Tigercat®

T250D TRACK LOADER

OPERATOR'S MANUAL

SERIAL NUMBER 250T2101 TO 250T2150

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GENERAL SAFETY PRECAUTIONS continued

SAFETY HAZARDS – VITON SEALS

O-rings and other seals manufactured of Viton material (fluorine rubber) produce a highly corrosive acid (Hydrofluoric) when subjected to temperatures above 600°F (315°C).

This contamination can have extreme consequences on human tissue since it is almost impossible to remove after contact.

The following procedures are recommended when inspecting equipment that has been subjected to high temperatures such as fire:

- Visually inspect any seals or gaskets which have suffered from heat; they will appear black and sticky. If these are found, **Do Not Touch!!!**
- Determine the material composition of any seals or gaskets, If fluoro-elastomer seals (Viton, fluorel, or tecmoflon) have been used, the affected area must be decontaminated before undertaking further work. Natural rubber and nitrile materials are not hazardous.
- Wear disposable heavy duty gloves (neoprene) and decontaminate the affected area by washing thoroughly with limewater (Calcium Hydroxide solution).
- Safely discard any cloths, residue and gloves after use.

NOTE: Burning discarded items is not recommended except in an approved incineration process where the dangerous products are treated by alkaline scrubbing.

SAFETY HAZARDS – OPERATING

Maintain a charged fire extinguisher on the vehicle at all times and KNOW HOW TO USE IT.

Do not carry passengers either in the cab or anywhere else on the machine. The vehicle is provided and approved with seating for the operator only.

Do not allow anyone to operate the machine who may not be physically fit or who may be under the influence of alcohol or drugs.

When moving the machine, watch that enough clearance is available on both sides and above the machine or any of its attachments. Extra clearance may be required particularly where the ground is uneven.

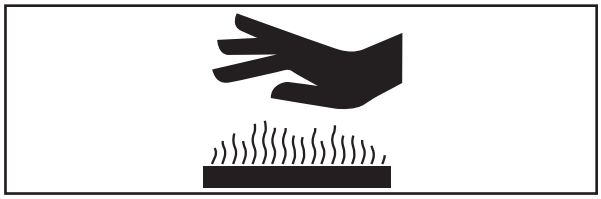
Approach with extreme caution any area where overhanging electrical power lines are present. Serious injury or death by electrocution can result if the machine or any of its attachments are not kept a safe distance from these lines.

Maintain a distance of 3 m (10 ft) between the machine or boom and any power line carrying up to 50,000 volts or less plus 12 mm (1/2 in) for each addition 1,000 volts above the 50,000 volt level.

If State/Provincial, local or job site regulations require even greater safety distances than stated above, adhere strictly to these regulations for your own protection.

If the machine must be transported, make sure that it is adequately secured to the transporting vehicle. Refer to Vehicle Moving Instructions page in SECTION 2 of the OPERATOR'S MANUAL.

Stopping the engine immediately after it has been working under load can result in overheating and premature wear of the engine components. Reduce engine speed to LOW IDLE and let run for approximately 5 minutes to allow gradual dissipation of heat and also to reduce turbo speed. This will also prevent loss of coolant by after boil and possible hot spot damage to the engine.



Be aware when performing service and maintenance tasks that surfaces and grab handles in and around the engine and cooling system may become very hot when the engine has been running. Contact with hot surfaces may cause injury.

Comply with instructions in this manual and also your company's regulations for the operation of this machine.

Read, understand and follow all general safety precautions specified by attachment manufacturer.

⚠ WARNING

Engine exhaust, some of its constituents, and certain vehicle components contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

SERVICING SAFETY PRECAUTIONS Continued

FLUID INJECTION INJURY

Hydraulic and diesel fuel systems on forestry machines operate at very high pressures, often 207 bar (3000 psi) and above. If a loose connection or a defect in a hose should occur, a fine, high velocity stream of fluid will result. Even for systems pressurized to as little as 7 bar (100 psi), this fluid stream can penetrate human skin as if it were a hypodermic needle.

Initially, an accidental fluid injection beneath the skin may only produce a slight stinging sensation. There is a danger that you will tend to ignore this, thinking that it will get better with time. Most often, it does not! Within a very short time the wound may begin to throb painfully, indicating that tissue damage has already begun.

Similarly fluid injected directly into a blood vessel can spread rapidly through your circulatory system. The human body has little ability to purge injected fluid.

Diesel fuel or hydraulic fluid under pressure can penetrate the skin and could result in death or serious injury. If any fluid is injected under the skin, a medical doctor familiar with the treatment of this type of injury must surgically remove it within a few hours.

Time becomes critical as tissue damage progresses rapidly. The longer you delay getting professional medical attention, the more damage can occur.

Although fluid injection accidents are rare, the resulting injury has on occasion required the amputation of a finger, a hand or in some cases the entire limb. The longer the delay in getting professional medical aid, the further up the limb the tissue damage can spread. An injury of this type can become very serious or even fatal if not dealt with promptly and properly.

WARNING

Diesel fuel or hydraulic fluid under pressure can penetrate the skin and could result in death or serious injury. If any fluid is injected under the skin, a medical doctor familiar with the treatment of this type of injury must surgically remove it within a few hours.

