EN

AL275

S/N ADBH 11001 & above

AL350

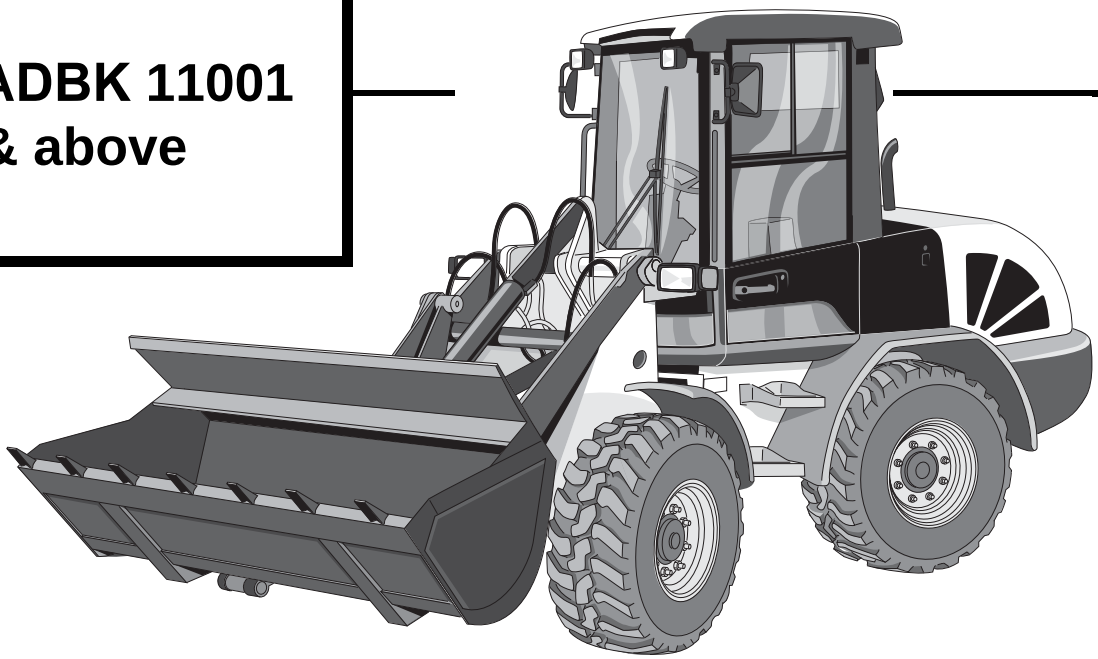
S/N ADBJ 11001 & above

AL440

S/N ADBK 11001 & above

Bobcat®

Service Manual



4950152 (10-09) (A)

Bobcat

Printed in Europe

Monitoring and inspections

The machine must be thoroughly inspected by an authorized and trained person according to the safety regulations valid in your country:

- Prior to the first commissioning and prior to re-commissioning after major changes
- At least once a year
- Periodically according to the operating conditions and the conditions in the operator's company

The inspection report is to be put in writing and kept for future reference.

Furthermore, prior to each work shift, the machine operator must check the earth-moving machine according to the inspections chart.

Hydraulic hoses must be replaced as soon as the following damages are recognized:

- Damages to the outer layer which reach the intermediate layer
- Embrittled patches on the outer layer
- Deformations when under pressure or without pressure which differ from the original shape of the installed hose
- Leakages
- Damages to hose fittings or to the connection between the fitting and the hose

The coolant level must only be checked when it has cooled down; the cap must be turned carefully in order to bleed off excess pressure.

Prior to operations, the machine operator must check the function of the safety devices.

The machine operator must advise the supervisor immediately - and the person relieving him, should there be a change of operators - with regard to any shortcomings.

In the event of shortcomings which jeopardize the operating safety of the earth-moving machine, it must not be used until these have been eliminated.

Fire protection

A fire extinguisher has to be stored in the operator's cab. A fire extinguisher symbol has to be applied.

Emergency exit

The windscreen acts as an emergency exit. If a front guard is fitted or this exit can no longer be used for any other reason, an emergency hammer must be affixed at an easily accessible place inside the driver's cab.

Other dangers

Failure of the hydraulics

If the hydraulic system fails due to a standstill of the diesel engine, a defectiveness of the hydraulic oil leakage, only the **emergency** functions „**lower working equipment**“ are possible.

