

**BPR/Rico Equipment, Inc.**  
Innovative Solutions for Material Handling



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# **OPERATOR INFORMATION MANUAL**

**Configuration Style :  
STAND-UP RIDER STEERING**

**FOR DRIVER'S USE.  
DO NOT REMOVE MANUAL FROM TRUCK.**



## Foreword

Industries throughout the United States utilize powered industrial trucks daily. The Occupational Safety & Health Administration (OSHA) estimates that almost 95,000 injuries occur annually and it is estimated that 20 – 25% of the incidents and injuries are, in at least, caused by inadequate training and/or careless operators. It concluded that allowing an untrained or poorly trained employee to use a powered industrial truck poses significant risks, both to the operator and to other workers in the vicinity of the truck. To protect employees from those risks, it is necessary to require that only properly trained employees operate these vehicles.

On December 1, 1998 the Occupational Safety and Health Administration (OSHA) released new regulations regarding the training of powered industrial truck operators. These new regulations became effective on March 1, 1999 and can be accessed on the OSHA web site at: [http://www.osha-slc.gov/FedReg\\_osh\\_data/FED19981201.html](http://www.osha-slc.gov/FedReg_osh_data/FED19981201.html)

BPR/Rico Equipment, in compliance with the new OSHA standards, has prepared this guide as part of the development and implementation of their training program. Covering the unique characteristics of a BPR/Rico industrial truck, the specifications of its operating environment, and the requirements of the OSHA standard, this guide will assist employers in the reduction of incidents and injuries associated with powered industrial trucks through operator training. It explains correct operating procedures, operational components and their functions. It tells you about safety inspections, general safety rules and hazards of lift truck operation.

This operator's information manual is not an instructional manual or a substitute for hands-on training. It is a guide to help trained and authorized operators to safely operate their lift truck by emphasizing correct procedures. However, it cannot cover every possible situation that may result in an incident or injury and on-going safety training is recommended. Employees must take reasonable care to ensure their own safety and health and that of others in the workplace, use protective equipment as instructed, and comply with agreed safety and health work procedures.

Industrial trucks manufactured by BPR/Rico Equipment shall not be altered, modified or any parts added or eliminated without written approval by BPR/Rico Equipment.

Only trained and authorized persons shall be permitted to operate a powered industrial truck. Operators of powered industrial trucks shall be qualified as to visual, auditory, physical and mental ability to operate the equipment safely according to the information within this manual.

# Table of Contents

<b>TABLE OF CONTENTS.....</b>	<b>3</b>
<b>GENERAL OVERVIEW OF TRUCK OPERATION.....</b>	<b>5</b>
<b>TYPES, FEATURES, AND PHYSICS OF STAND-UP RIDER POWERED INDUSTRIAL TRUCKS.....</b>	<b>5</b>
<b>STABILITY OF POWERED INDUSTRIAL TRUCKS.....</b>	<b>8</b>
BASIC PRINCIPLES OF STABILITY.....	9
THE STABILITY TRIANGLE.....	9
LONGITUDINAL STABILITY.....	10
LATERAL STABILITY.....	10
DYNAMIC STABILITY.....	11
<b>KNOWING YOUR RIDER TRUCK.....</b>	<b>11</b>
DATA AND CAPACITY PLATES.....	11
BATTERY DATA PLATES.....	12
OTHER SAFETY AND WARNING DECALS.....	13
DRIVE COMPARTMENT LAYOUT (BASIC).....	14
<b>INSPECTING THE VEHICLE BEFORE OPERATION.....</b>	<b>15</b>
DAILY INSPECTION CHECKLIST – CHECK BEFORE OPERATION.....	15
<i>Visual Checks</i> .....	15
<i>Operational Checks</i> .....	16
<b>OPERATING AND DRIVING THE TRUCK.....</b>	<b>17</b>
YOUR LIFT TRUCK IS NOT A CAR.....	17
BEING A SAFE DRIVER.....	18
OPERATING POSITION.....	19
TRAVELING AND STEERING.....	19
BRAKING AND STOPPING.....	21
<b>LOAD HANDLING.....</b>	<b>21</b>
BEFORE YOU START.....	21
MOVING LOADS AROUND.....	22
WORKING IN TRUCKS AND TRAILERS.....	23
WORKING IN RAILCARS.....	23
<b>SHUT DOWN COMPLETELY.....</b>	<b>23</b>
<b>SAFETY TAKES PLACE EVERYDAY.....</b>	<b>24</b>
SAFEGUARD YOUR UNIT.....	24
PEDESTRIAN SAFETY.....	25
PROTECT OTHER PEOPLE.....	25
PROTECT YOURSELF.....	25
PROTECT OTHER PROPERTY.....	26
KNOW YOUR TRUCK.....	26
<b>LIFT TRUCK MAINTENANCE.....</b>	<b>28</b>
TYPICAL OPERATING CONDITIONS.....	28
SAFE MAINTENANCE PRACTICES.....	29
DAILY MAINTENANCE CHECKS.....	31
PERIODIC MAINTENANCE CHECKS.....	31
50 – 250 hours or Every Month.....	31
<b>INSPECTION INFORMATION FOR FORKS, LIFT MECHANISMS, AND HYDRAULIC FLUID.....</b>	<b>31</b>

LIFT TRUCK FORKS .....	31
LIFT MECHANISMS AND CONTROL LEVERS .....	32
HYDRAULIC FLUID .....	32
<b>CLEANING THE LIFT TRUCK .....</b>	<b>32</b>
<b>INDUSTRIAL BATTERY SAFETY AND HAZARDS .....</b>	<b>33</b>
BATTERY SAFETY BASICS .....	33
WORKING SAFELY AROUND BATTERIES AND CHARGING THEM .....	33
BATTERY HAZARDS .....	34
<b>BATTERY MAINTENANCE, CLEANING AND EMERGENCY PROCEDURES .....</b>	<b>35</b>
SAFETY EQUIPMENT .....	35
THE CLEANING PROCEDURE .....	35
EMERGENCY PROCEDURE IN THE EVENT OF ACID SPLASH ON PERSONNEL .....	35
ACID SPILLS .....	36
PROPER HANDLING OF SPENT LEAD-ACID BATTERIES .....	36
<b>RIDER LIFT TRUCK TERMINOLOGY .....</b>	<b>37</b>
<b>A FINAL WORD ON POWERED INDUSTRIAL TRUCKS .....</b>	<b>40</b>
<b>INDEX .....</b>	<b>41</b>

# Truck Operation

## Configuration Style: STAND-UP RIDER STEERING

### General Overview of Truck Operation

The trucks are designed for use on smooth, relatively level surfaces such as warehouse and factory floors, loading docks, and paved areas. Due to the various options available, refer to the data plate attached to the truck for information regarding:

- Truck Model.
- Serial Number.
- Truck Weight (including battery)
- Truck Capacity.
- Battery Type.
- System Voltage.

Rider trucks are designed for operation with the operator standing in the operator compartment of the truck (near the drive transmission), and controlling the truck via the steering wheel or lever and the control "T" handle. No provision is made for the operator to ride on any other part of these trucks.

All trucks are battery powered for both lifting of loads and travel. Tractive effort is provided through a motor-driven wheel located at the back end of the truck. A separate electric motor drives the hydraulic pump that supplies hydraulic pressure for raising the load to be transported. The travel motor is typically controlled through a transistor control circuit, although certain trucks may require the use of a SCR. Steering is controlled by means of a steering wheel or lever located on the drive compartment console. This steering wheel or lever, mechanically connected via gears and/or chains and sprockets, is used to pivot the drive wheel(s) that is mounted to the transmission and controls turning. Travel may be in either the forward or reverse direction and is controlled electrically by the rotation of the "T" handle. A mechanical or electric brake mounted on the drive unit controls braking. A hydraulic system is used to raise the load. An electric motor driven pump applies pressure for this system. A single or dual hydraulic cylinder produces lift and raises through mechanical linkages. A solenoid valve or a manual hydraulic valve is used to control lifting and lowering of the load.

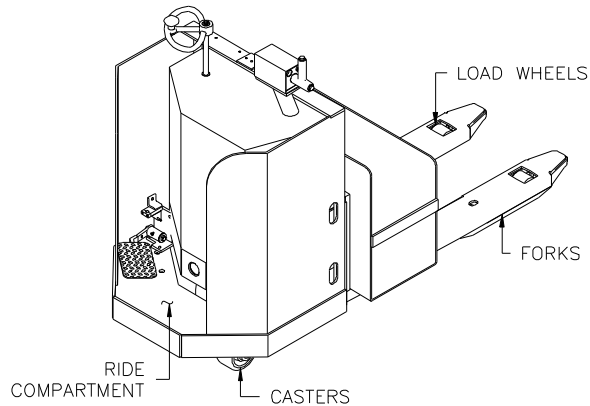
### Types, Features, and Physics of Stand-up Rider Powered Industrial Trucks

With the variety of powered industrial trucks in use, operators must understand each of the truck's operating characteristics and hazards. Lift trucks are divided into two broad categories: low lift and high lift.

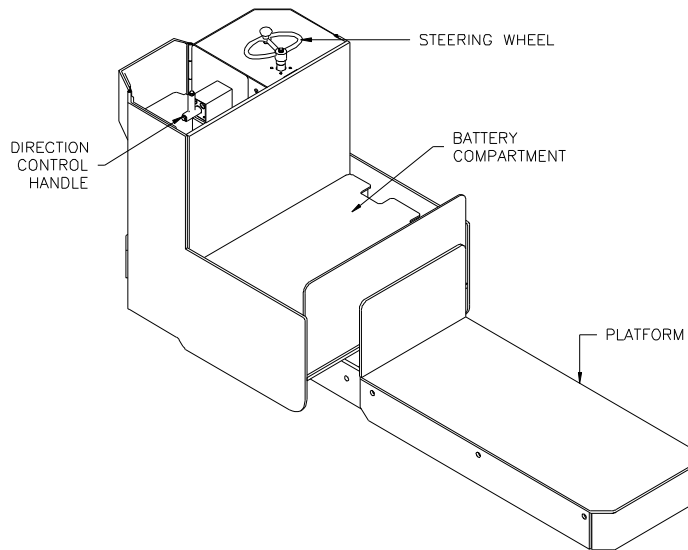
Although either of these types may be a walkie or a rider version, this manual only covers the rider style configuration with a Type "E" or "EE" ratings.

**Low lift units** are used for transporting products and materials; the load is kept high enough just to clear the floor while travelling. Usually the load is only 4 to 6 inches from the floor for proper clearance. The name low lift implies the load is not raised for any stacking. Pallet trucks and platform trucks are the two most common types of low lift units.

Pallet trucks are units that have two wide, flat forks as a load surface and they have retractable wheels that pivot in a housing at the tips of the forks when raised. The low height of the forks is such that it enables the forks to be placed into a pallet or under a load. Lift is in a vertical direction. An example is shown below.

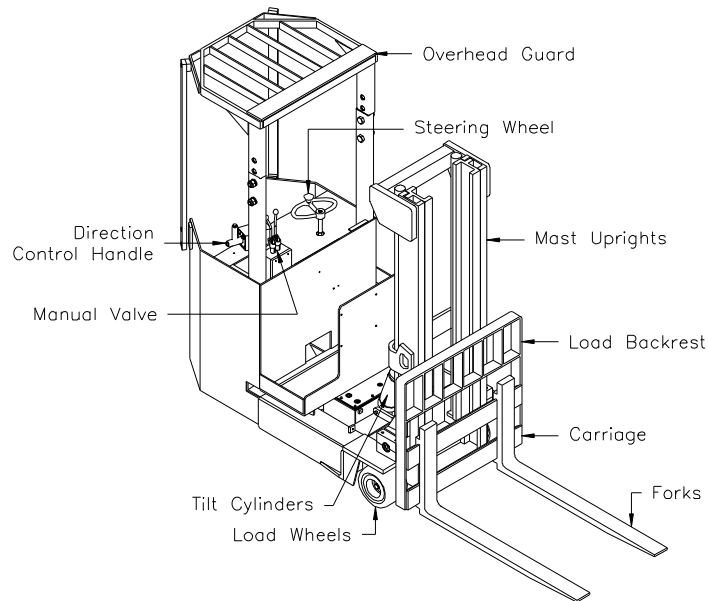


Platform trucks have one flat, solid platform that is used as a load surface. Wheel housings are typically rigid and the lift is in a “up and back” hinged direction, although platform trucks may utilize the pallet style lift depending on the application. An example is shown below.



