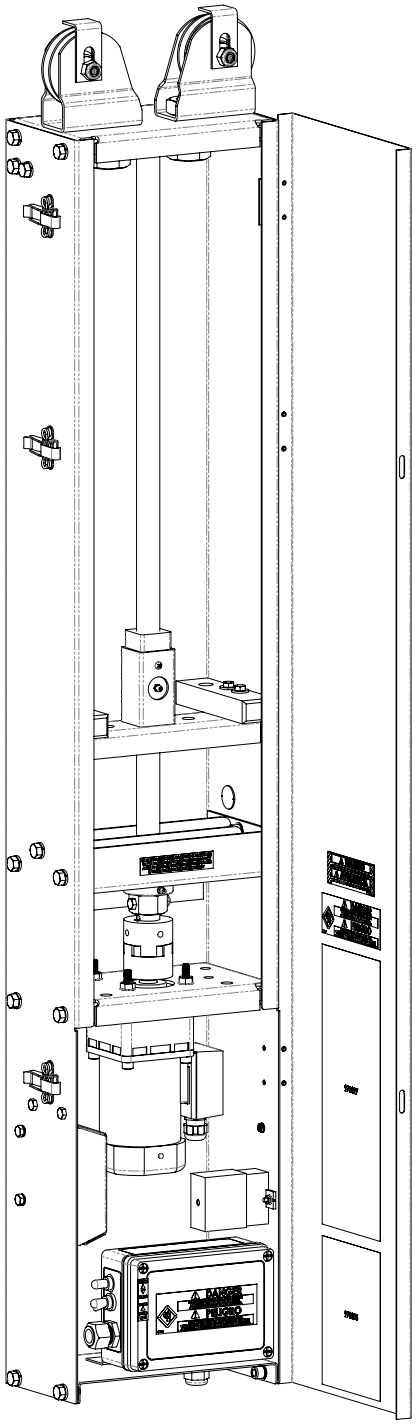
SafeTRAC™ Gen III Indoor Curtain Machine
ATLAS™ Weather Resistant Curtain Machine
(24, 36, 48, and 72 inch)
Installation Manual



970500, 970501, 970504, 970505, 970508, 970512, 970516, 970520, 970532, 970536, 970540, 970544, 970561, 970562

Part No. followed by "-length"
(-24, -36, -48, -72)

990177
REV [G]

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Optional Equipment

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VAL PRODUCTS, INC. WARRANTIES

For Warranty claims information, please see the “Manufactured Products Standard Warranty” form QMS101 available from Val Products, Inc. by:

- Phone: 1-800-998-2526
- Email: marcom@val-co.com
- Online: https://www.val-co.com/doc/382/warranty/16368/qms101-warranty.pdf

Conditions and Limitations:

- Products and Systems involved in a warranty claim under the “Manufactured Products Standard Warranty” shall have been properly installed, maintained and operated under competent supervision, according to the instructions provided by Val Products, Inc.
- Malfunction or failure resulting from misuse, abuse, negligence, alteration, accident or lack of proper installation or maintenance shall not be considered a defect under the Warranty.

Introduction

Features

The Curtain and Inlet Operators from VAL-CO® are rugged and reliable. They are engineered for optimum performance in the harshest conditions. The SafeTRAC & ATLAS Ball-screw and Acme-screw models are available in 24, 36, 48, and 72” sizes with 220V, 50/60Hz or 110V, 50/60Hz motors for domestic and international use.

The VAL-CO Curtain Machine is designed to open ventilation inlets, sidewall curtains, or tunnel curtains. Using the equipment for any other purpose not within the operating recommendations specified in this manual will void the warranty and may cause personal/livestock injury and/or death.

These instructions are designed to provide a general guide to planning, installation, wiring, and operation. Nothing in this manual should be construed to supercede national or local codes in any way. Authorities having jurisdiction should be consulted before installation.

Each model also includes:

- Installation options to fit many applications
- Local control switches
- Greasable needle bearing pulleys
- Helical gears for maximum efficiency and performance
- Safety features to prevent over-run damage
- Up to 4,000 lb. (1,814 kg.) capacity for all normal speed, non-clutch machines
- Up to 3,000 lb. (1,361 kg.) capacity for clutch machines
- Up to 2,000 lb. (907 kg.) capacity for high speed machines
- SafeTRAC Gen. III : Interior installation
- ATLAS : Exterior or interior installation
- Polymer thread block engineered for superior performance and longevity (Acme-screw only)
- 30 RPM gearbox output

Options available:

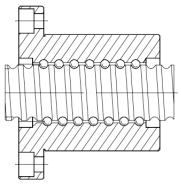
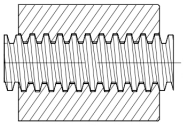
- Swivel chain and sprocket (replaces pulleys)
- Potentiometer feedback kit (10-turn)
- Interlock switch to sense associated equipment (whisker switch)
- Clutch to open curtains on power failure (Ball-screw only)

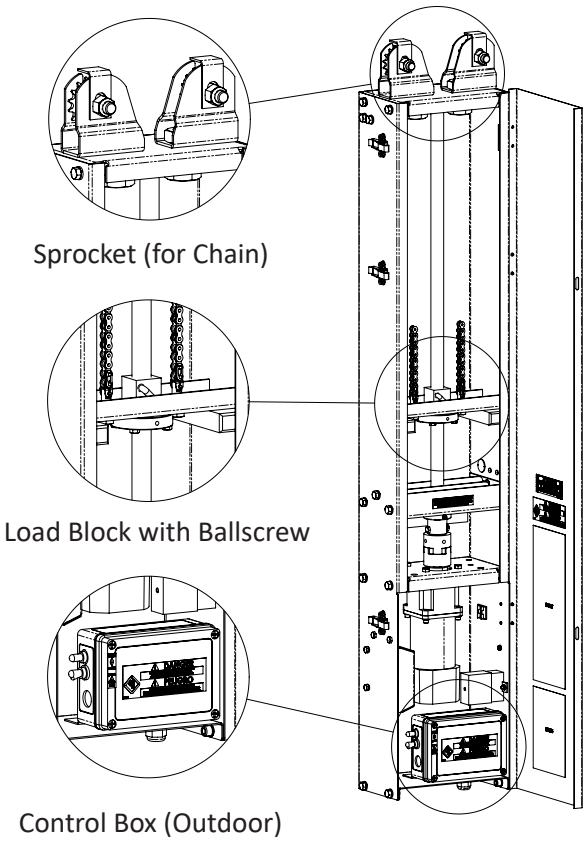
Curtain Machine Specification Table and Identification Diagram

PART # ~(followed w/ -length)	SCREW STYLE	CABLE or CHAIN	CLUTCH	INDOOR or OUTDOOR	LOCAL SWITCH	VOLTAGE (V)	FREQUENCY (Hz)	PHASE (Ph)	TRAVEL RATE (in/min.)	LOAD RATING (lb)
970500	ACME	CABLE	NO	OUTDOOR	YES	220	50/60	1	4/4.8	4000
970501	ACME	CABLE	NO	OUTDOOR	YES	110	60	1	5	4000
970504	ACME	CHAIN	NO	OUTDOOR	YES	220	50/60	1	4/4.8	4000
970505	ACME	CHAIN	NO	OUTDOOR	YES	110	60	1	5	4000
970508	BALL	CABLE	NO	OUTDOOR	YES	220	50/60	1	5/6	4000
970512	BALL	CHAIN	NO	OUTDOOR	YES	220	50/60	1	5/6	4000
970516	BALL	CABLE	YES	OUTDOOR	YES	220	50/60	1	5/6	3000
970520	BALL	CHAIN	YES	OUTDOOR	YES	220	50/60	1	5/6	3000
970532	ACME	CABLE	NO	INDOOR	*NO	220	50/60	1	4/4.8	4000
970536	ACME	CHAIN	NO	INDOOR	*NO	220	50/60	1	4/4.8	4000
970540	ACME	CABLE	NO	INDOOR	*NO	110	60	1	5	4000
970544	ACME	CHAIN	NO	INDOOR	*NO	110	60	1	5	4000
970561	ACME	CABLE	NO	INDOOR	*NO	110	60	1	10	2000
970562	ACME	CHAIN	NO	INDOOR	*NO	110	60	1	10	2000

*Add “-SW” to end of part number to get local switches.

~ Length Options: -24, -36, -48, -72
Example = 970536-36-SW

Ballscrew   Acme Screw



Sprocket (for Chain)

Pulley (for Cable)

Load Block with Ballscrew

Load Block with Acme Screw

Control Box (Outdoor)

Electrical Terminal Strip (Indoor)

Manual Symbols

Our concern is for your safety. The safety warnings are included in this manual as a guide to help and encourage the safe operation of your equipment. It is your responsibility to evaluate the hazards of each operation and implement the safest method of protecting yourself as owner and/or operator.

INFORMATIONAL AND WARNING SYMBOLS

 = NOTE - take notice this may help you!

 = IMPORTANT INFORMATION - be sure to read!

 = WARNING - The safety alert symbol is always used on warning signs that involve your safety or have extra significance since it is describing the importance of a feature or explaining a step to which you should pay close attention to avoid problems.

= DANGER - imminent hazard, if ignored serious injury or death WILL occur.

= WARNING - probable hazard, if ignored serious injury or death COULD occur.

= CAUTION - potential hazard, if ignored minor or moderate injury MAY occur.

The above DANGER, WARNING OR CAUTION symbols may appear as shown to left.

= PLAN - plan before continuing.

 = CHECK - the details of all requirements, processes or procedures of instructions listed.

= STOP - before you go further check the details of all requirements, processes or procedures of instructions listed.

Safety Information

All persons OPERATING or WORKING AROUND electrical curtain actuators should **READ** and **UNDERSTAND** this Manual.

General Safety: This manual must be delivered with the equipment to its owner. Our principal concern is your safety and the safety of others associated with ventilation equipment. This manual is to help you understand safe operating procedures and common problems that may be encountered by the operator and other personnel. As owner and operator, it is your responsibility to know what requirements, hazards, and precautions exist and inform all persons operating or working with this equipment.

Safety Alert: Avoid making any changes to the equipment. Using this equipment for purposes other than specified in this manual may produce dangerous conditions, where serious injury or death could occur. This machine may start automatically. Disconnect power before opening or servicing.

- Disconnect electrical power before inspecting or servicing equipment unless maintenance instructions specifically state otherwise.
- If possible, remove load from machine before working on or near drive mechanism.
- Ground all electrical equipment for safety.
- A qualified electrician must do all electrical wiring in accordance with local and national electrical codes.
- Ground all non-current carrying metal parts to guard against electrical shock.
- Motor overload protection, electrical disconnects and over current protection are not supplied with the equipment.

ABSOLUTELY NO POWER should be applied to any terminals on the circuit board other than the L2/N and L1.

Helpful Hints on Setting Up & Installing Your Curtain Machine

Unpack the machine, remove the machine's cover and inspect the machine for any visible defects. Contact your dealer immediately if you see any visible defects or missing parts.

Consumer Caution: System configuration, operator control of the system, and the application affect product performance. While the product is considered compatible with its intended purpose, the specific functional implementation by the customers of the product may vary. Therefore, the suitability of the product for a specified purpose or application must be determined by the customer and is not warranted by the manufacturer.

- After installation and setup, be sure when the machine closes the curtains there is not too much tension in the curtain. The Curtain Machine SHOULD NOT pull the curtain tight. If the close position end-stop collar is positioned incorrectly, the machine could go into a lockrotor-current condition and burn out the motor.
- In the event of an over travel condition, first determine the cause of the condition and correct the problem, then reset the over travel switch. To reset the over travel switch: 1) Verify that the set screw in the limit switch block has not vibrated loose. 2) Note which over travel switch has been activated and set the controller to run in the opposite direction. 3) Hold down the override toggle switch located near the rear of the motor until the limit switch block moves off the over travel switch and is centered over the limit switches.

Warning!

When this equipment is used in a life support ventilation system where failure could result in loss or injury, the user shall provide adequate maintenance, back-up ventilation, supplementary natural ventilation and failure (alarm) system etc. necessary to control the operation or acknowledge willingness to accept the associated risks of such loss or injury. This equipment is offered for sale specifically on the buyer's acceptance of the above condition and the manufacturers warranty for this equipment. Acceptance, retention, installation, or operation of this equipment by the buyer shall be considered as acknowledgement and acceptance of the above conditions.

Setting up the ATLAS™ for use as a "Power Off Curtain Drop" with clutch

When working with Ball Screw machines with a clutch, be very careful of falling curtains and moving parts when disconnecting power.

- Setting up your ATLAS Inlet, Sidewall and Tunnel Curtain Actuator, and its optional clutch, for use as a "Power Off Curtain Drop" requires following a few important directives which are outlined below.
- When setting up the machine, the load block should be positioned to the motor end of the machine with the curtains in their closed position. With the machine set up as described, upon power failure there will be enough travel for the load block to come to a stop without activating the Over-travel switch. In some instances, such as using a 3' machine and a 3' curtain, it may be necessary to either use a 4' machine or a 1:2 cable set up to prevent the Open Position Over-Travel switch from being activated as there is a certain amount of coasting caused by the inertia of the falling load.
- On **clutch based** models being used as a curtain drop only, position the open position end-stop collar 4" past fully open. In the event of a power failure, if the open end-stop collar is positioned too close to the actual travel distance of the curtains the inertia of the load could back-drive the screw past the open end-stop collar and actuate the over travel switch. The machine would then be inoperable until the over travel switch has been reset manually.
- On **clutch-based** models, if there is excessive clutch slippage, adjust the air gap between the two clutch halves. The air gap should be .010" to .020". To adjust the air gap, be sure all load is removed from the machine and that power has been removed. Loosen the two set screws on the rotor side of the clutch and slide the rotor into position. Use a feeler gauge to verify the air gap. Tighten down both set screws and test the machine. If the machine does not back drive now, the air gap is too small.
- On **clutch-based** models with the curtains in the fully open position, install a cable clamp on the cable inside the machine at the point where the cable exits the machine, so that it stops against the top of the machine. This clamp will prevent the counter weights from constantly pulling on the cable and causing the emergency limit switch to be activated.

Hardware

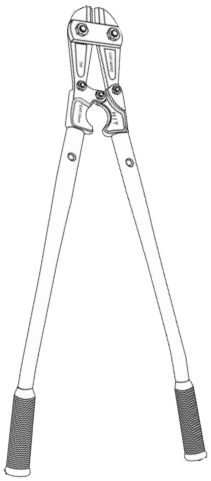
3/8” Mounting Hardware to fit (6) Ø.406” Holes:

Lag Screws, or a Nut and Bolt combination, depending on mounting surface.

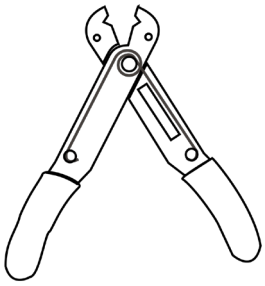
Tools

- *Cable Cutters*
- *Wire Strippers*
- *Allen Wrench (1/8”)*
- *Phillips Screwdriver*
- *Straight Screwdriver*
- *Driver/Socket/Wrench Set with 6” extension OR*
- *Open End Wrench (9/16” for Mounting Hardware) OR*
- *Adjustable Wrench*

Cable Cutters

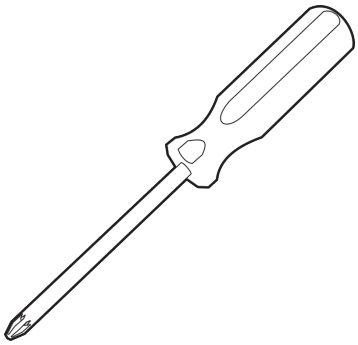


Wire Strippers

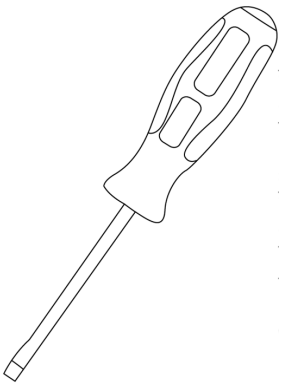


Allen Wrench (1/8”)

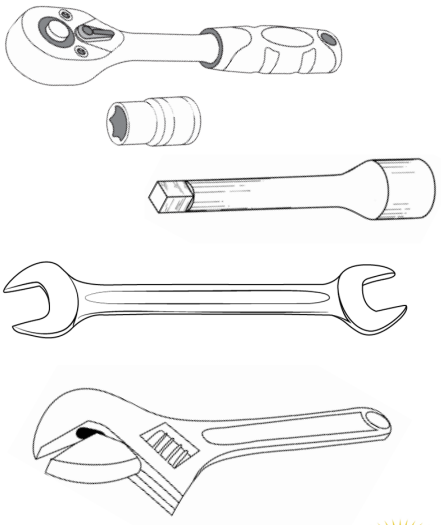
Phillips Screwdriver



Small Straight Screwdriver



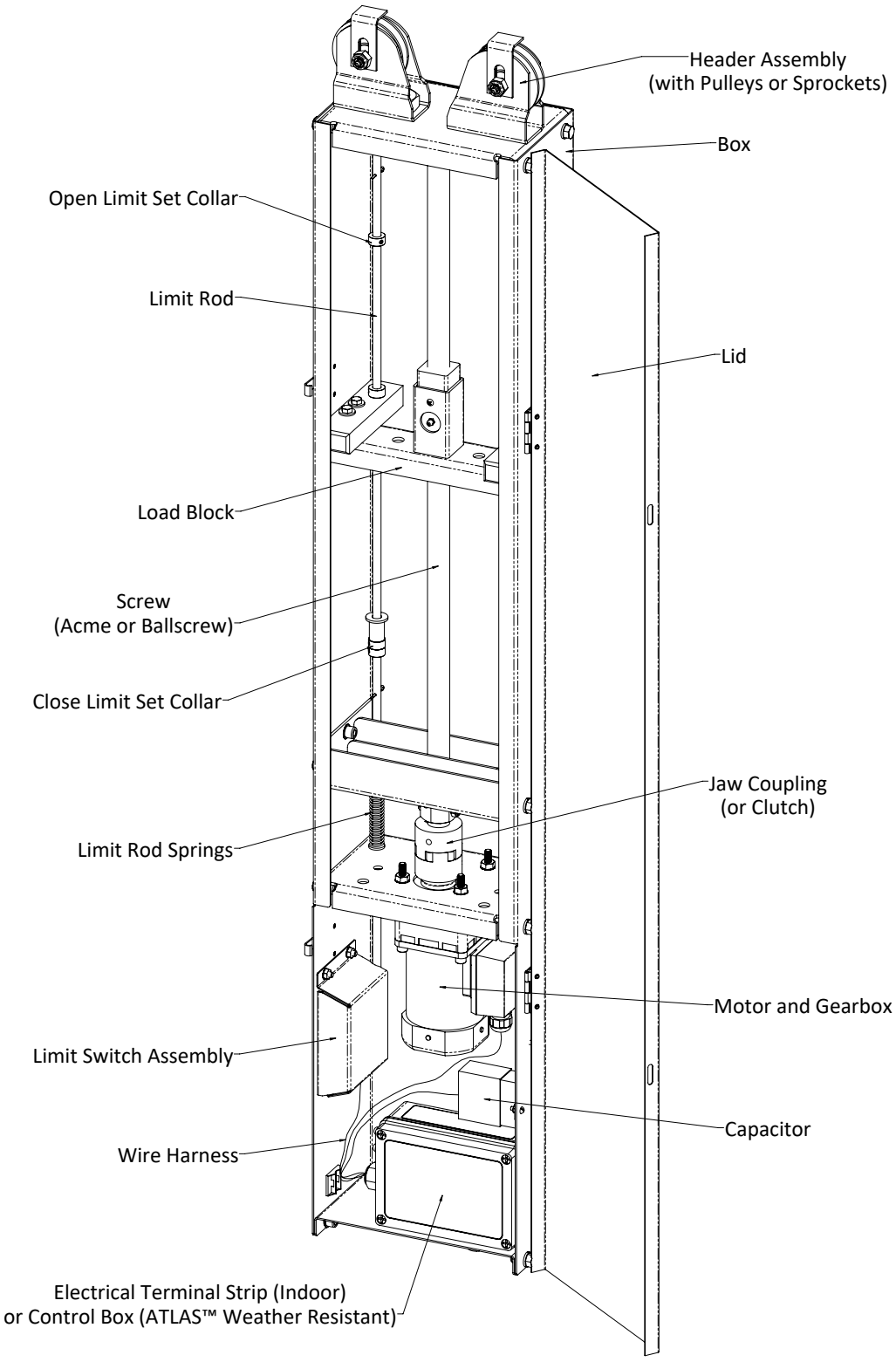
Socket Set, Open End Wrench, or Adjustable Wrench



Installation

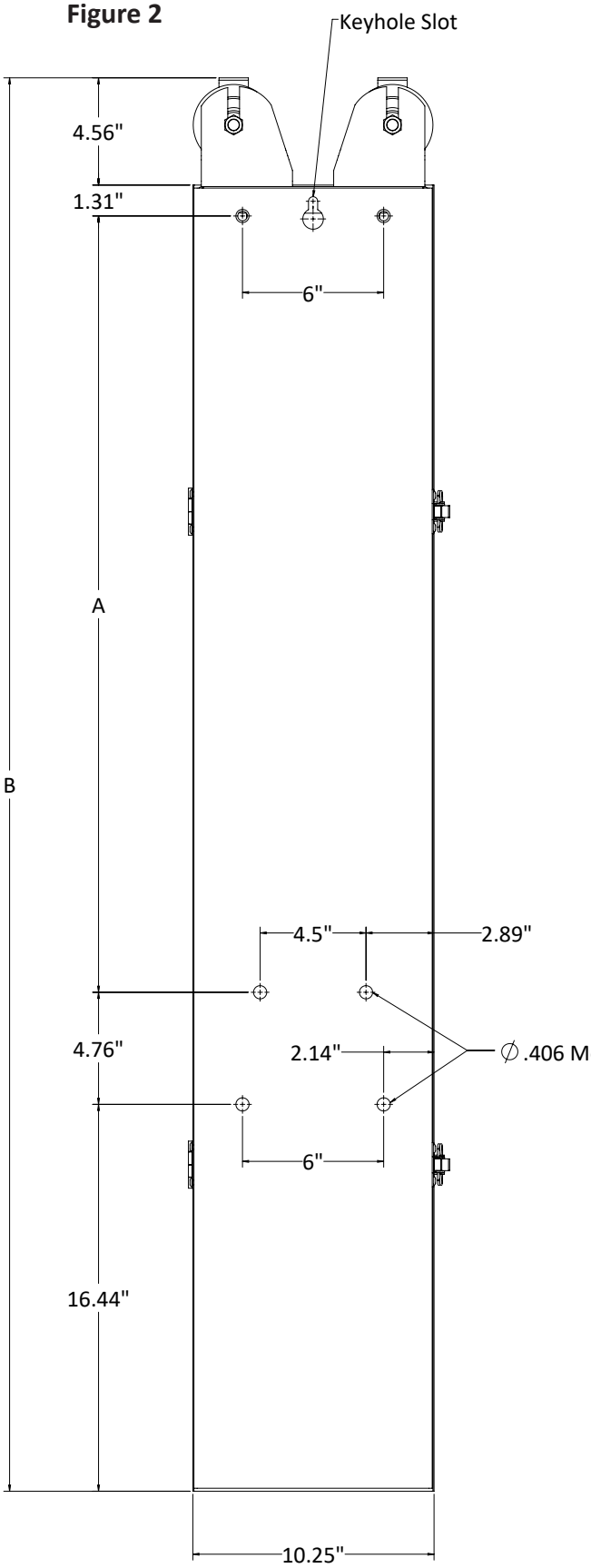
Terminology of the Curtain Machine

Figure 1



Mounting the Curtain Machine

Figure 2



When installed on a vertical sidewall, hang curtain machine with keyhole slot, using lag screw as shown in Figure 3.

