

### ***Electrak 10 Series / Electromechanical Linear Actuator***



## INTRODUCTION

Thomson has many years of experience designing and manufacturing linear actuators for a wide variety of applications on combines, school buses, industrial sweepers, vans for the handicapped, and other mobile applications. The Thomson linear actuator you have purchased is a well designed, high quality unit which will provide consistent, maintenance-free service throughout its life. When the Electrak 10 is mated with an MCS-2000 series control, it will provide controlled linear force for applications which require moving, positioning, adjusting, or opening and closing on in-plant or mobile applications.

This manual provides complete information needed to install and troubleshoot Thomson D12-05B5, D12-20B5, D24-05B5 and D24-20B5 DC linear actuators. All of these products are easy to apply and require no maintenance.

Please follow the instructions provided in this manual carefully to ensure safe, reliable operation. The Application Notes found on page 3 are of paramount importance, so be sure to read them care thoroughly before proceeding with installation. All stated or implied manufacturer's warranties are voided if this product is not installed and operated in accordance with these instructions.

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## WARRANTY

Thomson warrants that it will repair or replace (whichever it deems advisable) any product manufactured and sold by it which proves to be defective in material or workmanship within a period of one (1) year from the date of original purchase for consumer, commercial or industrial use.

This warranty extends only to the original purchaser and is not transferable or assignable without Danaher's prior consent.

Warranty service can be obtained in the U.S.A. by returning any defective product, transportation charges prepaid, to the appropriate Thomson factory. Additional warranty information may be obtained by writing the Customer Service Department:

Thomson  
1300 N. State St.  
Marengo, Il. 60152  
Phone: 1-800-554-8466

A purchase receipt or other proof of original purchase will be required before warranty service is rendered. If found defective under the terms of this warranty, repair or replacement will be made, without charge, together with a refund for transportation costs. If found not to be defective, you will be notified and, without your consent, the item will be repaired or replaced and returned to you at your expense.

This warranty covers normal use and does not cover damage or defect which results from alteration, accident, neglect, or improper installation, operation, or maintenance. Some states do not allow limitation on how long an implied warrant lasts, so the above limitation may not apply to you.

Thomson's obligation under this warranty is limited to the repair or replacement of the defective product and in no event shall Thomson be liable for consequential, indirect, or incidental damages of any kind incurred by reason of the manufacturer, sale or use of any defective product. Thomson neither assumes nor authorizes any other person to give any other warranty or to assume any other obligation or liability on its behalf.

WITH RESPECT TO CONSUMER USE OF THE PRODUCT, ANY IMPLIED WARRANTIES WHICH THE CONSUMER MAY HAVE ARE LIMITED IN DURATION TO ONE YEAR FROM THE DATE OF ORIGINAL CONSUMER PURCHASE. WITH RESPECT TO COMMERCIAL AND INDUSTRIAL USES OF THE PRODUCT, THE FOREGOING WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED BY OPERATION OF LAW OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS.

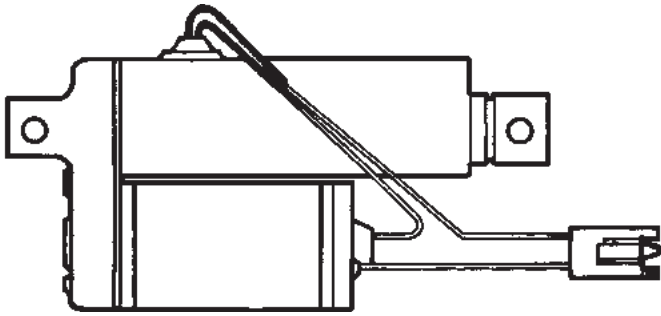
Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

## Other Actuator Products

Thomson's family of actuators offers the right load capacity, stroke length, and control package for almost every application. With stroke lengths from 2 to 24 inches, load ratings from 25 to 1000 lbs., AC or DC models, and control systems from simple on-off control to sophisticated closed loop sensing types, Danaher actuator systems

encompass a broad product range. The actuator series described on this page are available at your local Thomson distributor or directly from the address on the back cover of this manual.

Ask for catalog no. P-786 for more information on these products.



Electrak 1 – Nominal load capacities in a small package.

Load Ratings: 25 or 75 lbs. max.

