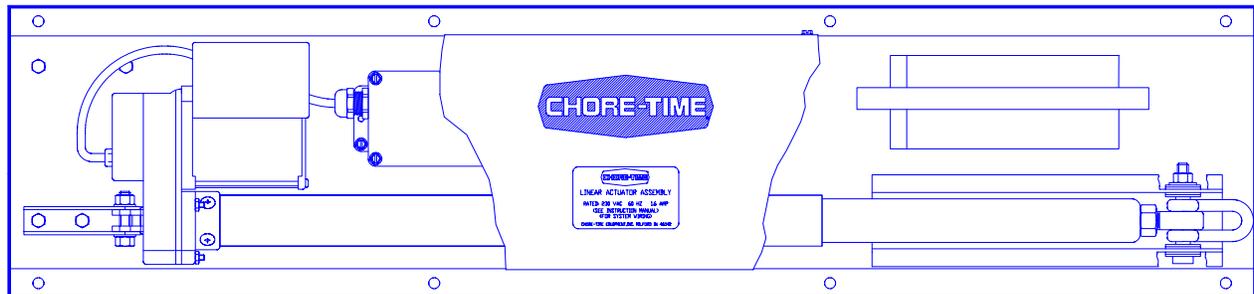




# Linear Actuator Installation Manual

warranty • installation • parts list



MA1221-1 11/95

## Warranty Information

**Chore-Time Equipment** (“Chore-Time”) warrants each new Chore-Time product manufactured by it to be free from defects in material or workmanship for one year from and after the date of initial installation by or for the original purchaser. If such a defect is found by the Manufacturer to exist within the one-year period, the Manufacturer will, at its option, (a) repair or replace such product free of charge, F.O.B. the factory of manufacture, or (b) refund to the original purchaser the original purchase price, in lieu of such repair or replacement. Labor costs associated with the replacement or repair of the product are not covered by the Manufacturer.

### Conditions and Limitations

1. The product must be installed by and operated in accordance with the instructions published by the **Manufacturer or Warranty will be void.**
2. Warranty is void if **all components** of the system are not original equipment supplied by the **Manufacturer.**
3. This product must be purchased from and installed by an authorized distributor or certified representative thereof or the Warranty will be void.
4. Malfunctions or failure resulting from misuse, abuse, negligence, alteration, accident, or lack of proper maintenance shall not be considered defects under the Warranty.
5. This Warranty applies only to systems for the care of poultry and livestock. Other applications in industry or commerce are not covered by this Warranty.

The **Manufacturer** shall not be liable for any **Consequential or Special Damage** which any purchaser may suffer or claim to suffer as a result of any defect in the product. **“Consequential” or “Special Damages” as used herein include, but are not limited to, lost or damaged products or goods, costs of transportation, lost sales, lost orders, lost income, increased overhead, labor and incidental costs and operational inefficiencies.**

THIS WARRANTY CONSTITUTES THE MANUFACTURER’S ENTIRE AND SOLE WARRANTY AND THIS MANUFACTURER EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES, INCLUDING, BUT NOT LIMITED TO, EXPRESS AND IMPLIED WARRANTIES AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSES SOLD AND DESCRIPTION OR QUALITY OF THE PRODUCT FURNISHED HEREUNDER.

Chore-Time Distributors are not authorized to modify or extend the terms and conditions of this Warranty in any manner or to offer or grant any other warranties for Chore-Time products in addition to those terms expressly stated above. An officer of CTB, Inc. must authorize any exceptions to this Warranty in writing. The Manufacturer reserves the right to change models and specifications at any time without notice or obligation to improve previous models.

February 19, 2004

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A Division of CTB, Inc.  
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Thank You

The employees of Chore-Time Equipment would like to thank you for your recent Chore-Time purchase. If a problem should arise, your Chore-Time distributor can supply the necessary information to help you.

## *Support Information*

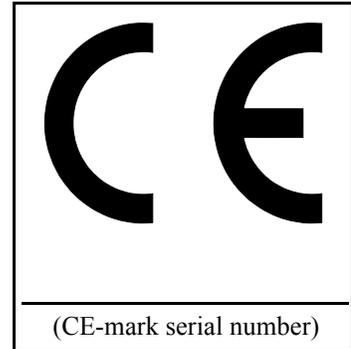
The Chore-Time Linear Actuator is designed to lift the Drop Balls in drop feeding applications. Using this equipment for any other purpose or in a way not within the operating recommendations specified in this manual will void the warranty and may cause personal injury and/or death.

This manual is designed to provide comprehensive planning, installation, wiring, operation, and parts listing information. The Table of Contents provides a convenient overview of the information in this manual. The Table of Contents also specifies which pages contain information for the sales personal, installer, and consumer (end user).

**IMPORTANT:** CE stands for *certified Europe*. It is a standard which equipment must meet or exceed in order to be sold in Europe. CE provides a benchmark for safety and manufacturing issues. CE is required only on equipment sold in Europe.

