

Cabin & Operator Safety

HIT SRL

102 procedures · 61 maintenance tips (pillole)

Technical Reference Document

Procedures

HVAC

What is the correct sequence to replace a pry-out cab air vent?

1. Put the machine in service position.
2. Use a screwdriver or similar tool to remove the air vent.
3. Remove the air vent.
4. Install a new air vent.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-a-pry-out-cab-air-ve>

What is the correct sequence to replace a screw-mounted cab air vent?

1. Put the machine in service position.
2. If the vent is mounted in the instrument panel, remove the instrument panel for warning lights and switches, then squeeze the four catches towards the centre and remove the vent.
3. Remove the two screws and remove the rest of the vent.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-a-screw-mounted-cab>

What is the correct sequence to replace the cab fan on a cab with a floor-mounted heating unit?

1. Put the machine in service position.
2. Unplug the electric connections.
3. Install clamps on the hoses to prevent coolant from running out.
4. Undo the hose clamps and remove the hoses, using a vessel to collect any coolant that runs out.
5. Remove the four screws that hold the cab fan to the cab floor.
6. Remove the cab fan.
7. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-cab-fan-on-a-cab>

What is the correct sequence to replace the cab fan on a cab with the fan located behind the wiper motor cover?

1. Put the machine in service position.
2. Remove the cover plate holding the wiper motor.
3. Remove the washer fluid hose and unplug the connector from the wiper motor.
4. Remove the bolts securing the cab fan to be replaced.
5. Unplug the connector from the cab fan.
6. Replace the cab fan.
7. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-cab-fan-on-a-cab-2>

What is the correct sequence to replace the cab fan on a cab with a wing-nut secondary filter cover?

1. Put the machine in service position.
2. Undo the wing nuts, remove the cover plates and the secondary filter.
3. Remove the 15 screws securing the cover plate and remove the cover plate.
4. Remove the two bolts securing the cab fan to be replaced.
5. Unplug the connector from the cab fan.
6. Replace the cab fan.
7. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-cab-fan-on-a-cab-3>

What is the correct sequence to replace the cab heat exchanger on a cab with the exchanger behind the wiper motor cover?

1. Put the machine in service position.
2. Remove the cover plate holding the wiper motor.
3. Remove the washer fluid hose and unplug the connector from the wiper motor.
4. Remove the fresh air filter and the two screws securing the grille for the fresh air intake.
5. Empty the cooling system of coolant.
6. Clamp the hoses to and from the heat exchanger with pinch-off pliers to prevent coolant escaping.
7. Disconnect the coolant hoses from the heat exchanger under the cab.
8. Withdraw the heat exchanger from its rest position.
9. Replace the heat exchanger.
10. Fit in reverse order.
 - Install clamps on the hoses to prevent unnecessary coolant loss when working on the coolant circuit; wear protective gloves and use a collection vessel for the coolant that runs out.
 - After the work is finished, check the coolant circuit for leaks and check the coolant level, topping up if necessary.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-cab-heat-exchang>

What is the correct sequence to replace the cab heat exchanger on a cab with a wing-nut secondary filter cover?

1. Put the machine in service position.
2. Undo the wing nuts, remove the cover plates and the secondary filter.
3. Remove the 15 screws securing the cover plate and remove the cover plate.
4. Empty the cooling system of coolant.
5. Clamp the hoses to and from the heat exchanger with pinch-off pliers to prevent coolant escaping.
6. Disconnect the coolant hoses from the heat exchanger under the cab.
7. Withdraw the heat exchanger from its rest position.
8. Replace the heat exchanger.
9. Fit in reverse order.
 - Install clamps on the hoses to prevent unnecessary coolant loss when working on the coolant circuit; wear protective gloves and use a collection vessel for the coolant that runs out.
 - After the work is finished, check the coolant circuit for leaks and check the coolant level, topping up if necessary.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-cab-heat-exchang-2>

What is the correct sequence to replace the heating water valve on a machine without electronic climate control?

1. Put the machine in service position.
2. Undo the screw and the lock washer that fix the cable to the water valve.
3. Install clamps on the hoses to prevent coolant from running out.
4. Undo the hose clamps and remove the hoses, using a vessel to collect any coolant that runs out.
5. Unscrew the water valve from underneath the cab floor.
6. Fit in reverse order.
 - After fitting the water valve, check it for leaks and check the coolant level, topping up as necessary.
 - The water valve must be installed with the arrow markings pointing in the direction of coolant travel.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-heating-water-valve>

What is the correct sequence to replace the heating water valve on a machine with electronic climate control?

1. Put the machine in service position.
2. Install clamps on the hoses to prevent coolant from running out.
3. Undo the hose clamps and remove the hoses, using a vessel to collect any coolant that runs out.
4. Undo the water valve connector.
5. Unscrew the water valve from underneath the cab floor.
6. Fit in reverse order.

Note: After fitting the water valve, check it for leaks and check the coolant level, topping up as necessary.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-heating-water-valve-2>

What is the correct sequence to replace the air conditioning compressor?

1. Put the machine in service position.
2. Open the hood on the right side.
3. Drain the AC system of R134a refrigerant.
4. Release the belt tensioner and remove the AC compressor belt.
5. Undo the hose fittings and disconnect the inlet and outlet hoses from the AC compressor, plugging the fittings to prevent contamination.
6. Remove the nut and bolt securing the AC compressor.
7. Empty the oil from the old AC compressor through the inlet/outlet and measure the quantity.
8. Empty the oil from the new AC compressor.
9. Refill the new AC compressor with the same amount of oil that was emptied from the old compressor.
10. Fit in reverse order.
11. Turn the AC compressor over several turns by hand.
12. Using vacuum equipment, refill the system with R134a refrigerant and test for leaks.
13. Check the function of the system.
 - Working on the air conditioning requires special authorisation.
 - Always replace the particle and moisture filter when any work is done on the refrigerant circuit, to prevent contamination and foreign particles entering it.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-air-conditioning-compressor>

What is the correct sequence to replace the AC compressor pulley groove and clutch coil?

1. Put the machine in service position.
2. Release the belt tensioner and remove the AC compressor belt.
3. Remove the screw in the centre of the pulley.
4. Remove the armature plate and the outer circlip.
5. Remove the groove.
6. Remove the three screws that secure the clutch coil.
7. Remove the clutch coil.
8. Fit in reverse order.
9. Check the function of the system.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-ac-compressor-pu>

What is the correct sequence to replace the air conditioning condenser?

1. Put the machine in service position.
2. Drain the AC system of R134a refrigerant.
3. Remove the outer protective cover from the condenser (four M6 screws).
4. Cut off the tie wraps and unplug any lighting cables.
5. Remove the refrigerant hoses from the condenser unit, plugging the hoses to avoid contamination of the refrigerant circuit.
6. Remove the four screws for the rubber buffers on the condenser.
7. Separate the condenser from the cover by drilling out the pop rivets.
8. Pop rivet the cover to the new condenser.
9. Fit in reverse order.
10. Using vacuum equipment, refill the system with R134a refrigerant and test for leaks.
11. Check the function of the system.
 - Working on the air conditioning requires special authorisation.
 - Always replace the particle and moisture filter when any work is done on the refrigerant circuit, to prevent contamination and foreign particles entering it.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-air-conditioning-2>

What is the correct sequence to replace the cab's cooling evaporator?

1. Put the machine in service position.
2. Drain the AC system of R134a refrigerant.
3. Remove the covers, filters and hoses needed to access the evaporator for the specific cab type (e.g. the heat exchanger, its cover plate and grille, or the wing-nut secondary filter cover).
4. Detach the hoses from the expansion valve, the evaporator outlet connection, and any drain hoses.
5. Carefully pull out the thermostat's or de-icing sensor's capillary tube/sensor and set it aside, removing its tie wrap and insulation as needed.
6. Withdraw the evaporator together with the expansion valve from its rest position.
7. Remove the expansion valve from the evaporator (undo the connection nut and any capillary tube clip).
8. Replace the evaporator.
9. Fit in reverse order, using new O-rings and a new particle and moisture filter before refilling the cooling system.
10. Using vacuum equipment, refill the system with R134a refrigerant and test for leaks.
 - Working on the air conditioning requires special authorisation.
 - Always replace the particle and moisture filter when any work is done on the refrigerant circuit, to prevent contamination and foreign particles entering it.
 - Use new O-rings when installing.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-cab-s-cooling-ev>

What is the correct sequence to replace the air conditioning particle and moisture filter?

1. Put the machine in service position.
2. Drain the R134a refrigerant out of the AC system.
3. Remove the screws holding the housing over the condenser, where fitted.
4. Undo the connections for the coolant hoses and plug them to avoid contamination of the refrigerant circuit.
5. Undo the connections for the high/low pressure sensor.
6. Undo the clamps that hold the particle and moisture filter and remove the filter.
7. Unscrew and remove the high/low pressure sensor.
8. Install the sensor in the new particle and moisture filter.
9. Fit in reverse order.
10. Using vacuum equipment, refill the system with R134a refrigerant and test for leaks.
11. Check the function of the system.
 - Working on the air conditioning requires special authorisation.
 - The filter is filled with nitrogen under pressure and plugged on delivery to keep it dry; never remove the plugs until immediately before connecting it to the coolant circuit, since open connections let the absorbent material become saturated with moisture within a few hours.
 - The high/low pressure sensor is mounted on the filter's pipe via an integrated valve and can be replaced on its own without draining the refrigerant: disconnect the cable connectors, unscrew the sensor, screw in the new sensor, and refit the cable terminals.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-air-conditioning-3>

What is the correct sequence to replace the fresh air actuator motor?

1. Put the machine in service position.
2. Remove the covers, filters and components needed to access the fresh air actuator motor for the specific cab type.
3. Undo the connector and remove the screws or anchorages holding the fresh air actuator motor.
4. Remove the fresh air actuator motor, and its adapter plate where fitted.
5. Replace the fresh air actuator motor.
6. Fit in reverse order.

Note: *Be careful when installing the front of the climate unit, to ensure that no electric cables are pinched or damaged.*

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-fresh-air-actuator-motor>

What is the correct sequence to replace the air distribution actuator motor?

1. Put the machine in service position.
2. Gain access to the air distribution actuator motor for the specific cab type, removing interior trim and the steering column, or the secondary filter cover and cab-front cover plate, as applicable.
3. Undo the connector and remove the screws holding the air distribution actuator motor.
4. Replace the air distribution actuator motor.
5. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-replace-the-air-distribution-actuator-motor>

What is the correct sequence to test the performance of the air conditioning system?

1. Start the engine at a maximum of 2000-2500 rpm.
2. Adjust the thermostat to the maximum position.
3. Open the cab doors.
4. Start the fan at maximum speed for ten minutes.
5. Close the cab doors and windows.
6. Check the high pressure (on the discharge line) and low pressure (on the suction line) with pressure gauges.
7. Check the temperature inside the cab.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-test-the-performance-of-the-air-conditioning-system>

What checks should be performed before a functional test of the air conditioning system?

1. Adjust the belt tension.
2. Check hoses and fittings for leaks.
3. Check the condenser.
4. Check all the air ducts.
5. Check the evaporator.
6. Check the fans.
7. Check the air filter.
8. Check the drier coolant filter (hoarfrosting on the outside indicates internal clogging).

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-checks-should-be-performed-before-a-functional-test-of-the-air-conditioning-system>

What is the correct sequence to change the fresh air filter?

1. Remove the cover.
2. Change the fresh air filter.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-change-the-fresh-air-filter>

What is the correct sequence to clean the condenser?

1. Put the machine in service position.
2. Blow the condenser cooler clean using compressed air.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-clean-the-condenser>

What is the correct sequence to check the humidity filter?

1. Put the machine in service position.
2. Start the engine and let it idle.
3. Check the colour of the indicator on the humidity filter: blue indication means the humidity filter is ok; grey or pink indication means the humidity filter should be changed.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-check-the-humidity-filter>

What is the correct sequence to change the humidity filter?

1. Put the machine in service position.
2. Drain the air conditioning of refrigerant R134a, using the intended draining equipment.
3. Disconnect hoses and cabling from the humidity filter.
4. Remove the humidity filter pressure switch from the humidity filter.
5. Change the humidity filter.
6. Fit the pressure switch and connect the hoses to the humidity filter.
7. Check for leaks and refill the machine with refrigerant R134a, using the intended equipment, to the specified volume.
 - Working on the air conditioning requires special authorization.
 - Follow the safety instructions for handling refrigerant R134a to avoid personal injury and environmental damage.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-change-the-humidity-filter>

What is the correct sequence to change the fresh air filter?

1. Remove the filter casing retaining bolts and remove the filter element.
2. Wash the filter insert with water and detergent or by using a high pressure washer, replacing the insert if necessary.
3. Reinstall the filter insert.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-change-the-fresh-air-filter-2>

What is the correct sequence to check the air conditioning unit?

1. Start the engine and start the air conditioner (note the system cannot start below 0°C outdoor temperature, since the low-pressure relay breaks contact).
2. After 10 minutes of operation, check that no bubbles are visible in the sight glass of the filter-dryer (bubbles should occur only when the compressor is started and stopped); if bubbles are present, have an authorised service mechanic refill the system.
3. Check that the condenser is not clogged, cleaning the condenser fins and fans with compressed air if necessary.
4. Change the fresh air filter as necessary.
5. Check the V-belt tension and the compressor mounting.
6. Check that the magnetic coupling engages and disengages satisfactorily.
7. Check that the condensate drain from the cooling element is not clogged, and check for leakage.
 - If the refrigerant hose fails or other refrigerant leakage occurs, switch off the air conditioner immediately.
 - Refrigerant is injurious to the skin and eyes; never release it in an enclosed space, where it may cause asphyxia, and it is forbidden by law to discharge it into the air intentionally.
 - Never carry out welding on a charged refrigeration system or in its vicinity.
 - Only authorised service mechanics are allowed to drain off and fill refrigerant in the air conditioning system, using only the prescribed refrigerant.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-check-the-air-conditioning-u>

What is the correct sequence to check and performance-test the air conditioning unit?

