Tigercat®

250D LOADER

OPERATOR'S MANUAL

SERIAL NUMBER 2502101 TO 2502150

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Tigercat Industries Inc.
P.O. Box 637
Brantford, Ontario
Canada N3T 5P9
Tel: (519) 753-2000
Fax: (519) 753-8272

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.

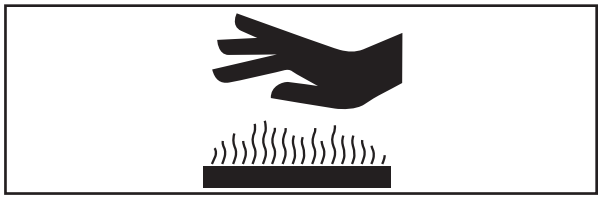
Approach with extreme caution any area where overhanging electrical power lines are present. Serious injury or death by electrocution can result if the machine or any of its attachments are not kept a safe distance from these lines.

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.

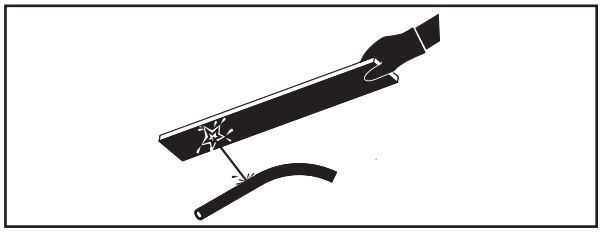
In the event of any suspected fluid injection injury

- **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

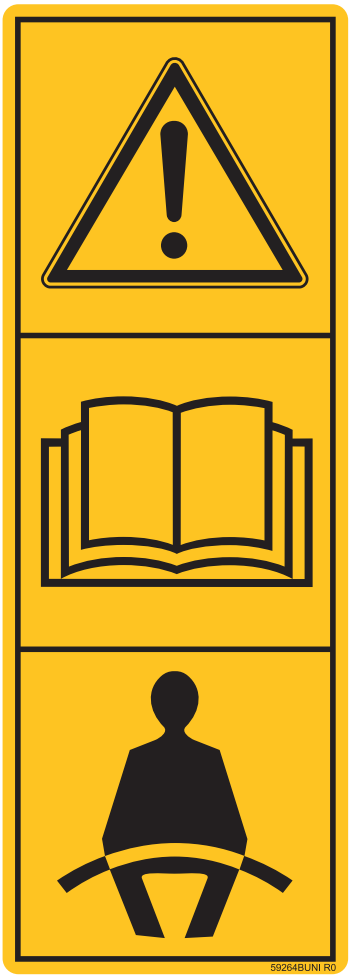
SAFETY LABELS

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

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.

READ OPERATOR'S MANUAL and USE THE SEAT BELT AT ALL TIMES



This label gives two messages.

The centre panel notifies the operator to 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.

The bottom panel notifies the operator that the operator's seat is equipped with lap belt. Use this 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 250D Loader
SECTION 2 – CONTROLS & OPERATION

10. KEY SWITCH, ENGINE START

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

STOP (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.

11. 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.

12. 12-VOLT AUXILIARY POWER

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

13. 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.

14. 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.

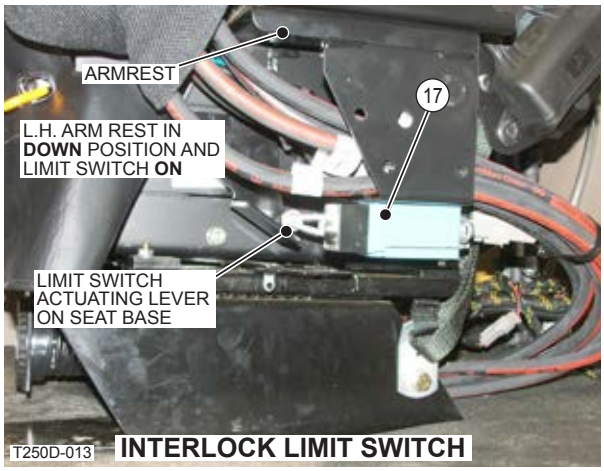
15. WORK LIGHTS

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.

