

# **SERVICE MANUAL SM535**

**NP 15-20-12D**

## **WARNING**

**Read and observe all warnings on the unit before operating it. Do not operate this equipment unless all factory installed guard and shields are properly secured in place.**

**SM535-00-00**  
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## INTRODUCTION

This manual is intended for the service mechanic who is seeking information about maintenance and service. It contains a section on troubleshooting which will enable a qualified mechanic to locate and solve problems which may occur.

This manual does not contain operation instructions or parts information. For operation instructions or parts information, refer to Clark Co. Product Support Department.

An index for this manual is located on the following page. The manual is arranged according to major sections. The first part of the page number indicates the section it belongs in, and the second number identifies the page number. The higher the number of the section, the farther in the manual it is located. The sectional breakdown is as follows:

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- Section 41 Jacking and Hoisting
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- Section 50 Specification Table and Charts
- Section 99 Troubleshooting

Although information in this manual is based on industry sources and is as complete as it was possible to make it at time of publication, the possibility exists that some make later have changes, which could not be included here. Such information would appear in next edition of this manual and in updated pages.

## "WARNING"

This is used to call your attention to items or operations that could be dangerous to you or other persons using this equipment. Please read these messages carefully. It is essential that you read the instructions and safety regulations before you attempt to assemble or use this unit.

## PRELIMINARY SERVICE

Examine this Clark Electric Truck carefully to determine whether or not it has been damaged in shipment. Any damage should be immediately reported to the transportation company.

This machine should also be checked out by a QUALIFIED MECHANIC. An arrival and pre-delivery checklist is sent with each machine. The sheet is to be returned to the Clark Co., to validate warranty and to assure that the user has received a quality Clark product ready to do its jobs. (There is an example on the next page of the predelivery checklist.)

All operators should be trained before operating this or any materials handling truck. This training should include a study of acceptable operating practices and actual supervised driving experience. The operator should be familiar with all operating instructions before attempting to operate the machine.

Check the transmission oil level and hydraulic unit oil level before operation. Check to determine that the battery is adequately charged properly installed and connected.

The deadman brake pedal should be checked before each operation. **THE MACHINE SHOULD NOT BE OPERATED IF RELEASE OF THE PEDAL DOES NOT SHUT OFF ELECTRICAL POWER TO THE DRIVE MOTOR AND SET THE BRAKES.** The schedule for checking the battery charge and condition is necessary for satisfactory operation of any battery powered truck.

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# **WARNING**

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Never bypass limit switches to gain speed. This can result in severe injury or death from unstable truck operation.

**READ AND OBSERVE ALL warnings BEFORE operating this machine.**

Keep ALL guards, shields and decals in place and properly secured.

Rest the forks in the down position when **NOT** in use.

Travel slowly over rough terrain and **NEVER** make sharp turns with load on forks.

Check battery in a safe place away **FROM** open flames and potential sparks.

**ALWAYS** park machine on a level ground or park across the incline.

**DO NOT ATTEMPT** to clean, adjust, lubricate or service the machine when parts are moving.

**DO NOT "HOT ROD"** when starting, stopping, turning, or reversing machine direction.

Operation of the machine at full speed should only be attempted after complete familiarization with all operations.

**ALWAYS** exercise caution and good judgment while running this machine.

**NEVER** leave the fork raised when not attended.

**ALWAYS** observe pedestrian's right-of-way.

Do not operate this truck unless you are trained and authorized. Read and understand operator's manual before operating lift truck. Prime-Mover dealer's have replacement manuals.

Do not operate damaged or faulty truck. Do not attempt repairs unless you are trained and authorized.

Look where you drive. Watch out for people, obstructions (especially overhead), and drop-offs.

Truck will tip over if not properly operated. Lower forks or attachments and slow down before turning. Do not operate on slopes.

Protect against falling objects. Overhead guard must be in place.

Do not load truck over capacity on nameplate. Move long, high or wide loads carefully. Do not move unstable loads.

Before getting off truck, lower forks or attachments all the way and turn off key. Brake applies automatically.

Do not clean electrical components with solvent or steam.

**NEVER** travel, lift, or lower with the reach mechanism extended except to place or remove a load from storage.

**ALWAYS** travel with load resting on forks not the outrigger legs.

## **OPERATING RULES AND INSTRUCTIONS**

### **OPERATOR QUALIFICATIONS**

Only trained and authorized operators 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.

### **OPERATOR TRAINING**

An effective operator training program should center around user company's policies, operating conditions and trucks. The program should be presented completely to all new operators and not condensed for those claiming previous experience.

### **OPERATOR RESPONSIBILITY**

Powered industrial truck operators shall abide by the following rules and practices.

