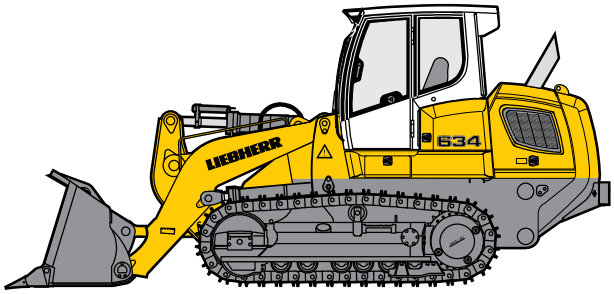
LIEBHERR

Service Manual

Property of Liebherr-Werk Telfs GmbH

Crawler Loaders SERIES 4 Litronic

Table of Contens



Book No.: _ _ _ _ _ _ _ _ _ _ _ _

Name of Manual Owner:

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1.3.00 Service fluids

Note!
See Operating instructions

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4.3 After shut down of longer than 12 months

Complete all items outlined in paragraph 4.2 and 4.1.

Note!
After a scheduled shut down of longer than 12 months contact the Service Dept. of the Diesel engine manufacturer.

- ▶ Remove all covers and closures, which were installed for conservation measures.
- ▶ Turn the Diesel engine manually a few turns (use the turning device - flywheel – see Special tools).
- ▶ Start the machine and bring it to operating temperature.
- ▶ After the machine was brought to operating temperature, change all lube and service fluids as well as filters according to the Operating instructions
- ▶ Check the entire machine for function and for leaks.

If necessary, carry out any time limited maintenance work at this time.

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Description	Id. No.	M-Type	Remarks	Illustration
Digital multi meter complete with cable and bag	**10018500**	**PR** Series 4 **LR** Series 4 **RL** Series 4	For Voltage (V)- Amperage (A)- Resistance (Ω)- Frequency (Hz)- tests	 428571
Optical charge tester	**see Pt. 1.1 Diesel engine**	**PR** Series 4 **LR** Series 4 **RL** Series 4	To check the battery condition and the antifreeze in the coolant	 425591

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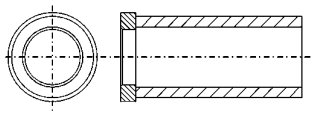
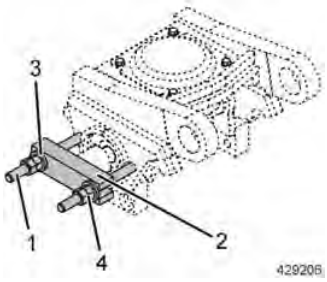
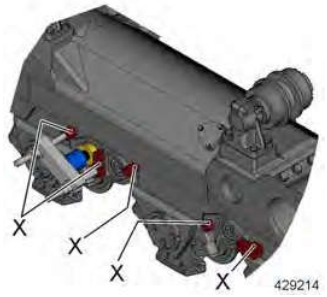
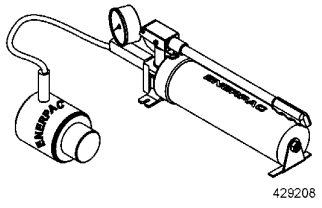
Description	Id. No.	M-Type	Remarks	Illustration
Installation sleeve Equalizer bar	**10306449**	**PR 754**	To press the equalizer bar in with bogies. For dimensions for in-house manufacture of mandrel, see Pt. 3.	 428806
Installation tool kit Double bogie Pos.1 Threaded rod M30x360 (2 each) Pos.2 Plate Pos.3 Washer M30 (2 each) Pos.4 Hex nut M30 (4 each)	**10318790**	**PR 764**	For removal / installation of pins with bearing for double bogies. For dimensions for in-house manufacture of plate (Pos.2) see Pt. 3. For use, see section 2.3	 429206
Modification kit for Installation tool kit double bogie	**10319443**	**PR 764**	For installation of the threaded rods of installation tool kit 10318790 Modification kit X (consisting of blocks with M30 thread) is welded on in exact position. For position of blocks on track, see section 2.3	 429214
Installation tool Double bogie		**PR764**	For removal / installation of pins with bearing for double bogies. For use see section 2.3	 429208
Hydraulic components for installation tool Consisting of:				
Hydraulic cylinder Enerpac RCS 201	**11081098**			
Hydraulic hose Enerpac HC- 7206	**10430200**			
Pressure gauge Enerpac GF- 230B	**11081099**			
Intermediate section Enerpac GA-2	**10430202**			
Hand pump Enerpac P39	**886120508**			

2.3.00 Installation instructions

1 Slipring seals

1.1 Design and function

Due to the pretension of the O-rings 2, the two sliprings 3 are pressed together and therefore seal of the bearing point via the gliding surface 4.

Seal variations:

- Seal toward the outside
- Seal toward the inside

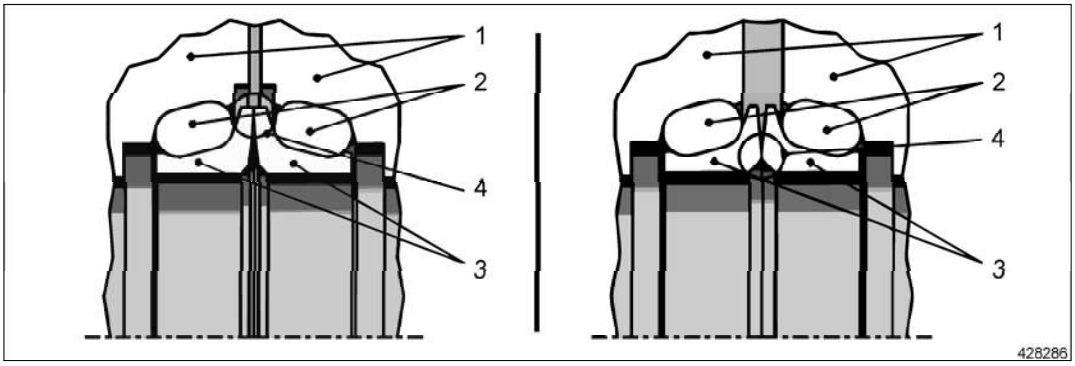


Fig. 1 Seal variations

1 Seal mount
2 O-ring
3 Slipring
4 Gliding surface

Note!
Only seals toward the outside are used in the machines of the Series 4, because of design reasons.

1.2 Installation

1.2.1 General installation notes

- The sliprings of the seals are manufactured as pairs. For that reason, new as well as used seals may only be installed as original pairs.
- Avoid impacts and blows, which could damage the sealing surfaces of the chilled cast sliprings.
- Round off sharp edges on the seal mounts.
- Slipring seals and their receptacles must be absolutely clean and free of grease and oil for installation.
- O-rings may not be lubricated with oil.

Slipring seals should be installed generally with the aid of an installation device, see Special Tools, section 2.1

Caution!
If the installation device is not used, the O-ring can roll up on the conical slipring surface. In case of one-sided installation pressure, the seal half and / or the O-ring can twist. These types of installation problems cause leaks as well as damage to the gliding surfaces.

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3.2.20 Maintenance and inspection schedule

Company:.....Mach.-Type.....S/N.....-.....Hrs.....Date.....

Maintenance / Inspection at operating hours							WORK TO BE CARRIED OUT	Reference see:	Remarks
at delivery	every 8 – 10	every 50	every 250	every 500	every 1000	every 2000	**by maintenance personnel** ■ First and only interval ● Repeat interval **by authorized trained personnel** ❑ First and only interval ❍ Repeat interval **OI** Operating instructions **SM** Service manual ① For correct fill quantities, use test marks- for procedure and quantities, see OI ② quality and viscosity guidelines, see “Service fluids”, OI ③ See data in SM		
DIESEL ENGINE									
❑	●	●	●	❍	❍	❍	Check oil level and coolant level	OI	①
	●	●	●	❍	❍	❍	Check Diesel engine, cooler assembly and belly pan for contamination / clean	OI	①
	●	●	●	❍	❍	❍	Check fuel water separator on pre-filter / empty as necessary -immediately if indicator light lights up	OI	
		●	●	❍	❍	❍	Fuel tank, drain condensation and sediments - but at least 1x a week	OI	
		●	●	❍	❍	❍	Clean air filter – Service cover and dust discharge valve (LR624)	OI	
				❍	❍	❍	Change engine oil [1] - Shorten interval in case of aggravating circumstances - but at least 1x a year	OI	①②
				❍	❍	❍	Change lube oil filter [1] - but at least 1x a year	OI	
				❍	❍	❍	Change / replace oil separator filter insert	OI	
				❍	❍	❍	Check corrosion inhibitor / antifreeze concentration in coolant	OI	①②
				❍	❍	❍	Check V-belt condition	OI	
				❍	❍	❍	Check control units mounting, sensory and cable connections for condition	OI	
❑				❍	❍	❍	Check oil, coolant and fuel system for leaks and condition	OI	
❑				❑	❍	❍	Check intake and exhaust system – mounting and leaks	OI	
				❑	❍	❍	Check engine mount	OI	
					❍	❍	Check engine rpm	SM	
					❍	❍	Change fuel prefilter and fine filter – observe bleeding instructions	OI	
					❍	❍	Check / adjust valve play - on cold Diesel engine	SM	③
					❍	❍	Grease gear ring on flywheel	SM	
					❍	❍	Take oil sample before oil change and send it in for analysis	OI	
							Check vibration damper for leaks and distortion - 3000 hrs.	OI	
							Check heat flange - before start of cold season	SM	
							Replace air filter inserts - as necessary / once a year	OI	
							Replace coolant with antifreeze - every 2 years	OI	

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2.4.5 Pressure cut-off

The pressure cut off limits the maximum working pressure, primary and secondary relief valves are only used for system relief. To check, proceed as outlined for primary pressure via the “Bucket down” function or via an auxiliary attachment without secondary relief.

2.4.6 Blank line

Blank line for pressure limitation of an auxiliary attachment (enter test point / description).

2.4.7 Blank line

Blank line for pressure limitation of an auxiliary attachment (enter test point / description).

2.5 Pressure difference - Working hydraulic - ∆p HD to LD

The regulating function „Pressure difference“ results from the adjustment of „Stand-by pressure“ and can therefore not be adjusted separately.

At full spool opening – in the last 1/3 of the lever stroke – Δp must drop abruptly below 13 bar.

If the range Δp ≤ 13 bar is not obtained, then the pump does not move to maximum flow volume and the maximum working speed is not reached.

2.6 Nitrogen accumulator

For safety reasons, it must be possible to actuate a working function several times for a short period of time immediately after the Diesel engine is turned off.

2.7 Replenishing pressure Travel hydraulic

Correct the cause of insufficient pressure before continuing machine operation.

2.8 Hydraulic neutral position -Travel hydraulic- variable displ. pumps

Leave the safety lever in the up position. Carry out pre-checks with a 0-600 bar pressure gauge, final checks / adjustments with a 0-40 bar pressure gauge.

The normal pressure reading should correspond more or less to the replenishing pressure. A difference M1 to M2 of up to 1.0 bar is permissible.

2.9 Pressure limitation Travel hydraulic

Not adjustable. Check only if needed. To block the parking brake, use Lin-Diag Software, item „Test- brake solenoid“.

Note: Lin-Diag deactivates this function after 10 seconds to avoid damage to the brake.

Prerequisite for the use of this function of Lin-Diag is that the machine is at a standstill, and the parking brake is applied. (no travel joystick deflection at the start of the test). See group 10.1.

Work clean and carefully. Carefully actuate the pumps and hold maximum pressure only for a short time.

2.10 RPM Diesel engine

Check via display.

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No.	Test Remarks	Unit	Nominal value	Test value at test	Test value after adjustment	Adjustment location	Test point	

2.5 Pressure difference Δp – Working hydraulic

ⓘ	At full spool opening, the Δp must drop below 13 bar							
2.5.1	**Lift**	bar	Δp <13			--	HD-LS	
2.5.2	**Lower**	bar	Δp <13			--	HD-LS	
2.5.3	**Tilt in**	bar	Δp <13			--	HD-LS	
2.5.4	**Tilt out**	bar	Δp <13			--	HD-LS	
2.5.5						--	HD-LS	
2.5.6						--	HD-LS	

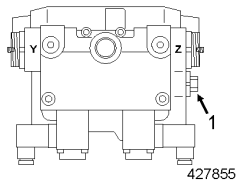
2.6 Accumulator - WH

ⓘ	Actuation via WH joystick after engine shut off	--	min. 4x					

2.7 Replenishing pressure - TH

ⓘ	No adjustment possible	bar	20^{+2}				SP	

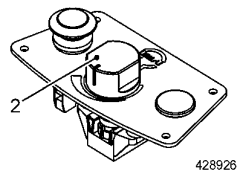
2.8 Hydraulic neutral position - TH

2.8.1	**Pump right**	bar	$M1=M2^{\pm1}$			1	MR1	
		bar	$M1=M2^{\pm1}$			1	MR2	
2.8.2	**Pump left**	bar	$M1=M2^{\pm1}$			1	ML1	
		bar	$M1=M2^{\pm1}$			1	ML2	

2.9 Pressure limitation - TH High pressure

ⓘ	Check only if necessary in connection with Pt. 3.3.2							
2.9.1	**Travel forward**	bar	420^{+30-10}				MR1	
		bar	420^{+30-10}				ML1	
2.9.2	**Travel reverse**	bar	420^{+30-10}				MR2	
		bar	420^{+30-10}				ML2	

2.10 Diesel engine RPM

ⓘ	Check via display	ULL	min^{-1}	910^{+50}		2	ⓘ	
	or special tool	OLL	min^{-1}	1895^{+50}				

Comments:

4.2.20 Fan and cylinder arrangement

1 General

The hydraulically driven fan is installed in travel direction, behind the radiator. The air flow drawn in by the radiator from the engine compartment is pressed to the outside by the fan.

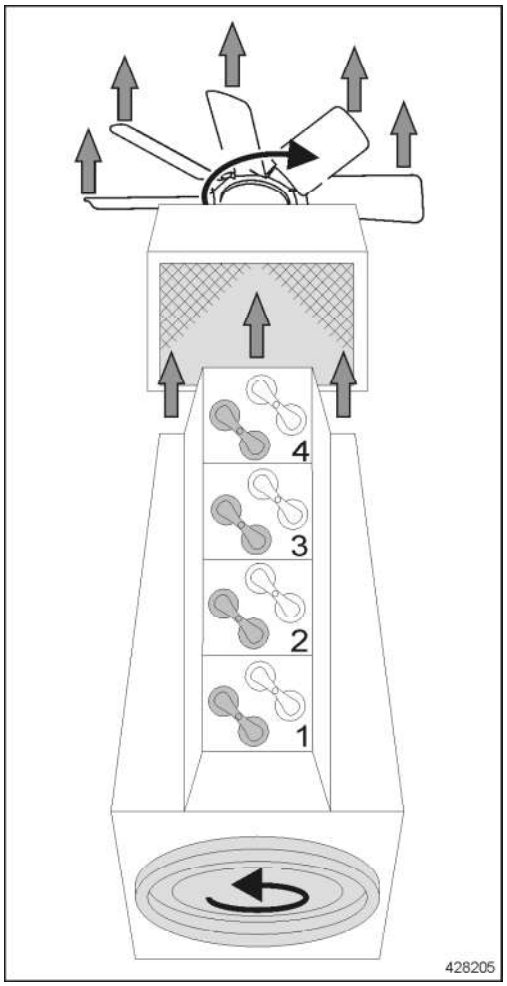


Fig. 1 Fan and cylinder arrangement

○ = Inlet

● = Outlet

2 Firing order

	D934 S / L
Firing order	1 - 3 - 4 - 2
Overlap	4 - 2 - 1 - 3

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7.2.5 Read out and evaluate the Service codes with the aid of the software PDL

Problems in the electrical system and leaks or plugs of the hose and pipe lines can be evaluated with the software PDL. In addition, the functionality of the exhaust system can be checked with the Data logger function via the recorded data. See section 10.2 Software PDL Diesel particle filter.

7.2.6 Clean the carbon particle filter

Note!
Some position numbers refer to the illustrations on page 1 or 2.

As a rule, the filter element 30 must be cleaned after as soon as the maintenance interval is over. If it is very dirty, then the inlet module must already be cleaned as soon as the warning light lights up.

Note!
The following view is turned by 180° compared to the installation position.

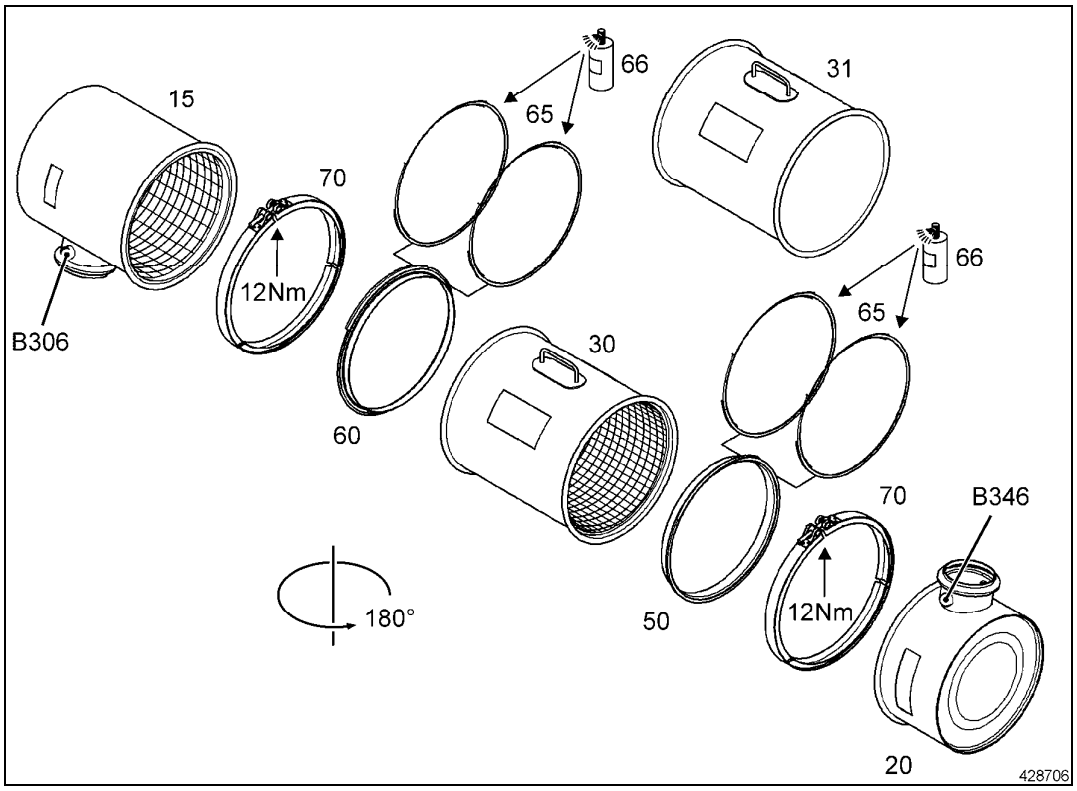

Fig. 9 Components of particle filter

15 Inlet module
20 Outlet module
30 Filter module
31 Muffler
50 Centering ring Outlet
60 Centering ring Inlet
65 Seal ring
66 Spray adhesive
70 Connector clamp
B306 Temperature sensor – Exhaust temperature inlet
B346 Temperature sensor – Exhaust temperature outlet

The filter is cleaned to remove the oil ash trapped in the filter module. This oil ash is created by the combustion of engine oil and can be recognized as white ash (metal oxide).

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5.3.20 Splitterbox

1 General

The splitterbox (3) is flanged directly onto the flywheel housing of the Diesel engine (1). The torque from the Diesel engine RPM is transferred to the drive shaft of the splitterbox via the elastic coupling (2).

The variable pumps for the travel hydraulic (5) as well as the tandem gear pump (6) for the replenishing and the fan drive are flanged on and driven on both outputs. The actual value of the pump RPM is taken by sensors on the output for the travel hydraulic for the electronic control.

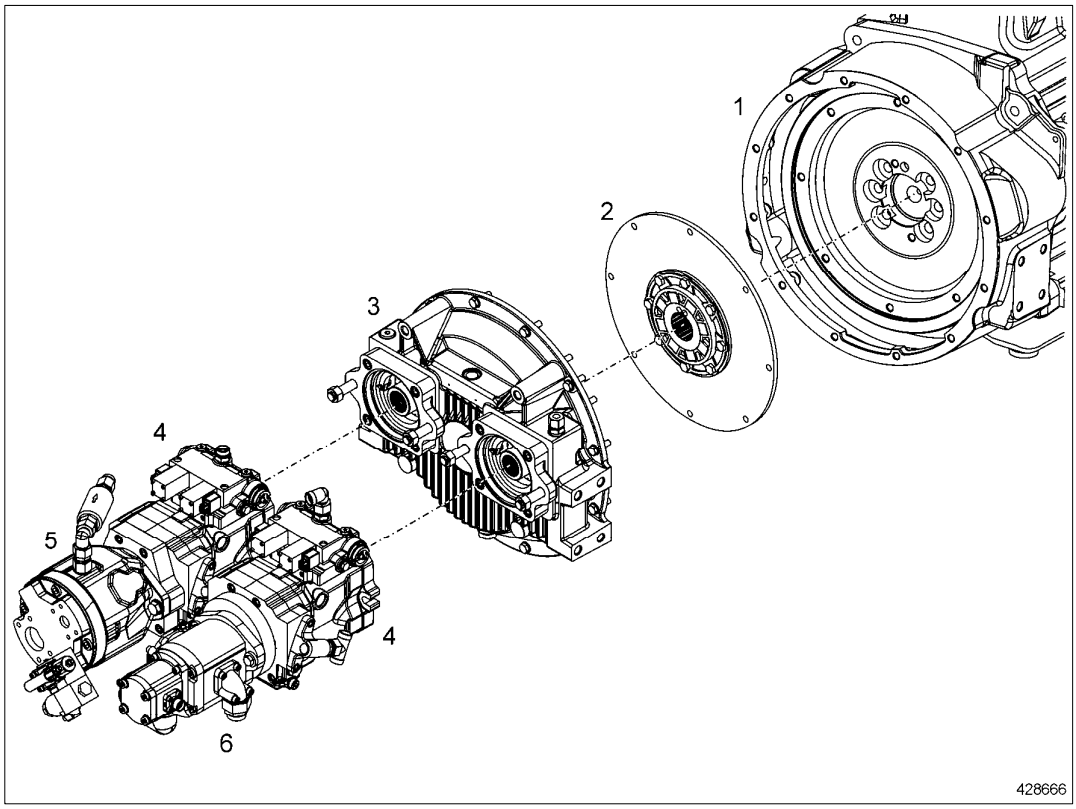

Fig. 1 Arrangement of splitterbox

2 Design

Note!
The given position numbers refer to the parts list and sectional drawing in paragraph 2.1.

The splitterbox is designed as a one stage spur gear with two outputs. The drive shaft (10) and the spur gears (20, 30) are held with ball bearings in the two halves of the housing (1, 22).

The drive shaft (10) transfers the torque to the two spur gears (20, 30) and via their four wedged gears to the flanged on pumps. On the output, the direction of rotation is reversed and the rotational speed is increased due to the gear ratio.

The gears and bearings are supplied with oil through splash lubrication. The radial shaft seal ring (13) seals toward the outside on the drive side and sealed grooved roller (24, 34) seal on the output side.

6.1.30 Data page

Description		LR 634 F/N xxx-8397→ 10328	LR 634 F/N xxx-10329→
Gear pump - Replenishing			
Flow quantity Q_{max}	l/min	117	117
Pressure relief valve - Replenishing SP	bar	20^{+2}	20^{+2}
Gear pump – Fan drive			
Flow quantity Q_{max}	l/min	39	39
Proportional solenoid valve – electronically regulated - Maximum pressure p_{max}	bar	170^{+10}	155^{+10}
Var. displ. pump - Travel drive			
- Flow quantity Q_{max}	l/min	282	282
Hydraulic regulating pressure - Actuator cylinder	bar	2 - 8	2 - 8
Pressure relief valves - max. high pressure - closed circuit left /r ight, Travel forward/ reverse	bar	$420^{+30/-10}$	$420^{+30/-10}$
Housing flush	l/min	≈ 10 - 15	≈ 10 - 15
Var. motors – Travel drive			
- Pressure relief valve - Discharge	bar	14	14
Housing flush	l/min	≈ 10 - 15	≈ 10 - 15

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2.1 Closed loop circuit / speed regulation

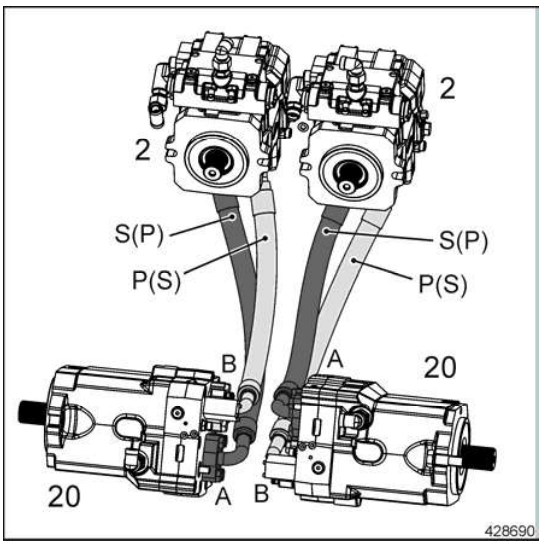

Fig.2 Closed loop circuit

The variable displacement pumps 2, via tow each high pressure line connection with the variable displacement motors 20 form the closed loop circuits of the hydrostatic drive.

The variable displacement pumps are regulated via two each proportional solenoid valves. They determine the flow direction in the pumps (= travel direction) and the flow quantity (=speed).

The displacement volume of the variable motors (= higher speed) is regulated via one each proportional solenoid valve per variable displacement motor. The transfer from pump to motor regulating range is stepless.

The basic adjustment and the fine adjustment of the travel speed are set via the electronic control (see Operating manual).

This type of regulation with the same Diesel engine output results in:

- **slow speed = high torque**

  on travel pumps: small pump angle = small flow
  on travel motors: large pump angle = large consumption

- **maximum speed = reduced torque**

  on travel pumps: large pump angle – large flow
  on travel motors: small pump angle = small consumption

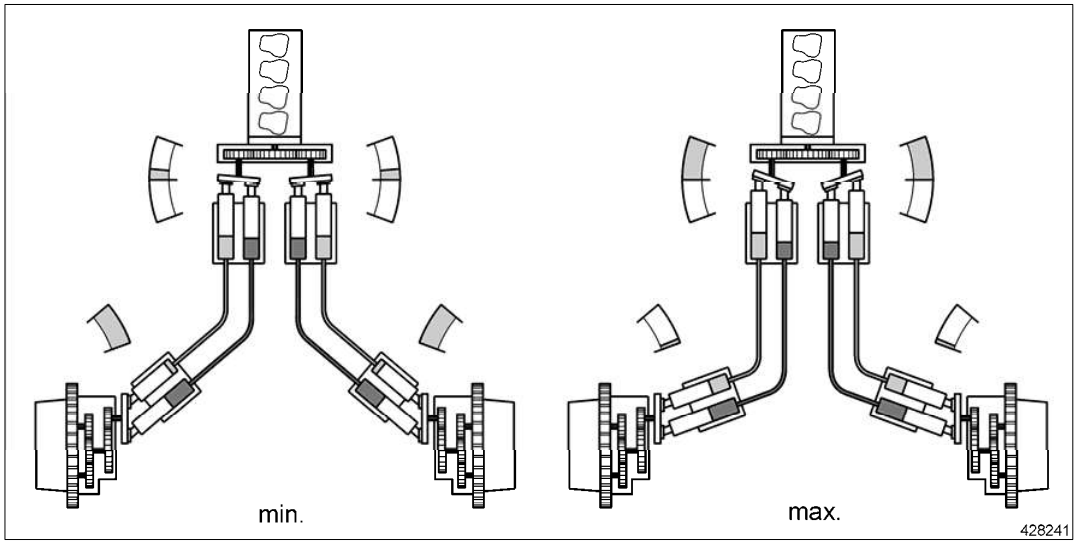

Fig. 3 Pump angle ranges

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4 Overview – fan drive

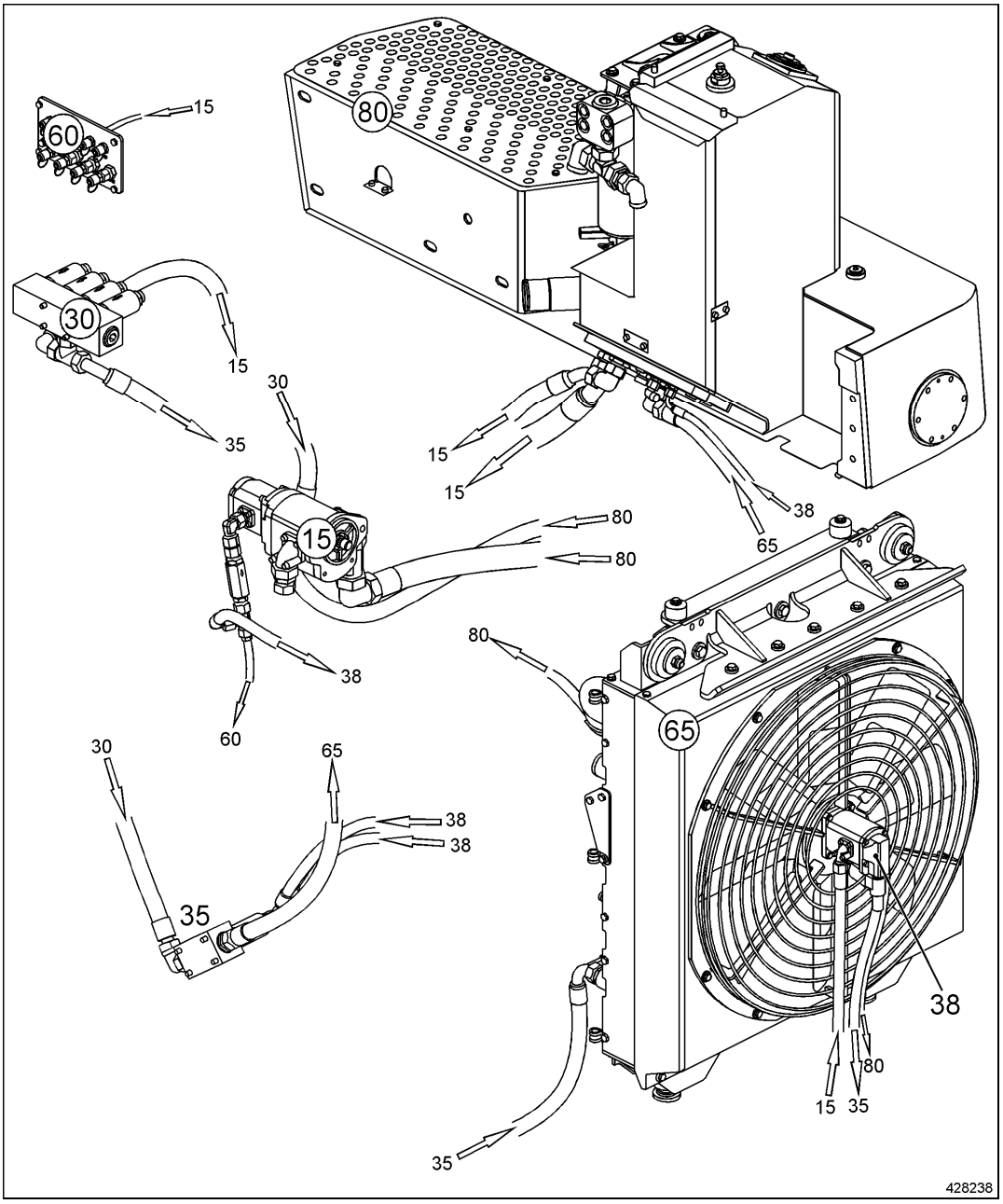

Fig.12 Overview fan drive

15 Tandem gear pump
30 Collector block 4 – way
35 Collector block 2 – way
38 Gear motor – fan drive
60 Test console
65 Combi cooler
80 Hydraulic tank

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6.3.20 Function

Note!
The chapter covers two hydraulic schematics:

Travel hydraulic	Functional schematic, see page 7/8
Coolant circuit / hydr. fan drive	Functional schematic, see page 8/8

1 Neutral function

1.1 Replenishing – Gear pump 15

The tandem gear pump 15 consists of 2 gear pumps. Die larger pump (S1-P1) supplies the replenishing, the smaller pump (S2-P2) supplies the fan drive.

As soon as the Diesel engine is running, the gear pump 15 (S1-S2) supplies oil from the hydraulic tank 80 to valve block 16 (P1) → test point SD. The pressure relief valves 17 secure the replenishing circuit with 20^{+4} bar. The oil not required in the replenishing circuit flows via valve block 16 (T) → return filter 82 into the hydraulic tank 80.

Additional distribution on the valve block 16

- P2 → filter block 18 (F) → distributor section 19
- F → check valve 52 → accumulator 55 → blocked
  → Y4 solenoid valve safety control WH → blocked
- SP → distributor block 50 (P1) → Y13 solenoid valve parking brake → blocked.

After lowering the safety lever, the solenoid valve Y4 switches to passage (P-B) and supplies the servo control of the working hydraulic with pressurized oil via connection GP.

The temperature sensor B24 takes the oil temperature on the distributor section 19 and reports it with the corresponding signal to the electronic fan control. The oil pressure switch B6 and the test connection SP monitor and control the replenishing pressure.

Distribution on the distributor section 19

- → Variable displ. pumps 2 (F) left / right → replenishing
- → Variable displ. motors 20 (E) left / right → control

Oil flow in variable displ. pump 2 right/left from F to →

- Replenishing function PR valve 5 → Replenishing - closed loop circuit M1
- Replenishing function PR valve 6 → Replenishing - closed loop circuit M2
- Pilot piston 8 → control cylinder 9.
- Proportional solenoid valves Y9/Y10 or Y11/Y12 → blocked.

The passages of the pilot piston 8 to and from the control cylinders 9 are strongly restricted. All controls cylinders are actuated evenly with pressurized oil and keep the swash plates of the pumps 4 in hydraulic zero position = 0° pump angle.

The oil flowing off via the pilot piston 8 and the available leak oil lubricate, cool and flush the drive gears of the variable displ. pumps 2 and flows via the housing connection T into the coolant circuit, see paragraph „4. Coolant circuit and hydraulic fan control“

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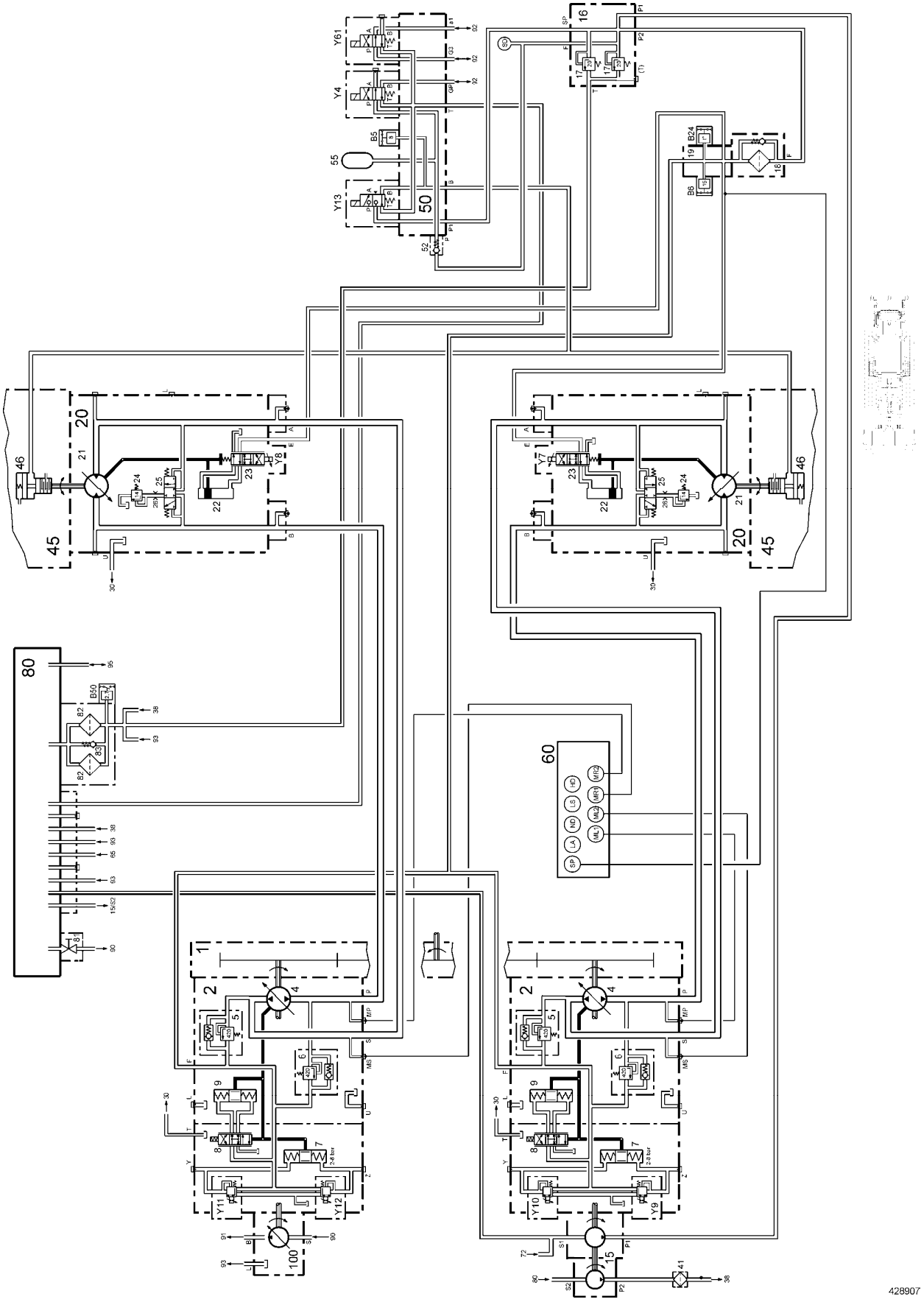

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4 Coolant circuit and hydraulic fan control

Note!
For functional schematic, see page 8/8

4.1 Coolant circuit

The leak oil or oil from the discharge (cooling and flushing of components) is directed via the housing connections F on the variable pumps 2 or U on the variable motors 20 via the strainers 71 and collector block 70 to the oil cooler 65. The return line (T) is also directed to the oil cooler by the fan motor 38 via the strainers 36 and collector block 35. The oil return flow is cooled on the oil cooler and also directed into the hydraulic tank 80.

When the oil is cold, a back pressure is created in front of the oil cooler 65. It opens the check valve 32 and a large part of the oil flow from the collector block 30 or 35 is directed un-cooled to the pump 15/S1 = oil cooler bypass for quicker warm up.

