OMPC550015039

Operation & Maintenance Manual

PC5500-6

HYDRAULIC MINING SHOVEL

SERIAL NUMBERS PC5500-6 15039

December 2006

- Always keep at a distance from the edges of building pits and slopes.
- Avoid any operation that might be a risk to machine stability.
- Never travel across slopes; always keep the working equipment and the load close to the ground, especially when travelling downhill.
- On sloping terrain always adapt your travelling speed to the prevailing ground conditions. Never change to a lower gear on a slope but always before reaching it.
- Before leaving the driver's seat always secure the machine against inadvertent movement and unauthorized use.

SPECIAL WORK IN CONJUNCTION WITH UTILIZATION OF THE MACHINE AND MAINTENANCE AND REPAIRS DURING OPERATION; DISPOSAL OF PARTS AND CONSUMABLES

- Observe the adjusting, maintenance and inspection activities and intervals set out in the Operation,- Lubrication and Maintenance Manual, including information on the replacement of parts and equipment. These activities may be executed by skilled personnel only.
- Brief operating personnel before beginning special operations and maintenance work, and appoint a person to supervise the activities.
- In any work concerning the operation, conversion or adjustment of the machine and its safety-oriented devices or any work related to maintenance, inspection and repair, always observe the start-up and shut-down procedures set out in the Operation,- Lubrication and Maintenance Manual and the information on maintenance work.
- Ensure that the maintenance area is adequately secured.
- If the machine is completely shut down for maintenance and repair work, it must be secured against inadvertent starting by:
  - locking the principal control elements and removing the ignition key and/or
  - attaching a warning sign to the main switch
- Carry out maintenance and repair work only if the machine is positioned on stable and level ground and has been secured against inadvertent movement and buckling.
- To avoid the risk of accidents, individual parts and large assemblies being moved for replacement purposes should be carefully attached to lifting tackle and secured. Use only suitable and technically perfect lifting gear and suspension systems with adequate lifting capacity. Never work or stand under suspended loads.

INSTRUCTIONS FOR USE

Open the lock, lift the harness by the catch hook (C), the blue straps (leg straps J) are below. The harness is being put on just like a jacket. Pull the belly strap (E) through the lock, as shown on the illustration, and secure it.

By closing the breast strap, you avoid the shoulder straps to side-slip. Bring the leg straps (J) around the legs to the front, pull them in, as shown in the illustration, and tighten them. Adapt the harness to body form, seeing to perfect fit, in particular that the catching hook (C) be in the center of the back.

The safety harness should belong to its wearer personally.

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

The attachment point for the safety harness should be above the wearer, and the carrying capacity of the attachment point should be sufficient to correspond with the minimum carrying capacity acc. to EN 795.

(1) Final drive, hub type travel gear

(2) Crawler carrier

(3) Track roller

(4) Carrier roller

(5) Guide wheel

(6) Swing circle guard

(7) Hydraulically operated access ladder, see page 46 for more information

(8) Hydraulic cylinder for access ladder

(9) Control switch for access ladder

(10) Battery main switches

(11) Emergency engine shut down switch and manual actuator switch for the fire suppression system, if so equipped.

⚠ CAUTION

Never stop the engines from a full load except in case of emergency.
If a hot engine is shut down without previous idling period of three to five minutes, the temperature in certain engine parts rising sharply after the cooling system ceases to function. The resulting thermal stress, especially in the turbochargers, may cause serious damage.

(12) Radiator of rear engine, designation number **1**

(13) Radiator of front engine, designation number **2**

(14) Sliding window of operator’s cab, see page 54 for more information

(15) Emergency escape ladder

(16) Exhaust muffler

(17) Engine air cleaners

(18) Hydraulically driven grease pump of the Swing circle pinion Lubrication System (SLS)

(19) Hydraulically driven grease pump of the Central Lubrication System (CLS)

(20) Counterweight

⚠ WARNING

The chambers of the counterweight are filled with a mixture of concrete, granulated ore and steel pellets. This mixture can create explosive gases which will accumulate in the chambers of the counterweight. Before any welding, flame-cutting, grinding or drilling procedures are carried out on the counterweight it is vital to expel these gases from the counterweight chambers. Failure to properly expel the gases from the counterweight chambers can result in an explosion with serious personal injury or death.
Follow the instructions given in PARTS & SERVICE NEWS No. AH04518 for expelling the gases from the counterweight chambers.

Legend for illust. Z24090

(1) Sliding window, serves also for emergency exit

REMARK

If the operator's cab is equipped with external metal sun visors, disengage the four catches and push out the sun visor panel.

(2) Release lever for hinged railing bar (3)

(3) Hinged railing bar

(4) Rigidly mounted emergency escape ladder. The rigidly mounted emergency escape ladder with rope ladder extension provides the means to go down to the ground.

(5) Rope ladder. The upper end of the rope ladder is fixed onto the lower rung of the rigid escape ladder (4) by means of the fasteners (6), see detail (X). The lower end of the rope ladder is fixed on brackets (8) and secured with rubber fasteners (7), see section (A-A).

(6) Hooks for fastening the rope ladder onto the rigid ladder (4)

(7) Rubber fasteners for rope ladder in lifted position

(8) Bracket for rope ladder in lifted position. The lower rung of the rope ladder is hooked up into the brackets (8)

Using the emergency escape ladder

In case of emergency with normal walkways obstructed use escape ladder (4) and (5) for leaving the machine. Proceed as follows:

1. Move up lever (2) and pull out.
2. Open the hinged railing bar (3).
3. Unhook fasteners (7) and take out rope ladder rung from brackets (8).
4. Let the rope ladder fall down to the ground. The upper end of the rope ladder is fixed onto the lower rung of the rigid ladder (4).
5. Use the rigid ladder (4) and then the rope ladder (5) for leaving the shovel.

Operator’s Seat Adjustment

Before operating the Shovel adjust the seat and mirrors for Operators maximum comfort, visibility, and complete control of the Shovel.

Legend for illust. (Z 21420):

(1) Seat suspension adjustment (firm to soft ride)

(2) Height adjustment

(3) Seat depth adjustment

(4) Seat cushion tilt adjustment

(5) Fore/aft adjustment

(6) Not used on this model

(7) Control lever carrier

(8) Headrest (optional)

(9) Seat heater switch (optional)

(10) Lumbar support adjustment

(11) Armrest, foldable

(12) Armrest adjustment

(13) Backrest adjustment

(14) Fore/aft isolator

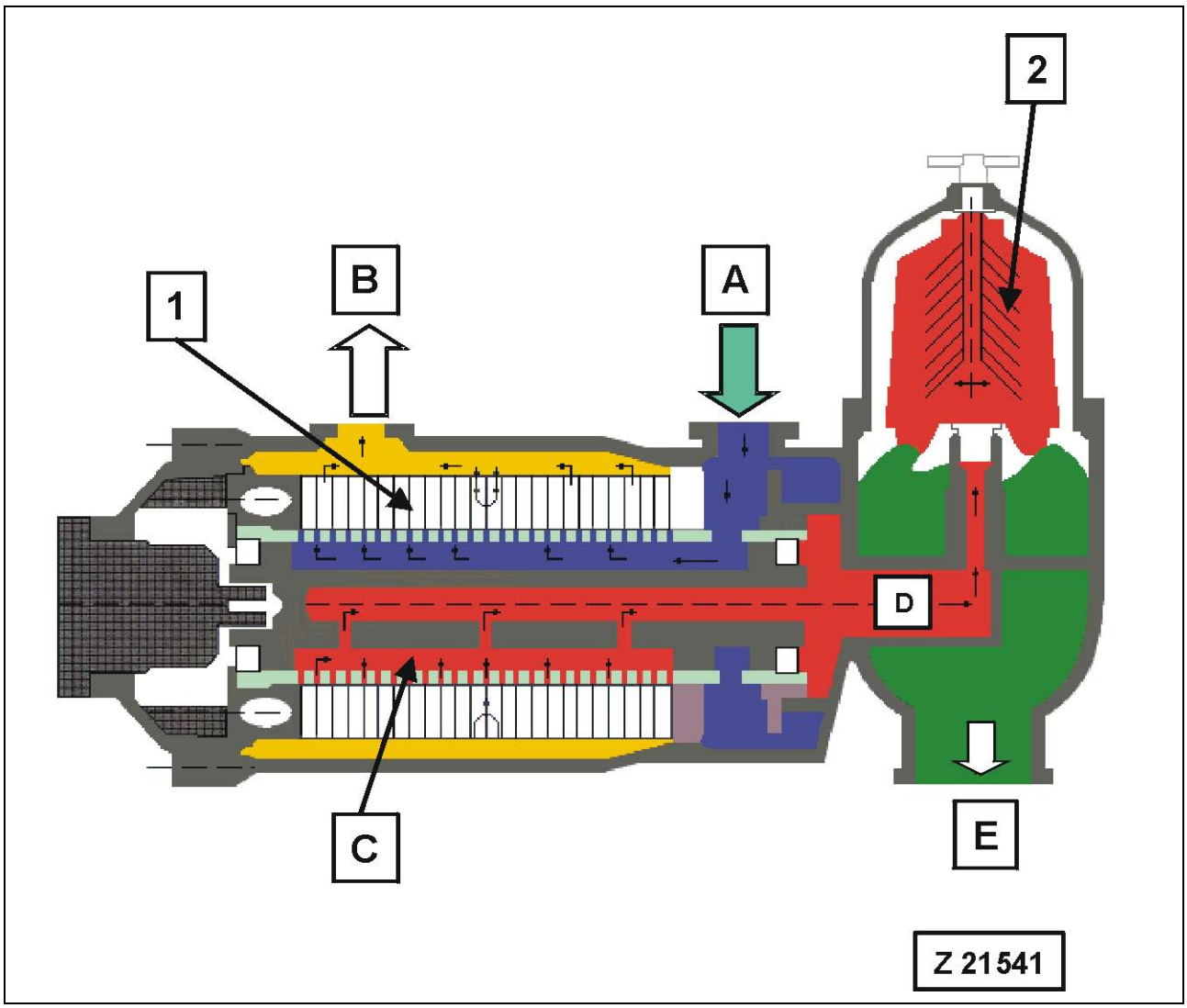
Seat belt (not shown)