### **GENERAL RULES AND PRACTICES**

- A. Safeguard the pedestrians at all times. Do not drive a truck up to anyone standing in front of a bench or other fixed object.
- B. Do not allow anyone to stand or pass under the elevated portion of any truck, whether loaded or empty.
- C. Unauthorized passengers shall not be permitted to ride.
- D. Do not put any part of the body between the uprights of the mast or outside the running lines of the truck.
- E. When the operator is dismounted and within 25 feet (7.60 m) of the truck which remains in his view, the load engaging means shall be fully lowered, controls neutralized and brakes set to prevent movement.
- F. A powered industrial truck is unattended when the operator is 25 feet (7.60 m) or more from the truck which remains in view, or whenever the operator leaves the truck and it is not in his view.

When a powered industrial truck is to be left unattended:

1. Stop truck.
  2. Lower the forks.
  3. Place directional controls in neutral.
  4. Apply the parking brake.
  5. Turn off power.
  6. Turn off the control circuit.
  7. Block the wheels if truck is on slight incline.
- G. Maintain a safe distance from the edge of docks and platforms when operating powered industrial trucks. Do not use powered industrial trucks, while on any elevated dock or platform, to move freight cars.
- H. Elevating personnel;  
This unit was not designed for elevating personnel. Refer to ANSI B56.1 1975 section 513 and 427 for elevating personnel requirements.
- I. Care shall be taken that overhead installations such as lights, pipes, sprinkler systems, etc. are not contacted.
- J. A load bracket extension shall be used when necessary to guard against the load, or part of it, from falling toward the operator.
- K. Do not use this truck in explosion and fire hazardous locations.
- L. Report all accidents involving personnel, building structures, and equipment.

## TRAVELING

- A. Observe all traffic regulations including authorized plant speed limits. Under normal traffic conditions, keep to the right. Maintain a safe distance, based on speed of travel, from the truck ahead and keep the truck under control at all times.
- B. Yield the right of way to pedestrians, ambulances, fire trucks or other vehicles in emergency situations.
- C. Do not pass another truck traveling in the same direction at intersections, blind spots or other dangerous locations.
- D. Slow down and sound the audible warning device(s) at cross aisles and other locations where vision is obstructed. If the load being carried obstructs forward view, the operator shall travel with the load trailing.
- E. Keep a clear view of the path of travel and observe for traffic personnel and safe clearances.
- F. These trucks are designed for level floor operation. If it is necessary to operate them on a slight grade, ramp, or incline be sure to do so slowly and cautiously. Operators should be totally familiar with the controls, the braking action of the trucks, plugging techniques, etc. It is also recommended that the truck be operated at some what less than full capacity on grades, ramps and inclines to assure full braking traction on the rear drive wheel.
  - 1. Loaded motorized hand trucks should be operated on all grades with load downgrade, ascending or descending.
  - 2. On all grades the load and load engaging means shall be tilted back, if applicable, and raised only as far as necessary to clear the road surface.
  - 3. Use extra caution when operating on grades. Never turn on any grade, ramp, or incline; Always travel straight up and down.
- G. Under all travel conditions the truck shall be operated at a speed that will permit it to be brought to a stop in a safe manner.
- H. Travel with forks or load low. Do not elevate the load except during picking or stacking.
- I. Make starts, stops, turns or direction reversals in a smoother manner so as not to shift load and/or overturn truck.
- J. Do not indulge in stunt driving or horseplay.
- K. Slow down for wet and slippery floors.
- L. Before driving over a dockboard or bridgeplate, be sure that it is properly secured. Drive carefully and slowly across the dockboard or bridgeplate and never exceed its rated capacity.
- M. Do not drive trucks onto any elevated unless specifically authorized to do so. Approach elevators slowly, and then enter squarely after the elevator car is properly leveled. Once on the elevator, neutralize the controls, shut off power and set brakes. It is advisable that all other personnel leave the elevator before a truck is allowed to enter or leave.
- N. Trucks shall enter elevator or other confined areas with load end forward.
- O. Avoid running over loose objects on the roadway surface.
- P. While negotiating turns, reduce speed, turning steering handle in a smooth sweeping motion. Except when maneuvering at a very low speed, turn the handle at a moderate even rate.

## LOADING

- A. Handle only stable and properly arranged loads. When handling off-center loads which cannot be centered, operate with extra caution.
- B. Handle only loads within the capacity of the truck as rated on the nameplate.
- C. Handle long and wide loads exceeding the dimension used to establish truck capacity with extra caution. Stability and maneuverability may be adversely affected.
- D. When attachments are used, extra care shall be taken in securing, manipulating, positioning and transporting the load. Operate trucks equipped with attachments as partially loaded trucks when not handling a load.
- E. The handling of suspended loads, by means of a crane arm ("boom") or other device, can introduce dynamic forces affecting the stability of a truck that are not considered in the stability criteria. Sudden starts, stops and turns can cause the load to swing and create a hazard.

