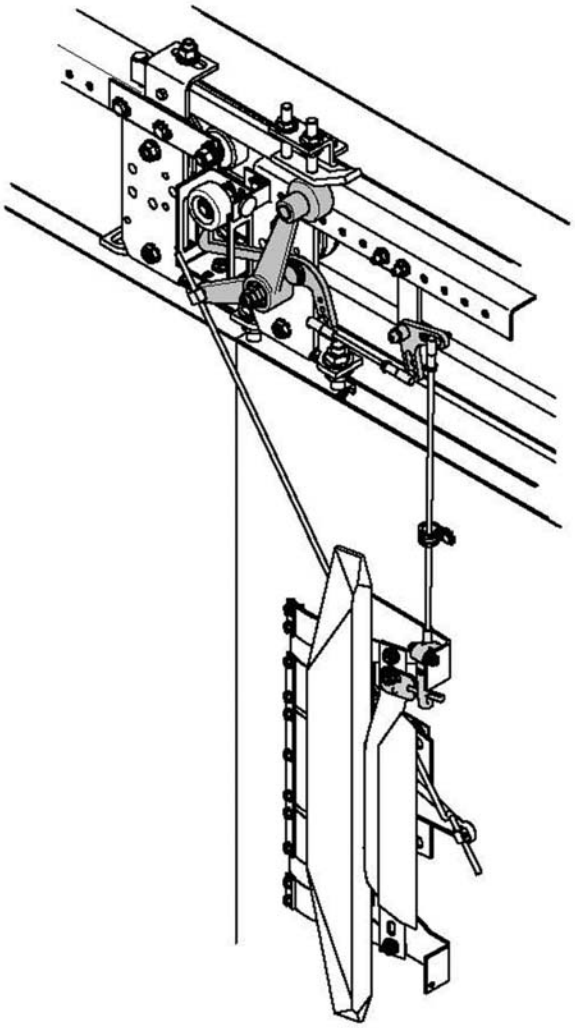
VERTICAL EXPRESS

Door Restrictor Assembly

Model R2



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Contents

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Safety Precautions

IMPORTANT!

Read this page before any work is performed on elevator equipment. The procedures contained in this manual are intended for the use of qualified elevator personnel. In the interest of your personal safety and the safety of others, do not attempt any procedure that you are not qualified to perform.

All procedures must be accomplished in accordance with the applicable rules in the latest edition of the National Electrical Code, the latest edition of ASME A17.1, and any governing local codes.

Terms in This Manual

CAUTION

CAUTION statements identify conditions that may result in damage to the equipment or other property if improper procedures are followed.

WARNING

WARNING statements identify conditions that may result in personal injury if improper procedures are followed.

General Safety

CAUTION

Before applying power to the controller, check that all factory wire connections are tight on relays, contactors, fuse blocks, resistors, and terminals on cards and DIN rail terminals. Connections loosened during shipment may cause damage or intermittent operation.

Other specific warnings and cautions are found where applicable and do not appear in this summary. See the *Elevator Industry Field Employees' Safety Handbook* for electrical equipment safety information on installation and service.

Electrical Safety

All wiring must be in accordance with the National Electrical Code and be consistent with all state and local codes.

Use the Proper Fuse

To avoid fire hazards, use only a fuse of the correct type, voltage, and current rating. See the job specific drawings sheet (Power Supplies) for fusing information.

Electric shocks can cause personal injury or loss of life. Circuit breakers, switches, and fuses may not disconnect all power to the equipment. Always refer to the wiring diagrams. Whether the AC supply is grounded or not, high voltage will be present at many points.

Printed Circuit Cards

Printed circuit boards may be damaged if removed or installed in the circuit while applying power. Before installation and/or removing printed circuit boards, secure all power.

Always store and ship printed circuit cards in separate static bags.

Electrical Safety
(continued)

Mainline Disconnect

Unless otherwise directed, always Turn OFF, Lock, and Tag out the mainline disconnect to remove power from elevator equipment. Before proceeding, confirm that the equipment is de-energized with a volt meter. Refer to the *Vertical Express Employees' Safety and Accident Prevention Program Manual* for the required procedure.

Test Equipment Safety

Always refer to manufacturers' instruction book for proper test equipment operation and adjustments.

Megger or buzzer-type continuity testers can damage electronic components. Connection of devices such as voltmeters on certain low level analog circuits may degrade electronic system performance. Always use a voltmeter with a minimum impedance of 1M Ohm/Volt. A digital voltmeter is recommended.

When Power Is On

To avoid personal injury, do not touch exposed electrical connections or components while power is ON.

Mechanical Safety

See the *Elevator Industry Field Employees' Safety Handbook* for mechanical equipment safety information on installation and service.

Static Protection Guidelines

IMPORTANT!

Read this page before working with electronic circuit boards.

Elevator control systems use a number of electronic cards to control various functions of the elevator. These cards have components that are extremely sensitive to static electricity and are susceptible to damage by static discharge.

Immediate and long-term operation of an electronic-based system depends upon the proper handling and shipping of its cards. For this reason, the factory bases warranty decisions on the guidelines below.

Handling

- Cards shipped from the factory in separate static bags must remain in the bags until time for installation.
- Anti-static protection devices, such as wrist straps with ground wire, are required when handling circuit boards.
- Cards must not be placed on any surface without adequate static protection.
- Only handle circuit cards by their edges, and only after discharging personal static electricity to a grounding source. DO NOT touch the components or traces on the circuit card.
- Extra care must be taken when handling individual, discrete components such as EPROMS (which do not have circuit card traces and components for suppression).

