SARITOR MALLEE 7000

Original

Operator's manual

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www.hardi.com.au

We congratulate you for choosing a HARDI plant protection product. The reliability and efficiency of this product depends upon your care. The first step is to carefully read and pay attention to this Operator's manual. It contains essential information for the efficient use and long life of this quality product.

Sprayer Use

The HARDI sprayer is for the application of crop protection chemicals and liquid fertilizers, and it is designed only for that purpose. If the sprayer is to be used for any other purposes than the ones described in this Operator's manual, a new risk assessment and a workplace assessment must be completed for this use. This obligation lies with the owner and operator of the sprayer.

Before first use of the sprayer, the owner and operator must take note of all of the following obligations:

- Workplace assessment
- Operator instructions
- Use of work equipment
- Statutory inspection
- Restricted use
- Maintenance regulations
- Health issues

For more details, please see "Before First Use of the Sprayer" on page 9 in this Operator's manual.

Operator's manual Formalities

The original Operator's manual is approved and published in English. All other languages are translations of the original Book. In the event of any conflicts, inaccuracies or deviations between the English Book and other languages, the English version shall prevail.

Illustrations, technical information and data in this manual are assumed to be correct at the time of printing.

As this Operator's manual covers more models and features or equipment, which are available in certain countries only, please pay attention to paragraphs dealing precisely with your model.

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2.1 Obligations and Liability

Comply with the Operator's Manual

Knowledge of the basic safety information and safety regulations is a fundamental requirement for safe handling and fault-free sprayer operation.

Lack of knowledge or non-compliance of the safety regulations can lead to injuries and fatal accidents as well as damage to the sprayer and its surroundings.

Follow the safety instructions in this operator's manual.

Before First Use of the Sprayer

The owner of the sprayer must take note of the following obligations before using the sprayer. These obligations also applies to the employer or the supervisor of the sprayer operators.

Workplace Assessment

This must be completed to start with. Check your local regulations regarding:

- The content of the workplace assessment.
- The frequency of repeating the workplace assessment.

Worker / Operator Instructions

Only let those people work with, or on the sprayer, who:

- Are aware of the basic workplace safety information and accident prevention regulations.
- Have been instructed in working with/on the tractor and sprayer and hereby achieving appropriate qualifications.
- Have read and understood this Operator's Manual.

If you still have queries after reading the Operator's Manual, or if something remains unclear after reading it, please contact the manufacturer or your HARDI dealer.

A worker is hereinafter called an operator. An operator is a person who installs, operates, configures, adjusts, maintains, cleans, repairs, transports or moves the sprayer.

Use of Work Equipment

Throughout the lifetime of the sprayer, the owner shall take every measure to ensure the safety of the sprayer and its equipment made available to operators.

The responsibility lies with the owner of the sprayer to ensure the safety of the operator in accordance with all of the relevant act (s).

Statutory Inspection

Before first use of the sprayer, a surveyor must complete a statutory inspection of the tractor and sprayer. However, the rules often allow the tractor and the sprayer to be inspected separately before being connected. Contact your local HARDI dealer for more information on this inspection and when it has to be completed.

Restricted Use

As the use of the sprayer is likely to involve a specific risk, the owner shall ensure restricted access to its use as needed, and any modification of the restrictions is to be allowed to specialized persons only.

Restricted use also applies to the selection of tractor to be used together with the sprayer. Usable tractors must be tested for driving the sprayer, and the owner must keep a document showing which tractors may be used for driving the sprayer, as well the information about the tests. This information must be available to the operator of the sprayer.

Maintenance Regulations

Throughout its working life, the owner shall keep the sprayer compatible with the current safety regulations by means of adequate maintenance.

The owner shall ensure that the sprayer is installed and set up correctly and is operating properly by inspection/testing of the sprayer (initial, after assembly, periodic and special) by authorized persons. The results of inspection/testing shall be recorded and kept.

Health Issues

Ergonomics and occupational health aspects shall be taken fully into account by the owner.

Obligations of the Operator

Before starting work, the operator or anyone in charge of working with/on the sprayer is obliged to:

- Comply with the basic workplace safety acts and accident prevention regulations.
- Read and follow the safety instructions as described in this Operator's Manual.
- Read the section "Representation of Safety Symbols" in this Operator's Manual and to follow the safety instructions represented by the danger, warning and attention symbols, when operating the sprayer.
- Get to know the sprayer.
- Connect the sprayer securely and correctly to a tractor, which has passed the test for driving the sprayer.
- Read the sections of this Operator's Manual that are important for carrying out the work.
- Read the manufacturer's information regarding safety and use of chemical products for crop care, such as spray chemicals or liquid fertilizer.
- Keep all the danger, warning and attention labels on the sprayer in a legible state.
- Replace damaged labels on the sprayer.
- Know the importance of the use of genuine HARDI spare parts.

If the operator discovers that a function is not working properly, he must eliminate this fault immediately. If this is not the task of the operator, or if the operator does not possess the appropriate technical knowledge, then he should report this fault to his superior (a qualified operator).

Risks in Handling the Sprayer

The sprayer has been highly developed and constructed to the recognized rules of safety. However, operating the sprayer may cause risks and restrictions to:

- The health and safety of the operator or third parties.
- The sprayer.
- Other property.

Only use the sprayer:

- For the purpose for which it was intended.
- In a perfect state of repair.

Eliminate any faults immediately which could impair the safety.

Disclaimer

Our "General Terms of Sale and Delivery" are always applicable. These shall be available to the owner at the latest on conclusion of the contract.

Warranty and liability claims for damage to people or property will be excluded by HARDI, if they can be traced back to one or more of the following causes:

- Improper use of the sprayer.
- Improper installation, commissioning, operation and maintenance of the sprayer.
- Operation of the sprayer with defective safety equipment, or improperly attached or non-functioning safety equipment.
- Non-compliance with the instructions in the instruction manual regarding commissioning, operation and maintenance.
- Unauthorized design changes to the sprayer.
- Insufficient monitoring of sprayer parts which are subject to wear.
- Improperly executed repairs.
- Spare parts used are not genuine HARDI spare parts. If the operator decides to use a spare part, which is not approved by HARDI, the operator immediately assumes responsibility for any accident, damage or malfunction, which can be traced back to the use of this spare part. HARDI accepts no liability for such incidents caused by the use of non-approved spare parts, wear parts or aids.
- HARDI accepts no liability for disasters through the impact of foreign bodies, natural disasters or force majeure.

2 - General Safety Instructions

Organisational Measures

This Operator's Manual

- Must always be kept together with the sprayer.
- Must always be easily accessible for the operator.

Personal Protective Equipment

The operator must use the necessary personal protective equipment as per the information provided by the manufacturer of the plant protection product to be used, such as:

Chemical-resistant gloves

Chemical-resistant and disposable overalls

Water-resistant footwear

Face shield

Breathing protection

Eye protection

Head protection

Skin protection products

2.2 Safety and Protection Equipment

Safety at Start up

Each time before the sprayer is started up, all the safety and protection equipment must be properly attached and fully functional. Check all safety and protection equipment regularly. Repair or replace the equipment as needed.

Faulty Safety Equipment

Faulty or disassembled safety and protection equipment can lead to dangerous situations.

2.3 Informal Safety Measures

Additional Safety Instructions

Together with the safety information in this Operator's Manual, also comply with the general and national regulations related to:

- Accident prevention.
- Environmental protection.
- The applicable workplace safety.

Follow these regulations, especially when:

- Driving on public roads and routes. Comply with the appropriate statutory road traffic regulations. These vary from country to country, and there may be local regulations which need to be followed.
- Local law may demand that the operator is certified to use spray equipment.
- Using pesticides or liquid fertilizer. Make sure you understand the information from the supplier regarding their use.

2.4 Operator Training

Authorised Persons

Only those people who have been trained and instructed may work with/on the sprayer. The operator must clearly specify the responsibilities of the people in charge of operation and maintenance work.

People being trained may only work with/on the sprayer under the supervision of an experienced operator.

	Person especially trained for the activity [1)]	Trained operator [2)]	Person with specialist training (specialized workshop) [3)]
Loading / Transport	X	X	X
Commissioning	0	X	0
Setup and tool installation	0	0	X
Operation	0	X	0
Maintenance	X	X	X
Troubleshooting and fault elimination	X	0	X
Disposal	X	0	0

Symbols: X - permitted, 0 - not permitted.

1. Persons who can assume a specific task, and who can carry out this task for an appropriately qualified company. Examples of these persons are truck drivers, machinery dealer and scrap dealers (depending on the activity).
2. Persons who have been instructed in their assigned tasks and in the possible risks in the case of improper behaviour, who have been trained if necessary, and who have been informed about the necessary protective equipment and measures. Examples of these persons are customers, farmers and farm workers.
3. Persons with specialist technical training shall be considered as a specialist. Due to their specialist training and their knowledge of the appropriate regulations, they can evaluate the work with which they have been appointed to and detect possible dangers. Examples of these persons are sprayer importers, dealers and service engineers and service technicians.

   Comment:

   A qualification equivalent to specialist training can be obtained from several years of experience in the relevant field.

If maintenance and repair work on the sprayer is additionally marked "Workshop work", or a similar marking, only a specialized workshop may carry out such work. The personnel of a specialized workshop shall possess the appropriate knowledge and suitable aids (tools, lifting and support equipment) for carrying out the maintenance and repair work on the sprayer in a way that is both appropriate and safe.

2.5 Safety Measures Under Normal Operation

Protection Equipment

Only operate the sprayer if all the safety and protection equipment is fully functional.

Check the sprayer at least once a day for visible damage and check the function of the safety and protection equipment.

2.6 Residual Energy

Possible Dangers

Note that there may be residual energy from mechanical, hydraulic, pneumatic and electric / electronic parts on the sprayer.

Use appropriate measures to inform the operators.

Prevent any accidents from happening due to residual energy.

Below are some examples on where the sprayer's residual energies may be present:

Mechanical Energy

- Springs under tension.
- Weights exposed to gravity.
- Heat from wheel motors.

Hydraulic Energy

- Trapped oil under pressure in cylinders, hoses and accumulators.
- Heat from cylinders and oil tank.

Pneumatic Energy

- Air tank.

Electric Energy

- 12v DC battery.

2.7 Service and Maintenance Work

Statutory Inspection

Each country should regulate the level and frequency of this inspection. Contact your local HARDI dealer for more information, before using the sprayer the first time.

Preventive Measures

Before carrying out service and maintenance work, secure all media against unintentional start-up. This goes for:

Hydraulic system

- Set the tractor's hydraulic levers in neutral position (or 'float') to relieve oil pressure.
- Turn off the ignition and remove the ignition key.

Electric system

- Turn off the ignition and remove the ignition key.
- Turn off the isolation switch.

Fluid system

- Turn off the ignition and remove the ignition key.

Compressed air

- Drain the air tank.

Carry out prescribed service, maintenance and inspection work in due time. This will help to eliminate faults on the sprayer, including safety related functions.

Carefully fix and secure larger components to lifting gear when carrying out replacement work.

Check all the screw and bolt connections for firm seating. On completion of the maintenance work, check the function of the safety devices.

2.8 Design Changes

Operator Limitations

You may make no changes, expansions or modifications to the sprayer without an authorization from HARDI. This also applies when welding support parts.

Any expansion or modification work shall require the written approval from HARDI. Only use modification and accessory parts approved by HARDI, so that the type approval or other design approvals remain valid in accordance with national and international regulations.

Vehicles with an official type approval, or with equipment connected to a vehicle with a valid type approval, or approval for road transport according to the local road traffic regulations, must be in the state specified by the approval.

It is strictly forbidden to:

- Drill holes in the steel frame or in the running gear.
- Increase the size of existing holes in the steel frame or in the running gear.
- Weld support parts.

Risk of crushing, cutting, catching, squeezing, getting trapped, being drawn in or being struck by sprayer parts due to the failure of support parts.

Spare Parts, Wear Parts and Aids

Immediately replace any sprayer parts which are not in a perfect state.

Only use genuine HARDI spare and wear parts or those approved by HARDI, so that the type approval remains valid according to national and international regulations. The use of spare and wear parts from third parties does not guarantee that they have been constructed in a way as to meet the requirements placed on them.

HARDI accept no liability for damage caused by the use of non-approved spare parts, wear parts or aids.

2.9 Cleaning and Disposal

Environmental Protection

Carefully handle and dispose of any materials used, in particular:

- When carrying out work on oiled or lubricated sprayer parts.
- When cleaning using solvents.

Always follow local legislation regarding disposal.

2.10 Workstation

Intended Place for Operator

There may be only one person sitting in the driver's seat of the sprayer. This is the intended workstation for operating the sprayer.

Risks of Non-Compliance

During the operation or transport of the sprayer:

If another person disturbs or interferes with the operator, or if the operator is trying to operate the sprayer from other places than the sprayer's driver seat, this can result in negligent or incorrect handling of the vehicle.

- Risk of the operator loosing his concentration and focus on operating the vehicle correctly.
- Risk of the operator loosing his ability to operate the vehicle correctly.
- Risk of fatal accidents while driving.
- Risk of damages to the sprayer and foreign objects while driving.
- Risk of inefficient spraying due to incorrect operation of the sprayer.

2.11 If the Safety Information is Ignored

Possible Risks and Dangers

Non-compliance with the safety information:

- Can pose a danger to people, to the environment and to the sprayer.
- Danger to people through non-secured working areas.
- Danger to people through mechanical and chemical influences.
- Failure of important sprayer functions.
- Failure of prescribed methods of maintenance and repair.
- Leakage of hydraulic oil or spray fluid to the environment.
- Can lead to the loss of all warranty claims.

2.12 Safety Information For Operators

General Safety and Accident Prevention

Before use or starting up the sprayer, always check their:

- Roadworthiness
- Operational safety

Risk of crushing, cutting, catching, squeezing, getting trapped, being drawn in or being struck by sprayer parts due to inadequate roadworthiness and operational safety.

Beside these instructions, comply with the generally applicable national safety and accident prevention regulations.

The warning symbols and other labels attached to the sprayer provide important information on safe sprayer operation. Compliance with this information is in the interests of your safety.

Keep the spray boom in folded position, whenever the sprayer is not coupled to a tractor. Unfolding the boom on an uncoupled sprayer will shift the balance point of the sprayer causing a risk of overturning.

Before driving off and starting up the sprayer, check the immediate area of the sprayer - look out especially for children and instruct them and other unauthorized persons to stay out of reach of the sprayer. Ensure that you can see clearly.

Drive in such a way that you always have full control over the tractor with the attached sprayer. In doing so, take your personal abilities into account, as well as the road, traffic, visibility, weather conditions and the driving characteristics of the tractor and of the connected sprayer.

Slow down when driving in uneven terrain or when making sharp turns, as the sprayer might be at risk of turning over.

It is forbidden to ride on the sprayer or use it as a means of transport.

Only authorized persons are allowed inside or outside the sprayer cabin during operation.

Keep persons, children and animals away from the operation areas of the sprayer and from the sprayer's equipment. Be careful when manoeuvring the sprayer, especially when reversing, as there is a risk of hitting people or surroundings.

Avoid eating, drinking or smoking while spraying or working with equipment contaminated with chemicals.

The chemicals used for spraying are dangerous to your health! In case of ingestion, poisoning or damage to your skin or face, immediately seek medical advice. Remember to identify the chemicals used.

Use of The Sprayer

Before starting work, ensure that you understand all the equipment and actuation elements of the sprayer and their function. There is no time for this when the sprayer is already in operation.

Do not wear loose clothing.

Only start the sprayer, when all the safety equipment has been attached and in the safety position.

It is forbidden to:

- Stand in or near the working area of the sprayer.
- Climb the sprayer.
- Stand or sit on the sprayer.
- Stand in the turning and swivel range of the sprayer.

There are crushing and cutting points at externally actuated sprayer points, e.g. hydraulic cylinders.

Only actuate externally actuated sprayer parts when you are sure that no one is standing within the prescribed safety distance.

Before leaving the cabin:

- Lower the spray boom to around waist height above the ground or lower.
- Fold the spray boom into the transport position.
- Activate the sprayer's parking brake, put the transmission into (P).
- Turn off the sprayer engine.
- Remove the ignition key.

Always keep the sprayer under supervision when:

- The vehicle is parked with the engine running.
- The sprayer pump is running.
- The tank on the sprayer is being filled.

Road Transport

When driving on public roads or highways, the following instructions must be followed. Failure to do so will create a risk of:

- Traffic accidents or fatalities!
- Damage to the sprayer.

General Instructions

Comply with the national or local road traffic regulations when using public roads and highways.

When driving in areas with special rules and regulations for markings and lights on sprayers, you should observe these and equip your sprayer accordingly.

Make sure that you have a clear field of vision when driving.

Check the immediate vicinity of the vehicle; no persons, children or animals must be near the vehicle!

It is forbidden to use the sprayer as a means of transportation of people or goods.

The sprayer driver must not be disturbed by other people in the cabin during driving.

Adjust your driving speed to the prevailing conditions.

Before driving downhill, switch to a low gear.

When making turns, lower your speed.

Checking the Vehicle

Before transporting the sprayer on a road, complete the following check points.

- Spray boom is folded and resting in transport brackets with the intended locks engaged.
- Engage transport locks on the steering cylinders.
- Supply lines for hydraulic, electric and pneumatic systems (if installed) are correctly connected.
- Parking brake is completely disengaged. Safety line is secured (if applicable).
- Pump drive is turned off, if the main tank is empty. If the main tank is filled with spray liquid, the need for agitation demands that the pump drive is turned on.
- Traffic lights and reflectors are in good working order, clean and free from damage.
- Signs or markings on the vehicle regarding road transport are correctly placed and visible.
- Brakes are in good working order and free from visible damage.
- Tyre pressure is correct according to the load.
- No cables or other parts must be strained or caught in the tractors wheels when cornering.
- Crop residues and dirt are removed.
- All moveable or loose equipment are securely latched or stowed away in the designated compartments.

Braking and Steering

Braking distance is increased and steering capabilities are influenced, both when the sprayer's tank is empty and even more so with a full tank.

Slow down as needed to avoid tilting or overturning of the vehicle, especially on sloping roads.

Hydraulic System

The sprayer is supplied with hydraulic functions operating under a high pressure.

In case of malfunction, there is a risk that the hydraulic system may act inadvertently. This can lead to:

- Fatalities or serious injuries to persons or animals in the working area of the sprayer.
- Material damage to the sprayer when colliding with trees, vehicles or other objects in the working area of the sprayer.

Ensure that the hydraulic hose lines are connected correctly.

When connecting the hydraulic hose lines, ensure that the hydraulic system is depressurized.

The operator-controls used for hydraulic and electrical movements of components must stay unlocked, e.g. for folding, swivelling and pushing movements. The movement must stop automatically when you release the appropriate control. This does not apply to equipment movements that:

- Are continuous.
- Are automatically controlled.
- Require a floating position or pressed position to function.

Before working on the hydraulic system:

- Lower the spray boom to its lowest position or into the transport position.
- Turn off / depressurize the hydraulic system.
- Turn off the engine.
- Engage the parking brake.
- Remove the ignition key.

Have the hydraulic hose lines checked at least once during a calender year by an expert to ensure that they are in safe working order.

Replace the hydraulic hose lines if they are damaged or worn, which is when:

- It is leaking.
- Reinforcement material inside the hose is visible due to cracks in the outer layers.

Only use genuine HARDI hydraulic hose lines.

The hydraulic hoses should not be in use for longer than 5 calender years, including any storage time of maximum 2 years. Even with proper storage and approved use, hoses and hose connections are subject to natural ageing, thus limiting storage time and the time of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose connections made from thermoplastics, other guide values may be decisive.

Never attempt to plug leaks in hydraulic hose lines using your hand or fingers. Escaping high pressure fluid (hydraulic oil) may pass through the skin and ingress into the body. Risk of serious injury or death.

If you are injured by hydraulic oil, contact a doctor immediately.

When searching for leaks, use suitable aids to avoid the risk of serious injury or death.

Electrical System

If climbing onto the sprayer during service work, be aware of the low voltage danger from electric components.

Only use the prescribed fuses. If the fuses used are too highly rated, the electrical system will be destroyed. Risk of fire.

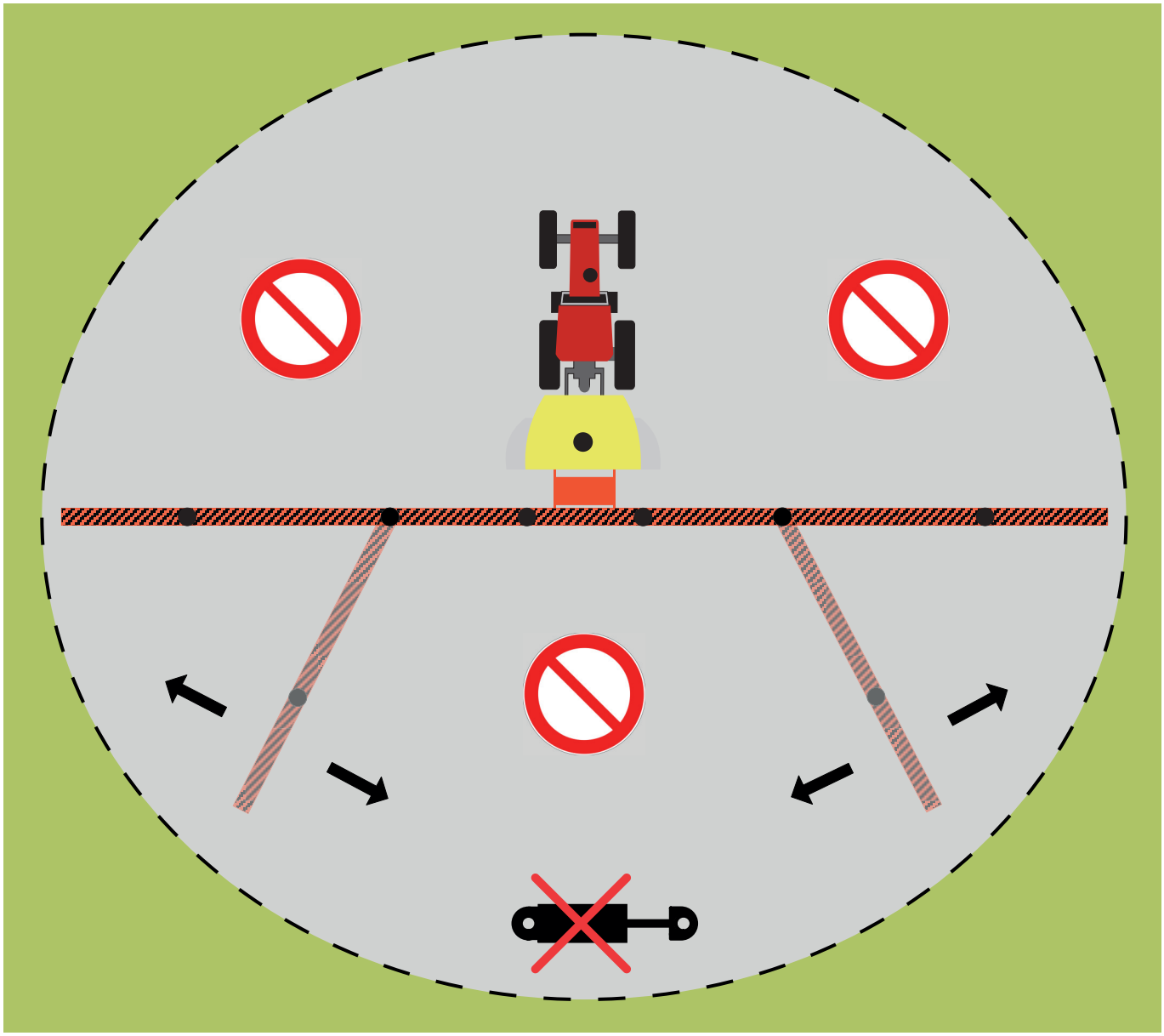
The sprayer may be equipped with electronic components whose functions are influenced by electromagnetic interference from other units. Such interference can pose risks to people, if the following safety information is not followed:

- If retrofitting electrical units and/or components on the sprayer with a connection to the on-board power supply, the user is responsible for checking whether the installation might cause faults on the vehicle electronics or other components.

Working Area of the Sprayer

Before operating the sprayer, the operator must ensure that the area around the sprayer is free.

This working area is defined as the area within the dashed line:



The working area includes the total width of the spray boom as well as the area used for boom folding. Please note the area immediately behind the sprayer, which is also defined as working area.
The size of the working area depends on the boom type and boom width. The operator must familiarize with the boom at hand before using the sprayer.

⚠ DANGER! Before the hydraulics for the sprayer are activated, there must be no risk of persons, animals or other machines or vehicles entering the working area of the sprayer. Risk of damage and fatality!

Field Sprayer Operation

Observe the recommendations from the manufacturer of the crop protection product in respect of:

- Personal protective equipment.
- Warning information on exposure to crop protection products.
- Regulations on dosing, applications and cleaning.

When there will be exposure to the crop protection product:

- Wear the proper personal protective equipment - this may differ depending on the chemical being sprayed.
- Wash and change clothes after spraying.
- Wash tools if they have been contaminated.

Observe the information in the national plant protection law.

Keep hoses, pipes or other lines closed, when they are under pressure.

When use of the TurboFiller or VACnMIX has ended, make sure that all valves on the TurboFiller or VACnMIX are closed / deactivated.

Only use genuine HARDI hoses and hose clamps for replacement, which stand up to chemical, mechanical and thermal requirements.

The rated volume of the spray liquid tank must not be exceeded during filling. If overfilled, some sprayer functions may be disabled. However, the MainTank is a little oversized to allow for foaming.

Observe the information on the compatibility of crop protections and substances for the field sprayer.

Be aware that some crop protection products have a tendency to stick together or settle when being mixed.

Do not fill the sprayer with water from bodies of water, which are open to the public. This is for the protection of people, animals and the environment due to the risk of contamination.

Only fill the sprayer using a free flow of water from the mains water supply or from an external water tank.

Environmental Precautions

It is essential to reduce the environmental impact of plant protection chemicals to a minimum. Particularly the soil, subsoil water, streams, lakes, flora and fauna must be in focus. Contamination of subsoil water must be prevented by paying particular attention to avoidance of spot contamination of the soil in connection with filling and washing and parking of the sprayer.

If any concentrated chemicals are spilled on the soil, the contaminated soil should be removed and sent for cleaning at a capable facility. Follow local regulations regarding disposal. This must be done to avoid seepage of chemicals to the subsoil waters. Avoid spillage - use the chemical filling device for filling the sprayer with chemicals.

Do not overfill the MainTank. The rated volume inside the MainTank is stated with large printed numbers on the outside of the tank. If overfilled, the spray liquid could leak from the sprayer causing contamination of the soil.

Before filling the sprayer with plant protection chemicals, the sprayer must be calibrated to apply the precise dose rate selected. The important input sensors are the flowmeter, the pressure sensor and the speed sensor.

It is recommended to establish a proper filling and washing location with hard, impenetrable surface drained to a receptacle if the sprayer is always filled or cleaned on the same spot at the farm. If a washing/filling location is NOT available, the following precautions should be taken:

- The sprayer should only be filled with clean water at the farm.
- The plant protection chemicals must be added and mixed in the field to be sprayed.
- Select a different location each time the sprayer is refilled.

Service Work Precautions

Before carrying out any service work, all of the following instructions must be followed in order to prevent damages to the sprayer, injuries and fatalities:

- Do not walk under any part of the sprayer, unless it is secured. The spray boom is secured when placed in the transport brackets.
- If the spray boom is folded up and resting in the transport brackets for service, check visually that the ParaLift locks are engaged (the boom is locked in place).
- If the spray boom is unfolded for service, the boom must be lowered, until it reaches its end stop. Place strong trestles under the boom for support or use a lifting crane for support.
- Never service or repair any equipment while it is operating.
- Any service work should be carried out on level ground with only authorized persons nearby.
- Depressurize the hydraulic system for the sprayer to prevent unintentional movements of the sprayer.
- Switch off the ignition and remove the ignition key to prevent unintentional starting.
- Activate the parking brake to prevent rolling.
- Put wheel chocks in front and behind of the wheels to prevent the sprayer from rolling.
- Any service work on electronic /electric parts must be carried out under dry conditions - no rain or splashes from water or other liquids.

Cleaning

When cleaning nozzles and filters, lower the spray boom to around waist height above the ground. For safety reasons, do NOT walk or stand below the boom or ParaLift during this cleaning work!

Dispose of oils, greases and filters in the appropriate way to protect the environment.

Cleaning of tanks:

- Due to toxic vapours from spray liquids in the MainTank, climbing into this tank is very hazardous. Cleaning should only be done from the outside.
- Do NOT enter the MainTank!
- Do NOT inspect any of the tanks with the liquid pump running!

Rinse and wash the equipment with clean water after use and before servicing.

Service and Maintenance

Always reassemble all safety devices or shields immediately after servicing.

After a longer period of storage, the sprayer must be inspected by a qualified operator. Contact your HARDI dealer for more information.

Repair work in the MainTank must only be carried out by a specialized workshop.

Do NOT enter the MainTank!

Access to the RinseTank must only take place with the spray boom in transport position, and after it is verified that the transport locks are engaged.

Regularly check the nuts and bolts for firm seating and re-tighten them as necessary.

Remove all inflammable or explosive materials from the area to prevent fire.

Pressure test the spray functions with clean water prior to filling with chemicals.

Do NOT disconnect hoses, pipes, or any equipment, if the sprayer is in operation!

Stay below the maximum speed (RPM).

When replacing spare parts, use suitable tools and personal protective equipment.

Spare parts must at least meet the specified technical requirements of HARDI. This is ensured through the use of genuine HARDI spare parts.

2 - General Safety Instructions

2.13 Operator safety

Symbols

These symbols are used thorough the manual to designate where extra attention is required by the reader. The four symbols have the following meaning:

This symbol means DANGER. Be very alert as your safety is involved! The DANGER symbol indicates a high risk for an immediate death or serious physical injury, if the instruction is not followed.

This symbol means WARNING. Be alert as your safety can be involved! The WARNING symbol indicates a medium risk for immediate death or serious injury, if the instruction is not followed.

This symbol means ATTENTION. This indicates an obligation to special behaviour or an activity required for proper sprayer handling. This instruction will help you to avoid faults on the sprayer or disturbance to the environment.

This symbol means NOTE. This instruction will help you to use all the functions of your sprayer in the best way possible for better, easier and safer operation

Label explanation

The labels are designating potential dangerous places on the machine. Anybody working with or being in close range of the sprayer must respect these labels!

The labels should always be clean and readable! Worn or damaged labels must be replaced with new ones. Contact your local dealer for new labels.

Note that not all labels shown here will apply to your sprayer.

978437 Chemical handling!

Carefully read the informations about chemical preparation before handling the machine. Observe instructions and safety rules when operating.

978436 Service!

Shut off the engine and remove ignition key before performing maintenance or repair.

97802100 Risk of death!

Do not attempt to enter tank.

978444 Risk of injury!

Do not open or remove safety shields while engine is running.

978448 Risk of injury!

Keep sufficient distance away from electrical power.

978443 Service!

Carefully read operator's manual before handling the machine. Observe instructions and safety rules when operating.

978440 Service!

Tighten to torque according to operator's manual.

978447 Risk of burn!

Stay clear of hot surfaces.

978586 Risk of injury!

Flying objects, keep safe distance from machine as long as the engine is running.

978435 Risk of injury!

Keep hands away.

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978441 Risk of squeeze!

Stay clear of raised unsecured loads.

978445 Risk of squeeze!

Never reach into the crushing danger area as long as parts are moving.

978434 Risk of squeeze!

Keep hands away, when parts is moving.

978442 Risk of falling off!

Do not ride on platform or ladder.

978446 Risk of sprayer tipping over!

Be aware when disconnecting the sprayer.

978438 Grip area!

Manual handling of boom etc.

97802200 Not for drinking!

This water must never be used for drinking water.

97802300 Not for drinking!

This water must never be used for drinking water.

97818100 Tank under pressure!

Beware when moving lid.

97827000 EasyClean filter service!

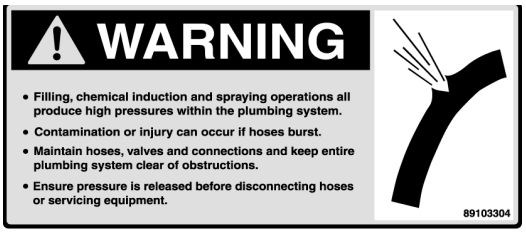
Open and clean filter monthly.

97829000 Lifting point!

978439 Lifting point!

97831500 Load index!

Max. permitted load rating is 164 at 40 km/h.



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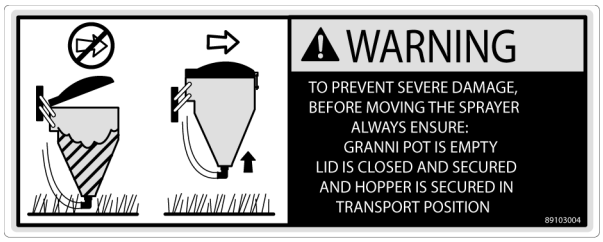

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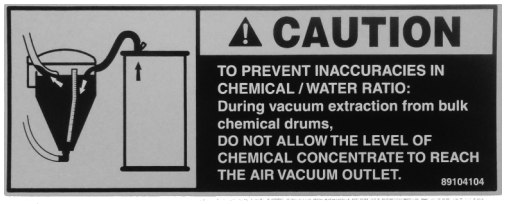

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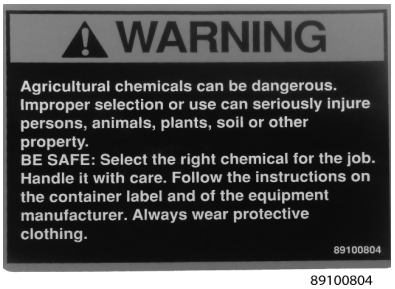

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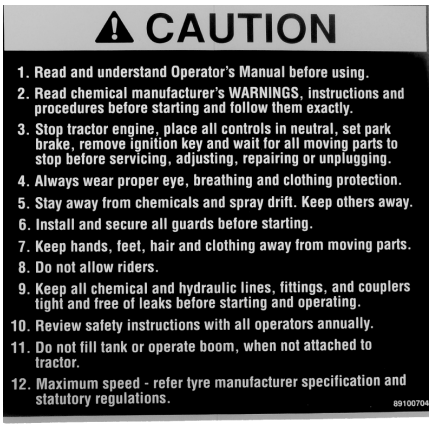

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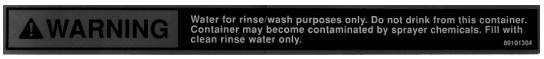

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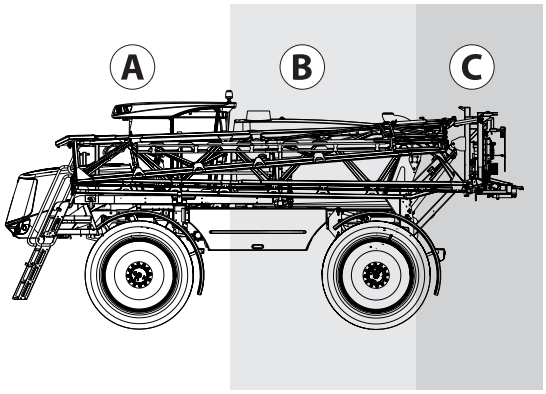
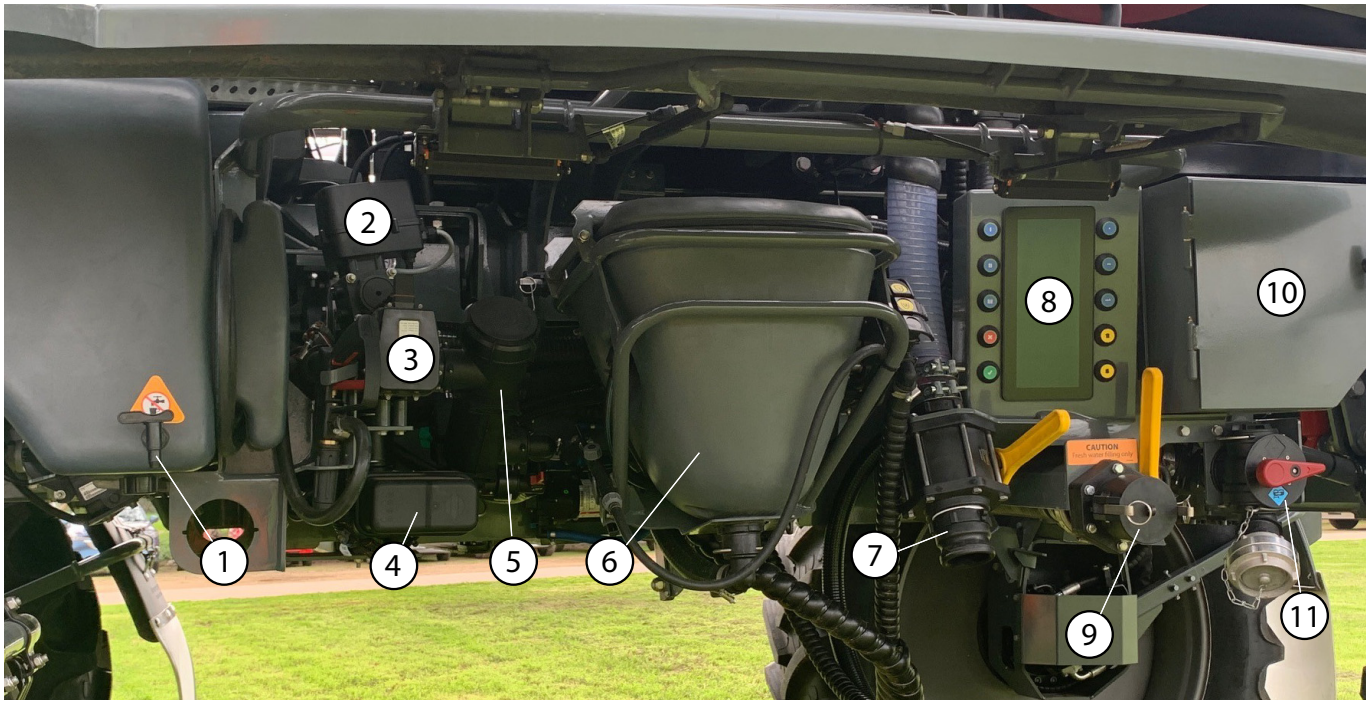
3.1 General information

General View

The SARITOR is divided into 3 zones: a Clean zone, a Working zone and an Application zone, referring to the level of possible pesticide contamination. In the following the functions and features are listed by zones. Please note that some of the features are optional equipment.



A. Clean zone	Engine Working platform with ladder Cabin Tap for hand washing Access to Main tank
B. Working zone	Tank level indicator Multipath Valves FastFiller coupler TurboFiller
C. Application zone	Boom lift, up/down Boom Nozzles Mudguards Suspension

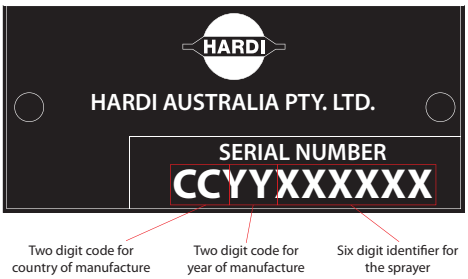


1. Clean Water Tap
2. RegulationValve
3. PressureValve
4. AgitationValve
5. SelfCleaningFilter
6. TurboFiller
7. SideFill (BatchFill)
8. HIVE Display
9. FreshWaterFill (BanjoFill)
10. Secondary Tool Box
11. VenturiFill

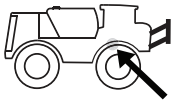
1. Primary Tool Box
2. Access Ladder
3. Fuel Tank

Identification plates

An identification plate is fitted near the front right hand side of the chassis on the sprayer. The reference number on plate will help you and your HARDI dealer to clearly identify your machine and assist in the correct supply of spare parts and service information.



ATTENTION! The identification plate is regulatory, it should always be in place on the sprayer. For all information about the machine, please quote the serial number of the sprayer.



Roadworthiness

When driving on public roads and in other areas, where the highway code applies, or in areas with special rules and regulations for marking and lights on implements, you should observe these and equip implements accordingly.

it is imperative to follow the directions of the Highway Code or any other regulations regarding the mandatory equipment on the farm equipment (lighting, beacon, etc.). Be sure to check the regulation regarding that the overall dimensions, including the height and width of the sprayer.

ATTENTION! Maximum driving speed for sprayers with or without brakes is different. Maximum driving speed is 25 km/h for unbraked machines and 50 km/h for braked machines.

DANGER! You must in all circumstances adapt your driving on the road, particularly by reducing your speed in the turns and dips.

Driving in field

The operator should be very careful of the risk of overturning concerning the sprayer speed as well as the slope of the field.

DANGER! Boom manoeuvres should be carried out when the sprayer is stationary. Before any manoeuvre of the boom, make sure that there is no obstacle in the vicinity (electrical line, person, pole, etc.).

Sprayer Use

The HARDI sprayer is for the application of crop protection chemicals and liquid fertilizers. The equipment must only be used for this purpose. It is not allowed to use the sprayer for any other purposes.

If no local law demands that the operator must be certified to use spray equipment, it is strongly recommended to be trained in correct plant protection and in safe handling of plant protection chemicals to prevent unnecessary risk for personnel and the environment, when carrying out your spray job.

Steel Frame

A very strong and compact steel frame / chassis with a strong chemically resistant, weatherproof electrostatic and UV resistant powder coat. Screws and bolts etc. are made of stainless steel, or they have been Delta/Magni-treated to resist corrosion.

3 - Description

Tanks

The tanks are made of stainless steel, resistant to UV radiation and chemicals.

The main tank has a purposeful design with no sharp corners for easy cleaning.

The tank lid is placed so it can be accessed from the platform. This ensures an easy access for the filling and cleaning of the tank, etc. The sprayer is also equipped with a TurboFiller, a RinseTank with a capacity of 450 litres and a HandWash Tank.

The sensors located inside main tank and rinse tank indicate the tank level on the HIVE screens located in cabin and fluid system.

Nominal main tank content is 7000 litres.

Lifetime

The expected lifetime for the sprayer is upto 10 years depending on use and conditions.

A sprayer's expected lifetime is the subject of multiple factors:

- Operating conditions and care of use
- Hours per year of operation
- Variations of agrichemicals used
- Service and Maintenance completed in a timely manner
- Cleaning the Sprayer
- Use of original parts

To obtain this successfully, these instructions should be followed:

- All service and maintenance work must be completed in due time
- Repair any damaged parts as quickly as possible
- Replace or change spare parts as instructed
- Only use original HARDI spare parts

ATTENTION! If using acidic liquid in a spray boom with stainless steel piping, this will shorten the lifetime significantly, as these pipes are not acid-proof. Risk of corrosion and leaks.

3.2 Boom

Boom and terminology

The Saritor Mallee is available with two different boom types. The B3 (48.5m) booms are 3-folded and the TR5 (36.5m and 42.5m) booms are 2-folded. The booms are supported by a wide Paralift which enhances the stability of the boom and is hydraulically dampened for smooth ride and performance. The AutoTerrain centre is a Pendulum type specifically designed for stability and auto height control. Yaw-dampening occurs through the fold cylinders. The booms are fully hydraulically operated Z-version with all functions controlled via the Direct Hydraulic System (D.H.).

Boom features:

- Hydraulic centre lock
- Third outer sections incorporate spring-loaded breakaway
- Wing tilt control
- AutoTerrain
- Partial folding of outer sections. This enables alternative boom widths
- Boom lights (optional)

For 3-folded booms the terminology is as follows:

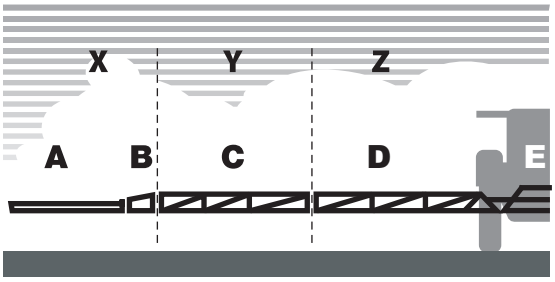
A. Breakaway section

B. Second outer section

C. First outer section

D. Inner section

E. Centre section



NOTE! When controlling the boom at the folding buttons, the folding sections are:

X Second outer and breakaway section

Y First outer section

Z Inner section

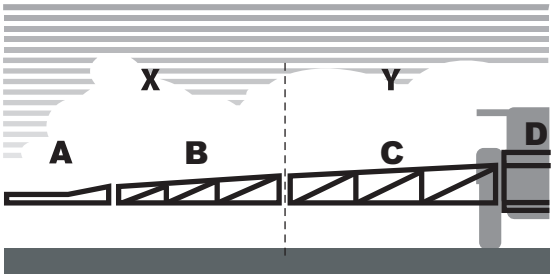
For 2-folded booms the terminology is as follows:

A. Breakaway section

B. First outer section

C. Inner section

D. Centre section



NOTE! When controlling the boom at the folding buttons, the folding sections are:

X First outer and breakaway section

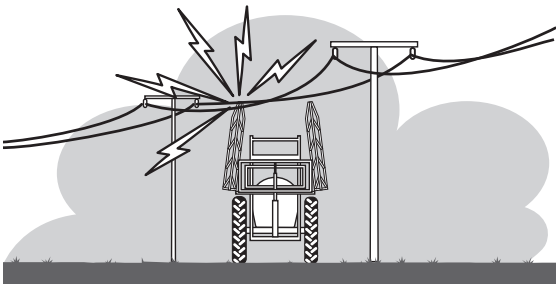
Y Inner section

Safety info

The boom must not be folded/unfolded while driving! Never use the folding/unfolding functions before the sprayer has been stopped! Failure to do so will damage the boom.

Keep the spray boom in folded position while driving outside the field. Park the sprayer on level ground before using the folding/unfolding functions.

Failure to comply will damage the boom and cause dangerous situations to people and the surroundings.



DANGER! When folding or unfolding the boom, make sure that no persons or objects are within the operating area of the boom.

DANGER! Always follow the guidelines listed below when driving in areas with overhead power lines.

DANGER! Stop using the folding/unfolding functions in areas with overhead power lines. Unintended boom movements may cause contact with overhead power lines, causing a risk of fatal accidents.

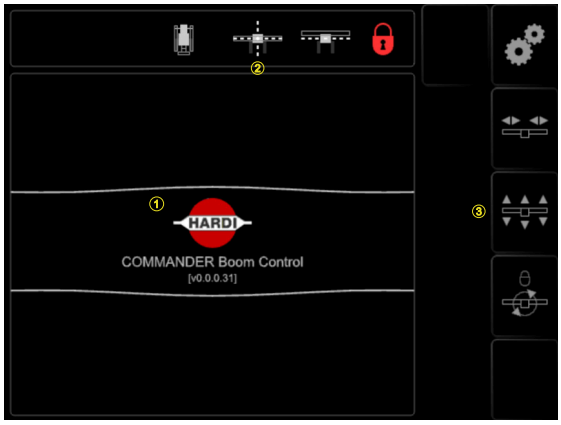
ATTENTION! A label (HARDI item no. 978448) is fitted to the sprayer. This label must be placed in an easily visible position.

3.3 Boom Controls HCH - 508 Overview

Main screen

The main screen of the HCH-508 ISOBUS hydraulic control system is displayed on the right. There are 3 elements to this screen.

1. Profile description and firmware version.
2. Top row display showing basic boom conditions.
3. RH column soft keys to access further operational pages.

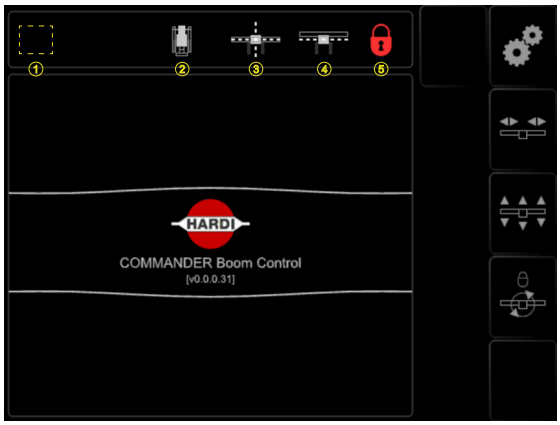


3 - Description

Top row iconography

The top row of the HCH-508 ISOBUS hydraulic control system is always shown at the top of the VT screen. There are 5 elements that may be seen from this part of the display.

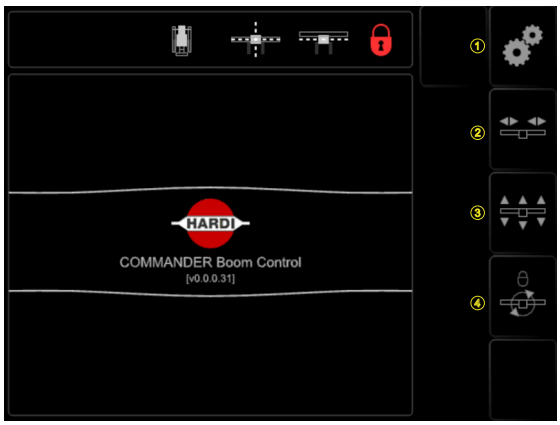
1. Active error symbol and error code (only when an error exists).
2. Inner boom fold condition.
3. Boom centre slant condition.
4. Boom height position.
5. Pendulum lock condition.



RH column soft keys

The RH soft keys allow access to different pages of the HCH-508 ISOBUS hydraulic control system. The soft keys may change depending on the page that is displayed. The following pages are available from the main screen:.

1. Settings.
2. Boom fold control.
3. Boom height control.
4. Slant and pendulum lock control.



Settings screen keys

The settings screen allows the user access to further menus for setup, diagnosis or emergency operation. The following pages are available from the settings screen:.

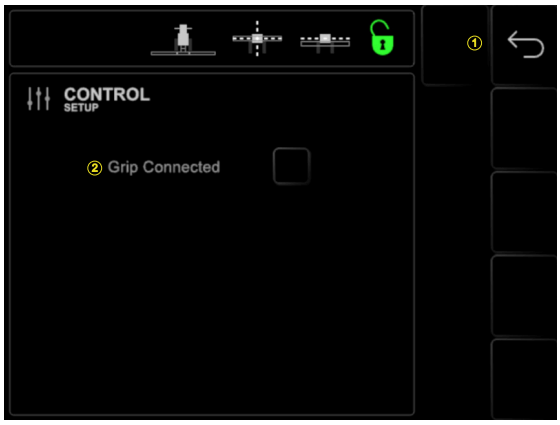
1. Return to the main screen.
2. Control setup screen.
3. Sensor information screen.
4. EMERGENCY MODE!

Control setup screen

The control setup screen allows the user to select various options:.

1. Return to the settings screen.
2. Allow grip functionality.

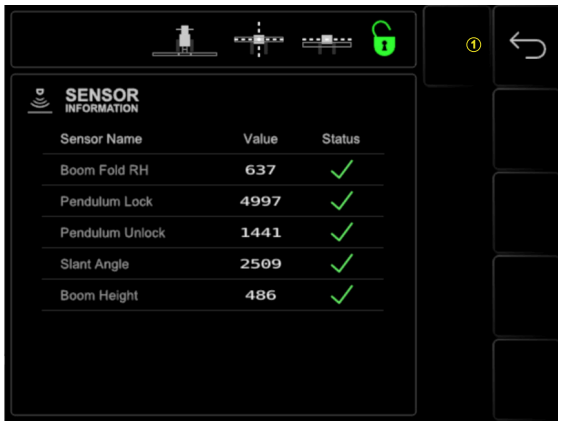
When the check-box is checked, the Hardi grip can be used to control some hydraulic functions. If the grip is unavailable or faulty, this check-box can be unchecked to prevent fault codes from being raised in relation to the Hardi grip.