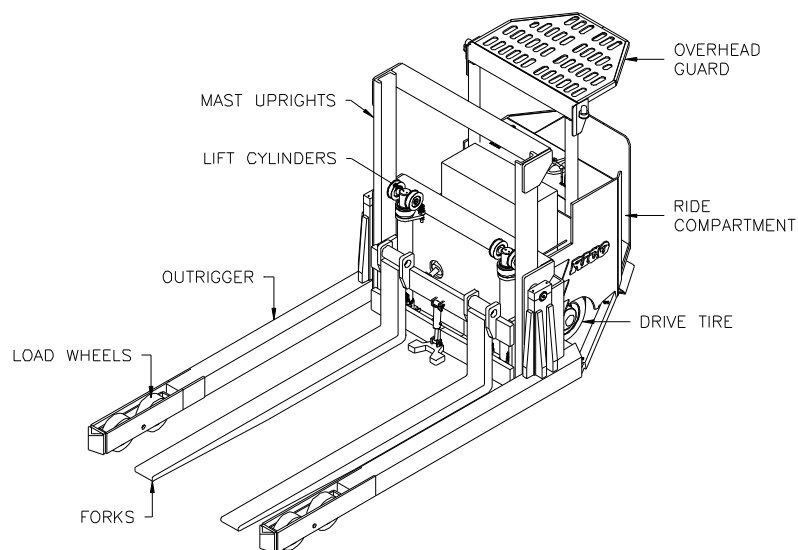
**High lift units** are used for lifting, stacking and retrieving products and materials. High lifts come in a wide variety of designs, models, and configurations. Counterbalance trucks, straddle trucks, and reach trucks are three common types of high lift units.

Counterbalance trucks contain adjustable forks, a tilt mast, and a counterweight. The load is lifted in front of the load wheels and while it is against the carriage. The weight on the forks is counterbalanced by the weight of the truck. An example is shown below.



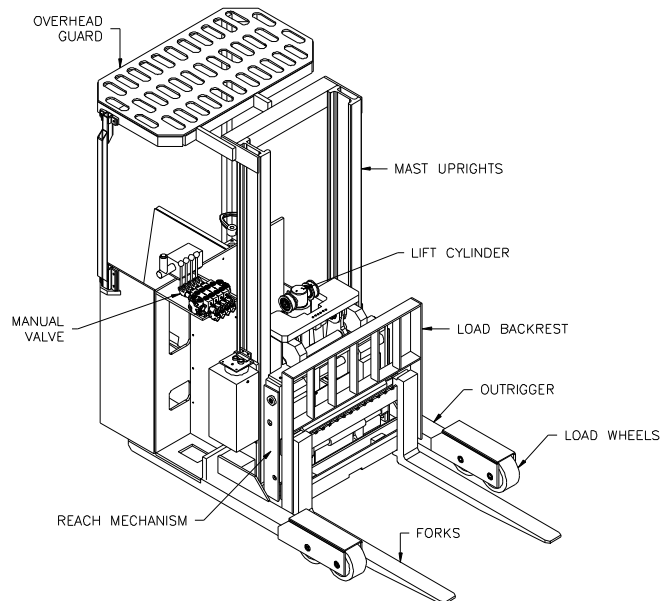
The load wheels act as a fulcrum and the battery weight is a major component of the counterweight. Loads can be lifted very high depending on the model. Due to its long wheelbase and the need for counterweight at the rear of the truck to counteract the load moment, a counterbalance truck is not practical for narrow aisle use.

Straddle trucks have extended outrigger base legs which are mounted parallel to and outside the lifting forks. The necessary straddle I.D. is determined at engineering and cannot be altered once manufactured. The I.D. is influenced by the width of the application's load. This design allows the truck's center of gravity to be directly beneath the load, which helps to keep the truck from tipping forward when the load is raised. This truck type does not have a counterweight because of that fact. An example is shown below.





Reach trucks have an outrigger base similar to the straddle truck. The outriggers are for stability and are not influenced by pallet width because they do not straddle the load. A pantograph, scissors-type mechanism allows the forks to be extended beyond the base legs to reach in under a load to lift it, and in turn, deposit it. An example is shown below.



## Stability of Powered Industrial Trucks

The center of gravity is a major problem with forklifts. Even though all wheels are touching the floor, the two front wheels and the center of the rear axle govern the stability of the vehicle. The narrow wheel base, the load, the overhead guard, speed, operating surface, tire pressure and operator control help effect tip overs.

Some of the factors that can cause a powered industrial truck to tip over are overloads, unstable loads, loads not centered on the forks, travelling with the load raised, sudden stops and starts, making sharp turns, travelling across an incline, driving into a ditch or over an obstacle. The causes of tip over are many and the previous list is not all-inclusive.

To explain the principle of stability, the following terms are used:

Center of Gravity---Counterweight---Fulcrum---Grade---Line of Action  
Load Center---Moment---Track---Wheelbase

If you do not know the definition of these terms, please look them up in Chapter 5: General Terminology, before continuing with this section.

Determining the stability of a powered industrial truck is simple once a few basic principles are understood. There are many factors that contribute to a vehicle's stability: the vehicle's wheelbase, track, and height; the load's weight distribution; and the vehicle's counterweight location (if the vehicle is so equipped).

# Basic Principles of Stability

Whether an object is stable depends on the object's moment at one end of a system being greater than, equal to, or smaller than the object's moment at the system's other end. This principle can be seen in the way a see-saw or teeter-totter works: that is, if the product of the load and distance from the fulcrum (moment) is equal to the moment at the device's other end, the device is balanced and it will not move. However, if there is a greater moment at one end of the device, the device will try to move downward at the end with the greater moment.

The longitudinal stability of a counterbalanced powered industrial truck depends on the vehicle's moment and the load's moment. In other words, if the mathematic product of the load moment (the distance from the front wheels, the approximate point at which the vehicle would tip forward) to the load's center of gravity times the load's weight is less than the vehicle's moment, the system is balanced and will not tip forward. However, if the load's moment is greater than the vehicle's moment, the greater load-moment will force the truck to tip forward.

## The Stability Triangle

Almost all counterbalanced powered industrial trucks have a three-point suspension system, that is, the vehicle is supported at three points. This is true even if the vehicle has four wheels. The truck's steer axle is attached to the truck by a pivot pin in the axle's center. When the points are connected with imaginary lines, this three-point support forms a triangle called the stability triangle. Figure 1, below, depicts the stability triangle.

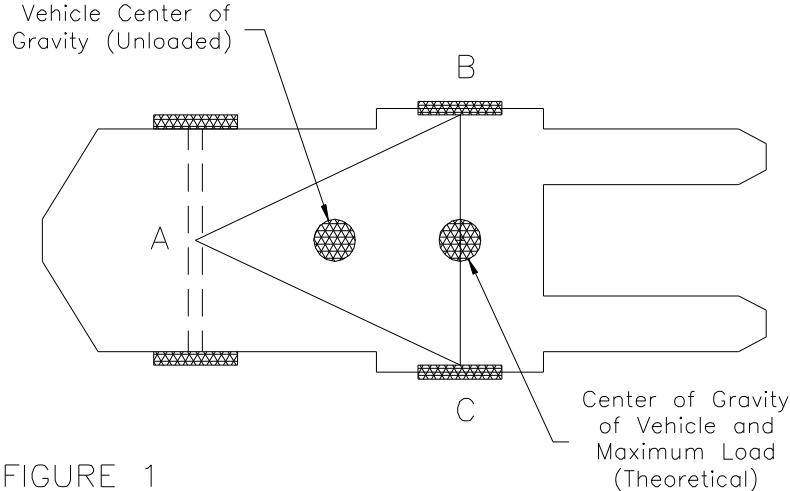


FIGURE 1

- Figure 1 Notes:
- When the vehicle is loaded, the combined center of gravity (CG) shifts toward line B-C. Theoretically, the maximum load will result in the CG at the line B-C. In actual practice, the combined CG should never be at line B-C.
  - The addition of additional counterweight will cause the truck CG to shift toward point A and result in a truck that is less stable laterally.

When the vehicle's line of action, or load center, falls within the stability triangle, the vehicle is stable and will not tip over. However, when the vehicle's line of action or the vehicles load combination falls outside the stability triangle, the vehicle is unstable and may tip over. (See Figure 2.)

## Longitudinal Stability

Longitudinal stability is the truck's resistance to overturning forward or rearward.

The axis of rotation when a truck tips forward is the front wheels' points of contact with the pavement. When a powered industrial truck tips forward, the truck will rotate about this line. When a truck is stable, the vehicle-moment must exceed the load-moment. As long as the vehicle-moment is equal to or exceeds the load-moment, the vehicle will not tip over. On the other hand, if the load moment slightly exceeds the vehicle-moment, the truck will begin to tip forward, thereby causing the rear to lose contact with the floor or ground and resulting in loss of steering control. If the load-moment greatly exceeds the vehicle moment, the truck will tip forward.

To determine the maximum safe load-moment, the truck manufacturer normally rates the truck at a maximum load at a given distance from the front face of the forks. The specified distance from the front face of the forks to the line of action of the load is commonly called the load center. Because larger trucks normally handle loads that are physically larger, these vehicles have greater load centers. Trucks with a capacity of 30,000 pounds or less are normally rated at a given load weight at a 24-inch load center. Trucks with a capacity greater than 30,000 pounds are normally rated at a given load weight at a 36- or 48-inch load center. To safely operate the vehicle, the operator should always check the data plate to determine the maximum allowable weight at the rated load center.

Although the true load-moment distance is measured from the front wheels, this distance is greater than the distance from the front face of the forks. Calculating the maximum allowable load-moment using the load-center distance always provides a lower load-moment than the truck was designed to handle. When handling unusual loads, such as those that are larger than 48 inches long (the center of gravity is greater than 24 inches) or that have an offset center of gravity, etc., a maximum allowable load-moment should be calculated and used to determine whether a load can be safely handled. For example, if an operator is operating a 3,000-pound capacity truck (with a 24-inch load center), the maximum allowable load-moment is 72,000 inch-pounds (3,000 times 24). If a load is 60 inches long (30-inch load center), then the maximum that this load can weigh is 2,400 pounds (72,000 divided by 30).

## Lateral Stability

Lateral Stability is a truck's resistance to overturning sideways.

The vehicle's lateral stability is determined by the line of action's position (a vertical line that passes through the combined vehicle's and load's center of gravity) relative to the stability triangle.

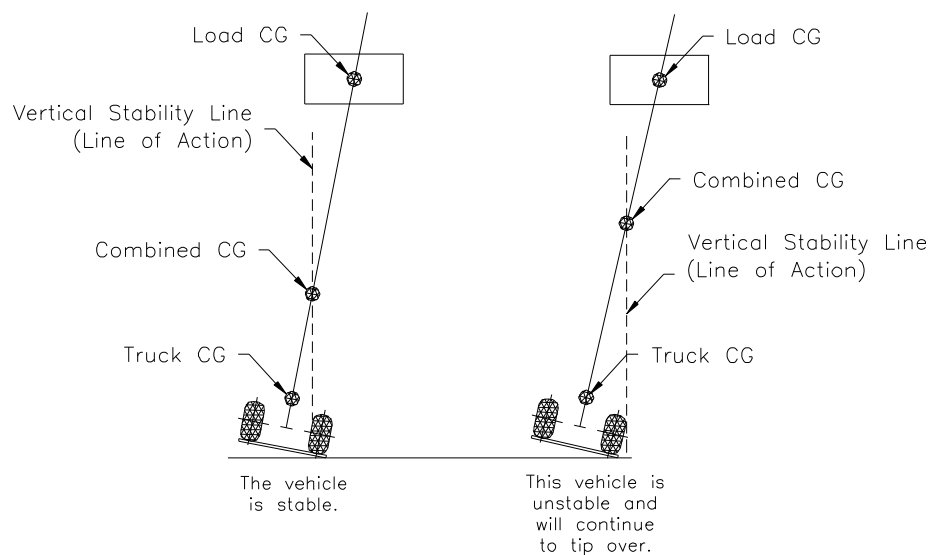


FIGURE 2

When the vehicle is not loaded, the truck's center of gravity location is the only factor to be considered in determining the truck's stability. As long as the line of action of the combined vehicle's and load's center of gravity falls within the stability triangle, the truck is stable and will not tip over. However, if the line of action falls outside the stability triangle, the truck is not stable and may tip over. Refer to Figure 2 above.

Factors that affect the vehicle's lateral stability include the load's placement on the truck, the height of the load above the surface on which the vehicle is operating, and the vehicle's degree of lean.