NOTE: Keyhole is intended as a temporary aide to locate and hang curtain machine only. Do not operate curtain machine until fully secure.

To secure curtain machine, install (6) 3/8” lag screws or 3/8” bolts (not provided) through Ø.406” mounting holes shown in Figure 2.

Figure 3

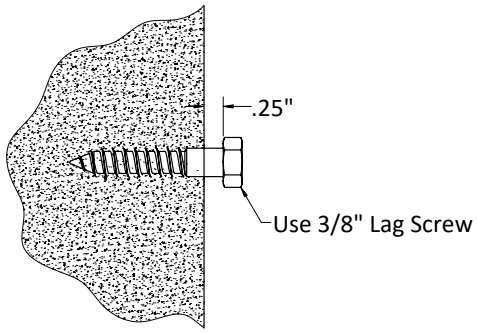


Figure 2 Detail *(bottom view, door open)*

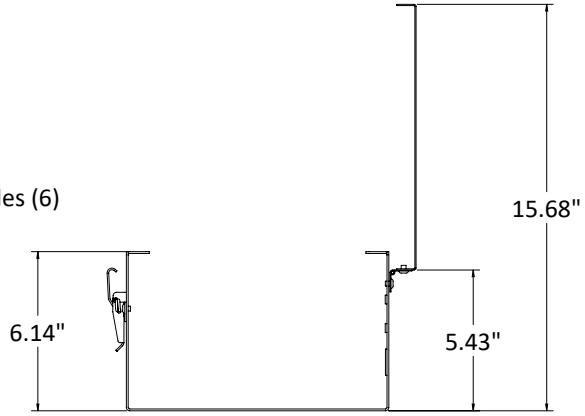


CHART A		
Curtain Machine Length	Dimension A	Dimension B
24”	33”	60”
36”	45”	72”
48”	57”	84”
72”	81”	108”

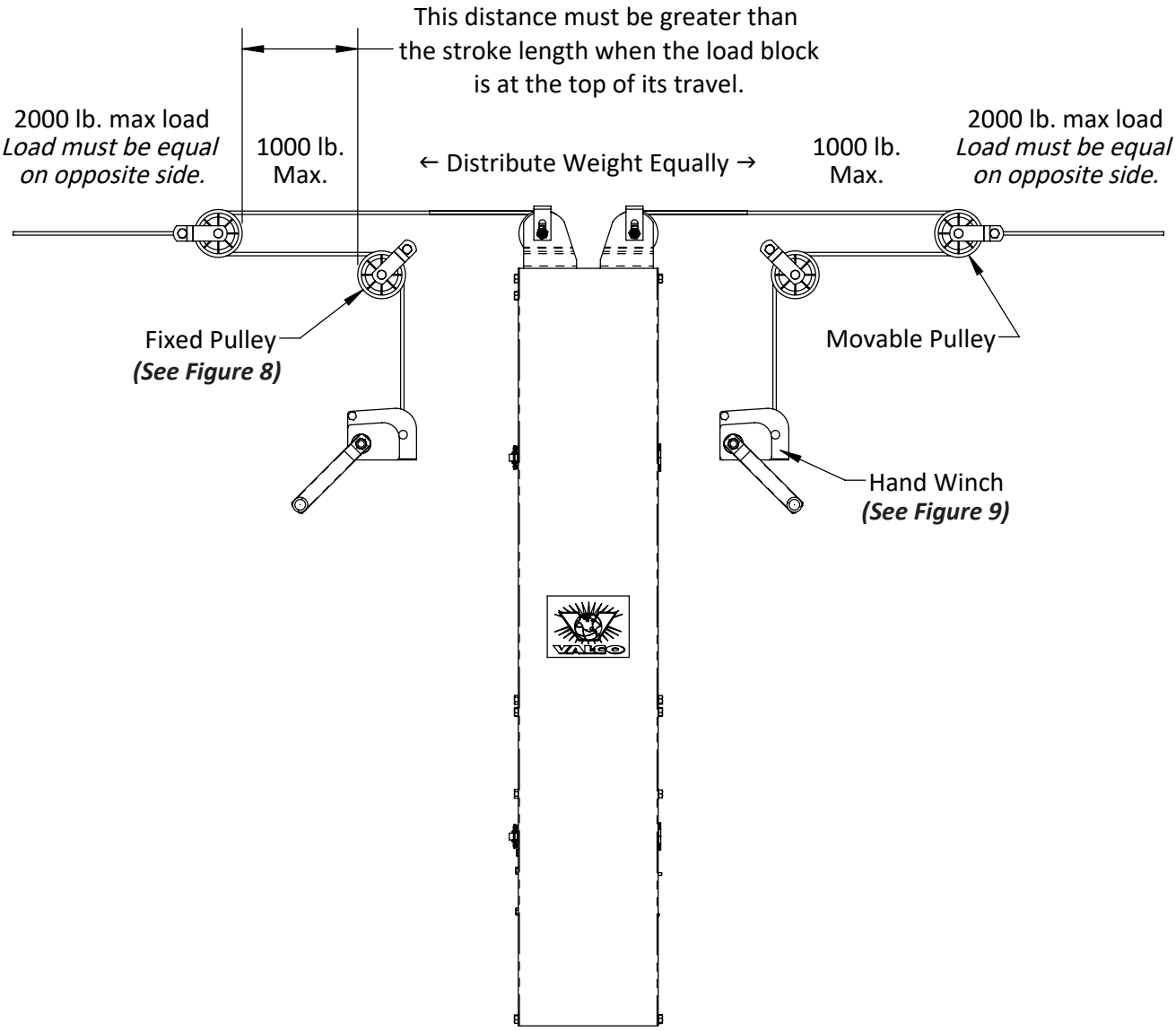
Cable Ratio Diagram - Speed Down (Ratio 2:1)

12 inches of cable movement at the machine equals 6 inches of cable movement at the load.

The distance between the fixed pulley and the movable pulley must be greather than the length of the machine.

Winching Ratio: The standard speed of the Curtain Machine is either 4.8, 5.0, or 6.0 inches (12.19 cm, 12.7 cm or 15.24 cm) per minute. The actual speed may vary depending on load weight and other factors.

Figure 4



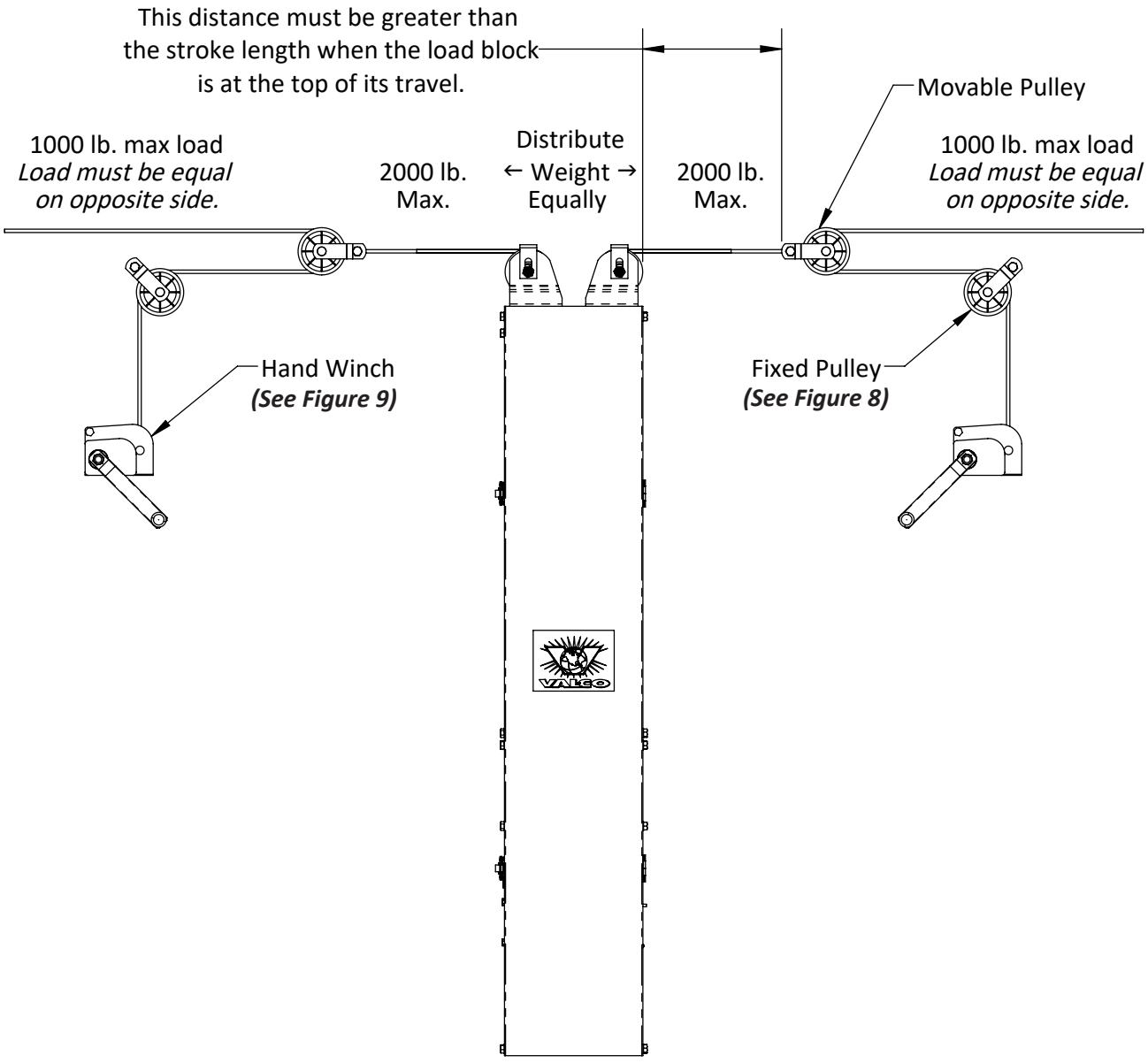
Cable Ratio Diagram - Speed Up (Ratio 1:2)

12 inches of cable movement at the machine equals 24 inches of cable movement at the load. ***This configuration reduces the load capacity of the machine by 50%.***

The distance between the top pulley mount of the machine and the movable pulley must be greater than the travel length of the machine.

Winching Ratio: The standard speed of the Curtain Machine is either 4.8, 5.0, or 6.0 inches (12.19 cm, 12.7 cm or 15.24 cm) per minute. The actual speed may vary depending on load weight and other factors.

Figure 5



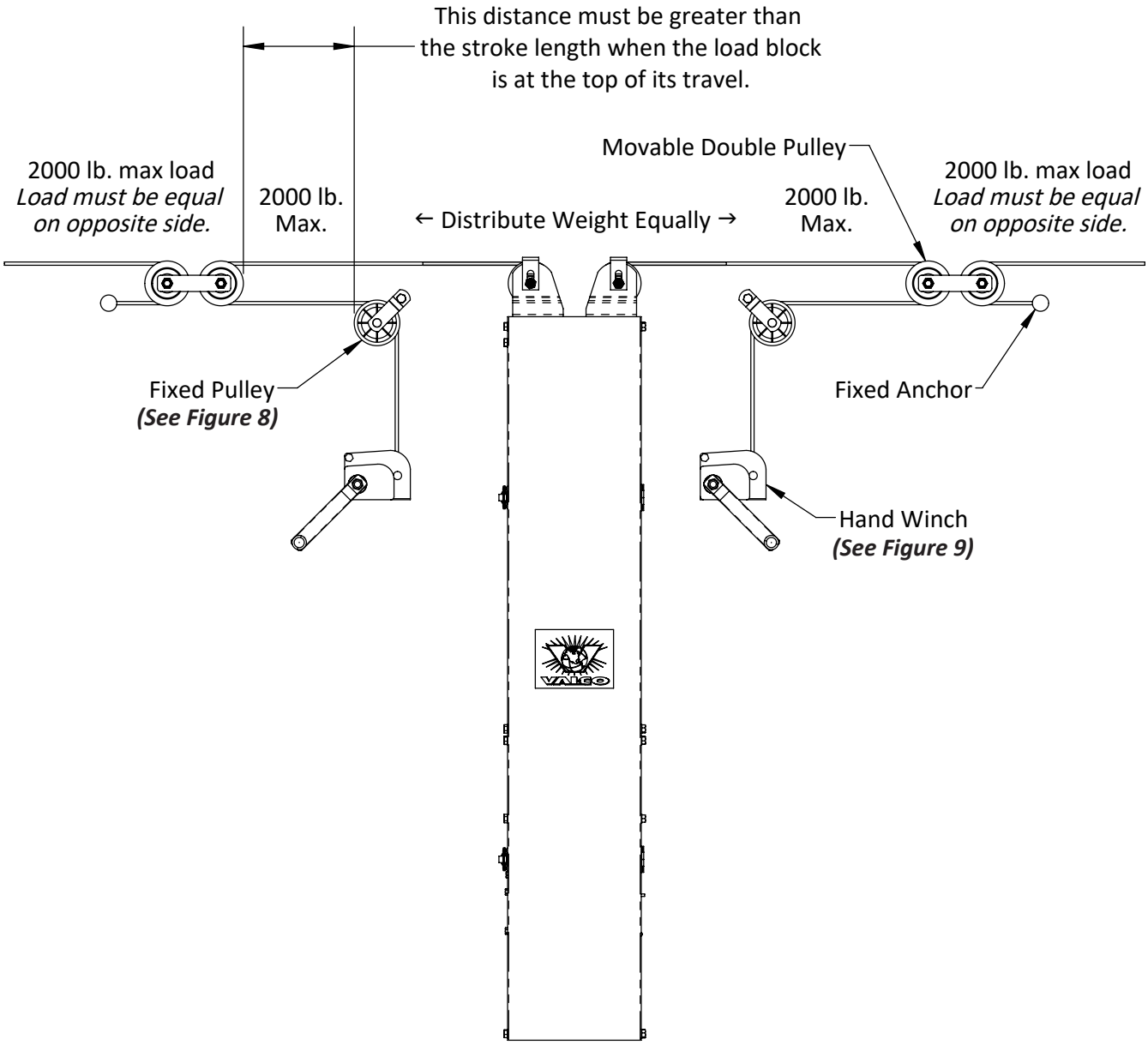
Cable Ratio Diagram - Same Speed (Ratio 1:1)

12 inches of cable movement at the machine equals 12 inches of cable movement at the load.

The distance between the fixed pulley and the movable pulley must be greather than the stroke length of the machine.

Winching Ratio: The standard speed of the Curtain Machine is either 4.8, 5.0, or 6.0 inches (12.19 cm, 12.7 cm or 15.24 cm) per minute. The actual speed may vary depending on load weight and other factors.

Figure 6



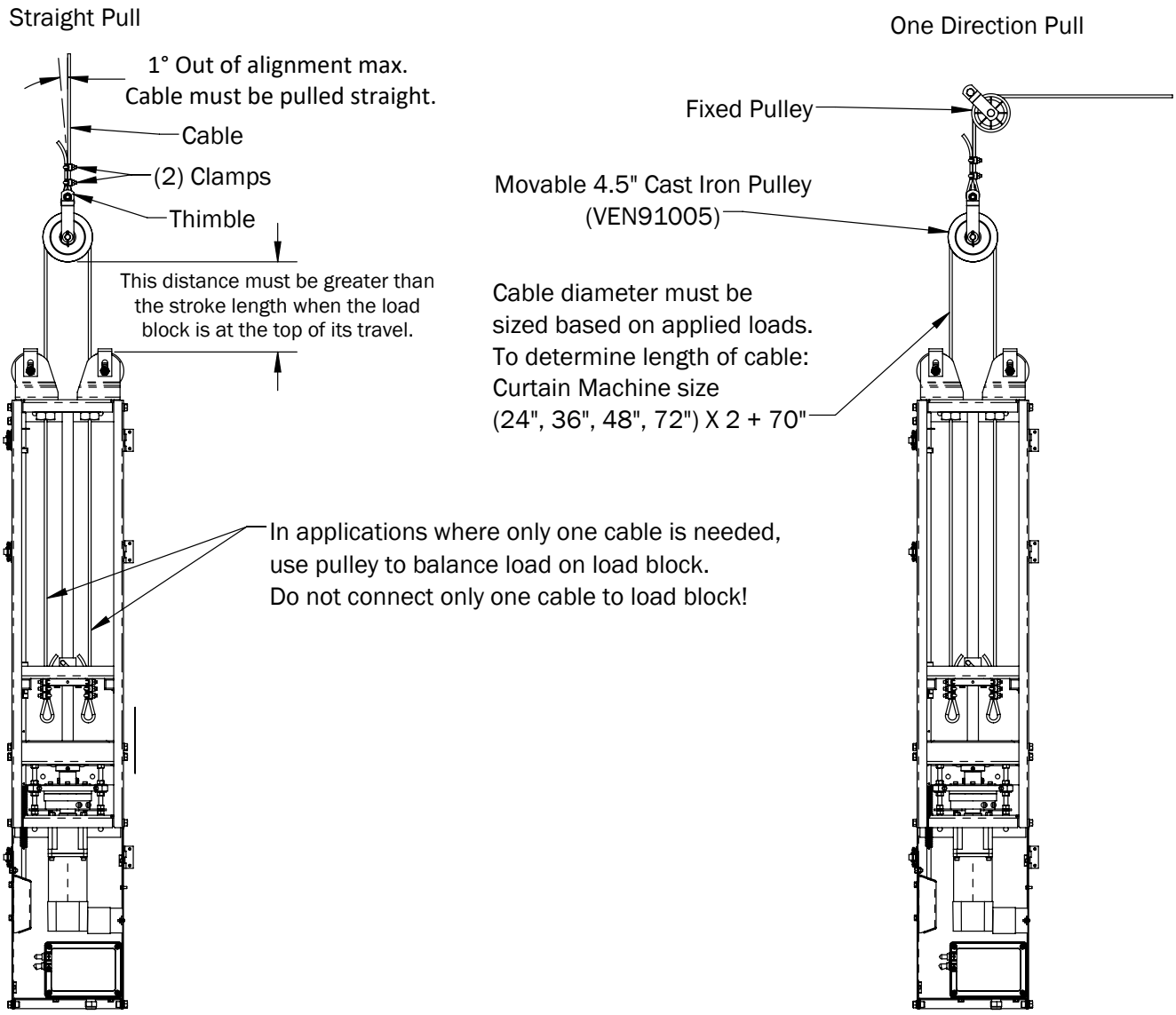
Single Cable Attatchment

12 inches of cable movement at the machine equals 12 inches of cable movement at the load.

The distance between the top pulley mount of the machine and the movable pulley must be greather than the stroke length of the machine.

Winching Ratio: The standard speed of the Curtain Machine is either 4.8, 5.0, or 6.0 inches (12.19 cm, 12.7 cm or 15.24 cm) per minute. The actual speed may vary depending on load weight and other factors.

Figure 7



Load Attachment and Header Pulley Configurations

Figure 8

Anchor Detail

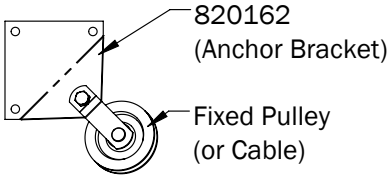


Figure 9

Winch Detail

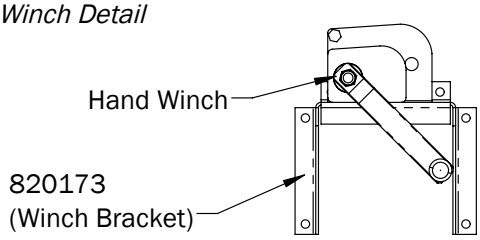
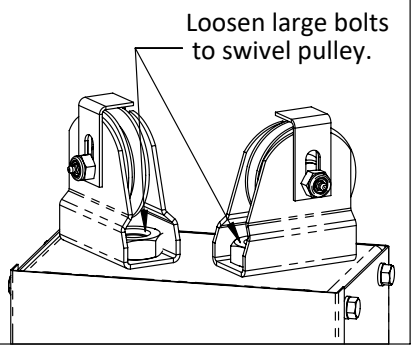
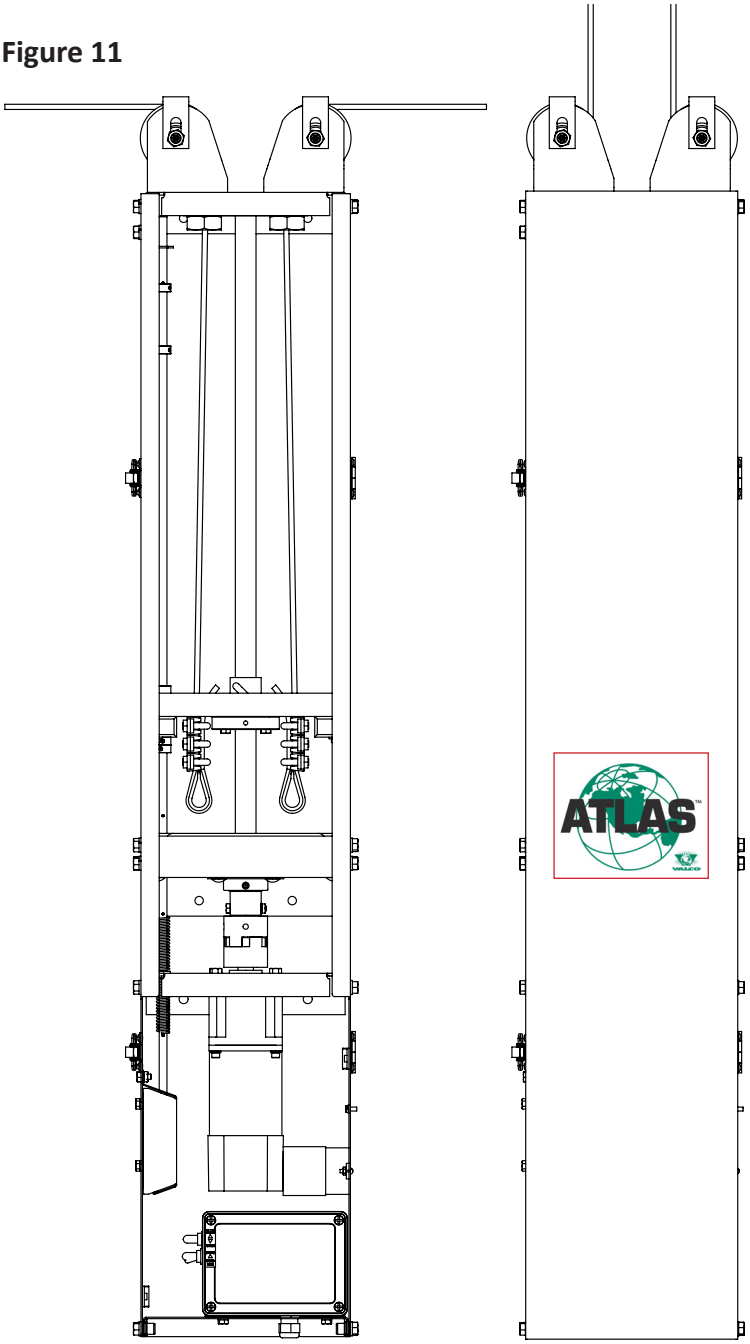


Figure 10



Note:
Each pulley can be rotated independently of the other to pull in any direction.
Loosen the large nut and rotate the pulley bracket into position.
Be sure to re-tighten the large nut.

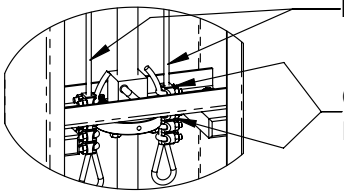
Figure 11



Pulling two curtains in opposite directions.

Pulling two curtains vertically.

