OPERATION MANUAL

COMPACT TRACK LOADER

TL100VS

(S/N: 00101 & Above)

Original Instructions

YANMAR

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: _____

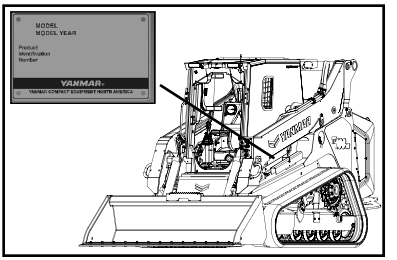
Commissioned on: _____

Dealer:

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

1.1 Product Identification (PIN)

The machine PIN is located on the identification plate, found on the left side of the operator enclosure.



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

Further information relating to machine identification can be found in subsequent sections of this manual (3 Technical Data, 4 Machine Description / Controls).

1.2 Introduction

Thank you for purchasing a TL100VS 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. Refer to section 2.7 of this manual for further information regarding operator qualifications and responsibilities.

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.

Refer to chapters 2 Safety, 4 Machine Description / Controls, 5 Operation and 7 Maintenance for information regarding safe operation and periodic maintenance requirements prior to operation.

Refer to sections 1.4 and 2.4 for information regarding intended use and unauthorized machine modifications (changes, additions, conversions).

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 (see section 1.4).

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 4.15) 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.

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.

1.7 Copyright

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

1.8 Warranty

Your TL100VS 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 TL100VS Distributor.

1.9 Tier 4F Compliance Information

In order to comply with tier 4F emissions regulations, the exhaust system in the TL100VS is equipped with a Diesel Particulate Filter (DPF) and a Selective Catalyst Reduction (SCR) system that consists of a Diesel Exhaust Fluid (DEF) injector, a Selective Catalyst Reduction (SCR) and sensors monitoring system performance.

A process called regeneration is used to elevate exhaust temperatures and incinerate / clean soot from the DPF when buildup occurs. The system is automatic and does not require operator intervention. No change in performance will occur.

If operating in an environment where surroundings are sensitive to high exhaust temperatures, you may temporarily disable regeneration. However, the manufacturer recommends allowing the system to operate automatically whenever possible. Please see pages 67 & 78 for more information on regeneration.

The tier 4F engine and emissions system in the TL100VS 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 TL100VS 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), 69 (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!**

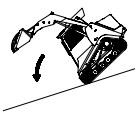
The safety alert symbol is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

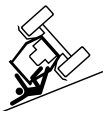
This symbol is used as an attention-getting device throughout this manual as well as on decals and labels fixed to the machinery to assist in potential hazard recognition and prevention.

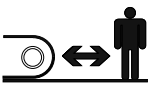
Property or equipment damage warnings in this publication are identified by the signal word "NOTICE".

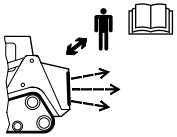
NOTICE
“NOTICE” Indicates a hazardous situation which, if not avoided, could result in property or equipment damage.

2.2 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 pinholes. • 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.

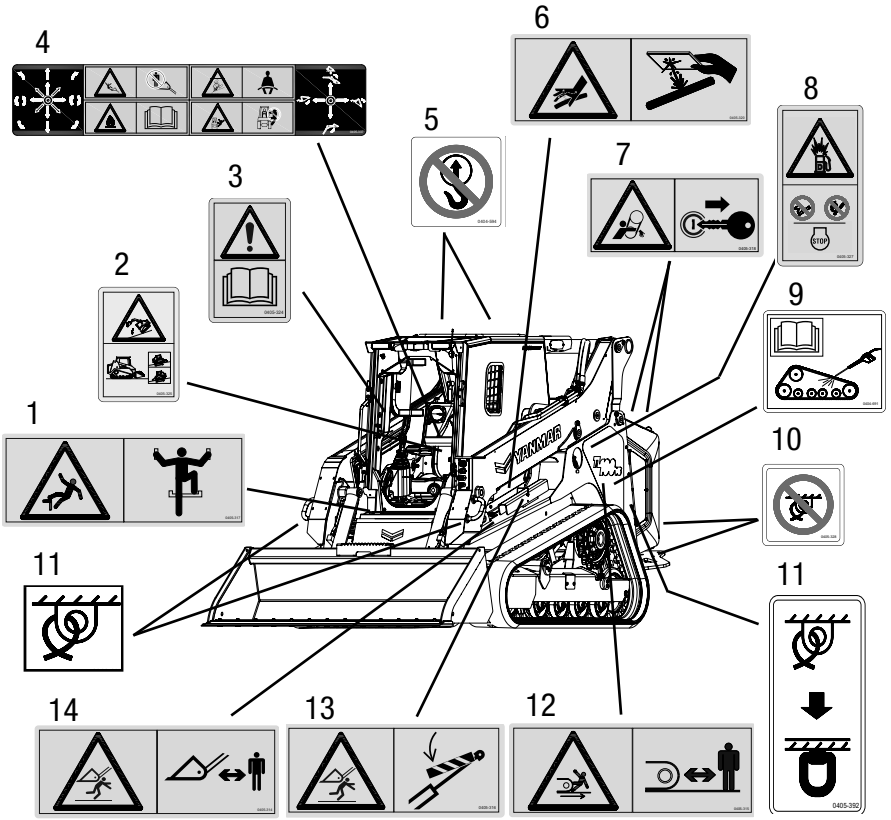
Hazard Pictorial	Avoidance Pictorial	Description
		**Hazard:** Explosion/Burn **Avoidance:** • Keep all flames/sparks away! • No Smoking! • Read and understand all manuals.
		**Hazard:** Corrosive **Avoidance:** Read and understand the operator's manual.
		**Hazard:** Fall **Avoidance:** No Riders.
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

Hazard Pictorial	Avoidance Pictorial	Description
		**Hazard:** Crush **Avoidance:** Keep hands clear of moving parts during equipment operation.
		**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 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.

2.3 Safety Signs

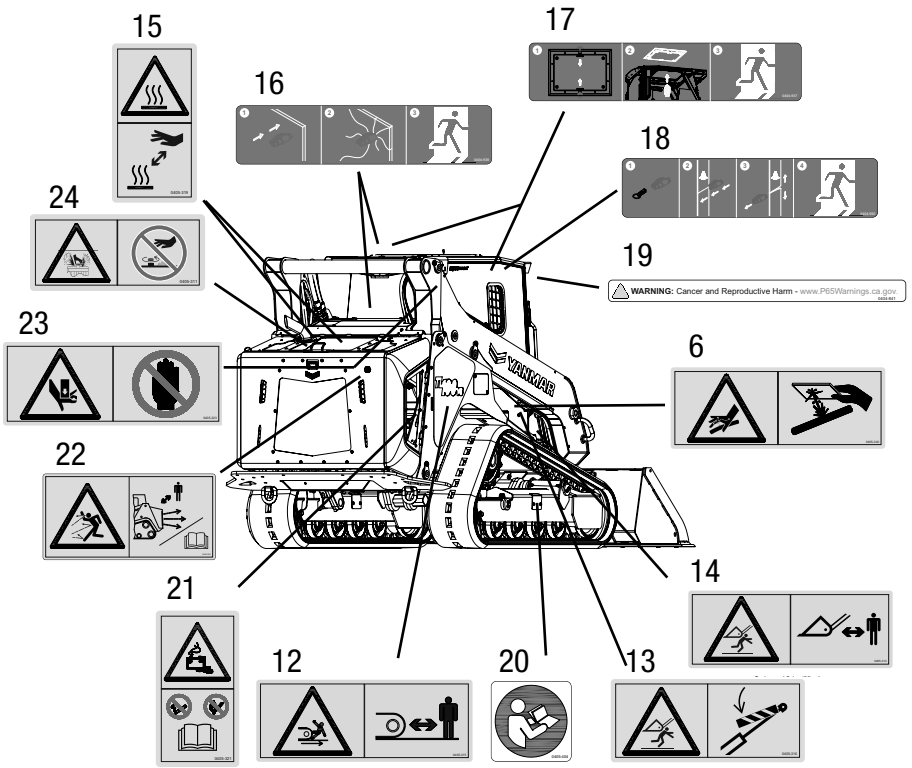
The safety signs are located in/on the machine as indicated. (Descriptions of the symbols are provided in section 2.2).



Key

1. Fall hazard
2. Rollover/ejection hazard (inside cab)
3. Read operator's manual (multiple locations, see section 2.18, accumulator)
4. Fall / crush hazards / fire notice (inside cab)
5. Not a lift point (top of cab)
6. Skin (oil) injection hazard
7. Entanglement hazard (engine compartment)
8. Explosion / burn hazard (fuel)
9. Clean undercarriages notice (one on each side of machine)
10. Not a Tie down location (one on each side of machine)
11. Tie down locations (two forward, two rear)
12. Crush hazard (run over)
13. Crush hazard (lift arm brace)

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 arms)
15. Burn hazard (multiple locations / orientations)
16. Emergency Exit (break glass, multiple locations in cab)
17. Emergency Exit (roof panel, multiple locations in cab)
18. Emergency Exit (cut seatbelt, inside cab)
19. Proposition 65 warning, (inside cab)
20. Read operator's manual (multiple locations, grease tension, lift arm brace)
21. Explosion / burn hazard (read operator's manual) (engine compartment)
22. Flying Debris Hazard
23. Crush Hazard (pinch point, found on both sides)
24. Burn hazard (engine compartment)

⚠ 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, 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, the operator must be guided or the driving and working zone must be secured by means of a solid barricade.

⚠ 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 (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.

⚠ 2.9 Transporting Persons

- The machine must not be used to transport persons.

⚠ 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 starting procedure in this manual.
- **DO NOT run the engine with the hood open. Exhaust routing is affected and can overheat nearby components.**
- 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 starting aids containing ether to start diesel engines with preheat systems! Use of starting aids of this nature can cause an EXPLOSION!
- Familiarize yourself with the location of any 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 residual 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.

⚠ 2.12 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 and mirrors (if equipped) 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), 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 electricity 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.

⚠ 2.15 Parking the Machine

- Stop the machine only on an even and solid surface.
- Lower the lift arms to the frame stops 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 any doors, windows, hoods and side panels on the machine.
- Secure the machine and any other items against slipping with chains, cables 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 ramps 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.

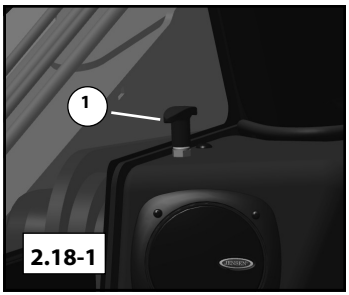
⚠ 2.18 Maintenance

- 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 suitable 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 (see note). Fully curl the quick attach (or you can extend it to the ground if the loader is down).

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).

2. **a.** If equipped with ride control, turn the key to the on position, set ride control speed setting to 0 (see page 68), then activate the ride control function by pressing the button on the keypad (item 14, section 4.1 / LED will illuminate).
   b. Activate the manual lift arm lowering valve (item 1 fig. 2.18-1) momentarily to release any residual pressure in the lift arm circuit.
   c. Perform step 2 in section 4.11 to release any residual pressure within the auxiliary circuit.
3. Turn the continuous auxiliary hydraulic switches off and ensure the variable auxiliary switch is in its neutral resting position (see section 4.11).
4. Make sure the drive and lift arm controls are in neutral positions (controls are spring centered, resting position is neutral).

- 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.

- Hydraulic accumulator (if equipped with ride control) is under high pressure. **Do not service!** Repairs must be performed by trained personnel.

⚠ 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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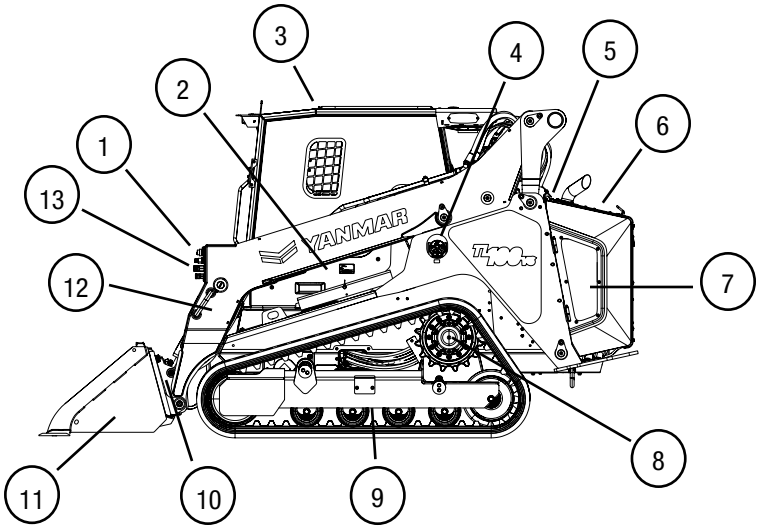
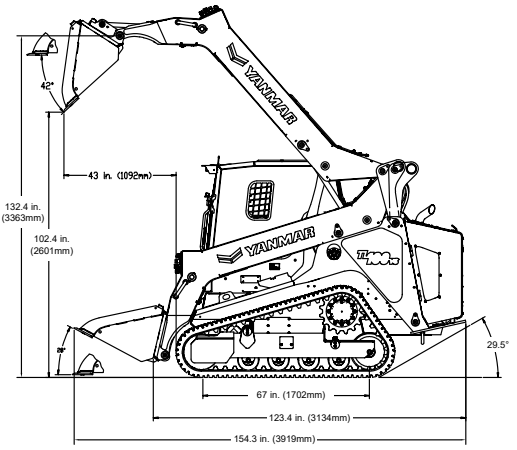
3.1 General Structure

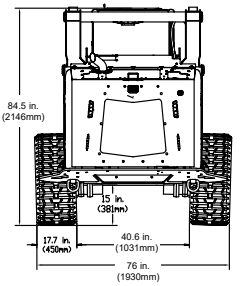


Key

1. Electric Attachment Control Receptacle (see section 4.9)
2. Product PIN Plate (on front portion of operator enclosure)
3. Operator Enclosure (R.O.P.S./F.O.P.S. approved)
4. Diesel Fuel (fill location)
5. Hydraulic Oil (fill location, right side of machine)
6. Hood (engine cover)
7. Engine
8. Drive Motor and Sprocket
9. Undercarriage
10. Quick Attach
11. Bucket
12. Lift Arm
13. Auxiliary Hydraulic Quick Couplers (see section 4.11)

3.2 Views





3.3 Engine TL100VS

Make	Yanmar
Type	4TNV94FHT
Design	4 cyl. (aftercooled, turbo)
Displacement	189.2 in. ³ (3.1L)
Power (2500 RPM)	103.5 hp (77.2 kW)
Admissible inclines	30° all directions (engine only)
Cooling	Water-antifreeze blend

3.4 Electrical System TL100VS

Operating Voltage	12 V
Battery (32° F / 0° C)	950 CCA
Alternator	80A
Starting Aid	Glow Plugs, w/ pre-heat
Lighting System	Cab mounted work lights

3.5 Undercarriage TL100VS

Type	Suspended, rubber track
Max. Speed	8 mph (12.8 kph)
Power Transmission	variable disp. / axial piston
Track length, on ground	67 in. (170.2 cm)

3.6 Transmission TL100VS

Design	Variable disp. / axial piston
Discplacement	2.746 in. ^{3} (45 cc) / rev
Relief Pressure	5802 psi (400 Bar)

3.7 Auxiliary Hydraulics TL100VS

Flow	23 gpm (87.1 lpm)
Relief pressure (std. flow)	3481 psi (240 Bar)
High Flow	41 gpm (155.2 lpm)
Relief pressure (high flow)	3989 psi (275 Bar)

3.8 Ground pressure TL100VS

At operating weight	4.4 psi (.303 Bar)

⚠ 3.9 Operating Specs. TL100VS

Tipping load	10800 lb (4899 kg)
Operating capacity 35%	3780 lb (1715 kg)

Note: The Maximum Gross Vehicle Weight of the TL100VS is not to exceed 16,399 lb (7,438 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.) TL100VS

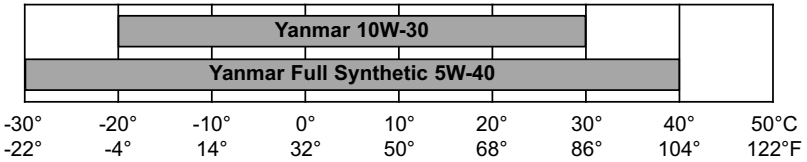
Fuel tank	34 gal (128.7 l)
Hydraulic tank	5 gal (18.9 l)
Engine coolant	2.9 gal (10.98 l)
Engine oil w/ filter	10 qt (9.46 l)
DEF capacity	5 gal (18.9 l)

3.11 Fluid Specifications

Specifications	Designation	Specification/standard
Fuel	Diesel Fuel	Ultra Low Sulfur Diesel ASTM S-15
Engine Oil	Engine Oil	Yanmar 10W-30 (see chart)
Engine Coolant	Coolant	HD EXPERT EXTEND
Hydraulic Oil	Hydraulic Oil	Yanmar ZF-46 MV
Diesel Exhaust Fluid	DEF	API Certified DEF
Lubricating Points	Grease	Yanmar High Performance Grease EP2

Note: ULSD / Biodiesel fuel blends up to B20 (20% biodiesel) supplied by a BQ9000 certified supplier are considered acceptable (see engine specific operation and maintenance manual for B7-B20 conditions and additional information).