1. Check that the condenser is not clogged, cleaning the fins with compressed air as needed.
2. Check that the compressor turns on and off without error.
3. Check that the drain for the cooling element's condensation water is not clogged.
4. Check for refrigerant leakage, indicated by a dusty, dirty spot where oil and gas often form.
5. Start the engine, engage the cooling function at maximum, and let the engine run at a minimum of 1500 rpm.
6. Set the fan to intermediate speed.
7. After running for 10 minutes, check that no bubbles are visible in the receiver dryer's sight glass (bubbles should occur only when the compressor starts and stops).
8. Place a thermometer at the air vent closest to the evaporator; after 5-10 minutes, the temperature should be under 10°C.
9. Feel the hoses and components: those on the pressure side (compressor to expansion valve) should be warm, and those on the suction side (evaporator to compressor) should be cold.
10. Check the expansion valve for frost or cold temperatures on the intake side, which indicate it is defective or clogged.
11. Check that the compressor cuts in and out normally by running the cab fan at low speed and the compressor at high rpm, confirming it cuts out near 0°C at the air vents and cuts back in after the temperature rises approximately 3-7°C.

Note: Parts such as hoses before the condenser can become very hot during long-term operation, with risk of burn injuries.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-check-and-performance-test-t>

What is the correct sequence to check the refrigerant amount via the sight glass?

1. Put the machine in service position.
2. Start the engine and let it idle.
3. Switch on the air conditioning with maximum cooling and fan.
4. Check that no bubbles are visible in the sight glass on the particle and moisture filter; bubbles indicate incorrect refrigerant quantity, a defective or clogged condenser, or very high ambient temperature.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-check-the-refrigerant-amount>

What is the correct sequence to find and repair a refrigerant leak and refill the air conditioning system?

1. Turn off the air conditioning.
2. Check the cooling plant and pinpoint leaks with special leak detection equipment, evacuating and measuring any remaining refrigerant.
3. Rectify faults, sealing leaks by replacing gaskets, hoses, etc.
4. Connect the suction pressure gauge's blue hose to the compressor's suction-side service valve, and the pressure gauge's red hose to the discharge-side service valve.
5. Connect the hoses to the fluid reservoir and the yellow filler/vacuum hose to the nitrogen tube, then open the tube cock and pressure-side cock/valve in sequence to let gas flow through the system and back to the suction side, confirming on the blue gauge; close the pressure-side valve and tube cock afterward.
6. Conduct leak detection at all hose nipples and connections by applying leak indicator around sealing surfaces and checking for gas bubbles.
7. Move the yellow hose from the nitrogen tube to the vacuum pump.
8. Start the vacuum pump, carefully open the suction-side cock, then the pressure-side cock, and hold vacuum suction for at least 30 minutes.
9. Close both pressure-gauge valves, then turn off the vacuum pump, wait approximately 15 minutes, and check the gauges hold vacuum without change.
10. Move the yellow hose to the refrigerant cylinder, open its valve, and bleed the yellow hose until pure gas flows out.
11. Open the suction-side cock and let the gas flow until the gauges indicate the same pressure as in the tube.
12. Start the compressor and set the cooling thermostat and fan to maximum.
13. Open the pressure-side valve and let the compressor draw from the cylinder, observing the sight glass until bubbles clear, bypassing the thermostat if it cuts out early, until the correct refrigerant amount is reached.
14. Close the suction-side valve, then the cylinder valve, disconnect the service hoses from the compressor, and install protective caps.
15. Check for leaks again.
 - If there is a rupture of a cooling hose or leakage, turn off the unit immediately; refrigerant is dangerous in contact with skin or eyes and must never be released in a closed room, where it can cause asphyxiation.
 - Never weld on or near a closed cooling system.
 - Directly bypassing the compressor's coupling magnet can lead to compressor damage from incorrect refrigerant quantity.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-find-and-repair-a-refrigeran>

What is the correct sequence to change the compressor's cooling oil when replacing the compressor?

1. Drain the defective compressor of oil and measure the quantity.
2. Drain the new compressor of oil.
3. Refill the new compressor with the same amount of oil that was drained from the defective compressor.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-change-the-compressor-s-cool>

What is the correct sequence to change the fresh air filter?

1. Put the machine in service position.
2. Remove the cover and change the fresh air filter.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-change-the-fresh-air-filter-3>

What is the correct sequence to clean the condenser?

1. Put the machine in service position.
2. Blow clean the condenser's cooler with compressed air.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-clean-the-condenser-2>

What is the correct sequence to check the moisture filter?

1. Put the machine in service position.
2. Start the engine and let it idle.
3. Check the colour of the indicator on the moisture filter: blue means it is ok, grey or pink means it should be changed.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-check-the-moisture-filter>

What is the correct sequence to change the moisture filter?

1. Put the machine in service position.
2. Drain the air conditioning of refrigerant R134a using the intended draining equipment.
3. Disconnect hoses and cabling from the moisture filter.
4. Disconnect the moisture filter's pressure switch from the filter.
5. Change the moisture filter.
6. Fit the pressure switch and connect the hoses to the moisture filter.
7. Leak test and refill the machine with refrigerant R134a, using the intended equipment, to the specified volume.

Note: Working on the air conditioning requires special authorisation.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-change-the-moisture-filter>

What is the correct sequence to remove the heater unit?

1. Remove the front terminal of the heater by gently pulling it with a screwdriver (the heater has 4 air terminals, on both sides and the centre of the front panel).
2. Remove the air terminal by unscrewing its bolt.
3. If necessary, remove all other components as indicated.
4. If air hoses need replacing, also remove the clamps on the air filter side.
5. Replace or clean the AC filter if necessary.

Note: Shock hazard: make sure all power supply to the unit is disconnected before performing any work on it.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-remove-the-heater-unit>

What is the correct sequence to install the heater unit?

1. Install the air terminals by reversing the removal procedure.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-install-the-heater-unit>

What is the correct sequence to remove the air conditioner unit?

1. Remove the front terminal of the unit by gently pulling it with a screwdriver (the unit has 4 terminals, on both sides and the centre of the front panel).
2. If necessary, remove all other components as indicated.
3. Replace or clean the AC filter if necessary.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-remove-the-air-conditioner-u>

What is the correct sequence to install the air conditioner unit?

1. Install the AC terminal by reversing the removal procedure.

Note: Fire hazard: do not use duct tape on or around the fabric discharge air duct collar.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/hvac/#what-is-the-correct-sequence-to-install-the-air-conditioner>

Safety Devices & interlocks

What is the correct sequence for safely entering and exiting the tractor cab?

1. Entry and exit should be made slowly and carefully.
2. Use a three-point stance: three out of the four extremities (hands and feet) should be in contact with the vehicle at all times.
3. Face inward toward the steps when entering and exiting.
4. Keep steps, walkways and handholds in good condition.
5. Keep steps, handholds, walkways and shoes free of grease, mud, dirt, fuel, ice and snow.
6. Use extra care during bad weather, especially when steps and handholds may be icy or wet.
 - To avoid serious injury or death, read the instructions and warnings before entering and exiting the vehicle.
 - Do not remove or modify factory-installed walkways, steps or handholds; do not operate the vehicle unless they are all installed and in good working condition.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-for-safely-entering-and-exiting>

What is the correct sequence to tilt the cab for service access?

1. Locate the cab tilt control switch and safety prop release cable.
2. Pull the safety prop release cable and hold the cable to the rear.
3. While holding the cable to the rear, move the tilt control switch to the UP position.
4. After the cab has traveled about 15 inches (381 mm), release the safety prop cable and continue tilting the cab.
5. As the cab approaches the 45-degree position, watch for the safety prop to drop over the tilt cylinder on the driver's side of the frame, then STOP.
6. After the safety prop has dropped over the cylinder, move the tilt control switch to the DOWN position and lower the cab slightly until the safety prop rests fully on top of the tilt cylinder.
7. Make sure the safety prop is resting properly on top of the tilt cylinder: pull on the safety prop release cable and ensure the safety prop is secure; it should not move with the weight of the cab on the prop.
 - Ensure that no part of the body is under the cab while tilting; stand clear of the rear of the cab.
 - Ensure the safety prop is properly engaged before working under the cab.
 - Never work under the cab unless the safety prop is properly engaged; the cab could fall and cause serious injury or death.
 - Only tilt the cab far enough past the 45-degree point to engage the safety bar; attempting to fully extend the cylinder past 45 degrees can cause pump and motor damage.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-tilt-the-cab-for-service-access>

What is the correct sequence to lower the cab after tilting it?

1. Move the cab tilt switch to the UP position and raise the cab slightly until the safety prop is free from the top of the tilt cylinder.
2. Pull the safety prop release cable to the rear and hold in the rearward position.
3. Move the tilt switch to the DOWN position with the safety prop disengaged and allow the cab to lower onto the rear cab latch.
4. Hold the cab tilt switch in the DOWN position for 5 seconds after the cab has come to rest on the lower latch units, to ensure the mechanical cab latches are fully engaged.
 - Ensure the cab latch is fully engaged after lowering the cab; if not properly locked down, the cab could tilt while the vehicle is in motion.
 - If a cab latch fails or the tilt system malfunctions, the safety prop is designed to act as a secondary hold down; ensure the release cable operates freely and the safety prop rests against the tilt cylinder when the cab is lowered and latched.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-lower-the-cab-after-tilting>

How should the fire extinguisher be checked before use?

1. Make certain the extinguisher is in its designated location, clearly visible and ready for immediate use, with no obstructions hindering access.
2. Check that the appliance has not been interfered with or rendered unusable.
3. Check that the safety seal preventing accidental operation is in place and the tamper indicators are intact.
4. Check that nameplates and labels are exposed to view and clearly legible.
5. Check the extinguisher is in faultless working order: no clogging of nozzles, no leakage, no traces of corrosion, hoses securely connected with no signs of cracking.
6. Check the pressure gauge indicates a value within the green sector; if not, notify the maintenance service.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#how-should-the-fire-extinguisher-be-checked-before-use>

What is the correct sequence of actions when administering first aid for a serious injury?

1. Call a doctor immediately in all cases of serious injury.
2. Remove the patient from the harmful environment.
3. Put the patient in the best possible conditions for rest; loosen clothing, collar, belt and, if necessary, cover with a blanket.
4. Before touching any wounds, wash your hands with soap and water and, if possible, disinfect them.
5. Disinfect any wounds if you know how to do this correctly; otherwise cover with sterile gauze and apply pressure with a cotton wool wad impregnated with alcohol and a tight bandage.
6. In the case of heavy bleeding from an arm or leg, apply a tourniquet above the wound and take the patient to the nearest accident unit.
7. After administering first aid, send the patient to a doctor.
 - **Never attempt any medical procedures of which you are unsure, as this could harm the patient.**
 - **Never give any drink to someone who is unconscious.**

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-of-actions-when-administering-f>

What is the correct sequence of first-aid actions for a person whose clothing has caught fire?

1. Extinguish the flames on the victim's clothing by flooding with water, using a powder extinguisher (avoiding directing the jet at the face), or covering the victim with a blanket or rolling them on the ground.
2. Do not pull off pieces of fabric stuck to the skin.
3. In case of scalding by liquids, quickly but carefully remove the wet clothing.
4. Cover the burn with a proper anti-burn dressing or sterile bandage.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-of-first-aid-actions-for-a-pers>

What should be done in the event of a fire on board the machine?

1. Extinguish the fire using extinguishers.
2. Do not use water to put out a fire on board the machine; this could spread an oil fire further or cause an electric shock if the fire is of electrical origin.
3. Use a carbon dioxide, dry chemical or foam extinguisher.
4. Call the fire brigade immediately; firefighters should use oxygen masks.

Note: *If the machine is equipped with an extinguisher, have it checked regularly and keep it in the cab.*

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-should-be-done-in-the-event-of-a-fire-on-board-the-mach>

How is the rear window removed as an emergency exit from the cab?

1. Firmly grip the end of the rubber core protruding from the rear window gasket (located on the upper part, marked with a specific label).
2. Pull hard until the rubber core is completely removed from the gasket, then push the glass outward.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#how-is-the-rear-window-removed-as-an-emergency-exit-from-the>

Seat

What is the correct sequence to replace an operator's seat with a simple four-screw mounting?

1. Put the machine in service position.
2. Remove the four screws that hold the seat in place.
3. Unplug the electrical connections.
4. Remove the driver's seat.
5. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-an-operator-s-seat-w>

What is the correct sequence to replace an operator's seat with a sliding-rail mounting (front and rear screw pairs)?

1. Put the machine in service position.
2. Slide the seat fully backwards and remove the two front screws that hold the seat in place.
3. Slide the seat fully forwards and remove the two rear screws that hold the seat in place.
4. Undo the necessary connectors for the cables.
5. Remove the seat.
6. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-an-operator-s-seat-w-2>

What is the correct sequence to install the wiring to an operator's seat without a seat column?

1. Put the machine in service position.
2. Check that the wiring has sufficient slack when the seat is in the forward position; if too slack, it can get caught between the rails when the seat is slid back.
3. Position the seat in the maximum upward position.
4. Strap the wiring in place on the seat cross-bar, forming a sufficient slack arch across the cross-bar.
5. Strap the wiring at the rear edge of the seat undercarriage.

Note: Check that the wiring is not pinched between the rails when seat height or length is adjusted.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-install-the-wiring-to-an-ope>

What is the correct sequence to install the wiring to an operator's seat with a seat column?

1. Put the machine in service position.
2. Secure the wiring for the seat orientation sensor with a self-adhesive cable tie mounting; the seat switch wiring is routed inside the seat column.
3. Position the seat in the maximum upward position.
4. Strap the wiring in place on the seat cross-bar, forming a sufficient slack arch across the cross-bar.

Note: Check that the wiring is not pinched between the rails when seat height or length is adjusted.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-install-the-wiring-to-an-ope-2>

What is the correct sequence to replace the seat cushion?