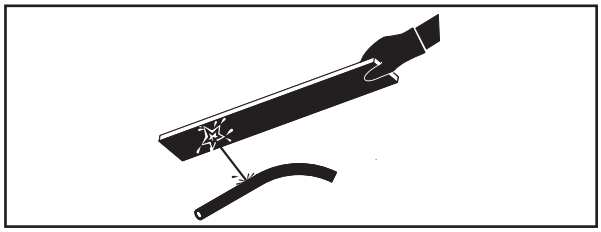
In the event of any suspected fluid injection injury

- **Report the injury to your supervisor immediately.**
- **Seek professional medical attention immediately.**

As always the best defence against suffering the effects of fluid injection is to prevent the accident from occurring in the first place.

When searching for possible fluid leaks

- Never search for leaks with your bare hands. Always wear thick protective gloves.
- Be sure to wear safety goggles for eye protection.
- Keep all body parts well away from the area being investigated for leaks.



- Use the end of a long piece of wood to move hoses or other obstacles.
- Place the end of a long piece of wood in the suspected path of any fluid stream. Never use any part of your body.
- Recognize that the source of the leak and the fluid streaming from it may be very small and not easily visible. You may only be able to see the fluid that accumulates as a result of the fluid stream.

SAFETY LABELS

SAFETY LABELS

The following safety labels must be periodically cleaned and inspected to ensure legibility is maintained. Replace any label that becomes illegible, damaged or removed.

READ OPERATOR'S MANUAL

Always read the operator's manual before operating the machine. Pay close attention to WARNINGS and HAZARD identifications.

Study all the safety messages in this manual and on the labels on the machine carefully.

OPERATOR'S MANUAL LOCATION

This label indicates the storage location of the operator's manual. This label is located on the outside of the operator's manual case inside the cab.

USE THE SEAT BELT AT ALL TIMES!

The operator's seat is equipped with lap and shoulder harness belts. Use both of these restraint systems at all times when operating the machine. **DO NOT ATTEMPT TO MOVE OR OPERATE** the machine until the seat belt is fastened properly.

Tigercat T250D Track Loader

SECTION 2 – CONTROLS & OPERATION

15. THROTTLE CONTROL

This is a three position 'momentary' switch connected into the engine CPU circuit to adjust the engine rpm between the  (IDLE) and  (FULL) throttle set points.

NOTE: Engage the interlock reset to increase engine speed. When the system is deactivated the engine speed will reset to minimum rpm.

PRESS and HOLD this switch in the  position to increase engine speed (rpm). Release switch at desired rpm or continue to HOLD to place engine at the correct FULL throttle setting.

PRESS and HOLD this switch in the  position to decrease engine speed (rpm). Release switch at desired rpm. or continue to HOLD to place engine at the correct MINIMUM throttle setting.

NOTE: All operations should be performed at FULL throttle.

Maintaining Correct Engine rpm

It is most important that the IDLE and FULL rpm of the engine be correct at all times:

IDLE - **800** rpm (No Load)
FULL - **1850 to 1880** rpm max. (No Load)
RATED WORKING — **1850 rpm**

NOTE: At start-up the engine will always default to IDLE.

The above values are with the hydraulic and engine oil at normal operating temperatures and no functions activated. These values are pre-set into the engine CPU (computer) and cannot be adjusted without the proper electronic programming software equipment.

Auto Idle Down
If the engine is set to run at full throttle and no functions are activated for 5 seconds, the engine will idle down. The engine will return to the set idle speed as soon as a function is activated.

16. KEY SWITCH, ENGINE START

This is a 3-position switch with *STOP/RUN/START* positions.

STOP 

Position – All electrical power through the Key switch is turned *OFF.*

Electrical power is still available for the horn, lighter, CD AM/FM radio, 2-way radio, cab dome light, defroster fan, work lights and service lights.

RUN  **Position** – Battery is connected to all functions. Used for normal machine operation.

START  **Position** – Connects the battery to the start relay to start the engine. Turning the key to this position starts the engine. The key will return to RUN position when released.

17. REAR LIGHTS - OPTIONAL

This switch controls the rear lights located on the rear of the cab. The circuit draws current directly from the battery and is protected by a fuse located in the fuse box.

18. LIGHTER/24 VOLT POWER

Depress lighter fully into socket and wait until it pops back up. Pull lighter out of socket and use coil to light cigar(ette).

CAUTION: Lighter coil reaches high temperatures that can cause burns to skin and can start fire. Handle with care. DO NOT use in presence of explosive or flammable liquids or vapor. Serious injury, death and/or property damage may result.