Recommended Engine Oil Viscosity Grades



Ambient Temperature

3.12 Dimensions and Weights

Length w/o bucket	123.4 in. (3134 mm)
Length w/bucket	154.3 in (3919 mm)
Width (Max)	76 in. (1930 mm)
Height (to top of cab)	84.5 in. (2146 mm)
Ground Clearance	15 in. (381 mm)
Weight (operating) OPEN	10555 lb (4788 kg)
Weight (operating) AWC	11045 lb (5010 kg)

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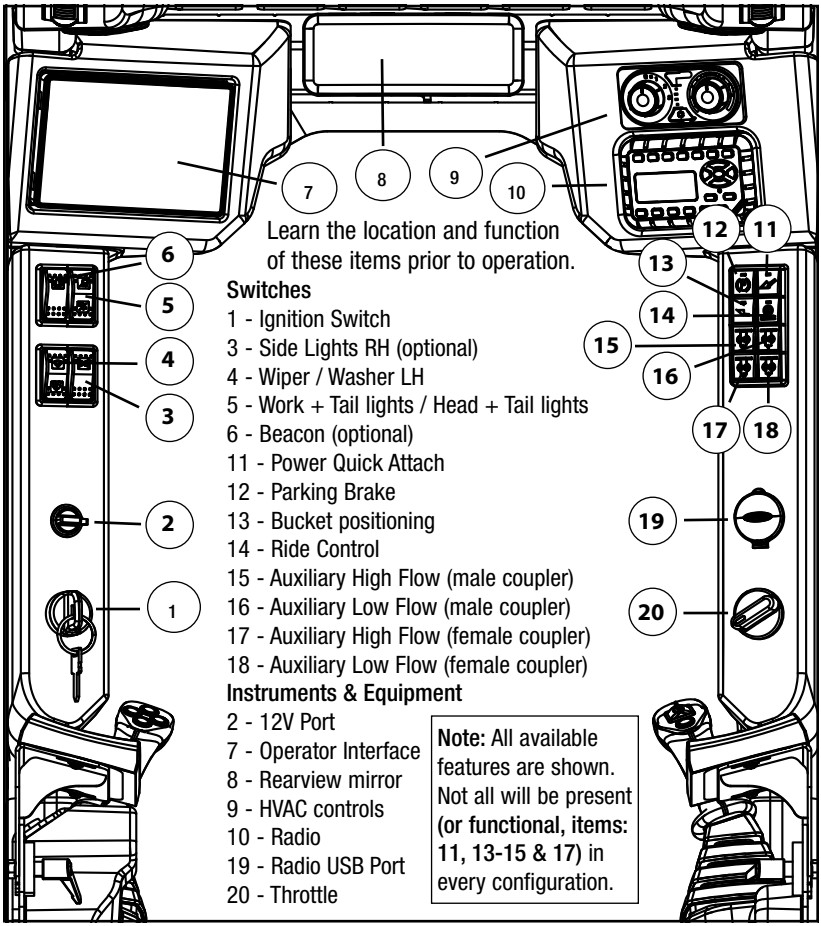
4.1 Display Elements / Switches



Learn the location and function of these items prior to operation.

Switches

1 - Ignition Switch
3 - Side Lights RH (optional)
4 - Wiper / Washer LH
5 - Work + Tail lights / Head + Tail lights
6 - Beacon (optional)
11 - Power Quick Attach
12 - Parking Brake
13 - Bucket positioning
14 - Ride Control
15 - Auxiliary High Flow (male coupler)
16 - Auxiliary Low Flow (male coupler)
17 - Auxiliary High Flow (female coupler)
18 - Auxiliary Low Flow (female coupler)

Instruments & Equipment

2 - 12V Port
7 - Operator Interface
8 - Rearview mirror
9 - HVAC controls
10 - Radio
19 - Radio USB Port
20 - Throttle

Note: All available features are shown. Not all will be present **(or functional, items: 11, 13-15 & 17)** in every configuration.

NOTICE

The TL100VS 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).

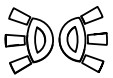
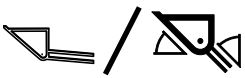
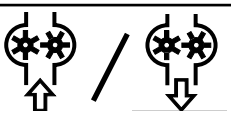
Consult your dealer to access and interpret diagnostic codes and recommend service (if needed). Complete necessary repairs before resuming operation.

See also “Active Faults” accessed through the main, diagnostics and fault menus found on pages 59 and 69 of this manual for further information.

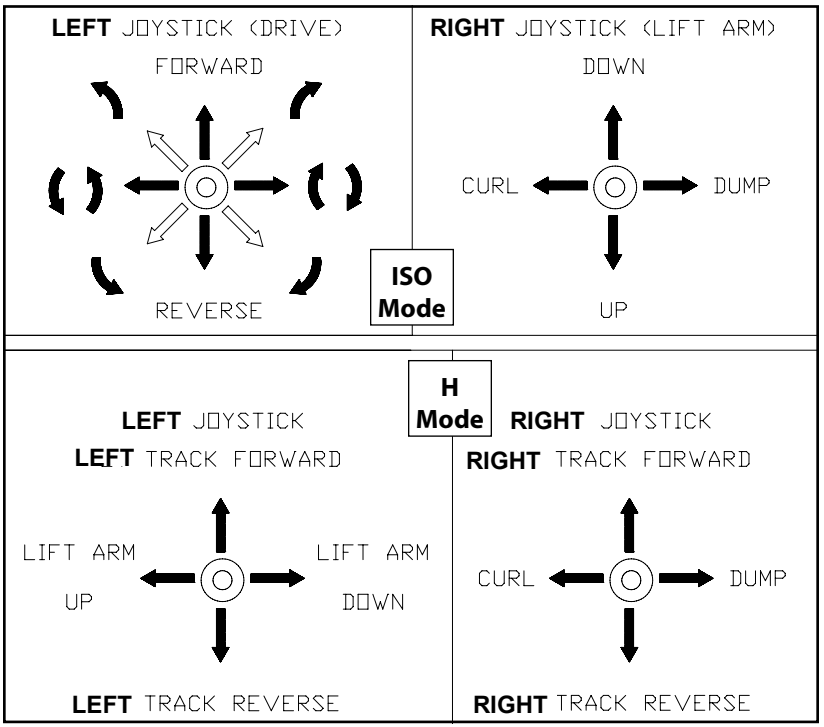
The engine may automatically derate if necessary, but as a precaution, always shut the machine down if any critical alarm messages or warnings appear during operation to prevent damage.

4.2 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

Symbol	Description
	Work & Tail lights / Head & Tail Lights
	Side Lights
	Ride Control
	Bucket Positioning / Loader Position Captured
	Power Quick Attach
	Beacon
	High Flow Auxiliary Hydraulics
	Low Flow Auxiliary Hydraulics
	Hydraulic Oil Only
	Ultra Low Sulfur Diesel Fuel

4.3 Controls



The TL100VS 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 section 4.12.

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).

Float Mode:

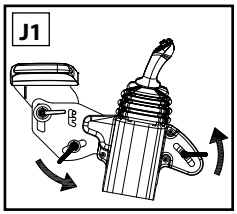
To engage: lower the lift arms to the stops, then give a lift arm down command while pressing the upper trigger on the right joystick. The lift arms will then stay in float mode until the button is pressed again or the operator raises the lift arms.

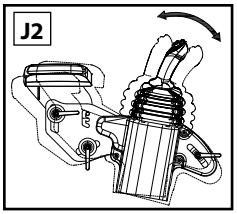
4.3.2 Left Joystick

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

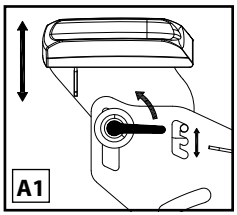
In some configurations, joystick and armrest position are adjustable for comfort.

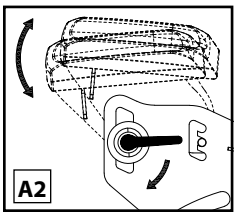




To adjust Joystick Position:

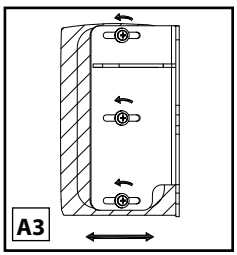
1. Rotate the two highlighted levers counter-clockwise to loosen to assembly for adjustment (fig. J1).
2. Adjust position as desired for comfort (fig. J2).
3. Reverse step 1 of this procedure to tighten and secure the assembly.

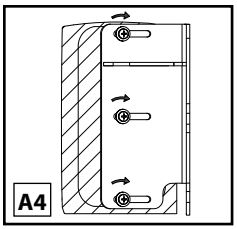




To adjust Armrest (height / angle):

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).

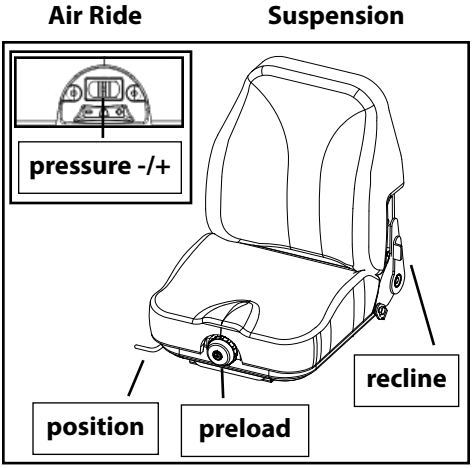
4.4 Operator Seat

The TL100VS 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.

4.6 Two Speed

The TL100VS 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. See also Automatic Shift in section 4.12.

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 Positioning Features (optional)

TL100VS machines are available with various automated positioning features.

4.7.1 Bi-Directional Bucket Positioning

The bucket positioning system, once activated, maintains the current angle of the quick attach throughout the upward and downward cycles 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) and can be temporarily overridden by operating the quick attach curl or dump functions. Bucket positioning operation will resume once overriding curl or dump commands are no longer present.

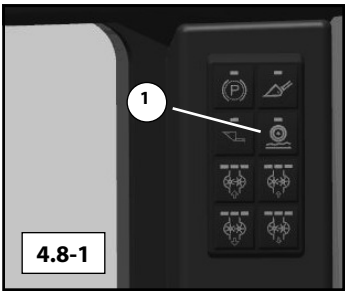
4.7.2 Work Tool Positioning (positions not retained when key is turned off)
Work Tool Positioning once activated, returns the quick attach (and coupled work tool) to a memorized angle. Work Tool Positioning can be overridden by operating the quick attach curl or dump functions, deactivating the function.

To memorize a position, set the quick attach to the preferred angle, then press and hold the float button (section 4.3) for 5 seconds. To activate, **move only the quick attach** momentarily in the direction of the memorized position and press the float button once. The “loader position captured” icon (section 4.2) will appear on the display when a position is memorized and flash twice if a new position is memorized while another position is actively in memory **(applies to both work tool positioning and return to position functions).**

4.7.3 Return to Position (positions not retained when key is turned off)
Return to position, once activated, returns both the lift arm and quick attach to memorized angles. Return to Position can be overridden by operating the lift arm up / down or quick attach curl /dump functions, deactivating the function.

To memorize a position, set the lift arm and quick attach to the preferred angles, then press and hold the float button (section 4.3) for 5 seconds. To activate return to position, **move both the lift arm and quick attach** momentarily in the direction of the memorized positions and press the float button once.

4.8 Ride Control (optional)

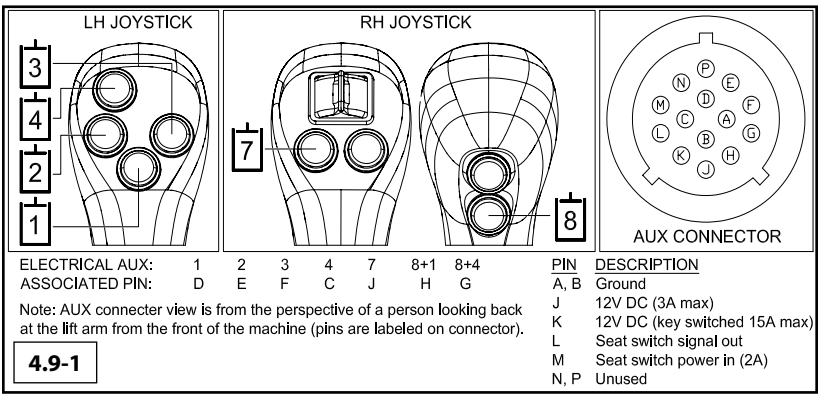


TL100VS machines can be equipped with a feature called ride control. This feature, when activated, acts as a shock absorber within the hydraulic system when a load is being carried. As a result, the machine is able to carry the load in a more controlled manner over rough terrain which improves ride and operator comfort (see also page 68, ride control).

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



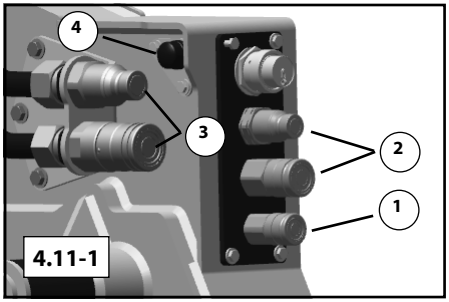
PIN	DESCRIPTION
A, B	Ground
J	12V DC (3A max)
K	12V DC (key switched 15A max)
L	Seat switch signal out
M	Seat switch power in (2A)
N, P	Unused

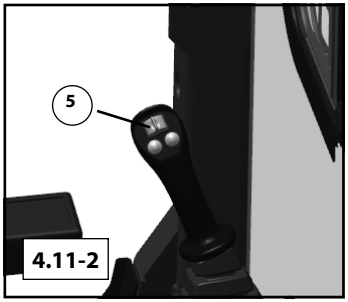
Attachments for the TL100VS can be controlled by pressing various buttons on the joysticks or switches in the cab. Most attachments are controlled hydraulically, but some require both hydraulic and electrical inputs. The electrical auxiliary switches identified above (excluding AUX 7) can send up to 20 amps (combined) of electrical current to pins C, D, E, F, G, H of the receptacle on the lift arms (AUX 7 provides a separate 3 amp auxiliary output to pin J). 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 4.15).

4.10 Auto Idle

The TL100VS 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 section 4.12.

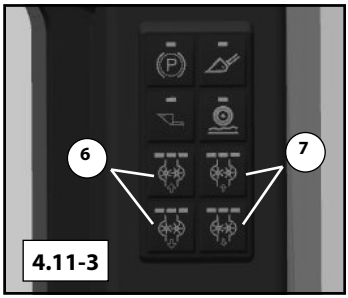




4.11 Auxiliary Hydraulics

The TL100VS models come equipped with an auxiliary hydraulic system designed to power compatible hydraulic attachments (see section 4.15). **High flow is not present in all configs.**

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



To connect couplers:

1. Clean couplers thoroughly (both ends).
2. With the engine running, press the auxiliary pressure release button (item 4, fig. 4.11-1) for 5 seconds to activate the function, then continue to hold. A confirmation beep will sound and display message will appear when activated.
3. While continuing to hold the button, connect the attachment female coupler to the machine male coupler first, then connect remaining couplers.
4. Release the button. Turn collars 1/4 turn to verify connections are secure.

Note: Holding the button for 30 seconds will trigger a fault. Cycle the key to clear.

Component Identification:

1. Case drain coupler
2. Low flow couplers
3. High flow couplers (optional)
4. Aux. Residual Pressure Release
5. High/Low flow (variable) switch
6. High flow switches (optional)
7. Low flow switches

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 pressurize the male couplers, while the lower buttons pressurize the female couplers allowing flow reversal within the circuit.

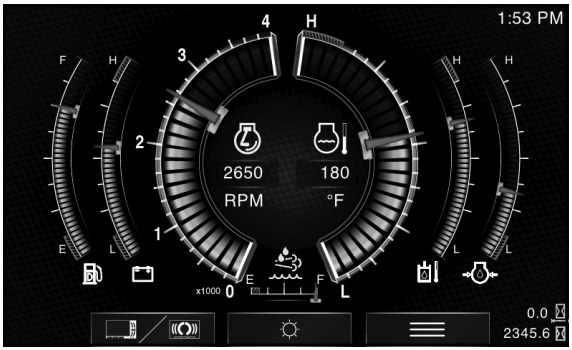
Note: The auxiliary hydraulic switches must be pressed and held in place until all three of the LED lights at the top of the button illuminate indicating activation.

4.12 Operator Interface

The following information (initial view to user profiles) is intended to be a quick start user guide covering commonly accessed screens and features. The main menu and its contents are covered in more detail starting on page 59.

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. 52). 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.

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

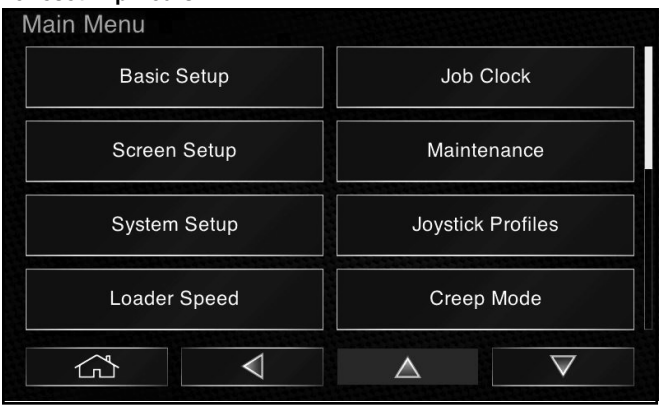
To confirm a selection, press the “confirm” icon when prompted.

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

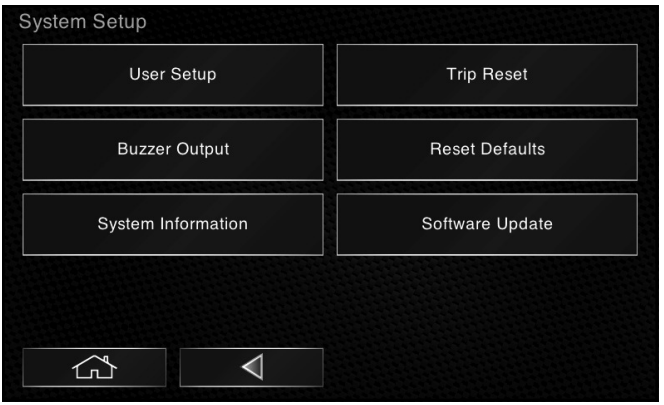
User Guide - Commonly Accessed Functions

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. 52).

To reset Trip Hours:



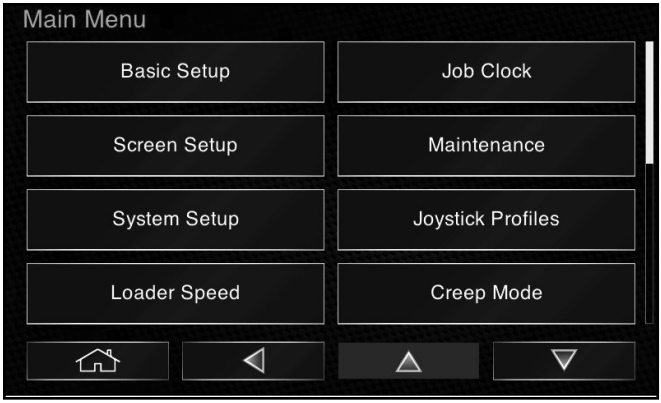
1. Select System Setup from the main menu.



