switch 2 (). By pressing button 1, the counter-rotating transverse movement is started. After releasing the button, both disks move back to the starting position

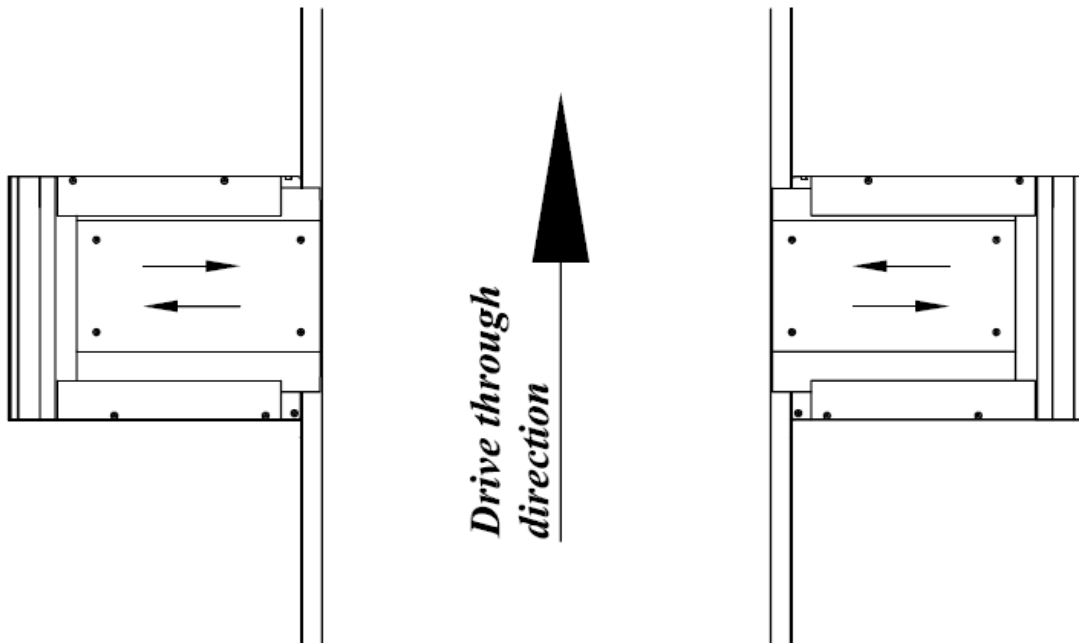


Image 4

7 Test description

7.1 Lateral movements

During the transverse movement, the panels are each moved 80 mm (total 160 mm) in opposite directions. After releasing the probe 1, the test plates move back to the starting position.

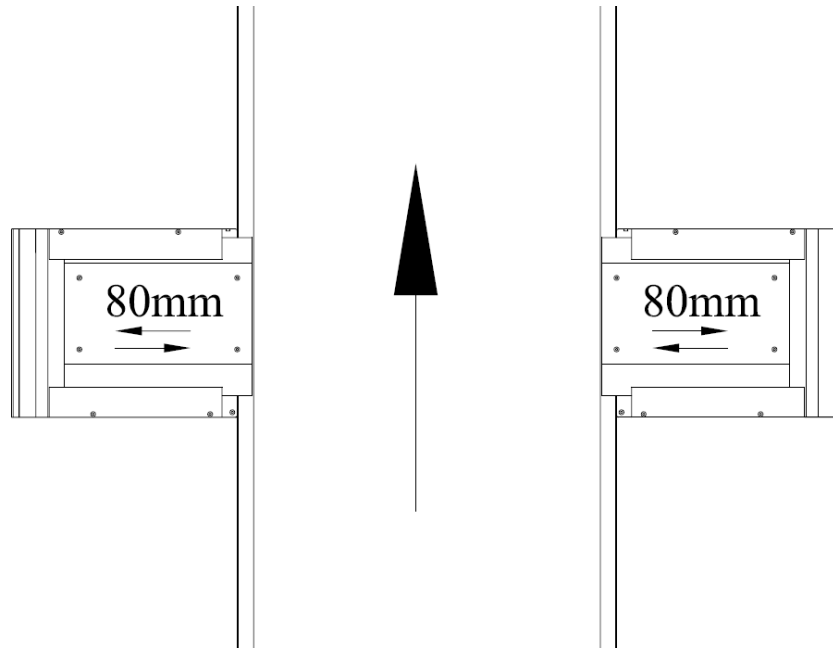


Figure 5.

This movement presses both wheels against each other and generates a force towards the center of the wheel and the outside of the wheel. Kingpin wear **[picture 6-7]** and clearance are always on the inside. When pressing the wheels, you can see play at the beginning of the movement and when changing direction. Frequent changes of direction can be achieved by quickly pressing the operating button 1. Faulty bearings and swing arms **[Fig. 6]** as well as steering elements can be tested with it. The upper steering elements can be seen much better at the end of the movement. Press the operating button until the end of the movement is reached (wheels are pressed towards the centre of the vehicle) and relieve for a short time.

If the tires are set to the correct air pressure, 80 mm of movement on one side is more than the tire flexibility. The wheels are pressed together and slide on the ribbed steel plate at the end of the backward movement **[Fig. 7-8]**. This allows the anti-roll bars to be checked. The transverse movement allows the testing of backlash and wear on different types of bearings **[Fig. 9-10-11]**.

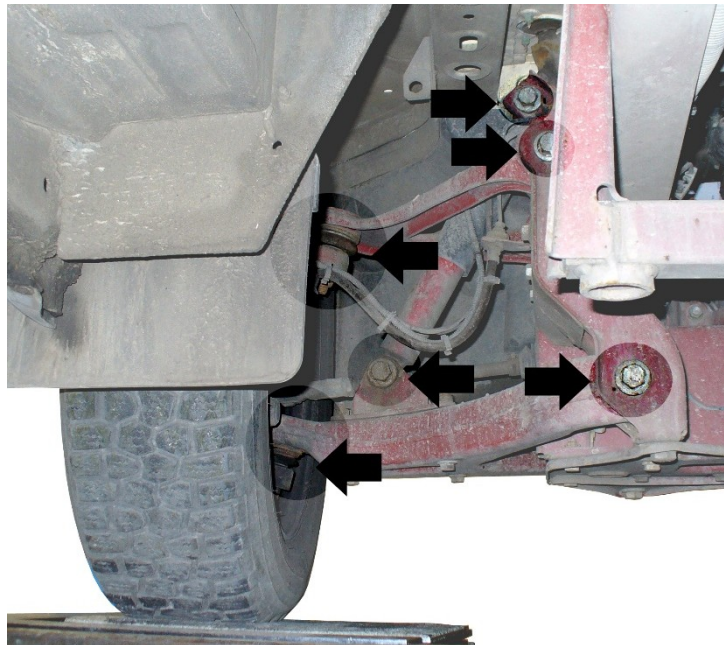
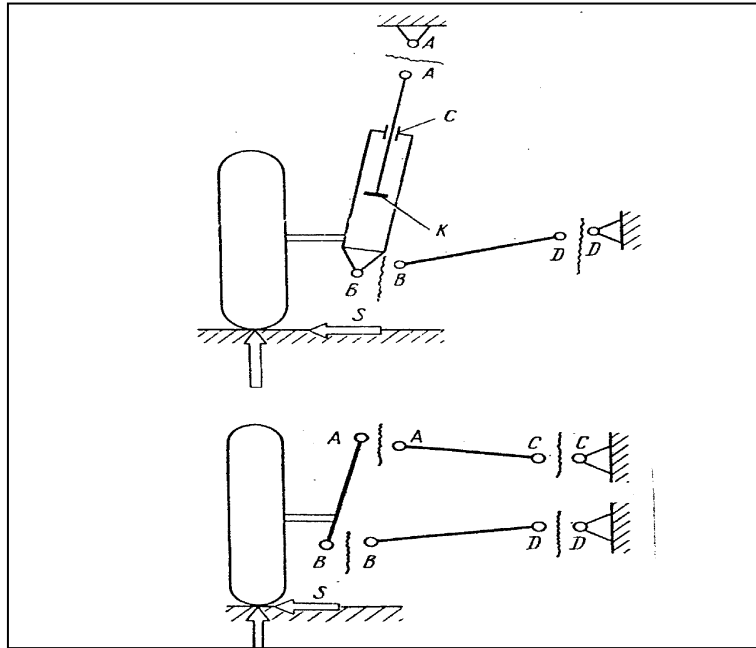


