Shop Manual

HYDRAULIC
MINING
EXCAVATOR

PC7000-11 T4

SERIAL NUMBER 35013 and up

Unsafe use of this excavator may cause serious injury or death. Operators and maintenance personnel must read this manual before operating or maintaining this excavator.
This manual should be kept near the excavator for reference and must be periodically reviewed by all personnel who will come into contact with it.

The original Shop Manual is written in English language. If any translation of the Shop Manual is used, the legal basis for liability and correctness of the contents always remains in the English source document.

KOMATSU

2.4.11.9 GAS, DUST, STEAM, SMOKE AND EXHAUST FUMES

⚠ WARNING

DIESEL FUMES!

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

⚠ WARNING

RISK OF EXPOLSION AND FIRE!

Welding, flame-cutting and grinding work on the excavator increases the risk of explosion and fire which may result in serious injury or death.

All relevant safety measures must be followed and only under expressly obtained authorization.
Special care must be taken before welding, flame-cutting and grinding operations are carried out on the counterweight. The filling of the counterweight chambers can create explosive gases which will accumulate in the chambers of the counterweight.
These gases must be expelled before welding, flame-cutting and grinding operations are carried out on the counterweight.

REMARKS: More information to expelling the gas from the counterweight chambers can be obtained from Komatsu service.

⚠ WARNING

RISK OF EXPLOSION!

Substances and objects igniting can lead to fire or explosion resulting in serious injury or death.
Before carrying out welding, flame-cutting and grinding operations, clean the excavator and its surroundings from dust and other flammable substances and make sure that the premises are adequately ventilated as there is a risk of explosion.

2.7.1 FRONT GUARD PROTECTIVE STRUCTURE ’FOPS’ FOR OPERATOR’S CAB

The excavator must be equipped with a front guard protective structure "OPG Front Guard” if it is used for applications where there is a risk of hitting objects from the front.

2.7.2 OBJECT HANDLING

Object handling operations are not allowed.

2.7.3 LIGHTING

The excavator must only be operated when the operator has sufficient visibility in relation to the work area. Disturbing shady areas or dazzling effects must be avoided.

If necessary, the excavator must be retrofitted with additional lighting equipment (working lights) in order to ensure sufficient visibility conditions.

2.7.4 WARNING BEACON

The excavator can be retrofitted with a warning beacon which is fitted on the cab roof by means of a magnetic bracket.

REMARKS: The above-mentioned special safety devices can be ordered as accessories together with the excavator.
They are also available as a field package for installation through our service organization.

2.7.5 SAFETY HARNESS IN CONFORMITY WITH EN 361 (EUROPEAN STANDARD)

The safety harness should only be used together with connectors according to EN 354, and fall arrest according to EN 355, or fall protection devices according to EN 360.

See the following pages for further information.

2.7.5.1 SAFETY HARNESS IN CONFORMITY WITH EN 361 (EUROPEAN STANDARD)

⚠ WARNING

RISK OF FALLING!
Falling from the boom can cause serious injury or death.
Always use a Safety Harness (1) in conjunction with a strap type Fall Absorber (2 - Fig. 2-55) before boarding the loader attachment or other unsecured areas on the excavator.

– The Safety Harness is located in the cabinet in the operator’s cab.
– The illustration (Fig. 2-55) shows the standard use of the safety harness with a strap type fall absorber.

Legend for Fig. 2-55:

(1) Safety Harness according to EN 361

(2) Strap-Type Fall Absorber according to DIN EN 355

3 MAIN ASSEMBLY GROUPS

3.11 UNDERCARRIAGE

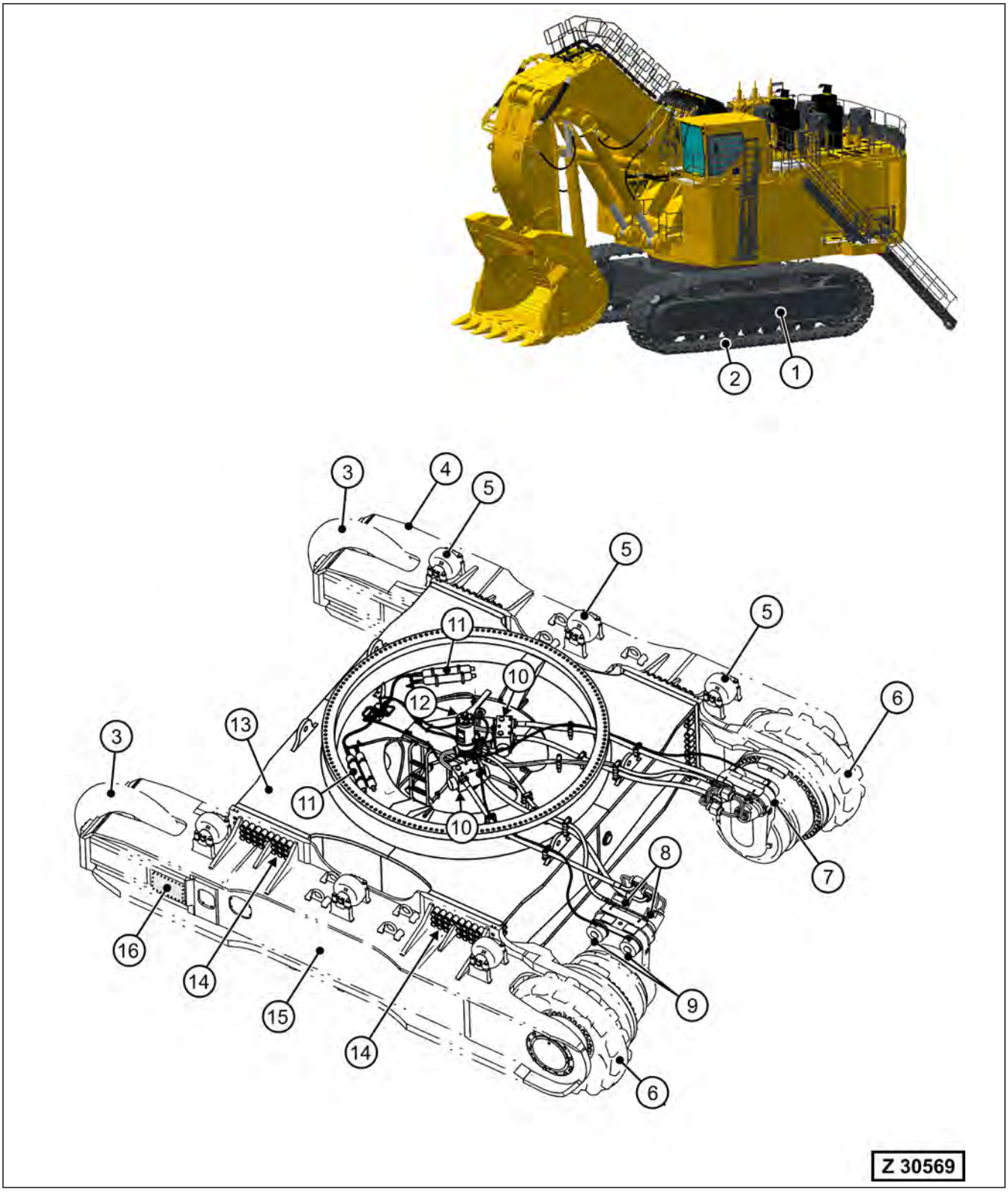


Fig. 3-14 Undercarriage

4.3.4 OPERATION TROUBLES, CAUSES, AND RECTIFICATION

⚠ CAUTION

INJURY AND MATERIAL DAMAGE MAY OCCUR!

• Worn out coupling parts

In case of changed running noise and/or if vibration occurs, directly stop the excavator.

Trouble	Cause	Rectification
Running noise	Loose bolts	1. Check tightening torques and correct if necessary
Rubber roller(s) broken	Components over lifetime Overload	1. Stop the excavator 2. Replace rubber rollers 3. Test run
Rubber rollers worn out	Normal wear	1. Stop the excavator 2. Replace rubber rollers 3. Test run

4.6.3.2 SCHEMATIC OVERVIEW - PTO GEAR OIL COOLING CIRCUIT-1

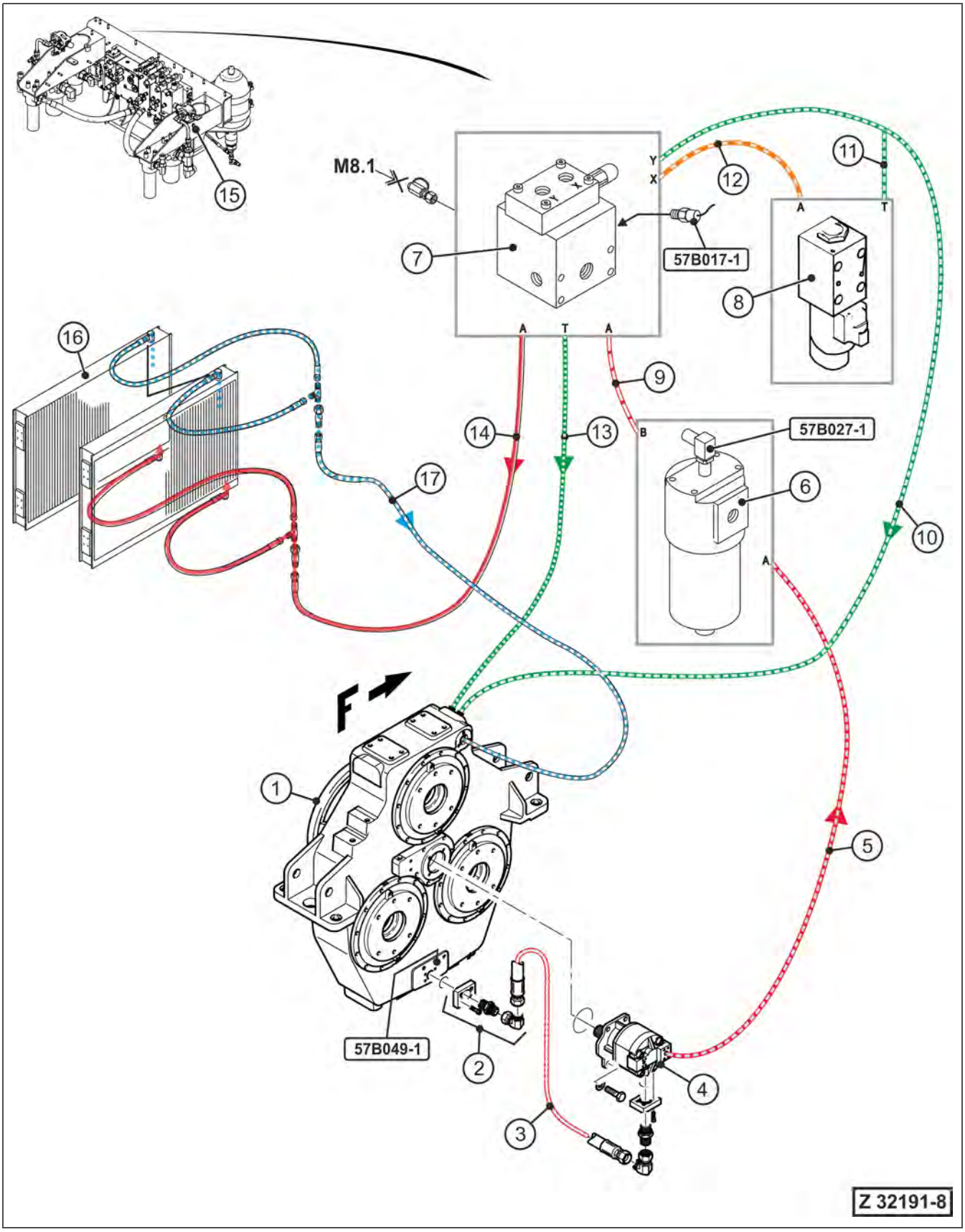


Fig. 4-20 Schematic overview - PTO gear oil cooling circuit-1 (exemplified)

Legend for Fig. 5-4:

(1)	Return oil collector pipe – part 1	(7)	Port for 40B166 Oil pressure behind oil strainer
(2)	Return oil collector pipe – part 2	(8)	Port for 40B165 Oil pressure in front of oil strainer
(3)	Return oil collector pipe – part 3	(9)	Hose
(4)	Gasket	(10)	Fitting at return oil collector pipe (location A)
(5)	Strainer	(11)	Back pressure valve
(6)	Junction block for oil pressure switches	(12)	Hydraulic oil tank

NOTE! For information about bolt connections see OPERATION& MAINTENANCE MANUAL, section Maintenance.

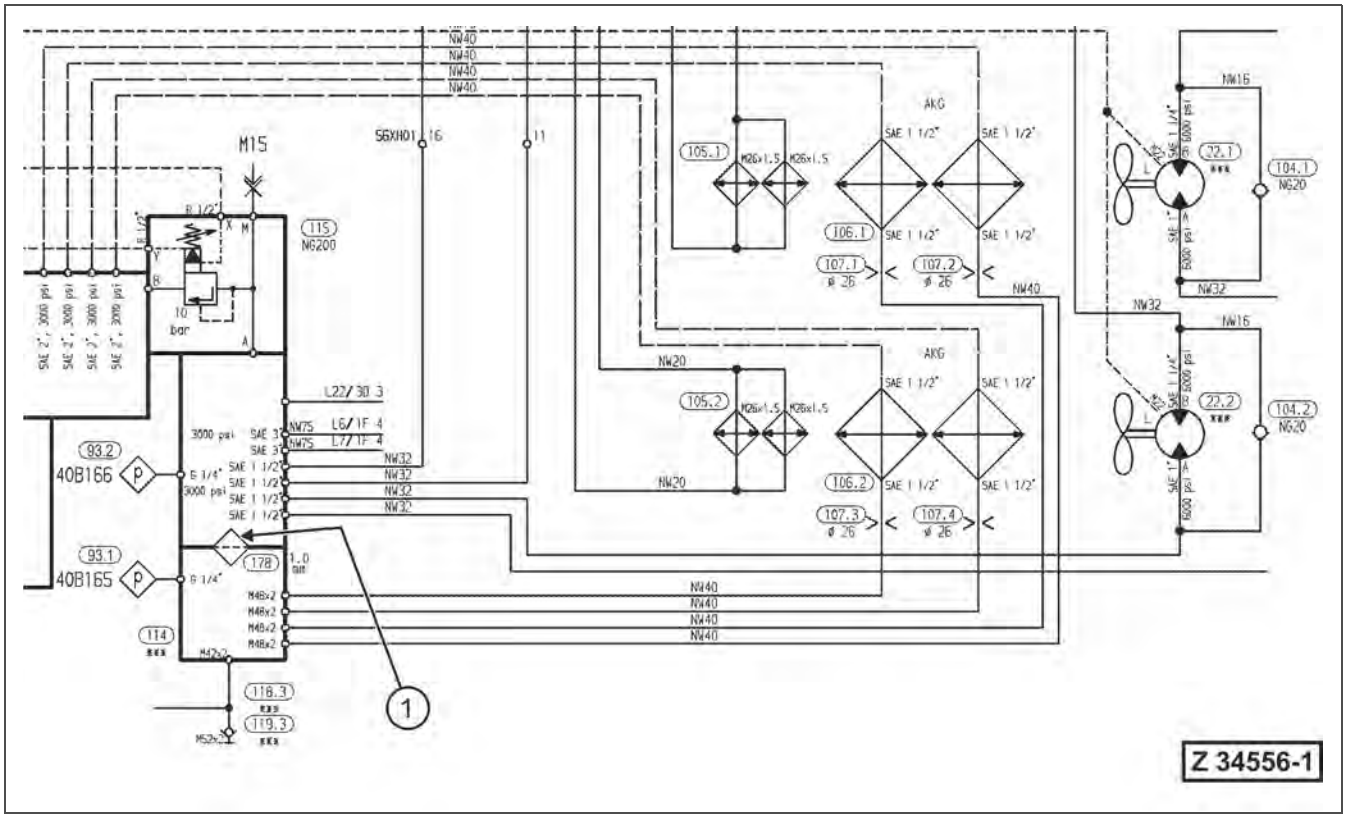


Fig. 5-5 Hydraulic diagram

Description

The strainer (Fig. 5-4, Pos. 1) is installed to prevent the hydraulic oil coolers (Fig. 5-4, Pos. 106.1/.2) from getting clogged up in case of contamination in the main return oil circuit.

Excessive increase of the hydraulic oil temperature can be an indication for a restricted strainer, i.e. bad cooling performance due to insufficient oil flow through the coolers.

In case that main components such as cylinders are internal fragmentary damaged, the strainer should be inspected for metal chips.

The strainer's condition is monitored by pressure switches 40B165 and 40B166.
A pressure difference of more than 2 bar causes a message on the machine monitor.

6.5 OIL COOLER FAN SPEED

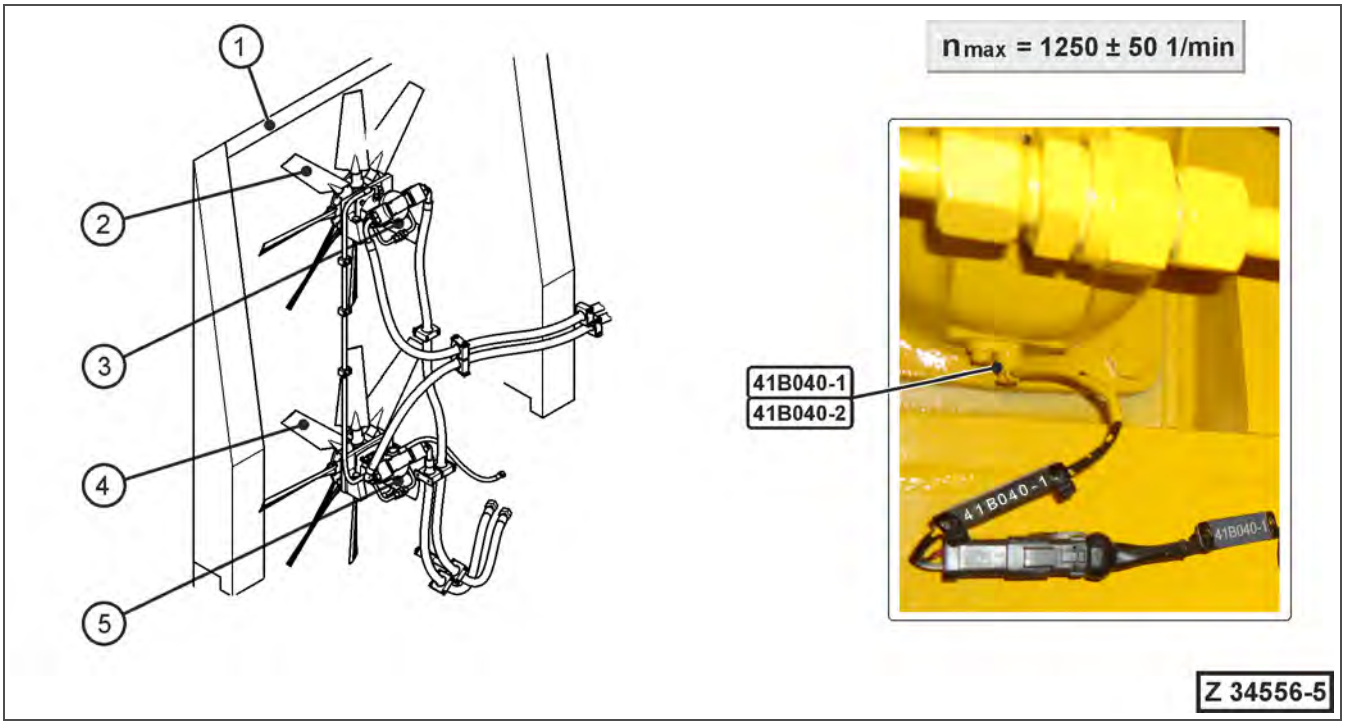


Fig. 6-9 Oil cooler fan speed

(1)	Hydraulic oil cooler
(2)	OC fan eng1 (upper)
(3)	Location of fan speed sensor 41B040-1
(4)	OC fan eng2 (lower)
(5)	Location of fan speed sensor 41B040-2
41B040-1/-2	Fan speed sensor

Legend for Fig. 7-9:

(1)	Control lever (joystick)	(9)	Directional solenoid valve, b side
(2)	Signal input to controllers	(10)	Main control valve block
(3)	Valve 0 controller	(11)	Pump (control oil)
(4)	Valve 1 controller	(12)	Filter
(5)	Valve 2 controller	(13)	Pump (control oil)
(6)	Signal output from controllers	(14)	Filter
(7)	Proportional solenoid valve	(15)	Pressure accumulator
(8)	Directional solenoid valve, a side		

Function

The electric-hydraulic control system is used to control direction and volume of oil flow to the operating cylinders and motors via main control valve blocks.

Hydraulically

The oil volume of the PPC pumps (Fig. 7-9, Pos. 11 & 13) flows through filters (Fig. 7-9, Pos. 12 & 14) into the pilot pressure system.

With pressurized oil stored in the accumulator (Fig. 7-9, Pos. 15), a limited number of control valve spool movements can be carried out with the main drive engines are at standstill.

When a lever (or pedal) is actuated, the proportional solenoid valve (Fig. 7-9, Pos. 7) and one of the directional solenoid valves (Fig. 7-9, either Pos. 8 or 9) are energized. Pilot pressure moves the spools of the main control valve blocks.

Electrical

Controlling takes place via 3 controllers:

- VALVE0 controller 14K302
- VALVE1 controller 14K303
- VALVE2 controller 14K304

All 3 controllers are connected via CAN1 BUS & CAN2 BUS (redundant system), refer to the following illustration.

Controller setting for *Lever Control* and *Attachment Type* in the Machine Configuration

If it is required to change the controller setting for EURO control ↔ KMG control, refer to section 9.13 on page 9-44.

It it is required to change the controller setting for the attachment type FSA ↔ BHA, refer to section 9.13 on page 9-44.

8.1 MAIN CONTROL BLOCKS AND HIGH PRESSURE SCREENS (FSA)

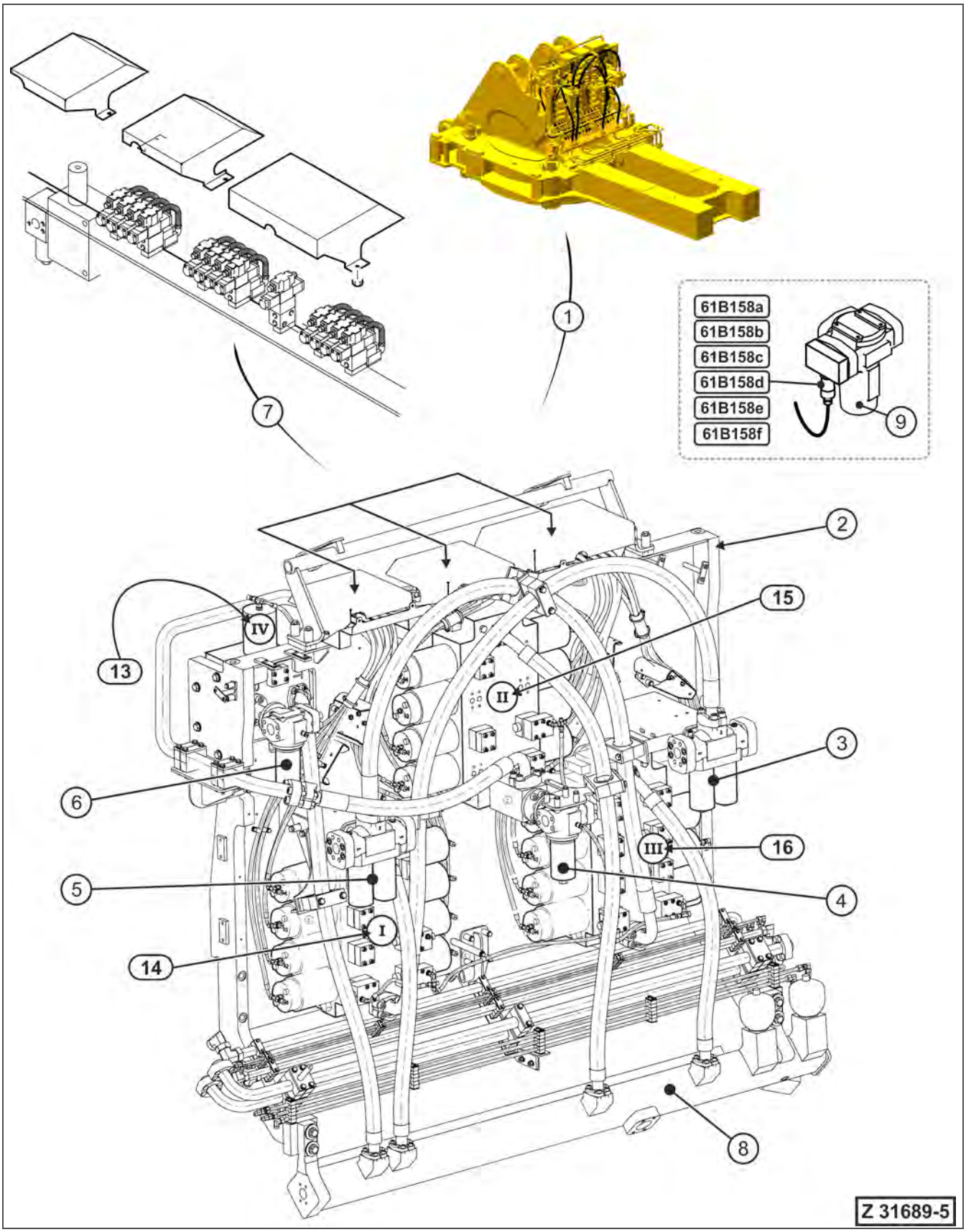


Fig. 8-1 Main control blocks and high pressure screens (FSA)

Legend for Fig. 8-15:

(1)	Main relief valve (MRV) location	(8)	Fine controlling grooves
(2)	Port "B" - to cylinder or hydraulic motor	(9)	Port "T" - to tank
(3)	Port "P" - from pumps	(10)	Spool
(4)	Port "A" - to cylinder or hydraulic motor	(11)	Side "B" service line port
(5)	Control block housing	(12)	Centering springs
(6)	Cap (side "A")	(13)	Cap (side "B")
(7)	Load holding valve	(14)	Spin lock - Retaining ball - Spring - Stopper

REMARKS: Principle drawing, showing valve block I, II, III

General

Control blocks I, II, III are 4-spool blocks. For spool details refer to the hydraulic diagram of your excavator.

Each spool is provided with *Fine Controlling Grooves* and *Ring Grooves* for hydraulically centering of the spool.

Between a pilot pressure of 8 bar and 19 bar the spools are already moved in their end position.

8.12.1.1 SPIN LOCK FOR VALVE BLOCKS (ND52)

1) Retaining ball (2) Spring (3) Stopper

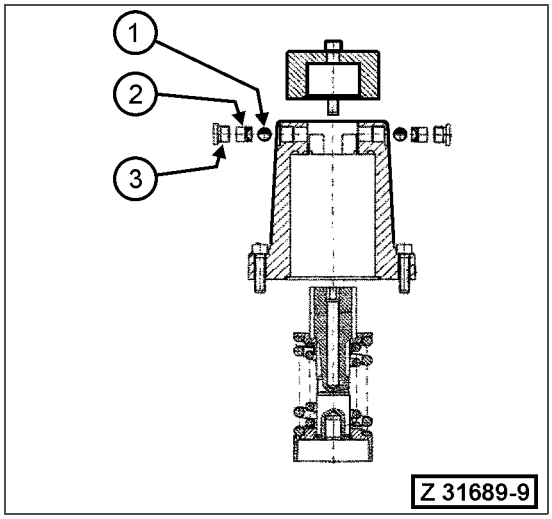


Fig. 8-16 Spin lock

General

Retaining balls prevent the main spools from spinning due to increasing oil flow.

NOTE! If disassembly is required catch the retaining balls, springs, and stoppers and keep them for assembly.

Hints for assembly

- Bring the components in their correct position so that retaining balls and their guides are aligned.
- Install retaining balls, springs, and stoppers in correct sequence

8.17.3 CYLINDER DATA MARKINGS

Cylinder data markings are located at the piston rod side retainer flange.

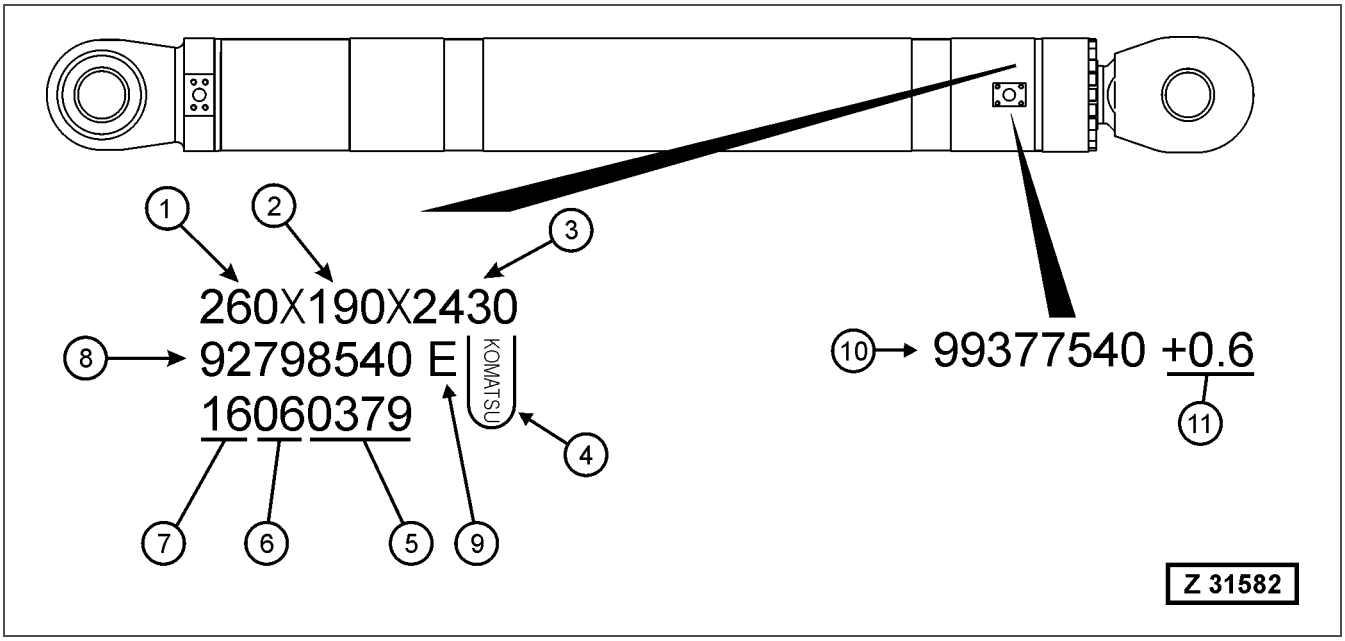


Fig. 8-32 Hydraulic cylinder – data markings

(1) Cylinder bore Ø [mm]

(2) Piston rod diameter [mm]

(3) Piston stroke [mm]

(4) Manufacturer symbol

(5) Annual counting number of the cylinder

(6) Month of production (06 = June)

(7) Last two digits of production year (16 = 2016)

(8) Hydraulic cylinder Part No.

(9) Index letter (optional)

(10) Komatsu job number (optional)

(11) Oversize identification (REMAN only)

REMARKS: For details on hydraulic cylinder data markings refer to Cylinder Repair Manual.

Please continue reading on the next page.

9.14.3 IN CASE OF PROBLEMS - WHEN CORRECT SPEED SENSOR ADJUSTMENT IS GUARANTEED

If the engine speed input signal at a pump controller (14K305 or 14K306) is out of range, the pump controller generates failure code *DLE2MA Engine speed sensor abnormality* or DLE6MA *Engine2 speed sensor abnormality* (refer to chapter 40 Troubleshooting).

In this case the wiring or the speed sensor is defective (or contaminated).

a) Check the engine speed sensor (52B064-1/-2) for contamination.

b) Check GND wiring and signal wiring of 52B064-1/-2 for continuity (refer to Wiring Diagram).

c) Measure the internal resistance of the disconnected speed sensor (850 ± 50 Ω according to Standard Value Table).

Locate the problem and repair as necessary.