⚠ WARNING

- **Use seat belt in accordance with the local safety regulations and laws.**
- **Check condition and fastening of the seat belt. Replace any worn or damaged part of the seat belt system.**
- **To ensure proper functioning of the seat belt replace the seat belt and securing parts after every three years.**

For more Information, refer to the separate Operating Instruction Manual ”AIR SUSPENSION SEAT” in volume 2 binder.

Eliminator Engine Oil Filtration System



Legend for illust. Z 21541 (schematic illustration)

(A)	Oil inlet from engine (100%)	(E)	Oil flow to engine oil pan (5%)
(B)	Oil outlet to engine (95%)	(1)	Stainless steel filter removes particles as small as 20 µm
(C)	Backflush oil (5%) for cleaning the filter	(2)	Centrifugal separator removes particles up to a size of 2 µm
(D)	Oil flow to centrifuge (5%)		

3.3.3 OPERATOR'S CONSOLE

Legend for illustration Z25352

(1) Analog gauges, see page 83 for more information

(2) Text display with key board of the Electronic Control and Monitoring System (ECS). Refer to page 92 for more information.

(3) Ashtray

(4) Switch board, see page 83 for more information

(5) Heater control panel, see page 196 for more information

(6) Air conditioning control panel, see page 196 for more information

(7) Switch for adjustment of left and right cab mirror

(8) Cigarette lighter

(9) Plug sockets 24V DC

(10) Radio

(11) Control module for the auxiliary cab heater HYDRONIC 10, see page 89 for more information.

(12) Switch board lighting with flexible arm

⚠ CAUTION

Make sure the cab door is always closed when working with the Shovel.
Secure the door in open position with the locking device provided.

Interface Panel for Diagnostics and Controls for Heating and Air Conditioning (continued)

Legend for illust. Z25354

(5) Control module for the engine independent auxiliary cab heater. This module is used for switching ON and OFF the auxiliary cab heater during operation of the shovel with the Diesel engines running, and for pre-selection of heater start times and duration of heating periods. For detailed setting instructions of the control module refer to the separate operating instruction sheet in volume 2 binder.

(6) Button for actual time indication

(7) Button for preselection of heating time

(8) Button for heating indication

(9) Button for settings backwards

(10) Button for settings forward

(11) Not used

(12) Display shows the operating condition of the auxiliary cab heater

(13) Thermostat for engine independent auxiliary cab heater. This unit is used to maintain a desired temperature in the cab during standstill periods of the shovel. For operation of the auxiliary cab heater, power supply must be provided by an external power source connected to the 1X1 plug socket at the cab stairway. The battery main switches and the pre-heating system main switch must be in ON position. See section PRE-HEATING SYSTEMS on page 224 and section OPERATING THE HEATER; VENTILATION AND AIR CONDITIONING on page 196 for more information. The fuel shut-off cock for the water heater HYDRONIC must be in open position, see page 199 for more information. Activate the heater with control module (5). With switched off pre-heating system, the control unit (13) is inoperative.

(14) Temperature selector button

(15) Air conditioner temperature control knob

REMARK

To lower the cab air temperature (maximum cooling output) rotate the control knob to the left (-) sign. To reduce cooling output rotate the knob to the right (+) sign.

(16) Air conditioner blower control knob

(17) Indicator light, air conditioning ON

(18) Indicator light, air conditioning blower ON

3.4.2 OPERATING THE ELECTRONIC MONITORING SYSTEM

1.0 TEXT DISPLAY (A) with integrated KEY BOARD (B)
illust. Z25237

After switching on the Shovel's key operated main switch, the following introductory messages will be displayed on screen (A):

1st. # Please be Safety Conscious when working!

This message will be displayed for approximately 10 seconds.

2nd. |QUI| Did you check the Operating Safety of the Shovel?

Press the "QUI" key (10) to acknowledge this message.

3rd. |QUI| Did you do Maintenance according to the Service Literature?

Press the "QUI" key (10) to acknowledge this message. Thereafter the basic ECS display normally automatically appears on the screen (A) if no information - or fault messages are present. Present information - or fault messages overwrite the introductory messages no. 2 and 3.

-0-	Date	h:	M1 *1) 1/min:
	Time		M2 *2) 1/min:

***1) M1 =** Short form for Rear Engine on counterweight side designated as Engine 1.

***2) M2 =** Short form for Front Engine on Operator's cab side designated as Engine 2.

All messages related to one of the two engines, their connected cooling systems and pump distributor gears are identified by the figure 1 or 2.

Example of an engine related message:

Fault No. 560: (563)	$h: Shut down of engine **1**: oil pressure at low idle too low
Help:	Message through sensor B1-**1**.

This message applies to the **rear engine** on counterweight side **"Engine 1".**

Emergency Indication of Operating Conditions.

The ECS system is equipped with an emergency indication. In case the text display (A) fails to work, it indicates faults in important operating systems of the Shovel. The indication is effected by means of LED's at the **P**rogrammable **L**ogic **C**ontroller "**PLC**" installed in the cab base. Refer to page 206 for the location of the "**PLC**".

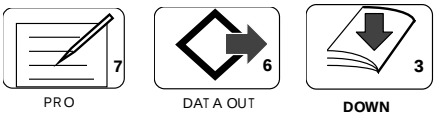
The following faults are indicated:

Fault:	LED No.:
The ECS system is by-passed (By-pass switch S27 actuated)	H30
Start of engine 1 and/or engine 2 blocked, resp. engine shifted to low idle speed by one or more of the six high pressure filters. **NOTICE** **The LED "H31" monitors all six high pressure filters. Refer to page 219 for description of the diagnostic codes flashed out by LED "H31".**	H31
Coolant pressure	H33
Coolant temperature	H34
Engine oil pressure	H36
Start of both engines blocked, resp. engine shut down, due to closed main shut-off (gate) valve hydraulic tank	H37
Faulty monitor channel for hydraulic oil temperature	H38
Too low hydraulic oil level! Stop the engines	H39
Faulty monitor channel engine speed	H112
Emergency shut down switch actuated	H116
Engine shutdown from ground man (if so equipped)	H135

How to print out Contents of Record (PROTOCOL) Memory:

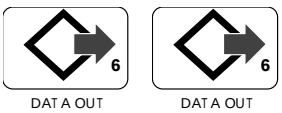
Print out the *complete* Contents of Record (PROTOCOL) Memory

Display:



Press until the maximum amount of entries **(39)** is reached

Print from the last	**>**	1**<** PRO entries
page no all * PRO has		39 entries ***P***



The complete PROTOCOL is now being printed out.

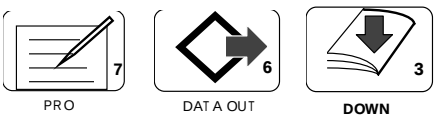
Distinctive marks for ”OLD” and ”NEW” entries:

New entries, not yet displayed / called up / printed or downloaded are marked with ***P*.**
After being displayed / called up / printed or downloaded the marking will change to **-P-.**

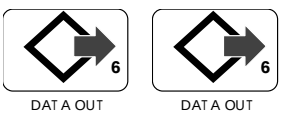
Print out the *last* Entries of the Record (PROTCOL) Memory

1st. Possibility - The last (X) Entries under consideration of all Messages

(X) = desired number of the last entries e.g. **10** (the last 10 entries of 39 total entries)



Press until the desired nos. of entries are reached,e.g. 10.



The record memory with the last 10 entries is now being printed out.

Print from the last	**>**	10**<**PRO entries
page no all * PRO has		39 entries *P*

Menu Control with Key Switch (C) and Key Group (D)

Display of Menu Options, see Menu Control Chart I (Z23063)

EXAMPLE: Display of **TRUCK COUNTER READING**, starting from basic display on level -0-

Proceed as follows:

1. Press the ”QUI” key (10), the menu level -1- with the current truck counter reading appears on the display.

2. If you want to reset the counter, press the ”QUI” key (10) again. Menu level -2- appears on display. Use key (12) for setting the counter to zero.