Figure 6. Testing the damping elements during transverse movement

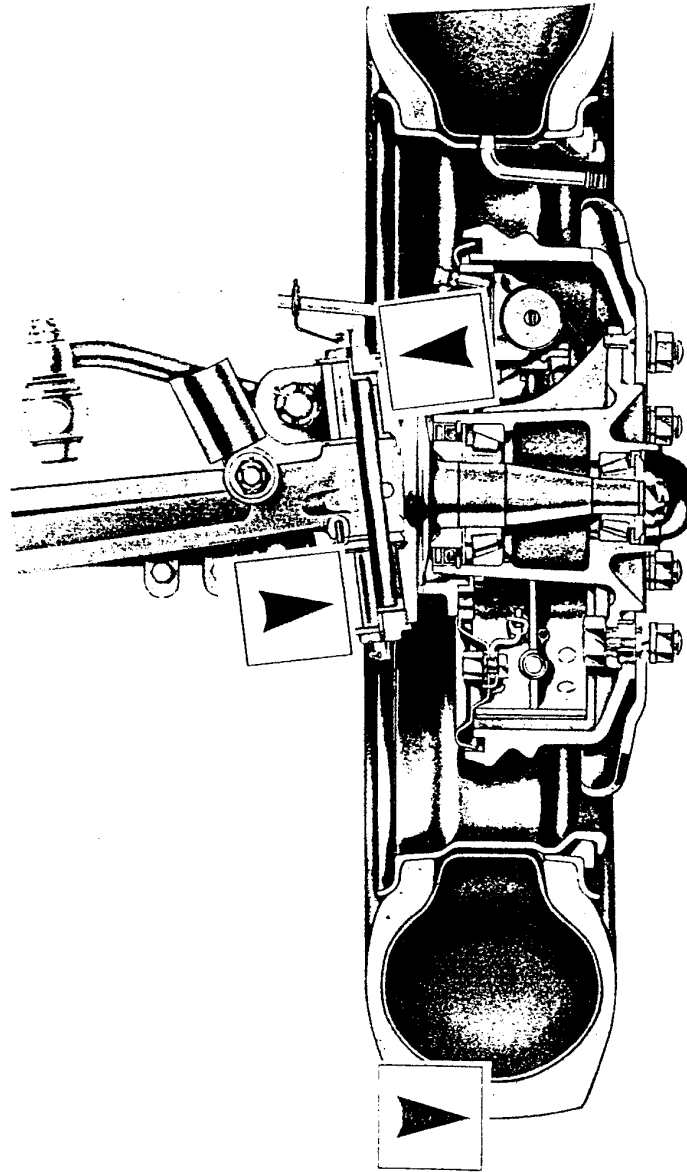


Figure 7. Testing the King's Pin

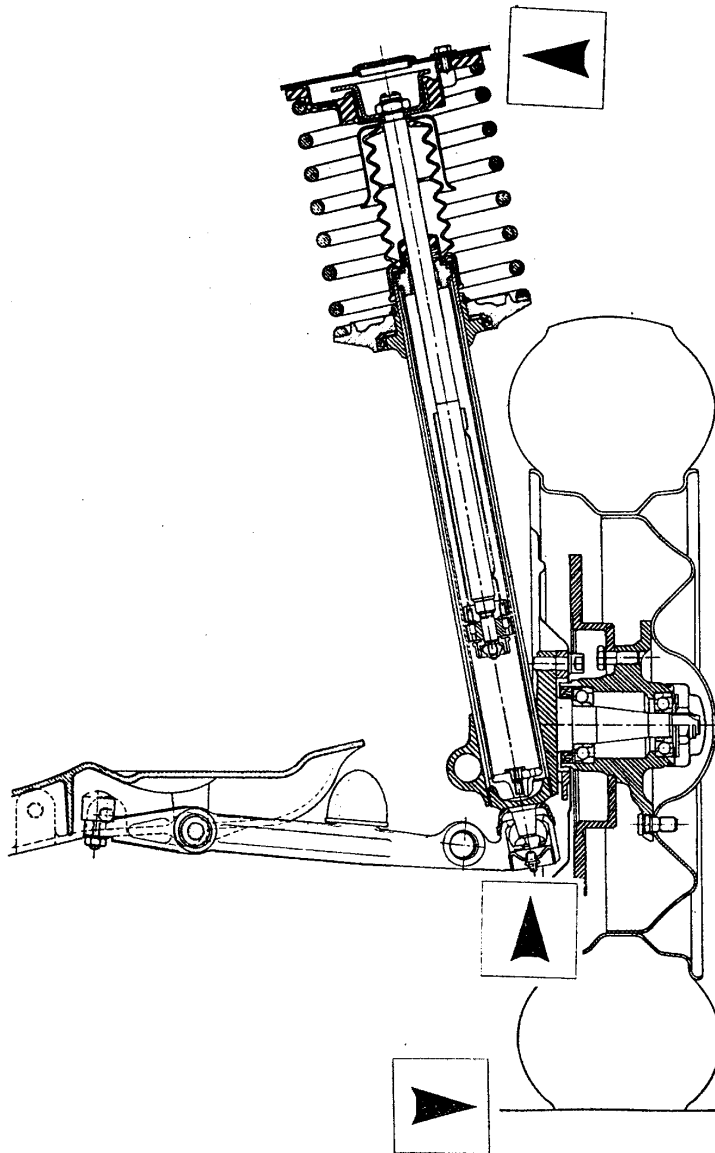


Figure 8. Testing a McPherson damping system

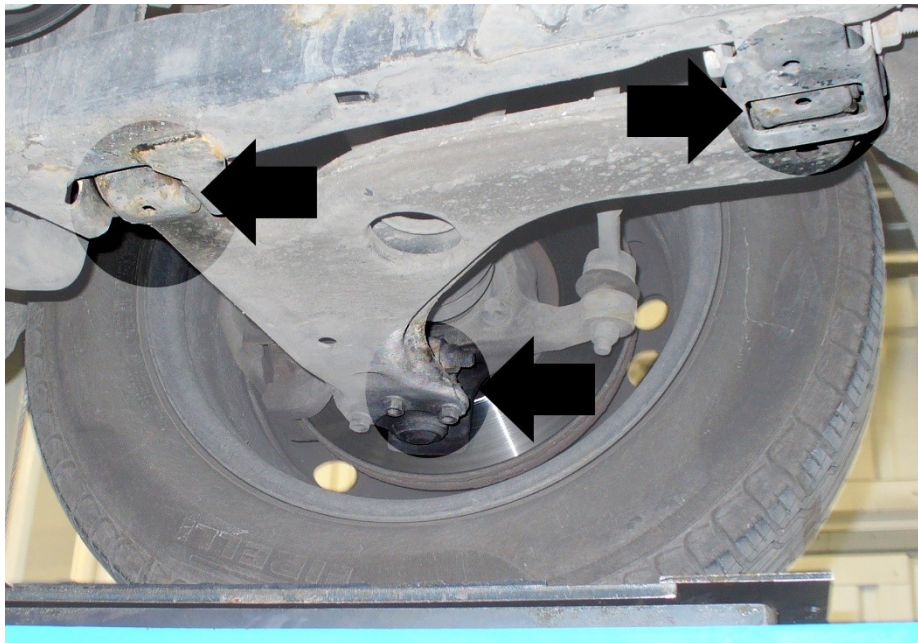
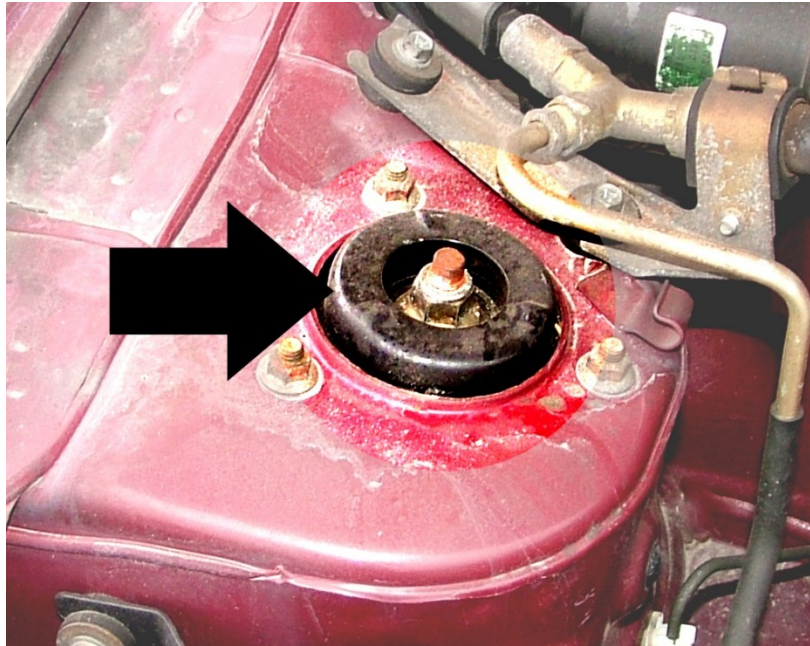


