

NEED HELP ?

If you have a question on the operation of this unit...

Or

If you have a problem on this or any other Princeton product...

Contact your local dealer.

A comprehensive dealer listing is available at www.piggy-back.com

Or call

Princeton Delivery Systems

1-800-331-5851

OPERATOR'S MANUAL



PIGGY BACK[®] PB50/PB65

You must read and understand this manual before operating the forklift.

Keep this manual with the forklift.



PRINCETON PIGGY BACK OPERATOR'S MANUAL

TRUCK DATA

Model No. _____

Serial No. _____

Weight (empty) _____

Rated Capacity _____

Gross Weight (loaded with Rated Load) _____

CALIFORNIA

PROPOSITION 65 WARNING

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

CALIFORNIA

PROPOSITION 65 WARNING

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer, birth defects, and other reproductive harm.

Wash hands after handling.

Notice: The information in this manual was in effect at the time of printing. Princeton Delivery Systems reserves the right to make improvements and changes in specifications or designs without incurring obligation. Please check with your Princeton dealer for possible updates or revisions.

11 Seat Belt Safety Supplement

Maintenance Guidelines

Seat Belts for Fork Lift Trucks

WARNINGS

- Failure to properly inspect & maintain seat belt can cause serious injury or loss of life.
- It is critical that any time a fork lift truck is involved in an accident, the entire seat belt system must be replaced in the machine.
- The seat belt in a fork lift truck application should be considered to have a finite life and must be replaced as needed throughout the life of the machine. Belt must be inspected for needed maintenance at least once a year or more often if exposed to severe environmental or vocational conditions.
- If replacement of any part of the seat belt is indicated through maintenance guidelines below, the entire belt must be replaced, both retractor and buckle side.

IMPORTANT

Follow Maintenance Guidelines 1-5 to properly inspect seat belt and letters to determine if replacement is necessary.

MAINTENANCE GUIDELINES

The following maintenance guidelines detail how to inspect seat belt for "cuts, fraying, extreme or unusual wear of the webbing, etc., and damage to the buckle, retractor, hardware, or other factors" which indicate that belt replacement is necessary.



1 Web cut or frayed or extremely worn at latch area.

2 Buckle casing broken.

- 1 Check the web wear at the buckle/latch area. The webbing must be closely examined to determine if there are any cuts, fraying or extreme wear in the webbing. Cuts, fraying, or excessive wear would indicate the need for replacement of the seat belt system.
- 2 Check buckle and latch for proper operation and to determine if latch plate is worn, deformed, or buckle is damaged or casing broken.
- 3 The retractor web storage device, is mounted on the seat. The retractor is the heart of the occupant restraint system and can be damaged if abused, even unintentionally. Check retractor web storage device operation to ensure that it locks properly and that it spools out and retracts webbing properly.
- 4 Hardware for seat belt mounting points should be evaluated for corrosion. All attachment points of system should be checked for tightness of bolts and nuts.
- 5 Check web in areas exposed to ultraviolet rays from the sun or excessive dust or dirt. If the original color of the web in these areas is extremely faded, the physical strength of the web may have deteriorated. If this condition exists replace the system.

IMPORTANT FACTS ABOUT SEAT BELTS IN FORK LIFT TRUCKS

The potential exposure of this seat belt to severe environmental conditions in a fork lift truck make it crucial to inspect the seat belt system regularly. It is recommended that the seat belt system in a fork lift truck be inspected at least once a year or more often if the vehicle is exposed to severe environmental or vocational conditions. Any seat belt system that shows cuts, fraying, extreme or unusual wear, significant discolorations due to UV exposure, dusty-dirty conditions, abrasion to the seat belt webbing, or damage to the buckle, latch plate, retractor, hardware or any other obvious problem should be replaced immediately.

Once replacement of the seat belt has been determined, be certain that it is only replaced with the original equipment manufacturer recommended replacement seat belt. See your authorized parts and service center for replacement. Your restraint system has been developed and tested specifically for your fork lift truck.

If the inspection indicates that any part of the seat belt requires replacement, the entire belt must be replaced. It is vitally important that all components be mounted back in the same position as the original components which were removed. This will maintain the design integrity of the mounting points for the seat belt assembly.

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10 Specifications

KUBOTA ENGINE: (See Kubota engine manual)

CAUTION: Do not use ether or starting fluid. Severe non-warrantable engine damage will occur.

FUEL: Diesel fuel must not be mixed with gasoline, kerosene, or alcohol.

*Above 32 Degrees. #2D should be used.

*Below 32 Degrees. either #1D or a mix of #1D and #2D may be used.

ENGINE OIL: Use only CC/CD/CE rating API index oil in your diesel engine.

*CF is the highest rating and is highly recommended.

*Change the engine oil type according to the ambient temperature.

above 77 F. (25 C.)	SAE30	or	SAE10W30 SAE10W40
32 F. (0 C.) to 77 F. (25 C.)	SAE20	or	SAE10W30 SAE10W40
below 32 F. (0 C.)	SAE10	or	SAE10W30 SAE10W40

COLD WEATHER START: When the ambient temperature is below 50 F (10 C), pre-heating is needed. The Kubota engine is equipped with quick glow plugs. Automatic preheating is made for about 6 to 10 seconds when starter switch key is turned to preheating position.

Start: Your unit is equipped with an (externally switched) Syncro-Start Solenoid (Model 1753ES/1751ES).

Caution: Multiple start attempts and excessive engine cranking could cause damage to the solenoid. Therefore, it is our recommendation that engine cranking (pull-in coil energized) be limited to three (3) 30 second attempts with a cool down period 120 seconds (two minutes) between each cranking attempt. After three (3) cranking attempts, the solenoid must be allowed to cool down to ambient temperatures before making further cranking attempts.

Your PIGGY BACK Delivery System was bought knowing it will give long and useful service. To get the value built into it a small amount of time and expense is needed to learn safe, productive operation, and to do regular inspections and service.

This manual will tell you how to safely operate, inspect, and maintain your PIGGY BACK forklift. Keep it with the forklift as a ready reference.

As with the use of all heavy machinery, failure to carefully follow these instructions and use common sense may result in serious injury.

If you have questions about operating, maintaining, or obtaining parts for your forklift; contact your Princeton dealer. They are always glad to help.

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To Forklift Owners

ASME B56.1 and B56.6 are the standards for forklift operation, rules and safety, maintenance, safe operation, training and supervision. You should read this manual and make it available to your operators and their supervisors. You can get it from the American Society of Mechanical Engineers, 345 East 47th Street, United Engineering Center, New York, NY 10017.

ASME B56.1 and B56.6 are a key part of forklift safety. However, making forklift operation safe involves other areas and responsibilities. The forklift owner is responsible to ensure their operators have adequate training in operating the forklift. This training includes, but should not be limited to, classroom and hands-on training. Forklift safety involves the forklift itself, the environment it works in, and the people who come in contact with it. Consider your entire operation when addressing forklift safety.

The operator's manual is not a training manual. It is a guide to help trained and authorized operators safely operate their forklift by showing the proper procedures. This manual combined with adequate operator training will help reduce situations that may cause an accident.

Operators must be trained and qualified to operate a forklift before actually operating one.

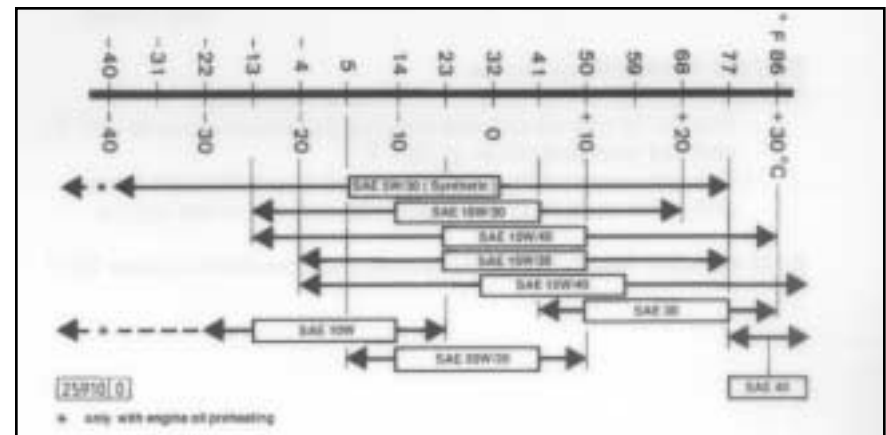
Forklift training and operator awareness of the forklift work area will help ensure a safe workplace for all your employees.

ENGINE OIL: Lube oils are differentiated according to their efficiency and quality grade. Commonly used are the API Specifications.

Approved Oils:

Non-turbocharged Engines	API-Specific
CC/SE	CC/SF
CD/SE	CD/SF

VISCOSITY: Because the viscosity of the lube oil is greatly influenced by the temperature, the choice of SAE-grade should be governed by the ambient temperature at the engine site. Optimum operating behavior will be attained if you use the chart below.



COLD WEATHER START: The Deutz engine is equipped with a cold weather starting aid called “Glow Plugs”. When the temperature is below 40 F, you should use the pre-heat option. To pre-heat the engine, turn the key to the “on” position until the pre-heat light goes out. Then turn the key to the “start” position “the right”. If the engine does not start, wait 1 minute before pre-heating the engine again.

IMPORTANT: DO NOT OVERCRANK THE ENGINE

10 Specifications

To Forklift Operators

DEUTZ ENGINE: See Deutz engine manual)

CAUTION: Do not use ether or starting fluid. Severe non-warrantable engine damage will occur.

FUEL: Always use branded grades of diesel fuel having a sulfur content of below 0.5%. In the case of higher sulfur content, the periods between oil changes must be shortened.