At operating temperature, the back pressure in front of the oil cooler drops and the check valve 32 remains closed. The complete return oil flows via the oil cooler 65, the pump 15/1 only receives cooled oil from the tank.

4.2 Hydraulic fan drive – Gear pump 15

When the Diesel engine is running, the gear pump 15 (S2) supplies oil from the hydraulic tank 80 via strainers 41 to the gear motor 38 (P) and the proportional pressure regulating valve Y48.

Depending on the pressure regulation of the valve Y48, a part of the oil flow flows via the valve, the remaining oil flow drives the gear motor 38/fan.

The oil flowing off from valve Y48 and motor 38 is directed via the oil cooler 65 to the hydraulic tank 80.

Test point LA (pressure build up in fan drive) is connected on the pump outlet P2.

4.3 Electronic regulation

The electronic regulation of the fan control is made by the electronic box A25 (ECU) of the Diesel engine. A25 regulates the energization of the proportional solenoid valve Y48, depending on the signal values of the temperature sensors B24 / B707 as well as B708 and therefore limits the pressure build up in the hydraulic fan drive = the fan speed.

A25 → ⇆ B24 – Hydraulic oil temperature
⇆ B707 – Charge air temperature
⇆ B708 – Coolant temperature
→ Y48 – Proportional solenoid valve – fan control

When the machine is cold, Y48 is energized with maximum value and regulated the possible pressure build up in the hydraulic fan drive - pump 15/2 → motor 38 – to the minimum value (fan turns at minimum speed or is at a standstill).

With increasing media temperature, the energization of Y48 is proportionally reduced and as a result, the hydraulic pressure level is increased correspondingly = fan speed increases.

If one of the media reaches the corresponding operating temperature, then the current to Y48 is turned off by A25.

If there is no current, for example in case of system failure, Y48 regulates to the adjusted maximum pressure = maximum fan speed (fail-save system) - p_{max} = 170^{+10} bar

For wiring, see section 9 – Electrical system.

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2.1 Regulation - Variable displ. pumps 2

Through the energization of the proportional solenoid valves Y9/Y11 or Y10/Y12 , the valve is opened, the pressurized oil flows to one side of the actuator cylinder 7 and builds up a hydraulic regulating pressure in proportion to the magnetic force.

The piston of the actuator cylinder 7 is moved from the regulating pressure against the opposite regulating spring assembly until a balance of forces is available.

Via a mechanical connection, the pilot piston 8 is moved into the opposite direction. This opens the pressurized oil supply to the side of the swash plate control – control cylinder 9 , on which the regulating pressure build up occurred and allows the oil from the opposite side of the swash plate control – control cylinder 9 – to flow off into the pump housing. The swash plate pump 4 is moved into flow direction against Q_{max} .

Low current → small flow volume
High current → large flow volume

As the swash plate is moved, the pilot piston 8 is moved back in the pilot piston housing by the mechanical connection until the housing bores and the pilot piston are back to a negative overlap = neutral position. Both sides of the swash plate control – control cylinder 9 are actuated right away with pressurized oil and the swash plate is held hydraulically on the selected pump angle.

If the current increases, the pumps are shifted in direction of Q_{max} until the mechanical regulating stop of the variable pump is reached.

If the current decreases, the swash plate pump 4 is moved in direction Q_{min} / neutral position.

2.2 Regulation - Variable displ. motors 20

When starting to travel, the 3/3 -directional valve 25 is pressurized on one side with low pressure, on the other side with high pressure from the closed loop circuit and is moved accordingly towards the low pressure side.

This results in the following oil flow, in addition to the closed loop circuit (valid for both motors on each side)

- Lower pressure side → directional valve 25 → orifice 26 → pressure relief valve 24 → Motor housing (lubrication / flushing) → coolant circuit; see paragraph „4.“.
- High pressure side → directional valve 25 → blocked.

Due to the corresponding energization of the proportional solenoid valves Y7 or Y8, the pilot piston 23 is moved against the regulating spring to shift position ”Diagonal passage”. The regulator side (spring side) control piston is relieved to the tank, the opposite control piston is actuated with pressurized oil and the axial piston unit is moved in direction Q_{min}.

With the movement in direction Q_{min} , the return spring pushes the pilot piston 23 increasingly against the force of the proportional solenoid. When the spring force is the same as the magnetic force, the pilot piston 23 is held in center position, the channels to the control piston 22 are closed and the axial piston unit is held on the selected angle.

As current increases, it continues to move in direction Q_{min}. The maximum possible current / adjustment is limited by the electronic control.

As current is decreased, the axial piston unit 21 is moved again in direction Q_{max} = neutral position, whereby the control pressure is moved the same way as in neutral function via the pilot piston 23 - ”diagonal passage” to the regulator side (spring side) of the control piston 22 and the opposite side is relieved. Intermediate positions for equal force between solenoid and spring are as described above.

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Note!
LinDiag deactivates this function after 15 seconds to avoid damage to the HP valve.

Prerequisite for the use of this function of LinDiag is that the machine is at a standstill and that the parking brake is applied (no deflection of the travel joystick at the start of the test). See section 10.1.

If the nominal value in one or more areas is not obtained, find the cause and remedy it. Possible causes are, for example: pressure relief valve is loose or damaged, cylinder barrel or swash plate is damaged, directional valve for replenishing is defective, control cylinder seal is defective or general wear.

To be able to limit a problem or defect to the area of the variable pumps or variable motors, the high pressure lines must be closed off. See paragraph 2.6.1”Preparation”

If the nominal value was not obtained after blocking off one or more areas, find the cause and remedy it. Possible causes are, for example: pressure relief valve is loose or damaged, cylinder barrel or swash plate is damaged, control cylinder seal is defective or general wear.

If the nominal values are obtained during the test with blocked off high pressure lines, but not during the pre-test in working application, then the cause is in the variable motor area, for example cylinder barrel or swash plate damaged, directional valve for replenishing defective. Find the cause and remedy it.

- ▶ After the test, remove the tools.
- ▶ Reinstall components with new seals.
- ▶ Tighten screws (for tightening torques, see section 1.4.)
- ▶ **Bleed** the hydraulic circuits**.** Carry out a test run.

2.6.1 **Preparation for test –** block off HP lines

- ❑ Prepare test plates – see Special tools, page 2.1. – and hex head screws M14 x 55 -10.9, Id. No. 4600510 for installation

The test plates are installed with the SAE flanges of the HP lines on the variable motors (20). The installation area is accessible by ”tilting the operator’s platform”.

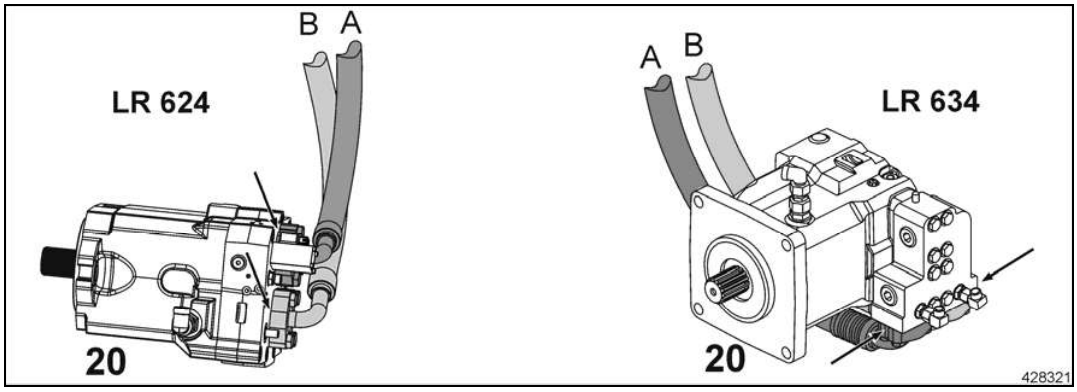

Fig. 7 Test plates – variable motor

Danger!
Danger of injury due to splashing oil.
The flow may not be blocked with test plates of this type on the pump outlets, since there is no O-ring to seal the pump side.

- ▶ For installation, loosen the screws of the SAE flange and push in the test plates.
- ▶ Replace the screws individually with the above listed, longer screws and tighten them.

7.1.30 Data page

Description		LR 634 F/N xxx-8397→
Servo pressure ND	bar	20^{+4}
Regulating pump		
Pump flow	l/min	209
Stand by pressure	bar	$20^{\pm 2}$
Pressure difference Δp HD-LS	bar	15
Pressure cut off	bar	$260^{\pm 5}$
Control valve block		
Type		M6 – 1194 – 00
Spool valve regulating range	bar	5 – 14,8
Spool travel - hoist	Cap A - mm Cap B - mm	11 11
Spool travel - tilt	Cap A - mm Cap B - mm	11 11
Primary pressure max.	bar	$320^{\pm 10}$
Secondary pressure max.		
tilt out/ tilt in	bar	$300^{\pm 10}$
lift	bar	$350^{\pm 10}$
Housing flush	l/min	15
Accumulator – fill pressure	bar	12

Note!
Attachments, such as cable winches and special attachment may require different pressure settings.

Cycle times

Lift / lower from groundlevel to maximum lifting height

Description			LR 634 F/N xxx-8397→
Standard bucket	lift (ground level - max.)	sec.	6,4
	lower (max. - ground level)	sec.	2,8
	tilt in (max. - max.)	sec.	3
	tilt out (oben: max. - max.)	sec.	2,2

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3.4 Tilt bucket in

Servo control

Servo pressure build up from regulating piston 118 → housing outlet 4 → b2-control valve block 130 → spool valve 145 – movement towards a2.

Working circuit

Pressurized oil flow from spool valve 145 to

- → control valve block-outlet B2 → block 176 → B-tilt cylinder 175.
- → PR-valve 148 → blocked.

In the tilt cylinder, the piston / piston rod is pushed outward, the bucket is tilted in.

Oil return flow from tilt cylinder / piston rod side to → block 176 → A2-control valve block 130 → spool valve 145 → tank line/connection T → return filter 82 → hydraulic tank 80.

Bucket return

After preselecting bucket return and deflecting the pilot control lever via the pressure points, the lever in held by the solenoids Y58. The bucket tilts in until the bucket return sensor B11 is actuated. The solenoid Y58 is de-energized and releases the pilot control lever. It returns to neutral position, the servo pressure on the regulating piston 118 is relieved to the hydraulic tank and the spool valve 145 is moved to neutral position. The bucket remains on the preselected position.

3.5 Tilt bucket out

Servo control

Servo pressure build up from regulating piston 119 → housing outlet 2 → a2-control valve block 130 →
spool valve 145 - movement towards b2.

Working circuit

Pressurized oil flow from spool valve 145 to

- → control valve block-outlet A2 → Block 176 → A-tilt cylinder 175.
- → one-way valve 151 → blocked.
- → PR-valve 147 → blocked.

In the tilt cylinder, the piston / piston rod is pushed in, the bucket is tilted out.

Oil return flow from tilt cylinder / piston bottom side to → block 176 → B2-control valve block 130 →
Spool valve 145 → tank line MT1 → pretension valve 135 → block connection T → return filter 82 → hydraulic tank 80.

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7.4.00 Test and adjustment

Important pre-information

To check pressures, use only glycerin filled pressure gauges with a reading accuracy of ± 1 % or even higher accuracy pressure gauges. The reading accuracy of the pressure gauge should be approx. 30%, max. approx. 100% above the test value to be set.

Caution!
Before checking/ adjusting or repairs, make sure to observe all applicable safety guidelines, the machine must be parked on firm and level ground, it must be raised and properly supported, the working attachment must be supported as well.

- Machines with raised cab may not be driven.
- Secure the danger zone.

Observe the safety guidelines as noted in section 1.2.

When **putting the machine into service**, proceed according to the guidelines given in the **Operating manual**, check the correct sequence of the indicators.

All checks and adjustments are carried out with the Diesel engine RPM noted in the adjustment check list and with the machine at operating temperature.

Any defects found during the tests must be remedied immediately or as soon as possible, depending on the type and possibility.

When carrying out checks and adjustments, **use** the corresponding **adjustment check list, page 3.5.**

The protocol sequence corresponds to the system requirements, the following instructions are attuned to them as far as possible. **Nominal adjustment values are noted on the check list. The following instructions must be strictly observed.**

1 Visual inspection and maintenance

Carry out any scheduled maintenance and inspection work before checking the system. For intermediate tests / adjustments, observe the following points.

1.1 Service items and maintenance

- Check **the coolant level** as well as the **oil level** in the Diesel engine, splitterbox and hydraulic tank; add fluids, as necessary.
- Check the **air filter** for contamination, damage, proper installation and correct type.
- Add **fuel**, if necessary. Depending on the machine type, drain water and sediments from the tank and **pre-separator.** If you suspect loss of power, replace the **pre- / fine filter**.
- Check / open the **hydraulic oil filter**, **strainer** of the affected system part and the **return filter** in the tank if there is any suspicion of broken or worn parts.
- In case of temperature problems, check the **hydraulic oil cooler** and fan for contamination / damage.

1.2 Mechanical components

- Check the **travel joystick** adjustment / wear of the control plate and the rubber dust covers.
- Check the **wiring harnesses** for damage, chafing and defective plug connections.
- Check for **leaks** and check the function of the system as well as hose routing.
- Check the **mounting of the components**, such as cylinder mountings, consoles etc. for condition / tight seating.

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8.1.20 Variable displacement pump

1 General

Caution!

- The following parts are matched to their installation location – do not mix them up:

  2 each Pos. 42 - Shim
  2 each Pos. 46 – oil guide tube and
  2 each Pos. 48 – Shim

- The following parts are matched to the existing component tolerances:

  Pos. 17 - Shim
  Pos. 21 - Shim
  Pos. 29 - Spacer
  Pos. 72 – Spring plate
  Pos. 87 - Shims (with Pos. 88 – retaining ring)

- Note at replacement:

  Warm up thrust ring Pos. 11 to maximum 150°C and insert with Loctite 648 or similar product.

  Insert radial shaft seal ring Pos. 12 with Loctite 270 or similar product and fill sealing lip gaps by approx. 50% with grease.

- The hydraulic zero position of the pump is given by the position of valve housing Pos. 80. Preadjustment (if necessary): Overlap front surface valve housing 80 to housing, Pos. 60 = 14,75 mm

- Tightening torque for pressure relief valve Pos. 50 = 170 Nm

2 Pump connections

F	Connection to filter (Servo pressure / replenishing)
L	Connection - housing to hydraulic tank
MP	Test point - to P/S
P(S)	Connection - high pressure line
S(P)	Connection - high pressure line
T	Connection / housing (vent)
U	Connection / housing
Y	Control flow direction S(P)
(Y)	Test point Servo pressure Y
Z	Control flow direction P(S)
(Z)	Test point Servo pressure Z

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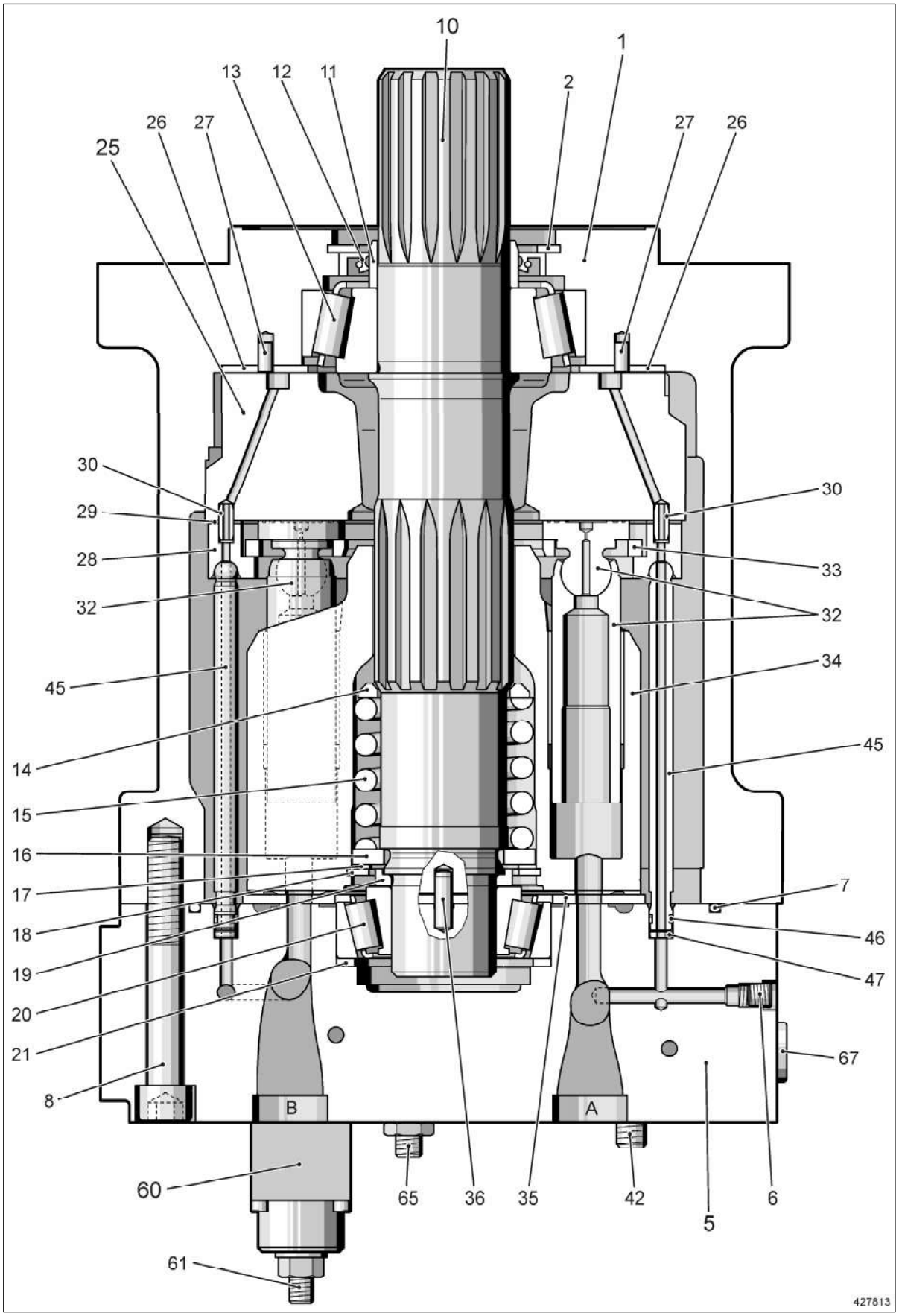

Fig. 2 Sectional diagram – var. displ. motor

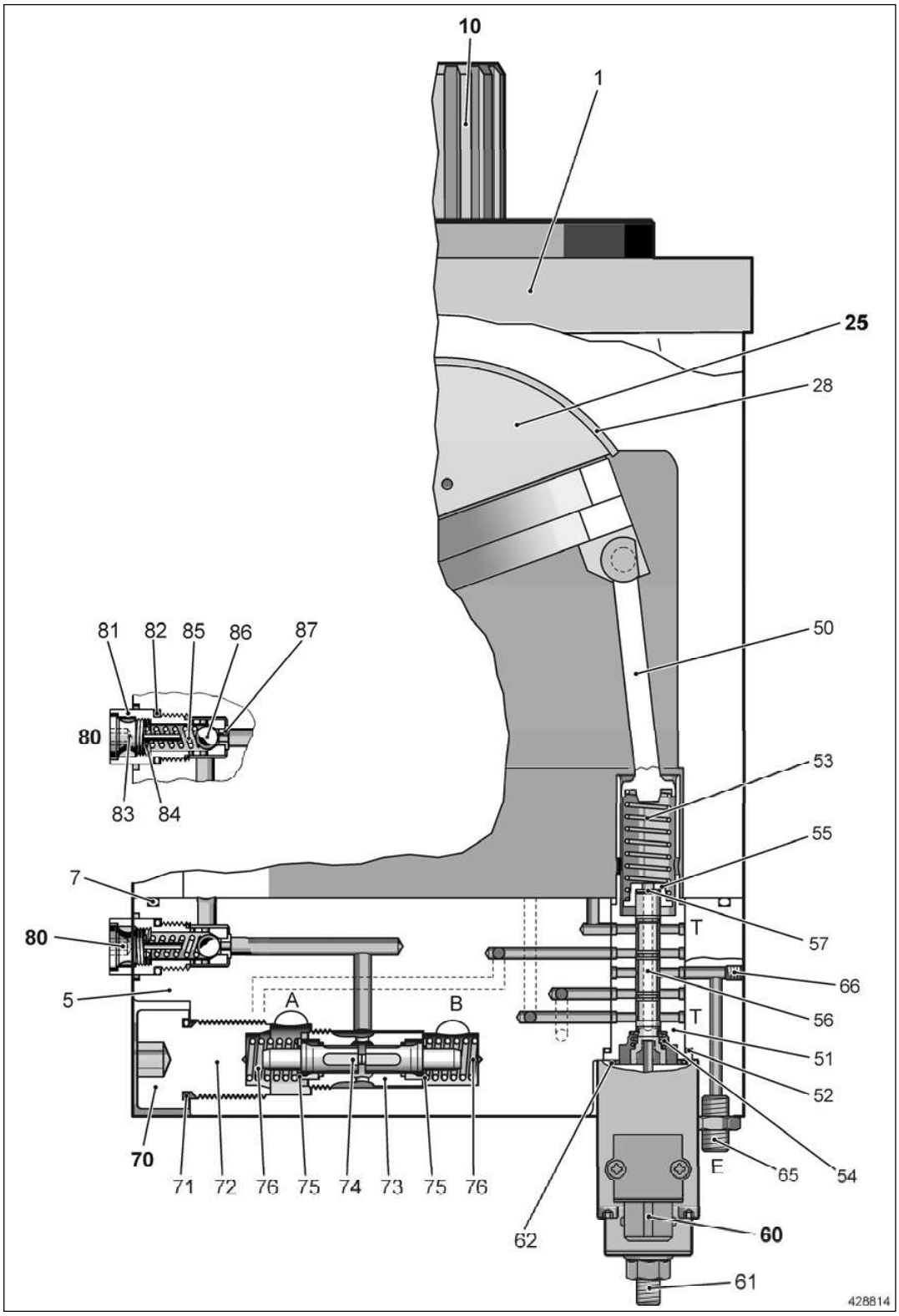

Fig. 4 Sectional diagram – var. displ. motor

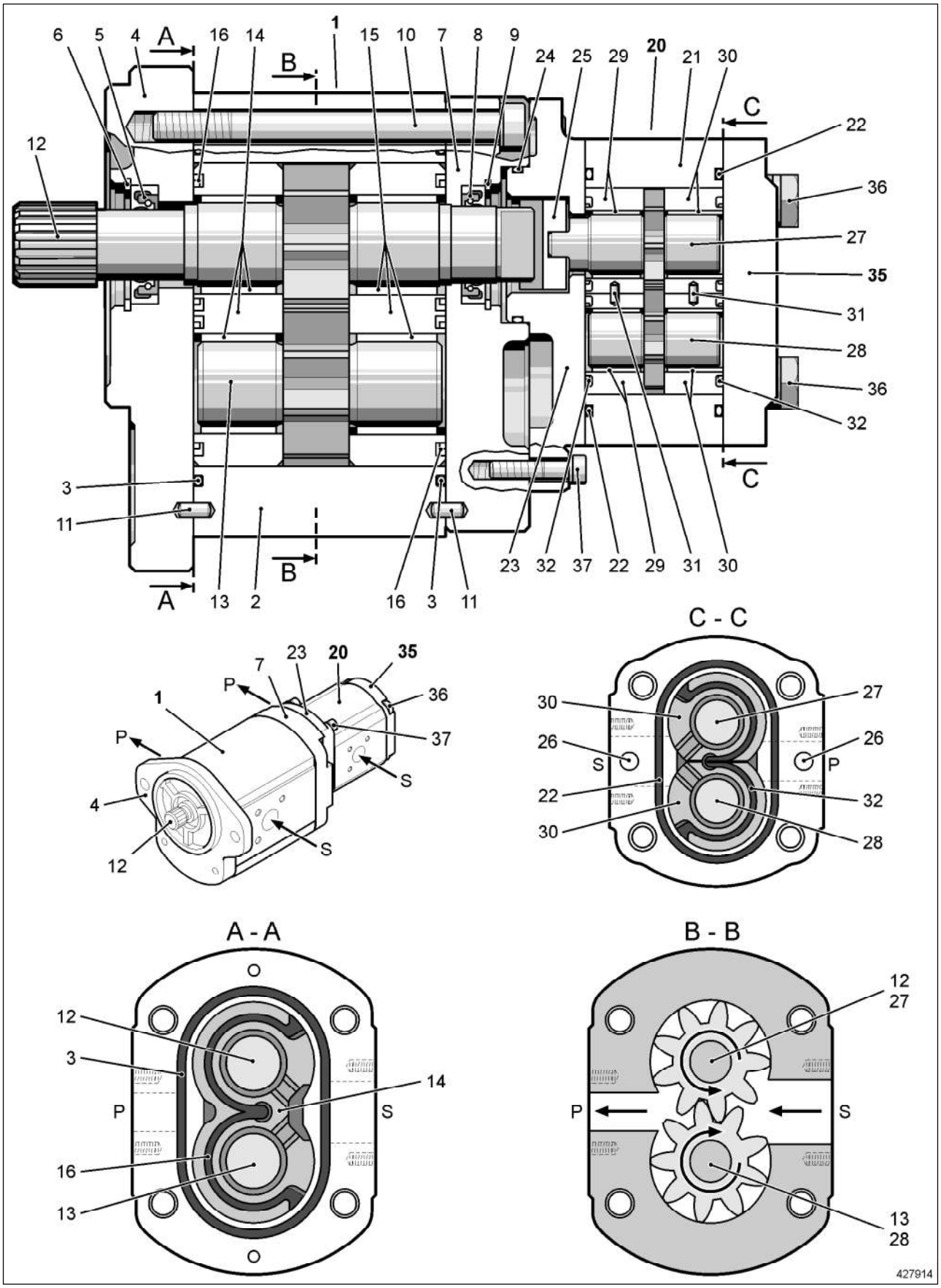

Fig. 1 Sectional diagram - Gear pump

3.2 Replacement of rocker switch 66 (Option 4 in 1 bucket)

The rocker switch 66 can be removed from the housing of the push button switch 6 with a knife or a small screw driver.

Note!
Make sure that the tool you use is not inserted too deeply at removal, otherwise the rubber seal of the switch can be damaged.

Insert the tool on the side of the edge of the rocker switch and push outward to make the rocker switch jump out from the lock.

The retaining function of the rocker switch 66 in the push button switch 6 is ensured by the two locks 67.

After removal of the rocker switch 66, check the rubber sleeve visually for damage. If the rubber sleeve is damaged, replace push button 6.

Then insert the rocker switch 66 and check the push button 6 for function.

3.3 Installation and removal of handle shells 1

For the installation of the wiring harness and replacement of the rocker switch 6 it is necessary to remove the handle shells 1. To do so, remove cover 2 as described in paragraph 3.1.

Then loosen both socket head screws 9 and remove the handle shells 1.

Assembly is in reverse order.

Due to vibrations, the socket head screws 9 must be inserted with Loctite 243 to secure the screws.

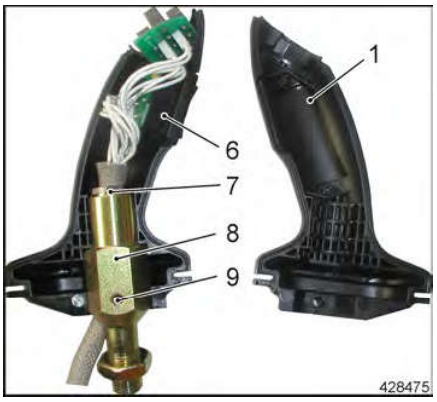

Fig. 3 Removal of handle shells

3.3.1 Replacement of push button switch 6 (Option 4 in 1 bucket)

Unplug the plug of the wiring harness and remove the push button switch 6 with seal ring.

Note!
When installing the push button switch 6 make sure that the seal ring is positioned correctly in the handle shell.

3.3.2 Installation of wiring harness

When installing the wiring harness, make sure that it is routed properly in the handle shell.

The wiring harness must be inserted in the slit of the actuator lever 8 and screwed together with the cable fitting 7

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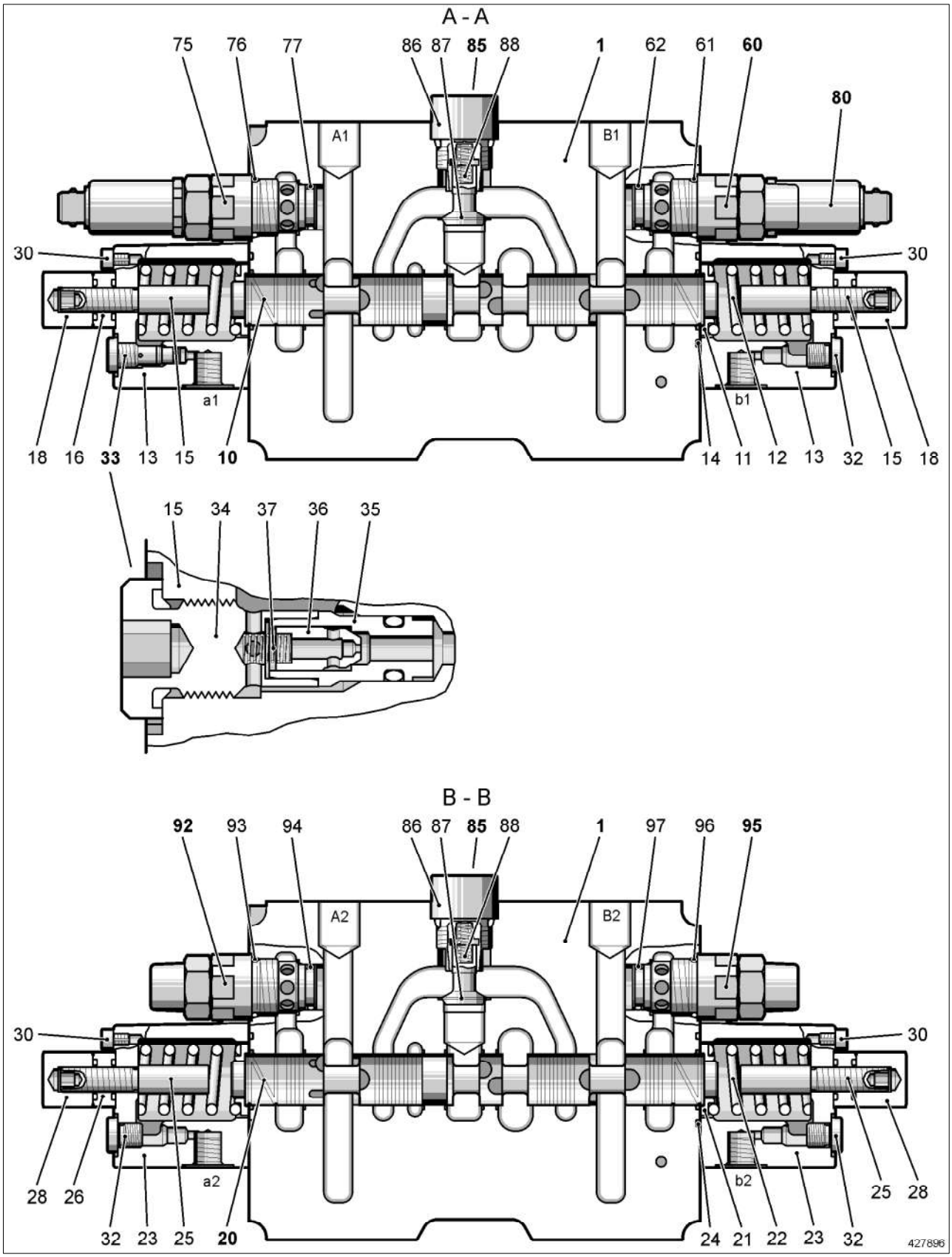

Fig. 3 Lift section A-A / B-B

8.8.00 Hydraulic cylinder

1 Design / function

Dual-acting cylinders with one-sided piston rod are predominately used. The forces and speeds transferred by the cylinder depend on the direction of the movement and the supplied oil quantity per time unit.

Size and shape of the cylinders are determined by the required pressure force, lift speed and length as well as their application.

1.1 Main components of a hydraulic cylinder

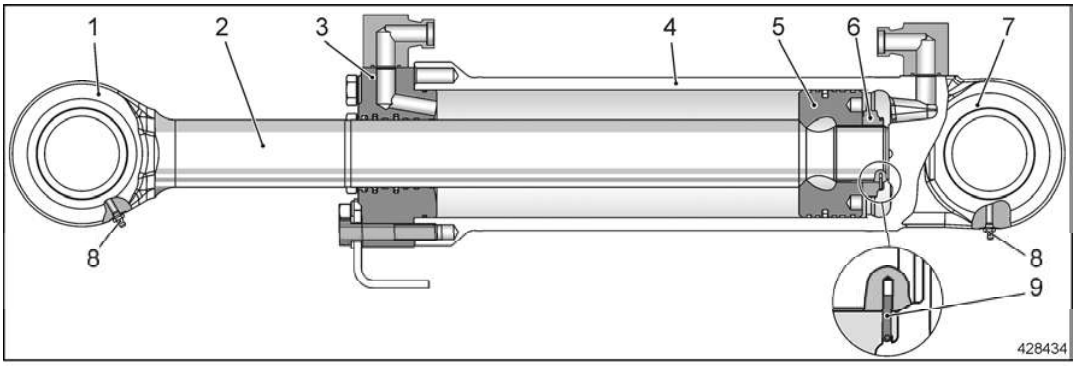

Fig. 1 Main components of a hydraulic cylinder

1 Cylinder bearing, rod side
2 Piston rod
3 Piston rod bearing
4 Cylinder barrel
5 Piston
6 Piston nut
7 Cylinder bearing, bottom side
8 Grease fitting
9 Snap hook

To seal the pressure chambers towards the inside and the outside, special seal systems are on the piston rod bearing and piston.

The piston rod is directed through guide rings in the piston rod bearing. A scraper ring in the piston rod bearing protects from dirt infiltration when the piston rod is retracted.

2 Function description

The hydraulic cylinder with one-sided piston rod is dual acting. The maximum forces in the cylinder depend on the maximum operating pressure and the corresponding active surfaces:

- **Extend** – Pressurized oil piston bottom side = circular surface – lower speed
- **Retract** - Pressurized oil piston rod side = ring surface smaller force – higher speed

The O-rings as well as the Glyd-, Rimseal and Stepseal seal rings seal the pressure chambers toward the inside and outside.

