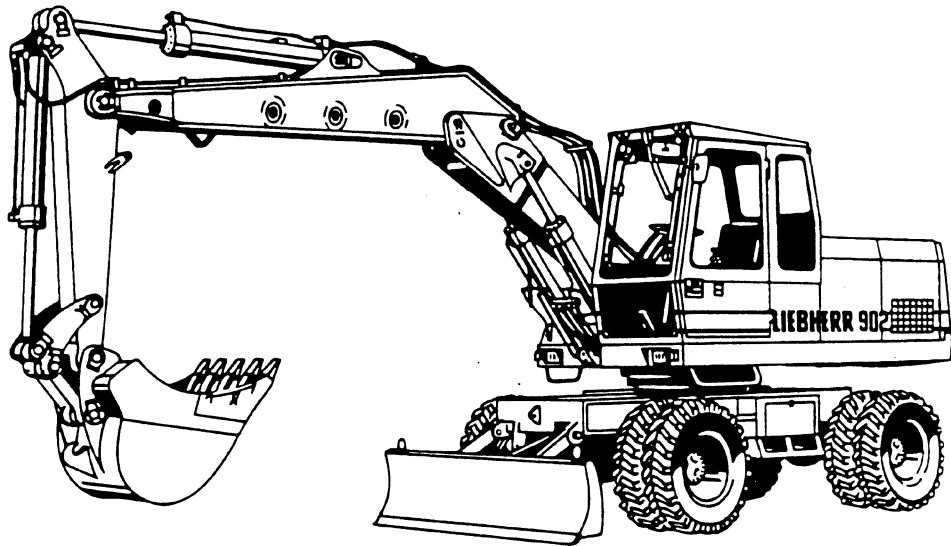


Operation and Maintenance Manual

A 902

from Serial No. on 2001



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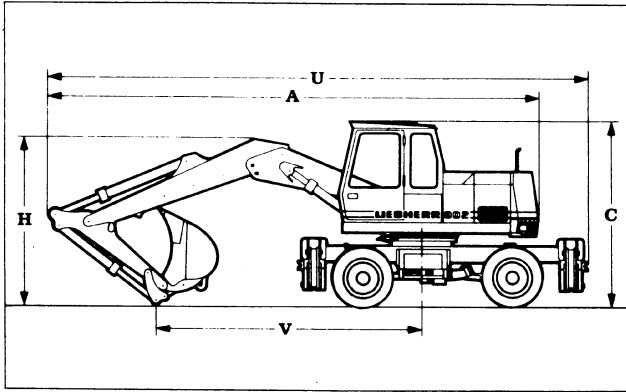


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Transport Dimensions

A902



For transportation on a low boy

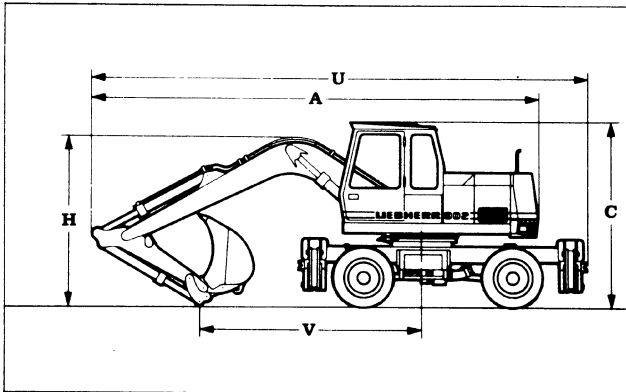
with two-piece boom
and

stick size 5' 3"/1600 7' 3"/2200 9' 2"/2800 11'10"/3600

	5' 3"/1600	7' 3"/2200	9' 2"/2800	11'10"/3600
A ft-in/mm	26'10"/8190	27' 0"/8230	27' 0"/8230	25' 9"/7860
C ft-in/mm	10' 3"/3118*	10' 3"/3118*	10' 3"/3118*	10' 3"/3118*
H ft-in/mm	8' 9"/2680	8' 4"/2550	9' 8"/2940	12' 4"/3760
U ft-in/mm	28'10"/8780	28'11"/8820	28'11"/8820	27' 9"/8450
V ft-in/mm	14' 5"/4400	11'10"/3600	11' 0"/3350	10' 4"/3150