16. INTERLOCK RESET SWITCH

This function is provided to prevent accidental or improper use of the controls from anywhere but the operators seat.

With the engine running and the L.H. arm rest DOWN, push this switch to REACTIVATE the *interlock system* after it has been deactivated by raising the L.H. arm rest, or by turning the Key switch to the OFF position.



INTERLOCK LIMIT SWITCH

17. INTERLOCK LIMIT SWITCH

When the L.H. arm rest is placed in the UP position, a limit switch shuts OFF the *interlock system* DEACTIVATING all operating functions. When the L.H. arm rest is placed in the DOWN position, the limit switch closes and turns the interlock system ON. The operating functions are not REACTIVATED until the INTERLOCK RESET switch is pressed.

OPERATOR'S SEAT

Height Adjustment Procedures

The spring-assisted height adjustment is controlled by the **height adjustment lever** located on the front left side of the seat chassis. The 4 height settings — top, bottom, and 2 in between — provide a total height adjustment of 75 mm (3 in).

To raise the seat:

Firmly lift up on the **height adjustment lever** and partially lift your body weight from the seat. When the seat rises to the desired height, FIRMLY PUSH DOWN on the lever into the locking position (a click should be heard).

To lower the seat:

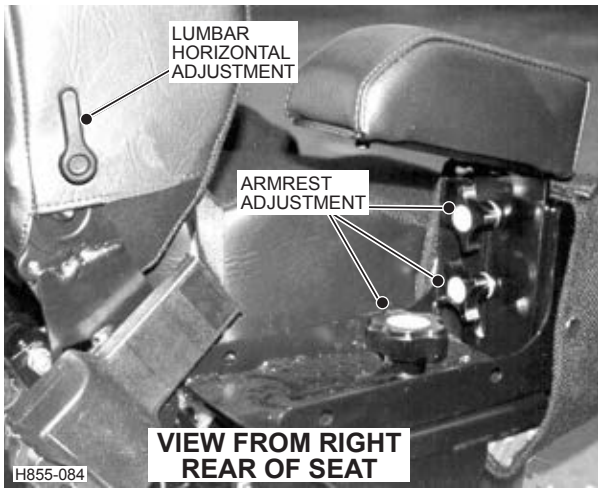
Firmly lift up on the **height adjustment lever** and add body weight to the seat until the seat is at the desired height. FIRMLY PUSH DOWN on the lever into the locking position (a click should be heard).

Air Ride Adjustment Procedures

After adjusting the seat height, the ride adjustment can be made by pulling or pushing the air ride control valve knob.

To stiffen the air ride:

For a **stiffer** ride **push** on the **air ride adjustment knob** to increase the air pressure in the suspension air bag.



To soften the air ride

For a **softer** ride, **pull** on the **air ride adjustment knob** to decrease the air pressure in the suspension air bag.

Adjustable Lumbar

To increase lumbar support pressure, turn lumbar adjustment lever forward. To decrease lumbar support pressure, turn lumbar adjustment lever backwards .

Back Angle Adjustment

Push down **backrest angle adjustment lever** to place backrest at the desired angle then release lever.

Fore/Aft Slide

Move and hold FORE/AFT SLIDE LEVER. Roll seat forward or backward to the desired position relative to the foot pedal controls.

Armrest adjustment

Each armrest has 2 adjustments to place it in the required position. Loosen adjustment locking wing-bolts to reposition armrest height and fore/aft position.

SAW FLOW ADJUSTMENT

The Saw Flow Adjustment (F3) provides access to the Top Saw Cut, Slasher Saw Cut and/or Circle Saw feed flow rate adjustments.

NOTE: The Circle Saw flow rate adjustment refers to the saw feed speed and not the saw motor speed.

Press F3 button to select the saw flow adjustment from the ADJUSTMENT MENU.

This function is password protected and requires entering a 4 digit PIN number to make adjustments.

IMPORTANT!
Before making any adjustments make sure you are aware of the flow requirements of your particular saw. Over driving the saw motor with more flow than required can damage your saw.

Select F1 (ENTER PIN) to enter PIN.

