Operator’s Manual

Utility Track Loader

SM100 / SM120

Machine Type	**UTL**
Material Number	**5100064108 / 3300031444**
Version	**14**
Date	**09/2024**
Language	**[en-US]**

This Operator's Manual includes the AEM Safety Manual

AEM MEMBER

Imprint

Publisher and copyright holder:

Wacker Neuson America Corporation

N92W15000 Anthony Ave

Menomonee Falls, WI 53051, USA

www.wackerneuson.us

Original instructions

California Proposition 65 Warning

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

⚠ WARNING

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

⚠ WARNING

Cancer and Reproductive Harm

www.P65Warnings.ca.gov

⚠ WARNING

Batteries, battery posts, terminals and related accessories contain lead and lead compounds, and other chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. WASH HANDS AFTER HANDLING.

EC Declaration of Conformity

Manufacturer

Wacker Neuson America Corporation, N92W15000 Anthony Avenue, Menomonee Falls, Wisconsin, 53051 USA

Product

Product	SM100
Product Category	Mini Compact Tracked Loader
Product function	Loading, excavating, and transporting material
Item Number	1000530600, 1000539176
Power in kW at nominal speed min-1	18.4 / 2700
Measured sound power level	101 dB(A)
Guaranteed sound power level	102 dB(A)

We hereby declare that this product meets and complies with the relevant regulations and requirements of the following directives and standards. The manufacturer bears sole responsibility for issuing this compliance statement.

Conformity Assessment Procedure: Outdoor Noise Directive 2000/14/EC

Annex 1 Item 37, Annex VIII as amended by 2005/88/EC

Harmonized Standards: EN ISO 3744:2010, EN ISO 11201:2010, EN ISO 6395:2008

Notified Body:

Number: 0197

Name: TUV Rheinland LGA Products GmbH

Address: Tillystrasse 2, 90431 Nuremberg, Germany

Conformity Assessment Procedure: Machinery Directive 2006/42/EC

Harmonized Standards: EN 474-1:2006+A5:2018, EN 474-2:2006+A1:2008, EN474-3:2006+A1:2009, EN ISO 13766-2:2018

Referenced Standards: ISO 20474-1:2017, ISO 20474-15:2019

Conformity Assessment Procedure: EMC Directive 2014/30/EU

Harmonized Standards: EN 13766-1:2018

Authorized Person for Technical Documents

Wacker Neuson Produktion GmbH & Co. KG, Wackerstraße 6, 85084 Reichertshofen, Germany

Menomonee Falls, WI, USA, 08.01.24

Will Wright

Vice President

Product Engineering and Purchasing

For Wacker Neuson

Original Declaration of Conformity

UKCA Declaration of Conformity

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Conformity Assessment Procedure: Noise Emission in the Environment by Equipment for use Outdoors Regulations SI 2001 No. 1701

Schedule 11

Harmonized Standards: EN ISO 3744:2010, EN ISO 11201:2010, EN ISO 6395:2008

Notified Body

AnP Certification Limited, Issue No.: 8500
2 Parkfield Street, Manchester, M14 4PN

Conformity Assessment Procedure: Supply of Machinery (Safety) Regulations SI 2008 No. 1597

Harmonized Standards: EN 474-1:2006+A5:2018, EN 474-2:2006+A1:2008, EN474-3:2006+A1:2009, EN ISO 13766-2:2018

Referenced Standards: ISO 20474-1:2017, ISO 20474-15:2019

Conformity Assessment Procedure: Electromagnetic Compatibility Regulations SI 2016 No. 1091

Harmonized Standards: EN 13766-1:2018

Authorized Person for Technical Documents

Manufacturer:

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Menomonee Falls, Wisconsin, 53051
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Will Wright
Vice President
Product Engineering and Purchasing for Wacker Neuson

Figure of the original Declaration of Conformity

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Table of Contents

1 Foreword

1.1 Information on This Operator's Manual

The canister for storing the operator's manual is located on the underside of the hood.

1.2 Machine Reference Information

The following machines and variants/options are described:

Machine	Item Number	CE (Y/N)
SM100	1000423340, 1000494879	No
	1000530600, 1000539176	Yes
SM120	1000506633, 1000506634	No

Machine identification

A nameplate listing the model number, item number, and serial number is attached to this machine. The location of the nameplate is shown below.

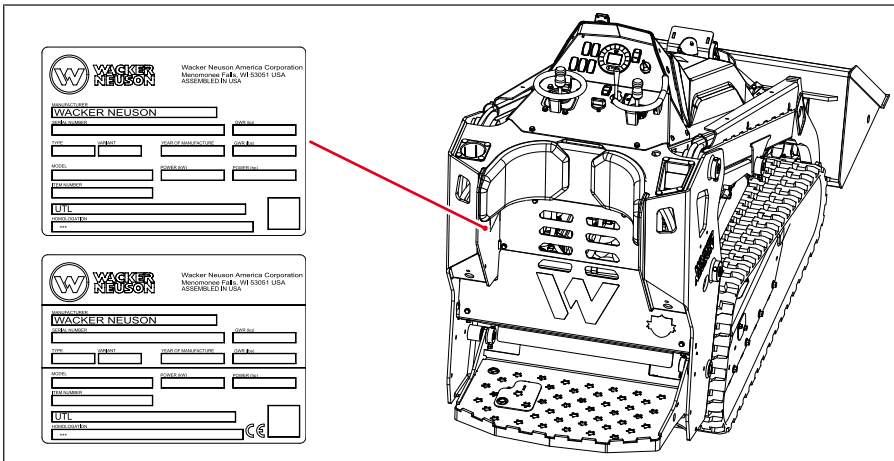


Fig. 1: Nameplate location

Engine nameplate

The engine nameplate identifies the model, displacement, and engine number. The location of the engine nameplate is shown below.

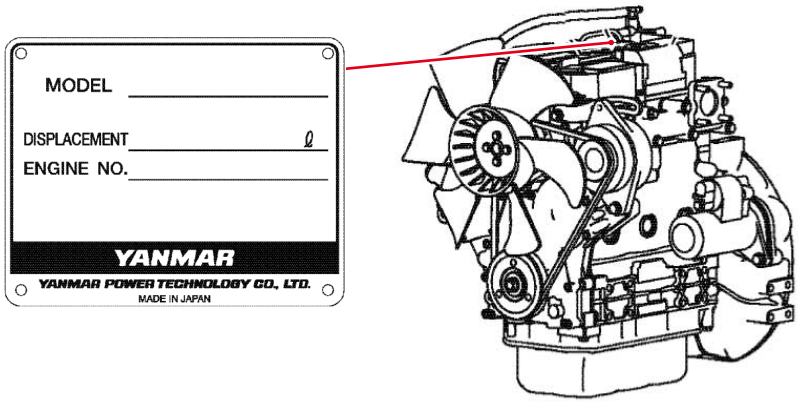


Fig. 2: Engine nameplate location

Write the machine information for your machine on this page. Provide these numbers to your dealer when you need service parts or information about your machine.

Machine model	
Machine item number	
Machine serial number	
Engine serial number	
Wacker Neuson dealer	
Address	
Phone number	

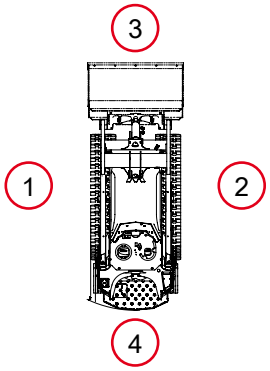


Fig. 3: Sides of the machine

Right/left/front/rear

The following depict the sides of the machine.

- **1**: left
- **2**: right
- **3**: front
- **4**: rear

1.3 Machine Documentation

Keep a copy of the operator's manual with the machine at all times.

From this point forward in this documentation, Wacker Neuson America Corporation will be referred to as Wacker Neuson or the manufacturer.

For spare parts information, please see your Wacker Neuson dealer, or visit the Wacker Neuson website at http://www.wackerneuson.com/.

When ordering parts or requesting service information, be prepared to provide the machine model number, item number, and serial number.

1.4 Expectations for Information in This Manual

This manual provides information and procedures to safely operate and maintain this machine. For your own safety and to reduce the risk of injury, carefully read, understand, and observe all instructions described in this manual.

The manufacturer expressly reserves the right to make technical modifications, even without notice, which improve the performance or safety standards of its machines.

The information contained in this manual is based on machines manufactured up until the time of publication. The manufacturer reserves the right to change any portion of this information without notice.

The illustrations, parts, and procedures in this manual refer to the manufacturer's factory-installed components. Your machine may vary depending on the requirements of your specific region.

This operator's manual does not include information on attachments.

Please contact your dealer if you require more information on the machine or the operator's manual.

1.5 Manufacturer's Approval

This manual contains references to approved parts, attachments, and modifications. The following definitions apply:

- Approved parts or attachments are those either manufactured or provided by the manufacturer.
- Approved modifications are those performed by an authorized service center according to written instructions published by the manufacturer.
- Unapproved parts, attachments, and modifications are those that do not meet the approved criteria.

Unapproved parts, attachments, or modifications may have the following consequences:

- Serious injury hazards to the operator and persons in the work area
- Permanent damage to the machine which will not be covered under warranty

Contact your dealer immediately if you have questions about approved or unapproved parts, attachments, or modifications.

1.6 Abbreviations

Term	Definition
AUX	Auxiliary
DTC	Diagnostic trouble code
ECU	Engine control unit
EGR	Exhaust gas recirculation
EH	Electro-hydraulic
FMI	Failure mode identifier
PEL	Permissible exposure limits

Term	Definition
PPE	Personal protective equipment
ROC	Rated operating capacity
SMV	Slow moving vehicle
SPN	Suspect parameter number
STD	Standard (hydraulics)
ULSD	Ultra low sulfur diesel

1.7 Maintenance Items

Item	Part Number		Item	Part Number
Oil filter	1000003052		Drive belt	1000470869
Air filter, primary	1000467407		Fan belt	1000466932
Air filter, secondary	1000467408		Battery	5000177257
Fuel filter	1000466939		Coolant	5000157214
Fuel water separator	1000466934		Radiator cap	1000431928
Hydraulic oil filter	1000463685		Fuel cap	1000340135
Hydraulic oil	5000164672		Hydraulic tank cap	1000340157
Tracks, wide (SM100)	1000513592		Hydraulic tank screen	1000340159
Tracks, wide (SM120)	1000455009		Grease	1000367563

1.8 Approved Attachments

Attachment	Part Number	Dimensions mm (in.)	Heaped Capacity (m^3) ft^3	Use	Bulk Density <t/m^3 (<t/ft^3)
Bucket - Cutting edge - Tooth bar	1000439496 5100069749 1000466648	914 (36) wide	0.14 (5)	Loosening, picking up, transporting, and loading loose or solid material	3.0 (106)
Bucket - Cutting edge - Tooth bar	1000439511 5100069750 1000446431	1065 (42) wide	0.16 (5.65)		2.6 (91.8)
Pallet fork	1000439173	1065 (42) wide	—	Picking up, transporting, and loading pallets	—
Auger drive – high speed	1000439175	—	—	Powering earth auger bits	—
Auger drive – high torque	1000439176	—	—		—
Brush grapple	1000439178	1065 (42) wide	—	Picking up, transporting, and loading brush and debris	—
Trencher	1000483894	914 (36) deep; 152 (6) wide	—	Cutting trench in earth	—
Auger bit	1000377037	1219 (48) long; 152 (6) diameter	—	Drilling holes in earth	
Auger bit	1000377038	1219 (48) long; 229 (9) diameter	—		—
Auger bit	1000377039	1219 (48) long; 305 (12) diameter	—		—
Auger bit	1000377041	1219 (48) long; 457 (18) diameter	—		—
Auger bit	1000377102	1219 (48) long; 610 (24) diameter	—		—
Auger bit	1000377104	1219 (48) long; 762 (30) diameter	—		—
Auger bit	1000377105	1219 (48) long; 914 (36) diameter	—		—
Extension for auger bits	1000377109	610 (24) long	—	Extending earth auger bit length	—

2 Usage

2.1 Intended Use

In accordance with this designated use, the machine may only be used for moving earth, gravel, coarse gravel or ballast, and rubble. It may also be operated with approved attachments for additional applications.

No other applications are designated for the use of the machine. Wacker Neuson will not be liable for damage resulting from use other than mentioned above. The operator alone will bear the risk.

Designated use includes following the instructions set forth in the operator's manual and following the maintenance schedule.

Machine safety can be negatively affected by performing machine modifications without proper authority and by using spare parts, equipment, attachments, and optional equipment which have not been approved by Wacker Neuson. Wacker Neuson will not be liable for damage resulting from unapproved parts or unauthorized modifications.

Wacker Neuson shall not be liable for personal injury and/or damage to property caused by failure to follow the safety instructions on labels and in this operator's manual, or by not exercising due care when:

- Transporting the machine
- Operating the machine
- Servicing the machine and performing maintenance work
- Repairing the machine

2.2 Unintended Use

The machine shall not be used for transport jobs on public roads unless it is in compliance with applicable regulations.

Using this machine for any other purpose than described above could permanently damage the machine or seriously injure the operator or other persons in the area. Machine damage caused by misuse is not covered under warranty.

The following are some examples of misuse:

- Using the machine as a ladder, support, or work surface
- Using the machine to carry or transport passengers or equipment
- Using the machine to tow other machines
- Using the machine for demolition or forestry applications where there is a risk of falling objects
- Operating the machine partially or completely under water
- Operating the machine outside of factory specifications
- Operating the machine in a manner inconsistent with all warnings found on the machine and in the operator’s manual

2.3 Residual Risks

⚠ WARNING

Serious injury or death hazard

Improper operation of the machine can result in serious injury or death. Before operating this machine, make sure to:

- ► Read and understand the operator's manual.
- ► Read and understand all labels on the machine.
- ► Have training in the safe and proper use of the machine.
- ► Follow all applicable laws and regulations that pertain to this machine.

This machine has been designed and built in accordance with the latest global safety standards. It has been carefully engineered to eliminate hazards as far as practicable and to increase operator safety through protective guards and labeling. However, some risks may remain even after protective measures have been taken. They are called residual risks.

On this machine, residual risks can include exposure to:

- Heat, noise, exhaust, and carbon monoxide from the engine
- Burns from hot hydraulic oil or hot surfaces
- Fire hazards from improper refueling techniques
- Fuel and its fumes
- Personal injury from improper lifting techniques
- Crushing hazards from improper operation (feet, legs, or arms extending outside of the operator work station) and for other persons in the work zone

3 Safety

3.1 Signal Words Used in This Manual

This manual contains DANGER, WARNING, CAUTION, *NOTICE,* and NOTE signal words which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

► To avoid death or serious injury from this type of hazard, obey all safety messages that follow this signal word.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

► To avoid possible death or serious injury from this type of hazard, obey all safety messages that follow this signal word.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

► To avoid possible minor or moderate injury from this type of hazard, obey all safety messages that follow this signal word.

NOTICE

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

► To avoid possible damage from this type of hazard, obey all safety messages that follow this signal word.

Note: A Note contains additional information important to a procedure.

3.2 Safety Guidelines for Operating the Machine

Operator and service training, knowledge, and qualifications

Before operating, maintaining, or servicing the machine:

- Familiarize yourself with the location and proper use of all controls and safety devices.
- Know the rules for the jobsite.
- Contact Wacker Neuson for additional training if necessary.

When operating this machine:

- Do not allow improperly trained people to operate the machine.
- Do not operate the engine while wearing a headset to listen to music or radio because it will be difficult to hear the alert signals.
- People operating the machine must be familiar with the potential risks and hazards associated with it.
- Follow legal and other mandatory regulations relevant to accident prevention and environmental protection. These may include handling hazardous substances, issuing and/or wearing PPE, or obeying traffic regulations.

The machine must not be accessed or operated by:

- Children
- People impaired by alcohol, drugs, or prescription drugs
- People who are feeling ill

Jobsite

⚠ WARNING

Electric shock hazard

Electric shock can cause severe injury or death.

► Maintain a safe distance from overhead energized electric lines.

The operator and any people in the jobsite are at risk if the machine is not operated correctly. Know the rules for the jobsite, which include but are not limited to the following:

- Remain aware of changing positions and the movement of other equipment and personnel in the jobsite.
- Use extra care when operating over uneven ground, on hills, or over soft or coarse material. The machine could shift or slide unexpectedly.
- Use caution when operating the machine near the edges of pits, trenches, or platforms. Ensure the ground surface is stable enough to support the weight of the machine with operator and there is no danger of the machine sliding, falling or tipping.
- Do not operate the machine in areas that contain flammable objects, fuels, or products that produce flammable vapors.
- Do not place diesel fuel or other flammable material such as oil, hay, or dried grass close to the engine during engine operation or shortly after shutdown.
- Keep the area around the muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite the debris and start a fire.
- When operating the machine in contaminated areas, take appropriate measures to protect the operator and the machine.
- Familiarize yourself with the jobsite before beginning work, especially when operating in buildings or enclosed areas. Be aware of:
  - Obstacles in the operating and traveling area
  - Any necessary barriers separating the jobsite from public roads

  - Height of the ceiling/clearances
  - Width of entrances
  - Maximum load of ceilings and floors
  - Sufficient room ventilation to reduce the risk of carbon monoxide poisoning
- Observe the risk zone.
- Be aware of overhead electric lines. If the machine touches an energized electric line:
  - Do not leave the machine until the energized electric line has either been de-energized or removed from the machine.
  - While the machine is touching the energized electric lines, warn others against approaching and touching the machine.
  - Move the machine away from the energized electric lines.
  - Have the energized electric lines de-energized.

Environmental conditions for operation

- Avoid operating in extremely dusty conditions.
- Avoid operating in the presence of chemical gases or fumes.
- Avoid operating in a corrosive atmosphere such as salt water spray.
- Do not expose the engine to the rain.
- When the engine is operated in dusty conditions, inspect the air cleaner element more frequently.
- Contact your authorized YANMAR industrial engine dealer or distributor if the engine will be operated an altitude of 1,676 m (5,500 ft) or higher. High altitude reduces engine power, de-stabilizes operation and generates exhaust gas that exceeds the specification amount in design.

Dust precaution

Dust created by construction activities can cause lung disease, silicosis, or respiratory harm. Do not exceed permissible exposure limits (PEL) to silica dust as determined by OSHA or other jobsite rules and regulations. To reduce the risk of exposure:

- Work in a well ventilated area.
- Use a dust control system.
- Wear an approved dust/particle respirator.

Demolition or excavation work

- When working on roofs or similar structures, check the resistance and the structure itself before starting work. The building can collapse, causing serious injury, death, and damage.
- Do not place the machine directly under the workplace during demolition. Debris can fall onto the machine or the building can collapse, causing serious injury, death, and damage.
- Look out for hazards such as high-voltage lines, underground cables, buried utility lines (electrical, gas, water, communication, sewer), etc., during excavation work.

Before any digging begins:

- Contact the person responsible for jobsite utilities. Follow their recommendations for support and securing of utility lines.

Risk zone awareness

- The risk zone is the area in which persons are at risk due to the movements of the machine, work equipment, additional equipment, or material.
- Stop work immediately if persons do not leave the risk zone in spite of warnings.
- The risk zone also includes areas affected by falling material, equipment, or constructions debris. For further information, see Risk of Injury or Death on page 48.

Before machine operation

The machine, including all components, safety devices, labels, and attachments must be in good condition before use.

- If the machine is functioning unpredictably or in event of malfunctions, immediately lower the lift arm, turn off the machine, remove the key, and report the malfunction to a qualified technician or supervisor. Safety-relevant damage or malfunctions of the machine must be repaired immediately.

Machine operation

- When stepping on or off the operator platform, face the machine and use three points of contact.
- Keep the attachments or work equipment close to the ground. Keep the load low when moving on slopes—up, down, and across.
- Do not get on or off a moving machine, and do not jump off the machine.
- Remain aware of the machine's moving parts. Keep hands, feet, and loose clothing away from the machine's moving parts.
- Know the machine's lifting capacity. Do not exceed the ROC for the machine. For further information, see Forces on page 129.
- Do not use a mobile device while operating this machine.
- Do not allow anyone underneath a raised load.
- Do not leave the machine running unattended.
- Do not operate the machine before it has reached its operating temperature.
- Do not consume the operating fluids used in this machine.
- Do not use the machine as a crane. These loaders are not approved for craning applications. These craning applications include raising, transporting, and lowering point loads with the help of slings and load-securing devices (for example, ropes and chains). This applies, for example, to lifting and lowering pipes, shaft rings or containers.