The following precautions shall be taken when handling suspended loads:

- 1. Do not exceed the truck manufacturer's load rating of the trucks as equipped for handling suspended loads.
- 2. The load shall only be lifted vertically and never dragged horizontally.
- 3. The load shall be transported with the bottom of the load as low as possible.
- 4. Maneuvering the truck with load elevated shall be done slowly and cautiously and only to the extent necessary to permit lowering to the transport position.

## OPERATOR OF THE TRUCK

- A. Before operating the truck, check its condition, giving special attention to the:
  - 1. Tires
  - 2. Warning Devices
  - 3. Lights
  - 4. Battery
  - 5. Controller
  - 6. Lift and tilt systems including load engaging means, chains cable and limit switches.
  - 7. Brakes
  - 8. Steering Mechanism

If the truck is found to be in need of repair or in any way unsafe, or contributes to an unsafe condition, the matter shall be reported immediately to the designated authority, and the truck shall not be operated until it has been restored to proper operating condition.

If, during operation, the truck becomes unsafe in anyway, the matter shall be reported immediately to the designated authority, and the truck shall not be operated until it has been restored to proper operating condition.

- B. Do not make repairs or adjustments unless specifically authorized to do so.
- C. Do not use open flames when checking electrolyte level in batteries.
- D. Operate the machine from the operators position after assuring that the operation will not endanger the operator or any other persons. Do not operate a truck in hazardous areas. Make sure that the forks and/or load have clearance to lower and do not "hang-up".

# Arrival and Pre-Delivery Check List

Your new Prime-Mover Electric Truck was carefully inspected prior to shipment from the factory and should be in good working condition upon arrival. However, the following items can be checked in just a few minutes and will assure that the unit is operating satisfactorily. If adjustments need be made, consult the Parts and Service Manual shipped with every unit.

**1. UPON DELIVERY BY FREIGHT COMPANY**

- Check the unit for visible or concealed damage caused during transit. Report any damage **immediately** to the delivering carrier.

**2. PRIOR TO DELIVERY TO ULTIMATE USER:**

- Operate the unit in all speeds and in both directions. Verify that the switches, wires, connections, etc. have not been loosened.
- Check the brake interlock switch to make sure it operates properly.
- Operate the brake to make certain it is functioning properly.
- Operate all hydraulic controls (lift, lower, etc.) to be sure hydraulic system operates properly. Be sure cutoff switches operate properly.
- Check transmission and hydraulic system.
- Inspect the hydraulic hoses and connections to be certain they are unbroken and free from dents or buckles.
- Check for oil leaks at cylinder, pump and transmission. All hydraulic connections should be tight.
- Grease all fittings. (See lubrication section in manual.)
- Review "OPERATING INSTRUCTIONS" section of the parts manual with user.

**3. The following checks should be made on all units using SCR control systems before battery is plugged in:**

- Check battery connections. DO NOT connect positive to positive, negative to negative connections. DO NOT connect positive to negative or negative to positive. **NO BATTERY IN TRUCK.**
- Check for correct polarity. + or - sides of battery plug (on truck) to truck frame. Show correct polarity. NO. If battery is unplugged, key switch is on and brake pedal is depressed. Also operate the master control switch (with battery unplugged) forward and reverse and the lift/tilt controls to check for grounds on control circuits. (Always use proper size and voltage battery. Never "jump" or "tap" batteries to operate SCR controlled machines or operate truck with dissimilar connectors.)
- Plug in battery and check for smooth control on SCR to high speed in both forward and reverse.

This is to certify all the above points have been checked before this unit was placed in service and is now qualified for warranty registration. (Warranty card must be returned to register unit for warranty.)

Distributor \_\_\_\_\_

By \_\_\_\_\_ Date \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

Form No. S0191



## PARTS ORDERING INSTRUCTIONS

### HOW TO ORDER

When you order, supply the part number, quantity and model and serial numbers of your machine. Supplying this information will assure prompt, efficient handling of your order. The pictorial reference number is not needed and including it can only add confusion.

Since your dealer carries many parts in stock and maintains up-to-date prices on all parts, he will be able to process your order immediately. If, for some reason, the part is not in stock, he will order it from the factory. In either event, he maintains a current file of Service References, which give all available parts ordering or technical information.

### WHERE TO ORDER

Always order parts from the dealer who sold you your Clark truck. If it is necessary for the dealer to order parts from the factory, he is able to get prompt service for you. Parts are shipped in accordance with shipping instructions given on the order.

### INSTRUCTIONS FOR RETURNING PARTS

Under no circumstances will parts be accepted at the factory for credit without prior approval. The Clark Co. cannot accept responsibility for parts returned without authorization.

If you have some parts which must be returned, contact your dealer. If he believes parts should be returned, he will arrange for authorization to return the parts.