Figure 12

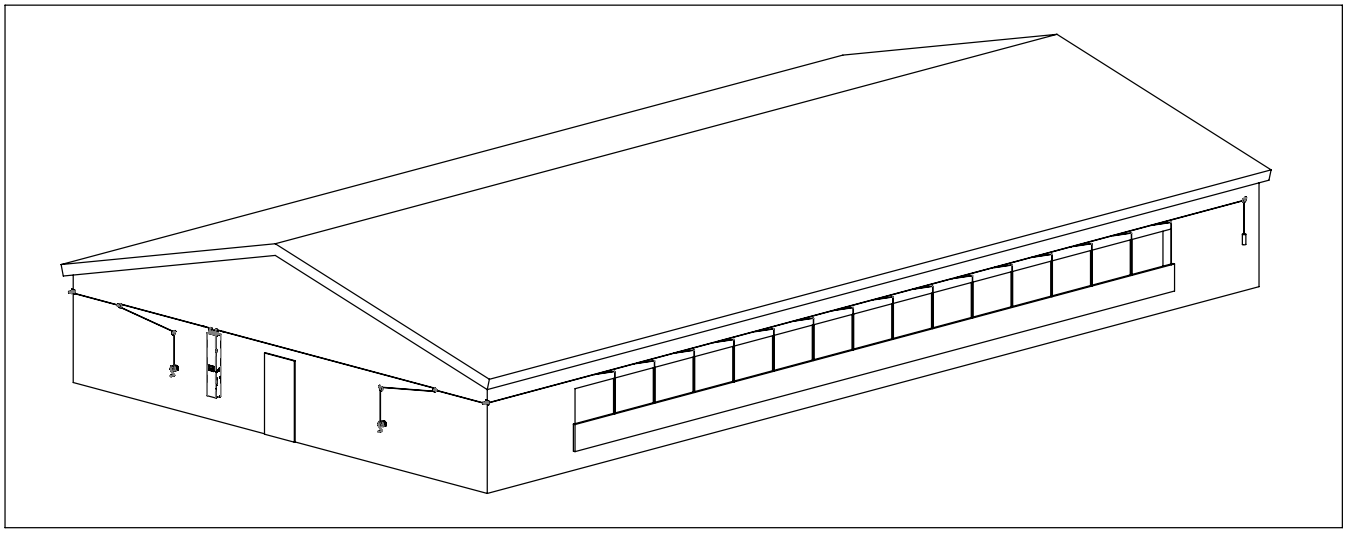


Planning - Location

Select the mounting location and identify the mounting diagram that will work best for your needs. The mounting area must be supported by the structural frame of the building. See examples in Figures 13, 14, 15, 16, 17 & 18 for a few possible mounts. ***The examples shown are recommendations only. The installer must determine the most suitable method for mounting and operation.*** Each Curtain Machine unit is designed for all position mounting. ***Only qualified personnel should attempt the installation.***

Figure 13

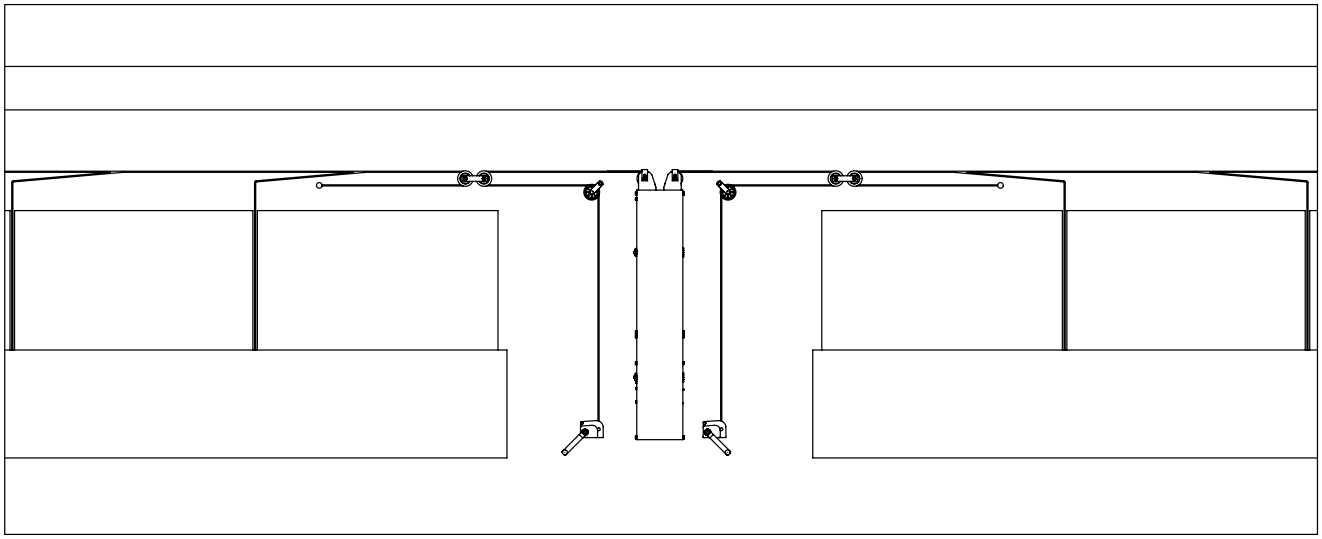
Outside of building endwall mount - curtains



Note: 2:1 ratio shown for reference only.

Figure 14

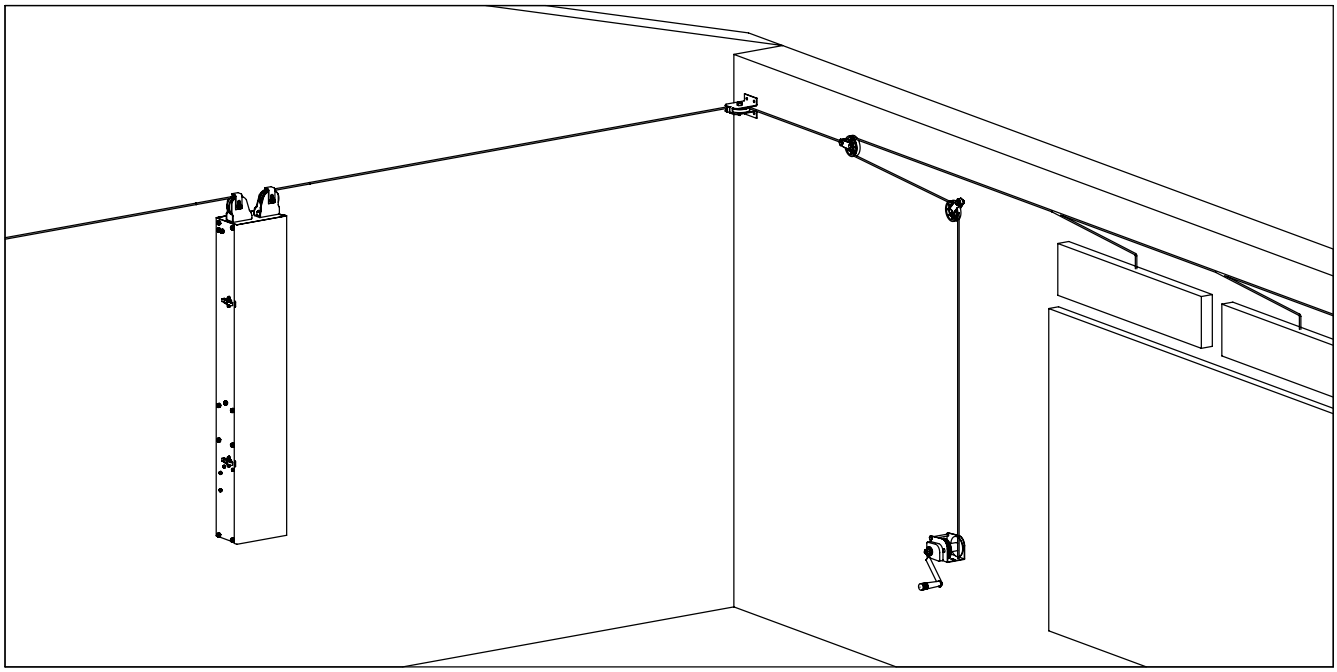
Outside of building, center of sidewall mount - curtains



Note: 1:1 ratio shown for reference only.

Figure 15

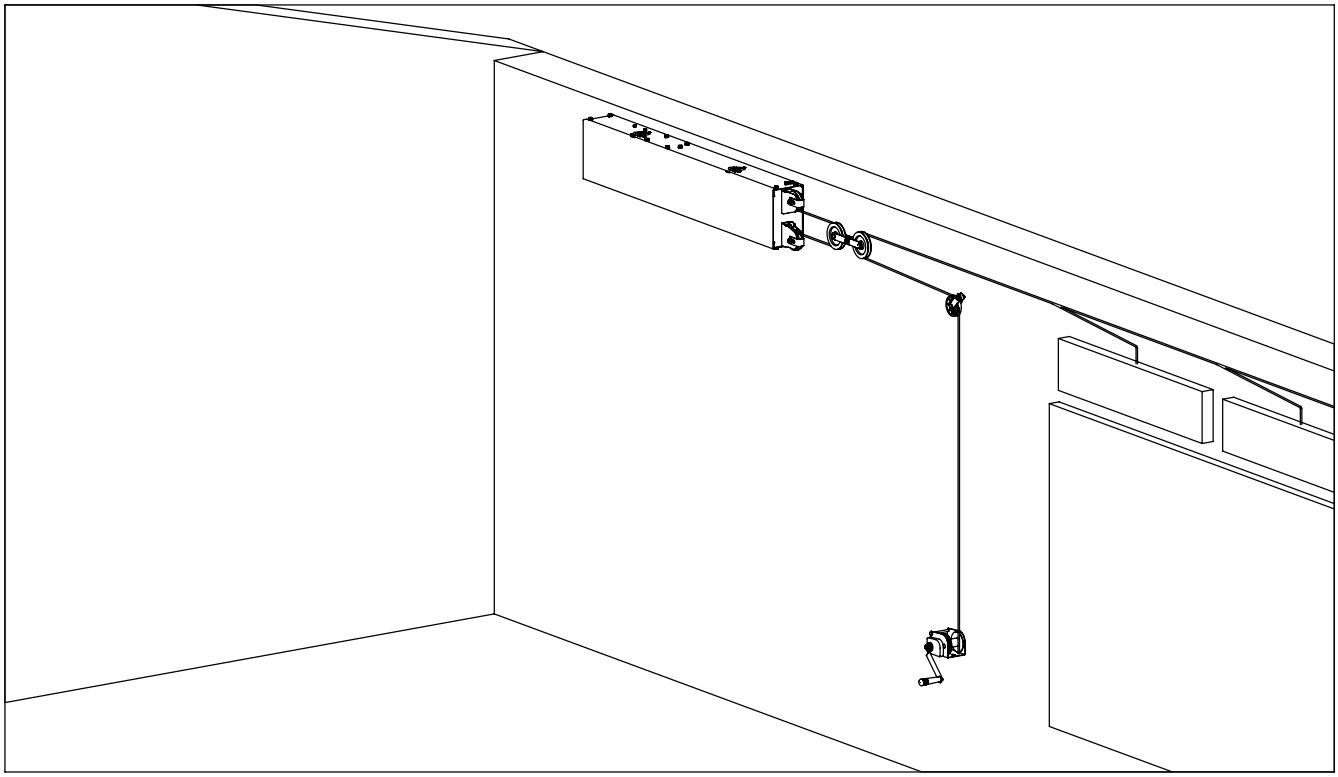
Inside endwall mount - vent doors



Note: 1:2 ratio shown for reference only.

Figure 16

Inside sidewall mount - vent doors



Note: 1:2 ratio shown for reference only.

Figure 17

Inline with inlet: elevation view

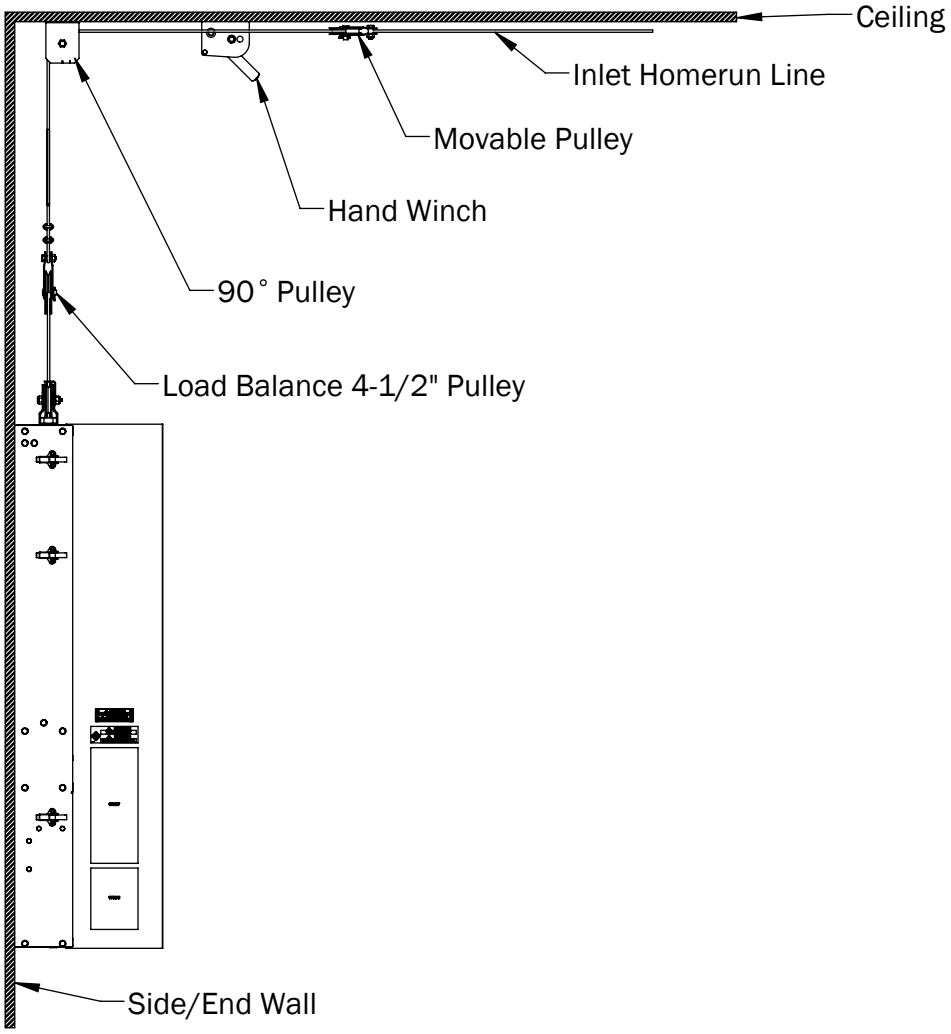
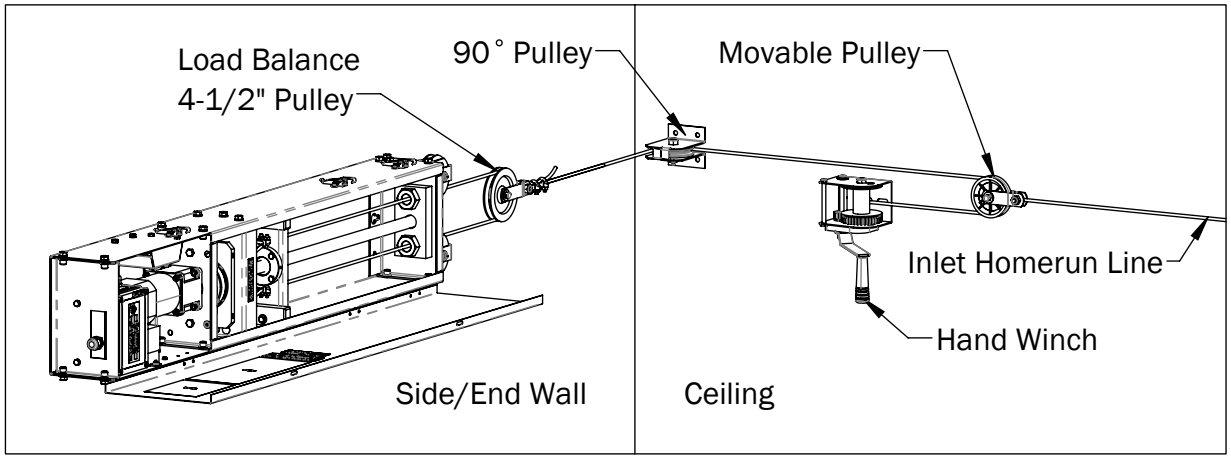


Figure 18

Ceiling or side wall mount in line with inlet



Setting Upper and Lower Limit Collars

1.) With the load block located nearest to the open position and the curtains open, thread the cable through the pulleys, hand winches and miscellaneous hardware and connect the cable to the load block. Loop cable through the holes in the load block, as shown in Figure 12. Add the appropriate number of cable clamps for your load, and verify that they do not contact the drive screw.

2.) Ensure that both end-stop collars are in the extreme positions by sliding each collar against its respective hard stop (against the cotter pins).

3.) Using your VentraPro, Horizon or other controller in manual mode, raise the curtain to the fully closed position. Be careful not to over tighten the cable or curtains, as the end-stop collars are not yet positioned.

4.) With the curtains in their closed position, slide the (2) closed end-stop collars against the load block and tighten the set screws lightly. Back off machine by lowering the curtains, and move collars ½" back towards load block to account for limit rod spring compression. This will ensure the limit switch triggers when the curtains are in the fully closed position. Then tighten set collar screws firmly to 78 in-lb.

5.) Lower the curtain to the fully open position using the manual mode of the controller. Slide the (2) open end-stop collars against the load block and tighten the set screws lightly. Back off machine by closing curtains, move collars ½" towards load block to account for limit rod spring compression. This will ensure the limit triggers when the curtains are in the fully open position. Then tighten set collars screws firmly.

6.) Operate the machine in the manual mode and verify the desired open and closed curtain positions. Check the machine to be sure that the curtains are not pulled too tight in the closed position. If the closed position end-stop collar is positioned incorrectly, the machine could go into a lock-rotor condition and burn out the motor. Likewise, check for excessive slack in the cable and curtains in the open position.

Note: In the event of an over travel condition, first determine the cause of the condition and correct the problem. Note: The following process only works for ATLAS (with circuit boards), and Indoor Models with switches (optional). First, reset the over travel switch. To reset the over travel switch:
1) Verify that the set screw in the limit switch block has not vibrated loose.
2) Note which over travel switch has been activated and set the controller to run in the opposite direction.
3) Hold down the override toggle switch located near the rear of the motor until the limit switch block moves off the over travel switch and is centered over the limit switches.

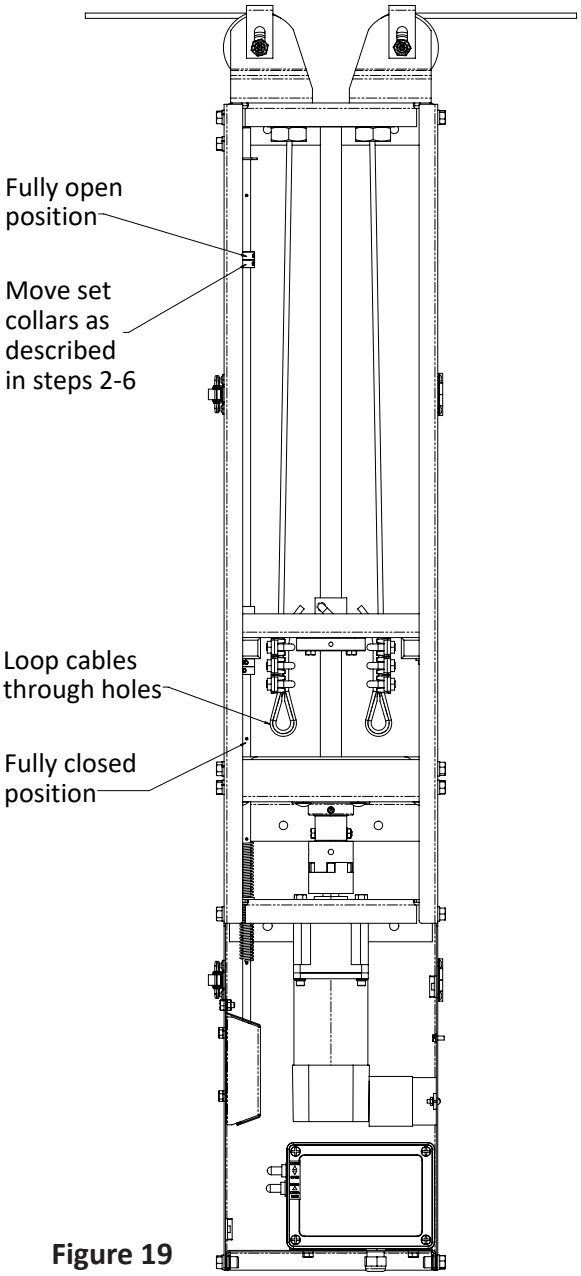


Figure 19

Curtain Machine Test Checklist

Every machine must be tested and inspected

Run Test (with machine attached to load)

1. Run in AUTO OPEN
   a) Moving towards the top.
   b) While running, pull switch rod towards top to trigger the limit switch, machine must stop.
   c) Listen for odd sounds, must sound smooth. No knocking, grinding, squeaking, groaning, or clicking sounds
2. Run in AUTO CLOSE
   a) Moving towards the bottom.
   b) While running, pull switch rod towards motor to trigger the limit switch, machine must stop.
   c) Listen for odd sounds, must sound smooth. No knocking, grinding, squeaking, groaning, or clicking sounds
3. Run in MANUAL OPEN
   a) Moving towards the top.
   b) While running, pull switch rod towards top to trigger the limit switch, machine must stop.
   c) Listen for odd sounds, must sound smooth. No knocking, grinding, squeaking, groaning, or clicking sounds
4. Run in MANUAL CLOSE
   a) Moving towards the bottom.
   b) While running, pull switch rod towards motor to trigger the limit switch, machine must stop.
   c) Listen for odd sounds, must sound smooth. No knocking, grinding, squeaking, groaning, or clicking sounds
5. Run in AUTO CLOSE
   a) Moving towards the bottom.
   b) When the machine stops, check the position of curtains, move one of the set collars down the rod until it is tight against the plastic block; then lock the set collar in place.
6. Run in AUTO OPEN
   a) Moving towards the top.
   b) When the machine stops, check the position of curtains, move one of the set collars down the rod until it is tight against the plastic block; then lock the set collar in place.
7. Run in MANUAL CLOSE
   a) Check to make sure the set collar which triggers the limit switches is centered between triggers.

Visual Test (disconnect power)

1) Set screws on limit switch trigger tight?
2) Screws holding limit switch tight?
3) Pulleys greased?
4) Grease in ACME or BALL nut?
5) Verify that all nuts and bolts are tight.

Automatic & Manual Curtain Machine Operation

VAL-CO curtain machines will operate automatically when correctly connected to a suitable controller. The detent position (or normal position) of the curtain machine local switches is in the automatic mode. To control the machine from the local switches the manual override switch must be held. Follow the below process in Figures 20 and 21 to operate the machines locally. When a machine has gone past a limit switch and come to rest on a back-up kill switch, the machine will not operate again in automatic mode. It must be reset by opening the door on the curtain machine, inspecting, and fixing whatever caused the overtravel condition. Afterward, the machine can be operated by holding the local manual over-ride switch and then pressing the open/close switch in whichever direction is desired.

Indoor
(*-SW models only)

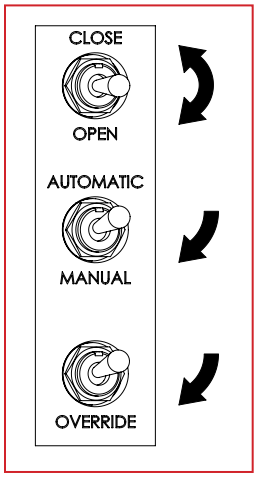


Figure 20

Hold auto/manual switch down in manual position and then press open/close switch in desired direction. Holding the override switch down is required in addition to the auto/manual when a kill switch is activated.