The following fuel specifications are approved:

DIN 51 601

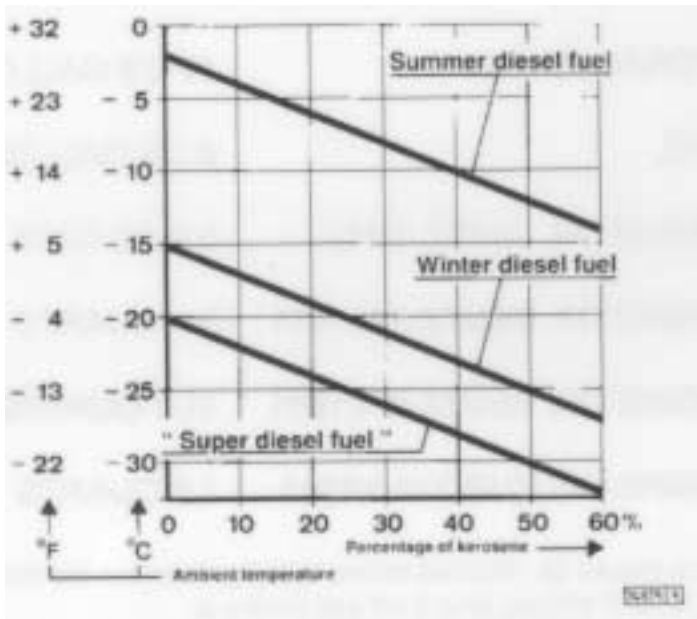
NATO Codes F54, F75 and F76

BS 2869: A1 and A2 (in case of A2, note sulfur content)

ASTM D 975-81 : 1-D and 2-D

VV-F-800a: DF-A, DF-1 and DF-2

WINTER-GRADE FUEL: At temperatures as low as -15 C (+5 F) to -20 C (-4 F), kerosene should be mixed with the diesel fuel. The necessary percentages for admixing are seen in the diagram below.



Operators must become familiar with all forklift controls, procedures, and work areas. Understand what this forklift can do and its limits. Understand and practice all safety rules.

Before driving a forklift, the user must inspect it completely to insure safe operation. This is a requirement of OSHA, ANSI, and ASME.

The operator is also responsible for understanding the environment the forklift is being operated in. Knowing how to operate the forklift within their working environment is very important to overall forklift safety.

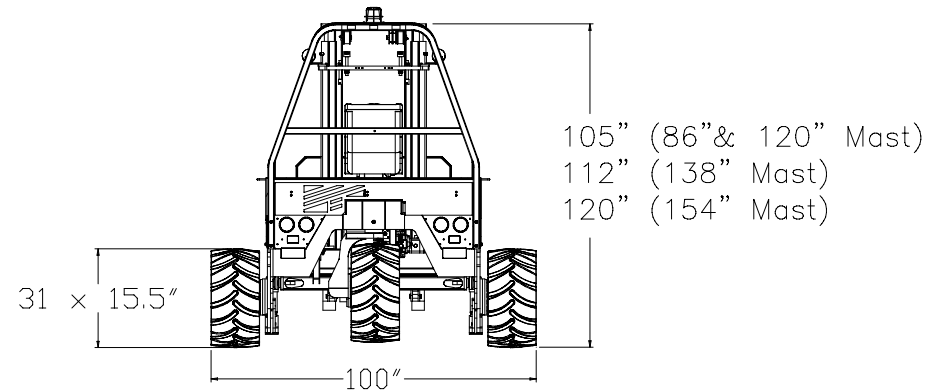
Operate your forklift safely; careful driving is your responsibility. Know your forklift's capabilities and limits. Follow all instructions in this manual.

How To Use This Manual

The illustrations and explanations in this manual will help you improve your skill and knowledge as a professional forklift operator while taking full advantage of the capabilities and safety features of your forklift.

The manual is designed to be easy to read and find information in. The sections are numbered. The page numbers are on the bottom leading edge of each page. The Table of Contents lists the sections and their beginning page number.

This manual is meant to be permanently attached to your forklift as a reference. If the manual gets lost or damaged call your Princeton dealer, they are waiting to help.

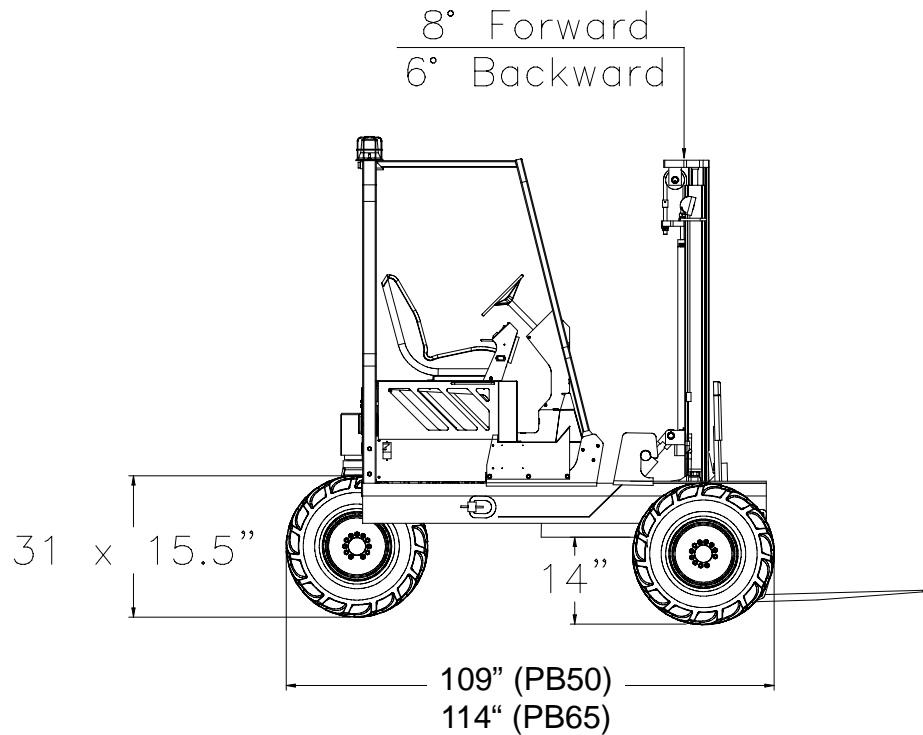


SPECIFICATIONS-FLUID CAPACITIES:

(All measurements listed below are completely empty/dry.)

HYDRAULIC OIL	17 US GALLONS
FUEL	8 US GALLONS
ENGINE OIL- DEUTZ 3FL1011	6.4 QUARTS
ENGINE OIL- DEUTZ 4FL1011	11.0 QUARTS
ENGINE OIL- KUBOTA 2003T	7.5 QUARTS

Fluids should be checked before starting, then run the PIGGY BACK for 1 minute, shut engine off and re-check.



Know these safety signal words and remember their meaning.

CAUTION

Is a reminder of safety practices, that if not followed, may lead to personal injury.

WARNING

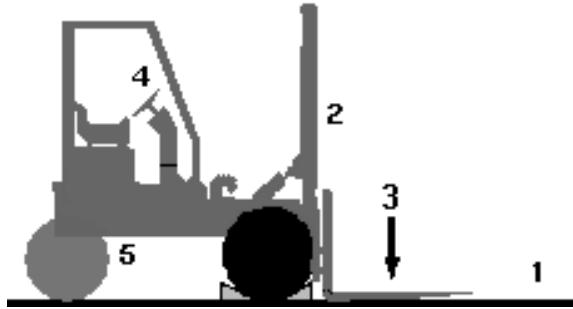
Is used when a hazard exists which can result in injury or death if proper precautions are not taken.

DANGER

Is used when extreme hazard exists which will result in death or serious injury if proper precautions are not taken.

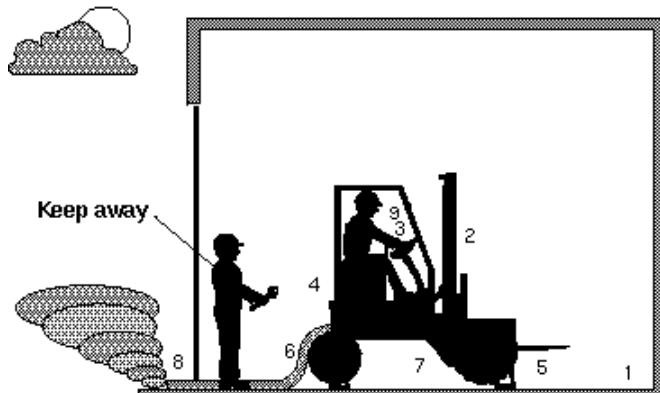
Service Position--Engine Off

1. Park forklift on flat level surface.
2. Tilt mast to vertical position.
3. Lower forks to floor.
4. Shut engine off.
5. Chock drive wheels.



Service Position--Engine Running

1. Park forklift on flat level surface.
2. Tilt mast to vertical position.
3. Set parking brake.
4. Shut engine off.
5. Chock drive wheels.
6. Raise rear of vehicle and block -- see jacking and blocking section.
7. Raise front of vehicle and block -- see jacking and blocking section.
8. Connect hose to exhaust -- **do not run engine in closed area without venting.**
9. Operator must remain in seat while engine is running.



9 Lubrication

LUBRICANT KEY

- (1) Lithium base multipurpose grease
- (2) Air filter P/N 505-141, 505-142
- (3) Hydraulic Fluid, Texaco Rando HD46 (or equal).
- (4) See engine manual
- (5) Hydraulic Filter P/N 207-104
- (6) Engine Oil Filter-see engine parts manual
- (7) SAE 10W30
- (8) Fuel Filter P/N 504-598
- (9) Motor Oil 30W-40W or chain lube

RECOMMENDED LUBRICATION

- (A) 8-10 hours or daily
- (B) 25-50 hours or monthly
- (C) 150 hours or every 6 months

IMPORTANT INFORMATION ON THE FILTRATION OF YOUR PB SERIES

Your PB Series unit is equipped with a “suction boost” filter. This filter provides superior protection to the drive circuit. It is equipped with a dash mounted notification light that indicates if the filter needs changed. **This light is additional information for the operator and is not a substitute for filter changes during PM’s.**

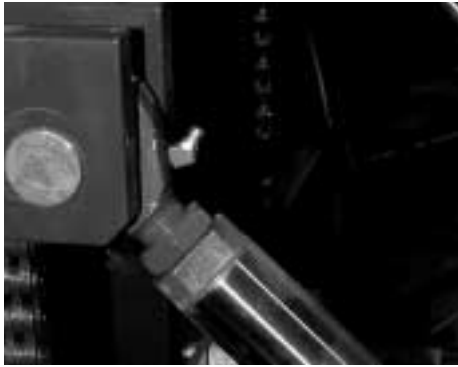
This light will normally illuminate* under three circumstances.