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M8 Refueling pump/ battery box right
M9 Blower air cond. condenser, left
M10 Blower Air cond. condenser, center
M11 Blower Air cond. condenser, right
M12 Compressor motor Operator's seat air cushioned
M13 Windshield washer pump, rear/ cab
M16 Control motor water valve / heater / air cond.
M19 Wiper, front
M20 Wiper, rear

P Displays

P1 Hour meter/ instrument panel
P2 for Fuel quantity / instrument panel
P3 for Coolant temperature / instrument panel
P4 for Engine oil pressure / instrument panel
P5 for Hydraulic oil temperature
P6 for Display Optional

R Resistors, users

R3 Blower resistor / heater / air cond.
R4 Preresistor - Alternator/ central electric A8
R10 Fuel condensation separator heatable
R12 Regulating potentiometer Water valve / roof console, left
R14 Heater coil intake air preheating / Diesel engine
R20 Resistor Windshield wiper intermittent speed
R21 Resistor Windshield wiper intermittent speed
R22 Resistor Windshield wiper Intermittent speed
R26 Resistor coding plug for 4 –Quadrant operation
R28 Fuel condensation separator heatable
R29 Resistor Coding plug for 2 –Quadrant + brake pedal - operation

S Switches

S1 Starter glow switch / Control panel
S2 Safety lever
S3 Emergency stop button/ Control panel
S4 Button scroll service code / Display panel
S5 Button horn/ cab
S7 Rocker switch speed preselection l/ Travel joystick
S8 Button bucket release/ Pilot control
S12 Stage switch Blower / roof console, left
S19 Rocker switch Air cond. system/ roof console, left
S20 Rocker switch float position ripper/ roof console, right
S21 Rocker switch Flood light cab front/ roof console, right
S22 Rocker switch Windshield wiper front/ roof console, right
S23 Combi switch windshield wipe / washer system rear/ roof console, right
S29 Rocker switch Back Up Alarm/ roof console, right
S35 Button flap 4 in 1 bucket (am AH- Geber)
S36 Rocker switch beacon/ roof console, right
S38 Combi switch intermittent wiper / wash/ roof console, right
S40 Stage switch speed intermittent wiper / roof console, right
S41 Button reversible fan / roof console, right
S43 Battery master switch mechanical / battery compartment
S44 Button refueling pump on/ roof console, right
S45 Button Refueling pump off / roof console, right
S47 Button Towing control
S48 Thumb button on WH joystick for hoist limit shut off
S53 Button preselection bucket return
S54 Switch Load control

V Diodes

V2 Safety lever an Start lock relay/ central electric A8 1A
V3 Display oil pressure replenishing / central electric A8 1A
V7 Display oil level Hydraulic tank/ central electric A8 1A
V8 Display coolant level/ central electric A8 1A
V9 Preresistor alternator / central electric A8 1A
V10 power supply/ central electric A8 1A
V13 Intermittent control Windshield wiper/ Diode combination 1A
V14 Intermittent control Windshield wiper/ Diode combination 1A
V26 Interference suppression - wind shield washer pump, front
V27 Interference suppression - wind shield washer pump, rear
V28 Varistor Interference suppression - Horn / B7
V30 Interference suppression - intake air preheating/

X Plugs

X1	Electrical socket 24V/ Fuel tank, left		2 pin
X2.6	to Cooler box 12V	Deutsch DT	2 pin
X2.7.3	to Periphery central electric	Deutsch DTHD	1 pin
X2.8	to Periphery central electric	Deutsch DT	8 pin
X3.1	to / from Periphery central electric A8	Deutsch DRC	
X3.2	to / from Periphery central electric A8	Deutsch DRC	
X3.3	to / from Periphery central electric A8	Deutsch DRC	
X4.1	to Display panel A24	Deutsch DRC	40 pin
X4.2	to Control panel A9	Deutsch HDP	18 pin
X6.2	Central electric A20 to cab	Deutsch DT	2 pin
X7	Terminal bar for problem reports		
X9	Terminal bar free fuses		
X10	Terminal bar switch inputs		
X11	Terminal bar free Relay		
X12	Terminal bar switch outputs		
X13	Terminal bar free Diodes		
X14	Terminal bar free connections		
X15	Terminal bar Options		
X16	Separation terminal ground connections		
X17	Terminal bar Special equipment		
X18	Terminal bar power supplies		
X20	for Hoist limit shut off	Deutsch DT	3 pin
X21	for Bucket return	Deutsch DT	3 pin
X23	to Pilot control working hydraulic	Deutsch DTM	12 pin
X27	to Safety lever S2	Deutsch DT	8 pin
X28	to Fuel level sensor B16	Deutsch DT	4 pin
X29	to Oil level sensor B26	Deutsch DT	3 pin
X30	to Oil level sensor B27	Deutsch DT	3 pin
X32	to Operator's seat A15	Fastin Faston	2 pin
X38	to Tilly travel lock		

Stkident Nr. 9417708

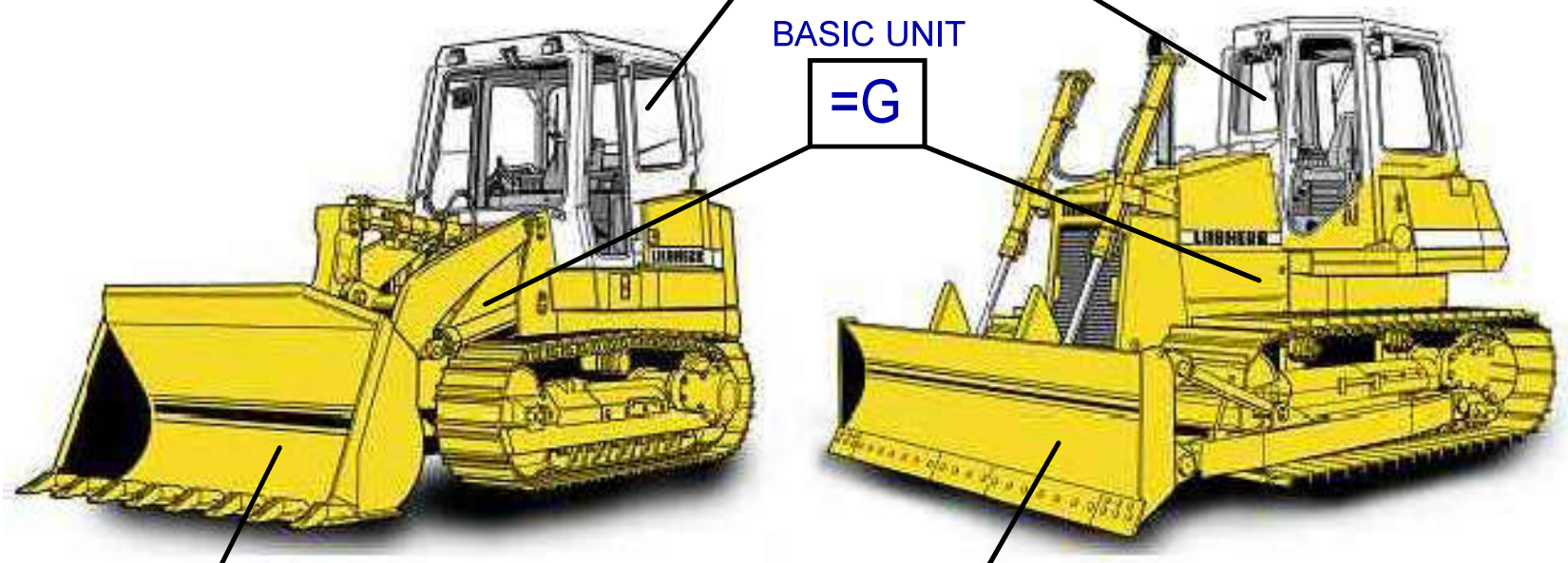
PROJEKT: 9417708_007

E3 series

=F DRIVER'S CAB

BASIC UNIT

=G



=A EQUIPMENT

=A EQUIPMENT

Zustand	Änderung	Datum	Name		
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				Datum Spei.	20.11.2007 09:05
				Ausgabe	lwtscj1
				Datum Plot	8.5.2008 08:23

LIEBHERR-WERK TELFS GMBH

SYSTEM FEATURE PICTURE

LR 624

Ident.-Nr. 9417708

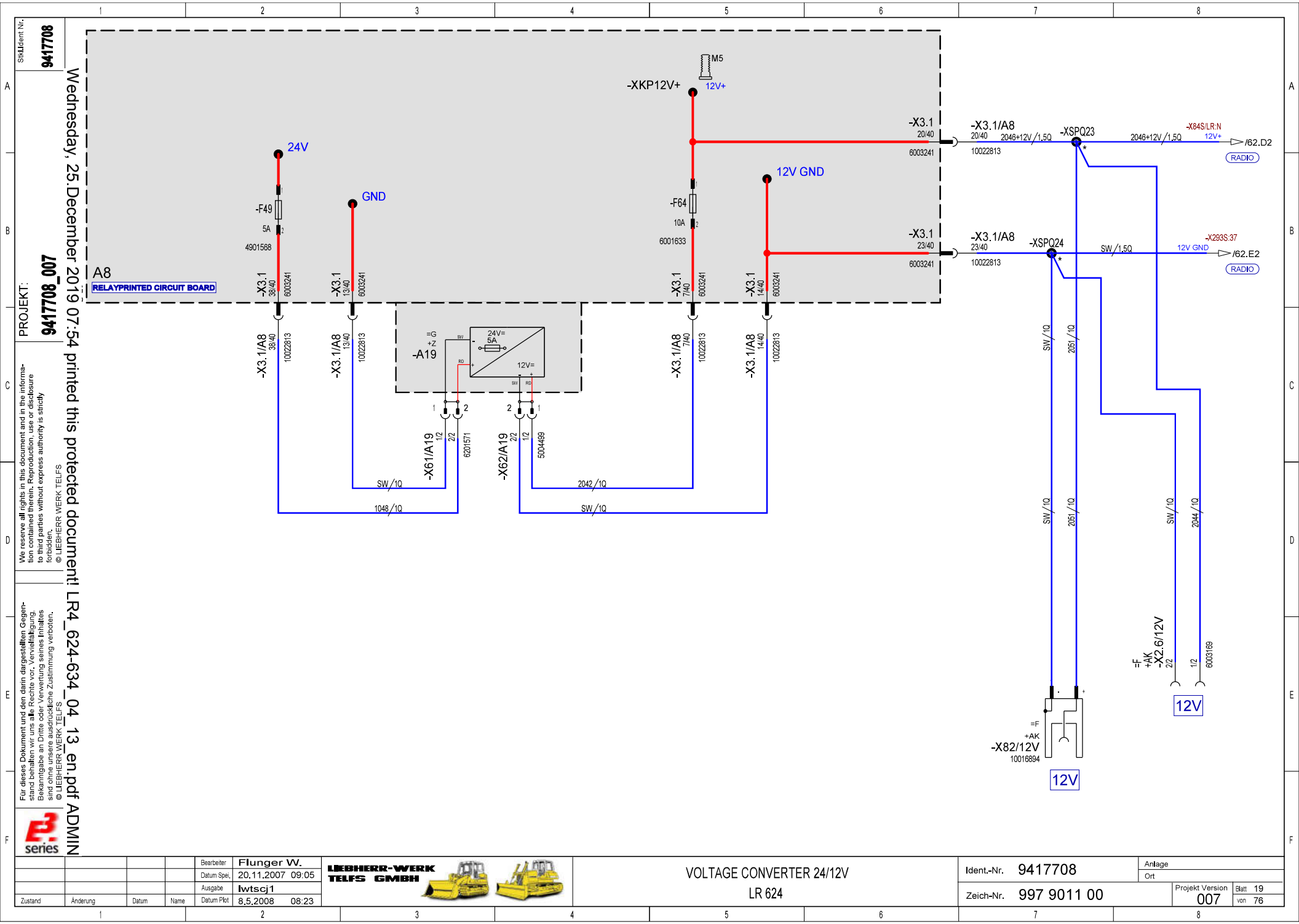
Zeich-Nr. 997 9011 00

Anlage

Ort

Projekt Version 007

Blatt 5 von 76



				Bearbeiter	Flunger W.	LIEBHERR-WERK TELFS GMBH	VOLTAGE CONVERTER 24/12V LR 624
				Datum Spei.	20.11.2007 09:05		
				Ausgabe	lwtscj1		
Zustand	Änderung	Datum	Name	Datum Plot	8.5.2008 08:23		

Ident.-Nr.	9417708	Anlage	
Zeich-Nr.	997 9011 00	Ort	
		Projekt Version 007	Blatt 19 von 76

Stk.Ident Nr. 9417708

PROJEKT: 9417708_007

E3 series

DRIVER'S CAB FRONT

SW,SW,SW,SW/1Q,1Q,1Q,1Q

=F +FK -MPFK.1 MASSE M8 /33.B4 GND

-X152/E18 2/2 6003169 — =F +FK -E18 7027205 H3 24V/70W — -X152/E18 1/2 6003169

-X148/E4 2/2 6003169 — =F +FK -E4 7027205 H3 24V/70W — -X148/E4 1/2 6003169

-X149/E6 2/2 6003169 — =F +FK -E6 7027205 H3 24V/70W — -X149/E6 1/2 6003169

-X153/E19 2/2 6003169 — =F +FK -E19 7027205 H3 24V/70W — -X153/E19 1/2 6003169

6416/1Q 6413,6417/1Q,1Q 6417/1Q

/13.B7 -S3:B 24V - F43

=F +FK -MPFK.1 MASSE M8 /32.A5 GND

SW/1Q

-X150/E5 2/2 6003169 — =F +FK -E5 7027205 H3 24V/70W — -X150/E5 1/2 6003169

-X151/E3 2/2 6003169 — =F +FK -E3 7027205 H3 24V/70W — -X151/E3 1/2 6003169

-X173/S21:10, -X299/S50:10, -X176/S19:10 24V - F42 /32.C7 /36.D7 /47.A6 /54.A8

2030,2031,2048,2076,2077/1Q,1Q,1Q,1Q,1Q

6415/1Q 6111/1Q 6412,6416,6413,6417/1Q,1Q,1Q,1Q

-X4,1P:9 24V - F43 /14.D8 6102/1Q

6414/1Q 6102,6111,6126/1Q,1Q,1Q 6126/1Q -S54:A 24V - F43 /41.B2

2050/1Q

-X15/14 6001074 b a

-X15/13 6001074 b a

2075/1Q

-S36.X:10 24V ÜBER F42 /58.A6

OPTIONAL

-A18 /32.E4 -A18.X4 6003259

-F42LR 5A 4901568

-A18 /32.E4 -A18.X4 6003259

-F43LR 5A 4901568

-A18 /32.E4 -A18.X3 6002260

-F22 15A

1062/2,5Q 1043/2,5Q 1044/1,5Q 1052/2,5Q

/32.A8 24V GECHALTET VON K19 -K19,X:87

/32.A8 24V ÜBER F41 -K17,X:87

A21

ACTUATOR CONSOLE DRIVER'S CAB RIGHT

Zustand	Änderung	Datum	Name		
				Bearbeiter	Flunger W.
				Datum Spei.	20.11.2007 09:05
				Ausgabe	lwtscj1
				Datum Plot	8.5.2008 08:23

LIEBHERR-WERK TELFS GMBH

DRIVER'S CAB LIGHTING
LR 624

Ident.-Nr. 9417708
Zeich-Nr. 997 9011 00

Anlage
Ort
Projekt Version 007
Blatt 33 von 76

Stkident Nr. 9417708

PROJEKT: 9417708_007

E3 series

A23
ACTUATOR CONSOLE DRIVER'S CAB LEFT SIDE

-S_Option1
-S_Option2

10016864 5/12 -X183
10016864 9/12 -X183
10016864 10/12 -X183
10016864 5/12 -X184
10016864 9/12 -X184
10016864 10/12 -X184

2076/1Q
SW/1Q
3061/1Q

=F
+R

A21
ACTUATOR CONSOLE DRIVER'S CAB RIGHT

2076.2077/1Q.1Q
-A18.X4:G
24V - F42
/33.B3
SW.SW/1Q.1Q
+FK
-MPFK.3
MASSE M8
/38.B5
GND
3062/1Q

=F
+FST
-X293P 15/70 6003242
-X293S 15/70 6003243

-X293P 16/70 6003242
-X293S 16/70 6003243

VARIABLE FOR OPTIONS 1

VARIABLE FOR OPTIONS 2

3061/1Q
-X3.1/A8 2/40 10022813
-X3.1 2/40 6003241

3062/1Q
-X3.1/A8 1/40 10022813
-X3.1 1/40 6003241

A8
RELAYPRINTED CIRCUIT BOARD

-X10/B1
-X11/Ö1
-X11/S1
-X10/A1
-X12/1
-VKO1
MICRORELAY
1(86) 4(87a) 5(87)
2(85) 3(30)
RELAY AND FUSE NOT EQUIPPED! EQUIPMENT RESULTED FOR OPTIONALCABLING
A
B
GND

A8
=G
+ZP
RELAYPRINTED CIRCUIT BOARD

-X10/B2
-X11/Ö2
-X11/S2
-X10/A2
-X12/2
-VKO2
MICRORELAY
1(86) 4(87a) 5(87)
2(85) 3(30)
RELAY AND FUSE NOT EQUIPPED! EQUIPMENT RESULTED FOR OPTIONALCABLING
A
B
GND

Zustand	Änderung	Datum	Name		
				Bearbeiter	Flunger W.
				Datum Spei.	20.11.2007 09:05
				Ausgabe	lwtscj1
				Datum Plot	8.5.2008 08:23

LIEBHERR-WERK TELFS GMBH

FREE CIRCUIT BOARD LAYOUT VARIABLE FOR OPTIONS 1 - 2
LR 624

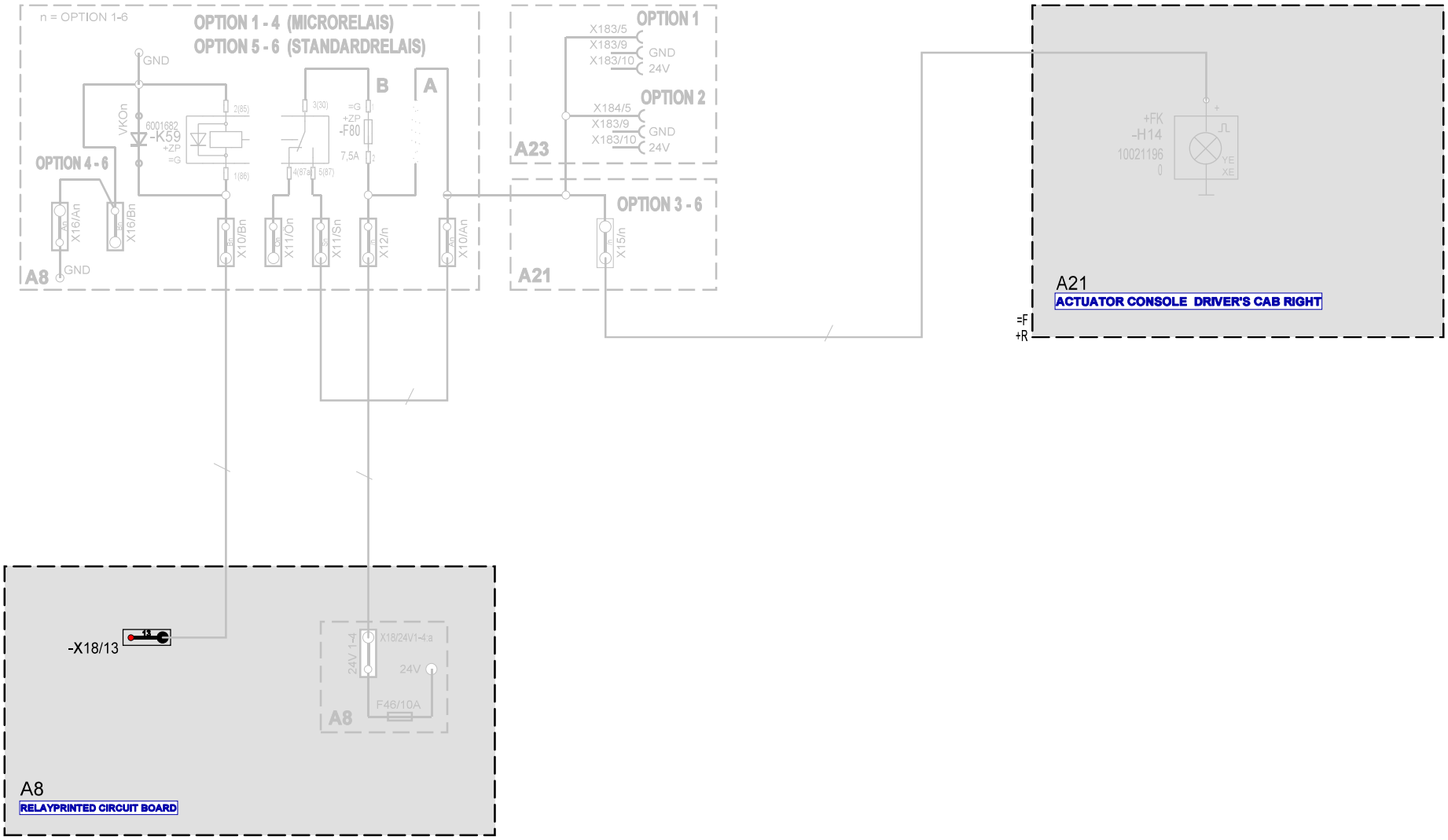
Ident.-Nr. 9417708
Zeich-Nr. 997 9011 00
Anlage
Ort
Projekt Version 007
Blatt 47 von 76

Stkl.Ident Nr. 9417708

PROJEKT: 9417708_007

E3 series

STROMLAUFPLAN

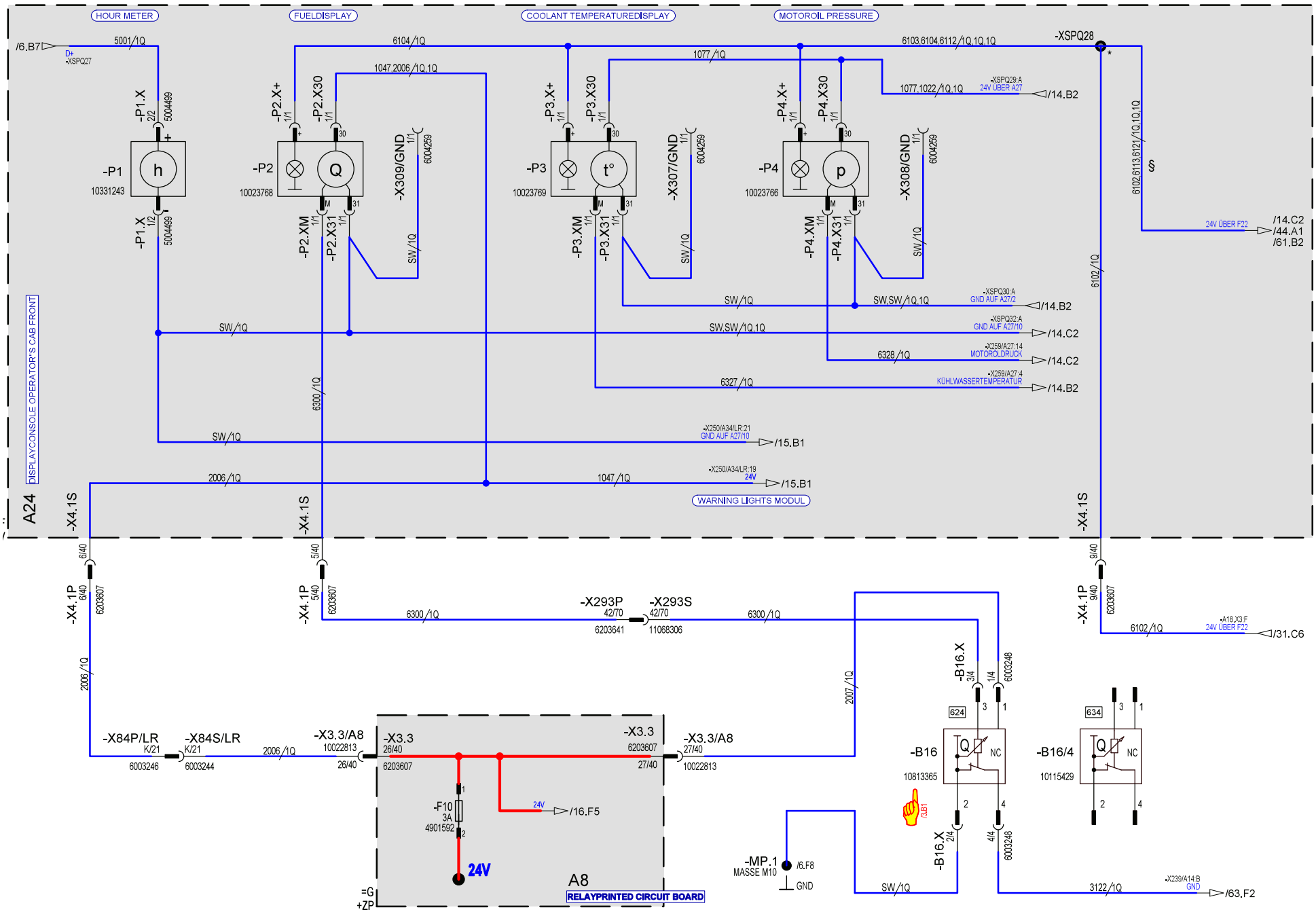


				Bearbeiter	lwtscj1	LEBHERR-WERK TELFS	OPTIONAL BACK-UP ALARM OPTIC LR 624
				Datum	20.11.2007 09:05		
E-STLPL				Ausgabe	lwtscj1		
Zustand	Änderung	Datum	Name	Datum Plot	8.5.2008 08:23		

Ident.-Nr.	9417708	Anlage	
Zeich-Nr.	997 9011 00	Ort	
		Projekt Version 007	Blatt 61 von 76

BMK	Anlage	Ort	Blatt	Funktion
-X295P	=G	+M	/51.D4	CONNECTOR VENTILATOR REVERSIBLE
-X295S *	=G	+M	/51.D4	CONNECTOR VENTILATOR REVERSIBLE
-X296P *	=G	+M	/52.C2	CONNECTOR VENTILATOR REVERSIBLE
-X296S	=G	+M	/52.D2	CONNECTOR VENTILATOR REVERSIBLE
-X298/S49 *	=F	+R	/36.D3	CONNECTOR SWITCH WINDSCREEN WIPER FRONT
-X299/S50 *	=F	+R	/36.E7	CONNECTOR SWITCH WIPER BEHIND
-X305/GND	=F	+V	/46.B3	CONNECTOR GND
-X306/GND	=F	+V	/63.C4	CONNECTOR GND
-X307/GND	=F	+V	/14.B5	CONNECTOR GND
-X308/GND	=F	+V	/14.B6	CONNECTOR GND
-X309/GND	=F	+V	/14.B3	CONNECTOR GND
-X323 *	=G	+T	/41.B8	CONNECTOR PRESSURE SWITCH POWER INCREASE
-X326/B50 *	=G	+T	/17.D2	CONNECTOR PRESSURE SWITCH RETURN FLOW FILTER CONTAMINATION
-X339	=G	+T	/10.D6	DUMMY PLUG
-X348/Y48 *			/22.D8	CONNECTOR PRESSURE RELIEF VALVE VENTILATOR CONTROL
-X348/Y48 *	=G	+H	/22.F6	CONNECTOR PRESSURE RELIEF VALVE VENTILATOR CONTROL
-X348P/Y48 *	=G	+H	/22.F7	CONNECTOR VENTILATOR ENGINE JPT
-X368P	=G	+Z	/9.C5	CONNECTOR STOP ENGINE STARTING
-X368S	=G	+Z	/9.C5	CONNECTOR STOP ENGINE STARTING
-X371P	=G	+Z	/48.C4	CONNECTOR HOLDING MAGNET FLOTATION POSITION
-X371S	=G	+Z	/48.C5	CONNECTOR HOLDING MAGNET FLOTATION POSITION
-X396P	=G	+T	/10.C3	CONNECTOR TILLY IMMOBILIZER
-X396P.X	=G	+T	/10.C4	CONNECTOR TILLY IMMOBILIZER
-XKP12V+	=G	+ZP	/19.A5	NODAL POINT
-XKP15	=G	+ZP	/8.D5	NODAL POINT
-XKP24	=G	+ZP	/8.E6	NODAL POINT
-XKP24	=G	+ZPR	/8.E8	NODAL POINT
-XKP30	=G	+ZP	/7.D7	NODAL POINT
-XKP30	=G	+ZPR	/8.D8	NODAL POINT
-XOPT17 *			/56.C4	CONNECTION OPTIONAL
-XOPT26 *			/57.B1	CONNECTION OPTIONAL
-XOPT28 *			/57.B7	CONNECTION OPTIONAL
-XOPT29 *			/57.D2	CONNECTION OPTIONAL
-XOPT31 *			/60.B1	CONNECTION OPTIONAL
-XOPT32 *			/60.B7	CONNECTION OPTIONAL
-XOPT33 *			/61.B1	CONNECTION OPTIONAL

BMK	Anlage	Ort	Blatt	Funktion
-XOPT34 *			/61.E2	CONNECTION OPTIONAL
-XOPT35 *			/51.B1	CONNECTION OPTIONAL
-XOPT36 *			/51.B7	CONNECTION OPTIONAL
-XOPT37 *			/51.E2	CONNECTION OPTIONAL
-XOPT38 *			/52.B1	CONNECTION OPTIONAL
-XOPT39 *			/52.B5	CONNECTION OPTIONAL
-XOPT40 *			/52.D2	CONNECTION OPTIONAL
-XOPT41 *			/52.D8	CONNECTION OPTIONAL
-XOPT68 *			/55.A2	CONNECTION OPTIONAL
-XOPT69 *			/55.A3	CONNECTION OPTIONAL
-XOPT70 *			/55.E1	CONNECTION OPTIONAL
-XOPT71 *			/55.E3	CONNECTION OPTIONAL
-XSP1	=G	+ZKS	/40.C6	SPLEISSPUNKT (ULTRASCHALL)
-XSP2	=G	+ZKS	/40.C6	SPLEISSPUNKT (ULTRASCHALL)
-XSP4	=G	+ZKS	/44.E2	SPLEISSPUNKT (ULTRASCHALL)
-XSP5 *	=G	+ZKS	/21.C7	SPLEISSPUNKT (ULTRASCHALL)
-XSP8	=G	+ZKS	/13.A6	SPLEISSPUNKT (ULTRASCHALL)
-XSP12	=G	+ZKS	/13.E7	SPLEISSPUNKT (ULTRASCHALL)
-XSP15 *	=F	+KSK	/39.B1	SPLEISSPUNKT (ULTRASCHALL)
-XSPQ1			/15.E5	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ2			/15.E6	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ4			/10.C4	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ5			/20.B2	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ6			/20.B2	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ7			/10.C5	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ8			/8.C3	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ9			/17.D3	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ10			/13.D5	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ12			/8.C5	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ13			/17.D8	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ14			/17.D7	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ15			/26.D6	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ17			/20.C7	PINCH CONNECTOR
-XSPQ23			/19.A7	PINCH CONNECTOR
-XSPQ24			/19.B7	PINCH CONNECTOR
-XSPQ25 *			/57.D4	PINCH CONNECTOR



Std.Ident Nr. 10310717

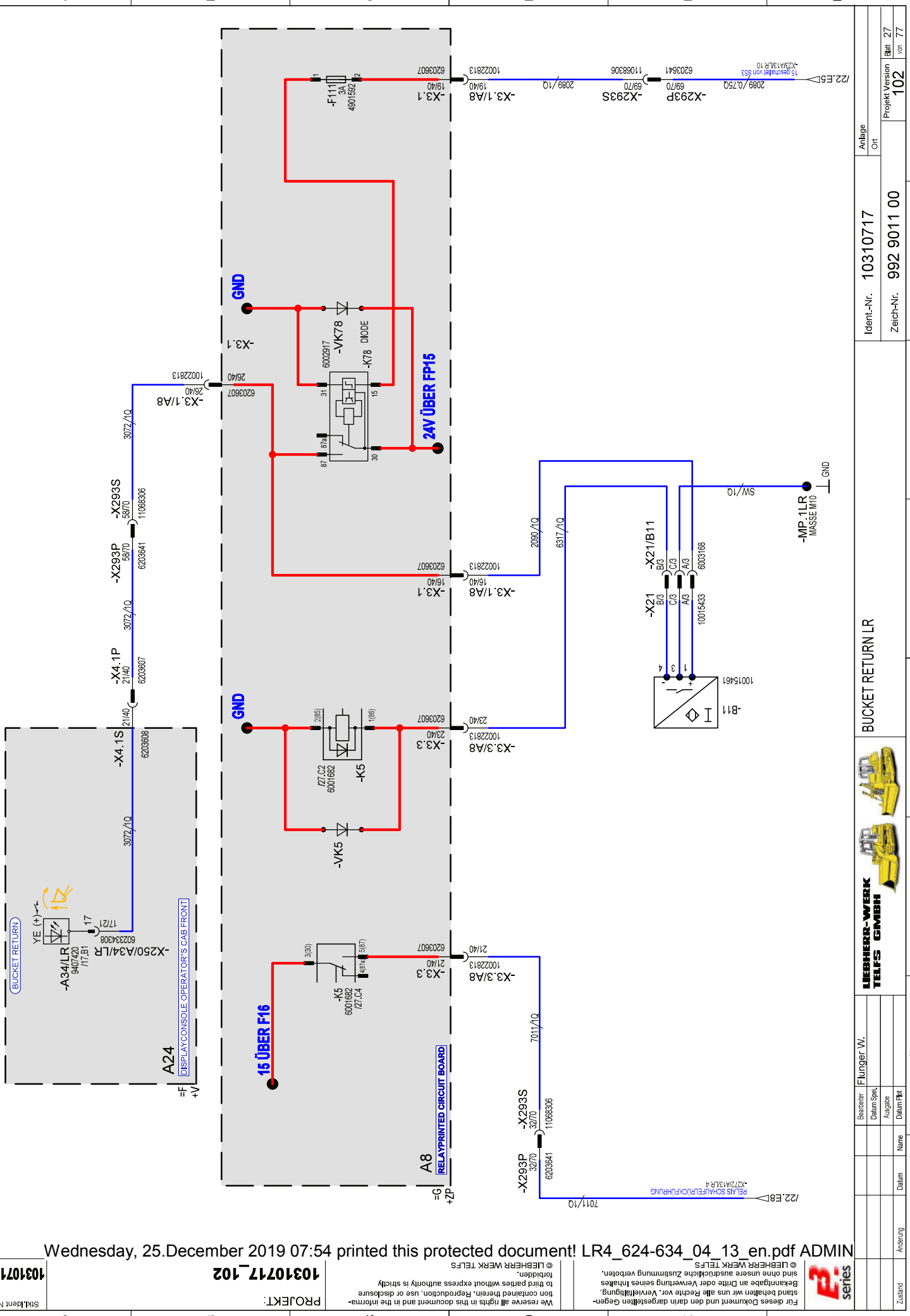
PROJEKT: 10310717_102

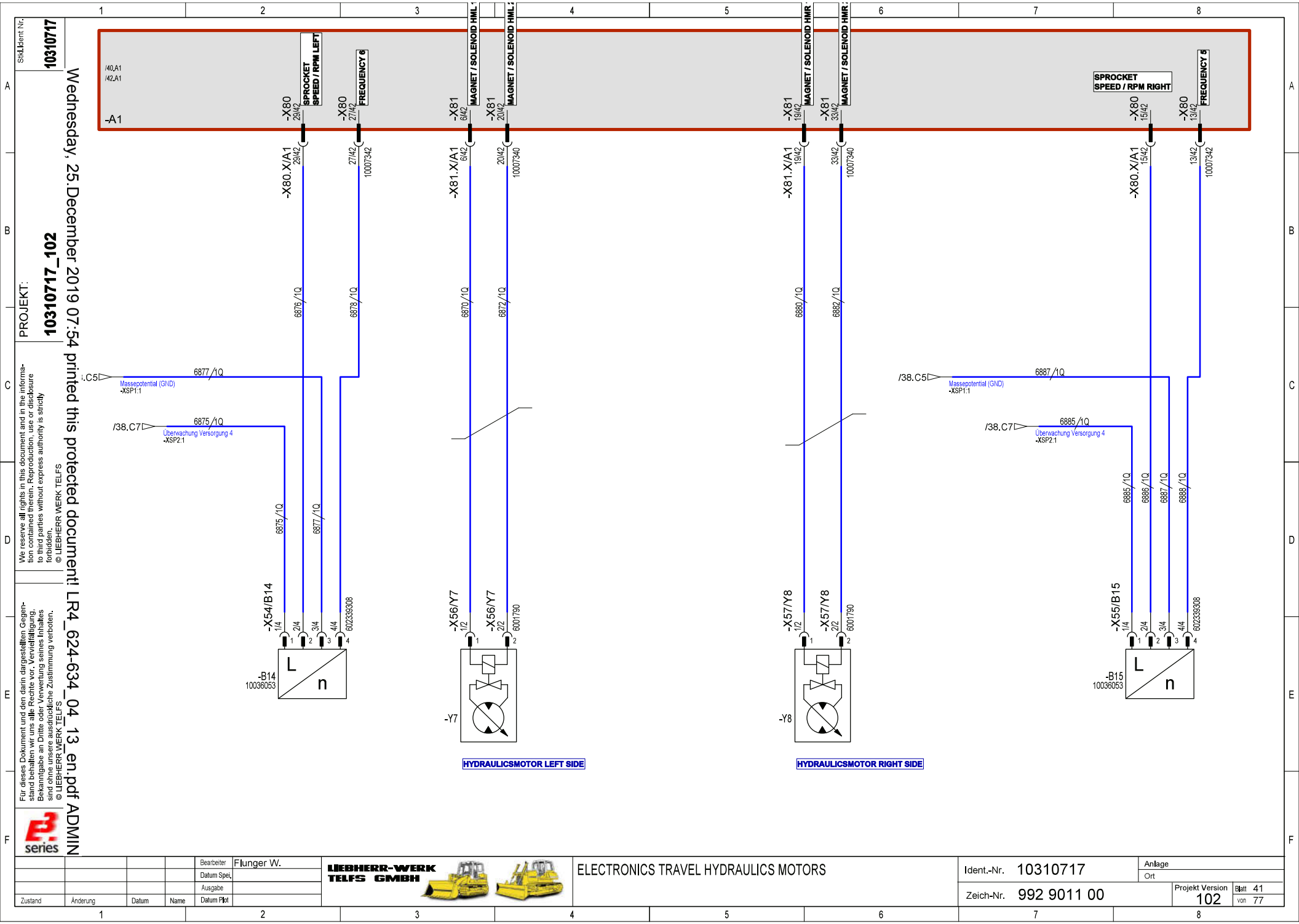
				Bearbeiter	Flunger W.		
				Datum Spei.			
				Ausgabe			
Zustand	Änderung	Datum	Name	Datum Plot			

LIEBHERR-WERK TELFS GMBH

DISPLAY INSTRUMENT

Ident.-Nr.	10310717	Anlage	
Zeich-Nr.	992 9011 00	Ort	
		Projekt Version 102	Blatt 13 von 77


GND
24V ÜBER FP15
15 ÜBER F16
-F111
3A
4901592
-VK78
DIODE
6002917
-K78
-VK5
-K5
6001682
/27.C2
-X3.1
-X3.1/A8
-X3.3
-X3.3/A8
-X293S
-X293P
-X4.1P
-X4.1S
-X21/B11
-X21
-B11
-MP.1LR
MASSE M10
-X250/A34/LR
-A34/LR
9407420
-A24
DISPLAYCONSOLE OPERATOR'S CAB FRONT
-A8
RELAYPRINTED CIRCUIT BOARD
BUCKET RETURN
SW/10
3072/10
2089/10
6317/10
7011/10
/22.E5
/22.E8
BUCKET RETURN LR
Ident.-Nr. 10310717
Zeich-Nr. 992 9011 00
Projekt Version 102
Blatt 27 von 77
LIEBHERR-WERK TELFS GMBH
Flunger W.
Wednesday, 25.December 2019 07:54 printed this protected document! LR4_624-634_04_13_en.pdf ADMIN
PROJEKT: 10310717_102
Stk.Ident Nr. 10310717



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Std.Ident Nr. 10310717

PROJEKT: **10310717_102**

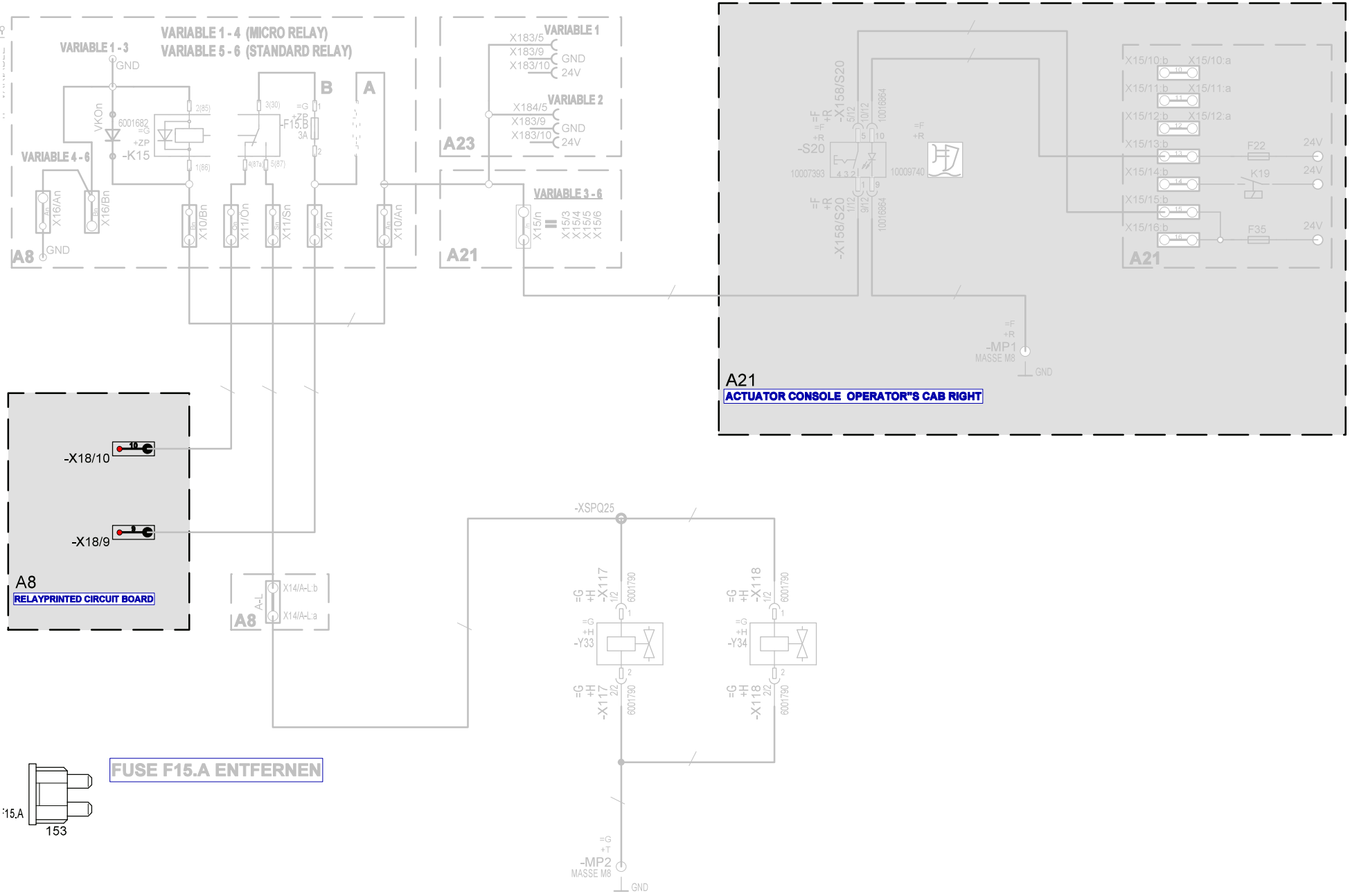
E3 series

Zustand	Änderung	Datum	Name		
				Bearbeiter	Flunger W.
				Datum Spei.	
				Ausgabe	
				Datum Plot	