Shipping

- Complete the included board discrepancy sheet.
- Any card returned to the factory must be packaged in a static bag designed for the card.
- Any card returned to the factory must be packaged in a shipping carton designed for the card.
- “Peanuts” and styrofoam are unacceptable packing materials.

Note: Refer to the Vertical Express Replacement Parts Catalog to order extra static bags and shipping cartons for each card.

Failure to adhere to the above guidelines will VOID the card warranty!

Arrival of Equipment

Receiving

Upon arrival of the equipment, inspect it for damage. Promptly report all visible damage to the carrier. All shipping damage claims must be filed with the carrier.

Storing

During storage in a warehouse or on the elevator job site, precautions should be taken to protect the equipment from dust, dirt, moisture, and temperature extremes.

Revision Change Bars

Each revised page included in this manual will have a vertical line (change bar) to the left of the text that has been added or changed. The example at the left of this paragraph shows the size and position of the revision change bar.

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Overview

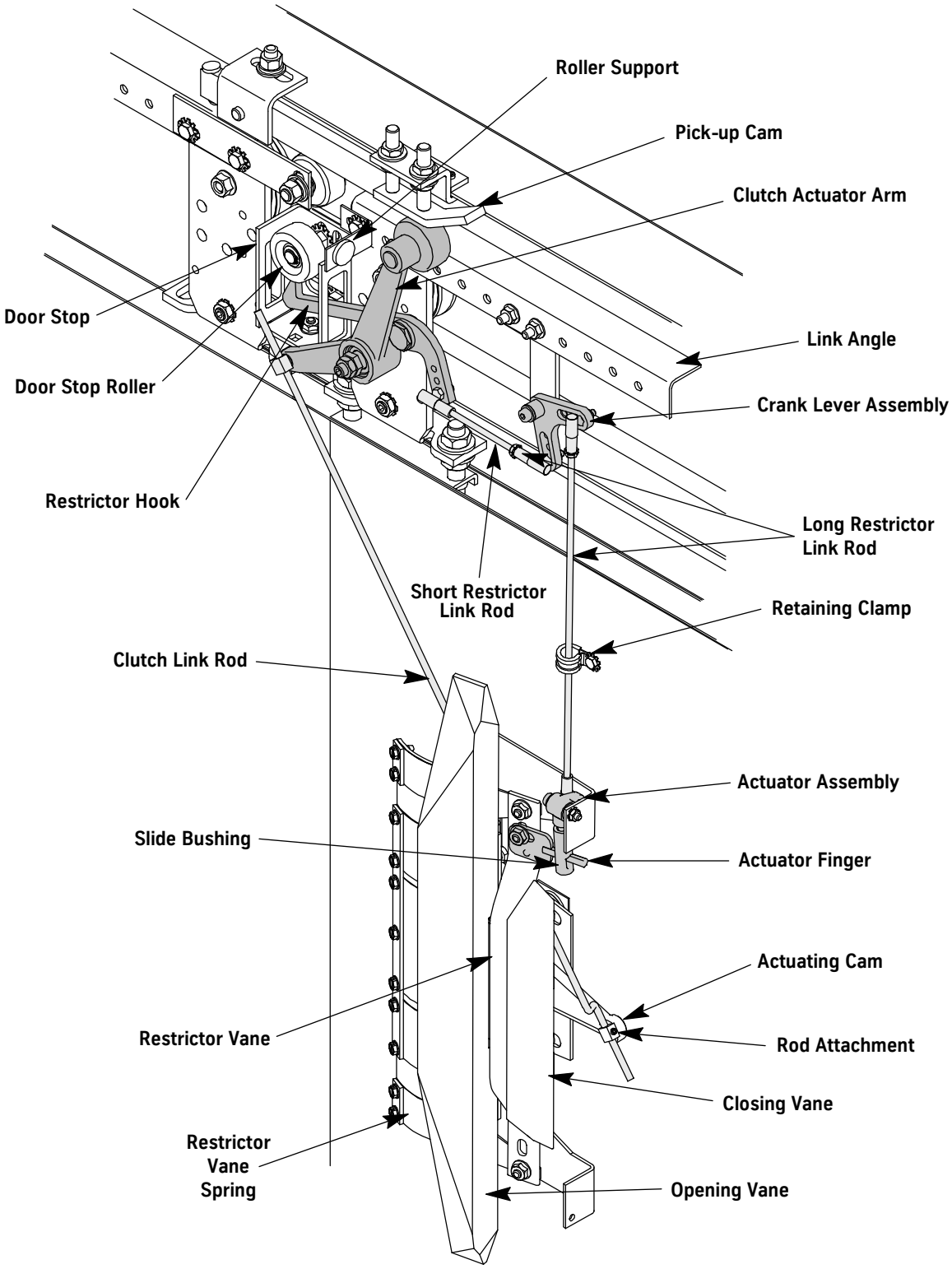


Figure 1 - Door Restrictor Assembly

Specifications

- Use Restrictor Angles with two-speed door widths of less than 46 inches.
- Use Restrictor Angles with two-speed center opening door widths of less than 72 inches.
- The pre-opening of doors should not start until reaching 3 inches from landing.

CAUTION **Use of this door restrictor with narrow doors could cause interference with the Door Operation Drive Arm.**

Installation

Note: To prevent unnecessary car movement at the clutch and the pick-up roller, the guide shoes and cab steady brackets must be tight.

1. Compare the height of the clutch with the shims, to the distance from the back of the door to the hoistway sill line. Leave 1/4" running clearance (remove shim, if necessary). Then attach the clutch to the door. See Figure 2.