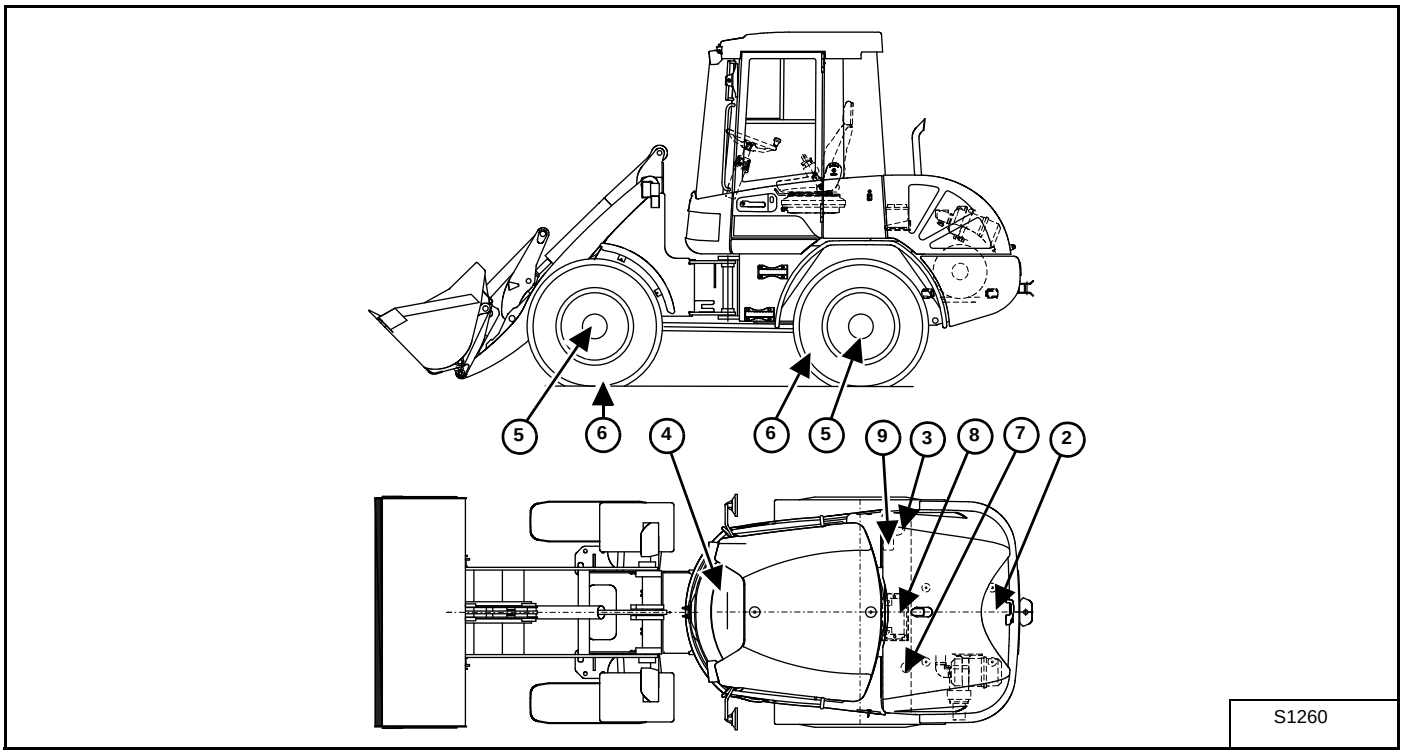
INTERVALS

First inspection	Once before first putting into operation	See “Initial inspection (delivery / handing-over inspection)” on page 10-70-1.
Daily jobs	Every 10 operating hours or every work shift 1)	See “Daily and weekly tasks” on page 10-70-2 .
Weekly jobs	Weekly or after 50 operating hours 1)	
AL275		See “Inspection plan” on page 10-90-1
Every 10 operating hours	Every 10 operating hours or every work shift 1)	
Every 100 operating hours	Once after first putting into operation 2)	
Every 200 operating hours	After every 200 operating hours	
Every 400 operating hours	After every 400 operating hours or 12 months 1)	
Every 800 operating hours	After every 800 operating hours or 12 months 1)	
Every 1,500 operating hours	After every 1,500 operating hours or 12 months 1)	
Every 3,000 operating hours	After every 3,000 operating hours or 12 months 1)	
AL350 / AL440		
Every 10 operating hours	Every 10 operating hours or every work shift 1)	
Every 250 operating hours	After every 250 operating hours or 12 months 1)	
Every 400 operating hours	After every 400 operating hours or 6 months 1)	
Every 500 operating hours	After every 500 operating hours or 12 months 1)	
Every 800 operating hours	After every 800 operating hours or 12 months 1)	
Every 1,000 operating hours	After every 1,000 operating hours or 12 months 1)	
Every 3,000 operating hours	After every 3,000 operating hours or 12 months 1)	

1) Whichever comes first.
2) Also applicable when new or overhauled diesel engines are put into operation.

Initial inspection (delivery / handing-over inspection)

Figure 10-70-1



NOTE: These jobs must be carried out by trained dealer service personnel.

ITEM	DESCRIPTION	SEE PAGE
1	Check whether machine-specific instruction book is in the machine.	--
2	Check engine oil level.	See page 10-90-5
3	Check hydraulic oil level.	See page 10-90-20
4	Check fuel level.	See page 10-90-10
5	Oil level check: differential and axle hubs.	See page 10-90-23
6	Check tyre pressure and tightening of wheel nuts.	See page 10-90-24
7	Check brake oil level.	See page 10-90-19
8	Battery: electrolyte level and charge condition.	See page 10-90-25
9	Top up windshield washer system.	See page 10-90-26
10	Grease machine (all lubricating points).	See page 10-80-1
11	Test run, hydraulic function check and test work.	--
12	Visual inspection for tightening of all hoses, pipes, cylinders, etc.	--
13	Check function of electrical indicating and warning elements, and the lighting system.	--
14	Initial delivery / handing-over certificate and return to manufacturer.	--