PPE

Wear the following PPE while operating this machine:

- Close-fitting work clothes that do not hinder movement
- Eye protection
- Hearing protection
- Safety-toed footwear

Tie back long hair and remove all jewelry (including rings).

Operator presence system

- This machine is equipped with an operator presence system that locks out machine operation when the operator has not engaged the operator presence pedal.
- With the machine in operation, the parking brake engages and the engine speed reduces to low idle (if applicable) when the operator disengages the operator presence pedal. When the operator engages the operator presence pedal, the parking brake disengages and the engine speed returns to the speed at which it was set (if applicable).
- Do not operate the machine when the operator presence system or any safety device is malfunctioning. Contact a Wacker Neuson dealer.
- Start and operate the machine from the operator platform only.

Emergency lift arm lowering

In the event of a sudden loss of power, use the lift arm manual override button to lower the lift arm to the ground. For further information, see Lift Arm Manual Override on page 80.

Traveling

- Before moving the machine, check whether the attachments have been safely attached.
- Adjust your travel speed to the road/ground conditions, machine handling, and to the visibility conditions.
- Look to the rear before moving the machine in reverse.
- In certain situations, use another person to direct movement of the machine on the jobsite safety.

3.3 Safety Guidelines for Attachments

Information regarding attachments

- Do not lift, lower, or transport people on the machine or in/on an attachment.
- Use approved attachments only. See your local Wacker Neuson dealer.
- Attachments and counterweights affect handling and the machine's steering capability.
- Lower the attachment to the ground before exiting the machine.

Installation and removal of attachments

- Follow attachment mounting instructions in this operator‘s manual.
- Before uncoupling or coupling an attachment with the hydraulic coupler:

  - Ensure the attachment is lowered to the ground and level.
  - Release the pressure in the auxiliary hydraulic system. For further information, see Auxiliary Hydraulic Connections on page 75.
- Ensure the attachment is securely attached and that it functions correctly.
- Connect all hydraulic and electrical devices for the attachment and check their function before operating the machine.
- Secure the attachments against unintentional movement.
- Keep others away from the machine when installing or removing an attachment.

3.4 Using Third-party Attachments

General instructions

⚠ WARNING

Accident hazard

Incorrectly locked attachments can disengage unintentionally. This may result in accidents that could result in serious injury or death.

► Check for correct locking after adding attachments.

Your sales partner or an authorized service center can assist with selecting the appropriate attachments. The following mechanical couplers are available from the factory:

- Coupler for attachment: Common industry interface (CII)

Prior to use, verify that the approved attachment matches the coupler interface of the machine.

When mounting and using unapproved attachments or third-party attachments, the conformity (stability test) according to the EN Machinery Directive or the standard DIN EN 4743 must be checked and documented by an authorized specialist service center in the EU.

In the case of non-EU countries, follow and apply the national regulations of these countries.

If attachments are not permitted or if they are subsequently modified or replaced, if their condition is prescribed, or if their operation could endanger persons, the operating permit and the warranty become null and void.

3.5 Safety Guidelines for Maintenance

General maintenance notes

- Follow all instructions in the Maintenance chapter of this operator's manual. For instructions on adjustment, maintenance, and inspection activities and intervals, see Maintenance on page 84.
- Wacker Neuson requires the machine owner to have maintenance performed under all circumstances. Otherwise, the warranty shall not be given in full.

- For inspection and maintenance work, ensure all tools and service center equipment are capable of performing the tasks prescribed. Do not use malfunctioning or broken tools. Use certified measuring devices that are routinely calibrated for accuracy (for example torque wrench, pressure gauge, ammeter).
- Retighten any screws, electrical connections, or hose connections that may have been loosened during maintenance and repair.
- Recycle scrapped parts and drained fluids according to environmental and hazardous material requirements. To avoid fire and health hazards, dispose of soiled shop towels by approved methods.
- If any lockout/support devices are removed for setup, maintenance, or repair purposes, they must be refitted and checked immediately upon completion of the maintenance/repair work.

Service training

Before servicing or maintaining the machine, see Safety Guidelines for Operating the Machine on page 18.

Replacing parts and labels

- Spare parts must comply with the technical requirements specified by Wacker Neuson. Contact your Wacker Neuson dealer for assistance.
- Replace worn or damaged components.
- Replace all missing and hard-to-read labels.
- When replacing electrical components, use components that are identical in rating and performance to the original components.
- When replacement parts are required for this machine, use only Wacker Neuson replacement parts or those parts equivalent to the original in all types of specifications, such as physical dimensions, type, strength, and material.

Cleaning and servicing

- Keep machine clean and free of debris such as leaves, paper, cartons, etc.
- Keep labels legible. When pressure washing decals, direct the stream at a 90 degree angle to the surface with the spray nozzle at least 12 inches away.
- Do not clean the machine while it is running.
- Never use gasoline or other types of fuels or flammable solvents to clean the machine. Fumes from fuels and solvents can become explosive.

3.6 Safety Guidelines for the Engine Control Unit (ECU)

- Never use the ECU for purposes that are not intended by YANMAR; such as using unauthorized ECU, writing unauthorized data to ECU, leaving it broken, or removing sensors and actuators. Doing so could result in the violation of emission control regulations and will void the product warranty.
- Be sure to use the ECU in conjunction with the engines whose models or serial numbers are specified by YANMAR. Other ECU/engine combinations than specified will void the engine warranty.
- Replacing the fuel injection pump involves rewriting the fuel injection data in the ECU. Be sure to contact your local YANMAR dealer before replacing the fuel injection pump. Failure to rewrite the fuel injection data before replacing the fuel injection pump will void the engine warranty.
- Replacing the ECU involves migrating the fuel injection data to the existing ECU to the new unit. Be sure to contact your local YANMAR dealer before replacing the ECU. Failure to migrate the fuel injection data before replacing the ECU will void the engine warranty.
- Improper use or misuse of the ECU may result in death or serious injury due to an abrupt and unexpected increase in engine speed.

3.7 Special Hazards

Electrical energy

- Use only fuses with the specified current rating.
- Stop the machine immediately if an electrical system malfunction occurs. Disconnect the battery and contact a trained technician to perform troubleshooting procedures.
- Regularly inspect the machine's electrical components. Immediately repair any defects such as loose connections, damaged or corroded connectors, or cracked or scorched cables.
- Attachments with electrical connections must be compatible with the machine's voltage specifications (12V).
- For specific safety precautions when working with batteries, see Maintaining the Battery on page 116.

Hydraulics

The machine's hydraulic system can still be pressurized even when the engine is not running.

- Be careful operating the machine when the hydraulic oil is very cold. Proceed with caution even after the cold system restriction warning turns off. Cold hydraulic oil can still be present in certain circuits.
- Do not touch hydraulic components while the machine is operating. Wait until the machine is cool.
- Hydraulic oil is flammable. Stop the engine immediately if a hydraulic leak is detected.

3.8 Safety Guidelines when Using Internal Combustion Engines

Running the engine

- Check the fuel lines for leaks and cracks before starting the engine.
- Do not run the machine if fuel leaks are present or the fuel lines are loose.
- Engine exhaust can kill you in minutes. Engine exhaust contains carbon monoxide. Do not run the machine indoors or in an enclosed area such as a deep trench unless there is adequate ventilation.
- Do not run the engine near open flames or in potentially explosive areas.
- Do not touch the engine or exhaust when the engine is running or immediately after it has been turned off.
- Do not operate a machine when its fuel cap is loose or missing.
- Do not remove the radiator cap when engine is running or hot. The radiator fluid is hot and under pressure, and can cause severe burns.

3.9 Disposal

Environment

The operating fluids in this machine, including fuel, engine oil, and grease, may be considered hazardous waste in many areas. Responsible disposal prevents toxic chemicals and materials from harming the environment. Follow the product-related safety regulations SDS (Safety Data Sheet – MSDS).

All fluids, lubricants, materials, etc., used on the machine are subject to specific regulations regarding collection and disposal. Dispose of different materials and consumables separately and responsibly in accordance with environmental protection legislation.

If the machine is no longer used according to its designated use, ensure it is decommissioned or put out of operation and disposed of according to applicable regulations.

- Follow all applicable safety regulations during machine disposal.
- Machine disposal must be performed in accordance with state-of-the-art standards that apply at the time of disposal.

4 Vehicle Description

4.1 Machine Description

The Wacker Neuson Utility Track Loader is a self-propelled work machine.

These machines are versatile and powerful helpers for moving earth, gravel, and debris on construction sites and elsewhere. A wide range of attachments allow for numerous different applications of the machines in various environments. When using these attachments, observe the legal regulations of your country and equip the machine with all the safety equipment required.

4.2 Machine Overview

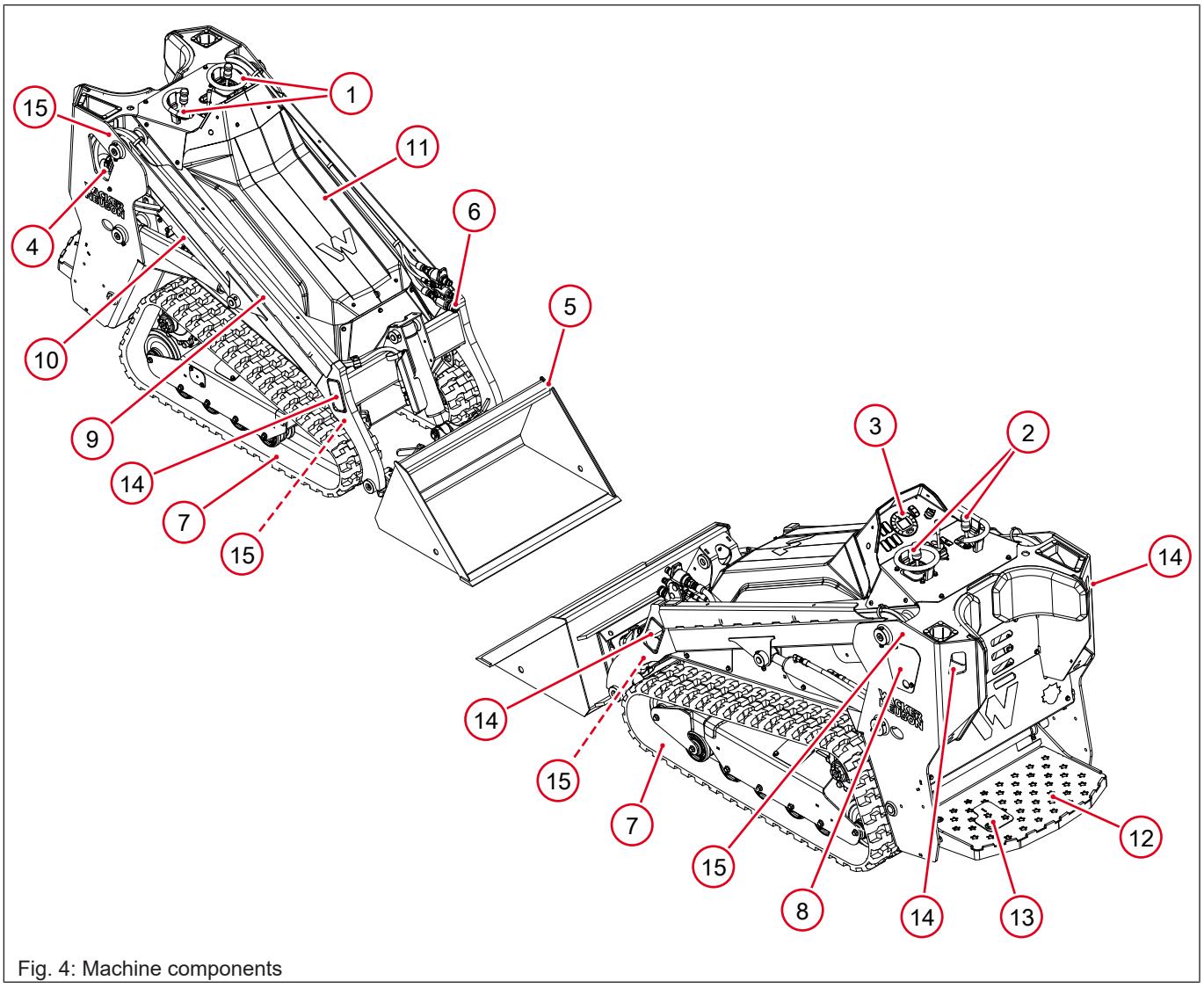


Fig. 4: Machine components

Ref.	Component	Ref.	Component
1	Handrails	2	Controls
3	Display	4	Diesel fuel fill
5	Attachment (options available)	6	Auxiliary hydraulic couplers
7	Tracks	8	Hydraulic oil fill
9	Lift arm	10	Lift arm support device
11	Hood	12	Operator platform
13	Operator presence pedal	14	Tie-down points
15	Lifting points	—	—