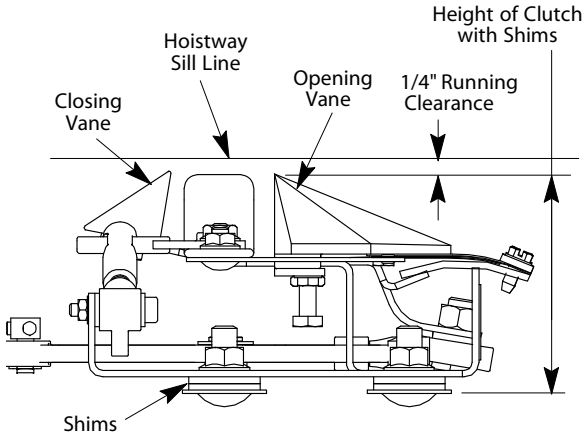


Figure 2 - Clutch Height

2. Attach the clutch actuating arm and roller support to the door hanger. See Figure 3.

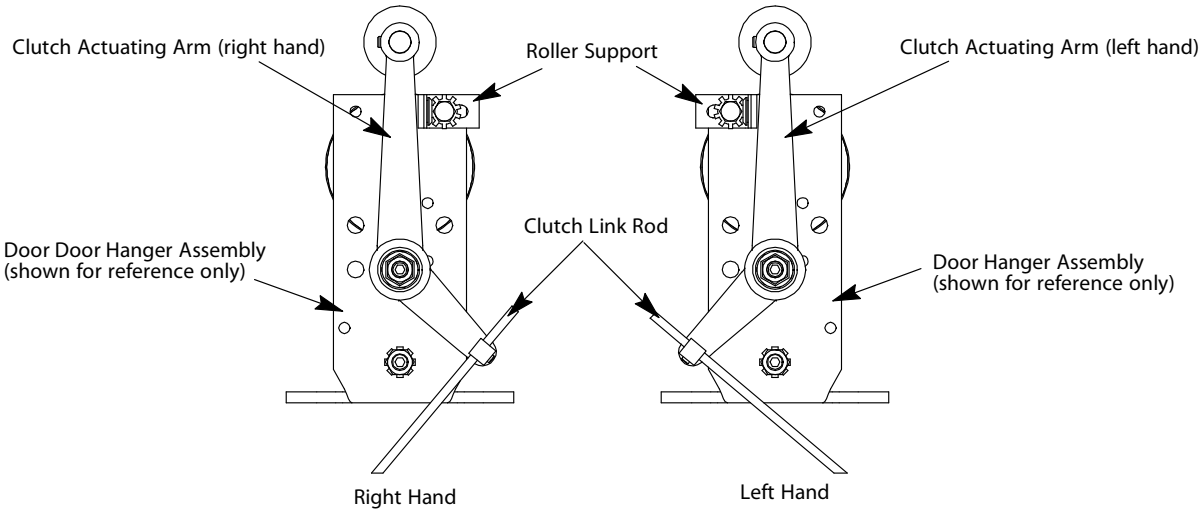


Figure 3 - Clutch Arm and Roller Support to Door Hanger

Installation

(continued)

3. Attach the clutch link rod, with the formed end of the rod at the clutch, to the actuating arm. See Figure 4.

Note: Depending on the distance of the clutch from the top of the door, the offset of the formed end may be either turned out, away from the clutch, or in toward the clutch.

4. Position the door so that the clutch actuating arm roller is off of the clutch pick-up cam. Adjust the roller support and the clutch link rod to retract the clutch closing vane to be even with the clutch opening vane.

5. Close the car door. Adjust the clutch pick-up cam to retract the clutch closing vane just short of striking the clutch actuating cam.

Note: If necessary, rotate the clutch link rod for clearance.