Engine oil

⚠ WARNING

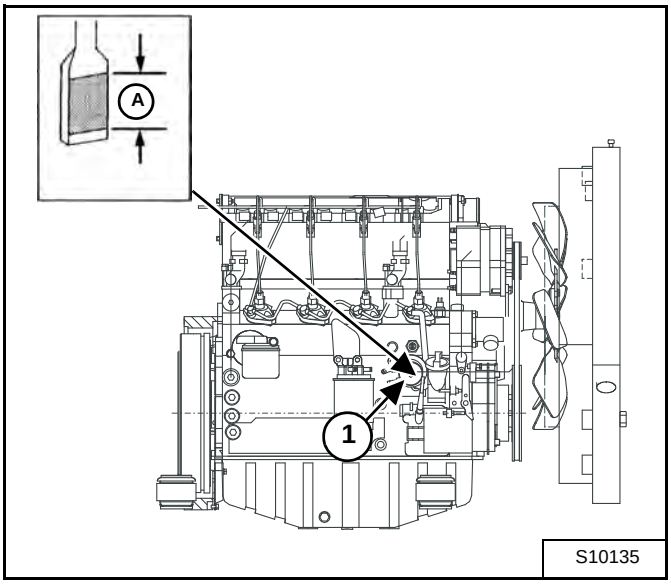
Be sure to stop the engine before checking and changing then engine oil and the oil filter cartridge. Do not touch muffler or exhaust pipes while they are hot. Severe burns could result. Always stop the engine and allow it to cool before conducting inspections, maintenance, or for a cleaning procedure.
Contact with engine oil can damage your skin. Put on gloves when using engine oil.
If you come in contact with engine oil, wash it off immediately.

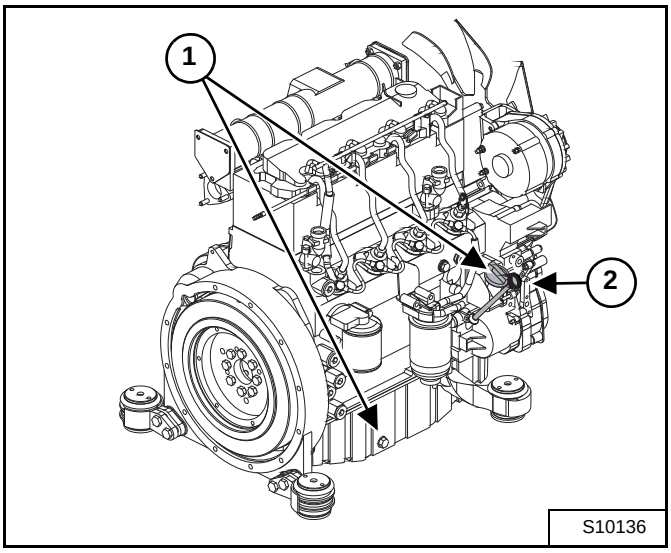
IMPORTANT

Do not operate a diesel engine when engine oil is overfilled. This oil can drain through the air intake system, which cause engine disacceleration and oil leaks from breather pipings.
It could result in an over-running or oil hammering of the engine caused by suction of blow-by gases.

Checking engine oil level and adding engine oil

Figure 10-90-1





ITEM	DESCRIPTION
1	Oil filler plug
2	Oil level gauge
A	Engine oil level within this range is proper

1. Check the engine oil level daily, with the machine parked on level ground. Either check before starting or more than 5 minutes after stopping the engine.

2. Remove the oil level gauge, wipe it clean and reinstall it.

3. Take the oil level gauge out again and check the oil level.

4. If the oil level is too low, remove the oil filler plug, and add new oil to the prescribed level.

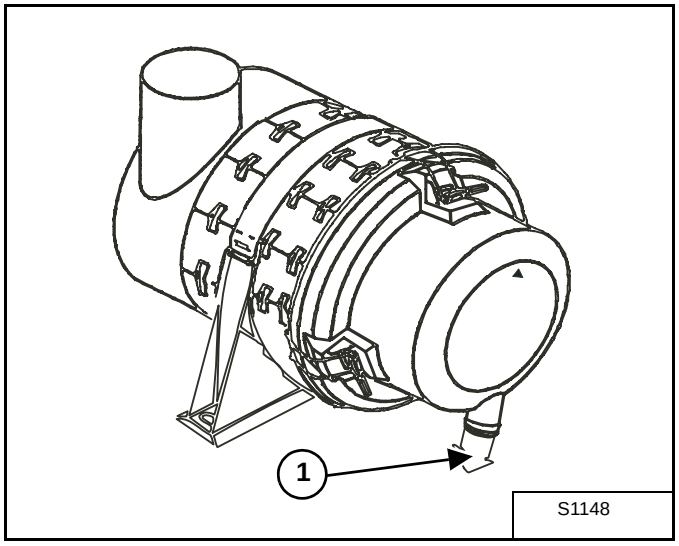
5. After adding oil, wait more than 5 minutes and check the oil level again. It takes some time for the oil to drain down to the oil pan.

Air filter, air intake

NOTE: All maintenance work on the air intake system must be carried out with the engine off. Do not start the engine while the filter cartridge is removed.

Dust extraction valve

Figure 10-90-14



- Dust extraction valves (1) are largely maintenance-free **[Figure 10-90-14]**.
- Any baked-on dust can be removed by squeezing the valve together.

Air intake

- Check the air filter attachment and retaining straps for damage.
- Check the tightness of the air intake between the air filter and the engine.
- Examine rubber parts for damage.
- Replace damaged parts immediately.

