MANITOU

HANDLING YOUR WORLD

52739832EN-USM1 (A - 07/2022)

USER MANUAL

(TRANSLATION OF THE ORIGINAL MANUAL)

MLA 2-25 H P ST5 S1

MLA 3-25 H-C P ST5 S1

MLA 3-25 H P ST5 S1

MLA 4-50 H-C P ST5 S1

MLA 4-50 H P ST5 S1

MLA 5-50 H P ST5 S1

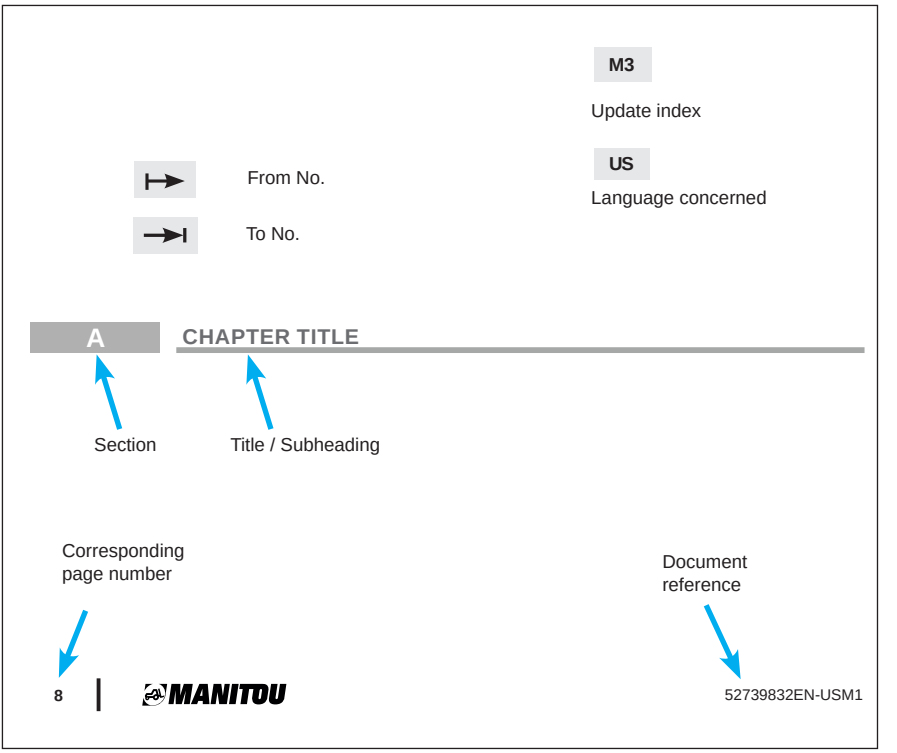
Machine	Machine serial no. from:	Version	Year
MLA 2-25 H			
MLA 3-25 H-C			
MLA 3-25 H			
MLA 4-50 H-C			
MLA 4-50 H			
MLA 5-50 H			

CONTENTS

A. OPERATION AND MAINTENANCE

OPERATION AND MAINTENANCE

01.1. Reading a page of the Manual



01.2. Symbols and notes

■ Description

	Important information
	Depending on country or machine options
	Locking symbol
	Unlocking/release symbol
	Size of tool to be used (e.g. 13 mm wrench)

	Type of tooling necessary for adjustment
	Control: no adjustment
	Visual inspection
	Focus on detail
	Service interval in hours (e.g. 500 h)

■ Danger signaling

HAZARD

Imminent hazardous situation that may cause death.

WARNING

Potentially hazardous with the risk of serious injuries.

CAUTION

Potentially hazardous with the risk of injuries.

NOTE

Note.

Any reproduction, source code access, decompilation, modification, copy (other than backup copies), correction of errors, transmission or distribution of any software built into Manitou Group machines is strictly prohibited.

In the event that such measures nevertheless prove essential for use of the software according to its intended purpose, or to obtain information required for interoperability with other software developed independently, Manitou Group must be informed in advance and may, at its sole discretion, take the necessary measures or give access to only the information strictly necessary for interoperability.

Any breach of these requirements is likely to constitute a counterfeiting offense subject to legal action by Manitou Group.

Connected Manitou Group machines are equipped with systems that collect technical data on the machines (such as geo-tracking data or data on component operation). This data, which is organized, processed and enhanced by algorithms and expertise proprietary to Manitou Group, constitutes, in combination with other elements, independent or not, a proprietary database according to applicable laws and regulations in the field of intellectual property.

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• Any extraction, reproduction, representation, reuse through provision to the public, distribution, transfer, permanent or temporary, on any medium, by any means, and in any form whatsoever, of all or of a qualitatively or quantitatively substantial part of the contents of the database.

• Any extraction, reproduction, representation, reuse through provision to the public, distribution, transfer, repeated and systematic, of qualitatively or quantitatively insubstantial parts of the contents of the database in ways manifestly exceeding normal use of the database by the user of the machine for his or her own needs.

• Any use of means to bypass technical protection measures for databases or software source code embedded in the data collection systems of the machines, in keeping with applicable laws and regulations in the field of intellectual property.

The most recent version in force of this document is available on demand.

Only the electronic version is updated and maintained.

MANITOU BF S.A. Public limited company (“Société Anonyme”) with a board of directors.
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Entered in the Nantes Trade and Companies Register under No. 857 802 508.
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A machine's operating safety and productivity, as well as its service life, depend primarily on correct use and regular servicing.

This operating and maintenance manual provided with the machine is therefore intended for the operator's use. We cannot stress enough the importance of reading it, not only before the machine is first put into service (for familiarization with how it works) but also during operation and for service or lubrication work.

So that the machine is as efficient as possible it is necessary to follow the indications in this manual carefully and adhere strictly to the recommendations defining the nature of service and lubrication operations and their frequency. Possible claims under the warranty can only be submitted subject to the express condition that all the planned inspections have been carried out by competent people within the limits of the specified intervals.

It is recommended that you use only original spare parts obtained from Manitou dealers.
Please quote the type and serial number of the machine concerned in all contacts with your dealer.
The machine dealt with in this manual meets the technical specifications valid on the date of publication. We reserve the right, at any time and without prior notice, to make modifications or innovations, of any type considered to be useful, to the components of the machine without being obliged to change the text in this manual at the same time. The illustrations and information in this manual are provided without obligation and cannot be the subject of a claim.

THE OPERATION OF A PUBLIC WORKS MACHINE IS SUBJECT TO THE SAFETY RULES IN FORCE IN THE COUNTRIES IN WHICH IT IS USED IN ADDITION TO THOSE ISSUED BY ITS GROUP OF COMPANIES.

BEFORE OPERATING THE MACHINE, READ THE SAFETY PAGES IN THIS MANUAL CAREFULLY.

Complies with French Ministry of Labor regulations.

■ MAINTENANCE

■ Carry out periodic maintenance (see Inspection and maintenance) in order to keep your forklift truck in good working order. Failure to perform periodic maintenance may invalidate your contractual warranty.

■ Maintenance logbook

- The maintenance operations carried out pursuant to the recommendations in the Inspection and maintenance section and any other inspection, service, repair or modification work performed on the forklift truck or on its attachments must be recorded in a maintenance logbook. For each operation, the date of the work, the names of the individuals or companies who carried out the work, the nature of the operation and, where applicable, its frequency, shall be indicated.
- In the event of replacement of forklift truck components, the references of these components shall be recorded.

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Fig. A1

PICTOGRAMS HIGHLIGHTING SAFETY INSTRUCTIONS HAVE BEEN STUCK NEXT TO THE MACHINE'S "AT-RISK AREAS".

• READ THE OPERATING AND MAINTENANCE MANUAL CAREFULLY AND ADHERE STRICTLY TO THESE INSTRUCTIONS,
• BE VERY ATTENTIVE TO WHAT IS HAPPENING NEAR THE MACHINE.

■ **Pictogram (1):**

- Stickers attached to the engine cover and the cab access door:
  - They indicate that it is necessary to stay a suitable distance from the operating area so as to avoid accidents and injuries.

■ **Pictogram (2):**

- Stickers located on the left and right sides of the undercarriage:
  - They indicate the presence of a transmission shaft and therefore the danger of inserting a hand in this space.

■ **Pictogram (3):**

- Stickers attached to the engine cover and the removable rear cover:
  - They indicate that it is dangerous to open the covers when the engine is running as this may cause accidents and injuries.

DO NOT OPEN THE ENGINE COVER WHILE THE ENGINE IS RUNNING:
• RISK OF SERIOUS INJURY,
• RISK OF DAMAGE TO THE COVER AND THE SOUNDPROOFING FOAM BY THE HOT GASES FROM THE EXHAUST PIPE.

■ **Pictogram (4):**

- Stickers located on the left and right sides of the undercarriage:
  - They indicate the presence of an articulated joint between the front and rear undercarriages and the risk of being crushed between them. Keep away from the machine.

■ **Pictogram (5):**

- Stickers located on the left and right sides of the arm:
  - They indicate that it is necessary to stay at a suitable distance from the operating area so as to avoid accidents and injuries.

■ **Pictogram (6):**

- Stickers located in the engine compartment:
  - They indicate a risk of injury, in particular mutilation of the hands, caused by moving fan blades or drive belts. Always stop the engine before accessing the engine compartment.

05.1. Prevention of exposure of machine operators to vibration.

Directive 2002/44/EC requires that company heads do not expose their employees to excessive doses of vibration. There is no recognized measurement code making it possible to compare the machines of different manufacturers. The actual doses received can therefore only be measured in real conditions experienced by the user.

■ **Recommendations**

☞ ***The level of operator exposure to vibrations can be reduced significantly if the following recommendations are adopted:***

1- **For each particular application, select a suitable machine, attachment and suitable accessories or attachments.**

2- **Use only original equipment operators seats, which comply with the ISO 7096/2000 standard. The seat must be maintained and adjusted correctly:**
   - Adjust the seat and the suspension to the weight and height of the operator.
   - Check and maintain the suspension and adjustment devices for the seat regularly.

3- **Make sure that the machine is correctly serviced:**
   - Tire pressure.
   - Brakes.
   - Steering.
   - Articulation systems, etc.

4- **Drive, brake, accelerate, change gear, remove and install the accessories or attachments.**

5- **Adjust the speed and path of the machine in order to reduce the vibration level:**
   - Slow down if necessary on rough ground.
   - Drive round obstacles and rough ground.

6- **Keep the ground on which the machines are used in good condition:**
   - Remove large stones and obstacles.
   - Fill in ditches and holes.
   - Schedule time for maintaining the ground conditions and supply the appropriate machines.

☞ ***The weighted root mean square acceleration to which the driver is exposed via the seat is less than 0.81 m/s² (2.66 ft/s²) (MLA 2-25 H) or 1.03 m/s² (3.38 ft/s²) (other models) under normal working conditions in accordance with EN 1032. The weighted root mean square acceleration to which the upper limbs of the driver are exposed is less than 2.5 m/s² (8.2 ft/s²) under normal working conditions in accordance with ISO 5349-2.***

06. SAFETY INSTRUCTIONS

06.1. Safety Symbol and Signal Words

The manuals and decals on the machine warn of safety hazards. Read and closely follow the information on these decals.

Manitou Group, in cooperation with the Society of Automotive Engineers, has adopted this:

■ **Safety Alert Symbol**

Be alert when you see the Safety Alert Symbol in the manuals and in or on the machine. The Safety Alert Symbol identifies potential safety hazards, which, if not properly avoided, could result in injury or death.

■ **Signal Words**

HAZARD

The word "HAZARD" or "DANGER" indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.

WARNING

The word "WARNING" indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death.

CAUTION

The word "CAUTION" indicates a potentially hazardous situation that, if not avoided, may result in injury or machine damage.

- Before operating or working on the machine, you must first read and understand the related safety information. The warnings and instructions must be provided to operators in a language they can read and understand.
- Before operating the machine, the operator must read and understand the related operating information and use the correct operating procedures. Complete safety information should be presented to all new operators regardless of previous experience. Make sure to comply with any local rules/laws which require certification before operating the machine.
- Operators must not be physically or mentally impaired or under the influence of drugs or alcohol. It is recommended that the operator be capable of obtaining a valid motor vehicle operator's license. Do not allow minors or unqualified persons to operate the machine, or to be near the machine unless they are properly supervised.
- Do not use the machine for any applications or purposes other than those described in the Operator's Manual, or in manuals supplied with any attachments used with the machine.
- Use of the machine is subject to certain hazards that cannot be eliminated by mechanical means, and these require the operator to use intelligence, care, and common sense. Examples of such hazards include, but are not limited to: hillside operation, overloading, load instability, poor maintenance, operating too fast for conditions, and use of the machine for a purpose for which it was not intended or designed.
- Manitou Group always considers operator's safety during the design process. Guards and shields are provided to protect the operator and bystanders from moving parts and other hazards. Operators must be alert, however, because some areas cannot be guarded or shielded without preventing or interfering with proper operation.
- Certain uses of the machine may require additional safety equipment. Users must examine the worksite for hazards and provide safety equipment as required to protect against those hazards.

- The information in this manual does not replace any applicable safety rules and laws. Before operating the machine, learn the rules and laws for the local area. Make sure the machine is equipped as required according to these rules/laws.
- Remember that some health risks may not be immediately apparent. Exhaust gases and noise pollution may not be visible, but these hazards can cause permanent injuries.
- Photographs and illustrations in this document may show doors, guards, shields, and panels open or removed for informational purposes. Make sure all doors, guards, shields, and panels are attached in the correct operating positions before operating the machine.

06.2. Mandatory safety shutdown procedure

BEFORE cleaning, adjusting, lubricating, fueling, or servicing the machine, or leaving it unattended:

1- Bring the machine to a complete stop on a level surface. If the machine must be parked on a slope, park across the slope and chock the wheels to prevent movement.

2- Be sure all working equipment and/or attachments are stopped and the auxiliary hydraulics valve is in neutral.

3- Empty the attachment. Lower the lift structure and the attachment to the ground. If the lift structure must be left in the raised position, make sure it is properly supported.

4- Place the forward/reverse drive switch (on top of the joystick) into the neutral position.

5- Apply the parking brake.

6- Move the throttle to the low-idle position and allow the engine to cool.

7- Shut off the engine. Make sure that parts have stopped moving before continuing.

8- Turn the ignition key to the ON/RUN position and move the joystick in all directions to verify the hydraulic system is depressurized.

9- Press the auxiliary hydraulics pressure relief switch to relieve the pressure in the auxiliary hydraulics circuit.

10- Turn off the ignition.

11- Unfasten the seat belt, remove the ignition key, and take it with you. Exit the machine using the hand-holds and steps.

12- Allow at least 2 minutes after turning off the ignition before disconnecting the battery or turning off the battery disconnect switch. Battery power is needed for computer/system maintenance functions which continue after the ignition is turned off.

13- Always turn off the battery disconnect switch when parking the machine inside an enclosure.

ONLY WHEN THESE PRECAUTIONS HAVE BEEN TAKEN CAN YOU BE SURE IT IS SAFE TO PROCEED. FAILURE TO FOLLOW THIS PROCEDURE COULD RESULT IN DEATH OR SERIOUS INJURY.

06.3. Before starting

- Unless specifically instructed for Manitou Group-approved service, do not remove or modify the Roll-Over Protective Structure/Falling Object Protective Structure (ROPS/FOPS). Unauthorized modifications such as welding, drilling or cutting, can cause the ROPS/FOPS to fail and increases the risk of injury or death. A damaged ROPS/FOPS cannot be repaired and must be replaced.
- Do not make unauthorized modifications to any part of the machine. Unauthorized modifications to the machine can cause injury or death. The owner is responsible for any safety hazards resulting from unauthorized modifications.
- Manitou Group equipment is designed and intended to be used only with approved attachments. To avoid possible personal injury, equipment damage, and performance problems, use only approved attachments that are within the rated capacity of the machine. Manitou Group cannot be responsible if the machine is used with non-approved attachments. Custom attachments are not supported, recommended, or warranted by Manitou Group for reliability or safety. Contact your dealer or Manitou Group for attachment approval and compatibility information.
- Optional kits are available through your dealer. Please contact Manitou Group for information on attachment compatibility with optional kits.
- Before using the machine, perform a walk-around inspection. Look for damage, loose or missing parts, leaks, and other problems. Fix/repair any problem as required before using the machine.
- Inspect the machine for trash and debris before use. Clean the machine as required. Trash, debris, or any other materials can obstruct machine operation and can be a fire hazard.
- Keep the operator's area, steps, platforms, and hand-holds clean and free of oil, dirt, ice, and unsecured objects.
- Walk around the machine and warn any nearby persons before starting the machine. Do not start the machine until all persons are clearly away from it.
- Check for proper tire pressure in all tires before operating the machine and adjust it if necessary. Improperly and/or unevenly inflated tires adversely affect machine stability.
- Check the tires for damage, deep cuts, abrasions and gouges in the wear surface and sidewalls that may affect tire performance. Do not operate the machine if the tires are worn past their service life.
- Check that the wheel fasteners are properly tightened. Properly torque the wheel fasteners if necessary.
- Know what is underneath the work site before starting to dig. Contact the proper local authorities for utility line locations BEFORE starting to dig. In North America, contact the North American One-Call Referral System at 8-1-1 in the U.S., or 1-888-258-0808 in the U.S. and Canada. Below-ground hazards also include water mains, tunnels and buried foundations.
- Work crew members should observe and monitor terrain and soil conditions at the job site, along with traffic, weather-related hazards, and any above- or below-ground obstacles or hazards:
  - Always check the job site for terrain, above- and below-ground hazards and obstructions, such as water mains, tunnels, and buried foundations.
  - Keep bystanders out of, and away from, the work area. Anyone near the machine is at risk of being injured.
  - Remove all objects from the worksite as required.
- Before working near power lines (above and/or below ground), contact your power utility and make a safety plan.
- Be cautious of dark and wet patches when working or traveling over frozen ground, especially if temperatures are changing.
- Use caution around excavations and/or ditches. Be sure the surface can support the machine and load. Be sure the surrounding ground has adequate strength to support the weight of the machine and the load.
- Use caution on loose ground. Working with heavy loads over loose, soft ground or uneven terrain could cause the machine to tip and could lead to death or serious injury.

- Make sure any installed lighting system is operating properly before using the machine.
- Always keep windows, lights, and mirrors clean. Poor visibility can cause accidents.
- Do not use the machine or start the engine if there is any indication that maintenance/service work is in progress.
- Never use ether or other starting fluids. The machine is equipped with engine preheating, which can detonate ether or other starting fluids. Explosions can cause injury and/or damage.
- Replace all damaged safety decals and a lost or damaged operator's manual. A storage location is provided in the machine for the operator's manual. Always return the operator's manual to the storage location after use.
- Read the operator's manual for each attachment before using the attachment(s).
- Use 3 points of contact when entering or exiting the machine. Always face the machine and use the handholds and steps when getting on and off the machine. Do not jump off the machine.
- Adjust the seat to allow full use of all controls. Never adjust the seat during machine operation.
- Always wear Personal Protective Equipment (PPE) as required for the job and working conditions. Hard hats, goggles, protective shoes, gloves, reflector-type vests, respirators, and ear protection are examples of PPE that may be required.
- Do not wear loose fitting clothing, long hair, jewelry, or loose personal items while operating or servicing the machine.

06.4. During operation

- Only start the engine or operate the controls while seated in the operator's seat.
- Always fasten the seat belt securely and properly. Never operate the machine without the seat belt fastened around the operator and/or any other safety devices in place.
- Always keep your head and appendages inside the operator's station while operating the machine. Shut down the machine before reaching outside the operator's station.
- After starting the machine, check all indicators and displays for normal conditions. Check all controls for proper operation. Listen for abnormal sounds. Remain alert for developing hazardous conditions.
- If the engine stalls for any reason, always turn the ignition key all the way counter-clockwise to the "OFF" position before re-starting the engine.
- Operator visibility is limited in certain areas. Items like ROPS/FOPS posts, attachments, the lift structure, items in the cab, and others can obstruct the operator's view and could mask hazards or people in the area around the machine. It is very important the operator is aware of these masked visibility areas before operating the machine, especially on busy work sites.
- To reduce the hazards posed by masked visibility areas:
- Use caution when raising or lowering attachments; masked visibility areas can change dramatically when attachments and/or the lift structure is moved.
- Look around the machine before operating. Objects near the machine and close to the ground can be difficult to see from the cab.
- Always look in the direction of travel, including reverse. A backup alarm is not a substitute for looking behind you when operating the machine in reverse.
  - Keep bystanders out of and away from the work area.
  - Keep the lift structure as low as possible while traveling.
- Control the machine with extra caution until fully familiar with all the controls and handling. Practice until control is safe and efficient. New operators must learn to operate the machine in an clear area away from other persons. Make sure to comply with any local rules/laws that require certification before operating the machine.
- The loading zone where the lift structure is raised should be level and free of dips, holes, or bumps which would compromise rated capacity and machine stability.
-

- Always be aware of load weights prior to operating the machine. Do not exceed the machine's rated operating capacity, including the type and weight of the attachment. Study any load chart or other capacity information provided with or on the machine to understand capacity under all working conditions. Be aware that capacity may be reduced when the machine is turned or in other circumstances.
- Do not raise or drop a loaded bucket or attachment suddenly. Abrupt movements under load can cause serious instability.
- Do not raise the lift structure so the lift cylinder slams against the extension limit. The resulting jolt could spill the load.
- The wheelbase of the machine changes when the steering wheel is turned. Tight turns reduce the wheel-base, rated capacity and machine stability. Additionally, rated capacity and stability are further compromised when:
  - Raising a load.
  - When the machine is not laterally level.
  - And/or when the travel drive is in operation.
- Do not use the machine to transport people. Never use the machine as a lift for personnel. Never carry riders. Do not allow others to ride on the machine or attachments, because they could fall or cause an accident.
- Do not leave the operator's station without first lowering the lift structure to the ground or engaging the lift structure support device. When the lift structure is lowered or supported, stop the engine. Remove the ignition key before leaving the operator's station.
- Do not allow anyone under a raised lift structure without the lift structure support device engaged. A lowering lift structure or a falling load can result in death or serious personal injury.
- Stop the machine and place the controls in the neutral position before fastening attachments. Make sure that attachments are securely fastened to the lift structure before using them.
- Be aware that attachments affect the handling and balance of the machine. Adjust the operation of the machine as necessary when using attachments.
- Before coupling or uncoupling the hydraulic lines for the attachment, stop the machine and relieve the pressure in the auxiliary hydraulics circuit.
- Make sure the attachment is lowered to the ground before activating the lift structure float. Never activate the float function with the attachment raised, because this will cause the lift structure and attachment to drop suddenly.
- Be aware of overhead obstacles. Overhead objects near the lift structure present potential hazards. Use a spotter or signal person when working near bridges, electrical or phone lines, work site scaffolds, or other obstructions.
- Do not place limbs near moving parts or severe personal injury could result.
- Do not run the engine in/near enclosed areas without providing proper ventilation for the exhaust. Exhaust gases contain carbon monoxide, an odorless and deadly gas.
- Avoid slowing suddenly while carrying a load. Sudden slowing can cause the load to fall off the attachment, or cause the machine to tip over.
- Use a signal person if you cannot see the entire work area clearly, in high traffic areas, or whenever the operator's view is not clear.
- Stay alert for people moving through the work area. When loading a truck, the operator should always know where the driver is.
- Exposed hydraulic hoses could react with explosive force if struck by falling or overhead items. Never allow hoses to be hit, bent or interfered with during operation. Extra guards may be required. Replace any damaged hoses.
- If equipped, always activate ride control when traveling on public roads, long distances, or on uneven terrain. When activated, ride control helps to prevent the load from bouncing, which may cause instability.

- Do not move the lift structure or attachment during travel. If equipped, use the lockout button to deactivate the lift and tilt during transport.
- Do not use the machine in an environment where the hot components of the machine could present a fire hazard, such as hay or straw storage facilities.
- To avoid being thrown forward, do not drive into materials at high speeds. Injury could result.
- Constant speed and the 3-speed high-speed range should only be used for transport on roads with flat, level surfaces. Never carry loads or elevate the lift structure when using constant speed. Keep the lift structure as low as possible.
- Do not turn off the ignition switch while traveling. Turning off the ignition applies the brake, which may cause loss of control, injury and/or tipping of the machine.
- Reduce speed before shifting from high to low travel speed. Down-shifting from high- to low-speed drive while traveling at high-speed may cause the machine to tip and can cause injury, loss of control and damage to the machine.
- Keep bystanders out of, and away from, the work area. Anyone near the machine is at risk of being injured.
- Do not open the engine hood while the engine is running unless specifically instructed for Manitou Group-approved service.
- In cold weather, avoid sudden travel movements and stay away from even slight slopes. The machine can slide sideways on icy slopes.
- Snow accumulation can hide potential hazards. Use care while operating in or clearing snow.
- If the machine becomes damaged or malfunctions, stop the machine immediately and lock and tag it. Repair the damage or malfunction before operating the machine again.
- Never travel over obstacles or slopes that will cause the machine to tilt severely. Travel around any slope or obstacle that would cause a tilt greater than 10°.
- When on slopes, keep the heavy end of the machine pointed uphill whenever possible.
- Avoid sharp turns and high speeds while carrying loads, especially on slopes. The stability of the machine is reduced during sharp turns, and the load may shift, greatly increasing the possibility of a rollover.

06.5. Provision for Stability/Avoiding Rollover and Tipover Accidents

IMPORTANT: ALSO REFER TO "ARTICULATED LOADER STABILITY".

- Machine stability and capacity are affected by the:
  - Load being carried.
  - Height of the load.
  - Machine speed.
  - Turn angle.
  - Width of the machine across the tires.
  - Abrupt control movements.
  - Driving over uneven and/or un-level terrain.
  - Operation on out-of-level (laterally) ground.
  - Tight turns reducing wheelbase.
  - Combinations of the factors above.

DISREGARDING ANY OF THESE FACTORS CAN CAUSE THE MACHINE TO TIP OR CAN THROW THE OPERATOR OUT OF THE SEAT OR MACHINE, WHICH COULD RESULT IN DEATH OR SERIOUS INJURY. OPERATORS MUST ASSESS THESE VARIABLES APPROPRIATELY TO ASSURE SAFE, STABLE OPERATION.

- The machine is most stable in the straight position (0° turn). The load rating decreases as the steering angle is increased. A 45° maximum turn is the lowest load capacity position.
- To avoid tipping, travel with the load/attachment as low as possible during transport and while turning. Observe the minimum ground clearance. Keep the bottom of the load no higher than wheel axle height during transport and turning.
- Operate the controls smoothly to prevent jerking and bouncing.
- Raise the lift structure only on level (laterally) ground.
- Be sure the surface can support the machine and load. Use extra care on loose ground. Working with heavy loads over loose, soft ground or uneven terrain can cause the machine to tip and could lead to death or serious injury. Traveling with a suspended load or an unbalanced load can also be hazardous.
- Be sure the surrounding ground has adequate strength to support the weight of the machine and the load. Stay away from:
  - Ditches.
  - Overhangs.
  - Weak support surfaces.
  - Loading dock edges.
  - Ramps.
  - Excavations.
  - Retaining walls.
  - Trenches.
- To cross railroad tracks, ditches, curbs or similar surfaces, cross perpendicular to the obstacle and drive slowly.
- Never travel over obstacles or slopes that will cause the machine to tilt severely. Travel around any slope or obstacle that would cause a tilt greater than 10°.
- Avoid sharp turns and high speeds while carrying loads, especially on slopes. The stability of the machine is reduced during sharp turns, and the load may shift, greatly increasing the possibility of a rollover.
- When unloading trucks or raising loads off elevated surfaces, approach the load straight ahead and back straight away with the load.
- Load and unload only on solid, level ground. Rated capacity and stability specifications are

based upon operation on a level surface.

- Maintain visibility with the attachment/load at all times.
- Do not try to exit the machine if tipping occurs. Trying to escape from a tipping machine can result in death or serious personal injury. If the machine becomes unstable and starts to tip, keep the seat belt fastened, hold on firmly and brace yourself. Lean away from the point of impact and stay with the machine. The machine is equipped with rollover protection, which can only protect the operator if they are in the operator's seat.
- Any damage or serious impact to the ROPS/FOPS requires ROPS/FOPS replacement. The ROPS/FOPS must be replaced if an rollover incident occurs. The protection offered by the ROPS/FOPS will be impaired if it has been damaged in a rollover incident.

■ Articulated Loader Stability

The articulated (pivot-frame) design of the machine allows sharper turning and increased traction. With this design however, individual or combined conditions can effect the stability of the machine.

To avoid overturn accidents, it is important to understand and recognize conditions that may decrease stability. Be aware of operating conditions and consider all factors before operating the machine and handling loads.

■ Effect of Articulation (Turning) on Stability

When an articulated loader is straight (not turned) (A, Fig. 1) and is on a flat, smooth surface, the stability of the machine is similar to non-articulating loaders where loads are carried over the center mass of the machine. Loads are supported between the four wheels, with the widest base of support. In this condition, loads are less likely to tip the machine to either side.

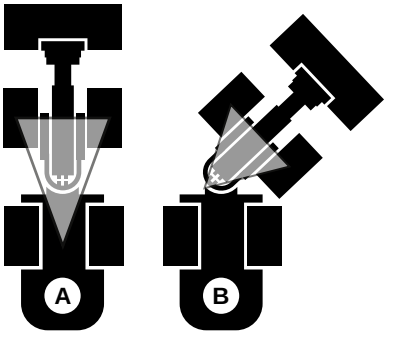


Fig. 1: Effect of articulation

As an articulated loader is turned (B), loads are shifted forward away from the center of the machine toward the articulation joint. This shrinks the support base and changes it to be more triangular in shape, decreasing stability.

Additionally, as an articulated loader is turned, the load center shifts from the center of the machine to the side. As the load center moves from the center of the support base, the potential for an overturn accident increases.

■ **Effect of Uneven or Unstable Ground on Stability**

Articulated loaders offer increased traction on uneven surfaces (G, Fig. 2) because the tires follow the contours of the ground. However, the load center can shift (H) when the wheels are not contacting the ground along the same plane, which reduces stability.

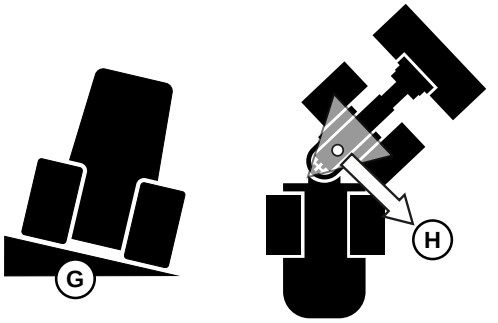


Fig. 2: Effect of uneven ground

To avoid overturn accidents, only load or unload the machine on a firm, level surface. Follow all precautions when traveling with a load, and consider all operating conditions when operating the machine on uneven, unstable, or inclined ground.

■ **Effect of Machine Travel on Stability**

Turning the machine (I, Fig. 3) while traveling shifts the load center in a direction opposite the turn. Load center movement increases with sharper turns and higher travel speeds. To avoid overturn accidents, follow all precautions when traveling with a load. Carry the load close to the ground. Consider load stability and all operating conditions before operating the machine and traveling with a load.

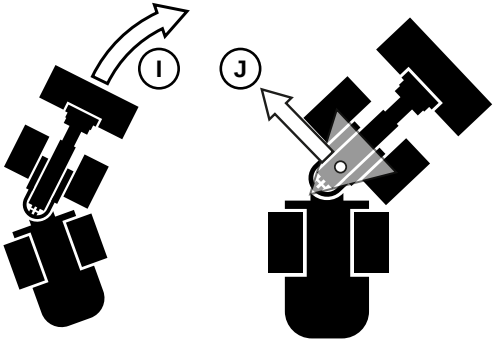


Fig. 3: Effect of movement

■ **Effect of Load Movement on Stability**

If the load shifts or moves, the load center moves as well. If the load rocks or swings, the load center will move back and forth as well. To avoid overturn accidents, keep the load stable. Make sure that materials will not shift, and avoid sudden changes in direction that could cause a load to become unstable or swing. Consider load stability and all operating conditions before moving a load.

06.6. Applications with Load-Handling Devices

- Specific procedures and precautions may be required, when using load-handling devices (e.g., slings, chains) for transporting and placing loads:
  - Only use the machine with load-handling and safety devices properly in place.
  - The load must be secured to prevent falling or slipping.
  - Persons guiding the load must stay in visual contact with the operator.
  - The operator must guide the load to the ground while avoiding any rotating, swinging, or unnecessary movements. Tag lines may be required.
  - Avoid moving the machine with a raised load if the path of the machine is not sufficiently level to allow for safe control of the machine and/or load.
  - Persons securing loads may only approach the machine from the side, so the persons are visible to the operator.
  - The operator must give permission before persons may approach the load. The operator may only give permission after the machine and the attachment are stationary.
  - Do not use any load-handling devices that are damaged or of inadequate rated capacity.
  - Lifting and lowering pipes, culverts, or other containers may require a spotter and/or additional assistant.

06.7. Parking the machine

- Park the machine according to local parking rules on a firm, level surface away from:
  - Traffic.
  - High walls.
  - Drop-offs.
  - Areas of potential water accumulation or runoff.
  - Areas of potential high winds.
- If it is necessary to park on a slope, park across the slope. Block/chock the tires, if equipped.
- To avoid collisions while parking on streets, use clearly visible safety devices such as barriers, caution signs, and lights so the machine can be easily seen at night.
- After parking properly, shut down the machine according to the “Mandatory Safety Shutdown Procedure” on page. 26.

06.8. Electrical Energy

- Stay away from high-voltage electric lines and avoid contact with any electrically charged conductor or gas line. Contact or being close to high-voltage electric lines can cause electrocution. The machine does not have to make physical contact with power lines for current to be transmitted. Refer to the following table for information about safe distances from electrical sources. Depending on atmospheric conditions, such as rainy weather, larger safe operating distances will be needed. Use a spotter and hand signals when near power lines not clearly visible to the operator.

- **Table 1: Electrical Energy Safe Distances (CFR 1910.269)**

Rated voltage	Safe distance
50 < U < 1000	2300 mm (91”)
1000 < U < 30000	2500 mm (99”)
30000 < U < 45000	2600 mm (103”)
45000 < U < 63000	2800 mm (111”)
63000 < U < 90000	3000 mm (119”)
90000 < U < 150000	3400 mm (134”)
150000 < U < 225000	4000 mm (158”)
225000 < U < 400000	5300 mm (209”)
400000 < U < 750000	7900 mm (311”)

- Do the following if the machine comes into contact with a live wire:
  - Do not leave the machine.
  - If possible, drive the machine out of the danger area.
  - Warn others not to approach or touch the machine.
  - Have the power to the live wire turned off.
  - Do not leave the machine until power to the live wire has been safely turned off.
- Only trained technicians should work on the machine’s electrical system.
- Inspect electrical components at regular intervals. Turn off the machine immediately if any problems are found, such as loose connections or scorched cables. Repair any problems found before starting the machine.
- Only use original equipment (OEM) electrical components, such as fuses and circuit breakers, with the correct specifications.

06.9. Maintenance and Service Safety Practices

- Only properly trained personnel with full awareness of safe procedures should perform maintenance or service on the machine. Certification may be required in certain circumstances.
- Use warning tag/control lockout procedures during service. Alert others with warning notices and/or by tagging the operator’s controls and/or other machine areas if required.
- Use solid support blocking. Never rely on jacks or other unsafe supports. Never work under any equipment supported only by jacks.
- Do not use the lift structure or any other machine component to support the machine for maintenance or service.
- Never allow anyone under the raised lift structure and do not exit the machine if the lift structure is raised unless the lift structure support is properly applied. Disconnecting or loosening any hydraulic connections, parts failure, and hydraulic pressure venting all can cause the lift structure to drop.
- Never bypass the key switch to start the machine. Use the proper jump-starting procedure.

- Do not search for fluid leaks using your hands. Use a piece of paper or cardboard. Escaping fluid under pressure can be invisible, cause serious burns, can penetrate the skin and cause serious injury. Injected fluid must be surgically removed by a doctor or gangrene may result. If any fluid is injected into your skin, seek medical attention immediately.
- Always wear safety glasses with side shields when striking metal against metal. In addition, it is recommended that a softer (chip-resistant) material be used to cushion the blow, otherwise, serious injury to the eyes or other parts of the body could result.
- Use care when seating retainer pins—retainer pins can fly out or splinter when struck and could cause injury.
- Do not smoke while filling the fuel tank, or when maintaining or servicing the machine. Do not smoke near charging batteries. Keep spark- or flame-producing equipment or materials away.
- Stay away from hydraulic components that have been in recent operation. Do not loosen or disconnect any hydraulic components without first relieving hydraulic circuit pressure. To relieve hydraulic pressure, perform the “Mandatory Safety Shutdown Procedure” on Page 18.
- Do not work on hot components. Severe burns can result. Wait for the components to cool. When the engine lube oil, gearbox lubricant, or other fluids require maintenance/service, wait for fluid temperatures to cool. Do not remove the radiator cap after the engine has reached operating temperature. At operating temperature, engine coolant is extremely hot and under pressure.
- Always use the correct parts and the proper fastener torques. Incorrect fastener connections can cause a dangerous condition.
- There should always be at least 2 people present if the machine must be moving/running to perform the procedure. All persons must maintain visual contact with each other. Keep a safe distance away from all rotating and moving parts.
- Always use proper attachments while working on the machine. Inappropriate attachments could break or slip, causing injury.
- Do not open the engine hood while the engine is running unless specifically instructed for Manitou Group-approved service.
- Do not postpone scheduled maintenance. Postponing scheduled maintenance can cause unsafe operating conditions. Postponing scheduled maintenance can also significantly reduce machine service life and cause serious and costly equipment failures.
- Only tow the machine as described in this manual.
- Dispose of all oils and fluids properly. Used oils/fluids are environmental contaminants and may only be disposed of at approved collection facilities. Never drain or dispose of any oils/fluids onto the ground, in public waste collection containers, or in sewer systems or landfills. Check local regulations for other requirements.
- Safety equipment must be maintained in good condition.
- Safety-critical parts must be periodically replaced. Replace the following potentially fire-related components as soon as they begin to show signs of deterioration:
  - Fuel system components, such as hoses, fuel tank overflow drain hose, and the fuel filler cap.
  - Hydraulic system hoses, especially the pump outlet lines. Replace hydraulic hoses every 6 years from the date of manufacture, even if they do not appear damaged. The date of manufacture (month or quarter and year) is indicated on the hydraulic hoses.
- Keep connections and mounting straps tight. Hose routings should have gradual bends.
- After cleaning the machine, examine all fuel, lubricant, and hydraulic oil lines for leaks, chafe marks, and damage. Tighten any loose connections and repair or replace parts as necessary.
- Tubes, hoses, wires, and cables must be routed and connected properly.
- When handling oil, grease, and other chemical agents, carefully follow the product-related safety requirements listed in the Material Safety Data Sheet (MSDS).
- When washing the machine using water, do not direct the water onto electrical connections or electronic components. Water may cause malfunction or damage. Power washing or other high-pressure jets may cause physical damage.

06.10. Battery Hazards

- Before performing electrical service or arc welding on the machine, disconnect the battery.
- Do not turn on the machine when the battery fluid is below the minimum level. An explosion or rupture could result.
- Turn off all electrical equipment before connecting leads to the battery, including electrical switches on the battery charger or jump-starting equipment.
- When disconnecting the battery, remove the negative terminal cable first. When connecting the battery, connect the positive terminal cable first.
- When jump-starting, wear safety glasses or goggles when connecting cables. Connect the positive (+) cable first when installing jumper cables. Connect the negative (-) cable to chassis of the machine being jump-started as far from the discharged battery as possible. Disconnect the negative (-) cable first when removing jumper cables. Do not allow the machines to touch when jump-starting.
- Sparks, open flames, and static discharge can ignite explosive battery gas. To prevent sparks, before working on the battery:
  - Turn off all switches and the engine.
  - Make sure battery terminals are tight.
  - Avoid contacting the battery terminals with metal objects.
- Never jump-start a machine with a frozen battery. The battery could explode. Thaw a frozen battery before charging it or attaching jumper cables.
- Avoid contact with battery acid. If battery acid comes in contact with your eyes, thoroughly rinse your eyes with clean water for 10-15 minutes and seek medical assistance. If battery acid is swallowed, immediately seek medical assistance. In the United States, call the Poison Control Center at 1-800-222-1222.

06.11. Fire Hazards

- Clean the machine regularly to avoid the buildup of flammable debris, such as leaves and straw. Dirt/debris, particularly in the engine compartment, creates a fire hazard.
- Avoid circumstances where explosive dust or gases can be ignited by open flame, arcs, sparks, or heat. If damaged or not properly maintained, the electrical system can arc or produce sparks.
- A 2.27 kg (5 lb.) or larger multi-purpose “A/B/C” fire extinguisher should be mounted in the cab. Check the fire extinguisher periodically according to the manufacturer's instructions and local regulations. Make sure that work crew members are trained to use it properly.
- Add all fluids to the machine only in a well-ventilated area. Turn off the engine, park the machine with switches turned off, and allow the machine to cool before performing service checks.
- Add fuel to the machine only in a well-ventilated area. Turn off the engine and park the machine with switches turned off before refueling.
- Do not smoke while filling the fuel tank, or when maintaining or servicing the machine. Do not smoke near charging batteries. Keep spark- or flame-producing equipment or materials away.
- Replace the fuel filler cap immediately after refueling. Keep fuel and other fluid reservoir caps tight. Do not start the engine until all caps have been secured.
- Avoid spilling combustible fluids, such as oil or fuel, on a hot engine.
- Static electricity can produce dangerous sparks at the fuel-filling nozzle. Do not wear polyester, or polyester-blend clothing while fueling. Before fueling, touch the metal surface of the machine away from the fuel fill to dissipate any built-up static electricity. Do not re-enter the machine and stay near the fuel filling point during refueling to minimize the build-up of static electricity. Do not use cell phones while fueling. If refueling from a fuel truck, make sure the static line is connected from the machine to the fuel truck before fueling begins.
- Ultra-Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations. Avoid death or serious injury from fire or explosion. Make sure the entire fuel delivery system is in compliance with fueling standards for proper grounding and bonding practices.
- Oil from leaks can ignite on hot components. Repair any damaged or leaking components before using the machine.

06.12. Additional Safety Equipment

- Certain uses of the machine may require additional safety equipment. Examine the worksite for hazards and provide safety equipment as required to protect against those hazards.
- Contact your dealer for available safety guards if there is any risk of objects striking the operator’s cab. Laminated glass or polycarbonate protection for the front, side or rear windows may need to be installed on the machine, depending upon particular work conditions.

06.13. Crystalline Silica Exposure

- Exposure to crystalline silica (found in sand, soil and rocks) has been associated with silicosis, a debilitating and often fatal lung disease. Comply with all applicable rules and regulations for the workplace. Wear approved respiratory protection or use water spray or other means if there is no other way to control the dust.
- A Silica rule “29 CFR 1929.1153" by the U.S. Occupational Safety and Health (OSHA) indicates a significant risk of chronic silicosis for workers exposed to inhaled crystalline silica over a working lifetime. Refer to the rule for more information regarding exposure limits and hazard prevention.

06.14. Transporting the machine

- Obey federal, state, and local over-the-road regulations. Check restrictions regarding weight, height, width, and length of a load. The hauling vehicle, trailer, and load must all be in compliance with applicable regulations.

06.15. Raising the Machine with a Crane

Only raise the machine according to the following guidelines:

- The crane and rigging equipment must have sufficient capacity.
- Secure the machine against unintentional movement. Use taglines as needed.
- Do not raise the machine with persons on or in the machine.
- Any person guiding the crane operator must be within sight or sound of the crane operator.
- Raise the machine only with the standard bucket installed, with the bucket empty and as low as possible.
- Persons must stay clear of, and not under, the machine when it is raised.
- Fasten the rigging equipment so the machine is horizontal when it is raised.
- Do not raise the machine by the cab. Attach the rigging equipment only at the lift points identified by this symbol:

06.16. Loading and Transporting the Machine

- Load and transport the machine according to the instructions given in this manual.
- The transport vehicle must support the weight, height, width, and length of the machine.
- Remove dirt, snow, or ice from the tires or tracks on the machine and from the loading ramps and transport platform to prevent slipping.
- Secure the machine to the transport vehicle according to the instructions given in this manual to prevent unintentional movement.

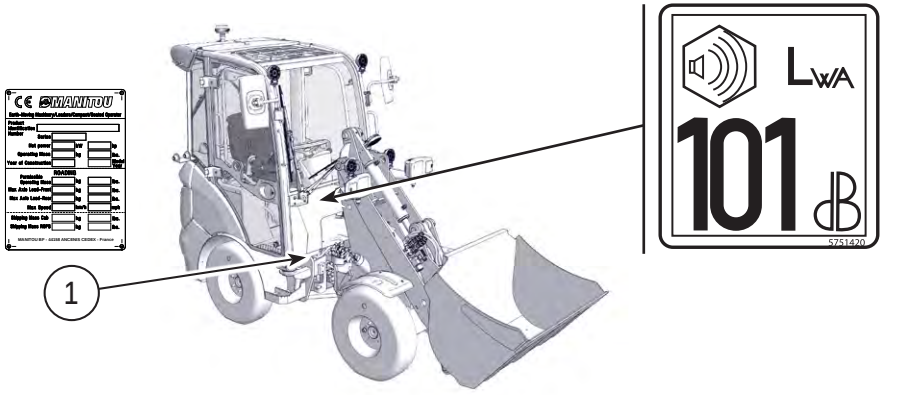
06.17. Safety Decals

- Decals on the machine provide safety information and warn of hazards at areas on and around the machine.
- Warning and safety decals must be legible. Any missing or illegible decals must be replaced promptly. Obtain replacements from your authorized dealer. Refer to the Parts Manual for decal part numbers and ordering information.
- **New Decal Application**
  - Before applying the decal, clean the surface where the decal will be applied. Refer to the following pages for proper decal locations.
  - If a part that must be replaced has a safety decal, the replacement part must have the same safety decal applied.

- The wheeled loader is made up of a rear undercarriage and a front undercarriage fitted with a loading arm. It is designed exclusively for work corresponding to the operation of the loader and its attachment. These operations include:.
  - Collection.
  - The movement and discharge of soil, gravel and bulk materials, as well as loading them onto trucks, conveyors or other transportation equipment.
  - For other appropriate work, special attachments (such as multi-service buckets, push brooms, pallet carriers etc.) can be fitted onto the wheeled loader, subject to the necessary provisions for their use.
- A central articulation between the two undercarriages allows the machine to make sharp turns and the four wheels to adapt to irregularities in the ground.
- The movement of the machine is provided by:
  - MLA 2-25 H:
    - Two travel hydraulic motors at the front.
    - Two travel hydraulic motors fitted with low-pressure brakes on the rear section (parking brake).
  - MLA 3-25 H / MLA 3-25 H-C / MLA 4-50 H / MLA 4-50 H-C / MLA 5-50 H:
    - One front axle fitted with a drum brake actioned by a cable (parking brake) and hydraulically (service brake).
    - One rear axle fitted with a transfer box connected to the travel hydraulic motor.
    - The transmission is the permanent 4x4 type with differential lock on the two axles as an option.
- The rear undercarriage is fitted with a water-cooled 3 in-line cylinder motor. It drives:
  - One travel pump (apart from MLA 2-25 H), coupled in closed circuit with a variable displacement motor, together forming the hydrostatic transmission.
  - One fixed displacement pump (Movement of the arm cylinders, control of steering and associated functions).
  - The cooling fan.
  - The air conditioning compressor (option).
- The loader is fitted with a protective structure against rollover and falling objects (canopy) and, as an option, a monocoque cab with sound insulation and heating. It includes:
  - The control levers for moving the machine.
  - A dashboard with the operating information and the warning and safety lights.
  - The controls incorporated into the seat consoles.
  - A suspended, damped seat, height-adjustable and adjustable longitudinally.
  - Cab heat (cab option).
  - Air conditioning (cab option).
- The loader arm is operated via joysticks that combine movements smoothly and efficiently. It is placed in the axis of the machine.
  - At the end of the arm is the quick coupler enabling the bucket or attachment to be changed.

Fig. A2

MLA 2-25 H



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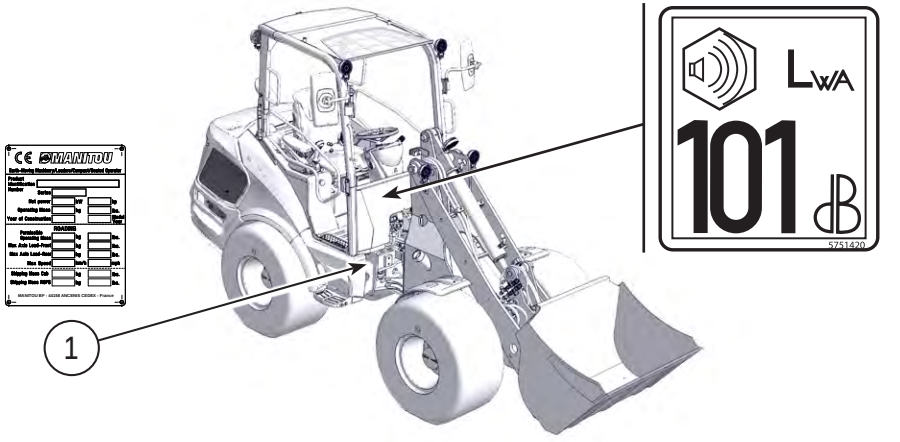

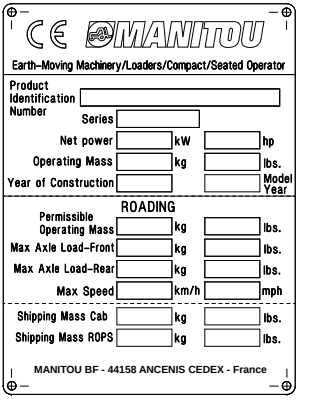

Fig. A3

■ **Manufacturer's identification plate**

- Type.
- Serial number.
- Year of manufacture.

Shown on a plate fixed on the undercarriage.

In order to obtain maximum efficiency from our after-sales service and to facilitate ordering, please provide the information on the manufacturer's identification plate, see above.

■ **Anti-theft marking PIN code**

■ **Acoustic characteristics**

The machine meets the acoustic standards in force in the EEC.
These acoustic characteristics indicate:

- The maximum permitted acoustic power level in dB (**A**).
- The Lwa sticker on the outside front left of the cab indicates the machine's approved acoustic power.

IT IS STRICTLY PROHIBITED TO CARRY OUT MODIFICATIONS ON THE MACHINE WHICH WOULD CAUSE AN INCREASE IN NOISE EMISSIONS.

USING THE MACHINE WITH THE COVERS OPEN IS PROHIBITED.

■ **ROPS and FOPS approval plate**

The machine meets the standards concerning operator protection:

- Rollover: ROPS (Rollover Protection System).
- Protection against falling objects: FOPS (Falling Object Protection System).

Certification that the cab is fitted with an upper and front protective structure, designed to leave an acceptable deformation volume around the operator in the event of a roll-over or falling objects.
Sticker on the upper pillar on the door side, inside the driver's compartment.

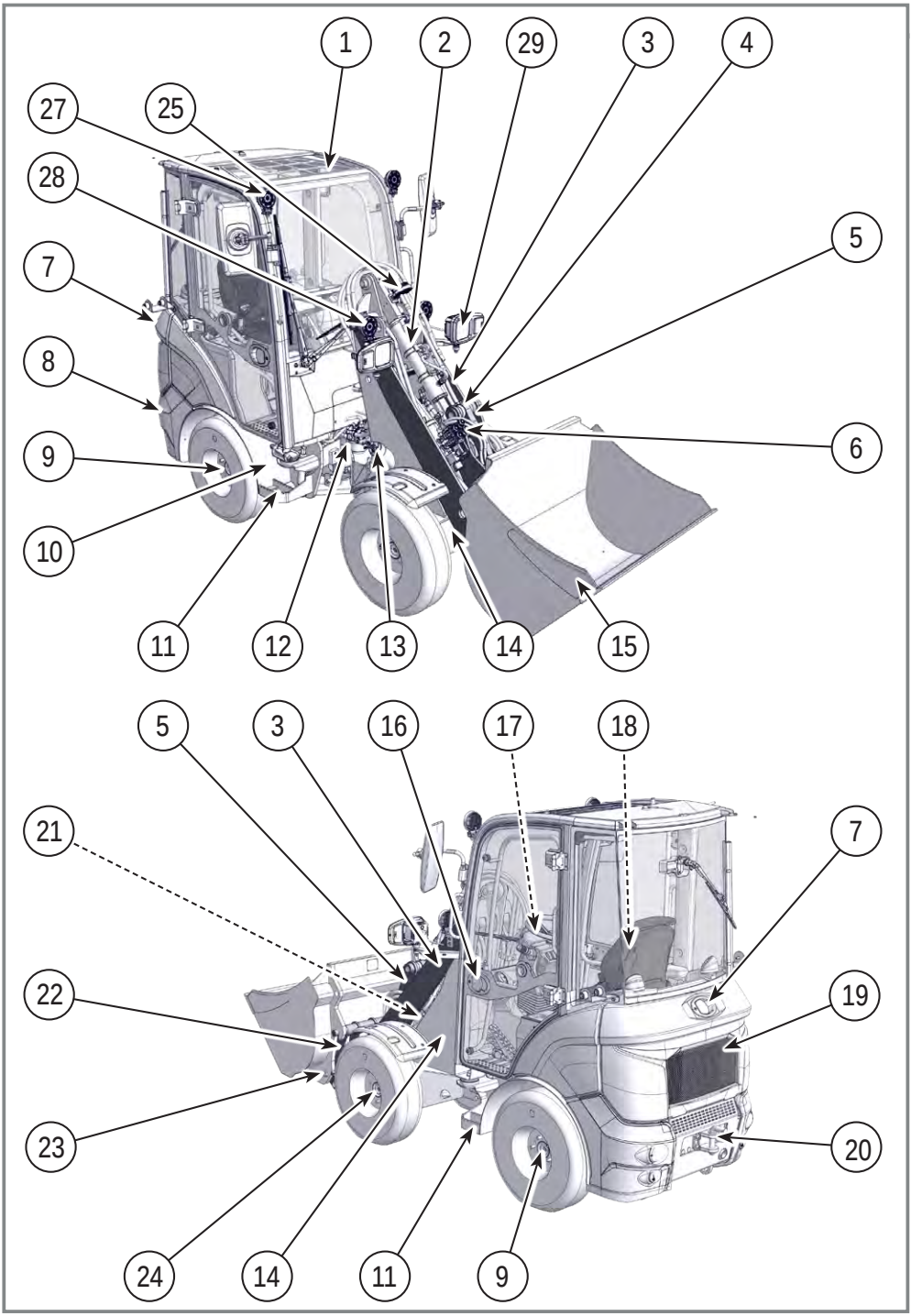
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Fig. A4

09.1. MLA 2-25 H

09.1.1. Cab version (option)

1- Cab
2- Tilt cylinder
3- Arm
4- Counter shaft connecting rod
5- Tilt connecting rod
6- Quick connectors for hydraulic attachments
7- Engine cover
8- Counterweight
9- Rear travel motors with low-pressure parking brake
10- Rear undercarriage
11- Step
12- Undercarriage articulated joint
13- Fuel tank
14- Front undercarriage
15- Tool (standard bucket shown)
16- Glazed door
17- Dashboard and steering wheel
18- Seat
19- Exterior protective grille for the radiator
20- Coupling hook (option)
21- Arm cylinder
22- Quick coupler
23- Quick coupler locking cylinder
24- Front travel motors
25- Front working lights on arm (option)
26- Rear working lights (option)
27- Front working lights (option)
28- Light on arm (option)
29- Headlights (option)

09.1. MLA 2-25 H (continued)

09.1.2. Canopy version

1- Canopy
2- Tilt cylinder
3- Arm
4- Counter shaft connecting rod
5- Tilt connecting rod
6- Quick connectors for hydraulic attachments
7- Engine cover
8- Counterweight
9- Rear travel motors with low-pressure parking brake
10- Rear undercarriage
11- Step
12- Undercarriage articulated joint
13- Fuel tank
14- Front undercarriage
15- Tool (standard bucket shown)
16- Glazed door
17- Dashboard and steering wheel
18- Seat
19- Exterior protective grille for the radiator
20- Coupling hook (option)
21- Arm cylinder
22- Quick coupler
23- Quick coupler locking cylinder
24- Front travel motors
25- Front working lights on arm (option)
26- Rear working lights (option)
27- Front working lights (option)
28- Light on arm (option)
29- Headlights (option)

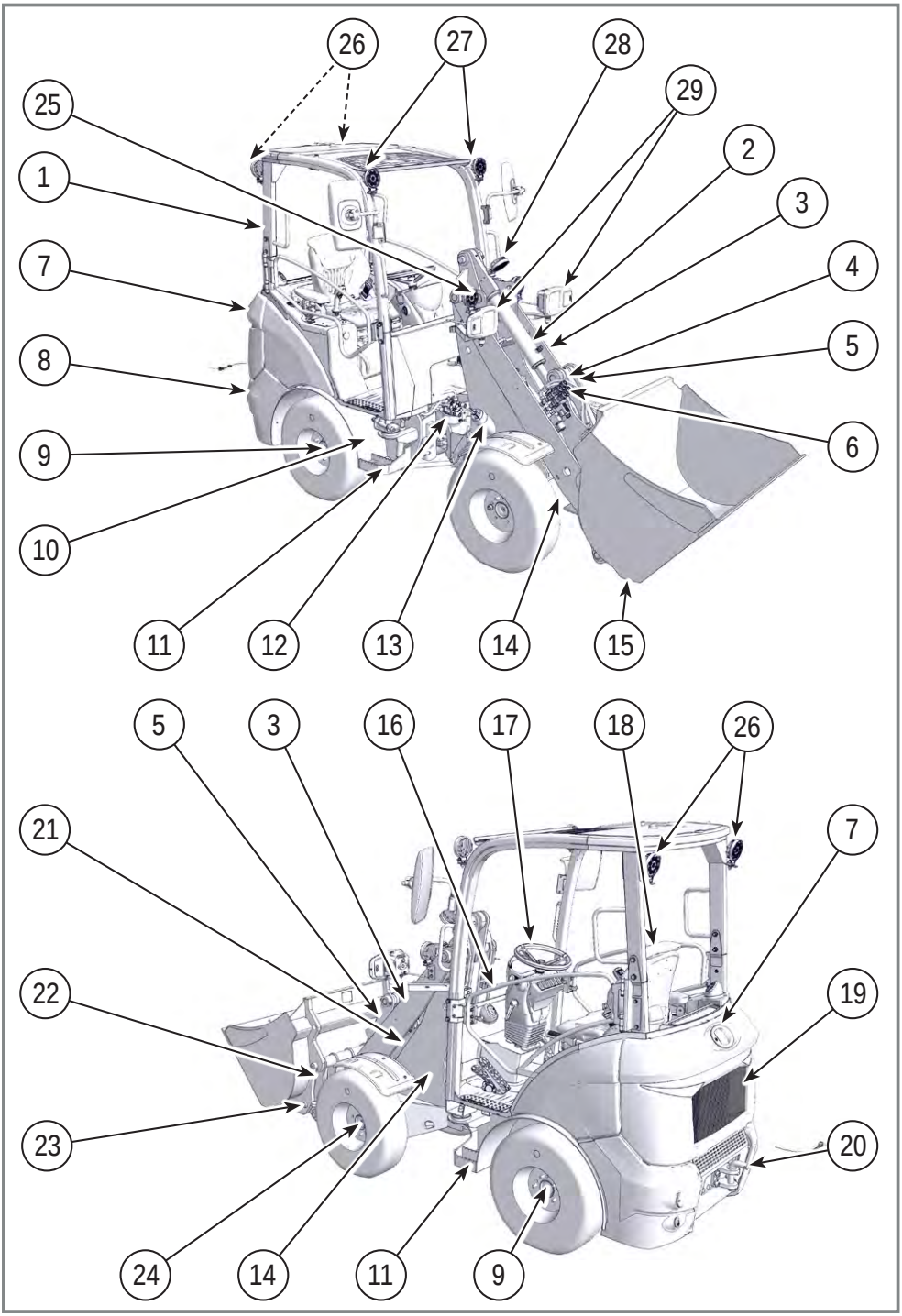
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Fig. A5

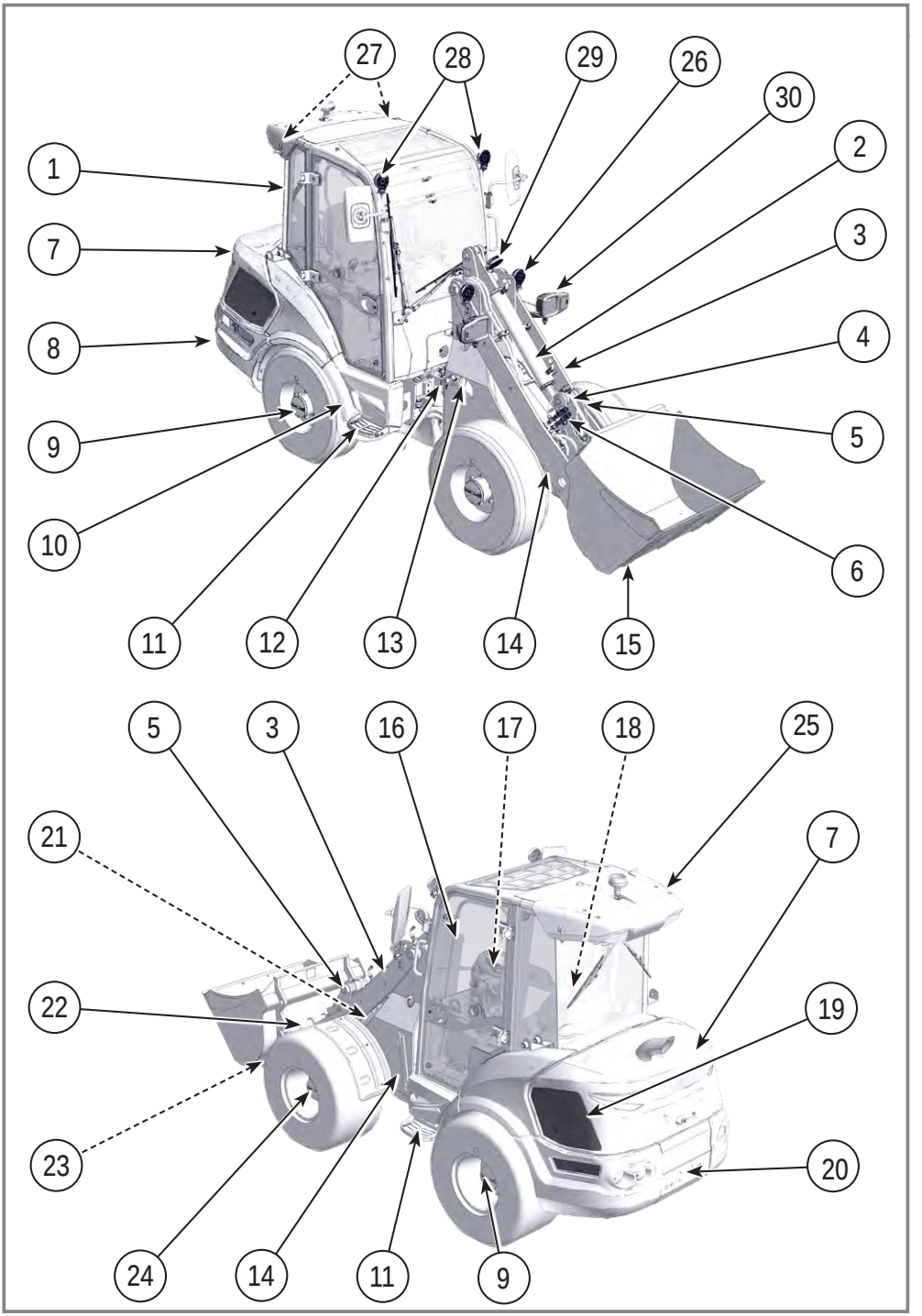
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Fig. A6

09.2. MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H

09.2.1. Cab version (option)

1- Cab
2- Tilt cylinder
3- Arm
4- Counter shaft connecting rod
5- Tilt connecting rod
6- Quick connectors for hydraulic attachments
7- Engine cover
8- Counterweight
9- Rear axle
10- Rear undercarriage
11- Step
12- Undercarriage articulated joint
13- Fuel tank
14- Front undercarriage
15- Tool (standard bucket shown)
16- Glazed door
17- Dashboard and steering wheel
18- Seat
19- Exterior protective grille for the radiator
20- Coupling hook (option)
21- Arm cylinder
22- Quick coupler
23- Quick coupler locking cylinder
24- Front axle with drum brake
25- Air conditioning condenser (option)
26- Front working lights on arm (option)
27- Rear working lights (option)
28- Front working lights (option)
29- Light on arm (option)
30- Headlights (option)

09.2. MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H (continued)

09.2.2. Canopy version

1- Canopy
2- Tilt cylinder
3- Arm
4- Counter shaft connecting rod
5- Tilt connecting rod
6- Quick connectors for hydraulic attachments
7- Engine cover
8- Counterweight
9- Rear axle
10- Rear undercarriage
11- Step
12- Undercarriage articulated joint
13- Fuel tank
14- Front undercarriage
15- Tool (standard bucket shown)
16- Protective barrier (Canopy version)
17- Dashboard and steering wheel
18- Seat
19- Exterior protective grille for the radiator
20- Coupling hook (option)
21- Arm cylinder
22- Quick coupler
23- Quick coupler locking cylinder
24- Front axle with drum brake
25- Front working lights on arm (option)
26- Rear working lights (option)
27- Front working lights (option)
28- Light on arm (option)
29- Headlights (option)

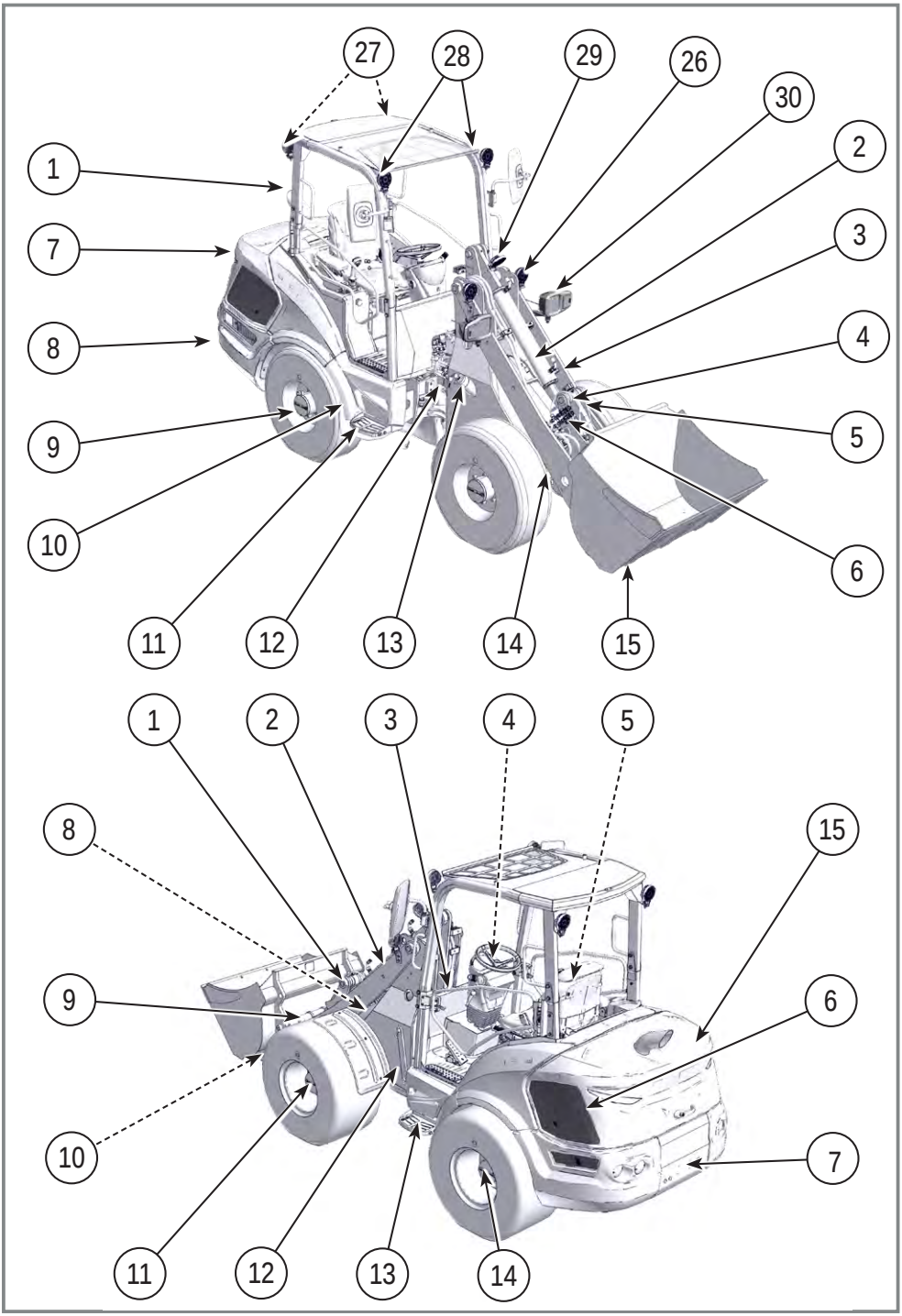
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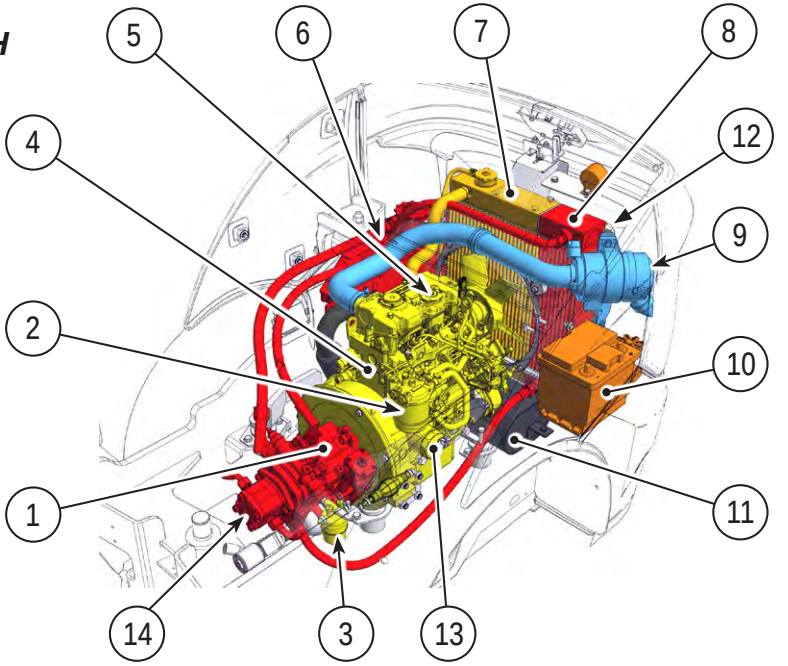
Fig. A7

MLA 2-25 H



MLA 5-50 H

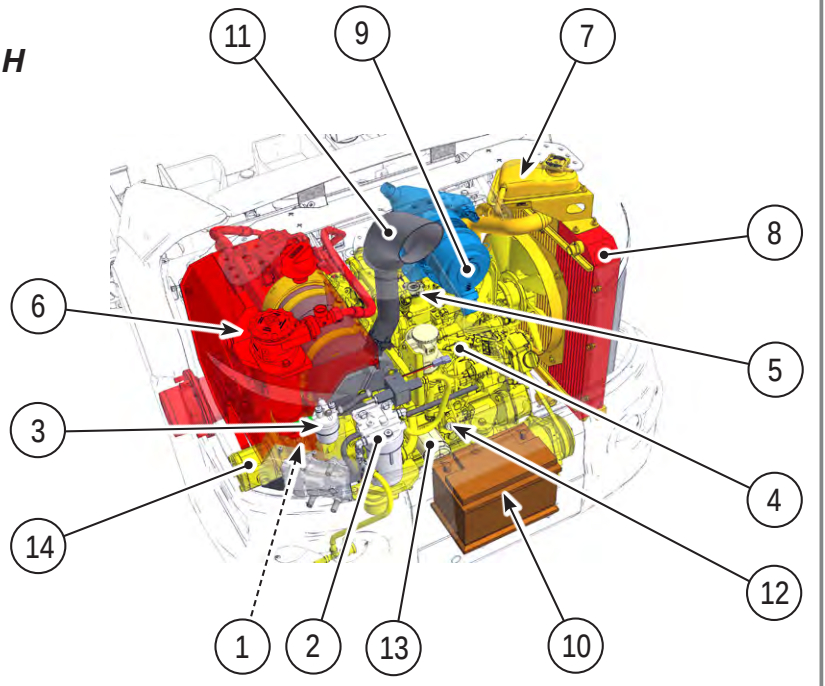


Fig. A8

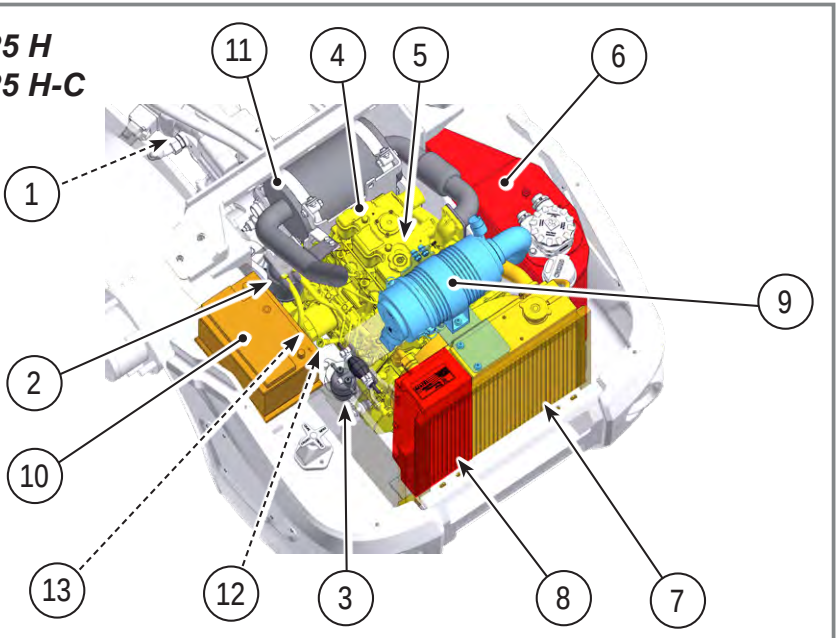
09.3. Internal machine components (MLA 2-25 H / MLA 5-50 H)

1- Hydrostatic travel pump
2- Diesel filter
3- Diesel pre-filter
4- Engine assembly
5- Engine oil filling
6- Hydraulic tank
7- Engine water cooling circuit
8- Hydraulic system cooling
9- Air filter
10- Battery
11- Exhaust pipe
12- Engine oil level dipstick
13- Oil filter
14- Attachment pump

09.4. Internal machine components (MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H)

1- Attachment pump and hydraulic travel pump
2- Diesel filter
3- Diesel pre-filter
4- Engine assembly
5- Engine oil filling
6- Hydraulic tank
7- Engine water cooling circuit
8- Hydraulic system cooling
9- Air filter
10- Battery
11- Exhaust pipe
12- Oil level
13- Oil filter

MLA 3-25 H
MLA 3-25 H-C



MLA 4-50 H
MLA 4-50 H-C

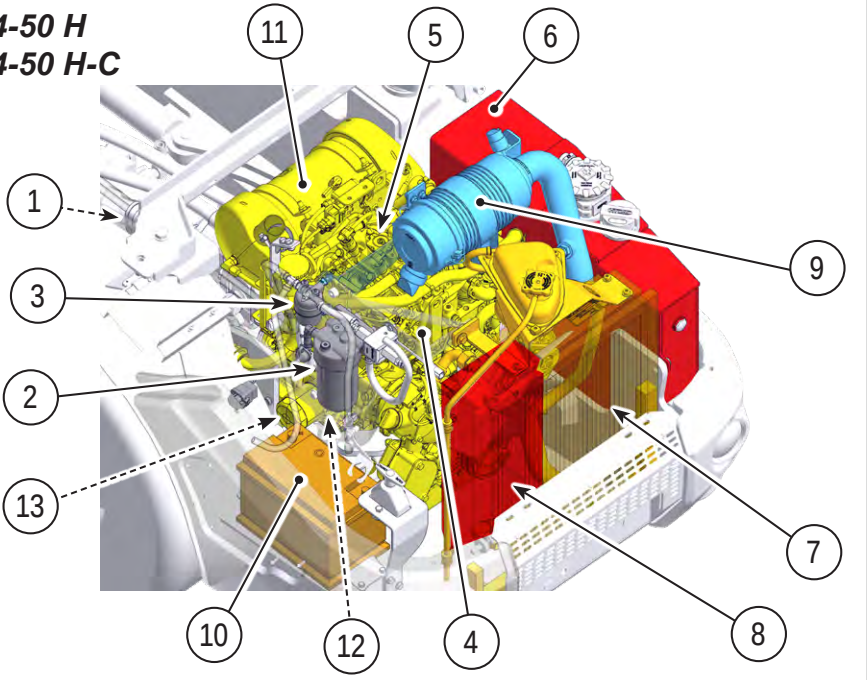


Fig. A9

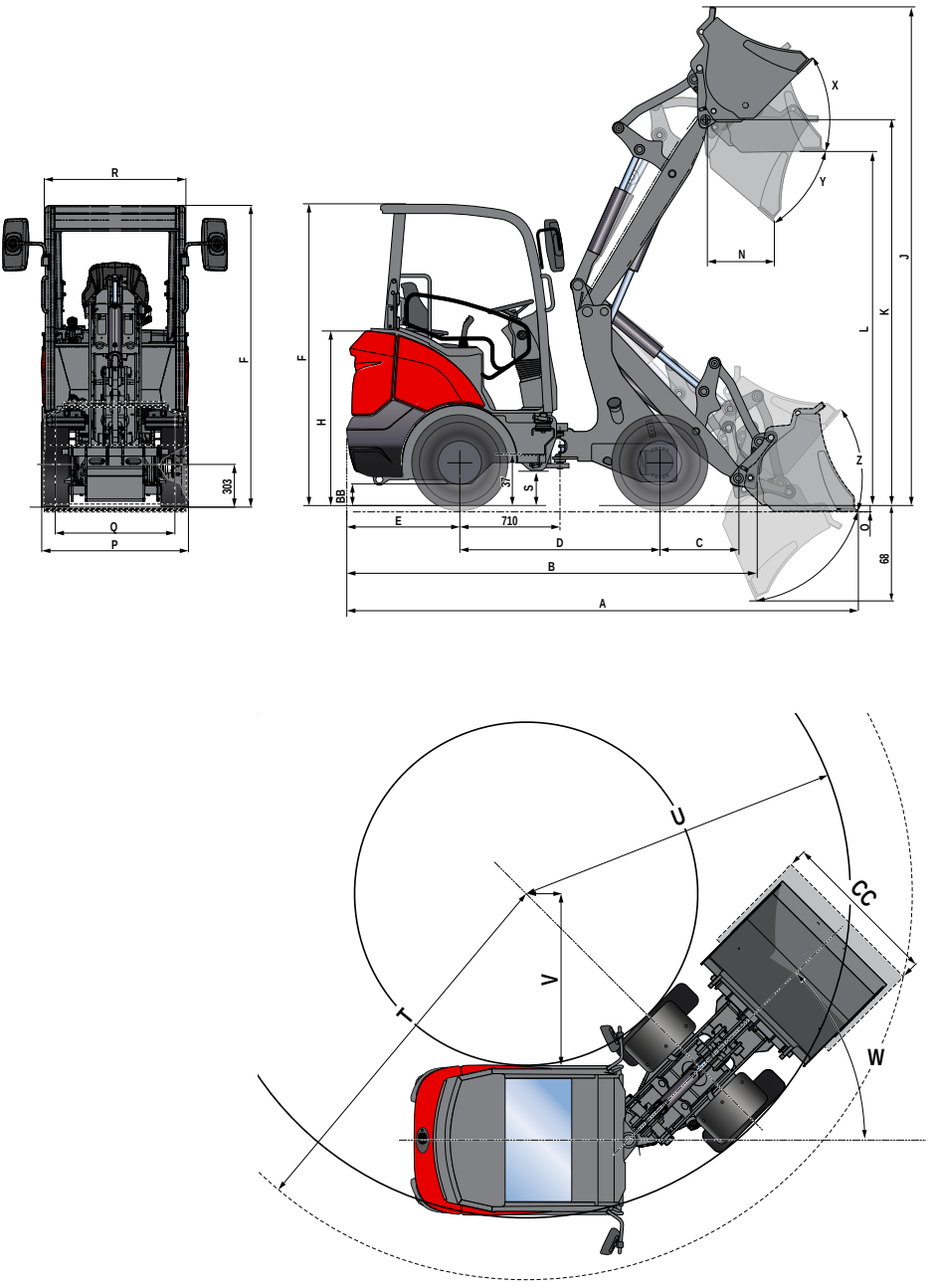


Fig. A10

10.1. Weight of the MLA 2-25 H machine

Unladen weight in working order fitted with:

- Standard arm.
- Full tanks of oil and diesel.
- Driver: 75 kg (170 lb).
- With standard counterweight of 90 kg (200 lb).
- With cab option (add 150 kg (330 lb)).

