CATERPILLAR®

Operation & Maintenance Manual

Original Instructions -
Keep this manual with the machine at all times.

Model
TH357, TH408, TH3510

PVC 2205, 2211

31211922
SEBU9983-00

August 1, 2022 - Rev A

CE UK CA
AUS

REVISION LOG

DATE	REVISION	DESCRIPTION
August 1, 2022	A	Original Issue of Manual.

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READ THIS FIRST

This manual is a very important tool! Keep it with the machine at all times.

The purpose of this manual is to provide owners, users, operators, lessors, and lessees with the precautions and operating procedures essential for the safe and proper machine operation for its intended purpose.

This machine is a telescopic material handler used to lift and transport materials.

Due to continuous product improvements, the manufacturer reserves the right to make specification changes without prior notification. Contact the local Caterpillar dealer for updated information.

Contact the local Caterpillar dealer for Warranty, Product Registration, and other machine-related documentation.

Operator Qualifications

The operator of the machine must not operate the machine until this manual has been read, training is accomplished and operation of the machine has been completed under the supervision of an experienced and qualified operator. Operation within the U.S.A. requires training per OSHA 1910.178.

Operators of this equipment must possess a valid, applicable driver's license, be in good physical and mental condition, have normal reflexes and reaction time, good vision and depth perception and normal hearing. Operator must not be using medication which could impair abilities nor be under the influence of alcohol or any other intoxicant during the work shift.

In addition, the operator must read, understand and comply with instructions contained in the following material furnished with the material handler:

- This Operation & Maintenance Manual
- Telehandler Safety Manual (ANSI only)
- All instructional decals and plates
- Any optional equipment instructions furnished

The operator must also read, understand and comply with all applicable Employer, Industry and Governmental rules, standards and regulations.

Modifications

Modifications to this machine may affect compliance with Industry Standards and/or Governmental Regulations. Any modification must be approved by the manufacturer.

This product must comply with all safety related bulletins. Contact the local Caterpillar dealer representative for information regarding safety-related bulletins which may have been issued for this product.

Other Publications Available

Service Manual. UENR8658 (31211924)

Parts Manual

TH357

SN A5300150 to Present M0127379
SN A5400150 to Present M0127381

TH408

SN A5700150 to Present M0127387
SN A5800150 to Present M0127389

TH3510

SN A5500150 to Present M0127383
SN A5600150 to Present M0127385

Note: Refer to the machine Serial Number Plate to identify the applicable compliance standard.

SECTION CONTENTS

Section	Subject	Page

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SECTION 1
General Safety Practices

1.1 HAZARD CLASSIFICATION SYSTEM

1.1.1 Safety Alert System and Safety Signal Words

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a potentiality hazardous situation which, if not avoided, may result in minor or moderate injury.

1.2 GENERAL PRECAUTIONS

⚠ WARNING

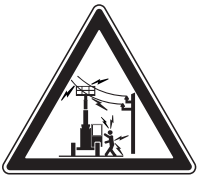
Before operation, read and understand this manual. Failure to comply with the safety precautions listed in this manual could result in machine damage, property damage, personal injury or death.

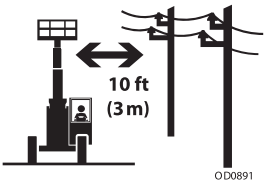
- Hydraulic cylinders are subject to thermal expansion and contraction. This may result in changes to the boom and/or attachment position while the machine is stationary. Factors affecting thermal movement can include the length of time machine is stationary, hydraulic oil temperature, ambient air temperature and boom and/or attachment position.
- Precautions to avoid all hazards in the work area must be taken by the user before and during operation of the machine.
- Some machine surfaces and components may become hot during operation. Avoid touching hot parts. Allow machine surfaces and components to cool before handling.

1.3 OPERATION SAFETY

Note: The manufacturer has no direct control over machine application and operation. Therefore, safety issues listed in this manual are non-exhaustive. The user and operator are responsible for conforming with good safety practices.

1.3.1 Electrical Hazards





- This machine is not insulated and does not provide protection from contact or being near electrical current.
- Always check for power lines before raising the boom.
- Maintain distance from electrical lines, apparatus, or any energized (exposed or insulated) parts according to the Minimum Approach Distance (MAD).

Voltage Range (Phase to Phase)	Minimum Approach Distance (MAD)
0 to 50 KV	10 ft (3 m)
Over 50KV to 200 KV	15 ft (5 m)
Over 200 KV to 350 KV	20 ft (6 m)
Over 350 KV to 500 KV	25 ft (8 m)
Over 500 KV to 750 KV	35 ft (11 m)
Over 750 KV to 1000 KV	45 ft (14 m)

Note: This requirement shall apply except where employer, local or governmental regulations are more stringent.

- Allow for machine movement and electrical line swaying.
- Maintain a clearance of at least 10 ft (3m) between any part of the machine and its occupants, their tools and their equipment from any electrical line or apparatus carrying up to 50,000 volts. One foot additional clearance is required for every additional 30,000 volts or less.

- The minimum approach distance may be reduced if insulating barriers are installed to prevent contact, and the barriers are rated for the voltage of the line being guarded. These barriers shall not be part of (or attached to) the machine. The minimum approach distance shall be reduced to a distance within the designed working dimensions of the insulating barrier. This determination shall be made by a qualified person in accordance with the employer, local, or governmental requirements for work practices near energized equipment.

⚠ DANGER

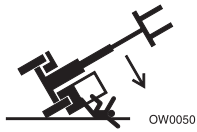
Do not maneuver machine or personnel inside prohibited zone (MAD). Assume all electrical parts and wiring are energized unless known otherwise.

- It is not recommended to use the machine during lightning. To prevent injury or machine damage if lightning occurs during operation, lower the boom and shut down the machine in a safe and secure location.

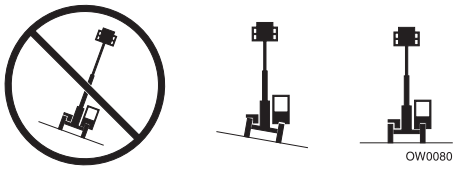
1.3.2 Tip Over Hazard

General

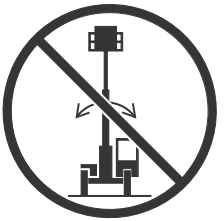
- For additional load requirements, refer to the appropriate capacity chart.

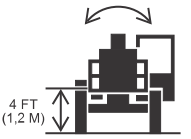


- Never use an attachment without the appropriate original equipment manufacturer (OEM) approved capacity chart installed on the telehandler.
- Understand how to properly use the capacity charts located in cab.
- **DO NOT** exceed rated lift capacity.
- Be sure that the ground conditions are able to support the machine.
- Be aware of wind conditions. Wind may cause load swing and dangerous side loads.
- Keep the machine a minimum of 2 ft (0,6 m) from holes, drop-offs, obstructions, debris, concealed holes and other potential hazards at ground level.



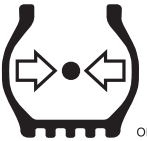
- **DO NOT** raise boom unless frame is level (0 degrees), unless otherwise noted on capacity chart.





OW0100

- **DO NOT** level machine with boom/attachment above 4 ft (1,2 m). (AUS - **DO NOT** level machine with load more than 11.8 in (300 mm) above ground surface.)



OH2291

- **MAINTAIN proper tire pressure** at all times. If proper tire pressures are not maintained, this machine could tip over.
- Refer to manufacturer's specifications for proper fill ratio and pressure requirements for tires equipped with ballast.

OH20911

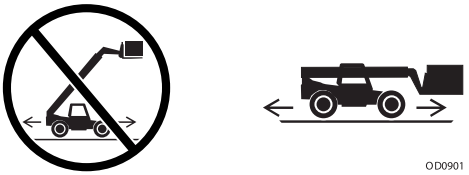
- Always wear seat belt.
- Keep head, arms, hands, legs and all other body parts inside operator's cab at all times.

OH2221

If telehandler starts to tip over:

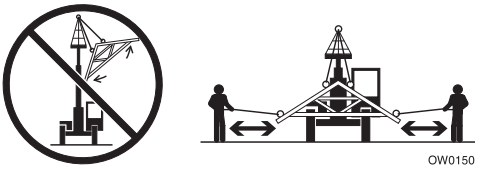
- **DO NOT** JUMP
- BRACE YOURSELF and STAY WITH THE MACHINE
- KEEP YOUR SEAT BELT FASTENED
- HOLD ON FIRMLY
- LEAN AWAY FROM THE POINT OF IMPACT

Non-Suspended Load



- **DO NOT** drive with boom raised.

Suspended Load

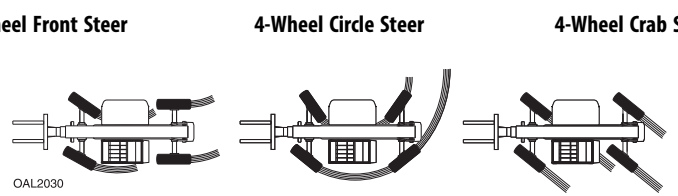


- Tether suspended loads to restrict movement.
- Weight of all rigging (slings, etc.) must be included as part of load.
- Beware of wind. Wind can cause a suspended load to swing and cause dangerous side loads - even with tag lines.
- **DO NOT** attempt to use telehandler frame-leveling to compensate for load swing.
- Keep heavy part of load closest to attachment.
- Never drag the load; lift vertically.

When driving with a suspended load:

- Start, travel, turn and stop slowly to prevent load from swinging.
- **DO NOT** extend boom.
- **DO NOT** raise the load more than 300 mm (11.8 in) above ground surface or the boom more than 45°.
- **DO NOT** exceed walking speed.

1.3.3 Travel Hazard



- Steering characteristics differ between steer modes. Identify the steer mode settings of the telehandler being operated.
- **DO NOT** change steer modes while traveling. Steer modes must be changed while telehandler is stationary.
- Visually verify proper wheel alignment after each steer mode change.
- Ensure that adequate clearance is provided for both rear tail swing and front fork swing.
- Look out for and avoid other personnel, machinery and vehicles in the area. Use a spotter if you DO NOT have a clear view.
- Before moving be sure of a clear path and sound horn.
- When driving, retract boom and keep boom/attachment as low as possible while maintaining visibility of mirrors and maximum visibility of path of travel.
- Always look in the direction of travel.
- Always check boom clearances carefully before driving underneath overhead obstructions. Position attachment/load to clear obstacles.
- When driving in high speed, use only front wheel steer (if steering modes are selectable).
- Telehandlers equipped with solid or foam filled tires should not be used in applications requiring excessive roading or driving extended distances. In the event an application requires excessive roading or driving expanded distances, it is recommended to use telehandlers not equipped with solid or foam filled tires.

1.3.4 Load Falling Hazard

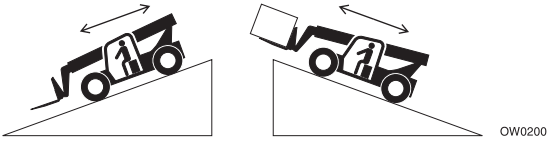
- Never suspend load from forks or other parts of carriage weldment. Use only approved lift points.
- **DO NOT** burn or drill holes in fork(s).
- Forks must be centered under load and spaced apart as far as possible.

1.3.5 Lifting Personnel

- When lifting personnel, **USE ONLY** an approved personnel work platform, with proper capacity chart displayed in the cab.

- **DO NOT** drive machine from cab when personnel are in platform.

1.3.6 Driving Hazards on Slopes

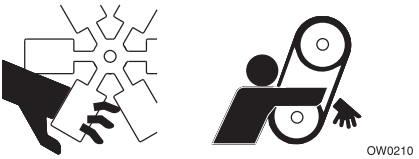


To maintain sufficient traction and braking capabilities, travel on slopes as follows:

- When unloaded, drive with forks pointed downhill.
- When loaded, drive with the forks pointed uphill.
- For additional travel requirements, refer to the appropriate capacity chart.
- To avoid overspeeding the engine and drivetrain when driving down slopes, downshift to a lower gear and use the service brake as necessary to maintain a slow speed. **DO NOT shift into neutral and coast downhill.**
- Avoid excessively steep slopes or unstable surfaces. To avoid tip over **DO NOT** drive across excessively steep slopes under any circumstances.
- Avoid turning on a slope. Never engage “inching” or shift to “Neutral” when going downhill.
- **DO NOT** park on a slope.

1.3.7 Pinch Points and Crush Hazards

Stay clear of pinch points and rotating parts on the telehandler.



- Stay clear of moving parts while engine is running.

- Keep clear of steering tires and frame or other objects.


OW0230

- Keep clear from under boom.


OW0240

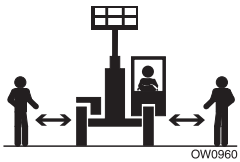
- Keep clear of boom holes.


OW0250

- Keep arms and hands clear of attachment tilt cylinder.


OW0260

- Keep hands and fingers clear of carriage and forks.


OW0960

- Keep others away while operating.

1.3.8 Fall Hazard

- Enter using the proper hand holds and steps provided. Always maintain 3-point contact when mounting or dismounting. Never grab control levers or steering wheel when mounting or dismounting the machine.
- **DO NOT** get off the machine until the *Shut-Down Procedure* has been performed.

- **DO NOT** carry riders. Riders could fall off machine causing death or serious injury.

1.3.9 Chemical Hazards

Exhaust Fumes

- **DO NOT** operate machine in an enclosed area without proper ventilation.
- **DO NOT** operate the machine in hazardous environments unless approved for that purpose. Sparks from the electrical system and the engine exhaust can cause an explosion.

Flammable Fuel


OW0300

- **DO NOT** fill the fuel tank or service the fuel system near an open flame, sparks or smoking materials. Engine fuel is flammable and can cause a fire and/or explosion.

Hydraulic Fluid


OW0950

- **DO NOT** attempt to repair or tighten any hydraulic hoses or fittings while the engine is running or when the hydraulic system is under pressure.
- Stop engine and relieve trapped pressure. Fluid in the hydraulic system is under enough pressure that it can penetrate the skin.
- **DO NOT** use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks. Wear gloves to protect hands from spraying fluid.

1.3.10 Battery Hazards

- Always disconnect batteries when servicing electrical components or when performing welding on the machine.
- Do not allow smoking, open flame or sparks near battery during charging or servicing.
- Do not contact tools or other metal objects across the battery terminals.
- Always wear hand, eye and face protection when servicing batteries. Ensure that battery acid does not come in contact with skin or clothing.

⚠ CAUTION

Battery fluid is highly corrosive. Avoid contact with skin and clothing at all times. Immediately rinse any contacted are with clean water and seek medical attention.

- Charge batteries only in a well ventilated area.

SECTION 2
Pre-Operation and Inspection

2.1 PREPARATION, INSPECTION AND MAINTENANCE

The following table covers the periodic machine inspections and maintenance required. Consult local regulations for further requirements for telehandlers. The frequency of inspections and maintenance must be increased as necessary when the machine is used in a harsh or hostile environment, if the machine is used with increased frequency, or if the machine is used in a severe manner.

Inspection and Maintenance				
Type	**Frequency**	**Primary Responsibility**	**Service Qualification**	**Reference**
Pre-Operation Inspection	Beginning of each work shift or at each change of operator.	User or Operator	User or Operator	Operation & Maintenance Manual
Pre-Delivery Inspection (see note)	Before each sale, lease or rental delivery.	Owner, Dealer or User	Qualified Mechanic	Service Manual and applicable Inspection form.
Preventative Maintenance	At intervals as specified in the Service Manual and/ or the Maintenance Charts located on the machine.	Owner, Dealer or User	Qualified Mechanic	Service Manual and Maintenance Charts

Note: Inspection forms are available.

2.2 PRE-OPERATION CHECK AND INSPECTION

Note: Complete all required maintenance before operating unit.

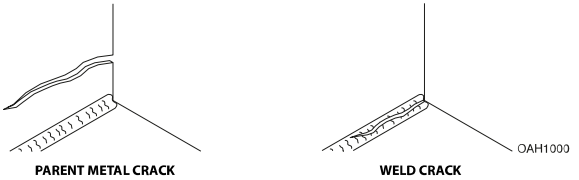
⚠ WARNING

FALL HAZARD. Use extreme caution when checking items beyond your normal reach. Use an approved ladder.

The pre-operation check & inspection, performed at beginning of each work shift or at each change of operator, should include the following:

1. **Cleanliness** - Check all surfaces for leakage (oil, fuel or battery fluid) or foreign objects. Report any leakage to the proper maintenance personnel.

2. **Structure** - Inspect the machine structure for dents, damage, weld or parent metal cracks or other discrepancies.



3. **Safety Decals** - Ensure all safety decals are legible and in place. Clean or replace as required. *See — Safety Decals* for details.

4. **Operation and Safety Manuals** - Operation & Maintenance Manual and AEM Safety Manual (ANSI only) are located in cab manual holder.

5. **Walk-Around Inspection** - See *Section - Walk-Around Inspection* for details.

6. **Fluid Levels** - Check fluids, including fuel, diesel exhaust fluid (DEF), hydraulic oil, engine oil and coolant. When adding fluids, refer to *Section - Lubrication and Maintenance* and *Section - Specifications* to determine proper type and intervals. Before removing filler caps or fill plugs, wipe all dirt and grease away from the ports. If dirt enters these ports, it can severely reduce component life.

7. **Attachments/Accessories** - Ensure correct capacity charts are installed on the telehandler. If provided, reference the Operation & Maintenance Manual of each attachment or accessory installed for specific inspection, operation and maintenance instructions.

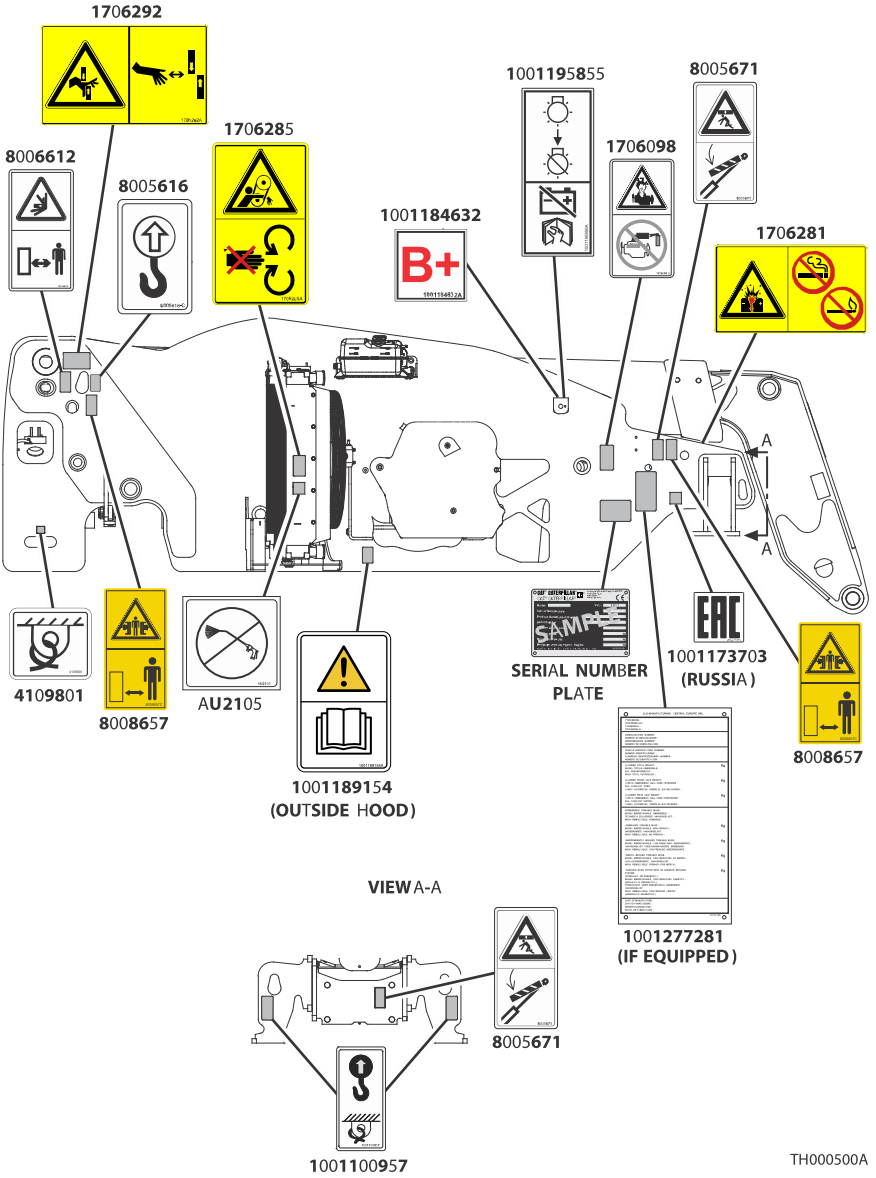
8. **Operational Check** - Once the walk-around inspection is complete, perform a warm-up and operational check (see *Section - Operational Check*) of all systems in an area free of overhead and ground level obstructions. See *Section - Controls and Indicators* for more specific operating instructions.

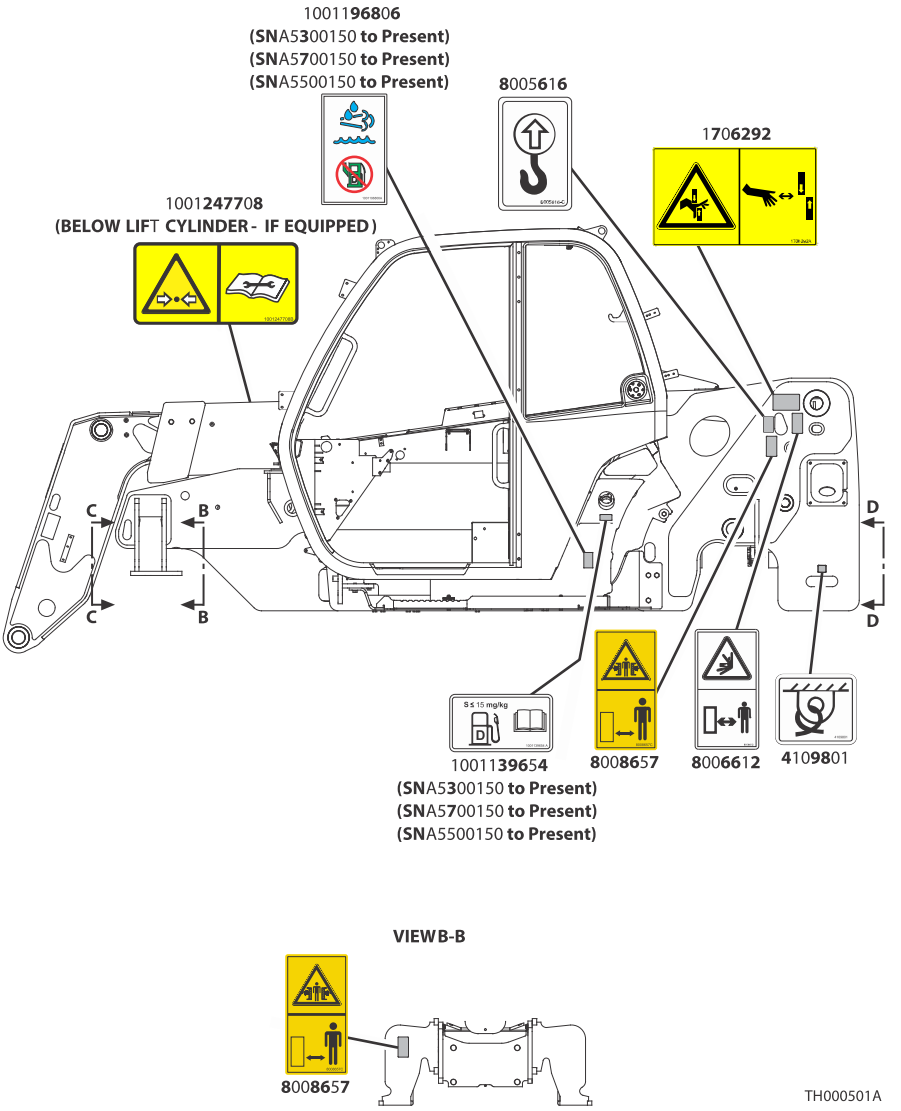
⚠ WARNING

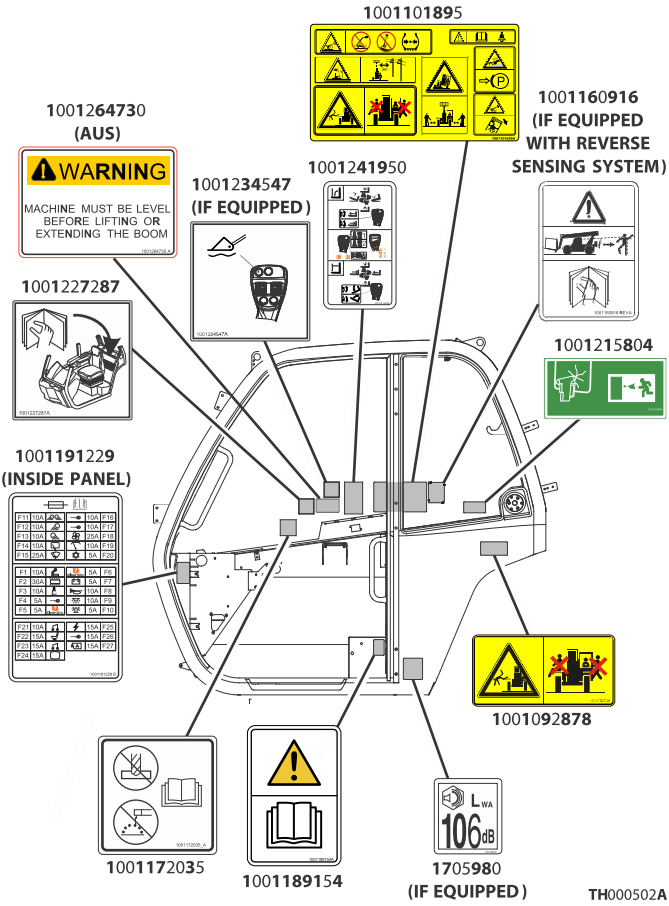
If telehandler does not operate properly, immediately bring machine to a stop, lower boom and attachment to ground and stop the engine. Determine cause and correct before continued use.

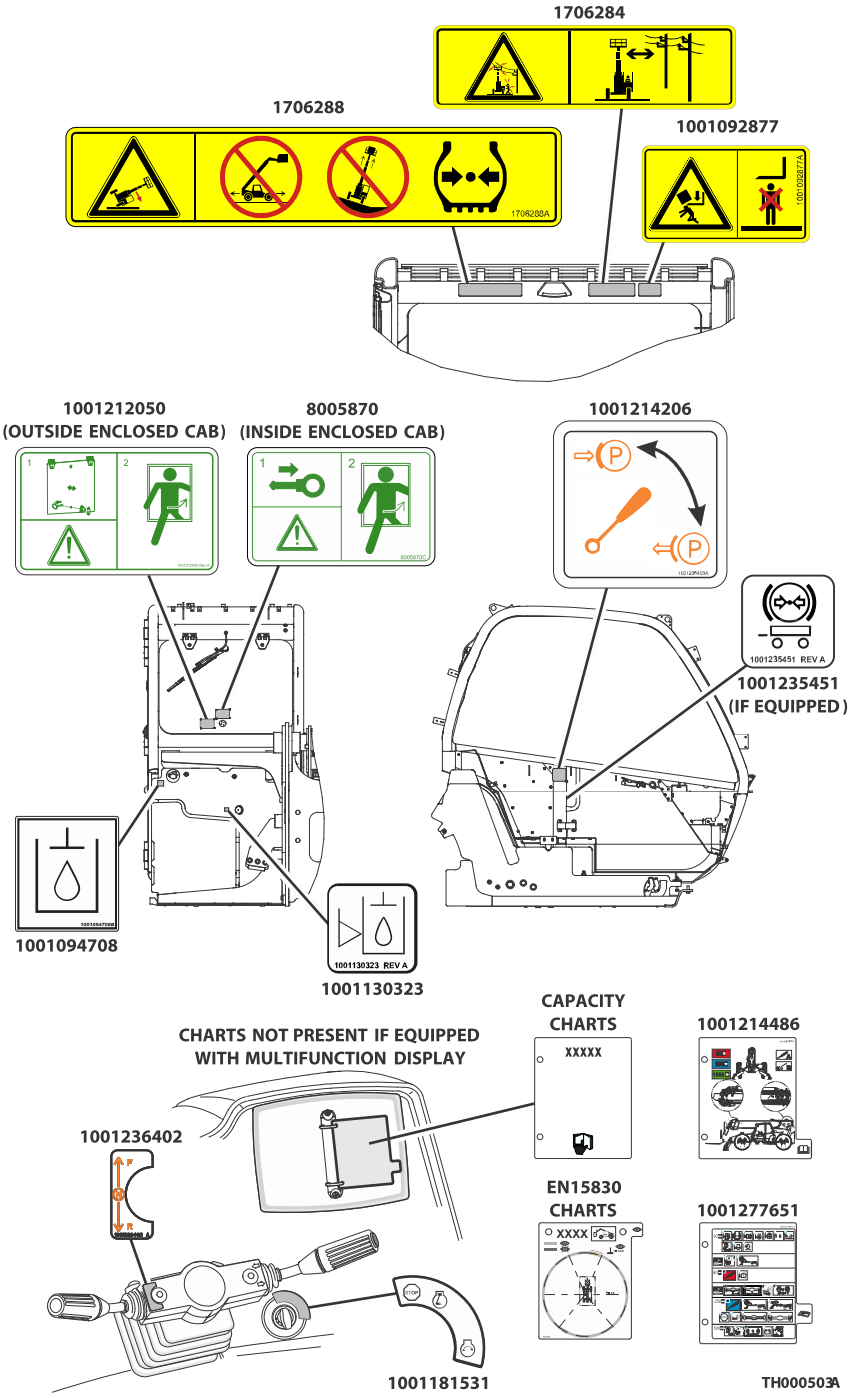
2.3 SAFETY DECALS

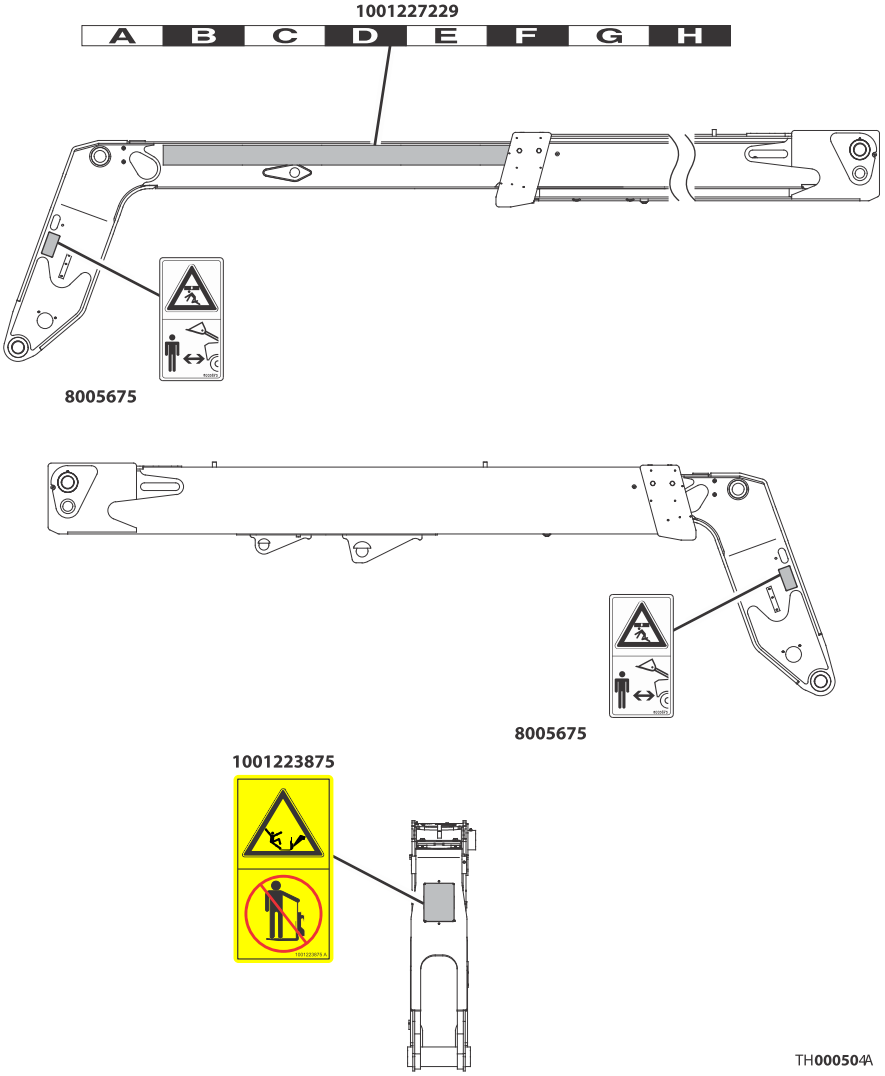
Ensure all **DANGER, WARNING, CAUTION** and instructional decals and proper capacity charts are legible and in place. Clean and replace as required.



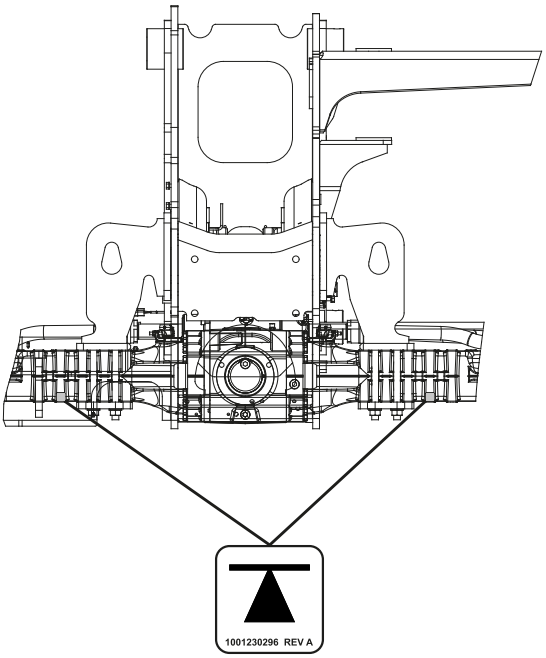

1001196806
(SNA53300150 to Present)
(SNA5700150 to Present)
(SNA5500150 to Present)
8005616
1706292
1001247708
(BELOW LIFT CYLINDER - IF EQUIPPED)
C
B
B
C
D
D
S ≤ 15 mg/kg
1001139654
(SNA53300150 to Present)
(SNA5700150 to Present)
(SNA5500150 to Present)
8008657
8006612
4109801
VIEW B-B
8008657
TH000501A


1001101895
1001264730
(AUS)
WARNING
MACHINE MUST BE LEVEL BEFORE LIFTING OR EXTENDING THE BOOM
1001234547
(IF EQUIPPED)
1001241950
1001160916
(IF EQUIPPED WITH REVERSE SENSING SYSTEM)
1001227287
1001215804
1001191229
(INSIDE PANEL)
1001092878
1001172035
1001189154
1705980
(IF EQUIPPED)
TH000502A


1706284
1706288
1001092877
1706288A
1001092877A
1001212050
(OUTSIDE ENCLOSED CAB)
8005870
(INSIDE ENCLOSED CAB)
1001214206
1001235451 REV A
1001235451
(IF EQUIPPED)
1001094708
1001130323 REV A
1001130323
CAPACITY
CHARTS
XXXXX
1001214486
CHARTS NOT PRESENT IF EQUIPPED
WITH MULTIFUNCTION DISPLAY
1001236402
EN15830
CHARTS
XXXX
1001277651
1001181531
TH000503A


1001227229
A B C D E F G H
8005675
8005675
1001223875
TH000504A

VIEW C-C



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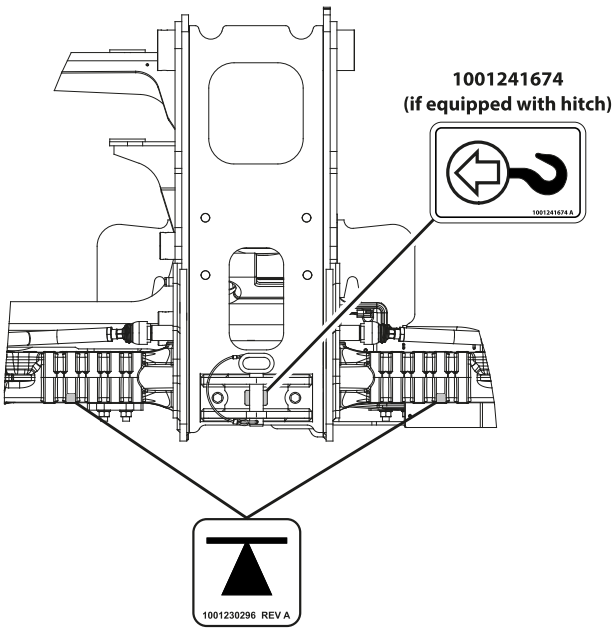
VIEW D-D



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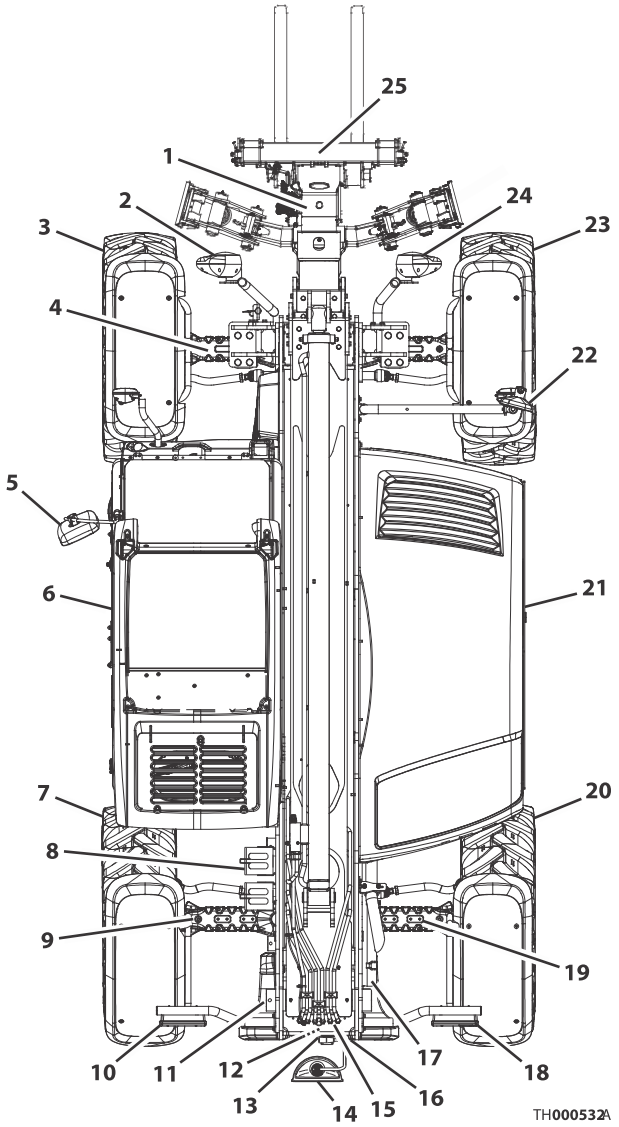
2.4 WALK-AROUND INSPECTION



Begin your walk-around inspection at item 1, as noted below. Continue to your right (counterclockwise when viewed from top) checking each item in sequence.

INSPECTION NOTE: On all components, make sure there are no loose or missing parts, that they are securely fastened and no visible leaks or excessive wear exists in addition to any other criteria mentioned. Inspect all structural members including attachment for cracks, excessive corrosion and other damage.