Figure 9. Testing a McPherson Suspension

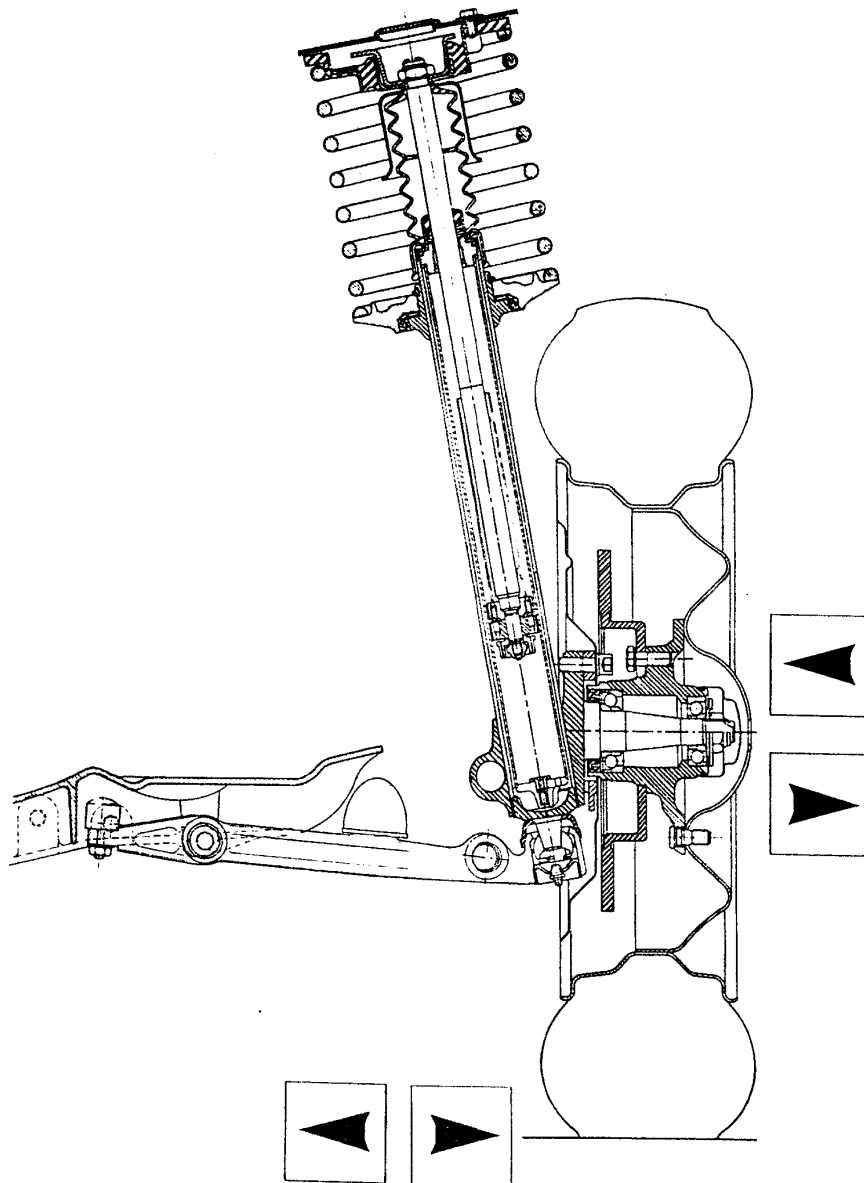


Figure 10. Testing the wheel bearing

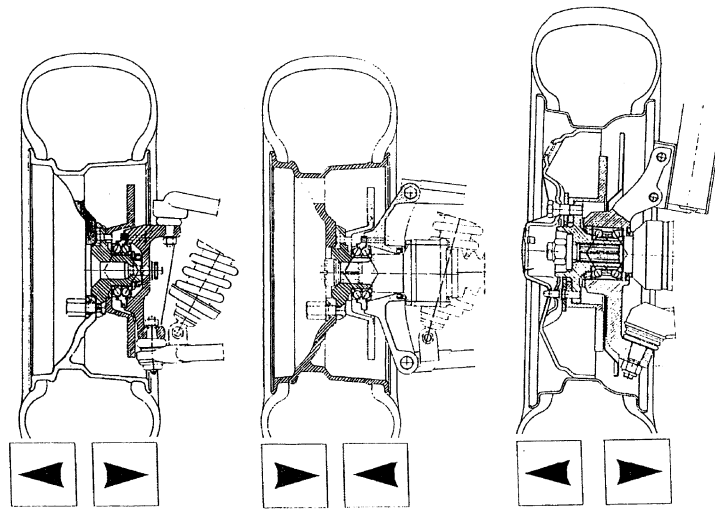


Figure 11. Testing of different types of bearings and wheel suspensions / damping

7.2 Longitudinal movements

This function produces a 50 mm longitudinal movement parallel or counter-current. After releasing the operating knob 1, the plate is returned to the original position **[Fig. 12-13]**.

