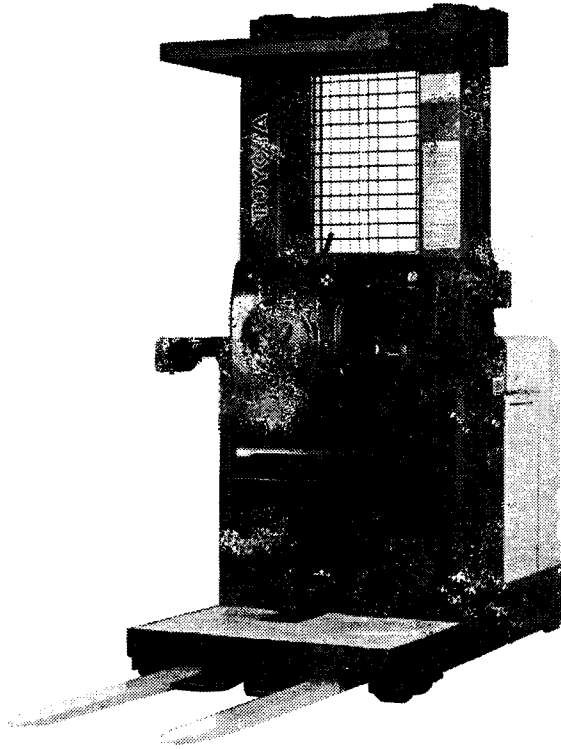


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# Service Manual



## TOYOTA ORDERPICKER

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**Model 6BPU15**

**Serial No. 70001-79999**

**00700-CL221**

**Issued: 9/10/98**

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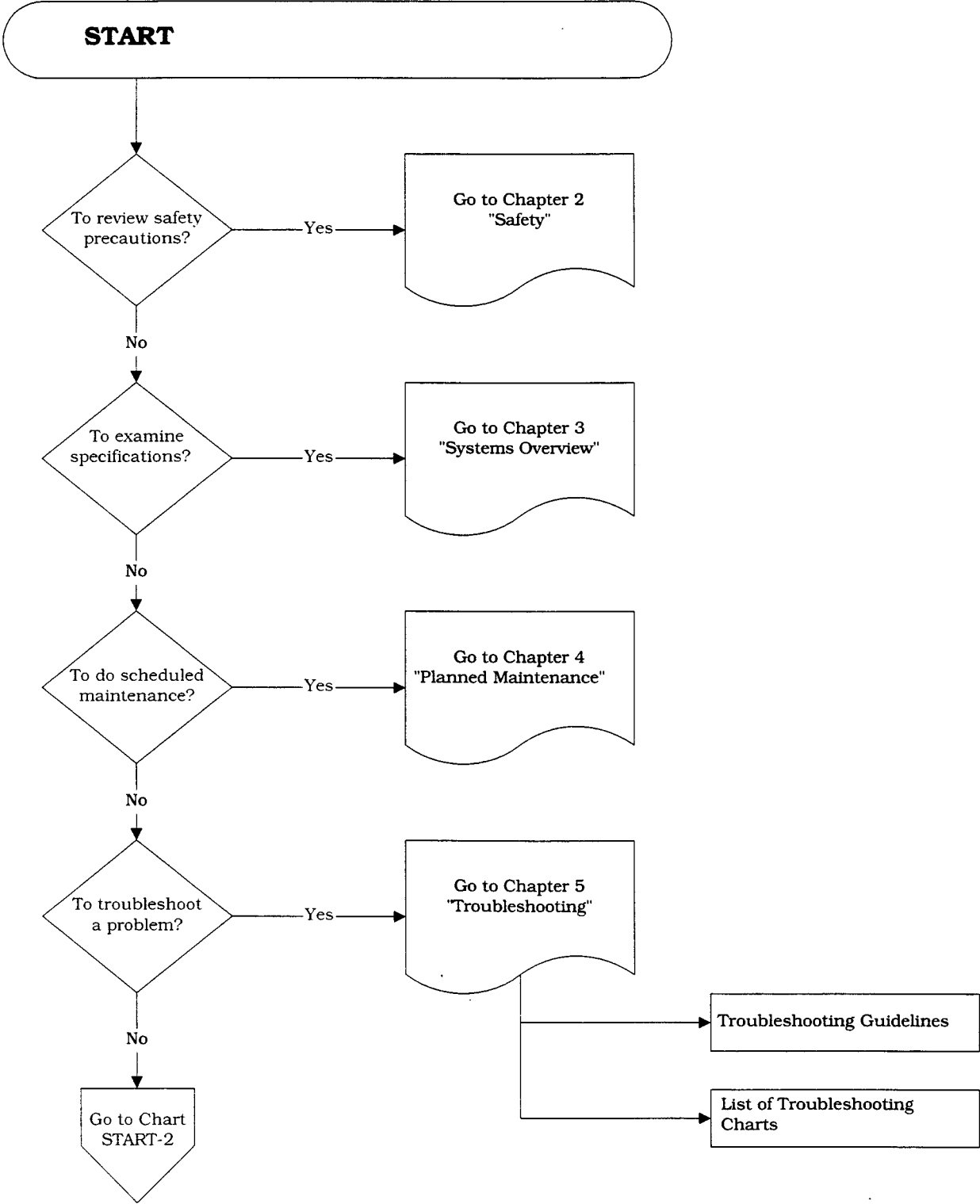