Chore-Time Equipment recognizes CE Mark and pursues compliance in all applicable products. Please fill in the CE-Mark serial number in the blank space provided for future reference.

Please include the name and address of your Chore-Time Distributor and installer.



Please fill in the following information about your Linear Actuator. Keep this manual in a clean, dry place for future reference.

**Distributor's Name** \_\_\_\_\_

**Distributor's Address** \_\_\_\_\_

**Distributor's Phone** \_\_\_\_\_ **Date of Purchase** \_\_\_\_\_

**Installer's Name** \_\_\_\_\_

**Installer's Address** \_\_\_\_\_

**Installer's Phone** \_\_\_\_\_ **Date of Installation** \_\_\_\_\_

**System Specifications** \_\_\_\_\_

## *Installation Tools Required*

1. Regular Screwdriver
2. Hex Key Wrenches
3. Box-End Wrenches
4. Drive Ratchet and Sockets
5. Screw-Hook Driver
6. Wire Cutters
7. Wire Strippers
8. Adequate size and quantity of electrical wire
9. Another person to help!!

## *Table of Contents*

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\*Legend: C = Customer (end user), D = Distributor (sales), I = Installer of equipment

# SAFETY INFORMATION

Caution, Warning and Danger Decals have been placed on the equipment to warn of potentially dangerous situations. Care should be taken to keep this information intact and easy to read at all times. Replace missing or damaged safety signs.

Using the equipment for purposes other than specified in this manual may cause personal injury or damage to the equipment.

## Safety–Alert Symbol

This is a safety–alert symbol. When you see this symbol on your equipment, be alert to the potential for personal injury. Chore-Time equipment is designed to be installed and operated as safely as possible...however, hazards do exist.



## Signal Words

Signal words are used in conjunction with the safety–alert symbol to identify the severity of the warning.

DANGER ..... indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

WARNING ..... indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

CAUTION ..... indicates a hazardous situation which, if not avoided, MAY result in minor or moderate injury.



## DANGER: Electrical Hazard

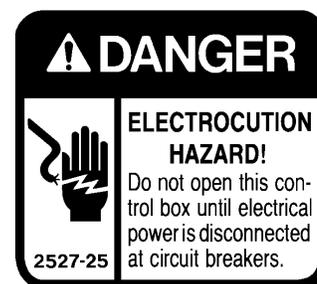
Disconnect electrical power before inspecting or servicing equipment unless maintenance instructions specifically state otherwise.

Ground all electrical equipment for safety.

All electrical wiring must be done by a qualified electrician in accordance with local and national electric codes.

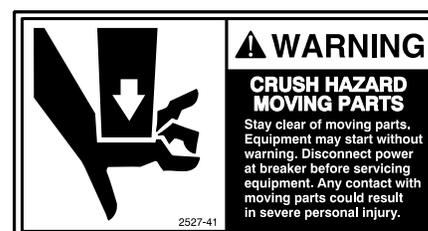
Ground all non-current carrying metal parts to guard against electrical shock.

With the exception of motor overload protection, electrical disconnects and over current protection are not supplied with the equipment.



## DANGER: Rotating Parts

Disconnect electrical power before inspecting or servicing equipment unless maintenance instructions specifically state otherwise.



## Linear Actuator Installation

A Linear Actuator is designed to automatically lift the Drop Balls in Drop Feeders.