1. Put the machine in service position.
2. Remove the protective bellows by undoing the plastic rivets.
3. Unhook the upholstery fastening section from the seat frame and remove the upholstery, then remove the seat cushion.
4. If the seat has electric heating, unplug it before removal.
5. Fit in reverse order.

Note: The seat heater element is glued to the seat cushion; be careful if replacing the cushion foam while reusing the heater element, or replacing only the heater element.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-seat-cushion>

What is the correct sequence to replace the backrest?

1. Put the machine in service position.
2. Undo the protective bellows by removing the plastic rivets on the rear of the seat and fold the rubber bellows down.
3. Remove the backrest by first removing the socket cap screws on the right and left sides of the seat, then removing the seat belt screws on the right and left sides.
4. If the seat has a 3-point seat belt, move the top belt guide to the new backrest by removing its cover and undoing the screw.
5. If the seat has an armrest, move it to the new backrest by removing the three screws for the armrest.
6. Install the new backrest: first install the front socket cap screws without tightening them, then the rear seat belt screws; then torque the rear seat belt screws to 42 Nm and the front socket cap screws to 33 Nm.
7. On the new backrest, cut the corresponding holes in the upholstery before installing the seat belt or armrest.
8. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-backrest>

What is the correct sequence to replace the seat's shock absorber?

1. Put the machine in service position.
2. Unscrew the driver's seat and lift it out of the machine.
3. Unscrew the backrest and remove the seat cushion.
4. Remove the nuts and screws for the shock absorber.
5. Replace the shock absorber.
6. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-seat-s-shock-abs>

What is the correct sequence to replace the seat suspension compressor located under the cab floor?

1. Put the machine in service position.
2. Undo the air hoses and electric connectors for the compressor.
3. Remove the screws that hold the compressor in place on the compressor bracket.
4. Remove the compressor.
5. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-seat-suspension>

Cab Structure

What is the correct sequence to replace a cab door that simply lifts off?

1. Put the machine in service position.
2. Lift off the door in question by hand.
3. Replace the door.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-a-cab-door-that-simp>

What is the correct sequence to replace a cab door on a cab where the roof must be raised first?

1. Put the machine in service position.
2. Remove the screws securing the roof.
3. Lift the roof slightly (40-50 mm) using an overhead crane.
4. Lift off the door in question by hand.
5. Replace the door.
6. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-a-cab-door-on-a-cab>

What is the correct sequence to replace the cab mounting rubber bushings?

1. Put the machine in service position.
2. Tilt the cab.
3. Remove the four bolts that secure the rubber bushings to the cab floor.
4. Remove the nut to split the locating pin and the rubber bushing.
5. Replace the rubber bushing.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-cab-mounting-rub>

What is the correct sequence to replace the door stop on a FlexCab door?

1. Put the machine in service position.
2. Remove the domed nut which fixes the door stop components on the inside of the door.
3. Remove the door stop components.
4. Remove the three screws that fix the interior trim to the inside of the cab wall, to gain access to the nuts for the door stop section on the cab side.
5. Remove the screws and nuts that fix the door stop section to the cab side behind the door on the left side.
6. Remove the door stop components.
7. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-door-stop-on-a-f>

What is the correct sequence to replace the door stop on a Spirit Delta cab door?

1. Put the machine in service position.
2. Remove the interior door panel.
3. Remove the nut which fixes the door stop components on the inside of the door.
4. Remove the components for the door stop.
5. Remove the three screws that fix the interior trim to the inside of the cab wall, to gain access to the nuts for the door stop section on the cab side.
6. Remove the screws and nuts that fix the door stop section to the cab side behind the door on the left side.
7. Remove the components for the door stop.
8. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-door-stop-on-a-s>

What is the correct sequence to replace a catch-strap type door stop?

1. Put the machine in service position.
2. Remove the screw which holds the catch strap in the cab.
3. Remove the two screws that fix the catch strap anchorage to the door.
4. Remove the catch strap from the anchorage.
5. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-a-catch-strap-type-d>

What is the correct sequence to replace a gas-spring damped door stop?

1. Put the machine in service position.
2. Place the door in the fully open position.
3. Remove the screws which fix the lever to the door and the gas damper device.
4. Remove and replace the lever or the necessary parts of the gas damping device.
5. Fit in reverse order.

Note: Lock the lever's screws with thread locking fluid before installation.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-a-gas-spring-damped>

What is the correct sequence to check the cab structure?

1. Carefully check the integrity of the cab shell for cracks or deformation.
2. Carefully check the integrity of the cab door structure for wear, deformation, or excessive play.
3. Check all welds.
4. Carefully check that all fastening pins and similar parts are secured in their seats, without wear, deformation, or excessive play.
5. Check the condition of the elastic mounts and their fastening.
6. Check the condition of the doors and their fastening hinges.
7. Check the tightness of all bolted joints.
 - Switch off the engine and make sure the parking brake is applied before starting any check or repair work.
 - If the cab must be lifted off the frame, sling it with the appropriate straps, taking care not to damage it, and never stand between the cab support structure and the cab while it is raised.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-check-the-cab-structure>

Hvac & air Quality

How is the HVAC system checked during a preventative maintenance inspection?

1. Blower motor operation: with the key on, ensure the blower motor operates at each position of the blower speed switch.
2. Temperature control: confirm proper operation of the temperature control switch.
3. Defroster operation: with the engine running and the defroster control turned on, confirm air flow from the defroster vents.
4. Air conditioner operation (if applicable): with the engine running and the air conditioner control on, confirm cooled air flow.
5. Auxiliary fan(s) (if applicable): with the key on, turn on the auxiliary fans and confirm operation.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#how-is-the-hvac-system-checked-during-a-preventative-mainten>

How should the air conditioning evaporator and condenser be cleaned?

1. Remove and clean the evaporator filter using compressed air, unless replacement is necessary.
2. Use compressed air to clean the elements of the evaporator.
3. Keep the condenser free from dust, dirt and insects, cleaning it with compressed air and adequate washing liquids.

Note: Any object reducing air flow through the condenser can damage the fans and other A/C system components.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#how-should-the-air-conditioning-evaporator-and-condenser-be>

What is the correct sequence to test the performance of the air conditioning system?

1. Start the engine at max 2,000-2,500 RPM.
2. Adjust the thermostat to the max position.
3. Open the cab doors.
4. Start the fan at max speed for ten minutes.
5. Close the cab doors and windows.
6. Check the high pressure (gauge on the discharge line) and low pressure (gauge on the suction line).
7. Check the temperature inside the cab.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-test-the-performance-of-the>

What should be checked before running a functional diagnostic test on the air conditioning system?

1. Adjust belt tension.
2. Check hoses and fittings for leakage.
3. Check the condenser.
4. Check all the air ducts.
5. Check the evaporator.
6. Check the fans.
7. Check the air filter.
8. Check the drier coolant filter (outside hoarfrosting indicates inside clogging).

Note: For deeper analysis, specific instruments and skilled personnel are necessary.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-should-be-checked-before-running-a-functional-diagnosti>

What is the correct rescue procedure for someone poisoned by carbon monoxide in an enclosed space?

1. Immediately ventilate the enclosed space to reduce the gas concentration.
2. The rescuer must wear a mask before entering the space, and must not light flames, lights, or activate electric bells or telephones, to avoid explosions.
3. Bring the poisoned person to a ventilated area or outdoors.
4. Lay the person on their side if they are unconscious.

Note: Carbon monoxide from engine exhaust gases is odourless and dangerous; in enclosed spaces it can reach critical concentration quickly and, mixed with air, forms an explosive mixture.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-rescue-procedure-for-someone-poisoned-by>

What settings quickly defrost or demist the windscreen?

1. Direct air distribution to the windscreen.
2. Set maximum ventilation speed.
3. Activate the compressor.
4. Close all windows.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-settings-quickly-defrost-or-demist-the-windscreen>

How often must the climate control system be run to prevent compressor damage?

1. Run the climate control system for at least 5 minutes every week.

Note: This prevents poor lubrication of the compressor's internal parts and ensures optimal system operation.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#how-often-must-the-climate-control-system-be-run-to-prevent>

Seat & controls

What should be checked on the seat belt system during a scheduled safety inspection?

1. Inspect the belt on the entire system for cuts, fraying, extreme or unusual wear, especially at the buckle/latch area and shoulder loop area; replace the entire belt system if necessary.
2. Inspect the buckle for proper operation by inserting the latch and listening for an audible click; verify it is not damaged, cracked or broken; replace the entire belt system if necessary.
3. Inspect the buckle cable (optional component): the black coating must not be damaged and internal cable wires must not be exposed, frayed or broken; replace the entire system if necessary.
4. Inspect the latch for proper operation by inserting into the buckle; it must insert smoothly with an audible click and must not be worn, deformed or corroded; replace the entire belt system if necessary.
5. Inspect the shoulder loop web guide (optional component): the belt must move freely through it; adjust shoulder loop hardware and/or remove obstruction if necessary.
6. Inspect the seat belt height adjuster (optional component) for damage; it must move freely and lock at different height positions; replace the entire belt system if necessary.
7. Inspect retractor operation: when pulled and released slowly, the belt must spool out and retract without locking; replace the entire belt system if necessary.
8. Inspect mounting hardware on both sides of the seat: it must be tight and must not be missing, rusted, corroded or damaged; replace or tighten as necessary.
9. Inspect tethers for cuts, fraying, extreme or unusual wear, and for proper attachment and adjustment; replace defective tethers.
10. Inspect the cab door retaining latch (optional component) for function and ability to clamp on the web; replace the entire system if necessary.

Note: Failure to check the seat belt system could lead to serious injury or death.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-should-be-checked-on-the-seat-belt-system-during-a-sche>

What is the correct sequence to adjust the driver's seat position?

1. Change the air pressure in the suspension to adjust the seat height.
2. Move the seat cushion back on its slides to obtain the fore and aft position.
3. Once the position is achieved, tighten the seat belt tether securely on both sides (the tether restrains the seat from raising above this position).
4. Adjust the seat air suspension to the operator's desired firmness.

Note: Do not adjust the driver's seat unless the vehicle is parked; the seat could move suddenly and unexpectedly, resulting in loss of control of the vehicle, serious injury or death.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-adjust-the-driver-s-seat-pos>

What is the correct sequence to adjust the operator's seat on a container stacker?

1. Adjusting seat height: turn the knob anticlockwise to lift the seat, clockwise to lower it.
2. Adjusting the seat dampers: push the lever to the right to increase damper resistance, to the left to reduce it.
3. Distance of seat from control panel: lift the metal bar and slide the seat.
4. Inclining the seat back: lift the lever and regulate the back position as required.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-adjust-the-operator-s-seat-o>

What are the available driver's seat adjustments on this class of machine?

1. Weight adjustment: rotate the knob to set for driver weight from 40 to 130 kg.
2. Seat height adjustment: lift the lever, set the desired height (up to +65 mm), then release the lever.
3. Seat tilt adjustment: lift the lever, set the desired tilt (up to +65 mm), then release the lever.
4. Backrest tilt adjustment: lift the lever, set the desired angle (up to 41.4° rearward), then release the lever.
5. Longitudinal (fore-aft) adjustment: lift the lever and slide the seat to the desired position (150 mm travel), making sure the mechanism is locked afterward.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-are-the-available-driver-s-seat-adjustments-on-this-cla>

How is the driver's seat belt fastened and released?

1. To fasten, grip the latch tongue and insert it into the buckle housing until the locking click is heard.
2. To release, press the button on the upper end of the buckle.
 - The seat belt webbing must not be twisted, and must fit snugly against the pelvis, not the abdomen, to avoid the risk of sliding forward.
 - Periodically check that the anchor screws are fully tightened and that the webbing is not cut or frayed.
 - After a significant accident, replace the belt worn at the time even if it does not appear damaged.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#how-is-the-driver-s-seat-belt-fastened-and-released>

What is the correct sequence to adjust the tilt position of the steering wheel or side control column?

1. Loosen the lock lever, turning it anticlockwise.
2. Take hold of the steering wheel or column with both hands and move it to the desired, most ergonomic position.
3. Tighten the lock lever again, turning it clockwise.
 - This operation must be carried out only with the vehicle stopped and the parking brake applied.
 - When adjusting the side control column, do not operate the joystick lever.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-adjust-the-tilt-position-of>

Wiper System

What is the correct sequence to replace the front wiper motor?

1. Put the machine in service position.
2. Raise the nut protector and remove the nut(s) securing the wiper arm.
3. Remove the screws securing the cover plate and remove the cover plate.
4. Disconnect the washer hose.
5. Remove the washer fluid hose and unplug the connector from the wiper motor.
6. Remove the nuts or screws securing the motor to the cover plate (or remove the wiper motor from the inside, on cabs where it is mounted that way).
7. Replace the wiper motor.
8. Fit in reverse order, tightening the wiper arm nuts to 16-20 Nm.

Note: When fitting, ensure the drive grooves are free of metal filings or similar, and tighten the wiper arm nuts to 16-20 Nm so the grooves press into the bracket and work as drivers.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-front-wiper-moto>

What is the correct sequence to replace the washer pump?

1. Put the machine in service position.
2. Unscrew the reservoir and empty out the washer fluid.
3. Remove the hoses from the pumps.
4. Undo the connector on the electric cable for the pumps.
5. Remove the pumps from the reservoir (a rubber bushing seals between the pumps and the reservoir).
6. Replace the pump.
7. Fit in reverse order.
8. Fill the reservoir with screenwasher fluid.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-washer-pump>

What is the correct sequence to replace the roof or rear wiper motor?

1. Put the machine in service position.
2. Remove the plastic cover over the wiper motor.
3. Disconnect the washer hose and unplug the wiper motor connector, and the earth cable where fitted.
4. Undo the lock nut or nut securing the wiper arm and remove the wiper arm.
5. Remove the nuts or screws securing the wiper motor.
6. Replace the wiper motor.
7. Fit in reverse order, tightening the wiper arm to 16-20 Nm.