ATLAS Weather Resistant
(all models)

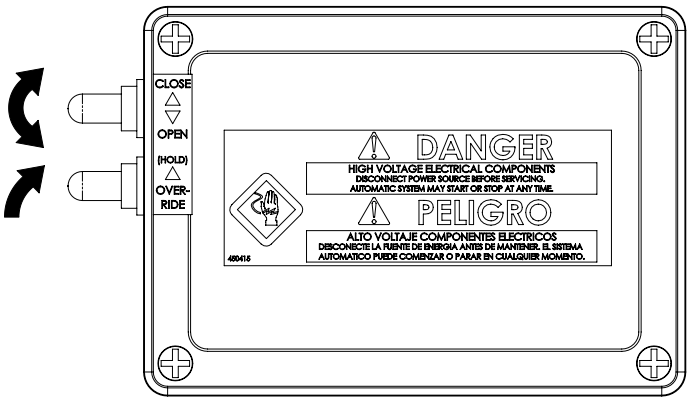


Figure 21

Hold manual switch up and then press open/close switch in desired direction.

VAL-CO Controller Settings

Reference your controller's manual to set up the curtain machine settings to operate in your ventilation scheme. A curtain machine will need two channels for operation, one to open and one to close. The channels must be interlocked together by setting the appropriate DIN switches inside the controller. Reference the controller manual for more information. A complete plan is needed to properly set up the machine to operate as a curtain or inlet actuator. The user is responsible to take all necessary actions to ensure the correct function of the machine. Contact VAL-CO technical support for more help on curtain machine and controller operation.

Some recommended controller settings:

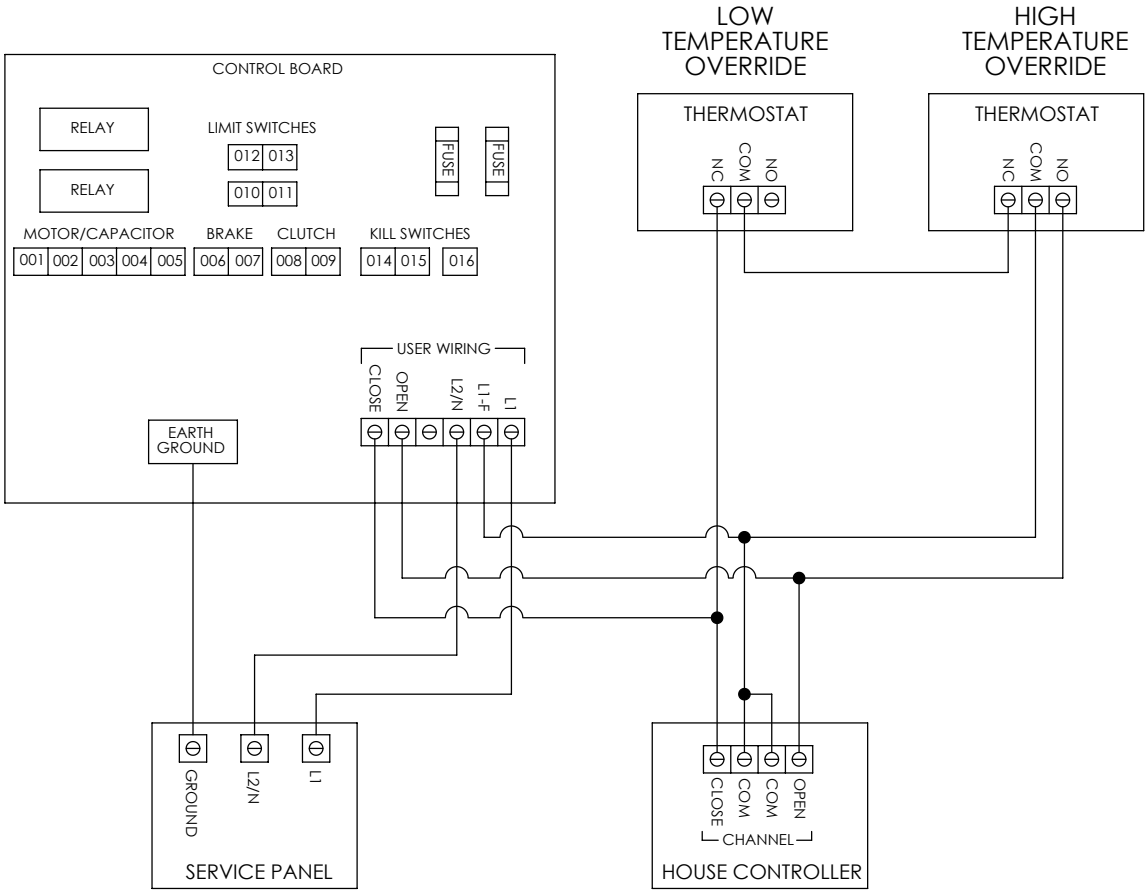
- Re-sync: set this parameter to ensure the controller knows the actual location of the curtains. The curtains will readjust themselves automatically with the controller when they are fully open or close. Adjust the settings to perform this manually once a day, if needed.
- Exercise: This feature gives the ability to have the controller fully close the sidewall curtains after long periods of being fully open. When curtains remain open for long periods of time, it is possible for rodents to build nests in the gathered curtain. This routine will help drive the rodents from the curtain.

Reference your controller manual for curtain machine set up.

- Never run more than 1 machine per 2 (locked) channels - damage can result!
- Never connect a curtain machine to a variable speed output channel - damage will result!

User Wiring

ATLAS™ Weather Resistant, Using L1-Fused



USER WIRING FOR WEATHER RESISTANT CURTAIN MACHINE MODELS USING L1-FUSED TO THE HOUSE CONTROLLER FROM THE CONTROL BOARD.

THE LOW THERMOSTAT OVERRIDE MUST BE SET SEVERAL DEGREES BELOW THE CONTROLLER LOW TEMPERATURE SETPOINT AND THE THE HIGH THERMOSTAT OVERRIDE MUST BE SET SEVERAL DEGREES ABOVE THE CONTROLLER HIGH TEMPERATURE SETPOINT.

THERMOSTAT SETPOINTS MUST BE UPDATED EVERY TIME CONTROLLER SETPOINTS CHANGE.

SYSTEM COMPONENTS MAY VARY DEPENDING ON THE STYLE OF VENTILATION USED IN THE CUSTOMER'S SPECIFIC APPLICATION.

FAILURE TO FOLLOW THE PROCEDURES LISTED BELOW MAY DAMAGE CURTAIN MACHINE ELECTRICAL COMPONENTS!

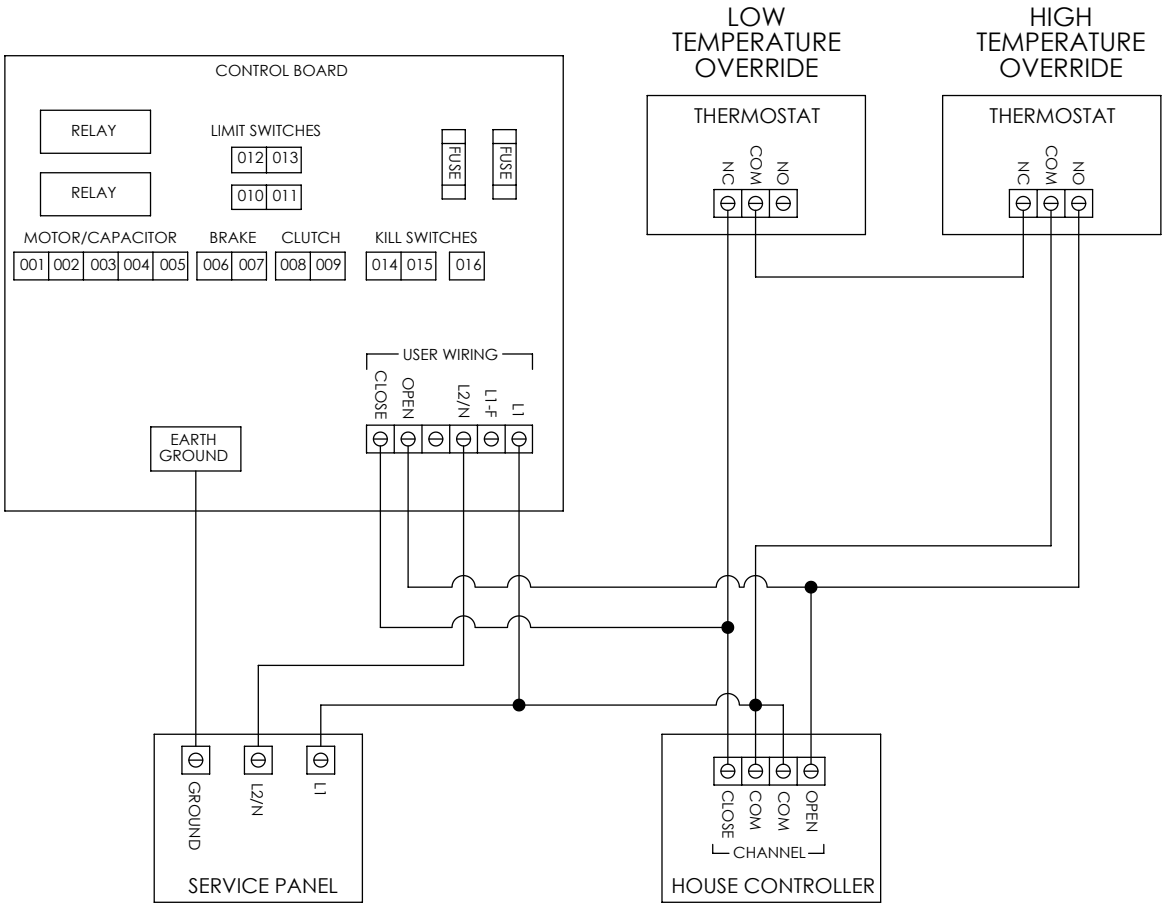
THE CONTROLLER MUST NOT SEND OPEN AND CLOSE SIGNALS TO THE CURTAIN MACHINE SIMULTANEOUSLY.

THE CURTAIN MACHINE MOTOR MUST COME TO A COMPLETE STOP BEFORE CHANGING DIRECTIONS.

WIRING MUST BE DONE BY A LICENSED ELECTRICIAN. ALL LOCAL AND NATIONAL CODES MUST BE FOLLOWED!

User Wiring

ATLAS™ Weather Resistant, L1 - Service Panel



USER WIRING FOR WEATHER RESISTANT CURTAIN MACHINE MODELS USING L1 FROM THE SERVICE PANEL TO THE CONTROL BOARD AND HOUSE CONTROLLER.

THE LOW THERMOSTAT OVERRIDE MUST BE SET SEVERAL DEGREES BELOW THE CONTROLLER LOW TEMPERATURE SETPOINT AND THE THE HIGH THERMOSTAT OVERRIDE MUST BE SET SEVERAL DEGREES ABOVE THE CONTROLLER HIGH TEMPERATURE SETPOINT.

THERMOSTAT SETPOINTS MUST BE UPDATED EVERY TIME CONTROLLER SETPOINTS CHANGE.

SYSTEM COMPONENTS MAY VARY DEPENDING ON THE STYLE OF VENTILATION USED IN THE CUSTOMER'S SPECIFIC APPLICATION.

FAILURE TO FOLLOW THE PROCEDURES LISTED BELOW MAY DAMAGE CURTAIN MACHINE ELECTRICAL COMPONENTS!

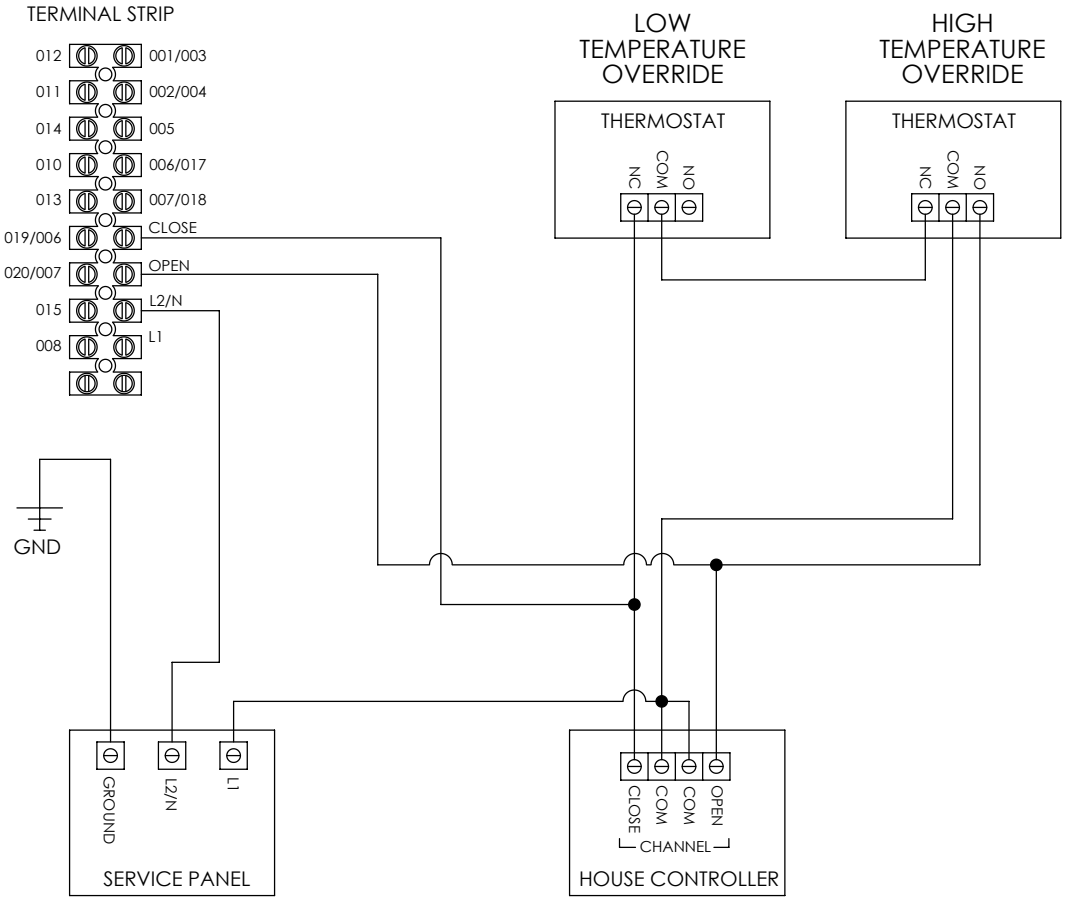
THE CONTROLLER MUST NOT SEND OPEN AND CLOSE SIGNALS TO THE CURTAIN MACHINE SIMULTANEOUSLY.

THE CURTAIN MACHINE MOTOR MUST COME TO A COMPLETE STOP BEFORE CHANGING DIRECTIONS.

WIRING MUST BE DONE BY A LICENSED ELECTRICIAN. ALL LOCAL AND NATIONAL CODES MUST BE FOLLOWED!

User Wiring

SafeTRAC™ Indoor, No Local Switches



USER WIRING FOR INDOOR CURTAIN MACHINE MODELS <u>WITHOUT</u> THE OPTIONAL LOCAL MANUAL SWITCHES INSTALLED.

THE LOW THERMOSTAT OVERRIDE MUST BE SET SEVERAL DEGREES BELOW THE CONTROLLER LOW TEMPERATURE SETPOINT AND THE THE HIGH THERMOSTAT OVERRIDE MUST BE SET SEVERAL DEGREES ABOVE THE CONTROLLER HIGH TEMPERATURE SETPOINT.

THERMOSTAT SETPOINTS MUST BE UPDATED EVERY TIME CONTROLLER SETPOINTS CHANGE.

SYSTEM COMPONENTS MAY VARY DEPENDING ON THE STYLE OF VENTILATION USED IN THE CUSTOMER'S SPECIFIC APPLICATION.

FAILURE TO FOLLOW THE PROCEDURES LISTED BELOW MAY DAMAGE CURTAIN MACHINE ELECTRICAL COMPONENTS!

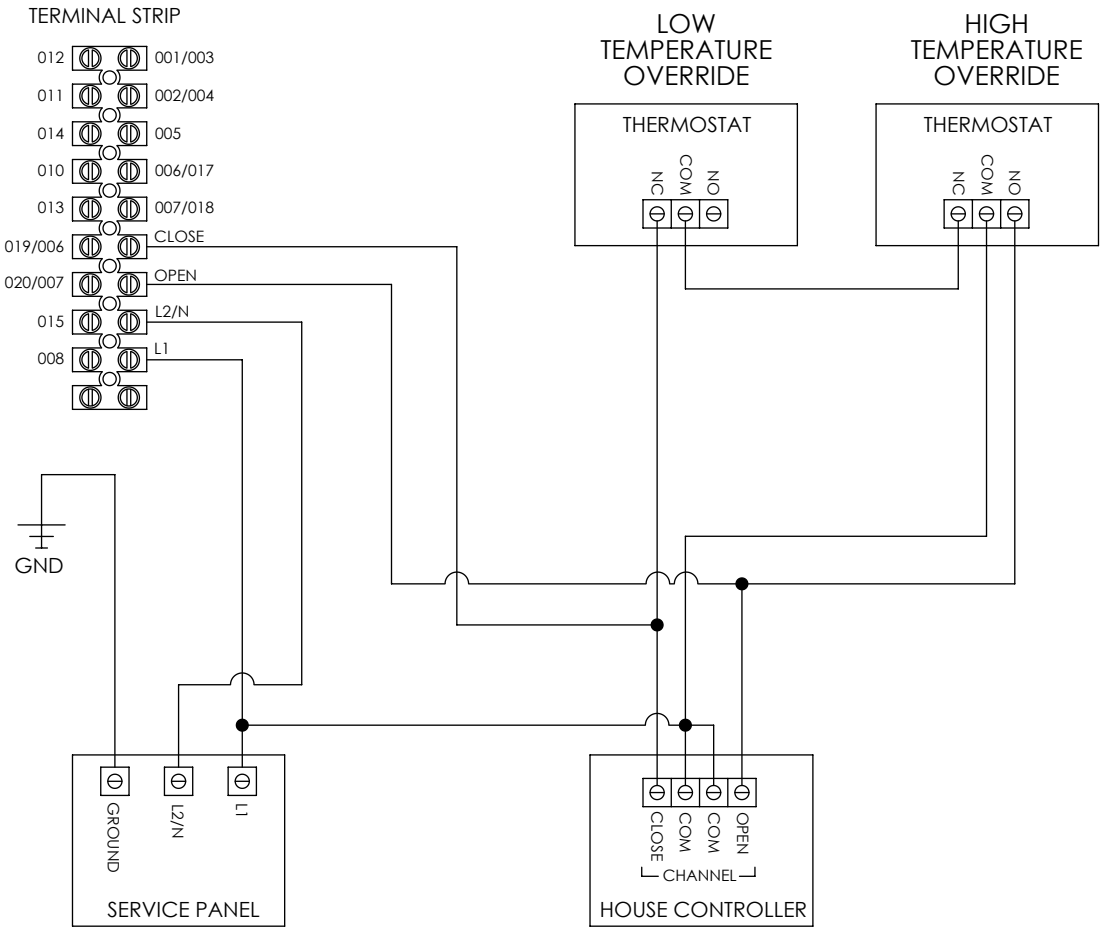
THE CONTROLLER MUST NOT SEND OPEN AND CLOSE SIGNALS TO THE CURTAIN MACHINE SIMULTANEOUSLY.

THE CURTAIN MACHINE MOTOR MUST COME TO A COMPLETE STOP BEFORE CHANGING DIRECTIONS.

WIRING MUST BE DONE BY A LICENSED ELECTRICIAN. ALL LOCAL AND NATIONAL CODES MUST BE FOLLOWED!

User Wiring

SafeTRAC™ Indoor, With Local Switches



USER WIRING FOR INDOOR CURTAIN MACHINE MODELS <u>WITH</u> THE OPTIONAL LOCAL MANUAL SWITCHES INSTALLED.

THE LOW THERMOSTAT OVERRIDE MUST BE SET SEVERAL DEGREES BELOW THE CONTROLLER LOW TEMPERATURE SETPOINT AND THE THE HIGH THERMOSTAT OVERRIDE MUST BE SET SEVERAL DEGREES ABOVE THE CONTROLLER HIGH TEMPERATURE SETPOINT.

THERMOSTAT SETPOINTS MUST BE UPDATED EVERY TIME CONTROLLER SETPOINTS CHANGE.

SYSTEM COMPONENTS MAY VARY DEPENDING ON THE STYLE OF VENTILATION USED IN THE CUSTOMER'S SPECIFIC APPLICATION.

FAILURE TO FOLLOW THE PROCEDURES LISTED BELOW MAY DAMAGE CURTAIN MACHINE ELECTRICAL COMPONENTS!

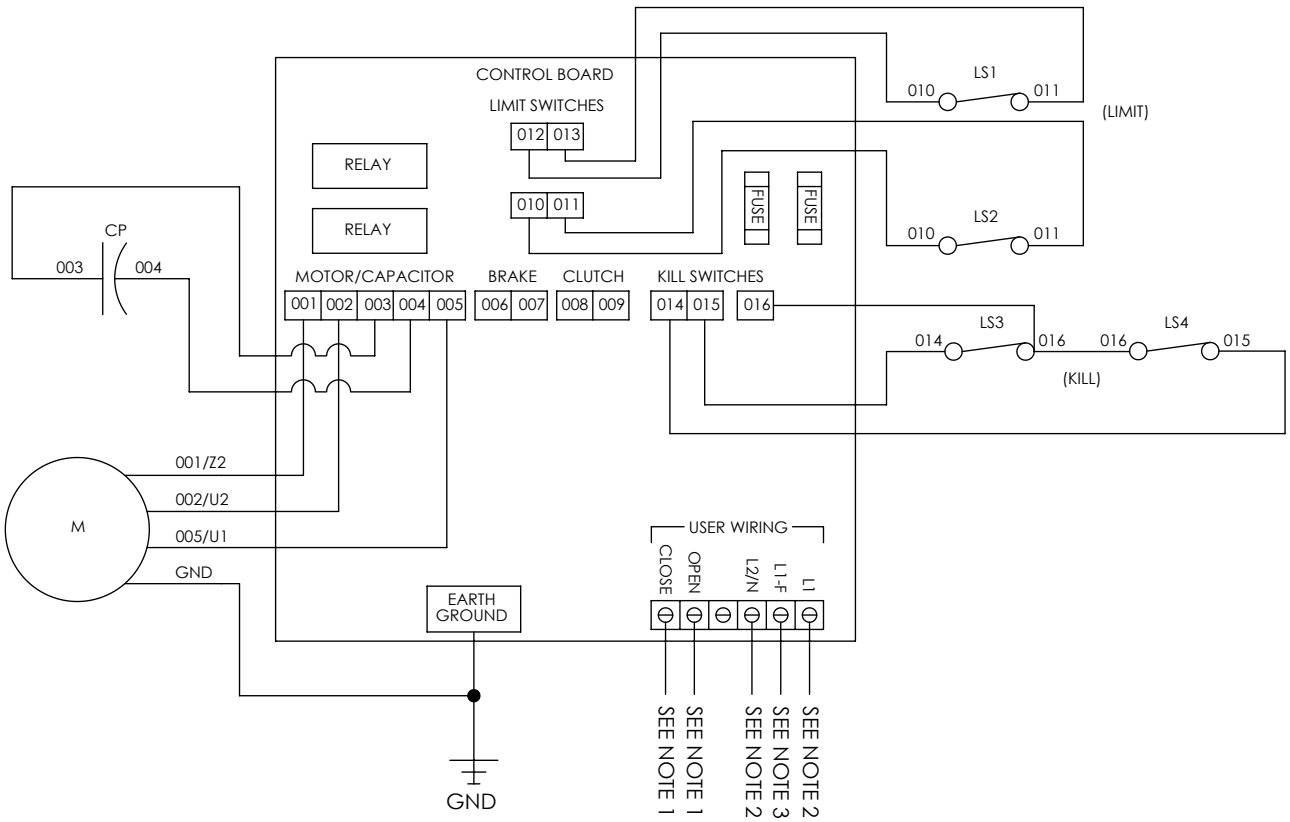
THE CONTROLLER MUST NOT SEND OPEN AND CLOSE SIGNALS TO THE CURTAIN MACHINE SIMULTANEOUSLY.