Legend for Fig. 10-11:

20S019	Control lever (joystick) RH
20S020	Control lever (joystick) LH
(1)	Controller input - lever order: stick out
(2)	Controller input - lever order: travel left
(3)	Controller input - lever order: travel right
15	Main control block II
42	Distributor manifold
45.1...45.3	Remote control valves
61K621 61K627 61K631	Proportional solenoid valve
61K621a 61K627a 61K631b	Directional solenoid valve
175	Main control block I
176	Main control block III

Electrical signal flow (EURO or KMG control)

Signal voltage of the joysticks (20S019 & 20S020) goes into VALVE0 and VALVE1 controllers.
Some input signals of VALVE0 controller are looped through to controllers VALVE1 and VALVE2.
The controller output signals (VALVE0, VALVE1, VALVE2) go to the proportional and directional solenoid valves (45.1...45.3).

Hydraulic signal flow (pilot pressure)

When the proportional and directional solenoid valves are energized, pilot pressure oil flows to the pilot pressure ports of the main control blocks I...III.

Hydraulic oil flow

Oil of the main pumps flows through the main control blocks (I...III) and via distributor manifold (42) to the hydraulic cylinders.

10.3.18.2 BOOM CYLINDER, PISTON ROD SIDE (BHA & FSA), BOOM DOWN

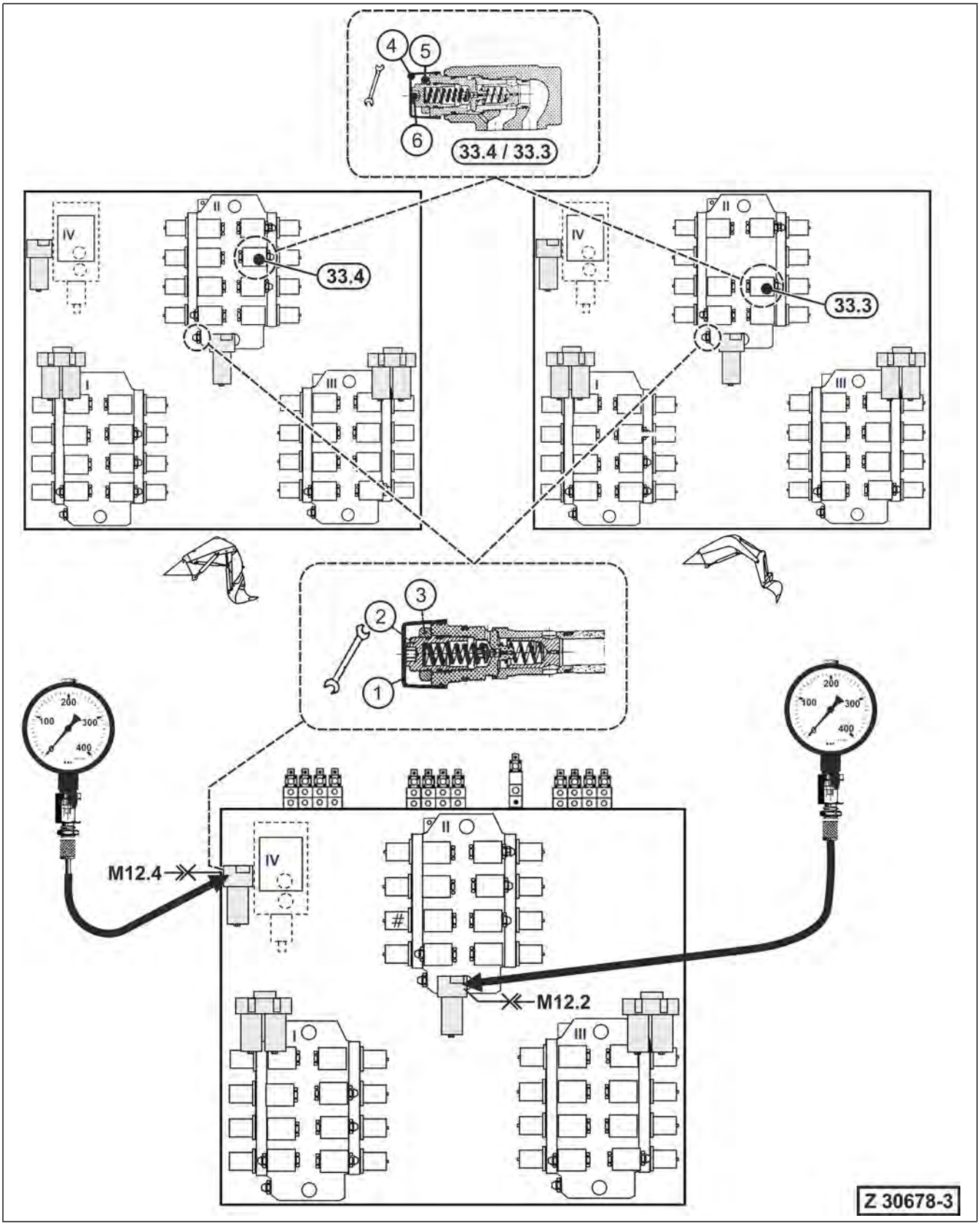


Fig. 10-23 Checks and adjustments of the SRVs, boom cylinders piston rod side (BHA & FSA)

General

There are 3 secondary relief valves (SRVs) installed at the distributor manifold to limit the maximum possible pressure peaks in the lines.

Since the opening pressure of the SRVs is higher than the setting of the main relief valves (MRVs) it is necessary to increase the main relief pressure for testing and adjusting purposes.

Valve	Pressure test port	Location
SRV 142.1	M17.1	Manifold section C
SRV 142.2	M17.2	Manifold section C
SRV 142.3	M17.3	Manifold section D
MRV - main control block I	M12.1	Double high pressure screen 46.1
MRV - main control block II	M12.2	Single high pressure screen 44.2
MRV - main control block III	M12.3	Double high pressure screen 46.2
MRV - slew control block IV	M12.4	Single high pressure screen 44.1

Table 10-14 Relief valves, locations and designations

Check

1. Connect pressure gauges (0...400 bar) to all test ports listed in Table 10-14.
2. Start engines and run them at high idle (TH3).
3. Switch pumps to Q_{min} *Test* via machine monitor.
4. Extend bucket cylinders (bucket fill) to final stop position until the hydraulic system stalls.
5. Slowly increase the pump supply line pressure by turning in the set screws (Fig. 10-29, Pos. 2) of the MRVs while observing the pressure gauges. Stop as soon as the pressure does not rise any further.
   See "MRV adjustment" on page 10-74.
   The gauges should show: **350±5 bar**.

REMARKS: Since the piston sides of the bucket cylinders are protected by several SRVs, the pressure gauges show the pressure of the valve with the lowest setting. Even when the gauges show the required pressure, it is possible that one or more valves have a higher setting.

To ensure that only the SRVs open during checks and adjustments, it is necessary to further increase the setting of the MRV to **360...370 bar**.

6. Turn the set screw (Fig. 10-29, Pos. 2) of the MRVs ½ turn further in. The pressure will remain at the value shown in step 5.

Adjustment

7. Adjust all SRVs equally until all gauges show a pressure of **360 bar**. See "SRV adjustment" on page 10-74.
   Adjust in steps of ¼ turn regarding the following sequence: 142.1 → 142.2 → 142.3
8. Reduce the pressure at SRV 142.1 at first to a value below the required value. Then increase the pressure to the required value of **350±5 bar** while observing all gauges. See "SRV adjustment" on page 10-74.

REMARKS: Now all gauges will show the same value of **350±5 bar**, but only SRV 142.1 has the correct setting.

9. Proceed with the other SRV in the same manner in the following sequence: 142.2 → 142.3

REMARKS: Since there are several valves throttling the return oil flow, the valves must be set synchronously (see Fig. 10-37).
The adjusting screws have to be turned in by the same amount of revolutions.

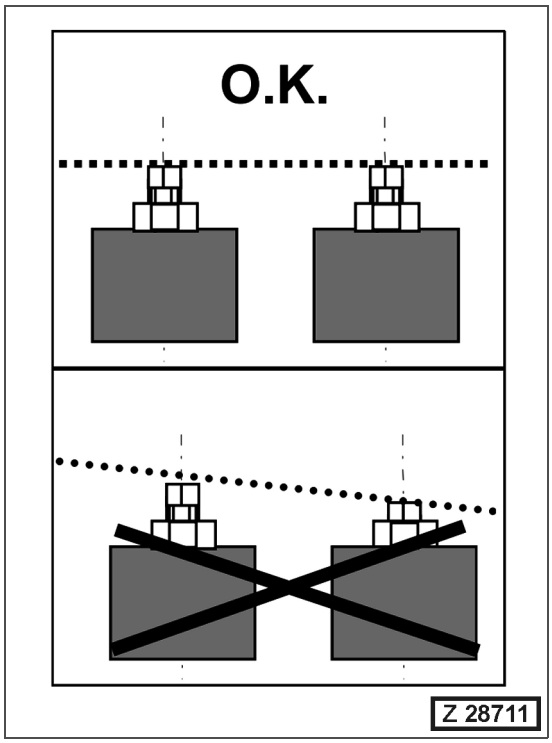


Fig. 10-37

7. Check boom lowering speed again and repeat the adjustment if necessary.
8. If adjustment is finished, tighten lock nut (Fig. 10-36, Pos. 1).
9. Stop engines.
10. Remove pressure gauge.

Legend for Fig. 10-49:

(1)	PTO 1
(2)	PTO 2
P4	Main pump 4
13	Slew control block (IV)
15	Main control block (II)
20.1...20.3	Slew motor
24	Distributor block
44.1	High pressure screen at control block IV
44.2	High pressure screen at control block II
49.1...49.3	Slew brake valve (double stage valve)

Information on the variable slew motors

The variable slew motors (Fig. 10-49, Pos. 20.1...20.3) are only driven by main pump 4 (Fig. 10-49, Pos. P4). The oil flows from main pump 4 through the high pressure screen (Fig. 10-49, Pos. 44.1) to control block IV.

With the spools in neutral position, oil flows via port C to main control block II (Fig. 10-49, Pos. 15).
If no function of control block II is activated the oil flows via port T into the collector pipe and further through the return oil filters back to the tank.

When operating the "slew" control lever the pump line inside control block IV is connected to the main lines (A1 or B1) to the slew motors (Fig. 10-49, Pos. 20.1...20.3).

From main control block IV the oil flows to the distributor block (Fig. 10-49, Pos. 24) from which the oil is led to each slew brake valve (Fig. 10-49, Pos. 49.1...49.3) and to the slew motors.

Each slew machinery includes one spring loaded multi-disk brake (slew parking brake) for locking the superstructure at stand still.

The leak oil (case drain) flows through lines (L11 + L12) and leak oil filter back to tank.

NOTE! Before initial operation or after repairs on the hydraulic circuit, the slew parking brakes on all slew gears have to be vented at the oil pressure port.
Refer to section "Slew parking brake (on slew gear type 2063)" on page 10-134
or section "Slew parking brake (on slew gear type 632770)" on page 10-136.

10.4.11 ELECTRIC / HYDRAULIC FLOWCHART "SLEW RIGHT" FSA

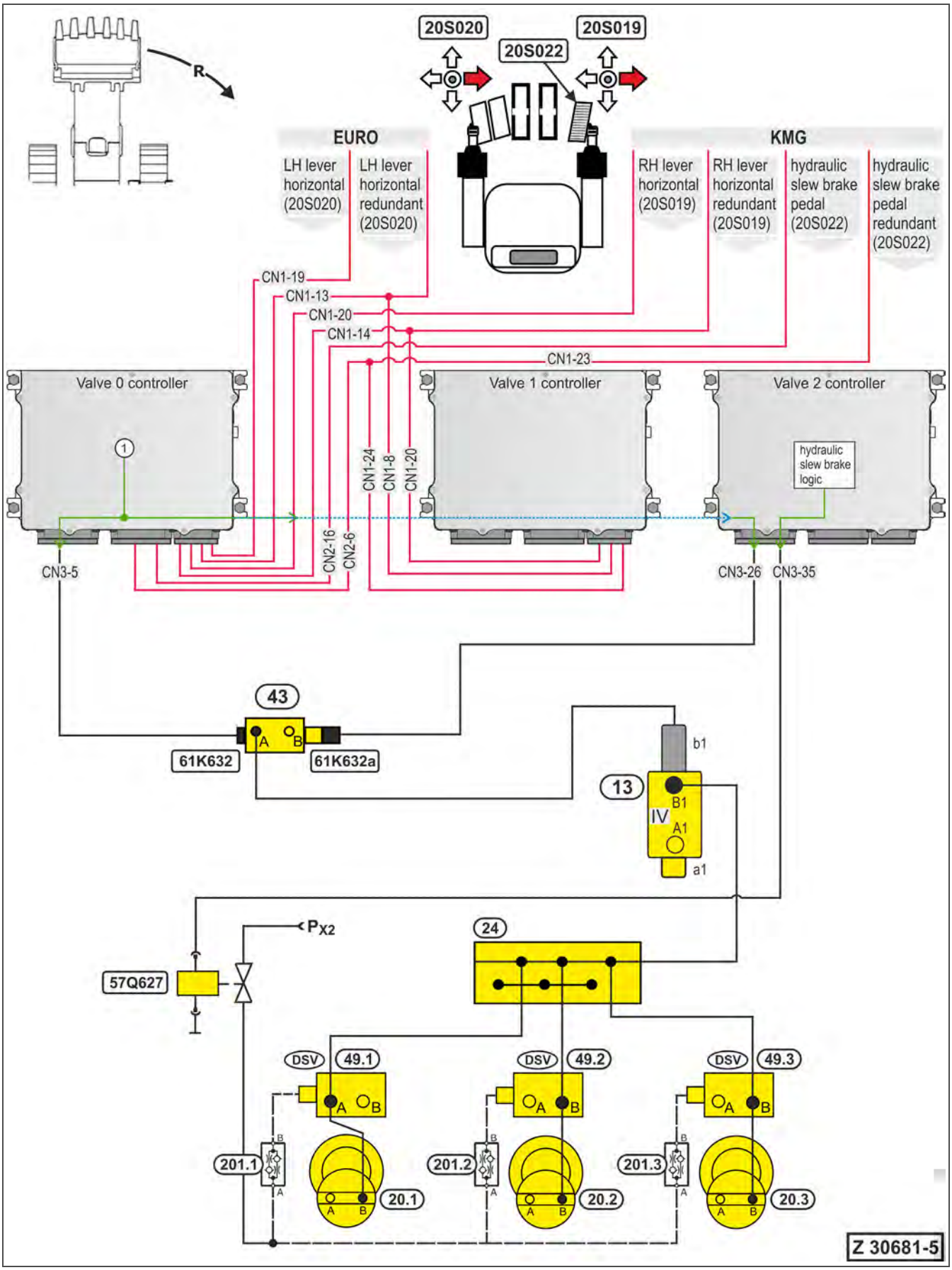


Fig. 10-62 Electric / hydraulic flowchart "Slew right" FSA

Legend for Fig. 10-74:

(1) Spur gear / drive shaft

(2) Motor adapter housing with travel brake housing

(3) Spur gear

(4) Drive shaft for planetary gear, first stage

(5) Planetary ring gear, first stage

(6) Planetary carrier, first stage

(7) Planetary ring gear, second stage

(8) Sun gear, second stage

(9) Planetary carrier, second stage

(10) Side frame mounting flange

The travel gear consists of a spur gear set and two planetary stages.
The travel gearbox is fitted to the side frame with bolts at the mounting flange (Fig. 10-74, Pos. 10).

Function

Two spur gears / drive shafts (Fig. 10-74, Pos. 1) are driven by hydraulic motors.

The spur gear (Fig. 10-74, Pos. 3) which is meshed with spur gears / drive shafts (Fig. 10-74, Pos. 1), drives the drive shaft (Fig. 10-74, Pos. 4) of the first planetary gear.

The planetary gears support themselves in the internal ring gear (Fig. 10-74, Pos. 5).

As a result of the fixed ring gear, the planetary gears are revolving, turning the planetary carrier (Fig. 10-74, Pos. 6) which is fixed to the sun gear (Fig. 10-74, Pos. 8) of the second stage.

The planetary carrier of the second stage is turned by the sun gear (Fig. 10-74, Pos. 8) which is connected to the sprocket drive shaft.

NOTE! The parking brake on travel gear type 631053 is a "**dry brake**".
No oil permissible in the housing / on the brake disks.

11.5 ADJUSTMENTS / CHECKS

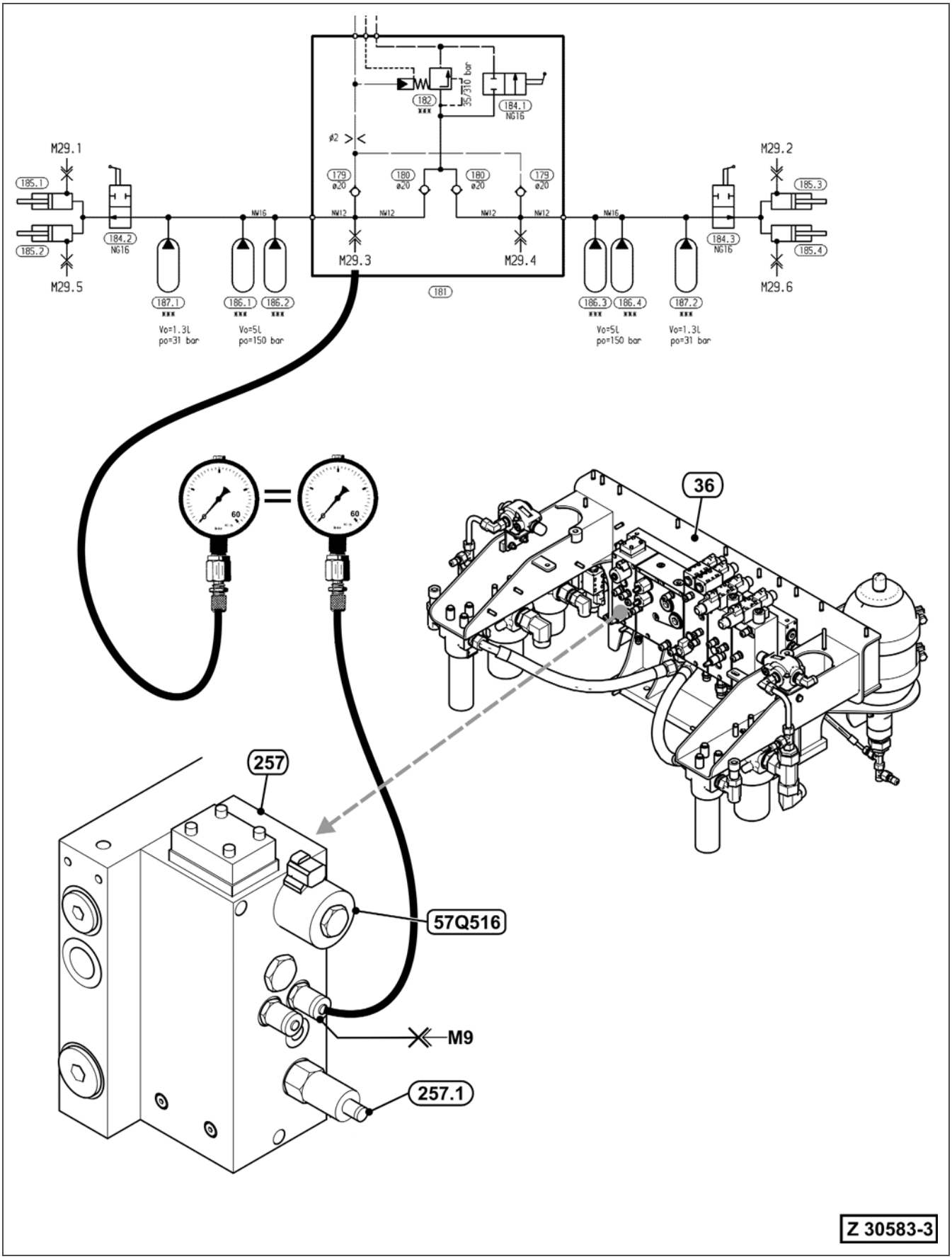
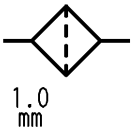
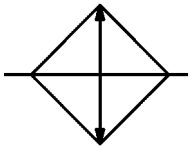
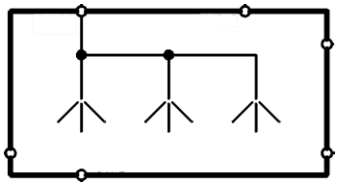
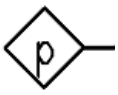


Fig. 11-5 Adjustments / checks of the hydraulic track tensioning system

14.2.2 COMPONENTS, VALVES

Item	Symbol	Description	Used as / at / on
15.		Accumulator, filled with nitrogen with the specified pressure for the accumulator	Input line to the remote control valves, return oil collecting tube, track tensioning system
16.		Screen filter (min. screening size: 1.0 mm)	Installed in suction lines to the pumps, oil tank outlet and return oil collecting tube.
17.		Oil cooler	Hydraulic oil cooler, PTO oil cooler
18.		Breather filter	On top of PTO or hydraulic oil tank
19.		Spray nozzles, inside a case for cooling and lubrication	Gearbox (PTO) cooling and lubrication system

14.2.3 SENSORS

Item	Symbol	Description	Used as / at / on
20.		Pressure switch / sensor Input = pressure Output = electrical signal (analogue or digital)	E.g.: return/leak oil tank (digital), high pressure screen (analogue)
21.		Pressure switch Input = pressure Output = digital	E.g.: Filter monitoring PTO lubrication

15.4.5 LOCATION LIST

Fig. 15-5 Location list

No.	Item	Example
(1)	Location list	40 Hydraulic oil tank

In the *Location list* all specified *Location Codes* are registered as an overview.

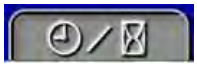
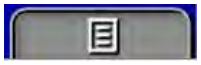
Legend for Fig. 16-9:

A...D	Main gauge screens 1...4
E	Function keys F1...F6

Symbol explanation - Topline of main gauge screens 1...4

	Degree Celsius, ambient temperature
	Engine1/2 speed (1/min)
	Central Lubrication System 1/2 + Slew ring gear Lubrication System - The prompt is displayed during pressure increasing and pressure holding time
	Service arm position - The prompt is displayed when the service arm is down
	Stairway down - The prompt is displayed when the stairway is NOT in upper retracted position
	Slew parking brake - The prompt is displayed when the slew parking brake is switched ON
	Truck counter 1/2

Symbol explanation - Footer of main gauge screens 1...4

	Clock time or Service meter reading 
	Date (format: dd.mm.yy)
	Key F1 - Change main gauge screens 1 → 2 → 3 → 4 → 1...
	Key F4 - Change *Clock Time* ↔ *Service Meter Reading*
	Key F6 - Open menu for operator information and operator settings: • Operation Records + Fuel Consumption • Machine Setting → Reset Truck Counter • Aftertreatment Devices Regeneration (eng1/2) • SCR Information (eng1/2) • Maintenance → Intervals and remaining hours • Monitor Setting → Screen - Clock - Language

16.6.7.1 RESET OF 'REMAINING TIME' TILL NEXT MAINTENANCE INTERVAL

Procedure - after maintenance is completed

After any maintenance is completed, its remaining time has to be reset. This ensures proper indication for the next service interval.

This function can be protected by password.

– In the operator menu select tab *Maintenance.*
– Use keys F3 and F4 to select the maintenance row, where the remaining time should be reset after maintenance (250 hours in the shown example).
– Press F6 for at least 1.5 seconds.

In the shown example the 1st 250h maintenance is overdue since 5h. Now, after maintenance is done, the remaining time is reset in the following example.

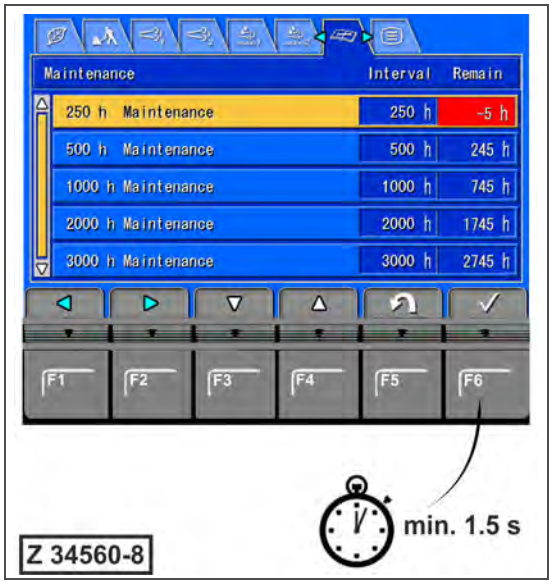


Fig. 16-23

Ex factory the reset function is password protected.

1. Type the provisional password 000000 and confirm with F6.
2. Confirm the reset procedure (F6) if the correct service interval is selected.
3. Reset confirmation. Press F6 if you want to reset.
4. The reset is done.
   Now the counter will count down again 250 hours, and it will display a correct reminder for the next 250h maintenance.
5. The remaining time until the next 250 h maintenance is displayed as 250 h again.

NOTE! If the password protection is switched OFF, the system will skip the above step 1.

The password protection for the reset of remaining time is called *Usage Limitation*.

Refer to the next section if you want to switch *Usage Limitation* ON/OFF or if you want to define another password.

Fig. 16-24

Failure code	Failure message	Failure detection	Action code	Icon	Mon MH 810	Buzzer	Shut down
DHQ8MA	PTO2 lube pressure sensor abnormality	PUMP2	L02	!	●	ON_2	–
DCH3KB	Fuel filter heating short circuit	PUMP2	L01	!	●	–	–
DCH3KY	Fuel filter heating hot short circuit	PUMP2	L01	!	●	–	–
DCH4KB	Fuel filter drain pipe heating short	PUMP2	L01	!	●	–	–
DCH4KY	Fuel filter drain pipe heating hot short	PUMP2	L01	!	●	–	–
AB3EMA	Starter Circuit Abnormality	PUMP2	L04	!	●	ON_3	E
D1EEKB	Starter cut relay short circuit	PUMP2	L04	!	●	ON_3	E
D1EEKY	Starter cut relay hot short circuit	PUMP2	L01	!	●	–	–
FF11KB	Starter power cut relay1 short circuit	PUMP2	L04	!	●	ON_3	E
FF11KY	Starter power cut relay1 hot short circuit	PUMP2	L01	!	●	–	–
FF11LK	Starter power cut relay1 abnormality	PUMP2	L04	!	●	ON_3	E
FF12LK	Starter power cut relay2 abnormality	PUMP2	L04	!	●	ON_3	E
D1F4KB	Engine2/motor2 shutdown relay short circuit	PUMP2	L04	!	●	ON_3	E
D1F4KY	Engine2/motor2 shutdown relay hot short circuit	PUMP2	L04	!	●	ON_3	–
DBZ7KP	24V sensor power abnormality	PUMP2	L02	!	●	ON_2	–
DBZ6KP	5V sensor2 power abnormality	PUMP2	L03	!	●	ON_2	–
DBZLKA	Operating Lamp Open Circuit(Pump2 Con)	PUMP2	L00a	–	–	–	–
DBZLKB	Operating Lamp Short Circuit(Pump2 Con)	PUMP2	L00a	–	–	–	–
DHPLMA	Pump-4 pressure sensor abnormality	PUMP2	L03	!	●	ON_2	–
DHPNMA	Pump-5 pressure sensor abnormality	PUMP2	L03	!	●	ON_2	–
DHPQMA	Pump-6 pressure sensor abnormality	PUMP2	L03	!	●	ON_2	–
DBZ2KK	Solenoid Power Low Error(Pump2 Con)	PUMP2	L04	!	●	ON_3	–
DLE6MA	Engine2 speed sensor abnormality	PUMP2	L03	!	●	ON_2	E
DBZ9KQ	Model Selection Abnormality	PUMP2	L04	!	●	ON_3	–
DBZWKQ	Motor/Engine Selection Abnormality	PUMP2	L04	!	●	ON_3	–
DBZ0KQ	Pump2 Con Selection Abnormality	PUMP2	L04	!	●	ON_3	–
DBZ0MC	Pump2 Con Error	PUMP2	L00a	–	–	–	–
DLMAMA	Oil cooler fan2 speed sensor abnormality	PUMP2	L01	⚙!	●	–	–
DDABL4	Lock lever switch mismatch	VALVE0	L04	!	●	ON_3	●
DDXAL4	Ladder up position proximity switch mismatch	VALVE0	L04	!	●	ON_3	●
DDXBL4	Service arm upper pos. proximity sw mismatch	VALVE0	L04	!	●	ON_3	●

C-code	SPN	FMI	**Fault message** (fault classification: Sys)	Action code	Icon	Buzzer
CC3697	630	12	ECM C2 Calibration Memory Error	L04		ON_3
CD3697	630	12	ECM C3 Calibration Memory Error	L04		ON_3
CA3712	5246	0	SCR Inducement Severe Error	L04		ON_3
CA3713	5491	7	DEF Line Heater 1 Voltage High Error	L01		–
CA3714	1569	31	Engine Protection Torque Derate	L01		–
CA3718	3216	13	Turbo 1 Outlet NOx Sensor Out of Cal.	L01		–
CA3725	3216	10	Turbo 1 Outlet NOx Sensor Unstable Error	L01		–
CA3726	3216	16	Turbo 1 Outlet NOx Data Error	L01		–
CA3727	5571	7	Common Rail Pressure Relief Valve Error	L01		–
CA3741	5571	0	Rail Press Valve Trip Error	L01		–
CA3748	3216	20	Turbo 1 Outlet NOx Sensor Stuck In Range	L01		–
CA3867	3364	18	DEF Low Concentration Error 1	L01		–
CA3868	3364	9	DEF Tank Sensor Datalink Timeout Error	L01		–
CA3878	3364	2	DEF Quality Sensor Data Error	L01		–
CA3925	1188	2	Turbocharger Actuator1 Data Error	L01		–
CA3969	1188	6	Turbocharger Actuator1 Above Normal	L01		–
CA3971	1188	5	Turbocharger Actuator1 Below Normal	L01		–
CB3972	1189	2	Turbocharger Actuator2 Data Out of Range	L01		–
CB3973	1189	6	Turbocharger Actuator2 Above Normal	L01		–
CB3974	1188	5	Turbocharger Actuator2 Below Normal	L01		–
CB3982	3255	4	Turbo 2 Outlet NOx Sensor Circuit Error	L01		–
CB3983	3255	2	Turbo 2 Outlet NOx Sensor Data Error	L01		–
CB3984	3255	13	Turbo 2 Outlet NOx Sensor Out of Cal.	L01		–
CB3985	3255	10	Turbo 2 Outlet NOx Sensor Unstable Error	L01		–
CB3986	3255	20	Turbo 2 Outlet NOx Sensor Stuck In Range	L01		–
CB3988	3265	9	SCR2 Outlet NOx Sensor 2 Datalink Error	L01		–
CB3995	3265	4	SCR2 Outlet NOx Sensor 2Voltage Low Error	L01		–
CB3998	4413	2	SCR2 Catalyst Intake Gas Temp. Error 1	L01		–
CB3999	4413	15	SCR2 Catalyst Intake Gas Temp.Error 2	L01		–
CB4111	4413	16	SCR2 Catalyst Intake Gas Temp.Error 3	L01		–
CB4112	4413	0	SCR2 Catalyst Intake Gas Temp.Error 4	L03		ON_2
CB4113	4413	3	SCR2 Catalyst Intake Gas Temp. Volt. High	L01		–

16.12.6 MONITORING LIST FOR: VALVE1 CONTROLLER

– In the SERVICE MENU press **F3** or **F4** to move up or down.
– Select item *01 Monitoring / Custom* and press key **F6**.
– Select tab VALVE1 using keys **F1** and **F2**.

Contents of VALVE1
All monitoring items of VALVE1 (14K303) are associated with valve control signals or with the VALVE1 controller hardware and software specifications.

– Scroll up and down (**F3**, **F4**) in the list of monitoring items as shown in screens (1)...(5) below.
– Select the desired monitoring item by pressing key **F6**.
– Selected items are highlighted yellow.

Fig. 16-67 Service Menu - selection 01

Fig. 16-68 Monitoring items of VALVE1 controller - screens 1...2

16.21 SERVICE MENU - ITEM 10 ADJUSTMENT

– In the SERVICE MENU press **F3** or **F4** to move up or down.
– Select item *10 Adjustment* and press key **F6**.

