WEIDEMANN

Repair Handbook

Telehandlers

T6027

Machine model	418-02
From serial no.	418 02 0011
Version	2.0
Document number	1000363125
Language	[en]

Legend	
Original Repair Handbook	
Version	2.0
Date	03/2017
Document	RHB 41802 *

KRAMER-WERKE GmbH keep abreast of the latest technical developments and constantly improve their products. For this reason, we may from time to time need to make changes to figures and descriptions in this documentation that do not reflect products that have already been delivered and that will not be implemented on these vehicles.

Technical data, dimensions and weights are only given as an indication. Responsibility for errors or omissions not accepted.

The cover features the machine with possible optional equipment.

Manufactured exclusively for Weidemann GmbH.

Kramer-Werke GmbH

Wacker-Neuson-Str. 1

D-88630 Pfullendorf

Tel. 0080090209020
E-mail info@kramer.de
www.kramer.de

E Introduction

E.1 Notes on the repair manual

Working with the repair manual

This repair book is intended to help ensure continual operational functionality. This ensures the high value of the machine through careful maintenance and after-sales monitoring.

The experiences of our customer service technicians as well as experience gathered from our sites are summarized in this repair book.

Every sequence of images shows the procedure of a repair process. The provided text contains necessary instructions for adjustment, application of special tools, etc.

Major repair procedures are described in such a way that smaller sub-tasks can also be performed individually following the respective procedures.

The manual is appended according to further technical development of the machines and therefore is kept up-to-date to serve as a reference.

For reasons of safety and security, always compare the specified values and capacities with the latest Operator's Manual of the respective machine.

Technical data, dimensions and weights are only given as an indication. Responsibility for errors or omissions not accepted.

Deviations of images are possible.

Information

Careful and prudent working is the best way to avoid accidents!

Explanation of symbols and abbreviations

The indication **left** or **right** in the descriptions always refers to the travel direction of the machine.

Symbols	Explanation
•	Identifies a general list
1 2	Identifies a list in a table (position numbers)
1. 2.	Identifies activities that must be performed in a certain order
➥	Identifies results
▶	Identifies things to be avoided in the warning and safety instructions

Abbreviations	Explanation
(opt)	Option
(SWxx)	Wrench size (e.g. WS15)
Agricultural/forestry certification	Agricultural or forestry registration
AUS	Acronym from the English term "Aqueous Urea Solution"
DEF	Acronym from the English term "Diesel Emission Fluid"
DOC	Acronym from the English term "Diesel Oxidation Catalyst"
DPF	Diesel particulate filter (AUS: Aqueous Urea Solution)
e.g.	for example
EAT	Acronym from the English term "Exhaust After-treatment System"
Fig.	Figure
FOPS	Falling Object Protective Structure
if nec.	if necessary
max.	maximum
min.	minimum
o/h	Operating hours
Order no.	Order, item or part number
poss.	possibly
resp.	respectively
ROPS	Roll Over Protective Structure
SCR	Acronym from the English term "Selective Catalytic Reduction"
SW	Quickhitch (loader unit)

Repair instructions

Technical data

Technical data, dimensions and weights are only given as an indication. Subject to technical modifications. Responsibility for errors or omissions not accepted.

Cause of damage

Identify the cause of damage, avoid further damage, and secure the machine.

Spare parts

Use original spare parts and corresponding special tools.

When ordering spare parts or submitting technical queries, always provide the machine serial number and, in case of the diesel engine and/or attachments, also the respective serial numbers. This is required to prevent the delivery of wrong spare parts.

Only use spare parts, accessories and accessory devices that come originally from and that have been tested and approved by . This is the only way to ensure constructively that the properties of the vehicle as well as its operational reliability can be maintained. In addition, original parts from maintain the active and/or passive driving safety and operational safety of the machine.

All liability for damages that, in this regard, result from not using original parts, accessories and accessory devices is excluded by .

Diesel engine

Always disconnect the battery cable or operate the battery master switch before working on the diesel engine.

Gearbox

When disassembling the gearbox, always drain the gear oil first before removing the gears. Separate parts that are interlocked with a soft-metal or plastic hammer.

Hydraulic system

In order to ensure that the hydraulics function smoothly, all work must be executed carefully and cleanly.

- Before removing, thoroughly clean the parts of the machine where assembly work is to be performed.
- Clean all the hydraulic screw connections and ports before disassembly.
- Use a suitable container to collect the hydraulic oil as it drains off and dispose of it in an environmentally friendly manner!
- When removing, seal all hose pipes and piping tightly.

Required tools and screw connections

- Standard tools, electric power tools, pit
- 2 x 60 bar (871 psi) pressure gauge
- 2 x 600 bar (8708 psi) pressure gauge
- 1 x 250 bar (3628 psi) pressure gauge
- 2 x micro screw connection 7/16 UNF with O-ring
- 2 x micro screw connection M12x1.5 with O-ring
- 2 x micro screw connection S25 (high pressure up to 600 bar (8708 psi))
- 2 x plug S25 (high pressure up to 600 bar (8708 psi))
- 1 x diesel engine speed sensor (or diagnosis system)
- 1 x multimeter (or diagnosis system)
- Allen key set with spherical lock (retaining function)

Procedure

Replacement of components/warranty handling

Basically, approval is required for replacing the variable displacement pump or the high-speed gearbox. Please always make a note of the name of the person giving the approval and the date of it on the test report.
If you are replacing a pump or the gearbox, the following documents must be sent back in paper form together with the old part:

- Standard test report “**Before troubleshooting**”
- Adjusting pump report
- High-speed gearbox report (only if high-speed gearbox is replaced)
- Standard test report "**After troubleshooting**"

E.2 Safety instructions

Pay particular attention to the following

To eliminate risks, the instructions in this system manual must be read and observed by every person using, servicing, repairing, maintaining or inspecting this machine.

In particular, read this section on safety.

Safety symbols and signal words

Explanation

The following symbol identifies safety instructions. It is used for warning against potential personal risk or danger.

DANGER

DANGER identifies a situation causing death or serious injury if it is not avoided.

Consequences in case of non-observance.

► Avoidance of injury or death.

WARNING

WARNING identifies a situation that can cause death or serious injury if it is not avoided.

Consequences in case of non-observance.

► Avoidance of injury or death.

CAUTION

CAUTION identifies a situation that can cause injury if it is not avoided.

Consequences in case of non-observance.

► Avoidance of injury.

NOTICE

NOTICE identifies a situation that causes damage to the machine if it is not observed.

► Avoidance of damage to property.

The warning and safety signs attached to the machine provide important information for safe operation. Compliance is for your safety.

Safety and accident prevention regulations

- In addition to this service manual also always observe the Operator's Manual of the machine.
- Observe all safety and accident prevention regulations.
- When driving on public roads, observe the respective regulations!
- Before starting the diesel engine, please ensure that no gear is engaged and that all safety devices are attached and set at the safety position.
- Before starting the diesel engine and before switching on the main drive, hoot the horn.
- Start the diesel engine only from the driver's seat. The diesel engine must not be started by short-circuiting the electric connections on the starter because doing so may cause the machine to start moving immediately!
- Do not let the diesel engine run in enclosed areas.
- The assemblers clothes should be close-fitting. Avoid loose-fitting clothes!
- Caution is essential when handling fuel – increased fire hazard.
- Do not smoke during refueling, and avoid fire and sparks.
- Do not smoke when refueling!
- Before refueling, always stop the diesel engine and remove the starting key. Do not refuel in closed rooms.
- Wipe away fuel spills immediately!
- Keep the machine clean to avoid fire hazard.
- Caution is required when handling brake fluids and battery acid. Battery acid is toxic and caustic!
- Only perform work under the lifted machine if safe and secure means of support are used.
- After maintenance work or servicing, reattach the safety devices!