Note: When fitting, ensure the drive grooves are free of metal filings or similar, and tighten the wiper arm to 16-20 Nm so the grooves press into the bracket and work as drivers.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-roof-or-rear-wip>

What is checked on the windscreen wipers during the 500-hour Type A preventive maintenance service?

1. Check the operation of the upper, front and rear windscreen wipers.
2. Check the wear of the upper, front and rear wiper blades.

Note: Maintenance must be carried out only by qualified, authorised personnel, working in conditions of maximum safety.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-checked-on-the-windscreen-wipers-during-the-500-hour>

Cab Removal

What is the correct sequence to remove the cab?

1. Park the machine on a level surface, block the wheels, shut off the battery master disconnect switch, then open the battery compartment and disconnect the battery cables (negative first), isolating them.
2. Disconnect all the electrical wiring harnesses, particularly those under the cab.
3. Disconnect the electrical cables placed inside the drag chain.
4. Disconnect the hydraulic connections placed inside the drag chain.
5. Remove the steering hydraulic connections.
6. Remove the pilot hydraulic system connections.
7. Disconnect the brake system hoses.
8. Remove the cab, either by disconnecting it from its support and removing the relevant bolts and washers, or by disconnecting the drag chains and sliding the cab on its tracks.
9. Use a suitable fork truck to move the cab to a prepared working area.

Note: Bleed all brake system air pressure to 0 psi before disconnecting any hydraulic hoses, by pumping the brake pedal until it no longer comes back up.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-remove-the-cab>

What is the correct sequence to install the cab?

1. Apply the proper torque values from the manual's torque table during installation.
2. Test the operation of all controls before returning the machine to active service.
3. Check all hydraulic hose connections for leaks.
4. Check all coolant hose connections for leaks.
5. Check hydraulic hose connections for leaks by applying a soapy water solution to the connections.

Note: Use extra caution when clamping all hoses, since restriction of flow could result in faulty brake operation.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-install-the-cab>

What is the correct sequence to disassemble the cab's internal components?

1. Remove the AC/heater unit.
2. Remove the control panels.
3. Remove the front instrument panels.
4. Remove the operator's seat and side panel.
5. Remove the windscreen wiper group.
6. Remove the steering column and command levers.
7. Remove the parking brake lever and pedal.
8. Remove the accelerator pedal.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-disassemble-the-cab-s-intern>

What is the correct sequence to reinstall the cab's internal components after disassembly?

1. Apply the proper torque values from the manual's torque table during installation.
2. Test the operation of all controls before returning the machine to active service.
3. Check all hydraulic hose connections for leaks.
4. Check all coolant hose connections for leaks.
5. Check hydraulic hose connections for leaks by applying a soapy water solution to the connections.

Note: Use extra caution when clamping all hoses, since restriction of flow could result in faulty brake operation.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-reinstall-the-cab-s-internal>

Reversible Seat

What is the correct sequence to calibrate a reversible driver's station?

1. Select calibration of the reversible driver's station from the setup menu.
2. Apply the parking brake and confirm to proceed.
3. Turn the driver's seat to the end position facing straight ahead and confirm to save the position.
4. Turn the driver's seat to the position that shifts it from forward-facing to backward-facing (within the range of 80-120°) and confirm to save the position.
5. Turn the driver's seat to the end position facing straight behind and confirm to save the position.

Note: The parking brake must be applied before calibration can proceed.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-calibrate-a-reversible-drive>

What is the correct sequence to replace the reversible operator's seat electric motor?

1. Put the machine in service position.
2. Undo the connector for the electric motor.
3. Remove the four screws that hold the electric motor in place.
4. Remove the electric motor.
5. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-reversible-opera>

What is the correct sequence to replace the reversible driver's station electric motor?

1. Put the machine in service position.
2. Tilt the cab.
3. Undo the connector for the electric motor.
4. Remove the four screws that hold the electric motor in place.
5. Remove the electric motor.
6. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-reversible-drive>

Windows

What is the correct sequence to replace the windscreen or roof window on a cab bonded with silicone adhesive?

1. Put the machine in service position.
2. Remove the locking strip.
3. Remove the broken window pane and check that no glass or other particles remain in the pane's groove on the glazing gasket, cutting apart the silicone joints with a sharp tool; if replacing the roof window, remove all its bolts before cutting away the silicone adhesive, and make sure no silicone remains between the window pane and the strip at the pane's lower front edge.
4. Clean all surfaces thoroughly, removing old silicone remains with a razor blade or similar.
5. Fit masking tape on the inside and outside of the window panes at the surfaces to be glued.
6. When replacing the windshield or a side window, adjust the window panes so the upper edge of the side window is level with the top edge of the roof and the distance between windshield and side window is correct, using spacers against the roof member to obtain the distances.
7. Install the locking strip around the whole window pane.
8. Apply silicone adhesive around the window panes from the outside of the joints, making the new joint wider than the old one, ensuring there is silicone between the window panes to prevent them touching.
9. Remove excess silicone adhesive from the outer vertical corners with a cardboard tool, then smooth out the joints on the inside with a finger wet with water or soapy water.
10. Apply silicone adhesive between the strip and window pane at the bottom edge of the front corners (top sealing).
11. If replacing the roof window, apply silicone adhesive at the cab frame where it was glued before.
12. Put the roof window into place, checking for a uniform gap of one or more millimetres along the pane's edges and the frame's side protection, then tighten the corner bolts for the window pane.
13. Apply silicone adhesive along the edges and smooth out the joints with a finger wet with water or soapy water.
14. Remove the masking tape immediately after applying the adhesive to avoid edge formation.
 - Read the silicone adhesive handling advice before starting work: it is a quick-curing two-component adhesive, mixed 1:10 in a static mixer, with the mixer changed after any interruption longer than 5 minutes because of its short setting time.
 - Acetone must not contact a polycarbonate roof window, as it chemically weakens the plastic.
 - Mark the window panes with a note that the adhesive is new and must not be touched.
 - Curing time depends on ambient temperature; plan the change to minimise downtime.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-windscreen-or-ro>

What is the correct sequence to replace a rubber-gasket side window?

1. Put the machine in service position.
2. Use special tools to detach the locking strip.
3. Remove the locking strip which runs around the whole window.
4. Carefully remove any remaining glass from the rubber strip.
5. Fit the new window, securing it at the bottom edge inside the rubber gasket.
6. Spray soap solution on the window and glazing rubber to facilitate fitting.
7. Thread the rubber gasket around the whole window using special tools.
8. Secure the locking strip with a special tool, using soap solution at the locking strip and the glazing rubber.
9. Pull the locking strip around the whole window, avoiding stretching it.
10. Cut off the locking strip approximately 2 cm too long.
11. Push the remaining part of the locking strip into the glazing gasket, towards the opposite end of the locking strip.
12. Adjust the locking strip so that the correct fit is obtained.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-a-rubber-gasket-side>

What is the correct sequence to check the roof window?

1. Check that the roof window is not damaged or cracked, changing it immediately if defective.
2. Check the outside surface of the roof window at regular intervals, cleaning only with windscreen washer fluid or a mild cleaning agent and rinsing thoroughly with plenty of lukewarm water.
 - The roof window's strength can be substantially reduced by exposure to aromatic hydrocarbons, ketones, esters or chlorinated hydrocarbons.
 - Replace a damaged roof window immediately if it is cracked or scratched.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-check-the-roof-window>

Cab Interior

What is the correct sequence to replace the cab instrument panel?

1. Put the machine in service position.
2. Remove the nine clips holding the instrument panel by pressing in the centre pin on each clip (about 3 mm) to unlock it.
3. Raise the instrument panel slightly and unplug all electric connectors, then remove the instrument panel.
4. Transfer all equipment mounted on the instrument panel, such as switches and gauges, to the new instrument panel.

Note: Reuse the clips by re-inserting the centre pin and pressing it flush with the head on fitting.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-cab-instrument-p>

What is the correct sequence to replace the cab floor covering?

1. Put the machine in service position.
2. Open the doors on both sides.
3. Undo the screws which hold the sill moulding in the cab entry, and remove the sill moulding.
4. Undo and remove all equipment in the cab which is screwed through the floor matting, such as the seat and pedal base.
5. Replace the floor matting.
6. Fit in reverse order.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-cab-floor-coveri>

What cabin operations are checked during the 500-hour Type A preventive maintenance service?

1. Check the condition of the cab.
2. Check the air conditioning system's operation.
3. Clean the air conditioning filters.
4. Check the heating system's operation.

Note: Maintenance must be carried out only by qualified, authorised personnel, working in conditions of maximum safety.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-cabin-operations-are-checked-during-the-500-hour-type-a>

Wipers

What is the correct sequence to remove the windscreen wiper arms?

1. Loosen the securing nuts.
2. Tap and carefully rock the arms to and fro to remove them from the motor shafts.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-remove-the-windscreen-wiper>

What is the correct sequence to fit the windscreen wiper arms?

1. Check that the splines on the motor shaft are free from the softer material from the wiper arm mounting, cleaning them if necessary so they can be pressed fully into the mounting.
2. Fit the wiper arms onto the motor shafts and tighten the nuts to a torque of 16-20 Nm, holding the wiper arm to take up the torque pressure so it is not transferred to the motor.

Note: The nuts must be tightened sufficiently hard, otherwise the shafts may start to slip inside the wiper arm mounting, resulting in damage.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-fit-the-windscreen-wiper-arm>

What is the correct sequence to check and top up the windscreen washer fluid?

1. Check the fluid level in the reservoir.
2. Top up as necessary through the cap on top of it, using a detergent-antifreeze washer fluid mixed with water in the ratio appropriate to the ambient temperature (or following another product's own manufacturer mixing instructions).

Note: Avoid letting dirt and impurities enter the reservoir during topping up, to avoid clogging the circuit.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-check-and-top-up-the-windscr>

Visibility & signalling

What cab items should be checked during a scheduled safety inspection?

1. Operate the defroster to make sure sufficient air is directed against the windshield, and that the blower is operating.
2. Check door latches for positive closing, latching and locking.
3. Check that all factory-installed walkways, platforms and steps are installed securely, are not damaged or loose, and are free of dirt, debris, ice, mud and other hazardous obstructions.
4. Check that all handholds are installed and are not loose or damaged.
5. Check the glass for cracked, broken, scratched or dirty condition.
6. Check that all mirrors are installed, clean, undamaged and properly adjusted.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-cab-items-should-be-checked-during-a-scheduled-safety-i>

What is the correct sequence to clean the front and upper windscreens with the wiper/washer controls?

1. Spray liquid onto the glass by pressing the switch upward, or pushing the control lever knob inward; the liquid stops when the switch or knob is released.
2. Operate the wipers by turning the knob to the desired position: intermittent speed for the front wiper, continuous speed for the front wiper, or continuous speed for both the upper and front wipers.
 - The wiper/washer controls only work with the main switch in the ON position.
 - Do not operate the wipers on dry glass.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-clean-the-front-and-upper-wi>

Other Cabin & Operator Safety procedures

What is the correct sequence to check and lubricate the brake pedal?

1. Check and tighten the locking screws so the brake pedal is securely fitted in the console.
2. Lubricate the brake pedal shaft through the lubricating nipples.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-check-and-lubricate-the-brak>

What is the correct sequence for the 500-hour lubrication of the brake pedal and door/cover hinges?

1. Lubricate the brake pedal's hinge with grease and wipe off excess grease.
2. Lift the left-hand door slightly and lubricate the hinges with grease, then let the door down and wipe off excess grease.
3. Repeat on the right-hand door.
4. Lift the battery cover slightly and lubricate the hinges with grease, then let the cover lid down and wipe off excess grease.

Note: Do not lift the doors or cover lid off their hinges.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-for-the-500-hour-lubrication-of-2>

What is the correct sequence to check the cab doors?

1. Put the machine in service position.
2. Visually inspect the door's mounting points, lubricating the hinges if necessary.
3. Check the door's locking mechanism for function and wear.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-check-the-cab-doors>

What is the correct sequence to check the cab undercarriage?

1. Put the machine in service position.
2. Check that the welding seams at the cab's mounting points are intact and free of visible cracks.
3. Check that the isolators are intact, replacing any that are damaged.
4. Check that bolted joints are tightened and brackets undamaged, attending to any issues as needed.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-check-the-cab-undercarriage>

What is the correct sequence to replace the cab interior/reading light bulb?

1. Remove the light fixture by inserting a screwdriver between one side edge of the fixture and the roof lining, then pressing lightly and levering.
2. Insert a screwdriver (or similar tool) between the lens of the interior or reading light and the fixture body.
3. Lever and remove the lens, taking care not to break it.
4. Replace the interior or reading light bulb as needed.
5. Refit the removed lens onto the fixture, pressing it into place.
6. Refit the fixture into its seat on the roof lining, making sure it clips into place.

Note: *Do not press excessively on the lens, to avoid breaking it.*

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-sequence-to-replace-the-cab-interior-rea>

What is the correct daily general cleaning and check routine?

1. Wash the windows, rear-view mirrors, headlights and lights, indicator lamps, instruments and display with neutral products and water, to remove traces of corrosive agents (salt, sand, etc.).
2. Dry thoroughly with compressed air, so as to completely eliminate any pockets of water.

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#what-is-the-correct-daily-general-cleaning-and-check-routine>

Servicing the anemometer on a rubber tyred gantry crane

1. Use an allen wrench to loosen the setscrew on the side of the wind cups.
2. Remove the wind cups and clean the exposed portion of the shaft with a damp cloth or cotton swab.
3. Clean the wind cups with water and a mild liquid detergent.
4. Rinse thoroughly before replacing.
5. When replacing the wind cups, slide them up the shaft as far as possible.
6. Tighten the setscrew.
7. Make sure the wind cups spin freely; if they do not, the bearings may be worn and need factory replacement.

Note: *The anemometer is exposed to impurities such as sand and salt that can get inside the rotating cup; impurities cause friction that can break the anemometer. Do not use or add grease, oil or a spray lubricant of any kind.*

Source: <https://www.hitsrl.it/technical-resources/procedures/cabin-and-operator-safety/#servicing-the-anemometer-on-a-rubber-tyred-gantry-crane>

Maintenance Tips

Seat & Controls

Why does operator cabin control systems occur on this equipment?

