Towable passenger stairs

CDS 2438

Instructions for use

Manufacturer: ZODIAC EQUIPMENT, spol. s r.o.
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1. Basic information

1.1. Stairs CDS 2438

Description

• The stairs are suitable for servicing all aircraft with door sills at heights from 1,8 up to 3,7 m. The height of the platform is adjustable in 80 mm intervals. Lifting the stairs provides hydraulic cylinder with separate hydraulic circuit with a pump driven by a diesel engine or a manual pump. The staircase is mounted on a towed chassis of steel hollow sections

• Securing the stairs in the desired position is accomplished by mechanical stops, which automatically engage into the holes in the telescopic supports platforms. The top platform is equipped with front rubber edge which is providing close contact of the stairs and aircrafts fuselage. The sides of the top platform are lined with sliding rails with front rubber bumper provided.

• Front steering axle is rotated on the vertical pins and ensures perfect handling.

• Two hydraulically operated stabilizers ensure stability of the the stairs in the operating position.

• Steps and upper platform are covered with aluminium antiskid sheet.

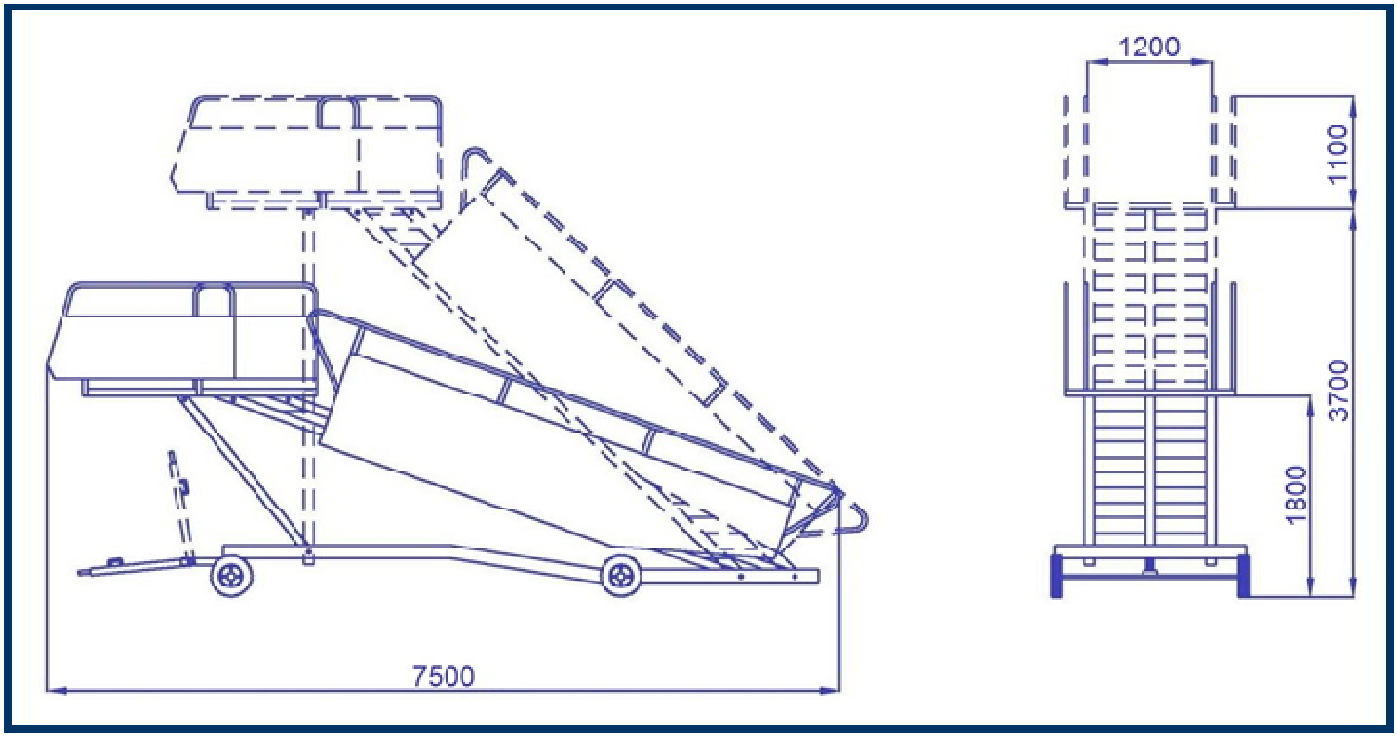
• Stairs can be illuminated by installed LED lights in case of reduced visibility.

• The circuit is powered by a traction battery 12 V / 100 Ah recharged during the engine running.