Option		Standard tires 7 x 12.00
Operating weight without attachments	Without bucket or option	1740 kg (3840 lb)
	On front axle	495 kg (1090 lb)
	On rear axle	1245 kg (2740 lb)
Gross Vehicle Weight (GVW)	Maximum	2600 kg (5730 lb)
	On front axle	1800 kg (3970 lb)
	On rear axle	1400 kg (3090 lb)

10.2. MLA 2-25 H overall dimensions

A	Total length with bucket on the ground	3627 (11'11")
B	Total length without bucket	2928 (9'7")
C	Length from front wheel axis to bucket articulated joint (arm lowered)	563 (1'10")
D	Wheelbase	1419 (4'8")
E	Rear overhang	801 (2'8")
F	Cab height/ROPS	2140 (7'0")
H	Rear cover height	1254 (4'1")
J	Max. height (arm raised, bucket tilted backward)	3535 (11'7")
K	Height of bucket articulated joint (arm raised)	2736 (8'12")
L	Ground height at the bucket, bucket flat	2515 (8'3")
M	Dumping height (greatest downward orientation of bucket)	2008 (6'7")
N	Discharge range	475 (1'7")
O	Digging depth (arm lowered in negative, bucket flat)	-45 (-0'2")
P	Total width without bucket	1040 (3'5")
Q	Track	848 (2'9")
R	Min. width at the cab/ROPS	991 (3'3")
S	Ground clearance	153 (0'6")
T	Turning radius with bucket in transport position	2681 (8'10")
U	Turning radius without bucket	2251 (7'5")
V	Turning radius at the interior of the wheels	1194 (3'11")
W	Max. articulation angle	45°
X	Max. bucket articulation angle	45°
Y	Max. discharge angle	41°
Z	Max. bucket articulation angle on the ground	47°
AA	Ground clearance at the quick coupler	192 (0'8")
BB	Rear ground clearance	144 (0'6")
CC	Bucket width	1100 (3'7")
---	Max. oscillation angle	10°
	Width with tires 7 x 12.00 - AG	1040 (3'5")
	Width with tires 27 x 8.5 - 15 - SK	1040 (3'5")
	Width with tires 27 x 10.5 - 15 - EM	1113 (3'8")
	Width with tires 10.0/75- 15.3 - EM	1145 (3'9")
	Width with tires 10.0/75- 15.3 - AG	1151 (3'9")
	Width with tires 26 x 12 - 12 - AG	1225 (4'0")
	Width with tires 26 x 12 - 12 - EM	1227 (4'0")

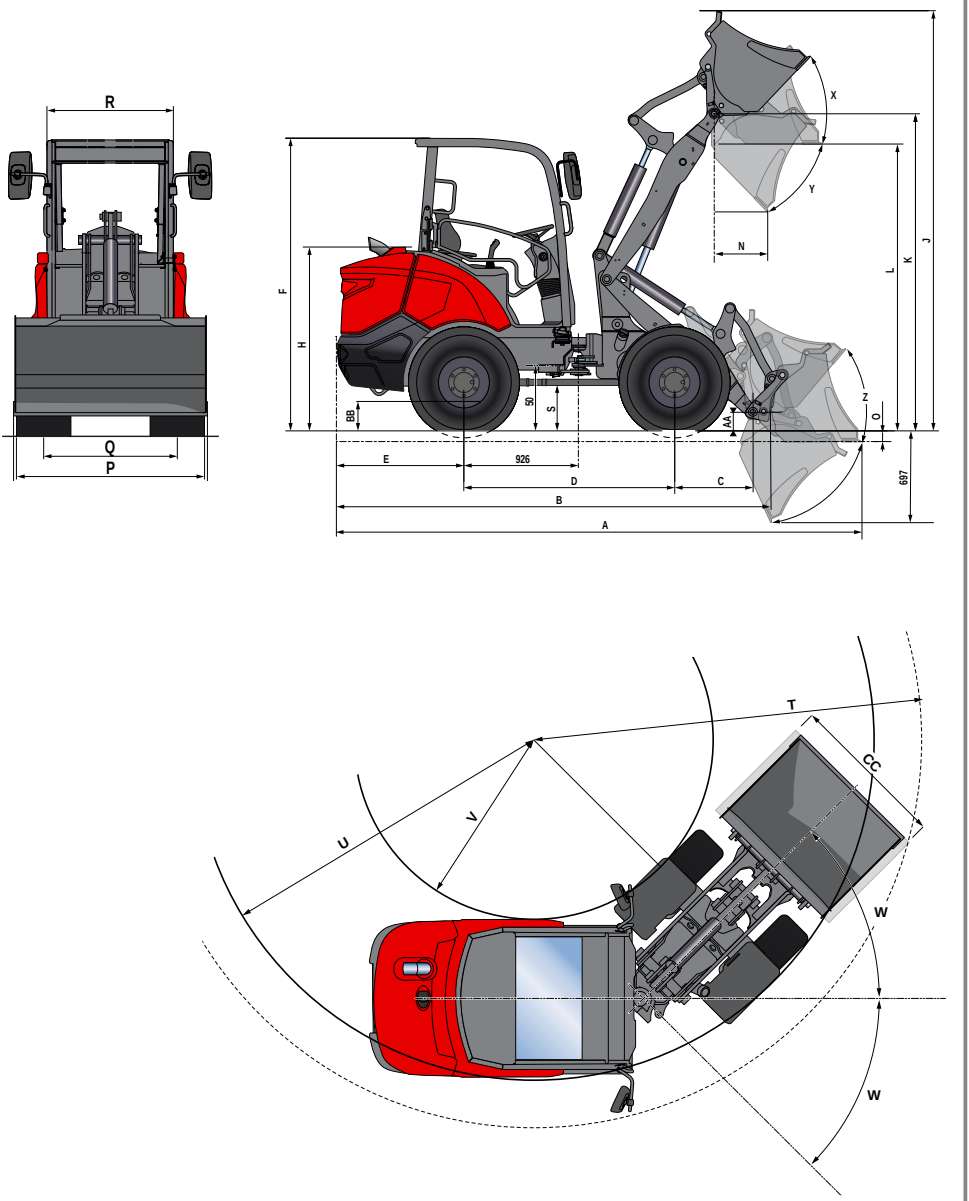


Fig. A11

10.3. Weight of the MLA 3-25 H-C machine

Unladen weight in working order fitted with:

- Short/standard arm (1545 mm (5'1")).
- Full tanks of oil and diesel.
- Driver: 75 kg (170 lb).
- With standard counterweight of 130 kg (290 lb).
- With cab option (add 150 kg (330 lb)).

Option		Standard tires 10 / 75 15.3
Operating weight without attachments	Without bucket or option	2100 kg (4630 lb)
	On front axle	640 kg (1410 lb)
	On rear axle	1460 kg (3220 lb)
Gross Vehicle Weight (GVW)	Maximum	3150 kg (6940 lb)
	On front axle	2600 kg (5730 lb)
	On rear axle	2000 kg (4410 lb)

10.4. MLA 3-25 H-C overall dimensions

A	Total length with bucket on the ground	4104 (13'6")
B	Total length without bucket	3406 (11'2")
C	Length from front wheel axis to bucket articulated joint (arm lowered)	617 (2')
D	Wheelbase	1650 (5'5")
E	Rear overhang	995 (3'3")
F	Cab height/ROPS	2258 (7'5")
H	Rear cover height	1405 (4'7")
J	Max. height (arm raised, bucket tilted backward)	3523 (11'7")
K	Height of bucket articulated joint (arm raised)	2435 (8')
L	Ground height at the bucket, bucket flat	2208 (7'3")
M	Dumping height (greatest downward orientation of bucket)	1829 (6')
N	Discharge range	524 (1'9")
O	Digging depth (arm lowered in negative, bucket flat)	-116 (-1'7")
P	Total width without bucket	1100 (3'7")
Q	Track	836 (2'9")
R	Min. width at the cab/ROPS	991 (3'3")
S	Ground clearance	320 (1'1")
T	Turning radius with bucket in transport position	3246 (10'8")
U	Turning radius without bucket	2767 (9'1")
V	Turning radius at the interior of the wheels	1623 (5'4")
W	Max. articulation angle	45°
X	Max. bucket articulation angle	49°
Y	Max. discharge angle	44°
Z	Max. bucket articulation angle on the ground	49°
AA	Ground clearance at the quick coupler	116 (0'5")
BB	Rear ground clearance	214 (0'8")
CC	Bucket width	1520 (4'12")
---	Max. oscillation angle	10°
	Width with tires 10.0/75- 15.3 AG	1100 (3'7")
	Width with tires 10 x 16.5 SK	1100 (3'7")
	Width with tires 31 x 15.5 - 15 AG	1350 (4'5")
	Width with tires 31 x 15.5 - 15 SK	1364 (4'6")
	Width with tires 31 x 15.5 - 15 TURF	1371 (4'6")
	Width with tires 31 x 15.5 - 15 EM	1380 (4'6")
	Width with tires 10.0/75- 15.3 EM	1094 (3'7")

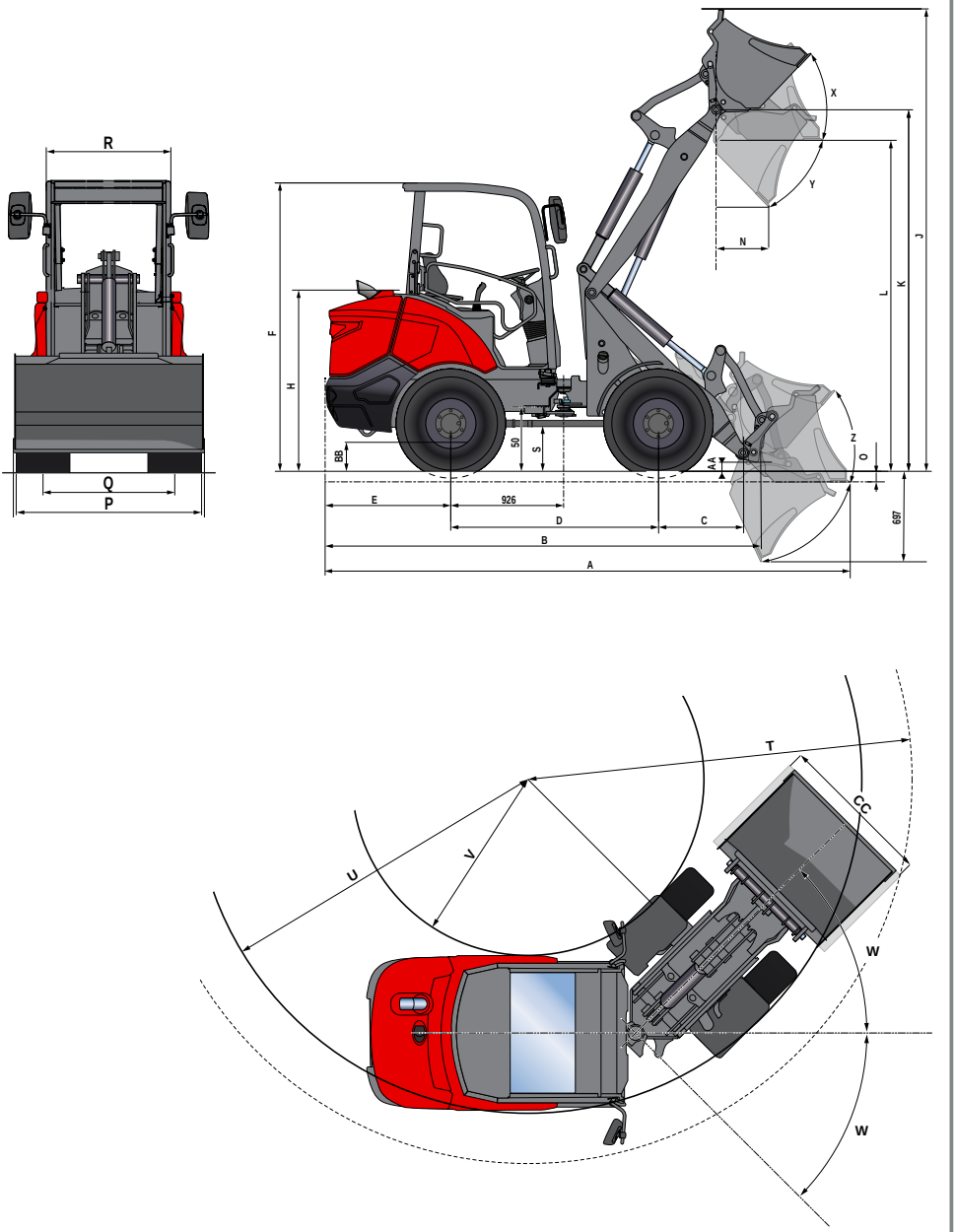


Fig. A12

10.5. Weight of the MLA 3-25 H machine

Unladen weight in working order fitted with:

- Long arm (1755 mm (5'9")).
- Full tanks of oil and diesel.
- Driver: 75 kg (170 lb).
- With standard counterweight of 130 kg (290 lb).
- With cab option (add 150 kg (330 lb)).

Option		Standard tires 10 / 75 15.3
Operating weight without attachments	Without bucket or option	2170 kg (4780 lb)
	On front axle	700 kg (1540 lb)
	On rear axle	1470 kg (3240 lb)
Gross Vehicle Weight (GVW)	Maximum	3150 kg (6940 lb)
	On front axle	2600 kg (5730 lb)
	On rear axle	2000 kg (4410 lb)

10.6. MLA 3-25 H overall dimensions

A	Total length with bucket on the ground	4154 (13'8")
B	Total length without bucket	3458 (11'4")
C	Length from front wheel axis to bucket articulated joint (arm lowered)	669 (2'2")
D	Wheelbase	1650 (5'5")
E	Rear overhang	995 (3'3")
F	Cab height/ROPS	2258 (7'5")
H	Rear cover height	1405 (4'7")
J	Max. height (arm raised, bucket tilted backward)	3636 (11'11")
K	Height of bucket articulated joint (arm raised)	2836 (9'4")
L	Ground height at the bucket, bucket flat	2595 (8'6")
M	Dumping height (greatest downward orientation of bucket)	2066 (6'9")
N	Discharge range	485 (1070 lb)
O	Digging depth (arm lowered in negative, bucket flat)	-139 (-0'5")
P	Total width without bucket	1100 (3'7")
Q	Track	836 (2'9")
R	Min. width at the cab/ROPS	991 (3'3")
S	Ground clearance	320 (1'1")
T	Turning radius with bucket in transport position	3246 (10'8")
U	Turning radius without bucket	2767 (9'1")
V	Turning radius at the interior of the wheels	1623 (5'4")
W	Max. articulation angle	45°
X	Max. bucket articulation angle	47°
Y	Max. discharge angle	46°
Z	Max. bucket articulation angle on the ground	50°
AA	Ground clearance at the quick coupler	103 (0'4")
BB	Rear ground clearance	214 (0'8")
CC	Bucket width	1520 (4'12")
---	Max. oscillation angle	10°
	Width with tires 10.0/75- 15.3 AG	1100 (3'7")
	Width with tires 10 x 16.5 SK	1100 (3'7")
	Width with tires 31 x 15.5 - 15 AG	1350 (4'5")
	Width with tires 31 x 15.5 - 15 SK	1364 (4'6")
	Width with tires 31 x 15.5 - 15 TURF	1371 (4'6")
	Width with tires 31 x 15.5 - 15 EM	1380 (4'6")
	Width with tires 10.0/75- 15.3 EM	1094 (3'7")

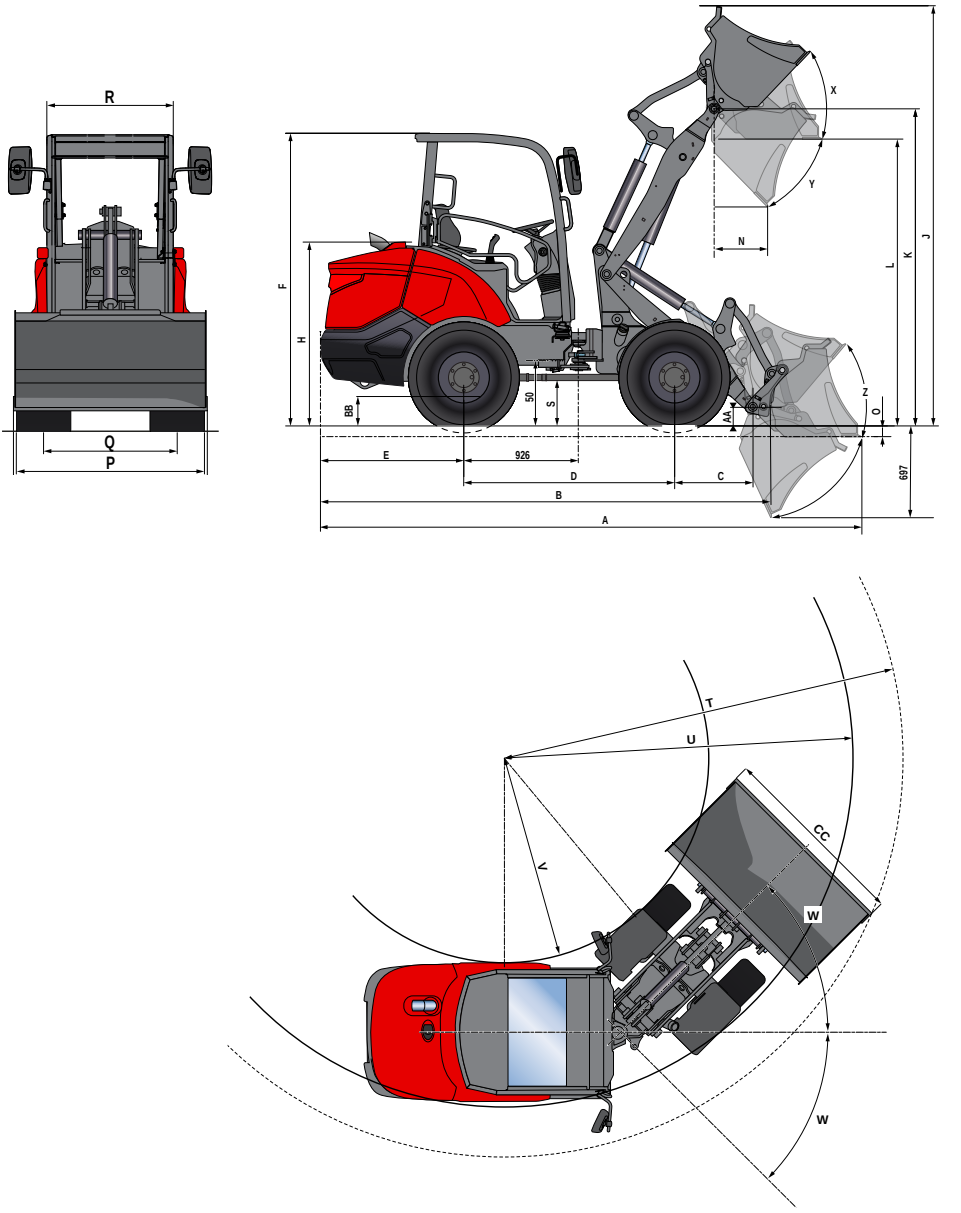


Fig. A13

10.7. Weight of the MLA 4-50 H-C machine

Unladen weight in working order fitted with:

- Short/standard arm (1545 mm (5'1")).
- Full tanks of oil and diesel.
- Driver: 75 kg (170 lb).
- With standard counterweight of 150 kg (330 lb).
- With cab option (add 150 kg (330 lb)).

Option		Standard tires 10 / 75 15.3
Operating weight without attachments	Without bucket or option	2245 kg (4950 lb)
	On front axle	610 kg (1340 lb)
	On rear axle	1635 kg (3600 lb)
Gross Vehicle Weight (GVW)	Maximum	3300 kg (7280 lb)
	On front axle	2600 kg (5730 lb)
	On rear axle	2000 kg (4410 lb)

10.8. MLA 4-50 H-C overall dimensions

A	Total length with bucket on the ground	4230 (13'11")
B	Total length without bucket	3531 (11'7")
C	Length from front wheel axis to bucket articulated joint (arm lowered)	617 (2')
D	Wheelbase	1650 (5'5")
E	Rear overhang	1120 (3'8")
F	Cab height/ROPS	2258 (7'5")
H	Rear cover height	1405 (4'7")
J	Max. height (arm raised, bucket tilted backward)	3523 (11'7")
K	Height of bucket articulated joint (arm raised)	2435 (8')
L	Ground height at the bucket, bucket flat	2208 (7'3")
M	Dumping height (greatest downward orientation of bucket)	1829 (6')
N	Discharge range	524 (1'9")
O	Digging depth (arm lowered in negative, bucket flat)	-116 (-1'7")
P	Total width without bucket	1100 (3'7")
Q	Track	836 (2'9")
R	Min. width at the cab/ROPS	991 (3'3")
S	Ground clearance	320 (1'1")
T	Turning radius with bucket in transport position	3246 (10'8")
U	Turning radius without bucket	2767 (9'1")
V	Turning radius at the interior of the wheels	1623 (5'4")
W	Max. articulation angle	45°
X	Max. bucket articulation angle	49°
Y	Max. discharge angle	44°
Z	Max. bucket articulation angle on the ground	49°
AA	Ground clearance at the quick coupler	116 (0'5")
BB	Rear ground clearance	214 (0'8")
CC	Bucket width	1520 (4'12")
---	Max. oscillation angle	10°
	Width with tires 10.0/75- 15.3 AG	1100 (3'7")
	Width with tires 10 x 16.5 SK	1100 (3'7")
	Width with tires 31 x 15.5 - 15 AG	1350 (4'5")
	Width with tires 15.0/55 - 17 AG	1361 (4'6")
	Width with tires 31 x 15.5 - 15 SK	1364 (4'6")
	Width with tires 31 x 15.5 - 15 TURF	1371 (4'6")
	Width with tires 31 x 15.5 - 15 EM	1380 (4'6")
	Width with tires 425/55 - R17 EM	1428 (4'8")
	Width with tires 10.0/75- 15.3 EM	1094 (3'7")

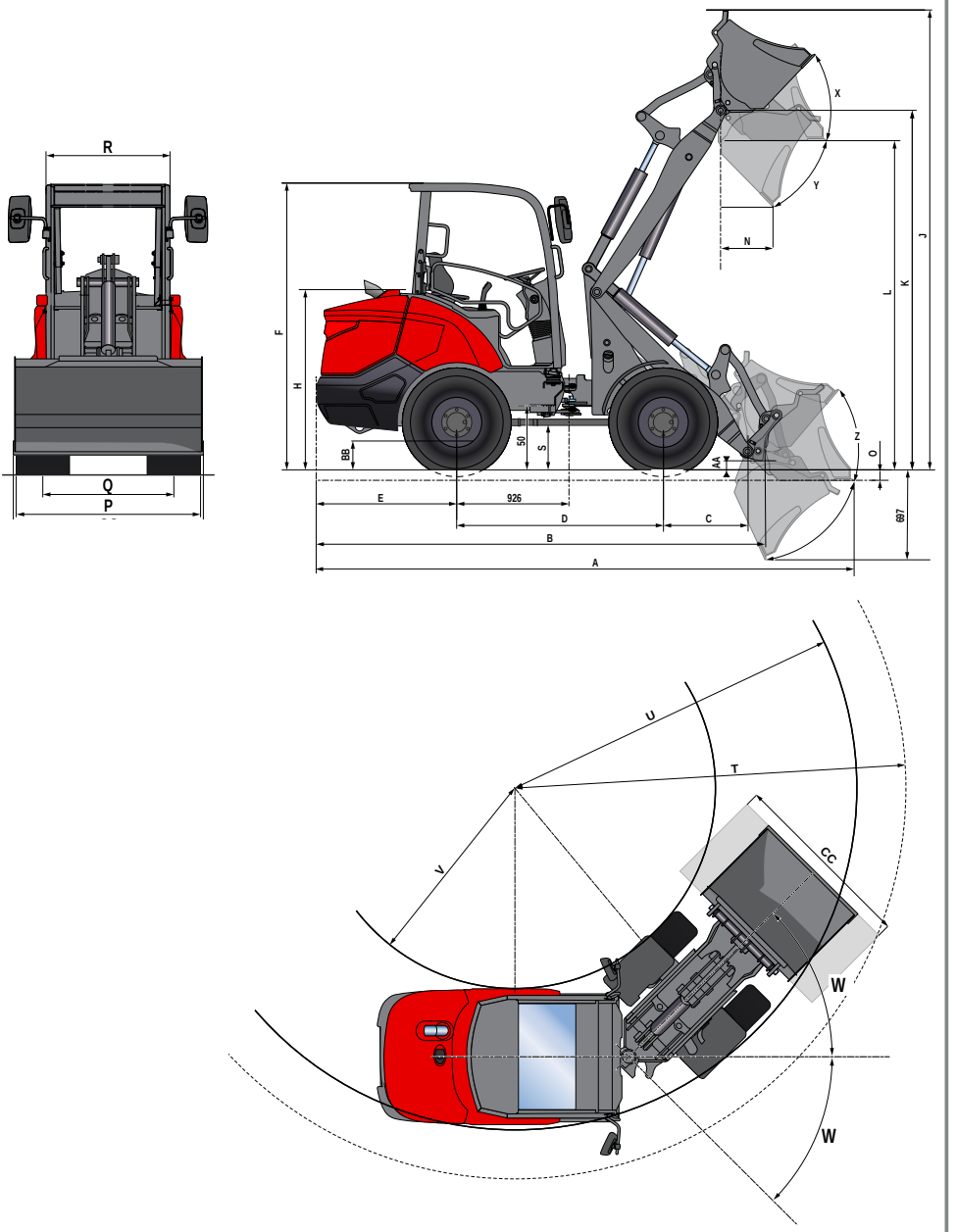


Fig. A14

10.9. Weight of the MLA 4-50 H machine

Unladen weight in working order fitted with:

- Long arm (1755 mm (5'9")).
- Full tanks of oil and diesel.
- Driver: 75 kg (170 lb).
- With standard counterweight of 150 kg (330 lb).
- With cab option (add 150 kg (330 lb)).

Option		Standard tires 10 / 75 15.3
Operating weight without attachments	Without bucket or option	2315 kg (5100 lb)
	On front axle	670 kg (1480 lb)
	On rear axle	1645 kg (3630 lb)
Gross Vehicle Weight (GVW)	Maximum	3300 kg (7280 lb)
	On front axle	2600 kg (5730 lb)
	On rear axle	2000 kg (4410 lb)

10.10. MLA 4-50 H overall dimensions

A	Total length with bucket on the ground	4279 (14'0")
B	Total length without bucket	3583 (11'9")
C	Length from front wheel axis to bucket articulated joint (arm lowered)	669 (2'2")
D	Wheelbase	1650 (5'5")
E	Rear overhang	1120 (3'8")
F	Cab height/ROPS	2258 (7'5")
H	Rear cover height	1405 (4'7")
J	Max. height (arm raised, bucket tilted backward)	3636 (11'11")
K	Height of bucket articulated joint (arm raised)	2836 (9'4")
L	Ground height at the bucket, bucket flat	2595 (8'6")
M	Dumping height (greatest downward orientation of bucket)	2066 (6'9")
N	Discharge range	485 (1070 lb)
O	Digging depth (arm lowered in negative, bucket flat)	-139 (-0'5")
P	Total width without bucket	1100 (3'7")
Q	Track	836 (2'9")
R	Min. width at the cab/ROPS	991 (3'3")
S	Ground clearance	320 (1'1")
T	Turning radius with bucket in transport position	3246 (10'8")
U	Turning radius without bucket	2767 (9'1")
V	Turning radius at the interior of the wheels	1623 (5'4")
W	Max. articulation angle	45°
X	Max. bucket articulation angle	47°
Y	Max. discharge angle	46°
Z	Max. bucket articulation angle on the ground	50°
AA	Ground clearance at the quick coupler	103 (0'4")
BB	Rear ground clearance	214 (0'8")
CC	Bucket width	1520 (4'12")
---	Max. oscillation angle	10°
	Width with tires 10.0/75- 15.3 AG	1100 (3'7")
	Width with tires 10 x 16.5 SK	1100 (3'7")
	Width with tires 31 x 15.5 - 15 AG	1350 (4'5")
	Width with tires 15.0/55 - 17 AG	1361 (4'6")
	Width with tires 31 x 15.5 - 15 SK	1364 (4'6")
	Width with tires 31 x 15.5 - 15 TURF	1371 (4'6")
	Width with tires 31 x 15.5 - 15 EM	1380 (4'6")
	Width with tires 425/55 - R17 EM	1428 (4'8")
	Width with tires 10.0/75- 15.3 EM	1094 (3'7")

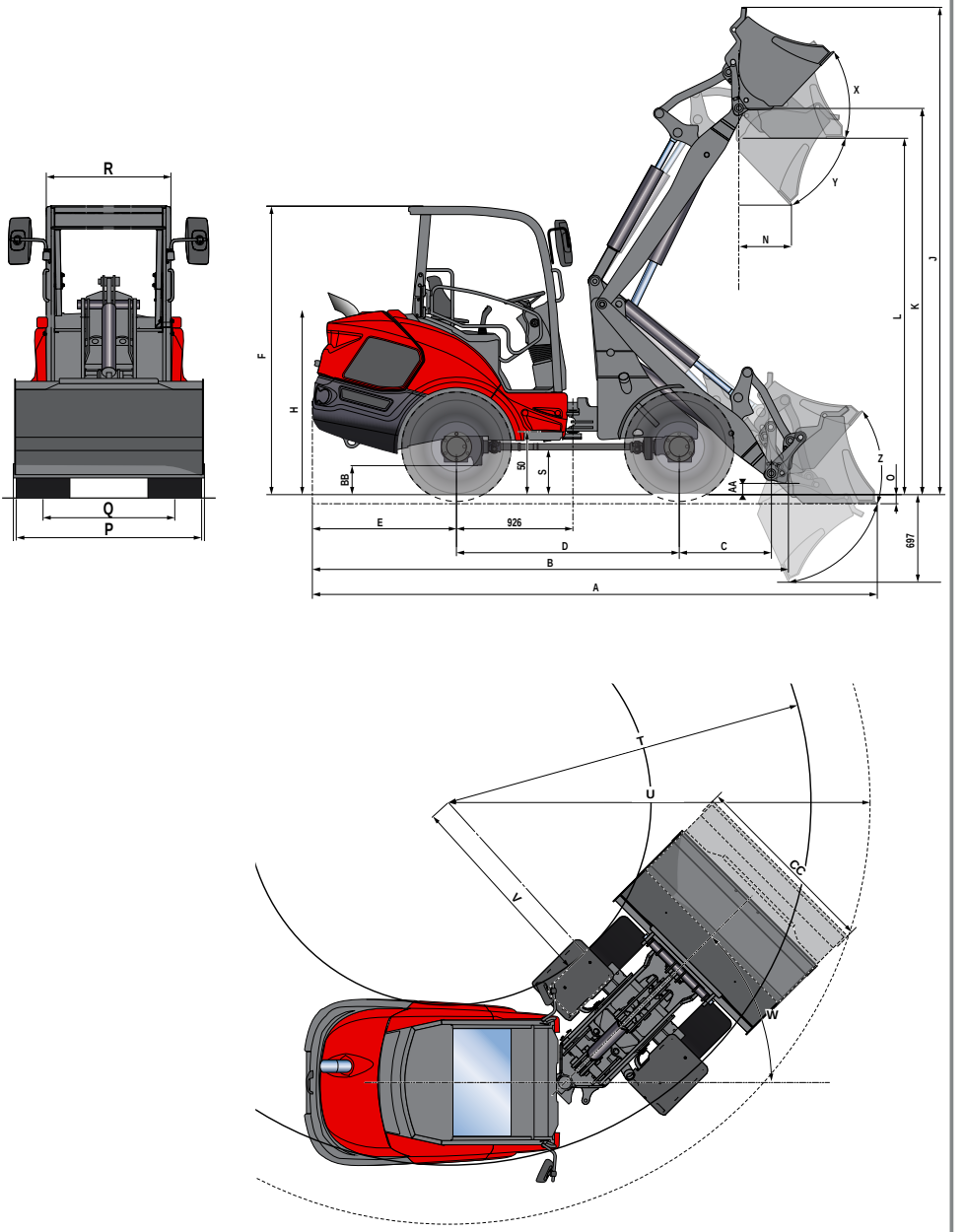


Fig. A15

10.11. Weight of the MLA 5-50 H machine

Unladen weight in working order fitted with:

- Standard arm.
- Full tanks of oil and diesel.
- Driver: 75 kg (170 lb).
- With standard counterweight of 185 kg (410 lb).
- With cab option (add 150 kg (330 lb)).

Option		Standard tires 11.5 / 80 15.3
Operating weight without attachments	Without bucket or option	2680 kg (5910 lb)
	On front axle	734 kg (1620 lb)
	On rear axle	1944 kg (4290 lb)
Gross Vehicle Weight (GVW) Canopy / Cab Version*	Maximum	3500 kg (7720 lb) / 3650 kg* (8050 lb*)
	On front axle	3400 kg (7500 lb) / 3400 kg* (7500 lb*)
	On rear axle	2500 kg (5510 lb) / 2500 kg* (5510 lb*)

10.12. MLA 5-50 H overall dimensions

A	Total length with bucket on the ground	4490 (14'9")
B	Total length without bucket	3792 (12'5")
C	Length from front wheel axis to bucket articulated joint (arm lowered)	733 (2'5")
D	Wheelbase	1770 (5'10")
E	Rear overhang	1146 (3'9")
F	Cab height/ROPS	2290 (7'6")
H	Rear cover height	1469 (4'10")
J	Max. height (arm raised, bucket tilted backward)	3870 (12'8")
K	Height of bucket articulated joint (arm raised)	3070 (10'1")
L	Ground height at the bucket, bucket flat	2837 (9'4")
M	Dumping height (greatest downward orientation of bucket)	2301 (7'7")
N	Discharge range	458 (1'6")
O	Digging depth (arm lowered in negative, bucket flat)	-72 (-1'9")
P	Total width without bucket	1330 (4'4")
Q	Track	946 (3'1")
R	Min. width at the cab/ROPS	991 (3'3")
S	Ground clearance	356 (1'2")
T	Turning radius with bucket in transport position	3361 (11'0")
U	Turning radius without bucket	2888 (9'6")
V	Turning radius at the interior of the wheels	1617 (5'4")
W	Max. articulation angle	40°
X	Max. bucket articulation angle	46°
Y	Max. discharge angle	47°
Z	Max. bucket articulation angle on the ground	50°
AA	Ground clearance at the quick coupler	168 (0'7")
BB	Rear ground clearance	230 (0'9")
CC	Bucket width	1520 (4'12")
---	Max. oscillation angle	10°
	Width with tires 10/75 - 15.3	1204 (3'11")
	Width with tires 10 x 16.5	1234 (4'1")
	Width with tires 11.5/80 - 15.3	1236 (4'1")
	Width with tires 31 x 15.5 - 15 - AG	1380 (4'6")
	Width with tires 31 x 15.5 - 15 - SK	1394 (4'7")
	Width with tires 31 x 15.5 - 15 - TURF	1401 (4'7")
	Width with tires 31 x 15.5 - 15 - EM	1410 (4'8")
	Width with tires 15.0/55 - 17	1435 (4'8")
	Width with tires 425/55 R17	1472 (4'10")

10.13. Engine

The loader is equipped with a Perkins direct injection, water-cooled, 3-cylinder diesel engine, compliant with the European standard Stage V and the American EPA Tier 4 Final.

	MLA 2-25 H	MLA 3-25 H-C MLA 3-25 H	MLA 4-50 H-C MLA 4-50 H	MLA 5-50 H
Type	PERKINS 403J-11	PERKINS 403J-17	PERKINS 403J-E17T	
Maximum power	18.4 kW (24.7 hp)	18.4 kW (24.7 hp)	36 kW (48.3 hp)	
Rated speed	2800 rpm		2500 rpm	
Maximum torque **Corresponding speed**	66.9 Nm (49.3 ft-lb) 1900 rpm	84.9 Nm (62.6 ft-lb) 1800 rpm	166 Nm (122.4 ft-lb) 1600 rpm	
Weight	96 kg (210 lb)	163 kg (360 lb)	190 kg (420 lb)	
Overall dimensions Length Height Width	502 mm (1'8") 576 mm (1'11") 407 mm (1'4")	575 mm (1'11") 668 mm (2'2") 488 mm (1'7")	713 mm (2'4") 722 mm (2'4") 536 mm (1'9")	
Injection	Indirect		Direct	
Exhaust	-	-	DOC + DPF *	
Displacement	1.1 l (0.3 US gal)	1.7 l (0.4 US gal)		
Aspiration	Natural		Turbocharged	
Bore	77 mm (3.03")	84 mm (3.31")	84 mm (3.31")	
Stroke	81 mm (3.19")	100 mm (3.94")	100 mm (3.94")	
Direction of rotation (front view, distribution side)	Clockwise			

* Retreatment of the exhaust gases by Diesel Oxidation Catalyst (DOC) and Diesel Particulate Filter (DPF)

10.14. Hydraulic system

Main circuit for the travel, attachment and steering functions.

■ **Attachment**

- Hydraulic gear pump (MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H)
- Engine displacement. . . . . .11.4 cm³ (0.7 in³)
  - Nominal pressure . . . . . .207 bar (3000 psi)
- Hydraulic gear pump (MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H)
- Engine displacement. . . . . 23 cm³ (1.4 in³)
  - Nominal pressure . . . . . .207 bar (3000 psi)
- Main control valve for the functions: “attachments”, “bucket”, “arm” and “quick coupler”:
  - Proportional controls for direct-action mechanics (arm, bucket) and low-pressure hydraulics (attachments).
- Associated functions by solenoid-operated valves:
  - Tool unlocking.
  - Auxiliary outlets for attachments . . . . . .
    Front 1 and 2 . . . . . 30 l/min (7.9 US gal/min) / 60 l/min (15.9 US gal/min)
    Rear (towing). . . . . 30 l/min (7.9 US gal/min) / 60 l/min (15.9 US gal/min)

■ **MLA 2-25 H travel**
- Front and rear travel hydraulic motors
  - Engine displacement. . . . . 398 cm³ (24.29 in³)
  - Low-pressure multi-disk brakes at the rear (parking brake).

■ **Travel**
- Hydraulic axial piston pump, variable displacement.
  - Max. engine displacement . . . . . 28 cm³ (1.71 in³)
  - Max. working pressure . . . . . 410 bar (5950 psi) differential
  - Max. pressure . . . . . 470 bar (6820 psi)
- Variable displacement hydraulic motor (except for MLA 2-25 H)
  - Max. engine displacement . . . . . 62 cm³ (3.78 in³)
  - Max. working pressure . . . . . 470 bars (6820 psi)
- Option 30 km/h (18.6 mph):
  - Max. engine displacement . . . . . 60.8 cm³ (3.71 in³)
  - Max. working pressure . . . . . 470 bars (6820 psi)

■ **DANA-type axle MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H (standard)**
- Front axle with drum brake 109/10211281
  - Ring and pinion ratio 11/31
  - Secondary axle reduction ratio 1:4,235
- Rear axle with transfer box type 315 . . . . . 601/109/0211282
  - Transfer box ratio 1:2,1
  - Ring and pinion ratio 11/31-LH
  - Secondary axle reduction ratio 1:4,235

■ **DANA-type axle MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H (with differential lock)**
- Front axle with drum brake 109/10211283
  - Ring and pinion ratio 11/31
  - Secondary axle reduction ratio 1:4,235
- Rear axle with transfer box type 315 . . . . . 601/109/0211284
  - Transfer box ratio 1:2,1
  - Ring and pinion ratio 11/31-LH
  - Secondary axle reduction ratio 1:4,235

■ **DANA-type axle MLA 5-50 H (standard)**
- Front axle with drum brake 111/10211285
  - Ring and pinion ratio 13/32
  - Secondary axle reduction ratio 1:4,235
- Rear axle with transfer box type 315 . . . . . 315/111/0211286
  - Transfer box ratio 1:2,56
  - Ring and pinion ratio 13/32-LH
  - Secondary axle reduction ratio 1:4,235

■ **DANA-type axle MLA 5-50 H (with differential lock)**
- Front axle with drum brake 111/10211287
  - Ring and pinion ratio 13/32
  - Secondary axle reduction ratio 1:4,235
- Rear axle with transfer box type 315 . . . . . 315/111/0211288
  - Transfer box ratio 1:2,56
  - Ring and pinion ratio 13/32-LH
  - Secondary axle reduction ratio 1:4,235

■ **Oil cooler on the return circuit**

■ **Hydraulic filtration**
  - On return circuit. . . . . (10 microns absolute)

■ **Brakes**

	MLA 2-25 H	MLA 3-25 H-C MLA 3-25 H	MLA 4-50 H-C MLA 4-50 H	MLA 5-50 H
Inching brake	Hydrostatic inching brake (Inching function) acting on the 4 wheels			
Working brake	N/A	Hydraulically controlled drum brake on front axle		
Parking brake	Low-pressure brake disks, acting on the 2 travel hydraulic motors, with deactivation of the drive.	Cable controlled drum brake on front axle, with deactivation of the drive		

10.15. Capacities

	MLA 2-25 H	MLA 3-25 H-C MLA 3-25 H	MLA 4-50 H-C MLA 4-50 H	MLA 5-50 H
Hydraulic tank	24 l (6 US gal)		50 l (13 US gal)	
Hydraulic circuit	38 l (10 US gal)	40 l (11 US gal)	80 l (21 US gal)	82 l (22 US gal)
Diesel tank	30 l (8 US gal)	SB 45 l (12 US gal) / LB 50 l (13 US gal)		65 l (17 US gal)
Engine housing (Min/Max)	3.4 l / 4.4 l (0.9 US gal / 1.2 US gal)	4.5 l / 6 l (1.2 US gal / 1.6 US gal)		
Cooling circuit (*) With cab/heating	6 l (1.6 US gal)		7.5 l (2 US gal)	
Front travel motor	0.7 l (0.2 US gal)	N/A	N/A	N/A
Rear travel motor	0.7 l (0.2 US gal)	N/A	N/A	N/A
Front axle housing	N/A	3.3 l (2.5 l + 2 x 0.4 l) (0.9 US gal (0.7 US gal + 2 x 0.1 US gal))		4.3 l (3.5 l + 2 x 0.4 l) (1.1 US gal (0.9 US gal + 2 x 0.1 US gal))
Rear axle housing	N/A	3 l (2.2 l + 2 x 0.4 l) (0.8 US gal (0.6 US gal + 2 x 0.1 US gal))		3.8 L (3.0 l + 2 x 0.4 l) (1 US gal (0.8 US gal + 2 x 0.1 US gal))
Transfer box on rear axle	N/A	0.4 l (0.11 US gal)		0.5 l (0.13 US gal)

10.16. Cylinders

Characteristics in mm (in): Ø bore × Ø rod × stroke

	MLA 2-25 H	MLA 3-25 H-C	MLA 3-25 H	MLA 4-50 H-C	MLA 4-50 H	MLA 5-50 H
Steering cylinder	50×25×247 (1.97"x0.98"X9.72")	63×32×250 (2.48"x1.26"x9.84")	63×32×250 (2.48"x1.26"x9.84")	63×32×250 (2.48"x1.26"x9.84")	63×32×250 (2.48"x1.26"x9.84")	63x32x327 (2.48"x1.26"x1'0.9")
Arm cylinder	75×50×512 (2.95"x1.97"x1'8.16")	85×50×548 (3.35"x1.97"x1'9.57")	85×50×642 (3.35"x1.97"x2'1.28")	85×50×548 (3.35"x1.97"x1'9.57")	85×50×642 (3.35"x1.97"x2'1.28")	100×60×596 (3.94"x2.36"x1'11.46")
Tilt cylinder	75×40×332 (2.95"x1.57"x1'1.07")	85×50×337 (3.35"x1.97"x1'1.27")	85×50×329 (3.35"x1.97"x1'0.95")	85×50×337 (3.35"x1.97"x1'1.27")	85×50×329 (3.35"x1.97"x1'0.95")	95×45×330 (3.74"x1.77"x1'0.99")
Quick coupler locking cylinder	40×22×104 (1.57"x0.87"x4.09"')					

■ Force on bucket tooth (breakout force) in accordance with NF ISO 14397-2:

- Max. pressure for safety valves . . . . . 350 bars (440 psi)
- Max. breakout force:
  - **MLA 2-25 H:** . . . . . 1422 daN (3197 lbf)
  - **MLA 3-25 H-C / MLA 3-25 H:** . . . . . 2015 daN (4530 lbf)
  - **MLA 4-50 H-C / MLA 4-50 H:** . . . . . 2015 daN (4530 lbf)
  - **MLA 5-50 H:** . . . . . 2501 daN (5622 lbf)

10.17. Permissible temperatures

- Max. ambient temp . . . . . 48°C (118°F)
- Engine water . . . . . 112°C (234°F)
- Hydraulic oil . . . . . 93°C (199°F)

10.18. Paint

- Black . . . . . RAL 9005 (gloss 68 ± 5 UB)
- Red . . . . . RAL 3020

10.19. Tires (only use the listed tire sizes for your machine)

■ **MLA 2-25 H**

Type	Dimensions (mm) (in) L. × Ø ext. × R.	Wheel rim	Vehicle width (mm) (in)	Total tire mass (kg) (lb)	Tire pressure (bar) (psi)
MITAS 7×12 AG profile	192×672×303 (7.56”x2'2.46”x11.93”)	5,00S-12	1040 (3'5")	76 (170)	8.5 (120)
MITAS 27×8.5-15 Skidsteer profile	214×680×317 (8.43”x2'2.77”x1'0.48”)	7.00 x 15	1051 (3'5")	97 (210)	2.5 (40)
26 x 12 - 12 Ag profile	308 x 655 x 289 (1'x2'2”x0'11”)	10.50 JA	1225 (4'0")	129 (280)	3.8 (55)
26 x 12 - 12 Turf profile	310 x 640 x 283 (1'x2'1”x0'11”)	10.50 JA	1227 (4'0")	124 (270)	3 (44)
BKT SKID POWER HD27 x 10.5 - 15 Earthmover	256×684×316 (10.08”x2'2.93”x1'0.44”)	8 LB x 15	1113 (3'8")	117 (260)	4.2 (60)

■ **MLA 3-25 H-C / MLA 3-25 H**

Type	Dimensions (mm) (in) L. × Ø ext. × R.	Wheel rim	Vehicle width (mm) (in)	Total tire mass (kg) (lb)	Tire pressure (bar) (psi)
10.0/75-15.3 AG (Standard tires)	264×780×345 (10.39”x2'6.71”x1'1.58”)	9.00 x 15.3	1100 (3'7")	157 (350)	7.1 (100)
31 x 15.5- 15 SK	384×766×360 (1'3.12”x2'6.16”x1'2.1”)	13 LB x 15	1364 (4'6")	220 (490)	2.0 (29)
31 x 15.5- 15 AG	370×760×350 (1'2.57”x2'5.92”x1'1.78”)	13 LB x 15	1350 (4'5")	210 (460)	2.0 (29)
31 x 15.5- 15 TURF	391×792×350 (1'3.39”x2'7.18”x1'1.7”)	13 LB x 15	1371 (4'6")	239 (530)	2.0 (29)
10 x 16.5 SK	264×773×345 (10.39”x2'6.43”x1'1.5”)	8.25 x 16.5	1100 (3'7")	154 (340)	5 (73)
10.0/75-15.3 EM	258×774×355 (10.16”x2'6.47”x1'1.98”)	9.00 x 15.3	1094 (3'7")	151 (330)	7.1 (100)
31 x 15.5- 15 EM	400×790×360 (1'3.75”x2'7.1”x1'2.1”)	13 LB x 15	1380 (4'6")	244 (540)	2.0 (29)

■ **MLA 4-50 H-C / MLA 4-50 H**

Type	Dimensions (mm) (in) L. × Ø ext. × R.	Wheel rim	Vehicle width (mm) (in)	Total tire mass (kg) (lb)	Tire pressure (bar) (psi)
10.0/75-15.3 AG (Standard tires)	264×780×345 (10.39"x2'6.71"x1'1.58")	9.00 x 15.3	1100 (3'7")	157 (350)	7.1 (100)
31 x 15.5- 15 SK	384×766×360 (1'3.12"x2'6.16"x1'2.1")	13 LB x 15	1364 (4'6")	220 (490)	2.0 (29)
31 x 15.5- 15 AG	370×760×350 (1'2.57"x2'5.92"x1'1.78")	13 LB x 15	1350 (4'5")	209 (460)	2.0 (29)
31 x 15.5- 15 TURF	391×792×350 (1'3.39"x2'7.18"x1'1.7")	13 LB x 15	1371 (4'6")	239 (530)	2.0 (29)
10 x 16.5 SK	264×773×345 (10.39"x2'6.43"x1'1.5")	8.25 x 16.5	1100 (3'7")	154 (340)	5 (73)
10.0/75-15.3 EM	258×774×355 (10.16"x2'6.47"x1'1.98")	9.00 x 15.3	1094 (3'7")	151 (330)	7.1 (100)
31 x 15.5- 15 EM	400×790×360 (1'3.75"x2'7.1"x1'2.1")	13 LB x 15	1380 (4'6")	244 (540)	2.0 (29)

■ **MLA 5-50 H**

Type	Dimensions (mm) (in) L. × Ø ext. × R.	Wheel rim	Vehicle width (mm) (in)	Total tire mass (kg) (lb)	Tire pressure (bar) (psi)
11.5/80 - 15.3 Ag profile (Standard tires)	290x867x380 (0'11"x2'10"x1'3")	9.00 x 15.3	1236 (4'1")	156 (340)	4.8 (70)
MITAS 31 x 15.5 - 15 Skidsteer profile	384×766×360 (1'3.12"x2'6.16"x1'2.1")	13 LB x 15	1394 (4'7")	220 (490)	2.0 (29)
MITAS 31 x 15.5 - 15 AG profile	370×760×350 (1'2.57"x2'5.92"x1'1.78")	13 LB x 15	1380 (4'6")	209 (460)	2.0 (29)
BKT LG306 31 x 15.5 - 15 TURF profile	391×792×350 (1'3.39"x2'7.18"x1'1.7")	13 LB x 15	1401 (4'7")	240 (530)	4.8 (70)
MITAS 10 x 16.5 Skidsteer	264×773×345 (10.39"x2'6.43"x1'1.5")	8.25 x 16.5	1234 (4'1")	154 (340)	5.0 (70)
MITAS 15.0/55 - 17 AG profile	391×872×410 (1'3.39"x2'10.33"x1'4.14")	13 x 17	1435 (4'8")	292 (640)	2.6 (40)
YOKOHAMA 425/55 R17 Earthmover	428×884×399 (1'4.85"x2'10.8"x1'3.1")	13 x 17	1472 (4'10")	328 (720)	4.0 (60)
BKT AS 567 10.0/75 - 15.3 Earthmover	258×774×355 (10.16"x2'6.47"x1'1.98")	9.00 x 15.3	1204 (3'11")	152	7.1 (100)
BKT SKID POWER HD 31 x 15.5 - 15 Earthmover	400×790×360 (1'3.75"x2'7.1"x1'2.1")	13 LB x 15	1410 (4'8")	244 (540)	2.0 (29)
425/55 R17 Earthmover	428x884x399 (1'8"x2'11"x1'4")	13 x 17	1472 (4'10")	327 (720)	4 (58)

10.20. Electrical circuit

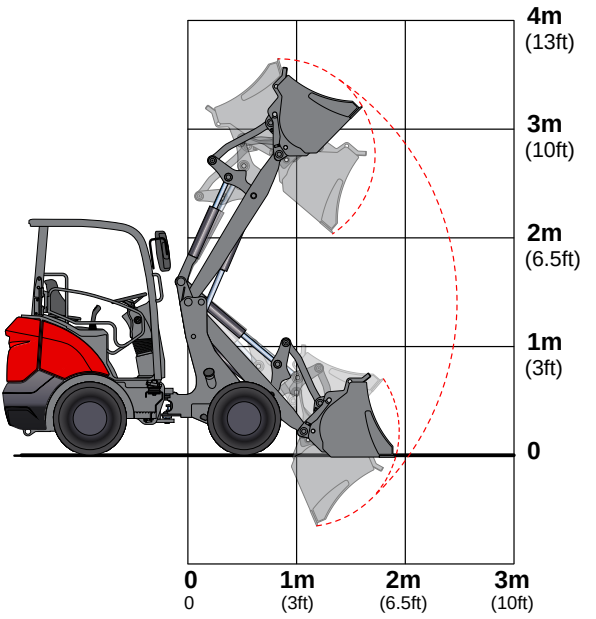
■ **12V electrical system:**

- Battery:
  - MLA 2-25 H . . . . . 12 V - 50 Ah / 420 A (EN)
  - MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H 12 V - 74 Ah / 680 A (EN)
- Starter:
  - MLA 2-25 H . . . . . 12 V (1.4 kW)
  - MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H . . . 12 V (2.0 kW)
- Alternator:
  - MLA 2-25 H . . . . . 12 V (65 A)
  - MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H . . . . . 12 V (85 A)
- Battery cut-off switch.
- Lighting and signaling (option).
- Heating . . . . . .12 V (3 kW)
- 1 Relay/fuse box (1 in the cab).
- Radio (option) . . . . . 12 V
- Cigarette lighter socket . . . . . .12 V
- USB telephone charger port . . . . . 12 V
- Rear 9-pole electrical socket (option) . . . . . 12 V (15 A)
- Front 3-pole electrical socket (option). . . . . 12 V (15 A)
- Front 7-pole electrical socket (option). . . . . 12 V (15 A)

■ **Electronics system:**

- Can Bus system.
- Dashboard with backlit LCD screen.
- 1 ECU in the cab.
- 1 engine ECU in the engine compartment (MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H).
- **Arm working ranges.**
- MLA 2-25 H (**Fig. A16, Page 68**).
- MLA 3-25 H-C Short arm (**Fig. A18, Page 70**).
- MLA 3-25 H (**Fig. A19, Page 71**).
- MLA 4-50 H-C Short arm (**Fig. A20, Page 72**).
- MLA 4-50 H (**Fig. A21, Page 73**).
- MLA 5-50 H (**Fig. A17, Page 69**).