1. **Boom Sections and Lift, Tilt, Extend/Retract, Compensating Cylinders** -
   - Check front, top, side and rear wear pads for presence of grease.
   - Pivot pins secure; hydraulic hoses undamaged, not leaking.
2. **Front Lights (if equipped)** - Clean and undamaged.
3. **Wheel/Tire Assembly** - Properly inflated and secured; no loose or missing lug nuts. Inspect for worn tread, cuts, tears or other discrepancies.
4. **Front Axle** - Steer cylinders undamaged, not leaking; pivot pins secure; hydraulic hoses undamaged, not leaking.
5. **Mirror** - Clean and undamaged.
6. **Cab and Electrical** -
   - General appearance; no visible damage
   - Frame level indicator(s) and window glass undamaged and clean
   - Gauges, switches, joystick, foot controls and horn operational
   - Check seat belt for damage, replace belt if frayed or cut webbing, damaged buckles or loose mounting hardware
7. **Wheel/Tire Assembly** - Properly inflated and secured; no loose or missing lug nuts. Inspect for worn tread, cuts, tears or other discrepancies.
8. **Wheel Chock (if equipped)** - See inspection note.
9. **Rear Axle** - Steer cylinders undamaged, not leaking; pivot pins secure; hydraulic hoses undamaged, not leaking.
10. **Rear Lights (if equipped)** - Clean and undamaged. See *Section — Road Operation (CE/UKCA)*.
11. **Boom Angle Sensor** - See inspection note.
12. **Main Control Valve** - See inspection note.
13. **Reversing Camera (if equipped)** - See inspection note.
14. **Mirror (if equipped)** - Clean and undamaged.
15. **Boom Retract Sensor** - See inspection note.
16. **Reverse Sensing Sensor (if equipped)** - See inspection note.
17. **Boom Prop (if equipped)** - See inspection note.
18. **Rear Lights (if equipped)** - Clean and undamaged. See *Section — Road Operation (CE/UKCA)*.
19. **LSI Sensor** - See inspection note.

20. **Wheel/Tire Assembly** - Properly inflated and secured; no loose or missing lug nuts. Inspect for worn tread, cuts, tears or other discrepancies.
21. **Engine Compartment** -
    - Drive belts, check condition and replace as required.
    - Engine mounts - See inspection note.
    - Power Distribution Plate - No damage or corrosion on connections or wiring.
    - Engine cover properly secured.
22. **Mirrors** - Clean and undamaged.
23. **Wheel/Tire Assembly** - Properly inflated and secured; no loose or missing lug nuts. Inspect for worn tread, cuts, tears or other discrepancies.
24. **Front Lights (if equipped)** - Clean and undamaged.
25. **Attachment** - Properly installed, see *Section — Attachment Installation*.

2.5 WARM-UP AND OPERATIONAL CHECKS

2.5.1 Warm-Up Check

During warm-up period, check:

1. Heater, air conditioning and wipers (if equipped).
2. Check all lighting systems (if equipped) for proper operation.
3. Adjust mirrors for maximum visibility.

⚠ WARNING

CUT/CRUSH/BURN HAZARD. Keep engine cover closed while engine is running except when checking transmission oil level.

2.5.2 Operational Check

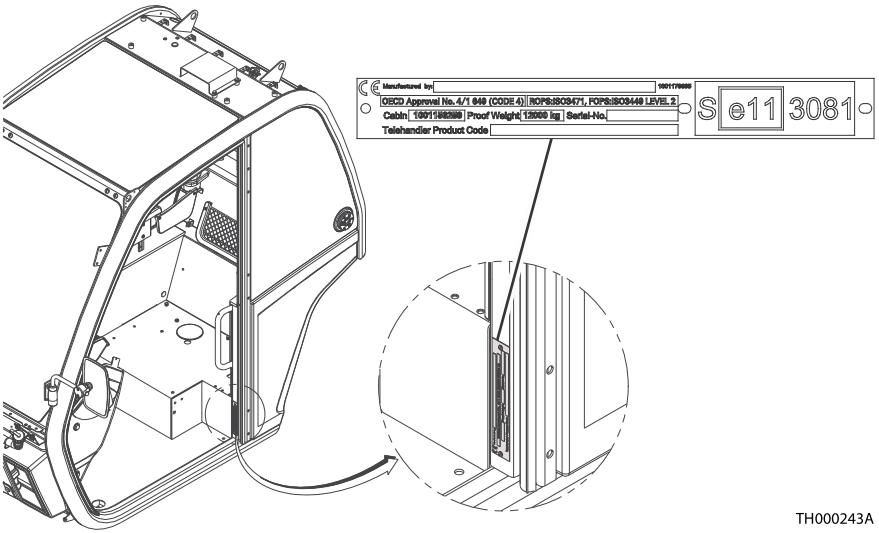
When engine warms, perform an operational check:

1. Service brake and parking brake operation.
2. Forward and reverse travel.
3. Each gear.
4. Steering in both directions with engine at low idle (steering lock to lock will not be reached). Check in each steering mode.

5. Horn and back-up alarm. Must be audible from inside operators cab with engine running.
6. All joystick functions operate smoothly and correctly.
7. Perform any additional checks described in *Section — Additional Checks*.

2.6 OPERATOR CAB

The telehandler is equipped with an enclosed ROPS/FOPS cab.



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⚠ WARNING

Never operate telehandler unless the overhead guard, cab structure and right side glass or screen are in good condition. Any modification to this machine must be approved by the manufacturer to assure compliance with ROPS/FOPS certification for this cab/machine configuration. If the overhead guard or cab structure is damaged, the **CAB CANNOT BE REPAIRED.** It must be **REPLACED.**

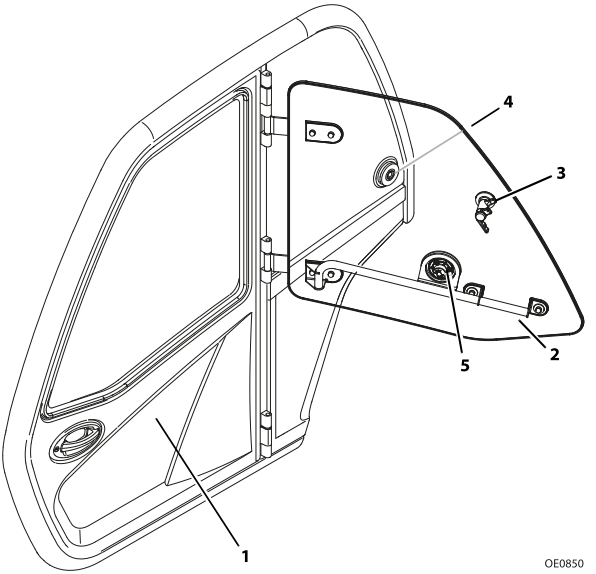
⚠ WARNING

Never drill, cut, and/or weld to cab. Any modification to this machine must be approved by the manufacturer to assure compliance with machine configuration. If unauthorized drilling, cutting and/or welding is present, the cab must be **REPLACED**.

2.7 ENCLOSED CAB WINDOWS

Keep all windows clean and unobstructed.

2.7.1 Cab Door Window

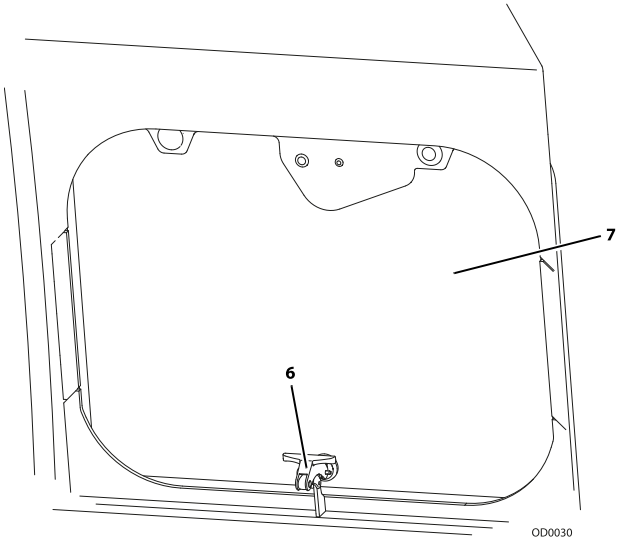


- During operation the cab door window (**2**) must either be latched open or closed.
- Open the cab door window using lever (**3**) and secure it in the latch (**4**).
- Press release (**4**) inside cab or (**5**) outside cab to unlatch window.

NOTICE

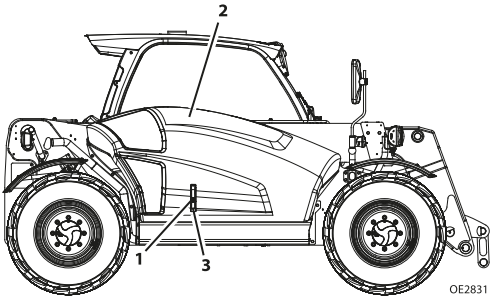
EQUIPMENT DAMAGE. Cab door (**1**) must be closed during operation. Failure to do so may result in machine damage.

2.7.2 Rear Window



- Lift lever (**6**) and push to open the rear window (**7**).
- Lift lever and pull to close.

2.8 ENGINE HOOD



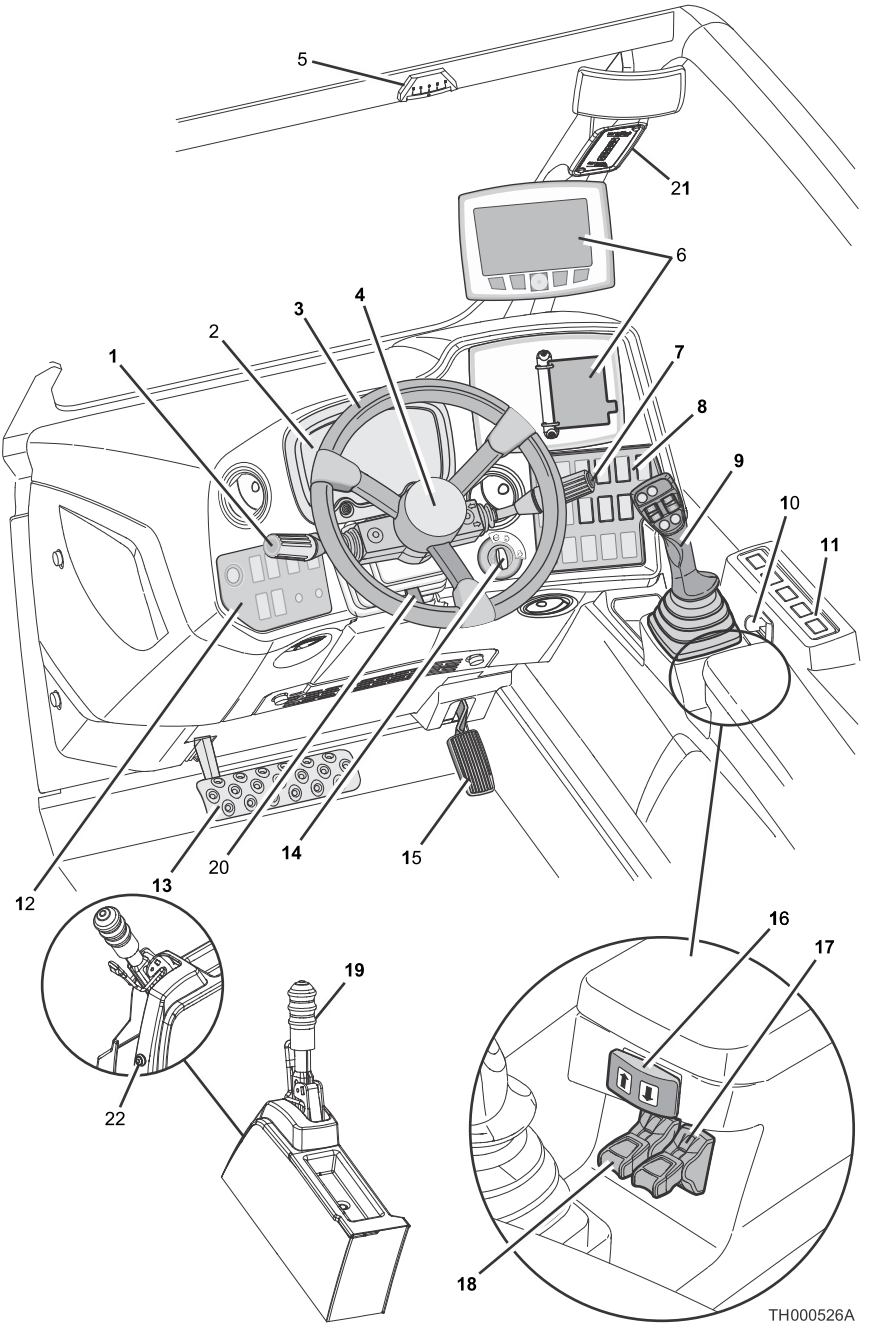
- Engine hood must be closed during operation.
- Insert key into key barrel (**1**) to unlock hood (**2**). Raise hood latch (**3**) and lift hood to open.
- Push hood down and secure hood latch to close. Lock hood using key in key barrel.

SECTION 3
Controls and Indicators

3.1 GENERAL

This section provides the necessary information needed to understand control functions.

3.2 CONTROLS



1. **Transmission Control Lever (if equipped):** See *Section — Transmission Control Lever (if equipped), page 54*.
2. **Instrument Panel:** See *Section — Instrument Panel, page 43*.
3. **Steering Wheel:** Turning the steering wheel to the left or right steers the machine in the corresponding direction. Three steering modes are available. See *Section — Steer Modes*.
4. **Horn:** Press to sound horn.
5. **Frame Level Indicator:** Enables operator to determine the left to right level condition of the telehandler.
6. **Charts/Display:**
   a. Capacity and Maintenance Charts (if equipped): See *Section - Attachments and Hitches* or *Section - Lubrication and Maintenance*.
   b. Multifunction Display (if equipped): See *Section — Multifunction Display (if equipped)*.
7. **Accessory Control Lever (if equipped):** See *Section — Accessory Control Lever (if equipped), page 55*.
8. **Right Dash Control Panel:** See *Section — Right Dash Control Panel, page 49*.
9. **Joystick:** See *Section — Joystick, page 60*.
10. **Adjustable Armrest Lever (Agriculture):** Activate lever to release armrest position lock.
11. **Control Panel (Agriculture):** See *Section — Agriculture Control Panel (if equipped), page 51*.
12. **Left Dash Control Panel:** See *Section — Left Dash Control Panel, page 48*.
13. **Service Brake Pedal:** Further pedal is pressed, the slower the travel speed.
14. **Ignition Switch:** Key activated. See *Section — Instrument Panel, page 43*.
15. **Accelerator Pedal:** Pressing down the pedal increases engine and hydraulic speed.
16. **Hitch Up/Down Switch (if equipped):** Controls position of hydraulic hitch. Press and hold right side of switch to raise hitch. Press and hold left side of switch to lower hitch.
17. **Rear Auxiliary 1 Hydraulic Lever (if equipped):** Controls the rear auxiliary hydraulic.
18. **Rear Auxiliary 2 Hydraulic Lever (if equipped):** Controls the rear auxiliary hydraulic.
19. **Park Brake:** See *Section — Park Brake, page 53*.
20. **Steering Column Adjuster:** See *Section — Steering Column Adjuster, page 59*.

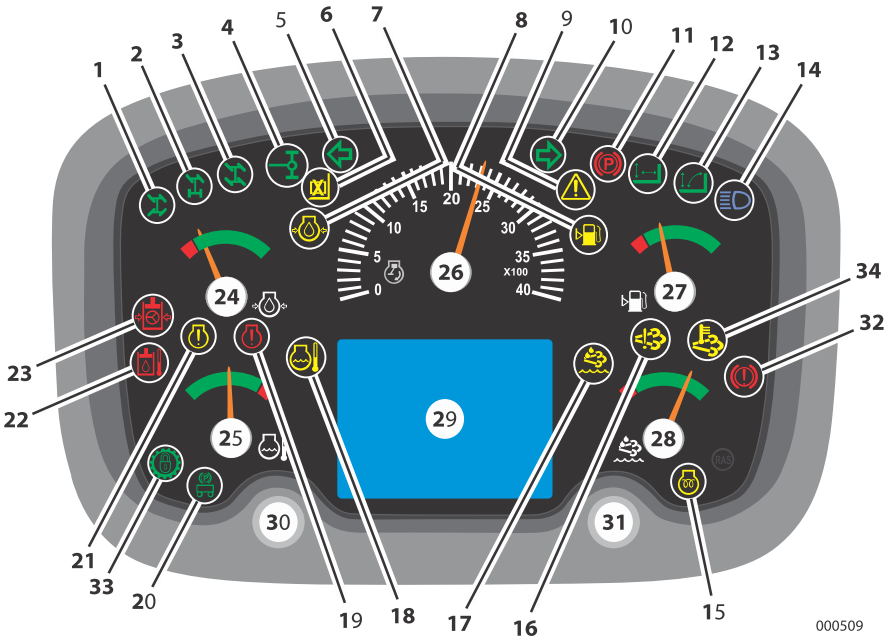
21. **LSI Indicator:** See *Section — Load Stability Indicator - LSI, page 57*.

22. **Trailer Brake Test Switch (if equipped):** Push button to release the trailer park brake while vehicle park brake is applied to ensure vehicle park brake is sufficient to hold vehicle and trailer stationary during removal of trailer.

3.2.1 Instrument Panel

The instrument panel uses different colors to alert the operator to different types of operational situations that could arise.

- When an indicator illuminates RED (except park brake) or if a gauge enters a red zone, immediately bring machine to a stop, lower boom and attachment to the ground and stop the engine. Determine cause and correct before continued use.
- When an indicator illuminates YELLOW an abnormal operating condition is present. If not corrected, machine interruption or damage may result.
- When an indicator illuminates GREEN or BLUE or if a gauge is in the green zone, important information regarding safe operation is being displayed.



NOTICE

EQUIPMENT DAMAGE. When a red indicator illuminates (except park brake), immediately bring machine to a stop, lower boom and attachment to ground and stop the engine. Determine cause and correct before continued use.

1. **4-Wheel Circle Steer:** Illuminates when all wheel steer is active. See *Section — Steer Modes*.
2. **2-Wheel Front Steer:** Illuminates when two wheel steer is active. See *Section — Steer Modes*.

3. **4-Wheel Crab Steer:** Illuminates when crab steer is active. See *Section — Steer Modes*.
4. **Rear Axle Center:** Illuminates when rear axle is aligned (centered).
5. **Left Turn (if equipped):** Illuminates and flashes when left turn signal or hazard lights are active.
6. **LSI Passive Mode:** Illuminates when LSI passive mode is active. See *Section — Load Stability Indicator - LSI, page 57*.
7. **Low Engine Oil Pressure:** Illuminates when oil pressure is low.
8. **Low Fuel Level:** Illuminates when fuel level is low.
9. **System Distress:** Illuminates when critical machine and engine faults exist.
10. **Right Turn (if equipped):** Illuminates and flashes when right turn signal or hazard lights are active.
11. **Park Brake:** Illuminates when park brake is applied. See *Section — Park Brake, page 53*.
12. **Lift Mode:** Illuminates when lift joystick pattern is active. See *Section — Left Dash Control Panel, page 48*.
13. **Loader Mode:** Illuminates when loader joystick pattern is active. See *Section — Left Dash Control Panel, page 48*.
14. **High Beam (if equipped):** Illuminates when high beam lights are active.
15. **Engine Preheat:** Illuminates with ignition key in position 1. Indicator goes out when start temperature is reached.
16. **Emissions System Malfunction (SN A5300150 to Present, SN A5700150 to Present, SN A5500150 to Present):** Illuminates when an issue exists with the emissions system.
17. **Low Diesel Emission Fluid (DEF) (SN A5300150 to Present, SN A5700150 to Present, SN A5500150 to Present):** Illuminates when DEF is low.
18. **High Engine Temperature:** Illuminates when engine temperature is high.
19. **Engine Fault Critical:** Illuminates when critical engine fault exists.
20. **Trailer Park Brake:** Illuminates when trailer park brake is activated.
21. **Engine Fault Warning:** Illuminates when engine is operating outside normal range.
22. **High Hydraulic Oil Temperature:** Illuminates when hydraulic oil temperature is high.
23. **Low Steering Pressure:** Illuminates when steering pressure is low.
24. **Engine Oil Pressure Gauge:** Indicates engine oil pressure.

25. **Engine Coolant Temperature Gauge:** Indicates engine coolant temperature.

26. **Engine Speed:** Indicates engine speed in revolutions per minute (rpm). When maximum engine speed is exceeded, overspeed alarm will sound, a fault code will appear in the LCD display and machine speed will flash. See *Section — LCD Display, page 46*.

NOTICE

EQUIPMENT DAMAGE. Operating machine with overspeed alarm sounding could result in engine or driveline damage.

27. **Fuel Level Gauge:** Indicates fuel level.

28. **Diesel Exhaust Fluid (DEF) Level Gauge (SN A5300150 to Present, SN A5700150 to Present, SN A5500150 to Present):** Indicates fluid level.

29. **LCD Display:** See *Section — LCD Display, page 46*.

30. **Left Control Button:** Press to decrease display brightness. Increases digits in anti-theft function. See *Section — Anti-Theft Functionality (If Enabled)*.

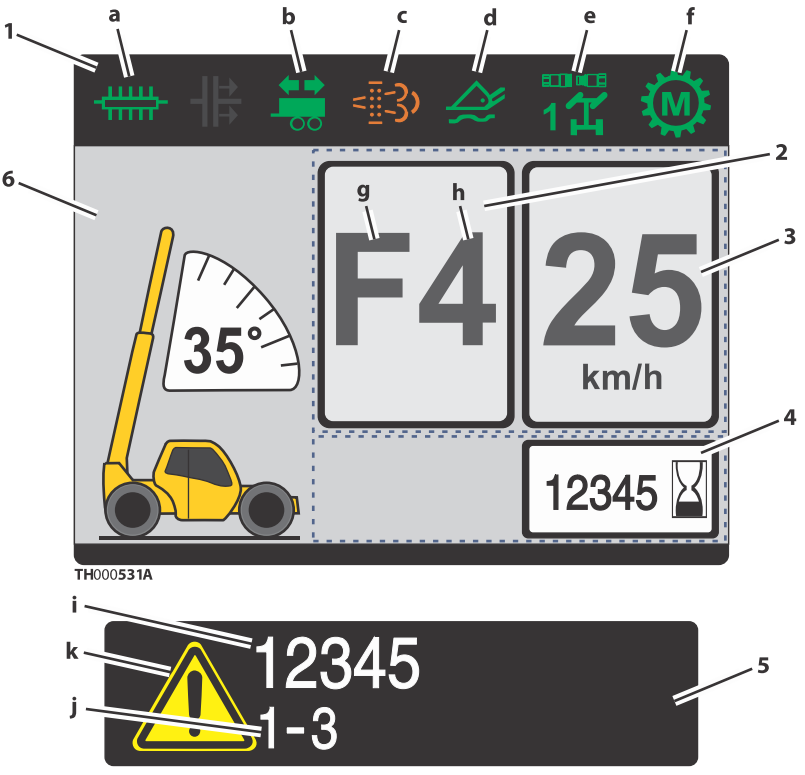
31. **Right Control Button:** Press to increase display brightness. Confirms digits in anti-theft function. See *Section — Anti-Theft Functionality (If Enabled)*.

32. **Service Brake Fault:** Illuminates when service brake oil level or pressure is low.

33. **Lock Up Clutch (if equipped):** Illuminates when lock up clutch feature is engaged. See page *Section — Agriculture Control Panel (if equipped), page 51*.

34. **Regeneration Active (SN A5300150 to Present, SN A5700150 to Present, SN A5500150 to Present):** Illuminates when an aftertreatment regeneration is active and is an indication that exhaust temperatures may be higher than normal. See *Section — Active Regeneration, page 46*.

3.2.2 LCD Display



VIEW WITH ACTIVE DIAGNOSTICS SHOWN

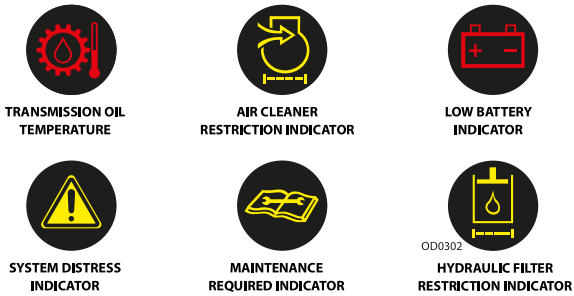
1. **Indicators:** Indicator will display when active.
   a. Continuous Auxiliary Hydraulics - Illuminates when continuous auxiliary hydraulics are active.
   b. Trailer Turn - Illuminates when trailer turn signal is activated.
   c. Diesel Particulate Filter (DPF) (SN A5300150 to Present, SN A5700150 to Present, SN A5500150 to Present) - Illuminates when a DPF regeneration is required. See *Section — Active Regeneration, page 46*.
   d. Boom Float - Illuminates when boom float function is activated. See *Section — Load Stability Indicator - LSI, page 57*.
   e. Auxiliary Hydraulic Selection - Illuminates when auxiliary hydraulics are activated. Indicator will show 1 or 2 depending on operator's selection. See *Section — Auxiliary Hydraulic Functions, Page 51*.
   f. Transmission Mode - Illuminates to display either Automatic or Manual mode. See *Section — Agriculture Control Panel (if equipped), page 51*.

2. **Driving Direction and Gear:** Displays current driving condition.
   g. Direction - Forward (F), Neutral (N) or Reverse (R).
   h. Gear - First (1), Second (2), Third (3), Fourth (4), Fifth (5) or Sixth (6).

3. **Speed (if equipped):** Displays machine speed km/h (mph). When maximum travel speed is exceeded, speed will flash and buzzer will sound.

4. **Operating Hours:** Displays total hours of telehandler operation. Displays when ignition is in ON position and no fault codes exist.

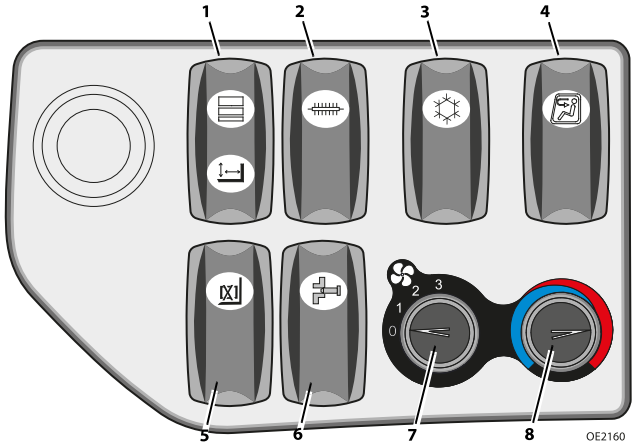
5. **Active Diagnostics:** Displays icon and applicable diagnostic code. Display cycles through each active warning or diagnostic if multiple are present. See Service Manual for details.
   i. Fault Code - Displays applicable diagnostic code.
   j. Numeric Code Indicator - Displays number of engine fault codes which are present.



   k. Diagnostic Icon - Displays diagnostic symbols.
   Transmission Oil Temperature Indicator - Illuminates when transmission temperature is high.
   Air Cleaner Restriction Indicator - Illuminates when air cleaner requires maintenance.
   Low Battery Indicator - Illuminates when battery is at low charge or charging system is not functioning properly.
   System Distress Indicator - Illuminates when critical machine and engine faults exist.
   Maintenance Required Indicator - Illuminates when maintenance is required.
   Hydraulic Filter Restriction Indicator - Illuminates when hydraulic filter requires maintenance.

6. **Boom Angle:** Displays boom angle.

3.2.3 Left Dash Control Panel



1. **Lift/Loader Switch (if equipped):** Activates lift or loader pattern on joystick. See *Section — Joystick, page 60*. Press top of switch to activate loader joystick pattern. Press bottom of switch to activate lift joystick pattern. Lock at top of switch holds switch in its current position. Press and shift bottom of lock down to unlock. Release to lock switch into selected position.

2. **Continuous Auxiliary Hydraulic Switch (if equipped):** Push for continuous operation of hydraulic powered attachments. To enable, press and hold while simultaneously pressing auxiliary roller switch to desired command and speed on joystick. Release both switches to enable continuous operation of attachment. To disable, press continuous auxiliary s switch again. See *Section - Attachments and Hitches* for approved attachments and control instructions.

3. **Air Conditioning Switch (if equipped):** On/Off switch.

4. **HVAC Recirculation Switch (if equipped):** On/Off switch. Push to activate and recirculate air inside the cab. While deactivated, air is circulated from outside the cab.

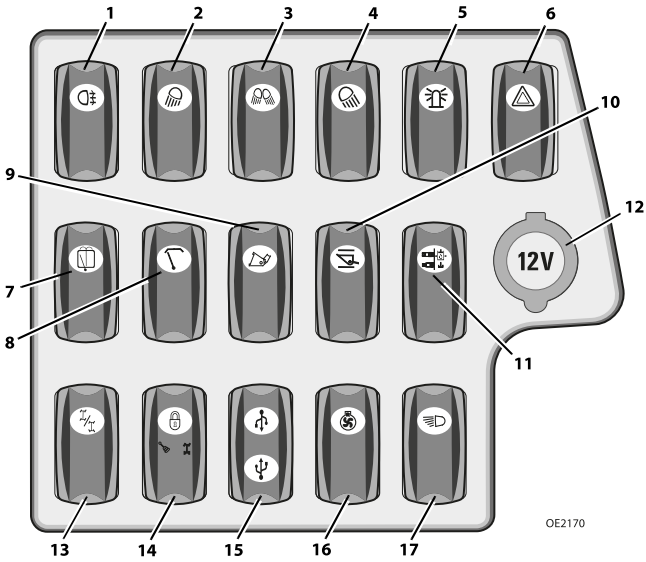
5. **LSI Override:** Momentarily disables the automatic function cut-out. Depress and hold up to 30 seconds while operating joystick to momentarily disable the automatic function cut-out.

6. **Coupler Switch (if equipped):** Used in conjunction with joystick to ally lock or unlock an attachment with boom angle below 20°. See *Section — Hydraulic Coupler* for details.

7. **HVAC Fan Speed (if equipped):** Adjustable rotary switch.

8. **HVAC Temperature Control Switch (if equipped):** Adjustable rotary switch.

3.2.4 Right Dash Control Panel



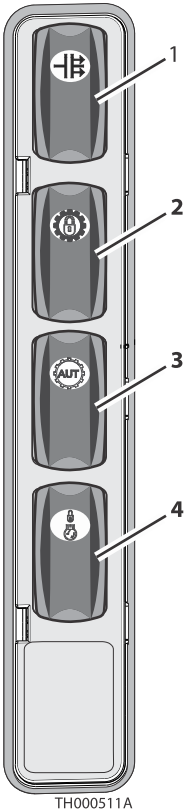
1. **Fog Lights Switch:** On/Off switch.
2. **Front Work Lights Switch (if equipped):** On/Off switch.
3. **Boom Work Lights Switch (if equipped):** On/Off switch.
4. **Rear Work Lights Switch (if equipped):** On/Off switch.
5. **Beacon Light Switch (if equipped):** On/Off switch.
6. **Hazard Lights Switch:** On/Off switch.
7. **Rear Wiper Switch:** On/Off switch.
8. **Roof Wiper Switch:** On/Off switch.
9. **Bucket Mode Switch:** On/Off switch. Increases response to boom functions.
10. **Boom Ride Control Switch (if equipped):** On/Off switch. While enabled and travelling 5 kph (3 mph) or faster, the system acts to improve boom control over rough terrain. Depress switch again to disable boom ride control.
11. **Auxiliary Decompression Switch:** Press to relieve pressure in auxiliary hydraulic circuit. See *Hydraulic Operated Attachment* and *Rear Auxiliary Hydraulics*.
12. **Power Outlet:** 12V receptacle.
13. **Steer Select Switch:** Three positions: circle steer, front steer and crab steer. See *Section — Steer Modes*.
14. **Road Use:** Joystick lock switch. See *Section — Road Operation (CE/UKCA)*.

15. **USB Port:** USB ports under protective tab.

16. **Reversing Fan Switch:** Three position switch. See *Section — Reversing Fan Switch (if equipped), page 56*.

17. **Master Light and Road Lights Switch:** Three positions: Off, Enable, On. Switch must be in the enable or on position in order to operate work lights. Prior to machine shutdown, ensure switch is in the off position.

3.2.5 Agriculture Control Panel



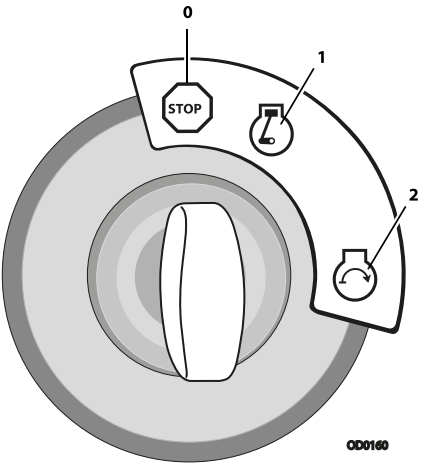
1. **Transmission Disconnect Switch:** On/Off switch. Depress switch to enable transmission to be put into neutral when service brake is applied while in lower gears. Release service brake to resume drive. Depress switch again to disable transmission disconnect.

2. **Lock Up Clutch Switch (if equipped):** On/Off switch. Provides better fuel economy and trailer towing capability.

3. **Automatic/Manual Shift Switch:** On/Off switch. Press to allow automatic shifting in upper four gears for operator convenience while traveling at high speeds.

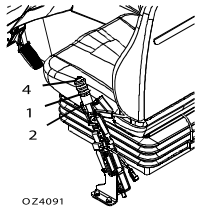
4. **Engine Speed Set Switch:** On/Off switch. Once operator has desired engine speed (rpm) using accelerator pedal, press and release to set speed. Press service brake pedal to disable engine speed set.

3.2.6 Ignition



- Position **0** - Engine off, no voltage available.
- Position **1** - Voltage available for all electrical functions. Wait to start engine until preheat indicator on instrument panel goes out.
- Position **1** - Engine run.
- Position **2** - Engine start. In the event the engine does not start, rotate key to position 0 then back to position 2 to re-engage the starter.

3.2.7 Park Brake



The park brake lever (**1**) controls the application and release of the park brake.

- Pull lever back to apply park brake.
- Squeeze release (**2**) and push lever forward to release park brake.
- The park brake may be adjusted with the knob (**4**). Turn clockwise to increase park brake force. Turn counterclockwise to decrease park brake force.

⚠ WARNING

MACHINE ROLL-AWAY HAZARD. In the event of engine failure, apply constant pressure to service brake pedal while activating the park brake to the ON position.

⚠ WARNING

MACHINE ROLL-AWAY HAZARD. Always move park brake lever to ON position, lower boom to ground and stop engine before leaving cab.

⚠ WARNING

CRUSH HAZARD. Turning engine off applies the park brake. Applying park brake or turning engine off while traveling will cause unit to stop abruptly and could cause load loss. Either may be used in an emergency situation.

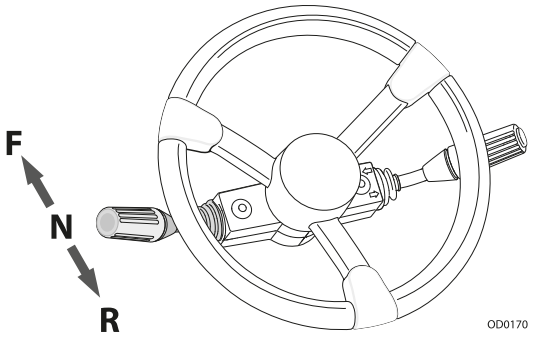
3.2.8 Parking Procedure

1. Using service brake, stop telehandler in an appropriate parking area.
2. Follow *Section — Shut-Down Procedure*.

3.2.9 Transmission Control Lever (if equipped)

Note: Transmission control lever takes priority over joystick transmission controls.

Direction of Travel Selection



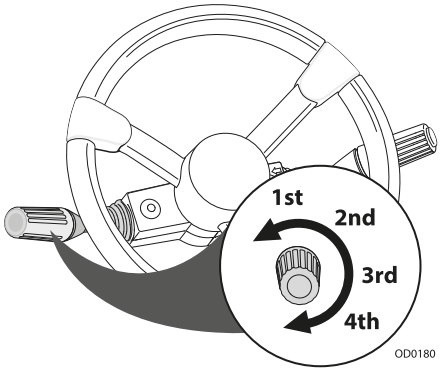
Transmission control lever engages forward or reverse travel.

- Push lever forward for forward travel; pull lever rearward for reverse travel. Move lever to centered position for neutral.
- Forward or reverse travel can be selected while in any gear.
- When traveling in reverse, the back-up alarm will automatically sound.
- Drive in reverse and turn only at slow rates of speed.
- Unless transmission disconnect switch is activated, do not increase engine speed with the transmission in forward or reverse and the service brake pressed in an attempt to get quicker hydraulic performances. This could cause unexpected machine movement.

⚠ WARNING

TIP OVER/CRUSH HAZARD. Bring telehandler to a complete stop before shifting transmission control lever. A sudden change in direction of travel could reduce stability and/or cause load to shift or fall.

Gear Selection (if equipped)

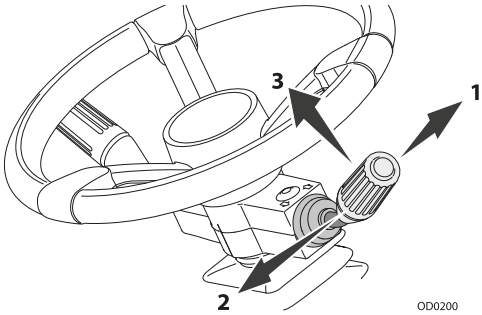


Gear selection is located on the twist grip handle of transmission control lever.

- Twist hand grip to select gear.
- The Transmission is equipped with six forward and three reverse gears.
- Select appropriate gear for task being performed. **Use a lower gear for transporting a load.** Use a higher gear only when driving unloaded for longer distances.
- Slow down prior to downshifting. **Do not downshift more than one gear at a time.**

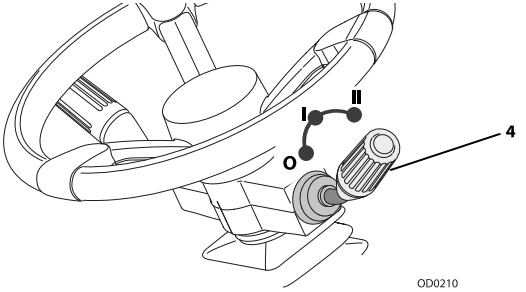
3.2.10 Accessory Control Lever (if equipped)

Turn Signals and Low/High Beam Headlights



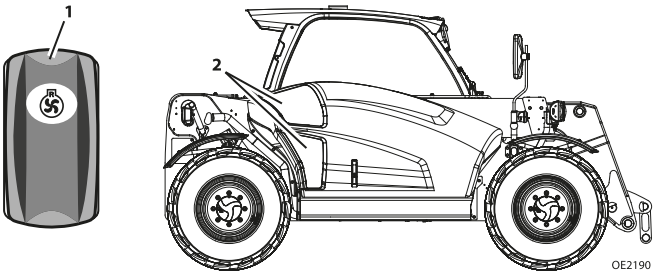
- Push accessory control lever forward (**1**) to activate left turn signal.
- Pull lever backward (**2**) to activate right turn signal.
- The lever must be manually returned to the center position to deactivate either turn signal. The lever will not cancel automatically after a turn.
- Pull lever up (**3**) to switch between low and high beam headlights.