19. 12-VOLT AUXILIARY POWER

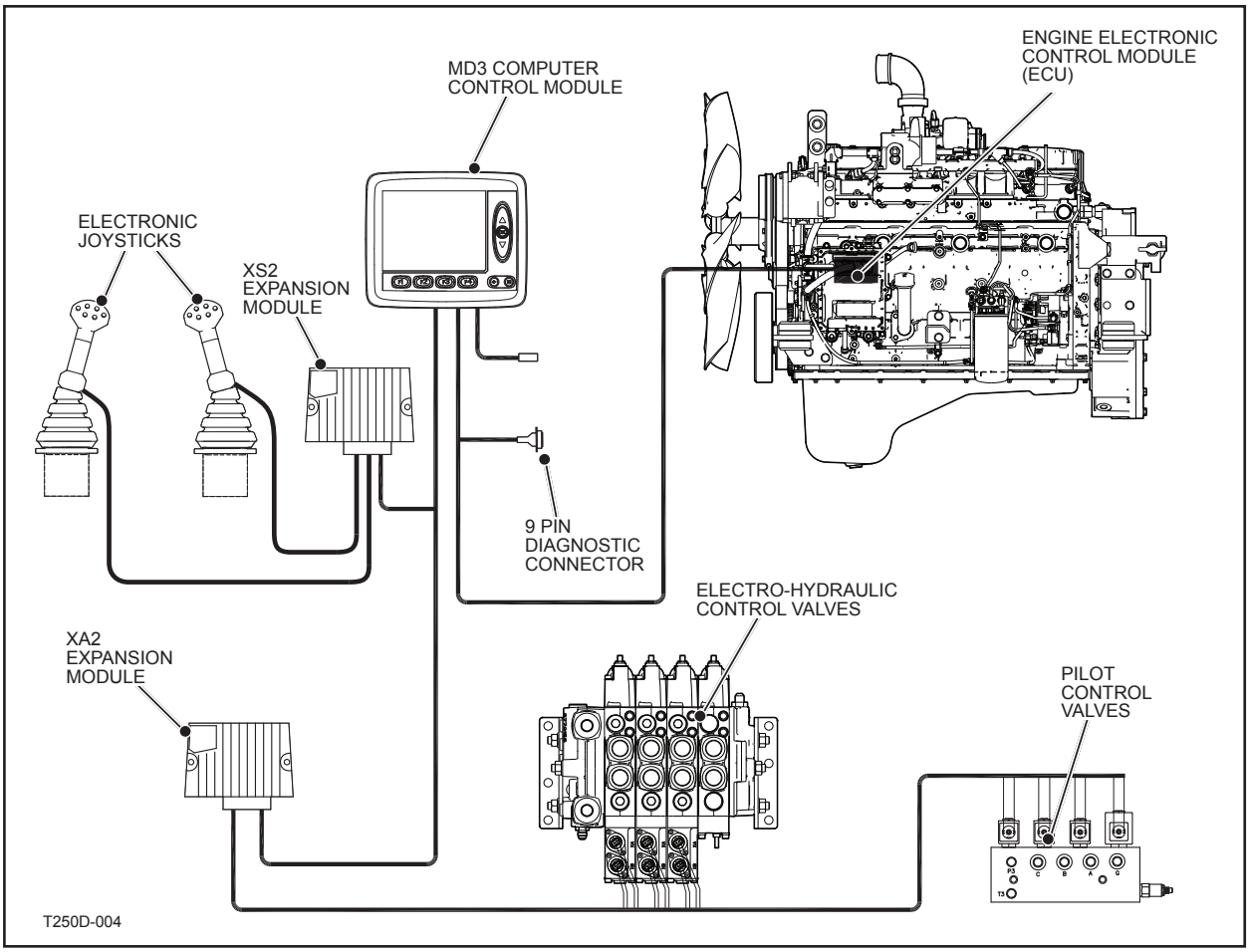
A 12-volt outlet with 20-amp capacity for portable devices such as phones.

20. SERVICE LIGHTS

This switch controls the service light located in the engine enclosure. The circuit draws current directly from the battery and is protected by a fuse located in the fuse box.

21. WORK LIGHTS

This switch controls the work lights located on the front of the cab and on the stick boom. The circuit draws current directly from the battery and is protected by a fuse located in the fuse box.



MD3 COMPUTER ELECTRONIC CONTROL & DISPLAY

The MD3 computer control system is part of a network of components (shown above). The system is made up of the following components:

- MD3 Computer and Display Module
- Electronic Joysticks
- XS2 Expansion Module
- XA2 Expansion Module
- Engine Electronic Control Unit
- Hydraulic Control Valve Electronic Solenoids
- Various controls, switches, sensors and valves not shown.

The MD3 computer is the main controller in the system. The MD3 computer program is the operating system for the computer display as well as the control system for the machine operating parameters.

As an example, the joystick movement/position is transmitted to the XS2 module which sends the signal to the MD3 control maodule electronically. This message is then transmitted to the XA2 expansion module from the MD3 control and on to the hydraulic control valve solenoid controls. The applicable hydraulic control valves will be activated allowing hydraulic oil to flow to the boom or grapple functions activated by the joystick movement.

The engine electronic control module provides electronic information to the MD3 computer via the J1939 CAN BUS link. This information is displayed on the computer display.

SAW ADJUSTMENT MODE

Press F3 button to select the SAW ADJUSTMENT Menu from the ADJUSTMENT MENU.

The following adjustments can be selected from the Saw Adjustment Menu:

Circle Saw Auto Retract Time – select F1

NOTE: The Saw Flow Rate affects the Auto Retract Speed. Saw Flow Adjustment should be set prior to setting the Auto Retract Speed. See SAW FLOW ADJUSTMENT later in THIS SECTION.