Contents of Adjustment

This option allows to change parameter adjustments.
Refer to following screens

Following adjustment items are state of the art at press date.
Slight changes are possible due to later software updates.

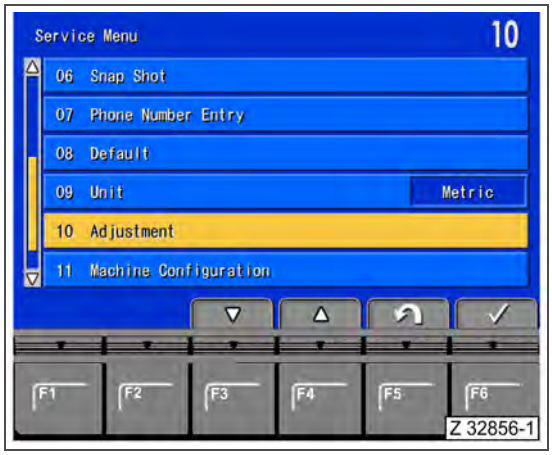


Fig. 16-103 Service Menu - 11 Adjustment

16.21.1 ADJUSTMENTS FOR: PUMP1 CONTROLLER

In the *Adjustment* menu select tab PUMP1 using keys **F1** and **F2**.

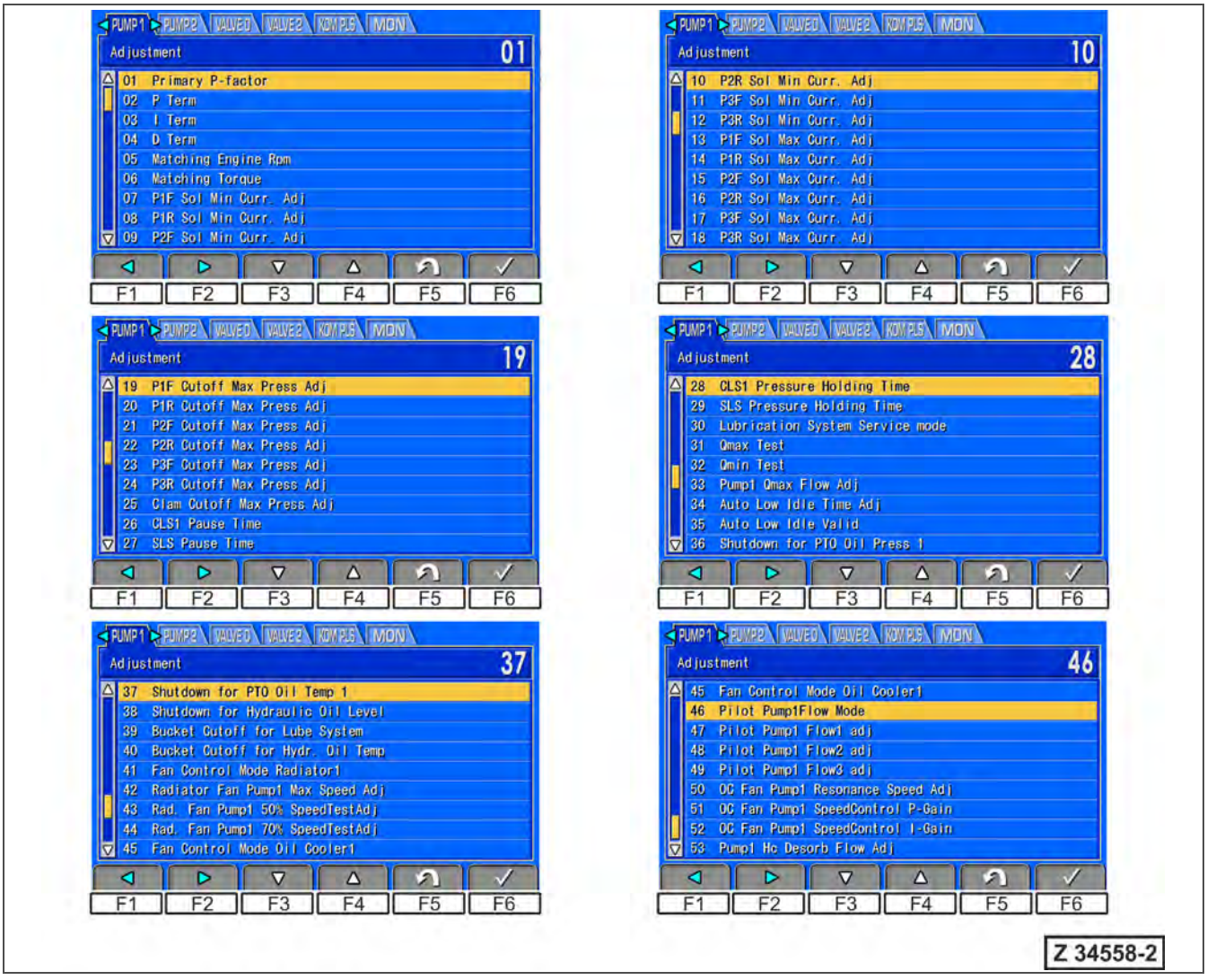


Fig. 16-104 Adjustments for PUMP1 controller

16.22.4 IN CASE OF PROBLEMS DURING CHANGING PROCEDURE FOR LEVER CONTROL OR ATTACHMENT TYPE

If the system identifies any problem during the changing procedure (lever or attachment) a message as shown is displayed.

The screen is for information only as the F5 key (*Quit*) is active only.

Open *03 Abnormality Record* and select *02 Electrical Systems* to see the pending fault codes.

RH screen shows the fault codes for *Changing lever control.*

DBWZKQ for VALVE0 controller
DBXZKQ for VALVE1 controller
DBYZKQ for VALVE2 controller

RH screen shows the fault codes for *Changing attachment type*.

DBWYKQ for VALVE0 controller
DBXYKQ for VALVE1 controller
DBYYKQ for VALVE2 controller

RH screen shows the *Error Detail* screen for DBWZKQ as an example.

- With the help of the troubleshooting procedures and the Error Detail screen locate the problem and correct/repair as necessary.

- After the problem is clarified repeat the complete changing procedure!

Go back to changing lever control on page 16-158

Go back to changing attachment type on page 16-160

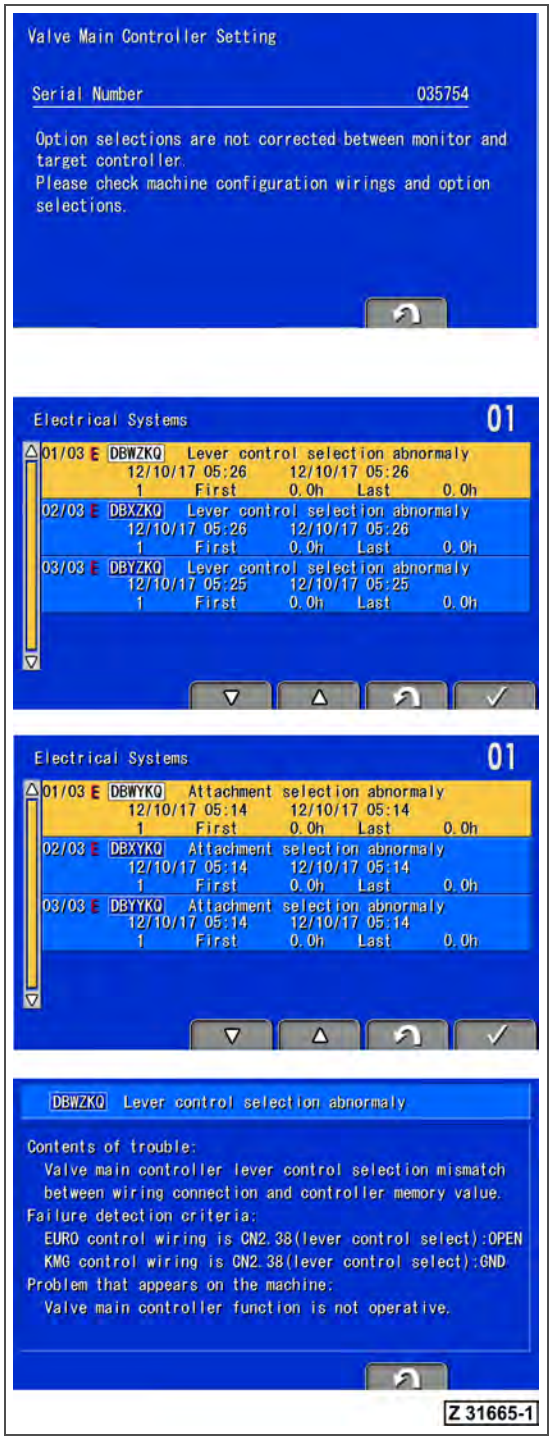


Fig. 16-121 Fault message & fault codes

17.4.2 LUBRICATION CYCLE – PROCESSING

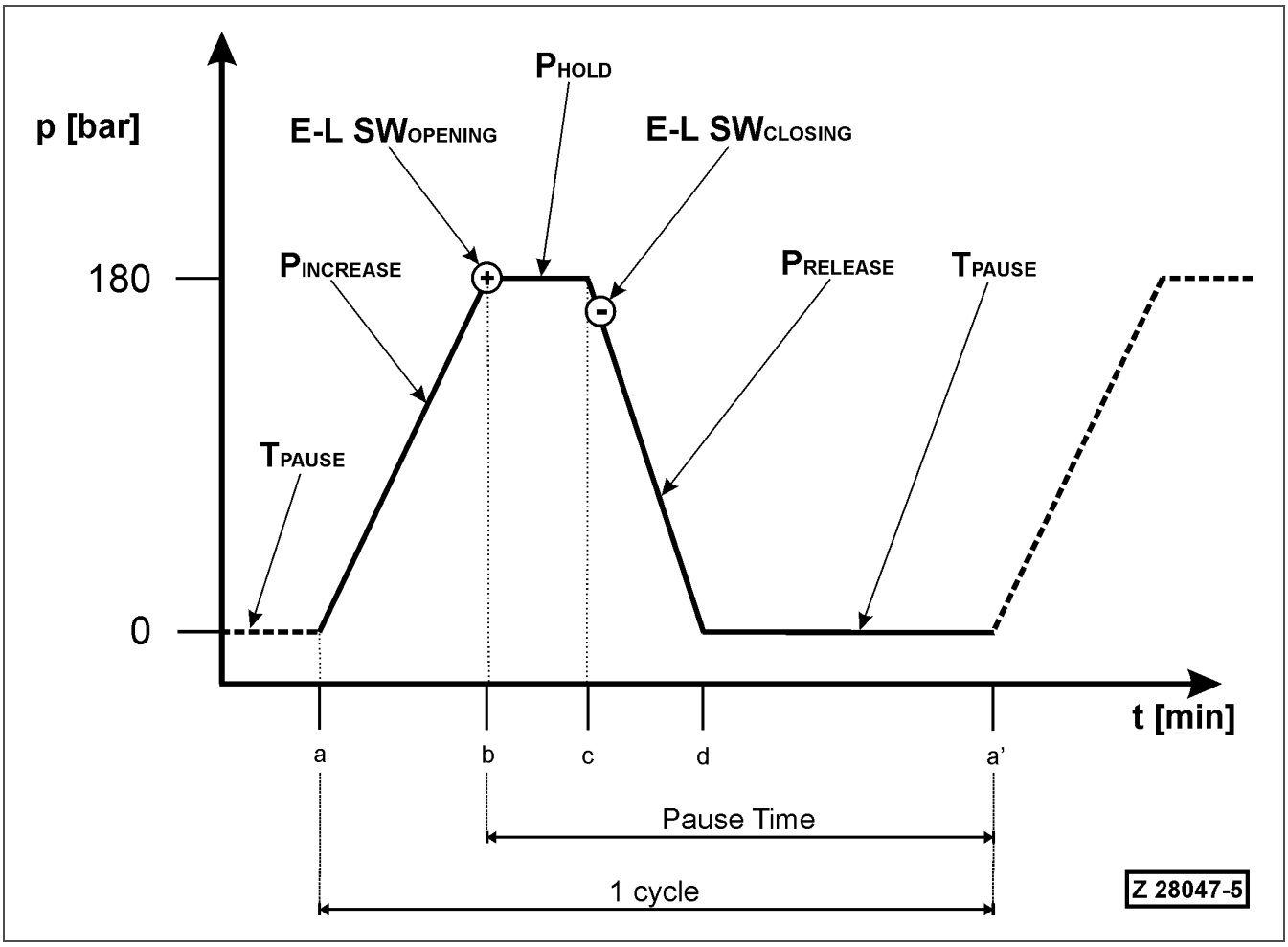


Fig. 17-5 Process of a lubrication cycle

X-axis	Task time
Y-axis	Pressure timeline in the lubricant supply line
$P_{INCREASE}$	Pressure increasing time (5 minutes)
E-L $SW_{OPENING}$	End-line switch opening point
P_{HOLD}	Pressure holding time (5 minutes)
E-L $SW_{CLOSING}$	End-line switch closing point
$P_{RELEASE}$	Pressure release time (5 minutes)
T_{PAUSE}	Pause time (CLS1/2: 10...60 min / SLS: 10...20 min)

REMARKS: If one of above cycle processes fails, bucket cut-off function is activated after approx. 4.2 h.

Legend for Fig. 17-16:

(a) Lubricant level sensor → full

(b) Lubricant level sensor → refill

(c) Lubricant level sensor → empty

17.9.1 DESCRIPTION

Task

The lubricant level sensor is a binary sensor type consisting of three single sensors for full, pre-warning (refill), and empty level.

Lubricant maximum filling level monitoring is necessary to prevent an overfilling of the grease container via refilling arm.

Minimum grease level monitoring allows timely refilling of grease and it prevents the grease pump from running dry.

General

The sensors are connected to the K+ controller. The controller activates the "full" light & an acoustic signal when the grease level reaches maximum filling. This indication light is mounted at the refilling arm.

When a grease level of 5% is reached, the controller generates a message → *CLS Grease Level Low* or *SLS Grease Level Low*. This allows grease charging in time, which prevents an unexpected breakdown.

If the lubricant level reaches 0%, the controller deactivates the lubrication pump and generates a message → *CLS Grease Level Too Low* or *SLS Grease Level Too Low*.

After approx. 4.2 h without refilling, the bucket cut-off function is automatically activated by the controller system.

Function

Each successfully completed lubrication cycle reduces a theoretical (calculated by the controller system) lubricant level by a certain percentage. This is used for the gauges on the machine monitor.

17.9.2 CHECKS

Check lubricant levels of the CLS1/2 & SLS system with the dip stick daily.

18.5.3.3 WIRING DIAGRAM "HYDRAULIC OIL TANK PREHEATING" PART 3 OF 3

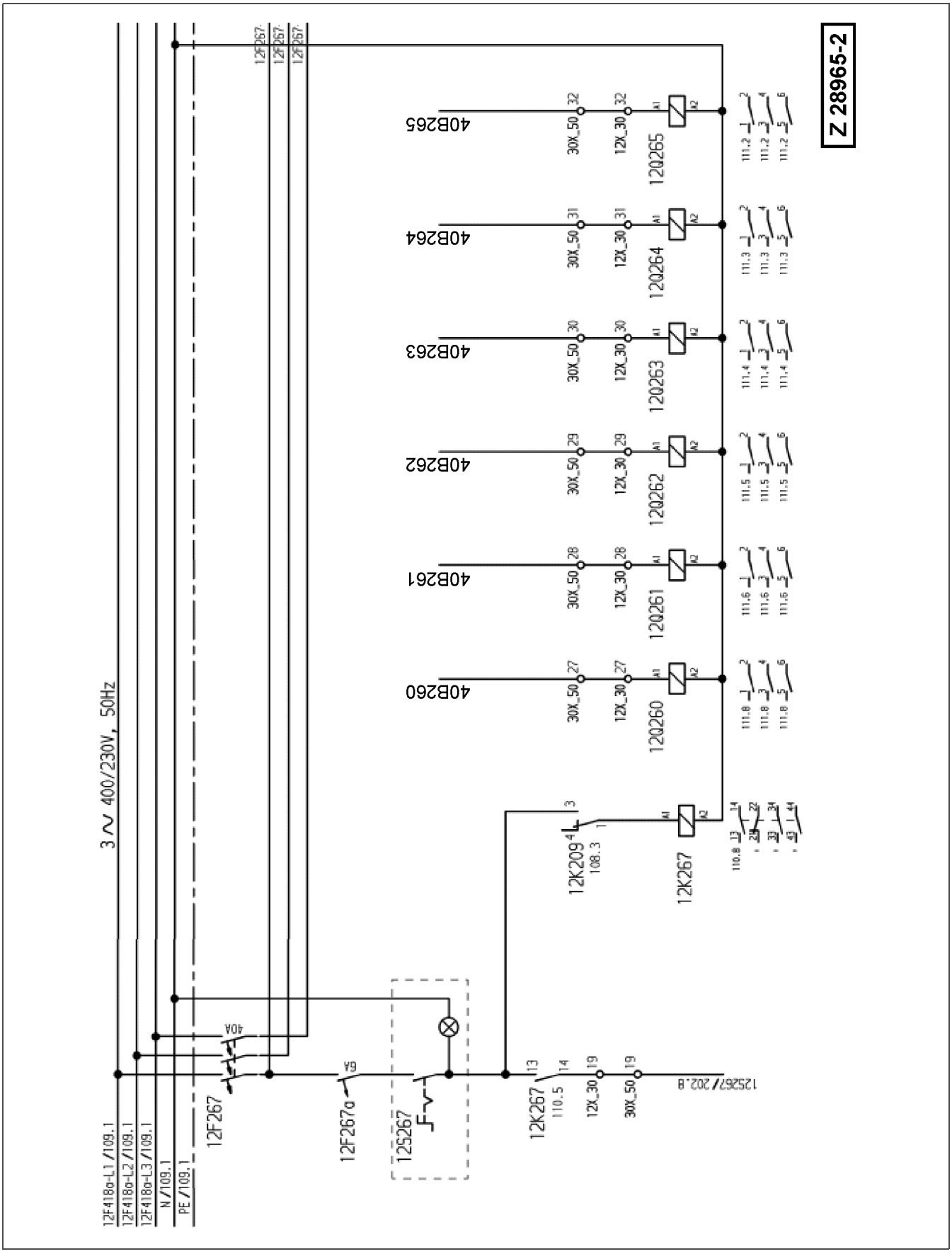


Fig. 18-15 Hydraulic oil tank preheating part 3 of 3

2.7 CHECKS BEFORE TROUBLESHOOTING

Item	Inspection	Criterion	Remedy
Lubricating oil, coolant	1. Check of fuel level and type of fuel	-	Add fuel
	2. Check of fuel for foreign matter	-	Clean and drain
	3. Check of fuel filter	-	Replace
	4. Check of hydraulic oil level	-	Add oil
	5. Check of hydraulic oil strainer	-	Clean and drain
	6. Check of slew machinery oil level	-	Add oil
	7. Check of level and type of engine oil (in oil pan)	-	Add oil
	8. Check of coolant level	-	Add coolant
	9. Check of dust indicator for clogging	-	Clean or replace
	10. Check of hydraulic oil filter	-	Replace
Electrical equipment	1. Check of battery terminals and wiring for looseness and corrosion	-	Retighten or replace
	2. Check of correct main power supply	-	Rectify
	3. Check of medium voltage board and LED panel for proper condition	-	Rectify
Hydraulic, mechanical equipment	1. Check for abnormal noise and smell	-	Repair
	2. Check for oil leakage	-	Repair
	3. Check for air inclusion	-	Bleed air
Electrical components	1. Check of battery voltage (engine stopped)	22...24V	Replace
	2. Check level of battery electrolyte	-	Add or replace
	3. Check of wires for discoloration, burn, and removal of the isolation cover	-	Replace
	4. Check for released wire clamp and dropping wire	-	Repair
	5. Check of wires for wetness (in particular check connectors and terminals for wetness)	-	Disconnect the connectors and dry
	6. Check for broken or corroded fuses	-	Repair
	7. Check battery relay for operating sound (when starting switch is turned ON or OFF)	-	Replace
	8. Check alternator voltage (engine running at over half throttle)	After operating for several minutes: 27.5 - 29.5V	Replace
	9. Check battery relay for operating sound (when start switch is turned ON or OFF)	-	Replace

Legend for Fig. 3-6:

(1)	Control and filter panel engine 1 (rear)
(2)	Valve cartridge block
	Pressure switches
57B017-1	Pressure switch – PTO gear lubrication pressure at 74.1
57B027-1	Pressure switch – PTO gear lubrication, filter clogging sensor
	Solenoid valve
57K553-1	Gear oil by-pass control
	Filters
60.1	Control oil engine1 (rear)
60.2	Control oil engine2 (front)
68.1	Hydraulic oil cooler fan drive engine1
68.2	Engine1 radiator fan drive
69.1	PTO gear lubrication engine1
74.1	Pressure limiting valve - PTO1 gear lubrication
	Pressure test ports
M3	Bladder accumulator
M6.1	Engine1 radiator fan drive operating pressure
M7.1	Hydraulic oil cooler fan drive operating pressure
M8.1	PTO1 gear lubrication - at pressure limiting valve 74.1
	Others
74.1	Pressure limiting valve - PTO gear lubrication
168.1	Pressure limiting valve - hydraulic oil cooler fan drive
168.2	Pressure limiting valve - engine1 radiator fan drive
253	Bladder accumulator (10 liters, 10 bar pre-charge pressure)

System	Component name	Component code	Inspection method	Judgement table	Measurement conditions
	EPC valves: PUMP1 controller PUMP2 controller	57K658f 57K658r 57K660f 57K660r 57K661f 57K661r 57K659f 57K659r 57K662f 57K662r 57K663f 57K663r	Measure resistance	Condition is normal if in range of below table. Between (1) - (2): 10 ± 1.0Ω	1) 22S001 OFF 2) Disconnect connector 3) Insert T-box
			Measure current	Check **min current** according to pump type plate on machine monitor Check **max current** according to pump type plate on machine monitor	1) 22S001 OFF 2) Disconnect connector 3) Insert T-box 4) 22S001 ON 5) Open terminals 1 & 2 at T-box 6) Engine high idle
Hydraulic system	EPC valves: - Pilot pressure - Oil cooler fan drive - Radiator fan drive	57K666-1/2 57K667-1/2 57K668-1/2	Measure resistance	Condition is normal if in range of below table. Between (1) - (2): 10 ± 1.0Ω	1) 22S001 OFF 2) Disconnect connector 3) Insert T-box
	Oil cooler preload pressure solenoid valve	40K601	Measure resistance	Condition is normal if in range of below table. Between (1) - (2): 20 ± 1.0Ω	1) 22S001 OFF 2) Disconnect connector 3) Insert T-box
	Slew brake proportional solenoid valve *[max. pressure 24 bar]*	57Q627	Measure resistance	Condition is normal if in range of below table. Between (1) - (2): 34 ± 1.0Ω	1) 22S001 OFF 2) Disconnect connector 3) Insert T-box
			Measure current	Between (1) - (2): 450...470mA	1) 22S001 OFF 2) Disconnect connector 3) Insert T-box 4) 22S001 ON 5) Open terminals 1 & 2 at T-box 6) Engines high idle 7) Fully press pedal
	Floating solenoid valves	Boom: 61K623b Stick: 61K631b	Measure resistance	Condition is normal if in range of below table. Between (1) - (2): 20 ± 1.0Ω	1) 22S001 OFF 2) Disconnect connector 3) Insert T-box
	Remote control proportional solenoid valve	61K620 61K621 61K622 61K623 61K624 61K625 61K626 61K627 61K628 61K629 61K630 61K631 61K632	Measure resistance	Condition is normal if in range of below table. Between (1) - (2): 22 ± 1.0Ω	1) 22S001 OFF 2) Disconnect connector 3) Insert T-box

Failure code	Failure message	Failure detection	Action code	Icon	Mon MH 810	Buzzer	Shut down
DWACKY	Service arm check valve sol. hot short circuit	VALVE0	L01		●	–	–
DWADKA	Ladder speed control solenoid open circuit	VALVE0	L01		●	–	–
DWADKB	Ladder speed control sol. short circuit	VALVE0	L01		●	–	–
DWADKY	Ladder speed control sol hot short circuit	VALVE0	L01		●	–	–
DBW5MA	5V sensor1 power abnormality	VALVE0	L04		●	ON_3	–
DBW6MA	5V sensor2 power abnormality	VALVE0	L04		●	ON_3	–
DBW9KQ	Model Selection Abnormality	VALVE0	L04		●	ON_3	E
DBWZKQ	Lever control selection abnormality	VALVE0	L04		●	ON_3	E
DBWYKQ	Attachment selection abnormality	VALVE0	L04		●	ON_3	E
DBW2KK	Solenoid Power Low Error(VALVE/M Con)	VALVE0	L04		●	ON_3	E
DBW0KQ	VALVE/M Con Selection Abnormality	VALVE0	L04		●	ON_3	E
DBW0MA	VALVE/M Con Error	VALVE0	L00a	–	–	–	–
DDDWMC	Ladder operation switch abnormality	VALVE1	L01		●	–	–
DKWHMA	R lever right-left redu pot abnorm(VLV/S1)	VALVE1	L04		●	ON_3	–
DKWFL4	R lever right-left sig. mismatch(VALVE/S1)	VALVE1	L04		●	ON_3	–
DKWLMA	R lever front-back redu pot abnorm(VLV/S1)	VALVE1	L04		●	ON_3	–
DKWJL4	R lever front-back sig. mismatch(VALVE/S1)	VALVE1	L04		●	ON_3	–
DKWPMA	L lever right-left redu pot abnorm(VLV/S1)	VALVE1	L04		●	ON_3	–
DKWML4	L lever right-left sig. mismatch(VALVE/S1)	VALVE1	L04		●	ON_3	–
DKWSMA	L lever front-back redu pot abnorm(VLV/S1)	VALVE1	L04		●	ON_3	–
DKWQL4	L lever front-back sig. mismatch(VALVE/S1)	VALVE1	L04		●	ON_3	–
DKWVMA	R pedal red pot abnormality(VALVE/S1)	VALVE1	L04		●	ON_3	–
DKWTL4	R pedal signal mismatch(VALVE/S1 Con)	VALVE1	L04		●	ON_3	–
DKWYMA	L pedal red pot abnormality(VALVE/S1)	VALVE1	L04		●	ON_3	–
DKWWL4	L pedal signal mismatch(VALVE/S1 Con)	VALVE1	L04		●	ON_3	–
DKX2MA	Clam open red pot abnormality(VALVE/S1)	VALVE1	L04		●	ON_3	–
DKX0L4	Clam open signal mismatch(VALVE/S1 Con)	VALVE1	L04		●	ON_3	–
DKX5MA	Clam close redu pot abnormality(VALVE/S1)	VALVE1	L04		●	ON_3	–
DKX3L4	Clam close signal mismatch(VALVE/S1 Con)	VALVE1	L04		●	ON_3	–
DKX8MA	Hyd. slew brake redu pot abnorm(VALVE/S1)	VALVE1	L03		●	ON_2	–
DKX6L4	Hyd. slew brake signal mismatch(VALVE/S1)	VALVE1	L03		●	ON_2	–

C-code	SPN	FMI	**Fault message** (fault classification: Sys)	Action code	Icon	Buzzer
CA6517	4364	17	SCR1 Catalyst Efficiency Low Error 1	L01		–
CA6592	3548	3	Oil Reservoir Level Sensor Voltage High	L01		–
CA6593	3548	4	Oil Reservoir Level Sensor Voltage Low	L01		–
CA6595	190	11	Engine Speed Error	L01		–
CB6595	190	11	Engine Speed Error	L01		–
CC6595	190	11	Engine Speed Error	L01		–
CD6595	190	11	Engine Speed Error	L01		–
CA6692	7932	15	SCR1 System Particulate Status 1	L01		–
CA6693	7932	16	SCR1 System Particulate Status 2	L03		ON_2
CA6694	7932	0	SCR1 System Particulate Status 3	L04		ON_3
CB6695	7933	15	SCR2 System Particulate Status 1	L01		–
CB6696	7933	16	SCR2 System Particulate Status 2	L03		ON_2
CB6697	7933	0	SCR2 System Particulate Status 3	L04		ON_3
CB6734	4419	17	SCR2 Catalyst Efficiency Low Error 1	L01		–
CA6886	8322	3	Bank1 Press Actuator Volt. High Error	L01		–
CA6887	8322	4	Bank1 Press Actuator Volt. Low Error	L01		–
CB6888	8323	3	Bank2 Press Actuator Volt. High Error	L01		–
CB6889	8323	4	Bank2 Press Actuator Volt. Low Error	L01		–
CA6891	8322	12	Bank1 Press Actuator Internal Error	L01		–
CB6892	8323	12	Bank2 Press Actuator Internal Error	L01		–
CA6893	8322	7	Bank1 Press Actuator No Response	L01		–
CB6894	8323	7	Bank2 Press Actuator No Response	L01		–
CA6897	8322	13	Bank1 Press Actuator Out Of Cal.1	L03		ON_2
CB6898	8323	13	Bank2 Press Actuator Out Of Cal.1	L03		ON_2
CA6899	8320	15	Bank1 Press Actuator Temp. High Error	L01		–
CB6911	8321	15	Bank2 Press Actuator Temp. High Error	L01		–
CB6912	8318	18	Bank2 Press Actuator Ckt Volt. Low Error	L01		–
CA6913	649	11	Bank1 Press Actuator Property Error	L01		–
CB6914	8318	11	Bank2 Press Actuator Property Error	L01		–
CA6915	8322	31	Bank1 Press Actuator Datalink Error	L03		ON_2
CB6916	8323	31	Bank2 Press Actuator Datalink Error	L03		ON_2
CA6917	8322	9	Bank1 Press Actuator Datalink Error	L01		–

Wiring Diagram - lube pump solenoid & vent valve (CLS1/2 & SLS)

[4/4]

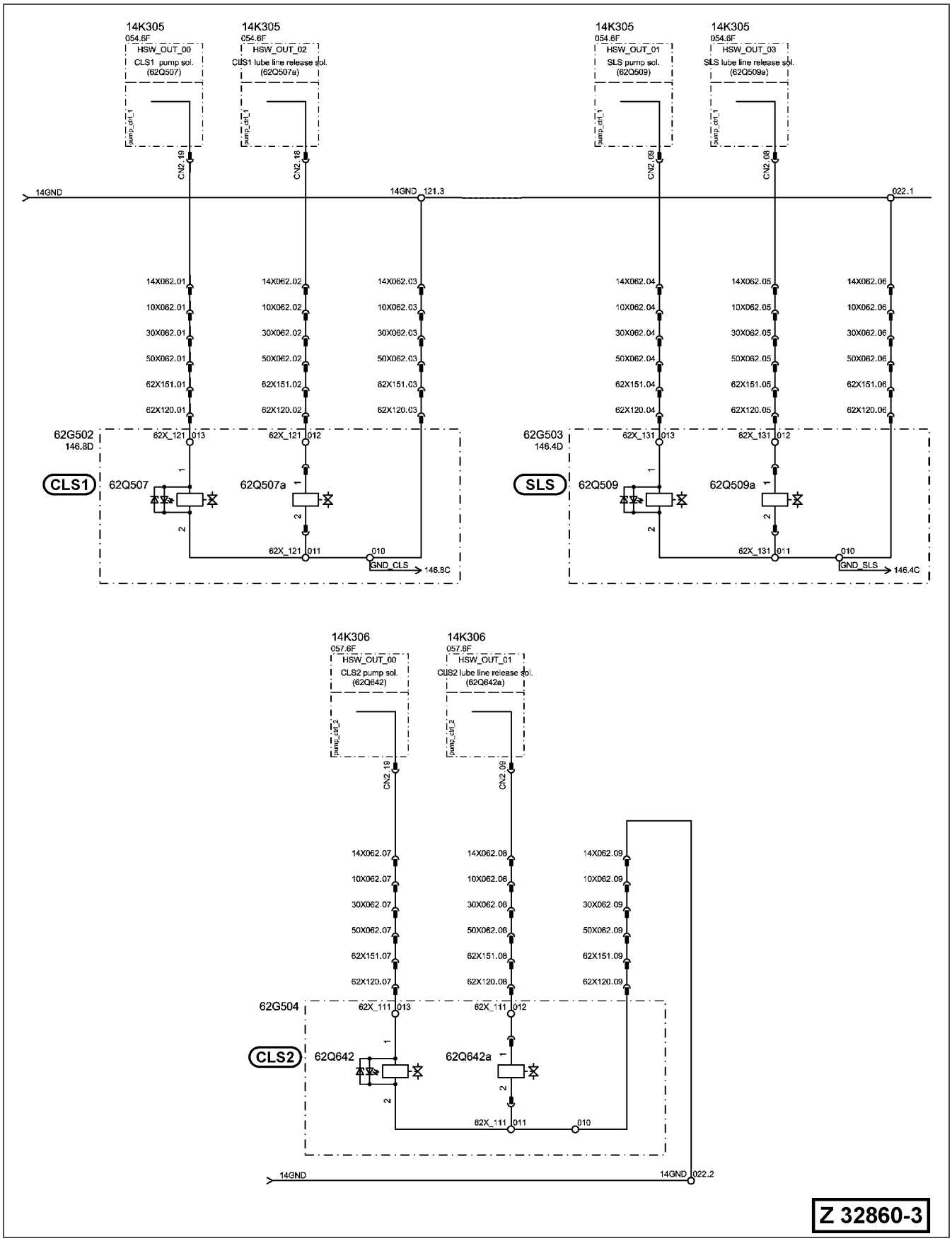


Fig. 6-6 Wiring Diagram - lube pump solenoid & vent valve (CLS1 & SLS)

B@HANX - Screen At Hyd Cooler Entry Clogging

[1/2]

Trouble code **B@HANX**	Message	Screen At Hyd Cooler Entry Clogging
Contents of trouble	- Pressure transducers 40B166 & 40B165 transmit pressure values of 0...50 bar in front of and behind the strainer in the collector pipe leading to the hydraulic oil cooler. - Pressure difference indicates pressure drop in strainer. - The system assumes that strainer is clogged if pressure difference exceeds 2.5 bar.	
Related information	The system assumes that pressure sensors 40B166 & 40B165 and wiring are not defective.	
Controller / Monitoring	Error detection: KOM PLS controller (14K300) Signal input of 40B166 at K+ terminal A.21 (preload valve return oil pressure) Signal input of 40B165 at K+ terminal A.15 (oil cooler pressure) Error condition: Pressure of 40B166 – pressure of 40B165 = >2.5 bar for 5 seconds Monitoring: 38307 Oil Cooler Press 38309 Preload Valve Return Oil Press	
Action of controller	Action code level: L01 Buzzer: no sound	
Problem that appears on the excavator	Risk, to run the excavator with insufficient cooling of the hydraulic oil.	