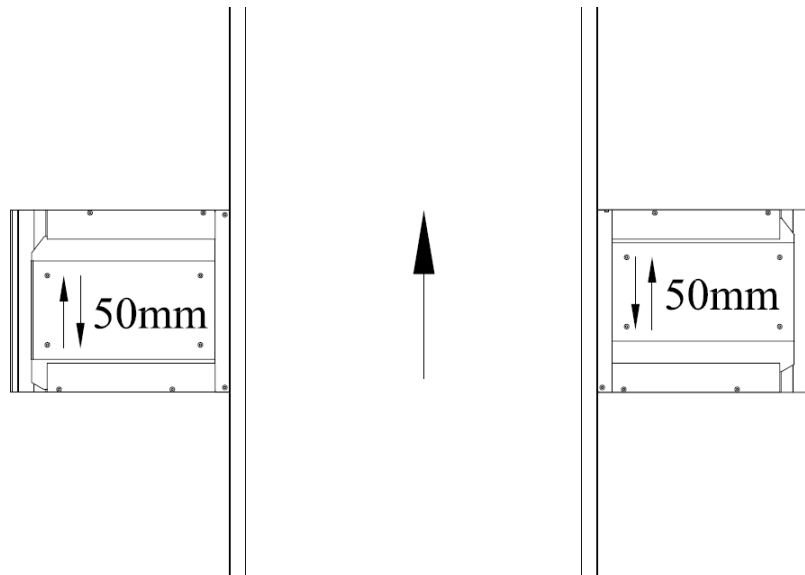


Figure 12. Longitudinal Motion Parallel

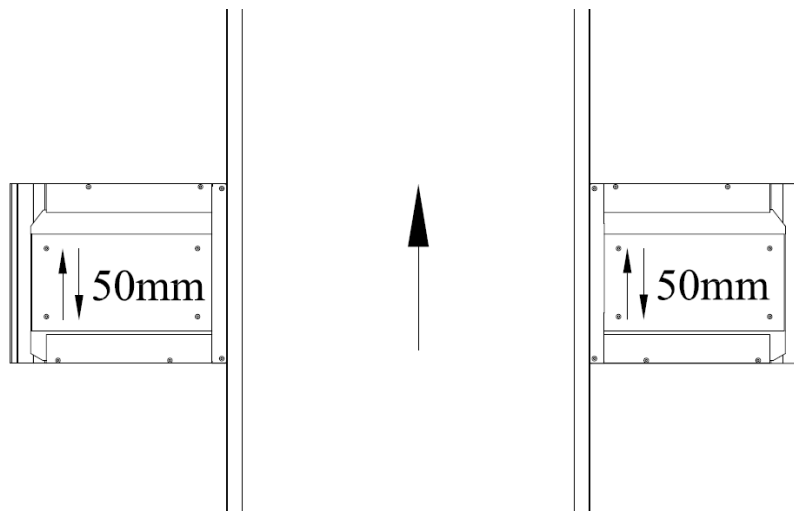


Figure 13. Longitudinal movement in the opposite direction

When using this movement, the vehicle/wheels must be braked. This can be done with the included pedal lock. Braking should not be done with maximum force, otherwise the wheel will be locked completely including the bearings and a possible play on bearings and the brake cannot be detected. When the wheels are braked, the movement puts a strain on the front and rear axles. This makes it possible to inspect fasteners, swing arms and longitudinal support rods **[Fig. 14-15]** as well as brake discs and all relevant elements. With the longitudinal tension and pressure movement, even flat spring fastening bolts can be tested. **[Fig. 16]**. All vehicles have a specific self-resonant frequency. With one movement at this frequency, all oscillating elements such as upper

and lower bearing elements of shock absorbers and springs can be tested. The natural resonance frequency of a vehicle is about 1-2 Hz.



ATTENTION!

WHEN THE PLATES MOVE AT THIS FREQUENCY, THE VEHICLE MOVEMENT CAN BECOME MUCH GREATER THAN THE EXCITATION ITSELF!

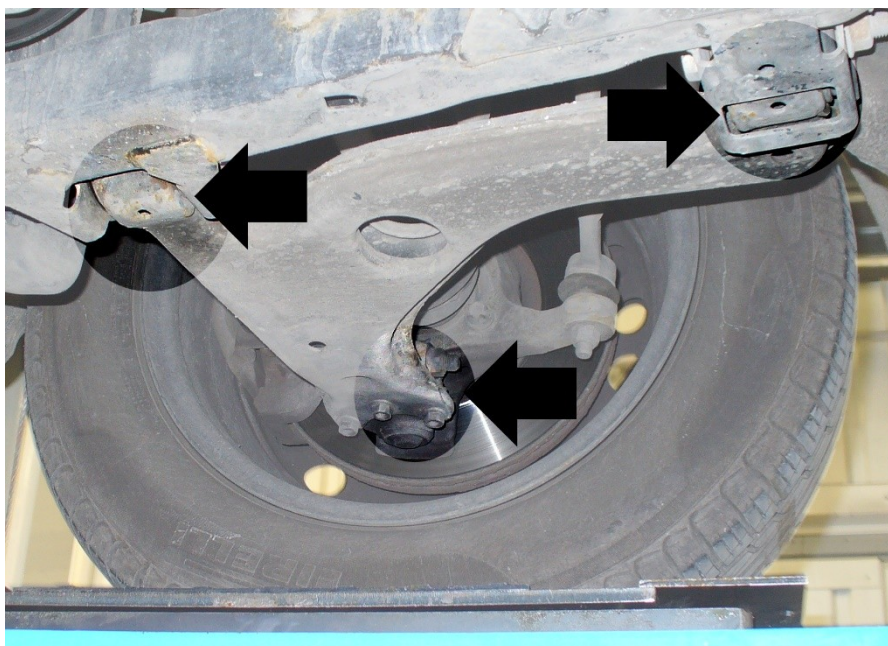
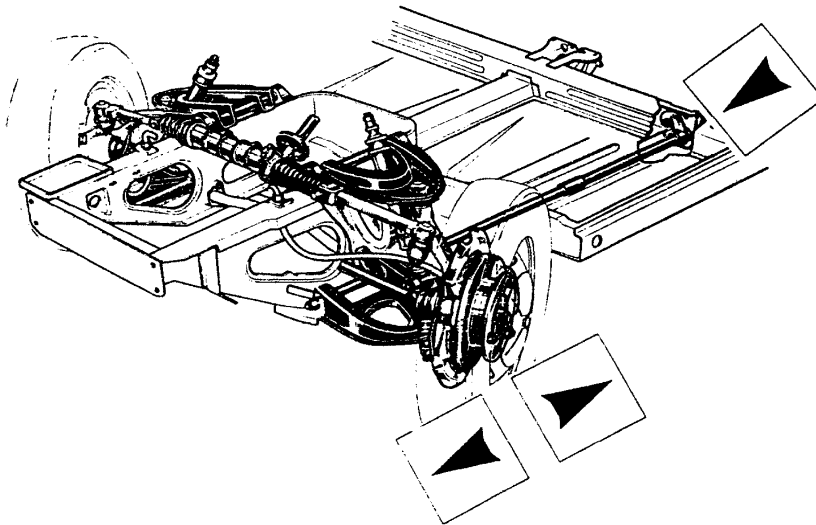


Figure 14. Testing of longitudinal support rods and swing arms



Figure 15. Bearing elements of longitudinally directed support rods

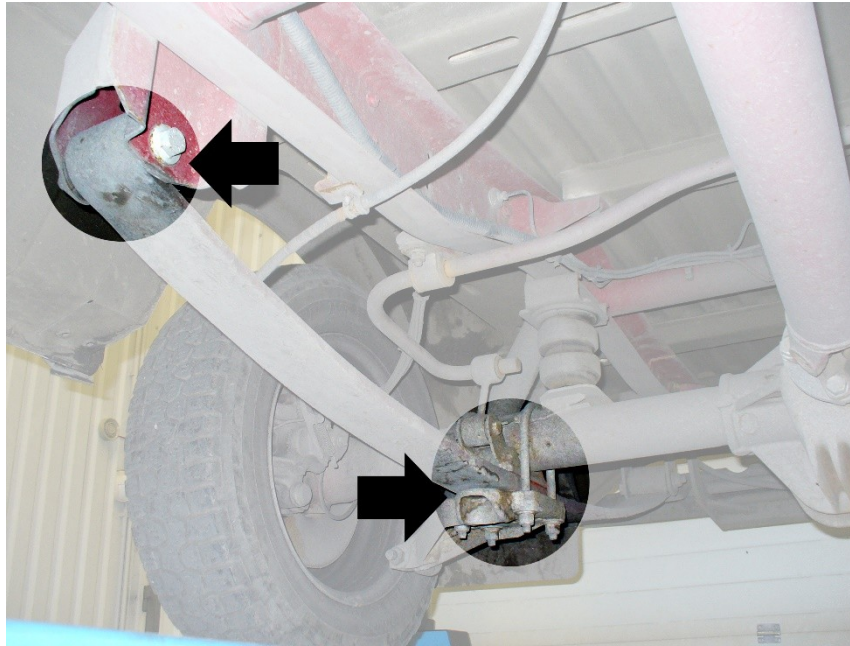


Figure 16. Testing of Flat Spring - Fastening Bolts

8 Maintenance



HINT!

MANUFACTURER'S RECOMMENDED SERVICE INTERVAL IS 1 YEAR

8.1 Servicing

8.1.1 Electronics

- Electronics Box - Vacuum Out
- Checking and tightening loosened nuts and bolts
- Triggering / Motion Testing
- Checking the connection cables
- Testing of protective grounding
- Functional test of the test lamp, the adjustment and operating knobs and the lamp switch

8.1.2 Mechanics

- Inspection of bearings / rolling elements

- Testing of fastening screws
- Testing of the hydraulic cylinders, their stroke and the return springs
- Testing for leaks in the hydraulics
- Testing of the hydraulics – oil quantity
- Testing and adjustment of the pressure switch and pressure regulator
- Cleaning of the mechanics inside.