- 1) During cold weather operation, the light may illuminate until the hydraulic oil warms. This generally takes 1 to 3 minutes of operation.
- 2) During high-speed multi-function operation, the light may illuminate temporarily.
- 3) If the light remains on at any other time the filter should be changed.

*An illuminated light does not mean the filter is by-passing but indicates contaminates in the hydraulic system.

A “break-in” filter change is recommended in the first 5-10 hours of operation.

9 Lubrication



Grease Fitting, top of tilt cylinder-1, B



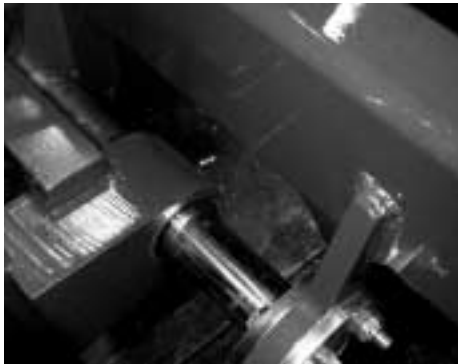
Grease Fitting, bottom of tilt cylinder-1, B



Mast Chains-9, B



Grease Fitting, Side Shift Cylinder-1, B



Side Shift Blocks-1, B



Side Shift Blocks-1, B

Jacking and Blocking

⚠ WARNING

Avoid the risk of injury or death. Use jack stands when working on raised truck.

Front Jacking

With forklift in **Service Position Engine Off:**

1. Use a hydraulic jack of 5 ton capacity minimum.
2. Position front jacks under stabilizer feet.
3. Position jack stands under carriage.
4. Slowly lower forklift onto stands.

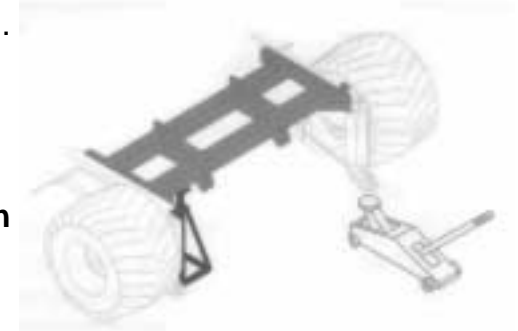
Rear Jacking

With forklift in **Service Position Engine Off:**

1. Use a hydraulic jack of 5 ton capacity minimum.
2. Position jack under frame at rear.
3. Position jack stand under frame.
4. Slowly lower forklift onto stands.

⚠ WARNING

Avoid hydraulic line damage. Do not jack or block forklift frame near hydraulic lines.



1 General Safety Practices

DO

- *Safeguard pedestrians at all times.
- *Be sure everyone is clear of rear swing area.
- *Use caution around pedestrian doorways, where they may step into path of travel.
- *Operate forklift safely.

DO NOT

- *Start or operate unless you are in the driver position.
- *Put any part of body into mast, or between mast and forklift.
- *Put body within reach of mechanism or attachments.
- *Drive forklift with anyone standing in front.
- *Allow anyone to stand or walk under elevated part of forklift.
- *Permit passengers.
- *Hit overhead installations such as lights, wiring , pipes, sprinklers, etc...
- *Leave forklift unattended.

CHANGES TO THE FORKLIFT

- *Affecting capacity or operation, must have manufacturer's prior written approval.
- *Involving rebuild, replacement parts, and repair must meet the manufacturer's set criteria and guidelines.

INSPECTION

- *Daily or each shift.

STOPPING DISTANCE

- *Operator must always have enough room to safely stop the forklift in any given situation.

STABILITY changed by:

- *Operator judgement.
- *Improper operation.
- *Faulty maintenance.
- *Grade.
- *Ground and floor conditions.
- *Fast turns.
- *Cutting corners.

9 Lubrication



Hyd. Return Filter-5, C (Left)
Fuel Filter-8, C (Right)



Engine Oil-Check A



Tire Pressure-Check A



Hydraulic Oil- Check A
Diesel Fuel-Check A



Chain Sheave-1, B



Air Cleaner-2, C

8 Inspection

*Mast

Push lift control away from you, forks should move down. As the control is pushed more, the forks should move faster. Report any sticking or jerking.
Pull lift control toward you, forks should move up. As the control is pulled more, the forks should move faster. Report any sticking or jerking.

Push tilt control away from you, mast should tilt forward. As the control is pushed more, the mast should tilt faster. Report any sticking or jerking.
Pull tilt control toward you, mast should tilt backward. As the control is pulled more, the mast should tilt faster. Report any sticking or jerking.

Push carriage control away from you, mast should move forward. As the control is pushed more, the mast should move faster. Report any sticking or jerking.
Pull carriage control toward you, mast should move backward. As the control is pulled more, the mast should move faster. Report any sticking or jerking.

Push side shifter control away from you, mast should move left. As the control is pushed more, the mast should move faster. Report any sticking or jerking.
Pull side shifter control toward you, mast should move right. As the control is pulled more, the mast should move faster. Report any sticking or jerking.

Push stabilizer control away from you, stabilizer should move down. As the control is pushed more, the stabilizer should move faster. Report any sticking or jerking.
Pull stabilizer control toward you, stabilizers should retract. As the control is pulled more, the stabilizers should move faster. Report any sticking or jerking.

If forklift is unsafe or in need of repair, do not use it until it is returned to a safe operating condition.

During use, if forklift becomes unsafe in any way, stop using. Do not use it until it is returned to a safe operating condition.

Do not make repairs or adjustments, unless you are authorized to do so.

DOUBLE REACH (Optional)

- 1) Ensure the cylinder operates smoothly and that it slows at the end of extension and retraction.
- 2) Inspect the cylinder and hoses for leaks and wear.
- 3) Inspect the bearings for breakage and that they turn freely.

1 General Safety Rules

LOAD BACKREST

*If the load causes hazard, equip forklift with a vertical load backrest extension.

FUEL

*Fuel handling and storage must be done following ANSI/NFPA 505 and ANSI/NFPA 30.

HAZARDOUS CONDITIONS

*Operating in hazardous conditions is the responsibility of the user.

AISLES AND OBSTRUCTIONS

*Path of operation and ramps must be marked and clearly visible.

LIGHTS

*Where needed, forklift must have lights.

ENGINE EXHAUST

*Forklift must be used in a well ventilated area.

SOUND

*Consideration should be given to the sound exposure of personnel in the work area.

DROP OFFS

*Keep safe distance from the edge of ramps and platforms.

TRAILER CREEP

*When driving on and off trucks or trailers apply trailer brakes and chock the wheels.
*Do not mount or dismount the forklift from a semi-trailer which is not coupled to a tractor.
*Forklifts mounted to uncoupled semi-trailers may need supports to prevent upending.

LIFTING PEOPLE

*Do not use this forklift to lift people; it is not designed for it.
*Equipment specifically designed to raise people is available.

OPERATING ENVIRONMENT

*Avoid areas near excavations and embankments.
*Watch out for low electric lines, tree branches, and other obstacles.

SEAT BELT

*Always wear the provided seat belt when operating the forklift.

2 Operators Safety Rules and Practices

OPERATORS RESPONSIBILITY

- *Safe operation is the responsibility of the operator.
- *Read and understand operator's manual.
- *Know all functions of controls and instruments.
- *Be alert to other personnel and hazardous conditions.
- *Be alert to unusual or special operating conditions and safety precautions.
- *In hazardous areas, use only forklifts approved for those areas.
- *Always wear the provided seat belt when operating forklift.

OPERATORS MUST BE TRAINED AND UNDERSTAND

- *Equipment operation.
- *Control locations and functions, and what problems will occur when handled improperly.
- *Traveling.
- *Loading.
- *Mechanical limits.
- *Center of gravity.
- *Stability.
- *Operating conditions.
- *Nameplate information.
- *Warning signs.

TRAVELING

- *Obey all traffic rules and speed limits.
- *Keep to the right.
- *Always keep your forklift under control and stay a safe distance, based on speed, from other vehicles.
- *Operate at speed that allows stopping in a safe manner.
- *Yield to pedestrians and emergency vehicles.
- *Be alert to blind spots, and other locations where vision is not clear.
- *Be sure you have a clear view of your path of travel.
- *When load obstructs view of forward travel, travel backward.
- *Cross railroad tracks at an angle, do not park closer than 6 ft.
- *Go up and down grades slowly and carefully, tilt forks back.
- *Avoid turning on grades, ramps or inclines.
- *Stopping distances going down grades will be longer.
- *Slow down and allow enough room at the bottom of grades to stop.
- *Travel with forks raised, only far enough to clear road surface, and tilted back.

8 Inspection

*Fuel

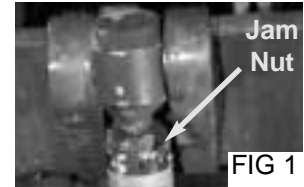
Do not use open flame to check fuel level. When refueling, stop engine. Replace fuel cap before starting engine. If spillage happens, be sure it has all been absorbed or evaporated before starting engine.

*Engine oil

Check and fill, following manufacturers instruction.

*Hydraulic oil

Check and fill, if needed, with recommended hydraulic oil.



*Lights

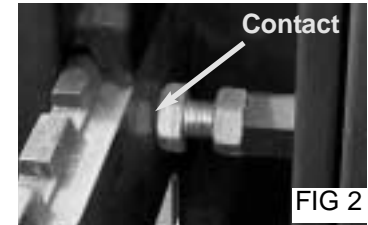
If forklift has lights, they must be in good condition and work.

*Mast chains

Check mast chains for damage or missing parts.

*Brakes

When the engine is off the brakes will engage.



DOUBLE REACH (Optional)

- 1) Ensure the scissor cylinder lock nut is tight. (FIG 1)
- 2) Ensure the stop bolts are properly contacting the ITA board. (FIG 2)
- 3) Inspect the scissor assembly for structural cracking.

INSPECTION WITH ENGINE RUNNING

Do this inspection in a large, open area (away from people, walls, ceilings, and other equipment).

*Travel

Bring forklift to a complete stop before changing direction.

*Neutral position

When motion pedal is in neutral, drive wheels will not turn.

*Travel control

Push motion pedal away from you. The forklift should move forward. As the pedal is pushed more, the the forklift should move faster.