4.3 Labels Overview—ANSI

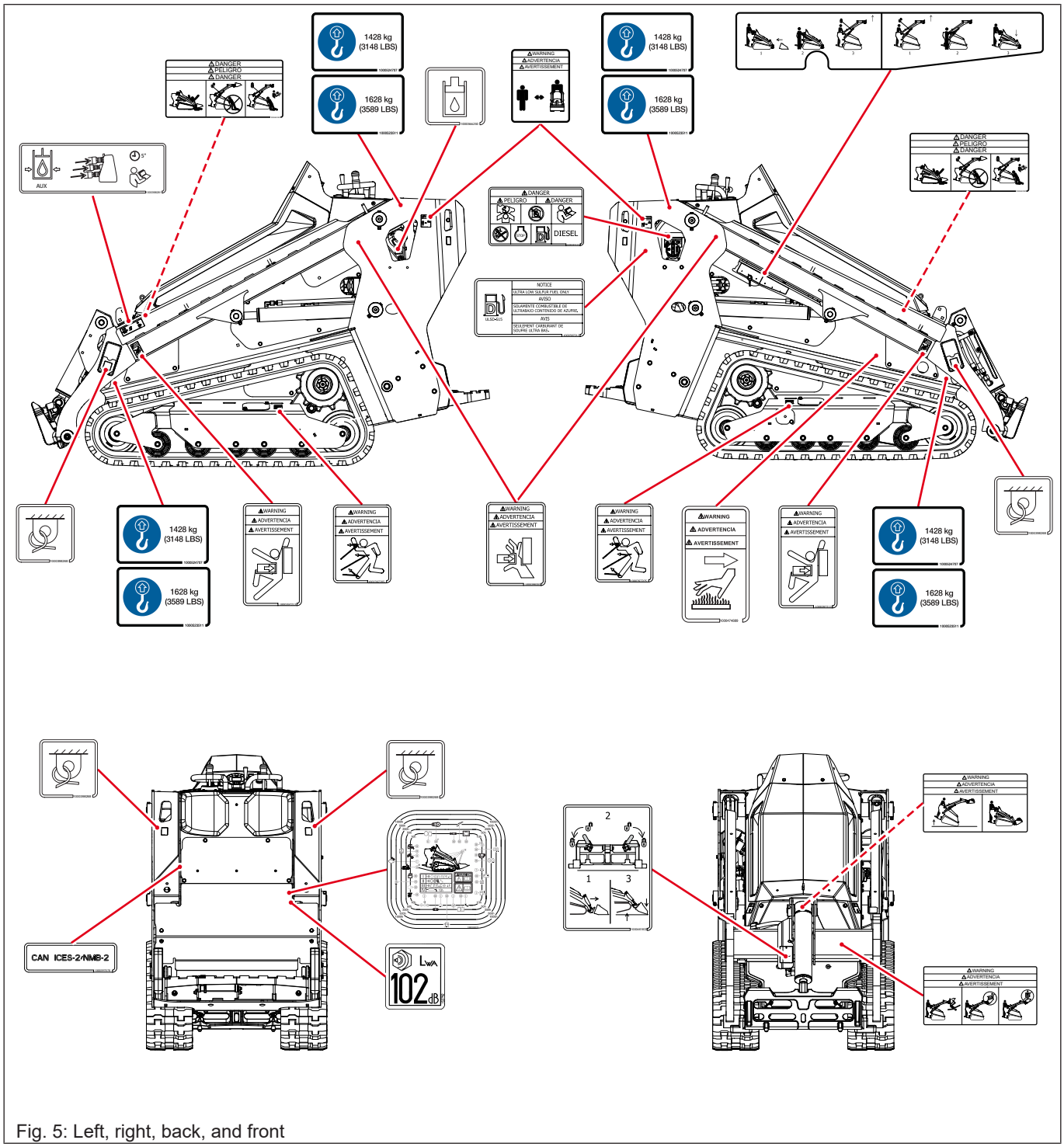


Fig. 5: Left, right, back, and front

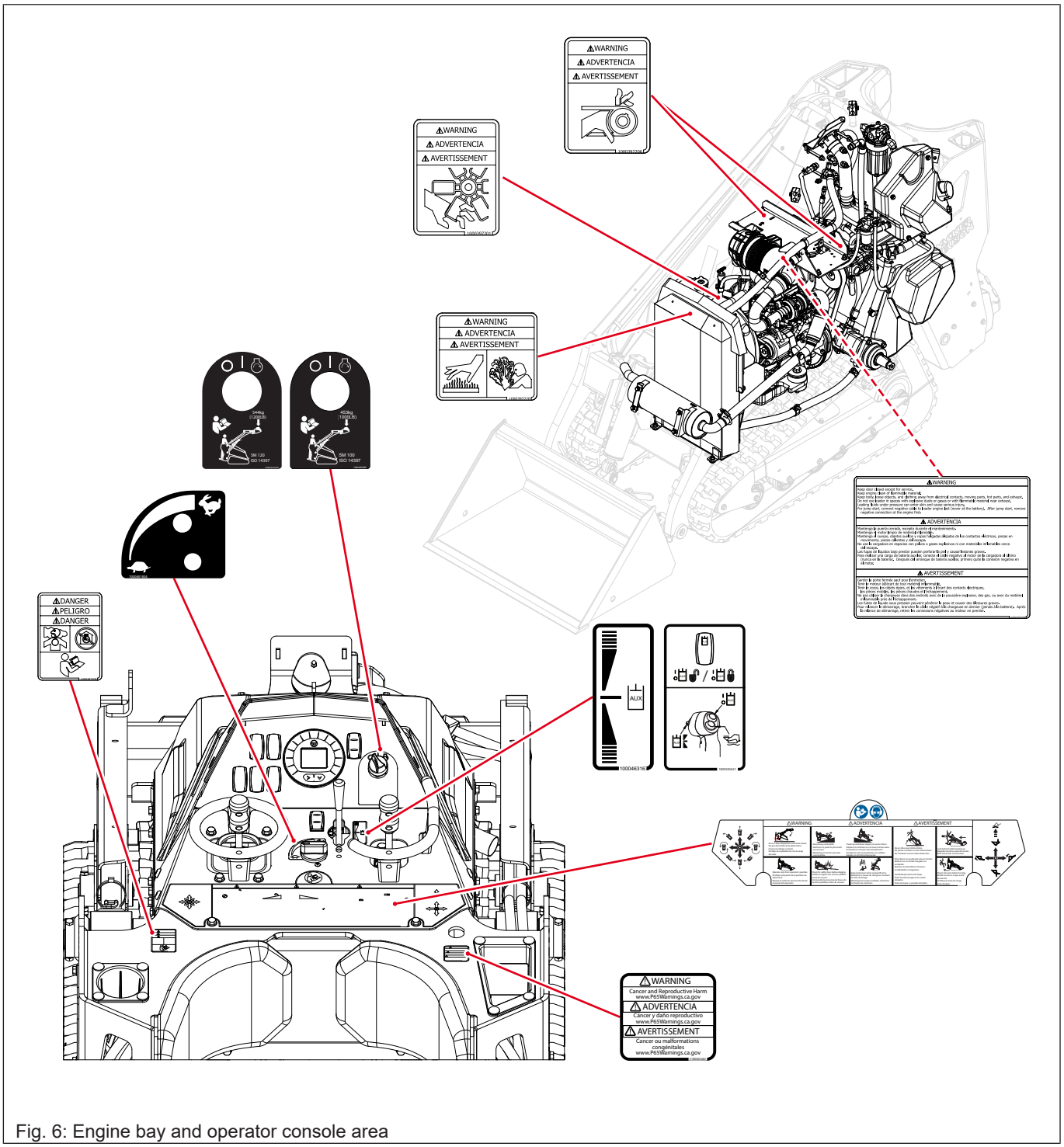


Fig. 6: Engine bay and operator console area

4.4 Labels Overview—ISO

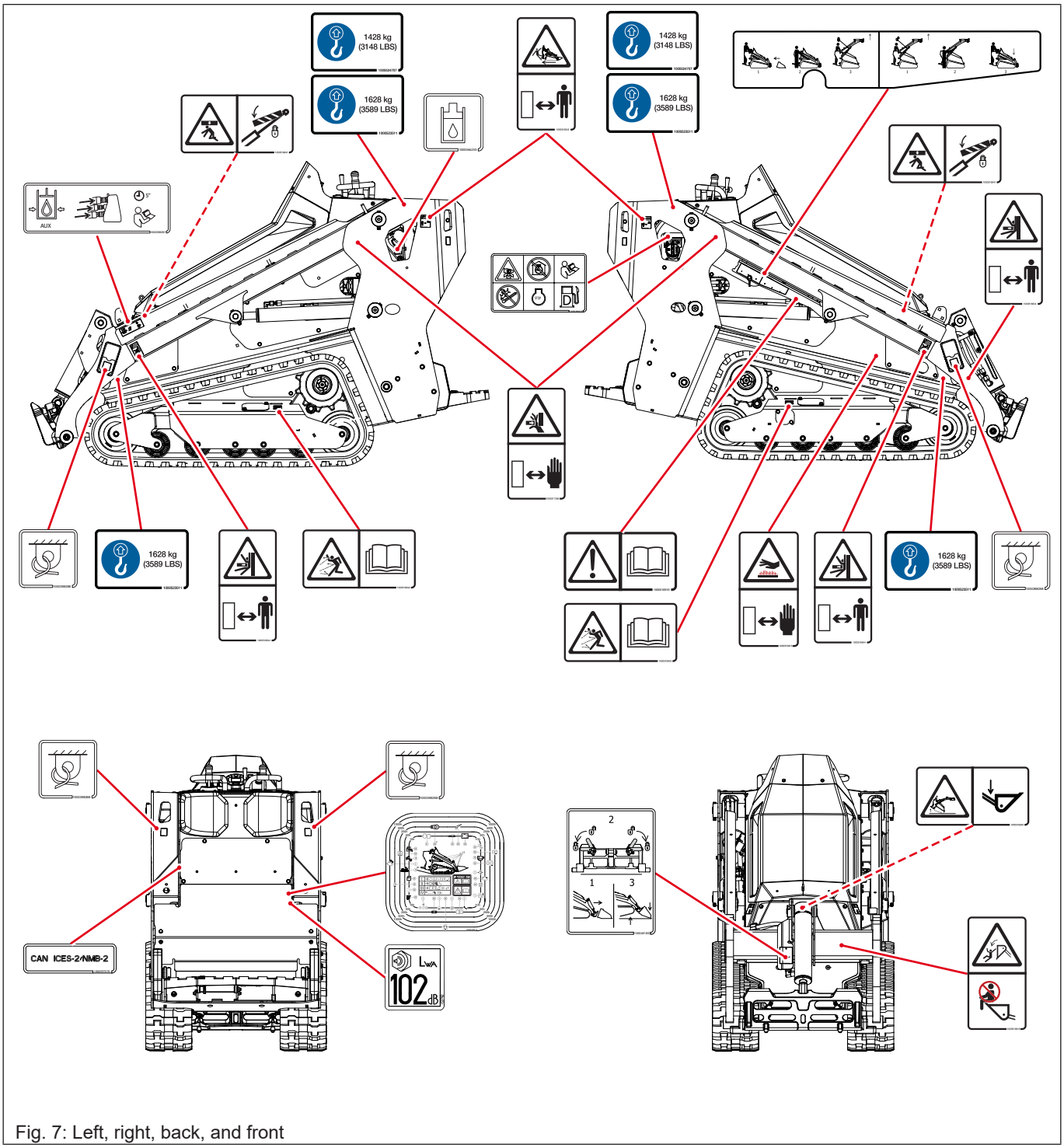


Fig. 7: Left, right, back, and front

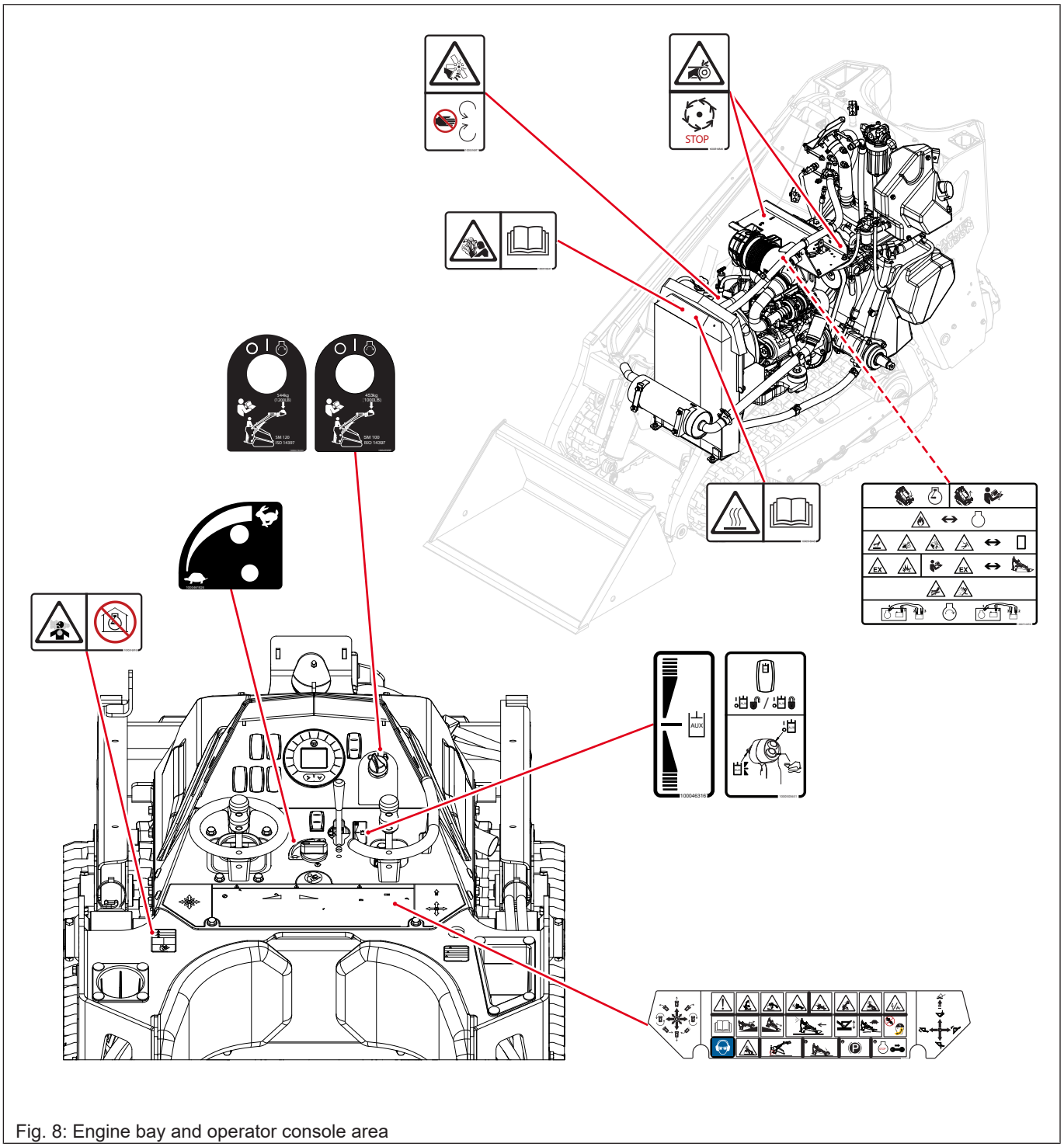


Fig. 8: Engine bay and operator console area

4.5 Safety Labels

DANGER

Asphyxiation hazard

Engines emit carbon monoxide.

Do not run the machine indoors or in an enclosed area unless adequate ventilation, through such items as exhaust fans or hoses, is provided.

Read the Operator's Manual.

No sparks, flames, or burning objects near the machine.

Stop the engine before refueling.

Use only clean, filtered diesel fuel.

DANGER

Crushing hazard

Ensure lift arm support device is in place before working under raised lift arm. Do not work under a raised lift arm without securing the lift arm support device.

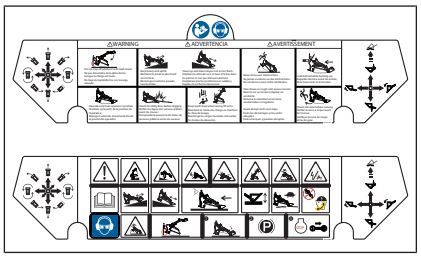
DANGER

Asphyxiation hazard

Engines emit carbon monoxide.

Do not run the machine indoors or in an enclosed area unless adequate ventilation, through such items as exhaust fans or hoses, is provided.

Read and understand the supplied operator's manual before operating the machine. Failure to do so increases the risk of injury to yourself or others.



WARNING

Do not step off platform with load raised.

Keep heavy end uphill.

Travel up and down slopes not across them.

Never drive over obstructions.

Slow down on rough and uneven terrain.

Avoid abrupt starts and stops.

Operate only from operator's position.

Check for utility lines before digging.

Keep loads level when raising lift arms.

Look behind while backing up.

Check risk zone before turning.

WARNING

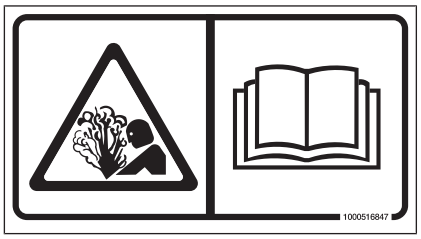
Injury hazard

High pressure contents can cause injury.

WARNING

Hot surface and explosion hazards

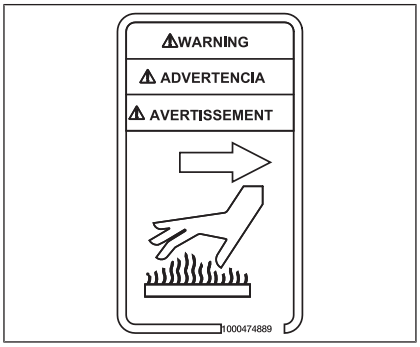
Dangerous heat and contents under pressure.



WARNING

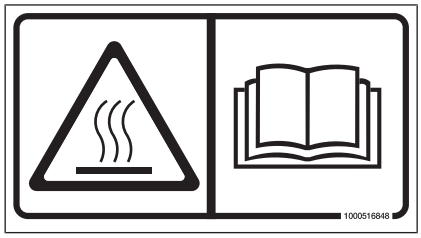
Explosion hazard

Read and understand the operator's manual.



WARNING

Hot surface hazard to the right



WARNING

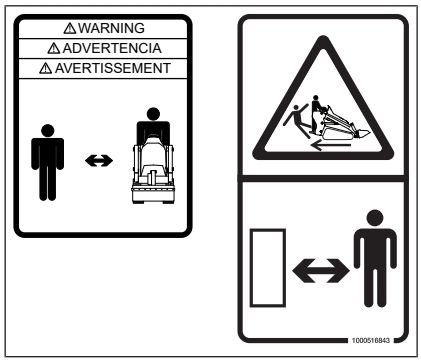
Hot surface hazard

Read and understand the operator's manual.

WARNING

Hot surface hazard

Keep body, loose objects, and clothing away from the surface.

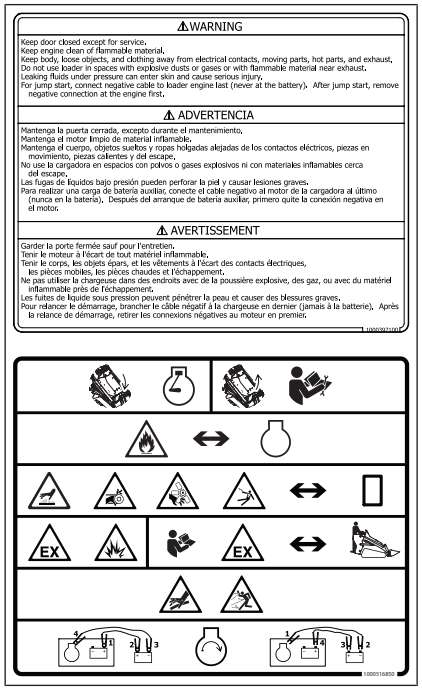


WARNING

Injury hazard

Do not stand within 2 m (6.6 ft) of the machine.

4



WARNING

Keep door closed except for service.

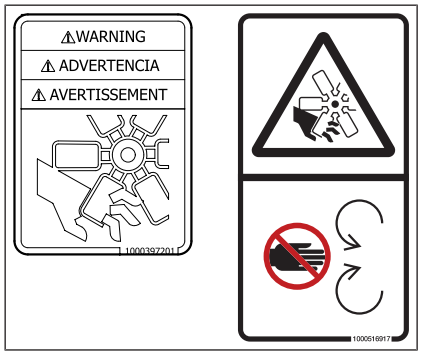
Keep engine clean of flammable material.

Keep body, loose objects, and clothing away from electrical contacts, moving parts, hot parts, and exhaust.

Do not use loader in spaces with explosive dusts or gases or with flammable material near exhaust.

Leaking fluids under pressure can enter skin and cause serious injury.

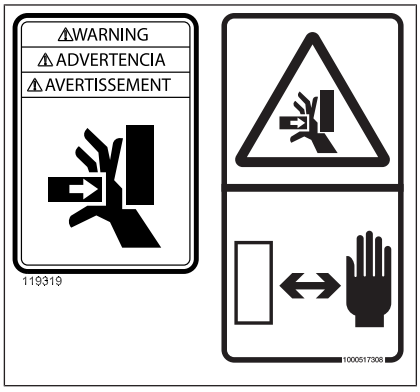
For jump start, connect negative cable to loader engine last (never at the battery). After jump start, remove negative connection at the engine first.



WARNING

Entanglement hazard

Avoid all moving parts while the engine is running.



WARNING

Crushing hazard

Keep body, loose objects, and clothing away from the surface.

WARNING

Entanglement hazard

Avoid all belts while the engine is running.

WARNING

Tipping hazard

Carry load low while traveling.

WARNING

Injury hazard

Do not carry passengers anywhere on the machine.

Do not use the machine as a person lift.

WARNING

Crushing hazard

Do not work under a raised lift arm without securing the lift arm support device.

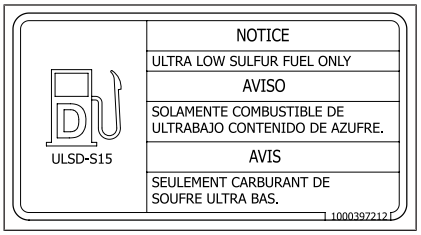
A disconnected hydraulic line can result in the lift arm dropping.

WARNING

California Proposition 65 Warning

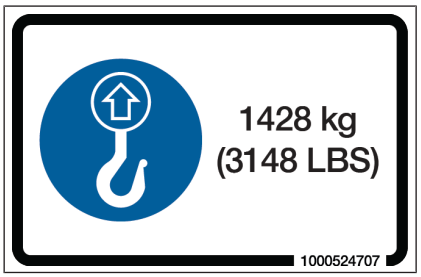
Cancer and Reproductive Harm

www.P65Warnings.ca.gov



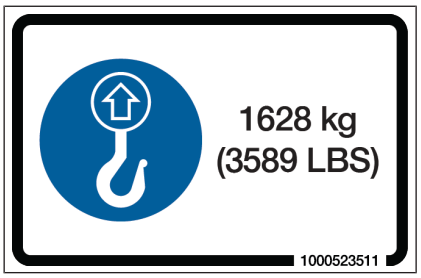
NOTICE

Ultra low sulfur fuel only



NOTICE

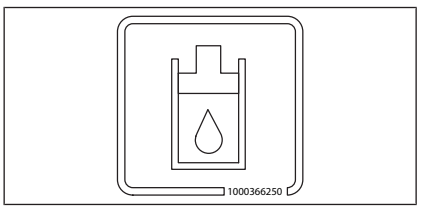
Lifting point—model SM100



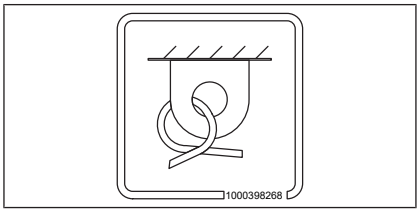
NOTICE

Lifting point—model SM120

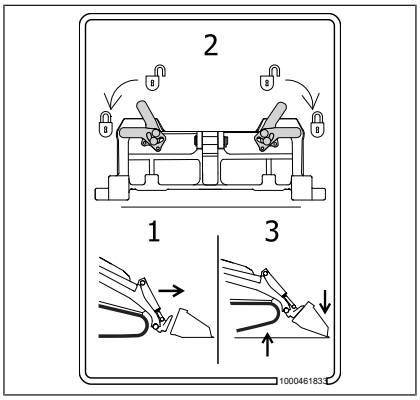
4.6 Information Labels



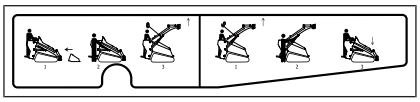
Hydraulic oil fill



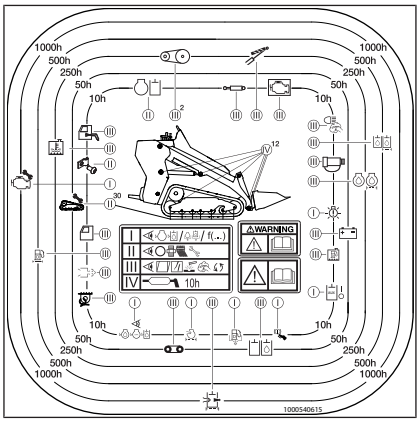
Tie-down point



Attachment coupler operation



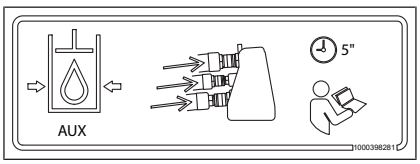
Instructions for using the lift arm support device. For further information, see Lift Arm Support Device on page 81.



Maintenance schedule

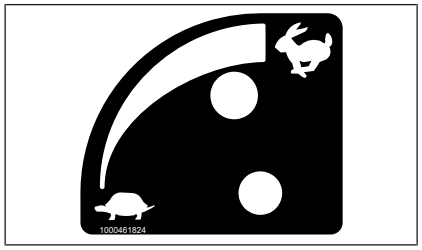
For further information, see Maintenance on page 84.

Industry Canada ICES-002 Compliance Label: CAN ICES-2/NMB-2

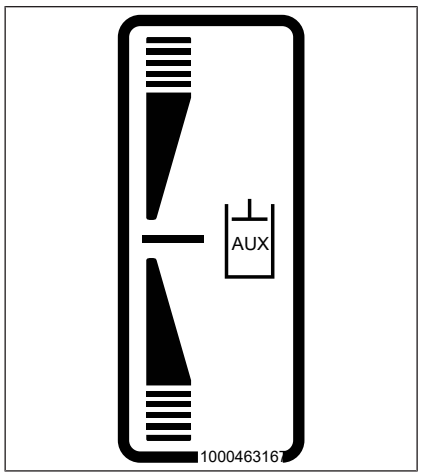


Push in the auxiliary hydraulic connector for 5 seconds to release the pressure in the auxiliary hydraulic circuit.