Stroke Lengths: 2, 4, or 6 inches

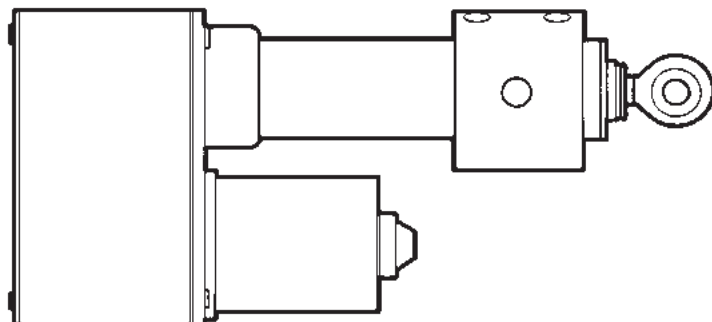
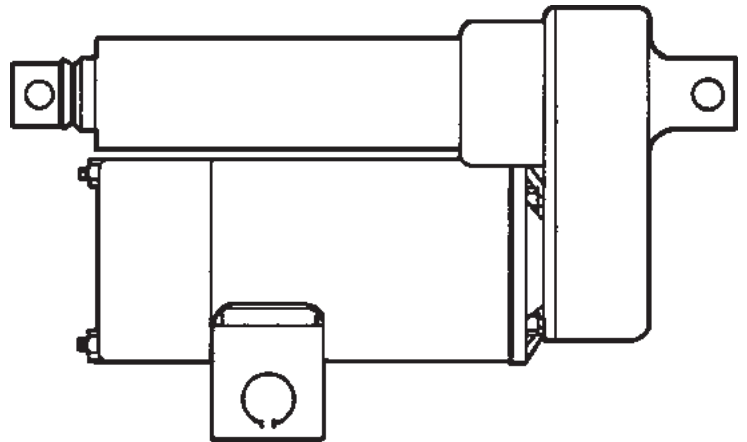
Power Input: 12 or 24 VDC

Overall Lengths: 7 to 11 inches, depending on stroke.

Electrak 5 – A 115 VAC for in-plant applications.

Load Ratings: 500 lbs. max.

Stroke Lengths: 4, 8, 12, 18 or 24 inches



Electrak 100 – Potentiometer position feedback control and internal adjustable limit switches make this Danaher's most sophisticated actuator.

Load Ratings: 500 or 1000 lbs.

Power Input: 24 VDC

Stroke Lengths: 4, 8, 12, 18, or 24 inches

Feedback: 10K ohm potentiometer

The Thomson family of actuator controls - a choice of separate or combined power supplies and controls to meet your various needs.

### MCS-2015

A power supply for use with a remote control station, photoscanner or programmable controller to run any 24 VDC actuator. 115/230 VAC input, 24 VDC output, thermal overload protection, fused, power on/off switch.



### MCS-2025

Combines the power supply of the MCS-2015 and the control of the PC compatible MCS 2020 in a single enclosure for ease of installation and wiring.



### MCS-2020

A control that can be used with the MCS-2015 or other 12 or 24 VDC power sources. Provides extend, retract, jog, run and auto return functions. Programmable controller compatible, 12 or 24 VDC input-output.



### MCS-2035

Combines the power supply of the MCS-2015 and the control of the PC compatible MCS-2030 in one enclosure for ease of installation and wiring.



### MCS-2030

Same as the MCS-2020 but includes an analog meter to display the position feedback from the Electrak 100.



## Application Notes

1. Always make sure power is off before attempting to work on or near the actuator and its electrical controls.
2. Electrak 10 actuators are load protected with a slip clutch. The clutch will slip when the load exceeds the actuator's rating, preventing any movement of the load. The clutch is factory set based on load rating.
3. The duty cycle for the Electrak 10 actuator is 25% "on time". For instance, an actuator operating for 25 seconds must remain off for 75 seconds before operating again. Exceeding this maximum will cause the motor to overheat and trip its internal thermal breaker.
4. Electrak 10 actuators are weather protected for use in outdoor applications, but they are not waterproof and should not be used in underwater conditions
5. Electrak 10 actuators are not explosion or dust ignition proof; do not use in those types of environments.
6. Electrak 10 actuators are factory lubricated for life. No disassembly is ever required for routine maintenance purposes.