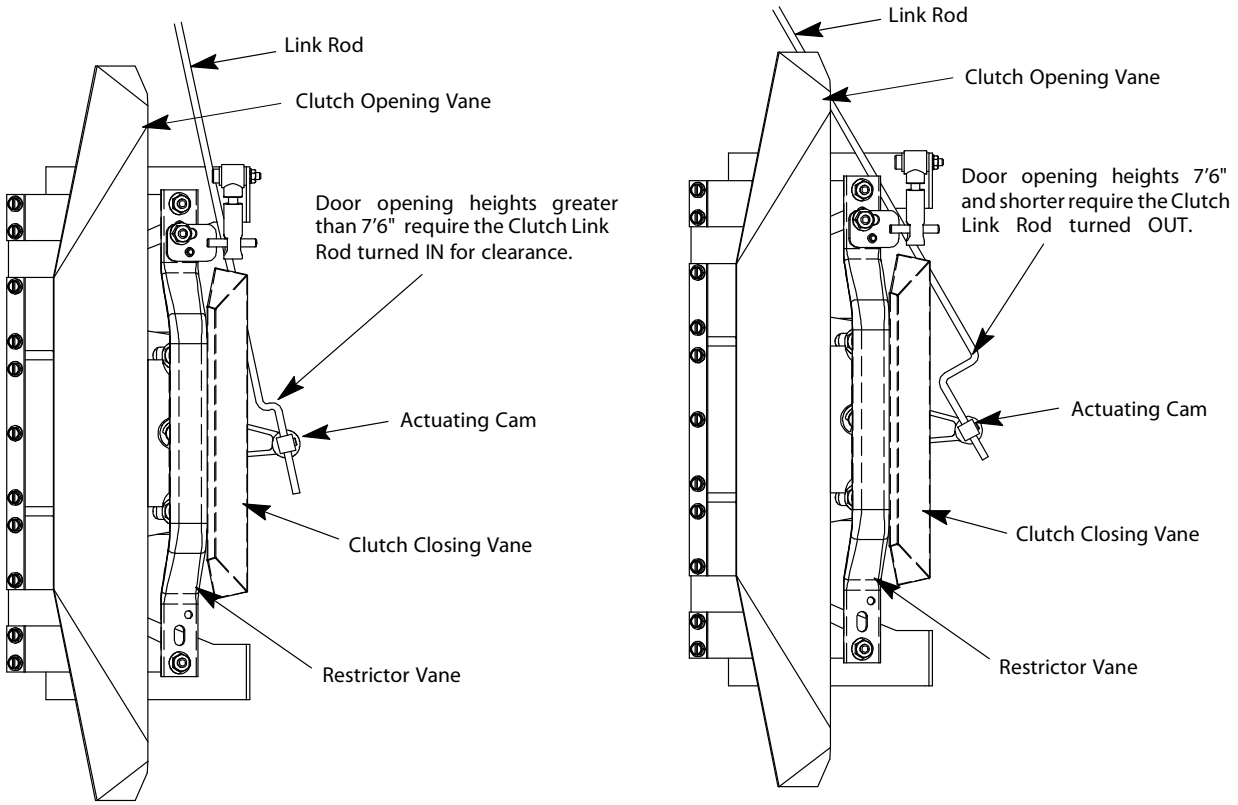


Figure 4 - Clutch Link Rod to Actuating Arm

Installation
(continued)

6. Use #10 nuts and lockwashers to attach the short and long link rods to the ball joints. See Figure 5.

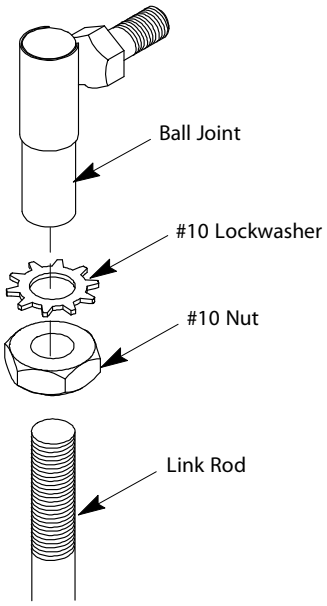


Figure 5 - Attach Link Rods to Ball Joints

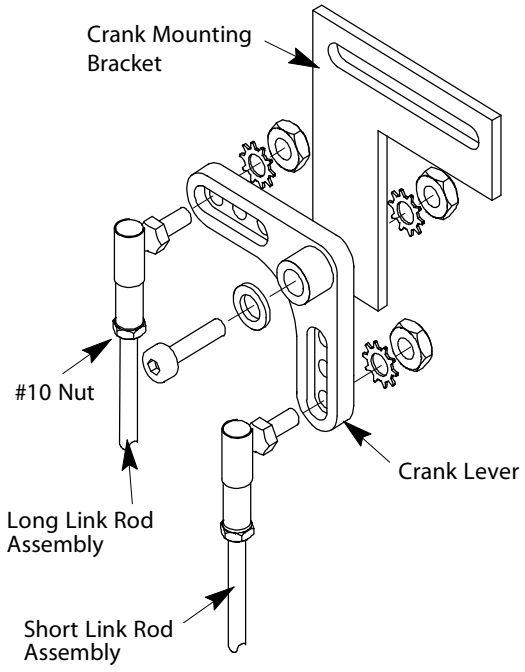
7. Use #10 nuts and lockwashers to attach the short and long link rods to the crank lever. See Figure 6 on page 11.

8. Use the crank mounting bracket to attach the crank lever assembly to the door link angle.

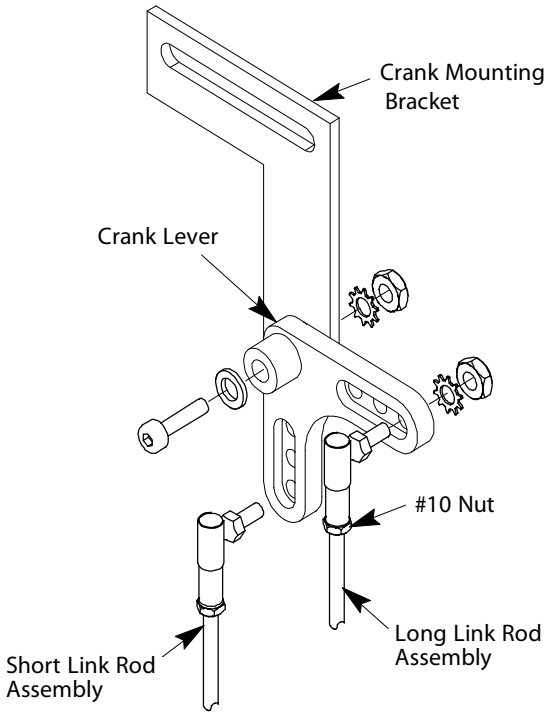
Note: If necessary, add 9/32" diameter holes to the link angle.

Installation

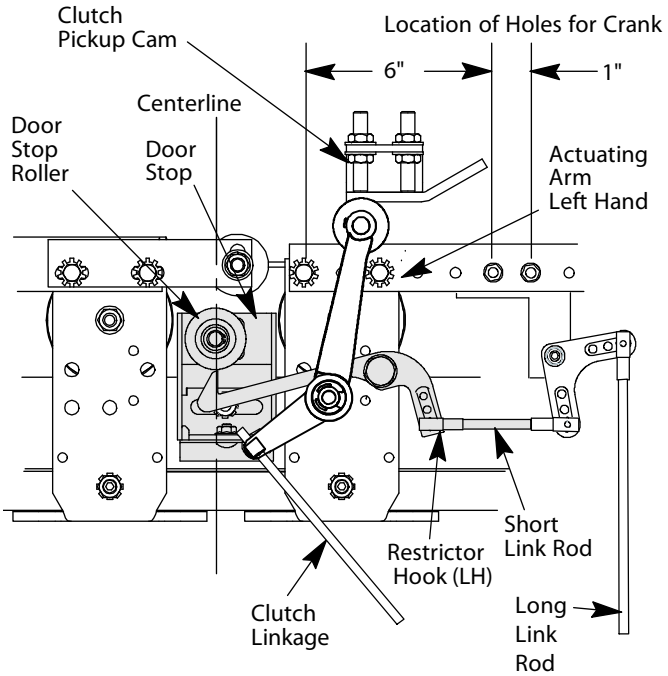
(continued)