MLA 2-25 H



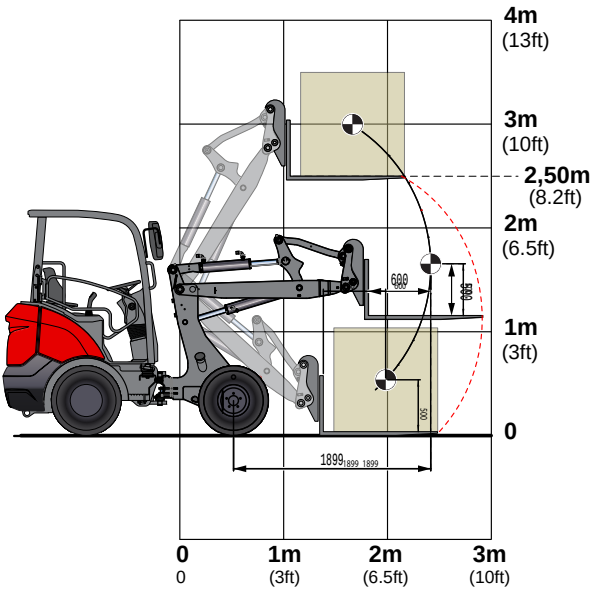
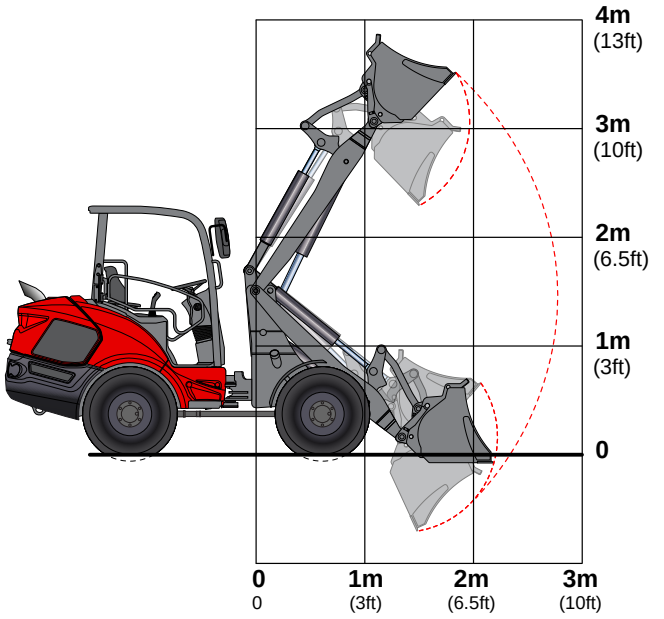


Fig. A16

MLA 5-50 H



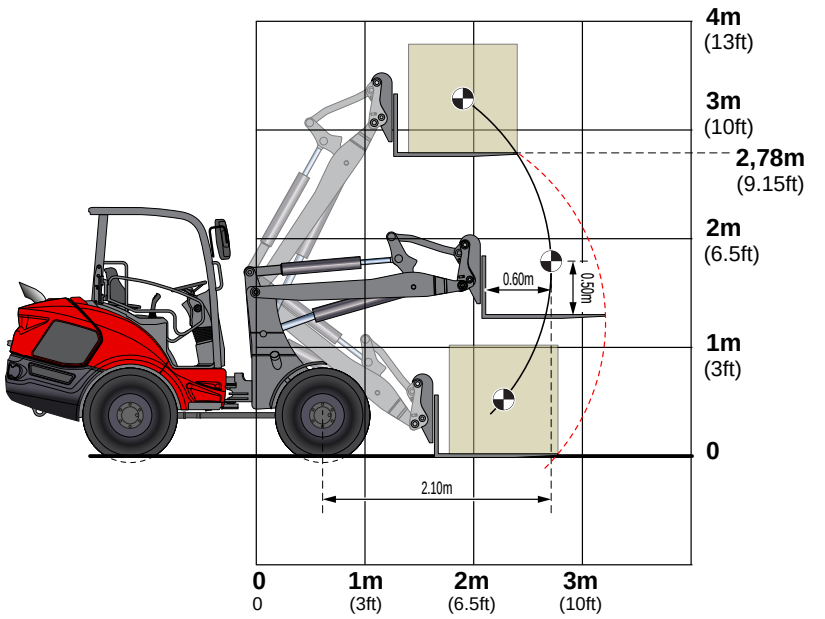
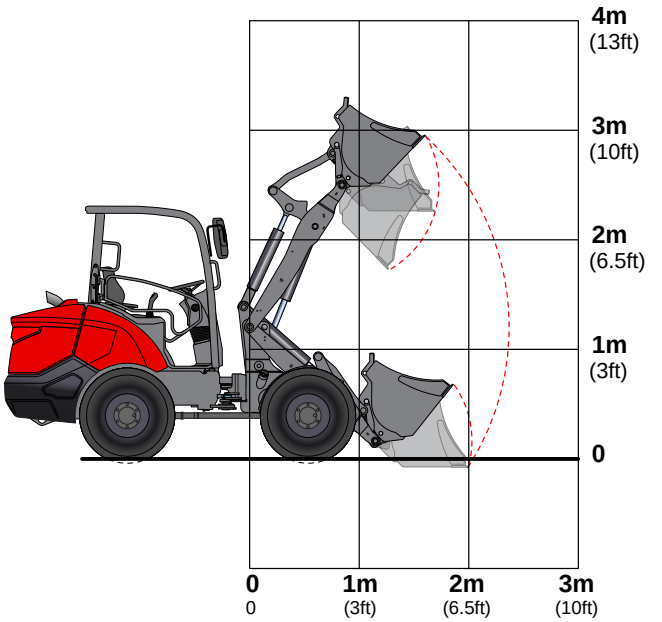


Fig. A17

MLA 3-25 H-C



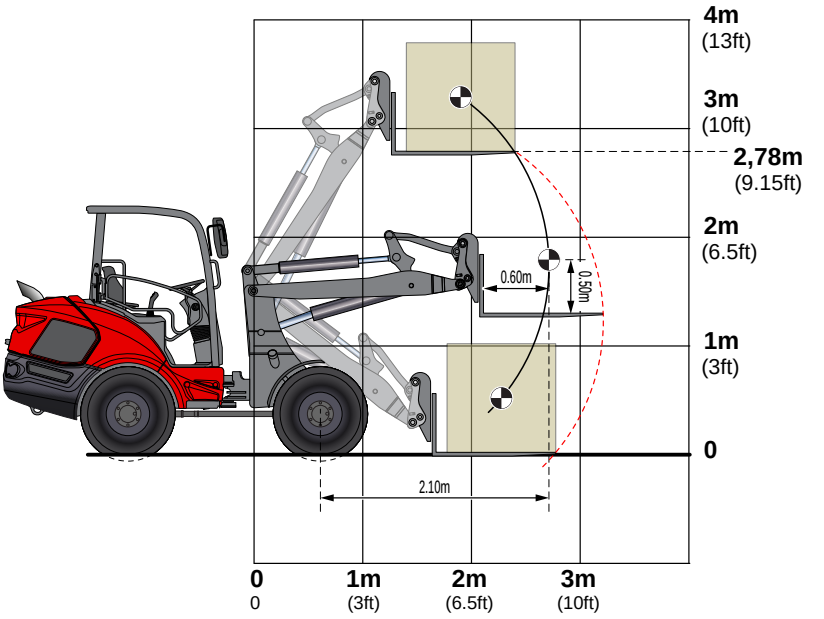
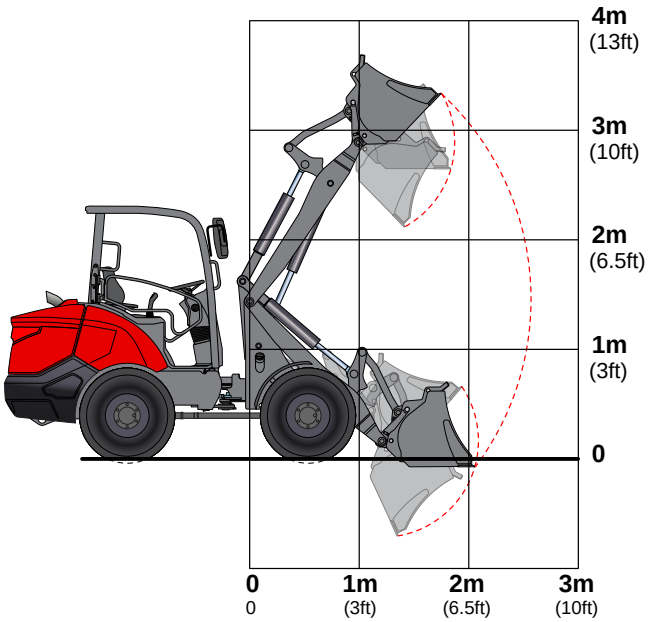


Fig. A18

MLA 3-25 H



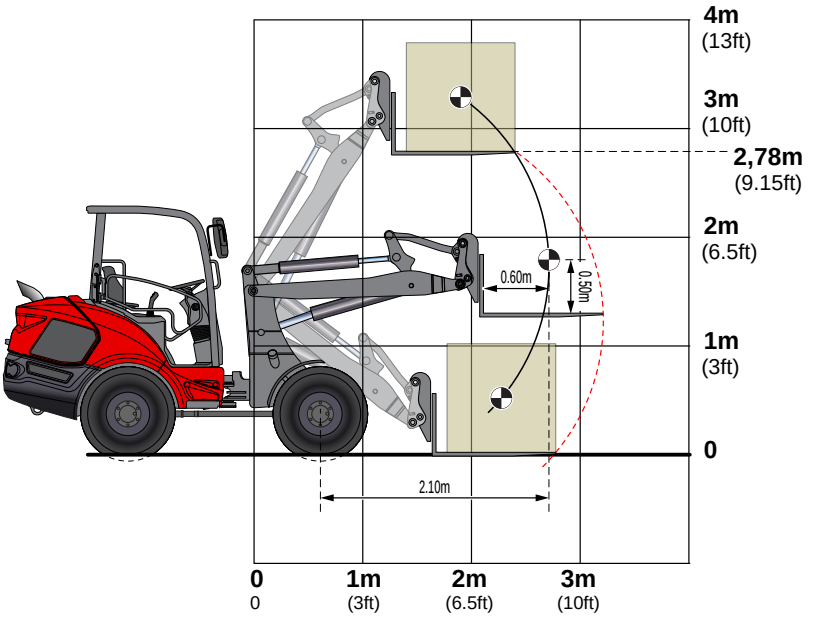
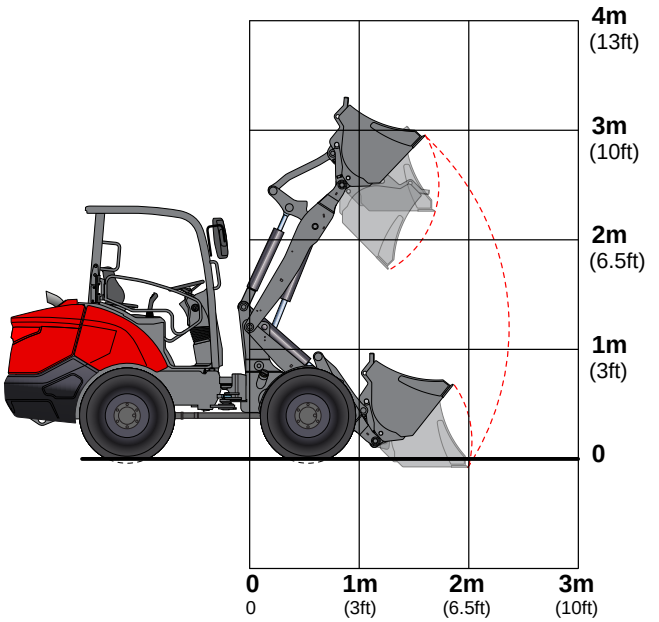


Fig. A19

MLA 4-50 H-C



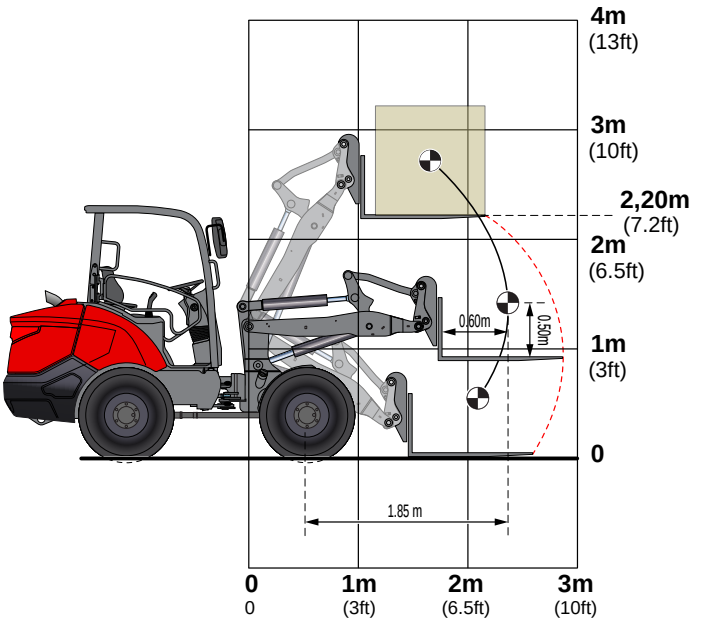
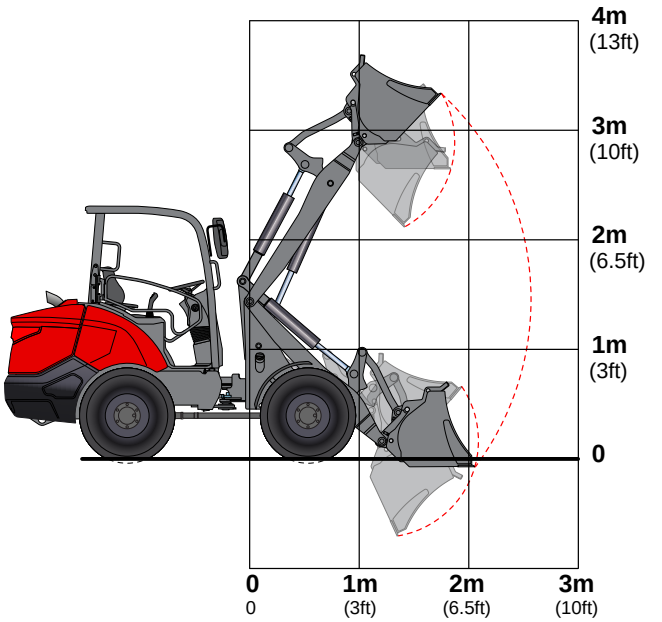


Fig. A20

MLA 4-50 H



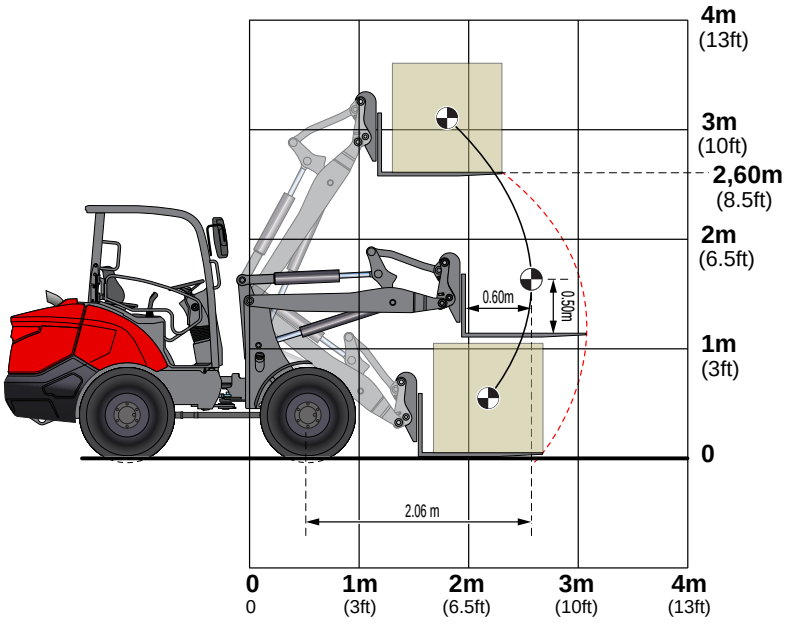


Fig. A21

11.1. Driver's compartment

1- Key ignition switch, the machine is fitted with:

- An electronic safety device to prevent the starter from being operated if the diesel engine is running.
- An electrical safety device to prevent starting when the direction of travel selection control (See Chapter 17a P81) is not in neutral (**N**).

2- Manual throttle control (Option)

This control makes it possible to adjust the engine speed and work at a set speed.
To work:

- **MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H:** Push the control forward to increase the engine speed or backward to reduce it.
- **MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H:** Turn the control button clockwise to increase the engine speed.

3- Speed limiter function (Option)

The speed limiter function helps to manage movement by limiting the maximum speed the machine can reach.
By pressing right or left the speed indexer makes it possible to increase or decrease the speed limit set point.
This set point is displayed on the dashboard screen in the form of an indexed value from 1 to 19 + "MAX".

☞ ***When the MAX set point is selected, the speed limiter is deactivated.***

- **MLA 5-50 H** (Option 30 km/h (18.6 mph)):
  - The activation and deactivation of the speed limiter is carried out by pressing the pushbutton for the "speed limiter" function on the joystick (See Chapter 17c P81).
    When activating the function, the speed currently set is displayed temporarily on the dashboard screen (this may happen at any time, even when the machine is moving).
  - As the speed limiter is activated (Display of the value for the speed currently set), operate the speed indexer by pressing to the right or left, to increase or decrease the limit speed set point from 0.3 km/h (0.2 mph) to 25 km/h (15.5 mph) then "MAX".

☞ ***When the MAX set point is selected, the speed limiter is deactivated.***

By combining the speed limiter function with the speed controller (as an option only on MLA 5-50 H) it is possible to limit the travel speed to a low value (e.g. 3 km/h (1.9 mph)), and then activate the speed controller.
This makes it possible to maintain a limited constant travel speed without using the travel pedal (example: use of a sweeper).

⚠ ***DO NOT USE THE LIFT STRUCTURE WHEN DRIVING ON PUBLIC ROADS. LOCK THE LIFT STRUCTURE USING THE LIFT STRUCTURE LOCKING SWITCH.***

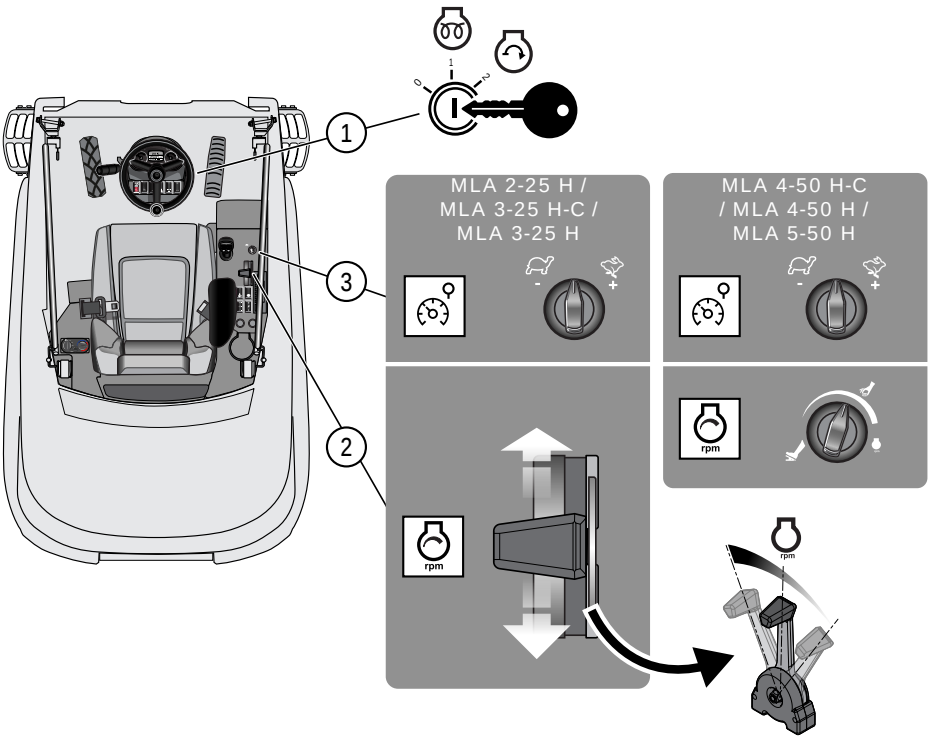

1
2
3
MLA 2-25 H /
MLA 3-25 H-C /
MLA 3-25 H
MLA 4-50 H-C
/ MLA 4-50 H /
MLA 5-50 H
rpm
rpm
rpm

Fig. B1

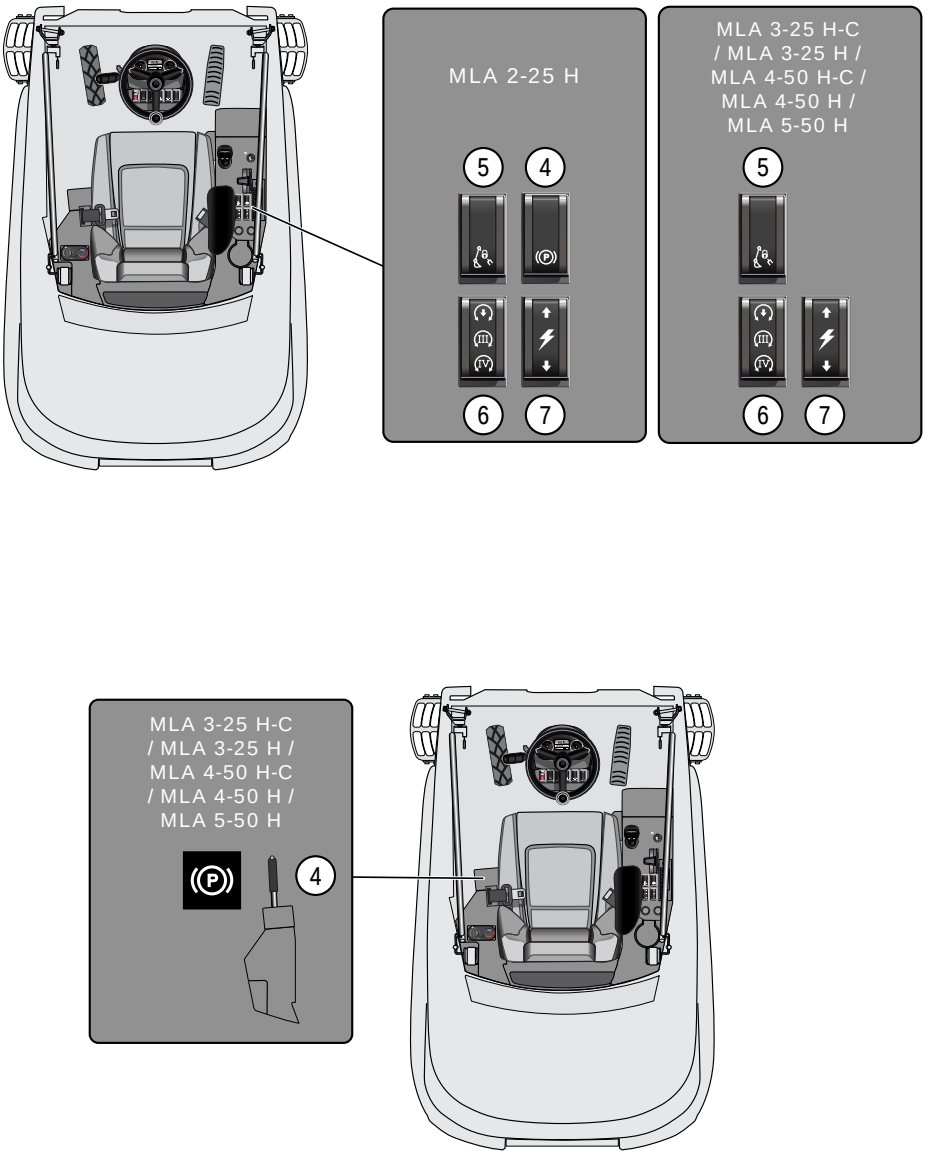

MLA 2-25 H
5
4
6
7
MLA 3-25 H-C
/ MLA 3-25 H /
MLA 4-50 H-C /
MLA 4-50 H /
MLA 5-50 H
5
6
7
MLA 3-25 H-C
/ MLA 3-25 H /
MLA 4-50 H-C
/ MLA 4-50 H /
MLA 5-50 H
4

Fig. B2

4- Parking brake

Activating the parking brake is recommended when the machine is at a complete stop or in an emergency (emergency brake function).

ACTIVATING THE PARKING BRAKE WHEN THE MACHINE IS IN MOTION CAUSES SUDDEN BRAKING OF THE MACHINE AND THE TRANSMISSION FUNCTION IS CUT OFF.

Once the parking brake is activated, the travel pedal only serves to adjust the engine speed.

- **MLA 2-25 H**:
  Tilt the parking brake control; the "parking brake activated" indicator light (**9**, Page 87) is displayed on the dashboard.
  When attempting to travel with the parking brake activated, the parking brake indicator light (**9**, Page 87) on the dashboard flashes to indicate that the brake is active, preventing the machine from moving.
  Tilt the parking brake control forward to deactivate the parking brake.
  The parking brake indicator light (**9**, Page 87) on the dashboard goes out.
- **MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H**:
  Pull the handle to operate the handbrake; the "parking brake activated" indicator light (**9**, Page 87) is displayed on the dashboard.
  To release the parking brake, press the button at the end of the handbrake handle and push the brake to the bottom stop.
  The parking brake indicator light (**9**, Page 87) on the dashboard goes out.

5- Locking the arm hydraulic functions

6- Selection of the auxiliary hydraulic function:

Tilt the 3-position switch to activate the desired auxiliary circuit:

- ○ Tilt upward: Power supply to auxiliary circuit on the rear of the machine.
- ○ Tilt to middle position: Hydraulic power supply to 3rd auxiliary circuit and quick coupler locking circuit.
- ○ Tilt downward: Power supply to 4th auxiliary circuit and quick coupler locking circuit.

The control of the auxiliary circuit selected takes place via the control for the auxiliary hydraulic line (**17b**, Page 81) on the joystick:

7- Selection of the auxiliary electrical power supply:

Tilt the 2-position switch to activate the desired electric circuit:

- Tilt upward: 12 V electrical power supply on the front of the machine.
- Tilt downward: 12 V electrical power supply on the rear of the machine.

8- Accelerator pedal:

Forward/reverse direction control on joystick:

- Select the direction of travel using the Forward/Reverse selection control (Display of the F/N/R indicator on the LCD screen, see **1**, Page 88).
- Press the pedal to move the machine.

9- Main brake/Inching control pedal:

- **MLA 2-25 H:**
  The MLA 2-25 H is not fitted with service brakes.
  Pressing the pedal operates the travel pump variable displacement (inching function). When the pedal is pressed down completely the output from the travel circuit is zero and the machine is stopped.
  In this case, as long as the pedal is pressed down completely, the brake disks of the rear travel motors block any unintentional travel movement.
- **MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H:**
  On the first third of its travel pressing the brake pedal makes it possible to operate the travel pump variable displacement (Inching function). After that the pedal will brake the machine via the drum brake on the front axle. When the pedal is pressed down completely, the combined action of the drum brake and the output of the travel circuit (at zero) causes the machine to stop.

10- Control for turn signals, high beam headlights, headlight flasher and horn (Option):

- Change of direction to the right-hand signal: push the combination control forward, the flashing change of direction pictogram appears on the dashboard.
- Change of direction to the left-hand signal: pull the combination control backward, the flashing change of direction pictogram appears on the dashboard.
- Position lights: pivot the combination control forward; the green position lights pictogram is displayed on the dashboard.
- Dipped headlights: Pivot the combination control forward two notches, the green dipped headlights pictogram is displayed on the dashboard.
- High beam headlights: lift the combination control upward, and the blue high beam headlights pictogram is displayed on the dashboard.
- Headlight flasher: lift the combination control upward and release it.
- Horn: press the pushbutton on the left-hand end of the combination control (Also see **17f**, Page 82).

11- Tool unlocking function pushbutton

REFER TO CHAPTER 11.10 FITTING BUCKETS AND ATTACHMENTS, PAGE 116

DO NOT UNHOOK THE ATTACHMENT IF IT IS NOT ON THE GROUND.
WHEN UNHOOKING THE ATTACHMENT CONSIDER ITS POSITION ON THE GROUND IN ORDER TO FACILITATE PICKING IT UP FOR SUBSEQUENT USE.

- To unlock the attachment or bucket, pull the safety latch (**11a**) and push the unlocking button (**11b**) backward.
- Hold the button (**11**) down and simultaneously operate the auxiliary hydraulic control (**17b**).
- The double locking cylinder releases the attachment.

DO NOT OPERATE THE UNLOCKING CONTROLS UNLESS REMOVING OR CONNECTING ATTACHMENTS. THE ATTACHMENT COULD FALL OFF THE HITCH AND CAUSE SERIOUS INJURY OR DEATH.

- Move the auxiliary hydraulic control (**17b**) forward to lock the attachment (with **11b** at rest).

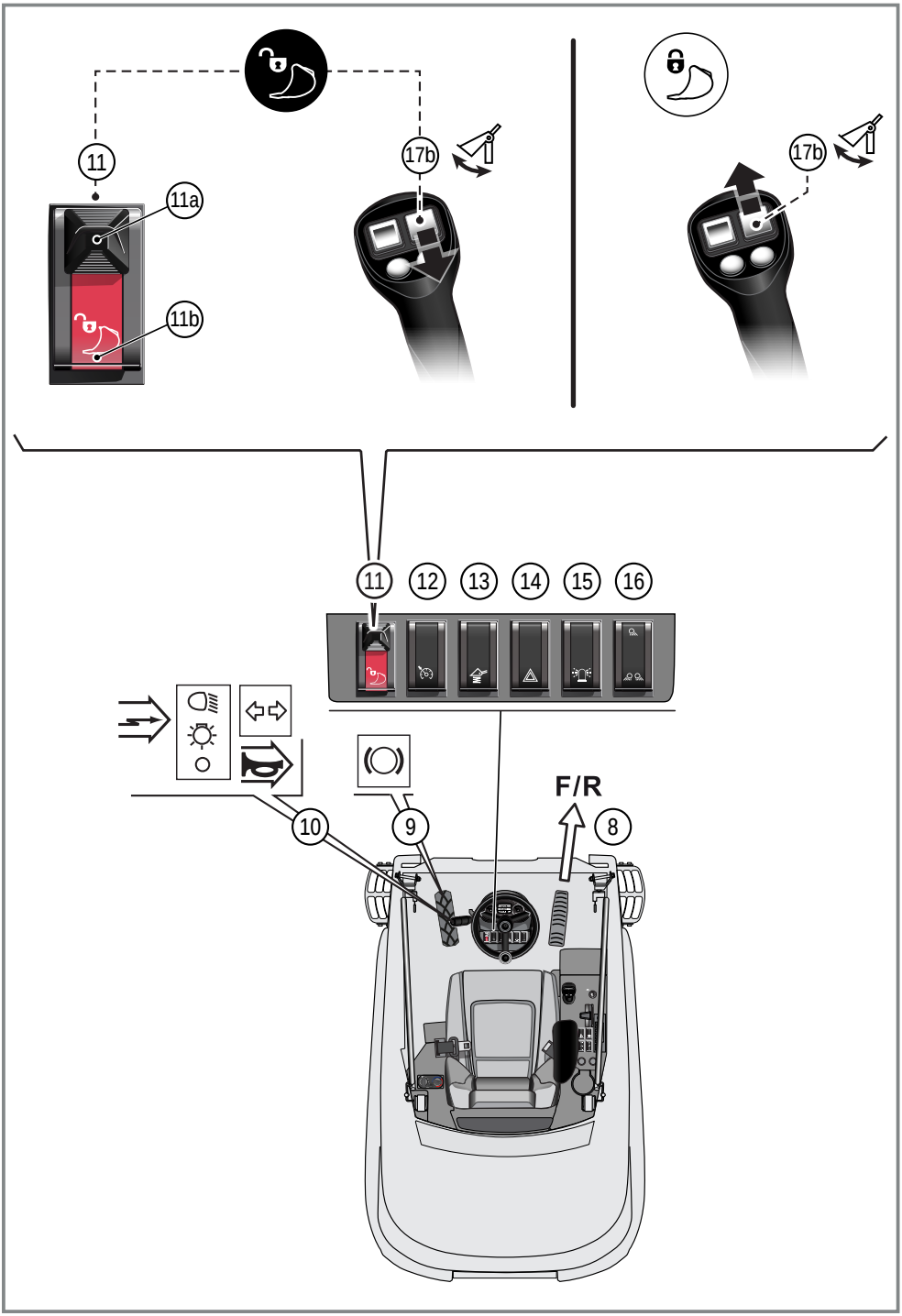


Fig. B3

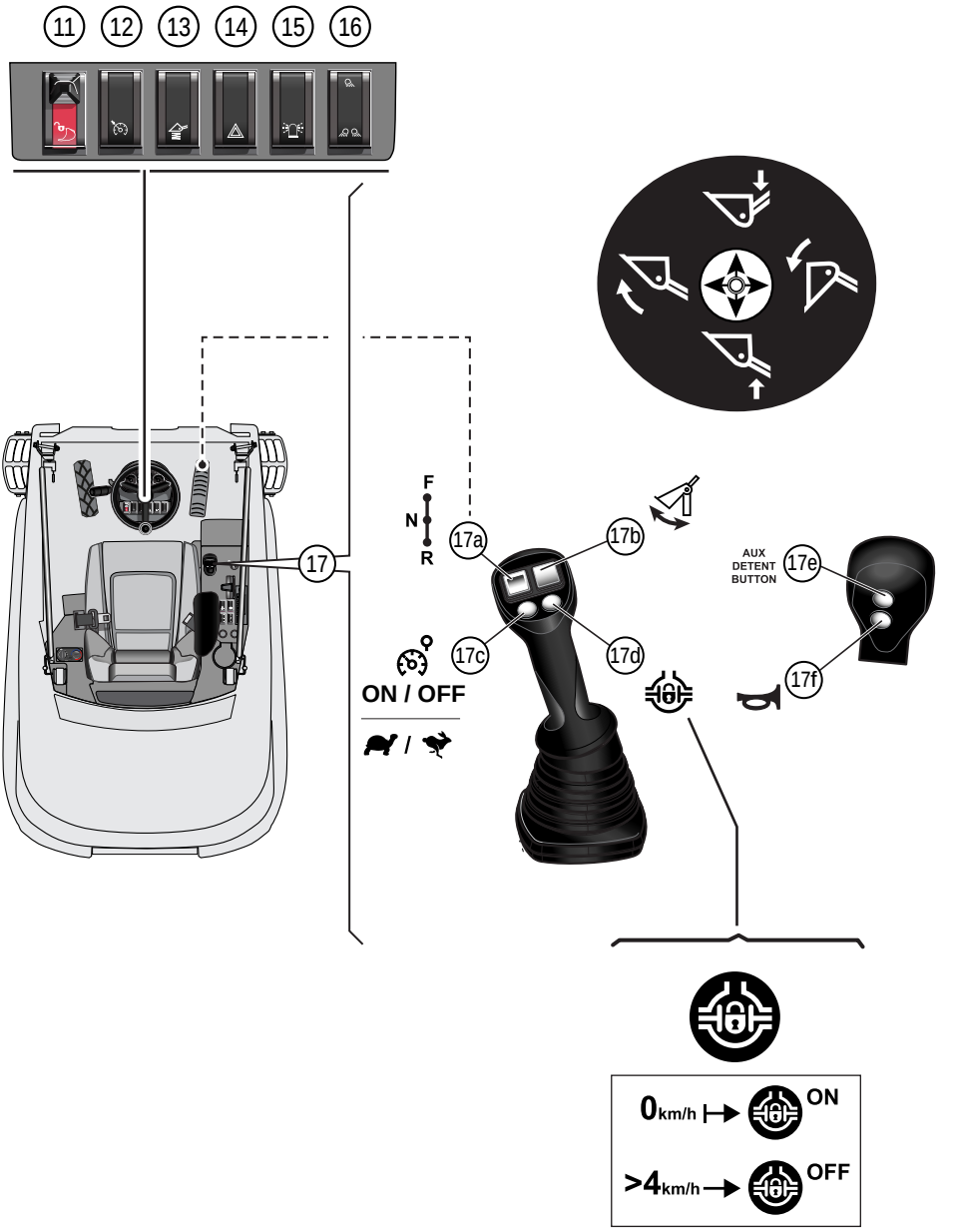

11
12
13
14
15
16
17
F
N
R
17a
17b
17c
17d
ON / OFF
AUX
DETENT
BUTTON
17e
17f
0km/h
ON
>4km/h
OFF

Fig. B4

12- Activation of the speed controller (Cruise Control) (Option for MLA 4-50 H-C, MLA 4-50 H and MLA 5-50 H)

Constant speed maintains a specific travel speed and constant auxiliary hydraulics continuous flow when engaged.

The function deactivates if the function key or brake pedal is pressed or if there is a change in the setting for the speed controller (**3**, Page 74).

13- Controlling the arm suspension (Option)

Hydraglide™ cushions the lift structure during transport. It provides a smoother ride over uneven surfaces.

DO NOT ACTIVATE THIS FUNCTION DURING WORK (LOADING, HANDLING, ETC.). USING HYDRAGLIDE™ WHILE DIGGING CAN SHORTEN HYDRAGLIDE™ COMPONENT SERVICE LIFE.

DO NOT CARRY THE ATTACHMENT TOO CLOSE TO THE GROUND DURING MOVEMENT, SO THAT THE AMPLITUDE OF THE DAMPING DOES NOT ALLOW THE ATTACHMENT COME INTO CONTACT WITH THE GROUND.

14- Hazard warning lights switch (Option)

15- Rotating beacon activation switch (Option)

16- Working lights

17- Arm and bucket control joystick:

- **Cylinder maneuvers:**
  - Lever pushed forward: Arm lowering.
  - Lever pushed backward: Arm raising.
  - Lever to the left: Filling of the bucket (closing).
  - Lever to the right: Emptying of the bucket (opening).
- **Mounted on the joystick are:**

17a. Forward and reverse direction selection control:

Also see Chapter "8 Accelerator pedal:, Page 78".

- Forward direction (**F**): tilt the selector forward.
- Neutral (**N**): mid position.
- Reverse direction (**R**): tilt the selector backwards.

Starting the machine is impossible if the direction of travel selector is not in the Neutral (N) position.

17b. Auxiliary hydraulic line/attachment locking-unlocking control:

- Auxiliary hydraulic control:
  - Push the control forward or backward to activate the attachment.
  - As soon as the control is released, the function is deactivated.
- Tool locking/unlocking control:
  Refer to Chapter "11 Tool unlocking function pushbutton, Page 78".

17c. Speed commutation/Speed controller activation pushbutton.

- **MLA 2-25 H:** not used.
- **MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H:** Successive shift from low speed (Tortoise) to high speed (Hare).
- **MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H 30 km/h** (18.6 mph) **option:** Activation and deactivation of the speed limiter, See Chapter 3 P74.

17d. Differential lock function (option) pushbutton (not available on MLA 2-25 H)

The differential lock can provide increased traction on loose and slippery surfaces.

When the machine is moving, the differential lock is only possible below a certain speed: The symbol **13**, Page 87 flashes if the button is pressed when the differential lock cannot be operated.

The move to high speed (hare) cuts off or prevents the differential lock.

For machines MLA 4-50 H, MLA 4-50 H-C and MLA 5-50 H with the 30 km/h** (18.6 mph) **option, the differential lock is only possible below 4 km/h** (2.5 mph)**; it deactivates above this speed.

○ Activate the differential lock only when stopped: Display of the symbol **13** , Page 87.

The differential lock is displayed when the differential lock is engaged.

DO NOT DEACTIVATE THE DIFFERENTIAL LOCK WHEN THE WHEELS ARE SKIDDING, SLIDING OR HAVE LOST THEIR GRIP: STOP TRAVEL BEFORE ACTIVATING/DEACTIVATING THE DIFFERENTIAL AXLE LOCKING. DAMAGE TO THE AXLE MAY RESULT.

○ Deactivate differential locking when the need for maximum traction is no longer necessary.

17e. Pushbutton for maintaining the auxiliary line

Pressing the pushbutton makes it possible to maintain the flow rate value set by the proportional selection control for the auxiliary line (See Chapter **17b** P81).

○ Operate the proportional selection control for the auxiliary line (**17b**).

○ Press the pushbutton (**17e**).

○ Release the proportional selection control for the auxiliary line (**17b**); the output of the auxiliary line is maintained at the value set (Symbol **23**, Page 87, displayed).

○ Press the pushbutton (**17e**) to deactivate the maintenance of the auxiliary line. The output of the auxiliary line returns to the current value defined by the auxiliary line control (Symbol **23**, Page 87, removed). Maintenance of the auxiliary line is deactivated in the following cases:

- Pressing the pushbutton **17e**.
- Locking of hydraulic controls (**5**, Page 77).
- Turning off the ignition (**1**, Page 74).

17f. Horn pushbutton

Ignition must be on for the horn to work.

18- Steering wheel

19- Control for tilting the steering wheel

20- Opening handle for the side arch (Canopy version)

21- Door (Cab option) or side arch (As an option on the Canopy version)

22- Armrest

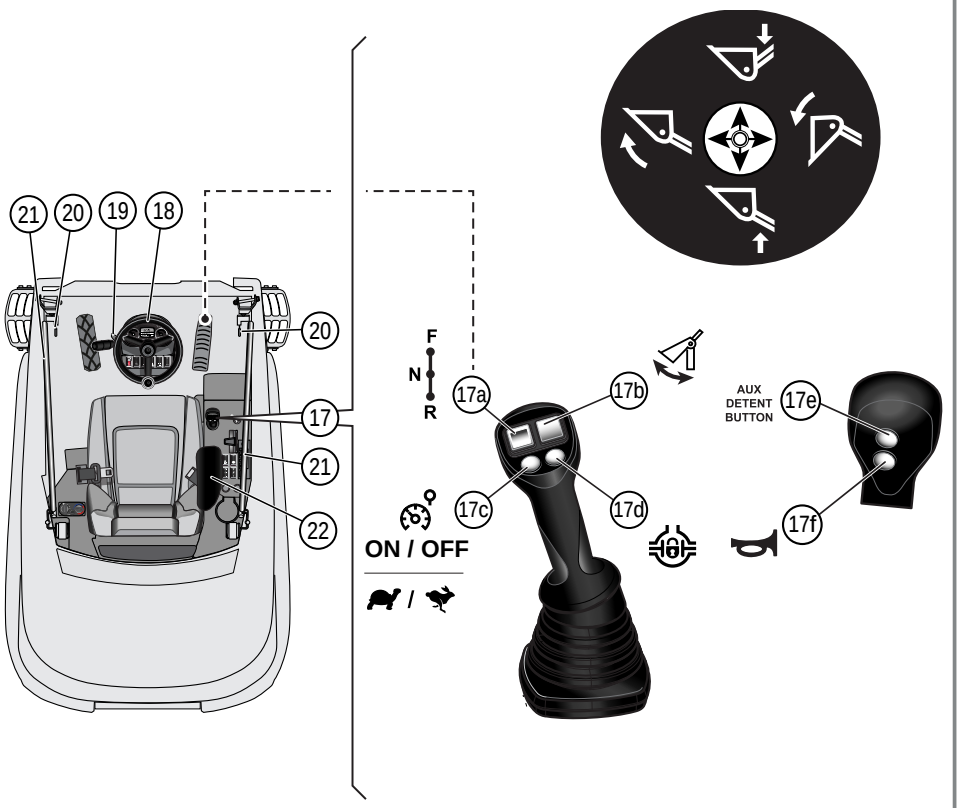

21
20
19
18
20
17
21
22
F
N
R
17a
17b
17c
17d
ON / OFF
AUX
DETENT
BUTTON
17e
17f

Fig. B5

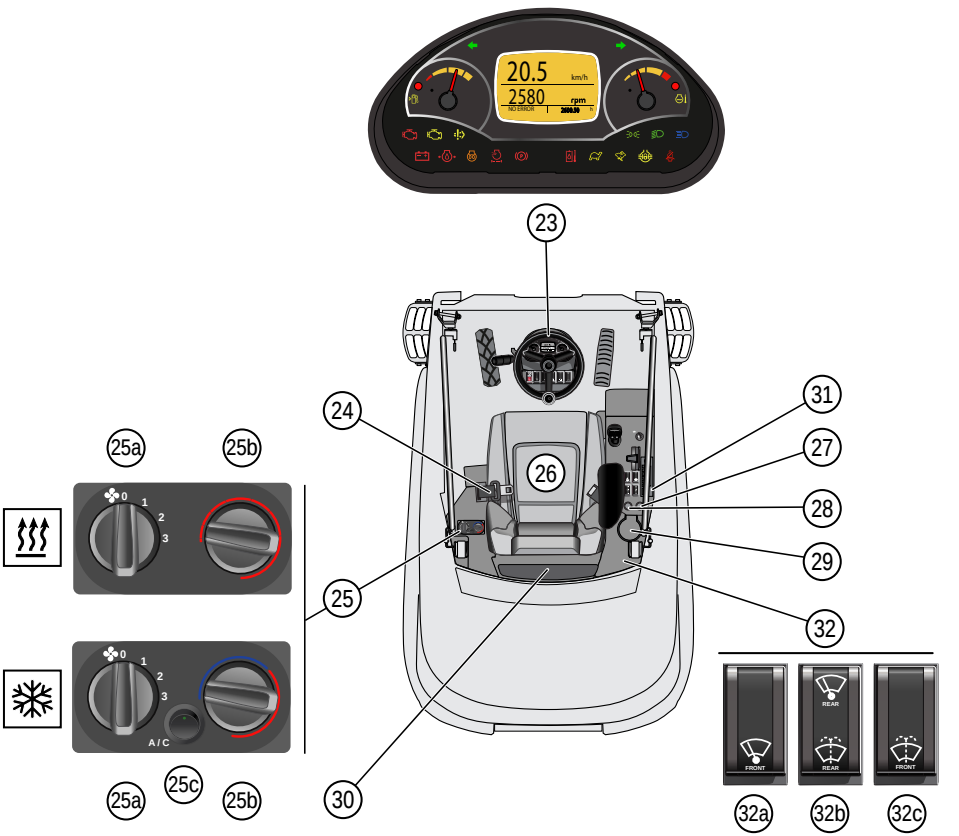

20.5
km/h
2580
rpm
23
24
25
25a
25b
25c
26
27
28
29
30
31
32
32a
32b
32c
0
1
2
3
A/C
FRONT
REAR
REAR
FRONT

Fig. B6

23- Dashboard

For details of the dashboard display, refer to Chapter 11.2 Dashboard and display unit, Page 87.

24- Seat belt

25- Heating and air conditioning (Cab only/air conditioning as an option)

25a. Air flow control.

25b. Temperature control

25c. Air conditioning activation switch (Option).

26- Driver's seat

27- Cigarette lighter or inspection lamp socket:

The socket is suitable for a 12 V lamp.

☞ ***CAUTION: Do not exceed a 25 W power draw. Damage could result..***

28- USB port for telephone charging

29- Cup holder

30- Storage compartment

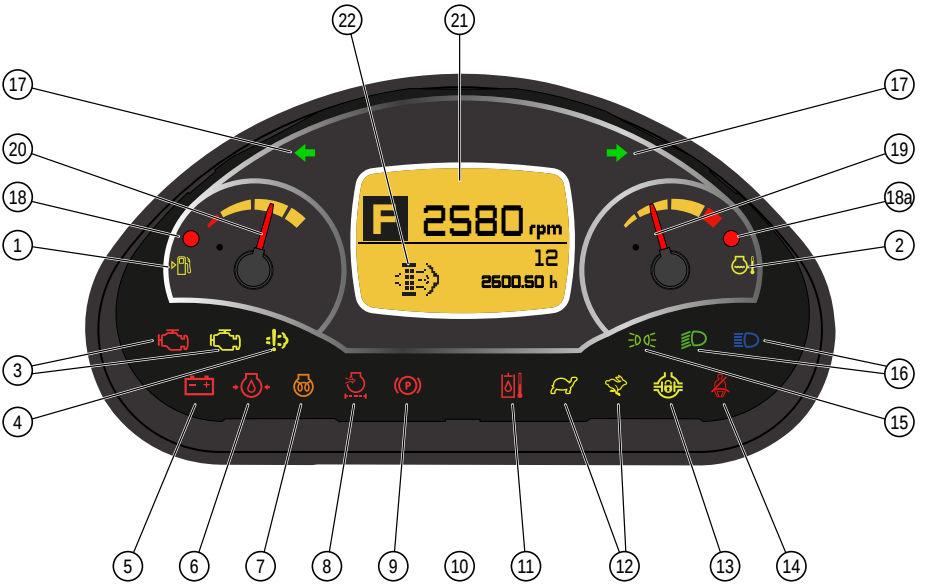
31- Radio (cab option)

32- Windshield wiper control (cab option)

32a. Front windshield wiper control

32b. Rear windshield wiper and windshield washer control

32c. Front windshield washer control


22
21
17
17
20
19
18
18a
1
2
3
16
4
15
5
6
7
8
9
10
11
12
13
14
F 2580 rpm
12
2600.50 h


F 2580 rpm
20
2600.50 h

Fig. B7

11.2. Dashboard and display unit

No.	A	B	Description
1			Fuel level alert
2			Water temperature warning
3			Engine fault (A)/critical fault (B) ⚠ ***ENGINE SHUTDOWN REQUIRED***
4			Indicator of malfunction in the exhaust gas filter system (contact the engine manufacturer)
5			Battery charge fault
6			Engine oil pressure fault
7			Engine pre-heat symbol
8			Air filter clogging
9			Parking brake activated (flashes if there is a fault in the parking brake control circuit)
10			Not used
11			Hydraulic oil temperature fault (flashes if there is a fault with the temperature sensor)
12			Selected speed indicator: high speed mode (Hare) (A)/Low speed mode (Tortoise) (B). A flashing tortoise light, and a constant hare light, indicates a speed mode malfunction.
13			Differential axle locking active.
14			Seat belt not fastened. WARNING! Never operate the machine without the seat belt fastened around the operator.
15			Position lights on
16			Dipped (A)/high beam (B) headlights on
17			Turn signals left (A) / right (B)
18			Gauge level warning light (flashes if there is a fault).
18a			**(Except for MLA 2-25 H)**, temperature warning light: Fixed on = cooling circuit hot / slow flashing = cooling circuit temperature warning / **fast flashing** = **critical engine overheat warning =>** ⚠ ***STOP THE ENGINE IMMEDIATELY***
19			Cooling circuit water temperature gauge
20			Fuel level gauge
21			Backlit LCD screen (see Digital display unit, Page 88)
22			DPF filter warning (see DPF regeneration system, Page 90)
23			Maintenance of the auxiliary line control activated (**See Chapter 17e P82)**

■ Digital display unit

No.	Description
1	Forward/Neutral/Reverse travel direction
2	MLA 5-50 H (Option 30 km/h (18.6 mph)) = Speed selected (Values from 0.5 (0.3 mph) to 25 km/h (15.5 mph) then “MAX”= Is displayed when using the speed controller.) .
3	Engine speed in revolutions per minute
4	Total cumulative number of hours
5	MLA 5-50 H (Option 30 km/h (18.6 mph)) = Speed actually reached by the machine (in km/h (mph))
6	Particulate filter (DPF) warning (see DPF regeneration system, Page 90)

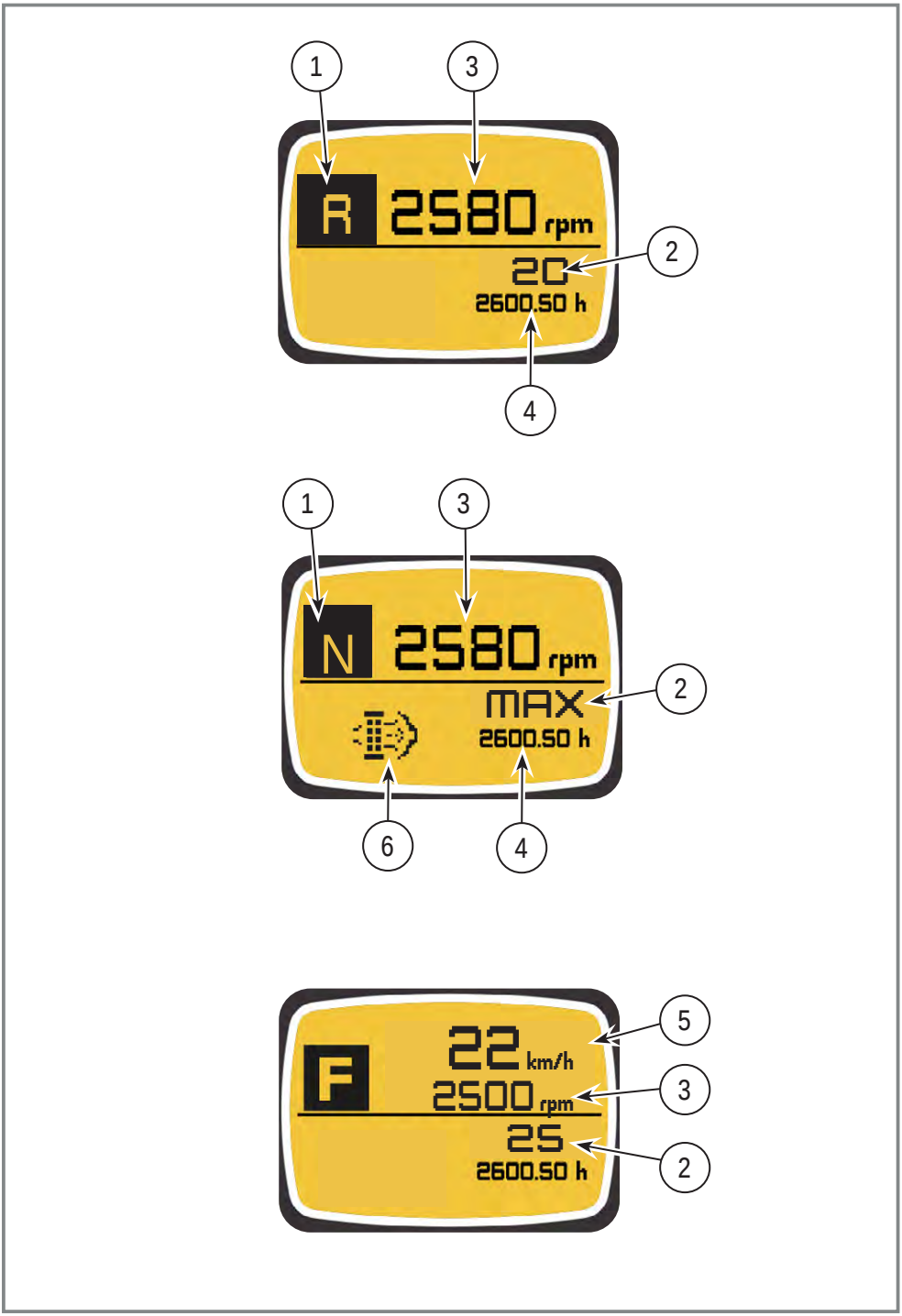

1
3
R
2580 rpm
2
20
2600.50 h
4
1
3
N
2580 rpm
2
MAX
2600.50 h
6
4
5
F
22 km/h
2500 rpm
3
25
2600.50 h
2

Fig. B8

11.3. DPF regeneration system (MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H)

11.3.1. Particulate filter (DPF) regeneration mode

The engine is fitted with a Diesel Oxidation Catalyst (DOC) Tier 4 or a Diesel Oxidation Catalyst + Diesel Particulate Filter (DPF) Stage V.

The DPF does not require any maintenance. The passive regeneration of the catalyst takes place during normal use of the machine.

However, the efficiency of the particulate filter (DPF) depends on the temperature of the exhaust gases (catalysis is almost zero below 250 °C (482°F)). Consequently, use of the machine for short periods or at low speed tends to generate more soot and clog the DPF catalyst.

When the clogging level is too high, the post-treatment management system will perform active regeneration of the catalyst to burn off the soot. This involves an increase of temperature within the catalyst caused by:

- ○ An increase in engine speed.
- ○ Management of the intake valve if the increase in engine speed is not enough.

☞ ***The regeneration cycle cannot take place if the engine temperature is < 65 °C** (149°F).*

11.3.2. Indicators and warnings for the particulate filter (DPF)

- A critical DPF warning indicates a malfunction and active regeneration cannot occur. Contact your dealer.
- These alert levels range from a simple display to permanent shutdown of the engine.

Criticality level	DPF symbol (on LCD screen)		Engine warning lights			Description and effects
			Fault		Critical	
	Status / Flashing		Status / Flashing		Status	
1 - 3	/	/	/	/	/	Active regeneration carried out by the moderate increase in engine speed at idle (maintained at 1400 rpm minimum).
4		/	/	/	/	The particulate filter is not successfully regenerated => Increase in engine speed (maintained at 1800 rpm minimum).
5		Once/ sec	/	/	/	After one hour of attempting active regeneration => Increase in engine speed (maintained at 1800 rpm minimum).
6		Twice/ sec*	/	/	/	Engine power is reduced at start-up for 1 minute (*) => Increase in engine speed (maintained at 1800 rpm minimum)
7		Twice/ sec*		Once/ sec	/	Engine power is reduced at start-up for 1 minute (*) => Increase in engine speed (maintained at 1800 rpm minimum)
8 - 9		Twice/ sec		Once/ sec		Filter clogged: Engine power reduced to minimum speed. Stop the machine and contact your Manitou dealer. Emergency maneuver permitted for 20 minutes.

In order to warn the operator about a DPF regeneration problem, a “DPF filter” symbol appears on the LCD screen (see Digital display unit, Page 88).

TO HELP WITH ENGINE REGENERATION, WORK WITH A MAXIMUM LOAD.

If there is no improvement after one hour of operation, the system will downgrade the engine speed.
The next time the machine is started, the engine speed will be downgraded for 1 minute before reverting to its nominal operation (DPF symbol flashing).
Finally, from criticality level 8, engine speed will remain blocked at its minimum value.

IF CRITICALITY LEVEL 8 IS REACHED, STOP THE ENGINE AND CONTACT YOUR DEALER.

11.3.3. Emergency maneuver (*Safe Harbor*):
When the engine speed is degraded by the engine post-treatment management system, it is possible to use the emergency maneuver (*Safe Harbor*) mode.
This Safe Harbor mode temporarily recovers full engine capacity in order to move the machine to a safe place or to a transporter for evacuation.

To activate safe harbor, turn off and immediately restart the machine. The machine can again be used at its normal operating speed for a limited period.

ONCE CRITICALITY LEVEL 8 IS REACHED, SAFE HARBOR CAN ONLY BE USED FOR AN ACCUMULATED TOTAL OF 20 MINUTES. BEYOND 20 MINUTES, ENGINE SPEED WILL REMAIN LIMITED TO LOW IDLE.

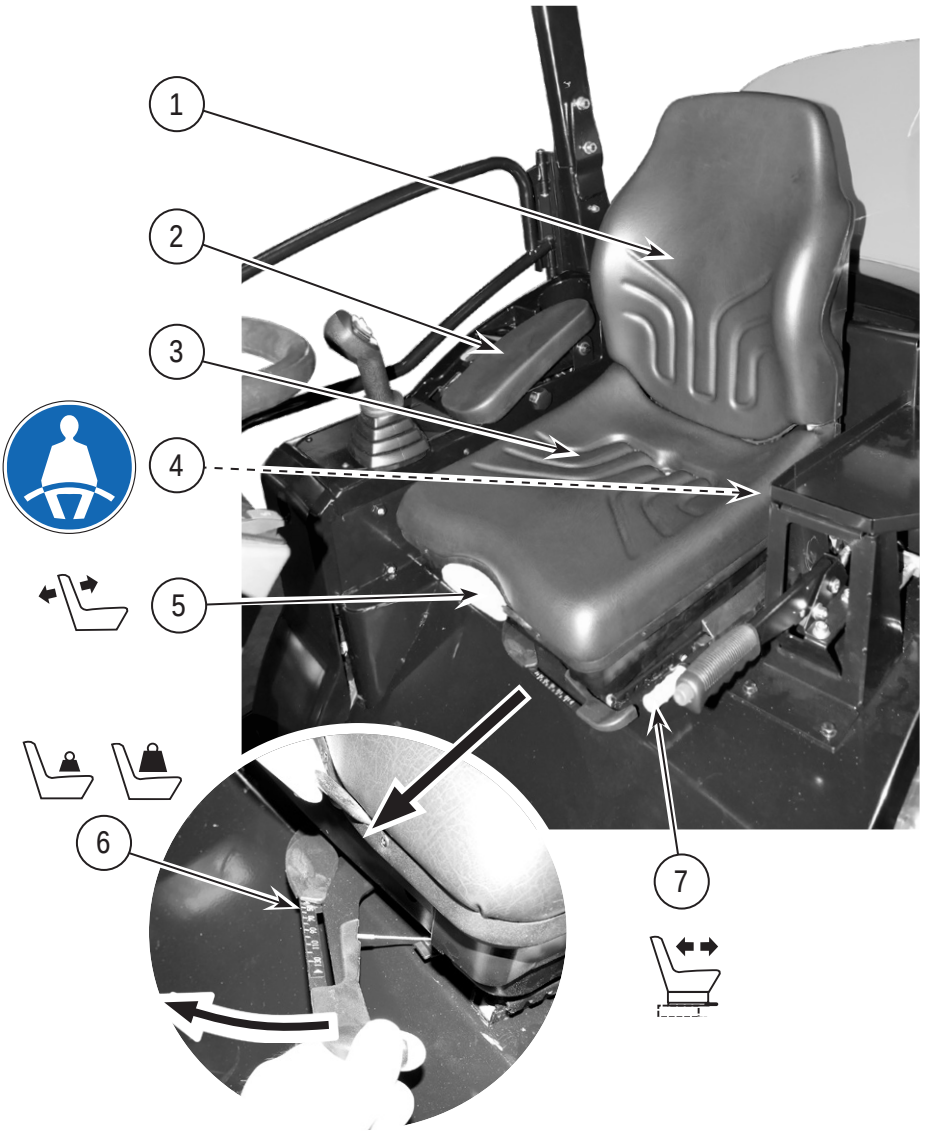


Fig. B9

11.4. Driver's seat

11.4.1. Standard version

A seat that functions correctly and is suitable for the stature of the driver is an important condition for preserving your health. Keep your driver's seat in good operating condition by carrying out regular maintenance and checks.

Carry out those checks while performing maintenance work on the vehicle.
In order to prevent injury, before using the vehicle and at each change of driver carry out a new weight adjustment depending on the driver's weight.
To prevent injury, keep objects out of the operator's seat suspension area.

TO PREVENT ACCIDENTS AND/OR SEVERE INJURY, NEVER ADJUST THE SEAT WHEN THE MACHINE IS IN OPERATION. ADJUST THE SEAT ONLY WHEN THE MACHINE IS STOPPED. AFTER ADJUSTMENTS, MAKE SURE THE SEAT IS FULLY LOCKED IN POSITION BEFORE USING THE MACHINE.

1- **Backrest**
2- **Armrest**
3- **Seat**
4- **Seat belt**
5- **Handle for adjusting the angle of the backrest**
6- **Adjustment control for the firmness of the seat cushion**
   - Pull the cable strip until the value of the weight desired is read.
   - Pull to the maximum and then release to go back to the minimum value.
7- **Handle for horizontal adjustment of the seat (seat and backrest)**

11.4.2. Pneumatic version

A seat that functions correctly and is suitable for the stature of the driver is an important condition for preserving your health. Keep your driver's seat in good operating condition by carrying out regular maintenance and checks.

Carry out those checks while performing maintenance work on the vehicle.
In order to prevent injury, before using the vehicle and at each change of driver carry out a new weight adjustment depending on the driver's weight.
To prevent injury, keep objects out of the operator's seat suspension area.

TO PREVENT ACCIDENTS AND/OR SEVERE INJURY, NEVER ADJUST THE SEAT WHEN THE MACHINE IS IN OPERATION. ADJUST THE SEAT ONLY WHEN THE MACHINE IS STOPPED. AFTER ADJUSTMENTS, MAKE SURE THE SEAT IS FULLY LOCKED IN POSITION BEFORE USING THE MACHINE.

1- Backrest
2- Armrest
3- Seat
4- Seat belt
5- Handle for adjusting the angle of the backrest
6- Adjustment control for the firmness of the seat cushion (weight adjustment)
- When sitting on the seat, pull or press the lever to adjust the weight. The weight is correctly adjusted when the arrow can be read in the central area of the porthole.

Adjust the weight each time the driver changes and before starting the vehicle.

7- Handle for horizontal adjustment of the seat (seat and backrest)
8- Height-adjustable headrest
- To remove the headrest completely, pull hard upward to go past the final stop.

9- Lumbar adjustment
10- Heated seat switch

■ **Maintenance**
• Keep the seat clean to prolong its service life.

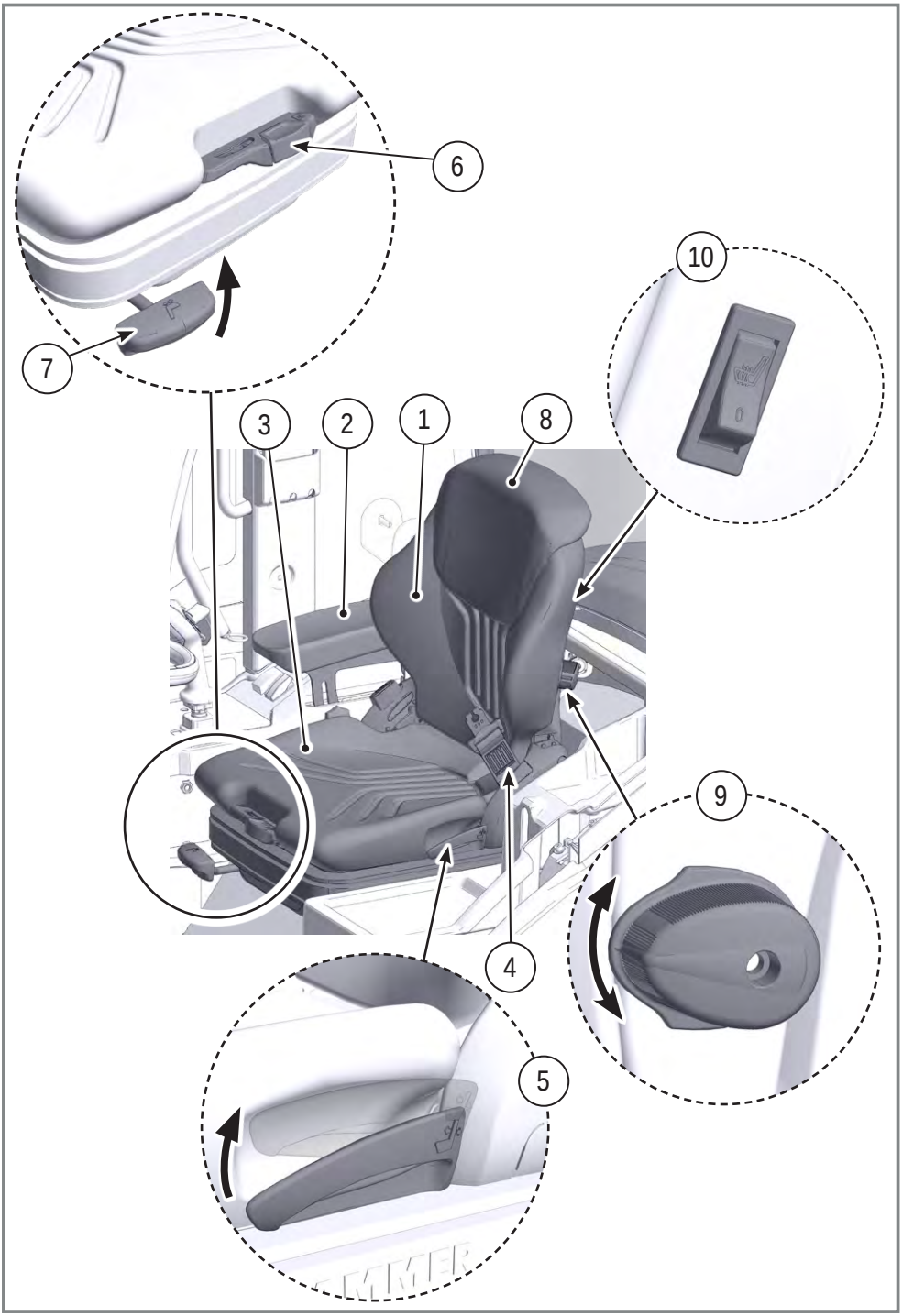


Fig. B10

11.5. Access to the driver's compartment

- Open the swiveling side arch (Option) (**1**) of the driver's compartment (*Canopy* version) using the external handle (**2**) Access the driver's compartment by the step (**3**) using the handrails (**4**).

ALWAYS USE 3 SUPPORT POINTS TO EXIT OR ENTER THE CAB USING 2 HANDS AND 1 FOOT OR 1 HAND AND 2 FEET.

- Always face the machine when exiting or entering the cab.
- Never enter or exit the machine by jumping.
- After sitting down:
- Adjust the driving position.
- Adjust the rear view mirrors (**5**) on the outside of the cab (front left and front right).
- Close the side arch (**1**) (Option) and lock it in the closed position (**6**).
- **Fasten the seat belt.**

■ **Starting the engine**

- Insure that the direction of travel selection control (**17a**, Page 81) is in neutral and that the parking brake (**4**, Page 77) is activated. Do not move the joystick or pedals.
- Insert the key in the ignition switch (**1**, Page 74).
- Turn the key clockwise to the ON position, wait for the engine preheat indicator light (**7**, Page 87) to turn off, and then turn the key to the starter position. Hold this position until the engine is running smoothly.
- Warm up the diesel engine after insuring that the engine oil pressure indicator light is off (**6**, Page 87). Avoid sudden throttle adjustments. Gradually and smoothing increase engine speed to half throttle. Allow the engine to reach operating temperature for at least 15 minutes.

A longer warm-up period may be necessary depending on ambient temperature.

■ **Traveling on the road**

Refer to the following chapters concerning the use of the machine when traveling and the regulations for travel on public roads.

USE CARE AND LIMIT TRAVEL SPEED WHEN TRAVELING DOWNHILL. OVER-SPEEDING THE MACHINE CAN CAUSE DAMAGE TO THE MACHINE AND POTENTIAL LOSS OF CONTROL.

Fig. B11

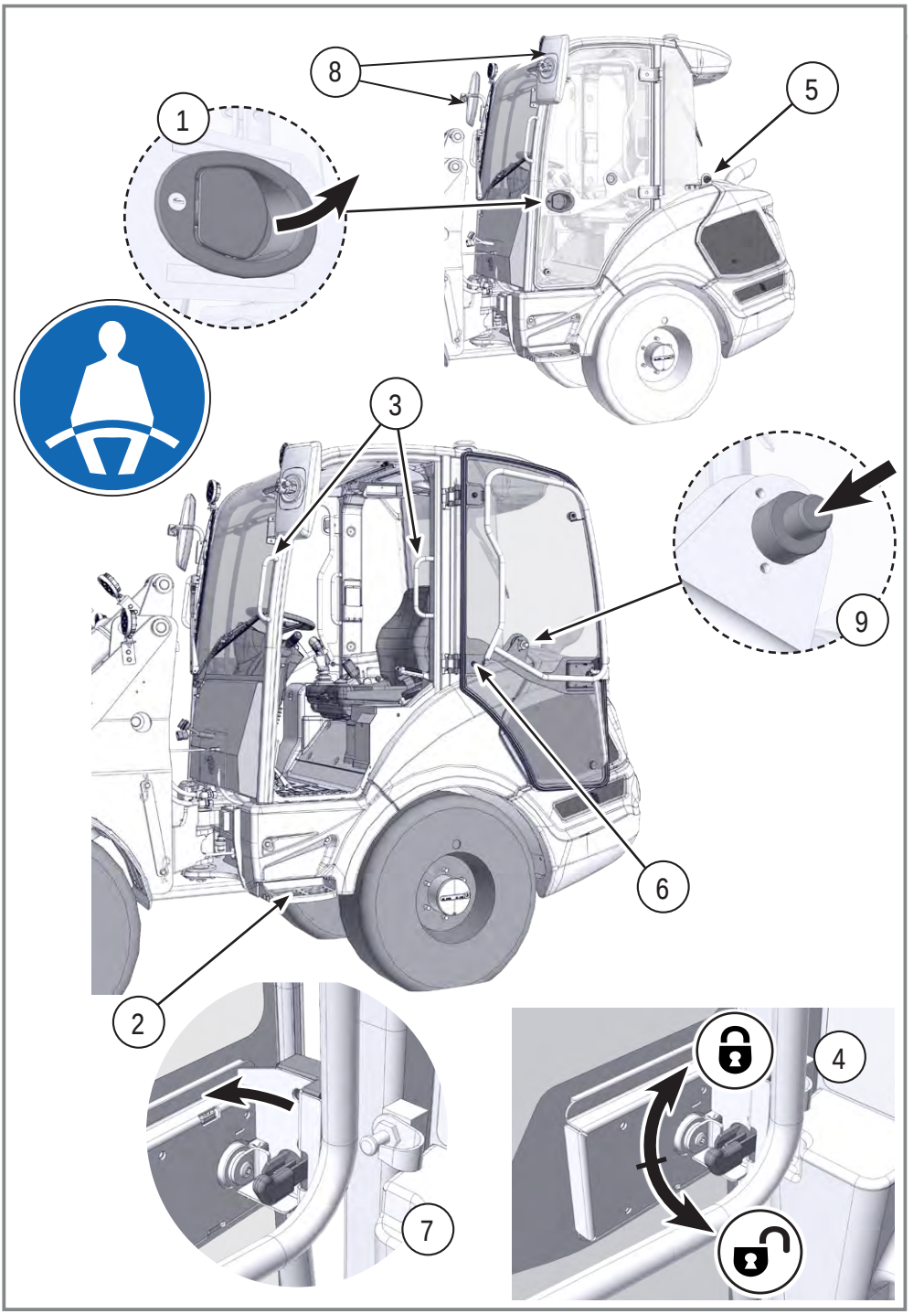


Fig. B12

11.5.1. Cab Version

■ **Use of the doors**

- From the outside: using the exterior locking handle (**1**) open the door using the exterior door handle (**1**). Access the operator's compartment using the step (**2**) and handrails (**3**).

ALWAYS USE 3 SUPPORT POINTS TO EXIT OR ENTER THE CAB USING 2 HANDS AND 1 FOOT OR 1 HAND AND 2 FEET.

- Always face the machine when exiting or entering the cab.
- Never enter or exit the machine by jumping.
- To keep the door in the open position: engage in the end piece to lock it (**5**).
- To release the door from the open position, press the button (**9**) or use the offset pull tab (**6**) from the driver's compartment.
- From the inside: lower the handle (**4**) to open the door or place it in the high position to lock it.
- Option: for more air, it is possible to lock the door in the half-open position with the lever (**7**).
- After sitting down:
  - Adjust the driving position.
  - Adjust the rear view mirrors (**8**) on the outside of the cab (front left and front right).
  - Close the door (**1**) and lock it in the closed position (**4**).
  - **Fasten the seat belt.**

■ **Starting the engine**

- Insure that the direction of travel selection control (**17a**, Page 81) is in neutral and that the parking brake (**4**, Page 77) is activated. Do not move the joystick or pedals.
- Insert the key in the ignition switch (**1**, Page 74).
- Turn the key to the contact position, wait for the engine preheat indicator light (**7**, Page 87) to turn off, and then turn the key to the starter position. Hold this position until the engine is running smoothly.
- Warm up the diesel engine after insuring that the engine oil pressure indicator light is off (**6**, Page 87). Avoid using the accelerator jerkily, maintain a constant speed and progressively increase to half throttle. The duration of this warming up period depends on the ambient temperature but must be at least 15 minutes.

■ **Traveling on the road**

Refer to the following chapters concerning the use of the machine when traveling and the regulations for travel on public roads.

USE CARE AND LIMIT TRAVEL SPEED WHEN TRAVELING DOWNHILL. OVER-SPEEDING THE MACHINE CAN CAUSE DAMAGE TO THE MACHINE AND POTENTIAL LOSS OF CONTROL.

■ **Windshield washer liquid**
- Open the rear cover to access the windshield wash tank (**1**).
- Fill with approximately 2 l (0.5 US gal) (MLA 2-25 H: 1.5 l (0.4 US gal)) of windshield washer liquid.
- The cab is fitted with front (**2**) and rear (**3**) windshield wipers.

■ **Cab fitted with a heating or air conditioning (Option) system**
- 4 swivel air nozzles (**4**) are present (two nozzles in the front and two at the back). They may be oriented in all directions, particularly toward the windows for defrosting or defogging.
- The heating/air conditioning control (**5**) is located on the ceiling to the left of the driver (**6**).
- For setting the heating air conditioning interface (**5**) (See **25**, Page 85).

It is recommended that the air conditioning is operated for a quarter of an hour each week to lubricate the compressor seals, even if the temperature is low. This will insure that the seals do not dry out, causing refrigerants to leak.

■ **Defrosting:**
- To activate defrosting, operate the heating, directing the air nozzles toward the areas to be defrosted.

■ **Defogging:**
- Act as for defrosting.
- If the machine is fitted with air conditioning (Option), operating it speeds up defogging.

■ **Roller blind (Option)**
The roller blind covers either the glazed cab roof or the top part of the front window.
- To unroll the roller blind (**7**), grasp the tab and gently pull the blind down to the rack on either side of the front window.
- Adjust the position of the roller blind on the notches of the rack.

CAUTION: THE BLIND MUST NOT OBSTRUCT THE OPERATOR'S VISION DURING WORK OR MOVING THE MACHINE.

- Unhook the blind from the rack and support it when rolling it to return it to its housing.

