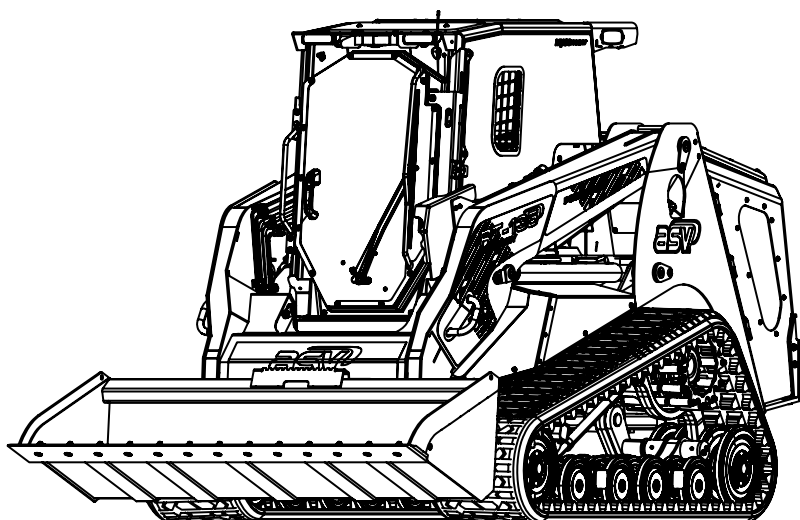




Operation and Maintenance Manual



Version: EN

Revision: A

Edition: 2022-01

Part Number: 0405-201 (US)

Valid From Serial No: 00101 (RT-135)

Original Instructions

RT-135

**For the Engine Operation & Maintenance Manual,
access the web at:
<https://quickserve.cummins.com/info/index.html>**

**Register, then provide your engine serial number. Once
entered, select the “Service” tab for access to your
engine specific manuals and information.**



WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

0404-841

Please fill in before commissioning the machine:

Model: _____

Vehicle Serial Number: _____

Year of Manufacture: _____

Commissioned on: _____

Dealer:

--



The operator must read and understand all the instructions in this manual before operating the machine.

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1 INTRODUCTION

1.1 Product Identification (PIN)

The machine PIN is located on the identification plate, on the rear of the right hand lift arm tower (in the engine compartment).

Please state the model of the machine and PIN when making inquiries in regards to parts, service, or warranty.

1.2 Introduction

Thank you for purchasing an RT-135 Compact Track Loader. We are confident that the machine you have chosen will provide excellent performance and efficient operation.

The information contained in this manual is intended to provide the operator with all necessary information for the proper use of the machine.

It is imperative that this manual be provided to the end user at the time of purchase, prior to operation and kept with the machine at all times. If lost or damaged, contact your dealer immediately to obtain a replacement prior to resuming operation.

The operator is responsible for the safe operation of the machine.

The operator must read, understand and obey the instructions in both this and the AEM safety manual for skid steer and compact track loaders prior to operating or performing maintenance or service on the machine.

Should you need clarification or further explanation of the topics in this manual, please contact your dealer immediately for assistance.

Information describing special equipment or attachments and their operation are not included in this manual.

This manual should be stored in the provided storage location in the cab of the machine.

1.3 Safety Alert Symbol



The safety alert symbol is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

1.4 Intended Use

The machine with bucket attachment is intended to be used solely for work consistent with its design. Such work includes loosening, collecting, transporting, and distributing soil, rock, or similar materials as well as loading these materials onto trucks, conveyors, or other methods of transport.

After installation of compatible (see section 4.14) special working attachments, the equipment can be used for corresponding applications.

The operator must follow the operating instructions (manuals) for any externally supplied components or attachments.

Any use varying from that described here or any lack of adherence to the operating instructions, maintenance procedures, or replacement intervals described in this manual shall be regarded as unintended or improper use. The supplier cannot be held responsible for any damage resulting from improper use. This risk is borne solely by the user.

Note: Mulching type brush cutting attachments commonly used on this type of machine may become unbalanced due to worn, damaged, or missing “teeth”, causing vibration. If the attachment is operated in this condition, it can cause metal fatigue and / or cracking in both the host machine and the attachment itself. Vibration can also cause hydraulic component failure (ex: relief valves).

Mulching type brush cutters also generate more dust and flying debris than other attachments. The increased particles can plug coolers, radiators, and air cleaners much faster causing overheating or even engine failure if left unattended. The debris can also be introduced into many high temperature areas and can become a fire hazard. Inspect for and clean debris from these areas daily or as needed.

Although these mulching type heads work extremely well on RT-135 machines with high flow hydraulics, educate yourself on the increased maintenance and operating costs before using this type of attachment.

1.5 Bulletin Compliance

It is very important to comply with all safety related bulletins. Bulletins are tied to the most current owner on record. Therefore, it is important that any new owner contact their local dealer to register the machine in their name. This will ensure that they will be notified in the event of a safety related bulletin affecting their machine.

1.6 Contacting the Manufacturer

If you have questions relating to ownership including, but not limited to: accident reporting, current owner updates, product applications and safety, standards and regulations compliance, product modifications, transfer of ownership, please consult your local dealer as the first point of contact.

1 INTRODUCTION

1.7 Copyright

This manual is intended for use by personnel responsible for operation, maintenance, repair, and supervision activities involving the machine described within.

This manual is copyrighted. It shall not, either in whole or in part, be reproduced, transmitted, or used for the purpose of competition without our prior written consent.

1.8 Warranty

Your RT-135 is warranted under the Compact Track Loader and Utility Vehicle Standard Limited New Product Warranty ("Warranty"). A copy of the Warranty certificate is available from your Authorized RT-135 Distributor.

1.9 Tier 4F Compliance Information

In order to comply with tier 4F emissions regulations, the exhaust system in the RT-135 is equipped with a Selective Catalyst Reduction (SCR) system that consists of a Diesel Exhaust Fluid (DEF) injector, a Decomposition Reaction Tube (DRT), a Selective Catalyst Reduction (SCR) and sensors monitoring system performance.

Selective Catalyst Reduction is a technique used to control Nitrous Oxide in diesel engine exhaust. Diesel Exhaust Fluid is injected into the exhaust over a catalyst. The Diesel Exhaust Fluid (section 7.21, which decomposes into ammonia) reacts with the Nitrous Oxide present in the exhaust and produces harmless nitrogen and water.

Exhaust system cleaning (regeneration) can take place if buildup occurs. The system is automatic and does not require operator intervention. No change in performance will occur. The manufacturer recommends allowing the system to operate automatically whenever possible.

If in an environment where surroundings are especially sensitive to high exhaust temperatures, you may temporarily disable regeneration (see pages 46, 69 for more information regarding regeneration).

The tier 4f engine and emissions system in the RT-135 requires Ultra Low Sulfur Diesel (ULSD) fuel to operate properly. There are special considerations regarding the use and handling of ultra low sulfur diesel fuel. Information on these topics can be found on the following pages: 18-19 (section 2.10 - Fuel Handling Precautions) and 34 (section 3.11 - Fluid Specifications).

The RT-135 is also equipped with self-diagnostic features common to modern diesel engines. Information regarding self-diagnostics can be found on the following pages: 37 (section 4.1 - *NOTICE* message), 70 (fault log and active faults - accessing fault information through the operator interface).

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2.1 Safety Alert System

Safety Alert Symbol

This symbol means: **Attention! Be alert! Your safety is involved!**



The safety alert symbol is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

This symbol is used as an attention-getting device throughout this manual as well as on decals and labels fixed to the machinery to assist in potential hazard recognition and prevention.

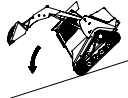
Property or equipment damage warnings in this publication are identified by the signal word "NOTICE".

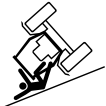
NOTICE

"NOTICE" Indicates a hazardous situation which, if not avoided, could result in property or equipment damage.

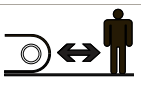
2 SAFETY

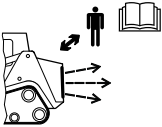
2.2 Graphical Symbols

Hazard Pictorial	Avoidance Pictorial	Description
		Hazard: Skin/Oil Injection Avoidance: • Relieve internal pressure before disconnecting any line or fitting. • Keep away from leaks or pin-holes. • Use cardboard to check for leaks. Fluid injected into skin must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene will result.
		Hazard: Fall Avoidance: Use the provided access system when entering or exiting the machine.
		Hazard: Rollover / Ejection Avoidance: Carry loads low, keep heaviest end of machine uphill at all times while operating on inclines.
		Hazard: Burn/Scald Avoidance: Allow to cool before opening.

Hazard Pictorial	Avoidance Pictorial	Description
		Hazard: Explosion/Burn Avoidance: • Keep all flames/sparks away! • No Smoking! • Read and understand all manuals.
		Hazard: Corrosive Avoidance: Read and understand the operator's manual.
		Hazard: Fall Avoidance: No Riders.
		Hazard: Burn Avoidance: Do not touch hot surfaces.
		Hazard: Crush Avoidance: Fasten seat belt.

2 SAFETY

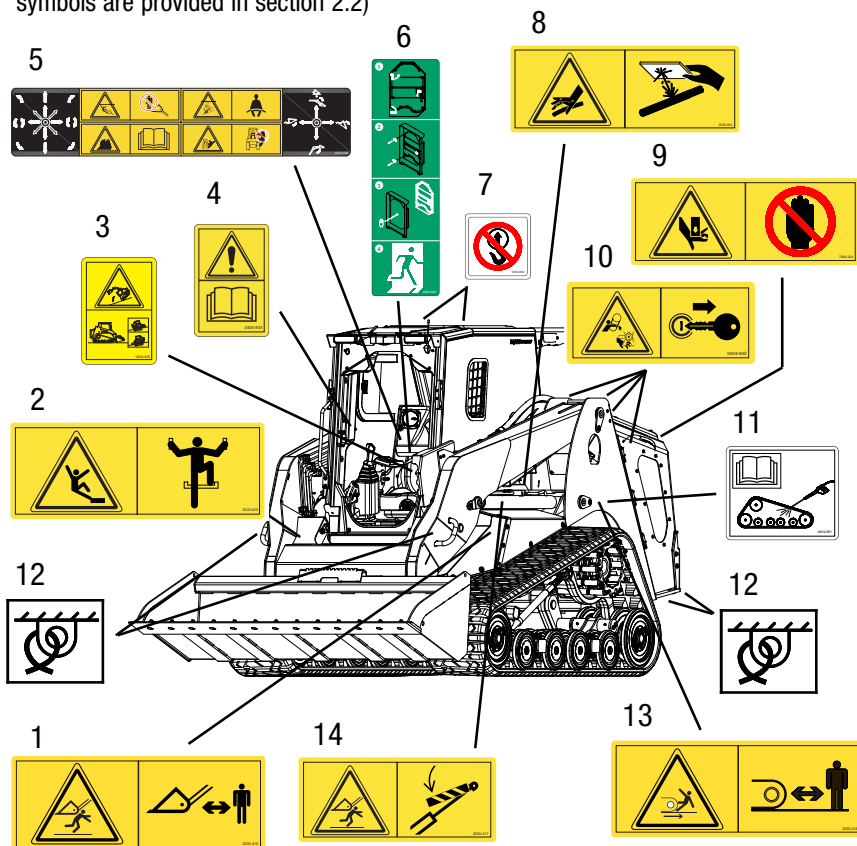
Hazard Pictorial	Avoidance Pictorial	Description
		Hazard: Entanglement Avoidance: Stop machine and remove key before servicing.
		Hazard: Entanglement Avoidance: Stop machine and remove key before servicing.
		Hazard: Fall Avoidance: Do not use the bucket or attachment as a work platform.
		Hazard: Crush Avoidance: Keep clear of moving machine.
		Hazard: Crush Avoidance: Keep clear of lift arms and attachments.
		Hazard: Crush Avoidance: Keep hands clear of moving parts during equipment operation.

Hazard Pictorial	Avoidance Pictorial	Description
		Hazard: Crush Avoidance: Install lift arm brace before servicing.
		Hazard: The safety alert symbol is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death. Avoidance: Read and understand the operator's manual.
		Hazard: Fire Avoidance: Read and understand the operator's manual.
		Hazard: Flying Debris Avoidance: Stay Clear of rear of machine. Read and understand the operator's manual.
		Hazard: Explosion / Burn Avoidance: No smoking. Keep all open flames and sparks away. Stop engine before adding fuel.

2 SAFETY

2.3 Safety Signs

The safety signs are located in/on the machine as indicated. (Descriptions of the symbols are provided in section 2.2)

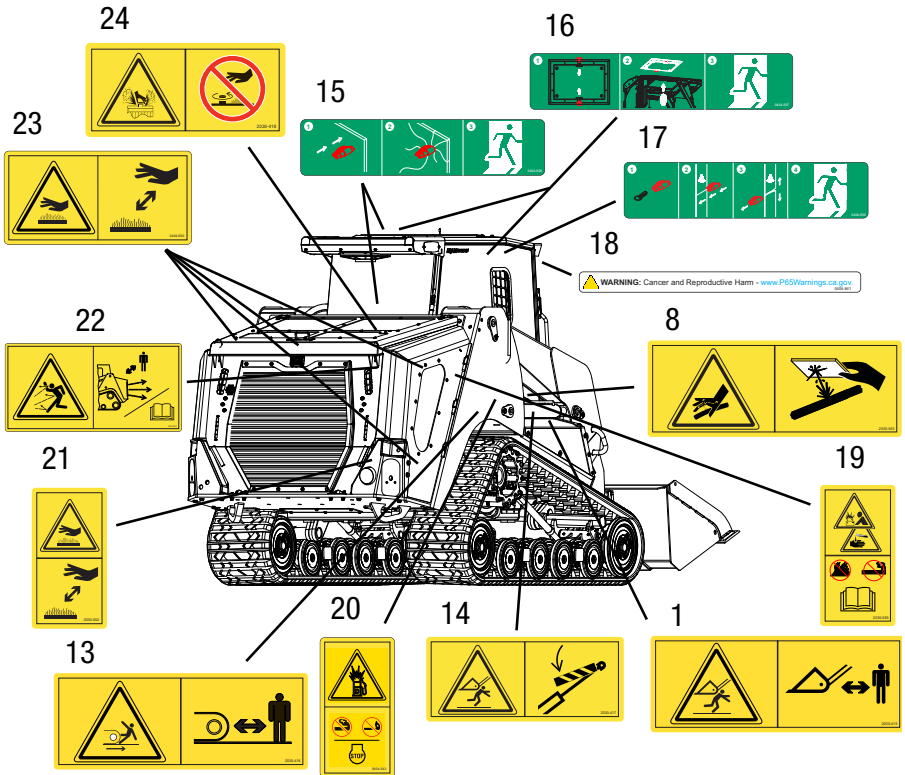


Key

1. Crush hazard (lift arms)
2. Fall hazard
3. Rollover/ejection hazard (inside cab)
4. Read operator's manual (inside cab)
5. Fall / crush hazards / fire notice (inside cab)
6. Emergency Exit (front door - forestry)
7. Not a lift point (top of cab)
8. Skin (oil) injection hazard
9. Crush hazard (pinch point)
10. Entanglement hazard (engine compartment)
11. Clean undercarriages notice (one on each side of machine)
12. Tie down locations
13. Crush hazard (run over)

Note:

Safety signs are designed and fitted to the product to warn of possible dangers, and **MUST** be replaced immediately if they become unreadable or lost. If the product is repaired and parts have been replaced on which safety signs were fixed, be sure new safety signs are fitted before the product is put into service.



Key (continued)

- 14. Crush hazard (lift arm brace)
- 15. Emergency Exit (break glass, multiple locations in cab)
- 16. Emergency Exit (roof panel, multiple locations in cab)
- 17. Emergency Exit (cut seatbelt, inside cab)
- 18. Proposition 65 warning, (inside cab)
- 19. Explosion / burn hazard (read operator's manual) (engine compartment)
- 20. Explosion / burn hazard (fuel)
- 21. Burn hazard
- 22. Flying debris hazard
- 23. Burn hazard (engine compartment)
- 24. Burn hazard (engine compartment)

2 SAFETY



2.4 General Safety Notes

- It is the responsibility of the operator to be aware of his/her surroundings at all times. **Keep a safe distance from bystanders at all times during operation. Always look in the direction of travel.**
- Read and understand all safety signs, the operator's manual and the AEM safety manual for this type of equipment prior to operation.
- If safety signs are obstructed by dirt or debris, clean them using mild soap and water prior to operation. DO NOT use solvent based cleaners, as they may damage the safety sign material.
- If safety signs are damaged or illegible, replace them immediately, prior to operation.
- Never jump off of the machine. Instead use the hand holds and step designed for entering and exiting the machine. Face the machine and use three points of contact (defined as: one foot and two hands, or one hand and two feet) to ensure your safety.
- Ensure the access system (step and handholds) are clean prior to entering or exiting the machine.
- Do not use any method of operation, inspection, or maintenance that may impair safety.
- This machine is only to be used when properly equipped for the task to be performed and when properly inspected and maintained to ensure safe operation.
- The manufacturer's instructions regarding operation, inspection, maintenance, repair and transportation **must** be followed.
- Never place the machine into operation without having first performed a thorough walk-around inspection and making any necessary repairs or adjustments.
- Safety devices on the machine shall not be deactivated or removed.
- Do not make any changes, additions or conversions to the machine that could have a negative effect on safety without the manufacturer's written approval.
- It is the responsibility of the operator to communicate intentions for work (machine movement) to anyone standing or working nearby, prior to operation (see section 2.6 Hazard Zone).



2.5 Personal Protection Equipment

The machine is designed to accommodate and protect an operator during operation from foreseeable injury **when used as intended and when equipped properly for the task(s) being performed**. Operators should not wear rings, scarves, open jackets, and should ensure that all clothing is tightly secured. Long hair should be restrained. Personal Protective Equipment (PPE) must be worn in the absence of an enclosed cab. In this case PPE would include, but not be limited to, safety glasses. The use of some attachments may require additional PPE, such as hearing protection, hardhat, gloves, and steel-toed shoes. In some applications high visibility/reflective jackets are required.

Personal protection equipment is also recommended when performing maintenance or service on a machine. Always wear appropriate protective equipment for working conditions when working on or around the machine. Loose clothing should not be worn and long hair should be restrained. Wear hard hats, protective face/eyewear, safety shoes and any other equipment necessary to ensure your safety and the safety of others around you as you work.



2.6 Hazard Zone

The hazard zone encompasses the area around the machine in which persons may be injured by movements of the machine, its attachments, or by falling loads, during operation.

Do not position yourself or allow anyone else within this hazard zone during machine operation. Keep a safe distance to ensure your safety while the machine is in operation.

If someone enters the hazard zone, the operator must stop all work and give a warning signal to the person who may be in danger to leave the hazard zone. Work should not resume until all persons have vacated the hazard zone.

To minimize the possibility of a crushing hazard, a safe, sufficient distance (min. 1.6 ft (0.5 m)) must be kept from solid objects, e. g. buildings, slopes, scaffolding, other machines, etc. If that distance cannot be kept, fence off the area between solid construction elements and the working elements of the machine.

If conditions are such that the machine operator's view of the driving and working zone is restricted, he must be guided or the driving and working zone must be secured by means of a solid barricade.

2 SAFETY



2.7 Operation

Earth moving machines are only to be operated and serviced by individuals who:

- are physically and mentally able to operate and / or service the machine in a safe and effective manner (not impaired in any way).
- have been instructed in the proper operation or maintenance of the machine and have demonstrated competence in these areas.
- can be trusted to perform their assigned duties in a safe and reliable manner.
- are of the legal minimum age for performing such duties.

It is the responsibility of the operator to:

- read, understand and obey the instructions in this manual and the AEM safety manual for skid steer and compact track loaders.
- maintain a safe distance from bystanders at all times and always look in the direction of travel.
- use the machine in accordance with its intended use (section 1.4).
- inspect the machine prior to operation and perform any necessary checks, adjustments or repairs to ensure safe operation.
- familiarize him/herself with the local jobsite conditions and immediately remedy any fault that may compromise safety.
- use the machine in accordance with the appropriate local jobsite organization system to ensure safe coordination with other machines, vehicles, and people on the jobsite.

Investigate any jobsite prior to operation to determine whether any special hazards exist. Take necessary measures to eliminate or reduce any hazard.

Do not operate the machine in unsafe conditions including, but not limited to: in inclement weather (example: electrical storm), near overhead electric lines, in enclosed areas without proper ventilation, in contaminated areas without necessary safety equipment and personnel.

Turning the key to the off position while the machine is in motion (as described below) should be done only in an emergency. If done, **the machine will stop abruptly.**

To stop all machine movement in case of emergency:

- Turn the ignition key to the off position (item 1, section 4.1).

Note: Pressing the parking brake switch located on the upper right switch pad (item 12, section 4.1) is also effective to stop track movement only in an emergency.



2.8 Stability

The machine must always be operated with caution in order to maximize machine stability and guard against the possibility of a rollover.

- Travel only at speeds appropriate for the local conditions.
- Do not exceed the operating capacity of the machine.
- Exercise extreme caution while operating on inclines.
- Avoid operation on steep inclines.
- Do not make sudden changes in direction, move slowly, and always carry loads low to maximize machine stability.
- Always keep the heaviest end of the machine facing uphill when working on an incline.
- When operating on any surface other than firm and level ground, use extra caution. Decrease work speeds, limit load size and make any other necessary adjustments to maximize your safety and that of others in the work area.

Note: The parking brake, which is activated:

- by pressing the switch (item 12, section 4.1)
- automatically when the engine is turned off, the operator is not in the seat or the lap bar is raised

is capable of holding the standard machine with bucket attachment in accordance with ISO 10265; 2008.



2.9 Transporting Persons

- The machine must not be used to transport persons.

2 SAFETY



2.10 Fire Prevention

Compact Track loaders have components that operate at high temperatures. It is important to observe all inspection, operation and maintenance guidelines to minimize the possibility of fire.

- Turn the engine off when refueling.
- When refueling or charging the battery, do not smoke or allow open flame near the machine.
- Always start the engine according to the procedure in the operating instructions.
- Inspect and clean the radiator/oil cooler, engine compartment, exhaust system and other areas where there may be hot or rotating parts **daily (or as needed)**. In some work environments, flammable debris including but not limited to: leaves, straw, wood particles (dust), and similar items can accumulate in these areas and can lead to fire.
- Check the electrical system regularly. Have any faults such as loose connections, burnt fuses, glow lamps and damaged wiring repaired by professional personnel immediately.
- Regularly check all lines, hoses and threaded couplings for leaks and damage. Repair leaks immediately and replace any defective parts. Oil leaks can easily lead to a fire. **NEVER use bare hands to check for hydraulic leaks!** Pressurized fluid (oil) can penetrate skin and cause gangrene. If injection occurs, seek medical attention immediately!
- Do not use any starting aids containing ether to start diesel engines with pre-heat systems! Use of starting aids of this nature can cause an EXPLOSION!
- Familiarize yourself with the location of fire extinguishers (if equipped) in/on the machine and how to use them as well as local options for reporting and fighting fires should one occur.