THE CURTAIN MACHINE MOTOR MUST COME TO A COMPLETE STOP BEFORE CHANGING DIRECTIONS.

WIRING MUST BE DONE BY A LICENSED ELECTRICIAN. ALL LOCAL AND NATIONAL CODES MUST BE FOLLOWED!

Factory Wiring Schematics

ATLAS™ Weather Resistant, Acme Screw



DEFINITIONS
CP OR C = CAPACITOR
GND = GROUNDING SCREW OR LUG
LS = LIMIT SWITCH
- LS1 = OPEN LIMIT SWITCH
- LS2 = CLOSE LIMIT SWITCH
- LS3 = OPEN KILL SWITCH
- LS4 = CLOSE KILL SWITCH

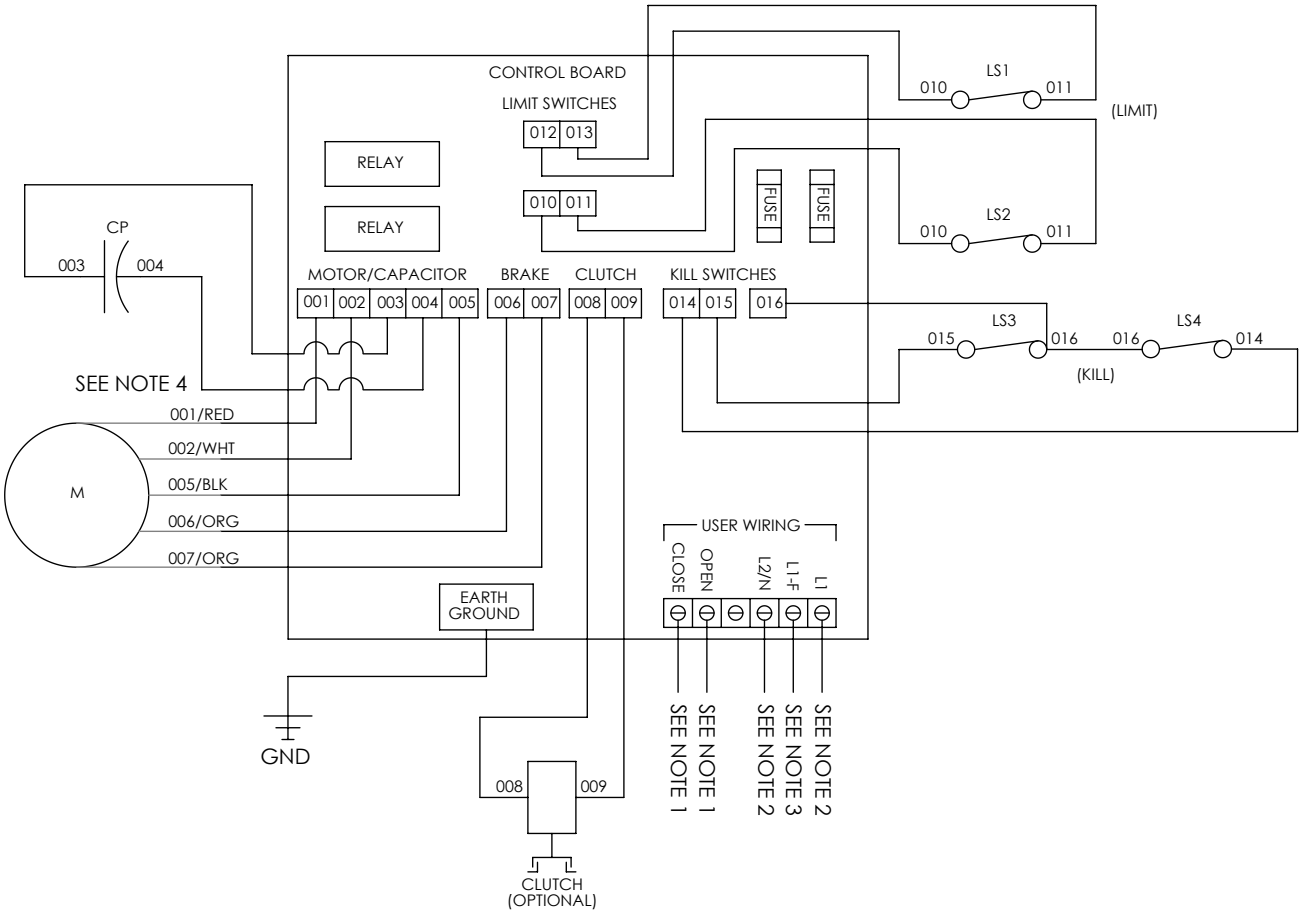
M = MOTOR

NOTES
1. CUSTOMER SUPPLIED (L1) CONTROL COMMANDS FROM VENTILATION CONTROL SYSTEM
2. ACCEPTABLE VOLTAGE RANGE 110-120 VAC, 50/60 HZ OR 220-240 VAC, 50/60 HZ DEPENDING ON MODEL SELECTED.
3. OPTIONAL L1-FUSED TO CUSTOMER HOUSE CONTROLLER.

WIRING MUST BE DONE BY A LICENSED ELECTRICIAN. ALL LOCAL AND NATIONAL CODES MUST BE FOLLOWED!

Factory Wiring Schematics

ATLAS™ Weather Resistant, Ball Screw



DEFINITIONS
CP OR C = CAPACITOR
GND = GROUNDING SCREW OR LUG
LS = LIMIT SWITCH
- LS1 = OPEN LIMIT SWITCH
- LS2 = CLOSE LIMIT SWITCH
- LS3 = OPEN KILL SWITCH
- LS4 = CLOSE KILL SWITCH

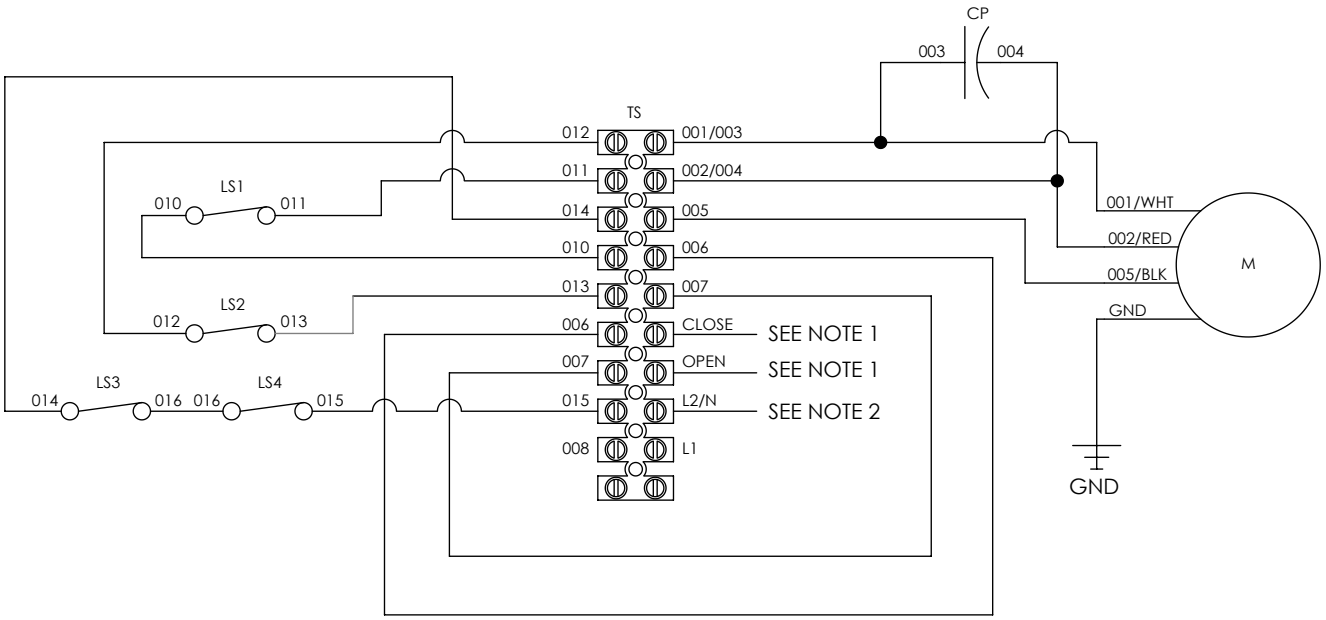
M = BRAKE MOTOR

NOTES
1. CUSTOMER SUPPLIED (L1) CONTROL COMMANDS FROM VENTILATION CONTROL SYSTEM
2. ACCEPTABLE VOLTAGE RANGE 220-240 VAC, 50/60 HZ.
3. OPTIONAL L1-FUSED TO CUSTOMER HOUSE CONTROLLER.
4. BRAKE CONNECTIONS (006 - ORG, 007 - ORG)

WIRING MUST BE DONE BY A LICENSED ELECTRICIAN. ALL LOCAL AND NATIONAL CODES MUST BE FOLLOWED!

Factory Wiring Schematics

SafeTRAC™ Indoor, No Local Switches



DEFINITIONS
CP OR C = CAPACITOR
GND = GROUNDING SCREW OR LUG
LS = LIMIT SWITCH
- LS1 = OPEN LIMIT SWITCH
- LS2 = CLOSE LIMIT SWITCH
- LS3 = OPEN KILL SWITCH
- LS4 = CLOSE KILL SWITCH

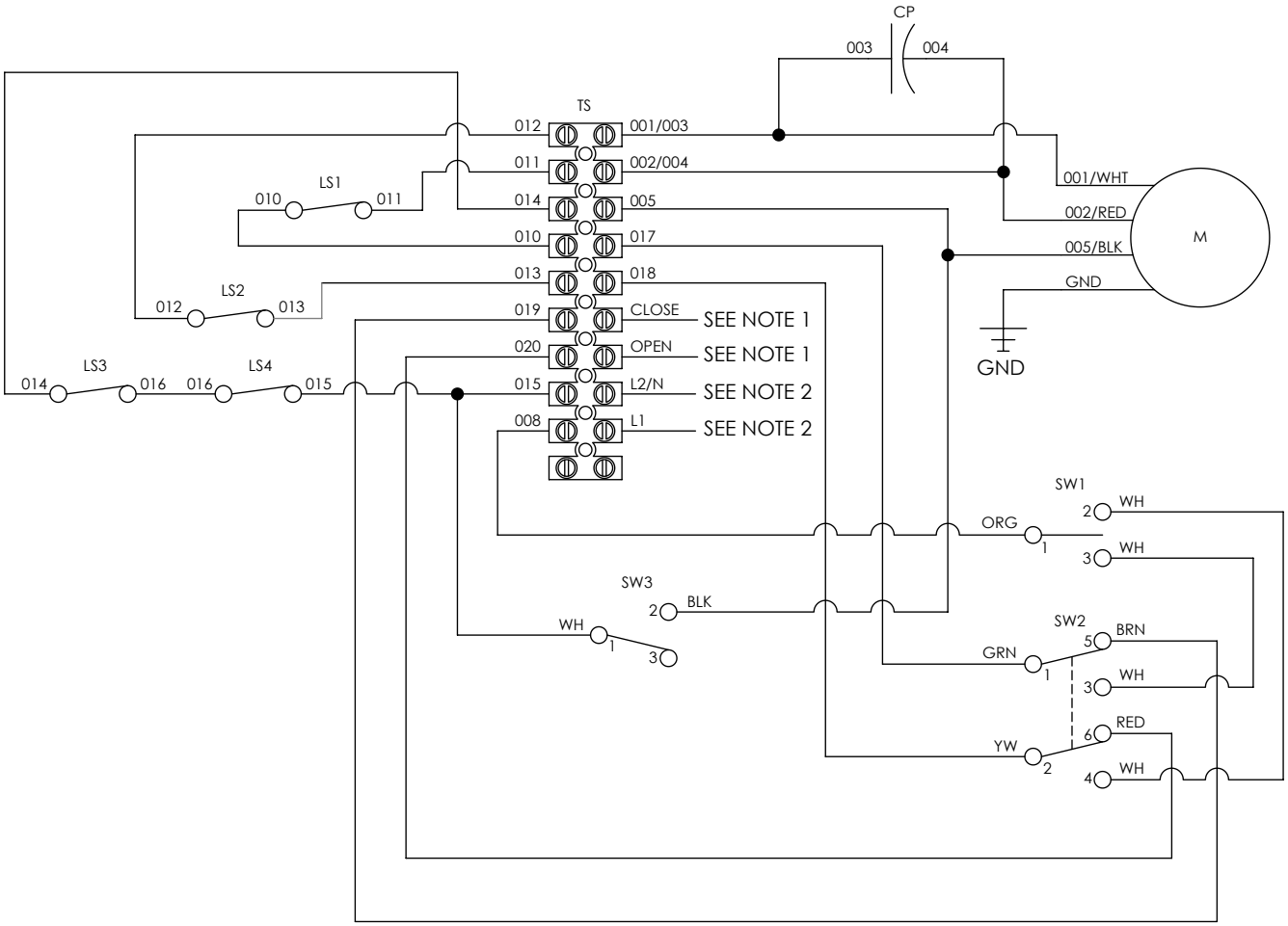
M = MOTOR
TS = TERMINAL STRIP

NOTES
1. CUSTOMER SUPPLIED (L1) CONTROL COMMANDS FROM VENTILATION CONTROL SYSTEM
2. ACCEPTABLE VOLTAGE RANGE 110-120 VAC, 50/60 HZ OR 220-240 VAC, 50/60 HZ DEPENDING ON MODEL SELECTED.

WIRING MUST BE DONE BY A LICENSED ELECTRICIAN. ALL LOCAL AND NATIONAL CODES MUST BE FOLLOWED!

Factory Wiring Schematics

SafeTRAC™ Indoor, With Local Switches



DEFINITIONS
CP OR C = CAPACITOR
GND = GROUNDING SCREW OR LUG
LS = LIMIT SWITCH
- LS1 = OPEN LIMIT SWITCH
- LS2 = CLOSE LIMIT SWITCH
- LS3 = OPEN KILL SWITCH
- LS4 = CLOSE KILL SWITCH

M = MOTOR
SW = SWITCH
- SW1 = OPEN/CLOSE SWITCH
- SW2 = AUTOMATIC/MANUAL SWITCH
- SW3 = OVERRIDE SWITCH

TS = TERMINAL STRIP

NOTES
1. CUSTOMER SUPPLIED (L1) CONTROL COMMANDS FROM VENTILATION CONTROL SYSTEM
2. ACCEPTABLE VOLTAGE RANGE 110-120 VAC, 50/60 HZ OR 220-240 VAC, 50/60 HZ DEPENDING ON MODEL SELECTED.

WIRING MUST BE DONE BY A LICENSED ELECTRICIAN. ALL LOCAL AND NATIONAL CODES MUST BE FOLLOWED!

Maintenance and Troubleshooting

Maintenance

It is recommended that the end user perform a monthly inspection and maintenance of the machine and all items used in combination with the machine (cables, pulleys, brackets and hand winches). The SafeTRAC™ & ATLAS™ are designed to operate with a minimum amount of maintenance, however the following steps must be performed on a regular basis to ensure peak performance and maximum life.

Warning!
Disconnect electrical power and remove all load from machine before servicing or maintaining the machine. Remember that CLUTCH based machines will DROP THE CURTAINS OR INLETS WHEN POWER IS DISCONNECTED. BE CAREFUL!

- Use Valvoline Valplex EP Wheel Bearing grease or equivalent for lubrication.
- Inspect the drive screw and nut. It is strongly recommended that you grease the unit every 1-3 months. Lubricate the entire length of the screw.
- Grease the zerk fitting on top of the bearing block until fresh grease comes out of the thrust bearing.
- Grease the zerk fitting on both the header pulleys until fresh grease comes out of the sides (cable machines only). The curtain machine uses high quality needle bearing pulleys that require periodic maintenance.
- Inspect and tighten the end-stop collars and limit switch actuation block on the limit switch rod to ensure proper operation of the safety limit switches.
- Inspect cable, pulleys, brackets, hand winches etc. for alignment and premature wear, especially at the beginning of cold weather. Damaged cables can break, and the risk is higher in cold temperatures. Re-align or replace worn parts as needed.
- Inspect bearing by listening for abnormal sound and watching for smooth rotation. Listen to the motor for any abnormal sounds.
- Inspect and tighten all set screws. Apply a removable thread-locking compound and re-tighten any screws that have vibrated loose.
- Run the machine in manual mode in both directions to ensure positive shut off and unrestricted cable movement. It is important to keep debris out of the machine's enclosure. The cover plate on the machine should be tightly secured at all times. Periodically inspect the drive screw for dust or debris. You may blow debris off the screw with pressurized air to prevent premature wear. Never clean the screw with water or any type of solvent.

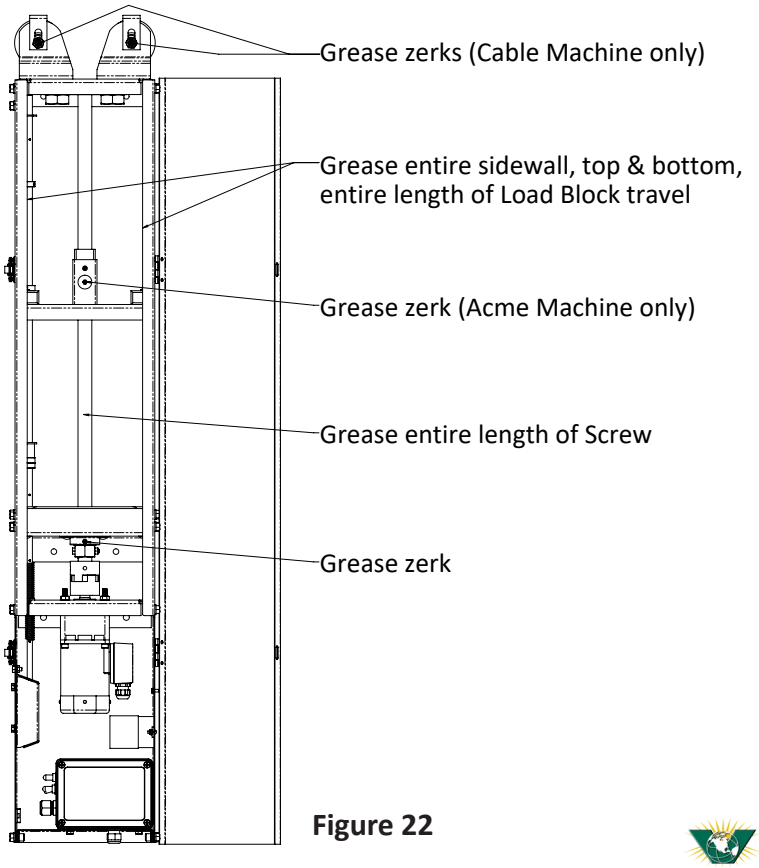


Figure 22

Troubleshooting Guide

Problem	Possible Cause	Corrective Action
Machine will not run in manual mode.	Control switch not in manual mode.	Switch control to manual mode.
		Check for loose wire connections, replace switch.
Machine operates in opposite direction in response to temperature change.	Control wired incorrectly, open and close inputs reversed.	Check wiring and re-wire per wiring schematic instructions.
Machine will not run in either direction (manual or automatic mode).	No power (circuit breaker or fuse) tripping may indicate machine overload or electrical wire short. Repair or replace before re-energizing circuit.	Check main panel circuit breaker or fuse.
		Check control circuit breaker or fuse.
	Limit switches activated.	Check the limit switches and limit switch trigger. In free position (half way between full open and full close) the limit switch block should be centered between the open and closed limit switches. Check all limit switches. Turn off power. Lightly press on each with a screwdriver and listen for a “click”. If no click, it may indicate a stuck or jammed switch, try to gently pull up on the switch arm. Check set screw in trigger and screws securing limit switches to the enclosure. Check for bent limit switch lever arm. Check for any loose connections.
	Motor failure.	Check fuse on universal circuit board. May indicate machine overload. Repair/Replace motor.

Warning!

Disconnect electrical power and remove all load from machine before servicing or maintaining the machine. Remember that CLUTCH based machines will DROP THE CURTAINS OR INLETS WHEN POWER IS DISCONNECTED. BE CAREFUL!

Problem	Possible Cause	Corrective Action
Machine will not run in automatic but will run in manual mode.	Control switch not in automatic mode.	Change control switch to automatic mode.
	Control failure.	Repair/Replace control.
Machine will only run in one direction (manual & automatic).	Broken or loose wire.	Repair broken or loose wire.
	Limit switch catching on limit rod mechanism.	Free switch and adjust as needed.
	Limit switch failure.	Replace limit switch.
	Control failure.	Repair/Replace control.
	Thermostat failure.	Test/Repair/Replace thermostat.
	Channels not locked together in controller.	Lock channels together in control. Reference controller manual.
Machine will not back-drive. (clutch models only)	Not enough load.	If load is less than 200 lbs., add more counterweight and attach weights to curtain conduit along entire curtain length.
	Air gap is too small.	Adjust air gap to .010” to .020” (.254 mm to .508 mm).
	Something jammed or out of alignment in cabling or pulleys	Check for any obstructions or resistance in curtain cables and accessories.
Clutch is slipping and machine will not shut off.	Improper air gap.	Adjust air gap to .010” to .020” (.254 mm to .508 mm).
	Close position end-stop collar not postioned properly & curtains are pulled too tight	Adjust close position end stop collar as described in installation instructions.
	Curtains adjusted unevenly.	Re-adjust all curtains so that the fully closed positions are all the same.
After the machine drops it will not run after power is regained. (clutch models only)	Inertia of dropping load caused screw to over rotate, driving the load block into the “open” collar and triggering the “kill” switch.	Adjust “open” collar to be at least 4 inches away from load block when curtains are fully open. Make sure the chain or cable stop is installed and properly positioned.

Curtain Machine Clutch set-up and troubleshooting

In no way is it acceptable to remove power to the machine and quickly turn it back on while the load is still dropping. Permanent damage to the clutch will occur and void the warranty.