A new message appears on the display 'Enter PIN Code. The factory PIN is '0000'. This number will remain the same until the password (PIN Code) is changed. Press the OK button 4 times to enter '0000'.

At this point the check mark will be displayed beside the PIN number to show that the correct PIN code has been selected. The flow adjustment icon will also be displayed above the F3 button

If you wish to change the password, select F2 SET PWD. Use the arrow up/arrow down and OK buttons to enter the new 4 digit PIN.

Remember the new PIN code. It will be required after the computer has been turned off when the ignition key has been put in the stop position. See RESETTING THE PASSWORD on this page if you forget the password.

RESETTING THE PASSWORD - If you forget the password, hold down on the **UP, OK** and **DOWN** buttons simultaneously. Release the buttons, press the OK button until the 'X' mark appears. Then enter **1234** and press OK. This is the new password. If you wish to change the password, select F2 SET PWD. Use the arrow up/arrow down and OK buttons to enter the new 4 digit PIN.

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.

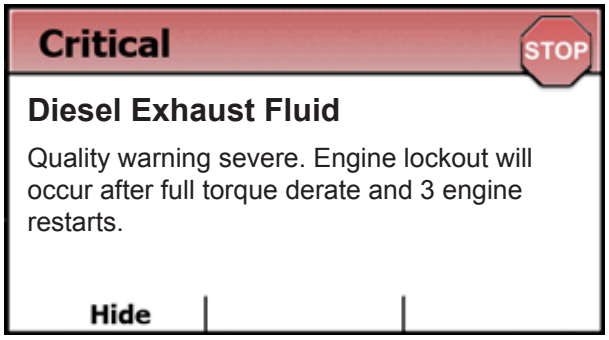
The following menu items can be selected.

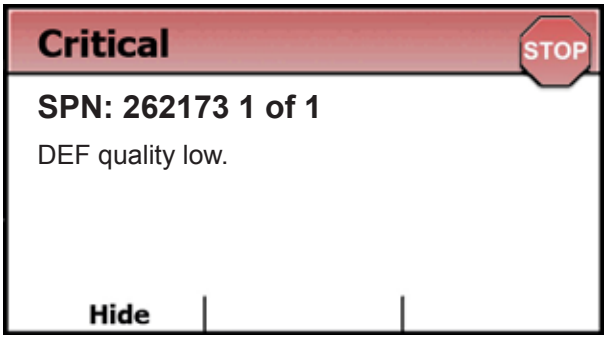
- Engine Paramenters
- IQAN Status
- LH Joystick
- RH Joystick
- SP Joystick
- Valve Functions
- Inputs
- Outputs
- AC16

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.

