Pre-delivery Inspection Report must be completed upon placing unit in service. Please use QR link or visit www.xmfg.com/warranty/pre-delivery-inspection-report to register online.
Xtreme Manufacturing, LLC (w://www.xmfg.com/) is headquartered in Las Vegas, Nevada, and has fabrication facilities in Selma, California. In October 2013, Xtreme became the majority shareholder in Snorkel, a global aerial work platform manufacturer, which has manufacturing facilities in the US, UK & New Zealand, as well as a global sales distribution network. Find out more about Snorkel at www.snorkellifts.com.

Pre-delivery Inspection Report must be completed upon placing unit in service. Please use QR link or visit www.xmfg.com/warranty/pre-delivery-inspection-report to register online.
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Introduction

This Operation and Safety Manual provides the information needed to safely operate the XR2045 Reach Forklift.

This manual should be considered a permanent part of the forklift, and kept in the protective manual case located in the operator’s cab.

Before operating the forklift, read this manual completely and carefully to understand the safety instructions and the operation of controls and safety equipment. You must comply with all DANGER, WARNING, and CAUTION notices. They are for your benefit.

Improper operation of this forklift could result in death or serious injury.

BEFORE starting the engine, do the following:

• Read the Operation and Safety Manual
• Read all the Safety Labels on the Forklift
• Clear the area of all other persons

Learn and practice safe use of forklift controls in a safe, clear area, BEFORE you operate this forklift on a work site.

It is your responsibility to observe applicable laws and regulations, and to follow manufacturer’s instructions on forklift operation and maintenance.

Replacement Manuals

Replacement manuals for the XR2045 Reach Forklift can be obtained by contacting our parts department by phone or visiting our website:

Xtreme Manufacturing
Phone: (800) 497-1704
www.XMFG.com

Model / Serial Plate

When contacting our parts department, please have the forklift serial number available. The serial number plate is located in the operator’s cab, at the base of the seat.

For easy reference, you can record the serial number in the space below.

Serial Number:

Orientation

Right side, left side, front, and rear are directional references given from the operator’s seat when facing forward.

Figure 1. Serial Number Plate

Figure 2. Forklift Direction Orientation
Safety

Xtreme Manufacturing reserves the right to make technical changes for product improvement. This manual may contain illustrations and photographs (for demonstration purposes), which slightly deviate from the actual product.

Safety information provided in this manual is a basic guide and an attempt to prevent accidents. Xtreme Manufacturing cannot anticipate every circumstance that might involve a potential hazard. Warnings in this manual and on the forklift are NOT all-inclusive.

You are responsible for safe operation of the forklift and all attachments. You must satisfy yourself that the techniques, operating procedures, work methods, or mentioned by Xtreme Manufacturing.

The safety of everyone around the forklift depends significantly on your knowledge and understanding of all correct and safe operating practices and procedures. You can help prevent accidents by remaining alert and recognizing potentially hazardous situations.

Follow State and Federal health and safety rules and/or local regulations for operating and maintaining the forklift.

• This manual does not replace any laws and regulations.
• The operator is required to comply with all applicable laws and regulations.

Signal Words

Signal words are the word or words that call attention to the safety sign and designate a degree or level of hazard seriousness. The signal words used in this manual are DANGER, WARNING, and CAUTION.

⚠️ Danger

DANGER (Red) used with the safety alert symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠️ Warning

WARNING (Orange) used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠️ Caution

CAUTION (Yellow) with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

CAUTION (Yellow) used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Safety Symbols

Safety symbols are provided to remind the operator of hazardous situations. Xtreme Manufacturing provides these symbols in an attempt to inform all operators, regardless of reading and language skills, of as many potential hazards as possible. These symbols cover many, but not all, potential dangers and hazards associated with operating the forklift.

Make safety a high priority while operating the forklift. Learn and follow all safety messages in this manual and on forklift labels to prevent death, serious injury, or equipment damage. The following two pages include a list of some of the safety symbols that may be used on this forklift.
Safety

- General Safety Alert Symbol
- Read Operator Manual Before Operating This Forklift
- Read Material Safety Data Sheets (MSDS) For Chemicals And Fluids
- Read Maintenance Manual Before Working On This Forklift

- DO NOT OPERATE! Forklift Down For Service Or Maintenance
- Perform Operator Inspection Before Starting This Forklift
- Personal Protective Equipment
  - Gloves
  - Ear Protectors
  - Personal Protective Equipment
  - Safety Shoes
  - Personal Protective Equipment
  - Safety Glasses
- Personal Protective Equipment
  - Hardhat
- No Smoking
- Personal Protective Equipment
  - Lead Acid Batteries Create Explosive Gases

- Keep Flames And Ignition Sources Away
- Warning! Hydraulic Oil Under Pressure
- Use A Board Or Cardboard To Check Hydraulic Leaks. DO NOT Use Your Hand!
- Keep Hands A Safe Distance From Rotating Fan Blades
- Hot Oil! DO NOT Open Unless Cap Is Cool To Touch
- Warning! Rotating Fan Blades Can Cut Or Entangle
- Keep Hands A Safe Distance From Rotating Belts
- Make Sure All Safety Labels Are Attached And Legible
- Replace Worn And Illegible Safety Labels And Labels
- Use Three Points of Contact When Entering and Exiting Forklift

Know First Aid Instructions And/Or Locations On Work site
Safety

DO NOT Jump While Dismounting The Telehandler

Fasten Seat Belt

DO NOT Allow Riders On Auxiliary Attachments

DO NOT Allow Riders On Telehandler Frame Or Fenders

DO NOT Allow Riders On Or In The Operator Cab

Set Parking Brake To OFF Disengage Parking Brake

Falling Off Of Attachment Can Result In Death Or Serious Injury

Set Parking Brake To ON Engage Parking Brake

DO NOT Jump! If Telehandler Tips, Keep Seat belt ON And Brace Yourself

Warning! Telehandler Roll Away Can Cause Death Or Serious Injury

Warning! Telehandler Tip Over Can Cause Death Or Serious Injury

DO NOT Raise Boom While Traveling On A Slope

Tip Over Hazard, Especially Traveling Up A Slope Without A Load

Warning! DO NOT Travel With Boom Raised

Warning! Electrocution Can Cause Death Or Serious Injury

Danger! Keep A Safe Distance From Electrical Lines

DO NOT Allow Anyone Under A Raised Load

Pinch Points Hands

Have Adequate Ventilation If Operating This Telehandler In An Enclosed Space

Warning! Explosion Hazard

DO NOT Use Ether As A Starting Aid

HOT COOLANT.

Warning! Establish Radio Communication Before Operating Solo

Warning! Operation With Caution During Storms Or High Wind

DO NOT Use As A Personnel Carrier
Safety

**Employer Responsibility**

Under Occupational Safety and Health Administration (OSHA) rules, employers are required to train workers about hazards related to operating and maintaining the forklift. Successful completion and certification of the Safety Training for Rough Terrain Forklifts is required.

Additional safety information and training resources can be obtained through these publications, organizations, and/or appropriate sources:

- (OSHA) Occupational Safety and Health Administration.
- (NIOSH) National Institute for Occupational Health and Safety.
- (ANSI) American National Standards Institute
- (AEM) Association of Equipment Manufacturers
- (ITSDF) Industrial Truck Standards Development Foundation

Always consult Material Safety Data Sheets (MSDS) for chemical hazards and first aid instructions for any oil or lubricant being used. MSDS should be available from the manufacturer/supplier of the fluid.

**Operator Qualifications**

Operators must be in good physical and mental condition, with appropriate reflexes, reaction time, vision, depth perception, and hearing.

Operators must possess a valid, current driver’s license as required for the work site; plus those required by applicable State, Federal, and/or local laws:

Successful completion and certification of Safety Training for Rough Terrain Forklifts is required.

- Operators must be properly instructed on how to operate the forklift and attachments.
- Operators must operate the forklift according to ALL appropriate safety regulations.
- Operator trainees must remain under constant observation and supervision of an experienced operator.

**Modifications**

- Unauthorized modifications or alterations will void the warranty.
- DO NOT modify, disable, or bypass any safety devices.
- DO NOT burn or drill holes in forks or other attachments.

Structural damage, modification, or alteration, including welding or drilling, can impair and weaken the protective capability of the Rollover Protective Structure/Falling Object Protective Structure (ROPS/FOPS) and could result in death or serious injury.

- Replace the ROPS/FOPS, if it is damaged, before operating the forklift.

---

**Warning**

Forklifts are potentially dangerous if proper safety procedures are not followed. Workers who operate, maintain, or work near the forklift can be at risk of roll over and run over incidents or can be crushed or caught by the forklift or its parts which could result in death or serious injury if the forklift is not properly operated or maintained.

Read the Operation and Safety Manual BEFORE operating the forklift. Follow all safety instructions and labels. Only operate the forklift if you understand the safety instructions and warnings in all applicable manuals and technical publications. Always follow all State and Federal health and safety laws and/or local regulations. You must have the required training, skills, and tools to perform installation, operation, maintenance, or repair procedures properly and safely. Make sure the forklift and attachments will not be damaged or made unsafe by any procedures you choose.
Mounting/Dismounting

**Warning**

Failure to use proper safety procedures when mounting and dismounting the forklift could result in death or serious injury.

- Keep steps clear of dirt, mud, snow, ice, debris, and other hazards.
  
  Face the forklift for mounting or dismounting. Use hand holds and steps to maintain three (3) points of contact at all times, either both hands and one foot or both feet and one hand.

- DO NOT use the controls, steering wheel, or foot pedals as hand holds or steps. Avoid accidentally engaging or disengaging a control.

DO NOT jump from the forklift. Clothing can get caught on pedals, levers, or other protruding parts. Landing on uneven surfaces could result in death or serious personal injury.

Work Site Safety

**Warning**

Use proper safety procedures and avoid hazardous situations while operating the forklift to prevent death, serious injury, or property damage.

- Check the work site for any hazards before operating the forklift.
- Check the work surface for loose soil conditions and overhead power lines.
- Contact your local underground utility service or digging hot line to mark all underground hazards.
- Learn the location of all underground hazards at the work site, such as; gas and water pipes, electrical cables, and sewers. Underground objects could cause death or serious injury.

Operate the forklift only on firm, stable surfaces. Holes, obstructions, debris, loose fill, and other work site hazards could result in death or serious injury.

- DO NOT allow bystanders in the work area.
- Avoid personnel, machinery, and forklifts in the work area.
- Know the rules for movement of people and forklifts on the work site.
- Follow work site signs and signals.
- Check boom clearance before driving under a door opening, bridge, etc.
- Slow down when approaching obstructions. Use a spotter, if necessary.
- Stop for poor visibility conditions, such as dust, smoke, fog, etc. Wait until visibility improves before continuing.

DO NOT operate the forklift if you are using drugs, alcohol, or any medication that might impair your judgment or ability.

- You must be 18 years of age or older to operate the forklift.
- DO NOT operate the forklift on roads. The reach forklift is not equipped for road travel.

California Proposition 65

Engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, and other reproductive harm.

**Caution**

Use caution when operating the forklift during storms or strong winds.
Safety

**Warning**

Wear appropriate protective clothing. Personal protective equipment can include, but is not limited to hardhat, gloves, footwear, safety glasses or goggles, and hearing protection. Make sure clothing is snug and properly belted. DO NOT wear loose clothing, jewelry, watches, or anything that can catch on forklift controls, moving parts, etc. Failure to wear the proper protective clothing could result in death or serious injury.

**Warning**

Perform a pre-operation inspection and functional tests at the beginning of each work shift. Perform the pre-operation inspection first. DO NOT perform the pre-operation inspection with the engine running or hot. Contact with moving or heated parts could cause death or serious injury.

**Warning**

Keep the Operation and Safety Manual on the forklift at all times. Contact Xtreme Manufacturing for replacement manuals.

Keep the assistant visible and a safe distance from the forklift to prevent death or serious injury.

Keep fingers and feet away from moving parts or pinch points to prevent pinching or crushing.

DO NOT allow anyone between the tires and the forklift frame while operating the forklift. Doing so can result in death or serious injury.

Always check the condition of the seat belt and mounting hardware before operating the forklift. If the seat belt or mounting hardware is defective, it may not properly restrain the operator, resulting in death or serious injury.

- DO NOT operate the forklift until the seat belt or mounting hardware is replaced, if worn or damaged.
- The seat belt MUST be worn while operating the forklift. Failure to wear the seat belt could result in death or serious injury.

Before Starting Forklift

Clearly define responsibilities and procedures for operating the forklift and all attachments. DO NOT proceed until you seek expert assistance from a qualified person if any doubt or question arises about the correct or safe methods for operating the forklift.

To avoid death or serious injury, carefully read and understand all instructions before operating the forklift. DO NOT operate, modify, repair, or maintain the forklift unless you read and understand the instructions and warnings in this and all other applicable manuals and technical publications. Follow all State and Federal health and safety laws and/or local regulations.

Consult Material Safety Data Sheets (MSDS) for chemical hazards and first aid instructions. MSDS should be available from the manufacturer or supplier of the fluid.

A brief description of controls, indicators, and instruments is provided as a convenience for the operator. These descriptions DO NOT provide complete operation instructions. Read and understand the entire manual to prevent death, serious injury, or equipment damage.

Keep fingers and feet away from moving parts or pinch points to prevent pinching or crushing. DO NOT allow anyone between the tires and the forklift frame while operating the forklift. Doing so can result in death or serious injury.

Become familiar with all safety and hazard labels, regulations, and procedures. Make sure all proper safety and hazard labels are attached to the forklift and remain legible.


Warning

Operators must be properly trained and qualified to operate this specific forklift. Know the location, learn the specific purpose, and demonstrate safe and proper use of all controls, instruments, indicator lights, and safety and instruction labels. Safety is your responsibility. Failure to follow these guidelines could result in death or serious injury.

To prevent death or serious injury, the operator must be seated with seat belt fastened, the travel select lever set to NEUTRAL, the Parking Brake switch ON (engaged), the service brake applied, and the area free of people and obstructions BEFORE starting the forklift.

Danger

Death or serious injury by electrocution will result from contact with or inadequate clearance with energized power lines or apparatus.

- Never operate the forklift in an area where active overhead power lines, overhead or underground cables, or other power sources exist.
- Contact the appropriate power or utility company to de-energize power lines or take other suitable precautions.

Keep the forklift, attachments, and loads a safe distance from electrical power lines.

- Remain at least 10 feet (3 meters), plus an additional 0.4 inches (10 millimeters) for each 1,000 Volts over 50,000 Volts, from active power lines and other power sources.
- Work site operating directives and/or local or state codes might require a greater distance.
- Know the maximum height and reach of this forklift.

Warning

Use of the frame sway control with the boom raised above horizontal could cause tip over resulting in death or injury. Always use the frame sway control to level the forklift BEFORE raising the boom above horizontal. If the forklift cannot be leveled using the frame sway control, do not attempt to raise or place load. Reposition forklift or have the surface leveled.

Warning

To prevent death, serious injury, or property damage, the operator must be seated with seat belt fastened, arms, legs, and head completely inside the Rollover Protection Structure/Falling Object Protection Structure (ROPS/FOPS), the travel select lever in NEUTRAL, the Parking Brake switch ON (engaged), and the service brakes applied BEFORE starting the forklift.

- The seat belt MUST be worn while operating the forklift. Failure to wear the seat belt could result in death or serious injury.

DO NOT adjust the seat or seat belt while the forklift is moving. Keep both hands on the wheel while the forklift is moving to prevent loss of forklift control which could result in death or serious injury.

Never try to escape the forklift if it becomes unstable. Learn and practice these safety procedures to protect yourself from a roll over or tip over incident:

- Remain securely fastened in the seat belt.
- Keep your head, body, and limbs within the ROPS/FOPS structure.
- Brace yourself and hold on firmly.
- Lean away from the point of impact.
- Stay on the forklift and ride out the roll over or tip over.

Warning

DO NOT use the forklift as a work platform or personnel carrier. Falling of attachments could result in death or serious injury.
NEVER allow passengers to ride on the forklift. DO NOT allow riders on the frame or operator cab. Allowing passengers to ride could result in serious injury. The forklift is designated for the safety of the operator only.

NEVER use crab or four wheel (4W) steering for traveling at high speeds. Use only two wheel (2W) steering for higher speed travel and slow the forklift before turning. Rapid turning while using crab or four wheel-steering can cause tip over which could result in death or serious injury.