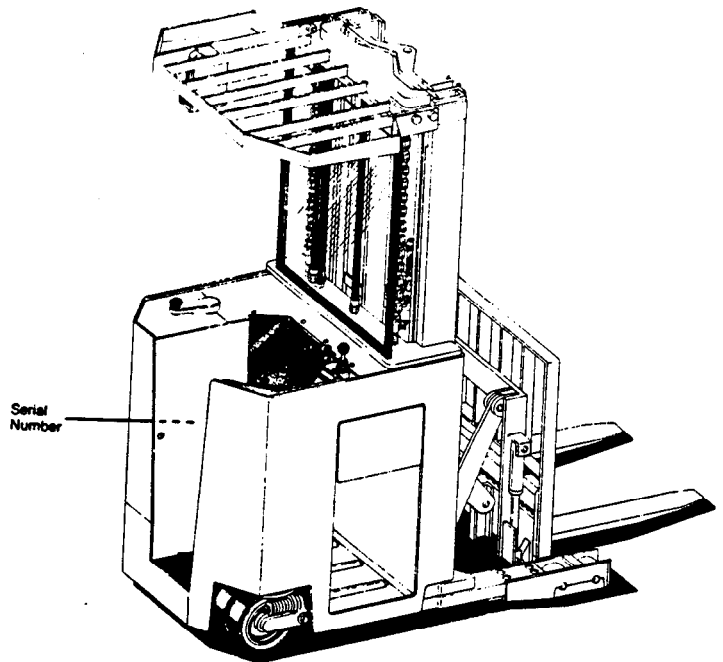
## FIELD MODIFICATIONS

The regulations imposed by OSHA make it mandatory that alternation of industrial trucks be done only as approved in advance and in writing by the manufacturer. These regulations apply to counterweighing, changes in masts when such changes affect capacity and any other safety modification. It is mandatory that nameplates and instructions be changed accordingly.  
(1910.178 (a) (4).

Clark will approve such change requests as we can properly evaluate and rerate as to capacity. Normally a change will be evaluated upon receipt of a written request with full particulars including truck and mast serial numbers, proposed changes, new heights of lift, etc.

If the change is approved, authorization will be sent as will new nameplates or other labeling where appropriate. The new nameplates should be installed over the earlier nameplate.

The modifier should send confirmation of the change to the factory along with pictures of the revised truck.



# DEALERS OWNERS RECORD

OWNERS NAME	SERIAL NUMBER	MAST HEIGHT	ATTACHMENTS

# SECTION 05 FRAME INDEX

CONTENTS	No.
<b>GENERAL DESCRIPTION</b>	05-01
<b>AUXILIARY DOOR REMOVAL &amp; INSTALLATION</b>	05-02
<b>BATTERY RETAINER REMOVAL &amp; INSTALLATION</b>	05-03
<b>BATTERY ROLLERS REMOVAL &amp; INSTALLATION</b>	05-04
<b>LOAD WHEEL REMOVAL &amp; INSTALLATION</b>	05-05
<b>CASTER ASSEMBLY REMOVAL &amp; INSTALLATION</b>	05-06

## 05-01 GENERAL DESCRIPTION

This section covers the frame used on the NP-15-20-12D Electric Reach Truck.

An index has been provided for reference and page numbers. Illustrations have been utilized for use in assemblies.

Before disassembling or assembling any major components, read and observe all warnings.

### WARNING

Perform all service routines with battery disconnected, except where noted within certain procedures outlined.

Do not attempt to assemble the frame without the appropriate assembly instructions.

## 05-02 AUXILIARY DOOR

Remove the access door, loosen screw in rider compartment all the way and open door. Lift the door just enough to clear hinge pins on main frame. The hinges can be removed at this time also, if needed.

### WARNING

The auxiliary door weight is 70 lbs. at this time.

To install the access door, install hinges on main frame and lower straight down the access door onto pins of hinges. Push door around to line up with screw in rider compartment and tighten.

## 05-03 BATTERY RETAINER

The battery retainer's purpose is to prevent the battery from rolling out around turns.

### WARNING

To remove the retainers, simply lift up and slide on way or the other, (generally will only go one direction) and pull towards you.

### WARNING

Always make sure unit is on level surface or battery will roll out.

To install the retainers, simply put one end of the retainer in one slot of main frame, making sure that the plate side of the retainer is toward you. (Generally will only go one direction.) Now push retainer all the way in slot and place the other end in slot and lock in place with groove in retainer against main frame.

Battery must not move more than a 1/2" in any horizontal direction. Means must be found to restrain battery and be a part of machine. But not reduce nominal voltage and ampere-hours capacity rating for this machine.

## 05-04 BATTERY ROLLERS

### ROUTINE MAINTENANCE

Routine maintenance consists of periodic checks for corrosion of the rollers and bearings and visual check for wear. Keeping the bearings and rollers greased will prolong life and decrease wear and corrosion.

Cleanliness is extremely important in the area of the bearing rollers.

NOTE: Dirt can wear bearings and cause failure.

The maintenance chart in this manual will guide you in your preventative maintenance.