HINT!

WHEN TESTING - KEEP THE HYDRAULIC OIL CLEAN!



HINT!

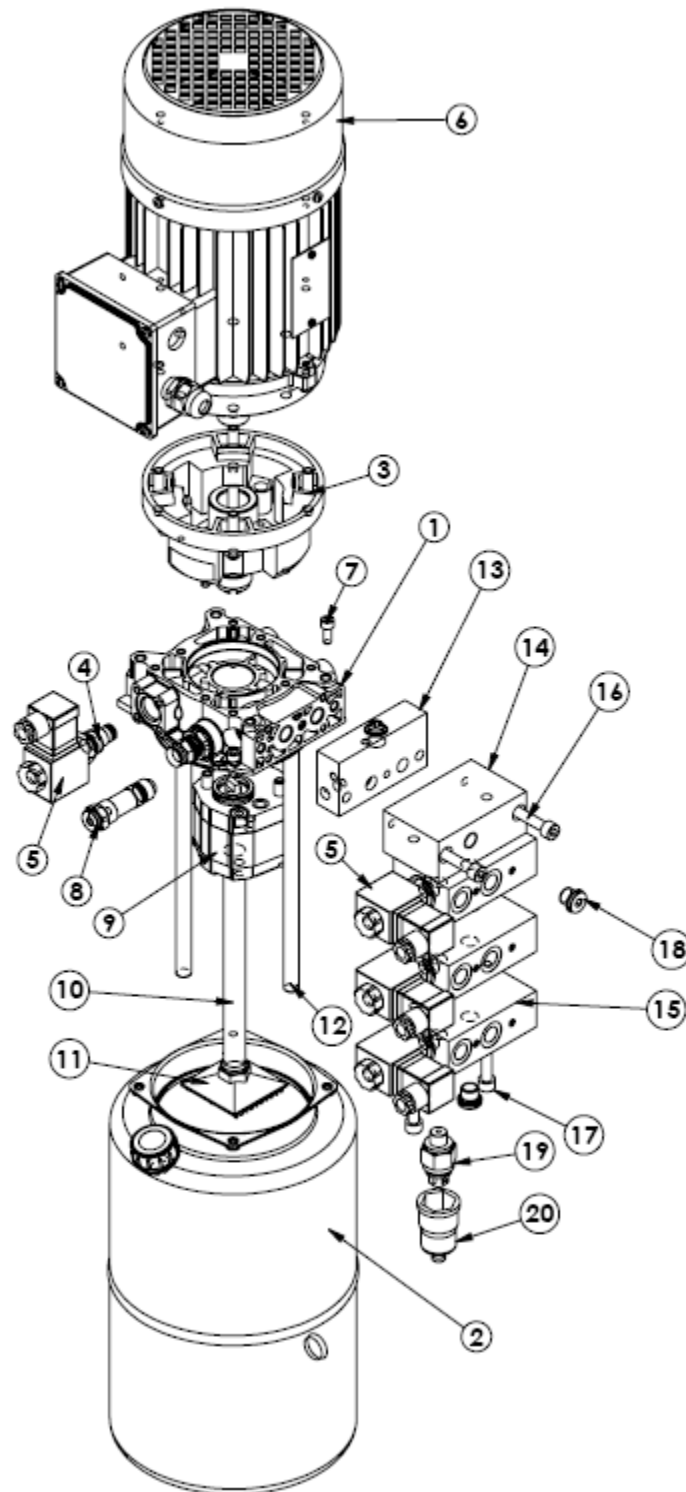
THE HYDRAULIC OIL MUST BE REPLACED AFTER 2000 HOURS OF OPERATION!

9 Attachements

9.1 Placement of the nameplate



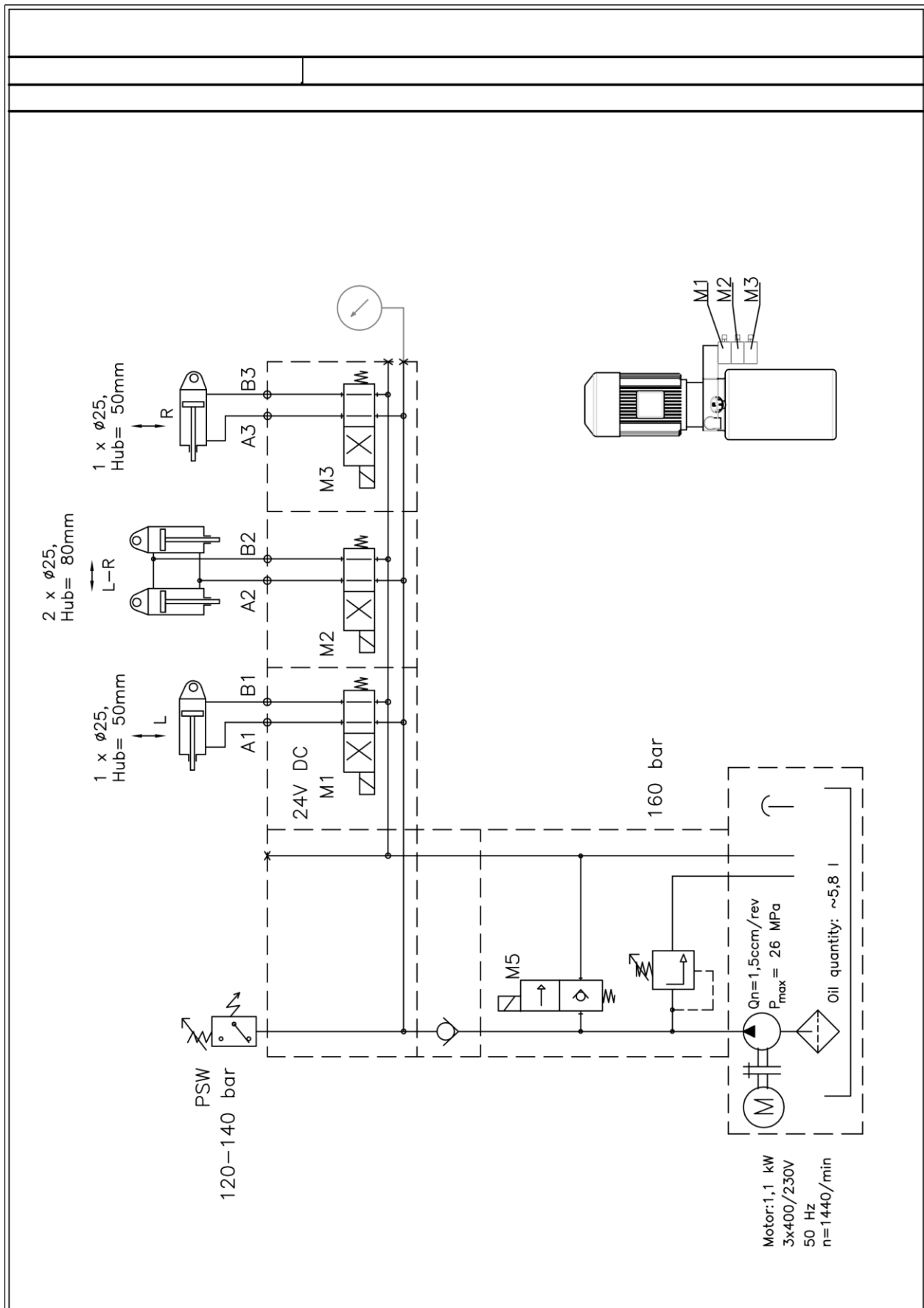
9.2 Exploded view of hydraulic power unit