3. Press ”RET” key (9) twice for return to the standard display, level -0-.

EXAMPLE: Display of **LUBRICATION SYSTEMS CYCLE COUNTER READINGS**, starting from basic display on level -0-

Proceed as follows:

1. Press the ”QUI” key (10), the menu level -1- with the starting item truck counter reading appears on the display.

2. Press key (12) once the Central lubrication system cycle counter reading appears on display. By pressing key (12) again the swing ring gear cycle counter reading is displayed.

3. For returning to the standard display level -0- press ”RET” key (9).

REMARK

Changing of the lubrication cycle counter settings can be carried out in the main group SERVICE under the section *SETTINGS*, see also menu control chart III.

EXAMPLE: Display of **Service *POWER CHECK*** starting from basic display on level -0-

1. Press the “QUI” key (10), the menu level -1- with the starting item truck counter reading appears on the display.

2. Press key (12) three times the menu item *SERVICE* appears on the display.

3. Press the “QUI” key (10), Service *LANGUAGE* appears.

4. Press key (12) once the menu item Service *POWER CHECK* appears on the display.

5. Press the “QUI” key (10), the menu level -3- with the starting item Power check *DISPLAY* appears on the screen.

Continue according to description on next page, menu control chart II.

Menu Control with Key Switch (C) and Key Group (D)

Display of Menu Options

Example: Display of **INPUTS-OUTPUTS**, starting from basic display on level -0-, see Menu Control Charts I and IV (Z 23066).

The main group *INPUTS-OUTPUTS* is basically used for Testing procedures through authorized service staff and therefore locked during normal operation. Access to the *INPUTS-OUTPUTS* can be obtained in the main group *SERVICE* as described below.

Proceed as follows:

1. Press the ”QUI” key (10), the menu level -1- *TRUCKS* appears on the display, see Chart I.
2. Press key (12) three times, the main group *SERVICE* appears on display.
3. Press key (10), the menu level -2- with the starting group *Language* appears on the display.
4. Press key (12) four times, the group *INPUTS-OUTPUTS ON/OFF* appears on the display.
5. Press key (10), the menu level -3- with Menu item INPUTS-OUTPUTS Condition: 0 **(OFF)**” is displayed.
6. Press key (12), *OPERATE KEY SWITCH* appears on the display.
7. Operate key switch (C) ”Condition: 0 (OFF)” appears on the display.
8. Press key (12) to change the condition from ”0” to ”1 **(ON)**” Now access to main group *INPUTS-OUTPUTS* is possible.
9. Press the ”RET” key (9) two times for returning to the menu level -1-. The main group *SERVICE* appears on the display.
10. Press key (12), for display of the main group "INPUTS-OUTPUTS*.
    All menu levels and items within the main group INPUTS-OUTPUTS are now accessible by means of key group (D), refer to menu control charts on the following pages.

Data Transfer from Protocol and Statistics Memory to various Downloading Equipment

The illustration (Z 20731) shows typical arrangement of several downloading equipment connected to the text display interface plug socket (X27).

Legend for illust. (Z 20731)

(1)	Text display unit on instrument panel (E35)
(2)	Plug socket (serial interface X27) for connecting data transfer cable to units (4, 5, 6 or 9)
(3)	Plug socket for connecting current supply cable to units (5 or 6)
(4)	MODULAR MINING field computer system ”MMS”
(5)	Printer
(6)	Memory Card System ”MCS”. As a special equipment, this system can also be installed in the instrument panel ex works.
(7)	Memory card
(8)	Protective box for memory card
(9)	Laptop or PC
(10)	Soft- and hardware package for PROSTAT operation program
(11)	Data transfer cable (VL3)
(12)	Adapter for 25 pin interface on PC or laptop
(13)	3,5” disk PROSTAT software
(14)	Instruction manual PROSTAT (PARTS & SERVICE NEWS No. AH02512)
(15)	Change-over switch for connecting the internal output channel to plug socket (2) or to the onboard MCS system (6) if so equipped
(E6)	Programmable Logic Controller ”PLC”
(VL4)	Data transfer cable to Memory card system (6)
(VL5)	Current supply cable to Memory Card System (6)
(VL6)	Data transfer cable to printer (5)
(VL7)	Current supply cable to printer (5)
(VL8)	Data transfer cable to field computer system (4)

REMARK

The downloading units shown in illust. (Z 20731) are special equipment.
More information to these units on request.

Level 3: Service / MESSAGES ON / OFF

- 3 - Messages OPERATE KEY SWITCH
- 3 - Messages | 0 | 1 | Condition **:**

Level 3: Service / EVALUATION ON / OFF

- 3 - Evaluation OPERATE KEY SWITCH
- 3 - Evaluation | 0 | 1 | Condition **:**

Level 2: Inputs - Outputs

- 2 - Inputs - Outputs * ANALOG-INPUTS *
- 2 - Inputs - Outputs * DIGITAL-INPUTS *
- 2 - Inputs - Outputs * DIGITAL-OUTPUTS *

Level 4: Inputs - Outputs / DIGITAL-OUTPUTS / Y53-1 Y53-2 GEAR OIL COOLER 1 / 2 BACK - PRESSURE

-4- Output signals | OPERATE KEY SWITCH
-4- Cooler 1 Y53-1 (A13.3): | 0 | 1 | Cooler 2 Y53-2 (A13.4):

Level 4: Inputs - Outputs / DIGITAL-OUTPUTS / Y101 VALVE OIL COOLER BACK-PRESSURE

-4- Output signals | OPERATE KEY SWITCH
-4- Valve oil cooler back-pressure | 0 | 1 | Y101 (A5.4):

Level 4: Inputs - Outputs / DIGITAL-OUTPUTS / Y124a VALVE SERVICE ARM LIFT

-4- Output signals | OPERATE KEY SWITCH
-4- Valve service arm lift | 0 | 1 | Y124a (A5.5):

Level 4: Inputs - Outputs / DIGITAL-OUTPUTS / Y124b VALVE SERVICE ARM LOWER

-4- Output signals | OPERATE KEY SWITCH
-4- Valve service arm lower | 0 | 1 | Y124b (A5.6):

Fault No. 836 (839)	$h: Faulty pressure switch of fan drive oil filter for oil cooler 1
Help:	Closed contact of pressure switch B28-1 for oil cooler fan drive filter with switched off engine. - Check pressure switch and cables.
Fault No. 842: (845)	$h: Hydraulic oil far below operating temperature. Wait for warm-up phase!
Help:	The machine was taken into operation although the start viscosity was not attained. - Preheat hydraulic oil !
Fault No. 848: (851)	$h: Faulty monitor channel for hydraulic oil temperature
Help:	Sensor B15 shows inadmissible values. - Check sensor and cables.
Fault No. 854: (857)	$h: PTO-gear 1 oil filter restricted
Help:	- Replace filter element.
Fault No. 860: (863)	$h: Pump regulation oil filter restricted
Help:	- Replace filter element.
Fault No. 866: (869)	$h: Oil tank breather filter restricted
Help:	- Replace filter element.
Fault No. 872: (875)	$h: Return oil filter restricted
Help:	- Replace filter elements.
Fault No. 878: (881)	$h: Leak oil filter restricted
Help:	- Replace filter element.

Fault No. 1280: (1283)	$h: Shutdown through emergency stop switch S33C.
Help:	Emergency stop S33C in pump compartment actuated. - Find cause
Fault No. 1286: (1289)	$h: CENSE ECM indicates engine trouble of engine 1
Help:	Repair engine 1 soon. (Shift end)
Fault No. 1292: (1295)	$h: CENSE ECM indicates engine trouble of engine 2
Help:	Repair engine 2 soon. (Shift end)
Fault No. 1298: (1301)	$h: CENSE ECM indicates fluid problem of engine 1 Derate/shutdown can occur
Help:	- Corrective action required.
Fault No. 1304: (1307)	$h: CENSE ECM indicates fluid problem of engine 2 Derate/shutdown can occur
Help:	- Corrective action required.