## Dynamic Stability

Up to this point, the stability of a powered industrial truck has been discussed without considering the dynamic forces that result when the vehicle and load are put into motion. The weight's transfer and the resultant shift in the center of gravity due to the dynamic forces created when the machine is moving, braking, cornering, lifting, tilting, and lowering loads, etc., are important stability considerations.

When determining whether a load can be safely handled, the operator should exercise extra caution when handling loads that cause the vehicle to approach its maximum design characteristics. For example, if an operator must handle a maximum load, the load should be carried at the lowest position possible, the truck should be accelerated slowly and evenly, and the forks should be tilted forward cautiously. However, no precise rules can be formulated to cover all of these eventualities.

## Knowing Your Rider Truck

### Data and Capacity Plates

Diagram illustrating the data and capacity plate for a lift truck. The plate includes a stability diagram at the top showing dimensions A, B, and C. Below the diagram are fields for SERIAL NO. (1), MODEL (2), and TYPE (3). There are also fields for VOLTS (4) and ATTACHMENT (5). A table shows TRUCK CAPACITY WITHOUT ATTACHMENT and TRUCK CAPACITY WITH ATTACHMENT for UPRIGHTS VERTICAL at load centers A, B, and C. At the bottom, there are fields for CAPACITY (7) and TRUCK WT. LESS BAT. (8) in both LBS. and KGS. units. A note at the bottom states: "THIS UNIT BUILT TO MEET OSHA REQUIREMENTS AS SPECIFIED IN UL 583 AND ANSI B56.1-1993, AS APPLICABLE OPERATE ON LEVEL SURFACE ONLY".

Check the data and capacity plates prior to operating any truck. These plates contain specific information regarding the specifications, restrictions, and capacities of the truck. Do the plates match the truck and the options that are installed? Are the loads you will be handling within the rated capacity at a given lift height? Some trucks will have reduced capacities at elevated lift heights. Information regarding maximum load center is especially important.

If the plate shows that a lift truck has a load capacity of 5000 pounds at a 24 inch load center, it means that the truck can handle a maximum load of 5000 pounds that is 48 inches long when the back of the load is against the fork face or platform upright. This rating also assumes that the load is symmetrical and can be picked up correctly. A load could be within the limits of the truck but if the load is out on the edge, the truck cannot lift it safely and it could tip forward. Furthermore, if the load is not symmetrical, the load center may change. See "longitudinal stability" above and the definition of "load center" in the glossary for more information.

The following information, items 1 – 8, refers to the "data and capacity" plate at the left.

1 ). *Serial number*: the unique identifying number assigned to the truck by the manufacturer. This number should be used when requesting information or ordering service parts. The serial number is also stamped on the chassis.

- 2 ). *Model*: the style or design designation of the truck as assigned by the manufacturer.
- 3 ). *Type*: these letter(s) designate the rating of the truck for working near fire hazards or combustion sensitive environments. Check with your supervisor for any special considerations in this area.
- 4 ). *Volts*: the operating electrical voltage of the truck. The battery must match this voltage.
- 5 ). *Attachment*: if an attachment is installed, this is its description and/or serial number. The user must see that the truck is marked to identify the attachment (s), including the weight of the truck/attachment combination and also the capacity of the truck with the attachment.
- 6 ). *Truck Capacity*: the capacity rating, load center, and lifting height data is shown. It shows the maximum load capacity of this truck with relation to the load centers and fork heights (see diagram on plate). Personal injury and damage to the truck can occur if these capacities are exceeded. **Do not exceed the maximum capacity specified!** Capacities are for centered loads only and are with attachment or forks with mast uprights in the vertical position.
- 7 ). *Capacity*: the rating given a truck indicating the amount of weight that a truck will lift to a predetermined fork height at a specified load center of an evenly distributed load.
- 8 ). *Truck Weight Less Battery*: the approximate weight of the truck without a load on the forks. This weight plus the weight of the load must be considered when operating on elevators, elevated floors, etc. to be sure they are safe.

If the truck does not have these data plates, notify your supervisor before using the truck. If the load you are going to pick up is heavier than the recommended load capacity, do NOT pick up the load. Never lift more than the rated capacity even if the load center is reduced below the rated load center.

When attachments are added or if the truck is modified, the capacity of the truck may be affected. It is OSHA law that written approval from the truck manufacturer is required before modifications to the truck that effect capacity or safety systems may be made.

## Battery Data Plates

The battery data tag contains various battery information. The “type” box designates the rating of the truck for working near fire hazards or combustion sensitive environments. Check with your supervisor for any special considerations in this area. The “length, width, and height” dimensions are the size of battery to use and the size that will correctly fit in the battery compartment. The “maximum AMP hours” that your battery should be rated for is shown in its respective box. The numbers in the “min. battery weight” box represent the minimum battery weight allowed for this vehicle.

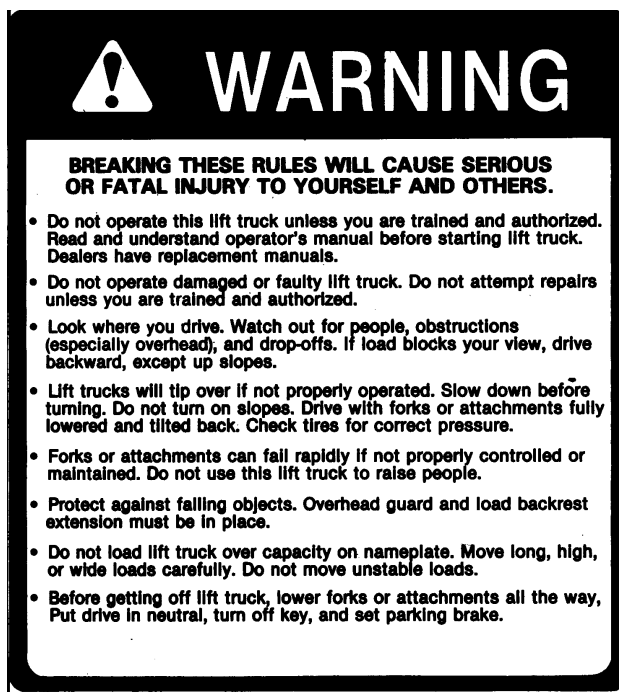
THIS TRUCK IS MANUFACTURED AND CLASSIFIED FOR USE WITH THE FOLLOWING BATTERY					
					TYPE
IN.	IN.	IN.			
CM.	CM.	CM.			
LENGTH	WIDTH	HEIGHT			
			LBS.	MIN.	BATTERY WT. KGS.
AMP. HR. MAXIMUM					

Does the battery you are using meet these requirements? Be sure to do a pre-operational check of the battery (see “Inspecting the Vehicle Before Operation” later in this chapter) and read and understand “Chapter 4: Industrial Batteries” of this manual regarding battery safety.

## Other Safety and Warning Decals

Safety and warning decals are placed in various conspicuous locations on your truck. These decals are provided to remind you of essential procedures or to prevent you from making an error, which could damage the truck or possibly cause personal injury. It is important that you know, understand, and follow the warnings and instructions. Missing, damaged or illegible safety and warning decals should be replaced immediately.

*Pinch Point Warning Decal* – this decal (shown at right) warns of the danger of injury from movement between rails, mast uprights, chains, sheaves, fork carriage, and other parts of the truck assembly. Do not climb on or reach into the mast upright. Personal injury will result if any part of your body is put between moving parts.

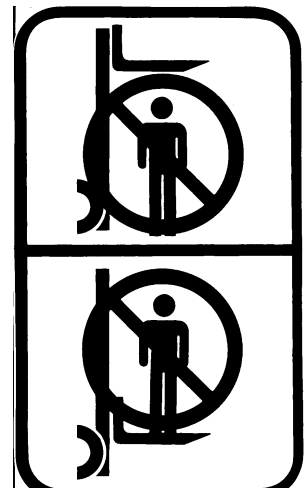


*Operation Warning Decal* – this decal (shown at the left) reminds the operator of very important operating principles.

**NO HAND HOLD**

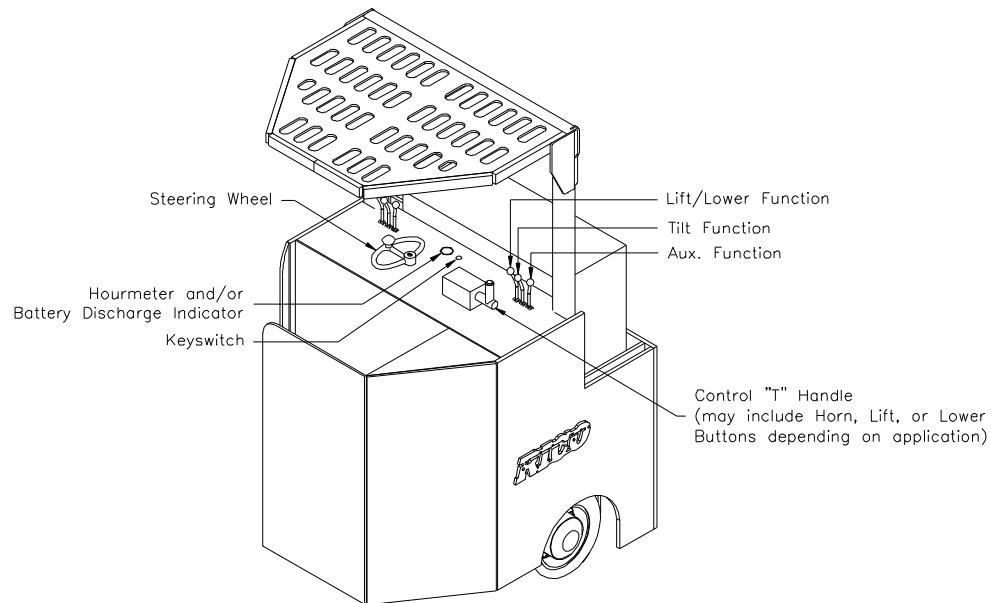
*No Hand Hold Decal* – this decal (shown above) reminds the operator that among the many spots that hands do not belong, this one in particular is not for holding on to.

*Keep Away from Forks Decal* – this decal (shown at the right) warns of the danger of injury from forks when they are in the raised position. Do not ride on or stand under forks or attachments. The forks can fall and cause injury or death. Always make sure that the forks are in the lowered position when they are not being used to handle a load.



## Drive Compartment Layout (Basic)

Below is a layout of a basic or typical drive compartment configuration. It shows the various controls and their locations. A definition for each item is also provided after the figure. Familiarize yourself with the controls and follow safe operating rules as discussed in this manual.



**Battery Discharge Indicator** - meter or gauge that indicates the state-of-charge in the battery.

**Control "T" Handle** – controls the direction of the truck. For smooth operation, rotate the handle slowly until the truck reaches its desired speed, such as the speed is proportional to rotation of the handle.

**Horn Button** – located on the control "T" handle enclosure and is electrically connected to the horn assembly

**Hour Meter** – meter or gauge that indicates the amount of time, in cumulative hours, that the truck has been used.

**Key Switch** – connects the battery with all truck operating systems, including, but not limited to, drive, lift, steer electrical circuits, hour meter and battery discharged indicator (as applicable). The key switch must always be turned to the ON position to operate the truck. When the key is in the vertical OFF position, all electrical circuits are shut off and the key can be removed. The horn should operate at all times as long as an adequately charged battery is connected at the truck receptacle.

**Lift and Lower Buttons** – located at the end of the control "T" handle and are electrically connected to the lift/lower assembly. These buttons will not exist if your truck has manual control valve levers for these functions.

**Manual Control Valve Levers** - if your vehicle is equipped with manual control valve levers, instead of pushbuttons for lift and lower, they are mounted on the operator's right-hand side and on the drive compartment frame. These levers would control hydraulic functions, such as lift, lower, tilting, and/or auxiliary functions (as applicable). The innermost lever (if there is more than one) controls lift and lower. Pull lever back to raise the lift mechanism. The longer you keep it pulled back, the more lift you will attain. Letting go of the lever will stop the lifting action. Push the lever forward to lower. You can lower the carriage even if the key switch is in the OFF position. The control lever

to the right of the lift/lower lever (if so equipped) would control tilting of the upright and forks. An auxiliary control lever would be mounted to the right of the tilt control lever. If your truck were equipped with an optional attachment, this lever would control the flow of hydraulic oil to the attachment.

*Steering Wheel or Lever* – controls steering and is used to swivel the drive wheel that is mounted to the transmission. Turning the steering wheel or lever to the left will turn the nose of the truck and/or the forks to the left. Turning it right will turn the nose of the truck and/or the forks to the right.

## Inspecting the Vehicle Before Operation

The purpose of an inspection is to ensure that the unit is safe. There must be a standing rule that if any defects are discovered, the piece of equipment is to be taken out of service immediately.