Front Windshield Wiper



- Rotate hand grip (**4**) to activate front windshield wiper.
  O - Off, **I** - Continuous or **II** - Fast.
- Push hand grip (**4**) towards column to activate windshield wiper fluid.

3.2.11 Reversing Fan Switch (if equipped)



The reversing fan enables the operator to clear debris from the engine cover grill (**2**). Two modes of operation are available at any engine speed.

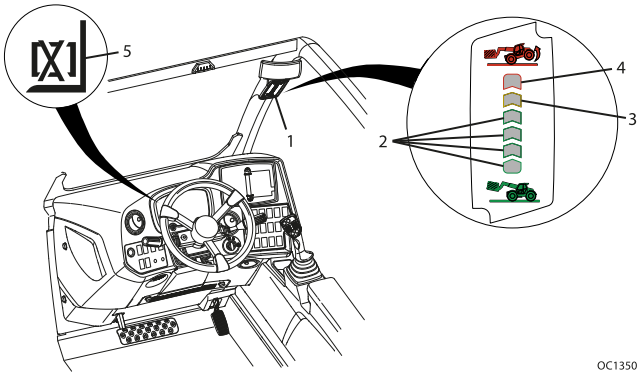
1. **Timed** - Fan will reverse automatically at predetermined intervals.
   a. The fan will reverse every 20 minutes for a duration of 2 seconds.
   b. The interval and duration can be adjusted using the analyzer.
2. **Manual** - The operator can depress and hold front of switch (**1**) to reverse the fan rotation.

Note: It is recommended to operate the reversing fan prior to opening the engine cover to remove debris.

3.2.12 Load Stability Indicator - LSI

⚠ WARNING

TIP OVER HAZARD. The LSI considers only longitudinal stability limitations, observe all operating parameters. Failure to follow operating parameters of the telehandler could damage the equipment and/or cause tip over.



The LSI (**1**) provides visual and audible indication of forward stability limitations when machine is static on firm, level surface.

- When approaching forward stability limitations LEDs progressively illuminate, green (**2**), then orange (**3**) and finally red (**4**).
- If the red LED illuminates the warning buzzer also sounds.

The LSI has two modes:

Active Mode

As the telehandler reaches forward stability limitations and the red LED (**4**) illuminates, the automatic function cut-out is activated. All boom functions are disabled except for boom retract and boom lift (CE/UKCA) and boom retract, boom lift and boom lower (AUS). Retract boom to re-enable functions.

Note: When functions are cut-out, the LSI Override Switch can be used to temporarily re-enable them. See *Section — Left Dash Control Panel, page 48*.

In some instances the LSI system may slow down or stop boom functions if operated close to forward stability limitations.

Passive Mode

When approaching forward stability limitations, visual and audible indication is provided and the automatic function cut-out and/or slow down feature is disabled.

The yellow LED (**5**) on the instrument panel illuminates when either of the following occurs:

CE/UKCA

- The boom is fully retracted.
- The park brake is not applied and transmission is in forward or reverse.

AUS

- The boom is fully retracted.
- The boom angle is below 10 degrees.

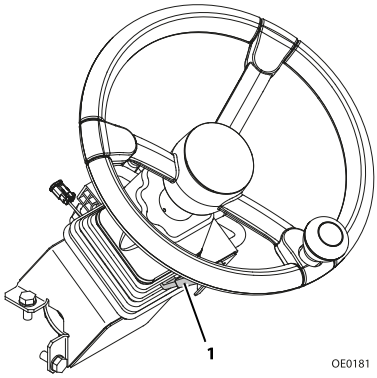
Travel in accordance with the requirements set forth in *Section - General Safety Practices*.

When placing a load, ensure axles are not fully steered in either direction.

⚠ WARNING

TIP OVER HAZARD. If the green, orange and red LEDs flash and warning buzzer sounds, retract and lower boom immediately. Determine cause and correct before continued use.

3.2.13 Steering Column Adjuster



- Follow *Section — Shut-Down Procedure*.
- Pull and hold lever (**1**) to unlock.
- Place steering column in desired position.
- Release lever to lock back into place.

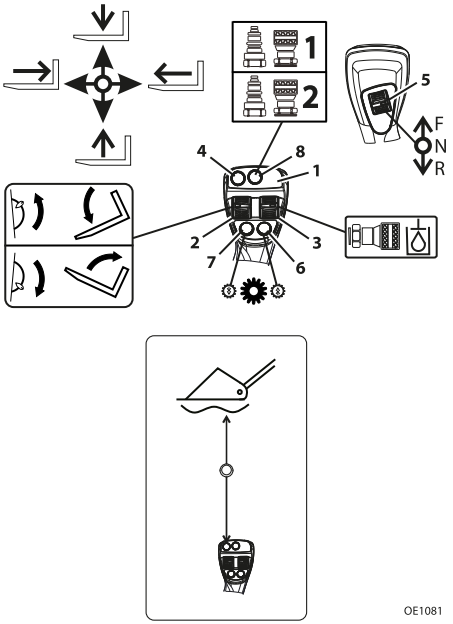
⚠ WARNING

TIP OVER/CRUSH HAZARD. Bring telehandler to a complete stop and shutdown engine before adjusting steering column. A sudden change in direction of travel could reduce stability and/or cause load to shift or fall.

3.2.14 Joystick

Lift Joystick Pattern

Verify the lift joystick pattern icon is active on the display.



The joystick (**1**) controls the boom, attachment, auxiliary hydraulics and transmission functions.

Boom Functions

- Move the joystick back to lift boom; move joystick forward to lower boom; move joystick right to extend boom; move joystick left to retract boom.
- The speed of boom functions depends upon the amount of joystick travel in corresponding direction. Increasing engine speed will also increase function speed.
- For two simultaneous boom functions, move joystick between quadrants. For example; moving the joystick forward and to the left will lower and retract boom simultaneously.

⚠ WARNING

TIP OVER/CRUSH HAZARD. Rapid, jerky operation of controls will cause rapid, jerky movement of the load. Such movements could cause the load to shift or fall or could cause the machine to tip over.

Attachment Tilt Function

Attachment tilt is controlled by the roller switch (**2**).

- Push the roller switch up to tilt attachment down; press the roller switch down to tilt attachment up.

Auxiliary Hydraulic Functions (if equipped)

The Auxiliary Hydraulics roller switch (**3**) controls the function of attachments that require the hydraulic supply for operation. See *Section - Attachments and Hitches* for approved attachments and control instructions.

The Auxiliary Hydraulic selection switch (**8**) allows the desired auxiliary hydraulic function to be selected. Depress button to alternate between functions.

Boom Float Functions (if equipped)

Joystick button (**4**) controls boom float. Boom float allows free movement of boom (lift/lower) while the attachment follows ground contours.

- With the boom retracted and lowered, press and hold the button; move the joystick forward to activate boom float. Button and joystick position must be held to maintain boom float.
- Release button to deactivate boom float and move joystick to neutral position.

Transmission Control (if equipped)

Note: Transmission control lever (see *Section — Transmission Control Lever (if equipped), page 54*) takes priority over joystick transmission controls.

Transmission roller switch (**5**) engages forward or reverse travel.

- Push the roller switch up for forward travel; push the roller switch down for reverse travel. Move roller switch to centered position for neutral.
- Forward or reverse travel can be selected while in any gear.
- When traveling in reverse, the back-up alarm will automatically sound.
- Travel at slow rates of speed when making turns and driving in reverse.

⚠ WARNING

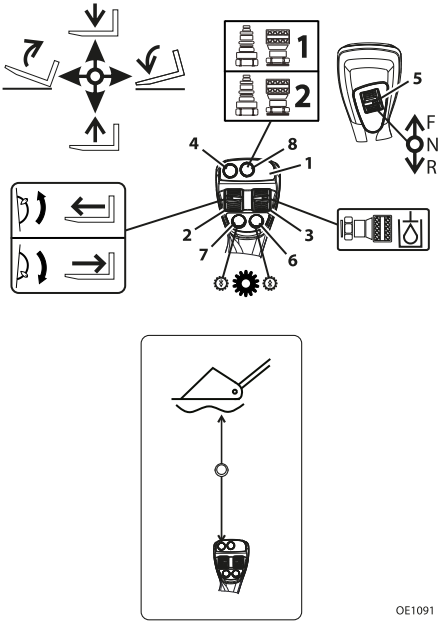
TIP OVER/CRUSH HAZARD. Bring telehandler to a complete stop before shifting transmission. A sudden change in direction of travel could reduce stability and/or cause load to shift or fall.

Gear selection is controlled by buttons (**6** & **7**).

- Depress upshift button (**6**) to select a higher gear; Depress downshift button (**7**) to select a lower gear.
- The transmission is equipped with six forward and three reverse gears. Default gear at start-up is third gear.
- Select the appropriate gear for the task being performed. Use a lower gear when transporting a load. Use a higher gear only when driving unloaded for longer distances.
- Slow down prior to downshifting. Do not downshift more than one gear at a time.

Loader Joystick Pattern

Verify the loader joystick pattern icon is active on the display.



The joystick (**1**) controls the boom, attachment, auxiliary hydraulics and transmission functions.

Boom Functions

- Move the joystick back to lift boom; move joystick forward to lower boom.
- The speed of boom functions depends upon the amount of joystick travel in corresponding direction. Increasing engine speed will also increase function speed.
- For two simultaneous boom functions, move joystick between quadrants. For example; moving the joystick forward and to the left will lower and retract boom simultaneously.

⚠ WARNING

TIP OVER/CRUSH HAZARD. Rapid, jerky operation of controls will cause rapid, jerky movement of the load. Such movements could cause the load to shift or fall or could cause the machine to tip over.

Attachment Tilt Function

Attachment tilt is controlled by the joystick.

- Move joystick right to tilt down; move joystick left to tilt up.

Auxiliary Hydraulic Functions (if equipped)

The Auxiliary Hydraulics roller switch (**3**) controls the function of attachments that require the hydraulic supply for operation. See *Section - Attachments and Hitches* for approved attachments and control instructions.

The Auxiliary Hydraulic selection switch (**8**) allows the desired auxiliary hydraulic function to be selected. Depress button to alternate between functions.

Boom Float Functions (if equipped)

Joystick button (**4**) controls boom float. Boom float allows free movement of boom (lift/lower) while the attachment follows ground contours.

- With the boom retracted and lowered, press and hold the button; move the joystick forward to activate boom float. Button and joystick position must be held to maintain boom float.
- Release button to deactivate boom float and move joystick to neutral position.

Transmission Control (if equipped)

Note: Transmission control lever (see *Section — Transmission Control Lever (if equipped), page 54*) takes priority over joystick transmission controls.

Transmission roller switch (**5**) engages forward or reverse travel.

- Push the roller switch up for forward travel; push the roller switch down for reverse travel. Move roller switch to centered position for neutral.
- Forward or reverse travel can be selected while in any gear.
- When traveling in reverse, the back-up alarm will automatically sound.
- Travel at slow rates of speed when making turns and driving in reverse.

⚠ WARNING

TIP OVER/CRUSH HAZARD. Bring telehandler to a complete stop before shifting transmission. A sudden change in direction of travel could reduce stability and/or cause load to shift or fall.

Gear selection is controlled by buttons (**6** & **7**).

- Depress upshift button (**6**) to select a higher gear; Depress downshift button (**7**) to select a lower gear.
- The transmission is equipped with six forward and three reverse gears. Default gear at start-up is third gear.
- Select the appropriate gear for the task being performed. Use a lower gear when transporting a load. Use a higher gear only when driving unloaded for longer distances.
- Slow down prior to downshifting. Do not downshift more than one gear at a time.

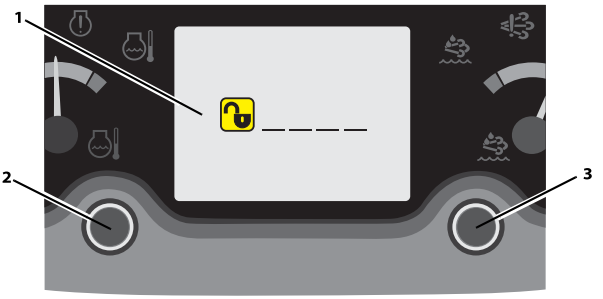
3.3 ANTI-THEFT FUNCTIONALITY (IF ENABLED)

Machines with anti-theft feature active require entering a numeric code before operation to prevent unauthorized use. If multifunction display is installed, ant-theft feature is accessed from that display only.

Note: If the anti-theft feature is active and the current access code is not known, it may be viewed or changed by the machine owner (level 2 password may be required). See Service Manual for information.

3.3.1 Instrument Panel Input

Code entry is accomplished using information provided in the instrument panel display.



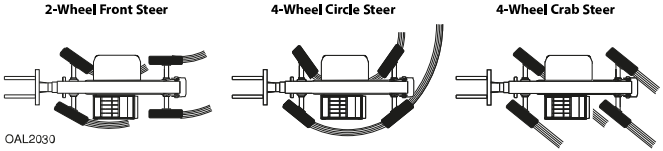
1. Turn ignition switch to position 1. If anti-theft is active, the display **(1)** will prompt the operator for a numeric code.
2. Use the left button **(2)** to select the first digit. Press button to increase number. Number will increase from 0 thru 9 then roll over to 0.
3. Press the right button **(3)** to confirm current digit and move to the next digit.
4. Continue until the code is complete.
5. If an incorrect code is entered, the display will prompt the operator again for the numeric code.
6. If the correct code is entered, normal start up can continue.

3.3.2 Multifunction Display Input

If machine is equipped with Multifunction Display, refer to *Section - Anti-Theft Functionality* for anti-theft functionality information.

3.4 STEER MODES

Three steer modes are available for operator use.

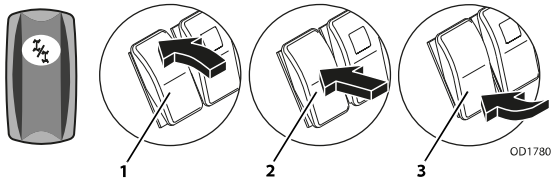


Note: 2-Wheel Front Steer mode is required for travel on public roads.

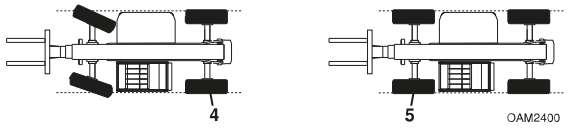
Manual or All Wheel Assisted steering alignment mode change can be configured using the analyzer hand-held diagnostic tool: Operator Tools menu: “Steer Modes” set to Manual or Automatic.

3.4.1 Manual Steering Alignment Mode Change

Note: Steer mode will change immediately after selection.



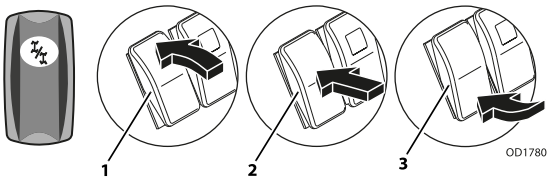
1. Bring machine to a stop using service brake. If front steer mode **(2)** is active and rear wheels are aligned, go directly to step 4.

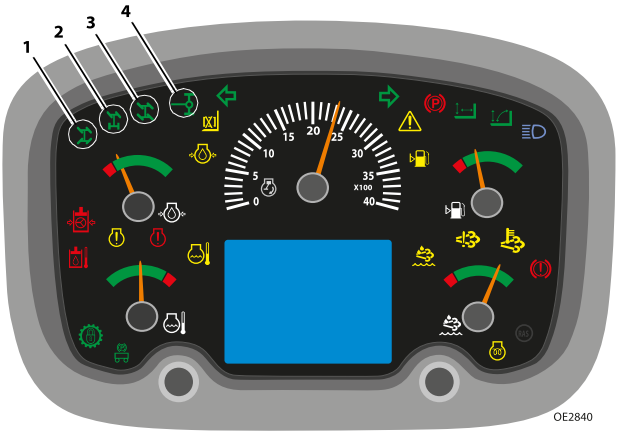


2. With circle steer **(1)** or crab steer **(3)** mode active, turn the steering wheel until the left rear wheel **(4)** is aligned with the side of the machine.
3. Select front steer mode **(2)**.
4. Turn the steering wheel until the left front wheel **(5)** is aligned with the side of the machine.
5. Wheels are now aligned. Select desired steer mode.

3.4.2 All Wheel Assisted Steering Alignment Mode Change

1. Bring machine to a stop using service brake.





2. Select desired steer mode: circle steer (**1**), front steer (**2**) or crab steer (**3**).

Note: Selected steer mode LED will flash until the change is complete. After steering alignment is complete, steer mode LED will illuminate solid.

3. Turn the steering wheel until the rear wheels are centered (**4**). This step will be skipped if changing from front steer mode and rear wheels are already centered.

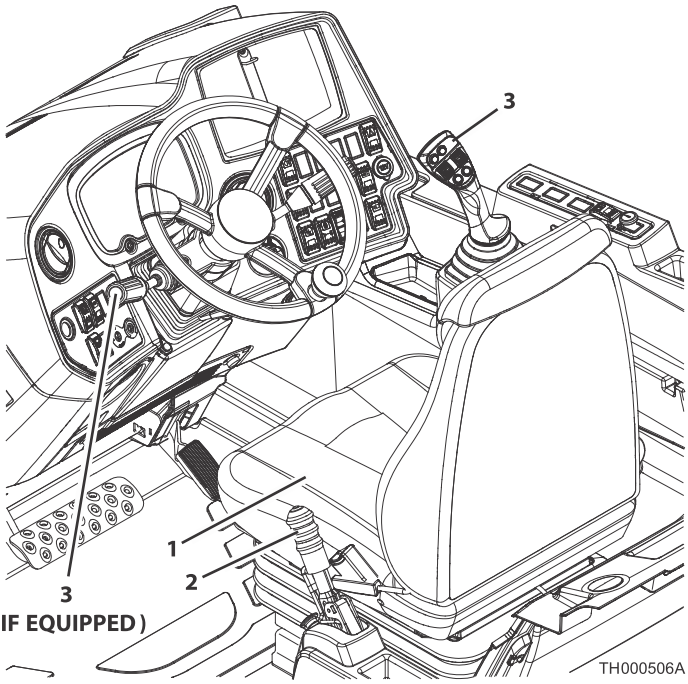
4. Turn the steering wheel until the front wheels are centered. This step will be skipped if changing to front steer mode.

5. Wheels are now aligned and steer mode change is complete.

Note: Avoid turning steering wheel while machine is shut down. If wheels are not correctly aligned, manual adjustment may be required. See *Section — Steer Modes*.

3.5 OPERATOR SEAT

3.5.1 Operator Presence



The operator seat (**1**) is equipped with an operator presence system. Engine start and hydraulic functions are prohibited if operator is not present. If the system detects a loss of pressure during operation, after a two second delay one of the following will occur:

1. With the park brake (**2**) engaged and transmission in neutral (**3**):
   - Hydraulic controls are disabled. (Continuous Auxiliary function permitted)
   - Upon returning to seated position, hydraulic controls are enabled.
2. With the park brake (**2**) disengaged and transmission in neutral (**3**):
   - Hydraulic controls are disabled and cabin alarm sounds continuously. (Continuous Auxiliary function permitted)
   - Upon returning to seated position, hydraulic controls are enabled and horn will cease.

3. With the park brake (**2**) disengaged and transmission in forward or reverse (**3**):

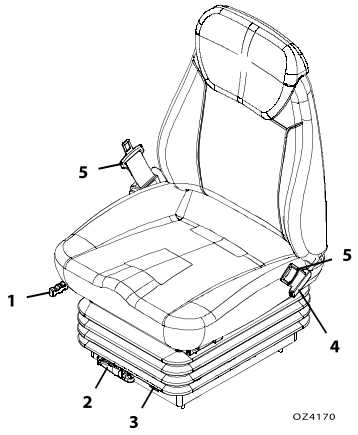
    - Hydraulic controls are disabled, horn sounds continuously and transmission shifts to neutral.

    - Upon returning to seated position, hydraulic controls are enabled and horn will cease. Return transmission to neutral to allow system to reset prior to reengaging forward or reverse travel.

3.5.2 Adjustments

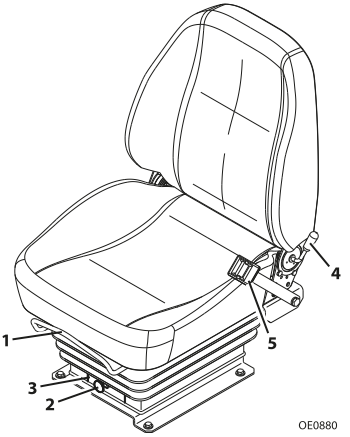
Prior to starting the engine adjust seat for position and comfort.

Mechanical Suspension Seat



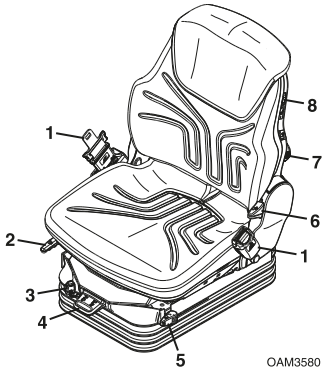
1. **Fore/Aft:** Use handle to move seat fore and aft.
2. **Suspension:** Use handle to adjust the suspension to the appropriate weight setting.
3. **Weight:** Displays current weight setting.
4. **Backrest:** Use lever to adjust backrest angle.
5. **Seat Belt:** Always fasten seat belt during operation. If required, a 76 mm (3 in) seat belt is available.

Pneumatic Suspension Seat



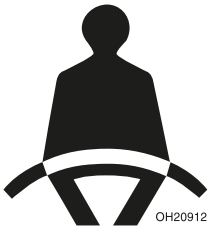
1. **Fore/Aft:** Use handle to move seat fore and aft.
2. **Suspension:** Use knob to adjust the suspension to the appropriate weight setting.
3. **Weight:** Displays current weight setting.
4. **Backrest:** Use lever to adjust backrest angle.
5. **Seat Belt:** Always fasten seat belt during operation. If required, a 76 mm (3 in) seat belt is available.

Pneumatic Suspension Seat



1. **Seat Belt:** Always fasten seat belt during operation. If required, a 76 mm (3 in) seat belt is available.
2. **Fore/Aft:** Use handle to move seat fore and aft.
3. **Absorber:** Use lever to adjust cushioning to soft or hard.
4. **Suspension:** Use the lever to adjust the suspension to the appropriate weight and height settings.
5. **Fore/Aft Isolator:** Use lever to activate fore/aft isolator.
6. **Backrest:** Use lever to adjust backrest angle.
7. **Lumbar:** Use knob to adjust the height and curvature of the backrest cushion.
8. **Heater:** Use switch to activate seat heater.

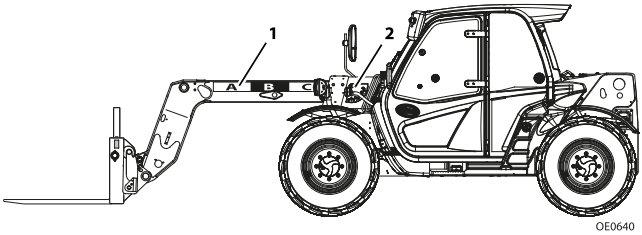
3.5.3 Seat Belt



Fasten seat belt as follows:

1. Grasp both free ends of the belt making certain that belt webbing is not twisted or entangled.
2. With back straight in the seat, couple the retractable end (male end) of the belt into the receptacle (buckle) end of the belt.
3. With belt buckle positioned as low on the body as possible, pull the retractable end of the belt away from the buckle until it is tight across the lap.
4. To release belt latch, press red button on the buckle and pull free end from buckle.

3.6 BOOM INDICATORS



3.6.1 Boom Extension

- The boom extension indicators (**1**) are located on the left side of the boom. Use these indicators to determine boom extension when using the capacity chart (see *Section — Use of the Capacity Chart*).

3.6.2 Boom Angle (if equipped)

- The boom angle indicator (**2**) is located on the left side of the boom. Use this indicator to determine the boom angle when using the capacity chart (see *Section — Use of the Capacity Chart*).

3.7 REVERSE SYSTEMS (IF EQUIPPED)

⚠ WARNING

CRUSH HAZARD. Running into persons or objects can cause death, serious injury, or damage to property and equipment. Always check mirrors and area behind vehicle before and when backing up. Reverse systems are for supplementary use only.

3.7.1 Reverse Sensing System

The reverse sensing system provides audible indication of objects to rear of unit while in reverse gear.

- Alarm sounds signaling machine is placed in reverse gear.

Note: Reverse Sensing System detects objects larger than 232.25 square centimeters (36 square inches) area and is functional when machine is moving in reverse direction.

- No alarm when detection zone is clear of objects.
- Pulsing alarm sounds when an object is in range of Reverse Sensing System. Alarm increases in frequency as object becomes closer.
- If alarm sounds at a frequency of eight pulses per second (8 Hz) an object is detected within 0.9 m (3 feet). Stop reverse direction of machine by applying service brake. Perform *Section — Shut-Down Procedure*. Check and clear area behind machine of objects before proceeding in a reverse direction.

3.7.2 Reversing Camera (if equipped)

If machine is equipped with Multifunction Display, refer to *Section — Reversing Camera (if equipped), Page 77* for reversing camera information.

3.8 MULTIFUNCTION DISPLAY (IF EQUIPPED)

3.8.1 General Information

This section provides the necessary information needed to understand the multifunction display.

Start of Multifunction Display

The multifunction display will be active when the ignition is in position 1.

OAP0320

After the multifunction display has been powered on, the machine brand logo (**1**) will be displayed briefly followed by the home screen.

Note: If anti-theft is active, the display will prompt the operator for a numeric code. See *Section — Anti-Theft Functionality, page 89* for procedure.

3.8.2 Multifunction Display and Buttons

Note: Apply park brake to access the Attachment Selection and Main Menu buttons.

1. **Display:** The display shows the following depending on selection.
   - Anti-theft. See *Section — Anti-Theft Functionality, page 89*.
   - Home screen. See *Section — Home screen, page 79*.
   - Reversing camera (if equipped). See *Section — Reversing camera (if equipped), page 77*.
   - Advanced diagnostics. See *Section — Advanced diagnostics, page 82*.
   - Maintenance charts. See *Section — Maintenance Schedule Screen, page 94*.
   - Lubrication charts. See *Section — Lubrication Schedule Screen, page 95*.
   - Visibility charts. See *Section — Visibility Chart Screen, page 100*.
   - Personalities screen: Personalities menu displays various electrically controlled parameters that drive the hydraulic functions related to outriggers, frame level, boom lift, extend/retract and auxiliary. See Service Manual for more personalities information.
   - Operator tools screen. See *Section — Operator Tools, page 71*.
   - Calibration screen. See *Section — Calibrations, page 72*.
2. **Previous Screen Button:** The previous screen button returns the display to the previous menu or screen. The screen will not change if already at the home screen.

3. **Attachment Select Button:** The attachment selection button allows the operator to select a specific attachment in order to display the applicable capacity chart. See page 3-59.

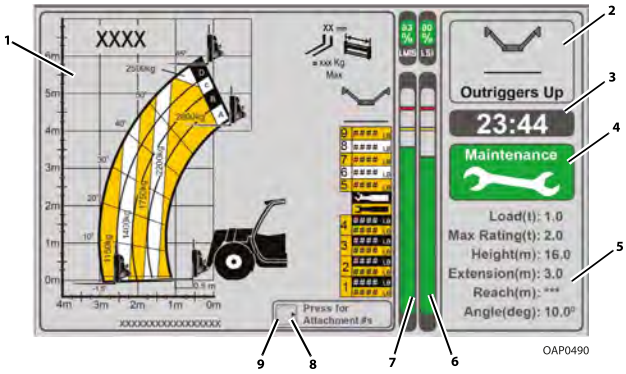
4. **Navigation Button:** The navigation button has four arrow buttons to navigate up, down, left or right. The center button allows the operator to confirm the selection.

5. **Main Menu Button:** The main menu button displays the main menu. The operator can navigate the menu using the navigation button. See *Section — Main Menu, page 82*.

6. **Home Screen Button:** The home screen button returns display to the home screen. The screen will not change if already at the home screen.

3.8.3 Home Screen

The home screen displays at the successful startup or when the Home Screen button is selected.



1. **Capacity Chart:** The capacity chart is displayed based on the selected attachment and if equipped selected outriggers position. See *Section — Capacity Chart Selection, page 89* for capacity chart selection and *Section — Use of Capacity Chart* for use of the capacity chart.

Note: If the display does not have capacity charts, see Service Manual for troubleshooting.

2. **Outriggers Position (if equipped):** Outriggers position displays the current outriggers position. Appropriate capacity chart will display based on the outriggers position. If machine is not equipped with pressure and proximity sensors, appropriate capacity chart will be manually selected based on outriggers position. See *Section — Outriggers Position (if equipped), page 91*.

Note: If machine is not equipped with outriggers, the outriggers position will be blank.

3. **Real-Time Clock (RTC):** The real-time clock displays the time in 12 or 24 hour format.

4. **Maintenance Status:** The maintenance status icon shows the current status of maintenance and notifies the operator if any maintenance activity is required. See 3-53.

    - Green: No scheduled maintenance required.
    - Yellow: Scheduled maintenance required. See page *Section — Maintenance Schedule Screen, page 94*.

Note: Brand logo is displayed when the maintenance status is not enabled.

5. **Lifting Information (if equipped with LMIS):** The lifting information displays the load and boom position information.

    - Load: Displays approximate load in metric ton or k-pounds. Load includes object being lifted and all rigging (slings, etc).
    - Maximum Rating/Rated Capacity: Displays rated capacity in metric ton or k-pounds.
    - Height: Displays boom height in meters or feet.
    - Length: Displays boom length in meters or feet.
    - Radius/Reach: Displays boom reach from front of tires in meters or feet.
    - Angle: Displays boom angle in degrees.

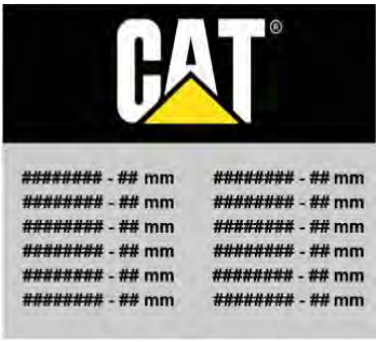
6. **Load Stability Indicator (LSI) Bar Graph (if equipped with LMIS):** Load stability indicator system bar graph displays forward stability limitations when machine is static on firm, level surface. See *Section — Load Stability Indicator - LSI, Page 47*.

    - Green: LSI bar graph displays in green color when forward stability limitations is less than 90%.
    - Yellow: LSI bar graph displays in yellow color when forward stability limitations is between 90% and 99%.
    - Red: LSI bar graph displays in red color when forward stability limitations is greater than 100%.

7. **Load Management Indicator System (LMIS) Bar Graph (if equipped):** Load management indicator system bar graph and external audible beacon tower display approximate load percentage to rated capacity.

    - Green: LMIS bar graph and external audible beacon tower display in green color when load is less than rated capacity.
    - Yellow: LMIS bar graph and external audible beacon tower display in yellow color and intermittent alarm sounds when load is approaching rated capacity.
    - Red: LMIS bar graph and external audible beacon tower display in red (3) color and constant alarm sounds when automatic function cut-out is activated. Certain functions are disabled (i.e. boom lift, extend, etc). Retract boom to re-enable functions.

8. **Attachment Part Numbers:** Press right Navigation button to display the list of OEM supplied attachment part numbers. Part numbers display for 3 seconds, then home screen displays.



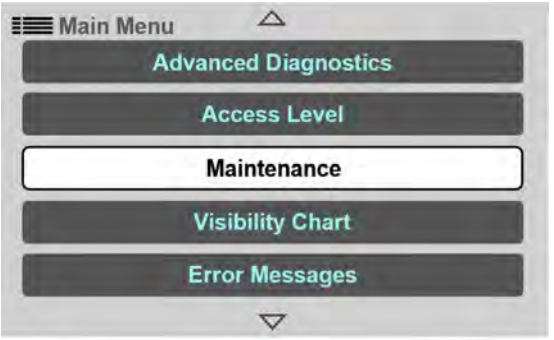
OAP0500

- **Additional Operating Information (AUS):** Press left Navigation button to display the travelling information, lifting information and specifications for safe use.

OAP0400

3.8.4 Main Menu

Press the Main Menu button to access the main menu.



Note: Scroll up or down to view all items.

Maintenance

Maintenance menu displays the maintenance intervals and lubrication requirements to properly maintain the telehandler.

Maintenance Intervals: Maintenance intervals allow the operator to view all the unique maintenance tasks required when engine hours reach an identified interval or multiples of the intervals. See *Section — Maintenance Schedule Screen, page 94*.

Lubrication: Lubrication allows the operator to view lubrication charts. See *Section — Lubrication Schedule Screen, page 95*.

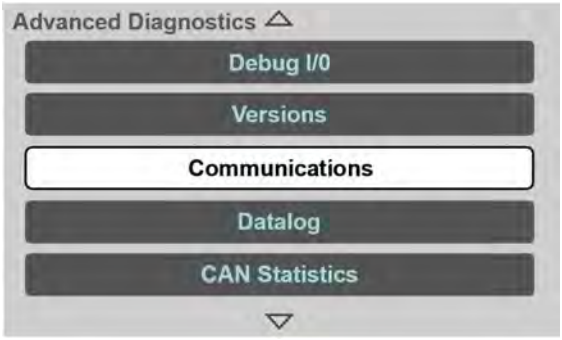
Access Level

The access level screen displays the current access level. Code entry determines access level.

- Operator (Level 3) - No code required.
- Customer (Level 2) - See Service Manual.
- Service (Level 1) - Manufacturer service representative only.

Advanced Diagnostics

Advanced diagnostics menu allows the operator to view diagnostic information.



OAP0060

Communications: Communications screen displays the status of all CAN modules in the control system. The status of the appropriate module will be RED in color, if there is any CAN loss. If the communication is good, the appropriate module status will be GREEN in color.

Versions: Versions screen displays the version of the software, hardware and constant data of control modules in the machine.

Debug I/O: Debug I/O screen displays the status of all inputs/outputs and assigned machine function name for the cabin control module, front frame facing control module, and rear frame facing control modules.

Engine: Engine screen displays parameters related to engine.

Joystick: Joystick screen displays parameters related to the joystick.

Transmission: Transmission screen displays parameters related to the drive or transmission.

Hydraulics: Hydraulics screen displays parameters related to the outriggers, frame level and cabin functions.

Load Stability Indicator: Load stability indicator screen displays parameters related to load stability indicator.

Calibration Data: Calibration data screen displays calibration values for all calibrated sensors in the control system.

System: System screen displays parameters related to control system.

Drive/Steer: Drive/Steer screen displays parameters related to steering system.

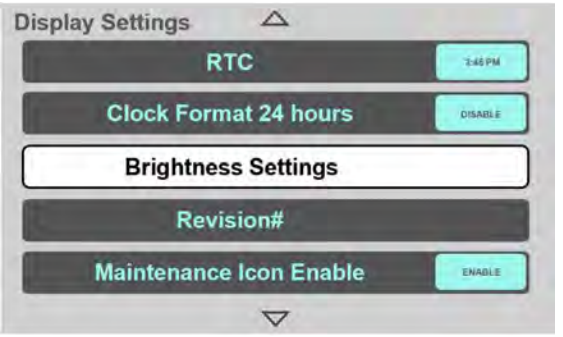
Lights: Lights screen displays parameters related to lighting.

Boom Ride & Float: Boom ride and float screen displays parameters related to boom ride and float.

CAN Statistics: CAN statistics screen displays the parameters of the system bus and diagnostic bus.

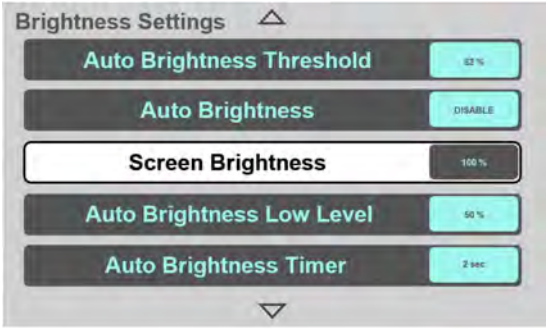
Display Settings

Display settings menu allows the operator to set up the Real-Time Clock (RTC) and screen brightness. Additionally, the operator can view the language settings, maintenance status icon (enable/disable) and revision number of library files.



OAP0070

Brightness Settings: Brightness settings menu allows the operator to adjust the screen brightness. It consists of following features to adjust the screen brightness.



OAP0080

a. **Screen Brightness:** Screen brightness allows the operator to adjust the screen brightness (0 - 100% in 1% increment).

b. **Auto Brightness:** Auto brightness screen allows the operator to set auto brightness to enable or disable mode.

c. **Auto Brightness Threshold:** Auto brightness threshold allows the operator to adjust the auto brightness threshold value when auto brightness is enabled. Based on ambient light level and auto brightness threshold, display will set to auto brightness low level or screen brightness.

d. **Auto Brightness Timer:** Auto brightness timer allows the operator to adjust the length of time to change to appropriate brightness when auto brightness is enabled.

e. **Auto Brightness Low Level:** Auto brightness low level allows the operator to set the preferred lowest brightness level (in %) when auto brightness is enabled.

Clock Format 24 Hours: Clock format screen allows the operator to set the real-time clock in 12 or 24 hour format.

Real-Time Clock (RTC): Real-time clock screen allows the operator to set hours, minutes, day, month and year by the use of navigation button.

Language: Language allows the operator to view the current language. See Service Manual to change current language.

Maintenance Icon Enable: Maintenance icon enable screen allows the operator to set the maintenance status to enable or disable mode on the home screen.

Revision#: Revision# screen displays the revision numbers of all libraries (including super library) and application.

Competitive Coupler: Competitive coupler screen allows the operator to show or hide competitive coupler attachments in the attachment selection menu when a competitive coupler is fitted.

Machine Set-Up

Machine set-up menu displays configuration (brand, model, engine and transmission etc.) of the machine.

OAP0510

Brand: Brand displays brand name of the machine.

Vehicle: Vehicle displays the type of vehicle based on boom configuration and market preferences.

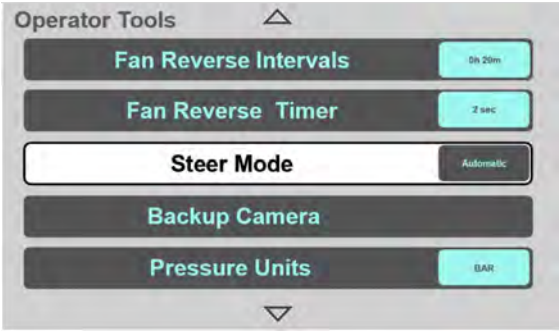
Model: Model displays machine model.

Options: Options screen provides machine configuration details for transmission, engine control, auxiliary functions and all other controls.

Market: Market displays applicable compliance standard.

Operator Tools

Operator tools menu allows the operator to set various machine settings.



OAP0430

Steer Mode: Steer mode allows the operator to select desired steer mode.

a. Manual steer mode

b. Automatic steer mode

Fan Reverse Timer (if equipped): Fan reverse timer allows the operator to set the duration to rotate the fan in reverse direction.

Fan Reverse Interval (if equipped): Fan reverse interval allows the operator to set the interval between fan reversals.

Default Gear: Default gear allows the operator to set the default transmission gear when engine is started.

Elevated Idle: Elevated idle allows the operator to set the elevated idle.

Vehicle Speed Units: Vehicle speed units allow the operator to set the units for vehicle speed in KPH or MPH.

Temperature Units: Temperature units allows the operator to set the units for temperature in Celsius (C) or Fahrenheit (F).

Pressure Units: Pressure units allows the operator to set the units for pressure in BAR or PSI.

Backup Camera (if equipped): Backup camera allows the operator to temporarily view the area behind the telehandler on the home screen.

Tire Selection: Tire selection allows the operator to select applicable tire.