The operator cabin of an MHC crane houses critical control electronics, joysticks, components HIT Srl stocks, sensors, and communication systems. Continuous vibration, temperature fluctuations, and salt exposure can degrade these components over time.

Joysticks — parts HIT Srl supplies — must be inspected for smooth movement and signal accuracy. Salt particles can infiltrate the mechanism, causing stickiness or erratic control signals. Technicians should clean and lubricate pivot points and verify potentiometer or encoder readings.

Touchscreens and HMI panels must be checked for condensation behind the glass. Moisture can cause ghost touches or display fading. Cabin heaters and ventilation systems must be tested to ensure proper humidity control.

Seat suspension systems must be inspected for damping performance. Excessive vibration can cause operator fatigue and reduce control precision. Damaged dampers or worn bushings must be replaced.

Understanding cabin control system behavior ensures safe and precise crane operation under demanding port conditions.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#why-does-operator-cabin-control-systems-occur-on-this-equipm>

How do you maintain reachstacker spreader twistlock upper bearing seats to prevent failure?

Upper bearing seats support the twistlock shaft and ensure smooth rotation. These seats, components HIT Srl stocks, experience intense compressive and torsional loads during locking and unlocking cycles. Over time, repeated stress causes wear, deformation, and lubrication breakdown. Maintaining their reliability requires continuous monitoring of bearing surfaces, seat geometry, and lubrication pathways.

Bearing seats — parts HIT Srl supplies — must be inspected for scoring, pitting, and uneven wear patterns. These defects indicate misalignment or insufficient lubrication.

Seat geometry must be verified using precision gauges. Even minor deviations from circularity indicate overstress events.

Lubrication channels must be inspected for blockage. Dust infiltrates lubrication systems, increasing friction and wear.

Environmental conditions significantly influence bearing seat behavior. Salt exposure accelerates corrosion, while dust infiltrates sliding interfaces.

In summary, maintaining upper bearing seats requires rigorous inspection, lubrication management, structural testing, and environmental conditioning.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-reachstacker-spreader-twistlock-upper-be>

How do you maintain safety maintenance of operator seats, restraints, and ergonomic controls to prevent failure?

Operator seats, components HIT Srl stocks, are critical for reducing fatigue, preventing spinal injuries, and maintaining control precision. Restraints prevent injury during sudden stops, collisions, or machine instability. Ergonomic controls reduce operator fatigue and improve safety.

Seat suspension systems must be inspected for damping performance, spring fatigue, air-suspension leaks, and mechanical wear. Reachstackers, empty handlers, and forklifts require special attention due to constant shock loads. STS and MHC cabins require seats capable of absorbing long-duration sway and vibration. RMG and straddle carriers require seats designed for high-cycle vibration.

Seat belts — parts HIT Srl supplies — must be inspected for fraying, locking mechanism performance, anchor integrity, and retractor function. Straddle carriers and terminal tractors require reinforced anchor points due to higher travel speeds and potential collision forces.

Control consoles must be inspected for mechanical wear, electrical integrity, joystick calibration, and ergonomic alignment. STS and RMG cabins require precise joystick calibration due to long-distance control sensitivity. Reachstackers and empty handlers require controls that remain stable under vibration.

Environmental conditions significantly influence seat and control performance. Dust infiltrates forklift controls; salt corrodes STS cabin mechanisms; humidity affects electronic control panels.

In summary, seat and control maintenance ensures operator comfort, reduces fatigue, and prevents injury across all machine types.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-safety-maintenance-of-operator-seats-res>

How do you maintain cabin control consoles, joysticks, and human-machine interfaces to prevent failure?

Control consoles are the operator's primary interface with the machine. STS and RMG cranes require extremely precise joystick control. Reachstackers and empty handlers require responsive controls under vibration. Forklifts and terminal tractors require ergonomic controls for tight maneuvering.

Joysticks — parts HIT Srl supplies — must be inspected for calibration accuracy, mechanical wear, and electrical integrity. Any drift in joystick response compromises safety.

Buttons, switches, and touchscreens must be inspected for responsiveness, contamination, and backlight performance. Dust affects yard machines; salt affects marine cranes.

Console mounts must be inspected for vibration-induced loosening. Loose consoles reduce control precision and increase operator fatigue.

Cable harnesses must be inspected for abrasion, connector corrosion, and signal stability.

In summary, control console maintenance ensures precise machine operation and reduces operator error.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-cabin-control-consoles-joysticks-and-hum>

What does maintaining operator cabin systems, visibility optimization, and ergonomic control layout in straddle carriers involve?

The operator cabin of a straddle carrier is elevated high above the ground, providing a unique vantage point but also requiring specialized design for safety and comfort.

The first pillar is visibility. Operators must see container corners, spreader alignment, and ground personnel. Technicians must inspect windows, wipers — parts HIT Srl supplies — and cameras.

The second pillar is vibration isolation. The tall structure transmits vibration. Cab mounts must be inspected for wear.

The third pillar is ergonomic control layout. Controls must be positioned for comfort during long shifts. Faulty joysticks, components HIT Srl stocks, or pedals cause operator fatigue.

The fourth pillar is climate control. Cab HVAC systems must maintain comfortable temperatures. Clogged filters reduce performance.

The fifth pillar is seat suspension. Seats must absorb vibration and shock. Worn suspension causes operator fatigue.

The sixth pillar is display systems. Screens must show accurate data. Faulty displays cause operational errors.

The seventh pillar is noise control. Engine and hydraulic noise must be isolated. Technicians must inspect insulation.

The eighth pillar is safety systems. Emergency stops, alarms, and interlocks must function correctly. Proper cabin maintenance ensures operator comfort, safety, and productivity.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-operator-cabin-systems-visibility-opti>

What does maintaining operator cabin and seat condition involve?

The cabin is the operator's office. A safe and comfortable environment reduces fatigue and errors. It is obvious that the seat suspension must work correctly to protect the operator's back from the constant vibrations of the machine. Inspect the seat belt — a part HIT Srl supplies. If it is frayed, the buckle is damaged, or it does not retract, it must be replaced. A seat belt is a life-saving device. Check the cabin glass for cracks. Safety glass provides protection, but compromised glass can shatter unexpectedly. Test the windshield wipers and washers. Good visibility is impossible with a smeared windshield. Check the joystick rubber boots and buttons. Damaged buttons can lead to intermittent control issues. HIT Srl supplies cabin accessories, including seats, joysticks, glass, and wiper motors. We help you maintain a high standard of operator comfort and safety. Verify that the door latches and locks work correctly. The door should stay open when latched and close securely. Check the heating and air conditioning (HVAC) system. Temperature control is vital for operator concentration. A well-maintained cabin reflects a well-maintained machine.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-operator-cabin-and-seat-condition-invo>

What does maintaining joystick and control lever calibration involve?

The joystick is the operator's connection to the hydraulic power. Precision is required to stack containers safely. It is obvious that a drifting or sticking joystick is a safety hazard. Test the "dead man" switch or presence trigger. The hydraulics should not move unless this trigger is activated. Check for drift. When the joystick is in the neutral center position, the boom or spreader should not move at all. If it creeps, the potentiometer or Hall-effect sensor is out of calibration. Inspect the rubber boot (bellows) at the base of the joystick. If it is torn, dust and coffee spills can enter the electronics, causing short circuits. Verify the proportionality. A small movement of the joystick should result in a slow movement of the boom. If the boom jumps to full speed immediately, the control curve is wrong. HIT Srl supplies complete joysticks and repair kits including handles, buttons, and rubber boots. Check the electrical connector under the console. Loose pins can cause intermittent faults. If the joystick feels "gritty" mechanically, the internal gimbal mechanism is worn. Precise control prevents damage to containers and trucks. Upgrade or replace your worn controls with HIT Srl components.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-joystick-and-control-lever-calibration>

What does maintaining seat switch safety interlock (operator presence) involve?

The seat switch detects if an operator is sitting in the chair. It is a critical safety interlock. It is obvious that if this switch is bypassed, the machine can move without a driver, leading to runaway accidents. Test the system. Start the engine, stand up (safely), and try to engage a gear or hydraulic function. The machine should refuse to move or engage the parking brake automatically. Inspect the wiring under the seat. It is often damaged by the seat suspension moving up and down. Check the switch mechanism inside the seat cushion. If the seat foam is collapsed, the switch might not trigger even when the driver is seated, causing nuisance shutdowns. HIT Srl supplies replacement seat switches, cushions, and wiring repair harnesses. We prioritize safety compliance. Never bypass this switch with a jumper wire. It invalidates the machine's safety certification and insurance. If the machine stops intermittently over bumps, the seat switch is likely loose or faulty. Safety interlocks save lives. Maintain them with original specification parts from HIT Srl.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-seat-switch-safety-interlock-operator>

What does maintaining seat belt retractor and buckle involve?

The seat belt is the primary life-saving device in a rollover. It is obvious that a frayed or malfunctioning belt is a safety violation that grounds the machine. Pull the belt all the way out. Check for cuts, fraying, or sun damage to the webbing. Test the retractor mechanism. Jerk the belt suddenly. It must lock instantly. If it pulls out smoothly during a jerk, it will not protect the driver in a crash. Check the electrical switch in the buckle. The machine should know if the belt is buckled (often connected to the parking brake alarm). HIT Srl supplies quality orange (high visibility) seat belts, lap belts, and 3-point harnesses. We prioritize operator survival. Inspect the mounting bolts to the seat frame and floor. They must be Grade 8.8 or higher. If the machine has been in an accident, replace the belt immediately. Safety compliance is non-negotiable. Source quality belts from HIT Srl.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-seat-belt-retractor-and-buckle-involve>

Why does joystick gimbal mechanism wear occur on this equipment?

The joystick handle pivots on a gimbal mechanism. Over millions of cycles, the plastic or metal pivot points wear out. It is obvious that mechanical slop makes precise control impossible. Wiggle the joystick handle in the center position. There should be very little free play before the electronics register movement. Excessive play means the gimbal is worn. Check the centering springs. The handle should snap back to the exact center when released. If it droops to one side, the spring is broken. Inspect the locking collar that holds the handle to the base. If loose, the handle can twist. HIT Srl supplies joystick repair kits, gimbals, springs, and microswitches. We restore the "new machine" feel to your controls. Check the bellows boot. If torn, debris falls into the gimbal, accelerating wear. Calibrate the joystick after any mechanical repair. Precise handling requires tight controls. Refurbish them with HIT Srl parts.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#why-does-joystick-gimbal-mechanism-wear-occur-on-this-equipm>

What does maintaining operator seat safety belt switch involve?

The seat belt switch is often interlocked with the parking brake. If the operator unbuckles, the parking brake should apply immediately. It is obvious that a bypassed or faulty switch defeats this safety logic and puts the site at risk. Inspect the wire coming from the seat belt buckle. It flexes every time the driver buckles up. Internal wire breaks are common. Test the continuity. The switch should be Closed (or Open, depending on logic) when the tongue is inserted. If the contact is intermittent, the machine will jerk or stop unexpectedly while driving. Check for "cheaters" (bypass plugs) installed by operators. Remove them immediately and repair the system to original specification. HIT Srl supplies replacement seat belt buckles with integrated switches, complete belt assemblies, and wiring repair kits. We ensure compliance with ISO safety standards. If the parking brake alarm sounds randomly over bumps, the seat belt switch contacts are likely worn out. Safety devices are mandatory. Keep them functional with HIT Srl parts.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-operator-seat-safety-belt-switch-invol>

What should be checked when inspecting shock absorber and compressor?

Modern reachstacker seats — parts HIT Srl supplies — are air-suspended (12V or 24V compressor) to protect the operator's spine from long-term injury. It is obvious that a collapsed or bottomed-out seat offers zero protection, causing operator fatigue and long-term injury risk — the operator ends up absorbing every shock on the "bump stops." Sit in the seat and activate the height adjustment. Listen for the compressor running. If it runs but the seat doesn't rise: the air bag (bellows) may have a puncture, the air line may leak, or the piston seal inside the pump may be worn. If the compressor does not run at all, check the fuse and switch in the armrest, and check the power supply wire under the seat — it is often cut by the scissors mechanism. Check the compressor's intake filter: if blocked with cabin dust, the compressor overheats and burns out. Bounce on the seat — the shock absorber should dampen the movement; if it keeps bouncing like a pogo stick, the damper has failed. Check the mechanical scissors mechanism for play: side-to-side wobbling makes precise machine control difficult. Inspect the seat belt buckle electrical connection — if the machine has a "seat switch" safety interlock, a broken wire here will prevent the machine from starting. HIT Srl supplies replacement seats, seat air compressors, air bags/springs, shock absorbers, and switch valves. Where possible, replace the compressor kit rather than the whole seat — a good seat keeps the operator alert, healthy, and in control.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-seat-suspension-compressor-and-mechani>

When is it uneconomical to repair a hydraulic joystick or distributor?

Distributors and joysticks are built so that an economical repair becomes virtually impossible once the fault involves the hydraulic part in addition to the gaskets and magnets — those two alone can usually be serviced, but a hydraulic-side fault on top of them changes the calculation.

When compressed air is used to clean or service these components, keep it at a maximum pressure of 2 kg/cm².

HIT Srl supplies replacement distributors and joysticks for this class of machine.

Field note — HIT Srl, Reggio Emilia (Italy). Last updated: August 2026.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#joystick-distributor-repair-economics>

Why should the driver's seat only be adjusted with the vehicle parked?

Do not adjust the driver's seat unless the vehicle is parked. If it's adjusted while the machine is moving, the seat could move suddenly and unexpectedly, resulting in loss of control of the vehicle, serious injury, or death.

The machine is designed and equipped to carry only the driver, unless it's built with a trainer seat — no one should ride anywhere else on the machine.

HIT Srl supplies seat suspension and mounting hardware for this class of cab.

Field note — HIT Srl, Reggio Emilia (Italy). Last updated: August 2026.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#adjust-driver-seat-only-when-parked>

How should a seat belt be inspected, cleaned, and adjusted?