The display above shows that auto retract time is set to 5 seconds (5.00s)

Press F1 button to select the Circle Saw Auto Retract Time Menu from the SAW ADJUSTMENT MENU.

The value can be set between 0 — 5 seconds for the Auto Retract Time. This is the amount of time that the saw retract will stay active after the circle saw cut button has been released. The time should be adjusted to allow the circle saw to retract fully. If the time is set longer than necessary hydraulic heat will be created in the main valve.

NOTE: To disable auto saw retract, set the retract time to 0 seconds.

If a different value is desired use the arrow up/ down buttons to reset the value.

Shown above the value has been adjusted to 2.25 seconds. When the new value is selected, press the OK button to accept the new value and to return to the Saw Adjustment Menu.

The new value for circle saw auto retract is now displayed (2.25s).

If no other adjustments are required continue to press the back button to return to the main menu

ENGINE

In the Engine the Cold Idle Speed can be selected.

The Cold Idle Speed can be adjusted from 950 – 1400 rpm.

To adjust the value use the arrow up/down buttons to change the setting. Then press the OK button to set the value.

Press the back button to return to the Engine menu.

Press the back button again to return to the Adjust menu.

Continue to press the back button to return to the Main Menu Display.

MEASURE MENU

From the main menu page press the F2 button (Measure) to access the measure menu.

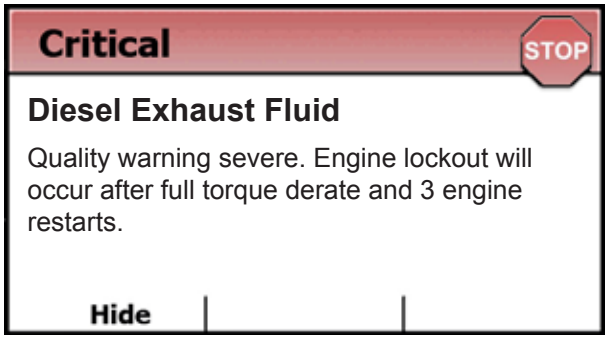
The following menu items can be selected.

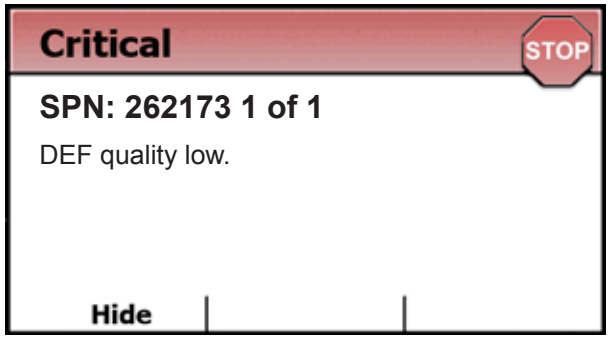
- Engine Paramenters
- IQAN Status
- LH Joystick
- RH Joystick
- SP Joystick
- Valve Functions
- Inputs
- Outputs
- AC16

Use the Arrow Up or Arrow Down to select the menu item. Press OK to confirm the selection.

This menu is used by Tigercat service technicians. Refer to SECTION 6 of the SERVICE MANUAL for more information. Press the back button (or F1) to return to the main menu page.

DIESEL EXHAUST FLUID QUALITY





This message will be displayed, alarm light will flash and alarm will sound when a diesel fluid quality problem is detected. Action to correct the problem should be taken immediately to avoid affecting engine performance and damage to the Selective Catalytic Reduction (SCR) after-treatment system components.

This message results in the following derate and engine lockout sequence if no action is taken to correct the problem:

- Beginning 1 hour after a Diesel Exhaust Fluid (DEF) quality message, there will be a ramp down of Engine Speed by 60% and Torque by 65% over 40 minutes.
- After 2 hours at derated engine speed and torque the engine is derated to idle within 30 minutes.
- A total of 3 restarts are allowed after any derate has started. Refer to COMPUTER – MESSAGES – CRITICAL–ENGINE LOCKED OUT and ENGINE RESTARTS REMAINING UNTIL ENGINE LOCKOUT in THIS SECTION.

To correct the DEF quality problem, clean the area around the DEF tank then drain and refill the tank with clean DEF which meets ISO 22241 specifications. Additional messages from the Denox Module will also be displayed. Refer to Engine Manuals for code information.

Note that an Engine Torque Derate Active message will also be triggered as the engine begins to derate. Refer to COMPUTER – MESSAGES – CRITICAL – ENGINE TORQUE DERATE ACTIVE.