## Specifications

<b>Stroke Length:</b>	4, 8 or 12"
<b>Duty Cycle:</b>	Twenty-five percent "on" time at 75° F at rated load (higher duty cycles at lower loads)
<b>Life:</b>	20,000 cycles, nominal
<b>Motor Protection:</b>	Automatically reset thermal overload protection.
<b>Temperature Range:</b>	-150F to +150° F
<b>End Play:</b>	.070 inch maximum
<b>Overload Protection:</b>	Mechanical load limit clutch
<b>Mounting:</b>	Actuator ends must be restrained from rotating (to counter 90 in-lb maximum torque developed) and mounted with parallel pins equally supported on both ends. Actuator not to be mounted off of cover (outer) tube.
<b>Lead Wires:</b>	14 AWG PVC, 800C insulation
<b>Static Loads:</b>	3000 lbs. maximum

**Dynamic Loads:**

Model	Volts	Max. Load	Max. Amps	Speed at Max. Load
D12-05B5	12 VDC	500#	29	1.315 in/sec
D24-05B5	24 VDC	500#	15	1.315 in/sec
D12-20B5	12 VDC	1000#	14	.481 in/sec
D24-20B5	24 VDC	1000#	7	.481 in/sec

## MOUNTING

Thomson linear actuators are quickly and easily mounted by slipping pins through the holes on each end of the unit and into brackets on the machine frame and the load.

Half inch diameter solid pins provide maximum holding strength and a retaining or cotter pin on each end will prevent the solid pin from falling out of its mounting bracket. Roll or spring type mounting pins should be avoided. The mounting pins must be parallel to each other as shown in Figure 1. Pins which are not parallel to each other may cause the actuator to bind.

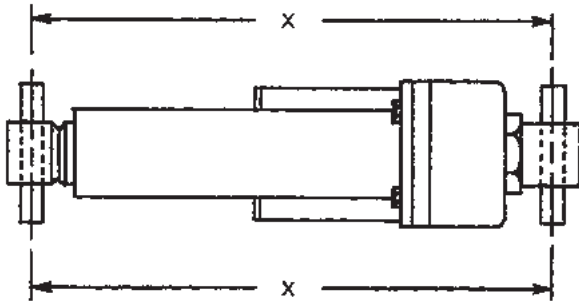


FIGURE 1

The load should act along the stroke axis of the actuator since off center loads may cause binding and lead to premature failure. See Figure 2.

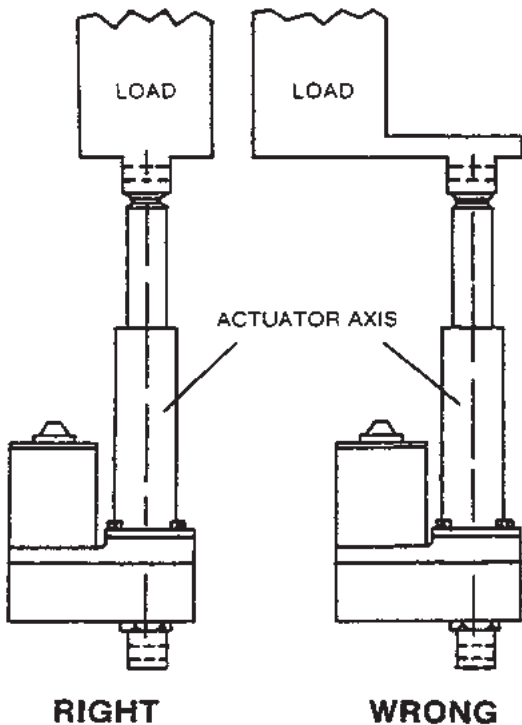


FIGURE 2

The actuator mounting brackets must be able to withstand the torque which is developed when the unit extends or retracts. Restraining torque required varies with the model being used. See Figure 3 and the chart below.

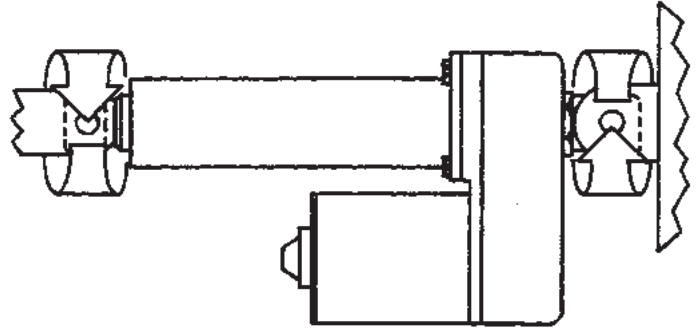


FIGURE 3

Actuator	Torque Required In.-Lbs.
D12-05B5	60
D24-05B5	60
D12-20B5	90
D24-20B5	90

Make sure mounting pins are supported on both ends. Cantilever mounts are unacceptable. Failure to do so could shorten the life of the actuator.