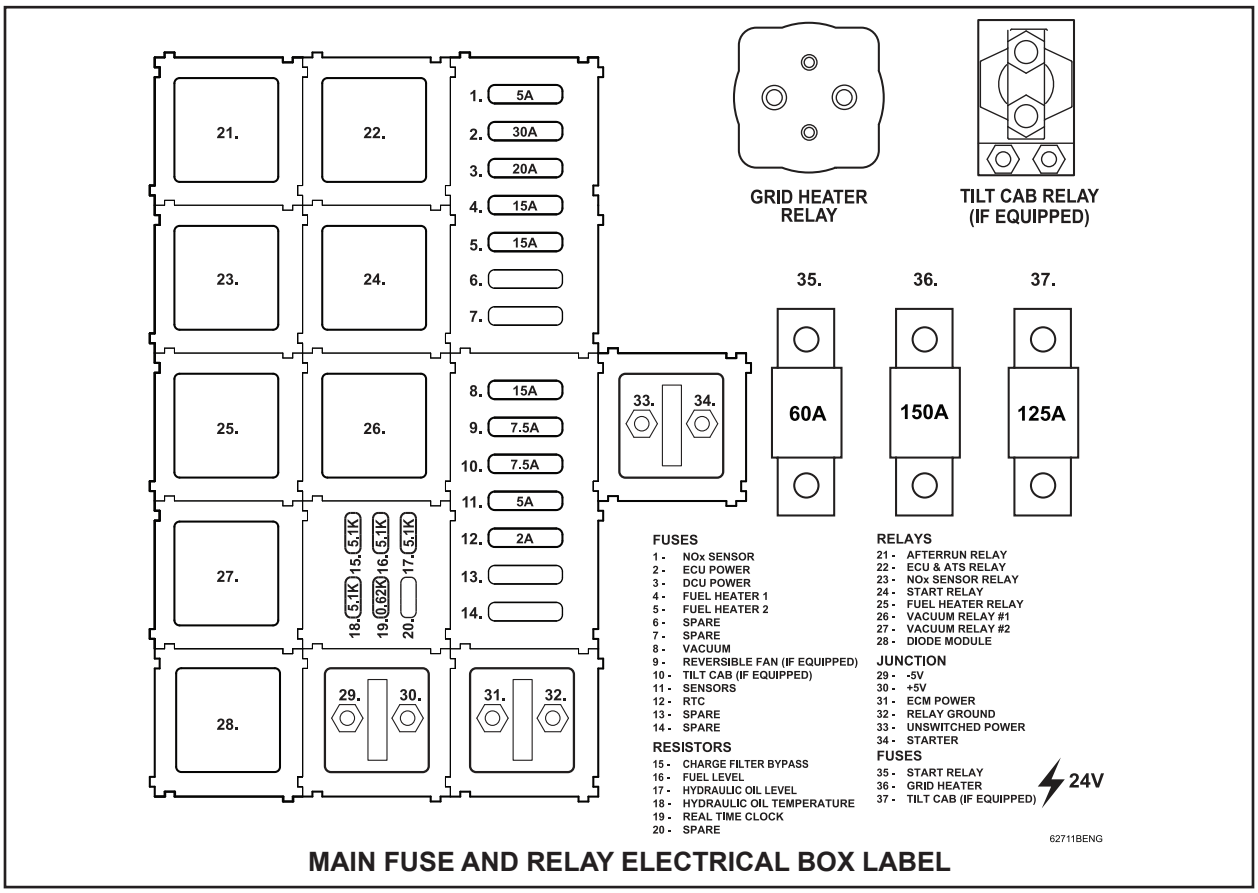
Note that an Engine Torque Derate Active message will also be triggered as the engine begins to derate. Refer to COMPUTER – MESSAGES – CRITICAL – ENGINE TORQUE DERATE ACTIVE.

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

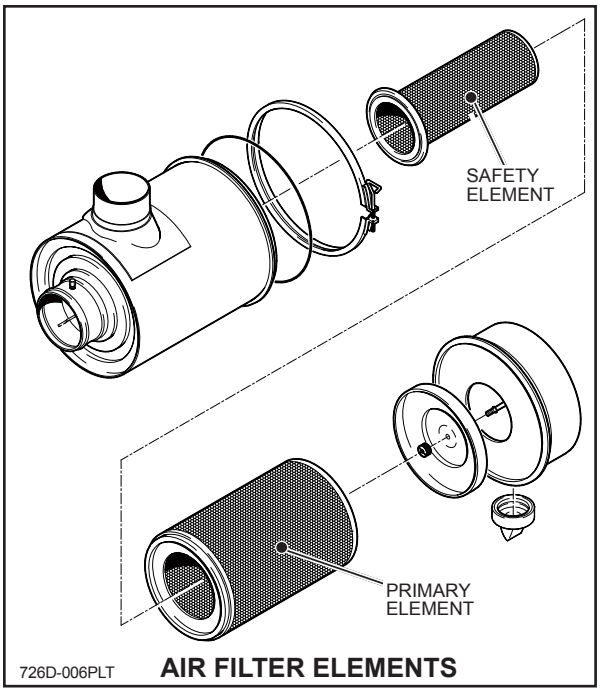
Use only diesel exhaust fluid (DEF) which meets ISO 22241 specifications. NEVER fill the DEF tank with any other fluid.
DEF fluid is injected into the exhaust gas stream during normal operation of the Selective Catalytic Reduction (SCR) after treatment system.
Use of other fluids may cause component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



MAIN FUSE AND RELAY ELECTRICAL BOX 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