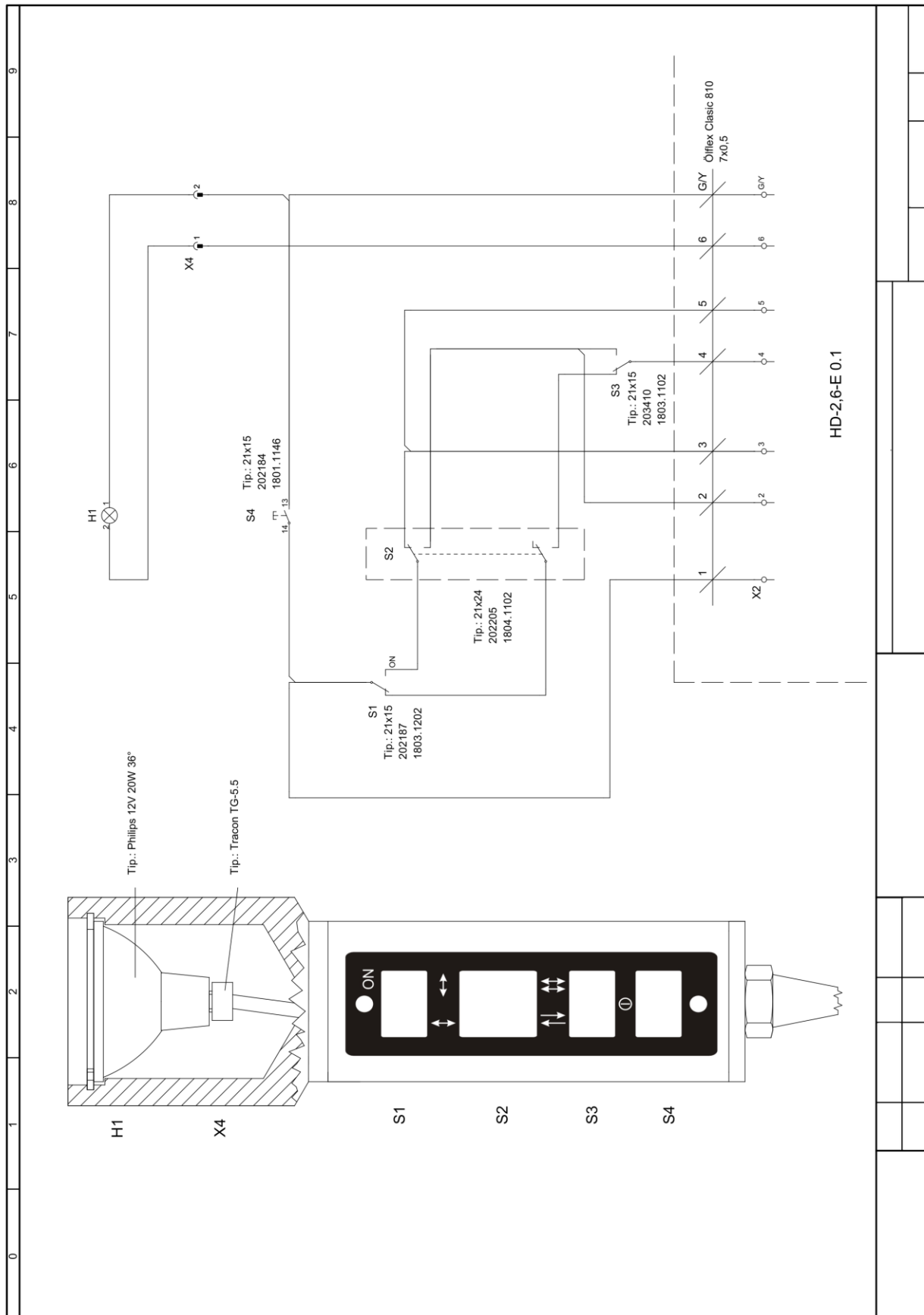
9.3 Spare parts list hydraulic power unit

Pos.	QTY	Code	Description
1	1	K3971S123Z	A12 Central manifold whit cavity CE Ø12.7
2	1	K3976SE008	Vertical Tank 8 liters
3	1	K3970TR021	F16 Junction elements for AC motor MEC 90
4	1	V389671A20	VE3-NC Solenoid valve 2/2 unidirectional
5	4	C166455OC2	S-CE+C coil 24Vcc 18W with connector
6	1	C1622170DR	406SDR Three phase motor A.C. 1.1kW B14 gr.90
7	4	C010018000	Screw M6x16-8.8 UNI 5931
8	1	R3897TA260	TPR adaptor for pressure gauge
9	1	CV10110308	12GH pump 1.6cc + screws M8x70
10	1	K2340S2125	Suction pipe MOSTEN 3/8" L=218
11	1	K225566000	Suction filter 3/8" female 15l/min (90 micron)
12	2	K234718000	Return pipe M12x1 l=250
13	1	G386056000	N57 modular block with check valve on P
14	1	G386025000	N26 Modular block for 90° rotation
15	3	G386547A10	V47 Modular block with V4D-CE-2P valve
16	2	C010046000	Screw TCEI M8x90-8.8 UNI 5931
17	2	C010048000	Screw TCEI M8x110-8.8 UNI 5931
18	2	CB12009000	Plug DIN 908 1/4" BSPP + Bonded seal
19	1	C164745000	Pressure switch PMN300A 14K (31471 50-300 bar)
20	1	F224006000	Protection cap