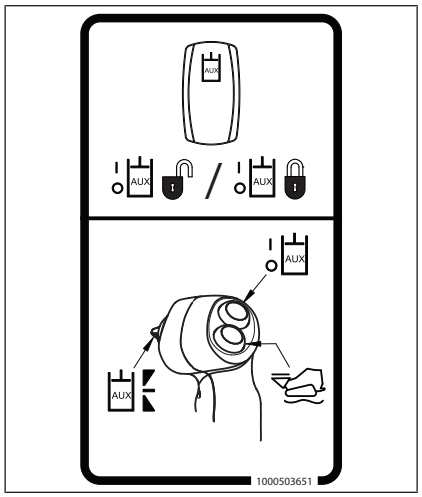
4



Engine throttle



Manual auxiliary control

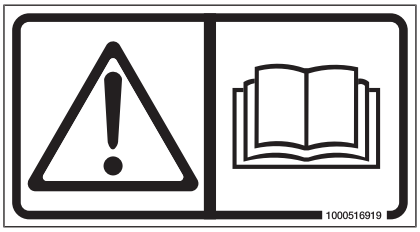


Auxiliary hydraulic flow and ride control (optional)

Ignition and rated operating capacity—model SM100

Ignition and rated operating capacity—model SM120

Guaranteed sound power level



Read and understand the operator’s manual before operating the machine.

5 Transportation

5.1 Preparing the Machine for Transportation

⚠ WARNING

Personal injury hazard

Improper loading can result in serious injury or death.

- ► Keep others away from the loading area.
- ► Drive the machine off the transport vehicle with the help of a guide.

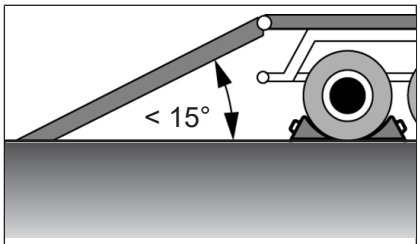


Fig. 9: Preparing for loading and unloading

Preparing transport vehicles for loading and unloading

1. Ensure the transport vehicle (trailer, truck) is capable of supporting the machine's weight. For the machine's operating weight, see Technical Data on page 127.
2. Secure the transport vehicle with chocks to prevent it from rolling.
3. If the trailer requires ramps, position the ramps at the smallest possible angle.
4. Use access ramps with an antiskid surface only.
5. Ensure the loading area is clear and that access to it is not obstructed.

5.2 Loading and Unloading the Machine

⚠ WARNING

Injury and machine damage hazard

Tie-down points that are cracked or otherwise damaged may fail when tying down the machine or during transport.

- ► Inspect the tie-down points before attaching any tie-down equipment.

⚠ WARNING

Accident hazard

Improperly tying the machine down can cause it to slip, tip over, or fall during transport. This may result in accidents that could result in serious injury or death.

- ► Always tie down the machine at the front and the rear.
- ► Secure the machine additionally with wheel chocks on the loading area of the transport vehicle.
- ► The specified angles (± 5°) must be observed.
- ► The fastening equipment must be designed for the specified forces.
- ► Apply the specified forces to tighten the fastening equipment.

NOTICE

Machine damage can occur if the machine is not loaded properly.

► Drive the machine onto the trailer with the heaviest end of the machine going up the ramp first.

NOTICE

Ensure the transport vehicle driver knows the overall height, width, and weight of the transport vehicle (including the machine to be transported) before starting machine travel, and the legal transport regulations of the countries where transport is taking place.

Loading the machine

1. Raise the lift arm so that the attachment (if equipped) does not contact the ramp or the ground.
2. Carefully back the machine onto the middle of the transport vehicle.
3. Lower the lift arm.
4. Stop the engine.
5. Remove the key.

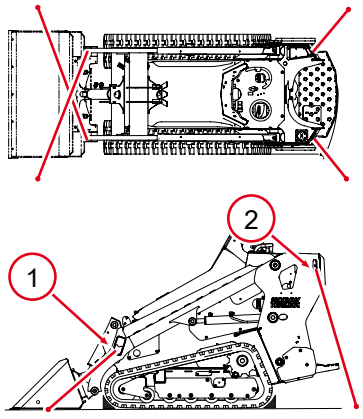


Fig. 10: Front and rear tie-down points

Tying down the machine

1. Secure the machine to the transport deck using the specified front **(1)** and rear **(2)** tie-down points on the machine with certified straps, chains, or cables.
2. At the front of the machine, make sure to use a crossing pattern as illustrated in the graphics.
3. At the rear of the machine, each side can be secured to the same side of the transport vehicle as illustrated in the graphics.
4. Make note of the following specifications:

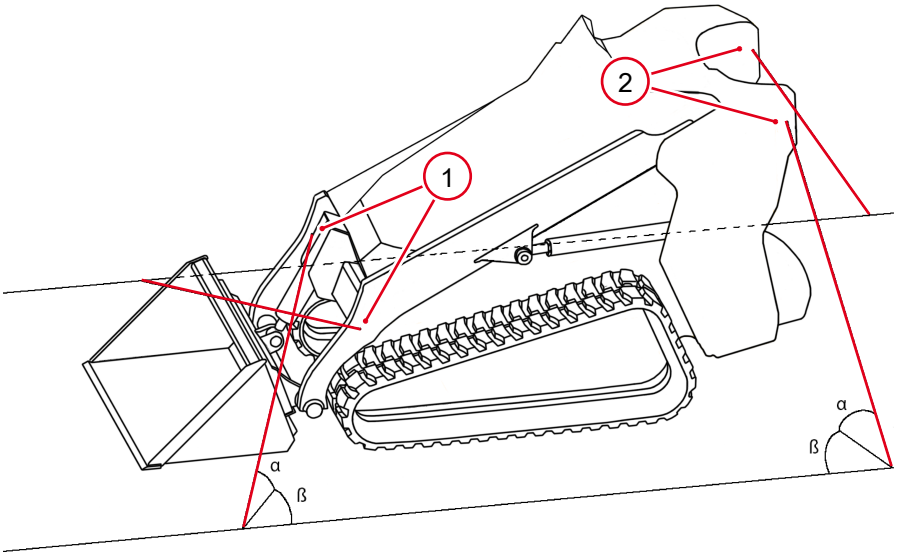


Fig. 11: Front and rear tie-down points and angles

Attachment Point	α	ß	Maximum Tie-down Force
1 (front)	32°	45°	4,125 (927) N (ft. lbs.)
2 (rear)	58°	51°	4,912 (1,104) N (ft. lbs.)

Unloading the machine

1. Ensure the area behind the access ramp is clear and that access to it is not obstructed.
2. Drive slowly down the ramp. Raise the lift arm slightly so that the attachment does not touch the ramp or ground.

5.3 Towing the Machine

NOTICE

Machine damage can occur during towing.

- ► The machine may only be towed out of the immediate risk zone. Then, load it on a truck or trailer.
- ► Towing the machine can cause excessive, uneven track wear.
- ► The manufacturer's warranty shall not apply to accidents or damage caused by towing.

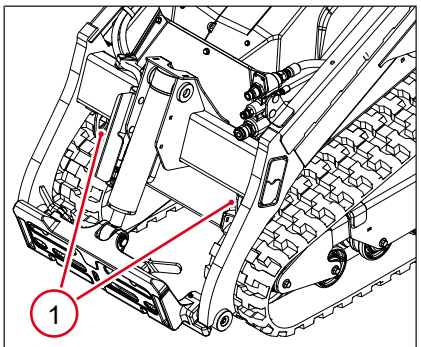


Fig. 12: Towing points

Do not tow this machine, except out of an immediate risk zone or to load onto a transport vehicle. Do not tow another machine with this machine. Only use the points on the frame **(1)** designated for towing.

If towing a short distance is unavoidable, use a towing chain or cable rated at 1.5 times the weight of the machine.

5.4 Lifting the Machine

⚠ DANGER

Crushing hazard

Unsecured objects or an incorrectly fastened machine may fall. If persons are hit by these parts or the machine itself, serious or fatal injuries will result.

- ► Use tested, undamaged, and sufficiently dimensioned lifting gear.
- ► Make sure the lifting gear is safely fastened.
- ► Make sure nobody remains under the raised machine.

⚠ WARNING

Injury or death hazard

Never allow bystanders within 5 m (15 ft) while lifting the machine.

⚠ WARNING

Personal injury hazard

Lifting the machine with most attachments can pose a risk of falling objects, which can cause serious injury or death.

- ► It is acceptable to lift the machine with an empty bucket. Remove any other attachment before lifting.

⚠ WARNING

Injury or death hazard

Lifting points that are cracked or otherwise damaged may fail when lifting the machine.

- ► Inspect the lifting points on the machine before connecting any lifting devices.

NOTICE

Machine damage hazard

Lifting the machine unevenly can lead to damage. To avoid damage from additional stress:

► Use spreader bars of appropriate dimension.

► Note that the maximum angle from vertical for lifting chains, straps, or cables is 60 degrees.

In order to avoid injury or accidents, observe the following instructions when lifting the machine:

- Seal off the risk zone.
- The crane and lifting gear must have suitable dimensions.
- Take into account the machine's overall weight.
- Use only tested ropes, belts, hooks (with clasps), shackles (screw and socket pins with lockable brackets) for fastening the machine.
- Have loads fastened and crane operators only guided by experienced persons.
- The person guiding the crane operator must be within sight or sound of him/her.
- The crane operator must observe all movements of the load and the lifting gear. Secure the machine against unintentional movement.
- The crane operator may move a load only after making sure the load is safely fastened and nobody is within the risk zone, or after receiving a signal from the signal person.
- The machine must not be fastened by winding the lifting rope or chain around it.
- Pay attention to load distribution when attaching the lifting gear. Note the center of gravity.
- Make sure no one is in or on the machine.
- Stay clear of a raised load.

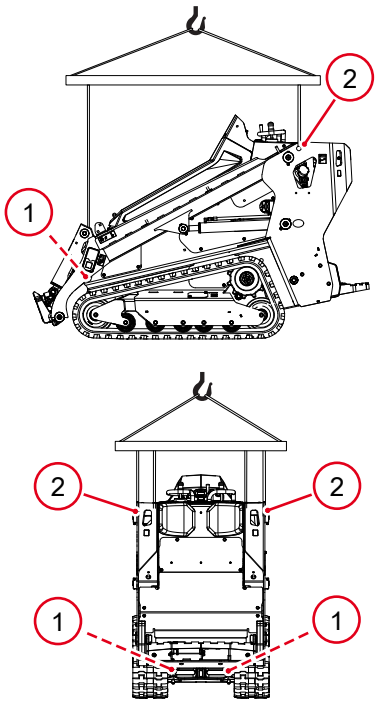


Fig. 13: Lifting points

Lifting

Note: For further information on lifting point locations, see Machine Overview on page 28, see Labels Overview—ANSI on page 29 or see Labels Overview—ISO on page 31, and see Safety Labels on page 33.

1. Move all switches and levers to the neutral or zero positions.
2. Remove the ignition key.
3. Secure suitable lifting devices of adequate strength to the four lifting points of the machine—two at the lower front of the chassis **(1)** and two at the upper end **(2)**.
   Note: Use shackles at the rear lifting points when lifting the machine.
4. Use spreader bars of appropriate dimension.
   Note: The maximum angle from vertical for lifting chains, straps, or cables is 60 degrees.
5. Fasten the machine at the crane eyelets with tested lifting gear of sufficient dimensions.
6. Carefully raise the machine, slowly position it over the unloading position, and carefully lower it.

6 Operation

6.1 Risk of Injury or Death

Before putting the machine into operation, ensure no one is at risk of injury or death. The risk zones are the areas in which persons can be seriously injured or killed if struck by, or caught by, the movements of the machine, attachment, load, or moving parts of the machine.

- The risk zone also includes the area that can be affected by falling material, equipment, or by parts that are thrown out.
- The risk zone on a slope is different from the one on a level surface (secure the load). Stop machine operation immediately as soon as someone enters the risk zone. For further information, see Operating on Slopes on page 70.
- Seal off the risk zone if it is not possible to keep a sufficiently safe distance.
- Extend the risk zone sufficiently in the immediate vicinity of buildings, scaffolds, or other elements of construction.

Avoid the following risks:

- Risk of cave-in—do not drive up to the edge of an unsecured pit or trench.
- Risk of collapse—do not undermine the foundations of walls.
- Risk of falling stones, earth, and debris—do not load under projecting earth.
- Risk of tipping over—keep the attachments or work equipment close to the ground.
- Risk of tipping over—keep the load low when moving on slopes—up, down, and across. For further information, see Operating on Slopes on page 70.

Demolition or excavation work

- Do not use the impact force of the attachment to perform demolition work. This can cause serious injury, death, and damage.
- The machine can lose its balance and tip over if heavy attachments (demolition hammers, for example) are used. Proceed as follows when performing such work:
  - Do not lower, turn, or set down the attachment abruptly.
  - Do not extend or retract the lift arm cylinder abruptly. Otherwise, the machine can tip over.

Risk regarding hydraulic system

The machine’s hydraulic system is still pressurized even when the engine is not running.

Before starting setup or repair work (for example, installing or removing a hydraulic attachment), release the pressure in the sections of the system and pressure lines that are to be opened.

Avoid risk of injury or death

Before operating the machine, instruct all personnel in the area to stay away from the machine while it is being operated.

While operating the machine, remain aware of people moving in the work area. Be ready to react to these movements if necessary.

Lock the lift arm before servicing the machine. For further information, see Lift Arm Support Device on page 81.

Do not allow someone to approach the machine while the machine is running or with the lift arm raised.

Starting and stopping

- Perform starting and stopping procedures according to this operator's manual.
- Observe all indicator lights.
- Do not use starting fluid (for example, ether). Failure to comply can result in an explosion, which can cause serious injury or death.
- Ensure that the machine is parked on level ground when stopping.
- Engage the parking brake to avoid unintentional operation.
- Lower the attachments to the ground before exiting the machine.

After use

- Turn the engine off when the machine is not being operated.
- Ensure that the machine is parked on level ground when not being operated.
- Store the machine properly when it is not being used. The machine should be stored in a clean location out of the reach of children.

6.2 Inspecting the Work Area

Before operating this machine, inspect the work area for unsafe conditions.

Be aware of any sharp drop-offs or rough terrain.

Remove objects or other construction material that could damage the machine or cause personal injury.

Check for the following ground conditions before operating the machine:

- Inspect for signs of instability such as cracks or settlement.
- Be aware of weather conditions that can affect ground stability.
- Check for adequate traction if working on a slope.

6.3 Break-in Period

New machines require a break-in period to ensure maximum efficiency. During the break-in period, the machine’s moving parts stabilize.

This machine has a 6-hour break-in period.

Operating during the break-in period

Follow the recommendations below while operating the machine during the break-in period:

- During the first hour of operation, vary the engine speed and the load on the engine. Short periods of maximum engine speed and load are desirable. Avoid prolonged operation at minimum or maximum engine speeds and loads for the next four to five hours.
- Make sure that the engine oil pressure and engine coolant temperature lights do not illuminate.
- Check the engine oil and coolant levels frequently.
- Warm up the engine and hydraulic system by running the engine at lower speeds and operating the machine at low loads.
- Do not run a cold engine up to high idle or change engine speeds suddenly. For further information, see Operating the Machine in Extreme Weather Temperatures on page 57.
- Avoid sudden machine acceleration, braking, and changing of travel directions.
- Avoid using the machine under heavy loads or at high speeds.
- Follow the machine maintenance schedule.

6.4 Operation Checklists

The checklists below are intended to assist you in checking and monitoring the machine before, during, and after operation. Additional details are found in this manual.

Start-up checklist

The following items should be checked daily before putting the machine into operation:

- Check cooler cores for debris. Clean if necessary.
- Check the fluid levels for fuel, engine oil, hydraulic oil, and engine coolant.
- Keep the machine clean. This reduces the risk of fire hazards, such as combustible material around the engine, and reduces the risk of injury or operational accidents that can be caused by dirt build-up on the operator platform.
- Ensure the attachment is securely locked in place. For further information, see Using the Manual Coupler on page 72.
- Ensure others are clear of the machine before starting the engine.
- Check the control interlock system for proper operation. The ground drive system and the loader control system should not operate without:
  - An operator standing on the platform
  - The operator presence pedal engaged
  - The parking brake disengaged
- Check the parking brake for proper operation.

Operation checklist

The following items should be checked after the engine is started:

- Check that the indicator lights for engine oil pressure and battery charge functions switch off within a few seconds after the engine is started.
- Check all other indicator lights for any malfunctions.
- Check that the ground drive and loader controls are working properly.

Parking checklist

- Park on a level surface.
- Lower the attachment to the ground. If the lift arm is raised, ensure the lift arm support device is engaged.
- Engage the parking brake.
- Stop the engine and remove the key if the machine is being left unattended.

6.5 Adjusting the Operator Platform

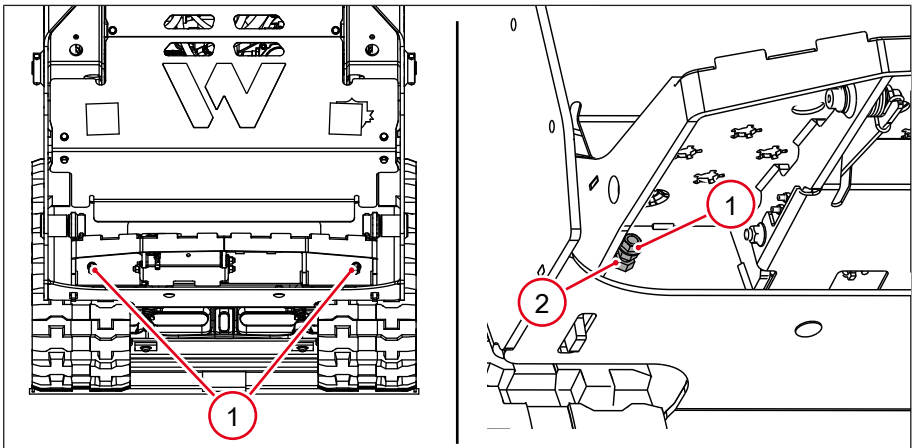


Fig. 14: Operator platform bumper spring adjustment

Tightening the operator platform

1. Locate the flange nut **(1)** around the bumper spring under the operator platform.
2. Loosen the nut **(2)** against the operator platform weldment.
3. Tighten the flange nut to push the bumper spring against the chassis weldment.
4. When you have finished the adjustments, tighten the nut against the operator platform weldment to hold the bumper spring in place.
5. Repeat on the other side.

Loosening the operator platform

1. Loosen the nut **(2)** against the operator platform weldment.
2. Loosen the flange nut **(1)** to pull the bumper spring away from the chassis weldment.

3. When you have finished the adjustments, tighten the nut against the operator platform weldment to hold the bumper spring in place.
4. Repeat on the other side.