GROUP 3 Information Message Texts of message pages No. 1310 - 1319 will be stored

Information No. 1310: (1311)	? 250 h Maintenance performed
Information No. 1312: (1313)	? 500 h Maintenance performed
Information No. 1314: (1315)	? 1000 h Maintenance performed
Information No. 1316: (1317)	? 2000 h Maintenance performed
Information No. 1318: (1319)	? 3000 h Maintenance performed

3.6.1 EMERGENCY ENGINE SHUTDOWN SWITCHES

Legend for illustration Z25238

(1) Pulling chains for emergency shut down from ground man (special equipment). When one of the chains (1) is being pulled down for emergency shut down of both engines, the Operator will be informed by the following message, displayed on the ECS screen:
" # Engine shut down has been actuated from ground man"

(2) Emergency engine shutdown switch (S33A) on radiator door

(3) Emergency engine shutdown switch (S33B) at the main control valves

(4) Emergency engine shutdown switch (S33C) in pump compartment on center post

(5) Emergency engine shutdown switch (S33D) at the counterweight

(A) Push button of emergency shutdown switches (2, 3, 4 and 5) for stopping the engines

(B) Release button for emergency shut down switch (if so equipped)

⚠ WARNING

- **In case of emergency push in the button (A) to stop the engines.**
- **Never stop the engines from a full load except in case of emergency. If a hot engine is shut down without previous idling period of three to five minutes, the temperature in certain engine parts rising sharply after the cooling system ceases to function. The resulting thermal stress, especially in the turbochargers, may cause serious damage.**

NOTICE

- **For restarting, first push in release button (B). On switches without button (B) pull out button (A) and then start the engines in the normal way at control panel in the operator's cab. The engines can not be started with button (A) in depressed position.**
- **When one of the Shutdown switches (2 - 5) is activated, the ECS display informs the Operator by a corresponding message.**

Switch Board “X2” in Cab Base (continued)

Service Switch (S155) for QMIN and QMAX Control of the Main Hydraulic Pumps, illustration Z25356

⚠ CAUTION

The Service switch (S155) is used for testing and adjustment procedures of the hydraulic system and should only be operated through authorized service personnel

(S155) Service switch for Qmin/Qmax position of main hydraulic pumps.

Switch positions:
0 - Normal operating position
1 - Qmax position: The main pumps remain in maximum delivery position.
2 - Qmin position: The main pumps remain in Qmin position i.e. minimum oil delivery to the hydraulic system.

NOTICE
Make sure that the switch (S155) is set to “0” position as soon as the testing and adjusting procedures of the hydraulic system are finished.

Indicator Lights (H63), (H138), (H143.1) and (H143.2)

(H63) Electronic pump control module (E32) active and program information.

(H138) This light pulses if there is a failure in the electronic pump control module (E32)

(H143.1 for rear engine 1) (H143.2 for front engine 2) Monitoring light of the automatic engine oil supply system "Reserve"
- Steady light: oil is pumped from engine oil pan to reserve oil tank.
- Regular blinking: oil is pumped from reserve oil tank to engine oil pan.
- Irregular blinking: oil is pumped in both directions, oil level in engine oil pan is correct.

REMARK
If the indicator lights (H143.1 and H143.2) are off with the engines running, there is a failure in the reserve systems. Have the reserve systems checked and repaired through authorized service personnel.

3.7.4 COMPONENTS OF ELECTRICAL PREHEATING SYSTEM IN CAB BASE

⚠ WARNING

The cab base contains high voltage electrical appliances. Access to the cab base for authorized service staff only.

General

The preheating system is a special equipment and can be installed in the factory or locally at site. Power supply to the preheating system is provided by an external power source.

The following systems are equipped with heaters:

- Engine cooling system
- Engine lubricating system
- Hydraulic system (main and suction oil reservoir)
- PTO's (pump distributor gears)
- Storage batteries

REMARK

The auxiliary heater unit in the cab base (6), illust. Z25358 and the battery charger (3) are also connected to the external power supply.

Legend for illustration Z25358

(1) Main switch board (1X1) for the preheating systems, located in the cab base

(2) Main switch (1Q1) for all system heaters

(3) Battery charger (E55)

(4) Fuse box with circuit breaker F76 - 125A for battery charger

(5) Key switch (S153) for battery charger (3)

(6) Heater unit for cab base

⚠ CAUTION

Before starting the Engines, make sure that no one will be endangered when starting the Engines.

CHECK THE FOLLOWING ITEMS

Legend for illustration Z 22468

(1) Engine oil pan dipstick oil level gauge

(2) Oil filler tube for engine oil pan

(3) Coolant expansion tank of front and rear engine radiators

(4) Coolant level sight gauge on front and rear coolant expansion tanks

(5) Cover plates on power house roof above front and rear radiator pressure caps

(6) Radiator pressure caps

Walk-around Inspection

Make a ”Walk-around” inspection of the Shovel. Refer to page 351 in the Maintenance Section for the daily inspection items.

Engine oil level of Front and Rear Engine

Check oil level with Shovel standing on level ground. Check oil level in engine oil pan with the dipstick oil gauge (1). For accurate readings, the oil level should not be checked until the oil has settled into the oil pan after the engine has been shut down (about 5 minutes).

REMARK

The oil level in the engine oil pan can vary between the MIN and MAX marking on gauge (1) depending on the operating condition of the reserve system when the engine was stopped.
With sufficient oil in the reserve tank and with the reserve system in proper working order, there is no need to fill the engine oil pan even with the oil level at the MIN mark on gauge (1). If the oil level is below the MIN marking on the gauge, corrective action must be taken. Fill the reserve tank and check the reserve system. The function of each reserve system is monitored by an indicator light located on the "X2" switch board in the cab base. See section "SWITCH BOARD (X2) IN CAB BASE" for more information.

Check the oil level in both engine oil reserve tanks, see page 329 for more information.

Be sure to fill the corresponding reserve tank of rear engine -1- or the reserve tank of front engine -2- when the information message **"Engine oil reserve tank 1 (or 2) empty"** is being displayed on the ECS screen in the operator’s cab.

REMARK

Never operate the starter longer than 30 seconds at a time in order to avoid damage. If the engine does not start within the first 30 seconds, wait 2 minutes before cranking again.

8. As soon as the engines are running, check display (3) for messages.

After starting observe the following:

The ECS System monitors the Shovel's functions and provides information about the appropriate operational data.
If a FAULT message is displayed on screen (3), the acoustic warning signal (2) will sound simultaneously for approximately 1 second. In such a case proceed according to the instructions of the ECS system on page 92.
Warning buzzer (2) will sound continuously when the hydraulic oil level is too low. In this case, stop the engines, locate and correct the cause immediately. Fill up hydraulic oil to the correct level.

9. Idle the engines 3 to 5 minutes to attain a minimum coolant temperature of 60°C before operating with a load.

10. After warming up of the engines, the speed can be increased by setting switch (4) to high idle speed position.

NOTICE

DO NOT idle the engines for excessively long periods. Long periods of idling, more than 10 minutes, can damage the engine because combustion chamber temperature drop so low the fuel will not burn completely. This will cause carbon to clog the injector spray holes and piston rings and can cause the valves to stick.

REMARK

If one engine fails to work during operation, the shovel can be operated with the second engine as an emergency measure, e.g. for moving the shovel out of a danger area.

Automatic Engine Shut-Down System (Safety Chain)

The engine(s) will be stopped or shifted to low idle speed automatically if a serious trouble condition occurs. The operator will be informed about the trouble condition by a corresponding message displayed on screen (3).

⚠ CAUTION

Never let the engines run with disconnected batteries. This may cause alternator damage.

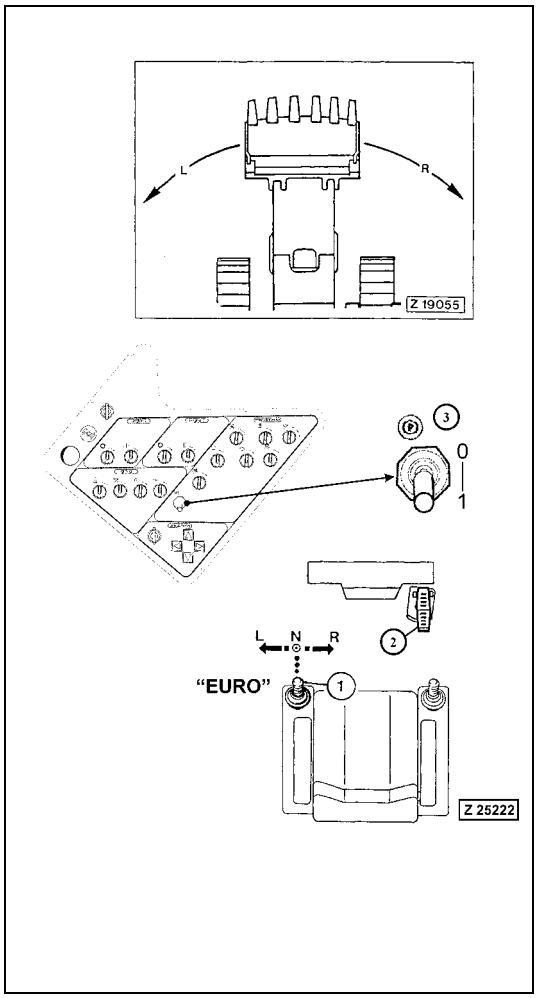
3.12 SLEWING AND BRAKING THE SUPERSTRUCTURE

3.12.1 SLEWING THE SUPERSTRUCTURE

MACHINES WITH "EURO" CONTROL

Legend for illustration Z25222

"L"	CCW- Lever (1) to the left "L"
"N"	Neutral position
"R"	CW- Lever (1) to the right "R"