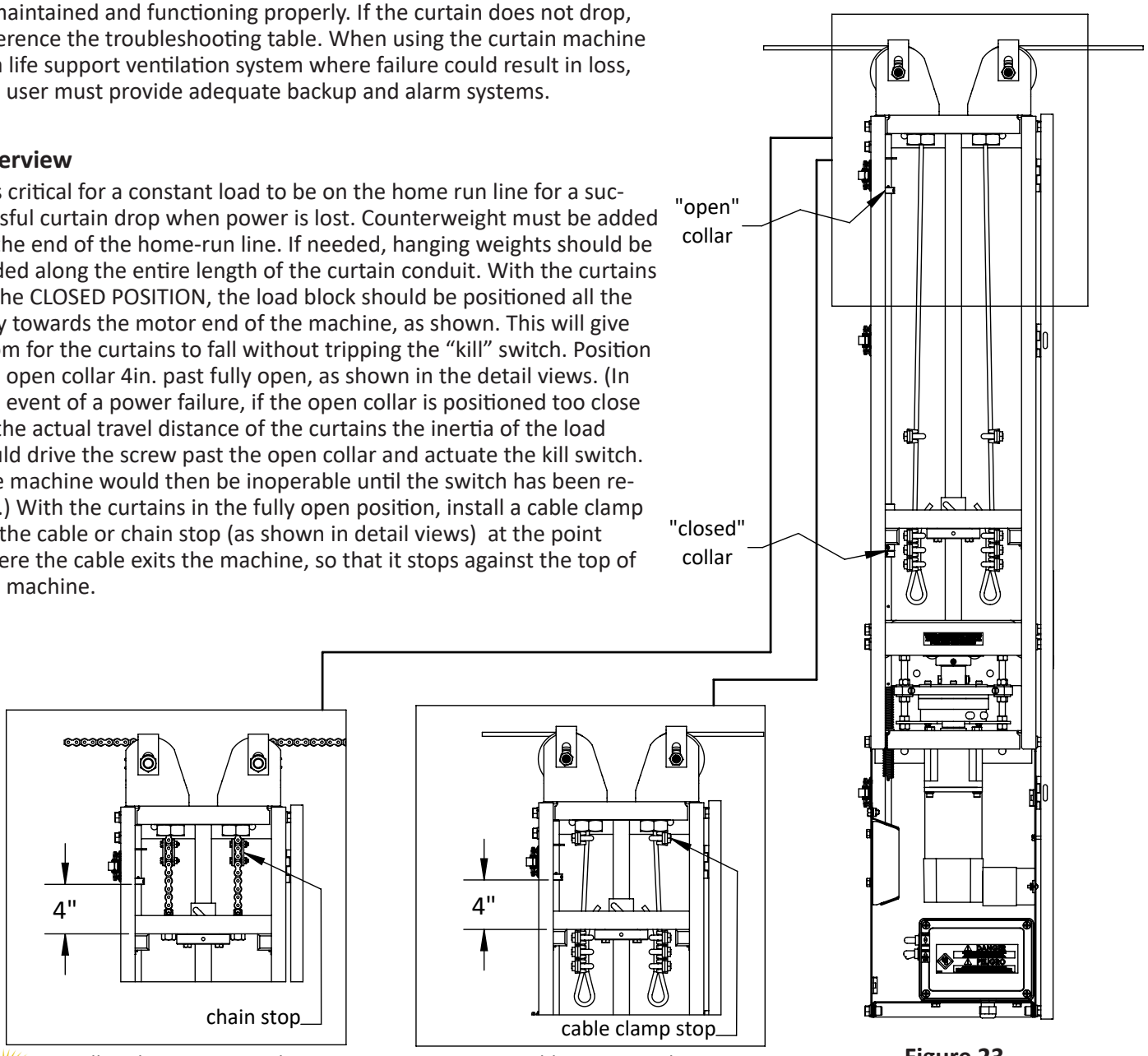
Clutch curtain machines should never be used in conjunction with generators. The generator test will cause the load to drop and power to be restored whiler dropping. This will void warranty.

Load Attachment:

The clutch model curtain machine is used within a ventilation system to actuate sidewall curtains and to provide protection against the loss of livestock during a power outage. When power is available, the clutch is engaged and the ventilation controller can open and close the curtain. When power is lost, the clutch disengages and the load (curtain and additional weight) on the curtain machine causes the ball-screw to free spin so the curtain drops. When power is restored, the clutch re-engages and the ventilation controller can resume normal operation. In order for the clutch model curtain machine to function as described, it is critical that the curtain open and close freely without any obstructions or debris and the curtain machine, cables, pulleys, and all other system components be properly maintained. Routine curtain drop tests should be performed to ensure the system is maintained and functioning properly. If the curtain does not drop, reference the troubleshooting table. When using the curtain machine in a life support ventilation system where failure could result in loss, the user must provide adequate backup and alarm systems.

Overview

It is critical for a constant load to be on the home run line for a successful curtain drop when power is lost. Counterweight must be added at the end of the home-run line. If needed, hanging weights should be added along the entire length of the curtain conduit. With the curtains in the CLOSED POSITION, the load block should be positioned all the way towards the motor end of the machine, as shown. This will give room for the curtains to fall without tripping the “kill” switch. Position the open collar 4in. past fully open, as shown in the detail views. (In the event of a power failure, if the open collar is positioned too close to the actual travel distance of the curtains the inertia of the load could drive the screw past the open collar and actuate the kill switch. The machine would then be inoperable until the switch has been reset.) With the curtains in the fully open position, install a cable clamp on the cable or chain stop (as shown in detail views) at the point where the cable exits the machine, so that it stops against the top of the machine.



Roller Chain Stop Detail

Cable Stop Detail

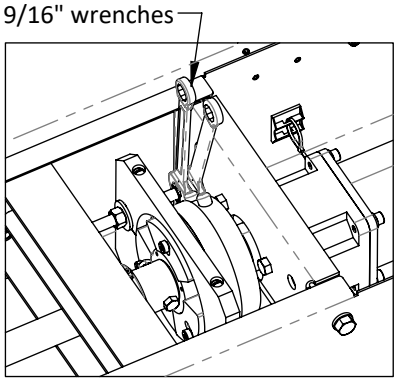
Figure 23

Clutch Air Gap Adjustment:

When the clutch is engaged the two clutch halves are forced together by an electromagnetic coil. When there is no power the two halves of the clutch will separate. This separation distance is termed the air gap. It is critical for power failure operation that the air gap be .010” to .020”. If the gap is too small the load may not drop when power is lost and the clutch could be damaged. If the gap is too large there will be a decrease in the clutch’s maximum torque transmission and service life. To adjust the air gap between the two clutch halves, be sure all load is removed from the machine and that electrical power has been removed. Follow steps 1 thru 3 below.

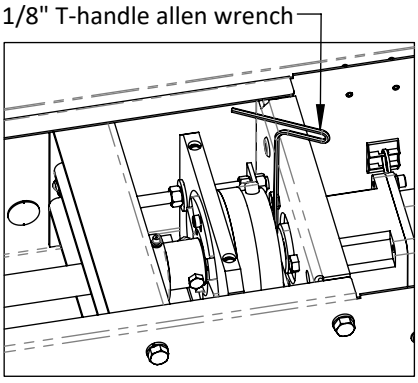
IMPORTANT: While adjusting clutch, be sure to push screw as far up towards the top of the machine as possible, taking all slack out and causing gap to be as large as possible. This will imitate weight hanging from load block.

Step 1:
Loosen the 4 hex nuts securing the clutch mount plate.



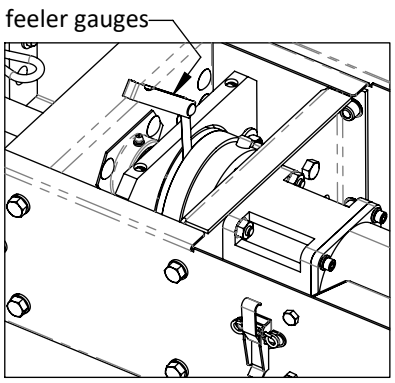
Step 1

Step 2:
Loosen the two set screws on the rotor side of the clutch and slide the rotor into position.



Step 2

Step 3:
Use a feeler gauge to verify the air gap, checking at several places around the clutch. Tighten down both set screws & hex nuts, then test the machine.



Step 3

Troubleshooting:

Problem	Possible Cause	Corrective Action
Machine will not freely backdrive (curtains will not drop)	Not enough load	If load is less than 200 lbs., add more counterweight and attach weights to curtain conduit along entire curtain length.
	Air gap is too small	Adjust air gap to .010” to .020”
	Something jammed or out of alignment in cabling or pulleys	Check for any obstructions or resistance in curtain cables and accessories.
Clutch is slipping and machine will not shut off	Improper air gap.	Adjust air gap to .010” to .020”
	"Close" position end-stop collar not positioned properly & curtains are pulled too tight	Adjust "close" position end stop collar as described in installation instructions in manual.
	Curtains adjusted unevenly	Re-adjust all curtains so that the fully closed positions are all the same
After the machine drops it will not run after power regained	Inertia of dropping load caused screw to over rotate, driving the load block into the "open" collar and triggering the "kill" switch.	Adjust "open" collar to be at least 4 inches away from load block when curtains are fully open. Make sure the chain or cable stop is installed and properly positioned.

Potentiometer Kit Installation

970370 - Ball Screw Potentiometer Kit
970371 - Acme Screw Potentiometer Kit

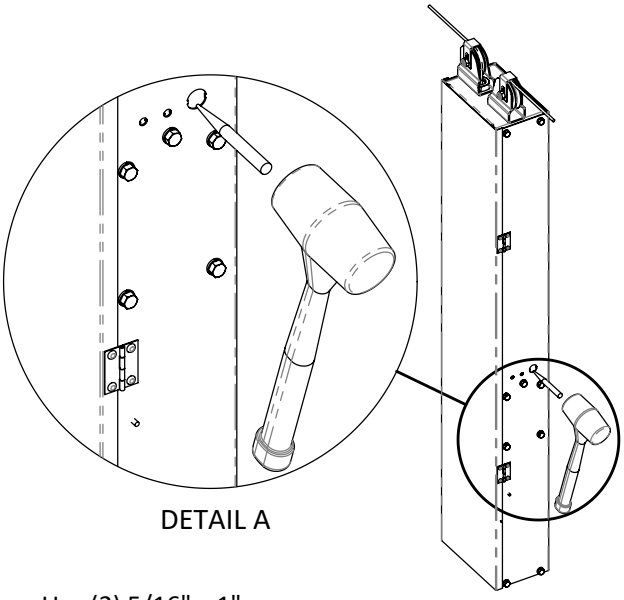
> *Disconnect electrical power and remove all load from machine before servicing or maintaining the machine.*
>
> *All local and national codes must be followed. Wiring must be done by a licensed electrician.*

Installation Instructions:

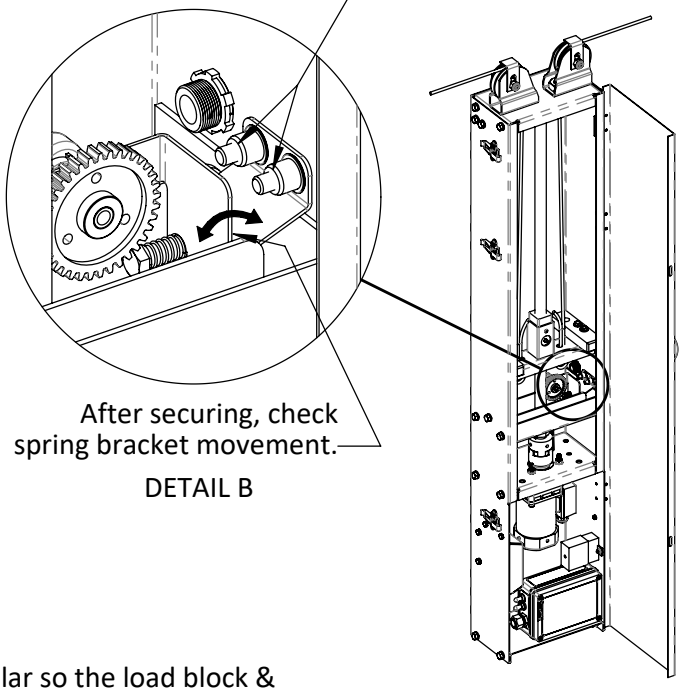
1. Use a hammer and punch to remove knockouts on side of box, as shown in Detail A.
2. Run the machine to the closed position (NOTE: there needs to be enough room for the potentiometer, with at least 1” of clearance between the potentiometer and the load block).

   Important: Position end stop collar so the load block cannot travel too far and hit the gear! Reference Detail C.

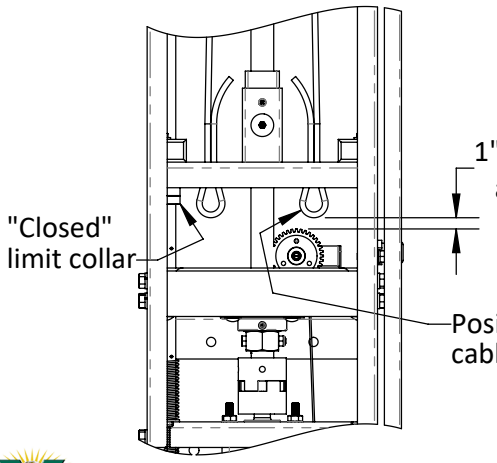
3. Rotate the gear on the potentiometer counter clockwise (while looking at the end of the shaft) until it stops. Then rotate the potentiometer clockwise half a turn.
4. Mount the potentiometer as shown in Detail B, using (2) 5/16" x 1" bolts.
5. Be sure the gears are meshing well with the screw thread. Also check the action of the spring bracket, making sure it compresses without binding, as shown in Detail B.
6. Set the open-position end stop collar.
7. Run the machine to the fully open position and watch the gear for proper meshing.
8. Route wires through strain relief. Wire the potentiometer in accordance with your controller’s instructions. *Note: Green wire needs to be connected to the input signal on the control.*



DETAIL A



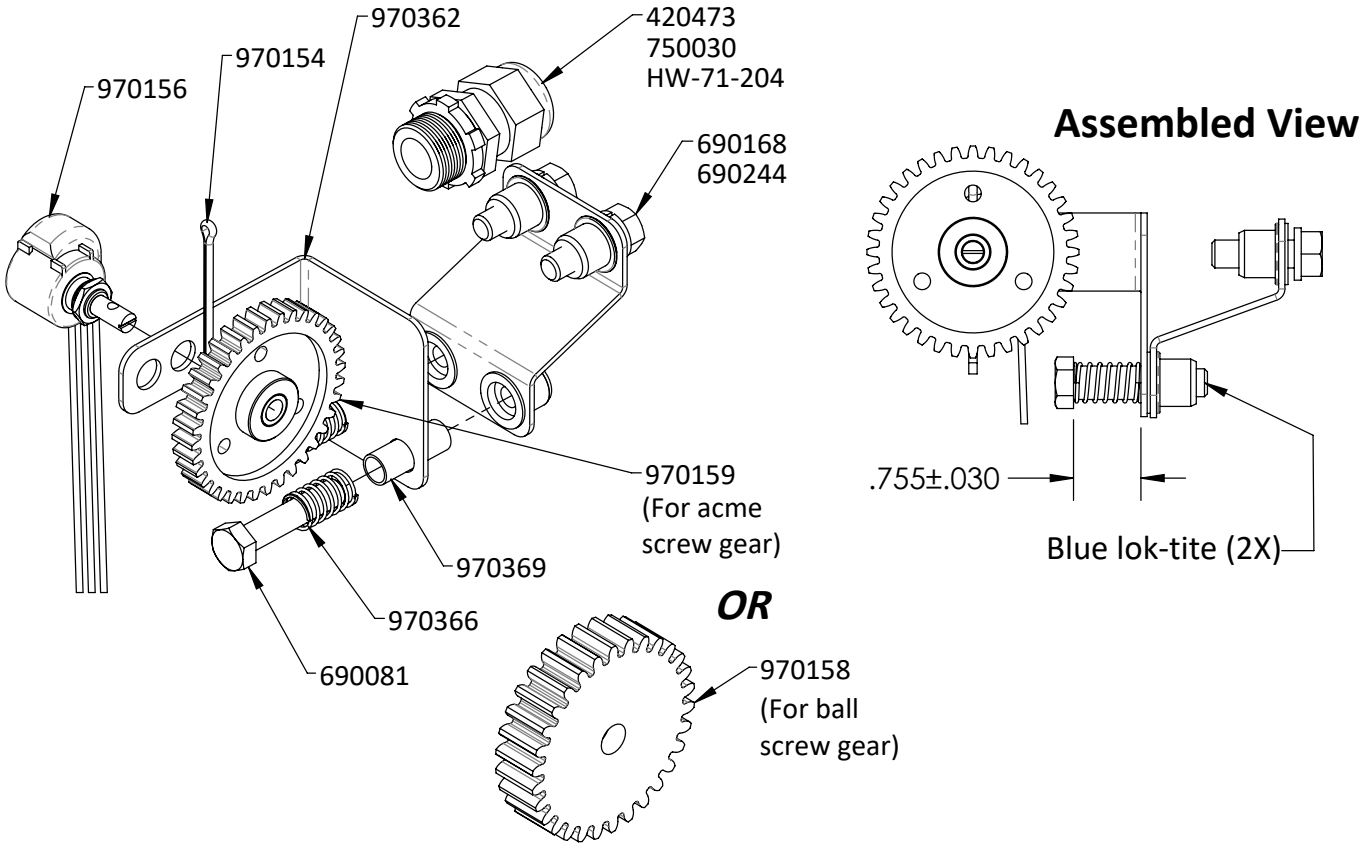
DETAIL B



DETAIL C

Potentiometer Kit - Exploded View & Parts List

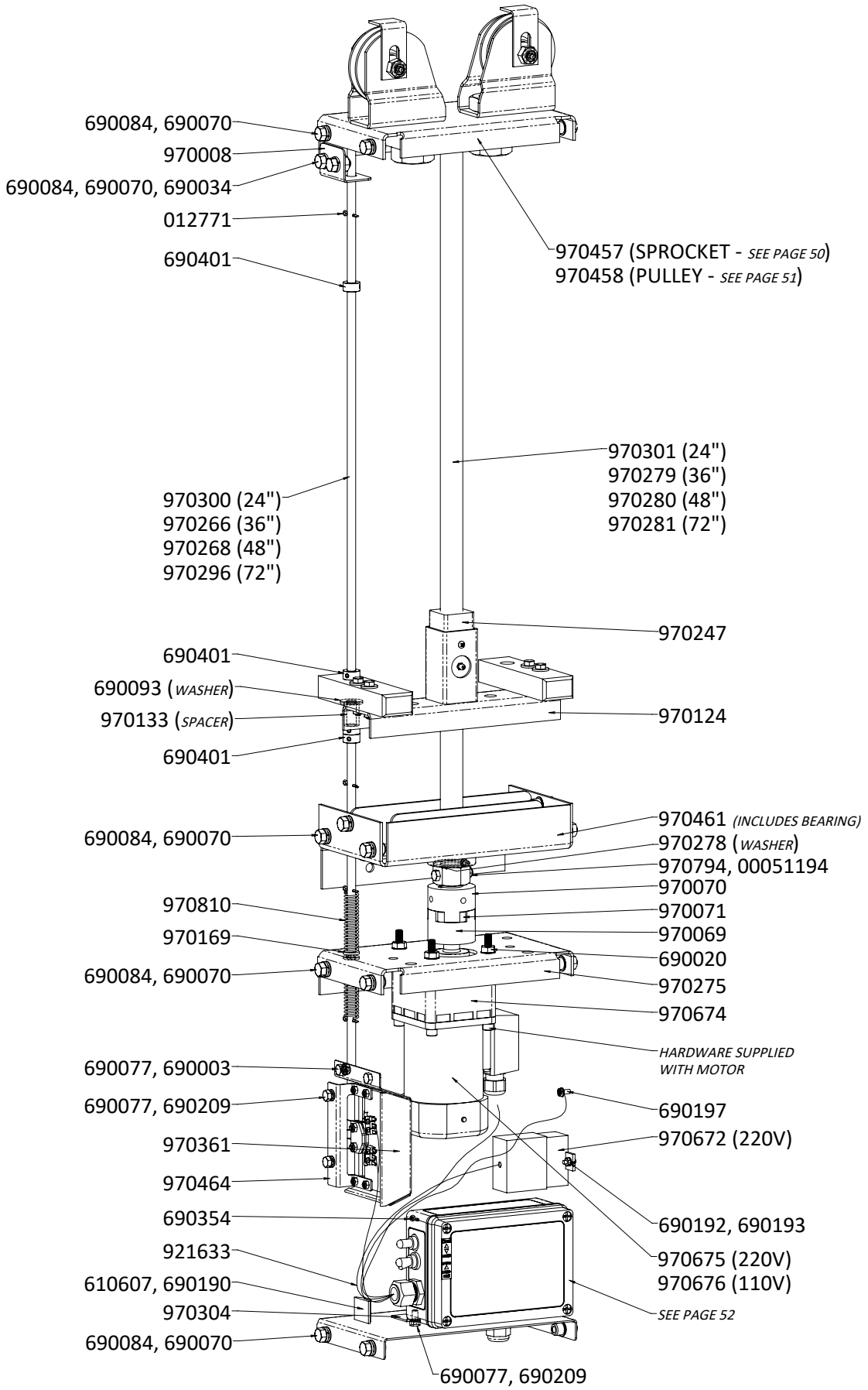
Parts Page (for repair only, kits come assembled from factory)



Part No.	Description	Qty
Common Parts		
420473	CONDUIT NUT, 1/2” NPT	1
690081	HEX BOLT, 5/16-18 X 1-1/2 ZP	2
690168	HEX BOLT, 5/16-18 X 1 ZP	2
690244	LOCK WASHER, 5/16 ZP	2
750030	STRAIN RELIEF, 1/2” NPT	1
970154	COTTER PIN, 3/32 X 1-3/4 ZP	1
970156	POTENTIOMETER, 10 TURN	1
970362	BRACKET, POTENTIOMETER SPRING	1
970366	COMPRESSION SPRING	2
970369	NYLON TUBE, 3/8 OD, 5/16 ID	2
HW-71-204	O-RING, 11/16 ID, 13/16 OD	1
970370 - Potentiometer Kit for Ball Screw Curtain Machines		
970158	GEAR FOR BALL SCREW, 30 TOOTH	1
970371 - Potentiometer Kit for Acme Screw Curtain Machines		
970159	GEAR FOR ACME SCREW, 36 TOOTH	1

Parts Pages

Exploded View: ATLAS™ Weather Resistant Acme Screw (970500, 970501, 970504, 970505)

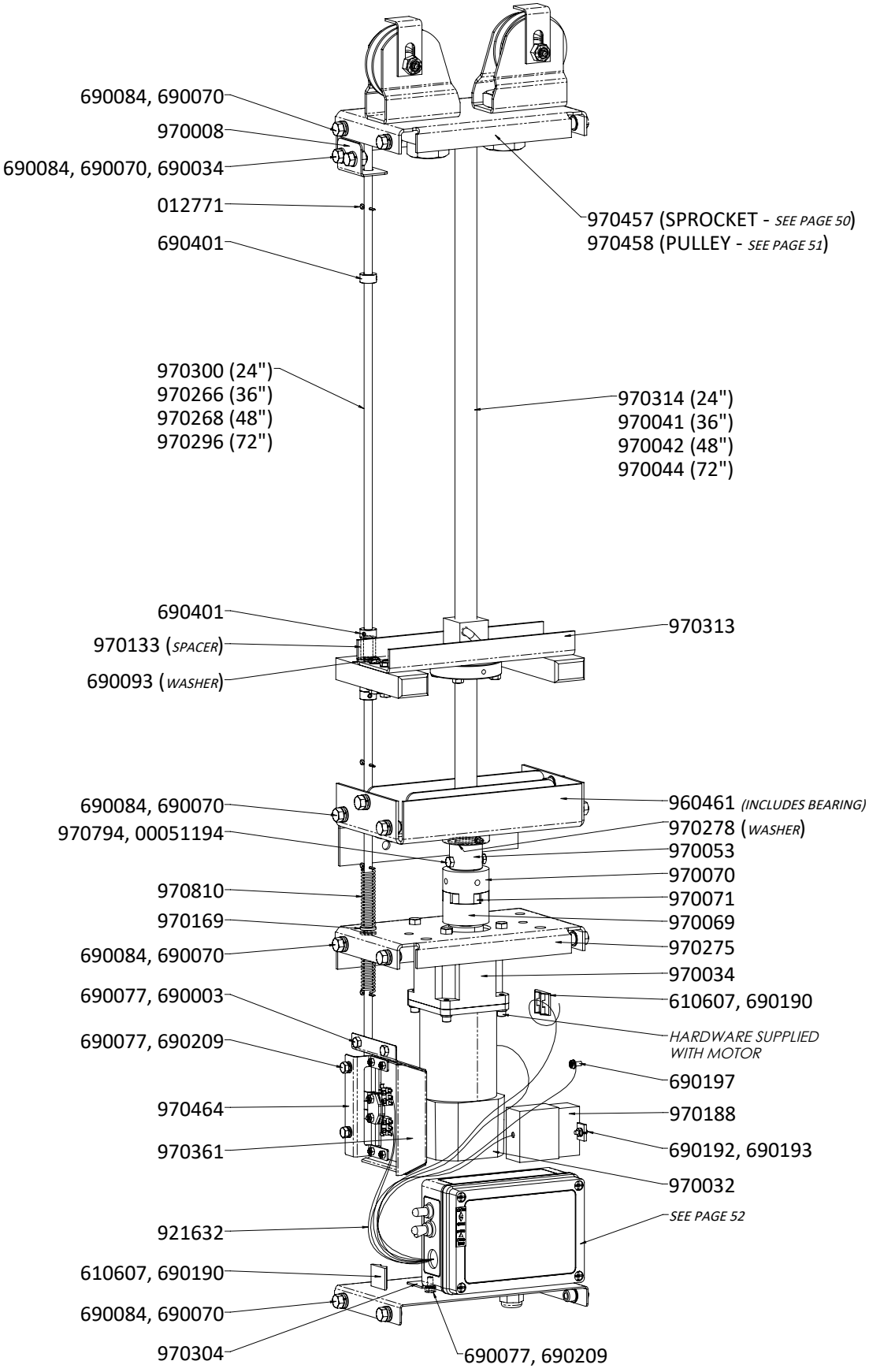


Parts List: ATLAS™ Weather Resistant Acme Screw (970500, 970501, 970504, 970505)