The Occupational Safety and Health Act requires that truck users inspect their trucks before each shift to be sure they are in safe working order. Defects, when found, shall be immediately reported and corrected. The truck shall be taken out of service until it has been restored to safe operating condition.

Below is a pre-operational checklist. It is important that you (the operator) take the time to go through this checklist before you operate the vehicle. Never assume, or take someone else's word that a truck is "okay". The truck must be inspected before the start of each shift for any condition that would adversely affect the safe operation of the truck. Where such conditions exist, they must be reported immediately, the truck shall be removed from service, and the defects corrected. Appropriate forms should be developed and used. Authorized personnel must make all repairs.

Check for damage and maintenance problems. Have repairs made before you operate the vehicle. If the truck becomes unsafe in any way while you are operating it, stop operating the truck. Unusual noises or problems should be reported immediately to your supervisor or other designated authority.

### Daily Inspection Checklist –CHECK BEFORE OPERATION

#### Visual Checks

*Walk around your truck and take note of obvious damage that may have been caused by operation during the last shift.*

Are all the capacity, safety, and warning plates or decals attached and legible?

Does the battery meet the minimum weight requirement shown on the data plate? Does the battery type match the truck type as specified on the data plate? Is the battery secure and the compartment closed (if equipped for side removal)? A properly sized battery should not be able to shift more than a half inch in any direction. Are the cell caps and terminal covers in place? Are the cables missing insulation? Check that the battery is clean, externally dry, and charged to 1.250 specific to gravity. Check electrolyte level of all cells. Add water to cover plates if needed. Are connectors in safe condition and secure? Also, be sure you have read the "battery" section of this manual.

Are there any cracks in the battery connector housing? Are the cables missing insulation? Do the battery connectors snap together and remain engaged?

Is there any external fluid leakage? Check for hydraulic oil and transmission fluid leaks and loose fittings, but do not do so using your bare hands.



Are safety devices and hand guards in place, undamaged, and securely attached? Are safety shields clean (if applicable)?

Check all mechanisms that handle or carry the load.

Are there any obvious missing parts? Are all mounting fasteners in place and tight?

Are lifting chains in place (if applicable)? Is there obvious wear on the lift chains? Check for possible maintenance problems such as damaged or missing parts, leaks, slack or broken chains, bent parts, etc. Is there wear or damage or kinks, signs of rust or any sign that lubrication is required? Do not repair damaged sections, replace chain as a whole! Are the chain anchors and locking means in place and tight?

Check the mast uprights. Are there broken welds, cracked or bent areas, and worn or missing stops or safety bolts?

Carefully inspect the load forks or platform for cracks, breaks, bending twisting, and wear. Be sure that the forks are correctly installed and locked in their proper position. Be sure forks are not mismatched. Is there excessive oil or water on them? See "Chapter 3: Planned Maintenance" for additional information on inspecting forks.

Check the appearance of the drive tire(s) and load wheels. Are they in good condition? Are they mounted safely and securely? Are there large cuts that go around the circumference? Are there large pieces of the material missing or separated from the rim? Are there any missing lugs? Is there bond separation that may cause slippage?

### Operational Checks

*Before checking the operation of the truck, familiarize yourself with the operating procedures explained in the following section, "Operating and Driving the Truck". Be sure there is enough room overhead to fully raise the upright.*

Pay attention to all labels and markings.

YOU - are you well and alert?

*Brakes* – Does the brake work? The truck should not be capable of movement when the brake is set.

*Footswitch or Pedal* – Does it return to neutral when you are not stepping on it?

*Gauges* – Are they all legible and properly working?

*Horn* – Does the horn work?

*Hydraulic Cylinders* – Is there leakage or damage to any of the cylinders?

*Hydraulic Fluid* - With load handling system fully lowered, check hydraulic fluid level. See "Chapter 3: Planned Maintenance" for additional information on inspecting the hydraulic fluid.

*Lift Chain and Rollers* - (if equipped) Is there squeaking?

*Lights* – (if equipped) Are they working properly?

*Lift Mechanism* – Does it raise and lower? Is there hesitation when raising or lowering? If equipped with tilt or sideshift, are there hesitations with these functions? See "Chapter 3: Planned Maintenance" for additional information on inspecting lift mechanisms.

*Manual Control Levers* – (if equipped) Does the lever(s) operate correctly? Check all the levers in both directions (push forward and pull backward). See “Chapter 3: Planned Maintenance” for additional information on inspecting the control levers.

*Motors* – Check the operation of the drive and hydraulic pump motors.

*Noises* - Check for unusual noises while traveling unloaded in both forward and reverse.

*Pushbuttons* – Do they work? If equipped, do lift and lower operate accordingly?

*Steering* – Is there excessive free play? If it is equipped with power steering, is the pump working?

*Transmission Fluid* - Check transmission fluid level.

*Travel* – Does the unit move in the forward and reverse direction when it is supposed to? Test travel through full speed range in both forward and reverse.

**Be sure you are a qualified operator and have read this manual completely. Do not operate a lift truck that has a maintenance problem or is not safe to operate.**

If you experience any problems, or something doesn't look right or sound right then “do not operate the truck”. Disconnect the power to the truck and immediately notify your supervisor.

The purpose of an inspection is to ensure that the unit is safe. There must be a standing rule that if any defects are discovered, the piece of equipment is to be taken out of service immediately. Authorized personnel must make all repairs.

If you have any questions, be sure to ask your supervisor. If all of the “Daily Inspection Checklist” items, both visual and operational, were normal or satisfactory, the truck can be operated.

## Operating and Driving the Truck

Before you operate a powered industrial truck in the facility for the first time, it is a good idea to take a walking tour with someone familiar with the facility. Look for dangerous intersections, pedestrian traffic areas, overhead obstructions, inclines, speed limits and surface conditions. The trucks are designed for use on smooth, relatively level surfaces such as warehouse and factory floors, loading docks, and paved areas.

### Your Lift Truck is NOT a Car

Forklifts are much different than cars. Operators are frequently told that if they can operate a car they can operate a lift truck. That statement is not true! Forklifts have a much narrower wheelbase and a much higher center of gravity. Forklifts operate on a teeter-totter principle. A counterweight on the rear of the truck helps balance the load on the forks. When a lift truck is empty there is a significant weight imbalance. An empty forklift does not imply that the forklift is safe. Operators have to be reminded that a car carries a load on the inside center of the vehicle. A lift truck carries its load outside of its supporting base. Cars have four point suspensions, forklifts have three. With this in mind the forklift can become unstable rather easily. Operators, especially those that are new, are to be reminded that the turning radius of a lift truck is much smaller than that of a car. Also, a car has front wheel steering while a lift truck has rear wheel steering which causes the back end to swing wide.

A car can turn over under certain circumstances; holes in the road, a sharp turn on a grade or ramp and speeds while driving on dry pavement and/or ice. A lift truck can turn over much easier and at much lower speeds. Speeds as low as five miles per hour can tip over a lift truck. Even empty lift trucks can turn over. Operating environments that include railroad tracks, rough pavement, holes in the roadway, uneven surfaces, ramps, grades or other less than desirable features can be dangerous.

Lift trucks have unique operating capabilities that include braking. A fully loaded lift truck, even though it is not moving fast, is not easily stopped. When the reaction time of the operator is combined with stopping distance it is very possible that even an experienced operator would not be able to stop in time if a pedestrian suddenly appeared in his path of travel. The small wheels on a forklift combined with only two braking wheels does not always allow for a sudden stop. There may not be a backup system to stop the vehicle if these systems fail. Maintenance on the vehicle could be lacking which could allow braking systems to fail when most needed. Operators could easily fail to properly inspect the vehicle at the start of a shift and not report defects to anyone.

## Being a Safe Driver

Always proceed with caution. Operators have to rely on the ability to see over their loads if they have to brake for any reason. Looking in all directions is very important before moving a powered industrial truck. A defensive driver is a safe driver. Always be on the lookout for pedestrians or other vehicles. Use your horn as often as necessary to let others know where you are, especially when coming out of an aisle or turning a corner.

Always wait until the truck has come to a complete stop before moving from behind the control handle. Never drive toward a person that is standing in front of a fixed object. If you could not stop the truck for any reason, you could crush the person between the truck you are operating and the fixed object.

Never drive over objects that are on the floor. Doing so can ruin the tires and cause the truck or load to become unstable and may even cause you to lose control of the truck. Take the time to stop your truck and clear away the obstacle before proceeding.

Anticipate danger! Slow down before reaching wet or slippery floors. Always travel slowly across wet surfaces if you must cross them. Powder or liquid spills can reduce your ability to stop or turn your truck. Allow for longer stopping distances in such cases. Also, remember that your tires will remain wet even after you leave the "wet" area.

Always drive your truck in the direction that has the best visibility. Always look in the direction of travel. Do not rely on mirrors. On low lift trucks, it is recommended to travel with the load fully raised, if possible. On high lift units (those units with 8" or more of lift), travel with the load as low to the floor as practical. **NEVER CARRY RIDERS!**

When in aisles, follow the local traffic rules or drive in the center if there is no traffic. This will increase side-to-side visibility and allow the maximum time to anticipate danger. If, at any time, you are following another vehicle, always stay at least three (3) truck lengths behind. Increase this distance on wet or slippery floor conditions, on any other less than ideal surface conditions, or when going down an incline. Never pass at an intersection or when visibility or congestion makes it risky.

Keep a safe distance from the edge of any dock, platform, or freight door. Do not use your truck for opening or closing freight doors. Keep sufficient headroom under overhead installations, lights, pipes, heaters, sprinkler systems, etc.

Yield the right of way to all emergency vehicles. Stunt driving and horseplay are not permitted! Under all travel conditions, the truck must be operated at a speed that will permit it to be brought to a stop in a safe manner.

When approaching an intersection, look both ways and ahead for traffic. Slow down or stop, sound your horn and proceed with caution. Your horn signals others of your presence. Use overhead mirrors when they are available.

Remember that most powered industrial trucks steer with their rear wheels. This means that the rear end of the truck will swing wide when making turns. Whenever turning, always anticipate the clearance required for the rear-end swing.

All rider trucks with a load should travel with the forks uphill. If the truck does not have a load, it should travel with the forks pointing downhill.

No matter what type of truck you are operating on a ramp or incline: you should always make sure the bottom of the incline is not congested in case of emergency. You should stay in the center of the incline (do not make turns until you are on level ground) and avoid stopping on the incline. If you must stop, set the parking brake and block the wheels.

If your facility has an elevator, know the capacity of the elevator and the loaded weight of your truck before entering the elevator. Always drive onto an elevator with the load on first. Do not enter if people are present.

If your facility has railroad tracks, always cross them at an angle and never straight on. If necessary, always park at least eight (8) feet from the center of the railroad tracks. (Park at a distance of 8-1/2 feet from the center of the railroad tracks in California and Michigan).

A lift truck is considered "unattended" when the truck is not in view of the operator, or when it is in the operator's view, but more than 25 feet away. When you are not using your truck, park only in the designated parking area or in an out-of-the-way place. The lifting mechanism should be fully lowered, controls set to neutral, power shut off, brakes set, key removed, and battery is connected. Block wheels if truck is set on an incline. Never leave your truck parked in front of exits, safety stations or pedestrian walkways.

## Operating Position

The operator's position for your rider truck is taken by standing in the ride compartment at the back end of the truck and facing the control "T" handle. Reach out and/or up (with your palms facing downwards) and grasp the control handle with the right hand and the steering wheel knob with the left hand. *Do not step on any footswitch or pedal at this time! Do not turn the wheel or handle at this time!*

## Traveling and Steering

Your truck can be operated with the handle in an infinite range of positions (see Figure 3 below).

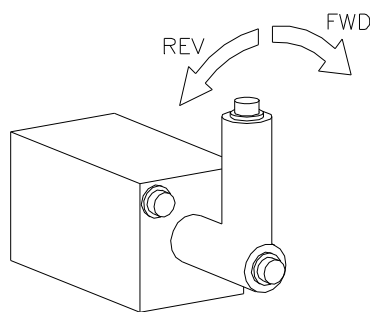


FIGURE 3

The power is “off” and the brake is applied while the key is in its “off” position (assuming the battery is plugged in). The brake is also applied as long as the footswitch or pedal is **not** depressed.

**To start the truck**, the key must be turned on. **Before** you travel, even without a load, it is recommended that you raise the “lift mechanism” for further floor clearance (unless your unit is a burden carrier and does not have lifting capabilities).

**To raise the lift mechanism** (the power does have to be on), depress the “lift” pushbutton typically located in the end of the control “T” handle (see Figure 4 below) but may have a different location than shown, depending on the configuration, so refer to the labeling on the unit.