Sensor information screen

The sensor information screen allows the user to view the output of sensors fitted to the machine. It also shows whether the sensor is within the normal operating range with a green tick, or out of range with a red cross. There are no actions available from this screen other than:

1. Return to the settings screen.



Emergency mode screen

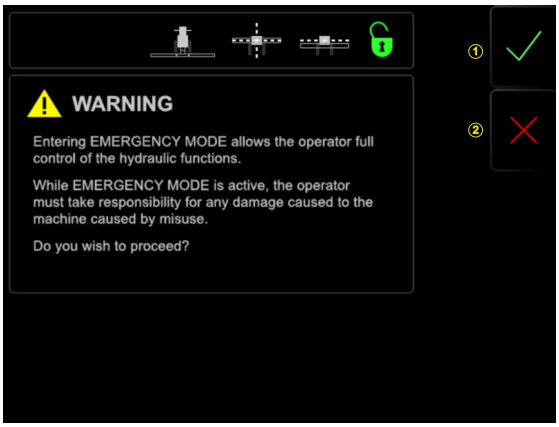
Access to the emergency mode is restricted, and the following must be acknowledged by the operator before proceeding:

"Entering EMERGENCY MODE allows the operator full control of the hydraulic functions."

"While EMERGENCY MODE is active, the operator must take responsibility for any damage caused to the machine caused by misuse."

"Do you wish to proceed?"

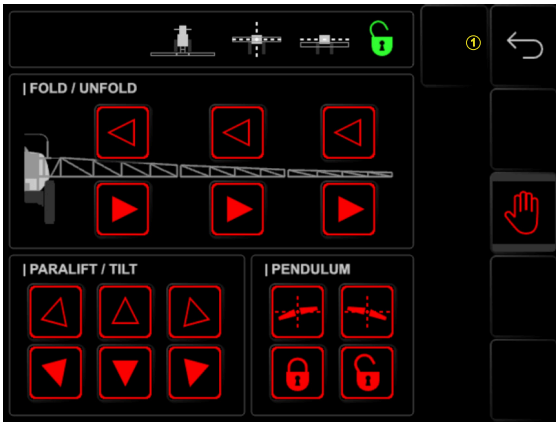
1. Pressing the tick will enter emergency mode.
2. Pressing the cross will return the user to the settings screen.



NOTE! The HCH-508 retains a permanent record of every time the emergency operations screen is accessed.

The emergency mode screen allows all hydraulic functions regardless of sensor signals or boom fold logic. The following is a list of reasons when emergency mode may be required:

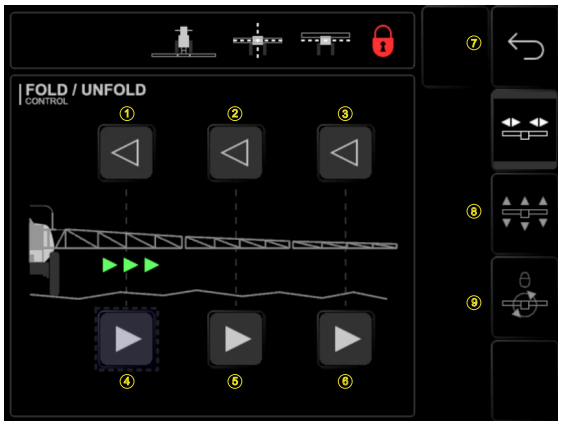
1. To allow folding or unfolding of the boom when normal operations have been interrupted.
2. To allow unfolding of the boom so that critical spraying operations may be completed, or to affect repairs to damaged sensors.
3. To allow folding of the boom for safe transport of the machine.



WARNING! Serious damage to the machine may occur when operating in this mode. Only use EMERGENCY MODE when necessary.

ATTENTION! Contact your local HARDI dealer as soon as practicable if repairs to the machine are required to bring it back into a normal state of readiness.

Boom fold control screen



The boom fold control screen of the HCH-508 ISOBUS hydraulic control system allows for the folding or unfolding of the boom when the machine is stationary. Access to all other boom functions are available whilst in this screen.

The available functions are:

1. Inner boom fold
2. 1st outer boom fold
3. 2nd outer boom fold
4. Inner boom unfold
5. 1st outer boom unfold
6. 2nd outer boom unfold
7. Return to the main screen
8. Boom height control
9. Slant and pendulum lock control

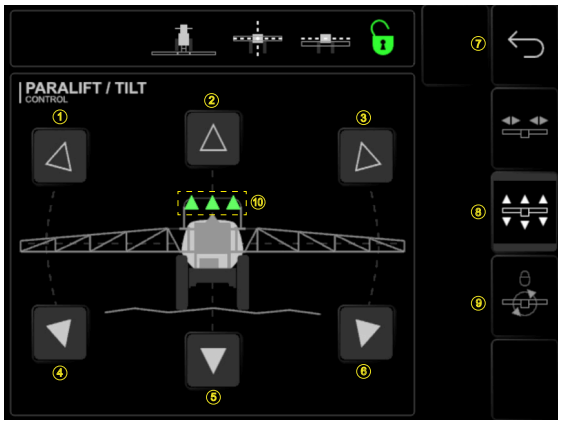
All boom functions have visual feedback on the relative screen. This feedback is activated from the VT screen soft keys and from the Hardi grip.

ATTENTION! Only one function can be used at a time (including grip).

ATTENTION! If the vehicle speed is above 1.5km/h a warning message will popup. STOP the machine before unfolding or folding.

ATTENTION! The boom must be raised above a certain set point before it can be folded or unfolded. The set point is indicated by the boom height position icon on the top row.

Boom height control screen



The boom height control screen of the HCH-508 ISOBUS hydraulic control system allows for lifting and lowering of the boom and wings at anytime. Access to all other boom functions are available whilst in this screen.

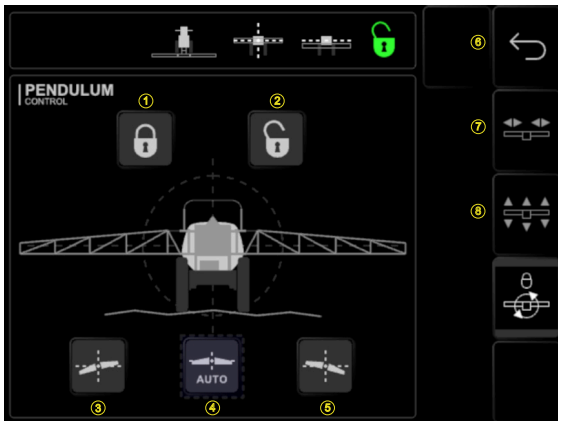
The available functions are:

1. LH boom wing tilt up
2. Raise boom centre
3. RH boom wing tilt up
4. LH boom wing tilt down
5. Lower boom centre
6. RH boom wing tilt down
7. Return to the main screen
8. Boom fold control
9. Slant and pendulum lock control

All boom functions have visual feedback on the relative screen. This feedback is activated from the VT screen soft keys and from the Hardi grip.

NOTE! All of these functions are available from the Hardi grip if it is installed.

Slant and pendulum lock control screen



The slant and pendulum lock control screen of the HCH-508 ISOBUS hydraulic control system allows for the folding or unfolding of the boom when the machine is stationary. Access to all other boom functions is available whilst in this screen.

The available functions are:

1. Lock the boom centre pendulum
2. Unlock the boom centre pendulum
3. Slant the boom centre anticlockwise
4. Auto-level the boom centre
5. Slant the boom centre clockwise
6. Return to the main screen
7. Boom fold control
8. Boom height control

WARNING! IF auto-height is installed, the boom centre pendulum must be unlocked before engaging the auto-height control. Failure to do so will result in erratic boom movement and damage to the machine.

3.4 Hydraulic System

AutoTerrain

AutoTerrain is a computer controlled pre-emptive boom stability & auto height control system which maintains the correct relationship and height of the boom to different field conditions. AutoTerrain highly tuned computer controlled proportional electro-hydraulics and ultrasonic sensors help spray more safely, reducing potential ground strikes and prevents incorrect spray height.

WARNING! The pendulum centre stability control linkage points must be regularly lubricated to protect swivel balls from moisture penetration and prevent swivel ball seizure.

WARNING! The boom should never be used to spray with the pendulum lock engaged.

ATTENTION! For optimum AutoTerrain performance the stability & height control sensors must be checked and cleaned regularly.

ATTENTION! Dusty, damp or missing sensors pads will not read accurately and AutoTerrain will be compromised. Foam pads must be washed and dried daily. The boom should not be used if foam pads are missing from the sensors.

ATTENTION! Regarding AutoTerrain, please refer to specific book for information about Operation, Calibration and Maintenance.

AutoTerrain Hydraulic block

On sprayers with AutoTerrain, this hydraulic block manages hydraulic pressure for the automatic boom height control functions. Functions controlled include:

- Lift (paralift)
- Wing Tilt (left and right hand side)
- Centre AutoTerrain Cylinder

3.5 Liquid system

General information - valve system

All of the spray functions are operated via centrally situated valves with colour coded pictorial symbols for easy operation. The fluid system is located on the self-propelled sprayers left side under the cover. To access the Fluid Working Zone open the cover. Most valves can be operated from both the Fluid Working Zone or from the cab.

Pump

The centrifugal pump has a simple design. The pump and valves are easy to access, they isolate the moving parts from the liquid.

Valves and symbols

The valves are identified by coloured symbols according to their function. They correspond to the different possible functions of the valves, thus facilitating their use. A function is activated by turning the handle towards the desired function.

Suction valve

Suction valve = blue symbols

Turn the handle towards the symbol for the required function

 TurboFiller empty	 Chemical Probe Transfer	 Side Banjo Filtered Fast Filling System
 Rinse Venturi	 Suction from external source	 Front Banjo Filtered Fast Filling System (optional)
 Flush Tank Fill	 Main Tank Fill	 Main Tank drain

Pressure valve

Pressure valve = green symbols

Turn the handle towards the symbol for the required function

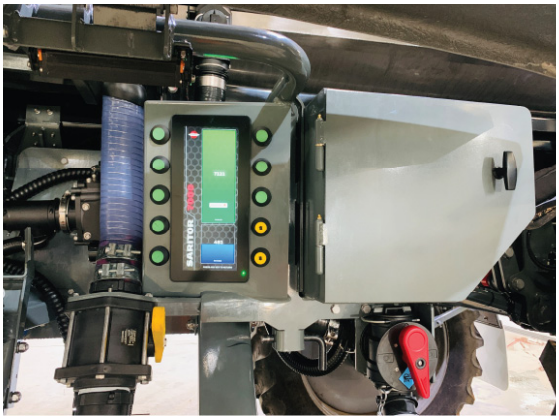
 TurboFiller Venturi/Probe	 Spray boom

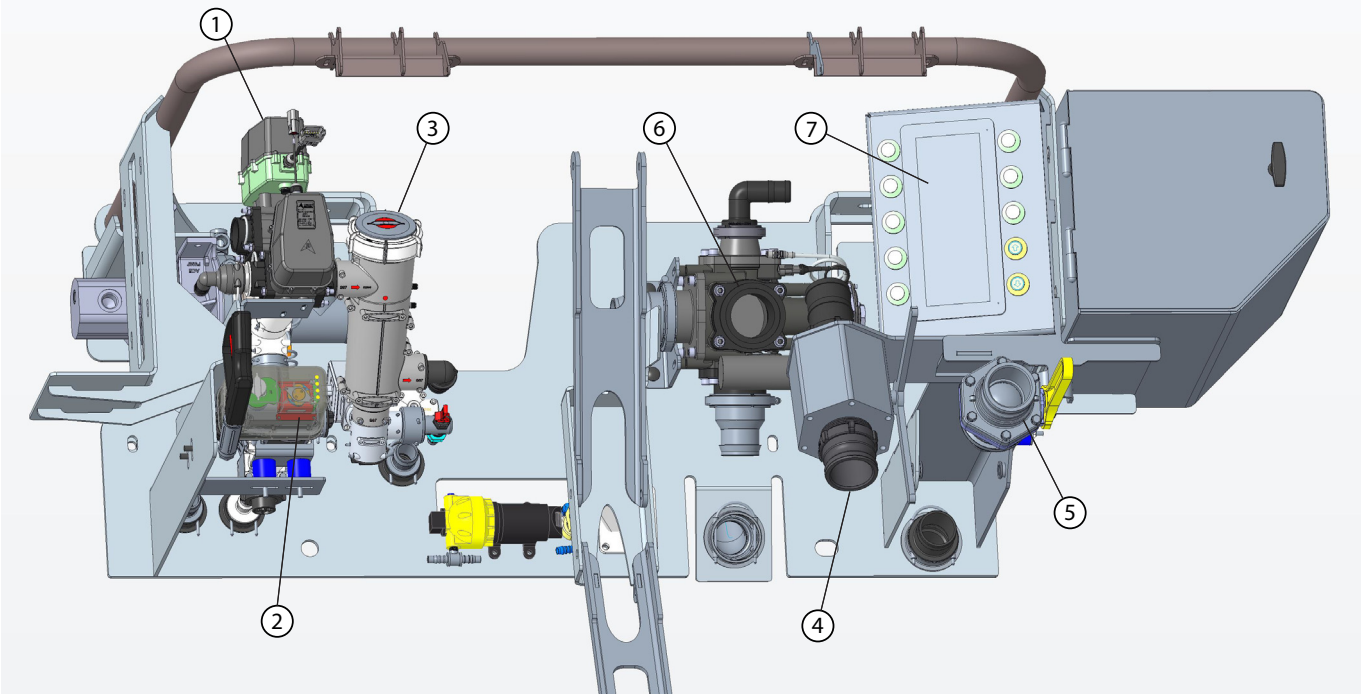
3.6 HIVE (Hardi Integrated Vehicle Environment)

General Information

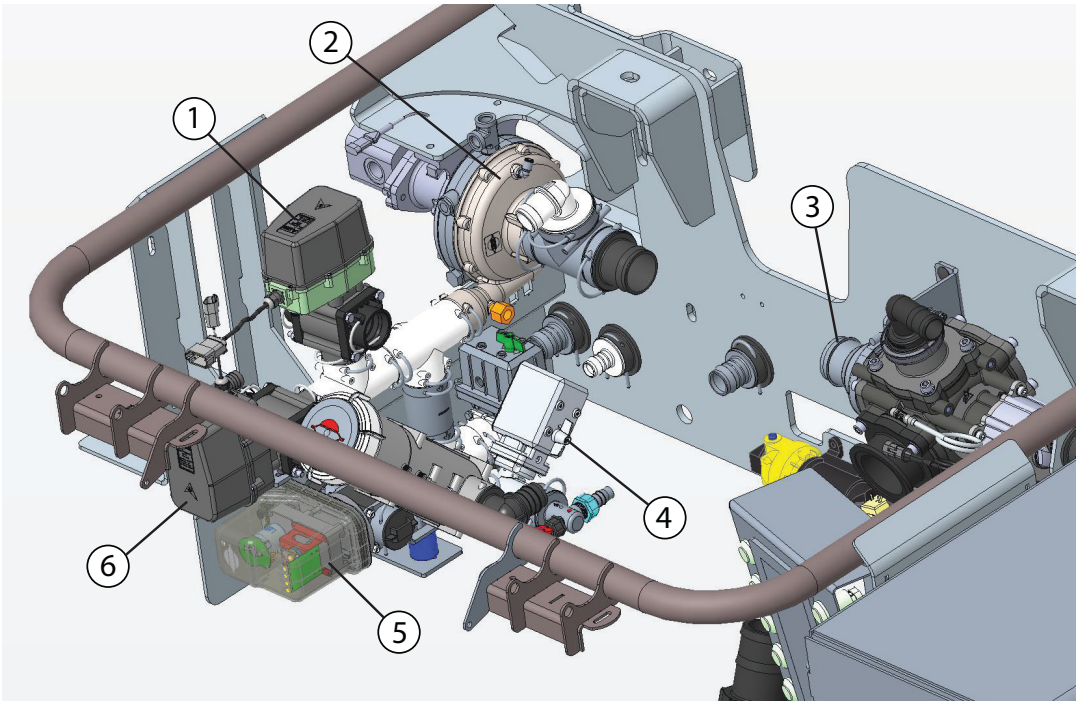
The HIVE brings together components and subsystems into one integrated system, ensuring that together they all function seamlessly as one. This advanced control system includes a completely remodelled armrest console with integrated dial and joystick interface and a display that promotes situational awareness inside and outside the cab by displaying critical information at eye level.

The "HIVE" concept extends to the filling station, with its new HIVE system screen. This displays clear filling information plus a set of visual guides and videos, so the operators can master filling the sprayer quickly. The Fill Station displays valve positions and pump speeds allowing hopper functions to be done automatically.





1. Main Regulation Valve
2. Agitation Valve
3. Self Cleaning Filter
4. Side Batch Fill
5. Fresh Water Fill (Banjo Fill)
6. Suction Valve
7. Hive Display



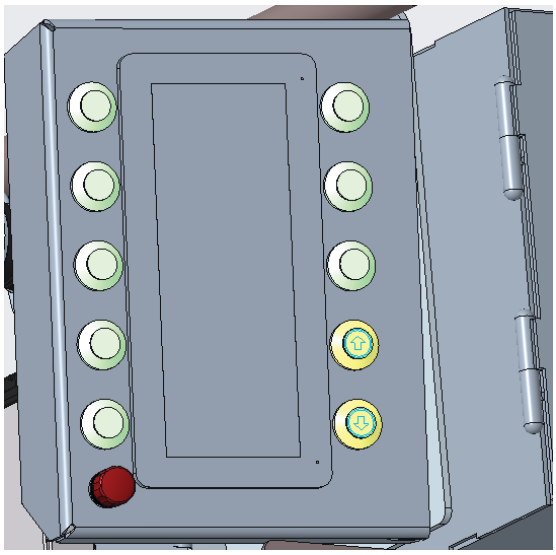
1. Main Regulation Valve
2. Main Pump
3. Suction Valve
4. Rinse Valve
5. Agitation Valve
6. Pressure Valve

User Interface - Overview

Operation of the fluid functions is performed using two displays – One located at the fluid station work zone and the other in the cabin. The fluid station display interface is accompanied by 10 buttons which provide the operator with a familiar and easy to way of selecting and controlling the fluid station functions.

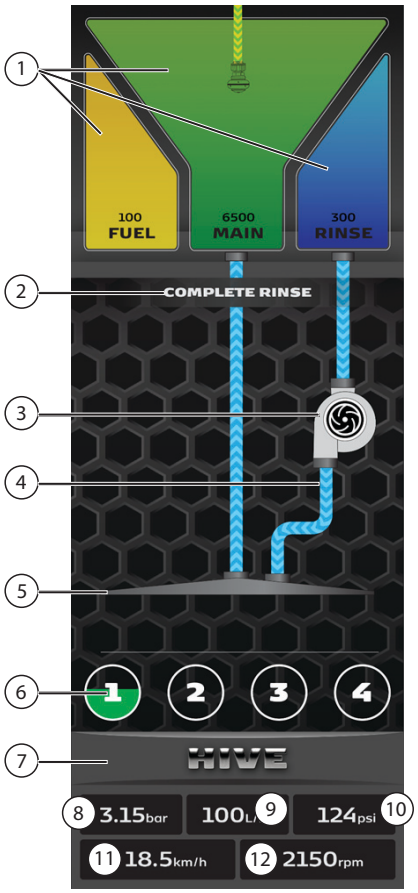
Green buttons are for selection and yellow buttons are for user input (ie. increase / decrease or left / right).

The red button is to stop the pump and to close all fluid valves.



ATTENTION! It does not stop the engine or turn the machine OFF.

Fluid Station Display Interface Layout



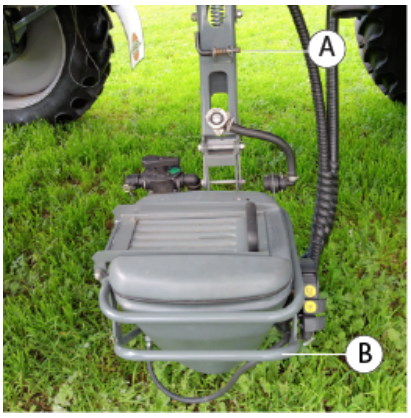
1. Tank Volumes
2. Current Function
3. Component State
4. Flow Indicator
5. Boom
6. Function Status
7. Operator Messages/s
8. Fluid Pressure
9. Rate
10. Air Pressure
11. Speed
12. Pump RPM

3.7 TurboFiller

TurboFiller = yellow symbols

The TurboFiller is located in the Fluid Working Zone on the sprayers left side. When being used it should be unlocked by pulling the locking lever and pulled down by grabbing the handle (B) downwards.

When retracting the TurboFiller after use, pull the handle (B) upwards until it is back in storing position.

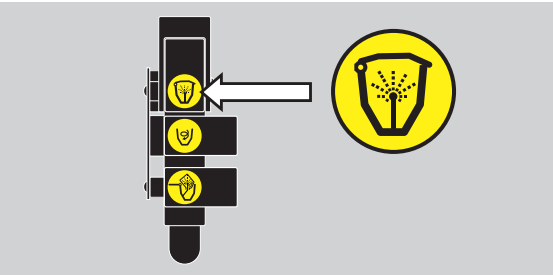


DANGER! Never operate the cleaning nozzle with the lid open unless it is covered by a chemical container!

WARNING! Before releasing the lock pin (A) always keep a hand on the grip to avoid abrupt movement of the TurboFiller!

Rinsing of TurboFiller Hopper

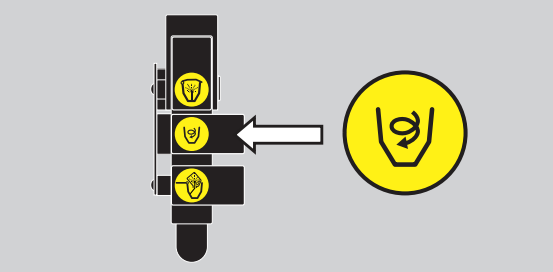
Use the upper lever for rinsing the hopper, when the filling of chemicals is completed and the lid is closed.



DANGER! Do not activate this lever, unless closing the TurboFiller lid, as spray liquid may otherwise hit the operator! Risk of injuries and spillage on the ground.

TurboDeflector Valve

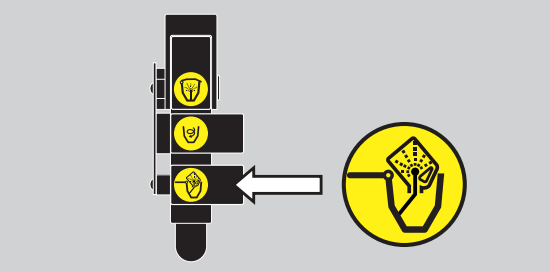
This TurboDeflector valve activates the vortex flushing of the TurboFiller. Push the lever for continuous liquid rotation in the hopper.



Rinsing of Chemical Containers

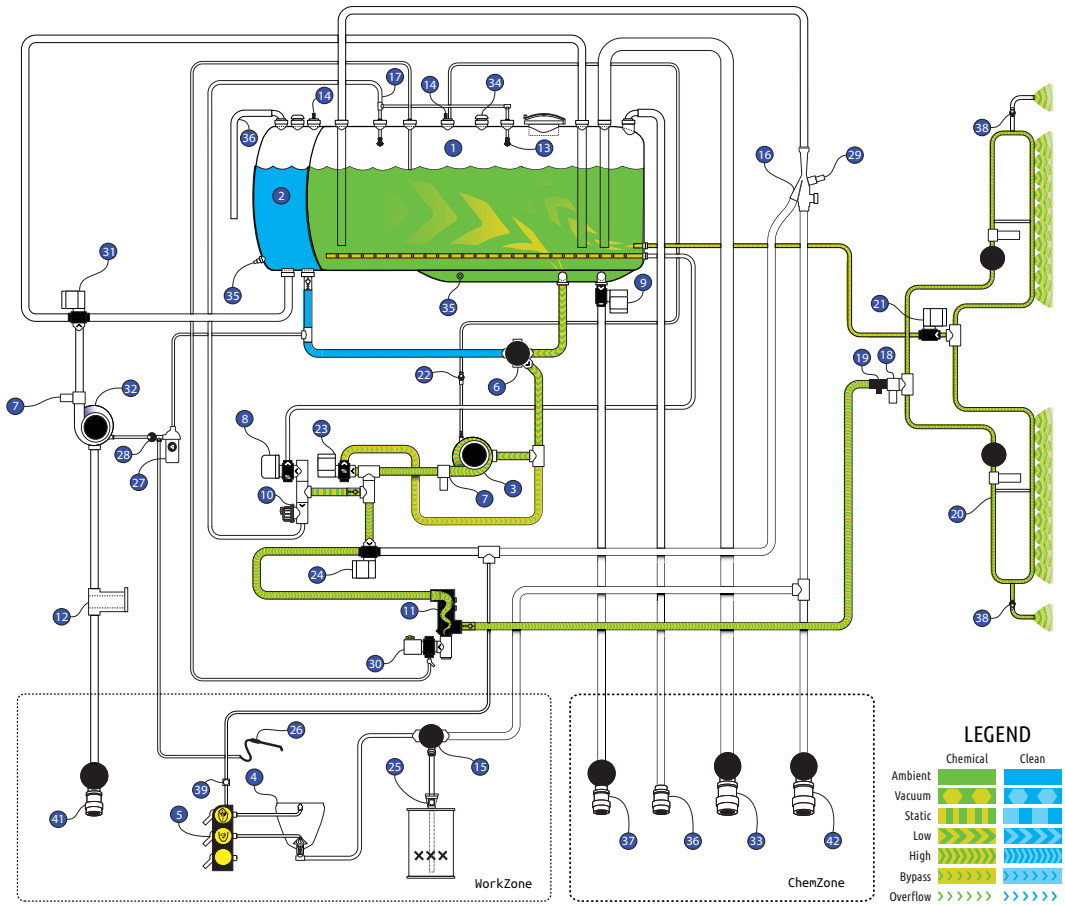
Use the valve for rinsing empty containers.

Enable the push-activated chemical container-rinsing nozzle, by lifting the lever up. Place the container over the rotating flushing nozzle in the left side of the TurboFiller. Then push to rinse the inside of the container.



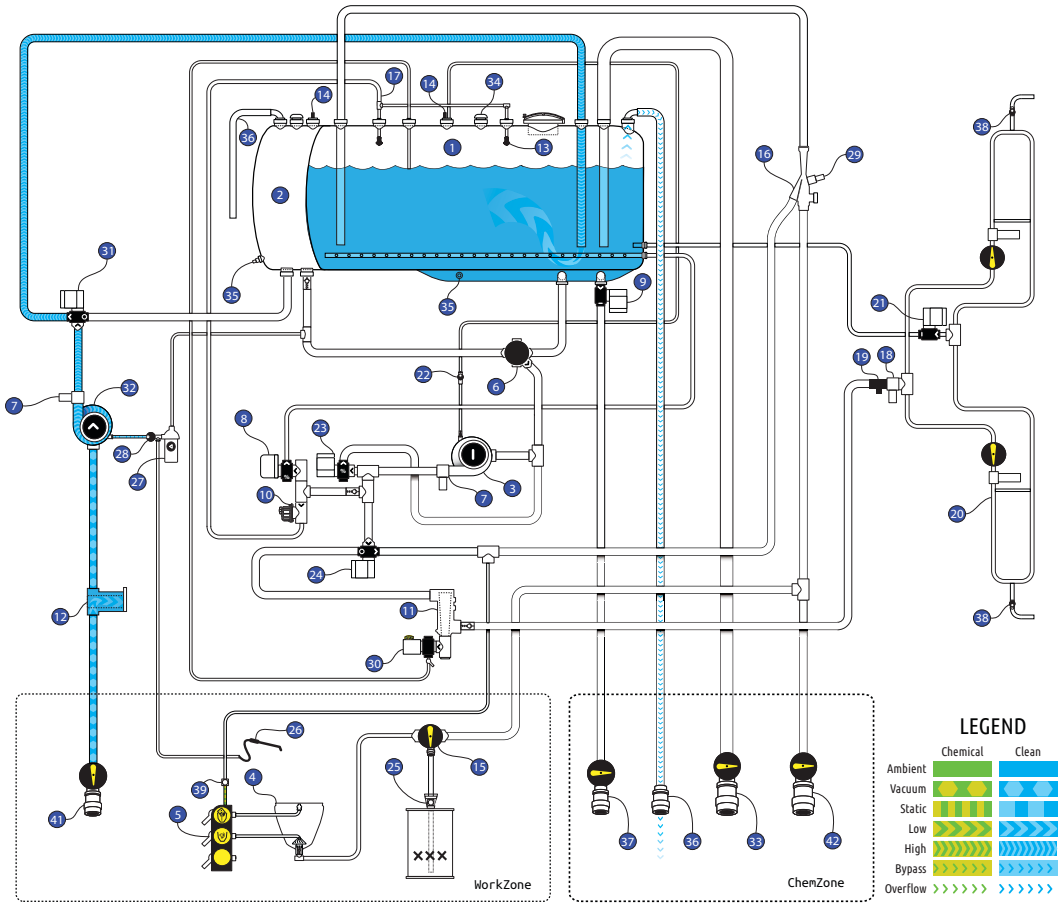
DANGER! Do not activate this lever, unless the nozzle is covered by a container as spray liquid may otherwise hit the operator! Risk of injuries and spillage on the ground.

Diagram - Fluid system - MODE 1 SPRAY



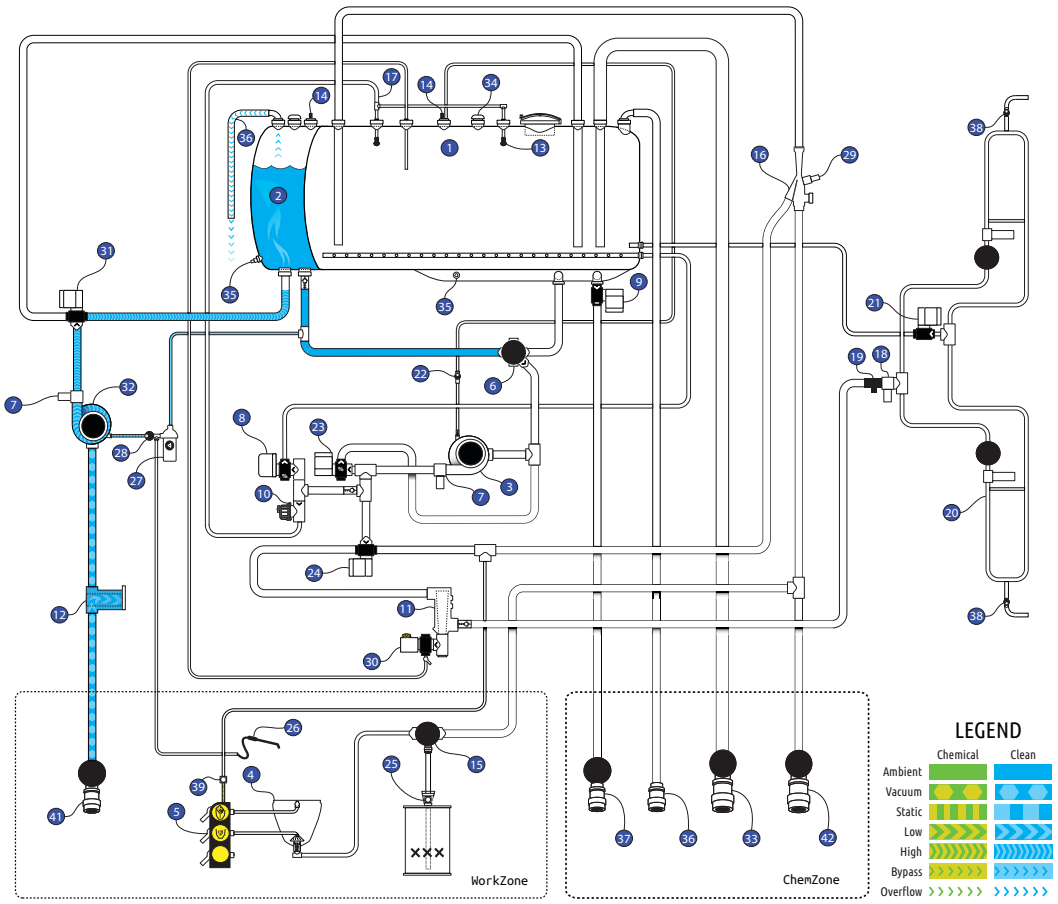
1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 2 MAIN TANK FILL



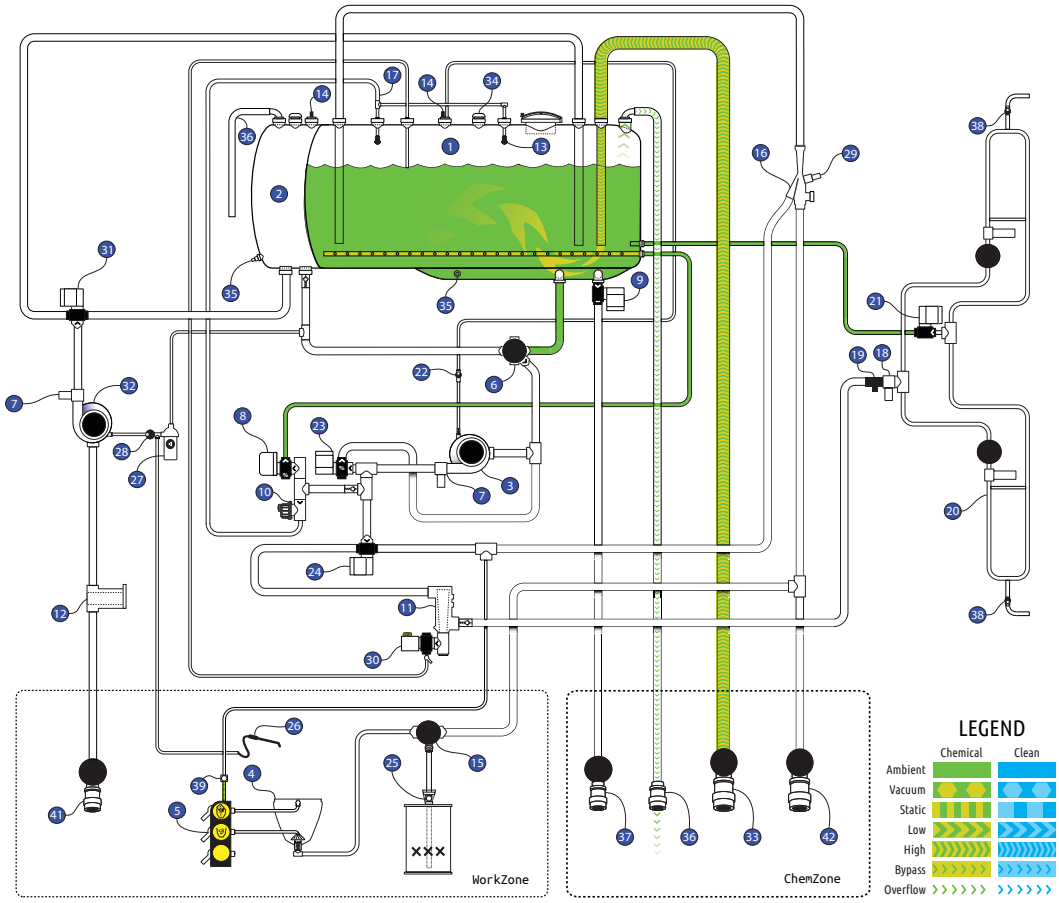
1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 3 FLUSH TANK FILL



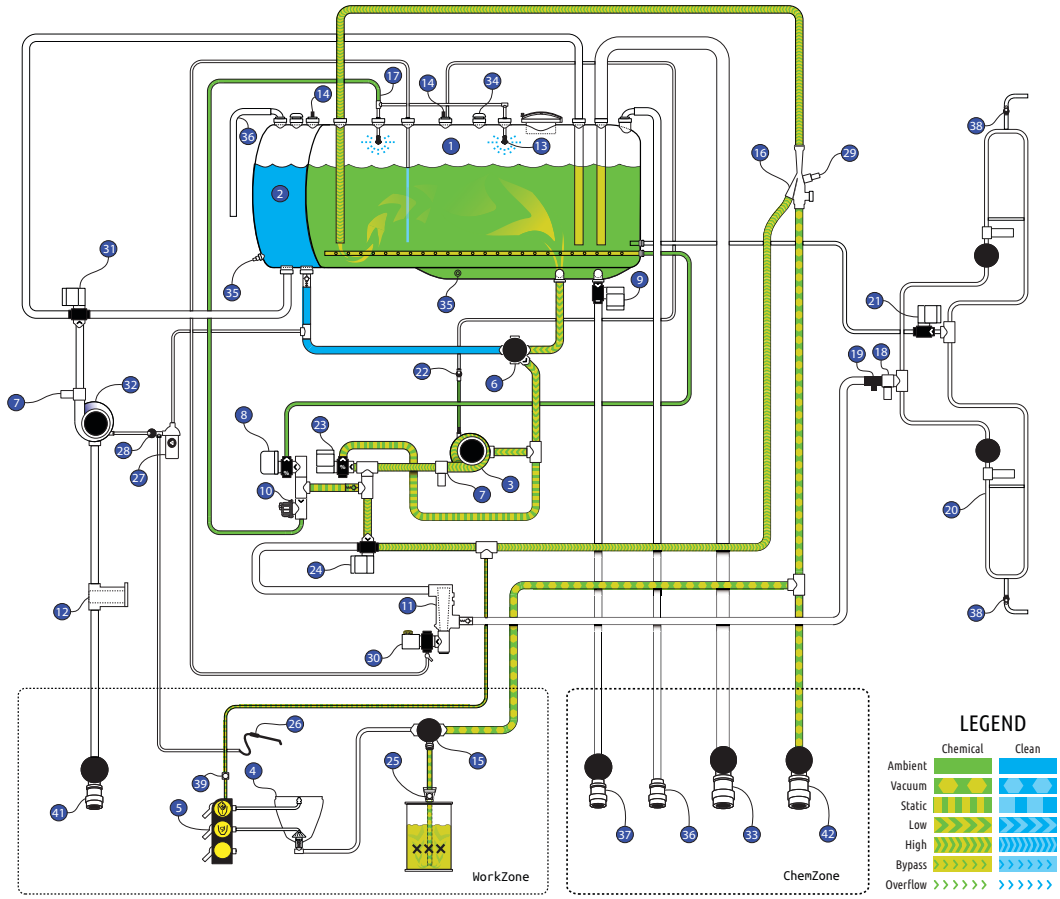
1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 4 BATCH FILL



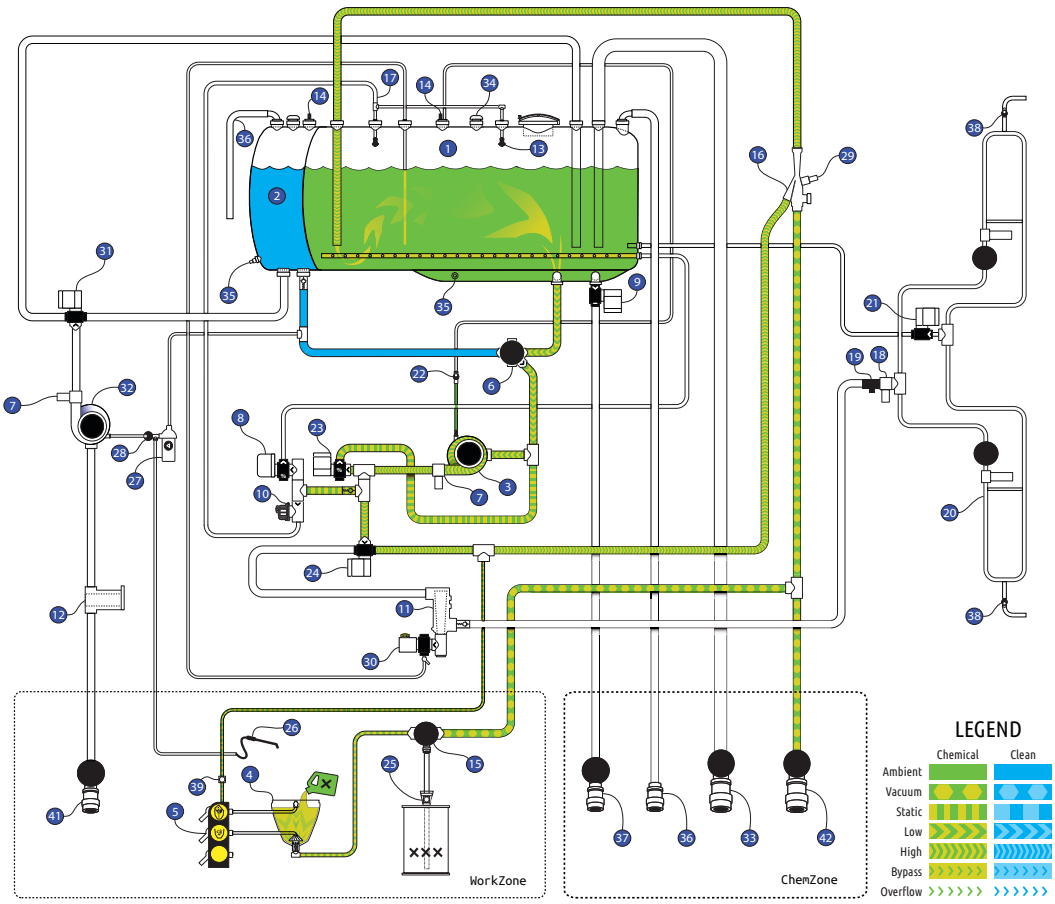
1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 5.1 VENTURI FILL - DRUM



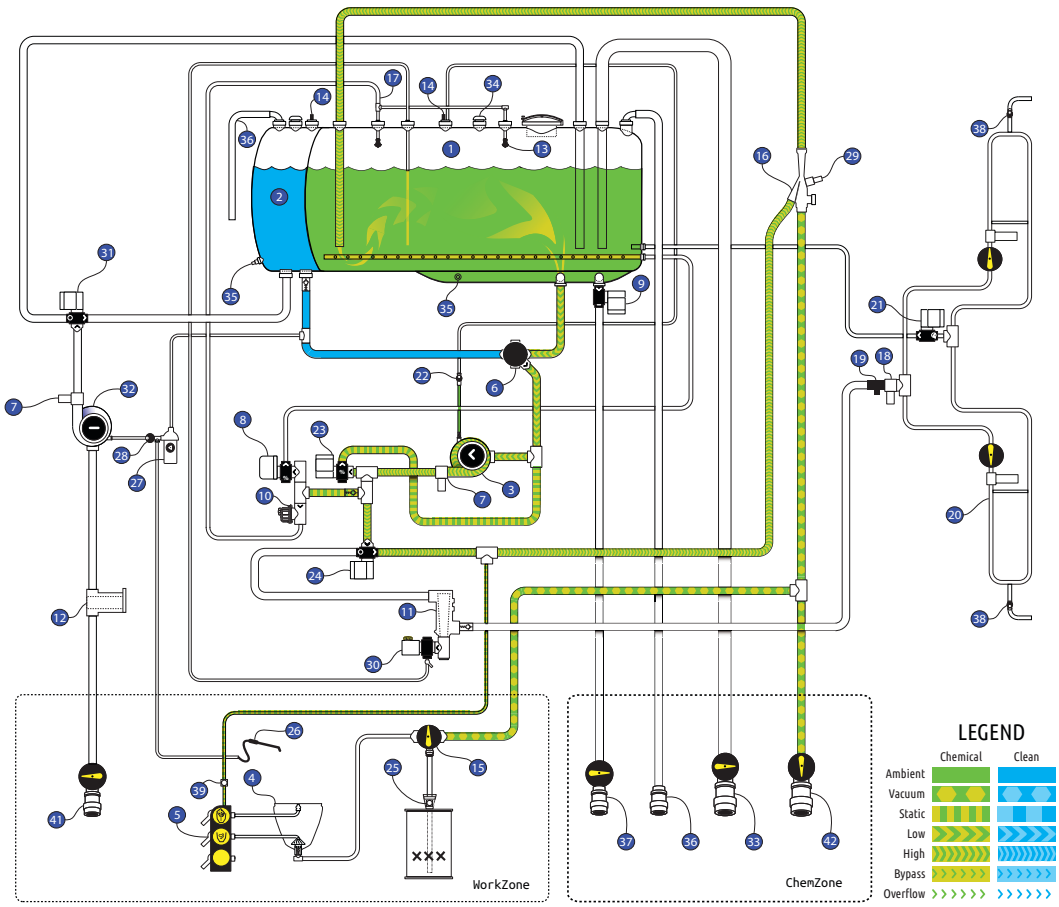
1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 5.2 VENTURI FILL - HOPPER



1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 5.3 VENTURI FAST FILL



1. Main Tank
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3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
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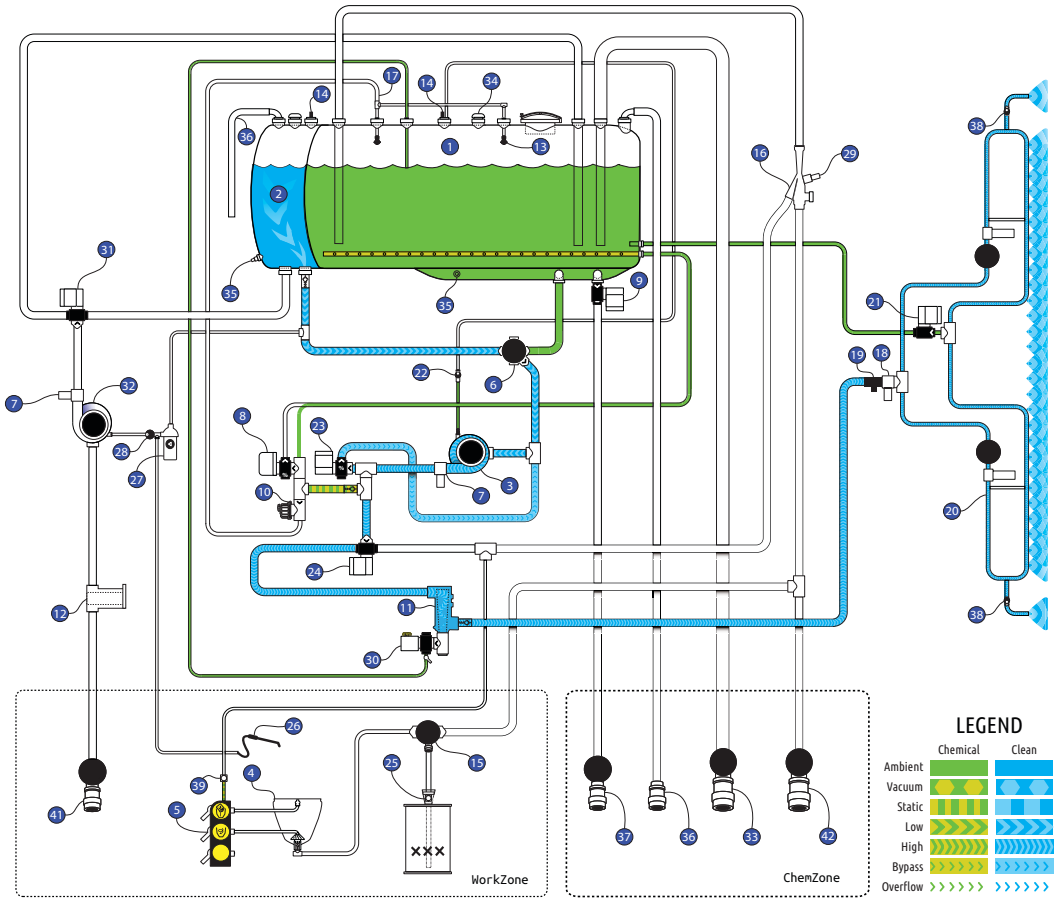
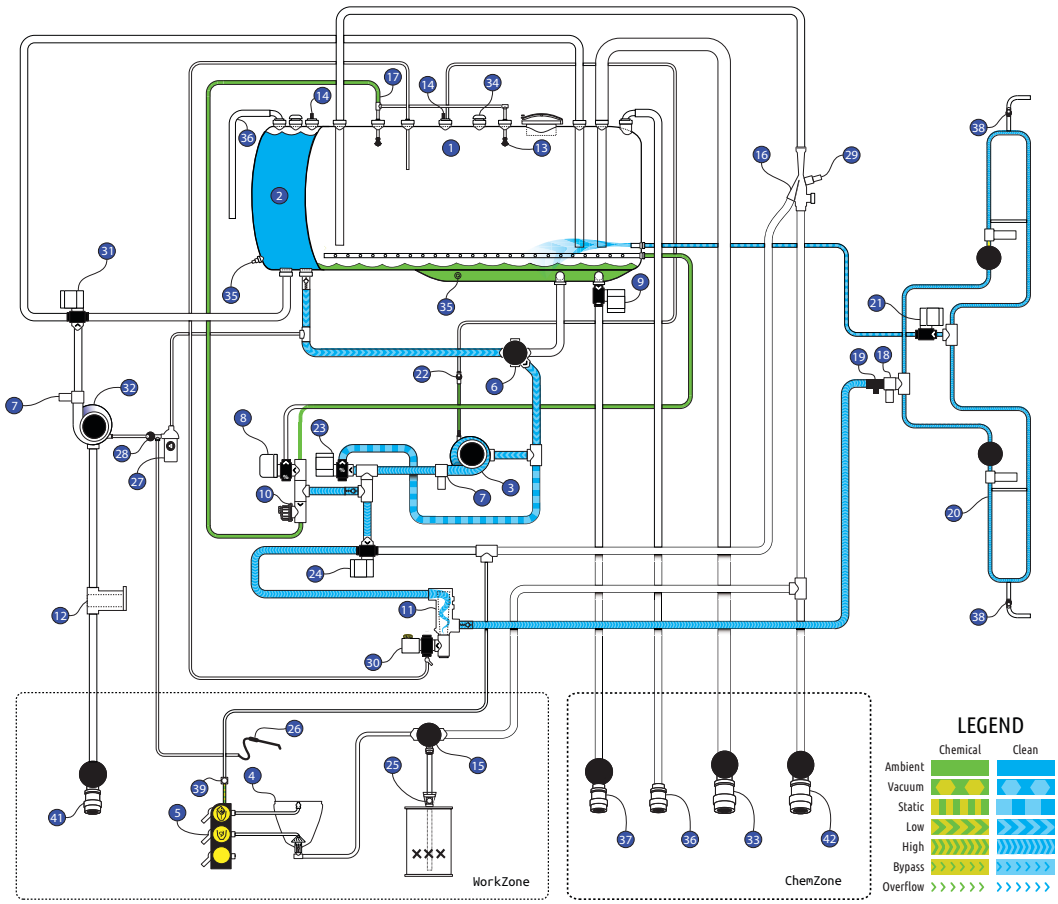
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 7 BOOM RINSE