Possible cause	Step	Test condition & Inspection	Procedure	Nominal value
Strainer in collector pipe is clogged (oil flow to oil cooler)	1	▶ Main key switch 22S001 OFF.		
		- Remove oil strainer from collector pipe. - Clean or replace the strainer as necessary. **REMARKS:** If the strainer is clogged, the cause for clogging needs to be found. Locate the problem and take adequate measures.		
Final check	2	Bring the excavator back into the original condition. Start the excavator and verify that the trouble code does not arise again.		

Monitoring screens for 40B165 and 40B166

Fig. 6-18 Monitoring screens for 40B165 and 40B166

Wiring Diagram - 5V sensor power supply for DA26KP

[2/2]

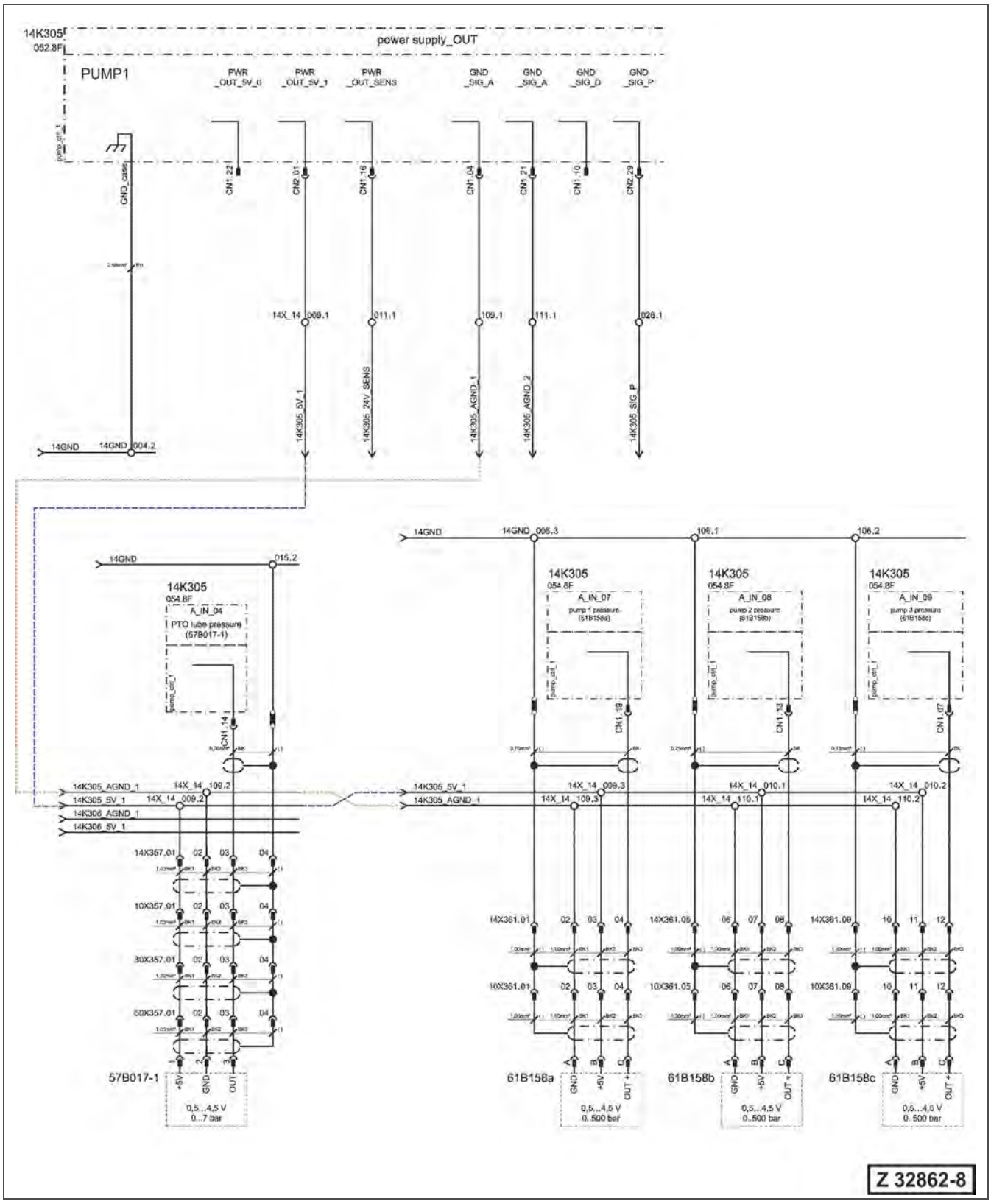


Fig. 6-30 Wiring Diagram - 5V sensor power supply for DA26KP

DWAAKA - PTO lube preload solenoid open circuit

[1/2]

Trouble code **DWAAKA**	Trouble	PTO lube preload solenoid open circuit
Contents of trouble	- Disconnection detected in the loop between PUMP1 controller output CN2.28 and PTO1 preload solenoid valve 57K553-1 - or disconnection between 57K553-1 and GND	
Related information	- PUMP1 controller 14K305 controls the PTO1 preload solenoid valve 57K553-1 (ON/OFF). - In case of open circuit the preload solenoid valve is permanently de-energized and PTO1 oil flows mainly over the cooler circuit.	
Controller / Monitoring	Error detection: PUMP1 controller (14K305), terminal CN2.28 Error condition: Controller diagnosis system detects: 2.5V<feedback voltage<7V Monitoring: 02300 Solenoid Valve PTO Lube Preload Sol. [ON/OFF]	
Action of controller	Action code level: L03 Buzzer: continuous sound	
Problem that appears on the excavator	PTO1 oil warm up function is permanently disabled.	

Possible cause	Step	Test condition & Inspection		Procedure	Nominal value
Wiring disconnection between controller output and 57K553-1 or between 57K553-1 and GND. (including connectors and terminals)	1	▶ Main key switch 22S001 OFF.			
		Take 2 measurements for continuity: 1) Controller output cable between CN2.28 and pin 1 of preload solenoid valve 57K553-1. 2) GND wiring between pin 2 of 57K553-1 and 14GND 015.1 Is wiring continuity OK?	Yes	Go to next step.	R_{max} 1Ω
			No	Refer to Wiring Diagram. Locate the problem in the faulty circuit and repair or replace as necessary.	
Solenoid 57K553-1 defective. Internal disconnection.	2	▶ Main key switch 22S001 OFF.			
		Disconnect 57K553-1. Measure internal resistance between solenoid terminals 1 and 2.		Replace defective solenoid valve.	$R_{solenoid}$ 20±1 Ω
Final check	3	Bring the excavator back into the original condition. Start the excavator and verify that the trouble code does not arise again.			

Wiring Diagram - Radiator fan pump1/2 solenoid

[2/2]

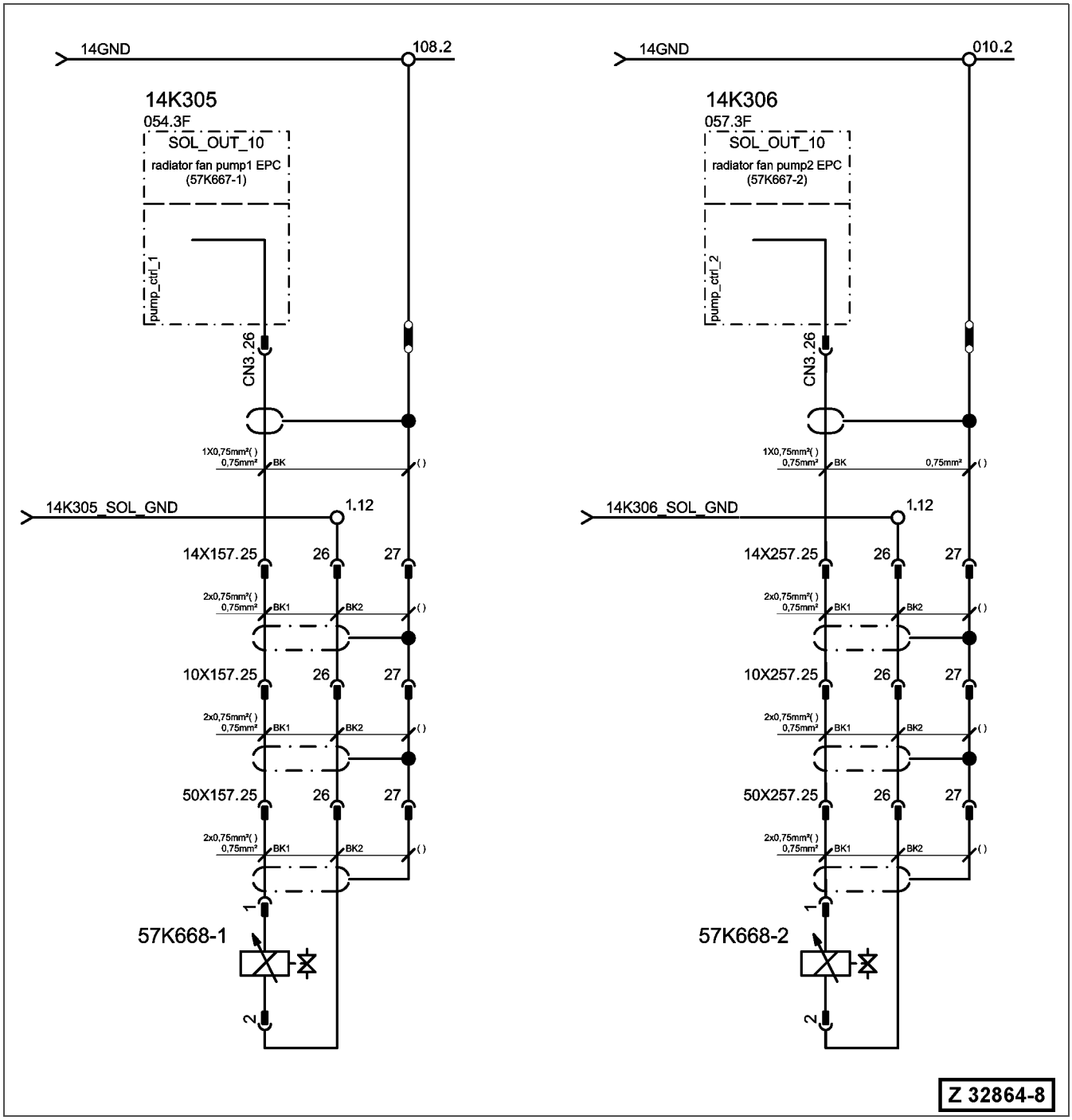


Fig. 6-55 Wiring Diagram - Radiator fan pump1/2 solenoid

DWAFKA - CLS2 line release solenoid open circuit

[1/2]

Trouble code **DWAFKA**	Trouble	CLS2 line release solenoid open circuit
Contents of trouble	a) Disconnection detected between PUMP2 controller output CN2.9, CLS2 lube line release solenoid 62Q642a, and GND. b) Pump2 solenoid 62Q642a has an internal disconnection.	
Related information	PUMP2 controller 14K306 controls the CLS2 lube line release solenoid (ON/OFF).	
Controller / Monitoring	Error detection: PUMP2 controller (14K306) Error condition: Controller diagnosis system detects: 2.5V<feedback voltage<7V Monitoring: 02350 Solenoid Valve CLS2 Lube Release Sol. [ON/OFF]	
Action of controller	Action code level: L03 Buzzer: continuous sound	
Problem that appears on the excavator	CLS2 lube line release circuit is inoperative because the lube line release solenoid does not work.	

Possible cause	Step	Test condition & Inspection		Procedure	Nominal value
Wiring disconnection (including connectors and terminals)	1	▶ Main key switch 22S001 OFF.			
		Take 2 measurements for continuity: - From controller output CN2.9 to 62Q642a, pin 1. - From 14GND_022.2 to pin 2 of 62Q642a. Is continuity of the relevant wiring OK?	Yes	Go to next step.	R_{max} 1Ω
			No	Refer to Wiring Diagram. Locate the problem in the faulty circuit and repair or replace as necessary.	
Lube line release solenoid defective. Internal disconnection.	2	▶ Main key switch 22S001 OFF.			
		Disconnect 62Q642a. Measure resistance between solenoid terminals 1 and 2.		Replace defective grease pump solenoid.	$R_{solenoid}$ 20±1 Ω
Final check	3	Bring the excavator back into the original condition. Start the excavator and verify that the trouble code does not arise again.			

Wiring Diagram for message DCH4KY

[2/2]

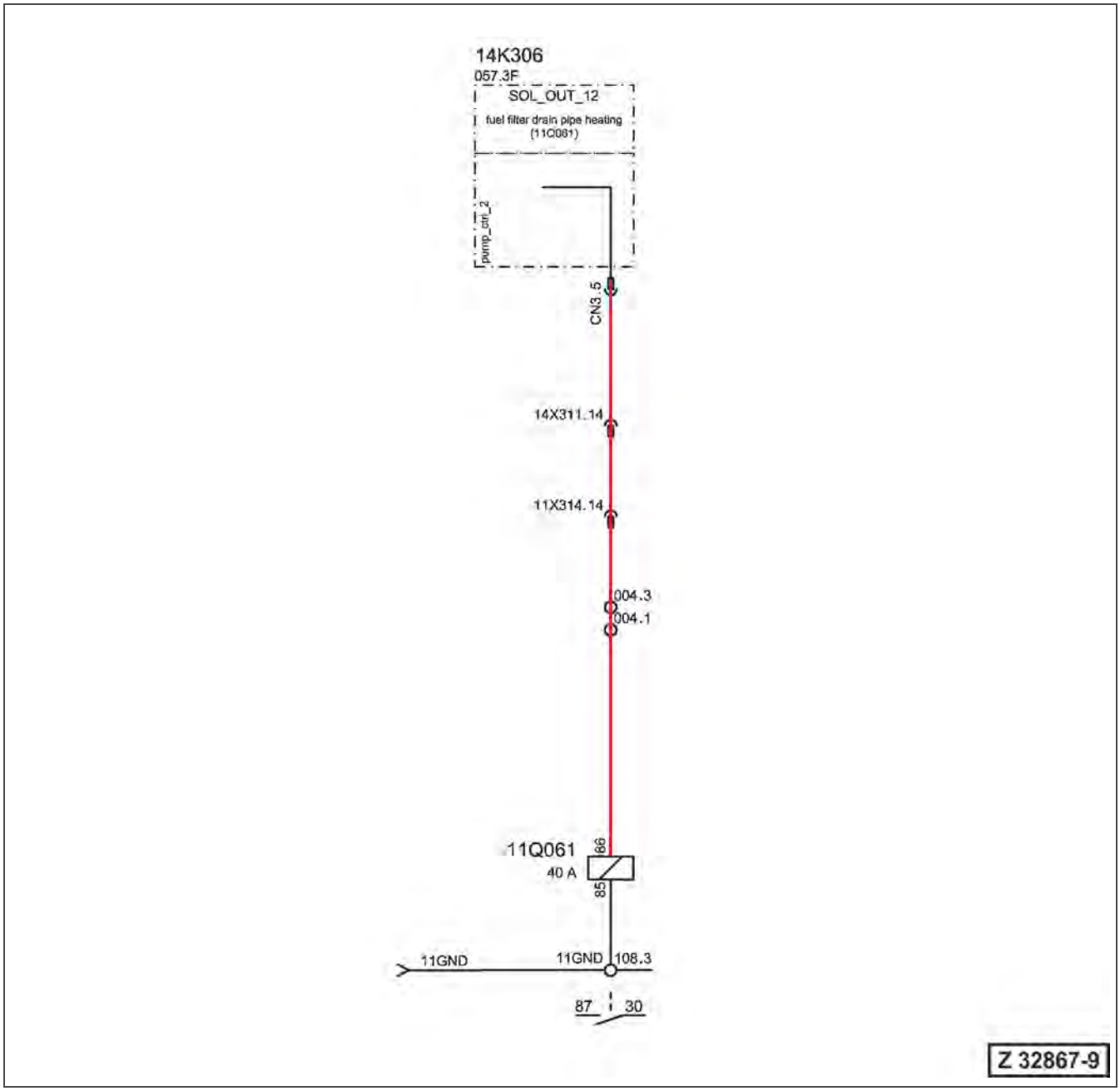


Fig. 6-81 Wiring Diagram for message DCH4KY

Monitoring screen & Wiring Diagram - PWR & GND supply for pump pressure transducers (main pumps 4...6)

[3/3]

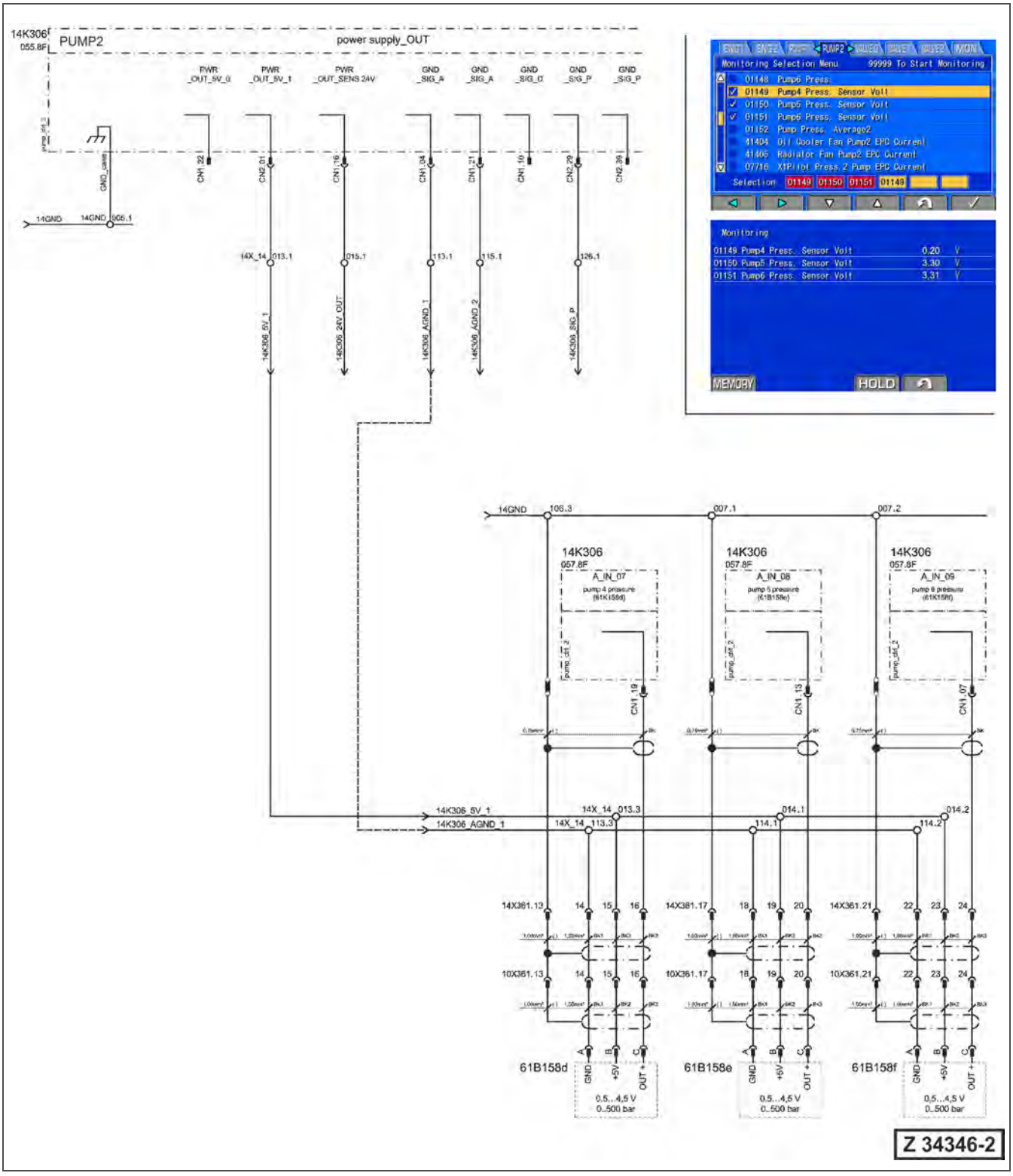


Fig. 6-91 Monitoring screen & Wiring Diagram - PWR & GND supply for pump pressure transducers

Wiring Diagram - right lever front-back potentiometer input (DKUNMA)

[2/2]

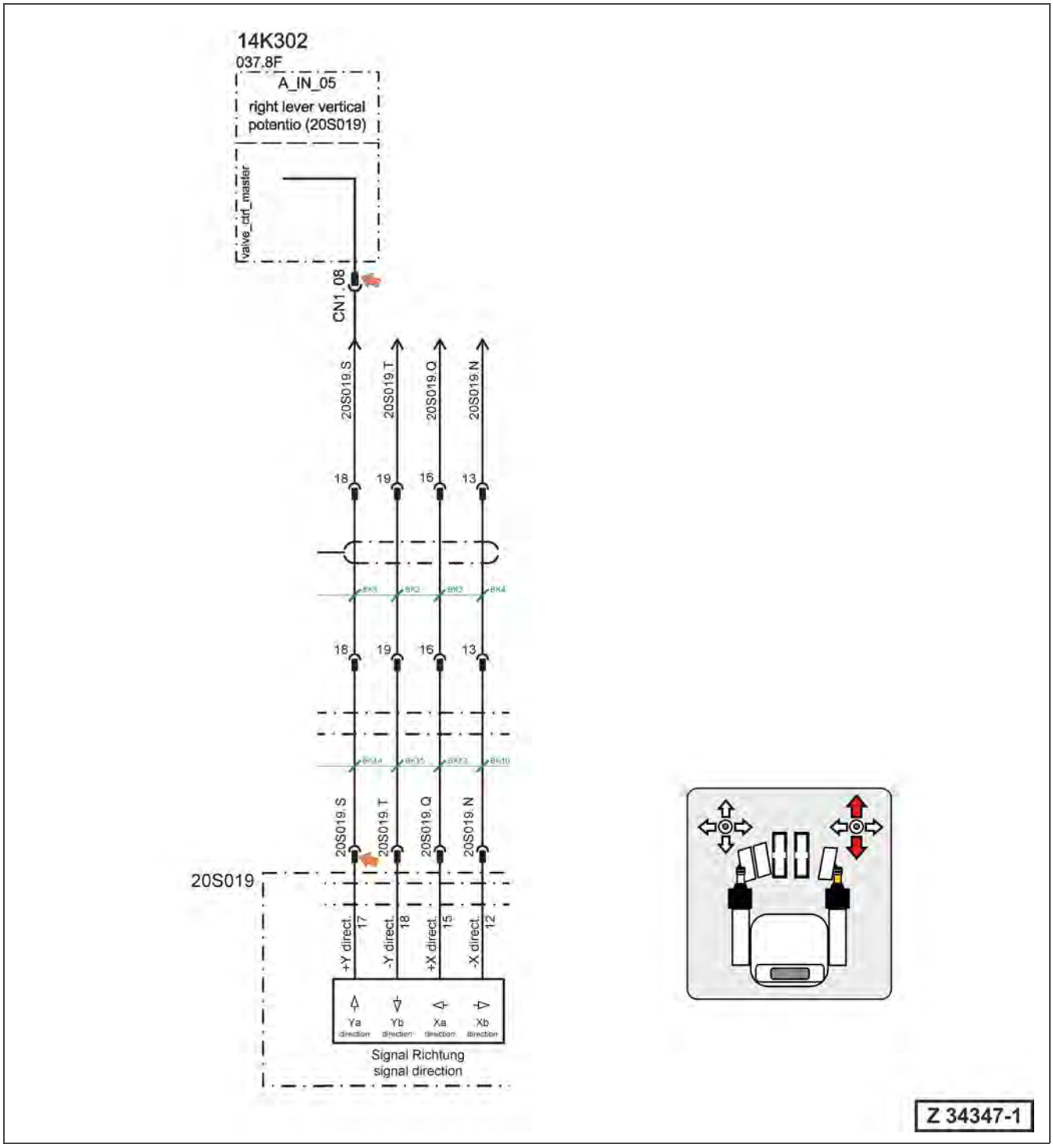


Fig. 6-102 Wiring Diagram - right lever front-back potentiometer input (DKUNMA)

DKW2MA - R pedal redundant pot abnormality(VALVE/M)

[1/2]

Trouble code **DKW2MA**	Trouble	R pedal redundant pot abnormality(VALVE/M)
Contents of trouble	Faulty redundant signal of RH pedal 20S021b detected by VALVE0 controller: - RH pedal redundant travel signal wiring faulty or - Defective pedal	
Related information	–	
Controller / Monitoring	Error detection: VALVE0 controller (14K302), terminal CN1.06 Error condition: Input voltage <0.4V or >4.6V Monitoring: 75214 R Pedal Red. Pot. Volt	
Action of controller	Action code level: L04 Buzzer: continuous sound	
Problem that appears on the excavator	Corresponding excavator control is not operative.	

Possible cause	Step	Test condition & Inspection		Procedure	Nominal value
RH pedal defective	1	▶ Main key switch 22S001 ON.			
		Open *Monitoring* on the machine monitor: Select → VALVE0 controller Select → 75214 Action → Move RH pedal in ↕ direction Monitor → Redundant potentiometer voltage Are the signals OK?	Yes	Signal problem (intermittent). Replace RH pedal.	
			No	Go to next step.	
	Info	Control pedal specification: Supply voltage 5V±0.2V Power input of 5V <40mA each axis Signals Pedal with 2 directions: 1V...2.5V...4V for A 4V...2.5V...1V for B ratiometric* for 5V Pedal with 1 direction: 2.5V...4V 2.5V...1V *ratiometric = Describing any system in which an output is directly proportional to an input.			
Wiring disconnection (including connectors and terminals)	2	▶ Main key switch 22S001 OFF.			
		Check wiring for continuity: - between 14K302 CN1.06 and 20S021b.04	Refer to Wiring Diagram. Locate the problem in the faulty circuit and repair or replace as necessary.		R_{max} 1Ω
Final check	3	Bring the excavator back into the original condition. Start the excavator and verify that the trouble code does not arise again.			

Wiring Diagram - Clam close redundant pot abnorm(VALVE/M) for DKWBMA

[2/2]

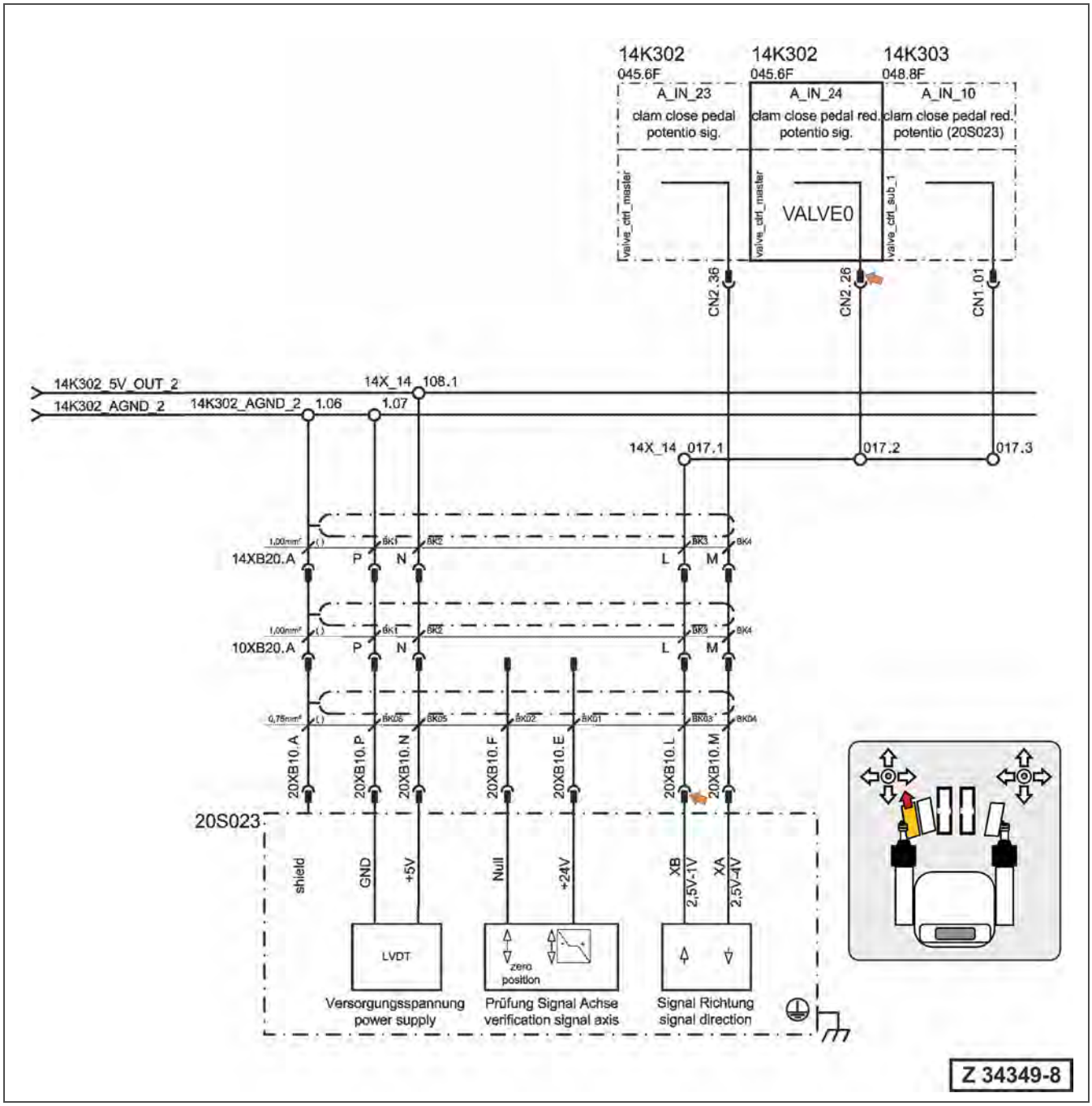


Fig. 6-127 Wiring Diagram - Clam close redundant pot abnorm(VALVE/M) for DKWBMA

DWNQKB - Service arm down solenoid short circuit

Trouble code **DWNQKB**	Message	Service arm down solenoid short circuit
Contents of trouble	Short circuit to GND detected in the loop between VALVE0 controller output CN2.09 and *service arm down* solenoid valve 57Q624b.	
Related information	VALVE0 (14K302) controls the *service arm down* solenoid valve 57Q624b (ON/OFF). In case of short circuit to GND the solenoid valve is permanently de-energized.	
Controller / Monitoring	Error detection: VALVE0 controller (14K302), terminal CN2.09 Error condition: Controller diagnosis system detects overcurrent Monitoring: 02304 Solenoid Valve 1 ServiceArm Down Sol. [ON/OFF]	
Action of controller	Action code level: L01 Buzzer: no sound	
Problem that appears on the excavator	*Service arm down* function is not available because the solenoid is not energized.	