Fuel Handling Precautions

- Do not smoke or allow open flame near fueling operations.
- Always maintain control of the fuel nozzle when filling the tank.
- Do not fill the fuel tank to capacity, allow room for expansion.
- Clean up fuel spills immediately.
- Tighten the fuel tank cap securely. Should the cap become lost or damaged, replace it immediately with the original manufacturer's recommended replacement cap to ensure proper venting and function.
- Never use fuel for cleaning purposes.
- Always use the correct fuel grade for the operating season and engine requirements.

Ultra Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations with higher Sulfur content. Avoid death or serious injury from fire or explosion; consult with your fuel or fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.



2.11 Crush and Burn Avoidance

- Do not work under the lift arms unless they are resting safely on the ground or supported by the lift arm brace.
- Keep your entire body inside the operator enclosure at all times during operation. Never work with any part of your body protruding from the cab.
- Do not use any restraining devices such as cables or chains that are damaged or do not have sufficient carrying capacity. Always wear safety gloves when working with wire cables.
- In adverse conditions (high winds, uneven terrain, etc.), keep clear of (or secure against unintended movement) raised or open hinged items (hoods, doors, engine enclosure panels and similar).
- Never align holes with your fingers when working on the machine. Instead use a suitable mandrel.
- Keep yourself and all objects that could be drawn into the fan at a safe distance while the engine is running.
- The entire cooling system is hot and under pressure when it is at or near operating temperature. Avoid touching parts that carry coolant to avoid the possibility of burns.
- Allow the machine to cool thoroughly prior to touching or removing the cooling system cap. Once cool, loosen the cover slowly to bleed off any excess pressure.
- The engine and hydraulic oil are hot when at or near operating temperature. Avoid skin contact with hot oil or parts carrying oil.
- Wear safety goggles and protective gloves when you are working with the battery. Keep sparks and open flames away from the work area.
- Charge air components are hot when at or near operating temperature. Allow the machine to cool thoroughly prior to touching or performing service work on charge air components to avoid the possibility of burns.
- Exhaust components are hot when at or near operating temperature. Allow the machine to cool thoroughly prior to touching or performing service work on exhaust components to avoid the possibility of burns.

2 SAFETY



2.12 Placing into Operation

- Every time before placing the machine into operation, perform a thorough walk-around inspection of the machine.
- Check the machine for loose pins, cracks, tears, wear, leaks and deliberate damage.
- Never place a damaged machine into operation.
- Make any necessary repairs immediately, prior to resuming operation.
- Inspect to make sure all warning signs are in place and legible, then close and latch all hoods and covers.
- Make sure all windows, mirrors (if equipped) and the backup camera screen and lens are clean. Secure door and windows against unintentional movements.
- If visibility is reduced by a lack of window or screen / lens clarity (yellowing, scratches, damage, etc) replace affected components prior to operating.
- Make certain no one is working on or under the machine and warn any persons standing nearby that the machine will be placed into operation.
- Prior to placing the machine into operation, adjust the driver's seat, mirrors (if equipped), rearview camera (if equipped) and ventilation system settings (if equipped) so you can work in comfort and safety.



2.13 Starting the Machine

- Before starting, check all indicator lamps and instruments to make certain they are working properly.
- Start the engine in the manner described in the operating instructions.
- Only allow the engine to run in enclosed rooms if there is adequate ventilation. If necessary, open doors and windows to ensure a proper supply of fresh air.
- Bring the engine and hydraulic oil up to operating temperature. Low oil temperatures can cause the control system to respond sluggishly.
- Move the machine carefully to open ground and then check the functionality of the lift arm and drive controls as well as the lighting equipment.



2.14 Jobsite Safety

- Before beginning work, become acquainted with any special features or requirements of the jobsite. These may include, for example, obstructions in the work area, the carrying capacity of the ground and requirements to close the jobsite off from public traffic.
- Always maintain a safe distance from bystanders, overhanging features, edges, embankments and unsafe surfaces.
- Be especially cautious if visibility is poor, light conditions are low or soil conditions vary.
- Become acquainted with the location of supply lines at the jobsite and be especially careful when working close to them. Consult appropriate local authorities for necessary information regarding any such lines prior to commencing work.
- Keep the machine at an adequate distance from overhead electrical lines. When working in the vicinity of overhead electrical lines, do not come close to the lines with the machine. **Injury or death may result!** If possible, have the current turned off or line re-routed prior to beginning work.
- In the event electrical current jumps from a line to the machine, follow these rules:
 - do not perform any movements with the machine
 - do not leave the cab
 - warn persons outside not to approach or touch the machine
 - have the current turned off immediately
- Always turn on the appropriate lighting when visibility is poor or light conditions are low.
- Do not allow any passengers in or on the machine.
- Stay seated with the seat belt fastened while working.
- Report any operating faults immediately. Make sure any necessary repairs are performed prior to resuming operation.
- Never leave the machine unattended with the engine running.

2 SAFETY



2.15 Parking the Machine

- Stop the machine only on an even and solid surface.
- Lower the lift arms to the frame stop and rest the bucket on the ground.
- Shut the machine down as described in section 5.13.
- Close the machine doors and windows (if equipped), remove the key to secure the machine against unauthorized use.



2.16 Towing/Retrieving the Machine

- Always observe the correct procedure as described in the operating instructions.
- The machine should be towed only in exceptional cases, for example to bring the machine away from an endangered place for repair.
- Towing equipment such as chains, cables, etc., must be of the correct capacity and must be connected in accordance with the retrieval guidelines found in chapter 6 of this manual.
- Pull the chains taut slowly and carefully. A sudden jerk can cause sagging chains or cables to tear or snap.



2.17 Transporting the Machine

- Use only suitable transport and lifting equipment with sufficient carrying capacity.
- Load the machine on firm and level ground.
- Before driving onto the ramps, clean them and the machine tracks of any materials that may cause slippage (snow, ice, water, mud, sludge, oil, etc.).
- Properly align the machine with the loading ramp.
- Have a guide give the machine operator any necessary signs to maximize safety during loading.
- Back the machine carefully up the ramps and onto the transport vehicle.

Note: The heaviest end of the machine should remain uphill when operating on an incline. Always back the machine onto the transport vehicle unless fitted with a heavy attachment or loaded bucket.

- Before you leave the machine, relieve all residual pressure by making sure all operating levers and switches are in their neutral positions. Remove the ignition key.
- Secure the door, windows and hood on the machine.
- Secure the machine and any other items against slipping with chains, ropes of the proper capacity.
- Before departure, investigate the route to be taken, especially in regard to limits for width, height and weight.
- Pay close attention when driving under electrical lines, bridges, or through tunnels.
- Use the same caution when unloading as for loading. Remove all cables/chains. Start the engine as described in the operating instructions. Carefully drive down the ramp from the transport vehicle using a guide if necessary to direct movement.
- When lifting attachments or components, use caution. Attach straps or chains securely and in such a way that they evenly distribute the weight of the item to be lifted, ensuring a balanced load. Stay clear of expected travel path.

2 SAFETY



2.18 Maintenance

- Do not perform any maintenance work or repair task that you do not understand thoroughly.
- Park the machine on firm and level ground in a well lit and well ventilated area suitable for performing service or maintenance work.
- Disconnect the battery (always disconnect the negative cable first and reconnect last) and remove the ignition key from the ignition before beginning work on a machine. Place a **Do Not Operate** tag across the opening of the cab to alert any operator that maintenance is in progress.
- Do not work on or under any machine that is supported only by a hydraulic jack or hoist. Always use mechanical supports to ensure that the machine will not fall.
- Make sure the work area around the machine is safe and make yourself aware of any hazardous conditions that may exist. If the engine needs to be started inside an enclosure, make sure that the engine's exhaust is properly vented.
- Be sure all protective devices including guards and shields are properly installed and functioning correctly before beginning any service task. If a guard or shield must be removed to perform the maintenance work, use extra caution.
- Always use the appropriate tools for the work to be performed. Tools should be in good condition and you should understand how to use them properly before performing any task.
- When replacing parts or fasteners, use parts of equivalent quality, grade and/or size. Use original equipment components to ensure the proper form, fit, and function of replacement parts.
- When performing maintenance work, always wear appropriate safety clothing for the task to be performed. Some examples might include: safety shoes, safety goggles and safety gloves.
- When performing service that requires the lift arms to be in the raised position, always utilize the lift arm brace.
- If safety equipment needs to be dismantled to fit equipment or perform maintenance or repairs, it must be reattached and tested immediately after the maintenance and repair jobs are completed.

- Clean the machine prior to beginning work. Clean especially the connections and screw couplings of oil, fuel and upkeep materials at the beginning of the maintenance/repair job.
- Do not use flammable liquids to clean the machine.
- Perform tasks on the machine that involve welding or grinding only if approved by the manufacturer. Clean the machine and the work area of dust and any combustible materials before welding or grinding to avoid fire or explosion.
- Before cleaning the machine with water jets (high pressure cleaner) or other cleaning agents, cover or seal over all openings in which water or cleaning agents should not penetrate for safety and/or functional reasons. Electrical motors, switch panels and plug connections are especially subject to damage. Before cleaning, inspect all fuel, engine oil and hydraulic oil lines for leaks, loose connections, rubbed spots and damage. Repair or replace any damaged components immediately.
- When working with oils, greases and other chemical substances, observe all safety requirements that apply to the product in question.
- Ensure that fuels, lubricants and coolants as well as replaced parts are disposed of in an environmentally proper manner.
- Proceed carefully when working with hot lubricants, coolants and fuels (danger of burns and scalding).

Relieve Hydraulic System Pressure

Prior to attempting any hydraulic maintenance or repair, relieve hydraulic system pressure by performing the following:

1. Remove any attachment, then shut the machine down as described in section 5.13 of this manual.
Note: When lowering the lift arms, lower them to the frame stops (or onto the lift arm brace if the lift arms are to remain up for service). Fully curl the quick attach (or you can extend it to the ground if the loader is down), then activate the float function (section 4.3.1 of this manual) momentarily to ensure there is no pressure left in the lift arm circuit.
2. Turn the continuous auxiliary hydraulic switches off and ensure the variable auxiliary switch is in its neutral position (section 4.11 of this manual).
3. Make sure the drive and lift arm controls are in neutral positions (controls are spring centered, resting position is neutral).
4. Relieve auxiliary hydraulic residual pressure (step 2 section 4.11 of this manual).

2 SAFETY

- Do not attempt to lift heavy parts. Use work aids with sufficient carrying capacity designed for that purpose. Fasten and secure individual parts and large assemblies carefully on lifting equipment to minimize the possibility of objects falling. Use only suitable lifting equipment with no technical defects. Do not work under suspended loads.
- Use only climbing aids and work platforms that meet safety requirements for assembly tasks above body height. Do not use machine parts as climbing aids if they were not designed for that purpose.
- If working at significant height, use a safety harness of the proper style and capacity to prevent falls. Keep all grips, steps, platforms, ladders, etc. free of snow, ice, water, mud, sludge, oil, etc.



2.19 Battery (corrosive)

- Use caution, wear face shield, safety gloves, and any other appropriate safety equipment when working near or with the battery. The battery contains acid and should be handled with care.
- **DO NOT** smoke or allow open flame or sparks near the battery. Explosion could result.
- When disconnecting the battery, disconnect the **negative** terminal **first**.
- When connecting the battery, connect the **negative** terminal **last**.



2.20 Hydraulic Hoses/Lines

- Repairs to hydraulic hoses and hydraulic hose lines are forbidden! These repairs must be performed by trained personnel.
- All hoses, hose lines and screw connections must be checked daily for leaks and externally visible damage! Replace any damaged parts immediately! Oil spraying out can cause injuries and burns.
NEVER use bare hands to check for hydraulic leaks! Pressurized fluid (oil) can penetrate skin and cause gangrene. If injection occurs, seek medical attention immediately!
- Even if they are stored properly and subject to proper loads, hoses and hose lines are subject to natural aging. Their service life is therefore limited.

Improper storage, mechanical damage and impermissible load are the most frequent causes of failure.

The usage period of a hose line should not exceed 6 years, including a storage time of no more than 2 years.

Operation under extreme conditions (examples: frequent exposure to heavy loads, high or low temperatures, extended operating times) will further reduce hose service life.

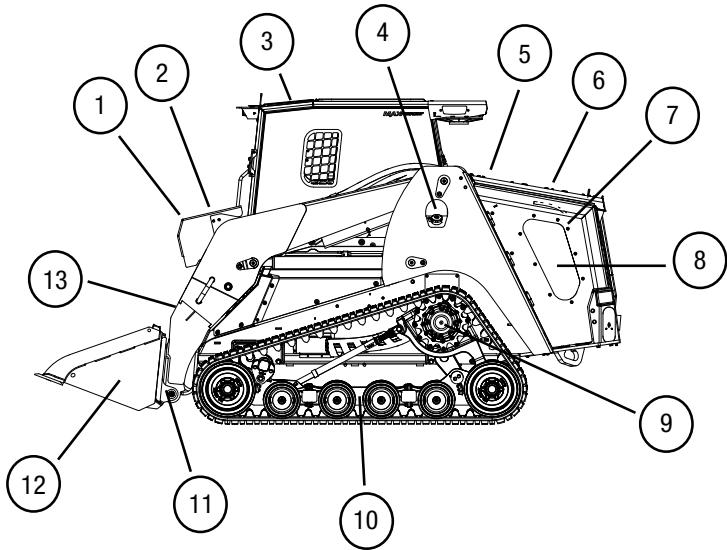
- Hoses and hose lines must be replaced if any of the following criteria are encountered during inspections:
 - damage to the outer hose up to the insert (for example worn spots, cuts and tears)
 - embrittlement of the outer layer (formation of cracks in the hose material)
 - deformation when under pressure, without pressure or when bending which differ from the original shape of the hose or hose line, for example separation of layers, formation of bubbles or leaks
 - damage resulting from improper installation
 - damage or deformation to the hose fitting that reduces the stability of the fitting or the hose/fitting connection
 - hose coming loose from the fitting
 - corrosion of the fitting that reduces functionality and stability
 - exceeding storage times and usage periods
- When replacing hoses and hose lines, use only original equipment replacement parts. Install hoses and hose lines properly. Do not confuse connections.

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3.1 General Structure

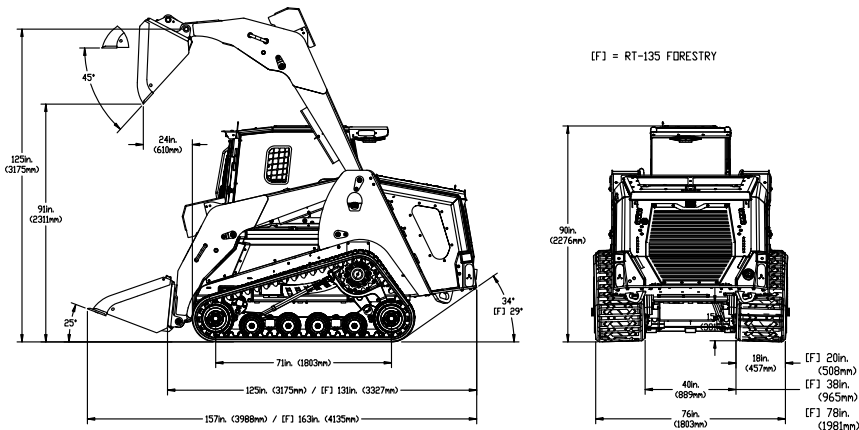


Key

1. Auxiliary Hydraulic Quick Couplers (see section 3.7)
2. Electric Attachment Control Receptacle (see section 4.9)
3. Operator Enclosure (R.O.P.S./F.O.P.S. approved)
4. Diesel Fuel Fill Location
5. Product PIN Plate (on rear of RH lift arm tower, under hood)
6. Hood (engine cover)
7. Hydraulic Oil (fill location, in engine compartment)
8. Engine
9. Drive Motor and Sprocket
10. Undercarriage
11. Quick Attach
12. Bucket
13. Lift Arm

3 TECHNICAL DATA

3.2 Views



3.3 Engine

RT-135

Forestry

Make	Cummins	Cummins
Type	QSF 3.8	QSF 3.8
Design	4 cyl. (turbo / aftercooled)	4 cyl. (turbo / aftercooled)
Displacement	232 in. ³ (3.8L)	232 in. ³ (3.8L)
Power @ 2500 RPM	132 hp (98.4kW)	132 hp (98.4kW)
Admissible inclines	35° all directions (engine)	35° all directions (engine)
Cooling	Water-antifreeze blend	Water-antifreeze blend

3.4 Electrical System

RT-135

Forestry

Operating Voltage	12 V	12 V
Battery @ 32° F (0° C)	12V 950 CCA	12V 950 CCA
Alternator	12V 120A	12V 120A
Starter	12V	12V
Starting Aid	Air intake grid heater	Air intake grid heater
Lighting System	Cab mounted work lights	Cab mounted work lights

3.5 Undercarriage

RT-135

Forestry

Type	Suspended, rubber track	Suspended, rubber track
Max. Speed (Low/High)	6/10 mph (9.7/16 kph)	6/10 mph (9.7/16 kph)
Power Transmission	variable disp.	variable disp.
Track length, on ground	71 in. (180.3 cm)	71 in. (180.3 cm)

3 TECHNICAL DATA

3.6 Transmission

RT-135

Forestry

Design	Axial piston	Axial piston
Displacement	3.84 in. ³ (63 cc) / rev.	3.84 in. ³ (63 cc) / rev.
Relief Pressure	5500 psi (37,920 kPa)	5500 psi (37,920 kPa)

3.7 Auxiliary Hydraulics

RT-135

Forestry

Design	Axial Piston	Axial Piston
Displacement	6.1 in. ³ (100 cc) /rev.	6.1 in. ³ (100 cc) /rev.
Relief press. Low Flow	3300 psi (22,750 kPa)	3300 psi (22,750 kPa)
Relief press. High Flow	4060 psi (27,993 kPa)	4060 psi (27,993 kPa)
Low Flow @2500 RPM	0-20 gpm (0-75.7 lpm)	0-20 gpm (0-75.7 lpm)
High Flow @2500 RPM	30-50 gpm (114-189 lpm)	30-50 gpm (114-189 lpm)

3.8 Ground pressure

RT-135

Forestry

At operating weight (18")	4.4 psi (30.3 kPa)	N/A
At operating weight (20")	N/A	4.6 psi (32 kPa)



3.9 Operating Specs. RT-135

Forestry

Tipping load *	10000 lb (4536 kg)	11858 lb (5379 kg)
Operating capacity 50%*	5000 lb (2268 kg)	5929 lb (2683 kg)
Operating capacity 35%*	3500 lb (1588 kg)	4150 lb (1882 kg)

Note: The Maximum Gross Vehicle Weight of the RT-135 is not to exceed 17,300 lb (7,847 kg.). This includes an operator, accessories, attachments and material being carried. * *Tipping load and operating capacity are measured using a foundry bucket.*

3.10 Refill Capacities (approx.) RT-135

Forestry

Fuel tank	52 gal (196.8l)	52 gal (196.8l)
Hydraulic tank	22 gal (83.3 l)	22 gal (83.3 l)
Engine coolant	5.5 gal (20.8 l)	5.5 gal (20.8 l)
Engine oil including filter	12 qt. (11.36 l)	12 qt. (11.36 l)

3 TECHNICAL DATA

3.11 Fluid Specifications (applies to both machines)

<u>Specifications</u>	<u>Designation</u>	<u>Specification/standard</u>
Fuel	Diesel Fuel	Ultra Low Sulfur Diesel ASTM S-15
Engine Oil	Engine Oil	ASV ELITE 5W-40 HD Full Synthetic
Engine Coolant	Coolant	OAT Final Charge extended life
Hydraulic Oil	Hydraulic Oil	ASV ELITE ZF 46 MV
Diesel Exhaust Fluid	DEF	API Certified DEF
Lubricating Points	Grease	ASV ELITE Green

Note: ULSD / Biodiesel fuel blends up to B20 (20% biodiesel) supplied by a BQ9000 certified supplier are considered acceptable (see Fuel for Cummins Engines, Bulletin 3379001 for additional information).

3.12 Dimensions and Weights RT-135

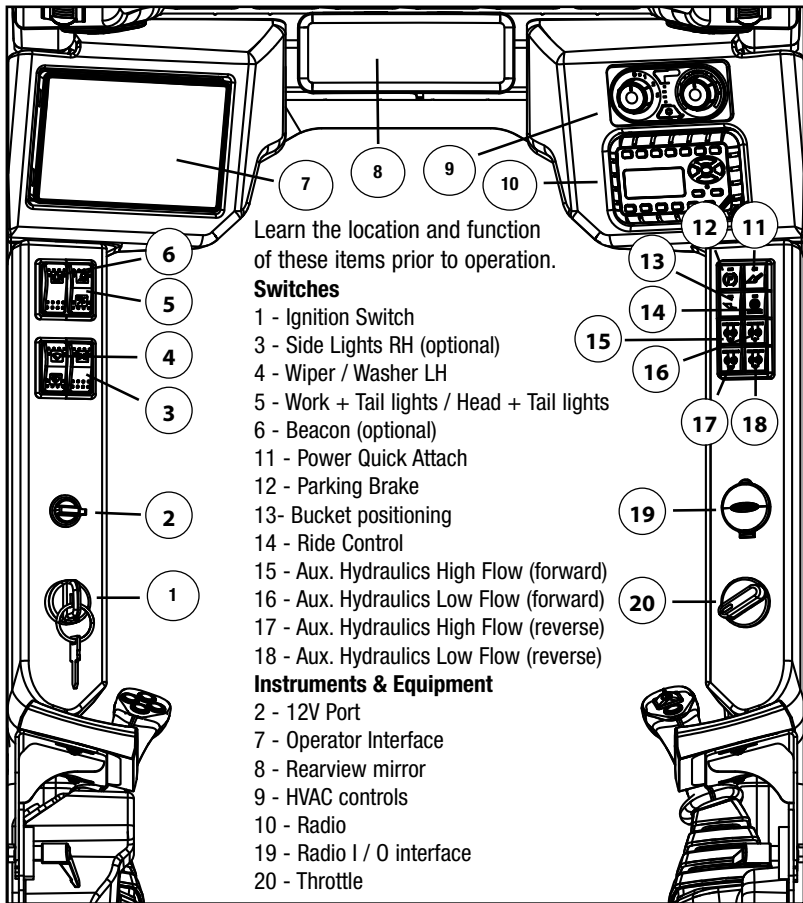
Forestry

Length w/o bucket	125 in. (3175 mm)	131 in. (3327 mm)
Length w/bucket	157 in (3988 mm)	163 in. (4135 mm)
Width (Max)	78 in. (1981 mm)	78 in. (1981 mm)
Width (Min)	76 in. (1803 mm)	78 in. (1981 mm)
Height (to top of cab)	90 in. (2276 mm)	90 in. (2276 mm)
Ground Clearance	15 in. (381 mm)	15 in. (381 mm)
Weight (operating)	12075 lb (5477 kg)	12990 lb (5892 kg)
Weight (ship / no bucket)	11023 lb (5000 kg)	11958 lb (5424 kg)

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4.1 Display Elements / Switches



NOTICE

The RT-135 is equipped with self-diagnostic features common to modern diesel engines. Should an alarm message be displayed (or other critical warning indicator illuminate) on the operator interface during normal operation, shut the machine down immediately (in a safe location).