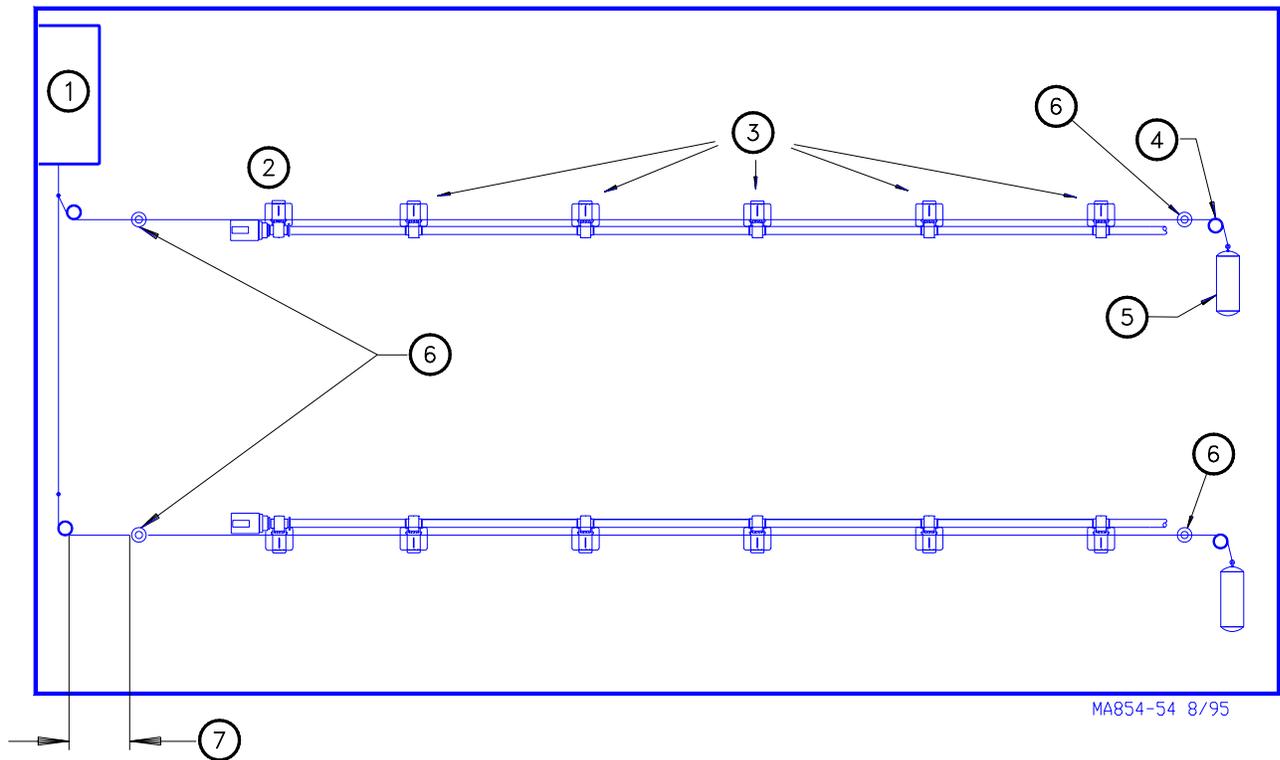
Two sizes are available; the 28990-9 featuring a 9" (229 mm) stroke, and the 28990-18 featuring an 18" (457 mm) stroke.

The Linear Actuators are rated at 600 pounds of pull. The rated capacity may be increased to 1200 pounds of pull by installing a double-back cable arrangement, as shown in Figure 5 (page 9).

Figures 1 through 4 show possible system layouts. Use these guidelines when planning your individual installation. Be careful to plan your component placement around existing equipment.

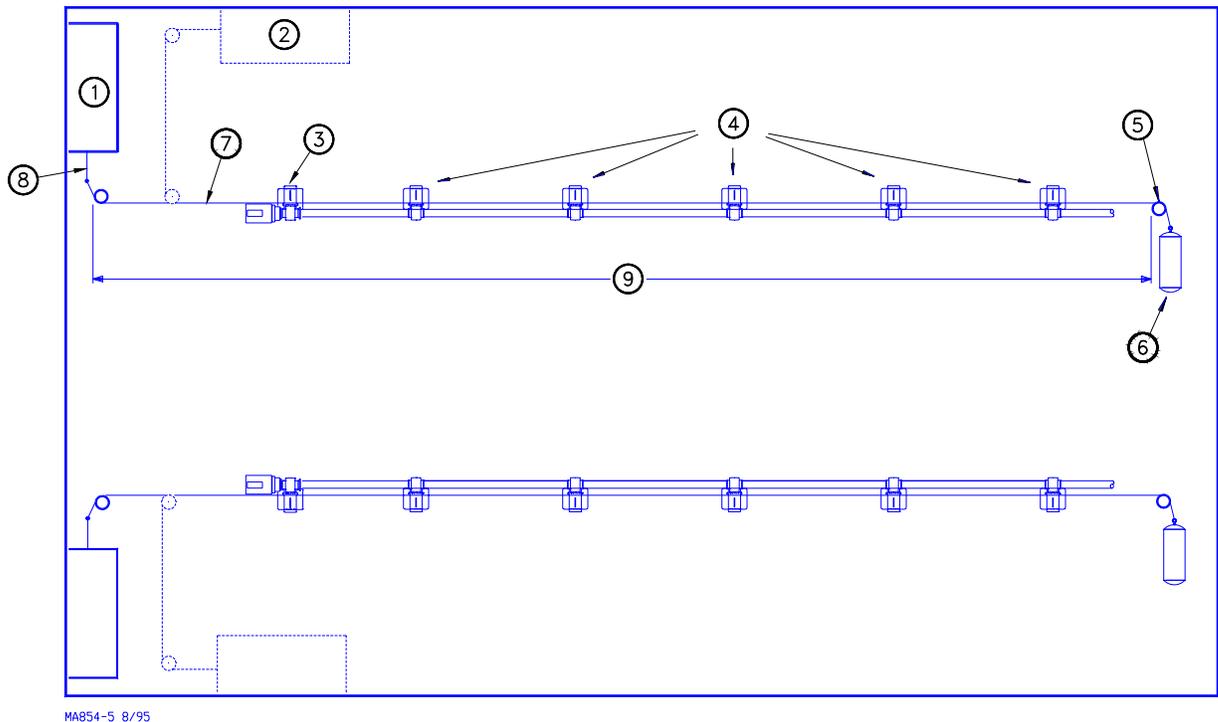
The 28990-9 Linear Actuator may be used to actuate up to 120 Drop Feeders. **Do not** use a double back cable hookup with the 28990-9 Linear Actuator.