Cartridge maintenance interval

Air filter - Main cartridge

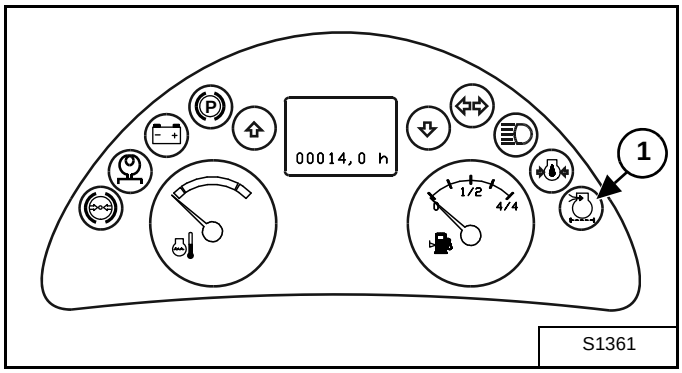
- The air filter main cartridge must be replaced as soon as the filter maintenance indicator light (1) on the instrument panel lights up during operation **[Figure 10-90-15]**.
- Brief delay in maintenance does not result in lower filter efficiency.

Air filter - Safety cartridge

The air filter safety cartridge must be replaced in the following cases:

- After the third maintenance of the main cartridge.
- After 2 years of operation at the latest.
- If the service indicator switches on after the main cartridge has just been serviced.
- If the main cartridge is damaged.
- If the safety cartridge is damaged.

Figure 10-90-15



Electrical equipment

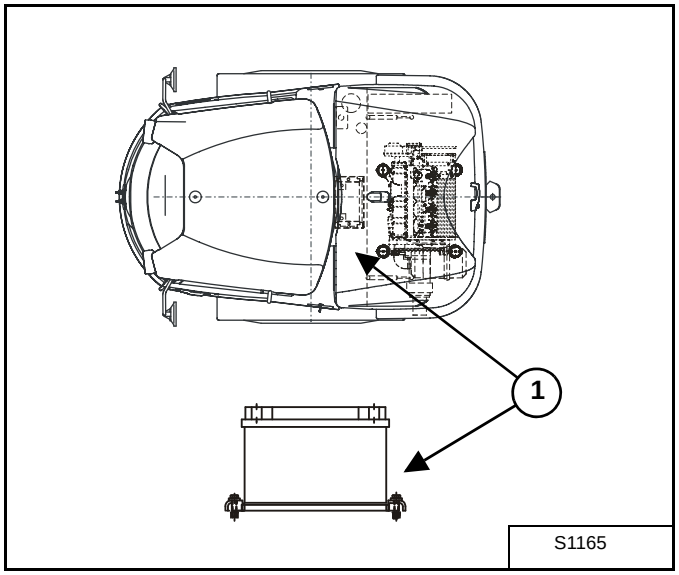
Battery

NOTE: The instructions of the battery manufacturer must be observed when using the battery for the first time.

- The acid level should be approx. 10 mm above the edges of the plates. If necessary, top up with pure distilled water.
- Only check the battery with the engine off.

NOTE: With maintenance-free batteries, this check can be omitted.

Figure 10-90-29



Removing the battery

1. First disconnect the battery ground cable (-), then the positive cable (+).
2. Detach the clamping bracket (1) **[Figure 10-90-29]**.
3. Lift out the battery.

Installing the battery

1. Lay the battery in the machine and secure with the clamping bracket.
2. First connect the positive cable (+), then the battery ground cable (-).

⚠ WARNING

Ensure that the negative terminal is connected to the negative pole (-) and the positive terminal to the positive pole (+).

Especially in winter, the battery charge should be closely monitored.

Lighting and warning equipment

- Check the correct function of the lighting equipment.
- Check the correct function of the indicator lights.
- Check the correct function of the warning equipment.

ELECTRICAL SYSTEM

X31	MODULE POWER SUPPLY, WORKING FLOODLIGHTS, ROTATING BEACON, WIPER
1	_
2	_
3	Reserve digital output
4	Relay K11:87a N.C. contact output
5	Relay K11:87 N.O. contact output
6	Reserve digital output
7	Relay K12:87 N.O. contact output
8	Relay K12 power supply Terminal 15 input
9	Relay K12:87a N.C. contact output
10	Power supply Terminal 15 input working floodlight front
11	Relay K11 power supply Terminal 15 input
12	Reserve PWM output
13	Power supply Terminal 15 input working floodlight rear
14	Reserve PWM output
15	Reserve PWM output
16	Power supply Terminal 30 input rotating beacon
17	Reserve Digital output
18	Reserve PWM output
19	Power supply Terminal 15 input wash/wipe rear
20	Power supply Terminal 15 input travel
21	Power supply Terminal 15 input wash/wipe rear