DO NOT travel with an elevated boom. Retract the boom fully. Lower the boom as low as practical for proper visibility. Maintain enough ground clearance for conditions. Traveling with an elevated boom can cause tip over, which could result in death or serious injury.

Allow for adequate clearance between the attachment and other objects when turning. The attachment extends beyond the front of the forklift. The operator must be aware of the maximum sweep of any attachment being used to avoid hitting personnel and other objects in the area and to prevent death, serious injury, or property damage.

Warning
To prevent death, serious injury, or property damage, make sure the forklift comes to a complete stop before moving the travel select lever. A sudden change in direction of travel, while carrying a load, could reduce stability and/or cause the load to shift or fall.

DO NOT shift through multiple gears with a single turn of the gear select lever. Allow the engine speed to slow down before shifting to the next lower gear. Improper use of the gear select lever could cause transmission damage or forklift tip over/roll over and result in death or serious injury.

Operate the forklift for maximum stability. Unstable forklifts can tip over, resulting in death, serious injury, or property damage. Keep the forklift stable by following these and other appropriate guidelines:

- Adjust speed for terrain and conditions.
- Avoid obstacles by driving around them rather than over them, when possible.
- Start, stop, travel, steer, and brake smoothly.
- Load, unload, and turn the forklift on level ground, when possible.
- Slow down for turns.
- Slow down for rough, slippery, or soft terrain.
- Use caution around steep slopes, creeks, gullies, ridges, ditches, and ravines.
- Stay away from soft edges that could collapse under the forklift.

Warning
Become completely familiar with the forklift before operating on slopes. The forklift could overturn due to sudden movement or while operating on a slope resulting in death or serious injury.

DO NOT raise the boom while operating on a slope. Raising the boom on a slope, even without a load, will change the center of gravity, could cause a tip over, and result in death or serious injury.

- DO NOT turn on a steep slope.
- DO NOT drive the forklift across slopes.
- Always drive the forklift straight up and down a slope (never drive diagonally up or down a slope).
- Drive the forklift forward up a slope (front of forklift facing uphill).
- Back the forklift down a slope when loaded (front of forklift facing uphill).

Follow appropriate procedures to prevent sudden changes in forklift speed that could result in death or serious injury.

- Turn the gear select lever to the lowest speed before descending a slope and before loading or unloading a trailer.
- DO NOT adjust the travel select lever while the forklift is moving.
- DO NOT coast downhill. Keep the travel select lever in the appropriate position.

DO NOT exit the forklift without following proper shut down procedures.

Engine fuel is flammable and can cause a fire or explosion resulting in death or serious injury. DO NOT smoke while refueling and keep sparks and open flames away from the forklift.
Safety

**Warning**

The reach forklift includes a Frame Sway Override switch. Improper use of the Frame Sway Override switch could result in death, serious injury, or property damage.

Make sure the forklift frame is level before raising and extending the boom. Frame swaying left or right with the boom raised is extremely dangerous and can result in death or serious injury.

- Use the frame sway control to level the forklift before raising the boom.
- Reposition the forklift if it cannot be leveled using the frame sway control.
- DO NOT enter or exit a tilted cab.
- Remain seated with the seat belt securely fastened while the cab is tilted.
- Keep personnel at least 30 feet (9.14 meters) from a tilted forklift.

Contact with hot surfaces and the exhaust pipe after the forklift has been operated could result in serious personal injury.

Check warning indicators and gauges on the dash panel frequently during operation. If a warning indicator is illuminated or a gauge shows abnormal readings, stop the forklift, follow proper shut down tag the forklift with “Do Not Operate” tags, and have a qualified mechanic service or repair the forklift BEFORE placing it into service again. Ignoring warning indicators can result in death, serious injury, or property damage.

**Caution**

Release the key immediately once the motor starts. If the motor does not start, DO NOT crank the starter motor continuously for more than 15 seconds. Failure to release the key after the motor has started or continuous cranking can damage the starter motor.

Load Safety

**Warning**

Failure to follow proper safety procedures when lifting, lowering, and traveling with a load could result in death, serious injury, or property damage.

DO NOT exceed forklift capacity of 12,000 pounds. The total rated capacity of the forks being used must equal or exceed forklift capacity. Forks can break causing loss of load and possible death or serious injury.

DO NOT exceed the manufacturer’s rated load for any auxiliary attachment. Any attempt to lift or carry loads in excess of the manufacturer’s rated load may cause forklift tip over, loss of load, or structural damage which could result in death or serious injury.

Failure to keep personnel clear of the load area while the load is being raised or lowered could result in death or serious injury. DO NOT lift, swing, or move a load over anyone or over a forklift cab.

- Review the rated load capacity of each auxiliary attachment before performing any operation.
- Use the correct load chart and NEVER exceed specified weights and load centers.
- DO NOT exceed the manufacturer’s recommended load capacity.
- DO NOT operate the forklift with an unsafe load distribution.
- Adjust the load as necessary, especially for nonstandard loads.
- Use caution when handling loose material that can fall into the cab.
- Remove overhanging load materials, when possible, and watch for sliding material.
- DO NOT reach a load over posts or other objects that can enter the cab, if tipped.
- Avoid sudden stops, starts, or turns.
- Avoid carrying a swinging load. If necessary, secure the load by attaching it to the forklift tie-downs and/or have another person assist with safely steadying the load.
Improper connection of an auxiliary attachment could result in death or serious injury. Attachments not locked into place can become unstable and fall on the operator or other personnel near the forklift.

- Make sure attachment locking devices are always in place.
- DO NOT operate the forklift until you have positive indication that the coupler pin and lever are fully engaged.
- Hydraulic attachments have a maximum hydraulic pressure rating. Failure to make sure the attachment is equipped with a pressure reducing valve, or is rated to be equal or greater than 268.8 bar (3,900 psi), which is the maximum pressure of the forklift auxiliary hydraulic system at the quick-disconnect couplers, could result in death or serious injury.
- Make sure all hydraulic connections are tight (if equipped).

To prevent death or serious injury, follow these procedures before leaving the forklift cab:

- Park forklift on a firm, level surface.
- Move travel select lever to NEUTRAL (N).
- Set parking brake to ON (engaged).
- Lower forks and attachments to the ground.

Always engage the parking brake before leaving the forklift. The forklift can roll if the parking brake is not ON (engaged), which could result in death, serious injury, or property damage.

- Turn Ignition switch to the OFF position.
- Remove the key.
- Unbuckle the seat belt.
- Place “Do Not Operate” tags on the Starter switch and steering wheel when maintenance or service is required.
- Block wheels when maintenance is required.
- Shut Down Procedure

Follow the manufacturer’s instructions for proper maintenance to make sure the forklift continues to meet manufacturer’s specifications. Failure to properly maintain the forklift can result in improper performance, which could cause death, serious injury, or property damage.

- “Do Not Operate” tags indicate the forklift should not be operated until all service or maintenance is completed.
- Keep two (2) legible “Do Not Operate” tags with the forklift at all times. “Do Not Operate” tags are provided at the end of this manual.
- DO NOT operate the forklift and attachments if they require repairs.
- Make sure basic maintenance is completed and service problems are corrected.
- Death or serious injury can result from operating a forklift before all repairs have been made and all proper maintenance is completed.

Check hydraulic lines, tubes, and hoses carefully. DO NOT use your bare hand to check for leaks. Always use a board or cardboard when checking for a hydraulic leak. Escaping hydraulic fluid under pressure, even a pinhole size leak, can penetrate body tissue, which could cause death or serious injury. If hydraulic oil is injected into your skin, a doctor familiar with this type of injury must treat it immediately.

Serious injury could result from hydraulic oil pressure or hot oil. DO NOT remove a hydraulic tank filler cap unless it is cool enough to touch with bare hands. Remove the hydraulic tank filler cap slowly to relieve pressure. Relieve all pressure in a hydraulic system before any caps, lines, fittings, or related items are disconnected or removed.
It is possible for the forklift to move suddenly when the brakes are released, which could result in death, serious injury, or property damage. To prevent sudden movement of the forklift, place wheel chocks in front of and behind wheels before the brakes are released.

If the forklift is to be towed, make sure the released brake(s) can be reapplied or the tow forklift has the braking capacity to stop the forklift.

DO NOT use ether as a starting aid. Ether is flammable and can cause an explosion when starting the engine, which could result in death or serious injury. Follow the cold starting procedures and engine manufacturer’s specifications for using a starting aid.

Tires must have proper ballast. DO NOT replace foam-filled tires with pneumatic tires. Use of pneumatic tires will severely affect vehicle load capacity, which could result in death, serious injury, or property damage.

California Proposition 65

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. Wash hands after handling these items.

Warning

Wear eye protection when starting a forklift with jump start cables. Improper jump start procedures could cause the battery to explode, which could result in death or serious injury.

- Never jump start a frozen battery, as it can explode. Let the battery thaw out before charging.
- NEVER jump start the forklift when travel select lever is in gear, which can cause the forklift to lurch forward or backward, and could result in death, serious injury, or property damage.
- To avoid injury or death when jump starting with another forklift, make sure the two (2) forklifts are not touching.
- DO NOT allow jump start cable ends to contact each other.
- Connect charged battery positive (+) to stalled battery positive (+).
- Connect charged battery negative (−) to stalled forklift ground. Make the connection to the stalled forklift ground last.
- Connect jump start cable to stalled forklift ground a safe distance from the battery to prevent sparks near the battery.
- Jump start only with a power source with the same voltage as the stalled forklift.
- Turn off all lights and accessories on the stalled forklift to prevent them from operating when the power source is connected.
- Electrolyte contains acid and could cause serious personal injury if it contacts the skin or eyes.

Lead-acid batteries produce flammable and potentially explosive gases. To avoid death or serious injury when checking, testing, or charging batteries:

- DO NOT use smoking materials near batteries.
- Keep arcs, sparks, and open flames away from batteries.
- Provide ventilation for flammable vapors.
- Wear proper personal protective equipment, including safety glasses.

Fluid in electric storage batteries contains sulfuric acid, which is poison and could cause severe chemical burns. Avoid all contact of fluid with eyes, skin, or clothing. Use protective gear when handling batteries. DO NOT tip a battery beyond a 45° angle in any direction. If contact does occur, follow these First Aid suggestions:

- External contact - Flush with water.
- Eyes - Flush with water (including under the eyelids) for at least 15 minutes and get medical attention immediately. Flushing must begin immediately to avoid permanent eye tissue damage.
- Internal contact - Drink large quantities of water or milk to dilute stomach contents. Do not induce vomiting. Get medical attention immediately.
Dead Engine Towing

Parking Brake Release (Front Axle)

⚠️ Warning

Block all four (4) wheels. Failure to do so could result in death or serious injury from forklift roll away.

1. Block all four wheels to prevent the forklift from moving once the parking brake is disabled.

2. Position the towing vehicle in place. Attach any chain needed to secure the disabled forklift.

3. Under the front of the forklift, locate the four (4) brake release bolts (A to D) at the base of the front axle [two (2) per side].

4. Loosen jam nuts. Loosen brake release bolts. Do not completely remove bolts. Tighten one (1) full turn if bolts completely back out (repeat for each side). Tighten jam nuts.

5. Crawl out from under the forklift and clear the area of any unnecessary personnel.

6. Carefully remove the blocking from each of the four (4) tires and tow the vehicle to a secure location.

Re-Activating Parking Brakes (Front Axle)

⚠️ Warning

Block all four wheels. Failure to do so could result in death or serious injury from forklift roll away.

1. After you have blocked all four (4) wheels, under the front of the forklift, locate the four brake release bolts [two (2) per side] at the base of the front axle.

2. Loosen jam nuts. Tighten brake release bolts until you begin to feel resistance. Tighten jam nuts. Repeat for each side.

3. The parking brakes should now be re-activated and the front wheels are locked. Remove the blocks from all four (4) wheels.

4. Verify the parking brake works.

5. Remove any warning tags from the ignition or steering wheel.
Labels

Left Side View

Figure 6. Label Legend (Left Side)

Right Side View

Figure 7. Label Legend (Right Side)
Labels

Front View

Rear View

Cab View

Figure 8. Label Legend (Front)

Figure 9. Label Legend (Rear)

Figure 10. Label Legend (Cab)
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Labels

Replacement Labels

Replacement labels can be obtained by contacting Xtreme Manufacturing directly at (702) 636-2969.

From outside Las Vegas, Nev., call Xtreme Manufacturing toll free at (800) 497-1704.

Please have the correct label number available when you call.

1) 18008-000

2) 18004-060

3) 18010-001

4) 18011-001

5) 18013-002

6) 18014-002
7) 18015-001

8) 18016-001

9) 18017-001

10) 18018-001

11) 18018-002

12) 18019-001
13) 18020-001

14) 18021-001

15) 18022-001

16) 18023-001

17) 18025-001

18) 18026-001
19) 18027-001
20) 18031-001
21) 18032-001
22) 18033-000
23) 18034-000
24) 18039-000
25) 18041-001

26) 18042-000

27) 18066-001

28) 18067-100

29) 18334-001

30) 18069-000
Labels

31) 18082-001
32) 18083-001
33) 18086-001
34) 18090-001
35) 18300-001
36) 18312-000
**CAUTION**

CARRIAGE DAMAGE

DAMAGE may result from adjusting forks when carriage is loaded.

**ONLY ADJUST FORKS WHEN CARRIAGE IS UNLOADED.**

---

**WARNING**

TIP OVER HAZARD

DEATH or SERIOUS INJURY could result from improper operation.

**DO NOT EXCEED RATED LIFT CAPACITY**

- Max capacity of lifting point is 12,000 lbs.
- Refer to the "Standard Fork Carriage Load Chart" for vehicle's load handling capacity.
- Refer to ANSI / ITSDF B56.6 for information regarding the handling of suspended loads.

---

**WARNING**

DEATH or SERIOUS INJURY could result from improper operation when using tow connection.

- **DO NOT ELEVATE BOOM ABOVE 30° WHEN TOWING.**
- **DO NOT EXCEED RATED TOW CAPACITY.**
  - Max vertical load 500 LBS.
  - Max tow capacity 5000 LBS.
52) 18306-001

53) 18306-000

54) 17228-000R01

55) 17229-000R01

56) 18409-000

58) 18412-000

59) 18413-000
# Features

## Standard Equipment

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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boom</td>
<td>Universal quick attach head</td>
</tr>
<tr>
<td></td>
<td>Three (3) section boom</td>
</tr>
<tr>
<td></td>
<td>Boom equipped with heavy duty boom rollers</td>
</tr>
<tr>
<td>Chassis</td>
<td>Rear axle stabilization</td>
</tr>
<tr>
<td></td>
<td>1-1/4 inch main frame plate</td>
</tr>
<tr>
<td></td>
<td>Sealed pivot pins for extended service periods</td>
</tr>
<tr>
<td></td>
<td>High boom mount design</td>
</tr>
<tr>
<td></td>
<td>Sliding engine transmission cowlung</td>
</tr>
<tr>
<td></td>
<td>Low mounted central engine &amp; drive train</td>
</tr>
<tr>
<td>Cab</td>
<td>Lights (front and rear)</td>
</tr>
<tr>
<td></td>
<td>12 Volt electrical system</td>
</tr>
<tr>
<td></td>
<td>Fuel level, engine coolant temperature, voltage, and oil pressure gauges</td>
</tr>
<tr>
<td></td>
<td>Easy access drop down electrical panel</td>
</tr>
<tr>
<td></td>
<td>12 Volt accessory power outlet</td>
</tr>
<tr>
<td></td>
<td>Brake oil pressure, parking brake, axle lock, rear wheel alignment, declutch indicator, transmission range, tilt interlock, engine warning lights</td>
</tr>
<tr>
<td></td>
<td>Electric horn and backup alarm</td>
</tr>
<tr>
<td></td>
<td>Declutch switch</td>
</tr>
<tr>
<td></td>
<td>Rear view mirror</td>
</tr>
<tr>
<td></td>
<td>Adjustable seat with seat belt</td>
</tr>
<tr>
<td></td>
<td>Deluxe suspension seat</td>
</tr>
<tr>
<td></td>
<td>Boom angle and frame level indicator</td>
</tr>
<tr>
<td></td>
<td>360° visibility</td>
</tr>
<tr>
<td></td>
<td>Boom angle and frame level indicator</td>
</tr>
</tbody>
</table>