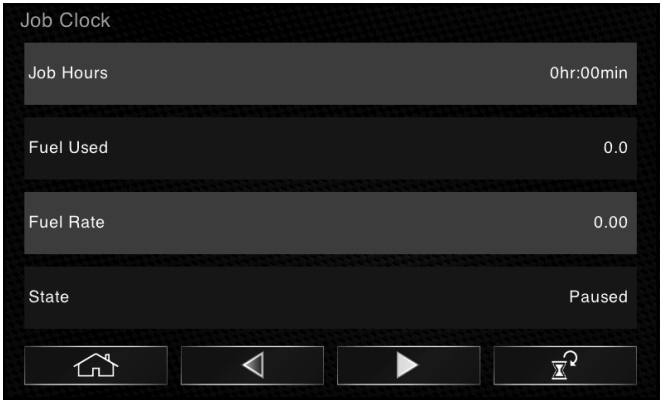
2. Select Trip Reset from the System Setup sub-menu.

3. When prompted, select the lower right icon to confirm and reset the trip hours.

To reset Job Clock:



1. Select Job Clock from the main menu.



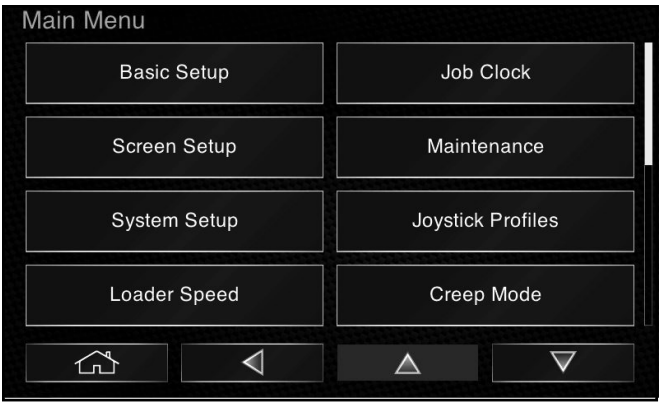
2. Select the reset icon in the lower right corner of the screen.

3. When prompted, select the lower right icon to confirm and stop / reset the job clock.

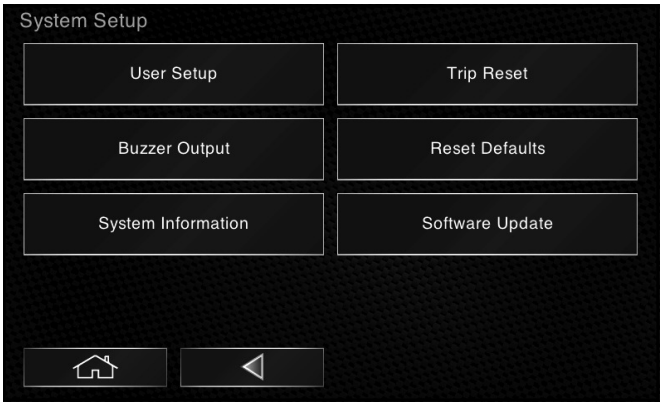
Buzzers & Pop-ups

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:



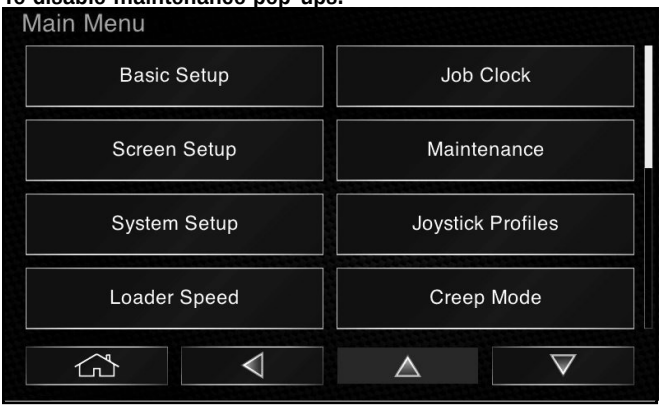
1. Select System Setup from the main menu.



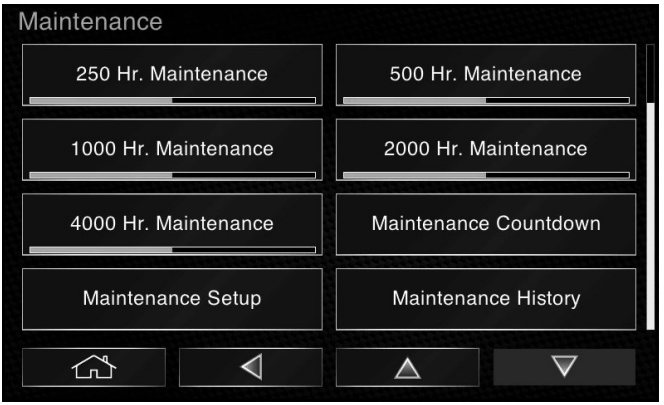
2. Select Buzzer Output from the System Setup sub-menu.

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.

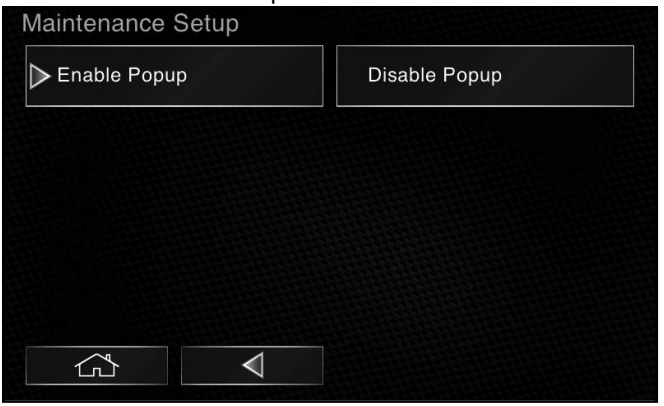
To disable maintenance pop-ups:



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.

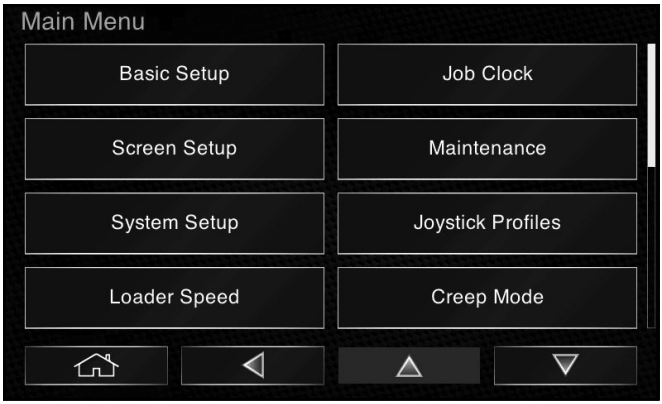
User Guide - Password Protection and User Profiles

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.

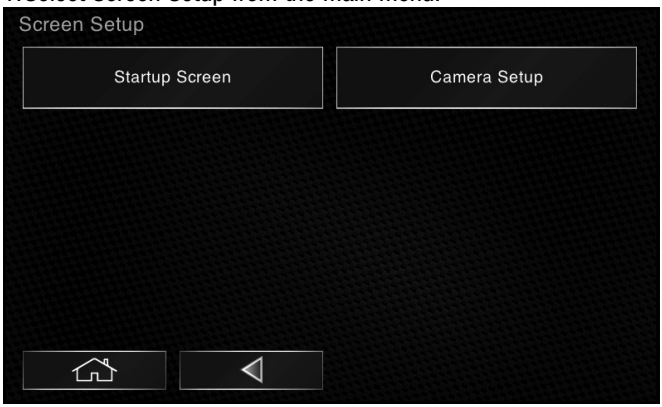
Password protection

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.

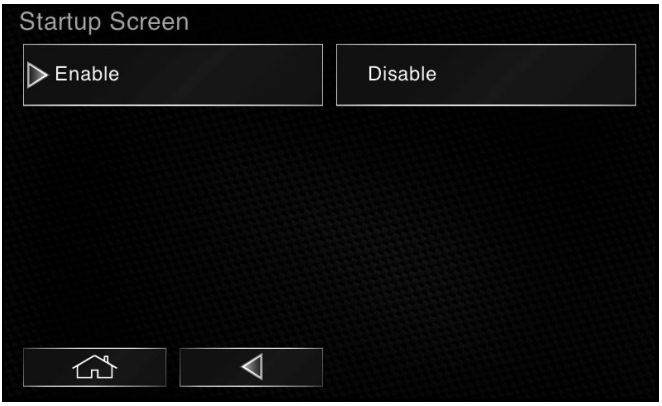
To Enable Password Protection:



1. Select Screen Setup from the main menu.



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

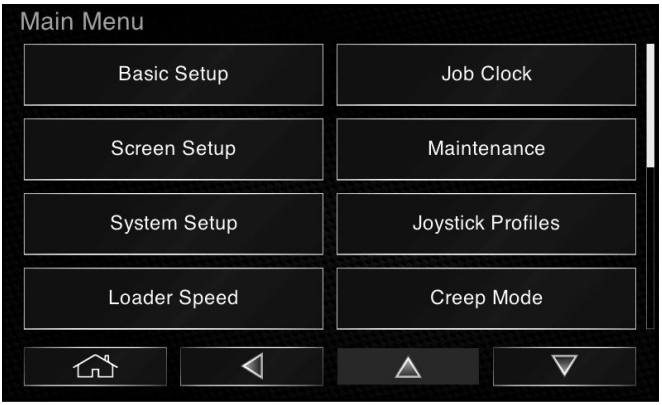


3. Select Enable From the Startup Screen sub-menu.

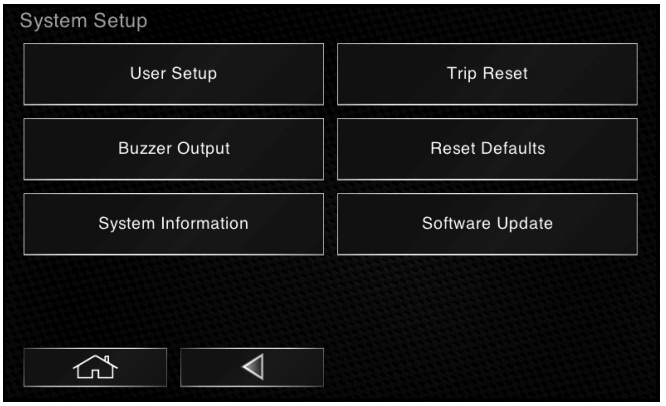
The default administrator password is 1111. Once you enable password protection, you must turn the key to the off position, wait 10 seconds to allow the change to take effect, then you may turn the key on and enter the default password to gain access to the operator interface.

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).

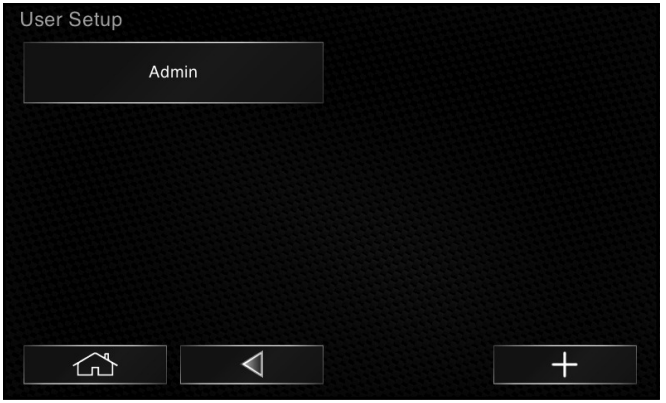
To Change Your Username or Password:



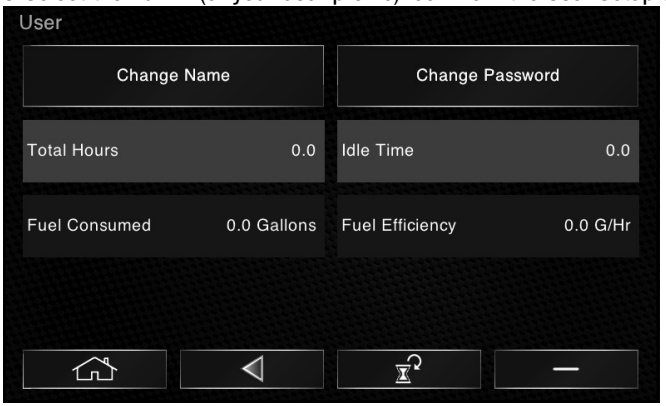
1. Select System Setup from the main menu.



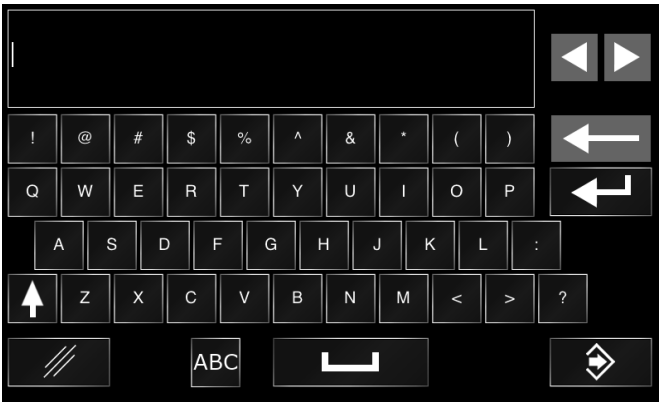
2. Select User Setup from the System Setup sub-menu.



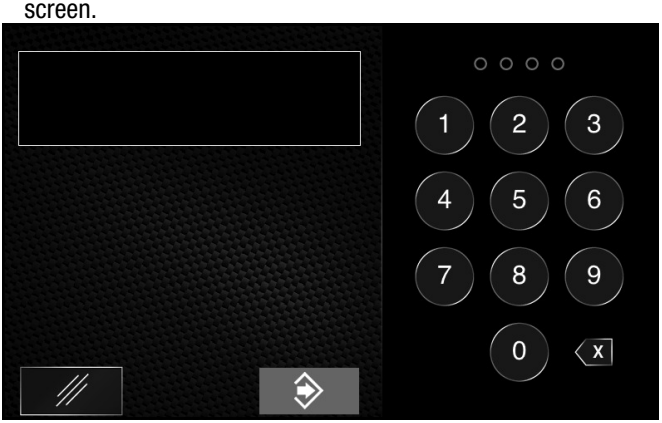
3. Select the Admin (or your user profile) icon from the User Setup sub-menu.



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.

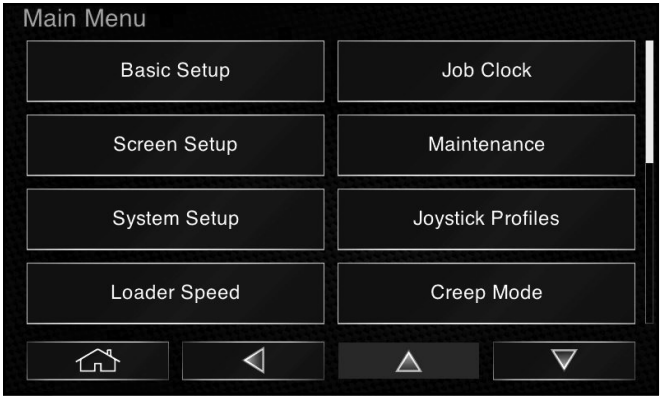
Forget your password?

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.

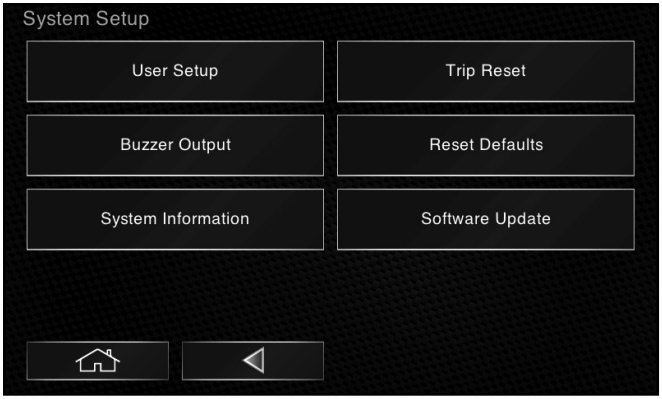
If the password for the administrator profile is forgotten, you must return to your local dealer and have the operator interface reset.

User Profiles

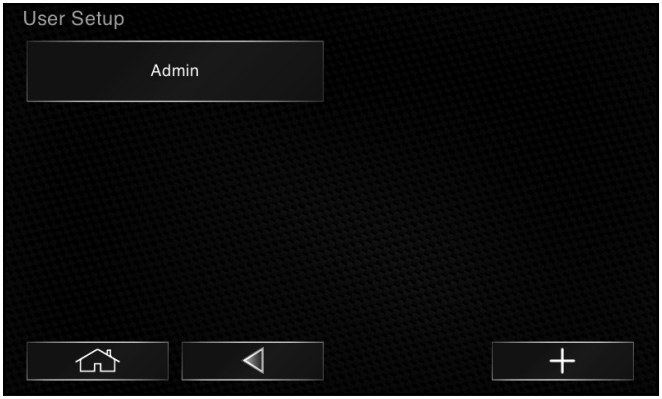
To create new user profiles:



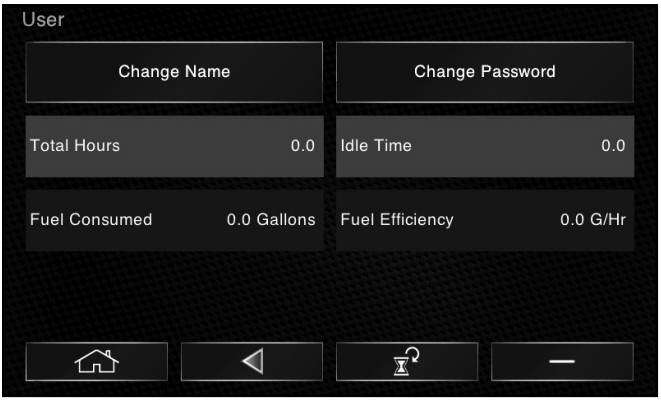
1. Select System Setup from the main menu.