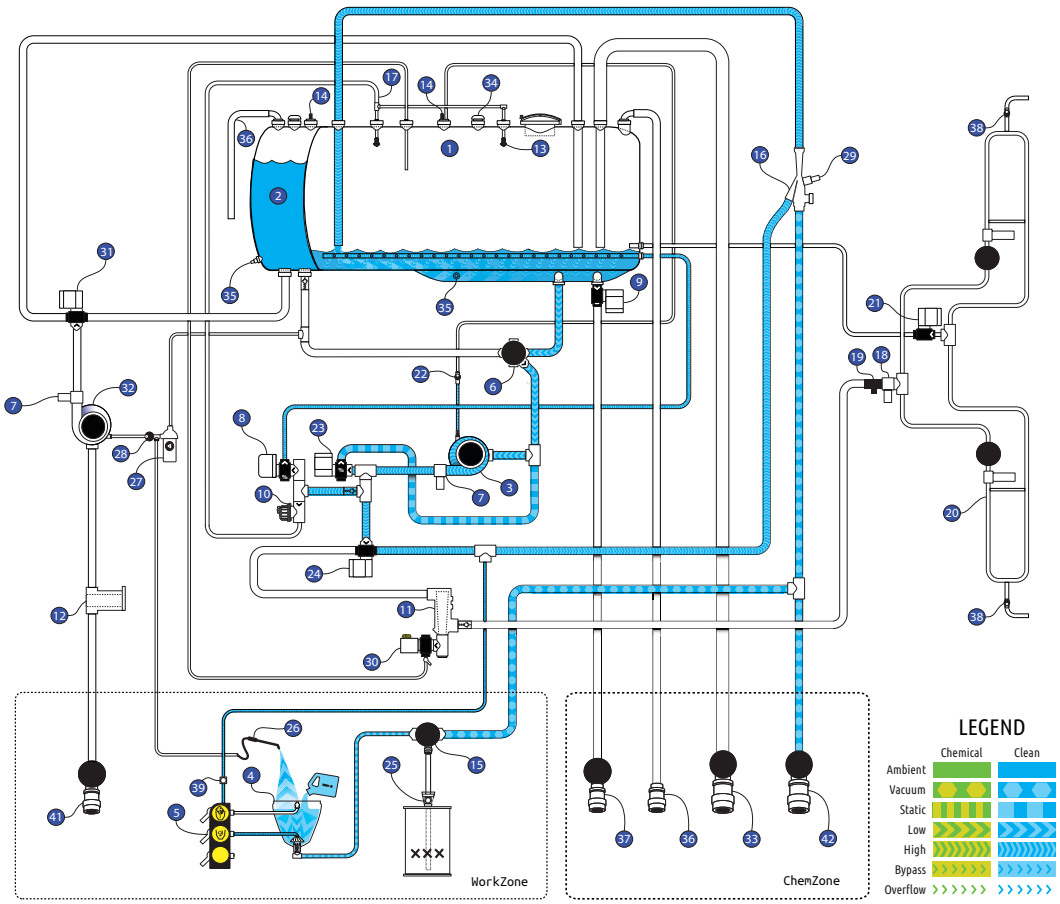
1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 8.0 COMPLETE RINSE - FILL



1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 8.1 COMPLETE RINSE - VENTURI



1. Main Tank
2. Flush Tank
3. Ace Pump
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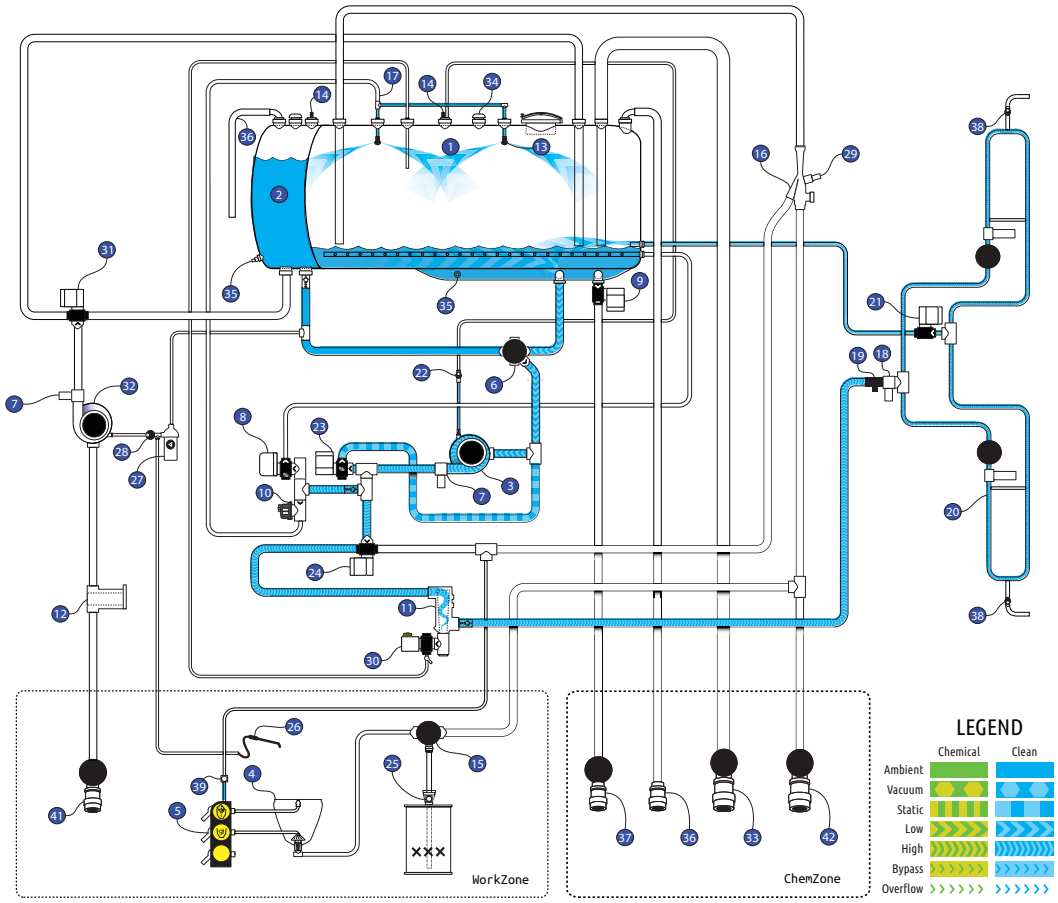
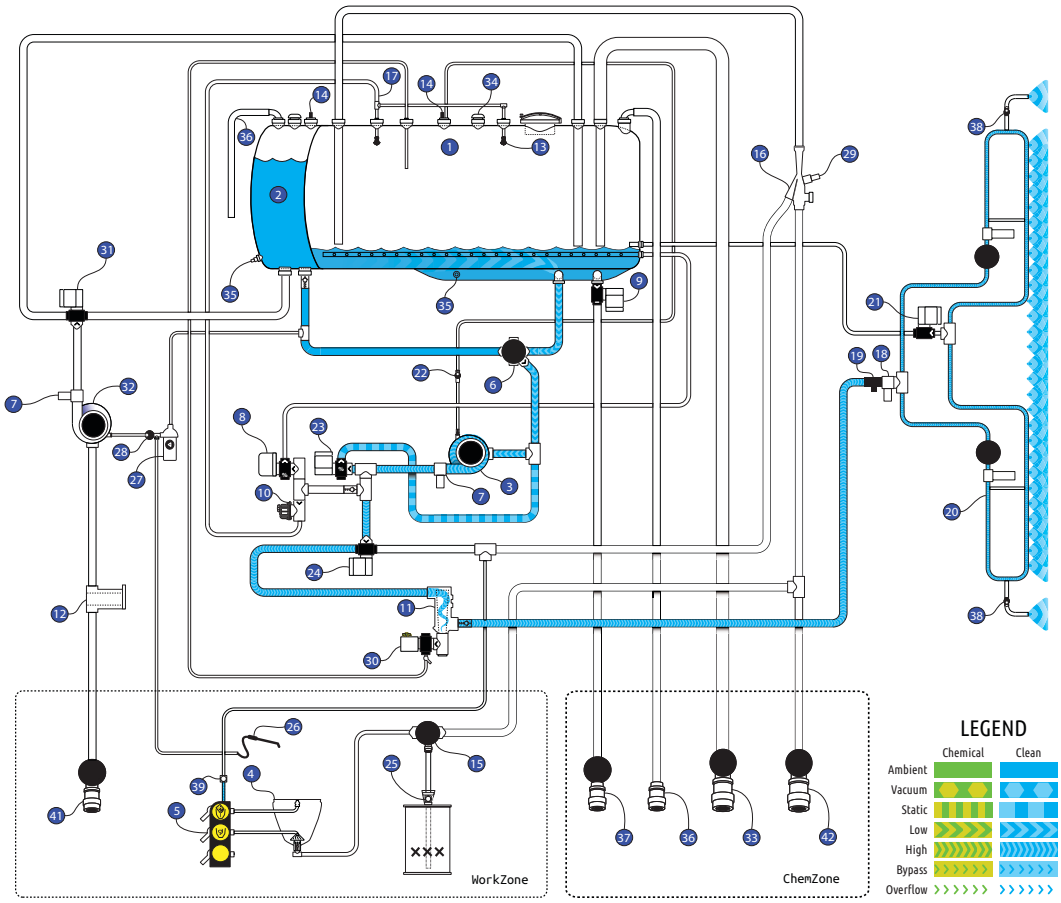
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 8.2 COMPLETE RINSE - MAIN



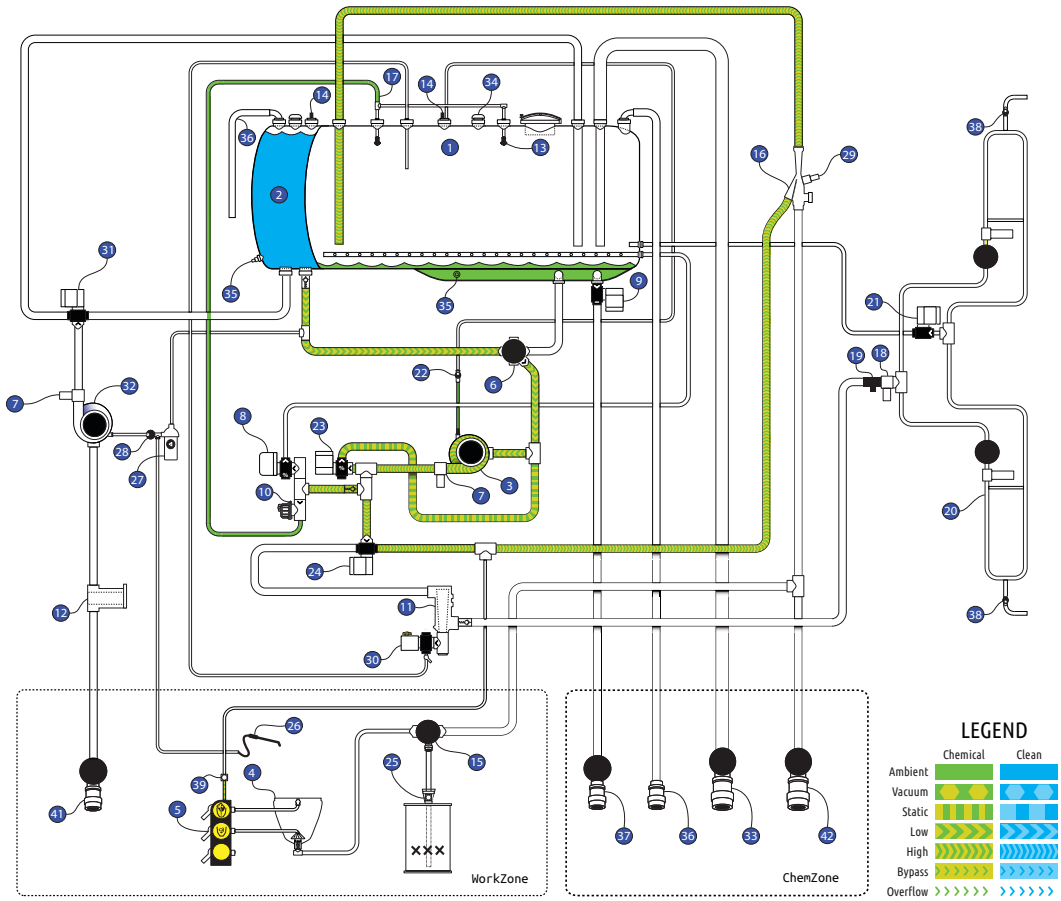
1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 8.3 COMPLETE RINSE - DUMP



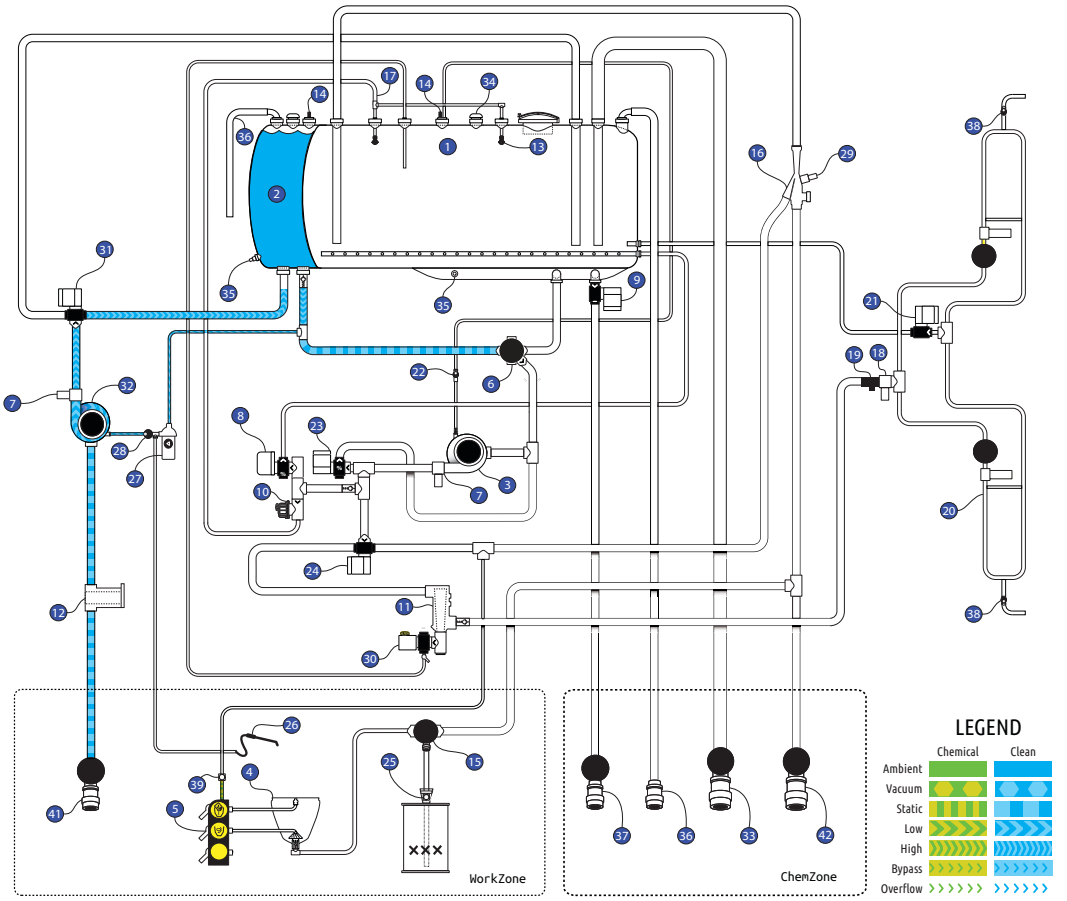
1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 9 PRIME - MAIN PUMP



1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 10 PRIME - FILL PUMP



1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
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26. Wash Down Hose
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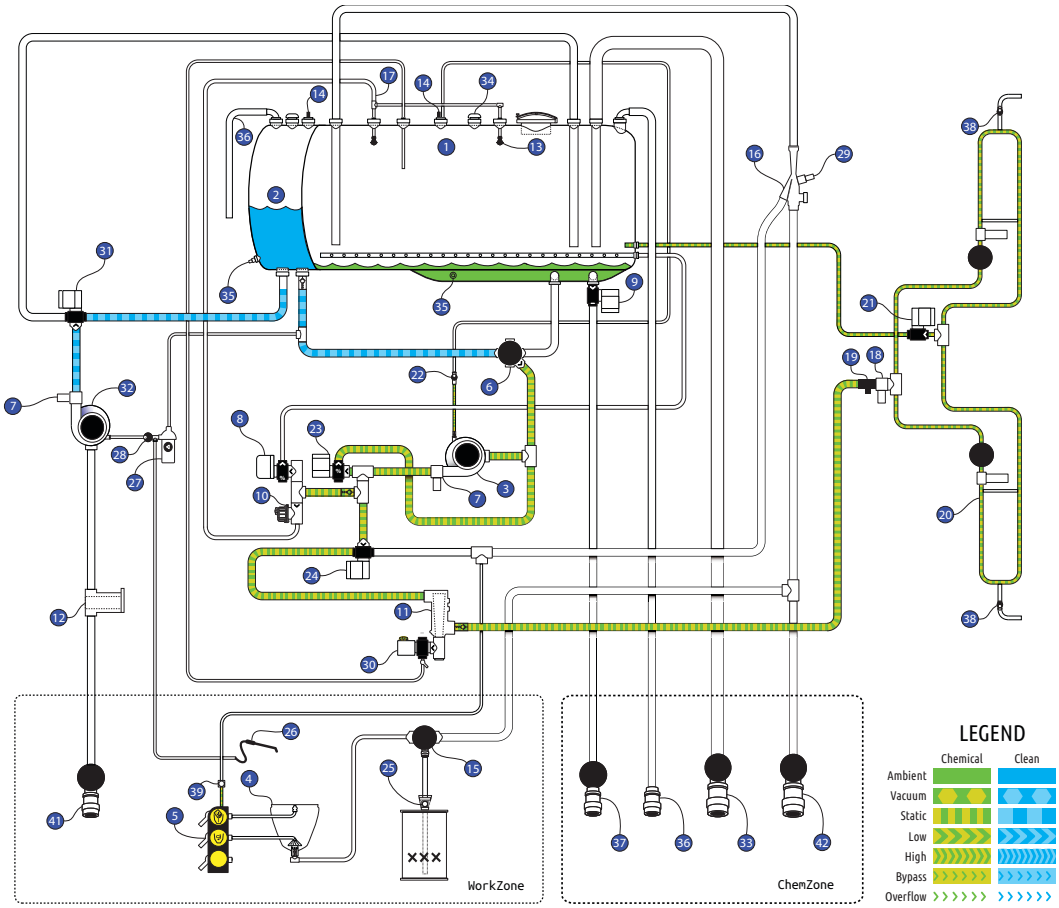
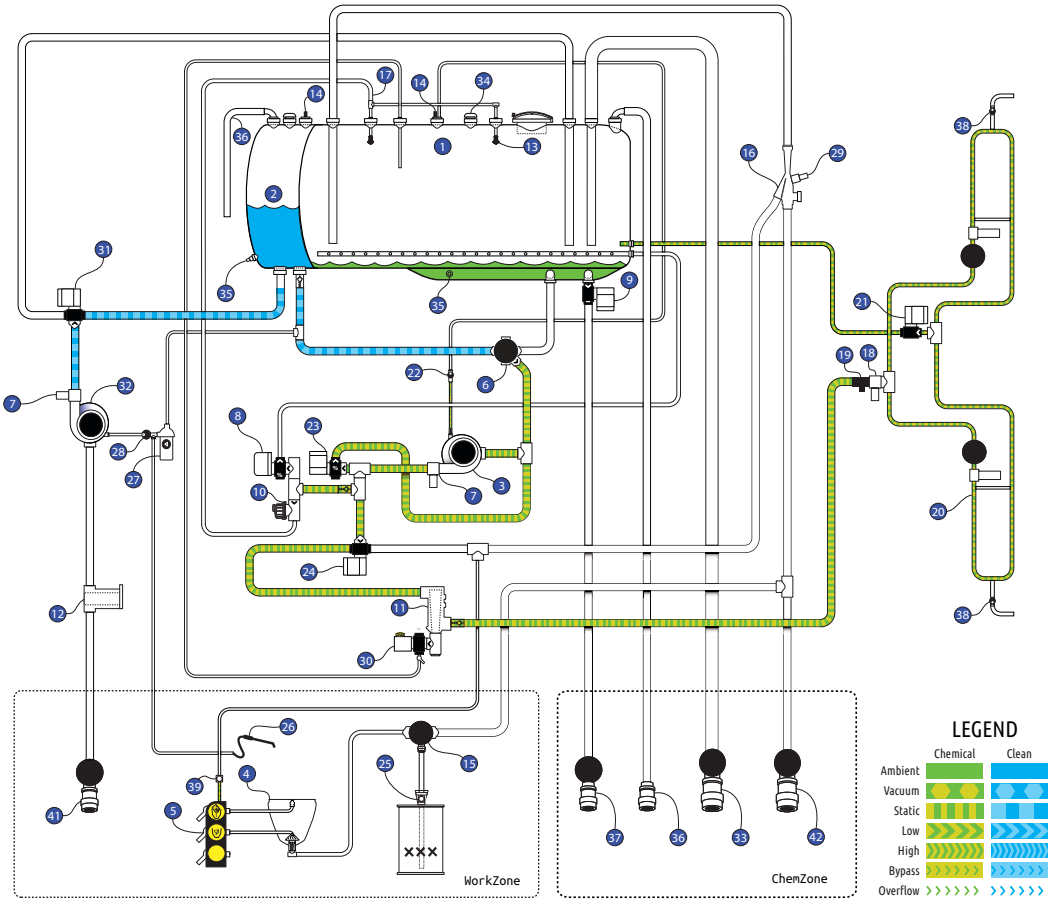
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 11 TRANSITION



1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
19. Flow Meter (Polmac)
20. Spray Boom
21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
25. Envirodrum/Chemical Inlet
26. Wash Down Hose
27. Flow Jet Pump
28. Banjo Prime Valve (ASCO)
29. Vacuum Sensor (IFM)
30. Cyclone Shutoff Valve (HARDI)
31. Fill Direction Valve (Altek)
32. Banjo Filling Pump
33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
36. Overflow/s
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

Diagram - Fluid system - MODE 12 EMERGENCY STOP



1. Main Tank
2. Flush Tank
3. Ace Pump
4. Turbo Filler Tank
5. Turbo Filler controls
6. Suction Valve (Altek)
7. Pump Pressure Sensor (HAU)
8. Agitation Reg. Valve (HARDI)
9. Main Tank Empty Valve (S93)
10. Rinse Nozzle Valve
11. Cyclone Filter (HARDI)
12. Side Filling Filter
13. Rinse Nozzles
14. Fill Sensor/s (HARDI)
15. Vacuum Source Valve
16. Venturi
17. Filter Bypass Return
18. Boom Pressure Sensor (Muller)
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21. Bypass Valve (Altek)
22. Pump Bleed Valve (ASCO)
23. Pump Regulation Valve (Altek)
24. Pump Pressure Valve (Altek)
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33. Batch Filling Coupler (3")
34. Vacuum Relief Valves (2")
35. Tank Volume Sensors
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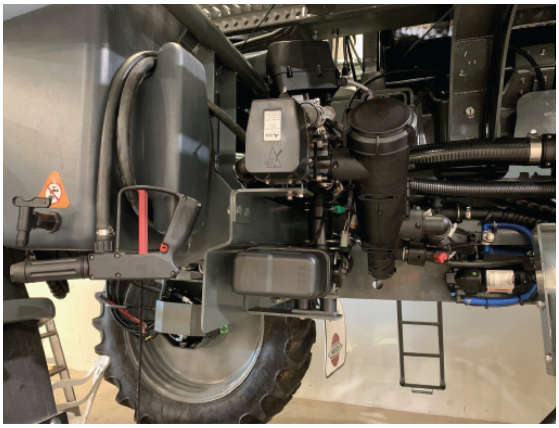
37. Tank Dump Valve
38. Fence Nozzle Valve/s
39. Envirodrum Coupler Cleaner (opt)
40. Not used
41. 3" Manual Valve (Banjo)
42. Venturi Fast Fill coupler

External Cleaning Device

The External Cleaning Device comprises of a hose, spray gun and an electric pump.



⚠ DANGER! The External Cleaning Device operates at very high pressure and could potentially cause serious personal injury, it is therefore essential that the following safety rules must be observed and strictly enforced:

1. Never point the water jet at people, animals, electric installations or equipment, overhead power lines or other sensitive objects.
2. Never try to clean clothing or foot wear, especially if being worn by a persons.
3. Pressure can penetrate skin and cause severe injury. Never work with un-protected eyes, bare feet or sandals.
4. Never operate without approved chemical safety wear including face mask, gloves, respirator, boots and cover-alls.
5. Beware of flying particles being dislodged by the cleaning jet.

The spray gun and hose are affected by "recoil" when the handle is released during operation - therefore always hold the insulation on top of the gun with one hand and the pistol grip with the other hand to facilitate better control of the device.

3 - Description

Filters

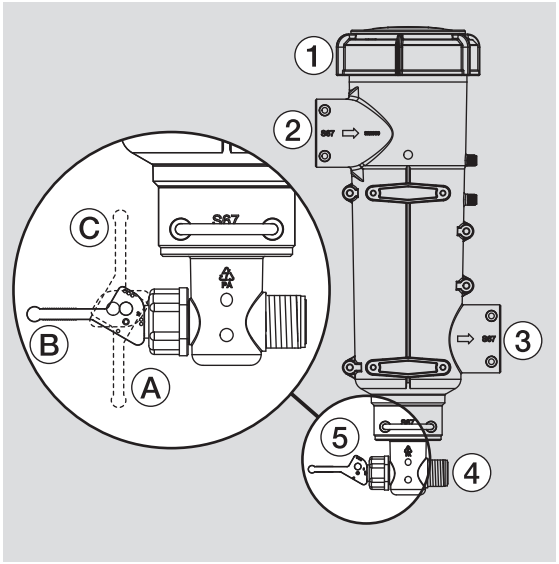
A Self Cleaning filter is fitted in the liquid area on the left side of the TurboFiller. It has a built in self-cleaning function.

In-line filters are fitted on left and right of the boom.

All filters should always be in use and their function checked regularly. Pay attention to the correct combination of filter and mesh size. The mesh size should always be less than the average of the nozzles in use.

SelfCleaningFilter

With the SelfcleaningFilter any impurities in the spray liquid will by-pass the filter and be recirculated back to the tank via the return flow.



Function diagram

1. Filter lid
2. From pump
3. To boom
4. Return to tank
5. Return valve

Valve (5) has three positions marked with small dots on the lever:

A. The position marked with 1 dot: There is no return flow. Position is used when rinsing the boom if there is spray liquid in the main tank. Also used when high spraying volume is required.

B. The position marked with 2 dots: Normal spraying position. With return flow to prevent filter is going to be clogged when spraying. This position is used when rinsing the boom if the main tank is empty.

C. The position marked with 3 dots: Flushing position which is used if filter is clogged. Lift and hold the lever to use this position which largely increases return flow and flushes the filter. The pressure SmartValve must be set to "Spraying".

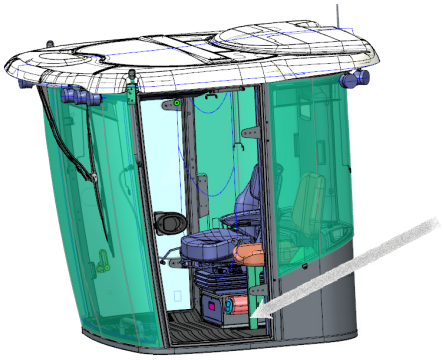
DANGER! The suction valve must always be turned to the closed position before opening the filter! Otherwise, the spraying liquid can hit you when opening the filter and drain the main tank content!

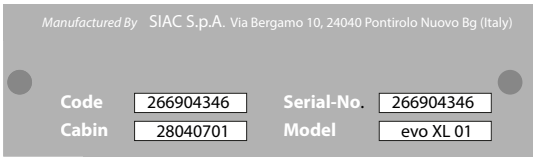
ATTENTION! Use of position C is no guarantee for a clean filter. Always do a visual inspection and cleaning of the filter regularly.

3.8 Cabin

Safety note

The cabin is equipped with a Category 4 combined air filtration device for the capture of solid particles, aerosol and sprays, organic vapours, in conformity with EN 15695-2 2009, the cabin is pressured to prevent unfiltered air from leaking into the cabin.





Catégorie 4 conforme à l'EN 15695-1:2009
Category 4 according to EN 15695-1:2009

WARNING! Check the filter in accordance with EN 15695-2 2009 is acceptable and is indicated on the label of the plant protection product as an option to protect against the potential dangers of plant protection products

WARNING! The operator must use, maintain and replace the filter as specified in the instructions provided by the filter manufacturer and the manufacturer of the plant protection products, if applicable.

WARNING! Before starting the spraying operation, the operator must verify that the correct filter is properly installed and that doors are hermetically closed.

WARNING! To reduce the risk of exposure to dangerous substances.

WARNING! Do not introduce used pesticides into the cabin.

WARNING! Keep clean the inside of the cabin. Remove contaminated clothing and shoes before entering into the cabin.

ATTENTION! When handling and disposing of worn filter, see "Every 250 hours - Cabin combined air filter" on page133.

ATTENTION! Follow the instructions provided by the manufacturer of personal protection equipment, plant protection products, the outdoor air supply and filtration system of sprayer and national directives on Work Health and Safety.

WARNING! If the minimum pressure is not reached into the cabin, indicated by a steady warning light; it is necessary to use a personal protection equipment, and it is important to proceed to repair the system as soon as possible.

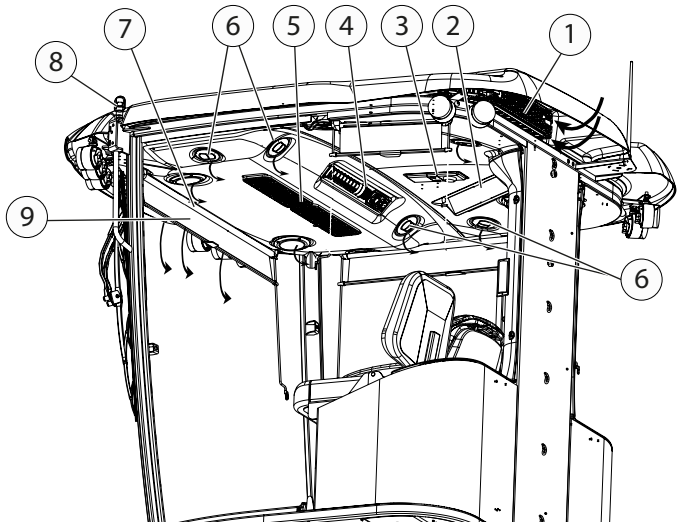
NOTE! For cabin pressure maintenance, see "Every 250 hours - Cabin combined air filter" on page 133.

NOTE! The combined air filter is not installed on the cabin. For installing the combined air filter, see "Every 250 hours - Cabin combined air filter" on page133.

Emergency Exit

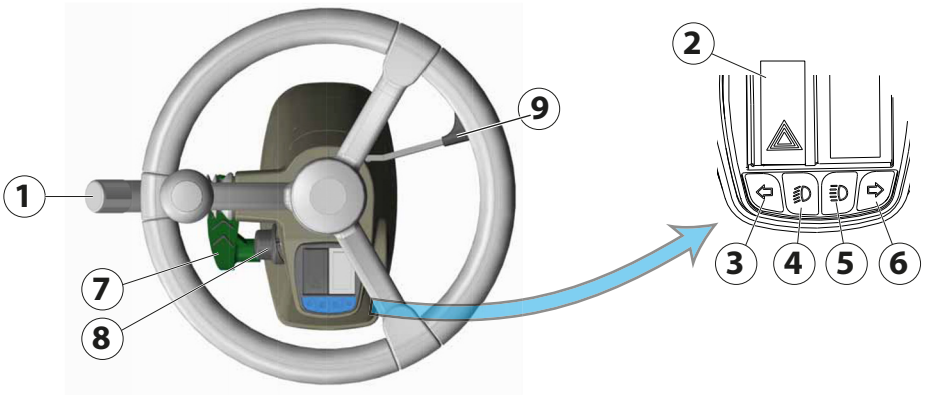
In case of emergency, a glass breaker is placed to the right of the driver's seat, on the opposite side to the access door to the cab.

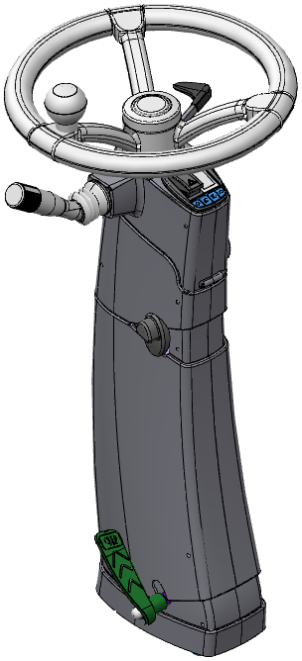
Description



1. Fresh air inlet
2. Car radio trap
3. Ceiling lights
4. Cabin and air conditioning controls
5. Air recycling trapdoor
6. Air diffusers
7. Air diffusers for demisting the windscreen
8. Beacon bracket
9. Sun-shield

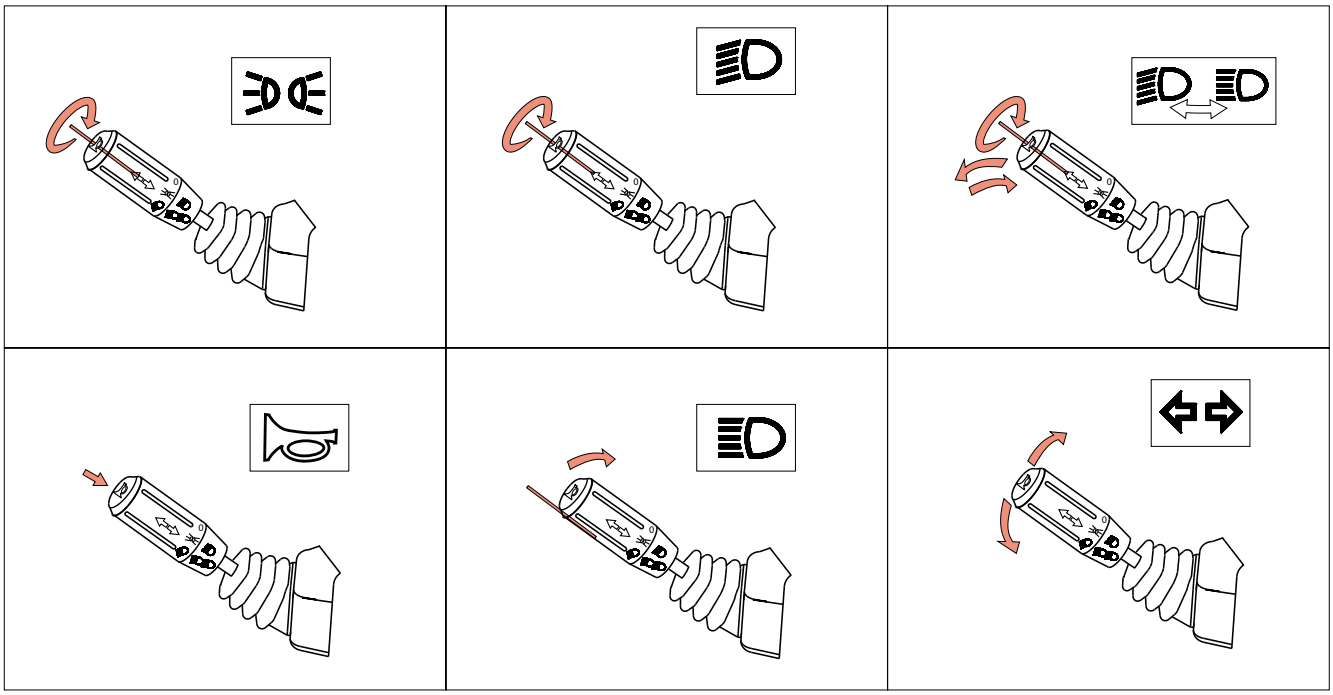
Steering column





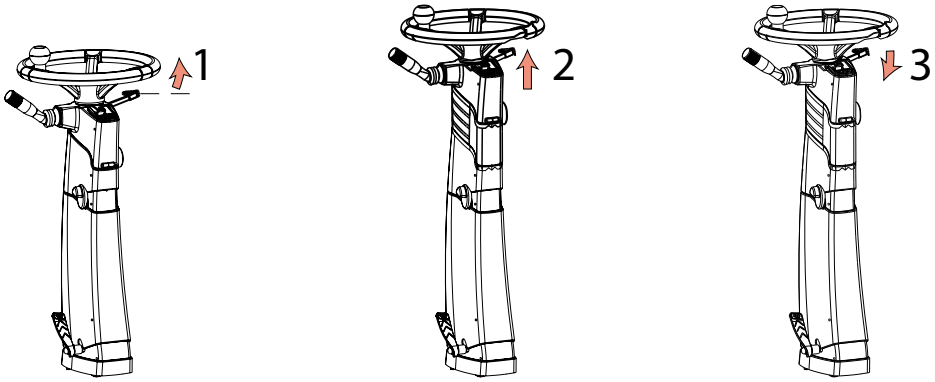
1. Headlights control
2. Hazard warning switch
3. Left direction indicator
4. Low beam headlights
5. High beam headlights
6. Right direction indicator
7. Tilting steering column lever
8. Tilting steering wheel lever
9. Telescopic steering wheel lever

Headlights controls

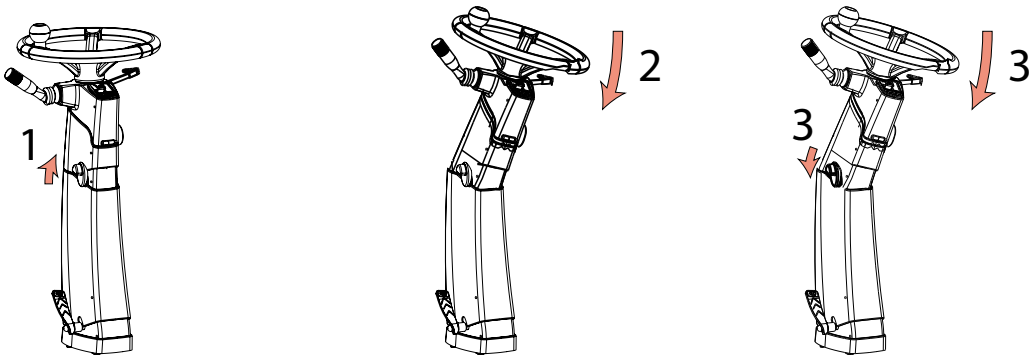


Steering Column Adjustment

Telescopic steering wheel adjustment

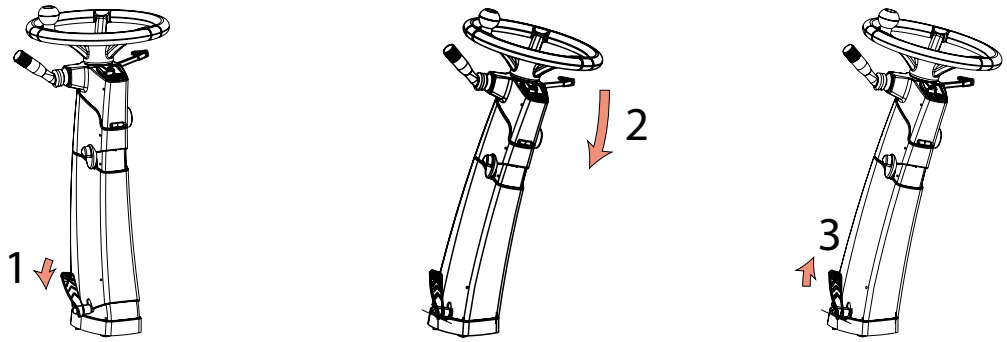


Steering wheel tilt adjustment

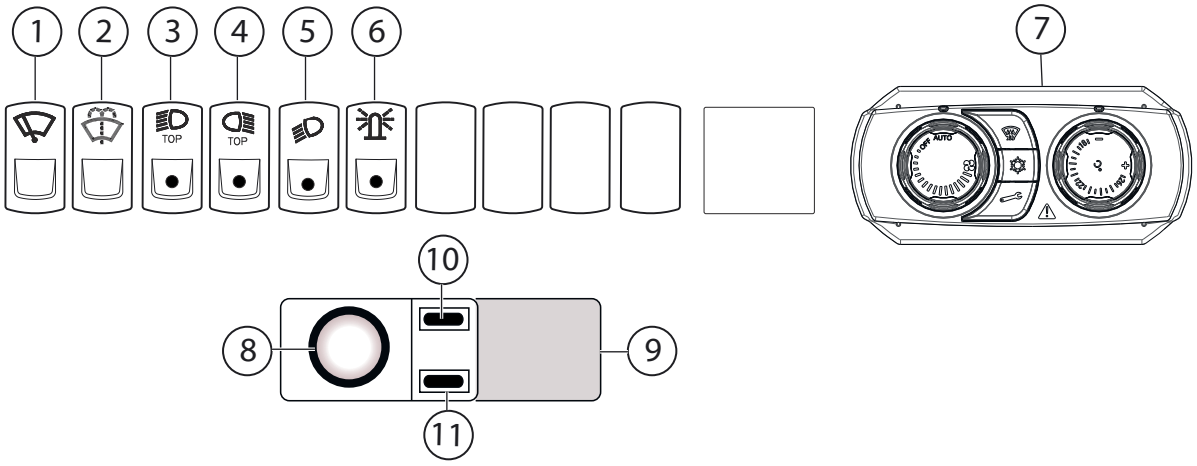


3 - Description

Steering column adjustment



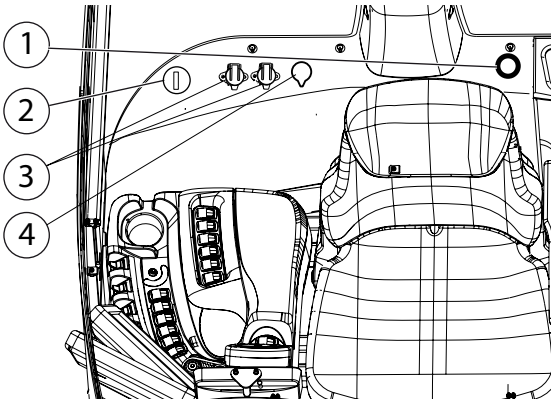
Cabin roof instrumentation



1. Wipers switch
2. Windscreen washer switch
3. Front cab work light
4. Rear cab work light
5. Side work lights
6. Beacon Light
7. HVAC control panel
8. Map lighting
9. Interior cab lighting
10. 3-position ceiling light switch (on-off-door)
11. Map lighting switch

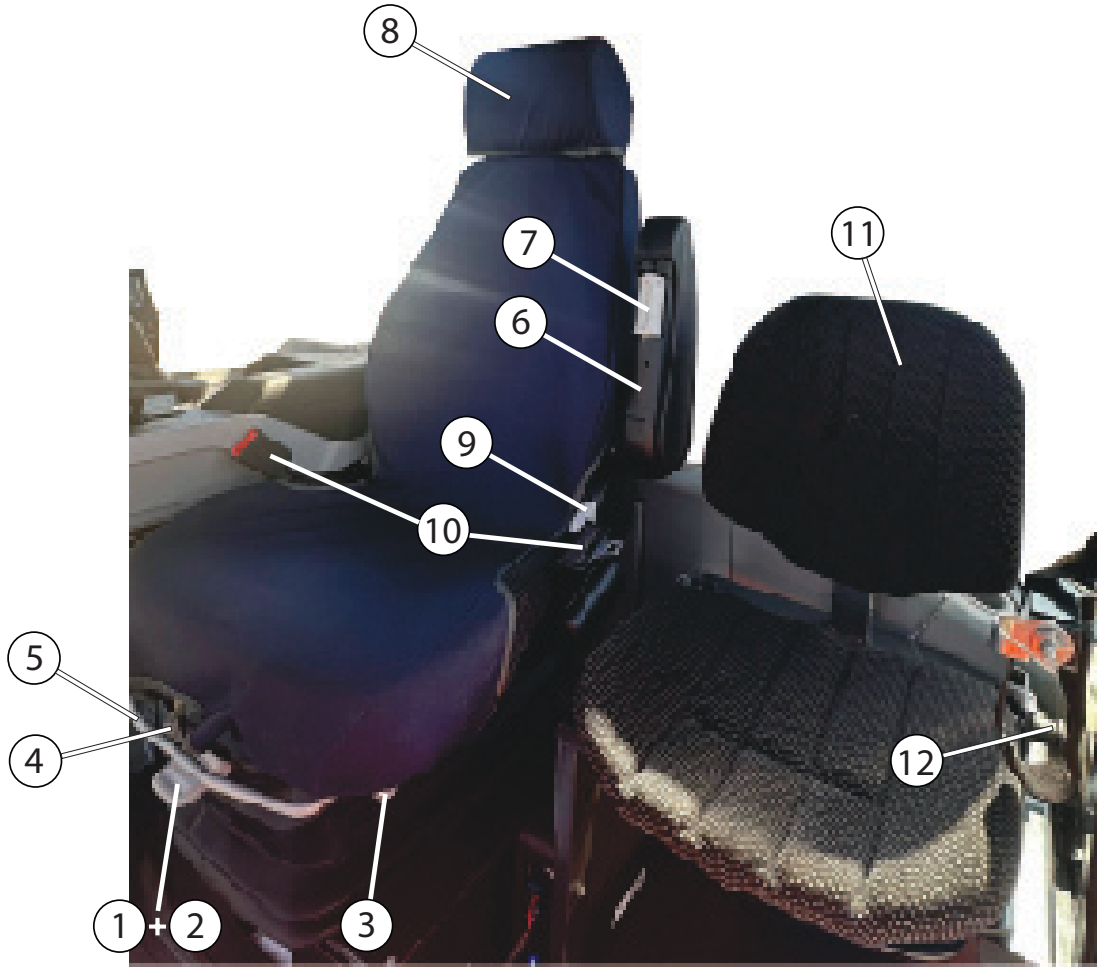
Ignition switch and 12V DC power supply

1. Cigar lighter
2. Ignition switch
3. 12V DC socket
4. 12V DC cigar lighter socket



3.9 Driver's Seat

Description



1. Weight adjustment
2. Height adjustment
3. Fore/aft isolator
4. Absorber
5. Fore/aft adjustment (without control carrier equipment)
6. Armrest
7. Armrest adjustment
8. Headrest
9. Backrest adjustment
10. Seatbelt
11. Fore/aft isolator
12. Trainer's seat
13. Trainer's seat fold lock

General instructions

- The operating instructions must be read in full before use.
- The operating instructions must be kept in the vehicle and always be at hand.
- The driver's seat may only be fitted, serviced and repaired by specialist personnel.
- The respective national regulations and the vehicle manufacturer’s fitting instructions must be observed.
- Worn parts such as rollers, shock absorbers and the fixation must be checked from time to time.
- A correctly functioning and individually adjusted driver's seat is essential to your health.
- Take adequate care of your seat and have it serviced regularly to ensure that it functions correctly.

⚠ DANGER! The functional checks are to be carried out at least as regularly as vehicle services.

- These operating instructions should always be kept with the driver's seat. If the seat is passed on to a third party, it must be accompanied by the relevant operating instructions.

Safety instructions

- Driver's seats that have been adjusted incorrectly have a smaller moving area. In order to prevent any personal injury, the seat must be adjusted for the driver's weight before use and before every change of driver.
- To prevent injury, no objects should be placed within the moving area of the driver's seat.
- Before commissioning of the driver’s seat, possible packaging material has to be removed from the seat cushion and the backrest upholstery.
- To eliminate any risk of accident, the settings must be checked to ensure they are correctly engaged before the vehicle is driven.
- Adjustments must not be made while driving.
- Only touch the handle for setting the fore/aft adjustment at the indented grip provided for that purpose.

Risk of crushing

- After removal of the backrest upholstery, the backrest frame must be supported, for example held in place, before the backrest adjuster is operated. If you fail to do so, there is a danger that the backrest frame may jerk forward and cause injury.
- Any changes to the series standard of the seat (for example fitting parts which are not original GRAMMER AG parts) may impair the safety standard to which it has been tested. Functions may be impaired, threatening your safety. For this reason, any change in design of the seat must be approved by GRAMMER AG.
- During the removal and installation of the driver’s seat, the corresponding instructions by the specific vehicle manufacturer must be strictly observed!
- Do not hold onto the covers for lifting the driver's seats. If you do so anyway, there is an increased risk of injury due to loosening or breaking covers.
- Before you remove the driver’s seat, disconnect all plug-in connections between the seat and the vehicle supply network. When you replace the plug-in connectors, make sure they are tight (dust, water).
- Seatbelts are fitted or can be retrofitted to the driver’s seat. Seatbelts may only be fitted on the approval of the vehicle manufacturer, as they increase the load in the seat mounting area. Seatbelts must be fitted in accordance with specific national regulations and guidelines, and must be approved by GRAMMER AG.
- Seatbelts must be fastened before driving.
- The seatbelts must be replaced after an accident. Where seatbelts are fitted to the driver's seat, the seat and seat mounting must be checked additionally by specialist personnel after an accident has occurred.
- Fasteners must be checked regularly for tight seat. If the seat wobbles, there may be loose bolts or other faults.
- If you find that the seat does not function correctly (for example a defective suspension of the driver's seat; improper curvature of the lumbar support, etc.) or is damaged (e.g. damaged bellows etc.) contact a specialist workshop immediately to arrange for repairs to be carried out. If you fail to do so, your health may be affected and the risk of accident increased.

- Before the vehicle is used, switches that might be in the seat (for shutting down mechanical equipment when the driver leaves his/her seat) must be checked for proper function.
- If malfunctions are detected, the vehicle must not be driven.
- Loads must not be placed on seats (e.g. with a built-in switch) except for the driver's weight during normal use, as the vehicle may otherwise start to move by itself.
- If you take off the weight from the seat while driving, this will cause the vehicle to stop.
- Do not indent the bellows while there is load on the driver's seat.
- Make sure that the interior of the driver's seat remains free of foreign particles or liquids.
- The driver's seat is not watertight and must be protected against splashes of water!
- Any conversion or refitting work on a GRAMMER AG driver's seat must be performed exclusively in authorized workshops by trained or suitably qualified personnel and in adherence with the applicable operating, maintenance and installation instructions and in compliance with all relevant national regulations.
- Improper installation and assembly bear the risk of bodily injury or property damage and the proper function of the driver's seat or mounted parts can no longer be guaranteed.
- Before driving, you must check if all seat settings selected guarantee a safe operation of the vehicle.

Connecting data

- If you need to connect cables to the vehicle supply network, strictly observe the following instructions:

  Before you connect an electrical consumer fitted in the driver's seat (eg: the seat heater or the seat ventilation), you must obtain the relevant electrical data for the respective vehicle with reference to voltage, protection and the kind of connections from the manufacturer, from GRAMMER AG or the company's agencies.

  For safety reasons, the installation and connection to the vehicle supply network must be carried out by authorized specialist personnel only.

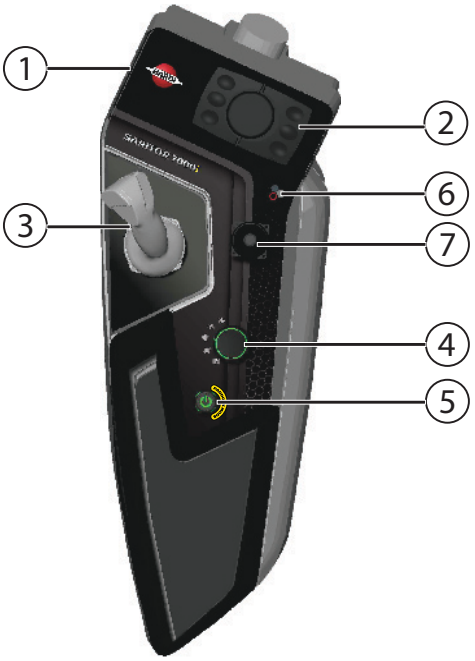
  The seat connections must be protected independently of other vehicle components.