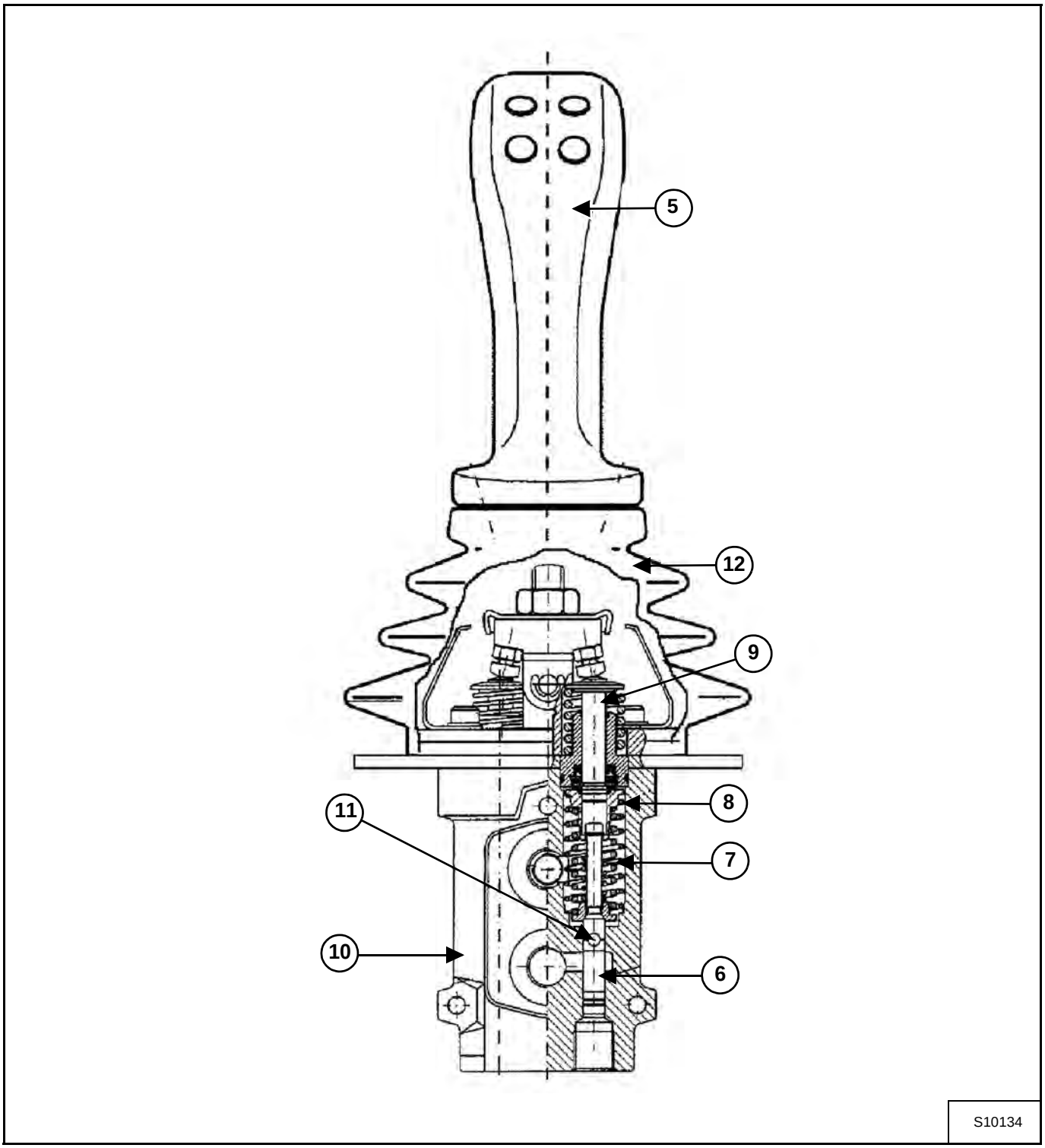
X70	WORKING FLOODLIGHTS, WIPERS
1	Brake light switch Terminal 15 output
2	_
3	Working floodlight front output
4	Working floodlight rear output
5	Rotating beacon output
6	Wiper terminal 53b 2. setting output
7	Washer pump front output
8	Wiper Terminal 31b output
9	Interior lamp Terminal 30 output
10	Wiper Terminal 53 output
11	Wiper Terminal 53a output
12	Hand brake switch signal input
13	Washer pump rear output
14	Rear wiper Terminal 53a output
15	_
16	Rear wiper Terminal 31b output
17	Rear wiper Terminal output
18	Brake light switch signal input

X61	REAR CARRIAGE
1	_
2	_
3	Starting Terminal 50a output

JOYSTICK

Relay Device Type PCL 401

Figure 60-10-8



Tires

Tire size	Tire pressures front	Tire pressures rear
10.5-18 MPT	3.0	2.0
12.5-18 MPT	2.0	1.8
15.5-55R18 MPT	2.5	2.0
335/80 R18	2.5	2.0
365/70 R18	2.5	2.0
12-16.5	4.5	2.5

Note: Special tires available on request!
If solid-rubber or foamed tires are used, special measures must be taken and restrictions apply.

Note: The tire pressure refers to standard equipment.
During fork lift operations, the tire pressure of the front wheels must be increased by at least 0.5 bar.