The 28990-18 Linear Actuator may be used to actuate up to 240 Drop Feeders. This Linear Actuator requires a 26078 Bracket Assembly and double back cable hookup.



| Key | Description                                      |
|-----|--|
| 1   | Linear Actuator                                  |
| 2   | Drop Feeder Control Unit                         |
| 3   | Drop Feeder                                      |
| 4   | Pulley   |
| 5   | Weight   |
| 6   | Anti-Cable Wrap Ball                             |
| 7   | This distance must be greater than cable travel. |

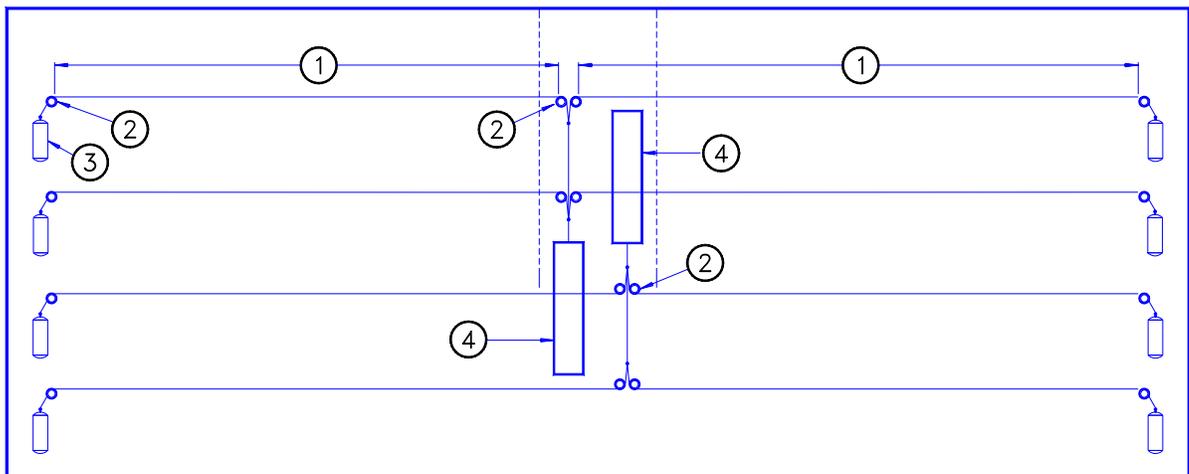
Figure 1. Drop Feeding System layout using a Linear Actuator (top view).



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| Key | Description                          |
|-----|--------------------------------------|
| 1   | Linear Actuator                      |
| 2   | Linear Actuator (optional location)  |
| 3   | Drop Feeder Control Unit             |
| 4   | Drop Feeder                          |
| 5   | Pulley                               |
| 6   | Weight                               |
| 7   | 1/8" (3.1 mm) Stainless Steel Cable  |
| 8   | 3/16" (4.7 mm) Stainless Steel Cable |
| 9   | 200' (61 m) Maximum                  |

Figure 2. Drop Feeding System layout using multiple Linear Actuators (top view)



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| Key | Description         |
|-----|---------------------|
| 1   | 200' (61 m) Maximum |
| 2   | Pulley              |
| 3   | Weight              |
| 4   | Linear Actuator     |

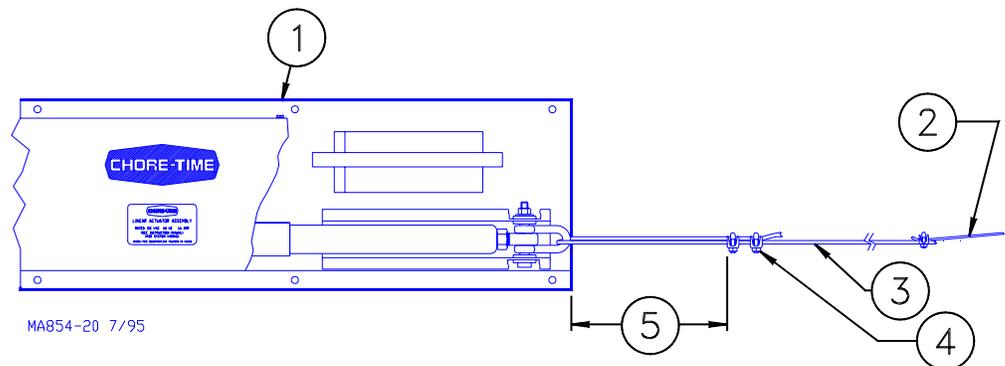
Figure 3. Drop Feeding System layout using multiple Linear Actuators (top view)

1. Install the pulleys on walls or ceiling at the height the cable system is to be installed. The same height or slightly higher than the top of the Drop Feeder units is recommended.