* with front and rear outriggers C = 10'4"/3138 mm

Boom mounted in upper hole of basic boom

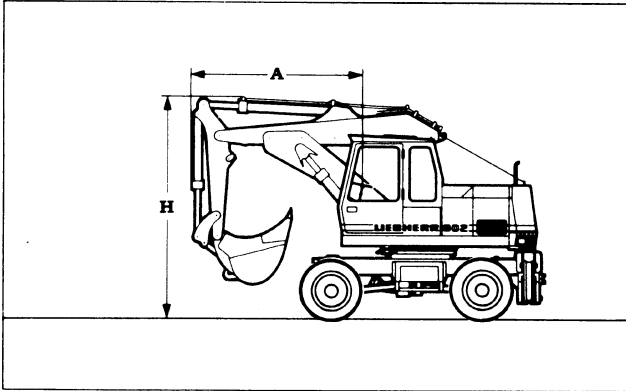


with gooseneck boom
and

stick size 5' 3"/1600 7' 3"/2200 9' 2"/2800 11'10"/3600

	5' 3"/1600	7' 3"/2200	9' 2"/2800	11'10"/3600
A ft-in/mm	26' 3"/8000	26' 1"/7950	26' 1"/7950	24' 5"/7450
C ft-in/mm	10' 3"/3118*	10' 3"/3118*	10' 3"/3118*	10' 3"/3118*
H ft-in/mm	9' 9"/2980	9' 9"/2980	10'11"/3330	13' 5"/4100
U ft-in/mm	28'10"/8800	28' 8"/8750	28' 8"/8750	27' 1"/8250
V ft-in/mm	14' 5"/4400	11'10"/3600	11' 0"/3350	10' 4"/3150

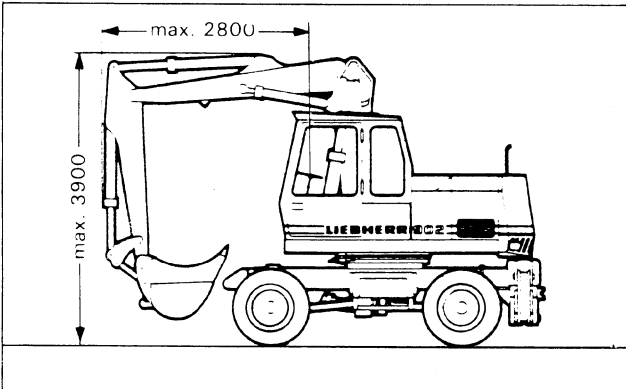
* with front and rear outriggers C = 10'4"/3138 mm



Highway traveling position

A ft-in/mm 11' 2"/3400
H ft-in/mm 11'10"/3600

Boom mounted in upper hole of basic boom



Traveling position with road travel
attachment

SAFETY INFORMATION

When operating or servicing the excavator, the following guidelines must be observed closely and at all times.

When working the machine, the operator must:

- never allow other persons on or near the machine,
- always remain seated,
- never allow other persons in the machine working range,
- always be watchful of his environment and closely observe the working area, soil conditions, truck loading area and possible obstructions,
- use a guide when working in tight quarters or under conditions where parts of the attachment are blocked from view,
- ask the truck driver to leave the cab during loading, even if the truck cab is equipped with a rock protection,
- locate the excavator, if possible, on level ground and at a safe distance from the bank to be removed,
- locate the machine with the attachment pointing down if the ground slopes to the side,
- air pressure -6,2 to 7,3 bar to be observed
- always make sure that the steering system is operational,
- closely observe all instruments and indicators,
- never come closer than 5 meter (15 feet) to high-voltage power lines.

When travelling, the operator must:

- never travel without the boom attached,
- lock the upper- to the undercarriage,
- if necessary, remove part of the attachment,
- use a guide when moving the machine in tight quarters,
- never travel down a hill if the slope exceeds maximum permissible inclination,
- if traveling down a steep hill, always keep the engine speed at maximum.

When hauling the machine, observe the following points:

- remove all snow, ice or mud from the machine running gear,
- use a guide to direct the operator on the ramp,
- make sure that the ramp does not incline more than 30° and that it is equipped with wooden planks,
- remove part of the attachment, if necessary,
- align the excavator with the loading ramp precisely,
- bring in the attachment as far as possible,
- drive up on the ramp.

After the machine has been placed on the loading platform, swing the uppercarriage to the rear and lower the attachment.