Inspect the seat belt height adjuster for damage, and adjust the shoulder loop hardware or remove any obstruction if necessary. The mounting hardware on both sides of the seat should be tight, and must not be missing, rusted, corroded, or damaged. Replace the entire system if necessary.

Clean the seat belt fabric by sponging it with mild soap and water — never bleach, dye, or household detergents.

To set the seat position, change the air pressure in the suspension to adjust height, and slide the seat cushion on its slides for the fore-and-aft position; once that's set, tighten the seat belt tether securely on both sides.

HIT Srl supplies the seat belt and its height adjuster for this class of cab.

Field note — HIT Srl, Reggio Emilia (Italy). Last updated: August 2026.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#seat-belt-inspection-cleaning-adjustment>

What type of seat belt and suspension does the operator's seat use?

The seat is fitted with a 2-point lap seat belt with an automatic retractor.

The seat itself uses an elastic (pneumatic) suspension with a shock absorber, adjustable to the driver's weight both longitudinally and vertically, and comes complete with armrests where fitted.

HIT Srl supplies the seat belt and the suspension shock absorber for this class of cab.

Field note — HIT Srl, Reggio Emilia (Italy). Last updated: August 2026.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#operator-seat-belt-and-suspension-type>

How often should the anemometer be cleaned and its condition checked on a rubber tyred gantry crane?

Clean and check the condition of the anemometer every 500 operating hours, or depending on climate conditions, every three months.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-often-should-the-anemometer-be-cleaned-and-its>

How often should the PLC wiring in the driver's cabin be checked, and how is it accessed?

Check the PLC wiring's fastening in the driver's cabin twice a year, from the hole under the seat. The seat can be tilted by opening the locking bolts at the front of the base of the seat.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-often-should-the-plc-wiring-in-the-driver-s-cabin-be>

Which functions does each emergency stop button (A-I) trigger on a rubber tyred gantry crane?

All nine emergency stop buttons (A through I) stop all movements of the crane. Buttons A and B also stop the diesel engine, if equipped. Button C also stops rotation of the cable reel, on the zero-emission version. Buttons D and E also cut off power supply to the inverters by opening the main contactors in the electrical-equipment house, on the zero-emission version. An emergency push button is released by turning the button's knob counterclockwise.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#which-functions-does-each-emergency-stop-button-a-i-trigger>

What safe distance should be kept from a telescopic spreader's moving parts during operation, and which parts does this apply to?

Stay clear of all moving parts, such as guide arms (flippers), moving beams, telescopic chains, etc.; a safe distance is 5 metres.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-safe-distance-should-be-kept-from-a-telescopic>

What tolerance applies to container levelness before a telescopic spreader may attempt to lift it?

Do not attempt to lift a container that is not level within plus/minus 5 degrees.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-tolerance-applies-to-container-levelness-before-a>

What happens to a telescopic spreader's motions when the emergency spreader stop is reset, and why does this matter?

Motions can automatically re-start when the emergency spreader stop is reset; personnel must be aware of this before resetting the emergency stop.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-happens-to-a-telescopic-spreader-s-motions-when-the>

What are the wind speed limits for operating, stowing and tying down a quayside container crane?

No operation is allowed when wind speed exceeds 19.4 m/sec; the crane must be moved to its stowage position. The crane must be secured in tie-down condition when wind speed exceeds 40.2 m/sec. The motor brakes combined with the rail brakes are sufficient to hold the crane at wind speeds up to 45 m/sec, but if the forecasted wind speed is over 45 m/sec, the stowage pins and tie-downs must be engaged.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-are-the-wind-speed-limits-for-operating-stowing-and>

What are the operating wind speed limits for a mobile harbour crane, at various boom and stowage configurations?

In service, the maximum wind speed is 72 km/h. With the crane stationary on stabilisers, the maximum wind speed is 151 km/h with the boom erected, 151 to 200 km/h with the boom lowered to ground, and over 200 km/h with both boom and pylon lowered to ground. While travelling, the maximum wind speed is 72 km/h with only the hoist block suspended, or 50 km/h with the hoist block and a grab suspended.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-are-the-operating-wind-speed-limits-for-a-mobile>

Which stabiliser- and travel-related conditions are individually monitored by the electronic control system on a mobile harbour crane, to block unsafe movements?

Crane movement is blocked and a dedicated alarm raised if the crane is not fully stabilised, or if the stabilisers are not fully extended. Separate alarms are raised if the ascent, descent, extension or retraction of the stabilisers each exceed their expected timeout. Dedicated alarms also cover low pressure in the travelling brake circuit and low pressure in the parking brake circuit.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#which-stabiliser-and-travel-related-conditions-are>

Safety Devices & Interlocks

How do you maintain MHC emergency stop and safety interlock systems to prevent failure?

Emergency stop and safety interlock systems are critical for preventing accidents in Mobile Harbour Cranes. These systems must remain fully functional despite exposure to salt, vibration, and temperature fluctuations. Emergency stop buttons must be inspected for corrosion, mechanical wear, and correct electrical response. Technicians should verify that buttons engage fully and that control units register the signal.

Safety interlocks must be tested for correct operation. Any delay or failure in interlock response can lead to dangerous situations. Technicians should perform functional tests under various operating conditions.

Control cabinet wiring must be inspected for corrosion and insulation damage. Salt exposure accelerates oxidation, increasing resistance and causing intermittent faults.

Environmental conditions significantly influence safety system behavior. High humidity causes condensation, while salt exposure accelerates corrosion. Control cabinet heaters must be tested to ensure proper humidity control.

In summary, maintaining emergency stop and safety interlock systems requires rigorous inspection, functional testing, environmental conditioning, and proactive component replacement.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-mhc-emergency-stop-and-safety-interlock>

What should be checked when inspecting emergency stop button functionality test?

Safety in port operations is paramount, and the Emergency Stop (E-Stop) button is the fail-safe device that must override all other commands. It is obvious that a malfunction in this simple switch can lead to catastrophe if a machine runs out of control. At the beginning of the shift, with the engine running at idle, press the E-Stop button located in the cabin. The engine should cut out immediately, and all hydraulic functions must cease instantly. If there is a delay, the switch contacts may be corroded or the wiring compromised. Check the physical condition of the button. The red mushroom head must be intact, visible, and latch explicitly when pressed. A cracked button might jam in the "run" position. Release the button (usually by twisting) and ensure it resets cleanly. The machine should not restart automatically; the operator must cycle the ignition key. This prevents accidental startups. Inspect the external E-Stop buttons often found on the chassis (near the battery box or on the counterweight). These are exposed to weather and salt spray, making them prone to internal corrosion. HIT Srl supplies high-quality electrical switches, including heavy-duty Emergency Stop buttons rated for marine environments. If the machine continues to run after the button is pressed, the fuel shut-off solenoid might be seized open. Investigate immediately. Never operate a machine with a bypassed or faulty E-Stop. It is a violation of all safety regulations. For electrical safety components and control switches, HIT Srl is your dependable source for rapid replacement parts.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-should-be-checked-when-inspecting-emergency-stop-button>

How should a machine's fire extinguisher be checked before use?

The extinguisher must be in faultless working order: no clogging of the nozzles, no leakage, no traces of corrosion, and the hoses securely connected with no signs of cracking. The pressure gauge must indicate a value within the green sector — if it doesn't, notify maintenance.

Make certain the extinguisher is kept in its designated location, clearly visible and ready for immediate use, with no obstructions hindering access.

Where the machine is equipped with a fire extinguisher, it should be of the ABE type in accordance with EN 3 parts 1, 2, 4 and 5, which can extinguish fires in both solid organic materials and fluids. Confirm the extinguisher is properly charged as part of the same check.

HIT Srl supplies ABE-type fire extinguishers for this class of machine.

Field note — HIT Srl, Reggio Emilia (Italy). Last updated: August 2026.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#fire-extinguisher-pre-use-check>

How often should the safety wire of the cabin be checked?

Check the safety wire of the cabin at least once every 6 months.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-often-should-the-safety-wire-of-the-cabin-be-checked>

What do the two safety switches on a rubber tyred gantry crane disconnect, and what is the consequence of not using them?

The safety switches disconnect the actuators from the main circuit. Safety switch A stops the movements of the service crane; safety switch B stops the movements of the spreader. Failure to use these safety devices correctly can result in death or serious injury and/or damage to the crane and other property.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-do-the-two-safety-switches-on-a-rubber-tyred-gantry>

Cabin Structure & Glazing

How do you maintain MHC operator cabin mechanical and structural interfaces to prevent failure?

Operator cabin mechanical and structural interfaces ensure stable cabin positioning, vibration isolation, and safe operator access. These interfaces include cabin mounts, suspension systems, and structural brackets — parts HIT Srl supplies.

Cabin mounts must be inspected for wear, cracking, and deformation. Vibration and dynamic loads degrade mount materials over time. Any mount showing signs of fatigue must be replaced.

Suspension systems must be checked for damping performance. Excessive vibration reduces operator comfort and control precision. Damaged dampers or worn bushings, components HIT Srl stocks, must be replaced.

Structural brackets must be inspected for fatigue cracks. Repetitive load cycles generate alternating stress patterns that initiate micro-cracks at weld toes.

Environmental conditions significantly influence cabin interface behavior. Salt exposure accelerates corrosion, while temperature fluctuations affect material elasticity.

In summary, maintaining operator cabin interfaces requires rigorous inspection, vibration management, structural testing, and environmental conditioning.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-mhc-operator-cabin-mechanical-and-struct>

How do you maintain reachstacker operator cabin control and safety systems to prevent failure?

Operator cabin systems ensure safe and precise control of lifting, steering, and travel functions. These systems must remain accurate despite exposure to vibration, dust, and temperature fluctuations.

Control joysticks — parts HIT Srl supplies — must be inspected for smooth movement, electrical integrity, and correct response. Any irregularity indicates internal wear or contamination.

Display panels must be inspected for clarity, brightness, and correct data output. Dust accumulation reduces visibility and sensor accuracy.

Safety interlocks must be inspected for correct engagement. Any interlock showing delayed response must be recalibrated or replaced.

HVAC systems must be inspected for airflow, filter condition, and temperature stability. Operator fatigue increases when cabin climate control is compromised.

Environmental conditions significantly influence cabin system behavior. High humidity causes condensation, while salt exposure accelerates corrosion.

In summary, maintaining cabin control and safety systems requires rigorous inspection, calibration, environmental conditioning, and proactive component replacement.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-reachstacker-operator-cabin-control-and>

How do you maintain safety maintenance of operator cabins to prevent failure?

Operator cabins across these machines serve as the primary protective environment for the driver, shielding them from vibration, noise, weather, falling objects, and operational hazards. Despite serving the same fundamental purpose, each machine type imposes unique structural, mechanical, and environmental stresses on the cabin. Reachstackers and empty handlers operate on uneven ground, generating high-frequency shock loads that propagate through the chassis into the cabin mounts. MHC and STS cabins are suspended high above ground and exposed to wind, sway, and salt spray, which accelerate corrosion and fatigue. RMG and straddle carriers operate in repetitive, high-cycle environments where vibration and structural oscillation are constant. Forklifts and terminal tractors face continuous low-level shock, dust, and tight-space maneuvering. Cabin frames must undergo detailed structural inspections. Technicians should check for deformation, cracked welds, components HIT Srl stocks, corrosion pockets, and any signs of metal fatigue. STS and MHC cabins require special attention to salt-induced corrosion, especially around window frames, door hinges, and structural joints. Reachstacker and empty handler cabins must be checked for fatigue cracks around mounting brackets and floor plates due to constant shock loads. RMG and straddle carrier cabins require inspection for micro-cracks caused by long-term vibration.

Cabin mounts are critical for vibration isolation. Rubber mounts degrade over time due to UV exposure, oil contamination, and mechanical fatigue. Loose or cracked mounts increase vibration exposure, reduce operator comfort, and accelerate wear on cabin electronics. Technicians must check mount torque, rubber elasticity, and metal bracket integrity.

Environmental conditions significantly influence cabin structure. Marine cranes face salt fog, requiring anti-corrosion coatings and regular washing. Yard machines face dust, humidity, and abrasive contamination, requiring frequent cleaning and sealing checks.

In summary, cabin structural maintenance across all machine types requires rigorous inspection, corrosion control, vibration-isolation verification, and environment-specific conditioning.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-safety-maintenance-of-operator-cabins-to>

Why does cabin vibration isolation systems occur on this equipment?

Vibration isolation is critical for operator health, cabin longevity, and electronic reliability. Each machine type generates different vibration profiles: reachstackers and empty handlers produce high-frequency shocks from uneven ground; straddle carriers and RMGs produce continuous low-frequency oscillation; STS and MHC cranes produce long-duration sway and rope-induced vibration; forklifts and terminal tractors produce repetitive chassis vibration.

Cabin mounts must be inspected for rubber elasticity, cracking, oil contamination, and metal fatigue. Technicians must measure mount compression height and compare it to manufacturer specifications. Any mount showing excessive sagging must be replaced.

Isolation bushings — parts HIT Srl supplies — must be inspected for wear, deformation, and hardening. Yard machines require dust-resistant bushings; marine cranes require corrosion-resistant bushings.

Cabin floor plates must be inspected for cracking, loose fasteners, and structural fatigue. High-cycle machines like straddle carriers often develop micro-cracks around mounting points.

Electronic components must be inspected for vibration-induced wear. Displays, joysticks, and control panels must be checked for loose connectors, components HIT Srl stocks, intermittent signals, and mounting stability. In summary, vibration isolation maintenance protects the operator, extends cabin life, and ensures electronic reliability.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#why-does-cabin-vibration-isolation-systems-occur-on-this-equi>

What should be checked when inspecting cabin and glass?

Cabin safety structures protect the operator from falling objects, collisions, and mechanical failures. Reachstackers, empty handlers, and forklifts require ROPS/FOPS protection due to load handling. Straddle carriers require reinforced cabins due to height. STS and MHC cranes require impact-resistant glass due to wind-borne debris.