## Optional Equipment

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tires</td>
<td>Foam-filled</td>
</tr>
<tr>
<td>Hydraulics</td>
<td>Auxiliary hydraulic circuit with quick attach</td>
</tr>
<tr>
<td></td>
<td>Attachment tilt switch</td>
</tr>
<tr>
<td></td>
<td>Frame sway control handle</td>
</tr>
<tr>
<td></td>
<td>Frame sway override switch</td>
</tr>
<tr>
<td>Options</td>
<td>Enclosed cab with A/C</td>
</tr>
<tr>
<td></td>
<td>Heater/defroster/windshield wiper</td>
</tr>
<tr>
<td></td>
<td>Work light package</td>
</tr>
<tr>
<td></td>
<td>Turn signals/hazard lights</td>
</tr>
<tr>
<td></td>
<td>Hydraulic side-swing carriage (with quick attach couplers)</td>
</tr>
<tr>
<td></td>
<td>Limited slip differential</td>
</tr>
<tr>
<td></td>
<td>Full line of attachments</td>
</tr>
</tbody>
</table>
Specifications

Performance
- Capacity: 20,000lbs
- Lift Height: 45’
- Forward Reach: 27’2”
- Frame Leveling L/R: 8°/8°
- Operating Weight: 47,100 lbs

Power Train
- Engine: Deutz 3.6, 134hp
- Fuel Capacity: 72 gal
- Transmission: 3-Speed
- Brakes: Inboard Wet Disc
- Parking Brake: SAHR

Tires
- Tires (Standard Eq): 17.5 x 25 E3

Hydraulics
- GPM: 49
- PSI: 4,000
- Hydraulic Oil Capacity: 58 gal

Dimensions
- Length to fork face: 23’6” (280”)
- Width: 8’6” (102”)
- Height: 8’11” (107”)
- Wheel Base: 12’3” (147”)
- Ground Clearance: 1’3” (15”)
- Turning Radius: 15’10” (190”)

Standard Equipment
- Heavy-duty Frame/Chassis
- Heavy-duty Roller Boom
- Robust Wiring
- Full-time Planetary 4-Wheel Drive
- Steering - 4-Wheel Circle, Crab, 2-Wheel Front
- Back-Up Alarm
- Open ROPS/FOPS
- Xtreme Service Accessibility
- Suspension Seat
- Rear Axle Stabilization (RAS)
- Rear View Mirrors

Attachments
- Standard Carriage - 72” or 96”
- Fork Positioning Carriage - 48” or 72”
- + 10° Side Tilt Carriage - 48” or 72”
- + 45° Swing Carriage - 52” or 72”
- Block Forks - 2” X 2” X 48”
- Pallet Forks - 2.25” X 4” X 48”
- Lumber Forks - 1.75” X 7” X 60”
- Utility Bucket - 1.00 cu. yd.
- Concrete Bucket - 0.5 cu. yd., or 1.00 cu. yd.
- Truss Boom - 3”, 12’ or 15’
- Wallboard/Sheet Material Handler

Accessories and Options
- Enclosed Cab
- Limited Slip Differential
- Air Conditioning
- Boom Work Lights
- Rotating Beacon
A brief description of controls, indicators, and instruments is provided as a convenience for the operator. These descriptions DO NOT provide complete operation instructions. Read and understand the entire manual to prevent death, serious injury, or equipment damage.

## Ignition Switch

A key is required to operate the ignition switch.

The ignition switch has three (3) positions: OFF, RUN, and START. To start the engine, turn the key to the RUN position, wait until the Wait to Start Indicator "I" (Figure 29) goes off and then turn the key to the START position to crank the engine. After the engine starts, release the key.

<table>
<thead>
<tr>
<th>Position</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Shuts down entire electrical system, except the horn and accessory outlet.</td>
</tr>
<tr>
<td>RUN</td>
<td>All controls and indicators are operable.</td>
</tr>
<tr>
<td>START</td>
<td>Engages starter motor to crank engine.</td>
</tr>
</tbody>
</table>

**NOTE:** The START position is spring-loaded. When the key is released, the Ignition switch will automatically return to the RUN position.

## Accessory Outlet

A 12 Volt accessory outlet is provided as a power source for personal items, such as a radio or cell phone.

**Figure 11. Key and Ignition Switch**

**Figure 12. Accessory Outlet**

## Accelerator Pedal

Press the accelerator pedal to increase engine speed. The accelerator pedal is spring-loaded to return to idle speed.

**Figure 13. Accelerator Pedal**
Press the service brake pedal to slow or stop the forklift. The service brake pedal activates the service brakes on all four (4) wheels.

Figure 14. Service Brake Pedal

Press the horn button to sound the horn.

Figure 16. Horn Button

Turn the steering wheel left or right to steer the forklift in the corresponding direction.

Figure 15. Steering Wheel

The operator seat can be adjusted four (4) ways: weight suspension, lumbar support, fore and aft, and backrest angle.

Figure 17. Operator Seat
Lumbar Support

The seat controls include a four (4) position lumbar support knob. Rotate the lumbar support knob to raise, lower, increase, or decrease the lumbar support.

Weight Suspension Lever

Rotate the weight suspension lever to increase or decrease the seat cushion suspension based on the weight of the operator and comfort level desired.

Fore and Aft Adjustment Lever

Pull the fore and aft adjustment lever outward from the seat to release the seat lock. Slide the seat forward or backward to a comfortable location and release the lever to lock the seat in the desired position.

Backrest Angle Adjustment Lever

Pull the backrest angle adjustment lever up to release the seat backrest lock. Adjust the angle of the backrest and release the lever to lock the backrest to the desired angle.
Operation Manual

Operator Cab

Seat Belt

**Warning**

Always check the condition of the seat belt and mounting hardware before operating the forklift. If the seat belt or mounting hardware is defective, it may not properly restrain the operator, which could result in death or serious injury.

- **DO NOT** operate the forklift until the seat belt or mounting hardware is replaced, if worn or damaged.
- The seat belt **MUST** be worn while operating the forklift. Failure to wear the seat belt could result in death or serious injury.

The forklift is equipped with a standard 2” wide retractable seat belt. A 3” wide retractable seat belt is available where required by local laws and regulations.

Before starting the engine, adjust the seat for position and comfort (refer to the Operator Seat section of this manual) and then adjust the seat belt as follows:

1. Grasp the free end of the seat belt (located on the left side of the seat) and make sure the belt webbing is not twisted or entangled in any portion of the seat assembly.
2. Pull the retractable seat belt across your lap. Position the seat belt as low on your body as possible.
3. Insert the latch plate into the buckle (on the right side of the seat) until a “click” is heard.
4. Make sure seat belt retracts snugly across your lap.

**Rear View Mirrors**

Two (2) adjustable rear view mirrors are provided to aid the operator’s rear vision.

One (1) rear-view mirror is mounted on the upper left of the operator’s cab.

**Warning**

DO **NOT** adjust the seat or seat belt while the forklift is moving. Keep both hands on the wheel while the forklift is moving to prevent loss of forklift control which could result in death or serious injury.
One (1) rear-view mirror is mounted on the right side of the chassis.

The travel select lever change the direction of travel; it has three (3) positions: FORWARD, NEUTRAL, and REVERSE.

<table>
<thead>
<tr>
<th>Position</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>F (Forward)</td>
<td>UP Position (away from the operator)</td>
</tr>
<tr>
<td>N (Neutral)</td>
<td>CENTER Position</td>
</tr>
<tr>
<td>R (Reverse)</td>
<td>DOWN Position (toward the operator)</td>
</tr>
</tbody>
</table>

The travel select lever automatically locks when it is in the NEUTRAL position. The operator must raise and move the travel select lever when changing to the FORWARD or REVERSE position.

NOTE: The travel select lever must be in the NEUTRAL position to start the forklift.

NOTE: The back-up alarm automatically sounds when the travel select lever is in the REVERSE position.

The Gear Select switch has a twist grip handle with three (3) positions: 1 - FIRST, 2 - SECOND, and 3 - THIRD.

NOTE: The forklift can be operated in three (3) forward and three (3) reverse gears.

The Parking Brake switch (A) has two (2) positions: ON and OFF.

Set Parking Brake switch (A) to ON (DOWN) to engage the parking brake and to OFF (UP) to disengage the parking brake. The parking brake indicator (B) illuminates when the parking brake is set to ON (engaged).
Load Capacity Charts

Load Capacity Charts are located on the left side of the front control panel. Load Capacity Charts are provided to assist the operator in determining how to safely handle loads with the forklift, including boom angle, height, and reach.

Digital Display Indicators

The digital display allows the operator to view vital engine information and other critical functions, including gauge display, engine diagnostics to monitor engine condition and performance, fault codes, and warning indicators.

A. HYDRAULIC OIL TEMPERATURE

The Hydraulic Oil Temperature Indicator illuminates when the oil temperature is above 1800 F. If this indicator illuminates, stop and idle the engine to allow time for cooling. If the Hydraulic Oil Temperature Indicator does not go out after five (5) minutes, stop the forklift, follow proper shut down procedures, tag the forklift with “Do Not Operate” tags, and have a qualified mechanic service or repair the forklift BEFORE placing it into service again.

B. WATER IN FUEL

The Water In Fuel Indicator will be displayed when there is water present in the Diesel fuel.

C. LOW BRAKE PRESSURE INDICATOR AND WARNING

The Low Brake Pressure Indicator illuminates if the hydraulic oil pressure gets too low. If the Low Brake Pressure Indicator is illuminated, do not release the parking brake or engage transmission until the indicator is out. If the indicator does not go out, stop the forklift, follow proper shut down procedures, tag forklift with “Do Not Operate” tags, and have a qualified mechanic service or repair the forklift BEFORE placing it into service again.
D. Oil Pressure Indicator / Low Pressure Warning

The Oil Pressure Indicator monitors the engine oil pressure. At normal operating pressure (above 20 psi) it stays green. When the oil pressure drops below 20 psi this indicator becomes Low Oil Pressure Warning and it turns yellow (between 12-20 psi). When the engine oil pressure is DANGEROUSLY low, below 10 psi, it becomes red. If the Low Oil Pressure Warning comes on during normal operation, stop the forklift, follow proper shut down procedures, tag forklift with “Do Not Operate” tags, and have a qualified mechanic service or repair the forklift BEFORE placing it into service again.

E. Wait To Start

The Wait To Start Indicator is displayed when the key switch is moved to the RUN position. Wait until the indicator goes out before starting the engine.

F. Service Reminder

The Service Reminder Indicator flashes for 30 seconds at key ON to indicate that Service is required.

G. Rear Axle Locked

Indicates that the rear axle is locked.

H. Tachometer

The Tachometer indicates engine RPM using an analog display and below it a digital display.

I. SCR Warning

The amber SCR Warning Indicator (Selective Catalytic Reduction) comes on in case of any error in the SCR system (DEF quality, system tampering and system malfunction) or if the DEF level in the storage tank is low (see below). A flashing SCR warning Indicator is used for tank level monitoring.

J. DEF Level Gauge

The DEF (Diesel Exhaust Fluid) level gauge indicates on a graph and as a percentage the DEF level. DEF reagent should be added when the SCR Warning indicator comes on.

A solid light indicates that the DEF level is low (between 10% and 15%).

Two flashes per second indicate very low DEF level (under 10%).

One flash per second indicates that the DEF is critically low (under 5%). Add DEF reagent immediately.

Note: The DEF tank capacity is five (5) gallons.

Warning

If no DEF reagent is available in the storage tank, the engine will follow the DEF level strategy. After 10 minutes, available torque is dropped by 25%. 10 minutes after that, the RPM is slowly lowered to low idle at a rate of 6rpm/sec.

K. Engine Stop

The Engine Stop Indicator is displayed with a flashing Engine Warning Indicator when the engine is either shut down or an engine shutdown is imminent.

An Engine Stop Indicator displayed with both the Oil Pressure Indicator and a flashing Engine Warning Indicator shows the oil pressure is low. The engine should be shutdown, following proper shut down procedures.

L. Fuel Gauge

The fuel gauge indicates the percentage of fuel left in the tank. The total capacity of the fuel tank is 48 gallons. Above 20% of fuel left in the tank, the indicator is green, turning yellow between 10 and 20%. It turns red when the fuel level is very low, 10% and under.

M. General Warning

In case of any engine errors the General Warning Indicator will be activated. Whenever this warning indicator is active, a fault code is stored in the error memory. No system reactions like power reduction can become active without error indicator.

Two different states are possible:

- Solid on - Errors that allow continuing engine operation with minor restrictions.
- Blinking - Errors that cause an engine shut down or shut down request.

Emission related errors of the EAT system will also be displayed below the tachometer in the hour meter box (T), which now becomes the Status Display. The General Warning Indicator will also come on.

N. Regeneration (Regen) Indicator

This is a multi-functional indicator for standstill request and active standstill. The following states of the standstill indicator are possible:

- Off - no standstill active, no standstill request active
- Solid On - standstill active (on-going)
- Slow blinking (every 2 sec.) - standstill required. The op-
Operator Cab

Operator can start standstill if the machine is in safe conditions (the forklift is stationary, engine is warmed and no DEF errors are active). See Standstill Regeneration Conditions for more information.

- Fast blinking (3/sec.) - standstill required.

If the operator tries to release a standstill with the push button, but the standstill is inhibited for any reason, the indicator will be switched off for 2 seconds before starting the blinking mode again. This provides a confirmation to the operator that the push button was accepted.

NOTE: During an active standstill, some of the machine functions are deactivated. The engine runs with the desired standstill speed. NO MACHINE OPERATION IS ALLOWED DURING THIS PERIOD.

To avoid engine damages, any machine operation is strictly forbidden during an active standstill regeneration.

O. ENGINE COOLANT TEMPERATURE

The Engine Coolant Temp Indicator monitors the engine cooling system. After starting the forklift, allow time for the indicator to display a temperature close to the normal range before operating the forklift. After the engine has sufficiently been warmed up, normal engine coolant temperature should read between 180 to 205°F. The Engine Coolant Temp Indicator turns yellow at coolant temperatures between 205 and 215°F to warn that the engine operates at higher than normal temperature. The Engine Coolant Temp Indicator becomes red when the temperature reaches 216°F, indicating an engine overheating situation.

P. REAR AXLE CENTERED

Indicates that the rear axle is centered.

Q. BATTERY VOLTAGE

The Battery Voltage Indicator monitors the amount of charge in Volts (V). The normal system voltage is between 12.5 and 14 V. The indicator turns yellow if the charge is between 11.5 and 12.5 V, and becomes red if the charge drops below 11.5V. If the voltage indicator shows abnormal readings (below 11.5V), stop the forklift, follow proper shut down procedures, tag forklift with “Do Not Operate” tags, and have a qualified mechanic service or repair the forklift BEFORE placing it into service again.

R. HIGH EXHAUST TEMPERATURE

This symbol is activated if the engine exhaust temperature exceeds 1,166°F in normal operation mode.

S. DIGITAL CLOCK

Displays the current time, selectable in 12 hr or 24 hr format.

T. HOUR METER

The Hour meter indicates and records engine operating hours. Use the Hour meter to establish a forklift maintenance schedule.

U. MAIN MENU INDICATOR

Press the select button corresponding to this indicator to open the Main Menu.

V. LEFT SIDE OUTRIGGER DOWN

Indicates that the outrigger on the left side of the forklift is locked in the DOWN position.

W. RIGHT SIDE OUTRIGGER DOWN

Indicates that the outrigger on the right side of the forklift is locked in the DOWN position.

Digital Display Features

The display allows the operator to view vital engine information and other critical functions, including gauge display, engine diagnostics to monitor engine condition and performance, fault codes, and warning lights.

POWER UP

When the ignition is turned on, the display powers up and defaults to GAUGE DISPLAY mode. The display should remain in this mode for normal operation.

Figure 30. Gauge Display
MAIN MENU
Pressing the MENU select button will bring up the MAIN MENU. Pressing the GAUGE DISPLAY select button, will return to the GAUGE DISPLAY mode.

![Main Menu](image1)

**Figure 31. Main Menu**

UTILITIES
Pressing the UTILITIES select button will bring up the Hidden Utilities Menu.

![Hidden Utilities](image2)

**Figure 32. Hidden Utilities**

SYSTEM SETTINGS
Pressing the SYSTEM SETTINGS select button will display engine information. The top left button restores the factory defaults. Use the up/down buttons to navigate this menu.

![Engine Diagnostics](image3)

**Figure 33. Engine Diagnostics**

When making changes to the system settings, you will be prompted to confirm or cancel the new entries.