Shovel configuration: line up shovel bucket with loading vehicle and lower on platform.

Backhoe configuration: curl in stick and bucket.

- lock upper- to undercarriage,
- secure machine with chains and blocks.

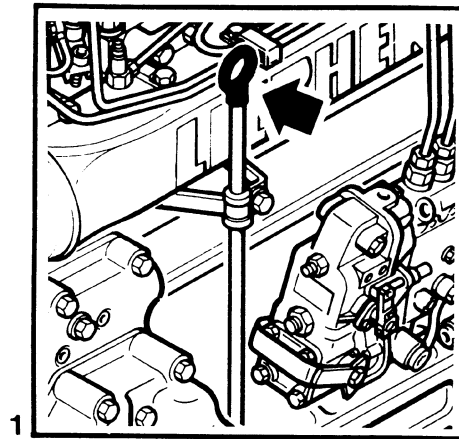
BEFORE STARTING THE ENGINE

ENGINE OIL LEVEL

Check engine oil level with the excavator standing on firm, level ground. Shut off engine and wait a few minutes for the oil to collect in the pan. The oil level must be between the »min« and »max« mark of the dipstick (see fig. 1).

NOTE: For machines with **DEUTZ** engine see fig. 1a

For details on engine operation and maintenance, refer to the enclosed **DEUTZ** Engine Operation and Maintenance Manual.



ENGINE COOLING SYSTEM - LIEBHERR ENGINE ONLY

⚠ CAUTION:

At or near operating temperature, the engine coolant is hot and under pressure. Avoid contact with components containing coolant, since it could cause severe burns. Check coolant level only after radiator cap is cool enough to touch.

To check the coolant level, turn the cap slowly to the first detent to relieve pressure. Turn to the second detent and remove cap.

With the engine cold, the coolant level should be at the lower edge of the radiator filler neck.

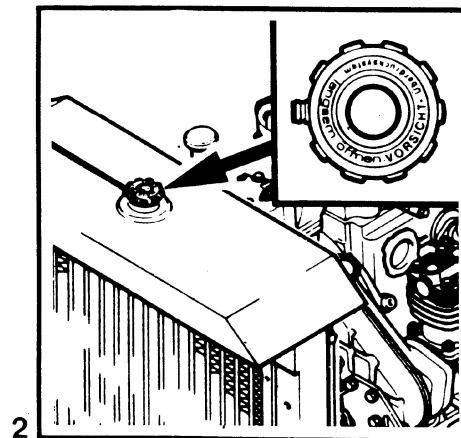
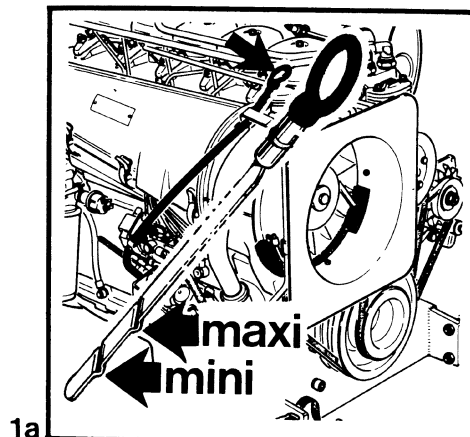
As delivered from the factory, the engine cooling system is protected down to -30° (-22°F).

The proper antifreeze concentration must be maintained all year.

Radiator capacity: 26 liter (6.7 gal)

Coolant ratio: 16 liter (4.2 gal) of water

plus: 10 liter (2.5 gal) of antifreeze

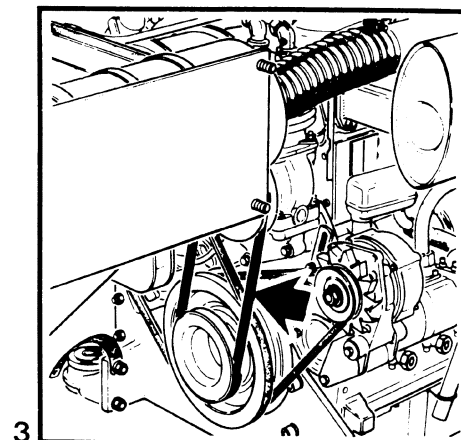


ELECTRICAL SYSTEM

Check all switch functions, indicator (warning) lights, fuses, battery electrolyte level and battery mounting (page 53).