6.6 Machine Controls—Standard

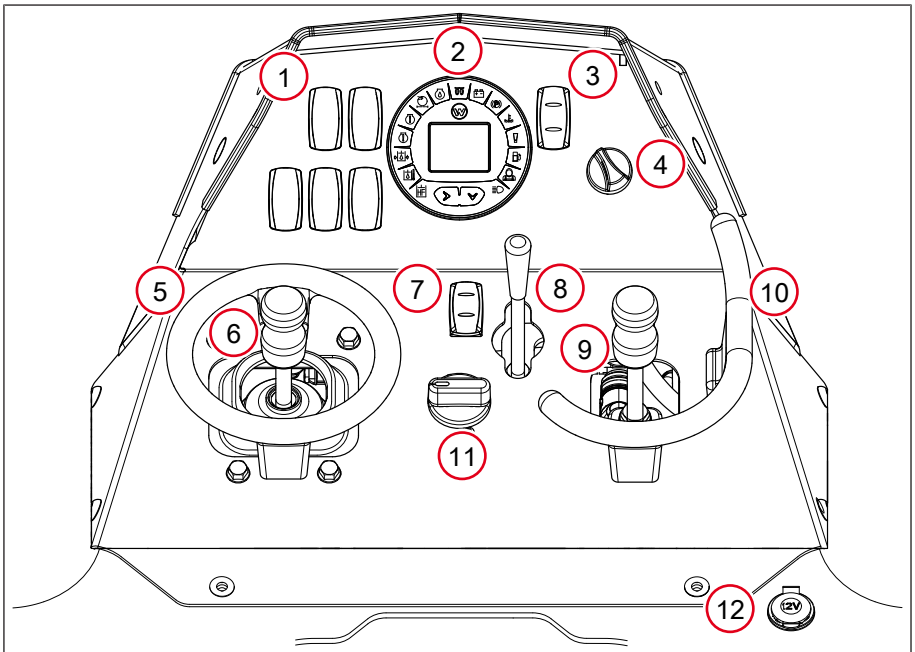


Fig. 15: Operator's console components

Ref	Description	Ref	Description
1	Spaces for optional features	2	Instrument display
3	Parking brake	4	Key switch
5	Left handrail	6	Ground drive joystick control
7	Auxiliary hydraulics switch	8	Auxiliary hydraulic control lever
9	Workgroup joystick control	10	Right handrail
11	Hand throttle	12	12V adapter

6.7 Machine Controls—EH Aux

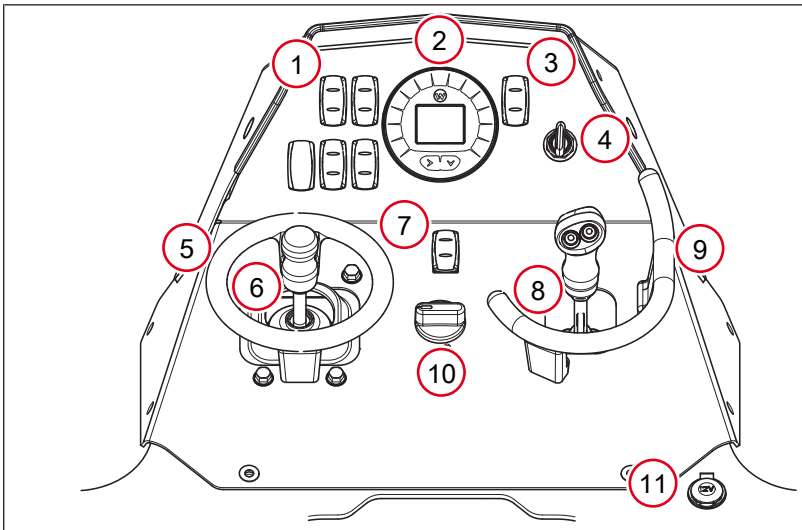


Fig. 16: Operator's console components

Ref	Description	Ref	Description
1	Spaces for optional features	2	Instrument display
3	Parking brake	4	Key switch
5	Left handrail	6	Ground drive joystick control
7	Auxiliary hydraulics switch	8	Workgroup joystick control
9	Right handrail	10	Hand throttle
11	12V adapter	—	—

Note: These controls show the machine with the optional ride control. With this option, the machine is equipped with the workgroup joystick control shown. Without this option, the machine is equipped with the workgroup joystick control and auxiliary hydraulic control lever shown with the standard controls.

6.8 Starting and Stopping the Engine

⚠ WARNING

Personal injury and machine damage hazard

Sudden movement of the engine and/or machine can cause death or serious personal injury. Engaging the starter while the engine is still rotating will result in damage to the starter and flywheel.

► Check before starting the engine that any tools or shop rags used during maintenance have been removed from the area.

⚠ WARNING

Personal injury hazard

Personal injury can occur if certain conditions are not met. Before starting the engine, the operator must:

- ► Remain aware of bystanders.
- ► Ensure there is sufficient ventilation before operating the machine in enclosed areas.
- ► Start the machine from the operator platform only.
- ► Review the starting and stopping procedures in this operator's manual.

NOTICE

Long cranking cycles can damage the starter.

- ► Do not crank the starter for more than 15 seconds.
- ► Wait 30 seconds before trying to crank the starter again so the battery can recover and the starter does not become overheated.

Starting the engine

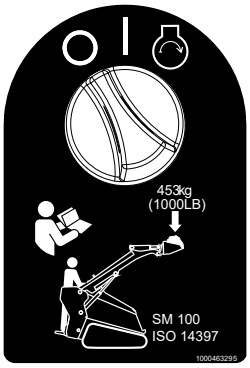


Fig. 17: Ignition key position 0

Position	Symbol	Function	
0		Stop position	Insert or remove the key
1		Preheats the engine	Preheater active; all electric functions are enabled
2		Starts the engine	Starter is actuated

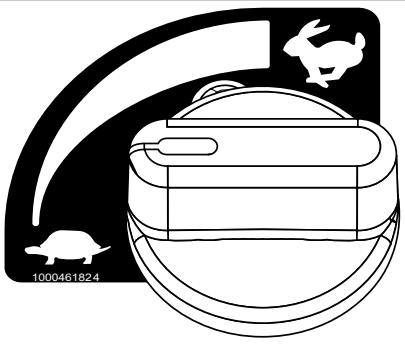


Fig. 18: Throttle

1. Stand on the operator platform and engage the operator presence pedal.
2. Set the throttle to the low idle position.
3. Turn the ignition key to position 1.
   ⇨ The parking brake switch illuminates, and the display turns on. If any indicator fails to illuminate when the key switch is in position 1, contact an authorized Wacker Neuson dealer or service center for assistance before operating the engine.

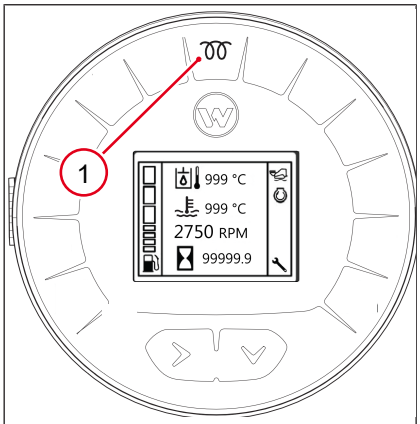


Fig. 19: Engine preheat light

4. Wait until the engine preheat light **(1)** goes off.
5. Turn and hold the ignition key to position 2 to crank the engine. When the engine starts, release the ignition key.
   ⇨ The oil pressure and battery charge status lights turn off. The parking brake light continues to stay illuminated until the parking brake switch is pressed to disengage the brake.

Warm-up phase

- Warm up the engine and hydraulic system by running the engine at half throttle before operating the machine.
- The cold system restriction limits engine speed until a certain temperature is reached. For further information, see Cold System Restriction on page 70.
- During the warm-up phase, check for unusual noise, exhaust color, leaks, malfunctions, or damage.
- In the case of any malfunctions or damage, do not operate the machine. Contact a Wacker Neuson dealer immediately for assistance.

Stopping the engine

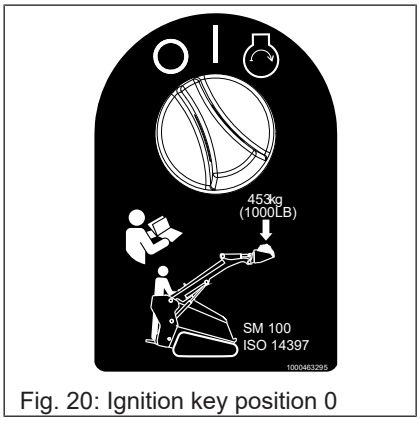


Fig. 20: Ignition key position 0

1. Allow the engine to cool down at low idle for 5 minutes without any load.
2. Turn the key to position 0.
3. Remove the key before leaving the operator platform.

Note: If it is necessary to disconnect the battery after stopping the engine, wait 2 minutes in order to avoid damage to the control electronics.

6

6.9 Control Interlock System

The intent of the machine's control interlock system is to ensure the operator is standing on the operator platform and ready to operate the machine before the controls are activated.

If any of these interlocks do not function properly, contact your Wacker Neuson dealer for service. Do not modify the system.

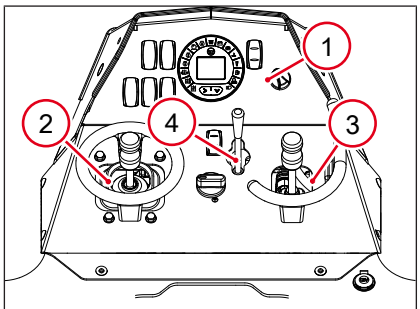


Fig. 21: Functions controlled by interlocks (standard controls shown)

Parking brake switch

The parking brake (indicated by an icon Ⓟ on the display and an illuminated LED on the parking brake switch **(1)**) defaults to ON when the engine is not running. When the engine starts, press the parking brake switch to disengage the parking brake.

The parking brake engages when any of the following occur:

- The operator steps off the operator presence pedal.
- The ignition key is turned to position 0.
- The engine stops.
- The parking brake switch is pressed.

The ground drive, lift arm control, and auxiliary hydraulic functions are not activated until the operator is standing on the platform with the operator presence pedal engaged and the parking brake disengaged.

On the initial start-up of the machine, the operator presence pedal and parking brake switch disengage interlocks. After initial start-up, the operator presence pedal locks all interlocks.

Drive controls

After the initial disengagement of the parking brake, to engage the drive control interlock, engage the parking brake again. The parking brake then locks out only the drive system. To disengage the interlock and operate the ground drive joystick **(2)**, the operator must engage the operator presence pedal and disengage the parking brake.

Lift arm controls

During normal machine operation (when the engine is running), the lift arm interlock is dependent on the operator presence pedal. To disengage the interlock, engage the operator presence pedal before operating the workgroup joystick **(3)**.

If the engine is off, the operator can lower the lift arm by turning the ignition key to the ON position and holding the parking brake switch. For further information, see Lift Arm Manual Override on page 80.

Auxiliary controls

The intent of the auxiliary controls interlock is to prevent unintentional hydraulic flow to attachments. The machine operates differently depending on the controls. With standard controls, if the operator presence pedal is not engaged and the operator shifts the auxiliary control lever **(4)** out of neutral, the engine shuts down.

With EH aux controls, the operator cannot operate the auxiliary hydraulics if the operator presence pedal is not engaged.

To disengage the interlock, engage the operator presence pedal before operating the auxiliary. For further information on continuous flow operation, see Auxiliary Override on page 65.

6.10 Operating the Machine in Extreme Weather Temperatures

⚠ WARNING

Accident hazard

Cold hydraulic oil can lead to unpredictable machine movement and a possible loss of machine control.

► Do not operate the machine until it has warmed up according to the information below.

► Operate the machine with extreme care.

⚠ WARNING

Explosion hazard

Evaporative starting fluids can cause unexpected explosions.

► Do not use evaporative starting fluids, such as ether, on this engine.

NOTICE

Operating the machine without warming it up first can render the machine ineffective and equipment damage can occur.

► Warm up the machine according to the information below.

Do not use the machine in ambient temperatures above 45°C (113°F) or below -20°C (-4°F).

Carefully observe the recommendations in the following sections when operating the machine in extreme temperatures.

Cold temperatures

Cold temperatures affect the engine's starting capability, and the hydraulic systems will be sluggish until the system temperatures increase to the normal operating range. The following are actions that help minimize cold start effects.

Engine/electrical

- Use proper diesel fuel for the ambient temperature.
- Use engine oil with the proper viscosity. For further information, see Engine Oil Viscosity on page 90.
- Check the engine coolant mixture for proper antifreeze mix.
- Make sure the battery is fully charged.
- Check to see if the battery connections and the connections to the starter and engine block are clean.

Hydraulic system

- Use proper hydraulic oil.
- Prevent damage to the hydraulic system by operating the machine at low loads. Follow the warm-up procedures before using the machine at full load.

Hot temperatures

Hot temperatures affect the engine and the hydraulic cooling systems.

The following are actions that help minimize issues with overheating of the machine.

Engine/cooling

- Check the engine coolant mixture for proper antifreeze mix.
- Check the engine coolant level.
- Check the radiator cap for damage. Replace the cap if it is damaged.
- Keep the radiator core clean by removing dirt and debris.
- Use engine oil with the proper viscosity.

Hydraulic system

- Use proper hydraulic oil.
- Keep the oil cooler core clean by removing dirt and debris.
- Operate the machine at a lower load.
- When operating an attachment, avoid the following; otherwise, the hydraulic system will run over a relief valve, resulting in excessive heat build-up in the hydraulic oil:
  - Holding the right hand lever or joystick in place when the attachment has been fully extended or retracted
  - Holding the auxiliary lever in place when an attachment stops moving
- Avoid driving for excessive amounts of time.

6.11 Instrument Display

The instrument display informs the operator of the operating states, required maintenance, or possible machine malfunctions.

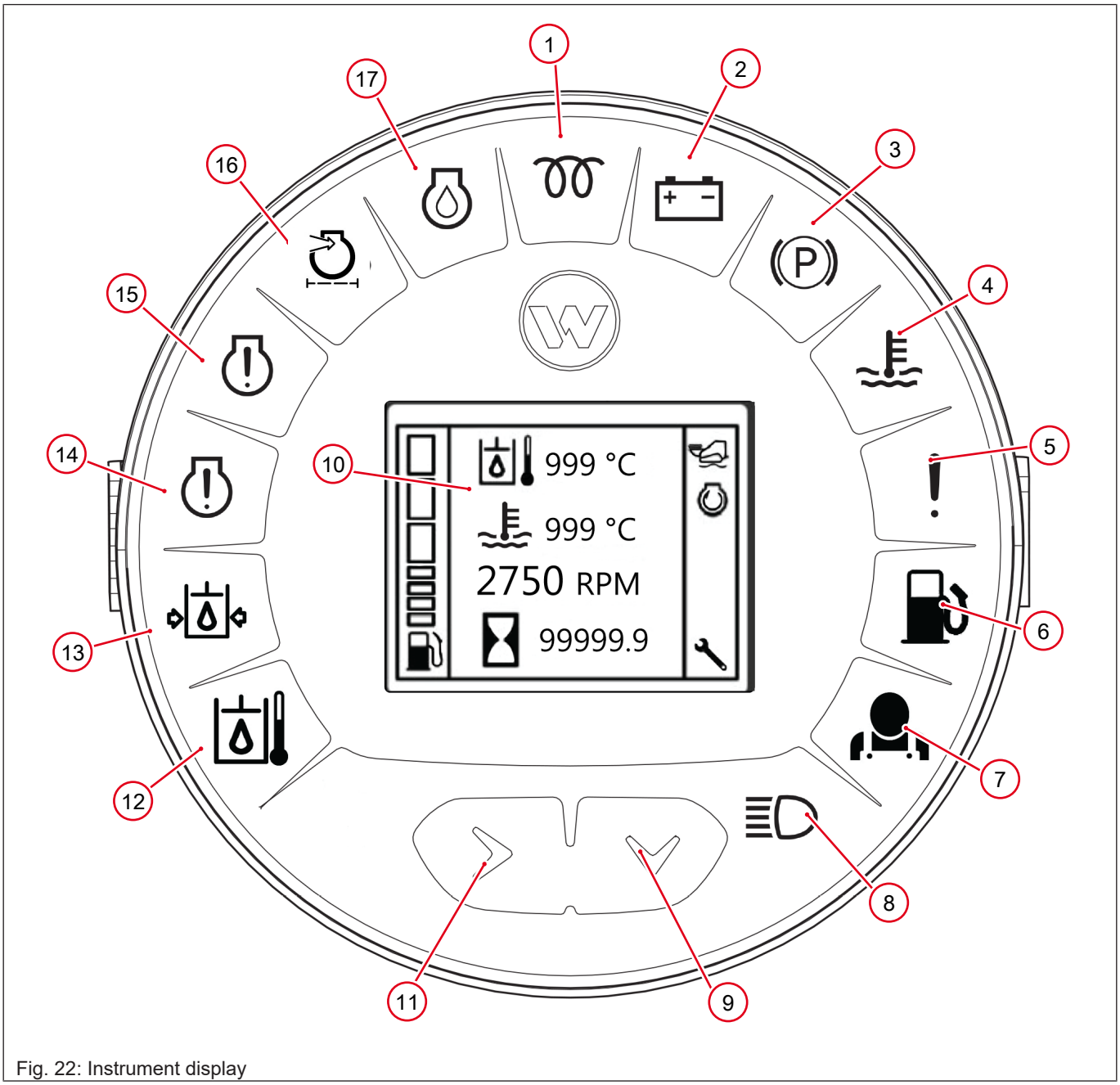
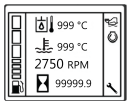


Fig. 22: Instrument display

Instrument display indicator lights

Ref	Symbol	Color	Function
1		Yellow	Engine preheating
2		Red	Battery charge indicator light
3		Red	Parking brake
4		Red	Engine coolant temperature
5		Red	General malfunction
6		Yellow	Low fuel
7		Red	Operator presence
8		Blue	Work lights
9		—	Down arrow (instrument display)
10		—	Instrument display
11		—	Right arrow (instrument display)
12		Red	Hydraulic oil temperature
13		Red	Hydraulic oil pressure
14		Red	Engine stop
15		Yellow	Engine warning
16		Red	Air filter restriction
17		Red	Engine oil pressure

6.12 Instrument Display Symbols and Functions

Symbol	Function
	Auto idle
	Service wrench
	Cold system restriction warning
	Hydraulic oil filter clogged
	Auxiliary continuous flow active
	Hydraulic oil temperature
	Engine speed
	Elapsed operating hours meter
	Fuel level
	Unable to disengage parking brake—auxiliary
	Unable to disengage parking brake—operator not present
	Unable to disengage parking brake—engine off
	Operating hours to next maintenance
	Operator unsafe shutdown warning

6.13 Instrument Display Pages and Subpages

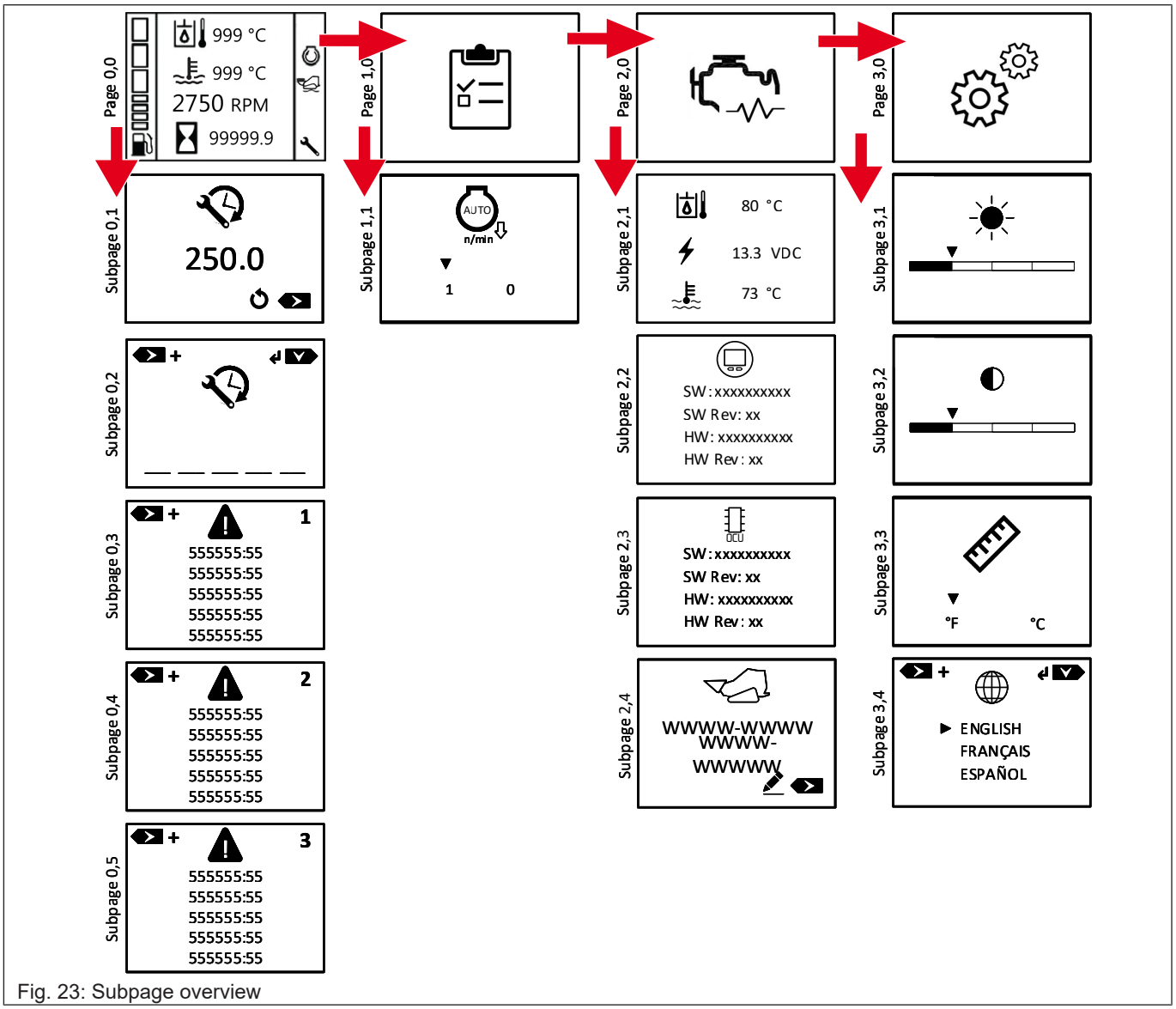


Fig. 23: Subpage overview

Use the selector button and to next menu page/set button to navigate the display's pages and subpages. For further information, see Instrument Display on page 59.