Leaving the machine

- Secure the machine against rolling before leaving it (parking brake, wheel chocks). Stop the engine, remove the starting key and, if necessary, lock the cabin!
- If the vehicle is not going to be moved for a longer period, switch off the battery circuit breaker.
- Never leave the machine untended as long as the engine is still running!
- Before leaving the vehicle, lower the loading unit completely!

Adjustment and maintenance

Due to their function the machine drives are not automatically secured after stopping the engine.

In addition, adjustment work can require that the drives are rotated.

Observe the following:

- Prior to adjustment, cleaning, and maintenance work as well as rectifying functional disorders:
  - Stop the engine.
  - Disconnect the battery circuit breaker.
- Before any adjustment, cleaning or maintenance work or before rectifying any functional faults in the hydraulic system, lower the attachment and/or infeed unit.
- When working on the electric system, always disconnect the battery circuit breaker.
- You must ensure that no-one can start the vehicle or cause the drives to start rotating.
- Fluids emitted under high pressure (fuel hydraulic oil, etc.) can penetrate the skin and cause serious injuries, therefore call a doctor immediately as otherwise serious infections can be caused!
- Repairs to the hydraulic system may only be carried out by specialist workshops.
- Be careful when opening the radiator cap. The radiator is under pressure when the engine is hot!
- Sufficient knowledge and assembly tools in accordance with regulations are required for mounting tires!
- Dispose of oil, fuels and filters properly!
- Re-tighten the wheel nuts regularly!

Jack up the machine

WARNING

Crushing hazard due to incorrectly jacked-up machine.

Serious injury or death of persons underneath the machine can be caused if the machine lowers or falls down.

► Use jack/jack stand of sufficient lifting capacity.

► Use hydraulic jacks/jack stands that function reliably.

► Use the jack/jack stand on firm and level ground.

► Install a jack/jack stand at a suitable position on the machine.

Parking the machine

Perform the following steps before working on the machine:

- Stop the diesel engine.
- Apply the parking brake.
- Remove the starting key.
- Remove key from main battery switch.
- Wait until all parts of the machine have come to a complete standstill.
- Secure the machine with wheel chocks.
- Ensure that the machine cannot be put into operation by other persons.

Air conditioning

Environment

The air-conditioning system is filled with an HFC refrigerant which can damage the atmosphere. Be particularly careful when working on the air conditioning system. Maintenance and repair work may only be performed by specialized cryo-service centers. Refrigerant must always be extracted and recycled properly

Risk of injury from hydraulic fluids

WARNING

Risk of injury due to liquids under high pressure.

Liquids can penetrate the skin and cause death or serious injury.

- ► Work on the hydraulic system may only be performed by authorized service centers.
- ► Check the hose pipes regularly.
- ► Search for leaks with a piece of wood or cardboard.
- ► Ensure that the oil jet is not directed toward your body.
- ► Replace damaged hose pipes.
- ► Replace flexible lines no later than 6 years after production date.
- ► If hydraulic fluids penetrate skin or eyes, this must be treated by a specialist doctor immediately.

Pressure accumulator

DANGER

Risk of injury or suffocation!

Risk of suffocation through uncontrolled release of large quantities of gas and risk of injury due to entrained components.

- ► Work is only to be carried out by an authorized service center.
- ► Ensure there is ample ventilation while work is being performed.
- ► Only use appropriate devices to perform tests.

DANGER

Explosion hazard!

Risk of serious injury through the explosion of the hydraulic accumulator when filling the membrane accumulator with non-approved gas.

- ► Work is only to be carried out by an authorized service center.
- ► Fill only with approved gas.

CAUTION

Risk of burns and injuries

Burn and injury hazard if hot hydraulic oil escapes under high pressure.

► Do not operate the machine with leaking or damaged hydraulic system components.

► Never search for leaks with your bare hands. Wear protective gloves and clothing.

► Wear safety glasses to protect the eyes. If oil contacts the eye, flush immediately with clean water and seek emergency medical treatment.

► Seek immediate medical attention if oil penetrates the skin. Oil can cause serious infections.

► Retighten leaking threaded fittings and hose connections only when the hydraulic system is not under pressure. In other words, release the pressure before working on pressurized lines.

► Never weld or solder damaged or leaking membrane accumulators. Have damaged parts replaced by an authorized service center.

► Do not check for leaks with an open flame due to explosive fire risk from vaporized oil mist.

- Have the membrane accumulator checked by an authorized service center in accordance with the maintenance plan intervals in chapter 7.x.
- Damaged membrane accumulators cannot be repaired and must be replaced.
- Seek the help of an authorized service center for disassembly and replacement.

First-aid measures

Breathing:

- Supply persons with fresh air and seek medical attention depending on symptoms.
- Remove person from the danger zone.

Eye contact:

Rinse thoroughly several minutes with plenty of water. Seek medical attention if necessary.

Skin contact:

Wash thoroughly with plenty of water and soap, immediately remove soaked clothes, seek medical attention in case of skin irritations (reddening, etc.).

Swallowing:

Do not induce vomiting, immediately seek medical attention.

E.3 Tightening torques

General tightening torques

Screw dimensions	Tightening torques[1] in Nm (ft.lb)		
	8.8	10.9	12.9
M4	3 (2,2)	4 (3)	5 (3,7)
M5	5,5 (4,1)	8 (5,9)	10 (7,4)
M6	10 (7,4)	14 (10,3)	16 (11,8)
M8	23 (17)	34 (25,1)	40 (29,5)
M10	46 (33,9)	67 (49,4)	79 (58,3)
M12	79 (58,3)	115 (84,8)	135 (99,6)
M14	125 (92,2)	185 (136,4)	220 (162,3)
M16	195 (143,8)	290 (213,9)	340 (250,8)
M18	280 (206,5)	400 (295)	470 (346,7)
M20	395 (291,3)	560 (413)	660 (486,8)
M22	540 (398,3)	760 (560,5)	890 (656,4)
M24	680 (501,5)	970 (715,4)	1150 (848,2)
M27	1000 (737,6)	1450 (1069,5)	1700 (1253,9)
M30	1350 (995,7)	1950 (1438,2)	2300 (1696,4)

1. These values are valid for screws with untreated, non-lubricated surfaces.

Specific tightening torques

Designation	Tightening torque in Nm (ft.lb)
Wheel nut	400 $^{\pm 20}$ Nm (295$^{\pm}$14 ft.lbs.)

Torque values for metric coarse-pitch thread

Screws and nuts

The tightening torques specified below only apply if:

- A friction coefficient of μ tot = 0.14 is reached in connection with a thread lubricant. A surface protection, for example A3C+L, Dacromet or Termosil, is recommended for this.
- No other tightening torque is specified in the text.
- No additional screw locks, for example MK screws or a liquid screw lock, are used.

Tightening torques in Nm (ft.lb)				
Property class		**8.8**	**10.9**	**12.9**
Designation	**Dimensions**			
Hexagon head cap screw ISO 4014 to ISO 4018 Cheese-head screws ISO 4762 Hexagon nuts ISO 4032	M4	2,9 (2,1)	4,3 (3,2)	5 (3,7)
	M5	5,8 (4,3)	8,5 (6,3)	10 (7,4)
	M6	10 (7,4)	14,5 (10,7)	17 (12,5)
	M8	24,5 (18,1)	36 (26,6)	42 (31)
	M10	48,5 (35,8)	71 (52,4)	83,5 (61,6)
	M12	83,5 (61,6)	123 (90,7)	144 (106,2)
	M14	133 (98,1)	196 (144,6)	229 (168,9)
	M16	207 (152,7)	304 (224,2)	355 (261,8)
	M18	296 (218,3)	422 (311,3)	494 (364,4)
	M20	417 (307,6)	594 (438,1)	695 (512,6)
	M22	570 (420,4)	813 (599,6)	951 (701,4)
	M24	718 (529,6)	1022 (753,8)	1196 (882,1)
	M27	1058 (780,3)	1506 (1110,8)	1763 (1300,3)
	M30	1437 (1059,9)	2046 (1509,1)	2395 (1766,5)
	M33	1944 (1433,8)	2770 (2043)	3240 (2389,7)
	M36	2500 (1843,9)	3561 (2626,5)	4167 (3073,4)
	M39	3237 (2387,5)	4610 (3400,2)	5394 (3978,4)

Torque values for metric fine-pitch thread

Screws and nuts

The specified tightening torques only apply if:

- A friction coefficient of μ tot = 0.14 is reached in connection with a thread lubricant. A surface protection, for example A3C+L, Dacromet or Termosil, is recommended for this.
- No other tightening torque is specified in the text.
- No additional screw locks, for example MK screws or a liquid screw lock, are used.