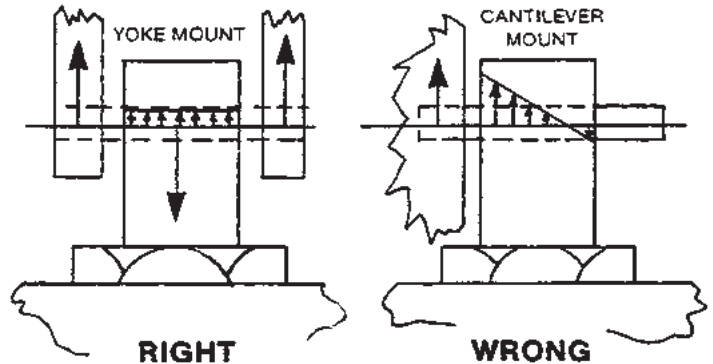


FIGURE 4

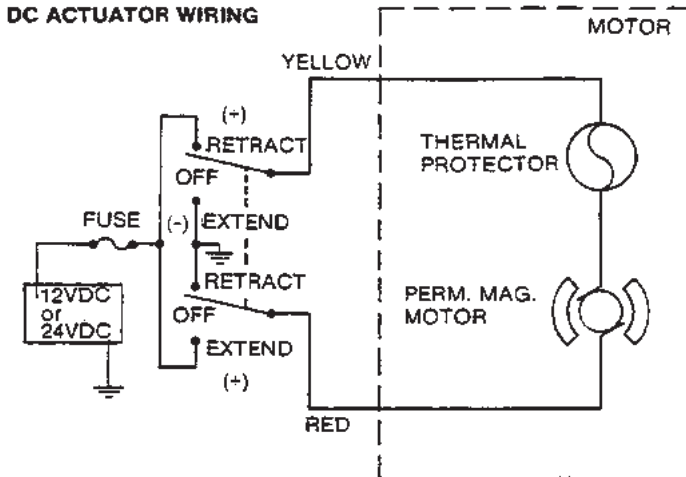
**NOTE:** Do not attempt to mount the Electrak 10 on its cover tube. The tube is not designed to support the forces required for this type of mounting.

# ELECTRICAL INSTALLATION

## Wiring

Thomson linear actuators should be connected in accordance with the diagram show below.

Make sure power is off before attempting to wire actuator.

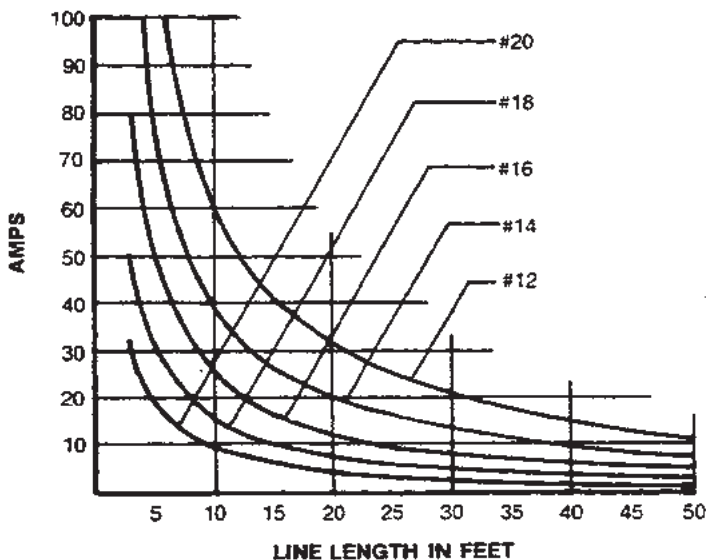


## WIRE GAUGE SELECTION

### DC Actuators

Long lead wires between the power source and the actuator will result in a voltage drop for DC units. This voltage drop can be avoided by sizing the wires in accordance with the following wire gauge selection chart, which is based on a 12 or 24 VDC power source.