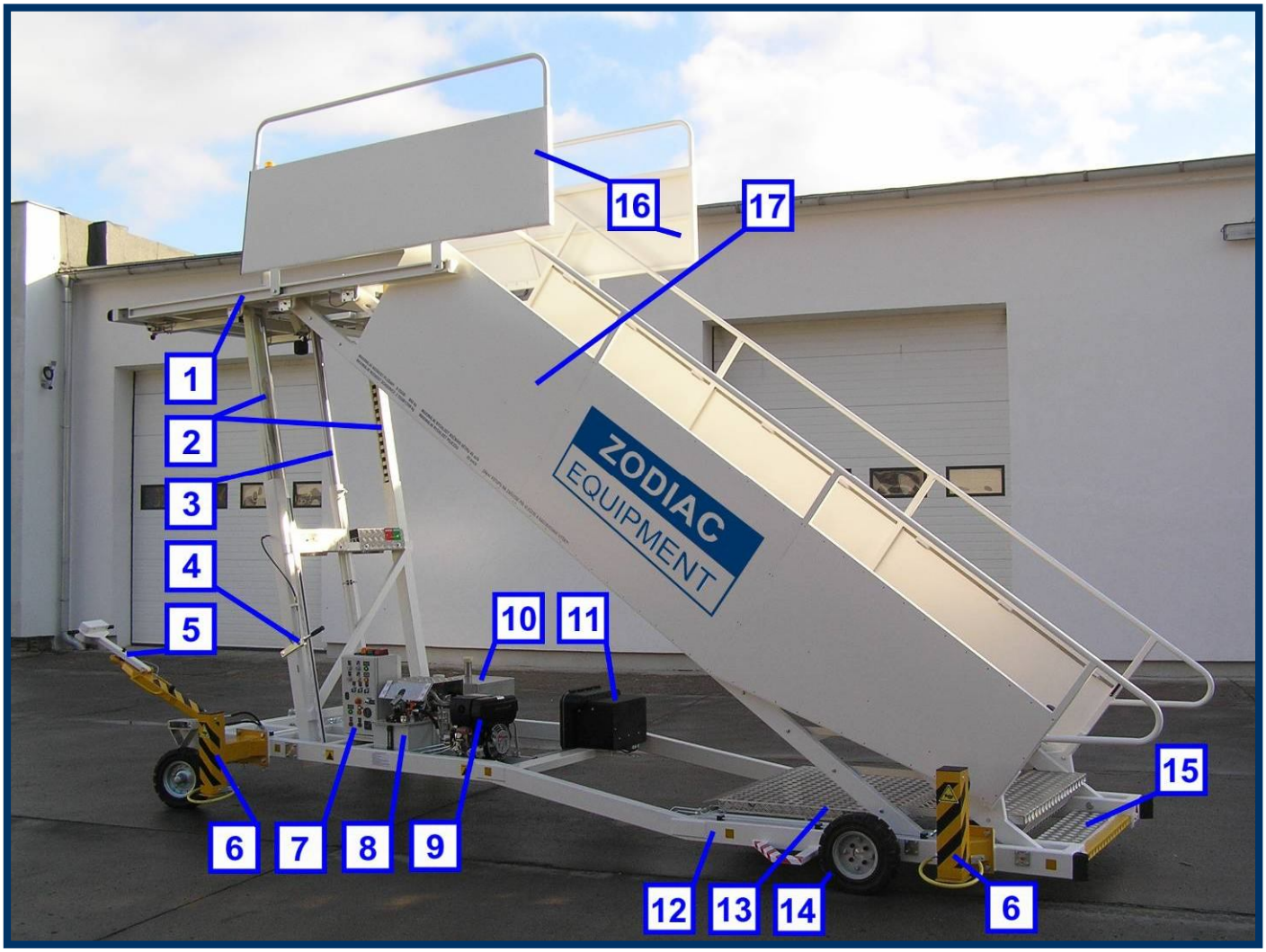
• Stairs are fitted with hydraulically driven pedestrian movement system for easy handling.

1.2. Technical specifications of the CDS 2438

Length	max.	8900 mm
Width		2400 mm
Height	min.	2900 mm
	max.	4800 mm
Platform height	min.	1800 mm
	max.	3700 mm
Platform size	width	1600 mm
	length	2100 mm
Weight		2100 kg
Max. load	step	200 kg
	platform	800 kg
Voltage		12 V DC
Max. towing speed		25 km/h
Max. side wind speed		45 knots
Inner width of staircase		1200 mm



2. Main parts of the stairs



1 platform with sliding front edge
2 telescopic struts with mechanical self-assembly safety pawls
3 hydraulic cylinder
4 release lever for safety pawls
5 towbar with foldable movement controller
6 stabilizers
7 control panel
8 hydraulic aggregate with manual pump
9 diesel Hatz engine
10 diesel tank
11 battery box
12 chassis
13 micro-movement drive
14 wheels
15 staircase
16 fixed handrails
17 sliding handrails

2.1. Platform with sliding front edge

Platform covered with non-slip aluminum plate prevents damage to the fuselage by ruber bumper in front of its moving parts.

2.2. Telescopic supports

Struts serve as solid mechanical ensuring of staircase and upper platform in desired height during embarking and disembarking of passengers.

2.3. Hydraulic cylinder

Hydraulic cylinder raises the platform to the desired position. The altimeter on the left strut indicates heigh of the platform. The cylinder is at the bottom equipped with a shield that prevents rapid lowering the platform in case of damage of the hydraulic circuit.

2.4. Release lever for safety pawls

Telescopic supports are mechanically secured in its position by two mechanical locks with mechanical postion signaling. The spring pressed lever is used to release the lock from secured position. The release can be made only by pressure on the lever while slightly lifting of platform. If you want to lower staircase down, you must keep lever in “Armed” position during lowering. Whenever you release the lever, safety pawls will automatically ensure locking in the nearest holes.

2.5. Towbar with foldable movement controller

Front steerable axle equipped by drawbar with eye of Ø 40mm. It also serves as handbrake lever.

2.6. Stabilizers

Hydraulically operated stabilizers are placed on the front of chassis and provide stability of stairs during embarking and disembarking passengers.

2.7. Control panel

Control elements on this panel are described in detail in chapter 3.3 page 11

2.8. Hydraulic aggregate with manual pump

The hydraulic unit consists of a diesel Hatz 1B20 with mounted gear pump, emergency hand pumps, valves, solenoid assembly and 20 liter hydraulic tank equipped with level gauge, drain and filling hole. The unit serves as a source of oil pressure to control stairs lift, stabilizers, micro movement. The hydraulic system can be operated electrically or manually in emergency case.

2.9. Diesel Hatz engine

For more information please visit:
http://www.hatz-diesel.com/uploads/tx_hatzproducts/BA_1B_EN_43380210.pdf

2.10. Stainless tank

Stainless steel fuel tank with a capacity of 30 liters fitted with a thermometer.

2.11. Battery box

Battery box 12V / 100Ah, fuses and battery disconnector.