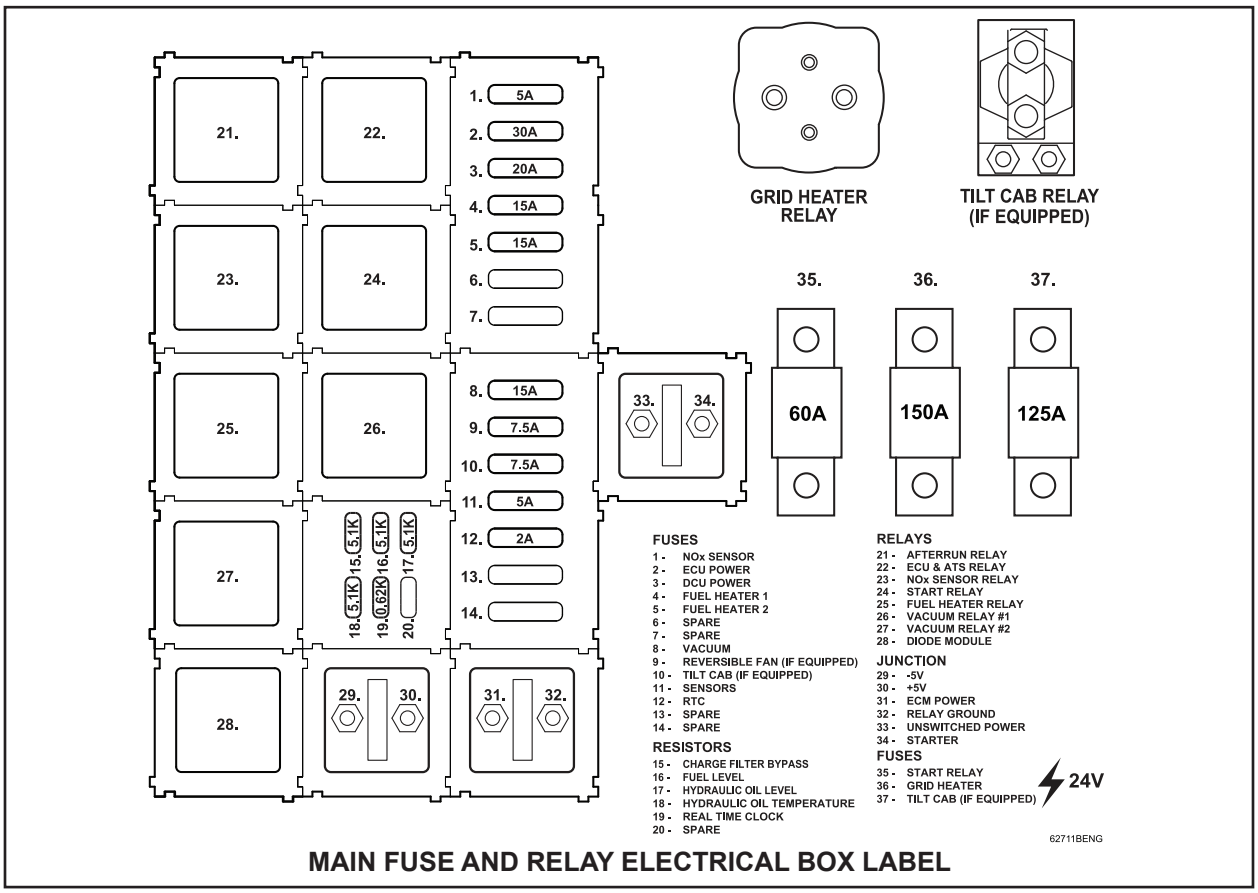
Refer to DIESEL EXHAUST FLUID TANK in SECTION 2 of THIS MANUAL and DRAINING DIESEL EXHAUST FLUID TANK in SECTION 3 of THIS MANUAL.

Refer also to SELECTIVE CATALYTIC REDUCTION SYSTEM in SECTION 3 of THIS MANUAL for more information regarding the use of DEF and its function in the SCR after treatment system.

⚠ WARNING

Use only diesel exhaust fluid (DEF) which meets ISO 22241 specifications. NEVER fill the DEF tank with any other fluid.
DEF fluid is injected into the exhaust gas stream during normal operation of the Selective Catalytic Reduction (SCR) after treatment system.
Use of other fluids may cause component damage, or a fire risk which could result in death or serious injury.

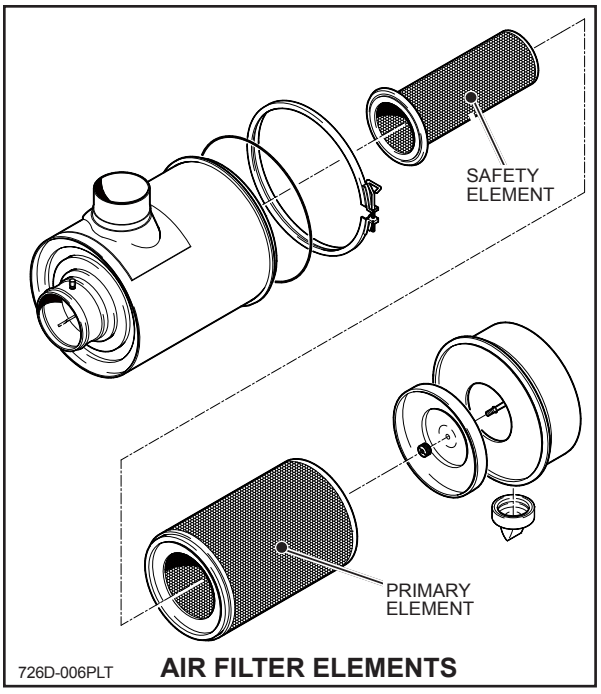
MAIN FUSE AND RELAY ELECTRICAL BOX



MAIN FUSE AND RELAY ELECTRICAL BOX LABEL

FUSES AND RELAYS - ELECTRICAL BOX

This Main Fuse and Relay electrical box is located in the engine compartment.