RH Assembly



LH Assembly



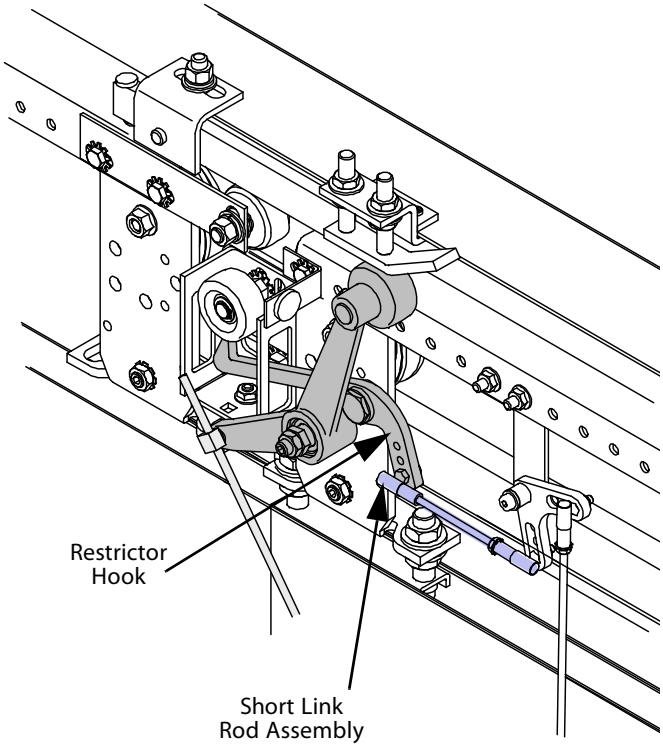


Figure 6 - Attach Crank Lever Assembly to Door Link Angle

Installation
(continued)

9. Use a shoulder bolt and nylon washer to attach the restrictor hook to the door hanger. See Figure 7.

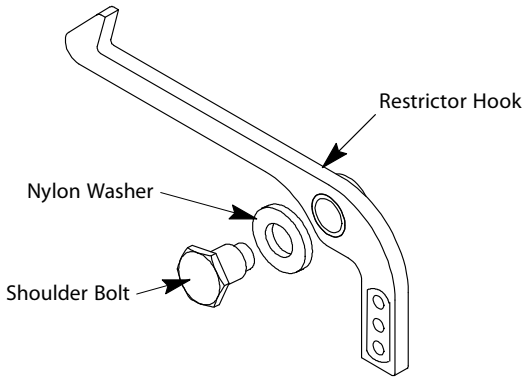


Figure 7 - Attach Restrictor Hook to Door Hanger

10. Use a #10 nut and lockwasher to attach the short link rod assembly to the restrictor hook. See Figure 8.

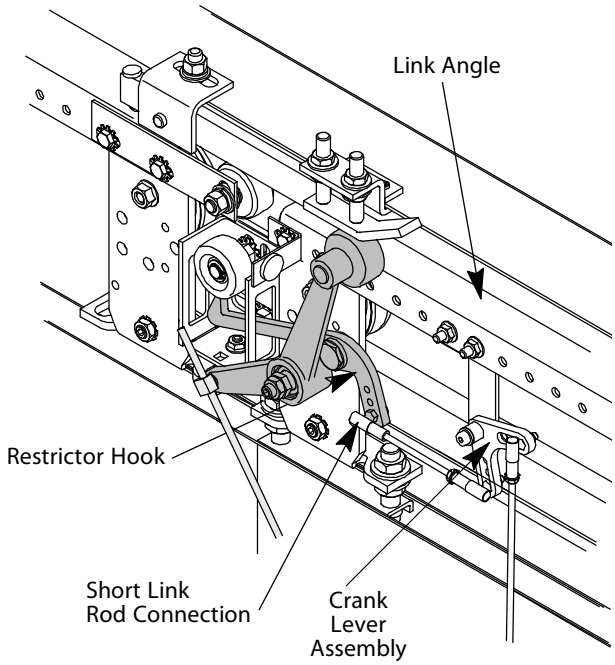


Figure 8 - Attach Short Link Rod Assembly to Restrictor Hook

11. Attach the long link rod to the clutch. The link rod should be vertically level, but a slight angle does not affect the operation.

12. With the door partially open, adjust—not tighten—the hook so it is horizontal to the link nuts.

13. Move, by hand, the restrictor vane in and out to check for binding.

14. Remove the door track bolt (if one is installed) from where the door stop must be placed.

Adjustment

1. Loosen the fasteners that are holding the door stop retaining clip on the door stop. See Figure 9.

Note: For center opening doors, remove the guard on the door stops.