Consumable specifications

		Stipulated consumables for Central Europe		
Application	**Code designation acc. to Bi [1)]**	**Designation**	**Specification, standards, quality**	**Remarks**
Engine	_	Diesel fuel	EN 590 ASTM D975 1-D / 2-D	**Note: Before using RME fuels (rape oil methyl ester), it is essential to consult your responsible dealer for further details.**
Engine	EO 1540 A	Engine oil	SAE 15W-40 API CH-4 or CI-4 ACEA E3 or E4	See also engine manufacturer's instructions
Hydraulic system	HYD 1040	Hydraulic oil or multi-grade engine oil	HVLP 46 or SAE 10W-40	**The following viscosity limit values must be kept (according to ASTM 445)** at 100° C min. 8 mm ^{2}/s (cSt) at -10° C approx. 1,500 mm ^{2}/s (cSt)
	BIO-E-HYD-HEES	Bio-degradable hydraulic oil based on synthetic ester	Filling according to customer specifications. Brand label on machine. **Note: Do not mix bio-degradable oils of different manufac-turers.**	The same viscosity specifications apply as for mineral hydraulic oils. **Note: When changing from mineral to biodegradable hydraulic oils, the tank and hydraulic system must be completely drained, cleaned and flushed. For further details before changing oils, please consult your responsible.**
Axles	GO 90 LS	Gearbox oil	SAE 85W-90LS API-GL 5	Alterative recommendations SAE 90LS SAE 80W-90LS
Lubricating points	MPG-A	Multi-purpose, lithium-soap based grease	K2K-30 DIN 51825	
Brake	ATF	Brake oil	ATF Type A Suffix A Dexron-IID	
Cooler		Mixture of water, additives and glycol	**Note: Machine damage: due to incorrect coolant and mix proportions. Observe the information on the cooling system given in the engine manufacturer's Operating and Maintenance Manual.**	The antifreeze is factory-set to approx. -25 °C.

1. In conformity with the regulation lubricants of the Main Association of the German Building Industry e.V. (Bi).

Front loader installation

Width of bucket	mm	1,950
Capacity to DIN/ISO 7546 (max. density = 1.8 t/m³)	approx. m³	1.0
Payload in bucket	kg	1,800
Dump height at 45° dump angle	approx. mm	2,635
Dump reach at max. dump height	approx. mm	710
Max. bucket hinge pin height	approx. mm	3,370
Reset angle	°	50
Dump angle at max. dump height	°	45
Digging depth, horizontal bucket	approx. mm	100
Lift capacity at ground level (ISO 14397-2)	approx. N	61,000
Ripping force at cutting edge of bucket	approx. N	55,000
Tipping load, straight (ISO 14397-1)	approx. Kg	4,400
Tipping load, articulated (ISO 14397-1)	approx. Kg	3,900
Work cycle times, “Lift”	sec.	5.1
“Lower”	sec.	3.2
Dumping in uppermost position “In”	sec.	1.1
Dumping in uppermost position “Out”	sec.	1.1
Stability conforms to DIN 24094		