COMPRESSOR V-BELT TENSION (DEUTZ ENGINE ONLY)

If a new belt has been installed, retighten after 15 to 20 minutes running time (see fig. 3).



Should the engine overheat, indicator light 18, and an audible alarm will come on.

The engine must be stopped immediately.

STARTING THE ENGINE AT AMBIENT TEMPERATURES DOWN TO -12°C (10°F).

Check all functions as outlined on page 24a.

NOTE: The preheat system makes starting at cold temperatures easier. Pull engine throttle to increased idle position - see fig. 15a, pos. 2.

Turn key to preheat -pos. 2- see fig. 11a.

After approximately 1 minute, the indicator light 35 will come on - engine is ready to be started (see fig. 13a).

Turn key to start - pos. 3. As soon as the engine has started, release key. **DO NOT** crank engine for more than 15 seconds. If the engine does not start, repeat starting procedure at 2 minute intervals. Allow starter to cool off.

If still experiencing starting difficulties, or if ambient temperatures are below -18°C (0°F), ether can be sprayed into the engine air intake during the starting procedure - see fig. 14a.



WARNING!

NEVER USE ETHER AND THE FLAME/GLOW PLUG AT THE SAME TIME. SEVERE ENGINE DAMAGE AND PERSONAL INJURY MAY RESULT!

IMPORTANT:

Never use the preheat system on a warm or hot engine.

ENGINE SPEED CONTROL

(see fig. 15a, item 45)

Position 1 = engine shutoff

Position 2 = low idle

Position 3 = high idle

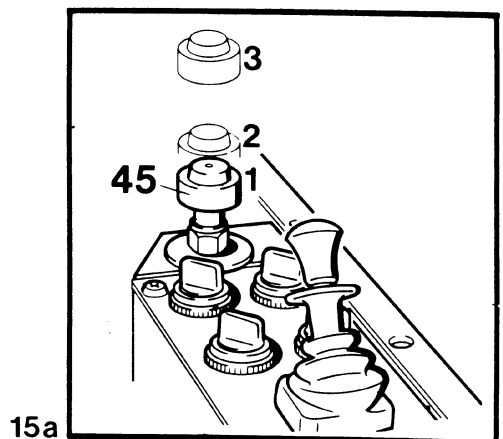
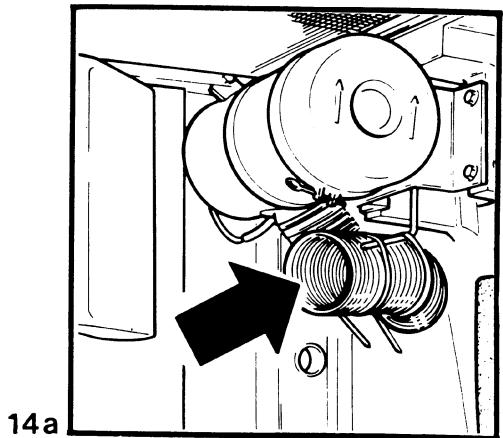
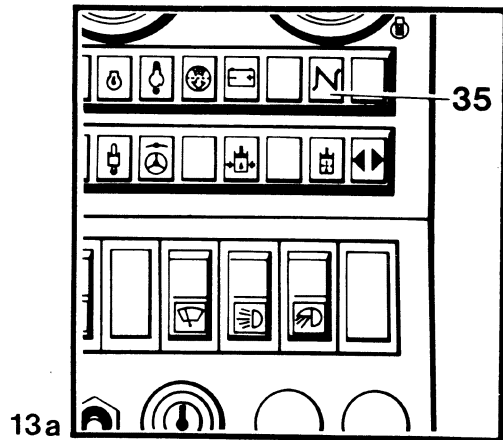
ENGINE SHUTOFF PROCEDURE

(see fig. 15a)

Never shut the engine off while running at high idle. Bring engine to low idle, operate engine at low idle for 5 minutes. Only then shut off the engine.

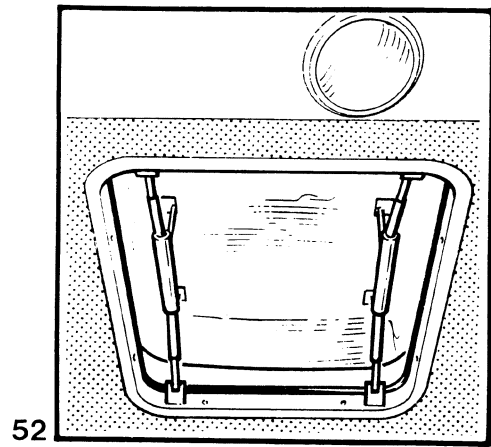
Move throttle lever 45 to low idle position. Operate engine at low idle for 5 minutes, then move lever to shut off position.