Pull motion pedal toward you. The forklift should move backward. As the pedal is pulled more, the the forklift should move faster.

8 Inspection

INSPECTION WITH ENGINE OFF

Do this inspection with the forklift in a safe parked position.

*Warning and safety devices

Push horn button, horn must sound loud and clear. If forklift has other warning devices (flashing lights, etc.), they must work.

*Frame

Look at the condition of the frame. Report cracked or broken frame members.

*Tires

Check tire pressure. Tires must be inflated to recommended pressure. Inspect wheel fasteners. All fasteners must be in place and tight. Look at the condition of the wheels and tires. Report worn, cracked or leaking tires.

*Lift control

Must work freely and return to neutral when released.

*Side shift control

Must work freely and return to neutral when released.

*Carriage control

Must work freely and return to neutral when released.

*Stabilizer control

Must work freely and return to neutral when released.

*Tilt control

Must work freely and return to neutral when released.

*Steering wheel

Must be in good condition and work freely.

*Forks

Must be in good condition and in good alignment. Report any cracks or breaks.

*Fuel system

Inspect fuel lines and fittings for leaks. Do not use open flame to inspect fuel system.

2 Operators Safety Rules and Practices

TRAVELING (cont.)

*Starts, stops, turns and directional changes must be made smoothly to prevent load shift and overturn.

*No horse play or stunt driving.

LOAD HANDLING

*Only handle loads that are stable, safely arranged, and within forklift capacity.

*Fork length must be within 2/3rds of load length.

*Tilt back only enough to stabilize load.

*Be careful when tilting stacked or high loads.

*Do not tilt forward when elevated except to deposit load.

BEFORE LEAVING OPERATOR'S POSITION

*Bring forklift to a complete stop.

*Do not block the way of fire equipment, fire aisles, or stairways.

*Be sure directional controls are in neutral.

*Full lower forks.

*Set parking brake.

*Turn ignition off and remove key.

ACCIDENTS

*Report all accidents , including personnel, equipment, or building structures.

SLOPES

*Use caution when driving on slopes. Avoid turning on slopes, if possible, and use extreme caution on grades, ramps or inclines; normally travel straight up and down.

*Elevation of load should also be avoided on sloped surfaces.

3 Forklift Description



REAR DOLLY



**HYDRAULIC FILTER
FUEL FILTER**



STABILIZER PAD AND ARM



7-PIN WIRING CONNECTOR



**SEAT BELT
(With Integrated Brake Interlock)**



MOTION PEDAL



TAIL LIGHTS

7 Moving A Disabled Forklift

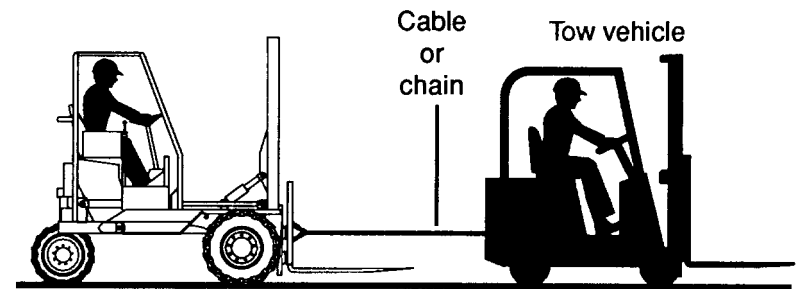
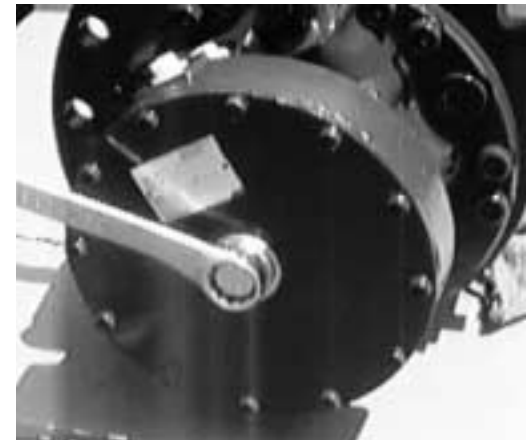
RELEASING BRAKE

THIS MACHINE HAS A BRAKE IN THE FRONT MOTORS.

To release drive hub brake, remove cap on the inside of the hydraulic motor. Screw in a 12mm x 1.75mm x 35mm hex head bolt with a washer larger than the hole diameter. Tighten the bolt to release the brake.

Reverse procedure to make brakes work after towing and repairs are completed.

Remove the bolt and install the cap before operating the PIGGY BACK. Drive hub will not operate unless the bolt is removed.



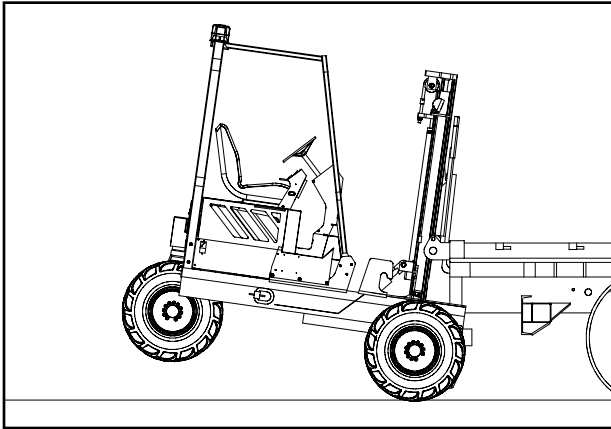
TOWING FORKLIFT

Fasten a chain or cable to tow vehicle around fork bar of forklift. Cable or chain must have capacity to pull 3 tons.

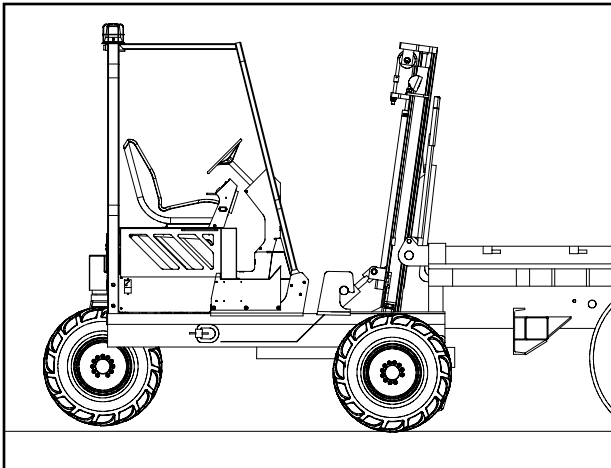
An operator must be seated on forklift.

6 Transport-EASY HITCH

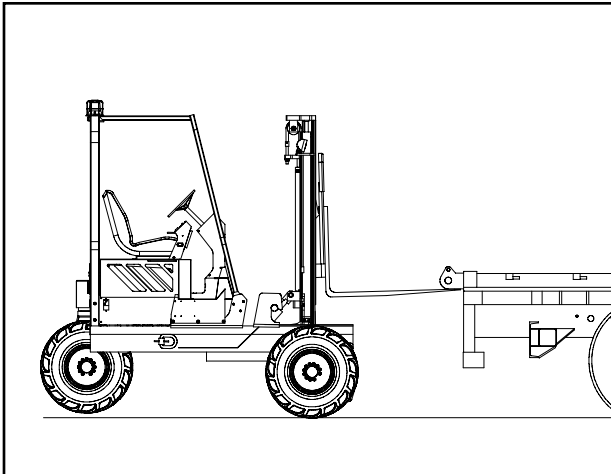
Lower the PIGGY BACK to the ground.



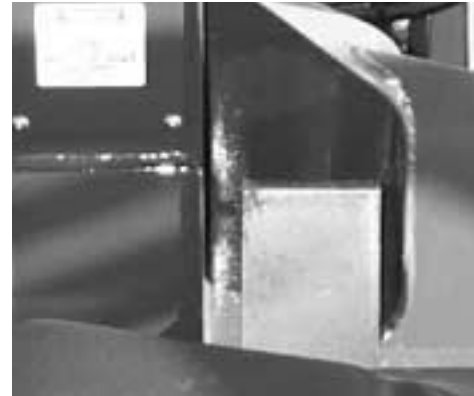
Tilt the top of the mast forward to lower the rear tire.



Drive the PIGGY BACK straight back to pull the forks from the fork supports.