DC	Compressor	Seat heater	Seat heater compressor
12V	10A	10A	20A
24V	5A	4A	10A

DC	Compressor
22Ω	2W

For building an electric connection, select an electric circuit by means of which the electric consumers of the driver's seat are separated from the live network when the ignition is switched off.

Console



1. Fascia Plate
2. Multifunction Dial
3. 3 Axis Joystick (grip)
4. Mode Selector
5. Steering Controller and Hydraulic lockout (for road transport)
6. Engine Warning Light
7. Secondary Joystick

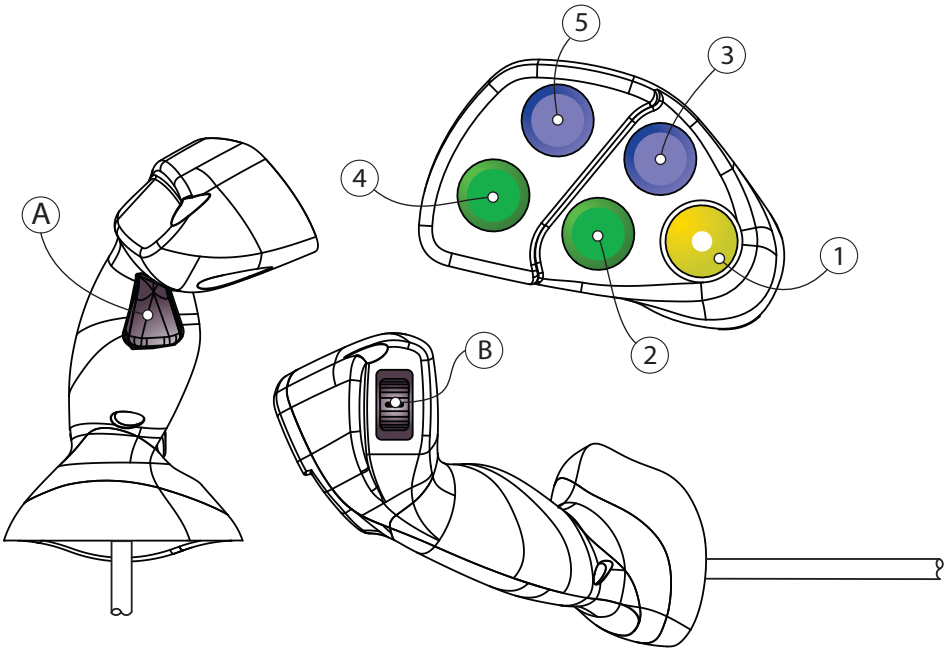
Fluid Stop Button

The fluid stop button is located at the right hand side of the console. When activated, it shuts down all HIVE and fluid functions, except the engine.

3 - Description

The multi-function grip (primary)

The grip allows the operator fast access to the Master Fluid Switch, Paralift, Boom Wing Tilt, AutoHeight and AutoSteer resume.



NOTE! Secondary functions are activated by pressing the secondary switch (A) simultaneously with primary buttons.

Primary function

1. Master on/off
2. Left side boom tilt down
3. Right side boom tilt down
4. Left side boom tilt up
5. Right side boom tilt up

A. Secondary switch
B. Engine rpm up/down

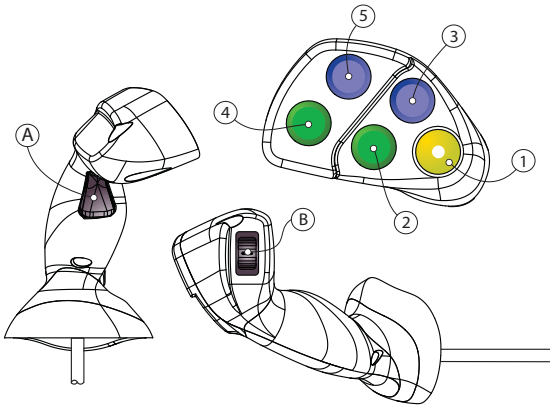
Secondary function

1A. Single button fold
2A. Auto Steering engage
3A. Right side end nozzle
4A. Norac engage
5A. Left side end nozzle
AB. Paralift up/down

NOTE! Single button fold option is also available on Hydac screen (boom control screen) in cabin.

Single button fold

Single button fold is currently performed by holding down the “Alt” button (A) and the master on/off button (1). Pressing again will pause.



Activation criteria are:

- The boom is either fully open or fully closed **and**
- The machine is stationary

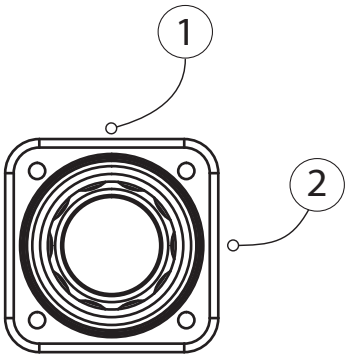
The process will halt if:

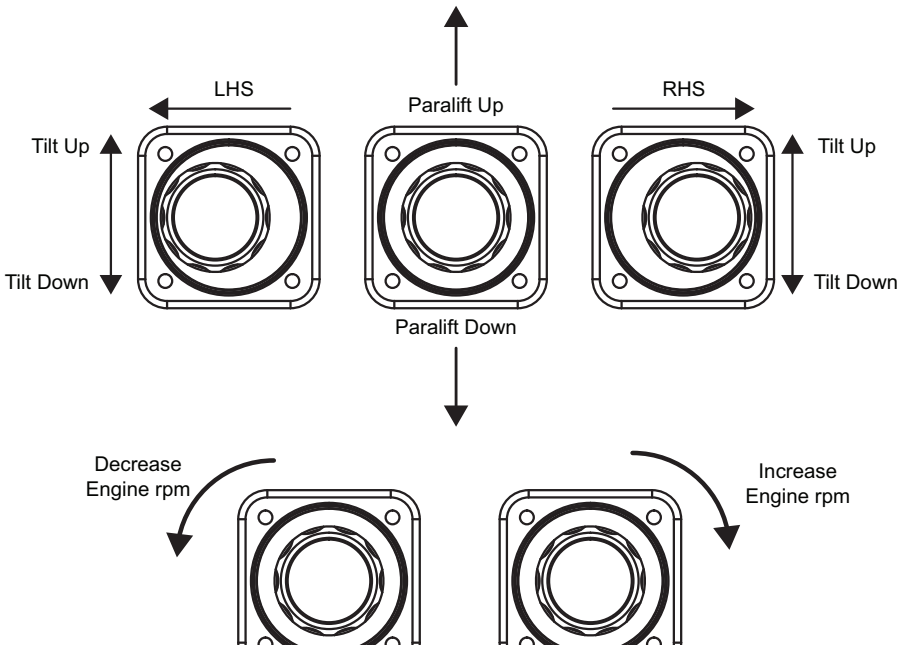
- Any button is hit
- Any sensor reports an unhealthy state

NOTE! The ‘single button fold’ option is also available on Hydac screen (boom control screen) in cabin.

Secondary Joystick

1. X-Axis
2. Y-Axis
3. Z-Axis (dial)

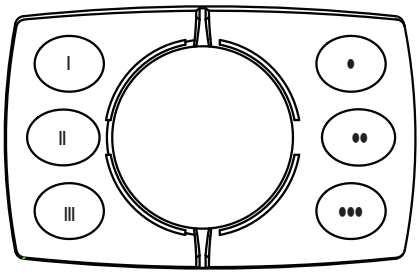




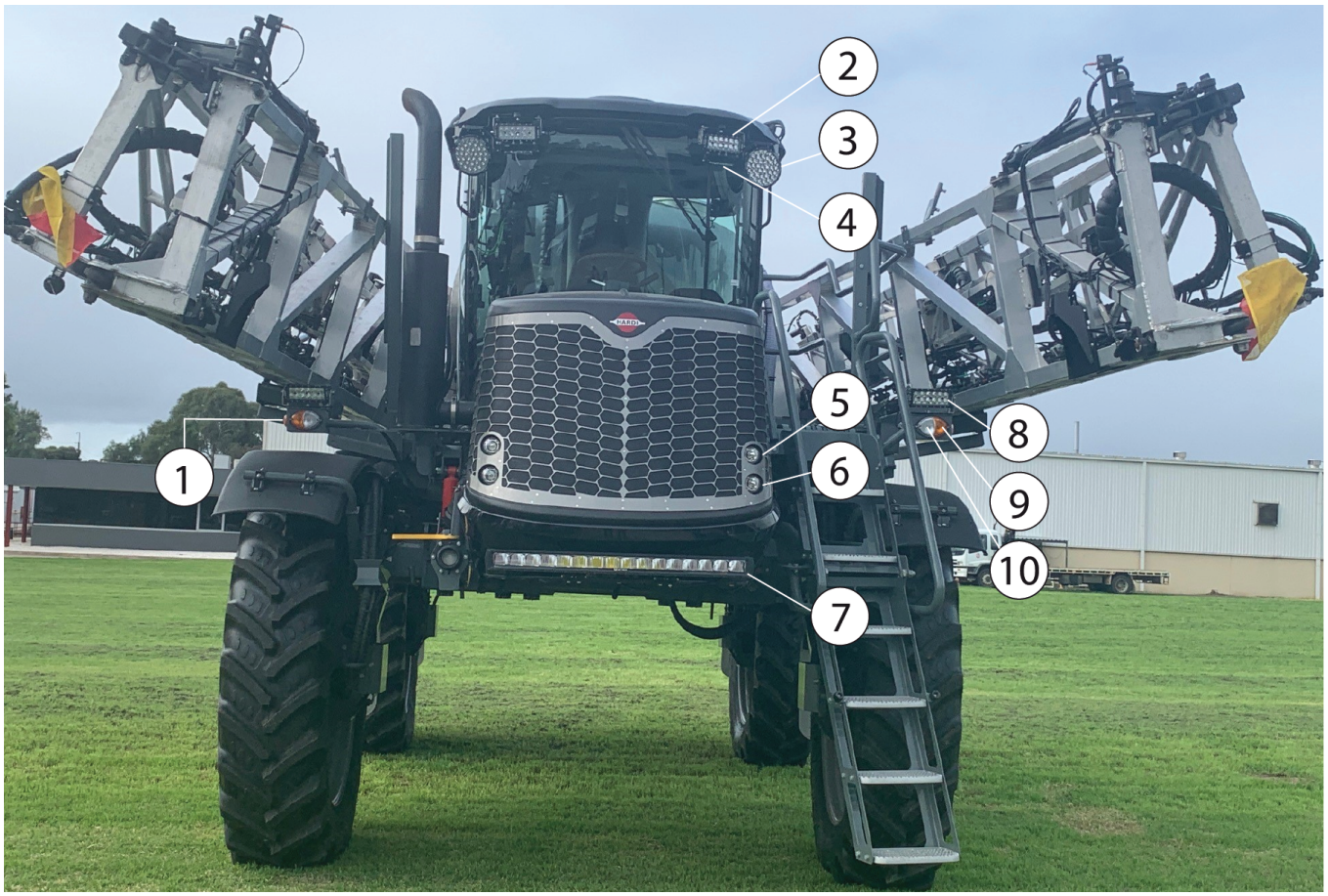
Multifunction Dial

The integrated dial that interacts with the HIVE screen, giving the operator control over the Boom Hydraulics, Fluid Functions, Machine Cameras, Machine Diagnostics, and integrate mode switching between GeoSelect /Blanket or both (when fitted).

Please refer "HIVE manual".

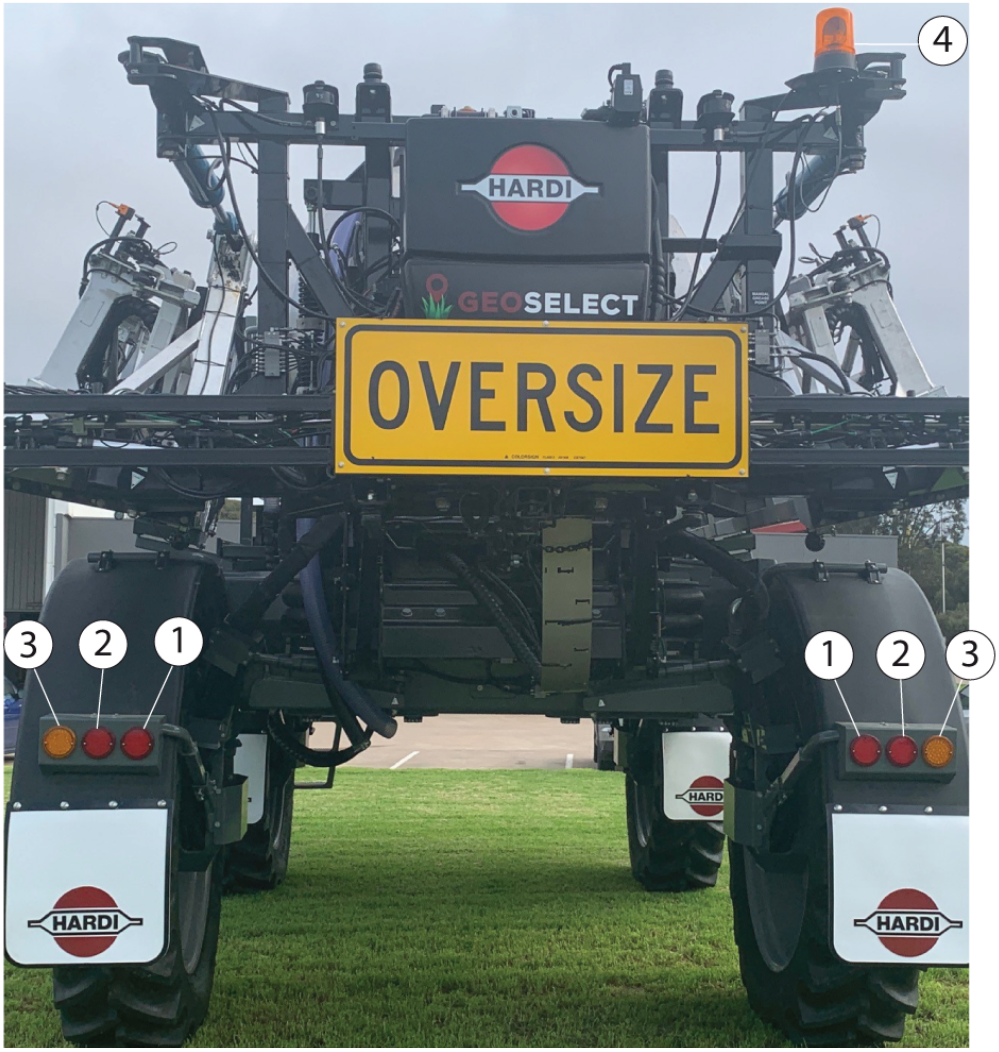


Lights (Front)



1. Side indicator lights
2. Flood lights
3. Spot lights (optional)
4. Egress lights
5. Low beam lights
6. High beam lights
7. Flood lights (optional)
8. Guard lights (optional)
9. Indicator lights
10. Park lights

Lights (Rear)



1. Brake lights
2. Park lights
3. Indicator lights
4. Rotating beacon light

The multifunction display (DM 430E)

The multifunction display shows the information relating to the operation of the engine, (tachometer, temperature, etc.) and the various driving modes (road, field, etc.). The display also shows the errors that may occur during the use of the machine (temperature and pressure of the engine oil, transmission error, etc.). The DM 430E is controlled by navigation through a set of four soft keys located at the lower front of the display. The keys are context dependent.

E. LCD screen

F. Alarms

G. Selector button

H. Selector button

I. Selector button

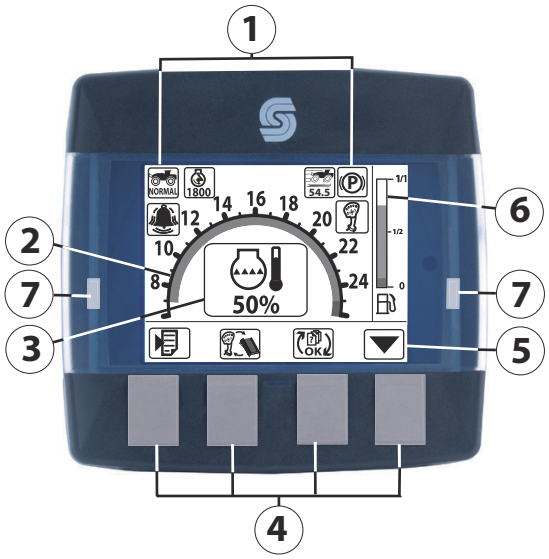
J. Selector button

3 - Description

The multifunction display (DP 250)

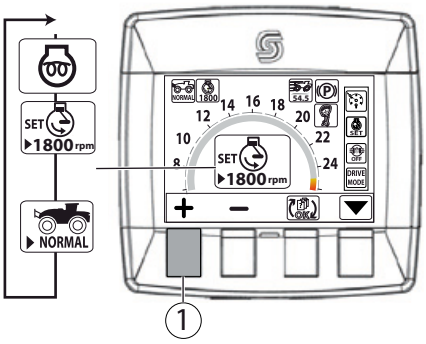
The multifunction display shows the information relating to the operation of the engine, (tachometer, temperature, etc.) and the various driving modes (road, field, etc.). The display also shows the errors that may occur during the use of the machine (temperature and pressure of the engine oil, transmission error, etc.).

1. Driving mode status
2. Tachometer
3. Display of the functions of the engine and transmission
4. Push Buttons of controls and settings
5. Horizontal Menu
6. Vertical Menu
7. Alarms

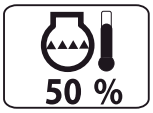


Display of functions

- Press the push button (1) to scroll through various functions.



Messages in normal operating mode



Engine temperature

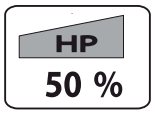
0 to 100%.

Engine oil pressure

Turbocharger pressure

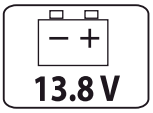
Hydraulic pressure of the transmission

Instant fuel consumption



Power supplied by the engine

Engine diagnostic trouble codes (level 1)



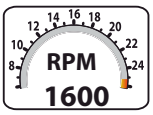
Battery charge voltage

Limitation of the motor speed mode [field]

See “Limitation of engine speed - hydraulic oil temperature too low” on page 100.

Restricting the speed of movement in mode [Road]

Restricting the speed of movement in mode [Field]



Displays the speed of the engine

Errors of functioning of the drive shaft

See “Transmission error codes” on page 216.

Preheating of the engine

Messages in selection mode

COMFORT Mode of conduct

See “Driving mode” on page 98.

Anti-slip disabled

See “Driving mode” on page 98.

NORMAL Driving Mode

See “Driving mode” on page 98.

Anti-slip engaged

See “Driving mode” on page 98.

Mode of conduct POWER

See “Driving mode” on page 98.

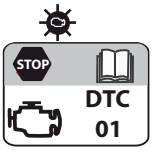
Alarm Messages - priority

WARNING! The display of these alerts requires immediate shut-down of the engine.

Alarm engine overheating

Alarm pressure of the turbo-compressor

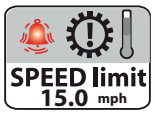
Alarm engine oil pressure.



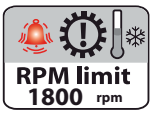
Alarm engine defect (level 3)

Alarm Messages - ‘Degraded mode’

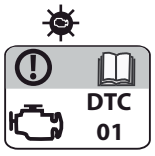
WARNING! These warning messages are displayed when the operating anomalies appear on the self-propelled.



Temperature of the hydraulic transmission too high



Temperature of the hydraulic transmission too low



Alarm engine defect (Level 2)

Alarm Messages - Maintenance

These warning messages are displayed when maintenance work must be performed on the self-propelled.

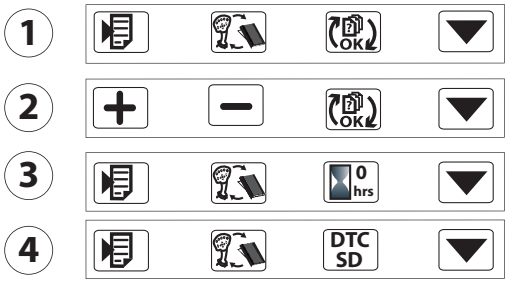
Maintenance (level 1)

Maintenance (level 2)

Horizontal Menus

Press button to select the menu corresponding to the symbol.

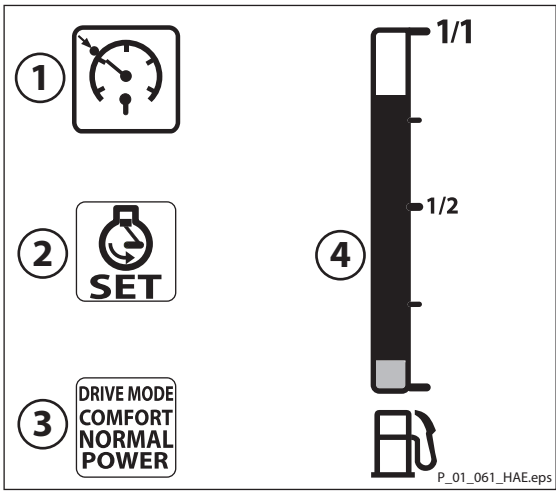
1. Normal Mode of Operation
2. Settings / settings
3. Hour meter
4. Management of errors of the transmission (SD) and the engine (DTC).



Vertical Menus

Press button to select the menu corresponding to the symbol.

1. Forward speed limitation
2. Engine speed limitation
3. Driving mode selector switch
4. Fuel gauge



NOTE! The fuel gauge (4) is displayed by default, or after 5 seconds of inactivity on one of the push buttons placed vertically.

4.1 General information

Unloading the sprayer from the truck

The machine can only be unloaded if the engine is running. To move the machine, you must observe the following points.

Turn the main switch to power the electrical circuits.

Place joystick in neutral position.

Check park brake is engaged.

Turn the ignition key to start the engine.

Select 'Field' mode (grass icon).

Increase engine rpm to 1600.

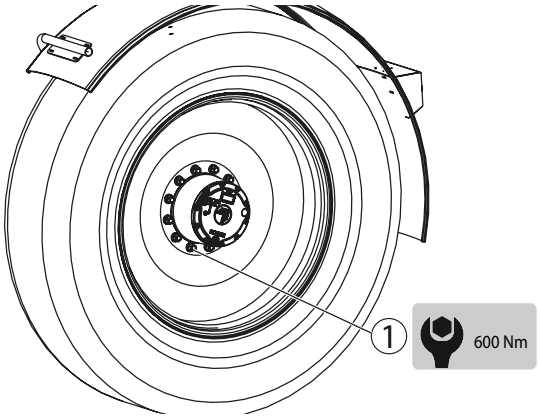
Ensure that no one is in the unloading area.

Move the joystick slowly.

NOTE! Setting cruise control in Danfoss screen to 3km/h may assist in loading.

Wheel nuts

- Tighten the nuts and apply a tightening torque of **650** Nm (**479.4** lb.ft).

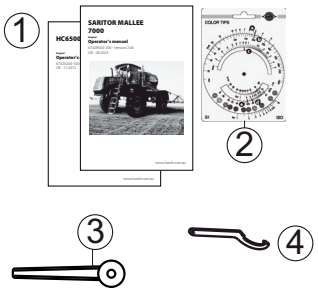


WARNING! Never oil or grease the wheel nut threads. Observe the tightening torque.

Accessories

Some accessories are supplied separately with the machine. The list varies according to the equipment and options.

1. Operator's manual
2. ISO nozzle disc
3. Brake release handle
4. Key for external connector



Access to the engine

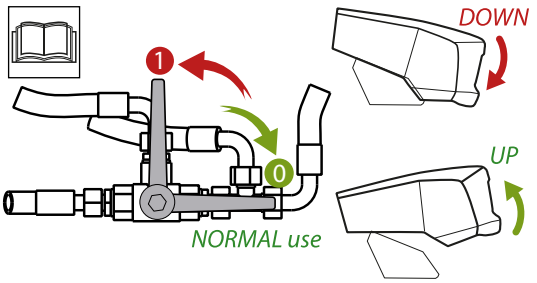
To access the engine, you must lift the hood.

Opening the hood

- Turn the valve to the position (**1**).
- Insert the lever located in the main tool box into the manual pump to lift and hold the hood open to the desired height.

Closing the hood

- Gradually turn the valve to the position (**0**) to close the hood.



NOTE! The valve should remain in the position (0) when the hood is lowered.

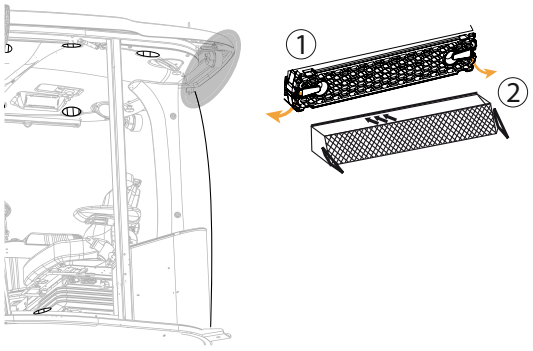
Check engine

The main elements must be verified before the first commissioning of the engine:

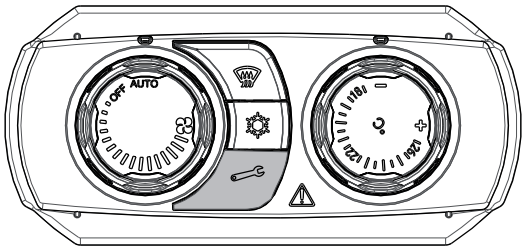
- Coolant Level and engine Oil Level
- Correct tightness of oil cartridge and fuel filter.
- Tension on the belts

Cabin combined air filter

- Pull out the 2 latch and remove the filter cover (**1**) from the K-Protect pressuriser.
- Install the filter (**2**) following the arrows direction



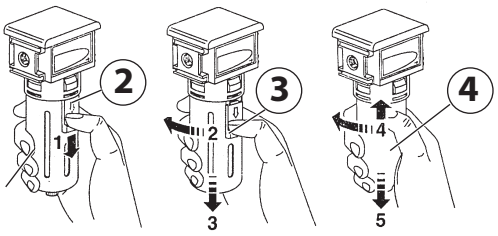
ATTENTION! If no filter is installed or if you use a non combined air filter (category 4) the warning light will remain on.



Filling the Air lubricator

WARNING! To avoid splatter, de-pressurise the compressed air line before dismantling the tank.

- Press the clip to unlock the protective bowl.
- Rotate by 1/8 turn to remove the protective bowl.
- Rotate the tank (4) by 1/4 turn to dismantle it.

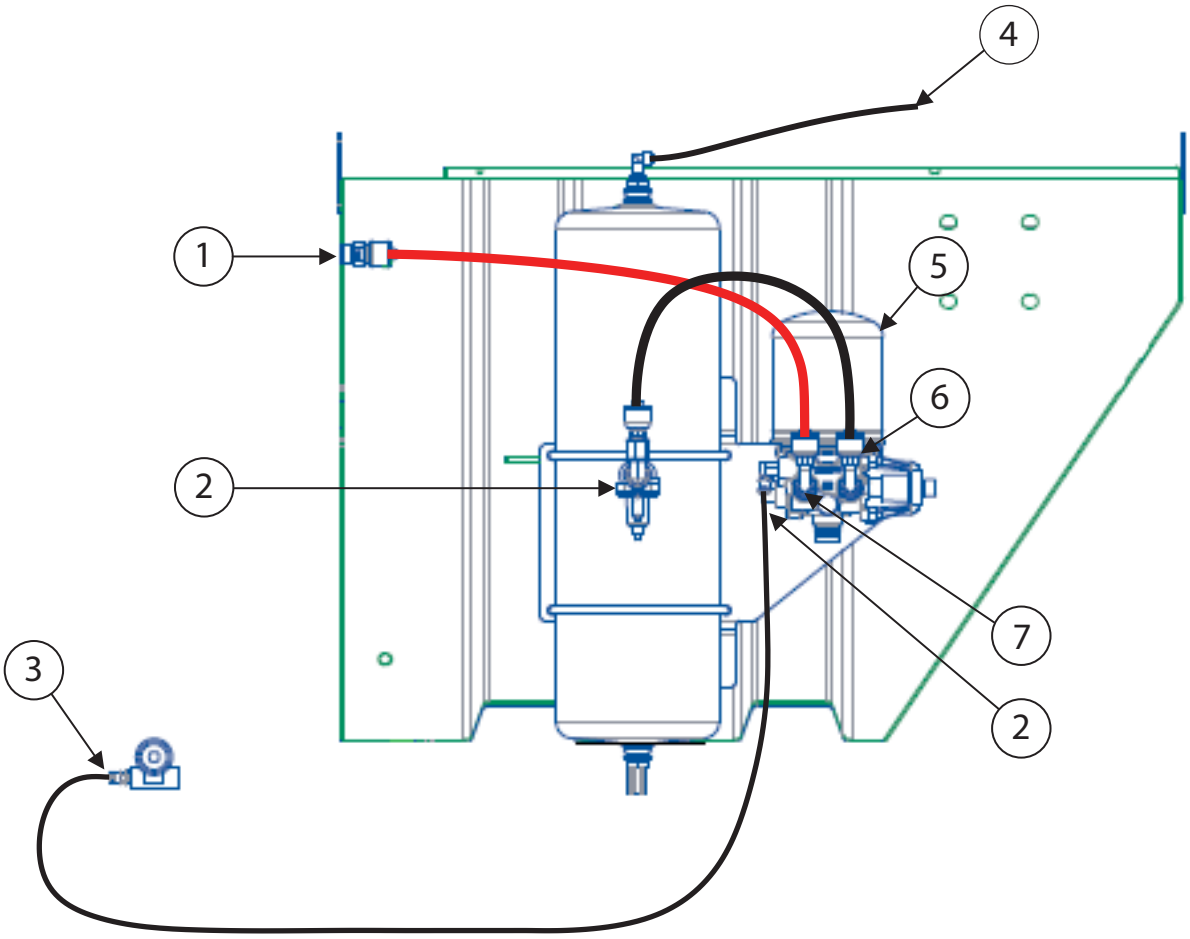


WARNING! The lubricator is designed to operate only with a special lubricant for pneumatic systems (recommended lubricant – reference: **6HU8000)**.

- Clean the tank with a soapy solution.

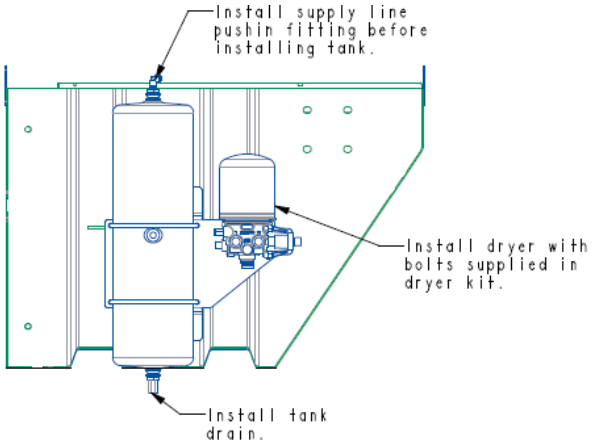
ATTENTION! The tank is made from polycarbonate, never use a solvent-based solution.

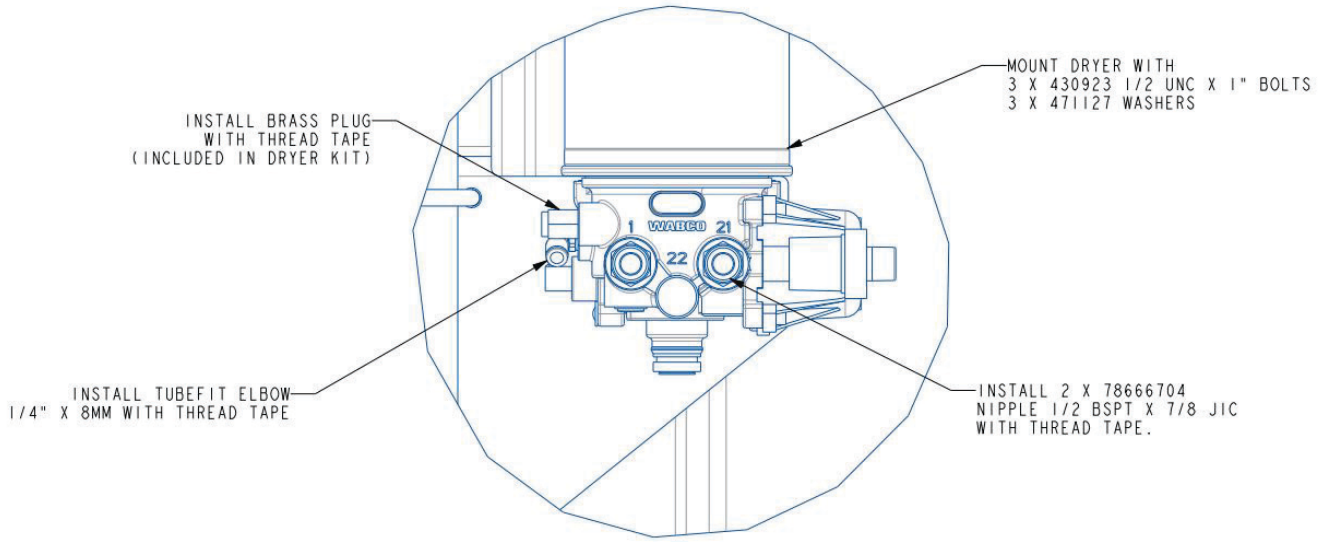
Fitment of Wabco Air Dryer System



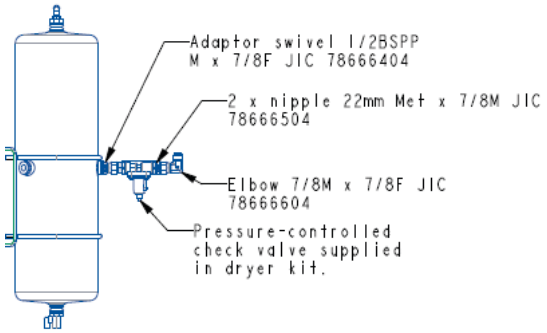
1. Compressor discharge line
2. Pressure-controlled check valve
3. Unloader port governor
4. Supply line to regulator
5. Wabco dryer
6. Port 2 dryer outlet
7. Port 1 dryer inlet
8. Governor port dryer

1. De-pressurize air system.
2. Remove air tank from the sprayer.
3. Mount air tank and dryer.
4. Install fittings into dryer body.

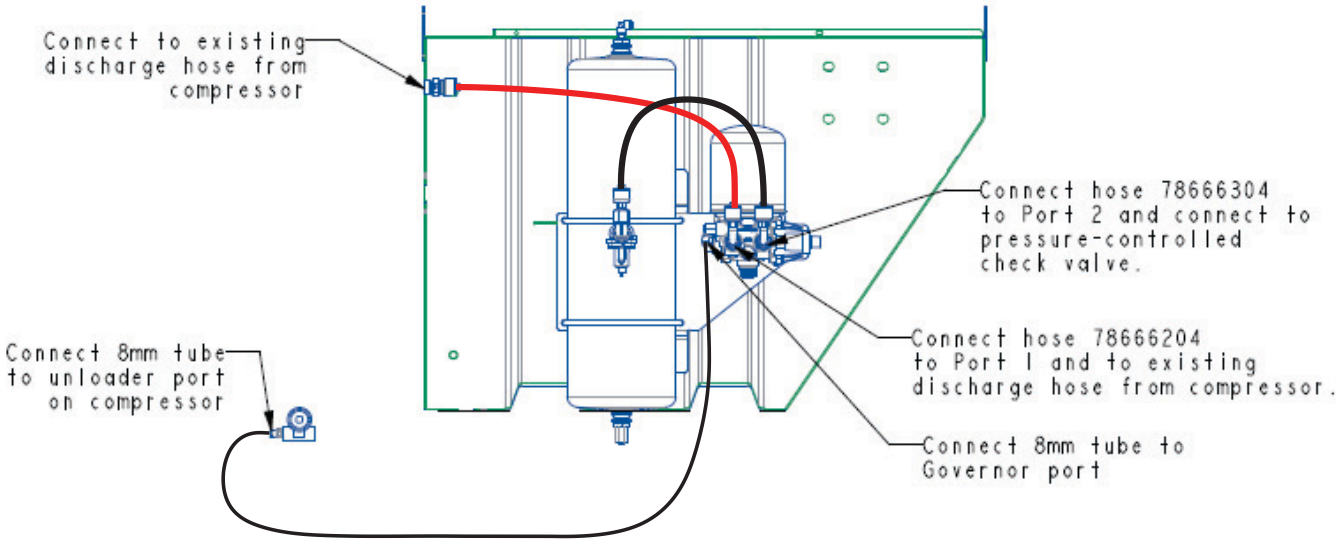




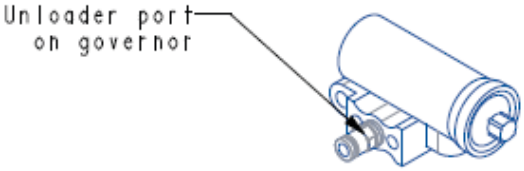
5. Install pressure-check valve onto tank. Ensure arrow on check valve is facing in the correct direction. (Arrow towards air tank)



6. Connect discharge, supply and governor signal tube.



7. Unloader port location on governor, install 5904270-7 90° COUPLER 1/8' THREAD X 8mm and connect 8mm tube.
8. Reconnect supply tube to tank.
9. Start the engine, pressurize system and check for leaks.



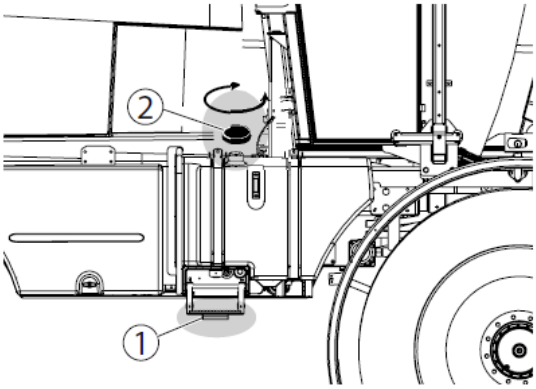
Access to the driving position

When the engine is off, the ladder to access the driving position is lowered. It folds automatically as soon as the engine is running and the parking brake is no longer engaged (P).

Filling the fuel tank

The fuel tank has a 1000 litre capacity. Before filling, do:

- Turn the engine off.
- Pull and lower the access ladder (1) to access the fuel tank.
- Thoroughly clean the cap to prevent the introduction of impurities into the tank. Use a funnel and a filter if necessary.



DANGER! Do not smoke when filling up the tank.

NOTE! We must not leave the tank completely empty, in order not to introduce any impurities or air in the circuit.

NOTE! Before a prolonged shutdown, it is preferable to keep the tank filled to the maximum qty, in order to avoid any trace of condensation in the tank.

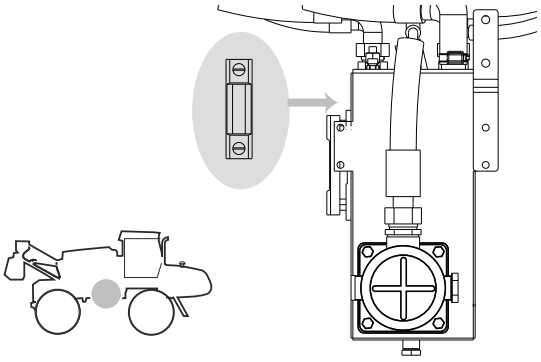
The CUMMINS engines with electronic injection standards meet the US, CANADA and Europe. The engines must operate with diesel to low sulphur (ultra-low ULSD diesel - ULSD), with a maximum of 15 ppm for the United States and Canada, and 10 ppm for Europe.

The mixture of fuels to low sulphur (ULSD) and biodiesel is accepted up to 20% in order to meet the certification B9000.

NOTE! Refer to CGE Cummins Service Bulletin 3379001 "Fuels For Cummins Engines" for more details.

Hydraulic Oil Level

A visual gauge is installed on the hydraulic reservoir with a capacity of 200 litre. A detector warns the user that the level in the tank is too low. Periodically check hydraulic oil level.



WARNING! When the audible alarm sounds, stop the sprayer and engine immediately to avoid any risk of damage to the hydraulic components.

The fill hole of the hydraulic reservoir is located in the vicinity of the platform for access to the cab. To fill the tank, it is recommended that:

- Thoroughly clean the tank cap, to eliminate all traces of dirt and moisture.
- Filter the oil when filling.

NOTE! It is essential to observe the quality of the recommended oil. See "Table of recommended lubricants" on page 243.

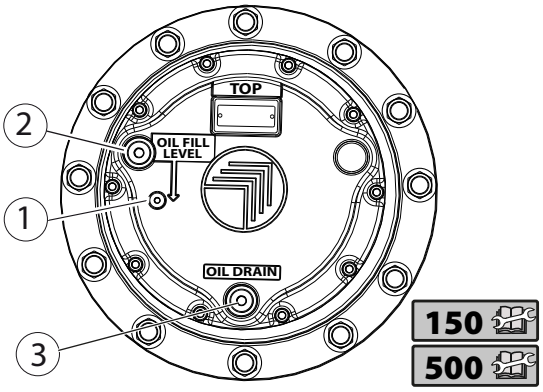
NOTE! To avoid backsplash when filling, ensure that you fill slowly.

Wheel Drive Gearbox Oil Level

WARNING! Before driving, check the oil level.

- Move the self-propelled to orient the reducers as shown in the illustration.
- Unscrew the level (1).
- Add oil if necessary, by the port (2); fill until the oil flows through the port level (1).

NOTE! Use exclusively recommended transmission oil. See "Table of recommended lubricants" on page 243.



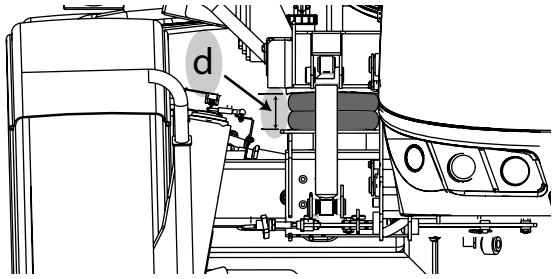
Air Suspension

Height of the suspension cushions (d), when the pressure of service is reached.

Front = **254** mm (10 in)

Rear = **235** mm (9.25 in)

If this is not the case, see "Air suspension adjustment" on page 157.

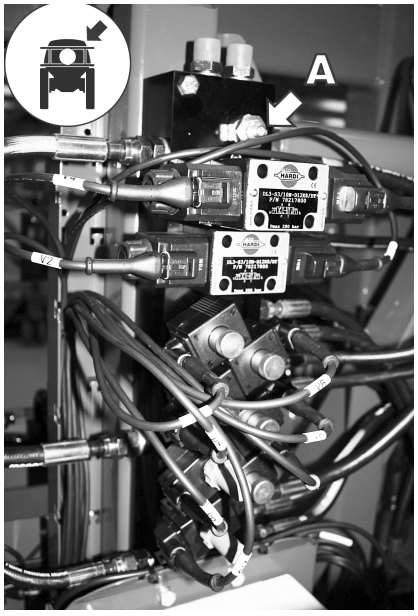


Boom folding speed adjustment

The restrictor for adjusting the boom folding speed is in the main hydraulic block.

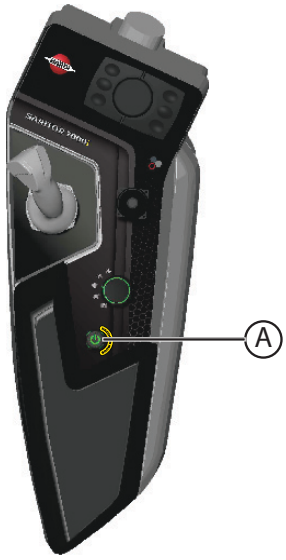
The throttle valve (A) can adjust the folding speed of the boom.

Adjusting inwards = slower boom.



4.2 Auto-steer

AutoSteering system and warnings



ATTENTION! Autosteering is a GPS controlled system that guides the sprayer along a predetermined heading. Whilst user-friendly, improper setup can result in overly aggressive steering behaviour.

WARNING! Engage AutoSteer only when the sprayer is close to the intended heading. Engaging it too far off the line may cause aggressive steering corrections or induce uncontrolled boom yaw movement. Excessive boom movement can lead to fatigue and damage to the boom, mounting hardware and frames.

- To ready the system and to enable AutoSteer. press button (A). The button backlight must be **green** to indicate that the system is active.
- To disable AutoSteer engage, press button (A) again.

WARNING! The steering controller is operational only when button (A) is pressed and illuminated **green**.

ATTENTION! Re-tuning AutoSteer is strongly recommended to reduce sprayer oscillation and boom yaw movement.

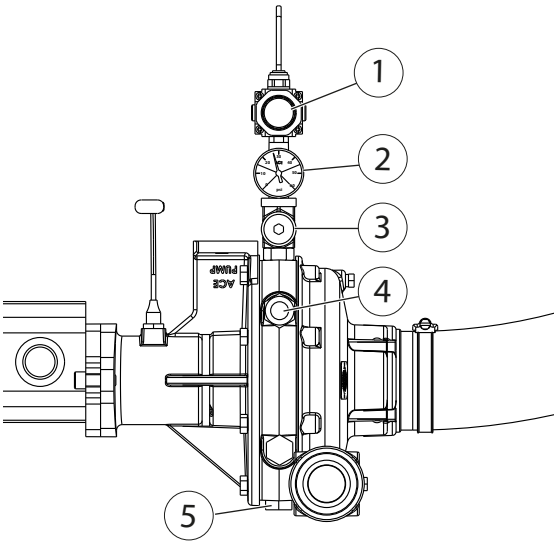
Contact your dealer or guidance system provider to:

- Install the latest firmware updates.
- Access improved line acquisition settings.
- Evaluate and adjust your AutoSteer aggressiveness for optimal performance.

Ace centrifugal pump

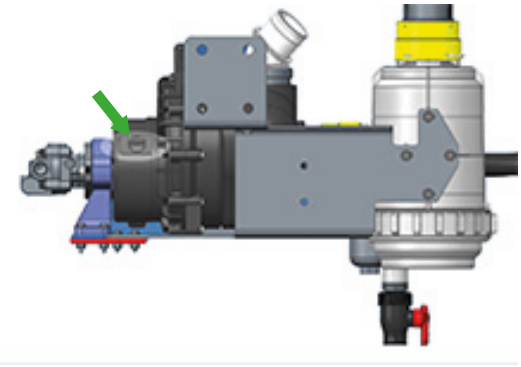
Before using the centrifugal pump for first time:

1. Check the air pressure at the gauge (2). Air supply is regulated to 30 psi, adjust the regulator (1) if necessary.
2. Check barrier fluid level in site gauge (4).



Banjo Pump (PWSP series)

The pump is ready for operation after you have filled the wet seal reservoir 3/4 full (the seal assembly should be submerged with a 50% water ethylene glycol (antifreeze) and 50% water mixture. Do not run the pump dry. Always fill the pump with water or the fluid being pumped before starting the drive unit to avoid premature pump seal failure.



NOTE! The Saritor Mallee has an external coolant reservoir line which runs up the fluid platform.

NOTE! There are no points on the pump that need lubrication. The pump seal is cooled and lubricated by the fluid being pumped.

NOTE! Make sure reservoir is 3/4 full and seal is completely submerged.

NOTE! Check coolant mixture every 8 hours of use.

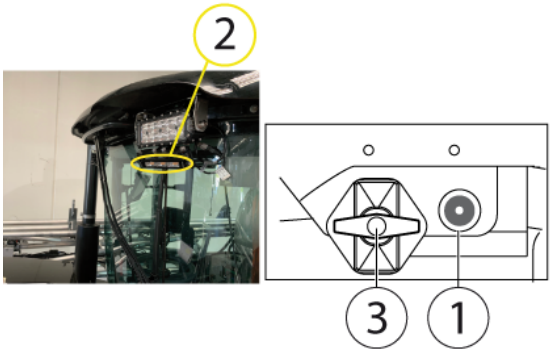
5.1 Starting and stopping of the machine

General information

WARNING! Before starting the engine, check the level of the engine oil, coolant and hydraulic oil. Check that the engine radiator and air filter is clean.

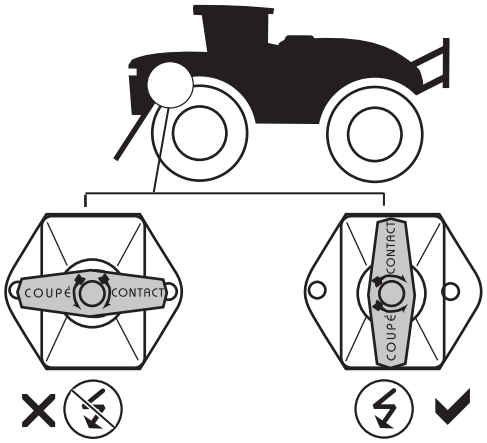
Lighting of the cabin walkway to access the driving position

The Saritor Mallee is equipped with a light at the side of the ladder and the walkway to facilitate access to the cabin. Press the push button (1) next to the isolator switch (3) to turn on the egress lights (2). The egress lights automatically turns off after few minutes. Time settings can be adjusted via cabin HIVE screen. When exiting the cabin, the egress lights turn on again and turn off automatically after few minutes.

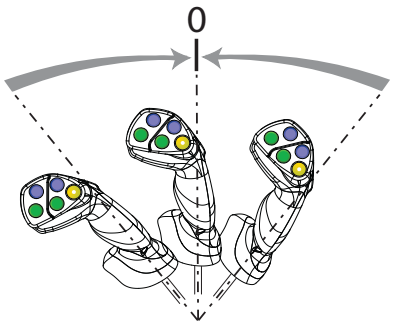


Initialise the system

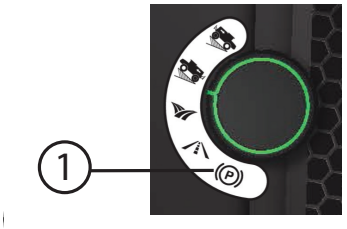
- Turn the handle of the isolator to power the electrical circuits of the sprayer.



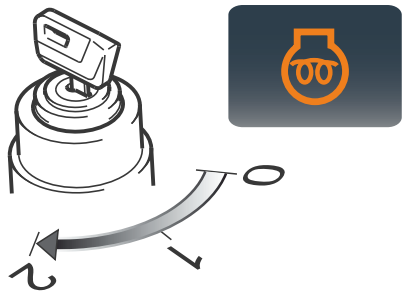
- Place the grip in neutral to start the engine.



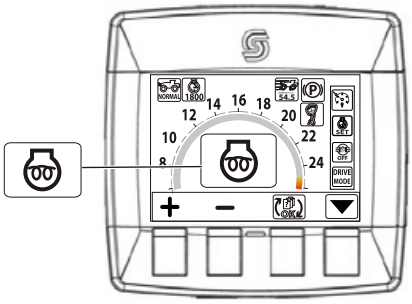
- Turn the mode selector switch to the parking position (1).



- Turn the ignition key to position (1) to initialize the system.
- Turn the key to position (2) to start the engine. Release it after start-up and the key will automatically return to position (1).

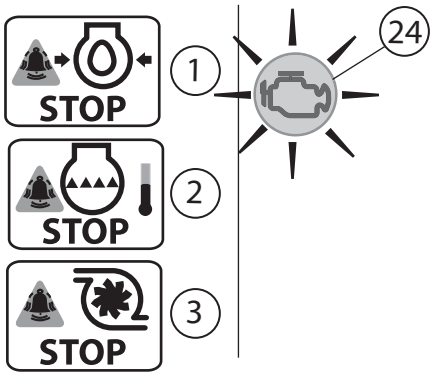


NOTE! The symbol only appears if engine preheat is required to start.