Remember: If the Linear Actuator is not directly in-line with the Drop Feeders, pulleys must be used to position the cable in-line with the feeder line. Some pulleys are supplied with the system, however, additional pulleys may be ordered through CHORE-TIME.

2. Use the hardware supplied to mount the Linear Actuator to a solid wall or ceiling.
3. If the 28990-9 Linear Actuator is to be used, cable hookup should be as specified in Figure 4.

**The cable that is to be fastened to the Linear Actuator should exit straight out of the Linear Actuator. Do not exit the Linear Actuator at an angle.**



| Key | Description  |
|-----|--|
| 1   | 28990-9 Linear Actuator (up to 120 Feeder Boxes)       |
| 2   | 1/8" Stainless Steel Cable (routed to Drop Ball Cords) |
| 3   | 3/16" (4.7 mm) Cable                                   |
| 4   | (2) Cable Clamps                                       |
| 5   | 9" (229 mm) Minimum                                    |

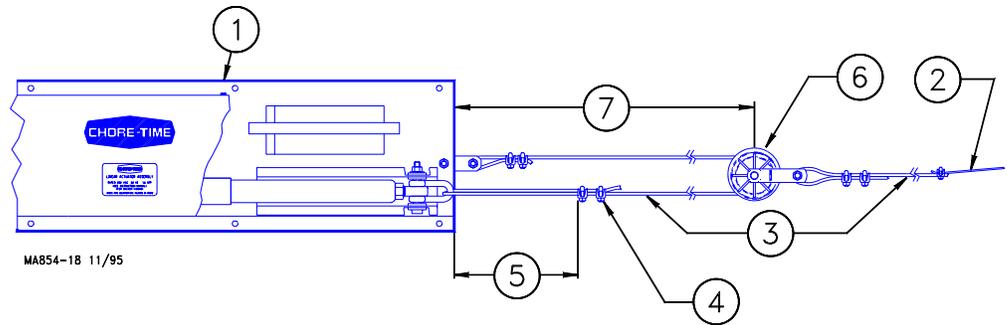
Figure 4. Cable hookup for 28990-9 Linear Actuator to activate 120 Drop Feeders (front view)

If the 28990-18 Linear Actuator is to be used, cable hook-up should be as specified in Figure 5. The 26078 Bracket Assembly is supplied with the necessary 3/8-16 hardware to mount it to the back Linear Actuator Mounting Plate of the Linear Actuator.

**The cable that is to be fastened to the Linear Actuator should exit straight out of the Linear Actuator, do not exit the Linear Actuator at an angle.**

**IMPORTANT**

**Linear Actuators that are actuating 120 to 240 Drop Feeders per Linear Actuator, require the 28990-18 Linear Actuator and the double-back cable hookup shown in Figure 5.**

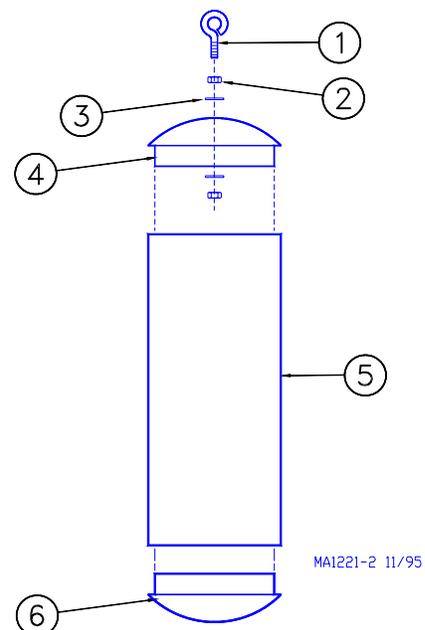


| Key | Description  |
|-----|--|
| 1   | 28990-18 Linear Actuator (up to 240 Feeder Boxes)      |
| 2   | 1/8" Stainless Steel Cable (routed to Drop Ball Cords) |
| 3   | 3/16" (4.7 mm) Cable                                   |
| 4   | (2) Cable Clamps                                       |
| 5   | 18" (457 mm) Minimum                                   |
| 6   | Pulley (p/n 2500)                                      |
| 7   | 24" (610 mm) Minimum                                   |

Figure 5. Cable hookup for 28990-18 Linear Actuator to activate 240 Drop Feeders (front view)

- Unroll the 1/8" (3 mm) Stainless Steel Cable down the full length of the feeder line before attaching any of the Drop Ball Cords.
- Loosely attach the end of the cable to the Linear Actuator, using hardware provided. Final adjustment and hookup to Linear Actuator should not be done until all feeder cords are attached to the cable.
- Assemble the 26051 Weight Kit, as shown in Figure 6. Fill the Weight Kit with approximately 10 lbs. (4.5 kg) of sand or gravel.