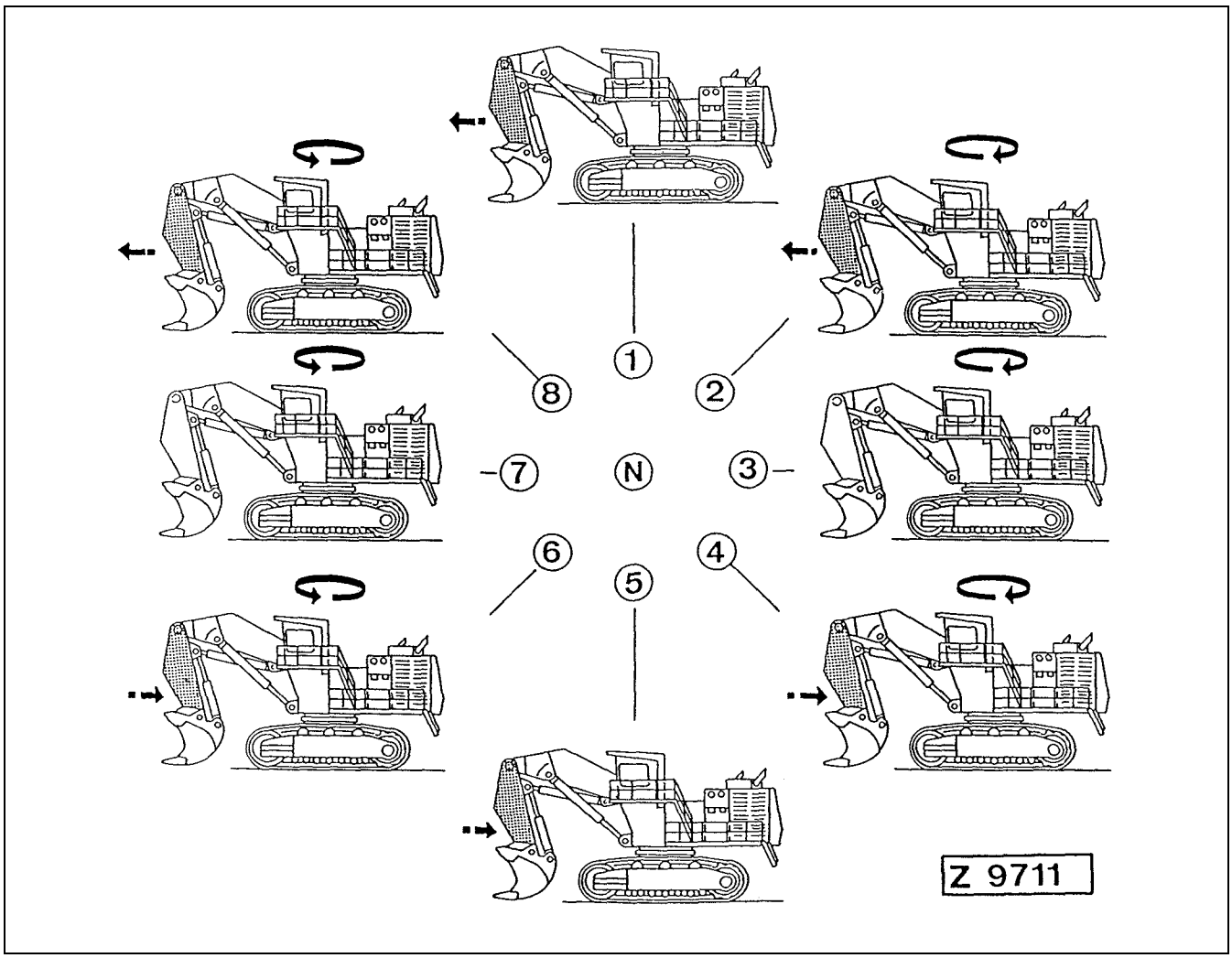


⚠ WARNING

- **Be sure everyone is in the clear before slewing the superstructure.**
- **Never swing or position the attachment or load over persons or vehicle cabs.**
- **Never allow anyone to walk or work under the Shovel or load while the Shovel is operating.**

NOTICE
The illustration shows a typical Shovel.
The movements shown in the illustration are controlled:

- **at KMG control system with R.H. lever**
- **at EURO control system with L.H. lever**

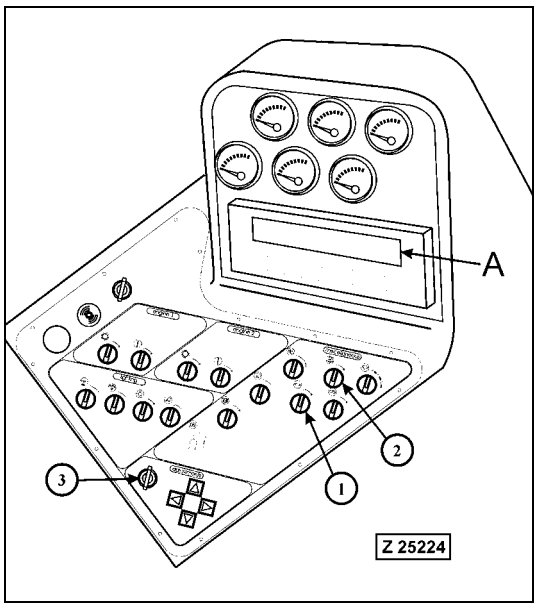


Legend for illustration Z 9711)

(N)	Neutral position	(5)	Retracting stick
(1)	Extending stick (away from machine)	(6)	Retracting stick and slewing to the left
(2)	Extending stick and slewing to the right	(7)	Slewing to the left
(3)	Slewing to the right	(8)	Extending stick and slewing to the left
(4)	Retracting stick (towards machine) and slewing to the right		

ADJUSTMENTS OF THE CENTRAL LUBRICATION SYSTEM

Manual actuation Mode of the Lubrication System with Service Key



The manual actuation in the Service mode is useful for testing the electrical and hydraulic functions of the of the lubrication system. The pause time is reduced to 30 seconds and the holding time to 15 seconds permitting rapid sequences of lubrication cycles. Both lubrication systems can be set to the manual actuation mode.

⚠ CAUTION

In the manual actuation mode all monitoring functions of the system are made inoperative and, because of the very short pause and holding times, grease will not reach to all lubrication points.

Carry out manual lubrication by using the service key

1. Insert key into service switch (3) and set to operating position.
2. Actuate the rotary switch (1) on the instrument panel. The message # SERVICE appears on the display. Up to ten repeated actuation of the switch are possible. The lubrication cycles are counted and displayed in the cycle counter window.
3. After finishing the manual lubrication remove service key. The system returns to the normal timer settings.

Adjustments of the Central Lubrication System

The following adjustments can be made with the menu control of the ECS system:

Level 4: Service / Settings

- 4 - Settings * CONDITION INDICATION *
- 4 - Settings (minutes) * PAUSE TIME : *
- 4 - Settings * LUBE CYCLE COUNTER : *

Refer to section "ELECTRONIC MONITORING AND CONTROL SYSTEM ECS" for description of adjustment procedure.

3.18.5 LOCATION OF THE EXTINGUISHING AGENT TANK ASSEMBLIES AND EXPELLANT GAS CARTRIDGES ON POWER HOUSE ROOF

REMARK

All fourteen extinguishing agent tank assemblies with their expellant gas cartridges are located on the rear railing of the power house roof.

Legend for illustration Z 20942

(1)	Extinguishing agent tank assembly
(2)	Name plate
(3)	Fill cap
(6)	Manual actuator switch at the radiator door
(7)	Manual actuator switch at the rear power house entrance
(9)	Extinguishing agent outlet to nozzle
(12)	Mounting clamp
(15)	Expellant gas cartridge
(20)	Pneumatic actuation line

REMARK

Check Extinguishing agent tank assemblies (1) and Expellant gas cartridges (15) for good condition and proper mounting.
Check filling level of Extinguishing agent tank assemblies (1) according to the instructions in the separate Inspection and Maintenance manual "A-101 VEHICLE FIRE SUPPRESSION SYSTEM".
When checking the filling level, make sure the extinguishing powder is not compacted. Stir up the extinguishing powder with a suitable stick until it is in a free flowing condition.

3.20.2 OPERATING THE HYDRAULIC SERVICE ARM

A - Diesel Engines OFF

The Service Arm can only be lowered.

Proceed as follows:

1. Turn main key switch to ON position.
2. Turn enabling switch (1), illust. (Z25240) to ON position ”1”.
3. For lowering the Service Arm (3) pull down chain (2).
4. Release chain (2) when arm (3) is in fully lowered position.

REMARK
To stop lowering movement of the Service Arm in any position release chain (2).

5. Before leaving the Shovel turn enabling switch (1) to OFF position ”0” and remove the main switch key.

B - Diesel Engines running

Control the Service Arm as follows:

1. Turn enabling switch (1), illust. (Z25240) to ON position ”1”.
2. To lower the service arm (3) pull chain (2) and hold until the service arm is in fully lowered position. For reversing moving direction of service arm release the chain (2) to stop service arm movement and then pull chain (2) again.
3. To lift the service arm pull chain (2) and hold until the service arm is completely lifted into its home position.

NOTICE
Be sure the Service Arm is completely lifted to its home position otherwise the proximity sensor in the guide frame of the service arm will not release the pilot control system.