2.12. Chassis

The staircase is assembled on the steel closed profile chassis, the construction is completely zinc metallized and painted. On back part there is movably mounted staircase. On front part there are telescopic struts, tow bar, stabilizers and steerable axle. On middle part of chassis, there are placed components of electrical and hydraulic systems.

2.13. Micro movement (MMW)

Stairs are equipped with hydraulic powered micro-movement system for easy handling. MMW rear wheels are driven by hydraulic motors directly. Micro-movement control panel is placed on the tow bar.

2.14. Wheels

Solid rubber wheels, equipped with rim with integrated hub and maintenance-free bearings.

2.15. Staircase

Stringers are closed steel profile and individual scales are mounted in so that when lifting and lowering steps maintain their horizontal position.

2.16. Fixed handrails

Handrails are fixed with upper stringers by bolts.

2.17. Sliding handrails

The top platforms handrails consists of fixed parts which compose the support for the movable handrails and ensure against further displacement by locks at intervals of 80 mm.

3. Instructions for use of the stairs

3.1. Operating the of the stairs

- Stairs may be operated only by a person familiar with the contents of this manual and authorized to manipulate ground support equipment on airfields. Without the use of micromovement should be handling of stairs CDS 2438 always done by at least two workers.

- Before towing the stairs to the designated place always lower the stairs to the lowest position and lift stabilizers to prevent their damage during towing.

- Maximum towing speed is 25 km/h (15 mph).

- After disconnecting the stairs from the towing vehicle nearby aircraft adjust the height of platform a little higher than the level of the aircraft.

Start the engine with applied parking brake only!

- The actual placing to the aircraft always perform just by using micro-movement. The manual positioning requires at least 2 operators. So that one operator controls front axle by drawbar and the other pushes the stairs closer to the aircraft fuselage.

- Position stairs flush with the fuselage by rubber edge of platform.

- Adjust the height of the platform so that walking from the plane will be smooth without height distinctions.

- Check supports backstops securing.

- Secure the stairs by stabilizers.

Eject stabilizers only if every person is out of their track range!

- After securing the stairs, walk on upper platform and secure side sliding rails in the closest position to aircraft fuselage.

- You can switch on stairs illumination in case of need.

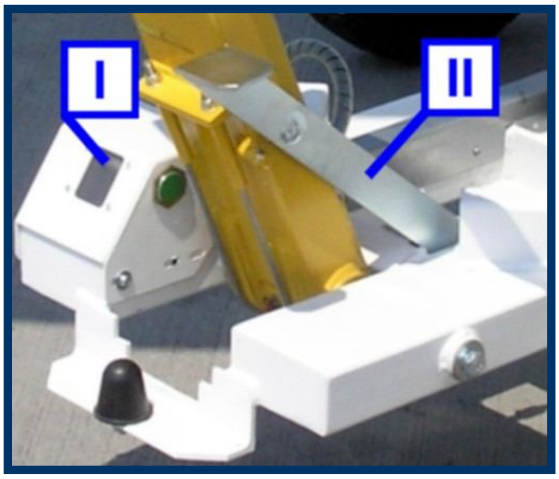
- For departing stairs away from plane do previous steps in reverse order.

3.2. Micro-movement control

Micromovement serves for independent and comfortable stairs handling. Moving forward (to the plane) is possible only if the movable rails are secured to the rear. Taxiing forward also automatically stops when touching the front edge of the platform stairs after pushing the limit switches on the front edge of the platform.

Turn on the power switch, make sure that are STOP buttons are not in locked position. Start the engine Hatz.

Lift the control panel MMW on the tow bar to the middle position and secure with the locking pedal. The position indicates the inductive sensor to the left of the pin shaft. At the same time the stairs are hampered by a hydraulic brake. Steps can then be controlled using the forward and backward buttons.