Possible cause	Step	Test condition & Inspection		Procedure	Nominal value
Short circuit to GND in the power leading controller output cable. (including connectors and terminals)	1	▶ Main key switch 22S001 OFF.			
		Take measurements for continuity: Controller output cable: - between VALVE0 CN2.09 and solenoid 57Q624b pin 1 Is wiring continuity OK?	Yes	Go to next step.	R_{max} 1Ω
			No	Refer to Wiring Diagram. Locate the problem in the faulty circuit and repair or replace as necessary.	
Solenoid valve 57Q624b defective. Internal short circuit.	2	▶ Main key switch 22S001 OFF.			
		Disconnect 57Q624b. Measure internal resistance between solenoid terminals 1 and 2.		Replace defective solenoid valve.	$R_{solenoid}$ 20±1 Ω
Final check	3	Bring the excavator back into the original condition. Start the excavator and verify that the trouble code does not arise again.			

Wiring Diagram for EPC 61K630 - 61K631 - 61K632

[6/7]

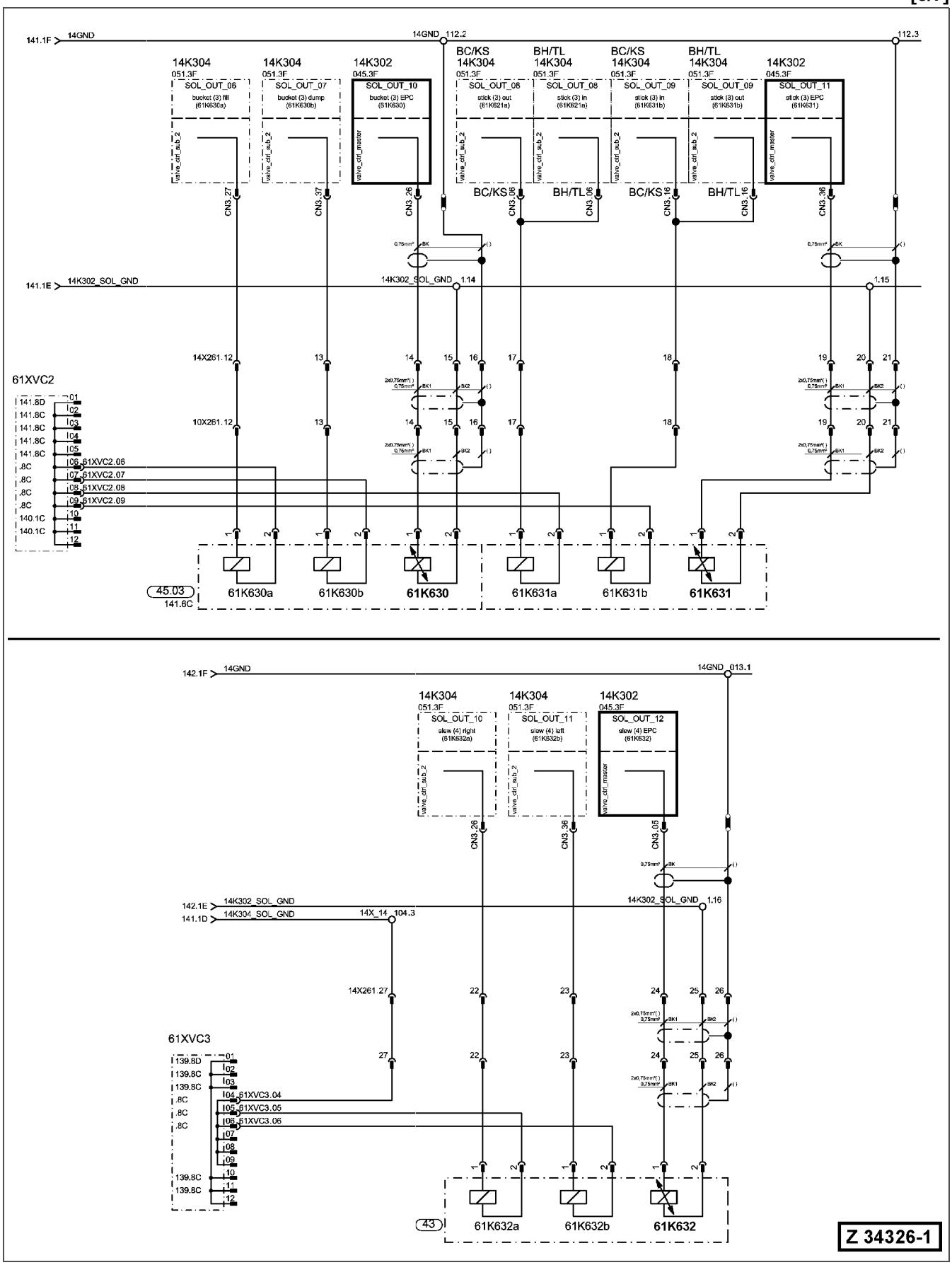
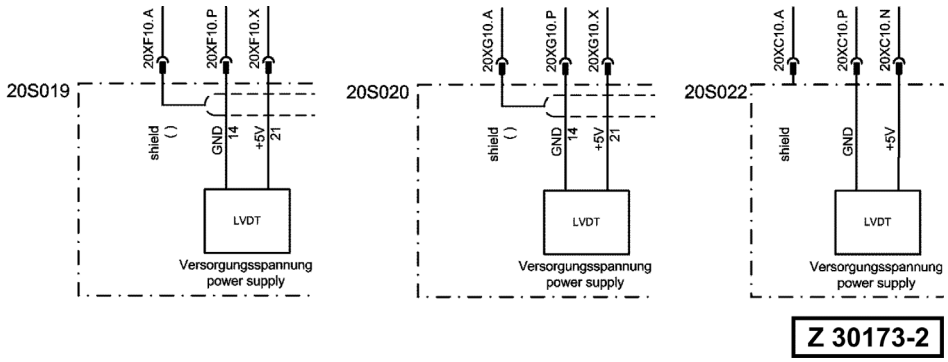


Fig. 6-153 Wiring Diagram for EPC 61K630 - 61K631 - 61K632

DBW5MA - 5V sensor1 power abnormality
DBW6MA - 5V sensor2 power abnormality

[3/5]

<table>
<tr><th>Possible cause</th><th>Step</th><th>Test condition & Inspection</th><th>Procedure</th><th>Nominal value</th></tr>
<tr><td rowspan="2">Sensor1
Hand lever or pedal has a short circuit
20S019 RH lever
20S020 LH lever
20S022 Slew br. pedal</td><td rowspan="2">3</td><td colspan="3">▶ Main key switch 22S001 OFF.</td></tr>
<tr><td colspan="3">DBW5MA - sensor1
 

Z 30173-2</td></tr>
<tr><td colspan="2">Refer to Wiring Diagram.
- Disconnect 20S019
- Measure resistance between 20XF10.P and 20XF10.X
- Disconnect 20S020
- Measure resistance between 20XG10.P and 20XG10.X
- Disconnect 20S022
- Measure resistance between 20XC10.P and 20XC10.N

Resistance should be ~1MΩ.</td><td>If resistance is not as specified, replace defective hand lever or pedal.</td><td>R_{lever_pedal}
1MΩ</td></tr>
</table>

Wiring Diagram - right lever redundant front-back potentiometer input (DKWLMA)

[2/2]

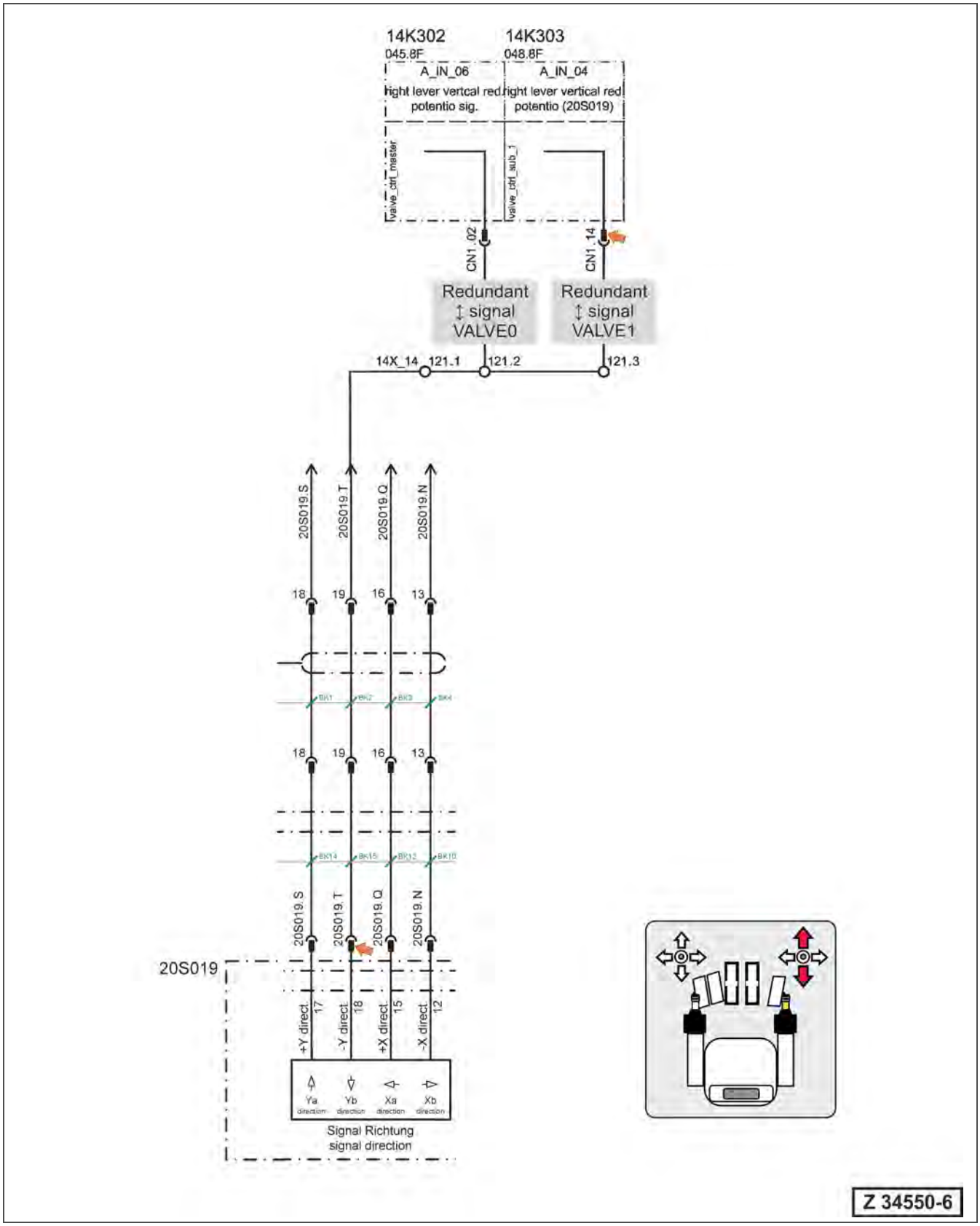


Fig. 6-176 Wiring Diagram - right lever redundant front-back potentiometer input (DKWLMA)

DKX3L4 - Clam close signal mismatch(VALVE/S1 Con)

[1/2]

Trouble code **DKX3L4**	Trouble	Clam close signal mismatch(VALVE/S1 Con)
Contents of trouble	Clam close pedal 20S023: VALVE1 detects pedal signal mismatch between VALVE0 and VALVE1 controller.	
Related information	Signal input at VALVE0 → CN2.26 Signal input at VALVE1 → CN1.01	
Controller / Monitoring	Error detection: VALVE1 controller (14K303) Error condition: Redundant pedal signal at VALVE1 is different (35%) to redundant pedal signal at VALVE0 Monitoring: **VALVE0** controller 75223 Clam Close Pedal Red. Pot. Volt **VALVE1** controller 75242 Clam Close Pedal Red. Pot. Volt	
Action of controller	Action code level: L04 Buzzer: continuous sound	
Problem that appears on the excavator	Corresponding excavator control is not operative.	

Possible cause	Step	Test condition & Inspection		Procedure	Nominal value
Clam close pedal defective	1	▶ Main key switch 22S001 ON.			
		Open *Monitoring* on the machine monitor: Select → VALVE0 controller Select → 75223 Select → VALVE1 controller Select → 75242 Action → Press 20S023 in close direction Monitor → Redundant potentiometer voltage at VALVE0 and VALVE1 Is redundant potentiometer voltage the same (±20mV) at both controllers?	Yes	Signal problem (intermittent). Replace clam close pedal.	
			No	Go to next step.	
	Info	Control pedal specification: Supply voltage 5V±0.2V Power input of 5V <40mA each axis Signals Pedal with 2 directions: 1V...2.5V...4V for A 4V...2.5V...1V for B ratiometric* for 5V Pedal with 1 direction: 2.5V...4V 2.5V...1V *ratiometric = Describing any system in which an output is directly proportional to an input.			
Wiring disconnection (including connectors and terminals)	2	▶ Main key switch 22S001 OFF.			
		Check the wiring for continuity: 1) between 14K302 CN2.26 and 20XB10.L 2) between 14K303 CN1.01 and 20XB10.L	Refer to Wiring Diagram. Locate the problem in the faulty circuit and repair or replace as necessary.		R_{max} 1Ω
Final check	3	Bring the excavator back into the original condition. Start the excavator and verify that the trouble code does not arise again.			

Wiring Diagram and monitoring screen for message DWASKB

[2/2]

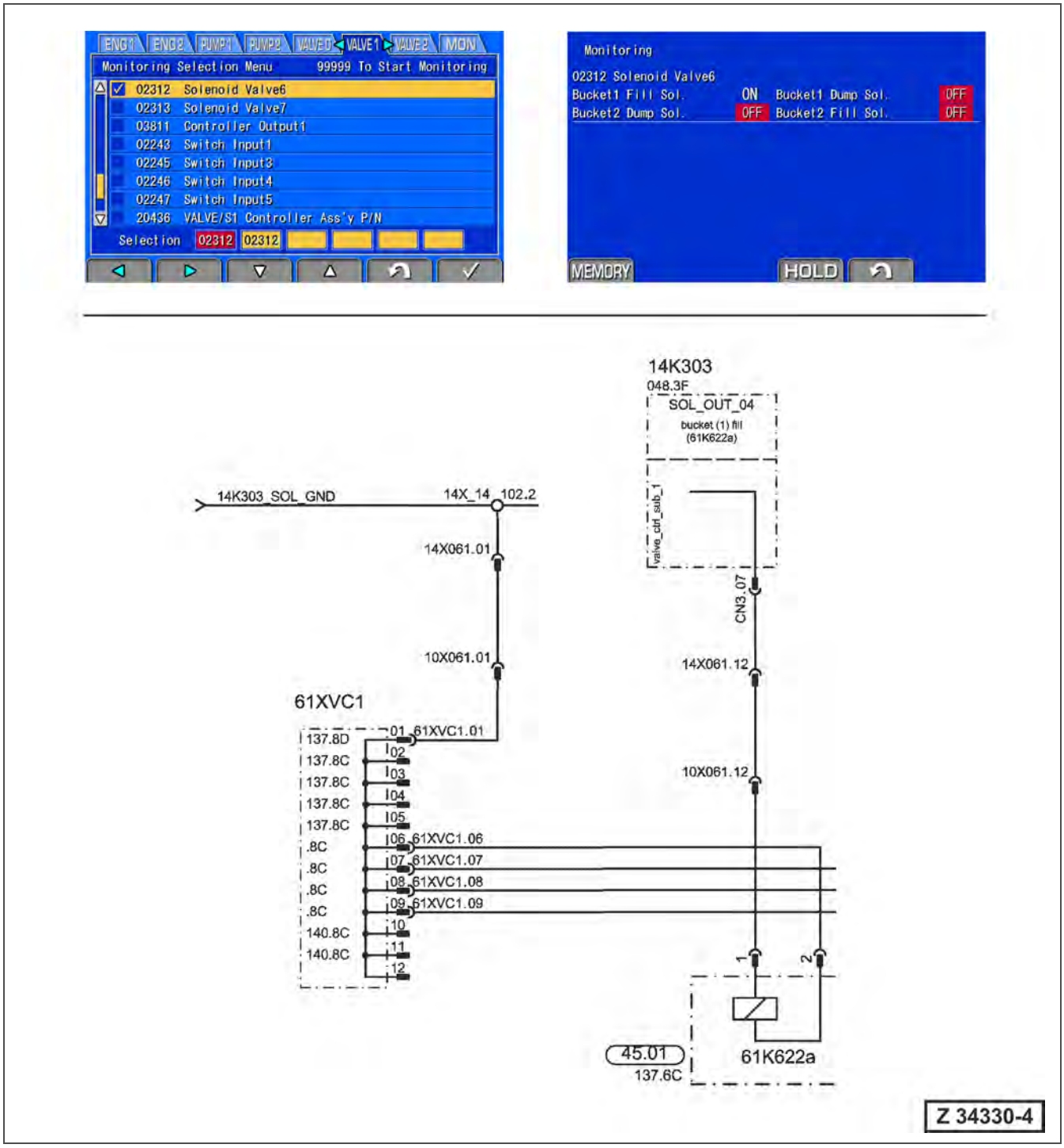


Fig. 6-201 Wiring Diagram and monitoring screen for message DWASKB

DWBEKY - Boom1 down solenoid hot short circuit

[1/2]

Trouble code **DWBEKY**	Trouble	Boom1 down solenoid hot short circuit
Contents of trouble	The boom1 down solenoid loop has a hot short circuit between VALVE1 controller output CN3.37 and solenoid 61K623b.	
Related information	If the failure code is set, the controller stops this function.	
Controller / Monitoring	Error detection: VALVE1 controller (14K303), terminal CN3.37 Error condition: Controller diagnosis system detects inverse voltage >3.5V Monitoring: 02310 Solenoid Valve4 Boom1 Down Sol. [ON/OFF]	
Action of controller	Action code level: L03 Buzzer: intermittent sound	
Problem that appears on the excavator	Boom1 down solenoid function is not available because the controller stops the function.	

Possible cause	Step	Test condition & Inspection	Procedure	Nominal value
Hot short circuit in the power leading controller output line (external power feed in)	1	▶ Main key switch 22S001 OFF and ON		
		Take 2 measurements at the controller output cable between CN3.37 and solenoid valve 61K623b: 1) Disconnect the cable and check for continuity (22S001 OFF). 2) In the disconnected cable check for external power feed in (22S001 ON). Wrong cable connection or contact to PWR is likely.	Refer to Wiring Diagram. Locate the problem in the faulty circuit and repair or replace as necessary.	R_{max} 1Ω $PWR_{Feed\ in}$ 0V
Final check	2	Bring the excavator back into the original condition. Start the excavator and verify that the trouble code does not arise again.		

Wiring Diagram (FSA) and monitoring screen for message DWBBKA

[3/3]

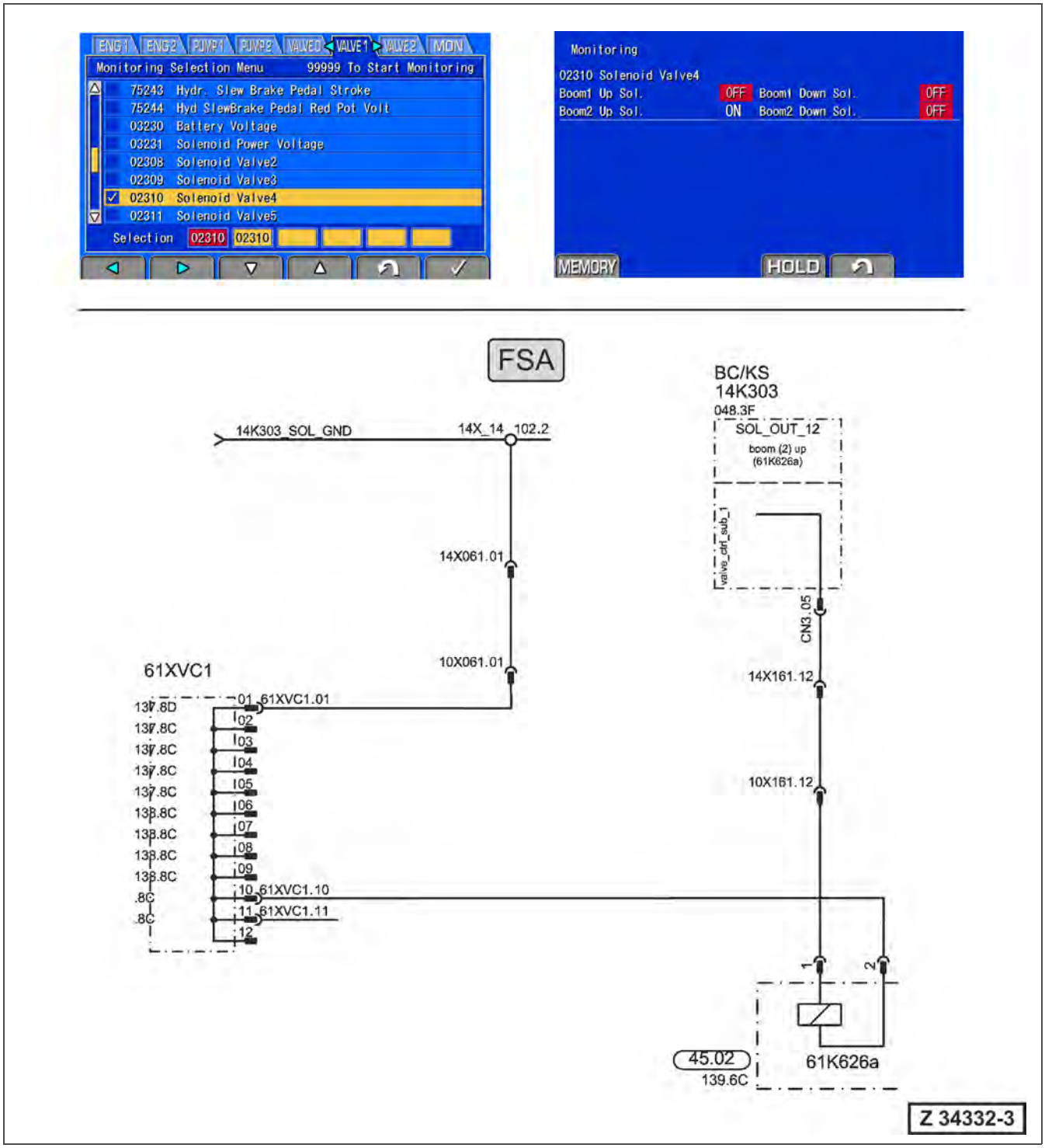


Fig. 6-227 Wiring Diagram (FSA) and monitoring screen for message DWBBKA

DWBTKB - Clam2 open solenoid short circuit

[1/2]

Trouble code **DWBTKB**	Trouble	Clam2 open solenoid short circuit
Contents of trouble	Short circuit to GND detected in the circuit between VALVE1 controller output CN3.16 and solenoid 61K624b.	
Related information	In case of short circuit solenoid 61K624b is permanently de-energized.	
Controller / Monitoring	Error detection: VALVE1 controller (14K303), terminal CN3.16 Error condition: Controller diagnosis system detects overcurrent Monitoring: 02309 Solenoid Valve3 Clam2 Open Sol. [ON/OFF]	
Action of controller	Action code level: L04 Buzzer: continuous sound	
Problem that appears on the excavator	Clam2 open solenoid function is not available because the solenoid is permanently de-energized (FSA only).	

Possible cause	Step	Test condition & Inspection		Procedure	Nominal value
Short circuit to GND in the power leading controller output cable (including connectors and terminals)	1	▶ Main key switch 22S001 OFF.			
		Check controller output cable for continuity: - between VALVE1 CN3.16 and solenoid 61K624b pin 1 Is wiring continuity OK?	Yes	Go to next step.	R_{max} 1Ω
			No	Refer to Wiring Diagram. Locate the problem in the faulty circuit and repair or replace as necessary.	
Solenoid 61K624b defective. Internal short circuit.	2	▶ Main key switch 22S001 OFF.			
		Disconnect 61K624b. Measure internal resistance between solenoid terminals 1 (PWR) and 2 (GND).		Replace defective solenoid valve.	$R_{solenoid}$ 30±1 Ω
Final check	3	Bring the excavator back into the original condition. Start the excavator and verify that the trouble code does not arise again.			

Wiring Diagram and monitoring screen for message DWAXKY

[2/2]

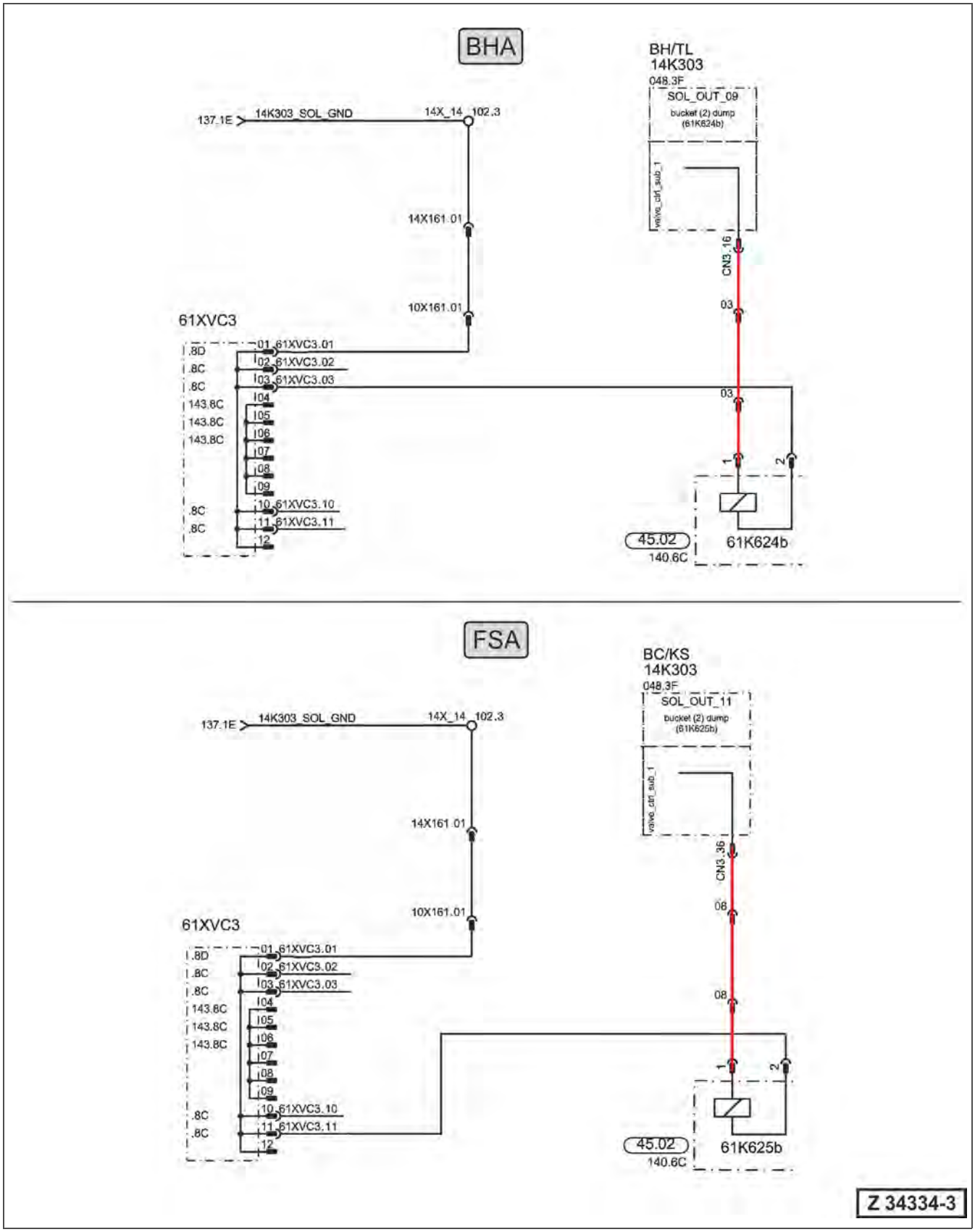


Fig. 6-255 Wiring Diagram and monitoring screen for message DWAXKY

Wiring Diagram 2 for message DBX2KK - PPC safety circuit

[3/3]

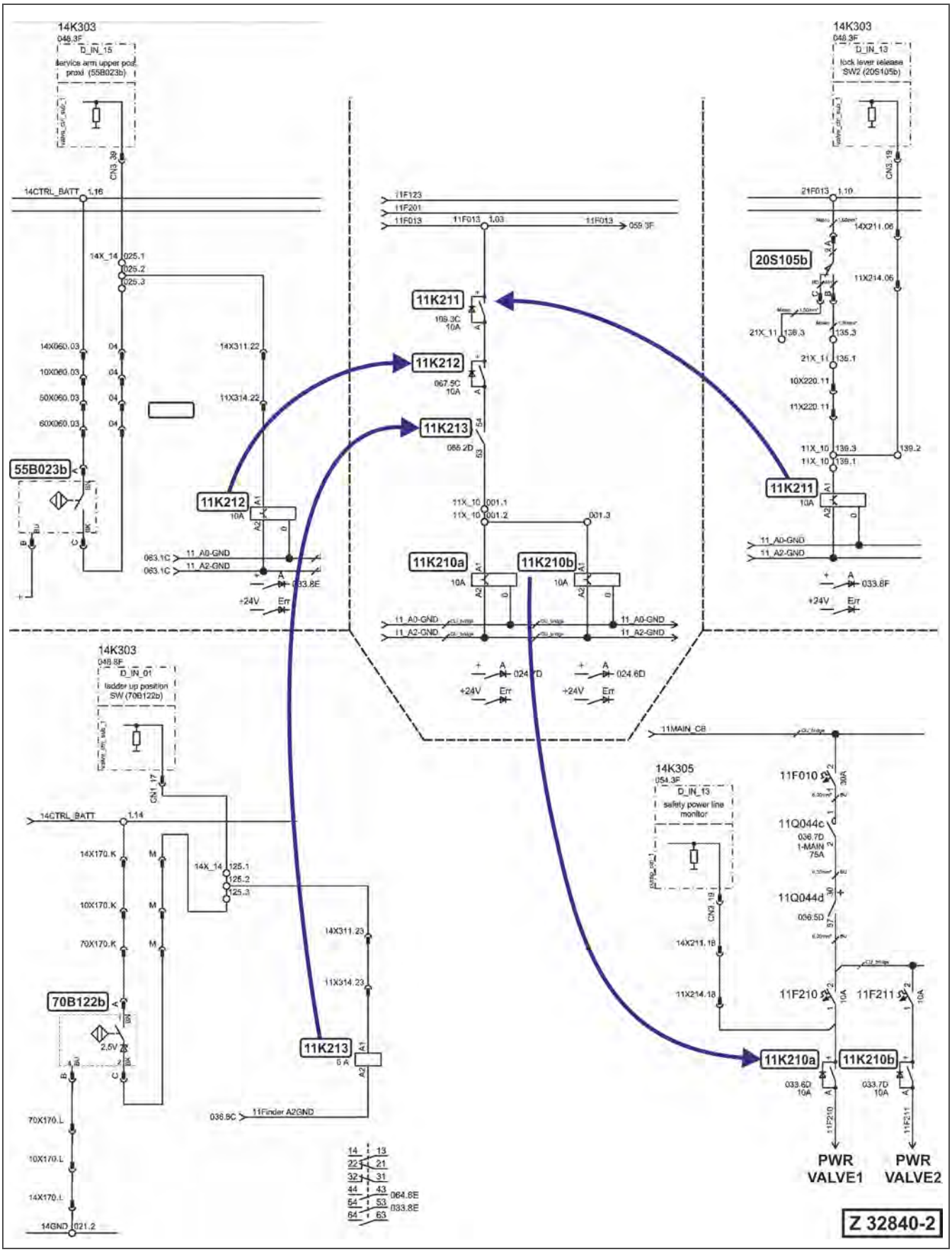


Fig. 6-268 Wiring Diagram 2 for message DBX2KK - PPC safety circuit

Wiring Diagram and monitoring screen for message DWBCKY

[2/2]