3 Forklift Description



ACCELERATOR PEDAL



BATTERY



DASH AND CONTROLS



MOUNTING HOOK

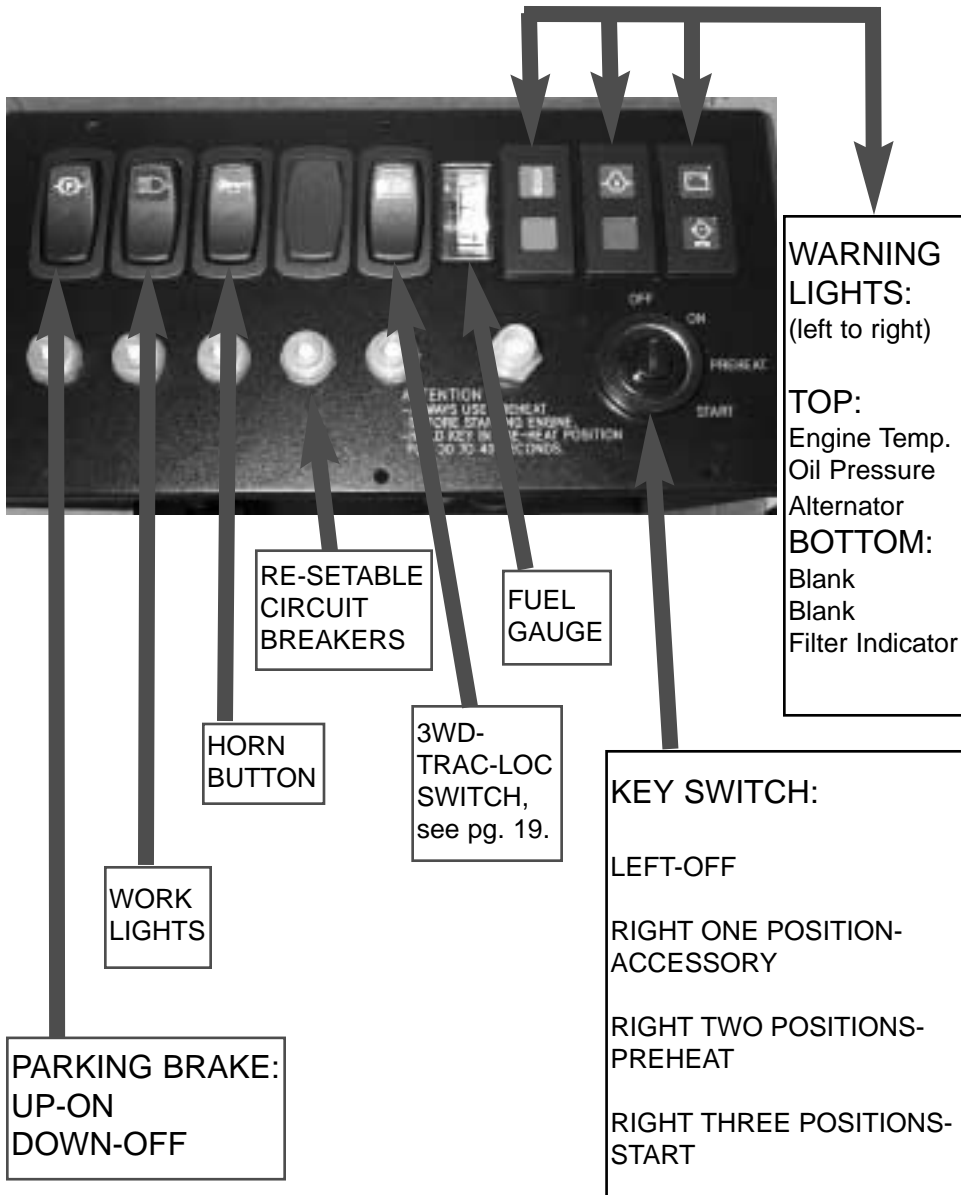


WHEEL MOTOR AND TIRE

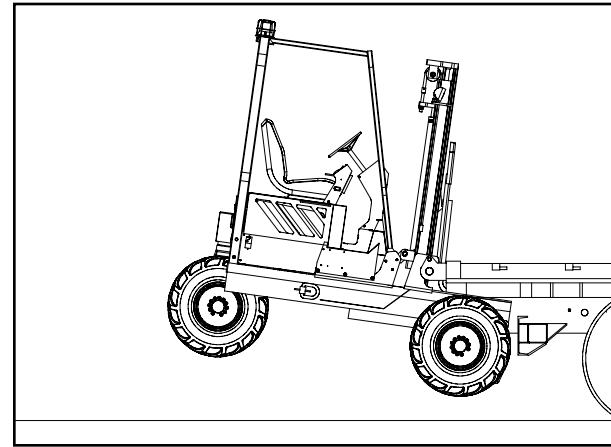


MAST

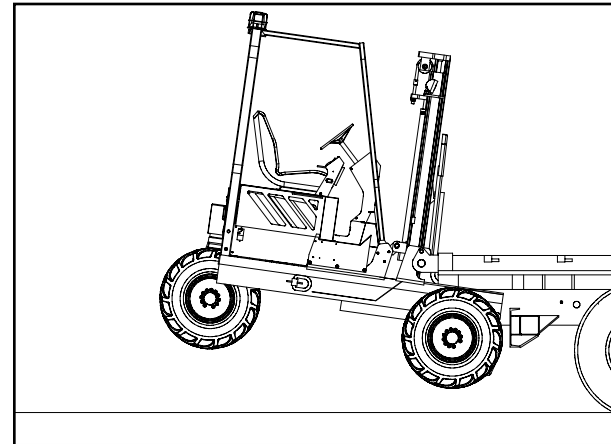
3 Forklift Description



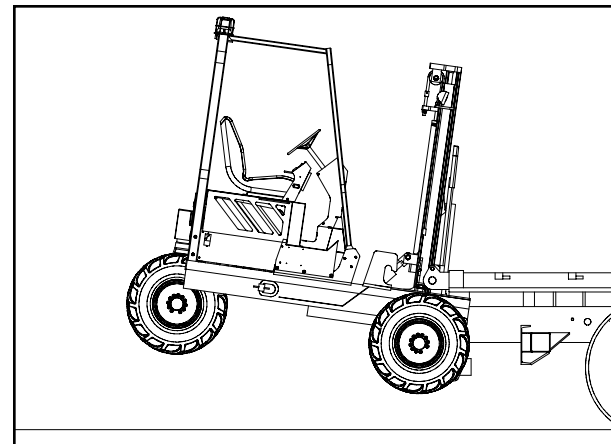
6 Transport-EASY HITCH



Tilt the top of the mast fully to the rear to raise the rear tire of the PIGGY BACK..



Raise the PIGGY BACK until the hooks clear the pins.

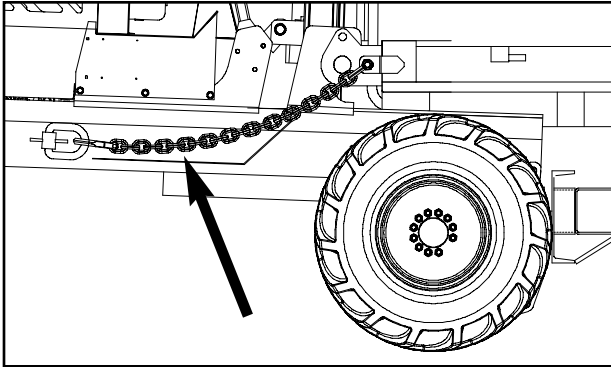


Extend the carriage 4-6 inches.

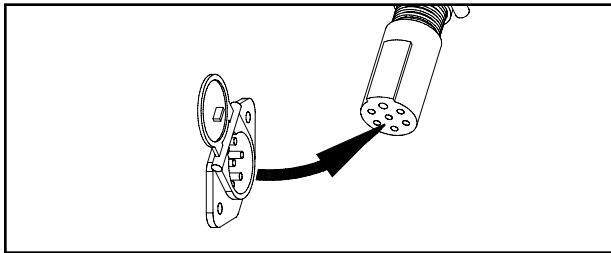
6 Transport-EASY HITCH

Dismounting the PIGGY BACK from the transport vehicle.

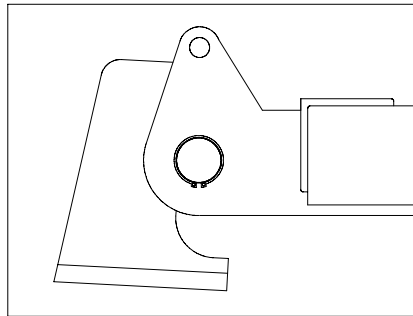
Disconnect the safety chains.



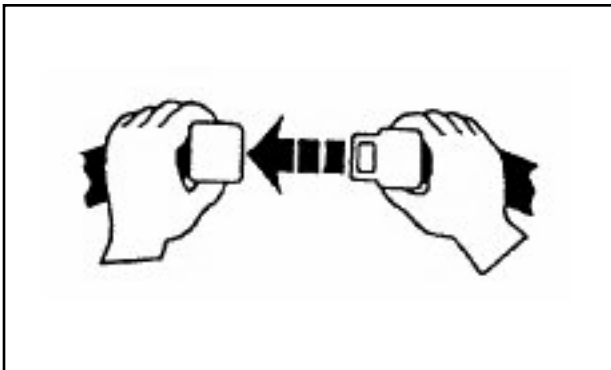
Disconnect the 7-pin electrical connector.



Remove the lynch pins and pull out the hitch pins.



Fasten your seat belt.
Start the PIGGY BACK.



BEFORE STARTING be sure

*Forward and reverse control (motion pedal) is in neutral.

*Seat belt is fastened.

*Operator Inspection is done.

COLD START (Deutz)

*Turn key to the right and hold on pre-heat for several seconds.

*Turn the key to the right and start engine.

*When the engine starts release ignition switch.

*If the engine fails to start, turn off ignition switch and repeat the above.

COLD START (Kubota)

*Turn key to the right and hold on pre-heat for several seconds.

*Pre-heat engine several times in colder climates.

*Turn the key to the right and start engine.

*When the engine starts release ignition switch.

*If the engine fails to start, turn off ignition switch and repeat the above.

WARM START

*Turn the key to the right and start engine.

*When the engine starts release ignition switch.

4 Starting

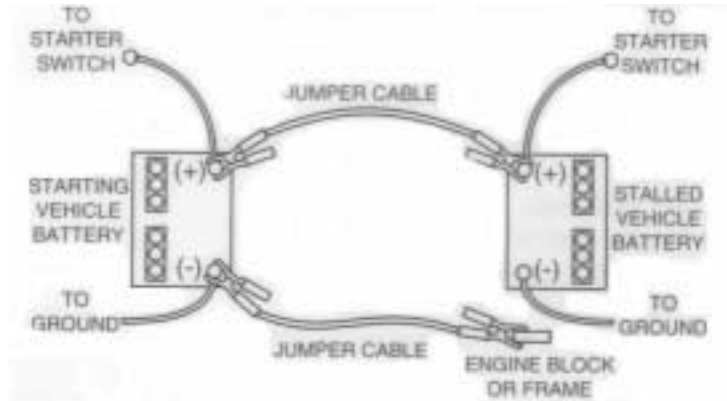
JUMP START

WARNING

Failure to follow these rules will cause serious injury or death.

BATTERIES PRODUCE EXPLOSIVE GASES.

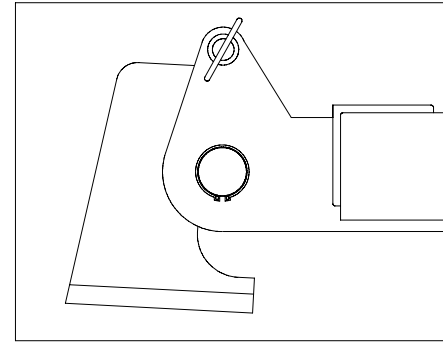
- *Keep sparks, flames, and cigarettes away from battery.
- *Do not let tools or other metal touch positive (+) battery post.
- *Remove all jewelry, rings, watches, etc.