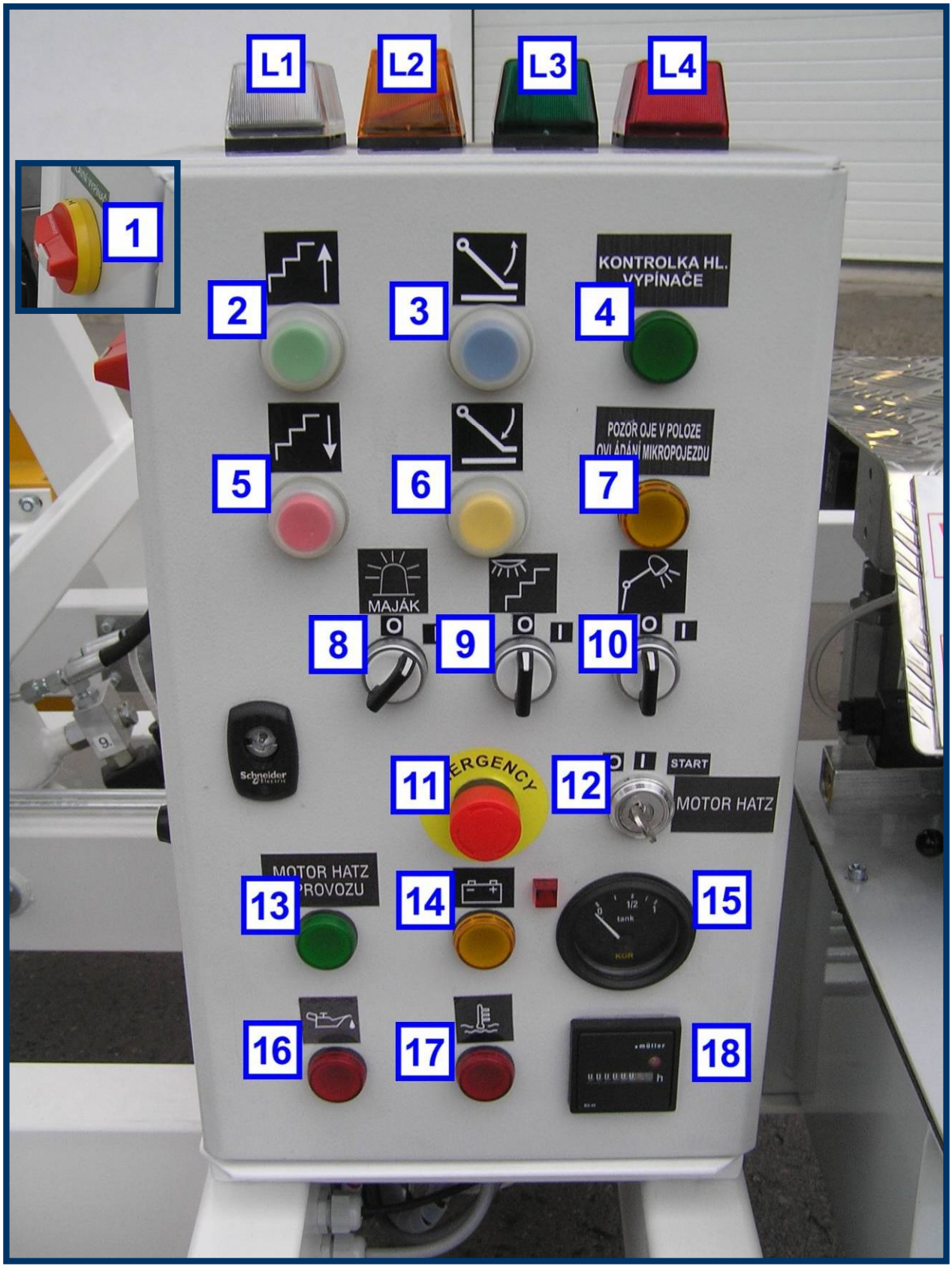
I induction sensor indicator

II locking pedal

For taxiing forward and backward, use the corresponding buttons on the control panel. Drive control approach and the maneuvering speed is marked with pictograms (rabbit for fast travel, turtle for slow approaching).

All system can be stopped by pressing the red STOP button
Always apply lifting of tow bar to the upper position and its ensuring at the end of maneuvering.

3.3. Stairs controls

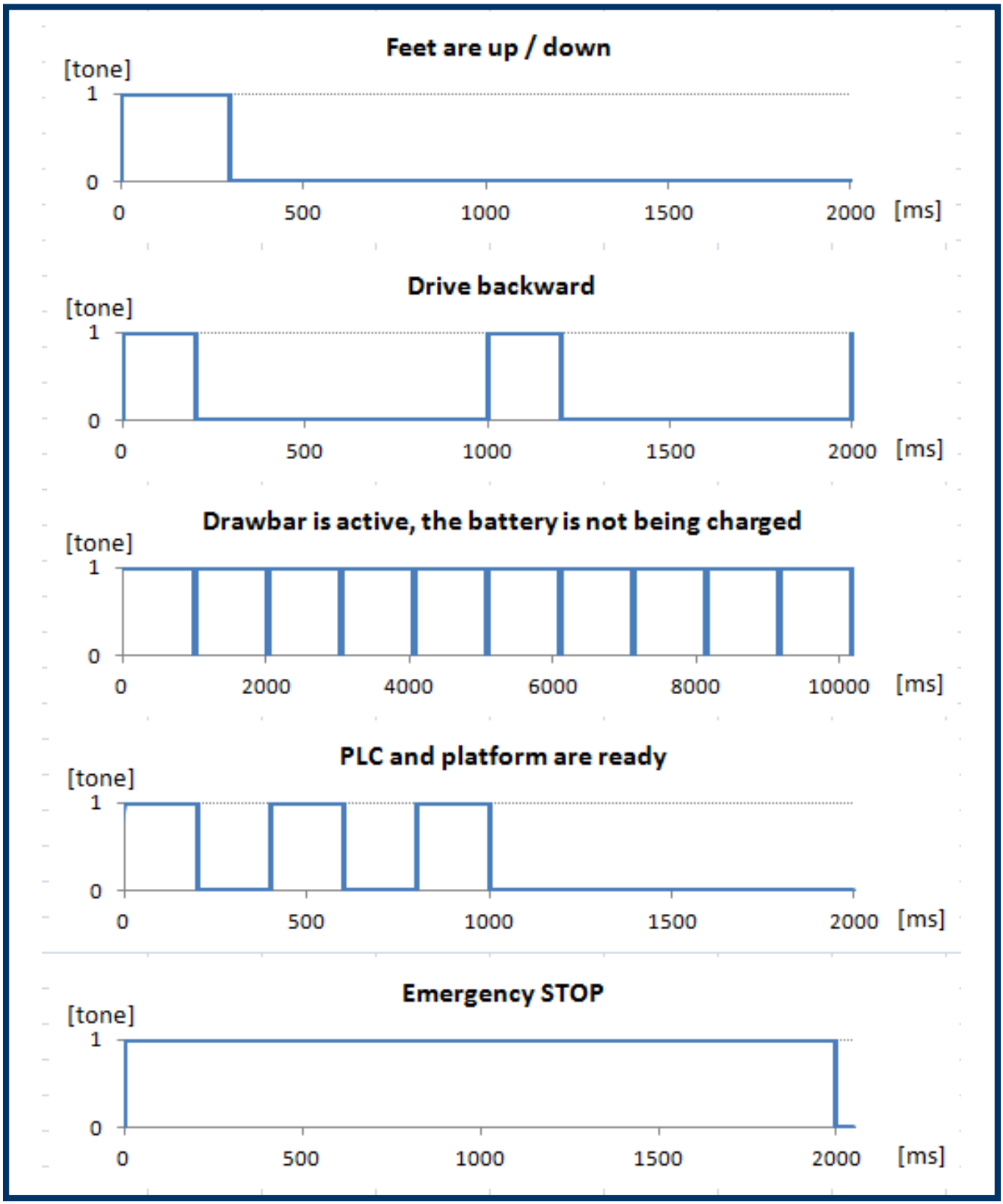


1 main switch
2 stairs UP
3 stabilizers UP
4 main switch light indicator
5 stairs DOWN
6 stabilizers DOWN
7 tow bar in micro-movement controlling position indicator
8 beacon
9 illumination switch
10 search light
11 EMERGENCY STOP
12 engine switch
13 indicator – engine runs
14 indicator – charging problem
15 fuel meter
16 indicator – lubricating problem
17 indicator – engine overheat
18 moto hours