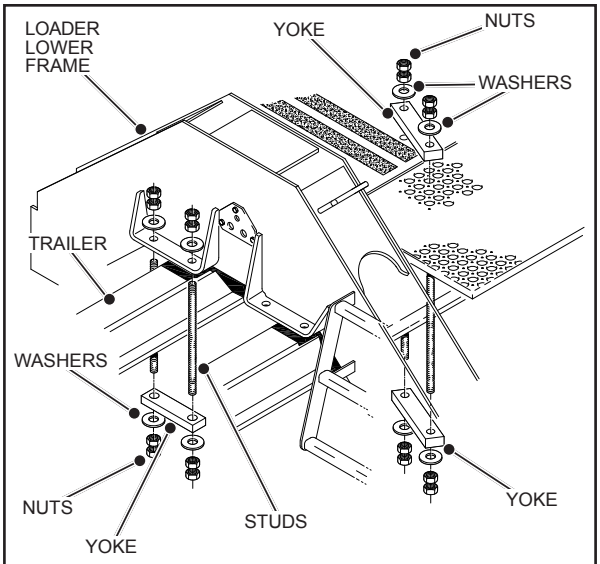
Engine exposure to dust during servicing is the largest single factor contributing to engine damage due to dust. Abrasive dust can easily enter the intake system once the air cleaner element has been removed for replacement. The safety element reduces the risk, however it must also be replaced at every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

LOADER TRAILER MOUNTING/ INSTALLATION

The mounting procedure will vary with the type of trailer being used. The following procedure is intended as a guide for mounting the loader on a typical I-beam or Channel beam trailer. The procedure may not be complete or may differ from the actual method or procedure used.

NOTE: *It is the responsibility of the owner of the machine to ensure that the installation or mounting of the loader onto the trailer is safe and complies to all local, state, provincial and federal regulations applicable for the region.*

1. Raise the loader off the ground by extending the stabilizers to a sufficient height to allow the trailer to pass underneath. Ensure that the grapple and booms are clear of any interference are supported on a stable surface.
2. Carefully back the trailer under the subframe of the loader. Ensure that the trailer is centered under the loader and that the loader is in the proper location. Refer to manufacturer of trailer to determine proper location and positioning of loader.
3. Ensure that trailer is stable and will not move.
4. Slowly and evenly lower the loader by retracting the stabilizers until the loader subframe is securely resting on the trailer frame.
5. Using **Tigercat** installation hardware (clamping bar(s) and studs) only, attach the loader to the frame of the trailer in eight locations.



TRAILER MOUNTING

NOTE: When clamping to a frame that is a 'C' or 'U' channel, make use of proper length spacers placed in between the flanges to prevent any deforming of the channel when tightening the clamps. The spacers length must be a slip fit into the channel. Short or long spacers will distort or deform the channel.

6. Torque the nuts/studs to 500 lbf-ft, then secure in place with a "jam" nut.
7. Check torque of mounting bolts as specified in maintenance schedule.
8. Ensure installation conforms to all applicable regulations.

⚠ WARNING

Do not perform any unauthorized welding of the loader subframe or any other component of the loader. Doing so may cause structural failure resulting in injury, death or property damage. Any welding performed on the Loader unauthorized by Tigercat will void the associated warranty.

Tigercat 250D Loader
SECTION 3 – LUBRICATION & MAINTENANCE

JUNE, 2014

CONTENTS - SECTION 3

APPROVED HYDRAULIC OILS

Use one of the following oils to fill or replenish the hydraulic system.