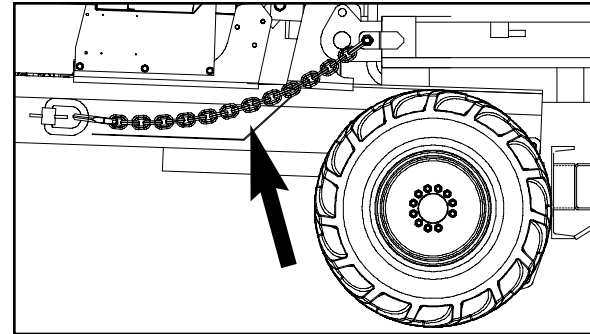
CONNECT BOOSTER CABLES IN THE FOLLOWING ORDER

- *Connect one Positive (+) red end of booster cable to Positive (+) post on each battery.
- *Connect second Negative (-) black end of booster cable to Negative (-) post of starting battery and the other end to stalled vehicle engine block or frame.
- *Be sure everyone is away from both vehicles.
- *Cables must be clear of all moving parts.
- *Start engine of starting vehicle. Wait a few minutes.
- *Start engine of stalled vehicle.
- *If vehicle does not start after cranking for ten seconds, STOP PROCEDURE. More than ten seconds seldom starts the engine unless some mechanical adjustments are made.
- *After vehicle starts, remove Negative (-) black booster from engine or frame ground. Then remove the other end from the starting battery.
- *Remove Positive (+) black booster cable from stalled battery, then from starting battery.

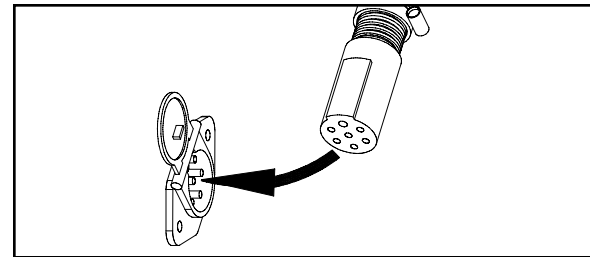
6 Transport-EASY HITCH



Install the hitch pins and attach lynch pins.



Connect the safety chains.



Connect the 7-pin electrical connector.

Before driving the transport vehicle

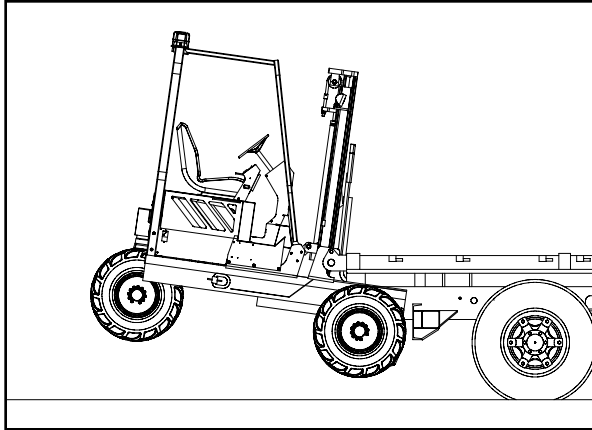
Check the function of the tail, turn and stop lights. Check the safety chains to see if they are latched. Check the hitch and lynch pins on top of the hooks for proper installation.

Note:

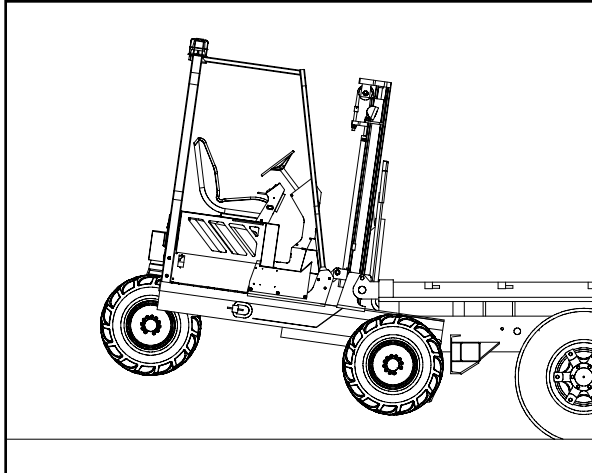
Your unit may be equipped with an automatic tilting device. It is activated when the transporting vehicle's lights are activated.

6 Transport-EASY HITCH

Retract the carriage to pull the PIGGY BACK toward the transport vehicle.



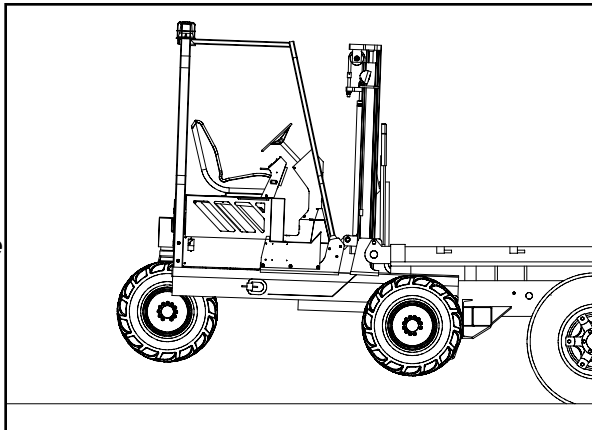
When the carriage is fully retracted, lower the PIGGY BACK until the hooks are fully seated on the pins. Do not power down.



Note: If tires do not contact tire pads before hooks are fully seated, tire pads may be incorrectly installed.

Shut off the PIGGY BACK.

Push the tilt lever forward to “relax” the PIGGY BACK tires onto the front tire pads.



Note: If unit does not correctly contact the two position tire pads, then correctly remount the tire pads.

5 Operation

MOTION PEDAL

WARNING

UNEXPECTED FORKLIFT MOVEMENT

Avoid the risk of injury, follow this rule.

Do not casually rest foot on motion pedal.

Motion pedal controls speed and direction of travel.

IMPORTANT NOTE:

Your unit may be equipped with a seat belt/brake interlock. The seat belt must be fastened to release parking brake. you must come to a complete stop before unlatching your seat belt to avoid a potential forward tip or premature brake wear.

REMEMBER

Forklift will not respond to motion pedal until parking brake is released.



Forward

Push front of motion pedal down and forklift will move forward. The more it is pushed the faster the forklift will go.

Reverse

Push rear of motion pedal down and forklift will move backward. The more it is pushed the faster the forklift will go.

Neutral Position

When the motion pedal is in the center, the forklift will be in the neutral position and should not move.

5 Operation

3WD AND TRAC-LOC SWITCH

Three Wheel Drive (3WD)

With the switch in the lower position, the forklift will be in 3WD and power is applied to all three wheels.

3WD IS THE NORMAL OPERATING MODE.

Trac-Loc

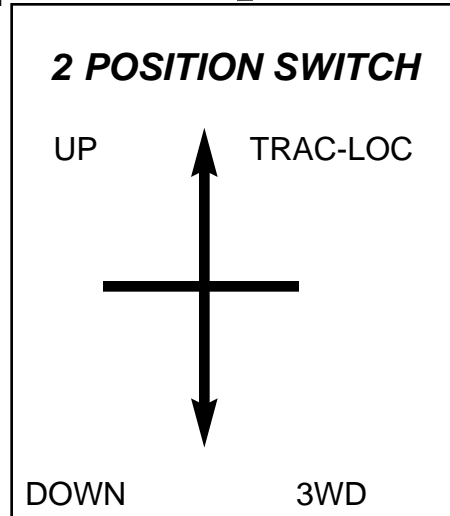
Rock switch toward mast and the rear wheel will be in locked in.

Use Trac-Loc in slippery conditions.

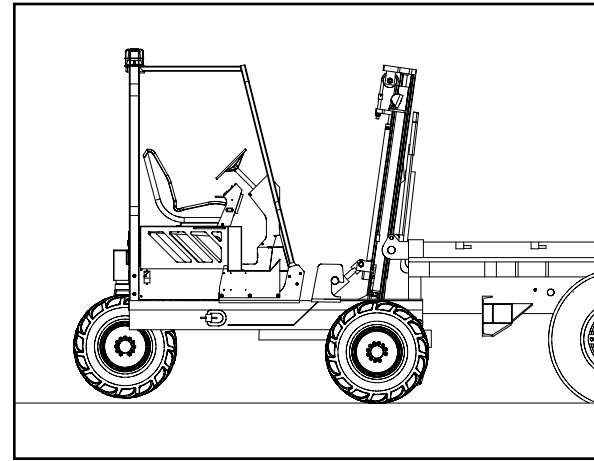
Continuous Trac-Loc usage adds heat to hydraulic drive system and inhibits vehicle turning. Use Trac-Loc only when necessary.

Important Note:

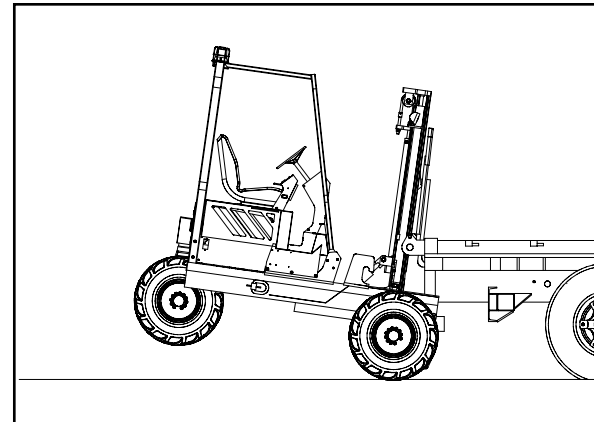
Disengage Trac-Loc before starting the PIGGY BACK or damage to the Hydraulic System may occur.



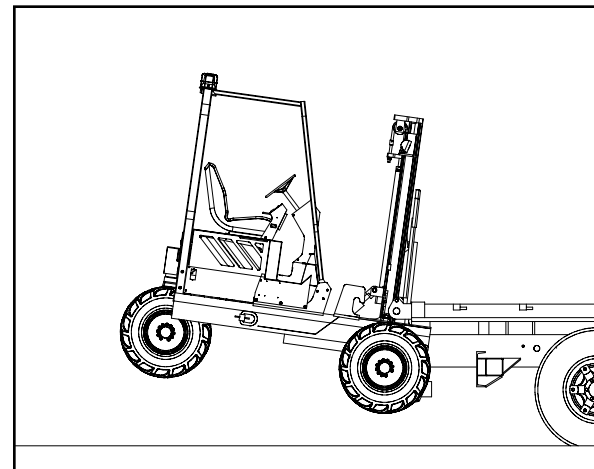
6 Transport-EASY HITCH



Drive the PIGGY BACK forward until the forks are in the fork supports, tilting the mast forward as you drive to make sure the forks are under the front fork tube.