Light sinals

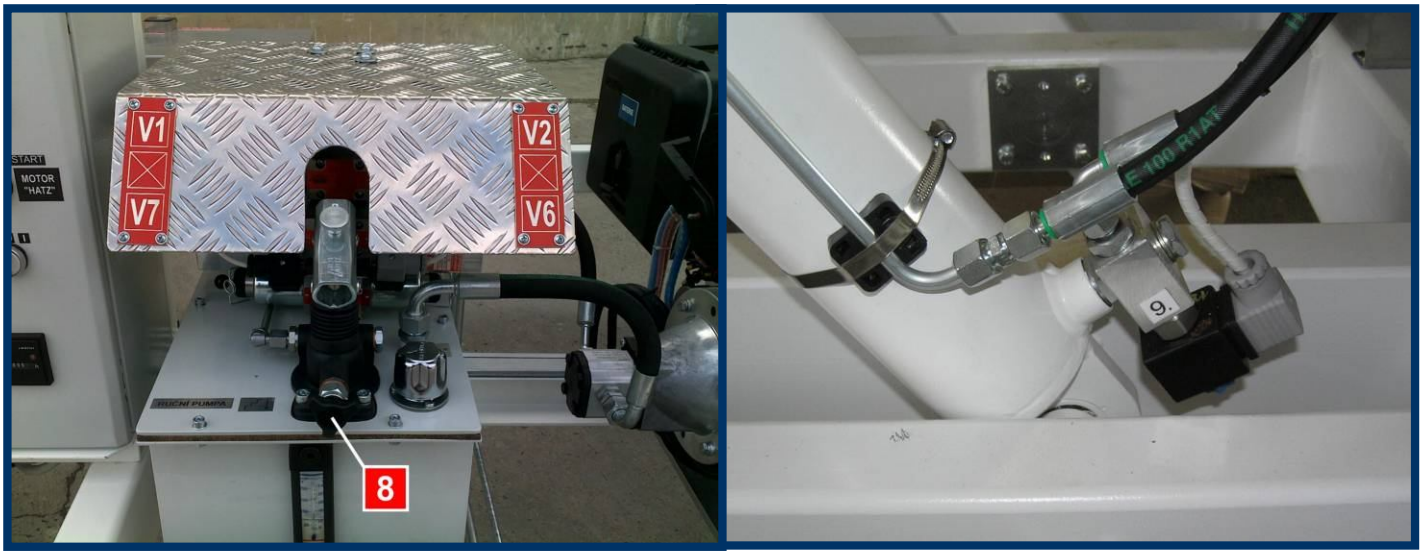
L1 illumination indicator
L2 EMERGENCY STOPS indicator
L3 stabilizers UP
L4 stabilizers DOWN

Acoustic signalization display:



4. Emergency handling

Stairs (instead of micro-movement) can be operated manually by hand pump and manual switching of hydraulic valves.



4.1. Emergency situations instructions

Instructions for emergency situations solving
in case of diesel engine drive failure

1. Putting stairs into the stabilized position:
Close valves nos. 7 and 2 on hydraulic aggregate and eject stabilizers into the working position with using of hand pump.
2. Raising stabilizers into the transport position:
Close valves nos. 6 and 2 on the aggregate and retract stabilizers into the transport position with using of hand pump
3. Raising stairs into the working height:
Open the valve no. 9 at the bottom of the hydraulic cylinder, press the valve no. 2 on the aggregate and lift the platform slightly above the aircraft door sill by using a hand pump. Then carefully press the valve no. 1 on the aggregate and lower the platform into closest locked position. The platform will be secured automatically.
4. Putting stairs into the transport height:
Slightly raise the stairs according to point 3 into a position in which securing locks can be released by the appropriate lever . Move the lever to the unlock position and press the valve no. 1 on the aggregate. Platform will lower to the desired height, where you can secure stairs by release of the locking lever.

WARNING! CHECK VALVES 6 & 7 ARE OPEN & VALVE 8 IS CLOSED BEFORE STARTING ENGINE

1. Prohibited manipulation

It is forbidden to:

- manipulate with loaded stairs
- use untested stairs
- allow operating of stairs and platforms by unauthorized person
- overload the structure over the allowed limit
- using stairs for other purposes, than it was designed for
- transport and move of raised stairs
- make changes to the design
- damage instructions and labels

Parking of stairs without the use of stabilizers is possible only when stairs are in the lowest position to prevent overturning due to winds!