Turn key to »0« position. Remove key.



SUNROOF (AIR VENT)

With the adjustable sunroof, good air circulation is provided, even with the windshield in the closed position, see fig. 52.

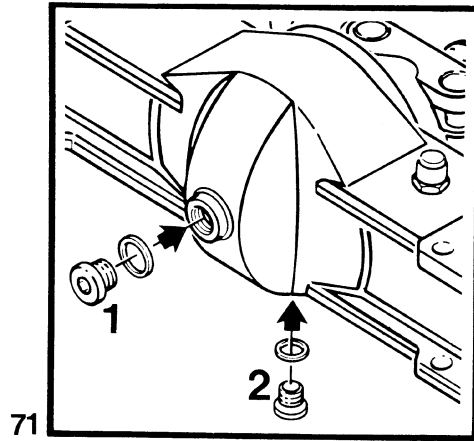


SWING GEAR - see fig. 70

In addition to checking and changing the gear oil, the following checks should be made:

- check swing brake function during normal operation.
Check for leaks.
- check tightness of mounting bolts 4
- check oil level - see item 2.

To drain the gear oil, remove the filler/vent plug 1 and drain plug 3. Collect oil in a suitable container. Reinstall drain plug 3, refill with correct amount and type of oil.



FRONT AND REAR AXLE



WARNING!

BEFORE SERVICING THE AXLE BE SURE TO APPLY THE PARKING BRAKE AND SECURE THE WHEELS WITH CHOCKS.

Both front and rear axles must be serviced in accordance with the maintenance schedule.

Figure 71 shows the differential - front/rear.

Position 1 = oil level/oil filler plug.

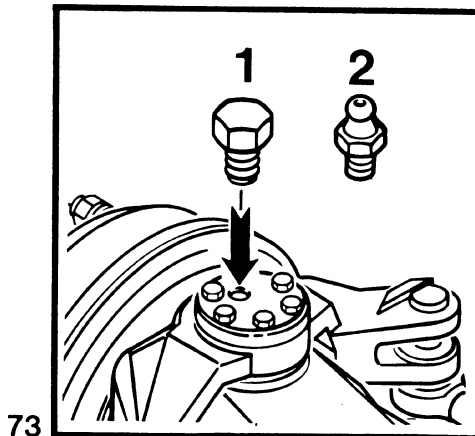
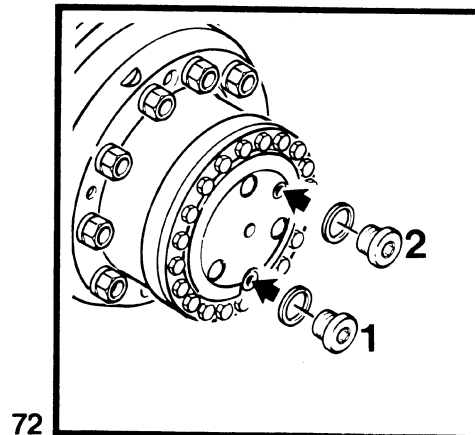
Position 2 = oil drain plug.

Figure 72 shows the (planetary) wheel hub.

Position 1 = oil drain plug.

Position 2 = oil level/oil filler plug.

To check the oil level or when changing the gear oil, park machine on firm and level ground. See above warning. Position the wheel hubs as shown in fig. 72.



KING PINS

The king pins are sealed and need to be lubricated only every 1000 hours. To lubricate, remove the plugs 1 and install M 10 x 1 grease fittings 2, see fig. 73. Do not discard the plugs 1. Attach grease gun and replenish factory grease filling with two strokes of the grease gun.

Remove grease fittings 2 and reinstall plugs 1.
Never over-lubricate the king pins.

ELECTRICAL SYSTEM

To insure trouble-free operation of your machine, the electrical system should be in good condition. The gauges, indicators and components of the electrical system should be checked daily for proper function.

NOTE: Always replace burnt out fuses and bulbs.
DO NOT repair fuses.