Tightening torques in Nm (ft.lb)				
Property class		**8.8**	**10.9**	**12.9**
Designation/dimensions				
Hexagon head cap screw ISO 8765, ISO 8876 Hexagon nuts ISO 4032	M8 x 1	26 (19,2)	38,5 (28,4)	45 (33,2)
	M10 x 1	54 (39,8)	79 (58,3)	92,5 (68,2)
	M10 x 1.25	51 (37,6)	74,5 (54,9)	88 (64,9)
	M12 x 1.25	90,5 (66,7)	134 (98,8)	156 (115,1)
	M12 x 1.5	87 (64,2)	128 (94,4)	150 (110,6)
	M14 x 1.5	143 (105,5)	210 (154,9)	246 (181,4)
	M16 x 1.5	219 (161,5)	323 (238,2)	378 (278,8)
	M18 x 1.5	331 (244,1)	470 (346,7)	551 (406,4)
	M18 x 2	313 (230,9)	446 (329)	522 (385)
	M20 x 1.5	459 (338,5)	655 (483,1)	766 (565)
	M22 x 1.5	622 (458,8)	886 (653,5)	1037 (764,9)
	M24 x 1.5	809 (596,7)	1152 (849,7)	1348 (994,2)
	M24 x 2	778 (573,8)	1108 (817,2)	1297 (956,6)
	M27 x 1.5	1173 (865,2)	1672 (1233,2)	1956 (1442,7)
	M27 x 2	1135 (837,1)	1617 (1192,6)	1892 (1395,5)
	M30 x 2	1580 (1165,3)	2251 (1660,3)	2634 (1942,7)
	M33 x 2	2116 (1560,7)	3015 (2223,7)	3528 (2602,1)
	M36 x 2	2773 (2045,3)	3951 (2887,6)	4623 (3409,7)
	M39 x 2	3557 (2623,5)	5067 (3737,2)	5930 (4373,7)

Tightening torques for hydraulic screw connections and air-conditioning screw connections with sealing cone and O-ring DIN 3865

Outside tube diameter in mm (in)	Tightening torque (lightweight series) in Nm (ft.lb)	Tightening torque (heavy series) in Nm (ft.lb)
6 (0,24)	10 (7,4)	15 (11,1)
8 (0,31)	15 (11,1)	25 (18,4)
10 (0,39)	25 (18,4)	35 (25,8)
12 (0,47)	35 (25,8)	50 (36,9)
15 (0,59)	50 (36,9)	–
16 (0,63)	–	80 (59)
18 (0,71)	80 (59)	–
20 (0,79)	–	110 (81,1)
22 (0,87)	110 (81,1)	–
25 (0,98)	–	160 (118)
28 (1,1)	160 (118)	–
30 (1,18)	–	210 (154,9)
35 (1,38)	210 (154,9)	–
38 (1,5)	–	320 (236)
42 (1,65)	320 (236)	–

Tightening torques for hydraulic screw connections with olive DIN 3861

Outside tube diameter in mm (in)	Tightening torque (lightweight series) in Nm (ft.lb)	Tightening torque (heavy series) in Nm (ft.lb)
6 (0,24)	15 (11,1)	25 (18,4)
8 (0,31)	25 (18,4)	35 (25,8)
10 (0,39)	35 (25,8)	50 (36,9)
12 (0,47)	50 (36,9)	80 (59)
15 (0,59)	80 (59)	–
16 (0,63)	–	110 (81,1)
18 (0,71)	110 (81,1)	–
20 (0,79)	–	160 (118)
22 (0,87)	160 (118)	–
25 (0,98)	–	210 (154,9)
28 (1,1)	210 (154,9)	–
30 (1,18)	–	320 (236)
35 (1,38)	320 (236)	–
38 (1,5)	–	400 (295)
42 (1,65)	400 (295)	–

Tightening torques for hydraulic system screw-in spud SDS

Shape B with sealing edge (cutting edge) and shape E with soft O-ring seal

Dimension	Tightening torque (lightweight series) in Nm (ft.lb)	Tightening torque (heavy series) in Nm (ft.lb)
M5	–	–
M6	–	–
M8 x 1	–	–
M10 x 1	18 (13,3)	–
M12 x 1.5	30 (22,1)	35 (25,8)
M14 x 1.5	45 (33,2)	55 (40,6)
M16 x 1.5	60 (44,3)	70 (51,6)
M18 x 1.5	70 (51,6)	110 (81,1)
M20 x 1.5	–	140 (103,3)
M22 x 1.5	140 (103,3)	170 (125,4)
M26 x 1.5	180 (132,8)	220 (162,3)
M27 x 2	190 (140,1)	250 (184,4)
M33 x 2	300 (221,3)	300 (221,3)
M42 x 2	500 (368,8)	550 (405,7)
M48 x 2	550 (405,7)	600 (442,5)
G 1/8 A	20 (14,8)	25 (18,4)
G 1/4 A	35 (25,8)	40 (29,5)
G 3/8 A	70 (51,6)	90 (66,4)
G 1/2 A	100 (73,8)	150 (110,6)
G 3/4 A	180 (132,8)	270 (199,1)
G 1 A	250 (184,4)	350 (258,1)
G 1-1/4 A	450 (331,9)	500 (368,8)
G 1-1/2 A	550 (405,7)	600 (442,5)
7/16-20	–	–
1/2-20 (UNF)	–	–
9/16-18	–	–
3/4-16	–	–
7/8-14	–	–
1-1/16-12	–	–
1-5/16-12	–	–
1-5/8-12 (UNF)	–	–
1-7/8-12 (UNF)	–	–
2-12 (UNF)	–	–

Shape F with O-ring and plug

Dimension	Tightening torque (lightweight series) in Nm (ft.lb)	Tightening torque (heavy series) in Nm (ft.lb)
M5	2,8 (2,1)	–
M6	5,2 (3,8)	–
M8 x 1	7 (5,2)	–
M10 x 1	11 (8,1)	–
M12 x 1.5	15 (11,1)	15 (11,1)
M14 x 1.5	25 (18,4)	25 (18,4)
M16 x 1.5	35 (25,8)	35 (25,8)
M18 x 1.5	50 (36,9)	50 (36,9)
M20 x 1.5	–	55 (40,6)
M22 x 1.5	80 (59)	80 (59)
M26 x 1.5	110 (81,1)	110 (81,1)
M27 x 2	110 (81,1)	160 (118)
M33 x 2	160 (118)	210 (154,9)
M42 x 2	210 (154,9)	320 (236)
M48 x 2	320 (236)	420 (309,8)
G 1/8 A	–	–
G 1/4 A	–	–
G 3/8 A	–	–
G 1/2 A	–	–
G 3/4 A	–	–
G 1 A	–	–
G 1-1/4 A	–	–
G 1-1/2 A	–	–
7/16 - 20	15 (11,1)	20 (14,8)
1/2-20 (UNF)	20 (14,8)	25 (18,4)
9/16-18	30 (22,1)	30 (22,1)
3/4-16	35 (25,8)	60 (44,3)
7/8-14	70 (51,6)	90 (66,4)
1-1/16-12	85 (62,7)	100 (73,8)
1-5/16-12	150 (110,6)	170 (125,4)
1-5/8-12 (UNF)	250 (184,4)	300 (221,7)
1-7/8-12 (UNF)	300 (221,7)	350 (258,1)
2-12 (UNF)	350 (258,1)	400 (295)