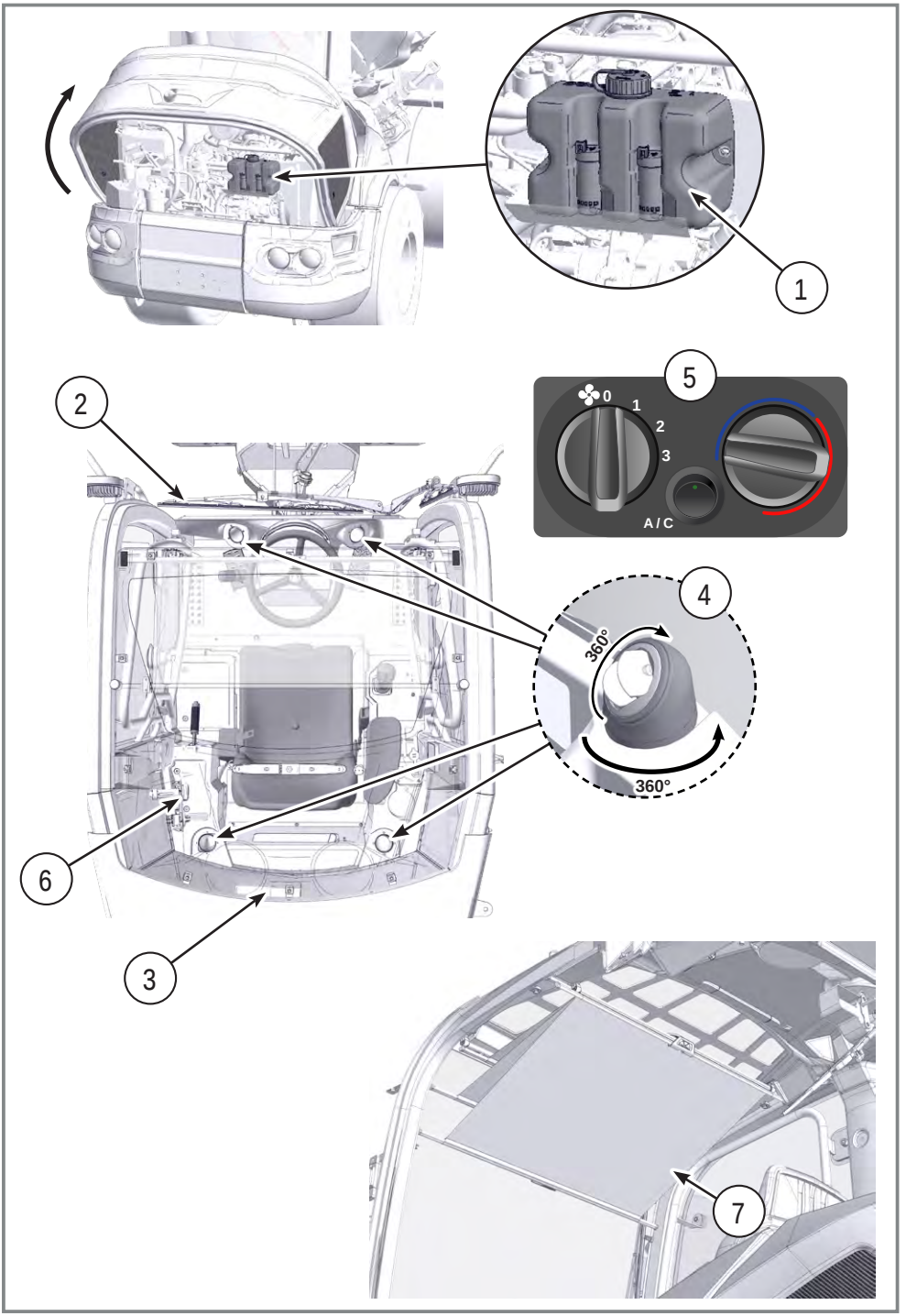
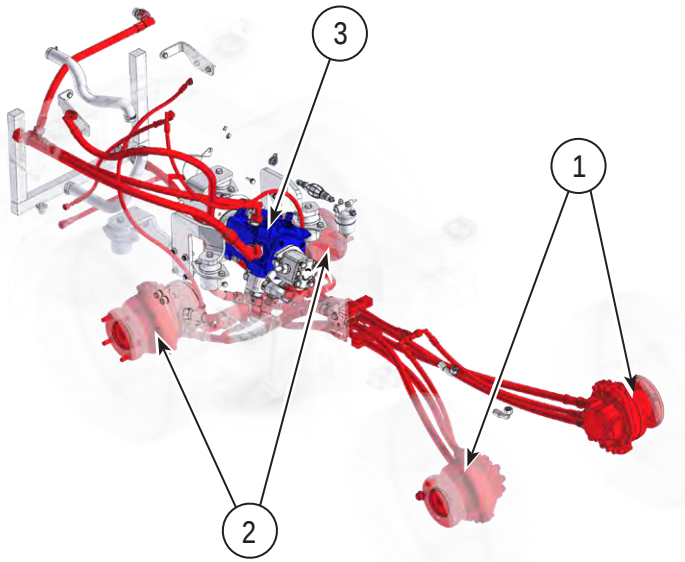


Fig. B13

MLA 2-25 H



MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H

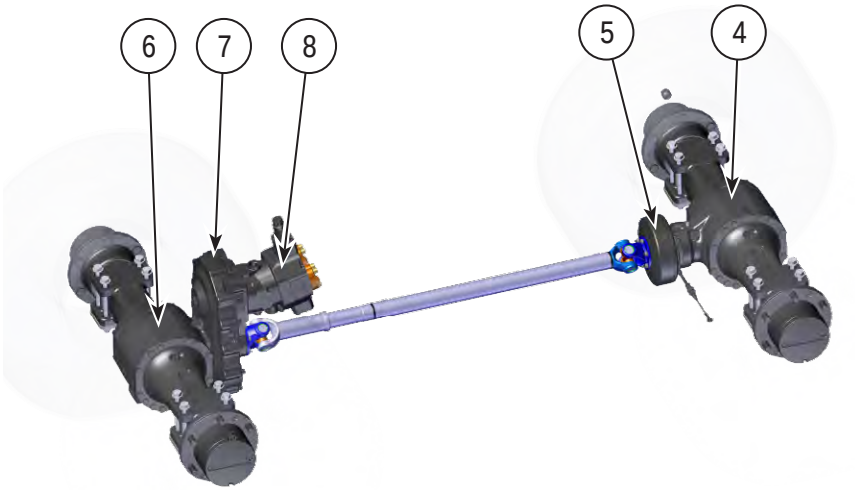


Fig. B14

11.6. Travel management

1- The movement of the machine is provided by:

- **MLA 2-25 H:**
  - Two travel hydraulic motors (**1**) at the front.
  - Two travel hydraulic motors fitted with low-pressure brakes (**2**) on the rear section (parking brake).
- **MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H:**
  - One front axle (**4**) fitted with a drum brake (**5**) (service brakes operated by an independent hydraulic circuit in closed circuit and a parking brake operated by a cable).
  - One rear axle (**6**) fitted with a transfer box (**7**) connected to the travel hydraulic motor (**8**).
  - The transmission is the permanent 4x4 type with differential lock on the two axles (Option).
  - The variation in the travel speed takes place by the combination of the variation in the travel pump displacement and the travel motor displacement. At high speed the travel motor displacement and the torque supplied are minimal. At low speed the travel motor displacement and the torque supplied are maximal. Pressing the low speed control artificially maintains the travel motor at maximum displacement and therefore the torque is maximal.

2- Speed limiter function (Speed Limit)

The speed limiter function helps to manage movement by limiting the maximum travel speed the machine can reach.

■ **Activation and deactivation of the speed limiter** (MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H 30 km/h (18.6 mph) option)

Is carried out by pressing the speed limiter pushbutton (see **17c**, Page 81) on the joystick.

The dashboard LCD screen displays the speed currently set (0.3 km/h (0.2 mph) to MAX) (this may be done at any time, even when the machine is moving).

When the speed limiter is deactivated, the maximum travel speed is no longer limited.

■ **Configuration of the speed limiter**

When the MAX set point is selected, the speed limiter is deactivated.

- **MLA 2-25 H**:
  By pressing right or left the speed indexer (**3**, Page 74) makes it possible to increase or decrease the speed limit set point.
  This set point is displayed on the dashboard screen in the form of an indexed value from 1 to 19 and then “MAX”.
- **MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H** (Standard version):
  - Pressing the speed change button of the joystick (see **17c**, Page 81) makes it possible to shift from high speed (hare) to low speed (tortoise) and vice versa.
  - Move the speed indexer to the right or left to increase or decrease the speed limit set point. Speed can be limited from 1 to 19, and "MAX".

- **MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H** (30 km/h (18.6 mph) option):
  - The activation and deactivation of the speed limiter is carried out by pressing the pushbutton for the “speed limiter” function on the joystick (See Chapter 17c P81).
    When activating the function, the speed currently set is displayed temporarily on the dashboard screen (this may happen at any time, even when the machine is moving).
  - As the speed limiter is activated (Display of the value for the speed currently set), move the speed indexer to the right or left to increase or decrease the speed limit set point. Speed can be limited from 0.3 km/h (0.2 mph) to 25 km/h (15.5 mph), and "MAX".

☞ ***When the MAX set point is selected, the speed limiter is deactivated.***

	**Selection/Display**	**Speed set points available (km/h)** (mph)	**Travel motor displacement**
ON		0.3 (0.2) ▪ 0.6 (0.4) ▪ 0.9 (0.6) ▪ 1.2 (0.7) ▪ 1.5 (0.9) ▪ 2 (1.2) ▪ 2.5 (1.6) ▪ 3 (1.9) ▪ 3.5 (2.2) ▪ 4 (2.5) ▪ 4.5 (2.8) ▪ 5 (3.1) ▪ 5.5 (3.4) ▪ 6 (3.7) ▪ 6.5 (4) ▪ 7 (4.3) ▪ 7.5 (4.7) ▪ 8 (5) ▪ 9 (5.6) ▪ 10 (6.2) ▪ 12 (7.5) ▪ 14 (8.7) ▪ 16 (9.9) ▪ 18 (11.2) ▪ 20 (12.4) ▪ 25 (15.5) ▪ MAX	AUTO
OFF		MAX	

11.7. Driving and traveling on the road

■ Traveling on the road

OBEY ALL OVER-THE-ROAD LAWS, RULES, AND REGULATIONS. MAKE SURE THE MACHINE IS IN COMPLIANCE ALL WITH APPLICABLE LAWS, RULES, AND REGULATIONS.

- Before using the machine, check the following for proper operation:
  - Of the main brake/Inching function (**9**, Page 78).
  - Of the parking brake (**4**, Page 77).
  - Of the steering (**18**, Page 82).
- Of the signaling and lighting devices (**10**, Page 78) and make sure all required reflector are properly installed, clean, and undamaged.
- Unlock the controls using the switch (**5**, Page 77) when maneuvering the arm.
- If the arm is equipped with an attachment, travel with the load/attachment as low as possible during transport and while turning. Observe minimum ground clearance. Keep the bottom of the load below the wheel axle height during transport and turning.

THE ARM HYDRAULIC CONTROLS (5, PAGE 77) MUST BE LOCKED-OUT AND DISABLED WHEN TRAVELING ON THE ROAD.

- Move the machine in the required direction of travel by:
  - Releasing the parking brake (**4**, Page 77).
  - Tilt the Forward/Reverse selection control (**17a**, Page 81), then gently tilt the one-way travel pedal (**8**, Page 78).
  - The machine will start to move.
- Select the speed limit using the speed limiter (**3**, Page 74). The dashboard (**23**, Page 85) indicates the selected speed set point.
- When moving main braking is available by pressing the braking circuit pedal (**9**, Page 78).

IMPORTANT: THE PARKING BRAKE (4, PAGE 77) IS ALSO THE EMERGENCY BRAKE.

WHEN GOING DOWNHILL, CAREFULLY CONTROL THE MACHINE AND LIMIT THE TRAVEL SPEED SO AS NOT TO DAMAGE THE HYDRAULIC AND MECHANICAL COMPONENTS OF THE POWER TRAIN. CAN RESULT IF THE MACHINE TRAVEL COMPONENTS OVER-SPEED.

■ End of travel

- Slow the machine by taking your foot off the travel pedal (**8**, Page 78) and brake by pressing on the braking circuit/inching control pedal (**9**, Page 78) until the machine stops.
  - **MLA 2-25 H**:
    The MLA 2-25 H is not fitted with service brakes.
    Pressing the pedal operates the travel pump variable displacement (inching function). When the pedal is pressed down completely the output from the travel circuit is zero and the machine is stopped.
    In this case, as long as the pedal is pressed down completely, the brake disks of the rear travel motors block any unintentional travel movement.
  - **MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H**:
    On the first third of its travel pressing the brake pedal makes it possible to operate the travel pump variable displacement (Inching function). After that the pedal will brake the machine via the drum brake on the front axle. When the pedal is pressed down completely, the combined action of the drum brake and the output of the travel circuit (at zero) causes the machine to stop.
- Put the machine in neutral by: Tilting the Forward/Reverse selection control into the middle/ NEUTRAL position (**17a**, Page 81).

- If the machine is equipped with an attachment, enable the hydraulic controls using the switch (**5**, Page 77) and lower the attachment to the ground.
- Switch off the diesel engine and remove the key from the ignition switch (**1**, Page 74).
- Open the door/arch (Option) using the handle on the inside.
- Get out of the driver's compartment using the step and the handrails.

ALWAYS USE 3 SUPPORT POINTS TO EXIT OR ENTER THE CAB USING 2 HANDS AND 1 FOOT OR 1 HAND AND 2 FEET.

- Always face the machine when exiting or entering the cab.
- Never enter or exit the machine by jumping.
- Close the cab door/arch (Option).
- Open the battery compartment cover and switch off the general power supply using the battery cut-off switch (See Chapter 12.6 P166).

11.8. Driving and traveling on work site

1- When working while traveling, comply with the following instructions:

For working while moving, follow the instructions and recommendations from section "Traveling on the road".

- If the attachment is fitted with a tool, position it as close as possible to the front of the machine about 20 cm (8 in) above the ground or more depending on the nature of the terrain, keeping the overhang as small as possible.

2- Before starting work

- Check the movements of the machine and its attachments for correct operation, to insure that they do not endanger people on the work site.
- Make sure that the original Manitou bucket or attachment is suitable for the work you wish to carry out.
- For traveling on a slope, lower the arm as close to the ground as possible.

3- While working

- For working use the main service brake as a working brake.
  - Operate the brake pedal and apply the parking brake to maintain active braking if the work does not require the machine to be moved immediately. Use the service brake routinely between two movements, even brief, on the work site.

Refer to Chapter B "HANDLING AND LIFTING" and apply the instructions concerning the safety devices.

  - Always remain in control of the stability and the movements that you make with the machine, because you can endanger your health or life, as well as those of the people on the work site.

BE VERY ATTENTIVE TO WHAT IS HAPPENING NEAR THE MACHINE.

OPERATOR VISIBILITY IS LIMITED IN CERTAIN AREAS. ITEMS LIKE ROPS/FOPS POSTS, ATTACHMENTS, THE LIFT STRUCTURE, ITEMS IN THE CAB, AND OTHERS CAN OBSTRUCT THE OPERATOR'S VIEW AND COULD MASK HAZARDS OR PEOPLE IN THE AREA AROUND THE MACHINE. IT IS VERY IMPORTANT THE OPERATOR IS AWARE OF THESE MASKED VISIBILITY AREAS BEFORE OPERATING THE MACHINE, ESPECIALLY ON BUSY WORK SITES. USE A SIGNAL PERSON IF YOU CANNOT SEE THE ENTIRE WORK AREA CLEARLY, IN HIGH TRAFFIC AREAS, OR WHENEVER THE OPERATOR'S VIEW IS NOT CLEAR.

4- Suspending work without getting out of the machine

- Immobilize the machine, put the control in neutral (**17a**, Page 81).
- Align the front undercarriage with the rear undercarriage.
- Bring the bucket or attachment back into contact with the ground, right control joystick (**17**, Page 81).
- Apply the parking brake (**4**, Page 77) to immobilize the machine and then neutralize the arm hydraulic controls (**5**, Page 77).
- Preferably stop the diesel engine using the key ignition switch (**1**, Page 74).

5- Suspending work in order to get out of the machine

- Bring the machine to a complete stop on a level surface. If the machine must be parked on a slope, park across the slope and chock the wheels to prevent movement.
- Be sure all working equipment and/or attachments are stopped and the auxiliary hydraulics valve is in neutral.
- Empty the attachment. Lower the lift structure and the attachment to the ground. If the lift structure must be left in the raised position, make sure it is properly supported.
- Place the forward/reverse drive switch (on top of the joystick) into the neutral position.
- Apply the parking brake.
- Move the throttle to the low-idle position and allow the engine to cool.
- Shut off the engine. Make sure that parts have stopped moving before continuing.

- Turn the ignition key to the ON/RUN position and move the joystick in all directions to verify the hydraulic system is de-pressurized.
- Press the auxiliary hydraulics pressure relief switch to relieve the pressure in the auxiliary hydraulics circuit.
- Turn off the ignition.
- Unfasten the seat belt, remove the ignition key, and take it with you. Exit the machine using the hand-holds and steps.
- Allow at least 2 minutes after turning off the ignition before disconnecting the battery or turning off the battery disconnect switch. Battery power is needed for computer/system maintenance functions which continue after the ignition is turned off.
- Always turn off the battery disconnect switch when parking the machine inside an enclosure.

Always use 3 support points to exit or enter the cab using 2 hands and 1 foot or 1 hand and 2 feet.

- Always face the machine when exiting or entering the cab.
- Never enter or exit the machine by jumping.
- Close the cab door/arch (Option).

6- End of work

- Same indications as in the above paragraph, but it is essential to stop the diesel engine with the key ignition switch (**1**, Page 74) and switch off the main power supply using the battery cut-off switch (See Chapter 12.6 P166).
- Carry out the daily maintenance on the machine and possibly clean it.

HIGH-PRESSURE (STEAM JET) CLEANING SHOULD BE USED WITH VERY GREAT CARE. IN ORDER TO PREVENT THE INGRESS OF WATER, FOR SAFETY AND OPERATING REASONS, BLOCK BREATHER HOLES AND PROTECT THE ELECTRICAL EQUIPMENT (CABLE GLAND, WIRING HARNESSES). DO NOT USE THIS CLEANING METHOD FOR THE INTERIOR OF THE CAB. SWEEP IT OR USE A SPONGE. AVOID SPRAYING WATER. THE SAME APPLIES TO THE ENGINE AIR INTAKE AREA.

7- Stopping the machine following emergency stop or engine shut-down:

- Put the arm in a safe position on the ground.
- If the machine's arm is not fitted with safety valves, the arm movements will be mechanically controlled. Switch on (**1**, Page 74) and unlock the arm hydraulic controls (**5**, Page 77) so that the arm is lowered onto the ground.

***Refer to Chapter* "Safety valves".**

TO PREVENT SERIOUS INJURY OR DEATH, MAKE SURE THAT NO ONE IS NEAR THE MACHINE WHEN THE LIFT STRUCTURE IS LOWERED.

■ Releasing residual pressures

- The residual hydraulic pressure does not allow a movement to be made or a change in direction for the front undercarriage.
- Once the arm is in the safety position, the engine stopped and ignition on, release the residual pressure by operating the arm joystick in all directions (**17**, Page 81).
- Apply the parking brake (**4**, Page 77) to immobilize the machine and then neutralize the arm hydraulic controls (**5**, Page 77).
- Switch off the diesel engine and remove the key from the ignition switch (**1**, Page 74).
- Turn off the general power supply using the battery cut-off switch. (See Chapter 12.6 P166).

11.9. Safety rules

At the slightest sign of a fault, even a minor one, repair it immediately (e.g. a fuse, a burned out light bulb or a slight leak from a connector). A fault can lead to serious damage, especially if it involves an indicator or a safety device.
Inspect the machine each time after use for fault and/or damage.

1- Maintenance

Carried out by trained or experienced personnel at the specified frequencies.
Put the machine on flat ground.
Switch the machine off completely (including the arm).
Switch off the general power supply (**See Chapter 06.2 P18**) to carry out certain types of work (e.g. welding).

WARNING: DO NOT WORK ON HOT COMPONENTS. SEVERE BURNS CAN RESULT. SHUT OFF THE ENGINE AND MAKE SURE PARTS HAVE STOPPED MOVING BEFORE WORKING ON THE MACHINE.

2- Guidance

If visibility is poor, use a signal person and make sure:
- People are away from the machine and there are no obstacles preventing them from moving further away.
- Use clear and easily understood hand signals.
- Agree on a signal to warn of danger (e.g. horn).

The operator must be in control of the machine and not the person or people guiding him.

3- Machine

Do not park the machine on a downhill slope or in an area at risk of landslide or slippage.
If it is necessary to park on a slope, park across a slope. Block/chock the tires, if equipped.

EXTREME LIMITS FOR SLOPES THAT CAN BE NEGOTIATED:
LONGITUDINAL: 45%
TRANSVERSAL: 35%

- **Dynamic working**

TRAVEL DOWN SLOPES USING "TORTOISE" SPEED, OR USE THE SPEED LIMITER SET TO A LOW SPEED SET POINT (SEE: 11.6 TRAVEL MANAGEMENT, PAGE 103). USE THE BRAKING/INCHING PEDAL (9, PAGE 78) IF NECESSARY.

- Lower the arm and bucket as far as possible (**17**, Page 81)

4- Working in loader mode (with a loader and 4-in-1 bucket):

- **Dynamic working**
  - Lower the arm and place the bucket teeth parallel with the ground.
  - Start loading using the arm cylinder and then, depending on the situation, use the bucket cylinder.
  - Close the bucket at the end of loading with the arm cylinder and then maneuver the machine to the discharge point.

☞ ***Avoid working jerkily, use the proportionality of the controls.***

5- Backfilling or leveling:

To backfill a trench, place the machine perpendicular to the trench with the bucket pressing against the ground.

If required, make several runs. Do not keep the arm control in the maximum position. As soon as the machine is pushing correctly, release the joystick.

6- Towing MLA 2-25 H

The rear travel motors are fitted with safety disk brakes, which lock travel if there is no pressure or when the parking brake is activated.

To be able to tow the machine if there is a breakdown in the travel hydraulic system, it is necessary to:

- ○ Release the brakes on the rear travel hydraulic motors.
- ○ Disengage the hydraulic travel pump (**See Chapter 8 P115**).

■ Releasing the brakes on the rear travel motors:

BEFORE CARRYING OUT ANY OPERATION, CHOCK THE WHEELS OF THE MACHINE TO AVOID IT MOVING WHEN THE PARKING BRAKES ARE RELEASED.

- Align the front undercarriage with the rear undercarriage.
- Lower the arm until it is as close to the ground as possible using the arm control joystick (**17**, Page 81).
- To prevent an engine restart, stop the engine before working on the machine and turn the battery disconnect switch to the OFF position (See Chapter **12.6**, Page 166).

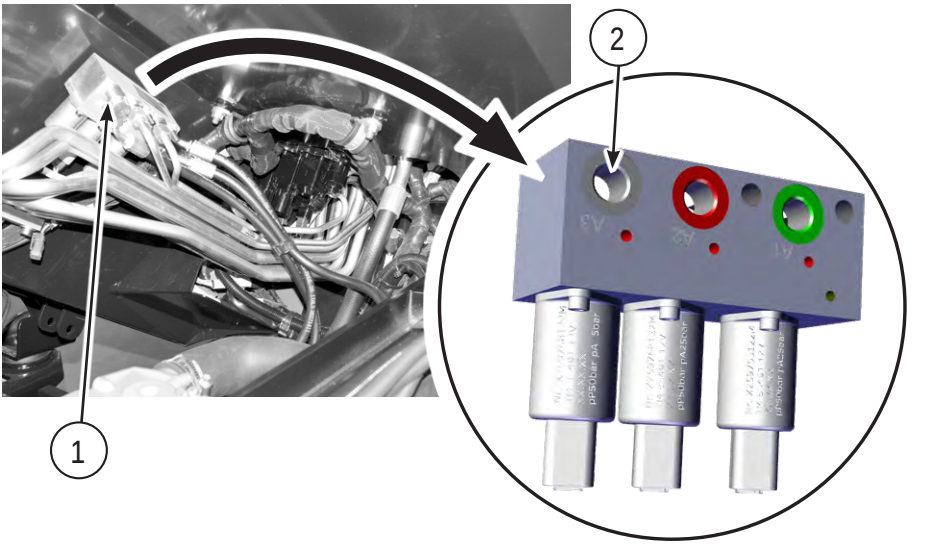
IMPORTANT: THIS PROCEDURE REQUIRES AN HYDRAULIC HAND PUMP (5) WITH A 0 - 40 BAR (0 - 580 PSI) PRESSURE GAUGE.

- Raise the cab/canopy (**See Chapter 11.14 P138**) to access the travel hydraulic unit (**1**).
- Unscrew the hose connector (**3**) located on orifice “A3” (**2**) of the hydraulic unit (**1**) and connect it to the hose (**4**) for the hydraulic pump (**5**).
- Plug the orifice “A3” (**2**) of the hydraulic unit (**1**).
- Make sure that the brake is filled with oil.
- Operate the pump (**5**) until there is a reading of 30 bar (440 psi) on the pressure gauge (**6**).
- Emergency manual brake release is then activated.
- Then disengage the hydraulic travel pump (**See Chapter 8 P115**), and the machine is now in freewheel mode.
- Put the cab/canopy back in place (**See Chapter 11.14 P138**) making sure that it does not crush the brake release hydraulic assembly.
- Do not allow anyone near the tow bar/strap/cable while towing. Use towing equipment 3 times the machine towing capacity. Hook the tow bar on the machine’s lashing points (**1**, Page 129), or on the coupling hook.
- Remove the chocks, restart the machine to be able to use the machine’s steering or lock the undercarriage if the steering is out of service (See: “Loading on a trailer and lashing” p. 129).
- Tow the machine onto the low loader.

CAUTION: WHEN TOWING, TRAVEL AT VERY SLOW SPEED (2-3 KM/H (1-2 MPH) MAX.) AND ONLY TO CLEAR THE ROAD OR TO PUT THE MACHINE ON OR OFF THE TRANSPORTER (MAXIMUM TOWING DISTANCE: 200 M (650 FT)). CAUTION: TOWING THE MACHINE TOO FAST AND/OR OVER EXTENDED DISTANCES CAN CAUSE HYDRAULIC SYSTEM OVERHEATING AND DAMAGE.

- Immobilize the machine on the transporter using chocks and straps (**1**, Page 129).
- Cause the pressure to drop using the pump’s valve (**7**).
- Remove the connectors.
- Unplug the orifice “A3” (**2**) of the hydraulic unit (**1**).
- Return the hose (**3**) to its original place (orifice “A3” on the hydraulic unit (**1**)).
- Re-engage the hydraulic travel pump (**See Chapter 8 P115**).

IF THE MACHINE DOES NOT NEED TO BE TOWED IMMEDIATELY, LEAVE IT IN A SAFE POSITION TO AVOID ANY RISK OF MOVEMENT:
• ALIGN THE FRONT/REAR CHASSIS, LOWER THE ATTACHMENT TO THE GROUND,
• STOP THE ENGINE, TURN THE BATTERY DISCONNECT SWITCH TO THE OFF POSITION.



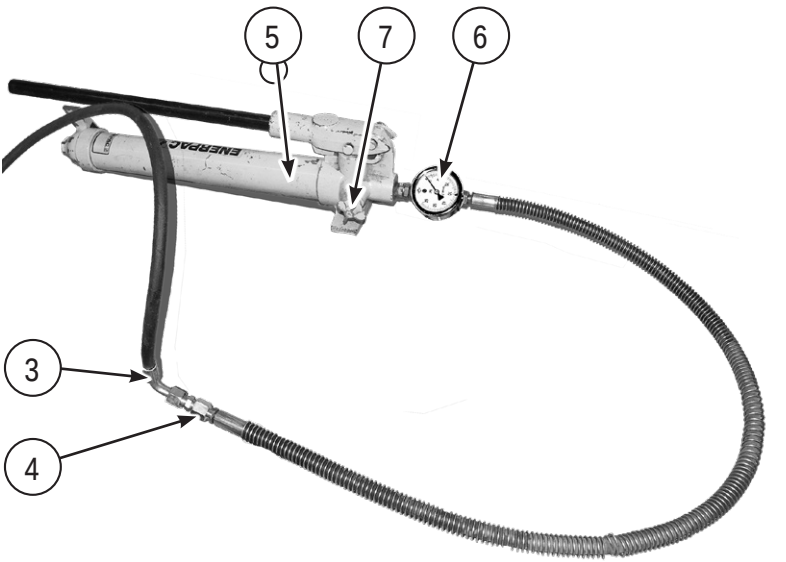


Fig. B15

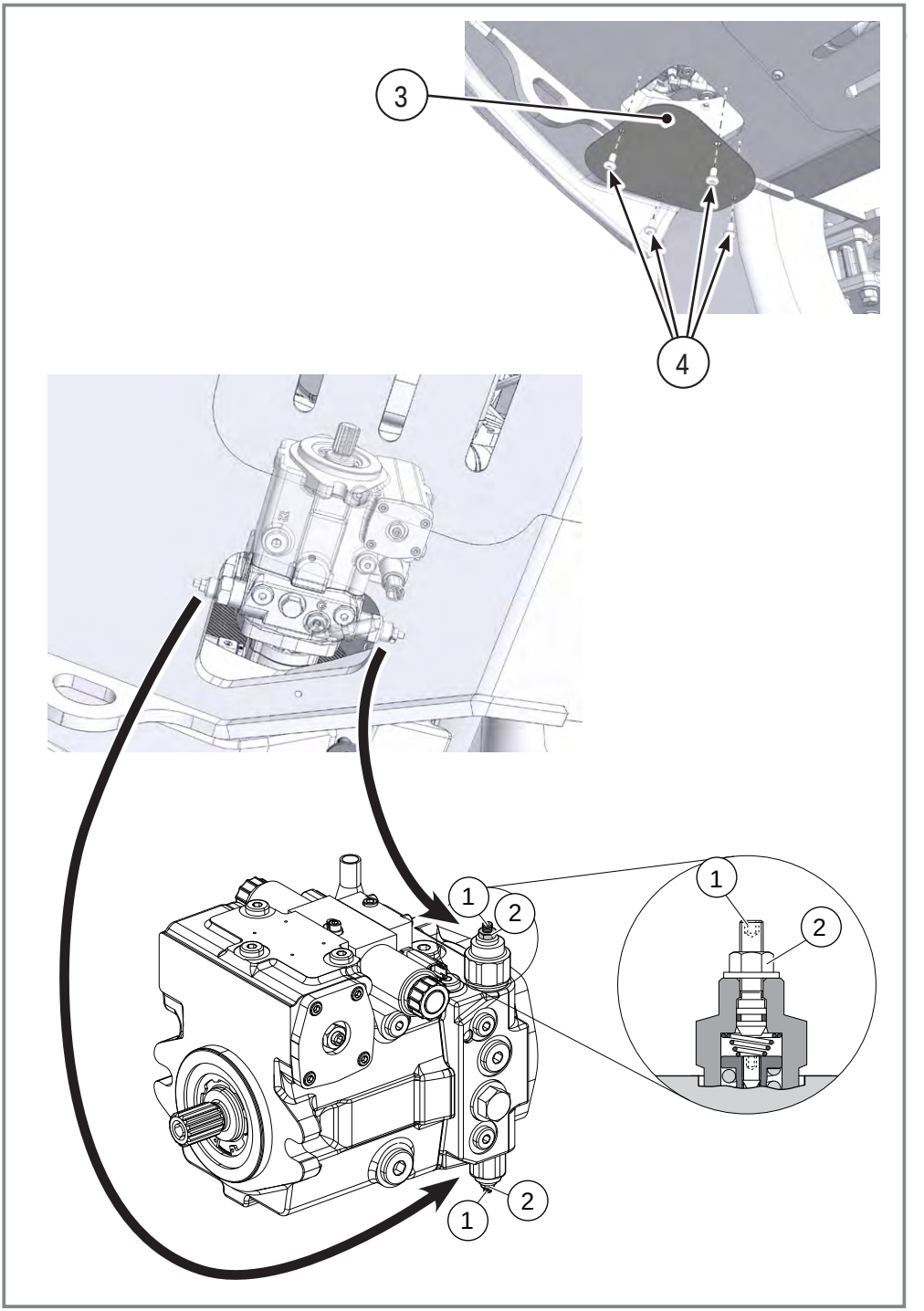


Fig. B16

7- Towing MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H

In case of breakdown in the travel hydraulic system, it is necessary to disengage the hydraulic travel pump, to be able to tow the machine:
Refer to the procedure “Disengagement of the travel pump” below.

CAUTION, WHEN TOWING, TRAVEL AT VERY SLOW SPEED (5 KM/H (3 MPH) MAX.) AND ONLY TO CLEAR THE ROAD OR TO PUT THE MACHINE ON OR OFF THE TRANSPORTER (MAXIMUM TOWING DISTANCE: 500 M (1640 FT)). CAUTION: TOWING THE MACHINE TOO FAST AND/OR OVER EXTENDED DISTANCES CAN CAUSE HYDRAULIC SYSTEM OVERHEATING AND DAMAGE.

8- Disengagement of the travel pump

In case of breakdown in the travel hydraulic system, follow the procedure below to tow the machine:

BEFORE PERFORMING THIS PROCEDURE, CHOCK THE WHEELS TO PREVENT THE MACHINE FROM MOVING WHEN THE PARKING BRAKES ARE RELEASED.

- Align the front undercarriage with the rear undercarriage.
- Lower the arm until it is as close to the ground as possible using the arm control joystick (**17**, Page 81).
- Stop the engine before any work on the machine and disconnect the electrical circuit (See Chapter 12.6 P166) to avoid an engine restart.
- Hook the tow bar on the machine’s lashing points (**1**, Page 129), or on the coupling hook.
- The travel gear motors (MLA 2-25 H) and the front and rear axles (except for MLA 2-25 H) are connected to the travel pump. **Use the ByPass function** of the pump to allow the hydraulic fluid to circulate freely within the travel motor and allow the machine to be towed.
  - Release all residual hydraulic pressures.
- Access the bottom of the pump by the trap door (**3**) by unscrewing the 4 screws (**4**).
  - Remove the plastic safety seals using pliers.
  - Loosen the locknut (**2**) by turning one half-turn counterclockwise using a 13 mm open-end wrench.
  - Turn the bolt (**1**) counterclockwise at the stop until the spring is completely released and then retighten the locknut (**2**).
  - Tighten the locknut to a torque of 22 Nm (16.2 ft-lb).
  - Carry out this operation on both sides of the pump to be able to tow the machine freely forward or backward.
  - Release the parking (hand) brake.

The travel drive system should now be in freewheel mode.

  - Remove the chocks, restart the machine to be able to use the machine’s steering or lock the undercarriage if the steering is out of service (See: “Loading on a trailer and lashing” p. 129).
- Place the machine on the transporter using the procedure described in the chapter See: “Loading on a trailer and lashing” p. 129.
- **Deactivate the ByPass function** of the pump by proceeding in reverse order: loosen the locknut (**2**) and, using a 4 mm Allen key, turn the screw until the spring resistance is felt then unscrew for one half-turn. Replace the plugs on the end pieces.
- Replace the trap (**3**) using the screws (**4**) after towing.

IF THE MACHINE DOES NOT NEED TO BE TOWED IMMEDIATELY, LEAVE IT IN A SAFE POSITION TO AVOID ANY RISK OF MOVEMENT:
• ALIGN THE FRONT/REAR CHASSIS, LOWER THE ATTACHMENT TO THE GROUND,
• STOP THE ENGINE, TURN THE BATTERY DISCONNECT SWITCH TO THE OFF POSITION.

11.10. Fitting buckets and attachments

11.10.1. General points

The Manitou quick coupler systems are designed for changing various attachments.
They are composed of the quick coupler.

FITTING OF A SEMI-AUTOMATIC LOCKING QUICK COUPLER ON THE ATTACHMENT (AUTOMATIC ENGAGEMENT FROM THE DRIVER'S COMPARTMENT AND MANUAL LOCKING DIRECTLY ON THE QUICK COUPLER) IS STRICTLY PROHIBITED.

- In all circumstances, meet the following conditions:
  - The loader and attachments must be suitable for the fitting and use of the quick coupler in normal conditions.
  - Original Manitou attachments must be adapted to the corresponding sizes of the loaders before using them.
  - Striking work with the quick coupler is not authorized (only with attachments intended for this!).
  - Do not make any change to or carry out work on the quick coupler system.

Suspended loads is not intended, apart from pallets handled with pallet forks in compliance with the intended use.

ANY OTHER USE IS CONSIDERED TO BE NON-COMPLIANT WITH ITS DESTINATION. THE OPERATOR WILL BE SOLELY RESPONSIBLE FOR ANY DAMAGE OR INJURY RESULTING FROM USING THE MACHINE IN A NON-COMPLIANT MANNER.

11.10.2. Safety and Warranty

The quick coupler has been constructed in accordance with the standards and the state-of-the-art. However, it can cause risks if:

- It is used in an unintended, inappropriate way.
- The recommendations in the user manual are not adhered to, particularly the safety instructions.
- In this case, the use of the pallet forks attachment is only possible with machines fitted with the necessary safety devices in compliance with the standard EN474-5:2006 for European union (Load tables in the driver's compartment and safety valves on the arm and bucket cylinders).

11.10.3. Safety instructions related to organization:

- The user manual must always be available to the operator (at the back of the seat in the structure of the cab / canopy.).
- At regular intervals, instruct operators about the safe use of the quick coupler.
- Do not make unauthorized modifications to any part of the machine. Unauthorized modifications to the machine can cause injury or death. The owner is responsible for any safety hazards resulting from unauthorized modifications.
- Undertake maintenance and inspection work in compliance with the frequencies specified in the instructions for use.

11.10.4. Safety instructions related to use:

Only use the Manitou quick coupler in perfect operating condition.

- Only use the quick couplers for cases described in this manual.
- Insure that the ***Manitou*** quick coupler is clean and free from deposits or dirt that could cause damage or prevent its correct operation.
- Check the ***Manitou*** quick coupler once a day to detect damage or visible defects on the exterior.
- Only use original ***Manitou*** attachments checked and approved by the company.
- After each locking cycle and before using the ***Manitou*** quick coupler system, carry out a visual inspection to check correct operation.

11.10.5. Information for users

The user of the Manitou quick coupler system must maintain the attachment in a condition which makes it possible to work completely safely, in compliance with the provisions in terms of accident prevention or other obligations imposed by the authorities.

11.10.6. Warranty notice

The warranty is specified in our General Conditions of Sale.

The warranty requires that the product is handled correctly and used according to its intended purpose. It will expire should we find ourselves unable to ensure further execution.

CORRECT, SECURE LOCKING OF THE ATTACHMENT ON THE MANITOU QUICK COUPLERS REQUIRES THAT ONLY ORIGINAL MANITOU ATTACHMENTS CORRESPONDING TO THE MANITOU QUICK COUPLER IN QUESTION ARE USED.

THE ATTACHMENTS ASSOCIATED WITH A MANITOU QUICK COUPLER MODEL ARE NOT COMPATIBLE WITH ANY MODEL OTHER THAN THE ONE FOR WHICH THEY HAVE BEEN DESIGNED.

11.11. Four-point quick coupler

Follow the safety instructions:

- Read and follow all the safety instructions found in this user manual carefully.
- Before starting work familiarize yourself with the handling of the attachment and with the machine and its control devices.

The machine is fitted with a ***Manitou*** quick coupler specially designed to take original buckets and attachments.

11.11.1. Picking up and locking attachments

Make sure that attachments are securely fastened and locked onto the quick coupler before using them.

BEFORE USE, THE ATTACHMENT MUST BE SECURELY LOCKED ONTO THE QUICK COUPLER TO PREVENT PROPERTY DAMAGE, SERIOUS INJURY, AND/OR DEATH.

MAKE SURE PEOPLE ARE AWAY FROM THE MACHINE DURING THIS OPERATION.

Make sure that the Manitou ***4-point quick coupler and the compatible approved attachment are clean and free from deposits or dirt that could cause damage or prevent correct operation.***

The bucket is placed on the ground facing the arm of the machine. The quick coupler is free of any attachment. The machine is in operation.

- **Procedure for picking up and locking the bucket:**

1- Maneuver the arm and the quick coupler using the joystick (**2**) (see also **17**, Page 81) to insert the upper shaft of the quick coupler into the attachment gripping lugs (**3**).

2- Pull the safety latch (**1a**) (Also see **11**, Page 78) and simultaneously tilt the unlocking button (**1b**) backward and hold it in position. While holding down the unlocking button, pull the attachment proportional selection control (**2a**) backward (Also see **17b**, Page 81).

This action will retract the attachment locking cylinder shafts (**4**).

3- Raise the lift structure slightly until the attachment hangs from the upper shaft on the quick coupler. Tilt the attachment backward slightly so that it comes into contact with the stops of the quick coupler (**5**).

RISK OF TILTING THE ATTACHMENT!

4- Release the attachment unlocking button; the locking cylinder shafts remain in the retracted position.Push the attachment proportional selection control (**2a**) forward to extend the cylinder holding shafts.

The locking cylinder shafts extend to be inserted into the side bores of the attachment (**6**).

5- Make sure the locking cylinder shafts extend through the holes in the sides of the attachment (**7**) and the attachment is secured tightly onto the quick coupler. The attachment is now locked to the Manitou quick coupler

6- Tilt the attachment forward slightly against the ground and apply downward pressure to make sure the attachment is properly locked on the hitch. If it is not, repeat this procedure.

WARNING! : MAKE SURE THE ATTACHMENT IS PROPERLY LOCKED ON THE QUICK COUPLER BEFORE USING IT. THE ATTACHMENT COULD FALL OFF IF IT IS NOT LOCKED ON THE QUICK COUPLER AND CAUSE SERIOUS INJURY OR DEATH.

You can now use the attachment.

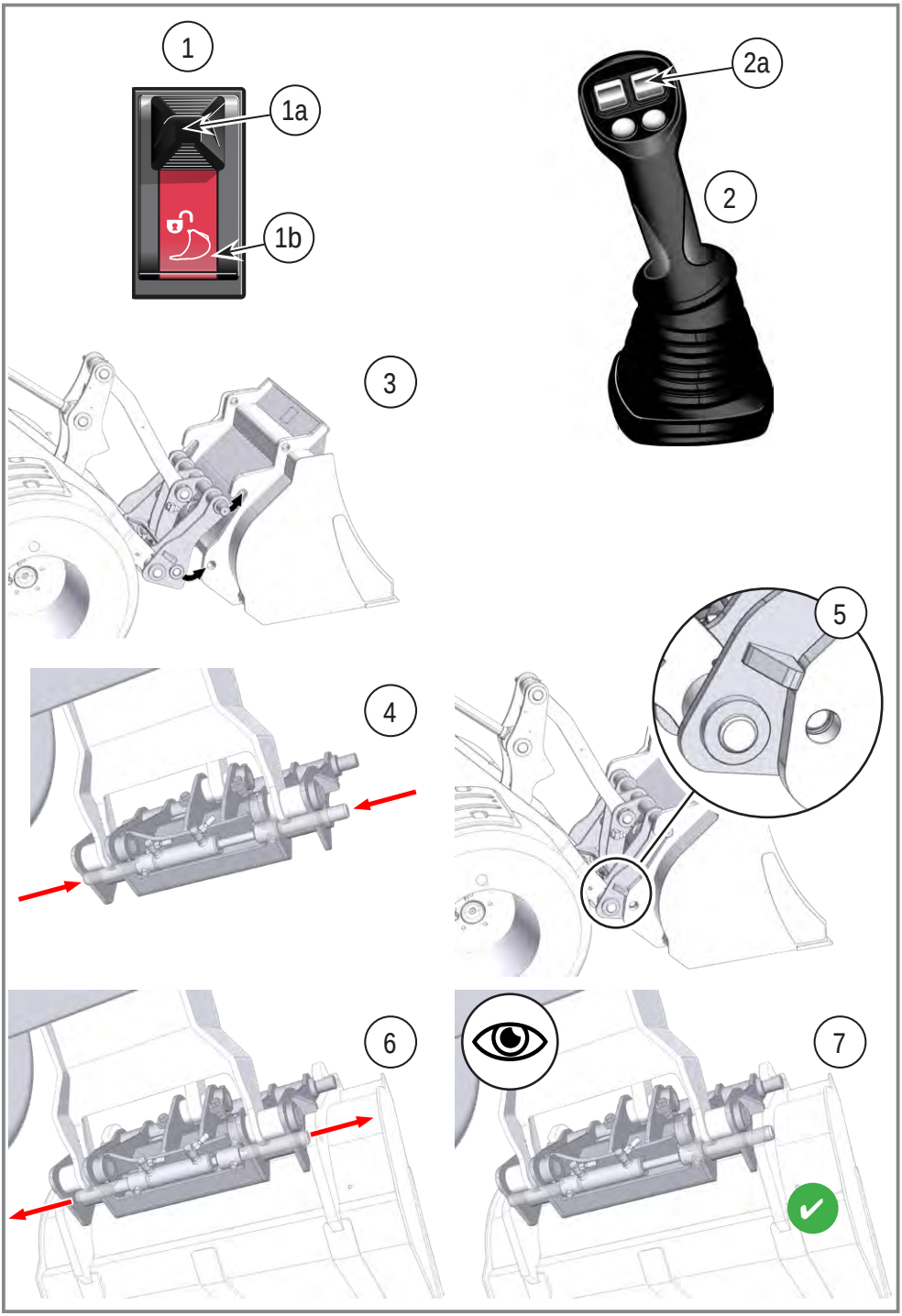


Fig. B17

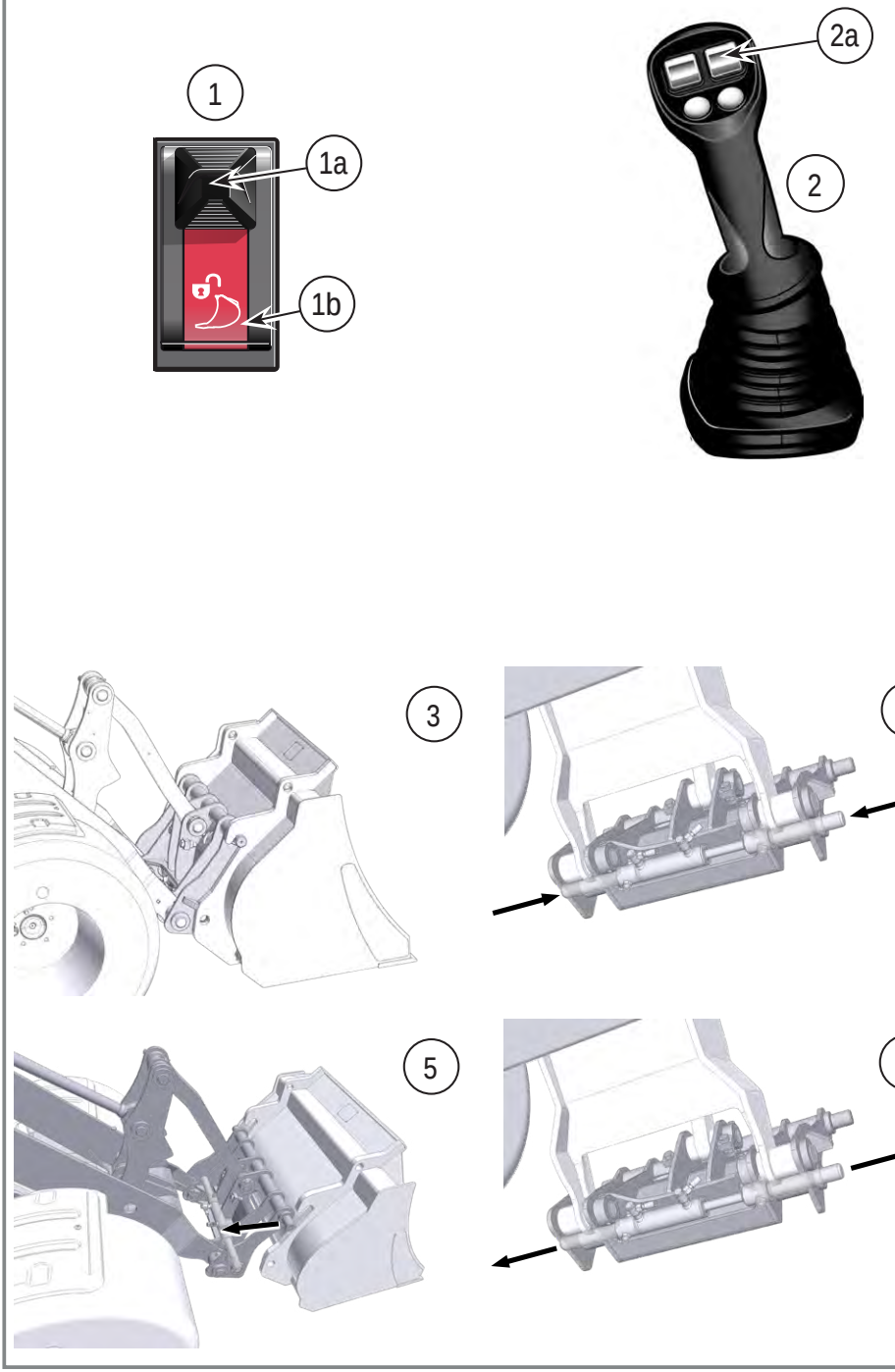


Fig. B18

11.11.2. Unlocking the quick coupler and putting down the attachments

EMPTY THE ATTACHMENT AND DRIVE TO AN OPEN, LEVEL AREA TO DISCONNECT THE ATTACHMENT. MAKE SURE PEOPLE ARE AWAY FROM THE MACHINE DURING THIS PROCEDURE. WARNING! POSITION THE ATTACHMENT SO IT WILL STAND AND NOT TIP OVER AFTER REMOVAL. SERIOUS INJURY CAN OCCUR IF AN ATTACHMENT TIPS OVER ONTO A PERSON.

■ **Procedure for taking off the attachment**

The attachment is fitted on the quick coupler and the machine is in operation.

1- Maneuver the attachment using the joystick (**2**) (also see **17**, Page 81) to place it in a stable position on the ground (**3**).

2- Pull the safety latch (**1a**) (Also see **11**, Page 78) and simultaneously tilt the unlocking button (**1b**) backward and hold it in position. While holding down the unlocking button, pull the attachment proportional selection control (**2a**) backward (Also see **17b**, Page 81) to retract the attachment locking cylinder shafts (**4**) and unlock the attachment from the quick coupler.

POSITION THE ATTACHMENT SO IT WILL NOT TIP OVER WHEN THE QUICK COUPLER IS UNLOCKED. SERIOUS INJURY CAN OCCUR IF AN ATTACHMENT TIPS OVER ONTO A PERSON.

3- Release the attachment unlocking button; the locking cylinder shafts remain in the retracted position. Use the joystick (**2**) to move the attachment away from the quick coupler and move the upper shafts of the quick coupler away from the attachment gripping lugs.

4- Look behind you for bystanders and obstacles. Drive straight back in reverse away from the attachment.

5- Push the attachment proportional selection control (**2a**) forward to extend the cylinder holding shafts. The locking cylinder shafts are extended (**6**).

11.11.3. Manual unlocking of the quick coupler

In some cases, it could prove necessary to unlock the quick coupler cylinder manually. For example, when the unlocking button (**1**) does not work. This chapter describes the necessary steps to carry out this unlocking completely safely.

EMPTY THE ATTACHMENT AND DRIVE TO AN OPEN, LEVEL AREA TO DISCONNECT THE ATTACHMENT. MAKE SURE PEOPLE ARE AWAY FROM THE MACHINE DURING THIS PROCEDURE. WARNING! POSITION THE ATTACHMENT SO IT WILL STAND AND NOT TIP OVER AFTER REMOVAL. SERIOUS INJURY CAN OCCUR IF AN ATTACHMENT TIPS OVER ONTO A PERSON.

Keep all hydraulic connections free of any dirt, debris or contamination.

When using hydraulically-operated attachments:
- Always connect the auxiliary hydraulic hoses to the attachment after the attachment is securely locked onto the hitch.
- Always disconnect the hydraulic hoses from the attachment before unlocking the attachment from the hitch.

During these operations make sure these connections are not damaged. Before connecting them, check that the male and female parts are clean and free of any impurities. The slightest impurity could damage the hydraulic circuit.

RISK OF SERIOUS POLLUTION OF THE HYDRAULIC CIRCUIT.

■ **Manual unlocking procedure:**

The attachment is fitted on the quick coupler. The machine is in operation.

1- Place the attachment using the joystick (**2**) (also see **17**, Page 81) on cleared, level, and stable ground (**3**).

TO CONNECT OR DISCONNECT THE (PUSH-PULL) QUICK-RELEASE COUPLINGS ON THE "ADDITIONAL FUNCTIONS" LINE, THE RESIDUAL PRESSURE MUST BE RELEASED (SEE: "RELEASING RESIDUAL PRESSURES" P. 109). FOR ANY WORK ON THE HYDRAULIC CIRCUIT THE ENGINE MUST BE STOPPED.

2- Stop the engine and put the ignition switch on 1 (**3**).

ALWAYS WEAR GLOVES AND SAFETY GLASSES WHEN WORKING ON THE HYDRAULIC SYSTEM COMPONENTS.

3- Move the proportional circuit control (**2a**) in both directions to relieve pressure in the auxiliary hydraulic circuit.

Prepare a container to catch draining hydraulic oil when disconnecting the hoses from the locking cylinder in the following step. Do not allow oil to spill onto the ground.

4- Disconnect the locking cylinder (**5**) hoses from the quick coupler located on the connecting rod so that the oil can run out freely.

TO PREVENT POSSIBLE CRUSHING AND SEVERE INJURY IF THE ATTACHMENT TIPS OVER, DO NOT USE YOUR HANDS DURING THE FOLLOWING STEP.

5- Retract the quick coupler cylinder manually, using a bar (**6**). Carry out this operation on each side of the quick coupler.Connect the locking cylinder (**5**) hoses of the quick coupler located on the connecting rod.

6- The attachment is now unlocked from the quick coupler. Restart the engine with the ignition switch (**3**).

7- Use the joystick (**2**) (see also **17**, Page 81) to lower the quick coupler (**7**) out and clear of the attachment.

8- Look behind you for bystanders and obstacles. Drive straight back in reverse away from the attachment.

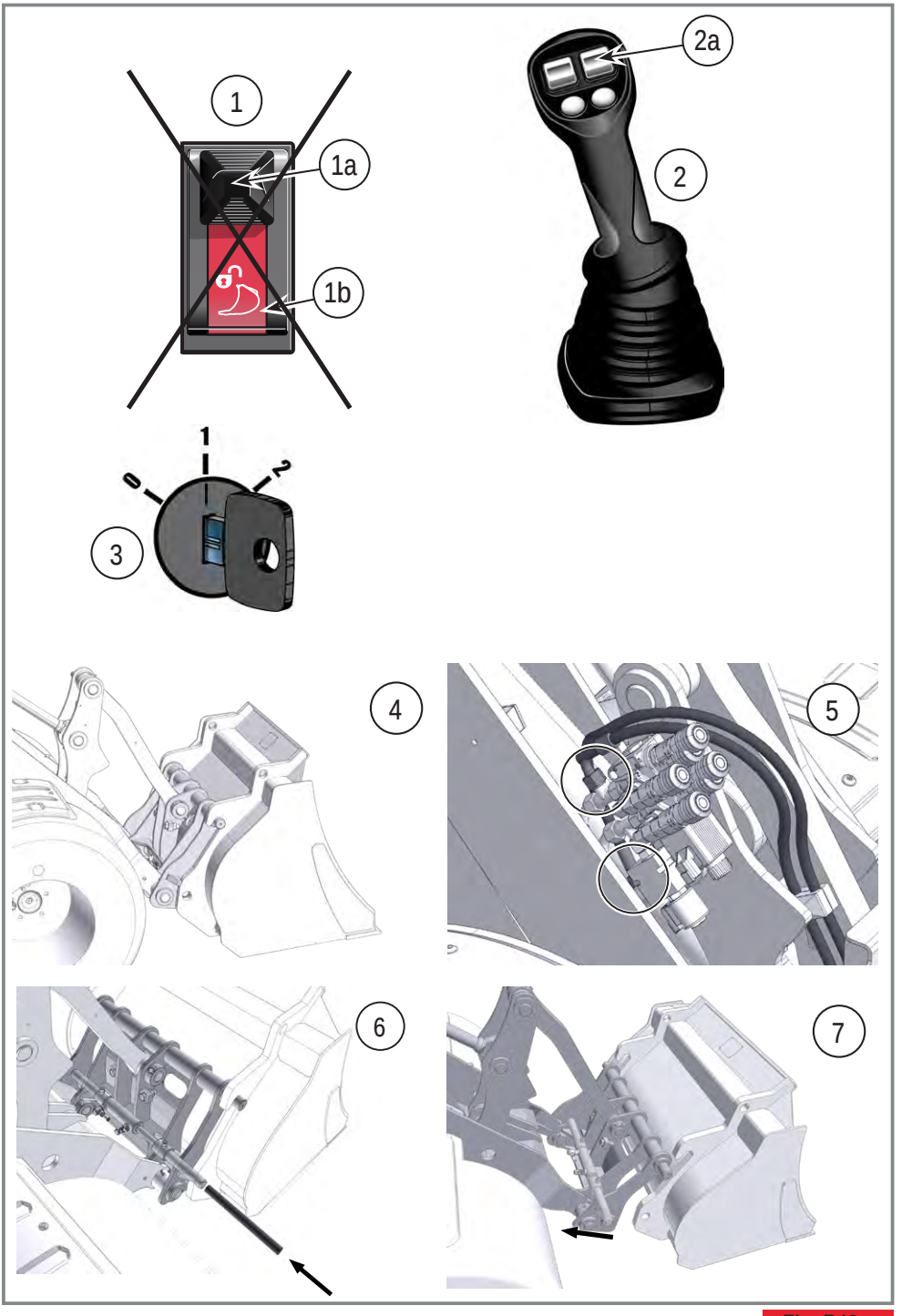


Fig. B19

11.12. Manual Power-A-Tach coupler

Follow the safety instructions:

- Read and follow all the safety instructions found in this user manual carefully.
- Before starting work familiarize yourself with the handling of the attachment and with the machine and its control devices.

11.12.1. Picking up and locking attachments

BEFORE USE, THE ATTACHMENT MUST BE SECURELY LOCKED ONTO THE QUICK COUPLER TO PREVENT PROPERTY DAMAGE, SERIOUS INJURY, AND/OR DEATH.

MAKE SURE PEOPLE ARE AWAY FROM THE MACHINE DURING THIS OPERATION.

Keep all hydraulic connections free of any dirt, debris or contamination.

When using hydraulically-operated attachments:

- Always connect the auxiliary hydraulic hoses to the attachment after the attachment is securely locked onto the hitch.
- Always disconnect the hydraulic hoses from the attachment before unlocking the attachment from the hitch. During these operations make sure these connections are not damaged. Before connecting them, check that the male and female parts are clean and free of any impurities. The slightest impurity could damage the hydraulic circuit.

RISK OF SERIOUS POLLUTION OF THE HYDRAULIC CIRCUIT.

■ **Procedure for picking up and locking the bucket:**

The bucket is placed on the ground facing the arm of the machine. The coupler is free of any attachment. The machine is in operation.

1- Activate the levers (**3**) (down to lock and up to unlock) in order to retract the locking pins (to prevent the attachment hitting the locking pins).

2- Maneuver the arm and the coupler using the joystick (**1**) (see also **17**, Page 81) to insert the folded plates (**4**) of the coupler into the notches on the attachment.

3- Raise the lift structure slightly until the attachment hangs from folded plates (**4**) on the coupler. Slightly tilt until the attachment is resting flat against the attachment plate (**6**).

RISK OF TILTING THE ATTACHMENT!

4- Stop the engine and put the ignition switch on 1 (**2**)

WEAR SAFETY SHOES AND PROTECTIVE GLOVES FOR HANDLING THE POWER A-TACH LEVERS

5- Use the levers (**3**) either side of the coupler to lock the attachment (down to lock and up to unlock).

6- Make sure the locking pins (**5**) are fully engaged into the attachment and the attachment is secured tightly on the hitch.

7- Turn the engine back on and tilt the attachment forward slightly against the ground and apply downward pressure to make sure the attachment is properly locked on the hitch. If it is not, repeat this procedure.

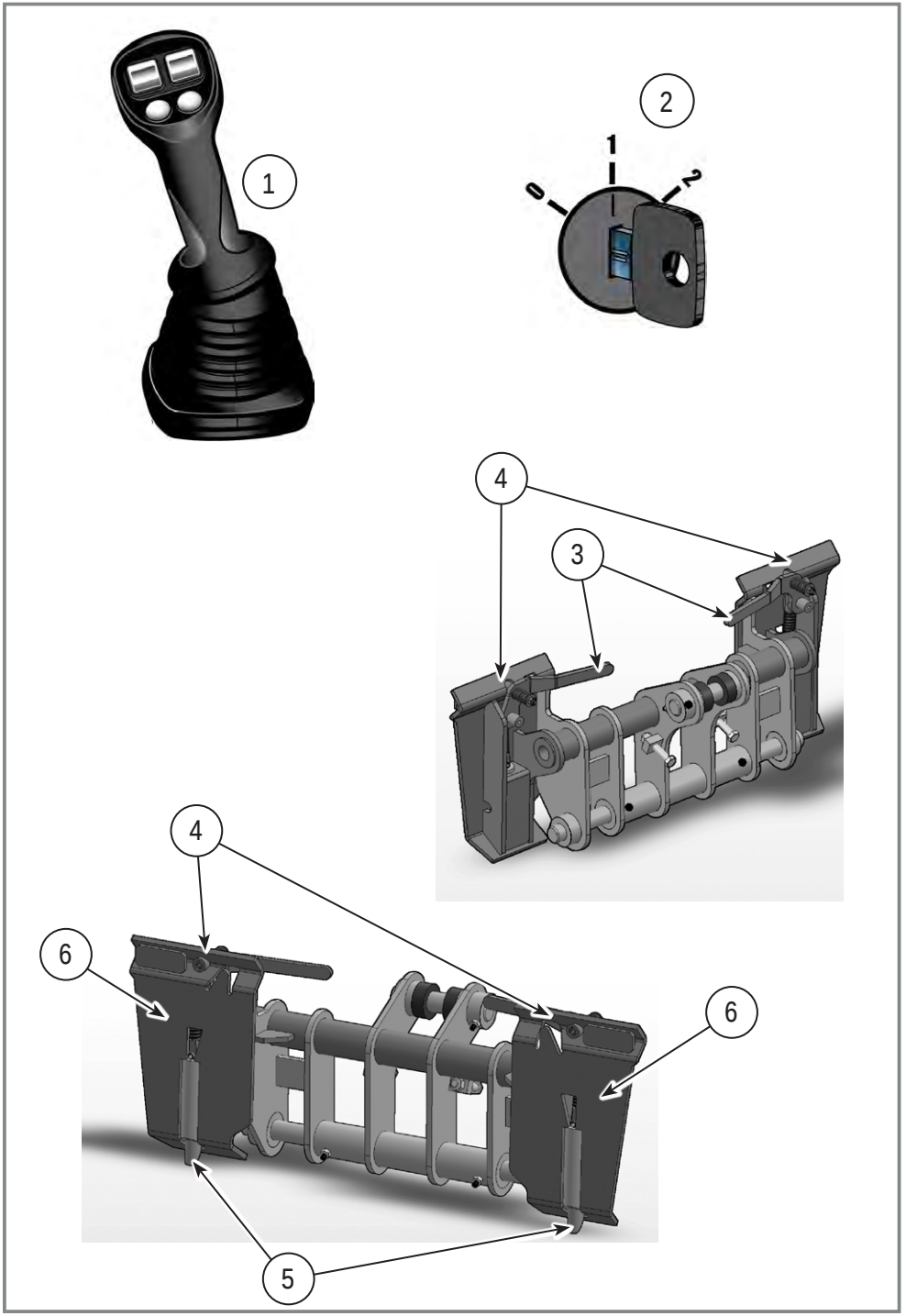


Fig. B20

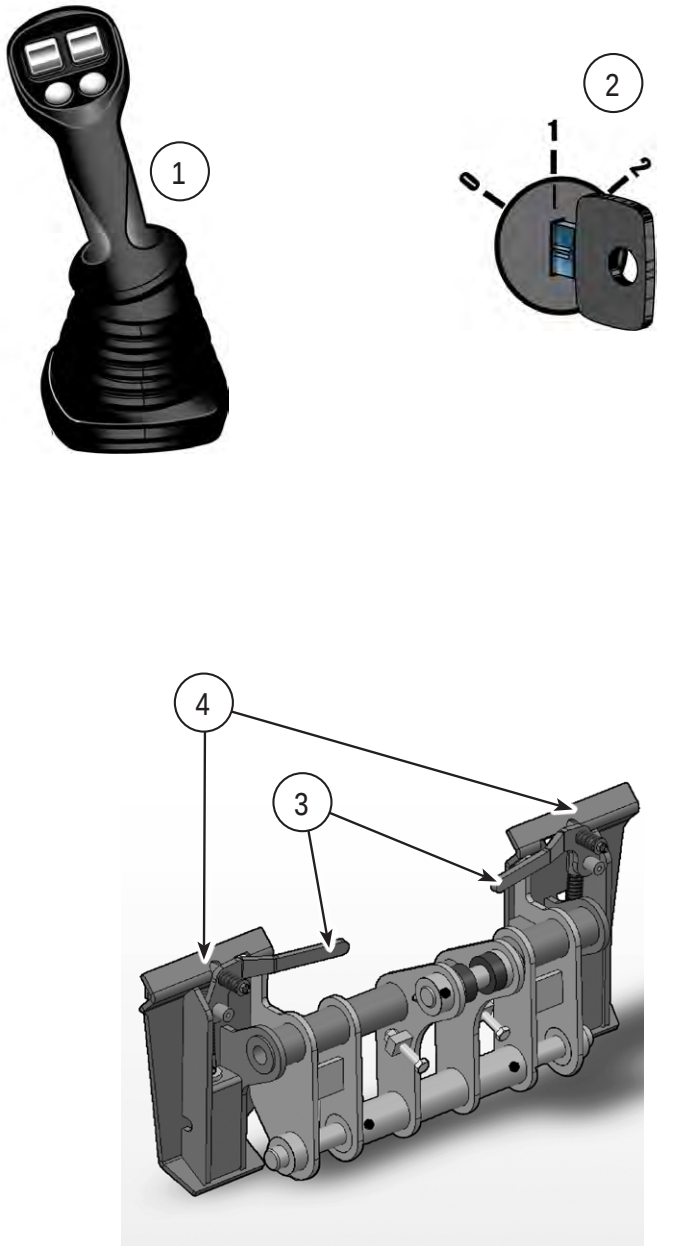


Fig. B21

■ **Manual unlocking procedure:**

The attachment is fitted on the coupler. The machine is in operation.

EMPTY THE ATTACHMENT AND DRIVE TO AN OPEN, LEVEL AREA TO DISCONNECT THE ATTACHMENT. MAKE SURE PEOPLE ARE AWAY FROM THE MACHINE DURING THIS PROCEDURE. WARNING! POSITION THE ATTACHMENT SO IT WILL STAND AND NOT TIP OVER AFTER REMOVAL. SERIOUS INJURY CAN OCCUR IF AN ATTACHMENT TIPS OVER ONTO A PERSON.

1- Place the attachment using the joystick (**1**) (also see **17**, Page 81) on cleared, level, and stable ground (**3**).

2- Stop the engine and put the ignition switch on 1 (**2**).

3- Use the levers (**3**) either side of the coupler to unlock the attachment (down to lock and up to unlock).

4- Restart the engine with the ignition switch (**2**).

5- Maneuver the arm and the coupler using the joystick (**1**) (see also **17**, Page 81) to move the coupler away from the tool.

6- Look behind you for bystanders and obstacles. Drive straight back in reverse away from the attachment.

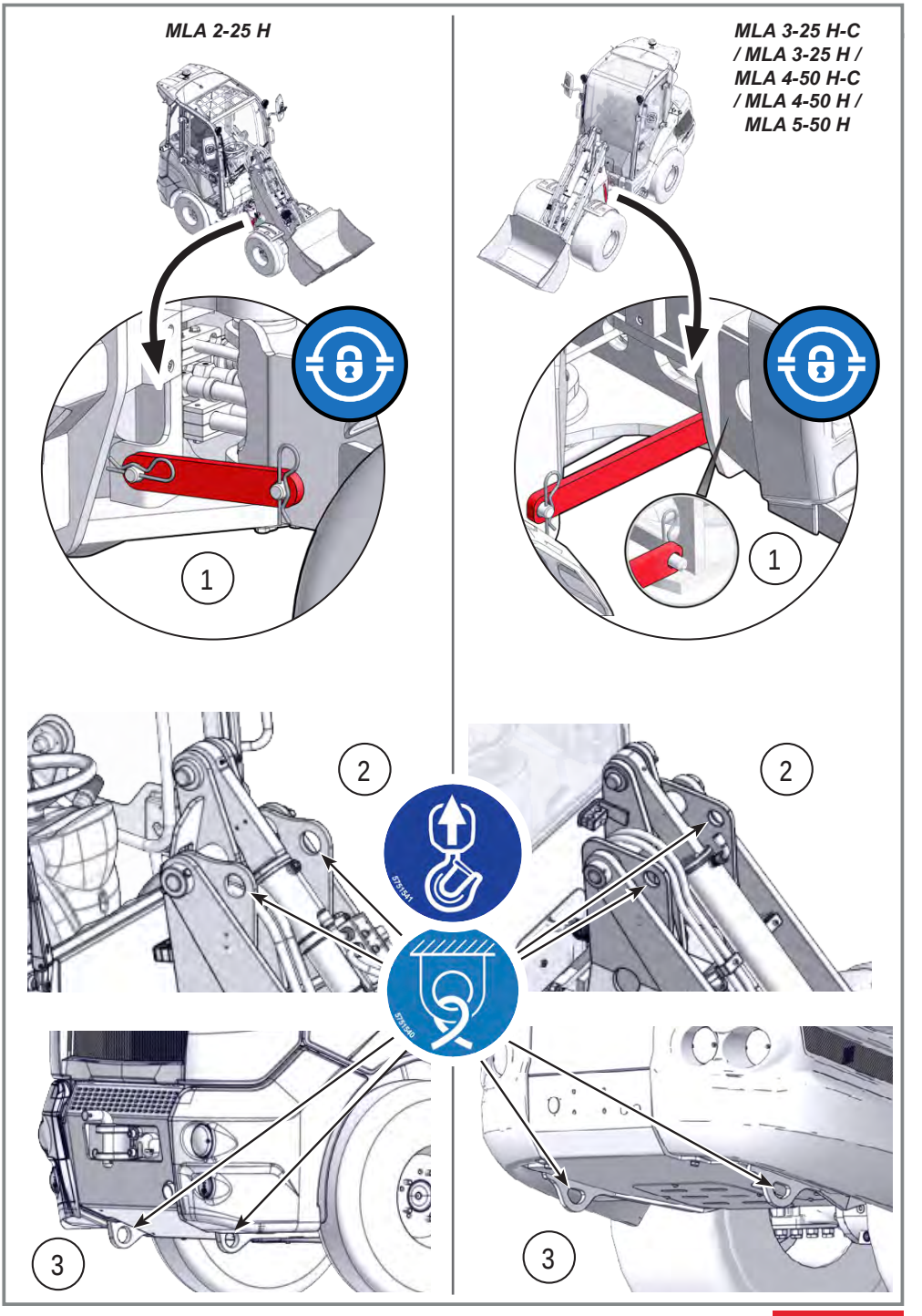

MLA 2-25 H
MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H
1
1
2
2
3
3

Fig. B22

11.13. Transporting the machine

1- Loading on a trailer and lashing

WARNING! SECURE LOADING RAMPS TO THE TRANSPORT VEHICLE BEFORE LOADING. POSITION THE LOADING RAMPS AT THE SHALLOWEST POSSIBLE ANGLE. DO NOT EXCEED AN ANGLE OF 30% (16°). ONLY USE RAMPS WITH ANTI-SKID SURFACES.