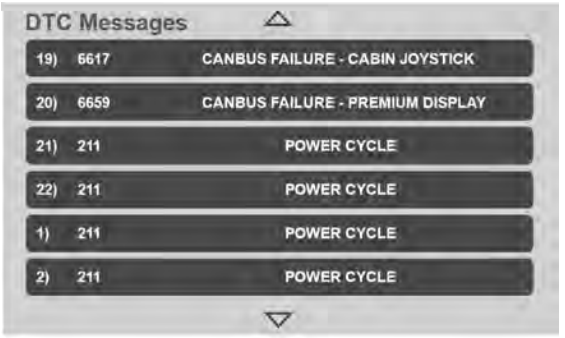
Calibrations

Calibrations menu allows the operator to perform functionality checks for various machine controls.

- Park brake test. See *Section — Park Brake Test, page 98*.
- See Service Manual for more calibrations information.

Error Messages (Fault Codes)

Error messages screen allows the operator to view up to 25 recently logged Diagnostic Trouble Code (DTC)/Diagnostics Message 1 (DM1) fault codes along with a text description. The fault codes are displayed in the order in which they are received. Active fault codes are shown with an asterisk symbol. See Service Manual for additional fault code information.



OAP0110

DTC Messages: DTC messages display all machine related fault codes. The DTC message consists of a three to five digit number and corresponding message.

OAP0120

DM1 Messages: DM1 messages display all engine related fault codes. The DM1 message consists of the Suspect Parameter Number (SPN) and Fault Mode Indicator (FMI) component.

Visibility Chart

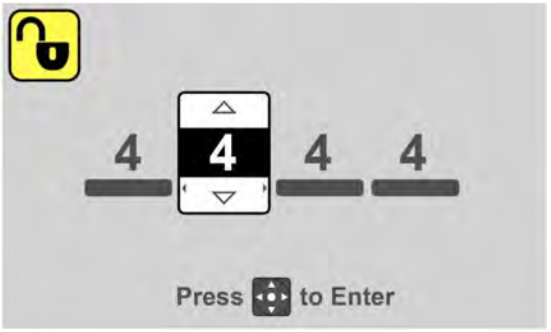
Visibility chart allows the operator to view the applicable visibility chart. See *Section — Visibility Chart Screen, page 100*.

3.8.5 Operation and Maintenance

Anti-Theft Functionality

Machines with anti-theft feature active require entering a numeric code before operation to prevent unauthorized use. If multifunction display is installed, anti-theft feature is accessed from that display only.

Note: If the anti-theft feature is active and the current access code is not known, it may be viewed or changed by the machine owner. See Service Manual.



OD1920

1. Turn ignition switch to position 1. If anti-theft is active, the display will prompt the operator for a numeric code.
2. Press the up/down arrows of the Navigation button to select the first digit.
3. Press the right arrow of the Navigation button to move to the next digit.
4. Continue until the code is complete. Press the center of the Navigation button to confirm the code.
5. If an incorrect code is entered, the display will prompt the operator again for the numeric code.
6. If the correct code is entered, normal start up can continue.

Capacity Chart Selection

The home screen displays proper capacity chart based on the selected attachment, and if equipped, selected outriggers position.

A. Attachment Selection

The attachment selection button allows the operator to select a specific attachment in order to display the applicable capacity chart.

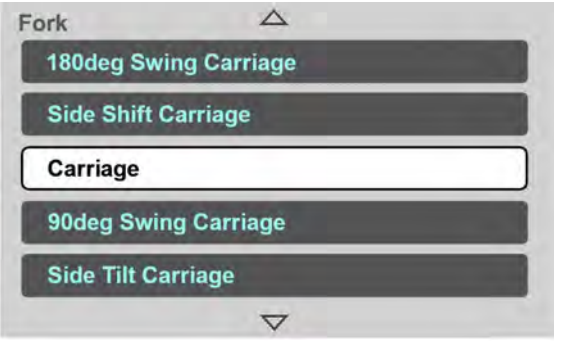
1. Press the Attachment Select button to access the types of attachments.

Note: The Competitive Coupler type is only visible when enabled. See “Display Settings” on *Section — Display Settings, page 68*

OAP0130

2. Select the type of attachment.

Note: Scroll up or down to view all items.



OAP0140

3. Select the specific attachment to be used.

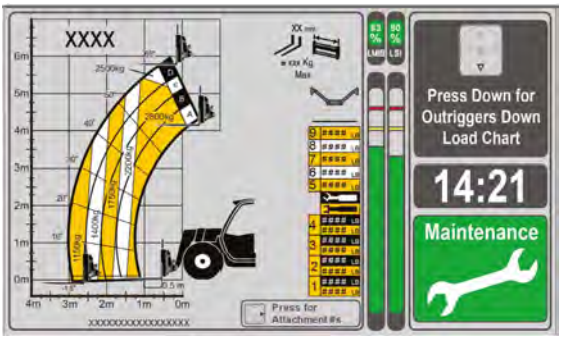
OAP0150

4. A message screen will display to confirm the selection. Press Home Screen button to go to home screen, the capacity chart for the selected attachment will display.

B. Outriggers Position Selection (if equipped)

If machine is equipped with outriggers, the display will show the capacity chart based on the outriggers position. See *Section — Use of Capacity Chart* for use of the capacity chart.

Manual:



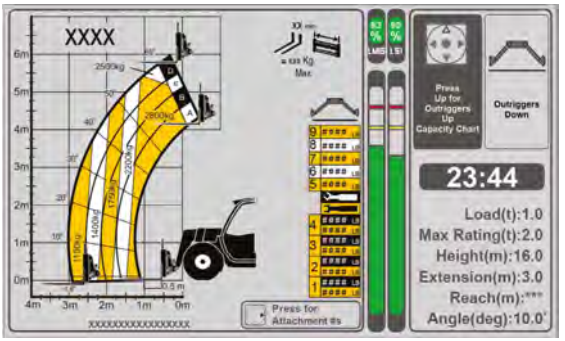
OAP0570

If machine is not equipped with proximity and pressure sensors to detect the status of outriggers position, the operator must select the applicable capacity chart manually.

Note: The default capacity chart is outriggers up.

1. Press down arrow of the Navigation button to display outriggers down capacity chart.
2. Press up arrow of the Navigation button to display outriggers up capacity chart.

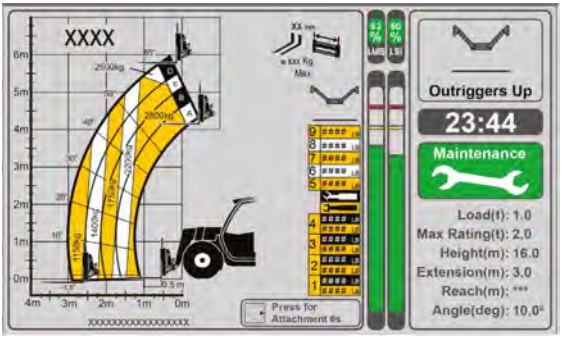
Semi-automatic:



OAP0590

If machine is equipped with pressure sensor only, the display will show the outrigger status and the operator requires to confirm the outrigger status with navigation button.

Automatic:



OAP0490

The proximity and pressure sensors detect the status of the outriggers position and automatically displays the corresponding capacity chart on the home screen.

Reversing Camera (if equipped)

⚠ WARNING

CRUSH HAZARD. Running into persons or objects can cause death, serious injury, or damage to property and equipment. Always check mirrors and area behind vehicle before and when backing up. Reverse systems are for supplementary use only.

The reversing camera provides an additional view of the area directly behind the telehandler. The view displays on the multifunction display home screen when the telehandler is running, transmission is in reverse and when backup camera is configured to be present under machine setup. The display automatically returns to the standard home screen when transmission is shifted out of reverse.

OAP0160

The screen provides a graphic overlay indicating approximate distances of objects at rear of telehandler.

- **Red Line:** Approximately 1,52 m (5 ft).

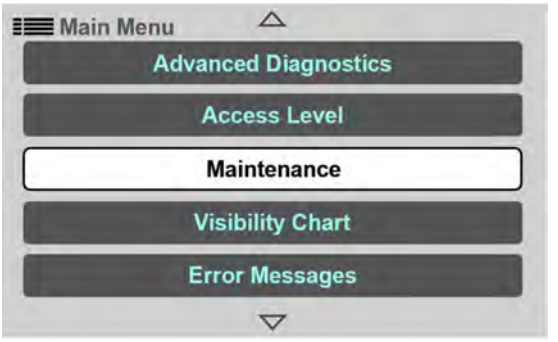
- **Yellow Line:** Approximately 4,57 m (15 ft).

NOTICE

EQUIPMENT MALFUNCTION. Always keep camera lens clean. Camera may not operate normally at extremely high or low temperatures.

Maintenance Schedule Screen

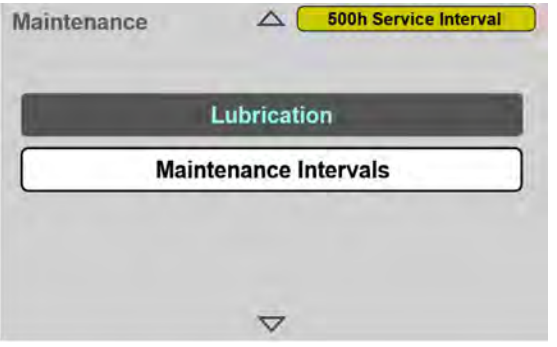
Maintenance schedules identify maintenance tasks required when operating hours reach an identified interval.



OAP0410

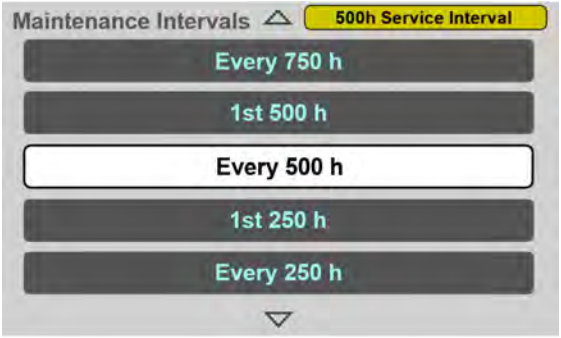
1. Press Main Menu button and select Maintenance.

Note: Scroll up or down to view all items.



OAP0170

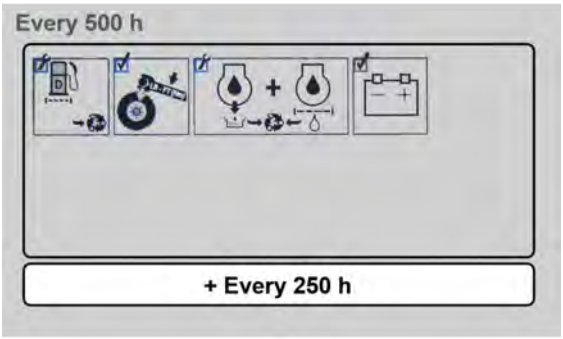
2. Select Maintenance Intervals.



OAP0180

3. Select the required maintenance interval to view the maintenance schedule. See *Section - Lubrication and Maintenance* for additional information.

Note: The screen will display the current maintenance interval in the upper right corner when scheduled operating hours are reached.

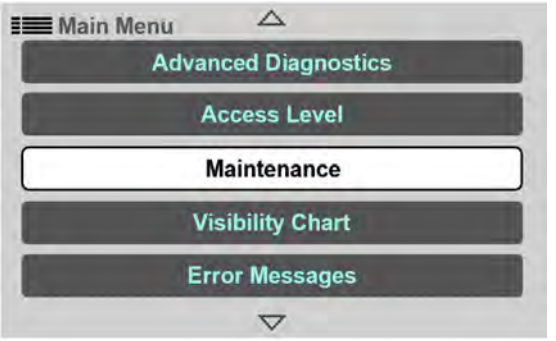


OAP0190

4. Press the center of the Navigation button to view subsequent maintenance schedules until maintenance intervals screen displays.

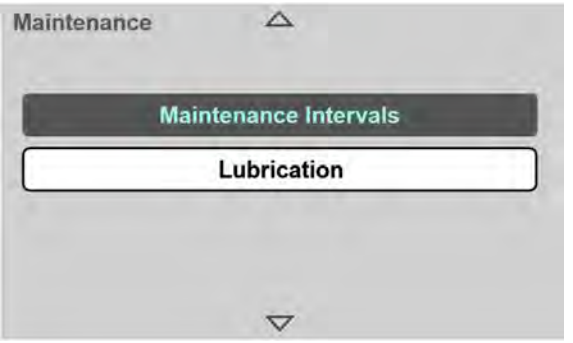
Lubrication Schedule Screen

Lubrication schedules identify lubrication tasks required when operating hours reach an identified interval.



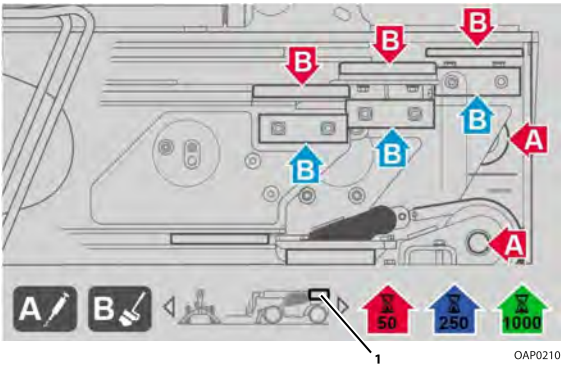
OAP0410

1. Press Main Menu button and select Maintenance.



OAP0200

2. Select Lubrication to view the lubrication schedule.

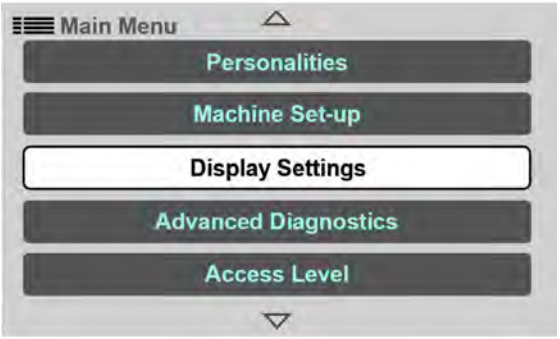


OAP0210

3. Use left/right arrow of the Navigation button to view lubrication points in different locations. See *Section - Lubrication and Maintenance* for additional information.

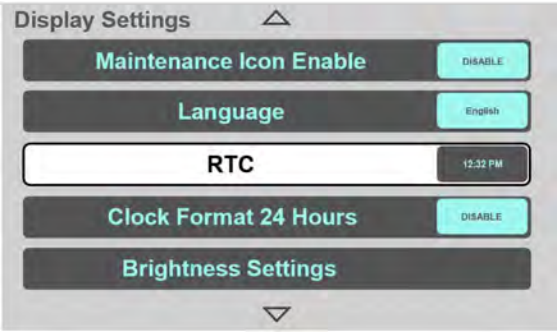
Note: Rectangle (**1**) indicates the area of the machine displayed on the screen above.

Real-Time Clock (RTC) Setup



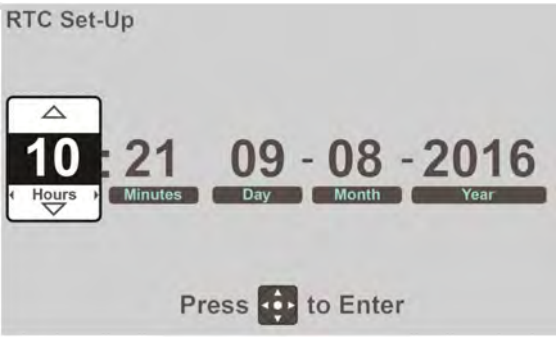
OAP0220

1. Press Main Menu button and select Display Settings.



OAP0230

2. Select RTC to set the date and time.



OAP0440

3. Press the up/down arrow of the Navigation button to select the first digit.
4. Press the right arrow of the Navigation button to move to the next digit.

5. Continue until the set-up is complete. Press the center of the Navigation button to confirm.

Park Brake Test

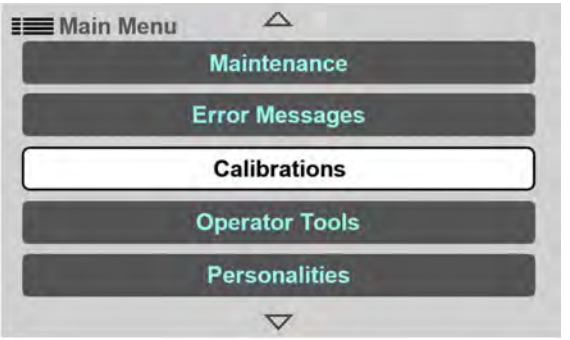
Park brake test allows the operator to check the function of park brake.

Note: Each step of the calibration procedure must be completed within 60 seconds. If not, then the calibration fails and need to initiate the calibration procedure again.

⚠ WARNING

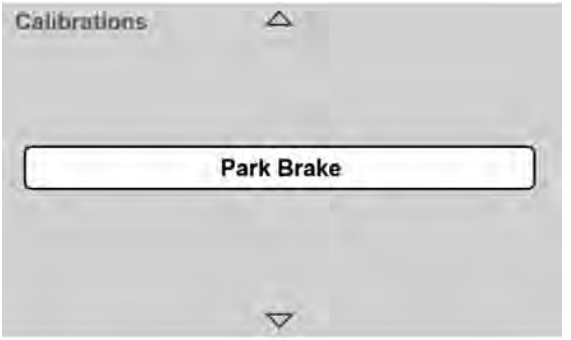
CRUSH HAZARD. Running into persons or objects can cause death, serious injury, or damage to property and equipment. Always check mirrors and area around machine before performing any test. Apply service brake if machine moves.

1. Apply park brake and start engine to perform the test.



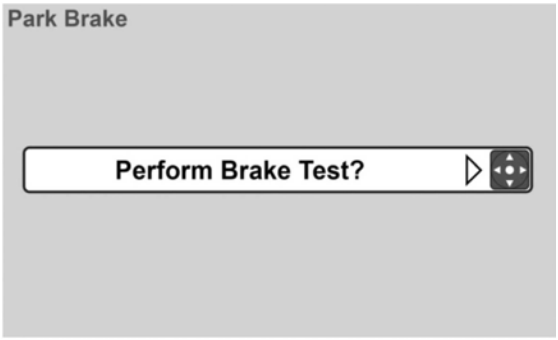
OAP0250

2. Press Main Menu button and select Calibrations.



OAP0260

3. Select Park Brake.



OAP0270

4. Press center of the Navigation button to confirm “Perform Brake Test?”.

OAP0280

5. Ensure the park brake is engaged. Press center of the Navigation button to confirm.

OAP0290

6. Display shows warning message, "Warning: Drive will be engaged". Place transmission in second gear. Press center of the Navigation button to continue.

OAP0300

7. Place the transmission in Forward (F).

8. Place the transmission in Neutral (N). Press center of the Navigation button to continue.

9. "Park Brake Test Complete" will be displayed if successful. Press center of the Navigation button to confirm and return to calibrations menu.
"Park Brake Test Failed" will be displayed if failed. Press center of the Navigation button to confirm and return to calibrations menu to repeat the test. If failed again, machine must be removed from service and repaired before continued operation.

Visibility Chart Screen

Visibility chart screen allows the operator to view applicable visibility charts.

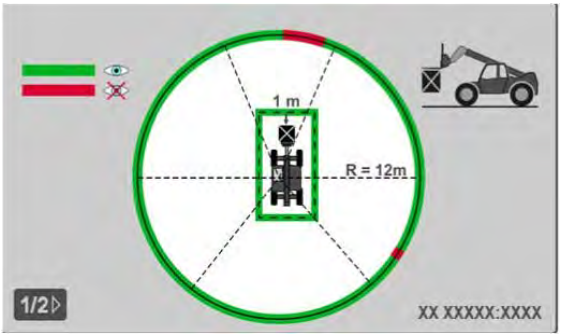
⚠ WARNING

CRUSH HAZARD. Running into persons or objects can cause death, serious injury, or damage to property and equipment. Always check mirrors and area around machine before moving.

OAP0450

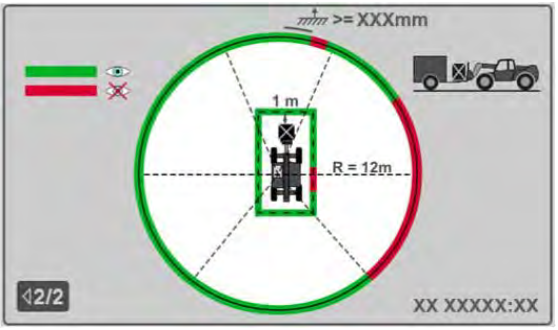
1. Press Main Menu button and select Visibility Chart.

Note: Scroll up or down to view all items.



OAP0460

2. The screen will display default visibility chart with suspended load.



OAP0470

3. Press right arrow of the Navigation button to display visibility chart with non-suspended load.

3.8.6 Troubleshooting

Communication Error Screen

OAP0310

Communication error screen will be displayed if there is a communication failure. Wait for a few moments and restart the machine. If the communication error continues to display, refer service manual for more information.

SECTION 4
Operation

4.1 ENGINE

Note: Refer to Engine Operation & Maintenance Manual for additional information.

4.1.1 Starting the Engine

This machine can be operated under normal conditions in temperatures of -29°C to 48°C (-20°F to 118°F). Consult Telehandler Product Group for operation outside this range or under abnormal conditions.

1. Turn on electrical master switch.
2. Make sure all controls are in "Neutral" and all electrical components (lights, heater, etc.) are turned off. Apply park brake.
3. Turn ignition switch to position 1 and wait for engine preheat indicator on instrument panel to go out.
4. Turn ignition switch to position 2 to engage starting motor. Release key immediately when engine starts. If engine fails to start within 20 seconds, release key and allow starting motor to cool for two minutes before trying again.

Note: If engine fails to start after three attempts, turn key to OFF position and allow starting motor to cool for 30 minutes before trying again.

5. After engine starts, observe indicators. If indicators remain on for more than five seconds, stop engine and determine cause before restarting engine.
6. Warm up engine at approximately 1/2 throttle.

Note: Engine will not start unless transmission is in neutral and park brake is applied.

⚠ WARNING

UNEXPECTED MOVEMENT HAZARD. Always ensure that transmission is in neutral and the service brake is applied before releasing park brake. Releasing park brake in either forward or reverse could cause the machine to move abruptly.

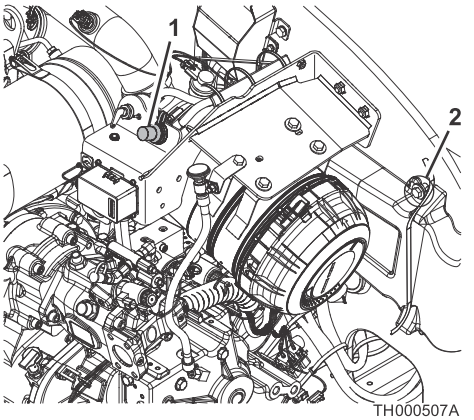
⚠ WARNING

ENGINE EXPLOSION. Do not spray ether into air intake for cold weather starting.

4.1.2 Battery Boosted Starting

If battery-boost starting (jump-start) is necessary, proceed as follows:

- Never allow vehicles to touch.
- Ensure boosting vehicle engine is running.



- Remote battery post is located on right side of engine compartment for jump-starting.
- Connect positive (+) jumper cable to positive (+) post (**1**) of discharged battery.
- Connect opposite end of positive (+) jumper cable to positive (+) post of booster battery.
- Connect negative (-) jumper cable to negative (-) post on booster battery.
- Connect opposite end of negative (-) jumper cable to bolt head on machine (**2**).
- Follow standard starting procedures.
- Remove cables in reverse order after machine has started.

⚠ WARNING

BATTERY EXPLOSION HAZARD. Never jump start or charge a frozen battery as it could explode. Keep sparks, flames and lighted smoking materials away from battery. Lead acid batteries generate explosive gases when charging. Wear safety glasses.

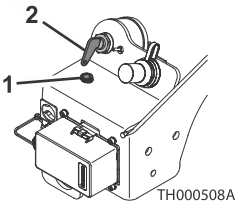
4.1.3 Normal Engine Operation

- Observe instrument panel and display frequently to be sure all systems are functioning properly.
- **Be alert for unusual noises or vibration.** When an unusual condition is noticed, park machine in safe position and perform shut-down procedure. Report condition to your supervisor or maintenance personnel.
- **Avoid prolonged idling.** If engine is not being used, turn it off.
- If prolonged idling is required (park brake applied and all controls in neutral), engine idle may increase.
- Driving lights on.
- Air conditioning on.
- Ambient temperature below -17° C (-1° F).
- When operating a machine at high altitudes, a decrease in machine performance may occur due to a decrease in air density. When operating a machine at high temperatures, a decrease in machine performance and an increase in engine coolant temperature may occur. Contact the local Caterpillar dealer for operation under abnormal conditions.

4.1.4 Shut-Down Procedure

When parking the telehandler, park in a safe location on flat level ground and away from other equipment and/or traffic lanes.

1. Apply park brake.
2. Shift transmission to “Neutral”.
3. Lower forks or attachment to ground.
4. Operate engine at low idle for 3 to 5 minutes. **DO NOT over rev engine.**
5. Shut off engine and remove ignition key.
6. Exit telehandler properly.



7. During machine shutdown, purge indicator (**1**) will illuminate until DEF is purged from the system. Do not turn key (**2**) to off while indicator is illuminated.
8. Turn off electrical master switch.
9. Block wheels (if necessary).

4.2 ACTIVE REGENERATION (SN A5300150 TO PRESENT, SN A5700150 TO PRESENT, SN A5500150 TO PRESENT)

When an active regeneration is in progress, the Regeneration Active Indicator (**2**) will illuminate. Active regenerations will occur approximately every 60 hours but could occur more often with some work cycles.

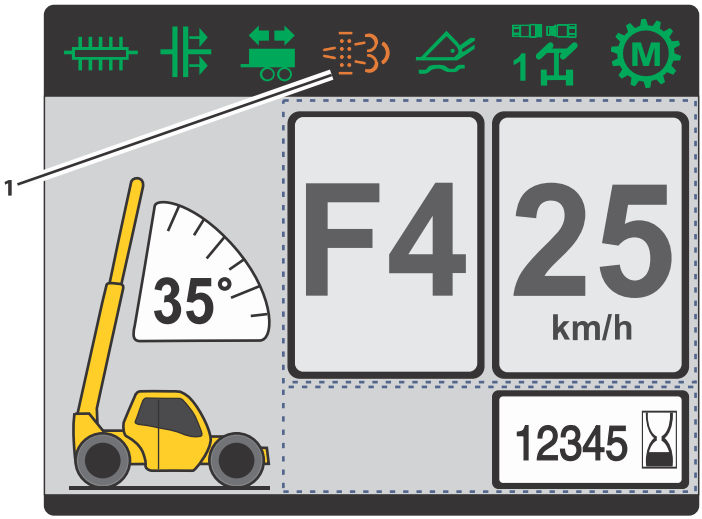
When the Regeneration Active Indicator illuminates, the operator may continue the normal work cycle. The regeneration can complete during normal use in most work cycles.

If the Regeneration Active Indicator (**2**) has illuminated more than once within a short period of time or the Diesel Particulate Filter (DPF) Indicator (**1**) illuminates, this indicates that the normal work cycle is not allowing the generation of sufficiently high exhaust temperatures to complete the regeneration. When the Regeneration Active Indicator illuminates again, park the machine to allow the elevated idle process to complete the regeneration.

Note: If the machine is parked while running during a regeneration already in progress or if a regeneration initiates while the machine is already parked while running, the engine speed may increase to 1800–2000 rpm after approximately 1 minute not in use.

In order to initiate an elevated idle regeneration, ensure all stationary conditions are met.

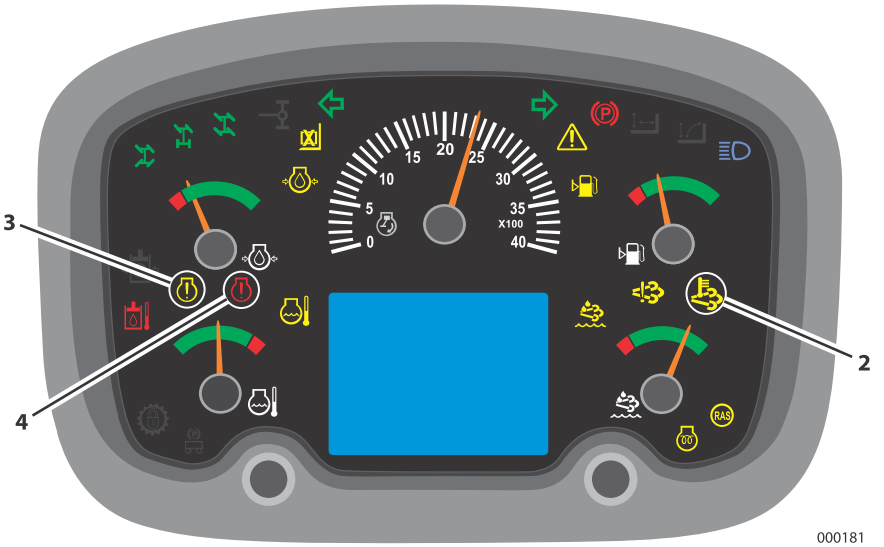
1. Move telehandler to a level area free of flammables and people that could be exposed to hot exhaust.
2. Keep engine warm (coolant temperature above 65° C) and at idle speed and ensure no engine system faults are active.
3. Shift transmission to neutral, retract and lower boom and engage park brake.



4.2.1 Elevated Idle Regeneration

⚠ WARNING

HIGH EXHAUST TEMPERATURE. Keep flammables and people away from hot exhaust.



1. Regeneration Active Indicator (**2**) will illuminate during elevated idle regeneration.

Note: Do not operate boom controls, park brake or accelerator pedal during regeneration. Elevated idle regeneration will stop and may be incomplete if any controls are inadvertently moved or activated.

2. Regeneration takes approximately 30– 50 minutes. Elevated idle regeneration is complete when the Regeneration Active Indicator (**2**) goes off and the engine speed reduces to approximately 900 rpm (low idle).

NOTICE

EQUIPMENT DAMAGE. If regeneration attempts are not allowed to complete, Engine Fault Warning (**3**) and then Engine Fault Critical (**4**) Indicators will illuminate, and progressively increasing limitations will be placed on engine operation. These limitations include engine speed reduction to low idle speed and torque reductions until eventually a service call is required and, ultimately, the engine will be permanently locked at low idle speed. Eventually the DPF soot load will be unrecoverable and will need to be replaced. If a machine must be moved while the engine is locked at low idle speed, a quick key cycle will allow the machine to be moved for a short time, but available torque will be reduced progressively until there is a 100% torque reduction.

4.3 OPERATING WITH A NON-SUSPENDED LOAD

4.3.1 Lift Load Safely

- You must know weight and load center of every load you lift. If you are not sure of weight and load center, check with your supervisor or with supplier of the material.

⚠ WARNING

TIP OVER HAZARD. Exceeding lift capacity of the telehandler could damage the equipment and/or cause tip over.

- Know rated load capacities (refer to *Section — Attachments and Hitches*) of telehandler to determine operating range in which you can safely lift, transport and place a load.

4.3.2 Picking Up a Load

- Note conditions of the terrain. Adjust travel speed and reduce amount of load if conditions warrant.
- Avoid lifting double-tiered loads.
- Make sure load is clear of any adjacent obstacles.
- Adjust spacing of forks so they engage the pallet or load at maximum width. See *Section — Adjusting/Moving Forks*.
- Approach load slowly and squarely with fork tips straight and level. **NEVER** attempt to lift a load with just one fork.
- **NEVER** operate telehandler without a proper and legible capacity chart in operator cab for telehandler/attachment combination you are using.

4.3.3 Transporting a Load

- After engaging the load and resting it against the backrest, tilt the load back to position it for travel. Travel in accordance with the requirements set forth in *Section — General Safety Practice* and *Section — Attachments and Hitches*.

4.3.4 Leveling Procedure

1. Position machine in best location to lift or place load.
2. Apply parking brake and shift transmission to NEUTRAL.
3. Observe level indicator(s) to determine whether machine must be leveled prior to lifting load.
4. Reposition machine to level.

Important things to remember:

- Never raise boom/attachment more than 1,2 m (4 ft) above ground unless telehandler is level.
  (AUS - Never raise the forks more than 300 mm (11.8 in) above ground surface unless telehandler is level.)
- Combination of frame leveling and load could cause telehandler to tip over.

4.3.5 Placing a Load

Before placing any load be sure that:

- Landing point can safely support weight of the load.
- Landing point is level; front to back and side to side.
- Use capacity chart to determine safe boom extension range. See *Section — Use of Capacity Chart*.
- Align forks at level the load is to be placed, then position boom slowly until load is just above area where it is to be placed.
- Lower the boom until the load rests in position and the forks are free to retract.

4.3.6 Disengaging a Load

Once the load has been placed safely at the landing point, proceed as follows:

1. With forks free from weight of load, boom can be retracted.
2. Lower carriage.
3. Telehandler can now be driven from landing location to continue work.

4.4 OPERATING WITH A SUSPENDED LOAD

4.4.1 Lift Load Safely

- You must know weight and load center of every load you lift. If you are not sure of weight and load center, check with your supervisor or with supplier of the material.

⚠ WARNING

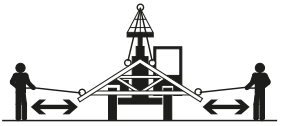
TIP OVER HAZARD. Exceeding lift capacity of the telehandler could damage the equipment and/or cause tip over.

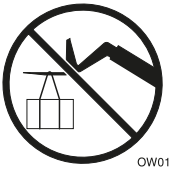
- Know rated load capacities (refer to *Section — Attachments and Hitches*) of telehandler to determine operating range in which you can safely lift, transport and place a load.

4.4.2 Picking Up a Suspended Load

- Note conditions of terrain. Adjust travel speed and reduce amount of load if conditions warrant.
- Avoid lifting double-tiered loads.
- Make sure load is clear of any adjacent obstacles.
- **NEVER** operate telehandler without a proper and legible capacity chart in operator cab for telehandler/attachment combination you are using.
- Only use approved lifting devices rated for lifting of load.
- Identify proper lifting points of load, taking into consideration center of gravity and load stability.
- Ensure to always properly tether loads to restrict movement.
- Refer to *Section — Use of Capacity Chart* for proper lifting guidelines in addition to appropriate capacity chart in operator cab.

4.4.3 Transporting a Suspended Load





- Travel in accordance with the requirements set forth in *Section — General Safety Practices* and *Section — Attachments and Hitches*.
- For additional requirements, refer to appropriate capacity chart in operator cab.

Important things to remember:

- Ensure boom is fully retracted.
- Never raise load more than 300 mm (11.8 in) above ground surface or boom more than 45°.
- Combination of frame leveling and load could cause telehandler to tip over.
- Guide persons and operator must remain in constant communication (verbal or hand) and be in visual contact with operator at all times.
- Never place guide persons between suspended load and telehandler.
- Only transport load at walking speed, 1.4 kph (0.9 mph), or less.

4.4.4 Leveling Procedure

1. Position machine in best location to lift or place load.
2. Apply parking brake and shift transmission to NEUTRAL.
3. Observe level indicator(s) to determine whether machine must be leveled prior to lifting load.
4. Reposition machine to level.

4.4.5 Placing a Suspended Load

Before placing any load be sure that:

- Landing point can safely support weight of load.
- Landing point is level; front to back and side to side.
- Use capacity chart to determine safe boom extension range. See *Section — Use of Capacity Chart*.
- Align load at level the load is to be placed, then position boom slowly until load is just above area where it is to be placed.
- Ensure that guide persons and operator remain in constant communication (verbal or hand) when placing load.

4.4.6 Disengaging a Suspended Load

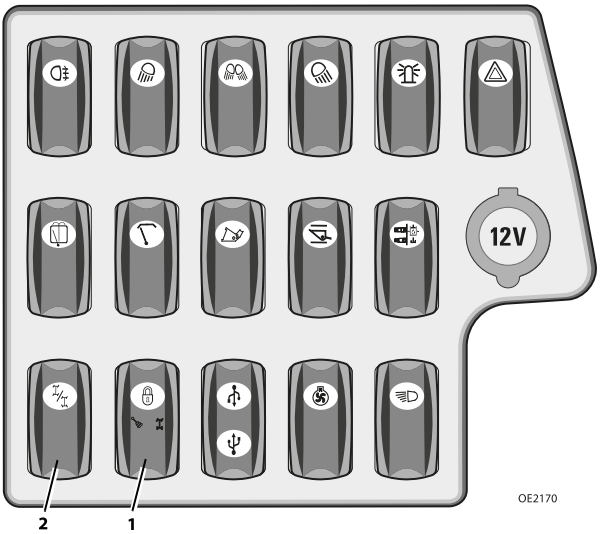
- Never place guide persons between suspended load and telehandler.
- Once at destination of load, ensure to bring telehandler to a complete stop and apply park brake prior to disengagement of lifting devices and tethers.

4.5 ROAD OPERATION (CE/UKCA)

1. Preparation
   a. Remove load from attachment.
   b. Remove any large amounts of dirt from machine.
   c. Check lights and mirrors and adjust if necessary.

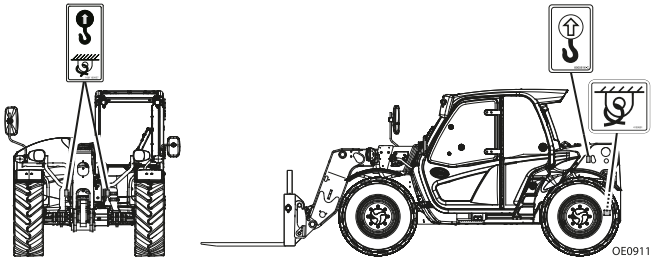
Note: Be sure to follow all local and federal/provincial traffic regulations.

2. Lower boom. Lowest part of attachment should be approximately 30 cm (12 in) above the ground.
3. Fully tilt attachment back.
4. Place protective shield over front bucket edge: remove or reposition carriage forks toward the machine and secure to the carriage.



5. Depress button (**1**) to deactivate joystick function and disable all joystick controlled functions.
6. Changes steer mode to front wheel steer (**2**). See *Section — Steer Modes* for details.
7. Machine is now ready for road operation.

4.6 LOADING AND SECURING FOR TRANSPORT



4.6.1 Tie Down

1. Level telehandler prior to loading.
2. Using a spotter, load telehandler with boom as low as possible.
3. Once loaded, apply parking brake and lower boom until boom or attachment is resting on deck. Move all controls to “Neutral,” stop engine and remove ignition key.
4. Secure machine to deck by passing chains through designated tie down points as shown in figure.
5. Do not tie down front of boom.

Note: User assumes all responsibility for choosing proper method of transportation and tiedown devices, making sure equipment used is capable of supporting weight of vehicle being transported and that all manufacturer’s instructions and warnings, regulations and safety rules of their employer, Department of Transportation and/or any other local, state or federal/ provincial laws are followed.

⚠ WARNING

TELEHANDLER SLIDE HAZARD. Before loading telehandler for transport, make sure deck, ramps and telehandler wheels are free of mud, snow and ice. Failure to do so could cause telehandler to slide.

4.6.2 Lifting

- When lifting machine, it is very important that the lifting device and equipment is attached only to designated lifting points. If machine is not equipped with lifting lugs contact the local Caterpillar dealer for information.
- Make adjustments to the lifting device and equipment to ensure the machine will be level when elevated. The machine must remain level at all times while being lifted.
- Ensure that the lifting device and equipment is adequately rated and suitable for the intended purpose. See *Section - Specifications* for machine weight or weigh machine.
- Remove all loose items from machine prior to lifting.
- Lift machine with smooth, even motion. Set machine down gently. Avoid quick or sudden motions that could cause shock loads to machine and/or lifting devices.