Consult your dealer to access and interpret diagnostic codes and recommend service (if needed). Complete necessary repairs before resuming operation.

See also "Active Faults" accessed through the main, diagnostics and fault log menus found on page 70 of this manual for further information.

The engine may automatically derate if necessary, but as a precaution, always shut the machine down if any critical alarm messages or warnings appear during operation to prevent damage.

4 MACHINE DESCRIPTION / CONTROLS

4.2 Symbols

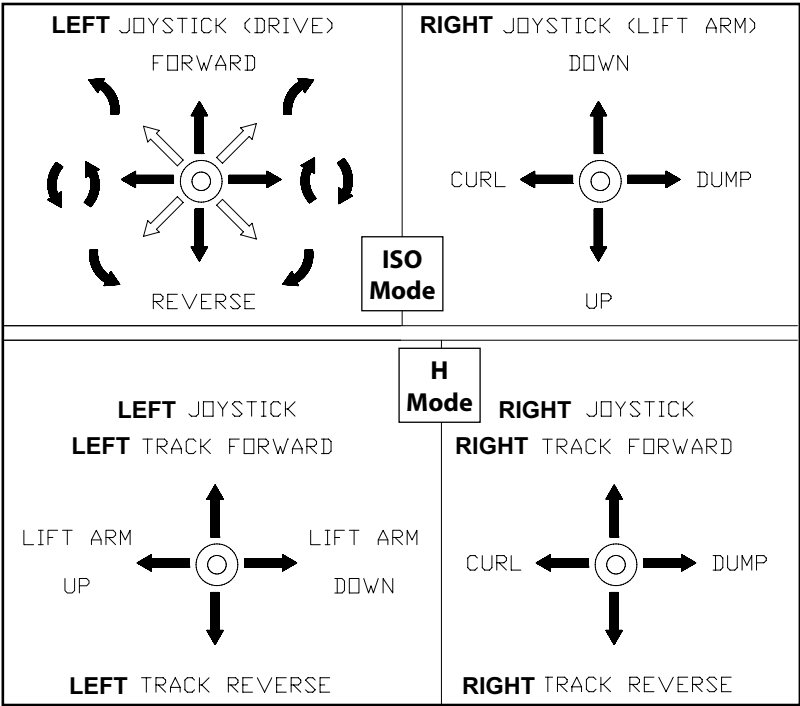
Symbol	Description
	Parking Brake
	Battery
	Engine Speed: Fast Transmission Range: High
	Engine Speed: Slow Transmission Range: Low
	Windshield Wiper / Washer
	Engine Pre-Heat
	Oil Pressure
	Engine Coolant Temperature
	Hydraulic Oil Temperature
	Engine RPM

4 MACHINE DESCRIPTION / CONTROLS

Symbol	Description
	Work & Tail Lights / Head & Tail Lights
	Side Lights
	Ride Control
	Bucket Positioning
	Power Quick Attach
	Beacon
	High flow Auxiliary / (reverse flow)
	Low flow Auxiliary / (reverse flow)
	Hydraulic Oil Only
	Ultra Low Sulfur Diesel Fuel

4 MACHINE DESCRIPTION / CONTROLS

4.3 Controls



The RT-135 is equipped with joystick style controls. The joysticks are used to control machine speed and direction as well as lift arm and bucket functions. The operator can select between two propel modes (accessed through the operator interface) to suit operator preference, ISO (standard) and H mode. The propel mode can be changed by selecting “propel mode” from the main menu as described in the operator interface section of this chapter.

Note: Upon startup, the current propel mode will be displayed on the operator interface screen to make the operator aware of the current control configuration.

4.3.1 Right Joystick

In ISO mode, the right joystick is used to control the lift arms, bucket, and to engage the float function. In H mode, the right joystick controls bucket and right track movement (see illustration above).

Note: To engage lift arm float, move the appropriate joystick to lower the lift arm, then press the trigger on the front of the right joystick. The lift arms will then stay in float mode until the button is pressed again or the operator raises the lift arms.

4.3.2 Left Joystick

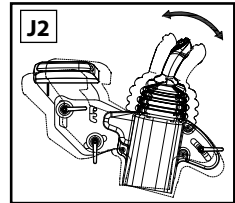
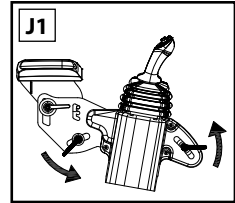
In ISO mode, the left joystick controls machine direction and speed. In H mode, the left joystick controls lift arm and left track movement (see illustration above).

4.3.3 Control Assembly Adjustment

In some configurations, joystick and armrest position are adjustable for comfort.

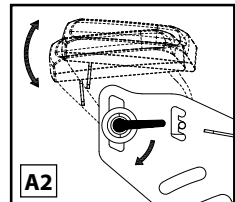
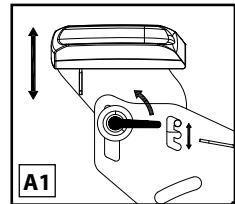
To adjust Joystick Position:

1. Rotate the two highlighted levers counter-clockwise to loosen to assembly for adjustment (fig. J1).
2. Adjust position as desired for comfort (fig. J2).
3. Reverse step 1 of this procedure to tighten and secure the assembly.



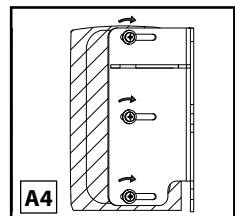
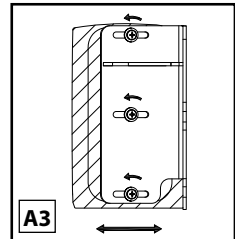
To adjust Armrest (height / angle):

1. Rotate the highlighted lever counter-clockwise to loosen the assembly for adjustment.
2. Adjust height by engaging the forward setting pin in the desired slot (fig. A1).
3. Set desired angle by rotating the armrest as shown (fig. A2).
4. Rotate the lever clockwise to tighten and secure the assembly (fig. A2).



To adjust Armrest Pad (inward / outward):

1. Loosen the fasteners securing the armrest pad to the bracket (fig. A3, view is from the underside of the pad).
2. Adjust the armrest pad inward or outward as desired for comfort (fig. A3).
3. Tighten the fasteners to secure the assembly (fig. A4).



4 MACHINE DESCRIPTION / CONTROLS

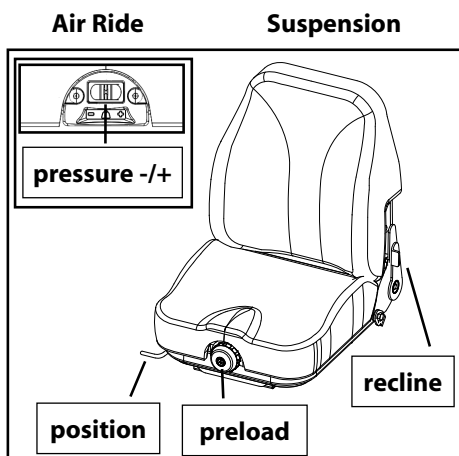
4.4 Operator Seat

The RT-135 is available with mechanical or air ride adjustable suspension seats.

To adjust preload:

Mechanical: Rotate the knob clockwise to increase preload for a heavier operator, counter clockwise to decrease preload for lighter operator.

Air Ride: Press + to increase pressure for a heavier operator, press - to decrease pressure for lighter operator.



To adjust position (fore/aft):

Lift the lever upward, then slide the seat forward or rearward as needed. Release the lever to set position.

To adjust recline:

Press the lever rearward, lean forward or rearward to adjust the level of recline, release lever to set recline.

4.5 Throttle

The hand throttle is located on the right hand pillar when seated in the machine. The foot throttle is located in the footwell on the right hand side. Throttle controls engine RPM.

The foot throttle works in tandem with the hand throttle. Set a base engine RPM with the hand dial, then increase (see note) RPM as needed with the foot pedal. Release the foot pedal to return to the level set with the hand throttle.

Note: When the hand dial is turned fully clockwise (wide open throttle), the foot throttle acts to decrease RPM as needed. Release the foot pedal to return to the level set with the hand throttle.

- Twist the hand throttle clockwise to increase engine RPM.
- Twist the hand throttle counter-clockwise to decrease engine RPM.
- Select a lower rpm for work that requires delicate operation.
- Select a higher rpm for faster travel or when more power or flow is needed.

4 MACHINE DESCRIPTION / CONTROLS

4.6 Two Speed

The RT-135 is equipped with a two-speed drive system. Low range is best suited to performing strenuous work or operating attachments. High range is intended mainly for transporting.

To shift between high and low ranges, push the button on the front of the left joystick. When shifting between ranges, slow the machine to ensure a smooth transition. The high range indicator (rabbit icon) illuminates to confirm high range operation.

Note: If the machine is turned off, the lap bar is raised, or the operator exits the seat, the machine automatically returns to low range.

4.7 Bucket Positioning

RT-135 machines are equipped with feature called bucket positioning. The bucket positioning system does not automatically level your attachment. Instead, it will maintain the current angle of the quick attach (relative to level) throughout the upward cycle of the lift arms.



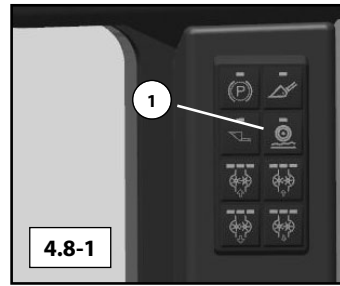
The bucket positioning feature can be turned on or off with the button located on the right switch panel (item 1, figure 4.7-1).

Note: The bucket positioning function can be overridden by operating the curl or dump functions of the appropriate joystick.

4 MACHINE DESCRIPTION / CONTROLS

4.8 Ride Control

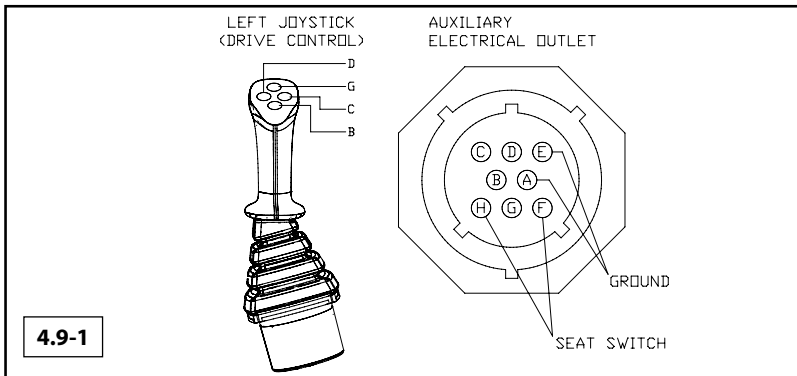
RT-135 machines are equipped with a feature called ride control. This feature, when activated, acts as a shock absorber within the hydraulic system when a load is being carried. As a result, the machine is able to carry the load in a more controlled manner over rough terrain which improves ride and operator comfort.



The ride control feature can be turned on or off with the switch located on the right switch panel (item 1, fig. 4.8-1).

- The ride control switch must be deactivated in order to start the engine.

4.9 Electric Attachment Control



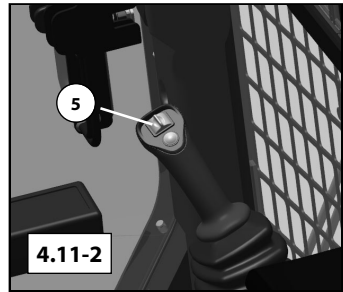
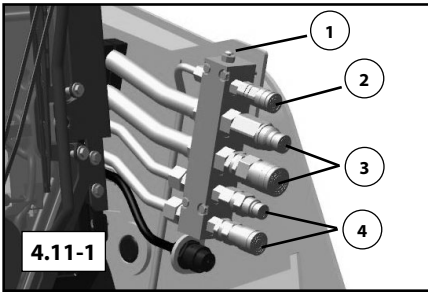
Attachments for the RT-135 can be controlled by pressing various buttons on the joysticks or switches in the cab. Most attachments are controlled hydraulically, but some require both hydraulic and electrical inputs. The upper 4 buttons on the left joystick (4.9-1) can send up to 20 amps (combined) of electrical current to pins B, C, D, G of the receptacle on the lift arms (4.9-1). Attachments requiring electrical inputs must have a matching receptacle.

Note: The electrical receptacle is not compatible with all attachment brands. Use only compatible attachments for proper function (see section 4.14).

4.10 Auto Idle

The RT-135 machines are equipped with a feature called Auto Idle. When activated the feature causes the machine to idle down to conserve fuel when it is not commanded to do work through the various controls and switches for 5 seconds.

This feature can be enabled or disabled through the main menu found in the operator interface section of this chapter.



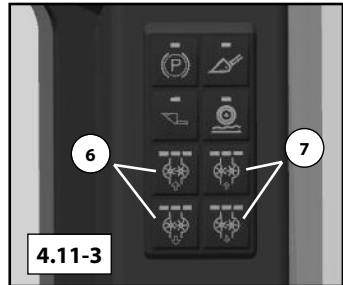
4.11 Auxiliary Hydraulics

The RT-135 models come equipped with an auxiliary hydraulic system designed to power compatible hydraulic attachments (see section 4.14).

To operate, connect the attachment to the quick couplers (fig. 4.11-1).

To connect couplers:

1. Clean couplers thoroughly (both ends).
2. Release residual pressure in the system by pressing item 1 (fig. 4.11-1).
3. Push the male and female coupler ends together, then turn coupler collar 1/4 turn to lock.



Component Identification:

- | | |
|---------------------------|------------------------------------|
| 1. Pressure release valve | 5. High/Low flow (variable) switch |
| 2. Case drain coupler | 6. High flow switches |
| 3. High flow couplers | 7. Low flow switches |
| 4. Low flow couplers | |

The auxiliary hydraulics can be engaged intermittently or continuously depending on the requirements of the attachment being utilized.

To engage the low flow auxiliary circuit intermittently, roll the switch on the top of the right joystick (item 5) to the right or left of center to control flow volume and direction (fig. 4.11-2).

To engage the high or low flow auxiliary circuit continuously, activate the switch for the desired circuit on the switch panel, labeled 6 or 7 in figure 4.11-3.

Note: The upper auxiliary hydraulic buttons direct fluid in one direction, while the lower buttons direct fluid in the opposite direction allowing flow reversal within the circuit.

Note: The auxiliary hydraulic switches must be pressed and held in place until all three of the LED lights at the top of the button illuminate indicating activation.

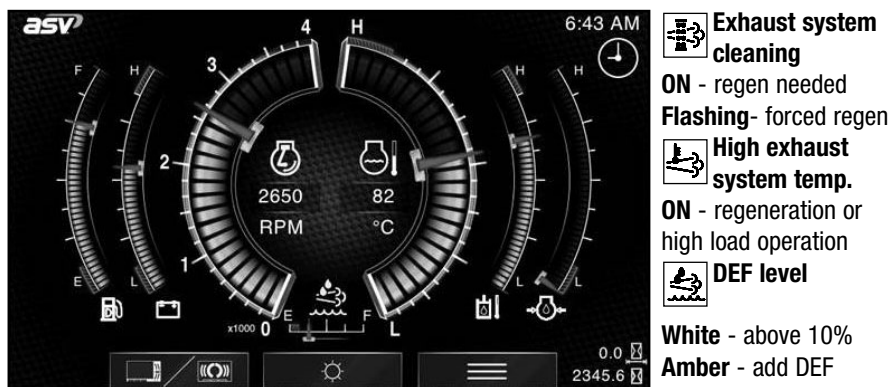
Note: In the event of low engine oil pressure, or a low hydraulic oil level, high flow auxiliary hydraulics will be automatically disabled.

4 MACHINE DESCRIPTION / CONTROLS

4.12 Operator Interface

The operator interface allows the operator to monitor machine systems. Data is displayed in various formats to keep the operator informed during operation. The display is equipped with a user friendly touch screen. To make a selection, simply touch the screen over active selection options to open sub-menus and screens.

User Guide - Initial View



When the key is turned on, the operator interface powers up to display the full gauge screen as shown (or password lock screen if enabled, see pg. 54). This screen displays many critical operating parameters such as: engine RPM, engine oil pressure, engine coolant temperature, hydraulic oil temperature, fuel level, DEF level, battery voltage, total engine hours and trip engine hours.

The selection bar visible on the bottom of this screen allows the operator to:

- Toggle between auto backup camera (full gauge screen) and split-screen (gauges and backup camera) modes (left). This selection will not be present if the backup camera is disabled.
- Access the brightness adjustment screen (middle).
- Access the main menu (right).

To access these sub-menus / screens, touch the screen over the desired icon.

User guide - Common Selections

-  To return to the gauge screen from sub-menus or screens, press the “home” icon.
-  To return to the previous screen, press the left arrow. Other directional arrows may appear to toggle between options.
-  To reset maintenance or job clocks to zero, press the “reset” icon.
-  To start a job clock, press the “play” icon.

4 MACHINE DESCRIPTION / CONTROLS



To pause a job clock, press the “pause” icon.



To confirm a selection, press the “confirm” icon when prompted.

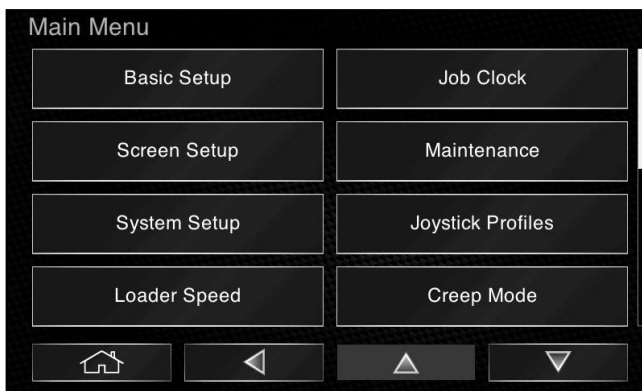


To cancel a selection, press the “cancel” icon when prompted.

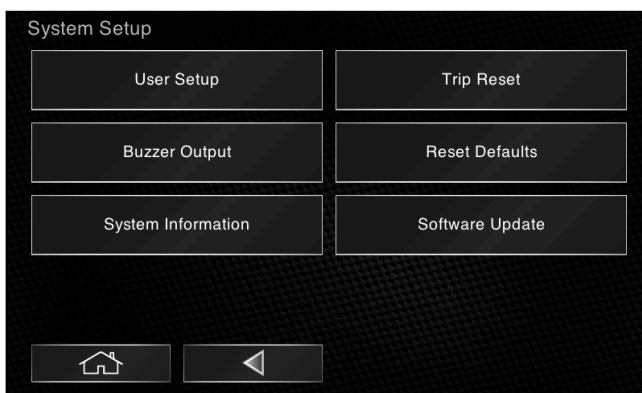
User Guide - Commonly Accessed Functions

The Main Menu (shown below) is the starting point for navigating the various functions within the operator interface. You will start here to access the functions discussed in this section. **Note:** some sub-menu items may only be accessed from the Admin level user profile (see pg. 54).

To reset Trip Hours:



1. Select System Setup from the main menu.



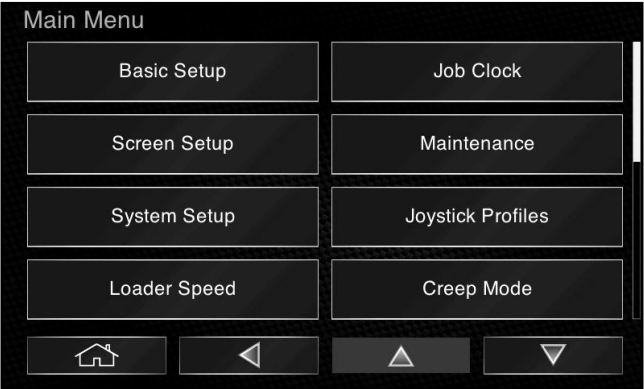
2. Select Trip Reset from the System Setup sub-menu.

4 MACHINE DESCRIPTION / CONTROLS



3. When the operator interface asks “are you sure?” select the lower right icon to confirm and reset the trip hours.

To reset Job Clock:



1. Select Job Clock from the main menu.



2. Select the reset icon in the lower right corner of the screen.

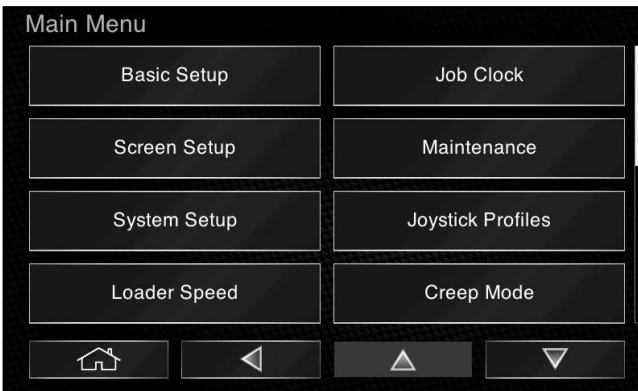


3. When the operator interface asks “are you sure?” select the lower right icon to confirm and stop / reset the job clock.

Buzzers & Pop-ups

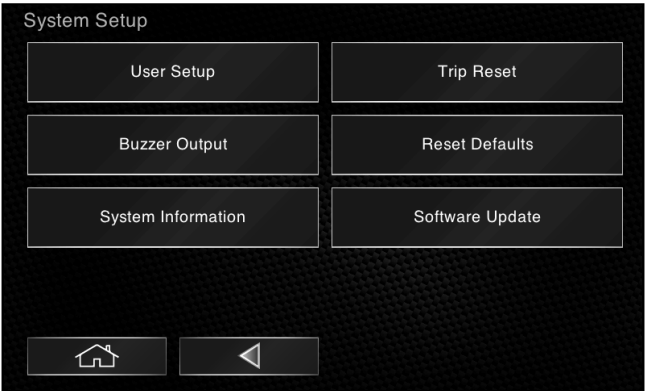
The machine is equipped with various notification methods to alert the operator to items that require their attention during operation. However, if considered a distraction, some may be disabled.

To disable buzzers:



1. Select System Setup from the main menu.

4 MACHINE DESCRIPTION / CONTROLS



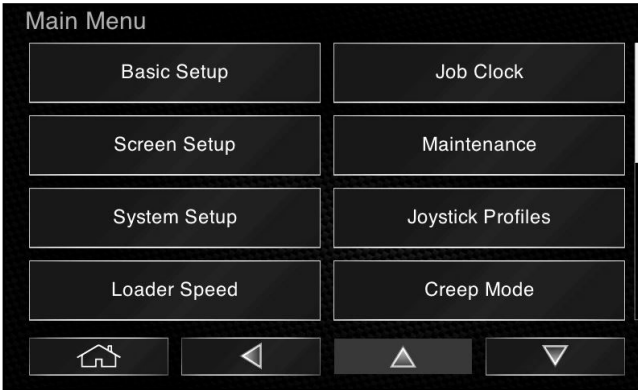
2. Select Buzzer Output from the System Setup sub-menu.