### DISASSEMBLY

1. Disconnect battery and remove from unit.
2. Thoroughly clean out of battery rollers (steam cleaning is preferred) before disassembly.
3. The battery rollers can be lifted out of unit or levered out if stubborn.
4. Drive shaft from roller and remove bearings.

NOTE: Roller can be placed in a soft jawed vice to remove bearings.

### **WARNING**

Always wear safety glasses or face shield when using a hammer.

5. Check for wear and replace if failure is found.

### **ASSEMBLY**

1. Grease all parts before assembly on unit.
2. Install bearings on each end of roller. Press bearings in as far as possible.
3. Slide shaft through bearings and out the other end.
4. Install battery roller in slot of unit. There are four rollers used on this unit. Test operation of battery rollers.
5. Install battery and battery retainers. (See battery Retainer for installation.)

### **05-05 LOAD WHEEL ASSEMBLY**

On this truck there is a possibility of two styles of load wheel assemblies. There is a dual load wheel assembly and single load wheel assembly.

### **WARNING**

Always securely block unit before jacking and lower forks.

### **WARNING**

Always make sure unit is on level surface before work can begin.

The load wheel as an assembly can be removed from the main frame of the truck by removing the eight (8) bolts and four (4) nuts which mount them. For further disassembly of load wheels see Drive Unit Section of this manual.

Installation of load wheel assembly is achieved by placing the assemblies back on main frame and install and tighten the bolts (torque to 200 ft./lbs.).

### **05-06 CASTOR ASSEMBLY**

#### **ROUTINE MAINTENANCE**

Routine maintenance consists of periodic checks for tightness of mounting bolts and a visual check for wear. Keeping the bearings of the caster wheels and flange well greased will prolong life and decrease wear. Cleanliness is extremely important in the area of the caster wheel bearing roller surface and flange.

**NOTE:** Dirt can wear bearings and cause failure.

The maintenance chart in this manual will guide you in your preventative maintenance.

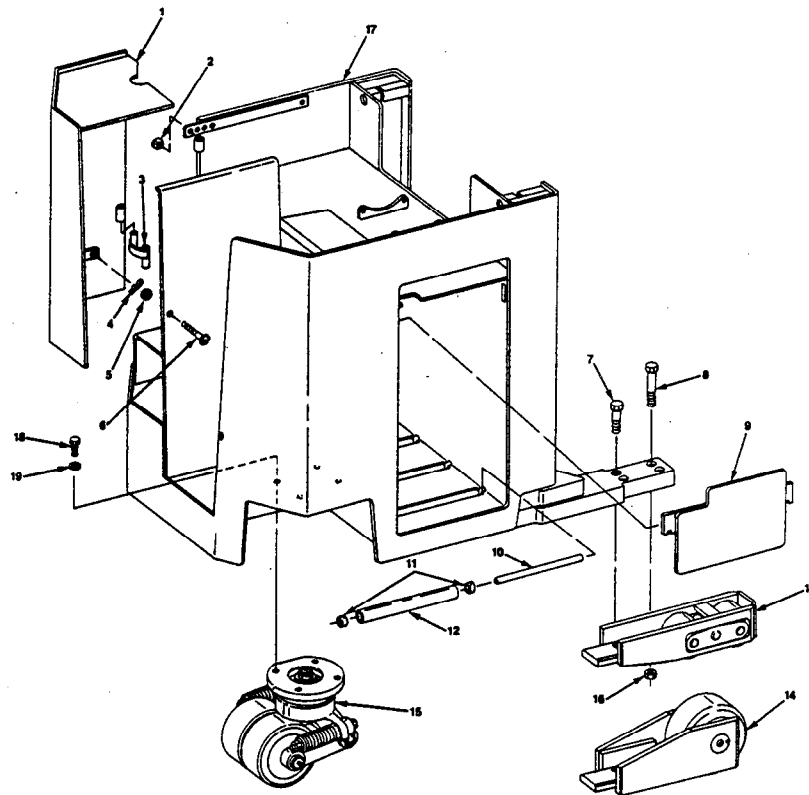
#### **REMOVAL**

1. Disconnect battery and remove from truck.
2. Elevate the rear of the main frame off the floor and block up (see hoisting instruction 38-02).
3. Remove four capscrews and flat washers holding the mounting plate.
4. Remove caster from truck and place on bench for further disassembly.
5. For further disassembly of caster, see Drive Unit section (22-01), of this manual.

#### **INSTALLATION**

1. Grease all grease fittings on caster. Use tex. ref. C&C #880 lubricant.
2. Install caster on truck. Use four flat washers and capscrews. Torque to 75 ft./lbs.
3. Unblock and lower truck to floor.
4. Install battery and connect cables to truck.
5. Test operation of caster and truck.