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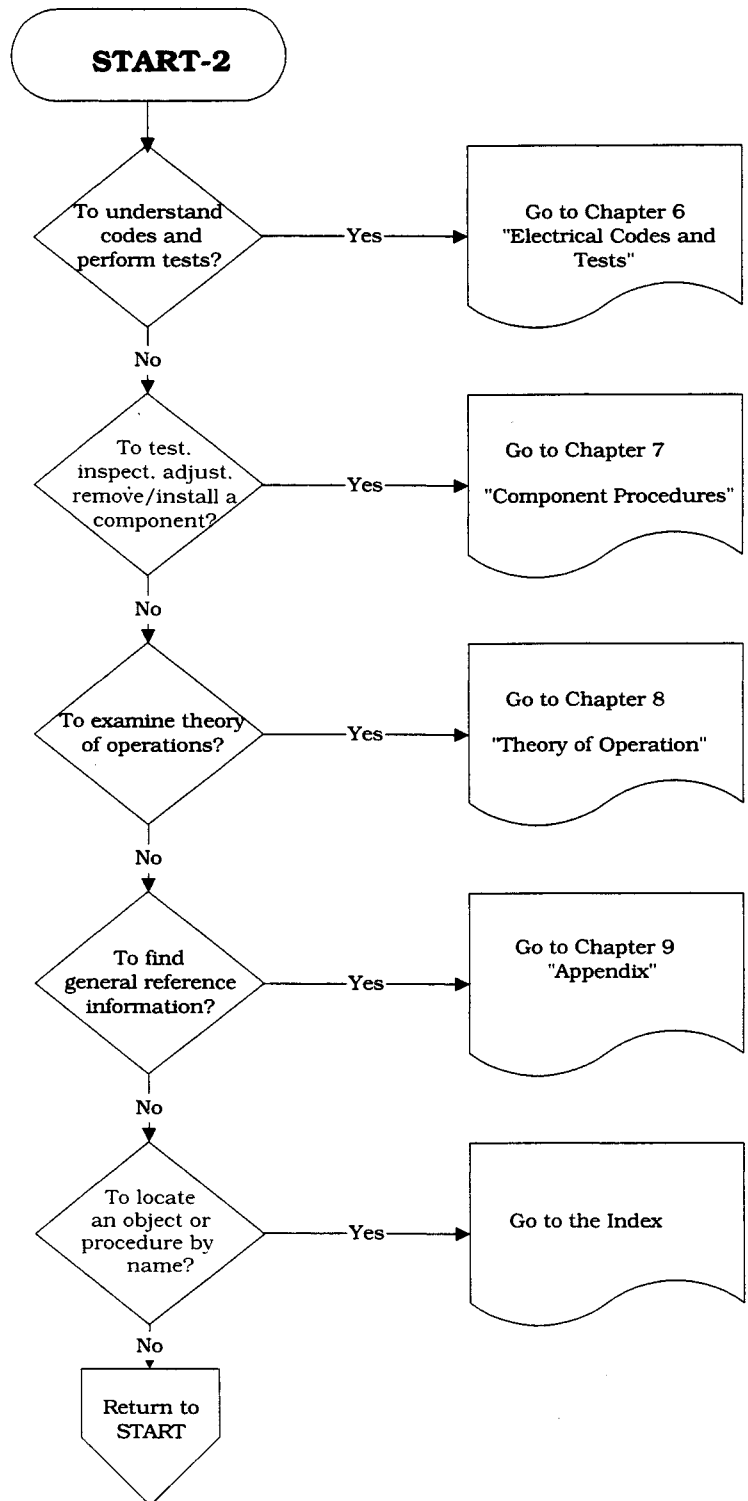


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# Start Page



Start Page



# Safety

## Definitions

## Definitions

Throughout this manual, you will see two kinds of safety reminders:

### **▲WARNING**

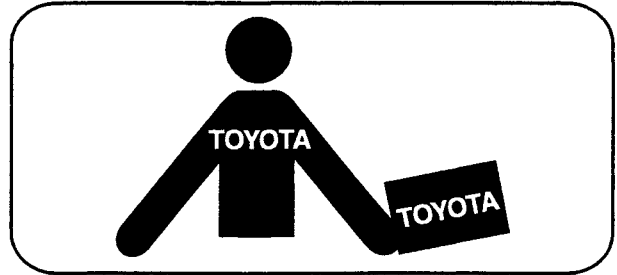
**Warning means a potentially hazardous situation exists which, if not avoided, could result in death or serious injury.**

### **▲CAUTION**

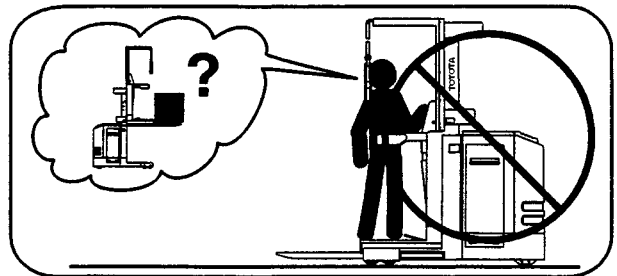
**Caution means a potentially hazardous situation exists which, if not avoided, could result in minor or moderate injury or in damage to the lift truck or nearby objects.**

## General Safety

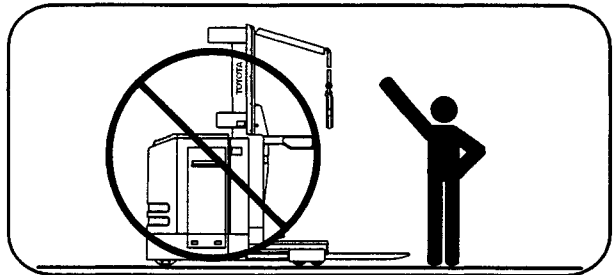
Do not operate or work on this lift truck unless you are trained, qualified, authorized to do so, and have read the operator's manual.



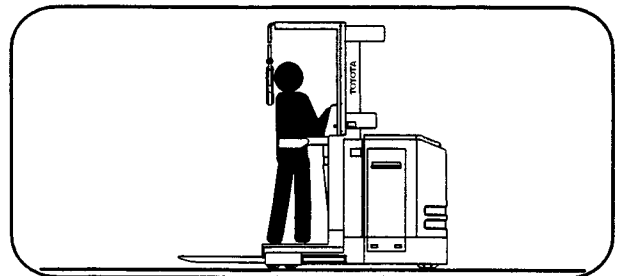
Know the lift truck's controls and what they do.



Do NOT operate this lift truck if it needs repair or if it is in any way unsafe.

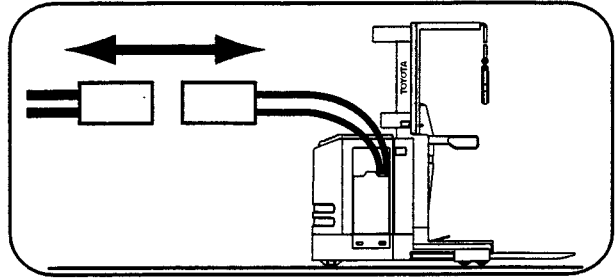


Operate this lift truck only from the operator's position.

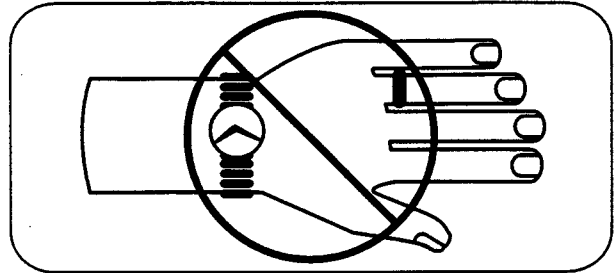


General Safety

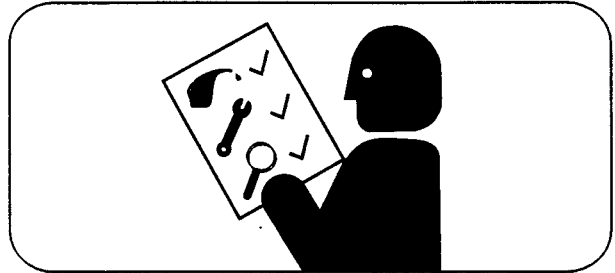
Before working on this lift truck, always turn the key switch to OFF and disconnect the lift truck's battery connector (unless this manual tells you otherwise).