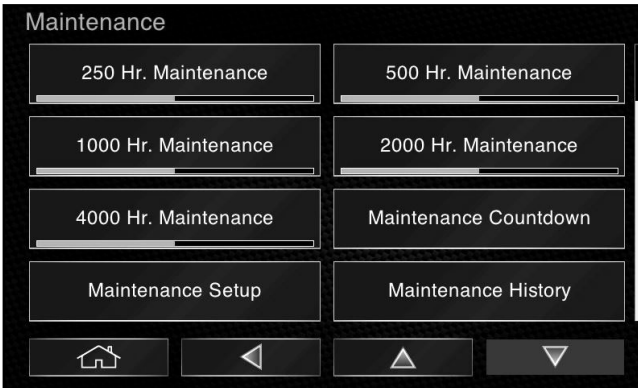
3. Select Disable and the arrow to the left of the Enable icon will then appear next to Disable indicating that buzzers have been disabled. To re-enable buzzers, select the Enable icon.

4 MACHINE DESCRIPTION / CONTROLS

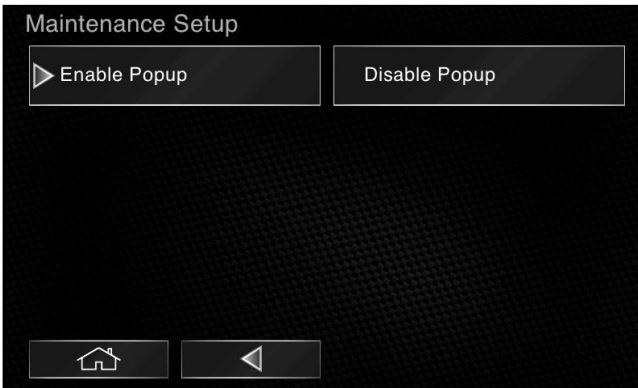
To disable maintenance pop-ups:



1. Select Maintenance from the main menu.



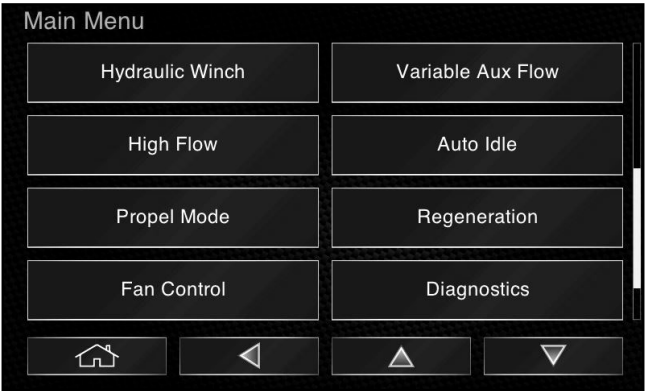
2. Select Maintenance Setup from the Maintenance sub-menu.



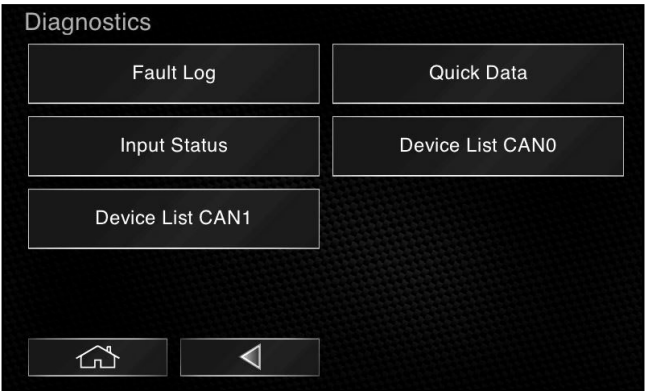
3. Select Disable Popup and the arrow to the left of the Enable Popup icon will then appear next to Disable Popup indicating that Pop-ups have been disabled. To re-enable pop-ups, select the Enable Popup icon.

4 MACHINE DESCRIPTION / CONTROLS

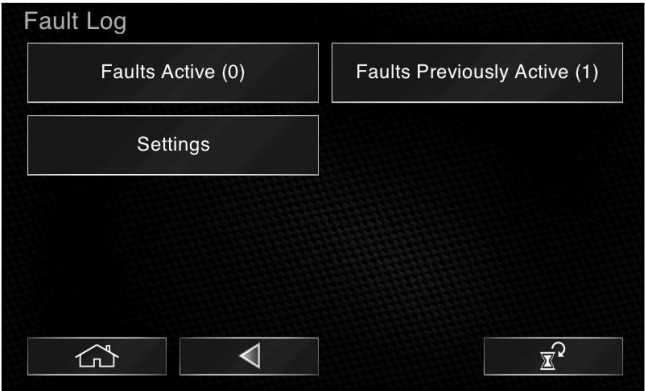
To disable fault pop-ups:



1. Select Diagnostics from the main menu.

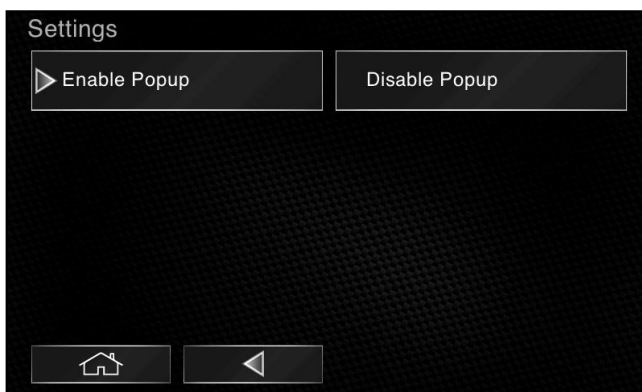


2. Select Fault Log from the Diagnostics sub-menu.



3. Select Settings from the Fault Log sub-menu.

4 MACHINE DESCRIPTION / CONTROLS



3. Select Disable Popup and the arrow to the left of the Enable Popup icon will then appear next to Disable Popup indicating that Pop-ups have been disabled. To re-enable pop-ups, select the Enable Popup icon.

4 MACHINE DESCRIPTION / CONTROLS

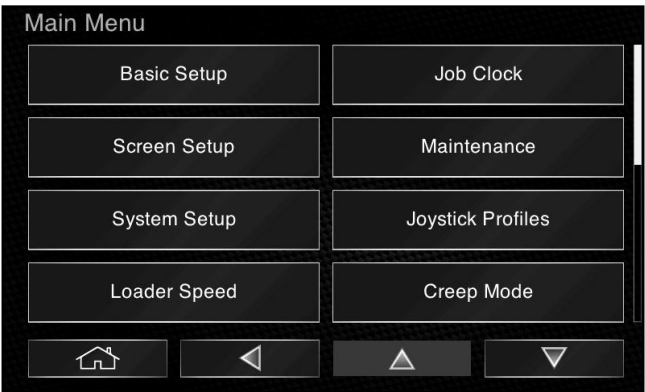
User Guide - Password Protection and User Profiles

The operator interface allows the use of operator (user) profiles accessed via password upon machine startup. User profiles allow operators to use the machine, but with limited access to various functions within the operator interface. For example, they may change their passwords and reset the job clock, but may not reset operating statistics. Only the administrator (admin) user profile may reset statistics or add/delete user profiles.

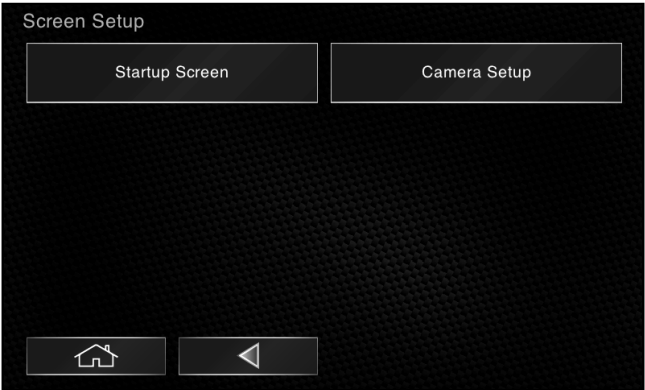
Password protection

The admin user profile is the default profile on the machine. If password protection is not enabled, any person who enters the machine is able to access the operator interface as the administrator and make changes as desired.

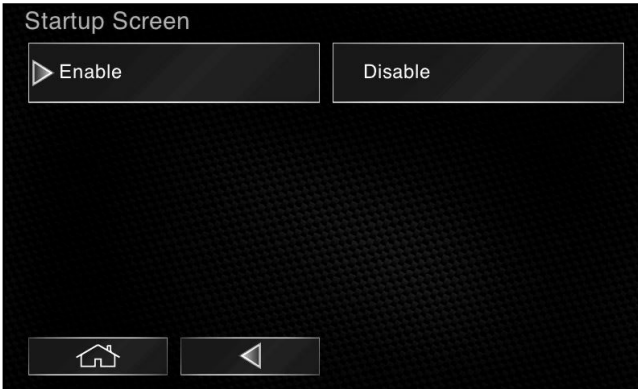
To Enable Password Protection:



1. Select Screen Setup from the main menu.



2. Select Startup Screen from the Screen Setup sub-menu.

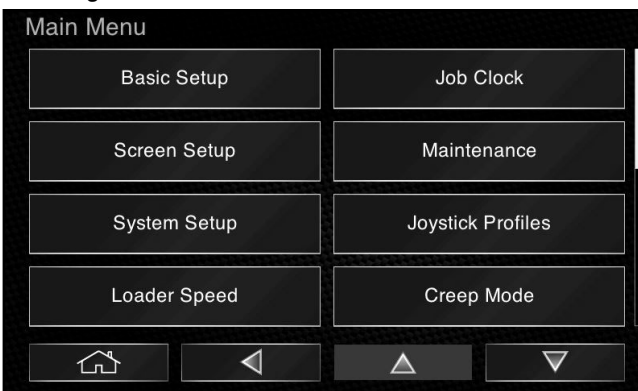


3. Select Enable From the Startup Screen sub-menu.

The default administrator password is 1111. Once you enable password protection, you must turn the key to the off position, wait 10 seconds to allow the change to take effect, then you may turn the key on and enter the default password to gain access to the operator interface.

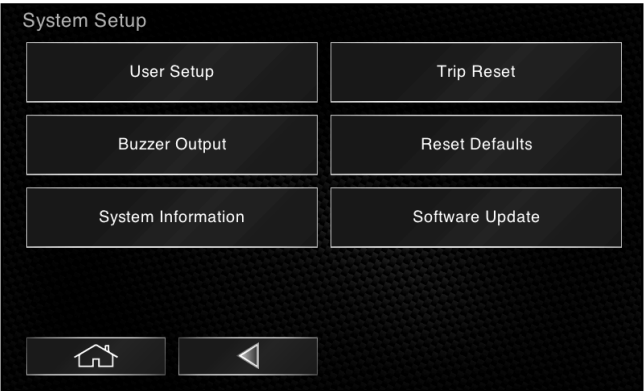
Once logged in, you can access the Administrator (Admin) user profile, change passwords, reset statistics or create new user profiles with their own individual passwords to limit access and allow the collection of useful operating statistics for each operator. **DO NOT forget the password to the administrator profile** (see “Forget your password?” later in this section).

To Change Your Username or Password:

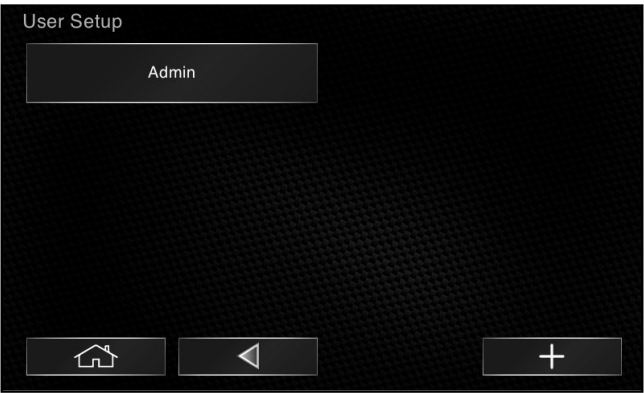


1. Select System Setup from the main menu.

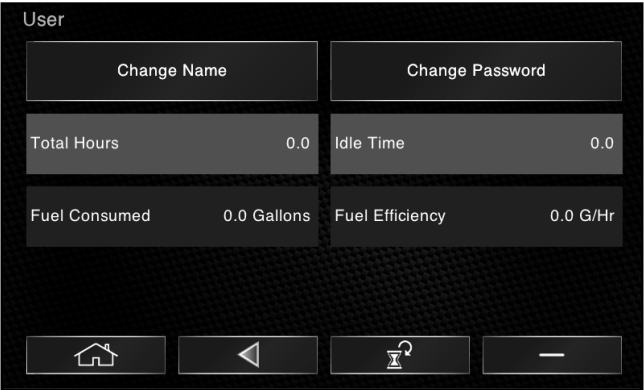
4 MACHINE DESCRIPTION / CONTROLS



2. Select User Setup from the System Setup sub-menu.



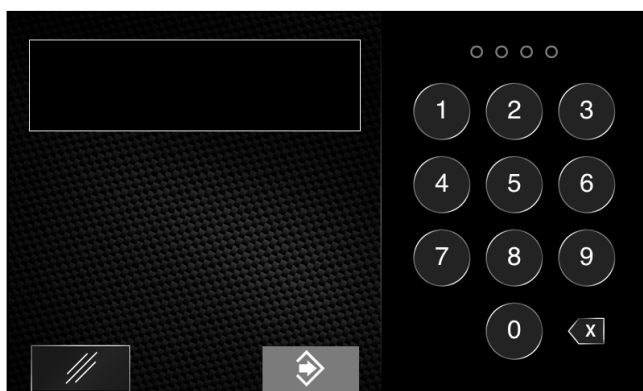
3. Select the Admin (or your user profile) icon from the User Setup sub-menu.



4. Select Change Name (or password, see step 6) from the User sub-menu.



5. Enter your desired username and select confirm in the lower right corner of the screen.



6. Enter your desired password and select confirm in the lower right corner of the data entry screen.

Note: You will enter and confirm the new password twice when setting up a new profile or changing passwords as you follow the on screen sequence. Turn the key off and wait 10 seconds for the password change to take effect. Turn the key on and access the desired user profile with the password set for that profile.

Forget your password?

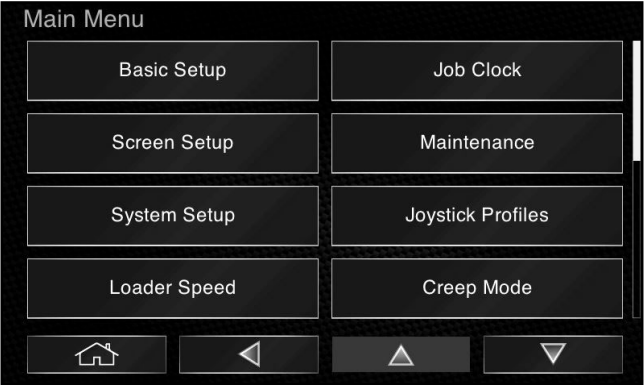
If the password for a general user profile is forgotten, simply log in as the administrator and change the password as described in this section.

If the password for the administrator profile is forgotten, you must return to your local dealer and have the operator interface reset.

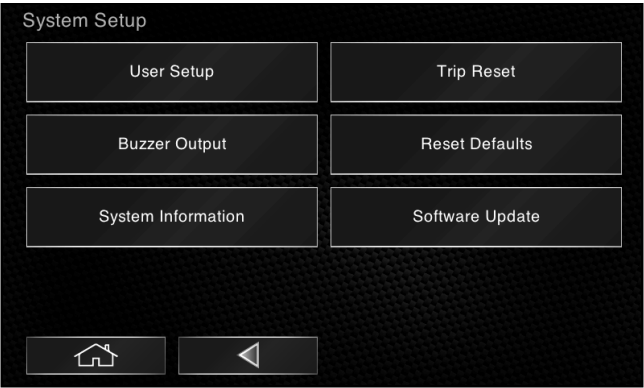
4 MACHINE DESCRIPTION / CONTROLS

User Profiles

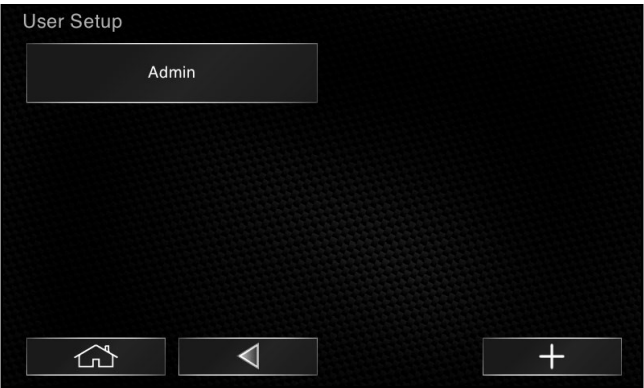
To create new user profiles:



1. Select System Setup from the main menu.



2. Select User Setup from the System Setup sub-menu.



3. Select the + icon in the lower right corner of the screen.

4 MACHINE DESCRIPTION / CONTROLS

User

Change Name	Change Password
Total Hours 0.0	Idle Time 0.0
Fuel Consumed 0.0 Gallons	Fuel Efficiency 0.0 G/Hr

Home Back Lock Screen

4. Enter a new username and change / enter password as described earlier in this section to allow the profile to be accessed upon startup through the password lock screen.

Once established, a user profile may be accessed upon startup by entering the associated password. Each profile will gather information about operation performed while signed in. Monitoring these statistics can be useful to help maximize efficiency or keep track of operating hours for a given operator or project.

To reset operating statistics (or delete a profile) for a given user:

1. Turn the key off, then turn the key back on to bring up the login screen.

asv

2702.0

0000

1 2 3
4 5 6
7 8 9
0 X

2. Log in using the password set for the Admin user profile.
3. Repeat steps 1 & 2 of the “create new user profiles” procedure on the preceding page. Then select the user profile for which you would like to reset statistics (or delete).

4 MACHINE DESCRIPTION / CONTROLS

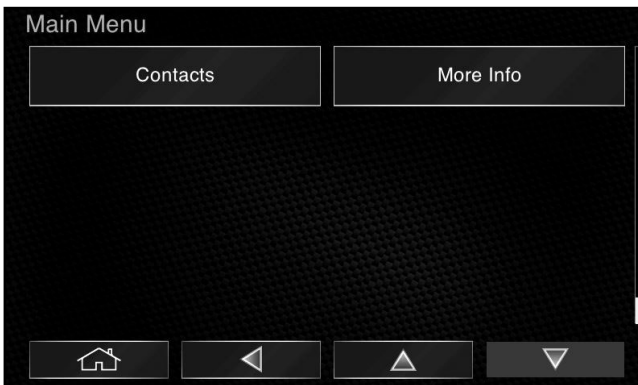
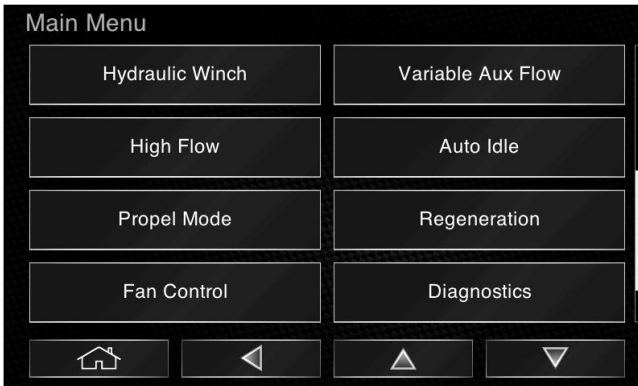
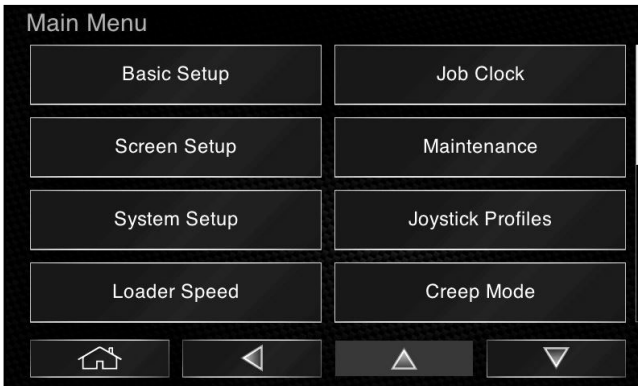
User

Change Name		Change Password	
Total Hours	0.0	Idle Time	0.0
Fuel Consumed	0.0 Gallons	Fuel Efficiency	0.0 G/Hr



- 4. **To reset user statistics**, select the “reset” icon at the bottom of the screen. When prompted, “are you sure?” select the confirm icon.
- 5. **To delete a user profile**, select the - Icon in the lower right corner of the screen. When prompted, “are you sure?” select the confirm icon.

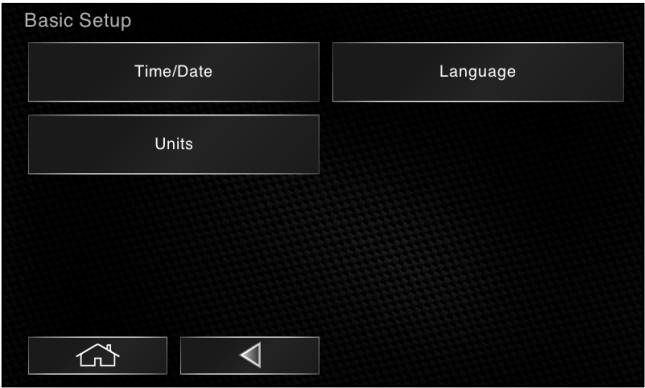
Main Menu



This screen allows you to access various sub menus. Simply scroll until you see the desired icon, then touch the screen over the icon to select its sub-menu. Press the Home icon to return to the gauge screen or back arrow to return to the previous screen.

4 MACHINE DESCRIPTION / CONTROLS

Basic Setup Menu



This screen allows you to enter the following sub-menus to change display parameters:

- Time / Date
- Language
- Units

Job Clock

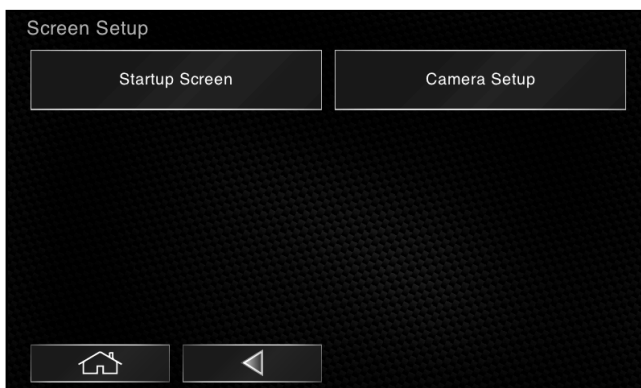


This screen displays collected operating information for a set period of time.