Note: Subpage 2.3 is available on the SM120 only.

6.14 Machine Status Pages

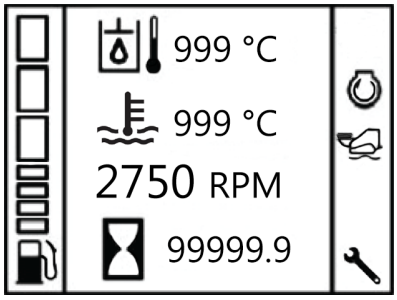


Fig. 24: Page 0.0

Page 0.0—Main display page

For descriptions of each of the icons displayed on this page, see Instrument Display Symbols and Functions on page 61.

The following machine statuses are accessible through this page:

- Service meter
- Diagnostic trouble codes

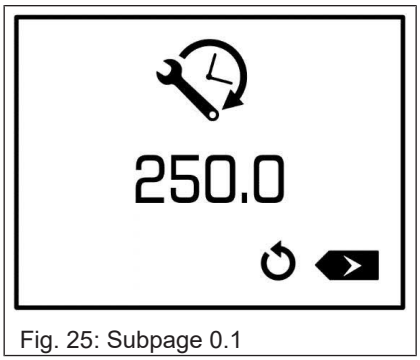


Fig. 25: Subpage 0.1

Subpage 0.1—Service meter

This subpage displays the remaining hours until service is due. The service interval is a set 250 hours. After the meter reaches 0, a negative number displays until the meter is reset.

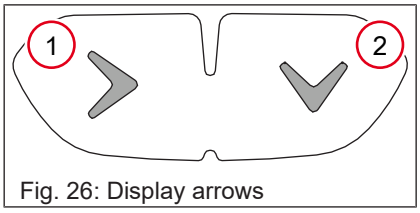


Fig. 26: Display arrows

To reset the service meter, from the main display page, press the next menu page/set button **(2)** to access Subpage 0.2—Service meter reset.

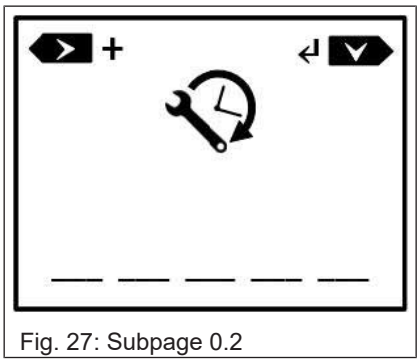


Fig. 27: Subpage 0.2

Subpage 0.2—Service meter reset

Enter the passcode on this subpage to reset the maintenance hours. Press the next menu/set button **(1)** to change the number. Press the selector button **(2)** to move to the next number.

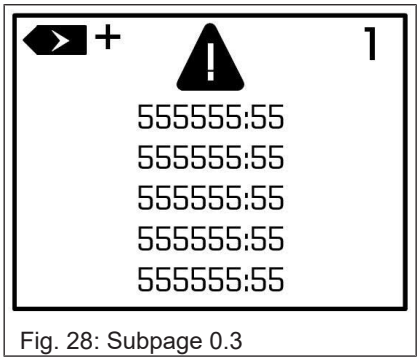


Fig. 28: Subpage 0.3

Subpages 0.3 through 0.5—Diagnostic trouble codes

Engine control unit and display error codes are shown on these subpages. For further information, see Diagnostic Trouble Codes on page 122.

6.15 Machine Options

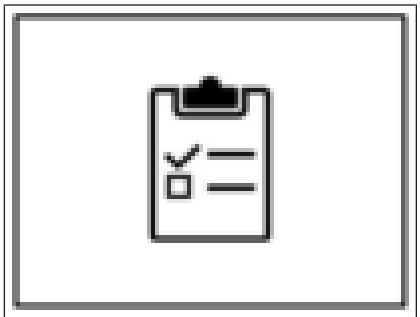


Fig. 29: Page 1.0

Page 1.0—Machine options

Auto-idle is accessible through the Machine Options page.

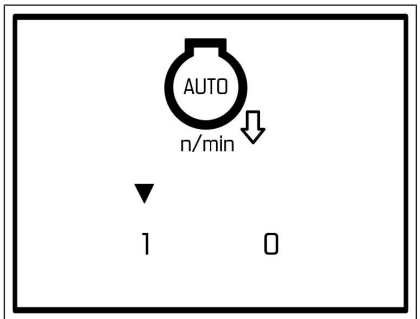


Fig. 30: Subpage 1.1

Subpage 1.1—Auto-idle

Auto-idle returns the engine RPMs to low idle after a set of criteria have been satisfied. When criteria are no longer met, the engine RPMs return to the throttle commanded value. These criteria are as follows:

- Engine coolant temperature above 25°C (77°F)
- Hydraulic oil temperature above 25°C (77°F)
- Not connected to WANDA
- Auto-idle delay time exceeded
- Throttle is moved more than 5%
- Operator is off the operator's platform

The Auto-idle ON-OFF status is saved to memory, and is resumed after turning the engine off and back on.

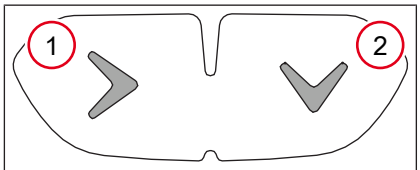


Fig. 31: Display arrows

Use the next menu button **(1)** and the selector button **(2)** at the bottom of the instrument display to scroll through the pages and subpages to get the subpage shown to turn the auto-idle on or off.

6.16 Machine Vitals

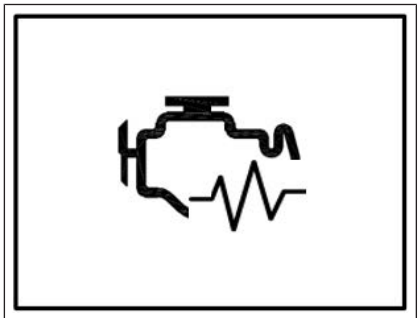


Fig. 32: Page 2.0

Page 2.0—Machine vitals

The following machine vitals are accessible through this page:

- Machine sensors
- Display data
- Machine serial number

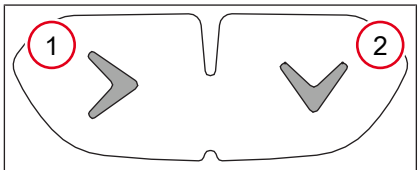


Fig. 33: Display arrows

Subpages 2.1 through 2.4—Machine vitals

Use the next menu button **(1)** and the selector button **(2)** at the bottom of the instrument display to scroll through the subpages. These subpages allow the user to:

- View the hydraulic oil temperature, system voltage, and engine coolant temperature
- View the software and hardware material number and version
- View the OCU software and hardware material number and version (SM120 only)
- View and reset the serial number

Fig. 34: Subpages 2.1 through 2.4

6.17 Instrument Display Settings

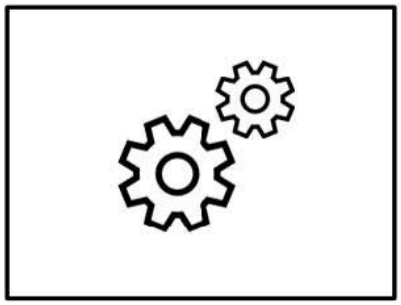


Fig. 35: Page 3.0

Page 3.0—Display settings

The following display settings are accessible through this page:

- Brightness (subpage 3.1)
- Contrast (subpage 3.2)
- Display units, °F or °C (subpage 3.3)
- Language (subpage 3.4)

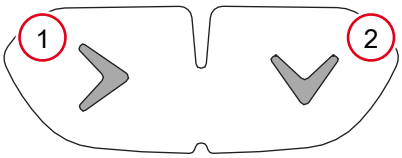


Fig. 36: Display arrows

Use the next menu page/set button **(1)** and the selector button **(2)** at the bottom of the instrument display to scroll through the subpages to get the subpage shown to adjust the brightness, adjust the contrast, change between Fahrenheit and Celsius, change the language, or increment the machine hours.

6.18 Auxiliary Override

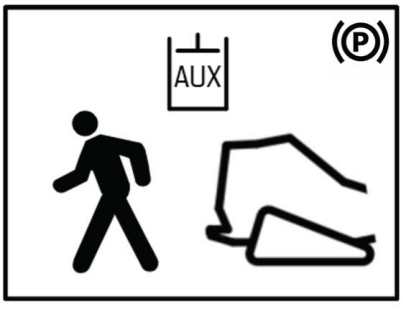


Fig. 37: Page 4.0

Page 4.0—Auxiliary override

This screen appears when auxiliary override mode is activated. Use auxiliary override mode to operate auxiliary functions while standing off the operator platform.
Note: After the initial disengagement of the parking brake, the operator can activate auxiliary override mode when the parking brake is engaged.

While in auxiliary override mode, the parking brake is engaged, and the hydraulic oil flow for an attachment is continuous.

Standard controls

To engage auxiliary override mode, perform the following:

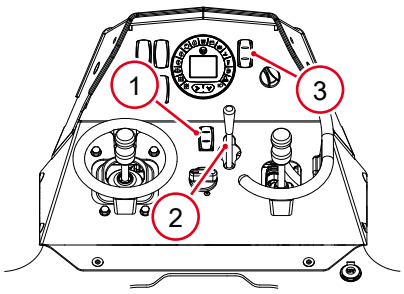


Fig. 38: Standard auxiliary override controls

1. Stand on the operator platform with the operator presence pedal engaged.
2. Set the engine to high idle.
3. For at least 3 seconds, hold the auxiliary hydraulics switch **(1)** while holding the auxiliary control lever **(2)** all the way out of NEUTRAL (forward or backward).

To deactivate auxiliary override, perform any of the following:

- Press the parking brake switch **(3)**.
- Press the auxiliary hydraulics switch.
- Move the auxiliary control lever to neutral.
- Turn off the engine.

The main display screen appears (unless the engine is turned off).

EH aux controls

To engage auxiliary override mode, perform the following:

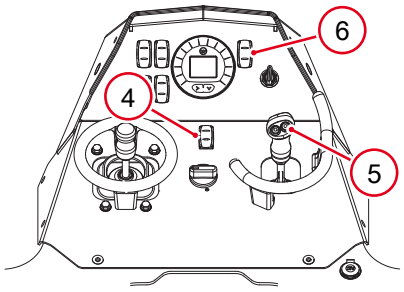


Fig. 39: EH aux auxiliary override controls

1. Stand on the operator platform with the operator presence pedal engaged.
2. Set the engine to high idle.
3. Press the auxiliary hydraulics switch **(4)** to turn off auxiliary hydraulics if they are on.
4. Press and hold the auxiliary hydraulics switch.
5. For at least 3 seconds, hold the hydraulic control wheel on the workgroup joystick control to the left or right, and press the continuous flow button **(5)**. (For further information on the hydraulic control wheel, see Manual Auxiliary Controls on page 76.)

To deactivate auxiliary override, perform any of the following:

- Press the parking brake switch **(6)**.
- Press the continuous flow button.
- Turn off the engine.

The main display screen appears (unless the engine is turned off).

6.19 Work Lights

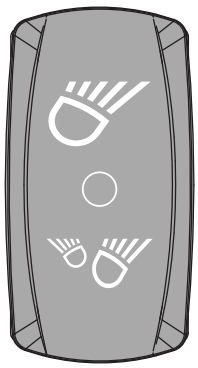


Fig. 40: Work lights switch

This is a three-position switch:

- Press the top of the switch to turn on only the front **(1)** work lights.
- Center the switch to turn off all the lights.
- Press the bottom of the switch to turn on all the front **(1)** and rear **(2)** work lights.

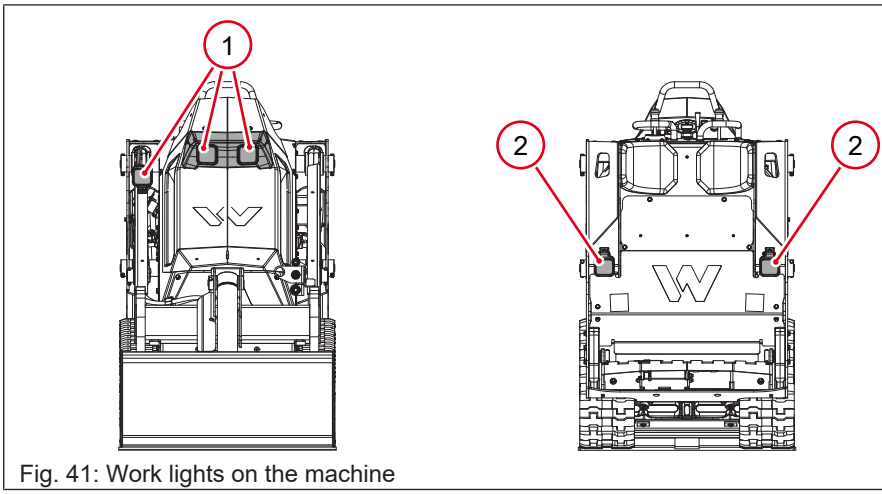


Fig. 41: Work lights on the machine

6.20 Ground Drive and Loader Controls

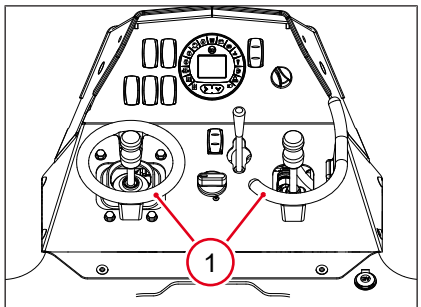


Fig. 42: Handrails

Note: All images shown in this section are of the standard controls. The EH aux controls look slightly different but function the same.

To have good control of the machine, move the levers smoothly, using the handrails **(1)** while operating.

For maximum power to the tracks, move the ground drive joystick most of the way off neutral.

For maximum ground speed, move the ground drive joystick to full stroke position.

All ground drive and loader controls are spring centered to neutral. This means when you let go of the controls, they will return to neutral.

Hydraulic pilot ISO controls

The ground drive joystick controls all of the ground drive functions (tracks), and the workgroup joystick controls all of the loader functions (lift arm and attachment tilt).
Note: Use the handrails when operating the controls.

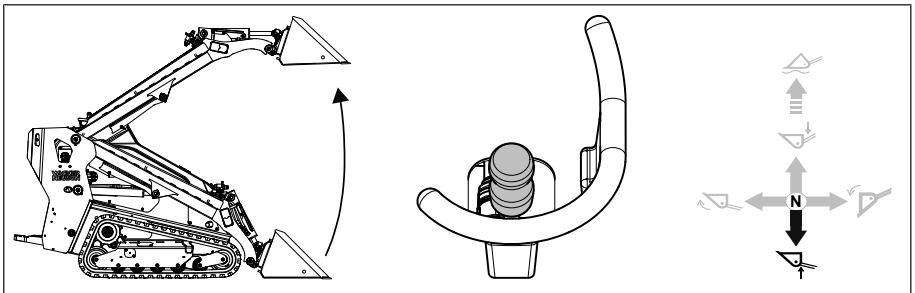


Fig. 43: Moving the right joystick back to raise the lift arm

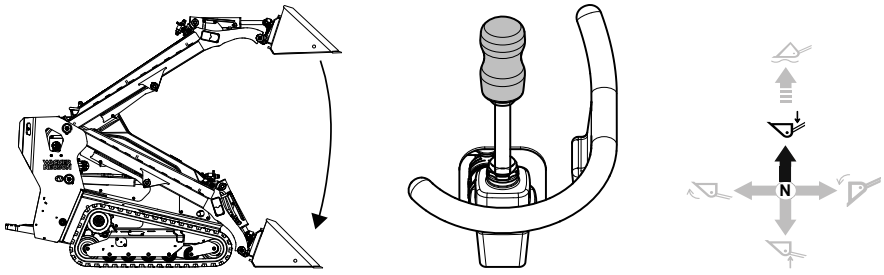


Fig. 44: Moving the right joystick forward to lower the lift arm

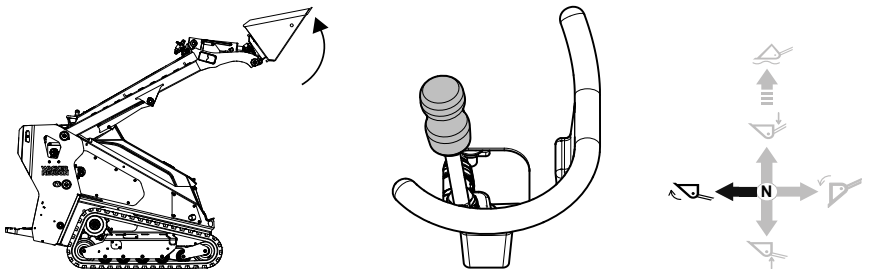


Fig. 45: Moving the right joystick to the left to roll the attachment inward

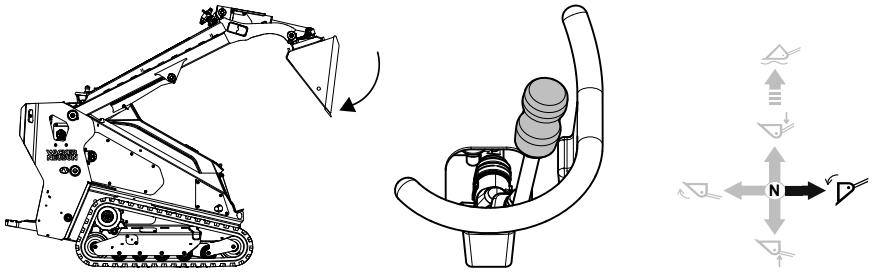


Fig. 46: Moving the right joystick to the right to roll the attachment outward

Ground drive control joystick functions

The ground drive joystick controls all of the ground drive functions.
Note: Use the handrails when operating the controls.

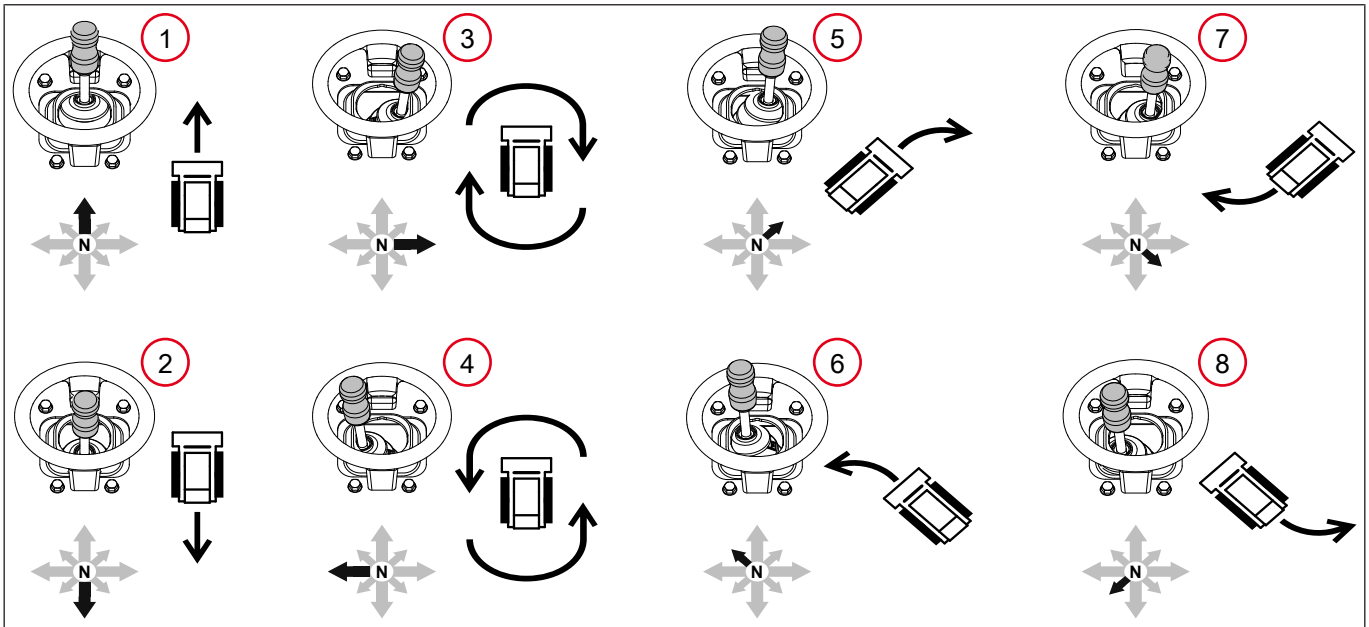


Fig. 47: Ground drive joystick functions

Refer to the illustration for the necessary joystick motions to move the machine as desired. Use the left joystick to move and turn the machine.