LIEBHERR-WERK TELFS GMBH

ELECTRONICS TRAVEL HYDRAULICS MOTORS

Ident.-Nr.	10310717	Anlage	
Zeich-Nr.	992 9011 00	Ort	
		Projekt Version 102	Blatt 41 von 77



Std.Ident Nr. 10310717

PROJEKT: 10310717_102

Wednesday, 25.December 2019 07:54 printed this protected document! LR4_624-634_04_13_en.pdf ADMIN

E3 series

Zustand	Änderung	Datum	Name		
				Bearbeiter	Flunger W.
				Datum Spei.	
				Ausgabe	
				Datum Plot	

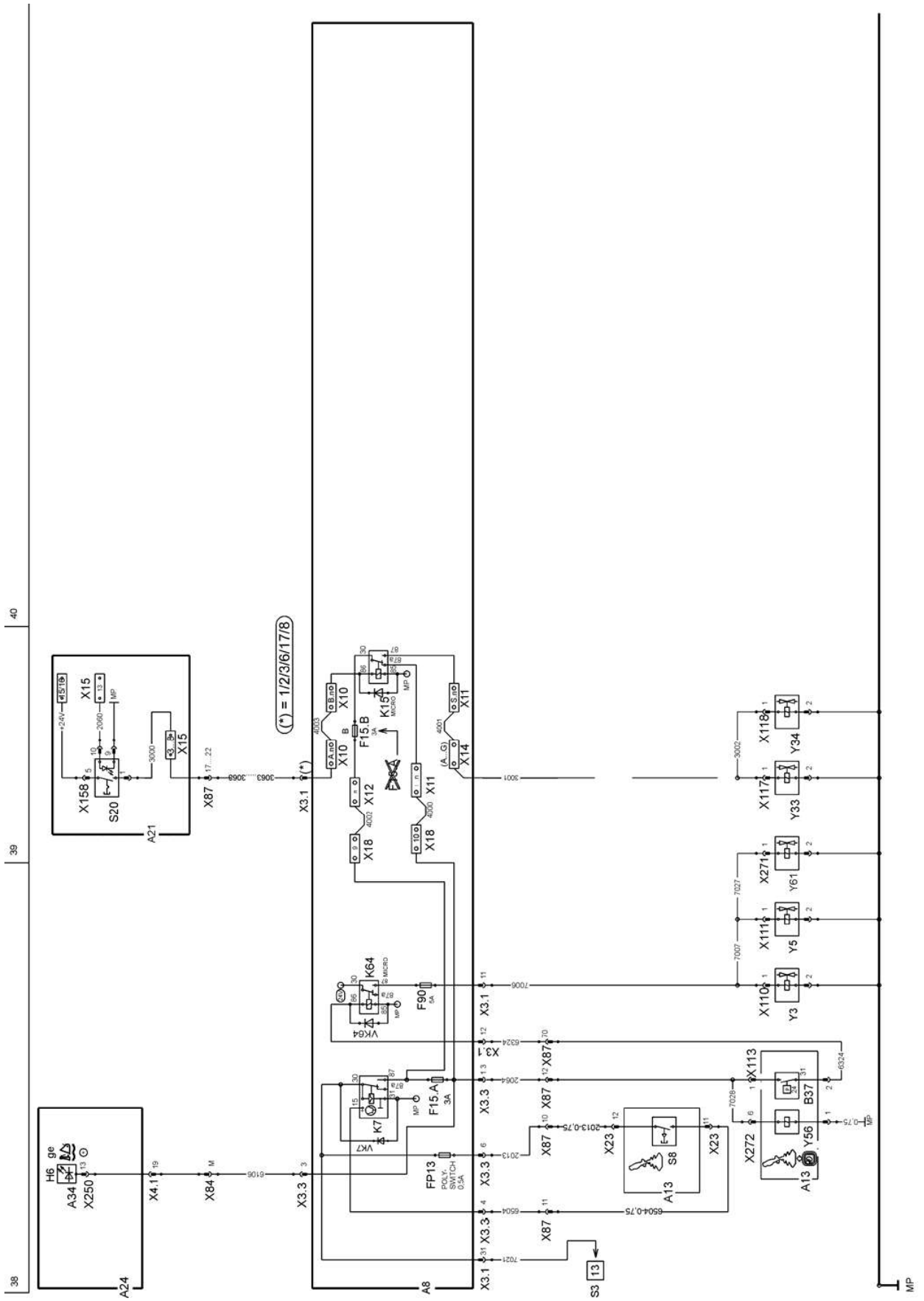
LIEBHERR-WERK TELFS GMBH

OPTIONAL FLOAT POSITION REAR-MOUNTED RIPPER

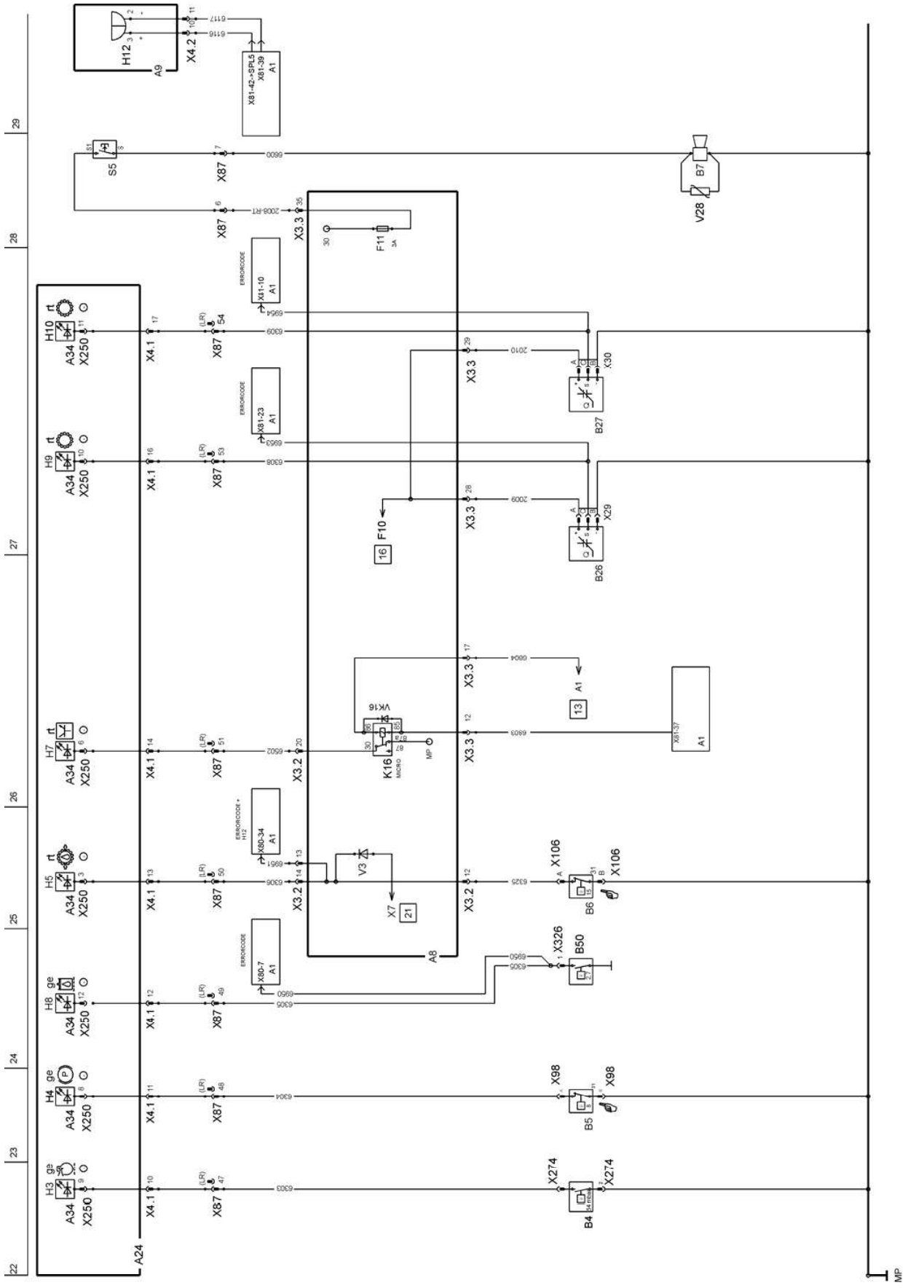
Ident.-Nr.	10310717	Anlage	
Zeich-Nr.	992 9011 00	Ort	
		Projekt Version 102	Blatt 55 von 77

BMK	Anlage	Ort	Blatt	Funktion
-E7/X31.	=F	+FK	/32.E3	CONNECTOR CAB LIGHTING
-E18	=F	+FK	/31.A5	FLOODLIGHT FRONT LEFT 2.
-E19	=F	+FK	/31.A8	FLOODLIGHT FRONT RIGHT 2.
-E36	=F	+FK	/37.E5	HEATER AURORA
-E37	=F	+FK	/37.D1	CONDENSER WITH 3 FAN MOTORS
-F1	=G	+B	/6.B1	INPUTFUSEAUTOMATIC 45A
-F2	=G	+B	/10.C3	FUSE RELAY FLAME GLOW PLUG
-F7	=G	+ZP	/7.D6	FUSE 24V DISPLAY CONSOLE CAB
-F8	=G	+ZP	/12.C3	FUSE RELAY SAFETY LEVER
-F9	=G	+ZP	/11.D2	FUSE EQUIPMENT PLUG / SOCKET
-F10	=G	+ZP	/13.E3	FUSE DISPLAY INSTRUMENT / WARNING LIGHT
-F11	=G	+ZP	/20.A2	FUSE PUSH-BUTTON SWITCH / BUTTON HORN
-F15.A	=G	+ZP	/23.C7	FUSE SOLENOID VALVE FLOAT POSITION
-F15.B *	=G	+ZP	/55.A3	FUSE SOLENOID VALVE FLOAT POSITION REAR-MOUNTED RIPPER
-F16	=G	+ZP	/12.B7	FUSE SUPPLY PUSH-BUTTON SWITCH / BUTTON AH SENSOR
-F19	=G	+ZPR	/52.C2	FUSE AIR CONDITIONING SYSTEM
-F20.LR	=G	+ZP	/36.E3	FUSE HEATING
-F21 *	=G	+ZP	/64.A2	FUSE DRIVER"S SEAT AIR
-F21.A *	=G	+ZP	/64.A4	FUSE DRIVER"S SEAT AIR AND SEAT HEATER
-F21.B *	=G	+ZP	/64.A5	FUSE DRIVER"S SEAT GRAMMER
-F22	=F	+R	/31.E7	FUSE HEADLIGHT CAB FRONT
-F27 *	=G	+ZPR	/63.B3	FUSE FUEL PUMP
-F28.A	=G	+ZP	/57.B4	FUSE BACK-UP-ALARM
-F28.B *	=G	+ZP	/58.A3	FUSE BACK-UP-ALARM
-F31 *	=G	+ZPR	/53.C3	FUSE FUEL WATER SEPARATOR HEATABLE
-F33 *	=G	+T	/62.E2	FUSE FIXTURE WITH COVER/LID
-F35	=G	+ZPR	/30.A2	FUSE CAB
-F40	=F	+R	/30.E4	FUSE WIPER DOOR
-F41	=F	+R	/30.D7	FUSE WIPER FRONT AND BEHIND / REAR
-F42LR	=F	+R	/31.E3	FUSE HEADLIGHT CAB REAR LEFT
-F43LR	=F	+R	/31.E4	FUSE HEADLIGHT CAB RIGHT REAR
-F45	=G	+ZP	/32.A3	FUSE CAB INTERIOR LIGHTING
-F46	=G	+ZP	/48.D2	FUSE CLAMP X18 (24V)
-F47	=G	+ZP	/48.E2	FUSE CLAMP X18 (30)
-F48	=G	+ZP	/48.E2	FUSE CLAMP X18 (15)
-F49	=G	+ZP	/18.B2	FUSE VOLTAGE CONVERTER / TRANSFORMER

BMK	Anlage	Ort	Blatt	Funktion
-F50 *	=F	+R	/30.E4	FUSE ROTATING BEACON
-F53	=G	+ZP	/36.E7	FUSE ACTUATING DRIVE / SERVO DRIVE HEATING AIR CONDITIONING SYSTEM
-F54	=F	+R	/30.E6	FUSE ACTUATING DRIVE / SERVO DRIVE HEATING AIR CONDITIONING SYSTEM
-F61	=G	+ZP	/12.C5	FUSE SAFETY LEVER
-F64	=G	+ZP	/18.B5	FUSE VOLTAGE CONVERTER / TRANSFORMER 12V
-F65	=G	+ZP	/9.A4	FUSE SUPPLY ECU
-F66	=G	+ZP	/9.A5	FUSE SUPPLY ECU AND E_BOX
-F67	=G	+ZPR	/9.B7	FUSE SUPPLY ECU
-F68	=G	+ZPR	/9.B8	FUSE SUPPLY ECU
-F73 *	=G	+ZP	/49.A3	FUSE FAN REVERSIBLE AUTOMATIC
-F79 *	=G	+ZPR	/63.B2	FUSE FUEL PUMP
-F80 *	=G	+ZP	/59.A3	FUSE BACK-UP-ALARM OPTIC
-F90	=G	+ZP	/24.B6	FUSE SOLENOID VALVE FLOAT POSITION / CUT OFF / SHUT OFF CONTROL PRESSURE / SE
-F92	=G	+ZP	/19.A6	FUSE SOLENOID VALVE FLOAT POSITION / CUT OFF / SHUT OFF CONTROL PRESSURE / SE
-F97 *	=G	+ZP	/50.A3	FUSE FAN CONTROL
-F98 *	=G	+ZP	/50.A7	FUSE FAN CONTROL
-F111	=G	+ZP	/27.C8	FUSE SENSOR PUSH-BUTTON SWITCH / BUTTON BUCKET RETURN
-F117 *	=G	+T	/62.D3	FUSE TILLY IMMOBILIZER
-F_1A	=G	+ZP	/48.B3	FUSE RESERVE
-F_3A	=G	+ZP	/48.C3	FUSE RESERVE
-F_5A	=G	+ZP	/48.B4	FUSE RESERVE
-F_7,5A	=G	+ZP	/48.C4	FUSE RESERVE
-F_10A	=G	+ZP	/48.B4	FUSE RESERVE
-F_15A	=G	+ZP	/48.C4	FUSE RESERVE
-F_20A	=G	+ZP	/48.B5	FUSE RESERVE
-F_25A	=G	+ZP	/48.C5	FUSE RESERVE
-F_30A	=G	+ZP	/48.C5	FUSE RESERVE
-FP1	=G	+ZP	/48.D6	POLY-SWITCH FUSE ELEMENT
-FP3	=G	+ZP	/7.E5	POLY-SWITCH FUSE ELEMENT
-FP6	=G	+ZP	/52.B2	POLY-SWITCH FUSE ELEMENT
-FP8	=G	+ZP	/6.C6	POLY-SWITCH FUSE ELEMENT
-FP9	=G	+ZP	/48.D4	POLY-SWITCH FUSE ELEMENT
-FP11	=G	+ZP	/6.C6	POLY-SWITCH FUSE ELEMENT
-FP12	=G	+ZP	/48.E6	POLY-SWITCH FUSE ELEMENT
-FP13	=G	+ZP	/23.C3	POLY-SWITCH FUSE ELEMENT
-FP14	=G	+ZP	/7.D3	POLY-SWITCH FUSE ELEMENT



LWT / Ausgabe / Edition / Edition / **01.2008**


H12
A9
X4.2
X81-42->SPL5
X81-39
A1
S5
X87
B7
V28
F11
3A
X3.3
ERRORCODE
X81-10
H10
A34
X250
X4.1
X30
B27
X81-23
H9
F10
X29
B26
VK16
K16
MICRO
MP
X81-37
H7
X3.2
V3
X7
21
X80-34
H5
X106
B6
A8
X80-7
H8
X326
B50
H4
X98
B5
H3
X274
B4
A24
LWT / Ausgabe / Edition / Edition / 01.2008

Stkl.Ident Nr. 9418941

PROJEKT: 9418941_005

PROJECT WAS CREATED OFF

NAME	IdentNr.	DATE
DESIGN PROJECT PR-LR_02-001-002	9416216	27.02.2007

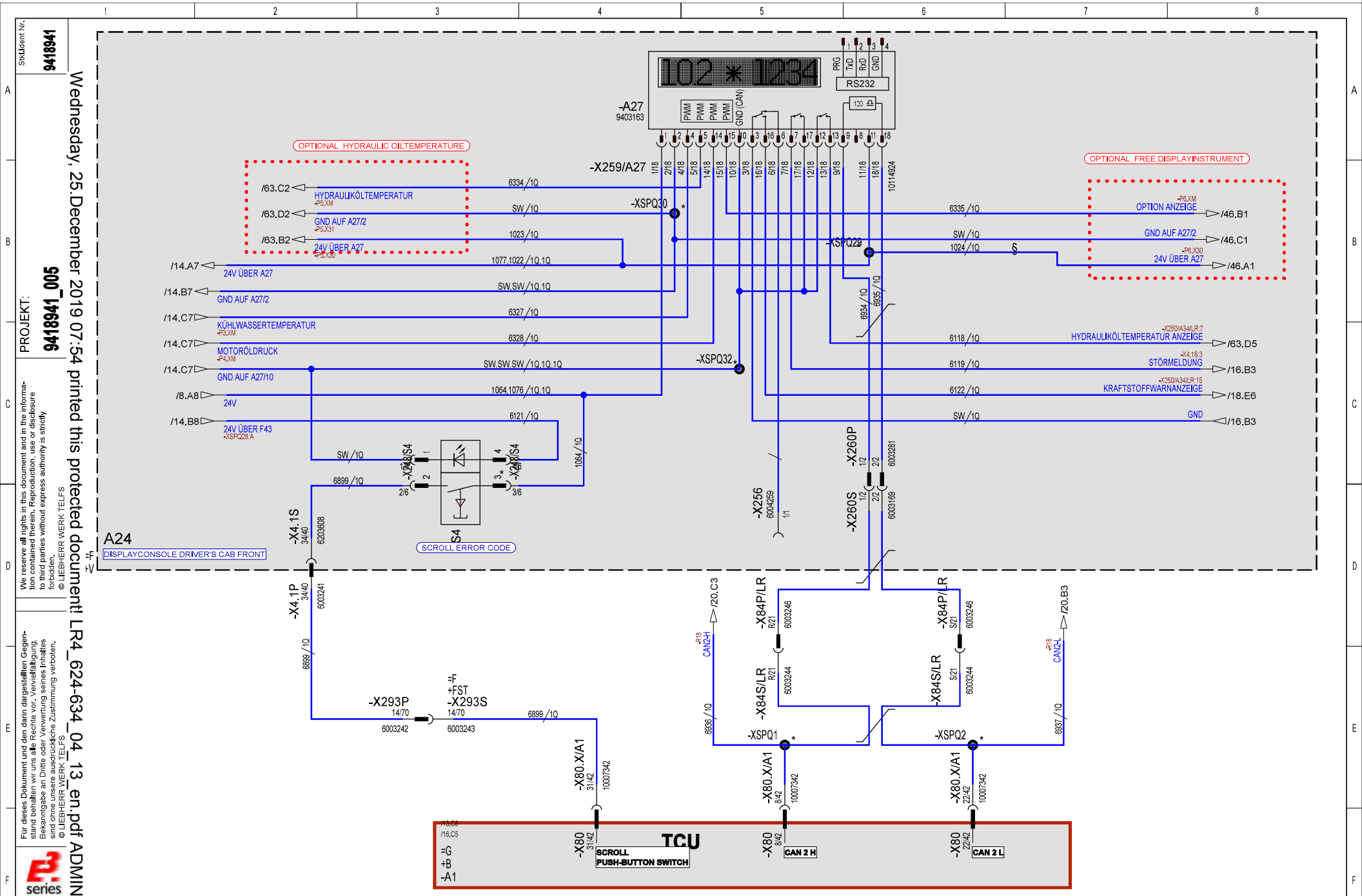
Zustand	Änderung	Datum	Name		
				Bearbeiter	Flunger W.
				Datum Spei.	20.11.2007 09:47
				Ausgabe	lwtscj1
				Datum Plot	8.5.2008 08:39

LIEBHERR-WERK TELFS GMBH

PROJEKTERSTELLUNG
LR 634

Ident.-Nr. 9418941
Zeich-Nr. 992 9011 00

Anlage
Ort
Projekt Version 005
Blatt 1 von 76



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Stk.Ident Nr. 9418941

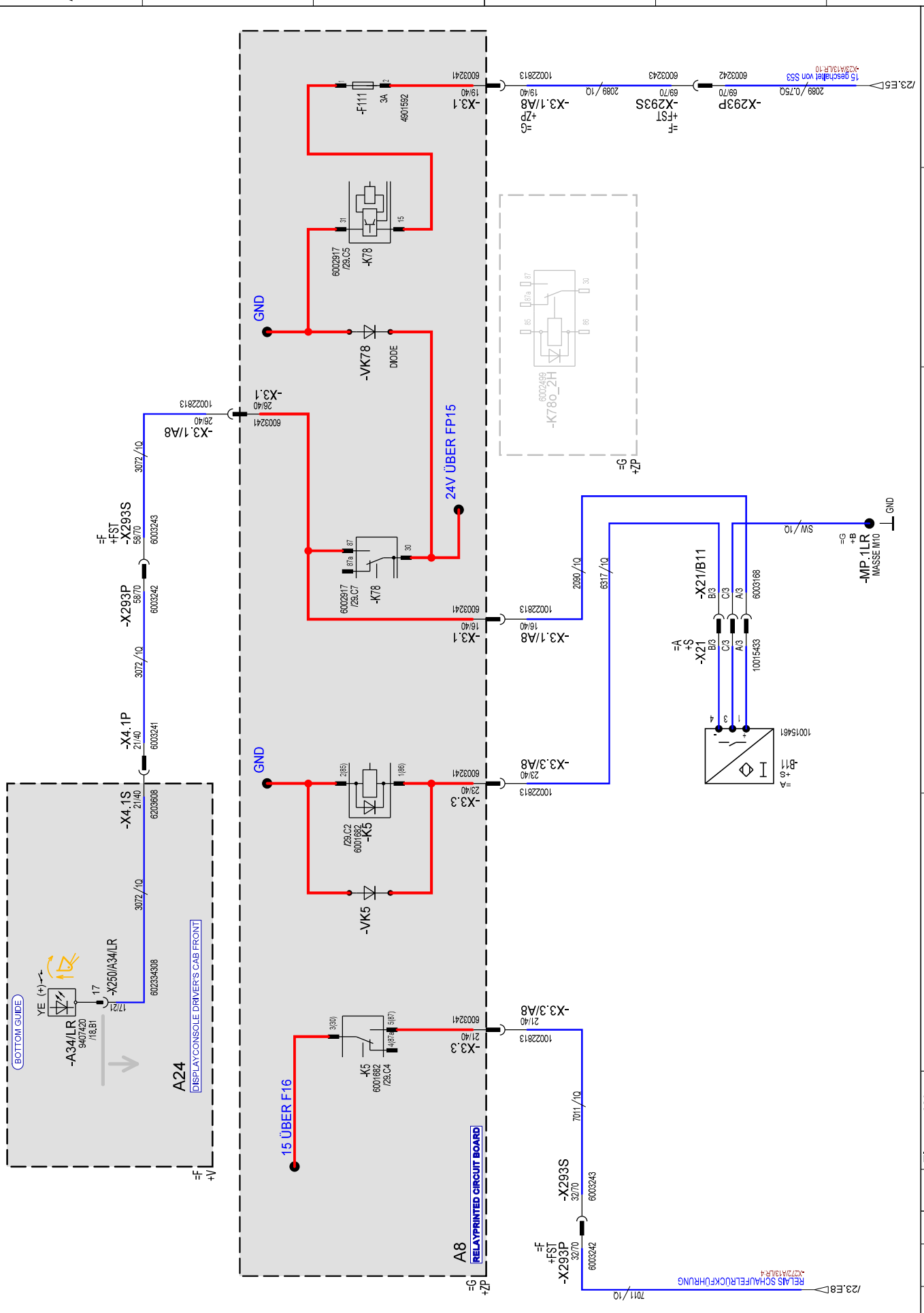
PROJEKT: 9418941_005

Zustand	Änderung	Datum	Name		
				Bearbeiter	Flunger W.
				Datum Spei.	20.11.2007 09:47
				Ausgabe	lwtscj1
				Datum Plot	8.5.2008 08:39

LIEBHERR-WERK TELFS GMBH

LCD DISPLAY SCROLL ERROR CODE
LR 634

Ident.-Nr.	9418941	Anlage	
Zeich-Nr.	992 9011 00	Ort	
		Projekt Version 005	Blatt 15 von 76


BOTTOM GUIDE LR
LR 634
Ident-Nr. 9418941
Zeich-Nr. 992 9011 00
Projekt Version 005
Blatt 29 von 76
LEBHERR-WERK TELFS GMBH
Flunger W. 8.5.2008 08:39
Iwtscj1 20.11.2007 09:47
A8 RELAYPRINTED CIRCUIT BOARD
A24 DISPLAYCONSOLE DRIVER'S CAB FRONT
-A34/LR 9407420
-X250/A34/LR
-X4.1S
-X4.1P
-X293P
-X293S
-X3.1/A8
-X3.1
-X3.3/A8
-X3.3
-X21/B11
-X21
-MP.1LR MASSE M10
-B11
-F111 3A 4901592
-K78 6002917 /29.C5
-K78 6002917 /29.C7
-K78o_2H 6002499
-VK78 DIODE
-K5 6001682 /29.C2
-K5 6001682 /29.C4
-VK5
-X293S
-X293P
GND
24V ÜBER FP15
15 ÜBER F16
BOTTOM GUIDE
RELAIS SCHAUFELRUCKFÜHRUNG
15 geschaltet von S53
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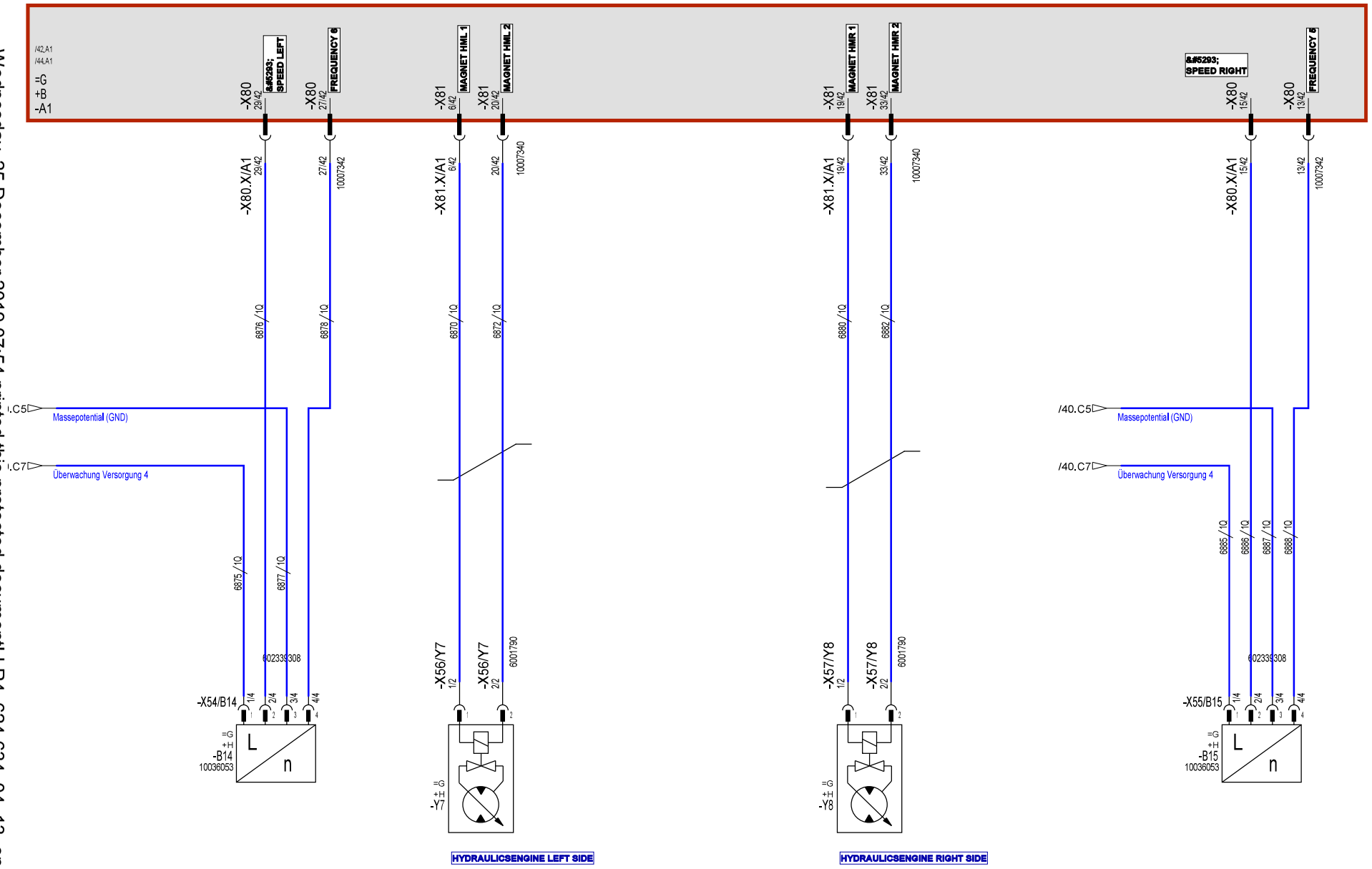
PROJEKT: 9418941_005
Sk.Ident Nr. 9418941
Wednesday, 25.December 2019 07:54 printed this protected document! LR4_624-634_04_13_en.pdf ADMIN



Stkident Nr. 9418941

PROJEKT: 9418941_005

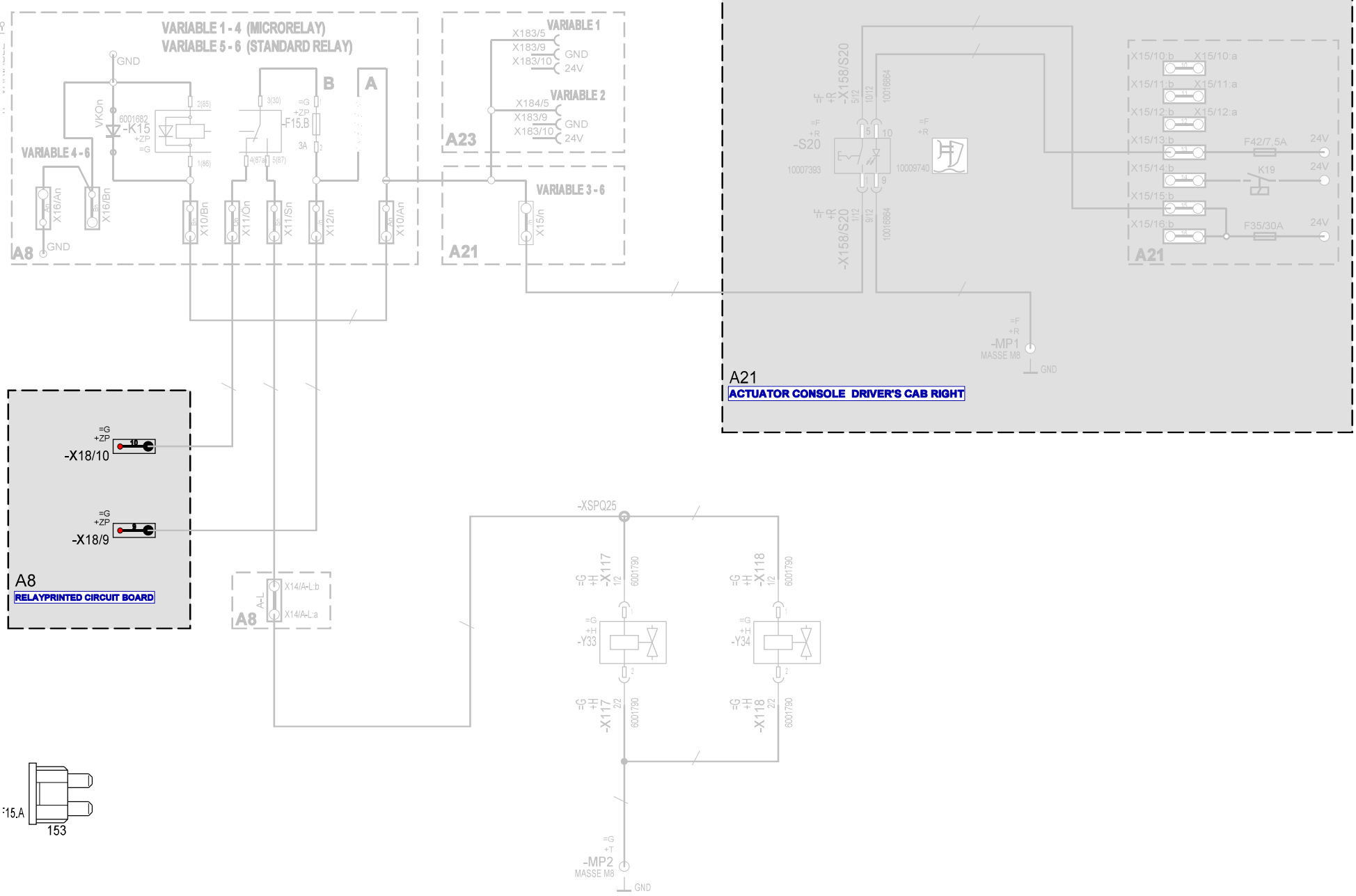
E3 series

Zustand	Änderung	Datum	Name		
				Bearbeiter	Flunger W.
				Datum Spei.	20.11.2007 09:47
				Ausgabe	lwtscj1
				Datum Plot	8.5.2008 08:39

LIEBHERR-WERK TELFS GMBH

ELECTRONICS TRAVEL HYDRAULICS MOTORS
LR 634

Ident.-Nr.	9418941	Anlage	
Zeich-Nr.	992 9011 00	Ort	
		Projekt Version 005	Blatt 43 von 76



Stkident Nr. 9418941

PROJEKT: 9418941_005

Wednesday, 25.December 2019 07:55 printed this protected document! LR4_624-634_04_13_en.pdf ADMIN

E3 series

STROMLAUFPLAN

				Bearbeiter	lwtscj1
				Datum	20.11.2007 09:47
				Ausgabe	lwtscj1
Zustand	Änderung	Datum	Name	Datum Plot	8.5.2008 08:39

LIEBHERR-WERK TELFS

OPTIONAL FLOTATION POSITION REAR-MOUNTED RIPPER
LR 634

Ident.-Nr.	9418941	Anlage	
Zeich-Nr.	992 9011 00	Ort	
		Projekt Version 005	Blatt 57 von 76

BMK	Anlage	Ort	Blatt	Funktion
-V2	=G	+ZP	/13.C4	ISOLATION DIODE
-V3	=G	+ZP	/16.E4	ISOLATION DIODE
-V9	=G	+ZP	/7.D6	ISOLATION DIODE
-V10	=G	+ZP	/8.E5	ISOLATION DIODE
-V11	=G	+ZP	/30.D3	ISOLATION DIODE
-V12	=G	+ZP	/30.D3	ISOLATION DIODE
-V16	=G	+ZP	/50.B6	DIODES F-TEST
-V18	=G	+ZP	/26.B7	VARISTOR 25 - 31V
-V26	=F	+KSK	/37.C6	ISOLATION DIODE
-V27	=F	+KSK	/37.C4	ISOLATION DIODE
-V28	=G	+ZKS	/21.E1	VARISTOR (HORN)
-V30	=G	+M	/11.C2	ISOLATION DIODE FAULT ELIMINATION INTAKE AIR PRE-HEATING
-V_Option1	=G	+ZP	/50.A2	FREE DIODES FOR OPTIONAL 1-8
-V_Option2	=G	+ZP	/50.A2	FREE DIODES FOR OPTIONAL 1-8
-V_Option3	=G	+ZP	/50.B2	FREE DIODES FOR OPTIONAL 1-8
-V_Option4	=G	+ZP	/50.B2	FREE DIODES FOR OPTIONAL 1-8
-VK5	=G	+ZP	/29.C3	FREE-WHEELING DIODE RELAY BOTTOM GUIDE
-VK7	=G	+ZP	/25.C2	FREE-WHEELING DIODE STEP RELAY FLOTATION POSITION
-VK11	=G	+ZP	/13.C1	FREE-WHEELING DIODE RELAY SAFETY SWITCH
-VK12	=G	+ZP	/54.A2	FREE-WHEELING DIODE RELAY AIR-CONDITIONING COUPLING
-VK16	=G	+ZP	/17.E5	FREE-WHEELING DIODE RELAY WARNING LIGHT ELECTRONICS MONITORING
-VK21	=G	+ZP	/30.D1	FREE-WHEELING DIODE RELAY STROKE STOP SWITCH RL
-VK50	=G	+ZP	/8.E4	FREE-WHEELING DIODE START INHIBITING RELAY ECU
-VK64	=G	+ZP	/25.C5	FREE-WHEELING DIODE RELAY FLOTATION POSITION AND CUTOFF CONTROL PRESSURE
-VK65	=G	+ZP	/28.C7	FREE-WHEELING DIODE STEP RELAY STROKE STOP SWITCH
-VK77	=G	+ZP	/28.C4	FREE-WHEELING DIODE RELAY STROKE STOP SWITCH
-VK78	=G	+ZP	/29.C7	FREE-WHEELING DIODE STEP RELAY STROKE STOP SWITCH
-VKO1	=G	+ZP	/47.E1	FREE-WHEELING DIODE RELAY RESERVE
-VKO2	=G	+ZP	/47.E5	FREE-WHEELING DIODE RELAY RESERVE
-VKO3	=G	+ZP	/48.E1	FREE-WHEELING DIODE RELAY RESERVE
-VKO4	=G	+ZP	/48.D5	FREE-WHEELING DIODE RELAY RESERVE
-VKO5	=G	+ZP	/49.D1	FREE-WHEELING DIODE RELAY RESERVE
-VKO6	=G	+ZP	/49.D5	FREE-WHEELING DIODE RELAY RESERVE
-W1	=G	+B	/32.E2	GROUND STRAP
-W2	=F	+FST	/32.E1	GROUND STRAP
-X1	=G	+Z	/12.B2	INSTALLATION PLUG