WARNING! After starting the engine, if the default light (24) lights up and that one of the 3 priority messages appears on the screen, you must stop the engine immediately to prevent any deterioration of the engine.

1. Engine oil pressure is too low.
2. Engine overheating.
3. Turbo-compressor pressure is too low.



NOTE! For more information on the error messages, see "CUMMINS engine error codes" on page 217.

Hour Meter

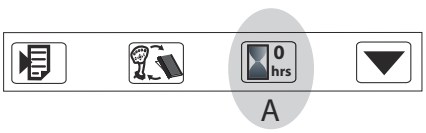
Description

1. Total hours of the machine
2. Hours since last maintenance
3. Time remaining until next maintenance

For more information on the maintenance of the self-propelled sprayer, see "Periodic Maintenance" on page 182.

Reset the Hour Meter

At any time, you can reset the Hour Meter, by pressing the button (A) for few seconds.

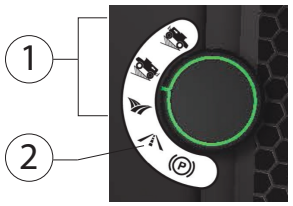


5.2 Field / Road Mode

Mode Selector

The mode Field/Road is obtained from the mode selector.

1. "FIELD" modes
2. "ROAD" mode



Road Mode using the grip

The sprayer movement is obtained by pushing the grip forward or backward.

The engine speed varies according to the position of the grip.

Braking is achieved by pulling the grip towards the neutral point. The self-propelled comes to a complete stop when the grip is in the neutral position.

To use the Road mode;

1. Place the grip in neutral position.
2. Turn the Selector Mode Switch to road mode.
3. Push the grip forward to move the sprayer.

ATTENTION! To change the direction, place the grip at neutral point and push it in the opposite direction.

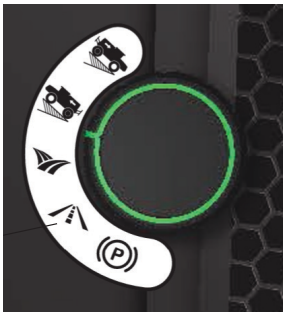
Field mode displacement

The field mode has 3 modes of use. Each of these modes affects the speed of travel as well as the torque of the transmission.

In this mode the speed of the engine remains constant, regardless of the position of the grip.

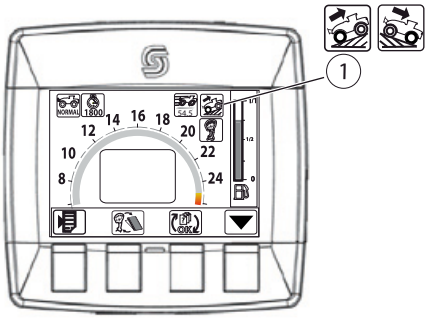
NOTE! The passage in one of the 3 modes (field-uphill-downhill) can be performed when the self-propelled is in motion.

NOTE! FIELD modes require a minimum engine speed of 2000 rpm for the transmission to give enough traction, braking torque and for adequate hydraulic flow for boom and pump performance.



- "FIELD" mode: The transmission pump flow is evenly distributed in all the hydraulic motors. This flow is proportional to the position of the joystick.
- "UPHILL" mode: In order to limit the slippage of the front wheels in the strong slope, the displacement of the rear motors is greater than that of the front motors
- "DOWNHILL" mode: In order to limit the slipping of the self-propelled in a steep descent, the displacement of the front motors is greater than that of the rear motors.

- Turn the selector switch to one of the modes.
- Push the joystick to obtain the desired travel speed.
- The screen shows the current mode of use (1)



NOTE: In FIELD mode, the maximum speed is 30 km/h. However the ground speed may be limited. For more information, see section "Restricting the speed of movement in field mode" on page 112.

Braking

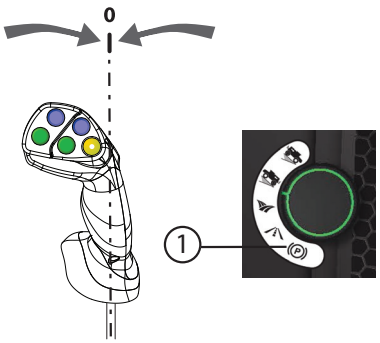
The braking of the machine is obtained in 2 ways:

1. By pulling the joystick to the neutral point.
2. By pressing the brake pedal (dynamic braking).

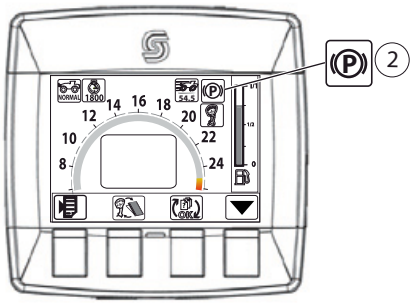
Parking brake

The parking brake is used to keep the machine at a standstill. To engage the parking brake:

- Pull the joystick in the neutral position to immobilise the sprayer.
- Turn the mode selector switch to the parking position.



- The display indicates that the parking brake is engaged (2)



NOTE! When the parking brake is on, any action on the forward handle will not make the machine move.

- Verify that the joystick is in the neutral position
- Turn the speed selector to [field] or [road], and then push the joystick to move the machine.

If the machine is in motion and that the parking brake is engaged (selector on the position [P]), the braking is performed following a deceleration ramp up to the cancellation of flow of the pump and hydraulic motors.

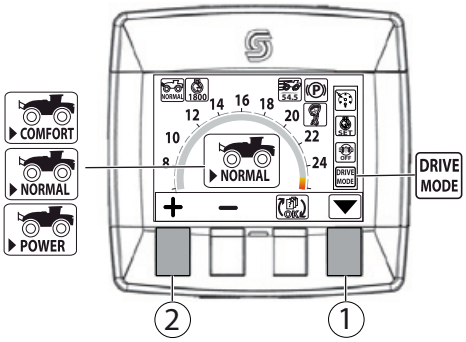
DANGER! The parking brake is very effective. Avoid engaging it when the machine is moving, except in an extreme emergency.

Driving mode

The self-propelled has 3 modes of operation, which allows you to optimize the overall performance of the transmission (speed/torque, acceleration and progressive braking) depending on the variations and conditions of use.

The mode [COMFORT] is designed for a gradual acceleration of the self-propelled. The [NORMAL] allows a superior acceleration compared to the mode COMFORT. The [POWER] mode allows a more reactive operation of the self-propelled.

- Press the key (1) to select [DRIVE MODE].
- Press the key (2) to change the driving mode.



NOTE! The mode can be changed while driving.

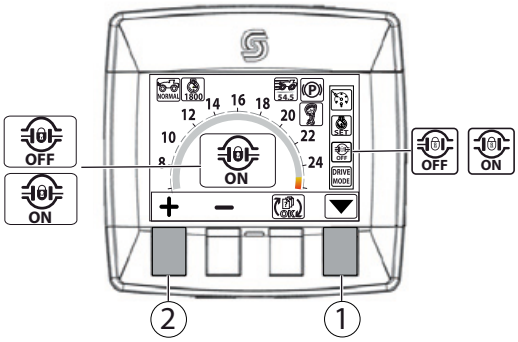
Traction Control System

Sensors built into the hydraulic motors constantly measure the speed of each wheel. A computer compares these speeds and if necessary operates a reduction in the hydraulic power to the wheel motor that is slipping.

To improve the control of the traction control system in the turns, the angular sensors placed on the front axle measure the turning angle of the wheels to allow the computer to optimize the traction control system.

The traction control function is operational only in the field mode.

- Press the key (1) to select the traction control system
- Press the key (2) to engage the traction control system



NOTE! Activation can be done while driving.

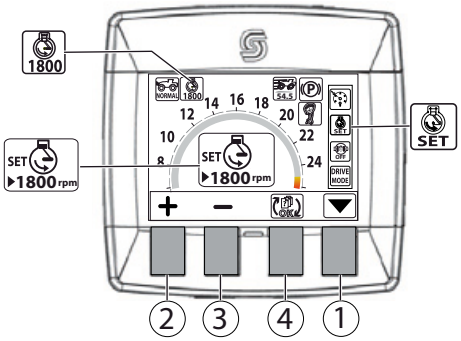
Limitation of engine speed

It is possible to limit the speed of the engine. This limitation applies only in mode [Field]

- Press the key (1) to select the engine speed limitation
- Press the button (2) or (3) to adjust the value
- Press the key (4) to validate

Minimum Value = 1200 rpm

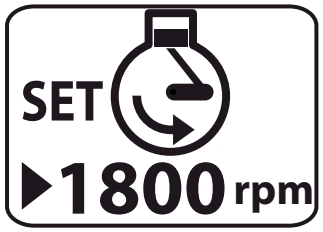
Maximum Value = 2500 rpm



Preset the speed of the engine

This feature allows you to optimise the power of the engine, while reducing fuel consumption. Preset the engine speed to vary between 1200 rpm and 2500 rpm. This limitation applies only in field mode.

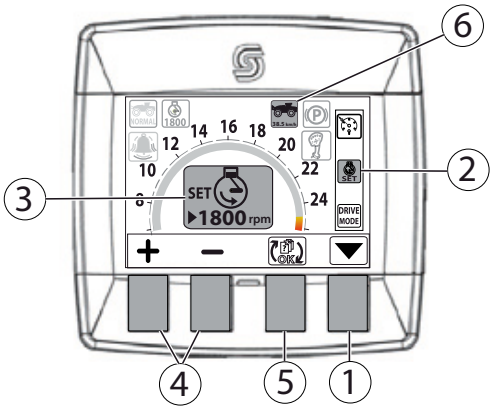
NOTE! It is recommended that for the transmission to give enough traction, braking torque and for adequate hydraulic flow for boom and pump performance, the engine rpm be set to 2000.



To change the value of the preset of the engine speed:

- Press two times on the push button (1). The symbols (2) and (3) show that the preset function of the engine speed is selected.
- Press the push buttons (4) to increase or decrease the value.
- Press the key (5) to save the value and return to the previous menu.

The symbol (6) indicates the value of the pre-adjustment of the engine speed.



NOTE! The fuel gauge reappears after 5 seconds of inactivity on the push buttons.

To disable the pre-setting the speed of the engine, it is sufficient to press the acceleration switch on the dashboard.

NOTE! The default speed: 2500 rpm

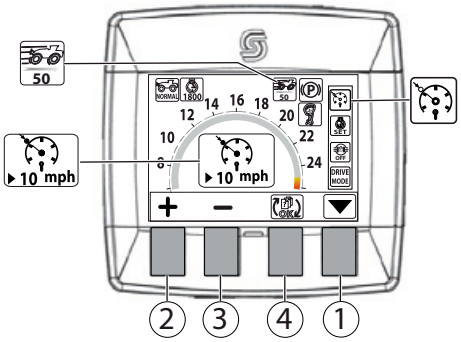
Restricting the speed of movement in field mode

It is possible to limit the travel speed in field mode.

- Turn the speed selector switch to one of the 3 positions of the field mode
- Press the button (1) to select cruise control
- Press the button (2) or (3) to adjust the value
- Press the button (4) to validate the data

Maximum Value = 30 km/h

Minimum Value = 3 km/h



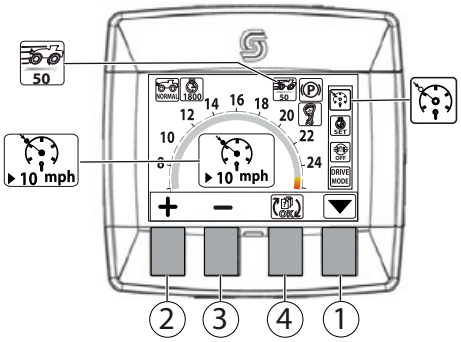
Restricting the speed of movement in road mode

It is possible to limit the travel speed in road mode.

- Turn the speed selector switch to the road mode
- Press the button (1) to select cruise control
- Press the buttons (2) or (3) to adjust the value
- Press the button (4) to validate the data

Maximum Value = 50 km/h

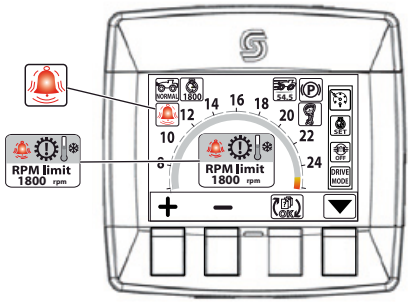
Minimum Value = 3 km/h



Limitation of engine speed - hydraulic oil temperature too low

When the temperature of the hydraulic oil is less than 30 degrees Celsius, the engine speed is limited to 1600 rpm, this effect is to protect components of the hydraulic transmission.

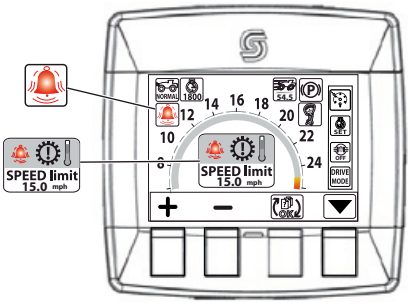
When the hydraulic oil temperature becomes greater than 30 degrees Celsius, the engine rpm increases to reach the set rpm.



Limitation of engine speed - hydraulic oil temperature too high

When the temperature of the oil in the transmission reaches 90 degrees Celsius, the computer reduces the flow of oil in the motors, which has the effect of limiting the speed of movement of the machine.

ATTENTION! The transmission will stop if the hydraulic oil temperature reaches 95 degrees Celsius.



Engine management

Management of the system Anti-stall

This device avoids engine stalling if the power demanded by the transmission is higher than that supplied by the engine. To prevent the engine from dropping below the threshold of normal operation, the displacement of hydraulic motors increase, then the displacement of pumps will be reduced.

When the anti-stall feature is enabled, the ground speed is decreased slightly compared to the normal operation of the machine.

Management of the engine Overspeed

This feature allows that the transmission does not accelerate the engine beyond a maximum bearable speed during a hydrostatic deceleration.

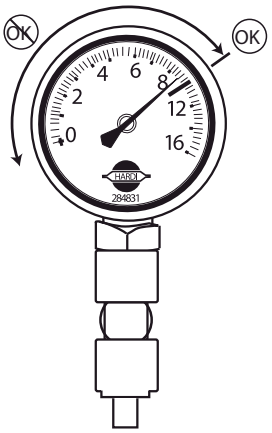
If the engine speed exceeds a specified threshold, the displacement of the wheel motors is increased and the displacement of the hydraulic pump is decreased, allowing the sprayer speed to be slowed in a controlled manner.

When the overspeed function is enabled, the hydrostatic braking is less effective in relation to the normal operation of the machine.

NOTE! The management of the engine overspeed is not active when the brake pedal is used.

Air Suspension

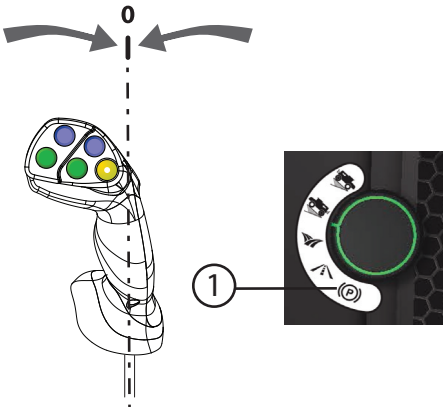
WARNING! Before traveling, wait until the air suspension is operational. A pressure gauge installed on the outside of the cab indicates the pressure in the circuit. The value must be at 8 bar (116 psi). To adjust the air pressure, see "Compressed air pressure adjustment" on page 204.



DANGER! The suspension components may adjust rapidly if the 8bar is not achieved when the park brake is released.

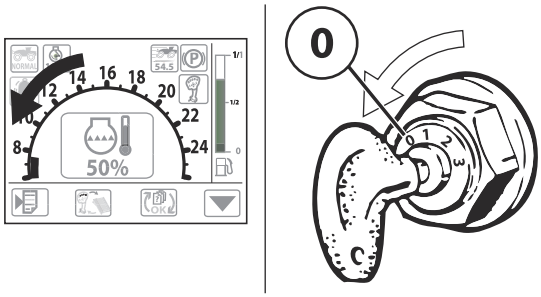
Stopping the engine

- Place the grip in neutral position (0) to immobilise the sprayer, and turn the mode selector switch to parking position (1).
- Reduce the engine speed to slow down the turbocharger and allow to stabilise the engine temperature.



- Turn the ignition key to position (0) to shut down the engine.
- Wait for the ladder to lower.

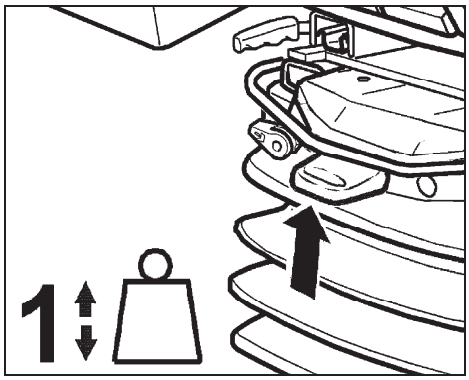
DANGER! When the engine is stopped the access ladder to the cab is automatically lowered.



WARNING! Turn the isolator switch OFF to disconnect power from the electrical and electronic circuits and prevent battery discharge.

5.3 Driver's Seat functions and operation

Weight adjustment



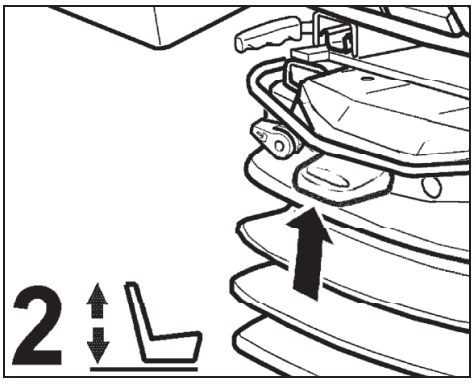
The seat must be adjusted for the driver's weight by briefly pulling the actuator lever of the automatic weight and height adjuster (arrow) with the vehicle at a standstill and the driver sitting on the seat.

The driver must sit absolutely still during adjustment.

DANGER! Before adjusting the weight, adjust shock absorbers to the position "soft".

ATTENTION! To prevent damage to the health, the setting for the driver's weight must be checked and adjusted individually before the vehicle is driven.

Height adjustment



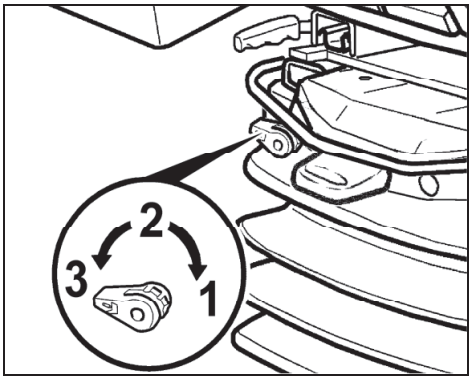
The seat height can be set pneumatically and is continuously adjustable.

The seat height can be altered by pulling or pushing the adjustment lever fully up or down (arrow). If the adjustment reaches the top or bottom endstop, the height is adjusted automatically in order to guarantee a minimum spring travel.

DANGER! Before adjusting the height, adjust shock absorbers to the position "soft".

ATTENTION! In order to avoid damage, do not operate compressor for more than 1 minute.

Absorber



The absorber setting of the seat can be varied to suit the on and off-road driving conditions. The cushioning effect can be individually adjusted for this purpose.

Turn the lever to the desired position and release

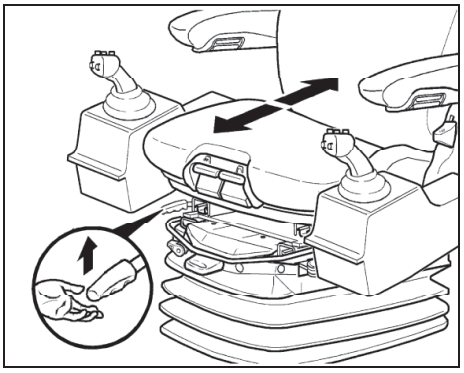
Position 1 = soft

Position 2 = medium

Position 3 = hard

Position 2 is the basic setting recommended by the manufacturer for an average driver's weight.

Fore/aft adjustment



The fore/aft adjustment is released by lifting the locking lever.

DANGER! Risk of accident! Do not operate the locking lever while driving.

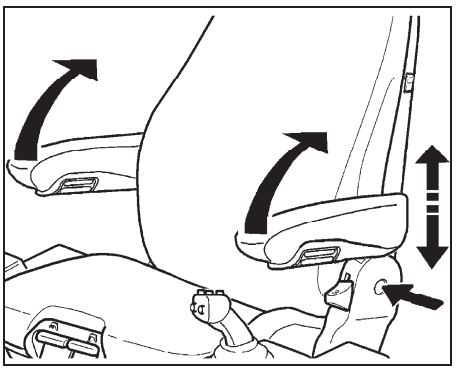
ATTENTION! The locking lever must latch into the desired position. It should not be possible to move the driver seat into another position when it is locked.

ATTENTION! Do not lift the locking lever with your leg or calf.

Armrests

The armrests can be folded up if required and the height individually adjusted.

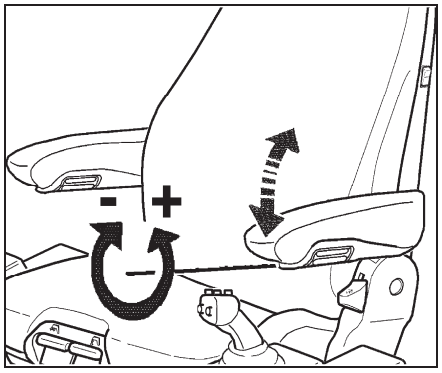
To adjust the armrests for height, separate the round cap (see arrow) from the cover, loosen the hexagon nut (size 13 mm) behind it and adjust the armrests to the desired position (5-steps) and tighten the nut again (25Nm). Replace the cap onto the nut.



Armrest adjustment

The inclination of the armrests can be modified by turning the adjustment knob.

When turning the knob to the outside (+) the front part of the armrest will be lifted, when turning the knob to inside (-) it will be lowered.

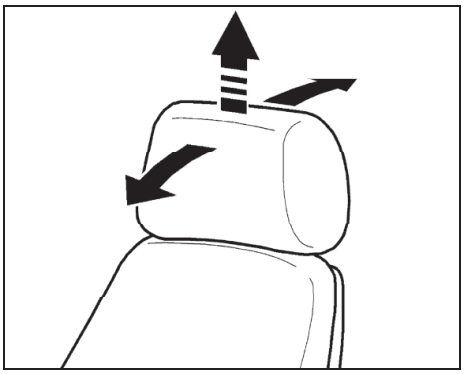


Headrest

The headrest can be individually adjusted for height by pulling it upward over the various increments up the end stop.

By pushing forward or rearward the angle of the headrest can be adjusted individually.

To remove the headrest, pull it over the end stop.

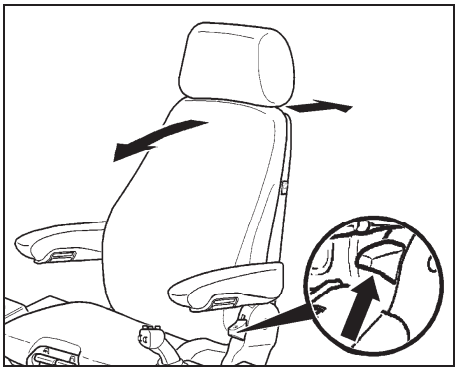


Backrest adjustment

Pull up the locking lever to release the backrest catch. When releasing the backrest catch, do not apply load to the backrest by pressing against it.

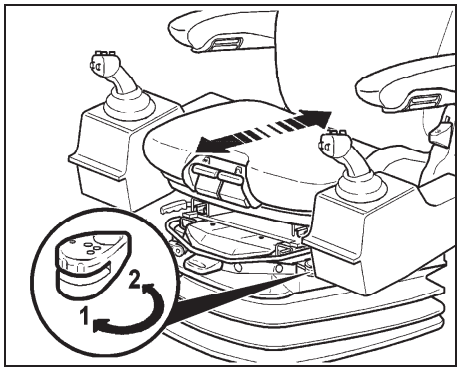
By exerting pressure on or off the front or rear part of the seat pan it can be moved to the desired position. Release the locking lever to lock the backrest.

ATTENTION! It should not be possible to move the backrest into another position after it has been locked.



Fore/aft isolator

Under certain driving conditions (for example with a trailer attached), it is useful to activate the fore/aft isolator. This means that shock impacts in the driving direction can be better absorbed by the driver seat.



Position 1 = fore/aft isolator off

Position 2 = fore/aft isolator on

ATTENTION! After the adjustment of position 1, the locking lever must latch into the desired position. For that, the seat must be pressed backwards until it latches with an audible click.

ATTENTION! It should not be possible to move the fore/aft isolator into another position when it is locked.

Trainer seat

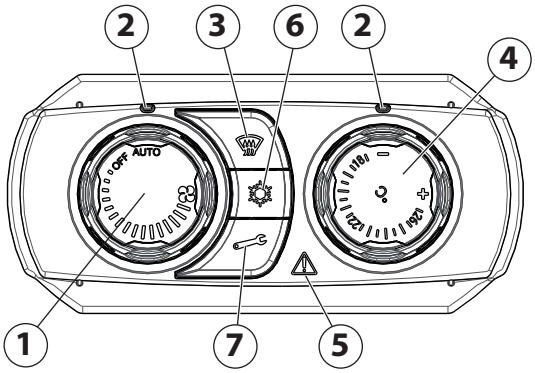
The trainer seat can be folded.

Pull the lever (1) and raise the seat. Release the lever to lock the seat in position.

5 - Operation

5.4 Air conditioning controls

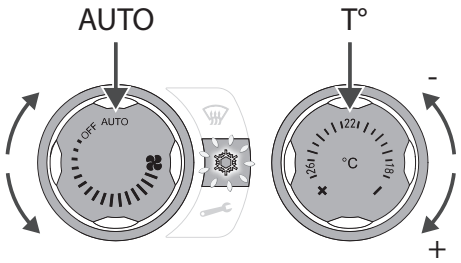
Description of Controls



1. Fan control
2. Indicator light (always on)
3. Defrost
4. Temperature setting
5. Warning light
6. Air Conditioning
7. Pressurisation maintenance
8. Air direction control

AUTOMATIC Mode

- Turn the control knob (**1**) to '**AUTO**' . The air conditioning light (**6**) will turn on
- Turn the control knob (**4**) to the desired temperature. The fan speed will adjust depending on the selected temperature.

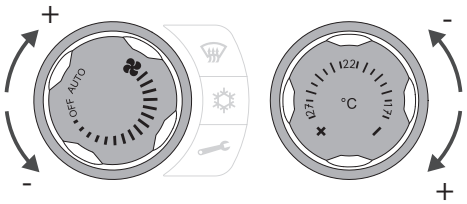


DEFROST Mode

- Turn the defrost button (**3**) the light (**6**) will turn on. The air conditioning, heating and maximum fan will turn on.

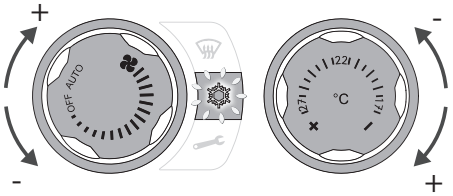
HEATING Mode

- Turn the temperature control knob to set the temperature (**4**).
- Select the fan sped (**1**).



AIR CONDITIONING (AIRCON) Mode

- Use to knob to set the minimum target temperature (**4**).
- Press the air conditioning button (**6**). The light will turn on.
- Control the fan speed by turning the knob (**1**).



Operational problems

An error code is displayed if there is a malfunction in the air conditioning system. For more information on errors, refer the section "Cabin error codes" on page 180.

Windshield Wiper/Washer

- Momentary position
- OFF position

5 - Operation

K PROTECT Pressurisation

The control panel comes with firmware that controls the cabin pressure. The firmware verifies and maintains.

- a minimum pressure air flow of 30 m^3/hour
- a cabin pressure higher than 23 Pa

NOTE! If the warning light ⚠ turns on, it means that the cabin pressure in the cabin is too low. To fix the problem, see chapter "Pressuriser maintenance instructions" page 177.

Combined air filter usage

The warning light will light after 250 hours of use to indicate that it is necessary to replace the combined air filter, Refer to the section "Every 250 hours - Cabin combined air filter" page 150.

Non Category 4 usage

If you use a configuration with a non category 4 filter, the warning light will remain on.

WARNING! A non category 4 usage means that the cabin is no longer certificated in category 4.

Combined air filter storage

For a long lasting performance, only use the filter during the spraying period. Store it carefully after use into a hermetic packaging.

5.5 Boom

General info

ATTENTION! A manual control of the centre lock is possible through the HYDAC hydraulics universal terminal.

WARNING! Compress the springs on both sides evenly to prevent the pendulum from tilting or slanting. Please refer Hydraulic Controller HYDAC section.

WARNING! Only operate the folding functions when the sprayer is stationary! Failure to do so may damage the boom.

ATTENTION! If a folding sequence is not completed, a warning message will ask you to complete this sequence before starting next sequence.

Operating the boom - AutoTerrain with HCH-508

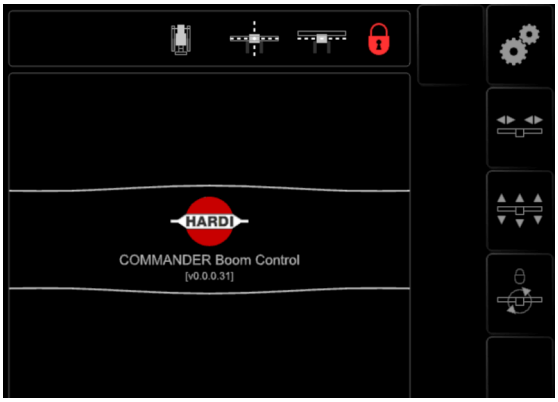
WARNING! The pendulum lock automatically activates when pressing one of the boom fold buttons. Boom folding is not possible if the pendulum is unlocked. A manual override of the pendulum lock is possible through the slant and pendulum lock control screen.

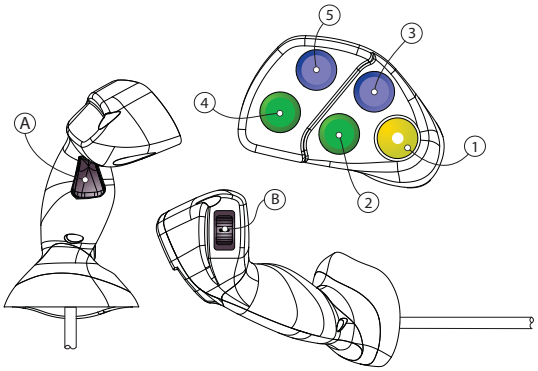
WARNING! Only operate the folding functions when the sprayer is stationary! Failure to do so may damage the boom. The pendulum lock automatically opens above the set speed!

ATTENTION! If a folding or unfolding sequence is not completed, a warning message will ask you to complete this sequence before starting next sequence.

To unfold the boom

9. Ensure that the HCH-508 VT screen is available.
10. Press buttons (4) and (5) to lift the boom wings.
11. Press the soft key to enter the boom fold control screen.
12. Unfold the inner booms. Wait until the inner booms have stopped moving before releasing the soft key.
13. Press buttons (2) and (3) to lower the booms wings until the booms are level.
14. Unfold the 1st outer booms. Wait until the 1st outer booms stop moving before releasing the soft key.
15. Unfold the 2nd outer booms. Wait until the 2nd outer booms stop moving before releasing the soft key.
16. Press the buttons to lower the boom to working height.
17. Unlock the pendulum lock before commencement of spraying operations.

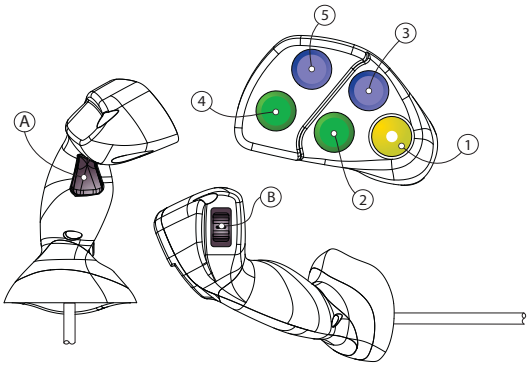




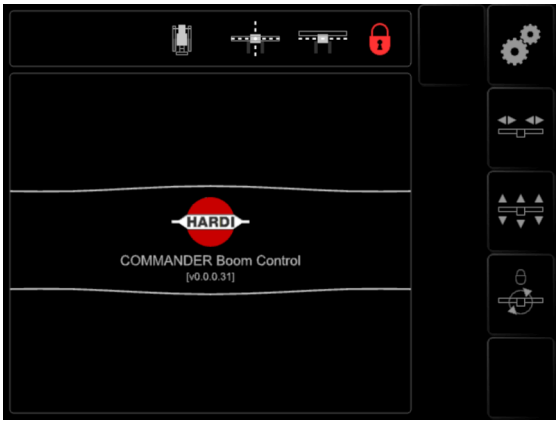
NOTE! All grip functions may be replaced by the relevant boom height control screen function.

To fold the boom

1. Press the buttons (2), (3), (4) or (5) to level the boom wings as required.
2. Press the (4) and (5) buttons to lift the boom to it's highest position.
3. Fold the 2nd outer wings. The symbol appears in display until the pendulum is locked. This takes approximately 10 seconds.
4. Fold the 1st outer wings.
5. Press the buttons (4) and (5) to tilt boom wings up.
6. Fold the inner wings until they touch the transport frame uprights.
7. Press and hold the boom lower button (2) and (3) to lower the boom until it rests in the paralift locks. Continue holding this button for 10 seconds to drain the paralift accumulators.



8. Press and hold the (2) and (3) buttons to lower boom wings until they rest in the transport brackets. Continue to hold these buttons for 10 seconds to drain the tilt accumulators.



5.6 Liquid system

Filling/washing location requirements

When filling the sprayer with chemicals and water it is important to avoid spot contamination by spray chemicals in order to protect the subsoil water resources.

A. If the sprayer is always filled at the same place, a special filling/washing location should be established. This should have a hard, liquid-impenetrable surface (e.g. concrete) and edges securing against run-off to the surrounding areas. The place should be drained to an adequate receptacle (e.g. slurry tank or similar).

   Any spillage or washings should be retained and diluted in order to be distributed on a larger area to ensure minimal environmental impact and avoid build-up of larger chemical concentrations at one spot.

   If no other requirements of distances exist, the following general recommendation of distance could be used. Not closer than:

   1) 50 metres from public water supplies for drinking purposes,

   2) 25 metres from non-public water supplies for drinking purposes and from treatment sumps and cesspools of drainage systems, and

   3) 50 metres from surface water (watercourses, lakes and coastal waters) and from nature reserves.

B. Alternatively the sprayer can be filled in the field where the spraying is to take place. If so, choose a different location for each refilling.

   If no other requirements of distances exist, the filling should not take place closer than:

   1) 300 metres from public or non-public water supplies for drinking purposes and

   2) 50 metres from surface water (watercourses, lakes and coastal waters), treatment sumps, cesspools of drainage systems and nature reserves.

ATTENTION! When filling the sprayer, care must be taken to ensure the gross weight of the machine does not exceed manufacturer limits.

ATTENTION! Heavier chemicals can make the loaded weight significantly greater than water alone.

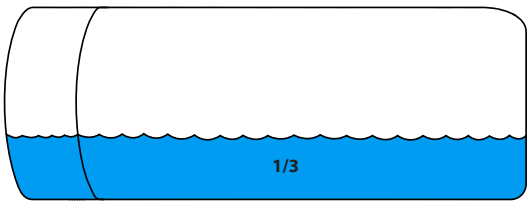
ATTENTION! Machine damage, tyre overload or unsafe operation may result if the sprayer is over-weight.

ATTENTION! Legislation and requirements vary from country to country. Always follow local legislation in force at any time.

NOTE! It is the responsibility of the sprayer owner/operator to comply with all relevant legislation. HARDI does not undertake any responsibilities for incorrect operation and use.

Filling of water

The tank should normally be filled 1/3 with water before adding chemicals. Always follow the instructions given on the chemical container!



WARNING! If the sprayer is put aside with liquid in the MainTank, all manifold valves must be closed.

Main Tank Filling

The Main Tank can be filled in 4 different ways:

1. Fast Fill System
2. Filtered Front Fill System (optional)
3. Banjo Filtered Fast Fill System
4. Venturi Fast Fill system

Fast Fill System

The Fast Fill System allows the operator to fill the using an auxiliary pump. The operator can also control the speed at which is filling takes place by adjusting the quick fill ball valve on the sprayer.

ATTENTION! Fast Fill System circuit does not include a filter or strainer! It is highly recommended you use a remote in line filter to remove any debris and impurities. For more information please contact your HARDI dealer.

1. Remove the cap from the 3 inch Cam-lock and connect the hose to a water source.
2. Start the water supply or remote fill pump that will be connected to a clean water supply.
3. Open the Batch Fill Valve
4. Fill Main Tank to required volume
5. Turn off water supply or remote fill pump.
6. Disconnect hose and fit the cam-lock cap.

Filtered Front Fill System (optional)

The fluid is filtered through a filling filter.

The Cam Lock coupling size is 2,0 (Standard) or 3,0 (Optional) inch and is located on the front of the sprayer.

NOTE! The front fill using the Banjo pump is only for clean water, the pump is not rated for chemical use.

1. For easy filling the fluid refill arm (B) can be lowered, to do so release locking pin (A) at same time pull the arm down.
2. Remove the cap from the Cam Lock and connect the hose.
3. Start the water supply or remote fill pump that will be connected to a clean water supply.
4. Open the valve (C).
5. Fill Main Tank to required volume, then close valve.
6. Turn off water supply or remote fill pump.
7. Disconnect hose if required, fit the cam-lock cap and lift the fluid refill arm to transport position.

WARNING! After filling ensure that the fluid refill arm is upper position and the lock is engaged.

Banjo Filtered Fast Fill System

The Banjo Fast Fill System employs a high capacity centrifugal pump driven by a hydraulic drive motor. (The motor is powered by the sprayer's hydraulic system.

The fluid is filtered through a filling filter.

The Cam Lock coupling size is 2,0 (Standard) or 3,0 (Optional) inch and can be located on side of the sprayer, or in the front of the sprayer or on both places.

NOTE! The Banjo filtered fast fill is only to be used with clean water, it is not rated for chemical use.

1. Remove the cap from the Cam Lock and connect a suction hose to a water source.
2. Open the valve.
3. Start the "FILL" from HIVE display.
4. Select "TANK" on HIVE display.
5. Select Volume.
6. Select Specific Gravity. (Default value is 1.00)
7. Adjust the flow rate by via the motor accelerations buttons located on the control panel.
8. When filling is done, close the valve and fit the cam-lock cap.

Venturi Fast Fill system

The Venturi Fast Fill option uses an on-board venturi system to draw water directly from an external source.

1. Remove the cover from the aluminium Quick coupler and connect a suction hose with the other end connected to an external source.
2. Open the Main Tank Valve.
3. Turn on the Main Fluid Pump from the control panel.
4. Open the Suction Source Valve.
5. Keep an eye on the main tank level indicator to prevent over filling.
6. To stop filling close the Suction Source Valve, disconnect the suction hose and replace the quick coupling dust cover.
7. Close the Main Tank Valve.
8. Turn off the Main Fluid Pump from HIVE display.
9. Close the Chemfiller/Ejector Valve by turning it so the arrow on the valve is facing up.

ATTENTION! The Fast Fill circuit does not include a filter or strainer! It is highly recommended you use a remote in line filter to remove any debris and impurities. For more information please contact your HARDI dealer.

Filling of Rinse tank

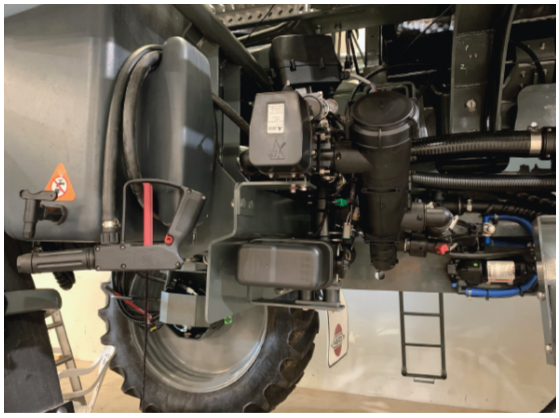
The rinse tank is filled via a 3 inch Cam Lock connection. To fill the rinse tank proceed as follows:

1. Remove the cap from the Cam Lock and connect a suction hose to a water source.
2. Open the valve.
3. Start the "FILL" from HIVE display.
4. Adjust the flow rate via the motor acceleration buttons located on the control panel.
5. When filling is done, close the valve and fit the cam-lock cap.

ATTENTION! Only fill the rinse tank with clean water. To avoid algae developing, always drain the rinse tank if the sprayer is not used for an extended period of time.

Filling of hand wash tank

A hand wash tank is fitted below the platform in the fluid working zone on the sprayer's left side. Fill with clean water only. The water from this tank is for hand washing, cleaning of clogged nozzles etc. To drain the clean water tank remove lid at the bottom and reposition the lid.



WARNING! Although the clean water tank is only filled with clean water, this water must never be used for drinking.

5.7 Chemical Filling - Turbofiller

Safety Precautions - Crop Protection Chemicals

Always be careful when working with crop protection chemicals!

WARNING! Always wear proper protective clothing before handling chemicals!

Personal Protection

Depending on the chemical type, protective gear/equipment should be worn to avoid contact with the chemicals, such as:

- Gloves
- Waterproof boots
- Headgear
- Respirator
- Safety goggles
- Chemical resistant coveralls

WARNING! Protective clothing/equipment should be used, when preparing the spray liquid, during the spray job and when cleaning the sprayer. Follow the chemical manufacturer's instructions given on the chemical label and/or local legislation.

WARNING! It is always advisable to have clean water available, especially when filling the sprayer with chemical.

WARNING! Always clean the sprayer carefully and immediately after each use.

WARNING! Only mix chemicals in the tank according to directions given by the chemical manufacturer.

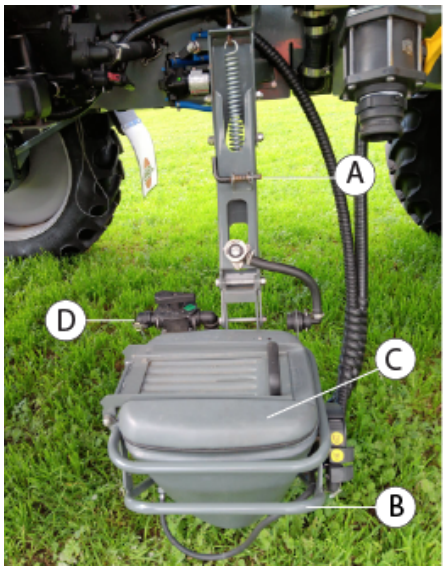
WARNING! Always decontaminate the sprayer before changing to another chemical.

Operating the TurboFiller

The TurboFiller is where you add the chemicals to be mixed with water in the MainTank.

Capacity: approximately 35 litres.

Before Use



- Pull the locking lever (A) to unlock the position of the TurboFiller.
- Grab the handle (B) and pull the TurboFiller downwards.
- Lower the TurboFiller to the stop and let go of the locking lever (A) to lock the position.
- Open the lid (C).
- Place the chemicals for the coming spray job nearby ready to be filled into the TurboFiller.

Filling chemicals using the HARDI TurboFiller

1. Select "Venturi Fill - Hopper" on HIVE.

NOTE! If filling from an external source, this can continue while performing the following steps.

2. Open the TurboFiller lid. Pour the correct quantity of chemical into the hopper.

DANGER! Always wear face shield and other appropriate personal safety equipment, when filling chemicals.

ATTENTION! The scale in the hopper can only be used, if the sprayer is parked on level ground! It is recommended to use a measuring jug for improved accuracy.

3. Engage suction to the TurboFiller by opening the turbo filler suction valve (D). Chemical will be transferred to the main tank. The turbo filler suction valve must be open for at least 20 seconds after the chemical is no longer visible in the hopper, in order to empty the transfer hoses completely.

DANGER! If the TurboFiller and the transfer hoses are not completely emptied, there is a risk of chemicals flowing back into the hopper!

4. If the chemical container is empty, it can be rinsed by the "chemical container cleaning device". Place the container over the multi-hole nozzle and open the drum cleaning valve to activate container cleaning.

DANGER! In order to avoid spray liquid hitting the operator, do not press the lever, unless the multi-hole nozzle is covered by a container, as spray liquid may otherwise hit the operator!

ATTENTION! The rinsing device uses spray liquid to rinse containers for concentrated chemicals. Before disposal, always rinse the chemical containers with clean water several times, until they are clean.

ATTENTION! If the suction valve is not moved to suction from a clean water supply, the hopper rinse will use spray liquid for rinsing the hopper! Cleaning of the TurboFiller must always be done, when the spray job is finished, together with cleaning the entire sprayer. Cleaning after the last filling, and before spraying, does not ensure a clean TurboFiller!

5. Close the TurboFiller suction valve, when the hopper has been rinsed. Close the lid.

General Info

Follow the below cleaning and maintenance program, in order to derive full benefit from the sprayer for many years.

ATTENTION! Always read the individual paragraphs. Carefully read the instructions for cleaning/maintenance jobs before starting on the job. If any portion remains unclear, or if it requires facilities not available, then please leave the job to your HARDI dealer's workshop for safety reasons.

ATTENTION! A clean sprayer:

- Is a safe sprayer.
- Is ready for action.
- Reduces risk of crop damage from crop protection chemical residue.

Guidelines

- Read the complete chemical label. Take note of any particular instructions regarding recommended protective clothing, deactivating agents, etc. Read the detergent and deactivating agent labels. If cleaning procedures are given, follow them closely.
- Be familiar with local legislation regarding disposal of chemical washings, mandatory decontamination methods, etc. If in doubt, contact the appropriate authority.
- Usually the chemical washings are sprayed out on the field just sprayed or at a suitable area. Avoid emptying the washings at the same spot every time and keep sufficient distance to the water environment. You must prevent seepage or runoff of residue into streams, watercourses, ditches, wells, springs, etc. The washings from the cleaning area must not enter sewers. Alternatively, retain the washings in an appropriate receptacle, diluted and distributed over a larger cultivated area - also see "Filling/washing location requirements" on page 147.
- Cleaning starts with the calibration, as a well-calibrated sprayer will ensure the minimal amount of remaining spray liquid.
- Good practice is to clean the sprayer immediately after use, and thereby rendering the sprayer safe and ready for the next pesticide application. This also prolongs the life of the components. Strongly advised is to perform an internal cleaning of the sprayer, when high concentrations of acids or chloride are present in the active ingredients, or if the spray liquid is corrosive. For the best result, use a cleaning agent.
- Sometimes it is necessary to leave spray liquid in the tank for short periods, e.g. overnight, or until the weather becomes suitable for spraying again. Unauthorized persons, children and animals must not have access to the sprayer under these circumstances.
- Recommended is to coat all metal parts of the sprayer before and after use with a suitable rust inhibitor, if the product applied is corrosive.
- Always park the sprayer under cover to avoid rain-washing off pesticides causing spot contamination in the soil. If parked outside, park the sprayer on the filling/washing location in order to retain possible pesticides.

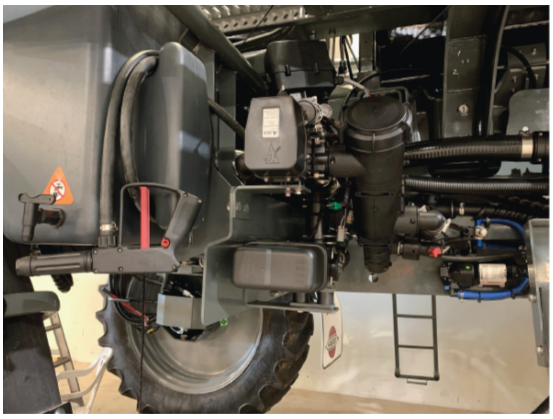
Cleaning and maintenance of filters

When cleaning the filters, ensure:

- Sprayer components such as valves, diaphragms and operating unit are not hindered or damaged during operation. Nozzle blockages do not occur whilst spraying.
- Long life of the pump. A blocked suction filter will result in pump cavitation. The main filter protecting sprayer components is the suction filter. Check it regularly.

External cleaning

This procedure is used to rinse the outside of the sprayer in the field as required.



WARNING! Never clean the sprayer if there are risks of contamination of surface or underground water! Choose a different spot for cleaning every time to avoid spot contamination to build up.

Use the External Cleaning Device to wash everything on the outwards side of the sprayer. This prevents contamination of storage place etc. and let the sprayer last for a longer life. When the External Cleaning Device is going to be used, open the cover for the fluid system on sprayers left side.

The cleaning gun is located on the inner side of the cover.

1. Un-roll the hose from the reel and take the handle.
2. Engage clean water pump by pressing the ON/OFF switch at the end of the pump.
3. After cleaning, turn off the clean water pump by pressing the ON/OFF switch.
4. Roll the hose to the reel again and close the cover.

Use of Cleaning Agents

- It is recommended to use an appropriate cleaning agent for cleaning agricultural sprayers.
- It is recommended to use cleaning agents containing a suitable lube or conditioner.
- If not available, and instead using triple ammonia water, it is important to rinse the liquid system immediately after, and add some lubricant to the rinsing water to prevent ball valves etc. seizing up.
- Use of automotive antifreeze/radiator coolant (ethylene glycol) will protect valves and seals from drying or seizing up.

Technical Residue

An amount of spray liquid will inevitably remain in the system. As the pump takes in air when the tank is just about empty, spraying the crop properly is not possible.

This technical residue is defined as the remaining amount of liquid in the system, when the first clear pressure drop appears on the pressure gauge.

ATTENTION! Liquid in the spray lines is undiluted residue. There should be an untreated paddock area available to spray this liquid out.

ATTENTION! Follow national regulations when disposing of chemical residues.

6.1 Lubrication

General information

Always store lubricants in a clean, dry and cool place - preferably at a constant temperature. Keep oil filling jugs, hoppers and grease guns clean, and clean the lubricating points thoroughly before lubricating. Avoid skin contact with oil products for longer periods. Always follow the recommendations concerning quantity. If no quantity is indicated, lubricate up to the required level.

6 - Maintenance

Service Intervals

ATTENTION! All lubricants/oil must be changed yearly irrespective of the operating hours threshold.