Make sure the loading area is clear and access to it is not obstructed.

1- Check the engine oil in the machine. The oil level must be at the “full” mark on the dipstick. Add oil if needed.

IMPORTANT: WHEN LOADING AND DRIVING ON RAMPS, THE ENGINE CAN BE DAMAGED IF THE ENGINE OIL LEVEL IS TOO LOW.

2- Start the engine.

3- If a bucket is attached, make sure it is empty.

4- Raise the attachment/coupler enough clear the loading ramps.

5- Slowly and carefully drive the machine in reverse straight onto the transport vehicle. Do not adjust travel direction while traveling on the ramps. If necessary, drive down off of the ramps and re-align the machine with the ramps.

6- Position the machine at the lowest possible position on the transport platform. Make sure the center of gravity of the load is over centerline of the transport vehicle.

7- Lower the attachment/coupler onto the loading area.

8- Lock the articulated joint steering with the lock bar (**1**)

8a. Remove the lock bar (1) from the storage location by removing the pins.

8b. Put the lock bar (1) in place between the front and rear chassis (1).

8c. Fasten the lock bar (1) in place using the pins.

9- Release residual hydraulic pressure (See: Releasing residual pressures, Page 109).

10- Apply the parking brake.

11- Stop the engine.

12- Remove the key from the ignition switch.

13- Do not allow anyone to stay in the cab.

14- Close and latch the windows, if equipped.

15- Close and lock the door, if equipped.

16- Close and secure all covers.

17- Tie the machine to the transport vehicle as follows:

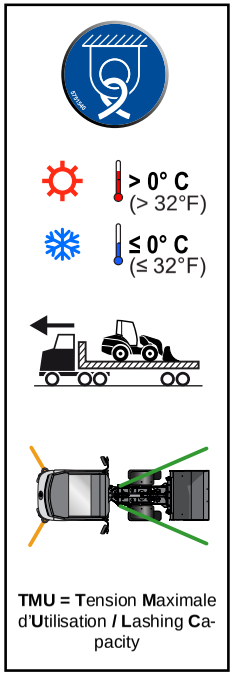
17a. Make sure the authorized maximum height is not exceeded.

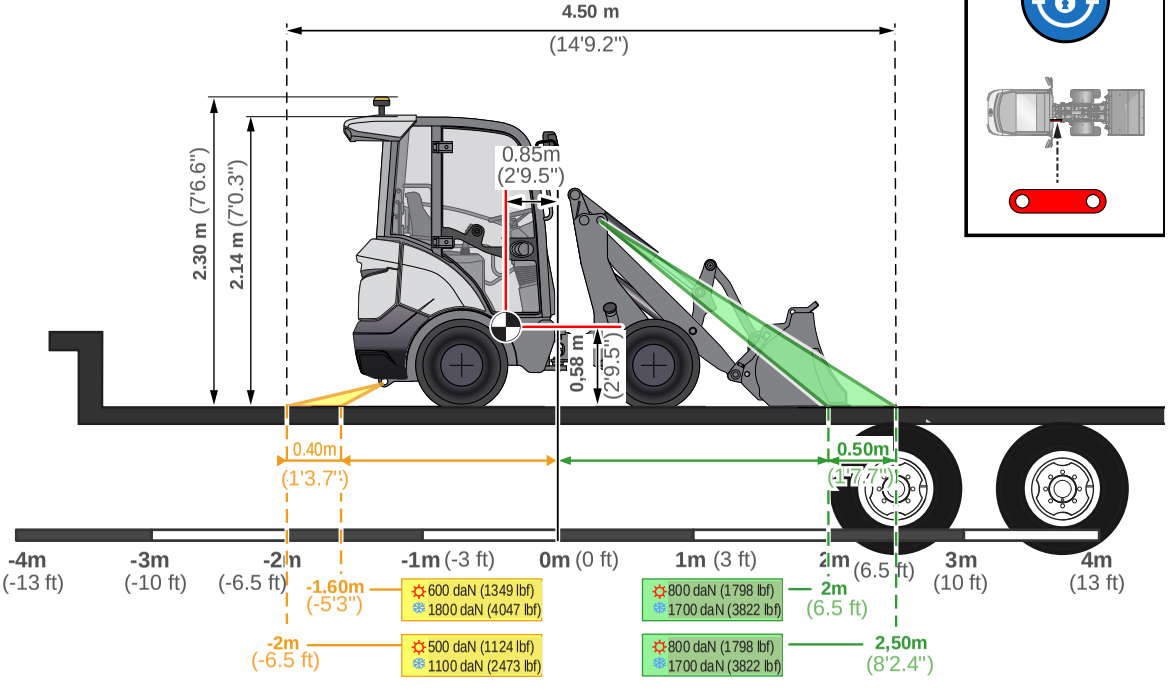
17b. Place blocks in front and behind the tires to prevent movement.

17c. Securely strap the machine to the platform at the tie-down points (Fig. B22), in compliance with the information on the following pages.

MANITOU

MLA 2-25 H





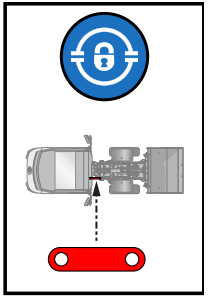


Fig. B23

MLA 3-25 H / MLA 3-25 H-C

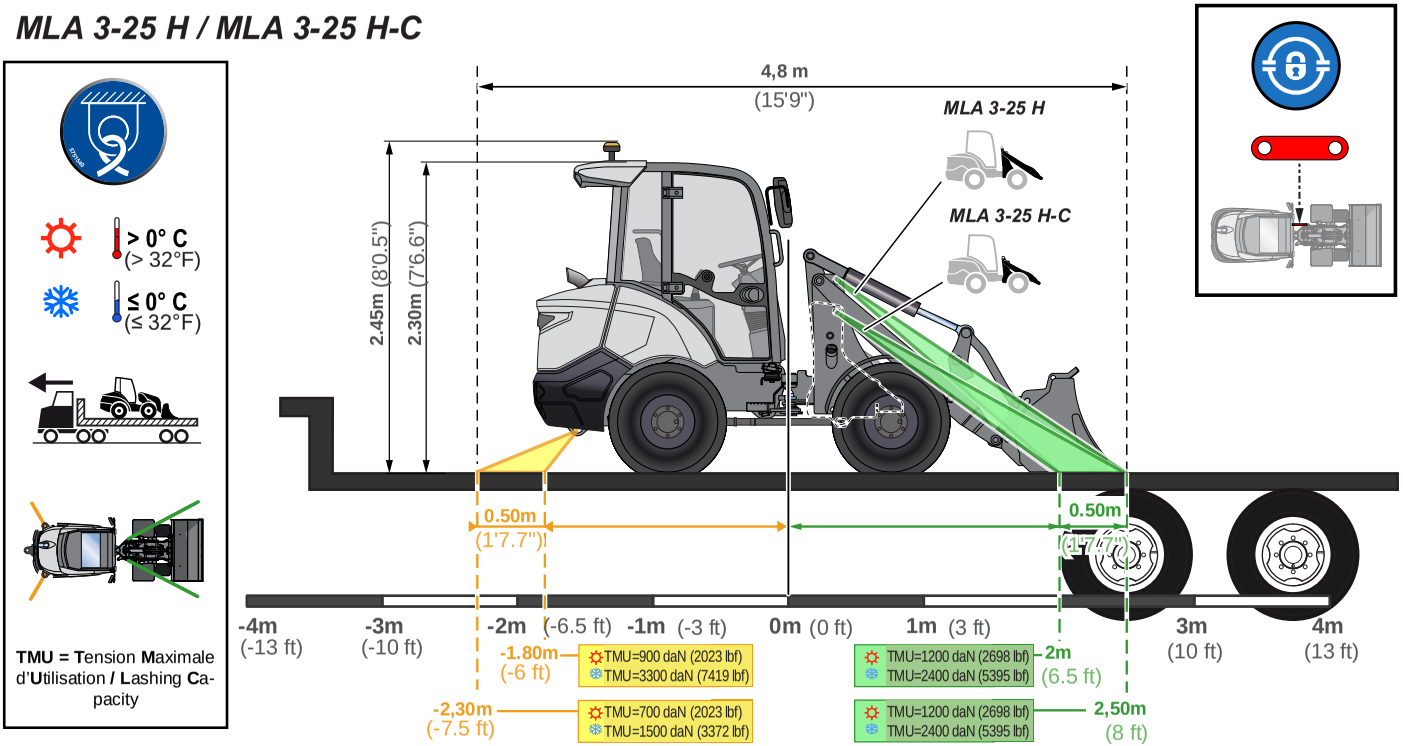


Fig. B24

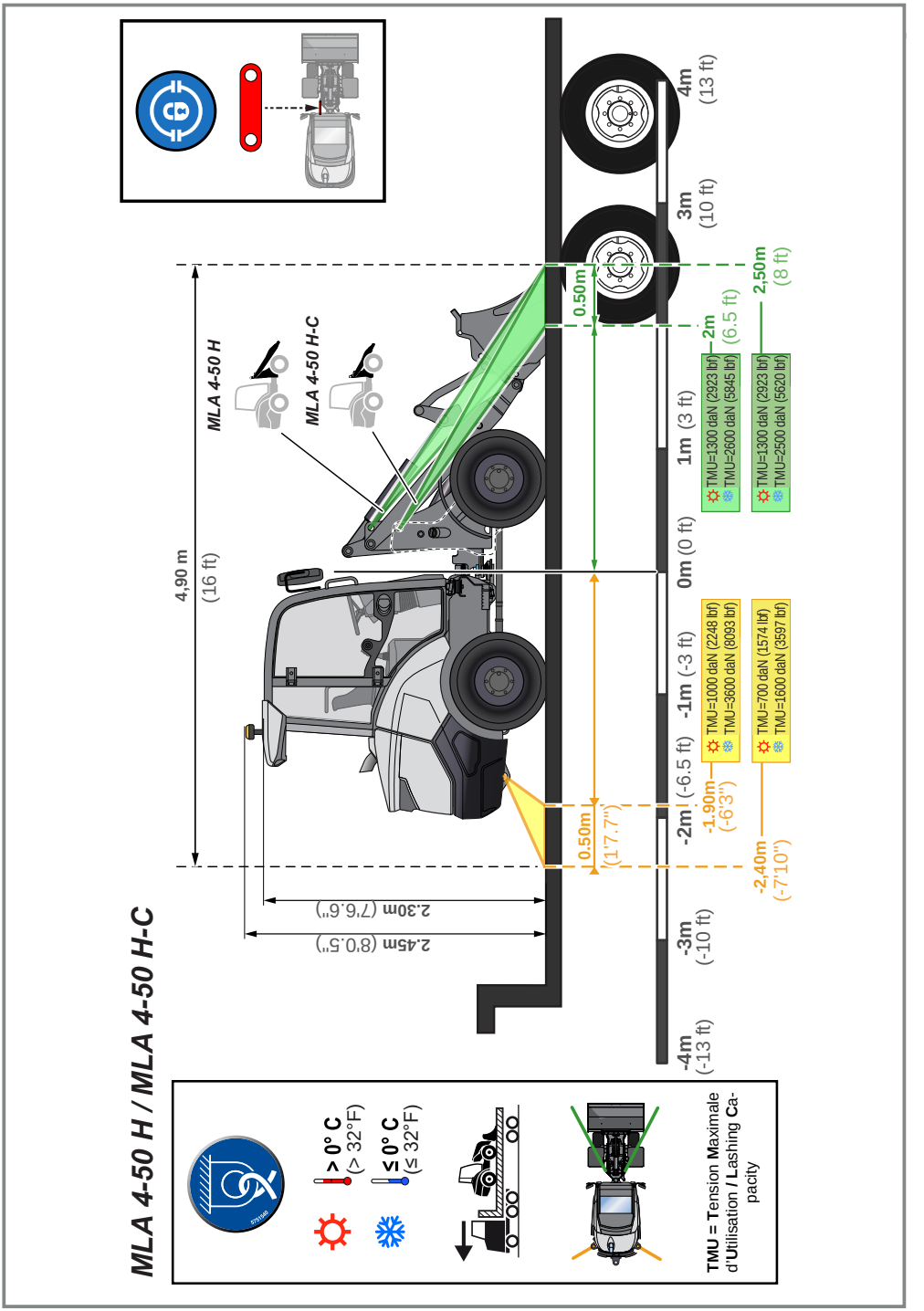
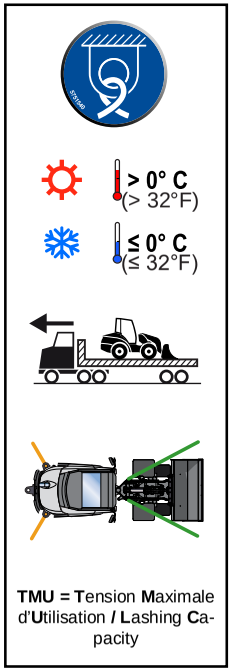
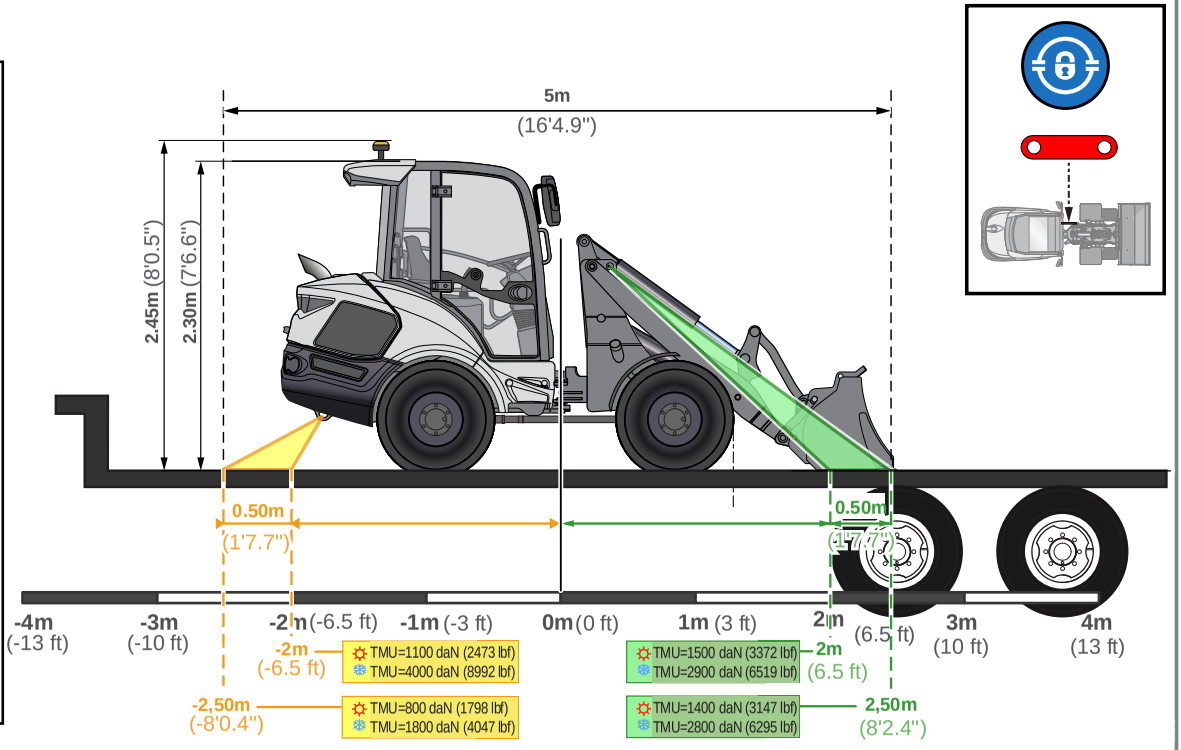

MLA 4-50 H / MLA 4-50 H-C
MLA 4-50 H
MLA 4-50 H-C
4,90 m
(16 ft)
2.45m (8'0.5")
2.30m (7'6.6")
0.50m
(1'7.7")
0.50m
-4m
(-13 ft)
-3m
(-10 ft)
-2m (-6.5 ft)
-1m (-3 ft)
0m (0 ft)
1m (3 ft)
2m (6.5 ft)
3m
(10 ft)
4m
(13 ft)
-1.90m
(-6'3")
-2,40m
(-7'10")
2,50m
(8 ft)
TMU=1000 daN (2248 lbf)
TMU=3600 daN (8093 lbf)
TMU=700 daN (1574 lbf)
TMU=1600 daN (3597 lbf)
TMU=1300 daN (2923 lbf)
TMU=2600 daN (5845 lbf)
TMU=1300 daN (2923 lbf)
TMU=2500 daN (5620 lbf)
> 0° C
(> 32°F)
≤ 0° C
(≤ 32°F)
TMU = Tension Maximale d'Utilisation / Lashing Capacity

Fig. B25

MLA 5-50 H


> 0° C
(> 32°F)
≤ 0° C
(≤ 32°F)
TMU = Tension Maximale d'Utilisation / Lashing Capacity


5m
(16'4.9")
2.45m (8'0.5")
2.30m (7'6.6")
0.50m
(1'7.7")
0.50m
(1'7.7")
-4m
(-13 ft)
-3m
(-10 ft)
-2m (-6.5 ft)
-1m (-3 ft)
0m (0 ft)
1m (3 ft)
2m (6.5 ft)
3m
(10 ft)
4m
(13 ft)
-2m
(-6.5 ft)
TMU=1100 daN (2473 lbf)
TMU=4000 daN (8992 lbf)
-2,50m
(-8'0.4")
TMU=800 daN (1798 lbf)
TMU=1800 daN (4047 lbf)
TMU=1500 daN (3372 lbf)
TMU=2900 daN (6519 lbf)
2m
(6.5 ft)
TMU=1400 daN (3147 lbf)
TMU=2800 daN (6295 lbf)
2,50m
(8'2.4")

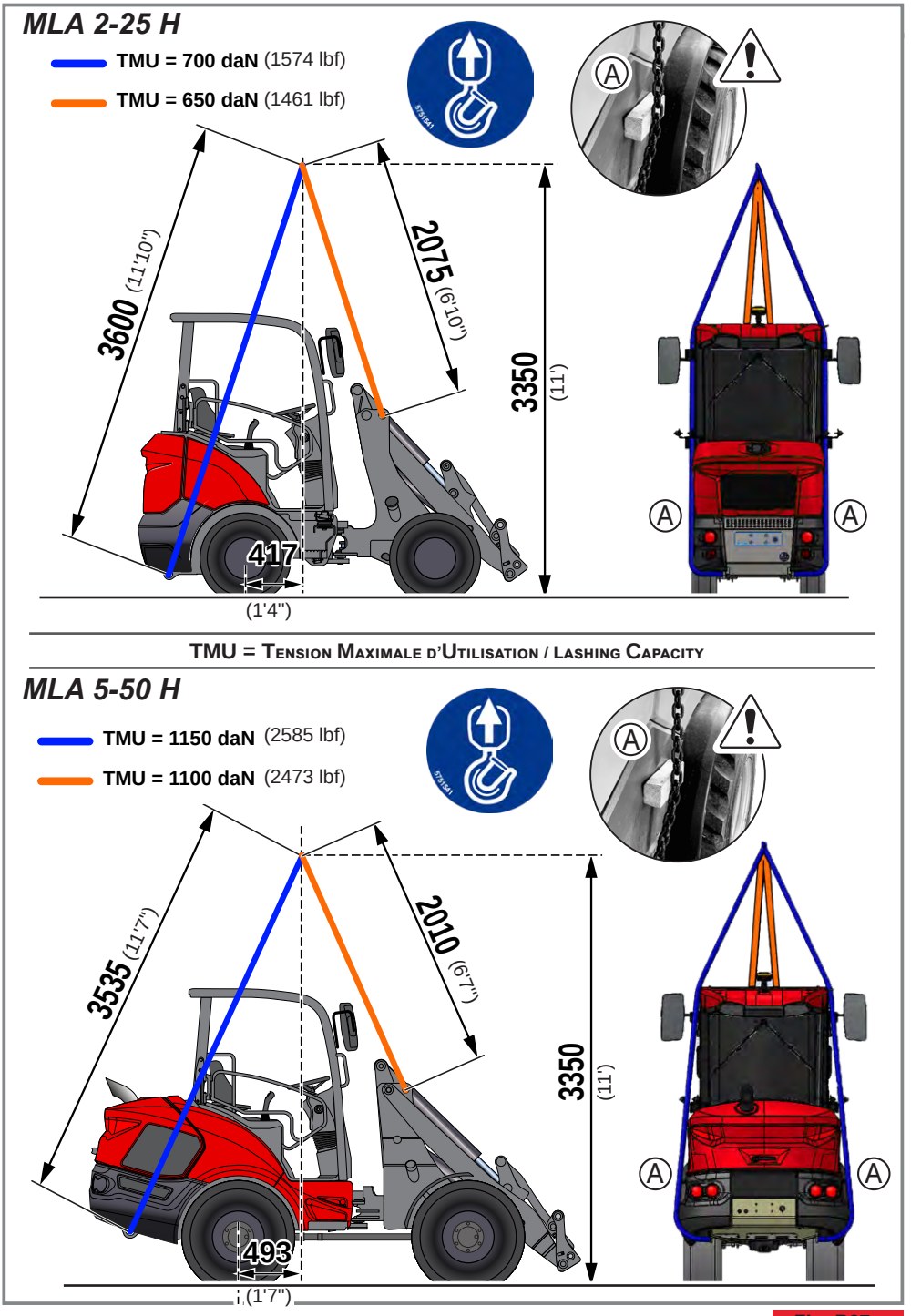

MLA 2-25 H
TMU = 700 daN (1574 lbf)
TMU = 650 daN (1461 lbf)
3600 (11'10")
2075 (6'10")
3350 (11')
417 (1'4")
A
A
A
TMU = Tension Maximale d'Utilisation / Lashing Capacity
MLA 5-50 H
TMU = 1150 daN (2585 lbf)
TMU = 1100 daN (2473 lbf)
3535 (11'7")
2010 (6'7")
3350 (11')
493 (1'7")
A
A
A

Fig. B27

18- Lifting

Illustrations for the other machine models on the following pages (Fig. B28 and Fig. B29).

DANGER: BE CAREFUL TO SECURE THE MACHINE CORRECTLY IN ORDER TO PREVENT IT SLIDING OR FALLING.
ONLY QUALIFIED PERSONNEL WITH PROPER EXPERIENCE SHOULD SECURE THE MACHINE OR GUIDE THE CRANE DRIVER IN LIFTING THE MACHINE.
THE CRANE OPERATOR MUST KEEP PERSONS GUIDING THE LOAD WITHIN SIGHT AND/OR SOUND AT ALL TIMES.
INSURE THAT THE ELEMENTS ENABLING THE MACHINE TO BE LIFTED ARE IN GOOD CONDITION AND SUITABLE FOR THE WEIGHT OF THE MACHINE.
THE SLINGS OR CHAINS MUST BE SUFFICIENTLY LONG TO ENABLE THE MACHINE TO BE LIFTED.
MARK OUT THE LIFTING AREA AND PREVENT ANYONE FROM STANDING UNDER THE MACHINE WHILE IT IS BEING LIFTED.
ONLY USE LIFTING SYSTEMS OF SUFFICIENT SIZE AND CAPACITY, SPECIFICALLY DESIGNED FOR LIFTING OPERATIONS OF THIS TYPE.
THE MACHINE MUST BE SECURED AGAINST UNINTENTIONAL SWINGING MOVEMENT. USE TAGLINES AS NEEDED.
CLOSE THE CAB DOORS (IF APPLICABLE) AND ALL COVERS BEFORE LIFTING THE MACHINE.
DO NOT LIFT THE MACHINE WITH ANYONE ON OR INSIDE THE MACHINE.
ATTACH THE LIFTING EQUIPMENT ONLY AT THE IDENTIFIED LIFT POINTS.

- Unhook the arm's attachment from the machine.
- Lock the articulated joint steering with the lock bar (See **8**, Page 129).
  - Remove the lock bar (**1**) from the storage location by removing the pins.
  - Put the lock bar (**1**) in place between the front and rear chassis (**1**).
  - Fasten the lock bar (**1**) in place using the pins.
- Put the machine in the reference position indicated:
  - Lower the arm as far as possible.
  - Fully retract the tilt cylinder, so the quick coupler is folded against the lift structure.
- Switch off the engine.
- With the lift structure as low as possible, the tilt cylinder fully retracted, the **engine stopped** and the **ignition on**, release the remaining residual pressure (See: "Releasing residual pressures" p. 109).
- Close the windows of the machine (Cab option).
- Exit the machine and lock the access door to the cab. Do not allow anyone to stay in the machine.
- Make sure the lifting equipment provides stability when lifting the machine and can withstand the weight of the machine.
- On the rear section of the machine, position the lifting system by the rings located under the rear undercarriage (see Page 129).

TO PROTECT THE UPPER COVERS, POSITION WOODEN BLOCKS ON THE REAR PART, BETWEEN THE SLING AND COVER (SEE A), SO AS TO KEEP THE SLING AWAY FROM THE COVERS.

- On the front section of the machine, position the lifting system by the 2 rings located on the top of the front undercarriage (see Page 129).
- Gently tension the slings and lift the machine smoothly.
- Avoid any swinging of the machine during lifting, use taglines as needed.

LOWERING THE MACHINE, MAKE SURE THE AREA IS:
- CLEAR OF PEOPLE AND OBSTACLES
- LARGE ENOUGH TO FIT THE MACHINE
- LEVEL, STABLE, AND CAN SUPPORT THE WEIGHT OF THE MACHINE

- Place the machine gently on the ground, always checking that nobody is in or around the area where the machine is to be placed.
- Unhook the handling systems from the machine and remove them from the area where the machine has been put down.

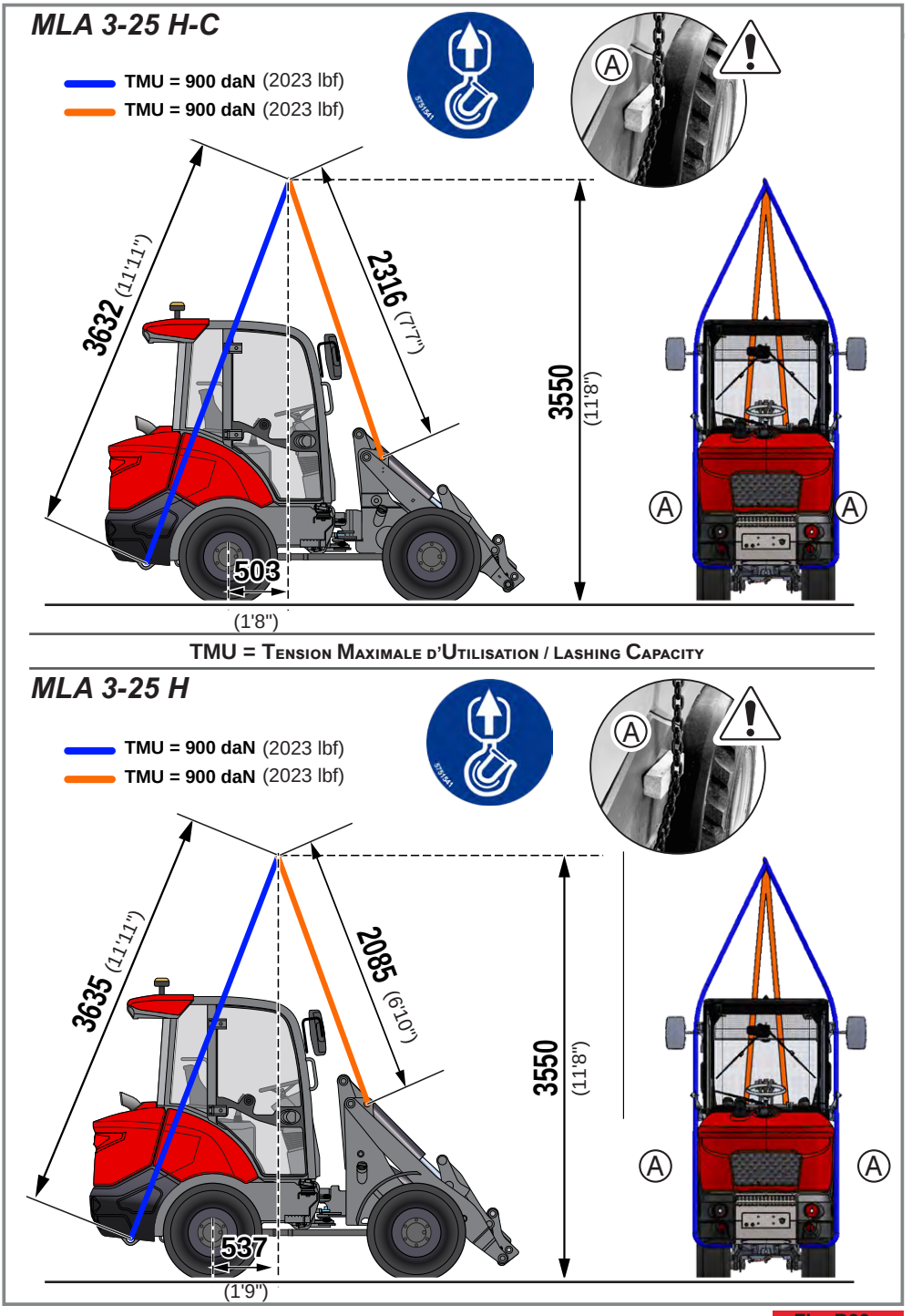
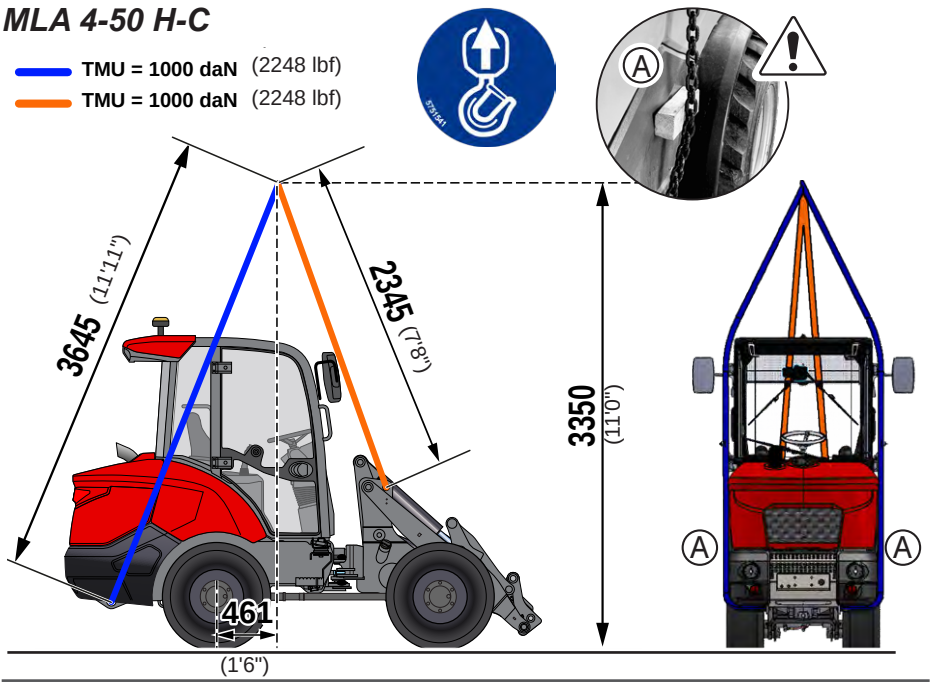

MLA 3-25 H-C
TMU = 900 daN (2023 lbf)
TMU = 900 daN (2023 lbf)
A
3632 (11'11")
2316 (7'7")
3550 (11'8")
503 (1'8")
A
A
TMU = Tension Maximale d'Utilisation / Lashing Capacity
MLA 3-25 H
TMU = 900 daN (2023 lbf)
TMU = 900 daN (2023 lbf)
A
3635 (11'11")
2085 (6'10")
3550 (11'8")
537 (1'9")
A
A

Fig. B28

MLA 4-50 H-C



TMU = Tension Maximale d'Utilisation / Lashing Capacity

MLA 4-50 H

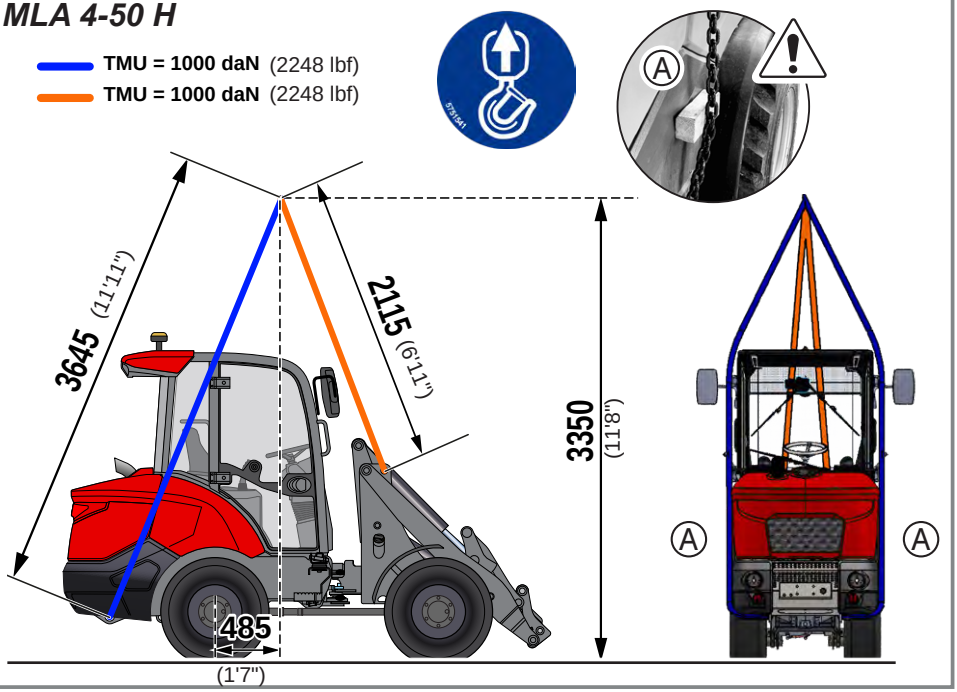


Fig. B29

11.14. Access to the rear undercarriage

■ **Before accessing the undercarriage**

- Turn off the engine and cut off the power supply by tilting the ignition switch to Position 0. Remove the key.
- Fix a “Do not use” warning sign or a similar sign on the ignition switch or on the controls before servicing or repairing the engine. Fix the warning signs on the engine and on each control position.

■ **To access the undercarriage**

- Remove the side protective covers (**1**) by pulling them by hand from each side of the machine.
- For the MLA 5-50 H machine only: unscrew the two nuts with their washers. Remove the side covers (**2**) above the step.
- Open the rear cover (**3**).
- Using pliers, remove the pins (**5**) to free the cab handling bar (**4**) located on the front undercarriage.
- (**7**) Insert this bar in the notch (**6**) provided under the cab just above the left step of the machine
- Unscrew the two nuts (**8**) fixing the cab to the rear undercarriage.
- (**9**) Use the handling bar to raise the cab. The gas cylinder (**11**) is used to ease the tilting movement.

Make sure the tilt support (10) securely locks the cab/canopy in the raised position. Never allow anyone under the cab/canopy if it is not securely locked in the raised position with the tilt support (10). Never attempt to remove the gas cylinder (1). Contact your dealer if any service is required for either the gas cylinder (1) or tilt support (10) components.

REGULARLY CHECK THE CONDITION OF THE GAS CYLINDER (1) AND THE CYLINDER MOUNTING HARDWARE. CONTACT YOUR DEALER IF ANY PARTS ARE FOUND TO BE WORN OR DAMAGED.

■ **Putting the cab back in place**

- Insure that no attachments or accessories impair the tilt of the cab.
- When closing it make sure that no-one is near the machine.

CAUTION, DO NOT ALLOW ANYONE UNDERNEATH THE CAB/CANOPY WHEN IT IS TILTED DOWN. SEVERE INJURY CAN RESULT.

- Release the safety connecting rod (**10**) by pulling it toward you.
- Using the handling bar (**4**), tilt the cab to close the access to the rear undercarriage.
- Refit the fastening nuts (**8**) for the cab (tighten to a torque of 170 Nm (125.4 ft-lb))

WARNING: ALWAYS SECURE THE CAB/CANOPY TO THE REAR CHASSIS WITH NUTS BEFORE OPERATING THE MACHINE

- Refit the handling bar (**4**) and hold it with the 2 pins (**5**).
- Refit the covers and close all openings.

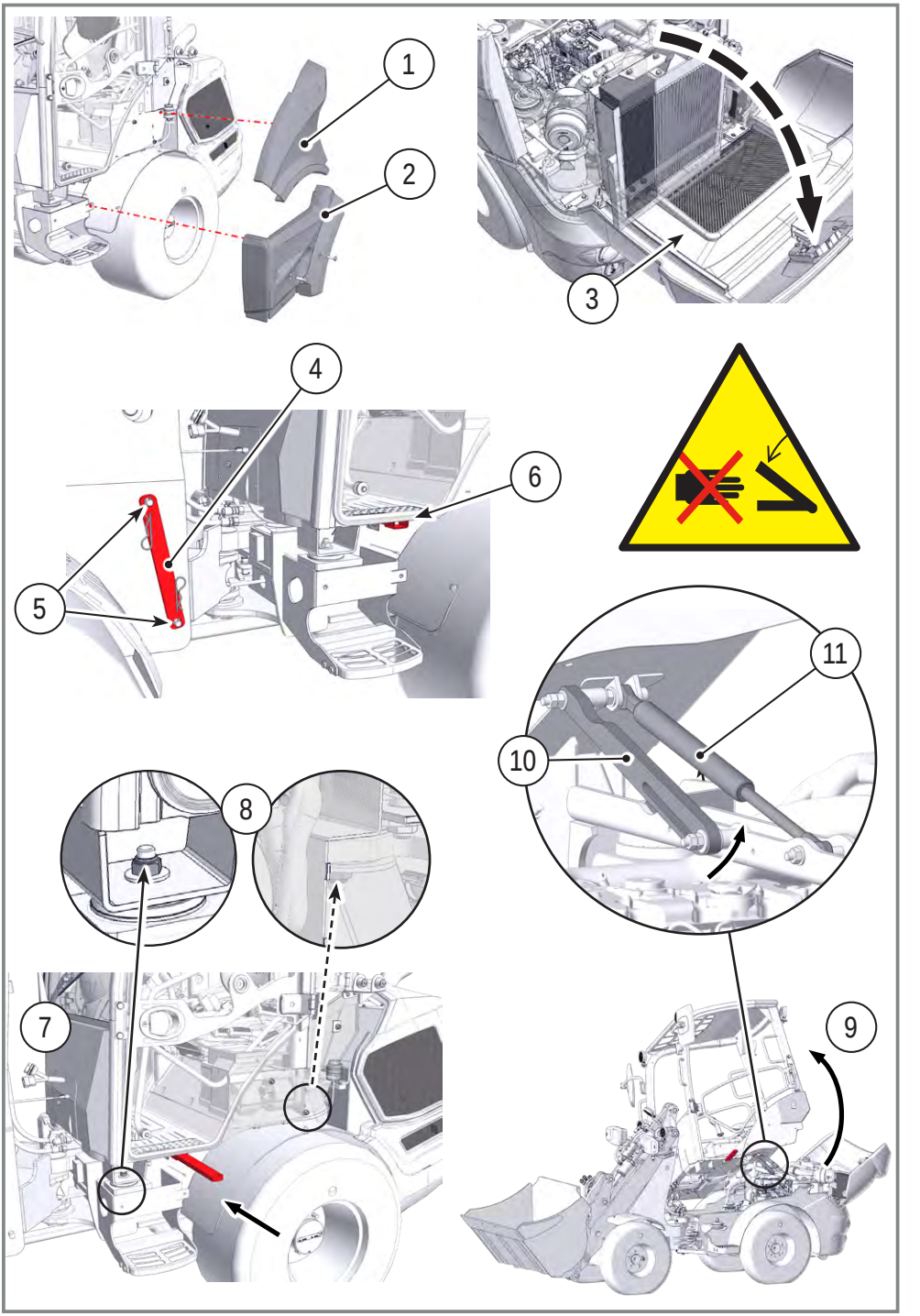


Fig. B30

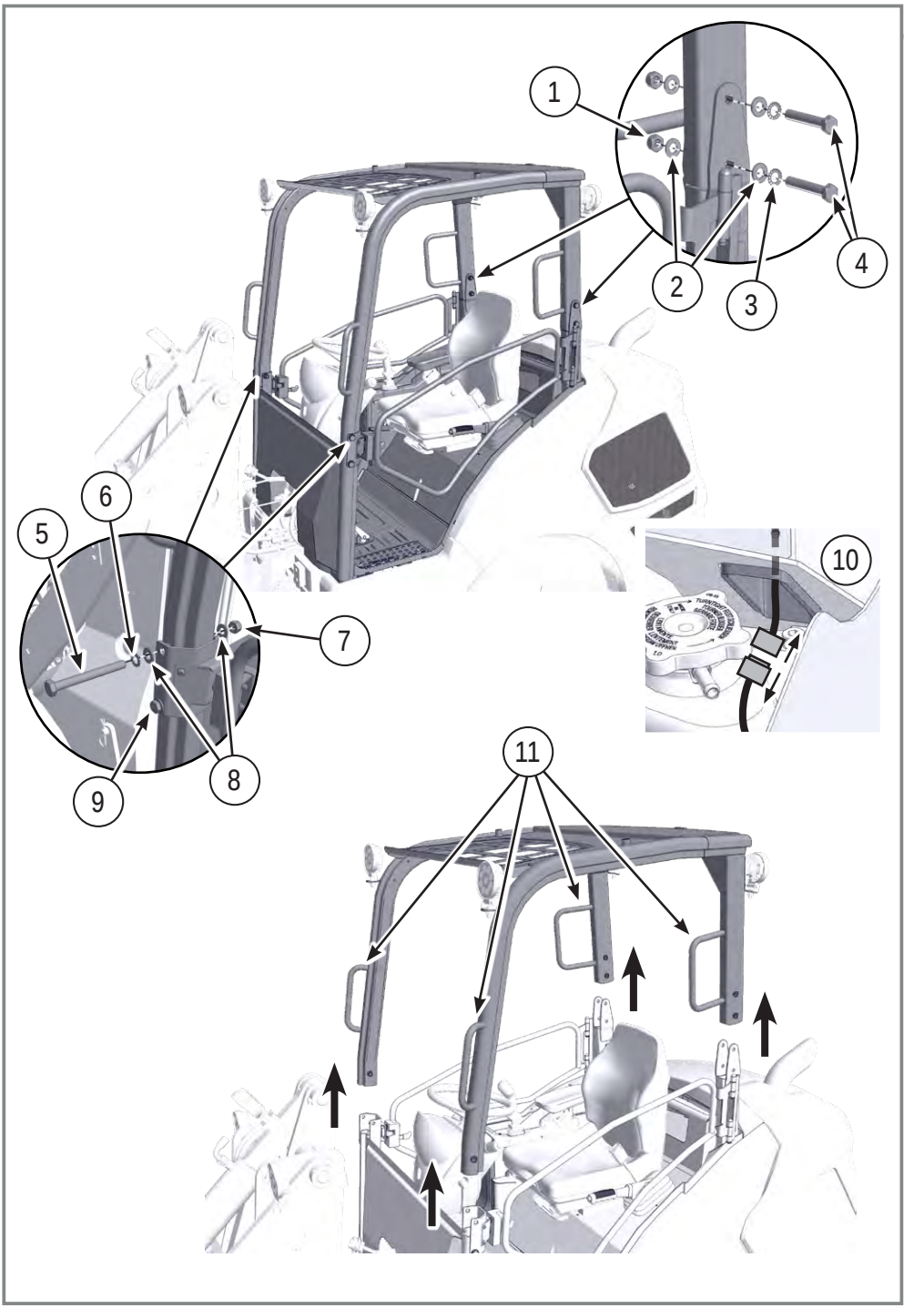


Fig. B31

11.15. Removal of the top of the canopy

To make the machine easier to store or transport, the top part of the canopy can be removed.

DANGER: OPERATING THE MACHINE WITHOUT THE COMPLETE ROPS/FOPS STRUCTURE PROPERLY INSTALLED COULD RESULT IN DEATH OR SERIOUS INJURY IN THE EVENT OF OVERTURNING OR FALLING OBJECTS.

■ **Before removing the top of the canopy, perform the mandatory safety shutdown:**
- Park the machine on a level surface in a clear area away from traffic.
- Apply the parking brake.
- Lower the lift structure/attachment to the ground.
- Turn off the engine.
- Remove the key from the ignition.

■ **Disassembly**
- On each of the two pillars at the rear:
  - Unscrew the two screws (**4**) with their nuts (**1**) using two 19 mm wrenches.
  - Remove the lock washer (**3**) and the two flat washers (**2**) from each screw.
- On each of the two front pillars:
  - Unscrew only the top screw (**5**) with its nut (**7**) using two 19 mm wrenches.
  - Remove the lock washer (**6**) and the two flat washers (**8**) from each screw
  - Do not touch the bottom screw (**9**).
  - Disconnect the cab wiring harness (options: working lights and rotating beacon) that runs into the canopy's rear right-hand pillar by disconnecting the X03 connector (**10**) and the ground.

CAUTION: THE CANOPY TOP WEIGHS 75 KG (170 LB) AND REQUIRES TWO PEOPLE TO REMOVE:
- WITH AN ASSISTANT, LIFT THE CANOPY TOP BY THE HANDLES (11) AND REMOVE IT FROM THE MACHINE.
- LAY THE STRUCTURE DOWN GENTLY ON HORIZONTAL, STABLE, CLEAN AND DRY GROUND.

■ **For refitting**
- On the front pillars:
  - Prepare the two front pillar screws (**5**) with a lock washer (**6**) and a flat washer (**8**)

MAKE SURE THAT YOU FEED THE CAB WIRING HARNESS AND ITS X03 CONNECTOR INTO THE REAR RIGHT-HAND PILLAR WITHOUT DAMAGING OR TRAPPING IT

  - With two people, use the handles (**11**) to raise the top part of the canopy and put it back in place on its pillars.
  - Align the pillars and insert the screws (**5**) with their lock washers (**6**) and flat washers (**8**) as soon as possible on the front part.

DURING THE FOLLOWING STEP, CAREFULLY ROUTE THE CAB WIRING HARNESS WITH THE X03 CONNECTOR INTO THE REAR RIGHT PILLAR. USE CARE TO NOT DAMAGING OR TRAP IT

  - Put the second washer in place (**8**) and position the nut (**7**) loosely to hold the structure in place while you continue with fitting.
- On the rear pillars:
  - Install the screws (**4**) with a lock washer (**3**) and a flat washer.
  - Put the second washer (**2**) back in place and position the nut (**1**) loosely.
- Tighten the nuts (**1** and **7**) with their respective screws (**4** and **5**) using two 19 mm wrenches to a torque of **71 Nm** (52.4 ft-lb).
- Reconnect the ground and the cab harness (via the X03 connector) (options: working lights and rotating beacon) and check that the components connected are working correctly before using the machine again.

■ **Foreword**
- The service intervals depend on the number of hours the machine is used. Consult the hour counter on the dashboard (**See Chapter 11.2 P87**) frequently.
- For all checking and draining operations, put the machine on level ground and switch off the engine.
- Before each check of levels, filling and lubrication, clean the filling holes, plugs and grease nipples.
- Also check the condition of the seals on the filler caps. Immediately replace any worn or damaged seals and/or filler caps. Always replace and securely tighten filler caps after maintenance.

12.1. Recommendations

8

■ **General inspection**

IMPORTANT: FIX/REPAIR ANY PROBLEM AS REQUIRED BEFORE USING THE MACHINE

- Perform regular inspections according to the Inspection and maintenance table on Page 200.
- Visual inspection for possible leaks (if found, check the level in the corresponding circuit).
- Check on oil and coolant levels.
- Check for fraying of the belt, scratches, tears and distortions in the hoses, accessories and work attachments.
- Check the hydraulic connectors and couplings.
- Check the appearance of mechanical parts.

After starting the machine:
- Check the operation of the controls, the warning lights and other indicators.
- Check the color of the exhaust gases and listen for unusual noises.
- Follow the Safety Shutdown Procedure in the safety section in this manual.

UNLESS SPECIFICALLY INSTRUCTED, NEVER PERFORM MAINTENANCE ON THE MACHINE WHEN IT IS IN OPERATION. BEFORE CLEANING, ADJUSTING, LUBRICATING, FUELING, OR PERFORMING OTHER MAINTENANCE ON THE MACHINE, PERFORM THE MANDATORY SAFETY SHUTDOWN:
• PARK THE MACHINE ON A LEVEL SURFACE IN A CLEAR AREA AWAY FROM TRAFFIC.
• APPLY THE PARKING BRAKE AND/OR CHOCK THE WHEELS.
• LOWER THE LIFT STRUCTURE/ATTACHMENT TO THE GROUND.
• TURN OFF THE ENGINE.
• REMOVE THE KEY FROM THE IGNITION.

■ **Warnings fixed on the engine**
- Various warning stickers may be fixed in your engine compartment.
- Clean or replace the warnings, the text or illustrations of which are not visible.
- Replace any damaged or missing warning.
- New warnings are available from the manufacturer.

■ **Safety during engine maintenance operations**

Fix a “Do not use” warning sign or a similar sign on the ignition switch or on the controls before servicing or repairing the engine. Fix the warning signs on the engine and on each control position. If necessary, disconnect the starting controls.

BEFORE PERFORMING ENGINE MAINTENANCE, PERFORM THE MANDATORY SAFETY SHUTDOWN:• PARK THE MACHINE ON A LEVEL SURFACE IN A CLEAR AREA AWAY FROM TRAFFIC.
• APPLY THE PARKING BRAKE AND/OR CHOCK THE WHEELS.
• LOWER THE LIFT STRUCTURE/ATTACHMENT TO THE GROUND.
• TURN OFF THE ENGINE.
• REMOVE THE KEY FROM THE IGNITION.

KEEP PEOPLE AWAY FROM THE MACHINE WHILE PERFORMING ENGINE MAINTENANCE.

DO NOT MAKE UNAUTHORIZED MODIFICATIONS TO ANY PART OF THE MACHINE. UNAUTHORIZED MODIFICATIONS TO THE MACHINE CAN CAUSE INJURY OR DEATH AND/OR CAN DAMAGE THE MACHINE. THE OWNER IS RESPONSIBLE FOR ANY SAFETY HAZARDS RESULTING FROM UNAUTHORIZED MODIFICATIONS.

DO NOT RUN THE ENGINE IN/NEAR ENCLOSED AREAS WITHOUT PROVIDING PROPER VENTILATION FOR THE EXHAUST. EXHAUST GASES CONTAIN CARBON MONOXIDE, AN ODORLESS AND DEADLY GAS.

Engine exhaust gases contain combustion products which could prove harmful. Always start the engine and let it run in a well-ventilated area. If the engine is in a closed area, evacuate the exhaust gases to the exterior.

■ **Use of compressed air**

TO PREVENT INJURIES, WEAR PROTECTIVE CLOTHING, SUCH AS EYE PROTECTION, IF USING COMPRESSED AIR AND/OR PRESSURIZED/HOT WATER.

When washing the machine using water, do not direct the water onto electrical connections or electronic components. Water may cause malfunction or damage. Power washing or other high-pressure jets may cause physical damage.

■ **General points**

DO NOT WEAR LOOSE CLOTHING OR RINGS, CHAIN BRACELETS, ETC. WHICH RISK GETTING CAUGHT ON THE CONTROLS OR OTHER PARTS OF THE ENGINE.

DO NOT STORE WASTE AND/OR MAINTENANCE FLUIDS IN GLASS CONTAINERS. GLASS CONTAINERS COULD BREAK AND CAUSE INJURY AND/OR ENVIRONMENTAL HAZARDS.

■ **Pressurized hydraulic circuits:**

INJURY COULD RESULT IF THE HYDRAULIC CIRCUIT IS NOT CORRECTLY DEPRESSURIZED, WHICH COULD CAUSE HYDRAULIC FLUID OR COMPONENTS, SUCH AS PLUGS, TO BE FORCIBLY EJECTED.

To prevent injury, do not loosen or disconnect any hydraulic components without first relieving hydraulic circuit pressure (See: “Releasing residual pressures” p. 109).

Only use a piece of paper or cardboard to search for hydraulic leaks, never hands.

DO NOT SEARCH FOR FLUID LEAKS USING YOUR HANDS. USE A PIECE OF PAPER OR CARDBOARD. ESCAPING FLUID UNDER PRESSURE CAN BE INVISIBLE, CAUSE SERIOUS BURNS, CAN PENETRATE THE SKIN AND CAUSE SERIOUS, EVEN FATAL INJURY.

IF ANY FLUID IS INJECTED INTO YOUR SKIN, SEEK MEDICAL ATTENTION IMMEDIATELY. INJECTED FLUID MUST BE SURGICALLY REMOVED BY A DOCTOR OR GANGRENE MAY RESULT..

■ **Disposal of waste**

Incorrect waste disposal may threaten the environment.

Potentially toxic liquids must be disposed of in accordance with local regulations.

Dispose of all oils and fluids properly. Used oils/fluids are environmental contaminants and may only be disposed of at approved collection facilities.

NEVER DRAIN OR DISPOSE OF ANY OILS/FLUIDS ONTO THE GROUND, IN PUBLIC WASTE COLLECTION CONTAINERS, OR IN SEWER SYSTEMS OR LANDFILLS. CHECK LOCAL REGULATIONS FOR OTHER REQUIREMENTS.

■ **Exhaust gas cooler/sulfuric acid warning**

The exhaust gas cooler may contain a small quantity of sulfuric acid. The use of fuel with sulfur contents higher than 15 ppm may increase the quantity of sulfuric acid formed. Sulfuric acid may run out of the cooler when the engine is running.

SULFURIC ACID CAN BURN THE EYES, SKIN AND CLOTHING ON CONTACT. ALWAYS WEAR THE APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) THAT IS NOTED ON A MATERIAL SAFETY DATA SHEET (MSDS) FOR SULFURIC ACID. ALWAYS FOLLOW THE DIRECTIONS FOR FIRST AID THAT ARE NOTED ON A MATERIAL SAFETY DATA SHEET (MSDS) FOR SULFURIC ACID.

12.2. Diesel circuit

■ Warnings

In normal operating conditions, the engine, exhaust, and the engine post-treatment circuit may reach temperatures of up to 650°C (1202°F).

FUEL UNDER HIGH PRESSURE CAN BURN AND PENETRATE THE SKIN.

FUEL EJECTED UNDER HIGH PRESSURE IS A FIRE HAZARD.

FAILURE TO FOLLOW SAFETY, OPERATING AND MAINTENANCE INSTRUCTIONS CAN RESULT IN SERIOUS INJURY OR DEATH.

To depressurize the diesel circuit, switch off the engine.

BLEED THE AIR AFTER COMPLETING ANY WORK ON THE DIESEL CIRCUIT. (SEE: "BLEED THE AIR FROM THE FUEL CIRCUIT" P. 150).

■ Diesel tank

It is located in the front undercarriage of the machine.

- Tank filler cap (**2**) (on the right of the front undercarriage).
- Draining (**3**), via the fuel return hose (See Rinsing the fuel tank, Page 150).
- Diesel sensor (**1**) on the top of the tank.

DO NOT ALLOW THE FUEL TANK TO EMPTY COMPLETELY DURING MACHINE OPERATION. DAMAGE TO THE ENGINE AND FUEL SYSTEM COMPONENTS CAN RESULT.

■ Filling of the tank

- To prevent the formation of condensation, the tank must be filled every day after work. Consult the summary table for capacities (**10.15**, Page 64).
- The level is shown by an indicator on the dashboard (**20**, Page 87).
- Do not overfill the fuel tank.

WHEN FILLING THE FUEL TANK:
- ADD FUEL TO THE MACHINE ONLY IN A WELL-VENTILATED AREA.
- TURN OFF THE ENGINE AND PARK THE MACHINE WITH SWITCHES TURNED OFF BEFORE REFUELING.
- DO NOT SMOKE WHILE FILLING THE FUEL TANK AND KEEP SPARK- OR FLAME-PRODUCING EQUIPMENT OR MATERIALS AWAY.
- AVOID SPILLING DIESEL FUEL. WIPE UP SPILLS IMMEDIATELY. NEVER USE A SHOP RAG TO CATCH DRAINING/LEAKING FUEL. DISPOSE OF THE RAG PROPERLY BECAUSE VAPORS FROM THE RAG ARE FLAMMABLE AND EXPLOSIVE.
- STATIC ELECTRICITY CAN PRODUCE DANGEROUS SPARKS AT THE FUEL-FILLING NOZZLE. DO NOT WEAR POLYESTER, OR POLYESTER-BLEND CLOTHING WHILE FUELING. BEFORE FUELING, TOUCH THE METAL SURFACE OF THE MACHINE AWAY FROM THE FUEL FILL TO DISSIPATE ANY BUILT-UP STATIC ELECTRICITY
- DO NOT RE-ENTER THE MACHINE AND STAY NEAR THE FUEL FILLING POINT DURING REFUELING TO MINIMIZE THE BUILD-UP OF STATIC ELECTRICITY
- DO NOT USE CELL PHONES WHILE FUELING.
- MAKE SURE THE ENTIRE FUEL DELIVERY SYSTEM IS IN COMPLIANCE WITH FUELING STANDARDS FOR PROPER GROUNDING AND BONDING PRACTICES.

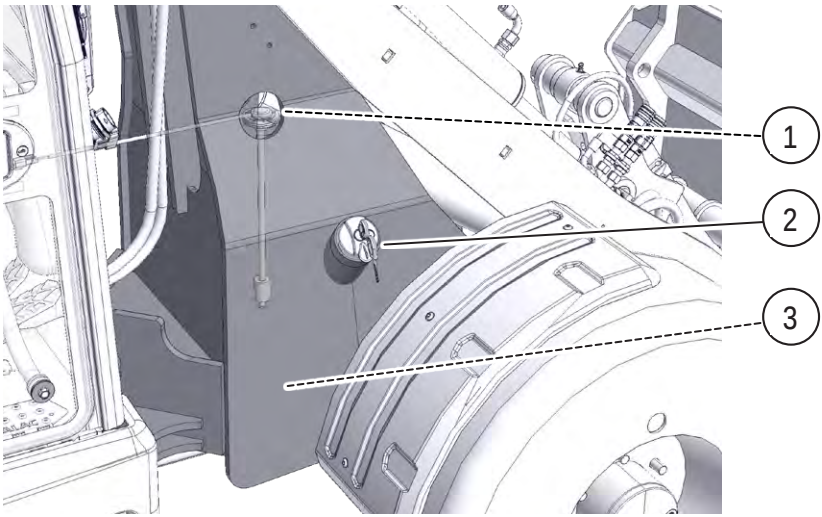
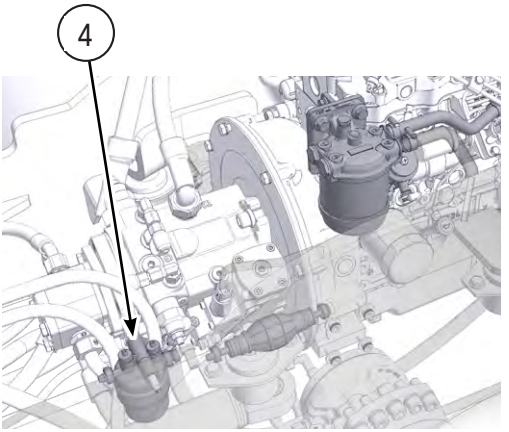
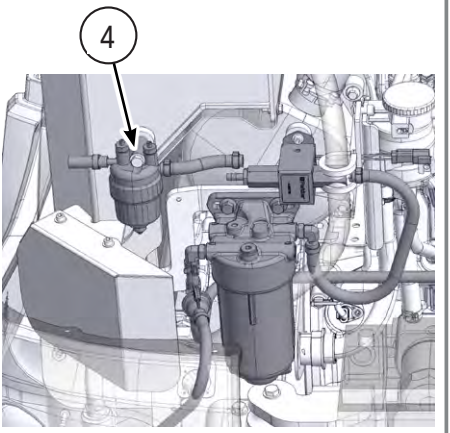


Fig. C1



MLA 2-25 H



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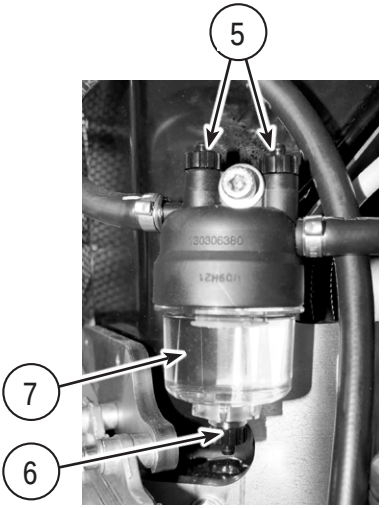


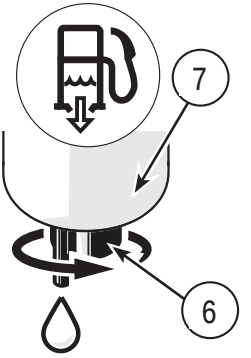


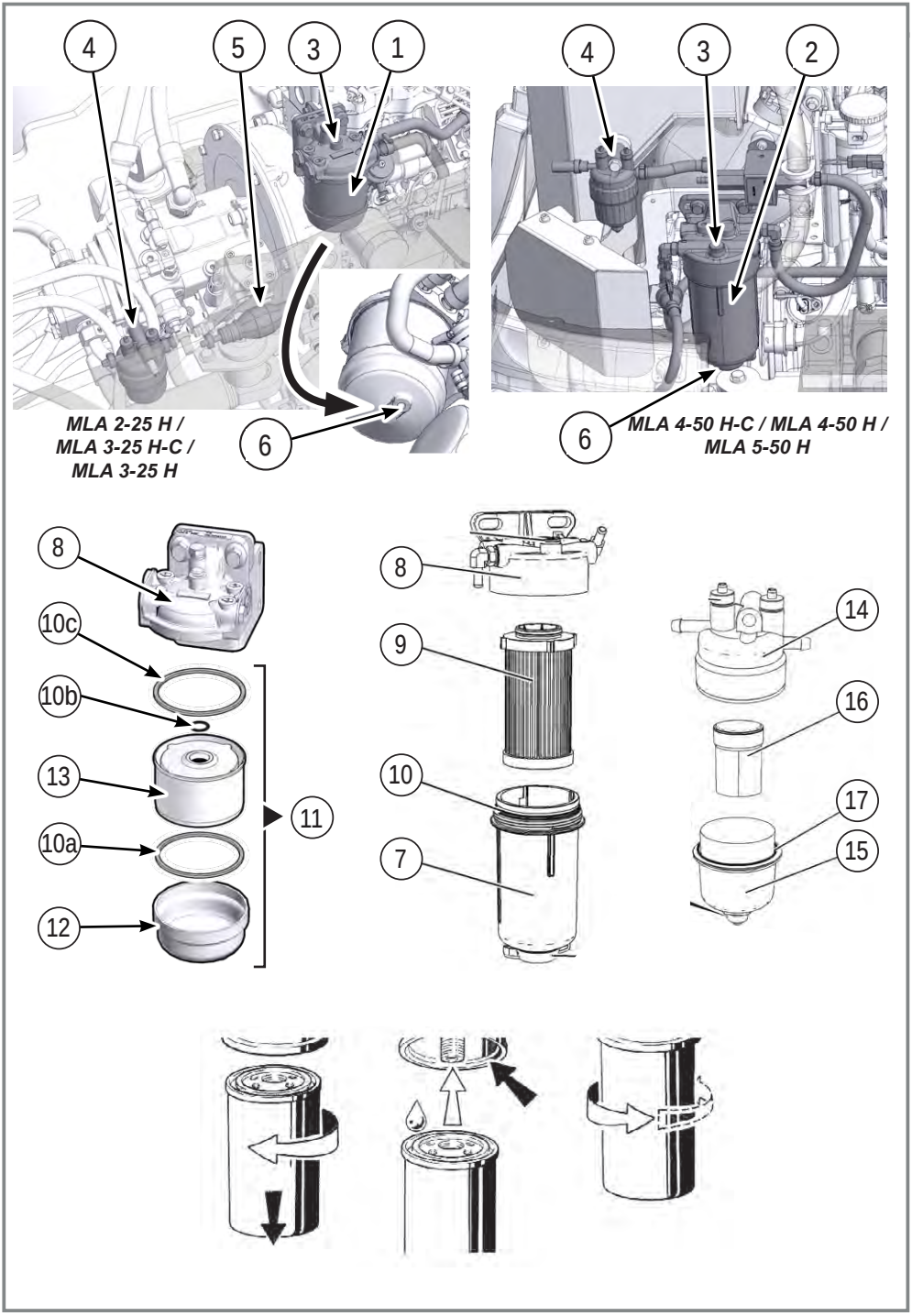
Fig. C2

8

■ **Bleeding water and impurities**

- Every day bleed the water in the diesel pre-filter (**5** Fig. C1) and regularly purge the bottom of the tank (See Rinsing the fuel tank, Page 150):
- Unscrew the pre-filter air bleed screw (**5**).
- Use the screw (**6**) to bleed the accumulated water in the pre-filter (**4**) separator bowl (**7**):
  - Unscrew the bleed screw (**6**) by hand and let the water and impurities run out until diesel runs out free of air.
  - Collect the diesel that runs out in accordance with the environmental protection legislation.
- Re-tighten the bleed valve (**6**) by hand (tightening torque 1.6 ± 0.3 Nm (14.16 ± 2.66 in-lb)).
- Re-tighten the pre-filter air bleed screw (**8**) by hand (tightening torque 1.6 ± 0.3 Nm (14.16 ± 2.66 in-lb)).
- Dispose of the collected fuel according to environmental laws or take it to a recycling center for proper disposal. DO NOT pour onto the ground or down a drain.

Loss of engine power may be due to a clogged diesel filter cartridge. If the cartridges clog too quickly, check the cleanliness of the fuel, clean the tank and make sure that it is perfectly sealed.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MLA 2-25 H /
MLA 3-25 H-C /
MLA 3-25 H
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MLA 4-50 H-C / MLA 4-50 H /
MLA 5-50 H
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10c
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10a
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Fig. C3

500 ■ **Replacement of the diesel filter (1) MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H and (2) MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H**

- Stop the engine and perform the Mandatory Safety Shutdown procedure,
- Clean the outside of the fuel filter.
- Place a suitable container under the fuel filter
- Open the bleed screw (**3**) and the drain screw (**6**)
- Collect the diesel that runs out in accordance with the environmental protection legislation.
- Use a suitable strap wrench to remove:
  - **MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H:** The filter and tank assembly (**11**) from the base of the filter (**8**).
  - **MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H:** The filter body (**7**) from the base of the filter (**8**).
- Remove the filter element (**9/13**) and the seal(s) (**10**) and discard them.
- Make sure that the filter tank (**7/12**) is clean and dust-free.
- Install a new filter element/cartridge as follows:

TO PREVENT FUEL SYSTEM CONTAMINATION, DO NOT PRE-FILL THE FILTER CARTRIDGE

NEVER SERVICE THE FUEL SYSTEM WHILE SMOKING, WHILE NEAR AN OPEN FLAME, OR IF THE ENGINE IS HOT.

  - **MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H:**
  - Refit a new O-ring (**10a**) on the filter tank (**12**).
  - Lightly oil the seal (**10a**) and screw the tank (**12**) fitted with its new seal on the new cartridge (**13**).
  - Fit new O-rings (**10b** and **10c**) on the new cartridge (**13**).
  - Lightly oil the seals (**10b** and **10c**) and screw the new fitted cartridge (**11**) onto the filter base (**8**). Do not use attachments to fit the filter assembly. Only use the pressure of your hand to tighten the filter tank.
  - **MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H:**
  - Fit a new filter element (**9**) in the filter base (**8**).
  - Fit a new O-ring (**10**) on the filter tank (**7**).
  - Lightly oil the seal (**10**) of the new cartridge with clean oil or diesel and fit the filter tank (**7**) on the filter base (**8**). Do not use attachments to fit the filter assembly. Only use the pressure of your hand to tighten the filter tank.
- Check the sealing.
- Bleed the air from the diesel circuit (see Procedure, Page 150).

500 ■ **Replacement of the diesel pre-filter cartridge (4).**

- Place a suitable container under the water separator to collect the fuel which could spread.
- Clean the outside of the fuel filter.
- Bleed the water separator (Bleeding water and impurities, Page 147).
- Remove the filter tank (**15**) and the filter element (**16**) and discard it.
- Remove the seal (**17**) and discard it.
- Make sure that all the components are clean and dry.
- Fit a new seal (**17**) and fit a new filter element (**16**).
- Lightly oil the seal (**17**) and fit the filter tank (**15**) on the filter base (**14**) and tighten the filter tank to a torque of 10 Nm (7.4 ft-lb).
- Dispose of the used filter element, and any collected fuel according to environmental protection legislation.

500 ■ **Bleed the air from the fuel circuit**

TO AVOID CAUSING ANY ENGINE FAULTS, DO NOT ATTEMPT TO START THE ENGINE DURING THE BLEEDING PROCEDURE.

When air has penetrated the fuel circuit this must be bled for the engine to start. Air can penetrate the fuel circuit in the following cases:

- The fuel tank is empty or has been partially drained.
- The low-pressure pipes for the fuel are disconnected.
- There is a leak in the low-pressure fuel circuit.
- The fuel filter or pre-filter has been replaced.

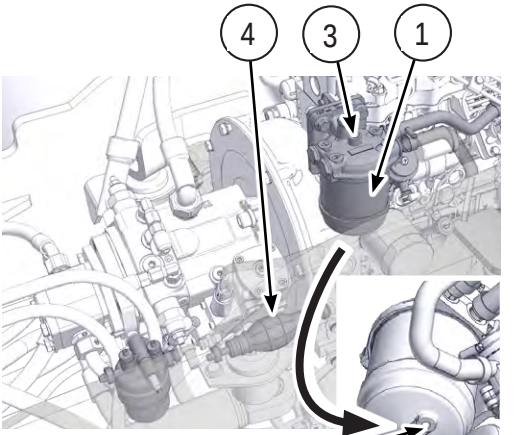
■ Bleed the air from the fuel circuit in the following way:

- Make sure that the fuel tank is full using the indicator located on the dashboard (**20**, Page 87).
- Open the air bleed screws on the diesel filter (**3**) using a 12 mm Allen key.
- **MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H:**
  - Use the manual priming pump (**4**) until fuel without air bubbles comes out of the air bleed screw (**3**).
  - Then close the bleed screw (**3**) using a 12 mm Allen key.
- **MLA 4-50 H-C/MLA 4-50 H/MLA 5-50 H:**
  The fuel circuit is bled using the electric fuel supply pump (**5**):
  - Turn the starter key to “Contact” (**7**).
  - The electric fuel supply pump (**5**) starts for 20 seconds to bleed the fuel circuit and reach the required pressure.
  - Turn off the machine.
  - Carry out at least 3 new 20-second bleed cycles (starter on “contact” (**7**)) until fuel without air bubbles comes out of the air bleed screw (**3**).
  - Turn off the machine.
  - Then close the bleed screw (**3**) using a 12 mm Allen key.
- Start the engine and leave it idling for a few minutes.
- Insure there are no leaks from the fuel circuit.