BMK	Anlage	Ort	Blatt	Funktion
-X2.6/12V	=F	+AK	/19.E8	CONNECTOR COOLING EQUIPMENT
-X2.8P	=G	+Z	/8.F7	CONNECTOR RELAY PRINTED CIRCUIT BOARD
-X2.8S	=G	+Z	/54.B3	CONNECTOR RELAY PRINTED CIRCUIT BOARD
-X3.1	=G	+ZP	/8.D6	CONNECTOR RELAY PRINTED CIRCUIT BOARD
-X3.1/A8	=G	+ZP	/8.C6	CONNECTOR RELAY PRINTED CIRCUIT BOARD
-X3.2	=G	+ZP	/8.D6	CONNECTOR RELAY PRINTED CIRCUIT BOARD
-X3.2/A8	=G	+ZP	/8.C6	CONNECTOR RELAY PRINTED CIRCUIT BOARD
-X3.3	=G	+ZP	/8.D3	CONNECTOR RELAY PRINTED CIRCUIT BOARD
-X3.3/A8	=G	+ZP	/8.C3	CONNECTOR RELAY PRINTED CIRCUIT BOARD
-X4.1P	=F	+V	/7.B5	CONNECTOR DISPLAY CONSOLE CABIN FRONT
-X4.1S	=F	+V	/7.B5	CONNECTOR DISPLAY CONSOLE CABIN FRONT
-X4.2P	=F	+FS	/8.A2	CONNECTOR ACTUATOR OPERATOR CONTROL STAND RIGHT
-X4.2S	=F	+FS	/8.A2	CONNECTOR ACTUATOR OPERATOR CONTROL STAND RIGHT
-X6 *	=G	+ZPR	/55.B3	CONNECTOR RELAY FUEL WATER SEPARATOR
-X6.2P	=G	+ZPR	/32.C2	CONNECTOR ASSEMBLY PLATE
-X6.2S	=G	+ZPR	/32.C2	CONNECTOR ASSEMBLY PLATE
-X7	=G	+ZP	/16.E3	CLAMP FAULT
-X9/A-V	=G	+ZP	/50.A3	CLAMP FREE FUSES
-X9/A-W	=G	+ZP	/50.A3	CLAMP FREE FUSES
-X9/A-X	=G	+ZP	/50.B3	CLAMP FREE FUSES
-X9/A-Y	=G	+ZP	/50.B3	CLAMP FREE FUSES
-X9/A-Z	=G	+ZP	/50.B3	CLAMP FREE FUSES
-X9/B-V	=G	+ZP	/50.A4	CLAMP FREE FUSES
-X9/B-W	=G	+ZP	/50.A4	CLAMP FREE FUSES
-X9/B-X	=G	+ZP	/50.B4	CLAMP FREE FUSES
-X9/B-Y	=G	+ZP	/50.B4	CLAMP FREE FUSES
-X9/B-Z	=G	+ZP	/50.B4	CLAMP FREE FUSES
-X10/A1	=G	+ZP	/47.E3	CLAMP INPUT
-X10/A2	=G	+ZP	/47.E7	CLAMP INPUT
-X10/A3	=G	+ZP	/48.E3	CLAMP INPUT
-X10/A4	=G	+ZP	/48.E7	CLAMP INPUT
-X10/A5	=G	+ZP	/49.E3	CLAMP INPUT
-X10/A6	=G	+ZP	/49.E7	CLAMP INPUT
-X10/A7	=G	+ZP	/46.E4	CLAMP INPUT
-X10/A8	=G	+ZP	/46.E5	CLAMP INPUT
-X10/B1	=G	+ZP	/47.D3	CLAMP INPUT

4 Cab

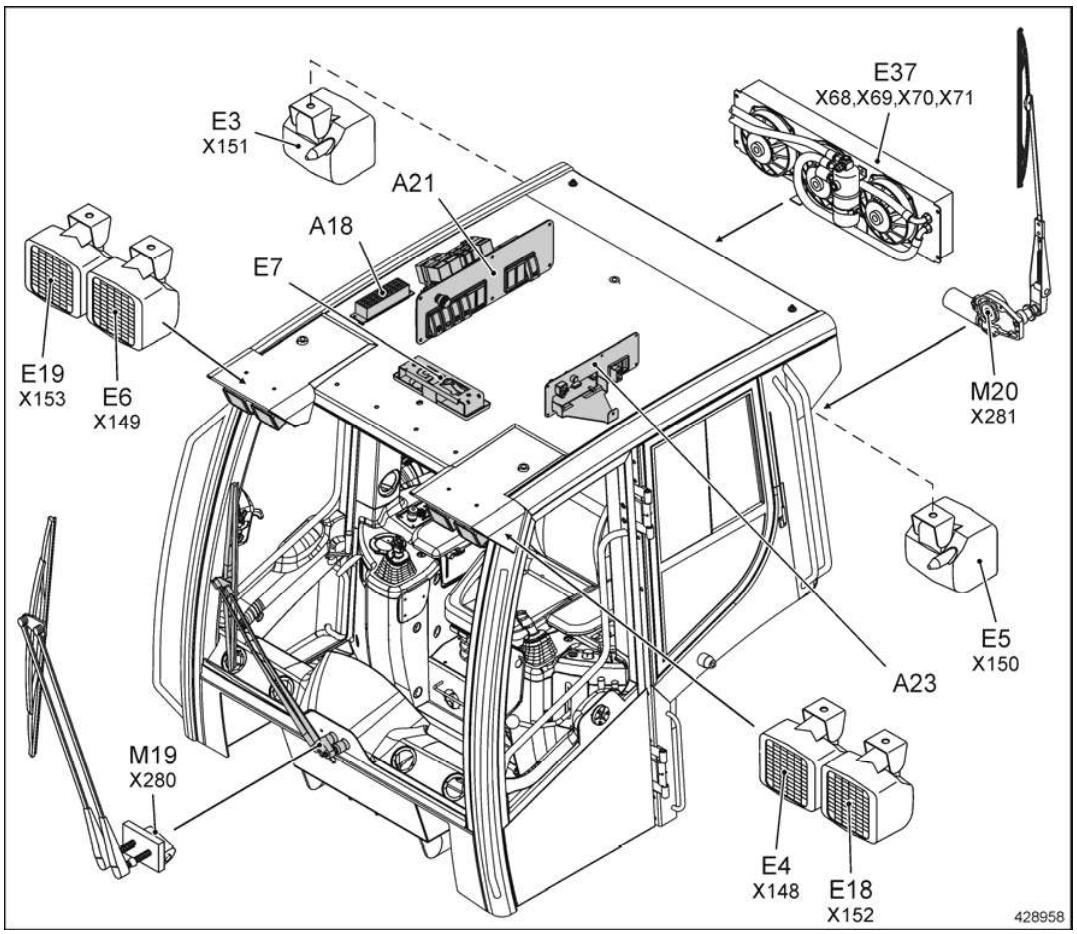


Fig. 4-1 Cab

A18 Fuse box 8-way
A21 Roof console right
A23 Roof console left

E3 Working floodlight rear right
E4 Working floodlight front left
E5 Working floodlight rear left
E6 Working floodlight front right
E7 Cab illumination
E18 Working floodlight front left
E19 Working floodlight front right
E37 Condenser air cond. system

M19 Windshield wiper motor front
M20 Windshield wiper motor rear

X68 Plug to blower motor
X69 Plug to blower motor
X70 Plug to blower motor
X71 Plug to pressure switch
X148 Plug to working floodlight E4
X149 Plug to working floodlight E6
X150 Plug to working floodlight E5
X151 Plug to working floodlight E3
X152 Plug to working floodlight E18
X153 Plug to working floodlight E19
X280 Plug to windshield wiper motor M19
X281 Plug to windshield wiper motor M20

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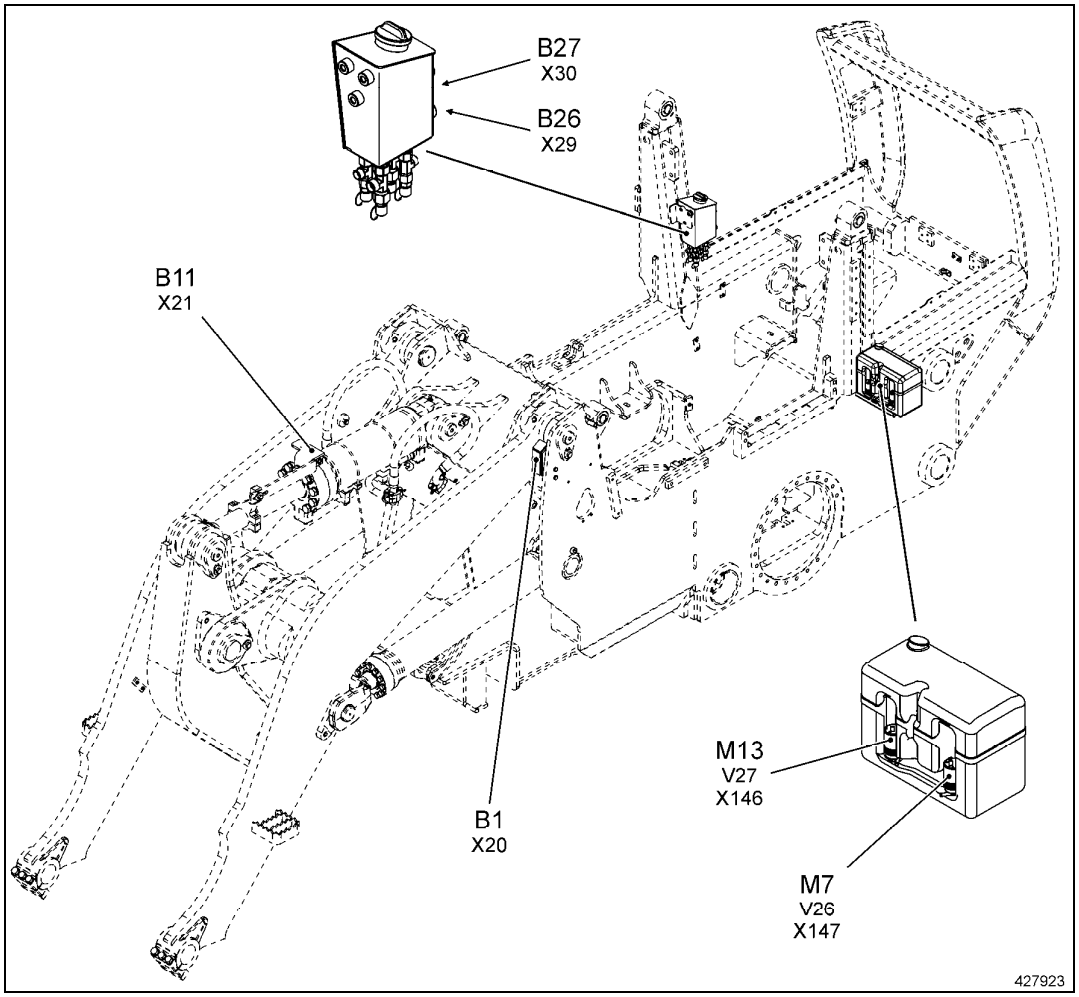


Fig. 1-3 Component arrangement

B1 Sensor hoist limit shut off
B11 Sensor bucket return
B26 Oil level sensor final drive - seal area left
B27 Oil level sensor final drive - seal area right

M7 Windshield washer pump front
M13 Windshield washer pump rear

V26 Varistor fault clearance Windshield washer pump front
V27 Varistor fault clearance Windshield washer pump rear

X20 Plug to sensor B1
X21 Plug to sensor B11
X29 Plug to sensor B26
X30 Plug to sensor B27
X146 Plug to windshield washer pump M7
X147 Plug to windshield washer pump M13

LWT / Ausgabe / Edition / Edition / **02.2012**

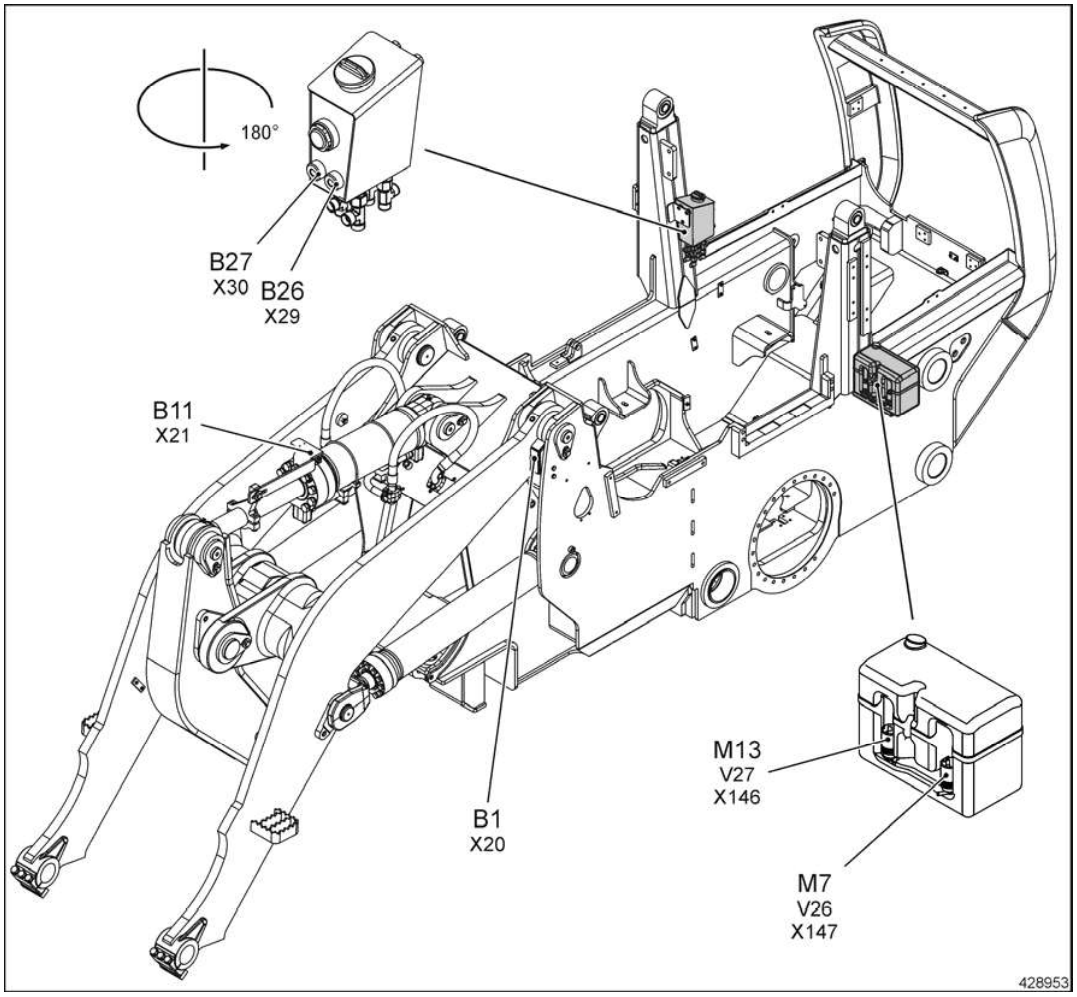


Fig. 1-3 Component arrangement - Main frame

B1 Sensor hoist limit shut off
B11 Sensor bucket repositioning
B26 Oil level sensor final drive - seal area left
B27 Oil level sensor final drive - seal area right

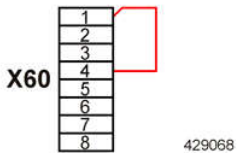
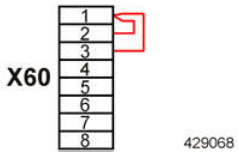
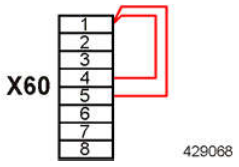
M7 Windshield wiper pump front
M13 windshield wiper pump rear

V26 Varistor interference suppression windshield wiper pump front
V27 Varistor interference suppression windshield wiper pump rear

X20 Plug to sensor B1
X21 Plug to sensor B11
X29 Plug to sensor B26
X30 Plug to sensor B27
X146 Plug to windshield wiper pump M7
X147 Plug to windshield wiper pump M13

LWT / Ausgabe / Edition / Edition / **02.2012**

Machine Type coding (Plug X60 – Main circuit board)

Machine Type	Bridges	Plug X60
LR 624 F/N xxx 8957→	B 1-4	
LR 634 F/N xxx 8397→11773	B 1-2 B 1-3	
LR 634 F/N xxx 11774→	B 1-4 B 1-5	

6.3 Plugs

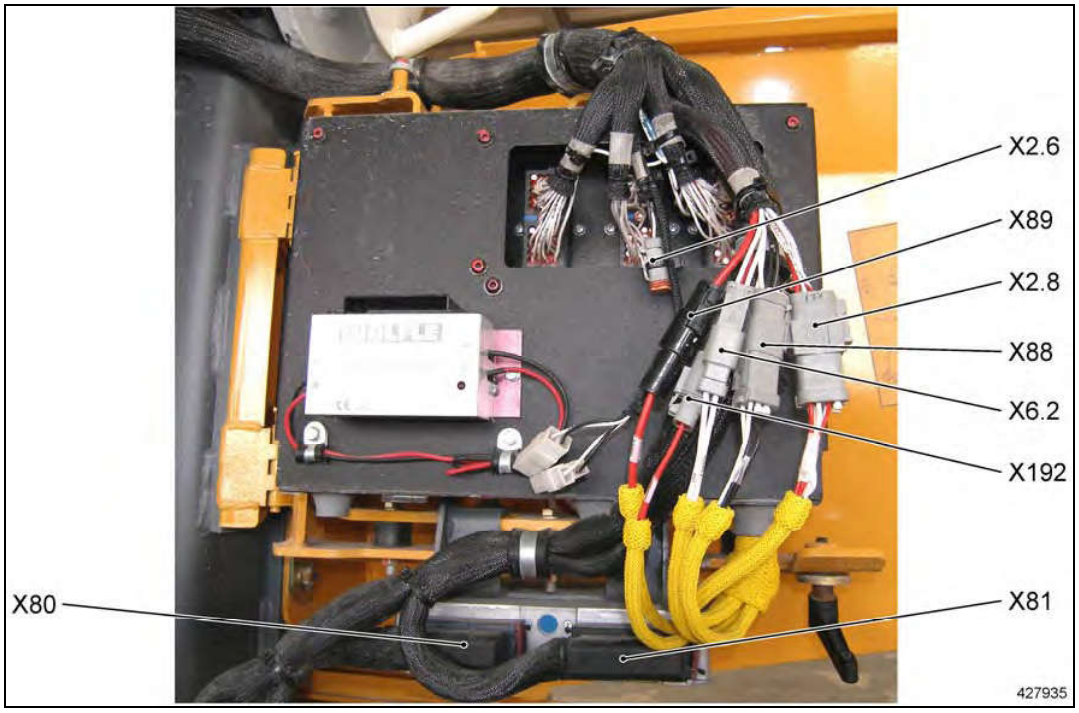


Fig. 6-6 Plugs

X2.6 Plug to cooler box 12V
X2.8 Plug to periphery central electric
X6.2 Plug central electric A20 to Cab
X80 Plug to electronic box A1
X81 Plug to electronic box A1
X88 Plug central electric A8 to periphery
X89 Plug central electric A8 to periphery
X192 Plug to central electric ECU

9.8.21 Speed reduction pedal

1 Design and function

Note!

The speed reduction pedal is available as optional equipment.

The speed reduction pedal is installed on the console 1 and is used for travel speed regulation within the speed range which was preselected on the joystick.

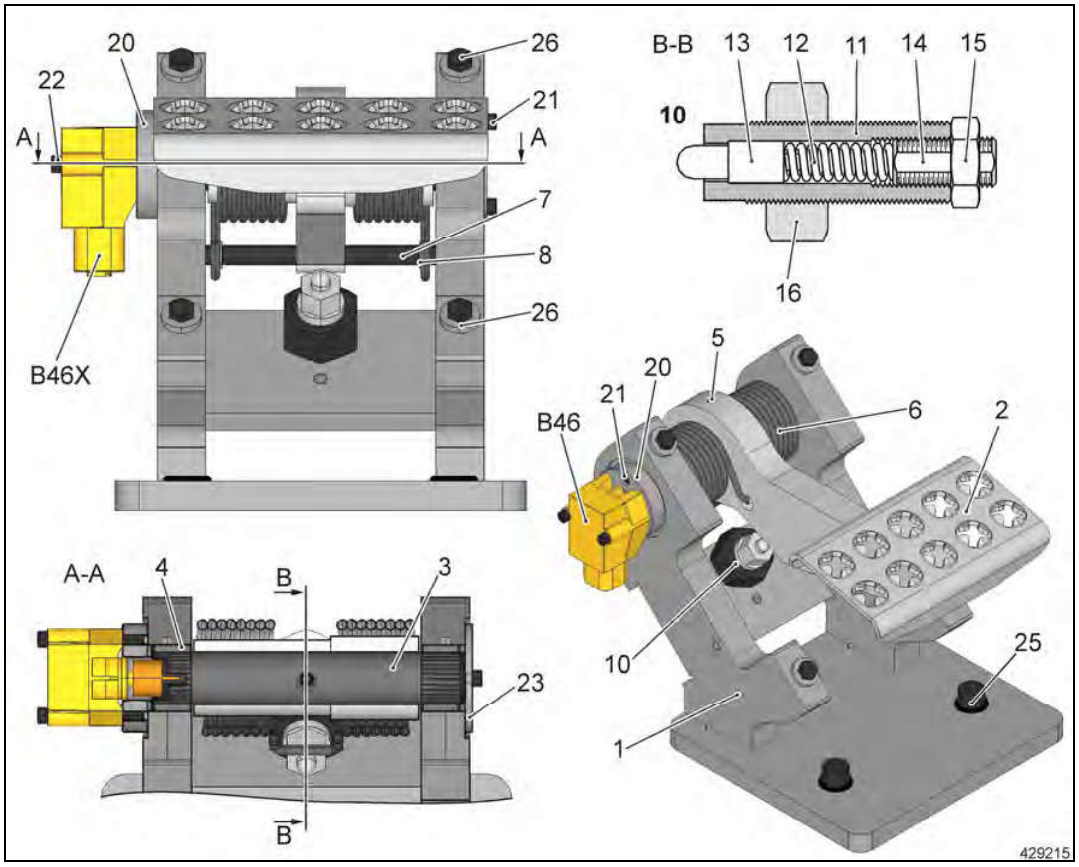


Fig.1 Speed reduction pedal

1 Console
2 Pedal
3 Pin
4 Bushing
5 Locking pin
6 Spring
7 Stop rod
8 Thrust washer

10 Stop cpl.
11 Sleeve
12 Pressure spring
13 Plunger
14 Threaded pin
15 Lock nut
16 Lock nut

20 Intermediate washer
21 Allen screw
22 Allen screw
23 Stop washer

25 Hex head screw with washer
26 Mounting screws f. cover

B46 Hall angle sensor
B46X Plug for sensor B46

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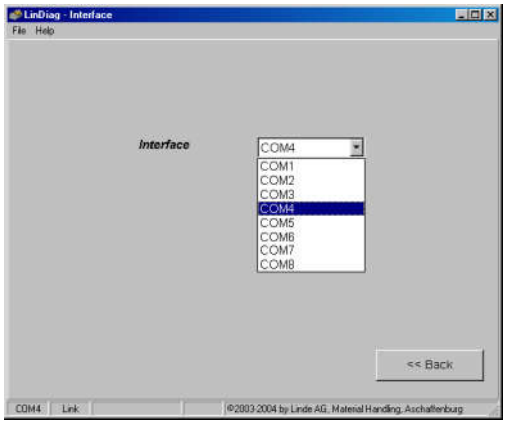
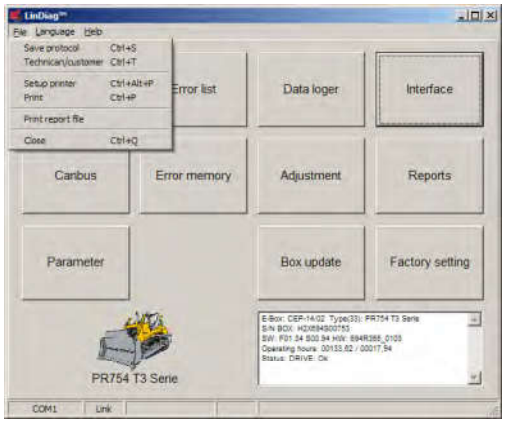
5 Interface [INTERFACE]

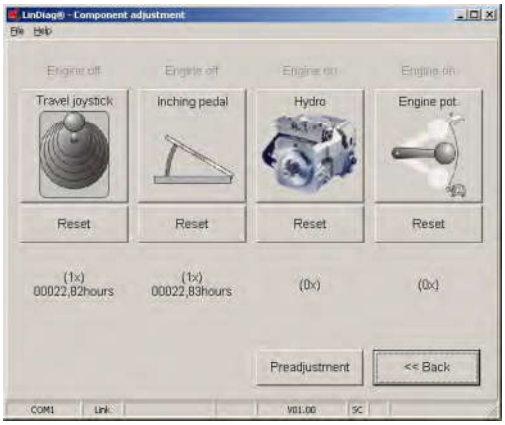


On the laptop, select the interface to which the data cable to the E-Box is connected. Available for selection are COM1 to COM10.

6 Base mask – menu [FILE], [LANGUAGE], [HELP]



Here the printer can be set up, the technician and the customer can be entered, a saved report file can be printed (for this point a connection to the E-Box is not required) and the program can be ended.

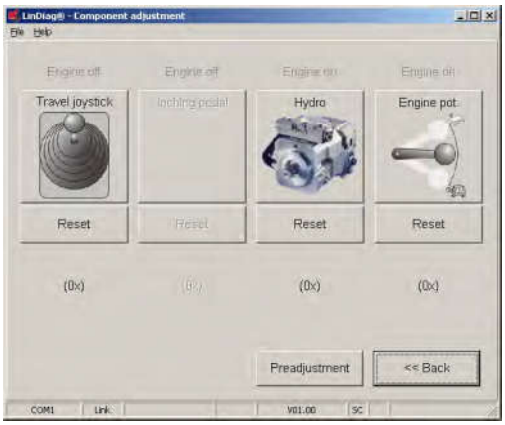


As confirmation for the error-free run of the inching / brake pedal adjustment, the index counter is increased by 1 – was previously on zero, for example.

If the adjustment procedure was erroneous or if it had been interrupted, the index counter does not count up and the previously learned values or base values remain valid. The learned values are only taken over if there were no errors.

In rare cases it can happen that the software does not jump from one view to another one when adjusting the pedal. In that case, turn the potentiometer a little directly on the pedal, as it operates in a limit range, where the software cannot carry out a conclusive adjustment.

Note!
The mechanical base adjustment of the inching / brake pedal is described in section 9 Electrical system in the chapter Inching / brake pedal.



Adjustment without inching / brake pedal is not possible.

Adjusted values of the inching pedal have no influence to the machine if a coding plug is installed instead of the pedal.

Note!
See also section 9 Electrical system – Chapter Inching / brake pedal.

If no inching / brake pedal is connected on the machine, then a coding plug must be installed. Otherwise the machine cannot be operated.

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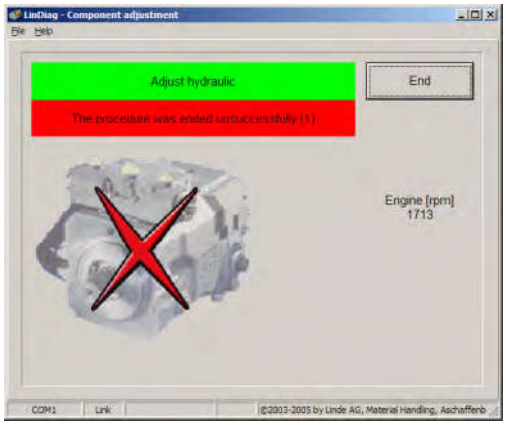


If an error occurs during the automatic adjustment procedure (tolerance ranges are not obtained or similar), this view (or similar) appears. Repeat the procedure 2-3 times. If you still have problems, select the manual adjustment procedure to localize and remedy any error in the adjustment of the hydro components.

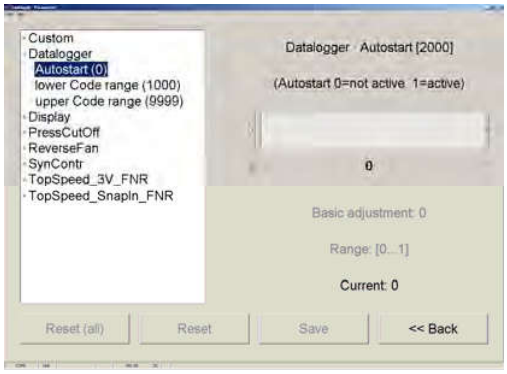
Possible error codes for automatic adjustment of hydro components

Error code	Cause
00	Initial neutral not OK
01	User has interrupted the adjustment by resetting the travel joystick or by actuating the inching pedal
02	Hydro pump forward current jump (movement already at min. current)
03	Upper limit for current jump of a hydro pump exceeded (forward)
04	Error when starting out of lower end of regulation limit of a hydro pump (forward)
05	Upper limit for end of regulation of a hydro pump exceeded (forward)
06	An error occurred during teaching
07	Impermissible Teach-Step
08	Error when starting out of lower current jump limit of a hydro motor
09	Upper limit for jump current of a hydro motor exceeded
10	Error when starting out of lower end of regulation limit of a hydro motor (forward)
11	Upper current limit for end of regulation of a hydro motor exceeded
12	Hydro pump reverse jump current (movement already at min. current)
13	Upper limit for jump current of a hydro pump exceeded (reverse)
14	Error when starting out of lower end of regulation limit of a hydro pump (reverse)
15	Upper limit for end of regulation of a hydro pump exceeded (reverse)

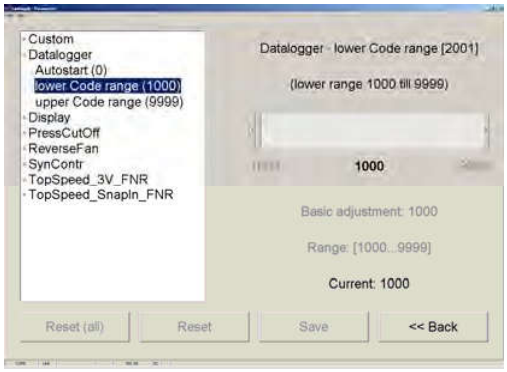
If any errors should occur at the automatic adjustment, then the adjustment procedure should be carried out manually. It is possible, if the given nominal RPM ranges are not reached in the pump area, that the Q_{max} adjustment of the oil motors is significantly misadjusted. Check Q_{max} and correct the adjustment, if necessary.

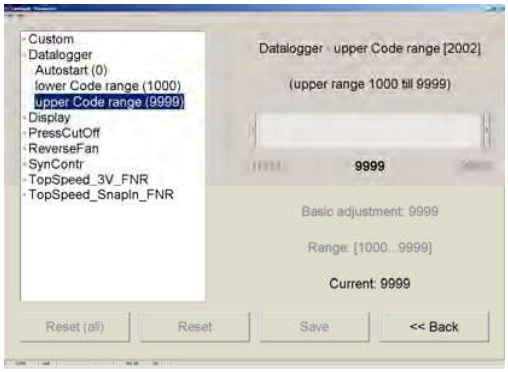
In case of repeated problems, report error code to Service.

A check of the automatically learned values with a manual adjustment procedure can result in slight differences in the adjustments, which are still in the valid tolerance range.



This parameter switches [DATALOGGER] on at startup. When ignition is in the ON position, this will be automatically. At occurrence of a service code, this feature will be automatically disabled.

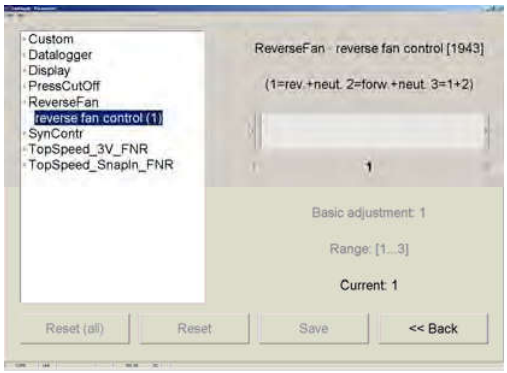




[lower Code range] … lower limit of the monitored service code number.

[upper Code range] … upper limit of the monitored service code number.

It may be the area where the function of the automatic data logger automatically disabled - for example, triggering to a specific service code number.



This parameter allows the presence of a reversible fan to control the reversible direction.

1 … Reversing the fan drive only in backward and standstill of the machine

2 … Reversing the fan drive only in forward and standstill of the machine

3 … Reversing the fan drive in all directions of the machine.

Attention!
By default, and after pressing **[FACTORY SETTING]** the parameter is in position 1 - any time.

Note!
Before working with the LinDiag, deactivate the screen saver and energy saving measures (turn monitor off, hard drive in energy saving mode, etc.) on computers.

Note!
It must be ensured that the rechargeable battery of the Notebook is sufficiently charged.

The connection between the Notebook and the electronic box may not be disconnected while working with the LinDiag diagnostics software.

2 System requirements

Screen resolution:

- At least: 1024x768

RAM memory

- At least: 1 GB

Memory requirements

- At least 500 MB free space on hard disk

Processor:

- Not older than 8 years

The following operating systems are supported:

- Windows XP Home + Professional 32 bit (at least Service Pack 2)
- Windows Vista 32 bit (at least Service Pack 1)
  (Software with Windows Vista Enterprise Edition was tested)
- Windows 7

Other operating systems were not tested.

Adapter cable

Connector cable PC – Machine.

(see LinDiag Diagnostics Kit in Service manual (Tools and work instructions)

LinDiag License Dongle

(see LinDiag Diagnostics Kit in Service manual (Tools and work instructions)

Program directory

The LinDiag directory and sub-directories nor any files they contain may be write-protected.

The user must have access rights to the LinDiag directory and all sub-directories and files.

LinDiag requires no registration entries and no special user rights.

Required interfaces

- a serial RS232 interface (interface PC – machine)

If no serial RS232 interface is available, then the USB adapter => RS232 adapter (Service manual / tools and work instructions) must be used.

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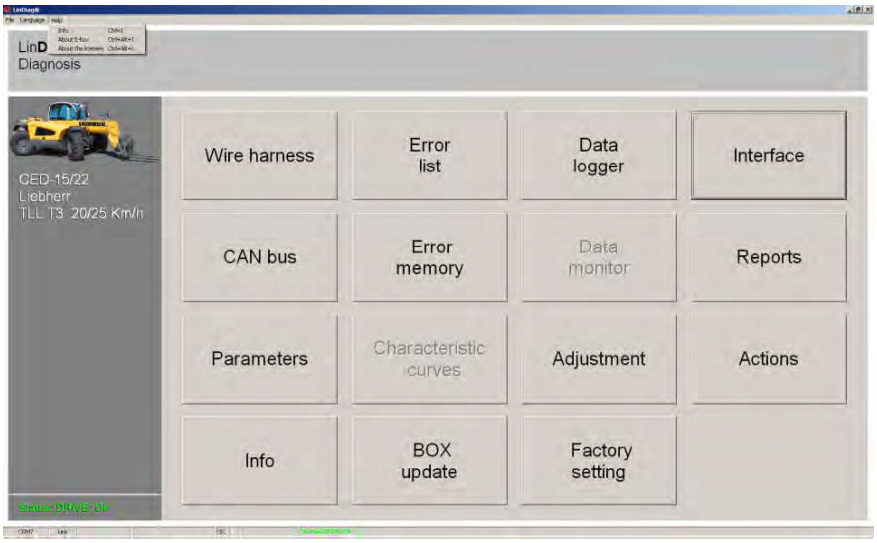
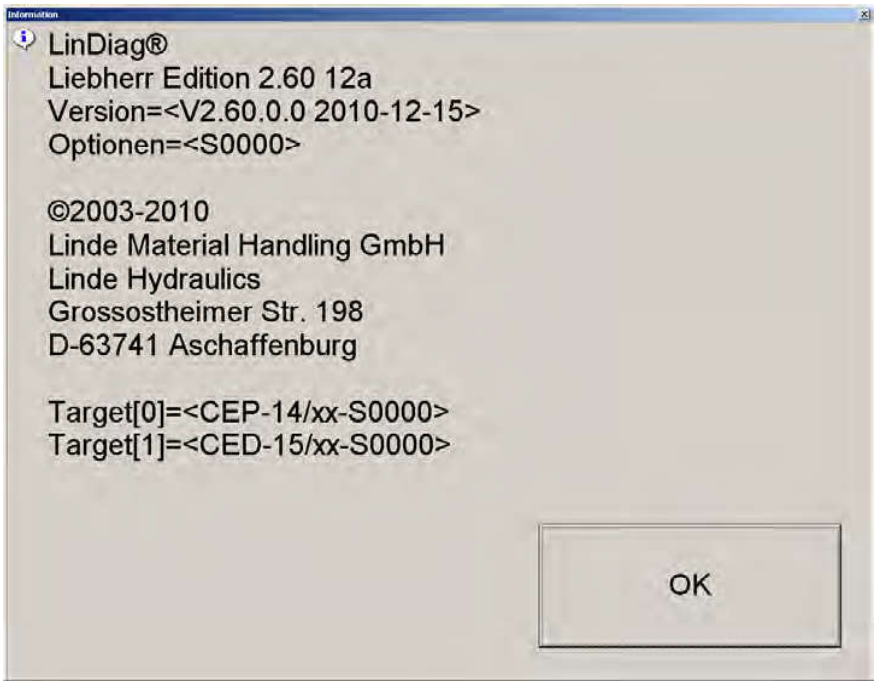


Here detailed information about the system in use is provided.



[Info] Information about the LinDiag version.

As confirmation for accurate run of the brake pedal adjustment: the index counter is increased by 1 – was previously on zero, for example.