Note: When the job clock is active, you may access it from the home screen by clicking on the clock icon in the upper right corner of the screen.

- **To start the job clock:** Press the right facing arrow (play) icon on the screen. Once activated, you will see a clock icon appear in the upper right hand corner of the gauge screen.
- **To pause the job clock:** Press the II (pause) icon on this screen. The icon on the gauge screen will also display the II (pause) symbol across the clock icon.
- **To resume the job clock when paused:** Press the play icon here.
- **To reset the job clock to zero:** Press the reset icon here.

Screen Setup



This screen allows access to Startup Screen options (password protection enabled / disabled) and Camera Setup (enabled /disabled or flip horizontal or vertical).

Maintenance Menu



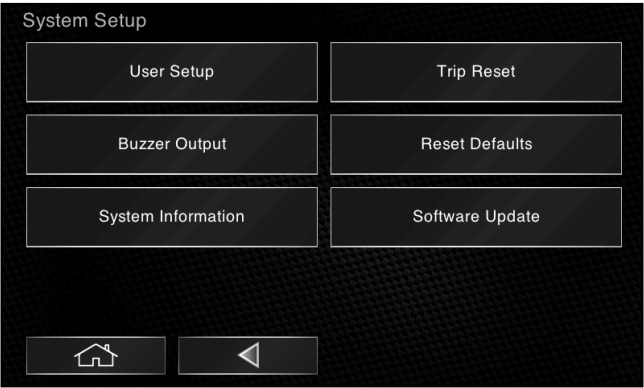
This screen allows access to various sub-menus relating to Maintenance. Within each sub-category, you will find the maintenance tasks required at each service interval. You will also find trackers that log operating hours since the last service interval. Once service is required, a pop-up will display on the screen indicating a need for maintenance. Once complete, you may reset the maintenance clock in the appropriate category allowing the interface to properly calculate the next service interval and begin the countdown.

Maintenance Setup allows an operator to enable or disable pop-ups relating to maintenance (see section 4.12).

Maintenance History provides a log of maintenance performed over the life of the machine.

4 MACHINE DESCRIPTION / CONTROLS

System Setup



This screen allows access to various sub-menus relating to system parameters.

User Setup allows the Admin user profile to add / change / delete user profiles within the display.

Trip Reset allows an operator to reset the trip engine hour meter.

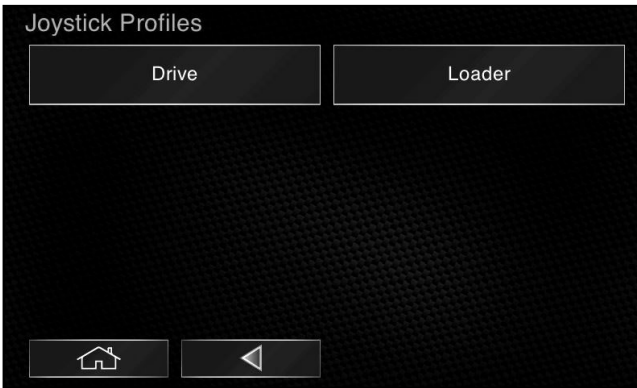
Buzzer Output allows an operator to enable or disable buzzer warnings.

Reset Defaults allows an operator to reset all affected parameters to factory default settings.

System Information provides critical operator interface information (software version, display serial number, etc.)

Software Update is a function that will most likely only be used by dealers as needed. Do not access or make changes to this category unless instructed by your dealer under direction from the ASV service department.

Joystick Profiles



This screen allows access to select between 3 modes of operation for loader and drive functionality relating to speed of movement and control responsiveness.

Soft: Gentle response for maximum precision

Medium: Moderate response for increased speed and efficiency

Aggressive: Rapid response for maximum speed and efficiency

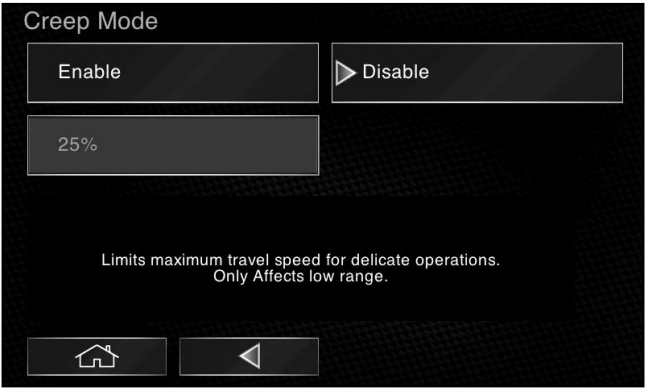
Loader Speed



This screen allows an operator to set the maximum speed of loader movement to limit machine performance as needed.

4 MACHINE DESCRIPTION / CONTROLS

Creep Mode



This screen allows you to activate creep mode which can limit maximum travel speed in low range for delicate operations.

Creep mode affects only low range. When shifted into high range from creep mode (less than 100% setting), the machine will ramp up slowly to 100% speed in low range, then shift into high range.

Similarly, when shifting down from high range into low range creep mode, the machine will shift down to 100% speed in low range, then slowly ramp down to the creep mode (set %) speed.

Hydraulic Winch



The winch is only to be used on an RT-135 Forestry machine equipped with standard polycarbonate rear window.

This screen allows you to choose whether the rocker switch (item 5, section 4.11) controls hydraulic flow at the front auxiliary couplers (disable) or flow at the rear couplers (enable) to power the hydraulic winch.

4 MACHINE DESCRIPTION / CONTROLS

The winch can then be powered by directing flow with item 5, rocker switch (section 4.11 of this manual). Pressing the rocker in one direction will retract the winch cable, while pressing the rocker in the other direction will let the cable out.

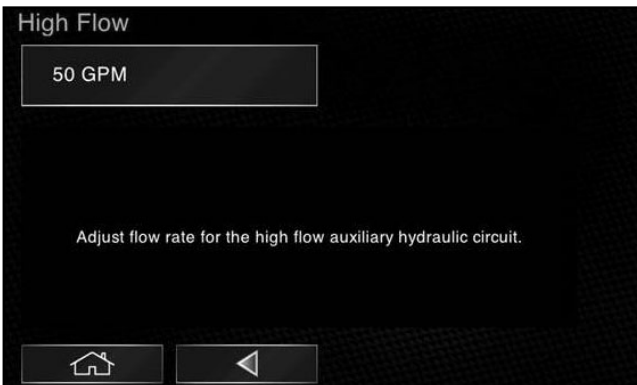
For information regarding the proper operation of the winch, please reference your Warn Industrial Winch installation and operator's guide. The operation and installation instructions for this accessory contain additional supplementary information regarding installation and intended / proper use of the winch.

Variable Auxiliary Flow



This screen allows you to choose whether the rocker switch (item 5, section 4.11) controls low flow or high flow.

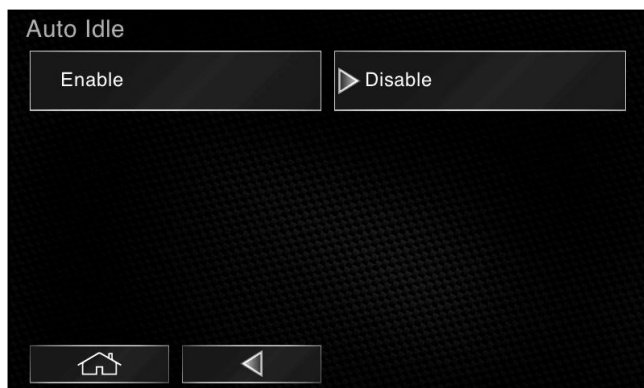
High Flow



This screen allows you to change the flow rate for the high flow auxiliary hydraulic circuit.

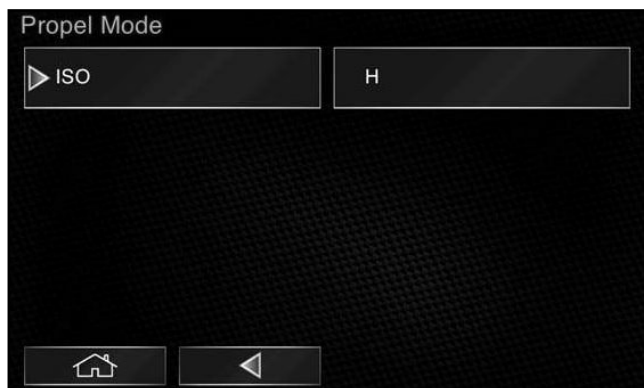
4 MACHINE DESCRIPTION / CONTROLS

Auto Idle



This screen allows you to enable or disable the Auto Idle feature.

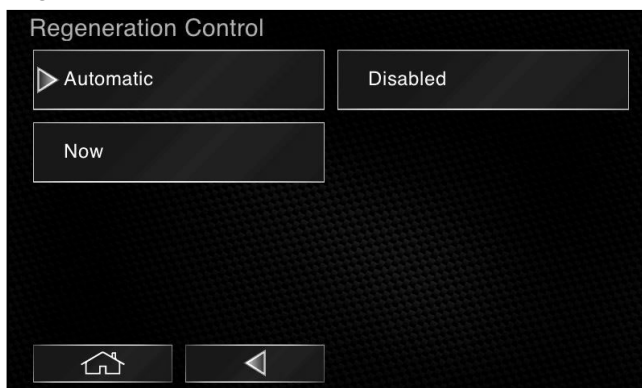
Propel Mode



This screen allows you to change the propel mode (control configuration) of the machine.

- ISO mode is the standard mode identified in section 4.3 of this manual.
- H mode is commonly referred to as a “Case” style control configuration.

Regeneration

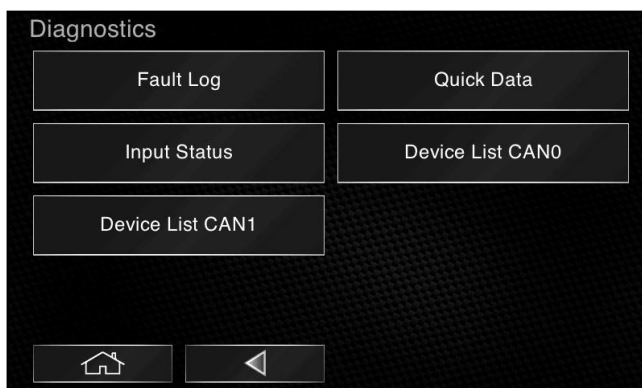


This screen allows you to enable or disable automatic exhaust system cleaning. Disable regeneration only when the surrounding environment is sensitive to high exhaust temperatures (example, flammable items present near exhaust opening). Re-enable automatic regeneration as soon as it is safe to do so.

“Now” allows you to activate forced regeneration (allowed only if needed).

Forced regeneration requires the machine be parked in a safe location on firm and level ground in a well ventilated area away from flammables. The machine must be in neutral with the parking brake applied for the duration of the process (approx. 20-25 min).

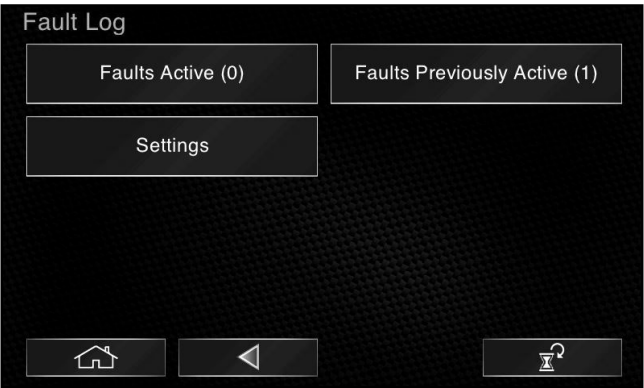
Diagnostics



This screen allows access to various sub-menus relating to diagnostics.

4 MACHINE DESCRIPTION / CONTROLS

Fault Log



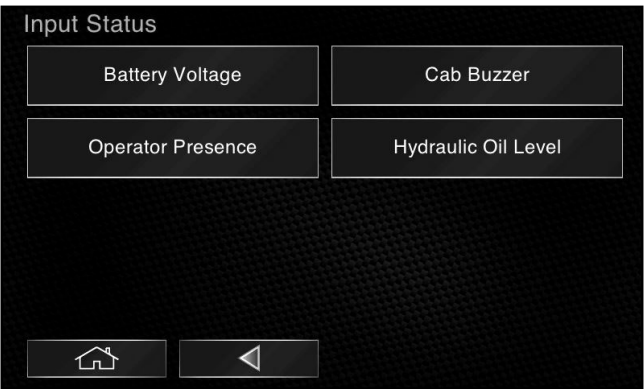
Selecting Fault Log allows access to currently active faults, previously active faults and settings (in which you can enable or disable fault pop-ups).

The faults recorded in Faults Active are typically ones that must be corrected in order to operate the machine.

Note: When a fault is detected, indicators may illuminate accompanied by a pop up message listing the current fault. Indicators will stay illuminated until acknowledged and will remain until the fault is cleared.

- Read, then clear any pop-ups by selecting the icon in the lower right corner.
- Remedy the issue(s) that caused the fault(s) to occur.
- Select the reset icon in the lower right corner of this screen to clear active faults from the operator interface. **Some faults are permanently stored in the engine computer and cannot be reset by the operator interface.** Faults not reset by the operator interface must be reviewed and addressed by your dealer.

Input Status



This screen allows access to inspect the state of various sensors providing the display with information. Select each icon to inspect the state of the item.

Quick Data

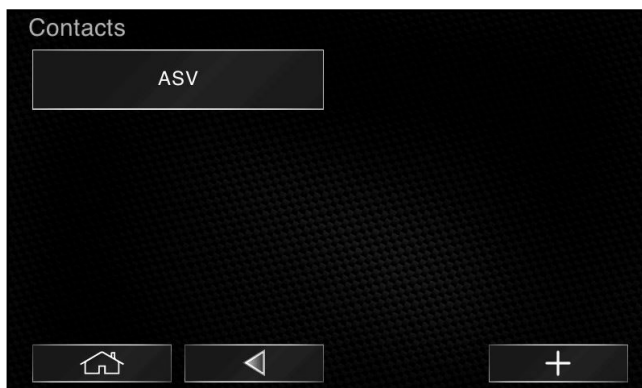


This screen allows you to access various streams of system information. Toggle between the selected signals using the up and down arrow icons to view relevant information.

Device List (CAN 0 / CAN 1)

This screen is there primarily to provide information about devices on the CAN bus to dealers when servicing the machine.

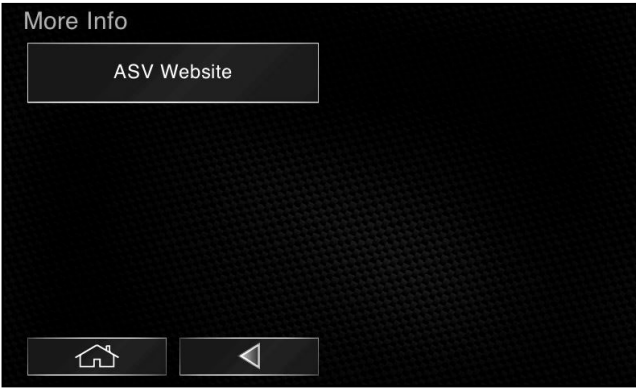
Contacts



This screen provides a place for storing contact information. Select a vacant box (or the + sign) to add name, address, phone, website, etc. for important contacts like your local dealer. Only the Admin user profile may add or delete entries here.

4 MACHINE DESCRIPTION / CONTROLS

More Info

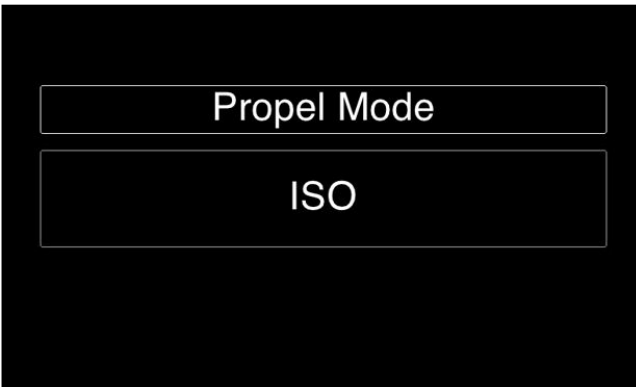


This screen allows an operator to access additional resources relating to the machine.

Splash Screens

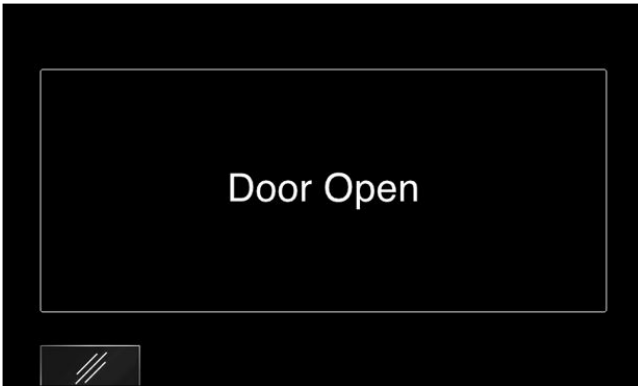
Splash screens display when the operator needs to be notified of issues quickly. Some display momentarily and then disappear. Others indicate a problem that must be acknowledged or resolved before operation can resume.

Propel Mode



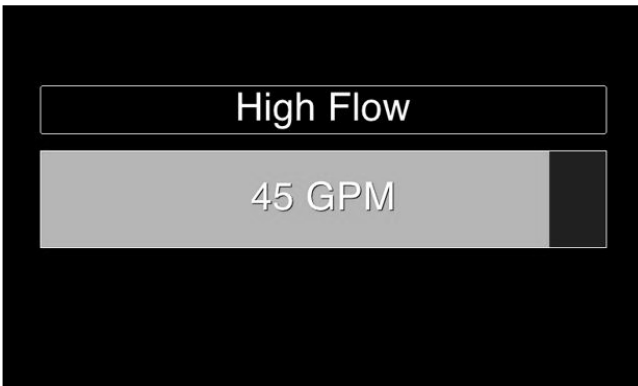
This screen indicates the current propel mode when the key is turned on and is also displayed when an operator sits down into the operator seat.

Door Open



This screen indicates the door switch is not making contact (door is not completely closed). The joysticks and auxiliary hydraulic controls will not operate if the door is not properly closed. Close door to clear screen and resume operation.

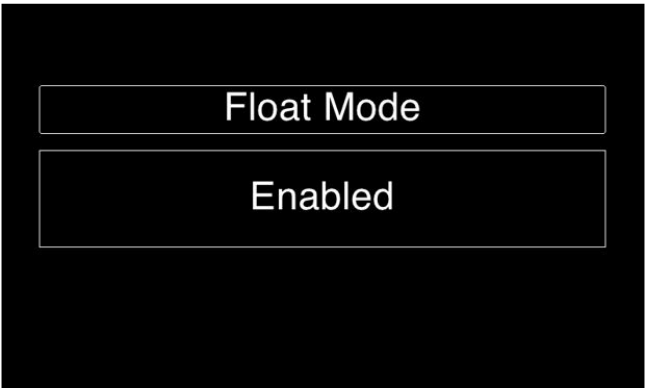
High Flow



This screen indicates the current high flow volume over time setting in gallons per minute. It is displayed when auxiliary hydraulic high flow is activated to make the operator aware of the current setting.

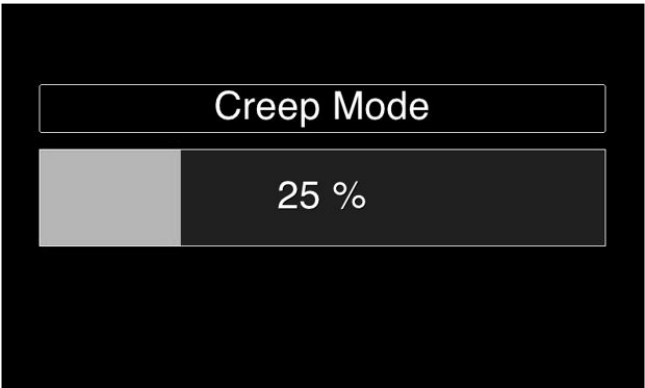
4 MACHINE DESCRIPTION / CONTROLS

Float



This screen is displayed when the float function is activated.

Creep Mode



This screen is displayed when creep mode has been enabled to make the operator aware of the current setting.

Hydraulic Winch



This screen is displayed when the hydraulic winch has been enabled.

Low DEF



The low DEF icon (highlighted amber) is displayed when the diesel exhaust fluid (DEF) needs to be refilled.

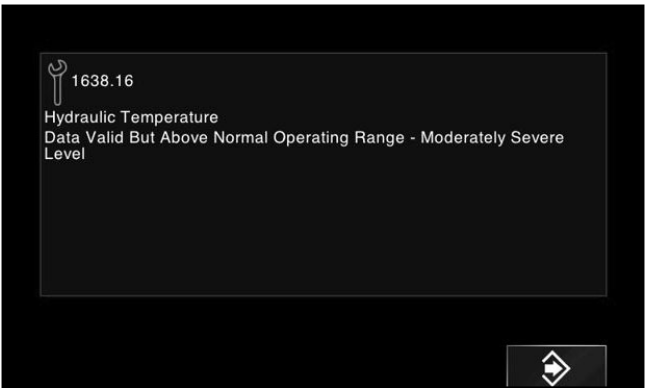
4 MACHINE DESCRIPTION / CONTROLS

Low Fuel



The low fuel icon (highlighted amber) is displayed when the fuel level reaches approximately 10% of capacity.

Fault



This screen indicates that a system fault has occurred. It must be acknowledged by pressing the button beneath the icon.

Some alarm messages may report an event that will cause the engine to derate. If this occurs, consult your dealer.

NOTICE

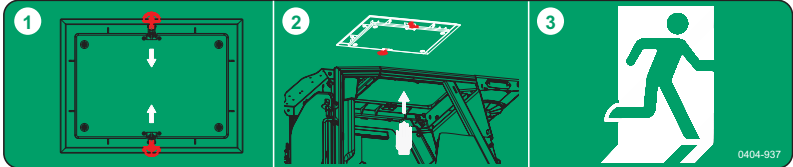
Maximum engine operating temperature is 225° F. Should the machine reach this temperature, shut down immediately, correct any faults and perform any needed maintenance prior to resuming operation.

4.13 Emergency Exits

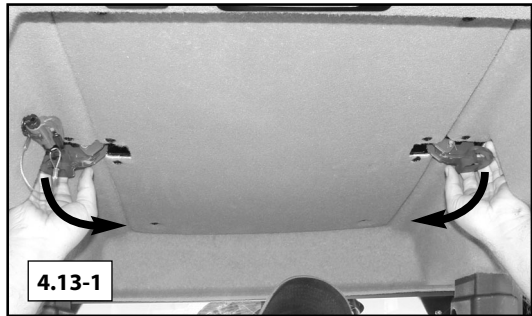
Familiarize yourself with the operation of emergency exits and associated features prior to operation as they allow escape from the cab in an emergency.