### WIRE GAUGE SELECTION CHART



In order to use the chart, find the point of intersection of the two known factors, such as amperage and distance, and read the required wire gauge from the curves on the chart. Example: A D12-2OB5 actuator draws 14 amps current at rated load. The intersection of the maximum current and the distance between the actuator and power source (44 feet, for example) indicates the wire gauge required (#12).

## SWITCHES

Actuator direction (forward, reverse) is controlled with a double-throw switch with the center position 11 off.”

### DC Actuator Switches

DC actuators require double pole, double throw switches. McGill switch no. 0111-004, Cutler Hammer switch no. 8835- or equivalent are recommended and are usually available locally. The required switch can be purchased locally or from Danaher under part number 830-8004-016. Here are the required parameters:

- Double-pole, double-throw
- 20 Amp at 28 VDC
- Lever seal to keep out dirt and moisture
- Center “off”
- Two momentary contacts
- 15/32” bushing
- Screw terminals

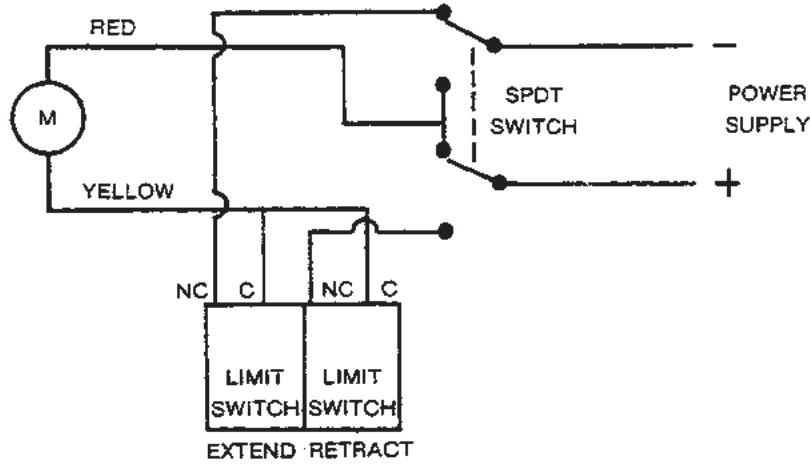
## CONNECTORS

Packard Electric connector 56 Series No. 2984883 and 56 Series No. 29692987. Male blade provided on DC actuators.

## ACTUATION

To extend actuator, connect red to positive and yellow to negative. To retract actuator, connect yellow to positive and red to negative.

## WIRING EXTERNAL LIMIT SWITCHES (OPTIONAL)



Thomson actuators may also be interfaced with the MCS-2000 Series controller.  
Available controllers are as follows:

- MCS-2015     Power Supply - 110 VAC in, 24 VDC out, 17 Amp maximum.
- MCS-2020     Actuator Controller - Capable of extend and retract functions in a jog or continuous run model. For use with 12 or 24 VDC actuators.
- MCS-2025     Combined Controller and 24 VDC power supply. Performs same functions as MCS-2020.



## TROUBLESHOOTING

### Covers D12 and D24 Models

**General:** The chart below will be helpful for isolating malfunctions in the control system, countering difficulties with system start-up, and in troubleshooting for worn or broken mechanical or electrical components in units which have been operating for sometime. For correct diagnosis it is important to do all tests before disassembling the actuator.

If the actuator is being used in conjunction with an MCS controller, see Troubleshooting Guide in controller manual for additional checkpoints.

**Symptom: Actuator will not extend/retract**

Checkpoint	Probable Cause	Possible Solution
No voltage or amp draw	Actuator not receiving power	-Check power supply
Proper voltage, no amp draw	Dead motor	-Replace motor
	Thermal overload cut-out (when overheated)	-Let cool, check duty cycle
Proper voltage, amp draw present, clutch slips	Actuator overloaded	-Check rated load
Clutch worn too low (Excessive ratcheting)	-Replace clutch	