AIR FILTER ELEMENTS

IMPORTANT STEPS TO FOLLOW WHEN CHANGING FILTER ELEMENTS

6. Release the cover latches gently to reduce the amount of dust dislodged.
7. Avoid dislodging dust from filter element(s) by gently pulling the element out of the housing.
8. Check your old filter sealing surfaces, This will help detect foreign material on the sealing surface that is causing leakage.

NOTE: Filter elements should never be cleaned and reused. Cleaning causes dust to bypass the filter and be deposited on the inner surface of the filter media. The dust is then drawn directly into the engine.

9. Always clean the inside of the housing.
10. Always clean the sealing surface before inserting a new filter element.
11. Inspect the new filter for damage.
12. Insert the new filter properly. Apply pressure to the filter frame not the pleated filter surface.
13. Check connections hoses and tubes for an air tight fit. Ensure that all clamps, bolts and connections are tight. Check rubber elbows for splits or wear points. Leaks in these locations send dust directly to the engine.

NOTE: Refer to diesel engine manufacturer's operation and maintenance manual for more details and additional required maintenance of the Air Cleaner or replacement of the air filter elements.

OVER SERVICING

Filter elements increase in dust cleaning efficiency as dust builds up on the media. Looks can be deceiving. A filter that is dirty is actually more efficient than one that is clean. A filter with dust build up on the media reaches nearly 100% dust cleaning efficiency. Only when a filter is so clogged with dirt that air restriction goes beyond the engine manufacturer's guidelines, should be replaced.

IMPROPER SERVICING

Engine exposure to dust during servicing is the largest single factor contributing to engine damage due to dust. Abrasive dust can easily enter the intake system once the air cleaner element has been removed for replacement. The safety element reduces the risk, however it must also be replaced at every third primary element change.

INSPECTION AND MAINTENANCE

Daily inspection and maintenance is essential to confirm that the window's ability to protect the operator has not been compromised.

- Inspect all windows daily and immediately after any impacts.
- Check for any damage to the window material or steel structure in the area of the window mounting.
- The edges of the polycarbonate window must be evenly and fully supported on a flat surface around the entire window opening at all times. Bent or dented skylight structures must be replaced immediately. Bent or dented cab structures must be evaluated immediately for possible repair or replacement.
- The edges of the polycarbonate window must be free from cracks, chips, notches or scarring and must not be pinched or stressed. These defects will decrease ability to resist heavy impacts. Windows with these defects must be replaced immediately.
- Cracks, chips, notches or scarring anywhere on the viewing surface of the window will decrease ability to resist heavy impacts. Windows with these defects must be replaced immediately.
- Bent, dented or missing window retaining parts must be replaced immediately.
- Rubber materials used in mounting the window must be maintained in good condition.
- Identification of the polycarbonate originally used by Tigercat is hot stamped in a corner of the window to identify its composition. Do not use any replacement window without proof of its material composition. Do not substitute with any other materials.
- Skylights, cab structures, windows and window retaining parts must not be modified or replaced with components that are not approved by Tigercat.

RESISTANCE TO CHEMICALS

The resistance of polycarbonate material to chemical exposure varies widely. Fortunately, polycarbonate materials have good resistance to diesel fuel, grease, hydraulic oil, kerosene and engine oil.

Other chemicals however can seriously weaken the polycarbonate.

DO NOT permit any of the following chemicals to come into contact with polycarbonate windows:

- Acetone
- Air conditioning refrigerant
- Ammonia
- Anti-freeze
- Benzene
- Brake fluid
- Carbon tetrachloride
- Cutting oils
- Gasoline
- Acquer thinner
- Toluene
- Turpentine
- Xylene

RESISTANCE TO WATER

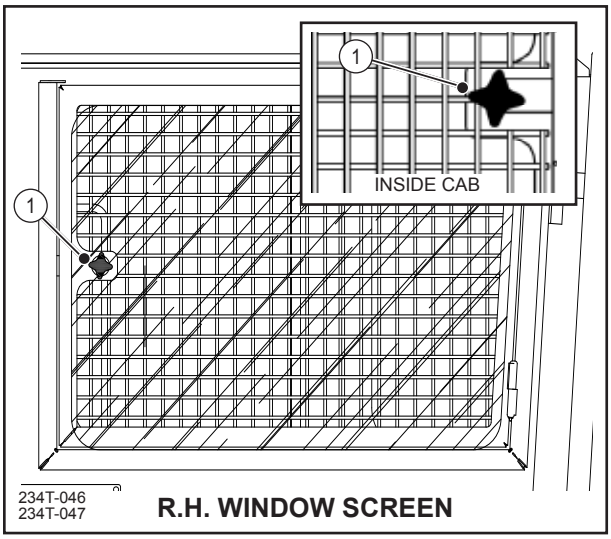
Polycarbonate material has good resistance to water up to approximately 65°C (150°F). Above this temperature the effect of water is time-temperature related. This means that the higher the water temperature, the shorter the time before the polycarbonate is adversely affected.

Exposing polycarbonate to repeated steam cleaning or high temperature pressure washing may result in crazing, a phenomenon that causes clouding of the surface. Crazing can ultimately result in a loss of physical strength and may precede a fracture.