Tilt the top of the mast fully to the rear to raise the rear tire.

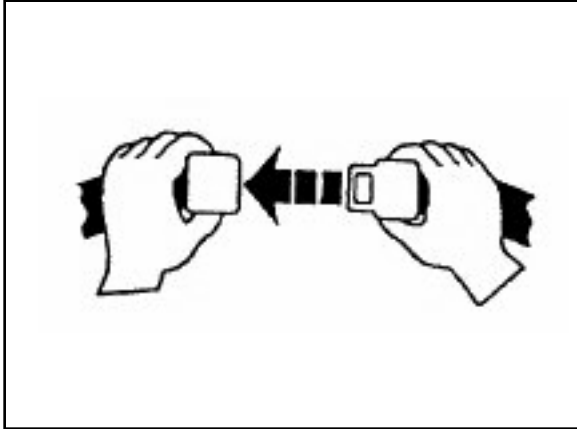


Raise the PIGGY BACK until the hooks are above the pins.

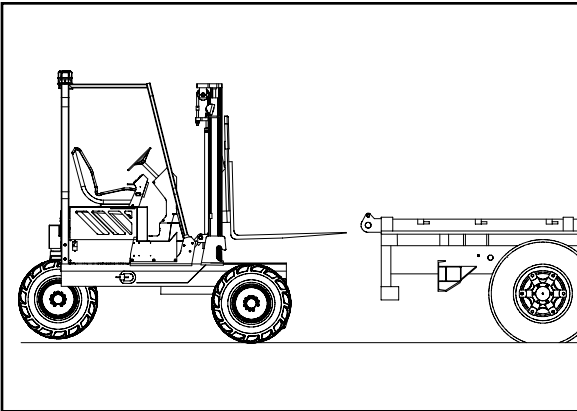
6 Transport-EASY HITCH

Mounting the PIGGY BACK to the transport vehicle.

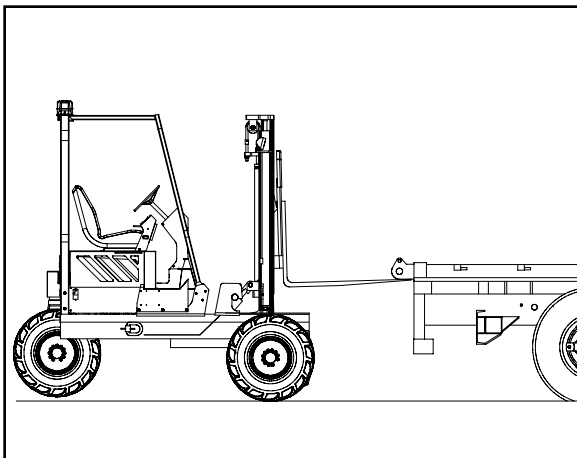
Fasten your seat belt.
Start the PIGGY BACK.



Raise the forks to the level
of the fork support tubes.



Extend the carriage 4-6
inches.



5 Operation

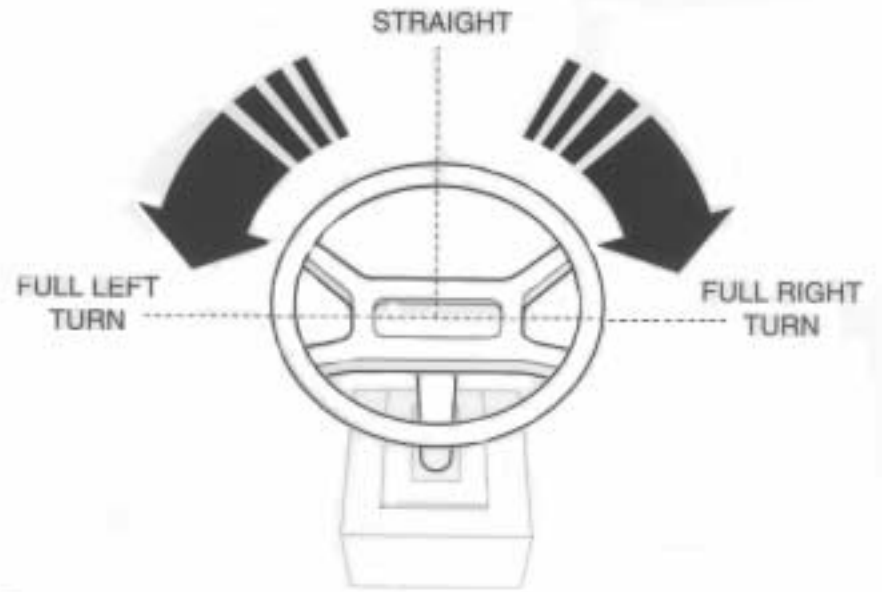
STEERING WHEEL

Left

Turning steering wheel left when
you want to turn left. The forklift
responds quicker, the more the
more the wheel is turned.

Right

Turning steering wheel right when
you want to turn right. The forklift
responds quicker, the more the
more the wheel is turned.



5 Operation

LIFT CONTROL

Up

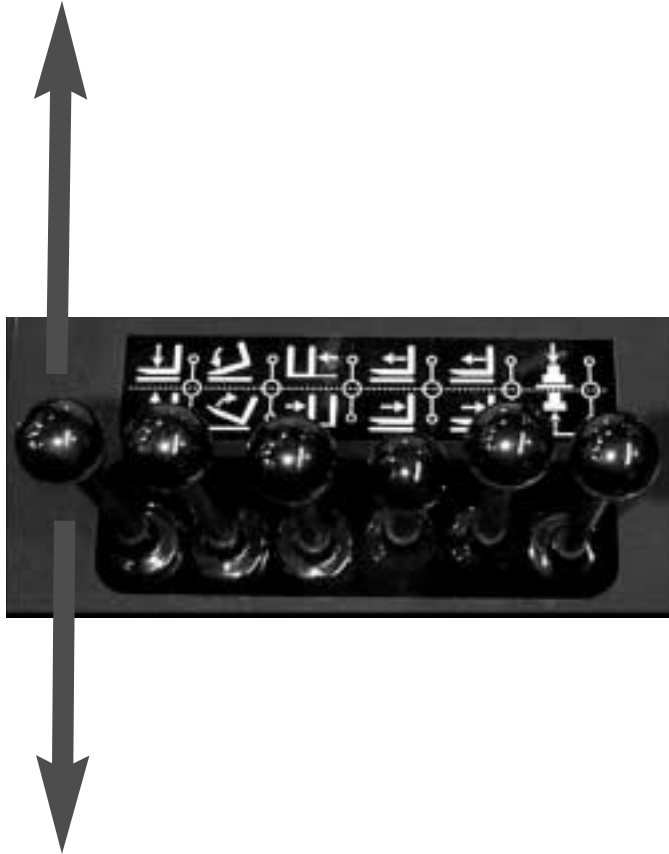
Push lift control away from you, the forks will move down. As the control is pushed more, the forks will move down faster.

Neutral

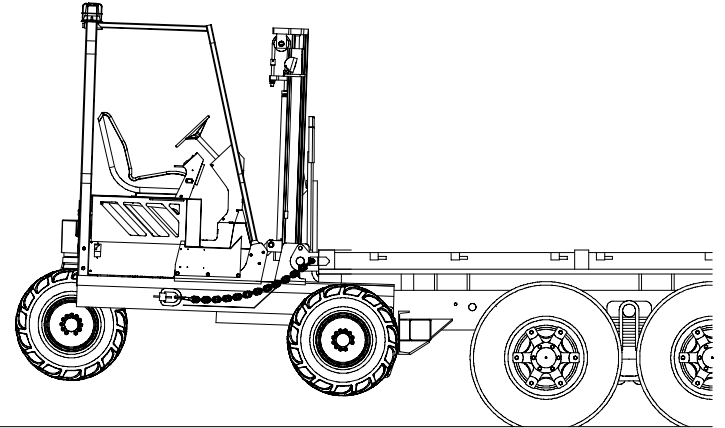
When lift control is in neutral, the forks will not move.

Down

Pull lift control to you, the forks will move up. As the control is pulled more, the forks will move up faster.



6 Transport-EASY HITCH



EASY HITCH MOUNTING SYSTEM OPERATORS INSTRUCTIONS

The Easy Hitch mounting system for the Princeton PIGGY BACK Material Handler consists of the following components:

- Safety Chains
- 7-Pin Electrical Connector
- Fork Support Tubes
- Front Tire Pads
- Hitch Pins with Lynch Pin Attached
- Support Pins mounted to the Transport Vehicle
- Hooks Mounted to the PIGGY BACK

5 Operation

SAFETY SIGNS



Motion Pedal



NEVER put your body between the horizontal carriage and dash.



STAY away from pedestrians at all times.



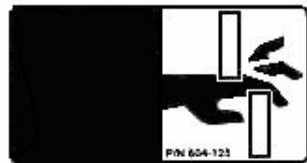
NEVER put your body between the forklift and the mast.



DO NOT place foot under the stabilizer pad .



KEEP YOUR HANDS AWAY from chains at all times



PINCHPOINT-keep hands and feet away at all times.

5 Operation

TILT CONTROL

Down

Push tilt control away from you, the forks will tilt forward. As the control is pushed more, the mast will tilt faster.

Neutral

When tilt control is in neutral, the mast will not move.

Up

Pull tilt control to you, the mast will tilt backward. As the control is pulled more, the mast will tilt faster.