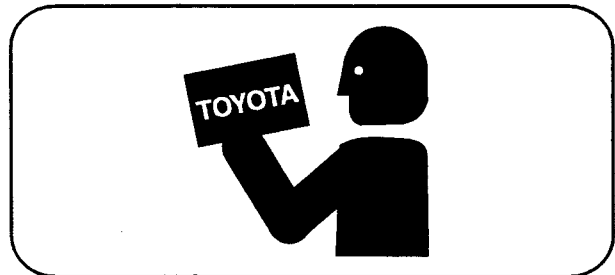
Do NOT wear watches, rings, or jewelry when working on this lift truck.



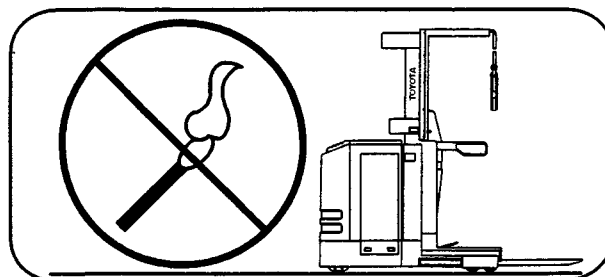
Follow the scheduled lubrication, maintenance and inspection steps.



Follow exactly the safety and repair instructions in this manual. Don't take "shortcuts".



Do NOT use an open flame near the lift truck.

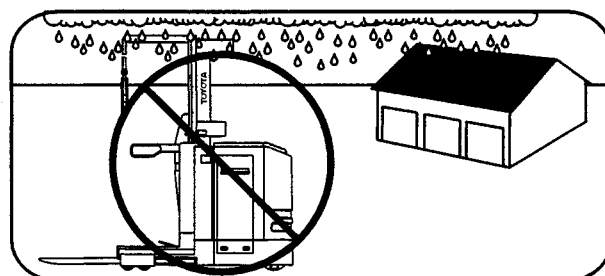


Do NOT use gasoline or other flammable liquids for cleaning parts.

Clean up any hydraulic fluid, oil or grease that has leaked or spilled on the floor.

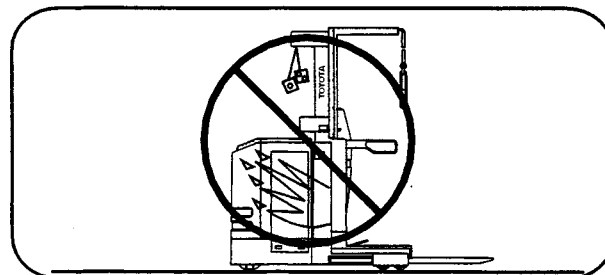


Always park this lift truck indoors.



Do NOT wash this lift truck with a hose.

Do NOT add to or modify this lift truck until you contact your local Dealer to receive written manufacturer approval.



Do NOT park this lift truck in a cold storage area overnight.



## Battery Safety

## Battery Safety

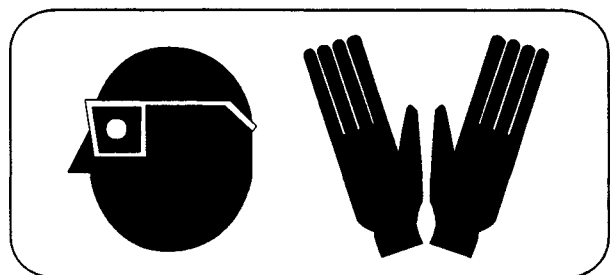
**⚠WARNING**

As a battery is being charged, an explosive gas mixture forms within and around each cell. If the area is not properly ventilated, this explosive gas can remain in or around the battery for several hours after charging. Be sure there are no open flames or sparks in the charging area. An open flame or spark can ignite this gas, resulting in serious damage or injury.

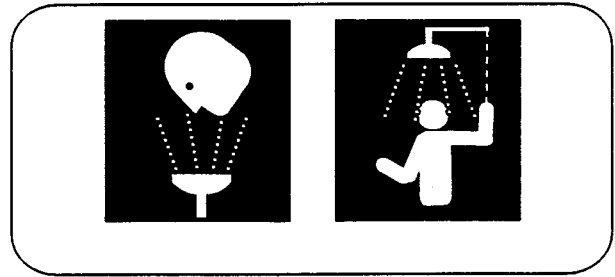
**⚠WARNING**

Battery electrolyte is a solution of sulfuric acid and water. Battery acid causes burns. Should any electrolyte come in contact with your clothing or skin, flush the area immediately with cold water. Should the solution get on your face or in your eyes, flush the area with cold water and get medical help immediately.