3.21.1 OPERATING THE CRANE

⚠ WARNING

- **Before operating the crane, check condition and fastening of the crane structure and base.**
- **Read the separate Instruction Manual "CRANE TYPE HMK 60 Ta1" before operating the Crane. The Crane Instruction Manual is filed in volume 2 Binder.**

NOTICE

- **DO NOT exceed maximum payload of 1000 kg.**
- **DO NOT lift the hook block to the stop.**
- **Carry out inspection and maintenance according to the separate Crane Instruction Manuals.**
  Check security and tightening torque of all mounting bolts after the first 100 operating hours and thereafter every 1000 operating hours. Refer to the maintenance section for the tightening torque specifications.

Legend for illustration Z22979:

1	Control panel.
2	Electric – hydraulic power unit
3	Rotating boom
4	Lift boom
5	Hydraulic rope winch
6	Lift boom extensions
7	Load hook
8	Support for lift boom (4) in home position
9	Securing eye for load hook (7) in home position
10	Emergency stop switch for all hydraulic operations of the crane
11	Warning light, if this light comes on the crane has reached 90% of its maximum permissible lifting capacity. This light is used as a pre-warning to indicate a possible overload condition.
12	Indicator light automatic cut-off of the hydraulic winch. Use button (12A) to reactivate winch.
12A	Push button. This button is used to override an automatic cut-off of the hydraulic winch. If a minimum of three windings of rope are left on the winch drum, the winch rope cut-off device automatically stops the winch. To reactivate the winch push in the button while simultaneously rewinding the winch rope.
13	Control lever for lift boom extensions EXTEND - RETRACT
14	Control lever for lift boom RAISE - LOWER
15	Control lever for rotating boom SLEW LEFT - SLEW RIGHT
16	Control lever for winch rope UP - DOWN

3.26.2 HYDRAULIC SYSTEM

Problem	Probable cause
Poor hydraulic system performance	● Hydraulic oil not at operating temperature. ● Engine speed too low. ● Reservoir low on oil ● Restrictions in lines ● Cooling circuit, pump control system and/or pilot control circuit defective. ● Internal leakage (control blocks, valves or power units.) ● Pressure lines twisted or kinked ● Spool not in full stroke. ● Relief valve defective, or out of adjustment. ● Worn cylinders. ● Defective hydraulic pump.
Excessive oil temperature	● Low oil level ● Incorrect viscosity or type of oil ● Hydr. oil cooler clogged with dirt. ● Oil cooler fan defective or wrong speed. ● Cooling circuit defective ● Pump control system defective ● Spool not in full stroke. ● Internal leakage (control blocks, valves or power units) ● Worn pump components ● Job conditions (high temperature of materials being handeld)
Jerky motion of power cylinders	● Piston rod bent ● Piston sticking ● Inside diameter of cylinder tube partially increased or scored ● Air in control circuit ● Oil too cold ● Valve spool sticking, centering springs defective ● Pump and/or engine control system defective ● Valve of power circuit defective
Noise when slewing	● Inssufficient lubrication of swing ring gear and/or slewing connection. ● Slewing connection mounting bolts loose ● Drive pinion worn ● Swing gear bearings worn ● Sun gear or planetary pinions worn ● High pressure circuit valves defective ● Anti-caviation valves sticking
Excessive oil foaming	● Air in hydraulic system ● Poor quality oil ● Excessive by-passing of oil over relief valves ● Pressure hoses badly twisted or kinked ● Restricted oil flow due to foreign matter ● Breather on the reservoir clogged. ● Relief valve improperly adjusted

4.6 LUBRICATION AND MAINTENANCE SCHEDULE

4.6.1 INITIAL SERVICING

AFTER THE FIRST 250 OPERATING HOURS

Change oil in Swing gears, Travel gears and PTO's (pump distributor gears). Thereafter every 3000 hours, but at least once a year. An oil sample analysis should be made every 1000 operating hours.

Hydraulic system: Replace return oil filter elements and leakage oil filter element. Inspect return oil strainers. Thereafter every 1000 hours.

AFTER THE FIRST 250 AND 1000 OPERATING HOURS

Check tightening torque of high strength bolt connections. Thereafter every 1000 hours.

NOTICE

- **The mounting bolts of the left and right crawler carrier to the undercarriage carbody have to be retightened only after the first 1000 operating hours, see page 445 for retightening procedure.**
- **The swing circle connection bolts need only to be checked after the first 1000 operating hours in accordance with PARTS&SERVICE NEWS No. AH00511 filed in volume 2 binder.**

NOTICE

The above initial service is of vital importance for proper operation and long service life of the machine.

4.6.2 PERIODIC SERVICING INTERVALS

All following intervals of time between services are based on average operating conditions. Under unusually severe conditions of operation, reduce the interval of time between services.

NOTICE

The periodic servicing intervals are also displayed on the ECS screen.
Carry out the maintenance work of indicated service intervals according to this maintenance section.

Extended Service Intervals for Engines with Engine Oil Management System

- **Every 500 operating hours**

  The contents of each engine oil reserve tank is sufficient for approximately 500 hours of operation. The oil level in the reserve tanks is also monitored by the ECS system. Be sure to fill the corresponding reserve tank for rear engine -1- or front engine -2- when the information message **"Engine oil reserve tank 1 (or 2) empty"** is being displayed on the ECS screen.
  Fill the reserve tanks via the swing down service arm.
  Use engine oil according to the specifications in the Engine Operation and Maintenance Manual.

  Change both oil filter cartridges (3) of the reserve system.

- **Every 4000 operating hours**

  Change engine oil. Drain the oil from both engine oil pans and from both engine oil reserve tanks. See illustration Z22452A on page page 333 for location of the drain plugs on the reserve tanks. It is recommended to change the oil when the oil level in the reserve tanks is near the minimum level.

NOTICE
After the engine oil has been drained from both engine oil pans and from both reserve tanks, fill both engine oil pans and both reserve tanks via the swing down service arm.
See section "Central Refilling System" on page 288 for more information.
DO NOT use the oil in the reserve tanks to fill the engine oil pans after an oil change.

Refer also to the Engine Operation and Maintenance Manual for oil change procedure and oil specifications.

4.6.5 RESETTING THE ENGINE OIL BURNING SYSTEM CENTINEL

Resetting of the Centinel system is necessary in the following cases:

- After every engine oil change.
- Whenever the engine oil reserve tank has been allowed to run empty.
- After repairs on the Centinel system.
- When changing the engine oil quality from Mineral oil to Synthetic oil and vice versa.

For resetting procedure refer to page 69 in section 3.2

4.7.2 SWING CIRCLE TOOTHING LUBRICATION

See illustration Z 20850

All teeth of the ring gear (3) must be completely covered with grease.

If teeth are not completely covered with grease, they have to be lubricated immediately with special adhesive spray grease, illust. (Z 0148) or spread type adhesive grease as specified in the Parts Catalog. The spread type grease can be applied, for example, with a brush.

Observe the instructions on the grease container for correct use of the lubricant.

NOTICE

- **If the machine is equipped with gear ring guard (6), remove covers (7) for swing circle teeth inspection.**
- **If the automatic lubrication system of the swing circle-teeth, is out of function for more than one shift, lubricate manually (using spray grease) and remove the lube pinion (5), to prevent serious damages.**
- **In order to ensure proper adherence of the lubricant, clean and dry the ring gear prior lubrication.**
  In most cases it is sufficient to rotate the superstructure several times for removing moisture from the gear teeth.
- **Make sure that the multi-purpose grease of the swing circle bearing does not come in contact with the teeth of the swing circle because this will diminish lubrication capability of the swing circle teeth lubricant.**
  If necessary remove excessive multi-purpose grease from the swing circle above the dust seal ring.

4.8.1 WALK - AROUND INSPECTION

⚠ WARNING

Before carry out any maintenance on this machine, make sure the mounting ladder, handrails and walkways are properly installed and in good condition. Keep the ladder, steps, handrails and walkways free of mud, oil and grease.
Always use the ladder, handrails and steps to get on or off the machine. Jumping on or off the machine can cause an injury.

Legend for illustration Z22881

(1) Working attachment. Check overall condition. Inspect for loose or missing securing parts.

(2) Hydraulic cylinders. Check cylinders, hydraulic lines and connections for leakage and damage.

(3) Check bucket teeth for proper mounting. Inspect for loose or missing securing parts.
Check condition of the loader bucket. Both loader bucket versions, bottom dump bucket and backhoe bucket are equipped with wear protection packages as specified in the contract. These wear packages protect the base body of the bucket from premature wear and tear. Therefore it is important to check the condition of the wear protection elements regularly. Worn or damaged protection elements should be replaced at an early stage in order to prevent damage to the base body of the bucket.
In case the bucket base is already weakened, reconditioning measures will be necessary. Contact your Komatsu dealer for support.

(4) Check guide wheels for leakage.

(5) Check carrier rollers for leakage.

(6) Check track rollers for leakage.