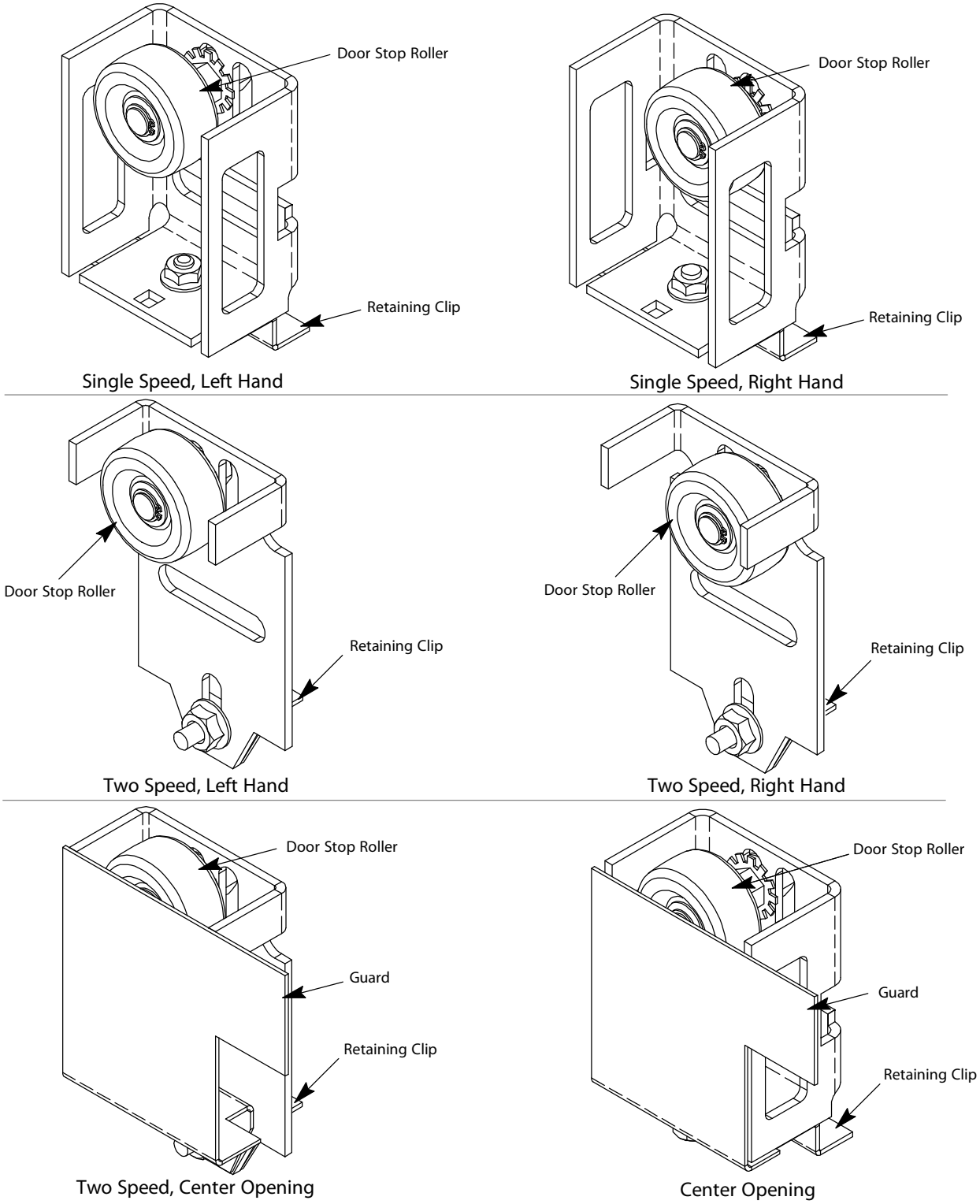


Figure 9 - Loosen Door Stop Retaining Clip Fasteners

Adjustment
(continued)

2. With the door stop roller in the highest position, use a 3/8" bolt and lockwasher to attach the door stop to the door track. See Figure 10.

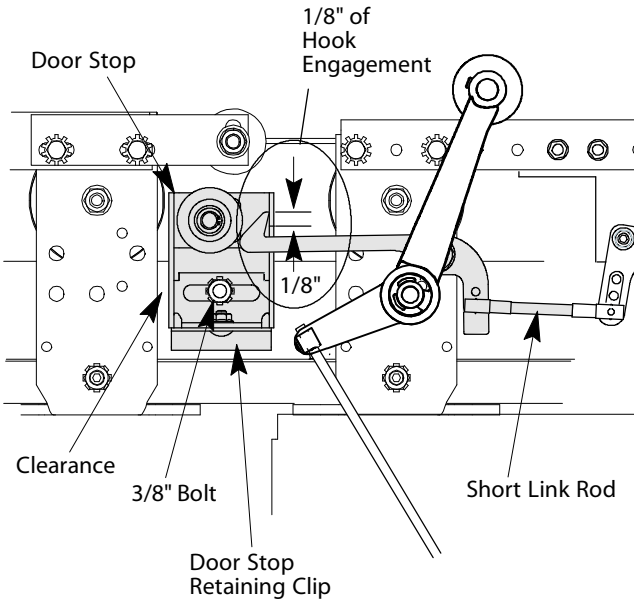


Figure 10 - Attach Door Stop To Door Track

3. With the door closed, center the doorstop roller over the hook.

4. Leave clearance between the doorstop and the hanger, and tighten the retainer clip and the doorstop to the track.

5. Open the car door so the hook is just inside the stop. Use the link rods for adjustment, and raise the hook to about 1/8" of engagement. Tighten the link rod nuts to secure the adjustment.

Note: For any necessary adjustment, slightly move the crank assembly from side-to-side on the link angle.

6. With the car door closed and the clutch closing vane retracted, lower the doorstop roller until the restrictor vane is retracted fully. Tighten the doorstop roller.

7. With the hoistway door open, open the car door (by hand) to check for locking. The door should be unlocked.

8. Open the car door (by hand) with the restrictor vane pushed into the clutch at least 1/4 unlocked. The door should be unlocked.