![Engine Diagnostics](image4)

**Figure 34. Engine Diagnostics**

CLOCK SETUP
Pressing the CLOCK SETUP soft button will enter a menu where the clock can be setup or adjusted.

![Clock Setup](image5)

**Figure 35. Clock Setup Menu**

SERVICE REMINDERS
Pressing the SERVICE REMINDERS soft button will display data pertaining to maintenance schedules.

![Service Reminders](image6)

**Figure 36. Service Reminders Menu**

If a scheduled service is due, the GAUGE DISPLAY indicates below the tachometer in the hour meter box, the service needed.
DIAGNOSTICS
Pressing the ENGINE DIAGNOSTICS soft button will display engine information. Use the up/down buttons to navigate. Pressing the MENU button will return to the GAUGE DISPLAY mode.

END OF LINE (EOL) TEST
Pressing the EOL Test select button will enter a test menu that runs the aftertreatment/regen system and makes sure it works properly.

USER SETTINGS
Pressing the USER SETTINGS soft button will enter a mode where some display settings may be adjusted using the Up/Down buttons.

CLEAR ALL FAULTS
Pressing the CLEAR FAULTS select button (A) will remove all the faults displayed.

REGEN RELEASE
Pressing the top left-hand select button will start the regen process.

FAULT BUTTON POP-UPS
A fault condition may trigger a pop-up dialog box describing the nature of the fault. It is displayed below the tachometer in the hour meter box (T), which now becomes the Status Display. The General Warning Indicator will also come on. A soft button may need to be pressed to acknowledge the fault.
Figure 42. Restore Defaults Confirmation. Enter Key “B”, Menu Key “C”

**REGEN MENU**

The Regen Menu is accessed by pressing the select button “D” at the top right corner of the Murphy display.

Pressing the Regen Stop/Inhibit select button will stop or inhibit the regen process.

Figure 43. Main Screen; Regen Indicator On Top Right Screen Corner

The message area in the middle of the screen will display a message regarding the conditions that need to be met for the regen process to start.

Figure 44. Regen Screen With No Alerts

**THE REGEN PROCESS**

The Regen Release select button “E” (Figure 44) is used to start the re-gen process. If a regen is requested and all the conditions of the machine to be able to regen are met, (park brake set, shifter in neutral, engine is idling and warm, inhibit button is not active), then the regen process starts.

If any of these conditions is not met, the regen process doesn’t start; the Regen Indicator shuts off for 2 seconds then it starts blinking again.

Once the regeneration starts, no machine functions should be operated.

The engine ECU takes over control of the engine speed and adjusts it as required. This process takes approximately 30 minutes. The regen process status is displayed on the screen.

**REGEN STOP / INHIBIT**

For emergency reasons, a standstill regeneration in process can be stopped by pressing the bottom left-hand button “F”. Besides stopping a standstill in progress, this button also toggles the inhibit switch if a standstill is not in progress.

**INDUCEMENT OVERRIDE**

The select button “G” (Figure 44) overrides engine inducement for emergency reasons. It temporarily deactivates engine inducements caused by the Engine Aftertreatment System (EAT).

The restore time and the handling of repeated activation of the EAT override button are treated dependent on the type of active errors.

**INDUCEMENT**

To meet the EPA requirements for tier four final diesel emissions, a two stage inducement system is used. As soon as a rel-
event error is detected, the operator is informed with an EAT related warning message.

- **Derating Step 1:** For DEF-Level, DEF-Quality and DEF-Tampering there will be no derating. For Standstill and DPF-Ash the available engine torque is reduced by 25% in the whole operating range of the engine. The torque reduction becomes active with minimum ramp of 10% per minute.

- **Derating Step 2:** If the error remains active, a final inducement becomes active. The final inducement is a forced low idle operation and will be announced by warning messages 10 minutes prior to activation. The torque reduction occurs at a rate of 10% per minute. The engine speed is reduced by 360 rotations every minute.

**INDUCEMENT OVERRIDE** - During final inducement (derating step 2) an override or restore functionality is not allowed. Due to previous warnings the operator must be aware of the impending circumstance.

- **Repeated Occurrence:** If DEF quality or tampering is detected again within a period of 40 operating hours, a warning is created immediately. The maximum time left before final inducement (derating step 2) will become active is 30 minutes. The inducement level 30 minutes before final inducement becomes active.

**GAUGE DISPLAY**

Press the GAUGE DISPLAY select button “H” (Figure 44) to return to the GAUGE DISPLAY mode.

**DEF-LEVEL MONITORING**

If no DEF reagent is available in the storage tank, the emission requirements cannot be fulfilled and the machine will derate eventually to idle only. There are three error messages available, representing the monitoring steps with active engine limitations. The machine is fully restored to normal functionality and operation when a tank fill is performed and indicated. A tank fill is assumed when the level exceeds the Reduction level 1 trigger level. If the filled DEF level does not exceed the initial warning level (<10%), the operator warning system remains activated.

**ACCESSING THE COLD WEATHER OPERATION MODE**

- Press the MENU button on the Murphy display, then press the UTILITIES button to access the cold weather ON/OFF switch.

![Figure 46. Cold Weather Mode ON/OFF](image)

- It will always default to OFF after key switch power is cycled. To turn the Cold Weather Operation Mode ON, the gear shifter must be in NEUTRAL and the parking brake must be ON. When the Cold Weather button is pressed, it toggles from OFF to ON and the engine automatically goes from an idle speed of 1000 rpm (normal operation) to 1550 rpm (cold weather operation).

- While in this mode, the throttle pedal is completely ignored. The engine will return to 1000 rpm and the throttle pedal will be active again only if either the park brake is turned OFF or the gear shifter is taken out of NEUTRAL. Once the combination of the shifter placed in NEUTRAL and the park brake ON is achieved, the engine will go back to 1550 rpm.

- The only way to return the machine back to normal operation mode with the idle at 1000 rpm, is to either cycle the key switch, or to select cold weather mode “OFF” in the digital display.

**BREATHER HEATER**

The breather heater is controlled automatically using the ambient temperature sensor for the engine. When the ambient temperature drops to 40°F or below, this will turn on automatically. Likewise, when the outside temperature is above 40°F it will stay off.

**Cold Weather Option**

The Cold Weather Option includes:

- Cold Weather Operation Mode, accessible on the digital display
- Breather Heater
- Battery Blanket
- Hydraulic Tank Heater

**Caution**

Do not idle for extended periods of time. Excessive idle time can cause poor engine performance.
Outrigger Control

The outrigger toggle switches are used to lower and raise the outriggers. The outrigger indicators “P” and “Q” (Figure 29) illuminate when the outriggers are fully extended and on the ground.

Once outriggers are fully extended, the transmission is disengaged, and the frame sway is locked. Frame sway lock can be overridden with the frame sway override switch.

The boom control handle has variable motions from the center position that control boom and tilt functions. The boom control handle is used to raise, lower, extend, retract the boom, tilt the carriage (or attachment), and control auxiliary functions (when equipped with a carriage or attachment with additional functions).

NOTE: The boom control handle is a variable speed control. Function speed is proportional to handle movement. The more the handle is moved in the appropriate direction, the faster the corresponding function will occur.

NOTE: Increasing engine speed can increase boom lift and extend speed.

NOTE: Two (2) boom functions can be performed at the same time by moving the handle into the corner between (2) functions.
The Attachment Tilt Switch located on the top of the boom control handle controls attachment tilt functions. The Attachment Tilt Switch:

- Controls the attachment tilt functions by rolling the switch upward and downward. For the attachment to tilt up, roll switch downward. For the attachment to tilt down, roll switch upward.
- Is a variable speed switch. Function speed is proportional to how far the switch is rolled. The more the switch is rolled in the appropriate direction, the faster the corresponding function will occur.

**NOTE:** The attachment carriage will retain any set angle throughout boom raising, lowering, retracting, or extending operations.

### Frame Sway Control Handle

<table>
<thead>
<tr>
<th>Function</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame sway right</td>
<td>Move handle right</td>
</tr>
<tr>
<td>Frame sway left</td>
<td>Move handle left</td>
</tr>
</tbody>
</table>

**NOTE:** Lock the frame sway by placing the travel select lever in NEUTRAL or applying the service or parking brake.

**NOTE:** Maximum frame sway is 22° overall or 11° each direction, left and right.

**Warning**

The forklift includes a Frame Sway Override switch. Improper use of the Frame Sway Override switch could cause death, serious injury, or property damage.

The frame sway feature becomes locked and will not operate when the boom is raised 40° or more. Pressing the Frame Sway Override switch (the trigger) on the control handle will override the lockout feature and allow slow frame sway.
Operator Cab

Auxiliary Attachment Control

The Auxiliary Attachment Control lever controls the functions of approved optional attachments that can be mounted to the forklift and require hydraulic supply for operation.

Steering Select Switch

⚠️ Warning

DO NOT change steering modes until the forklift slows or comes to a complete stop. Align all four (4) wheels perpendicular to the axle, before changing steering mode. Changing steering modes at higher travel speeds can make the forklift unstable, and cause a loss of control, which could result in death, serious injury, or property damage.

The Steering Select switch has three (3) steering positions: Crab, Two Wheel Steering (2W), and Four Wheel Steering (4W).

Lights Switch

Flip the toggle switch to ON to turn the front lights on.

Boom Angle Indicator

The boom angle indicator is located on the left side of the boom and is visible from the operator’s seat. Use the boom angle indicator to determine the boom angle when referring to load capacity charts. Refer to the LOAD CAPACITY CHARTS section of this manual for more information.

NOTE: The boom angle indicator is a plumb arrow with angular graduations from -5° to +70°

Boom Extend Letters

As the boom is extended, the boom extend letters on the left side of the boom are visible to the operator. These letters indicate boom extension as it corresponds to the load capacity charts.
Frame Level Indicator

The frame level indicator is mounted on the upper right corner of the operator’s cab. The frame level indicator allows the operator to view if the forklift has been positioned in a level condition.

Figure 60. Frame Level Indicator

Boom Maintenance Stand (If Equipped)

The Boom Maintenance Stand is an optional safety equipment used to support the boom during any and maintenance activities where the boom is raised.

- When preparing to set boom stand, make sure machine is on a flat level ground and machine has no load on the forks.
- Raise machine boom to 40 degrees for clearance and remove latch and pin from boom stand weldment.
- Position the boom stand in the upright position and re-apply the pin to secure stand. Proceed by slowly lowering machine boom to lay on stand.

When not in use, fold the support down and latch it in place. When preparing to remove boom stand, make sure all maintenance has been performed and area is clean.

- Raise machine boom to 40 degrees for clearance and remove pin from stand weldment
- Lay boom stand in the down position and re-latch stand to secure.

Forklift Lifting Points

The XR2045 lifting points are shown below. The forklift should only be lifted if lifting points are installed.

Warning

Ensure that no one is in the work radius before lifting forklift to avoid crushing hazard.

DO NOT try to lift or handle heavy components without the use of appropriate lifting equipment.
Operation

Pre-Operation Inspection

To perform the pre-operation inspection make sure the forklift is NOT running, the engine is cool, the forklift is parked on level ground, the boom is completely retracted, and the frame is level.

NOTE: Copy and use the Pre-Operation Inspection Checklist in this section.

Warning

Wear appropriate protective clothing. Personal protective equipment can include, but is not limited to hardhat, gloves, footwear, safety glasses or goggles, and hearing protection. Make sure clothing is snug and properly belted. DO NOT wear loose clothing, jewelry, watches, or anything that can catch on forklift controls, moving parts, etc. Failure to wear the proper protective clothing could result in death or serious injury.

Perform a pre-operation inspection and functional tests at the beginning of each work shift. Perform the pre-operation inspection first. DO NOT perform the pre-operation inspection with the engine running or hot. Contact with moving or heated parts could cause death or serious injury.

Perform a pre-operation inspection and functional tests in an open area.

Become familiar with all safety and hazard labels, regulations, and procedures. Make sure all proper labels are attached to the forklift and remain legible.

Remove forklift from service and place “Do Not Operate” tags on the Starter switch and steering wheel if anything is found to be in need of repair or maintenance, defective, or unsafe in any way.

Caution

Contact with hot surfaces and the exhaust pipe after the forklift has been operated could result in serious personal injury.

Warning

Always check the condition of the seat belt and mounting hardware before operating the forklift. If the seat belt or mounting hardware is defective, it may not properly restrain the operator, resulting in death or serious injury.

- DO NOT operate the forklift until the seat belt or mounting hardware is replaced, if worn or damaged.
- The seat belt MUST be worn while operating the forklift. Failure to wear the seat belt could result in death or serious injury.

Check hydraulic oil lines, tubes, and hoses carefully. DO NOT use your bare hand to check for leaks. Always use a board or cardboard when checking for a hydraulic leak. Escaping hydraulic fluid under pressure, even a pinhole size leak, can penetrate body tissue, which could cause death or serious injury. If hydraulic oil is injected into your skin, a doctor familiar with this type of injury must treat it immediately.

Serious injury could result from hydraulic oil pressure or hot oil. DO NOT remove a hydraulic tank filler cap unless it is cool enough to touch with bare hands. Remove the hydraulic tank filler cap slowly to relieve pressure. Relieve all pressure in a hydraulic system before any caps, lines, fittings, or related items are disconnected or removed.

Never remove the radiator cap while the engine is hot. The cooling system is under pressure. Hot coolant could cause severe burns or eye injury. Wear protective clothing and safety glasses.

Pre-Operation Inspection

To perform the pre-operation inspection make sure the forklift is NOT running, the engine is cool, the forklift is parked on level ground, the boom is completely retracted, and the frame is level.

NOTE: Copy and use the Pre-Operation Inspection Checklist in this section.

Warning

Wear appropriate protective clothing. Personal protective equipment can include, but is not limited to hardhat, gloves, footwear, safety glasses or goggles, and hearing protection. Make sure clothing is snug and properly belted. DO NOT wear loose clothing, jewelry, watches, or anything that can catch on forklift controls, moving parts, etc. Failure to wear the proper protective clothing could result in death or serious injury.

Perform a pre-operation inspection and functional tests at the beginning of each work shift. Perform the pre-operation inspection first. DO NOT perform the pre-operation inspection with the engine running or hot. Contact with moving or heated parts could cause death or serious injury.

Perform a pre-operation inspection and functional tests in an open area.

Become familiar with all safety and hazard labels, regulations, and procedures. Make sure all proper labels are attached to the forklift and remain legible.

Remove forklift from service and place “Do Not Operate” tags on the Starter switch and steering wheel if anything is found to be in need of repair or maintenance, defective, or unsafe in any way.

Caution

Contact with hot surfaces and the exhaust pipe after the forklift has been operated could result in serious personal injury.

Warning

Always check the condition of the seat belt and mounting hardware before operating the forklift. If the seat belt or mounting hardware is defective, it may not properly restrain the operator, resulting in death or serious injury.

- DO NOT operate the forklift until the seat belt or mounting hardware is replaced, if worn or damaged.
- The seat belt MUST be worn while operating the forklift. Failure to wear the seat belt could result in death or serious injury.

Check hydraulic oil lines, tubes, and hoses carefully. DO NOT use your bare hand to check for leaks. Always use a board or cardboard when checking for a hydraulic leak. Escaping hydraulic fluid under pressure, even a pinhole size leak, can penetrate body tissue, which could cause death or serious injury. If hydraulic oil is injected into your skin, a doctor familiar with this type of injury must treat it immediately.

Serious injury could result from hydraulic oil pressure or hot oil. DO NOT remove a hydraulic tank filler cap unless it is cool enough to touch with bare hands. Remove the hydraulic tank filler cap slowly to relieve pressure. Relieve all pressure in a hydraulic system before any caps, lines, fittings, or related items are disconnected or removed.

Never remove the radiator cap while the engine is hot. The cooling system is under pressure. Hot coolant could cause severe burns or eye injury. Wear protective clothing and safety glasses.

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Lead-acid batteries produce flammable and potentially explosive gases. To avoid death or serious injury when checking, testing, or charging batteries:

- DO NOT use smoking materials near batteries.
- Keep arcs, sparks, and open flames away from batteries.
- Provide ventilation for flammable vapors.
- Wear proper personal protective equipment, including safety glasses.

Fluid in electric storage batteries contains sulfuric acid, which is poison and could cause severe chemical burns. Avoid all contact of fluid with eyes, skin, or clothing. Use protective gear when handling batteries. DO NOT tip a battery beyond a 45° angle in any direction. If contact does occur, follow these First Aid suggestions:

- External contact - Flush with water.
- Eyes - Flush with water (including under the eyelids) for at least 15 minutes and get medical attention immediately. Flushing must begin immediately to avoid permanent eye tissue damage.
- Internal contact - Drink large quantities of water or milk to dilute stomach contents. Do not induce vomiting. Get medical attention immediately.