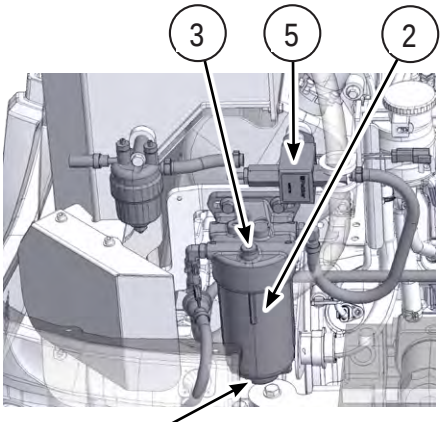
1000 ■ **Rinsing the fuel tank**

The diesel tank is located in the front undercarriage of the machine.
A suction hose (**8**) supplies the engine via the diesel filter and pre-filter.
The fuel return takes place via the hose (**9**) in the lower part of the tank.

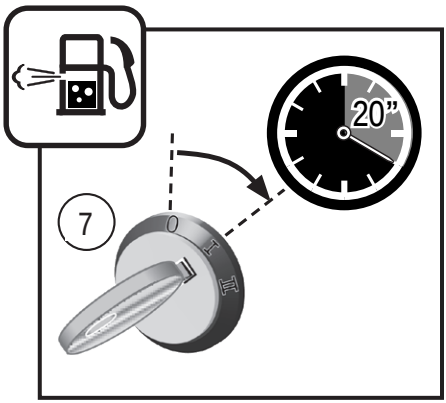
- Unscrew the hose (**9**) in the lower part of the diesel tank and allow the tank to empty (tank capacities see **10.15**, Page 64).
- Put a plug in the drain hole, fill the tank to half and drain again.
- Change the seal on the connector and replace the hose (**9**).
- Fill up the fuel tank.
- Bleed the air from the diesel circuit as indicated above.

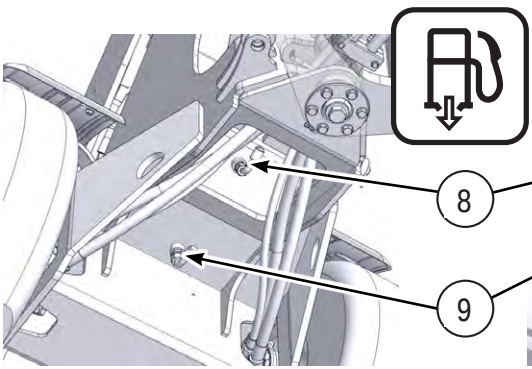


MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H

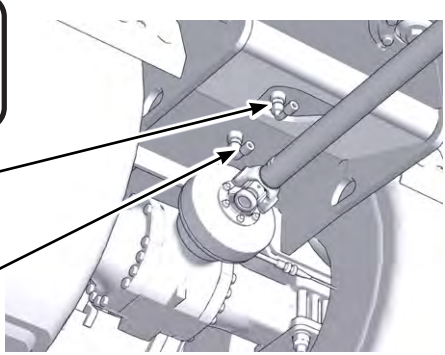


MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H





MLA 2-25 H



MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H

Fig. C4

12.3. Water cooling circuit

Before working on the cooling system, perform the mandatory safety shutdown:
- Park the machine on a level surface in a clear area away from traffic.
- Apply the parking brake.
- Lower the lift structure/attachment to the ground.
- Turn off the engine.
- Remove the key from the ignition.
- Allow the machine to cool.

8 ■ **Checking the cooling circuit levels**
- Check the maximum and minimum levels in the expansion tank (**2**) when the engine is cold. If necessary, top up with coolant COOLELF AUTO SUPRA -26 °C (-15°F) (suitable for temperatures down to -26 °C (-15°F)) / Perkins ELC (pre-mix with 50% glycol suitable for temperatures down to -36 °C (-33°F)).

DO NOT REMOVE THE COOLANT RESERVOIR CAP WHEN THE COOLANT IS HOT. SERIOUS BURNS MAY OCCUR.
SLOWLY LOOSEN THE PLUG, LET THE PRESSURE ESCAPE, THEN UNSCREW COMPLETELY.

NEVER ADD OR TOP UP THE COOLANT WITH PURE WATER. IMPROPER COOLING AND DAMAGE TO THE MACHINE COULD RESULT.

USE ONLY PROPER COOLANT/ANTIFREEZE ONLY: COOLELF AUTO SUPRA -26 °C (-15°F) (SUITABLE FOR TEMPERATURES DOWN TO -26 °C (-15°F)) / PERKINS ELC (PRE-MIX WITH 50% GLYCOL SUITABLE FOR TEMPERATURES DOWN TO -36 °C (-33°F)). USING ANY OTHER COOLANT/ANTIFREEZE MAY RESULT IN IMPROPER COOLING AND DAMAGE TO THE MACHINE.

8 ■ **Checks**
- Check the condition of the hoses and collars as well as their tightness. Replace them if necessary.
- Check that the cooler (**3**) has no deterioration causing small leaks or deposits of impurities. If necessary have it repaired by the manufacturer or clean it.

250 ■ **Cleaning the outside of the coolant radiator**

TO PREVENT INJURIES, WEAR PROTECTIVE CLOTHING, SUCH AS EYE PROTECTION, WHEN USING COMPRESSED AIR.

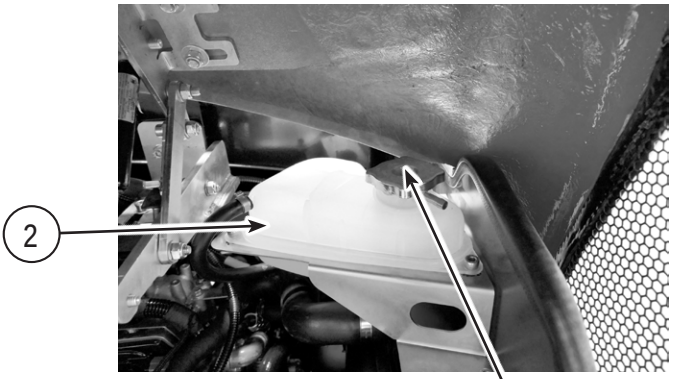
CAUTION! HIGH PRESSURE AIR CAN DAMAGE RADIATOR FINS (3):

- **Dry compressed air cleaning.** Remove dust by directing the jet parallel to the fins. Then clean around the radiator or where dust has settled.
- **Steam jet cleaning.** This cleaning method is preferable to all others and is carried out when the engine is cold. Cover the main control valve and the engine so that they are not directly exposed to the jet. Remove dust by directing the jet parallel to the fins.

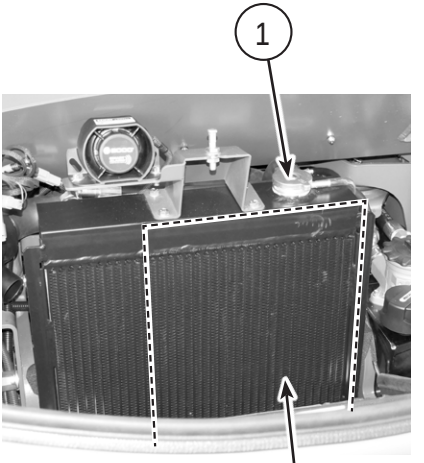
500 • **Check the condition of the pressure relief plug of the expansion tank** (**1**), tared to 1 bar (100 kPa, 15 psi).
  - ○ Clean the filler cap for the cooling circuit and check the condition of the pressurization plug (**1**).
  - ○ Replace the pressurization plug if the seal of the filler cap (**4**) and seal surface (**5**) are damaged.

3000 ■ **Get the coolant thermostat replaced**

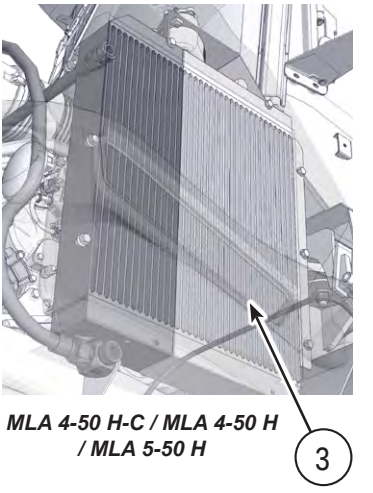
■ **Have the water pump inspected**



MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H



MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H



MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H

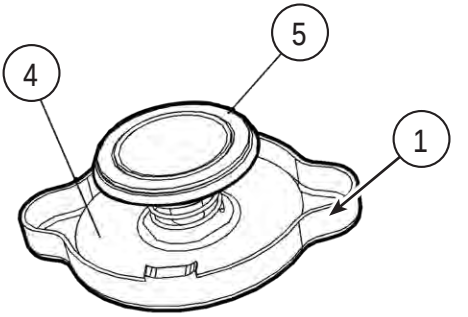
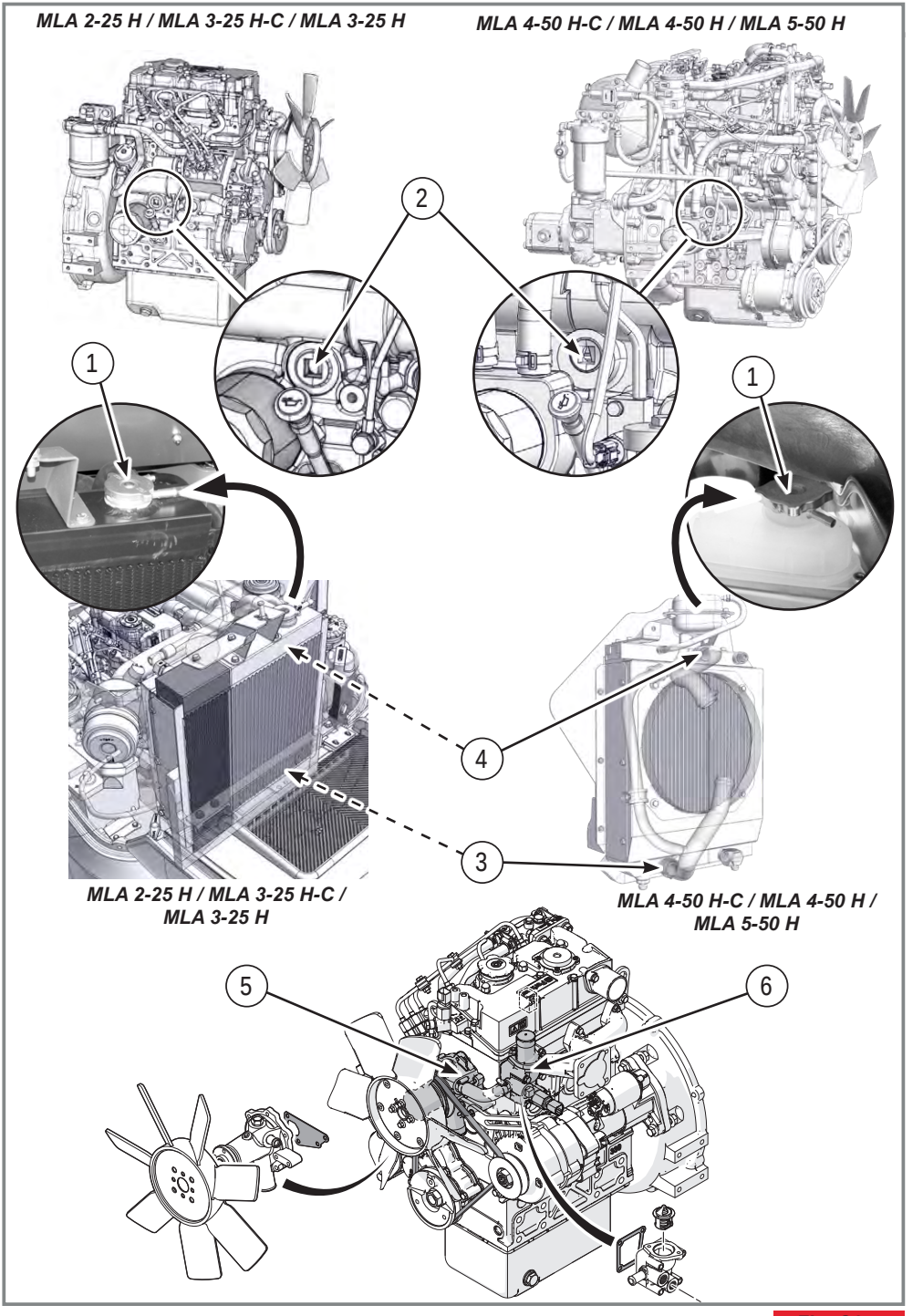


Fig. C5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MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H
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MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H
MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H
5
6

Fig. C6

6000 ■ **Cleaning the inside of the coolant radiator**

Clean and rinse the cooling circuit before the recommended service interval if the following conditions occur: The engine overheats, scum is observed, oil has penetrated the cooling circuit and has contaminated the coolant, fuel has entered the cooling circuit and contaminated the coolant.

- **Draining and rinsing the coolant radiator:**

Before draining and rinsing the coolant radiator: perform the mandatory safety shutdown:

- ○ Park the machine on a level surface in a clear area away from traffic.
- ○ Apply the parking brake.
- ○ Lower the lift structure/attachment to the ground.
- ○ Turn off the engine.
- ○ Remove the key from the ignition.
- ○ Allow the machine to cool.
- ○ Put a collecting tray under the bottom hose of the radiator (**3**).

DO NOT DRAIN THE COOLANT RADIATOR WHEN THE COOLANT IS HOT. SERIOUS BURNS MAY OCCUR.

GENTLY LOOSEN THE PLUG OF THE EXPANSION TANK (1), LET THE PRESSURE ESCAPE, THEN UNSCREW COMPLETELY.

- ○ Open the expansion tank plug (**1**).
- ○ Remove the drain plug (**2**) located on the engine.
- ○ Unscrew the collar on the lower hose of the radiator (**3**) and drain the cooling circuit. Allow the liquid to run out (provide a container with a capacity of approximately 10 liters (2.5 US gal)).
- ○ Collect the liquid in accordance with the environmental protection legislation.
- ○ Remove the hose located at the top part of the radiator (**4**).
- ○ Rinse copiously with hot liquid (distilled or deionized water). If the circuit has mineral deposits (carbon deposits, rust and oil) use a descaling product (special radiator product), do not use detergent! Damage to the cooling system could result. If the radiator is very clogged, contact your dealer.
- ○ Refit the hoses (**3** and **4**) and fix them using their clamping collars.
- ○ Re-tighten the engine drain screw (**2**).
- ○ Fill the radiator (see the next page).

NEVER RUN THE ENGINE WITHOUT COOLANT IN THE COOLING SYSTEM.
DAMAGE TO THE MACHINE COULD RESULT. NEVER WORK ON THE COOLING SYSTEM WITH THE ENGINE RUNNING.
AFTER EACH WET CLEANING OPERATION, RUN THE ENGINE SO THAT LIQUID RESIDUES CAN EVAPORATE, THUS PREVENTING THE FORMATION OF RUST.
AFTER THE MACHINE HAS BEEN INACTIVE FOR MORE THAN TWO MONTHS, CLEAN THE INSIDE AND OUTSIDE OF THE RADIATOR.

- Visually inspect the water pump (**5**) for leaks. Renew the water pump seal or the water pump if there is an excessive leakage of coolant. A failed water pump may cause severe engine overheating problems that could result in the following conditions:
  - ○ Cracks in the cylinder head.
  - ○ A piston seizure.
  - ○ Other potential damage to the engine.

■ **Cleaning the inside of the coolant radiator (continued)**

• **Filling the coolant radiator**

○ Remove the plug from the expansion tank (**1**).

***USE ONLY PROPER COOLANT/ANTIFREEZE ONLY: COOLELF AUTO SUPRA -26 °C** (-15°F) (SUITABLE FOR TEMPERATURES DOWN TO **-26 °C** (-15°F)) / **PERKINS ELC** (PRE-MIX WITH **50%** GLYCOL SUITABLE FOR TEMPERATURES DOWN TO **-36 °C** (-33°F)). USING ANY OTHER COOLANT/ANTIFREEZE MAY RESULT IN IMPROPER COOLING AND DAMAGE TO THE MACHINE.*

○ Fill up to the max. marker level. Be careful not to introduce any grease when filling.

***DO NOT FILL THE COOLING CIRCUIT AT A RATE OF MORE THAN 5 L** (1.32 US GAL) PER MINUTE TO PREVENT AIR POCKETS. THE PRESENCE OF AIR POCKETS IN THE COOLING CIRCUIT RISKS DAMAGING THE ENGINE.*

○ Tighten the plug (**1**).

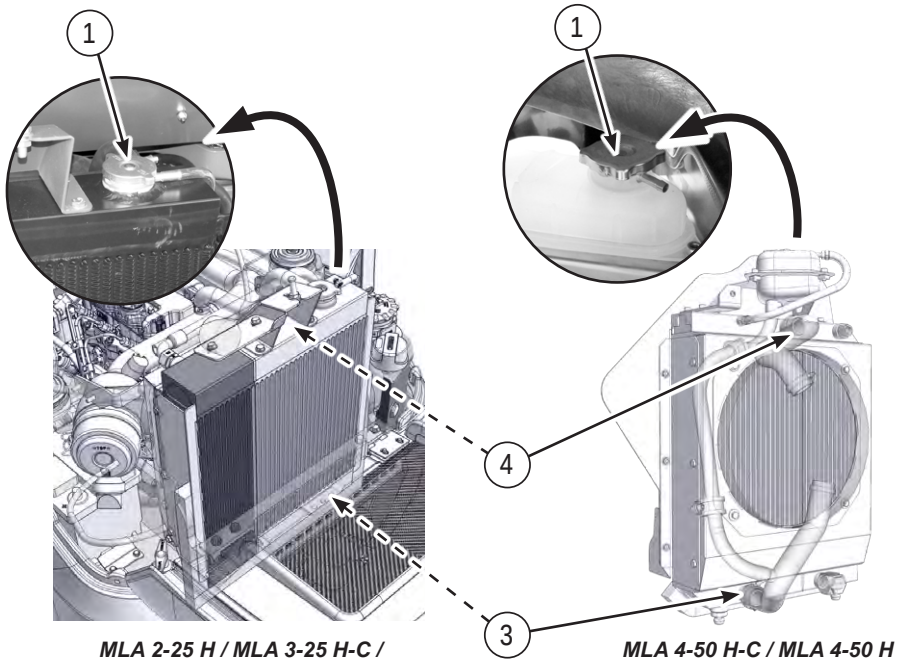
○ Start the engine and let it run for several minutes with the heating on (Cab option) to bleed the air from the circuit.

○ Stop the engine and top up, refer to the paragraph “Checking the level”.

○ Check that there are no leaks in the circuit.

○ Check the level again, top up if necessary.

IT IS ESSENTIAL TO REPLACE THE COOLANT EVERY TWO YEARS.
***USE COOLELF AUTO SUPRA -26°C** (-15°F) COOLANT (SUITABLE FOR TEMPERATURES DOWN TO **-26°C** (-15°F)) THROUGHOUT THE YEAR TO PROTECT THE CIRCUIT FROM CORROSION AND ANY RISK OF FROST.*
CHECK THE COOLANT BEFORE WINTER.



MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H

MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H

Fig. C7

12.4. Engine

8

■ Check the oil level

- Place the machine on level ground and stop the engine for at least 10 minutes.
- Open the engine cover and remove the dipstick (**1**).
- Check the oil level. The level should be between the two marks “ADD” (**Y**) and “FULL” (**X**). Dipstick (**A**) or dipstick (**B**) may be fitted on the engine.

DO NOT OVERFILL THE ENGINE. AN OIL LEVEL HIGHER THAN THE “FULL” MARK MAY CAUSE LOSS OF POWER AND ENGINE DAMAGE.

- If necessary top up through the oil filling hole.

500

■ Changing the engine oil

At least once a year.

- Warm the engine to normal operating temperature.
- Stop the engine.
- Place a collection container under the crankcase drain plug (**2**).

CAUTION! HOT ENGINE OIL CAN CAUSE BURNS. WAIT UNTIL THE ENGINE HAS COOLED, BUT IS NOT COMPLETELY COLD. THE OIL WILL DRAIN FASTER AND MORE COMPLETELY IF IT IS WARM.

- Unscrew and remove the plug (**3**) using a 27 mm wrench. Allow the oil to drain completely. Dispose of the waste engine oil in accordance with the environmental protection legislation.

***CHECK THE CONDITION OF THE USED OIL. BLACK, VERY FLUID OIL INDICATES DILUTION CAUSED BY FUEL. MILKY OIL INDICATES DILUTION CAUSED BY COOLANT. COMPLY WITH OIL CHANGE FREQUENCIES, OTHERWISE THE QUALITY OF THE OIL MAY BE ADVERSELY AFFECTED. SHORTEN THE FREQUENCIES BY HALF IF THE EXTERIOR TEMPERATURE IS < 10°C** (50°F).*

- Retighten the drain plug (**2**) with a new seal (**3**) on the engine oil pan and then tighten to a torque of 35 Nm (25.8 ft-lb).
- Unscrew the oil filler cap (**4**) and fill. The level must reach the “X” or “B” max. mark on the dipstick.
- Tighten the filler cap (**4**) and run the engine on idle for a few moments.

IMPORTANT! IF THE ENGINE OIL PRESSURE INDICATOR LIGHT (A11) DOES NOT GO OUT WHEN THE ENGINE IS RUNNING, TURN OFF THE ENGINE IMMEDIATELY AND CORRECT THE PROBLEM. DAMAGE TO THE ENGINE MAY RESULT IF ENGINE IS RUN AND THE PROBLEM IS NOT CORRECTED.

- Check that there are no leaks on the cap.
- Switch off the engine and wait 15 minutes for the oil to go back down into the pan.
- Check the oil level and top up if necessary.

500

■ Replacing the oil filter

At least once a year.

- Clean the filter head (**5**) and all around.
- Unscrew the filter cartridge (**6**) using a 70-75 mm (2.76-2.95 in) wrench.

IMPORTANT! AFTER REMOVING THE OIL FILTER CARTRIDGE, MAKE SURE THE SEAL ON THE OIL FILTER IS NOT STUCK TO THE FILTER HEAD.

- Clean the bearing surface (**8**) of the seal on the new cartridge.
- Lubricate the seal (**7**) on the new cartridge with clean oil.

NEVER FILL THE FILTER CARTRIDGE IN ADVANCE. RISK OF POLLUTING THE CIRCUIT!

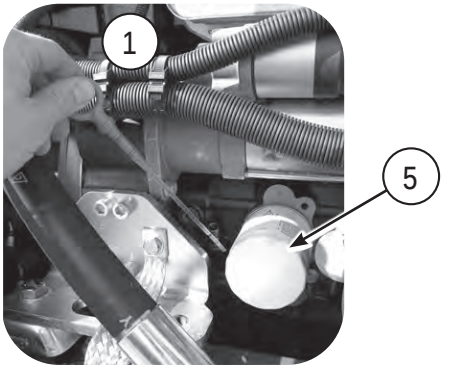
- Install the new cartridge (**6**) screwing it by hand 1/2 turn (follow the manufacturer’s instructions).

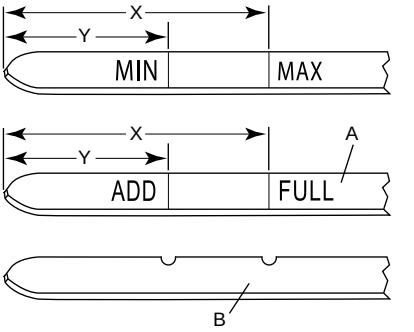
IMPORTANT! OVERTIGHTENING THE FILTER CARTRIDGE CAN DAMAGE THE THREADS AND SEAL.

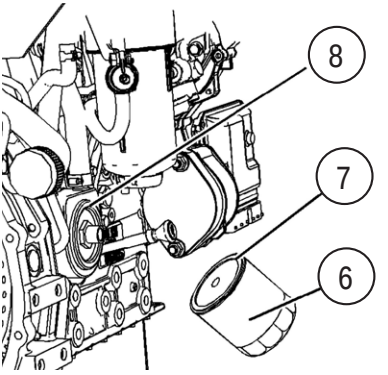
- Run the engine for a few moments.

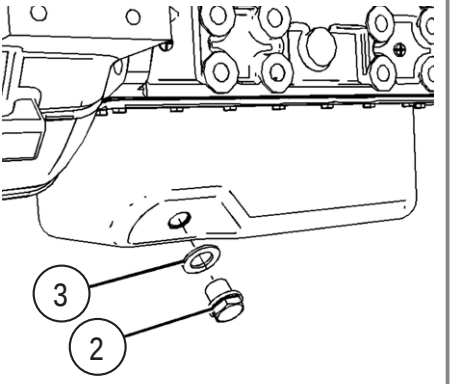
IMPORTANT! IF THE ENGINE OIL PRESSURE INDICATOR LIGHT (A11) DOES NOT GO OUT WHEN THE ENGINE IS RUNNING, TURN OFF THE ENGINE IMMEDIATELY AND CORRECT THE PROBLEM. DAMAGE TO THE ENGINE MAY RESULT IF ENGINE IS RUN AND THE PROBLEM IS NOT CORRECTED.

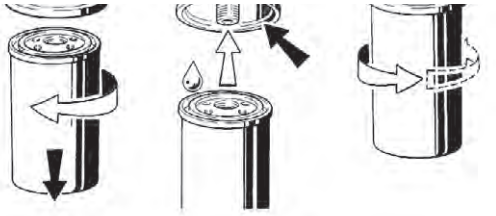
- Switch off the engine and wait 15 minutes for the oil to go back down into the pan.
- Check the oil level and top up if necessary.
- Check for leaks.











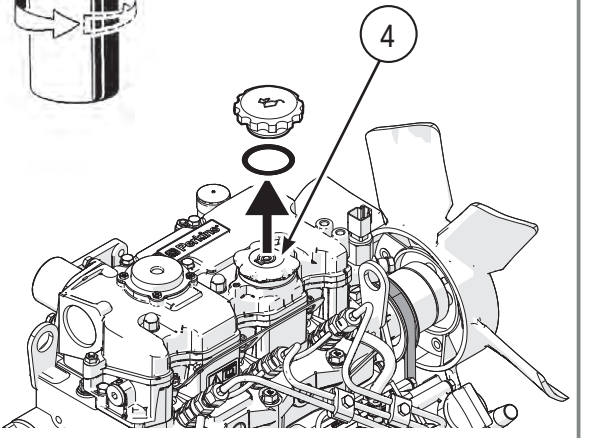


Fig. C8

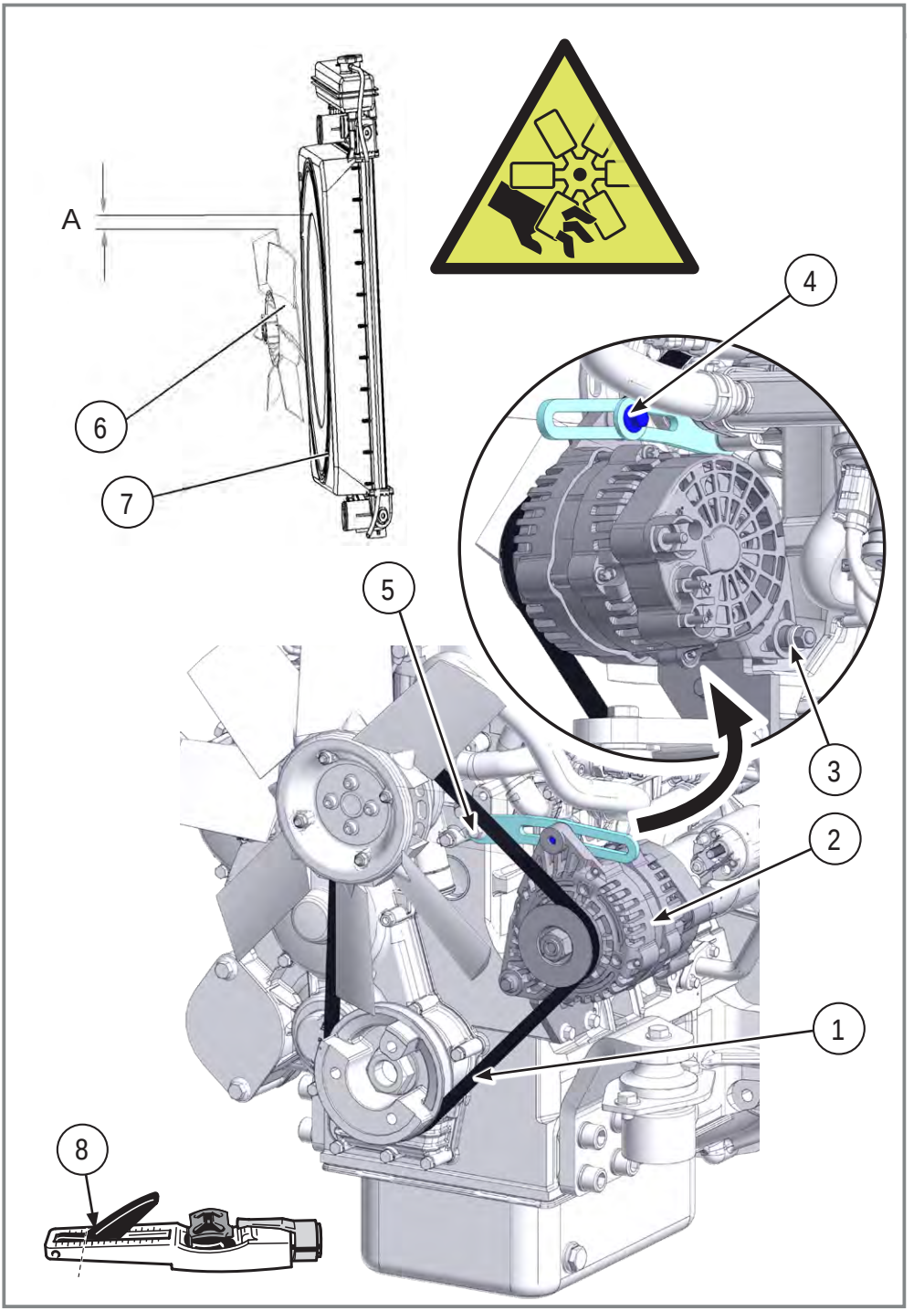


Fig. C9

In order to replace the cartridge every 500 hours, it is essential to use oil of the correct quality (see Chapter 15, Page 204). If the engine oil pressure indicator light (A11) does not go out when the engine is running, turn off the engine immediately and correct the problem. Damage to the engine may result if engine is run and the problem is not corrected. In frosty conditions: Run the engine at a moderate speed for 5 minutes at temperatures < 0°C (32°F) and then increase to full power.

Caution! Hot engine oil can cause burns.

8 ■ **Check the condition of the drive belt**

250 ■ **Check the tension of the drive belt**

At least every 6 months.

- Check the general condition of the belt (**1**): Fraying, tears, etc. Replace it if necessary.
- Check the fan belt tension using a tension gauge. Belt tension should be 400 N (± 50 N) (90 lbf (± 11 lbf)). If necessary, adjust the belt tension using the adjusting screw (4).

Measure the belt tension as close as possible to the alternator pulley (2).

To prevent serious injury, before checking/tensioning the fan belt and/or working in the engine compartment:
- Shut off the engine. Make sure that parts have stopped moving before continuing.
- Turn off the ignition and remove the ignition key.
- Turn off the battery disconnect switch.

500 ■ **Checking the fan gap**

- The gap between the cover (**7**) and the fan (**6**) must be checked. The gap (A= approx. 5 mm (0.2 in)) between the rim of the cover and point of the fan blade must be checked in four places equally spaced apart.

■ **Check that the air intake hoses are in good condition**

1000 ■ **Replacing the drive belt** (depending on its condition):

At least every 2 years.

- Loosen the V-belt:
  - Loosen the screws 3, 4 and 5.
  - Turn the adjusting screw (**4**) to move the alternator (**2**) closer, and release the drive belt (**1**).

Fit the new belt:

- Re-tension the belt using the adjustment screw (**4**) to a value of between 400 N (90 lbf) and 489 N (110 lbf) for initial setting.
- Tighten the screws 3, 4 and 5 to a torque of 25 Nm (18.4 ft-lb).
- Carry out a test for 15 minutes, and then measure the belt (**1**) tension again. A correctly tightened belt should have a tension of 400 N (± 50 N) (90 lbf (± 11 lbf)). Measurement carried out as high as possible toward the alternator pulley (**2**) using a belt tension measuring gauge (**8**).
- Adjust as required.

■ Check the engine suspensions (Re-tighten if required to a torque of 42 Nm (30.8 ft-lb), contact your dealer if damaged)

■ Check the condition and the attachment of hoses/clamps (Re-tighten if required, replace if damaged)

■ Check the turbo (to be performed by your ***Manitou*** dealer)

■ Check the engine alarms (to be performed by your ***Manitou*** dealer)

1000 ■ **Check the engine valve gap**

- The gap of the engine valves should be inspected and adjusted when the engine is cold: for the intake and the exhaust, setting of 0.20 mm (0.008 in).

1500 ■ **Get the injectors checked/replaced**

2000 ■ **Have the alternator and the starter checked**

BEFORE CARRYING OUT ANY WORK, STOP THE MACHINE, SWITCH OFF THE IGNITION AND THE CIRCUIT BREAKER. NEVER WORK ON THE MACHINE WHEN THE ENGINE IS RUNNING.

1000 ■ **Atmospheric crankcase breather (MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H)**

KEEP ALL PARTS FREE OF EXTERIOR POLLUTION (DUST, GREASE, ETC.). POLLUTANTS MAY CAUSE RAPID WEAR AND REDUCE THE SERVICE LIFE OF THE COMPONENTS.

- Loosen the screws (**1**) and remove the breather cover (**2**) from the valve mechanism cover.
- Remove the spring (**3**). Remove the diaphragm and the plate (**4**).
- Loosen the screws (**6**), remove the deflector (**7**) and the gauze (**8**). Throw away the diaphragm and the plate (**4**) and the gauze (**8**).
- Check the condition of the deflector (**7**) and replace it if necessary.
- Clean the air hole (**9**) and the cavity (**5**) of the cover for the valve mechanism.

INSURE THAT THE COMPONENTS FOR THE BREATHER ASSEMBLY ARE CORRECTLY INSTALLED. THE ENGINE MAY BE DAMAGED IF THE BREATHER ASSEMBLY DOES NOT OPERATE CORRECTLY.

- Install the deflector (**7**) and the new gauze (**8**). Install and tighten the deflector screws (**6**).
- Install a new diaphragm and a new plate (**4**) for the breather assembly in the cavity (**5**) of the valve mechanism cover.
- Install a new spring (**3**).
- Install the breather cover (**2**) and the four screws (**1**). Tighten the screws.

1000 ■ **Crankcase breather MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H**

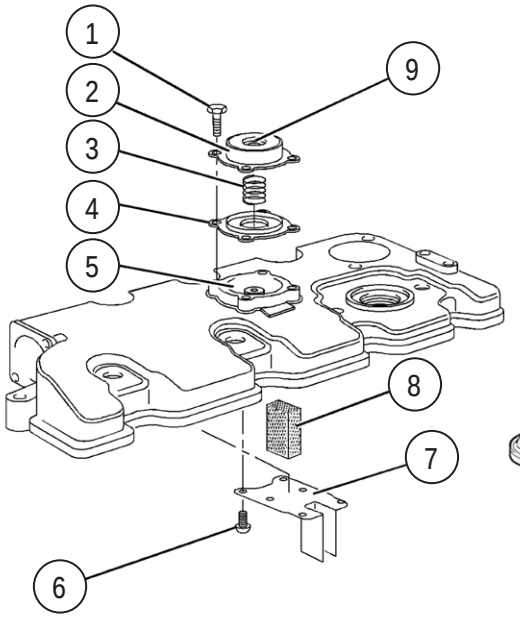
INSURE THAT THE ENGINE IS OFF BEFORE ANY WORK OR REPAIR.

- Loosen the screws (**10**), remove the deflector (**11**) and the gauze (**12**). Throw away the gauze (**12**).
- Install the deflector (**11**) and the new gauze (**12**). Install and tighten the deflector screws (**10**).
- Insure that no dirt penetrates the breather assembly. Insure that the external body of the breather assembly is clean and in good condition.
- Place a container under the breather assembly.
- Draw provisional marks on the hose (**14**) to identify the correct orientation and facilitate the subsequent installation.

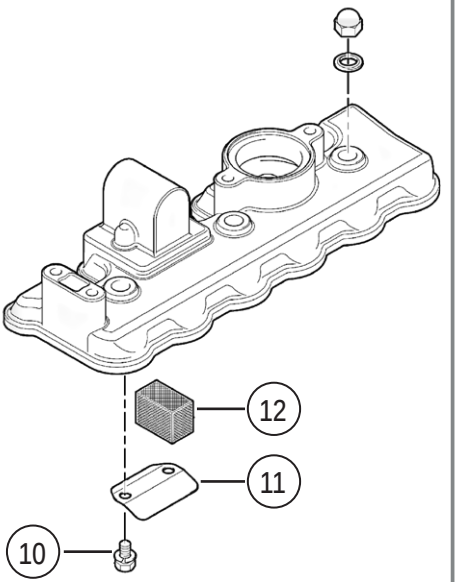
THE HOSE INCORPORATES AND NON-RETURN VALVE. INCORRECT INSTALLATION OF THE HOSE MAY DAMAGE YOUR ENGINE FOR GOOD.

- Take off the coupler (**15**) and remove the hose (**14**) from the plug (**16**). Remove the plug (**16**) from the main body.
- Remove the filter element (**17**) and the O-ring (**18**) and discard them.
- Insure that all the parts are clean, free of dirt and in perfect condition before refitting.
- Apply a drizzle of clean engine oil to the new O-ring (**18**). Fit the O-ring on the cap (**16**).
- Fit the new filter element (**17**) in the plug (**16**).
- Fit the plug assembly into the main body (**19**). Tighten the plug assembly to a torque of 10 Nm (7.4 ft-lb).
- Fit the hose (**14**) and the coupler (**15**). Check that the hose is correctly oriented.
- If a new hose is fitted, the end of the hose with the white strip must be fixed to the breather cartridge.
- Clean all the surfaces and sort the waste.

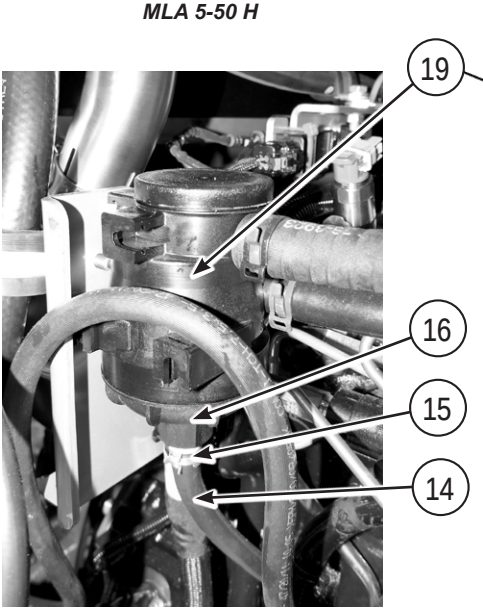
MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H



MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H



MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H



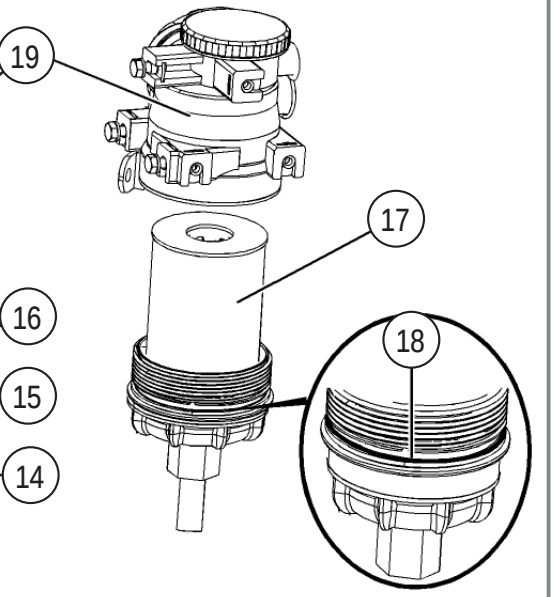


Fig. C10

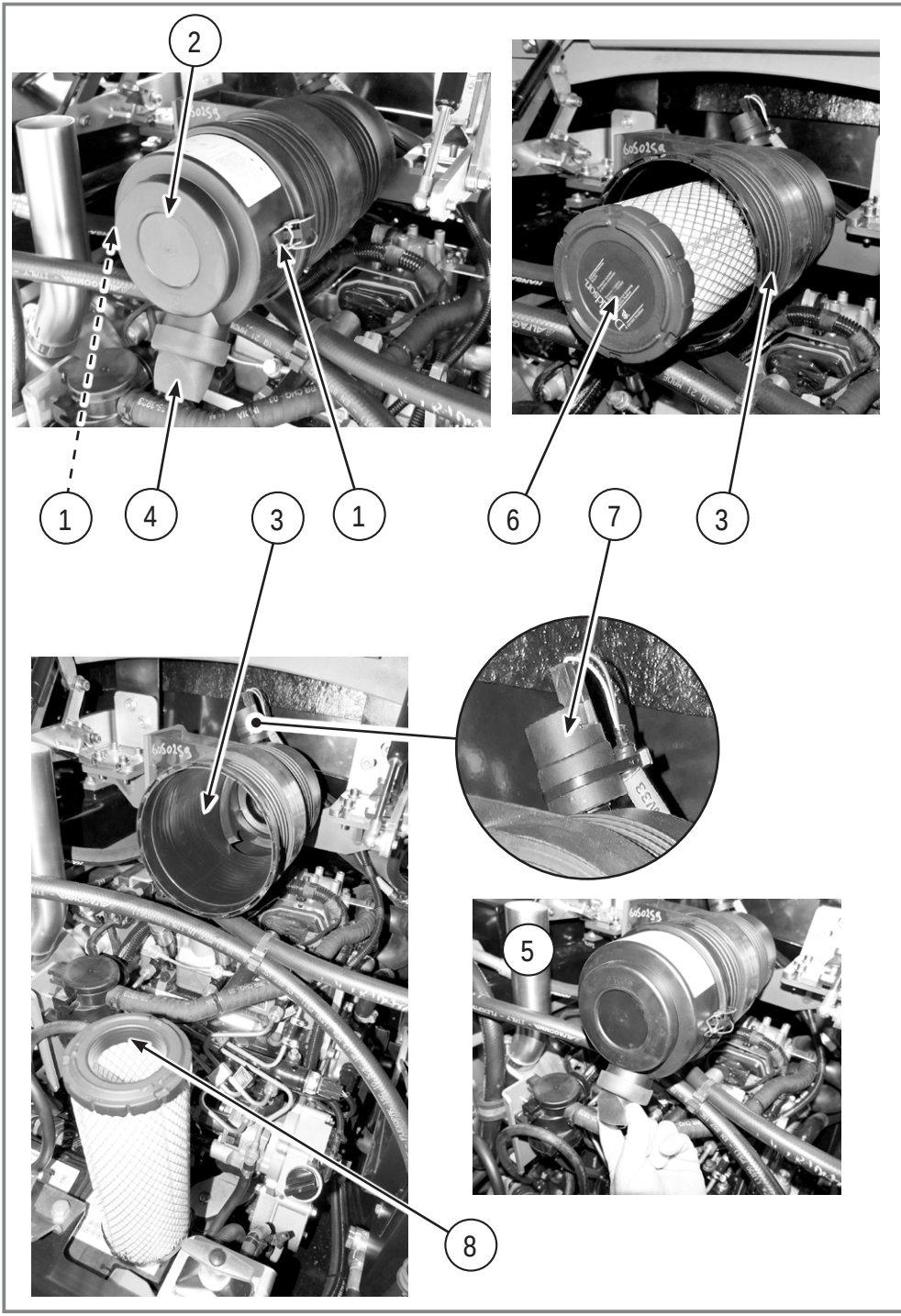


Fig. C11

12.5. Air filter

NEVER SERVICE THE AIR FILTER WHILE THE ENGINE IS RUNNING AS THIS MAY ALLOW PARTICLES TO PENETRATE THE ENGINE.

CHECK THE SEALING OF THE CONNECTORS AND PIPES. CHECK FOR ANY DAMAGE (CRACKED HOSES) AND LOOSE COLLARS, ETC.
NEVER RUN THE ENGINE WITHOUT AN AIR FILTER.

8

■ **Check the condition and efficiency of the air filter**

■ **Cleaning the cover**

- Open the drawer latches (**1**) and take off the cover (**2**) of the filter body (**3**).
- Check that the evacuation valve (**4**) is not blocked.
- Remove the dust by pressing the evacuator (**5**).
- Clean the inside of the cover.

■ **Cleaning the filter element**

CLEANING FILTER ELEMENTS IS FORBIDDEN. THE PROCEDURES USUALLY USED FOR THIS OPERATION (BLOWING) RISK DAMAGING THE CARTRIDGES IRREVERSIBLY AND DETERIORATING THEIR FILTERING FUNCTION.

500

■ **Replacement of the filter element (6):**

When the sensor (**7**) detects the air filter is clogged, the fault symbol (**8**, Page 87) lights on the dashboard.

Replace the air filter cartridge (**6**) at least once a year.

- Take off the cover (**1**).
- Clean the inside of the cover, filter body and outlet tube carefully.
- Check the condition of the cartridge (**6**) to be changed. E.g. foreign body on the sealing surface (leak), trace of dust on the clean side. Eliminate the cause before replacing the cartridge.
- Take out the filter element by pulling and turning it to release the seal.
- Check the new cartridges (follow the manufacturer's instructions).
- Do not hit or knock the air filter element.
- Apply a light film of engine oil or silicone on the sealing area of the filter element (**8**).
- Apply firm pressure on the cartridge when putting it in place to insure the seal is fully watertight. Check the final position of the cartridge before replacing the cover. Be careful, the filter body is fragile.
- Push the cover, close the drawer latches without forcing.

WHEN THE ENGINE IS USED IN A DUSTY ATMOSPHERE THE FREQUENCY OF FILTER REPLACE MAY BE SHORTER.

NEVER WORK ON THE ENGINE AIR FILTER WHEN THE ENGINE IS RUNNING. TO PREVENT SERIOUS INJURY, BEFORE WORKING ON THE ENGINE AIR FILTER AND/OR WORKING IN THE ENGINE COMPARTMENT:
- SHUT OFF THE ENGINE. MAKE SURE THAT PARTS HAVE STOPPED MOVING BEFORE CONTINUING.
- TURN OFF THE IGNITION AND REMOVE THE IGNITION KEY.
- TURN OFF THE BATTERY DISCONNECT SWITCH.

12.6. Battery

The battery circuit comprises:

- A battery (**1** **Fig. C12**) located in the rear engine compartment:
  - 12 V - 50 Ah / 420 A = MLA 2-25 H
  - 12 V - 74 Ah / 680 A = MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H
- A battery cut-off switch (**Fig. C12**) connected to the positive terminal of the battery, located under the rear cover, the battery cut-off switch is used to disconnect the battery from the electrical system and disable all electrical functions. It is used when shutting the machine down at the end of work, if the machine will not be used for a prolonged period, and/or in case of emergency (fire, accident, etc.) :
  - Battery cut-off switch “OFF” **(2 Fig. C12)**.
  - Battery cut-off switch “ON” **(3 Fig. C12)**.

TURN OFF THE ENGINE AND TURN THE BATTERY CUT-OFF SWITCH TO THE "OFF" POSITION AND PERFORM THE MANDATORY SHUTDOWN PROCEDURE BEFORE WORKING ON THE BATTERY. NEVER DISCONNECT CABLES FROM THE BATTERY TERMINALS WHEN THE ENGINE IS RUNNING. KEEP IGNITION SOURCES AWAY FROM THE BATTERY SPARKS, OPEN FLAMES, AND STATIC DISCHARGE CAN IGNITE EXPLOSIVE BATTERY GAS. AVOID CONTACTING THE BATTERY TERMINALS WITH METAL OBJECTS.
TURN OFF THE BATTERY AT THE END OF WORK.

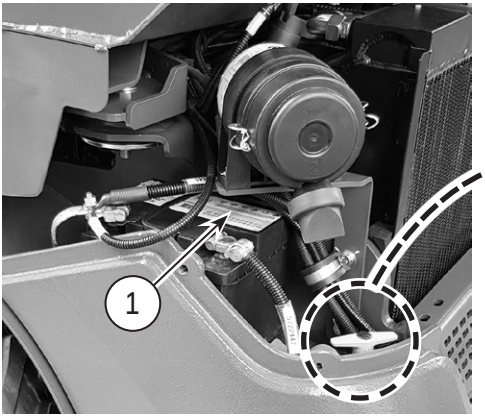
■ **Check the tightness of the terminals**

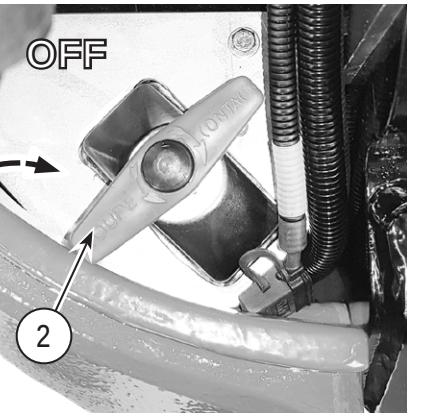
■ **Check the connection and the cables**

- Clean the battery terminals (+ and -) and the locking ring.
- Lubricate with acid-free, acid-resistant grease.
- When refitting make sure the terminals make the correct contact.
- Tighten the terminal screws fully by hand.

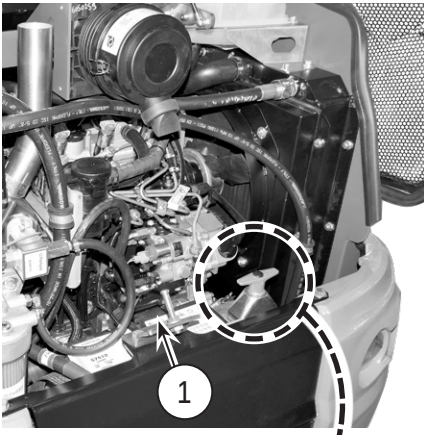
MAKE SURE THAT ATTACHMENTS/METAL OBJECTS OR METAL PARTS OF THE MACHINE DO NOT CONTACT THE BATTERY TERMINALS.
RISK OF SHORT CIRCUIT.

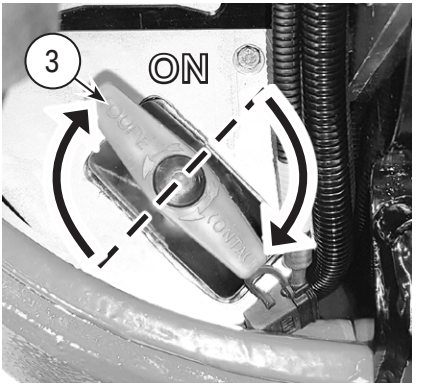
WARNING! NEVER JUMP-START A MACHINE WITH A FROZEN BATTERY. THE BATTERY COULD EXPLODE. THAW A FROZEN BATTERY BEFORE CHARGING IT OR ATTACHING JUMPER CABLES.



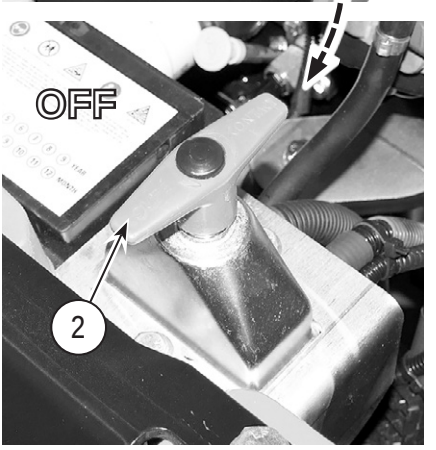


MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H





MLA 2-25 H



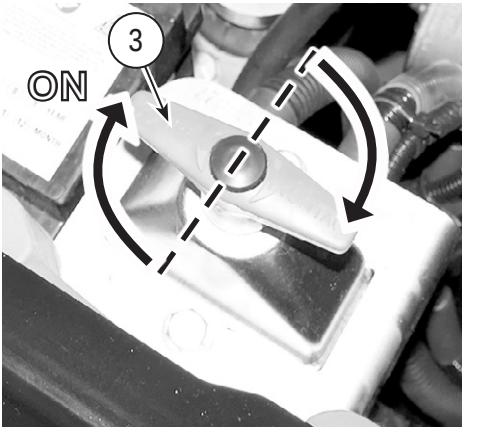


Fig. C12

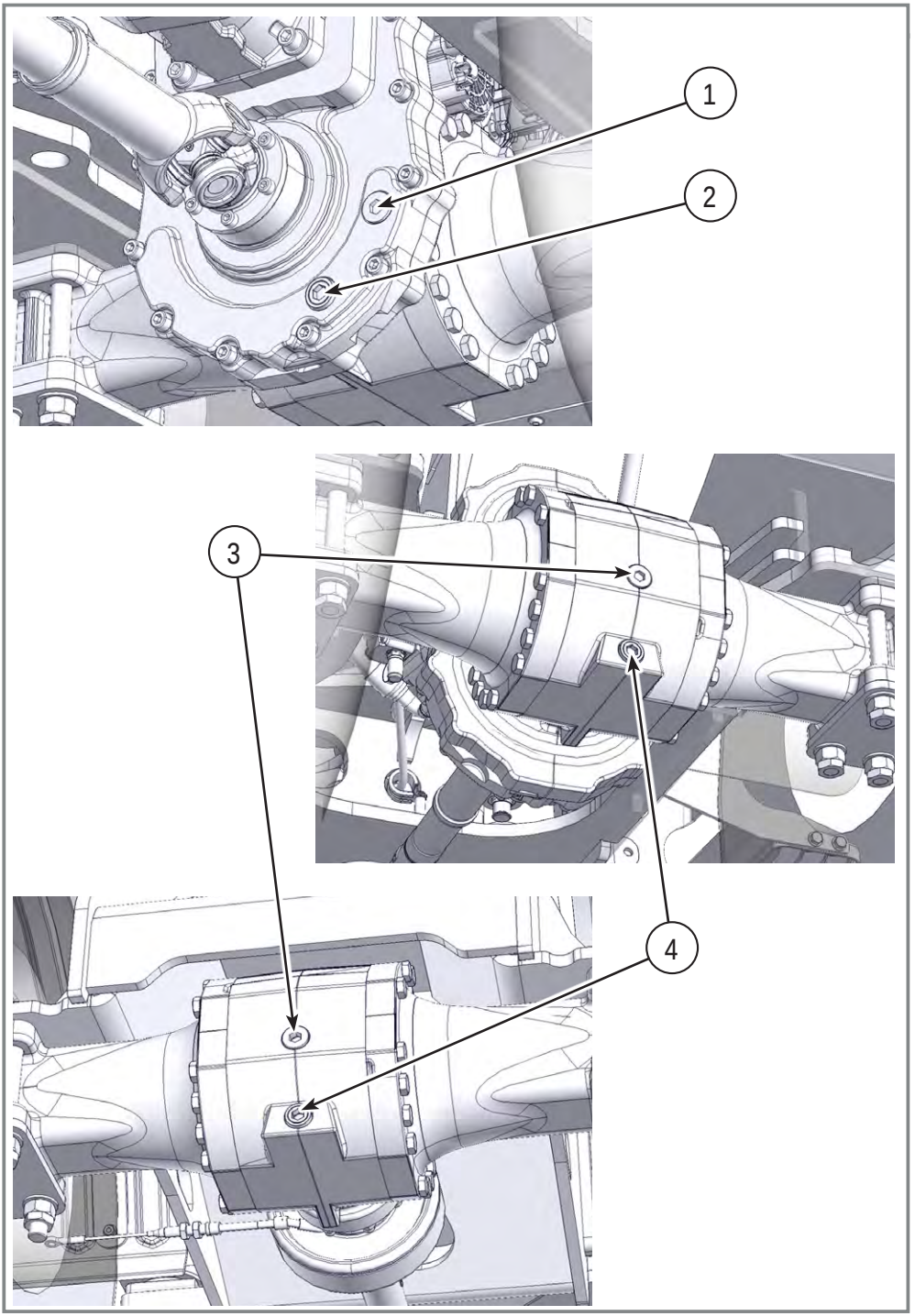


Fig. C13

12.7. Axles, gear wheels and transfer box (MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H)

- Front axle.
- Rear axle.
- Transfer box.

STOP THE MACHINE, TURN OFF THE ENGINE AND TURN THE BATTERY CUT-OFF SWITCH TO THE "OFF" POSITION AND PERFORM THE MANDATORY SHUTDOWN PROCEDURE BEFORE WORKING ON THE AXLES AND/OR TRANSFER BOX. NEVER WORK ON THE TRAVEL DRIVE ELEMENTS WHEN THE ENGINE IS RUNNING.

Use the recommended oils and lubricants (See Chapter **15***, Page 204).*

250 ■ **Checking levels in the axles, the transfer box and the gear wheels**

- Park the machine on level ground.
- Remove the filler caps (**1** and **3**) from the components that are to be checked, the oil level must be flush with filling holes.
- Top up if necessary.
- Tighten the filler cap (**1** and **3**) again.

1000 ■ **Draining the axles**

- Position suitable collection containers under the axle drain plugs.
- Unscrew the drain plug of the component to be drained (**4**). Collect tand dispose of the waste axle oil in accordance with the environmental protection legislation.
- Tighten the plug after having drained the oil.
- Top up with oil through the filling hole (**3**).
- Check the level and top up if required.
- Capacities: **See: "Capacities" p. 64**.

1000 ■ **Draining the transfer box**

- Position a suitable collection container under the transfer box drain plug.
- Unscrew the magnetic drain plug (**2**) from the transfer box.
- Collect and dispose of the waste transfer box oil in accordance with the environmental protection legislation.
- Remove the metallic residue from the magnetic plug, remove the O-ring and fit a new one.
- Refit the drain plug (**2**) (Tightening torque: 80 Nm (59 ft-lb)).
- Fill up with oil through the filling hole/oil level control hole (**1**).
- Check the level and top up if required.
- Re-tighten the filler cap (tightening torque: 80 Nm (59 ft-lb)).
- Capacities: **See: "Capacities" p. 64**.

■ **Check there are no leaks, the tightening and the connections**

12.8. Travel hydraulic motors (MLA 2-25 H)

The machine's travel hydraulic motors (**1** and **2**) do not need draining.
They are lubricated directly by the hydraulic circuit.

8

■ **Periodically check:**

- The tightness of the couplings, bleed screws and connections, which could cause oil leaks.

50

■ **Check on the tightness of the screws on the travel hydraulic motors** (**3** and **4**)**:**

- After the first 50 hours of machine use, tighten the travel hydraulic motor mounting hardware to a torque of 160 Nm (147.5 ft-lb). Check the motor mounting hardware tightness every 100 hours thereafter and tighten to the correct torque as necessary.

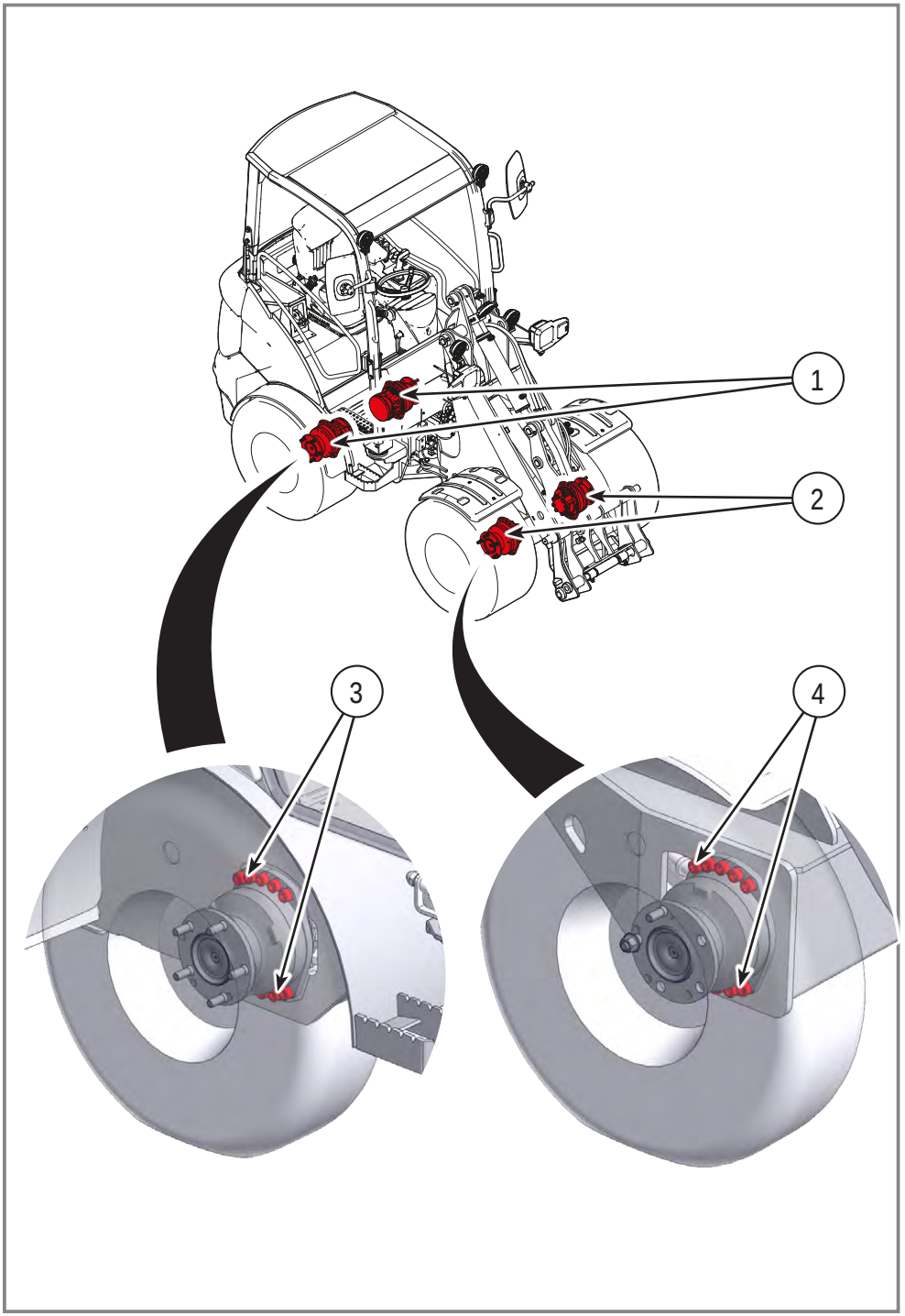


Fig. C14

MLA 2-25 H

MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H

Fig. C15

12.9. Tires

Wheel fastener torque must be checked before initial operation and every two hours or 30 miles (50 km) thereafter until the wheel mounting hardware torque stabilizes. Torque the wheel fasteners in a criss-cross pattern to the following correct torques. This procedure must be repeated when tires are removed and replaced, .

100

■ **Check the tightness of the wheel nuts (1)**

Apply a tightening torque of:

- 250 Nm (184.4 ft-lb) (+10% +0) = MLA 2-25 H.
- 330 Nm (243.4 ft-lb) (+10% +0) = MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H.

■ **Fit four tires of the same type and wear on the machine**

THE TREAD BAR OF ALL TIRES SHOULD FACE THE SAME DIRECTION.

■ **Check the tire pressures (2) regularly and after each period of prolonged inactivity of the machine**

■ **Pressures: See Chapter 10.19 P65**

TO ENSURE EVEN TIRE WEAR, ROTATE THE TIRES FROM FRONT TO REAR AND REAR TO FRONT. DIFFERENCES IN WEAR BETWEEN THE FRONT AND REAR TIRES SHOULD NOT EXCEED 30%.

12.10. Front and rear cardan drives (MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H)

■ Maintenance

Maintenance work must be carried out at least once a year by qualified personnel.

When replacing the transmission, it is essential to change the safety bolts and to check the tightening torque.

CAUTION: RISK OF INJURIES IF THE OPERATOR CARRIES OUT THE WORK HIMSELF; THE WORK MUST BE CARRIED OUT BY SPECIALISTS.

■ Control

100

- Check the correct position of the flange screws (**1**) and check the tightening torque is 29 Nm (21.4 ft-lb).
- Check of visible damages on the sliding part (**2**).
- Check that there are no abnormal vibrations or noises.

■ Lubrication

500

Lubricate the drive shaft annually or more often under extreme conditions. Lubricate after washing the machine, especially if high-pressure or steam washing is used.

IMPORTANT! DO NOT DIRECT HIGH-PRESSURE WATER OR STEAM DIRECTLY AT THE DRIVESHAFT.

Use only the recommended lubricants (See Chapter **15**, Page 204). Do not use lubricants containing additives.

- Cross-braces (**3**):
  - Clean the cross-braces before lubricating them. Do not use chemicals that might damage the seals.
  - Lubricate until clean grease escapes from the seals of all the bearing bushes (**5**). Perform lubrication using the ball valve greaser (**4**); avoid excessively high pressures.
- Sliding part (**2**):
  - The sliding part is lubricated using the ball valve greaser (**4**).

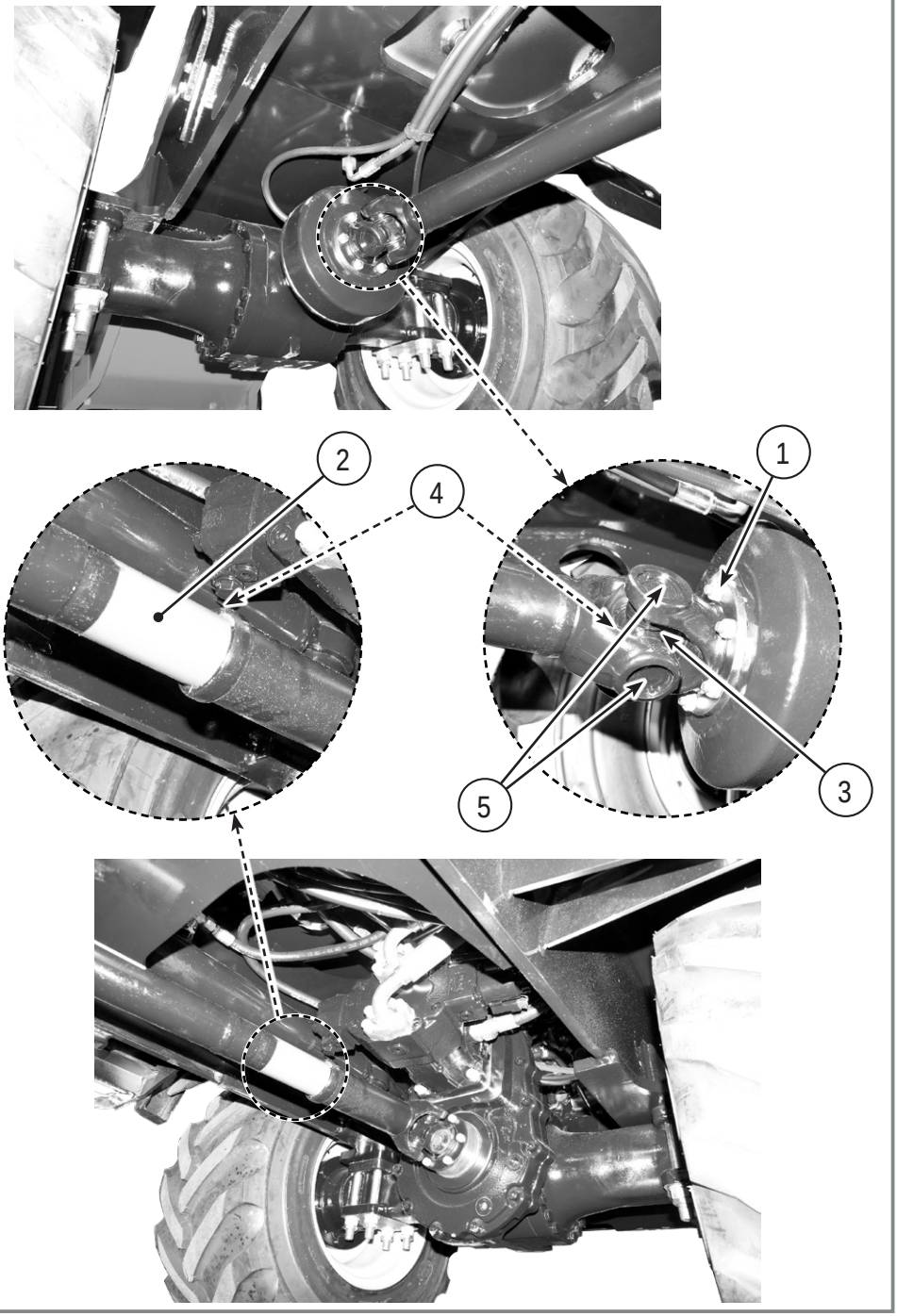


Fig. C16

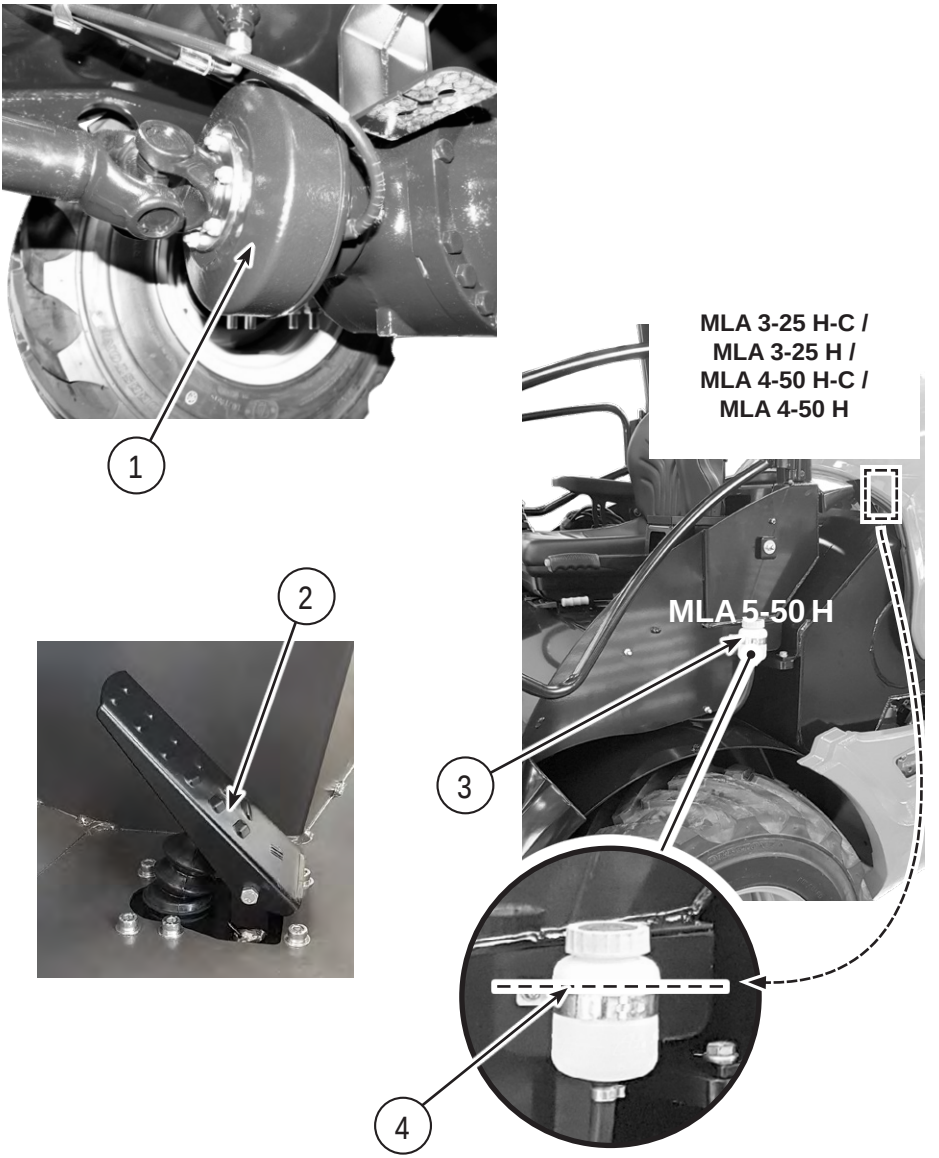


Fig. C17

12.11. Braking system (MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H)

The drum brake (**1**) located on the front axle is operated by:
- A cable when the parking brake is operated.
- A hydraulic control pedal (**2**) for use as a service brake.