	Daily	x1 10	100	Interval +500 hours 250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
Hydraulic														
Hydraulic oil level	●													
Hydraulic oil			❑		❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Check hydraulic filters clogged				●	●	●	●	●		●	●		●	●
Hydraulic filters				❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Drain the hydraulic tank								❑		❑		❑		
Wheel Drive (gearbox)														
Oil level				● (Every 150 hours)										
Oil replacement				❑ (Every 500 hours)										
Tightening screws	●			●						●				
Cabin														
Combined filter (category 4)				❑ (Every 250 hours)										
Air conditioning gas				❑ (Every 5 years)										
Clean air conditioning condenser			●		●	●	●	●	●	●	●	●	●	●
Engine(1)														
Clean cooler	●													
Check oil level	●													
Check coolant level	●		●	●	●	●	●	●	●	●	●	●	●	●
Replace engine coolant				❑ (Every 2 years)										
Clean air filter	●													
Replace air filter						❑		❑		❑		❑		❑
Replace safety air filter						❑		❑		❑		❑		❑
Drain lubricating oil				❑ (Every 250 hours or 3 months)										
Empty water fuel prefilter														
Replace fuel prefilter					❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Replace fuel filter					❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Filling the fuel tank	●													
Clean fuel tank									❑					❑
Compressed air tank	●													
Compressed air filter and lubricator				●										
Compressed air pressure				●	●	●	●	●	●	●	●	●	●	●
Inspect V-belts roller				● (Every 2 years)										
Battery (maintenance + terminals)					●	●	●	●	●	●	●	●	●	●
Chassis and booms				●										
Tighten lug nuts		●		●										
Lubricate chassis and axles				●										
Check inflation pressure (tires)				●										
Inspect tires				●										
Dynamic brake accumulator							● (5 years)							
Spraying														
Check coolant mixture of the Banjo Pump (PWSP)	●													
Check the boom		●		●										
Inspect spraying circuits	●													
Ace Centrifugal Pump	●			● (Weekly)						❑ (Season end)				
Inspect line filters	●													
Remove and inspect the pressure transducer				●	●	●	●	●	●	●	●	●	●	●
		10	100	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
	Daily	x1		Interval +500 hours										

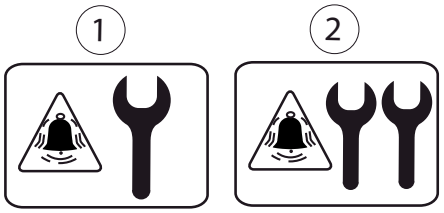
● Check ❑ Replacement (1) Refer to Cummins Operation manual (bulletin 4021531)

6.2 Maintenance

Display of the frequency of maintenance

When maintenance is required on the self-propelled, the display shows the symbols of alerts corresponding to the different periods:

1. Maintenance after 250 hours of use
2. Servicing every 500 hours



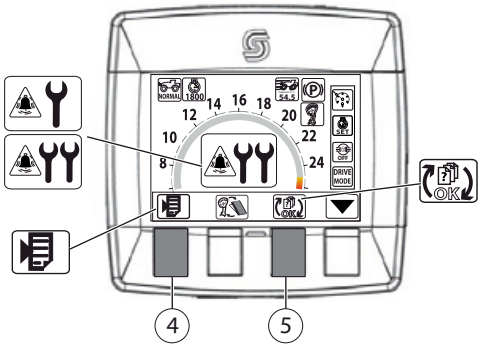
The message (1) appears every 250 hours to indicate that maintenance is required on the machine.

The message (2) appears periodically at every 500 hours to indicate that maintenance is required on the machine.

Reset the Hour Meter

- Simultaneously press the keys (4) and (5) for 5 seconds to reset the hour meter for maintenance

NOTE! The cancellation of the message is to be performed when the work of maintenance have been made.



After 10 hours - Hydraulic system

- Check the tightness of the hydraulic hoses and the oil level in the hydraulic reservoir.
- Check the tightness of the wheel studs.

6.3 Periodic Maintenance

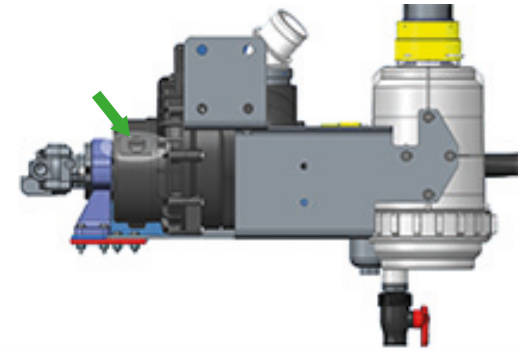
Daily

- Check sprayer filters
- Check spraying circuit
- Check engine oil level
- Filling the fuel tank
- Check hydraulic oil level
- Cleaning of the engine radiators
- Check air compressor/compressor dryer
- Check air filter is not clogged
- Check barrier fluid level of Ace centrifugal pump
- Check the mixture coolant of the Banjo Pump (PWSP series)
- Check tyre pressure
- Check wheel studs

Filling the Banjo Pump (PWSP series)

The pump is ready for operation after you have filled the wet seal reservoir 3/4 full (the seal assembly should be submerged with a 50% water ethylene glycol (antifreeze) and 50% water mixture.

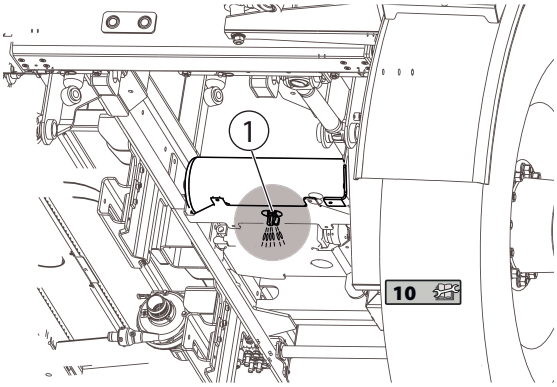
- Check and refill coolant mixture every 8 hours of use.
- Coolant fill is located behind the cabin.
- Hose to remain filled with coolant.
- Change the antifreeze every 500 hours or annually.



NOTE! The Saritor Mallee has an external coolant reservoir line which runs up to behind the cabin.

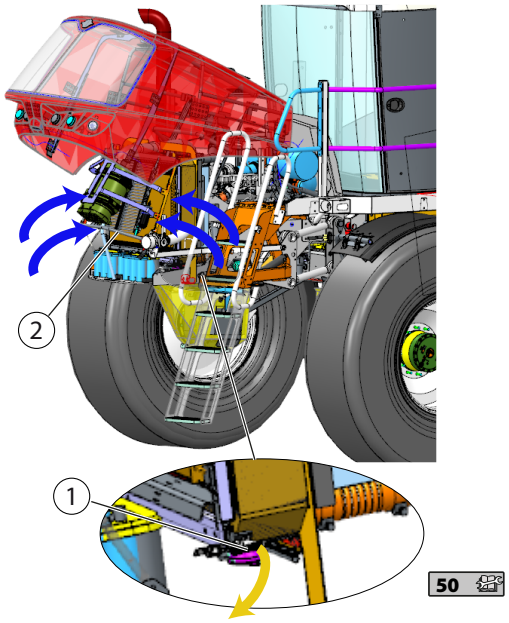
Compressed air reservoir

- Turn the bleed valve (1) to eliminate the condensate content in the tank.



Engine radiators

- Lift the engine bonnet fully.
- Release the 2 latch and raise the radiators assembly (2).
- Remove the dust from the filter with compressed air from inside to outside.



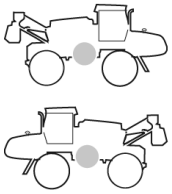
NOTE! During cleaning operations, take precautions not to damage the cells of the exchangers of temperature

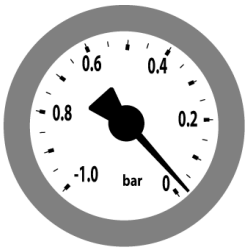
NOTE! When the machine is operating in areas with a lot of dust or pollen, the cleaning intervals should be shortened.

NOTE! The residue of oil and fuel promotes the clogging of the engine and the radiators. That is why it is advised to carefully check the sealing of the circuits of the engine.

Every 250 hours - Hydraulic filter

The hydraulic suction filters are fitted with clogging indicators.





NOTE! The clogging indicator is read when the hydraulic oil is at the normal temperature for use.

- Regularly check the clogging level.

Less than 0.2 = filters in good condition.

More than 0.2 = filters to be replaced.

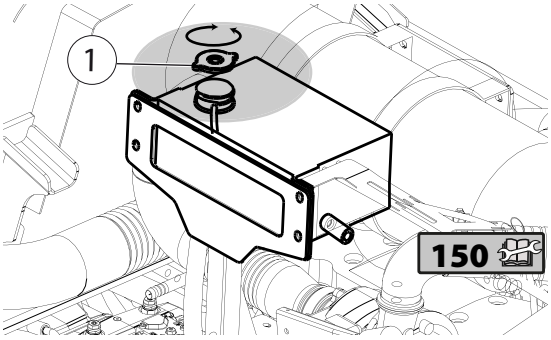
Every 250 hours - Engine

NOTE! For the maintenance of the engine, refer to Cummins operation manual.

Coolant level

DANGER! In the event of overheating of the engine's cooling system, wait a few minutes before opening the expansion tank plug, in order to avoid any risk of projection that could cause serious burns.

- Regularly check the coolant level.



DANGER! To avoid burns, unscrew the plug (1) when the temperature is below 50 °C.

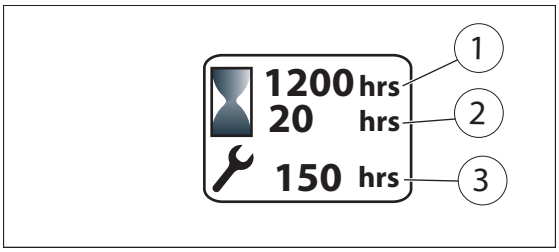
NOTE! For further information, see the CUMMINS engine user and maintenance manual.

ATTENTION! Only use the coolant recommended, see "Table of recommended lubricants" page 203.

Every 500 hours - Hour Meter

This message appears every 500 hours of use, to indicate that an intervention of mandatory maintenance is to perform on the machine.

1. Total hours of the machine
2. Hours since last maintenance
3. Time remaining until next maintenance



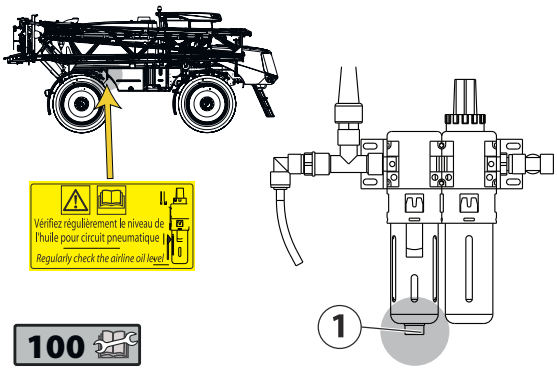
- Change of engine oil and replacement of oil filter cartridge.
- Replacement of fuel filter.
- Bleed the fuel pre-filter.
- Inspection of tightness and tension of engine belts.
- Draining of the hydraulic reservoir and replacement of hydraulic filters.
- Replace the cabin active carbon filter.

Bleed the pneumatic system

Sprayers fitted with a compressed air system have filter and lubricator mechanisms for the compressed air which is necessary for correct operation of the pneumatic components.

Bleed

- Press the push-button (1) under the filter to bleed the filter tank.

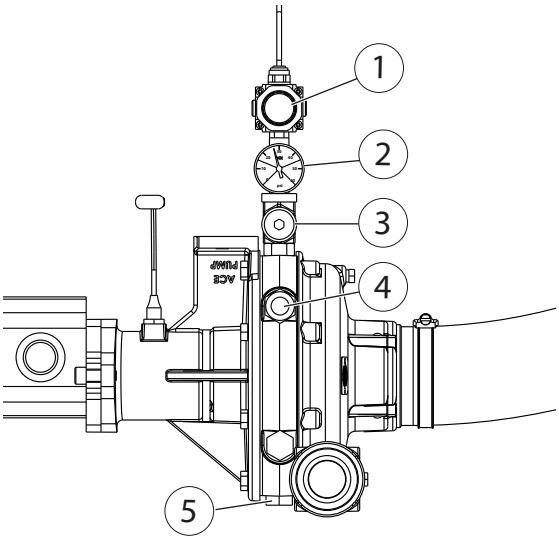


NOTE! The filter can be bled when the system is pressurised.

6 - Maintenance

Ace centrifugal pump

The seal reservoir fluid and pressure must be monitored and maintained to ensure proper operation of the WetSeal feature



Daily

Check the air pressure at the gauge (2). Air supply is regulated to 30psi, adjust the regulator (1) if necessary.

Weekly

Check barrier fluid level. A small amount of barrier fluid will be consumed under normal operating conditions.

If the barrier fluid appears cloudy or discoloured in site gauge (4), drop the air pressure, then drain until fluid runs clear, remove the refill plug (3) with clean fluid and recharge pressure. Check again in one week. If fluid is cloudy or discoloured again, this is an indication of inboard seal leakage. A seal kit installation should be scheduled for next machine downtime.

Season End

Remove drain plug (5) and drain barrier fluid from the reservoir into a clean bucket.

1) If the fluid is clear: reinstall plug, refill with barrier fluid, and recharge air pressure.

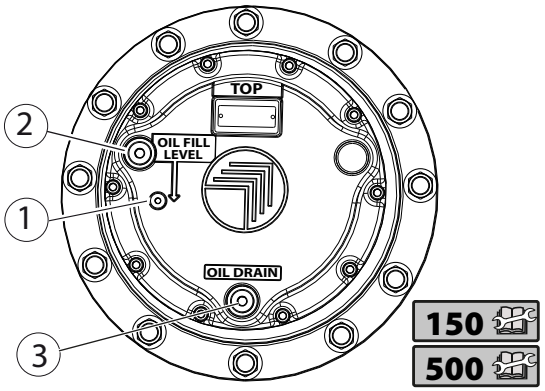
2) If fluid is cloudy, discoloured, or contains water: this could be the indication that a seal leak is developing. Installation of a seal kit is recommended to ensure trouble free operation for the next season.

Flush pump thoroughly to prevent corrosion.

Fill pump with recreational vehicle antifreeze to protect from corrosion and freezing.

Wheel Drive Gearbox Draining

- Move the self-propelled to orient the reducers as shown in the illustration.
- Unscrew the cap (1) and (3) to drain the gearbox.
- Add the oil from the orifice (2) until it flows out from the level orifice (1).



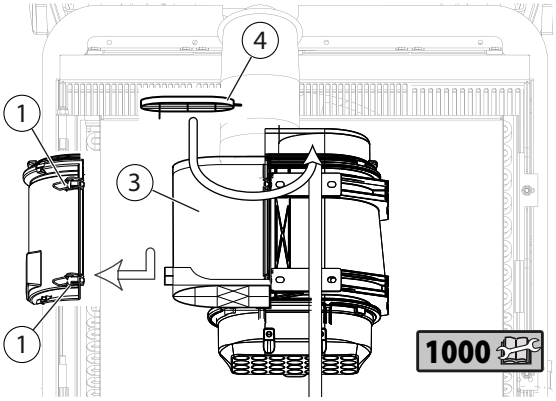
NOTE! Use new O rings for plugs.

NOTE! Use exclusively recommended transmission oil. See "Table of recommended lubricants" on page 243.

Replacement of engine air filters

WARNING! Wear goggles and a mask for protection to avoid the inhalation of dust and to protect the eyes.

- Lift the engine cover completely.
- Remove the 4 straps (1) and remove the cover.
- Gently push the main filter (3) down to the release of its housing, then remove.
- Remove the filter (4).
- Replace the filters (3) and (4).

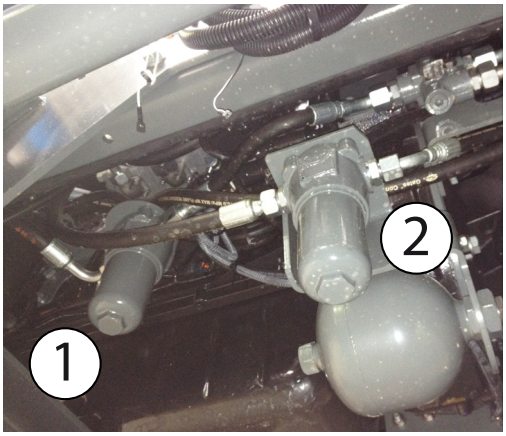


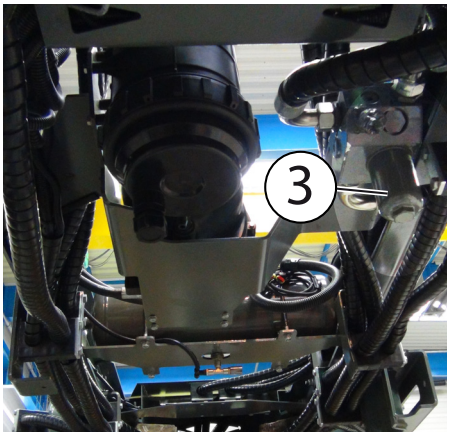
When reassembling:

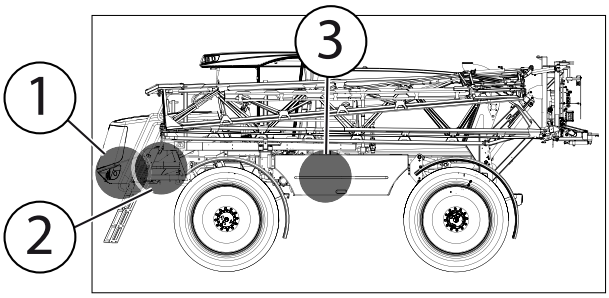
- Check the surface of the seals - clean with a slightly damp cloth.
- Inspect the air inlet of the engine and the tightening the fasteners.
- Check that the filter is not damaged.
- Check that the filter is completely in place during the reassembly.

NOTE! To ensure the best protection, make sure to use original air filters.

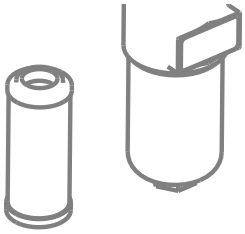
Auxiliary hydraulic filters







500



1. Steering valve filter
2. Brake circuit filter
3. Regulating valve filter for hyd. motor

To replace the filter cartridge:

- Unscrew the filter housing (1).
- Remove the filter cartridge (2) and replace it with a new one.

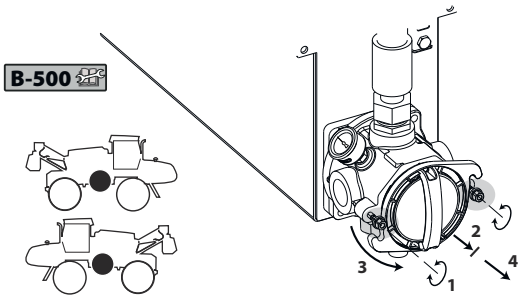
WARNING! It is essential to use an original filter.

Oil tank hydraulic filters

WARNING! Before replacing the filters, wear protective gloves to avoid the oil making any contact with the skin.

DANGER! Hot oil can cause serious burns.

WARNING! It is essential to use original filter elements.

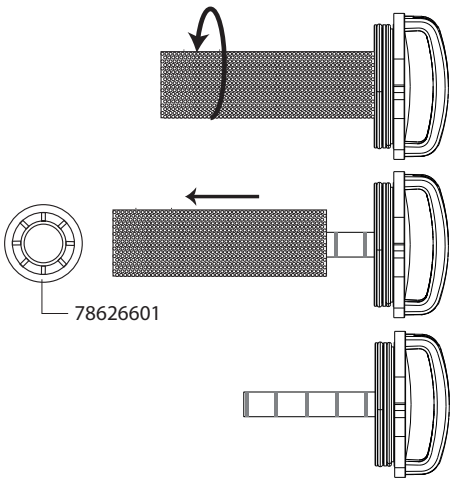


The filters elements should be fitted on either side of the tank. They should always be replaced at the same time.

A drip pan should be put in place to collect the used oil contained in the filter housing. A valve at the end of the filter housing retains the oil from the tank.

Remove the filter cap

- Unscrew the two nuts, without disassemble
- Pull out the cover up to the limit stop of the nuts. A one-way valve at the end of the filter housing retains the oil from the tank
- Turn the cover and completely pull the assembly



ATTENTION! Move slowly to ensure that the one way valve has closed completely.

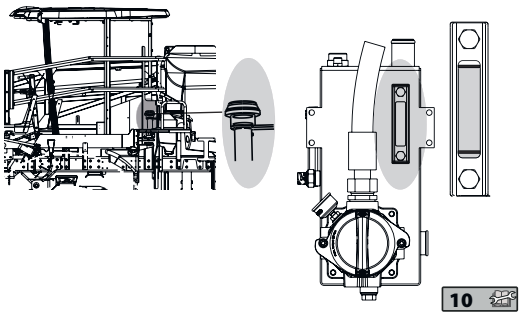
Remove the filter element

- Unscrew the filter element
- Clean carefully the magnetic core with a cloth
- Replace the filter element

NOTE! The oil running from the filters must never be re-used as it may damage the hydraulic system components.

After reassembling the filters elements

- Top-up to the maximum level.
- Start the engine on idle then stop it after a few seconds. This evacuates the air contained in the hydraulic system.
- Start the engine again on idle and then gradually increase the engine speed.
- Top-up again with oil to the maximum level.



Left & Right original filter element Part Number: 78626601

Every 250 hours - Cabin combined air filter

General info

The warning light will turn on usually after 250 hours of operation on HIVE screen.

Store the air filter carefully into a hermetic packaging after operation.

ATTENTION! Use only an genuine category 4 combined air filter.

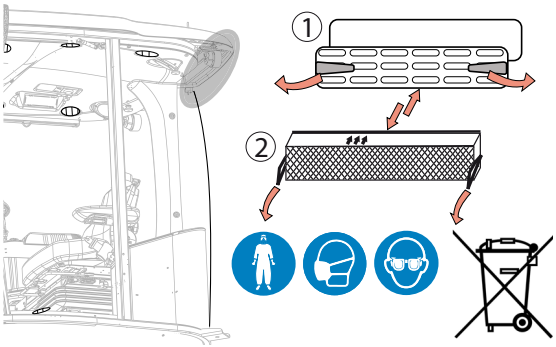
Safety recommendations

WARNING! The frequency of replacement is given for information purposes. However, a daily check is highly recommended for optimum efficiency of the filter.
In any case, if bad odours would appear in the cabin, that would mean that the filter is no longer completely effective, it must be replaced in the shortest time possible, to avoid any risk of contamination.

WARNING! Stricly follow instructions: Do not blow, wash or open the filter. For a long lasting performance, use the filter only during the spraying period.

Operating procedure

- Unlock the 2 latches and pull and remove the filter cover (1) from the K-Protect pressuriser.
- Simultaneously pull the two strips of the filter and extract it.
- Install the filter (2) following the arrows direction.



ATTENTION! If you use a non combined air filter (category 4) the warning light will remain on.

Every 1000 hours

- Cleaning of the hydraulic reservoir
- Check the engine belts
- Drain the engine coolant
- Checking the charge of gas from the air conditioning
- Cleaning the condenser of the air conditioning

Driver's seat

Dirt can impair the function of the seat, so make sure you keep your seat clean.

Upholstery does not need to be removed from the seat frame for cleaning.

WARNING! Be attentive with the backrest - it may jerk forward and cause injury!

WARNING! The backrest must be held in place when operating the backrest lever and when cleaning the backrest cushion.

ATTENTION! Do not clean the seat with a pressure washer!

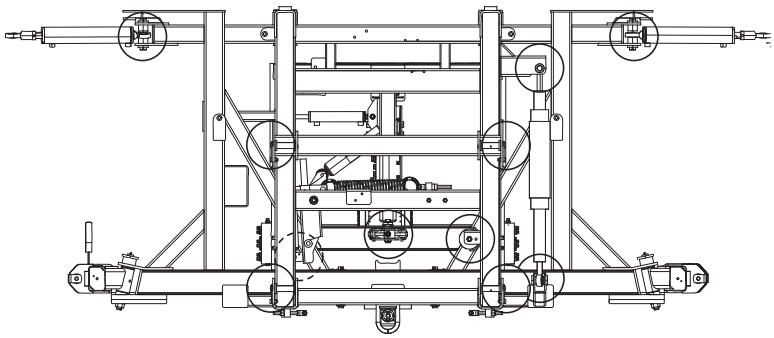
ATTENTION! When cleaning the upholstery, make sure the upholstery is not soaked.

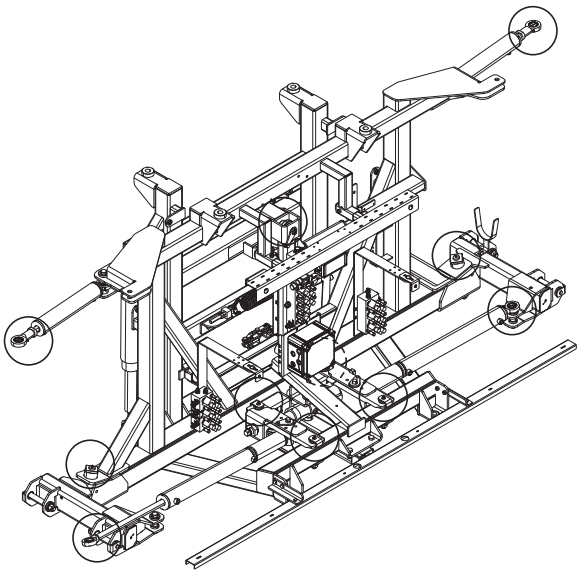
ATTENTION! Use commercially available standard upholstery or plastics cleaning agent. Before use, test first for compatibility on a small, concealed area.

6.4 Boom and Centre

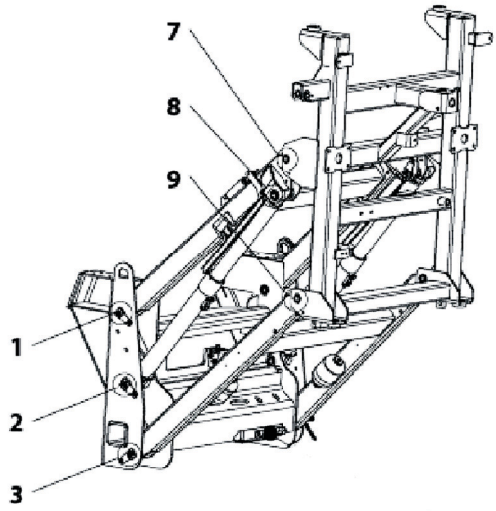
Pendulum Auto-terrain centre

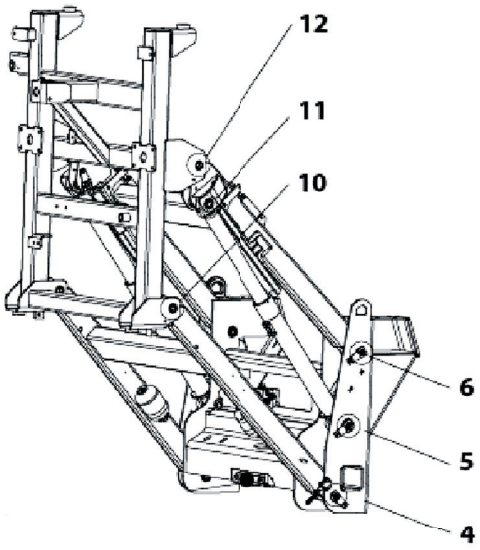
B-8 AutoTerrain





Paralift lubrication



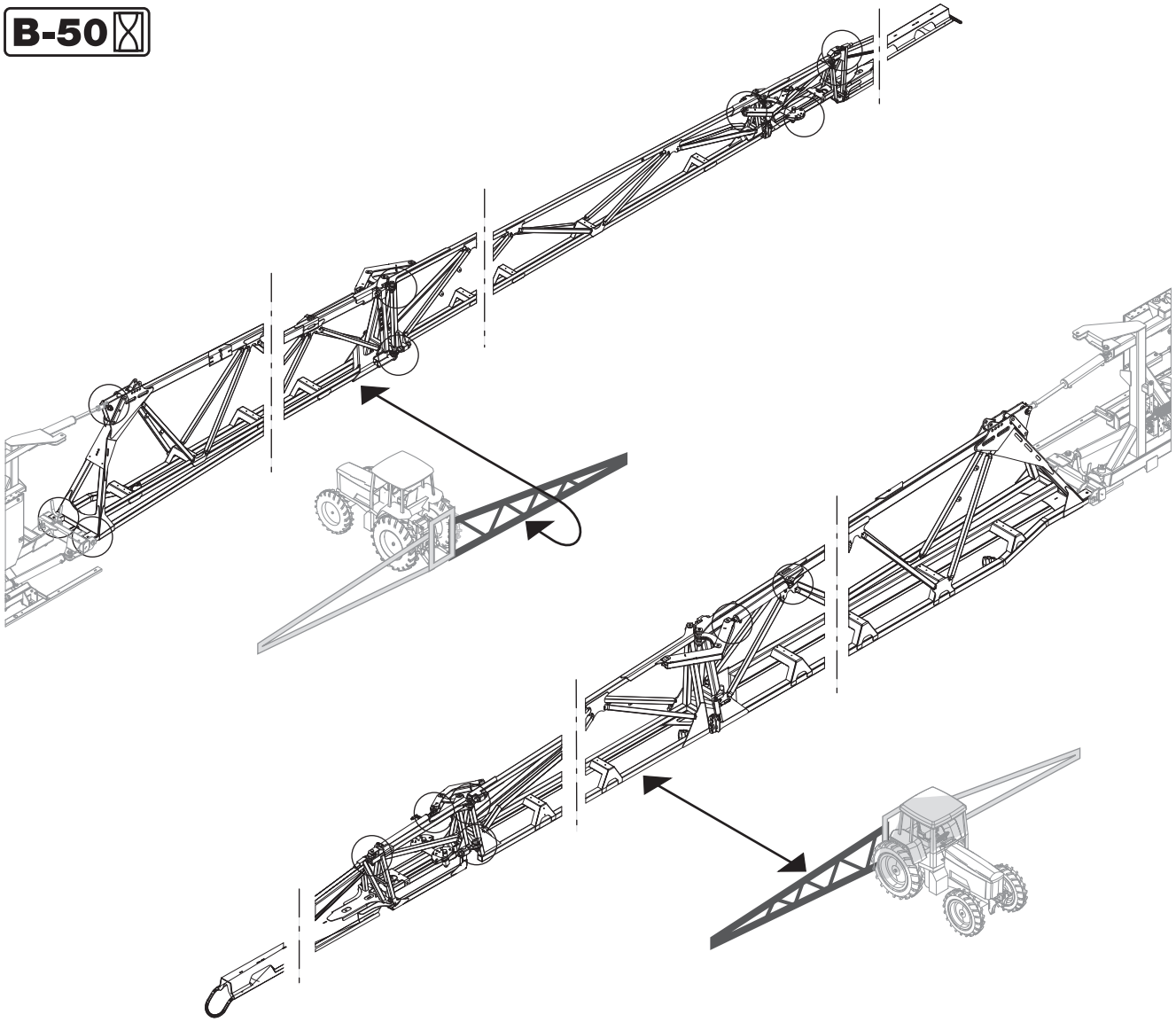


Central lubrication

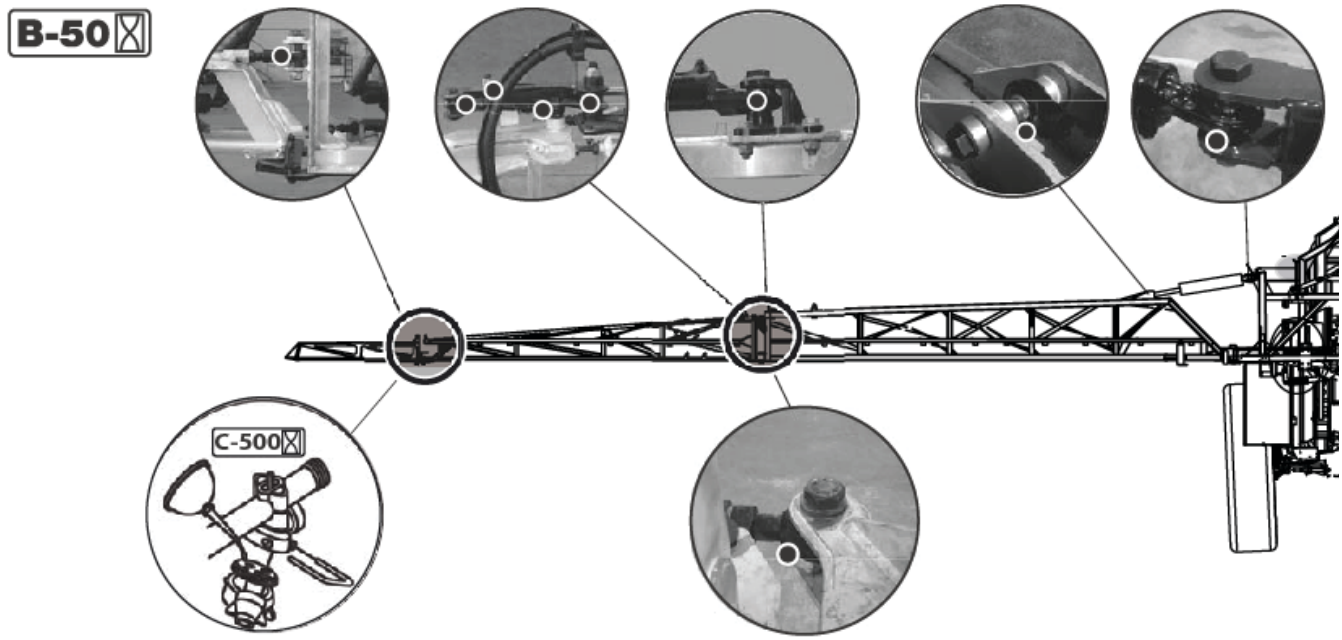
The chassis and paralift is equipped with remote lubrication points. These are located from the inside of the chassis rear end.

1. Chassis left hand upper lift arm attach point
2. Chassis left hand cylinder attach point
3. Chassis left hand lower lift arm attach point
4. Chassis right hand lower lift arm attach point
5. Chassis right hand cylinder attach point
6. Chassis right hand upper lift arm attach point
7. Paralift left hand upper lift arm attach point
8. Paralift left hand cylinder end attach point
9. Paralift left hand lower lift arm attach point
10. Paralift right hand lower lift arm attach point
11. Paralift right hand cylinder end attach point
12. Paralift right hand upper lift arm attach point

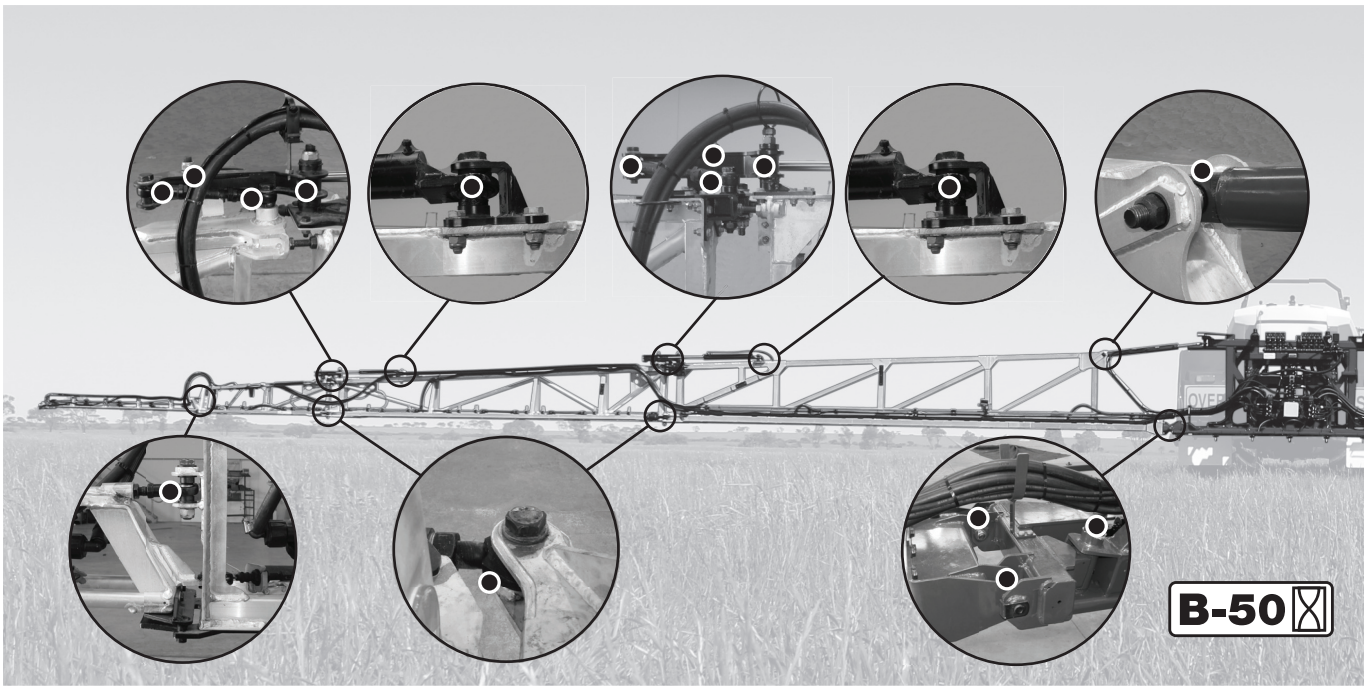
Boom lubrication



Boom lubrication TR5



Boom lubrication B3



6.5 Service and maintenance intervals

After first use - Tighten Bolts and nuts

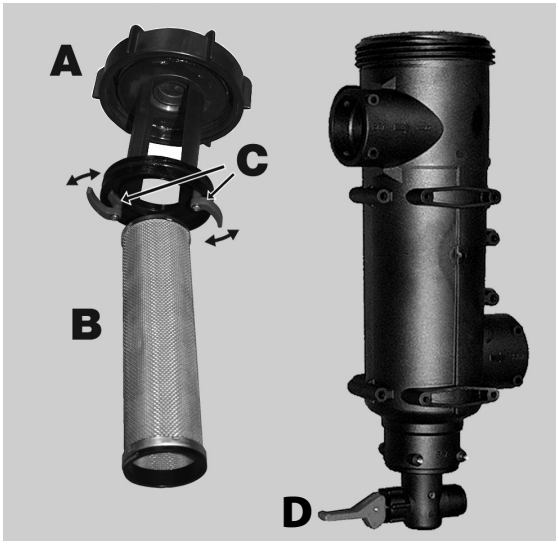
- Check that all bolts and nuts are properly tighten and re-tighten if necessary using suitable tool. Large bolt and nuts should be really tight, it is recommended to use a spanner with a 1-metre extension bar.
- Tighten the nuts on the parallelograms arms.

8 hours service - AutoTerrain centre

Some lubrication points on the boom and centre parts need extra attention when having AutoTerrain system. These lubrication points, marked in "Pendulum Auto-terrain centre" page 200, need attention every 8 working hours to work correctly.

10 Hours Service - SelfCleaning Filter

Servicing the Filter



1. Turn the pressure SmartValve towards the unused function or to "tank cleaning nozzles"
2. Unscrew the filter lid (A).
3. Lift lid and filter (B) out of the housing.
4. Turn the two locks (C) outwards to unlock the filter from the lid.
5. Separate the filter from the integrated filter guide in the lid.
6. Clean the filter.

To Reassemble

1. Grease the two O-rings on the lid/filter guide. Due to small space at the lid, use a paintbrush to apply the grease.
2. Fit the filter onto the recess (do not grease the recess) in the lid/filter guide.
3. Turn the two locks (C) inwards to lock the filter into position.
4. Place the filter/filter lid into the housing and screw the lid, until it hits the stop.

WARNING! Always wear protective clothing and gloves, before servicing the filter!

DANGER! The pressure SmartValve must always be turned to the unused function before opening the filter.

In addition, turn the boost valve (D) to the closed position. Otherwise, spraying liquid may hit you when opening the filter and this will also drain the MainTank!

250 hours service - Readjustment of the boom

See section "Readjustment of Boom - General Info" page 204.

Break-away

Adjustment should be performed regularly to prevent uncontrolled breakaway movement during cornering and when avoiding obstacles.

Surface treatment

Some chemicals mixed together can have a reaction on polyester powder coated surfaces if poor hygiene is practiced. Regular cleaning is highly recommended.

250 hours service - Hydraulic circuit

Check the hydraulic circuit for leaks and repair if any.

Refill Nitrogen accumulators.

- Yaw system
- Tilt system

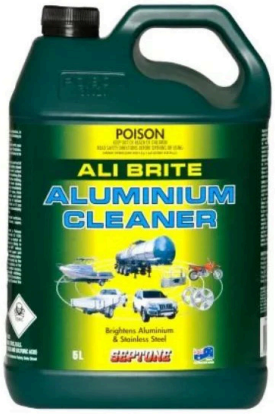
WARNING! Hoses for boom lifting device must be changed after every 5 years of use.

WARNING! Nitrogen accumulators contain oil under pressure.

Yearly service - Aluminium Boom etching cleaning

Use ALI BRITE Aluminium Cleaner or similar product to remove corrosion and oxide film.

ALI BRITE can be bought from most boat/car part shops.



6.6 Occasional maintenance

General Info

The maintenance and service intervals for the following components will depend very much on the operating conditions, and therefore it is almost impossible to specify the intervals beforehand.

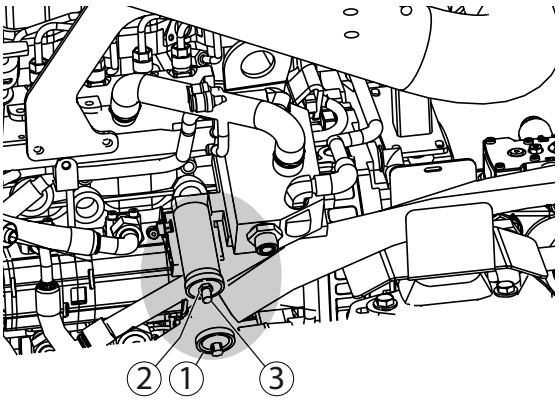
The operator must select appropriate intervals for the occasional maintenance.

If in doubt, contact your local HARDI dealer.

Compressed air pressure adjustment

Compressed air is used for the operation of the suspension of the sprayer. The operation pressure must be at 8 bar (**116** psi).

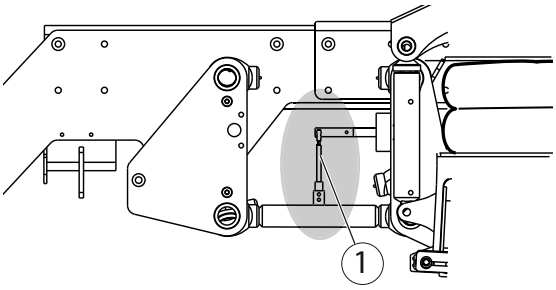
- Raise the engine cover to access the adjustment of the air compressor, located on the left side of the engine.
- Unscrew the protection cover (1).
- Loosen the lock nut (2) and turn the screw to adjust the pressure of service of the suspension.

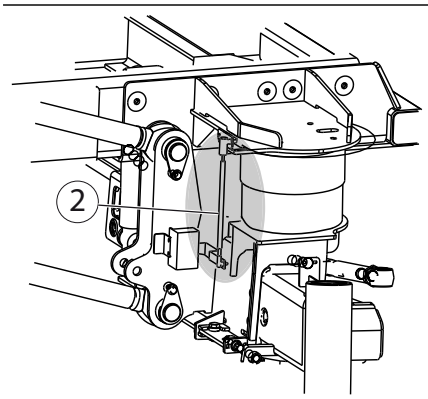


Air suspension adjustment

NOTE! The air suspension adjustment is to be done only with an empty tank.

- Check beforehand that the compressed air pressure is adjusted correctly.
- If the height of the front pneumatic cushion is different from 254 mm (10 in) you can modify it by adjusting the front connecting rod (1).
- If the height of the rear pneumatic cushion is different from 235 mm (9.25 in) you can modify it by adjusting the rear connecting rod (2).





6.7 Readjustment of boom

Readjustment of Boom - General Info

Before commencing adjustment jobs, please go through this checklist.

1. Keep the sprayer well lubricated. See "General information" on page 177.
2. Place the sprayer on level and solid ground.
3. Place wheel chocks under the wheels to prevent rolling.
4. Unfold the boom.
5. Set slanting angle to neutral position (horizontal).
6. Place strong supports below the centre section and all boom sections to relieve the load from the hydraulic cylinders.

   If you have a lifting crane, support the centre section as a minimum, as this is the heaviest boom part (up to 1000 kg).

DANGER! While carrying out adjustment, allow no one under the boom.

ATTENTION! Boom sections not supported during an adjustment job might fall down or be difficult to adjust.

7. Check the boom alignment.

   Use a spirit level, or measure the distance to the ground from similar points in both ends of the boom wing (use this method for horizontal alignment and only on level ground). When using the latter method, both distances should be equal to obtain a horizontal boom.

DANGER! Carry out adjustment of hydraulic cylinders without pressure in the system.

DANGER! If maintenance is to be done on the tilt cylinder, make sure the boom rests on sturdy support before commencing any work.

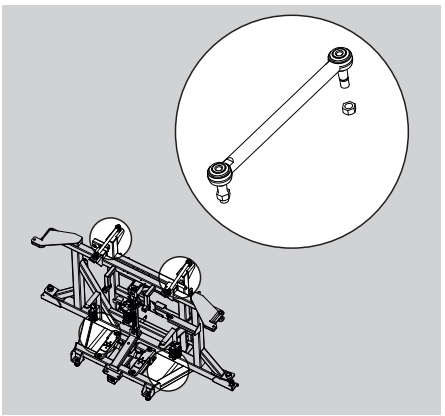
ATTENTION! Carry out adjustment equally for both the left and right boom wings.

WARNING! Nobody is allowed to remain near the boom during adjustment operations.

TR5/B3 Boom - Tighten the nuts on the horizontal parallelogram arms

These link arms act on the boom centre as a form of suspension. The arms have no adjustment however they are fitted with a high quality ball end that has a tapered shaft locked into each side of the boom centre. It is important that these tapered shafts remain tight in their respective housing.

The nuts should be done up at 160 Nm. It is recommended to check this after the first days of operation and then at regular intervals of 250 hours.

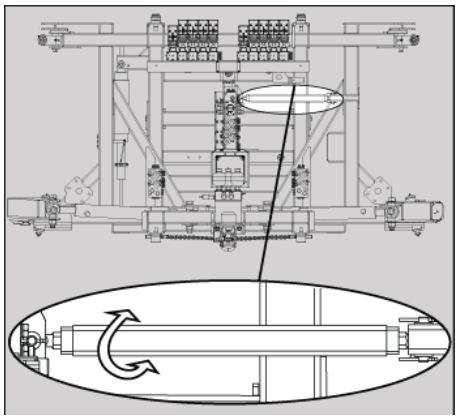


ATTENTION! Tapers must be pressed in before torquing to specification.

TR5/B3 Boom - Alignment of centre and lift frame

The centre is connected to the lift frame by an adjustable tie bar. Adjust it as follows:

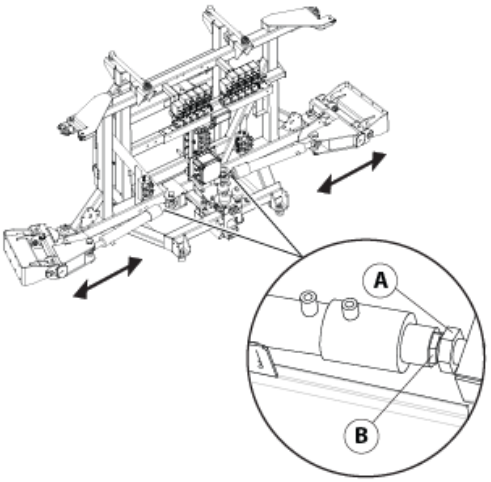
1. Unfold all boom sections.
2. Loosen the locknut on the tie bar.
3. Put a spirit level at the top or side of the centre, or measure if centre is parallel to lift frame. Rotate the tie bar until the centre is completely horizontal and align with the lift frame.
4. Tighten the locknuts again.



TR5/B3 Boom- Horizontal alignment of centre and inner boom sections

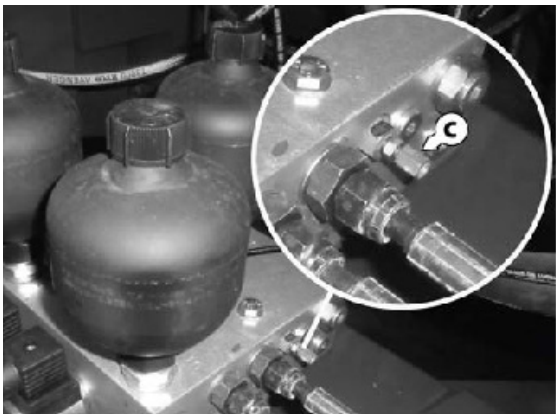
The boom tip should point slightly forward. If necessary adjust the inner section folding as follows: Depressurise the folding rams.

1. Loosen the counter-nut **A**.
2. Adjust stop screw **B** until the correct setting is reached.
3. Tighten counter-nuts again.



TR5/B3 Boom - Air bleeding inner fold cylinder

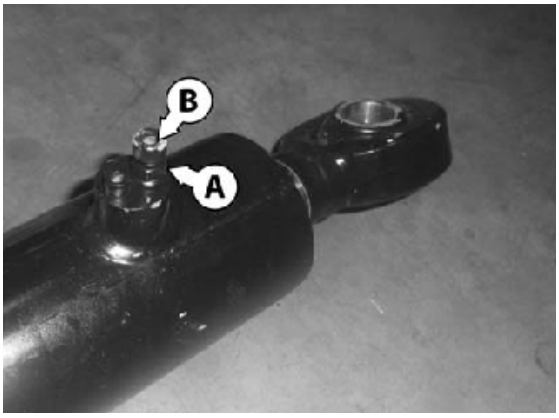
If the hydraulic circuit has been disconnected so air has entered the system, the hydraulic circuit has to be bled of air before adjusting. Bleed it as follows:



1. Unfold the boom and turn off the hydraulic pressure
2. Open the bleed air screw **C** on the hydraulic block
3. Press button to unfold the boom (as there is no hydraulic pressure only the electric valve will open). The boom will now open slightly. Check if the fold cylinder is completely in; if not, push by hand. When the fold cylinder is fully in, close the air nipple.
4. Activate the hydraulic pressure and press button to unfold the boom again, boom will now go back to neutral position.
5. Repeat steps 1-4 four times to be sure that all air in the cylinder is out.
6. See the section above on how to adjust the inner boom.

TR5/B3 Boom - Soft close adjustment inner fold

The speed of the last bit of the extension stoke can be adjusted.This prevents that the wing hits the transport brackets during fold.



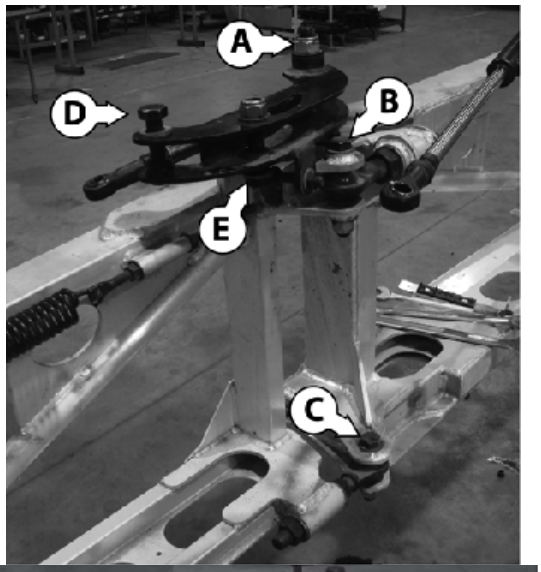
Adjust it as follows:

1. Unfold the boom loosen nut **A**.
2. The setting is very sensitive so proceed slowly, rotating the screw **B** one tenth of a turn at a time. By rotating the nut inwards the damping effect will increase, by undoing the bolt, the dampening will decrease.
3. Tighten the nut **A** again.
4. Fold the wing hydraulically. If adjustment is necessary repeat steps 1-4.