# MAIN FRAME AND LOAD WHEEL ASSEMBLY



ITEM #	NAME
1	Door
2	Bumper
3	Hinge
4	Pin, cotter
5	Washer
6	Screw, machine
7	Screw, cap
8	Screw, cap
9	Retainer, left battery
10	Shaft
11	Bearing
12	Roller
13	Articulating load wheels
14	Single load wheels
15	Caster assembly
16	Nut
17	Frame, main
18	Screw, cap
19	Washer, flat

# SECTION 10 INSTRUMENTS AND DASH CONTROLS

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<b>HAND LIFT AND SPEED CONTROL REMOVAL AND REPAIR</b>	10-04
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## 10-01 GENERAL DESCRIPTION

This section covers the control linkages used on the NP15-20-12D Electric Reach Truck.

An index has been provided for reference and page numbers.

Illustrations have also been utilized for use in assemblies.

Before disassembling or assembling any major components, read and observe all warnings.

Do not attempt to assemble the controls with the appropriate assembly instructions.

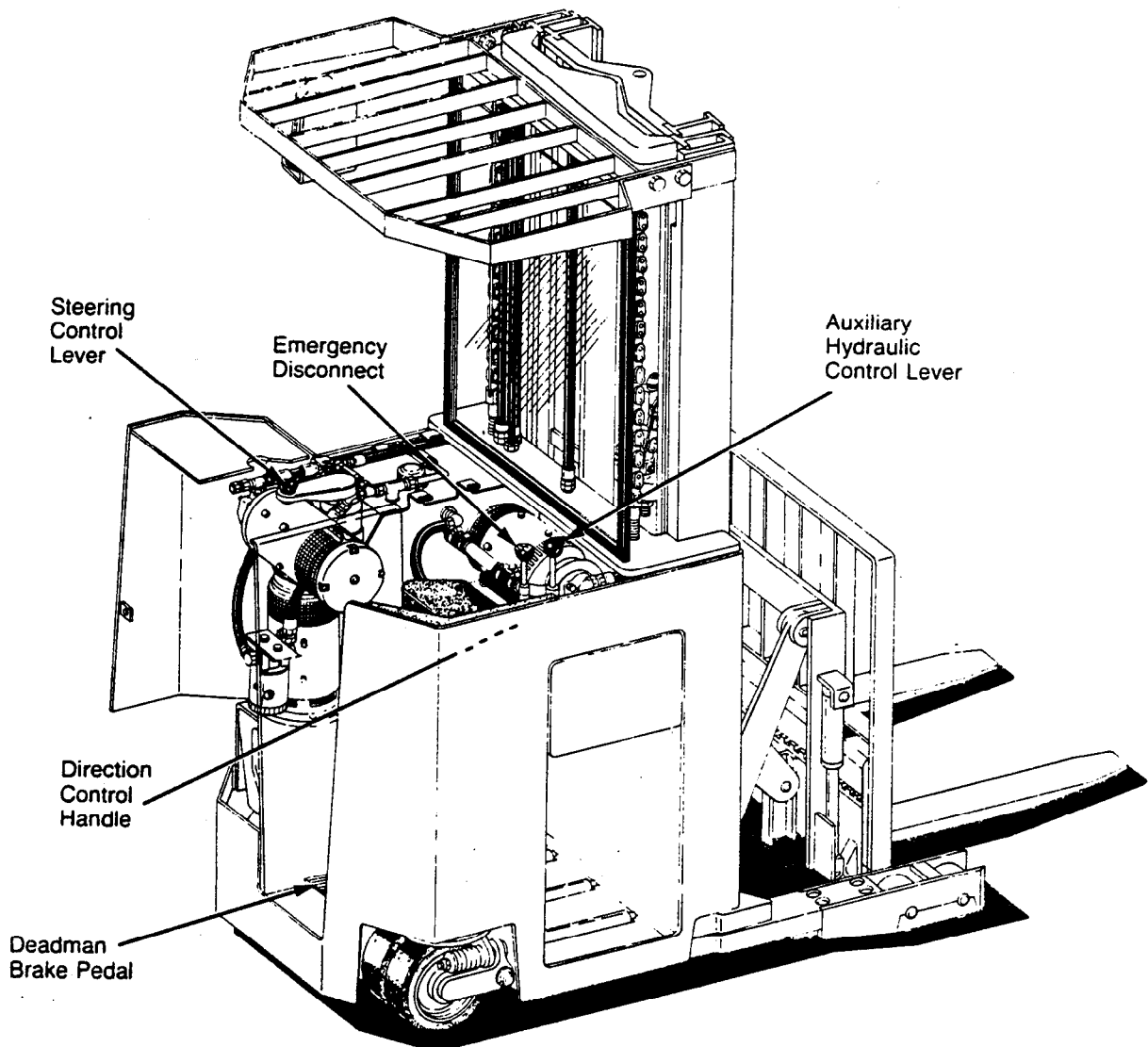
### WARNING

Always make sure unit is on level surface before work can begin.