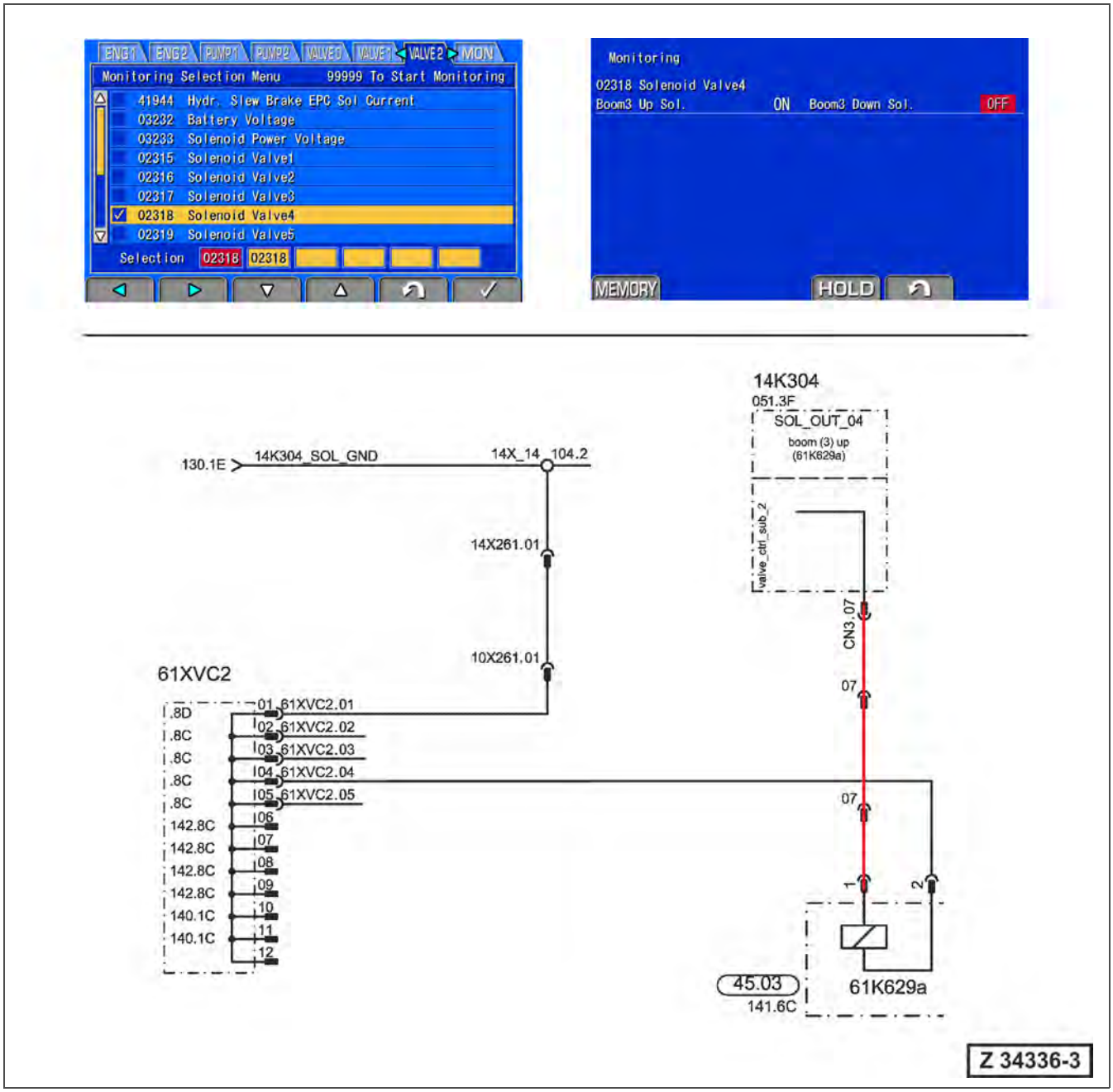


Fig. 6-281 Wiring Diagram and monitoring screen for message DWBCKY

DWKQKB - Travel3 right backward sol. short circuit

[1/2]

Trouble code	Trouble	Travel3 right backward sol. short circuit
DWKQKB		
Contents of trouble	Short circuit to GND detected in the circuit between VALVE2 controller output CN3.28 and solenoid 61K628a.	
Related information	In case of short circuit solenoid 61K628a is permanently de-energized.	
Controller / Monitoring	Error detection: VALVE2 controller (14K304), terminal CN3.28 Error condition: Controller diagnosis system detects overcurrent Monitoring: 02316 Solenoid Valve2 Travel3 Right Bwd. Sol. [ON/OFF]	
Action of controller	Action code level: L04 Buzzer: continuous sound	
Problem that appears on the excavator	Travel3 right backward solenoid function is not available because the solenoid is permanently de-energized.	

Possible cause	Step	Test condition & Inspection		Procedure	Nominal value
Short circuit to GND in the power leading controller output cable (including connectors and terminals)	1	▶ Main key switch 22S001 OFF.			
		Check controller output cable for continuity: - between VALVE2 CN3.28 and solenoid 61K628a pin 1 Is wiring continuity OK?	Yes	Go to next step.	R_{max} 1Ω
			No	Refer to Wiring Diagram. Locate the problem in the faulty circuit and repair or replace as necessary.	
Solenoid 61K628a defective. Internal short circuit.	2	▶ Main key switch 22S001 OFF.			
		Disconnect 61K628a. Measure internal resistance between solenoid terminals 1 (PWR) and 2 (GND).		Replace defective solenoid valve.	$R_{solenoid}$ 30±1 Ω
Final check	3	Bring the excavator back into the original condition. Start the excavator and verify that the trouble code does not arise again.			

Wiring Diagram and monitoring screen for message DXEDKB

[2/2]

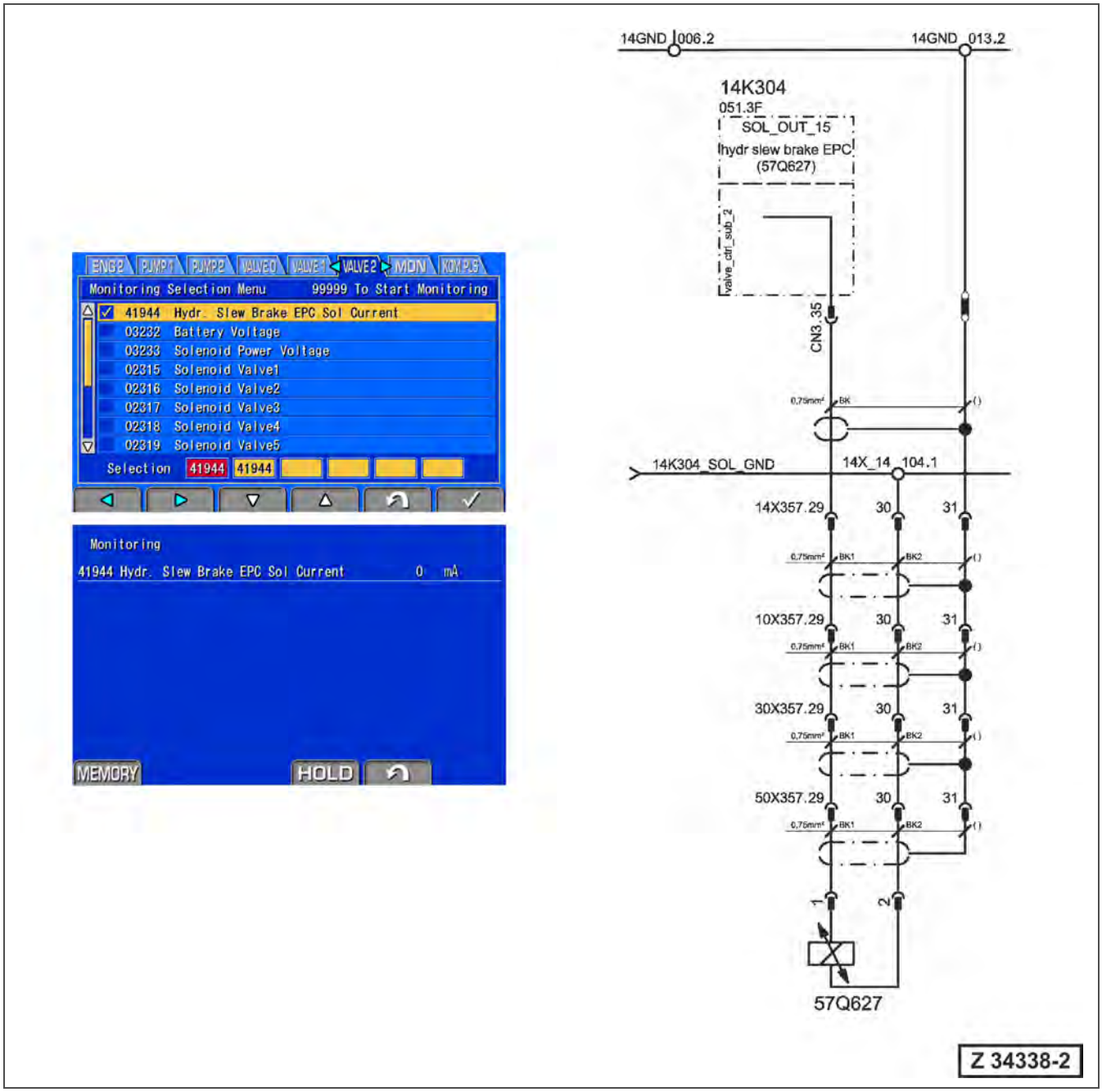


Fig. 6-308 Wiring Diagram and monitoring screen for message DXEDKB

Wiring Diagram and monitoring screen for message DBY0KQ

[2/2]

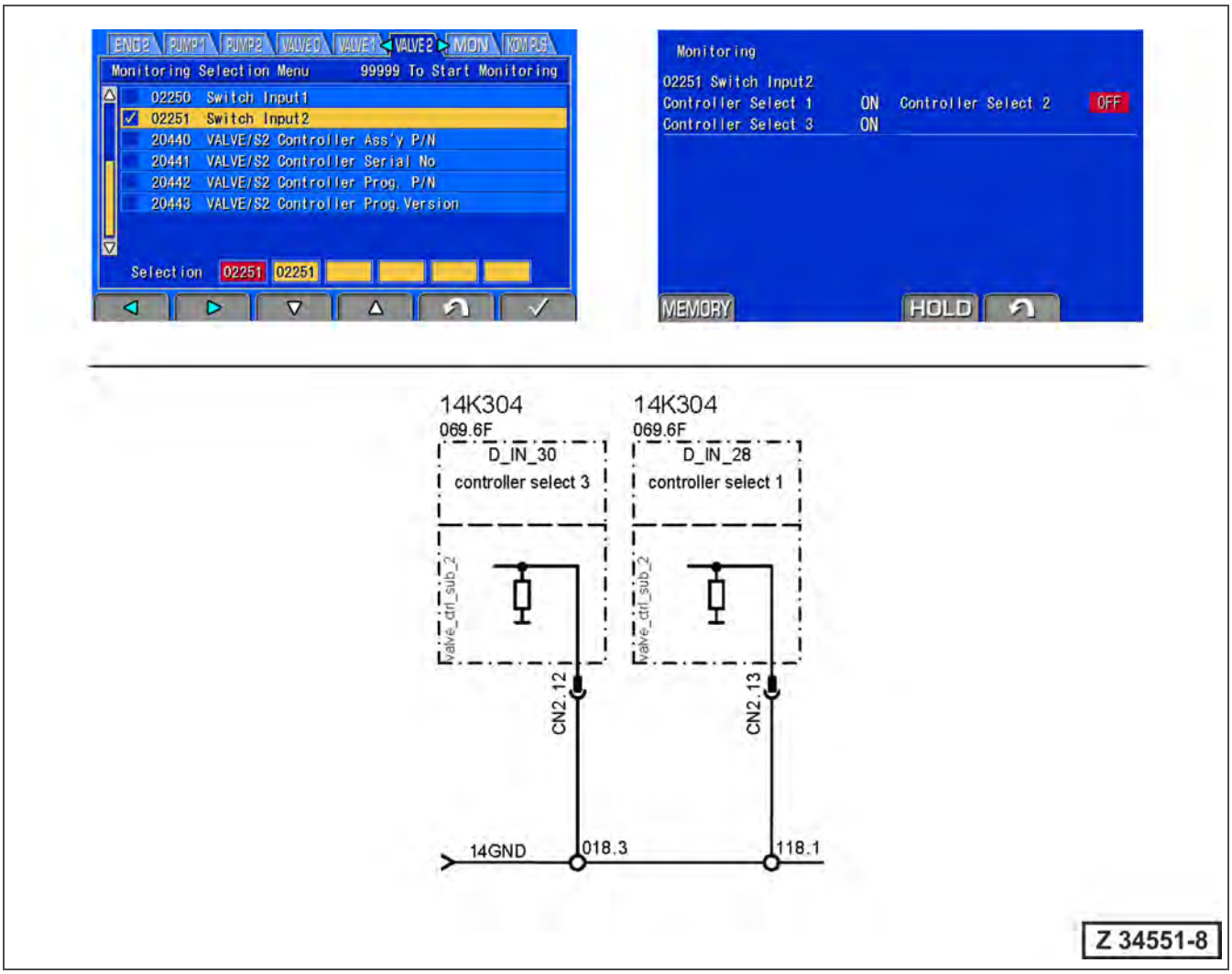


Fig. 6-321 Wiring Diagram and monitoring screen for message DBY0KQ

Wiring Diagram and monitoring screen for message DJE6L4

[2/2]

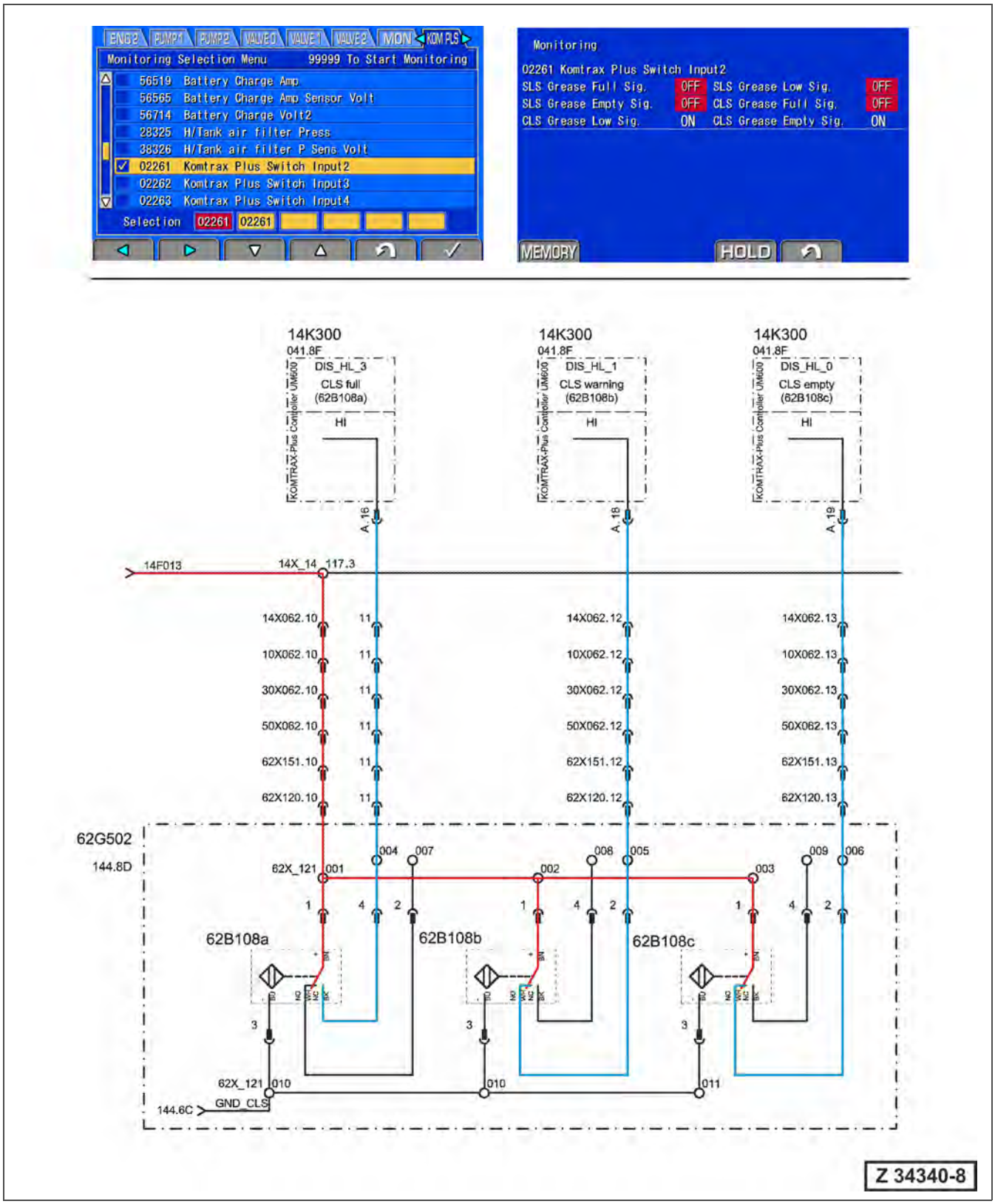


Fig. 6-334 Wiring Diagram and monitoring screen for message DJE6L4

DB2QKR - CAN2 Discon (Engine Con)

[1/3]

Trouble code **DB2QKR**	Message	CAN2 Discon (Engine Con)
Contents of trouble	- CAN2 disconnection detected between engine1 controller (52K014-1) and monitor (22P047). - Real time monitoring of Quantum data is not possible due to CAN2 disconnection.	
Related information	**Definition for CAN0 and CAN2** Unfortunately there is a discrepancy between Trouble Message and Wiring Diagram. → **CAN2 in a trouble message is CAN0 in the Wiring Diagram** When troubleshooting, please consider that CAN2 in the Wiring Diagram is for MMS only.	
Controller / Monitoring	Error detection: MON (22P047) Error condition: Monitor CAN2 port detects no CAN communication from engine1 controller. Monitoring: –	
Action of controller	Action code level: L03 Buzzer: intermittent sound	
Problem that appears on the excavator	ENG1 controller fault codes and monitoring items are not displayed on the machine monitor.	

Possible cause	Step	Test condition & Inspection		Procedure	Nominal value
CAN2 wiring disconnection (including connectors and terminals)	1	▶ Main key switch 22S001 OFF.			
		Check CAN2 wiring (H) & (L) for proper connections and continuity: - from 52K014-1 connector X021 - via CAN2 to machine monitor 22P047 ▶ See the CAN2 overview in following illustration. Can you confirm CAN2 disconnection?	Yes	Refer to Wiring Diagram. Locate the problem in the faulty circuit and repair or replace as necessary.	$R_{wire\ max}$ 1Ω $R_{end\ resistor}$ 120Ω
			No	Go to next step.	
No PWR supply at engine1 controller 52K014-1	2	▶ Main key switch 22S001 ON.			
		Check voltage in the PWR line (24V) - from 11F124-1 - via 11K124a-1 - to engine1 controller 52K014-1 - and GND connection to 11GND (including connectors and terminals)		- Refer to Wiring Diagram. - Locate the problem in the PWR / GND line and repair or replace as necessary.	V_{PWR} 24V
Final check	3	Bring the excavator back into the original condition. Start the excavator and verify that the trouble code does not arise again.			

Wiring Diagram for message DAFLKA

[2/2]

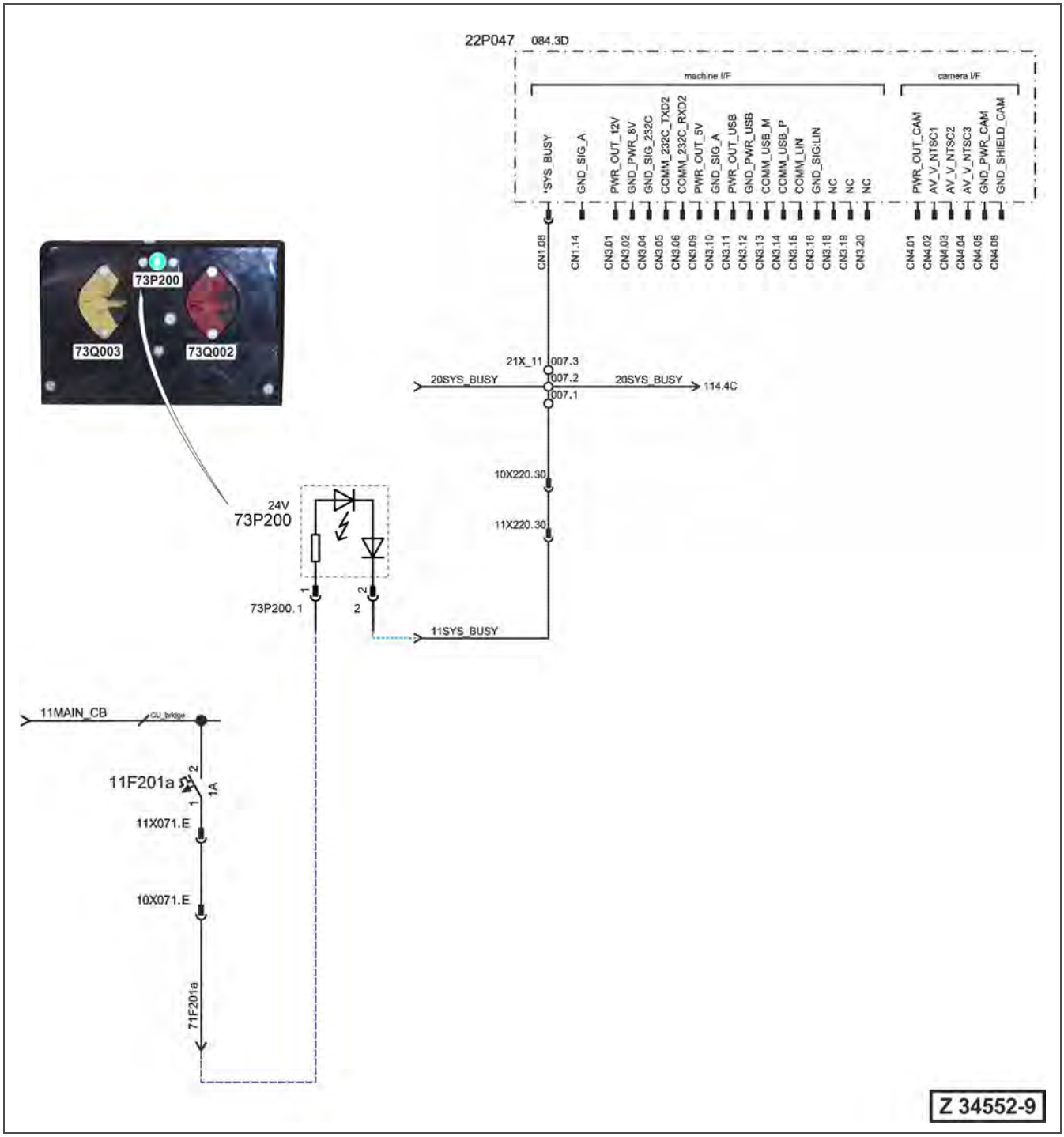


Fig. 6-360 Wiring Diagram for message DAFLKA

DBPLKA - Operating Lamp Open Circuit (KomVision)

[1/2]

Trouble code **DBPLKA**	Message	Operating Lamp Open Circuit (KomVision)
Contents of trouble	Disconnection between KomVision controller CN2.10 (SYS_BUSY), system operating lamp (73P200), and 24V PWR supply.	
Related information	The system operating lamp (73P200) between switches 73Q002 and 73Q003 is monitored by the system. If the control light circuit is open, the fault code is saved only (no fault indication).	
Controller / Monitoring	Error detection: KomVision controller (23K310) terminal CN2.10 Error condition: Controller diagnosis system detects open circuit Monitoring: –	
Action of controller	Action code level: L0a (is not displayed, only saved in the error history) Buzzer: no sound	
Problem that appears on the excavator	System operating lamp not operative	

Possible cause	Step	Test condition & Inspection	Procedure	Nominal value
Wiring disconnection in - loop 71F201a between circuit breaker 11F201a and control light 73P200 - or in the loop between control light and KomVision controller CN2.10 (including connectors, and terminals)	1	▶ Main key switch 22S001 OFF		
		Check the circuit for continuity and proper connections.	Refer to Wiring Diagram. Locate the disconnection in the harness and repair or replace as necessary.	R_{max} 1Ω
Final check	2	Bring the excavator back into the original condition. Start the excavator and verify that the trouble code does not arise again.		

SEL009 - Fuel consumption is excessive

Judgment Table for SEL009				Causes			
Legend O : Possible causes (judging from Questions & Check Items) ◙ : Most probable causes (judging from Questions & Check Items) ◊ : Possible causes due to length of use (used for a long period) ● : Items to confirm the cause				Defective fuel pump	Defective injector holder, spray	External leakage at fuel piping, fuel filter	Fuel leakage inside the cylinder head
Questions	Confirm the recent repair history						
	Degree of use of the excavator		Operated for a long period		◊		
	Condition of fuel consumption	More than other excavators of same model		◙			
		Gradually increased			O		
		Suddenly increased				O	O
Check items	Exhaust smoke colour		Black	◙	O		
			White				O
	Seal on injection pump has come off			◙			
	There is irregular combustion				◙		
	When touching the exhaust manifolds immediately after engine start, the temperature of some cylinders is low.				◙		
	External fuel leakage at the engine					◙	
	Engine oil level rises and smells of Diesel fuel			O			◙
	Engine low idle speed is high			O			
Trouble-shooting	Remove cylinder head cover and inspect directly						●
			Remedy	Adjust	Replace	Correct	Correct

SHY014 - Stairway does not move, or slow movement

[1/2]

Trouble code	Trouble	Stairway does not move, or slow movement
SHY014		
Contents of trouble	Stairway does not move when function "*stairway up*" or "*stairway down*" is requested, or stairway movement is too slow.	
Related information	- Electrical function of this circuit is already tested and OK. - Stairway pressure supply is charged by X4 pressure (60 bar). - A 70 bar SRV is mounted in the stairway circuit.	
Problem that appears on the excavator	Stairway does not move when function "*stairway up*" or "*stairway down*" is requested, or stairway movement is too slow.	
Possible causes	1) No or too low X4 pressure. 2) Too low SRV pressure, or valve defective. 3) Valve 57Q623a/b is mechanically stuck. 4) Stairway cylinder has an internal leakage (piston seal defective). 5) Stairway bearing defective or it is tightened too firmly.	

Possible cause	Step	Test condition & Inspection		Procedure	Nominal value
No or too low X4 pressure	1	▶ Engines running at high idle (TH3).			
		Check X4 pressure according to instructions and specifications in SHOP MANUAL chapter 10 and in PM CLINIC sheets. Is X4 pressure adjustment correct?	Yes	Go to next step.	p_{X4}= 60bar SHOP MANUAL chapter 10 PM CLINIC
			No	Re-adjust and check for proper stairway function.	
Too low SRV pressure or valve defective	2	▶ Engines running at low idle.			
		Check SRV pressure in stairway circuit according to instructions and specifications in SHOP MANUAL chapter 10. Is SRV pressure adjustment correct?	Yes	Go to next step.	p_{SRV}= 70bar SHOP MANUAL chapter 10
			No	Replace SRV in stairway circuit.	
Valve 57Q623a or 57Q623b mechanically stuck	3	▶ Main key switch 22S001 OFF & Maintenance safety switch 50S058 locked.			
		Disassemble solenoid valve 57Q623a/b and check the inner spool part for proper condition and function. Is mechanical spool inlet OK?	Yes	Go to next step.	
			No	Replace valve 57Q623a/b.	
Stairway cylinder has an internal leakage (piston seal defective)	4	▶ Engines running at high idle (TH3).			
		- Activate function "*stairway up*" or "*stairway down*" until cylinder end position is reached.	Yes	Repair or replace stairway cylinder.	
		- Using an infrared temperature gun measure temperature difference between cylinder rod and cylinder bottom side. Do you measure a temperature difference of more than 15°C?	No	Go to next step.	

SME009 - Abnormal noise coming from work equipment (lack of grease)

Possible cause	Step	Test condition & Inspection		Procedure	Nominal value
Contaminated grease is used (grease container refilling without refilling filter)	2	▶ Main key switch 22S001 OFF.			
		- Pins & bushings & injectors are worn out due to contaminated grease in the container. - No or not enough grease causes early wear and noise at pins and bushings of attachment. Are pins and bushings worn out due to missing grease and defective injectors?	Yes	- Replace contaminated grease by specified grease. - Clean or replace container as necessary. - Replace defective pins and bushings on attachment side. - Check all grease injectors for proper function. - In case of damage replace all injectors. - Pre-lubricate all pins and bushings through the injectors until new grease flows out.	
			No	Go to next step.	
Daily fault messages of CLS1/2 system occur	3	▶ Main key switch 22S001 ON. For repair main key switch OFF & maintenance safety switch locked			
		- Download history data via KOMTRAX+ and check system status. - Check history data for fault codes of the grease systems.		- Repair or replace any defective parts of CLS1/2 as necessary. - Replace defective pins and bushings on the attachment side (standardization). - Check all grease injectors for proper function. - Pre-lubricate all pins and bushings through the injectors until new grease flows out.	
Final check	4	Bring the excavator back into original condition. Start the excavator and verify that repair was successful.			

1.4 PROCEDURES FOR DISASSEMBLING AND ASSEMBLING IN THIS MANUAL

– The procedures for disassembling and assembling which are given in this manual correspond to state of the technology at the time of press date.
– Modifications of shown components are possible prior notice.
– Working steps may include steps or procedures that must be carried out prior to the described steps, i.e. removing a cover to gain access to the shown component.