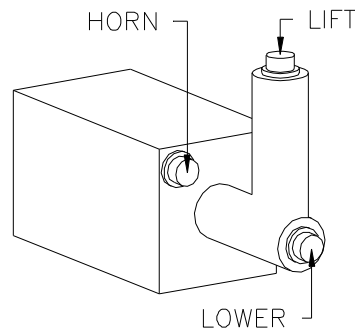


FIGURE 4 (Typical Configuration)

The longer you keep it depressed, the more lift you will attain. Letting go of the pushbutton will stop the lifting action.

#### Manual Control Valve Levers for Lifting

If your vehicle is equipped with manual control valve levers, instead of pushbuttons for lift and lower, they are mounted on the operator's right-hand side and on the drive compartment frame. The innermost lever (if there is more than one) controls lift and lower. Pull lever back to raise the lift mechanism. The longer you keep it pulled back, the more lift you will attain. Letting go of the lever will stop the lifting action. The control “T” handle should be in the vertical position when operating the manual control levers.

Now, **to travel forward or backward**, you must first release the brake. To do so, step on the footswitch or pedal and keep it pressed down. If you remove your foot, the brakes will be applied. **Travelling and steering on a rider truck is a two handed operation.** Keep a firm grip on the steering knob and slowly rotate the control “T” handle (in your right hand) in the direction in which you want to go. For smooth operation, rotate the handle slowly until the truck reaches its desired speed, such as the speed is proportional to rotation of the handle. Steer the truck by rotating the steering wheel (in your left hand) in the clockwise or counter-clockwise direction as needed. *Be aware that the back end of the truck is the steered end and will swing with rotation of the steering wheel.* Remain inside the operator's compartment at all times. Traveling in the forward direction is recommended. Use caution at all times.

If you are travelling and want to change directions, gradually release the control handle back to its neutral vertical position **before rotating it the other way and apply the brake** by stepping off of the footswitch or pedal **before travel direction is reversed**. Strict application of this driving practice will insure long continuance of service and do much to relieve maintenance attention. Quickly changing from forward to reverse (or vice verse) will cause motor “plugging”. Although this method is **not** recommended, “plugging” is a method of braking in which the motor connections are reversed so that the motor develops a counter-torque, which acts as a braking force. Plugging will not, however, stop the truck as quickly as braking. Always use brakes in congested areas, on

ramps, or when quick stops are required. *Avoid lurching when restarting by making sure you release the brake before you rotate the control handle.*

**Lowering the Lift Mechanism:** On the control “T” handle, depress the push button labeled “lower”. The pushbutton is typically located in the end of the control “T” handle (see Figure 4 above) but may have a different location than shown, depending on the configuration, so refer to the labeling on the unit. The longer you keep it depressed, the more it will lower. Letting go of the pushbutton will stop the lowering action.

#### Manual Control Valve Levers for Lowering

If your vehicle is equipped with manual control valve levers, instead of pushbuttons for lift and lower, they are mounted on the operator’s right-hand side and on the drive compartment frame. The innermost lever (if there is more than one) controls lift and lower. Push lever forward to lower the lift mechanism. The longer you keep it pushed forward, the more it will lower. Letting go of the lever will stop the lowering action. The control “T” handle should be in the vertical position when operating the manual control levers.

## Braking and Stopping

**To brake or stop your truck,** gradually release the control handle back to its neutral vertical position and slowly lift your foot off of the footswitch or pedal that you are depressing and allow it to return to its neutral position. If you quickly remove your foot, the truck will **not** immediately stop but rather slow to a complete stop. Be aware of that point and take that into account when you begin stopping.

## Load Handling

### Before You Start

Check the data and capacity plates prior to operating any truck. These plates contain specific information regarding the specifications, restrictions, and capacities of the truck. Do the plates match the truck and the options that are installed? Are the loads you will be handling within the rated capacity at a given lift height? Some trucks will have reduced capacities at elevated lift heights. Information regarding maximum load center is especially important. If you are unsure about any of the specifications, do not take any chances, ask your supervisor!

If the load you are carrying increases beyond the lift trucks’ capacity the rear of the truck will lift off the ground, your ability to brake and steer will be affected and the lift truck may tip forward.

If a load looks unstable, or if it is poorly stacked on a pallet, do not attempt to move it. A truck’s load center rating is for an evenly distributed load. If a load is unevenly distributed, it may need to be restacked, blocked, or banded. If it is not possible to redistribute the load, keep the heaviest part closest to the fork upright and carriage. Liquid loads require special attention due to fluid movement. Tall loads or loads that could shift should be wrapped or strapped to protect the load, the operator and other personnel in the area.

On pallet trucks, always fully raise the load when travelling. This helps prevent damage to the lifting mechanism when the truck passes over dockplates or expansion joints in the floor.

**Lift and lower with the mast upright vertical or tilted slightly back, never tilted forward!**

If the upright malfunctions in any way or becomes stuck in a raised position, DO NOT go under a raised upright or forks to attempt repairs. DO NOT climb on uprights to try to free hang-ups.

On high lift trucks, make sure the forks or attachments are adjusted properly. Forks should be spread as wide as practical and centered on the truck and under the load. Forks should support at least three quarters (3/4) of the length of the load. Forks that are longer than load itself can possibly damage materials or the structure behind the load you are intending to move.

## Moving Loads Around

**Approaching the Load:** Approach the load squarely with lift mechanism fully lowered and approximately centered under the load. Move the truck until the lift mechanism is completely under the load. When lifting an unevenly loaded pallet, keep the heavy load toward the mast. On a reach type truck, a manual valve will be supplied to extend the reach mechanism (see “Working in Racks”).

**Lift the Load:** (the power does have to be on), depress the “lift” pushbutton typically located in the end of the control “T” handle (see Figure 4 above) but may have a different location than shown, depending on the configuration, so refer to the labeling on the unit. The longer you keep it depressed, the more lift you will attain. Letting go of the pushbutton will stop the lifting action. Lift the load just high enough for clearance. If your truck is equipped with a tilt mechanism, tilt the load back slightly for added stability. Retract the reach mechanism if extended.

### Manual Control Valve Levers for Lifting

If your vehicle is equipped with manual control valve levers, instead of pushbuttons for lift and lower, they are mounted on the operator's right-hand side and on the drive compartment frame. The innermost lever (if there is more than one) controls lift and lower. Pull lever back to raise the lift mechanism. The longer you keep it pulled back, the more lift you will attain. Letting go of the lever will stop the lifting action. The control “T” handle should be in the vertical position when operating the manual control levers.

**Transporting the Load:** Before backing up with the load, look behind and to the sides. Always travel in the direction that offers the best visibility. Operate the truck as previously described when transporting the load to the desired location. Travel with the load or carriage as low as possible and tilted back. Never travel with the load or carriage raised in a high, elevated position. Observe all traffic regulations and always watch for other traffic, pedestrians, and other obstacles. Be aware of possible “blind spots” such as others coming out of aisle ways and be aware of overhead clearances. When the load blocks your visibility, travel in reverse with the load trailing (except when climbing an incline). Always be concerned with the stability of your truck and avoid sharp turns, sudden stops, and rapid acceleration when traveling with loads. Be sure to read the “Safety” chapter of this manual.

**Depositing the Load:** Position the load where you want it, and level the forks if tilted back. On the control “T” handle, depress the push button labeled “lower”. The pushbutton is typically located in the end of the control “T” handle (see Figure 4 above) but may have a different location than shown, depending on the configuration, so refer to the labeling on the unit. The longer you keep it depressed, the more it will lower. Letting go of the pushbutton will stop the lowering action. Continue holding the “lower” pushbutton until the lift mechanism is in a fully lowered position and the load is independent of the lift mechanism. Slowly withdraw from underneath the load after looking behind you and to the sides.

### Manual Control Valve Levers for Lowering

If your vehicle is equipped with manual control valve levers, instead of pushbuttons for lift and lower, they are mounted on the operator's right-hand side and on the drive compartment frame. The innermost lever (if there is more than one) controls lift and lower. Push lever forward to lower the lift mechanism. The longer you keep it pushed forward, the more it will lower. Letting go of the lever will stop the lowering

action. The control "T" handle should be in the vertical position when operating the manual control levers, continue holding it forward until the lift mechanism is in a fully lowered position and the load is independent of the lift mechanism. Slowly withdraw from underneath the load.

**When working in racks:** To put a load away when working with racks, square up the truck in front of the rack. With the load as close as practical to the rack, lift the load to the proper insertion height. Depending on the operation of the truck, position the load by either driving forward or extending the reach mechanism. When the pallet is in position, level the load if it was tilted. Lower the load and remove the forks. NEVER allow pedestrians to walk underneath raised forks. With the forks clear of the rack, lower the forks to the travel position. After looking in all directions, turn the truck into the aisle for travel. To remove a load, again position the truck squarely in front of the rack. Raise the forks to the proper level for the load. Insert the forks fully either by driving forward or if your truck is equipped with a reach mechanism, extending it until the forks are fully inserted. Lift the load and if available, tilt it back to add stability. Retract the load completely. After looking in all directions, back the truck slowly until the load clears the racks. Slowly lower the load into its travel position. After looking in all directions, turn the truck into the aisle for travel.

**NOTE** - Trucks may be equipped with special controls. See label on each truck before operating. In addition, each type of truck may have unique features or attachments that affect safe lifting procedures. If your truck has an attachment, be sure to read the manufacturer's operating instructions. Practice its safe operation until you can operate it safely. You will not be considered "trained" until you have been shown the specific operating procedures for the industrial truck that you will be using. You must also demonstrate your ability to properly operate the equipment.

## Working in Trucks and Trailers

To load or unload a truck or trailer, first, check to see that the trailer is locked to the dock, that it is supported properly with jack stands under the nose of the trailer, and that the rear wheel has a wheel block, or chock, in front of it. This will prevent the truck or trailer from rolling or being pushed away from the dock during loading operations. Next, check out the dock leveler or plate. Make sure that it safely and smoothly spans into the trailer and it will not move out of position. Make sure that it will handle the weight of the load and the industrial truck. Before you drive onto the trailer, visually inspect it to be sure that there is not any floor problems that could create a safety hazard. Move smoothly across dockplates. Keep your speed low. Never stop or park your truck on the dockplate.

## Working in Railcars

To load or unload a railcar, make sure that the brake is set and that the wheels are chocked. Ensure that the dockboard is the proper size and capacity to handle the weight of the truck and the load that you will be moving. Make sure that the mast will safely pass under the door opening with a load.

## Shut Down Completely

When leaving the lift truck unattended, make sure you leave it in a safe condition. Park the lift truck in a safe and designated area. The lifting mechanism should be fully lowered, controls set to neutral, power shut off, brakes set, key removed, and battery disconnected. Never park on a grade unless absolutely necessary and at that time, block the wheels. Block the wheels any time that you must park it and have any doubt about the truck moving from a safe position. Never park in areas that block emergency routes or equipment, access to fire aisles, or stairways, and fire equipment.



## Safety Concerns

### Configuration Style: STAND-UP RIDER STEERING

#### Safety Takes Place Everyday

Safety should be your primary concern when handling the truck. Operator carelessness or misjudgment causes most incidents and injuries. Adhere to the following safety hints and, at all times, use good common sense. Report any malfunctions and remove truck from service until it can be repaired.

Your powered industrial truck was designed with safety in mind. Never remove or bypass any safety features on your truck. Always perform the pre-operational check at the beginning of your shift as specified earlier in this manual. If there is anything wrong, do not operate the truck. Contact your supervisor immediately. Adhere to the truck's capacity ratings. Remember that your truck is a powerful machine and can weigh as much as several cars.

Powered equipment should be equipped with an all-purpose (ABC) fire extinguisher if the equipment travels where there are no extinguishers available. There should be only 50 to 75 feet of travel to an extinguisher if an operator needs one to put out a unit that may be on fire. The nature of the hazards in the facility will determine the distance to an extinguisher. Local fire codes can help determine this distance. Check the fire extinguisher's tag to ensure that a professional has serviced it during the past year. The gauge arrow should read full, the pin and seal should be intact. Be sure the bracket supporting the extinguisher is in place. Of course, proper training in the use of fire extinguishers is necessary.

#### Safeguard Your Unit

Make safety checks before use.

Don't let others operate your unit unless they are authorized and trained.

Use caution when changing direction. Come to a complete stop before changing direction.

Don't overload (know its capacity). Overloading could upset your unit or cause hydraulic or mechanical failure endangering both you and components.

Avoid sudden stops and starts.