(7) Check travel gears for leakage

(8) Check swing circle toothing for adequate lubrication.

(9) Check condition, fastening and security of access ladders.

(10) Check condition, fastening and security of all walk-ways, steps, railings and hand rails.

(11) Check condition, fastening and security of emergency escape ladder

(12) Check condition and fastening of engine air cleaners

(13) Check condition and fastening of exhaust mufflers

(14) Check condition and fastening of automatic lubrication system grease container

(15) Make a visual inspection of the engine room. Check engine oil level and coolant level.

NOTICE
If any damages, failures or wrong condition, have been found during the inspection, corrective action must be taken.

4.8.3 RADIATORS - CHECK COOLANT LEVEL

Legend for illustration Z 21770

(6) Coolant expansion tank of front and rear engine radiators

(7) Coolant level sight gauge on front and rear coolant expansion tanks

(8) Cover plates on power house roof above front and rear radiator pressure caps

(9) Radiator pressure caps

⚠ WARNING

DO NOT remove the radiator pressure cap (9), illust. Z21770 from a hot engine. Wait until the temperature is below 50°C before removing the pressure cap (9). Failure to do so can result in personal injury from heated coolant spray or steam. Press the red button on the radiator pressure cap to allow the pressure to escape. Turn the radiator cap slowly counterclockwise to the safety stop, then continue to turn until cap is free to be removed.

The coolant level should be in the upper field of the sight gauges (7). If necessary add coolant.

REMARK

Refer to the Engine Operation and Maintenance Manual for the correct coolant composition.

4.8.4 TRACK GROUPS - CLEAN

See (10), illustration Z 21770.

Clean track groups especially during the cold season.

TRAVEL GEARS, MOTOR ADAPTER HOUSINGS AND FINAL DRIVES - CHECK BREATHER FILTERS

Legend for illustration Z25243

(11)	Connector on travel gear box for breather filter (18)
(16)	Connectors on motor adapter housing for breather filter (19)
(18)	Breather filters for travel gears
(19)	Breather filters for motor adapter housings
(20)	Breather filters for final drives
(21)	Pilot oil pressure hydraulic lines for releasing the parking brakes

Check the six breather filters(18, 19 and 20), located inside the center frame, for restriction. If necessary, remove breather filters, blow out with compressed air from inside to outside and reinstall.

4.10.1 AIR CONDITIONING COMPRESSOR - CHECK DRIVE BELT TENSION

⚠ WARNING

Be sure to set the maintenance safety switch to 0 position before to start the checking procedure. Refer to page 203 for the location of the maintenance safety switch. In the 0 position the engines can not be started. Secure this position by inserting a padlock into the holes of the switch. Up to three padlocks can be attached to the holes provided.

Legend for illustration Z 22511

(1) Refrigerant compressor

(2) Electromagnetic clutch

(3) Compressor carrier

(4) Swivel bracket

(5) Pivot bolt, loosen for adjusting belt tension

(6) Drive belts

(7) Lock nut

(8) Adjusting bolt for belt tension

Check tension of each belt

The tension is correct if the belt can be depressed with 110 N (25 lb.) force approximately 15 to 20 mm midway between the belt pulleys.

Excessive belt tension causes undue wear on the bearings. After a new belt has been in use for approximately 20 minutes, check the tension and adjust again if necessary.

NOTICE
Always replace the belts in complete sets.

Adjust belt tension

1. Loosen pivot bolt (5)
2. Loosen lock nut (7)
3. Turn adjusting bolt (8) until correct belt deflection is obtained. Tighten lock nut (7)
4. Tighten pivot bolt (5) and check the belt adjustment.

4.10.8 WINDSHIELD WASHER SYSTEM - CHECK FLUID LEVEL

Legend for illustration Z 25422

(1) Water reservoir for windshield washer

(2) Filler cap with suction line

(3) Water pump for windshield washer

(4) Upper washer nozzle for windshield

(5) Water pump for windshield washer

(6) Lower washer nozzle for windshield

(7) Wiper motor for lower windshield wiper

(8) Wiper motor for upper windshield wiper

Fill the water reservoir (1) with clear water, add anti-freeze and cleaning agent as necessary. Filling capacity of the water reservoir is 7 liters.

Check washer and wiper system for tightness and carry out a functional test of both systems.

CHECK ADJUSTING RANGE FOR GUIDE WHEELS

Legend for illustration Z 20015

(1) Guide wheel

(2) Slide block

(3) Stop plate

“X” Adjusting range for track tension

The adjusting range for track tension is the distance “X” between guide wheel slide block (2) and stop plate (3). Depending on lenghtening of the track the slide block (2) may come in contact with stop plate (3). In such a case, it must be ensured that the track does not become too loose, Depending on track condition, the removal of one track pad will restore the adjusting range “X”. If necessary contact our Service Department for more information.

⚠ WARNING

Before working on the track adjusting system, relieve all pressure in the system by opening the pressure relief cock (5), see illust. Z 20371 on previous page.

NOTICE

- **If removal of a track pad becomes necessary, it must be done on both tracks in order to maintain the same length of both tracks.**
- **During operation, the pressure relief cock (5) must always be in CLOSED position. Open cock (5) for pressure relieve prior servicing any part of the system, e.g. removal of a track pad.**

High-Strength Bolt Connections (continued)

Check mounting of Operator's cab, illust. Z 22663

- Check tightening torque of mounting bolts as indicated in the illustration.
- Check condition and fastening of chains (1).
- Check the silicone oil filled viscous mounts (2) for leakage and signs of fatigue.

High-Strength Bolt Connections (continued)

Check fastening and condition of the eight power house posts (75) and transverse carrier (82), illust. Z 20706

Reference No.:	Bolt size mm	Grade	SW * mm	Tightening torque Nm	Qty.
(85)	M30	10.9	46	1770	48
(86)	M24	10.9	36	880	12

* SW = Wrench size

- Re-tighten mounting bolts to their correct torque and replace missing or damaged bolts.

High-Strength Bolt Connections (continued)

- Check fastening and condition of main hydraulic pumps (1-6), illust. Z 20710.
  Mounting bolt size: M20, Grade 8.8, tightening torque 360 Nm.

- Check fastening and condition of auxiliary pumps (8.1 - 8.6) and secondary hydraulic pumps (10.1 - 10.4).
  Mounting bolt size: M12, Grade 8.8, tightening torque 74 Nm.

Pump Description:

(1-6)	Main hydraulic pumps, swash plate type for all working and travelling motions.
(8.1-8.6)	Gear type pumps.
(10.1-10.4)	Axial piston pumps.

High-Strength Bolt Connections (continued)

Check condition and fastening of swivel joint (A), illust. Z 20865

Reference No.:	Bolt size mm	Grade	SW * mm	Tightening torque Nm	Qty.
(1)	M 16	10.9	24	265	4
(2)	M 16	10.9	24	265	8

* SW = Wrench size

- Re-tighten mounting bolts to their correct torque and replace missing or damaged bolts.

High-Strength Bolt Connections (continued)

Special hydraulic torque wrench

Legend for illustration Z24072:

(1) Application of the hydraulic torque wrench

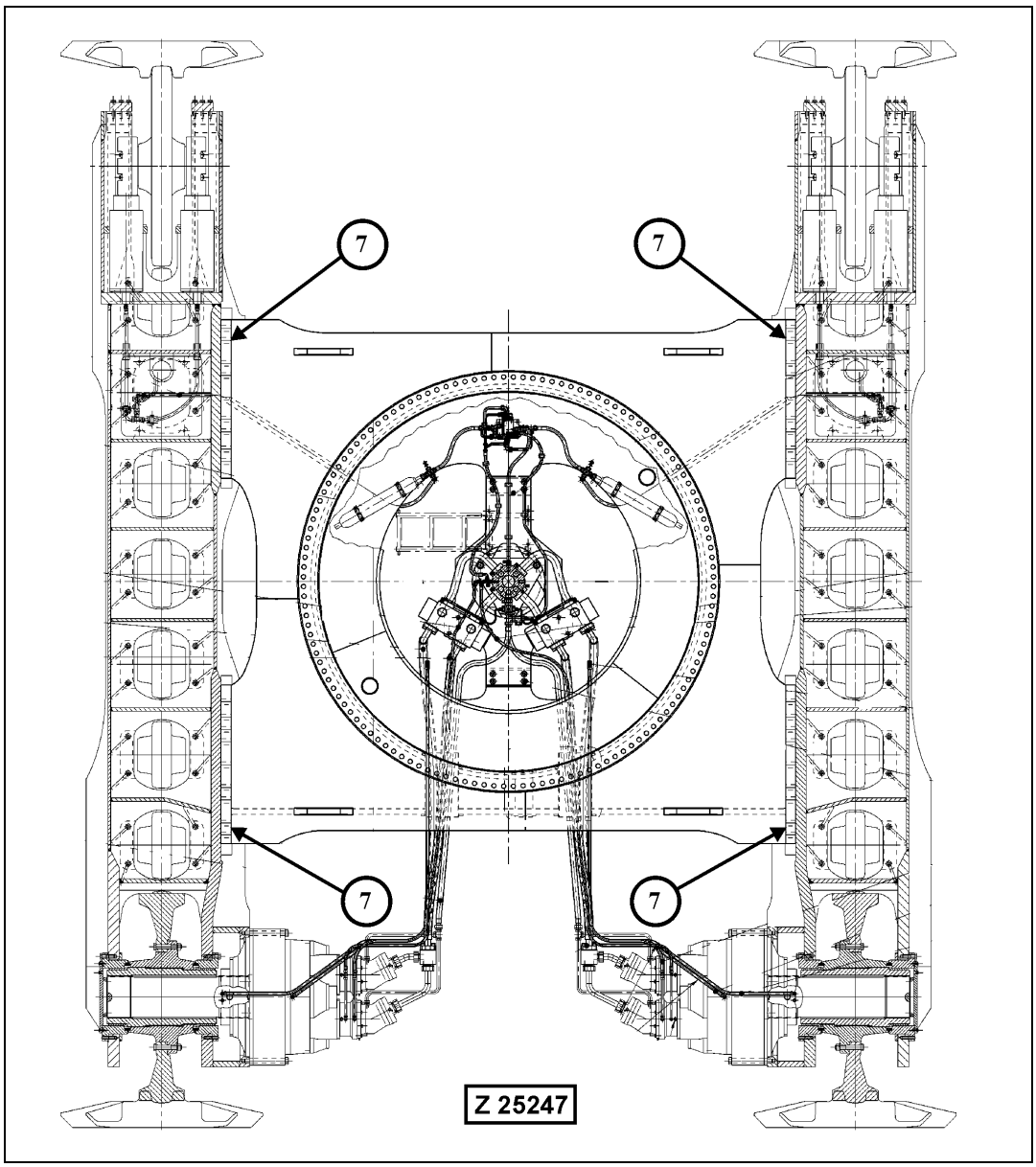
(2) Special wrench socket with supporting bar (P/N 793 376 73)