Shape H with O-ring and chamber ring

Dimension	Tightening torque (lightweight series) in Nm (ft.lb)	Tightening torque (heavy series) in Nm (ft.lb)
G 1/8 A	20 (14,8)	20 (14,8)
G 1/4 A	40 (29,5)	40 (29,5)
G 3/8 A	75 (55,3)	75 (55,3)
G 1/2 A	85 (62,7)	85 (62,7)
G 3/4 A	180 (132,8)	180 (132,8)
G 1 A	310 (228,6)	310 (228,6)
G 1-1/4 A	450 (331,9)	450 (331,9)
G 1-1/2 A	540 (398,3)	540 (398,3)

Tightening torques for hydraulics rotating threaded fittings

Dimension	Tightening torque (lightweight series) in Nm (ft.lb)	Tightening torque (heavy series) in Nm (ft.lb)
M10 x 1	20 (14,8)	30 (22,1)
M12 x 1.5	35 (25,8)	40 (29,5)
M14 x 1.5	45 (33,2)	50 (36,9)
M16 x 1.5	60 (44,3)	70 (51,6)
M18 x 1.5	75 (55,3)	80 (59)
M20 x 1.5	–	100 (73,8)
M22 x 1.5	125 (92,2)	130 (95,9)
M26 x 1.5	130 (95,9)	–
M27 x 2	130 (95,9)	140 (103,3)
M33 x 2	300 (221,3)	300 (221,3)
M42 x 2	500 (368,8)	500 (368,8)
M48 x 2	600 (442,5)	600 (442,5)
G 1/8 A	20 (14,8)	–
G 1/4 A	40 (29,5)	40 (29,5)
G 3/8 A	65 (47,9)	70 (51,6)
G 1/2 A	90 (66,4)	100 (73,8)
G 3/4 A	130 (95,9)	130 (95,9)
G 1 A	270 (199,1)	380 (280,3)
G 1-1/4 A	500 (368,8)	600 (442,5)
G 1-1/2 A	600 (442,5)	700 (516,3)

Tightening torques for banjo bolts DIN 7643

Dimension	Tightening torque in Nm (ft.lb)
M8 x 1	8 (5,9)
M10 x 1	15 (11,1)
M12 x 1.5	27 (19,9)
M14 x 1.5	38 (28.)
M16 x 1.5	70 (51.6)
M18 x 1.5	45 (33,2)
M20 x 1.5	58 (42,8)
M22 x 1.5	95 (70,1)
M26 x 1.5	130 (95,9)
M30 x 1.5	183 (135)

Tightening torques for adjustable hydraulics screw-in spuds SDE

Shape F with O-ring

Dimension	Tightening torque (very lightweight series) in Nm (ft.lb)	Tightening torque (lightweight series) in Nm (ft.lb)	Tightening torque (heavy series) in Nm (ft.lb)
M8 x 1	–	–	–
M10 x 1	20 (14,8)	15 (11,1)	–
M12 x 1.5	–	25 (18,4)	35 (25,8)
M14 x 1.5	–	35 (25,8)	45 (33,2)
M16 x 1.5	–	40 (29,5)	55 (40,6)
M18 x 1.5	–	45 (33,2)	90 (66,4)
M20 x 1.5	–	–	140 (103,3)
M22 x 1.5	–	60 (44,3)	170 (125,4)
M26 x 1.5	–	100 (73,8)	190 (140,1)
M27 x 2	–	100 (73,8)	190 (140,1)
M33 x 2	–	160 (118)	310 (228,6)
M42 x 2	–	210 (154,9)	330 (243,4)
M48 x 2	–	260 (191,8)	420 (309,8)
7/16-20	–	15 (11,1)	20 (14,8)
1/2-20 (UNF)	–	30 (22,1)	40 (29,5)
9/16-18	–	35 (25,8)	45 (33,2)
3/4-16	–	55 (40,6)	60 (44,3)
7/8-14	–	80 (59)	90 (66,4)
1-1/16-12	–	100 (73,8)	100 (73,8)
1-5/16-12	–	150 (110,6)	170 (125,4)
1-5/8-12 (UNF)	–	290 (213,9)	340 (250,8)
1-7/8-12 (UNF)	–	325 (239,7)	415 (306,1)
2-12 (UNF)	–	350 (258,1)	450 (331,9)

Shape H with O-ring and chamber ring

Dimension	Tightening torque (very lightweight series) in Nm (ft.lb)	Tightening torque (lightweight series) in Nm (ft.lb)	Tightening torque (heavy series) in Nm (ft.lb)
M8 x 1	10 (7,4)	–	–
M10 x 1	20 (14,8)	18 (13,3)	–
M12 x 1.5	–	30 (22,1)	35 (25,8)
M14 x 1.5	–	45 (33,2)	55 (40,6)
M16 x 1.5	–	60 (44,3)	80 (59)
M18 x 1.5	–	70 (51,6)	105 (77,4)
M20 x 1.5	–	–	140 (103,3)
M22 x 1.5	–	125 (92,2)	125 (92,2)
M26 x 1.5	–	180 (132,8)	180 (132,8)
M27 x 2	–	180 (132,8)	180 (132,8)
M33 x 2	–	300 (221,3)	380 (280,3)
M42 x 2	–	450 (331,9)	500 (368,8)
M48 x 2	–	600 (442,5)	600 (442,5)
G 1/8 A	20 (14,8)	20 (14,8)	25 (18,4)
G 1/4 A	–	35 (25,8)	45 (33,2)
G 3/8 A	–	70 (51,6)	75 (55,3)
G 1/2 A	–	100 (73,8)	100 (73,8)
G 3/4 A	–	180 (132,8)	180 (132,8)
G 1 A	–	300 (221,3)	300 (221,3)
G 1-1/4 A	–	450 (331,9)	450 (331,9)
G 1-1/2 A	–	540 (398,3)	540 (398,3)

Tightening torques for brake line threaded fittings

Shape F male fitting screws and shape FS male fitting screws with flare

Dimension	Tightening torque in Nm (ft.lb)
M10 x 1	14+2 (10,3+1,5)

Tightening torques for worm drive hose clamps

Width of the bracket in mm (in)	Tightening torques for new hoses for first installation in Nm (ft.lb)	Tightening torques for re-tightening or new assembly in Nm (ft.lb)
7,9 (0,31)	0,9±0,2 (0,7±0,1)	0,7±0,2 (0,5±0,1)
13,5 (0,53)	4,5±0,5 (3,3±0,4)	3,0±0,5 (2,2±0,4)
15,9 (0,63)	7,5±0,5 (5,5±0,4)	4,5±0,5 (3,3±0,4)

Tightening torques for spring-loaded worm drive hose clamps

Width of the bracket in mm (in)	Diameter of the bracket in mm (in)	Tightening torque in Nm (ft.lb)
12 (0,47)	60-80 (2,36-3,15)	5+0,5 (3,7+0,4)
12 (0,47)	70-90 (2,76-3,54)	5+0,5 (3,7+0,4)

1 Maintenance

1.1 Maintenance preparations, instructions

Information on maintenance

Responsibilities and prerequisites

Have the following maintenance performed by an authorized service center otherwise warranty claims will not be acknowledged:

- Delivery inspection,
- “A” 1st inspection at 100 o/h
- "B" 2nd inspection at 500 o/h and every 500 o/h,
- “C” every 1500 o/h (once a year).

The daily work that is to be performed "every 10 hours of operation (daily)", as well as the care work that is to be done "every 20 hours of operation", which is indicated in the maintenance schedule, has to be performed by a specially trained operator. *– see "Maintenance plan" on page 1-7.*

The manufacturer shall not be liable for damage or personal injury caused by failure to observe instructions!