5 Operation

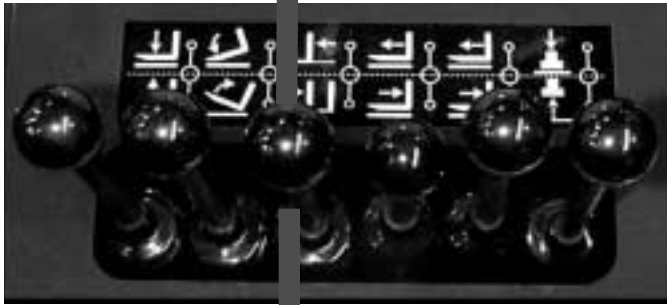
SIDE SHIFTER CONTROL (OPTIONAL)

Left

Push side shifter control away from you, the forks will move left. As the control is pushed more, the forks will move faster.

Neutral

When control is in neutral, the side shifter will not move.

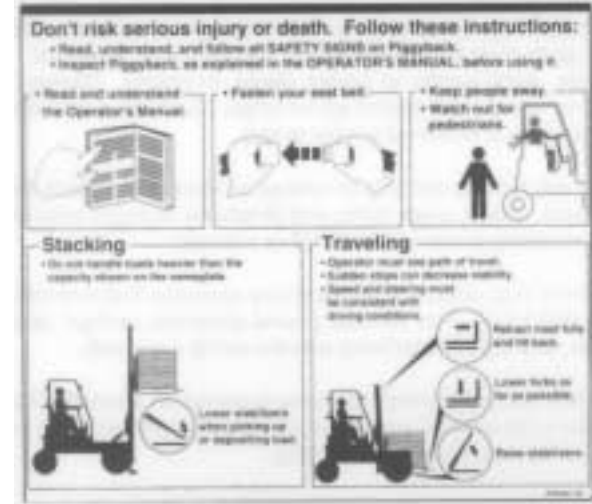


Right

Pull side shifter control to you, the forks will move right. As the control is pulled more, the forks will move faster.

5 Operation

SAFETY SIGNS



MAIN WARNING



DO NOT stand on or below the forks.



NO RIDERS



STEERING CYLINDER- keep hands, arms and body away from cylinder at all times

5 Operation

Go up and down grades slowly and carefully. The mast must be extended and as low as possible when climbing grades. Grades that are approaching the forklift's capability limits should be climbed in reverse with the mast fully retracted.

Extreme care must be taken in these cases. Avoid turning on grades, ramps, or inclines. Stopping distance going down grades will be longer. Slow down and allow enough room at bottom of grades to stop.

Travel with forks raised only far enough to clear road surface and tilted back. Starts, stops, turns, and directional changes must be made smoothly to prevent overturn.

Operators must always be aware of any obstacles that may interfere with forklift travel. These objects include: ground obstacles, ceilings, ceiling fixtures, and objects interfering with the forklift travel path.

DEPOSITING LOAD-MAST RETRACTED

To deposit load after being moved into correct position, tilt mast forward to vertical position and lower load.

Adjust fork height and tilt mast forward as needed for smooth fork removal from load.

Carefully back away and clear forks from the load.

Raise forks for travel and tilt mast back.

DEPOSITING LOAD-MAST EXTENDED

To deposit load after being moved into correct position, tilt mast forward to vertical position and put stabilizers down. Extend mast and lower load.

Adjust fork height and tilt mast forward as needed for smooth fork removal from load.

Carefully retract mast all the way from the load.

Raise stabilizers and back away from the load.

Raise forks for travel and tilt mast back.

5 Operation

SCISSOR CONTROL (OPTIONAL)

Out

Push scissor control away from you, the forks will move forward. As the control is pushed more, the forks will move faster.

Neutral

When scissor control is in neutral, the forks will not move.

Back

Pull scissor control to you, the forks will move backward. As the control is pulled more, the forks will move faster.



5 Operation

CARRIAGE CONTROL

Out

Push carriage control away from you, the mast will move forward. As the control is pushed more, the mast will move faster.

Neutral

When control is in neutral, the mast will not move.

Back

Pull carriage control toward you, the mast will move backward. As the control is pulled more, the forks will move faster.



5 Operation

Raise load to travelling height and tilt fully back. Never tilt mast forward past horizontal when loaded.

PICKING UP LOAD-MAST EXTENDED

Forks must be spaced as far apart as the load being carried allows. Both forks should be the same distance from the center of the mast. Be sure the fork lock pin fits securely into a locking notch.

Handle only stable loads within the forklift's rated capacity as shown on the capacity sign. Always center load on forks.

Do not handle loads higher than the load backrest or its extension, unless load is secured and will not fall backward.

Use lift and tilt controls, adjust the forks to correct height and angle for engaging load.

Move forward until the forklift is almost touching load. Put stabilizers down. Extend forks into load. Be sure forks do not extend beyond load, getting caught on other loads or materials.

If forks are longer than load, move tips partially under load without extending beyond the load. Raise load to clear floor. Back out, set the load down and position correctly on forks.

Raise load by tilting mast back just far enough to lift load from floor.

Raise load to travelling height and tilt fully back. Never tilt mast forward past horizontal when loaded.

Retract mast and lift stabilizers.

TRAVELING LOADED

Keep load against the load backrest. Loads out on the fork ends make the forklift less stable and more likely to overturn.

Obey all traffic rules and speed limits. Always keep your forklift under control and at a safe distance, based on speed, from other vehicles.

Be sure you have a clear view of your path of travel. Be alert to blind spots, and other locations where vision is not clear. When load obstructs view, travel backwards.

5 Operation

TRAVELING EMPTY

Obey all traffic rules and speed limits. Always keep your forklift under control and at a safe distance, based on speed, from other vehicles.

Be sure you have a clear view of your path of travel. Be alert to blind spots, and other locations where vision is not clear.

Go up and down grades slowly and carefully. The mast must be extended and as low as possible when climbing grades. Grades that are approaching the forklift's capability limits should be climbed in reverse with the mast fully retracted.

Extreme care must be taken in these cases. Avoid turning on grades, ramps, or inclines. Stopping distance going down grades will be longer. Slow down and allow enough room at bottom of grades to stop.

Travel with forks raised only far enough to clear road surface and tilted back. Starts, stops, turns, and directional changes must be made smoothly to prevent overturn.

Operators must always be aware of any obstacles, trees, electrical wires, and objects interfering with forklift travel path.

PICKING UP LOAD-MAST RETRACTED

Forks must be spaced as far apart as the load being carried allows. Both forks should be the same distance from the center of the mast. Be sure the fork lock pin fits securely into a locking notch.

Handle only stable loads within the forklift's rated capacity as shown on the capacity sign. Always center load on forks.

Do not handle loads higher than the load backrest or its extension, unless load is secured and will not fall backward.

Use lift and tilt controls, adjust the forks to correct height and angle for engaging load.

Move forward until the forks are squarely and completely under load. Be sure forks do not extend beyond load, getting caught on other loads or materials. If forks are longer than load, move tips partially under load without extending beyond the load. Raise load to clear floor. Back out, set the load down and position correctly on forks.

Raise load by tilting mast back just far enough to lift load from floor.

5 Operation

STABILIZER CONTROL

Down

Push stabilizer control away from you, the stabilizers will move down. As the control is pushed more, the stabilizers will move faster.

Neutral

When stabilizer control is in neutral, the stabilizers will not move.

Up

Pull stabilizer control to you, the stabilizers will retract. As the control is pulled more, the stabilizers will retract faster.



5 Operation

DOUBLE REACH (Optional)



The first stage of reach is the standard moving mast and the second stage of the reach is a scissor mechanism.

This option has been ordered by the owner of the PIGGY BACK Delivery System for the following uses.

- 1) It allows a 4000 lb.* load on a truck or trailer to be unloaded from one side.
- 2) It allows a 2500 lb.* load to be placed in an area with low overhead clearance.
- 3) It allows a 2500 lb.* load to be placed across a small open area. (See restrictions below)

GENERAL

It is recommended that the scissor is only operated as a second stage reach. This means that it is the last reach extended and the first retracted when utilizing the double reach feature. The unit has two extend levers the tall one operates the mast movement, the short one operates the scissor (FIG 3). The utilization of the scissor reach for unloading may require a spotter to watch the other side of the truck or trailer for pedestrian or vehicle traffic.

FREE LIFTING (LOAD FULLY EXTENDED)

The rated capacity for this option is 2500 lbs. when the unit is free standing, with stabilizers down, on reasonably firm terrain. This means that a 2500 lb. load that is 48" wide can be fully extended out when the stabilizers are engaged. This would be a typical low overhead clearance or an across open area drop. **WARNING:** Exceeding this capacity will result in a forward tip.

ONE SIDE TRUCK UNLOADING

When unloading from one side of the truck you can get a lift capacity of up to 4000 lbs. This is achieved by placing the mast of the unit up against the truck or trailer. There are special bars welded to the mast (FIG 4) that allows free operation of the mast when the unit is against the truck. To unload the truck or trailer, you will 1) drive up to it while raising your forks, 2) engage your stabilizers, 3) extend your mast until it contacts the truck or trailer, 4) extended your scissor reach, 5) lift your load 1" to 2" (FIG 5), 6) fully retract your scissor reach, 7) fully retract your mast, 8) raise your stabilizers, 9) back away from the truck or trailer and lower your load to the carrying height.



FIG 3
Scissor Control Mast Control

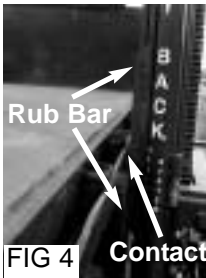


FIG 4
Rub Bar Contact

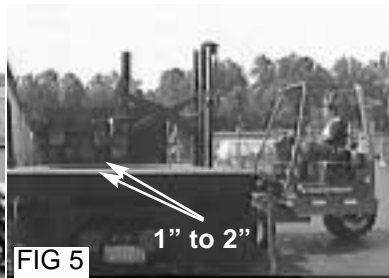


FIG 5
1" to 2"

5 Operation

LOAD ARMS (Optional)

The Load Arm Option is used when the forklift is carrying long loads such as lumber, drywall, and other building materials.

LOWERING ARMS

To lower the Load Arms into operating position, pull the spring pin out of the hole on mounting hook and lower the arm onto the front support. Make sure pin end is below the load surface or dimpling of load arm and load will occur.



RAISING ARMS

To raise Load Arms, lift the arm until spring pin snaps into detent hole on mounting hook.

MOUNTING

Load Arms are to be in the raised position when the forklift is mounted on an EASY HITCH Mounting. Safety chains will run through the holes in the Load Arms.