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



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



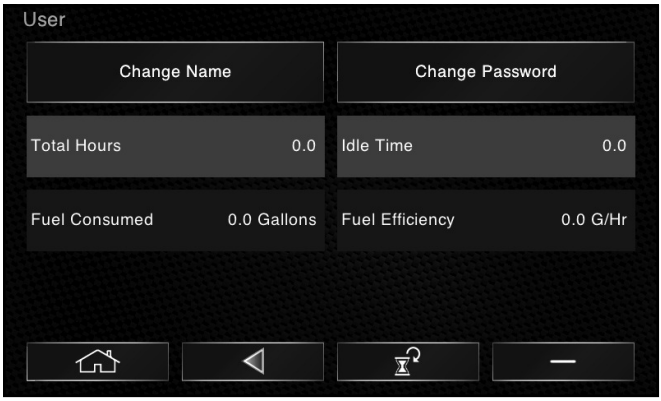
4. Enter a new username and change / enter password as described earlier in this section to allow the profile to be accessed upon startup through the password lock screen.

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.

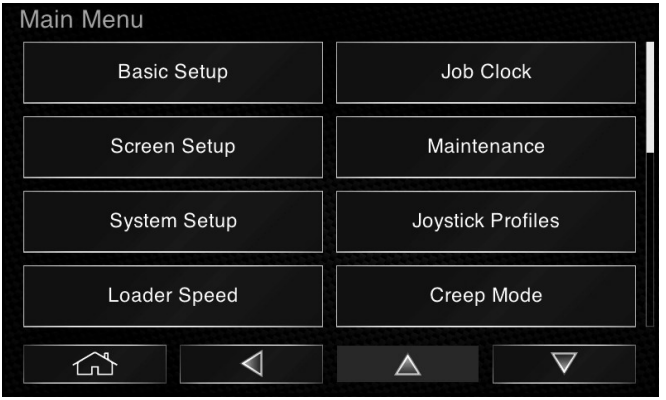
2. Log in using the password set for the Admin user profile.
3. Repeat steps 1 & 2 of the “create new user profiles” procedure on the preceeding page. Then select the user profile for which you would like to reset statistics (or delete).

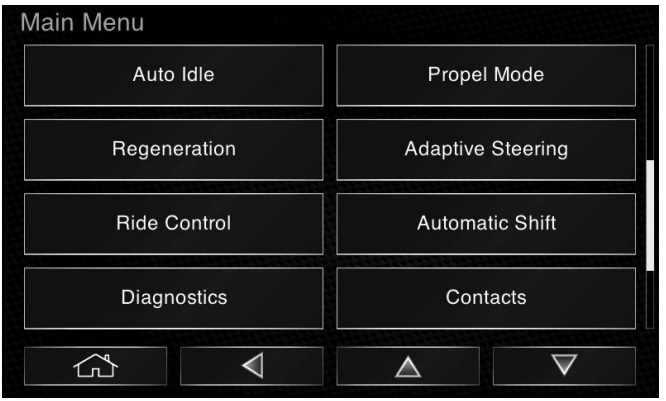


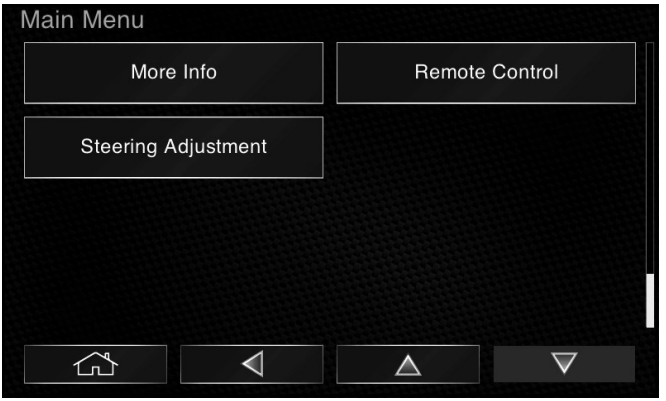
4. **To reset user statistics**, select the “reset” icon at the bottom of the screen. When prompted, select the confirm icon.

5. **To delete a user profile**, select the - Icon in the lower right corner of the screen. When prompted, select the confirm icon.

Main Menu

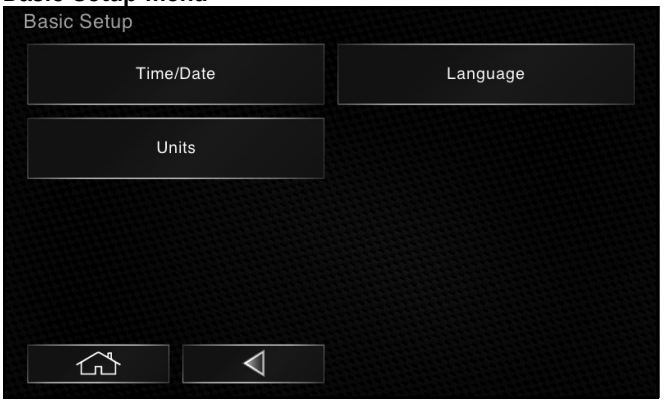






This screen allows you to access various sub menus. Simply scroll until you see the desired icon, then touch the screen over the icon to select its sub-menu. Press the Home icon to return to the gauge screen or back arrow to return to the previous screen. Some sub-menus may or may not be present depending on machine configuration.

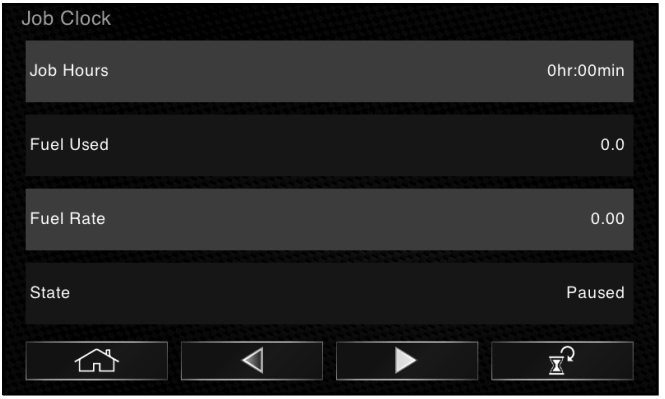
Basic Setup Menu



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

- Time / Date
- Language
- Units

Job Clock

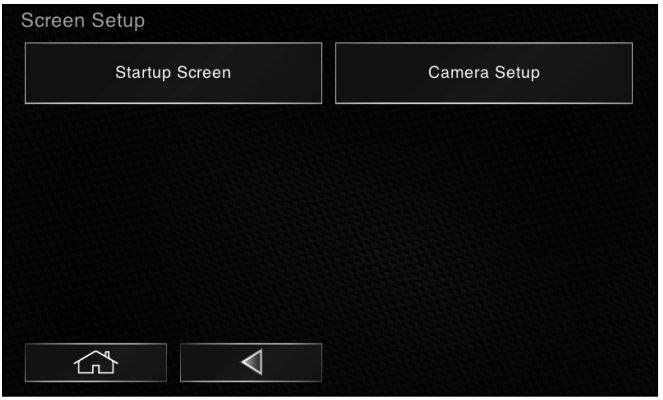


This screen displays collected operating information for a set period of time.

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).

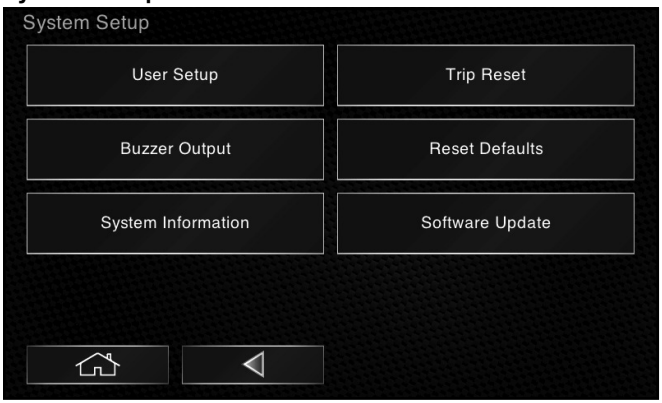
Maintenance Menu

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.

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.

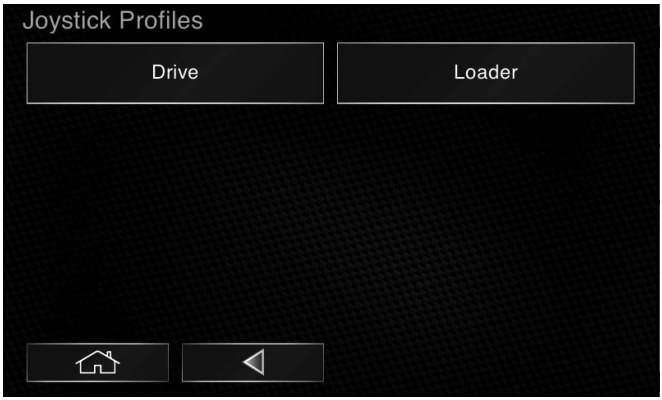
Buzzer Output allows an operator to enable or disable buzzer warnings.

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 Yanmar 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

Secondary Confirmation Sequence

Changing the display settings for functions that affect physical operating characteristics of the machine (ex: loader speed, creep enable, creep speed percentage, variable auxiliary flow, propel mode, etc.) require secondary confirmation to ensure that selections are intentional. When prompted, follow the on screen instructions to confirm your selections.

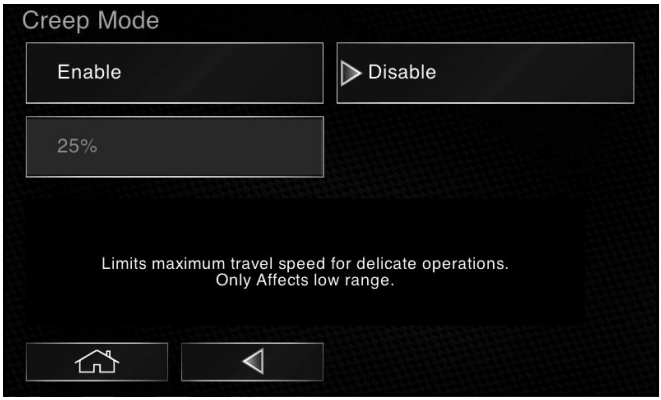
Note: When making changes in the display, always make sure the machine is in a neutral (safe) state, defined more specifically as:

- Machine parked in a safe location on firm and level ground
- Lift arm down or supported by the lift arm brace
- Engine at idle (or engine off with key on)
- No attachments or auxiliary functions currently active / operating

Loader Speed

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

Creep Mode



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

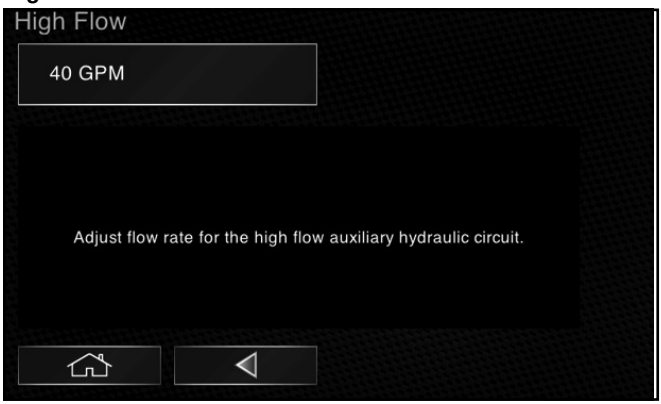
Creep mode affects only low range. When shifted into high range from creep mode (less than 100% setting), the machine will ramp up slowly to 100% speed in low range, then shift into high range.

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.

Variable Auxiliary Flow

This screen allows you to chose 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.

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 refered to as a “Case” style control configuration.

Regeneration

This screen allows you to enable or disable automatic regeneration.

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 stationary regeneration (allowed only if needed).

Stationary 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). See page 78 for more information.

Adaptive Steering

This screen allows you to enable or disable the adaptive steering feature.

Ride Control

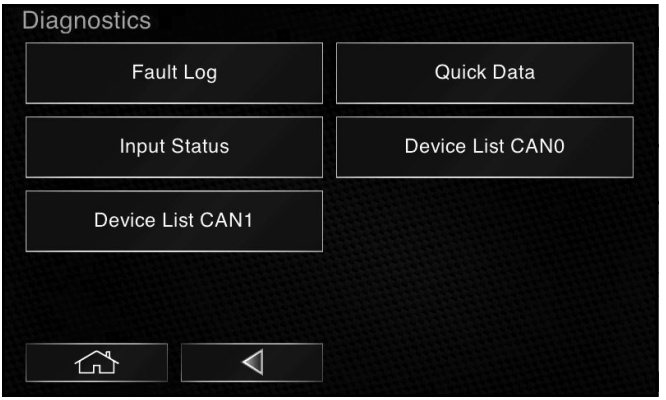
This screen allows you to set the speed at which automatic ride control is enabled. If set to 0, manual mode will be displayed and the feature will only be active when the button on the keypad (item 14 page 37) is active and illuminated.

Automatic Shift

This screen allows you to enable or disable the automatic shift feature.

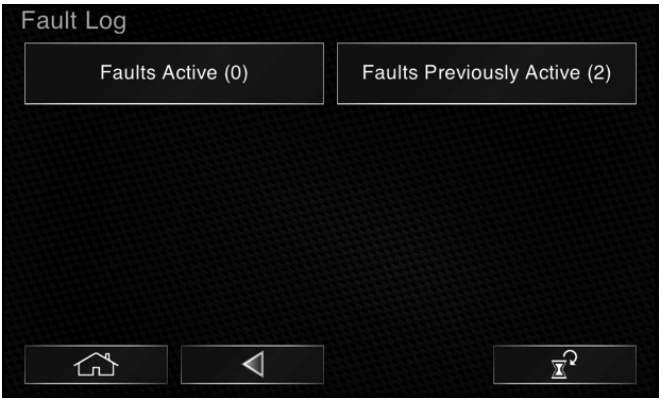
Automatic shift, when enabled, automatically shifts the machine from low to high range and back again as needed during operation.

Diagnostics



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

Fault Log



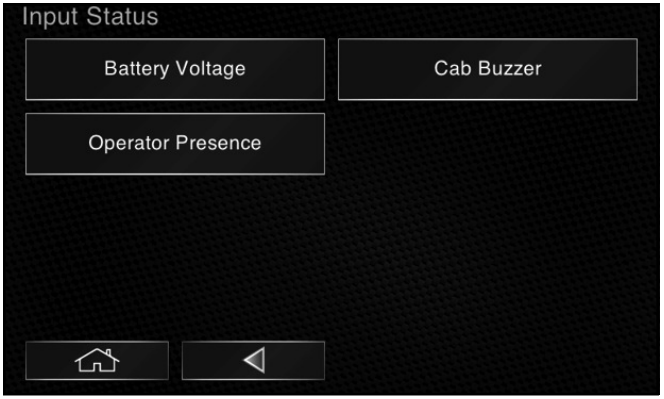
Selecting Fault Log allows access to currently active faults and previously active faults.

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.

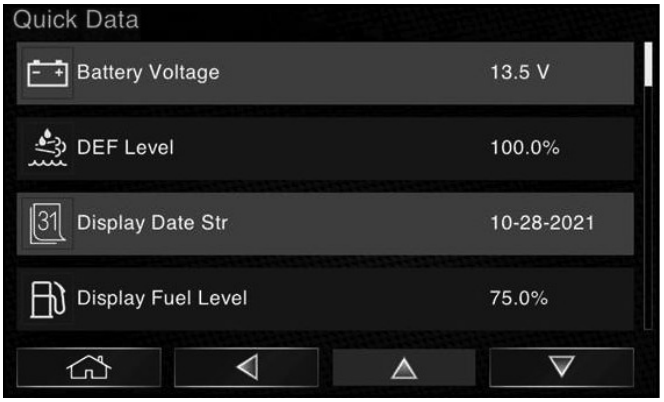
- Read, then clear any pop-ups by selecting the icon in the lower right corner.
- Remedy the issue(s) that caused the fault(s) to occur.
- Select the reset icon in the lower right corner of this screen to clear active faults from the operator interface. **Some faults are permanently stored in the engine 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.

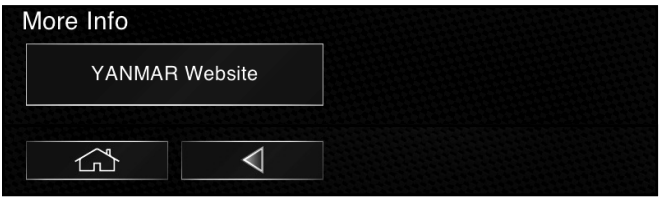
Device List (CAN 0 / CAN 1)

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

Contacts

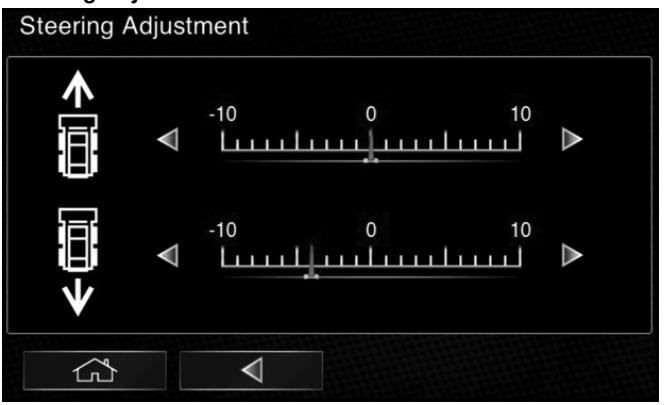
This screen provides a place for storing contact information. Select a vacant box (or the + sign) to add name, address, phone, website, etc. for important contacts like your local dealer. Only the Admin user profile may add or delete entries here.

More Info



This screen allows an operator to access additional resources.