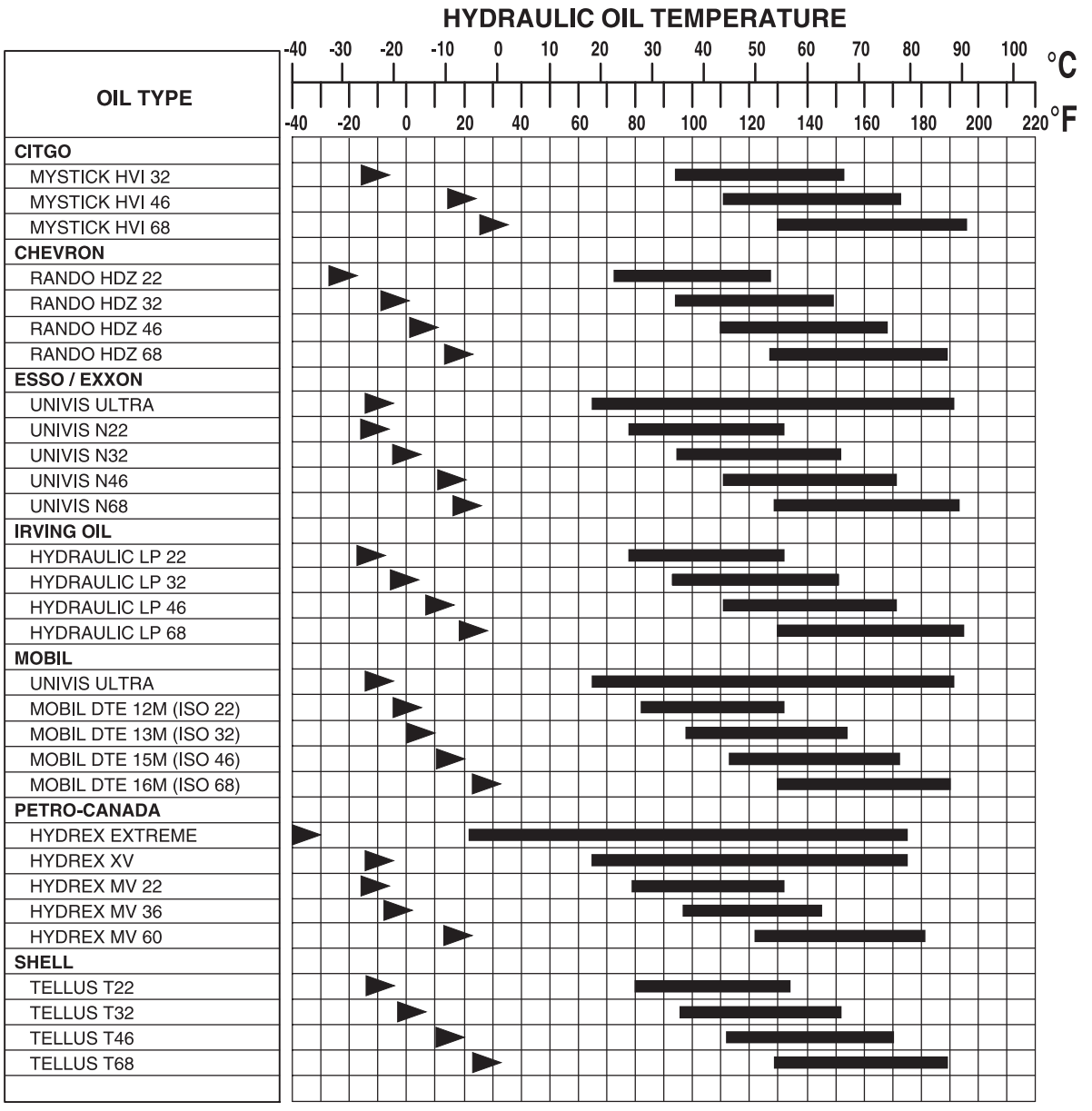
HYDRAULIC OIL OPERATING RANGE

(Not suitable for axle applications)

Tigercat®

OPERATING TEMP. RANGE

LOWEST START-UP TEMP.

