

# Wheel Loaders

Definition: A wheel loader consists of an articulated main frame that supports a front end attachment, and a cab and engine compartment with transmission at the rear end.

Wheel loader, by design, are extremely versatile in scrap applications. They can be used as a carrier for implements such as shovel bucket, fork lift tines, or grapple.

## **Primary Hazards**

Falling and ejected objects

Slipping and falling

Cutting

Pinching and crushing

Burning and explosions

## **Safety Solutions**

Wearing personal protective equipment

Pre-startup inspections

Scheduled inspections and maintenance

Safe operating and working procedures

Employee safety training

Operator and maintenance training

## **Pre-Start Up Procedure and Inspection**

A wheel loader is designed to re-handle, load and transport loose material if equipped with the appropriate attachment, i.e. bucket, grapple, or lift forks. It is not designed to crush, rip apart or compact loaded material

Ensure that the operator is properly trained and certified to operate the equipment in the material handling application at hand

Only designated and authorized personnel may operate the wheel loader

The wheel loader operator must be mentally and physically fit, have good vision, spatial perception, adequate hearing and quick reaction time (response)

The operator must always adhere to the guidelines for the appropriate use of the wheel loader. The wheel loader can pose a hazard if the safety practices and

instructions outlined in the manufacturer's instruction and safety manual are not adhered to at all times

The operator must be completely familiar with the layout and operation of all wheel loader controls, monitors and indicators

The operator must know the wheel loader's precise lifting capabilities and limitations

Prior to start up the wheel loader operator must thoroughly plan the operating procedure of the machine, based on the existing working conditions and prevailing environment

He must be aware of the location of all underground and above ground utilities at the jobsite

The operator and maintenance personnel must identify the clear and safe approach to the machine

The operator must perform a daily walk-around inspection and check the wheel loader and the jobsite surroundings

He must check for secured pin and bolt connections, the condition of wear and tear items, hydraulic and fuel leaks as well as any structural damage

The operator must pay attention to obvious maintenance deficiencies including, but not limited to, loose wheel lug nuts, incorrect tire inflation, tire damage, clutch or brake failures, frayed or otherwise damaged fuel or hydraulic lines, hoses or hose assemblies

Never operate a defective or damaged machine

Access the machine using a three-point stance on ladders, steps and handholds provided

Never use the steering wheel or a joystick as a handhold

Familiarize yourself with the emergency exit on the machine

Perform a machine inspection and check prior to every shift change as outlined in the manufacturer's instruction manual

Verify that all maintenance has been completed and documented

Ensure that all doors are unlocked but closed and secured to avoid inadvertent movement

Ensure that all windows and mirrors are unobstructed and clean. Mirrors must be properly positioned for best operator visibility to the rear of the machine

Take a seat and fasten the seat belt prior to operating the wheel loader

Adjust the seat and armrests to the most comfortable operating position

Ensure that the area of operation is clear of personnel and obstructions

### **Starting and Operating the Wheel Loader**

Operate the wheel loader only outdoors or in a well-ventilated interior space

Maintain clear communication with co-workers and good visibility at all times

Ensure that other personnel in the vicinity is aware that this machine has been started and the operation is about to commence

Use one of the following signals to alert all personnel in the area of the impending machine operation

by sounding the horn twice

by energizing the beacon light/flasher (if applicable)

A signal-person should be provided if the wheel loader operates in a confined area with limited visibility. The signal-person should remain out of reach of the wheel loader at all times

Test and verify radio contact to the operator, if available

Keep the cab and control levers and pedals clean and do not place drinking cups, magazines or other objects on the control panel

Do not store any tools, equipment, or flammable liquids in the cab

Start the engine as specified by the manufacturer. Once the engine is running, observe the control panel and monitor the display for any abnormal indication or error codes; consult the machine's instruction manual

Energize the servo circuit control before any hydraulic function can be activated

Test all wheel loader functions including the lift arm and bucket-tilt operations, the steering and brake systems, as well as all lights and turning signals

Increase the engine speed and allow the systems such as engine coolant and hydraulic fluid to warm up to operating temperatures

During operation always proceed carefully with sufficient clearance to power lines and other obstructions

Know the weight, dimensions and center of gravity of the load to be lifted

Place the machine in the proper working position and assure that you work within the machine's capabilities at all times

Use only slow and progressive joystick movements when operating the machine under load conditions

Reduce the travel speed of the wheel loader to a minimum (i.e. first gear) during poor visibility and/or when traveling down-hill, on rough terrain, or icy roads

Allow plenty of time and space for stopping the movement of the loaded wheel loader. Do not slam the service brakes while traveling with a load

While driving on public roads the operator must be aware of the pertinent Department of Transportation rules and regulations, road conditions, posted overpass clearances (width and height) and bridge load limitations

When traveling the machine, lower the attachment and load to the ground as low as possible

Never leave the machine for any reason while the engine is running and/or the machine is still in motion

Never allow any other person on or near the machine during operation

In the event that the attachment touches a high voltage power line proceed as follows:

Stay in the cab and do not touch any metal parts

Warn coworkers not to touch the machine

If possible, travel the machine slowly away from the point of contact

Have the supervisor request the power company to switch the power line off

- Leave the cab only after the power line has been switched off or the machine is

at a safe distance from the power line

To minimize shock loads and/or shaking of the machine, reduce the travel speed and avoid road bumps, potholes, hard breaking and sudden steering maneuvers or attachment controls

## **Shutdown and Parking Procedures**

Always park the wheel loader on firm and level ground

Lower the attachment completely to the ground as outlined in the manufacturer's instruction manual and de-energize the servo control hydraulics to avoid unintentional activation of any hydraulic function

To depressurize the hydraulic circuits, lower the attachment completely to the ground, de-energize the servo system and activate the joystick lever(s) in a circular motion several times before placing them in neutral position

In case a wheel loader must be temporarily parked on an incline, engage the parking brake, bring the bucket into the dump position and lower it completely to the ground. Use the wheel chucks supplied with the machine or otherwise sufficiently block the machine from rolling downhill

De-energize the wheel loader's servo system and engage the parking brake. Gradually reduce the engine speed and idle it for a couple of minutes prior to shut-off

Shut and secure windows and covers, and lock doors and covers

Climb down facing the machine using a three-point stance. Never jump off the machine!

Remove the battery disconnect switch if the machine is parked for an extended period of time

Secure and lock the machine to void unauthorized use and/or vandalism

## **Maintenance and Repair Procedures**

Always follow the manufacturer's daily, scheduled and preventive maintenance, and inspection procedures and instructions

While an operator may perform the daily and weekly maintenance service, only properly trained and qualified mechanics/technicians should attempt to perform the more involved maintenance, machine inspections and/or required repairs

Prior to any maintenance and/or repair service follow the proper shutdown (as described above in section 3) and lock-out/tag-out procedures

If the wheel loader features an articulated steering mechanism, install the locking bar to avoid unintentional articulation while servicing the machine

In case a machine is serviced underneath the lift arms in front of the machine use the prop up bar to block one lift cylinder. If a prop up bar is not available place the

bucket into the extreme dump position and lower it completely to the ground

Steam-clean the wheel loader prior to any inspections, maintenance or repairs. Avoid spraying steam directly at electrical components and connectors. Do not use aggressive chemical degreaser solvents such as brake cleaners to clean the machine or its components, other than brakes

Never open a hydraulic circuit unless it has been completely depressurized as described above

When servicing the wheel loader or its attachments, never use hands or fingers to align bolts or pins

Use an appropriate lifting device, slings or chains to lift heavy part and/or components

Always use the appropriate tool to service the equipment and always wear the personal protective equipment (PPE) as required by OSHA and local jobsite regulations

Never place yourself or allow anyone else underneath the machine or under an elevated attachment to be serviced, unless it is securely blocked; consider that loads may shift

Use a man lift or a portable platform and wear a full body harness when working at elevations in excess of 2 m above ground

If a wheel loader must be transported use only a trailer with sufficient load capacity. Remove the attachment as required to abide by the transportation weight and height limitations in compliance with the rules and regulations established by the Department of Transportation

In case a wheel loader is inoperative and must be towed out of a danger area proceed as follows:

Use only towing equipment such as wire ropes, chains or drawbars in good working order that are designed for the required load capacity

Prepare the wheel loader for towing as described in the machine's instruction manual

Slowly pull the wire ropes, chains or drawbar taut and gradually tow the wheel loader out of the danger area at a very low speed. Avoid any jerky motions while pulling

- Ensure that no one is standing near or in line with the towing equipment, the tractor or dozer, and the wheel loader being pulled
- Avoid any sudden load changes and changes in travel direction

Never modify or change the configuration of the wheel loader without the expressed, written approval of the machine's manufacturer

Frequently check all hydraulic lines and hose assemblies as instructed in the machine's instruction manual. Replace all defective lines and/or hose assemblies

Never attempt to repair a damaged or leaking accumulator. Replace it as a complete unit if defective. Accumulators may only be charged with nitrogen up to the pressure limit stamped into the housing. Never use oxygen or compressed air

Load bearing structures may only be welded by experienced and AWS (American Welding Society) certified welders

### **Visitor/Vendor/Supplier Alert**

Post safety signs that inform of all jobsite hazards

Inform to maintain the proper and safe distance from the operational equipment, especially in the loading and unloading area

Instruct truck drivers to leave their cab and to proceed to a designated safe area

### **General Safety Instructions**

The operator(s) must be made aware of the dangers and risks involved with the operation of the wheel loader

Train every employee what each warning signal or audible alarm represents

Identify areas where flying debris may occur

Frequently check the placement of safety signs, make certain they are legible and complete. Replace missing or illegible safety signs at once

Instruct all employees to adhere fully to the instructions on the safety signs

Identify and cordon off or mark specific areas that are prohibited to enter during wheel loader operation

Ensure that trip and fall hazards are kept out of drive and walkways

Always follow good housekeeping procedures