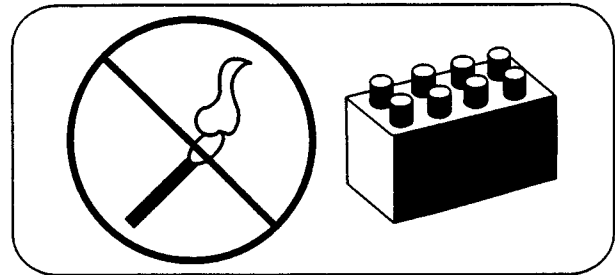
Wear personal protective equipment to protect eyes, face and skin when checking, handling or filling batteries. This equipment includes goggles or face shield, rubber gloves (with or without arm shields) and a rubber apron.



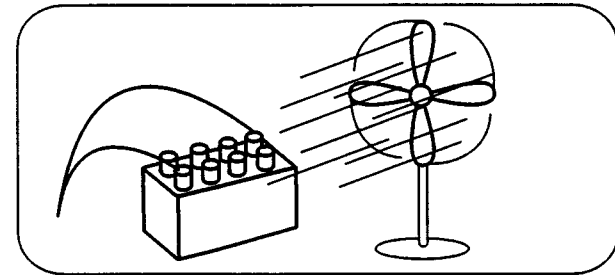
Make sure a shower and eyewash station are nearby in case there is an accident.



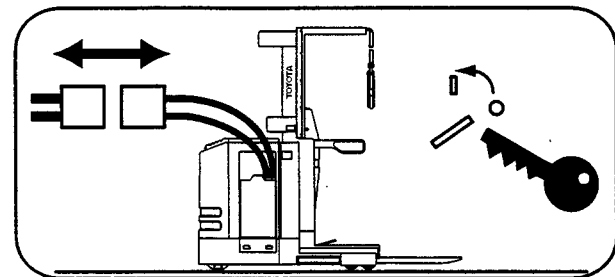
A battery gives off explosive gases. NEVER smoke, use an open flame, or use anything that gives off sparks near a battery.



Keep the charging area well-ventilated to avoid hydrogen gas concentration.

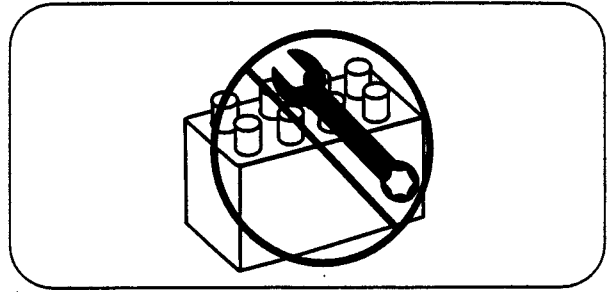


Turn the key switch off *before* disconnecting the battery from the lift truck at the battery connector. Do not break live circuits at the battery terminals. A spark often occurs at the point where a live circuit is broken.



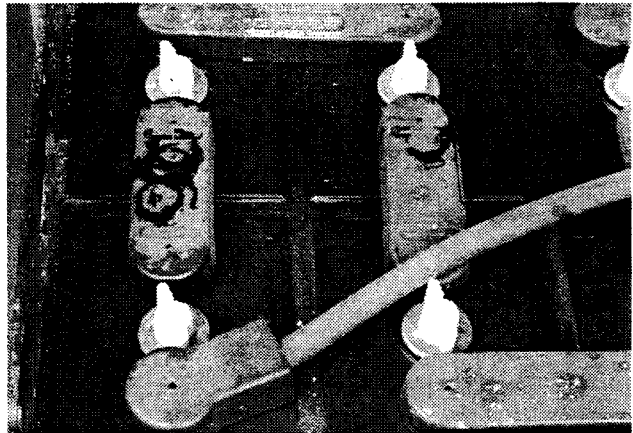
**Battery Safety**

Do not lay tools or metal objects on top of the battery. A short circuit or explosion could result.



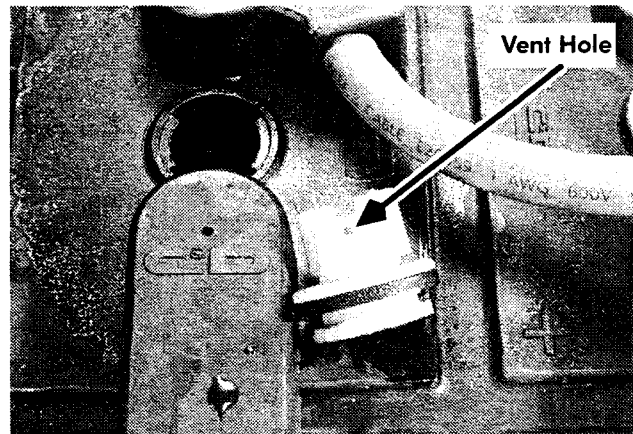
Keep batteries clean. Corrosion causes shorts to the frame and possibly sparks.

Keep plugs, terminals, cables and receptacles in good condition to avoid shorts and sparks.