SECTION 5
Attachments and Hitches

5.1 APPROVED ATTACHMENTS

To determine if an attachment is approved for use on the specific telehandler you are using, perform the following prior to installation.

- The attachment type, weight, dimensions and load center must be equal to or less than the data shown on a capacity chart located in the operator cab.
- The model on the capacity chart must match the model telehandler being used.
- Hydraulically powered attachments must only be used on machines equipped with auxiliary hydraulics.
- Hydraulically powered attachments that require auxiliary electrics must only be used on machines equipped with auxiliary hydraulics and electrics.

If any of the above conditions are not met, do not use the attachment. The telehandler may not be equipped with the proper capacity chart or the attachment may not be approved for the model telehandler being used. Contact the local Caterpillar dealer for further information.

5.2 UNAPPROVED ATTACHMENTS

Do not use unapproved attachments for the following reasons:

- Range and capacity limitations for “will fit,” homemade, altered, or other non-approved attachments cannot be established.
- An overextended or overloaded telehandler can tip over with little or no warning and cause serious injury or death to the operator and/or those working nearby.
- The ability of a non-approved attachment to perform its intended function safely cannot be assured.

⚠ WARNING

Use only approved attachments. Attachments which have not been approved for use with your telehandler could cause machine damage or an accident.

5.3 JLG SUPPLIED ATTACHMENTS

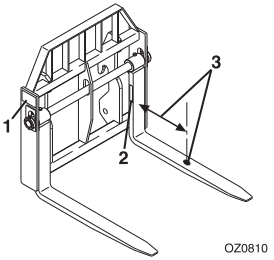
Attachment	Part Number	TH357		TH408		TH3510	
		CE/ UKCA	AUS	CE/ UKCA	AUS	CE/ UKCA	AUS
Carriage, 1225 mm (48 in)	326-2013	X	X	X	X	X	X
Carriage, 1524 mm (60 in)	474-0135	X	X	X	X	X	X
Carriage, 1829 mm (72 in)	474-0136	X	X	X	X	X	X
Carriage, John Deere	513-7381	X		X		X	
Carriage, Manitou	487-0690	X		X		X	
Carriage, JCB	346-2975	X		X		X	
Fork Positioning Carriage 1270 mm (50 in)	479-0237	X	X	X	X	X	X
Fork Rotator Carriage 990 mm (39 in)	515-1158						X
Fork Rotator Carriage 1270 mm (50 in)	456-0454	X	X	X	X	X	X
Side Tilt Carriage 1200 mm (47.2 in)	231-3229	X	X	X	X	X	X
Side Tilt Carriage 1829 mm (72 in)	227-5748	X	X	X	X	X	X
Side Shift Carriage 1200 mm (47.2 in)	222-6210	X	X	X	X	X	X
Carriage, FEM	486-0527	X	X	X	X	X	X
Fork, Pallet 50x100x1200 mm (2x4x47.2 in)	326-1997	X		X		X	
Fork, Pallet 50x120x1250 mm (2x4.7x49.2 in)	364-5356	X		X		X	
Fork, Pallet 60x100x1200 mm (2.4x4x47.2 in)	326-1998	X	X	X	X	X	X

Attachment	Part Number	TH357		TH408		TH3510	
		CE/ UKCA	AUS	CE/ UKCA	AUS	CE/ UKCA	AUS
Fork, Pallet 50x100x1070 mm (2x4x42.1 in)	463-1675	X		X		X	X
Fork, Pallet 50x100x1525 mm (2x4x60 in)	252-1456	X		X		X	
Fork, Pallet 60x100x1524 mm (2.4x4x60 in)	559-1414	X		X	X	X	X
Fork, Block 50x50x1220 mm (2x2x48 in)	485-7240	X	X	X	X	X	X
Fork, Lumber 40x150x1540 mm (1.6x5.9x60 in)	497-6985	X	X	X	X	X	X
Fork, Lumber 45x150x1540 mm (1.75x6x60 in)	525-9244	X	X	X	X	X	X
Fork Extension 50x100 mm (2x4 in)	485-7238	X		X		X	
Fork Extension 60x100 mm (2.4x4 in)	491-1372		X		X		X
Pipe Grapple	486-0526	X	X	X	X	X	X
Bale, Dual Tine, 1225 mm (48 in)	517-6817	X	X	X	X	X	X
Bale Handler, Spike	609-8452	X	X	X	X	X	X
Bale Handler, Clamp	609-8453	X	X	X	X	X	X
Bucket, Fork Mounted 1524 mm-1,0 m^3 (60 in-1.3 yd^3)	580-3544	X	X	X	X	X	X
Bucket, General Purpose 2450 mm-1,0 m^3 (96.5 in-1.3 yd^3)	456-0498	X	X	X	X	X	X
Bucket, General Purpose 2438 mm-1,5 m^3 (96.0 in-2.0 yd^3)	456-0507	X	X	X	X	X	X
Bucket with Teeth 1,0 m^3 (1.3 yd^3)	474-2537	X	X	X	X	X	X

Attachment	Part Number	TH357		TH408		TH3510	
		CE/ UKCA	AUS	CE/ UKCA	AUS	CE/ UKCA	AUS
Bucket, Light Material 2,0 m^3 (2.6 yd^3)	220-4759	X	X	X	X	X	X
Bucket, Light Material 2,5 m^3 (3.3 yd^3)	220-4760	X	X	X	X	X	X
Bucket, Light Material 3,0 m^3 (3.9yd^3)	220-4761	X	X	X	X	X	X
Bucket, Multi-Purpose 1,0 m^3 (1.3 yd^3)	486-0141	X	X	X	X	X	X
Concrete Bucket Mixer, 500 L	474-2534	X	X	X	X	X	X
Grapple, Multi-Purpose Grapple 0,8 m^3 (1.0 yd^3)	509-4664	X	X	X	X	X	X
Bucket, Manure Grapple 1,55 m^3 (2.0 ^{3})	509-4663	X		X		X	
Muck Fork, 2400 mm (94 in)	509-4662	X	X	X	X	X	X
Sweeper	486-0528	X	X	X	X	X	X
Auger	491-9892	X	X	X	X	X	X
Truss Boom, 2,1 m (6.9 ft)	479-0239	X	X	X	X	X	X
Truss Boom, 3,7 m (12.1 ft)	474-0144	X	X	X	X	X	X
Truss Boom, 4,0 m (13.1 ft)	456-0473	X	X	X	X	X	X
Truss Boom, Adjustable 2,0 - 4,0 m (6.6 - 13.1 ft)	229-9714	X		X		X	
Truss Boom w/Winch 1 m (3.3 ft)	491-9893	X		X		X	
Truss Boom w/Winch 3.7 m (12.1 ft)	474-0147	X		X		X	
Truss Boom, Adjustable, Fork Mounted	549-5456	X	X	X	X	X	X
Coupler Mounted Hook	456-0465	X	X	X	X	X	X
Fork Mounted Hook	309-9182	X		X		X	

Attachment	Part Number	TH357		TH408		TH3510	
		CE/ UKCA	AUS	CE/ UKCA	AUS	CE/ UKCA	AUS
Trash Hopper, Fork Mounted	560-2573	X	X	X	X	X	X
Silage Defacer	614-9588	X	X	X	X		

5.4 TELEHANDLER/ATTACHMENT/FORK CAPACITY



Prior to installing attachment, verify it is approved and telehandler is equipped with proper capacity chart. See *Section — Approved Attachments*.

To determine maximum capacity of telehandler and attachment, use the **smallest** of the following capacities:

- Capacity stamped on attachment identification plate (**1**).
- Fork capacities and load centers are stamped on the side of each fork (**2**) (if equipped). This rating specifies maximum load capacity that the individual fork can safely carry at maximum load center (**3**). Total attachment capacity is multiplied by number of forks on attachment (if equipped), up to maximum capacity of attachment.
- Maximum capacity as indicated on the proper capacity chart. See *Section — Approved Attachments*.
- When load rating of telehandler differs from capacity of the forks or attachment, the lower value becomes the overall load capacity.

Use the proper capacity chart to determine maximum capacity at various machine configurations. Lifting and placing a load may require use of more than one capacity chart based on machine configuration.

Other than block forks, all forks should be used in matched pairs, block forks used in matched sets.

⚠ WARNING

Never use an attachment without the appropriate manufacturer approved capacity chart installed on the telehandler.

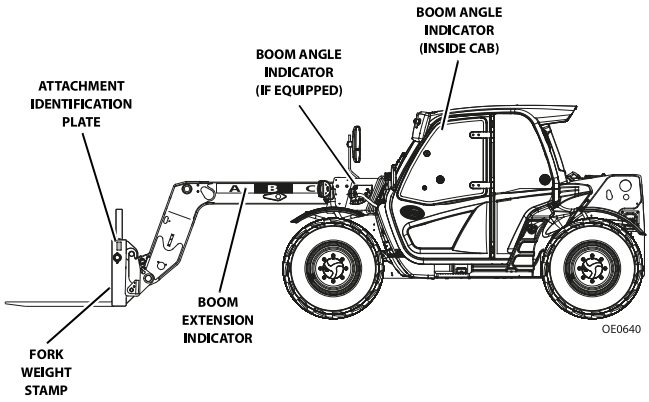
5.5 USE OF THE CAPACITY CHART

To properly use capacity chart (see *Section — Sample Capacity Chart (CE/UKCA), page 126*) operator must first determine and/or have the following:

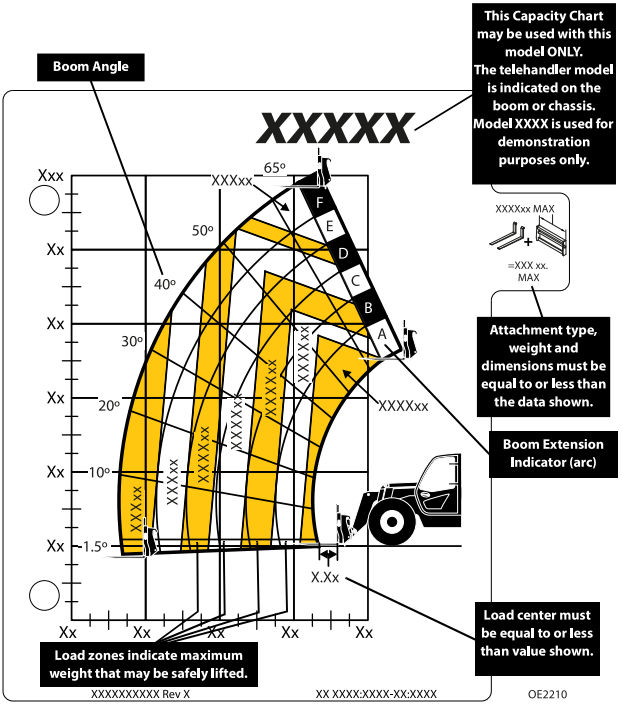
1. An approved attachment. See *Section — Approved Attachments*.
2. Proper Capacity Chart(s).
3. Weight of load being lifted
4. Load placement information:
   a. HEIGHT where load is to be placed.
   b. DISTANCE from front tires of telehandler where load is to be placed.
5. On capacity chart, find the line for height and follow it over to distance.
6. Number in load zone where the two cross is the maximum capacity for this lift. If the two cross at a division between zones, the smaller number must be used.

The number in load zone must be equal to or greater than weight of load to be lifted. Determine limits of load zone on capacity chart and keep within these limits.

5.5.1 Capacity Indicator Locations



5.5.2 Sample Capacity Chart (CE/UKCA)

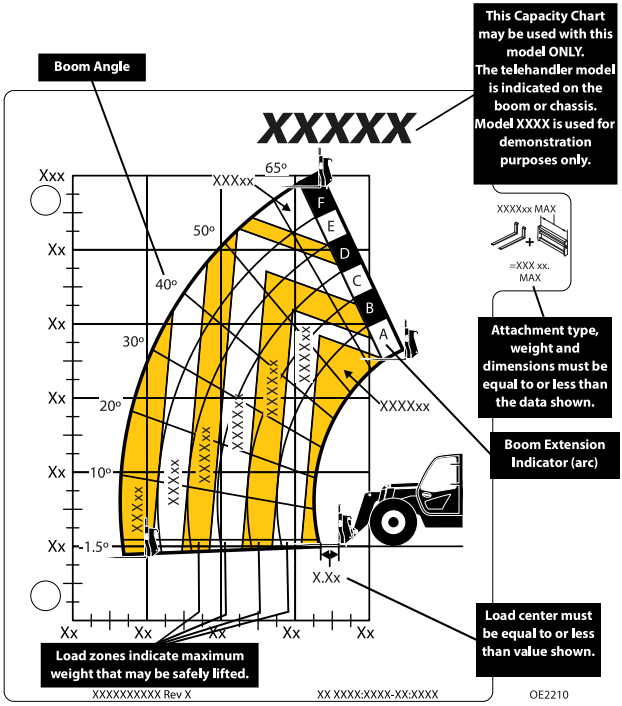


Note: This is sample capacity chart **only! DO NOT** use this chart, use the one located in your operator cab.

⚠ WARNING

TIP OVER HAZARD. All loads shown on rated capacity chart are based on machine being on firm ground with frame level (see *Section — Levelling Procedure* or *Section — Levelling Procedure*); the forks being positioned evenly on carriage; the load being centered on forks; proper size tires being properly inflated; and the telehandler being in good operating condition.

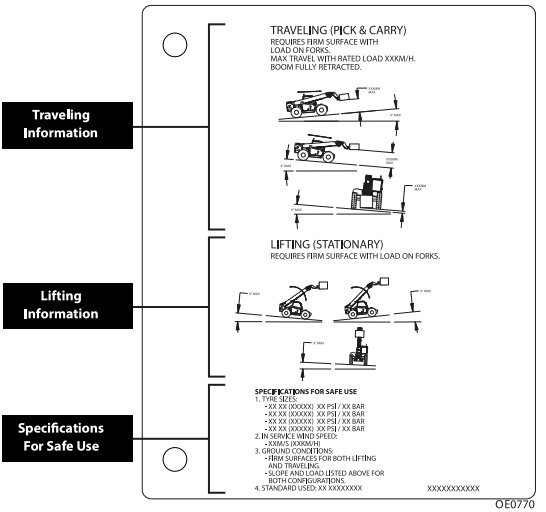
5.5.3 Sample Capacity Chart (AUS)



Note: This is sample capacity chart **only! DO NOT** use this chart, use the one located in your operator cab.

⚠ WARNING

TIP OVER HAZARD. All loads shown on rated capacity chart are based on machine being on firm ground with frame level (see *Section — Levelling Procedure* or *Section — Levelling Procedure*); the forks being positioned evenly on carriage; the load being centered on forks; proper size tires being properly inflated; and the telehandler being in good operating condition.



Note: This is a sample capacity chart **only! DO NOT** use this chart, use the one located in your operator cab.

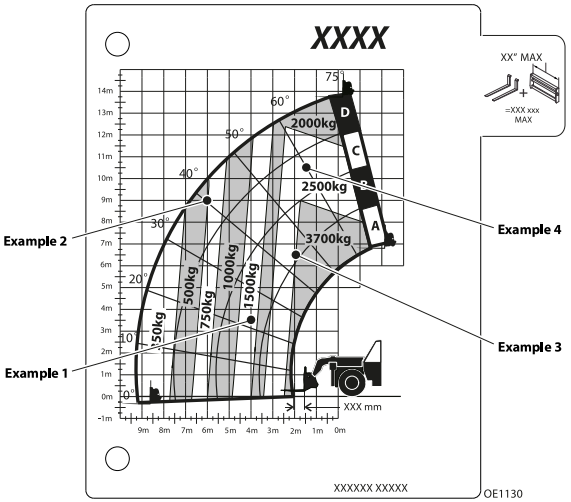
5.5.4 Example

A contractor owns a model xxxx telehandler with a fork carriage. The contractor knows this attachment may be used with his model since:

- The attachment style, weight, dimensions and load center match the attachment data on the capacity chart.
- The capacity chart is clearly marked for model xxxx and corresponds with machine configuration being used.

Below are examples with various conditions the contractor may encounter and whether or not the load may be lifted.

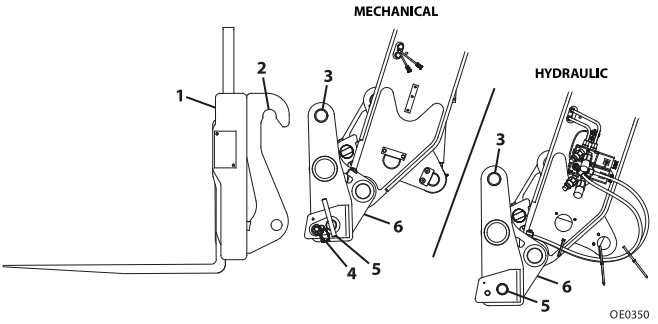
	Load Weight	Distance	Height	OK to Lift
1	1250 kg (2755 lb)	4,0 m (13.1 ft)	3,5 m (11.5 ft)	Yes
2	750 kg (1653 lb)	6,0 m (19.7 ft)	9,0 m (29.5 ft)	NO
3	2500 kg (5512 lb)	2,0 m (6.6 ft)	6,5 m (21.3 ft)	Yes
4	3000 kg (6614 lb)	1,5 m (4.9 ft)	10,5 m (34.4 ft)	NO



Note: This is a sample capacity chart **only! DO NOT** use this chart, use the one located in your operator cab.

5.6 ATTACHMENT INSTALLATION

5.6.1 Coupler



1. **Attachment**
2. **Attachment Pin Recess**
3. **Attachment Pin**
4. **Retainer Pin** (mechanical coupler)
5. **Lock Pin**
6. **Coupler** (attachment tilt control in cab, see *Section — Joystick*)

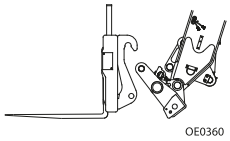
⚠ WARNING

CRUSH HAZARD. Always be certain that carriage or attachment is properly positioned on boom and is secured by lock pin and retainer pin. Failure to ensure proper installation could permit carriage/attachment/load to disengage.

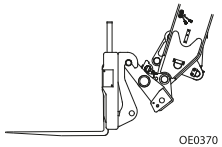
Mechanical Coupler

This installation procedure is designed for one-person operation. Prior to exiting cab, perform *Section — Shut-Down Procedure*.

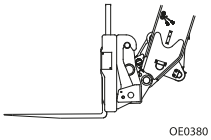
1. Tilt coupler forward to provide clearance. Check to be sure lock pin and retainer pin is out.


OE0360

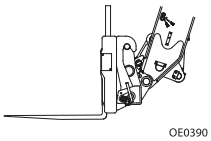
2. Align attachment pin with recess in attachment. Raise boom slightly to engage attachment pin in recess.


OE0370

3. Tilt coupler back to engage attachment.


OE0380

4. Insert lock pin and secure with retainer pin.

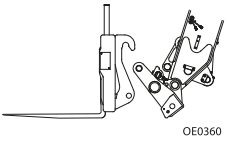

OE0390

5. If attachment is equipped, connect auxiliary hydraulic hoses. See *Section — JD Coupler, page 134*.

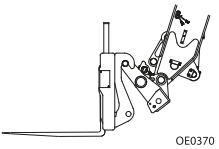
Hydraulic Coupler

This installation procedure is designed for one-person operation.

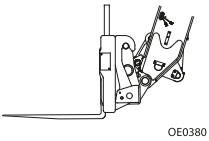
1. Tilt coupler forward to provide clearance. Check to be sure lock pin is disengaged.



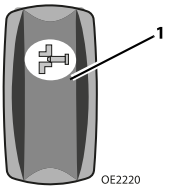
2. Align attachment pin with recess in attachment. Raise boom slightly to engage attachment pin in recess.

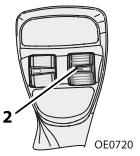


3. Tilt coupler back to engage attachment.

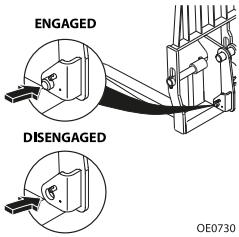


4. Press and hold coupler switch (**1**) on left control panel. At the same time, press roller switch (**2**) up to engage lock pin. Press roller switch (**2**) down to disengage lock pin.



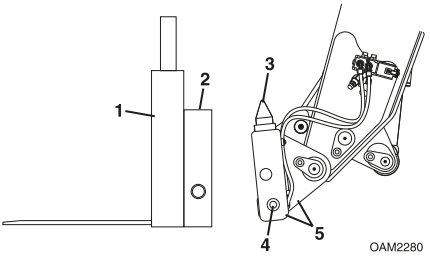


5. Raise boom to eye level and visually check that the lock pin protrudes through the hole. If the pin does not protrude through the hole, place the attachment on the ground and return to step 2.



6. If attachment is equipped, connect auxiliary hydraulic hoses. See *Section — JD Coupler, page 134*.

5.6.2 JD Coupler



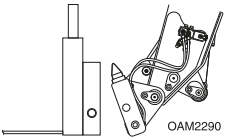
1. **Attachment**
2. **Attachment Point Opening**
3. **Coupler Point**
4. **Lock Pin**
5. **JD Coupler** (attachment tilt control in cab, see *Section — Joystick*)

⚠ WARNING

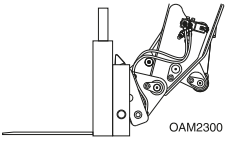
CRUSH HAZARD. Always be certain that carriage or attachment is properly positioned on boom and is secured by lock pin. Failure to ensure proper installation could permit carriage/attachment/load to disengage.

This installation procedure is designed for one-person operation.

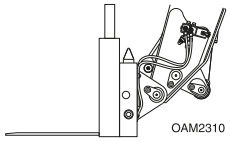
1. Tilt coupler forward to provide clearance. Check to be sure lock pin is disengaged.



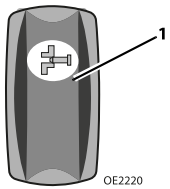
2. Align coupler point with opening in attachment. Raise boom slightly to engage coupler point in opening.

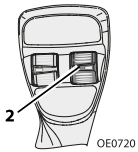


3. Tilt coupler back to engage attachment.



4. Press and hold the coupler switch (**1**) on left control panel. At the same time, press roller switch (**2**) up to engage lock pin. Press roller switch (**2**) down to disengage lock pin.

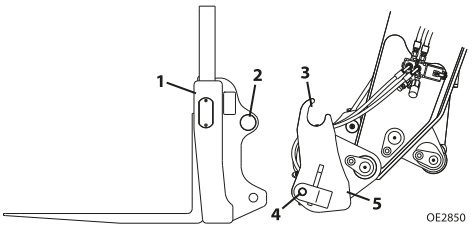




5. Raise boom to eye level and visually check that the lock pin protrudes through the attachment hole. If the pin does not protrude through the attachment hole, place the attachment on the ground and return to step 2.

6. If attachment is equipped, connect auxiliary hydraulic hoses. See *Hydraulic Operated Attachment, page 140*.

5.6.3 Manitou Coupler



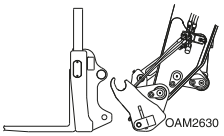
1. **Attachment**
2. **Attachment Pin**
3. **Attachment Pin Recess**
4. **Lock Pin**
5. **Manitou Coupler** (attachment tilt control in cab, see *Section — Joystick*)

⚠ WARNING

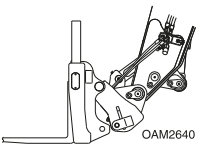
CRUSH HAZARD. Always be certain that carriage or attachment is properly positioned on boom and is secured by lock pin. Failure to ensure proper installation could permit carriage/attachment/load to disengage.

This installation procedure is designed for one-person operation.

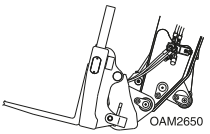
1. Tilt coupler forward to provide clearance. Check to be sure lock pin is disengaged.



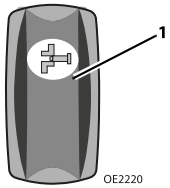
2. Align attachment pin recess with attachment pin. Raise boom slightly to engage attachment pin in recess.

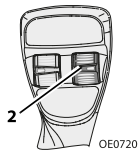


3. Tilt coupler back to engage attachment.



4. Press and hold the coupler switch (**1**) on left control panel. At the same time, press roller switch (**2**) up to engage lock pin. Press roller switch (**2**) down to disengage lock pin.

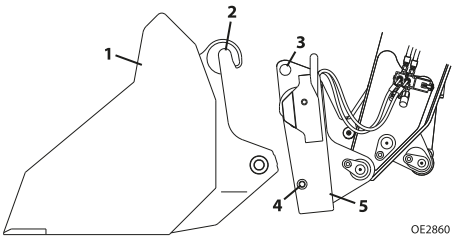




5. Raise boom to eye level and visually check that the lock pin protrudes through the attachment hole. If the pin does not protrude through the attachment hole, place the attachment on the ground and return to step 2.

6. If attachment is equipped, connect auxiliary hydraulic hoses. See *Hydraulic Operated Attachment, page 140*.

5.6.4 JCB Coupler



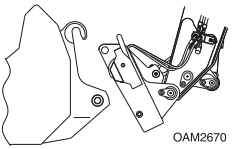
1. **Attachment**
2. **Attachment Pin Recess**
3. **Attachment Pin**
4. **Lock Pin**
5. **JCB Coupler** (attachment tilt control in cab, see *Section — Joystick*)

⚠ WARNING

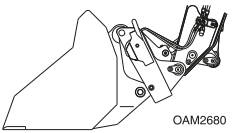
CRUSH HAZARD. Always be certain that carriage or attachment is properly positioned on boom and is secured by lock pin. Failure to ensure proper installation could permit carriage/attachment/load to disengage.

This installation procedure is designed for one-person operation.

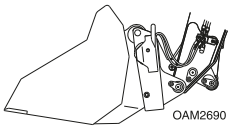
1. Tilt coupler forward to provide clearance. Check to be sure lock pin is disengaged.



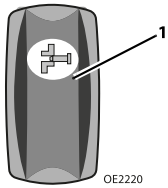
2. Align attachment pin with recess in attachment. Raise boom slightly to engage attachment pin in recess.

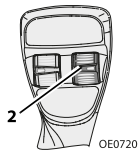


3. Tilt coupler back to engage attachment.



4. Press and hold the coupler switch (**1**) on left control panel. At the same time, press roller switch (**2**) up to engage lock pin. Press roller switch (**2**) down to disengage lock pin.

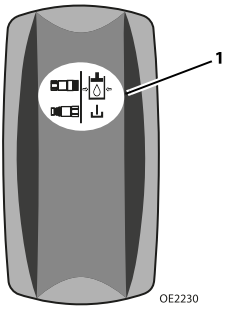


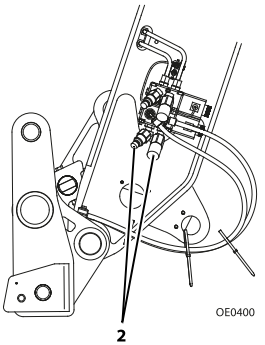


5. Raise boom to eye level and visually check that the lock pin protrudes through the attachment hole. If the pin does not protrude through the attachment hole, place the attachment on the ground and return to step 2.

6. If attachment is equipped, connect auxiliary hydraulic hoses. See *Hydraulic Operated Attachment, page 140*.

5.6.5 Hydraulic Operated Attachment





1. Install attachment (see *Section — Attachment Installation*).
2. Lower attachment to ground.
3. Press and hold auxiliary decompression switch (**1**) on right control panel for three seconds to relieve pressure at both auxiliary fittings (**2**).

Note: Auxiliary decompression procedure will decompress the currently active front auxiliary hydraulics circuit, either #1 or #2 (if dual front auxiliary equipped).

4. Perform *Section - Shut-Down Procedure*.
5. Connect attachment hoses to both auxiliary fittings.

5.7 ADJUSTING/MOVING FORKS

Carriages may have different locations where forks can be positioned. Two different methods can be used for repositioning, depending upon carriage structure.

Note: Apply a light coating of appropriate lubricant to ease sliding of forks or fork bar.

To slide forks:

1. Ensure attachment is properly installed. See *Section — Attachment Installation*.
2. If equipped, loosen fork locking bolt.
3. Elevate attachment to approximately 1,5 m (5 ft) and tilt carriage forward until fork heel is free from attachment.
4. Stand at side of carriage. To slide fork toward center of carriage, push fork near fork eye. To slide fork toward edge of carriage, pull fork near fork eye. To avoid pinching, do not place fingers or thumb between fork and carriage structure.
5. If equipped, tighten fork locking bolt.

If removing fork bar is necessary:

1. Rest forks on ground.
2. If equipped, loosen fork locking bolt.
3. Remove fork bar.
4. Reposition forks.
5. Reinstall the fork bar and fork bar retaining mechanism(s).
6. If equipped, tighten fork locking bolt.

5.8 ATTACHMENT OPERATION

- Capacities and range limits for telehandler change depending on attachment in use.
- Separate attachment instructions must be kept in manual holder in cab with this Operation & Maintenance Manual. An additional copy must be kept with attachment if it is equipped with a manual holder.

Note: Operations described within this section reference the Lift joystick pattern. Refer to *Section — Loader Joystick Pattern, Page 52* if utilizing the Loader joystick pattern.

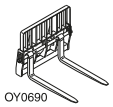
NOTICE

EQUIPMENT DAMAGE. Some attachments may contact front tires or machine structure when the boom is retracted and the attachment is rotated. Improper use of attachment may result in attachment or machine structural damage.

NOTICE

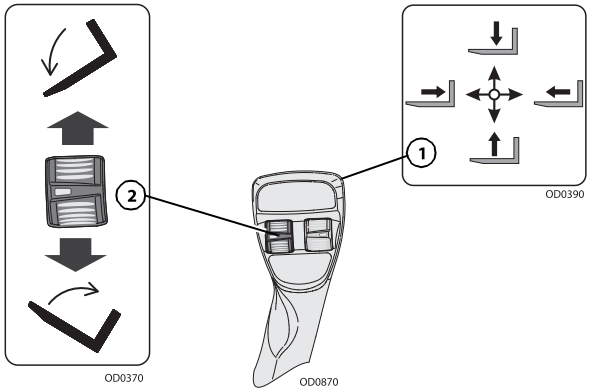
EQUIPMENT DAMAGE. Avoid contact with any structure or object when lifting a load. Maintain clearance around boom structure and load. Failure to maintain clearance may result in attachment or machine structural damage.

5.8.1 Carriage with Forks



Use Carriage Attachment Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls carriage tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

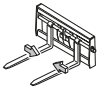
Installation Procedure:

Refer to *Section — Attachment Installation*.

Equipment Damage Precautions:

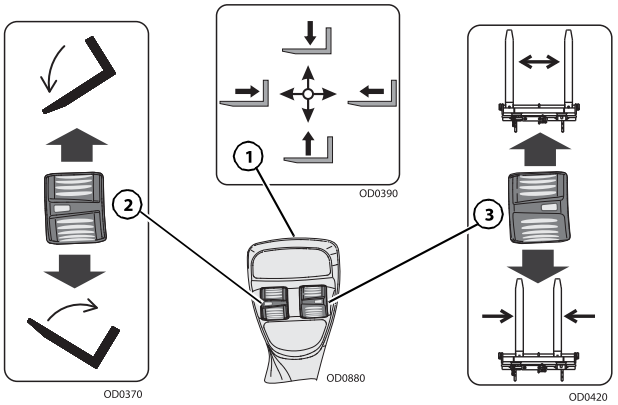
- Do not use forks as a lever to pry material. Excessive prying forces could damage forks or machine structure.
- Do not attempt to lift loads that are attached or connected to another object.

5.8.2 Fork Positioning Carriage


OZ3670

Use Fork Positioning Carriage Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls carriage tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Fork Position:

Roller switch (**3**) controls fork position.

- Press roller switch down to shift forks in.
- Press roller switch up to shift forks out.

Installation Procedure:

Refer to *Section — Attachment Installation*.

⚠ WARNING

CRUSH HAZARD. Do not use rotation to push or pull objects or load. Failure to comply could cause object or load to fall.

Equipment Damage Precautions:

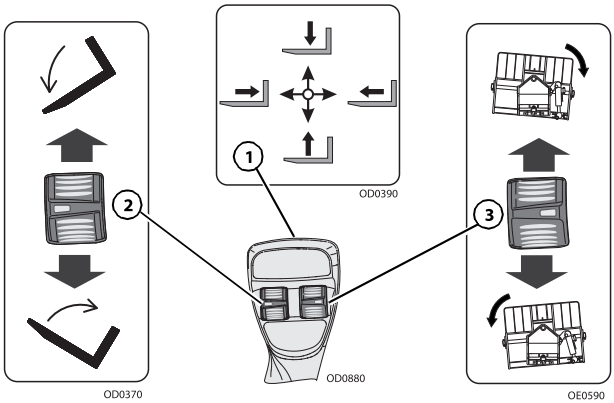
- Do not use forks as a lever to pry material. Excessive prying forces could damage forks or machine structure.
- Do not attempt to lift loads that are attached or connected to another object.

5.8.3 Side Tilt Carriage and Fork Rotator Carriage


OAL1550

Use Appropriate Side Tilt Carriage or Fork Rotator Carriage Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls carriage tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Rotate:

Roller switch (**3**) controls carriage position.

- Press roller switch down to rotate left.
- Press roller switch up to rotate right.

Installation Procedure:

Refer to *Section — Attachment Installation*.

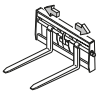
⚠ WARNING

CRUSH HAZARD. Do not use rotation to push or pull objects or load. Failure to comply could cause object or load to fall.

Equipment Damage Precautions:

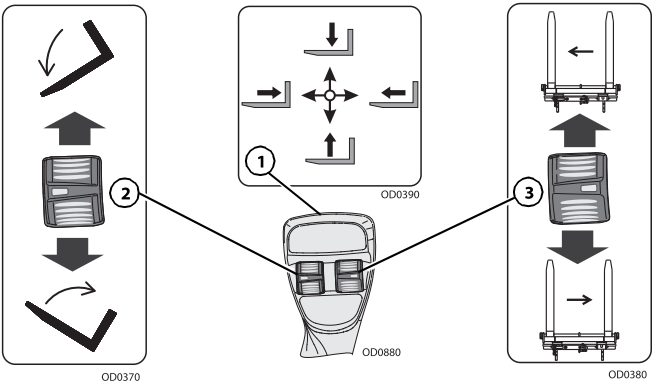
- Do not use forks as a lever to pry material. Excessive prying forces could damage forks or machine structure.
- Do not attempt to lift loads that are attached or connected to another object.

5.8.4 Side Shift Carriage


OAL1540

Use Side Shift Carriage Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls carriage tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Side Shift:

Roller switch (**3**) controls carriage side shift.

- Press roller switch down to shift forks right.
- Press roller switch up to shift forks left.

Installation Procedure:

Refer to *Section — Attachment Installation*.

⚠ WARNING

CRUSH HAZARD. Do not use side shift to push or pull objects or load. Failure to comply could cause object or load to fall.

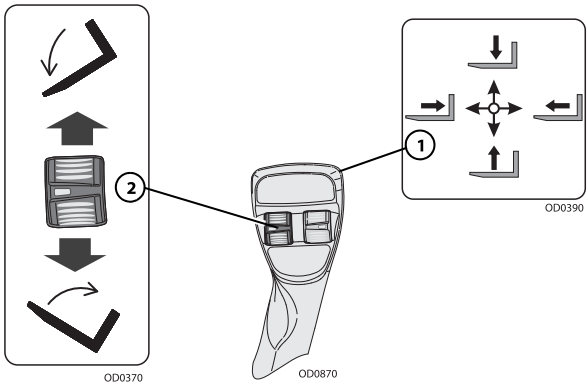
Equipment Damage Precautions:

- Do not use forks as a lever to pry material. Excessive prying forces could damage forks or machine structure.
- Do not attempt to lift loads that are attached or connected to another object.

5.8.5 Fork Extension

Use Appropriate Carriage Attachment Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*. The maximum capacity of the carriage when equipped with fork extensions may be reduced to the capacity indicated on the fork extensions. If the load exceeds the capacity of the fork extension, contact the local Caterpillar dealer to obtain forks and/or fork extensions of the proper load rating and length.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls carriage tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

Installation Procedure:

- Ensure carriage is properly installed. Refer to *Section — Attachment Installation*.
- Ensure length and cross section of the parent fork arm is equal to or exceeds the parent fork arm blade length stamped into the fork extension.
- Secure the fork extensions to the forks by sliding the fork extensions onto the parent forks and install the retaining pin behind the vertical shank of the fork.

Operation:

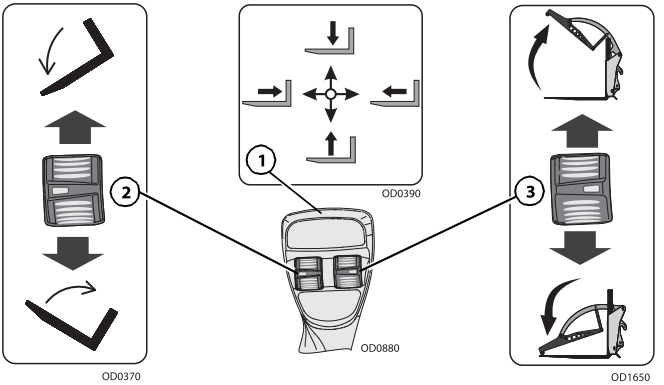
- Heavy part of load must be against carriage backrest.
- Do not allow load center of gravity to be in front of tip of the supporting fork.
- Do not pick up a load or pry materials with tip of fork extensions.

5.8.6 Pipe Grapple


OH5660

Use Pipe Grapple Attachment Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls pipe grapple tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Open/Close Pipe Grapple:

Roller switch (**3**) controls the open/close movement of the pipe grapple.

- Press roller switch down to close grapple.
- Press roller switch up to open grapple.

Installation Procedure:

Refer to *Section — Attachment Installation*.

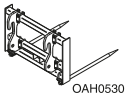
Operation:

- Raise or lower boom to appropriate height and open pipe grapple for loading material.
- Align and center telehandler with face of material.
- Drive slowly and smoothly into material for loading. Boom extension may be required for loading material.
- Center load on forks, tilt forks up far enough to retain load, close pipe grapple and back away.
- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- Open pipe grapple and unload material from forks.

Equipment Damage Precautions

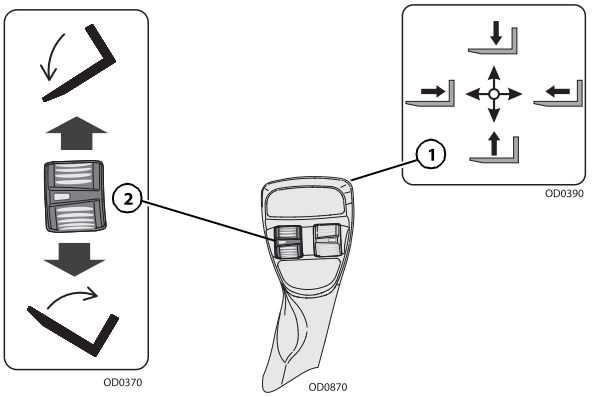
- Except for lifting or unloading material, the boom must be fully retracted for all operations.
- Do not use forks as a lever to pry material. Excessive prying forces could damage forks or machine structure.
- Do not use pipe grapple as a lever to pry material. Excessive prying forces could damage pipe grapple or machine structure.
- Do not attempt to load material which is hard or frozen. This could cause severe damage to coupler or machine structure.
- Do not attempt to lift loads that are attached or connected to another object.

5.8.7 Dual Tine Bale



Use Dual Tine Bale Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls pipe carriage tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

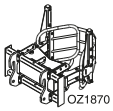
Installation Procedure:

Refer to *Section — Attachment Installation*.