2. Maintenance

2.1. Inspections

before each use

visual check of telescopic support's secure backstops function

visual check of hydraulic system tightness

daily

visual check of threaded joints

visual check of the electrical systém integrity

sliding handrails rail travel and limit switches

control function of sliding front edge of platform and limit switches

hydraulic fluid check

check battery and illumination status

check engine and fuel quantity

quarterly

joints lubrication

conservation of moving joints

visual inspections of all parts of steel structure integrity

6.2. Lubricating plan

once per year to do the lubrication of pins fitted with pressure grease nipples

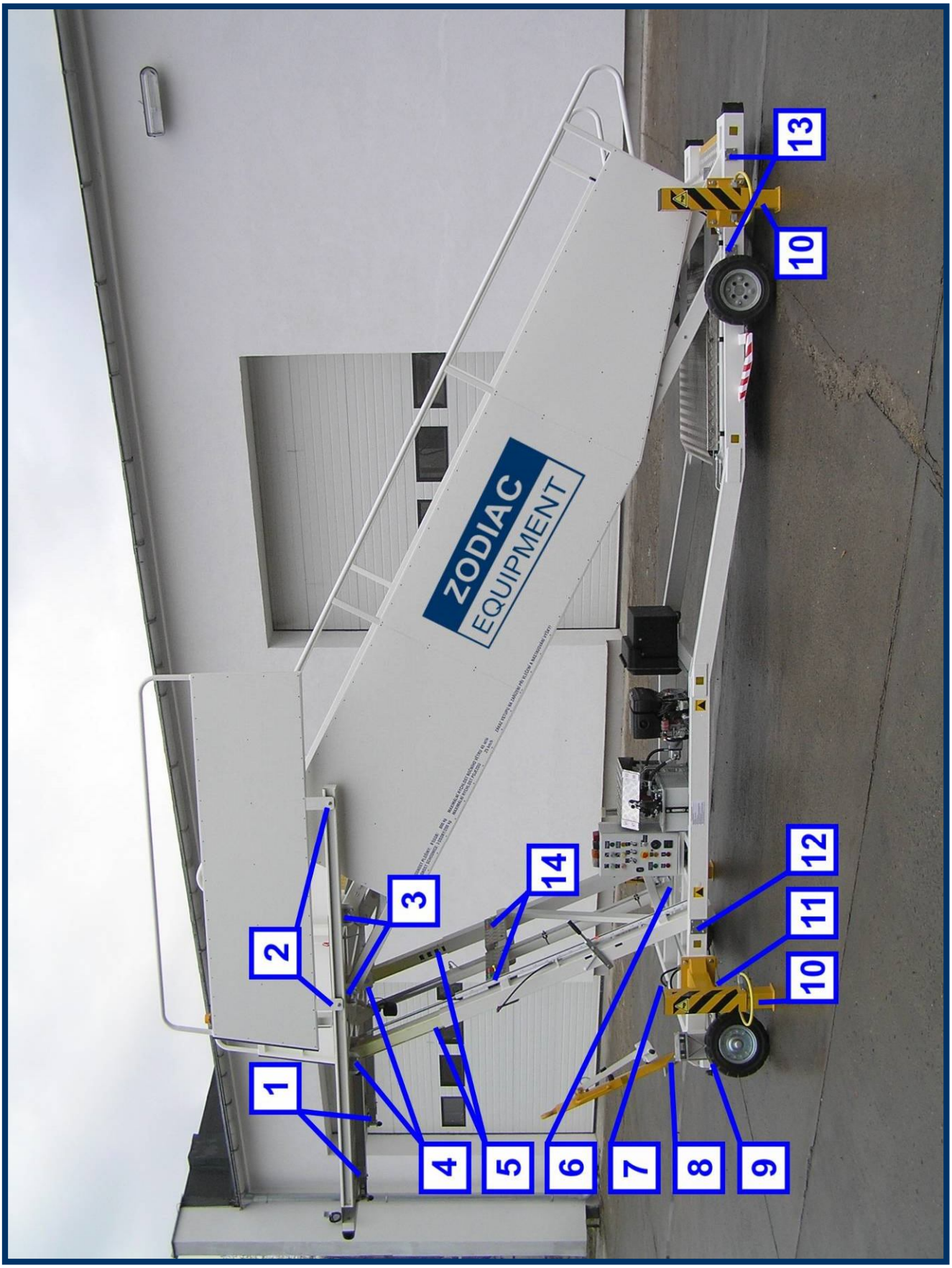
1. top platform sprung edge rails	2x
2. sliding handrails bearings	4x
3. staircase beams top pins	4x
4. top supports pins	2x
5. telescopic supports	2x
6. hydr. cylinder storage	2x
7. front axle pin	1x
8. draw bar pin	1x
9. suspension pins	2x
10. stabilizers	2x
11. brake cables	2x
12. bottom supports pins	4x
13. staircase beams bottom pins	4x
14. supports securing locks	2x

Recommended lubricants

Vaseline Klüber Lubrication Microlube GBU-Y 131:

6.3. Hydraulic unit

The hydraulic system is filled with liquid MOBIL DTE 10 EXCEL 15.
Topping up fluid as needed through the filler hole on the cover of the hydraulic tank.
Keep the area around the filler hole clean to avoid ingraining of the dirt into the tank.
Replace liquid at least once per 2 year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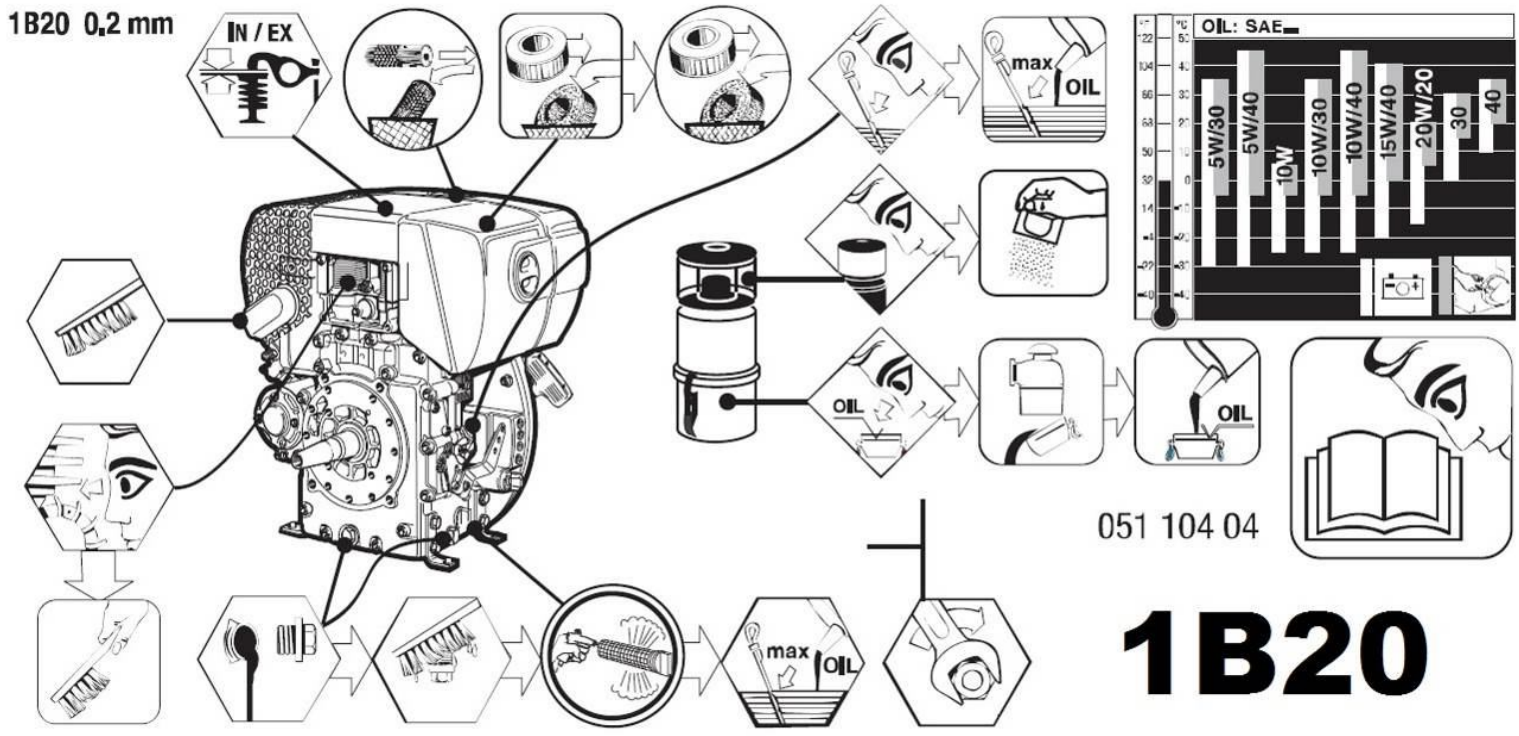
6.4 Engine HATZ - maintenance

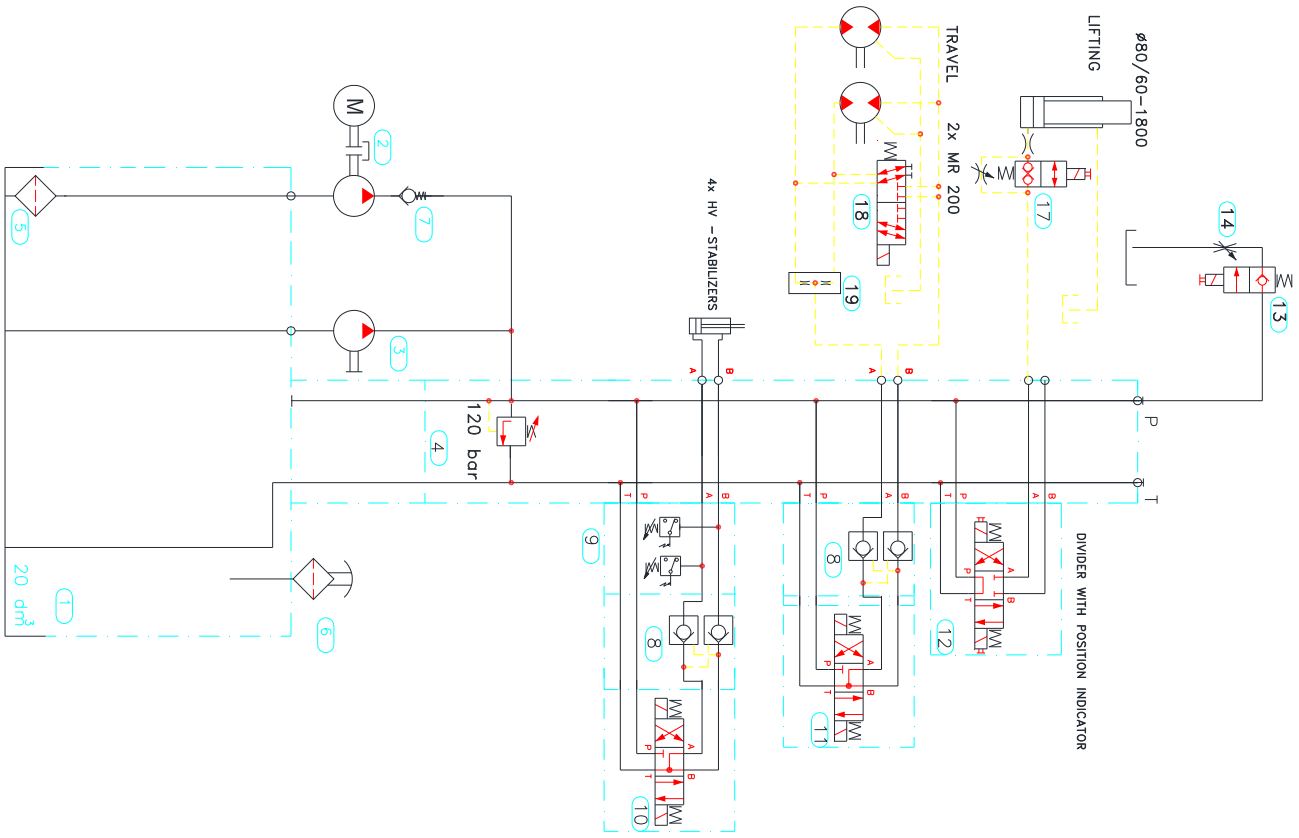
After the first 25 operating hours - oil change