Disassembling of the roof cover plate engine *1/2* (Fig. 3-5, Pos. 3 or 4):

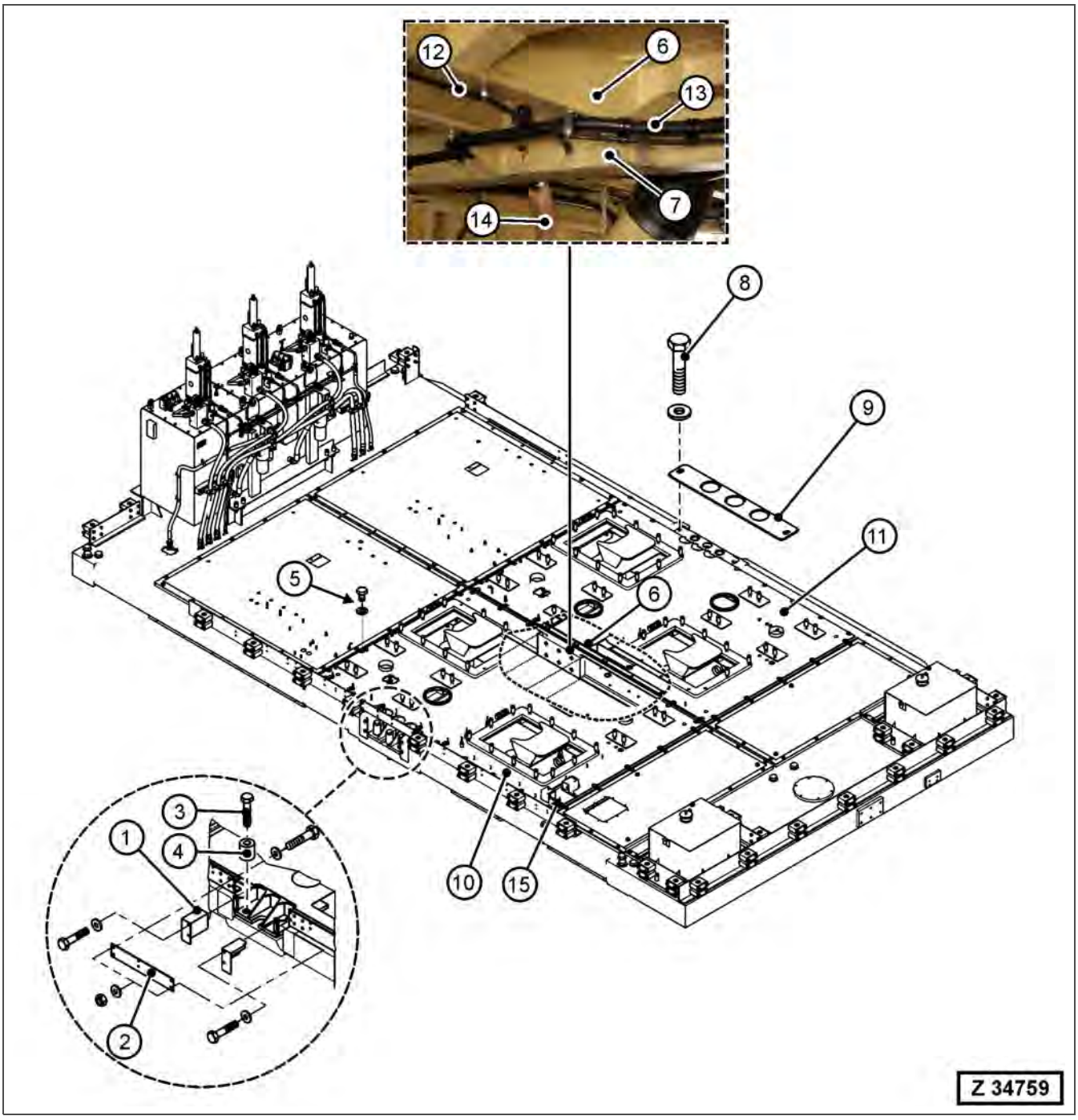


Fig. 3-9

The roof cover plates *engine 1/2* (Fig. 3-9, Pos. 10 & 11) are reinforced from below with bracings and a bar (Fig. 3-9, Pos. 6), which are mounted ever with six bolts at the frame work and the machinery house post.

1. Remove the air intake system, refer to section 3.2.3.1 on page 3-38 from the corresponding roof cover plate. Also disconnect the dedusting hose (Fig. 3-9, Pos. 14) from the corresponding roof cover plate.

2. Clear the wire harnesses (Fig. 3-9, Pos. 12) of the air intake system from the corresponding roof cover plate and the bar (Fig. 3-9, Pos. 6).

3. Clear the wire harnesses (Fig. 3-9, Pos. 13) at the bar's mounting flanges (see detail in Fig. 3-9).

4. Disconnect and clear the lines of the cold start system from the corresponding roof cover plate.

3.2.3 AIR INTAKE SYSTEM

The air intake system consists of the engine air cleaners with the air intake pipes, and of the air duct on the machinery house.

3.2.3.1 DISASSEMBLING OF THE AIR INTAKE SYSTEM

Special tools:	n/a
Additional equipment:	Crane
	Engine air cleaner: 190 kg
	Dogman/rigger

1. Prepare an area of flat ground large enough to accommodate the machine and the additional working equipment (crane, mobile working platforms, forklift, etc.).

2. Park the machine on the prepared flat ground area.

REMARKS: If the ground condition is too poor to guarantee safe and stable stand of the machine and the additional working equipment (crane, mobile working platforms, forklift, etc.), make sure that the machine is moved to any location with appropriate ground condition.

3. Isolate the excavator, refer to section 2.3.8 on page 2-10.

Disassembling of the air intake pipes and the engine air cleaners:

⚠ WARNING

HOT MACHINE PARTS!

Coming in contact with hot machine parts may result in personal injury.

Do not carry out the following work on a hot engine.
Wait until the temperature of the engine is below 50°C.

At engine cylinder bank 1 (front) only:

4. Open the hose clamps (Fig. 3-37, Pos. 1) and remove the elbow (Fig. 3-37, Pos. 2).

5. Open the pipe clamps (Fig. 3-37, Pos. 5) and remove the elbow (Fig. 3-37, Pos. 6) from the air intake pipe (Fig. 3-37, Pos. 3); and from the turbo charger if required.

6. Dismount the nuts of the U-bolt (Fig. 3-37, Pos. 4) at the machinery house roof and remove the air intake pipe (Fig. 3-37, Pos. 3).

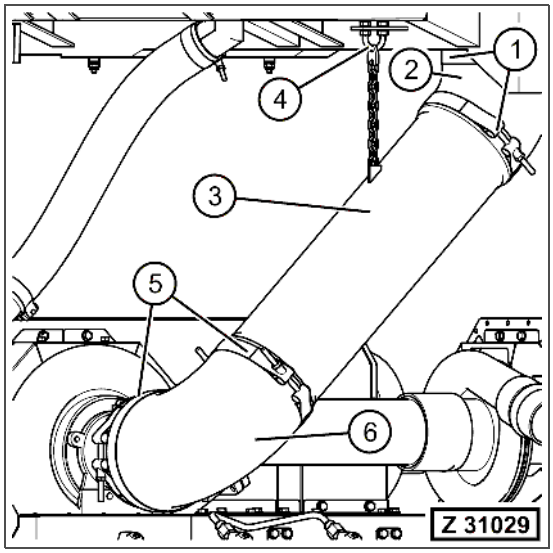


Fig. 3-37

3.2.5.4 ASSEMBLING OF THE ALTERNATOR

Special tools:	n/a
Additional equipment:	Belt tension gauge Alignment chart (steel ruler)
kg	Alternator: 39 kg
★	If there is nothing mentioned explicitly, tighten all bolts according to KOMATSU company standard, refer to section 6.5 on page 6-10.

REMARKS: Carry out assembling in reverse order of disassembling.
A second person is required to assemble the alternator.

1. Assemble the alternator (Fig. 3-85, Pos. 1) and the mounting bolt (Fig. 3-85, Pos. 2).
2. Install the drive belt.
3. Tense the drive belt and fasten the bolt (Fig. 3-85, Pos. 4) at the tensioner (Fig. 3-85, Pos. 3).

REMARKS: For further information regarding belt's tension refer to the Engine OPERATION & MAINTENANCE MANUAL.

4. Fasten the mounting bolt (Fig. 3-85, Pos. 2).

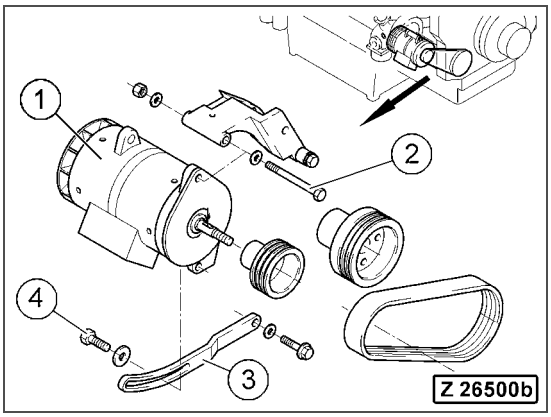


Fig. 3-85

5. Reconnect the grounding cable (Fig. 3-86, Pos. 2) at the alternator (Fig. 3-86, Pos. 3).
6. Reconnect and attach the wire harnesses (Fig. 3-86, Pos. 1) at the alternator (Fig. 3-86, Pos. 3).
7. Assemble the alternator belt guard (Fig. 3-86, Pos. 4).

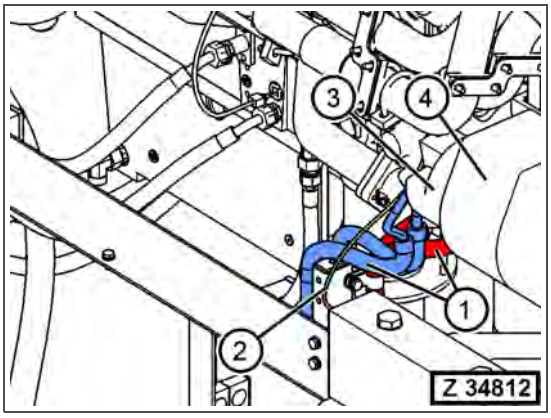


Fig. 3-86

8. Check the alignment of the pulleys using an alignment chart.

REMARKS: For the correct belt tension and use of the belt tension gauge, refer to the Engine OPERATION & MAINTENANCE MANUAL and the User Instructions delivered together with the belt tension gauge.

9. Check charging current of the new alternator.

7. Sling the coupling adapter (Fig. 3-123, Pos. 3) and attach a chain hoist.
8. Disassemble the bolts (Fig. 3-123, Pos. 1) attaching the outer part (Fig. 3-123, Pos. 4) of the coupling to the engine.
9. Disassemble the bolts (Fig. 3-123, Pos. 2) attaching the adapter to the PTO.

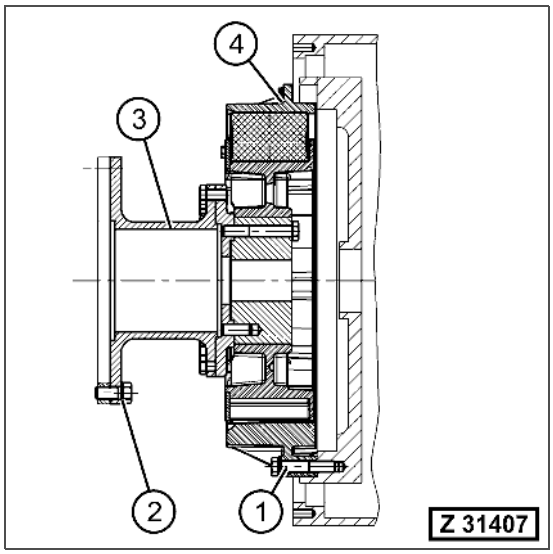


Fig. 3-123

REMARKS: When disassembling the bolts turn the coupling using the barring device (Fig. 3-124, Pos. 1).

To use the barring device, remove the clip and push the device shaft toward the flywheel. The barring device must be rotated counter clockwise to turn the flywheel in the direction of normal rotation.

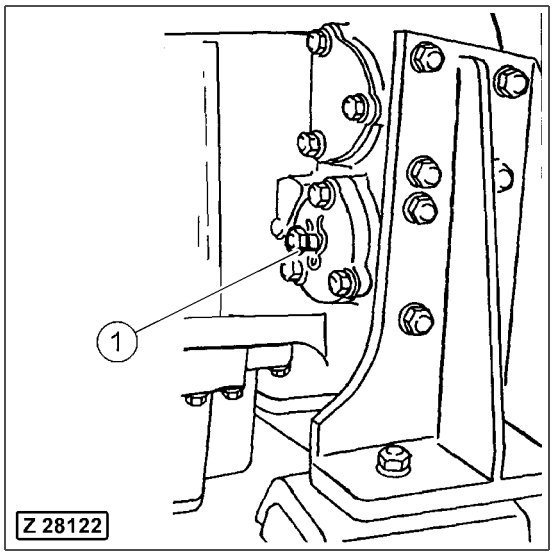


Fig. 3-124 Exemplaric sketch

REMARKS: For disassembling the control and filter plate assembly at PTO 1 (rear) continue on page 3-113.
For disassembling the control and filter plate assembly at PTO 2 (front) continue on page 3-118.

Disassembling of the control and filter plate assembly at PTO 1 (rear)

1. First disconnect the hydraulic hoses (Fig. 3-161, Pos. 1, 4) from the control block base plate and than the hoses (Fig. 3-161, Pos. 2, 3 and 5) from the control blocks.

REMARKS: When a hydraulic line is disconnected hydraulic oil will flow out. Catch it in an oil pan.
Cap the openings with blind plugs to avoid contamination.

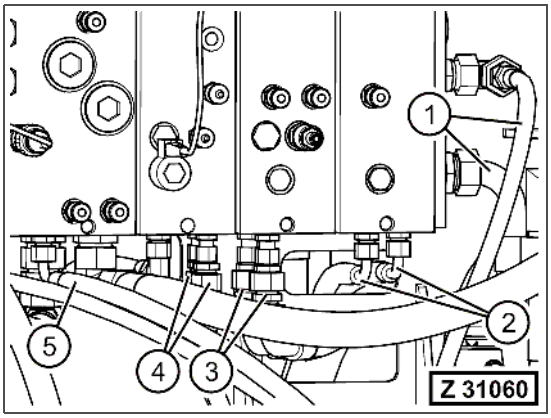


Fig. 3-161

2. Disconnect the elbow union (Fig. 3-162, Pos. 1) from the control block base plate (Fig. 3-162, Pos. 3) to remove the two hydraulic hoses (Fig. 3-162, Pos. 2).

REMARKS: When a hydraulic line is disconnected hydraulic oil will flow out. Catch it in an oil pan.
Cap the openings with blind plugs to avoid contamination.

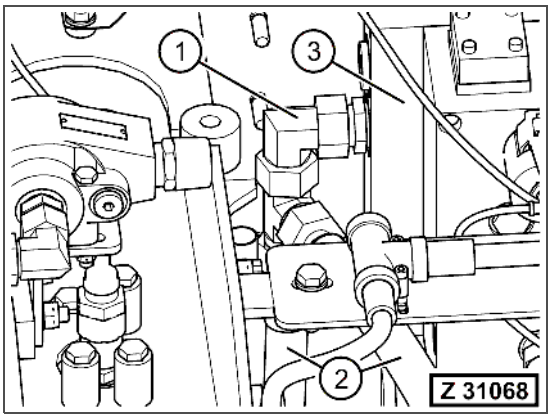


Fig. 3-162

3. Disconnect the hydraulic hose (Fig. 3-163, Pos. 1) from the pressure relief valve and the pilot pressure hose (Fig. 3-163, Pos. 2) from the pressure test port at the bladder accumulator.

REMARKS: When a hydraulic line is disconnected hydraulic oil will flow out. Catch it in an oil pan.
Cap the openings with blind plugs to avoid contamination.

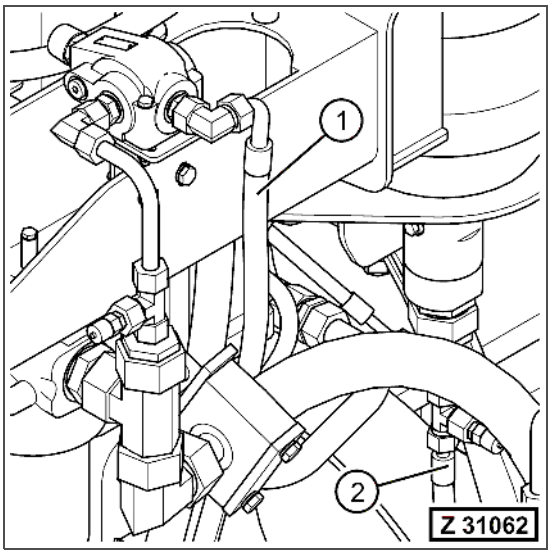


Fig. 3-163 View onto assembly's R.H. side

⚠ WARNING

HOT HYDRAULIC OIL!

May result in personal injury from heated oil.

Do not carry out the following work on a hot machine. Wait until the temperature of the hydraulic oil is below 50 °C.

⚠ DANGER

HYDRAULIC PRESSURE!

The hydraulic system may be pressurized. Opening any hydraulic lines under pressure will result in blindness, serious injury or permanent disfigurement.

Make sure that the pressure is relieved before any hydraulic lines will be removed.

8. Disconnect the hydraulic-pressure hoses (Fig. 3-218, Pos. 1).
9. Disassemble the piping arch (Fig. 3-218, Pos. 2) incl. the valve.

NOTE! Mark the mounting direction of the valve.

10. Disassemble the flange blocks (Fig. 3-218, Pos. 3) from the hydraulic motor.
11. Disconnect the leak oil hose (Fig. 3-218, Pos. 4) from the hydraulic motor.

REMARKS: When a hydraulic line is disconnected hydraulic oil will flow out. Catch it in an oil pan.
Cap the openings with blind plugs to avoid contamination.

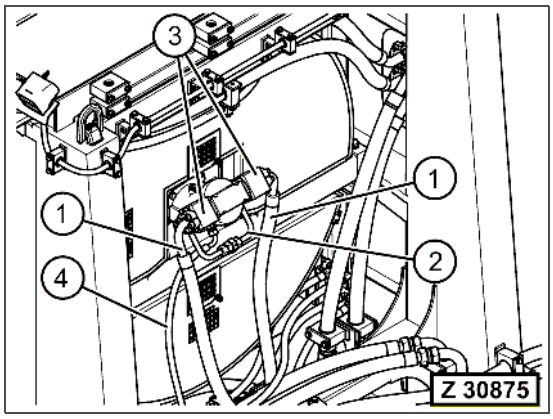


Fig. 3-218

12. Attach the hydraulic motor (Fig. 3-219, Pos. 2) to a crane.

⚠ DANGER

FLOATING LOADS!

Death or serious injury will result due to swinging or downfalling of heavy machine parts.

When moving machine parts using a crane, make sure that nobody steps below or in close range to the lifted machine part.

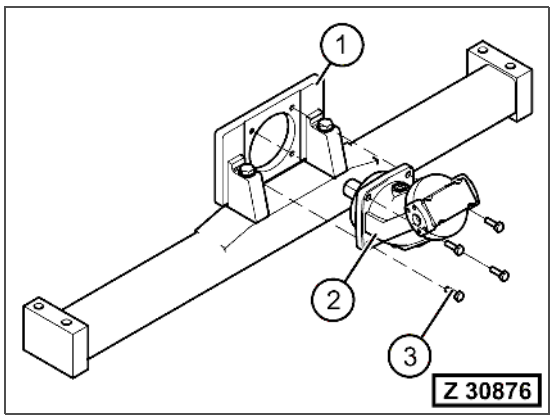


Fig. 3-219

13. Disassemble four mounting bolts (Fig. 3-219, Pos. 3) and pull the hydraulic motor out of the motor carrier (Fig. 3-219, Pos. 1). Remove the hydraulic motor using the crane.

3. Install the bracket (Fig. 3-261, Pos. 1) at the frame.

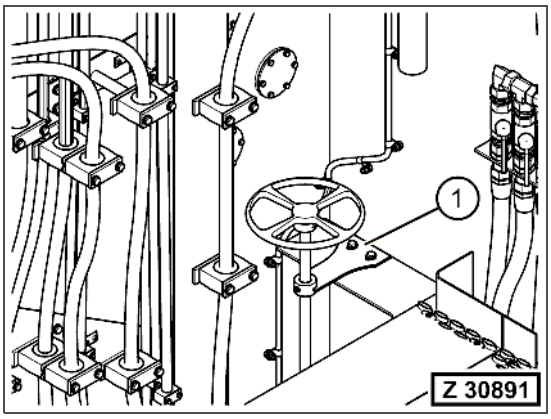


Fig. 3-261

4. Install the grid (Fig. 3-262, Pos. 1) below the hand wheel (Fig. 3-262, Pos. 2) at the main shut-off valve.

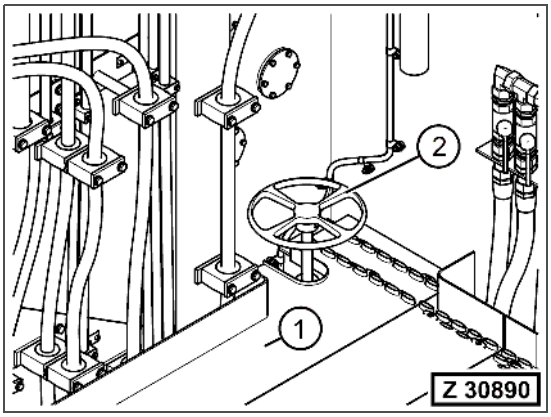


Fig. 3-262

Refill specified hydraulic oil up to the specified level, approx. 4,450 liters.
Refer to the OPERATION & MAINTENANCE MANUAL, chapter 4, section "HYDRAULIC SYSTEM - CHANGE OIL, REPLACE SUCTION STRAINERS AND PULSATION DAMPER".

5. Open the main shut-off valve completely.
6. Bleed air from the hydraulic system, refer to the OPERATION & MAINTENANCE MANUAL, chapter 4, section "BLEEDING THE HYDRAULIC SYSTEM".
7. Check for leaks and proper operation.
8. Check the hydraulic oil level again and add oil if required.

⚠ DANGER

HYDRAULIC PRESSURE!

The hydraulic system may be pressurized. Opening any hydraulic lines under pressure will result in blindness, serious injury or permanent disfigurement.

Make sure that the pressure is relieved before any hydraulic lines will be removed.

5. Disassemble the high pressure filter at the corresponding main control valve block, refer to section 3.3.3.5 on page 3-199.

6. Disconnect all pilot hoses (Fig. 3-313, Pos. 1) from the spool valves (Fig. 3-313, Pos. 2) at the main control valve block.

REMARKS: When a hydraulic line is disconnected hydraulic oil will flow out. Catch it in an oil pan.
Cap the openings with blind plugs to avoid contamination.

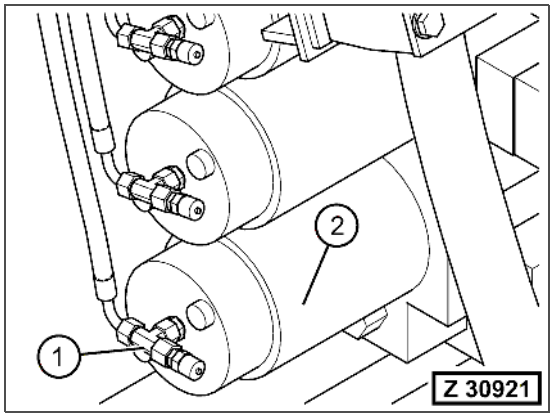


Fig. 3-313

7. Disconnect two hydraulic-pressure hoses (Fig. 3-314, Pos. 1) from the main control valve blocks (each center, top and bottom. Also refer to Fig. 3-315).
Remove the intermediate flange (Fig. 3-314, Pos. 2).

REMARKS: When a hydraulic line is disconnected hydraulic oil will flow out. Catch it in an oil pan.
Cap the openings with blind plugs to avoid contamination.

REMARKS: Note the different installation situation of the lower hydraulic-pressure hose at the main control valve block II (see Fig. 3-315).

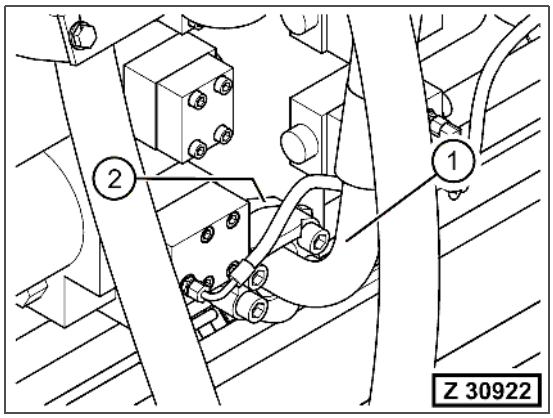


Fig. 3-314 Main control valve block I and III

Fig. 3-315 shows the different installation situation of the lower hydraulic-pressure hose at the main control valve block II.

8. Main control valve block II only:
Disconnect the hydraulic-pressure hose (Fig. 3-315, Pos. 1) from the block (Fig. 3-315, Pos. 2).

REMARKS: When a hydraulic line is disconnected hydraulic oil will flow out. Catch it in an oil pan.
Cap the openings with blind plugs to avoid contamination.

9. Main control valve block II only:
Disassemble the block from the main control valve block.

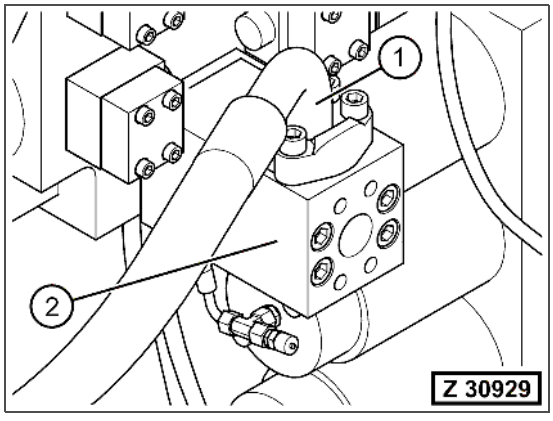


Fig. 3-315 Main control valve block II only

ACV-block with attached SRV-block:

2. Install SRV-block (Fig. 3-352, Pos. 3) together with the ACV block (Fig. 3-352, Pos. 4) and assemble the four mounting bolts (Fig. 3-352, Pos. 2).

3. Reconnect the leak oil hoses (Fig. 3-352, Pos. 1) at the SRV-block.

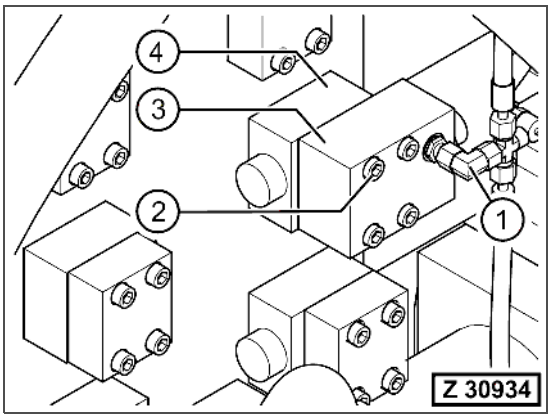


Fig. 3-352

4. Note the mounting direction of the ACV and SRV cartridge. The ACV cartridges (Fig. 3-351, Pos. 3) / (Fig. 3-352, Pos. 4) always faces inward and the SRV cartridges (Fig. 3-352, Pos. 3) always faces Bleed air from the hydraulic system, refer to the OPERATION & MAINTENANCE MANUAL, chapter 4, section "BLEEDING THE HYDRAULIC SYSTEM".

5. Add hydraulic oil up to the specified level.

6. Start engines and let in run in high idle (TH3 is reached).

7. Check and adjust the ACV / SRV.
   Refer to part *"10 Structure & Function"* in the SHOP MANUAL for further information.

8. Check for leaks and proper operation.

9. Check the hydraulic oil level again and add oil if required.

NOTICE

BRAKE NOT BLED!

The slew parking brake can not be released completely due to air in the hydraulic system. This may cause severe damage to the brake lamellas.

Before initial operation or after repairs on the hydraulic circuit, the slew parking brake must be bled to prevent the brake lamellas from welding when slewing.
If not installed, a vent plug can be connected to the pressure port to bleed the brake.

15. Bleed the slew parking brake, refer to part *"10 Structure & Function"* in the SHOP MANUAL for further information.

5. Disassemble all pinion covers (Fig. 3-405, Pos. 1) and the lubrication pinion assemblies behind, refer to section 3.4.6.1 on page 3-268.

6. Disassemble all slew circle protection covers (Fig. 3-405, Pos. 2) covering the slew circle.

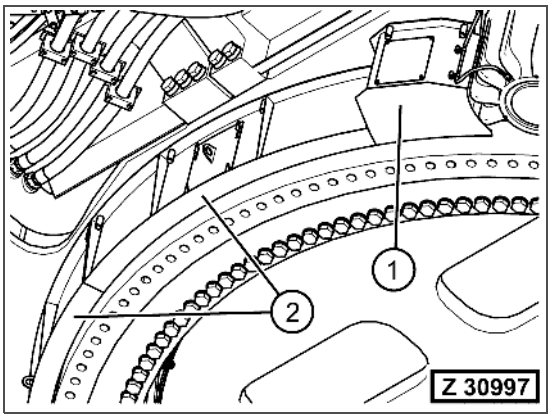


Fig. 3-405

7. Disconnect all slew ring bearing lubrication lines (Fig. 3-406, Pos. 2) from the inner slew ring (Fig. 3-406, Pos. 1).

8. Clear all hose straps (Fig. 3-406, Pos. 3) from the inner slew ring.

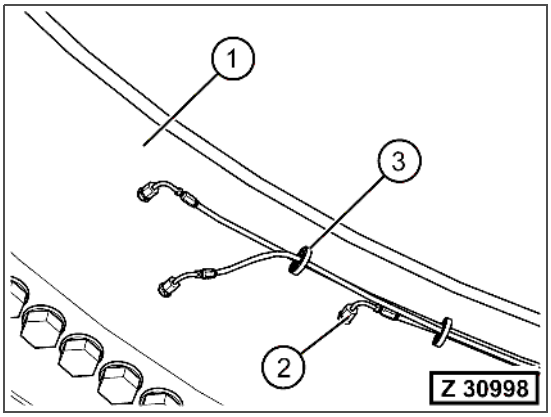


Fig. 3-406

9. Position the mounting cross, PN 379 128 40 underneath the slew circle.

REMARKS: Make sure that the mounting cross including the slew circle can be moved underneath the superstructure.

10. Attach the mounting cross to a crane.
The mounting cross is accessible from the center of the machine in front of the manifold.

NOTICE

DAMAGE AT HYDRAULIC LINES!

The sling accessory may damage the hydraulic pipes at the front of the manifold while moving the slew circle using a crane.

Handle the sling accessory / move the crane with great care in order to avoid damages.
It is recommended to remove the pipes at the manifold.

11. Lift the mounting cross under the slew circle using the crane.

REMARKS: Before removing the slew circle, mark location of both slew rings to superstructure and the car body as well for further investigations in case of troubleshooting.

⚠ WARNING

HAZARDOUS REFRIGERANT!

The refrigerant may cause frostbite and toxication when it comes in contact with the skin. The refrigerant is also toxic when inhaled.

Any maintenance, repair or service at the air conditioning system must be carried out by authorized and special skilled service specialists only.

15. Evacuate the air conditioning system and refill the system with refrigerant and compressor oil.
    For information about servicing the air conditioning system refer to the PARTS & SERVICE NEWS No. "AH05537".

REMARKS: Use new bolts (Fig. 3-480, Pos. 2) and self locking nuts (Fig. 3-480, Pos. 3) at the bearings of the access stairway (Fig. 3-480, Pos. 4).

Tightening torque for new self-locking nuts:
Screw on the nuts until they have contact with the stairway carrier frame. Then tighten further through an angle of 45°.

5. Detach the crane.
6. Assemble the hand rail (Fig. 3-480, Pos. 1).
7. Install the wire harness through the cable feed-through (Fig. 3-481, Pos. 3).
8. Install all clamps (Fig. 3-481, Pos. 2) along the wire harness and attach the wire harness at the platform.
9. Re-plug harness connector (Fig. 3-481, Pos. 1).

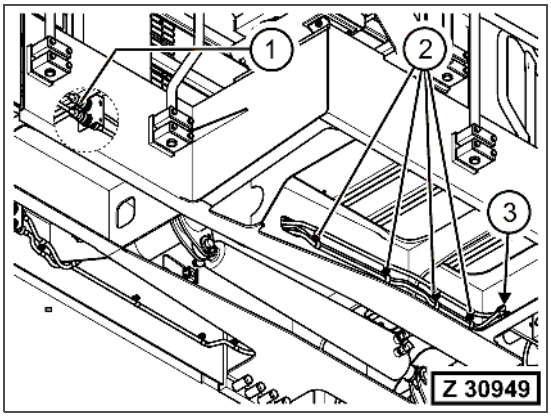


Fig. 3-481

10. Assemble the pin (Fig. 3-482, Pos. 2) and install the cotter pin (Fig. 3-482, Pos. 1).

REMARKS: Lubricate the eye of hydraulic cylinder before assembling the pin.