The hydraulic braking circuit is in closed circuit.
It is supplied by a brake fluid tank (**3**) located under the side cover on the left of the machine.

500 ■ **Control of the brake hydraulic fluid level**:
- Place the machine on a level surface with the parking brake applied and the engine switched off:
  - MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H: Open the machine's rear cover.
  - MLA 5-50 H: Remove the side cover on the left of the machine.
- Check the filling level for the brake hydraulic fluid in the tank (**3**).
- Top up if necessary to reach the maximum level (**4**).
- Wipe up any brake hydraulic fluid that may have spilt on the outside of the tank.
- Close the tank cover again:
  - MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H: Close the machine's rear cover.
  - MLA 5-50 H: Put the side cover back in place

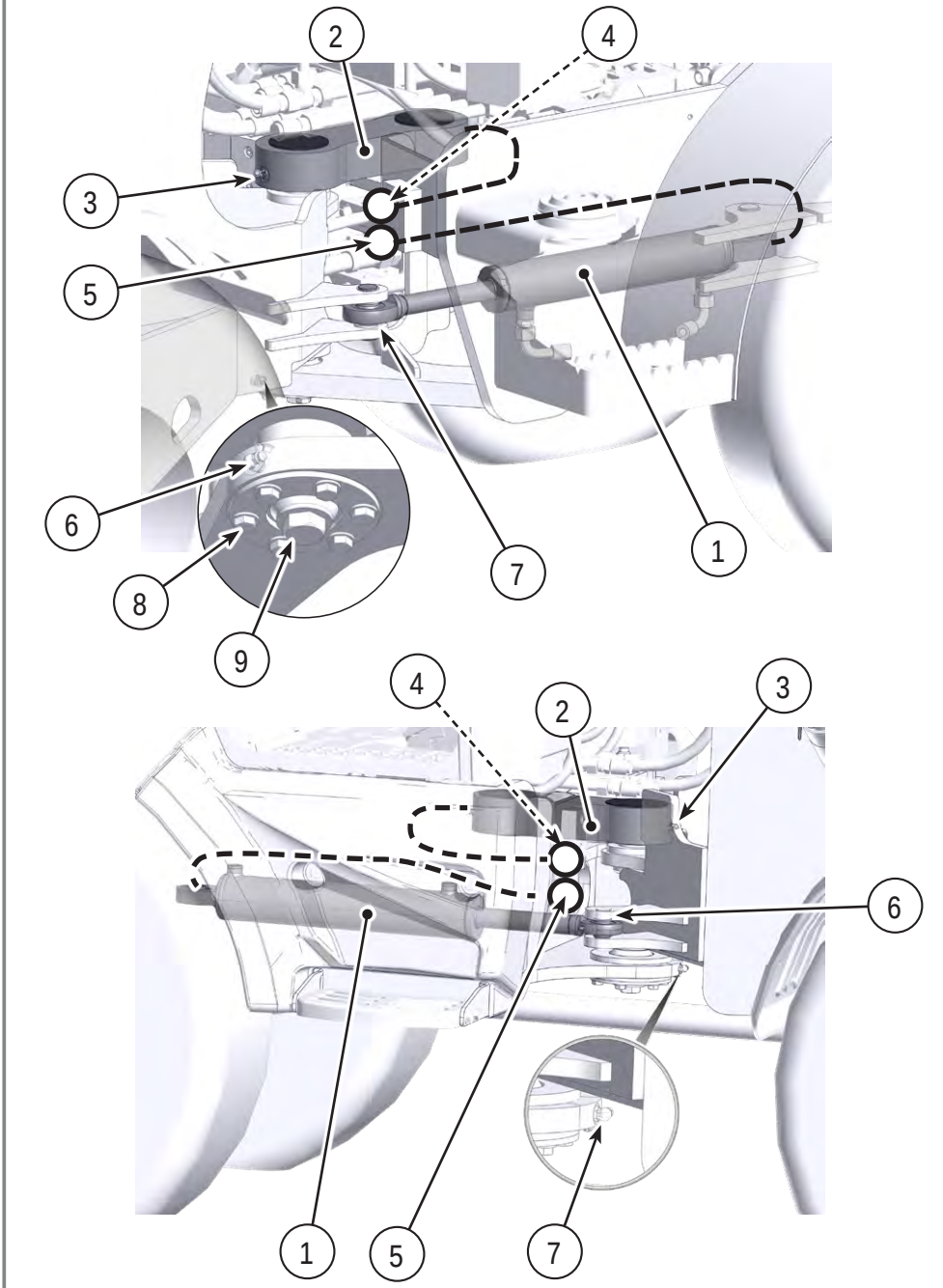


Fig. C18

12.12. Steering cylinder

The steering cylinder (**1**) is located on the left of the vehicle for the MLA 2-25 H model and on the right for the MLA 3-25 H-C, MLA 3-25 H, MLA 4-50 H-C, MLA 4-50 H and MLA 5-50 H models.

8 ■ **Lubrication**

Refer to chapter 12.15 Lubrication, Page 189 for the lubrication points

Lubricate the front (**3**) and rear (**4**) ball joint of the connecting rod, which is easily accessible from the outside.

Lubricate the front (**7**) and rear (**5**) shafts of the steering cylinder. The rear shaft is accessible from underneath the vehicle.

8 ■ **Checks**

Check the general condition of the steering cylinder (**1**) and the connecting rod (**2**), check the condition of the mounting components, and check for leaks. Clean if necessary.

DO NOT SEARCH FOR FLUID LEAKS USING YOUR HANDS. USE A PIECE OF PAPER OR CARDBOARD. ESCAPING FLUID UNDER PRESSURE CAN BE INVISIBLE, CAUSE SERIOUS BURNS, CAN PENETRATE THE SKIN AND CAUSE SERIOUS INJURY. INJECTED FLUID MUST BE SURGICALLY REMOVED BY A DOCTOR OR GANGRENE MAY RESULT. IF ANY FLUID IS INJECTED INTO YOUR SKIN, SEEK MEDICAL ATTENTION IMMEDIATELY.

Use a piece of paper or cardboard to check the steering cylinder hydraulic hoses/connections for leak.

100 ■ **Check steering pivot fastening hardware tightening torques**

- Check that the mounting components are tightened correctly:
  - The central bolt (**9**) (H M20 CL10.9) must be tightened to a torque of 480 Nm (354 ft-lb).
  - The 6 peripheral bolts (**8**) (H M10 CL8.8) must be tightened to a torque of 42 Nm (31 ft-lb).

12.13. Gas cylinder for canopy/cab tilting

The gas cylinder (**1**) is located under the canopy/cab.
To access the gas cylinder, follow the procedure described in chapter 11.14 Access to the rear undercarriage, Page 138.

250 ■ **Gas cylinder**

- Check the general condition of the gas cylinder (**1**).
- Check for signs of premature wear and leaks from the piston, clean with a damp cloth and apply a thin layer of grease.
- Inspect and lubricate the ball joints (**2** and **4**).
- Check the condition of the shafts and spacers (**7**) and check for deformation.
- Check the tightening of the screws by the shafts (**3**) and (**6**) using the 16 mm wrench at a torque of 42 Nm (31 ft-lb).

250 ■ **Safety connecting rod**

- Check the tilt support (**5**) components for wear or damage. Contact your dealer if any worn or damaged components are found.
- Check the tilt support mounting hardware, shafts, spacers (**7**) and or brackets (**4**) for wear or damage. Contact your dealer if any worn or damaged parts are found.
- Check the tightening of the screws by the shafts (**3**) and (**6**) using the 16 mm wrench at a torque of 42 Nm (31 ft-lb).
- Check the chassis for deformation (**4**).

TO PREVENT SERIOUS INJURY, NEVER ATTEMPT TO REMOVE THE GAS CYLINDER (1). THE GAS CYLINDER IS PRESSURIZED AND HOLDS THE WEIGHT OF THE CAB/CANOPY.

In the event of wear or a fault, contact your dealer to replace the gas cylinder.

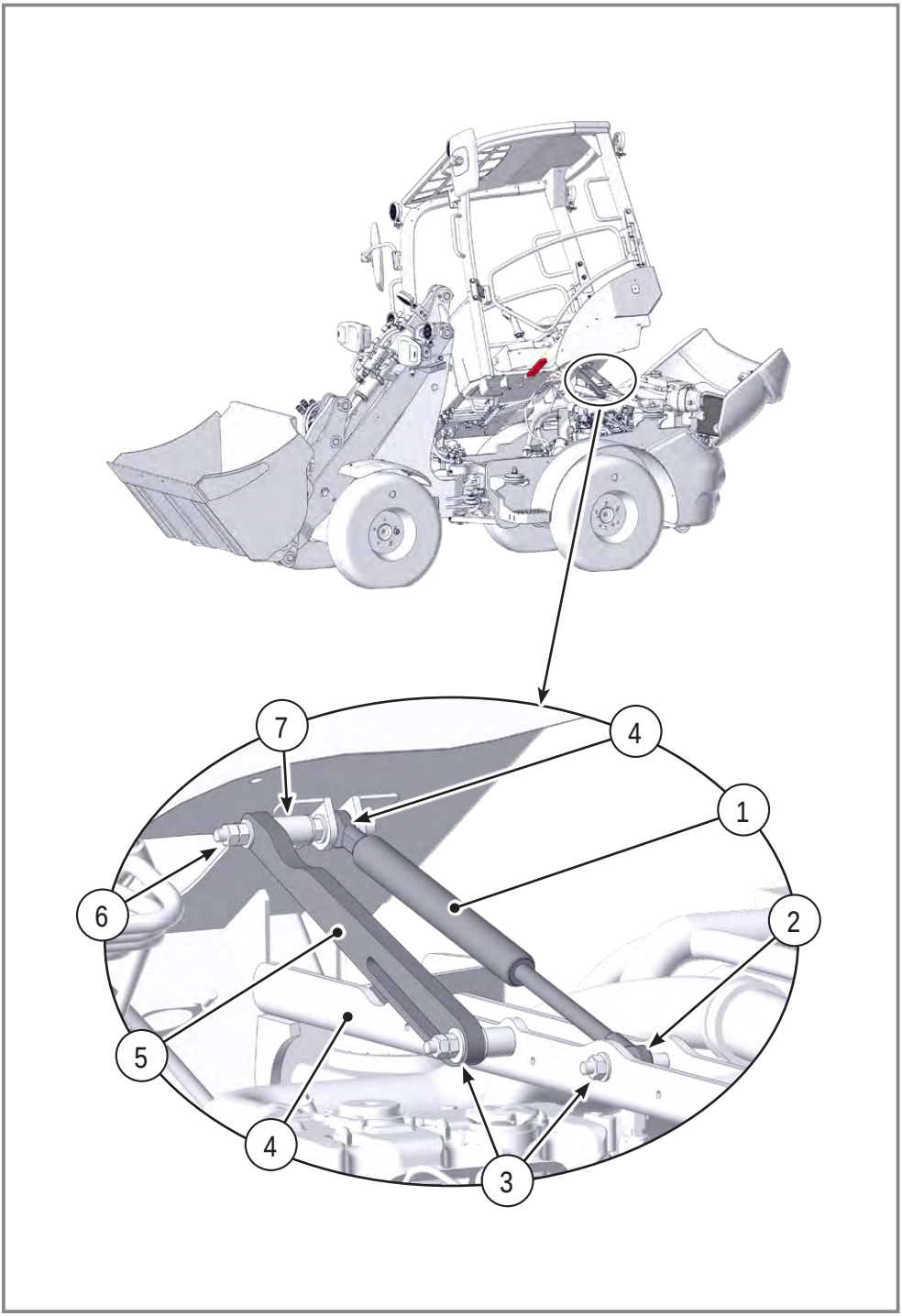


Fig. C19

12.14. Hydraulic circuit maintenance

Refer to Chapter 11.14 Access to the rear undercarriage, Page 138 to open the rear cover and access the hydraulic tank.

Document and archive the maintenance information.

■ **Release of residual pressures in the hydraulic circuit**

- Lower the lift structure to the ground and turn off the engine.
- Turn the ignition switch clockwise to the "I" position.
- Move the joystick in all directions (**17**, Page 81) to release the residual hydraulic pressure (See: Releasing residual pressures, Page 109).

STOP THE MACHINE, TURN OFF THE ENGINE AND TURN THE BATTERY CUT-OFF SWITCH TO THE "OFF" POSITION AND PERFORM THE MANDATORY SHUTDOWN PROCEDURE BEFORE WORKING ON THE HYDRAULIC SYSTEM.

■ **Cleaning**

DO NOT USE PRESSURIZED WATER DIRECTLY ON THE SEALS OR THE ELECTRICAL PARTS OF THE SYSTEM!

- Check whether all the connector seals and plugs are correctly in place to guarantee that no humidity can enter the axial piston unit during cleaning.
- Only use water and, if necessary, a gentle detergent to clean the axial piston unit. Never use solvents or aggressive cleaning products.
- To help prevent system overheating, malfunction, and to aid inspection, clean most of the external dirt from the hydraulic system components, especially important components, such as solenoids, valves and sensors.

■ **Inspection**

Abnormally strong vibrations, impacts or rattling metal parts could indicate incorrect tightening or a machine defect.

Hydraulic system faults, such as over-temperature, are displayed on the dashboard and display unit (Warning light displayed 11, Page 87).

■ **Check there are no leaks**

- Early detection of a loss of hydraulic fluid can help find defects on the machine and correct them. To facilitate this type of inspection, it is recommended that everything is kept clean. Inspect methodically hose by hose.

Only use a piece of paper or cardboard to search for hydraulic leaks, never hands.

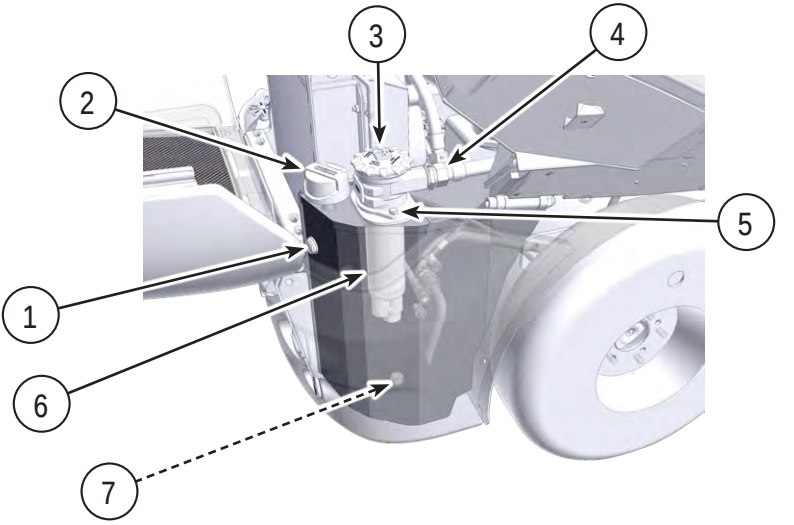
DO NOT SEARCH FOR FLUID LEAKS USING YOUR HANDS. USE A PIECE OF PAPER OR CARDBOARD. ESCAPING FLUID UNDER PRESSURE CAN BE INVISIBLE, CAUSE SERIOUS BURNS, CAN PENETRATE THE SKIN AND CAUSE SERIOUS, EVEN FATAL INJURY.

IF ANY FLUID IS INJECTED INTO YOUR SKIN, SEEK MEDICAL ATTENTION IMMEDIATELY. INJECTED FLUID MUST BE SURGICALLY REMOVED BY A DOCTOR OR GANGRENE MAY RESULT.

■ **Check the hydraulic fluid level in the tank**

- Place the machine on level ground and retract all the cylinders.
- Lower the lift structure to the ground.
- Tilt the attachment/quick coupler all the way back.
- Turn the steering 45° to the right on models AL320, AL330, AL420, AL430 and AL530.
- Turn the steering 45° to the left on model AL230.
- Turn off the engine, remove the ignition key, and apply the parking brake.
- The level (**1**) must be at max. level.
- Top up if required. Open the breather by unscrewing the breather plug (**2**), top up with oil through the breather body.
- If the hydraulic system fluid level was low, check the hydraulic system for leaks.

MLA 2-25 H



MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H

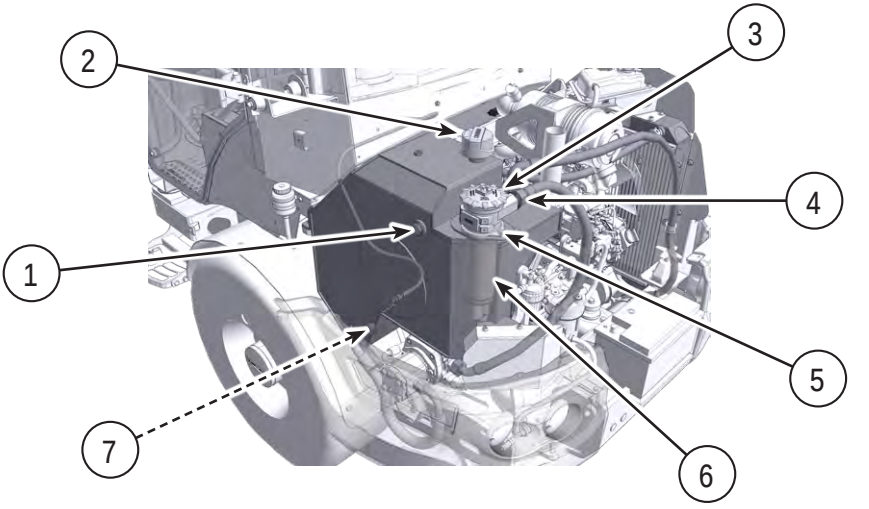
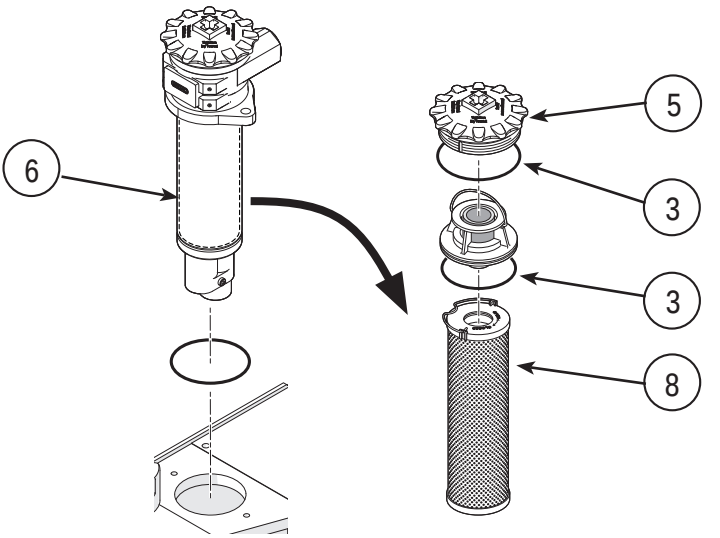
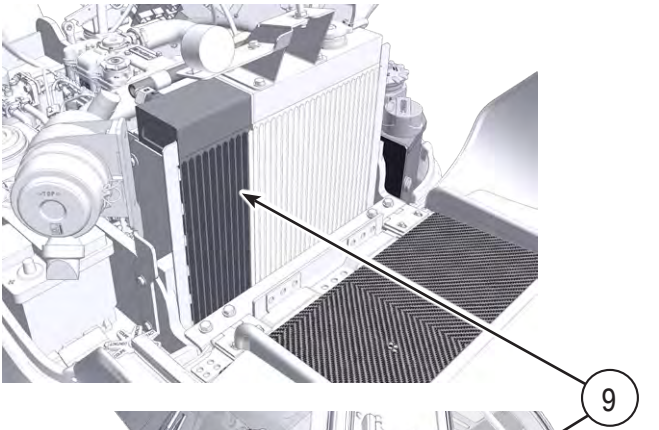


Fig. C20



MLA 2-25 H



MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H

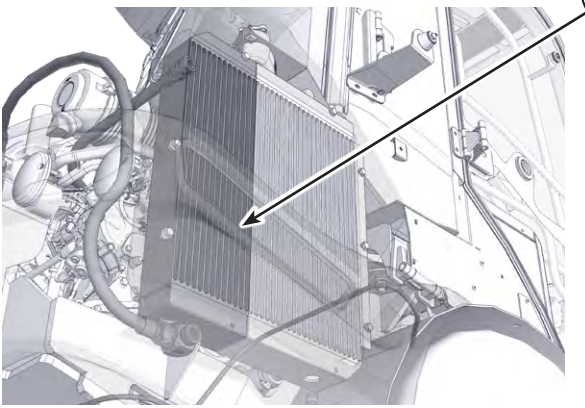


Fig. C21

8 ■ **Check that the mounting elements are perfectly tight.**

- All mountings must be checked when the hydraulic system is turned off, depressurized and cooled. Refer to the table of standard tightening torques.

250 • **Cleaning the outside of the oil cooler**

TO PREVENT INJURIES, WEAR PROTECTIVE CLOTHING, SUCH AS EYE PROTECTION, WHEN USING COMPRESSED AIR.

When compressed air or pressurized water are used for cleaning, wear protective clothing, protective shoes and eye protection (safety glasses or face shield)

Caution! The fins (9) are very fragile:

- **Steam jet cleaning.** This cleaning method is preferable to all others and is carried out when the engine is cold. Cover the engine so that it is not directly exposed to the jet. Remove dust by directing the jet parallel to the fins.
- **Dry compressed air cleaning.** Remove dust by directing the jet parallel to the fins. Then clean around the radiator or where dust has settled.

500 ■ **Changing the hydraulic filter cartridge and the breather:**

- Lower the lift structure to the ground and turn off the engine.
- Turn the ignition switch clockwise to the "I" position.
- Move the joystick in all directions (**17**, Page 81) to release the residual hydraulic pressure (See: Releasing residual pressures, Page 109).

Return circuit hydraulic filter and breather:

- Take off the cover (**3**).
- Remove the filter cartridge (**8**) from the filter unit (**6**).
- Fit the new cartridge (**8**).
- Refit the cover (**3**).

Breather:

- Start the machine and let the engine idle.
- Check the hydraulic oil level (**1**), which must be at the maximum level when all the cylinders are retracted.
- Unscrew the breather plug (**2**) and change it.
- Apply a thin layer of oil to the new cap seal before installation.

1500 ■ **Cleaning the inside of the oil cooler**

- Contact a ***Manitou*** dealer.

AFTER THE MACHINE HAS BEEN INACTIVE FOR MORE THAN TWO MONTHS, CLEAN THE INSIDE AND OUTSIDE OF THE RADIATOR.

1500 ■ **Changing the hydraulic fluid**

- Change the hydraulic fluid annually. More frequent changes may be required depending upon the level and type of use.
- Wait until the engine has cooled, but is not completely cold. The hydraulic fluid will drain faster and more completely if it is warm.
- Park the machine on level ground and retract all the cylinders:
- Lower the lift structure to the ground.
- Tilt the attachment/quick coupler all the way back.
- Turn the steering 45° to the right on models AL320, AL330, AL420, AL430 and AL530.
- Turn the steering 45° to the left on model AL230 (capacity of the tank and the circuit: See Chapter 10.15 P64).

TO PREVENT DAMAGE TO THE HYDRAULIC SYSTEM, MAKE SURE THE HYDRAULIC FLUID/ SYSTEM IS PROTECTED FROM CONTAMINATION WHEN CHANGING THE HYDRAULIC FLUID: "RISK OF DAMAGING THE HYDRAULIC COMPONENTS".

- Stop the engine.
- Turn the ignition switch clockwise to the "I" position.
- Move the joystick in all directions (**17**, Page 81) to release the residual hydraulic pressure (See: Releasing residual pressures, Page 109).
- Wait until the engine has cooled, but is not completely cold. The hydraulic fluid will drain faster and more completely if it is warm.

■ **Draining of the hydraulic tank**

- MLA 5-50 H: Unscrew the 4 screws (**10**) and remove the trap (**11**) to access the base of the hydraulic tank.
- Unscrew the breather (**2**).
- Place a collection container under the hydraulic tank drain plug.
- Unscrew the drain plug (**7**) of the hydraulic tank (14 mm Allen key).
- Allow the hydraulic fluid to drain completely. Dispose of the waste hydraulic oil in accordance with the environmental protection legislation.
- When the tank is empty, screw the drain plug (**7**) back on (14 mm Allen key) (tightening torque of 90 Nm (66.4 ft-lb) (MLA 2-25 H / MLA 3-25 H-C / MLA 3-25 H) or 140 Nm (103.3 ft-lb) (MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H)).
- Remove the filter (**6**) and replace the filter element as described in the previous paragraph. Refit the assembly.
- Fill up the tank through the filling strainer of the breather with the recommended oil.
- Install a new breather/filler cap (**2**). Apply a thin layer of oil to the new cap seal before installation.
- Start the machine and let the engine idle.
- Check the hydraulic oil level (**1**), which must be at the maximum level when all the cylinders are retracted.
- Check for any leaks on the filters.
- MLA 5-50 H: Refit the trap (**11**) and hold it in place with the 4 screws (**10**) (tightening torque of 9 Nm (79.66 in-lb)).
- **Draining of the hydraulic radiator.**
- Contact a ***Manitou*** dealer.

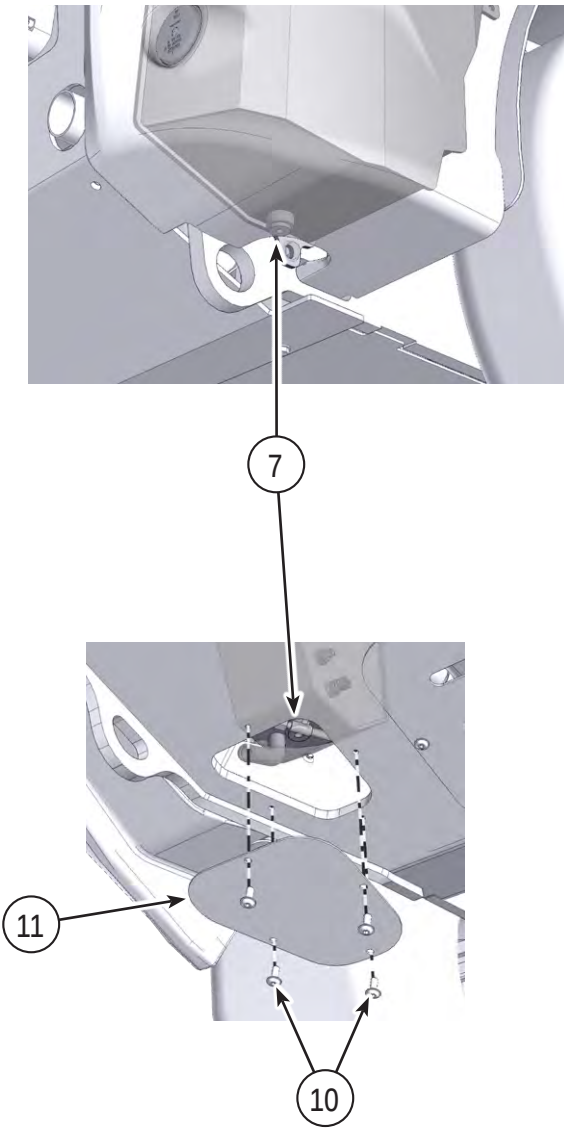
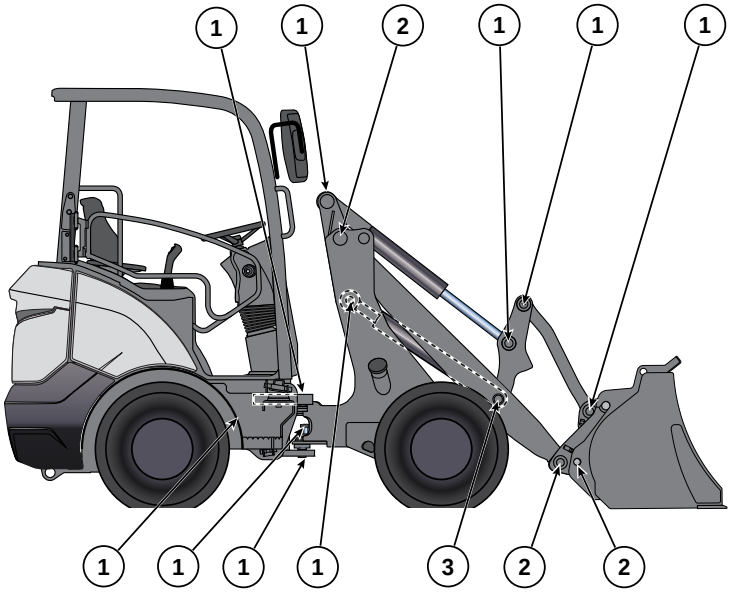


Fig. C22

MLA 2-25 H



MLA 5-50 H

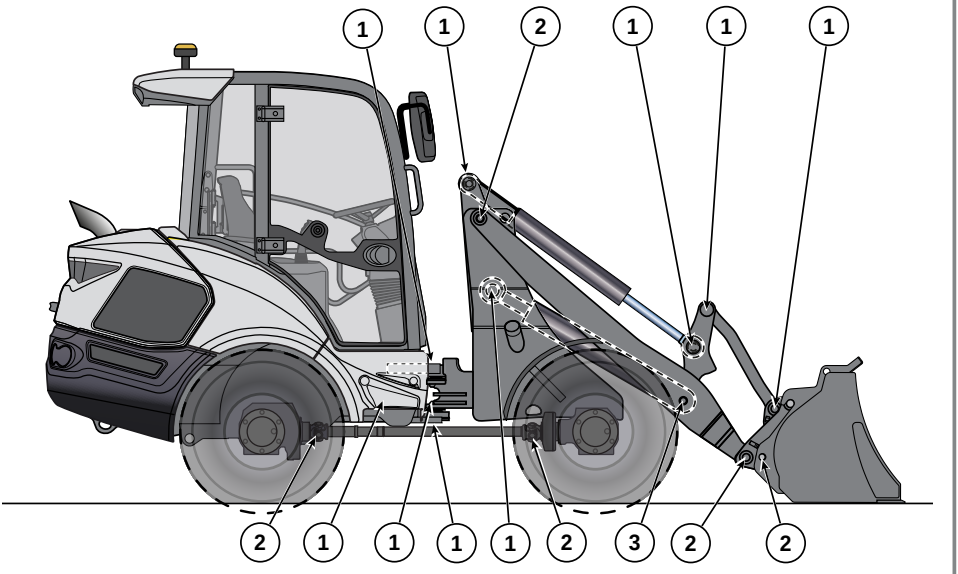


Fig. C23

12.15. Lubrication

8 ■ **Manual lubrication**

- Park the machine on a level surface in a clear area away from traffic.
- Apply the parking brake and/or chock the wheels.
- Lower the lift structure/attachment to the ground.
- Turn off the engine. Move the ignition key to the "I" position.
- Move the joystick in all directions (**17**, Page 81) to release the residual hydraulic pressure (See: Releasing residual pressures, Page 109).
- Turn off the ignition and remove the key.

The frequency of lubrication may be increased for the most exposed articulations depending on the environmental conditions and the work performed. Wipe dirt from the fittings before applying lubricant to prevent contamination, 19 lubrication points (MLA 2-25 H), 23 lubrication points (MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H). **Distributor:**

- Arm cylinder foot shaft.
- Arm cylinder head shaft.
- Bucket cylinder foot shaft.
- Bucket cylinder head shaft.
- Steering cylinder foot shaft.
- Steering cylinder head shaft.
- Rod on the attachment holder.

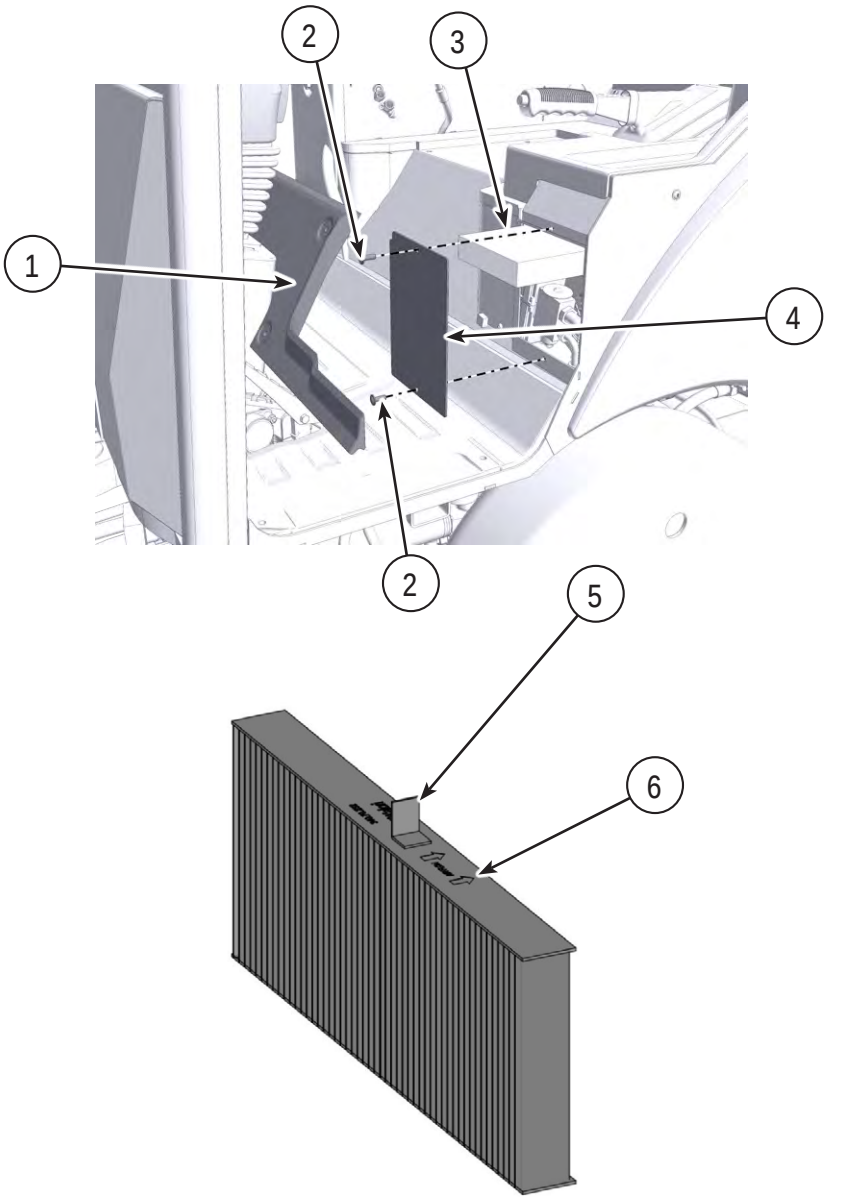


Fig. C24

12.16. Heating

■ Cleaning of the evaporator filter

Reduction in the performance of the air conditioning is often due to clogging of the cab air filter (3). If the flow rate is insufficient, check the condition of the air filter.

The air filter for the air conditioning system is located on the left of the seat.

- Unscrew the retaining screws and remove the protective cover (**1**).
- Loosen the screws (**2**) and the metal plate (**4**) to access the evaporator filter housing.
- Take the paper filter (**3**) out of its housing.
- Carefully tap the filter (**3**) on a hard flat surface to dislodge the dirt. Direct the arrows on the paper filter upward.

OTHER THAN CAREFUL TAPPING, THE FILTER ELEMENT CANNOT BE CLEANED. IT MUST BE REPLACED.

- Replace the filter by turning back the tab (**5**) and directing the arrows (**6**) on the paper filter upward.
- Refit the metal plate (**4**) and retighten the screws (**2**) holding the filter cover plate.
- Replace the protective cover (**1**) with its screws.

■ Replacement of the filter

Replace the cab filter every 500 hours, or more often if dirty/blocked.
Remove the existing filter according to "Cleaning the cab filter" and replace it with a new one.

12.17. Air conditioning

45 ■ **Maintenance of the air conditioning**

It is recommended that the air conditioning is operated for a quarter of an hour each week to lubricate the compressor seals, even if the temperature is low. This will insure that the seals do not dry out, causing refrigerants to leak.

100 ■ **Cleaning the condenser (1) (using compressed air)**

- Remove the rotating beacon.
- Loosen the screws and remove the upper (**5**) and lower (**7**) covers from the hood of the cab to access the air conditioning condenser (**1**). Raise the upper cover carefully.
- Disconnect the wiring harness from the fan and loosen the screws (**6**) (torque of 9 Nm (79.66 in-lb)) with their washers to access the fan blades (**4**).
- Blow the outside of the condenser clean using compressed air (maximum pressure = 3 bar (44 psi))

250 ■ **Check the tension of the compressor drive belt (3).** Open the engine cover to access the air conditioning compressor. The belt clearance must be 20 mm (0.79 in) for a stress of 10 daN (22 lbf).

- Make sure the condenser wire harness is clean, undamaged, and securely connected.
- Control of leaks: Connectors and pipes.
- Water condensation is discharged from the evaporator via a pipe located under the cab hood.

■ **Air conditioning qualified/dealer maintenance**

REGULATIONS IN CERTAIN LOCALITIES PROHIBIT AIR CONDITIONING SERVICING AND PROCESSING WITHOUT PROPER LICENSING/CERTIFICATION. CHECK STATE AND LOCAL REGULATIONS AND PERFORM AIR CONDITIONING SERVICE ONLY ACCORDING TO THESE RULES/LAWS. AIR CONDITIONING SYSTEM SERVICING SHOULD ONLY BE PERFORMED BY TRAINED, PROPERLY CERTIFIED AND LICENSED TECHNICIANS AND SERVICE CENTERS.

1000 ■ **Checking the refrigerant charge** (at least once a year) = 600 g (1.32 lb) max.

2000 ■ **Replacement of the dryer filter (8)** At least every 2 years.

■ **Oil and fluid charge** (at least every 2 years) = 600 g (1.32 lb) max.

■ The oil moves with the refrigerant in all the components of the air conditioning system (compressor, evaporator, condenser). If there is a leak or change of component, the balance of the oil/gas mixture is disrupted and must be reviewed by a ***Manitou*** dealer.

■ **Checking the pressure switch and the thermostat** (at least every 2 years)

To prevent damage to the air conditioning compressor, do not use the air conditioning if it requires repair, if there is insufficient refrigerant, leaks or any malfunction of any kind. Contact your dealer if the air conditioning does not work, cools poorly, or if abnormal noises occur.
During the cold, dry periods of winter, if the air conditioning is not used very much, switch it on each week so that the compressor lubricates the rubber pipes, the connectors and the seals.

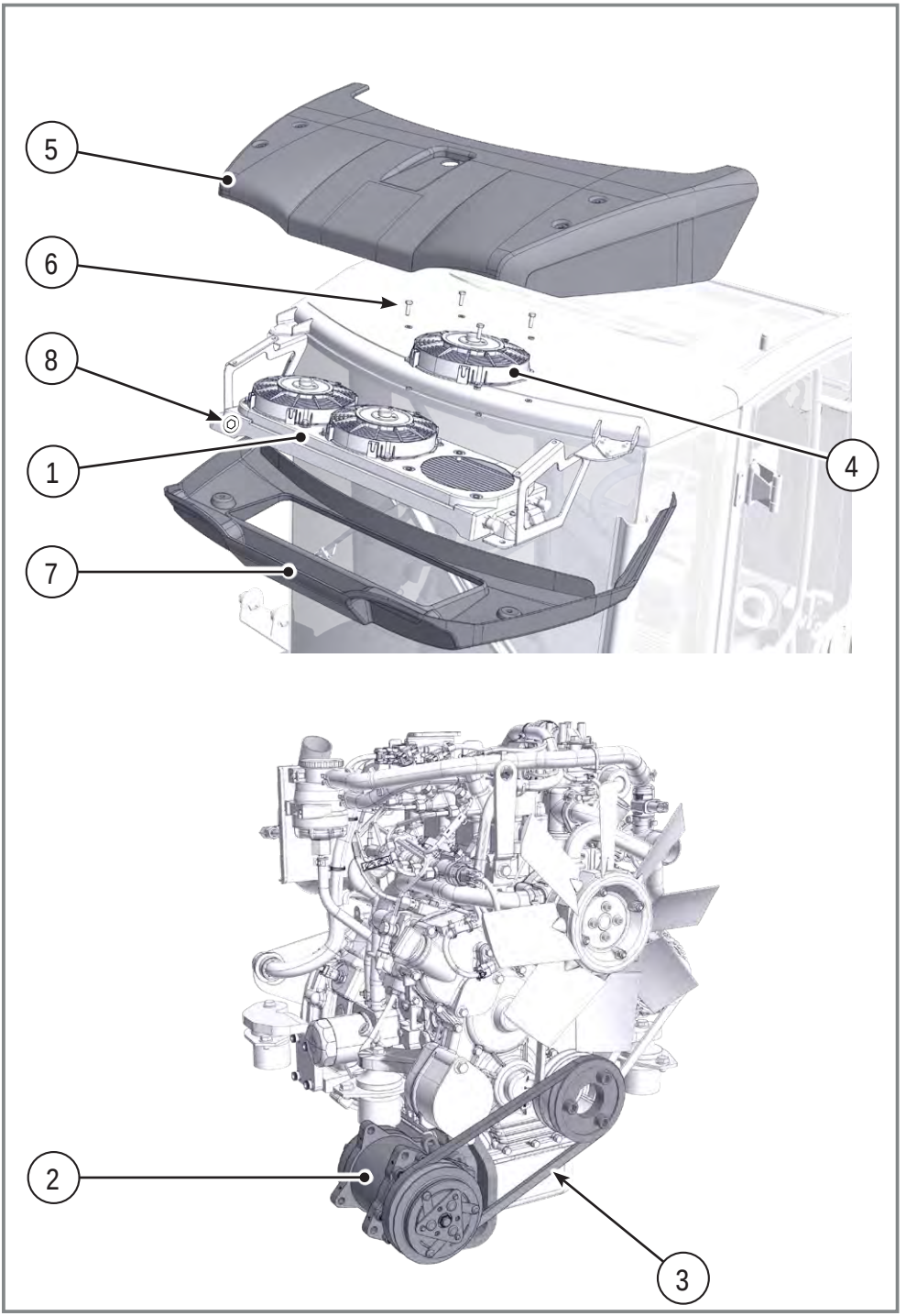
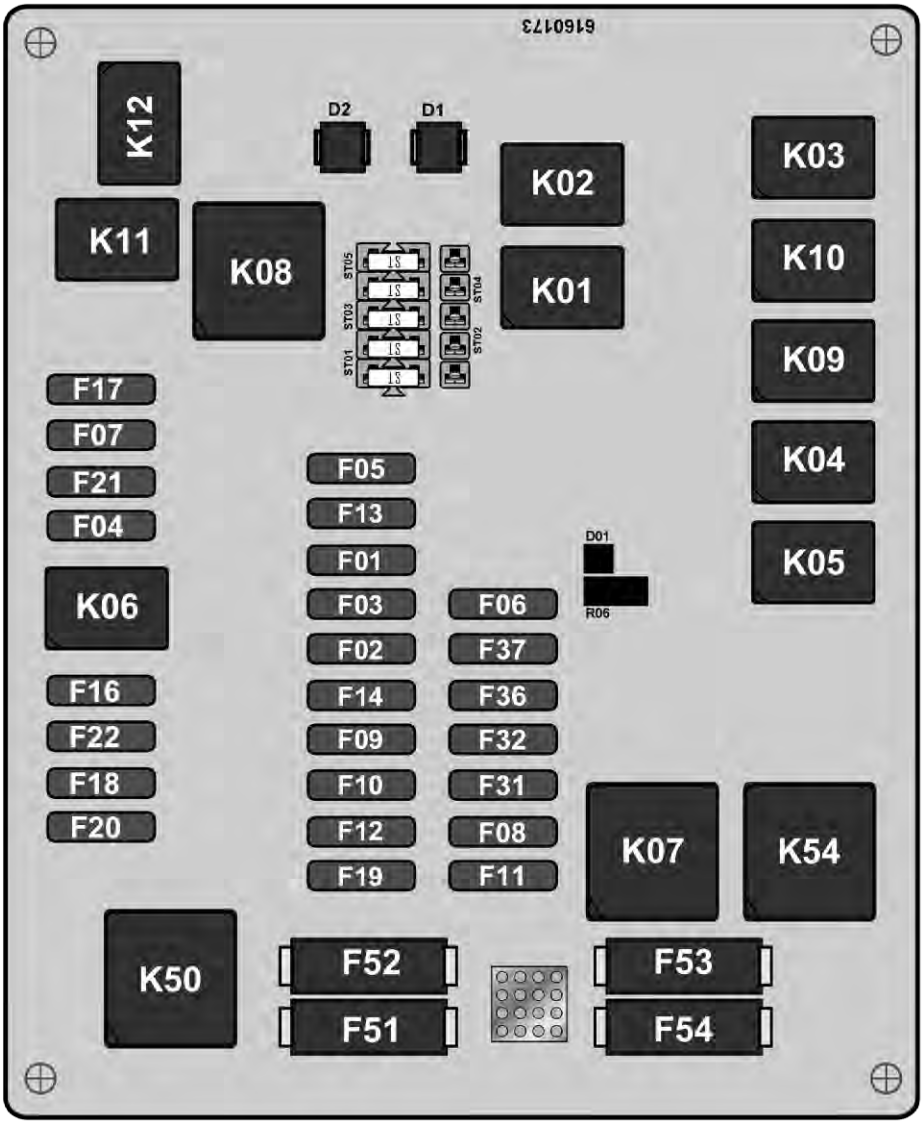


Fig. C25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F17
F07
F21
F04
F05
F13
F01
F03
F02
F14
F09
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F19
F06
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F08
F11
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F22
F18
F20
F52
F51
F53
F54
D01
R06
ST01
ST02
ST03
ST04
ST05

Fig. D26

13.1. Relay board

U15		Upper carriage relay plate
F01	**20A**	Fuse KL30 - BCHT
F02	**15A**	Fuse KL30 - Horn
F03	**15A**	Fuse KL30 - Rotating beacon + Working lights
F04	**15A**	Fuse KL15 - Rear windshield wiper + Front/rear windshield washer
F05	**20A**	Fuse KL30 - Y15/Y15A
F06	**25A**	Front/rear auxiliary power supply connector
F07	**20A**	Fuse KL30 - Front windshield wiper + Differential lock + Diesel booster pump
F08	**5A**	Fuse KL30 - Starting relay + preheater plug relay (MLA 2-25 H/MLA 3-25 H-C)
F09	**25A**	Fuse KL30 - Perkins ECU power supply (MLA 5-50 H)
F10	**20A**	Fuse KL30 - Front/rear lights
F11	**20A**	Fuse KL30 - Front windshield wiper
F12	**20A**	Fuse KL30 - Starter coil
F13	**20A**	Fuse KL30 - Radio
F14	**10A**	Fuse KL30 - Reserve
F16	**5A**	Fuse KL15 - Fuel supply cut-off (MLA 2-25 H)
F17	**5A**	Fuse KL15 - Perkins BCHT/ECU
F18	**15A**	Fuse KL15 - Pneumatic/heated seat
F19	**7.5A**	USB_12V port
F20	**15A**	Fuse KL15 - HVAC + Attachment suspension solenoid-operated valve
F21	**15A**	Fuse KL15 - Steering column + warning light
F22	**7.5A**	Fuse KL15 - Steering column + Switches + Trackunit + Radio
F31	**5A**	Fuse 5A_KL30 - Perkins diag port + Diesel booster pump + air filter
F32	**5A**	Not used
F36	**15A**	Not used
F37	**5A**	Fuse_ Air conditioning drive chain (MLA 5-50 H)
F51	**30A**	Fuse KL30 - KL15
F52	**70A**	Fuse KL30 - KL30
F53	**20A**	Fuse KL30 - Air conditioning condenser
F54	**60A**	Fuse 60A_KL30 - Glow plugs
K01		Relay - Air conditioning/Y50 compressor clutch (MLA 5-50 H)
K02		Relay - Front 12 V auxiliary socket J08
K03		Relay - Rear 12 V auxiliary socket J09
K04		Relay - Differential lock Y55 (MLA 5-50 H)
K05		Relay - Diesel booster pump (MLA 5-50 H)
K06		Relay - Back-up alarm
K07		Relay - Air conditioning condenser (MLA 5-50 H)
K08		Relay - Movement cut-off coil Y15/Y15A
K09		Relay - Starter coil M05
K10		Relay - Horn
K11		Relay - Front windshield wiper
K12		Relay - Starting signal interface RC40
K50		Relay_ KL15
K54		Relay - Glow plugs
X30		Terminal - KL30 power supply

13.2. Relay and electrical components

Reference	Component	Machine		Description
1	K01			Relay - position lights
2	K10			Turn signal unit
3	K02			Relay - dipped headlights
4	K03			Relay - high beam headlights
5	K04			Relay - rear brake light
6	U01			“BCHT” (upper carriage hydraulic control box) ECU
7	M06			Diesel booster pump
8	K20			Engine starting relay
9	M05			Starter
10	F81	◆ ✱ ■	5A	Fuse KL30P -“TrackUnit”
11	U05	◆ ✱ ■		Engine ECU
12	F50	● ◆	70A	Fuse KL30 - Alternator
		✱ ■	100A	
13	G02			Alternator
14	SW33			Air filter clogging pressure switch

Type of machine	
MLA 2-25 H	●
MLA 3-25 H-C	◆
MLA 3-25 H	
MLA 4-50 H-C	✱
MLA 4-50 H	
MLA 5-50 H	■

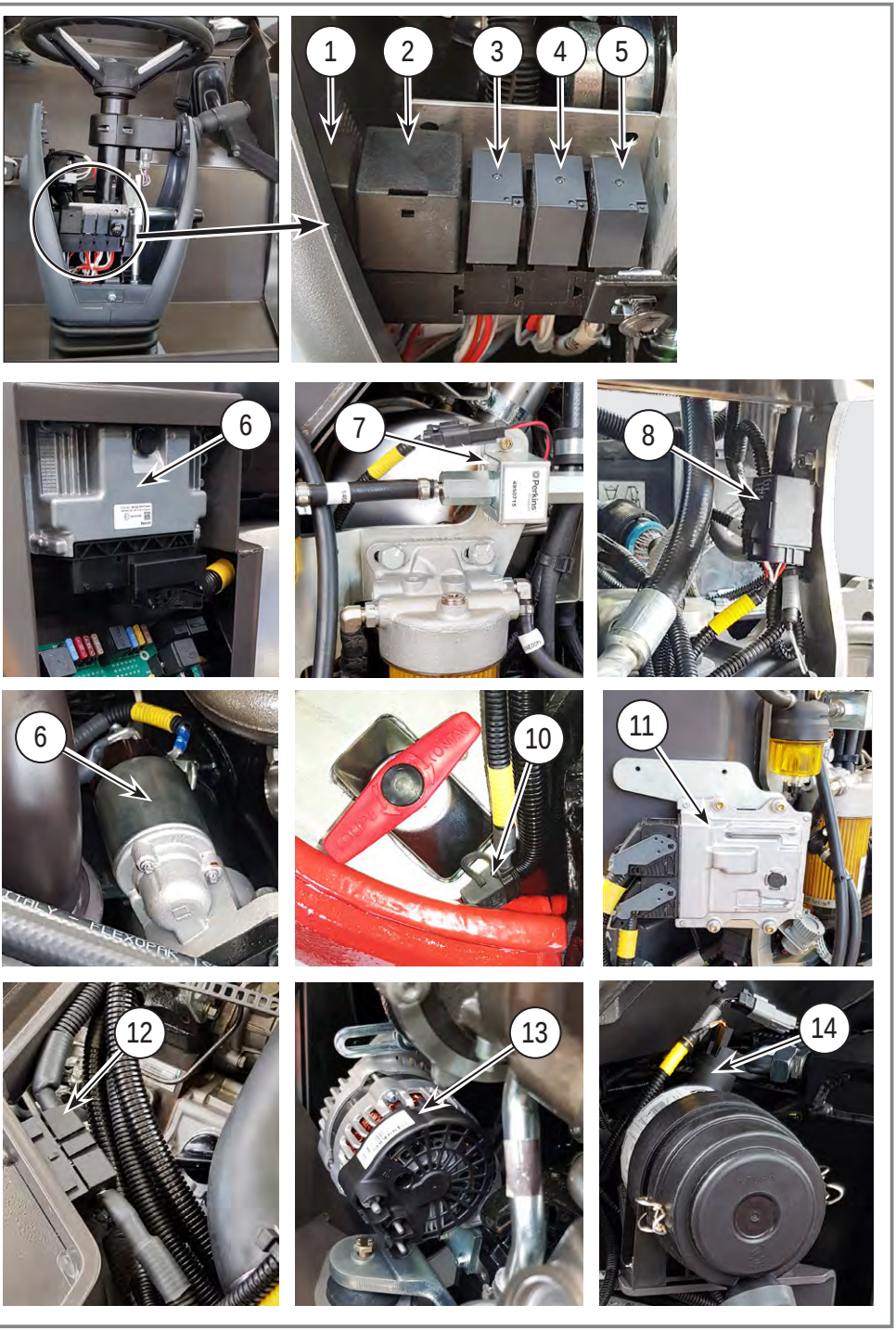


Fig. D27

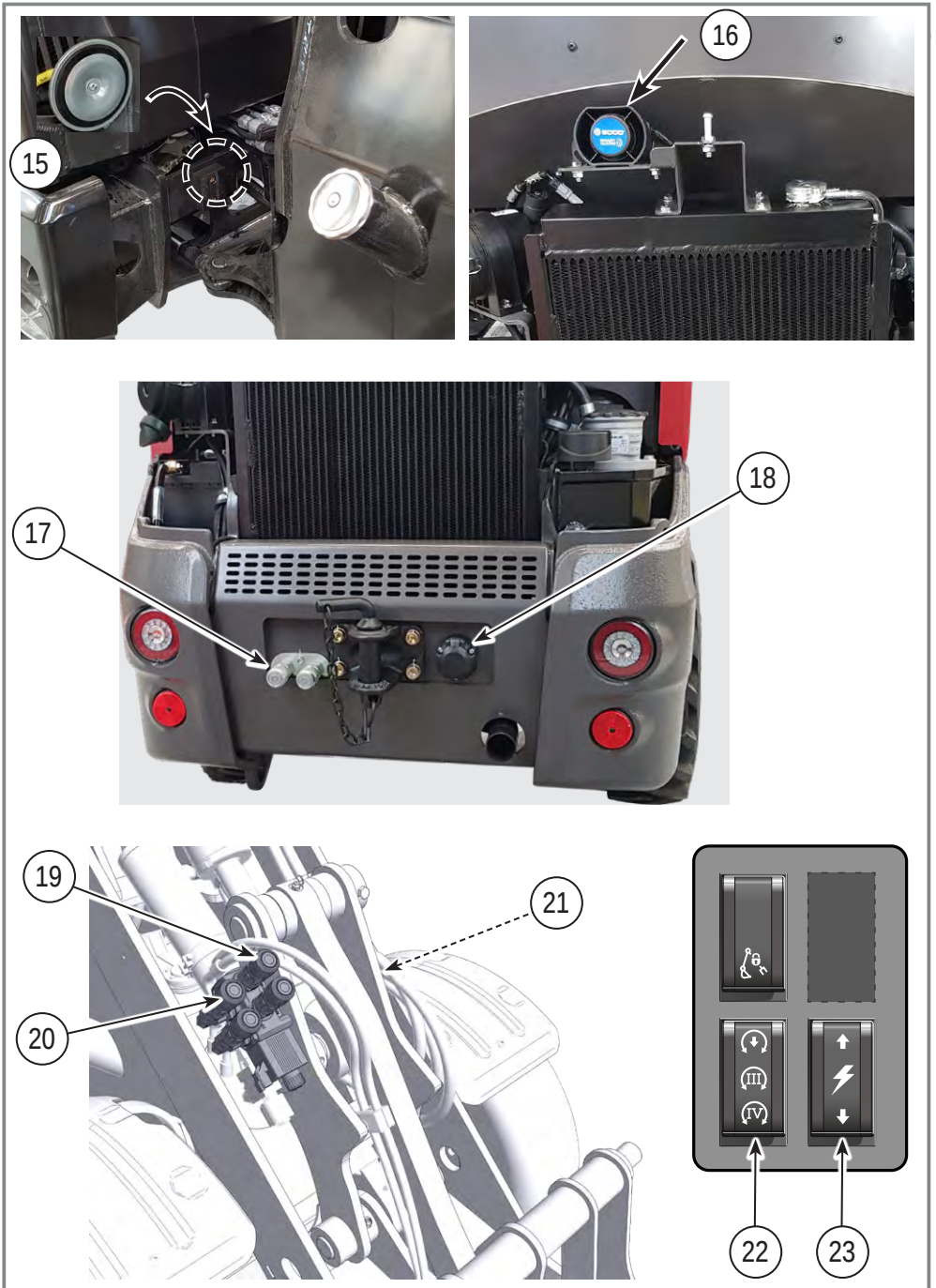


Fig. D28

13.2 • Relay and electrical components (continued)

Reference	Component		Description
15			Horn
16			Back-up alarm

13.3. Sockets for attachments (Option)

■ **At the rear of the machine (Options)**
- 7-pole electrical socket (**18**) (Move the switch (**23**) (See Chapter 7 P77) backward to supply power to the 12 V / 15 A socket).
- Rear auxiliary hydraulic socket (**17**) (Move the 3-position switch (**22**) (See Chapter 6 P77) forward and activate the auxiliary line with the joystick (See Chapter 17b P81)

■ **At the front of the machine (Options)**
- 3-pole electrical socket (**21**) (Move the switch (**23**) (See Chapter 7 P77) forward to supply power to the 12 V / 15 A socket).
- Front auxiliary hydraulic sockets (19 and 20) (Move the 3-position switch (**22**) (See Chapter 6 P77) forward or to the middle position and activate the auxiliary line selected with the joystick (See Chapter 17b P81)).
- 7-pole electrical socket to supply power to the signals and clearance lights (wide attachments).

	Service intervals: ● Every "... " hours ▲ Compulsory warranty inspections	**8**	**100**	**250**	**500**	**1000**	**1500**	**2000**	**3000**
	§ 12.1 Recommendations								
	Check:								
	Leaks (engine and hydraulic oils, coolant, diesel)	●							
	The appearance of the mechanical parts and hoses	●							
	The tightness of the bolts and connectors	●	▲		▲	▲			
	Brake adjustment (MLA 3-25 H / MLA 3-25 H-C / MLA 4-50 H / MLA 4-50 H-C / MLA 5-50 H)		▲		▲	▲			
	Check the undercarriage articulated joint								
	The operation of the controls, lighting, lamps, indicators and turn signals	●							
	Check the horn	●	▲		▲	▲			
	The diesel engine (exhaust gas and unusual noises)	●							
	The operation of the electrical circuit		▲		▲	▲			
	§ 12.2 Diesel circuit								
	Check the level and top up	●							
	Bleed the filter and pre-filter of water and impurities	●							
	Replace the diesel filter and the pre-filter (at least once a year)		▲		● ▲				
	Rinse the diesel tank					●			
	§ 12.3 Water cooling circuit								
	Check the level and top up	●							
	Clean the outside of the cooler		▲		● ▲	▲			
	Clean the inside of the cooler								●
	Change the coolant (every two years at least) Bleed the heating circuit after each job and check the water pump								●
	Check the radiator/expansion tank pressure relief plug				●				
	Get the coolant thermostat replaced								●
	Have the water pump inspected								●

	Service intervals: ● Every "... " hours ▲ Compulsory warranty inspections	8	100	250	500	1000	1500	2000	3000
	§ 12.4 Engine								
	Check the oil level and top up	●							
	Change the engine oil (at least once a year)		▲		● ▲	▲	▲		
	Replace the oil filter cartridge (at least once a year)		▲		● ▲	▲	▲		
	Check the condition of the drive belt and the fan blade	●							
	Check the drive belt tension (or every 6 months)		▲	●	▲	▲			
	Check the play in the fan blade				● ▲				
	Change the drive belt, (depending on the condition) at least every 2 years					● ▲			
	Check the tightness of the engine mounts		▲			● ▲			
	Check the condition of the **air intake hoses**.				●				
	Check the condition of hoses/clamps (Tighten/ Replace as required)					●			
	Hose and clamp checks (at least once a year)				●				
	Check the condition and operation of the starter and alternator						●		
	Have the turbo inspected					● ▲			
	Have the engine alarms inspected					● ▲			
	Have the engine valve clearance inspected					● ▲			
	Have the injectors checked/replaced (MLA 2-25 H / MLA 3-25 H / MLA 3-25 H-C)						● ▲		
	Have the alternator and the starter checked							●	
	§ 12.5 Air filter								
	Check condition and efficiency of the air filter	●							
	Clean the cover and check the evacuation valve	●							
	Replace the filter element (at least once a year)				● ▲	▲			
	Replace the crankcase breather					● ▲			
	§ 12.6 Battery								
	Check that the terminals are tightened and the cables are connected	●	▲		▲	▲			

	Service intervals: ● Every "... " hours ▲ Compulsory warranty inspections	8	100	250	500	1000	1500	2000	3000
	§ 12.7 Axles, gear wheels and transfer box (MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H)								
	Lubrication of joints				●				
	Check the levels		▲	●	▲	▲			
	Change the axle oil		▲		▲	● ▲			
	Change the transfer box oil s		▲			● ▲			
	Change the gear motor oil		▲			● ▲			
	Adjust the parking brake (front axle)				●				
	§ 12.8 Travel hydraulic motors (MLA 2-25 H)								
	Check that the connectors are tightened and that there are no oil leaks	●							
	Check the tightening torque of the gear motor screws after the first 50 hours of use		● ▲						
	§ 12.9 Tires								
	Check the tightening torque of the wheel nuts		●						
	The tire pressures	●	▲		▲	▲			
	§ 12.10 Front and rear cardan drives (MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H)								
	Check the tightening torque of the flange and the play in the sliding part and check that there are no vibrations or abnormal noises		● ▲						
	Lubrication (at least once a year)				●				
	§ 12.11 Braking system (MLA 3-25 H-C / MLA 3-25 H / MLA 4-50 H-C / MLA 4-50 H / MLA 5-50 H)								
	Check the brake hydraulic fluid level				●				
	§ 12.12 Steering cylinder								
	Check the condition of the steering cylinder and the connecting rod	●							
	Lubrication	●							
	Check the articulated joint for tightness		● ▲						
	§ 12.13 Gas cylinder for canopy/cab tilting								
	Check the condition of the gas cylinder and the connecting rod			●					

	Service intervals: ● Every "... " hours ▲ Compulsory warranty inspections	8	100	250	500	1000	1500	2000	3000
	§ 12.14 Hydraulic circuit maintenance								
	Check the tank level and the fastenings and check that there are no leaks	●							
	Clean the outside of the cooler		▲	●	▲	▲			
	Clean the inside of the cooler						●		
	Change the return circuit filter and breather		▲		● ▲	▲			
	Change the hydraulic oil (at least once a year) and change the strainer						●		
	Check the pressures and settings if necessary		▲		▲	● ▲			
	§ 12.15 Lubrication								
	Lubricate the arm (articulation and cylinders) and quick coupler	●	▲		▲	▲			
	Lubricate the undercarriage articulated joint and steering cylinder		● ▲		▲	▲			
	§ 12.16 Heating								
	Change the air filter depending on fouling				●				
	§ 12.17 Air conditioning								
	Air conditioning filter replacement				●				
	Condenser cleaning		●						
	Refrigerant charge check (at least once a year)					●			
	Replacement of the dryer filter (at least every 2 years)							●	
	Check compressor belt tension			●					
	Checking the pressure switch and the thermostat (at least every 2 years)							●	
	Re-charge the air conditioning circuit with gas							●	

INGREDIENTS	WORKING TEMPERATURE LIMITS	VISCOSITY*	RECOMMENDATIONS
■ Engine			
Standards: **Oil** Perkins DEO-ULS (API CK-4 or ACEA E9)	from -20°C (-4°F) to +50°C (122°F)	SAE 10W-40	Shell Rimula R5 LE 10W-40
Approved DEUTZ DQC III-10 LA or DQC III-18 LA	from -20°C (-4°F) to +40°C (104°F)		
■ Hydraulic circuit and brake circuit (except for MLA 2-25 H)			
Standards: Bosch Rexroth Fluid Rating RDE 90245 (ISO VG 32–68) ISO 11158 (HV Fluids) DIN 51524-3 (HVLP Fluids) ASTM D6158 (HV Fluids)	from -25°C (-13°F) to +30°C (86°F)	ISO VG 32	Shell Tellus S2 VX 32
	from -20°C (-4°F) to +40°C (104°F)	ISO VG 46	Shell Tellus S2 VX 46
	from -10°C (14°F) to +50°C (122°F)	ISO VG 68	Shell Tellus S2 VX 68
	from 0°C (32°F) to +60°C (140°F)	ISO VG 100	Shell Tellus S2 VX 100
Environmentally compliant fluids For European countries Ecolabel-approved hydraulic oils Other countries ISO 15380 hydraulic oils HEES (hydraulic)	from -20°C (-4°F) to +40°C (104°F)	ISO VG 46 (organic)	Shell Naturelle S2 Hydraulic Fluid 46
■ Transfer box and gear wheels, delivered filled with: FUCHS TITAN LS85W90 or TRACTELF SF3 oil			
STANDARDS: **Oil** ZF TE-ML: 05C, 12C, 21C API Service Classification: GL-5 Limited Slip MIL-L-2105D: Meets	All temperatures	SAE 80W90	Shell Spirax S3 ALS 80W-90
■ Axles (with limited slip)			
STANDARDS: **Oil** API GL5 MIL-L 2105D Oil ELF SF3 (GL4)	All temperatures	LS 85W90	FUCHS TITAN
■ Transfer box ZF			
STANDARDS: API CK-4, CJ-4, and SN ACEA E7 and E9	from -20°C (-4°F) to +40°C (104°F)	SAE 10W-40	Shell Rimula R5 LE 10W-40
■ Engine tank (Compliant with the standard DIN EN 590 EN 190 (B7))**			
“Summer” diesel “Winter” diesel	above 0 °C (32°F) from -12°C (10°F) to 0°C (32°F)		
■ General lubrication			
STANDARDS: **Lubricant** DIN 51 502: KP2K-20 ISO 6743-09: L-XBCEB 2		NLGI 2	Shell Gadus S2 V220AC 2
■ Coolant			
STANDARDS: AFNOR: NF R15601 AFNOR: NF BS 6580 ASTM D6210	-26°C (-15°F)		COOLELF AUTO SUPRA -26°C (-15°F)
■ Air conditioning circuit			
Oil			PLANETELF PAG SP 10
Gas			R134a

*Viscosity should be adapted to the temperature ranges in your geographical location. Consult your Manitou dealer. See **Fig. D29**, Page 205 for Perkins engine oil viscosity recommendations.
** Do not stock EN590 diesel for more than 6 months.

The coolant system is filled at the factory with a long-life antifreeze mixture. It consists of a mixture of water and anti-freeze and anti-corrosion products. Anti-freeze protection is designed for temperate climate regions and cold weather areas down to -26°C (-15°F).

USE ONLY PROPER COOLANT/ANTIFREEZE ONLY: COOLELF AUTO SUPRA -26 °C (-15°F) (SUITABLE FOR TEMPERATURES DOWN TO -26 °C (-15°F)) / PERKINS ELC (PRE-MIX WITH 50% GLYCOL SUITABLE FOR TEMPERATURES DOWN TO -36 °C (-33°F)). USING ANY OTHER COOLANT/ANTIFREEZE MAY RESULT IN IMPROPER COOLING AND DAMAGE TO THE MACHINE.

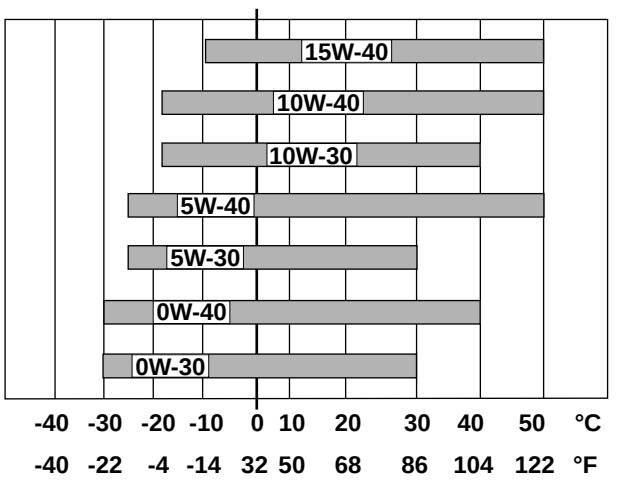


Fig. D29

16.1. Engine

Incident	Cause	Remedy
Steam is escaping from the expansion tank.	Coolant level too low.	Find the leaks and top up.
	Belt slack.	Adjust the tension.
	Cooling circuit dirty.	Drain, clean and fill.
The water temperature indicator flashes, the horn sounds.	The cooler fins are clogged or damaged.	Clean or repair them.
	The water temperature transmitter is defective.	Consult your dealer.
	The belt is slack or smeared with oil, the fan is not working.	Adjust the belt tension or clean it.
The engine turns over, but does not start.		Consult your dealer.
The engine starts, then stops.	The diesel level is too low	Check the diesel level and top up if required
		Consult your dealer.
The engine lacks power.	Too much engine oil.	Restore the recommended level.
	Diesel filter dirty.	Replace it.
	Diesel pump faulty.	Replace it.
The engine speed is irregular.		Consult your dealer.
The engine overheats.	Oil pump worn.	Consult your dealer.
	Oil level too low.	Top up.
	Cooling circuit dirty or level too low.	Drain the circuit or top up.
	Water pump defective.	Consult your dealer.
The engine makes an unusual noise.		Consult your dealer.
Black smoke from the exhaust.		Consult your dealer.
Exhaust gas white or bluish.	Cold engine start	Normal if present for only a few minutes after a cold engine start.
		Consult your dealer.