Check for bare and damage wires which could cause damage to the electrical system or a fire. Check for loose, dirty or corroded connections.

IMPORTANT:

When performing repairs on the electrical system, or before using an arc welder on the machine, the battery ground cables should be disconnected.

BATTERY MAINTENANCE

Always keep the batteries clean, and the battery connections free of corrosion. Clean terminals regularly and coat them with anti-corrosive grease. Check electrolyte level frequently. The electrolyte level should be 10-15 mm (3/8 - 5/8 in) above the plates. If needed, add distilled water.

Check battery charge at regular intervals. A fully charged battery will show an electrolyte density of 1.28 kg/l (31.5° Be). If a lower reading is indicated, recharge the battery.



WARNING!

WEAR PROTECTIVE GLOVES AND SAFETY GLASSES WHEN HANDLING BATTERIES! KEEP SPARKS AND OPEN FLAME AWAY FROM BATTERY. BATTERY FUMES ARE HIGHLY FLAMMABLE AND EXPLOSIVE. BATTERIES CONTAIN ACID WHICH SHOULD NOT BE TOUCHED. IN CASE OF CONTACT, FLUSH WITH WATER AND GET MEDICAL ATTENTION. FOR MORE INFORMATION ON BATTERIES, REFER TO THE LIEBHERR WORKSHOP MANUAL.

FUSE REPLACEMENT

Instrument Panel: - see fig. 102 and 103

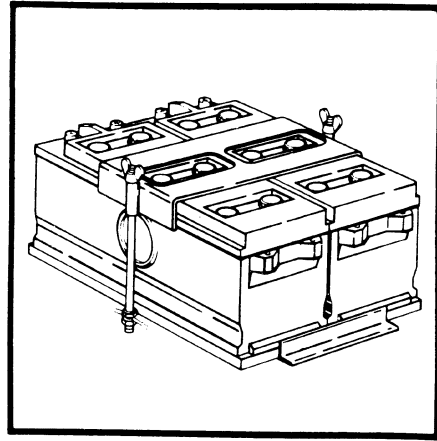
Junction Box: - see fig. 104

When replacing a fuse, check the circuit for defects, see Controls and Instruments.

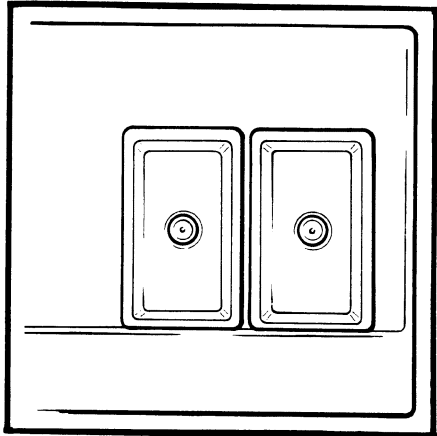
See pages 57 and 58 for fuse listing.

IMPORTANT!

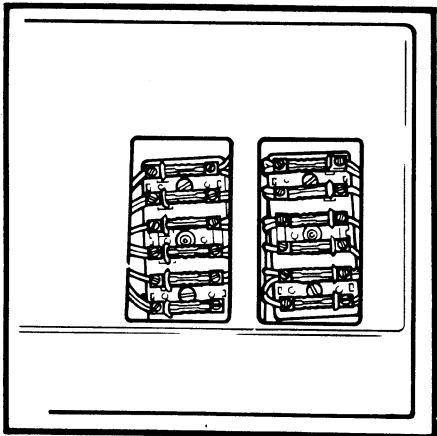
When washing or steam cleaning the excavator, cover all electrical components to keep them dry.