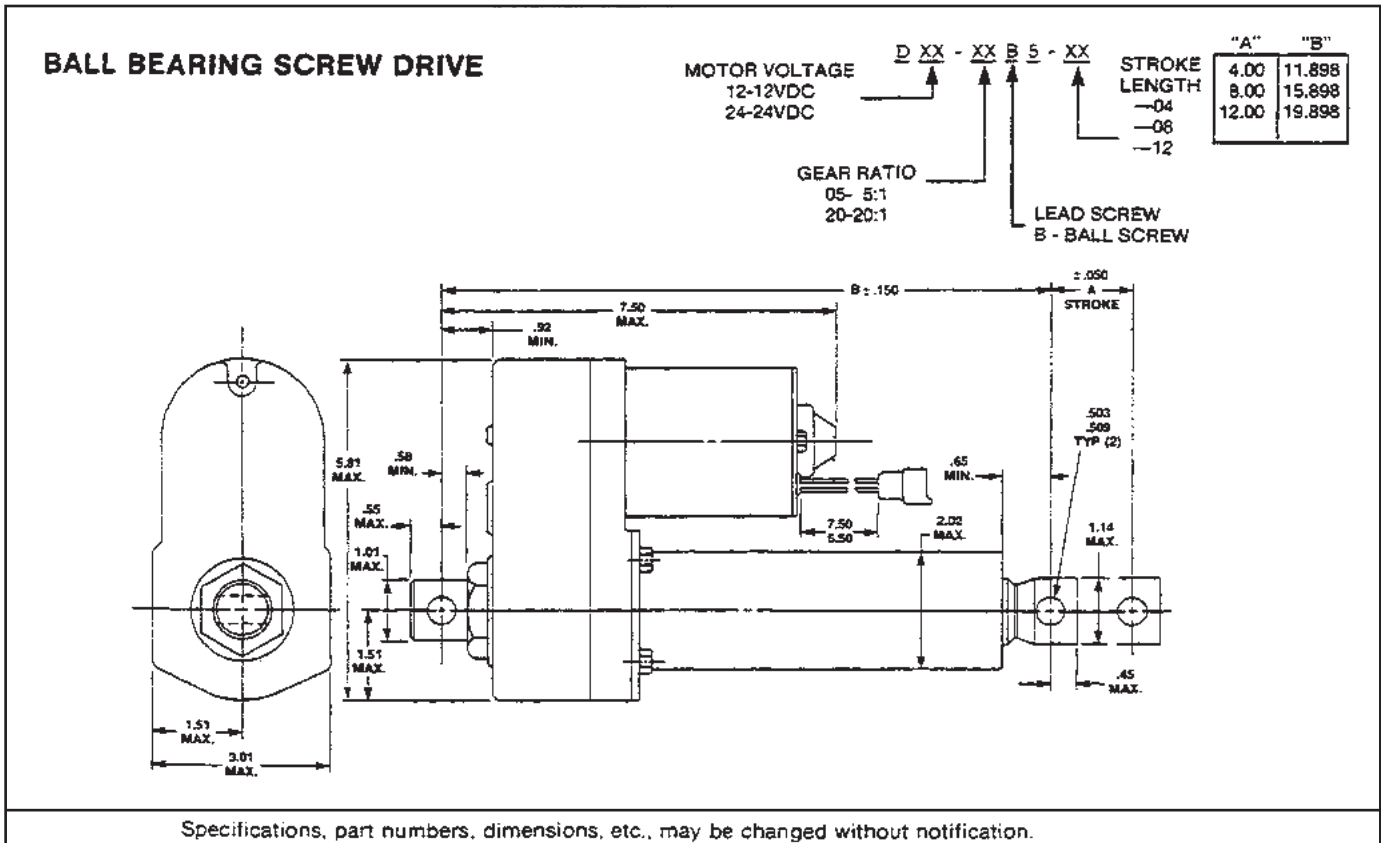
**Symptom: Actuator stops in mid-stroke**

Checkpoint	Probable Cause	Possible Solution
Clutch slips	Actuator overloaded	-Check rated load
Clutch doesn't slip, no amps	Blown fuse (customer provided)	-Replace fuse
	Thermal cut-out	-Let cool, check duty cycle
Clutch doesn't slip, amps present	Motor stalled	-Check voltage too low

If the above checks do not reveal the source of the difficulty, remove actuator from the mechanism to run by itself. Watch and listen for any changes in behavior.

## DIMENSIONS

The outline drawing shown below describes Electrak 10 ball bearing screw driven actuators. The tabulated dimension chart shows these lengths for each model and also describes the part numbers.





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