Note: If seatbelt needs to be cut, see cut seatbelt in this section.

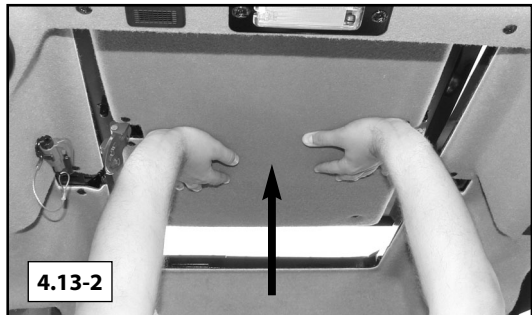
Roof Escape:



1. Firmly grasp the two red latches on the overhead roof escape panel and pull downward and inward to release them (fig. 4.13-1).

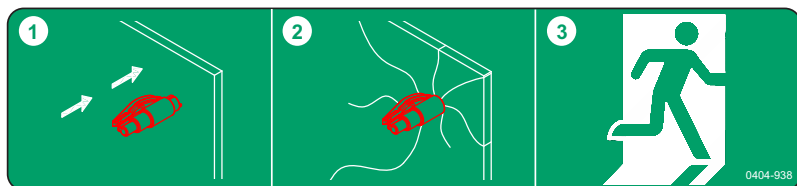


2. Push or kick the panel out, then escape to safety (fig. 4.13-2).



4 MACHINE DESCRIPTION / CONTROLS

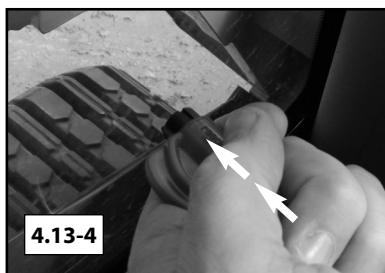
Glass Door / Glass Rear Window / Glass Side Screen (if equipped) Escape:



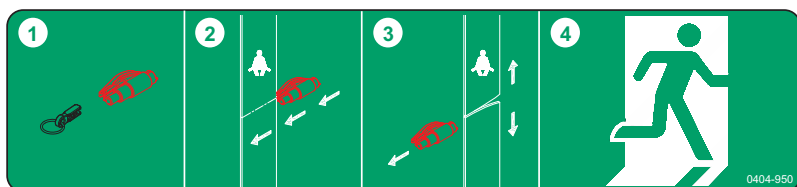
1. Remove the red escape tool from the stowed position (up and to the right of the operator). Pull to separate it from the black key ring / blade guard (fig. 4.13-3)



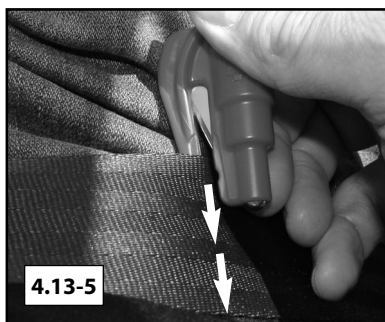
2. Press the blunt, spring loaded end of the tool against the glass panel with a clear escape route (near an edge or corner of the pane is preferred). Press firmly until the tool releases and snaps the end forcefully into the glass to break it. **Repeat until glass breaks**, then escape to safety (fig. 4.13-4).



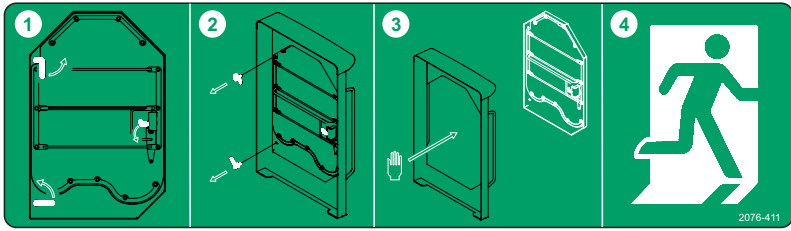
Cut Seatbelt:



1. Remove the red escape tool from the stowed position (up and to the right of the operator). Pull to separate it from the black key ring / blade guard (fig. 4.13-3)
2. Slide the seatbelt into the razor equipped interior slot in the tool and pull the tool through the seatbelt to cut it, freeing yourself (fig. 4.13-5).
3. Escape to safety using the most appropriate method listed above.



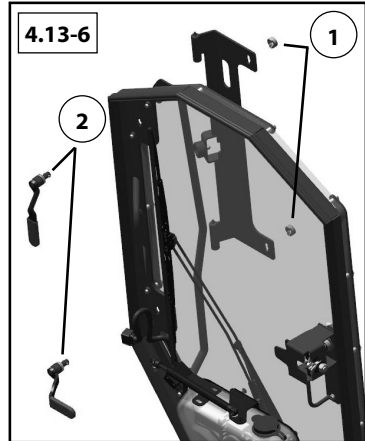
Forestry Door Escape



Forestry Door Escape: Firmly grasp the red levers attached to the left side of the door frame. Turn **both levers counter-clockwise** and pull them inward to remove and release the door from its hinges. Activate the door latch lever to release it from the cab, then forcefully push or kick the door off of the hinges and discard to escape.

Forestry Door Escape (non-emergency):

Remove the spring clip from the ball end of the gas spring where it attaches to the door. Separate the gas spring from the door mount. Disconnect any hoses or wires tethering the door to the cab. Turn the red levers counter-clockwise as described above, release the door latch, then carefully lift and remove the door to escape.



Note: Ensure that the door hinge, emergency exit levers (items 2, fig. 4.13-6) and cams (items 1, fig. 4.13-6) are in place, secure and not damaged or distorted in any way. If loose or damaged, replace worn components prior to operation.

4 MACHINE DESCRIPTION / CONTROLS

4.14 Attachment Compatibility

There are many things to consider when determining if an attachment is compatible with your RT-135 Compact Track Loader (CTL). The following criteria must be met in order for an attachment to be considered compatible.

A compatible attachment must:

- Be designed for use with the RT-135 CTL quick attach system. It must mate and attach securely to the machine using the supplied quick attach and locking pins (see sections 5.9-5.11).
- Not cause the machine to operate in excess of the GVW rating at any time during use. This includes any loads that may be carried or forces that may be applied to the attachment or by the attachment (chapter 3).
- Not cause the machine to operate in excess of the rated operating capacity at any time during use. This includes any loads that may be carried or forces that may be applied to the attachment or by the attachment (chapter 3).
- Have a matching electrical attachment receptacle (If electrical actuation is required) and not require electrical input in excess of the 20 amp max supplied by the machine (section 4.9).
- Have matching auxiliary hydraulic quick couplers and components that are designed to operate within the range of pressures and flows supplied by the CTL auxiliary hydraulic system (chapter 3).
- Not detrimentally impact machine stability during operation.
- Be designed for use with a machine of this size, weight and capability and in line with the intended use of the machine (see introduction) taking into consideration: GVW, Operating Capacity, ROPS/FOPS rating, Engine HP, Electrical and or hydraulic input requirements.
- Be used in conjunction with any necessary auxiliary equipment or PPE required to maintain the safety of the operator and any bystanders during use (example: reinforced polycarbonate door and full cab package for use when brush cutting).

Note: The operator must follow the operating instructions (manuals) for any externally supplied components or attachments.

If the attachment you intend to use does not meet the above criteria, it is not considered a “compatible” attachment and should not be used.

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5.1 General Information

Safe operation is the responsibility of the operator (**see chapter 2, Safety**). Be aware of your surroundings at all times. Keep a safe distance from bystanders at all times during operation. Always look in the direction of travel.

5.2 Pre-Operation Safety Checklist

Before operating the machine, perform a pre-operation safety check. Inspect the machine for any items that may affect safe operation.

Check to make sure:

1. Engine compartment, chassis and coolers are clean and free of debris.
2. Windows, backup camera screen / lens and lights are clear, clean, unobstructed. Visibility is not impaired.
3. Tracks are in good condition and are properly tensioned.
4. Fluids are filled to proper levels.
5. Hydraulic hoses and fittings are in good condition. (no visible signs of wear)



Never use bare hands to check for leaks! Pressurized oil can penetrate skin and cause gangrene. Seek medical attention immediately from a physician familiar with this type of injury!

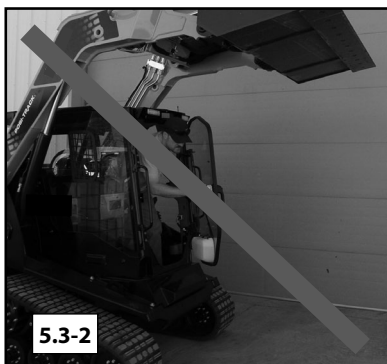
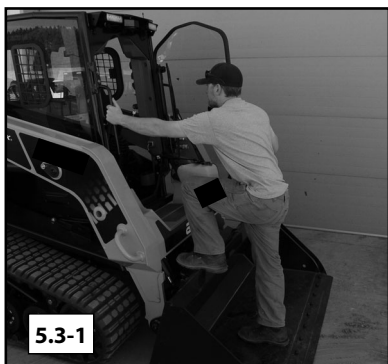
6. Battery cables are in good condition and properly fastened.
7. Joysticks are in neutral positions, auxiliary hydraulic switches are off. Power quick attach switch (if equipped) is on (quick attach locked).
8. The R.O.P.S./F.O.P.S. approved operator enclosure (including integral emergency exit roof escape panel and glass or metal side screens) is not damaged or distorted structurally in any way and is securely fastened to the chassis. Roof escape panel and side screens are in place and secure.
9. The seat belt and lap bar restraint are in good working order.
10. All safety signs are in place and legible on the machine.
11. All control devices are present, in good operating condition, and are not damaged in any way.
12. Rear view mirror and camera (if equipped) are adjusted for proper viewing.
13. All guards, shields and access panels are in place and secure.
14. The backup alarm is audible when the drive control is moved rearward.
15. You have read and understood the information in this manual in its entirety.

Note: If any of the items listed above are not as described, they must be corrected / repaired prior to operation.

16. The safety circuit is functioning properly by performing the following:
 - A. Start the engine according to section 5.3.
 - B. Raise the lap bar, then attempt to curl the bucket.
 - C. Lower the lap bar.
 - D. Raise yourself off of the seat to remove pressure from the operator presence safety switch (in seat), then attempt to curl the bucket.

Note: If the bucket moves during either of the tests listed in item 16, the safety circuit is not functioning properly. It must be repaired prior to operation.

5 OPERATION



5.3 Starting Procedure

Before starting the engine, perform the pre-operation safety checklist. Once complete, you may proceed by following the procedure below. See section 4.12 for information regarding password protection and accessing user profiles at startup through the operator interface.

1. Enter machine with lift arms all the way down. Maintain three points of contact (defined as: one foot and two hands, or one hand and two feet) with the machine (fig. 5.3-1).



Personal Protective Equipment should be worn during operation in accordance with section 2.5 of this manual.

2. Sit down into the operator's seat, fasten the seat belt, then lower the lap bar.
3. Position the throttle in the SLOW (turtle icon) position.
4. Turn the ignition key to the on position to "pre-heat" the ignition system. While this occurs, the pre-heat operation light will illuminate.
5. Once the pre-heat operation light goes out, turn the ignition key to the right to start the engine.

Note: If the engine is cranked for over 30 seconds (within a 2 minute period), the ignition will "lock out" (for 2 minutes). During this time, an indicator lamp will flash (key in "on" position). Once the lamp goes out, restart may be attempted.

6. With the exhaust adequately vented, bring the engine and hydraulic oil up to operating temperature. Low oil temperatures can cause the control system to respond sluggishly.
7. Set the throttle to desired rpm for operation.

Note: The parking brake is automatically engaged when the engine is turned off, the operator is not in the seat or the lap bar is raised.



Entering or exiting the vehicle under raised lift arms could result in injury or death. Never allow anyone beneath raised, unsecured lift arms.

Cold Weather Operation

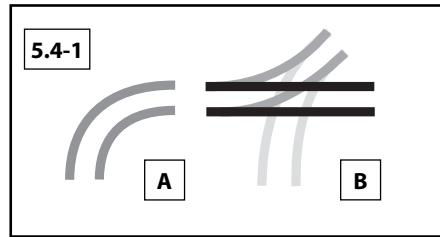
The RT-135 is designed for operation above -22°F (-30°C). If operating in lower temperatures, special accommodations must be made. Contact your local dealer for more information.

When operating in cold climates:

- Minimize idle time. Idling at low temps builds insufficient heat to allow engine and aftertreatment systems to function properly. **Engine damage may result.**
- Never allow a machine to idle during transport.
- Use proper oil and fuel grades for conditions (e.g., #1 diesel in cold climates).
- If hydraulic oil temperature does not exceed 100°F (37.8°C) during operation, reduce cooler screen air intake area (e.g., cardboard or similar).

5.4 Surface Preservation

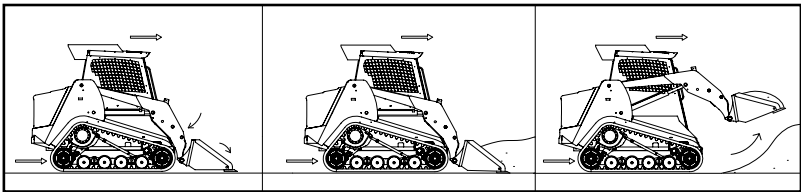
ASV Compact Track Loaders are designed to minimize ground disturbance while operating on finished surfaces like turf, however, care should be taken while operating on these surfaces to prevent blemishes from occurring.



Turning poses the greatest risk of surface disturbance during operation. Moving in a straight line across turf will cause little or no disturbance, whereas tight cornering will most likely cause blemishes.

While working on turf, make gradual turns. (see item A) If space is limited, turn gradually by moving back and forth until facing the desired direction. (see item B)

5.5 Filling The Bucket

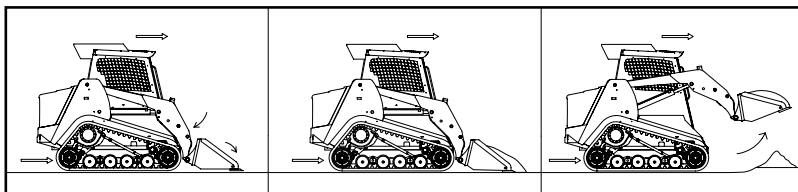


Steps: (see illustration, section 5.1)

1. Lower the lift arms until they rest on the frame.
2. Tilt the bucket slowly forward until the cutting edge engages the ground.
3. Drive the machine forward until the bucket is full of material.
4. Curl the bucket and raise the lift arms simultaneously to break the load free from the pile.
5. Maneuver the machine clear of the pile and then lower the lift arms, keeping the bucket curled upward, to approximately 10-12 in. (25-30 cm) above the ground for transporting.

5 OPERATION

5.6 Grading



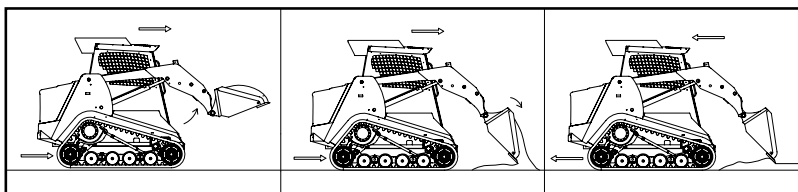
Steps: (see illustration, section 5.1)

1. Lower the lift arms until they rest on the frame.
2. Tilt the bucket slowly forward until the cutting edge engages the ground.
3. Drive the machine forward making slight bucket angle adjustments to vary cut depth as necessary.
4. When full, curl the bucket and raise the lift arms simultaneously. Once clear, lower them to approximately 10-12 in. (25-30 cm) above the ground for transporting.

NOTICE

Do not push or pull dirt as done in digging, grading, or leveling operations with the bucket tilted fully forward into the “Dump” position. This will stress the bucket cylinders and may damage them.

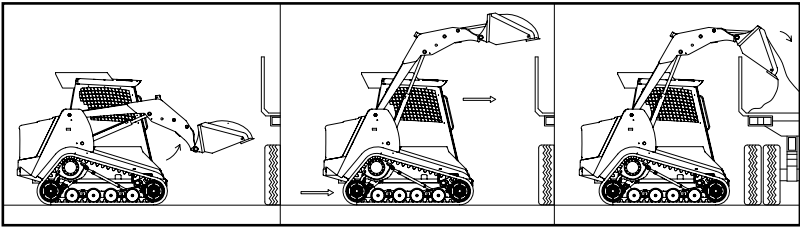
5.7 Leveling



Steps: (see illustration, section 5.1)

1. Moving forward, raise the lift arms as you tilt the bucket slowly forward to evenly spread the material out over the ground.
2. Once the load is released, tilt the bucket forward to an angle 45° or less to the ground.
3. Lower the lift arms until the cutting edge rests on the ground.
4. Engage the float function (which allows the lift arms to follow the contours of the ground with only their own weight acting as down pressure) and back the machine over the material varying bucket angle slightly as necessary to maintain grade.

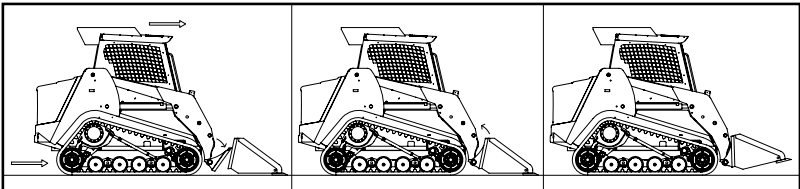
5.8 Loading



Steps: (see illustration, section 5.1)

1. Engage the bucket positioning function (if equipped), then raise the lift arms upward until the bottom of the bucket clears the side of the truck bed or trailer.
2. Once clear, drive the machine forward until the pivot point of the bucket clears the bed side.
3. Tilt the bucket forward until all of the material has been released into the bed and if necessary, quickly tilt and curl the bucket to loosen stubborn material.

5.9 Fastening Attachments (see also sections 5.11, 5.1)



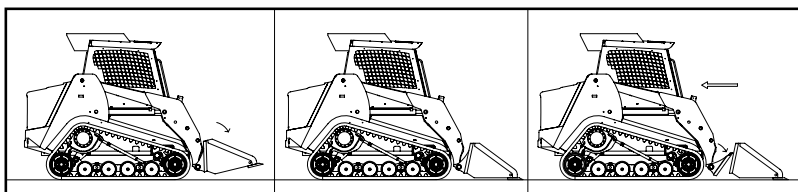
1. Press and hold the power quick attach button until the L.E.D. illuminates to unlock the quick attach (item 1, figure 5.11-1).
2. With the lift arms fully lowered, drive the machine to the attachment and hook the top edge of the quick attach under the upper lip of the attachment.
3. Curl the quick attach slowly upward by moving the lift arm control joystick to the left until the attachment is properly mated with the quick attach mechanism (curl enough to lift the attachment off of the ground).
4. Once the attachment is properly mated, press the power quick attach button to lock the attachment in place (L.E.D. off, item 1 figure 5.11-1).

Note: When fastening an attachment, always visually verify that the attachment is locked in place prior to operation. (fig. 5.10-1)

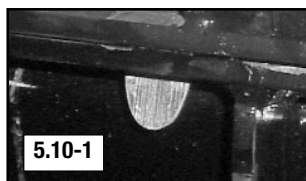
5. To physically verify that the attachment is properly locked in place, apply light pressure to the attachment while rotating it against the ground.

5 OPERATION

5.10 Unfastening Attachments (see also sections 5.11, 5.1)



1. Lower the lift arms so that the attachment is just slightly off of the ground.
2. Press and hold the power quick attach button until the L.E.D. illuminates to unlock the attachment (item 1, figure 5.11-1).
3. Lay the attachment gently onto the ground by moving the lift arm control joystick slowly to the right.
4. Once the attachment is in contact with the ground, move the lift arm control joystick gently to the right until the quick-attach is clear of the attachment.
5. Back the machine away from the attachment.



5.11 Power Quick Attach

RT-135 machines are equipped with a hydraulic (power) quick attach. The locking and unlocking of the quick attach mechanism is performed by pressing a switch instead of moving levers on the unit itself.

To lock the quick attach:

- Press the switch (item 1)

To unlock the quick attach:

- Press and hold the switch (item 1) until the L.E.D. illuminates.



5.12 Operation on Inclines

By design, Compact Track Loaders are very stable on inclines. Machine weight is distributed evenly throughout the chassis and the suspended undercarriage track system provides excellent traction and floatation on nearly all surfaces.



Even with these capabilities, extreme caution should always be exercised while operating the machine on an incline. Avoid operation on steep inclines. Do not make sudden changes in direction, move slowly, and always carry loads low to maximize machine stability.

5.13 Shut Down Procedure

1. Stop and lower any work attachments that may be coupled to the machine.
2. Stop the machine in a safe location (on firm and level ground) where it is protected from the elements and vandals.
3. Lower the lift arms until they rest on the frame stops.
4. Reduce engine RPM to a low idle.
5. Turn the ignition key counterclockwise to stop the engine, remove key.
6. Remove the seat belt and raise the lap bar.
7. Open the door (if equipped) and exit the machine using 3 points of contact as described in the starting procedure in this section.

5 OPERATION

5.14 Lift Arm Brace

When the lift arms must be left in the raised position, the lift arm brace must be engaged.

To install:

1. Lower the lift arms, stop and remove any attachments and park the machine on firm and level ground.
2. Have an assistant withdraw the retaining pin from the lift arm brace (on the underside of the lift arm, left side) and remove the brace, then stand clear.
3. Raise the lift arms to the upper limit to allow for brace installation.
4. Have the assistant place the lift arm brace onto the top side of the cylinder ram and install the retaining pin to secure it there, then stand clear.
5. Slowly lower the lift arms until they come to rest on the brace.

To remove:

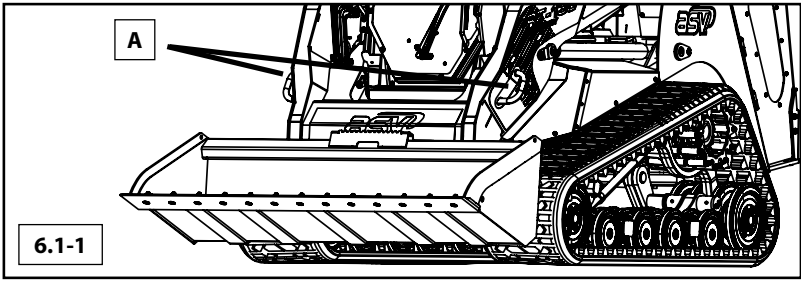
1. Raise the lift arms until they are clear of the brace.
2. Have an assistant withdraw the retaining pin and remove the brace from the cylinder, then stand clear.
3. Lower the lift arms to the lower stop.
4. Position the lift arm brace over the lift arm bracket as found and install the retaining pin to secure it there.



Do not go beneath unsecured lift arms. Always install the lift arm brace prior to going beneath the lift arms while raised.