Steering Adjustment



This screen allows an operator to make adjustments to compensate for steering drift. If your machine does not travel in a straight line (on firm and level ground) when giving a straight forward or reverse command, make adjustments here to correct any perceivable drift to the right or left (+/- 3ft - forward, +/- 6ft - reverse over 50 ft distance is considered acceptable).

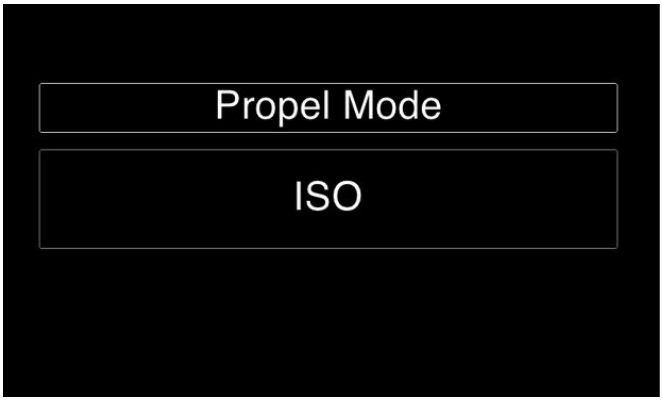
This feature can also be useful to help keep the machine tracking straight when operating on uneven surfaces (inclines, crowned roads, etc.), using attachments that unevenly load the machine (affecting tracking) and to compensate for component wear or variation (track tension, wear, etc.).

Adjustments are effective immediately and can be made any time (key on).

Splash Screens

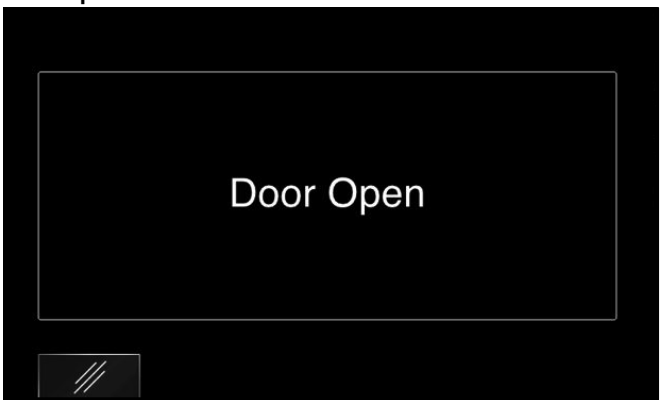
Splash screens display when the operator needs to be notified of issues quickly. Some display momentarily and then disappear. Others indicate a problem that must be acknowledged or resolved before operation can resume. Some examples are shown here.

Propel Mode



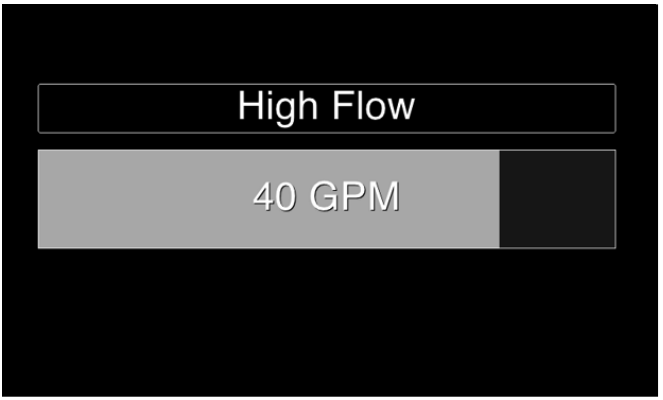
This screen indicates the current propel mode when the key is turned on and is also displayed when an operator sits down into the operator seat.

Door Open



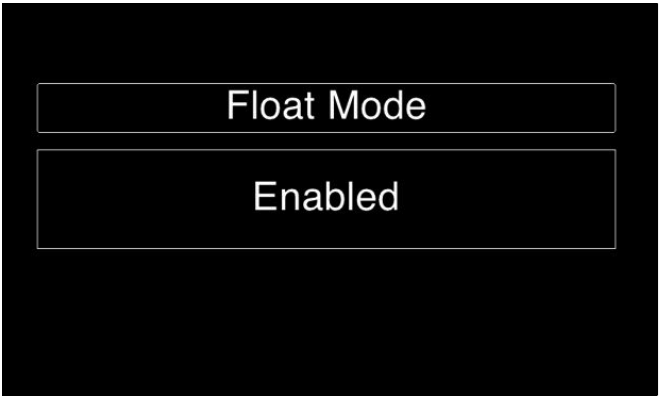
This screen indicates the door switch is not making contact (door is not completely closed). The joysticks and auxiliary hydraulic controls will not operate if the door is not properly closed. Close door to clear screen and resume operation.

High Flow



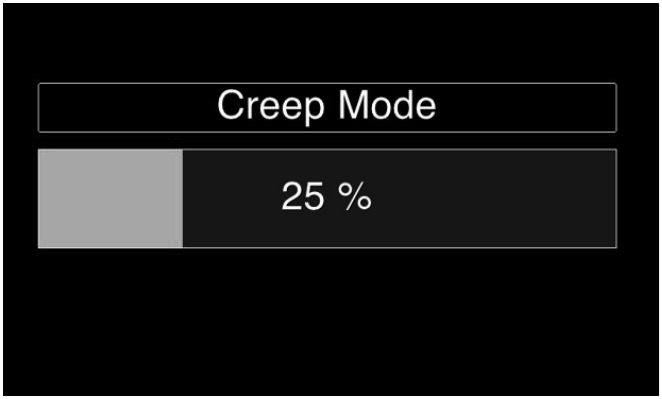
This screen indicates the current high flow volume over time setting in gallons per minute. It is displayed when auxiliary hydraulic high flow is activated to make the operator aware of the current setting.

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.

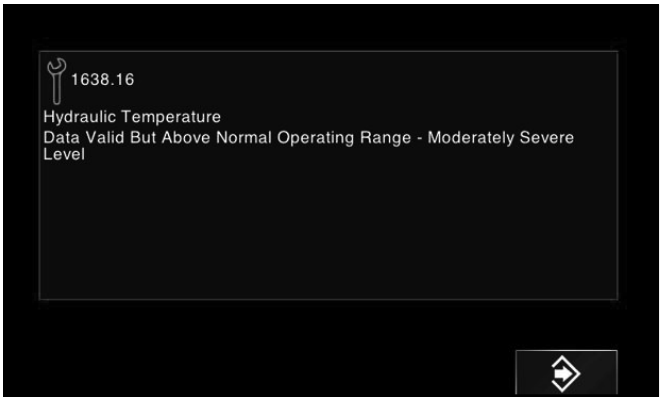
Low DEF

The low DEF icon (highlighted amber) will illuminate when the diesel exhaust fluid (DEF) level reaches approximately 10% and will flash when the level reaches 5%.

Low Fuel

The low fuel icon (highlighted amber) will illuminate when the fuel level reaches approximately 12.5% of capacity and will flash when the level reaches 5%.

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.

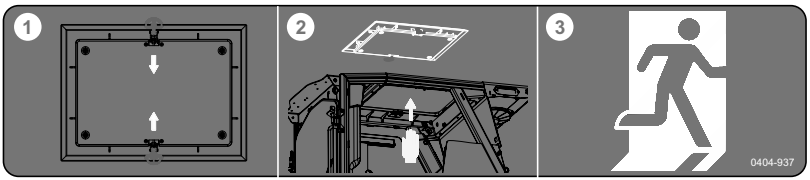
NOTICE
Maximum engine operating temperature is 225° F. Should the machine reach this temperature, shut down immediately, correct any faults and perform any needed maintenance prior to resuming operation.

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. **The primary method of escape in an emergency is the roof escape as described below.** Other methods described should only be used if the roof escape is obstructed and cannot be used.

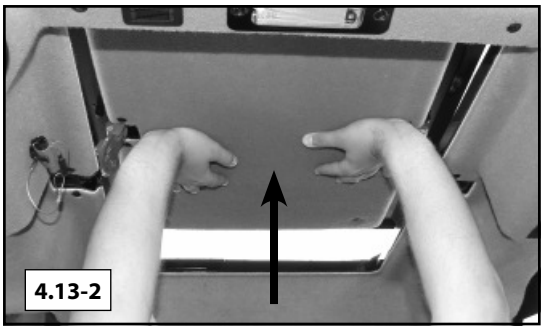
Note: If seatbelt needs to be cut, see cut seatbelt in this section.

Roof Escape (primary method):

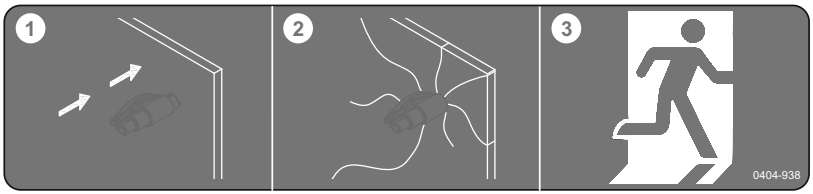


1. Firmly grasp the two red latches on the overhead roof escape panel and pull downward and inward to release them (fig. 4.13-1).

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

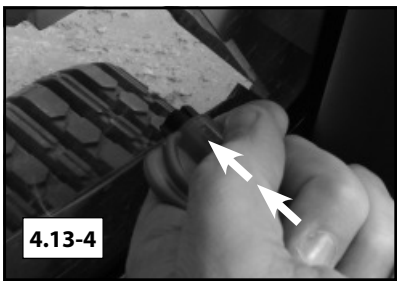


Glass Door / Glass Rear Window / Glass Side Screen (if equipped) Escape:

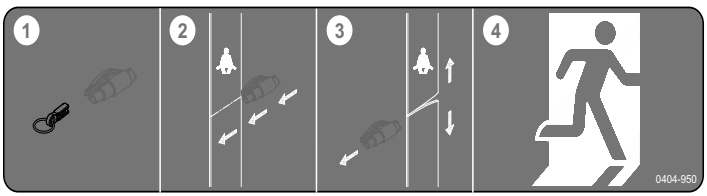


1. Remove the red escape tool from the stowed position (up and to the right of the operator). Pull to separate it from the black key ring / blade guard (fig. 4.13-3)

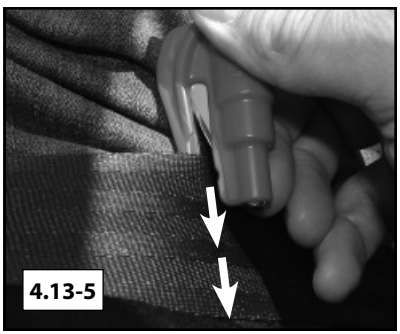
2. Press the blunt, spring loaded end of the tool against the glass panel with a clear escape route (near an edge or corner of the pane is preferred). Press firmly until the tool releases and snaps the end forcefully into the glass to break it. **Repeat until glass breaks**, then escape to safety (fig.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



4.14 Engine Regeneration (see also pages 4 & 67)

Automatic Regeneration Overview

The engine is equipped with an emissions system that removes soot from the exhaust during operation. It then purges (incinerates) the accumulated soot at regular intervals in a process called regeneration.

Regeneration is an automatic, self cleaning process that occurs as a normal part of operation. There is no need to discontinue operation and no power loss will occur while regeneration is taking place.

During regeneration, various methods are employed by the emissions system to increase exhaust temperatures until sufficient to remove (incinerate) any accumulated soot from the diesel particulate filter (DPF), effectively cleaning the filter.

Elevated Exhaust Temperatures

⚠ Exhaust temperatures are elevated significantly during the regeneration process. If operating in an environment that is sensitive to high temperatures (example: flammable items are present near exhaust opening), automatic regeneration can be inhibited (disabled) temporarily to allow safe operation.

To inhibit automatic regeneration temporarily (press the appropriate button on the operator interface, pg. 79). Once back in a safe environment, enable automatic regeneration once again to allow the process to occur automatically.

Inhibiting automatic regeneration for extended periods can cause an excessive amount of soot to build up in the DPF leading to decreased performance and fuel efficiency. If left unaddressed, this buildup can ultimately lead to emissions system failure. **Allow the system to operate automatically whenever possible to prevent this from occurring.**

IMPORTANT: If you operate with automatic regeneration inhibited for an extended period of time, you may see the regen request lamp illuminate. If you see this lamp illuminate (Flashing or ON), the DPF is in need of regeneration.

Regeneration Lamps

Regen Request Lamp
This lamp indicates an immediate need for regeneration. If you see this lamp Illuminate, take the appropriate action listed below.
Flashing: Enable / Allow automatic regeneration.
ON: Perform the stationary regeneration procedure.

Regen ACK Lamp
This lamp indicates that the machine is ether ready for regen (standby) or that regen is currently underway.
Flashing: This indicates standby mode, stationary regen required.
ON: This indicates that regeneration is currently underway.

High Exhaust Temperature Lamp
This lamp illuminates when regeneration is underway and indicates that exhaust temperatures are elevated.

Regen Inhibit Lamp
This lamp illuminates when automatic & stationary regeneration is in the inhibited (disabled) state.

Default State
Automatic regeneration is the default state and should be allowed whenever possible to minimize the possibility of excessive soot buildup in the DPF. If the key is cycled off and on again, it will revert to the default setting even if inhibited was previously selected.

To allow regeneration (default state): Select Automatic.

To inhibit regeneration: Select Disabled.

Stationary Regeneration
Stationary regeneration is a longer, more intensive process used to clean the DPF when soot accumulation has reached levels that automatic regeneration cannot effectively eliminate.

To initiate stationary regeneration:

- Park the machine outside or in a well ventilated area away from potential hazards or flammable items (especially near the exhaust opening).
- Stop the machine & apply the parking brake.
- Warm engine until coolant temperature is at or above 140° F (60° C), then set the throttle to idle (lowest setting).
- Press and hold the regeneration now button as shown above for two seconds to begin the process.

Note: Stationary regeneration can only occur once every 50 hours. Coolant temperature must be 140°F (60°C) for regeneration to occur. A regeneration cycle typically lasts 25-30 minutes.

To abort regeneration: press the disable regeneration button, disengage the parking brake, adjust the throttle higher than idle, turn the ignition key off.

The information included here is a condensed general overview of regeneration and the typical operating experience under normal conditions. **For more in depth information regarding the process of regeneration, regen lamps and their meanings, emission system components and function, please refer to the Yanmar engine operation manual provided with the machine.**

4.15 Attachment Compatibility

There are many things to consider when determining if an attachment is compatible with your TL100VS 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 TL100VS 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 lens (if equipped) 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!

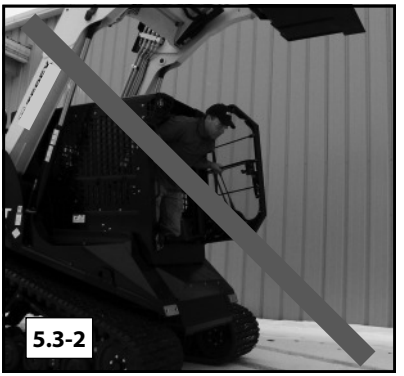
6. Battery cables are in good condition and properly fastened.
7. Joysticks and auxiliary hydraulic switch are in neutral position. Power quick attach switch (if present) must be in the locked position.
8. The R.O.P.S./F.O.P.S. approved operator enclosure (including integral emergency exit roof escape 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. The rear view mirror (if equipped) is 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.


5.3-1


5.3-2

5.3 Starting Procedure

Perform the pre-operation safety checklist (section 5.2), then follow the steps below. See section 4.12 for information regarding password protection and accessing user profiles at startup through the operator interface. **DO NOT run the engine with the hood open. Hot exhaust can overheat nearby components.**

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).
2. Sit down into the operator seat, fasten the seat belt, then lower the lap bar.

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

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.
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 (see also “Warm Up Procedure” below).
7. Set the throttle to desired rpm for operation.

Cold Climate Warm Up Procedure: Perform steps 1-6 above, then set the throttle to high idle (approximately 1800 RPM) until warm. Set the HVAC controls to full heat and fan, then allow the machine to warm up until the cab windows are clear (visibility is not impaired) before operating.

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 (fig. 5.3-2).

Cold Weather Operation

The TL100VS 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.

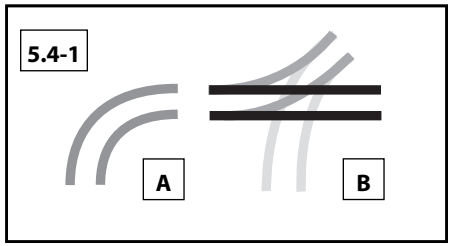
When operating in cold climates:

- 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 (37.8C) during operation, reduce cooler screen air intake area (e.g., cardboard or similar).

5.4 Turning Techniques

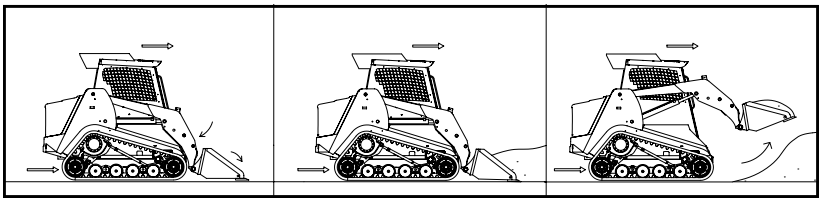
Turning the machine presents the greatest risk of surface disturbance and track derailment.

The likelihood of surface disturbance or track derailment occurring while moving in a straight line is remote, whereas tight cornering increases the probability of both.



Always 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). Counter-rotation is not recommended. Turning in this manner significantly increases the likelihood of track derailment and surface disturbance.

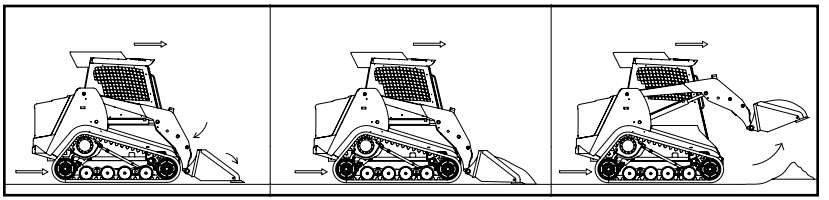
5.5 Filling The Bucket



Steps: (see illustration, sections 5.1 & 4.7)

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.