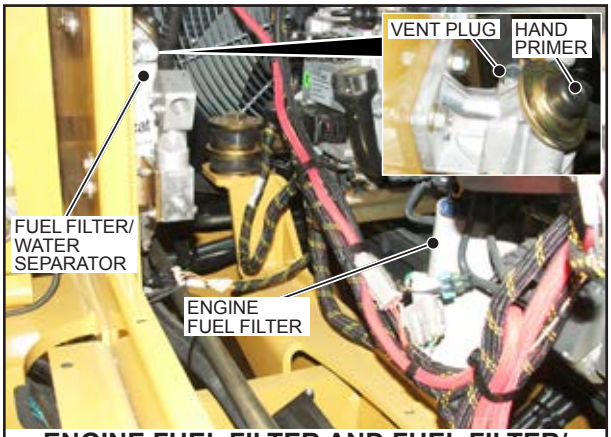


⚠ CAUTION OPERATING MACHINE OUTSIDE LIMITS SHOWN WILL RESULT IN FAILURE OF HYDRAULIC COMPONENTS

5168AR04

ENGINE FILTERS - REMOVE AND REPLACE

This machine is equipped with two fuel filters. One fuel filter comes with and is mounted on the engine. The other remote mounted fuel filter is a combination unit, with a replaceable fuel filter with drain valve and a reusable water in fuel sensor. For service and replacement intervals see SERVICE AND LUBRICATION POINTS in THIS SECTION. Refer also to engine manufacturer's manual for more detailed information.



ENGINE FUEL FILTER AND FUEL FILTER/ WATER SEPARATOR
250D-019

IMPORTANT !
Failure to service and replace filters at the proper intervals specified in the manufacturer's manuals, could cause damage to the machine and result in the product warranty becoming NULL and VOID. Check Tigercat parts catalog for replacement filters.

IMPORTANT !
Filters that are an integral part of the engine (fuel and lubricating oil) should be serviced and replaced according to the engine manufacturer's manual.

Tier III and IV engines typically use filters with a very fine micron rating. If the fuel supply is dirty, the fuel filter must be replaced more frequently than recommended in the owner's manual. Operating the machine with a clogged fuel filter will result in low engine power. It is also recommended that the fuel/water separator bowl be drained daily.

When installing a new fuel filter, DO NOT pre-fill with diesel fuel, engine fuel pump damage may result. This type of failure is not warrantable by the engine manufacturer.

To prolong the operating life of the fuel filter, ensure that the fuel supply storage tank is clean and free of water and that the fuel is pre-filtered prior to adding it to the machine.

⚠ WARNING
The fuel pump high-pressure fuel lines and fuel rail contain very high pressure fuel. Never loosen any fittings while the engine is running. Personal injury and property damage can result.

ENGINE FUEL FILTER AND REMOTE FUEL FILTER/WATER SEPARATOR

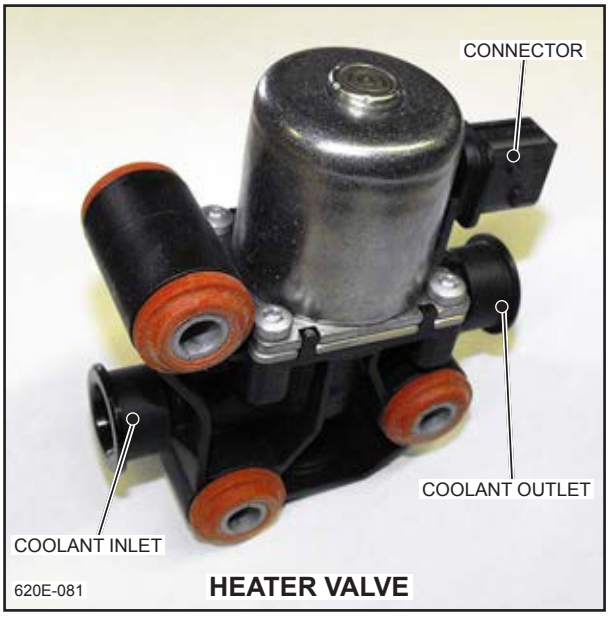
Changing the primary fuel filter:

1. Park machine on level ground, lower stabilizers and grapple to the ground, stop engine.
2. Wipe clean the area around the filter and head.
3. Place rags below to catch the spillage of fuel.
4. Wearing face protection (in case of a fuel spray) unscrew the old filter. Dispose of any fuel and the fuel filter properly.
5. Check the seating area for the o-ring on the filter head and wipe clean.
6. Lubricate the o-ring on top of the new filter with clean **engine oil**. DO NOT pre-fill the new filter.
7. Screw the new filter onto the filter head as specified by the filter manufacturer. Note: Mechanical over tightening can damage the filter element.
8. Prime the fuel system using the hand primer on the remote fuel filter/water separator before starting the engine.