9.5 Adjustment of steering pedals

▶ Select menu item steering pedals

▶ Steering pedals in neutral position

▶ Press the left down fully

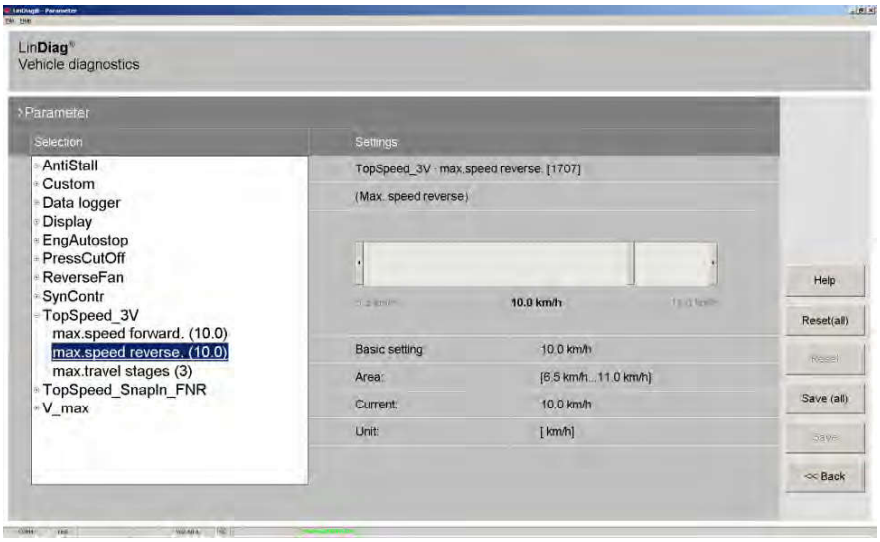
LinDiag Report

DieselPotCharL[2].y = 1.60 V

F/N (Pin) History
FnPin[00] = [12155] 00000,18 h
FnPin[01] = [00000] 00000,00 h

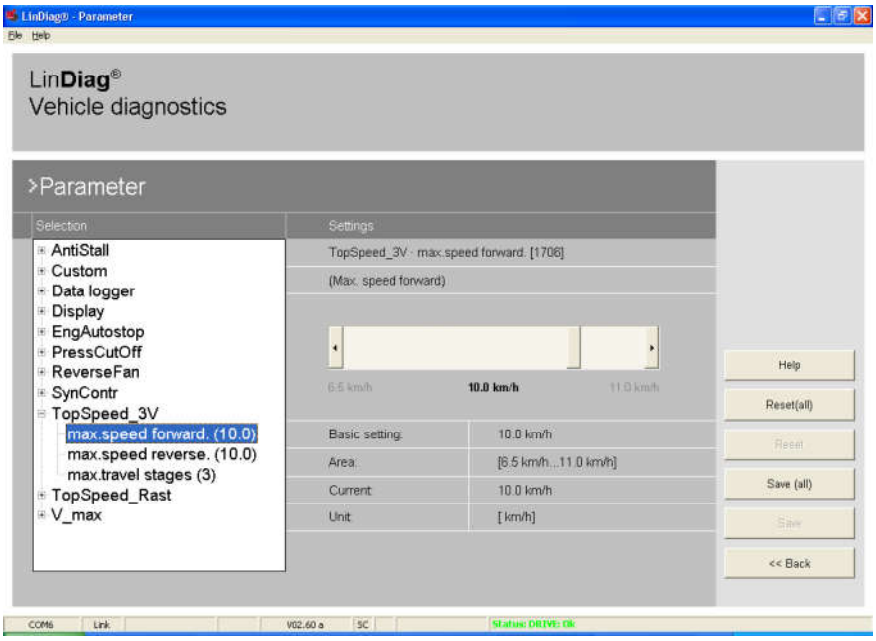
Commentary
Do not enter commentary

14.18 TopSpeed_3V – Maximum speed reverse



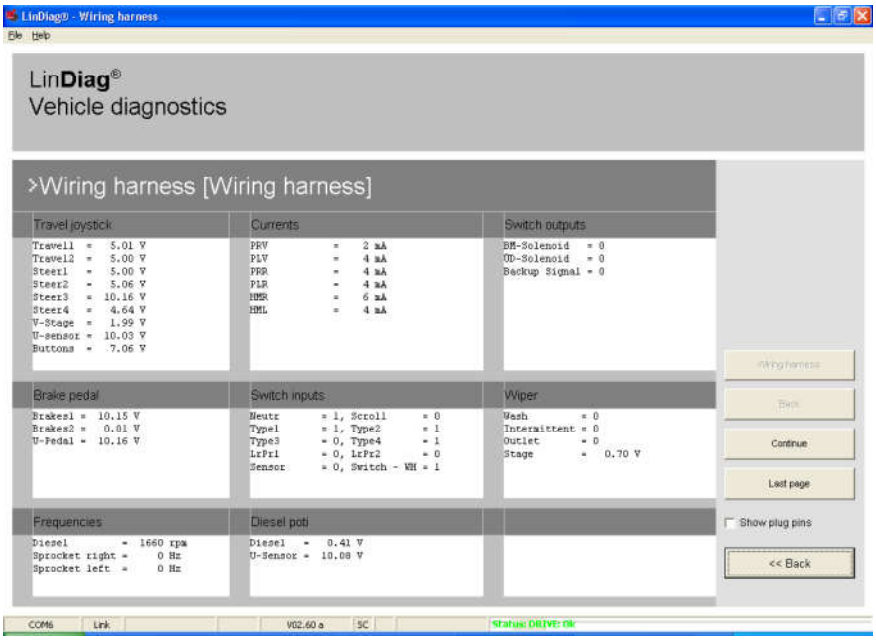
This parameter limits the maximum speed which can be driven in travel direction reverse.

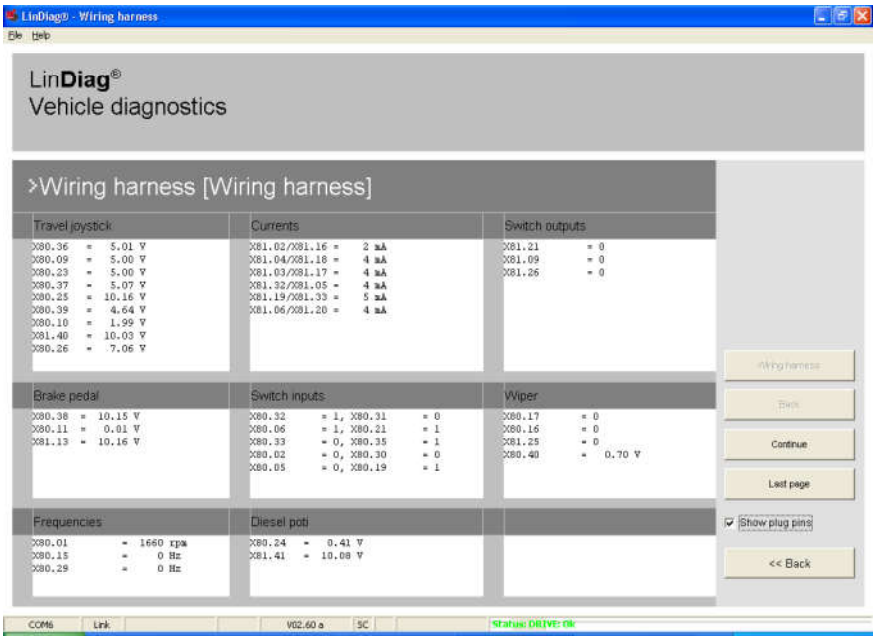
14.19 TopSpeed_3V – Maximum speed forward



This parameter limits the maximum speed which can be driven in travel direction forward.

16 Wiring harness check [WIRING HARNESS CHECK]





The values shown here are applied directly to the plugs on the travel hydraulic. In addition, all currents for pump and oil motor, including Diesel engine rpm and HMV rpm are shown in real time (actual time).

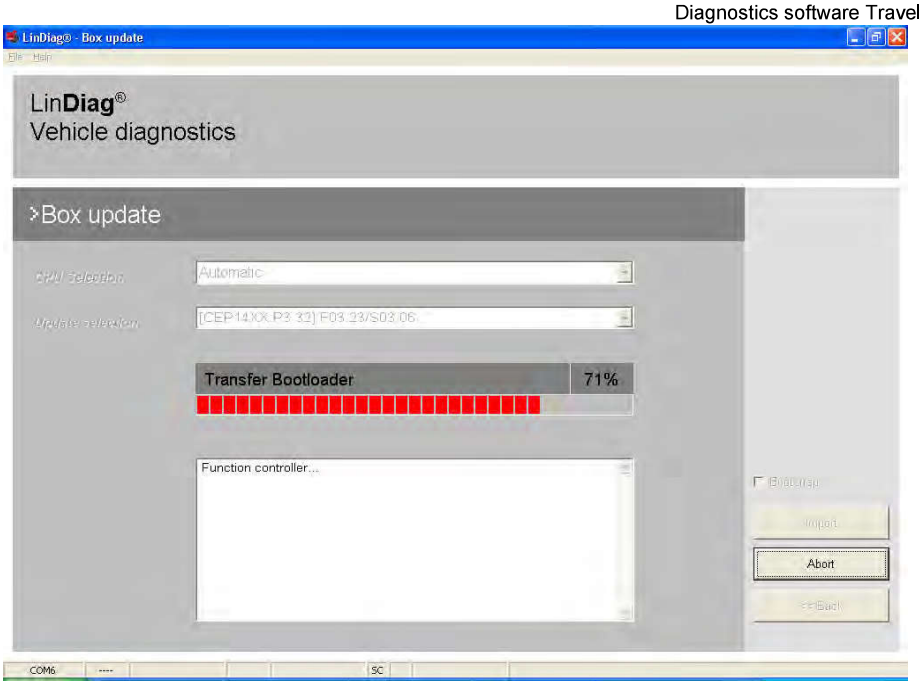
These values should be consulted to aid troubleshooting.

With the button **[Show plug pins]** switch between pin assignment and clear text explanation.

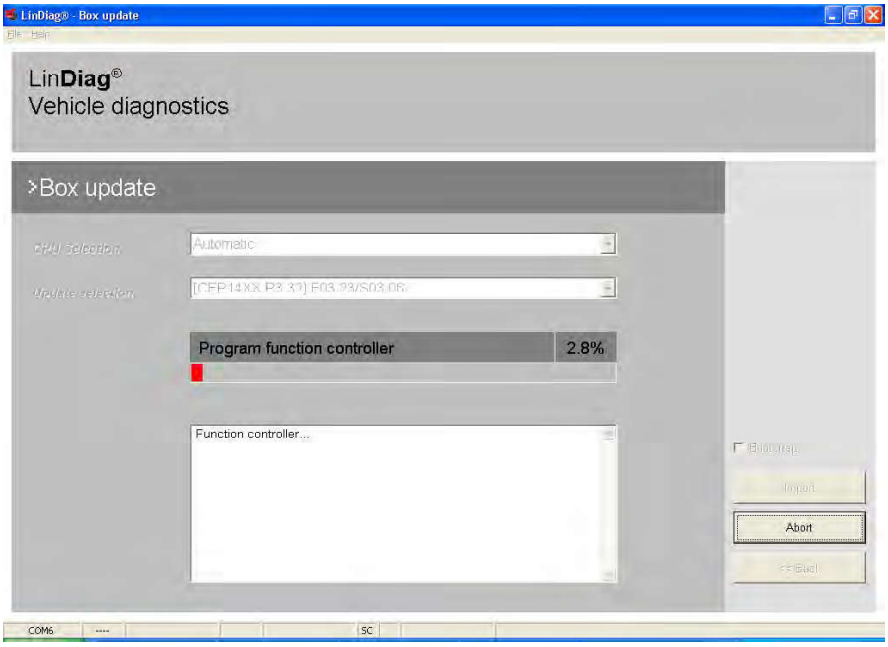
With the buttons **[Wiring harness]**, **[back]**, **[continue]** and **[last page]**, navigate between the various screens without leaving them. Depending on the software version of the machine control, different information can be called up.

Examples for possible information:

Wiring harness



▷ Bootloader is transferred.



▷ The function controller is updated.

To be able to access the program, a password **[Kennung]** must be entered.

Password for registration (LH-Service level)

081441

▶ Enter the password.
▷ The software PDL is started.

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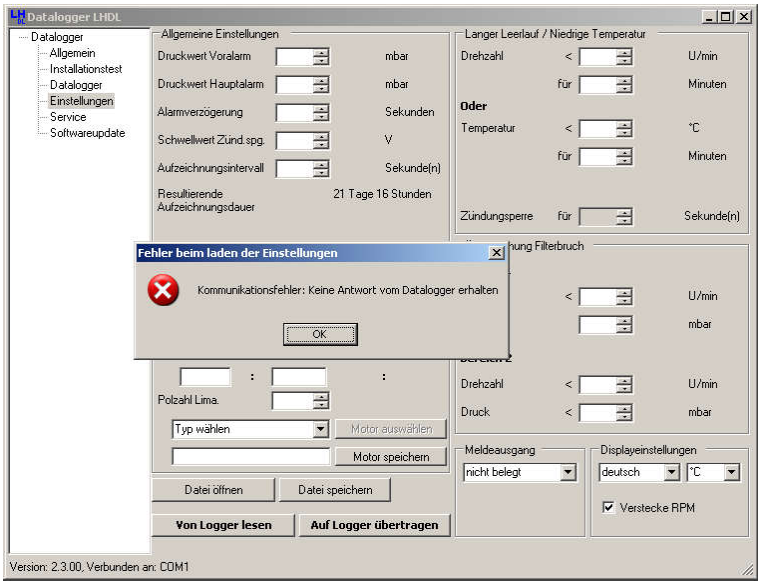
6 Error reporting of Software PDL



For proper run of evaluation with the PDL software, the ignition of the machine must always be turned on. If it is turned off, or the data cable is unplugged, then a window on the user interface is opened and continued procedure is no longer possible.

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Service Codes	Error message	Action	Plug/Pin/Remedy	Tolerance time	Nominal value	Tolerance value
						<100mA
2014	MagCurrentPump RREmy	TCU turns off	X81 3/42, X81 17/42 Magnet pump, right reverse - short circuit, check wiring harness and magnet	500ms	No data, value is variable	<50ms
2021	MagCurrentPump LRMin	TCU turns off	X81 32/42, X81 5/42, Magnet pump, left reverse, current feed faulty; external current feed, check wiring harness and magnet	200ms	0mA	12V Magnet <200mA 24V Magnet <100mA
2022	MagCurrentPump LRMax	TCU turns off	X81 32/42, X81 5/42, Magnet pump, left reverse, max. current exceeded – short circuit or external current feed, check wiring harness and magnet	200ms	12V Magnet ≤1500mA 24V Magnet ≤800mA	12V Magnet >1500mA 24V Magnet >800mA
2023	MagCurrentPump LRDif	Emergency operation (machine can be driven forward at reduced speed)	X81 32/42, X81 5/42, Magnet pump left reverse - broken wire, check wiring harness and magnet	400ms	No data, value is variable	12V Magnet <200mA 24V Magnet + type 0 to 2 <200mA all other types <100mA
2024	MagCurrentPump LREmy	TCU turns off	X81 32/42, X81 5/42 Magnet pump left reverse - short circuit, check wiring harness and magnet	500ms	No data, value is variable	<50ms
2031	MagCurrentPump LVMin	TCU turns off	X81 4/42, X81 18/42, Magnet pump, left forward, current feed faulty; external current feed, check wiring harness and magnet)	200ms	0mA	12V Magnet <200mA 24V Magnet <100mA
2032	MagCurrentPump LVMax	TCU turns off	X81 4/42, X81 18/42, Magnet pump, left forward, max. current exceeded – short circuit or external current feed, check wiring harness and magnet	200ms	12V Magnet ≤1500mA 24V Magnet ≤800mA	12V Magnet >1500mA 24V Magnet >800mA
2033	MagCurrentPump LVDif	Emergency operation (machine can be driven backward at reduced speed)	X81 4/42, X81 18/42, Magnet pump, left, forward - broken wire, check wiring harness and magnet	400ms	No data, value is variable	12V Magnet <200mA 24V Magnet + type 0 to 2 <200mA all other types <100mA
2034	MagCurrentPump LVEmy	TCU turns off	X81 4/42, X81 18/42, Magnet pump, left, forward - short circuit, check wiring harness and magnet	500ms	No data, value is variable	<50ms
2041	MagCurrentMotor RMin	TCU turns off	X81 19/42, X81 33/42, Magnet Motor, right, current feed faulty; external current feed, check wiring harness and magnet	200ms	0mA	12V Magnet <200mA 24V Magnet <100mA
2042	MagCurrentMotor RMax	TCU turns off	X81 19/42, X81 33/42, Magnet Motor, right, max. Current exceeded – short circuit or external current feed, check wiring harness and magnet	200ms	12V Magnet ≤1500mA 24V Magnet ≤800mA	12V Magnet >1500mA 24V Magnet >800mA
2043	MagCurrentMotor RDif	Emergency operation (machine can be driven at reduced speed in both	X81 19/42, X81 33/42, Magnet Motor, right - broken wire, check wiring harness and magnet	400ms	No data, value is variable	12V Magnet <200mA 24V Magnet + type 0 to 2 <200mA

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11.1.30 Data page

Description			LR634 F/N xxx-8397→
FAT		Type	450 E 510
Oil quantity			See Operating instructions
Oil quantity – seal area (from hydraulic circuit)			See Operating instructions
Number of teeth			
Spur gear	Input gear		14
	Gear reduction		94
1. Planetary stage	Sun gear		17
	Planetary gears		44
	Internal gear		106
Gear ratio		i ges.	48,58 : 1
Bearing adjustment – Axial play Straight roller bearing Pos.31,32		mm	$0,2^{+0,4}$
Bearing pretension Tapered roller bearing Pos.77		Friction momentum Nm	50^{+10}
Dimensions			
Straight roller bearing – Axial play Spur gear stage		mm	$0,2^{+0,4}$
Straight roller bearing – Radial play - general		mm	Max. 0,1
Dimension „a“: front side – connector flange Pos. 5 to front side disk carrier 25		mm	$9,0^{+1,0}$
Dimension „b“: front side RPM sensor 90 to spur gear Pos. 34		mm	$46,7^{\pm 0,1}$
Disk brake	Brake release begin	bar	~12,1
	Completely released	bar	~15,5
	Begin of braking action	bar	~15,2
	Brake completely applied	bar	~11,8

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11.3.20 Sectional view – final drive

1 Installation notes

Note!
The given position numbers refer to paragraph „1.2. Sectional view“.

Caution!
The following installation notes must be adhered to!

- All screws must be secured with Loctite 242!
- Straight roller bearing Pos. 31/32: Axial play $0.2^{+0,4}$ mm
- Tapered roller bearing Pos. 77: Axial pretension (=friction) 45^{+10} Nm (without Pos. 42/43)

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As a result, the pitch of the chain no longer matches the pitch of the sprocket. The sprocket already meshes with the tooth tips into the bushings and becomes greatly worn.

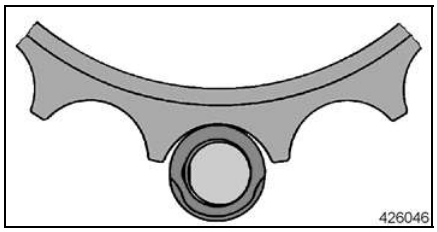

Fig. 4 Mesh of pin, bushing in sprocket segment

If the chain parts are pressed apart and the pins and bushings are turned around their longitudinal axis by 180º when they press together again, still unworn surfaces of pins and bushings are meshed and the total service life of these parts can be extended. A prerequisite is, however, that the sprocket is re-machined or not worn much.

The rolling off chain transfers its movement via the chain links to the carrier rollers, track rollers and idler. Since the transfer is made by touch and friction, these parts are also worn on the contact surfaces.

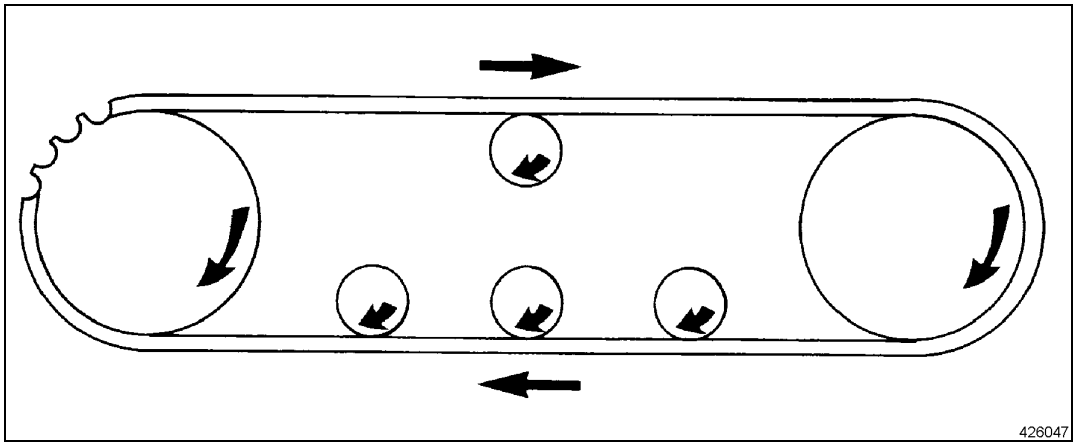

Fig. 5 Movement of track components

A similar process occurs between the track pads and the ground.

The entire track is therefore subjected to normal wear, which is influenced by three main criteria:

- Ground condition
- Type of application and mode of travel
- Maintenance

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Cracks and chips on the chain link

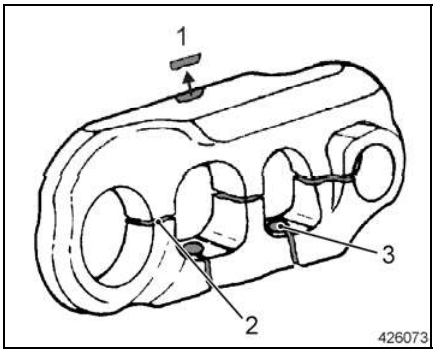


Fig. 25 Cracks and chips

Cracks and chips on the chain link as well as elongated bolt holes are usually caused by too wide track pads on uneven ground conditions. Also loose track pads or excessive shock loads can cause this type of wear.

Minor chips and cracks (less than 30% of the running surface) and hairline cracks on the surface of the links (mostly in the corner areas) normally do not influence the service life expectancy of the chain links, provided the correct track pads are installed.

4.6 Track pads

Depending on the type of machine and application, single, double or triple grousers are used. For crawler dozers, single grousers are normally used, double and triple grousers are usually installed on crawler loaders.

Single grouser pads provide good traction and can therefore be used for pushing and pulling, however, they are relatively hard to steer. Triple grouser pads are easier to steer, however, the traction is lower. Double grouser pads provide a mid range.

As the track pad width increases, the ground pressure on the machine decreases, the steering resistance and the load on the individual track components increases significantly.

If a machine equipped with wide track pads is used in rocky terrain, the service life expectancy of the complete undercarriage may be reduced to one tenth of the normal service life expectancy.

When evaluating tracks, always compare the given operating conditions to the width of the track pads. In some cases, the economic solution would be to have two sets of tracks (one with wide pads and one with narrow pads).

To determine the amount of track pad wear, the height of the grousers should be measured for all types of track pads.

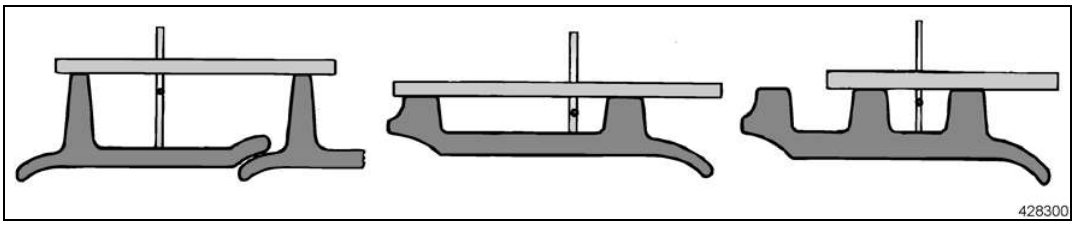


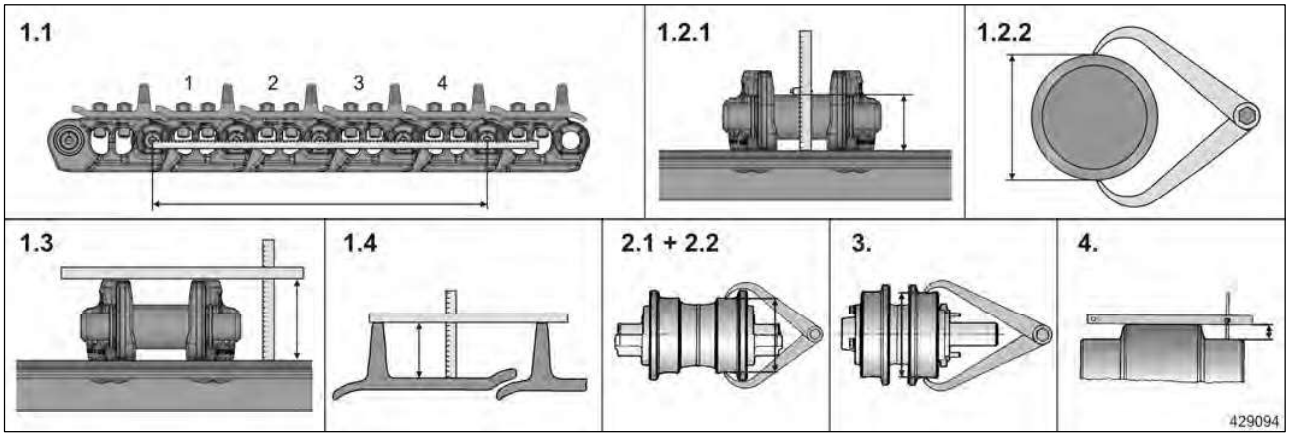
Fig. 26 Measure the height of the grousers

- ▶ To determine the amount of wear, lay the depth gauge across the center of the grousers over two grousers – on single grouser pads, tighten the track chain - and measure the height of the grousers. Repeat this measurement on several pads on each chain.

12.3.01 Wear chart

Brand BERCO

LR 624 F/N xxx- 8957→



Dimensions in [mm]	0%	20%	40%	60%	80%	90%	100%	110%	120%
1. Chain									
For chain link									
CR 5465A / ..									
CR 5458 / ..									
CR 5459 / ..									
1.1 Chain pitch	760,00	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
1.2 Bushings - Wear									
1.2.1 Dimension with depth gauge	81,30	80,10	78,80	76,20	73,70	72,40	71,20	70,30	69,50
1.2.2 Dimension Diameter	65,00	63,80	62,50	59,90	57,40	56,10	54,90	54,00	53,20
1.3 Chain link height	119,00	117,00	115,00	113,00	110,50	109,25	108,00	106,75	105,50
1.4 Chain pads grouser height	35,00	32,00	26,50	21,50	16,50	14,00	11,50	9,00	6,50
2.1 Track roller single flange									
LH 1501	203,00	199,60	196,00	192,80	190,00	187,60	184,00	180,40	177,00
2.2 Track roller double flange									
LH 1502	203,00	199,60	196,00	192,80	190,00	187,60	184,00	180,40	177,00
3. Carrier roller									
CR 4799A	171,50	169,70	167,40	165,10	162,80	161,00	159,20	157,40	155,50
4. Idler									
CR 3170	20,00	21,40	22,80	24,20	27,20	28,80	30,50	32,20	33,80

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12.6.20 Carrier roller

1 Sectional view

LR624 F/N xxx-8957→

LR634 F/N xxx-8397→9608

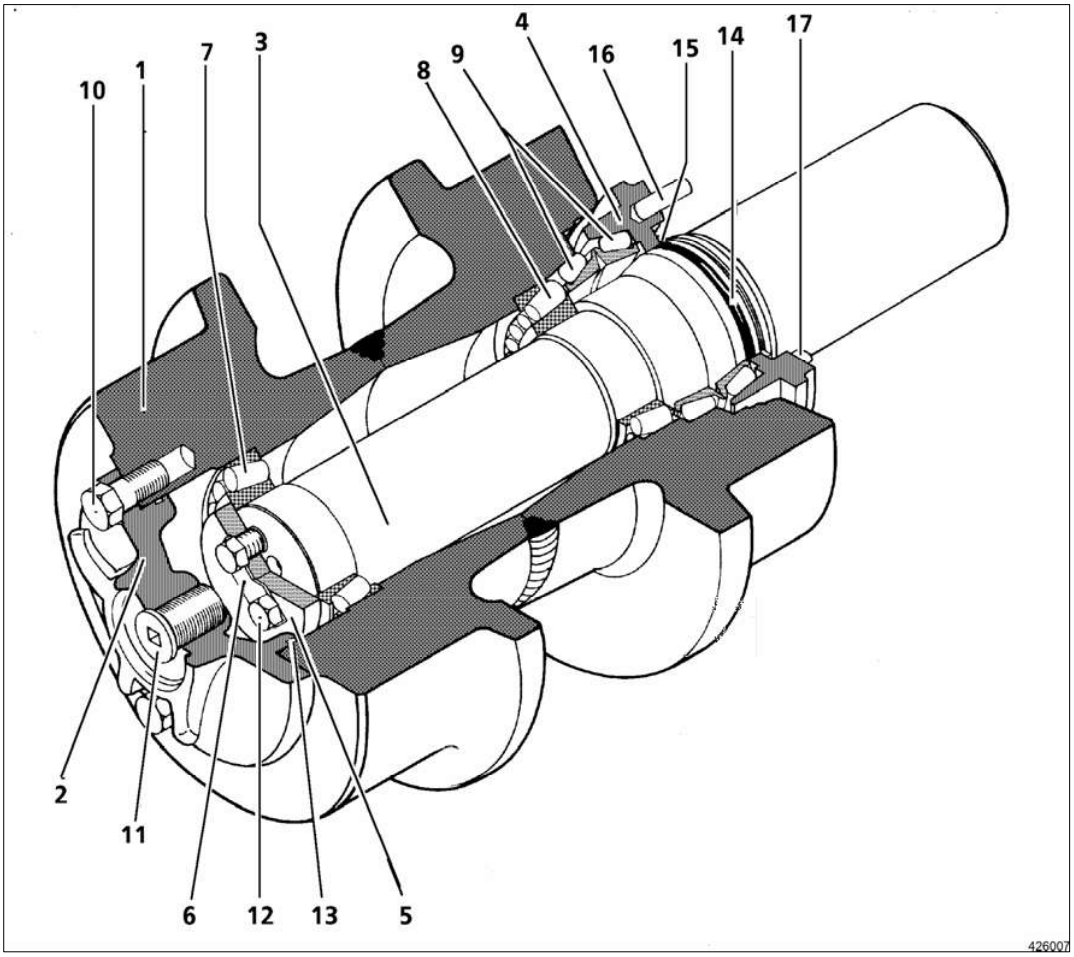

Fig. 1 Sectional view – Carrier roller

1	**Roller shell**	10	Hex head screw with washer
		11	Plug with O-Ring
2	Cover, outside	12	Hex head screw with washer
3	Axle	13	O-Ring
4	Cover, inside	14	O-Ring
5	Retaining plate	15	Retaining ring
6	Retaining plate	16	Dowel pin
7	Tapered roller bearing	17	Dowel pin
8	Tapered roller bearing		
9	Slip ring seal		

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13.1.20 4 in 1 Bucket

1 Design

This bucket is very versatile. It can be used for loading, pushing, clamping and drawing off backwards.

With the rocker switch on the working hydraulic joystick, the function open / close flap is electrically actuated and subsequently hydraulically moved.

The flap control is made via the two hydraulic cylinders on the back of the bucket. To close the flap, the piston bottom side (= larger power) is actuated on the cylinder – the piston rods extend, to open the flap, the piston rod side is actuated – the piston rods retract.

To prevent the bucket flap from opening inadvertently due to natural leakage, a hydraulically releasable check valve is installed on the auxiliary segment, outlet B3. When the joystick is moved in direction “open flap”, then the check valve is opened by servo pressure for the return to the hydraulic tank.

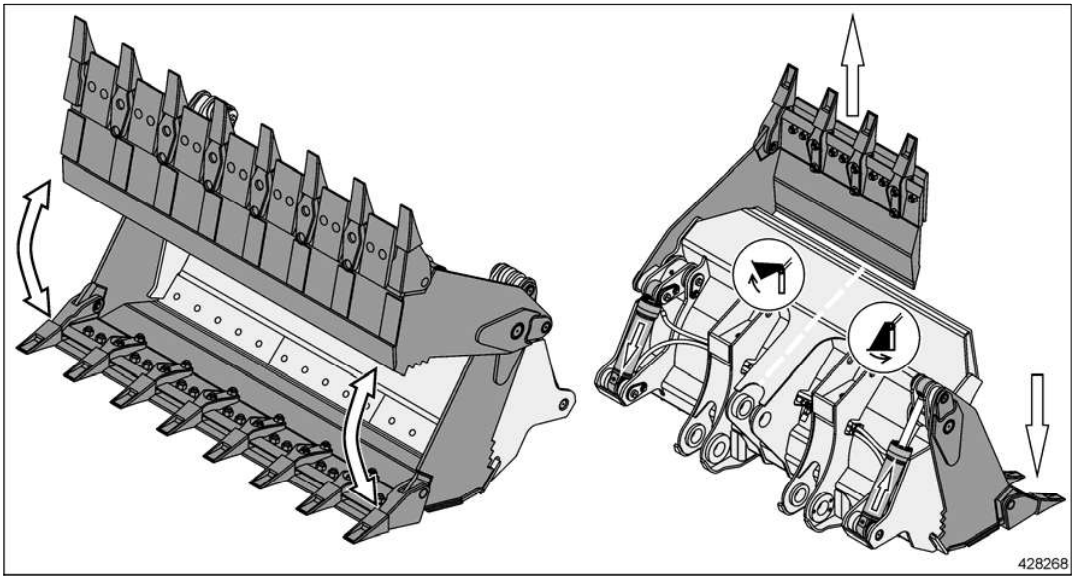
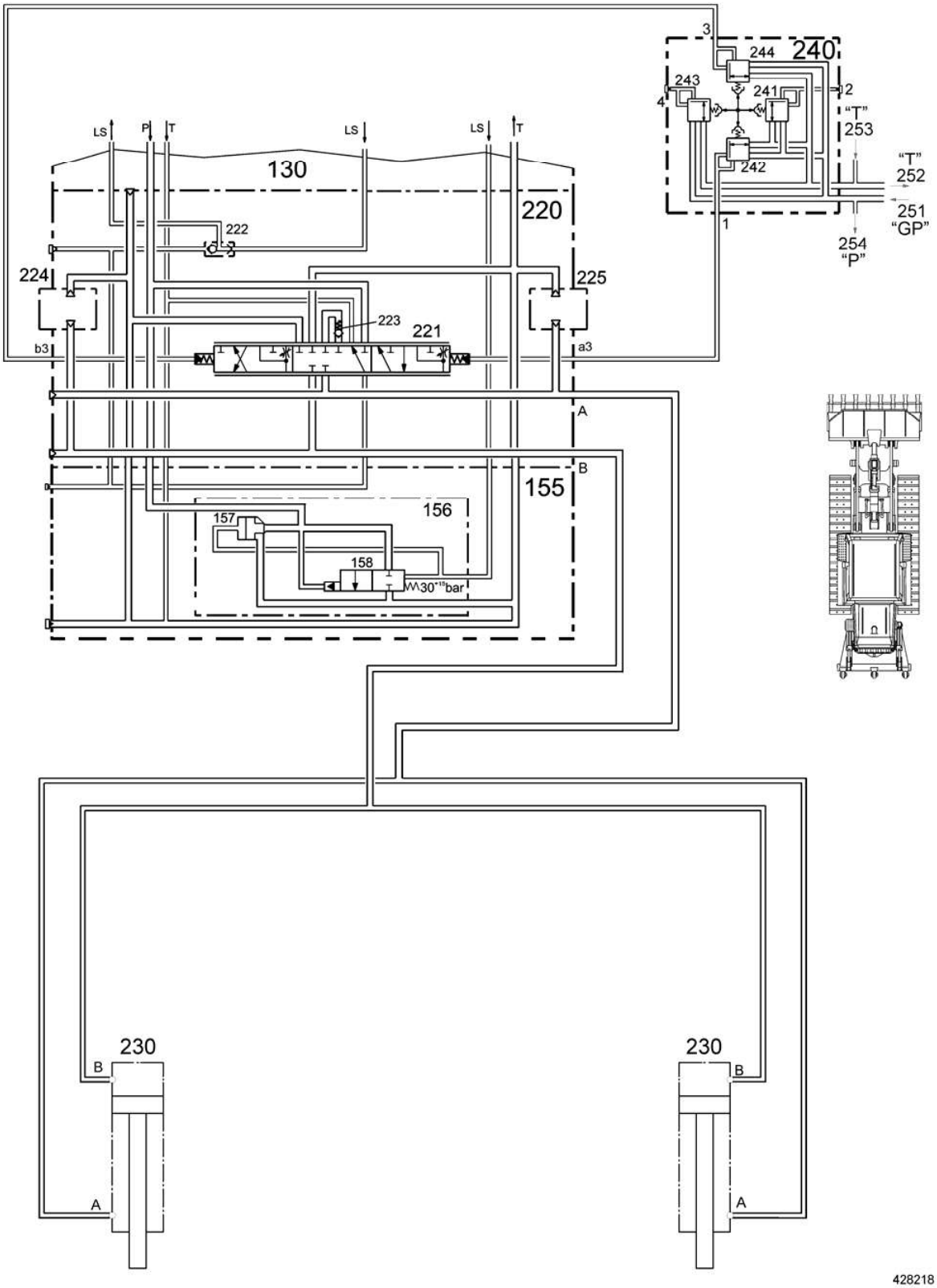


Fig. 1 Design

LWT / Ausgabe / Edition / Edition / **03.2007**


3
244
240
243
241
2
4
"T"
253
242
"T"
252
251
"GP"
1
254
"P"
LS
P
T
LS
LS
T
130
220
222
224
225
223
221
b3
a3
A
B
155
156
157
158
30"19 bar
230
B
A
230
B
A
428218

15 Main frame - Add on components

15.0.00 Sub group index Main frame - Add on components

LWT / Ausgabe / Edition / Edition / **03.2007**

15.4.20 Engine mount

LR624 F/N xxx-8957→

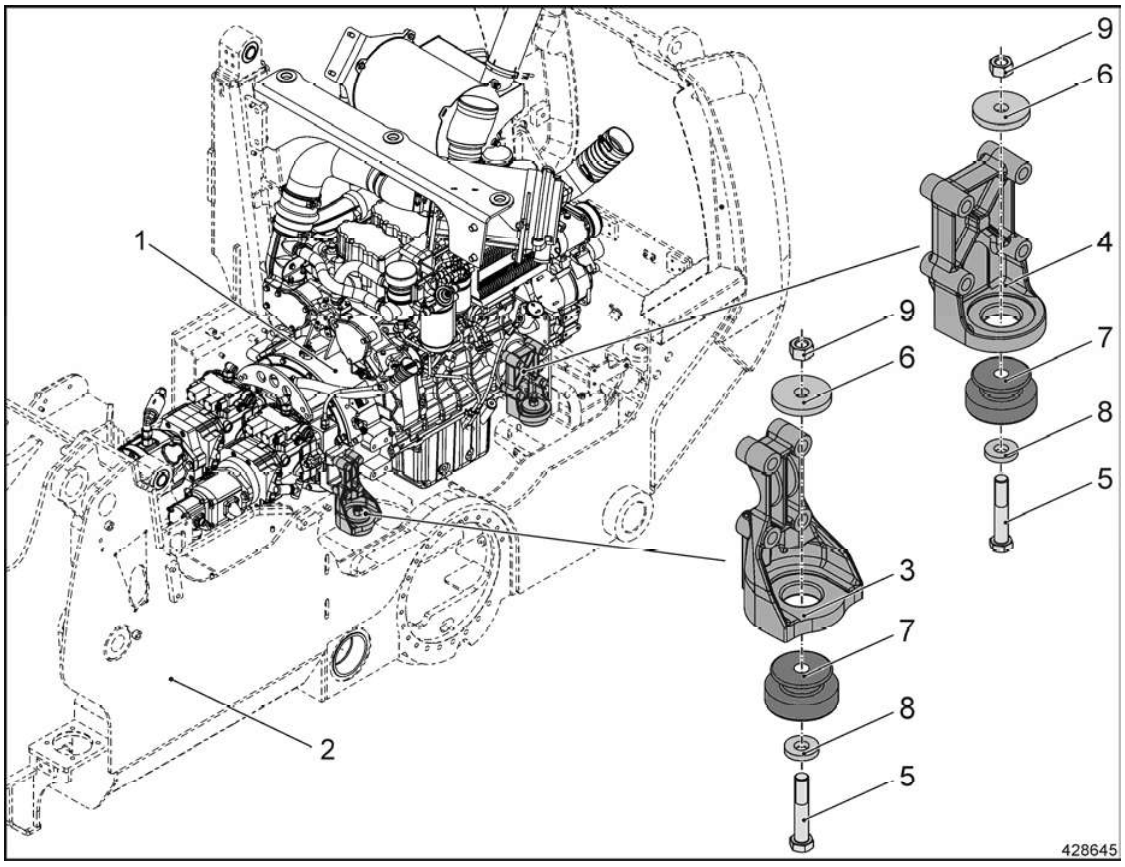


Fig. 1 Engine mount

1 Diesel engine
2 Main frame
3 Engine mount, front
4 Engine mount, rear
5 Hex head screw
6 Washer
7 Rubber cushion
8 Washer
9 Hex nut

Note!
For tightening torques, see section 1.5

LWT / Ausgabe / Edition / Edition / **01.2008**

16.2.20 Fuel tank

1 General

The fuel tank is attached with hex head screws with washers and rubber pads on the main frame. It is located on the front on the machine below the suspension of the working hydraulic cylinders.