### WARNING

Perform all service routines with the battery disconnected, except where noted within the outlines of certain procedures.

Do not attempt to assemble the controls without the appropriate assembly instructions.





## 10-02 EMERGENCY DISCONNECT

The only routine maintenance that is necessary other than periodic check for tightness of the mounting hardware is greasing of the moving parts.

### DISASSEMBLY

Disconnect battery before starting disassembly.

1. Remove emergency disconnect and auxiliary control knobs.
2. Remove seat panel cover. (For service of seat panel cover, see shielding section of this manual).
3. Loosen jam nut and remove rod from end yoke.
4. Remove end yoke by removing cotter pin from pin and remove pin.
5. Loosen and remove two nuts, cap screws, and four washers. This will allow spacers and connector push bar to be removed from machine.
6. Thoroughly clean all parts and lightly coat all metal parts with oil.

### WARNING

Be extremely careful when working with solvent. Even a small explosion or fire could cause injury or death.

### WARNING

Wear eye protection and be sure to comply with OSHA or other maximum air pressure requirements.

## INSPECTION

1. Thoroughly clean all parts and lightly oil metal parts.

### WARNING

Be extremely careful when working with solvent. Even a small explosion or fire could cause injury or death.

### WARNING

Wear eye protection and be sure to comply with OSHA or other maximum air pressure requirements.

2. Inspect all parts for wear and replace if needed.

**ASSEMBLY**

1. Thoroughly clean all parts and lightly coat all metal parts with oil.

**WARNING**

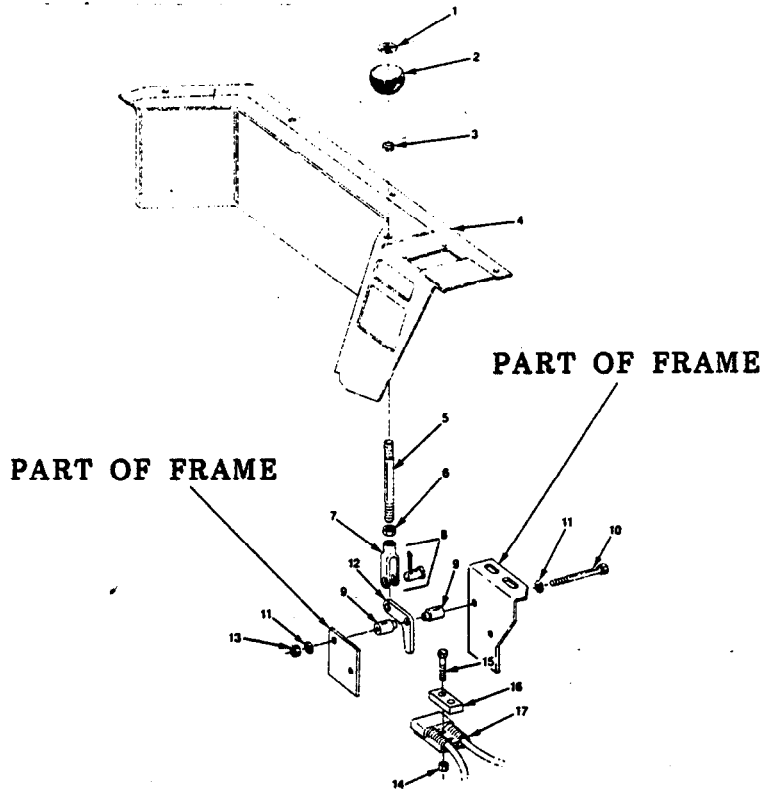
Be extremely careful when working with solvent. Even a small explosion or fire could cause injury or death.

**WARNING**

Wear eye protection and be sure to comply with OSHA or other maximum air pressure requirements.

2. Install spacers on each side of connector push bar, with smaller end into connector push bar.
3. Install washers on cap screws and push through frame mountings. (Only one cap screw will go through spacers.)
4. Install washer on cap screws and tighten nut.

**EMERGENCY DISCONNECT ASSEMBLY**



Tighten nuts until cap screws are tight but not binding or bending of frame mountings, (some play is required).

5. Thread yoke end on rod behind jam nut.
6. Install pin and cotter pin through yoke and connector push bar.
7. Insert grommet in hole on seat panel cover and install on machine.
8. Install decal on knob and knobs on rod.
9. Install block on connector from battery with screws and nuts. Tighten.
10. Connect battery and test operation.
11. Adjustments may be needed and can be done by loosening the jam nut and threading rod in or out. After adjustment is done, tighten jam nut so rod does not move.
12. Grease all moving parts.

ITEM #	NAME
1	Decal
2	Knob
3	Grommet
4	Cover, seat panel
5	Rod
6	Nut, jam
7	Yoke, end
8	Pin with cotter pin
9	Spacer
10	Screw, cap
11	Washer, flat
12	Bar
13	Nut
14	Nut
15	Screw, cap
16	Block
17	Connector assembly

## 10-03 AUXILIARY CONTROL

The only routine maintenance that is necessary other than periodic check for tightness of the mounting hardware is greasing of the moving parts.