5.6 Grading



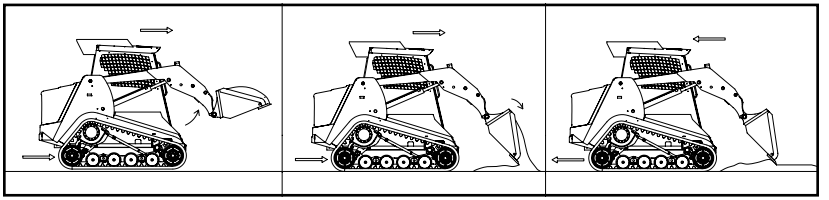
Steps: (see illustration, sections 5.1 & 4.7)

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.

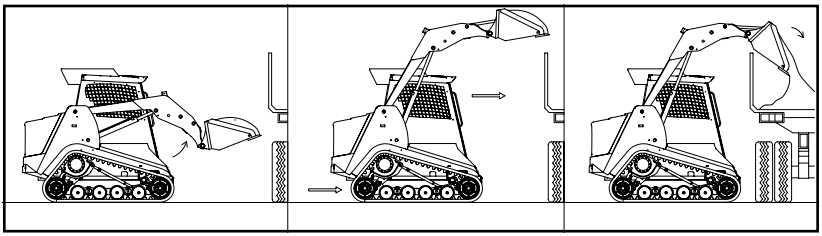
5.7 Leveling



Steps: (see illustration, sections 5.1 & 4.7)

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.

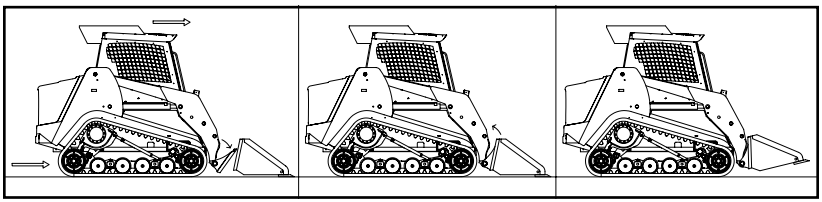
5.8 Loading



Steps: (see illustration, sections 5.1 & 4.7)

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 section 5.11, 5.1)



1. Make sure the locking levers on the quick attach mechanism are in their respective unlocked positions. (fig. 5.10-1)
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, move the two locking levers inward and downward to lock the attachment in place.

Note: When fastening an attachment, always visually verify that the attachment is locked in place prior to operation. (fig. 5.10-2, 5.10-3)

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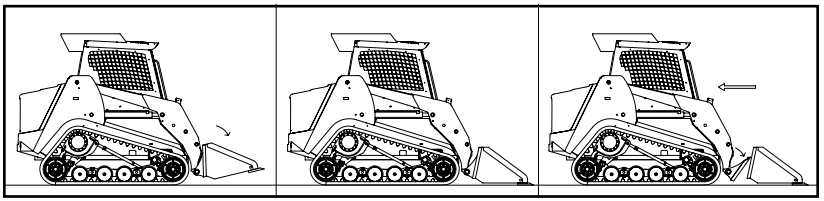
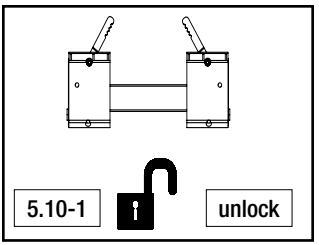
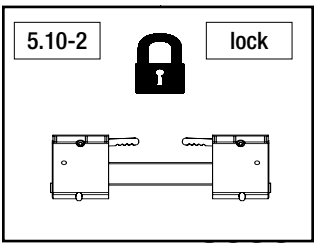
5. To physically verify that the attachment is properly locked in place, apply light pressure to the attachment while rotating it against the ground.

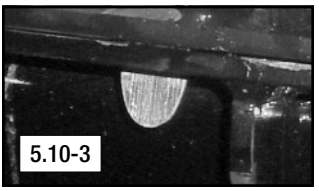
5.10 Unfastening Attachments (see also section 5.11, 5.1)



1. Lower the lift arms so that the attachment is just slightly off of the ground.
2. Pull the locking levers on the quick attach mechanism upwards and toward the outside of the machine to unlock the attachment.
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.

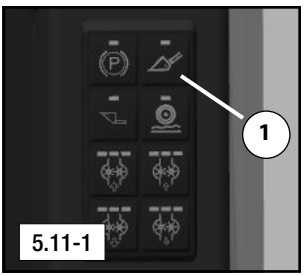






5.11 Power Quick Attach

Some machines may be equipped with a hydraulic (power) quick attach. The procedure is the same for fastening and unfastening attachments as described in sections 5.9 and 5.10 with one exception. The locking and unlocking of the 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) on the keypad (LED off = locked).

To unlock the quick attach:

- Press the switch (item 1) on the keypad (LED on = unlocked).

5.12 Inclines & Uneven Surfaces

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 and minimize the possibility of track derailment.

Although the rubber tracks on a compact track loader often act as a bridge over uneven surfaces and obstacles, it is important to remember that traversing rough / rocky terrain or sharp edged obstacles can damage the tracks.

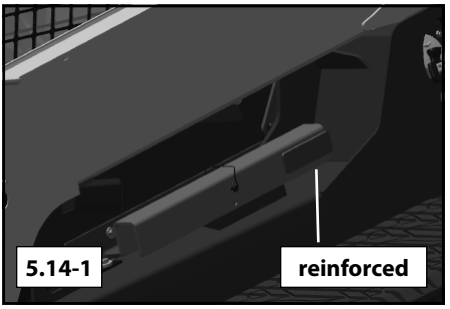
Keep in mind the internal steel structure of the track does not extend to the edges, but typically just to the outer contact points of the wheel assemblies. Do not drive over objects that contact only the unsupported outer or inner edges of the tracks or large or sharp objects that may, cut or tear the tracks. If you must travel over rough terrain, do so slowly and carefully and avoid turning as much as possible to prevent track damage.

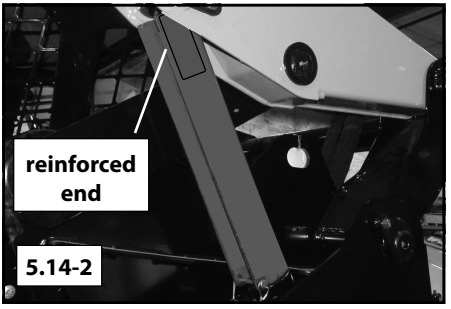
5.13 Shut Down Procedure

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.

5.14 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 fender) and remove the brace.

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 **with the reinforced end up** toward the lift arm 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. Have the assistant position the lift arm brace over the lift arm bracket(s) on the fender 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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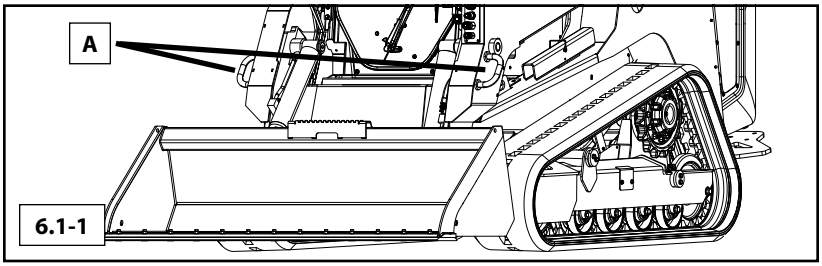
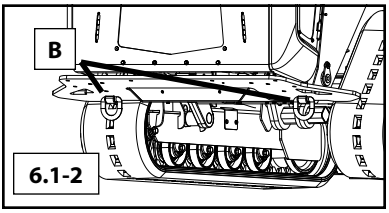


6.1 Transporting

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 at four points, one on each corner of the machine and secure to suitable locations on the transport vehicle (Items A, and B fig. 6.1-1 and 6.1-2). Tighten as needed to eliminate possible load shift during transport.

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

6.2 Tie Down Points

This section covers intended/proper use of tie down points on the machine.

Tie Down Points: The TL100VS 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 and 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 town points "A" (fig. 6.1-1), chains must extend forward a minimum of 9.5" from points "A" on either side of the machine with a minimum chain length of 39.17".

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 36.8" from points "B" on either side of the machine with a minimum chain length of 81.9" (crossed) or 46.5" (not crossed).

6.3 Towing / Retrieving the TL100VS

In the event that the TL100VS 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.

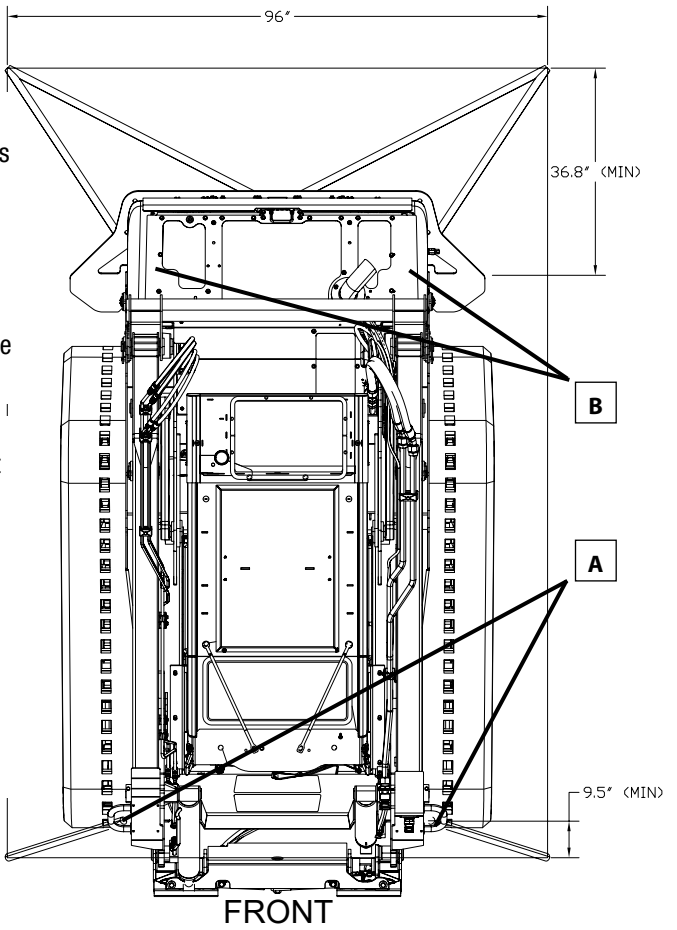
Note: When connected, chains should be attached so that they extend straight backward from points "B" (fig. 6.1-2) and must remain within 20° of the original position (in all directions) throughout the retrieval process (fig. 6.3-1). **Machine weight (including accessories, attachments or material being carried) MUST NOT exceed GVW rating during retrieval.**

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

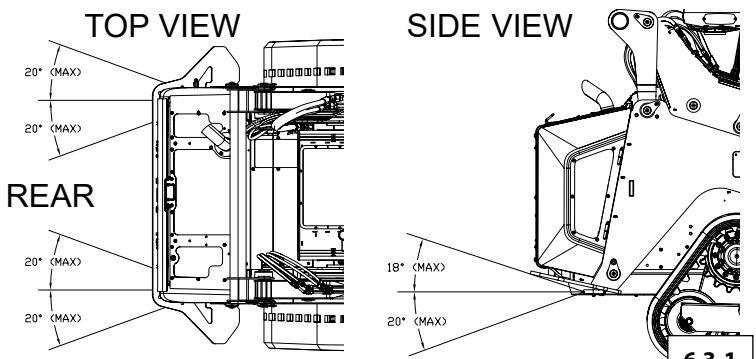
6.2-1

Note: Tie down points "B" are D shaped rings found on the underside of the machine (fig. 6.1-2).

Note: If an attachment causes machine weight to exceed 12,100 lb (5488 kg), the attachment must also be secured.

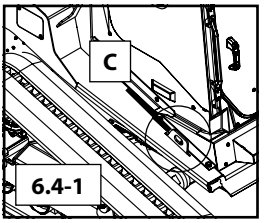


Bucket excluded from illustration for clarity.

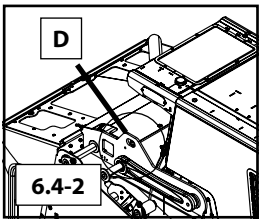


6.4 Lift Points

This section addresses the intended / proper use of lift points on the TL100VS.



6.4-1



6.4-2

Lift Points: The TL100VS has 4 lift points (points C, fig. 6.4-1 and points D fig. 6.4-2).

Lift points “C” and “D” are to be used **ONLY** for lifting the machine in accordance with the overhead lifting procedure in this chapter.

Lift points “C” and “D” are not to be used as anchor points for moving or retrieving the machine in any way varying from the overhead lifting procedure, nor are they to be used to lift, move or extract objects of any kind, in any way.

Any use of the machine lift 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.

6.5 Overhead Lifting Procedure

The TL100VS is equipped with lift points that allow it to be lifted from above for transportation purposes.

To lift the TL100VS:

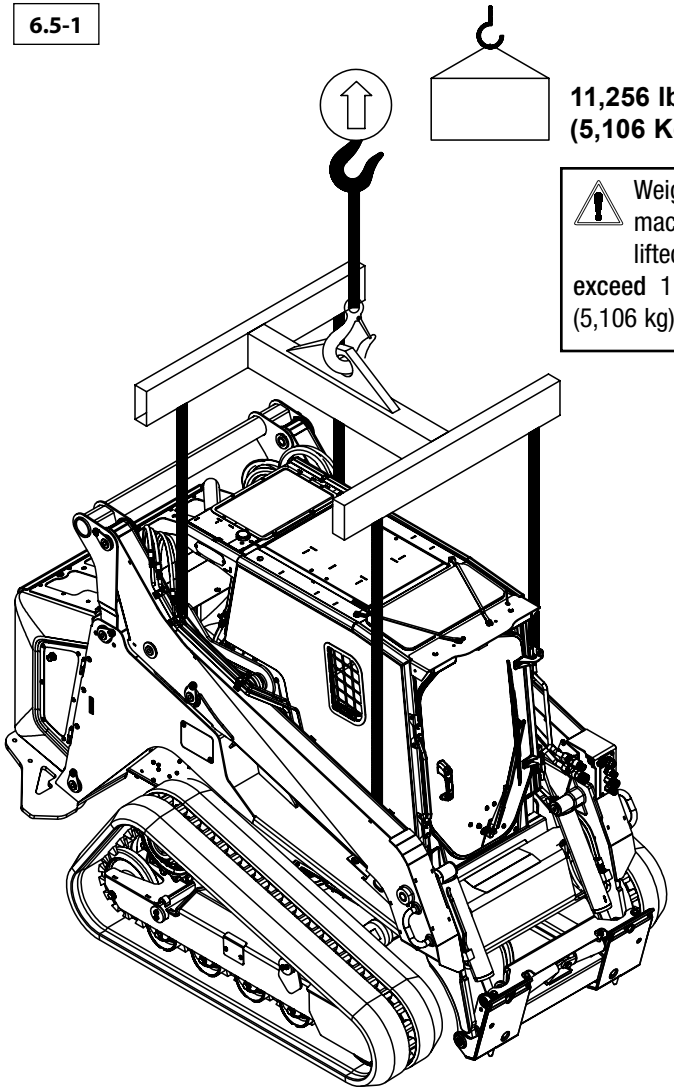
1. Shut the machine down in accordance with the shut down procedure in section 5.13 of this manual, remove any attachments from the machine.
2. Attach the lifting apparatus **(see note)** to the machine as shown in figure 6.5-1. The machine center of gravity (ideal lift point) is 50.5” back from the frontmost point (nose) of the chassis weldment.

Note: The “lifting apparatus” must include the following: a suitable hoist, spreader beams, straps (chains or cables) and hooks all sized and rated for lifting a machine of this nature (size and weight).

3. Once attached, you may slowly and carefully lift and move the machine, exercising caution throughout the entire operation.

Note: See also sections 2.17 and 6.6 for further information regarding transport prior to performing this procedure.

6.5-1



Weight of machine being lifted **must not exceed** 11,256 lb (5,106 kg).

When lifting the machine, attach suitable lifting chains / straps to all four lift points and lift vertically as shown. Chains / straps **must remain vertical** (with the intent that the machine remain level) throughout the lifting operation (fig. 6.5-1).

The spreader beam pictured above is a general representation only. It's purpose is to illustrate that the lifting chains must remain vertical during lifting.

6.6 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 any doors, windows, hoods and side panels on the machine.
10. Secure the machine and any other items to the transport vehicle with chains or cables 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.

Page

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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 supplied with the machine 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.

7.3 Maintenance Intervals

7.3-1 Daily Maintenance Tasks

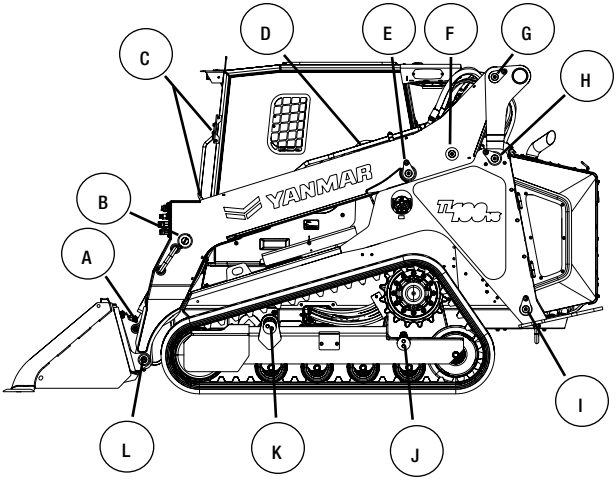
Daily		Page
1	Check hydraulic oil level (figure 7.7-3, p-106)	106
2	Check engine oil level	104
3	Check fuel level (gauge screen on display)	37
4	Check diesel exhaust fluid level (gauge screen on display)	37
5	Check track tension / condition	109
6	Check for proper control operation	40
7	Check safety circuit for proper operation	83
8	Check for proper switch and lighting operation	37
9	Check display for air filter fault message, service as required	112,113
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	108
13	Lubricate all grease points	103
14	Inspect / clean the coolers and engine compartment (as needed)	114,115
15	Inspect / clean undercarriages (as needed)	109
16	Inspect / clean chassis	115
17	Inspect/replace missing/damaged safety signs	12,13

7.3-2 250-2000 hour Tasks

Every 250 operating hours		Page
1	Replace hydraulic filter(s)	107
2	Check alternator / A/C belt tension / condition	107
Every 500 operating hours		Page
1	Replace engine oil & filter	105
2	Replace fuel filter elements	108
Every 1000 operating hours		Page
1	Replace hydraulic oil	106
Every 2000 operating hours		Page
1	Replace engine coolant (see chapter 3 for specifications)	114
2	Replace DEF filter	117

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 with the exception of the door pivots. Lubricate all points daily, prior to operation.