Information

Insist on using original spare parts for repairs.
The machine’s permits, certifications, registrations, etc., may be withdrawn if machine parts/components with a prescribed condition or quality, or machine parts/components that can put persons at risk during operation, are subsequently modified or exchanged!

Please contact your dealer if you require more information on maintenance.

Safety instructions concerning maintenance work

CAUTION

Risk of injury from maintenance work!

Injury hazard!

- ► Apply the parking brake.
- ► Stop the engine and remove the starting key.
- ► Observe the danger indications and safety instructions during maintenance.
- ► Always park the machine on firm and level ground and secure it to prevent it from rolling away.
- ► Secure the raised loader unit against unintentional lowering.
- ► Switch of battery master switch **S008**.
- ► Follow the maintenance and safety instructions given in the operator's manuals of the attachments.

NOTICE

In order to avoid damage from malfunctions in the electronic regulation of the diesel engine, do not unscrew main battery switch **S008** from the frame immediately after switching off the engine!

Follow the correct order (see label)!

It is not possible to operate an external vehicle heater (optional) when the main battery switch **S008** has been removed.

Parking the machine

Perform the following steps before working on the machine:

1. Park the machine on level and firm ground.
2. Apply the parking brake.
3. Retract the telescopic boom and lower the telescopic arm to the ground.
4. When working on a raised telescopic arm – *see "Mounting the safety prop onto the lift ram" on page 1-5*.
5. Stop the diesel engine.
6. Remove the starting key.
7. Secure the machine with wheel chocks.
8. Wait until all parts of the machine have come to a complete standstill.
9. Switch off battery master switch S008 – *see "Switch off the battery master switch S008" on page 1-4*.
10. Ensure that the machine cannot be put into operation by other persons.