Note!
For tank contents as well as for instructions to empty, clean and bleed the fuel tank, refer to the Operating instructions.

2 Design

The main components of the fuel tank are the filler neck, the level sensor and the fuel drain valve.

The fuel tank can be filled by removing the tank lock. The fuel is coarsely filtered on the strainer and flows into the fuel tank via the filler neck.

The level sensor monitors the fill level of the fuel tank electronically.

Note!
It should be avoided to run the machine until the fuel tank is „empty“, since the required subsequent bleeding procedure of the fuel lines of the Diesel engine is very time-consuming.

The condensation and deposits in the tank can be drained via the drain valve.

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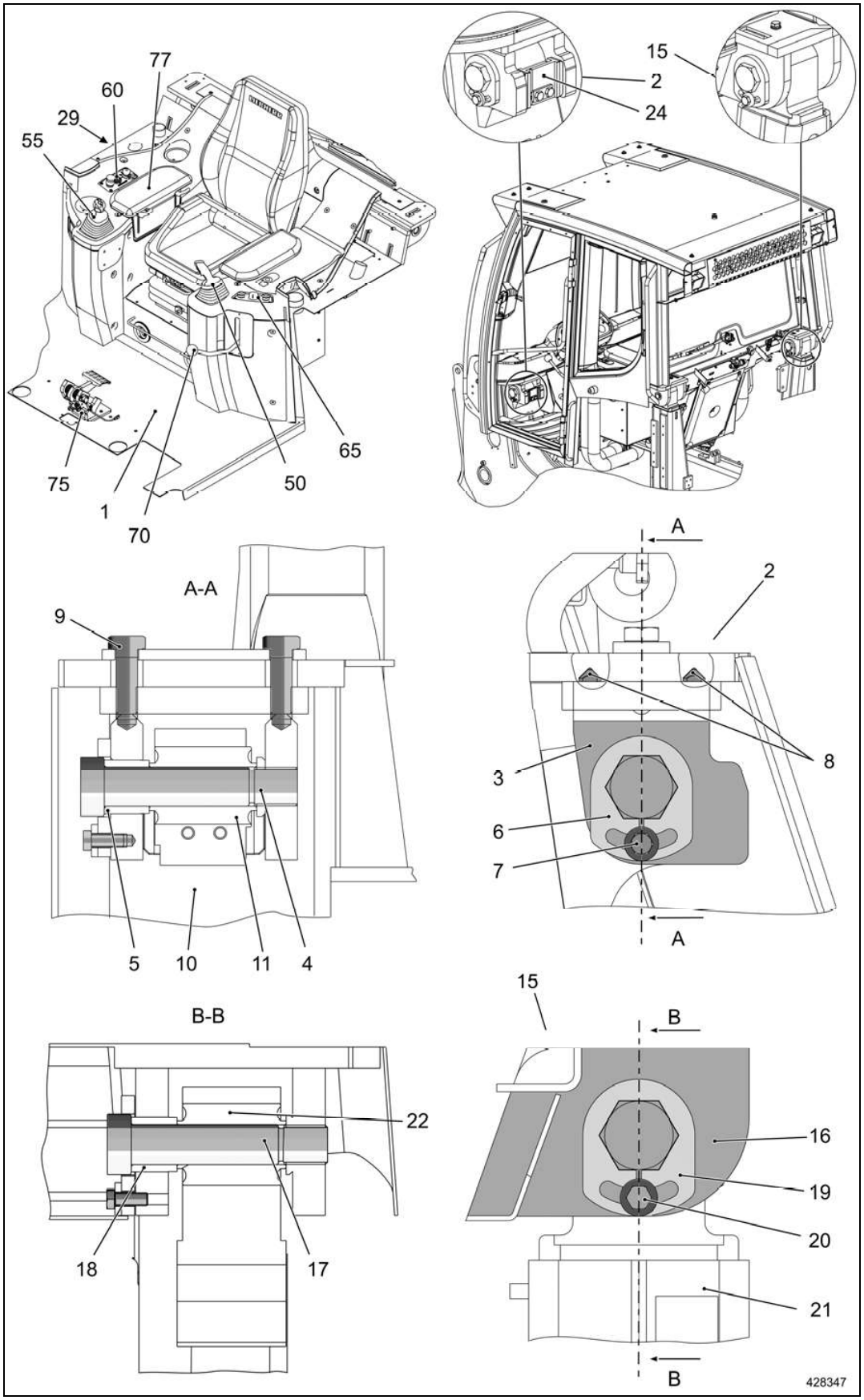


Fig. 1 Operator's platform, complete

6 Troubleshooting

For safety reasons, work marked with # must be handled by personnel especially trained in refrigeration (HVAC mechanics), since most of the time, the system must be evacuated, dried and refilled. Improper handling can cause additional damage and danger to persons and life.

Problem	Cause	Remedy
System does not cool	Electrical connections interrupted	Check connections on magnetic coupling, switch, relay, temperature sensor and electronic thermostat
	V-belt broken	Change V-belt
	Electronic ice-up protection defective	Replace
	Electronic thermostat defective	Replace
	Turn potentiometer R12 defective	Replace
	Magnetic coupling is not energized - - Relay K12 defective	 Replace
	Magnetic coupling defective	Replace magnetic coupling
	Fans on condenser do not turn - - Relay K11 defective - Fuse F19 defective	 Replace Replace
	Compressor turns off due to excessive max. permissible operating pressure	Clean condenser (cooling surface) Check function of fan on condenser for proper function
	Filter dryer plugged up	# Replace filter dryer
	Too much refrigerant in system	# Draw off refrigerant
	Compressor turns off due to falling below minimum operating pressure	# Check system for leaks, add refrigerant, if necessary
System cools only for a short time	Evaporator iced up	Check electronic ice-up protection, replace if necessary
System cools insufficiently	Not enough air supply	Clean evaporator and condenser externally
	Too little refrigerant in system – bubbles visible in sight gauge	# Check system for leaks, refill if necessary
	Expansion valve plugged up	# Clean expansion valve or replace
	Expansion valve iced up due to too much moisture in the system – moisture indicator is yellow	# Replace filter dryer
	Filter dryer partially plugged up (ice formation on dryer)	# Replace filter dryer
	Air in coolant circuit – increased pressure values and bubble formation in sight gauge	# Evacuate system and check for leaks, refill
Noise on compressor	Compressor mount is defective	# Replace compressor
	Magnetic coupling on compressor is defective	Replace magnetic coupling
	Insufficient oil in compressor	# Check compressor, add oil
Whistling sound on V-belt	V-belt worn	Replace V-belt
	V-belt too loose	Check tension device

LWT / Ausgabe / Edition / Edition / **01.2009**

3 Hydraulic system

3.1 Parts list

15 Tandem gear pump - replenishing
30 Collector block -4-way
38 Gear motor – fan combi cooler

41 Strainer
65 Combi cooler
71 One way valve
73 Block for Y51 and Y52

80 Hydraulic tank
81 Shut off valve
82 Return filter
83 Bypass valve (3 bar)

B50 Oil pressure switch – Filter monitor

Y51 Solenoid valve – reversal of direction of rotation fan / water, oil and charge air cooler
Y52 Solenoid valve – reversal of direction of rotation fan / water, oil and charge air cooler
Y55 External pressure relief valve for reversible fan

LA System pressure fan drive

Note!

The one way valve 71 is used to draw oil to prevent the fan hydro motors from running dry when the Diesel engine is turned off.

Note!

All interrupted hose lines in the hydraulic schematic are fully shown in the series version, section 6.3.

LWT / Ausgabe / Edition / Edition / **02.2010**

4 Electrical system

see section 9.4.: Optional electronic fan control automatic, reversible

5 Component arrangement

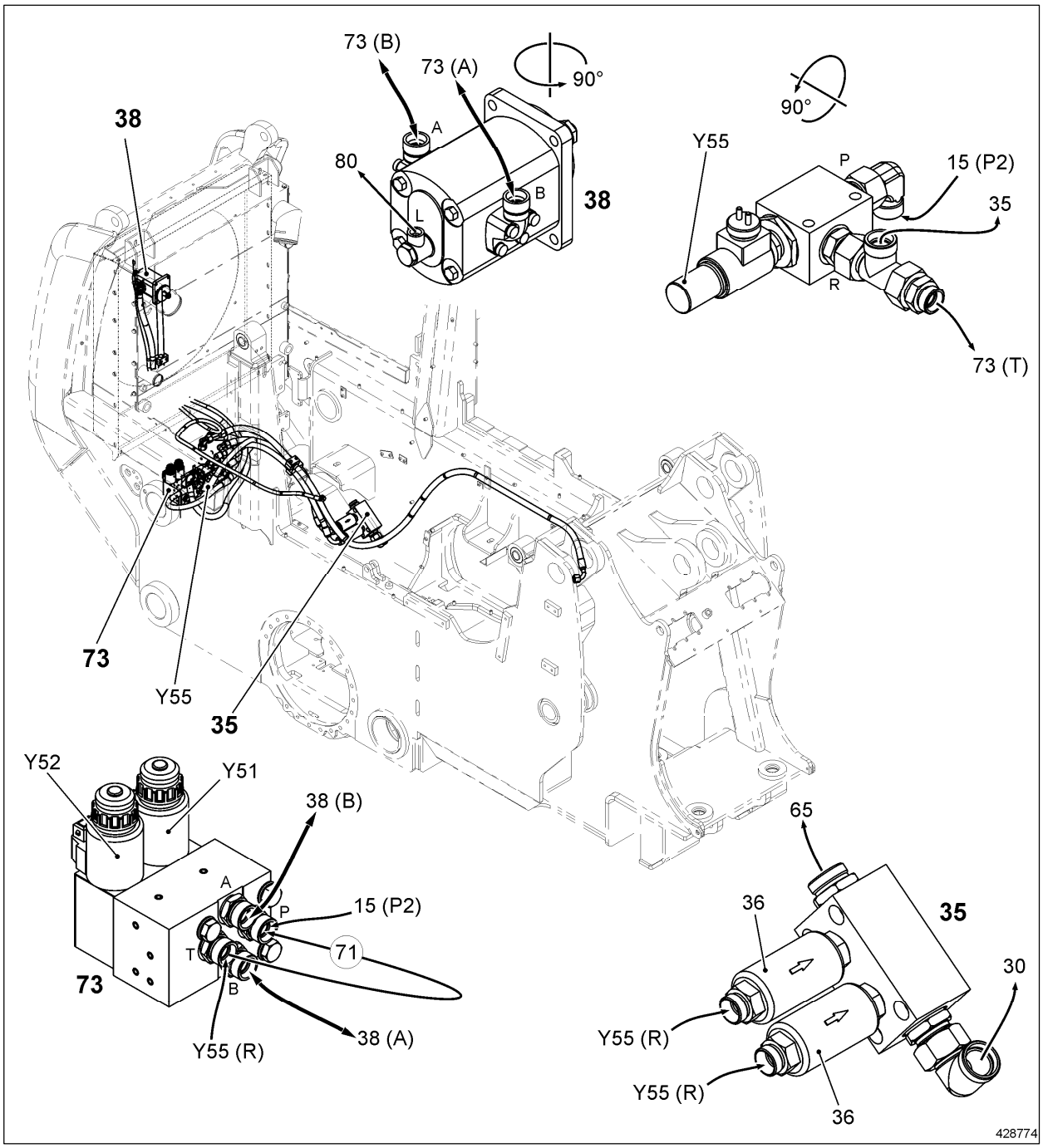
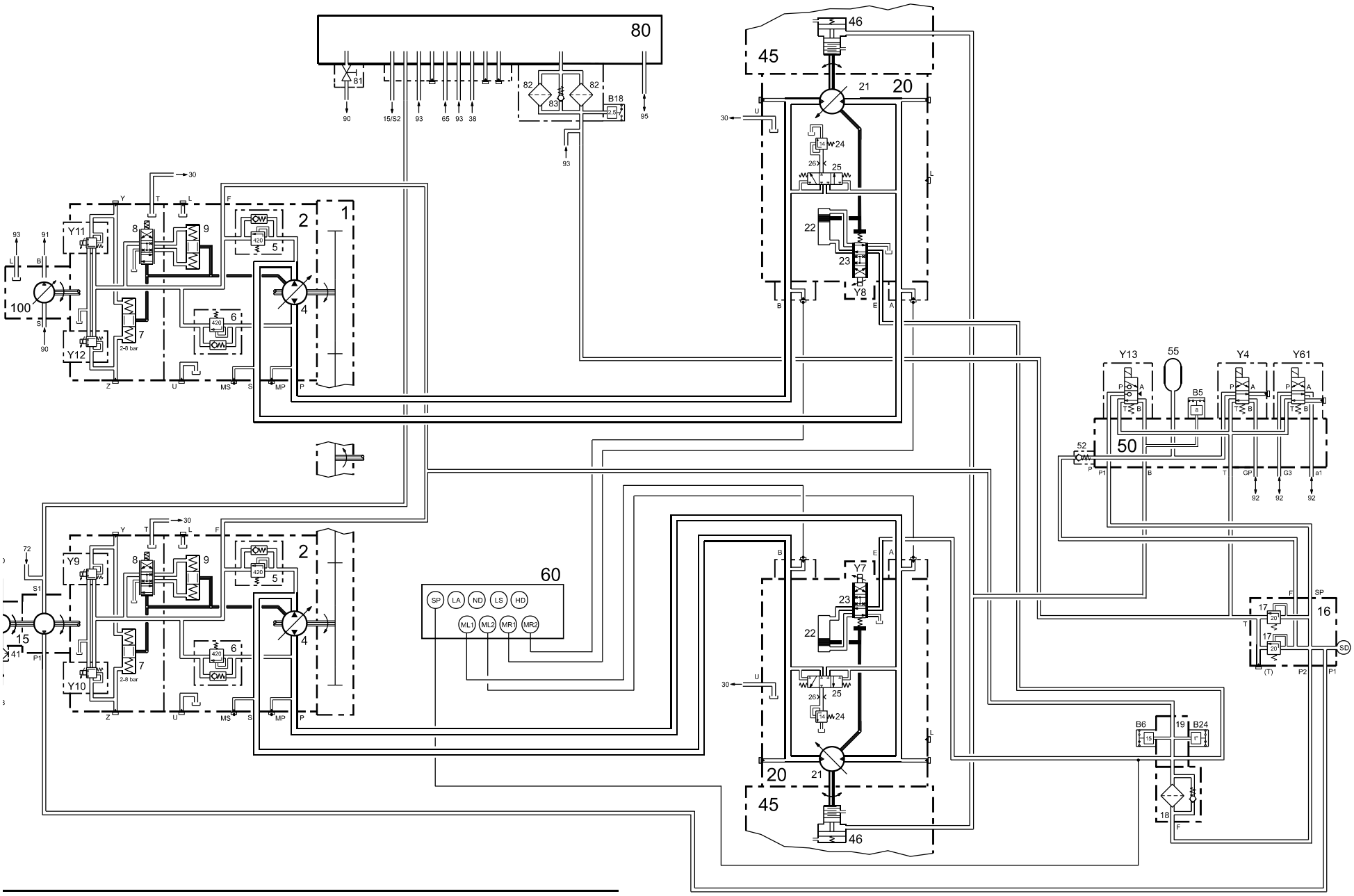


Fig. 3 Component arrangement reversible fan



Stkident Nr. 9417708

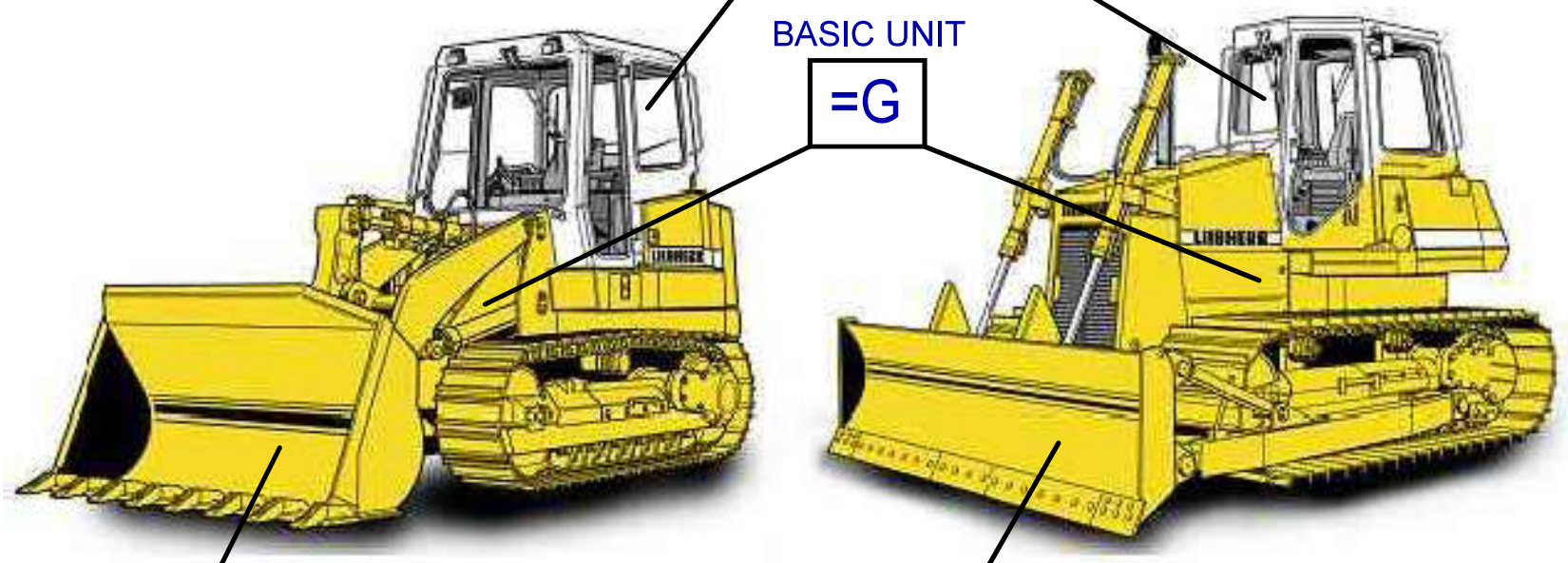
PROJEKT: 9417708_007

E3 series

=F DRIVER'S CAB

BASIC UNIT

=G



=A EQUIPMENT

=A EQUIPMENT

				Bearbeiter	Flunger W.	LIEBHERR-WERK TELFS GMBH	SYSTEM FEATURE PICTURE LR 624
				Datum Spei.	20.11.2007 09:05		
				Ausgabe	lwtscj1		
Zustand	Änderung	Datum	Name	Datum Plot	8.5.2008 08:23		

Ident.-Nr. 9417708

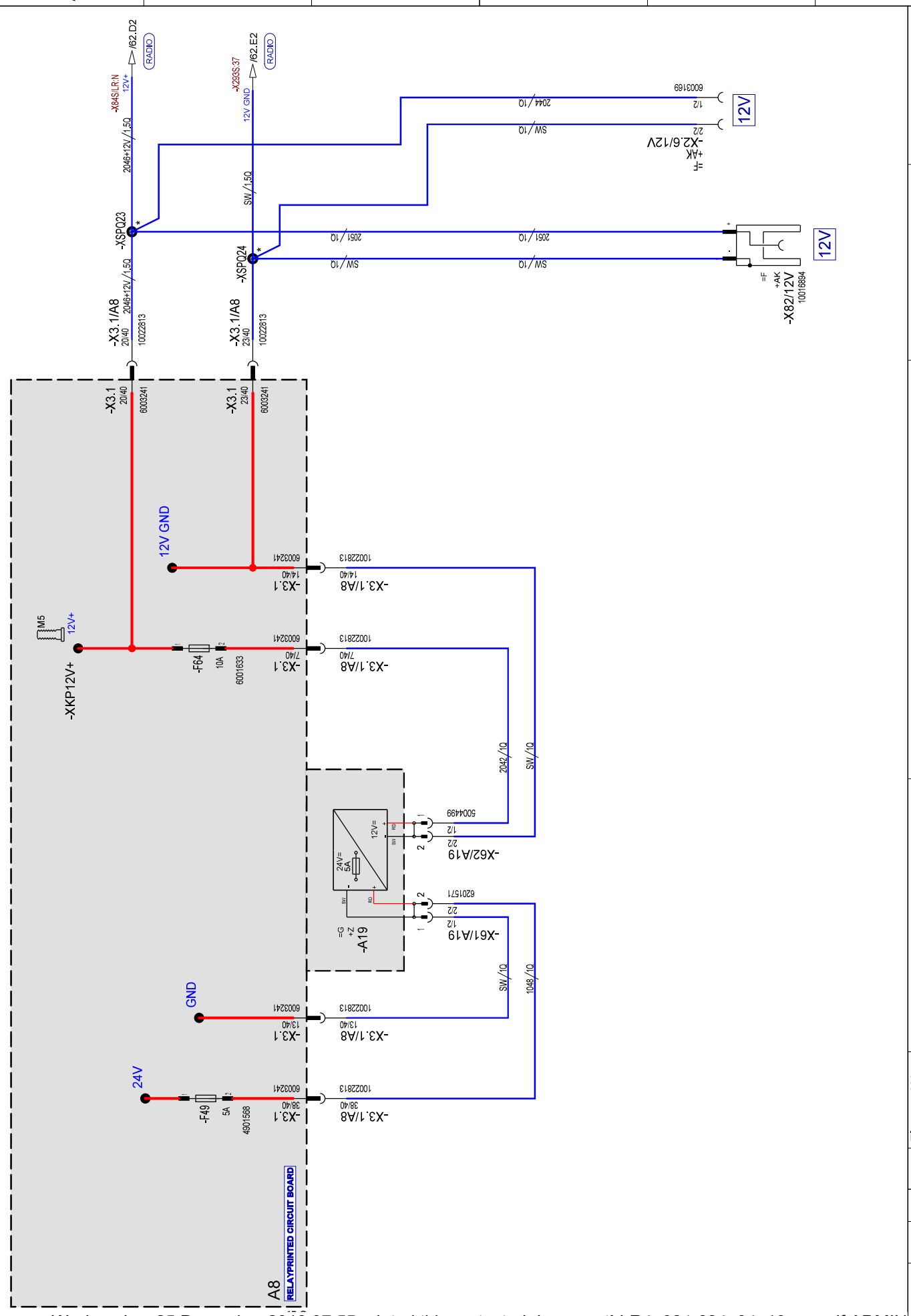
Zeich-Nr. 997 9011 00

Anlage

Ort

Projekt Version 007

Blatt 5 von 76


VOLTAGE CONVERTER 24/12V
LR 624
Ident-Nr. 9417708
Zeich-Nr. 997 9011 00
Projekt Version 007
Blatt 19
von 76
LEHERR-WERK TELFS GMBH
Flunger W.
20.11.2007 09:05
lwtsci1
8.5.2008 08:23
RELAYPRINTED CIRCUIT BOARD
A8
-XKP12V+
-FG4 10A
-F49 5A
-A19
-X3.1/A8
-X62/A19
-X61/A19
-X82/12V
-X2.6/12V
-XSPQ23
-XSPQ24
-X3.1
-X3.1/A8
-X84SLR:N
-X238S.37
/62.D2
/62.E2
RADIO
12V+
12V GND
GND
24V
12V
2046+12V/1.5Q
SW/1.5Q
SW/10
2042/10
2044/10
2051/10
1048/10
6003169
6003241
10022813
10016894
6001633
4901568
5004499
6201571
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PROJEKT: 9417708_007
Sk.Ident Nr. 9417708
Wednesday, 25.December 2019 07:55 printed this protected document! LR4_624-634_04_13_en.pdf ADMIN

Stkident Nr. 9417708

PROJEKT: 9417708_007

E3 series

DRIVER'S CAB FRONT

SW,SW,SW,SW/1Q,1Q,1Q,1Q

=F +FK -MPFK.1 MASSE M8 /33.B4 GND

-X152/E18 2/2 6003169 — =F +FK -E18 7027205 H3 24V/70W — -X152/E18 1/2 6003169

-X148/E4 2/2 6003169 — =F +FK -E4 7027205 H3 24V/70W — -X148/E4 1/2 6003169

-X149/E6 2/2 6003169 — =F +FK -E6 7027205 H3 24V/70W — -X149/E6 1/2 6003169

-X153/E19 2/2 6003169 — =F +FK -E19 7027205 H3 24V/70W — -X153/E19 1/2 6003169

6416/1Q 6413,6417/1Q,1Q 6417/1Q

=F +FK -MPFK.1 MASSE M8 /32.A5 GND

SW/1Q

-X150/E5 2/2 6003169 — =F +FK -E5 7027205 H3 24V/70W — -X150/E5 1/2 6003169

-X151/E3 2/2 6003169 — =F +FK -E3 7027205 H3 24V/70W — -X151/E3 1/2 6003169

-X173/S21:10, -X299/S50:10, -X176/S19:10 24V - F42 /32.C7 /36.D7 /47.A6 /54.A8

2030,2031,2048,2076,2077/1Q,1Q,1Q,1Q,1Q

-S3:B 24V - F43 /13.B7

6111/1Q

6412,6416,6413,6417/1Q,1Q,1Q,1Q

-X4,1P:9 24V - F43 /14.D8

6102/1Q

6415/1Q

6414/1Q

2050/1Q

6102,6111,6126/1Q,1Q,1Q

6126/1Q

-S54:A 24V - F43 /41.B2

-X15/14 6001074 — -X15/13 6001074

2075/1Q

-S36.X:10 24V ÜBER F42 /58.A6

OPTIONAL

-A18 /32.E4 — -A18.X4 6003259

-F42LR 5A 4901568

-A18 /32.E4 — -A18.X4 6003259

-F43LR 5A 4901568

-A18 /32.E4 -F22 15A — -A18.X3 6002260

1062/2,5Q

1043/2,5Q

1044/1,5Q

1052/2,5Q

/32.A8 24V GECHALTET VON K19 -K19,X:87

/32.A8 24V ÜBER F41 -K17,X:87

A21

ACTUATOR CONSOLE DRIVER'S CAB RIGHT

Zustand	Änderung	Datum	Name	Bearbeiter	Flunger W.	LIEBHERR-WERK TELFS GMBH	DRIVER'S CAB LIGHTING LR 624
				Datum Spei.	20.11.2007 09:05		
				Ausgabe	lwtscj1		
				Datum Plot	8.5.2008 08:23		

Ident.-Nr. 9417708 | Anlage | Ort

Zeich-Nr. 997 9011 00 | Projekt Version 007 | Blatt 33 von 76

Stkident Nr. 9417708

PROJEKT: 9417708_007

E3 series

A23
ACTUATOR CONSOLE DRIVER'S CAB LEFT SIDE

-S_Option1
-S_Option2

10016864 5/12 -X183
10016864 9/12 -X183
10016864 10/12 -X183
10016864 5/12 -X184
10016864 9/12 -X184
10016864 10/12 -X184

2076 /1Q
SW /1Q
3061 /1Q

=F
+R

A21
ACTUATOR CONSOLE DRIVER'S CAB RIGHT

2076.2077 /1Q.1Q
-A18.X4:G
24V - F42
/33.B3
SW.SW /1Q.1Q
+FK
-MPFK.3
MASSE M8
/38.B5
GND
3062 /1Q

=F
+FST
-X293P 15/70 6003242
-X293S 15/70 6003243

-X293P 16/70 6003242
-X293S 16/70 6003243

VARIABLE FOR OPTIONS 1

VARIABLE FOR OPTIONS 2

3061 /1Q
-X3.1/A8 2/40 10022813
-X3.1 2/40 6003241

3062 /1Q
-X3.1/A8 1/40 10022813
-X3.1 1/40 6003241

A8
RELAYPRINTED CIRCUIT BOARD

-X10/B1
-X11/Ö1
-X11/S1
-X10/A1
-X12/1
-VKO1
1(86) 4(87a) 5(87) 2(85) 3(30)
MICRORELAY
RELAY AND FUSE NOT EQUIPPED! EQUIPMENT RESULTED FOR OPTIONALCABLING
A
B
GND

A8
RELAYPRINTED CIRCUIT BOARD
=G
+ZP

-X10/B2
-X11/Ö2
-X11/S2
-X10/A2
-X12/2
-VKO2
1(86) 4(87a) 5(87) 2(85) 3(30)
MICRORELAY
RELAY AND FUSE NOT EQUIPPED! EQUIPMENT RESULTED FOR OPTIONALCABLING
A
B
GND

Zustand	Änderung	Datum	Name		
				Bearbeiter	Flunger W.
				Datum Spei.	20.11.2007 09:05
				Ausgabe	lwtscj1
				Datum Plot	8.5.2008 08:23

LIEBHERR-WERK TELFS GMBH

FREE CIRCUIT BOARD LAYOUT VARIABLE FOR OPTIONS 1 - 2
LR 624

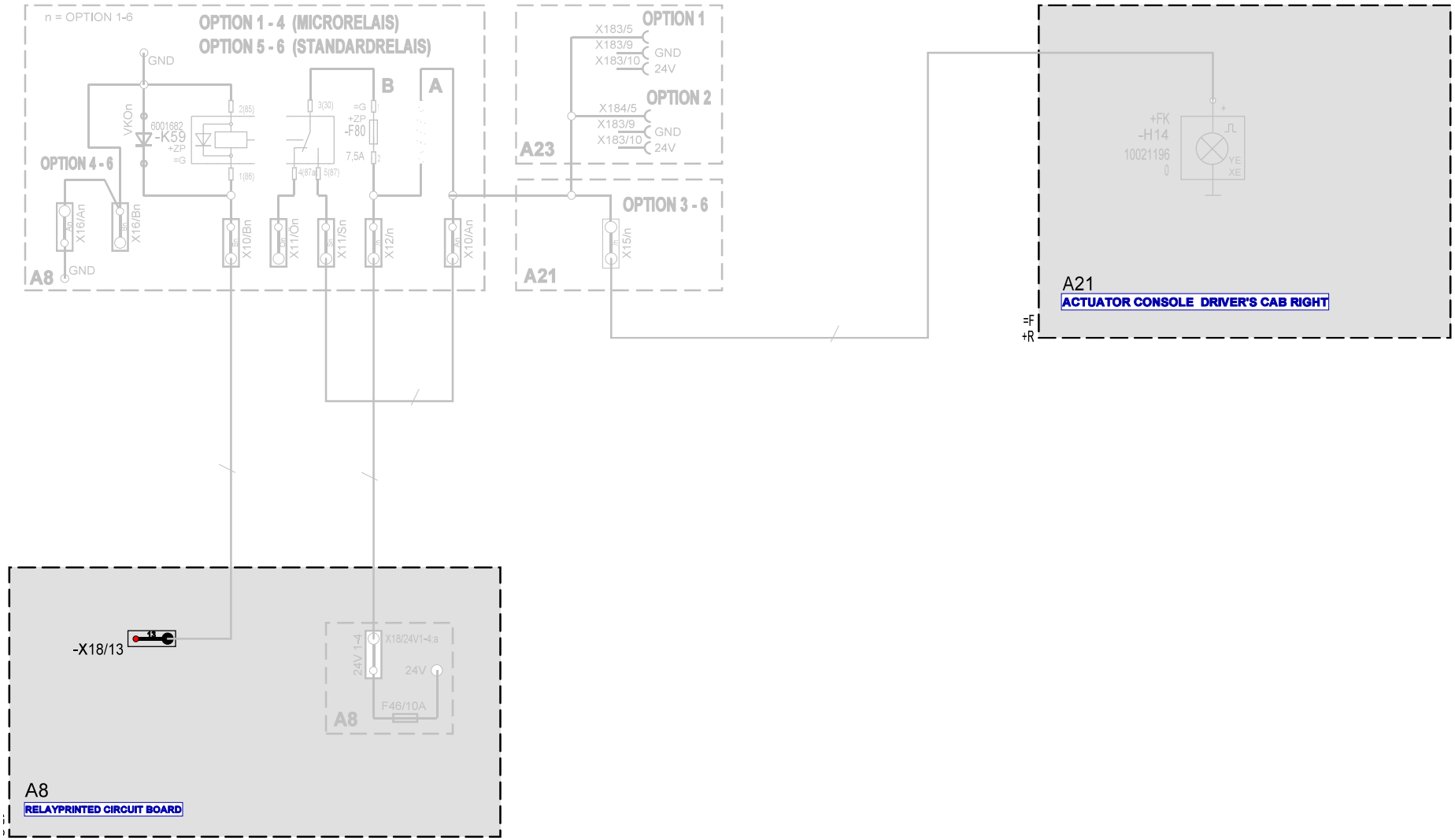
Ident.-Nr. 9417708
Zeich-Nr. 997 9011 00

Anlage
Ort
Projekt Version 007
Blatt 47 von 76

Stkident Nr. 9417708

PROJEKT: 9417708_007

E3 series



ROMLAUFPLAN

				Bearbeiter	lwtscj1
				Datum	20.11.2007 09:05
E-STLPL				Ausgabe	lwtscj1
Zustand	Änderung	Datum	Name	Datum Plot	8.5.2008 08:23

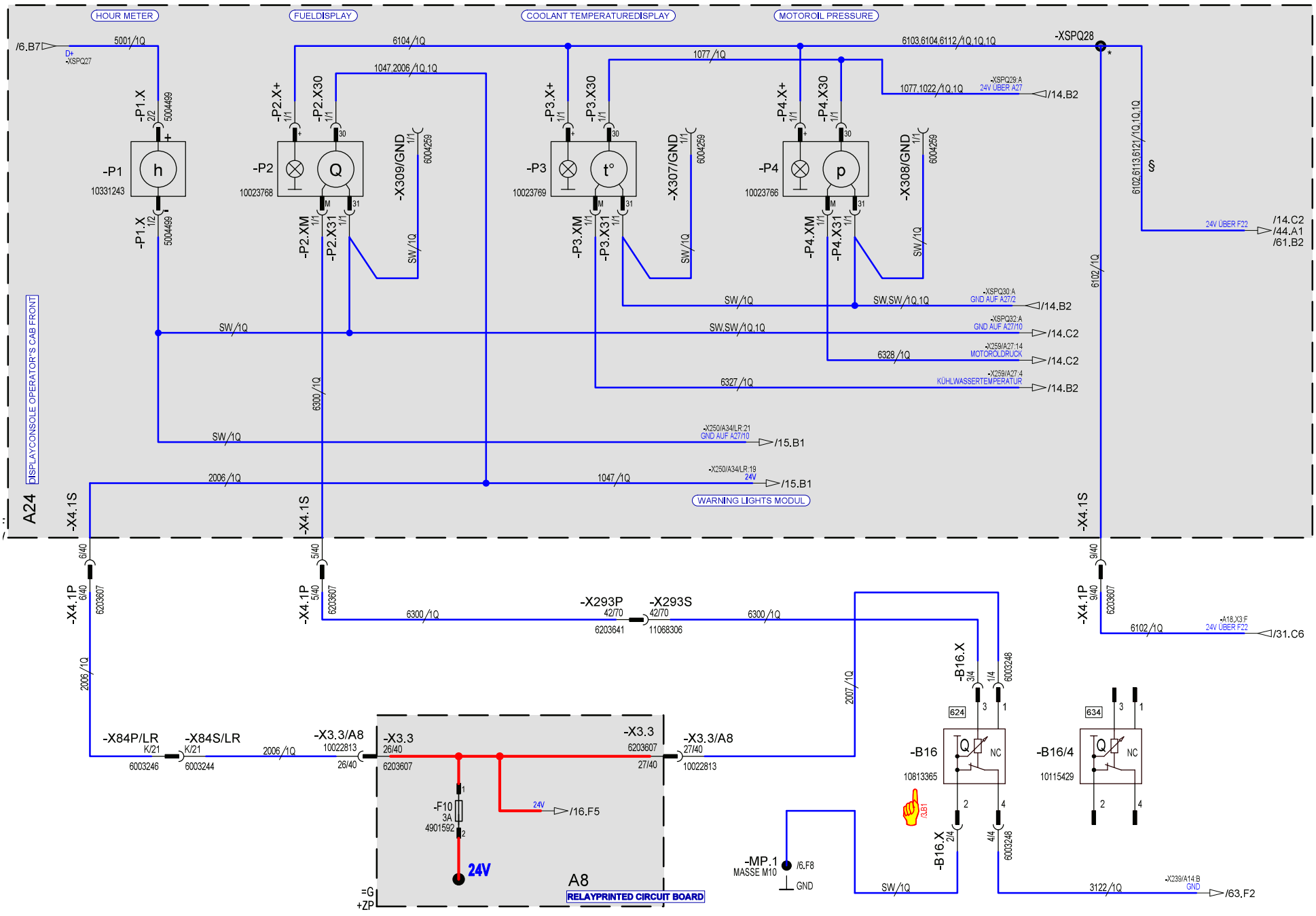
LIEBHERR-WERK TELFS

OPTIONAL BACK-UP ALARM OPTIC
LR 624

Ident.-Nr.	9417708	Anlage	
		Ort	
Zeich-Nr.	997 9011 00	Projekt Version 007	Blatt 61 von 76