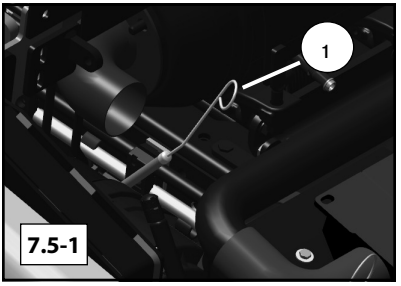
A. Lower Bucket Cylinder Pivot
B. Upper Bucket Cylinder Pivot
C. Door Pivot (2)
D. Front Control Arm Pivot
E. Upper Lift Cylinder Pivot
F. Rear Control Arm Pivot
G. Rear Lift Arm Pivot
H. Rear Lift Arm Linkage Pivot
I. Lower Lift Cylinder Pivot
J. Rear Axle Pivot (2)
K. Front Axle Pivot (2)
L. Lower Bucket Pivot

7.5 Engine Oil Check

1. Shut the machine down according to the procedure in section 5.13.

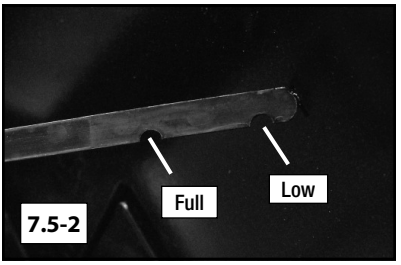
2. Open the hood to gain access to the engine compartment (pg. 125).

3. Locate and remove the engine oil dipstick (1) from its tube (fig. 7.5-1).



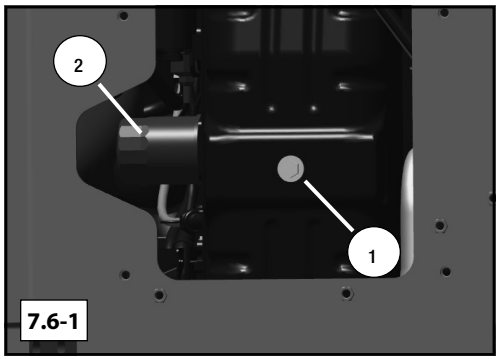
4. Wipe the dipstick with a clean shop cloth and reinsert it into the tube until it comes to rest in its seated position.

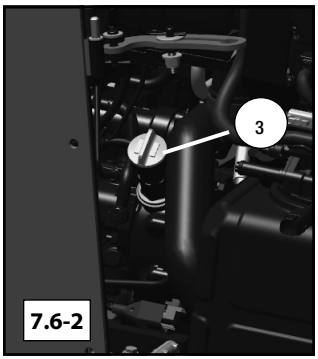
5. Remove the dipstick once again and inspect the end for oil on the level indicator.



6. Oil should be present on the dipstick up to, but not over the upper (full) level indicator. 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 as described in section 7.6 and re-check as necessary until the proper level has been achieved. Then reinstall the dipstick and filler cap and close the rear door, hood and side panels to complete the procedure.





7.6 Engine Oil Change

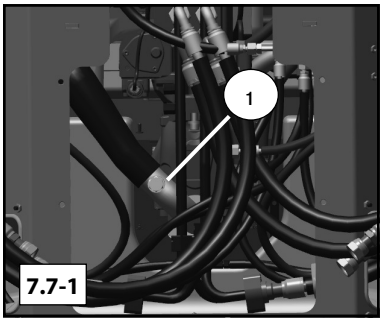
Regular oil changes are necessary to maintain a strong running engine. Change the oil at 500 hour intervals (or every year if annual operating hours do not exceed 500). Allow the machine to cool prior to service. Wear safety glasses, safety gloves and any other items necessary to ensure your safety while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

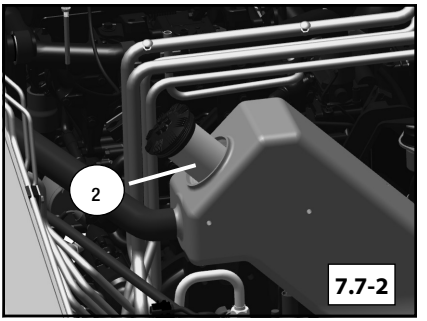
To change engine oil:

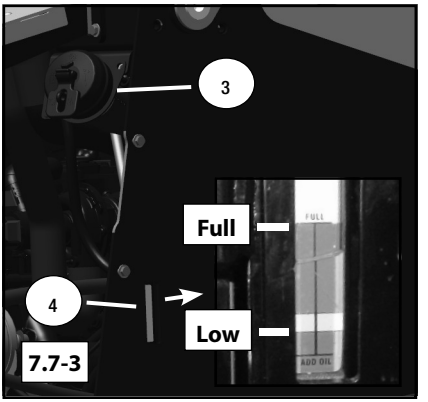
1. Shut the machine down according to the procedure in section 5.13 and allow the machine to cool thoroughly. Open the hood and side panels, then pivot the cooler assembly for access (pg. 125).
2. Lower the access panel beneath the engine to access the oil drain and filter.
3. Remove the oil drain plug (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 new oil filter seal and install the filter (fig. 7.6-1).
7. Tighten filter according to the specifications on the filter label or box.
8. Reinstall the oil drain plug as found upon removal and tighten to secure.
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, side panels and rear door. 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.

7.7 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:

1. Shut the machine down in accordance with the procedure in section 5.13.
2. Allow the machine to cool.
3. Lower the middle belly pan to access the hydraulic oil drain. Remove the hydraulic fluid drain plug (item 1) as shown (fig. 7.7-1). Also, drain the hydraulic oil from the rear oil cooler (open the hood and side panels, then pivot the cooler assembly (pg. 125), remove drain plug (item 1, fig. 7.18-1).
4. Drain the used oil into a suitable catch container.
5. Dispose of the oil according to mandates.
6. Reverse step 3 to reinstall / tighten the drain plugs and secure the cooler assembly, hood, side panels and belly pan.
7. Open the hood and right side panel, then refill the hydraulic system (fill point, item 3) with hydraulic oil as specified in chapter 3 (fig. 7.7-3).

Note: Visually inspect the hydraulic oil sight gauge (item 4) to verify proper oil level (fig. 7.7-3). Oil should be visible in the site gauge, indicating the level is safe. If oil is not present in the gauge, fill until oil is visible.

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. Close hood and side panel.

7.8 Hydraulic Filter Change

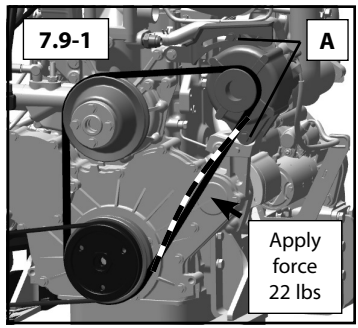
The hydraulic filter should be changed every 250 hours. Hydrostatic components require extremely clean oil in order to have a long service life. Use caution when changing the hydraulic filter. Before beginning the procedure, make sure the machine is clean and parked in a clean working environment. Take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

To change the hydraulic filter:

1. Shut the machine down in accordance with the procedure in section 5.13.
2. Tilt the cab as described in section 7.23 for filter access.
3. Allow the machine to cool, then release any residual pressure in the hydraulic system by following the procedure in section 2.18 of this manual.
4. Clean above and around the hydraulic tank filter cap to prevent contaminants from entering the hydraulic system, then thread the cap off of the tank. Slowly guide the cap and filter upward and out of the tank.
5. Twist the cap counter-clockwise to separate it from the filter element, then empty any trapped oil from the top of the element into a suitable catch container. Dispose of the filter and used oil according to mandates.
6. Install new filter element onto the cap and twist clockwise to secure.
7. Install the filter and cap assembly into the tank. Lower it into place as found upon removal, ensuring the bottom of the filter is centered over the lower inlet tube. Carefully thread the cap/filter assembly into place until secure.
8. Inspect the hydraulic oil level. If low, add as needed until full (see sections 3.11 and 7.7 for fluid specifications and oil fill procedure).
9. Reverse step 2 to complete the procedure.

7.9 Accessory Belts

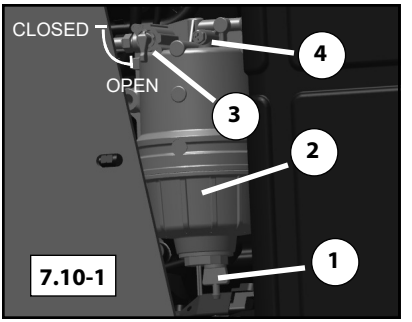
The accessory belts should be visually inspected initially at 50 hours, then at 250 hour intervals thereafter. Replace if damaged. To inspect:



1. Shut the machine down as described in section 5.13, allow to cool.
2. Open the hood and side panels, then pivot the cooler assembly (pg. 125).
3. Visually inspect the belt. If it appears loose, apply moderate thumb pressure to the belt (fig. 7.9-1). If it deflects more than .38 - 0.5 in. (10-14 mm), loosen alternator fasteners (A) and use a lever between the engine block and alternator to increase tension until within limits. Tighten fasteners (A).

Note: For additional clearance, remove the fan guard as described in section 7.26. A/C belt tension is not adjustable. Inspect only for presence and condition.

7.10 Water Separator

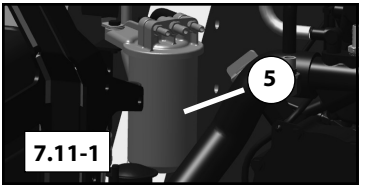


The water separator (item 1) removes water from the fuel supply as the engine runs. (fig. 7.10-1) It is located on the left side of the engine compartment behind the side panel. Drain the water separator every 50 hours or as indicated (operator interface will display water in fuel fault message) to maintain 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. Close fuel valve 3.
3. Loosen the twist valve (1) on the bottom of the separator (2) to drain the contents into a suitable catch container. Dispose according to mandates. If no water comes out, loosen the air vent screw (4) 2-3 turns. If still no water comes out, open fuel valve (3) to drain.
4. Once all of the water has been drained, close twist valve (1), close air vent screw (4), then reverse step 2 (ensure fuel valve 3 is open). **IMPORTANT:** prime the fuel system by turning the key to the on position for 10-15 seconds and check for leaks prior to starting 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. **See also section 7.26.**

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, side panels and rear door assembly for access (pg. 125).
3. Clean the outside of the filters (items 2, 5) thoroughly (fig. 7.10-1, 7.11-1).
4. Drain the water separator as described in section 7.10. Disconnect the electrical connector. Close fuel valve (3).

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

5. Twist the fuel filter (5) and water separator housing (2) CCW when viewed from the bottom to remove the filter (5) and expose the internal water separator element for removal. Remove and dispose of both filter elements according to mandates.
6. Reverse steps 2, 4 and 5 to reinstall new fuel filter and separator elements. Open fuel valve (3), then prime the fuel system (step 4, section 7-10) and check for leaks prior to starting to complete the procedure.

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.

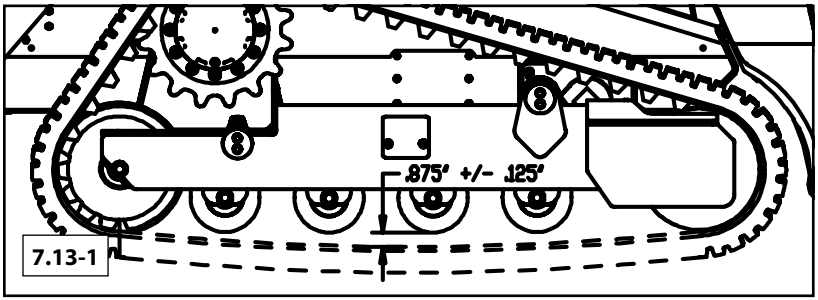
Operation on sand, turf, or other finished surfaces may require less frequent cleaning, but daily inspection is still advised.

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 wear or derailment. Check track tension every 50 hours and adjust as needed to maintain proper tension.

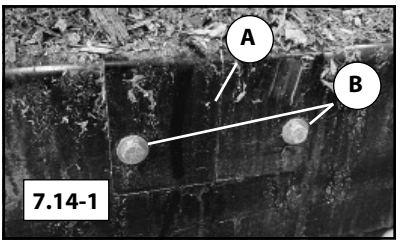
To check for proper track adjustment:

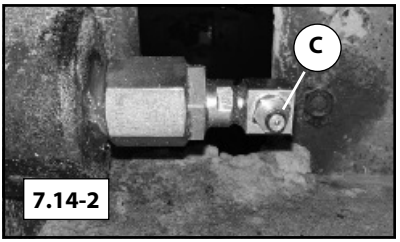
1. Shut the machine down according to the procedure in section 5.13.
2. Jack and support the machine according to the procedure in section 7.24. Once off of the ground, any slack in the tracks should hang down off of the bottom of the undercarriage between the front and rear idler wheels (fig. 7.13-1).
3. Using a ruler or tape, measure the distance between the bottom of the center idler wheels and the top of the lower section of track. The track should deflect .875 in. (2.2 cm) + / - .125” (.32 cm) between the idlers and track.
4. If the track deflection measurement does not fall within limits, adjust track tension until within specification.

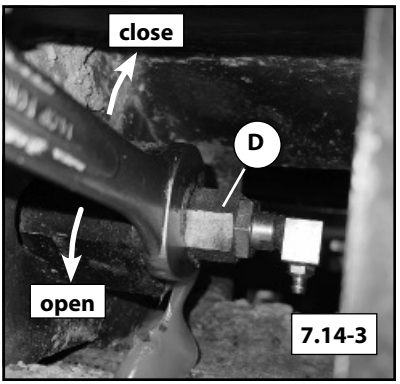


7.14 Track Tension Adjust (see 7.13)

1. Perform steps 1-2 of the track tension check procedure to jack and support the machine.
2. Remove the fasteners (B) and access cover (A) on the outside of the undercarriage you plan to service (figure 7.14-1).
3. To tighten the track, attach the grease gun hose coupler to fitting (C) and pump grease into the tensioner unit until the track tension measurement is within specification (figure 7.14-2).
4. To loosen the track, use the appropriate size open end wrench to open the grease valve as shown. Turn the nut counter clockwise to open the grease valve (no more than 1 full turn). Turn the nut clockwise to close the valve (figure 7.14-3).





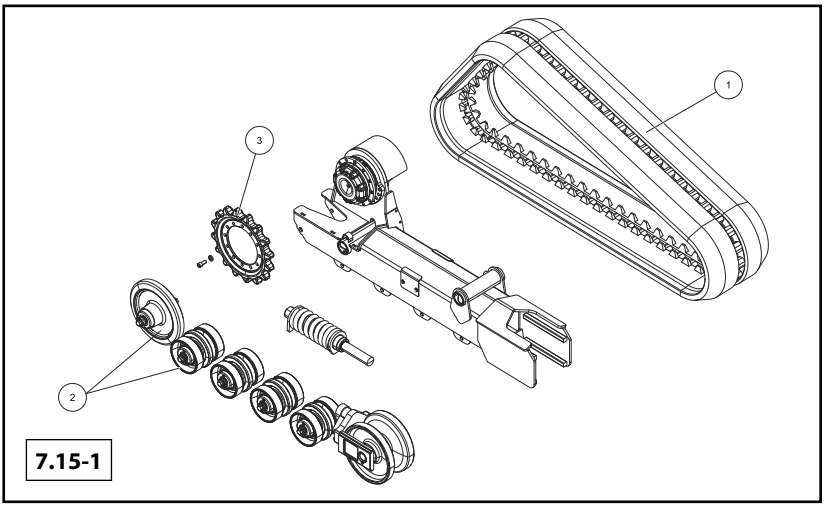


Note: Grease will weep from the tensioner when the valve is opened. Place a shop towel beneath fitting (C) to catch grease when released. Dispose of grease according to mandates.

5. Once track tension is set, reverse steps 1-2 of this procedure to return the machine to operating condition and complete this procedure.

7.15 Track and Drive System

Compact Track Loaders use a steel sprocket and steel embedded rubber tracks. Undercarriages should be cleaned often and inspected daily for leaks, damage and completeness. Tracks, wheel assemblies and sprockets should be inspected.



Tracks

Tracks (1) consist of an external rubber structure with a steel core. The rubber acts as a cushion between the steel core, roller assemblies (2) and external terrain that contact the track. If the rubber begins to separate from the steel core or if the rubber portion of the track is worn to less than 20% of its original thickness it should be replaced. Additionally, if the track is significantly torn, cut, or worn around the drive sprocket contact points affecting operation, it should also be replaced (see also sections 5.4 and 5.12).

Wheel assemblies

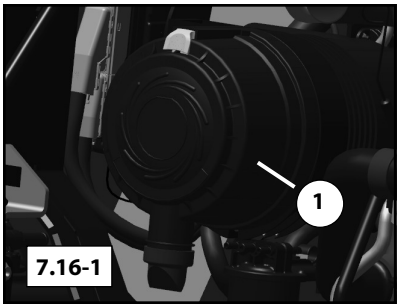
Wheel assemblies (2) are oil filled and should be inspected for leaks or damage. If a wheel assembly is found to be leaking, does not rotate freely or is damaged it should be replaced.

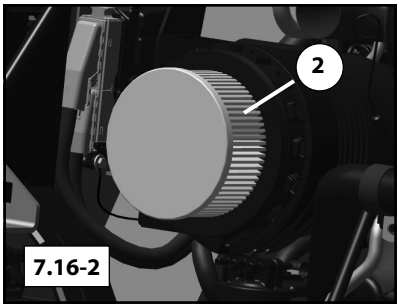
Drive Sprockets

Large steel sprockets (3) are used to drive the tracks. Wear will occur on sprocket teeth as well as in the track drive windows during use. Over time this will affect their ability to engage effectively and increase the likelihood of track ratcheting or derailment. If significantly worn, replace the drive sprockets, especially when replacing tracks to maximize track life.