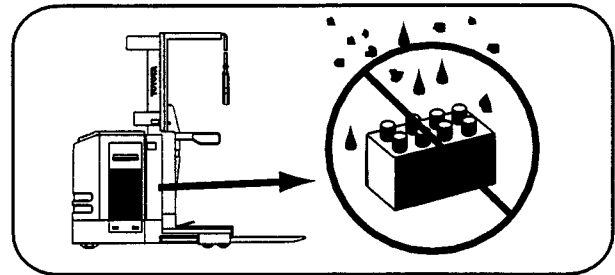


Keep filler plugs firmly in place at all times *except* when the electrolyte level is checked, when water is added to the cells or when the specific gravity is checked.

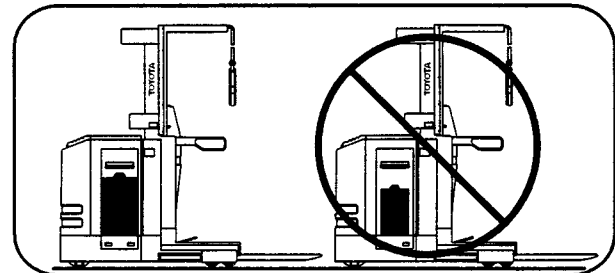
Make sure the vent holes in the filler plugs are open to allow the gas to escape from the cells.



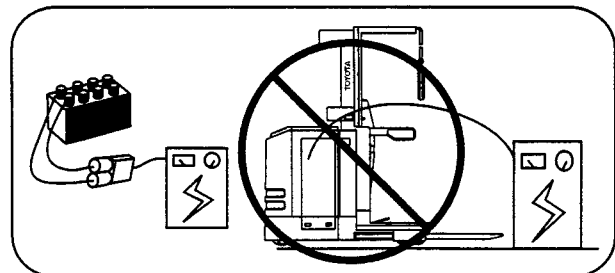
Do not allow cleaning solution, dirt or any foreign matter to enter the cells.



Make sure you install the correct size battery. A smaller or lighter weight battery could seriously affect lift truck stability. See the lift truck's specification plate for more information.

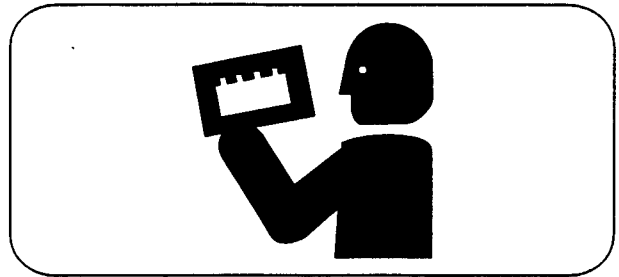


Never plug a battery charger into the lift truck's battery connector. Plug the battery charger only into the battery connector from the battery.



**Battery Safety**

**Follow the charging procedures in the Battery Instruction Manual and in the Battery Charger Instruction Manual.**



## Static Safety

Electronic circuit boards and devices used on the Toyota lift truck can be damaged by the discharge of static electricity, called electrostatic discharge.

Static charges can accumulate from normal operation of the lift truck as well as movement or contact between non-conductive materials (plastic bags, synthetic clothing, synthetic soles on shoes, styrofoam coffee cups, etc.)

Accumulated static can be discharged through human skin to a circuit board or component by touching the parts. Static discharge is also possible through the air when a charged object is placed close to another surface at a different electrical potential. **Static discharge can occur without your seeing or feeling it.**

Whenever working on or near static-sensitive electronics, always use static discharge precautions.

1. Place a static discharge wrist strap around your wrist. Connect the ground lead to the wrist strap connector.
2. Connect the ground clamp to an unpainted, grounded surface on the lift truck frame.
3. If you will be removing or installing static-sensitive components, place them on a properly grounded static mat.
4. To transport static-sensitive components, including failed components being returned, place the components in an antistatic bag or box (available from your dealer).

The wrist strap and associated accessories should be tested monthly to verify they are working properly. A defective static discharge wrist band will not alert you that it is bad.