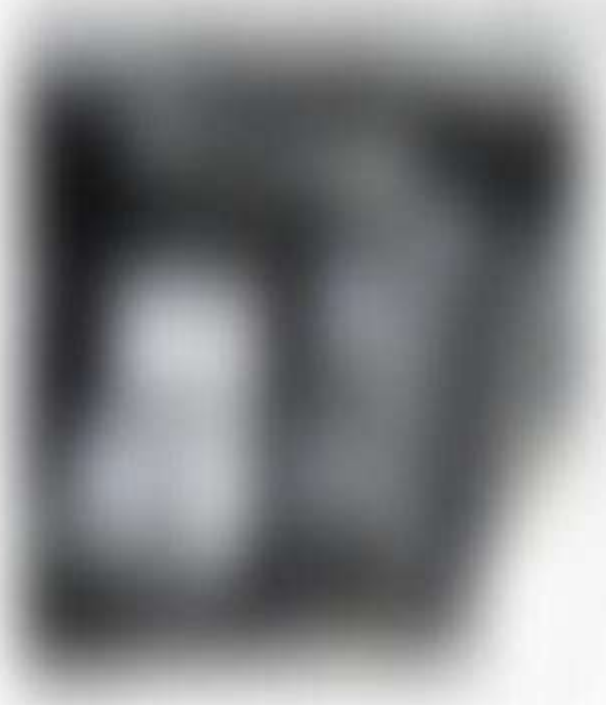
Jack up the machine

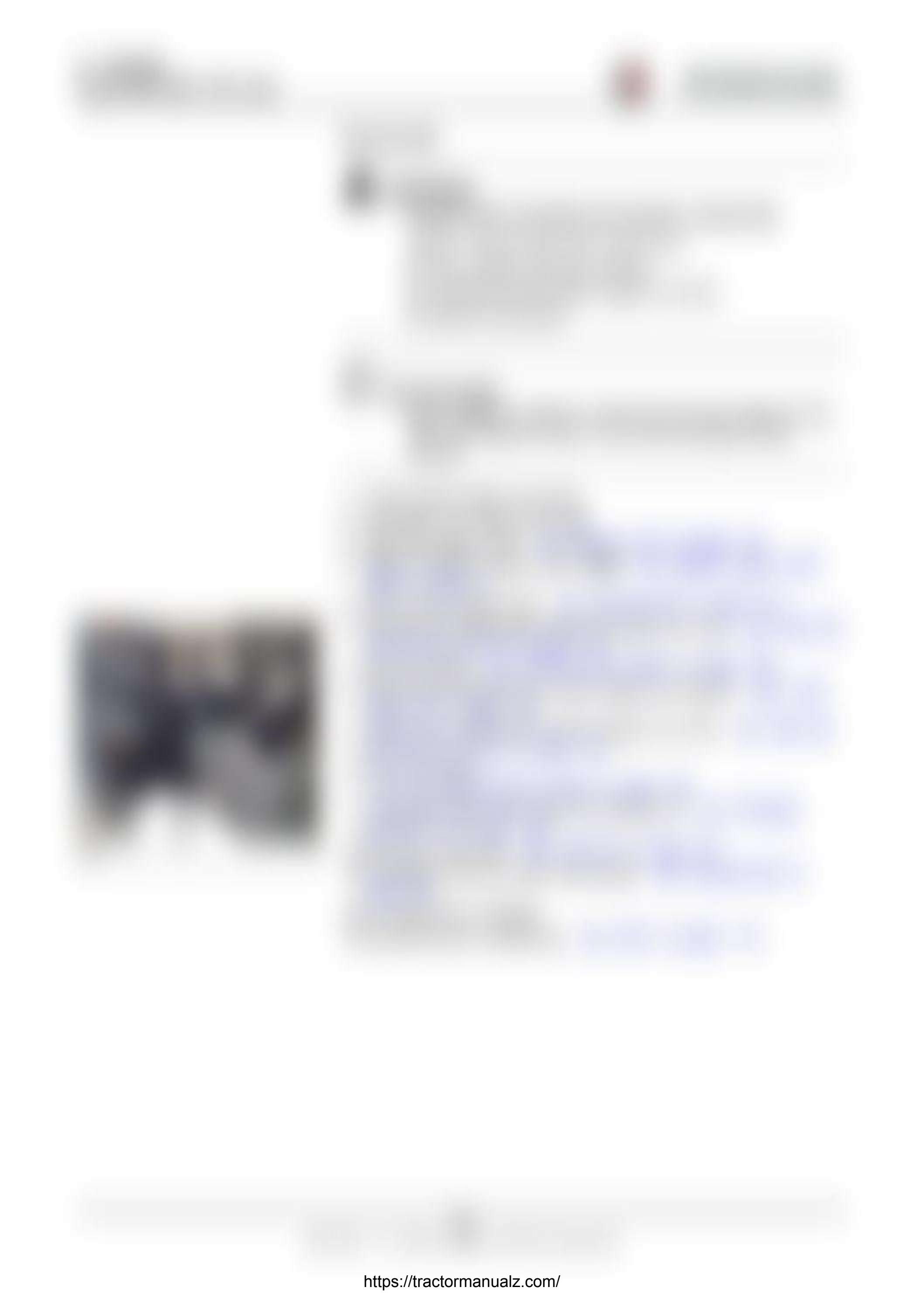
WARNING

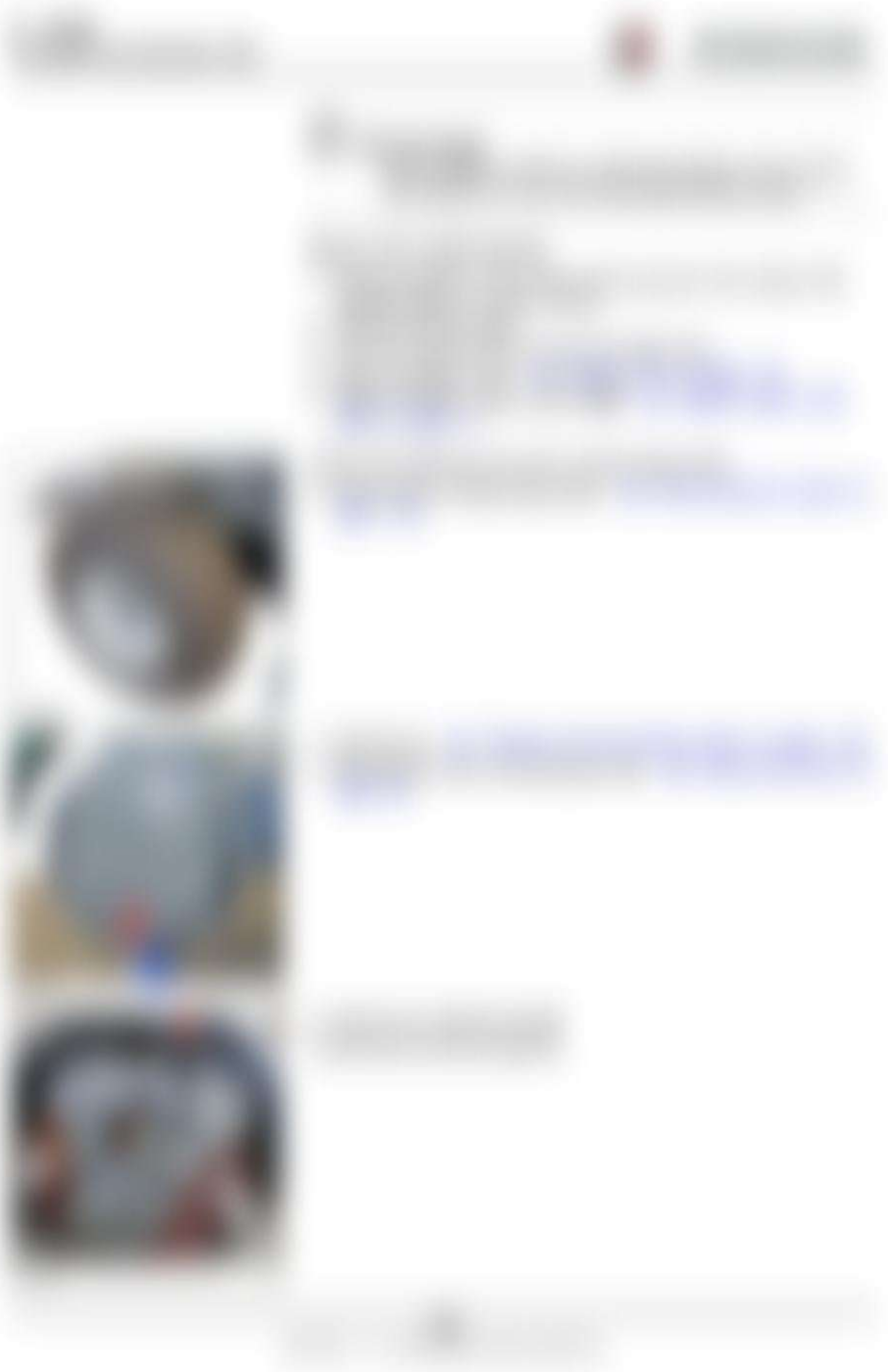
Crushing hazard due to incorrectly jacked-up machine.

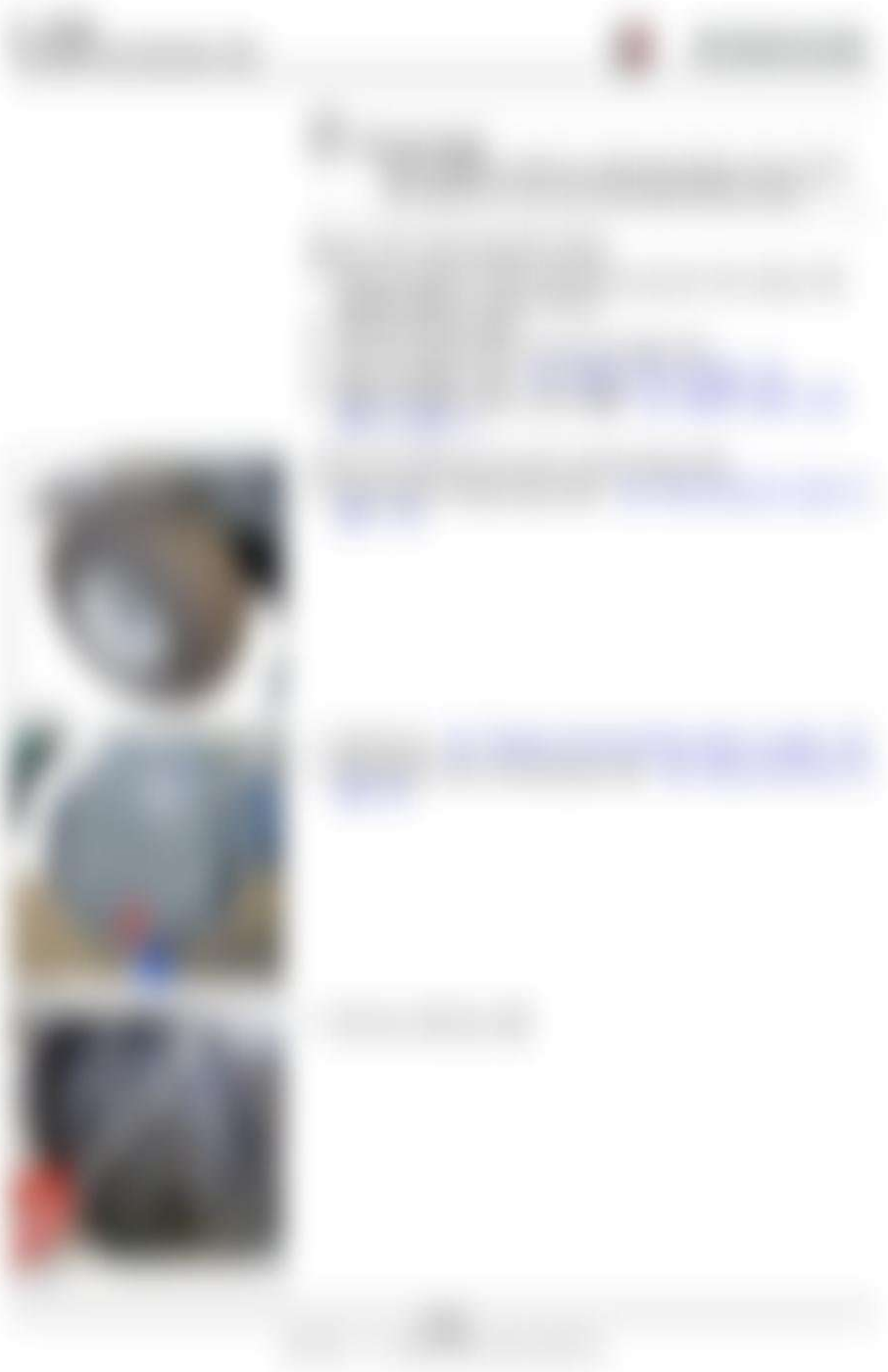
Serious injury or death of persons underneath the machine can be caused if the machine lowers or falls down.