9. With car and hatch doors closed at this landing, try—by hand—to open the doors to be sure that the doors are not locked.

Adjustment
(continued)

10. Measure the running clearance between the pick-up rollers and the car sill at this landing. Use the running clearance dimension to adjust the remaining pick-up rollers.

11. Check at each landing (during normal operation) to verify that the doors do not lock.

12. Install the door stop guard (center opening doors only).

Note: Restrictor link rods longer than 24" that are close to the door panel can vibrate during fast door stops or reversals. A provided retainer clamp will contain the rod. Bend the clamp to leave a clearance between the rod and the clamp. See Figure 11.

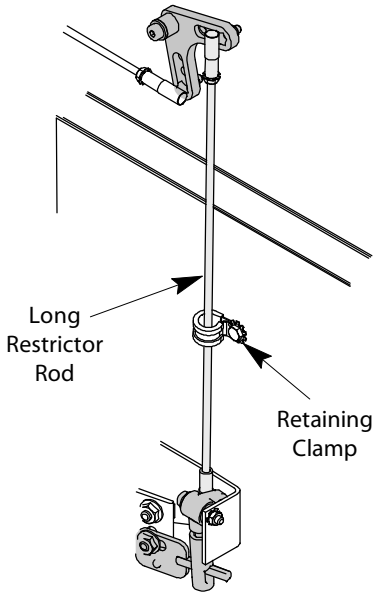
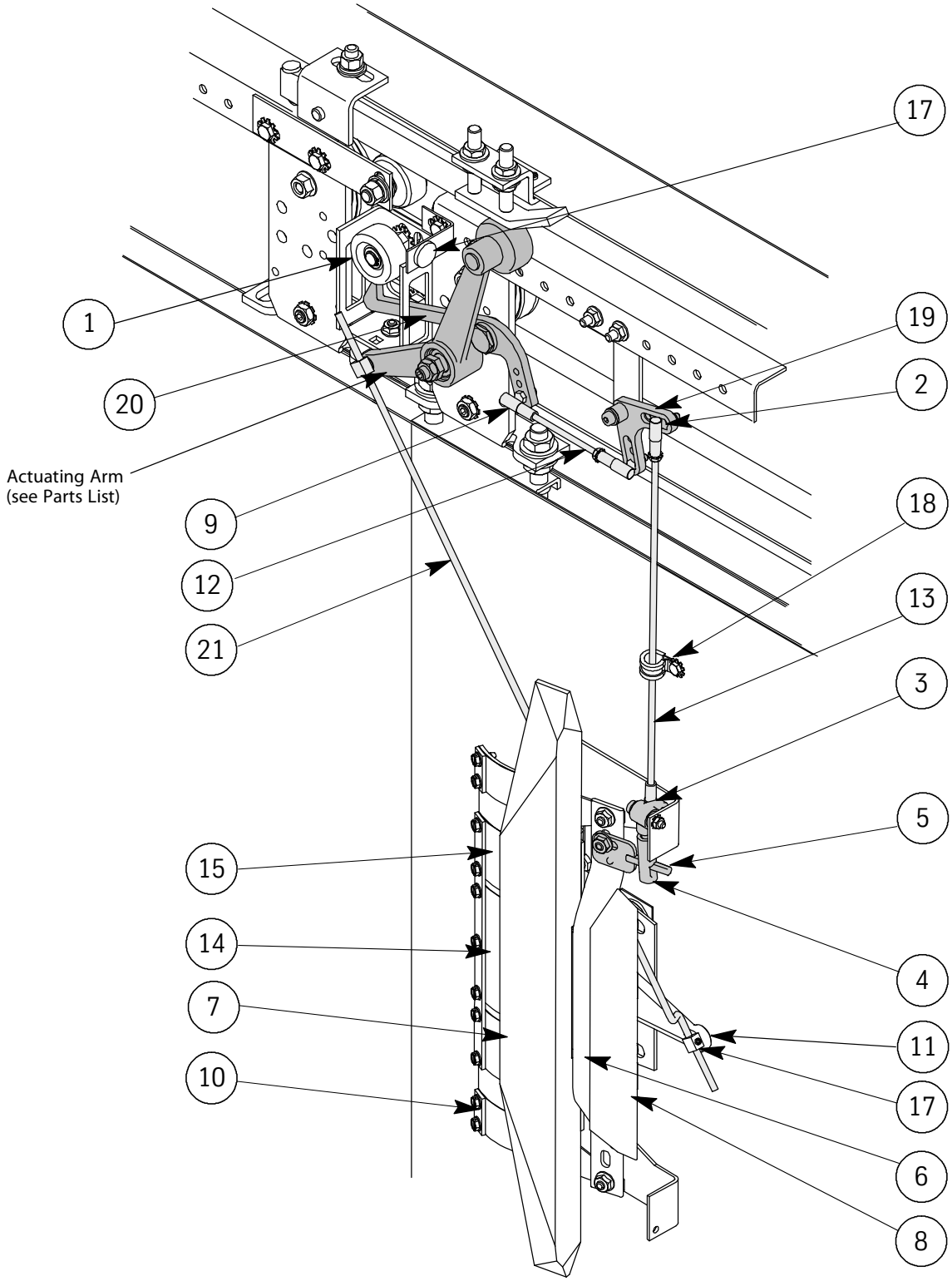