Fasten the end of the cable to the Weight Kit to keep the cable tight.



| Key | Description     |
|-----|-----------------|
| 1   | Eyebolt         |
| 2   | 1/4-20 Locknut  |
| 3   | Flat Washer     |
| 4   | Cap (with hole) |
| 5   | Weight Tube     |
| 6   | Cap             |

Figure 6. Weight Kit Assembly (side view)

7. Begin at the Control Unit end of the line and use a split-bolt clamp to attach each drop ball cord to the cable.

The Drop Ball Cord must travel across the top of the feeder to fasten to the main cable, as specified in the Drop Feeding Manual (MA854).

Make sure each ball is properly "seated" in the closed position and there is no slack in the cord.

## Linear Actuators Adjustment Procedure

The Linear Actuators switches are properly adjusted prior to shipment. In the event a switch needs to be replaced, refer to the following adjustment procedures to properly adjust the switches.

Remove the shoulder bolt and hardware (Items 6, 8, 10, 11, & 13 of Parts Listing on page 12) from Guide Track prior to performing the following adjustment procedure.

**Note: The Inner Tube must be restrained from turning (by hand) while extending or retracting it for adjustment.**

1. EXTEND tube from retracted position 2-3 inches (50 to 75 mm).
2. Fully RETRACT tube to cammed stop.
3. ADJUST Inner Tube by turning counter-clockwise until mounting hole is .50 inches (13 mm) from end of track. See Figure 7.
4. EXTEND the Tube until a 9" or 18" (229 or 457 mm) stroke, whichever is applicable, is achieved. See Figure 8.
5. Locate outer cam (under motor cap) and adjust until switch just actuates. See Figure 9.
6. RETRACT tube 2 to 3 inches (50 to 75 mm).
7. Repeat step 4 and check stroke.
8. Readjust cam per step 5, if needed.
9. Assemble shoulder bolt, shackle, etc.
10. Fully retract then fully extend unit to assure proper settings and replace motor cap.

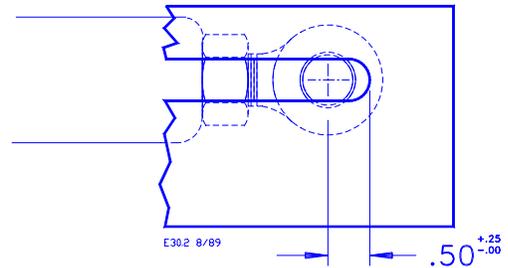


Figure 7. Linear Actuator Adjustment Procedure (side view)

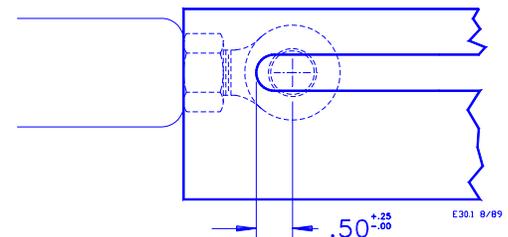


Figure 8. Linear Actuator Adjustment Procedure (side view)