Equipment Damage Precautions

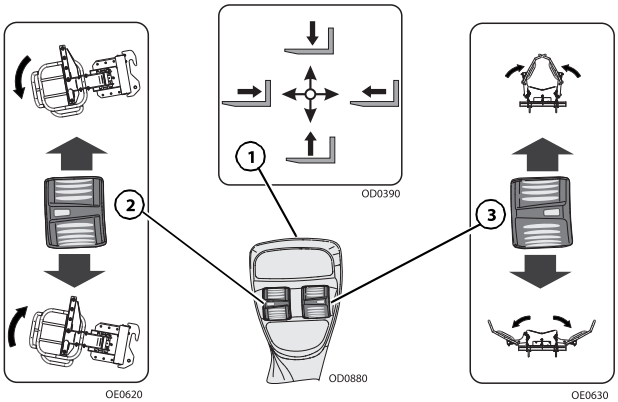
- Do not use forks as a lever to pry material. Excessive prying forces could damage forks or machine structure.
- Do not attempt to lift loads that are attached or connected to another object.

5.8.8 Bale Handler



Use Bale Handler Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls bale handler tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Open/Close Bale Handler:

Roller switch (**3**) controls the open/close movement of the bale handler.

- Press roller switch down to open bale handler.
- Press roller switch up to close bale handler.

Installation Procedure:

Refer to *Section — Attachment Installation*.

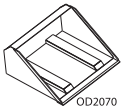
Operation:

- Travel in accordance with requirements set forth in *Section — General Safety Practices*.

Equipment Damage Precautions

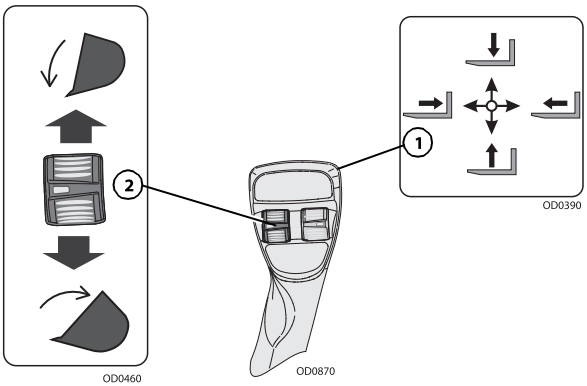
- Do not use bale handler as a lever to pry material. Excessive prying forces could damage the bale handler or machine structure.
- Do not attempt to load material which is hard or frozen. This could cause severe damage to coupler or machine structure.

5.8.9 Bucket - Fork Mounted



Use Appropriate Carriage Attachment Capacity Chart.

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick **(1)** controls movement of the boom.

Roller switch **(2)** controls bucket tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

Installation Procedure:

- Ensure carriage is properly installed. Refer to *Section — Attachment Installation*.
- Secure the fork mounted bucket to the forks by sliding the fork mounted bucket onto the parent forks and install the retaining pin behind the vertical shank of the fork.

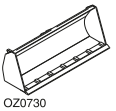
Operation:

- Raise or lower boom to appropriate height for loading material from stockpile.
- Align telehandler with face of stockpile and drive slowly and smoothly into pile to load bucket.
- Tilt bucket up far enough to retain load and back away from pile.
- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- Tilt bucket down to dump load.
- Fork mounted bucket weight must be included as part of total load being lifted.
- Do not use with mast carriage attachment.
- Do not use fork mounted bucket with attachments capable of rotating (i.e. side tilt and swing carriages) without disabling the rotation feature(s).

Equipment Damage Precautions

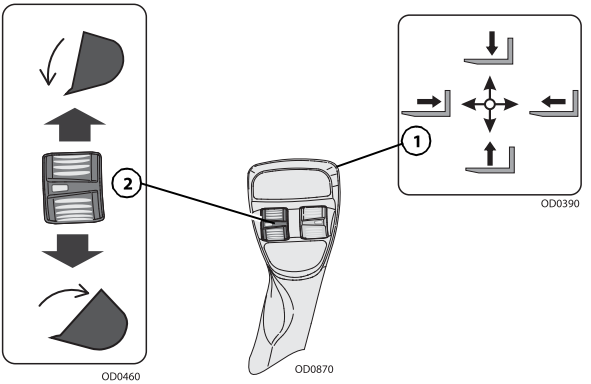
- Except for lifting or dumping a load, the boom must be fully retracted for all bucket operations.
- Do not corner-load bucket. Distribute material evenly within the bucket. Capacity charts are for evenly distributed loads only.
- Do not use bucket as a lever to pry material. Excessive prying forces could damage bucket or machine structure.
- Do not attempt to load material which is hard or frozen. This could cause severe damage to coupler or machine structure.
- Do not use bucket for "back dragging." This could cause severe damage to coupler and retraction cables/chains.

5.8.10 Bucket


OZ0730

Use Appropriate Bucket Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls bucket tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

Installation Procedure:

Refer to *Section — Attachment Installation*.

Operation:

- Raise or lower boom to appropriate height for loading material from stockpile.
- Align telehandler with face of stockpile and drive slowly and smoothly into pile to load bucket.
- Tilt bucket up far enough to retain load and back away from pile.
- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- Tilt bucket down to dump load.

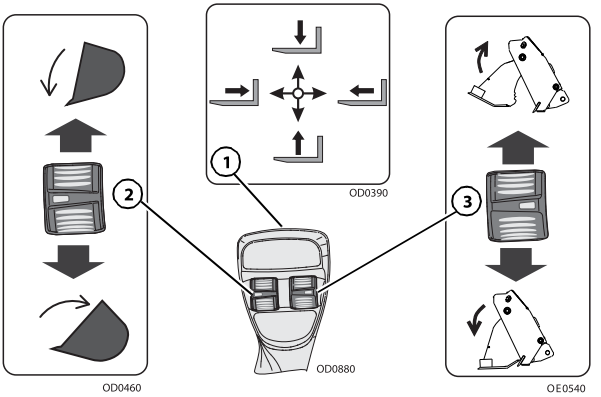
Equipment Damage Precautions

- Except for lifting or dumping a load, the boom must be fully retracted for all bucket operations.
- Do not corner-load bucket. Distribute material evenly within the bucket. Bucket capacity charts are for evenly distributed loads only.
- Do not use bucket as a lever to pry material. Excessive prying forces could damage bucket or machine structure.
- Do not attempt to load material which is hard or frozen. This could cause severe damage to coupler or machine structure.
- Do not use bucket for "back dragging." This could cause severe damage to coupler and retraction cables/chains.

5.8.11 Multi-Purpose Bucket

Use Appropriate Multi-Purpose Bucket Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls bucket tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Open/Close Bucket:

The attachment auxiliary hydraulic roller switch (**3**) controls open/close movement of the bucket.

- Press roller switch down to close bucket.
- Press roller switch up to open bucket.

Installation Procedure:

Refer to *Section — Attachment Installation*.

Operation:

- Raise or lower boom to appropriate height and close bucket for loading material from stockpile.
- Align telehandler with face of stockpile and drive slowly and smoothly into pile to load bucket.
- Tilt bucket up far enough to retain load and back away from pile.
- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- Open bucket or tilt bucket down to dump load.

Equipment Damage Precautions

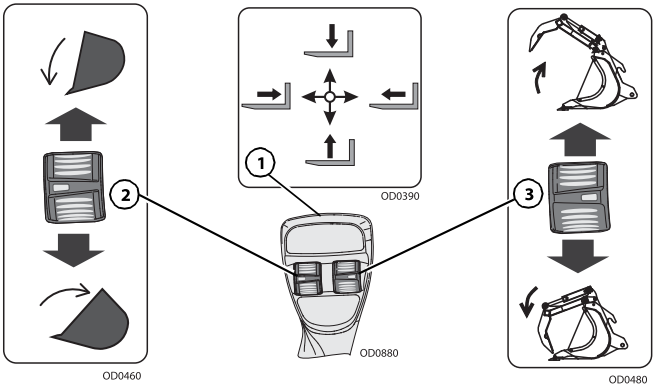
- Except for lifting or dumping a load, the boom must be fully retracted for all bucket operations.
- Do not corner-load bucket. Distribute material evenly within the bucket. Bucket capacity charts are for evenly distributed loads only.
- Do not use bucket as a lever to pry material. Excessive prying forces could damage bucket or machine structure.
- Do not attempt to load material which is hard or frozen. This could cause severe damage to coupler or machine structure.
- Do not use bucket for "back dragging." This could cause severe damage to coupler.

5.8.12 Grapple Bucket


OZ1450

Use Grapple Bucket Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls grapple bucket tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Open/Close Grapple:

Roller switch (**3**) controls the open/close movement of the grapple.

- Press roller switch down to close grapple.
- Press roller switch up to open grapple.

Installation Procedure:

Refer to *Section — Attachment Installation*.

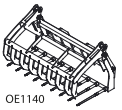
Operation:

- Raise or lower boom to appropriate height and open grapple for loading material from stockpile.
- Align telehandler with face of stockpile and drive slowly and smoothly into pile to load bucket.
- Tilt bucket up far enough to retain load, close grapple and back away from pile.
- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- Open grapple or tilt bucket down to dump load.

Equipment Damage Precautions

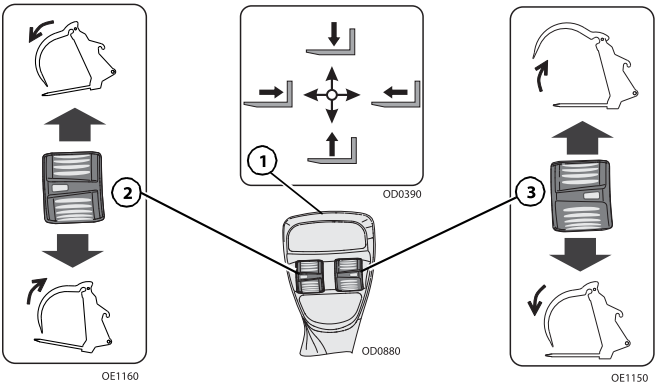
- Except for lifting or dumping a load, the boom must be fully retracted for all bucket operations.
- Do not corner-load bucket. Distribute material evenly within the bucket. Bucket capacity charts are for evenly distributed loads only.
- Do not use bucket as a lever to pry material. Excessive prying forces could damage bucket or machine structure.
- Do not attempt to load material which is hard or frozen. This could cause severe damage to coupler or machine structure.
- Do not use bucket for "back dragging." This could cause severe damage to coupler and retraction cables/chains.

5.8.13 Manure Grapple


OE1140

Use Manure Grapple Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls manure grapple tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Open/Close Manure Grapple:

Roller switch (**3**) controls the open/close movement of the manure grapple.

- Press roller switch down to close grapple.
- Press roller switch up to open grapple.

Installation Procedure:

Refer to *Section — Attachment Installation*.

Operation:

- Raise or lower boom to appropriate height and open manure grapple for loading material from stockpile.
- Align telehandler with face of stockpile and drive slowly and smoothly into pile to load manure grapple.
- Tilt manure grapple up far enough to retain load, close manure grapple and back away from pile.
- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- Open manure grapple and tilt down to dump load.

Equipment Damage Precautions

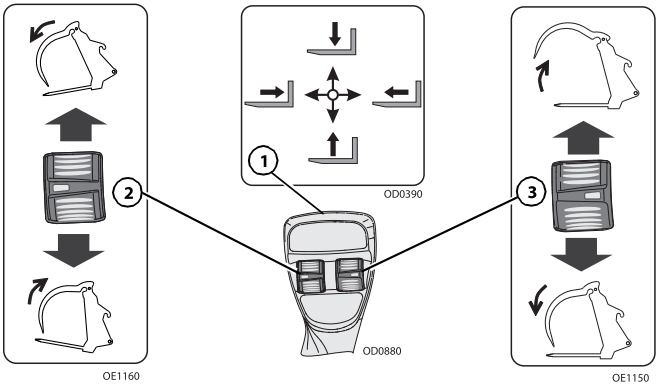
- Except for lifting or dumping a load, the boom must be fully retracted for all operations.
- Do not corner-load manure grapple. Distribute material evenly within the manure grapple. Manure grapple capacity charts are for evenly distributed loads only.
- Do not use manure grapple as a lever to pry material. Excessive prying forces could damage manure grappled or machine structure.
- Do not attempt to load material which is hard or frozen. This could cause severe damage to coupler or machine structure.
- Do not use manure grapple for "back dragging." This could cause severe damage to coupler and retraction cables/chains.

5.8.14 Muck Fork


OE1170

Use Muck Fork Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls muck fork tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Open/Close Muck Fork:

Roller switch (**3**) controls the open/close movement of the muck fork.

- Press roller switch down to close muck fork.
- Press roller switch up to open muck fork.

Installation Procedure:

Refer to *Section — Attachment Installation*.

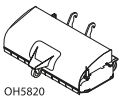
Operation:

- Raise or lower boom to appropriate height and open muck fork for loading material from stockpile.
- Align telehandler with face of stockpile and drive slowly and smoothly into pile to load muck fork.
- Tilt muck fork up far enough to retain load, close muck fork and back away from pile.
- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- Open muck fork and tilt down to dump load.

Equipment Damage Precautions

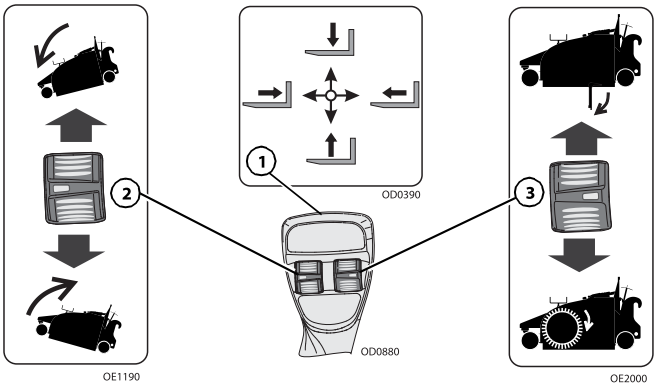
- Except for lifting or dumping a load, the boom must be fully retracted for all operations.
- Do not corner-load muck fork. Distribute material evenly within the muck fork. Muck fork capacity charts are for evenly distributed loads only.
- Do not use muck fork as a lever to pry material. Excessive prying forces could damage muck fork or machine structure.
- Do not attempt to load material which is hard or frozen. This could cause severe damage to coupler or machine structure.
- Do not use bucket for "back dragging." This could cause severe damage to coupler and retraction cables/chains.

5.8.15 Sweeper



Use Sweeper Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls sweeper tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Control Sweeper:

Roller switch (**3**) controls the sweeper.

- Press roller switch down to close hopper and engage sweeper brushes.
- Press roller switch up to open hopper.

To Enable/Disable Continuous Operation of Sweeper Brushes:

- With transmission in neutral, press and hold continuous auxiliary hydraulics switch on left dash control panel.
- Press roller switch (**3**) down to engage sweeper brushes.
- Release continuous auxiliary hydraulics switch and roller switch (**3**) to enable continuous operation of sweeper brushes.
- To disable continuous operation of sweeper brushes, press continuous auxiliary hydraulics switch again.

Installation Procedure:

Refer to *Section — Attachment Installation*.

⚠ WARNING

CRUSH HAZARD. Remove large objects in path of sweeper before operating. Failure to comply could cause object to be thrown by sweeper.

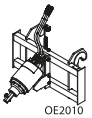
Operation:

- Place sweeper on a level area. Fully retract boom and lower until all three sweeper wheels are in contact with the ground.
- Using height and angle gauge on the sweeper, obtain the central mid-float position to obtain best sweeping operation.
- Operate roller switch (**3**) to engage sweeper brushes.
- Sweep a path less than the width of the sweeper.
- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- To empty hopper, raise sweeper over desired dump area ensuring proper clearance. Operate roller switch (**3**) to open the hopper allowing the contents to slide out. Close the hopper after all contents are removed.

Equipment Damage Precautions

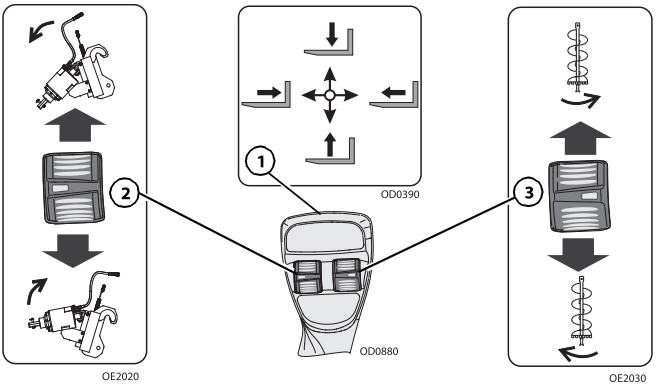
- Except for emptying hopper, the boom must be fully retracted for all sweeper operations.
- Avoid excessive downward pressure on brushes when sweeping.
- Do not store sweeper with weight on brushes. Place on blocks or storage stands.

5.8.16 Auger



Use Auger Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls auger tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Control Auger Bit:

Roller switch (**3**) controls the auger bit rotation.

- Press roller switch down to rotate clockwise.
- Press roller switch up to rotate counter-clockwise.

Installation Procedure:

Refer to *Section — Attachment Installation*.

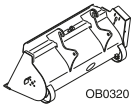
Operation:

- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- Tilt auger down so auger bit is perpendicular to ground and carriage is horizontal.
- Lower auger to ground so that only the center point penetrates ground.
- Operate roller switch (**3**) to turn auger in a clockwise ("digging") rotation.
- Release roller switch (**3**) to stop auger rotation.
- Raise auger from hole to clean out debris.

Equipment Damage Precautions

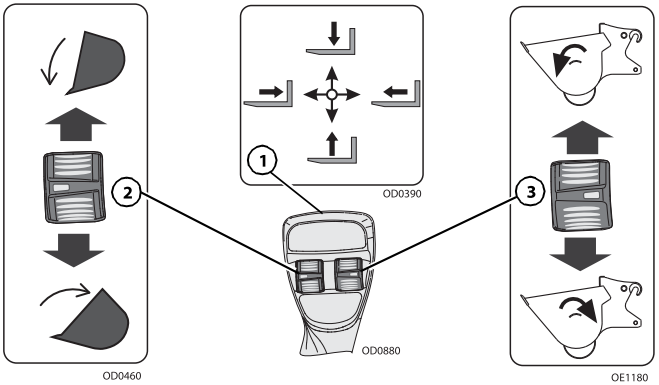
- Travel with the auger in a safe transport position to prevent uncontrolled movement.
- Transport the auger unit as low as practical at a slow speed without rapid side to side movement.
- Do not engage auger rotation unless the point of the auger cutting head is touching the ground.

5.8.17 Concrete Bucket Mixer



Use Concrete Bucket Mixer Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls bucket tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Control Mixer:

Roller switch (**3**) controls the bucket mixer.

- Press roller switch down to rotate rearward.
- Press roller switch up to rotate forward.

Installation Procedure:

Refer to *Section — Attachment Installation*.

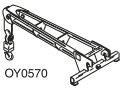
Operation:

- Close bucket gate, level bucket and fully retract and lower boom to load material.
- Distribute material evenly within the bucket. Bucket capacity charts are for evenly distributed loads only.
- Load center will vary depending on the amount of material in the bucket. Always ensure compliance with the capacity chart.
- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- Position bucket and open bucket gate to release load.

Equipment Damage Precautions

- Transport the concrete bucket as low as practical at a slow speed and without rapid side to side movement.

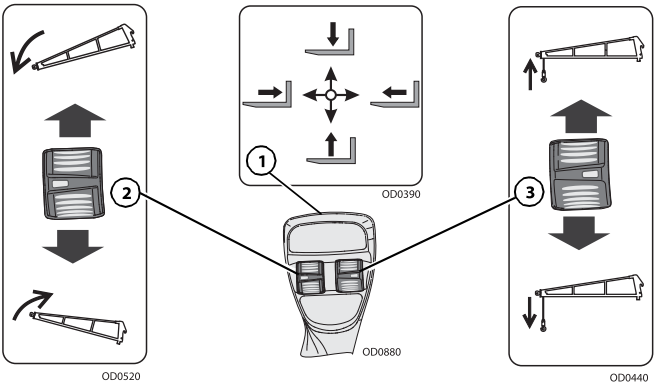
5.8.18 Truss Boom



Use Appropriate Truss Boom Attachment Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.

Suspend loads in accordance with requirements set forth in *Section — General Safety Practices*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls truss boom tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

Winch Control (if equipped):

Roller switch (**3**) controls truss boom mounted winch.

- Press roller switch down to lower cable.
- Press roller switch up to raise cable.

Installation Procedure:

Refer to *Section — Attachment Installation*.

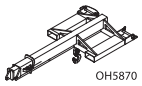
⚠ WARNING

CRUSH HAZARD. Maintain a minimum of three wraps of wire rope on the cable drum at all times. Failure to comply could cause object or load to fall.

Operation:

- Weight of rigging must be included as part of total load being lifted.

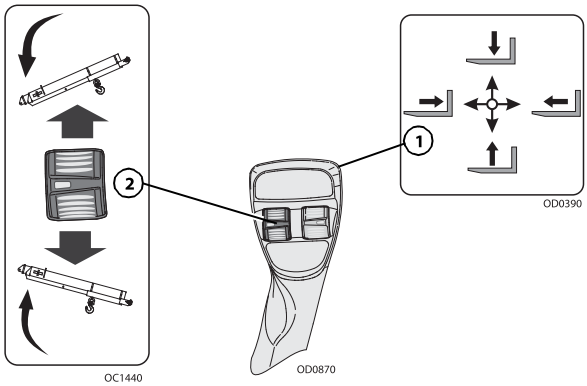
5.8.19 Adjustable Truss Boom - Fork Mounted



Use Appropriate Adjustable Truss Boom Attachment Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.

Suspend loads in accordance with requirements set forth in *Section — General Safety Practices*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls adjustable truss boom tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

Installation Procedures

- Ensure carriage is properly installed. Refer to *Section — Attachment Installation*.
- Secure the adjustable truss boom to the forks by sliding the adjustable truss boom onto the parent forks and install the retaining pin behind the vertical shank of the fork.

⚠ WARNING

CRUSH HAZARD. Ensure adjustable arm is properly secured using the retaining pin prior to lifting load. Failure to comply could cause object or load to fall.

Operation:

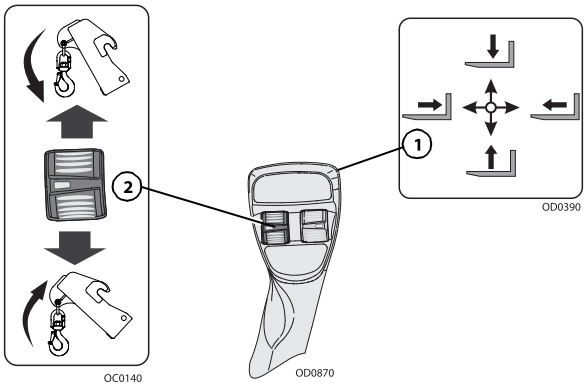
- Pallet or lumber forks of an appropriate load rating must be used. Do not use with cubing or block forks.
- Weight of rigging must be included as part of total load being lifted.
- Do not use with mast carriage attachment.
- Do not use adjustable truss boom with attachments capable of rotating (i.e. side tilt and swing carriages) without disabling the rotation feature(s).

5.8.20 Coupler Mounted Hook

Use Appropriate Coupler Mounted Hook Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.

Suspend loads in accordance with requirements set forth in *Section — General Safety Practices*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls coupler mounted hook tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

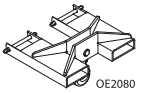
Installation Procedure:

Refer to *Section — Attachment Installation*.

Operation:

- Weight of rigging must be included as part of total load being lifted.

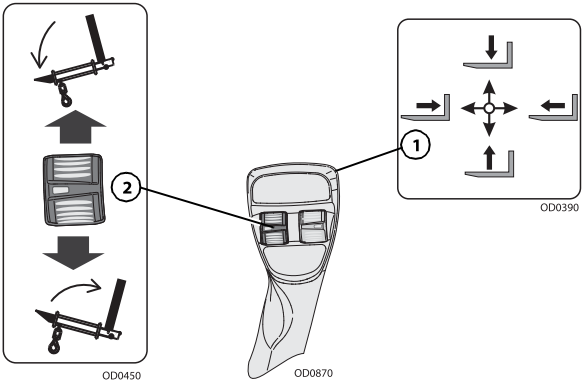
5.8.21 Fork Mounted Hook



Use Appropriate Carriage Attachment Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.

Suspend loads in accordance with requirements set forth in *Section — General Safety Practices*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls carriage tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

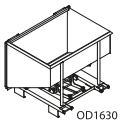
Installation Procedure:

- Ensure carriage is properly installed. Refer to *Section — Attachment Installation*.
- Secure the fork mounted hook to the forks by sliding the fork mounted hook onto the parent forks and install the retaining pin behind the vertical shank of the fork.

Operation:

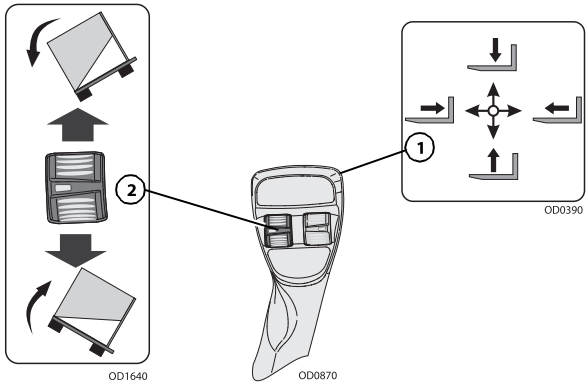
- Pallet or lumber forks of an appropriate load rating must be used. Do not use with cubing or block forks.
- Fork mounted hook and rigging weight must be included as part of total load being lifted.
- Do not use with mast carriage attachment.
- Do not use fork mounted hook with attachments capable of rotating (i.e. side tilt and swing carriages) without disabling the rotation feature(s).

5.8.22 Trash Hopper - Fork Mounted



Use Appropriate Trash Hopper Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls trash hopper tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

Installation Procedure:

- Ensure carriage is properly installed. Refer to *Section — Attachment Installation*.
- Secure the fork mounted trash hopper to the forks by sliding the fork mounted trash hopper onto the parent forks and install the retaining pin behind the vertical shank of the fork.

Operation:

- Raise or lower boom to appropriate height for loading material.
- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- To release gate, tilt fork mounted trash hopper down approximately 10 degrees and engage bottom bumper on edge of dumpster. The gate will open allowing the contents to slide out.
- Tilt fork mounted trash hopper back to close and secure the gate.
- Do not use with mast carriage attachment.
- Do not use fork mounted trash hopper with attachments capable of rotating (i.e. side tilt carriages) without disabling the rotation feature(s).

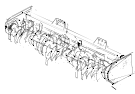
Equipment Damage Precautions

- Except for lifting or dumping a load, the boom must be fully retracted for all fork mounted trash hopper operations.

5.8.23 Silage Defacer

Use Silage Defacer Capacity Chart

To determine maximum capacity, refer to *Section — Telehandler/Attachment/Fork Capacity*.



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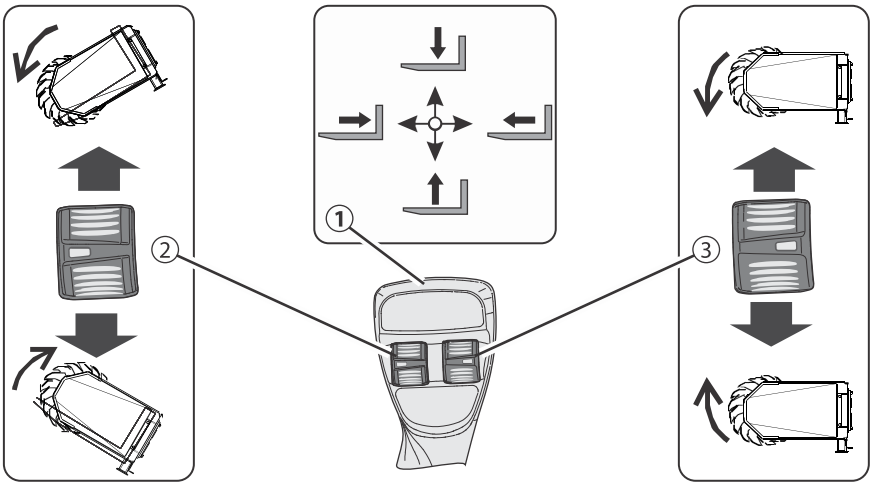


TH000238A

Joystick (**1**) controls movement of the boom.

Roller switch (**2**) controls silage defacer tilt.

- Press roller switch down to tilt up.
- Press roller switch up to tilt down.

To Control Silage Defacer:

Roller switch (**3**) controls the silage defacer rotation.

- Press roller switch down to rotate clockwise.
- Press roller switch up to rotate counter-clockwise.

Installation Procedure:

- Refer to *Section — Attachment Installation*.

Operation:

- Travel in accordance with requirements set forth in *Section — General Safety Practices*.
- Position silage defacer at top of bunker and operate roller switch (**3**) to engage silage defacer. When defacer has reached full speed, slowly lower into silage at desired cutting depth. It is recommended to not cut deeper than the length of the defacer teeth.
- To help maintain an even cut, keep silage defacer angled upward for best control.
- After the first downward pass, move telehandler to the side and position the silage defacer adjacent to the previous pass. Do not try to cut multiple passes deep.

Equipment Damage Precautions:

- Travel with the silage defacer in a safe transport position to prevent uncontrolled movement.
- Transport the silage defacer as low as practical at a slow speed without rapid side to side movement.
- Avoid direct contact with bunker walls and floor.

5.9 HITCHES AND TRAILER BRAKES

Machines may be equipped with various types of hitches. If not previously installed, secure hitch to machine with hardware supplied with installation.

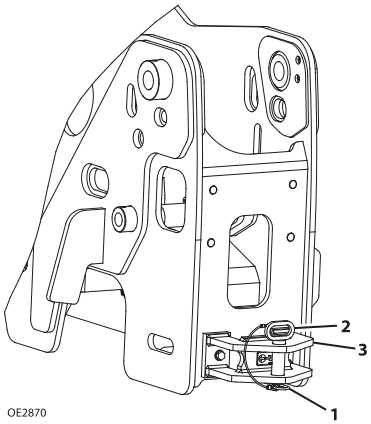
Maximum towing capacity shall be the smallest of the telehandler and hitch capacities. Refer to *Section — Machine Towing Capacity* for details.

Note: Ensure hitch is in lowest position when towing trailer. Speed and/or load may need reduced if traveling on ground which is not level.

⚠ WARNING

CRUSH HAZARD. Stay clear from area between machine and trailer.

5.9.1 Retrieval Hitch



Connecting for retrieval:

1. Remove safety pin (**1**) and pull pin (**2**) from hitch (**3**).
2. Place pin through hitch and retrieval device. Secure pin with safety pin.

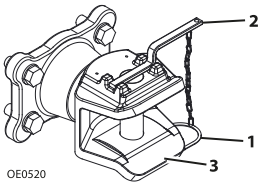
Note: Retrieval devices are not intended for trailer towing applications.

5.9.2 Fixed Hitch

Hitch Capacities

Maximum combined weight of trailer and load. . . . . 12 000 kg (26 450 lb)

Maximum vertical load at hitch interface . . . . . .2500 kg (5500 lb)



Connecting trailer for towing:

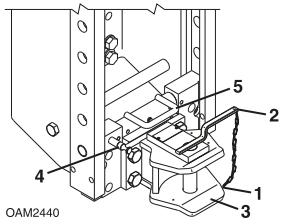
1. Remove safety pin (**1**) and pull pin (**2**) from hitch (**3**).
2. Align machine and tow eye of trailer.
3. Place pin through hitch and tow eye. Secure pin with safety pin.

5.9.3 Pin Hitch - CUNA C (Italy)

Hitch Capacities

Maximum combined weight of trailer and load. . . . . 6000 kg (13 225 lb)

Maximum vertical load at hitch interface . . . . . .1500 kg (3305 lb)



Connecting trailer for towing:

1. Remove safety pin (**1**) and pull pin (**2**) from hitch (**3**).
2. Align machine and tow eye of trailer.
3. Place pin through hitch and tow eye. Secure pin with safety pin.
4. If equipped, connect trailer harness to trailer plug.
5. If equipped, connect trailer hydraulics to rear auxiliary fittings.

Adjusting Hitch Height:

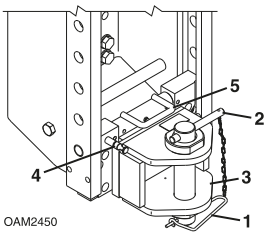
1. Pull lock pin (**4**) and lift handle (**5**) to release locking mechanism.
2. Move hitch to desired height.
3. Lower handle. When locking mechanism engages, lock pin will return to locked position.

5.9.4 Pin Hitch - CUNA D2 (Italy)

Hitch Capacities

Maximum combined weight of trailer and load. . . . . 12 000 kg (26 450 lb)

Maximum vertical load at hitch interface . . . . . .2000 kg (4400 lb)



Connecting trailer for towing:

1. Remove safety pin (**1**) and pull pin (**2**) from hitch (**3**).
2. Align machine and tow eye of trailer.
3. Place pin through hitch and tow eye. Secure pin with safety pin.
4. If equipped, connect trailer harness to trailer plug.
5. If equipped, connect trailer hydraulics to rear auxiliary fittings.

Adjusting Hitch Height:

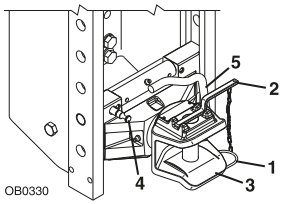
1. Pull lock pin (**4**) and lift handle (**5**) to release locking mechanism.
2. Move hitch to desired height.
3. Lower handle. When locking mechanism engages, lock pin will return to locked position.

5.9.5 EEC Manual Pin Hitch

Hitch Capacities

Maximum combined weight of trailer and load. . . . . 12 000 kg (26 450 lb)

Maximum vertical load at hitch interface . . . . . .2500 kg (5500 lb)



Connecting trailer for towing:

1. Remove safety pin (**1**) and pull pin (**2**) from hitch (**3**).
2. Align machine and tow eye of trailer.
3. Place pin through hitch and tow eye. Secure pin with safety pin.
4. If equipped, connect trailer harness to trailer plug.
5. If equipped, connect trailer hydraulics to rear auxiliary fittings.

Adjusting Hitch Height:

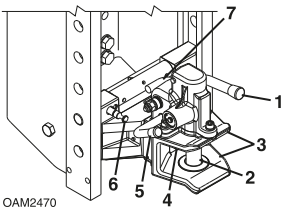
1. Pull lock pin (**4**) and lift handle (**5**) to release locking mechanism.
2. Move hitch to desired height.
3. Lower handle. When locking mechanism engages, lock pin will return to locked position.

5.9.6 EEC Auto Hitch

Hitch Capacities

Maximum combined weight of trailer and load. . . . . 12 000 kg (26 450 lb)

Maximum vertical load at hitch interface . . . . . .2500 kg (5500 lb)



Connecting trailer for towing:

1. Remove safety pin (**1**) and pull pin (**2**) from hitch (**3**).
2. Align hitch mouth (**3**) and tow eye of trailer.
3. Reverse machine toward trailer.
4. After the tow eye contacts trigger (**4**), the pin and lever will be released.
5. If equipped, connect trailer harness to trailer plug.
6. If equipped, connect trailer hydraulics to rear auxiliary fittings.

Note: Use lever (**5**) to lower pin (**2**) after disconnecting from trailer.

Adjusting Hitch Height:

1. Pull lock pin (**6**) and lift handle (**7**) to release locking mechanism.
2. Move hitch to desired height.
3. Lower handle. When locking mechanism engages, lock pin will return to locked position.

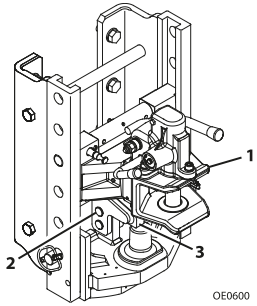
5.9.7 Piton Frame and EEC Auto Hitch

Hitch Capacities

Maximum combined weight of trailer and load. . . . . 12 000 kg (26 450 lb)

Maximum vertical load at hitch interface . . . . . .2500 kg (5500 lb)

Note: See *Section — EEC Auto Hitch, page 186* for Auto Hitch information.



Connecting trailer for towing:

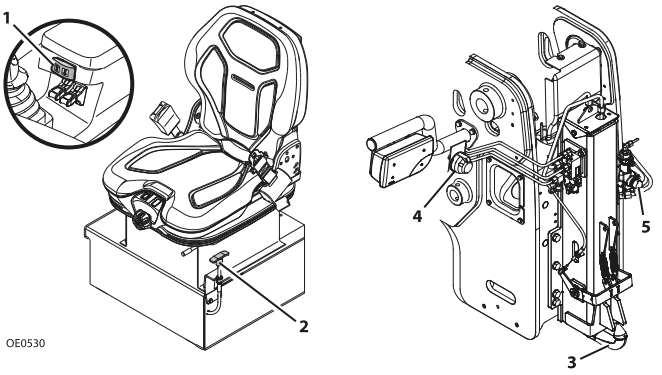
1. Raise Auto Hitch (**1**) to highest position.
2. Remove safety pin (**2**) and lift locking latch (**3**).
3. Insert safety pin to hold locking latch in the up position.
4. Align machine and tow eye of trailer.
5. Remove safety pin and lower locking latch. Secure locking latch with safety pin.
6. If equipped, connect trailer harness to trailer plug.
7. If equipped, connect trailer hydraulics to rear auxiliary fittings.

5.9.8 Hydraulic Hitch

Hitch Capacities

Maximum combined weight of trailer and load. . . . . 12 000 kg (26 450 lb)

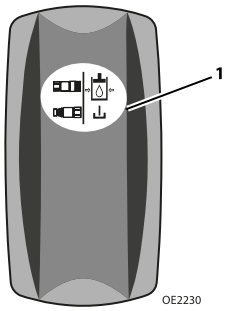
Maximum vertical load at hitch interface . . . . . .2500 kg (5500 lb)

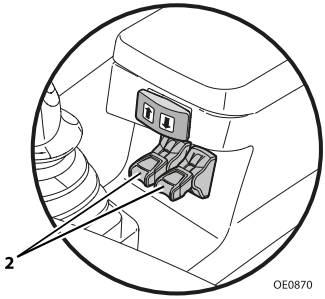


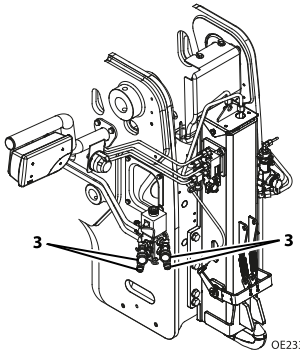
Connecting trailer for towing:

1. Depress and hold right side of hydraulic hitch switch (**1**) to raise hitch safety posts off safety hooks.
2. Pull and hold cable release (**2**) to withdraw safety hooks. Cable can be released once posts are lower than safety hooks.
3. Depress and hold left side of hydraulic hitch switch to lower the hitch (**3**) to the required height.
4. Reverse machine until the hitch is under the center of the tow eye.
5. Depress and hold right side of hydraulic hitch switch to raise hitch until the safety hooks are engaged.
6. If equipped, connect trailer harness to trailer plug (**4**).
7. If equipped, connect trailer brake line to trailer coupling (**5**). See *Section — Trailer Brakes, page 190*.