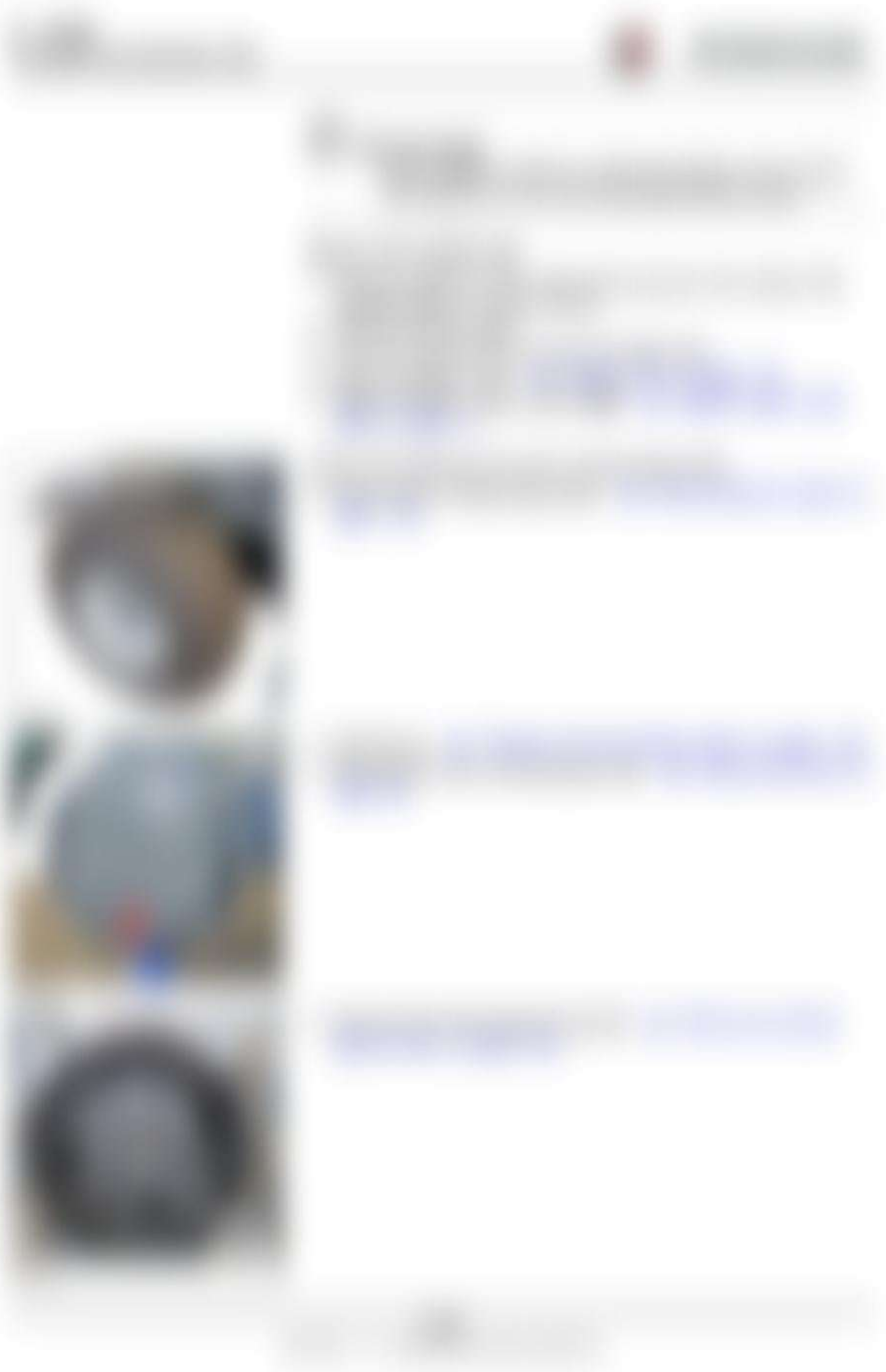
► Use jack/jack stand of sufficient lifting capacity.
► Use hydraulic jacks/jack stands that function reliably.
► Use the jack/jack stand on firm and level ground.
► Install a jack/jack stand at a suitable position on the machine.