PART #	DESCRIPTION	QTY
INTERCHANGEABLE PARTS - ALL SIZES		
012771	PIN, COTTER 3/32 X 3/4	4
610607	CABLE TIE, 3.62”L, .093”W	1
690003	NUT, KEP 1/4-20 ZP	2
690020	NUT, KEP 5-16-18 ZP	4
690034	NUT, KEP 3/8-16 ZP	2
690070	WASHER, LOCK, 3/8, ZP	20
690077	SCREW, 1/4-20 X 1/2 HHCS, ZP	6
690084	SCREW, 3/8-16 X 0.75 HHCS ZP	20
690093	WASHER, FLAT 3/8 USS ZP	1
690190	HOLDER, TY-RAP #1A870 GRAINGER	1
690192	SCREW, 8-32 X 1/2 RHMS, ZP	1
690193	NUT, KEP, 8-32, ZP	1
690197	SCREW, 10-32 X 3/8 THD CUT #11-104	1
690209	WASHER, LOCK 1/4 SPLIT, ZP	4
690354	SCREW, #8-18 X 1/2 PPHMS ZP	4
690401	COLLAR, SET 3/8 SS (1/4-20 THREAD)	5
921633	WIRE HARNESS SINGLE BD CONTROLLER	1
970008	SUPPORT, ROD, .469” GUIDE HOLE	1
970069	HUB, LOVEJOY, L095, 3/4IN W/KW	1
970070	HUB, LOVEJOY, L095, 1IN W/KW	1
970071	SPIDER, L/AL090/095	1
970081	KEY, SQ 1/4 X 3/4	1
970124	LOAD BLOCK ASSY, ACME	1
970133	SPACER, F/LIMIT SWITCH RODS	1
970169	SPLIT WASHER, UHMW .094IN, ID .	2
970247	ACME NUT	1
970275	MOTOR MOUNT ASSY, CURT MACHINE	1
970278	WASHER, FLAT, 1.00 ID X 1.63 OD	1
970304	BRACKET ASSY, ENCLOSURE MTG	1
970361	BRACKET, PROTECTION HOOD	1
970461	BEARING BLOCK ASSY, CURT MACHINE	1
970464	LIMIT SWITCH ASSY, WR CM	1
970674	REDUCER, 60:1, .75 SHAFT, 3.54 FRAME	1
970794	SCREW, 1/4-20 X 1-3/4in	1
970810	SPRING, 5/8in X 3-1/4in	2
00051194	NUT, HEX LOCK 1/4-20 SS NYLOC	1

PART #	DESCRIPTION	QTY
CURTAIN MACHINES W/PULLEY 970500-XX and 970501-XX *(all sizes)*		
970458	PLATE ASSEMBLY, TOP F/CABLE	1
CURTAIN MACHINES W/SPROCKET 970504-XX and 970505-XX *(all sizes)*		
970457	PLATE ASSEMBLY, TOP F/CHAIN	1
CURTAIN MACHINES W/220V 970500-XX and 970504-XX *(all sizes)*		
970672	CAPACITOR, F/70675 MOTOR	1
970675	MOTOR, 90W, 220/230VAC, 50/60HZ	1
CURTAIN MACHINES W/110V 970501-XX and 970505-XX *(all sizes)*		
970676	MOTOR, 90W, 110/115V, 60HZ	1
24” CURTAIN MACHINES 970500-24, 970501-24, 970504-24 & 970505-24		
970300	ROD, LIMIT SWITCH, 24” MACHINE	1
970301	ACME SCREW ASSY, 35.5”LG SCREW	1
970452	BOX ASSY, 24” CURTAIN MACHINE	1
36” CURTAIN MACHINES 970500-36, 970501-36, 970504-36 & 970505-36		
970266	ROD, LIMIT SWITCH, 36” MACHINE	1
970279	ACME SCREW ASSY, 47.5”LG SCREW	1
970453	BOX ASSY, 36” CURTAIN MACHINE	1
48” CURTAIN MACHINES 970500-48, 970501-48, 970504-48 & 970505-48		
970268	ROD, LIMIT SWITCH, 48” MACHINE	1
970280	ACME SCREW ASSY, 59.5”LG SCREW	1
970454	BOX ASSY, 48” CURTAIN MACHINE	1
72” CURTAIN MACHINES 970500-72, 970501-72, 970504-72 & 970505-72		
970296	ROD, LIMIT SWITCH, 72” MACHINE	1
970281	ACME SCREW ASSY, 83.5”LG SCREW	1
970455	BOX ASSY, 72” CURTAIN MACHINE	1

Exploded View: ATLAS™ Weather Resistant Ball Screw (970508, 970512)

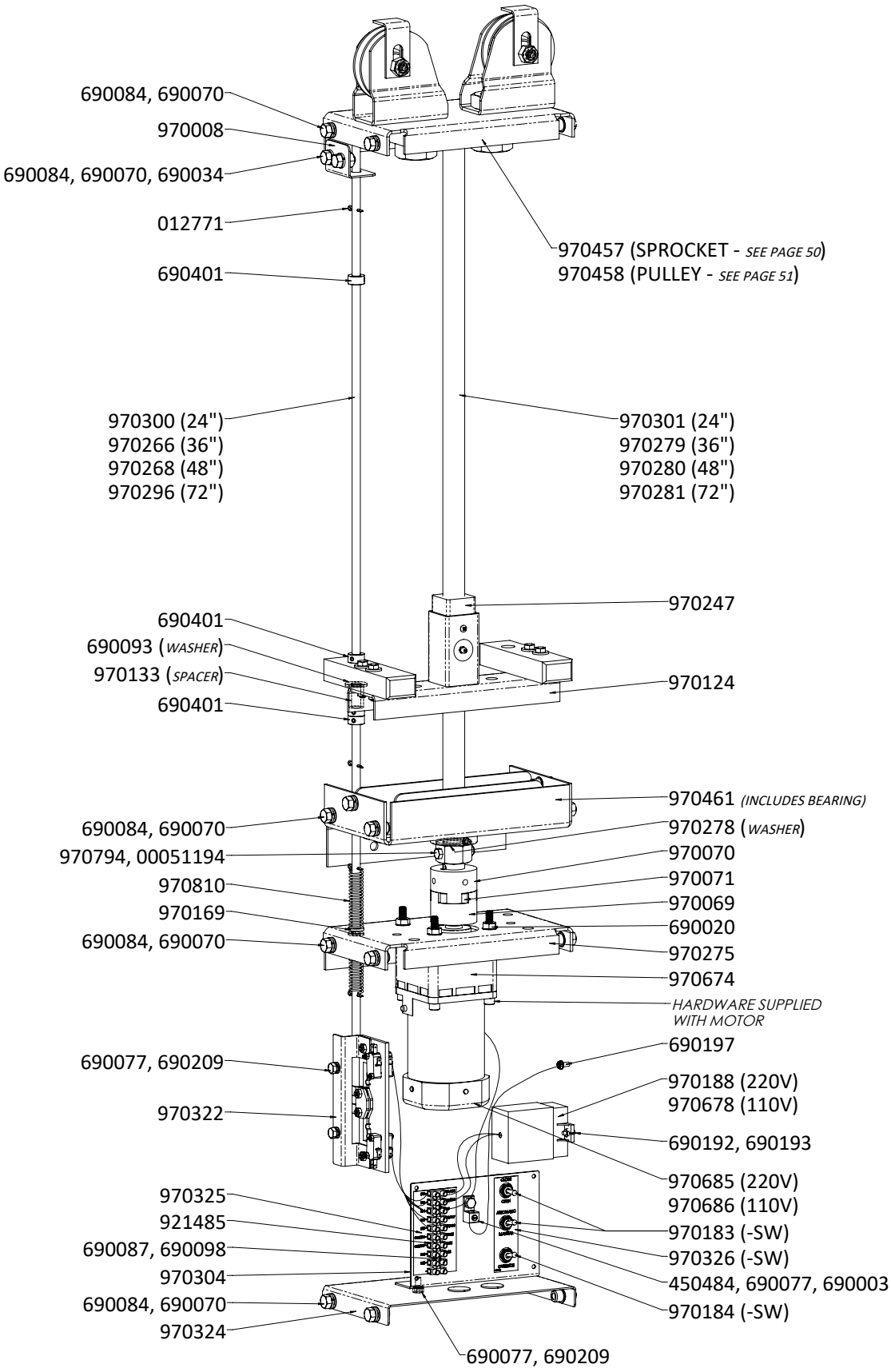


Parts List: ATLAS™ Weather Resistant Ball Screw (970508, 970512)

PART #	DESCRIPTION	QTY
INTERCHANGEABLE PARTS - ALL SIZES		
012771	PIN, COTTER 3/32 X 3/4	4
610607	CABLE TIE, 3.62”L, .093”W	2
690003	NUT, KEP 1/4-20 ZP	3
690020	NUT, KEP 5-16-18 ZP	4
690034	NUT, KEP 3/8-16 ZP	2
690070	WASHER, LOCK, 3/8, ZP	20
690077	SCREW, 1/4-20 X 1/2 HHCS, ZP	6
690084	SCREW, 3/8-16 X 0.75 HHCS ZP	20
690093	WASHER, FLAT 3/8 USS ZP	1
690168	SCREW, 5/16-18 X 1 HHCS ZP	4
690190	HOLDER, TY-RAP #1A870 GRAINGER	2
690192	SCREW, 8-32 X 1/2 RHMS, ZP	1
690193	NUT, KEP, 8-32, ZP	1
690197	SCREW, 10-32 X 3/8 THD CUT #11-104	1
690209	WASHER, LOCK 1/4 SPLIT, ZP	4
690348	QUICK CONNECT 18-22 AWG .110	5
690354	SCREW, #8-18 X 1/2 PPHMS ZP	4
690401	COLLAR, SET 3/8 SS (1/4-20 THREAD)	5
921632	WIRE HARNESS, CURT, BALL, WR	1
970008	SUPPORT, ROD, .469” GUIDE HOLE	1
970032	MOTOR, .13HP, 220/230V, 50/60HZ, 1P	1
970034	GEARBOX, #VAC5GU60KHA	1
970053	COLLAR, LOAD	1
970069	HUB, LOVEJOY, L095, 3/4IN W/KW	1
970070	HUB, LOVEJOY, L095, 1IN W/KW	1
970071	SPIDER, L/AL090/095	1
970081	KEY, SQ 1/4 X 3/4	1
970133	SPACER, F/LIMIT SWITCH RODS	1
970169	SPLIT WASHER, UHMW .094IN, ID .	2
970188	CAPACITOR, 7.0 uF	1
970275	MOTOR MOUNT ASSY, CURT MACHINE	1
970278	WASHER, FLAT, 1.00 ID X 1.63 OD	1
970304	BRACKET ASSY, ENCLOSURE MTG	1

PART #	DESCRIPTION	QTY
970313	LOAD BLOCK ASSY, BALL SCREW	1
970361	BRACKET, PROTECTION HOOD	1
970461	BEARING BLOCK ASSY, CURT MACHINE	1
970463	CONTROL ASSY, SAFETRAC	1
970464	LIMIT SWITCH ASSY, WR CM	1
970794	SCREW, 11/4-20 X 1-3/4	1
970810	SPRING, 5/8in X 3-1/4in	2
00051194	NUT, HEX LOCK 1/4-20 SS NYLOC	1
CURTAIN MACHINES W/PULLEY 970508-XX *(all sizes)*		
970458	PLATE ASSEMBLY, TOP F/CABLE	1
CURTAIN MACHINES W/SPROCKET 970512-XX *(all sizes)*		
970457	PLATE ASSEMBLY, TOP F/CHAIN	1
24” CURTAIN MACHINES 970508-24 & 970512-24		
970300	ROD, LIMIT SWITCH, 24” MACHINE	1
970314	SCREW, BALL F/24” MACHINING	1
970452	BOX ASSY, 24” CURTAIN MACHINE	1
36” CURTAIN MACHINES 970508-36 & 970512-36		
970266	ROD, LIMIT SWITCH, 36” MACHINE	1
970041	SCREW, BALL F/36” MACHINING	1
970453	BOX ASSY, 36” CURTAIN MACHINE	1
48” CURTAIN MACHINES 970508-48 & 970512-48		
970268	ROD, LIMIT SWITCH, 48” MACHINE	1
970042	SCREW, BALL F/48” MACHINING	1
970454	BOX ASSY, 48” CURTAIN MACHINE	1
72” CURTAIN MACHINES 970508-72 & 970512-72		
970296	ROD, LIMIT SWITCH, 72” MACHINE	1
970044	SCREW, BALL F/72” MACHINING	1
970455	BOX ASSY, 72” CURTAIN MACHINE	1

Exploded View: SafeTRAC™ Indoor Acme Screw (970532, 970536, 970540, 970544)

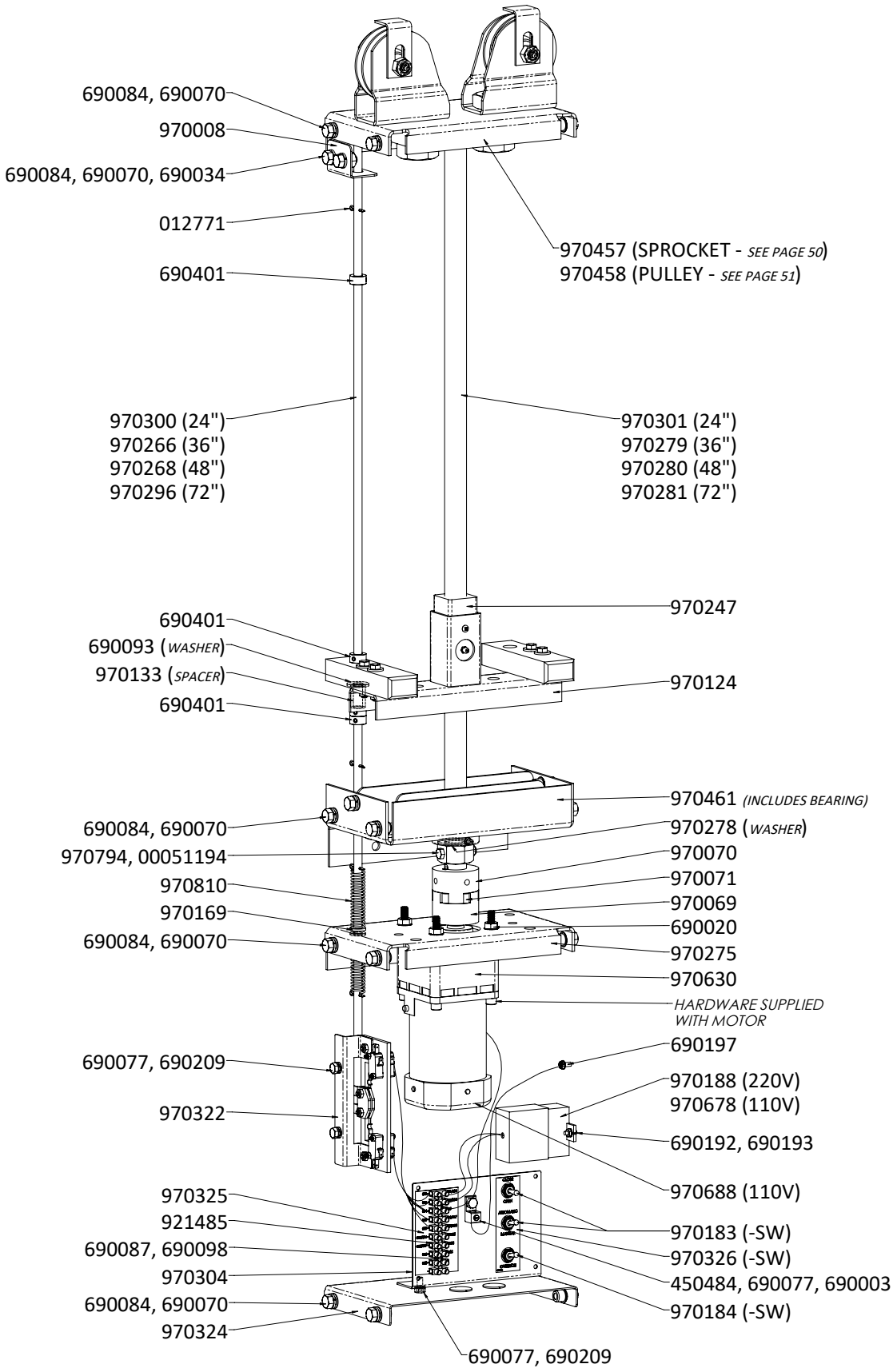


Parts List: SafeTRAC™ Indoor Acme Screw (970532, 970536, 970540, 970544)

PART #	DESCRIPTION	QTY
INTERCHANGEABLE PARTS - ALL SIZES *(including -SW)*		
012771	PIN, COTTER 3/32 X 3/4	4
450484	GROUND BLOCK	1
690003	NUT, KEP 1/4-20 ZP	1
690020	NUT, KEP 5-16-18 ZP	4
690034	NUT, KEP 3/8-16 ZP	2
690070	WASHER, LOCK, 3/8, ZP	20
690077	SCREW, 1/4-20 X 1/2 HHCS, ZP	5
690084	SCREW, 3/8-16 X 0.75 HHCS ZP	20
690087	SCREW, 6-32 X 5/8 RHMS ZP	2
690093	WASHER, FLAT 3/8 USS ZP	1
690098	NUT, KEP 6-32 ZP	2
690192	SCREW, 8-32 X 1/2 RHMS, ZP	1
690193	NUT, KEP, 8-32, ZP	1
690197	SCREW, 10-32 X 3/8 THD CUT #11-104	1
690209	WASHER, LOCK 1/4 SPLIT, ZP	4
690401	COLLAR, SET 3/8 SS (1/4-20 THREAD)	5
921485	WIRE HARNESS, CURT, ACME, IND	1
970008	SUPPORT, ROD, .469" GUIDE HOLE	1
970069	HUB, LOVEJOY, L095, 3/4IN W/KW	1
970070	HUB, LOVEJOY, L095, 1IN W/KW	1
970071	SPIDER, L/AL090/095	1
970081	KEY, SQ 1/4 X 3/4	1
970124	LOAD BLOCK ASSY, ACME	1
970133	SPACER, F/LIMIT SWITCH RODS	1
970169	SPLIT WASHER, UHMW .094IN, ID .	2
970247	ACME NUT	1
970275	MOTOR MOUNT ASSY, CURT MACHINE	1
970278	WASHER, FLAT, 1.00 ID X 1.63 OD	1
970304	BRACKET ASSY, ENCLOSURE MTG	1
970322	LIMIT SWITCH ASSY, INDOOR	1
970324	BOTTOM ASSY, CURTAIN MACH BOX	1
970325	DECAL, TERMINAL STRIP, CURT	1
970461	BEARING BLOCK ASSY, CURT MACHINE	1
970674	REDUCER, 60:1, .75 SHAFT, 3.54 FRAME	1
970794	SCREW, 11/4-20 X 1-3/4	1
970810	SPRING, 5/8in X 3-1/4in	2
00051194	NUT, HEX LOCK 1/4-20 SS NYLOC	1

PART #	DESCRIPTION	QTY
CURTAIN MACHINES W/SWITCH 9705XX-XX-SW *(all sizes)*		
970183	SWITCH ASSY, OP/CL, MAN/AUTO	1
970184	SWITCH ASSY, OVERRIDE	1
970326	DECAL, MANUAL SWITCHES, CURT	1
CURTAIN MACHINES W/PULLEY 970532-XX and 970540-XX *(all sizes, including -SW)*		
970458	PLATE ASSEMBLY, TOP F/CABLE	1
CURTAIN MACHINES W/SPROCKET 970536-XX and 970544-XX *(all sizes, including -SW)*		
970457	PLATE ASSEMBLY, TOP F/CHAIN	1
CURTAIN MACHINES W/220V 970532-XX and 970536-XX *(all sizes, including -SW)*		
970188	CAPACITOR, 7.0 uF	1
970685	MOTOR, 90W, 220/230VAC, 50/60HZ	1
CURTAIN MACHINES W/110V 9705040-XX and 970544-XX *(all sizes, including -SW)*		
970678	CAPACITOR, 30 uF	1
970686	MOTOR, 90W, 110/115V, 60HZ	1
24" CURTAIN MACHINES *(including -SW)* 970532-24, 970536-24, 970540-24 & 970544-24		
970300	ROD, LIMIT SWITCH, 24" MACHINE	1
970301	ACME SCREW ASSY, 35.5"LG SCREW	1
970452	BOX ASSY, 24" CURTAIN MACHINE	1
36" CURTAIN MACHINES *(including -SW)* 970532-36, 970536-36, 970540-36 & 970544-36		
970266	ROD, LIMIT SWITCH, 36" MACHINE	1
970279	ACME SCREW ASSY, 47.5"LG SCREW	1
970453	BOX ASSY, 36" CURTAIN MACHINE	1
48" CURTAIN MACHINES *(including -SW)* 970532-48, 970536-48, 970540-48 & 970544-48		
970268	ROD, LIMIT SWITCH, 48" MACHINE	1
970280	ACME SCREW ASSY, 59.5"LG SCREW	1
970454	BOX ASSY, 48" CURTAIN MACHINE	1
72" CURTAIN MACHINES *(including -SW)* 970532-72, 970536-72, 970540-72 & 970544-72		
970296	ROD, LIMIT SWITCH, 72" MACHINE	1
970281	ACME SCREW ASSY, 83.5"LG SCREW	1
970455	BOX ASSY, 72" CURTAIN MACHINE	1

Exploded View: SafeTRAC™ High Speed Indoor Acme Screw (970561, 970562)