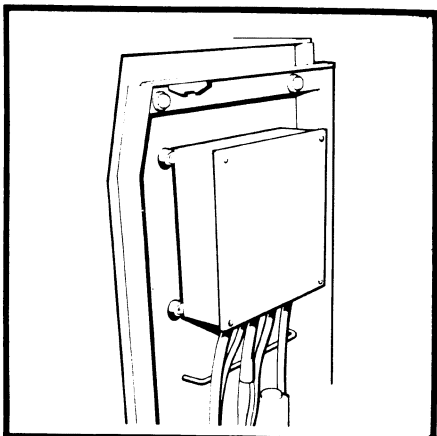
101



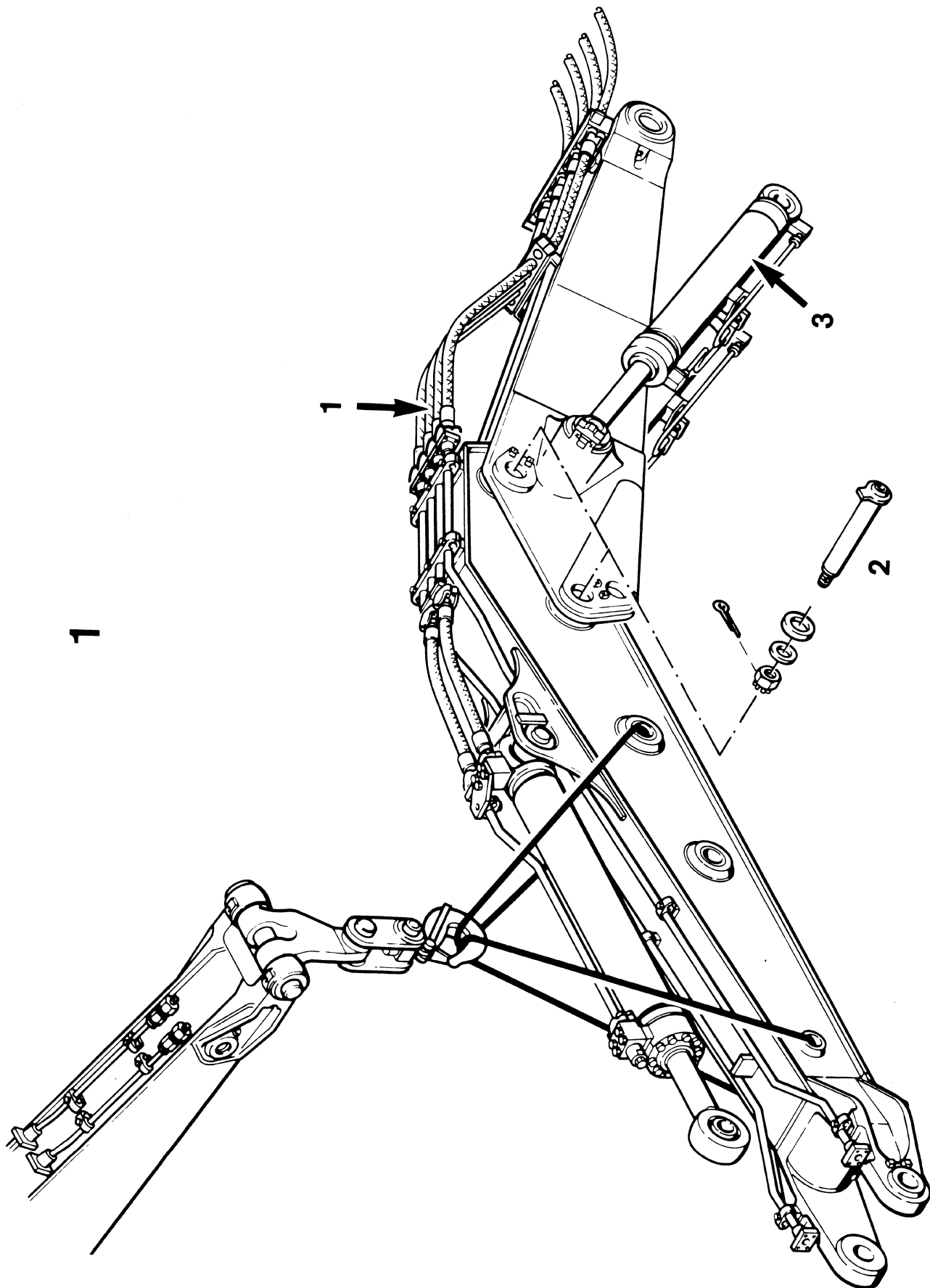
102



103



104



A 902

WORK TO BE CARRIED OUT

OPERATING HOURS	MAINTENANCE						CHECK	CLEAN	REPLACE	ADJUST	ADJUSTMENT VALUES QUANTITIES	SERVICE INTERVALS BY HOURS
	DAILY MAINT.	AT PRE-DELIVERY	EVERY 250 HRS	EVERY 500 HRS	EVERY 1000 HRS	EVERY 2000 HRS						
SWING RING	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Lube swing ring teeth			<input checked="" type="checkbox"/>		daily
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Lube swing ring bearing			<input checked="" type="checkbox"/>		10-60
			<input checked="" type="checkbox"/>				Refill grease container	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		250
			<input checked="" type="checkbox"/>				Swing ring mounting bolts	<input checked="" type="checkbox"/>			300/600 Nm	250
			<input checked="" type="checkbox"/>				Remove grease pipe and clean nozzle	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			500
			<input checked="" type="checkbox"/>				Pinion gear mesh	<input checked="" type="checkbox"/>				500
OIL/ AIR ROT.			<input checked="" type="checkbox"/>				Leaks - oil or air - tightness of bolts	<input checked="" type="checkbox"/>				250
			<input checked="" type="checkbox"/>				Air rotary lubrication	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		250
ELEC- TRIC SYST.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				System for function & damage	<input checked="" type="checkbox"/>				daily
			<input checked="" type="checkbox"/>				Batteries	<input checked="" type="checkbox"/>				250
HEATER		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				System for function & damage (before cold season)	<input checked="" type="checkbox"/>				250
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Hose connections for leaks - oil or coolant	<input checked="" type="checkbox"/>				250
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Heater mounting bolts	<input checked="" type="checkbox"/>				250
GEARBOX		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Oil level, leaks and tightness	<input checked="" type="checkbox"/>				250
			<input checked="" type="checkbox"/>				Tightness of drive shaft	<input checked="" type="checkbox"/>				250
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Function of shifting mechanism	<input checked="" type="checkbox"/>				250
			<input checked="" type="checkbox"/>				Function of parking brake / check clearance	<input checked="" type="checkbox"/>				500
					<input checked="" type="checkbox"/>		Gear oil SAE 80 1)			<input checked="" type="checkbox"/>	7.2 ltr.	2000
AXLES			<input checked="" type="checkbox"/>				Mounting (tightness) of axles/wheels	<input checked="" type="checkbox"/>				250