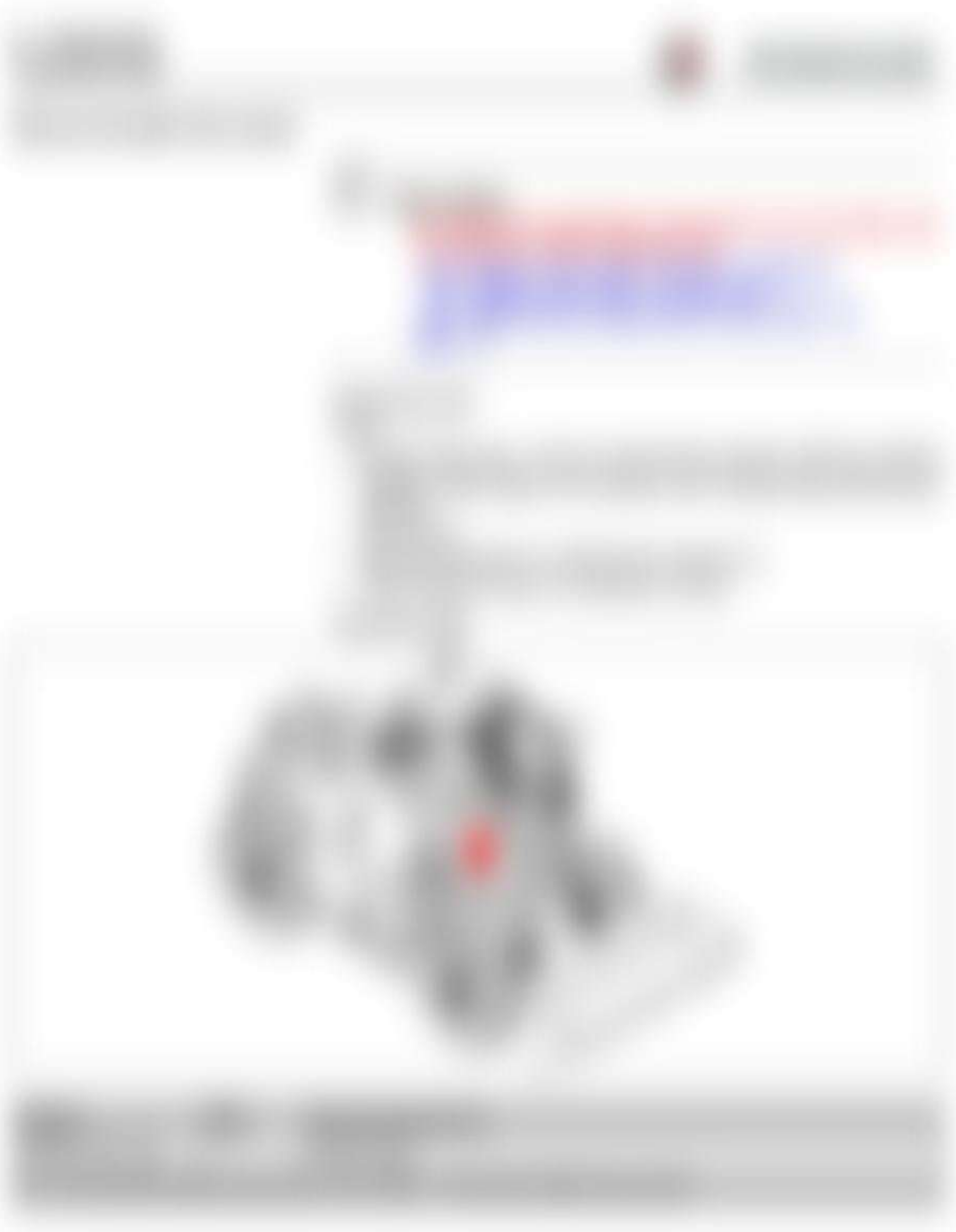


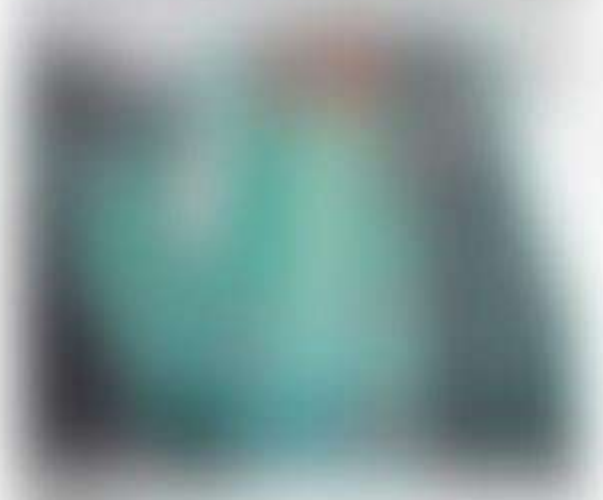


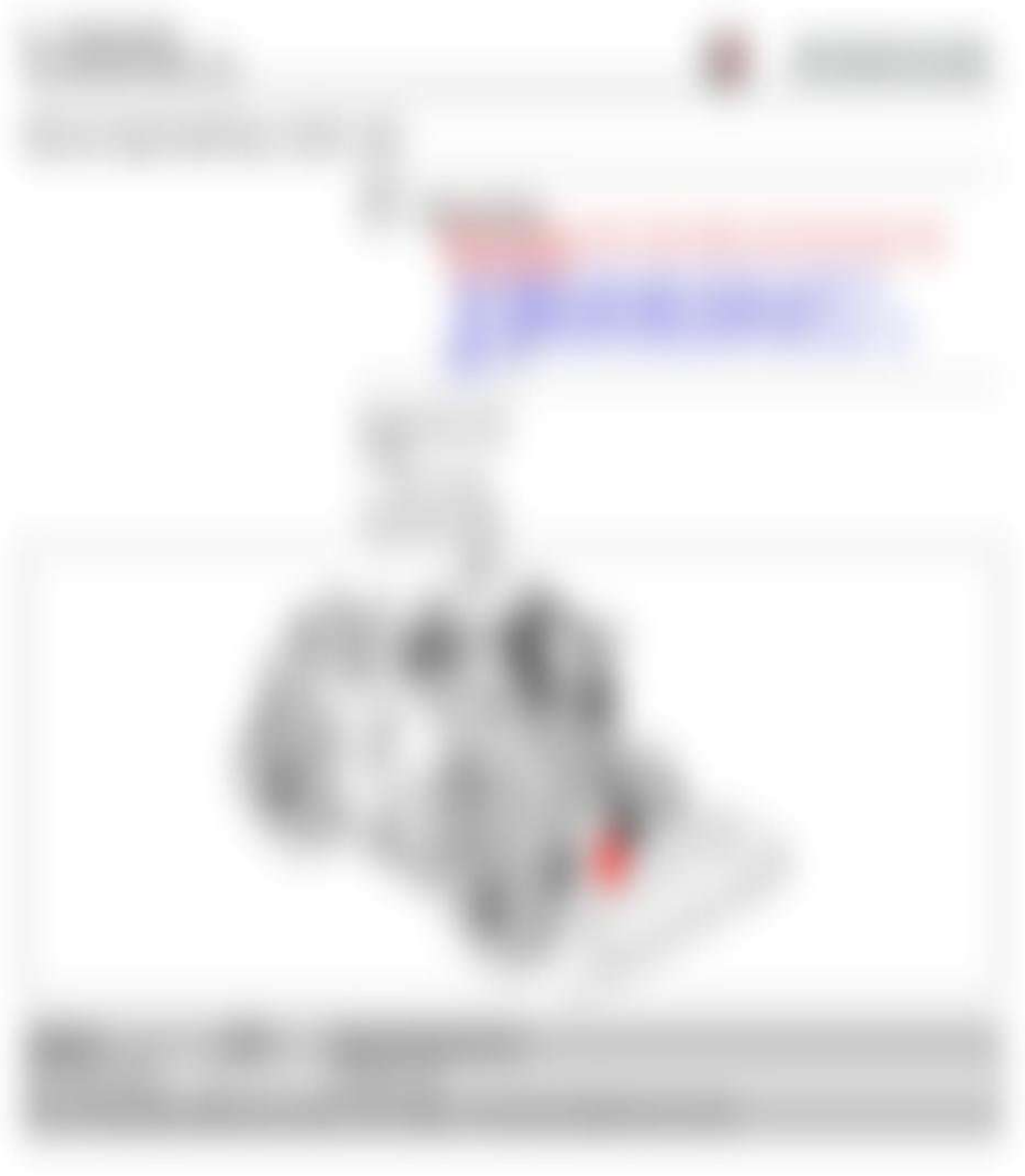


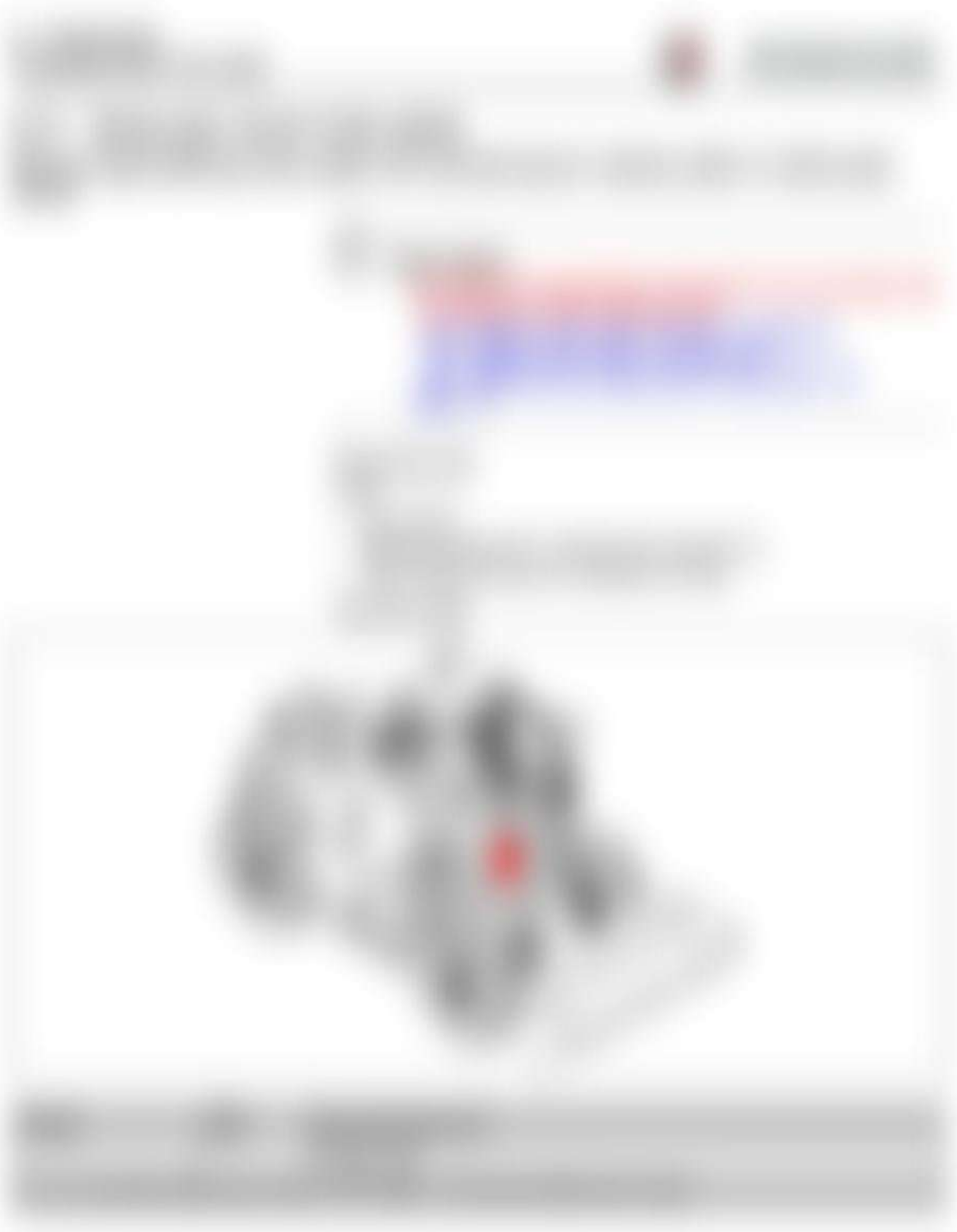












4 Electrical system