16.2. Electrical equipment

Incident	Cause	Remedy
The starter does not work.	Lack of diesel	Check the diesel level and top up if required
	Wiring or connections defective.	Check the connections and repair.
	Ignition switch defective.	Replace it.
	Battery charge too low.	Check and charge.
	Starter defective.	Consult your dealer.
Charge indicator light is dim even when the engine is running at full speed.	Wiring or connections defective.	Check the connections and repair.
	Alternator or regulator defective.	Consult your dealer.
External splashing of electrolyte.	Regulator defective.	Consult your dealer.

16.3. Hydraulic attachment

Incident	Cause	Remedy
Lack of power on the attachment cylinders.	Lack of oil.	Top up.
	Pump wear.	Consult your dealer.
	Main control valve limiters defective.	Consult your dealer.
	Incorrect setting.	Consult your dealer.
	Cylinder defective.	Consult your dealer.
	Main control valve defective.	Consult your dealer.
Lack of power in travel.	Lack of oil.	Top up.
	Incorrect setting (for example the setting of the flow rate is incorrect).	Consult your dealer.
	Engine pump wear.	Consult your dealer.
The machine does not move.	Lack of oil.	Top up.
	Incorrect setting.	Consult your dealer.

THE ABSENCE OF A SEAL CANCELS THE WARRANTY ON THE PART CONCERNED.

16.4. Travel motor and pump

Incident	Cause	Remedy
The machine does not work in either direction.	Pump or motor defective, boost pressure too low.	Consult your dealer.
Lack of high pressure.	Pump or motor defective, boost pressure too low.	Consult your dealer.
The machine is not immobile in neutral.	Pump incorrectly adjusted in the neutral position.	Consult your dealer.

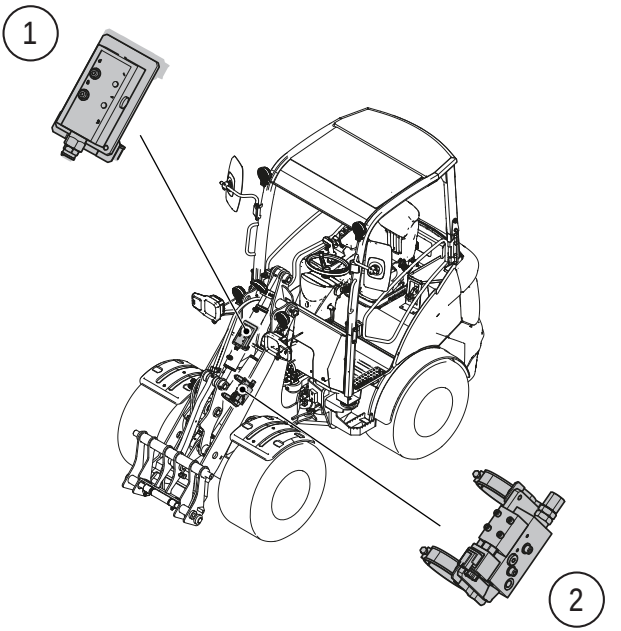
In addition to the Operating and Maintenance Manual, the following are supplied with each machine:

- A spare parts catalogue.
- A service book.

HANDLING AND LIFTING

THESE OPERATIONS ARE PROHIBITED IF THE MACHINE IS NOT FITTED WITH THE RECOMMENDED SAFETY DEVICES.

MLA 2-25 H



MLA 3-25 H / MLA 3-25 H-C / MLA 4-50 H / MLA 4-50 H-C / MLA 5-50 H

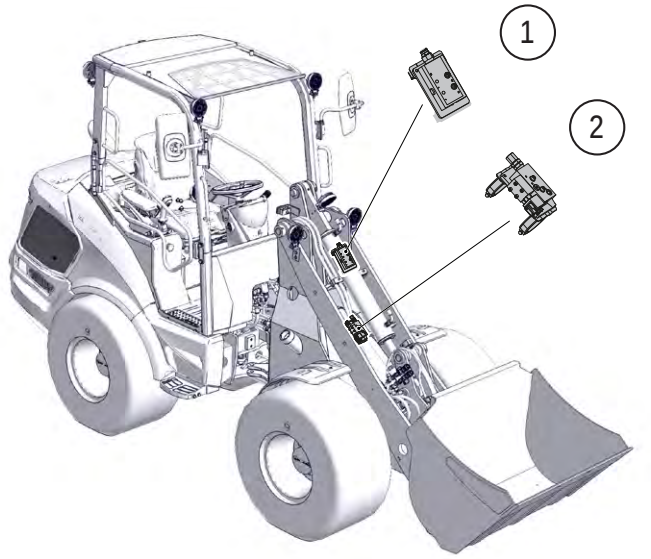


Fig. E1

01.1. Safety valves

■ The use of the machine with handling equipment involves the installation and use of compulsory safety devices.

IT IS STRONGLY RECOMMENDED TO FIT SAFETY DEVICES WHEN USING PALLET FORKS.

■ **“Handling with pallet forks” safety valves**

Two valves tared at 350 bar (440 psi):

1- Bucket cylinder.

2- Arm cylinder.

02.1. Use of the pallet forks MLA 2-25 H

DO NOT ACTIVATE THE ARM SUSPENSION FUNCTION WHEN USING PALLET FORKS (SEE 13, PAGE 81) (LOADING, HANDLING, ETC.).

IT IS STRONGLY RECOMMENDED TO FIT SAFETY DEVICES WHEN USING PALLET FORKS.

When using pallet forks:

- Always approach, lift, and lower the load from a straight-ahead position with the machine not turned:
- On level, firm ground.
- Use only pallet forks approved for use with your original ***Manitou*** quick coupler.
- With original ***Manitou*** pallet forks.
- According to ISO 8313:
  - 75% of the tipping load or 87% of the hydraulic limit.
- Safety valves on all the attachment cylinders:
  - Bucket cylinder.
  - Arm cylinder.
- The center of gravity is centered at 600 mm (1'12") from the bottom of the forks.
- The table only applies to loads when the forks are horizontal.

MLA 2-25 H

⚠ WARNING ⚠

OVERLOAD CAN TIP THE LOADER AND CAUSE INJURY OR DEATH.

- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown.The weight of all lifting devices must be deducted to determine the net load that can be lifted.

Where applicable, specifications conform to ISO Standards.Specifications are subject to change without notice.

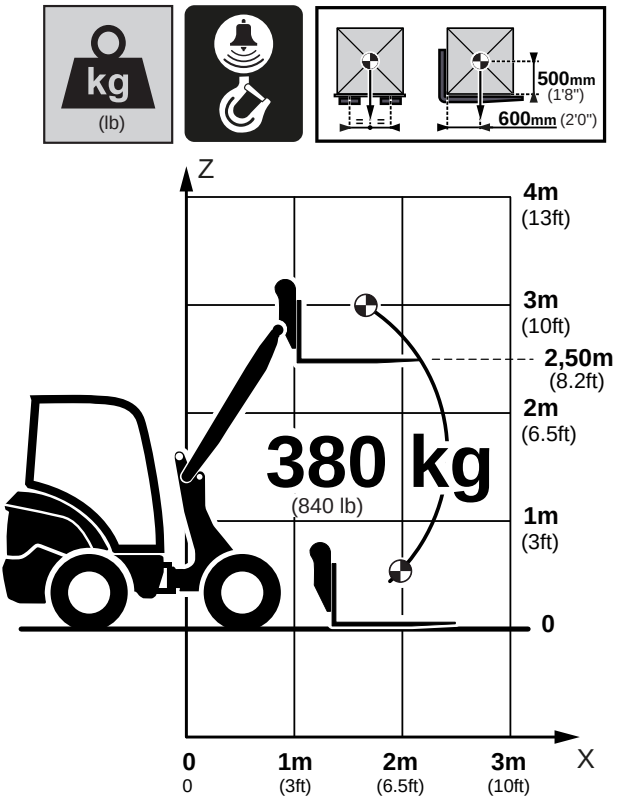


Fig. E2

02.2. Use of the pallet forks MLA 3-25 H-C / MLA 3-25 H

DO NOT ACTIVATE THE ARM SUSPENSION FUNCTION WHEN USING PALLET FORKS (SEE 13, PAGE 81) (LOADING, HANDLING, ETC.).

THESE OPERATIONS ARE PROHIBITED IF THE MACHINE IS NOT FITTED WITH THE COMPULSORY SAFETY DEVICES.

02.2.1. MLA 3-25 H-C (Fig. E3)

- Always approach, lift, and lower the load from a straight-ahead position with the machine not turned:
- On level, firm ground.
- Use only pallet forks approved for use with your original Manitou quick coupler.
- With short arm (1545 mm long (5'1")).
- With original ***Manitou*** pallet forks.
- According to ISO 8313:
  - 75% of the tipping load or 87% of the hydraulic limit.
- Safety valves on all the attachment cylinders:
  - ○ Bucket cylinder.
  - ○ Arm cylinder.
- The center of gravity is centered at 600 mm (1'12") from the bottom of the forks.
- The table is only given in the positions where the forks are horizontal.

02.2.2. MLA 3-25 H (Fig. E4)

- Always approach, lift, and lower the load from a straight-ahead position with the machine not turned:
- On level, firm ground.
- Use only pallet forks approved for use with your original Manitou quick coupler.
- With long arm (1755 mm long (5'9")).
- With original ***Manitou*** pallet forks.
- According to ISO 8313:
  - 75% of the tipping load or 87% of the hydraulic limit.
- Safety valves on all the attachment cylinders:
  - ○ Bucket cylinder.
  - ○ Arm cylinder.
- The center of gravity is centered at 600 mm (1'12") from the bottom of the forks.
- The table only applies to loads when the forks are horizontal.

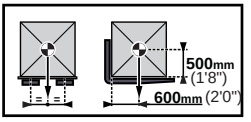
⚠ WARNING ⚠

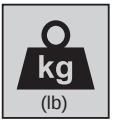
OVERLOAD CAN TIP THE LOADER AND CAUSE INJURY OR DEATH.

- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown.The weight of all lifting devices must be deducted to determine the net load that can be lifted.

Where applicable, specifications conform to ISO Standards.Specifications are subject to change without notice.

MLA 3-25 H-C





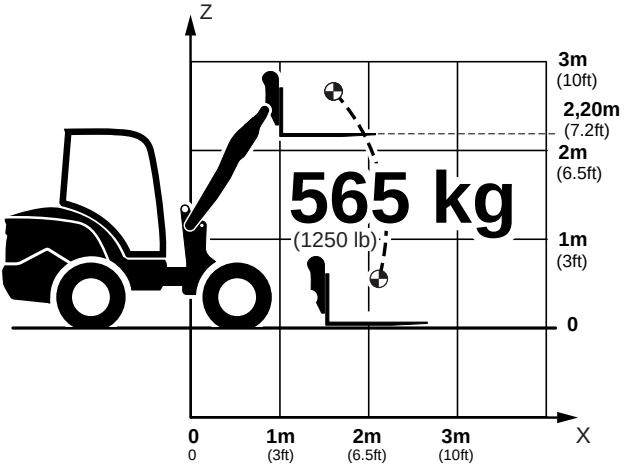
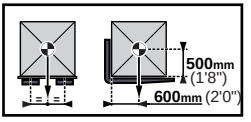
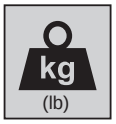


Fig. E3

MLA 3-25 H





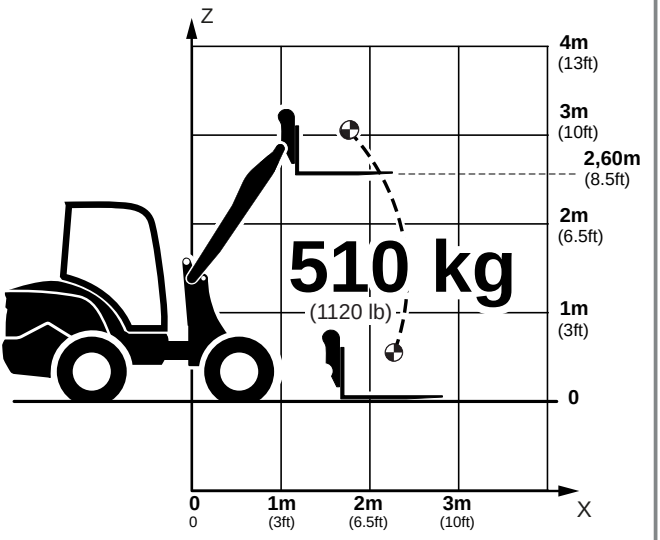


Fig. E4

02.3. Use of the pallet forks MLA 4-50 H-C / MLA 4-50 H

DO NOT ACTIVATE THE ARM SUSPENSION FUNCTION WHEN USING PALLET FORKS (SEE 13, PAGE 81) (LOADING, HANDLING, ETC.).

THESE OPERATIONS ARE PROHIBITED IF THE MACHINE IS NOT FITTED WITH THE COMPULSORY SAFETY DEVICES.

02.3.1. MLA 4-50 H-C (Fig. E5)

- Always approach, lift, and lower the load from a straight-ahead position with the machine not turned:
- On level, firm ground.
- Use only pallet forks approved for use with your original Manitou quick coupler.
- With short arm (1545 mm long (5'1")).
- With original ***Manitou*** pallet forks.
- According to ISO 8313:
  - 75% of the tipping load or 87% of the hydraulic limit.
- Safety valves on all the attachment cylinders:
  - ○ Bucket cylinder.
  - ○ Arm cylinder.
- The center of gravity is centered at 600 mm (1'12") from the bottom of the forks.
- The table is only given in the positions where the forks are horizontal.

02.3.2. MLA 4-50 H (Fig. E6)

- Always approach, lift, and lower the load from a straight-ahead position with the machine not turned:
- On level, firm ground.
- Use only pallet forks approved for use with your original Manitou quick coupler.
- With long arm (1755 mm long (5'9")).
- With original ***Manitou*** pallet forks.
- According to ISO 8313:
  - 75% of the tipping load or 87% of the hydraulic limit.
- Safety valves on all the attachment cylinders:
  - ○ Bucket cylinder.
  - ○ Arm cylinder.
- The center of gravity is centered at 600 mm (1'12") from the bottom of the forks.
- The table is only given in the positions where the forks are horizontal.

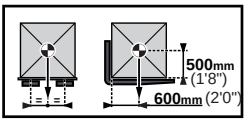
⚠ WARNING ⚠

OVERLOAD CAN TIP THE LOADER AND CAUSE INJURY OR DEATH.

- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown.The weight of all lifting devices must be deducted to determine the net load that can be lifted.

Where applicable, specifications conform to ISO Standards.Specifications are subject to change without notice.

MLA 4-50 H-C



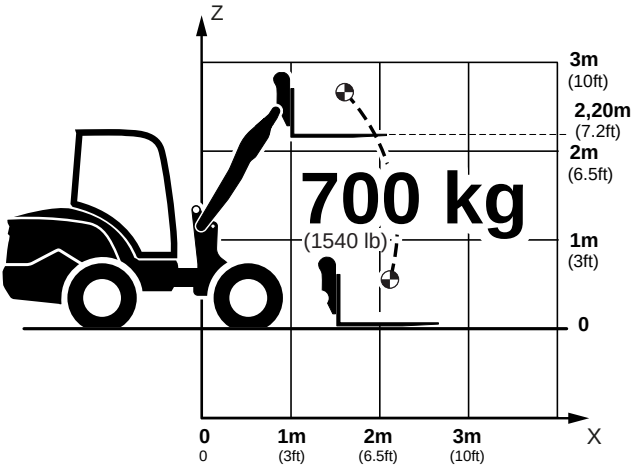
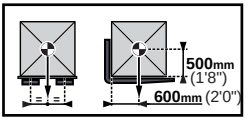
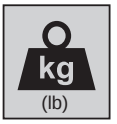


Fig. E5

MLA 4-50 H





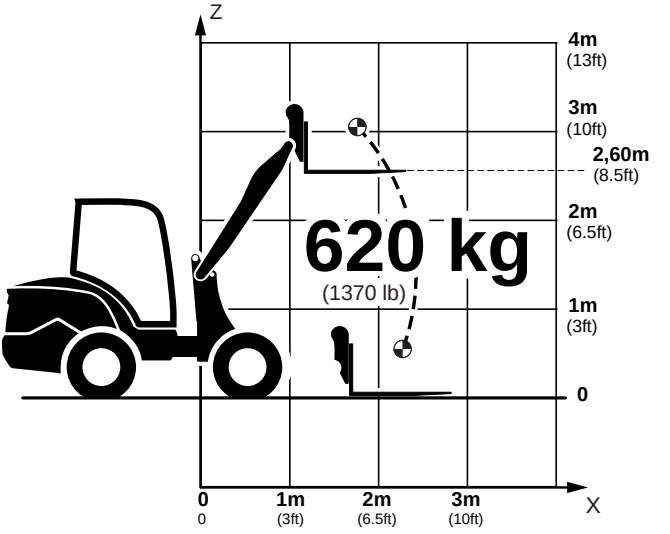


Fig. E6

02.4. Use of the pallet forks MLA 5-50 H

DO NOT ACTIVATE THE ARM SUSPENSION FUNCTION WHEN USING PALLET FORKS (SEE 13, PAGE 81) (LOADING, HANDLING, ETC.).

THESE OPERATIONS ARE PROHIBITED IF THE MACHINE IS NOT FITTED WITH THE COMPULSORY SAFETY DEVICES.

- Always approach, lift, and lower the load from a straight-ahead position with the machine not turned:
- On level, firm ground.
- Use only pallet forks approved for use with your original Manitou quick coupler.
- With original ***Manitou*** pallet forks.
- According to ISO 8313:
  - 75% of the tipping load or 87% of the hydraulic limit.
- Safety valves on all the attachment cylinders:
  - ○ Bucket cylinder.
  - ○ Arm cylinder.
- The center of gravity is centered at 600 mm (1'12") from the bottom of the forks.
- The table is only given in the positions where the forks are horizontal.

MLA 5-50 H

⚠ WARNING ⚠

OVERLOAD CAN TIP THE LOADER AND CAUSE INJURY OR DEATH.

- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown.The weight of all lifting devices must be deducted to determine the net load that can be lifted.

Where applicable, specifications conform to ISO Standards.Specifications are subject to change without notice.

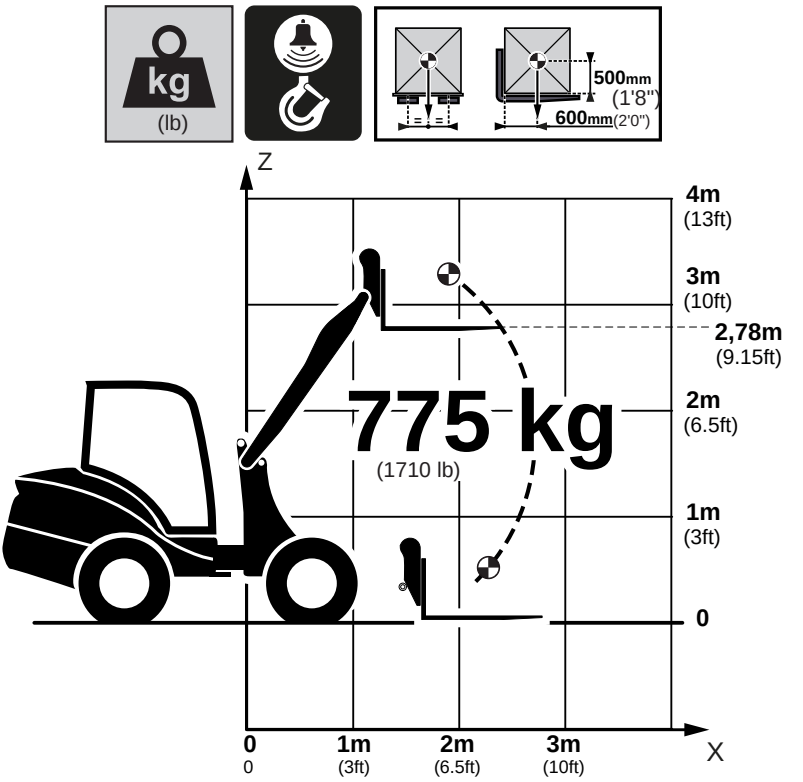
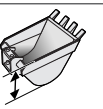
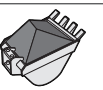
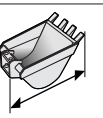


Fig. E7

APPENDICES

01. Tools

FR	GB	DE	Symbol		
Largeur (mm)	Width (mm) (in)	Breite (mm)			
Hauteur (mm)	Height (mm) (in)	Höhe (mm)			
Profondeur (mm)	Depth (mm) (in)	Tiefe (mm)			
Capacité (m^3)	Capacity (cu m) (yd^3)	Kapazität (m^3)			
Nombre de dents	Number of Teeth	Anzahl der Zähne			
Longueur (mm)	Length (mm) (in)	Länge (mm)			
Type de machine	Machine type	Maschinentyp		**MLA 2-25 H**	●
				MLA 3-25 H-C	◆
				MLA 3-25 H	
				MLA 4-50 H-C	✱
				MLA 4-50 H	
				MLA 5-50 H	■

Part Number	Part Description	 (mm) (in)	 (mm) (in)	 (mm) (in)	 (cu m) (yd³)		 (mm) (in)	
Brooms								
4-Point Quick Attach								
N51502376	Angle Broom w/ Hydraulic Swivel (SCA 1330) - 1328 mm (4'4") Wide	1448 (4'9")	684 (2'3")	1331 (4'4")				●
N51502377	Angle Broom w/ Hydraulic Swivel (SCA 1530) - 1525 mm (5') Wide	1753 (5'9")	684 (2'3")	1331 (4'4")				●■
N51502378	Angle Broom w/ Hydraulic Swivel (SCA 1680) - 1680 mm (5'6") Wide	1908 (6'3")	684 (2'3")	1331 (4'4")				■
Euro Style Quick Attach								
N51502380	Angle Broom w/ Hydraulic Swivel (SCA 1330) - 1328 mm (4'4") Wide	1448 (4'9")	684 (2'3")	1331 (4'4")				●
N51502381	Angle Broom w/ Hydraulic Swivel (SCA 1530) - 1525 mm (5') Wide	1753 (5'9")	684 (2'3")	1331 (4'4")				●■
N51502382	Angle Broom w/ Hydraulic Swivel (SCA 1680) - 1680 mm (5'6") Wide	1908 (6'3")	684 (2'3")	1331 (4'4")				■
Manual and Power-A-Tach® Quick Attaches								
N004039	Angle Broom w/ Hydraulic Swivel (SCA 1330) - 1328 mm (4'4") Wide	1448 (4'9")	684 (2'3")	1331 (4'4")				●
N004041	Angle Broom w/ Hydraulic Swivel (SCA 1530) - 1525 mm (5') Wide	1525 (5')						■
N004040	Angle Broom w/ Hydraulic Swivel (SCA 1530) - 1525 mm (5') Wide	1753 (5'9")	684 (2'3")	1331 (4'4")				●
N004042	Angle Broom w/ Hydraulic Swivel (SCA 1680) - 1680 mm (5'6") Wide	1908 (6'3")	684 (2'3")	1331 (4'4")				■
N004035	"Broom Bucket (SCB 1120) - 1376 mm (4'6") Wide **Sweeps and Collects in One Operation **Working Width - 1120 mm (3'8")	1376 (4'6")	652 (2'2")	1148 (3'9")				●
N004038	"Broom Bucket (SCB 1525) - 1776 mm (5'10") Wide **Sweeps and Collects in One Operation **Working Width - 1525 mm (5')	1776 (5'10")	652 (2'2")	1222 (4')				■
Buckets								
4-Point Quick Attach								
N003022	Light Material Bucket (BLM 1080/510) - 1080 mm (3'7") Wide, 0.51 cu. m. (0.67 yd³)	1080 (3'7")	775 (2'7")	1025 (3'4")	0.51 (0.67)			●
N003012	Standard Digging Bucket (BS 1080/300) - 1080 mm (3'7") Wide, 0.30 cu. m. (0.39 yd³)	1080 (3'7")	626 (2'1")	817 (2'8")	0.30 (0.39)			●
N003054	Standard Digging Bucket w/ Teeth (BS 1080/300 T) - 1080 mm (3'7") Wide, 0.30 cu. m. (0.39 yd³)	1080 (3'7")	626 (2'1")	907 (3')	0.30 (0.39)	6		●

Part Number	Part Description	 (mm) (in)	 (mm) (in)	 (mm) (in)	 (cu m) (yd³)		 (mm) (in)	
N003013	Standard Digging Bucket (BS 1150/320) - 1150 mm (3'9") Wide, 0.32 cu. m. (0.42 yd³)	1150 (3'9")	626 (2'1")	817 (2'8")	0.32 (0.42)			●
N003055	Standard Digging Bucket w/ Teeth (BS 1150/320 T) - 1150 mm (3'9") Wide, 0.32 cu. m. (0.42 yd³)	1150 (3'9")	626 (2'1")	898 (2'11")	0.32 (0.42)	6		●
N003056	Earth Bucket w/ Teeth (BS 1200/340 T) - 1200 mm (3'11") Wide, 0.34 cu. m. (0.44 yd³)	1200 (3'11")	626 (2'1")	907 (3')	0.34 (0.44)	6		●
N003023	Light Material Bucket (BLM 1200/580) - 1200 mm (3'11") Wide, 0.58 cu. m. (0.76 yd³)	1200 (3'11")	775 (2'7")	1025 (3'4")	0.58 (0.76)			●
N003014	Standard Digging Bucket (BS 1200/340) - 1200 mm (3'11") Wide, 0.34 cu. m. (0.44 yd³)	1200 (3'11")	626 (2'1")	817 (2'8")	0.34 (0.44)			●
N003024	Light Material Bucket (BLM 1300/630) - 1300 mm (4'3") Wide, 0.63 cu. m. (0.82 yd³)	1300 (4'3")	775 (2'7")	1025 (3'4")	0.63 (0.82)			●
N003015	Standard Digging Bucket (BS 1300/370) - 1300 mm (4'3") Wide, 0.37 cu. m. (0.48 yd³)	1300 (4'3")	626 (2'1")	817 (2'8")	0.37 (0.48)			●
N003057	Standard Digging Bucket w/ Teeth (BS 1300/370 T) - 1300 mm (4'3") Wide, 0.37 cu. m. (0.48 yd³)	1300 (4'3")	626 (2'1")	907 (3')	0.37 (0.48)	6		●
N51502391	4 in 1 Bucket (B4x1 1380/270) - 1380 mm (4'6") Wide, 0.27 cu. m. (0.35 yd³)	1380 (4'6")	713 (2'4")	770 (2'6")	0.27 (0.35)			●
N51502394	4 in 1 Bucket w/ Teeth (B4x1 1380/270 T) - 1380 mm (4'6") Wide, 0.27 cu. m. (0.35 yd³)	1380 (4'6")	713 (2'4")	870 (2'10")	0.27 (0.35)	7		●
N003093	Light Material Bucket (BLM 1400/680) - 1400 mm (4'7") Wide, 0.68 cu. m. (0.89 yd³)	1400 (4'7")	795 (2'7")	967 (3'2")	0.68 (0.89)			■
N003080	Standard Digging Bucket (BS 1400/470) - 1400 mm (4'7") Wide, 0.47 cu. m. (0.61 yd³)	1400 (4'7")	732 (2'5")	817 (2'8")	0.47 (0.61)			■
N003086	Standard Digging Bucket w/ Teeth (BS 1400/470 T) - 1400 mm (4'7") Wide, 0.47 cu. m. (0.61 yd³)	1400 (4'7")	732 (2'5")	907 (3')	0.47 (0.61)	7		■
N003094	Light Material Bucket (BLM 1500/730) - 1500 mm (4'11") Wide, 0.73 cu. m. (0.95 yd³)	1500 (4'11")	795 (2'7")	951 (3'1")	0.73 (0.95)			■
N003081	Standard Digging Bucket (BS 1500/510) - 1500 mm (4'11") Wide, 0.51 cu. m. (0.67 yd³)	1500 (4'11")	732 (2'5")	817 (2'8")	0.51 (0.67)			■
N003091	Standard Digging Bucket w/ Teeth (BS 1500/510 T) - 1500 mm (4'11") Wide, 0.51 cu. m. (0.67 yd³)	1500 (4'11")	732 (2'5")	907 (3')	0.51 (0.67)	7		■
Euro Style Quick Attach								
N51502113	Light Material Bucket (BLM 1080/510) - 1080 mm (3'7") Wide, 0.51 cu. m. (0.67 yd³)	1080 (3'7")	975 (3'2")	1025 (3'4")	0.51 (0.67)			●

Part Number	Part Description	 (mm) (in)	 (mm) (in)	 (mm) (in)	 (cu m) (yd³)		 (mm) (in)	
N51502101	Standard Digging Bucket (BS 1080/300) - 1080 mm (3'7") Wide, 0.30 cu. m. (0.39 yd³)	1080 (3'7")	626 (2'1")	817 (2'8")	0.30 (0.39)			●
N51502107	Standard Digging Bucket w/ Teeth (BS 1080/300 T) - 1080 mm (3'7") Wide, 0.30 cu. m. (0.39 yd³)	1080 (3'7")	626 (2'1")	907 (3')	0.30 (0.39)	6		●
N51502102	Standard Digging Bucket (BS 1150/320) - 1150 mm (3'9") Wide, 0.32 cu. m. (0.42 yd³)	1150 (3'9")	626 (2'1")	817 (2'8")	0.32 (0.42)			●
N51502108	Standard Digging Bucket w/ Teeth (BS 1150/320 T) - 1150 mm (3'9") Wide, 0.32 cu. m. (0.42 yd³)	1150 (3'9")	626 (2'1")	898 (2'11")	0.32 (0.42)	6		●
N51502114	Light Material Bucket (BLM 1200/580) - 1200 mm (3'11") Wide, 0.58 cu. m. (0.76 yd³)	1200 (3'11")	775 (2'7")	1025 (3'4")	0.58 (0.76)			●
N51502103	Standard Digging Bucket (BS 1200/340) - 1200 mm (3'11") Wide, 0.34 cu. m. (0.44 yd³)	1200 (3'11")	626 (2'1")	817 (2'8")	0.34 (0.44)			●
N51502109	Standard Digging Bucket w/ Teeth (BS 1200/340 T) - 1200 mm (3'11") Wide, 0.34 cu. m. (0.44 yd³)	1200 (3'11")	626 (2'1")	907 (3')	0.34 (0.44)	6		●
N51502115	Light Material Bucket (BLM 1300/630) - 1300 mm (4'3") Wide, 0.63 cu. m. (0.82 yd³)	1300 (4'3")	775 (2'7")	1025 (3'4")	0.63 (0.82)			●
N51502185	Light Material Bucket (BLM 1300/630) - 1300 mm (4'3") Wide, 0.63 cu. m. (0.82 yd³)	1300 (4'3")	795 (2'7")	967 (3'2")	0.63 (0.82)			■
N002015	Standard Digging Bucket (BS 1300/370) - 1300 mm (4'3") Wide, 0.37 cu. m. (0.48 yd³)	1300 (4'3")	626 (2'1")	817 (2'8")	0.37 (0.48)			●
N51502179	Standard Digging Bucket (BS 1300/440) - 1300 mm (4'3") Wide, 0.44 cu. m. (0.58 yd³)	1300 (4'3")	732 (2'5")	817 (2'8")	0.44 (0.58)			■
N51502110	Standard Digging Bucket w/ Teeth (BS 1300/370 T) - 1300 mm (4'3") Wide, 0.37 cu. m. (0.48 yd³)	1300 (4'3")	626 (2'1")	907 (3')	0.37 (0.48)	6		●
N51502182	Standard Digging Bucket w/ Teeth (BS 1300/440 T) - 1300 mm (4'3") Wide, 0.44 cu. m. (0.58 yd³)	1300 (4'3")	732 (2'5")	907 (3')	0.44 (0.58)	6		■
N51502134	4 in 1 Bucket (B4x1 1380/270) - 1380 mm (4'6") Wide, 0.27 cu. m. (0.35 yd³)	1380 (4'6")			0.27 (0.35)			●
N51502137	4 in 1 Bucket w/ Teeth (B4x1 1380/270 T) - 1380 mm (4'6") Wide, 0.27 cu. m. (0.35 yd³)	1380 (4'6")			0.27 (0.35)	7		●
N51502186	Light Material Bucket (BLM 1400/680) - 1400 mm (4'7") Wide, 0.68 cu. m. (0.89 yd³)	1400 (4'7")			0.68 (0.89)			■
N51502180	Standard Digging Bucket (BS 1400/470) - 1400 mm (4'7") Wide, 0.47 cu. m. (0.61 yd³)	1400 (4'7")	732 (2'5")	817 (2'8")	0.47 (0.61)			■

Part Number	Part Description	 (mm) (in)	 (mm) (in)	 (mm) (in)	 (cu m) (yd³)		 (mm) (in)	
N51502183	Standard Digging Bucket w/ Teeth (BS 1400/470 T) - 1400 mm (4'7") Wide, 0.47 cu. m. (0.61 yd³)	1400 (4'7")	732 (2'5")	907 (3')	0.47 (0.61)	7		■
N51502187	Light Material Bucket (BLM 1500/730) - 1500 mm (4'11") Wide, 0.73 cu. m. (0.95 yd³)	1500 (4'11")	795 (2'7")	951 (3'1")	0.73 (0.95)			■
N51502181	Standard Digging Bucket (BS 1500/510) - 1500 mm (4'11") Wide, 0.51 cu. m. (0.67 yd³)	1500 (4'11")	732 (2'5")	817 (2'8")	0.51 (0.67)			■
N51502184	Standard Digging Bucket w/ Teeth (BS 1500/510 T) - 1500 mm (4'11") Wide, 0.51 cu. m. (0.67 yd³)	1500 (4'11")	732 (2'5")	907 (3')	0.51 (0.67)	7		■
Manual and Power-A-Tach® Quick Attaches								
N004011	"Standard Digging Bucket (BS 980/270) - 980 mm (3'3") Wide, 0.27 cu. m. (0.35 yd³) Note: APPROVED for Road Use in Italy"	980 (3'6")	626 (2'1")	817 (2'8")	0.27 (0.35)			●
N004053	Standard Digging Bucket w/ Teeth (BS 980/270 T) - 980 mm (3'3") Wide, 0.27 cu. m. (0.35 yd³)	980 (3'6")	626 (2'1")	907 (3')	0.27 (0.35)	6		●
N51502388	4 in 1 Bucket (B4x1 1080/170) - 1080 mm (3'7") Wide, 0.17 cu. m. (0.22 yd³)	1080 (3'7")	713 (2'4")	770 (2'6")	0.17 (0.22)			●
N004022	Light Material Bucket (BLM 1080/510) - 1080 mm (3'7") Wide, 0.51 cu. m. (0.67 yd³)	1080 (3'7")	775 (2'7")	1025 (3'4")	0.51 (0.67)			●
N004012	Standard Digging Bucket (BS 1080/300) - 1080 mm (3'7") Wide, 0.30 cu. m. (0.39 yd³)	1080 (3'7")	626 (2'1")	817 (2'8")	0.30 (0.39)			●
N004054	Standard Digging Bucket w/ Teeth (BS 1080/300 T) - 1080 mm (3'7") Wide, 0.30 cu. m. (0.39 yd³)	1080 (3'7")	626 (2'1")	907 (3')	0.30 (0.39)	6		●
N004013	Standard Digging Bucket (BS 1150/320) - 1150 mm (3'9") Wide, 0.32 cu. m. (0.42 yd³)	1150 (3'9")	626 (2'1")	817 (2'8")	0.32 (0.42)			●
N004055	Standard Digging Bucket w/ Teeth (BS 1150/320 T) - 1150 mm (3'9") Wide, 0.32 cu. m. (0.42 yd³)	1150 (3'9")	626 (2'1")	898 (2'11")	0.32 (0.42)	6		●
N004023	Light Material Bucket (BLM 1200/580) - 1200 mm (3'11") Wide, 0.58 cu. m. (0.76 yd³)	1200 (3'11")	775 (2'7")	1025 (3'4")	0.58 (0.76)			●
N004014	"Standard Digging Bucket (BS 1200/340) - 1200 mm (3'11") Wide, 0.34 cu. m. (0.44 yd³) Note: APPROVED for Road Use in Italy"	1200 (3'11")	626 (2'1")	817 (2'8")	0.34 (0.44)			●
N004056	Standard Digging Bucket w/ Teeth (BS 1200/340 T) - 1200 mm (3'11") Wide, 0.34 cu. m. (0.44 yd³)	1200 (3'11")	626 (2'1")	907 (3')	0.34 (0.44)	6		●
N004024	Light Material Bucket (BLM 1300/630) - 1300 mm (4'3") Wide, 0.63 cu. m. (0.82 yd³)	1300 (4'3")	775 (2'7")	1025 (3'4")	0.63 (0.82)			●

Part Number	Part Description	 (mm) (in)	 (mm) (in)	 (mm) (in)	 (cu m) (yd³)		 (mm) (in)	
N004092	Light Material Bucket (BLM 1300/630) - 1300 mm (4'3") Wide, 0.63 cu. m. (0.82 yd³)	1300 (4'3")	795 (2'7")	967 (3'2")	0.63 (0.82)			■
N004015	Standard Digging Bucket (BS 1300/370) - 1300 mm (4'3") Wide, 0.37 cu. m. (0.48 yd³)	1300 (4'3")	626 (2'1")	817 (2'8")	0.37 (0.48)			●
N004079	Standard Digging Bucket (BS 1300/440) - 1300 mm (4'3") Wide, 0.44 cu. m. (0.58 yd³)	1300 (4'3")	732 (2'5")	817 (2'8")	0.44 (0.58)			■
N004057	Standard Digging Bucket w/ Teeth (BS 1300/370 T) - 1300 mm (4'3") Wide, 0.37 cu. m. (0.48 yd³)	1300 (4'3")	626 (2'1")	907 (3')	0.37 (0.48)	6		●
N004085	Standard Digging Bucket w/ Teeth (BS 1300/400 T) - 1300 mm (4'3") Wide, 0.40 cu. m. (0.52 yd³)	1300 (4'3")	732 (2'5")	907 (3')	0.40 (0.52)	6		■
N004046	4 in 1 Bucket (B4x1 1380/270) - 1380 mm (4'6") Wide, 0.27 cu. m. (0.35 yd³)	1380 (4'6")	713 (2'4")	770 (2'6")	0.27 (0.35)			●
N004093	Light Material Bucket (BLM 1400/680) - 1400 mm (4'7") Wide, 0.68 cu. m. (0.89 yd³)	1400 (4'7")	795 (2'7")	967 (3'2")	0.68 (0.89)			■
N004080	"Standard Digging Bucket (BS 1400/470) - 1400 mm (4'7") Wide, 0.47 cu. m. (0.61 yd³) Note: APPROVED for Road Use in Italy"	1400 (4'7")	732 (2'5")	817 (2'8")	0.47 (0.61)			■
N004086	Standard Digging Bucket w/ Teeth (BS 1400/470 T) - 1400 mm (4'7") Wide, 0.47 cu. m. (0.61 yd³)	1400 (4'7")	732 (2'5")	907 (3')	0.47 (0.61)	7		■
N004094	Light Material Bucket (BLM 1500/730) - 1500 mm (4'11") Wide, 0.73 cu. m. (0.95 yd³)	1500 (4'11")	795 (2'7")	951 (3'1")	0.73 (0.95)			■
N004081	Standard Digging Bucket (BS 1500/510) - 1500 mm (4'11") Wide, 0.51 cu. m. (0.67 yd³)	1500 (4'11")	732 (2'5")	817 (2'8")	0.51 (0.67)			■
N004091	Standard Digging Bucket w/ Teeth (BS 1500/510 T) - 1500 mm (4'11") Wide, 0.51 cu. m. (0.67 yd³)	1500 (4'11")	732 (2'5")	907 (3')	0.51 (0.67)	7		■
Forks								
4-Point Quick Attach								
N701966	Farm Fork (FM 1200) - 1200 mm (3'11") Wide	1200 (3'11")	694 (2'3")	843 (2'9")				●
N701984	Farm Fork (FM 1500) - 1500 mm (4'11") Wide	1500 (4'11")	765 (2'6")	863 (2'10")				■
N701955	Farm Fork (FM 920) - 920 mm (3') Wide	920 (3')	694 (2'3")	843 (2'9")				●
Euro Style Quick Attach								
N51502141	Farm Fork (FM 1200) - 1200 mm (3'11") Wide	1200 (3'11")	694 (2'3")	843 (2'9")				●
N51502174	Farm Fork (FM 1500) - 1500 mm (4'11") Wide	1500 (4'11")	765 (2'6")	863 (2'10")				■

Part Number	Part Description	 (mm) (in)	 (mm) (in)	 (mm) (in)	 (cu m) (yd^3)		 (mm) (in)	
Manual and Power-A-Tach® Quick Attaches								
N004073	Farm Fork (FM 1200) - 1200 mm (3'11") Wide	1200 (3'11")	694 (2'3")	843 (2'9")				●
N004075	Farm Fork (FM 1500) - 1500 mm (4'11") Wide	1500 (4'11")	765 (2'6")	863 (2'10")				■
N004072	Farm Fork (FM 920) - 920 mm (3') Wide	920 (3')	694 (2'3")	843 (2'9")				●
Carriage and Forks								
4-Point Quick Attach								
N701954	Standard Carriage (CAT 920/1000) - 915 mm (3') Wide w/ 35 mm (1.38") x 100 mm (3.94") x 1000 mm (3'3") Pallet Forks	915 (3')	893 (2'11")	1160 (3'10")			1000 (3'3")	●
N701974	Standard Carriage (CAT 920/1100) - 915 mm (3') Wide w/ 35 mm (1.38") x 100 mm (3.94") x 1100 mm (3'7") Pallet Forks	915 (3')	893 (2'11")	1160 (3'10")			1100 (3'7")	●
N701978	Standard Carriage (CAT 1210/1200) - 1212 mm (4') Wide w/ 40 mm (1.57") x 100 mm (3.94") x 1200 mm (3'11") Pallet Forks	1212 (4')	890 (2'11")	1418 (4'8")			1200 (3'11")	■
Euro Style Quick Attach								
N002018	Standard Carriage (CAT 920/1000) - 915 mm (3') Wide w/ 35 mm (1.38") x 100 mm (3.94") x 1000 mm (3'3") Pallet Forks	915 (3')	893 (2'11")	1160 (3'10")			1000 (3'3")	●
N002019	Standard Carriage (CAT 920/1100) - 915 mm (3') Wide w/ 35 mm (1.38") x 100 mm (3.94") x 1100 mm (3'7") Pallet Forks	915 (3')	893 (2'11")	1260 (4'2")			1100 (3'7")	●
N51502172	Standard Carriage (CAT 1210/1200) - 1210 mm (4') Wide w/ 40 mm (1.57") x 100 mm (3.94") x 1200 mm (3'11") Pallet Forks	1212 (4')	890 (2'11")	1418 (4'8")			1200 (3'11")	■
Manual and Power-A-Tach® Quick Attaches								
N001938	Standard Carriage (CAT 920/1200) - 915 mm (3') Wide w/ 35 mm (1.38") x 100 mm (3.94") x 1200 mm (3'11") Pallet Forks	915 (3')	893 (2'11")	1360 (4'6")			1200 (3'11")	●
N004018	"Standard Carriage (CAT 920/1000) - 915 mm (3') Wide w/ 35 mm (1.38") x 100 mm (3.94") x 1000 mm (3'3") Pallet Forks Note: APPROVED for Road Use in Italy"	915 (3')	893 (2'11")	1160 (3'10")			1000 (3'3")	●
N004019	"Standard Carriage (CAT 920/1100) - 915 mm (3') Wide w/ 35 mm (1.38") x 100 mm (3.94") x 1100 mm (3'7") Pallet Forks Note: APPROVED for Road Use in Italy"	915 (3')	893 (2'11")	1260 (4'2")			1100 (3'7")	●
N004020	Standard Carriage (CAT 1210/1200) - 1212 mm (4') Wide w/ 40 mm (1.57") x 100 mm (3.94") x 1200 mm (3'11") Pallet Forks	1212 (4')	890 (2'11")	1418 (4'8")			1200 (3'11")	■

Part Number	Part Description	 (mm) (in)	 (mm) (in)	 (mm) (in)	 (cu m) (yd³)		 (mm) (in)	
Grapples								
4-Point Quick Attach								
N701967	Fork w/ Grapple (FMG 1200/320) - 1200 mm (3'11") Wide, 0.32 cu. m. (0.42 yd³)	1200 (3'11")	746 (2'5")	904 (3')	0.32 (0.42)			●
N701979	Fork w/ Grapple (FMG 1500/540) - 1500 mm (4'11") Wide, 0.54 cu.m. (0.71 yd³)	1500 (4'11")	772 (2'6")	1025 (3'4")	0.54 (0.71)			■
N51502274	Grapple Bucket w/ Single Cylinder (BG 1200/430) - 1200 mm (3'11") Wide, 0.43 cu. m. (0.56 yd³)	1200 (3'11")	850 (2'9")	978 (3'3")	0.43 (0.56)	4		●
N51502278	Grapple Bucket w/ Single Cylinder (BG 1400/510) - 1400 mm (4'7") Wide, 0.51 cu. m. (0.67 yd³)	1400 (4'7")	840 (2'9")	995 (3'3")	0.51 (0.67)			■
N51502279	Grapple Bucket w/ Single Cylinder (BG 1500/540) - 1500 mm (4'11") Wide, 0.54 cu. m. (0.71 yd³)	1500 (4'11")	850 (2'9")	978 (3'3")	0.54 (0.71)			■
All Quick Attach Systems								
N51502297	Grapple Bucket Side Plate Kit							■
Euro Style Quick Attach								
N51502144	Fork w/ Grapple (FMG 1100/320) - 1100 mm (3'7") Wide, 0.32 cu. m. (0.42 yd³)	1100 (3'7")	746 (2'5")	848 (2'9")	0.32 (0.42)			●
N51502145	Fork w/ Grapple (FMG 1200/320) - 1200 mm (3'11") Wide, 0.32 cu. m. (0.42 yd³)	1200 (3'11")	746 (2'5")	904 (3')	0.32 (0.42)			●
N51502175	Fork w/ Grapple (FMG 1500/540) - 1500 mm (4'11") Wide, 0.54 cu.m. (0.71 yd³)	1500 (4'11")	796 (2'7")	1028 (3'4")	0.54 (0.71)			■
N51502286	Grapple Bucket w/ Single Cylinder (BG 1200/430) - 1200 mm (3'11") Wide, 0.43 cu. m. (0.56 yd³)	1200 (3'11")	850 (2'9")	938 (3'1")	0.43 (0.56)			●
N51502290	Grapple Bucket w/ Single Cylinder (BG 1400/510) - 1400 mm (4'7") Wide, 0.51 cu. m. (0.67 yd³)	1400 (4'7")	840 (2'9")	995 (3'3")	0.51 (0.67)			■
N51502291	Grapple Bucket w/ Single Cylinder (BG 1500/540) - 1500 mm (4'11") Wide, 0.54 cu. m. (0.71 yd³)	1500 (4'11")	850 (2'9")	938 (3'1")	0.54 (0.71)			■
Manual and Power-A-Tach® Quick Attaches								
N004030	Fork w/ Grapple (FMG 1200/320) - 1200 mm (3'11") Wide, 0.32 cu. m. (0.42 yd³)	1200 (3'11")	746 (2'5")	836 (2'9")	0.32 (0.42)			●
N004032	Fork w/ Grapple (FMG 1500/540) - 1500 mm (4'11") Wide, 0.54 cu.m. (0.71 yd³)	1500 (4'11")	772 (2'6")	1038 (3'5")	0.54 (0.71)			■
N51502263	Grapple Bucket w/ Single Cylinder (BG 1200/430) - 1200 mm (3'11") Wide, 0.43 cu. m. (0.56 yd³)	1200 (3'11")	850 (2'9")	997 (3'3")	0.43 (0.56)			●

Part Number	Part Description	 (mm) (in)	 (mm) (in)	 (mm) (in)	 (cu m) (yd^3)		 (mm) (in)	
N51502268	Grapple Bucket w/ Twin Cylinder (BG 1500/540) - 1400 mm (4'7") Wide, 0.54 cu. m. (0.71 yd^3)	1400 (4'7")	850 (2'9")	997 (3'3")	0.54 (0.71)			■
	Snow Attachments							
	4-Point Quick Attach							
N51502217	Snow Blade (BLS 1500) - 1500 mm (4'11") Wide, Hydraulic Orientation	1500 (4'11")	700 (2'4")	900 (2'11")				●
N51502222	Snow Blade (BLS 1800) - 1800 mm (5'11") Wide, Hydraulic Orientation	1800 (5'11")	700 (2'4")	900 (2'11")				■
	All Quick Attach Systems							
N51502314	Snow Blade Rubber Edge, Polyurethane - 1500 mm (4'11") Wide	1500 (4'11")						●
N51502316	Snow Blade Rubber Edge, Polyurethane - 1800 mm (5'11") Wide	1800 (5'11")						■
	Euro Style Quick Attach							
N51502218	Snow Blade (BLS 1500) - 1500 mm (4'11") Wide, Hydraulic Orientation	1500 (4'11")	700 (2'4")	900 (2'11")				●
N51502223	Snow Blade (BLS 1800) - 1800 mm (5'11") Wide, Hydraulic Orientation	1800 (5'11")	700 (2'4")	900 (2'11")				■
	Manual and Power-A-Tach® Quick Attaches							
N51502219	Snow Blade (BLS 1500) - 1500 mm (4'11") Wide, Hydraulic Orientation	1500 (4'11")	700 (2'4")	900 (2'11")				●
N51502224	Snow Blade (BLS 1800) - 1800 mm (5'11") Wide, Hydraulic Orientation	1800 (5'11")	700 (2'4")	900 (2'11")				■
	4-Point Quick Attach							
N51502632	Bale Clamp, Round (CLBR 2x2/800) - Minimum Diameter 800 mm (2'7") to Maximum Diameter 1550 mm (5'1"), Capacity 800 kg (1760 US gal)	1583 (5'2")	869 (2'10")					■
N51502429	Bale Clamp, Wrapped (CLBW 800) - Minimum Diameter 800 mm (2'7") to Maximum Diameter 1500 mm (4'11"), Capacity 800 kg (1760 US gal)	1503 (4'11")	810 (2'8")					■
N51502685	Bale Spikes (FB 950/700) - Tine Length 670 mm (2'2"), Capacity 700 kg (1540 US gal)	1150 (3'9")	610 (2')	820 (2'8")		2		●
N51502688	Bale Spikes (Foldable) w/ Backrest (FB 950/700 LB) - Tine Length 950 mm (3'1"), Capacity 700 kg (1540 US gal)	1150 (3'9")	1392 (4'7")	1170 (3'10")		2		■
N750996	Dozer Blade (BLD 1525) - 1525 mm (5') Wide	1525 (5')						■

Part Number	Part Description	 (mm) (in)	 (mm) (in)	 (mm) (in)	 (cu m) (yd³)		 (mm) (in)	
Euro Style Quick Attach								
N51502633	Bale Clamp, Round (CLBR 2x2/800) - Minimum Diameter 800 mm (2'7") to Maximum Diameter 1550 mm (5'1"), Capacity 800 kg (1760 US gal)	1583 (5'2")	869 (2'10")					■
N51502430	Bale Clamp, Wrapped (CLBW 800) - Minimum Diameter 800 mm (2'7") to Maximum Diameter 1500 mm (4'11"), Capacity 800 kg (1760 US gal)	1503 (4'11")	810 (2'8")					■
N51502686	Bale Spikes (FB 950/700) - Tine Length 670 mm (2'2"), Capacity 700 kg (1540 US gal)	1150 (3'9")	610 (2')	820 (2'8")		2		●
N51502689	Bale Spikes (Foldable) w/ Backrest (FB 950/700 LB) - Tine Length 950 mm (3'1"), Capacity 700 kg (1540 US gal)	1150 (3'9")	1392 (4'7")	1170 (3'10")		2		■
N51502207	Dozer Blade (BLD 1525) - 1525 mm (5') Wide	1525 (5')						■
Manual and Power-A-Tach® Quick Attaches								
N51502631	Bale Clamp, Round (CLBR 2x2/800) - Minimum Diameter 800 mm (2'7") to Maximum Diameter 1550 mm (5'1"), Capacity 800 kg (1760 US gal)	1583 (5'2")	869 (2'10")					■
N51502013	Bale Clamp, Wrapped (CLBW 800) - Minimum Diameter 800 mm (2'7") to Maximum Diameter 1500 mm (4'11"), Capacity 800 kg (1760 US gal)	1503 (4'11")	810 (2'8")					■
N51502684	Bale Spikes (FB 950/700) - Tine Length 670 mm (2'2"), Capacity 700 kg (1540 US gal)	1150 (3'9")	610 (2')	820 (2'8")		2		■
N51502699	Bale Spikes (FB 950/700) - Tine Length 670 mm (2'2"), Capacity 700 kg (1540 US gal)	1150 (3'9")	610 (2')	820 (2'8")		2		●
N51502687	Bale Spikes (Foldable) w/ Backrest (FB 950/700 LB) - Tine Length 950 mm (3'1"), Capacity 700 kg (1540 US gal)	1150 (3'9")	1392 (4'7")	1170 (3'10")		2		■
N700396	Dozer Blade (BLD 1525) - 1525 mm (5') Wide	1525 (5')						■
N51502717	Pot Clamp (CLP 1000/800) - Minimum Diameter 180 mm (7.09") to Maximum Diameter 1000 mm (3'3"), Capacity 800 kg (1760 US gal)	1000 (3'3")	507 (1'8")					●

"EC" DECLARATION OF CONFORMITY

01. "EC" declaration of conformity

1) DÉCLARATION «CE» DE CONFORMITÉ (originale)

«EC» DECLARATION OF CONFORMITY (original)

2) Société, *Company* : MANITOU BF
3) Adresse, *Address* : 430 RUE DE L'AUBINIERE
B.P 10249 44158 ANCENIS CEDEX 6 FRANCE
4) Titulaire de dossier technique, *Holder of the technical file* : MANITOU BF
3) Adresse, *Address* : 430 RUE DE L'AUBINIERE
B.P 10249 44158 ANCENIS CEDEX 6 FRANCE
5) Constructeur, *Manufacturer* : MANITOU BF
5) Le constructeur déclare que la machine décrite ci-après, *The manufacturer declares that the machine described below* :

MLA 2-25 H P ST5 S1

MLA 3-25 H-C P ST5 S1

MLA 3-25 H P ST5 S1

MLA 4-50 H-C P ST5 S1

MLA 4-50 H P ST5 S1

MLA 5-50 H P ST5 S1

7) Est conforme aux directives suivantes et à leurs transpositions en droit national (si applicables), *Complies with the following directives and their transpositions into national law (if applicable)* :

2006/42/CE

8) Pour les machines annexe IV, *For annex IV machines* :
9) Numéro d'attestation, *Certificate number* :
10) Organisme notifié, *Notified body* : Deutsche Gesetzliche Unfallversicherung e.V.
Fachbereich Bauwesen - c/o BG BAU
Helmstedter Straße 2 - 10717 Berlin - Germany

2000/14/CE + 2005/88/CE

11) Procédure appliquée, *Applied procedure* :
10) Organisme notifié, *Notified body* : Deutsche Gesetzliche Unfallversicherung e.V.
Fachbereich Bauwesen - c/o BG BAU
Helmstedter Straße 2 - 10717 Berlin - Germany
12) Niveau de puissance acoustique, *Sound power level* :
13) Mesuré, *Measured* : dB (A)
14) Garanti, *Guaranteed* : dB (A)

2014/30/UE

15) Normes harmonisées utilisées, *Harmonised standards used* : EN 474-1
EN 474-3
16) Normes ou dispositions techniques utilisées, *Standards or technical provisions used* : EN 474-1
EN 474-3

17) Fait à, *Done at* : 18) Date, *Date* :
19) Nom du signataire, *Name of signatory* :
20) Fonction, *Function* :
2) Société, *Company* :

21) Signature, *Signature* :

bg : 1) удостоверение за « CE » съответствие (оригинална), 2) Фирмата, 3) Адрес, 4) Техническо досие, 5) Фабрикант на описаната по-долу машина, 6) Обявява, че тази машина, 7) Отговаря на следните директиви и на тяхното съответствие национално право, 8) За машините към допълнение IV, 9)Номер на удостоверението, 10) Наименувана фирма, 15) хармонизирани стандарти използвани, 16) стандарти или технически правила, използвани, 17) Изработено в, 18) Дата, 19) Име на разписалия се, 20) Функция, 21) Функция.

cs : 1) ES prohlášení o shodě (původní), 2) Název společnosti, 3) Adresa, 4) Technická dokumentace, 5) Výrobce níže uvedeného stroje, 6) Prohlašuje, že tento stroj, 7) Je v souladu s následujícími směrnicemi a směrnicemi transponovanými do vnitrostátního práva, 8) Pro stroje v příloze IV, 9) Číslo certifikátu, 10) Notifikační orgán, 15) harmonizované normy použity, 16) Norem a technických pravidel používaných, 17) Místo vydání, 18) Datum vydání, 19) Jméno podepsaného, 20) Funkce, 21) Podpis.

da : 1) EF Overensstemmelseserklæring (original), 2) Firmaet, 3) Adresse, 4) tekniske dossier, 5) Konstruktør af nedenfor beskrevne maskine, 6) Erklærer, at denne maskine, 7) Overholder nedennævnte direktiver og disses gennemførelse til national ret, 8) For maskiner under bilag IV, 9) Certifikat nummer, 10) Bemyndigede organ, 15) harmoniserede standarder, der anvendes, 16) standarder eller tekniske regler, 17) Udfærdiget i, 18) Dato, 19) Underskrivers navn, 20) Funktion, 21) Underskrift.

de : 1) EG-Konformitätserklärung (original), 2) Die Firma, 3) Adresse, 4) Technischen Unterlagen, 5) Hersteller der nachfolgend beschriebenen Maschine, 6) Erklärt, dass diese Maschine, 7) den folgenden Richtlinien und deren Umsetzung in die nationale Gesetzgebung entspricht, 8) Für die Maschinen laut Anhang IV, 9) Bescheinigungsnummer, 10) Benannte Stelle, 15) angewandten harmonisierten Normen, 16) angewandten sonstigen technischen Normen und Spezifikationen, 17) Ausgestellt in, 18) Datum, 19) Name des Unterzeichners, 20) Funktion, 21) Unterschrift.

el : 1) Δήλωση συμμόρφωσης CE (πρωτότυπο), 2) Η εταιρεία, 3) Διεύθυνση, 4) τεχνικό φάκελο, 5) Κατασκευάστρια του εξής περιγραφόμενου μηχανήματος, 6) Δηλώνει ότι αυτό το μηχάνημα, 7) Είναι σύμφωνο με τις εξής οδηγίες και τις προσαρμογές τους στο εθνικό δίκαιο, 8) Για τα μηχανήματα παραρτήματος IV, 9) Αριθμός δήλωσης, 10) Κοινοποιημένος φορέας, 15) εναρμονισμένα πρότυπα που χρησιμοποιούνται, 16) Πρότυπα ή τεχνικούς κανόνες που χρησιμοποιούνται, 16) Είναι σύμφωνο με τα εξής πρότυπα και τεχνικές διατάξεις, 17) Εν, 18) Ημερομηνία, 19) Όνομα του υπογράφοντος, 20) Θέση, 21) Υπογραφή.

es : 1)Declaración DE de conformidad (original), 2) La sociedad, 3) Dirección, 4) expediente técnico, 5) Constructor de la máquina descrita a continuación, 6) Declara que esta máquina, 7) Está conforme a las siguientes directivas y a sus transposiciones en derecho nacional, 8) Para las máquinas anexo IV, 9) Número de certificación, 10) Organismo notificado, 15) normas armonizadas utilizadas, 16) Otras normas o especificaciones técnicas utilizadas, 17) Hecho en, 18) Fecha, 19) Nombre del signatario, 20) Función, 21) Firma.

et : 1) EÜ vastavusdeklaratsioon (algupärane), 2) Äriühing, 3) Aadress, 4) Tehniline dokumentatsioon, 5) Seadme tootja, 6) Kinnitab, et see toode, 7) On vastavuses järgmiste direktiivide ja nende riigisisesesse õigusesse ülevõtmiseks vastuvõetud õigusaktidega, 8) IV lisas loetletud seadmete puhul, 9) Tunnistuse number, 10) Sertifitseerimisasutus, 15) kasutatud ühtlustatud standarditele, 16) Muud standardites või spetsifikatsioonides kasutatakse, 17) Väljaandmise koht, 18) Väljaandmise aeg, 19) Allkirjastaja nimi, 20) Amet, 21) Allkiri.

fi : 1) EY-vaatimustenmukaisuusvakuutus (alkuperäiset), 2) Yritys, 3) Osoite, 4) teknisen eritelmän, 5) Jäljessä kuvatun koneen valmistaja, 6) Vakuuttaa, että tämä kone, 7) Täyttää seuraavien direktiivien sekä niitä vastaavien kansallisten säännösten vaatimukset, 8) Liitteen IV koneiden osalta, 9) Todistuksen numero, 10) Ilmoitettu laitos, 15) yhdenmukaistettuja standardeja käytetään, 16) muita standardeja tai eritelmät, 17) Paikka, 18) Aika, 19) Allekirjoittajan nimi, 20) Toimi, 21) Allekirjoitus.

ga : 1) « EC »dearbhú comhréireachta (bunaidh), 2) An comhlacht, 3) Seoladh, 4) comhad teicniúil, 5) Déantóir an innill a thuairisctear thíos, 6) Dearbhaíonn sé go bhfuil an t-inneall, 7) Go gcloíonn sé le na treoracha seo a leanas agus a trasuímh isteach i ndlí náisiúnta, 8) Le haghaidh innill an aguisín IV, 9) Uimhir teastais, 10) Comhlacht a chuireadh i bhfios, 15) caighdeáin comhchuibhithe a úsáidtear, 16) caighdeáin eile nó sonraíochtaí teicniúla a úsáidtear, 17) Déanta ag, 18) Dáta, 19) Ainm an tsínitheora, 20) Feidhm, 21) Síniú.

hu : 1) CE megfelelőségi nyilatkozat (eredeti), 2) A vállalat, 3) Cím, 4) műszaki dokumentáció, 5) Az alábbi gép gyártója, 6) Kijelenti, hogy a gép, 7) Megfelel az alábbi irányelveknek valamint azok honosított előírásainak, 8) A IV. melléklet gépeihez, 9) Bizonylati szám, 10) Értesített szervezet, 15) felhasznált harmonizált szabványok, 16) egyéb felhasznált műszaki szabványok és előírások hivatkozással, 17) Kelt (hely), 18) Dátum, 19) Aláíró neve, 20) Funkció, 21) Aláírás.

is : 1) (Samræmisvottorð ESB (upprunalega), 2) Fyrirtækið, 3) Aðsetur, 4) Tæknilegar skrá, 5) Smiður tækisins sem lýst er hér á eftir, 6) Staðfestir að tækið, 7) Samræmist eftirfarandi stöðlum og staðfærslu þeirra með hliðsjón af þjóðarrétti, 8) Fyrir tækin í aukakafla IV, 9) Staðfestingarnúmer, 10) Tilkynnt til, 15) samhæfða staðla sem notaðir, 16) önnur staðlar eða forskriftir notað, 17) Staður, 18) Dagsetning, 19) Nafn undirritaðs, 20) Staða, 21) Undirskrift.

it : 1) Dichiarazione CE di conformità (originale), 2) La società, 3) Indirizzo, 4) fascicolo tecnico, 5) Costruttore della macchina descritta di seguito, 6) Dichiara che questa macchina, 7) È conforme alle direttive seguenti e alle relative trasposizioni nel diritto nazionale, 8) Per le macchine Allegato IV, 9) Numero di Attestazione, 10) Organismo notificato, 15) norme armonizzate applicate, 16) altre norme e specifiche tecniche applicate, 17) Stabilita a, 18) Data, 19) Nome del firmatario, 20) Funzione, 21) Firma.

lt : 1) CE atitikties deklaracija (originalas), 2) Bendrovė, 3) Adresas, 4) Techninė byla, 5) Žemiau nurodytas įrenginio gamintojas, 6) Pareiškia, kad šis įrenginys, 7) Atitinka toliau nurodytas direktyvas ir į nacionalinius teisės aktus perkeltas jų nuostatas, 8) IV priedas dėl mašinų, 9) Sertifikato Nr, 10) Paskelbtoji įstaiga, 15) suderintus standartus naudojamus, 16) Kiti standartai ir techninės specifikacijas, 17) Pasirašyta, 18) Data, 19) Pasirašiusio asmens vardas ir pavardė, 20) Pareigos, 21) Parašas.

lv : 1) EK atbilstības deklarācija (oriģināls), 2) Uzņēmums, 3) Adrese, 4) tehniskās lietas, 5) Tālāk aprakstītās iekārtas ražotājs, 6) Apliecina, ka šī iekārta, 7) Ir atbilstoša tālāk norādītajām direktīvām un to transpozīcijai nacionālajā likumdošanā, 8) Iekārtām IV pielikumā, 9) Apliecības numurs, 10) Reģistrētā organizācija, 15) lietotajiem saskaņotajiem standartiem, 16) lietotajiem tehniskajiem standartiem un specifikācijām, 17) Sastādīts, 18) Datums, 19) Parakstītāja vārds, 20) Amats, 21) Paraksts.

mt : 1) Dikjarazzjoni ta' Konformità KE (originali), 2) Il-kumpanija, 3) Indirizz, 4) fajl tekniku, 5) Manifattrici tal-magna deskritta hawn isfel, 6) Tiddikjara li din il-magna, 7) Hija konformi hija konformi mad-Direttivi segwenti u l-liġijiet li jimplimentawhom fil-liġi nazzjonali, 8) Għall-magni fl-Anness IV, 9) Numru taċ-ċertifikat, 10) Entità nnotifikata, 15) l-istandards armonizzati użati, 16) standards tekniċi u speċifikazzjonijiet oħra użati, 17) Magħmul f', 18) Data, 19) Isem il-firmatarju, 20) Kariga, 21) Firma.

nl : 1) EG-verklaring van overeenstemming (oorspronkelijke), 2) Het bedrijf, 3) Adres, 4) technisch dossier, 5) Constructeur van de hierna genoemde machine, 6) Verklaart dat deze machine, 7) In overeenstemming is met de volgende richtlijnen en hun omzettingen in het nationale recht, 8) Voor machines van bijlage IV, 9) Goedkeuringsnummer, 10) Aangezegde instelling, 15) gehanteerde geharmoniseerde normen, 16) andere gehanteerde technische normen en specificaties, 17) Opgemaakt te, 18) Datum, 19) Naam van ondergetekende, 20) Functie, 21) Handtekening.

no : 1) CE-samsvarserklæring (original), 2) Selskapet, 3) Adresse, 4) tekniske arkiv, 5) Fabrikant av følgende maskin, 6) Erklærer at denne maskinen, 7) Oppfyller kravene i følgende direktiver, med nasjonale gjennomføringsbestemmelser, 8) For maskinene i tillegg IV, 9) Attestnummer, 10) Notifisert organ, 15) harmoniserte standarder som brukes, 16) Andre standarder og spesifikasjoner brukt, 17) Utstedt i, 18) Dato, 19) Underskriverens navn, 20) Stilling, 21) Underskrift.

pl : 1) Deklaracja zgodności CE (oryginalne), 2) Spółka, 3) Adres, 4) dokumentacji technicznej, 5) Wykonawca maszyny opisanej poniżej, 6) Oświadcza, że ta maszyna, 7) Jest zgodna z następującymi dyrektywami i odpowiadającymi przepisami prawa krajowego, 8) Dla maszyn załącznik IV, 9) Numer certyfikatu, 10) Jednostka certyfikująca, 15) zastosowanych norm zharmonizowanych, 16) innych zastosowanych norm technicznych i specyfikacji, 17) Sporządzono w, 18) Data, 19) Nazwisko podpisującego, 20) Stanowisko, 21) Podpis.

pt : 1) Declaração de conformidade CE (original), 2) A empresa, 3) Morada, 4) processo técnico, 5) Fabricante da máquina descrita abaixo, 6) Declara que esta máquina, 7) Está em conformidade às directivas seguintes e às suas transposições para o direito nacional, 8) Para as máquinas no anexo IV, 9) Número de certificado, 10) Entidade notificada, 15) normas harmonizadas utilizadas, 16) outras normas e especificações técnicas utilizadas, 17) Elaborado em, 18) Data, 19) Nome do signatário, 20) Cargo, 21) Assinatura.

ro : 1) Declarație de conformitate CE (originală), 2) Societatea, 3) Adresa, 4) cărtii tehnice, 5) Constructor al mașinii descrise mai jos, 6) Declară că prezenta mașină, 7) Este conformă cu directivele următoare și cu transpunerea lor în dreptul național, 8) Pentru mașinile din anexa IV, 9) Număr de atestare, 10) Organism notificat, 15) standardele armonizate utilizate, 16) alte standarde si specificatii tehnice utilizate, 17) Întocmit la, 18) Data, 19) Numele persoanei care semnează, 20) Funcția, 21) Semnătura.

sk : 1) ES vyhlásenie o zhode (pôvodný), 2) Názov spoločnosti, 3) Adresa, 4) technickej dokumentácie, 5) Výrobca nižšie opísaného stroja, 6) Vyhlasuje, že tento stroj, 7) Je v súlade s nasledujúcimi smernicami a smernicami transponovanými do vnútroštátneho práva, 8) Pre stroje v prílohe IV, 9) Číslo certifikátu, 10) Notifikačný orgán, 15) použité harmonizované normy, 16) použité iné technické normy a predpisy, 17) Miesto vydania, 18) Dátum vydania, 19) Meno podpisujúceho, 20) Funkcia, 21) Podpis.

sl : 1) ES Izjava o ustreznosti (izvirna), 2) Družba. 3) Naslov. 4) tehnične dokumentacije, 5) Proizvajalec tukaj opisanega stroja, 6) Izjavlja, da je ta stroj, 7) Ustreza naslednjim direktivam in njihovi transpoziciji v državno pravo, 8) Za stroje priloga IV, 9) Številka potrdila, 10) Obvestilo organu, 15) uporabljene harmonizirane standarde, 16) druge uporabljene tehnične standarde in zahteve, 17) V, 18) Datum, 19) Ime podpisnika, 20) Funkcija, 21) Podpis.

sv : 1) CE-försäkran om överensstämmelse (original), 2) Företaget, 3) Adress, 4) tekniska dokumentationen, 5) Konstruktör av nedan beskrivna maskin, 6) Försäkrar att denna maskin, 7) Överensstämmer med nedanstående direktiv och införlivandet av dem i nationell rätt, 8) För maskinerna i bilaga IV, 9) Nummer för godkännande, 10) Organism som underrättats, 15) Harmoniserade standarder som används, 16) andra tekniska standarder och specifikationer som används, 17) Upprättat i, 18) Datum, 19) Namn på den som undertecknat, 20) Befattning, 21) Namnteckning.

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