GENERAL

CHECK EMERGENCY EXIT, MONTHLY:~
An alternate exit route is provided: the right side window can be used as an emergency exit. This exit is only to be used if the side door cannot be opened.

Open the right side window by lifting the latch handle and slide the window open.



On machines equipped with window screens, there are two hand knobs (1), one on the inside and one on the outside that can be removed to open the window screen. Only one hand knob has to be removed to open the window screen as follows:

From inside the cab:
Open the cab window and turn the inside hand knob (1) counterclockwise to remove the hand knob and open the window screen. Push the window screen out to open it. Exit the cab if you can safely do so.

From outside the cab:
The window screen can also be opened from the outside by unscrewing the hand knob on the outside (1) and remove it. When the hand knob is removed the screen can be swung open.

It is therefore essential that this exit be inspected monthly to ensure it is operational.

FIRE PREVENTION
Maintaining your machine properly will greatly extend its life and reduce your operating costs.

Fire can result in a machine loss which can be financially devastating.

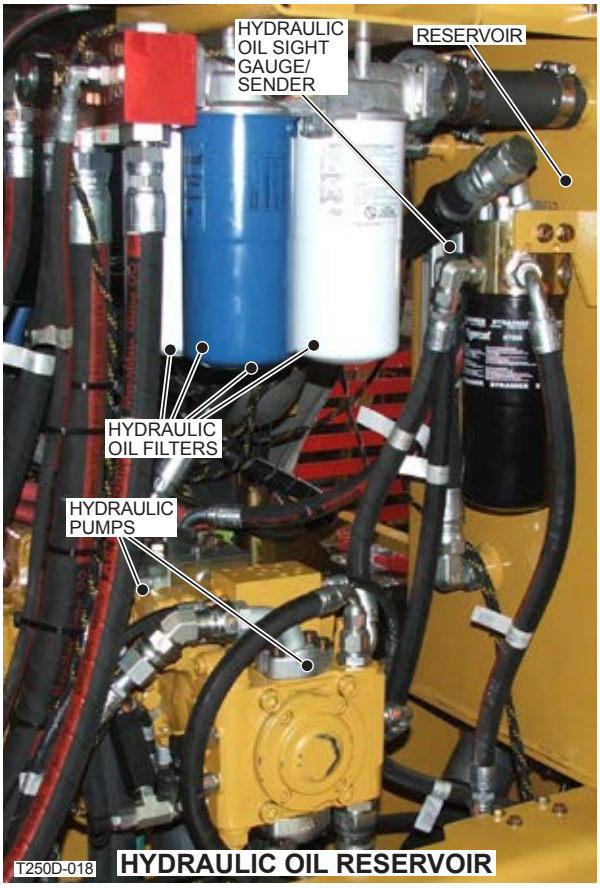
IMPORTANT!
AFTER transporting (trucking) a machine from one job sight to the next, open all doors and access panels and blow off any debris that could have re-positioned itself onto the engine and exhaust parts due to wind turbulence caused by the journey.

1. Pine needles and bark when allowed to accumulate, form a fuel source that when ignited is extremely difficult to extinguish. A thorough program of regular cleaning and washing will reduce the possibility of a fire starting. In the event a fire does start, the regular cleaning program will improve the chances of successfully extinguishing a fire.
2. Pay close attention to wiring and hoes routing during maintenance. Ensure that ALL wiring harnesses or hydraulic hoses are properly restrained and clamped to prevent damage from chaffing.
3. If equipped, read the fire suppression system manual and have the system serviced regularly by qualified personnel.
4. In case of fire lower the boom system to the ground and shut off the engine before discharging the fire suppression system.

Also refer to FIRE PREVENTION in SECTION 1 of THIS MANUAL for additional information.

HYDRAULIC OIL RESERVOIR

HYDRAULIC OIL SIGHT GAUGE/SENDER



HYDRAULIC OIL RESERVOIR

A sight gauge on the front of the reservoir is visible from the front access panel or the left hand side door. The hydraulic oil level must be kept between the HIGH and LOW limits at all times. A low level switch is incorporated into the level indicator, when the hydraulic oil reaches this level the switch turns a warning light ON in the operator's cab.

Allowing the level to drop below the LOW limit can result in severe damage to hydraulic components.

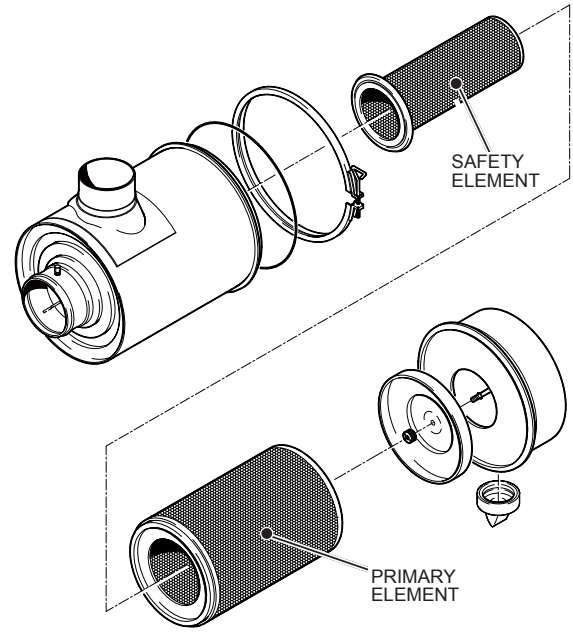
If the oil level drops, inspect the machine including all fittings and hydraulic components for leaks. Once the source of the oil loss is located and repaired, oil can be added to the reservoir.