After 250 hours / 12 months - Change oil and oil filter

After 500 hours - Change the fuel filter



7. Hydraulic scheme

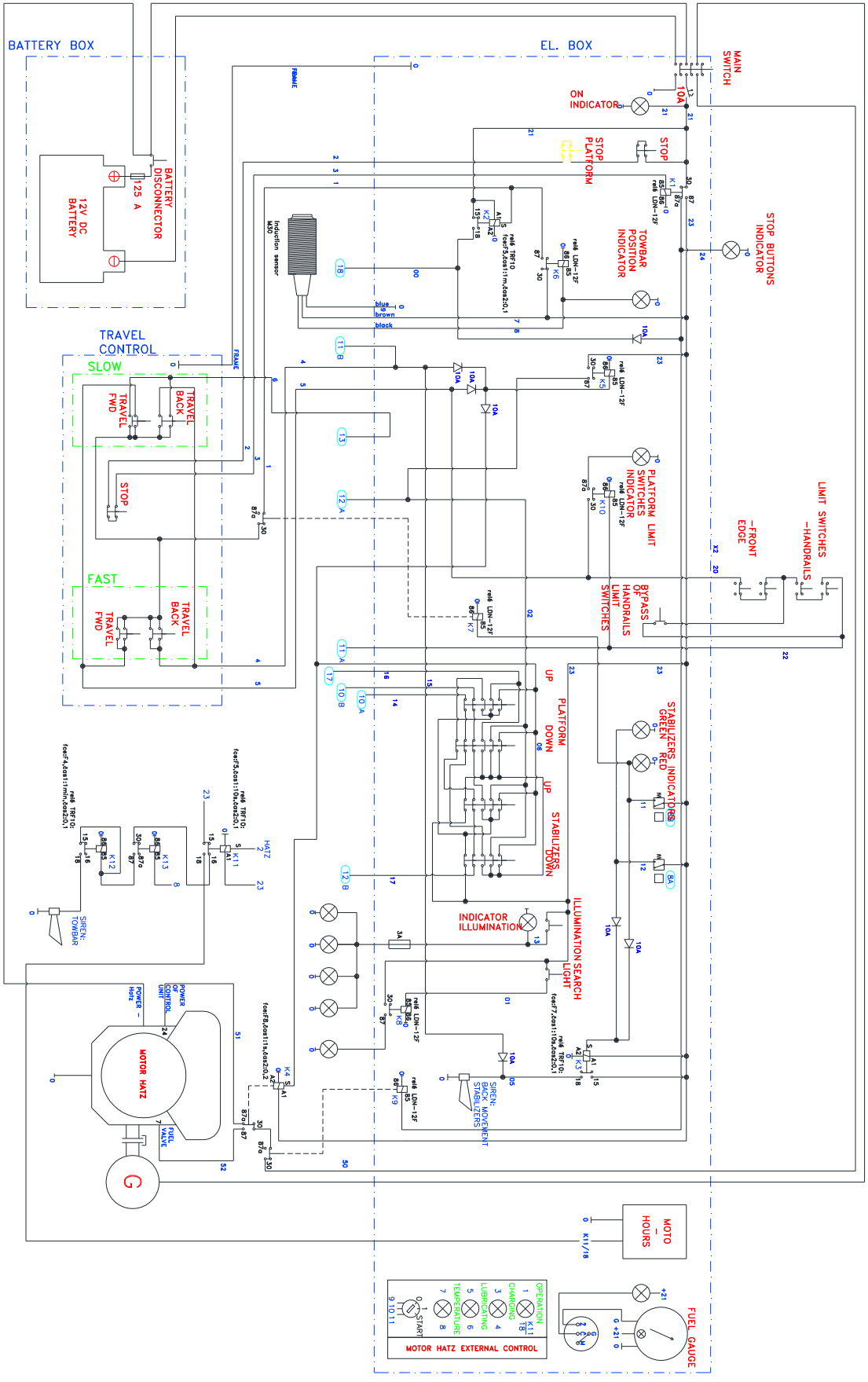


SOURCE BASIC PARAMETERS

Q	$dm^3.min^{-1}$	ot.	2800	min^{-1}
P_{max}	18 MPa	P	2,5	kW

ITEM	NAME	TYPE	SETTING	NOTE
1	TANK	N8C	20 dm^3	1
2	AGGREGATE Hatz + OT100P4,9			1
3	HAND PUMP	PM 25s		1
4	BLOCK&SAFETY VALVE	EA062138-03-1-3-H	18 MPa	1
5	INTAKE FILTER	STR0502SG1M60	60 um	1
6	FILLING PLUG	TA46B10		1
7	ONE-WAY VALVE	VU38		1
8	HYDRAULIC LOCK	2RJV06/C		2
9	PRESSURE SWITCH	Hydropa DS117B/350		1
10	DISTRIBUTOR	RPE3-063Y11/01200N3M		1
11	DISTRIBUTOR	RPE3-063Y11/01200		1
12	DISTRIBUTOR	RPE3-063H11/01200N		1
13	SADDLE DISTRIBUTOR	EDI 00153118		1
14	THROTTLE VALVE	VRFU9001C		1
15				
16				
17	SADDLE DISTRIBUTOR	OD 150918		1
18	DISTRIBUTOR 6/2	CDL106WIL		1
19	PISTON DIVIDER	A-DRF16-1238-16B		1
20				

8.Wiring diagram



9. Appendix

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