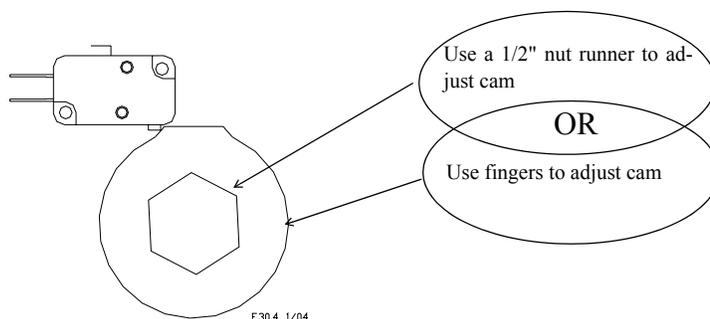
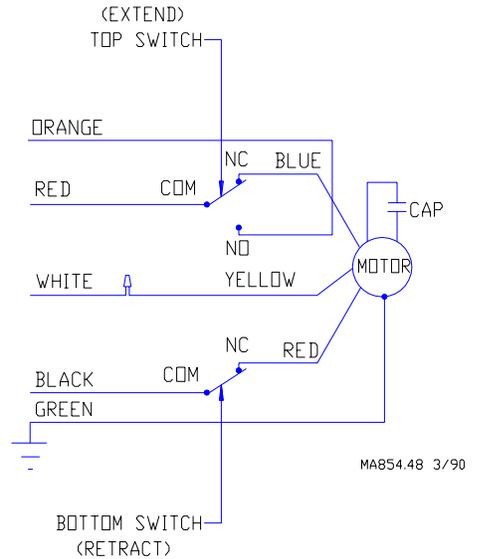
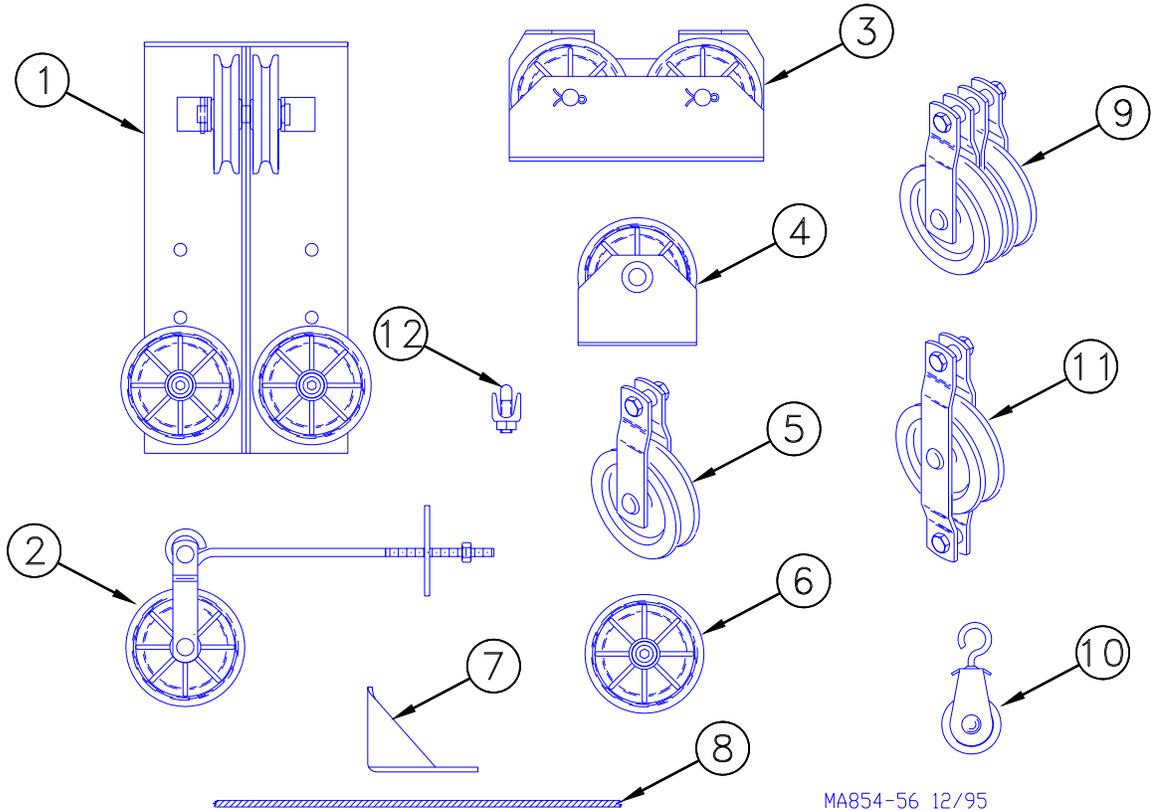


Figure 9. Linear Actuator Adjustment Procedure (side view)