OVER SERVICING

Filter elements increase in dust cleaning efficiency as dust builds up on the media. Looks can be deceiving. A filter that is dirty is actually more efficient than one that is clean. A filter with dust build up on the media reaches nearly 100% dust cleaning efficiency. Only when a filter is so clogged with dirt that air restriction goes beyond the engine manufacturer's guidelines, should be replaced.

IMPROPER SERVICING

Engine exposure to dust during servicing is the largest single factor contributing to engine damage due to dust. Abrasive dust can easily enter the intake system once the air cleaner element has been removed for replacement. The safety element reduces the risk, however it must also be replaced at every third primary element change.



726D-006PLT **AIR FILTER ELEMENTS**

IMPORTANT STEPS TO FOLLOW WHEN CHANGING FILTER ELEMENTS

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2. Avoid dislodging dust from filter element(s) by gently pulling the element out of the housing.
3. Check your old filter sealing surfaces, This will help detect foreign material on the sealing surface that is causing leakage.

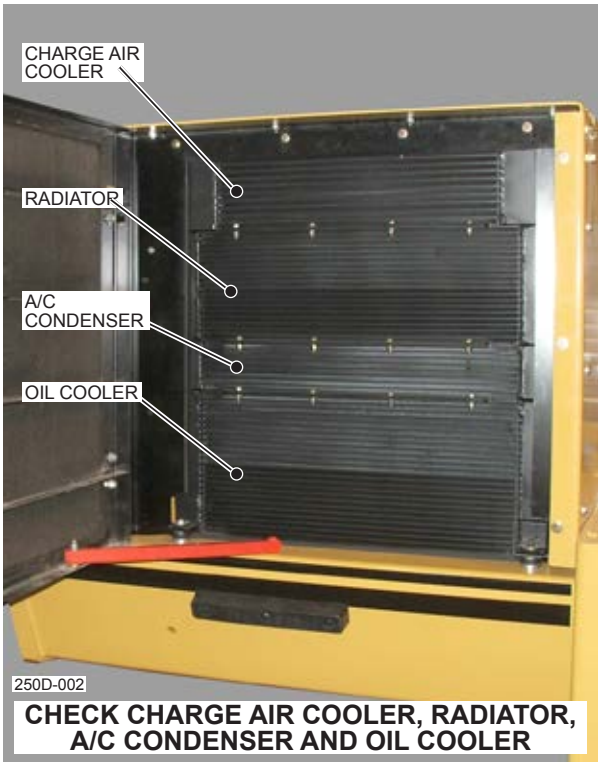
NOTE: Filter elements should never be cleaned and reused. Cleaning causes dust to bypass the filter and be deposited on the inner surface of the filter media. The dust is then drawn directly into the engine.

4. Always clean the inside of the housing.
5. Always clean the sealing surface before inserting a new filter element.
6. Inspect the new filter for damage.
7. Insert the new filter properly. Apply pressure to the filter frame not the pleated filter surface.
8. Check connections hoses and tubes for an air tight fit. Ensure that all clamps, bolts and connections are tight. Check rubber elbows for splits or wear points. Leaks in these locations send dust directly to the engine.

NOTE: Refer to diesel engine manufacturer's operation and maintenance manual for more details and additional required maintenance of the Air Cleaner or replacement of the air filter elements.

CLEANING COOLER PACKAGE

The A/C condenser core is located on the right side of the machine and is one of the cores in a stack of four that make up the cooler package. The cooling fan is mounted on the front of the engine. The fan draws air from the right side of the machine through the door screen and the cooler package blowing it out of the opposite side of the machine.



CHECK CHARGE AIR COOLER, RADIATOR, A/C CONDENSER AND OIL COOLER

The cooler package should be manually checked every 8 hours (every shift) or more often where conditions cause accumulation of twigs, leaves, pine needles and dust. All of the engine enclosure doors should also be checked.

PROCEDURE:

OPEN THE SCREEN DOOR ON R.H. SIDE OF ENGINE COMPARTMENT

Remove the 3 capscrews and washers and swing open the screen door on the right side of the engine compartment.

⚠ CAUTION

- **If using compressed air for cleaning, use 2 bar (30 psi) or less.**
- **Always use personal protective equipment to guard against flying debris.**

This cooling assembly must be checked daily and may require thorough cleaning on a regular basis depending on operating conditions. Compressed air or water may be used for cleaning. **Use personal protective equipment to guard against flying debris.**

If an oil leak occurs in this area it should be thoroughly power-washed with a mild soap to ensure that all of the oil is removed. The presence of oil causes dust and dirt to cling to surfaces which will impair the reversible fan's ability to remove dust and dirt particles.

Care must be taken when cleaning this assembly, as the components can be damaged by careless handling and cleaning.