Check the work area. Look for damaged floors, note overhead obstructions; note ramps and docks; make certain your unit is intended for ramp use), check traffic areas.

When leaving your unit unattended:

- Fully lower forks.

- Turn off key switch (if applicable).

- Avoid parking on inclines when possible.

- Block wheels of unit if you must park on an incline.

Maintain a distance of at least three truck lengths from the truck ahead.

Observe in-plant speed limits.

Keep truck under control at all times.

Don't pass other vehicles traveling in the same direction at intersections, blind spots, or other dangerous locations.

Avoid running over loose objects in the aisle.

When attachments are used, operate a partially loaded truck.

## Pedestrian Safety

The following safety procedures should be followed when working around pedestrians:

Take extra care because pedestrians may not be able to hear your approach in a congested, noisy environment. Scan the area carefully, looking for pedestrians.

Use your horn to warn pedestrians of your approach. Be sure you inspect the horn and, where present, alarms and lights before your shift starts.

Reduce your speed. Allow for slow-down at intersections, aisle ways, blind corners, where doors open to an aisle, dock areas, and where lighting is impaired.

Anticipate pedestrians stepping out in the path of travel, taking short cuts, or being oblivious to pieces of power equipment.

Where possible, drive in the middle of the aisle; this would allow for reaction time should someone step out in front of you.

Be prepared for the movement of pedestrians when entering a building from outdoors. Your eyes may need time to allow for an adjustment to the light and it could take a few minutes.

## Protect Other People

Don't let others operate your unit unless they are authorized and trained.

No riders (except for the operator).

When elevating personnel:

- Use a securely attached safety platform.

- Make certain lifting mechanism is operating properly.

- Mast vertical (never tilt when elevated if applicable).

- Make certain truck brake is set.

- Lift and lower smoothly.

- Watch for overhead obstructions.

- Never transport personnel on the platform from one location to another.

Watch for pedestrians and yield to their presence.

Slow down in congested areas.

Lower forks when parking or traveling.

Yield the right-of-way to vehicles on your right.

Don't follow too closely.

Sound your horn when approaching intersecting aisles.

Never drive your unit up to anyone standing in front of a fixed object.

Do not allow anyone to stand or pass under elevated portion of the truck.

Operate at a speed that will permit the truck to be brought to a stop in a safe manner.

Spread forks as far as the load will permit.

Handle only stable loads.

Use extreme care when handling long, high, or wide loads.

Tilting (if applicable):

- Tilt forward only to deposit or pick up load.

- Tilt forward only at lower elevations.

- Tilt rearward only to stabilize the load.

## Protect Yourself

Are you trained?

Watch for overhead obstructions.

Keep your arms, hands, and legs away from the lifting mechanism.

Keep feet clear of wheels.

Do not drive with wet or greasy hands.

Check capacity and mounting of dockboards before using.

Elevators:

- Do not drive onto elevator unless authorized.

Check capacity of elevator before entering.  
Check to make certain all personnel have left the elevator  
Enter elevator load first.  
Enter squarely and slowly.  
Neutralize control - Shut off power - Set brakes.  
Never pass or stand under elevator portion of truck.  
Maintain a safe distance from the edges of ramps, dockboards, and docks.  
Never use your unit in an unauthorized area or explosive atmosphere (unless unit is type "EX" rated).  
Ascend or descend grades slowly. With a load, travel with the forks uphill. Without a load, travel with forks downhill.  
Don't turn on grades, ramps, or inclines. Always travel straight up or down.  
Slow down when making turns.  
Travel with load against the vertical face of the forks and with load or lifting mechanism at minimum ground clearance and tilted back.

## Protect Other Property

Slow down for hazardous conditions (such as wet or slippery floors).  
Avoid bumping into objects.  
Be sure your load or forks are clear before lowering.  
Be alert - Anticipate.  
Yield to emergency vehicles.  
Travel in direction providing the best visibility.

For additional information pertaining to operating and maintenance procedures, we recommend American National Standards ANSI B56.1.

## Know Your Truck

Do not operate this truck unless you have been trained and authorized to do so. Read all warnings and instructions in this operator's manual and on this truck.

### ***Check Your Truck***

Truck should be checked daily before being placed in service. If found to be in need of repair, defective, or in any way unsafe it, should be reported immediately to the proper authority and the truck should be removed from service until it has been restored to safe operating condition.

### ***No Riders***

Only the operator is permitted to ride on this unit and in the compartment designated by us, the manufacturer. Do not carry passengers.

### ***Stand Clear***

Stay at arms length from control handle, keeps hands on handle grips and feet clear of truck. Never place any part of your body between the mast uprights or in linkage.

### ***Stabilize Your Load***

Do not handle unstable or loosely stacked loads. Use special care when handling long, high or wide loads to avoid losing the load, striking bystanders, or tipping the truck.

### ***Center Your Load***

When using forks, space them out as far as the load will permit. Before lifting, be sure the load is centered and forks are completely under the load.

**Never Overload**

Do not overload this truck. Check the capacity plate for load weight and load center information.

**Keep Load Low**

Travel with load or lifting mechanisms low as possible and titled back (when tilt is provided).

**Avoid Sudden Movements**

Start, stop, travel, steer, and brake smoothly. Use special care when travelling without a load as the risk over overturn is greater.

**Look Overhead**

Elevate forks and other lifting mechanisms only to pick up or stack a load. Lift and lower with the mast vertical or slightly tilted back (when tilt is provided), never forward. Watch out for obstructions, especially overhead.

**Minimum Tilt**

Operate a tilting mechanism smoothly and slowly. Do not tilt forward when elevated except to pick up a load. When stacking use only enough backward tilt to stabilize a load.

**Care on Ramps**

Use special care when operating on ramps. Travel slowly and do not angle or turn. Always travel with the load or lifting mechanism downhill.

**Secure Bridgeplates**

Drive carefully and slowly across dockboards or bridgeplates. Never exceed its rated capacity. Be sure it is properly secured.

**Watch People**

Do not allow anyone to stand or pass under load or lifting mechanisms.

**Use Work Platform**

Do not lift work personnel except on a securely attached, specifically designed work platform. Never transport personnel on forks or work platform.

**Shut Down Completely**

When leaving the truck unattended, lifting mechanism should be fully lowered, controls set to neutral, power shut off, brakes set, key removed, and battery disconnected. Never park on a grade unless absolutely necessary and at that time, block the wheels. Block the wheels any time that you must park it and have any doubt about the truck moving from a safe position.

**Failure to comply with these warnings will create an unreasonable risk of injury to you and others!**

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## Planned Maintenance

### Configuration Style: STAND-UP RIDER STEERING

#### Lift Truck Maintenance

Regular maintenance and care of your lift truck is not only important for full and efficient truck life, but also for your safety. The importance of maintaining your lift truck in a safe operating condition cannot be emphasized enough. Improperly used or maintained lift trucks can become hazardous and may lead to injury if neglected. The Occupational Safety and Health Act requires that truck users inspect their trucks before each shift to be sure they are in safe working order. Defects, when found, shall be immediately reported and corrected. The truck shall be taken out of service until it has been restored to safe operating condition.

To assist you in keeping your lift truck in service and in good operating condition, this section outlines general maintenance procedures that should be done at recommended intervals. (In-depth service information is included with your truck's parts manual). It is your responsibility to be alert for any indication that your truck may need service and have it attended to promptly. In addition to the daily inspection previously outlined in this manual, we recommend that you set-up and follow a periodic planned maintenance (PM) and thorough inspection program. **Only trained and authorized personnel shall be permitted to maintain, repair, adjust, and inspect industrial trucks – and in accordance with the manufacturer's specifications.** The specific schedule for these PM inspections depends on the conditions of your application and the lift truck usage. If you need more information on the care and repair of your BPR/Rico lift truck, please contact your dealer.

A planned maintenance program of regular, routine inspections and lubrication is important for long life and trouble free operation of your lift truck. Ensure that a record is kept at the workplace of any inspection, testing, maintenance, repair or modification to the truck– and the name and qualifications of the person doing the work. Use these records to help establish the correct PM intervals for your application and to indicate maintenance required to prevent major problems from occurring during operation.

#### Typical Operating Conditions

Time intervals between maintenance are largely determined by operating conditions and the following indicated intervals are intended for **normal** operation.

Operating conditions are defined as follows but since operating environments vary widely, these descriptions are highly generalized and should be applied as actual conditions dictate:

*Normal Operation* – Eight hours of material handling, mostly in buildings or in clean, open air on clean, dry, paved surfaces.

*Severe Operation* – Prolonged operating hours or constant usage.

*Extreme Operation* – Use in sandy or dusty locations, such as cement plants, lumber mills, and coal dust or stone crushing sites. Use in high temperature locations, such as steel mills, foundries, etc. Use in sudden temperature changes, such as constant trips from buildings into the open air, refrigeration plants, etc.

If your lift truck is operating in severe or extreme conditions, the maintenance intervals listed must be shortened accordingly. If you need more information on the care and repair of your BPR/Rico lift truck, please contact your dealer.

## Safe Maintenance Practices

### **For safety, it is good practice to:**

Remove all jewelry (watch, rings, bracelets, etc.) before working on this truck. Disconnect the battery before working on electrical components. Always wear safety glasses. Wear a safety hard hat in industrial plants and in special work areas where protection is necessary and required.

The following instructions are from current industry and government safety standards applicable to industrial truck operator and maintenance. These recommended procedures specify conditions, methods, and accepted practices that aid in the safe maintenance of industrial trucks. They are listed here for the reference and safety of all workers during maintenance operations. If you need more information on the care and repair of your BPR/Rico lift truck, please contact your dealer.

- Powered industrial trucks can become hazardous if maintenance is neglected. Suitable maintenance facilities, trained and authorized personnel, and procedures shall be provided.
- Maintenance and inspections of all powered industrial trucks shall be done in conformance with the manufacturer's recommendations.
- A scheduled planned maintenance, lubrication, and inspection format shall be followed.
- **Only trained and authorized personnel shall be permitted to maintain, repair, adjust, and inspect industrial trucks – and in accordance with the manufacturer's specifications.**
- Properly ventilate the work area and keep the shop clean and the floor dry.
- Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check fluid or electrolyte levels. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.
- Before starting work on truck, (a) raise the drive wheels free of the floor and use blocks or other positive truck positioning devices, (b) put blocks under the load-engaging mean, inner masts, or chassis before working on them, (c) disconnect battery.
- Operation of the truck to check performance must be conducted in an authorized, safe, clear area.
- Before starting to drive the truck, make sure the brake is applied, put the directional control in neutral, connect the battery, turn the key switch to the ON position, release the brake, check functioning of hydraulic systems, directional and speed controls, speed, brakes, warning devices, and any load handling attachments.
- Before leaving the truck, stop, fully lower the load engaging means (upright, carriage, forks, or attachments), tilt upright forward., put directional control in neutral, apply the brake, turn the key switch to the OFF position, disconnect the battery, block the wheels if the truck must be left on an incline or any time you have doubt about the truck moving from a safe position.

- Carefully and regularly inspect and maintain brakes, steering mechanisms, control mechanisms, warning devices, lights, lift overload devices, lift and tilt mechanisms, and frame members in a safe operating condition.
- Special trucks or devices designed and approved for hazardous area operation must receive special attention to insure maintenance preserves the original approved safe operating features.
- All hydraulic systems must be regularly inspected and maintained in conformance with good practice. Tilt and lift cylinders, valves, and other parts must be checked to assure that “drift” or leakage has not developed to the extent that it would create a hazard.
- When working on hydraulic systems, be sure the battery is disconnected, mast upright is in the fully lowered position, and hydraulic pressure is relieved in hoses and tubing. Do not check for hydraulic leaks with your bare hands.
- **Always put blocks under the carriage and upright rails when it is necessary to work with the upright in an elevated position.**
- The truck manufacturer’s capacity, operation, and maintenance instruction plates, tags, or decals must be maintained in legible condition.
- Batteries, limit switches, protective devices, electrical conductors, and connections must be maintained in conformance with good practice. Special attention must be paid to the condition of electrical insulation.
- To avoid injury to personnel or damage to the equipment, consult the manufacturer’s procedures in replacing contacts on any battery connection.
- Industrial trucks must be kept in a clean condition to minimize fire hazards and help in the detection of loose or defective parts.
- Modifications and additions that affect capacity and safe truck operation must not be done without the manufacturer’s prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals must be changed accordingly.
- Care must be taken to assure that all replacement parts, including tires, are interchangeable with the original parts and of a quality at least equal to that provided in the original equipment. Parts, including tires, are to be installed per the manufacturer’s procedures. Always use genuine BPR/Rico or BPR/Rico approved parts.
- Use special care when removing heavy components from the truck, such as upright, battery, etc., as the truck can become unstable and tipover. Be sure that lifting and handling equipment is of correct capacity and in good condition.