IMPORTANT - In case of internal contact, DO NOT give fluids that induce vomiting.

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**California Proposition 65**

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. Wash hands after handling these items.

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**Warning**

Wear eye protection when starting a forklift with jump start cables. Improper jump start procedures could cause the battery to explode, which could result in death or serious injury.

- Never jump start a frozen battery, as it can explode. Let the battery thaw out before charging.
- NEVER jump start the forklift when travel select lever is in gear, which can cause the forklift to lurch forward or backward, and could result in death, serious injury, or property damage.
- To avoid injury or death when jump starting with another forklift, make sure the two (2) forklifts are not touching.
- DO NOT allow jump start cable ends to contact each other.
- Connect charged battery positive (+) to stalled battery positive (+).
- Connect charged battery negative (–) to stalled forklift ground. Make the connection to the stalled forklift ground last.
- Connect jump start cable to stalled forklift ground a safe distance from the battery to prevent sparks near the battery.
- Jump start only with a power source with the same voltage as the stalled forklift.
- Turn off all lights and accessories on the stalled forklift to prevent them from operating when the power source is connected.
- Electrolyte contains acid and could cause serious personal injury if it contacts the skin or eyes.

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**Warning**

Tires must have proper ballast. DO NOT replace foam-filled tires with pneumatic tires. Use of pneumatic tires will severely affect forklift load capacity, which could result in death, serious injury, or property damage.

To avoid engine damages, any machine operation is strictly forbidden during an active standstill/regen.
Pre-Operation Inspection Checklist

Walk around the ENTIRE forklift while visually performing the pre-operation inspection.

☐ Check that “Do Not Operate” tags have not been placed on the forklift.
☐ Check that load capacity charts are legible.
☐ Check that frame level indicator is working properly.
☐ Check condition and operation of the seat belt and mounting hardware.
☐ Check that Operation and Safety Manual is in the protective case and legible.
☐ Check forks for welds, cracks, misalignment, or any other damage.
☐ Check that carriage fork pins are straight and in place to prevent forks from changing position or coming off the carriage.
☐ Check all hydraulic hoses and hose connections for wear or leaks.
☐ Check tilt cylinders for leaks or any other damage.
☐ Check boom for straightness or any other damage.
☐ Check all four (4) tires and wheels for:
  ☐ Punctures, cracks, cuts, gouges, bulges, foreign objects, or any other damage to tires.
  ☐ Loose or missing lug nuts.
  ☐ Bent flanges or any other damage to rims.
☐ Check front and rear sway cylinders and hoses for leaks or any other damage.
☐ Check electrical connections on rear sway cylinder.
☐ Check mirrors for cracks, cleanliness, and proper adjustment.
☐ Check hydraulic reservoir sight gauge for proper fluid level. Add hydraulic fluid, if necessary.
☐ Check engine compartment for:
  ☐ Loose or damaged belts, hoses, and radiator fan blades.
  ☐ Coolant reservoir level. Add radiator coolant, if necessary.
  ☐ Engine oil level. Add engine oil, if necessary.
  ☐ Electrical wires and connectors.
☐ Check transmission fluid level.
☐ Check front and rear axles for leaks or any other damage.
☐ Check boom lift and carriage master tilt cylinders and hydraulic lines for leaks or any other damage.
☐ Check battery terminals for corrosion.
☐ Check battery for cracked, melted, or damaged case.
☐ Check that all labels are present and legible. Replace any damaged or illegible labels.
☐ Check that operator’s cab is empty of all trash, debris, or any loose items.
☐ Check that personal belongings are secured in the personal storage box.
☐ Check that pedals, and non-skid surfaces are clean and free of grease, oil, dirt, snow, or ice.

☐ Date: __________________________   ☐ Initials: __________________________
### Functional Tests

**Warning**

Perform a pre-operation inspection and functional tests at the beginning of each work shift. Perform the pre-operation inspection first. DO NOT perform the pre-operation inspection with the engine running or hot.

Contact with moving or heated parts could cause death or serious injury.

Perform the pre-operation inspection and functional tests in an open area and away from any other obstacles or equipment. Inspections and functional tests may require assistance. Keep the assistant visible and a safe distance from the forklift to prevent death or serious injury.

Remove forklift from service and place “Do Not Operate” tags on the starter switch and steering wheel if anything is found to be in need of repair or maintenance, defective, or unsafe in any way.

The safety, efficiency, and service life of your forklift will be increased by performing functional tests at the beginning of each shift. If any of the items in the functional tests are not operating properly or within set tolerances, stop the forklift, follow proper shut down procedures, tag the forklift with “Do Not Operate” tags, and have a qualified mechanic service or repair the forklift before placing it into service again.

- Operate the boom control handle forward and backward to lower and raise boom.
- Operate the boom control handle left and right to retract and extend boom.
- Operate the attachment tilt thumb stick up and down to tilt the attachment.
- Operate the sway control handle left and right to frame sway left or right.
- Operate the auxiliary attachment control (if an auxiliary attachment is being used).
- Turn work lights on and off.
- Press the horn button to sound the horn.
- Place the travel select lever in reverse to sound the backup alarm.
- Release the parking lever.
- Operate the forklift in forward and reverse.

- Test the service and parking brakes.
  - Apply the service brake pedal after the forklift begins to move and the forklift should stop immediately.
  - Apply the parking brake. The forklift should not move unless the parking brake is released.

- Test each steering function. Operate the forklift in forward and reverse at low idle speed and turn the steering wheel approximately 1/4 turn in each direction for each of the following modes:
  - Align the wheel and set the Steering Select switch to crab steering.
  - Align the wheel and set the Steering Select switch to 2 wheel (2W) steering.
  - Align the wheel and set the Steering Select switch to 4 wheel (4W) steering.

- Check the gauges after the engine warms to the proper operating range.
  - Check the voltage gauge. The voltage gauge should read between 11 to 15 Volts.
  - Check the engine coolant temperature gauge. The engine coolant temperature gauge should read between 180° to 200° F.
  - Check the engine oil pressure gauge. The engine oil pressure gauge should read between 40 to 80 PSI.

#### Diesel Exhaust Fluid (DEF)

The DEF tank should be filled after every fuel refill. DEF should be added when the Low DEF level indicator is displayed. Refer to the Operation section on Warning Indicators and Fault Codes and the Engine Indicator Chart (Fig. 69). The total capacity of the DEF tank is 5 gallons.

**Warning**

If no DEF reagent is available in the DEF tank, the emission requirements cannot be fulfilled and the machine derates eventually to idle only, following a predetermined schedule.

**Caution**

Using anything other than DEF fluid may result in permanent aftertreatment damage.
Figure 62. Check Hydraulic Oil Sight Gauge (A); Add Hydraulic Oil, if Necessary (B).

**WARNING! DO NOT Remove Hydraulic Tank Filler Cap Unless It Is Cool Enough To Touch With Bare Hands.**

Figure 63. Add DEF (Diesel Exhaust Fluid) when the Low DEF Level indicator is displayed.

Figure 64. Check Coolant Reservoir Level. Add Coolant, if Necessary.

**WARNING! Hot Coolant. DO NOT Open Radiator Cap When Hot To Touch.**

Figure 65. Check Engine Oil Level Using Yellow Dipstick “A”.


Figure 66. Check Battery Case and Terminals

Figure 67. Store Operation Manual in Protective Case
Before Starting Forklift

**Warning**

Failure to use proper safety procedures when mounting and dismounting the forklift could result in death or serious injury.

- Keep steps clear of dirt, mud, snow, ice, debris, and other hazards.

  Face the forklift for mounting or dismounting. Use hand holds and steps to maintain three (3) points of contact at all times, either both hands and one foot or both feet and one hand.

- DO NOT use the controls, steering wheel, or foot pedals as hand holds or steps. Avoid accidentally engaging or disengaging a control.

  DO NOT jump from the forklift. Clothing can get caught on pedals, levers, or other protruding parts. Landing on uneven surfaces could result in death or serious personal injury.

1. Master battery disconnect on.
2. Use safe mounting/dismounting procedures to enter the operator cab.
3. Adjust the operator seat for position and comfort. (Refer to Seat Adjustment section in this manual)
4. Adjust mirrors (this may require assistance).
5. Adjust the side console control panel.
6. Fasten seat belt.
7. Make sure the travel select lever is set to NEUTRAL (N) and the Parking Brake is ON (engaged).

**NOTE:** The engine will only start when the travel select lever is in NEUTRAL (N) and the Parking Brake switch is ON (engaged).

Figure 68. Travel Select Lever Must Be in NEUTRAL (N) to Start the Forklift

Figure 69. Parking Brake Switch (A) Must Be ON (Engaged) to Start the Forklift.

**Oil Change Request**

Running the engine in standstill operation mode for longer periods may lead to oil dilution. Under normal operating conditions of the engine the number of standstill regenerations and the total time in standstill operation mode do not cause critical oil dilution.

If, due to system errors, extreme operating conditions or misuse of the service regeneration function, the standstill regeneration time is critically high, an additional engine oil exchange becomes necessary.

The ECU monitors the time in standstill operation mode and activates a system error if a threshold is exceeded. The error code requires an additional oil exchange service and can only be reset via Service Tool.

Two different error codes are possible:

- The first error indicates an unusual high regeneration time in a short term monitoring interval (50 hours).
- The second error informs about unusual high regeneration time in a long term monitoring interval (corresponding to the standard oil exchange interval).

For the XR2045 forklift, the Oil Change Request triggers from the ECU are:

- Five (5) standstill regenerations within 50 hours, or
- Twenty (20) standstill regenerations within 500 hours

**Caution**

Do not idle for extended periods of time. Excessive idle time can cause poor engine performance.
Starting Forklift

Normal Starting

**Warning**

To prevent death, serious injury, or property damage, the operator must be seated with seat belt fastened, arms, legs, and head completely inside the Rollover Protection Structure/Falling Object Protection Structure (ROPS/FOPS), the travel select lever in NEUTRAL, and the Parking Brake switch ON (engaged) BEFORE starting the forklift.

1. Place Key in Ignition Switch.
2. To start the engine, turn key in ignition switch clockwise to the RUN position.
3. Wait until the Wait to Start Indicator goes off and then turn the key to the START position to crank the engine.
4. Release key immediately after the engine starts. The Ignition Switch will automatically return to RUN.

**NOTE:** The Start position is spring-loaded. When the key is released, the ignition switch will automatically return to the RUN position.

**NOTE:** If the engine fails to start on the first try, wait until the engine and starter come to a complete stop before cranking the engine again.

5. After the engine starts, allow the engine to idle for approximately 60 seconds.
6. Apply the service brake pedal and disengage the Parking Brake switch.

**Caution**

Release the key immediately once the motor starts. If the motor does not start, DO NOT crank the starter motor continuously for more than 15 seconds. Failure to release the key after the motor has started or continuous cranking can damage the starter motor.

**Jump Starting**

Jump Start or replace the battery of the forklift when the battery is discharged to the point that it will not crank the starter.

**Warning**

Lead-acid batteries produce flammable and potentially explosive gases. To avoid death or serious injury when checking, testing, or charging batteries:

- DO NOT use smoking materials near batteries.
- Keep arcs, sparks, and open flames away from batteries.
- Provide ventilation for flammable vapors.
- Wear proper personal protective equipment, including safety glasses.

Fluid in electric storage batteries contains sulfuric acid, which is poison and could cause severe chemical burns. Avoid all contact of fluid with eyes, skin, or clothing. Use protective gear when handling batteries. DO NOT tip a battery beyond a 45° angle in any direction.

If contact does occur, follow these First Aid suggestions:

- **External contact** - Flush with water.
- **Eyes** - Flush with water (including under the eyelids) for at least 15 minutes and get medical attention immediately. Flushing must begin immediately to avoid permanent eye tissue damage.
- **Internal contact** - Drink large quantities of water or milk to dilute stomach contents. Do not induce vomiting. Get medical attention immediately.

**IMPORTANT** - In case of internal contact, DO NOT give fluids that induce vomiting.

**NOTE:** If the engine fails to start on the first try, wait until the engine and starter come to a complete stop before cranking the engine again.
Warning

Wear eye protection when starting a forklift with jump start cables. Improper jump start procedures could cause the battery to explode, which could result in death or serious injury.

- Never jump start a frozen battery, as it can explode. Let the battery thaw out before charging.
- NEVER jump start the forklift when travel select lever is in gear, which can cause the forklift to lurch forward or backward, and could result in death, serious injury, or property damage.
- To avoid injury or death when jump starting with another forklift, make sure the two (2) forklifts are not touching.
- DO NOT allow jump start cable ends to contact each other.
- Connect charged battery positive (+) to stalled battery positive (+).
- Connect charged battery negative (–) to stalled forklift ground. Make the connection to the stalled forklift ground last.
- Connect jump start cable to stalled forklift ground a safe distance from the battery to prevent sparks near the battery.
- Jump start only with a power source with the same voltage as the stalled forklift.
- Turn off all lights and accessories on the stalled forklift to prevent them from operating when the power source is connected.
- Electrolyte contains acid and could cause serious personal injury if it contacts the skin or eyes.

1. Connect one end of the positive (+) jumper cable to the positive (+) post of the discharged battery.
2. Connect the other end of the positive (+) jumper cable to the positive (+) post of the charged battery.
3. Connect one end of the negative (-) jumper cable to the negative (-) post of the charged battery.
4. Make the final jumper cable connection to the stalled forklift ground at the furthest point from the battery.
5. Start the forklift. Refer to the Starting Forklift section in this manual.
6. After the engine starts, allow the engine to idle for approximately 60 seconds.
7. Remove the jumper cables in reverse order of their connection (i.e. negative cable ground connection first, etc).

Forklift Travel

Warning

Never use crab or four wheel (4W) steering for traveling at high speeds. Use only two wheel (2W) steering for higher speed travel and slow the forklift before turning. Rapid turning using crab, four wheel (4W), or the optional two wheel rear (2WR) steering could cause tip over, which could result in death, serious injury, or property damage.

Check the turning radius around the forklift before making a turn, especially if using four wheel (4W) steering or two wheel rear (2WR) steering, which provide a tighter turning radius. Look over your shoulder in the direction of the turn when backing. Failure to remain aware of your turning radius area could result in death, serious injury, or equipment damage.

Caution

DO NOT change steering modes until the forklift slows or comes to a complete stop. Align all four (4) wheels “straight-ahead”, or perpendicular to the axle, before changing steering mode. Changing steering modes without aligning all four (4) wheels may result in equipment damage.

The forklift includes three STANDARD modes of steering: Crab, Two Wheel (2W), and Four Wheel (4W) Steering. Use the Steering Select switch located on the dash panel to change steering modes.

Crab Steering

Crab steering allows all four (4) wheels to turn in the same direction as the steering wheel, allowing the forklift to move “sideways”. Crab steering is useful in a congested work site to line up to a loading location.

Two Wheel Front Steering (2W)

Two wheel (2W) steering allows the front wheels to turn in the same direction as the steering wheel. The rear wheels remain in a fixed forward position. Two wheel (2W) steering is useful for traveling at higher speeds.
Four Wheel Steering (4W)

Four wheel (4W) steering allows the front wheels to turn in the same direction and the rear wheels to turn in the opposite direction of the steering wheel. The rear wheels follow the front wheel path. Four wheel (4W) steering is useful for a short turning radius and in muddy or sandy conditions.

Two Wheel Rear Steering (2WR) - OPTIONAL

OPTIONAL two wheel rear (2WR) steering allows the rear wheels to turn in the same direction as the steering wheel. The front wheels remain in a fixed forward position.

Starting Travel

1. Start the forklift. Refer to the Starting Forklift section in this manual.
2. Apply service brake.
3. Release parking brake.
4. Rotate the gear select switch to the gear desired.
5. Move the travel select lever to FORWARD or REVERSE for the appropriate direction of travel.
6. Release the service brake pedal.
7. Slowly press the accelerator pedal to start travel.

Shifting Gears

1. Do not shift through multiple gears with a single turn of the gear select lever. Allow the engine speed to slow down before shifting to the next lower gear. Improper use of the gear select lever could cause transmission damage or forklift tip over/roll over and could result in death or serious injury.