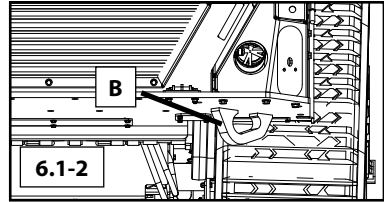
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6.1 Transporting

At times, you will most likely need to transport the machine to distant locations with a transport vehicle. To do this safely, there are some precautions that must be observed.



When transporting:

1. Always make sure the transport vehicle (trailer or truck) being used to haul the machine is capable of bearing the weight and size of the machine over the distance and terrain that will be covered.
2. Secure the machine to the transport vehicle bed, with heavy chains rated for use with a machine of this nature (size and weight).
3. Attach the chains to the machine tie down locations, one on each corner (Items A and B fig. 6.1-1 and 6.1-2) and secure to suitable locations on the transport vehicle. Tighten as needed to eliminate possible load shift during transport.

Note: Close and latch doors and windows, secure any loose items prior to transporting.

6 TRANSPORTATION

6.2 Tie Down Points

This section covers the intended / proper use of tie down points on the RT-135.

Tie Down Points: The RT-135 has 4 tie down points (fig. 6.1-1 and 6.1-2, items A and B). Tie down points “A” are to be used **ONLY** for securing the machine to a trailer during transport.

Tie down points “A” are **NOT** to be used as anchor points for lifting, moving or retrieving the machine in any way, nor are they to be used to lift, move or extract objects of any kind, in any way.

Note: Points B (fig. 6.1-2) serve multiple purposes (see also sections 6.1 - 6.3).

Any use of the machine tie down points varying from that described in this manual shall be regarded as unintended or improper use. The supplier cannot be held responsible for any damage resulting from improper use. This risk is borne solely by the user.

6.2-1 Tie Down Guidelines

Below are guidelines that must be followed when tying the machine down for transport. Chains must not contact the bucket or other attachment while in use for tie down purposes.

Front Tie Down Points (see figure 6.2-1)

When securing the machine at the front using tie down points “A” (fig. 6.1-1), chains must extend forward a minimum of 15” from points “A” on either side of the machine with a minimum chain length of 42.4”. The chains may only extend forward 22” from points “A” (max. chain length of 45.3”).

Rear Tie Down Points (see figure 6.2-1)

When securing the machine at the rear using tie down points “B” (fig. 6.1-2), chains must extend rearward a minimum of 37” from points “B” on either side of the machine with a minimum chain length of 82.6” (crossed) or 47.1” (not crossed).

6.3 Towing / Retrieving the RT-135

In the event that the RT-135 needs to be towed or retrieved, it will not roll freely. You must drag it to safety. Use only chains that are rated for pulling a machine of this size and weight. Attach these chains to **BOTH** multi purpose anchor points (items B, fig. 6.1-2) at the rear of the machine.

Note: When connected, chains should be attached so that they extend straight backward from points “B” (fig. 6.1-2) and must remain within 20° of the original position (in all directions) throughout the retrieval process (fig. 6.3-1).

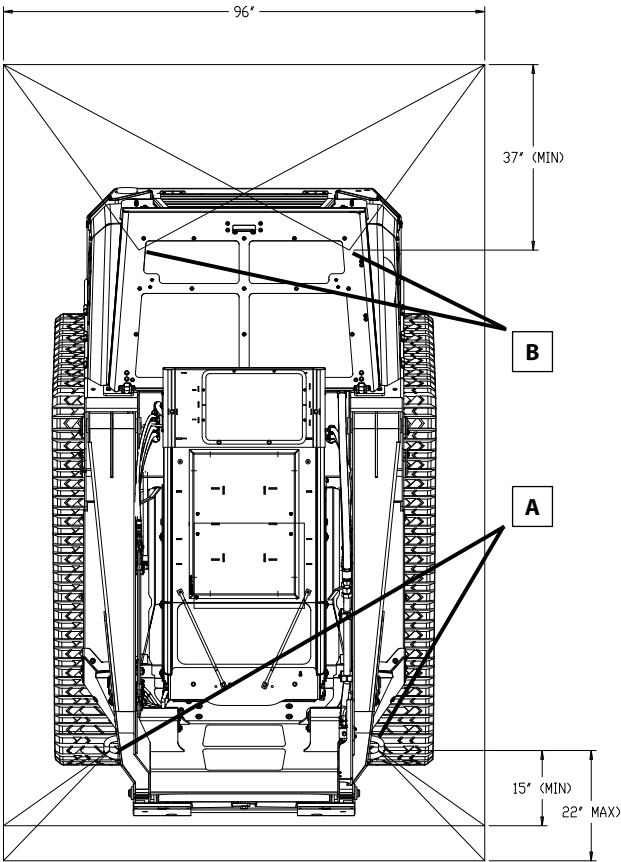
Machine weight during retrieval must never exceed the maximum GVW rating found in section 3.9 of this manual.

Once secure, pull the machine from the rear **ONLY**. If possible, drag the machine onto a trailer, then secure and transport.

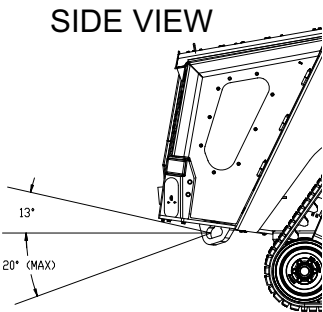
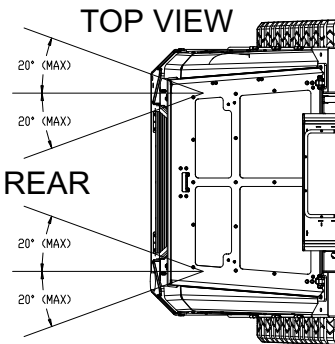
6.2-1

Note: Tie down points “B” are found on the underside of the machine at the rear (fig. 6.1-2).

Note: If an attachment causes machine weight to exceed 14,250 lb, the attachment must also be secured.



Bucket excluded from illustration for clarity.



6.3-1

6 TRANSPORTATION

6.4 Transport Loading / Unloading procedure

1. If loading onto a trailer, the trailer must be securely attached to the towing vehicle. The towing vehicle must have the wheels blocked or parking brake engaged.
2. Load the machine only on firm and level ground.
3. Before driving onto the ramps, clean them and the machine tracks of any materials that may cause slippage (snow, ice, water, mud, sludge, oil, etc.).
4. Properly align the machine with the loading ramp.
5. Have a guide give the machine operator any necessary signs to maximize safety during loading.
6. Back the machine carefully up the ramps and onto the transport vehicle.

Note: The heaviest end of the machine should remain uphill when operating on an incline. Always back the machine onto the transport vehicle unless fitted with a heavy attachment or loaded bucket.

7. Have a guide instruct you as to where and when to stop and park the machine. Lower the lift arms and turn off the engine.
8. Before securing the machine, relieve all residual pressure by making sure the operating levers and the auxiliary hydraulic switch are in their neutral positions. Remove the ignition key.
9. Secure the door, windows and hood on the machine.
10. Secure the machine and any other items to the transport vehicle with chains or ropes of the proper capacity.
11. Before departure, investigate the route to be taken, especially in regard to limits for width, height and weight.
12. Pay close attention when driving under electrical lines, bridges, or through tunnels.



Electrocution hazard exists if electrical lines are contacted! Stay clear of electrical lines!

13. To unload, reverse steps 1-10 of this procedure. Use the same caution when unloading as for loading. Remove all cables or chains. Start the engine as described in the operating instructions. Carefully drive down the ramp from the transport vehicle using a guide if necessary to direct movement.

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7.1 General

The operating condition and life expectancy of a machine is largely influenced by care and maintenance. For this reason, it is in every machine owner's interest to perform the specified maintenance work and comply with the service intervals.

This chapter describes periodic maintenance, inspection and lubricating tasks. The maintenance interval charts list all work to be performed on the machine at regular intervals.

Note: Always use genuine original equipment replacement parts when performing maintenance or service to maintain the highest possible level of quality.

The supplemental engine operation and maintenance manual (access information provided on the back of the cover page in this manual) contains information specific to the proper operation, inspection and maintenance of the engine and its internal components. This manual must be read, understood and followed in order to properly maintain the engine and comply with warranty requirements.



The operator must have sufficient knowledge to inspect and maintain the machine. The operator should follow the procedures in this manual and take any necessary precautions to ensure his/her safety. Wear appropriate personal protection equipment for all tasks.

7.2 Care and cleaning

Cleaning the machine

- Do not use aggressive detergents to clean the machine. We recommend using commercially available cleaning agents for passenger cars.
- Linings (insulating materials, etc.) should not be exposed directly to water, or high-pressure jets.
- When cleaning with water jets, take care not to direct the jet into exhaust and air filter openings and do not expose sensitive engine parts, such as alternator, wiring, oil pressure switches, etc. directly to the jet.
- Do not clean the machine with hot water in excess of 140° F or steam as it can accelerate the formation of corrosion on zinc plated components.
- Pay particular attention to the radiator / oil cooler, engine compartment, and chassis area when cleaning. Remove any visible debris from these areas prior to cleaning.
- After wet cleaning lubricate the machine as specified in section 7.4 prior to operation.
- Inspect the machine after cleaning for the presence and condition of safety signs. If any are missing or damaged, contact your dealer immediately to obtain a replacement.

7 MAINTENANCE

7.3 Maintenance Intervals

7.3-1 Daily Maintenance Tasks

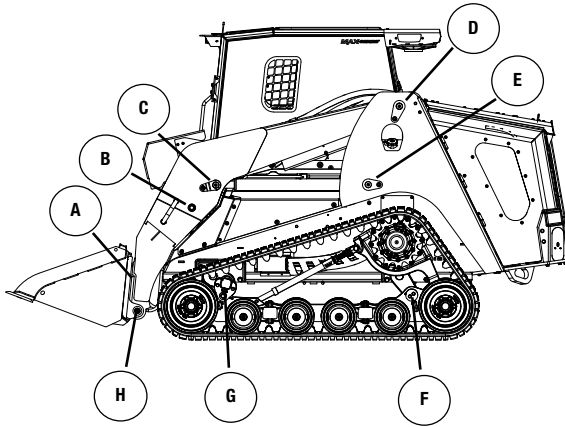
Daily	Page
1 Check hydraulic oil level (figure 7.7-3, p-104)	104
2 Check engine oil level	102
3 Check fuel level (gauge screen on display)	37
4 Check diesel exhaust fluid level (gauge screen on display)	37
5 Check track tension / condition	107
6 Check for proper control operation	40
7 Check safety circuit for proper operation	83
8 Check for proper switch and lighting operation	37
9 Check display for air filter fault message, service as required	110,111
10 General visual check for cracks, damage, completeness	20,83
11 Check for leaks in hoses, tubes, valves, pumps, cylinders, etc.	18,27,83
12 Check display for water in fuel fault message, drain as required	106
13 Lubricate all grease points	101
14 Inspect / clean the coolers and engine compartment (as needed)	112,113
15 Inspect / clean undercarriages (as needed)	107
16 Inspect / clean chassis	113
17 Inspect/replace missing/damaged safety signs	12,13

7.3-2 50-4000 hour Tasks

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Every 250 operating hours	Page
1 Replace hydraulic filter(s)	105
2 Check alternator / A/C belt tension / condition	105
Every 500 operating hours	Page
1 Replace engine oil & filter	103
2 Replace fuel filter elements	106
Every 1000 operating hours	Page
1 Replace hydraulic oil	104
Every 2000 operating hours	Page
1 Replace engine coolant (see chapter 3 for specifications)	112
Every 4000 operating hours (or 3 years)	Page
1 Replace DEF filter	115

7.4 Lubrication Points

The illustration below shows the location of grease points found on the left side of the machine. Identical points also exist on the opposite side of the machine. Lubricate all points daily, prior to operation.

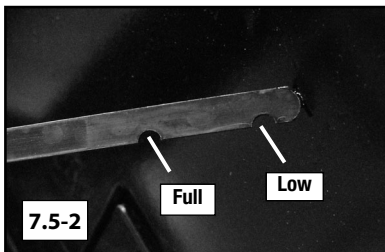
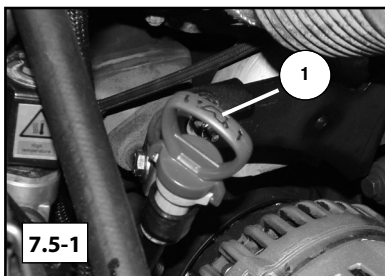


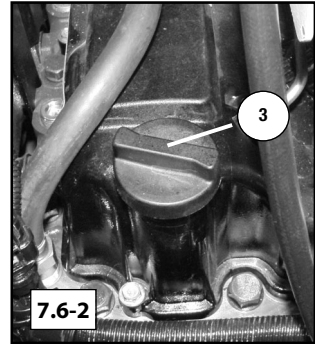
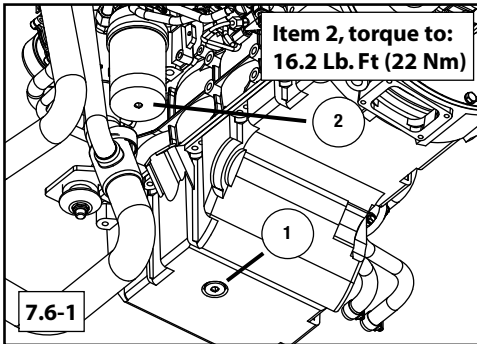
- A. Lower Bucket Cylinder Pivot
- B. Upper Bucket Cylinder Pivot
- C. Front Lift Cylinder Pivot
- D. Lift Arm Pivot
- E. Rear Lift Cylinder Pivot
- F. Rear Axle Pivot (2)
- G. Front Axle Pivot (2)
- H. Lower Bucket Pivot

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7.5 Engine Oil Check

1. Shut the machine down according to the procedure in section 5.13.
2. Open the hood and left side panel to gain access to the engine compartment.
3. Locate and remove the engine oil dipstick (1) from its tube. (fig. 7.5-1)
4. Wipe the dipstick with a clean shop cloth and reinsert it into the tube until it comes to rest in its seated position.
5. Remove the dipstick once again and inspect the end for oil on the level indicator.
6. Oil should be present on the dipstick up to, but not over the upper (full) level indicator notch. If the level is correct, reinstall the dipstick and then close and latch the hood to complete the procedure. (fig. 7.5-2)
7. If the level is low, add the proper grade and viscosity engine oil and re-check as necessary until the proper level has been achieved. Then reinstall the dipstick and filler cap and close the hood and side panel to complete the procedure.



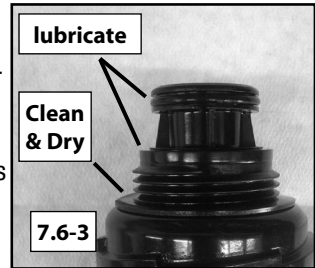


7.6 Engine Oil Change

Regular oil changes are necessary to maintain a strong running engine. Change the oil at 500 hour intervals (or every year if annual operating hours do not exceed 500). Allow the machine to cool prior to service. Wear safety glasses, safety gloves and any other items necessary to ensure your safety while performing maintenance or service.

To change engine oil:

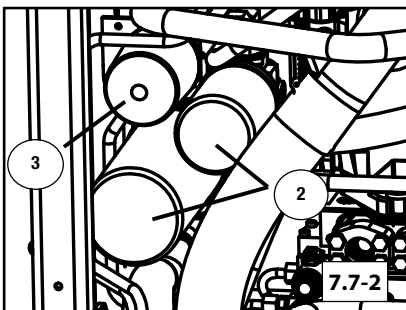
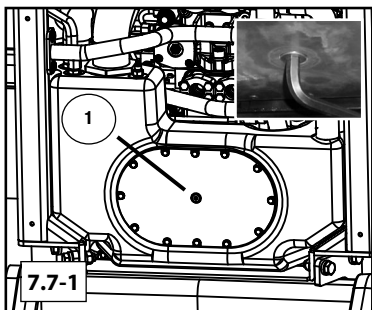
1. Shut the machine down according to the procedure in section 5.13 and allow the machine to cool thoroughly. Open the hood and side panels.
2. Lower the access panel beneath the engine to access the oil drain and filter.
3. Remove the oil drain plug (item 1, fig. 7.6-1) from the bottom of the pan.
4. Drain the oil into a suitable catch container.
5. Remove the engine oil filter (item 2, fig. 7.6-1).
6. Apply fresh oil to the upper two oil filter seals only, (lower seal and engine sealing surface must be clean and dry) and install the new filter (fig. 7.6-3).
7. Using a torque wrench and appropriate 1/2" extension, **torque the new oil filter to 16.2 Lb. ft (22 Nm)** from the bottom through the chassis opening.
8. Reinstall the oil drain plug as found upon removal and tighten.
9. Refill the engine to capacity at the location labeled 3 above with oil as specified in chapter 3, Technical Data.
10. Re-secure the access panels as found upon removal, close hood and side panels. Dispose of the used oil and filter according to mandates.



Oil and machine components can be HOT! Allow the machine to cool thoroughly prior to performing maintenance or service to avoid the possibility of burns.

7 MAINTENANCE

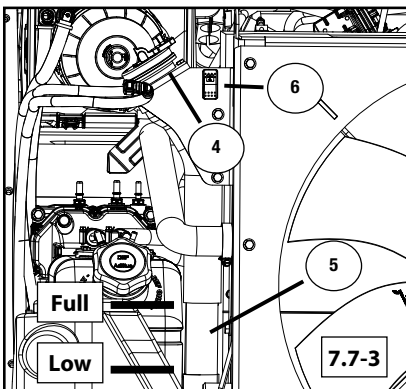
7.7 Hydraulic Oil Change



The hydraulic oil should be changed every 1000 service hours. Before beginning the procedure, make sure the machine is in a clean working environment. Take any necessary measures to prevent dirt or debris from entering the hydraulic system.

To change hydraulic oil and filter:

1. Shut the machine down according to the procedure in section 5.13.
2. Allow the machine to cool, then release any residual pressure in the hydraulic system by following the procedure in section 4.11 of this manual.
3. Lower the rear middle belly pan to access the tank drain. Remove the hydraulic fluid drain plug (item 1) as shown (fig. 7.7-1).
4. Drain the used oil into a suitable catch container.
5. Dispose of the oil according to mandates.
6. Reverse step 3 to reinstall and tighten the drain plug and secure belly pan.
7. Open the hood and left side panel, then refill the hydraulic system (fill point item 4) with hydraulic oil as specified in chapter 3 (fig. 7.7-3).



Note: Activate sight gauge light (item 6), then visually inspect the hydraulic oil sight gauge (item 5) as shown to verify proper oil level (fig. 7.7-3). Oil should be visible in the sight gauge, indicating the level is safe. If oil drops below the level visible in the site gauge, fill until oil is visible in the gauge.

8. Once full, reinstall the cap and start the engine according to the proper starting procedure and operate all hydraulic circuits to work any trapped air out of the system. Then, check the oil level. If low, add oil as necessary until full. Deactivate the sight gauge light (item 6, fig. 7.7-3), then close hood and side panel.

7.8 Hydraulic Filter Change

The hydraulic filter should be changed every 250 hours. Hydrostatic components require extremely clean oil in order to have a long service life. Use caution when changing the hydraulic filter. Before beginning the procedure, make sure the machine is in a clean working environment. Take any necessary measures to prevent dirt or debris from entering the hydraulic system.

To change the hydraulic filter:

1. Shut the machine down according to the procedure in section 5.13.
2. Allow the machine to cool, then release any residual pressure in the hydraulic system by following the procedure in section 4.11 of this manual.
3. Lower the forward middle belly pan to access the hydraulic filters (items 2), as shown in fig. 7.7-2.
4. Clean around the filters, then thread the filters off and replace them. Dispose of the used filter according to mandates.
5. Reverse step 3 to complete the procedure.

Note: The machine is also equipped with a filter in the auxiliary circuit case drain line. It protects the main hydraulic system in the event of catastrophic failure in an attachment. This filter is designed to last the life of the machine unless an attachment equipped with a case drain has a drive motor failure during use. (item 3 fig. 7.7-2)

Note: Should a hydraulic hose or fitting need to be removed for maintenance or service, always inspect it for damage prior to re-installation. If none is found it may be reused; if damaged, replace.

7.9 Accessory Belts

The engine uses a belt to drive accessories. The accessory belt on the RT-135 is tensioned automatically, but should be visually inspected every 250 hours for tension, condition and presence prior to operation.

To check the belts:

1. Shut the machine down according to the procedure in section 5.13, allow the machine to cool thoroughly.
2. Raise the hood and open the side panels at the rear of the machine.
3. Visually inspect the belt to make sure it is present, tight around the pulleys and in good condition.

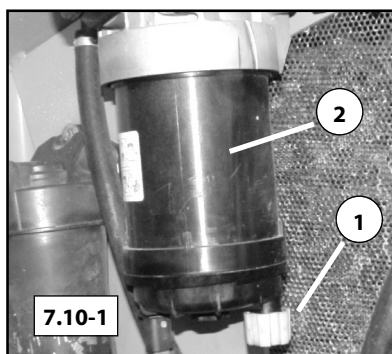
If the belt appears loose, or is cracked or damaged, replace it.

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7.10 Water Separator

The water separator (item 1) removes water from the fuel supply as the engine runs. (fig. 7.10-1) It is located inside the left engine compartment side panel.

Drain the water separator as required (operator interface will display water in fuel fault message) to maintain proper function.



To drain the water separator:

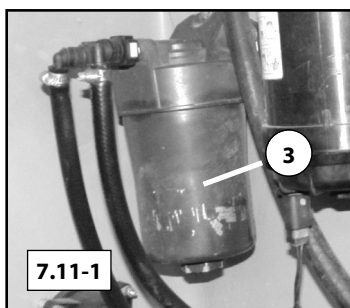
1. Shut the machine down according to the procedure in section 5.13.
2. Open the hood and left side panel to access the water separator, attach a section of hose to the separator outlet for draining.
3. Close side panel enough to restore separator to near vertical, then loosen the twist valve on the bottom of the separator to drain the contents into a suitable catch container. Dispose according to mandates.
4. Once all of the water has been drained, close the twist valve and reverse step 2 to complete the procedure.

7.11 Fuel Filter(s) Change

The fuel filters should be changed every 500 service hours, or as needed. A plugged fuel filter can cause loss of engine power, rough running, or no start.

To change the filter:

1. Shut the machine down according to the procedure in section 5.13, allow the machine to cool before performing this procedure.
2. Open the hood and left side panel at the rear of the machine to access the fuel filters.
3. Clean the outside of the filters (items 2, 3) thoroughly (fig. 7.10-1, 7.11-1).
4. Drain the water separator as described in section 7.10. Disconnect the electrical connector.



Note: Drain fluids into a suitable catch container. Dispose according to mandates.

5. Twist the filter housings CCW when viewed from the bottom to separate the fuel filters from their respective filter heads. Lift and remove each filter.
6. Reverse steps 4, 5 to reinstall each assembly (with new filter) into the machine.

7.12 General Undercarriage Information

The undercarriage assemblies typically operate in harsh working conditions. They work in mud, gravel, debris and various other abrasive materials during operation. A daily inspection of the undercarriage assemblies and cleaning (if necessary) is recommended.