### DISASSEMBLY

1. Remove emergency disconnect and auxiliary control knobs.
2. Remove seat panel cover. (For service of seat panel cover, see Sheilding Section of this manual.)
3. Remove wires from switch(s) (noting their positions).
4. Remove link from auxiliary control valve and handle.
5. Remove control handle assembly from truck and place on bench.
6. Remove switch(s) from handle to avoid damage.
7. Drive out roll pin and remove washers, and control rod.
8. Drive out roll pin and remove spring retainers and springs.
9. Drive out bearings from tube.
10. Remove plate from main frame by removing two (2) flange bolts and flange nuts (if needed).
11. Thoroughly clean all parts and lightly coat all metal parts with oil.

### WARNING

Be extremely careful when working with solvent. Even a small explosion or fire could cause injury or death.

### WARNING

Wear eye protection and be sure to comply with OSHA or other maximum air pressure requirements.

### INSPECTION

1. Thoroughly clean all parts and lightly coat all metal parts with oil.

### WARNING

Be extremely careful when working with solvent. Even a small explosion or fire could cause injury or death.

### WARNING

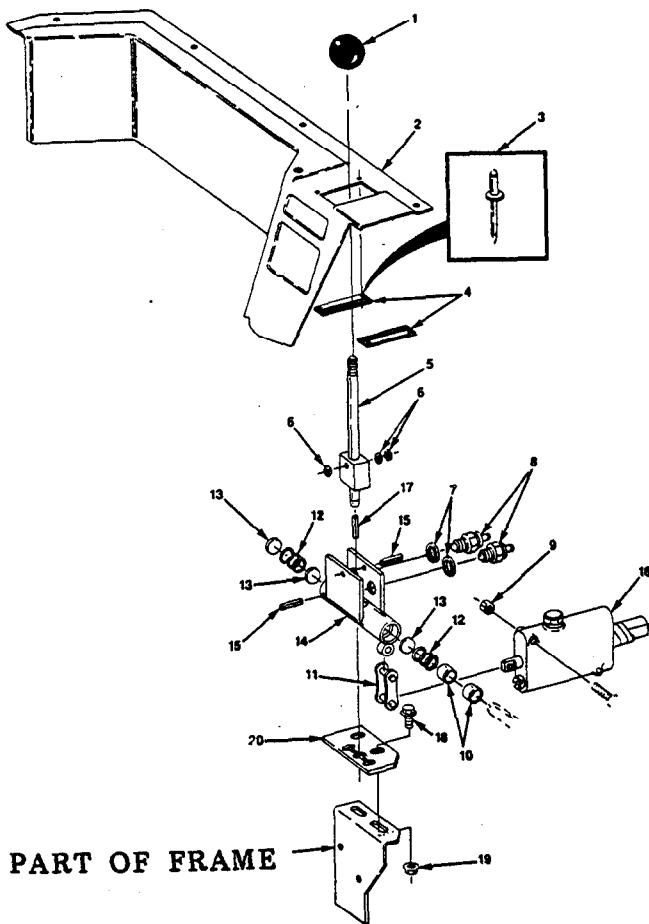
Wear eye protection and be sure to comply with OSHA or other maximum air pressure requirements.

2. Examine tube interior. It should be smooth and free of rust and obstructions.
3. Inspect bushings for wear. I.D. of bushing should not exceed 0.745.
4. Inspect plate for excessive wear and crascking of slots.
5. Inspect all parts for wear and replace if needed.

**ASSEMBLY**

1. Examine tube interior. It should be smooth and free of rust and obstructions.
2. Install plate on main frame using two (2) flange bolts and flange nut.
3. Install roll pin in bottom of ontrol rod.
4. Install spring and spring retainers against bushings. Oil lightly.
5. Install control rod in tube with washers and foll pin (as shown in illustration).
6. Install spring retainers and spring. Hold in place with roll pin.
7. Install switch(s) and spacer(s) in tube and connect wires to proper switch (see wiring schematic).
8. Install link on tube and connect link to valve.
9. Thread knob on control rod after seat panel cover has been installed.
10. Adjust plate so roll pin in control rod flows through slots smoothly and with no binding.
11. Connect battery and test operation.

**AUXILIARY CONTROL ASSEMBLY**



ITEM #	NAME
1	Knob
2	Cover, seat panel
3	Rivet, pop (1/8 x 1/4)
4	Brush
5	Rod
6	Washer, flat
7	Spacer
8	Switch
9	Nut
10	Bushing
11	Link
12	Spring
13	Round
14	Tube
15	Pin, roll
16	Valve, auxiliary control
17	Pin, roll
18	Bolt, flange
19	Nut, flange
20	Plate