(3) Hydraulic wrench (P/N 793 374 73)

(4) Electro-hydraulic pump set (P/N 793 375 73)

The equipment shown in illustration Z24072 will be provided by your Komatsu dealer.

Location of the four measuring bolts (7), illustration Z25247



High-Strength Bolt Connections (continued)

Roof-mounted crane for grease barrel replacement
Check condition and fastening of the crane

Legend for illustration Z 23054

1	Crane post
2	Outrigger
7	Ropes for securing the outrigger (2) in home position
8	Ring for fastening the wire ropes (7).
9	Storage box for hoist chain
10	Crane mounting bolts, M27 quality grade 8.8. Tightening torque 920 Nm.

Be sure to check security and tightening torque of the crane mounting bolts (10) after the first 100 operating hours and thereafter every 1000 operating hours. Check condition of fastening ropes (7) and ring (8).

FILTER SERVICE

High Pressure Filters "HPF", illustration Z 21780

NOTICE
Carefully inspect elements for damage. Always install new elements if ruptures or other damages are found.

5. Remove element (10) and clean. Take care not to contaminate the "Clean" inside of the element when flushing.

6. Inspect O-rings (12 and 14) and back-up ring (13). Replace if necessary.

7. Install drain plug (7) with new packing ring (11). Fill filter case (8) half way up with clean hydraulic oil and re-assemble the filter. Make sure element (10) is properly seated in the filter head.

8. After short operating period check filter units for leakage.

⚠ CAUTION

In case filter element (10) is soiled by metal chips, examine hydraulic pump for damages. Install new element (10).

NOTICE
If after cleaning of the filter element, the message "High pressure filter restricted" is displayed again, replace the filter element.
Replace elements (10) after three cleanings or after every 5000 operating hours, whichever occurs first.
After pump repairs all high pressure filter elements must be replaced.

4.12.5 HYDRAULIC TRACK TENSIONING SYSTEM - CHECK PRESSURE ACCUMULATORS

⚠ WARNING

Before working on any part of the hydraulic track tensioning system relieve all pressure in the system by opening pressure relief cock (5), illustration Z 20371.

NOTICE
For checking the charging pressure a special testing and filling device must be used. This device can be ordered from your Komatsu Dealer.
The testing and filling procedure of the pressure accumulators has to be carried out in accordance with Service Bulletin No. AH01531.

Legend for illust. Z 20371:

(1) Rotary distributor

(2) Supply line, pilot pressure from travel brake release circuit

(3) Return oil line (leakage oil)

(4) Valve block

(5) Pressure relief cock for hydraulic track tensioning system.

“C” - Closed (Normal working position)

“O” - Open

(6) Shut-off cock in supply line

“O” - Open (Normal working position)

“C” - Closed

(7) Two stage pilot pressure operated relief valve

(8A) Pressure accumulator, high pressure (150 bar)

(8B) Pressure accumulator, low pressure (31 bar)

(9) Shutoff cocks, RH & LH

“O” - Open (Normal working position)

“C” - Closed

(10) Track adjusting cylinders, inner

(11) Track adjusting cylinders, outer

(12) Test connectors and vent valves

HYDRAULIC SYSTEM - CHANGE OIL, REPLACE SUCTION STRAINERS AND PULSATION DAMPER

Legend for illust. Z 21785

(1) Return oil collector manifold

(2) Drain coupling

(3) Pulsation damper

(4) Return oil collector pipe

(5) Main control valves

(6) Swing control valve

NOTICE
Attach drain hose (part of tool set) to coupling (2) and drain oil from return oil collector manifold (1). Remove pulsation damper (3) and install new pulsation damper with new O-ring.

4.13.2 EMERGENCY ESCAPE LADDER - INSPECTION

Legend for illust. Z24090

(1) Sliding window, serves also for emergency exit

(2) Release lever for hinged railing bar (3)

(3) Hinged railing bar

(4) Rigidly mounted emergency escape ladder

(5) Rope ladder. The upper end of the rope ladder is fixed onto the lower rung of the rigid escape ladder (4) by means of the fasteners (6), see detail (X). The lower end of the rope ladder is fixed on brackets (8) and secured with rubber fasteners (7), see section (A-A).

(6) Hooks for fastening the rope ladder onto the rigid ladder (4)

(7) Rubber fasteners for rope ladder in lifted position

(8) Bracket for rope ladder in lifted position. The lower rung of the rope ladder is hooked up into the brackets (8)

- Check rigidly mounted emergency escape ladder (4) for good condition and proper fastening.
- Check rope ladder (5) for good condition and proper fastening.

If any damage or bad condition is found replace the concerned parts without delay.

4.14.2 TRAVEL GEARS, MOTOR ADAPTER HOUSINGS AND FINAL DRIVES CHANGE OIL

Legend for illustration Z25244

- A - View of the RH Final drive. The configuration of the LH Final drive is the same.

(1) Travel gear

(2) Oil level gauge

(3) Oil filler plug

(4) Oil drain plug

(5) Connector for breather filter line. The breather filter is located inside the center frame, see illustration Z25243 on page 371.

(6) Travel brake housing

REMARK
The travel gear brakes are dry type multiple disk brakes. DO NOT fill the housings with oil.

(7) Motor adapter housing

(8) Oil level plug

(9) Connector for breather filter line, the breather filter is located inside the center frame, see illustration Z25243 on page 371. The port of connector (9) is also used as oil filler opening.

(10) Oil drain plug

(11) Hydraulic motors

(12) Final drive housing contains the lubricating oil for sprocket bearing lubrication.

(13) Oil level gauge

(14) Oil filler plug

(15) Oil drain plug

(16) Connector for breather filter line, the breather filter is located inside the center frame, see illustration Z25243 on page 371.

GENERAL INFORMATION

Welding operations can cause damage to electronic components. (Computers, Control Units, Sensors etc.), in case the welding current goes through these units. Therefore protective measures are necessary before any weld repair is started.

GENERAL PROTECTIVE MEASURES

A. Observe the prevailing safety and fire prevention regulations.

Before any weld repair is started, a survey should be made of the area and all safety considerations satisfied such as fuel tanks, oil lines, electrical cables and synthetic materials.

B. Attach the welding ground directly to the part that is being repaired. Do not allow welding current to go through bearings. Welding current could arc the bearings, resulting in severe damage to the bearing.

WELD REPAIRS ON MAJOR COMPONENTS OF THE EXCAVATOR

COUNTERWEIGHT

⚠ WARNING

The chambers of the counterweight are filled with a mixture of concrete, granulated ore and steel pellets. This mixture can create explosive gases which will accumulate in the chambers of the counterweight. Before any welding, flame-cutting, grinding or drilling procedures are carried out on the counterweight it is vital to expel these gases from the counterweight chambers. Failure to properly expel the gases from the counterweight chambers can result in an explosion with serious personal injury or death.
Follow the instructions given in PARTS & SERVICE NEWS No. AH04518 for expelling the gases from the counterweight chambers.

Legend for illustration Z 20674

(1) Undercarriage, refer to page 523 for protective measures.

(2) Loader attachment, refer to page 525 for protective measures.

(3) Superstructure, refer to page 527 for protective measures.