Materials that are particularly sticky or abrasive like clay, mud, or gravel should be cleaned from the undercarriages often to minimize component wear. A pressure washer works well for cleaning materials from the undercarriages. At times when a pressure washer is not available, use a bar, shovel or similar device to carefully remove foreign materials.

When cleaning, pay particular attention to the drive motors/sprockets and the front and rear wheels where debris is likely to accumulate. If working in scrap or debris, inspect the undercarriages more often and remove foreign objects that may wrap around or lodge themselves between components causing premature wear and damage.

Operation on sand, turf, or other finished surfaces may require less frequent cleaning, but daily inspection is still advised.

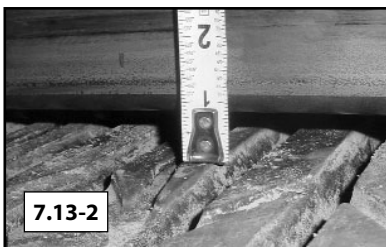
7.13 Track Tension Check

Proper track tension is important for achieving both optimum performance and maximum track and undercarriage life. **Always operate with track tension within the specified range.** Operating with tracks that are over tightened will result in accelerated wear to sprockets, bearings, tracks and other undercarriage components. Operating with tracks that are under tensioned however, can result in accelerated track drive lug wear or derailment. During the first 50 hours of operation, the tracks will "break-in", and may require adjustment.

To check for proper track adjustment:

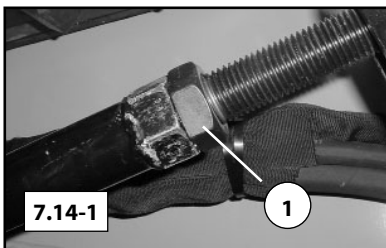
1. Drive the machine forward 5 ft (1.5 m) to remove slack from the lower and rear portions of the track. Shut the machine down according to the procedure in section 5.13.
2. Lay a straight edge along the top of the track, across the sprocket and the front idler wheel (fig. 7.13-1).
3. Using a rope or wire, put 90 lb (41 kg) of down force on the track at the mid point between the sprocket and idler.
4. Using a ruler or tape, measure the distance between the straight edge and track (fig. 7.13-2). The track should not deflect more than .75 in. (2.5 cm) between the top of the track and the straight edge.
5. If the track does deflect more than .75 in. (2.5 cm), tighten the track until within specification.

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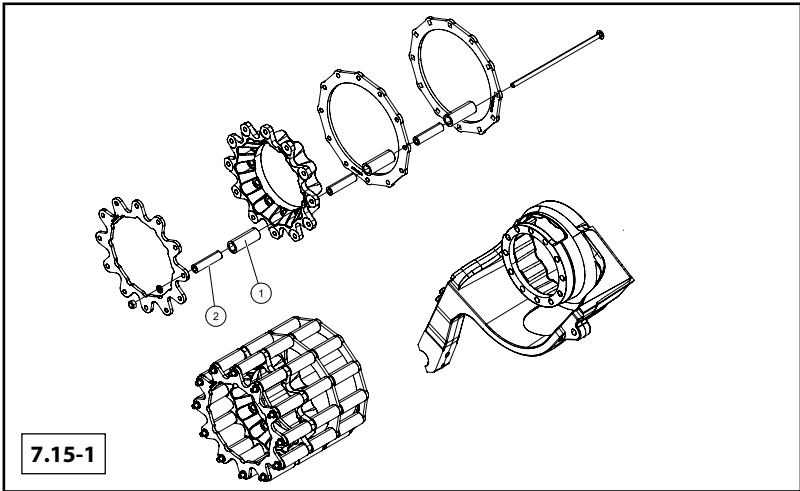
7.14 Track Tension Adjustment

1. Shut the machine down as described in section 5.13, locate jam nut on track tension device and clean the threads thoroughly before proceeding. (fig. 7.14-1).
2. Using a wrench, loosen the jam nut (item 1) on the track tension device. (fig. 7.14-1)
3. Once the jam nut is loose, turn the tensioner until the track tension is within specification (figure 7.14-2).
4. Turn the tensioner the opposite direction to loosen the track.
5. Once proper tension is achieved, retighten the jam nut on the tensioner.

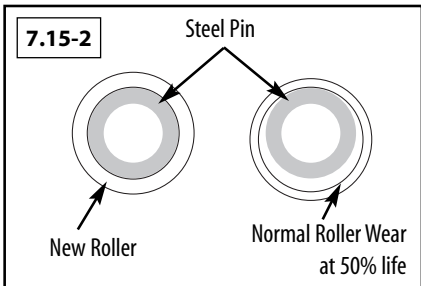


Note: If the track tensioner is stiff, it may be helpful to apply a penetrating lubricant onto the threads prior to adjusting tension.

7.15 Drive Sprocket Rollers



Compact Track Loaders use rollers on each drive tooth of the drive sprockets. These rollers help minimize friction between lugs on the track and the sprocket. Sprocket rollers should be treated as wear items that are inspected regularly and replaced as needed.



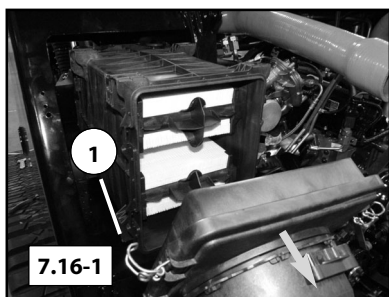
The rollers (1) rotate on steel pins (2), limiting wear to the inside of the rollers. As they wear, the rollers become thinner, but will continue to function and perform as long as they are rotating.

At 50 hour intervals, shut the machine down as described in section 5.13 and visually inspect rollers. Replace any that show signs of cracking or wear-through.

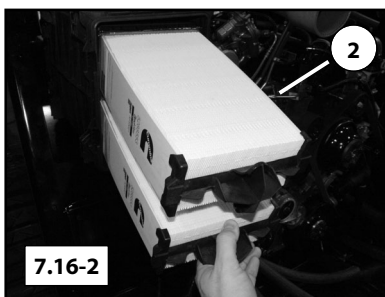
Drive sprocket removal and roller / pin replacement should be performed by your local RT-135 dealer.

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7.16 Air Cleaner Inspection / Service



A properly functioning air cleaner is necessary to ensure performance and to prolong engine life. The air cleaner is electronically monitored. If the air filter requires service, a fault message will be displayed on the operator interface (fig. 7.16-4) indicating the need for service.



To service the air cleaner:

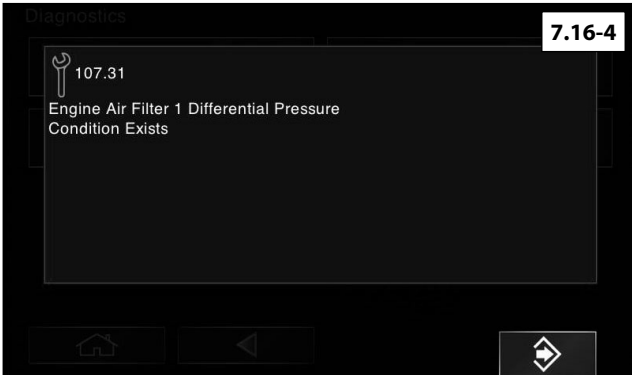
1. Shut the machine down as described in section 5.13, then open the hood and lower the left side panel to uncover the air cleaner housed in the left loader tower.
2. Open the latches (1) on the air cleaner canister to release the cover, pull to remove.
3. Immediately vacuum the inside of the canister to remove loose dirt.
4. Once any dirt particles have been removed, slowly remove the primary element (2) taking care not to disturb dirt that may be caked around the filter seal. Again vacuum the canister.

Note: You may need to remove the hydraulic oil fill cap to remove air filter (2).

5. Remove the secondary element (3) at this time, again taking care not to disturb dirt that may be caked around the filter seal. Vacuum the canister.
6. Wipe the seal areas with a clean damp cloth to remove any remaining dirt.
7. Reverse steps 1, 2, 4 and 5 to reinstall new elements prior to resuming operation. If hydraulic oil fill cap was removed, reinstall prior resuming operation.

NOTICE

- DO NOT remove filters until you know they need to be replaced.
- DO NOT clean air filter elements. Instead, replace them. Heavy-duty air filter manufacturers will not warrant the air filter once it has been cleaned.



A message like the one shown above will be displayed when the air cleaner requires service.

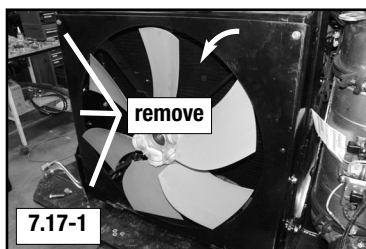
7 MAINTENANCE

7.17 Radiator / Oil Cooler Cleaning

The radiator and oil cooler must be clean to ensure proper operation. Engine and hydraulic system overheating, damage and even failure can result if the radiator/oil cooler is not kept clean. A pressure washer or compressed air both work well to blow debris clear of the fins in the coolers.

To clean radiator / oil cooler:

1. Shut the machine down as described in section 5.13. Allow the machine to cool thoroughly.
2. Raise the hood and lower the side panels. Remove the 4 bolts securing the main rear panel, then lower it. Remove the six bolts securing the fan support panel, then lower it (fig. 7.17-1).
3. Thoroughly clean all coolers with a pressure washer or compressed air. Wear any appropriate safety clothing. Direct spray through the cooler as shown. (fig. 7.17-2).



Note: If hydraulic oil or engine coolant temperature warnings occur during operation, clean coolers more often.

NOTICE

Make sure water nozzle is at least 12 in. (30.5 cm), for air 8 in. (20.3 cm) from the cooler and that the spray is directed straight through the cooler or the cooling fins may be damaged (bent over) which will decrease cooling performance.



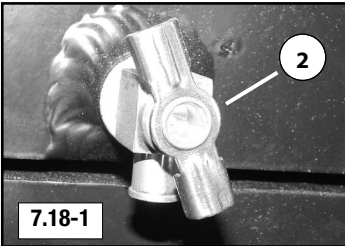
In dusty applications check and clean the coolers and chassis often to avoid overheating and prevent fires.

7.18 Engine Coolant Change

1. Shut the machine down according to section 5.13, allow to cool. Open the hood and left side panel, then locate valve (2) on the left side of the cooler.
2. Attach a hose to the valve (2), then open and drain the old coolant into a suitable catch container. Dispose according to mandates. (fig. 7.18-1)
3. Close valve (2), then add coolant (see chapter 3) at the fill point in the coolant expansion tank until visible in the sight gauge.
4. Warm the engine to operating temperature, then turn the engine off, remove the key and allow the machine to cool.
5. Check the coolant level, and add if needed (repeat steps 4 and 5 until all air has been purged and the level is visible in gauge when cold).



Coolant and machine components can be HOT! Allow the machine to cool thoroughly prior to performing maintenance or service to avoid the possibility of burns.



7.19 Chassis/Engine Cleaning

Periodic cleaning of the chassis area beneath the cab and engine compartment is also necessary to maintain safe operation. Clean as necessary. (fig. 7.19-1)

To clean the chassis/engine:

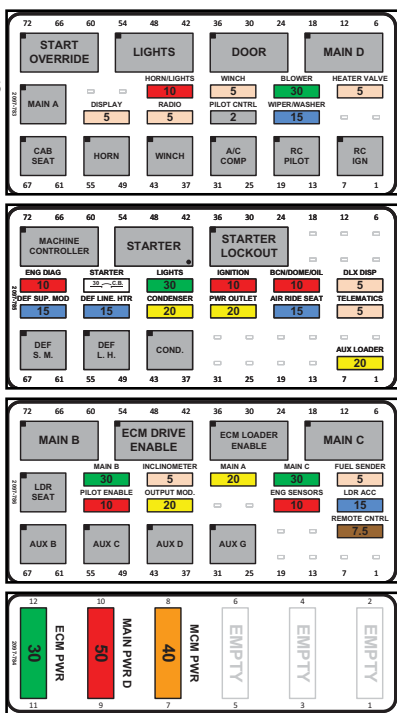
1. Shut the machine down as described in section 5.13, allow the machine to cool thoroughly, then lower the belly pans on the underside of the machine.
2. Raise the hood and lower the side panels at the rear of the machine.
3. Pressure wash any debris from the engine compartment out through the lower opening.
4. Tilt the cab as described in section 7.23.
5. Pressure wash any debris from the chassis area out through the lower opening. Once complete, lower and secure the cab.
6. Re-secure the belly pans, then close and secure the hood and side panels to complete the cleaning procedure.



If any safety signs are found to be damaged or missing after cleaning, contact your dealer for a replacement immediately. They can be reapplied according to the location illustration in section 2.3 of this manual.

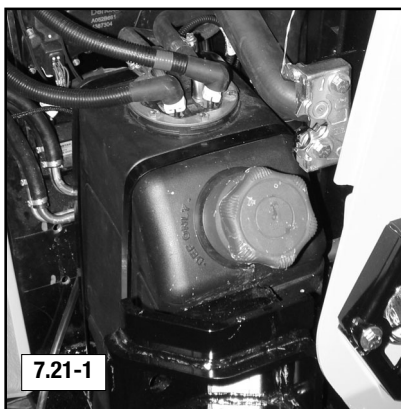
7.20 Electrical System

In the event of an electrical malfunction, check the fuse panels. Remove the fuse related to the component that is not working properly and inspect it. If it appears damaged in any way, replace it.



The emissions system in the RT-135 requires diesel exhaust fluid (DEF) to operate (see chapter 3 for fluid specifications).

The level should be checked and topped off (if needed) daily, prior to operation. The current level is shown on the display and low level warnings will be displayed if the DEF level gets too low.



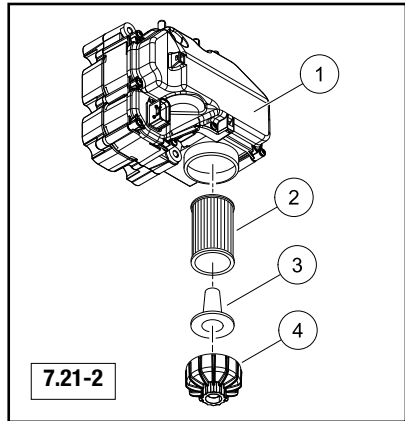
Use only DEF that is API (American Petroleum Institute) certified to ensure proper function of the aftertreatment system. **Add ONLY specified diesel exhaust fluid to your DEF tank or the aftertreatment system may be damaged.**

DEF Filter Change

The DEF dosing unit (1), located on the lift arm tower adjacent to the DEF tank (fig. 7.21-2) is equipped with a filter (2) to prevent contaminants from entering the unit. The filter must be replaced every 3 years or 4000 operating hours.

To access the filter:

1. Shut the machine down as described in section 5.13, allow the machine to cool thoroughly, then open the left rear side panel to access the DEF system.
2. Wait at least 5 minutes after shutting the machine down to allow the dosing unit to complete the purge cycle (the dosing unit will create an audible pumping noise while this occurs). Once complete, disconnect the battery (see sections 2.18 and 2.19 for safety precautions and additional information).



Diesel exhaust fluid (DEF) contains urea. Do not get the substance in your eyes. In case of contact, immediately flush eyes with large amounts of water for a minimum of 15 minutes. Do not swallow. In the event the DEF is ingested, contact a physician immediately. Reference the Materials Safety Data Sheet (MSDS) for additional information.

3. Wear appropriate PPE to avoid DEF contact with eyes, then place a suitable catch container beneath filter cap (4) to catch any spills.
4. Remove cap (4), filter (2) and equalizing element (3) from the dosing unit. Discard items 2, 3 according to mandates (DO NOT reuse items 2, 3).
5. Remove any visible DEF deposits from the threads on the cap (4) and dosing unit (1) with warm water and a clean cloth. At this time, inspect the cap and dosing unit for damage. Replace any damaged components.
6. Insert a new equalizing element (3) into new filter (2) and insert the assembly into the dosing unit as found upon removal in step 4.
7. Reinstall cap (4) and tighten to 177 in-lb (20 Nm) to secure.
8. Reconnect the battery by reversing step 2 of this procedure.

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7.22 Storage

It may be necessary to store your RT-135 Compact Track Loader for an extended period of time.

Perform the following tasks to prepare the machine for storage.

7.22.1 Storage Preparation

- Thoroughly clean the machine (inside and out) including the engine compartment and underbody. Open hood, remove belly pans and pressure wash to remove all buildup and debris.
- Allow machine to dry thoroughly, then reinstall belly pans, close hood. Touch up any paint blemishes to prevent rust.
- Lubricate all chassis, lift arm and undercarriage points as indicated on the chart in this chapter. Wipe away any excess grease.
- Replace any worn or damaged components.
- Add fuel stabilizer to near empty fuel tank, then fill to evenly distribute stabilizer throughout fuel.

Note: Run the engine for 5 minutes to circulate stabilized fuel throughout fuel system.

- Park the machine in a dry place that provides protection from the elements.
- Drain and refill the cooling system with 50/50 pre-mixed antifreeze/water.
- Replace engine oil and filter. (chapter 7)
- Replace hydraulic oil and filters (chapter 7)
- Jack the machine and rest the chassis on suitable mechanical supports to remove weight from the torsion axles and suspend the tracks off of the ground.
- Apply protective lubricant (grease) to all exposed cylinder rods.
- Replace air cleaner elements and a/c filter element (if equipped).
- Return all controls to neutral position.
- Cover the exhaust outlet to shield it from the elements and foreign objects.
- Disconnect and remove the battery from the machine. Adjust the electrolyte level if needed and charge before storing. Store in a warm dry place. **Do not allow battery to freeze.** Charge periodically during storage as necessary.
- Label or tag the machine to indicate storage condition.



Battery contents are flammable and corrosive. Contact with skin can cause burns! Do not smoke or allow open flame near the battery to avoid explosion! Wear appropriate PPE.

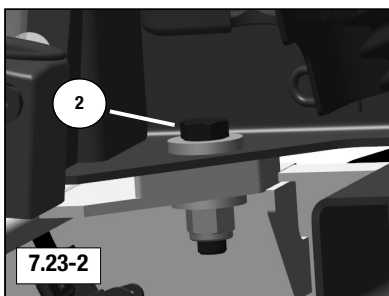
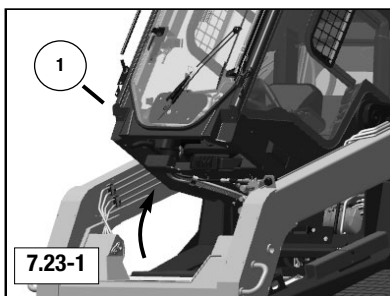
7.22.2 Removal From Storage

Perform the following tasks to remove the RT-135 Compact Track Loader from storage and return to operating condition.

Return to Operating Condition:

- Remove protective lubricant from cylinder rods.
- Lubricate all chassis, lift arm and undercarriage points.
- Safely remove the mechanical supports and lower machine to the ground.
- Install fully charged battery.
- Remove exhaust outlet cover.
- **If storage time has exceeded 6 months**, remove any remaining diesel exhaust fluid from the DEF tank and replace it with fresh API certified DEF. Dispose of expired DEF according to mandates.
- Perform pre-operation safety checklist in chapter 5 of this manual.
- Perform starting procedure (chapter 5)
- Let engine run while observing engine monitoring systems (gauge screens / warning lights). Look for anything out of the ordinary. Should the coolant temp. or hydraulic oil temp gauge screens read excessive temperatures (**or** warning lights illuminate) or should the oil pressure gauge read abnormally low, shut the machine down immediately. Diagnose and make needed repairs before resuming operation.

7 MAINTENANCE

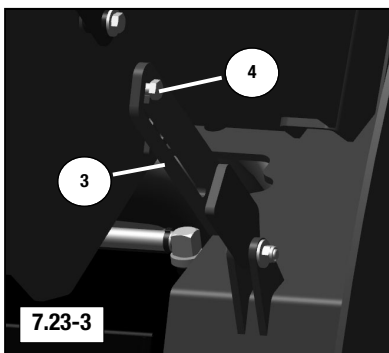


7.23 Cab Tilt Procedure

The ROPS/FOPS approved cab (1) tilts up to allow easy access to components while performing maintenance or service. It is equipped with a gas spring assist and a brace mechanism to hold it in place while tilted.

To tilt the cab:

1. Remove any attachments that may be fastened to the machine.
2. (Optional) Raise the lift arms and secure them with the lift arm brace per section 5.14.
3. Remove the two bolts (item 2) that fasten the cab to the footwell. They are located along the upper edge of the footwell inside the cab, one in each of the front corners.
4. Once the bolts have been removed, **ask an assistant to help you** tilt the cab slowly upwards. The cab brace (3) should fall onto the shoulder bolt (4) locking the cab in its upright position.



Note: The force required to lift the cab exceeds 50 lbs (22.7 kg) and requires at least 2 people to safely tilt it (or the use of a suitable lifting apparatus).

The cab is now secure.

To lower the cab:

1. Raise the cab brace so that the locking channel is clear of the shoulder bolt.
2. Hold the brace upwards and lower the cab (with help from the assistant) until the locking channel is clear of the shoulder bolt then release the brace.
3. The cab is now free to be lowered into operating position.
4. Lower the cab completely and then fasten it to the footwell with the bolts removed previously.
5. Lower the lift arms (if raised) per section 5.14.

7.24 Jacking Procedure

Lifting the machine should only be done from beneath the machine with a jack of the proper capacity.

To safely lift your machine:

1. Remove any attachments that may be fastened to the machine and raise the lift arms.
2. Install the lift arm brace as instructed in section 5.14.
3. Once the lift arms are secured, carefully exit the machine.
4. Roll or slide your jack under the front of the machine and center the lifting pad **beneath the center of the front torsion axle**.

NOTICE

Note: When using a jack to lift the machine, place the jack beneath the torsion axles only. Lifting at any other point will cause machine damage.

5. Once in place, jack/lift the machine upward making sure it remains stable until it has reached sufficient height to install suitable mechanical supports beneath the machine.
6. Slide the mechanical supports into place making sure they are positioned beneath the torsion axles or structural tubing along the bottom of the chassis only and spaced in such a manner that the machine will be stable when its weight rests solely on the supports.
7. Once the supports are in place, slowly lower the machine onto them and then remove the jack.

Repeat steps 4-7 at the rear of the machine should both ends of the machine need to be off of the ground for service.

Lift the machine straight up in a slow and careful manner (under the torsion axles only). Lower it this same way making sure all persons in the area are clear of the machine and its expected path.



When lifting attachments or components, use caution. Attach straps or chains securely and in such a way that they evenly distribute the weight of the item to be lifted, ensuring a balanced load. Stay clear of expected travel path.

CALIFORNIA PROPOSITION 65

California (U.S.A.) state law stipulates that manufacturers of machines operated within its borders must provide a clear warning to customers regarding exposure to substances commonly associated with the machine that are recognized by the state as harmful. The manufacturer provides the following information.

**WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov0404-841