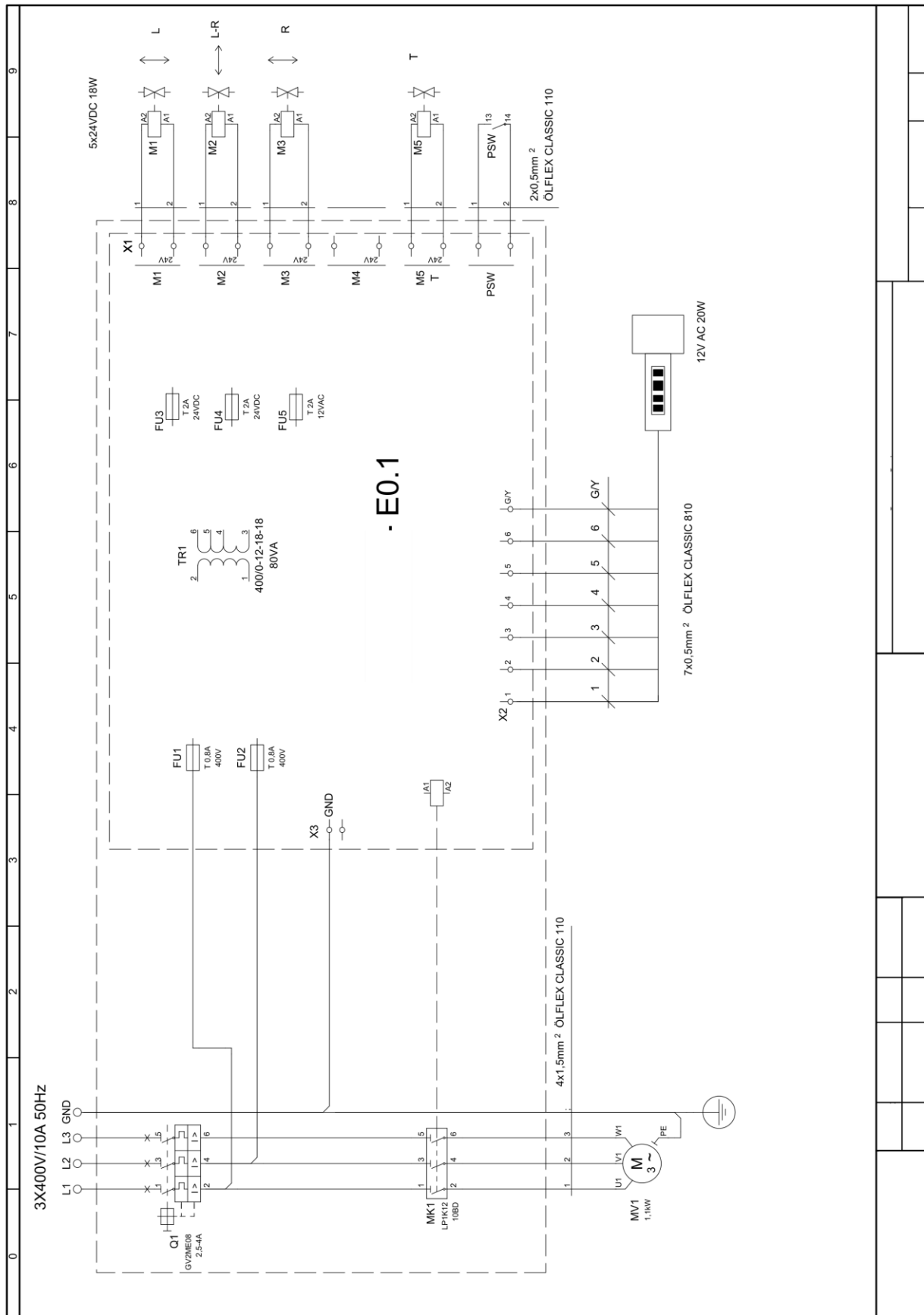
9.4 Hydraulic wiring diagram



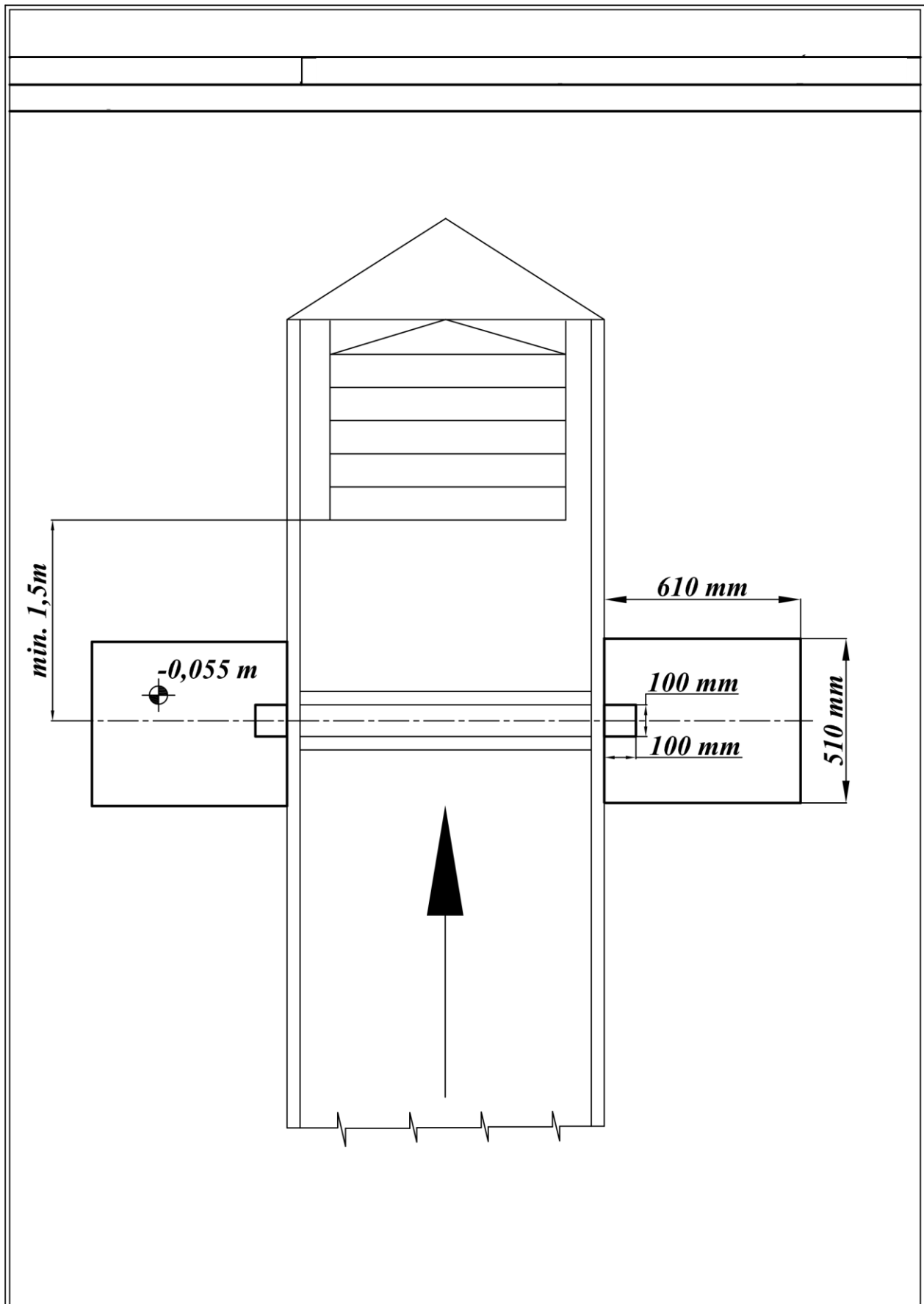
9.5 Remote Control Electrical Wiring Diagram



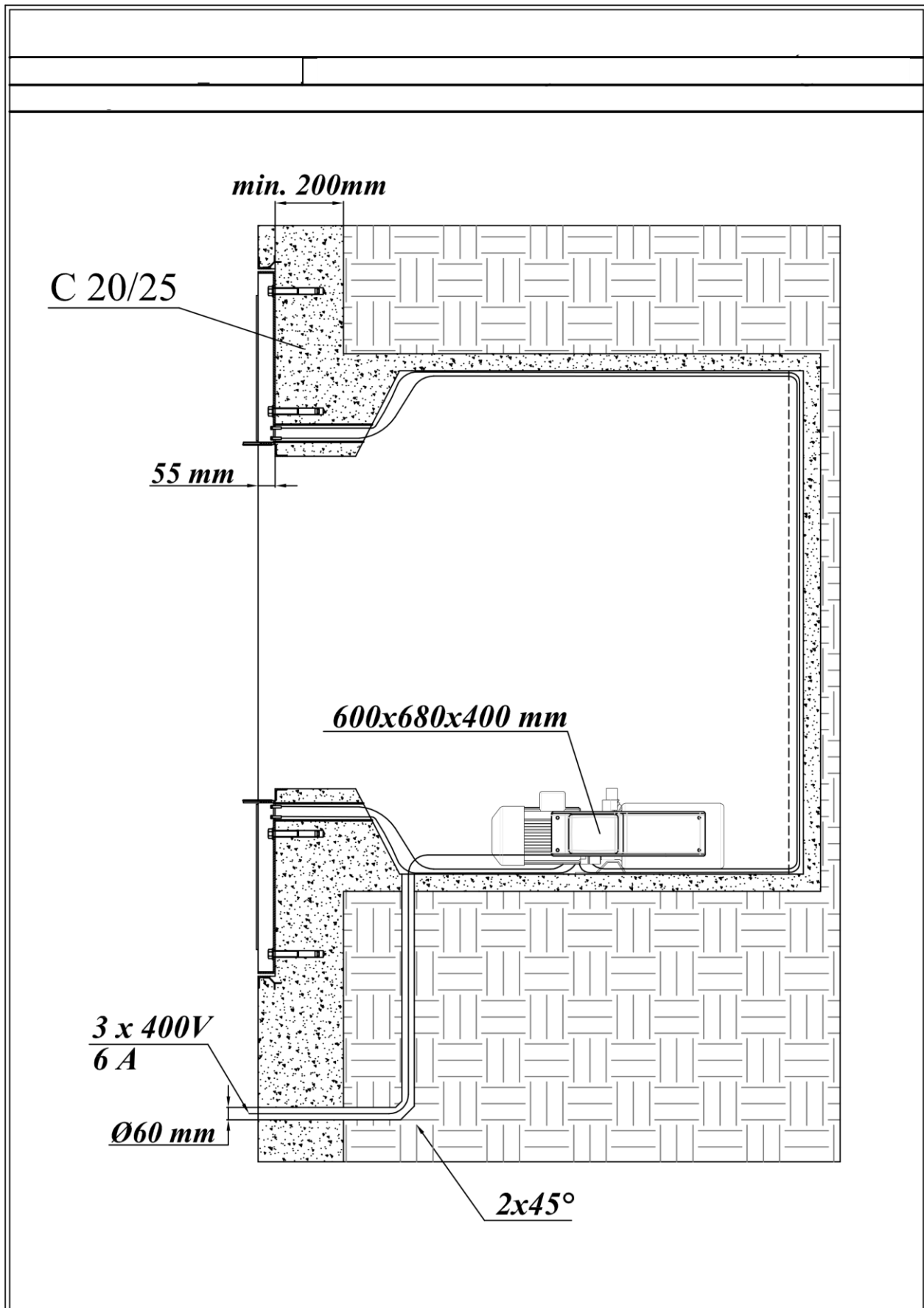
9.6 Electrical wiring diagram hydraulic power unit