5.9.9 Rear Auxiliary Hydraulics

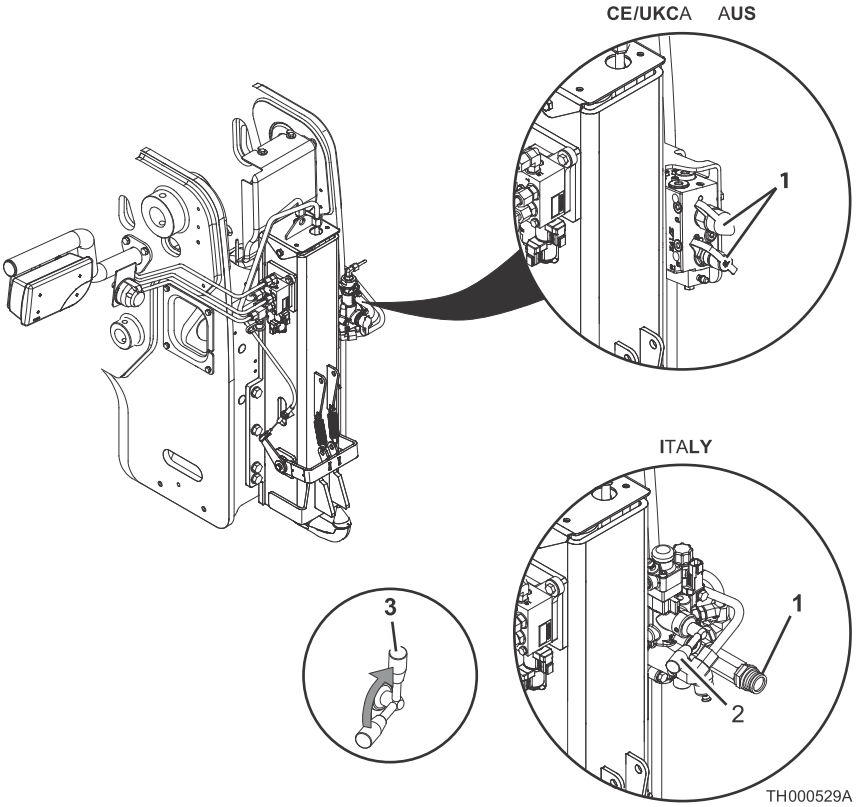






1. Press and hold auxiliary decompression switch (**1**) on right control panel then operate the rear auxiliary hydraulic lever (**2**) corresponding to the circuit needed for decompression (either #1 or #2 if dual rear auxiliary equipped) to relieve pressure at rear auxiliary fittings (**3**).
2. Perform *Section — Shut-Down Procedure*.
3. Connect hoses to auxiliary fittings.

5.9.10 Trailer Brakes



Connecting trailer brake system:

CE/UKCA & AUS

1. Ensure trailer is properly connected for towing.
2. Connect trailer brake lines to machine couplings (**1**).

Italy

1. Ensure trailer is properly connected for towing.
2. Lever should be in horizontal position (**2**).
3. Connect trailer brake line to machine coupling (**1**).
4. Lift lever to vertical position (**3**).

SECTION 6
Emergency Procedures

6.1 TOWING A DISABLED PRODUCT

The following information assumes telehandler cannot be moved under its own power.

- Before moving the telehandler, read all of the following information to understand options available. Then select the appropriate method.
- Machine mounted retrieval devices provide suitable means to attach a tow rope, chain or tow bar only in the event the telehandler becomes stuck or disabled.
- Retrieval devices are not intended for on-road trailer towing applications.
- The steering system permits manual steering if engine or power assist feature fails; however, **steering will be slow and will require much greater force.**
- **DO NOT** attempt to tow a telehandler that is loaded or the boom/attachment is raised above 1,2 m (4 ft).

6.1.1 Moving Short Distances

- If it is only necessary to move telehandler a short distance, less than 30 m (100 ft), it is permissible to use a vehicle of sufficient capacity to tow the unit with no previous preparation.

Note: Ensure park brake is released prior to moving machine. See *Section — Park Brake*.

6.1.2 Moving Longer Distance

- See Service Manual for information.
- Dependant on local regulations the appropriate machine Service Manual should be kept in the cab of homologated machines at all times.

Contact the local Caterpillar dealer for specific instructions if neither of these methods are applicable.

6.2 EMERGENCY LOWERING OF BOOM

In the event of total loss of engine power or hydraulic pump failure with an elevated load, the situation must be properly evaluated and dealt with on an individual basis. **Contact the local Caterpillar dealer for specific instructions.**

Secure the telehandler using the following procedures:

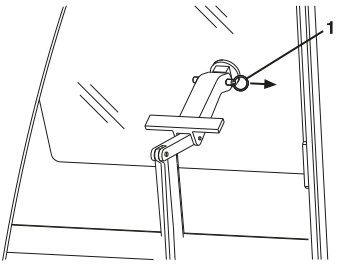
1. Clear the area around telehandler of all personnel.
2. Engage the parking brake. Place the transmission control lever in “NEUTRAL”.
3. Block all four wheels.
4. Section off a large area under the boom to restrict any personnel from entering this area.
5. See Service Manual for information.

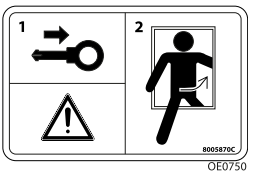
6.3 EMERGENCY EXIT FROM ENCLOSED CAB

In an emergency, the rear window or right side window can be used to exit the telehandler if it is not possible to use the cab door.

If possible, fully lower the boom, shut off the engine and remove ignition key before using any of the following procedures to exit the telehandler.

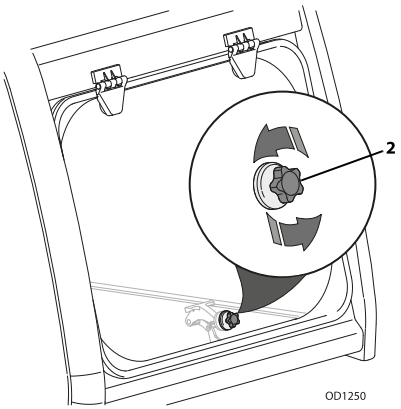
6.3.1 Rear Window Inside Cab

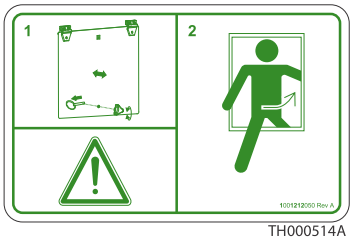




1. Remove the latch pin (**1**).
2. Swing open the window and exit the telehandler.

6.3.2 Rear Window Outside Cab (if equipped)





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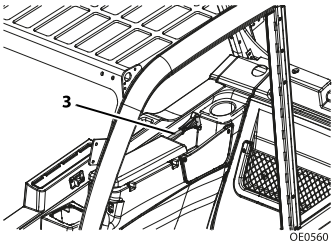
1. Remove the knob (**2**) securing the window.
2. Swing open the window and exit the telehandler.

6.3.3 Right Side Window (Agriculture)

Note: Only exit through the right side window if it is not possible to exit through the cab door or rear window.



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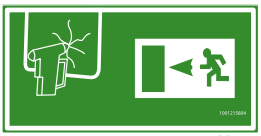
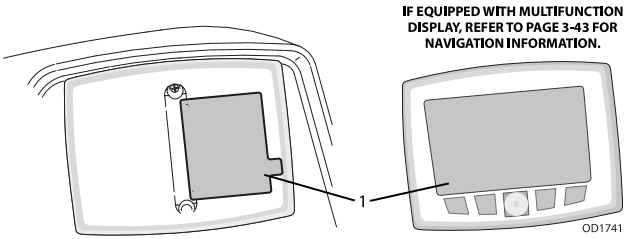

OE2590

1. Remove the escape hammer (**3**) located below the right hand side window.
2. Use the hammer to break the window and exit the telehandler.

SECTION 7
Lubrication and Maintenance

7.1 INTRODUCTION

This section is intended as information to assist the operator to perform maintenance tasks only. Service product in accordance with maintenance schedule on the following pages.



Lubrication and maintenance charts (**1**) contain instructions that must be followed to keep this product in good operating condition. Operation & Maintenance Manual and Service Manual contain more detailed service information with specific instructions. If equipped with Multifunction Display, refer to *Section — Multifunction Display (If Equipped)* for navigation information.

7.1.1 Clothing and Safety Gear

- Wear all protective clothing and personal safety devices issued to you or called for by job conditions
- **DO NOT** wear loose clothing or jewelry that can get caught on controls or moving parts

7.2 GENERAL MAINTENANCE INSTRUCTIONS

Prior to performing any service or maintenance on the telehandler, follow the *Shut-Down Procedure* unless otherwise instructed. Ensure telehandler is level, for proper fluid readings.

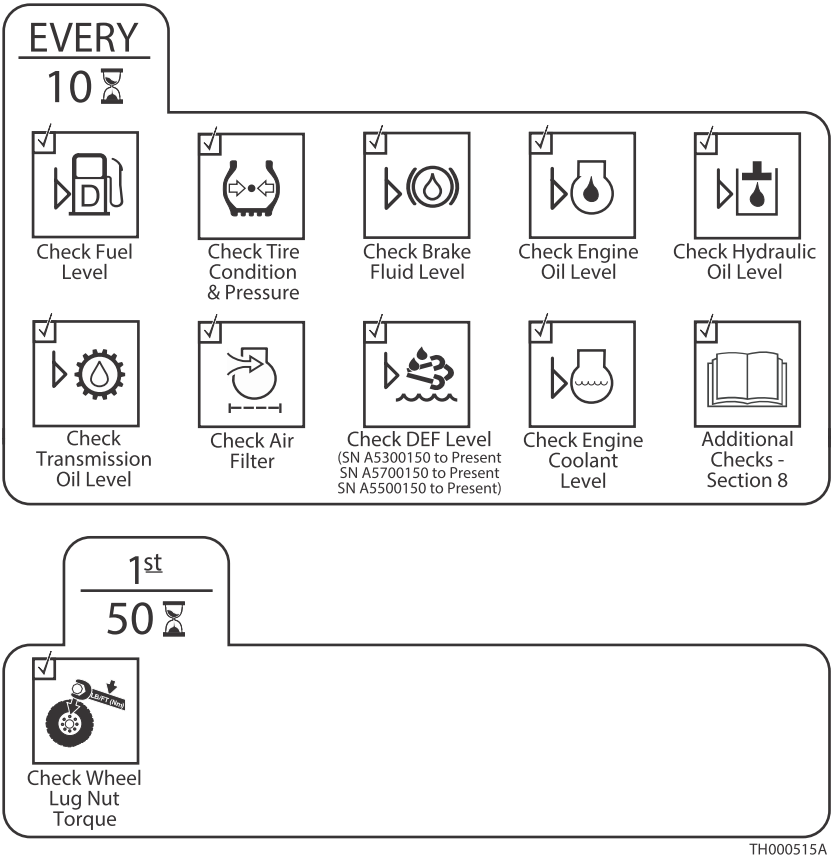
- Clean lubrication fittings before lubricating.
- After greasing telehandler, cycle all functions several times to distribute lubricants. Perform this maintenance procedure without attachment installed.
- Apply a light coating of engine oil to all linkage pivot points.
- Intervals shown are for normal usage and conditions. Adjust intervals for abnormal usage and conditions.
- Check all lubricant levels when lubricant is cool, with the exception of the transmission fluid. For ease of filling hydraulic reservoir, use a funnel with a hose or flexible tube for best results.

⚠ WARNING

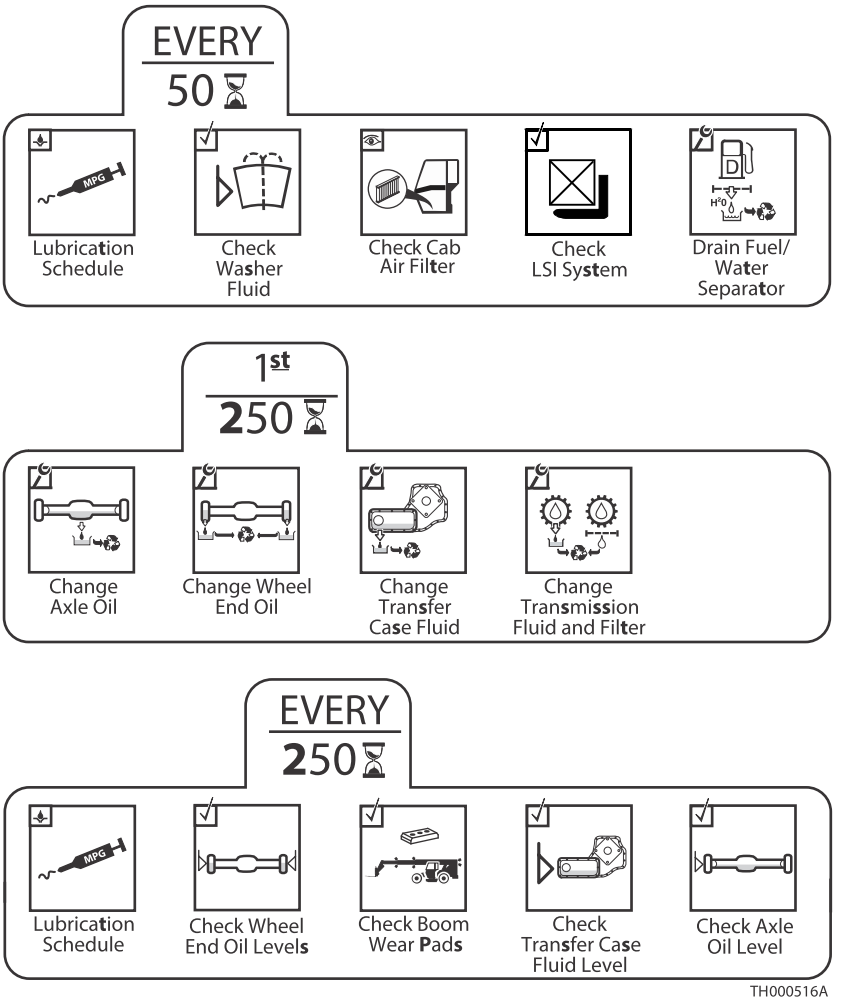
CUT/CRUSH/BURN HAZARD. Do not perform service or maintenance on the machine with engine running with the exception of transmission fluid level check.

7.3 MAINTENANCE SCHEDULES

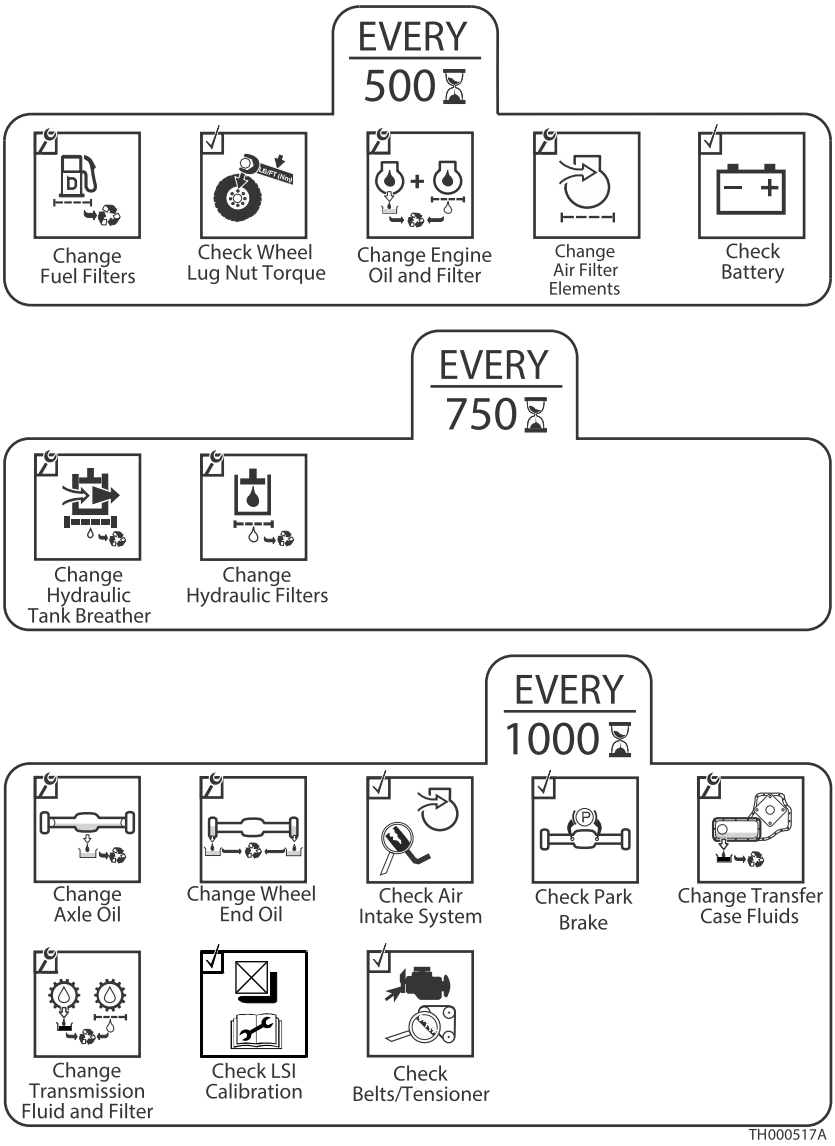
7.3.1 10, & 1st 50 Hour Maintenance Schedule



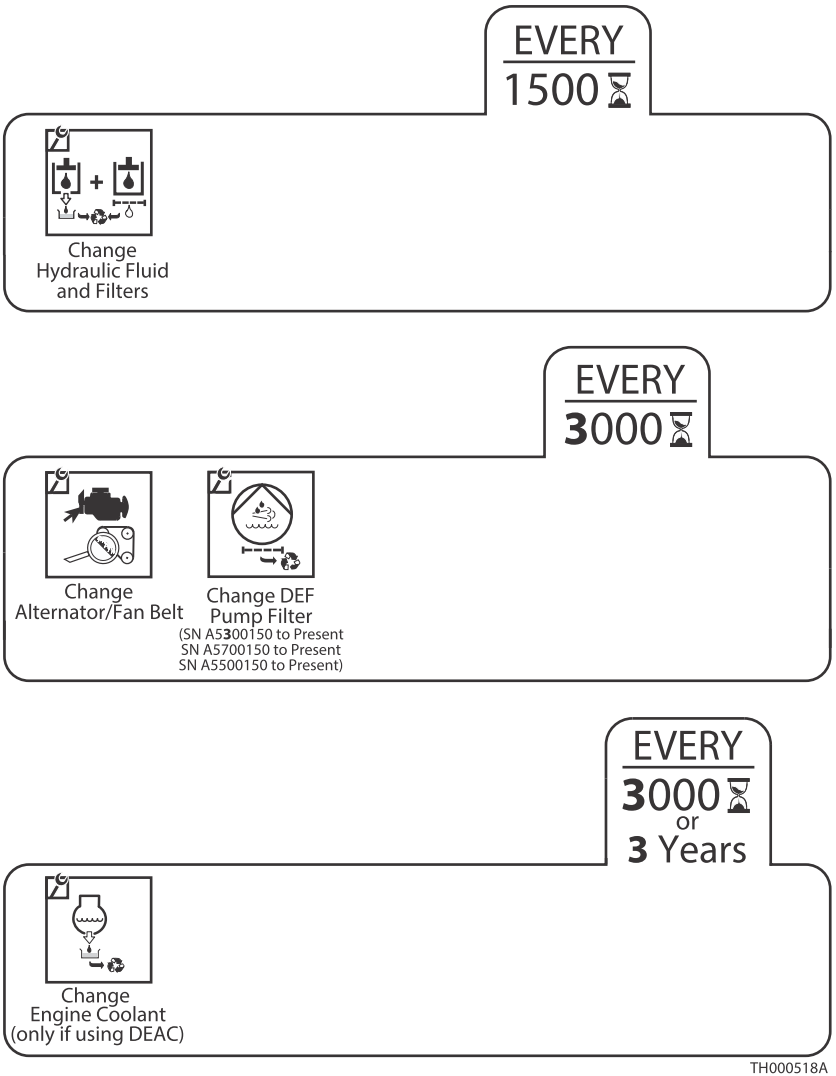
7.3.2 50, 1st 250 & 250 Hour Maintenance Schedule



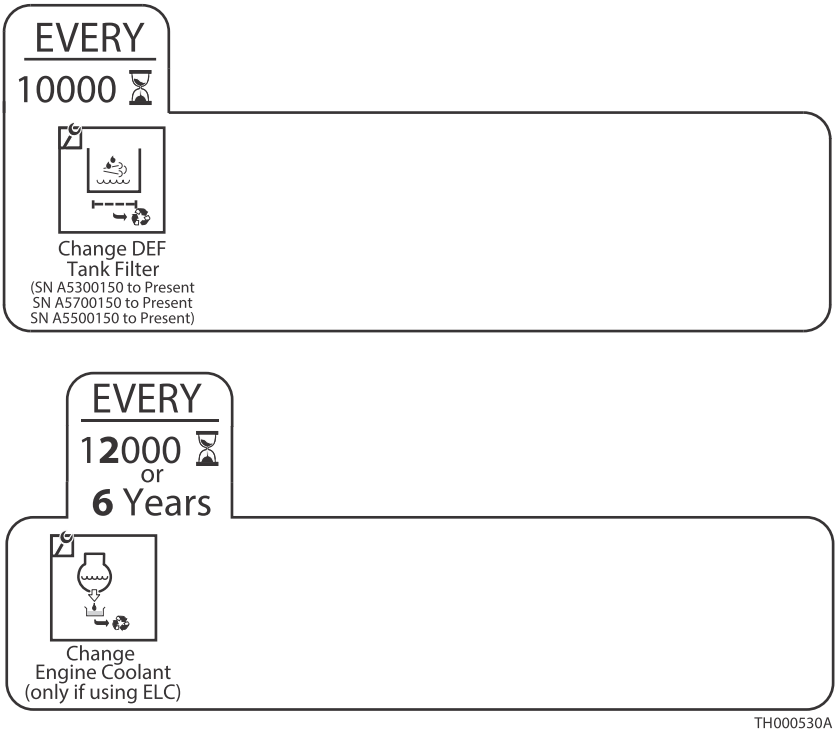
7.3.3 500, 750 & 1000 Hour Maintenance Schedule



7.3.4 1500, 2000 & 3000 Hour Maintenance Schedule

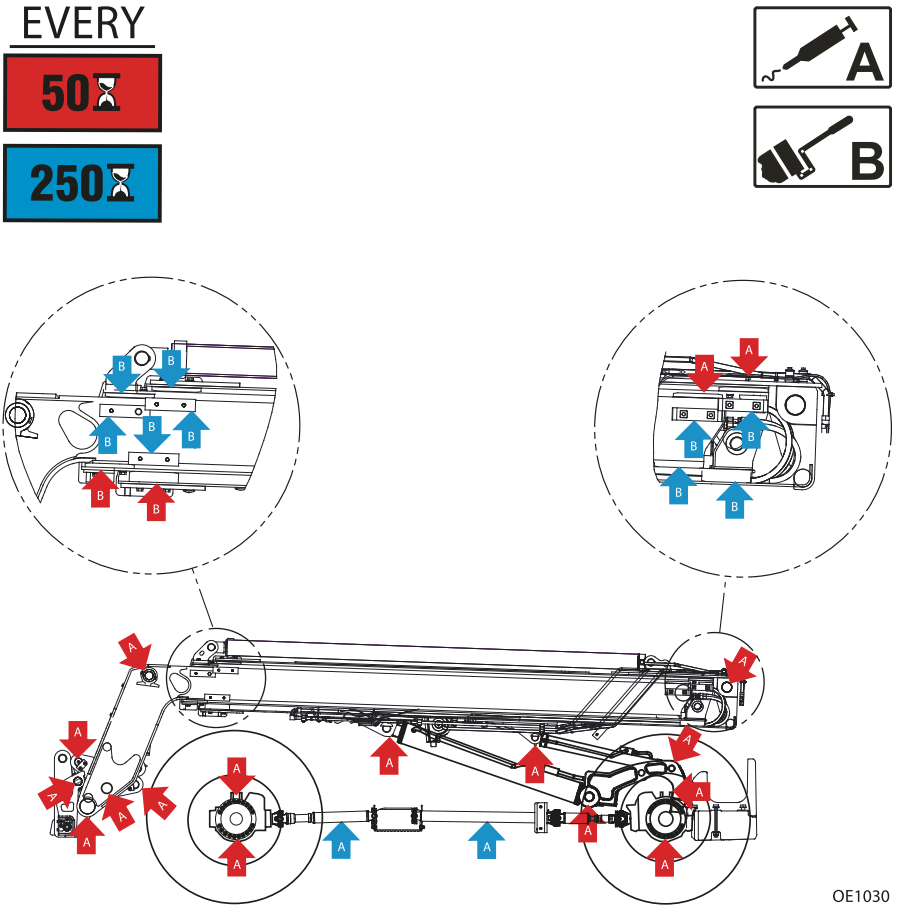


7.3.5 10000 & 12000 Hour Maintenance Schedule



Note: If hour and year intervals are listed, use the interval that occurs first. Refer to Engine Operation & Maintenance Manual for additional information.

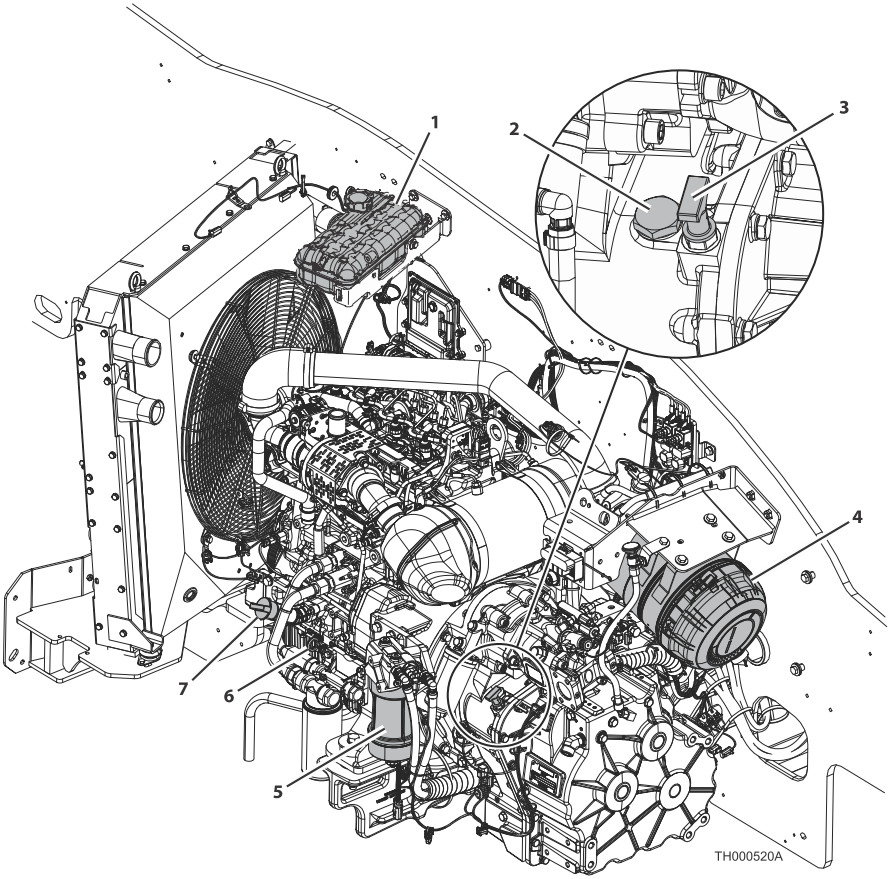
7.4 LUBRICATION SCHEDULES



7.5 OPERATOR MAINTENANCE INSTRUCTIONS

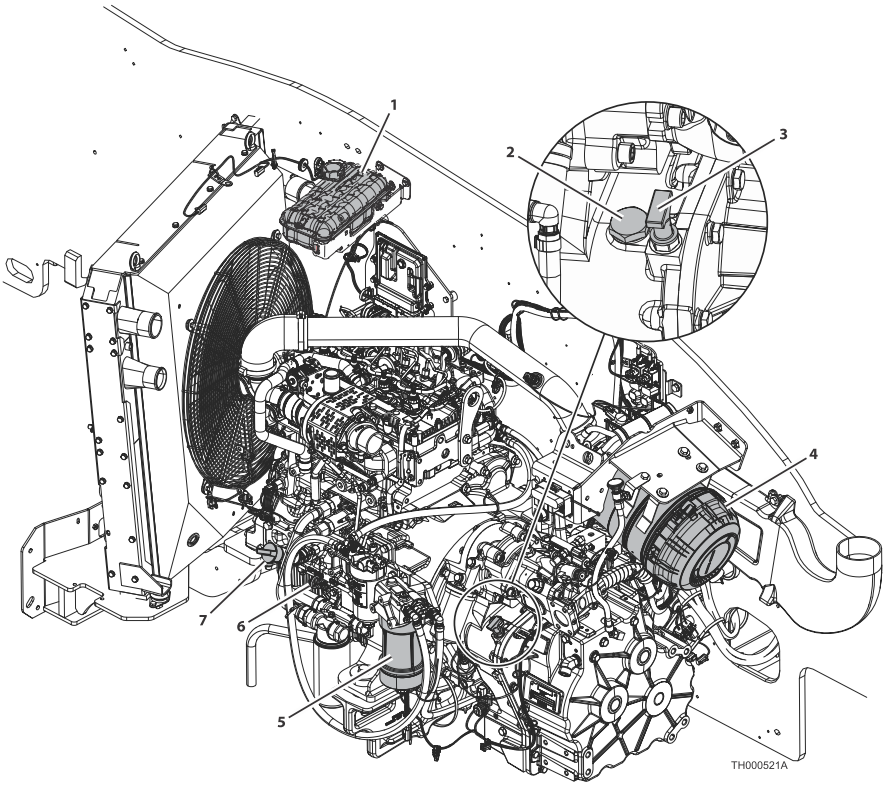
7.5.1 Engine Maintenance Components

TH357 - SN A5300150 to Present, TH408 - SN A5700150 to Present, TH3510 - SN A5500150 to Present



1. **Surge Tank:** See *Section — Engine Cooling System, page 220*.
2. **Transmission Fluid Plug:** See *Section — Transmission Oil, page 216*.
3. **Transmission Fluid Dipstick:** See *Section — Transmission Oil, page 216*.
4. **Air Cleaner:** See *Section — Air Intake System, page 210*.
5. **Primary Fuel Filter:** See *Section — Drain Fuel Water Separator, page 207*.
6. **Engine Oil Dipstick:** See *Section — Engine Oil, page 209*.
7. **Engine Oil Cap:** See *Section — Engine Oil, page 209*.

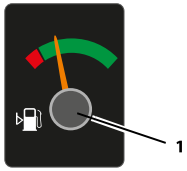
TH357 - SN A5400150 to Present, TH408 - SN A5800150 to Present, TH3510 - SN A5600150 to Present

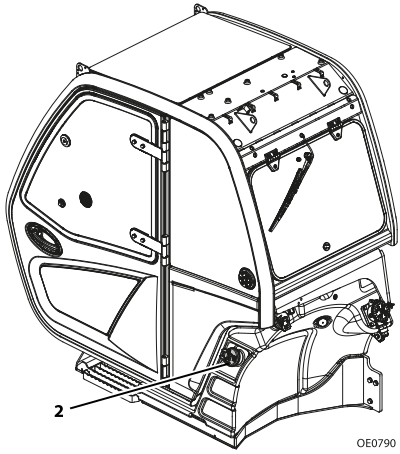


1. **Surge Tank:** See *Section — Engine Cooling System, page 220*.
2. **Transmission Fluid Plug:** See *Section — Transmission Oil, page 216*.
3. **Transmission Fluid Dipstick:** See *Section — Transmission Oil, page 216*.
4. **Air Cleaner:** See *Section — Air Intake System, page 210*.
5. **Primary Fuel Filter:** *See Section — Drain Fuel Water Separator, page 207*.
6. **Engine Oil Dipstick:** See *Section — Engine Oil, page 209*.
7. **Engine Oil Cap:** See *Section — Engine Oil, page 209*.

7.5.2 Fuel System

Fuel Level Check





1. Check Fuel Gauge (**1**) located in right side of Instrument Panel in cab.
2. If fuel is low, proceed to fuel source and perform *Section — Shut-Down Procedure*.
3. Turn fuel tank cap (**2**) to remove from filler neck.
4. Add fuel as needed.
5. Replace fuel tank cap.

Note: Replenish diesel fuel at end of each work shift to minimize condensation.

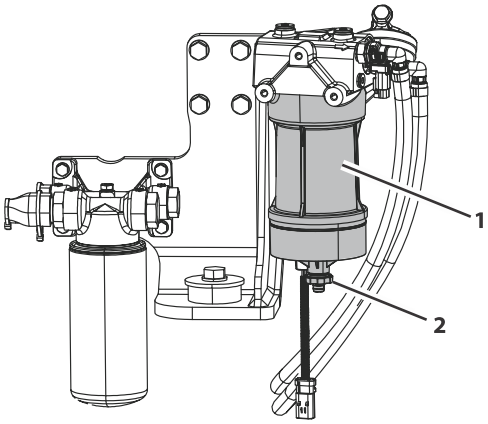
NOTICE

EQUIPMENT DAMAGE. Do not allow machine to run out of fuel during operation. See Engine Operation & Maintenance Manual for details prior to servicing.

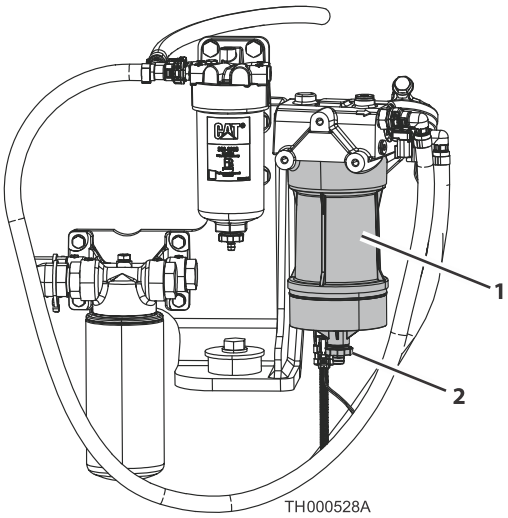
Drain Fuel/Water Separator

50 OW0980 OW1000

TH357 - SNA5300150 TO PRESENT
TH408 - SNA5700150 TO PRESENT
TH3510 - SNA5500150 TO PRESENT



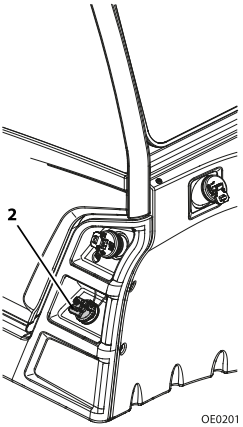
TH357 - SNA5400150 TO PRESENT
TH408 - SNA5800150 TO PRESENT
TH3510 - SNA5600150 TO PRESENT



1. Perform *Section — Shut-Down Procedure*.
2. Open engine cover.
3. Loosen drain cock (**2**) on underside of fuel filter (**1**) and allow all water to drain into a glass until clear fuel is visible. Tighten drain cock.
4. Close and secure engine cover.

7.5.3 Emission System (SN A5300150 to Present, SN A5700150 to Present, SN A5500150 to Present)

Diesel Emission Fluid (DEF) Level Check



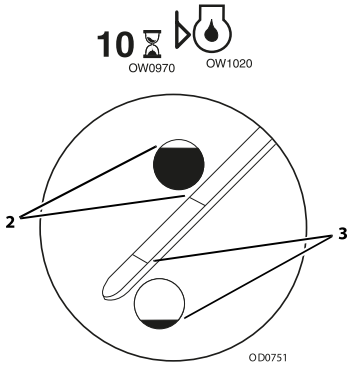
1. Check Diesel Emission Fluid (DEF) Gauge (**1**) located in right side of Instrument Panel in cab.
2. If DEF is low, proceed to DEF source and perform *Section — Shut-Down Procedure*.
3. Turn DEF tank cap (**2**) to remove.
4. Check DEF tank fill strainer for debris or damage. Clean strainer with clean water if debris is present. Replace strainer if cannot be cleaned or is damaged.
5. Add DEF as needed.
6. Replace DEF tank cap.

NOTICE

EQUIPMENT DAMAGE. Do not allow machine to run out of Diesel Emission Fluid (DEF) during operation. See the Engine Operation & Maintenance Manual for details prior to servicing.

7.5.4 Engine Oil

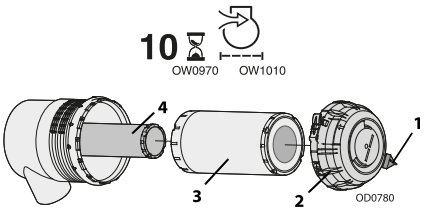
Engine Oil Level Check



1. Perform *Section — Shut-Down Procedure*.
2. Open engine cover.
3. Remove dipstick and check oil mark. Oil should be between full (**2**) and add (**3**) marks of dipstick.
4. Replace dipstick.
5. If oil is low, remove oil fill cap and add oil to bring oil up to full mark.
6. Replace oil fill cap.
7. Close and secure engine cover.

7.5.5 Air Intake System

Air Cleaner Check



1. Perform *Section — Shut-Down Procedure*.
2. Open engine cover.
3. Remove dust from vacuator valve (**1**) by squeezing bottom of valve to allow loose particles to fall out.
4. Close and secure engine cover.

NOTICE

EQUIPMENT DAMAGE. Only remove air cleaner cover to service elements. Excessive access to check elements can lead to premature element and/or engine failure.

Filter Change

Note: Change elements as air cleaner restriction indicator indicates or every two years. Use the interval that occurs first.

1. Perform *Section — Shut-Down Procedure*.
2. Open engine cover.
3. Unlock air cleaner cover (**2**) and remove from air cleaner.
4. Remove outer primary element (**3**). Inspect element for damage then discard.
5. Thoroughly clean interior of air cleaner canister and vacuator valve.
6. Replace inner safety element (**4**) every third primary element change or if primary element was found to be damaged. If replacing inner safety element at this time, carefully slide element out and replace with new element.
7. Slide new primary element over inner safety element making sure sealing edge is flush with base of air cleaner.
8. Position air cleaner cover in place and lock into position.
9. Close and secure engine cover.

Note: Elements should never be washed or reused. Always install new elements.

NOTICE

EQUIPMENT DAMAGE. Primary and safety elements are required to be replaced if used in an application longer than two years regardless of hours of operation.

7.5.6 Tires

Tire Air Pressure Check

1. Perform *Section — Shut-Down Procedure*.
2. Remove valve stem cap.
3. Check tire pressure.
4. Add air if required. See *Section — Tires* for tire pressures.
5. Replace valve stem cap.

Tire Damage

For pneumatic tires, when any cut, rip or tear is discovered that exposes sidewall or tread area cords in the tire, measures be taken to remove the product from service immediately. Arrangements must be made for replacement of the tire or tire assembly.

For polyurethane foam filled tires, when any of the following are discovered, measures must be taken to remove the product from service immediately. Arrangements must be made for replacement of the tire or tire assembly.

- Smooth even cut through the cord plies which exceeds 7,5 cm (3 in) in total length
- Any tears or rips (ragged edges) in cord plies which exceeds 2,5 cm (1 in) in any direction
- Any punctures which exceed 1 in 2,5 cm (1 in) in diameter

If a tire is damaged but within above noted criteria, tire must be inspected daily to ensure damage has not propagated beyond allowable criteria.

Tire and Wheel Replacement

Machines equipped with pneumatic tires from manufacturer must use pneumatic replacements. Machines equipped with foam filled or ballast filled tires from manufacturer must use foam filled or ballast filled replacements.

It is recommended that a replacement tire to be same size, ply, inflation medium and brand as originally installed. Refer to appropriate parts manual for ordering information. If not using an approved replacement tire, replacement tires must have the following characteristics:

- Equal or greater ply/load rating and size of original
- Tire tread contact width equal or greater than original
- Wheel diameter, width and offset dimensions equal to the original
- Approved for application by tire manufacturer (including inflation pressure and maximum tire load)

Due to size variations between tire brands, when selecting and installing a replacement tire ensure both tires on the axle are the same.