Figure 11 - Retaining Clamp

Replacement Parts

Door Restrictor



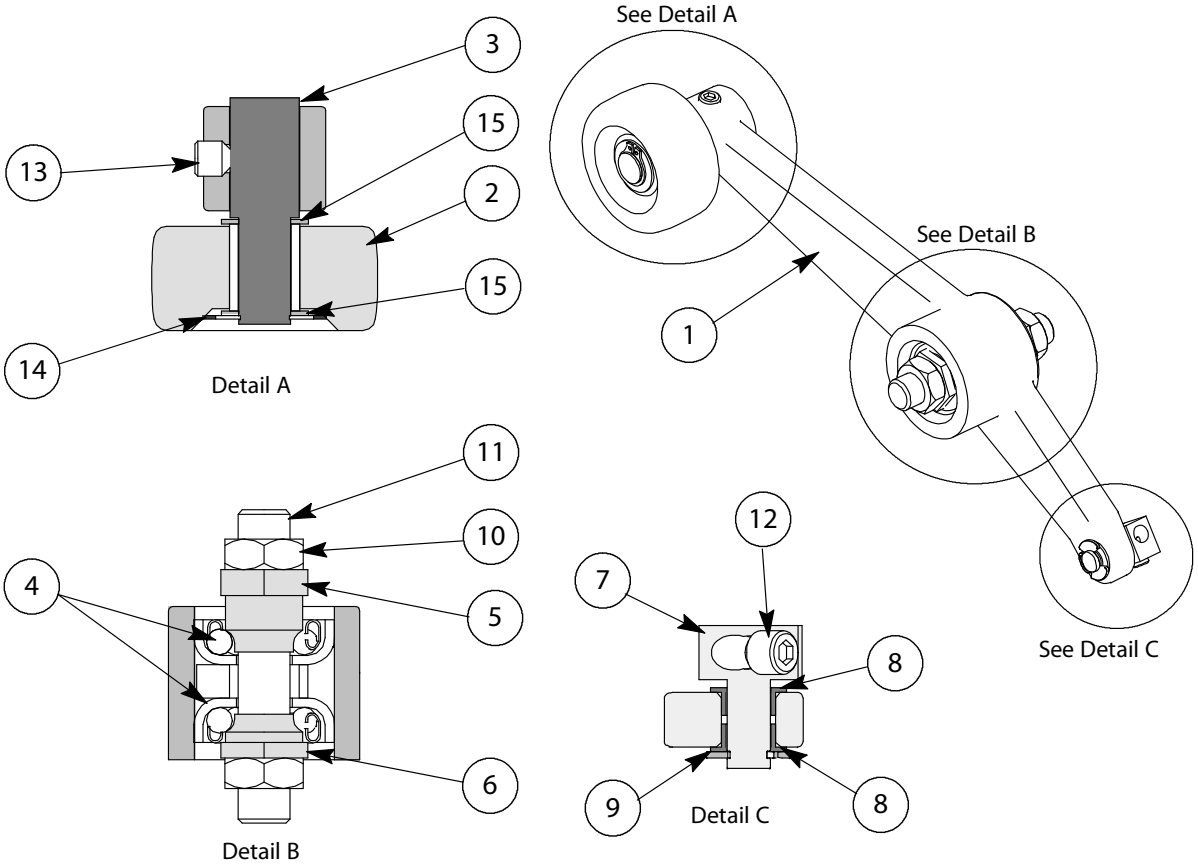
Replacement Parts

(continued)

ITEM	PART NO.	PRINT NO.	DESCRIPTION
1	9838351	63835	Roller, Door Stop
		196ADT2	Bracket, Door Stop, Single Speed
		196ADV2	Bracket. Door Stop, 2-Speed (not shown)
2	9802400	47530	Ball Joint, Right Hand
3	9725461	558BN1	Restrictor Actuator Lever Assembly
4	9852410	208BF2	Bushing, Slide
5	9784695	256GP1	Finger, Casting
6	9709287	888AT1	Vane, Restrictor
7		888AY1	Vane, Opening
8		888AX1	Vane, Closing
9	9802411	145793	Ball Joint, Left Hand
10	9898989	888AR1	Spring Assembly
		888AR2	Spring Assembly
11	9800888	228CF2	Cam, Clutch Actuator
12	9834214	718CH3	Link Rod, Short, 3 5/16"
13		718CH4	Link Rod, Long, 10 11/16"
		718CH2	Link Rod, Long, Contract (length must be specified)
14	9838806	40133	Spring, Closing Vane
15	9739180	40106	Spring, Opening Vane
16	9747035	44703	Rod Attachment
17	9841265	196ACV1	Bracket Assembly, Header Roller Support
18	9875391	274CD1	Clamp, Link Rod Retainer
19	9802415	558BK1	Crank, Restrictor
20		166AL1	Catch, Restrictor, Left Hand
		166AL2	Catch, Restrictor, Right Hand
21		718CP3	Rod, Clutch Link (standard length for 7' doors)
		718CP4	Rod, Clutch Link (length must be specified)

Replacement Parts
(continued)

Actuating Arm Assembly



ITEM	PART NO.	PRINT NO.	DESCRIPTION
1	9739427	558BH1	Arm, Clutch Actuating, RH
	9739439	558BH2	Arm, Clutch Actuating, LH
2	9845781	64578	Roller with Bushing
3		638CB1	Shaft, Roller
4	9774087	47408	Ball Bearing
5	9874392	47439	Race, Bearing, (outer)
6	9874045	47404	Race, Bearing, Nut, (inner)
7	9747035	44703	Rod Attachment
8	9758525	75852	Bushing, Flanged, Nylon
9	9777891	77789	Retaining Ring
10	9718296	700584	Nut, .375" Z
11	9723816	47405	Stud, Actuating Arm Mounting
12		123175	Set Screw, .190" x .250"
13		700633	Set Screw, .250" x .250"
14	9736141	70115	Retaining Ring
15	9759256	75925	Washer, Nylon

Vertical Express

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