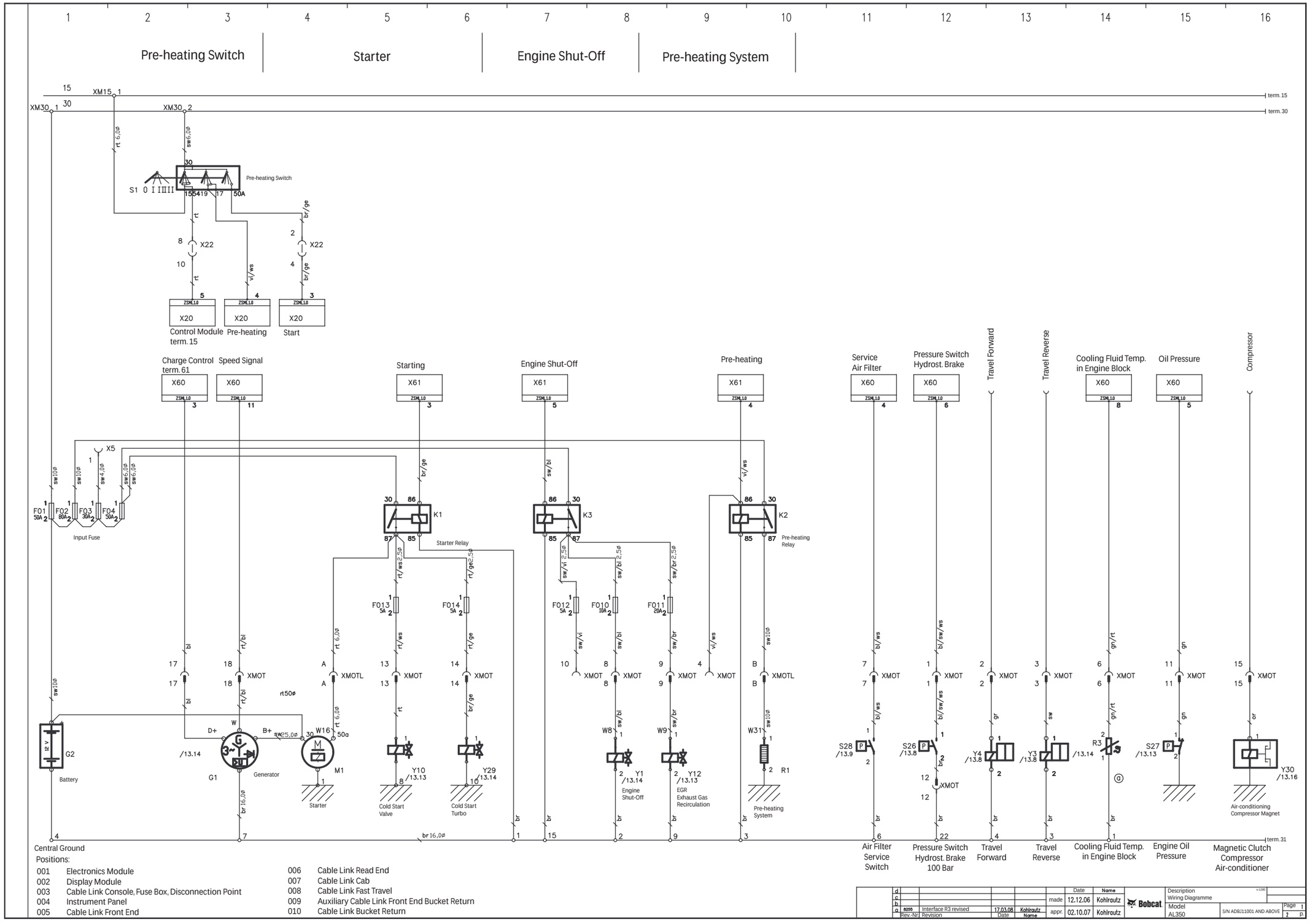
Bucket

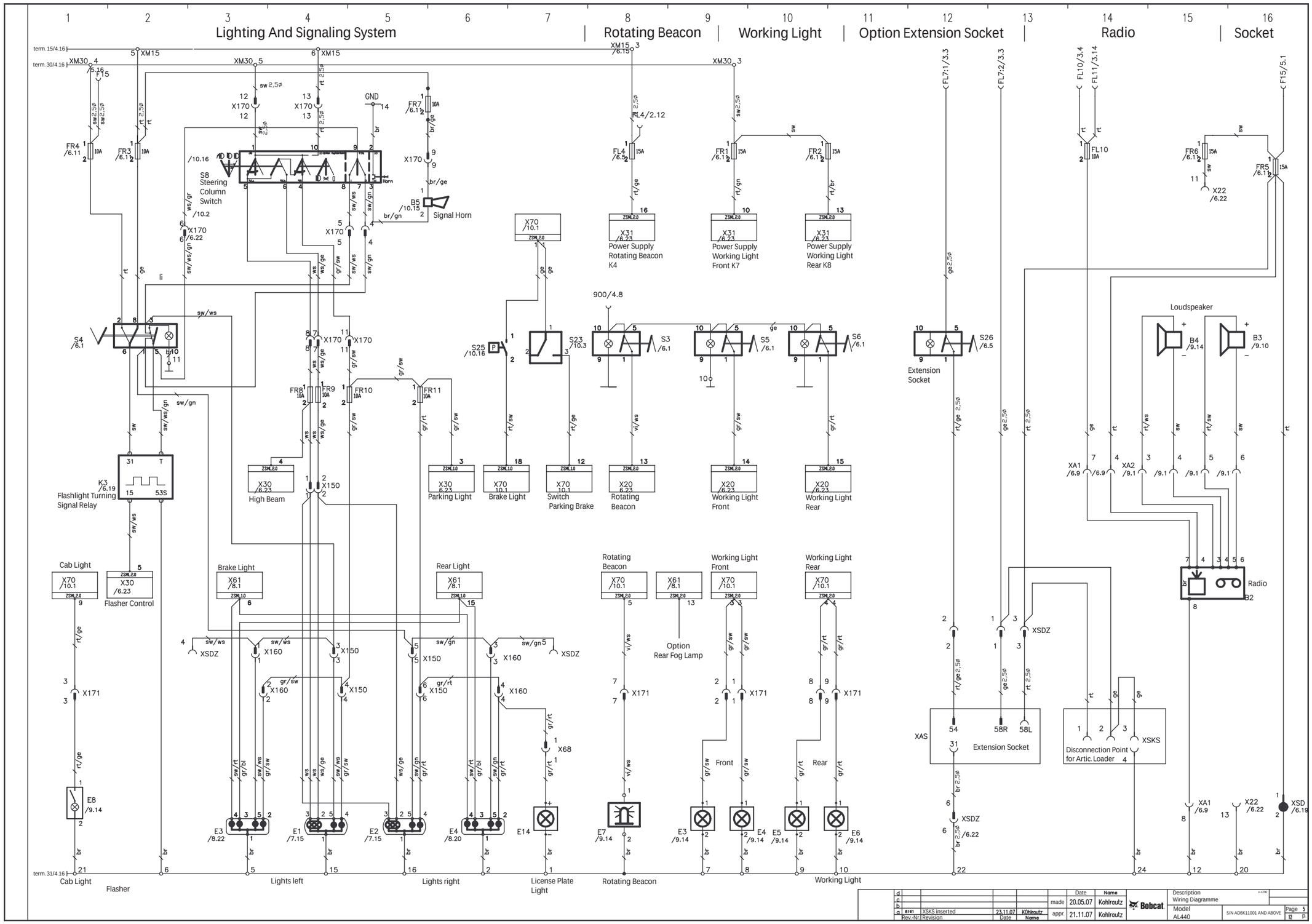
	Width mm	**Capacity, heaped m³**	**Max. density (g) t/m³**
General-purpose bucket	1,950	1.0	1.8
Multi-purpose bucket	1,950	0.9	1.6
Earth bucket	1,950	1.1	1.6
Light-material bucket	2,050	1.35	1.2
Super light-material bucket	2,200	1.55	0.8
Side-dump bucket	2,050	0.85	1.8
High-tip bucket	2,050	1.0	1.2
Compost bucket	2,050	1.05	1.2
Quarry bucket	2,050	0.9	2.15