## Static Safety

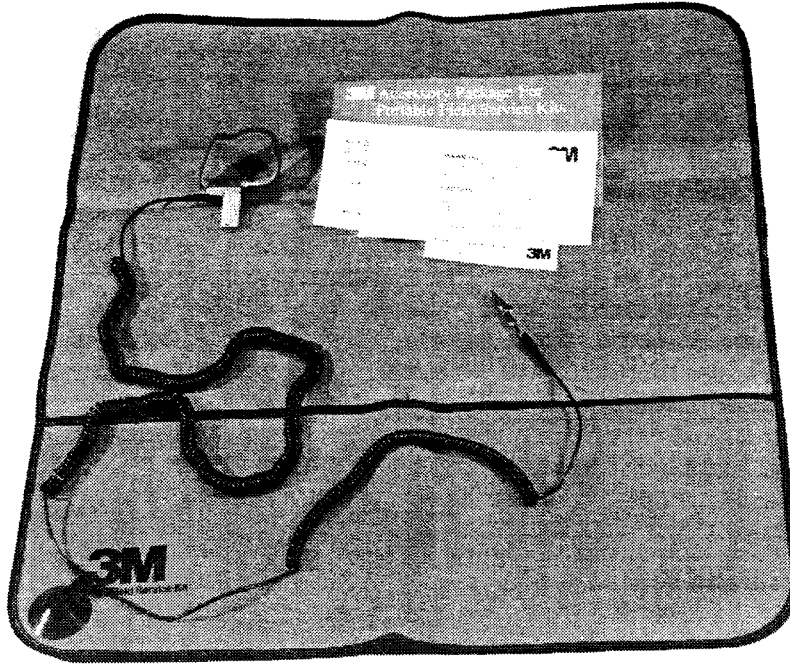


Figure 2-1: Anti-Static Kit with Wrist Strap and Mat

Figure 2-1 shows the components of the Toyota antistatic field service kit, part number 00590-04849-71. The kit includes a wrist strap, ground cord and static-dissipative work surface (mat). Follow the instructions packaged with this kit.

Wrist straps are available in quantities of 25, as part number 00590-04848-71.

A wrist strap tester is available as part number 00590-04850-71.

Contact your local Dealer for further information.

## Jacking Safety

Sometimes you may need to jack up the lift truck off the floor to perform maintenance procedures. When doing so, observe the proper safety precautions:

1. Lower the forks completely. Remove any load.
2. Place all controls in neutral.
3. Block the wheels to prevent movement of the vehicle.
4. Disconnect battery connector.
5. Place the jack under the designated jacking points. See Figure 2-2.

### **▲WARNING**

**Use extreme care whenever the lift truck is jacked up. Keep hands and feet clear from vehicle while jacking the lift truck. After the lift truck is jacked, place solid blocks beneath it to support it. DO NOT rely on the jack alone to support the lift truck.**

#### Tractor

1. Place the jack in the designated jacking position. See Figure 2-2.
2. Jack the rear of the lift truck so that the drive tire is off the floor no more than 2" (51 mm).
3. Block the lift truck in place.

#### Mast

1. Place the jack in the designated jacking position. See Figure 2-2.
2. Jack the side of the truck so that the load wheel is off the floor no more than 1/2" (13 mm).
3. Block the lift truck in place.

**NOTE:** After working on a vehicle, test all controls and functions to assure proper operation.

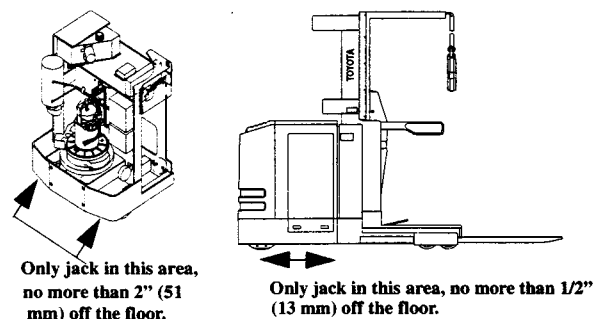


Figure 2-2: Correct Jacking Locations



## Tie-down for Transport

## Tie-down for Transport

To transport your Toyota lift truck in an over-the-road vehicle or rail car, follow these steps:

1. Lower the forks and locate the lift truck in the center of the transport vehicle.
2. Using suitable lifting device, remove the battery. See "Battery Safety" on page 2-6.
3. Position the adjustable chain over and through the battery compartment.
4. Position an additional adjustable chain over and through the battery compartment.
5. Position the chain ends of one chain toward the front of the vehicle bed and the chain ends of the other chain to the back of the vehicle bed and draw taut. This will secure the lift truck to the vehicle bed and prevent tip-over and forward or backward movement.
6. Secure the battery according to the battery manufacturer's instructions.

## Towing

To safely tow a Toyota lift truck:

1. Lower the carriage and remove any load from the forks.
2. Turn the key switch OFF and disconnect the battery connector.
3. Using a suitable towing vehicle, lift the tractor end of the lift truck until the drive tire is no more than 1" off the floor.
4. Tow the lift truck slowly in the tractor-first direction.