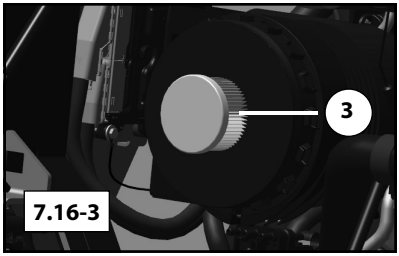
Track / drive sprocket removal and replacement should be performed by your local TL100VS dealer.

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. Open the hood and side panels, then pivot the cooler assembly for access (pg. 125).
2. Pull the yellow slide latch outward, twist the housing cover (1) CCW, then pull to remove it (1).
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.
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.

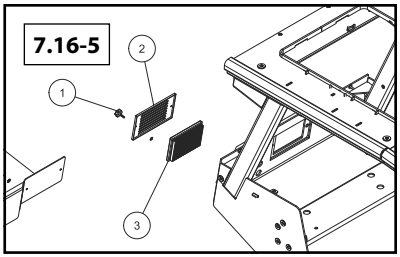
NOTICE

- 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.

Cabin Air Filter

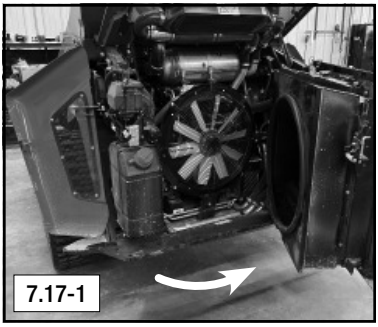
Machines equipped with an all weather cab are equipped with a cabin air filter (3) located on the right rear of the cab. Check the condition of the filter every 250 hours and replace if necessary. If operating in extremely dirty or dusty conditions, check the filter more often.



To service the cabin air filter:

1. Shut the machine down as described in section 5.13.
2. Loosen the thumb screws (1) securing the vented cover (2) to the cab.
3. Remove the cover and inspect the filter (3) for condition.
4. If soiled or damaged, replace the filter.
5. Reverse steps 2 and 3 to reinstall the vented cover over the new filter and secure prior to resuming operation.

7.17 Radiator / Oil Cooler Cleaning


7.17-1


7.17-2

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. Open the hood and side panels, then pivot the cooler assembly away from the engine for access (pg. 125 / fig. 7.17-1).
3. Thoroughly clean all coolers with a pressure washer or compressed air. Wear any appropriate PPE (see section 2.5). 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

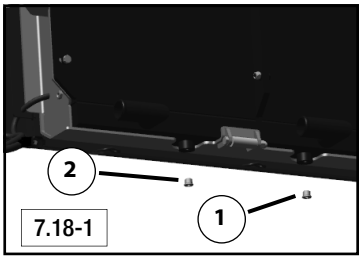
Make sure water nozzle is at least 12 in. (30.5 cm), for air 8 in. (20.3 cm) from the cooler and that the spray is directed straight through the cooler or the cooling fins may be damaged (bent over) which will decrease cooling performance.

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

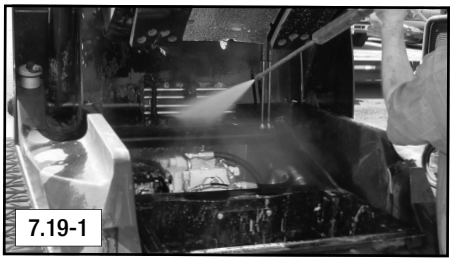
7.18 Engine Coolant Change

1. Shut the machine down as described in section 5.13 and allow it to cool thoroughly, then open the hood, side panels and pivot the cooler assembly (pg. 125).
2. Remove the coolant drain plug (item 2, fig. 7.18-1) and drain the old coolant into a suitable catch container. Dispose according to mandates.
3. Reinstall the drain plug and tighten, then add specified coolant (chapter 3) into the reservoir through the fill neck until full.
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 top off (repeat steps 4 and 5 until all air has been purged and the level is full 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.



7.18-1


7.19-1

7.19 Chassis / Engine / A/C 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 access panels on the underside of the machine.
2. Open the hood and side panels, then pivot the cooler assembly at the rear of the machine (pg. 125).
3. Pressure wash any debris from the engine compartment out through the lower openings.
4. Tilt the cab as described in section 7.23.
5. Pressure wash any debris from the chassis area out through the lower openings. Once complete, lower and secure the cab.
6. Re-secure the access panels, then close and secure the hood, side panels and cooler assembly 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.

A/C Equipped Machines

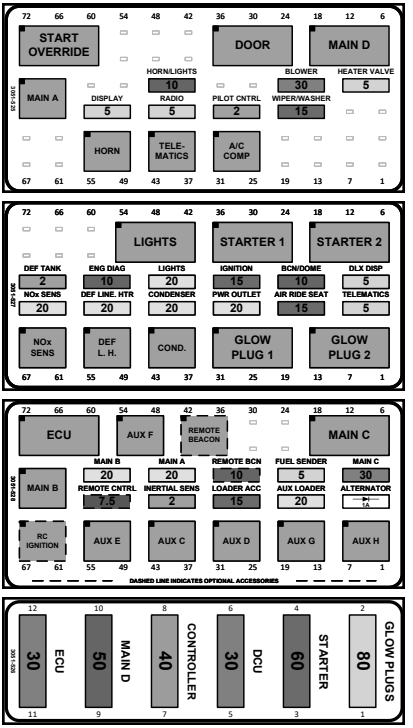
Air Conditioning Condenser: There is an A/C condenser (radiator like component at the top rear of the cab, behind the fan). This must be kept clean so that air can easily pass through.

Cleaning the condenser is very similar to cleaning the other coolers on the machine. Clean from the top down using compressed air. Water and cleaner may also be used and covers may be removed, but only if required. Perform steps 1 and 3 (and obey notice) of section 7.17 to clean the A/C condenser.

7.20 Electrical System

The electrical systems in compact track loader machines are equipped with fuses that help to protect the electrical components from damage. They are found in the fuse panel enclosures located to the right of the operator seat and in the on the right side of the chassis behind the access panel.

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.



7.21 Diesel Exhaust Fluid (DEF)

The emissions system in the TL100VS requires diesel exhaust fluid (DEF) to operate (see chapter 3 for fluid specifications).

The DEF tank is located in the left rear corner of the engine compartment as shown (fig. 7.21-1).

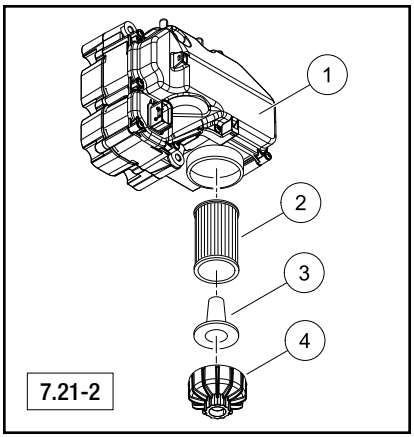
The level should be checked and topped off (if needed) daily, prior to operation. The current level is shown on the display and low level warnings will be displayed if the DEF level gets too low.


7.21-1

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 supply module (1), located behind the left side panel 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 2000 operating hours. Reference the Yanmar engine specific service manual for more details.



7.21-2

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 supply module to complete the purge cycle (the module 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 module (1). 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 supply module (1) with warm water and a clean cloth. At this time, inspect the cap and supply module for damage. Replace any damaged components.
6. Insert a new equalizing element (3) into new filter (2) and insert the assembly into the supply module as found upon removal in step 4.
7. Reinstall cap (4) and tighten to 177 in-lb (20 Nm) to secure.
8. Reverse steps 1 and 2 of this procedure to complete the filter change.

7.22 Storage

It may be necessary to store your TL100VS 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 the hood and side panels, pivot the cooler assembly, then remove belly pans and pressure wash to remove all buildup / debris.
- Allow machine to dry thoroughly, then reinstall belly pans, close hood, rear door and side panels. 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. 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 (see note below regarding SMARTASSIST-Remote equipped machines). 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.

Note: The SMARTASSIST-Remote system consumes trace amounts of electrical energy to maintain function even when the ignition key is turned off. Although equipped with an internal battery, the system requires machine battery power for long term operation. For security reasons, we recommend leaving the machine battery in place and attaching a maintenance charger to the battery to maintain voltage during storage on SMARTASSIST-Remote equipped machines.

⚠ 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.

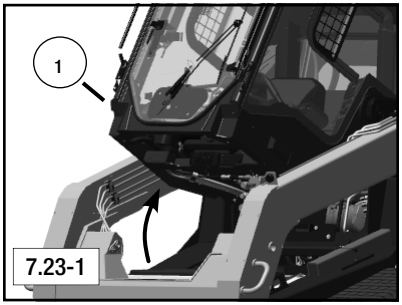
- Label or tag the machine to indicate storage condition.

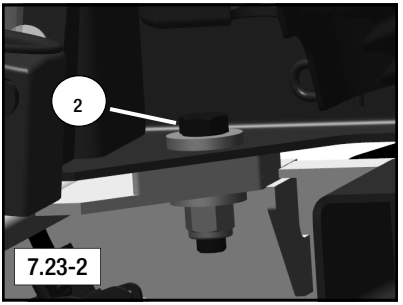
7.22.2 Removal From Storage

Perform the following tasks to remove the TL100VS Compact Track Loader from storage and return to operating condition.

Return to Operating Condition:

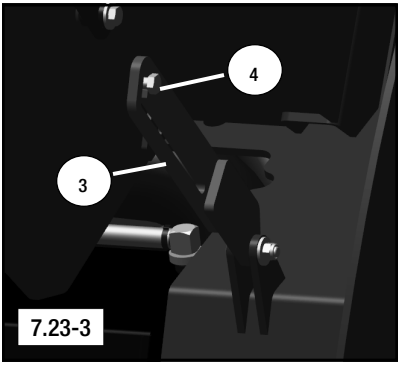
- Remove protective lubricant from cylinder rods.
- Lubricate all chassis, lift arm and undercarriage points.
- Safely remove the mechanical supports and lower machine to the ground.
- Install fully charged battery.
- Remove exhaust outlet cover.
- **If storage time has exceeded 6 months,** remove any 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.





7.23 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 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.

7.25 SMARTASSIST-Remote (optional)

SMARTASSIST-Remote is a system that uses communication devices mounted in machines to manage information pertaining to the location and operation of the machine. A contract must be signed for usage of SMARTASSIST-Remote. If interested, please contact your local dealer for further information.

⚠ Under no circumstances must attempts be made to disassemble, repair, remodel, move or otherwise tamper with SMARTASSIST-Remote communication devices. Failure to observe this warning may result in malfunction of the machine or communication device or fire.

Be careful to ensure that cables or cords are not damaged by, for example, becoming trapped or being subjected to excessive tugging. Failure to observe this warning may result in malfunction of the machine or communication device or fire due to short circuits or severed cables or cords.

Persons with pacemakers must be careful to ensure that the implant is never less than 8.7in. (22cm) away from the antenna on the communication device. Failure to observe this warning may result in adverse effects on the operation of pacemakers caused by radio waves emitted by the communication device.

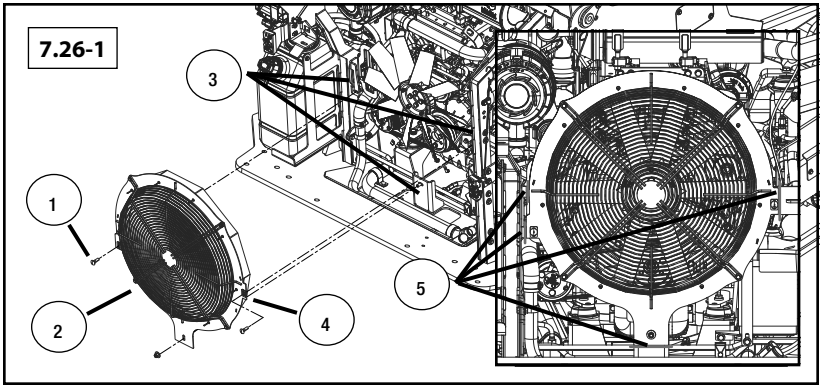
SMARTASSIST-Remote utilizes various communication devices. The following items should be considered when operating with SMARTASSIST-Remote.

- Since SMARTASSIST-Remote uses mobile communications, use of the system may not be possible in places inaccessible by radio waves such as tunnels, underground locations or in buildings or in places with poor radio reception.
- Disassembling or removing the communication device may inhibit operation of the machine. In the event that the device needs to be removed or repaired, please contact your local dealer.
- Although SMARTASSIST-Remote communication devices do not require any special operational procedures or inspections, please contact your local dealer in the event of possible abnormalities.
- Communication devices mounted in machines use radio waves and, therefore, require approval in accordance with national and local laws and ordinances.
- Since measures such as the removal of communication devices before resale or export of machines in which they are mounted may be required, please contact your local dealer in such cases.
- Some SMARTASSIST-Remote communication devices are mounted with a nickel metal hydride battery depending on the specification. Disposal of communication devices mounted with a nickel metal hydride battery requires appropriate treatment. Please contact your local dealer before disposing of such communication devices.

Note: The SMARTASSIST-Remote communication device consumes minute amounts of power even when the machine is turned off. Please refer to section 7-22 for information regarding machine storage.

7.26 Fan Guard

Some maintenance procedures may be aided by the removal of the fan guard for additional clearance / access. If desired, remove and install the fan guard as described below (see also section 2.18).



1. Shut the machine down according to the procedure in section 5.13. Remove key to avoid accidental start. **Exercise extra caution anytime a guard is removed for service.**
2. Allow the machine to cool thoroughly.
3. Open the hood, side panels and rear door to access the fan guard (pg. 125).

To remove the fan guard (fig. 7.26-1):

A. Mark the brackets (3) where the guard mounting tabs (4) contact them with a paint marker along tab edges (5) on both sides and similarly on the lower mounting tab. This will give you clear references to help to align the guard (horizontally and vertically) when reinstalled.

B. Remove fasteners (1) securing guard (2) to the brackets (3), then remove the guard from the machine.

C. After maintenance is complete, reinstall the fan guard (2) by reversing step B, aligning the tabs with marks from step A.

D. Inspect for equal clearance between the fan tips and the surrounding brush around the entire circumference of the fan (fan should be centered). Once the guard is properly positioned, tighten fasteners to secure.

Note: Fan must be centered within the guard or it may contact the guard during operation, causing damage. Ensure fan guard is properly installed, secured and that the fan is centered within the guard (equal fan tip to guard clearance around circumference of the fan) prior to returning the machine to service.

4. Reverse step 3 to complete the procedure.

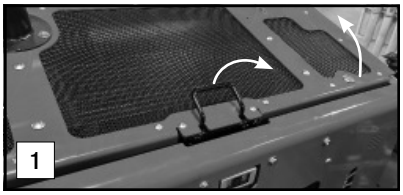
CALIFORNIA PROPOSITION 65

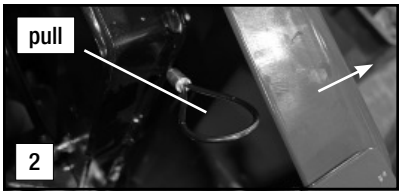
California (U.S.A.) state law stipulates that manufacturers of machines operated within its borders must provide a clear warning to customers regarding exposure to substances commonly associated with the machine that are recognized by the state as harmful. The manufacturer provides the following information.

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.
0404-841

Hood Opening Procedure

The machine has an upper hood, two side panels and a rear door assembly that can be opened for access to the engine compartment. They must be opened and closed in sequence **(DO NOT run engine with hood open (see notice below)**.



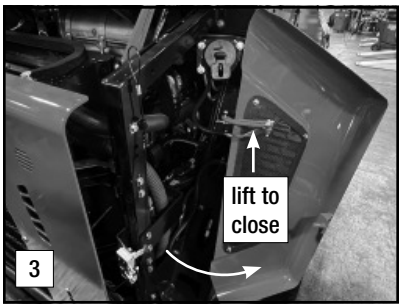


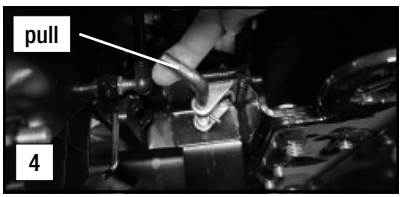
To open:

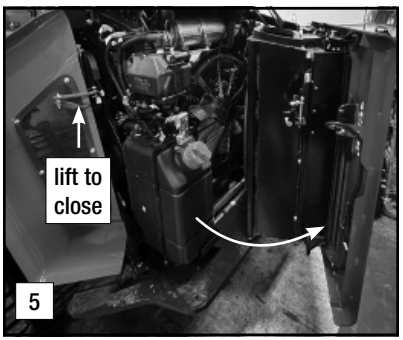
1. Lift the latch on the top rear of the machine, then raise the upper hood. It is supported by gas springs and a locking brace and will remain open once lifted (fig. 1).

2. Locate the latch release cables on each side of the machine, then pull each one and open the corresponding side panel (fig. 2, 3).

3. Once the upper hood and side panels are open, locate the rear door assembly latch on the left side of the door (inside, fig. 4). Pull the L shaped pin upward to disengage the latch, then pivot the door assembly open (fig. 5) to access the engine compartment.





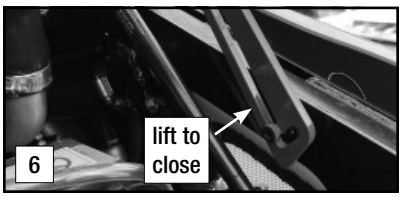


To close:

1. Close the rear door.

2. Lift and hold the locking mechanisms on the inside of the side panels to disengage them, then close the side panels (fig. 3, 5).

3. Lift and hold the locking mechanism on the right side of the hood to disengage it, then close the upper hood (fig. 6).



Exiting exhaust can overheat items near tailpipe outlet. Keep hood closed.

YANMAR POWER TECHNOLOGY CO., LTD.

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