Stopping Travel

1. Stop the forklift by applying the service brake pedal. Slow the forklift down until it comes to a complete stop.
2. Move the travel select lever to NEUTRAL (N) and set the parking brake to ON (engaged).

Starting Travel Warning

Use proper safety procedures and avoid hazardous situations while operating the forklift to prevent death, serious injury, or property damage.

- Check the work site for any hazards before operating the forklift.
- Check the work surface for loose soil conditions and overhead power lines.

To avoid death or serious injury, the operator must have the seat belt fastened, the travel select lever set to NEUTRAL, the Parking Brake ON (engaged), and the area free of people and obstructions BEFORE starting the forklift.

Warning

Allow for adequate clearance between the attachment and other objects when turning. The attachment extends beyond the front of the forklift. The operator must be aware of the maximum sweep of any attachment being used, when turning, to avoid hitting personnel and other objects in the area to prevent death, serious injury, or property damage.

Warning

DO NOT shift through multiple gears with a single turn of the gear select lever. Allow the engine speed to slow down before shifting to the next lower gear. Improper use of the gear select lever could cause transmission damage or forklift tip over/roll over and could result in death or serious injury.

The transmission has three (3) gears that can be used for traveling in forward or reverse.

To shift gears rotate the gear select lever to the next gear while the forklift is traveling.
- Use first gear (1) for highest torque and pulling power.
- Use higher gears for higher ground speed.
- Never travel in top gear (3) when carrying a load.
- Allow the engine speed to slow down before shifting to a lower gear.
Warning and Fault Indicators

Fault condition dialog boxes will pop up and warning lights on the display will illuminate during critical circumstances. Some of these conditions demand immediate attention and forklift servicing. If an Engine Shutdown fault condition is present, the forklift should be shut down as soon as practical to prevent serious mechanical failure.

Pintle Hook

Death or serious injury could result from improper operation when using tow connection. Do not elevate boom above 30 degrees when towing. Do not exceed rated tow capacity (500 lbs vertical load, 5000 lbs tow capacity).

The Pintle Hook is used for towing trailers and equipment, rated at or below 5,000 lbs maximum capacity. Failure to comply with this capacity limitation, or elevating the boom above 30 degrees when towing could result in death or serious injury.

Warning

Engine fuel is flammable and can cause a fire or explosion resulting in death or serious injury. DO NOT smoke while refueling and keep sparks and open flames away from the forklift.

- Make sure the forklift is level to obtain an accurate fuel level reading.
- Shut off the engine.
- Ground the fuel nozzle against the filler neck to avoid sparks. Use ASTM #2 diesel fuel with a minimum Cetane rating of 40 for better fuel economy and performance.

Refueling

A fault condition may trigger a pop-up dialog box on the display describing the nature of the fault during operation. Corresponding red or amber warning lights will illuminate to indicate the severity of the fault. If an Engine Shutdown fault condition is present, stop the forklift, follow proper shut down procedures, tag the forklift with “Do Not Operate” tags, and have a qualified mechanic service or repair the forklift BEFORE placing it into service again. Report all warning indicators and fault codes to a qualified mechanic. Ignoring warning indicators or fault codes can cause improper performance, which could result in death, serious injury, or property damage.

Pintle Hook

![Warning]

Death or serious injury could result from improper operation when using tow connection. Do not elevate boom above 30 degrees when towing. Do not exceed rated tow capacity (500 lbs vertical load, 5000 lbs tow capacity).

The Pintle Hook is used for towing trailers and equipment, rated at or below 5,000 lbs maximum capacity. Failure to comply with this capacity limitation, or elevating the boom above 30 degrees when towing could result in death or serious injury.

Warning

Make sure the forklift comes to a complete stop before moving the travel select lever. A sudden change in direction of travel, while carrying a load, can reduce stability and/or cause the load to shift or fall, which could result in death, serious injury, or property damage.

Shut Down Procedure

1. Park forklift on level ground, if possible.
2. Stop the forklift by applying the service brake pedal.
3. Place the travel select lever in NEUTRAL (N) and set the parking brake to ON (engaged).
4. Lower the boom and rest carriage on ground.
5. Turn the ignition key to OFF and remove the key.
6. If the forklift is parked on an incline, block the wheels. Shut off the engine.
7. Ground fuel nozzle against the filler neck to avoid sparks.

Changing Travel Direction

Stop the forklift by applying the service brake pedal. Move the travel select lever to FORWARD or REVERSE.

Release the service brake pedal. Slowly press the accelerator pedal to start travel.

Warning

Make sure the forklift comes to a complete stop before moving the travel select lever. A sudden change in direction of travel, while carrying a load, can reduce stability and/or cause the load to shift or fall, which could result in death, serious injury, or property damage.

Operations Manual
**ENGINE WARNING INDICATOR**

A steady Engine Warning Indicator by itself shows the engine is operating normally but there are one or more minor faults with the engine electronic management system.

A flashing Engine Warning Indicator by itself shows there are one or more serious faults and the engine is operating in at reduced power. A flashing Engine Warning Indicator is displayed with the Engine Stop Indicator when the engine is either shut down or an automatic engine shutdown is imminent. See Engine Indicator Chart, Figure 66 for more info.

A flashing Engine Warning Indicator displayed with both the Oil Pressure Indicator and Engine Stop Indicator shows the oil pressure is low. The engine should be shutdown. Automatic engine shutdown is imminent.

**ENGINE STOP INDICATOR**

The Engine Stop Indicator is displayed with a flashing Engine Warning Indicator when the engine is either shut down or an engine shutdown is imminent.

An Engine Stop Indicator displayed with both the Oil Pressure Indicator and Engine Stop Indicator shows the oil pressure is low. The engine should be shutdown. Automatic engine shutdown is imminent.

**OIL PRESSURE INDICATOR**

An Oil Pressure Indicator displayed with both the Engine Stop Indicator and flashing Engine Warning Indicator shows the oil pressure is low. The engine should be shutdown. Automatic engine shutdown is imminent.

---

### DEF Level Monitoring

If no DEF reagent is available in the storage tank, the emission requirements cannot be fulfilled and the machine will derate eventually to idle only.

Three error messages are available representing the monitoring steps with active engine limitations.

When a DEF tank fill is performed and indicated, the machine is fully restored to normal functionality and operation. A tank fill is assumed when the level exceeds the initial warning level (>10%).

If the tank fill condition is not met (DEF level is below 10%), after 10 minutes the available torque is dropped by 25%. Ten minutes after that, the RPM is slowly lowered to low idle at a rate of 6rpm/s.

---

### DEF Quality Monitoring

If the reagent quality requirements are not met, the emission performance of the engine cannot be guaranteed. The SCR system could be damaged if the DEF used in the engine is out of specification. Dilution of the reagent with water will lead to deteriorated NOx reduction and clogging of the catalyst with resulting damage to the SCR system.

**NOTE:** The DEF reagent used must comply with ISO 22241.

Mis-fueling with diesel leads to injection of diesel and DEF reagent into the catalyst and the very high combustion temperatures will damage the catalyst.

---

<table>
<thead>
<tr>
<th>Engine Warning</th>
<th>Engine Stop</th>
<th>Engine Oil</th>
<th>Lamp State</th>
<th>Description</th>
<th>Engine State</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STOP</td>
<td></td>
<td></td>
<td>No Faults</td>
<td>Engine operating with no faults</td>
</tr>
<tr>
<td>ON</td>
<td></td>
<td></td>
<td></td>
<td>Active Diagnostic</td>
<td>Minor fault present</td>
</tr>
<tr>
<td>FLASH</td>
<td></td>
<td></td>
<td></td>
<td>De-rate</td>
<td>Engine operating with reduced power</td>
</tr>
<tr>
<td>FLASH</td>
<td>ON</td>
<td></td>
<td></td>
<td>Shutdown</td>
<td>Engine should be shutdown by operator. Automatic shutdown will occur after a short period of time.</td>
</tr>
<tr>
<td>FLASH</td>
<td>ON</td>
<td>ON</td>
<td>Low Oil Pressure</td>
<td>Engine should be shutdown by operator. Automatic shutdown will occur after a short period of time.</td>
<td>Engine is either shutdown or automatic shutdown is imminent</td>
</tr>
</tbody>
</table>

*Figure 71. Engine Indicator Chart*
Operation

Out of specification reagent is detected within maximum 30 minutes and a warning will be activated. If low efficiency DEF is detected after refilling the DEF tank, (i.e. the reducing agent not according to ISO 22241-1), a low Efficiency Rate of the SCR system warning message is displayed.

SCR Hardware Failure Errors

Hardware failure errors such as defects of the urea pump are indicated in Figure 67. If the Urea Injection can still be guaranteed, no restriction is set. In other cases a restriction is set and derating will be active after a delay time.

In case of a Hardware failure, the Urea Warning Lamp and the Engine Error Indicator are permanently active.

<table>
<thead>
<tr>
<th>Hardware Failure</th>
<th>EPA2 Symbol</th>
<th>ATTITUDE Symbol</th>
<th>DEF Phase Symbol</th>
<th>Urea Lamp Symbol</th>
<th>Warning Lamp Symbol</th>
<th>Buzzer</th>
<th>System Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td></td>
<td></td>
<td></td>
<td>000</td>
<td>000</td>
<td>off</td>
<td></td>
</tr>
<tr>
<td>Failure detected</td>
<td>110</td>
<td>100</td>
<td>010</td>
<td>Solid on</td>
<td>Blinking</td>
<td>on</td>
<td>no derating</td>
</tr>
<tr>
<td>Inducement Pretrigger</td>
<td></td>
<td></td>
<td></td>
<td>Restriction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure activated Inducement Pretrigger</td>
<td>110</td>
<td>101</td>
<td>0100</td>
<td>Solid on</td>
<td>Blinking</td>
<td>on</td>
<td>derating step 2 active 10 min after detection</td>
</tr>
</tbody>
</table>

Figure 73. Hardware Failure Escalation Steps

Crystallization Detection

The SCR system is monitored for crystallization. If crystallization is detected, the system can request special engine operation modes as countermeasure. If the operator ignores the standstill request, a specific error message will be created and optional system reactions like power reduction may become active. See also escalation management standstill.

<table>
<thead>
<tr>
<th>Crystallization Detection</th>
<th>Description</th>
<th>Standstill Lamp</th>
<th>Warning Lamp</th>
<th>Buzzer</th>
<th>System Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Normal operation</td>
<td>No crystallization detected</td>
<td>off</td>
<td>no derating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Crystallization detected</td>
<td>Standstill required</td>
<td>0.5 Hz</td>
<td>Blinking</td>
<td>on</td>
<td>Engine power reduction 25%</td>
</tr>
<tr>
<td>2 Crystallization detected</td>
<td>Warning Level required for standstill</td>
<td>3 Hz</td>
<td>Blinking</td>
<td>on</td>
<td>engine power reduc. 50% of max, engine torque and engine speed limit 60% of rated speed</td>
</tr>
</tbody>
</table>

Figure 74. Crystallization Escalation Steps

DPF System

The DPF system is a closed soot filter system that accumulates soot during machine operation. The filter regeneration is a continuous process (CRT) starting as soon as the necessary conditions at the inlet of the system are reached. These conditions are mainly exhaust temperatures and NOx/Soot-ratio.

The filter load is permanently monitored and controlled. If the regeneration process is not possible for any reason, the system triggers additional actions to start the regeneration. Operator input is required only if these actions are not successful.

Under average operating conditions, the filter soot load is within an expected range and no further action is needed. Standstill lamp is off.

If the operating conditions of the machine do not allow a successful continuous regeneration process, the filter load can exceed the expected range. This could happen in extremely low load applications, or if the machine is always operated only
for short intervals. In this case the engine enters HEAT MODE 1 and certain engine internal actions (i.e. using intake throttle flap or exhaust flap) are performed in order to improve the regeneration conditions (Level 1). Operator input is not needed at this point. The standstill lamp is off.

<table>
<thead>
<tr>
<th>Soot level</th>
<th>Description</th>
<th>Standstill Lamp</th>
<th>Warning Lamp</th>
<th>Buzzer</th>
<th>System Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Normal operation</td>
<td>off</td>
<td>no derating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>HEAT MODE 1 requested</td>
<td>off</td>
<td>no derating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>HEAT MODE 2 requested</td>
<td>off</td>
<td>no derating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Standstill required</td>
<td>0.5 Hz</td>
<td></td>
<td>off</td>
<td>no derating</td>
</tr>
<tr>
<td>4</td>
<td>Warning Level</td>
<td>Standstill required</td>
<td>0.5 Hz</td>
<td>On</td>
<td>derating step 1 active</td>
</tr>
<tr>
<td>5</td>
<td>Shut Off Level</td>
<td>Service Tool required for standstill</td>
<td>3 Hz</td>
<td>blinking</td>
<td>derating step 2 active</td>
</tr>
<tr>
<td>6</td>
<td>Remove Filter</td>
<td>DPF removal required</td>
<td>No standstill allowed (DPF C, Syst. 830+)</td>
<td>3 Hz</td>
<td>blinking</td>
</tr>
</tbody>
</table>

Figure 75. DPF Regeneration Strategy

If HEAT MODE 1 is not sufficient to allow a reduction of the soot load, the filter load continues rising and stronger engine internal actions become necessary to improve the regeneration conditions and the engine enters HEAT MODE 2. Fuel consumption and engine dynamic response is higher than in HEAT MODE 1. The standstill lamp is off (Level 2).

Main: If all preconditions are fulfilled, the main process starts. The exhaust temperature is increased. The duration of the standstill is approximately 30 minutes.

Afterrun: When the main process is finished, the engine and the EAT-system cool down to protect the hardware. The duration of the afterrun is approximately 5 minutes.

Standstill Regeneration

If the engine heat mode described above is not sufficient to allow a reduction of the soot load, the filter load continues rising and finally a standstill-regeneration is requested. The standstill is the last option to regenerate a filter if all other attempts to clean the filter failed. The machine should not be operated during an active standstill regeneration!

During an active standstill, high exhaust gas temperatures may occur. The engine speed changes to a predefined value and cannot be influenced by the operator. Due to extreme engine settings, the engine oil quality is influenced by standstill. After a certain number of standstill an oil change may be necessary. Standstill lamp blinks twice a second (Level 3).

A standstill has to be released by the operator. If the operator ignores the standstill request, engine protections are activated (Level 4). Once a standstill was requested, the request remains active until a standstill regen is successfully finished. If the standstill request is further ignored and the soot load gets extremely high, a service-regeneration via Service Tool (SERDIA, VCADS) has to be performed by a qualified service technician, and the regeneration cannot be performed by the operator. The standstill lamp blinks 3 times/sec. (Level 5).

When the soot load has reached a critical level (Level 6) where safe regeneration no longer can be possible, the DPF has to be replaced before operation is allowed to continue. The standstill lamp blinks rapidly, 3 times/sec.

Standstill Regeneration Conditions

The forklift needs to meet the following conditions to be able to perform a successful standstill regeneration:

- Park brake must be ON and shifter in neutral (N) position
- The inhibit button is not active
- Engine is at idle with the coolant temperature > 158°F and exhaust gas temperature after DOC < 482°F
- DEF level above 15% with no quality errors (i.e. DEF tank not frozen, DEF quality conforms to ISO 22241-1, etc.)
- The operator needs to acknowledge the coming regeneration process via input through the release button
Standard Carriage Operation

The standard carriage uses manually adjustable forks and can be tilted up or down by using the thumb stick on the control handle.

Fork Positioning Carriage Operation

Do not adjust forks when Fork Positioning Carriage is loaded. Adjusting forks when carriage is loaded may result in loss of load or carriage damage. Always use the Fork Positioning control handle to adjust the forks BEFORE loading the carriage.

To move the forks outward, press the top button on the front control handle, or move the auxiliary handle to the left. To move the forks inward, press the lower button on the front control handle, or move the auxiliary handle to the right.
This forklift includes a quick attach system that allows for easy attachment changes. Perform attachment connection and removal procedures on level ground.

### Attachment Connection

**Warning**

Improper connection of an auxiliary attachment can result in death or serious injury. Attachments not locked into place could become unstable and fall on the operator or other personnel near the forklift, which could result in death or serious injury.

- Make sure attachment locking devices are always in place.
- DO NOT operate the forklift until you have positive indication that the carriage attachment is fully engaged.

1. Position the forklift directly behind the attachment. **NOTE:** Allow enough distance to extend the boom approximately 18 to 20 inches.
2. Tilt the quick attach adapter forward.
3. Extend the boom and/or drive the forklift forward until the pivot pins (A) are below and between the two (2) attachment hooks (B).
4. Raise the boom until pivot pins (A) have seated fully in attachment hooks (B).

