VTCA 2019

Carter Machinery

Richard Church

BUILT FOR IT
# Machine Inspection

![Machine Inspection Image](image)

## Safety & Maintenance Checklist:

### Wheel Loaders

<table>
<thead>
<tr>
<th>Operator/Inspector</th>
<th>Date</th>
<th>Time</th>
<th>Serial Number</th>
<th>Machine Hours</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>What are you inspecting?</th>
<th>What are you looking for?</th>
<th>Evaluator Comments</th>
</tr>
</thead>
</table>

For more information, please refer to the Operation and Maintenance Manual or any other applicable manuals and instructions for this product. If you have questions, please contact your local Caterpillar dealer.

### FROM THE GROUND

<table>
<thead>
<tr>
<th>Item</th>
<th>Condition</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tires, Wheels, Lug Nuts, Stem Caps</td>
<td>Inflation, Leaks, Damage, Wear</td>
<td></td>
</tr>
<tr>
<td>Bucket Cutting Edge, Moldboard</td>
<td>Excessive wear, Damage</td>
<td></td>
</tr>
<tr>
<td>Bucket Lift and Tilt Cylinders, Lines, Hoses</td>
<td>Excessive wear, Damage, Leaks</td>
<td></td>
</tr>
<tr>
<td>Loader Frame, Arms</td>
<td>Excessive wear, Damage</td>
<td></td>
</tr>
<tr>
<td>Underneath Machine</td>
<td>Leaks, Damage</td>
<td></td>
</tr>
<tr>
<td>Transmission, Transfer Case</td>
<td>Leaks</td>
<td></td>
</tr>
<tr>
<td>Steps and Handholds</td>
<td>Condition, Cleanliness</td>
<td></td>
</tr>
<tr>
<td>Fuel Tank</td>
<td>Fluid Level</td>
<td></td>
</tr>
<tr>
<td>Differential and Final Drive Oil</td>
<td>Fuel Level, Damage, Leaks</td>
<td></td>
</tr>
<tr>
<td>Air Tank (if equipped w/ air brakes)</td>
<td>Drain Moisture</td>
<td></td>
</tr>
<tr>
<td>Axles – Final Drives, Differentials, Brakes, Duo-cone Seals</td>
<td>Leaks, Damage, Wear</td>
<td></td>
</tr>
<tr>
<td>Hydraulic Tank</td>
<td>Fluid Level</td>
<td></td>
</tr>
<tr>
<td>Transmission Oil</td>
<td>Fluid Level</td>
<td></td>
</tr>
<tr>
<td>Lights, Front and Rear</td>
<td>Function, Damage to Lens, Housing, or Wiring</td>
<td></td>
</tr>
<tr>
<td>Battery Compartment</td>
<td>Cleanliness, Loose Nuts &amp; Bolts</td>
<td></td>
</tr>
</tbody>
</table>
# Machine Inspection

## ENGINE COMPARTMENT

<table>
<thead>
<tr>
<th>Item</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Oil</td>
<td>Fluid Level</td>
</tr>
<tr>
<td>Engine Coolant</td>
<td>Fluid Level</td>
</tr>
<tr>
<td>Radiator</td>
<td>Debris, Damage, Leaks</td>
</tr>
<tr>
<td>All Hoses</td>
<td>Cracks, Wear Spots, Leaks</td>
</tr>
<tr>
<td>Fuel Filters / Water Separator</td>
<td>Leaks / Drain Water (if equipped)</td>
</tr>
<tr>
<td>All Belts</td>
<td>Tension, Wear, Cracks</td>
</tr>
<tr>
<td>Air Filter</td>
<td>Restriction Indicator</td>
</tr>
<tr>
<td>Overall Engine Compartment</td>
<td>Trash or Dirt Buildup, Leaks</td>
</tr>
</tbody>
</table>

## ON THE MACHINE, OUTSIDE THE CAB

<table>
<thead>
<tr>
<th>Item</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handholds</td>
<td>Condition and Cleanliness</td>
</tr>
<tr>
<td>ROPS</td>
<td>Damage, Loose Mounting Bolts</td>
</tr>
<tr>
<td>Fire Extinguisher/System</td>
<td>Change, Damage</td>
</tr>
<tr>
<td>Windshield, Windows</td>
<td>Broken Glass, Cleanliness</td>
</tr>
<tr>
<td>Windshield Wipers / Washers</td>
<td>Wear, Damage / Fluid Level</td>
</tr>
<tr>
<td>Doors</td>
<td>Open properly, broken glass</td>
</tr>
</tbody>
</table>

## INSIDE THE CAB

<table>
<thead>
<tr>
<th>Item</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat</td>
<td>Adjustment-Height, Weight, Able to Reach Pedals</td>
</tr>
<tr>
<td>Seat Belt &amp; Mounting</td>
<td>Damage, Wear, Adjustment, Age</td>
</tr>
<tr>
<td>Horn, Backup Alarm, Lights</td>
<td>Proper Function</td>
</tr>
<tr>
<td>Mirrors</td>
<td>Damage, Adjust for Best Visibility</td>
</tr>
<tr>
<td>Cab Air Filter</td>
<td>Dirt, Dust</td>
</tr>
<tr>
<td>Gauges, Indicators, Switches, Controls</td>
<td>Damage, function</td>
</tr>
<tr>
<td>Overall Cab Interior</td>
<td>Cleanliness</td>
</tr>
</tbody>
</table>

HTTP://SAFETY.CAT.COM/CHECKLISTS  
V0611.2
It’s my fault because I said park it with the blade down.
Why do we do a walk around?
Why do we do a walk around?