1—Forward
2—Reverse
3—Rotate right
4—Rotate left
5—Forward right turn
6—Forward left turn
7—Reverse right turn
8—Reverse left turn
N = Neutral

6.20.1 Float Position

⚠ WARNING

Crushing hazard

When float is activated with the lift arm in the raised position, the lift arm will lower to the ground.

► Keep others clear of the area.

The float position for the lift arm is usually used to level loose material by allowing the bucket, or attachment, to follow the contour of the ground.

Engage the float function by pressing the workgroup joystick forward into a detented position (beyond the maximum lift arm down position) The tilt function can be used while the float function is active. To disengage float, move the workgroup joystick to raise the lift arm.

6.20.2 Leveling the Ground Using the Float Function

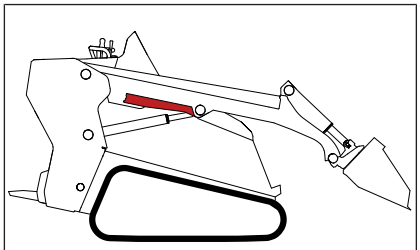


Fig. 48: Bucket float position

1. Raise the lift arm.
2. Tilt the bucket to a horizontal position or beyond.
3. Move the lift arm control past the lowering position into the float position to activate the float function.
4. Adjust the bucket angle.
5. Look to the rear before operating the machine in reverse.
6. To disengage float, move the lift arm control to raise the lift arm.

6.20.3 Using the Brakes

Overview

This machine uses a hydrostatic transmission. Track movement is controlled by the movement of the ground drive joystick.

The joystick is spring-loaded back to the neutral position. If you remove your hand from the joystick, the machine will stop.

6.21 Cold System Restriction

Cold hydraulic oil results in decreased driving performance. When cold system restriction is engaged, the engine speed limit is activated.

Temperature	
< 10°C (50°F)	**≥ 10°C (50°F)**
Engine speed limited to 1,300 rpm	Full engine speed range is available

6.22 Operating on Slopes

⚠ WARNING

Crushing hazard

Do not operate the machine sideways on slopes. The machine can tip or roll over, even on stable ground.

- ► Operate the machine straight up and down slopes with the heavy end of the machine uphill.
- ► Do not turn with the machine on a slope.
- ► Keep the lift arm low to the ground.
- ► Maintain control of the machine by adjusting the travel and movements speeds for the operating conditions.

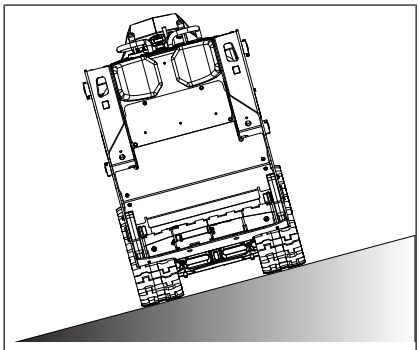


Fig. 49: Machine on a 15° lateral angle

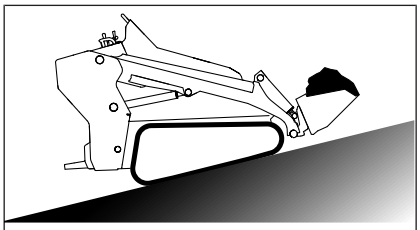


Fig. 50: Traveling with a load

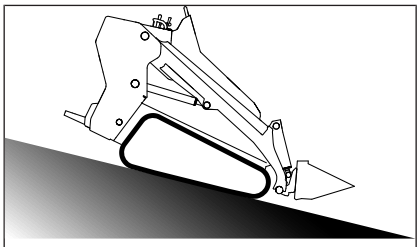


Fig. 51: Traveling without a load

Overview

When operating on slopes or hills, special care must be taken to reduce the risk of personal injury or damage to the machine. The maximum operating angle rating is 15°.

The risk zone on a slope is different from the one on a level surface. Stop machine operation immediately as soon as someone enters the risk zone. For further information, see Safety Guidelines for Operating the Machine on page 18.

Note: Without an attachment or a load in/on an attachment (such as a bucket), the rear of the machine is the heavy end. With most attachments or a load in/on an attachment, the front of the machine is the heavy end.

Traveling with a load

- When loaded, point the heavy end uphill on slopes.
- To avoid tipping, carry loads close to the ground, yet high enough to clear obstacles.
- Drive up and down slopes slowly.
- Do not drive diagonally across slopes.
- Do not make turns on slopes, or the machine may roll over.

Traveling without a load

- When unloaded, point the heavy end uphill on slopes.
- Keep the lift arm low to the ground, yet high enough to clear obstacles.
- Drive up and down slopes slowly.
- Do not drive diagonally across slopes.
- Do not make turns on slopes, or the machine may roll over.

Surface conditions

- Pay attention to changing surface conditions while operating the machine. Adjust speed and travel direction as necessary to maintain safe operation.
- Drive slowly when operating the machine on surfaces that are less than ideal. Machine stability and traction can be severely reduced on uneven or rough terrain, rocky soils, or wet or loosely packed surface materials.
- The machine can suddenly tip, sink, or fall when moved onto surfaces that have newly filled earth.

Operating over curbs

- The machine tips quickly forward or backward as it travels over a curb. Keep feet and body inside the operator’s station and away from the tracks at all times.
- Do not drive the machine in reverse over a curb with no load or the lift arm raised.
- If repeatedly driving over a curb is necessary, build a dirt ramp to make the ascent/descent more gradual.

6.23 Machine Tip Over

⚠ CAUTION

Engine damage hazard

Engine damage may occur if it is started when there is fluid present in the combustion chamber.

► Do not start the engine if the machine has been tipped over for any length of time.

In the event the machine rolls over or tips onto its side, perform the following:

1. Turn off the machine as soon as it is safe to do so.
2. Safely right the machine (put it back on its tracks) as soon as possible.
3. Contact your Wacker Neuson dealer to discuss with them what steps to take next.

6.24 Using the Manual Coupler

A coupler is a device for mounting and removing attachments without the aid of tools.

⚠ WARNING

Crushing hazard

The attachment can fall while mounting it to or removing it from the machine.

► Keep others clear of the area while mounting or removing attachments.

► Keep hands clear of the area while mounting or removing attachments.

► After the attachment has been mounted, check the coupler lower pin engagement to ensure the attachment is secured. This will prevent the attachment from falling off during machine operation.

► Set the attachment on level ground when removing it to ensure stability.

Notes

- Use only attachments that are approved by Wacker Neuson.
- Read and understand the instructions for use and operation of any attachment used on this machine.
- Ensure the mounting pad on the attachment is clear of any debris to allow to proper mounting of the attachment.

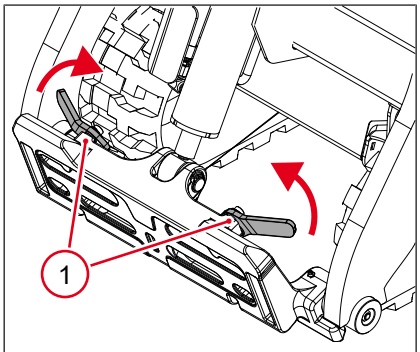


Fig. 52: Lock levers

Mounting an attachment

1. Set the lock levers **(1)** to the unlocked (up) position.
   Note: The attachment should be in a stable position on level ground.
2. Start the engine and disengage the parking brake.
3. Tilt the coupler forward.
4. Ensure the lift arm is completely lowered.

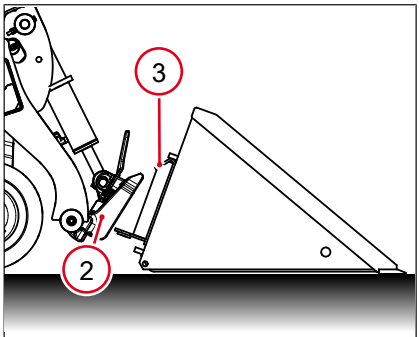


Fig. 53: Coupler and mount

5. Move the machine forward until the coupler **(2)** is under the attachment's upper mount **(3)**.
6. Raise the lift arm until the coupler begins to lift the attachment.

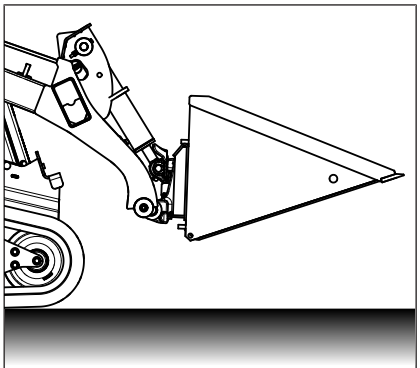


Fig. 54: Tilting the coupler back

7. Tilt the coupler back until the attachment mount is against the coupler frame.
8. Lower the lift arm completely with the attachment slightly rolled back.
9. Stop the engine.

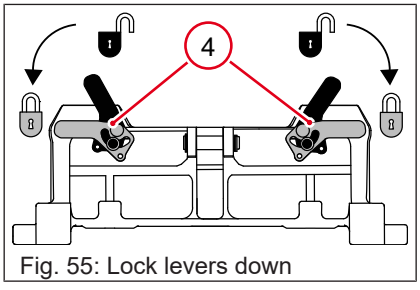


Fig. 55: Lock levers down

10. Set the lock levers **(4)** down to the locked position.
11. Check the coupler to ensure the attachment is secure.

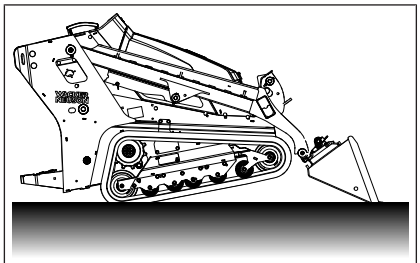


Fig. 56: Testing the attachment

Testing the attachment system

For buckets, lower the lift arm fully and tilt the bucket down until the front of the machine lifts off of the ground.

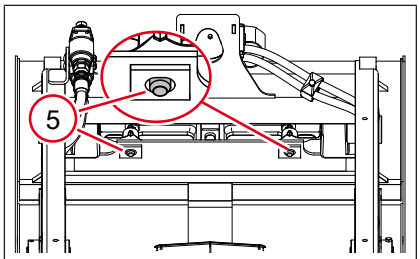


Fig. 57: Coupler Pins

With any attachment, ensure the lower coupler pins **(5)** protrude through the attachment's lower mounting plate.

Removing an attachment

1. Lower the lift arm completely. Then, tilt the attachment back slightly so that it is not touching the ground.
2. Stop the engine.
3. Set the lock levers **(6)** in the unlocked (up) position.
4. Start the engine and disengage the parking brake.
5. Tilt the coupler forward until the upper guide **(7)** clears the attachment's upper mount **(8)**.
6. Move the machine in reverse away from the attachment.

Note: Tilting the attachment back reduces the force to set the lock levers in the locked and unlocked positions.

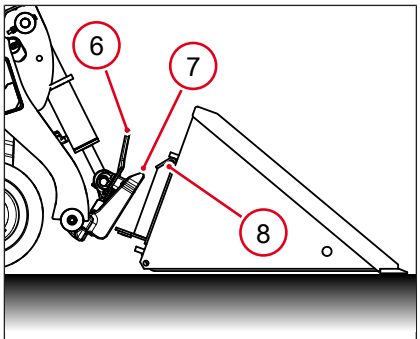


Fig. 58: Lock levers, guide, and mount

6.25 Auxiliary Hydraulic Connections

⚠ WARNING

Severe injury hazard

Hydraulic oil, tubes, and hoses are under high pressure and become very hot during operation.

- ► Relieve the hydraulic system pressure before connecting or disconnecting any hydraulic components.
- ► Do not disconnect hydraulic system lines until components have cooled.

Overview

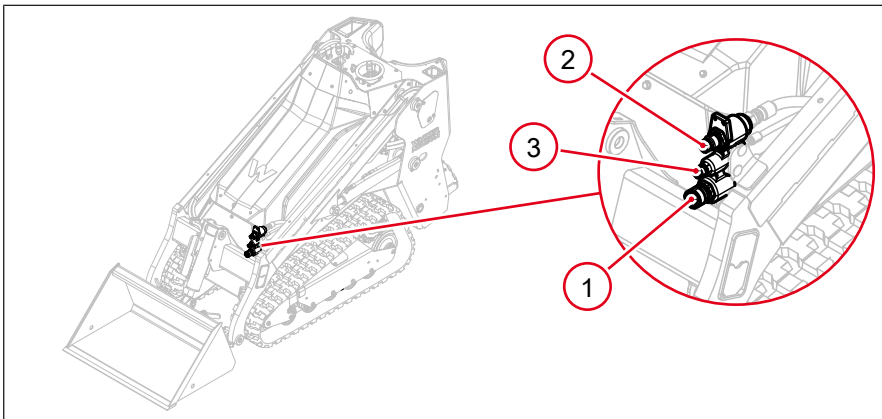


Fig. 59: Auxiliary hydraulic connections

Ref	Function
1	Female auxiliary hydraulic connector (return)
2	Male auxiliary hydraulic connector (supply)
3	Case drain line

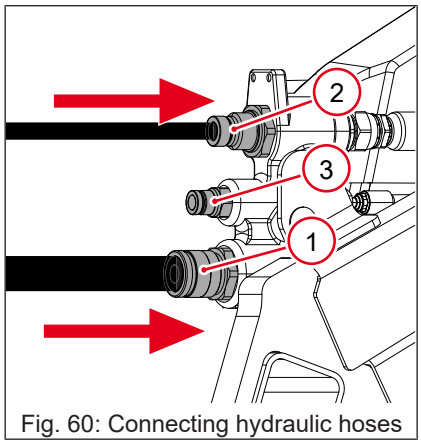


Fig. 60: Connecting hydraulic hoses

Connecting hydraulic hoses

1. Lower the lift arm.
2. Stop the engine.
3. Clean the couplers with a clean cloth.
4. Push in the top and bottom couplers or move the auxiliary hydraulic control lever back and forth while holding the parking brake switch to relieve pressure in that auxiliary hydraulic hose circuit.
5. Push the male connector attachment into the female auxiliary hydraulic connector (bottom) **(1)**.
6. Push the female connector attachment onto the male auxiliary hydraulic connector (top) **(2)**.
7. Push the case drain connector attachment (if present) onto the case drain line connector (middle) **(3)**.

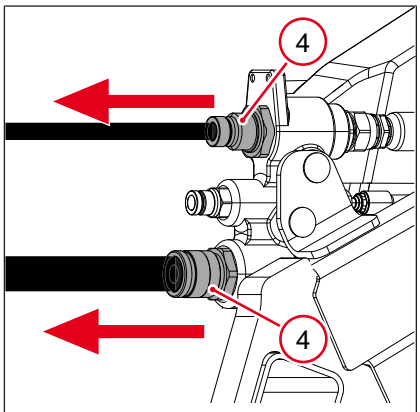


Fig. 61: Disconnecting hydraulic hoses

Disconnecting hydraulic hoses

1. Lower the lift arm.
2. Stop the engine.
3. Push in the top and bottom couplers or move the auxiliary hydraulic control lever back and forth while holding the parking brake switch to relieve pressure in that auxiliary hydraulic hose circuit.
4. Pull the rings **(4)** on the couplers to release the hoses from the machine.

6.26 Manual Auxiliary Controls

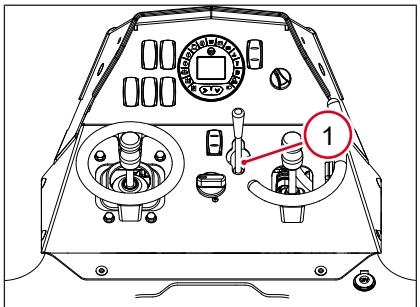


Fig. 62: Auxiliary hydraulic control lever

Standard

Push the auxiliary hydraulic control lever **(1)** forward for auxiliary hydraulic oil flow to the front male coupler. Hydraulic oil flow increases to the coupler as the lever is pushed forward.

Pull the auxiliary hydraulic control lever backward for auxiliary hydraulic oil flow to the front female coupler. Hydraulic oil flow increases to the coupler as the lever is pulled backward.

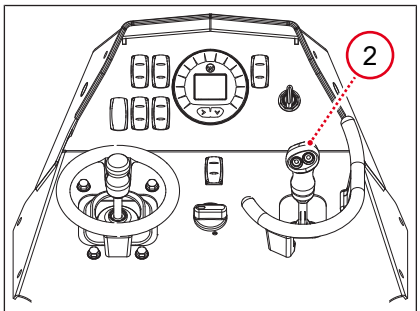


Fig. 63: Workgroup joystick

EH aux

Move the hydraulic control wheel **(2)** (on the front of the workgroup joystick) to the right for auxiliary hydraulic oil flow to the front male coupler.

Move the hydraulic control wheel to the left for auxiliary hydraulic oil flow to the front male coupler.

Hydraulic oil flow increases to the coupler as the hydraulic control wheel is moved to either side.

6.27 Using Continuous Flow Hydraulics

This feature allows the operator to turn on full hydraulic flow in either direction while requiring no additional input from the operator.

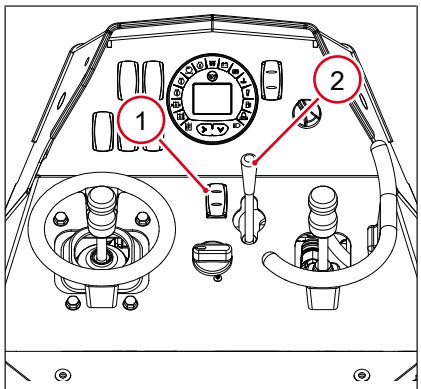


Fig. 64: Auxiliary hydraulics switch and control lever

Standard controls

1. Stand on the operator platform with the operator presence pedal engaged.
2. Set the engine to high idle.
3. Press the auxiliary hydraulics switch **(1)**.
4. Push the hydraulic control lever **(2)** fully forward (or backward, depending on the desired flow direction) to its detent position.
5. Move the hydraulic control lever back to neutral to turn off continuous flow.

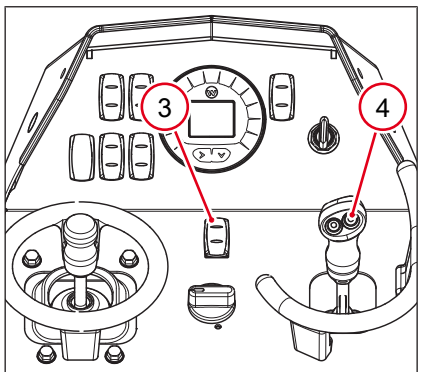


Fig. 65: Auxiliary hydraulics switch and continuous flow button

EH aux controls

1. Stand on the operator platform with the operator presence pedal engaged.
2. Set the engine to high idle.
3. Press the auxiliary hydraulics switch **(3)**.
4. Hold the hydraulic control wheel on the workgroup joystick control to the left or right, and press the continuous flow button **(4)**. (For further information on the hydraulic control wheel, see Manual Auxiliary Controls on page 76.)
5. Press the continuous flow button again to shut off continuous flow hydraulics.

Note: When the operator presses the continuous flow button after turning off continuous flow, the machine starts flow again in the same direction as was previously set. There is no need to direct flow again with the hydraulic control wheel unless the operator desires flow in the other direction.

6.28 Filling and Dumping the Bucket

⚠ WARNING

Accident hazard

Operate the machine with extreme care to avoid possible loss of machine control.

- ► Know the machine's lifting capacity. Do not exceed the ROC for the machine. For further information, see Forces on page 129.
- ► Dump the load with the machine on a level surface.

Filling the bucket

1. Lower the lift arm.
2. Tilt the bucket so it is flat on the ground.

3. While driving the machine slowly forward into the pile, tilt the bucket back and raise the lift arm at the same time to fill the bucket.
4. Reverse away from the pile, turn the machine around on level ground, then travel to the dumping location with the bucket low to the ground.