---

**Hydraulic attachments have a maximum hydraulic pressure rating.** Failure to make sure the attachment is equipped with a pressure reducing valve, or is rated to be equal or greater than 3,900 psi, which is the maximum pressure of the forklift auxiliary hydraulic system at the quick-disconnect couplers, could result in death or serious injury.

When the auxiliary attachment control lever is moved right or left it activates hydraulic pressure through the quick attach couplers to move the carriage.
5. Tilt the attachment up slightly. The quick attach adapter should be tight against the rear of the attachment. Align the holes between the quick attach adapter and attachment.

6. Raise the quick attach lock lever.

7. With lock lever raised, insert quick attach pin completely through the attachment and quick attach adapter.

8. Release the quick attach lock lever and make sure it has lowered and seated itself in groove (A) of the quick attach pin.

**Warning**

Hydraulic attachments have a maximum hydraulic pressure rating. Failure to make sure the attachment is equipped with a pressure reducing valve, or is rated to be equal or greater than 3,900 psi, which is the maximum pressure of the forklift auxiliary hydraulic system at the quick-disconnect couplers, could result in death or serious injury.
9. Connect the quick attach couplers (this only applies to attachments with a quick attach hydraulic system).

![Figure 86. Quick Attach Couplers For Hydraulic Systems. (A) Female Coupler. (B) Male Coupler.]

**Attachment Removal**

**NOTE:** To remove a standard carriage with forks, spread the forks apart on the carriage shaft. This provides adequate support for the carriage to stand alone.

1. Bring the forklift to a complete stop.
2. Move the travel select lever to NEUTRAL (N).
3. Set the parking brake switch to ON (engaged).
4. Extend the boom approximately 18 to 20 inches.
5. With attachment 10 to 12 inches off of the ground, tilt the attachment backward.
6. Disconnect the quick attach couplers as shown in Figure 79 above. This only applies to attachments with a quick attach hydraulic system.
7. Raise the quick attach lock lever.

8. Pull out the quick attach pin at the bottom of the quick attach adapter.

![Figure 87. Quick Attach Lock Lever]

9. Lower the attachment to the ground in a level position.

![Figure 88. Pull Quick Attach Pin from Attachment and Quick Attach Adapter.]

![Figure 89. Lower Attachment to Ground in Level Position]
10. Tilt and lower boom until pivot pins (A) have disconnected from attachment hooks (B).

![Image](image.png)

Figure 90. Tilt and Lower Boom to Release Pivot Pins (A) from Attachment Hooks (B).

11. Retract the boom to fully disconnect the attachment from the quick attach link.

---

**Load Handling**

---

**Warning**

Failure to follow proper safety procedures when lifting, lowering, and traveling with a load could cause death, serious injury, or property damage.

DO NOT exceed forklift capacity of 20,000 lbs. The total rated capacity of the forks being used must equal or exceed forklift capacity. Forks can break causing loss of load and could result in death or serious injury.

---

**Danger**

Death or serious injury by electrocution will result from contact with or inadequate clearance with energized power lines or apparatus.

- Never operate the forklift in an area where active overhead power lines, overhead or underground cables, or other power sources exist.
- Contact the appropriate power or utility company to de-energize power lines or take other suitable precautions.

Keep the forklift, attachments, and loads a safe distance from electrical power lines.

- Remain at least 10 feet, plus an additional 0.4 inches) for each 1,000 Volts over 50,000 Volts, from active power lines and other power sources.
- Work site operating directives and/or local or state codes might require a greater distance.
- Know the maximum height and reach of this forklift.

---

**Warning**

DO NOT exceed the manufacturer’s rated load for any auxiliary attachment. Any attempt to lift or carry loads in excess of the manufacturer’s rated load may cause forklift tip over, loss of load, or structural damage which could result in death, serious injury, or property damage. DO NOT use attachments that are corroded excessively.

Failure to keep personnel clear of the load area while the load is being raised or lowered could result in death or serious injury. DO NOT lift, swing, or move a load over anyone or over a forklift cab.

- Review the rated load capacity of each auxiliary attachment before performing any operation.
- Use the correct load chart and NEVER exceed specified weights and load centers.
- DO NOT exceed the manufacturer’s recommended load capacity.
- DO NOT operate the forklift with an unsafe load distribution.
- Adjust the load as necessary, especially for nonstandard loads.
- Use caution when handling loose material that can fall into the cab.
- Remove overhanging load materials, when possible, and watch for sliding material.
- DO NOT reach a load over posts or other objects that can enter the cab, if tipped.
- Avoid sudden stops, starts, or turns.
- Avoid carrying a swinging load. If necessary, secure the load by attaching it to the forklift tie-downs and/or have another person assist with safely steadying the load.

**NOTE:** Store attachments in an appropriate enclosure to prevent corrosion and deterioration due to environmental conditions. Inspect forklift attachments periodically for corrosion.
Warning

DO NOT exceed rated capacities. Any attempt to lift or carry loads in excess of those shown on the load capacity charts could cause forklift tip over, loss of load, or structural damage which could result in death, serious injury, or property damage.

There is boom lift point on the underside of the boom that may be used to lift and carry loads. There is a dedicated boom lift point load chart on the forklift, which should be referenced when using the boom lift point. Refer to the suspended loads section of this manual when handling suspended loads for specific warnings and instructions unique to this type of operation.

Figure 91. Boom Lift Point

Suspended Loads

Avoid carrying a suspended load. If necessary, secure the load by attaching it to the forklift tie-downs and/or have another person assist with safely steadying the load. The handling of suspended loads can introduce dynamic forces drastically affecting the stability of the forklift. Grades and sudden starts, stops, and turns can cause the load to swing and create a hazard if not stabilized. Swinging loads can become unstable, and could cause death, serious injury, or property damage.

1. Do not exceed the load capacity of the forklift (as noted on the load chart).
2. Only lift the load vertically, and never drag it horizontally.
3. Transport the load with the bottom of the load and the boom as low as possible.
4. With the load elevated, move the forklift slowly and cautiously. Only move the forklift to the extent needed to raise, transport, and place the load.
5. Use guy lines to restrain load swing if possible.

Pick Up A Load

1. Use correct load chart to review the rated load capacity of the auxiliary attachment being used. NEVER exceed specified weights and load centers.
2. Approach the load slowly and squarely with the fork tips straight and level.
3. Adjust the spacing of the forks so they engage the pallet or load at its maximum width. NEVER use just one fork to lift a load.
4. Tilt the attachment forward so the forks hang freely on the fork shaft.
5. Insert forks under the load until the load is against the fork frame.
6. Tilt the forks back, and raise the boom slightly to secure the load.

Place A Load

1. Before placing the load, refer to the appropriate load capacity chart to determine safe boom extension range.
2. Set the Parking Brake switch to ON (engaged).
3. Set the Declutch switch to ON.
4. Use the frame sway control to level the forklift. For

Warning

Use of the frame sway control with the boom raised above horizontal could cause tip over resulting in death or injury. Always use the frame sway control to level the forklift BEFORE raising the boom above horizontal. If the forklift cannot be leveled using the frame sway control, do not attempt to raise or place load. Reposition forklift or have the surface leveled.
additional information, refer to the Frame Leveling section in this manual.
5. Align the forks at the level the load is to be placed.
6. Extend the boom slowly until the load is just above the area where it is to be placed.
7. Lower the boom until the pallet rests in position and the forks are free to retract.
8. Retract the forks slowly from under the load.

**Load Shift**

1. If the load shifts, stop the forklift immediately.
2. Lower and adjust the load to center its weight.
3. If the load shift is too great for adjustment, rearrange the load before attempting to move the forklift.

**Elevating Personnel**

Use only a compliant work platform to lift or lower personnel. Never drive the forklift with the work platform in a raised position or with personnel on board, even for a short distance. Doing so could result in death, serious injury, or property damage.

Please refer to ANSI/ITSDF B56.6 for additional design and operating information regarding elevating personnel.

**Design Requirements For A Personnel Platform:**

1. Platform floor must have a slip resistant surface located not more than 8 inches above the normal load supporting surface of the fork.
2. Platform floor dimensions shall not exceed two times the load center distance. This floor dimension is measured parallel to the longitudinal center pane of the forklift.
3. Platform floor width shall not be greater than the overall width of the forklift, measured across the load bearing tires, plus 10 inches on each side.
4. Minimum space requirements for each person on the platform shall not be less than 18 inches in either direction.
5. Minimum 4 inches height toe plate around the perimeter of the platform which may be omitted at the access opening.
6. On the overhead protection device, when requested by the user.
7. Protection must be provided for the personnel in their normal working position on the platform from moving parts of the rough terrain forklift that represent a hazard.
8. Information prominently indicated on the platform;
9. Maximum work load including personnel and equipment.
10. Weight of empty platform.
11. Provide a means so that the platform can only be centered laterally on the forklift and retained against the vertical face of the forks, carriage, or lifting mechanism.
12. Provide a means to securely attach the platform to the lifting mechanism, and to prevent the platform from inadvertent pivoting.
13. Provide restraining means for securing personnel such as an anchorage for attaching the lanyard of a body belt or harness.
14. Provide a guardrail or similar structure with a nominal height to the platform of 42 inches around its upper periphery and include a mid rail. It may be hinged, removable, or of chains, and used if proper positioning is easily discernible. Such restraining means shall be capable of withstanding a concentrated horizontal force of 200 lbs applied at the point of least resistance without permanent deformation. A body belt and lanyard is to have an attachment point provided for freedom of movement, and its length is limited to a free-fall of 5' measured from the point of attachment to the operator. The complete system shall be capable of withstanding three consecutive drop tests to simulate a 250 lbs person free falling 6' without allowing the test weight to fall free to the ground. A deceleration device may be included.
15. Lanyards shall be arranged so as not to cause a tripping hazard.
16. Body belts should have a width of at least 1.75 inches.
17. Structural safety factor - all load supporting structural elements of the work platform shall have a structural safety factor of not less than 2-to-1 based on the minimum yield strength of the material used.

**Capacity Limitations:**

The combined weight in pounds of the platform, load, and personnel shall not exceed 33% of the capacity of the related load center position indicated on the machine load chart.

**Preparation and Set-Up:**

1. DO NOT alter or modify the work platform in any manner that is detrimental to its safe use.
2. Make sure that the work platform is securely attached to the quick attach or forks. Follow the platform manufacturer's instructions.
3. Make sure the platform, carriage, and forks are secured to prevent them from pivoting from side to side.

4. On side tilt or swing carriage, the carriage must be centered and/or leveled horizontally and vertically. The hydraulic system quick disconnects must also be disconnected and the carriage securely fastened to prevent any tilting or side to side swinging motion.

5. Ensure the forklift has a firm footing and is level.

6. Be sure the forklift is in a level position (side to side) before any operation is begun. Use the frame sway to level the forklift. If the forklift cannot be leveled, reposition the forklift.

7. Place the travel select lever in the NEUTRAL position.

8. Engage the parking brake switch. Blocking the wheels is also recommended.

9. Level the platform in both the side-to-side and front-to-back directions before use.

10. Before lifting or lowering personnel, be sure the forklift lifting mechanism operates smoothly through the entire lifting and lowering of the platform and maintains its self-leveling function. The forklift must operate smoothly both empty and loaded.

11. Lift and lower personnel smoothly, with caution, and only at their request.

12. Keep hands and feet clear of controls other than those in use.

13. Be certain that the path of platform travel is clear of hazards, e.g., storage racks, scaffolds, overhead obstructions, and electrical wires.

14. Be sure any lift limiting devices and latches are functioning properly.

15. A trained operator shall be in position to control the forklift. When the operator is not in the operating position, block the wheels and apply the parking brake with all controls in neutral.

16. Alert elevated personnel before moving the platform. Then move the platform smoothly and with caution.

17. Always lower the platform if you must move the forklift for adjustment in positioning.

18. Be certain that personnel and equipment on the platform do not exceed the available space.

19. Any body belt, lanyard, or deceleration devices which has sustained permanent deformation or is otherwise damaged shall be replaced.

20. Use of railings, planks, ladder, etc. on the platform for purpose of achieving additional reach or height is prohibited.

21. Before elevating personnel, the area around and under the work platform should be marked to warn anyone on the ground that overhead work is being done.

22. The platform shall be lowered to ground level for personnel to enter and exit. Personnel shall not climb on any part of the rough terrain forklift in attempting to enter and exit.

23. Protection must be provided for the personnel on the work platform from pinch points or moving parts while in their normal working position on the platform.

24. Provide overhead protection device as required by work site conditions or if requested by the user of the platform.

---

**Load Capacity Charts**

**Warning**

DO NOT exceed rated capacity. Any attempt to lift or carry loads in excess of those shown on the load capacity charts could cause forklift tip over, loss of load, or structural damage which could result in death, serious injury, or property damage.

All load ratings shown on load capacity charts are based on the forklift being on firm, level ground, the forks being evenly positioned on the carriage, the load being centered on the forks, properly sized tires properly inflated and/or foam filled, and the forklift being in good operating condition.

Load capacity charts, located on the left side of the dash panel, are provided to assist the operator in determining how to safely operate the boom to pick up, carry, and set down a load with the forklift, including what angle, how high, and how far to extend the boom.

---

**Figure 92. Load Capacity Chart**
Using Load Capacity Charts

The forklift includes two (2) indicators to assist the operator for accurately using the load capacity charts. These indicators are the Boom Extend Letters and the Boom Angle Indicator.

Boom extend letters are located on the left side of the boom and visible to the operator as the boom is extended. These letters indicate boom extension as it corresponds to the load capacity charts.

NOTE: For example, when letter “A” first appears, the boom extension corresponds to the arc of line “A” throughout all the load capacity charts.

Reading Load Capacity Charts

To accurately read the load capacity charts, you must determine three (3) things:

- Weight of the load being lifted
- Height of structure where load is to be placed
- Distance from front tires where load will be placed

For example:

1. The operator determines load weight and makes sure load does not exceed fork, attachment, or boom capacity.

   The load is 11,000 pounds.

2. The operator safely moves the load to a loading position:
   - places forks under load
   - tilts and raises load safely
   - fully retracts boom
   - drives forklift to position perpendicular to structure
   - levels the forklift
   - lowers the outriggers

3. The operator determines height of structure where load is to be placed.

   The structure height is 30 feet from ground level.

4. The operator determines distance from front tires where load will be placed.

   The distance in front of forklift where load will be placed is 17 feet.

5. Operator reads load capacity chart for attachment carriage to learn it will be safe to place the load at any boom angle with the boom extend letter “E” showing.
Frame Leveling

**Warning**

Use of the frame sway control with the boom raised above horizontal could cause tip over resulting in death or injury. Always use the frame sway control to level the forklift BEFORE raising the boom above horizontal. If the forklift cannot be leveled using the frame sway control, do not attempt to raise or place load. Reposition forklift or have the surface leveled.

The frame sway control handle has variable motions from the center that control frame sway (right and left).

<table>
<thead>
<tr>
<th>Frame Sway Functions</th>
<th>Control Handle Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAME SWAY RIGHT</td>
<td>Move control handle RIGHT.</td>
</tr>
<tr>
<td>FRAME SWAY LEFT</td>
<td>Move control handle LEFT.</td>
</tr>
</tbody>
</table>

Figure 96. Frame Sway Control Handle.

The frame sway control handle controls the frame sway (right and left) functions.

To lock the frame sway, place the travel select lever in NEUTRAL or apply the service or parking brake.

NOTE: Maximum frame sway is 16° overall or 8° each direction, left and right.

A frame level indicator is mounted on the inside upper right corner of the operator’s cab. The frame level indicator allows the operator to view if the forklift has been positioned in a level condition. Always frame sway the forklift right or left until the indicator shows 0° (level).

The reach forklift includes a Frame Sway Override switch. Improper use of the Frame Sway Override switch could cause death, serious injury, or property damage.

The frame sway feature becomes locked and will not operate when the boom is raised 40° or more. Applying service brake, parking brake, and placing travel select lever in NEUTRAL, then pressing the Frame Sway Override switch (the trigger on the Front Control handle) will override the lockout feature and allow frame sway.

Figure 97. Frame Level Indicator.

Figure 98. Frame Sway Override Switch.
Preventive Maintenance

Establishing a Maintenance Program

The hour meter displays elapsed engine operating hours and has a total readout of 9,999.9 hours. Use the hour meter and the schedules contained in this section to establish a comprehensive preventive maintenance program.