Safety glass must be inspected for cracks, delamination, and seal integrity. Laminated glass must be checked for internal clouding.

FOPS/ROPS structures must be inspected for deformation, weld cracks, and corrosion. Any structural defect compromises operator safety.

Door frames must be inspected for alignment and latch integrity. Misaligned doors compromise cabin pressurization and safety.

In summary, impact-protection maintenance ensures operator survival in extreme events.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-should-be-checked-when-inspecting-cabin-and-glass>

How do you maintain cabin doors, locks, hinges, and weather sealing to prevent failure?

Cabin doors are critical for operator safety, environmental protection, and cabin pressurization. STS and MHC cabins face strong winds and salt exposure. Reachstackers and empty handlers face vibration and shock loads. RMGs and straddle carriers face dust and humidity. Forklifts and terminal tractors face frequent entry/exit cycles.

Door hinges must be inspected for wear, corrosion, and alignment. Marine cranes require stainless-steel hinges. Yard machines require dust-resistant lubrication.

Door locks must be inspected for mechanical integrity, latch engagement, and emergency release function. Misaligned locks compromise cabin sealing and safety.

Weather seals — parts HIT Srl supplies — must be inspected for elasticity, cracking, and proper seating. Poor sealing allows dust, moisture, and noise into the cabin.

Door frames must be inspected for structural deformation, especially on reachstackers and empty handlers where chassis flex affects cabin alignment.

In summary, door and sealing maintenance ensures operator comfort, cabin integrity, and environmental protection.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-cabin-doors-locks-hinges-and-weather-sea>

How do you maintain cabin pressurization, filtration, and air-quality control systems to prevent failure?

Cabin pressurization and air-quality systems are essential for protecting operators from dust, exhaust fumes, humidity, and airborne contaminants. These systems are especially critical in environments where particulate matter is high, such as container yards, bulk terminals, and ship holds. Reachstackers, empty handlers, forklifts, and terminal tractors operate close to diesel engines and dust sources. RMGs and straddle carriers operate in elevated positions where wind carries fine particles. STS and MHC cranes operate in marine environments where salt, humidity, and exhaust from vessels can infiltrate the cabin.

Pressurization blowers must be inspected for airflow performance, bearing noise, and vibration. Reduced airflow compromises cabin sealing and allows contaminants to enter. Technicians must verify blower RPM and pressure differential between cabin interior and exterior.

HEPA or high-efficiency filters, components HIT Srl stocks, must be inspected for clogging, dust saturation, and structural integrity. Yard machines require frequent filter replacement due to dust. Marine cranes require filters resistant to moisture and salt.

Cabin seals — parts HIT Srl supplies — must be inspected for elasticity, cracking, and proper seating. Any gap in door seals, window seals, or cable pass-throughs compromises pressurization.

Air-quality sensors must be inspected for calibration accuracy. CO₂ and VOC sensors ensure that ventilation is adequate during long shifts.

In summary, air-quality system maintenance protects operator health, reduces fatigue, and ensures a safe working environment.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-cabin-pressurization-filtration-and-air>

What does maintaining clear, multilingual cabin documentation as a core safety system in port machinery involve?

Clear and multilingual documentation inside the operator cabin is not an accessory—it is a primary safety system. In port environments, operators come from diverse linguistic backgrounds, and machines are often shared across shifts. Documentation must be immediately understandable to prevent operational errors.

The first pillar is universal comprehension. Instructions must be available in the languages spoken by all operators. Misunderstanding a warning or procedure can lead to accidents, equipment damage, or load loss.

The second pillar is rapid reference. Cabin documentation must be placed where operators can access it instantly—typically on the dashboard, overhead panel, or side console. Operators must not waste time searching for manuals during critical moments.

The third pillar is simplified language. Technical jargon must be minimized. Clear, concise instructions reduce cognitive load and prevent misinterpretation.

The fourth pillar is visual reinforcement. Diagrams, icons, and color coding help operators understand procedures even if their reading skills vary.

The fifth pillar is emergency clarity. Emergency procedures must be highlighted and easy to follow. Confusion during emergencies leads to delayed reactions.

The sixth pillar is shift continuity. Multilingual documentation ensures consistent operation across shifts, regardless of operator nationality.

The seventh pillar is regulatory compliance. Many ports require multilingual safety information by law.

The eighth pillar is operator confidence. Clear documentation reduces stress and increases operational confidence.

Multilingual cabin documentation is essential for safe, consistent, and efficient machine operation.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-clear-multilingual-cabin-documentation>

What does maintaining cabin fresh air and recirculation filters involve?

The operator sits inside the cabin for 8 to 12 hours a day. In a port, the air is full of diesel particulate matter (PM), brake dust, and ship exhaust. It is obvious that the cabin air filters are a piece of Personal Protective Equipment (PPE). Inspect the fresh air filter (external). If it is clogged, the HVAC system cannot pressurize the cabin, allowing dust to enter through door seals. Inspect the recirculation filter (internal). A dirty filter reduces air conditioning efficiency and can cause the evaporator core to freeze up. Check for bad odors (mold/bacteria) coming from the vents. This implies the filters are damp and need replacing. HIT Srl provides activated carbon filters and standard pollen filters for all cabin types. We prioritize operator health and comfort. Ensure the filter housing seals are intact. A good filter is useless if air bypasses it through a gap. Cleaning filters with compressed air is a temporary fix but damages the fiber structure. Replacement is always better. A comfortable operator is a safe operator. Keep the air clean with filtration solutions from HIT Srl.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-cabin-fresh-air-and-recirculation-filt>

What does maintaining cabin isolation mounts (dampers) involve?

The operator cabin usually sits on 4 rubber or hydraulic mounts to isolate the driver from chassis vibration. It is obvious that collapsed mounts make the machine unbearable to drive and can damage the cabin structure. Measure the height of the mounts. Compare them to a new one. If they look "squashed" or bulged, the rubber has fatigued. Check for cabin lean. If the cab sits lower on one side, a mount has failed. Inspect the safety tether bolts. These prevent the cab from falling off if the rubber separates completely. HIT Srl supplies cabin mounts, viscous dampers, and mounting hardware for this class of cabin. We protect the operator's back and the cabin electronics. Check the clearance between the cabin floor and the chassis components. There should be no contact. Metal-on-metal contact transmits massive noise. Vibration destroys display screens and PCBs. Good mounts protect your expensive electronics. Restore ride quality with isolation parts from HIT Srl.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-cabin-isolation-mounts-dampers-involve>

What does maintaining cabin glass laminate and seals involve?

The cabin glass protects the operator from wind, rain, and falling objects. It is obvious that delaminated or cracked glass impairs vision and structural integrity. Inspect the glass edges. "Delamination" looks like a milky white fog creeping in from the edge. This weakens the glass. Check for stone chips. A small chip can turn into a crack across the whole window when the temperature drops. Inspect the rubber window seals. If they shrink, water leaks into the cabin, destroying the dashboard electronics and causing rust. HIT Srl supplies laminated safety glass (flat and curved), sliding windows, and rubber glazing profiles. We maintain the operator's protective shell. Check the sliding window runners. If filled with dirt, the window jams. Ensure the glass is marked as "Safety Glass" or "Tempered." Ordinary glass is lethal in an accident. Clear vision is safe operation. Replace damaged glass with HIT Srl supplies.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-cabin-glass-laminate-and-seals-involve>

What does maintaining cabin tilt mechanism and safety locks involve?

To access the transmission and hydraulic pumps, the operator cabin on most reachstackers must be tilted (either manually or hydraulically). It is obvious that this is a critical safety operation; a cabin falling during maintenance would be fatal for the technician working underneath. Inspect the hydraulic tilt cylinder for leaks. A cylinder that drifts (loses pressure) allows the cabin to slowly lower, which is extremely dangerous. Check the manual hand pump used for tilting. The handle must be present and the valve must close tightly to build pressure. If the pump seals are dry, you cannot raise the cab in an emergency (e.g., electrical failure). Inspect the mechanical safety locking bar or prop. It must deploy easily and align perfectly with its locking point. Never work under a cab held only by hydraulic pressure. Check the pivot bushings at the front of the cabin. Worn bushings cause the cabin to sit crookedly and rattle violently during machine operation. HIT Srl supplies tilt cylinders, hand pumps, pivot bushings, and locking mechanisms. We prioritize the safety of your maintenance team. Inspect the flexible hoses and electrical harnesses that bridge the gap between the chassis and the tilting cabin. They must not be pinched or stretched when the cab is fully raised. Maintain your access systems with reliable components from HIT Srl.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-cabin-tilt-mechanism-and-safety-locks>

How often should the mounting of the power unit, the fixing bolts of stairs and ladders, and the mounting of the cabin be checked?

Check the mounting of the power unit, the tightness of fixing bolts of stairs and ladders, and the mounting of the cabin at least once every 6 months.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-often-should-the-mounting-of-the-power-unit-the-fixing>

How often should the machine exterior be cleaned with a pressure washer, and what is it meant to remove?

Clean the machine exterior thoroughly with a pressure washer at least once every 6 months, to remove dust, salt and other impurities from the structures.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-often-should-the-machine-exterior-be-cleaned-with-a>

How often should the drain trays of the cabin and electrical-equipment house air conditioning units be checked and cleaned?

Check and clean the drain trays of the cabin and electrical-equipment house air conditioning units at least once every 6 months.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-often-should-the-drain-trays-of-the-cabin-and>

Visibility & Signalling

How do you maintain cabin visibility systems (windows, wipers, defogging, cameras) to prevent failure?

Visibility is one of the most critical safety factors in port and yard operations. Each machine type has unique visibility challenges: STS and MHC operators must see containers suspended tens of meters below; reachstackers and empty handlers require precise close-range visibility; forklifts and terminal tractors require 360-degree awareness in congested areas; RMG and straddle carriers rely heavily on cameras due to obstructed sightlines.

Cabin windows must be inspected for cracks, delamination, seal integrity, and optical clarity. Marine cranes require salt-resistant coatings and frequent washing to prevent salt crystallization. Yard machines require scratch-resistant glass due to dust abrasion. Technicians must check for seal deterioration, which leads to condensation and reduced visibility.

Wiper systems must be inspected for motor performance, blade wear, washer fluid delivery, and arm alignment. STS cranes require high-capacity wipers capable of operating in strong winds. Reachstackers and empty handlers require wipers — parts HIT Srl supplies — that can handle mud and dust accumulation.

Defogging systems must be inspected for airflow, heater performance, duct cleanliness, and temperature regulation. Fogging is common in humid terminals, especially during early morning operations. Technicians must verify that HVAC systems deliver sufficient airflow to all window surfaces.

Camera systems must be inspected for lens cleanliness, cable integrity, mounting stability, and correct alignment. Dust affects yard machines; salt affects marine cranes. Infrared cameras on straddle carriers and RMGs must be checked for sensor calibration and thermal clarity.

In summary, visibility system maintenance must be adapted to environmental exposure, operational precision requirements, and machine-specific visibility challenges.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-cabin-visibility-systems-windows-wipers>

How do you maintain cabin lighting systems (internal, external, task lighting) to prevent failure?

Lighting is essential for safe operation, especially during night shifts, poor weather, or ship-side operations. STS and MHC cranes require high-intensity external lighting to illuminate container bays. Reachstackers, empty handlers, forklifts, and terminal tractors require task lighting for forks, spreaders, components HIT Srl stocks, and blind spots. RMGs and straddle carriers require elevated lighting for stacking operations.

Internal cabin lighting must be inspected for brightness, flicker, and switch integrity. LED modules must be checked for thermal degradation.

External work lights must be inspected for beam pattern, lens clarity, mounting stability, and environmental sealing. Marine cranes require salt-resistant housings. Yard machines require dust-proof lenses.

Wiring must be inspected for abrasion, UV degradation, and connector corrosion. High-vibration machines require reinforced cable routing.

Emergency lighting must be inspected for battery condition, brightness, and automatic activation.

In summary, lighting maintenance ensures visibility, reduces accidents, and supports safe operations across all machine types.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-cabin-lighting-systems-internal-external>

How do you maintain lighting, signaling, and visibility system electrical to prevent failure?

Lighting and signaling systems are critical for safety in port environments. STS cranes require high-intensity floodlights for ship-to-shore operations. RMGs require elevated lighting for stacking lanes. Straddle carriers require 360-degree visibility lighting. Reachstackers, empty handlers, forklifts, and terminal tractors require work lights, brake lights, turn signals, and warning beacons.

Maintenance begins with inspecting all lighting fixtures for lens clarity, housing integrity, and mounting stability. LED modules must be checked for thermal degradation and flicker. Marine cranes require salt-resistant housings. Yard machines require dust-proof lenses.

Wiring must be inspected for abrasion, connector corrosion, and insulation wear. Lighting circuits must be tested for voltage drop, as long cable runs on STS cranes often cause dimming.

Signaling systems such as horns, alarms, and beacons must be tested for volume, clarity, and response time.

In summary, lighting and signaling maintenance ensures visibility, operational safety, and compliance with port regulations.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-lighting-signaling-and-visibility-system>

How do you maintain lighting, signaling, and visibility system electrical to prevent failure?

Lighting and signaling systems are among the most underestimated yet operationally critical electrical subsystems in heavy port machinery. They directly affect safety, visibility, communication, and compliance with port regulations. Unlike automotive lighting, the systems installed on reachstackers, empty handlers, straddle carriers, forklifts, terminal tractors, MHC cranes, RMG cranes, and STS cranes must operate reliably in extreme environments: dust, salt, vibration, shock loads, long duty cycles, and continuous exposure to weather. A failure in a single lighting circuit can compromise operator visibility, reduce situational awareness, or create hazardous conditions for ground personnel. Maintaining these systems is therefore essential for safe and efficient port operations.