11. Remove the access stairway cylinder (Fig. 3-482, Pos. 3) fixation.

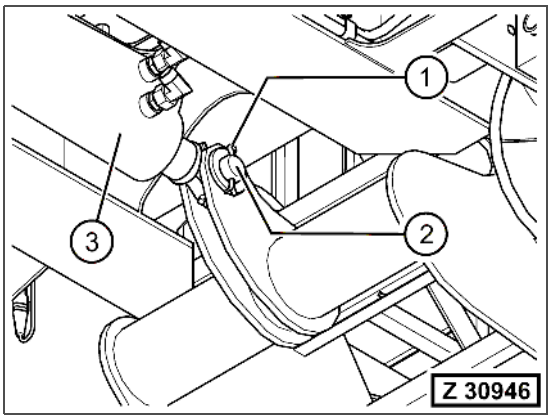


Fig. 3-482

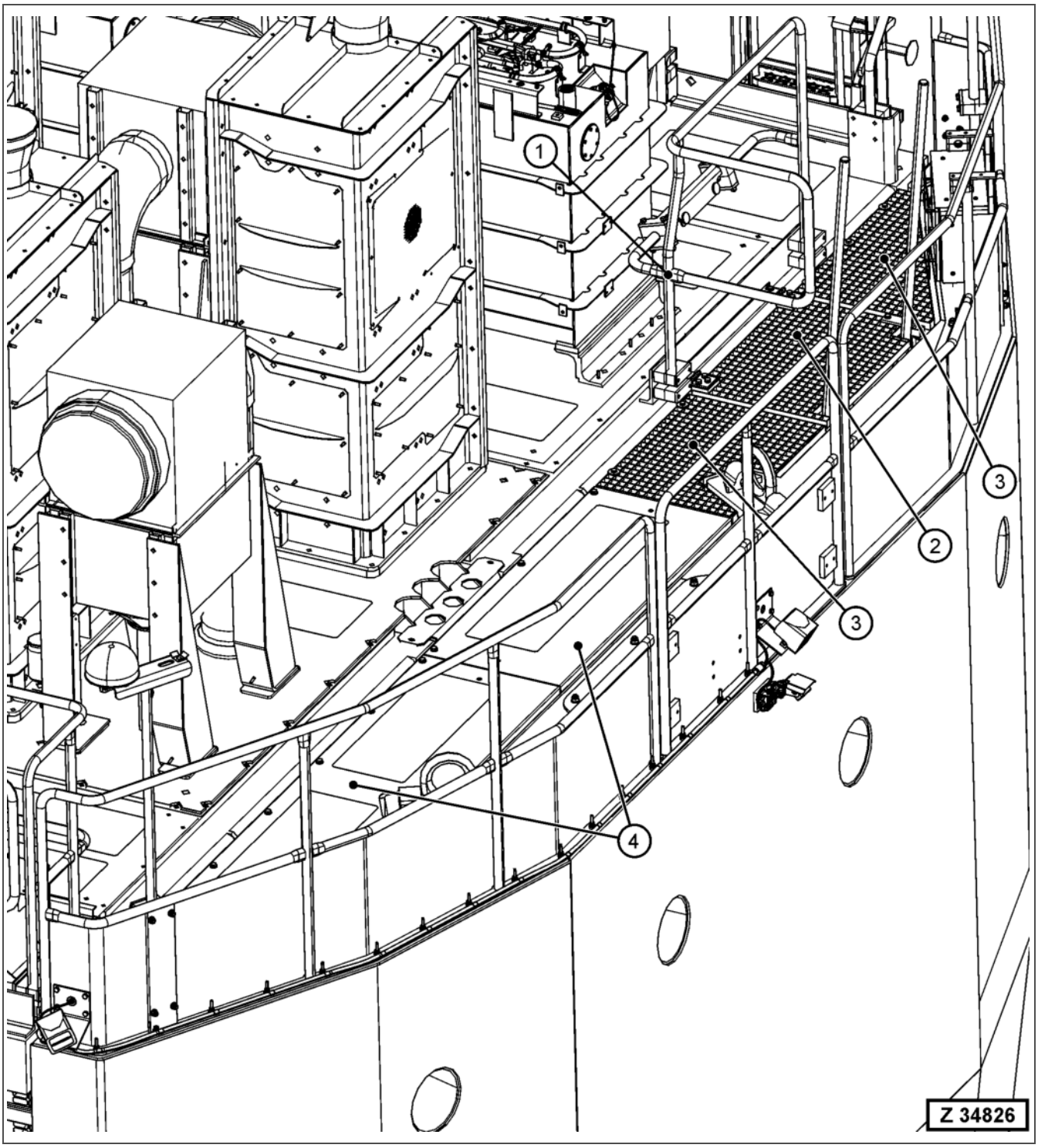


Fig. 3-514

8. Assemble the grids (Fig. 3-514, Pos. 3) and the cover plates (Fig. 3-514, Pos. 4).
9. Install the emergency escape hatch (Fig. 3-514, Pos. 2).
10. If removed:
    Assemble the hand rail (Fig. 3-514, Pos. 1) at the machine house.
11. Assemble all custom equipment at the counterweight.

7. Disassemble the complete attachment and the boom arc hoses, refer to section 5.3 on page 5-22 for the backhoe attachment or refer to section 5.4 on page 5-108 for the face shovel attachment.

8. Reassemble the pins of both boom cylinder foot bearings.

9. Mark and disconnect the hydraulic hoses (Fig. 3-556, Pos. 2) from the rotary joint (Fig. 3-556, Pos. 1).

10. Disconnect the hydraulic hoses (Fig. 3-556, Pos. 3 to 5) from the rotary joint.

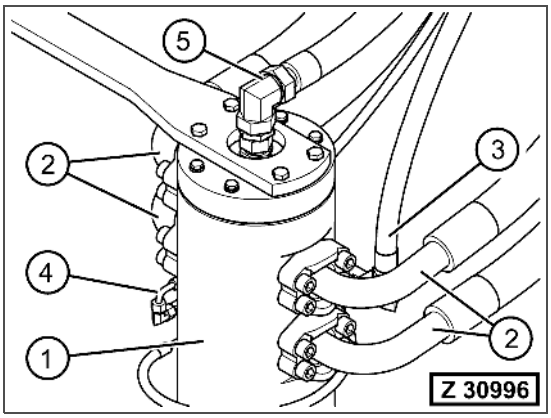


Fig. 3-556

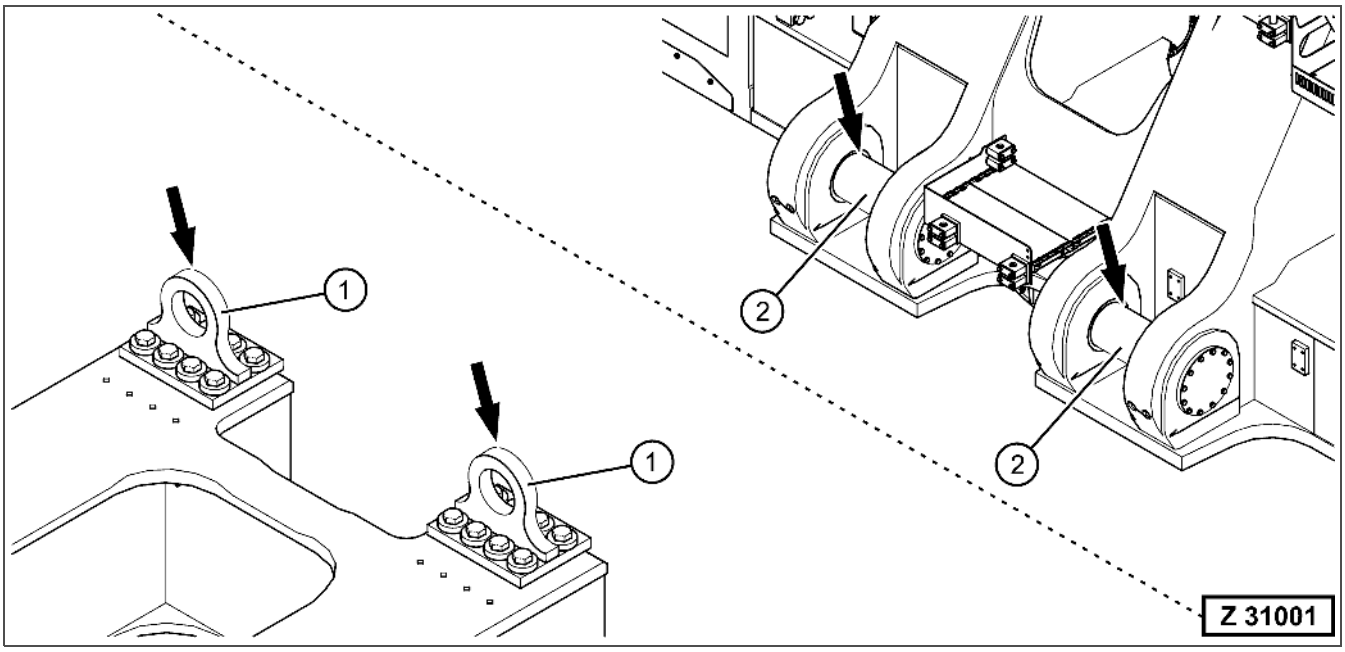


Fig. 3-557 Lifting points for superstructure lifting

11. Install the shackles (Fig. 3-557, Pos. 1) delivered with the machine to the flanges of the counterweight and attach both shackles to a crane.

NOTICE

DAMAGE TO THE BOOM CYLINDER FOOT BEARING PINS!

Using wire ropes or chains for lifting the superstructure may damage the machined surface of the pins.

Do not use wire ropes or chains.
Only use slings on the boom cylinder foot bearing pins.

12. Attach the superstructure to a second crane by means of the boom cylinder foot bearing pins (Fig. 3-557, Pos. 2).

6. Close the ball cock (Fig. 4-30, Pos. 1) behind the service opening.

REMARKS: This is done to prevent the respective track tensioning cylinders to get pressurized while running the excavator.

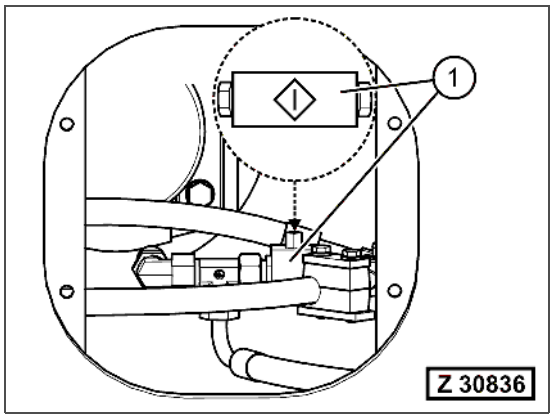


Fig. 4-30

7. Unroll the crawler track only that far that the guide wheel is free, refer to section 4.2.1.1 on page 4-4.

8. Disassemble the bolts (Fig. 4-31, Pos. 1) and remove the stop plates (Fig. 4-31, Pos. 2) from both sides of the track frame (Fig. 4-31, Pos. 3).

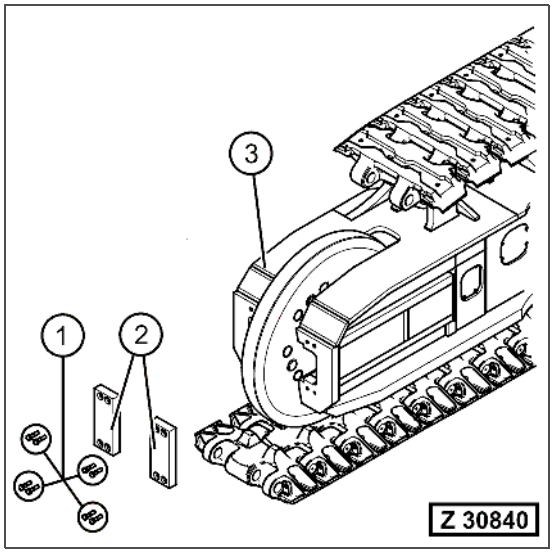


Fig. 4-31

NOTE! Always replace the flat seals at flange connections when installing used hydraulic lines!
A flat and level sealing surface is essential for proper sealing!

Tighten the mounting bolts of hydraulic-flange connections according to the KOMATSU company standard "Torques for hydraulic-flange connections", **refer to section 6.5.5 on page 6-14.**

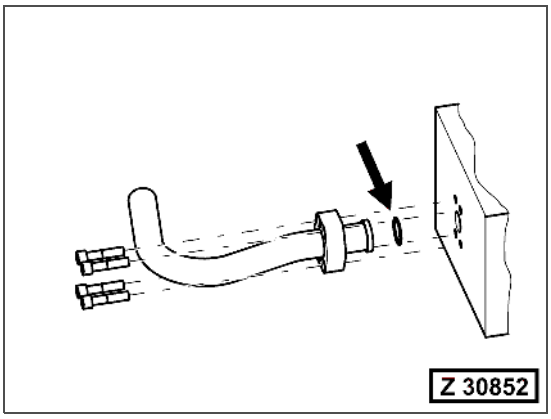


Fig. 4-69 Exemplaric sketch

6. Bleed air from the hydraulic system, refer to the OPERATION & MAINTENANCE MANUAL, chapter 4, section "BLEEDING THE HYDRAULIC SYSTEM".

7. Add specified hydraulic oil up to the specified level, refer to the OPERATION & MAINTENANCE MANUAL, chapter 4, section "FILLING THE HYDRAULIC SYSTEM".

8. Check the travel system and adjust if required.
Refer to part *"10 Structure & Function"* in the SHOP MANUAL for further information.

4.2.12 TRACK ROLLERS

4.2.12.1 DISASSEMBLING OF THE TRACK ROLLER ASSEMBLY

Special tools:	Safety unit for changing track rollers, PN 921 142 40 Tool for changing track rollers (optional, contact KOMATSU service)
Additional equipment:	Crane Forklift (optional, instead of the tool for changing track rollers) Chain hoist (if forklift is used)
	Track roller assembly: 925 kg
	Dogman/rigger Operator, familiar with the jacking procedure

1. Prepare an area of flat ground large enough to accommodate the machine and the additional working equipment (crane, mobile working platforms, forklift, etc.).

2. Park the machine on the prepared flat ground area.

REMARKS: If the ground condition is too poor to guarantee safe and stable stand of the machine and the additional working equipment (crane, mobile working platforms, forklift, etc.), make sure that the machine is moved to any location with appropriate ground condition.

3. Relieve the pressure in the track tensioning system by opening the ball cock (Fig. 4-96, Pos. 1) at the track tensioning valve block inside the undercarriage center body.

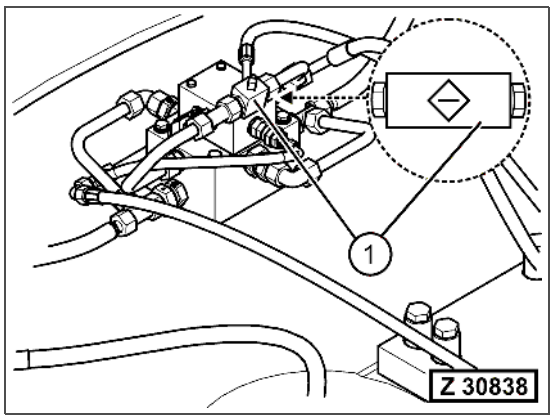


Fig. 4-96

NOTE! Two persons (driver, service technician) are required.
Driver must be familiar with the jacking procedure using the attachment.
Safe and delay-free communication between technician and driver must be assured.

⚠ WARNING

RISK OF CRUSHING!

Death or serious injury may result due to unintendend missoperation of the excavator.

When jacking up, make sure that no persons are in close range to the track frame.
Make sure that the lock lever is secured in lock position and both joysticks are in neutral position.
Only get close to the track frame when excavator is secured.

4. Jack up the machine using the machine’s working attachment.

NOTE! Note the mounting location!
From the direction of travel: ports A/C must point to the left and ports B and D to the right side in order to correctly mount the rotary joint.

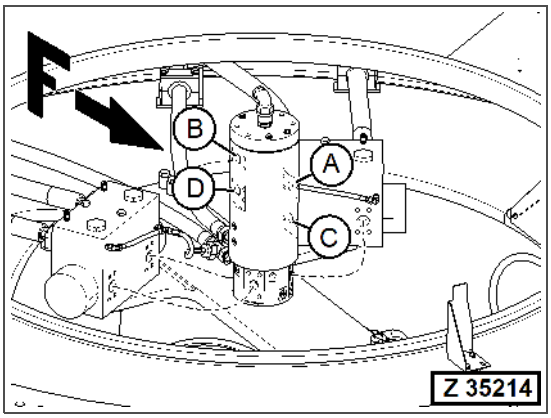


Fig. 4-128

Reconnect all hydraulic hoses and pipes of the travel system at the lower end of the rotary joint, refer to Fig. 4-128.

5. Connect the hydraulic hoses (Fig. 4-132, Pos. 2) at the rotary joint (Fig. 4-132, Pos. 1).
6. Connect the hydraulic hoses (Fig. 4-132, Pos. 3 to 5) at the rotary joint.

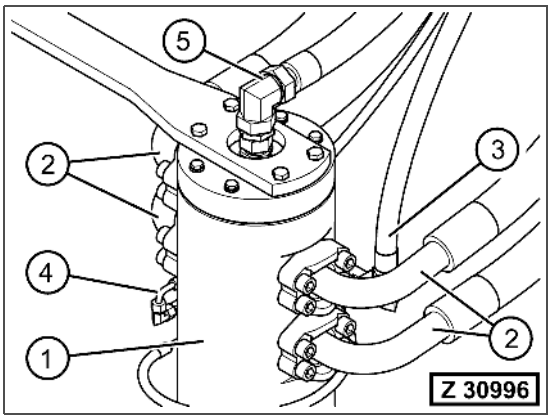


Fig. 4-129

7. Assemble the torque support lever (Fig. 4-130, Pos. 2) to the rotary joint (Fig. 4-130, Pos. 3). Note Fig. 4-131 for assembly.

   Insert new mounting bolts (Fig. 4-130, Pos. 1) of grade 10.9. Apply MPG (or roller bearing grease, or grease from the CLS system) and tighten the bolts to the specified tightening torque.

Tightening torque for torque support lever mounting bolts (Fig. 4-130, Pos. 1): 265 Nm.

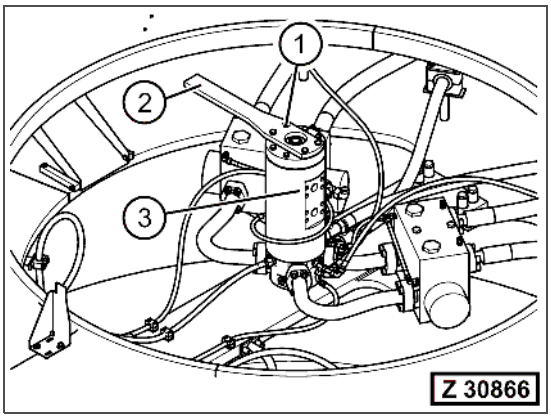


Fig. 4-130

5.3 BACKHOE (BHA)

5.3.1 OVERVIEW

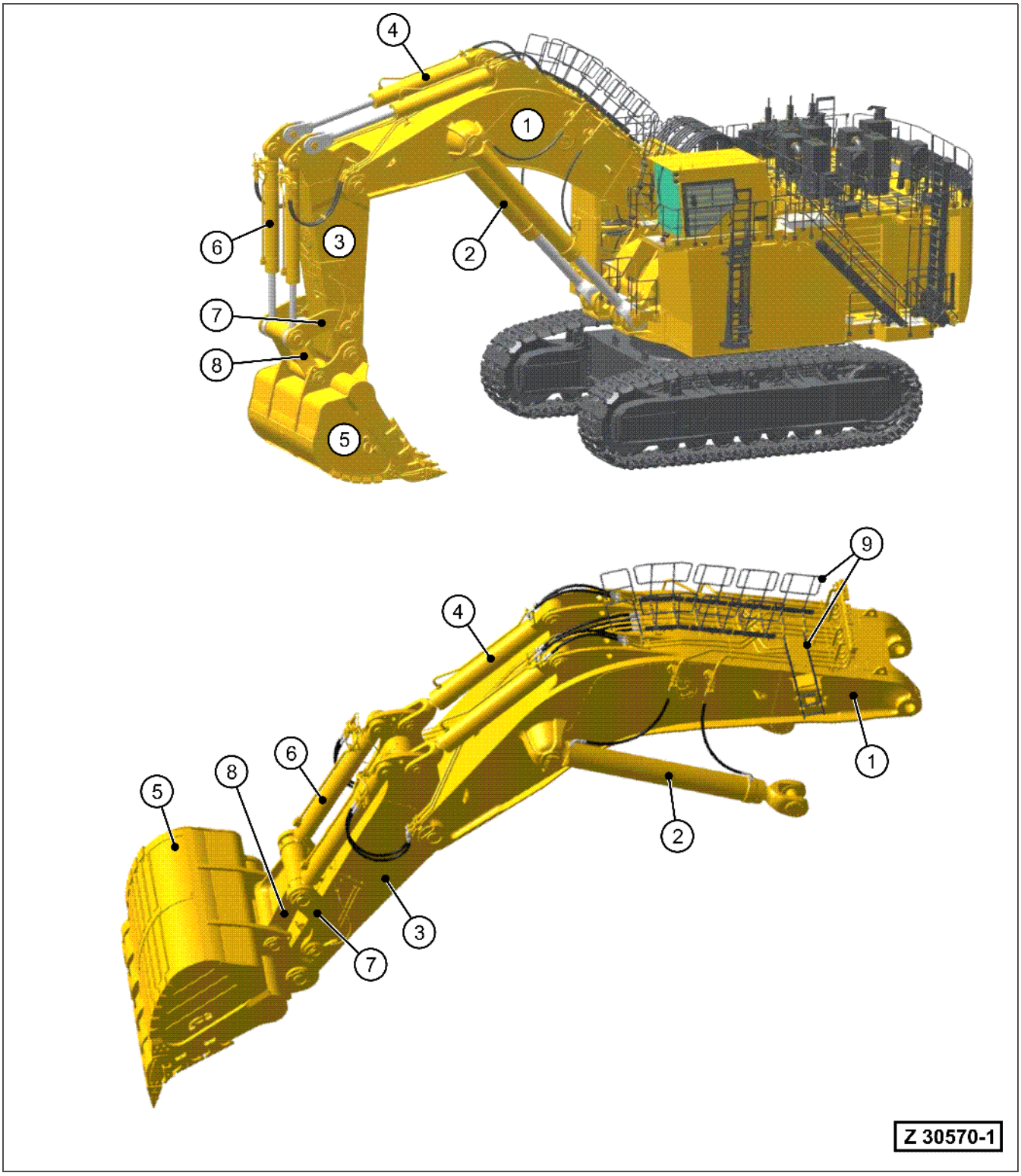


Fig. 5-19 Backhoe attachment - overview

14. Detach the rear crane from the stick.

⚠ DANGER

HAZARD OF SQUEEZING AND SHEARING!

Will result in serious injury to hands and fingers from squeezing and sharing due to violent pressure from sliding parts.

Align the parts with great caution. Never put hands through or into the bushings when aligning parts.

15. Align the stick to the stick cylinders. Move the stick with the crane at the front end for aligning.
    Precondition: Stick cylinders yet in disassembly position (refer to Fig. 5-48 on page 5-40)!

⚠ DANGER

FLOATING LOADS!

Death or serious injury will result due to swinging or down-falling of heavy machine parts.

When moving machine parts using a crane, make sure that nobody steps below or in close range to the lifted machine part.

16. Insert the pins (Fig. 5-60, Pos. 2) connecting the stick cylinders (Fig. 5-60, Pos. 1) to the stick.

REMARKS: Apply paste *Aluminium Anti-Seize* at the fixed portion of the pin and the pin fixing point of the pin bearing, refer to section 5.2.2 on page 5-20.

17. Assemble the shackles (Fig. 5-60, Pos. 4) and two bolts (Fig. 5-60, Pos. 3) with washers securing the pins.

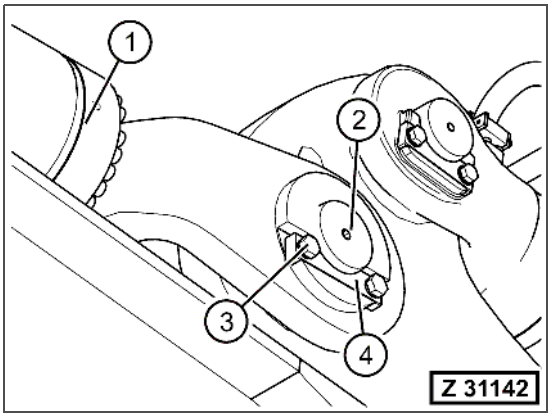


Fig. 5-60

18. Install the hydraulic hoses (Fig. 5-61, Pos. 1 and 2) at the bucket cylinders (Fig. 5-61, Pos. 3).

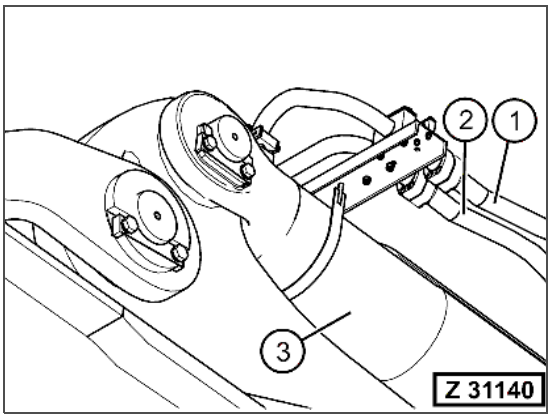


Fig. 5-61

Working steps and checks in the aftermath of disassembling:

34. Check the bushings (Fig. 5-102, Pos. 1) of the bucket cylinder for wear and damage.
    Replace the bushings if required, refer to section 5.2.1 on page 5-18.

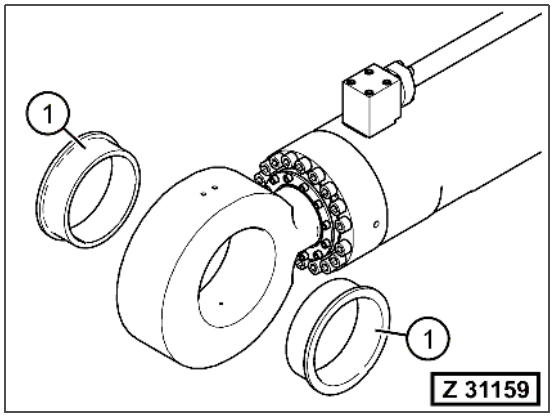


Fig. 5-102

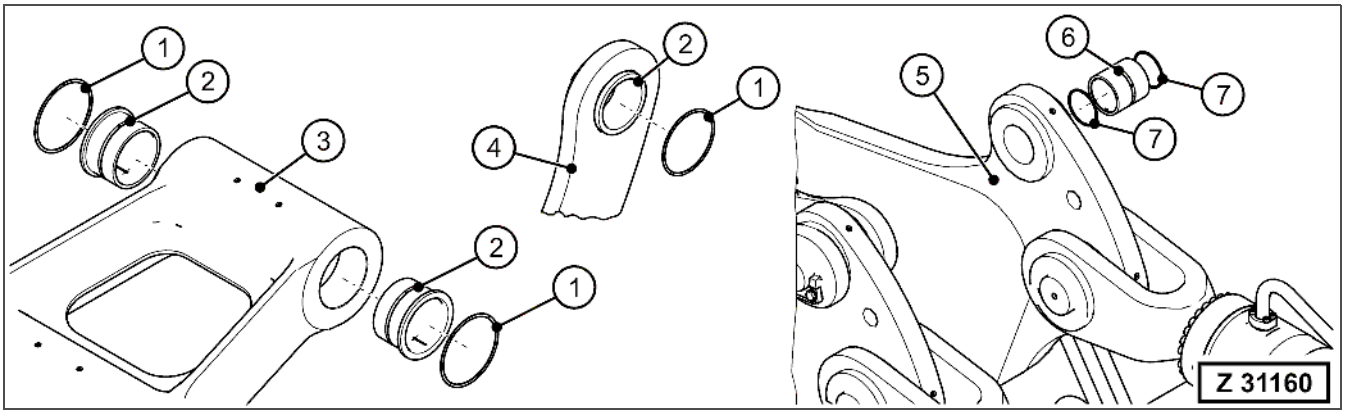


Fig. 5-103

35. Remove the seal ring(s) (Fig. 5-103, Pos. 1) that are slipped over the collar bushing(s) (Fig. 5-103, Pos. 2) in the cleared end of the bucket link rod (Fig. 5-103, Pos. 3) and the steering rod(s) (Fig. 5-103, Pos. 4).

36. Disassemble the seal rings (Fig. 5-103, Pos. 7) from inside bushing(s) (Fig. 5-103, Pos. 6) of the bucket cylinder bearing(s) in the stick (Fig. 5-103, Pos. 5).

37. Discard all removed seal rings.

38. Check the collar bushing(s) (Fig. 5-103, Pos. 2) in the cleared end of the bucket link rod and the steering rod(s) for wear and damage.
    Replace the bushing(s) if required, refer to section 5.2.1 on page 5-18.

REMARKS: If the bushing(s) are worn it is recommended to disassemble the bucket link rod and replace all bushings in the assembly refer to section 5.3.5.5 on page 5-80.

Under normal conditions the collar bushings in the steering rods are not subject to wear.

39. Check the bushing(s) (Fig. 5-103, Pos. 6) of the bucket cylinder bearing(s) in the stick for wear and damage.
    Replace the bushing(s) if required, refer to section 5.2.1 on page 5-18.

Please continue reading on the next page.

9. Push the pin (Fig. 5-185, Pos. 1) into the cylinder eye (Fig. 5-185, Pos. 3) until justified with the pin bearing (Fig. 5-185, Pos. 4).

REMARKS: Apply paste *Aluminium Anti-Seize* at the fixed portion of the pin and the pin fixing point of the pin bearing, refer to section 5.2.2 on page 5-20.

10. Assemble the catches (Fig. 5-185, Pos. 2) securing the pin.

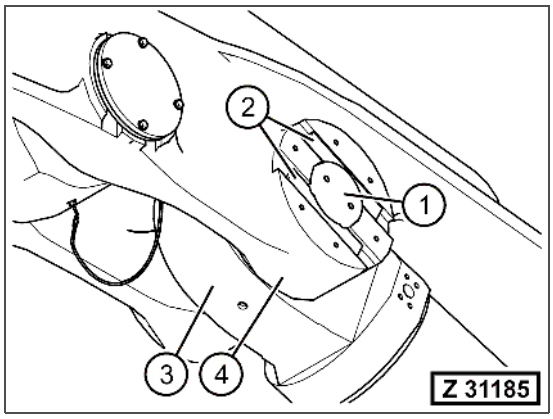


Fig. 5-185

11. Assemble the cover (Fig. 5-186, Pos. 2), the ring (Fig. 5-186, Pos. 3), and the bolts (Fig. 5-186, Pos. 1).

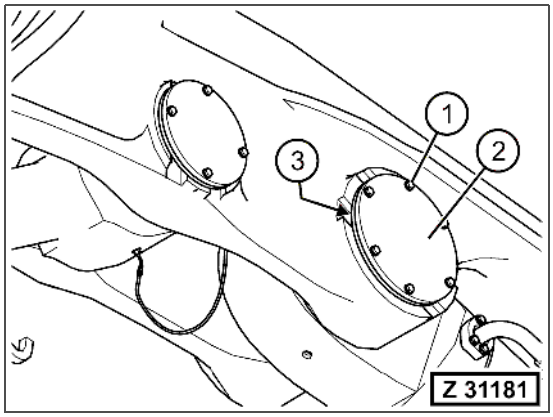


Fig. 5-186

12. Detach the cylinder mounting device from the boom cylinder, refer to the manual of the cylinder mounting device.

13. Attach a chain hoist (Fig. 5-187, Pos. 2) to the fixing eye (Fig. 5-187, Pos. 4) at the boom and at the swivel hoist ring (Fig. 5-187, Pos. 3) at the boom cylinder (Fig. 5-187, Pos. 1).

14. Using the chain hoist move the boom cylinder into a position in which the hydraulic hoses can be installed at the cylinder.

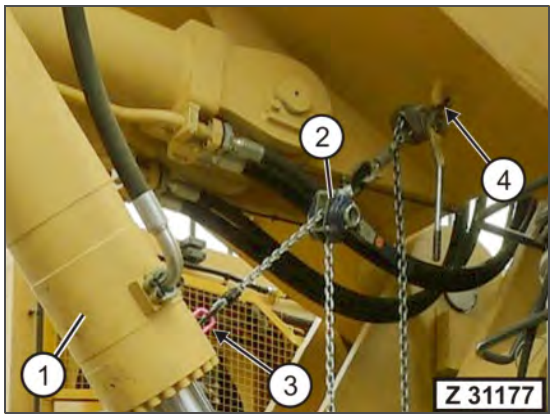


Fig. 5-187