Figure 99. Hour Meter

Maintenance Schedule

Every Day or 8 Hours of Operation
See Pre-Operation Inspection Checklist

After First 50 Hours of Operation

- Check condition and tension of drive belts (use tension meter to check belt tension)
- Lubricate front and rear drive shaft grease fittings
- Lubricate outrigger pivot point grease fittings
- Lubricate front and rear axle grease fittings
- Change differential oil
- Change wheel-end oil
- Check wheel lug nuts torqued to 380-420 ft lbs
- Lubricate boom pivot point grease fittings
- Lubricate front and rear axle cylinder pivot point grease fittings
- Lubricate boom roller grease fittings and chains
- Replace hydraulic return line filter
- Replace transmission filter and top off fluid, as required

After Every 50 Hours of Operation

- Lubricate boom pivot point grease fittings
- Lubricate front and rear axle cylinder pivot point grease fittings
- Lubricate outrigger pivot point grease fittings
Preventive Maintenance

**After Every 250 Hours of Operation**

- Comply with 50-Hour Maintenance Requirements
- Change engine oil and filter
- Check air filter (replace if necessary)
- Check tension and condition of drive belts (use tension meter to check belt tension)
- Lubricate front and rear drive shaft grease fittings
- Lubricate front and rear axle grease fittings
- Check differential oil level
- Check wheel-end oil level
- Check boom chain tension (adjust if necessary)
- Inspect boom rollers and slide blocks for condition and tightness
- Lubricate boom roller grease fittings and chains

**After Every 1,000 Hours of Operation**

- Check specific gravity of engine coolant
- Replace transmission fluid and filters
- Replace hydraulic reservoir air breather
- Replace hydraulic return line filter
- Replace hydraulic high-pressure filter

**After Every 500 Hours of Operation**

- Comply with 50-Hour Maintenance Requirements
- Comply with 250-Hour Maintenance Requirements
- Comply with 500-Hour Maintenance Requirements
- Change wheel-end oil
- Change differential oil
- Inspect boom chains

**After Every 2,000 Hours of Operation**

- Comply with 50-Hour Maintenance Requirements
- Comply with 250-Hour Maintenance Requirements
- Comply with 500-Hour Maintenance Requirements
- Comply with 1000-Hour Maintenance Requirements
- Change hydraulic fluid
- Clean or replace hydraulic reservoir strainer

**After Every 4,000 Hours of Operation**

- Drain and flush cooling system
Preventive Maintenance

Boon Emergency Lowering

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 a local Xtreme Authorized Distributor for specific instructions.

Secure the Telehandler and area by following the procedure below until the situation has been properly evaluated.

1. Clear the area around the Telehandler of all personnel.
2. Engage the parking brake switch to the ON position and Place the sift lever in NEUTRAL.
3. Block all four wheels.
4. Section off a large area under the boom with tape to restrict any personnel from entering this potentially dangerous area.
### Do Not Operate - Accident Prevention Tags

Before beginning any maintenance or service, place a Do Not Operate Tag on both the starter key switch and the steering wheel, stating that the forklift should not be operated. Do Not Operate Tags, which can be cut out and used, are included at the end of this manual. Retain these Tags for use at a later date.

### New or Additional Operators

At the time of original purchase, the purchaser of this forklift was instructed by the seller on its proper use. If this forklift is to be used by an employee or is loaned or rented to someone other than the purchaser, make certain that the new operator is trained, in accordance with OSHA regulations, and reads and understands this Operation & Safety Manual before operating the forklift.

In addition, make sure that the new operator has completed a walk-around inspection of the forklift, is familiar with all the labels on the forklift, and has demonstrated the correct use of all controls.

### Lockout/Tagout Procedure

Perform the following procedure to lockout and tag out the forklift. This procedure, requiring a lock, and danger tags are to be used whenever the forklift is unsafe for operation or maintenance.

#### Removing Forklift From Service

1. Attach “DO NOT OPERATE” tags to steering wheel and ignition key.
2. Open battery access cover.
3. Set battery disconnect switch to OFF.
4. Lock battery disconnect switch.
5. Attach “DO NOT OPERATE” tag to battery disconnect switch.

**Warning**

If forklift is unsafe for operation or maintenance, the defect or defects must be clearly documented and posted in a conspicuous place on the forklift. Failure to comply could result in death, serious injury, or property damage.

#### Return Forklift to Service

When the forklift has been repaired and made safe for operation and maintenance, perform the following procedure to return forklift to service.

1. Remove lock and “DO NOT OPERATE” tag from battery disconnect switch.
2. Close battery access cover.
3. Remove “DO NOT OPERATE” tags from steering wheel and ignition key.
Lockout / Tagout

Do Not Operate Tags

Danger
Do Not Operate

Danger
Do Not Operate
Xtreme Manufacturing Product Warranty Policy

1) Xtreme Manufacturing warrants, its authorized sales and service centers (herein referred to as “SSC”), new product(s) the mainframe and chassis weldments shall be free from defect in material and workmanship for the period of 10 years or 10,000 hours whichever comes first. The boom weldment and boom rollers shall be free from defects in material and workmanship for the period of 5 years or 5,000 hours whichever comes first. The powertrain assemblies consisting of engine, transmission and drive axles and all other components not listed above shall be free from defects in material and workmanship for the period of 2 year or 2,000 hours after date of delivery. This warranty is made to the original owner of the new product(s) and is transferable for the duration of the coverage period, to the subsequent owner with prior written approval from Xtreme Manufacturing (see limitations).

2) Machines may be held in an authorized Distributor/SSC’s stock for a maximum period of six (6) months from the date of shipment from Xtreme, before the warranty period is automatically initiated on each machine.

3) It is the responsibility of the Distributor/SSC to complete and return to Xtreme Manufacturing a Pre-delivery Inspection Record, Warranty Registration Form, before the act of rental / loan / demonstration of the machine or delivery to an end user. In the case of direct sale to end customers the same responsibility lies with the end customer.

4) Any end customer, SSC, distributor or dealer shall not be entitled to the benefits of this warranty and Xtreme Manufacturing shall have no obligations hereunder unless the “Pre-Delivery and Inspection Record” has been properly completed and returned to the Xtreme Manufacturing Warranty department within fifteen (15) days after delivery of the Xtreme Manufacturing product to the Customer or Dealer’s demonstration/rental fleet. Xtreme Manufacturing must be notified, in writing, within ten (10) days, of any machine sold to a Customer from a Dealer/SSC’s rental fleet during the warranty period.

5) Any part or parts which upon examination by the Xtreme Product Support Department are found to be defective within the specified warranty period, will be replaced or repaired at the sole discretion of Xtreme Manufacturing, through its local Authorized Distributor/SSC, at no charge. Any parts replaced under warranty must be original Xtreme parts obtained through an authorized Xtreme Manufacturing Distributor/SSC unless expressly agreed otherwise in writing and in advance by Xtreme Manufacturing’s warranty department.
Xtreme Manufacturing Product Warranty Policy

6) All parts claimed under warranty must be held available for return and inspection upon request for a period of 90 days from date of claim submission. It is necessary that all parts are individually tagged or marked with their part number and the warranty claim number. All parts returning should be still in a factory state, free of any alteration to the original design. If the parts are subject to repair, it will need to be pre authorized by the Xtreme Product Support Group and or Warranty Department prior to the repair being completed. After 90 days all parts replaced under warranty which have not been returned, to Xtreme Manufacturing should be destroyed. Failure to produce parts requested by the Warranty Administrator for inspection within a period of 14 days will result in the claim being automatically rejected in full. Materials returned for warranty inspection must have the following procedure:

- Carefully packaged to prevent additional damage during shipping
- Drained of all contents and all open ports capped or plugged
- Shipped in a container tagged or marked with the RMA number
- Shipped PREPAID (ground service only). Any item(s) returned for warranty by any other means may be refused and returned, unless prior approval is agreed with Xtreme.

7) At the direction of the Xtreme Manufacturing Warranty department, any component part(s) of Xtreme Manufacturing products to be replaced or repaired under this warranty program must be returned freight prepaid for inspection. An RMA (Returns material authorization) must be requested from Xtreme Manufacturing Warranty department, a copy to be placed with the returning component part(s).

8) All warranty replacement parts will be shipped freight prepaid (standard charges, ground shipping only) from the Xtreme Manufacturing Parts department, Service Department or from the Vendor to Dealer/SSC or Customer. Any other shipping method is the customer responsibility.

9) All warranty claims are subject to approval by Xtreme Manufacturing Service department. Xtreme Manufacturing reserves the right to limit or adjust claims with regard to defective parts, labor or travel time based on usual and customary guidelines.

10) Reimbursement policy, labor will be paid at 75% of posted hourly shop rate. Travel time will be paid at $50 per hour up to a maximum of 3 hours. Xtreme Manufacturing will pay 1 hour of troubleshooting time per warranty claim, unless expressly agreed otherwise in writing and in advance by Xtreme’s Warranty Department. An annual rate declaration must be supplied to the Xtreme Warranty administrator by January 31st and will be used as the reimbursable rate for that calendar year.
Xtreme Manufacturing Product Warranty Policy

REPLACEMENT PARTS WARRANTY

1. Any part replaced under this limited warranty is not subject to further warranty cover beyond the normal warranty period of the machine upon which the part was installed.
2. Any replacement parts sold (not delivered under a warranty claim) will be subject to a warranty period of (6) six months from the date of invoice.
3. Parts held by an authorized Distributor/SSCare covered under warranty for a period of (12) twelve months from the date of invoice, provided that those parts have been subject to appropriate storage to prevent damage and deterioration (conditional on Xtreme Manufacturing review).

CLAIM PROCEDURE

The Xtreme Manufacturing Warranty department must be notified within forty-eight hours (48) of any possible warranty situation during the applicable warranty period. Personnel performing major warranty repair or parts replacement must obtain specific approval by the Xtreme Manufacturing Warranty department prior to performing the warranty repair or replacement.

When a Distributor/SSC / Customer perceive a warranty issue to exist the following steps must be adhered to:

- Customer/SSC / Distributor to place a purchase order for genuine Xtreme Manufacturing replacement parts.
- Xtreme Manufacturing to dispatch parts via the requested method (in line with the required response time).
- Confirmation that a qualified technician is available to replace the part and that this person has been accepted by Xtreme Manufacturing to carry out such work under the warranty of the machine. Failure to do this may nullify the warranty.
- Customer / SSC / Distributor to allocate a warranty claim number to the repair.
- All correspondence in respect of the claim to be on an official Xtreme Manufacturing warranty claim form as supplied by Xtreme Manufacturing’s warranty department.
- All warranty claims must be submitted within 30 days of the date of the machine repair.

FREIGHT DAMAGE

- If a machine is received in a damaged condition, then the damage must be noted on the bill of lading and/or delivery documents and photographs must be taken at the point of delivery, prior to signing acceptance of the consignment.
- The freight company and Xtreme Manufacturing must be contacted by the Distributor and a damage claim registered by either party immediately.
• The above requirements apply only to freight damage associated with equipment supplied by Xtreme Manufacturing transport. Customer freight issues are excluded from this warranty policy.

THIS PRODUCT WARRANTY POLICY SPECIFICALLY EXCLUDES:

1. Engines, motors, tires and batteries are manufactured by specialist suppliers to Xtreme Manufacturing, who furnish their own warranty policies. Xtreme Manufacturing will, however, to the extent permitted pass through any such warranty protection to the Distributor/SSC/Customer.

2. Xtreme Manufacturing products which have been modified or altered outside Xtreme Manufacturing factories without written approval, if such modification or alteration, in the sole judgment of Xtreme Manufacturing Engineering and/or Service Departments, adversely affects the stability, reliability or service life of the Xtreme Manufacturing product or any component thereof.

3. Any Xtreme Manufacturing product which has been subject to misuse and abuse, improper maintenance or accident. “Misuse” includes but is not limited to operation beyond the factory-rated load capacity and speeds. “Improper maintenance” includes but is not limited to failure to follow the recommendations contained in the Xtreme Manufacturing Operation, Maintenance, and repair Parts Manuals.

4. Normal wear of any Xtreme Manufacturing component/part(s). Normal wear of component parts may vary with the type, application or type of environment in which the machine may be used; such as, but not limited to sandblasting applications.

5. Routine maintenance, routine maintenance items and minor adjustments are not covered by this warranty, including but not limited to hydraulic fluid, filters and lubrication, paint and decals engine tune-up, brake adjustments etc. Xtreme Manufacturing will not cover leaks from fittings, hoses and any other connection points after the unit has been in service for 90 days or 150 hours of operation which ever comes first.

6. Any Xtreme Manufacturing product that has come into direct contact with any chemical or abrasive material.

7. Incidental or consequential expenses, losses, or damages related to any part or equipment failure, including but not limited to freight cost to transport the machine to a repair facility, downtime of the machine, lost time for workers, lost orders, lost rental revenue, lost profits, expenses or increased cost. This warranty is expressly in lieu of all other warranties, representations or liabilities of Xtreme Manufacturing, either expressed or implied, unless otherwise amended in writing by Xtreme Manufacturing.

8. Xtreme Manufacturing warranty policy does not cover any duties, taxes, environmental fees including without limitation, disposal or handling of tires, batteries and petrochemical items.

9. Items specifically excluded are: fuel injectors, motor brushes, glow plugs, contactor tips and springs, filters, lamp bulbs, lamp lenses, coolants, lubricants, brake pads and cleaning materials.

10. Failure of replacement parts due to fault misdiagnosis or incorrect fitting by the
Xtreme Manufacturing Product Warranty Policy

Distributor/SSC/ Customer.

XTREME MANUFACTURING MAKES NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THIS LIMITED WARRANTY. XTREME MANUFACTURING MAKES NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND DISCLAIMS ALL LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO INJURY TO PERSONS OR PROPERTY.

Wherever possible the end customer shall obtain all warranty support & make all warranty claims through the local Xtreme Manufacturing authorized Distributor/SSC/ Dealer. Warranty support should be from the Distributor/SSC/ Dealer from whom the Xtreme Manufacturing product was purchased. Where Xtreme Manufacturing equipment is supplied directly from the factory, the end customer, if unable to contact a Distributor/SSC/ Dealer, may contact the Xtreme Manufacturing Warranty Department for further assistance.

APPEAL
The buyer may appeal in writing against a rejected or adjusted claim to Xtreme Manufacturing warranty department within a period of 21 days of receiving the rejection or adjustment notice. The appeal should be grounded on express reasons and supported by relevant evidence. Appeals received outside of this time limit will not be considered.
# Xtreme Manufacturing Product Warranty Policy

## XTREME MANUFACTURING WARRANTY SCHEDULE

### Limited Warranty Periods

<table>
<thead>
<tr>
<th>Item</th>
<th>Warranty Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Frame and Chassis</td>
<td>10 years or 10,000 hours, parts replacement or repair</td>
</tr>
<tr>
<td>Boom weldment and rollers</td>
<td>5 years or 5,000 hours, parts replacement or repair</td>
</tr>
<tr>
<td>Powertrain and all other components not listed above</td>
<td>2 years or 2,000 hours, parts replacement or repair</td>
</tr>
<tr>
<td>Parts held in a Distributor’s stock</td>
<td>12 months from date of invoice, subject to adequate storage / protection.</td>
</tr>
<tr>
<td>Parts sold (non warranty)</td>
<td>6 months from date of invoice</td>
</tr>
<tr>
<td>Batteries supplied on new machines</td>
<td>6 months from warranty registration date</td>
</tr>
<tr>
<td>Other specifically excluded parts:</td>
<td>Not covered by Warranty</td>
</tr>
<tr>
<td>Fuel injectors</td>
<td></td>
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<tr>
<td>Brake pads</td>
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<td>Glow plugs</td>
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<td>Springs</td>
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<td>Oils</td>
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<td>Filters</td>
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<td>Lamp bulbs</td>
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<td>Lamp lenses</td>
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<tr>
<td>Coolants</td>
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<tr>
<td>Lubricants</td>
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</tr>
<tr>
<td>Cleaning materials</td>
<td></td>
</tr>
<tr>
<td>All consumable / wear parts.</td>
<td></td>
</tr>
</tbody>
</table>

Xtreme Warranty Statement  
Effective: 1/1/2017
Pre-delivery Inspection Report must be completed upon placing unit in service. Please use QR link or visit www.xmfg.com/warranty/pre-delivery-inspection-report to register online.