### **▲ CAUTION**

**Use care to avoid damage to the wire guidance sensor located beneath the truck.**

## Welding Safety

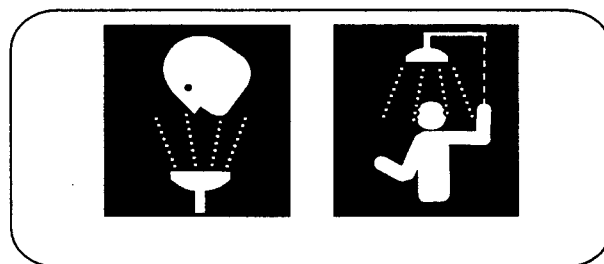
### **▲WARNING**

Flame cutting or welding on painted surfaces may produce potentially harmful fumes, smoke and vapors. Prior to performing flame cutting or welding operations, it is recommended that the coating be removed in the vicinity where the operation(s) will be performed.

Coating removal may be by mechanical methods, chemical methods or a combination of methods. Flame cutting and/or welding operations should be carried out only in well ventilated areas using local exhaust if necessary.

Before working on this lift truck, make sure that:

- Fire protection equipment is nearby.
- You know where the nearest eyewash station is.



## Welding Safety

**▲ CAUTION**

**Disconnect the battery before you attempt to inspect, service or repair the lift truck.**

- Check for shorts to frame as described in "Shorts to Frame Test" on page 5-6.
- If any shorts are detected, remove them before you proceed with the welding operation.
- Clean the area to be welded.
- Protect all lift truck components from heat, weld spatter and debris.
- Attach the ground cable as close to the weld area as possible.
- Do not perform any welding operations near the electrical components.

Disconnect the following connectors:

- HD1 on Display Card
- JPC1 on Carriage Interface Card
- JPR1, JPR3 on Tractor Interface Card
- JP4, JP5 on Steer Controller Card
- JT1, JT2 on Traction Power Amplifier
- JL1, JL2 on Lift Power Amplifier

**▲ CAUTION**

**If welding must be done near the battery compartment, remove the battery from the lift truck.**

- When you are finished welding, perform all ground tests and electrical inspections before the vehicle is operated.

# Systems Overview

## Systems Overview

Figure 3-1 provides an overview of the Toyota Orderpicker. Detailed descriptions of major components, supported by photographs and drawings, are contained herein.

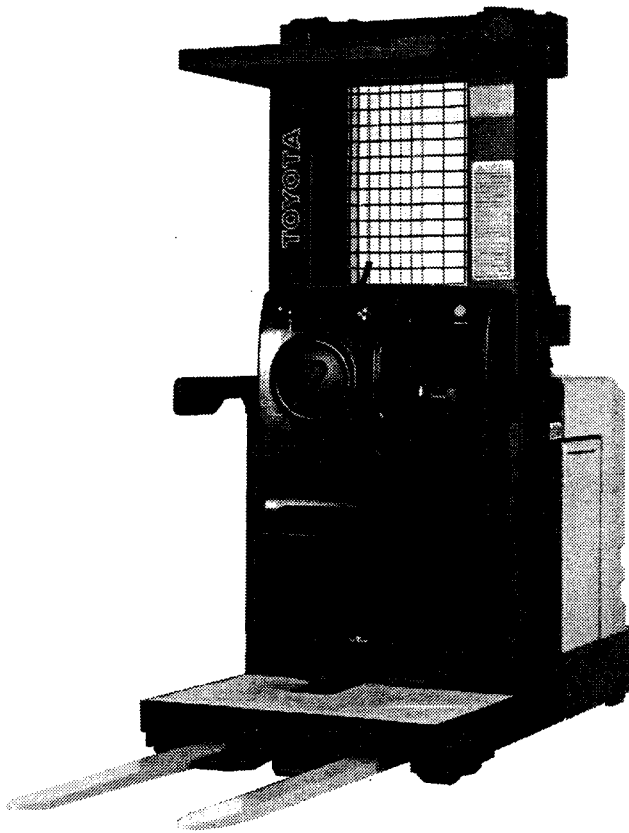


Figure 3-1: Toyota Orderpicker

## Use

The Orderpicker is designed for indoor warehouse use only.

## Type

Stand-up, rider type, designed for narrow aisle installations where the operator must orderpick items from storage racks. The lift truck is operated with electric steering and may be wire or rail guided.

## Power

24-volt industrial battery.

## Capacity

Refer to specification plate.

## Mast

Two\three stage, hydraulic lift with a variety of overall lowered heights (OALH) and elevated heights (EH).

## Controls

Lockable key switch, emergency power off switch, emergency lower valve, steering wheel, electric steering, wire/rail guidance, traction/lift/lower amplifiers, brake, and horn button. Selector switches are available for options such as working lights, fan, or other customer selected options.

## Indicators

Operator's display, wire/rail guidance acquisition light, and an audible alarm which sounds to alert the operator of certain system conditions and when acquiring the guide wire/rail. A strobe light helps to alert others of the orderpicker's presence.



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