The rims installed have been designed for stability requirements which consist of track width, tire pressure and load capacity. Size changes such as rim width, center piece location, larger or smaller diameter, etc., without written factory recommendations, may result in unsafe condition regarding stability.

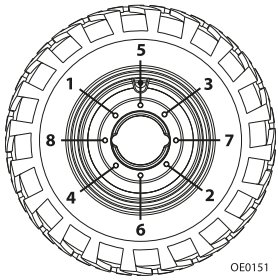
When replacing tires and wheels see *Section — Jacking Up Machine, page 228*.

Wheel Installation

Torque lug nuts after first 50 hours and after each wheel installation.

Note: If machine is equipped with directional tire assemblies, wheel and tire assemblies must be installed with directional tread pattern “arrows” facing in direction of forward travel.

1. Start all nuts by hand to prevent cross threading. DO NOT use a lubricant on threads or nuts.



2. Tighten lug nuts in an alternating pattern as indicated in figure. See *Section — Tires* for torque value.

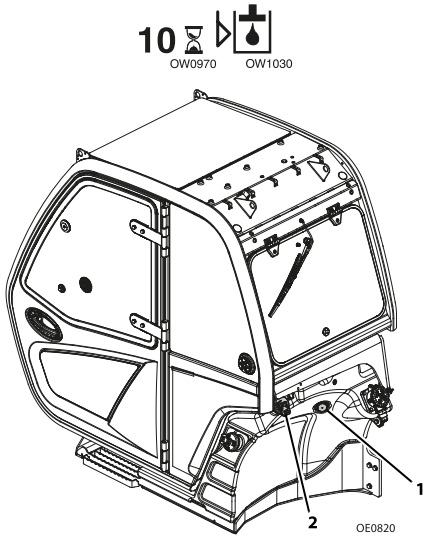
⚠ WARNING

TIP OVER HAZARD. Lug nuts must be installed and maintained at the proper torque to prevent loose wheels, broken studs and possible separation of wheel from the axle.

Note: After replacing tires, refer to Service Manual to configure the new tires using the analyzer hand–held diagnostic tool: Machine Setup menu.

7.5.7 Hydraulic Oil

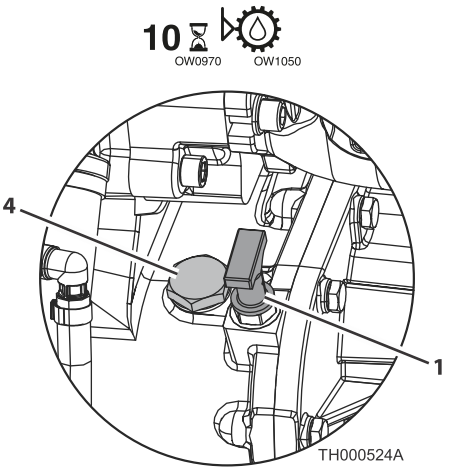
Hydraulic Oil Level Check

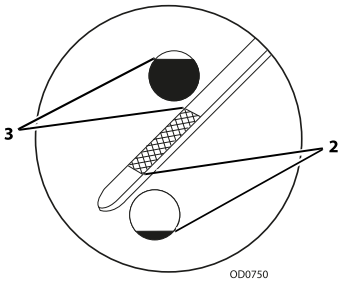


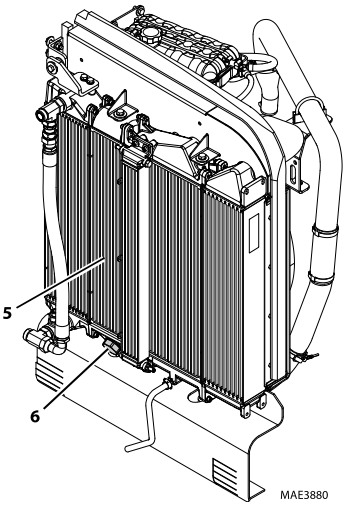
1. Be sure all cylinders are fully retracted, outriggers (if equipped) are fully raised and machine is level.
2. Perform *Section — Shut-Down Procedure*.
3. Allow hydraulic oil to cool. Check fluid level at sight gauge (**1**). Oil level should be visible in gauge window.
4. Remove fill cap (**2**). Add fluid to bring oil up to the center of the sight gauge.
5. Replace hydraulic oil fill cap.

7.5.8 Transmission Oil

Transmission Oil Level Check







Note: Final transmission oil level must always be checked with engine at idle and transmission oil at operating temperature (minimum 80°C/176°F).

1. Start machine on a firm, level surface, level machine, fully retract boom, lower boom, place transmission in (N) NEUTRAL, engage park brake and run engine at idle.
2. Open engine cover.
3. Remove the transmission dipstick (**1**) and check the oil level. The cold oil level after 2-3 minutes of idle must be between the MIN (**2**) and MAX (**3**) oil level marks.
4. If the oil is low, remove plug (**4**) and add oil as required.
5. Replace the transmission dipstick and plug.
6. Close and secure the engine cover.
7. Ensure that the front of the machine is clear of persons or obstacles.
8. Apply the service brake and disengage the park brake. Place the transmission in (F) FORWARD at 4th gear.
9. Stall the transmission against service brake at full throttle a maximum of 60 seconds. If transmission temperature warning light illuminates, go to step 12.
10. Allow the engine to run at idle for 30 seconds.
11. Repeat steps 9 and 10 three more times or until the transmission temperature warning light illuminates.
12. Place the transmission in (N) NEUTRAL and apply the park brake. Allow the engine to run at idle for 30 seconds.
13. Open the engine cover.
14. Verify that top of transmission oil cooler (**5**) is warm to determine that the bypass valve (**6**) has closed and oil is circulating through the cooler. If the top tank of the transmission oil cooler is not warm, repeat steps 6 thru 10.
15. Remove the transmission dipstick (**1**) and check the oil level. The oil level should be between the MIN and MAX level marks.
16. Add oil as required.
17. Replace the transmission dipstick and plug.
18. Close and secure the engine cover.
19. Shut engine OFF.

7.5.9 Brake Fluid

Brake Fluid Level Check

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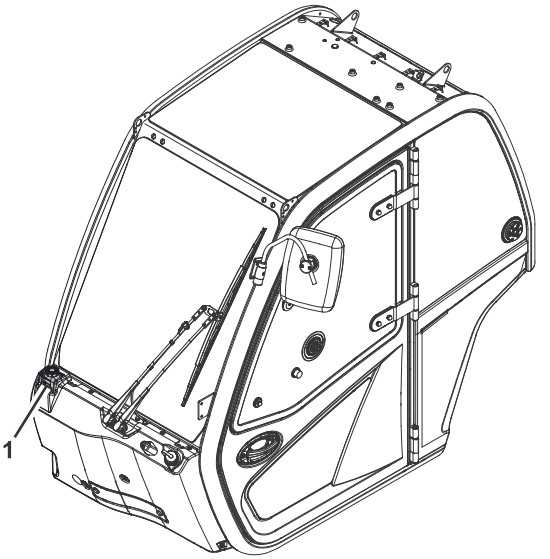
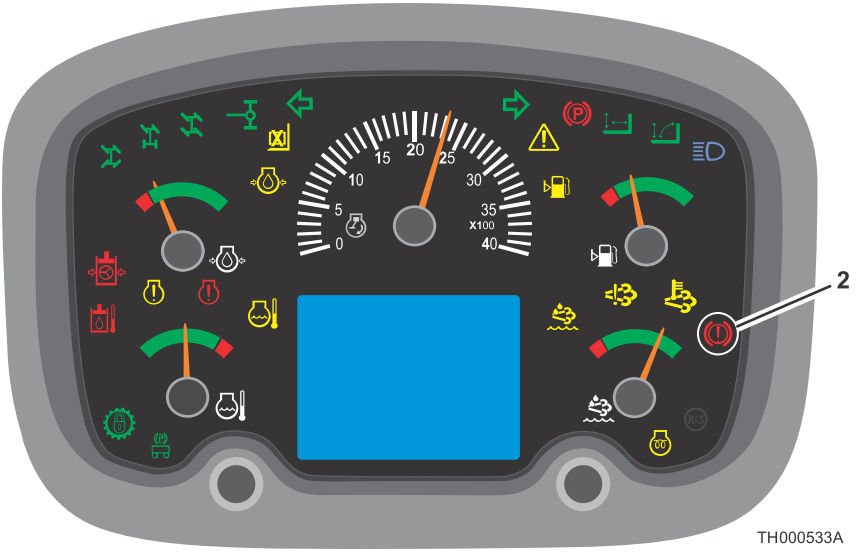
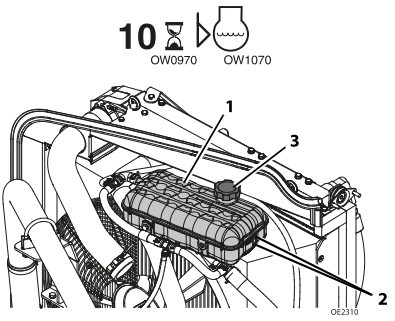




1. Release the park brake.
2. Check the brake fluid level (**1**). Depress and hold the service brake pedal all the way and verify that the Service Brake Fault (**2**) on the instrument panel does not illuminate.
3. If the Service Brake Fault illuminates, remove the product from service. See Service Manual for information.

7.5.10 Engine Cooling System

Engine Coolant Level Check

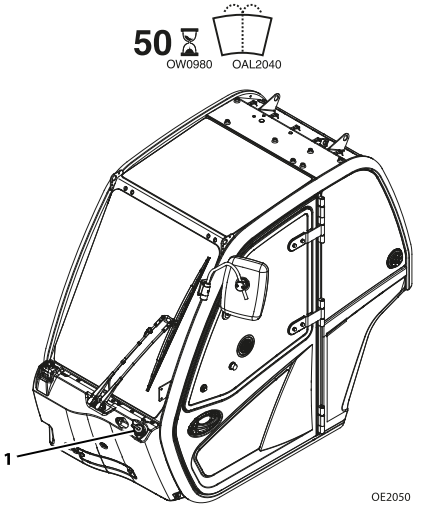


1. Perform *Section — Shut-Down Procedure*.
2. Open engine cover.
3. Check coolant level in surge tank (**1**). Coolant should be between Max and Min (**2**) marks on surge tank.
4. If coolant is low, allow fluid to cool.
5. Remove surge tank cap (**3**) slowly. Add coolant as required.
6. Replace surge tank cap.
7. Close and secure engine cover.

Note: When filling coolant, maximum fill rate is 9,5 liter per minute (2.5 gallon per minute).

7.5.11 Windshield Washer System

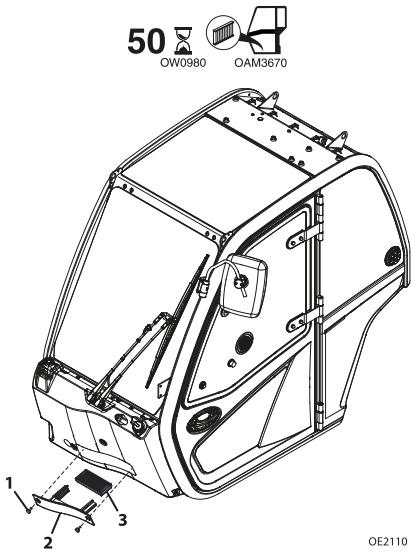
Windshield Washer Fluid Level Check



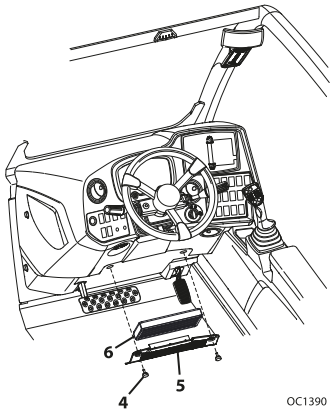
1. Perform *Section — Shut-Down Procedure*.
2. Remove reservoir cap (**1**).
3. Windshield washer fluid should be visible in the reservoir.
4. If washer fluid level is low, add fluid as needed.
5. Replace reservoir cap.

7.5.12 Cab Air Filters (if equipped)

Cab Air Filters Check



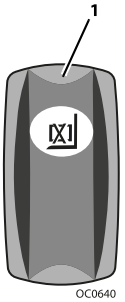
1. Perform *Section — Shut-Down Procedure*.
2. Remove two thumb screws (**1**) and panel (**2**) from front of cab.
3. Remove filter (**3**) and inspect.
4. If filter is not damaged, clean and place back under dash. If damaged, replace filter.
5. Replace panel on front of cab and secure with thumb screws.

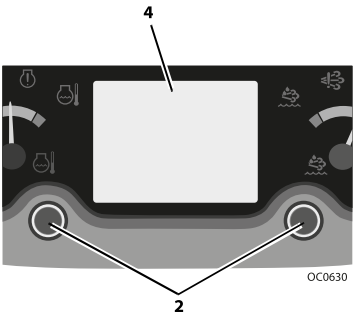


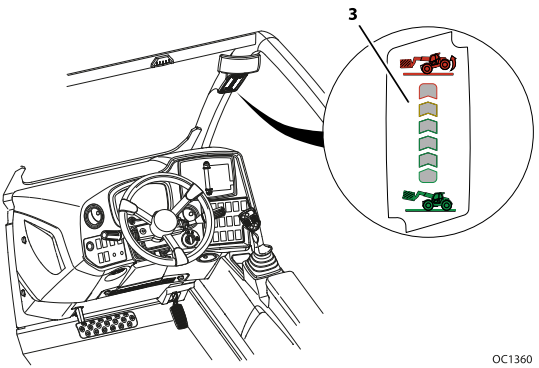
6. Remove two thumb screws (**4**) and panel (**5**) from under dash.
7. Remove cab air filter (**6**) and inspect.
8. If filter is not damaged, clean and place back under dash. If damaged, replace filter.
9. Replace panel and secure with thumb screws.

7.5.13 Load Stability Indicator System

Load Stability Indicator System Check







The Load Stability Indicator (LSI) is intended to continuously monitor the forward stability of the telehandler. To check this feature, perform the following:

1. Remove attachment, fully retract and fully raise boom and fully lower outriggers (if equipped).

2. Press and hold LSI override switch (**1**) on left control panel and the two control buttons (**2**) on instrument panel.

3. LSI indicator LEDs (**3**) will illuminate sequentially then repeat if check is successful. LSI indicator LEDs will resume normal functionality when control buttons are released.

4. If check fails, a fault code will appear in the LCD display (**4**) and must be corrected before continued use. Repeat system check or re-calibrate machine. See Service Manual for LSI system calibration information.

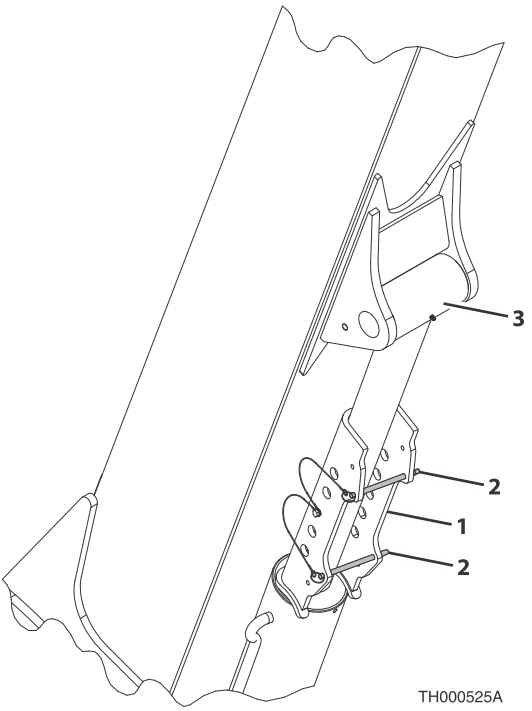
7.5.14 Boom Prop (if equipped)

⚠ WARNING

A raised boom can fall if a hydraulic component is removed. Remove any load, retract the boom and install the boom prop or a suitable supporting stand before working under a raised boom.

Boom Prop Installation

1. Park the machine on a firm, level surface. Place the transmission in (N) NEUTRAL, engage the park brake switch.
2. Raise the boom to an angle of approximately 20 degrees. Stop engine.
3. Place a Do Not Operate Tag on both the ignition key switch and the steering wheel.
4. Before installing the boom prop, inspect the prop for damage. **DO NOT** use if the prop is damaged or if the locking pins are damaged or missing.



5. Align boom prop (**1**) so the locking pins (**2**) are on the bottom side of the lift/lower cylinder rod (**3**). Install the boom prop (**1**) onto the lift/lower cylinder. Install locking pins (**2**).

6. Start the engine and SLOWLY lower the boom until there is a clearance of 6 mm (0.25 in) between the end of the boom prop and the lift/lower cylinder rod end (**3**).

NOTICE

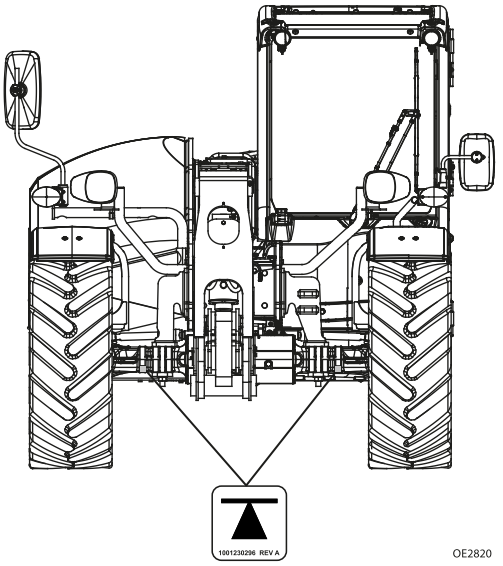
EQUIPMENT DAMAGE. **DO NOT** operate with the boom prop in place. Damage to the boom prop and/or the lift/lower cylinder could occur.

7. Shut **OFF** engine.

Boom Prop Removal

1. If needed, start machine and slowly raise the boom until the boom prop is clear of the lift/lower rod end.
2. Remove the locking pins (**2**) and boom prop (**1**) from the lift cylinder. Return the boom prop to the proper location and secure.
3. Lower boom, shut engine **OFF**.

7.5.15 Jacking Up Machine



Jack up machine at designated locations. Improper placement may damage machine or cause injury.

1. Ensure machine is parked on a solid, level surface.
2. Set the park brake and turn off engine.
3. Place wheel chocks on both sides of tires at end of machine that will not be jacked up.
4. Jack machine up at designated jack points located on both the front and rear axles. Use jack stands to support the machine.

SECTION 8
Additional Checks

8.1 GENERAL

If any of the following test results cannot be achieved, the system is not functioning properly and the machine must be removed from service and repaired before continued operation.

8.2 REVERSE SENSING SYSTEM (IF EQUIPPED)

8.2.1 Reverse Sensing System Check

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OW0970

Reverse Sensing System provides audible indication of objects to rear of unit while in reverse gear.

1. Clear all people and/or obstacles behind machine before performing Reverse Sensing System check.
2. Start machine and depress and hold brake. Place machine in reverse gear.
3. Verify alarm sounds upon system start up.

Note: Reverse Sensing System detects objects of size more than 232.25 square centimeters (36 square inches) area and is functional when machine is moving in reverse direction.

Note: The use of a construction cone or similar object must be used to test the Reverse Sensing System.

⚠ WARNING

CRUSH HAZARD. Do not use a person to test the reverse sensing system.

4. Verify operation with no objects in detection zone. No audible alarm.
5. Verify operation when object is in range of approximately 2.7 to 4.5 m (9 to 15 ft). Produces pulsing audible alarm at a frequency of one per second (1 Hz).
6. Verify operation when object is in range of approximately 2.1 to 2.7 m (7 to 9 ft). Produces pulsing audible alarm. Produces pulsing audible alarm at a frequency of two per second (2 Hz).
7. Verify operation when object is range of approximately 0.9 to 2.1 m (3 to 7 ft). Produces pulsing audible alarm at a frequency of four per second (4 Hz).
8. Verify operation when object is under approximately 0.9 m (3 ft) from machine. Produces pulsing audible alarm at a frequency of eight per second (8 Hz).

SECTION 9
Specifications

9.1 PRODUCT SPECIFICATIONS

9.1.1 Fluids

SN A5300150 to Present, SN A5700150 to Present, SN A5500150 to Present

Compartment or System	Type and Classification	Viscosities	Ambient Temperature Range			
			°F		°C	
			Min	Max	Min	Max
Engine Crankcase	CAT DEO ULS API CJ-4	SAE 15W-40	14	118	-10	48
		SAE 10W-30	-4	104	-20	40
		SAE 0W-40	-20	118	-29	48
Transmission and Transfer Case	CAT TDTO	SAE 50	50	122	10	50
		SAE 30	32	95	0	35
		SAE 10W	0	95	-20	35
		SAE 5W-30	-22	68	-30	20
		SAE 0W-30	-40	68	-40	20
Axle Differential and Wheel Ends	API GL5 with LS Additives	80W-90 LS	-4	118	-20	48
		85W-90 LS	-4	118	-20	48
		75W-90 LS	-40	118	-40	48
Hydraulic System	CAT TDTO CAT Arctic TDTO SYN commercial TO-4	SAE 15W-40	5	122	-15	50
		SAE 10W-30	-4	104	-20	40
		SAE 30	50	122	10	50
		SAE 10W	-4	104	-20	40
		SAE 5W-40	-22	104	-30	40
		SAE 5W-30	-22	104	-30	40
		SAE 0W-30	-40	104	-40	40
		SAE 0W-20	-40	104	-40	40
Boom Wear Pad Grease	Extreme Pressure Grease	NLGI Grade 000	-31	122	-35	50

Compartment or System	Type and Classification	Viscosities	Ambient Temperature Range			
			°F		°C	
			Min	Max	Min	Max
Grease Fittings	Extreme Pressure Grease	NLGI Grade 2 EP with Moly Additive or NLGI Grade 3 EP with Moly Additive	5	122	-15	50
Engine Coolant	CAT Extended Life Coolant (ELC)	50/50 Mix				
Fuel	EN590 ASTM D975 Grade 2-D ASTM D975 Grade 1-D (Maximum B5 Biodiesel)	Ultra Low Sulfur ($S \leq 15$ mg/kg)				
Diesel Exhaust Fluid	ISO22241-1	32.5%Urea				
Brake Fluid	Mobil ATF 220		-40	122	-40	50
Air Conditioning	Refrigerant R-134-a	Tetrafluoroethane				

SN A5400150 to Present, SN A5800150 to Present, SN A5600150 to Present

Compartment or System	Type and Classification	Viscosities	Ambient Temperature Range			
			°F		°C	
			Min	Max	Min	Max
Engine Crankcase	CAT DEO API CI-4	SAE 15W-40	14	118	-10	48
		SAE 10W-30	-4	104	-20	40
		SAE 0W-40	-20	118	-29	48
Transmission and Transfer Case	CAT TDTO	SAE 50	50	122	10	50
		SAE 30	32	95	0	35
		SAE 10W	0	95	-20	35
		SAE 5W-30	-22	68	-30	20
		SAE 0W-30	-40	68	-40	20
Axle Differential and Wheel Ends	API GL5 with LS Additives	80W-90 LS	-4	118	-20	48
		85W-90 LS	-4	118	-20	48
		75W-90 LS	-40	118	-40	48

Compartment or System	Type and Classification	Viscosities	Ambient Temperature Range			
			°F		°C	
			Min	Max	Min	Max
Hydraulic System	CAT TDTO CAT Arctic TDTO SYN commercial TO-4	SAE 15W-40	5	122	-15	50
		SAE 10W-30	-4	104	-20	40
		SAE 30	50	122	10	50
		SAE 10W	-4	104	-20	40
		SAE 5W-40	-22	104	-30	40
		SAE 5W-30	-22	104	-30	40
		SAE 0W-30	-40	104	-40	40
		SAE 0W-20	-40	104	-40	40
Boom Wear Pad Grease	Extreme Pressure Grease	NLGI Grade 000	-31	122	-35	50
Grease Fittings	Extreme Pressure Grease	NLGI Grade 2 EP with Moly Additive or NLGI Grade 3 EP with Moly Additive	5	122	-15	50
Engine Coolant	CAT Extended Life Coolant (ELC)	50/50 Mix				
Fuel	EN590 ASTM D975 Grade 2-D ASTM D975 Grade 1-D (Maximum B5 Biodiesel)	Low Sulfur (S ≤ 500 mg/kg)				
Brake Fluid	Mobil ATF 220		-40	122	-40	50
Air Conditioning	Refrigerant R-134-a	Tetrafluoroethane				

9.1.2 Capacities

Engine Crankcase Oil

Capacity with Filter Change . . . . . 11,6 L (12.3 qt)

Fuel Tank

Capacity. . . . . 145 L (38 gal)

Diesel Exhaust Fluid Tank

Capacity . . . . . 19 L (5.0 gal)

Cooling System

System Capacity . . . . . 17,5 L (18.5 qt)

Hydraulic System

System Capacity . . . . . 130 L (34.3 gal)

Reservoir Capacity to Full Mark . . . . . 97 L (25.6 gal)

Transmission System

Capacity with Filter Change . . . . . 14 L (14.8 qt)

Transfer Case

Capacity. . . . . 2,75 L (2.9 qt)

Axles

Differential Housing Capacity

Front Axle . . . . . 6,15 L (6.5 qt)

Rear Axle . . . . . 7,5 L (7.9 qt)

Wheel End Capacity . . . . . 1,61 L (1.7 qt)

Brake Fluid

Capacity. . . . . 0,5 L (0.5 qt)

Air Conditioning System (if equipped)

System Capacity . . . . . 1200 g (2.65 lb)

9.1.3 Tires

15.5/80-24 . . . . . 4,25 bar (62 psi)

15.5 R25 XHA TL . . . . . 4,25 bar (62 psi)

460/70 R24 XMCL . . . . . 4,0 bar (58 psi)

500/70 R24 XMCL . . . . . 3,0 bar (44 psi)

400/80-24 POWER CL . . . . . 4,0 bar (58 psi)

460/70 R24 BIBLOAD . . . . . 4,0 bar (58 psi)

Wheel Lug Nut

Torque . . . . . .460 ±20 Nm (340 ±15 lb-ft)

9.1.4 Performance

Maximum Lift Capacity

TH357 ..... 3500 kg (7716 lb)

TH408 ..... 4000 kg (8819 lb)

TH3510 ..... 3500 kg (7716 lb)

Maximum Lift Height

TH357 ..... 7000 mm (23.0 ft)

TH408 ..... 7610 mm (25.0 ft)

TH3510 ..... 9800 mm (32.2 ft)

Capacity at Maximum Height

TH357 ..... 2375 kg (5236 lb)

TH408 ..... 2150 kg (4740 lb)

TH3510 ..... 1050 kg (2813 lb)

Maximum Forward Reach

TH357 ..... 3700 mm (12.1 ft)

TH408 ..... 4276 mm (14.0 ft)

TH3510 ..... 6600 mm (21.7 ft)

Capacity at Maximum Forward Reach

TH357 ..... 1375 kg (3031 lb)

TH408 ..... 1275 kg (2811 lb)

TH3510 ..... 500 kg (1102 lb)

Reach at Maximum Height

TH357 ..... 550 mm (1.8 ft)

TH408 ..... 900 mm (3.0 ft)

TH3510 ..... 1230 mm (4.0 ft)

Auxiliary Hydraulic Circuit Max Flow

Front Auxiliary ..... 90 lpm (23.8 gpm)

Rear Auxiliary ..... 100 lpm (26.4 gpm)

Maximum Travel Speed ..... 40 kph (24.9 mph)

Maximum Travel Grade (boom in travel position)

Gradeability 45%

Side Slope 8.75%

Note: Refer to machine specific documents and/or plates for local governmental requirements and/or restrictions.

9.1.5 Dimensions

Note: Values will vary depending on machine configuration.

Maximum Overall Height. . . . . 2475 mm (97.4 in)
Maximum Overall Width . . . . . 2382 mm (93.8 in)
Maximum Track Width . . . . . 1988 mm (78.3 in)
Wheel Base . . . . . 3165 mm (124.6 in)
Length at Front Wheels . . . . . 4433 mm (174.5 in)
Overall Length (no attachment)
TH357. . . . . 4972 mm (195.8 in)
TH408. . . . . 5258 mm (207.0 in)
TH3510 . . . . . 5300 mm (208.7 in)
Ground Clearance . . . . . 429 mm (16.9 in)
Outside Turning Radius Over Tires . . . . . 3847 mm (151.5 in)
Outside Turning Radius Over Forks
TH357. . . . . 4400 mm (173.2 in)
TH408. . . . . 4525 mm (178.2 in)
TH3510 . . . . . 4585 mm (180.5 in)
Maximum Operating Weight (no attachment)
TH357. . . . . 8132 kg (17,928 lb)
TH408. . . . . 8712 kg (19,207 lb)
TH3510 . . . . . 9287 kg (20,474 lb)
Distribution of Maximum Operating Weight
(no attachment, boom level and fully retracted)
Front Axle
TH357. . . . . 4058 kg (8,946 lb)
TH408. . . . . 3985 kg (8,785 lb)
TH3510 . . . . . 4273 kg (9,420 lb)
Rear Axle
TH357. . . . . 4074 kg (8,982 lb)
TH408. . . . . 4727 kg (10,421 lb)
TH3510 . . . . . 5014 kg (11,054 lb)

Maximum Ground Bearing Pressure

TH357

15.5/80-24 . . . . . 10,04 kg/cm² (142.8 lb/in²)

15.5 R25 XHA TL . . . . . 7,44 kg/cm² (105.8 lb/in²)

460/70 R24 XMCL . . . . . 11,21 kg/cm² (159.4 lb/in²)

500/70 R24 XMCL . . . . . 8,58 kg/cm² (122.0 lb/in²)

400/80-24 POWER CL . . . . . 11,46 kg/cm² (163.0 lb/in²)

460/70 R24 BIBLOAD . . . . . 8,74 kg/cm² (124.3 lb/in²)

TH408

15.5/80-24 . . . . . 10,23 kg/cm² (145.5 lb/in²)

15.5 R25 XHA TL . . . . . 7,41 kg/cm² (105.4 lb/in²)

460/70 R24 XMCL . . . . . 11,48 kg/cm² (163.3 lb/in²)

500/70 R24 XMCL . . . . . 8,76 kg/cm² (124.6 lb/in²)

400/80-24 POWER CL . . . . . 11,65 kg/cm² (165.7 lb/in²)

460/70 R24 BIBLOAD . . . . . 8,96 kg/cm² (127.4 lb/in²)

TH3510

15.5/80-24 . . . . . 10,65 kg/cm² (151.5 lb/in²)

15.5 R25 XHA TL . . . . . 7,51 kg/cm² (106.8 lb/in²)

460/70 R24 XMCL . . . . . 12,00 kg/cm² (170.7 lb/in²)

500/70 R24 XMCL . . . . . 9,12 kg/cm² (129.7 lb/in²)

400/80-24 POWER CL . . . . . 12,06 kg/cm² (171.5 lb/in²)

460/70 R24 BIBLOAD . . . . . 9,42 kg/cm² (134.0 lb/in²)

9.2 SUPPLEMENTAL INFORMATION ONLY APPLICABLE TO CE/UKCA MACHINES

The following information is provided in accordance with the requirements of the European Machinery Directive 2006/42/EC or Supply of Machinery (Safety) Regulations 2008 No. 1597.

9.2.1 Vibration

According to Regulation (EU) No 1322/2014, Annex XIV

Seat*	Weighted Seat Vibration Acceleration (a^{ws})	
	Light Driver	Heavy Driver
503-1691	1,18 m/s^2	1,01 m/s^2
476-8930	1,13 m/s^2	1,01 m/s^2
503-1690	1,14 m/s^2	1,06 m/s^2

According to Standard EN13059

Seat*	Average Weighted Whole Body Acceleration
Mechanical Suspension	0,387 m/s^2 (1.3 ft/s^2)
Pneumatic Suspension	0,298 m/s^2 (1.0 ft/s^2)

*A seat is an essential means to reduce the vibration transmitted to the operator. In case of replacement of the seat, refer to the manufacturer.

9.2.2 Noise Emission Levels

Note: To avoid any increase in noise emission, after maintenance and repair work, all panels and other sound absorbing materials must be replaced in their original condition. Do not modify the machine in such a manner as to increase noise emissions.

L_{WA} is A-weighted emission sound power level

L_{pA} is A-weighted emission sound pressure level at the operator position

According to Directive 2000/14/EC and Regulations 2001 No. 1701 (Outdoor Noise) & EN 12053 (Operator Noise)

Model	Net Power:	2000/14/EC, 2001 No. 1701	EN 12053
TH357 TH408 TH3510	≤90,0 kW	106 dB(A) L_{WA}	<80 dB(A) L_{pA}
TH357 TH408 TH3510	>90,0 kW	107 dB(A) L_{WA}	<80 dB(A) L_{pA}

According to Regulation (EU) No 1322/2014, Annex XIII (Operator Noise)

Test Method 1

Model	Windows Closed	Windows Open
TH357 TH408 TH3510	81.6 dB(A)	82.5 dB(A)

Test Method 2

Model	Windows Closed	Windows Open
TH357 TH408 TH3510	76.4 dB(A)	76.2 dB(A)

According to Regulation (EU) No 2015/96 (Annex III) Amendment (EU) No 2018/985 (Drive By Noise)

Model	Windows Closed	Windows Open
TH357 TH408 TH3510	78 dB(A)	69 dB(A)

9.2.3 Machine Towing Capacity

Note: Refer to machine specific documents and/or plates for local governmental requirements and/or restrictions.

Unbraked . . . . . 3000 kg (6,614 lb)

Hydraulic or Pneumatic Braked . . . . . 12000 kg (26,455 lb)

According to Regulation (EU) No 2015/208, Annex XXI & XXII

TH357, TH408

Tires	Maximum Mass per Axle (kg)		Hitch Load TH357		Hitch Load TH408	
	30 km/h	40 km/h	30 km/h	40 km/h	30 km/h	40 km/h
15.5/80-24	8700	7900	2500	2500	2500	2500
15.5 R25 XHA TL	9000	8200	2500	2500	2500	2500
460/70 R24 XMCL	9000	8100	2500	2500	2500	2500
500/70 R24 XMCL	8000	7800	2500	2500	2500	2500
400/80-24 POWER CL	8200	7900	2500	2500	2500	2500
460/70 R24 BIBLOAD	9000	8100	2500	2500	2500	2500

TH3510

Tires	Maximum Mass per Axle (kg)		EEC Manual Hitches Hitch Load		Fixed Height & Hydraulic Hitches Hitch Load	
	30 km/h	40 km/h	30 km/h	40 km/h	30 km/h	40 km/h
15.5/80-24	8700	7900	2500	2400	2500	2500
15.5 R25 XHA TL	9000	8200	2500	2500	2500	2500
460/70 R24 XMCL	9000	8100	2500	2500	2500	2500
500/70 R24 XMCL	8000	7800	2500	2400	2500	2400
400/80-24 POWER CL	8200	7900	2500	2400	2500	2500
460/70 R24 BIBLOAD	9000	8100	2500	2500	2500	2500

9.2.4 EC Declaration of Conformity

Manufacturer:

JLG Industries, Inc.

Address:

1 JLG Drive

1McConnellsburg, PA

17233 USA

Technical File:

JLG EMEA B.V.

Polaris avenue 63,

2132 JH Hoofddorp

The Netherlands

Contact / Position:

Senior Manager — Product Safety & Reliability

Date / Place:

Hoofddorp, Netherlands

Machine Type:	Telescopic Handler
Model Type:	TH357, TH408, TH3510
Notified Body:	(Self Certified)
Certificate Number:	JLG TCF 218001
Reference Standards:	• EN 1459-1:2017+A1:2020 • EN ISO 12100:2010 • EN ISO 13766-1:2018 • EN ISO 14982:2009

JLG Industries Inc. hereby declares that the above mentioned machine conforms with the requirements of:

- 2006/42/EC - Machinery Directive
- 2014/30/EU - EMC Directive
- 2014/53/EU - RED Directive (If fitted with optional equipment)
- 2000/14/EC - Outdoor Noise Directive

Note: This declaration conforms with the requirements of annex II-A of the council directive 2006/42/EC. Any modification to the above described machine violates the validity of this declaration.

9.2.5 UKCA Declaration of Conformity

Manufacturer:

JLG Industries, Inc.

Address:

1 JLG Drive

1McConnellsburg, PA

17233 USA

Technical File:

JLG Industries UK Ltd

Braunstone Frith Industrial Estate

Unit 3 Sunningdale Road

Leicester, LE3 1UX

United Kingdom

Contact / Position:

Director of Engineering-Europe

Date / Place:

Leicester, United Kingdom

Machine Type:	Telescopic Handler
Model Type:	TH357, TH408, TH3510
Approved Body:	(Self Certified)

Certificate Number: JLG TCF 218001

Reference Standards:

- EN 1459-1:2017+A1:2020
- EN ISO 12100:2010
- EN ISO 13766-1:2018
- EN ISO 14982:2009

JLG Industries Inc. hereby declares that the above mentioned machine conforms with the requirements of:

- 2008 No. 1597 - Supply of Machinery (Safety) Regulations 2008
- 2016 No. 1091 - Electromagnetic Compatibility Regulations 2016
- 2017 No. 1206 - Radio Equipment Regulations 2017 (If fitted with optional equipment)
- 2001 No. 1701 - Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001

Note: This declaration conforms with the requirements of annex II-A of the Regulations 2008 No. 1597. Any modification to the above described machine violates the validity of this declaration.

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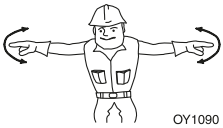
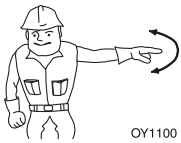
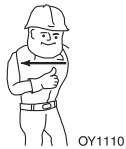
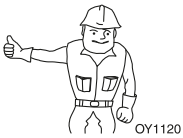
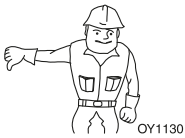
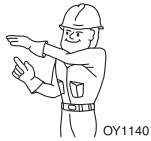
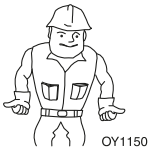
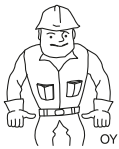
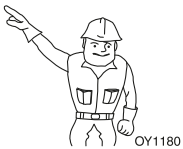
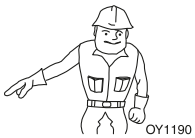
Serial Number ____

Date	Comments

Hand Signals

 OY1090 EMERGENCY STOP - With both arms extended laterally, hands open downward, move arms back and forth.	 OY1100 STOP - With either arm extended laterally, hand open downward, move arm back and forth.	 OY1110 STOP ENGINE - Draw thumb or forefinger across throat.
 OY1120 RAISE BOOM - With either arm extended horizontally, fingers closed, point thumb upward.	 OY1130 LOWER BOOM - With either arm extended horizontally, fingers closed, point thumb downward.	 OY1140 MOVE SLOWLY - Place one hand motionless in front of hand giving motion signal. (Raise load slowly shown)
 OY1150 EXTEND BOOM - With both hands clenched, point thumbs outward.	 OY1160 RETRACT BOOM - With both hands clenched, point thumbs inward.	 OY1170 THIS FAR TO GO - With hands raised and open inward, move hands laterally, indicating distance to go.
 OY1180 TILT FORKS UP - With one arm held at side, extend other arm upward at about 45 degrees.	 OY1190 TILT FORKS DOWN - With one arm held at side, extend other arm downward at about 45 degrees.	

Special Signals - When signals for auxiliary equipment functions or conditions not covered are required, they shall be agreed upon in advance by the operator and signalman.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