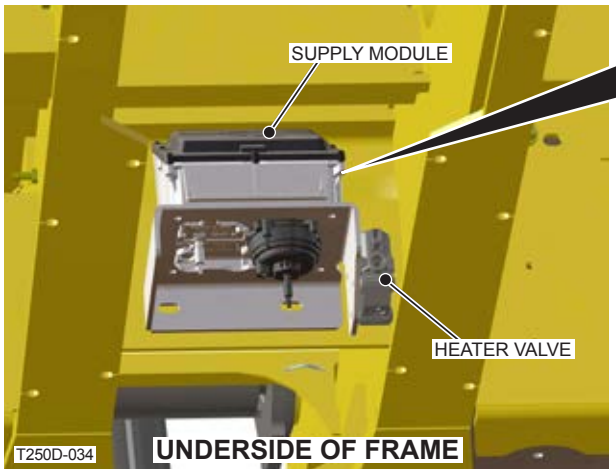
   Loosen the plug on the top of the remote fuel filter/water separator. Pump the hand primer until fuel begins to seep out around the loosened plug, continue to pump until no air bubbles are visible (approximately 30 pumps). Tighten the plug. Pump the hand primer 30 more times.
9. Start the engine and check for leaks. Refer to STARTING ENGINE in SECTION 2 of the OPERATOR'S MANUAL.

⚠ WARNING
Drain fuel filter into a container and dispose of all fluids properly.

HEATER VALVE / HEATED DEF SUPPLY LINES



The heater valve is mounted beside the supply module which is located on the frame under the engine. Access it from underneath the rear of the machine.



The heater valve controls the flow of engine coolant through the DEF tank heater coil. This machine is equipped with electrically heated DEF supply lines.

DEF freezes at -11°C (12°F).

Temperature sensors signals control the operation of both the electrically heated DEF supply lines and the heater valve which, depending on the temperature, opens or closes the flow of hot engine coolant in the heater coil.

Heating is switched OFF when:

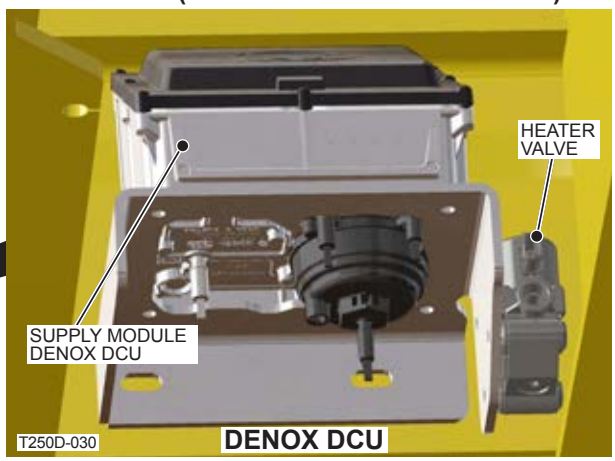
- DEF tank temperature >16°C (61°F)
- Supply module temperature >10°C (50°F)
- Ambient air temperature >-4°C (25°F)

Heating is switched ON when:

- DEF tank temperature <15°C (59°F)
- Supply module temperature: +8°C (46°F)
- Ambient air temperature: -5°C (23°F)

When conditions require heating the system will thaw DEF within 30 minutes of engine start for proper operation of the SCR after treatment system. Note also that whenever the engine is stopped all DEF is pumped back to tank before the engine power system is turned off. This process takes approximately 90 seconds.

DENOX DCU (DOSING CONTROL MODULE)



DENOX DCU is located on the frame under the engine. Access it from underneath the rear of the machine.

The SCR after treatment system is electronically managed by the DCU incorporated in the supply module. The DCU calculates and adjusts the flow rate of the DEF solution into the system based on current engine speed, torque delivered, exhaust temperature, amount of nitrogen oxides present and humidity levels incoming air.

The DCU is connected to the engine Electronic Control Module (ECM).