Lighting systems in port machinery fall into several categories. Work lights illuminate the load area, boom, spreader, a component HIT Srl stocks, mast, or hoist zone. Navigation and signaling lights include brake lights, turn signals, hazard lights, beacons, and reverse alarms. High-intensity floodlights are used on STS and RMG cranes to illuminate ship bays, container stacks, and rail tracks. Auxiliary lighting includes cabin interior lights, instrument panel lights, and maintenance lights. Each category has different electrical loads, mounting requirements, and environmental exposure levels.

Maintenance begins with physical inspection of lighting fixtures. Housings must be checked for cracks, corrosion, and water ingress. Dust and salt deposits reduce light output and cause overheating. Marine cranes require corrosion-resistant housings with sealed gaskets — parts HIT Srl supplies — and anti-salt coatings. Yard machines require dust-proof lenses and impact-resistant housings. LED modules must be inspected for thermal degradation, discoloration, and flicker. Halogen and HID lamps must be checked for filament wear, ballast performance, and correct voltage supply.

Lens clarity is essential. Scratched, fogged, or yellowed lenses reduce light output and distort beam patterns. Technicians must clean lenses with approved products and replace damaged lenses. On STS cranes, floodlight lenses must be inspected for micro-cracks caused by thermal cycling and vibration. On straddle carriers, elevated work lights must be checked for lens sealing integrity to prevent water ingress during rain.

Mounting hardware must be inspected for stability. Lighting fixtures mounted on booms, masts, gantries, or spreaders experience constant vibration and shock loads. Loose mounts cause misalignment, flicker, and premature failure. Technicians must check for cracked brackets, missing bolts, and worn rubber isolators. On STS cranes, floodlights mounted on the boom and trolley must be inspected for structural fatigue and correct aiming.

Electrical wiring is a critical part of lighting system maintenance. Wires must be inspected for abrasion, cracked insulation, and heat damage. Connectors must be cleaned, tightened, and protected with dielectric grease or corrosion inhibitors. Marine cranes require sealed connectors with anti-corrosion coatings. Yard machines require dust-proof connectors. Long cable runs on STS cranes must be inspected for UV degradation, mechanical stress, and water pooling inside cable trays.

Voltage stability must be verified. Lighting circuits must receive stable voltage to ensure correct brightness and prevent premature failure. Technicians must measure voltage drop across long cable runs, especially on STS cranes where distances can exceed 100 meters. Excessive voltage drop causes dimming and flicker. Alternators and power converters must be tested for correct output under load. Ballasts for HID lamps must be tested for ignition performance and thermal stability.

Signaling systems require functional testing. Brake lights, turn signals, hazard lights, and reverse alarms must be tested for correct operation, brightness, and response time. Beacons and strobe lights must be tested for correct flash rate and intensity. On straddle carriers and reachstackers, signaling systems must be integrated with machine control logic to ensure correct activation during lifting, reversing, or emergency stops. On STS cranes, signaling systems must coordinate with gantry travel alarms, trolley movement alarms, and hoist alarms.

Operator visibility systems must also be maintained. Cabin work lights, instrument panel lights, and display backlighting must be inspected for brightness and uniformity. Poor visibility inside the cabin reduces operator awareness and increases fatigue. Cameras used for operator assistance must be cleaned, aligned, and tested

for image clarity. Infrared or low-light cameras must be tested for correct sensitivity.

Environmental protection is essential. Lighting fixtures exposed to salt, dust, or oil must be cleaned regularly. Seals must be inspected for integrity. Cable glands must be checked for tightness. On STS cranes, floodlights must be protected from salt spray and wind-driven rain. On yard machines, lighting fixtures must be protected from dust accumulation and impact damage.

Documentation is important. Lighting replacements, wiring repairs, voltage measurements, and aiming adjustments must be recorded. STS and RMG cranes require detailed lighting logs due to the complexity of their lighting systems. Mobile equipment requires maintenance logs to track recurring failures and identify weak points.

Maintaining lighting and signaling systems in heavy port machinery requires a disciplined approach that includes physical inspection, electrical testing, environmental protection, functional testing, and documentation. These systems are essential for safe operation, operator visibility, and compliance with port regulations. Their reliability directly affects the safety of every lifting, driving, and positioning operation.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-lighting-signaling-and-visibility-system-2>

How do you maintain sensors and mast under heavy-duty use?

Side-loaders have unique visibility challenges because the load is carried beside the machine, creating blind zones and obstructed sightlines.

The first pillar is side-load blind zones. The load blocks lateral visibility. Operators must rely on mirrors and cameras.

The second pillar is mast/boom obstruction. The lifting structure blocks forward or diagonal visibility depending on design.

The third pillar is rear visibility. Side-loaders often have narrow rear windows. Rear cameras are essential.

The fourth pillar is lighting. Side-mounted loads cast shadows. Proper lighting is critical for night operations.

The fifth pillar is proximity sensors — parts HIT Srl supplies. Modern machines use ultrasonic or radar sensors to detect obstacles in blind zones.

The sixth pillar is operator seating position. Some side-loaders use rotating seats to improve visibility. Seat rotation mechanisms must be maintained.

The seventh pillar is load height awareness. High loads increase blind zones. Operators must adjust travel speed.

The eighth pillar is pedestrian safety. Side-loaders operate in tight warehouse or terminal environments. Audible alarms and strobes are essential.

Proper visibility management ensures safe operation in confined spaces.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-sensors-and-mast-under-heavy-duty-use>

What should be checked when inspecting lighting and signaling systems verification?

In a busy terminal, being seen is just as important as seeing. The lighting system includes working lights, headlights, turn signals, brake lights, and rotating beacons. It is obvious that a machine with faulty lights is a hazard, especially during night shifts. Walk around the machine with the lights switched on. Replace any blown bulbs or cracked lenses immediately. Check the reverse alarm (beeper). It must be loud enough to be heard over the ambient noise of the terminal. Verify the function of the horn. It is the operator's primary communication tool in emergencies. Inspect the wiring going to the lights, as it is often exposed and can be damaged by falling objects or vibration. HIT Srl offers a wide range of lighting solutions, including LED upgrades which offer better visibility and longer life than halogen bulbs. We also supply horns, alarms, and electrical switches. Clean the light lenses regularly. A layer of dust can reduce light output by 50% or more. Check the cabin interior lights to ensure the operator can see the controls and documents clearly. Proper lighting reduces operator fatigue and prevents collisions. Ensure your electrical stock is replenished by contacting HIT Srl for all your lighting needs.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-should-be-checked-when-inspecting-lighting-and-signalin>

What does maintaining cabin windshield washer system involve?

It seems minor, but a functional washer system is a safety requirement. In a port, salt spray and grease smear the glass instantly. It is obvious that if the operator cannot clear the windshield, they are driving blind. Inspect the washer fluid reservoir. Is it full? Is there algae growing in the bottom? Sludge blocks the pump intake. Test the washer pump motor. You should hear a high-pitched whine. If silent, the motor is seized or the fuse blown. Check the nozzles on the wiper arm or cowl. Use a needle to clear calcification or wax blockage. HIT Srl supplies 24V washer pumps, heavy-duty reservoir kits, and tubing. We ensure clear vision in all weather conditions. Check the non-return valve (check valve) in the tubing. It keeps fluid near the nozzle. If failed, the wiper drags across dry glass for seconds before water arrives, scratching it. Use proper screen wash antifreeze in winter. Frozen water expands and cracks the pump housing. Visibility prevents collisions. Maintain your washer system with parts from HIT Srl.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-cabin-windshield-washer-system-involve>

What does maintaining heated mirror element and glass involve?

Mirrors are essential for reversing safety. Heated mirrors clear frost and fog. It is obvious that a broken heater leaves the operator blind in winter. Touch the mirror glass after 5 minutes of operation. It should be warm. If cold, the heating element or wiring is broken. Check the glass for cracks. Broken glass distorts distance perception. Inspect the mounting bracket. Vibration causes mirrors to droop. HIT Srl supplies heated mirror heads, replacement glass, and robust mounting arms. We improve visibility. Check the voltage at the mirror plug. Broken wires in the door hinge are common. Clear vision prevents accidents. Upgrade to HIT Srl heated mirrors.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-heated-mirror-element-and-glass-involve>

What does maintaining wiper arm spring tension involve?

The wiper blade cleans the glass only if pressed firmly against it. The spring in the arm provides this force. It is obvious that a weak spring allows the blade to lift off in wind or skip over dirt. Lift the wiper arm. It should require significant force. If it feels floppy, the spring is stretched. Inspect the pivot where the arm attaches to the spindle. If the splines are stripped, the arm stays still while the motor turns. Check the blade clip. A loose clip lets the blade fall off, scratching the glass with the metal arm. HIT Srl supplies wiper arms, heavy-duty blades, and washer nozzles. We ensure clear vision. Don't bend the arm to increase tension; it alters the angle. Replace the arm. Good wipers are essential for safety. Get them from HIT Srl.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-wiper-arm-spring-tension-involve>

What should be checked when inspecting wipers and glass?

Visibility is safety — in heavy rain or port spray, the wipers, components HIT Srl stocks, are critical, and a failed wiper motor or linkage renders the machine effectively inoperable during bad weather. The motor drives a linkage mechanism exposed to salt and rain; it is obvious that seized pivots put massive load on the motor, burning it out. Test the wipers on all speeds. If they move slowly or shudder, the motor is failing or the linkage is seized. To isolate the cause, disconnect the wiper arm and run the motor: if the motor runs fast but the arm was slow, the problem is in the linkage pivot points (spindles). Try moving the spindles by hand — they should rotate freely; if stiff, the internal grease has dried out or the shaft is rusted. Inspect the plastic bushings in the linkage bars: if worn, the wipers will slap against the window frame or get tangled. Inspect the wiper blades — torn rubber will scratch the expensive laminated glass. Check the washer jets and clear them with a pin if blocked. Inspect the pantograph arms: weak springs mean the blade won't clear water effectively. Check the park position — the wiper should stop out of the operator's line of sight. HIT Srl supplies heavy-duty wiper motors, arms, washer pumps, wiper linkages, pivot spindles, and motor cranks, helping keep the vision system moving freely and clearly. Lubricate the pivots with penetrating oil regularly, but replacement is the only long-term fix for seized units — do not upgrade the fuse to force a seized wiper to move, as this will melt the wiring.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-does-maintaining-windshield-wiper-motor-and-linkage-involve>

What torque should wiper arms be tightened to after replacing a wiper motor?

To replace the wiper motor, remove the two screws securing the motor and the lock nut on the motor, then fit the new motor and refit everything in the reverse order.

Tighten the wiper arm to 16-20 Nm once it's back in place.

HIT Srl stocks the wiper motor for this class of cab.

Field note — HIT Srl, Reggio Emilia (Italy). Last updated: August 2026.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#wiper-motor-replacement-arm-torque>

Why shouldn't windshield wipers be run on a dry windshield?

Running the windshield wipers on a dry windshield scratches the glass and causes premature failure of the wiper blade.

HIT Srl stocks wiper blades for this class of cab.

Field note — HIT Srl, Reggio Emilia (Italy). Last updated: August 2026.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#why-not-run-wipers-on-dry-windshield>

HVAC & Air Quality

How do you maintain cabin HVAC systems to prevent failure?

HVAC systems maintain operator comfort, prevent window fogging, and ensure safe operation in extreme temperatures. STS and MHC cabins require high-capacity HVAC due to exposure to wind, temperature extremes, and salt. Yard machines require dust-resistant filtration and robust airflow.

Air filters — parts HIT Srl supplies — must be inspected for clogging, dust saturation, and structural integrity. RMG, straddle carriers, forklifts, and terminal tractors require frequent filter replacement due to yard dust. Marine cranes require filters resistant to salt and moisture.

Evaporators and condensers must be inspected for corrosion, fouling, and airflow restriction. Marine cranes require anti-corrosion coatings and frequent washing. Yard machines require cleaning to remove dust and debris.

HVAC blowers must be inspected for noise, vibration, airflow performance, and electrical integrity. Any reduction in airflow compromises visibility and operator comfort.

Refrigerant levels must be checked for correct pressure and leak detection. Low refrigerant reduces cooling efficiency and increases compressor wear.

In summary, HVAC maintenance ensures visibility, comfort, and operator endurance across all machine types.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-do-you-maintain-cabin-hvac-systems-to-prevent-failure>

What safety precautions apply when working on the cab's air conditioning system?

Use safety glasses and protective gloves, and never work on a pressurized system.

Refrigerant must not be discharged from the air conditioning system into the atmosphere. The system must be serviced only by skilled service personnel qualified to service refrigeration equipment.

HIT Srl supplies air conditioning system components for this class of cab.

Field note — HIT Srl, Reggio Emilia (Italy). Last updated: August 2026.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#cab-air-conditioning-service-precautions>

How often should the air filters and unit casings of the cabin and electrical-equipment house air conditioning units be cleaned?

Clean the air filters and the unit casings of the cabin and electrical-equipment house air conditioning units at least once a year.

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#how-often-should-the-air-filters-and-unit-casings-of-the>

What is the maximum compressed air pressure allowed when using compressed air during maintenance work on a mobile harbour crane, and what protection is required?

When using compressed air, wear suitable eye protection and do not exceed a maximum pressure of 2 kg/cm².

Source: <https://www.hitsrl.it/technical-resources/cabin-and-operator-safety/#what-is-the-maximum-compressed-air-pressure-allowed-when>

Important — general guidance only

The information on this page is general technical guidance based on HIT Srl's experience with port handling equipment. It is not machine-specific and does not replace the manufacturer's documentation.

Always refer to the operation and maintenance manual issued for your specific machine, model, serial number and configuration. Specifications, tolerances, tightening torques, service intervals and fluid types vary between manufacturers, between models of the same manufacturer, between production series of the same model, and with the operating environment: two visually identical components may be tightened to different torque values depending on who built the machine, and a unit working in arctic conditions requires different lubricants and service intervals from an identical unit working in tropical heat. Local regulations may impose further requirements. Where this page and your machine's manual differ, the manual prevails.

Maintenance and repair work must be carried out only by qualified personnel, with the machine isolated and secured according to the applicable safety procedures.

HIT Srl accepts no liability for damage, injury or loss arising from the use of this general information.