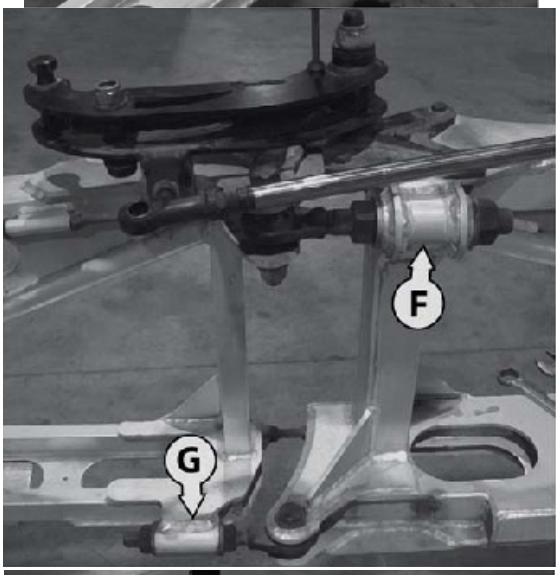
B3 Boom - Horizontal alignment and vertical alignment between 2nd and 1st outer wing

NOTE! The adjustment for the 1st outer and inner wing is the same.

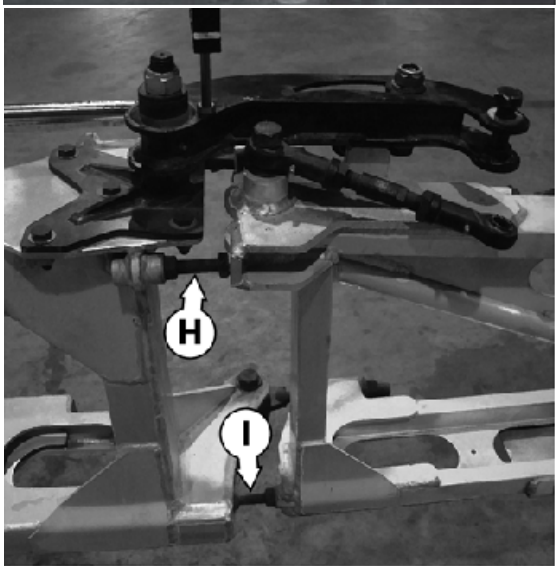
1. Unfold the boom completely.
2. Tighten bolt **A, B** and **C** fully. Use box spanner with extension so the bolts are very tight.
3. Remove bolt **E** that hold the cylinder at the rod end and lift the cylinder on side.
4. Remove bolt **D** on the tension rod and lift out the tension rod.



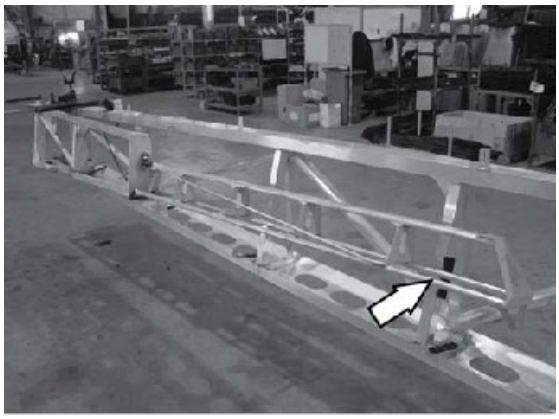
5. The vertical adjustment is done by ball joints **F** and **G**. Loosen the lock nut and work on the other nut until the 2nd outer is horizontal.



6. Loosen the lock nut and pre-adjust the two stops **H** and **I** until the boom is lined up perfectly.



7. Fold the 1st outer section by hand until it rest on the wing rest on the 2nd outer section. If the 2nd outer section is too high or too low unfold the wing again.

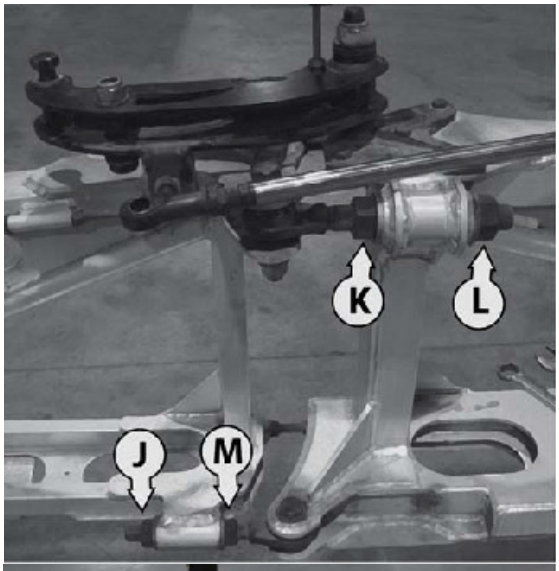


NOTE! Picture shows 36m boom and it doesn't have a rest support instead there is a rubber support.

ATTENTION! The boom rests are preset and should not be moved. Follow the instructions below on how to adjust the boom in order to sit correctly on the boom rest.

8. Moving the 2nd outer section away from the 1st outer wing will bring the 2nd outer wing down when its folded. Moving the 2nd outer wing closer to 1st outer wing will bring the 2nd outer section up when its folded.

   If the 2nd outer section is too high when its folded, loosen nuts **J** and **L** and turn nuts **M** and **K** evenly bringing the wing sections apart.



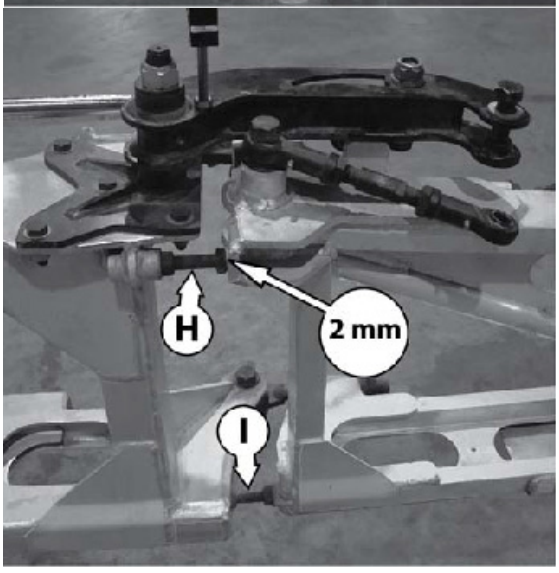
NOTE! Work has to be done evenly on nuts **M** and **K,** otherwise it will change the vertical adjustment.

   If the outer section is too low, work on nut **J** and **L** evenly bringing the wing sections closer together.

9. Fold the 2nd outer wing again to see how it sits on the 1st outer section brackets. If necessary, unfold the wing again and adjust.

10. When the outer section sits perfect on the brackets, the bolt joint nuts need to be tightened very hard. Use a spanner with 1m extension.

11. Check again, make sure the booms are straight, if necessary adjust stop **H** and **I** until its perfectly straight.



ATTENTION! When the boom is straight stop **I** should be in contact and stop **H** must have a 2mm gap between the head of the bolt a and point of contact.

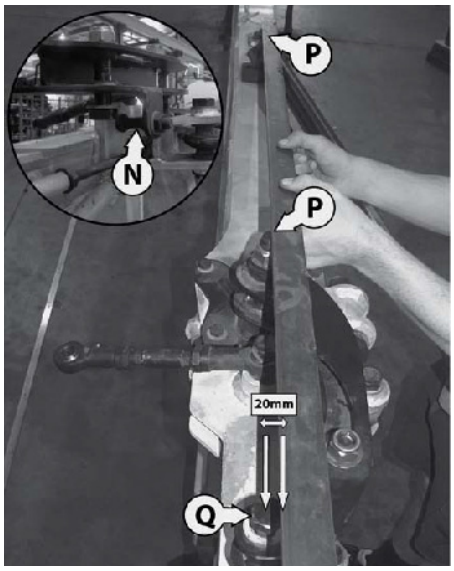
NOTE! When the over-centre lock is locked the 2mm gap will be closed.

12. Re-attach the cylinder rod and tension rod to the over-centre lock and tighten the bolts very hard. Continue with step 13 "Adjustment of over-centre lock" on next page.

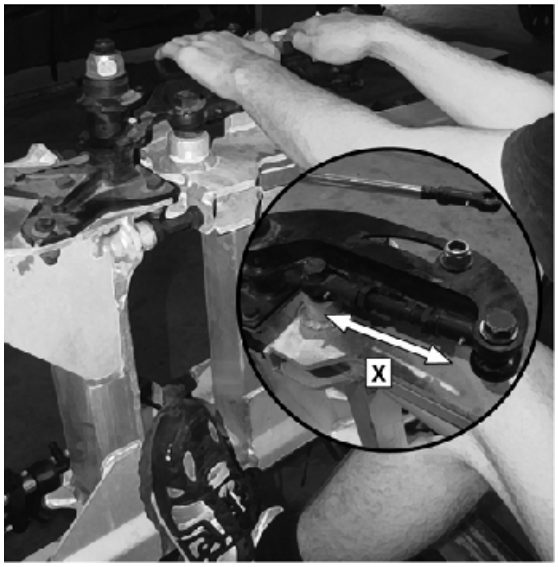
B3 Boom - Adjustment of over-centre lock

ATTENTION! Make sure the horizontal adjustment is correct and that the boom is straight. If not, start with "B3 Boom - Horizontal alignment and vertical alignment between 2nd and 1st outer wing" on page 165.

13. Make sure steps 3 and 4 are done.
14. Use a straight metal bar or similar, place it in the centre of the bolt **P** and measure so that its 20mm offset to bolt **Q**. If not, loosen the lock nut and adjust bolt **N**.



15. Re-attach the tension rod and tighten the bolt very hard.
16. Stand on the opposite side of the folding joint and grab the over-centre lock. Put one foot on the 1st outer wing, then try to lock it by pulling it. It should have a distinct clack sound when its locked into place. If it is too hard to close, decrease the distance **X**. If it is to loose increase the distance **X**. Check again that the boom is straight. If needed, adjust the bolts on stop **I** and **H**.



ATTENTION! The tension in the lock should be very hard.

17. When the tension in the lock is correct. Increase distance X by turning the tension rod half a turn extra. You may not be able to lock it by hand now! Tighten the lock nut strongly.

NOTE! If the tension rod has been changed, the cylinder rod also need to be adjusted; go to step 19.

B3 Boom - Adjusting the boom fold cylinders

ATTENTION! Make sure the horizontal adjustment is correct and that the boom is straight. If not, start with "B3 Boom - Horizontal alignment and vertical alignment between 2nd and 1st outer wing" on page 165 on how to adjust it.

ATTENTION! Make sure the adjustment of over-centre lock is correct. If not start with "B3 Boom - Adjustment of over-centre lock" on page 167.

18. Screw the eyelet on the cylinder rod fully in.
19. Re-attach the cylinder to the over centre lock, and tighten the bolt very hard.
20. Unfold the wing the hydraulically and make sure the cylinder is fully out. There is now a gap between bolt head **N** and the stop plate.
21. Fold the wing again hydraulically so you can reach the adjustment settings on the cylinder.
22. Loosen the lock nut on the eyelet and turn the cylinder rod counter clock-wise with a wrench one turn at time.

WARNING! Adjustment has to be done in small increments, otherwise damage will occur to the cylinder and folding arm.

23. When stop **N** is in contact. Fold the wing again so you can reach the adjustment settings on the cylinder. Turn the cylinder rod so it extends 2-3 mm extra. When the boom is unfolded and the over centre-lock is locked there should be a small bow on the cylinder rod.
24. When the adjustment is done, tighten the lock on the eyelet very hard.
25. When adjustment of the wing has been made it is important to check the tension when folded is correct. See "B3/TR5 Boom - Adjustment of the retraction stroke" on page 173 on how to check and set correct tension.

DANGER! If tension is too low the boom can unfold while driving.

26. If the wing fold inner/1st outer has been adjusted, wing lock needs to be checked to make sure it is correctly adjusted. See "Vertical alignment of outer sections with break-away sections" on page 174.

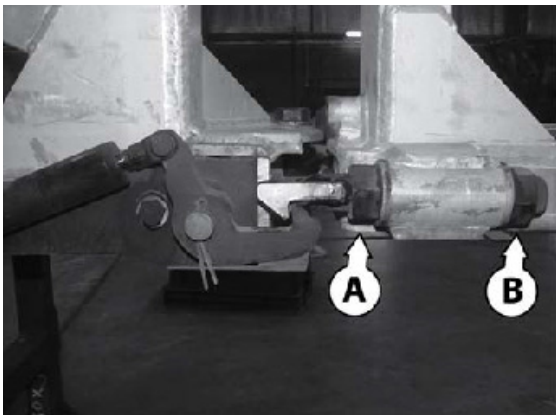
B3 Boom - Adjustment of wing lock

The wing lock is a safety feature and it is important that is correctly adjusted.

ATTENTION! If the wing fold inner/1st outer has been adjusted wing lock needs to be checked so it is correctly adjusted.

Adjust as below:

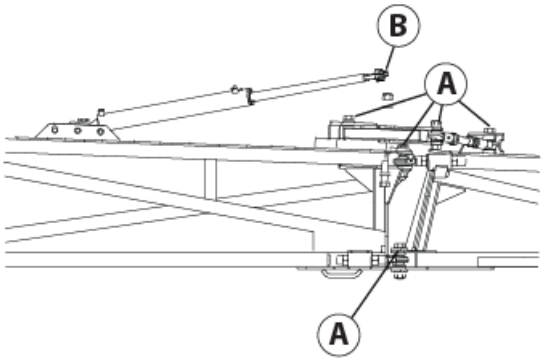
1. Unfold the 1st outer wing, make sure the cylinder is fully out and that the over-centre lock has engaged.
2. If it needs adjustment, loosen bolts (A) and (B).
3. If the wing lock is not latching, work on nut (A) until it latches. If there is too much gap, work on nut (B) to close the gap. The wing lock is perfectly adjusted if it latches just before the over-centre locks.
4. After adjustment open the wing and close it to see if works correct, adjust if needed.
5. When the locks works correct tighten both nuts (A) and (B) very hard!



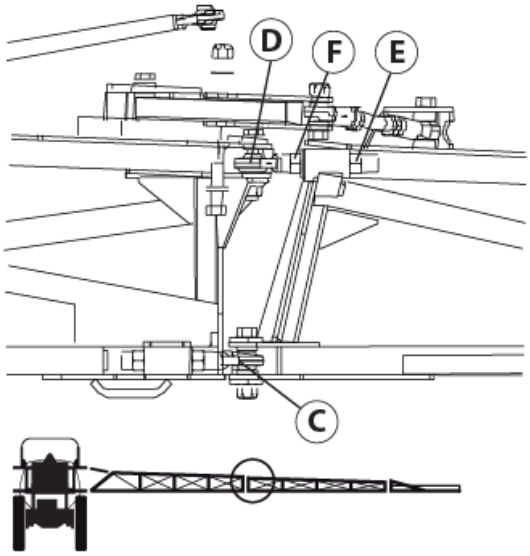
TR5 Boom - Horizontal alignment and vertical alignment of outer sections

This adjustment is for changing the alignment of the outer section with respect to the inner section.

1. Unfold the boom completely.
2. Tighten bolt **A** fully use box spanner.
3. Remove the bolt hold the cylinder at the rod end **B**.

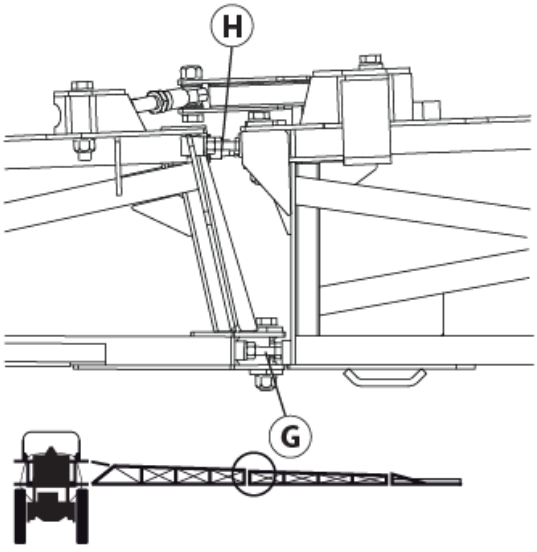


4. The vertical adjustment is done by ball joints **C** and **D**. If the outer end of the outer wing is to low. Loosen nuts **F** and work clockwise on nuts **E**. Tighten the nuts **F** slightly when the boom is perfectly horizontal. Do the opposite direction if the outer wing is too high.

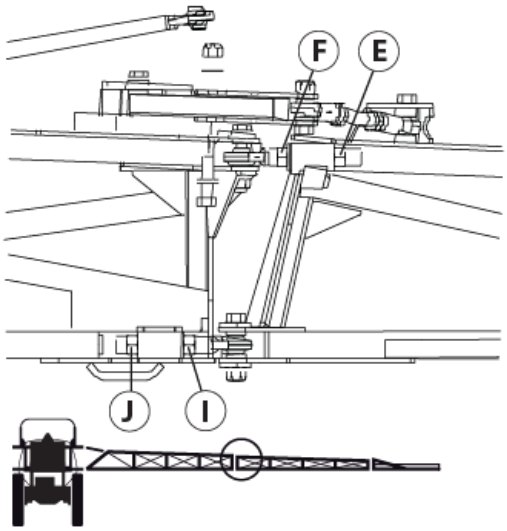


5. The horizontal adjustment is done by adjusting bolt **G** and **H**. Loosen the lock nut and pre-adjust the two stops G and H until the boom is lined up perfectly.
6. Fold the outer section by hand until it rest on the brackets on the inner section. If the outer section is too high or too low unfold the wing again.

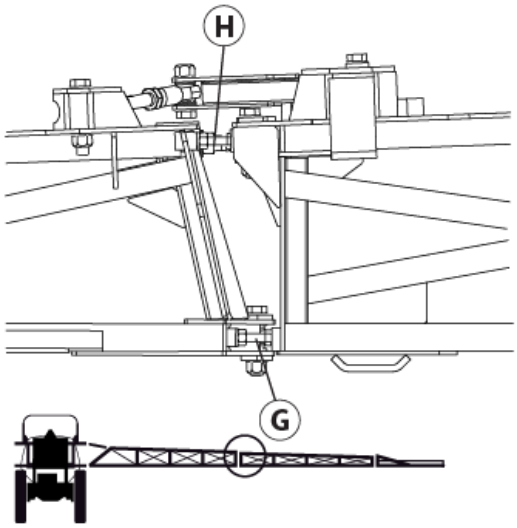
ATTENTION! The brackets on the boom are preset and should not be moved. Instead following instruction below on how to adjust the boom to sit correctly on the brackets.



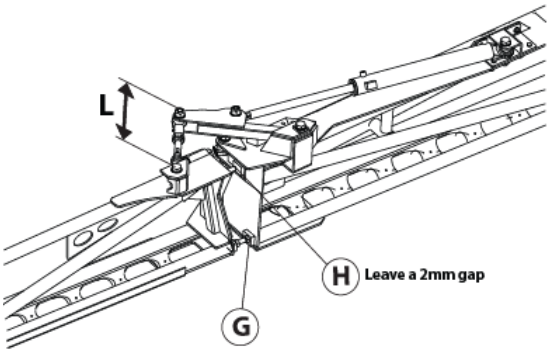
7. By moving the outer section away from the inner section will bring the outer section down when its folded. By moving the outer section closer to inner section the will bring the outer section up when its folded.
8. If the outer section is to high when is folded. Loosen nut **E** and turn nut **F** one turn clockwise, loosen nut **I** and turn **J** one turncounter clockwise. Work has to be done evenly on nut **F** and **J** otherwise it will change the vertical adjustment.
9. Fold the outer wing again to see how it fits on the inner section brackets. If necessary, unfold the wing again and adjust.
10. When the outer section sits perfectly on the brackets, the bolt joint nuts need to be tightened very hard. Use a spanner with 1m extension.



11. Check again so booms align horizontal. If necessary, adjust stop **G** and **H** until its perfectly straight.
12. Re-attach the rod end of the cylinder to the hinge arm and bolt it firmly in place.

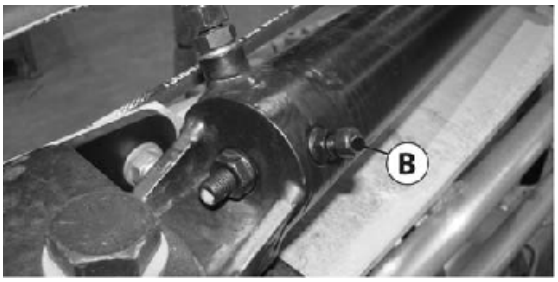


13. Close the distance **L** as mush as possible then fully extend the cylinder hydraulically. Then increase the distance **L** until the lower stop **G** is touching the other section. With stop **G** touching the other section there should be a 2 mm gap at stop **H**. If not, adjust it, this is very important.
14. Continue to increase the distance **L** until stop **H** comes in contact with the other section.
15. Slightly close the cylinder and slightly increase the length of double ball joint **L** again. On extending the cylinder rod buckle slightly (this buckling increases the rod stroke by approx. 2-3mm). Make sure that the cylinder is fully extended.
16. The force of the cylinder can put the boom slightly out of horizontal alignment, check again and if necessary repeat step 11 and if needed, adjust stop **G** and **H**.
17. When the boom is perfectly straight, firmly tighten the locknuts on the stops and on the double ball joints.



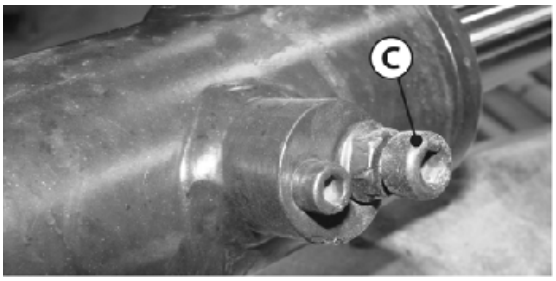
TR5 Boom - Adjustment of the outer wing fold cylinders

The end stroke of the fold cylinders can be changed. Screw **B** adjusts the end cushioning of the retraction stroke. Screw **C** adjusts the end cushioning of the extension stroke.



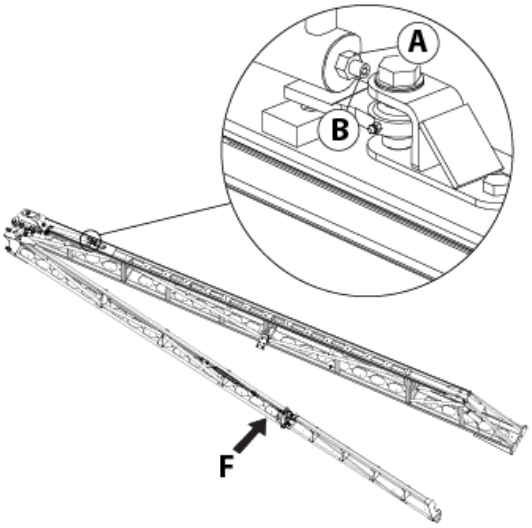
ATTENTION! Adjustment of the cylinders is recommended to be done when the oil is hot.

1. Fold the boom out halfway, then undo the locknut and tighten screw **B** so it is fully in without forcing. Tighten again the locknut to stop oil from leaking.
2. Fold the boom in.
3. The boom will suddenly stop at the point where the cushioning takes effect. Now loosen off screw **B** to control the speed at which the boom moves and prevent it to smash into the bracket. The setting is very sensitive so proceed slowly, rotating the screw one tenth of a turn at a time.
4. When the adjustment is complete, keep a firm hold of screw **B** and tighten the locknut.
5. Do the same procedure for adjusting screw **C** for the extension stroke.



B3/TR5 Boom - Adjustment of the retraction stroke

The end stroke of the fold cylinders can be changed. Screw (B) adjusts the retraction stroke of the cylinder rod, this will affect the tension between the inner wing and outer wing when is folded.



ATTENTION! Adjustment of the cylinders is recommended to be done when the oil is hot.

DANGER! If tension is too low the boom can unfold while driving!

To check the tension follow the steps below:

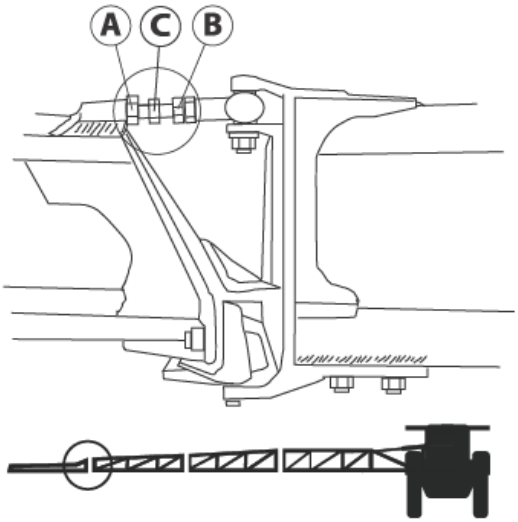
1. Turn off the hydraulic pressure if it is on.
2. Fold the outer wing by hand until it until it sits on the rest brackets on the inner wing.
3. Grab the wing and pull trying to opening it. There should be a strong tension force (F) against the inner wing.

If the tension is too low, follow the steps below to increase the tension:

4. Loosen the hydraulic hoses on the cylinder and lock nut (A).
5. Fold the boom in by hand so it's resting on the brackets on the wing brackets.
6. Unscrew socket head screw (B), small increments.
7. Test again the tension step 3, adjust if needed.
8. When the tension correct. Tighten locknut (A) and re-fit the hydraulic hoses.

Vertical alignment of outer sections with break-away sections

1. Undo counter-nuts **A** and **B.**
2. Turn the rod **C** for vertical adjustment of the outer section.
3. Tighten the counter-nuts **A** and **B** again.



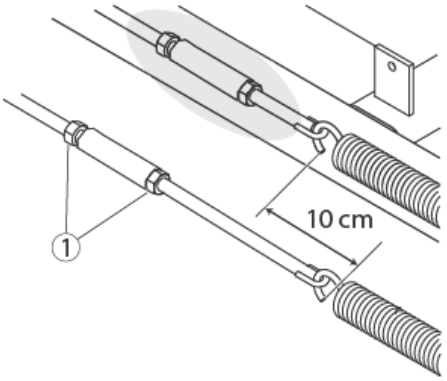
B3/TR5 Boom - Adjustment of break-away spring

The end sections of the boom can break away. The spring tension determines activation of break-away when the section encounters an obstacle.

- Change the spring tension by working on the nuts (**1**).

The 10 cm distance corresponds to the spring tension.

The tension corresponds to the distance of the spring when idle, to which 10 cm should be added.



NOTE! A tension value that is too low can cause untimely activation of the safety system.

B3/TR5 Boom - Wing tilt adjustment

The tilt is controlled by two single acting hydraulic cylinders that are dampened by nitrogen accumulators. The wings when opened will go below horizontal.

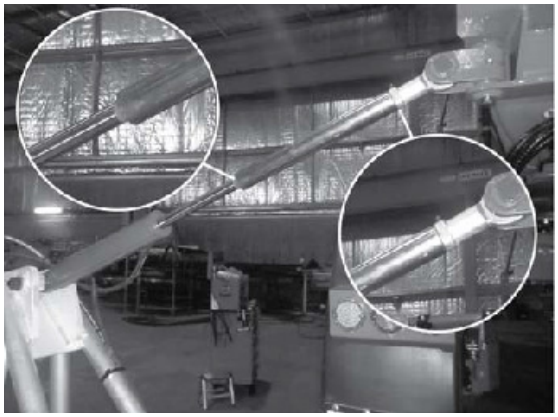
DANGER! If maintenance is to be done on the tilt cylinder, make sure the boom rests on sturdy supports before commencing any work.

WARNING! If the cylinder is adjusted in a way that the boom will not to go below horizontal; then the suspension of the tilt will not work and boom will be damaged. Never decrease the negative tilt!

NOTE! If equipped with AutoTerrain, the boom will self-adjust so it is completely horizontal when the AutoTerrain is turned on.

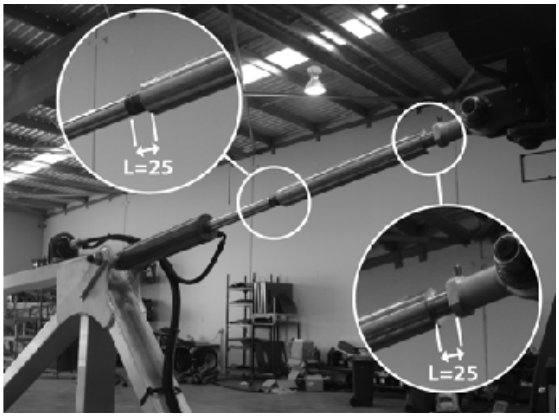
Adjustment - TR5 Boom

On the TR5 boom the extension rod on the wing tilts cylinder should be turned all the way in at both ends (there should not be any visible threads). This adjustment makes the boom tilt below horizontal and it shouldn't be changed.



Adjustment - B3 Boom

The wing tilt adjustment is preset with a 25mm visible thread in both ends as shown. This adjustment makes the boom tilt below horizontal and it shouldn't be changed.



ParaLift Lock

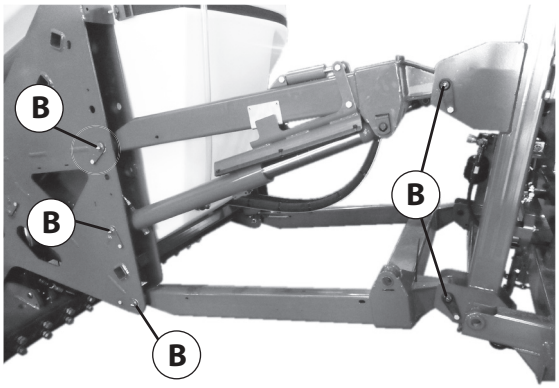
The boom is mechanically held in transport position with paralift lock mechanisms that automatically engage when the first outer is closing. The folded channel-section locks are fixed to the top paralift arm and engage directly on the top of the paralift cylinders when lowered for transport. This means the boom is not supported by hydraulic oil pressure when in transport.

WARNING! when the sprayer is being transported along rough road and is bounced over potholes, in extreme cases there is a risk that the lock arms can disengage. Paralift locks should be checked before and after transport to ensure positive lock engagement.

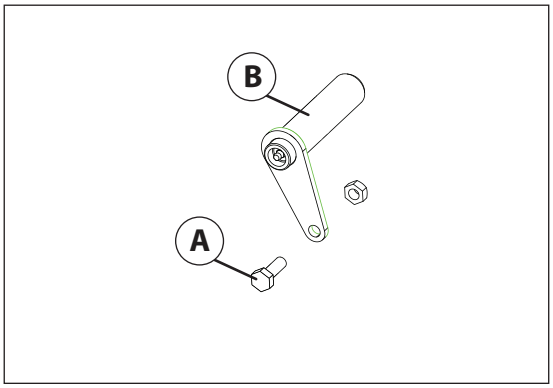
ParaLift wear bush renewal

The ParaLift is used to raise and lower the boom height to suit the terrain however with AutoTerrain small adjustments are being made continuously. Greasing the ParaLift pivot points on a regular basis will prolong the life of the wear bushes.

Inspect and replace the wear bushes before they are worn through.



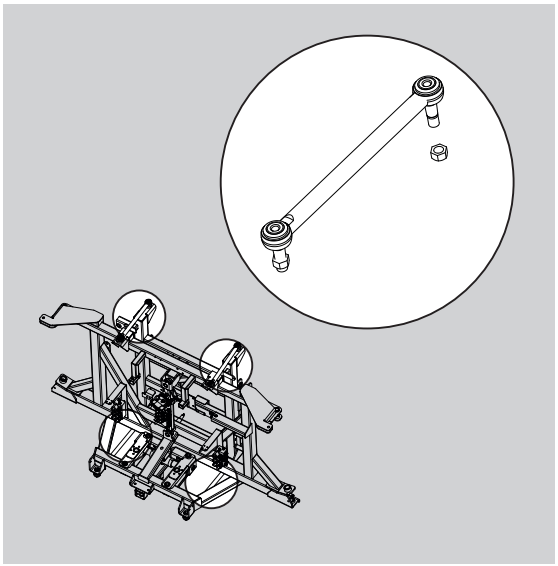
1. Lift the boom centre frame with a lifting device and support it until the load is taken off the parallelogram arms.
2. Remove the bolts (**A**), pull out the pins (**B**) at one of the upper parallelogram arms and replace the wear bushes.
3. Refit the arm.
4. Repeat this on the other upper arm.
5. The lower arms must be disconnected simultaneously.
6. Grease all nipples.
7. Remove the lifting gear again.



Horizontal Parallelogram Arms

These link arms act on the boom centre as a form of suspension. The arms have no adjustment however they are fitted with a high quality ball end that has a tapered shaft locked into each side of the boom centre. It is important that these tapered shafts remain tight in their respective housing. The bolts should be done up at 160 Nm.

Inspect often to ensure bolts remain tight in housing.



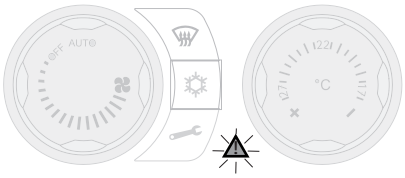
7.1 Cabin

Pressuriser maintenance instructions

The control panel features a warning light that indicates a problem with cabin pressure.

Follow the instructions below to troubleshoot.

If the problem persists, contact your dealer.



FAULT	PROBABLE CAUSE	SOLUTION
The pressuriser fan doesn't work	Power supply	Connect the pressuriser directly to a power supply
		If the problem persists, replace the pressuriser
The pressuriser fan works but the ⚠ light is on	Category 4 filter is missing	Make sure a category 4 filter is installed in the pressurizer
		Install a filter if necessary
	Cabin door is open or not properly close	Close the cabin door
	Air diffuser is closed or blocked	Check and open the diffusers
	Cabin is not sealed	Check the roof panel is firmly closed Check the seals on the cabin door
		Replace if necessary
	Door adjustment	Check the adjustment of the cabin openings
	Cabin pressure sensor	Check and replace the pressure sensor if necessary
	Air flow sensor	Check and replace the air flow sensor if necessary

Maintenance

The ⚠ light indicates a problem with the control panel or electrical system.

⚠ LIGHT STATUS	PROBABLE CAUSE
Steady light	Problem with cabin pressurization
Blinking 1 time / 2 seconds	Overheating of the control panel or electrical short circuit. Check the electrical circuit (cable harness, fuses and relays). Measure the electricity consumption of the K Protect air conditioner and pressurizer.
Blinking 1 time / 4 seconds	Temperature sensor default Check the connection of the probes.

7 - Fault Finding

Cabin error codes

The messages below will be displayed when a fault appears on the system of the cab's air conditioning

List of error codes

ERROR CODE	DESCRIPTION	FAULT OPERATION
01	High pressure switch - Wiring or cycling (2 in 1 minute)	Heat mode - compressor clutch disabled
02	Low pressure switch - Wiring or open for 1 minute	Heat mode - compressor clutch disabled only while low pressure switch is open
03	Blower speed select pot open/shorted to power	Auto blower speed
04	Temperature select pot open /shorted to power	72°F Set point
05	Recirc. pot open/shorted to power	Not used on combine
06	Mode select pot open/shorted to power	Not used on combine
07	Cab temp sensor wiring - open, short, ground, power	Manual mode - compressor clutch disabled
08	Evap temp sensor wiring - open, short, ground, power	Heat mode - compressor clutch disabled
09	Outlet tmp sensor wiring - open, short, ground, power	Doesn't limit blower speed on startup
10	Outside temp sensor wiring - open, short, ground, power	Not used on combine
12	Cab pressure sensor wiring	Not currently implemented
14	Clutch output fault (overcurrent, short to ground)	Not currently implemented
15	Defog light output fault (overcurrent, short to ground)	Not currently implemented
15	Defog light output fault (overcurrent, short to ground)	Not currently implemented
19	No data from control module	Depends on cause of problem

7.2 Transmission

Transmission error codes

The Transmission Error Codes will automatically appear on the DM430E screen whenever the system detects a transmission fault.

The screen shows 'Quantity of codes'.

Push button (1) to get the list of errors.

To exit press (1) again.

To clear the displayed codes, perform key cycle.

ERROR CODE	DESCRIPTION	ERROR CODE	DESCRIPTION
001	Low battery voltage	070	Loop error
002	Low battery voltage	071	PWM2 current loop error
003	12V sensor low supply voltage	074	Loop error pump 1
004	12V sensor high supply voltage	080	Brake pressure sensor signal out of range
005	5V sensor low supply voltage	083	CAN bus communication error: signal not received
006	5V sensor high supply voltage	084	High pressure sensor signal out of range
007	Stack overflow	092	Joystick sensor error
008	E2prom memory error	097	Analogue mode selector sensor error
009	FLASH memory error	100	Joystick limitation control error
010	RS232 memory error	200	Offroad SD: high battery voltage
011	CAN bus connection error	201	Offroad SD: low battery voltage
012	Current return protection	202	Offroad SD: 12V supply voltage sensor out of range
020 to 045	Internal system error		
051	MAF loading error		
052	Inconsistent key		
053	Inconsistent MAF		
054	Inconsistent input/output		
055	Error in sensitive parameter		
056	SDPHASE code error		
057	Checksum error		
058	Min/Max error in parameter		

7.3 Engine

CUMMINS engine error codes

The CUMMINS engine error codes are displayed on the DM430E screen.

Push button (1) to get quantity of codes

Push button (1) to get SPN/FMI

To exit press (1) again.

To clear the displayed codes, perform key cycle.

SPN	COMPONENT/LOCATION	DESCRIPTION (ERROR LOCATION)	FMI
29	Hand throttle	Cable break or short circuit, signal implausible compared to signal or idle sensor	2, 3, 4, 11
84	Vehicle speed signal	Speed above target range, signal missing or implausible	0, 8, 12, 14
91	Accelerator pedal	Cable break or short circuit, signal implausible compared to signal of idle sensor (Analog pedal)	2, 3, 4, 11
91	Accelerator pedal	Cable break or short circuit, bad PWM signal range or frequency (digital pedal)	2, 8
91	Accelerator pedal	Bad PWM pulse-width repetition rate (digital pedal)	8, 11
94	Fuel low pressure sensor	Cable break or short circuit	3, 4, 11
94	Fuel low pressure	Below target range with system reaction	2, 11
97	Fuel filter water level sensor	Cable break or short circuit	3, 4, 11
97	Water level in fuel filter	Above target range	11, 12
100	Oil pressure sensor	Cable break or short circuit	0, 2, 3, 4
100	Oil pressure sensor	Pressure value implausible low	1, 11
100	Oil pressure	Above target range	0, 11
100	Oil pressure	Below target range	1, 11
102	Charge air pressure sensor	Cable break or short circuit	2, 3, 4
102	Charge air pressure	Outside target range with system reaction	2, 11
105	Charge air temperature sensor	Cable break or short circuit	2, 3, 4, 11
105	Charge air temperature	Outside target range with system reaction	0, 11
107	Air filter condition	Pressure loss above target range with system reaction	0, 11
108	ECU internal error	Ambient pressure sensor defective	2, 3, 4, 11
110	Coolant temperature sensor	Cable break or short circuit	2, 3, 4
110	Coolant temperature	Outside target range with system reaction	0, 11
111	Coolant Level	Outside target range with system reaction	1, 11
157	Rail pressure sensor	Cable break or short circuit	3, 4, 11
157	Rail pressure sensor	Deviation of signal during start or after-run above target range	0, 1, 11
158	Terminal 15	Ignition ON not detected	11, 12
168	Battery	Voltage below target range	0, 1, 11
168	Battery voltage	Above target range with system reaction	2, 11
174	Fuel temperature sensor	Fuel temp. sensor: Cable break or short circuit	3, 4, 11
174	Fuel temperature	Above target range with system reaction	0, 11
175	Oil temperature sensor	Cable break or short circuit	2, 3, 4
175	Oil temperature	Below target range with system reaction	0, 11
190	Engine speed sensor	Engine running with cam-shaft speed signal only	11, 12
190	Engine speed sensor	Speed signal from cam-shaft bad or missing	8, 11, 12
190	Engine speed sensor	Speed signals from crank-shaft bad or missing	8, 11, 12
190	Engine speed sensor	Speed signals of crank-shaft and cam-shaft are phase-shifted	2, 11
190	Overspeed	Engine Overspeed with system reaction	0, 11
190	Overrun conditions	Overrun conditions with system reaction	11, 14
520	CAN message	Missing (message "TSC1-TR")	11, 12
563	Main relay	Short circuit to ground or emergency shut-off (relay 3)	7, 11, 12
624	Diagnostic lamp	Cable break or short circuit, disabled by ECU	2, 3, 4, 5
630	ECU internal error	EEPROM memory access	11, 12
639	CAN bus off-state	Cable break or short circuit, off-state (CAN bus A)	11, 14
651	Single injector	Short circuit (injector 1)	3, 4, 11, 13
651	Single injector	Cable break (injector 1)	5, 13
652	Single injector	Short circuit (injector 2)	3, 4, 11, 13
652	Single injector	Cable break (injector 2)	5, 13
653	Single injector	Short circuit (injector 3)	3, 4, 11, 13
653	Single injector	Cable break (injector 3)	5, 13
654	Single injector	Short circuit (injector 4)	3, 4, 11, 13
654	Single injector	Cable break (injector 4)	5, 13
655	Single injector	Short circuit (injector 5)	3, 4, 11, 13
655	Single injector	Cable break (injector 5)	5, 13

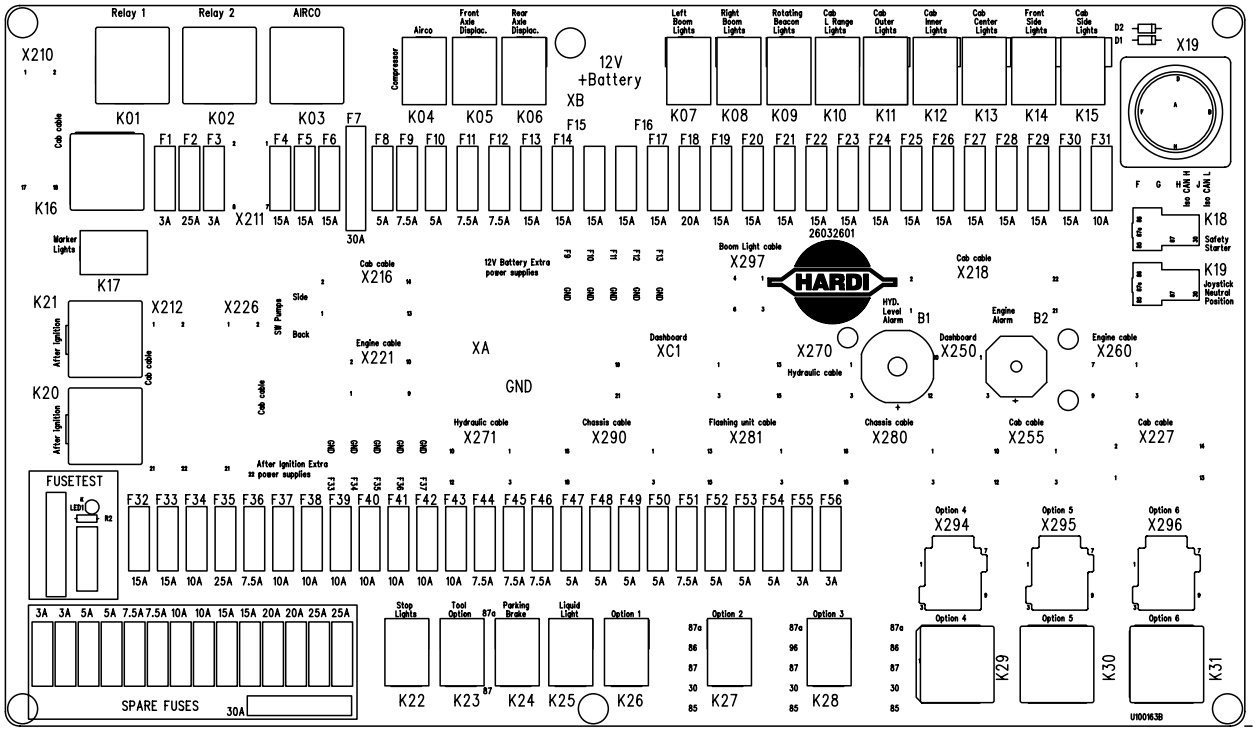
SPN	COMPONENT/LOCATION	DESCRIPTION (ERROR LOCATION)	FMI
656	Single injector	Short circuit (injector 6)	3, 4, 11, 13
656	Single injector	Cable break (injector 6)	5, 13
657	Single injector	Short circuit (injector 7)	3, 4, 11, 13
657	Single injector	Cable break (injector 7)	5, 13
658	Single injector	Short circuit (injector 8)	3, 4, 11, 13
658	Single injector	Cable break (injector 8)	5, 13
676	Air heater relay	Cable break or wrong connection	4, 11
676	Air heater relay	Inoperable during shut-off	2, 5, 11
677	Start relay	Start relay (high side): Short circuit	3, 4, 11
677	Start relay	Start relay (low side): Cable break or short circuit, disabled by ECU	3, 4, 5, 11
701	Reserve output	Short circuit to Ubatt (output 1)	11
701	Reserve output	Short circuit to ground (output 1)	11
701	Reserve output	Cable break or ECU internal error (output 1)	11
702	Reserve output	Short circuit to Ubatt (output 2)	11
702	Reserve output	Short circuit to ground (output 2)	11
702	Reserve output	Cable break or ECU internal error (output 2)	11
703	Engine operating signal lamp	Cable break or ECU internal error	2, 3, 4, 5
704	Coolant temperature warning lamp	Cable break or short circuit	11
705	Oil pressure warning lamp	Cable break or short circuit	2, 3, 4, 5
729	Air heater relay	Cable break or short circuit	3, 4, 5, 11
730	Air heater magnetic valve	Cable break or short circuit	3, 4, 5, 11
898	CAN message	Missing (message "TSC1-TE")	11, 12
923	Engine power output	Engine power output: Cable break or short circuit	2, 3, 4, 5
975	Fan actuator	Fan actuator: Cable break or short circuit	2, 3, 4, 5
1072	Engine break (internal)	Internal engine brake: Cable break or short circuit	3, 4, 5, 11
1074	Engine break flap actuator	Engine brake flap actuator: Cable break or short circuit	3, 4, 5, 11
1079	ECU internal error	Wrong voltage of internal 5V reference source 1	3, 4, 11
1080	ECU internal error	Wrong voltage of internal 5V reference source 2	3, 4, 11
1081	Preheating signal lamp	Cable break or short circuit	2, 3, 4, 5
1109	Shut-off request	Shut-off request ignored by operator	2, 11
1231	CAN bus off-state	Cable break or short circuit, off-state (CAN bus B)	11, 14
1235	CAN bus off-state	Cable break or short circuit, off-state (CAN bus C)	11, 14
1237	Override switch	Switch hangs	2, 11
1322	Multiple cylinders	Misfire detected	11.12
1323	Single cylinder	Misfire detected (cylinder 1)	11, 12
1324	Single cylinder	Misfire detected (cylinder 2)	11, 12
1325	Single cylinder	Misfire detected (cylinder 3)	11, 12
1326	Single cylinder	Misfire detected (cylinder 4)	11, 12
1327	Single cylinder	Misfire detected (cylinder 5)	11, 12
1328	Single cylinder	Misfire detected (cylinder 6)	11, 12
1346	Misfire	Misfire detected with system reaction	0, 11
1450	Single cylinder	Misfire detected (cylinder 7)	11, 12
1451	Single cylinder	Misfire detected (cylinder 8)	11, 12
1638	Customer-specific sensor	Cable break or short circuit (sensor 2)	3, 4, 11, 12
1638	Customer-specific temperature	Outside target range with system reaction (tempereature 2)	2, 11
2634	Main relay	Short circuit to Ubatt (relay 1)	3, 11
2634	Main relay	Short circuit to ground (relay 1)	4, 11
2634	Main relay	Short circuit to ground or emergency shut-off (relay 2)	7, 11, 12
2634	Main relay	Short circuit to ground or emergency shut-off (relay 3)	7, 11, 12
2791	EGR actuator (external)	Short circuit to Ubatt	3, 11
2791	EGR actuator (external)	Short circuit to ground	4, 11
2791	EGR actuator (external)	Cable break or ECU internal error	2, 5, 11
2791	EGR actuator (external)	Cable break or short circuit	2, 3, 4, 5
523212	CAN message	Missing (message"EngPrt" = engine protection)	11, 12
523216	CAN message	Missing (message "PrHtEnCmd" = Preheat and engine command	11, 12
523218	CAN message	Missing (message "RxCCVS" = cruise control)	11, 12

SPN	COMPONENT/LOCATION	DESCRIPTION (ERROR LOCATION)	FMI
523222	CAN message	Missing (message "TCO1" = speedo signal)	11, 12
523238	CAN message	Missing (message "SwtOut" = switch outputs)	11, 12
523239	CAN message	Missing or value above target range (message "DecV1" = pseudo pedal)	2, 12
523240	CAN message	Missing (message "FunModCtl" = function mode control)	11, 12
523350	Multiple injectors	Short circuit (cylinder bank 1)	3, 4, 11, 13
523351	Multiple injectors	Cable break (cylinder bank 1)	5, 13
523352	Multiple injectors	Short circuit (cylinder bank 2)	3, 4, 11, 13
523353	Multiple injectors	Cable break (cylinder bank 2)	5, 13
523354	ECU internal error	Injector power stage A	2, 3, 12, 14
523355	ECU internal error	Injector power stage B	12
523370	Rail pressure	Compression test active: Rail-pressure monitoring is going to be disabled	11, 14
523420	ECU internal error	Watchdog counter exceeds maximum	11, 14
523450	Multi state switch	Cable break or short circuit, input voltage outside target range (switch 1)	2, 3, 4, 11
523451	Multi state switch	Cable break or short circuit, input voltage outside target range (switch 2)	2, 3, 4, 11
523452	Multi state switch	Cable break or short circuit, input voltage outside target range (switch 3)	2, 3, 4, 11
523470	Rail pressure limiting valve	Opening failure	2, 11, 12, 14
523470	Rail pressure limiting valve	Opening failure with system reaction	11, 12
523490	ECU internal error	Redundant shut-off conditions detected	3, 4, 11, 12
523500	CAN message	Time-out of at least one sent message	11, 12
523550	Terminal 50	Engine start switch hangs	11, 12
523550	ECU internal error	Time processing unit (TPU) defective	2, 11
523561	Begin of injection period	Outside target range or missing (cylinder 1)	2
523562	Begin of injection period	Outside target range or missing (cylinder 2)	2
523563	Begin of injection period	Outside target range or missing (cylinder 3)	2
523564	Begin of injection period	Outside target range or missing (cylinder 4)	2
523565	Begin of injection period	Outside target range or missing (cylinder 5)	2
523566	Begin of injection period	Outside target range or missing (cylinder 6)	2
523567	Begin of injection period	Outside target range or missing (cylinder 7)	2
523568	Begin of injection period	Outside target range or missing (cylinder 8)	2
523600	ECU internal error	Serial communication interface defective	11, 12
523601	ECU internal error	Wrong voltage of internal 5V reference source 3	3, 4, 11
523602	Fan speed	Above target range with system reaction	2, 11
523604	CAN message	Missing (message "RxEngTemp" = engine temperature)	11, 12
523605	CAN message	Missing (message "TSC1-AE")	11, 12
523606	CAN message	Missing (message "TSC1-AR")	11, 12
523607	CAN message	Missing (message "TSC1-DE")	11, 12
523608	CAN message	Missing (message "TSC1-DR")	11, 12
523609	CAN message	Missing (message "TSC1-PE")	11, 12
523610	CAN message	Missing (message "TSC1-VE")	11, 12
523611	CAN message	Missing (message "TSC1-VR")	11, 12
523612	ECU internal hardware monitoring	A recovery occurred which is stored as protected	11, 14
523612	ECU internal hardware monitoring	A recovery occurred which is not stored	11, 14
523612	ECU internal hardware monitoring	A recovery occurred which is visible in the error memory	11, 14
523612	ECU internal hardware monitoring	Over voltage	3, 11
523612	ECU internal hardware monitoring	Under voltage	4, 11
523613	Rail pressure	Positive deviation (speed dependent) outside target range	0, 11
523613	Rail pressure	Positive deviation (flow dependent) outside target range (=> Leakage!)	0 , 11
523613	Rail pressure	Negative deviation (flow dependent) outside target range	0, 11
523613	Rail pressure	Negative deviation (speed dependent) outside target range	1, 11
523613	Rail pressure	Pressure above target range	0, 11
523613	Rail pressure	Implausible (leakage, injector needle blocked in open position)	2, 11
523615	Metering unit valve	Flow rate outside target range	3, 4, 11
523615	Metering unit valve	Not connected or output disabled	5, 11, 12
523615	Metering unit valve	Short circuit to Ubatt	11, 12
523615	Metering unit valve	Short circuit to ground	11, 12
523617	ECU internal error	Communication with chip CJ940 disturbed	11, 12

SPN	COMPONENT/LOCATION	DESCRIPTION (ERROR LOCATION)	FMI
-	Customer-specific sensor	Cable break or short circuit (sensor 1)	2, 3, 4, 11
-	Customer specific temperature	Outside target range with system reaction (temperature 1)	2, 11

7.4 Electrical incidents

Main circuit fuses and relays (U100163B)



U100163B

CODE	Amp.(A)	DESCRIPTION	CODE	Amp.(A)	DESCRIPTION
F1	3 A	Outdoor cab light timer	F29	15A 20 A	Cab front inner halogen lights Cab front inner XENON lights
F2	10 A	side lights/back lighting	F30	15 A	starter contactor
F3	3 A	12 V BAT - ceiling	F31	10 A	starter solenoid
F4	15 A	flasher unit - control	F32	15 A	dipped beam
F5	15 A	not used	F33	15 A	main beam headlights
F6	15 A	not used	F34	10 A	work area lighting (optional)
F7	30 A	12V BAT - air conditioning	F35	15 A	windscreen washer pump - windscreen wipers
F8	5 A	12V BAT - car radio	F36	7.5 A	horn
F9	7.5 A	timer control	F37	10 A	12 V after ignition
F10	5 A	air conditioning compressor	F38	10 A	12 V after ignition - optional
F11	7.5 A	hydraulic ECU	F39	10 A	12 V after ignition - optional
F12	7.5 A	hydraulic ECU	F40	10 A	12 V after ignition - adjustable track width
F13	15 A	12V BATT - optional	F41	10 A	12 V after ignition - OFFROAD controller
F14	15 A	12V BATT - optional	F42	10 A	road - parking
F15	15 A	12V BATT - optional	F43	10 A	stop lights
F16	15 A	12V BATT - optional	F44	7.5 A	12 V after ignition hydraulic ECU
F17	15 A	12V BATT - optional	F45	7.5 A	permanent 12 V battery - console
F18	20 A	flasher unit	F46	7.5 A	12 V after ignition -hydraulic ECU
F19	15 A	boom lights 1 and 2 (HC9500 only)	F47	5 A	hydraulic ECU
F20	15 A	boom lights 3 and 4 (HC9500 only)	F48	5 A	not used
F21	15 A	hazard lights	F49	5 A	brake pressure - display alarms
F22	15 A	cigarette lighter - 12V sockets	F50	5 A	hydraulic oil level alarm
F23	15 A	seat compressor unit	F51	7.5 A	12 V after ignition - engine error
F24	15 A 20 A	Cab front outer halogen lights Cab front outer xenon lights	F52	5 A	12 V after ignition -HC9500 console
F25	15.0 A	Right front cab lights	F53	5 A	12 V after ignition - right and left direction indicator
F26	15 A	Cab front center halogen lights	F54	5 A	12 V after ignition - cab switches
F27	15 A	not used	F55	3 A	12 V after ignition - air conditioning and car radio
F28	15 A	Hood working halogen lights	F56	3 A	12 V after ignition - J1939 diagnostic socket

NOTE! Always use the appropriate fuse listed in the table located in the fuses box.