## Linear Actuator Internal Wiring Diagram



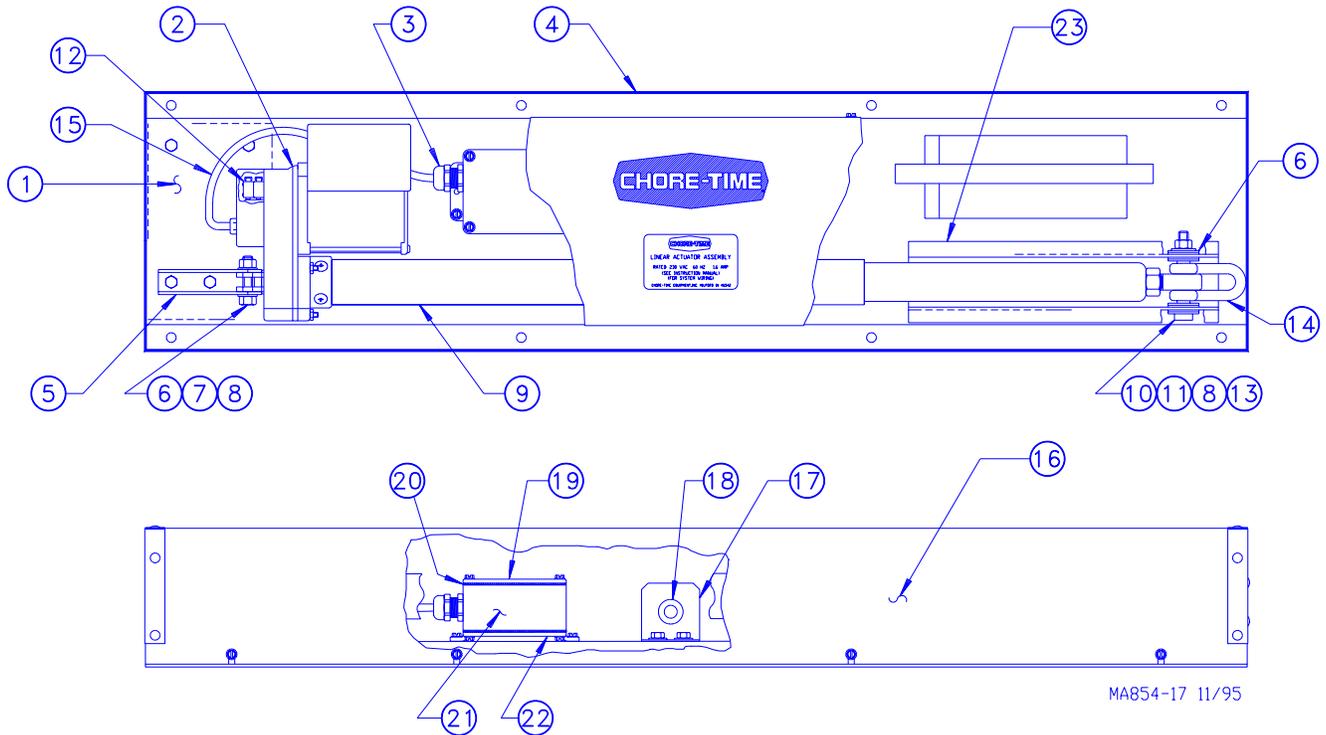
## Miscellaneous Components



| <u>Item</u> | <u>Components</u>      | <u>Part No.</u> |
|-------------|------------------------|-----------------|
| 1           | Pulley Kit Assembly    | 27111           |
| 2           | Master Pulley          | 2617            |
| 3           | Center Pulley Assembly | 27302           |
| 4           | Pulley Assembly        | 7886            |
| 5           | Pulley Assembly        | 2500            |
| 6           | Pulley                 | 2503            |
| 7           | Mounting Plate         | 24495           |
| 8           | 3/16" Cable (150')     | 13976           |
| 9           | Double Pulley Assembly | 2502            |
| 10          | Pulley w/Swivel        | 3004            |
| 11          | Double Eye Pulley      | 2501            |
| 12          | Cable Clamp            | 732             |

**28990-9 Linear Actuator--used to pull drop balls in up to 120 boxes**

**28990-18 Linear Actuator--used to pull drop balls in up to 240 boxes**



| <u>Key</u> | <u>Description</u>           | <u>28990-9<br/>Part No.</u> | <u>28990-18<br/>Part No.</u> |
|------------|------------------------------|-----------------------------|------------------------------|
| 1          | Plate                        | 25559                       | 25559                        |
| 2          | Gearmotor Assembly           | 28888                       | 28888                        |
| 3          | 1/2" Liquid Tight Connector  | 23779                       | 23779                        |
| 4          | Mounting Plate               | 25139                       | 26301                        |
| 5          | Motor End Brace              | 25137                       | 25137                        |
| 6          | 3/8" Washer                  | 4967                        | 4967                         |
| 7          | 3/8-16 x 1-1/2" Hex Hd Screw | 4413-6                      | 4413-6                       |
| 8          | 3/8-16 Hex Locknut           | 2183                        | 2183                         |
| 9          | Linear Actuator Tube         | 25992-9                     | 25992-18                     |
| 10         | 7/16" Flat Washer            | 1551                        | 1551                         |
| 11         | 1/2" Shoulder Bolt           | 5373-3                      | 5373-3                       |
| 12*        | Switch                       | 25993                       | 25993                        |
| 13         | 1/4-20 x 5/8" Hex Hd Screw   | 2152                        | 2152                         |
| 14         | Shackle                      | 25995                       | 25995                        |
| 15*        | Cord Assembly                | 4999-71                     | 4999-71                      |
| 16         | Guard Assembly               | 25136-9                     | 25136-18                     |
| 17         | Angle Bracket                | 7216                        | 7216                         |
| 18         | Heyco 7/8" Bushing           | 3326                        | 3326                         |
| 19         | Switch Box Cover             | 6776                        | 6776                         |
| 20         | Gasket                       | 6777                        | 6777                         |
| 21         | Switch Box                   | 26794                       | 26794                        |
| 22         | Mounting Cover               | 6956                        | 6956                         |
| 23         | Bracket Guide                | 27421-9                     | 27421-18                     |
| --         | Warning Decal                | 2527-41                     | 2527-41                      |
| --         | Danger Decal                 | 2527-10                     | 2527-10                      |

\*Indicates components of Item #2 Gearmotor Assembly.

Note: A Parts Package (P/N 26079), containing (1) 2500 Pulley, (1) 26078 Bracket Assembly and necessary hardware to install the Bracket Assembly, is supplied with the 28990-18 Linear Actuator. This Parts Package is not needed with the 28990-9 Linear Actuator.

Contact your nearby Chore-Time distributor or representative for additional parts and information.

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