Fork lift attachment

Fork-arm connection in compliance with ISO/FEM Class 2 Form B, DIN 15 173 / ISO 2328 respectively		
Width of fork carrier	mm	1,240
Length of forks	mm	1,120
Fork cross section	mm	100 x 50
Max. stacking height	mm	3,210

HYDRAULIC DIAGRAM AL350




Lighting And Signaling System
Rotating Beacon
Working Light
Option Extension Socket
Radio
Socket
S8 Steering Column Switch
Signal Horn
Power Supply Rotating Beacon K4
Power Supply Working Light Front K7
Power Supply Working Light Rear K8
Extension Socket
Loudspeaker
Flashlight Turning Signal Relay
High Beam
Parking Light
Brake Light
Switch Parking Brake
Rotating Beacon
Working Light Front
Working Light Rear
Cab Light
Flasher Control
Option Rear Fog Lamp
Disconnection Point for Artic. Loader
Radio
Cab Light
Flasher
Lights left
Lights right
License Plate Light
Rotating Beacon
Working Light
Front
Rear
Description Wiring Diagramme
Model AL440
S/N ADBK11001 AND ABOVE
XSKS inserted
Rev.-Nr. Revision
made 20.05.07 Kohlrautz
appr. 21.11.07 Kohlrautz

Click the check box **activate,** confirm the hardware reset with OK button. After the confirmation, switch off and on the ignition. This will make the button “Programming” selectable.

Click on the “**Programming” button**.

The programming progress is shown by the **progress indicator bar**. After the programming is finished, **switch off and on the ignition**.

Figure 20-10-20

Appendix

Ident no. of Software	Permitted Types				Anouncements
	TEREX | Schaeff	TEREX |Atlas	Ingersoll Rand	Bobcat	
SKL824-834-844 V3-02.hex **(6451045102_302.hex)**	SKL814 SKL824 SKL834 SKL844	--- _AL65 _AL80 _AL100	--- WL275 K/N WL350 K/N WL440 K/N	--- AL275 K/N AL350 K/N AL440 K/N	**Basic Software** incl. 2nd control circuit (Continuous and impulse mode via rocker switch) **Deutz engine**
SKL824-834-844 V3-03.hex **(6451045202_303.hex)**	SKL814 SKL824 SKL834 SKL844	--- _AL65 _AL80 _AL100	--- WL275 K/N WL350 K/N WL440 K/N	--- AL275 K/N AL350 K/N AL440 K/N	**Basic Software** incl. 2nd control circuit (Continuous and impulse mode of 2nd control circuit and floating of lifting frame via momentary switch) **Deutz engine**
WL275 - V3-03.hex **(6451845001_303.hex)**			WL275 K/N	AL275 K/N	**Basic Software** incl. 2nd control circuit (Continuous and impulse mode of 2nd control circuit and floating of lifting frame via momentary switch) **Kubota engine**
WL350-WL440 - V3-03.hex **(6453845001_303.hex)**			WL350 K/N WL440 K/N	AL350 K/N AL440 K/N	**Basic Software** incl. 2nd control circuit (Continuous and impulse mode of 2nd control circuit and floating of lifting frame via momentary switch) **Kubota engine**
6 4512 491 02	SKL824 SKL834 SKL844	_AL65 _AL80 _AL100			Optional software for SKL824-844
6 4532 170 81	SKL824 SKL834 SKL844	_AL65 _AL80 _AL100			Optional software for SKL844
SKL854 V3-02.hex **(6454045001_302.hex)**	SKL854	_AL120			**Basic Software** incl. 2nd control circuit (operation via joystick) (Continuous and impulse mode via rocker switch)
SKL854 V3-03.hex **(6454045101_303.hex)**	SKL854	_AL120			**Basic Software** incl. 2nd control circuit (Continuous and impulse mode of 2nd control circuit and floating of lifting frame via momentary switch)
6 4542 490 01	SKL854	_AL120			Optional software for SKL854
6 4542 170 81	SKL854	_AL120			Optional software for SKL854
SKS634 V3-02.hex **(6473045102_302.hex)**	SKS634	_AS80			**Basic Software** incl. 2nd control circuit (operation via joystick) (Continuous and impulse mode via rocker switch)
SKS634 V3-03.hex **(6473045202_303.hex)**	SKS634	_AS80			**Basic Software** incl. 2nd control circuit (Continuous and impulse mode of 2nd control circuit and floating of lifting frame via momentary switch)
6 4732 491 02	SKS634	_AS80			Optional software for swing loader
Z-SKL160-260 V3-01.hex **(6455046010.hex)**	SKL160 SKL260	_AL160 _AL260			**Basic Software for additional unit**
SKL160 V1-02.hex **(6455045002.hex)**	SKL160 SKL260	_AL160 _AL260			**Basic Software** incl. 2nd control circuit (operation via joystick)
SKL260 V1-02.hex **(6457045002.hex)**	SKL160 SKL260	_AL160 _AL260			**Basic Software** incl. 2nd control circuit (operation via joystick)

SPECIFICATIONS AL350

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