RELAYS	DESCRIPTION	RELAYS	DESCRIPTION
K01	not used	K16	not used
K02	not used	K17	backlighting - side lights
K03	air conditioning power	K18	engine starter control
K04	air conditioning compressor	K19	forward handle neutral position
K05	Not used	K20	circuit control after contact
K06	Not used	K21	circuit control after contact
K07	HC9500 only (boom lights 3 and 4)	K22	BRAKE lights
K08	HC9500 only (boom lights 1 and 2)	K23	ROAD mode
K09	hazard lights	K24	parking brake
K10	not used	K25	work area lighting (optional)
K11	right rear cabin lights	K26	not used
K12	left rear cabin lights	K27	not used
K13	not used	K28	not used
K14	front cabin lights		
K15	Front side of the cab lights		

HCH508 Controller fault codes

Below is a table that display a list of conditions that may be required for a fault to be detected.

CONDITION	DESCRIPTION
SC_HYD_BYPASS_LS_ON	Hydraulic Bypass low-side switch is ON
SC_HYD_BYPASS_LS_OFF	Hydraulic Bypass low-side switch is OFF
SC_FLOW_FWD_LS_ON	Flow Forward low-side switch is ON
SC_FLOW_FWD_LS_OFF	Flow Forward low-side switch is OFF
SC_FLOW_REV_LS_ON	Flow Reverse low-side switch is ON
SC_FLOW_REV_LS_OFF	Flow Reverse low-side switch is OFF
SC_PARA_RAISE_LS_ON	Paralift Raise low-side switch is ON
SC_PARA_RAISE_LS_OFF	Paralift Raise low-side switch is OFF
SC_PARA_LOWER_LS_ON	Paralift Lower low-side switch is ON
SC_PARA_LOWER_LS_OFF	Paralift Lower low-side switch is OFF
SC_PEND_LOCK_FX_INACTIVE	Pendulum locking functions are inactive
SC_NONE	SC_NONE
RELEASE CONDITION	**DESCRIPTION**
RC_VT_RESET_BTN	The operator has "pressed" the fault reset button on the screen.

Below is a table of alarms and warnings relevant for the hydraulic control unit which may occur in the terminal display. Cross reference the DTC (Diagnostic Trouble Code,) to the description.

DTC	CATEGORY TYPE	DESCRIPTION	CONDITION	RELEASE BEHAVIOR
SPN: 1005		CPU core error - check source code and EMI		
SPN: 1006		Memory error		
SPN: 1007		Error during watchdog startup - check watchdog timing constraints		
SPN: 1013		Battery voltage fell below lower threshold		
SPN: 1014		Battery voltage exceeds upper threshold		
SPN: 1015		Temperature at lower threshold		
SPN: 1016		Temperature at upper threshold		
SPN: 1049		HARDI Grip - CAN Timeout		
SPN: 1058		ISOBUS Ground Speed - CAN Timeout		
SPN: 1083		HIVE System Command - CAN Timeout		
SPN: 9000		RH Boom Fold Proxy - Low voltage / short to ground		RC: RC_VT_RESET_BTN
SPN: 9001		RH Boom Fold Proxy - High voltage / short to power		RC: RC_VT_RESET_BTN
SPN: 9002		RH Boom Fold Proxy -Voltage out of valid range		RC: RC_VT_RESET_BTN
SPN: 9003		RH Boom Fold Proxy - SW parameter invalid		RC: RC_VT_RESET_BTN
SPN: 9004		RH Boom Fold Proxy - SW initialization error		RC: RC_VT_RESET_BTN
SPN: 9005		Pendulum Locked Proxy - Low voltage / short to ground		RC: RC_VT_RESET_BTN

DTC	CATEGORY TYPE	DESCRIPTION	CONDITION	RELEASE BEHAVIOR
SPN: 9006		Pendulum Locked Proxy - High voltage / short to power		RC: RC_VT_RESET_BTN
SPN: 9007		Pendulum Locked Proxy - Voltage out of valid range		RC: RC_VT_RESET_BTN
SPN: 9008		Pendulum Locked Proxy - SW parameter invalid		RC: RC_VT_RESET_BTN
SPN: 9009		Pendulum Locked Proxy - SW initialization error		RC: RC_VT_RESET_BTN
SPN: 9010		Pendulum Unlocked Proxy - Low voltage / short to ground		RC: RC_VT_RESET_BTN
SPN: 9011		Pendulum Unlocked Proxy - High voltage / short to power		RC: RC_VT_RESET_BTN
SPN: 9012		Pendulum Unlocked Proxy - Voltage out of valid range		RC: RC_VT_RESET_BTN
SPN: 9013		Pendulum Unlocked Proxy - SW parameter invalid		RC: RC_VT_RESET_BTN
SPN: 9014		Pendulum Unlocked Proxy - SW initialization error		RC: RC_VT_RESET_BTN
SPN: 9015		Slant Angle Sensor - Short to power		RC: RC_VT_RESET_BTN
SPN: 9016		Slant Angle Sensor - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9017		Slant Angle Sensor - Invalid parameter		RC: RC_VT_RESET_BTN
SPN: 9018		Slant Angle Sensor - Unknown internal error		RC: RC_VT_RESET_BTN
SPN: 9019		Boom Height Sensor - Short to power		RC: RC_VT_RESET_BTN
SPN: 9020		Boom Height Sensor - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9021		Boom Height Sensor - Invalid parameter		RC: RC_VT_RESET_BTN
SPN: 9022		Boom Height Sensor - Unknown internal error		RC: RC_VT_RESET_BTN
SPN: 9038		Pendulum Lock & Unlock - Open load		RC: RC_VT_RESET_BTN
SPN: 9039		Pendulum Lock & Unlock - Short to power		RC: RC_VT_RESET_BTN
SPN: 9040		Pendulum Lock & Unlock - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9041		Pendulum Lock & Unlock - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9042		Yaw Fold Unlock - Open load		RC: RC_VT_RESET_BTN
SPN: 9043		Yaw Fold Unlock - Short to power		RC: RC_VT_RESET_BTN
SPN: 9044		Yaw Fold Unlock - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9045		Yaw Fold Unlock - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9046		Slant CW & CCW - Open load		RC: RC_VT_RESET_BTN
SPN: 9047		Slant CW & CCW - Short to power		RC: RC_VT_RESET_BTN
SPN: 9048		Slant CW & CCW - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9049		Slant CW & CCW - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9050		Yaw Fold LH & RH - Open load		RC: RC_VT_RESET_BTN

DTC	CATEGORY TYPE	DESCRIPTION	CONDITION	RELEASE BEHAVIOR
SPN: 9051		Yaw Fold LH & RH - Short to power		RC: RC_VT_RESET_BTN
SPN: 9052		Yaw Fold LH & RH - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9053		Yaw Fold LH & RH - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9055		Override Slant CW - Short to power		RC: RC_VT_RESET_BTN
SPN: 9056		Override Slant CW - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9057		Override Slant CW - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9059		Override Slant CCW - Short to power		RC: RC_VT_RESET_BTN
SPN: 9060		Override Slant CCW - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9061		Override Slant CCW - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9062		Inner Fold LH #1&#2 - Open load		RC: RC_VT_RESET_BTN
SPN: 9063		Inner Fold LH #1&#2 - Short to power		RC: RC_VT_RESET_BTN
SPN: 9064		Inner Fold LH #1&#2 - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9065		Inner Fold LH #1&#2 - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9066		Paralift Lock - Open load		RC: RC_VT_RESET_BTN
SPN: 9067		Paralift Lock - Short to power		RC: RC_VT_RESET_BTN
SPN: 9068		Paralift Lock - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9069		Paralift Lock - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9070		Outer 1 Fold LH #1&#2 - Open load		RC: RC_VT_RESET_BTN
SPN: 9071		Outer 1 Fold LH #1&#2 - Short to power		RC: RC_VT_RESET_BTN
SPN: 9072		Outer 1 Fold LH #1&#2 - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9073		Outer 1 Fold LH #1&#2 - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9074		Outer 2 Fold LH #1&#2 - Open load		RC: RC_VT_RESET_BTN
SPN: 9075		Outer 2 Fold LH #1&#2 - Short to power		RC: RC_VT_RESET_BTN
SPN: 9076		Outer 2 Fold LH #1&#2 - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9077		Outer 2 Fold LH #1&#2 - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9078		Hydraulic Bypass HS - Open load	SC_HYD_BYPASS_LS_ON	RC: RC_VT_RESET_BTN
SPN: 9079		Hydraulic Bypass HS - Short to power		RC: RC_VT_RESET_BTN
SPN: 9080		Hydraulic Bypass HS - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9081		Hydraulic Bypass HS - Internal driver error		RC: RC_VT_RESET_BTN

DTC	CATEGORY TYPE	DESCRIPTION	CONDITION	RELEASE BEHAVIOR
SPN: 9082		Paralift Raise HS - Open load	SC_PARA_RAISE_LS_ON	RC: RC_VT_RESET_BTN
SPN: 9083		Paralift Raise HS - Short to power		RC: RC_VT_RESET_BTN
SPN: 9084		Paralift Raise HS - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9085		Paralift Raise HS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9086		Paralift Lower HS - Open load	SC_PARA_LOWER_LS_ON	RC: RC_VT_RESET_BTN
SPN: 9087		Paralift Lower HS - Short to power		RC: RC_VT_RESET_BTN
SPN: 9088		Paralift Lower HS - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9089		Paralift Lower HS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9090		TDZ Flow Forward HS - Open load	SC_FLOW_FWD_LS_ON	RC: RC_VT_RESET_BTN
SPN: 9091		TDZ Flow Forward HS - Short to power		RC: RC_VT_RESET_BTN
SPN: 9092		TDZ Flow Forward HS - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9093		TDZ Flow Forward HS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9094		TDZ Flow Reverse HS - Open load	SC_FLOW_REV_LS_ON	RC: RC_VT_RESET_BTN
SPN: 9095		TDZ Flow Reverse HS - Short to power		RC: RC_VT_RESET_BTN
SPN: 9096		TDZ Flow Reverse HS - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9097		TDZ Flow Reverse HS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9098		Tilt LH - Open load		RC: RC_VT_RESET_BTN
SPN: 9099		Tilt LH - Short to power		RC: RC_VT_RESET_BTN
SPN: 9100		Tilt LH - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9101		Tilt LH - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9102		Tilt RH - Open load		RC: RC_VT_RESET_BTN
SPN: 9103		Tilt RH - Short to power		RC: RC_VT_RESET_BTN
SPN: 9104		Tilt RH - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9105		Tilt RH - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9108		Hydraulic Bypass LS - Short to ground	SC_HYD_BYPASS_LS_OFF	RC: RC_VT_RESET_BTN
SPN: 9109		Hydraulic Bypass LS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9112		Paralift Raise LS - Short to ground	SC_PARA_RAISE_LS_OFF	RC: RC_VT_RESET_BTN
SPN: 9113		Paralift Raise LS - Internal driver error		RC: RC_VT_RESET_BTN

DTC	CATEGORY TYPE	DESCRIPTION	CONDITION	RELEASE BEHAVIOR
SPN: 9116		Paralift Lower LS - Short to ground	SC_PARA_LOWER_LS_OFF	RC: RC_VT_RESET_BTN
SPN: 9117		Paralift Lower LS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9120		TDZ Flow Forward LS - Short to ground	SC_FLOW_FWD_LS_OFF	RC: RC_VT_RESET_BTN
SPN: 9121		TDZ Flow Forward LS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9124		TDZ Flow Reverse LS - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9125		TDZ Flow Reverse LS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9128		Sensor Supply Relay LS - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9129		Sensor Supply Relay LS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9131		Override Tilt RH Up - Short to power		RC: RC_VT_RESET_BTN
SPN: 9132		Override Tilt RH Up - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9133		Override Tilt RH Up - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9135		Override Tilt RH Down - Short to power		RC: RC_VT_RESET_BTN
SPN: 9136		Override Tilt RH Down - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9137		Override Tilt RH Down - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9139		Override Tilt LH Up - Short to power		RC: RC_VT_RESET_BTN
SPN: 9140		Override Tilt LH Up - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9141		Override Tilt LH Up - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9143		Override Tilt LH Down - Short to power		RC: RC_VT_RESET_BTN
SPN: 9144		Override Tilt LH Down - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9145		Override Tilt LH Down - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9147		Override Main Down - Short to power		RC: RC_VT_RESET_BTN
SPN: 9148		Override Main Down - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9149		Override Main Down - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9151		Override Main Up - Short to power		RC: RC_VT_RESET_BTN
SPN: 9152		Override Main Up - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9153		Override Main Up - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9154		Pendulum lock/unlock sensor disparity	SC_PEND_LOCK_FX_INAC	
SPN: 9155		Pendulum lock timeout		
SPN: 9156		Pendulum unlock timeout		

DTC	CATEGORY TYPE	DESCRIPTION	CONDITION	RELEASE BEHAVIOR
SPN: 9157		Auto centre failed due to timeout		
SPN: 9178	Type: Info	Emergency mode activated		
SPN: 9186		Inner Fold RH #1&#2 - Open load		RC: RC_VT_RESET_BTN
SPN: 9187		Inner Fold RH #1&#2 - Short to power		RC: RC_VT_RESET_BTN
SPN: 9188		Inner Fold RH #1&#2 - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9189		Inner Fold RH #1&#2 - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9190		Outer 1 Fold RH #1&#2 - Open load		RC: RC_VT_RESET_BTN
SPN: 9191		Outer 1 Fold RH #1&#2 - Short to power		RC: RC_VT_RESET_BTN
SPN: 9192		Outer 1 Fold RH #1&#2 - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9193		Outer 1 Fold RH #1&#2 - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9194		Outer 2 Fold RH #1&#2 - Open load		RC: RC_VT_RESET_BTN
SPN: 9195		Outer 2 Fold RH #1&#2 - Short to power		RC: RC_VT_RESET_BTN
SPN: 9196		Outer 2 Fold RH #1&#2 - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9197		Outer 2 Fold RH #1&#2 - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9198		Inner Fold 1 - Open load		RC: RC_VT_RESET_BTN
SPN: 9199		Inner Fold 1 - Short to power		RC: RC_VT_RESET_BTN
SPN: 9200		Inner Fold 1 - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9201		Inner Fold 1 - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9202		Inner Fold 2 - Open load		RC: RC_VT_RESET_BTN
SPN: 9203		Inner Fold 2 - Short to power		RC: RC_VT_RESET_BTN
SPN: 9204		Inner Fold 2 - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9205		Inner Fold 2 - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9206		Outer Fold 1 - Open load		RC: RC_VT_RESET_BTN
SPN: 9207		Outer Fold 1 - Short to power		RC: RC_VT_RESET_BTN
SPN: 9208		Outer Fold 1 - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9209		Outer Fold 1 - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9210		Outer Fold 2 - Open load		RC: RC_VT_RESET_BTN
SPN: 9211		Outer Fold 2 - Short to power		RC: RC_VT_RESET_BTN
SPN: 9212		Outer Fold 2 - Short to ground		RC: RC_VT_RESET_BTN

DTC	CATEGORY TYPE	DESCRIPTION	CONDITION	RELEASE BEHAVIOR
SPN: 9213		Outer Fold 2 - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9214		FTZ Flow Forward HS - Open load		RC: RC_VT_RESET_BTN
SPN: 9215		FTZ Flow Forward HS - Short to power		RC: RC_VT_RESET_BTN
SPN: 9216		FTZ Flow Forward HS - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9217		FTZ Flow Forward HS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9218		FTZ Flow Reverse HS - Open load		RC: RC_VT_RESET_BTN
SPN: 9219		FTZ Flow Reverse HS - Short to power		RC: RC_VT_RESET_BTN
SPN: 9220		FTZ Flow Reverse HS - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9221		FTZ Flow Reverse HS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9224		FTZ Flow Forward LS - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9225		FTZ Flow Forward LS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9228		FTZ Flow Reverse LS - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9229		FTZ Flow Reverse LS - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9230		Outer Fold LH - Open load		RC: RC_VT_RESET_BTN
SPN: 9231		Outer Fold LH - Short to power		RC: RC_VT_RESET_BTN
SPN: 9232		Outer Fold LH - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9233		Outer Fold LH - Internal driver error		RC: RC_VT_RESET_BTN
SPN: 9234		Outer Fold RH - Open load		RC: RC_VT_RESET_BTN
SPN: 9235		Outer Fold RH - Short to power		RC: RC_VT_RESET_BTN
SPN: 9236		Outer Fold RH - Short to ground		RC: RC_VT_RESET_BTN
SPN: 9237		Outer Fold RH - Internal driver error		RC: RC_VT_RESET_BTN

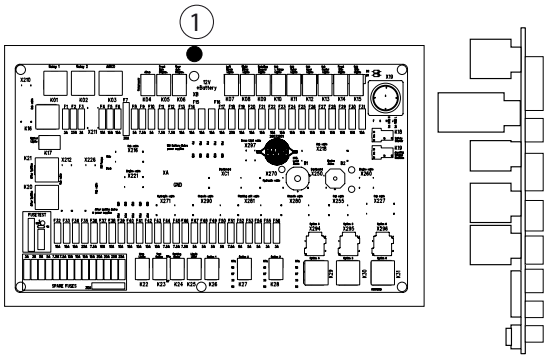
VT Popup Messages - Boom

VT POPUP MESSAGE	REASONS FOR ACTIVATION
SYSTEM NOT CONFIGURED. A valid boom type must be selected in the MST.	No boom type has been selected in the MST. (CfgBoomType->BoomType)
Complete the folding of the 1st outer wing.	Inner fold button pressed when the 1st outer is not folded. 1st outer fold button must be held for the configured time (Cfg03Fold->Outer1FoldTime) before it is considered folded.
Lock the pendulum before folding the inner or 1st outer wings.	Inner fold or 1st outer fold buttons pressed while the pendulum is not locked.
Complete the folding of the 2nd outer wing.	1st outer fold button is pressed when 2nd outer is not folded. 2nd outer fold button must be held for the configured time (Cfg03Fold->Outer2FoldTime) before it is considered folded.
Unfold the inner wing before folding the outer wings.	1st outer fold or 2nd outer fold button pressed when inner RH boom has not been unfolded. Inner RH boom sensor is still reading folded or a sensor fault has occurred.
Centre the boom before folding or unfolding.	Any fold or unfold button pressed when the pendulum has not been centred (Cfg02Pendulum->SlantAngle). Pendulum not at the configured centre position, or the slant angle sensor has a fault.
Raise the boom before folding or unfolding the inner wing.	Inner fold or inner unfold button pressed when the boom is not above the configured paralift fold height (Cfg01Paralift->FoldEnableHeight). Paralift not at the configured fold height, or the height sensor has a fault.
Stop the vehicle before folding or unfolding.	Any fold or unfold button pressed when the vehicle speed is still above the zero-speed threshold (Cfg05Speed->SpeedZeroThreshold).
Pendulum lock failed!	Pendulum lock function times out after configured time (Cfg02Pendulum->LockTimeout) – expected lock feedback was not achieved. Potential issue with sensor feedback, cylinder position or hydraulic controls.
Pendulum lock state unknown!	Any function button pressed (apart from pendulum lock / unlock) when the pendulum state cannot be determined as locked or unlocked. The lock cylinder is not fully extended or retracted, or the feedback sensors have a fault.
Pendulum unlock failed!	Pendulum unlock function timed out when the vehicle was below the zero-speed threshold. (Cfg02Pendulum->UnlockTimeout) (Cfg05Speed->SpeedZeroThreshold) Potential issue with sensor feedback, cylinder position or hydraulic controls.
STOP! PENDULUM LOCKED!	Pendulum unlock function timed out when the vehicle was moving faster than the zero-speed threshold. (Cfg02Pendulum->UnlockTimeout) (Cfg05Speed->SpeedZeroThreshold) Potential issue with sensor feedback, cylinder position or hydraulic controls.
Centre the boom before locking the pendulum.	Pendulum lock button pressed while the boom is not centred.
Complete the unfolding of the 1st outer wing.	2nd outer unfold button is pressed when the 1st outer is not unfolded. 1st outer unfold button must be held for the configured time (Cfg03Fold->Outer1UnfoldTime) before it is considered folded.
Complete the unfolding of the inner wing.	1st outer or 2nd outer unfold buttons pressed when the inner RH boom is not fully unfolded. Inner RH boom sensor is still reading folded or a sensor fault has occurred.
Boom angle sensor fault.	Any fold or unfold button pressed when the boom angle sensor has a fault (voltage outside expected range 0.2…4.8V).
Boom height sensor fault.	Inner fold or unfold button pressed when the boom height sensor has a fault (voltage outside expected range 0.2…4.8V).
Inner RH boom fold sensor fault.	Any fold or unfold button pressed when the inner RH boom fold sensor has a fault (voltage outside high/low logic levels: 0.5…1.5V, 4.9…5.0V).
Pendulum lock sensor fault.	Any fold or unfold button pressed when the pendulum lock sensor has a fault (voltage outside high/low logic levels: 0.5…1.5V, 4.9…5.0V).
Pendulum unlock sensor fault.	Any fold or unfold button pressed when the pendulum unlock sensor has a fault (voltage outside high/low logic levels: 0.5…1.5V, 4.9…5.0V).
Auto-centre failed due to timeout.	Auto-centre process stopped due to the boom angle feedback not reaching the centre position within the configured time (Cfg02Pendulum -> AutoCentreTimeout).
Unfold the inner wing before unlocking the pendulum.	Pre-condition: FTZ boom selected and pendulum lock option has been enabled. Pendulum unlock button pressed while the inner wing is still folded.

Position Lights Fuse

The main printed circuit is placed at the rear inside the cabin to protect the lighting circuit.

- Remove the screw (1) and rock the main printed circuit to access the fuses.
- Check and replace the defective fuse.



NOTE! Spare fuses are available on the main printed circuit.

NOTE! Ensure that the replacement fuse has the same capacity as the original fuse.

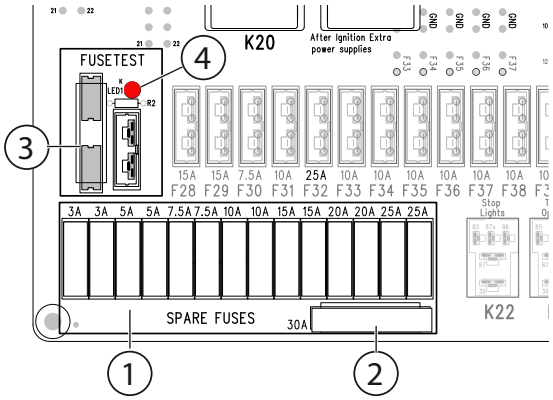
Fuse test

The main circuit has "Autofuse" type spare fuses (1) and a "Maxifuse" (2).

To test a fuse.

- Remove the fuse to be checked and place it in the fuse holder (3) according to the model.

  If the indicator (4) lights up, this means that the fuse is in good working order. If not, use an "Autofuse" (1) or "Maxifuse" (2) replacement fuse.



NOTE! Ensure that the replacement fuse has the same capacity as the original fuse.

7.5 Hydraulic incidents

General info

Before any towing of the machine following a failure in the engine or the hydraulic transmission, it is essential to check the hydraulic motors and the transmission pump.

NOTE! To avoid any risk of damage to the transmission components (pump, motors etc.), the machine should be towed over a short distance and at low speed.

Before moving the machine, you should:

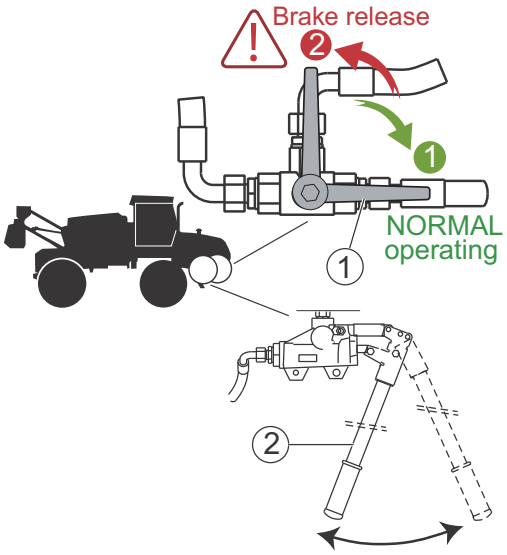
1. Release the hydraulic motor brakes. See "Releasing the hydraulic motor brakes" on page 235.
2. Release the high pressure valves on the transmission pump. See "Transmission pump high pressure valves" on page 235.

Releasing the hydraulic motor brakes

1. Valve in NORMAL operating mode.
2. Valve in BRAKE RELEASE mode.

For releasing the brakes of the hydraulic motors, apply the following procedure:

- Turn the handle (1) of the release valve to the position 1
- Place the handle (2) to the hand pump.
- Operate the arm lever pump until the brakes on both motors are fully released.



NOTE! The arm lever pump (2) is placed into the storage box.

NOTE! Do not continue to work the hand pump after the brakes have been fully released. Excessive pressure could damage the motor braking mechanism.

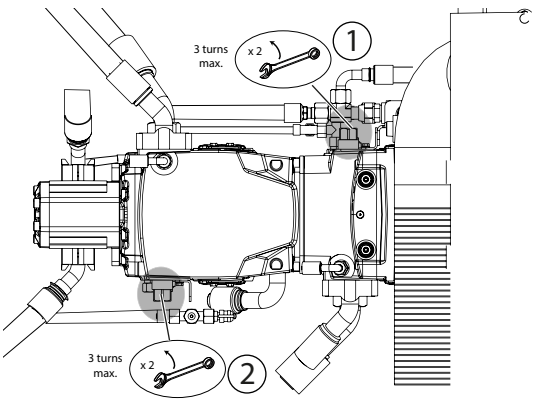
NOTE! An excessive towing distance and a too high speed could damage the motor braking mechanism.

NOTE! After towing or before starting the machine again, always engage the parking brake by turning the valve handle to vertical position and remove the brake release handle.

Transmission pump high pressure valves

This operation consists of releasing the 2 high pressure valves located on the transmission pump to allow free circulation of oil in the system when towing the machine.

- Loosen the 2 valves (1) and (2) by a maximum of 3 turns to allow free circulation of the oil in the hydraulic transmission.



WARNING! The high pressure valves should be tightened before the machine is started up again.

7.6 HIVE incidents

Completion bar

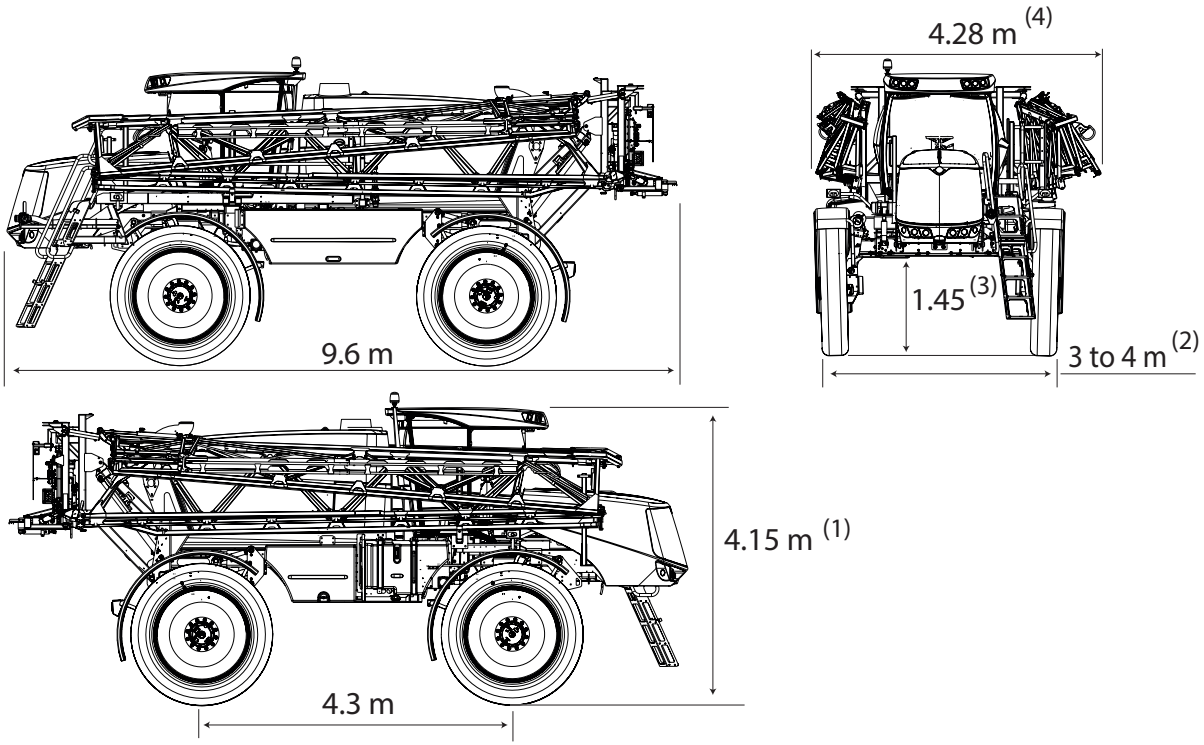
Error bar

Info bar

Warning bar

Awaiting input

8.1 Overall dimensions



(1) Wheels set 380/90/ R50
(2) Wheels set 380/105/ R50
(3) Wheels set 480/80 R50
(4) Transport 3.5m

Tyre pressures

Please refer to manufacturer specifications.

8 - Technical Specifications

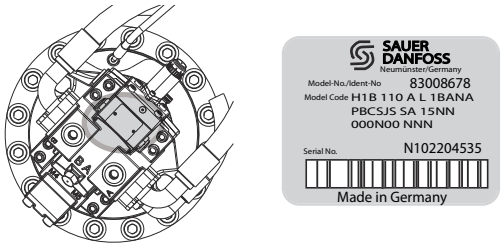
Identification plates

A. Identification of moto-hydraulic reducers:

B. Identification of hydraulic pumps
1. Hydraulic Pump primary transmission, placed behind the engine.
2. Hydraulic Pump of secondary transmission.

C. Identification of hydraulic n,s

The model and serial number are shown on the identification plate, as shown in the illustration.



8.2 Lubrication

General information

Always store lubricants in a clean, dry and cool place - preferably at a constant temperature Keep oil filling jugs, hoppers and grease guns clean, and clean the lubricating points thoroughly before lubricating. Avoid skin contact with oil products for longer periods. Always follow the recommendations concerning quantity. If no quantity is indicated, lubricate up to the required level, unless otherwise indicated.

For the opening of the engine hood, see the section "Access to the engine" page 44.

Table of recommended lubricants

Components	Capacity (litres)		Recommended lubricants
	Housing	With filter	
Crankcase - Cummins QSB 6.7 Diesel Engine	18	18.5	Delo® 400 SLK SAE 15W-40 Delo® 400 MGX SAE 15W-40 Delo® Gold Ultra SAE 15W-40
Hydraulic/Hydrostatic Transmission	100		Rando® HDZ 46
Final Drives - Moto-reducers	3.0		Delo®Gear EP-5 SAE 85W-140 (Gear Oil)
Radiator	25		Delo® XLC Antifreeze/Coolant Premixed 50/5
Grease-General lubrication	--		Delo® Starplex® Moly 3% EP2 Caltex Multifak® Moly EP 2
Banjo Pump Coolant	--		ACDelco Dex-Cool Extended Life (Red) Antifreeze/Coolant 19375294
Ace Pump Barrier Fluid	--		Barrier Fluid (1quart) for Ace Wet Seal Pumps 55032

NOTE! The data values in the table above are indicative to titles. Only the level indicated by the gauge should be taken into consideration.

8 - Technical Specifications

Service Intervals

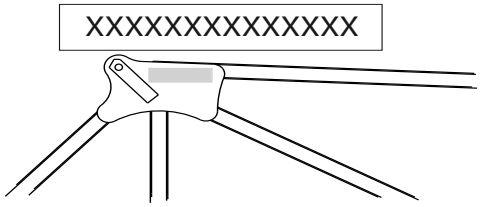
ATTENTION! All lubricants/oil must be changed yearly irrespective of the operating hours threshold.

	Daily	x1 10	100	Interval +500 hours 250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
Hydraulic														
Hydraulic oil level	●													
Hydraulic oil			❑		❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Check hydraulic filters clogged				●	●	●	●	●		●	●		●	●
Hydraulic filters				❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Drain the hydraulic tank								❑		❑		❑		
Wheel Drive (gearbox)														
Oil level				● (Every 150 hours)										
Oil replacement				❑ (Every 500 hours)										
Tightening screws	●			●						●				
Cabin														
Combined filter (category 4)				❑ (Every 250 hours)										
Air conditioning gas				❑ (Every 5 years)										
Clean air conditioning condenser			●		●	●	●	●	●	●	●	●	●	●
Engine[1]														
Clean cooler	●													
Check oil level	●													
Check coolant level	●		●	●	●	●	●	●	●	●	●	●	●	●
Replace engine coolant				❑ (Every 2 years)										
Clean air filter	●													
Replace air filter						❑		❑		❑		❑		❑
Replace safety air filter						❑		❑		❑		❑		❑
Drain lubricating oil				❑ (Every 250 hours or 3 months)										
Empty water fuel prefilter														
Replace fuel prefilter					❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Replace fuel filter					❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Filling the fuel tank	●													
Clean fuel tank									❑					❑
Compressed air tank	●													
Compressed air filter and lubricator				●										
Compressed air pressure				●	●	●	●	●	●	●	●	●	●	●
Inspect V-belts roller				● (Every 2 years)										
Battery (maintenance + terminals)					●	●	●	●	●	●	●	●	●	●
Chassis and booms				●										
Tighten lug nuts		●		●										
Lubricate chassis and axles				●										
Check inflation pressure (tires)				●										
Inspect tires				●										
Dynamic brake accumulator							● (5 years)							
Spraying														
Check coolant mixture of the Banjo Pump (PWSP)	●													
Check the boom		●		●										
Inspect spraying circuits	●													
Ace Centrifugal Pump	●			● (Weekly)					❑ (Season end)					
Inspect line filters	●													
Remove and inspect the pressure transducer				●	●	●	●	●	●	●	●	●	●	●
		10	100	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
	Daily	x1		Interval +500 hours										

● Check ❑ Replacement (1) Refer to Cummins Operation manual (bulletin 4021531)

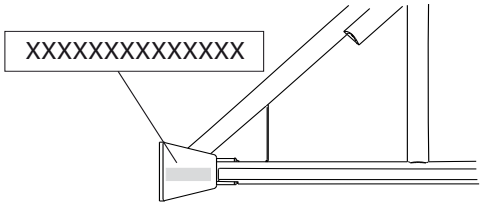
Boom identification B3

The serial number of the aluminium boom is engraved on the inner section. This serial number is identical for both sides of the boom. If needed to order boom section replacement, please provide this number.

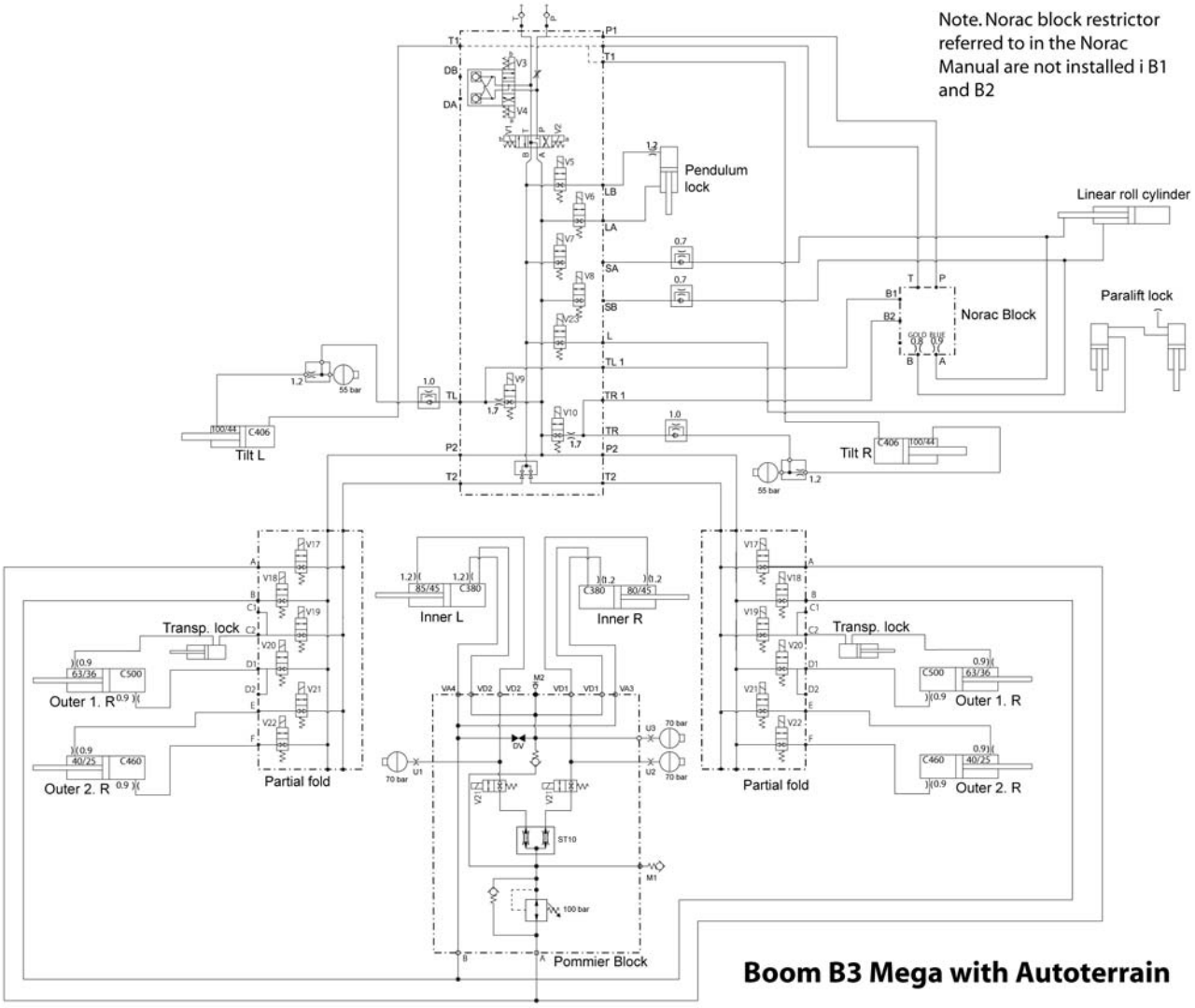


Boom identification TR5

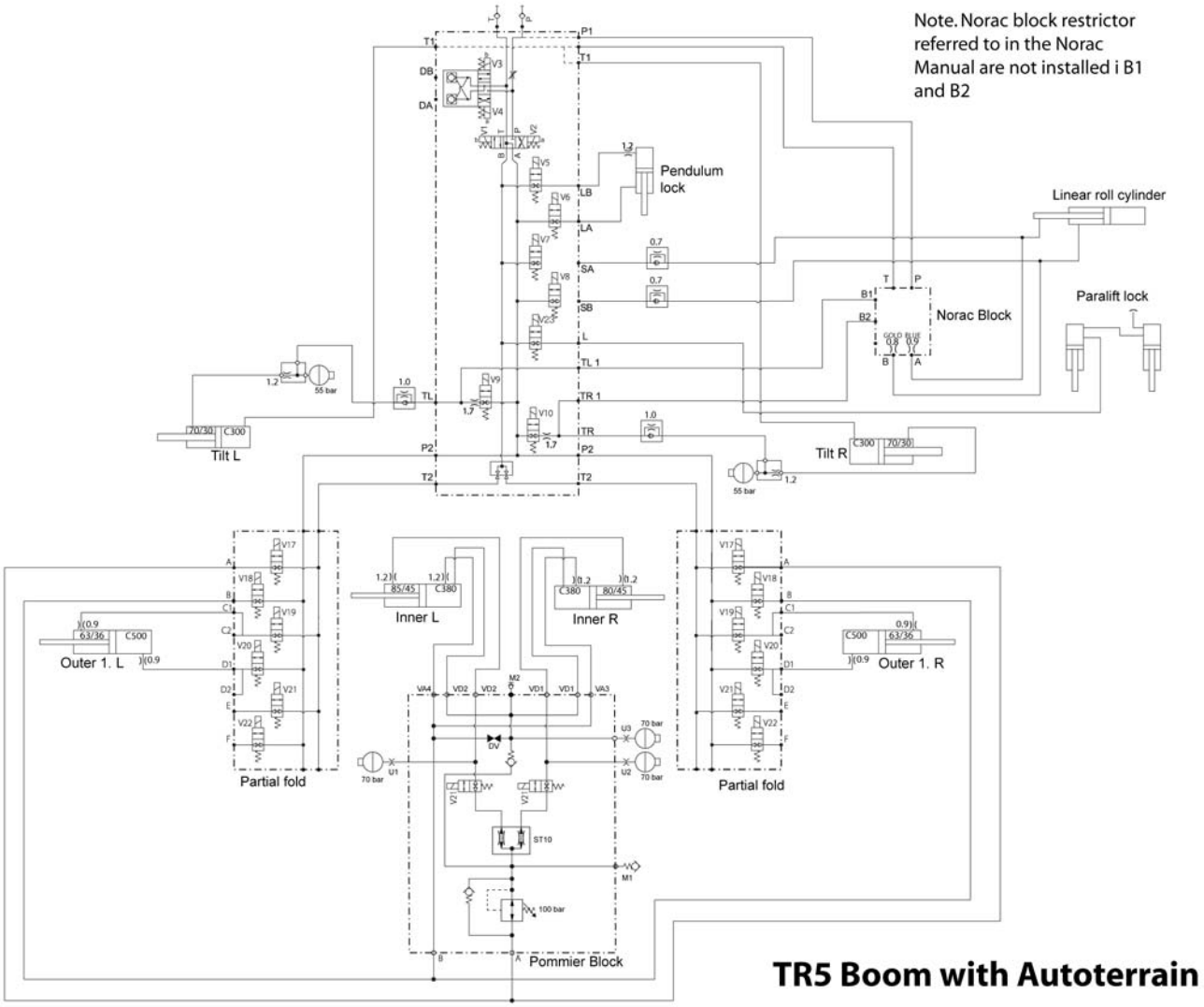
The serial number of the aluminium boom is engraved on the inner section. This serial number is identical for both sides of the boom. If needed to order boom section replacement, please provide this number.



Charts

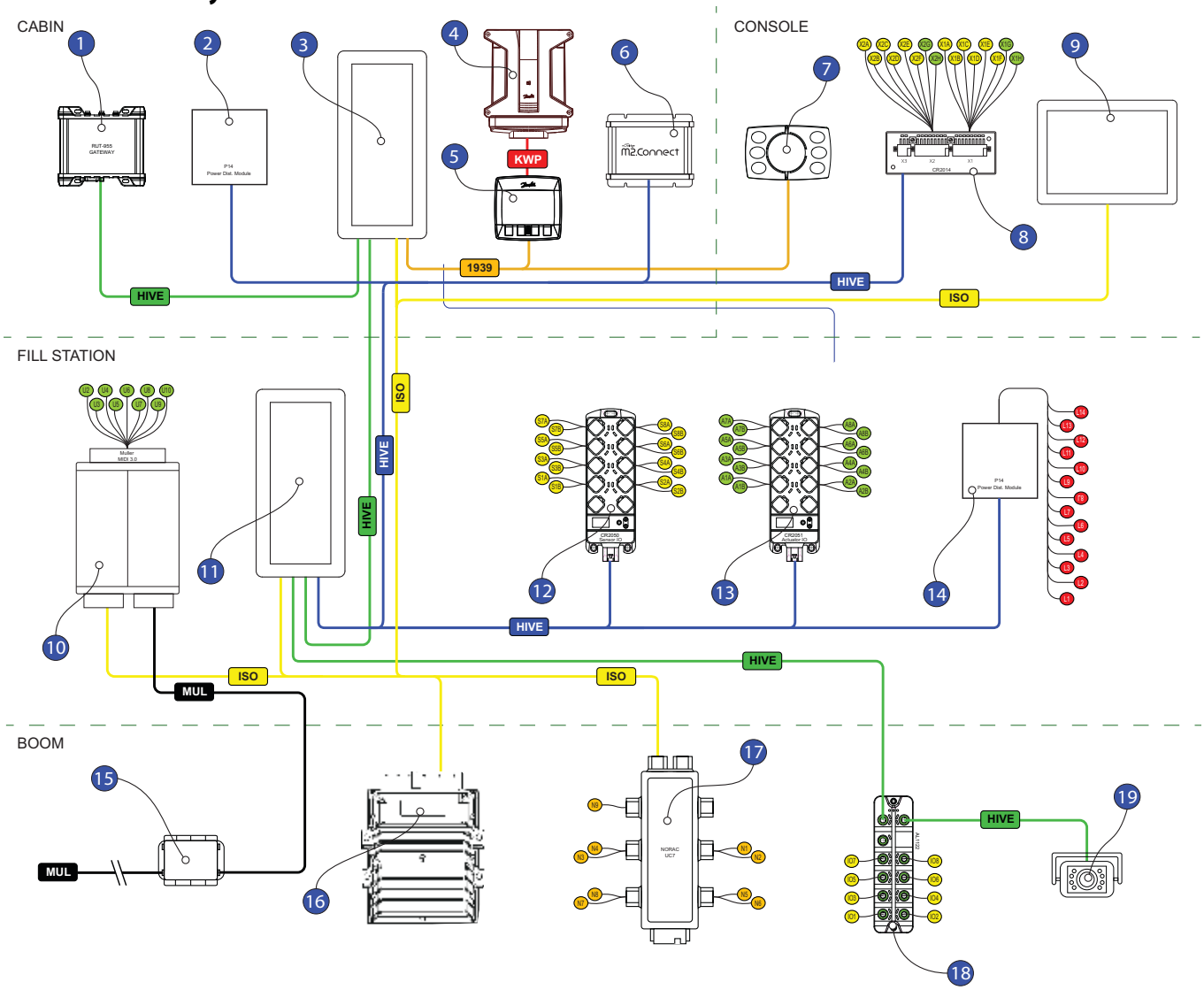

Note. Norac block restrictor referred to in the Norac Manual are not installed i B1 and B2
Pendulum lock
Linear roll cylinder
Paralift lock
Norac Block
Tilt L
Tilt R
Transp. lock
Outer 1. R
Outer 2. R
Partial fold
Inner L
Inner R
Pommier Block
Boom B3 Mega with Autoterrain

Charts


Note. Norac block restrictor referred to in the Norac Manual are not installed i B1 and B2
Pendulum lock
Linear roll cylinder
Paralift lock
Norac Block
Tilt L
Tilt R
Inner L
Inner R
Outer 1. L
Outer 1. R
Partial fold
Partial fold
Pommier Block
TR5 Boom with Autoterrain

8 - Technical Specifications

Communication Layer Overview



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Spare Parts Information

To see updated spare part information, visit the Agroparts website on the internet.

Here all parts information can be accessed in the spare parts catalogue:

1. Go to www.agroparts.com, register for free and log in.
2. Select "HARDI" in the menu on the left.
3. Select "Spare parts catalogue" and find your spare part.
4. Online ordering is also possible.
5. Contact your HARDI dealer for further information on spare parts.

User Evaluation

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hau.marketing@hardi.com

Thank you.

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