1. To make sure the equipment is in running condition
2. Operator safety
3. Job site safety
4. To avoid downtime
5. To help plan repairs
772 Walk Around Inspection
772 Walk Around Inspection
772 Walk Around Inspection
772 Walk Around Inspection

Left Inside Rear Axle
772 Walk Around Inspection
772 Walk Around Inspection
772 Walk Around Inspection
772 Walk Around Inspection
772 Walk Around Inspection
772 Walk Around Inspection
772 Walk Around Inspection
772 Walk Around Inspection
772 Walk Around Inspection
772 Walk Around Inspection
950K Inspection
950K Inspection
950K Inspection
950K Inspection
950K Inspection
950K Inspection
950K Inspection
950K Inspection
Tire Inspection
Tire Inspection
Delayed Engine Shutdown

- Simply turn off key
- Allows machine to cool down and then turn off on its own
  Once enabled, machine travel and implements are disabled for safety*
- Important to allow DEF to purge from the lines and return to tank
- Important to allow DPF to cool down to protect DEF injector
- For a few machines, the RPM may actually increase during this cool down period depending on the normal idle RPM. Need the airflow to cool the DPF.
- And, do not hit the battery disconnect switch until the light goes out

*OSHA requires the operator stay within 25 feet of a running machine
No MSHA notes about this
Tier 4 Emissions
Cat Clean Emissions Module

- SCR catalyst
- Mixing Pipe
- DPF
- DOC
- AMOX
- DEF Injector
- CRS
- Coolant lines
- Fill Adapter and Cap
- Pump Electronics Tank Unit
- DEF ECU
Active Regeneration System
Active Regeneration System
Passive Regeneration
Cat Clean Emissions Module (CEM)

130-560 kW (175-750 hp)

SCR catalyst
Mixing Pipe
DPF
DOC

AMOX
DEF Injector
CRS

Coolant lines
Fill Adapter and Cap

DEF ECU
Pump Electronics Tank Unit
Selective Catalytic Reduction (SCR) and Diesel Exhaust Fluid (DEF) Sales

DEF tanks have been carefully designed to prevent accidentally filling the DEF tank with fuel or filling the fuel tank with DEF. The standard nozzle diameter for dispensing DEF is 19 mm (.75 in.) compared to the diesel fuel nozzle diameter of 22 mm (.87 in.). Because the fuel nozzle is larger than the DEF tank opening, it reduces the chance of dispensing the wrong fluid into the tank.

As an added safeguard, the DEF nozzle and fill neck feature a special magnetic release design that only allows dispensing of DEF when the magnet on the nozzle lines up with the magnet in the tank fill neck. In addition, the tank cap for the DEF tank is blue in color to differentiate the DEF storage tank from the diesel tank.
What is a DPF?
Active Temperature Regeneration

- High Temperature Regeneration (550-600°C) With O2, 1112°F
  - Fuel injection
  - Burner
  - Rapid regeneration
  - Less frequent on-set
  - Potential risk of filter damage from exothermic
Diesel Exhaust Fluid
DEF Tank
ISO Symbols
Wait to Disconnect Light (battery disconnect)

- Located with the battery disconnect station
- Do not turn the master disconnect switch until the light goes out
Passive Regeneration
Passive Regeneration

Moderate Temperature Regeneration (300-350°C) with NO2, 662°F

- Air Restriction
- Fuel Injection
- Takes relatively long time (lower soot burn rate)
- More frequent on-set or longer operation
- Safe strategy
Operation and Maintenance Manual
Read and Understand the O & MM so we have no Surprises
Warning Lights

Low DEF level indicator light
Tier 4 Final Operator Training & Interface

- **Delayed Engine Shutdown**
  - Simply turn off key
  - Allows machine to cool down and then turn off on its own
    Once enabled, machine travel and implements are disabled for safety*
  - Important to allow DEF to purge from the lines and return to tank
  - Important to allow DPF to cool down to protect DEF injector
  - For a few machines, the RPM may actually increase during this cool down period depending on the normal idle RPM. Need the airflow to cool the DPF.
  - And, do not hit the battery disconnect switch until the light goes out

*OSHA requires the operator stay within 25 feet of a running machine
No MSHA notes about this
Selective Catalytic Reduction (SCR) and Diesel Exhaust Fluid (DEF) Sale:

The PETU pump assembly has a serviceable filter (arrow) that removes debris and contaminants from the DEF supply. The filter and black rubber cone shown here are replaced together and available in one service kit. The Cat service interval is every 5,000 hours.
Suggested Link