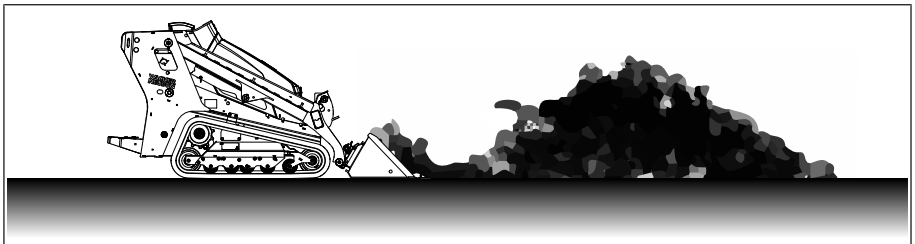


Fig. 66: Filling the bucket

Dumping the bucket

1. Raise the lift arm while keeping the top edge of the bucket level to prevent spilling the load.
2. Dump the load.

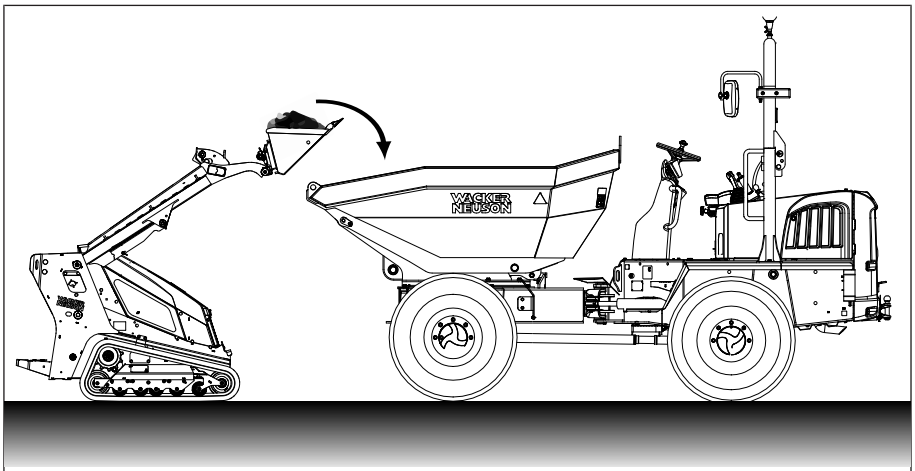


Fig. 67: Dumping the bucket

6.29 Recommended Fuels—Diesel and Biodiesel

⚠ WARNING

Fire hazard

Do not use gasoline, kerosene, kerosene mixes, crankcase oil, or any oil containing gasoline as fuel for this machine.

NOTICE

Poor quality fuel can reduce engine performance and cause damage. Only use the recommended diesel fuels for the best engine performance. The recommended fuel complies with the U.S. EPA and ARB protection guidelines.

Use the same diesel fuel that is used in cars.

Fuel requirements

- Fuel must meet the ASTM D975, EN590:96, ISO 8217 DMX, BS 2869-A1 or A2, JIS K2204 Grade No. 2, KSM-2610, or GB252 standard.
- Biodiesel fuel for blending must meet the EN14214 or ASTM D-6751 and D7467, or JIS K2390 standard. (Blend ratios up to B20 are acceptable.)
- Fuel sulfur content must not exceed 0.5% by volume. Less than 0.05% is preferred. In the U.S. and Canada, it is illegal to use greater than 0.0015% sulfur.
- Do not use kerosene or mix kerosene with fuel.
- Do not use fuel stored for an extended time.

Diesel fuel

Low temperatures cause diesel fuel to gel. Use the proper fuel for the conditions. Follow the guidelines in the table below.

Lowest Expected Temperature	Recommended Fuel
Above 0°C (32°F)	#2 diesel plus additives (ULSD only[1)])
Above -20.5°C (-5°F)	#1 diesel plus additives (ULSD only[1)])

1) In the U.S. and Canada, use only ULSF. Otherwise, high sulfur fuel less than 5,000 ppm is acceptable. However, a sulfur fuel with lower PPMs is recommended.

Biodiesel fuel

Use the following recommended biodiesel fuels.

Biodiesel Fuel	Maximum % in Fuel
EN14214	20%
ASTM D 6751-09a	—

6

6.30 Refueling the Machine

⚠ WARNING

Fire and explosion hazard

Fuel and its vapors are extremely flammable and can be explosive. Burning fuel can cause severe burns.

- ► Keep all sources of ignition away from the machine while refueling.
- ► Store fuel containers in a well-ventilated area, away from any combustible materials or sources of ignition.
- ► Refuel only when the machine is outdoors.
- ► Clean up spilled fuel immediately.
- ► Do not smoke while refueling.
- ► To prevent static electricity buildup when transferring the fuel from the pump to the container, place the fuel container on the ground. Hold the hose nozzle firmly against the side of the container while filling it.

⚠ CAUTION

Fire and health hazard

Fuel expands when heated. Expanding fuel in an over-filled tank can lead to spills and leaks.

► Do not fill the fuel tank completely.

NOTICE

Keep the fuel tank and fuel-handling equipment clean at all times. Be careful not to let any contaminants or even dust from the outside into the filler port when supplying fuel.

Do not remove the primary strainer (if equipped) from the fuel tank filler port. If removed, dirt and debris could get into the fuel system causing it to clog.

Requirements

- Machine and fuel tank supply level with the ground
- Fresh, clean fuel supply

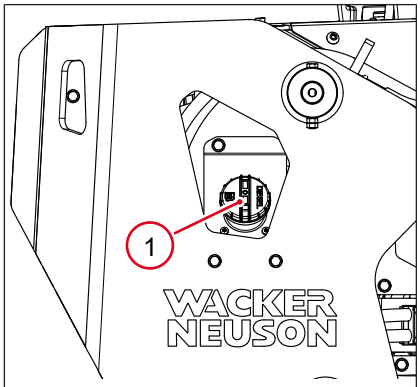


Fig. 68: Fuel cap

Procedure

1. Stop the engine.
2. Remove the fuel cap **(1)**.
3. Fill the fuel tank.
4. Install the fuel cap.
   Note: Replace the fuel cap if it is malfunctioning.

6.31 Lift Arm Manual Override

⚠ WARNING

Crushing hazard

The lift arm can drop if a sudden pressure loss occurs.

► Keep others clear of the area when lowering the lift arm.

The lift arm manual override can be used if the machine loses engine power with the lift arm in the raised position.

Procedure

1. Stand on the operator platform and engage the operator presence pedal.
2. Turn the ignition key to position 1.

3. Press and hold the parking brake switch.
4. Push the workgroup joystick forward to lower the lift arm.

6.32 Lift Arm Support Device

⚠ WARNING

Crushing hazard

A disconnected hydraulic line can result in the lift arm dropping, resulting in serious injury or death.

► Secure the lift arm support device before working under a raised lift arm.

Maintaining the lift arm support device

Every 250 hours, check the lift arm support device for damage, such as cracking, bending, or excessive rust.

Installing the lift arm support device

1. Lower the lift arm to the ground and remove the attachment.
2. Stop the engine and step off the operator platform.
3. Remove the pin **(1)** from the lift arm support device **(2)** and lower the lift arm support device onto the lift cylinder **(3)**.
4. Step onto the platform and start the engine.
5. Raise the lift arm until the lift arm support device drops down over the lift cylinder.
6. Lower the lift arm onto the lift arm support device.
7. Stop the engine and step off the platform.
8. Install the pin to prevent the lift arm support device from moving upward.

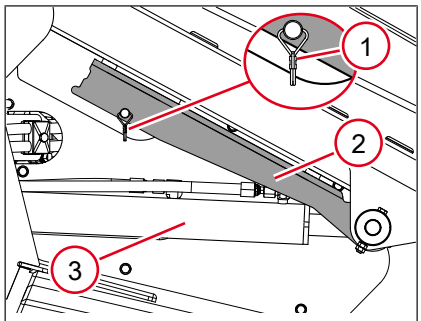


Fig. 69: Lift arm support device

Removing the lift arm support device

1. Start the engine and raise the lift arm to the maximum height.
2. Stop the engine and step off the operator platform.
3. Remove the pin **(4)** from the lift arm support device **(5)**.
4. Raise the lift arm support device to its storage position and insert the pin.
5. Step onto the platform and start the engine.
6. Slowly lower the lift arm to the ground.
7. Stop the engine and step off the platform.

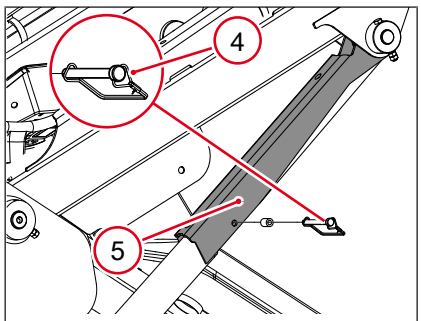


Fig. 70: Install pin

6.33 Parking the Machine

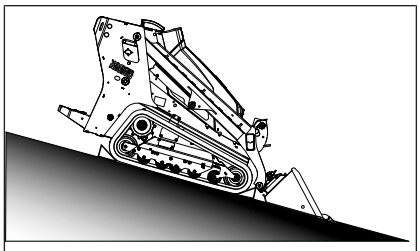


Fig. 71: Parking the machine

1. Park the machine on a level surface with the lift arm completely lowered.
   Note: If the machine is parked on a slope, position the front of the machine downhill. If possible, tilt the attachment (such as a bucket) down so that it digs into the ground.
2. Engage the parking brake.
3. Allow the engine to cool down at low idle for 5 minutes without any load.
4. Turn the ignition key to the OFF position to stop the engine.
5. Step off the operator platform.
6. Chock the tracks.
7. Make sure the parking brake pins are engaged (at least one).

7 Factory-Installed Options

7.1 Ride Control

Ride control reduces the machine's pitching motion to provide a smoother ride and to prevent loss of material from the bucket while traveling.

Relieving hydraulic pressure in the ride control accumulator

To relieve hydraulic pressure:

1. Lower the lift arm to the ground.
2. Stop the engine and turn the key to position 1.
3. Press the lower right button on the right handgrip for 2 seconds.
4. Turn the key to position 0.

Note: Ride control is only available on machines with EH aux controls.

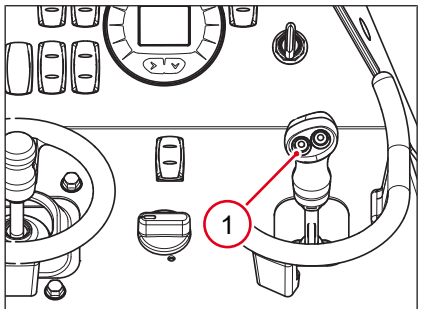


Fig. 72: Ride control button

To use ride control, raise the lift arm at least 300 mm (12 in.), then press the ride control button **(1)** on the workgroup joystick. A large ride control icon appears in the center of the display screen for 3 seconds. It then appears in the middle of the icon bar on the right side of the screen until changed again. Examples of this are shown below.

To disengage ride control, press the ride control button again.

Note: When ride control is activated, the base ends of the lift cylinders are connected to a nitrogen-charged accumulator. The lift arm may rise or drop until a pressure balance is obtained.

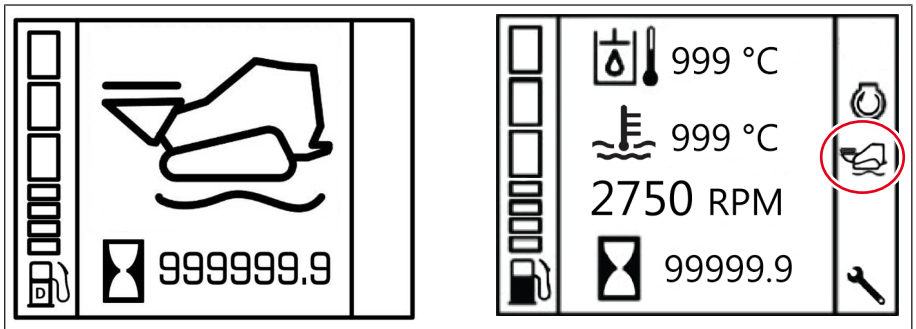


Fig. 73: Ride control screen

Relieving hydraulic pressure in the ride control accumulator

To relieve hydraulic pressure:

1. Lower the lift arm to the ground.
2. Stop the engine and turn the key to position 1.
3. Press the ride control button.
4. Turn the key to position 0.

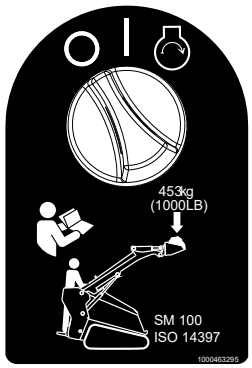


Fig. 74: Ignition key position 0

8 Maintenance

8.1 Maintenance Introduction

⚠ WARNING

Personal injury and machine damage hazard

A poorly maintained machine can malfunction, causing injuries or permanent damage to the machine.

- ► Keep the machine in safe operating condition by performing periodic maintenance and making repairs as needed.
- ► Do not make unauthorized modifications to the machines. This includes structural, hydraulic, engine, and electrical systems.
- ► Before returning the machine to service, ensure all covers and parts are installed, check for any fluid leaks, check all fluid levels, operate all controls, and test the loader interlock system functionality.

Unless otherwise specified, the operator can perform the maintenance items listed in this manual. A qualified technician should perform other maintenance and repairs. Repairs can be hazardous if not performed correctly.

Preparing for maintenance work

- Remove all attachments from the machine when service procedures require raising the lift arm. Secure the lift arm with the lift arm support device.
- Prior to performing maintenance work on the machine, make sure that all interlock devices are engaged to prevent unintended movement on the machine.

Performing maintenance

- If any operating fluid, such as fuel or hydraulic oil, is spraying or leaking, avoid skin contact. High-pressure fuel can penetrate your skin and result in serious injury. If you are exposed to high-pressure fluid spray, seek prompt medical treatment.
- Disassembling or repairing the fuel system must be done by professionals such as the authorized YANMAR distributor or dealer.
- The engine block and exhaust system become very hot during operation and require cool-down time after the machine is shut off. Avoid contact with hot parts.
- After cleaning, examine all fuel, lubricant and hydraulic oil lines for leaks, chafe marks, and damage.
- Do not use the attachment or work equipment as lifting platforms for persons.

8.2 Maintenance Label

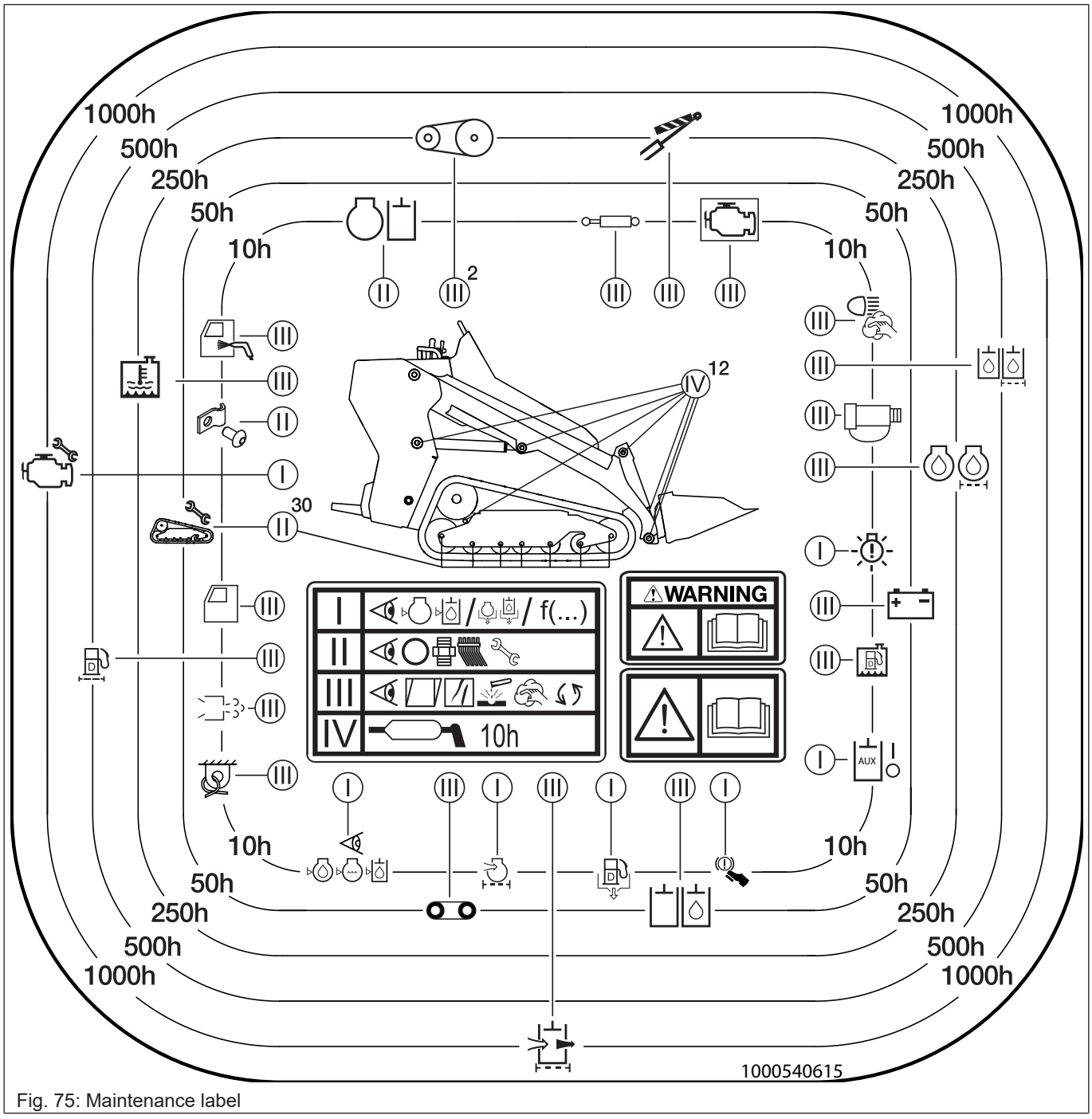
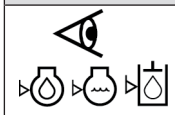


Fig. 75: Maintenance label

I Check the functions and fluid levels, filling up and draining.
II Check parts for wear, seals, hoses, and threaded fittings.
III Check for damage, corrosion, or dirt. Replace if necessary.
IV Lubricate daily after operation.

Symbol	Task	Reference
Every 10 Operating Hours (Daily)		
	Check the fluids and lubricants (engine oil, engine coolant, hydraulic oil).	[▷ 96] [▷ 91] [▷ 92]
	Check the engine air filter condition indicator for leaks and damaged components.	[▷ 88]
	Check the water separator.	[▷ 99]
	Lubricate the machine according to the lubrication plan.	[▷ 89]
	Check the exhaust system for damage.	[▷ 97]
	Check the service and parking brake function.	[▷ 88]
	Check the continuous flow shutoff system for proper function.	[▷ 98]
	Check access panels for dirt.	[▷ 88]
	Check the piston rods of the cylinders for damage.	[▷ 88]
	Check the line fixtures.	[▷ 88]
	Check the indicator lights and acoustic warning devices.	[▷ 88]
	Check the engine compartment for damage.	[▷ 88]
	Check the hydraulic couplings for dirt.	[▷ 88]
	Clean the lights/light system and signaling systems.	[▷ 88]
	Check the engine and hydraulic system.	[▷ 88]
	Check the fuel tank level and fill as needed.	[▷ 79]
	Check the tie-down points for damage.	[▷ 88]
	Check and clean the operator platform.	[▷ 88]
—	Check the interlocks for proper function.	[▷ 93]
—	Check for damaged safety labels. Replace damaged labels.	[▷ 88]
Only Once after the First 50 Operating Hours		
	Replace engine oil and filter.	[▷ 102]
	Check condition of all drive belts. Adjust or replace as needed.	[▷ 104]
	Replace the hydraulic filter.	[▷ 113]
Every 50 Operating Hours		
	Check the hydraulic fluid, hoses, and tubelines for damage and leaks. Repair or replace as needed.	[▷ 106]
	Check the tracks (damage, tension, profile).	Checking and Adjusting Track Tension
	Check the undercarriage for loose bolts and nuts.	[▷ 106]