**You should also be familiar with additional operating and maintenance safety instructions contained in the following publications:**

General Industry Standards, OSHA 2206: OSHA Safety and Health Standards (29 CFR 1910), Subpart N – Materials Handling and Storage, Section 1910.178 Powered Industrial Trucks. For sale by: Superintendent of Documents, U.S. Government Printing Office, Washington, DC, 20402.

ANSI/ASME B56.1: Safety Standard for Low Lift and High Lift trucks (Safety Code for Powered Industrial Trucks). Published by: Society of Mechanical Engineers, United Engineering Center, 345 E. 47<sup>th</sup> Street, New York, NY 10017.

NFPA 505-1982: Fire Safety Standards for Powered Industrial Trucks: Type Designations, Areas of Use, Maintenance and Operation. Available from National Fire Protection Association, Inc., Batterymarch Park, Quincy, MA 02269.

## Daily Maintenance Checks

For daily maintenance checks, follow the “Daily Inspection Checklist – CHECK BEFORE OPERATION” section found in Chapter 1. Both visual and operational checks should be preformed daily.

## Periodic Maintenance Checks

The following maintenance intervals relate to the truck’s operating hours as recorded by the truck’s hour meter and based on normal operating conditions as defined above.

50 – 250 hours or Every Month

- Perform the Daily Maintenance Checks as usual
- Check truck visually and inspect components
- Test drive truck and check functional performance
- Air clean truck (described below in this chapter)
- Check torque on all fasteners (torque specified in the parts manual)
- Lubricate truck per lubrication chart in parts manual (bearings, chains, pivots, rollers, etc.)
- Clean and check battery terminals and electrolyte level
- Check battery cables and truck receptacle
- Perform battery load test
- Check drive motor brushes (replace as required)
- Check lift motor brushes (replace as required)
- Check steer motor brushes (replace as required)
- Test ground
- Check hydraulic fluid level
- Check transmission fluid level
- Check lift chain adjustment and wear
- Check brake condition and wear
- Check drive wheel mountings and fasteners

## Inspection Information for Forks, Lift Mechanisms, and Hydraulic Fluid

The below information is not intended to be a thorough description of all inspection procedures, but rather a reiteration of information that should be part of existing procedures.

### Lift Truck Forks

Neglected forks on a lift truck can be potentially dangerous. Forks can wear a long time if not abused by operators. Descriptions of fork damage include overloading, modifications, attachments, stress to the fork, hidden damages and cracks. A basic rule of lift truck operation is to keep the forks low when traveling. This could wear forks if an operator allows them to drag on the floor. This practice can wear the heel and bottom of the fork, which reduces fork capacity.

Inspect the load forks for cracks, breaks, bending and wear. The fork top surfaces should be level and even with each other. The height difference between both fork tips should be no more than 3% of the fork length. The Industrial Truck Association recommends that forks be withdrawn from service when the fork blade thickness has been reduced by 10%. Inspect the forks for twists and



bends. Inspect the fork latches. Be sure they are not damaged or broken and operate freely and lock correctly. Check the fork stop pins for secure condition.

## Lift Mechanisms and Control Levers

Check the function of the lift system and controls. Be sure that there is adequate overhead clearance before raising the mast upright. If your truck is equipped with manual control levers, pull back on the lift/lower control lever momentarily. Release the lever. It should spring back to the neutral position freely without assistance. If your truck has other control levers, they should return to neutral as well when they are tested. Pull back on the lift/lower control lever and raise the fork carriage to its full height. Watch the upright assembly as it rises. All movements of the upright, fork carriage, and lift chains must be even and smooth, without binding or jerking. Watch for chain wobble or looseness; chains should have equal tension and move smoothly without noticeable wobble. Release then lever, again it should spring back freely to the neutral position. If the maximum fork height is not reached, this is an indication that there is an inadequate oil level in the hydraulic tank or severe binding within the mast upright. Push the lift/lower control lever forward. Watch the upright as it lowers. Movement should be smooth and even. When the forks reach the floor, release the lever. It should spring back freely to the neutral position.

If your truck is equipped with an attachment, test the control lever for correct function and briefly operate the attachment, checking for smooth operation.

## Hydraulic Fluid

Check the hydraulic tank fluid level. Correct fluid level is important for proper system operation. Low fluid level can cause pump damage. Hydraulic fluid expands as its temperature rises. Therefore, it is preferable to check the fluid level at operating temperature (after about 30 minutes of truck operation). The hydraulic fluid level should be checked with the truck parked on a level surface. Check the condition of the fluid (age, color or clarity, contamination). Change the oil as necessary. Keep the oil level at the recommended level and add only recommended and new hydraulic fluid (see parts manual). Do not overfill.

## Cleaning the Lift Truck

Always maintain a lift truck in a clean condition. Do not allow dirt, dust, lint or other contaminants to accumulate on the truck. Keep the truck free from leaking oil and grease. Wipe up all oil spills. Keep the controls and drive compartment clean, dry, and safe. A clean lift truck makes it easier to see leakage and loose, missing, or damaged parts. A clean condition helps prevent fires and helps the truck run cooler. The environment in which a lift truck operates determines how often and to what extent cleaning is necessary.

**Before air cleaning a truck, suitable eye protection and protective clothing must be worn. Make sure no one is in the vicinity of the direction of air blow off.**

Lift trucks should be air cleaned at every PM interval, and more often if needed. Use an air hose with special adapter or extension having a control valve and nozzle to direct the air properly (and away from you). Use clean, dry, low pressure compressed air. Restrict air pressure to 30 psi (207kPa), maximum (OSHA requirement). Air clean the upright assembly, drive compartment, battery, cables, switches, wiring, transistor controller, motors, and linkages.

# Industrial Batteries

## Configuration Style: STAND-UP RIDER STEERING

### Industrial Battery Safety and Hazards

A fundamental understanding of industrial truck power sources is important for all operators. Each facility may have its own procedures and rules for charging or refueling trucks. Learn and understand the specific procedures, rules and equipment that apply to your situation. Do not attempt to change or charge a battery until you have been shown how and where to do so by your trainer or supervisor. **Industrial batteries, by their very nature, can be dangerous if not used or handled properly.**

#### Battery Safety Basics

Batteries are very heavy. Respect their weight when you have to move them.

Your truck should be unloaded, lifting mechanism, forks or attachment lowered to the floor, and parking brake set before recharging. The operator should not be on the truck.

Properly size the battery to the truck battery compartment. There should be no more than 1/2" on all sides. Otherwise, the battery may shift and throw off the balance of the truck.

Make sure the battery weight complies with the counter balance rating of the truck. If it does not, the truck will not be balanced properly and the rated load capacity of the truck is no longer valid.

When lifting a power battery, always use a lifting beam. Using a chain with two hooks can stress the battery tray and cause distortion and internal damage.

When lifting a power battery with a metal lifting device, be careful not to let the lifting device come in contact with the battery terminals. Temporarily place a non-conductive material over the top of the battery while lifting so that contact cannot be made.

#### Working Safely Around Batteries and Charging Them

Before you handle any chemical, it is a good idea to review its characteristics and handling requirements. This information is found on the "Material Data and Safety Sheet" or "MSDS Sheet" located on file in your facility. Ask your trainer or supervisor for help if you are unsure how to read a MSDS Sheet.

Only properly trained personnel should be involved with the maintenance of the batteries and the handling of the battery acid. If you do not have trained personnel available, contact your local battery representative for service.

#### ***A properly equipped battery charging area will have:***

➤ An eyewash able to provide 15 minute flow. For large installations, a plumbed drench shower and eyewash should be provided.

- A phone or other means of communication in the immediate area for use in the event of an emergency.
- Adequate ventilation to avoid the build up of hydrogen gas during battery charging. (This is dependent on the location and size of the battery charging area. However, a guideline for minimum protection is two to three air changes per hour.
- Soda ash or other neutralization materials immediately available.
- A dry chemical, CO<sub>2</sub> or foam fire extinguisher in the immediate area.

**Charging a battery.**

Hydrogen gas generation during charging!

Always assume there is flammable hydrogen gas present in a battery charging area. Hydrogen gas is potentially explosive if it is allowed to accumulate in a closed area. Observe the following:

- No smoking.
- Use non-sparking tools and prevent open flames, sparks or electrical arcs in battery areas.
- Adequate ventilation must be provided for dispersal of fumes and gases from batteries when they are on charge.
- When charging, open the battery cover so the hydrogen gas can vent better. This is particularly important in confined areas.

Make sure that the correct charger is selected for the battery. Be sure to check the cables and connectors for breaks or corrosion. If charging on the truck, make sure to connect the charge to the battery, NOT the truck. Follow the specific instructions on the battery charger for daily or weekend charging cycles. Never overcharge a battery. Overcharging reduces battery efficiency and useful life.

After charging, make sure that the cells contain the proper level of water. Never use a match or a lighter to look in the cells because the gasses that are given off are explosive. Water is lost during normal operation and during the charging process. Because the battery contains sulfuric acid which can cause severe burns or even blind you, use protective equipment to add water to the battery. Follow the specific instructions provided by the battery and charger manufacturers.

**Battery Hazards**

**The battery acid**

Battery acid is dilute sulfuric acid. It is corrosive and it can cause severe burns. When handling battery acid and watering the battery always:

- Wear chemical splash goggles or full-face shield with safety glasses equipped with side shields.
- Wear acid-proof gloves (rubber or neoprene).
- Wear acid-resistant clothing or plastic apron.
- Wear acid-resistant safety shoes or boots.

Employees working around battery acid should not wear contact lenses. In the event of an acid splash to the eyes, the acid could be held against the eye by the lenses. This will make it harder to flush the acid away – causing more serious damage to the eye.

### **Hydrogen gas generation during charging**

Always assume there is flammable hydrogen gas present in a battery charging area. Hydrogen gas is potentially explosive if it is allowed to accumulate in a closed area. Observe the following:

- No smoking.
- Use non-sparking tools and prevent open flames, sparks or electrical arcs in battery areas.
- Adequate ventilation must be provided for dispersal of fumes and gases from batteries when they are on charge.
- When charging, open the battery cover so the hydrogen gas can vent better. This is particularly important in confined areas.

### **Electrical hazard**

Even when disconnected from the forklift, batteries present an electrical hazard.

- Do not wear conductive metal jewelry when working around batteries.
- Do not put metal articles or tools on top of the batteries. Be careful not to put conductive articles across the battery posts.
- Do not use the battery connector as a circuit breaker. Always shut the charger off when connecting or disconnecting the battery. An arc or spark could cause an explosion.
- Use only non-sparking, non-conductive tools.
- Keep the vent plugs in place at all times except when adding water to the cells or taking hydrometer readings.
- Check the battery cables and cable connectors regularly. If the insulation is worn or contacts are pitted, have the truck removed from service and make repairs immediately.

## **Battery Maintenance, Cleaning and Emergency Procedures**

Keeping the top of the battery clean is a safety issue. A heavy build-up of corrosion can allow electrical shorts or arcing to occur, which could cause the battery to explode. A clean battery dissipates heat more efficiently and lasts longer.

### **Safety Equipment**

- Wear chemical splash goggles or full-face shield with safety glasses equipped with side shields.
- Wear acid-proof gloves (rubber or neoprene).
- Wear acid-resistant clothing or plastic apron.
- Wear acid-resistant safety shoes or boots.

### **The Cleaning Procedure**

**Frequency** = when you see corrosion by products around the battery terminals.

- Mix a solution of one pound baking soda to one gallon of water.
- With the vent plugs in place, brush the solution around the top of the battery until fizzing stops.
- Make sure to brush the outside cells and the rim of the metal battery tray.
- Carefully rinse the top of the battery with clean water and dry.
- Inspect the black sealing compound where the cells are against the steel tray. If the sealing compound appears to be cracked, contact your local service representative to have it repaired.

### **Emergency Procedure in the Event of Acid Splash on Personnel**

#### **Skin**

Remove acid-soaked clothing immediately.  
Flush acid contact area thoroughly with clean water for at least five minutes.  
If redness or burns occurs, seek medical help.

#### **Eyes**

Remove safety eye wear and immediately flush with low pressure clean water for 15 minutes.  
Seek medical attention immediately.

### ***If Acid is Swallowed***

Call for emergency medical assistance immediately.

#### If victim is unconscious:

- Remove victim from battery area and provide fresh air.
- Maintain open airway. Start CPR if it becomes necessary.
- If properly trained personnel are available, provide oxygen.