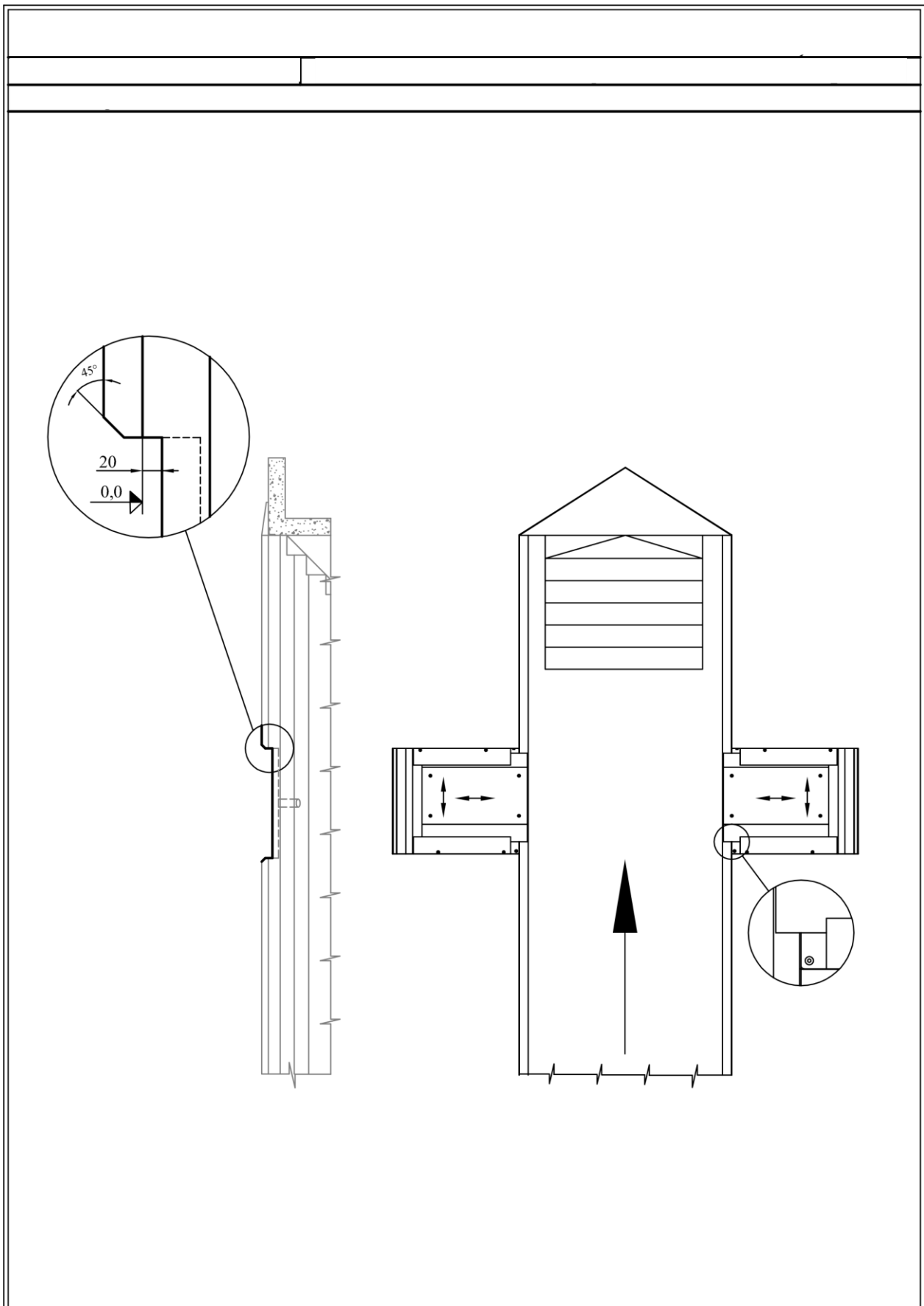
9.7 Installation Drawing

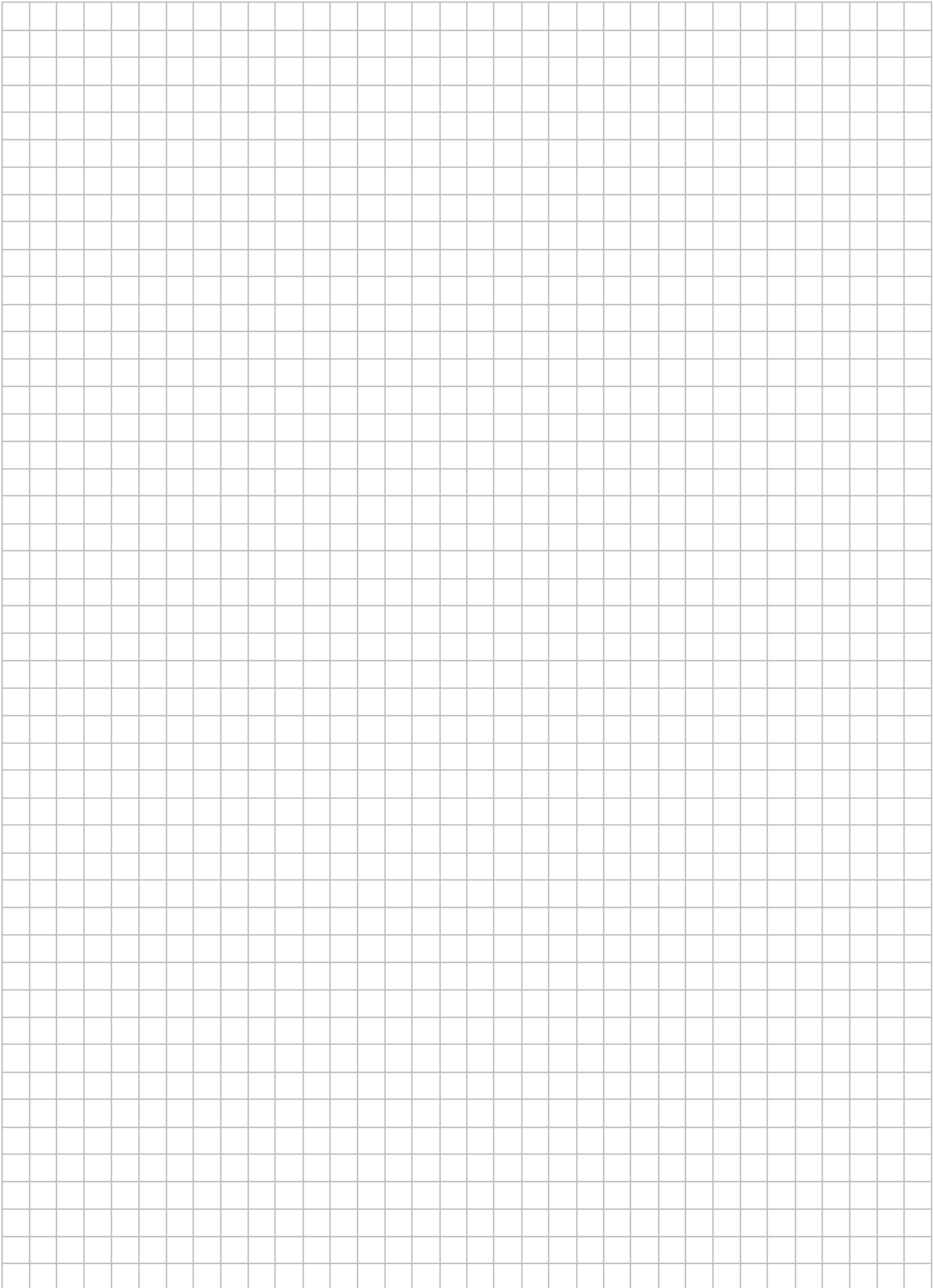


9.8 Foundation-Plan



9.9 Mounting frame





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