BMK	Anlage	Ort	Blatt	Funktion
-X295P	=G	+M	/51.D4	CONNECTOR VENTILATOR REVERSIBLE
-X295S *	=G	+M	/51.D4	CONNECTOR VENTILATOR REVERSIBLE
-X296P *	=G	+M	/52.C2	CONNECTOR VENTILATOR REVERSIBLE
-X296S	=G	+M	/52.D2	CONNECTOR VENTILATOR REVERSIBLE
-X298/S49 *	=F	+R	/36.D3	CONNECTOR SWITCH WINDSCREEN WIPER FRONT
-X299/S50 *	=F	+R	/36.E7	CONNECTOR SWITCH WIPER BEHIND
-X305/GND	=F	+V	/46.B3	CONNECTOR GND
-X306/GND	=F	+V	/63.C4	CONNECTOR GND
-X307/GND	=F	+V	/14.B5	CONNECTOR GND
-X308/GND	=F	+V	/14.B6	CONNECTOR GND
-X309/GND	=F	+V	/14.B3	CONNECTOR GND
-X323 *	=G	+T	/41.B8	CONNECTOR PRESSURE SWITCH POWER INCREASE
-X326/B50 *	=G	+T	/17.D2	CONNECTOR PRESSURE SWITCH RETURN FLOW FILTER CONTAMINATION
-X339	=G	+T	/10.D6	DUMMY PLUG
-X348/Y48 *			/22.D8	CONNECTOR PRESSURE RELIEF VALVE VENTILATOR CONTROL
-X348/Y48 *	=G	+H	/22.F6	CONNECTOR PRESSURE RELIEF VALVE VENTILATOR CONTROL
-X348P/Y48 *	=G	+H	/22.F7	CONNECTOR VENTILATOR ENGINE JPT
-X368P	=G	+Z	/9.C5	CONNECTOR STOP ENGINE STARTING
-X368S	=G	+Z	/9.C5	CONNECTOR STOP ENGINE STARTING
-X371P	=G	+Z	/48.C4	CONNECTOR HOLDING MAGNET FLOTATION POSITION
-X371S	=G	+Z	/48.C5	CONNECTOR HOLDING MAGNET FLOTATION POSITION
-X396P	=G	+T	/10.C3	CONNECTOR TILLY IMMOBILIZER
-X396P.X	=G	+T	/10.C4	CONNECTOR TILLY IMMOBILIZER
-XKP12V+	=G	+ZP	/19.A5	NODAL POINT
-XKP15	=G	+ZP	/8.D5	NODAL POINT
-XKP24	=G	+ZP	/8.E6	NODAL POINT
-XKP24	=G	+ZPR	/8.E8	NODAL POINT
-XKP30	=G	+ZP	/7.D7	NODAL POINT
-XKP30	=G	+ZPR	/8.D8	NODAL POINT
-XOPT17 *			/56.C4	CONNECTION OPTIONAL
-XOPT26 *			/57.B1	CONNECTION OPTIONAL
-XOPT28 *			/57.B7	CONNECTION OPTIONAL
-XOPT29 *			/57.D2	CONNECTION OPTIONAL
-XOPT31 *			/60.B1	CONNECTION OPTIONAL
-XOPT32 *			/60.B7	CONNECTION OPTIONAL
-XOPT33 *			/61.B1	CONNECTION OPTIONAL

BMK	Anlage	Ort	Blatt	Funktion
-XOPT34 *			/61.E2	CONNECTION OPTIONAL
-XOPT35 *			/51.B1	CONNECTION OPTIONAL
-XOPT36 *			/51.B7	CONNECTION OPTIONAL
-XOPT37 *			/51.E2	CONNECTION OPTIONAL
-XOPT38 *			/52.B1	CONNECTION OPTIONAL
-XOPT39 *			/52.B5	CONNECTION OPTIONAL
-XOPT40 *			/52.D2	CONNECTION OPTIONAL
-XOPT41 *			/52.D8	CONNECTION OPTIONAL
-XOPT68 *			/55.A2	CONNECTION OPTIONAL
-XOPT69 *			/55.A3	CONNECTION OPTIONAL
-XOPT70 *			/55.E1	CONNECTION OPTIONAL
-XOPT71 *			/55.E3	CONNECTION OPTIONAL
-XSP1	=G	+ZKS	/40.C6	SPLEISSPUNKT (ULTRASCHALL)
-XSP2	=G	+ZKS	/40.C6	SPLEISSPUNKT (ULTRASCHALL)
-XSP4	=G	+ZKS	/44.E2	SPLEISSPUNKT (ULTRASCHALL)
-XSP5 *	=G	+ZKS	/21.C7	SPLEISSPUNKT (ULTRASCHALL)
-XSP8	=G	+ZKS	/13.A6	SPLEISSPUNKT (ULTRASCHALL)
-XSP12	=G	+ZKS	/13.E7	SPLEISSPUNKT (ULTRASCHALL)
-XSP15 *	=F	+KSK	/39.B1	SPLEISSPUNKT (ULTRASCHALL)
-XSPQ1			/15.E5	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ2			/15.E6	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ4			/10.C4	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ5			/20.B2	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ6			/20.B2	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ7			/10.C5	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ8			/8.C3	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ9			/17.D3	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ10			/13.D5	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ12			/8.C5	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ13			/17.D8	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ14			/17.D7	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ15			/26.D6	SPLICING POINT WITH PINCH CONNECTOR
-XSPQ17			/20.C7	PINCH CONNECTOR
-XSPQ23			/19.A7	PINCH CONNECTOR
-XSPQ24			/19.B7	PINCH CONNECTOR
-XSPQ25 *			/57.D4	PINCH CONNECTOR



Std.Ident Nr. 10310717

PROJEKT: 10310717_102

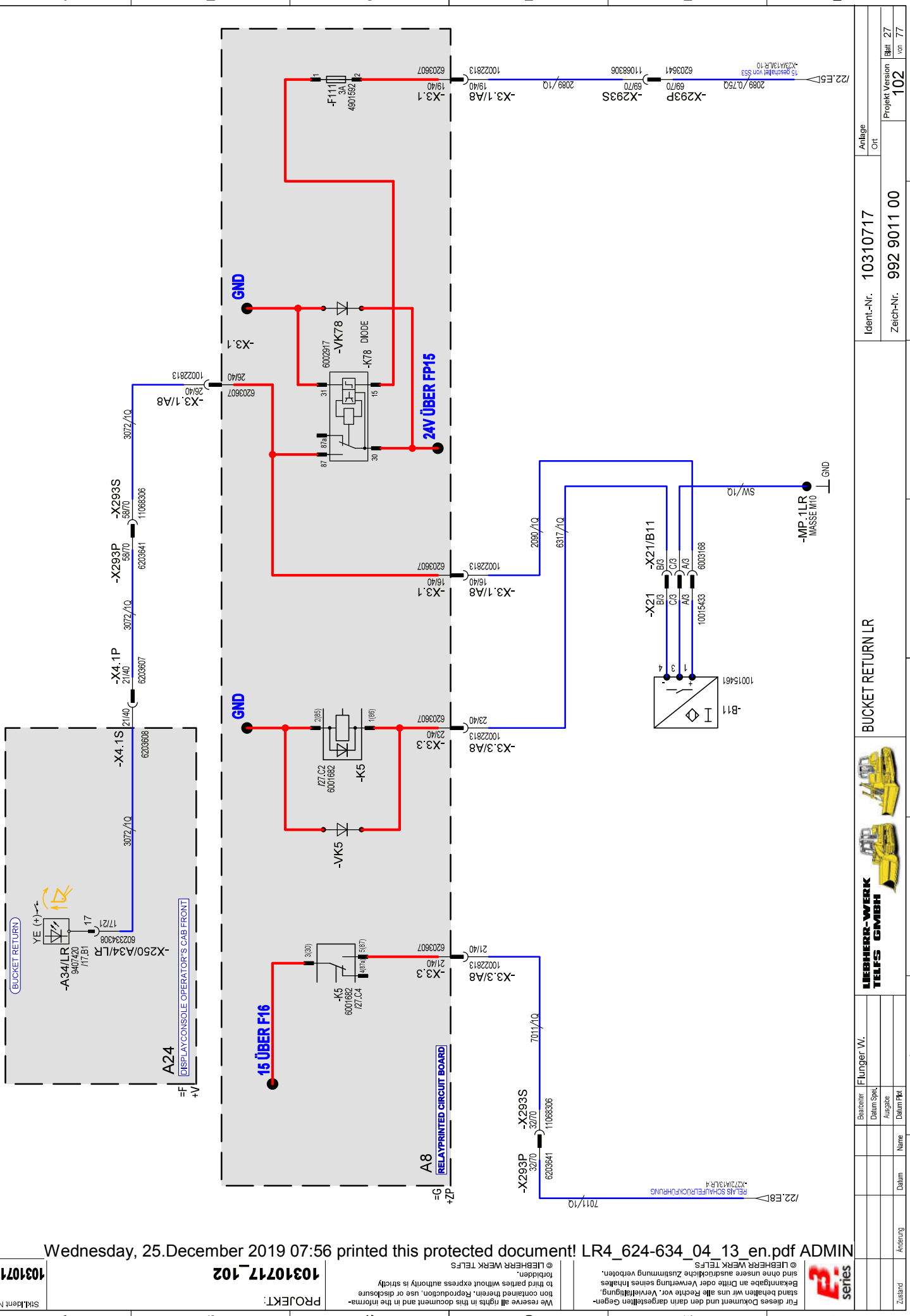
E3 series

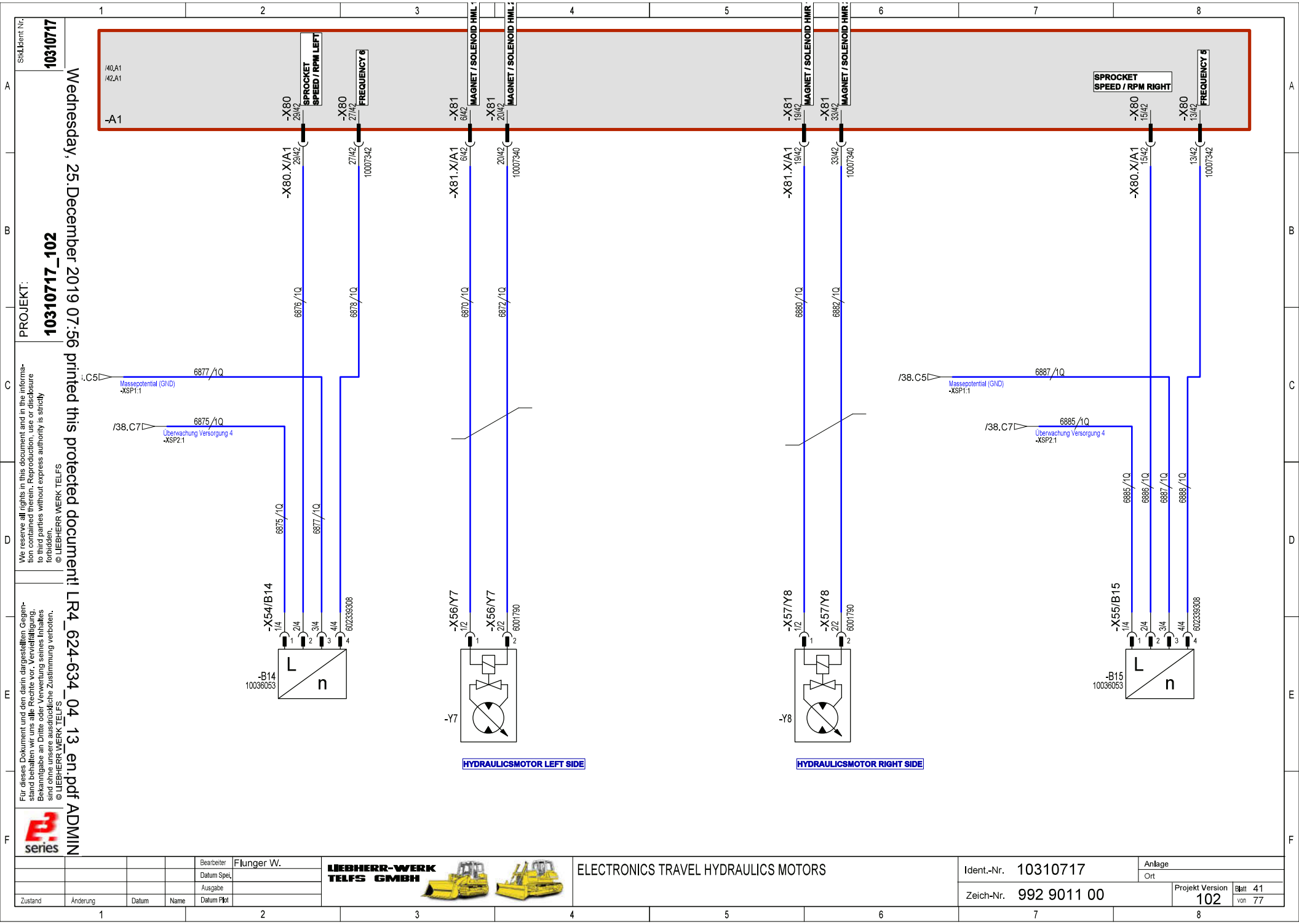
Zustand	Änderung	Datum	Name	
			Bearbeiter	Flunger W.
			Datum Spei.	
			Ausgabe	
			Datum Plot	

LIEBHERR-WERK TELFS GMBH

DISPLAY INSTRUMENT

Ident.-Nr.	10310717	Anlage	
Zeich-Nr.	992 9011 00	Ort	
		Projekt Version 102	Blatt 13 von 77


GND
24V ÜBER FP15
15 ÜBER F16
-VK78
DIODE
-K78
-VK5
-K5
-F111
3A
-X3.1
-X3.1/A8
-X3.3
-X3.3/A8
-X293S
-X293P
-X4.1P
-X4.1S
-X250/A34/LR
-A34/LR
-X21/B11
-X21
-B11
-MP.1LR
MASSE M10
A24
DISPLAYCONSOLE OPERATOR'S CAB FRONT
A8
RELAYPRINTED CIRCUIT BOARD
BUCKET RETURN
BUCKET RETURN LR
Ident.-Nr. 10310717
Zeich-Nr. 992 9011 00
Projekt Version 102
LIEBHERR-WERK TELFS GMBH
Flunger W.
Wednesday, 25.December 2019 07:56 printed this protected document! LR4_624-634_04_13_en.pdf ADMIN
PROJEKT: 10310717_102
Stk.Ident Nr. 10310717


Std.Ident Nr. 10310717
PROJEKT: 10310717_102
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E3 series
/40.A1
/42.A1
-A1
-X80 29/42 SPROCKET SPEED / RPM LEFT
-X80 27/42 FREQUENCY 6
-X81 6/42 MAGNET / SOLENOID HML1
-X81 20/42 MAGNET / SOLENOID HML2
-X81 19/42 MAGNET / SOLENOID HMR1
-X81 33/42 MAGNET / SOLENOID HMR2
SPROCKET SPEED / RPM RIGHT
-X80 15/42
-X80 13/42 FREQUENCY 5
-X80.X/A1 29/42
-X81.X/A1 6/42
-X81.X/A1 19/42
-X80.X/A1 15/42
27/42 10007342
20/42 10007340
33/42 10007340
13/42 10007342
6876 /1Q
6878 /1Q
6870 /1Q
6872 /1Q
6880 /1Q
6882 /1Q
6885 /1Q
6886 /1Q
6887 /1Q
6888 /1Q
/38.C5
6877 /1Q
Massepotential (GND)
-XSP1:1
/38.C7
6875 /1Q
Überwachung Versorgung 4
-XSP2:1
6875 /1Q
6877 /1Q
-X54/B14
1/4 2/4 3/4 4/4
602339308
-B14
10036053
L
n
-X56/Y7 1/2
-X56/Y7 2/2
6001790
-Y7
HYDRAULICSMOTOR LEFT SIDE
-X57/Y8 1/2
-X57/Y8 2/2
-Y8
HYDRAULICSMOTOR RIGHT SIDE
-X55/B15
-B15
Bearbeiter Flunger W.
Datum Spei.
Ausgabe
Datum Plot
Zustand Änderung Datum Name
LIEBHERR-WERK TELFS GMBH
ELECTRONICS TRAVEL HYDRAULICS MOTORS
Ident.-Nr. 10310717
Zeich-Nr. 992 9011 00
Anlage
Ort
Projekt Version 102
Blatt 41
von 77

Stkl.Ident Nr. 10310717

PROJEKT: 10310717_102

VARIABLE 1 - 4 (MICRO RELAY)
VARIABLE 5 - 6 (STANDARD RELAY)

VARIABLE 1 - 3
VARIABLE 4 - 6
GND
VKOn
6001682
+ZP
-K15
-F15.B 3A
B
A
A8
GND
X16/An
X16/Bn
X10/Bn
X11/On
X11/Sn
X12/n
X10/An

A23
VARIABLE 1
X183/5
X183/9
GND
X183/10
24V
VARIABLE 2
X184/5
X183/9
GND
X183/10
24V
VARIABLE 3 - 6
X15/n
X15/3
X15/4
X15/5
X15/6
A21

A21
ACTUATOR CONSOLE OPERATOR"S CAB RIGHT
-X158/S20
-S20
10007393
10009740
10016864
-MP1
MASSE M8
GND
X15/10:b
X15/10:a
X15/11:b
X15/11:a
X15/12:b
X15/12:a
X15/13:b
X15/14:b
X15/15:b
X15/16:b
F22
F35
K19
24V

A8
RELAYPRINTED CIRCUIT BOARD
-X18/10
-X18/9
A-L
X14/A-L:b
X14/A-L:a

-XSPQ25
-X117
-X118
-Y33
-Y34
6001790
-MP2
MASSE M8
GND

FUSE F15.A ENTFERNEN
15.A
153

				Bearbeiter	Flunger W.	LIEBHERR-WERK TELFS GMBH	OPTIONAL FLOAT POSITION REAR-MOUNTED RIPPER
				Datum Spei.			
				Ausgabe			
Zustand	Änderung	Datum	Name	Datum Plot			

Ident.-Nr. 10310717 | Anlage / Ort
Zeich-Nr. 992 9011 00 | Projekt Version 102 | Blatt 55 von 77

Stkl.Ident Nr. 10310717

PROJEKT: 10310717_102

BMK	Anlage	Ort	Blatt	Funktion
-E7/X31.	=F	+FK	/32.E3	CONNECTOR CAB LIGHTING
-E18	=F	+FK	/31.A5	FLOODLIGHT FRONT LEFT 2.
-E19	=F	+FK	/31.A8	FLOODLIGHT FRONT RIGHT 2.
-E36	=F	+FK	/37.E5	HEATER AURORA
-E37	=F	+FK	/37.D1	CONDENSER WITH 3 FAN MOTORS
-F1	=G	+B	/6.B1	INPUTFUSEAUTOMATIC 45A
-F2	=G	+B	/10.C3	FUSE RELAY FLAME GLOW PLUG
-F7	=G	+ZP	/7.D6	FUSE 24V DISPLAY CONSOLE CAB
-F8	=G	+ZP	/12.C3	FUSE RELAY SAFETY LEVER
-F9	=G	+ZP	/11.D2	FUSE EQUIPMENT PLUG / SOCKET
-F10	=G	+ZP	/13.E3	FUSE DISPLAY INSTRUMENT / WARNING LIGHT
-F11	=G	+ZP	/20.A2	FUSE PUSH-BUTTON SWITCH / BUTTON HORN
-F15.A	=G	+ZP	/23.C7	FUSE SOLENOID VALVE FLOAT POSITION
-F15.B *	=G	+ZP	/55.A3	FUSE SOLENOID VALVE FLOAT POSITION REAR-MOUNTED RIPPER
-F16	=G	+ZP	/12.B7	FUSE SUPPLY PUSH-BUTTON SWITCH / BUTTON AH SENSOR
-F19	=G	+ZPR	/52.C2	FUSE AIR CONDITIONING SYSTEM
-F20.LR	=G	+ZP	/36.E3	FUSE HEATING
-F21 *	=G	+ZP	/64.A2	FUSE DRIVER"S SEAT AIR
-F21.A *	=G	+ZP	/64.A4	FUSE DRIVER"S SEAT AIR AND SEAT HEATER
-F21.B *	=G	+ZP	/64.A5	FUSE DRIVER"S SEAT GRAMMER
-F22	=F	+R	/31.E7	FUSE HEADLIGHT CAB FRONT
-F27 *	=G	+ZPR	/63.B3	FUSE FUEL PUMP
-F28.A	=G	+ZP	/57.B4	FUSE BACK-UP-ALARM
-F28.B *	=G	+ZP	/58.A3	FUSE BACK-UP-ALARM
-F31 *	=G	+ZPR	/53.C3	FUSE FUEL WATER SEPARATOR HEATABLE
-F33 *	=G	+T	/62.E2	FUSE FIXTURE WITH COVER/LID
-F35	=G	+ZPR	/30.A2	FUSE CAB
-F40	=F	+R	/30.E4	FUSE WIPER DOOR
-F41	=F	+R	/30.D7	FUSE WIPER FRONT AND BEHIND / REAR
-F42LR	=F	+R	/31.E3	FUSE HEADLIGHT CAB REAR LEFT
-F43LR	=F	+R	/31.E4	FUSE HEADLIGHT CAB RIGHT REAR
-F45	=G	+ZP	/32.A3	FUSE CAB INTERIOR LIGHTING
-F46	=G	+ZP	/48.D2	FUSE CLAMP X18 (24V)
-F47	=G	+ZP	/48.E2	FUSE CLAMP X18 (30)
-F48	=G	+ZP	/48.E2	FUSE CLAMP X18 (15)
-F49	=G	+ZP	/18.B2	FUSE VOLTAGE CONVERTER / TRANSFORMER

BMK	Anlage	Ort	Blatt	Funktion
-F50 *	=F	+R	/30.E4	FUSE ROTATING BEACON
-F53	=G	+ZP	/36.E7	FUSE ACTUATING DRIVE / SERVO DRIVE HEATING AIR CONDITIONING SYSTEM
-F54	=F	+R	/30.E6	FUSE ACTUATING DRIVE / SERVO DRIVE HEATING AIR CONDITIONING SYSTEM
-F61	=G	+ZP	/12.C5	FUSE SAFETY LEVER
-F64	=G	+ZP	/18.B5	FUSE VOLTAGE CONVERTER / TRANSFORMER 12V
-F65	=G	+ZP	/9.A4	FUSE SUPPLY ECU
-F66	=G	+ZP	/9.A5	FUSE SUPPLY ECU AND E_BOX
-F67	=G	+ZPR	/9.B7	FUSE SUPPLY ECU
-F68	=G	+ZPR	/9.B8	FUSE SUPPLY ECU
-F73 *	=G	+ZP	/49.A3	FUSE FAN REVERSIBLE AUTOMATIC
-F79 *	=G	+ZPR	/63.B2	FUSE FUEL PUMP
-F80 *	=G	+ZP	/59.A3	FUSE BACK-UP-ALARM OPTIC
-F90	=G	+ZP	/24.B6	FUSE SOLENOID VALVE FLOAT POSITION / CUT OFF / SHUT OFF CONTROL PRESSURE / SE
-F92	=G	+ZP	/19.A6	FUSE SOLENOID VALVE FLOAT POSITION / CUT OFF / SHUT OFF CONTROL PRESSURE / SE
-F97 *	=G	+ZP	/50.A3	FUSE FAN CONTROL
-F98 *	=G	+ZP	/50.A7	FUSE FAN CONTROL
-F111	=G	+ZP	/27.C8	FUSE SENSOR PUSH-BUTTON SWITCH / BUTTON BUCKET RETURN
-F117 *	=G	+T	/62.D3	FUSE TILLY IMMOBILIZER
-F_1A	=G	+ZP	/48.B3	FUSE RESERVE
-F_3A	=G	+ZP	/48.C3	FUSE RESERVE
-F_5A	=G	+ZP	/48.B4	FUSE RESERVE
-F_7,5A	=G	+ZP	/48.C4	FUSE RESERVE
-F_10A	=G	+ZP	/48.B4	FUSE RESERVE
-F_15A	=G	+ZP	/48.C4	FUSE RESERVE
-F_20A	=G	+ZP	/48.B5	FUSE RESERVE
-F_25A	=G	+ZP	/48.C5	FUSE RESERVE
-F_30A	=G	+ZP	/48.C5	FUSE RESERVE
-FP1	=G	+ZP	/48.D6	POLY-SWITCH FUSE ELEMENT
-FP3	=G	+ZP	/7.E5	POLY-SWITCH FUSE ELEMENT
-FP6	=G	+ZP	/52.B2	POLY-SWITCH FUSE ELEMENT
-FP8	=G	+ZP	/6.C6	POLY-SWITCH FUSE ELEMENT
-FP9	=G	+ZP	/48.D4	POLY-SWITCH FUSE ELEMENT
-FP11	=G	+ZP	/6.C6	POLY-SWITCH FUSE ELEMENT
-FP12	=G	+ZP	/48.E6	POLY-SWITCH FUSE ELEMENT
-FP13	=G	+ZP	/23.C3	POLY-SWITCH FUSE ELEMENT
-FP14	=G	+ZP	/7.D3	POLY-SWITCH FUSE ELEMENT

Zustand	Änderung	Datum	Name		
				Bearbeiter	Flunger W.
				Datum Spei.	
				Ausgabe	
				Datum Plot	

LIEBHERR-WERK TELFS GMBH

BMK-DIRECTORY

Ident.-Nr. 10310717

Zeich-Nr. 992 9011 00

Anlage

Ort

Projekt Version 102

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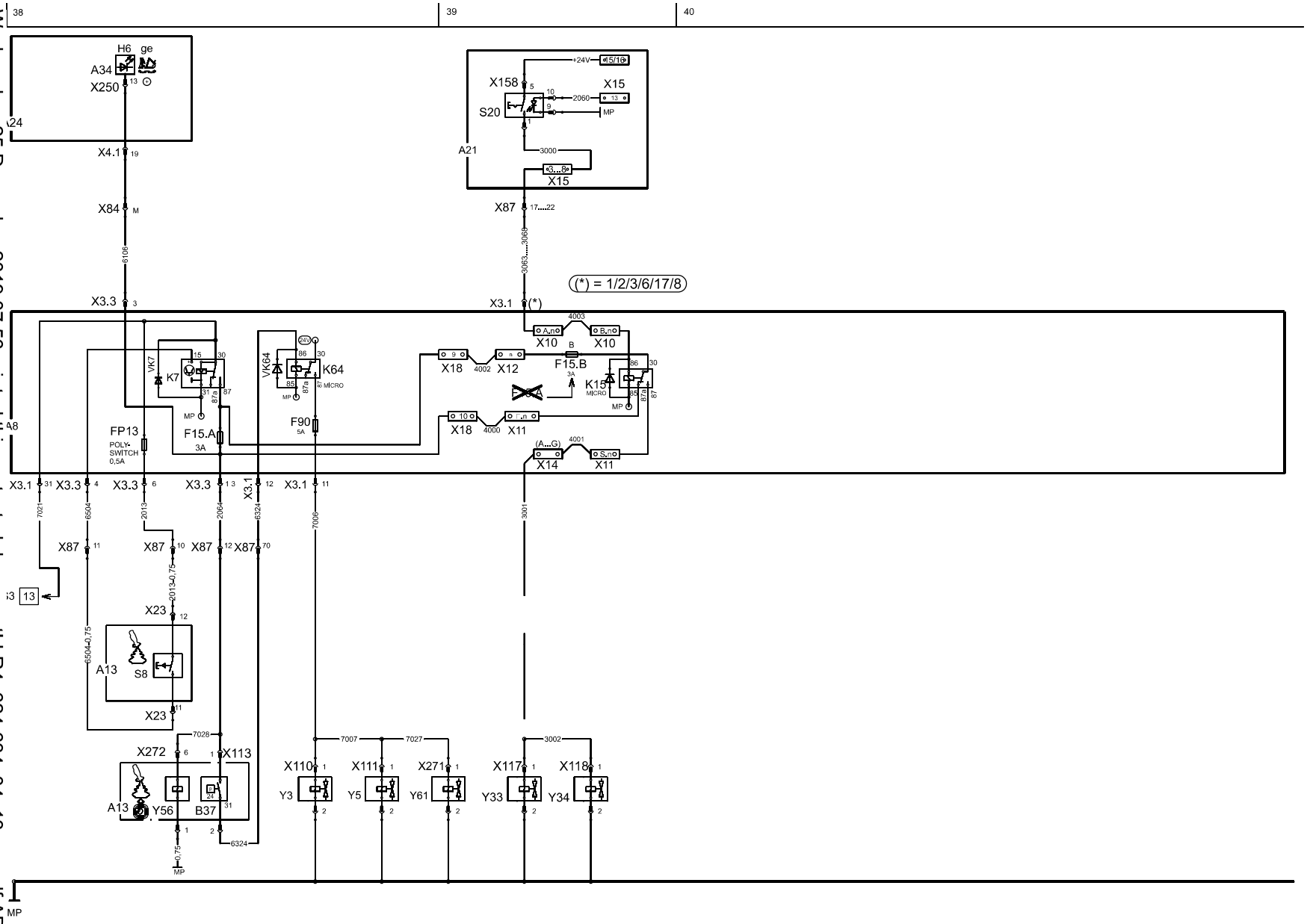
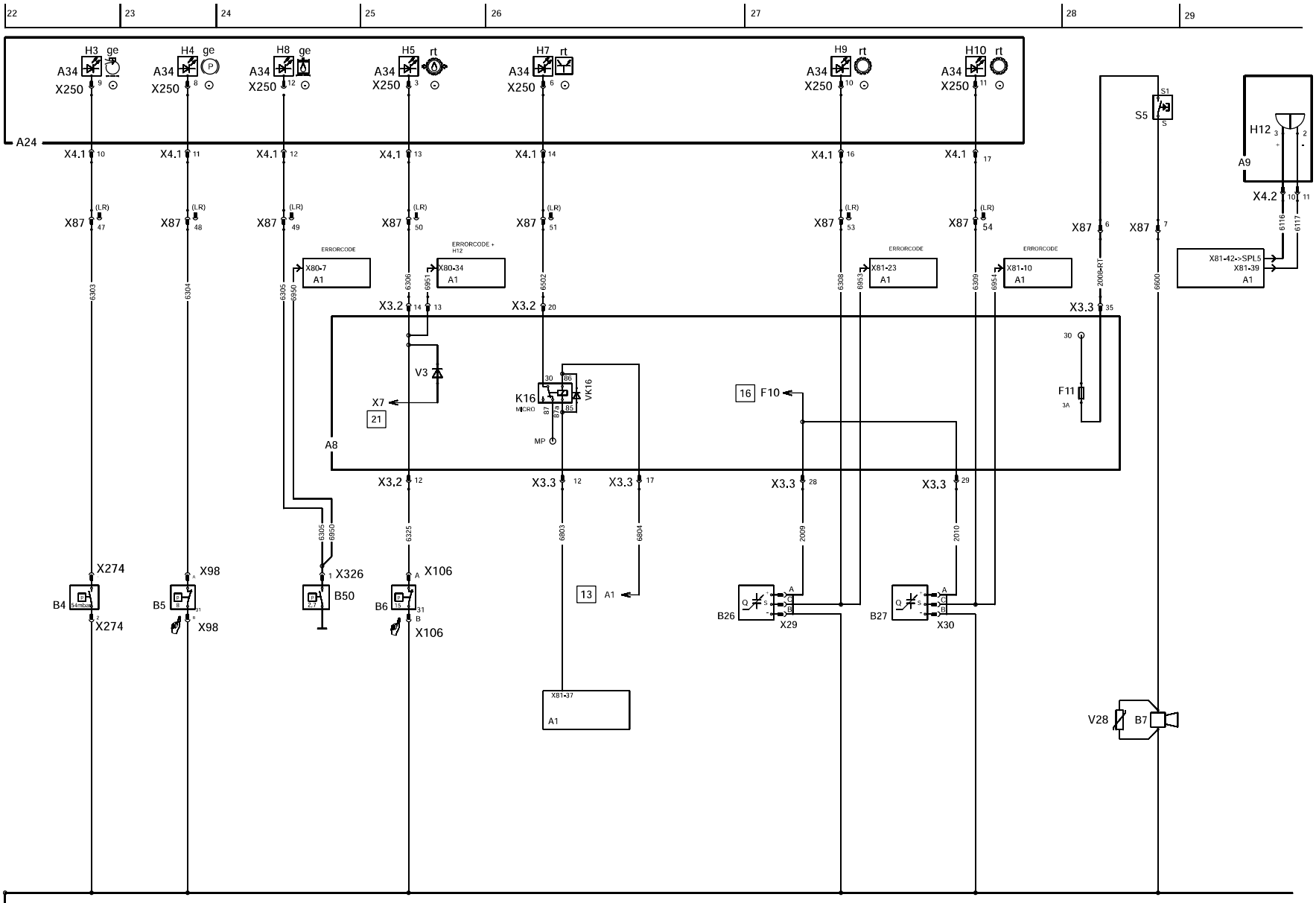




Stkl.Ident Nr. 9418941

PROJEKT: 9418941_005

PROJECT WAS CREATED OFF

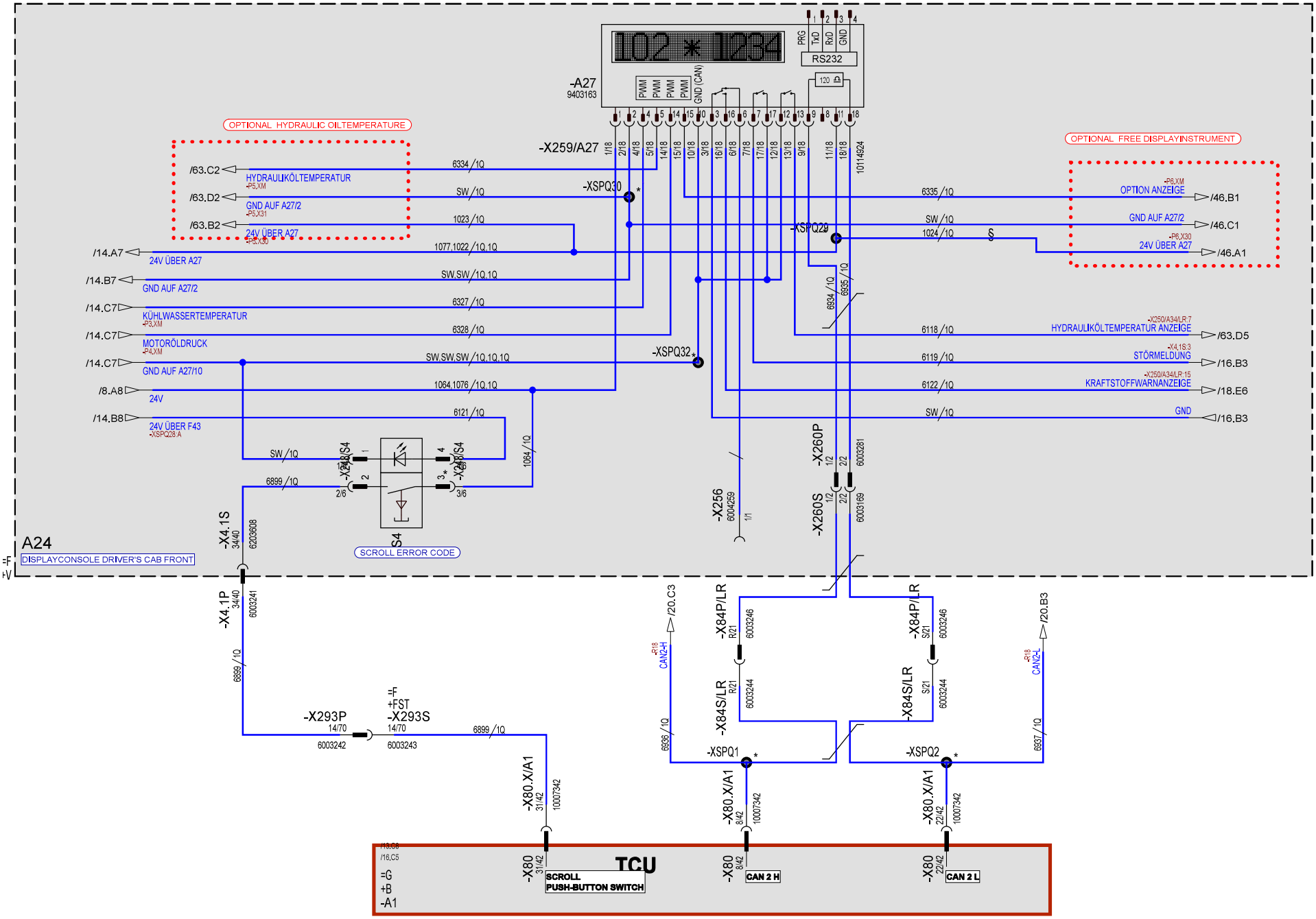
NAME	IdentNr.	DATE
DESIGN PROJECT PR-LR_02-001-002	9416216	27.02.2007

Zustand	Änderung	Datum	Name		
				Bearbeiter	Flunger W.
				Datum Spei.	20.11.2007 09:47
				Ausgabe	lwtscj1
				Datum Plot	8.5.2008 08:39

LIEBHERR-WERK TELFS GMBH

PROJEKTERSTELLUNG
LR 634

Ident.-Nr.	9418941	Anlage	
Zeich-Nr.	992 9011 00	Ort	
		Projekt Version 005	Blatt 1 von 76



Stk.Ident Nr. 9418941

PROJEKT: 9418941_005

				Bearbeiter	Flunger W.		
				Datum Spei.	20.11.2007 09:47		
				Ausgabe	lwtscj1		
Zustand	Änderung	Datum	Name	Datum Plot	8.5.2008 08:39		

LIEBHERR-WERK TELFS GMBH

LCD DISPLAY SCROLL ERROR CODE
LR 634

Ident.-Nr.	9418941	Anlage	
Zeich-Nr.	992 9011 00	Ort	
		Projekt Version 005	Blatt 15 von 76