#### If victim is conscious:

- Wash out mouth with abundant amounts of water.
- Remove victim from battery area and provide fresh air.
- Immediately give the victim milk to drink.
- Do not induce vomiting.
- Monitor the victim's breathing and condition. Start CPR if it becomes necessary.

## Acid Spills

### ***Safety Equipment***

- Wear chemical splash goggles or full-face shield with safety glasses equipped with side shields.
- Wear acid-proof gloves (rubber or neoprene).
- Wear acid-resistant clothing or plastic apron.
- Wear acid-resistant safety shoes or boots.

### ***Spill Response***

Neutralize the spill with soda ash or baking soda to a pH of six (6) to nine (9). The acid reaction is complete when the soda ash or baking soda stops fizzing. Verify the acid is neutralized by checking the pH.

Contact your local environmental authorities to determine proper disposal protocol for your site.

The neutralized material can be absorbed onto clay or some other absorbent material if necessary.

## Proper Handling of Spent Lead-Acid Batteries

Lead-acid batteries are recyclable and are hazardous if they are not handled properly.

It is illegal to dispose of lead-acid batteries as municipal trash and land filling or waste incineration should not dispose of batteries.

Your local battery representative may provide a recycling program for spent batteries. Contact them for details.

## General Terminology

### Configuration Style: STAND-UP RIDER STEERING

#### Rider Lift Truck Terminology

It is vital that you have an understanding of the terminology associated with the truck that you will be operating.

**Adjustable Fork** – Forks that can be moved closer together or farther apart to fit a load (may be either manual or powered).

**ANSI** – American National Standards Institute. Section B56.1 refers to standards for safety and stability for powered industrial trucks.

**Articulated** – When two wheels on a common assembly are connected to the truck at a center pivot point. This articulated or jointed mechanism provides a pivoting action for leveling effect and to maximize control and traction.

**Attachments** – A device other than conventional forks mounted on the fork carriage of a truck for handling particular loads.

**Battery Discharge Indicator** – A meter or gauge that indicates the state-of-charge in the battery.

**Battery, Industrial** – A classification used on lift trucks capable of handling extended usage and recharging several times over its life. The battery stores an electrical charge and furnishes the current required for operation of your truck.

**Capacity** – The rating given a truck indicating the amount of weight that a truck will lift to a predetermined fork height at a specified load center of an evenly distributed load.

**Carriage** – A support structure for the load platform that is roller mounted and is restrained to travel vertically within the mast.

**Casters** – Non-powered wheels containing a swiveled base that allows them to turn freely. Used for additional stability.

**Center of Gravity** – the point on an object at which all of the object's weight is concentrated. For symmetrical loads, the center of gravity is at the middle of the load.

**Counterweight** – the weight that is built into the truck's basic structure and is used to offset the load's weight and to maximize the vehicle's resistance to tipping over.

**Dockboard** – A device that acts as a bridge between the gap of a dock and the bed of a vehicle.

**Drive End** – The section of the truck that houses the electrical components, the hydraulic components, the drive unit, and their related parts.

**Drive Tire**– The tire located on the drive unit that propels the vehicle, may be solid rubber or polyurethane.

**Fixed Forks**– Forks that are welded to the fork carriage and whose spread cannot be changed or adjusted.

**Fork Face**– The front surface of the forks.

**Fork Heel**– The bottom surface located at the bend in the fork.

**Fork Length**– The total length of the forks measured from the fork face to the fork tip.

**Fork Spread**– The dimension from the outside of one fork to the outside of the other fork.

**Free Lift**– The height the forks reach before the collapsed height of the truck begins to rise. On a truck with full free lift, the fork carriage travels to the top of the inner mast before this inner mast begins to rise. On a truck with limited free lift, the forks rise from 6" to 12" before the inner mast begins to rise.

**Fulcrum** - the truck's axis of rotation when it tips over.

**Grade** - the slope of a surface, which is usually measured as the number of feet of rise or fall over a hundred foot horizontal distance (the slope is expressed as a percent).

**Grade Clearance**– The maximum grade that a truck will clear empty and loaded without contact between the floor and the truck.

**Gradeability**– The maximum percent of slope that the truck can negotiate with a capacity load.

**Hour Meter**– A meter or gauge that indicates the amount of time, in cumulative hours, that the truck has been used.

**Lift Chains**– A flexible series of connecting links (leaf chain) that transmit the lift force from the hydraulic cylinder to the carriage and load platform.

**Limit Switch**– A switch that limits movement of components or systems to predetermined settings.

**Line of Action** - an imaginary vertical line through an object's center of gravity.

**Load Center (1)** - the horizontal distance from the load's edge (or the fork's or other attachment's vertical face) to the line of action through the load's center of gravity.

**Load Center (2)** - The rating that is one-half the length of the maximum uniformly distributed load that a truck can safely pick up.

**Load Wheels**– The wheels located on in the outrigger housing, at the load end of the truck. Load wheel configurations may be single, dual, or tandem, and are usually made of polyurethane.

**Mast**– The vertical uprights of a high lift truck that provide guideways for the carriage and load platform to travel a given distance for raising or lowering.

**Moment** - the product of the object's weight times the distance from a fixed point (usually the fulcrum). In the case of a powered industrial truck, the distance is measured from the point at which the truck will tip over to the object's line of action. The distance is always measured perpendicular to the line of action.

**Nameplate** – A plate attached to each truck that contains important information about the truck. Such information includes the model, the serial number, the weight, the capacity, the load center, etc.

**OSHA** – Occupational Safety and Health Administration. The governing body that monitors and enforces standards reacting to industrial safety.

**Outriggers** – The stabilizing structure extending from the drive end, beyond the mast, and out under the load platform to support the load reactions of the chassis, with and without the load.

**Overhead Guard** – A framework mounted on a lift truck and positioned above the riding operator's head to protect against falling objects but not a capacity load.

**Reservoir** – A container (tank) used for the storage of fluid for the hydraulic system.

**Safety Bolts** - Bolts installed in the mast of a truck to ensure that the inner mast and/or lifting mechanism carriage can not somehow become disassembled from the mast during operation.

**Side Shift** – A function that allows the forks to travel horizontally to the left and/or to the right to aid in the loading or unloading.

**Steering Arm** – The mechanism on such trucks that includes that control handle and related parts that the operator uses to steer, brake and operate the truck.

**Track** - the distance between the wheels on the same axle of the truck.

**Turning Radius** – The radius of a circle created by the outmost projection of a lift truck when the operator has the steering mechanism in the tightest turning position.

**Type “E”** – This rating means the designated units are electrically powered units that have minimum acceptable safeguards against inherent fire hazards.

**Type “EE”** – This rating means the designated units are electrically powered units that have, in addition to all the requirements for the E units, the electric motors and all other electrical equipment completely enclosed. In certain locations the EE unit may be used where the use of an E unit may not be considered suitable.

**Type “EX”** – This rating means the designated units are electrically powered units that have electrical fittings and equipment designed, constructed and assembled so that the units may be used in certain atmospheres containing flammable vapors or dusts.

**Wheel base** – The distance between the center points of the front load wheels and the rear drive wheels. Wheelbase length affects turning radius and stability.



## A Final Word on Powered Industrial Trucks

Be sure you have read this manual in its entirety, as there are many safety notes and advisories throughout each section. You must be a trained and authorized operator in order to operate this vehicle. Operating a powered industrial truck is a very important responsibility. You are responsible for your own safety and that of those around you. Understand and practice the material presented in this manual. Make sure you receive hands-on training and practice operating the equipment you will use before using it with a load. Review the operator's manual for specific information about the safe operating procedures of your truck. Understand and abide by the safe operating guidelines for your facility.

Powered industrial trucks are designed and manufactured in accordance with the requirements of the OSHA Safety and Health Standards (29 CFR 1910.178) and recommendations of the American Society of Mechanical Engineers/American National Standards Institute (ASME/ANSI) B56.1. It is fully anticipated that the user will operate and maintain the truck in accordance with these same standards. **You should also be familiar with additional operating and maintenance safety instructions contained in the publications listed in the maintenance chapter of this guide!** Learn and know these rules and regulations!

# Index

## A

Adjustable Fork .....	37
ANSI.....	30, 37
Articulated .....	37
Attachment .....	12, 37

## B

Batteries.....	33
Acid Spills.....	36
Acid Splash on Personnel .....	35
Cleaning .....	35
Emergency Procedure.....	35
Hazards.....	34
Proper Handling of Spent .....	36
Safety Basics.....	33
Working Safely Around and Charging .....	33
Battery Data Plates.....	12
Battery Discharge Indicator .....	14, 37
Battery, Industrial.....	37

## C

Capacity.....	12, 37
Capacity Plates.....	11
Carriage .....	37
Casters .....	37
Center of Gravity .....	37
Cleaning the Lift Truck.....	32
Control T Handle .....	14, 19
Counterbalance Trucks .....	7
Counterweight .....	37

## D

Decals	
Other Safety and Warning .....	13
Dockboard .....	37
Drive Compartment Layout .....	14
Drive End.....	37
Drive Tire .....	38

## E

Elevator.....	<i>See</i> Operating and Driving the Truck
Elevators.....	25

## F

Fire Extinguisher.....	24, 34
Fixed Forks.....	38
Flammable Hydrogen Gas .....	34, 35
Foreword.....	2
Fork Face.....	38
Fork Heel.....	38
Fork Length .....	38
Fork Spread.....	38
Free Lift .....	38

Fulcrum .....	38
<b>G</b>	
Grade .....	38
Grade Clearance.....	38
Gradeability .....	38
<b>H</b>	
Horn Button .....	14
Hour Meter .....	14, 38
<b>I</b>	
Inspecting the Vehicle	
Before Operation .....	15
Daily Inspection Checklist.....	15
Inspection Information.....	31
Hydraulic Fluid.....	32
Lift Mechanisms and Control Levers.....	32
Lift Truck Forks.....	31
<b>K</b>	
Key Switch .....	14
<b>L</b>	
Lift and Lower	
Buttons .....	14
Manual Control Valve Levers.....	14
Lift Chains .....	38
Limit Switch .....	38
Line of Action.....	38
Load Center .....	38
Load Handling .....	21
Before You Start.....	21
Moving Loads Around .....	22
Working in Racks.....	23
Working in Railcars.....	23
Working in Trucks and Trailers.....	23
Load Wheels.....	38
Lowering the Lift Mechanism.....	21
<b>M</b>	
Maintenance.....	28
Daily Checks .....	31
Lift Truck .....	28
Operating Conditions.....	28
Periodic Checks.....	31
Safe Practices.....	29
Manual Control Valve Levers.....	14, 20, 22
Mast.....	38
Model.....	12
Moment .....	38
<b>N</b>	
Nameplate.....	39
NFPA.....	31
<b>O</b>	
Operating and Driving the Truck.....	17

Approaching an Intersection.....	19
Braking and Stopping.....	21
Difference from a Car.....	17
Elevator.....	19
Following Another Vehicle.....	18
Leaving it Unattended.....	19
Operating Position.....	19
Proceed with Caution.....	18
Railroad Tracks.....	19
Safe Driver.....	18
Traveling and Steering.....	19
OSHA.....	2, 30, 39
Outriggers.....	39
Overhead Guard.....	39

**P**

Pallet Trucks.....	6
Platform Trucks.....	6
Plugging.....	20
Publications.....	30

**R**

Raising the Lift Mechanism.....	20
Rating Type.....	12
Reach Trucks.....	8
Reservoir.....	39

**S**

Safety.....	24
Know Your Truck.....	26
Other People.....	25
Other Property.....	26
Pedestrian.....	25
Safeguard Your Unit.....	24
Yourself.....	25
Safety Bolts.....	39
Serial Number.....	11
Shut Down.....	23
Side Shift.....	39
Stability	
Basic Principles of.....	9
Center of Gravity.....	8
Dynamic.....	11
Factors Leading to Tip Over.....	8
Lateral.....	10
Longitudinal.....	10
of Powered Industrial Trucks.....	8
Stability Triangle.....	9
Starting the Truck.....	20
Steering Arm.....	39
Steering Wheel or Lever.....	15
Straddle Trucks.....	7

**T**

Terminology.....	37
Track.....	39
Truck Operation	
General Overview.....	5

Where Used.....	5
Turning Radius .....	39
Type "E" .....	39
Type "EE" .....	39
Type "EX" .....	39
Types of Riders	
High Lift Units.....	6
Low Lift Units .....	6
<b>V</b>	
Volts .....	12
<b>W</b>	
Weight, Truck.....	12
Wheel base.....	39



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