			<input checked="" type="checkbox"/>				Oil level and leaks of wheel hubs & differentials	<input checked="" type="checkbox"/>				250
					<input checked="" type="checkbox"/>		Gear oil - diff.front SAE 90 1)			<input checked="" type="checkbox"/>	6,0 ltr.	2000
					<input checked="" type="checkbox"/>		Gear oil - diff.rear SAE 90 1)			<input checked="" type="checkbox"/>	7,0 ltr.	2000
					<input checked="" type="checkbox"/>		Gear oil - wheel hub front & rear SAE 90 1)			<input checked="" type="checkbox"/>	1,4 ltr.	2000
STEERING	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				System for function	<input checked="" type="checkbox"/>				daily
			<input checked="" type="checkbox"/>				System for leaks	<input checked="" type="checkbox"/>				250
				<input checked="" type="checkbox"/>			Mounting of st.cylinder & tie rods	<input checked="" type="checkbox"/>				500
STABILIZ- ER	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				System for function	<input checked="" type="checkbox"/>				daily
			<input checked="" type="checkbox"/>				System for leaks	<input checked="" type="checkbox"/>				250
			<input checked="" type="checkbox"/>				Mounting (tightness) of stabilizer cylinder	<input checked="" type="checkbox"/>				250
TRAVEL BRAKES	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Function of brakes	<input checked="" type="checkbox"/>				daily
			<input checked="" type="checkbox"/>				Brake fluid (renew every 2 years)	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		250
			<input checked="" type="checkbox"/>				Effectiveness of brakes	<input checked="" type="checkbox"/>				250
ATTACH- MENTS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Grease and lubrication points (or as necessary)	<input checked="" type="checkbox"/>				10-60
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				All attachments for cracks and play (clearance)	<input checked="" type="checkbox"/>				250
			<input checked="" type="checkbox"/>				Explain advantages of the different attach.pos.					
MISC.			<input checked="" type="checkbox"/>				Door, window, cover hinges and locks	<input checked="" type="checkbox"/>				250
			<input checked="" type="checkbox"/>				Upper and undercarriage for cracks	<input checked="" type="checkbox"/>				250
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Explain proper lubrication to operator					250
			<input checked="" type="checkbox"/>				explain defects and deficiencies					
	<input checked="" type="checkbox"/>						Explain proper use and maintenance to operator.	<input checked="" type="checkbox"/>				daily
						Includes visual inspection for leaks and defects.						

1) see lubricant chart

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