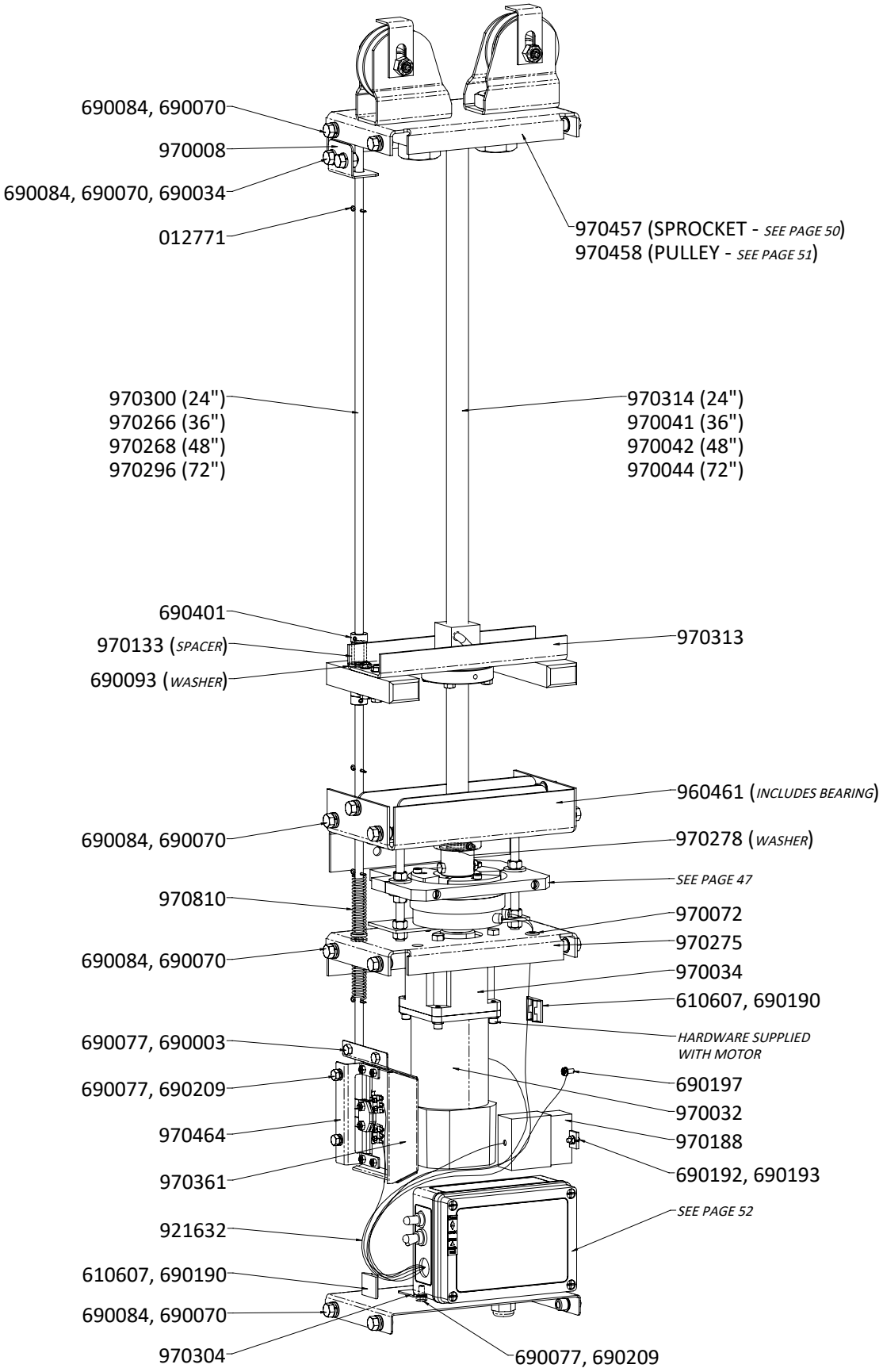


Parts List: SafeTRAC™ High Speed Indoor Acme Screw (970561, 970562)

PART #	DESCRIPTION	QTY
INTERCHANGEABLE PARTS - ALL SIZES *(including -SW)*		
012771	PIN, COTTER 3/32 X 3/4	4
450484	GROUND BLOCK	1
690003	NUT, KEP 1/4-20 ZP	1
690020	NUT, KEP 5-16-18 ZP	4
690034	NUT, KEP 3/8-16 ZP	2
690070	WASHER, LOCK, 3/8, ZP	20
690077	SCREW, 1/4-20 X 1/2 HHCS, ZP	5
690084	SCREW, 3/8-16 X 0.75 HHCS ZP	20
690087	SCREW, 6-32 X 5/8 RHMS ZP	2
690093	WASHER, FLAT 3/8 USS ZP	1
690098	NUT, KEP 6-32 ZP	2
690192	SCREW, 8-32 X 1/2 RHMS, ZP	1
690193	NUT, KEP, 8-32, ZP	1
690197	SCREW, 10-32 X 3/8 THD CUT #11-104	1
690209	WASHER, LOCK 1/4 SPLIT, ZP	4
690401	COLLAR, SET 3/8 SS (1/4-20 THREAD)	5
921485	WIRE HARNESS, CURT, ACME, IND	1
970008	SUPPORT, ROD, .469" GUIDE HOLE	1
970069	HUB, LOVEJOY, L095, 3/4IN W/KW	1
970070	HUB, LOVEJOY, L095, 1IN W/KW	1
970071	SPIDER, L/AL090/095	1
970081	KEY, SQ 1/4 X 3/4	1
970124	LOAD BLOCK ASSY, ACME	1
970133	SPACER, F/LIMIT SWITCH RODS	1
970169	SPLIT WASHER, UHMW .094IN, ID .	2
970247	ACME NUT	1
970275	MOTOR MOUNT ASSY, CURT MACHINE	1
970278	WASHER, FLAT, 1.00 ID X 1.63 OD	1
970304	BRACKET ASSY, ENCLOSURE MTG	1
970322	LIMIT SWITCH ASSY, INDOOR	1
970324	BOTTOM ASSY, CURTAIN MACH BOX	1
970325	DECAL, TERMINAL STRIP, CURT	1
970461	BEARING BLOCK ASSY, CURT MACHINE	1
970630	REDUCER, 30:1, .75 SHAFT, 3.54 FRAME	1
970688	MOTOR, 90W, 110/115V, 60HZ	1
970794	SCREW, 11/4-20 X 1-3/4	1
970810	SPRING, 5/8in X 3-1/4in	2
00051194	NUT, HEX LOCK 1/4-20 SS NYLOC	1

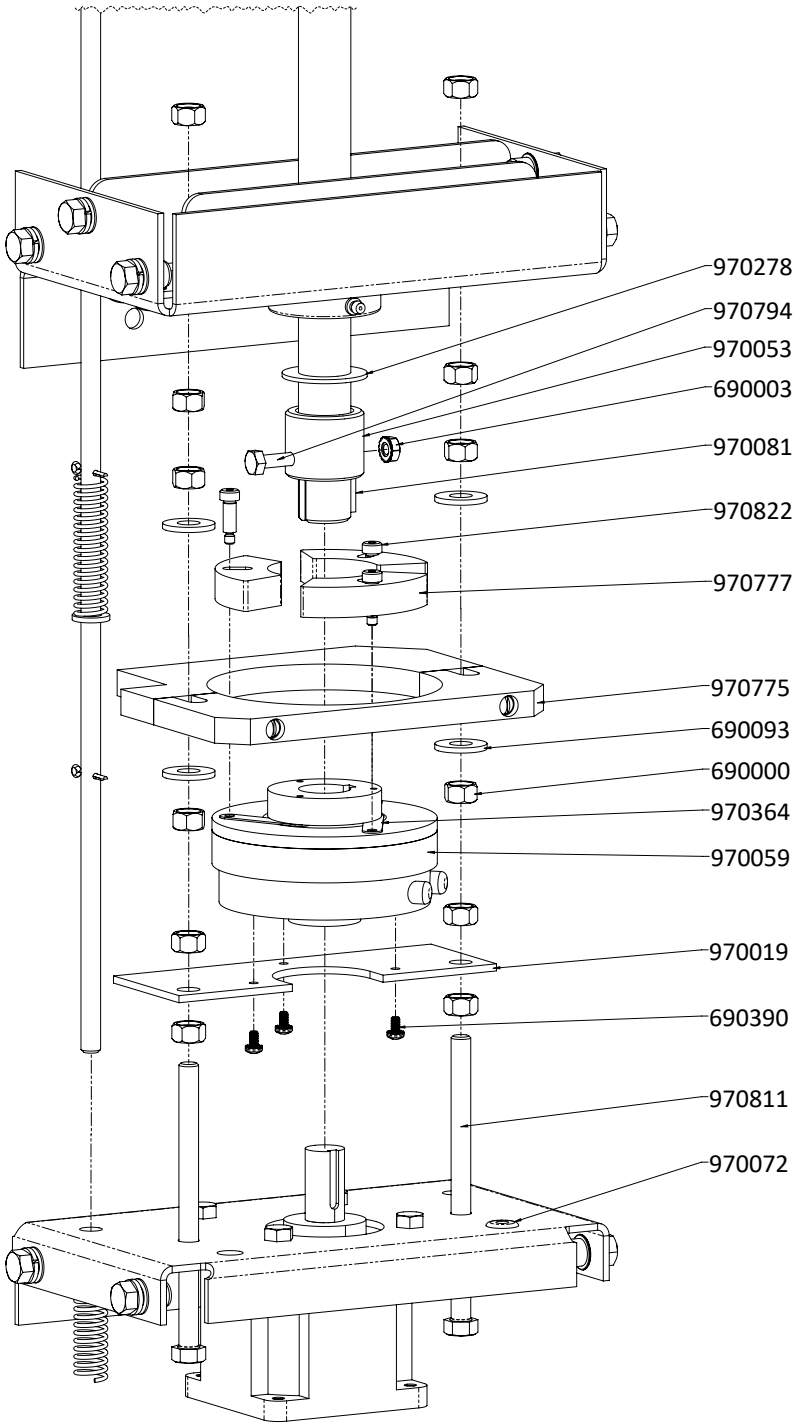
PART #	DESCRIPTION	QTY
CURTAIN MACHINES W/SWITCH 97056X-XX-SW *(all sizes)*		
970183	SWITCH ASSY, OP/CL, MAN/AUTO	1
970184	SWITCH ASSY, OVERRIDE	1
970326	DECAL, MANUAL SWITCHES, CURT	1
CURTAIN MACHINES W/PULLEY 970561-XX *(all sizes, including -SW)*		
970458	PLATE ASSEMBLY, TOP F/CABLE	1
CURTAIN MACHINES W/SPROCKET 970562-XX *(all sizes, including -SW)*		
970457	PLATE ASSEMBLY, TOP F/CHAIN	1
24" CURTAIN MACHINES *(including -SW)* 970561-24 & 970562-24		
970300	ROD, LIMIT SWITCH, 24" MACHINE	1
970301	ACME SCREW ASSY, 35.5"LG SCREW	1
970452	BOX ASSY, 24" CURTAIN MACHINE	1
36" CURTAIN MACHINES *(including -SW)* 970561-36 & 970562-36		
970266	ROD, LIMIT SWITCH, 36" MACHINE	1
970279	ACME SCREW ASSY, 47.5"LG SCREW	1
970453	BOX ASSY, 36" CURTAIN MACHINE	1
48" CURTAIN MACHINES *(including -SW)* 970561-48 & 970562-48		
970268	ROD, LIMIT SWITCH, 48" MACHINE	1
970280	ACME SCREW ASSY, 59.5"LG SCREW	1
970454	BOX ASSY, 48" CURTAIN MACHINE	1
72" CURTAIN MACHINES *(including -SW)* 970561-72 & 970562-72		
970296	ROD, LIMIT SWITCH, 72" MACHINE	1
970281	ACME SCREW ASSY, 83.5"LG SCREW	1
970455	BOX ASSY, 72" CURTAIN MACHINE	1

Exploded View: ATLAS™ Weather Resistant with Clutch (970516, 970520)



See Page 48 for Bill of Materials.

Exploded View: ATLAS™ Weather Resistant with Clutch - Detail (970516, 970520)



See Page 48 for Bill of Materials.

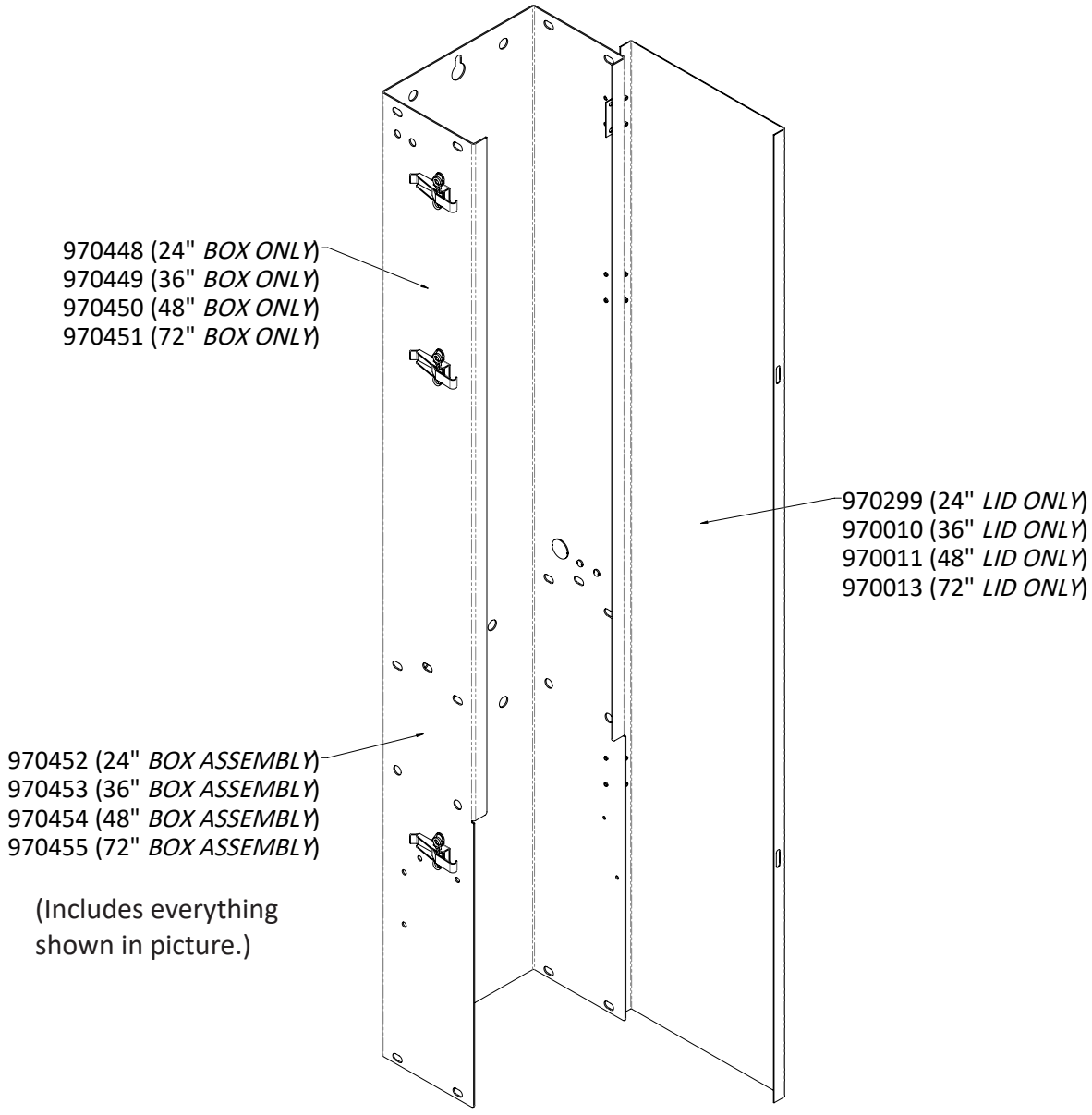
Parts List: ATLAS™ Weather Resistant with Clutch (970516, 970520)

PART #	DESCRIPTION	QTY
INTERCHANGEABLE PARTS - ALL SIZES		
012771	PIN, COTTER 3/32 X 3/4	4
610607	CABLE TIE, 3.62”L, .093”W	2
690000	NUT, HEX 3/8-16 ZP	12
690003	NUT, KEP 1/4-20 ZP	3
690020	NUT, KEP 5-16-18 ZP	4
690034	NUT, KEP 3/8-16 ZP	2
690070	WASHER, LOCK, 3/8, ZP	20
690077	SCREW, 1/4-20 X 1/2 HHCS, ZP	6
690084	SCREW, 3/8-16 X 0.75 HHCS ZP	20
690093	WASHER, FLAT 3/8 USS ZP	5
690168	SCREW, 5/16-18 X 1 HHCS ZP	4
690190	HOLDER, TY-RAP #1A870 GRAINGER	2
690192	SCREW, 8-32 X 1/2 RHMS, ZP	1
690193	NUT, KEP, 8-32, ZP	1
690197	SCREW, 10-32 X 3/8 THD CUT #11-104	1
690209	WASHER, LOCK 1/4 SPLIT, ZP	4
690348	QUICK CONNECT 18-22 AWG .110	5
690354	SCREW, #8-18 X 1/2 PPHMS ZP	4
690390	SCREW, 8/32 X 5/16 RH-SEM SP	3
690401	COLLAR, SET 3/8 SS (1/4-20 THREAD)	4
921299	TERMINAL, RING 18-14 AWG #6	2
921632	WIRE HARNESS, CURT, BALL, WR	1
970008	SUPPORT, ROD, .469” GUIDE HOLE	1
970019	MOUNT, CLUTCH	1
970032	MOTOR, .13HP, 220/230V, 50/60HZ, 1P	1
970034	GEARBOX, #VAC5GU60KHA	1
970053	COLLAR, LOAD	1
970059	CLUTCH, 220V 1IN X 3/4, #0717-0013	1
970072	GROMMET, RUBBER	1
970081	KEY, SQ 1/4 X 3/4	1
970133	SPACER, F/LIMIT SWITCH RODS	1
970188	CAPACITOR, F/970032 (220 W/BRA	1
970169	SPLIT WASHER, UHMW .094IN, ID .	2
970264	BOTTOM ASSY , CURTAIN MACH BOX	1
970275	MOTOR MOUNT ASSY, CURT MACHINE	1

PART #	DESCRIPTION	QTY
970278	WASHER, FLAT, 1.00 ID X 1.63 OD	1
970304	BRACKET ASSY, ENCLOSURE MTG	1
970313	LOAD BLOCK ASSY, BALL SCREW	1
970361	BRACKET, PROTECTION HOOD	1
970364	CLUTCH FINGER RETAINER SPRING	3
970461	BEARING BLOCK ASSY, CURT MACHINE	1
970464	LIMIT SWITCH ASSY, WR CM	1
970775	GUARD, CLUTCH, CURT MACHINE	1
970777	SHOE, CLUTCH, CURT MACHINE	3
970794	SCREW, 11/4-20 X 1-3/4	1
970810	SPRING, 5/8in X 3-1/4in	2
970822	SCREW, 1/4 X 5/8 SHOULDER	3
CURTAIN MACHINES W/PULLEY 970516-XX *(all sizes)*		
970458	PLATE ASSEMBLY, TOP F/CABLE	1
CURTAIN MACHINES W/SPROCKET 970520-XX *(all sizes)*		
970457	PLATE ASSEMBLY, TOP F/CHAIN	1
24” CURTAIN MACHINES 970516-24 & 970520-24		
970300	ROD, LIMIT SWITCH, 24” MACHINE	1
970314	SCREW, BALL F/24” MACHINING	1
970452	BOX ASSY, 24” CURTAIN MACHINE	1
36” CURTAIN MACHINES 970516-36 & 970520-36		
970266	ROD, LIMIT SWITCH, 36” MACHINE	1
970041	SCREW, BALL F/36” MACHINING	1
970453	BOX ASSY, 36” CURTAIN MACHINE	1
48” CURTAIN MACHINES 970516-48 & 970520-48		
970268	ROD, LIMIT SWITCH, 48” MACHINE	1
970042	SCREW, BALL F/48” MACHINING	1
970454	BOX ASSY, 48” CURTAIN MACHINE	1
72” CURTAIN MACHINES 970516-72 & 970520-72		
970296	ROD, LIMIT SWITCH, 72” MACHINE	1
970044	SCREW, BALL F/72” MACHINING	1
970455	BOX ASSY, 72” CURTAIN MACHINE	1

Box and Lid Assemblies

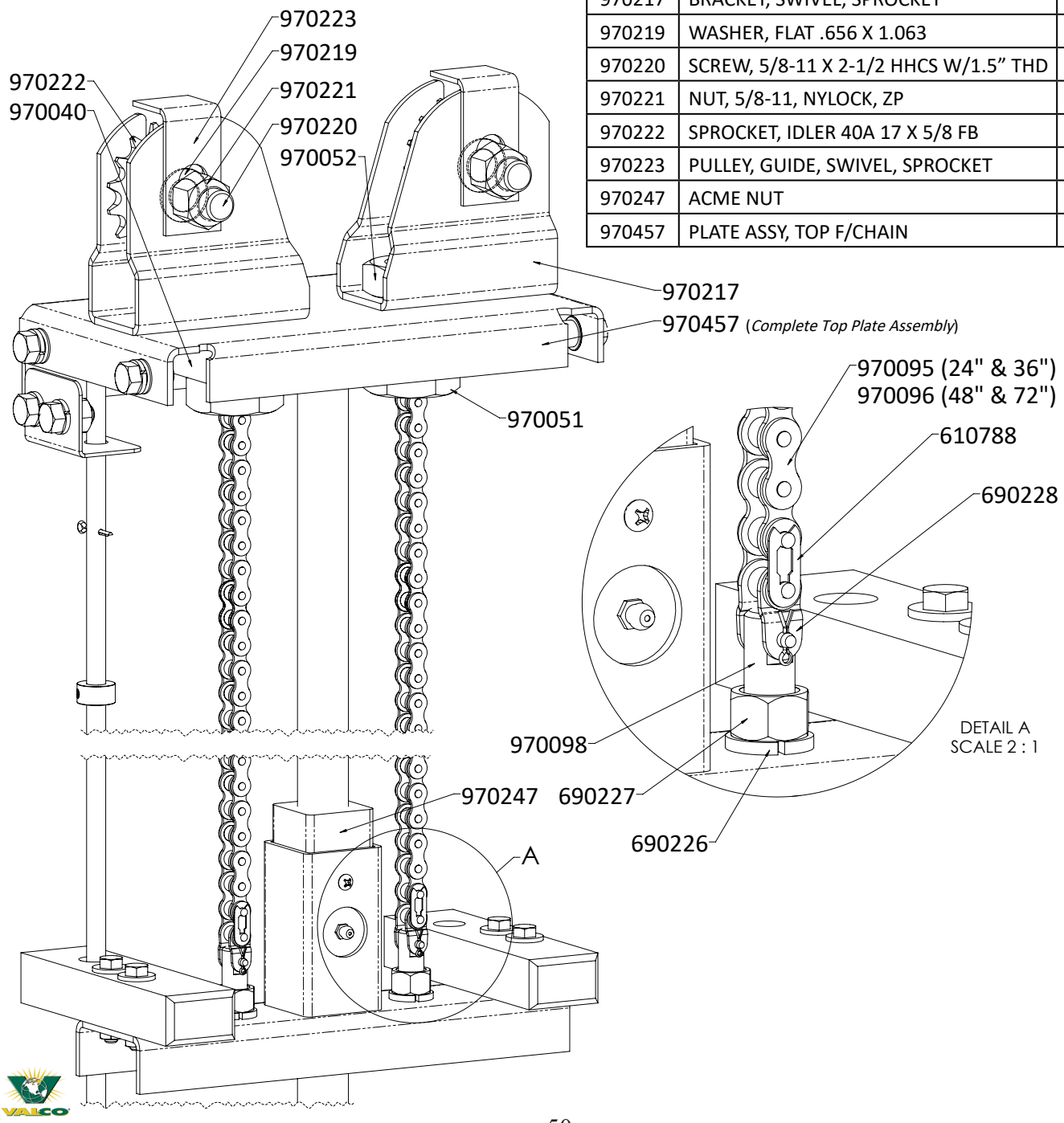
PART #	DESCRIPTION	QTY
970452 - 24” BOX ASSEMBLY		
970299	LID, ACTUATOR, 24"	1
970448	BOX, 24" CURTAIN MACHINE	1
970453 - 36” BOX ASSEMBLY		
970010	LID, ACTUATOR, 36”	1
970449	BOX, 36” CURTAIN MACHINE	1
970454 - 48” BOX ASSEMBLY		
970011	LID, ACTUATOR, 48”	1
970450	BOX, 48” CURTAIN MACHINE	1
970455 - 72” BOX ASSEMBLY		
970013	LID, ACTUATOR, 72”	1
970451	BOX, 72” CURTAIN MACHINE	1



Header Assembly with Chain and Sprocket

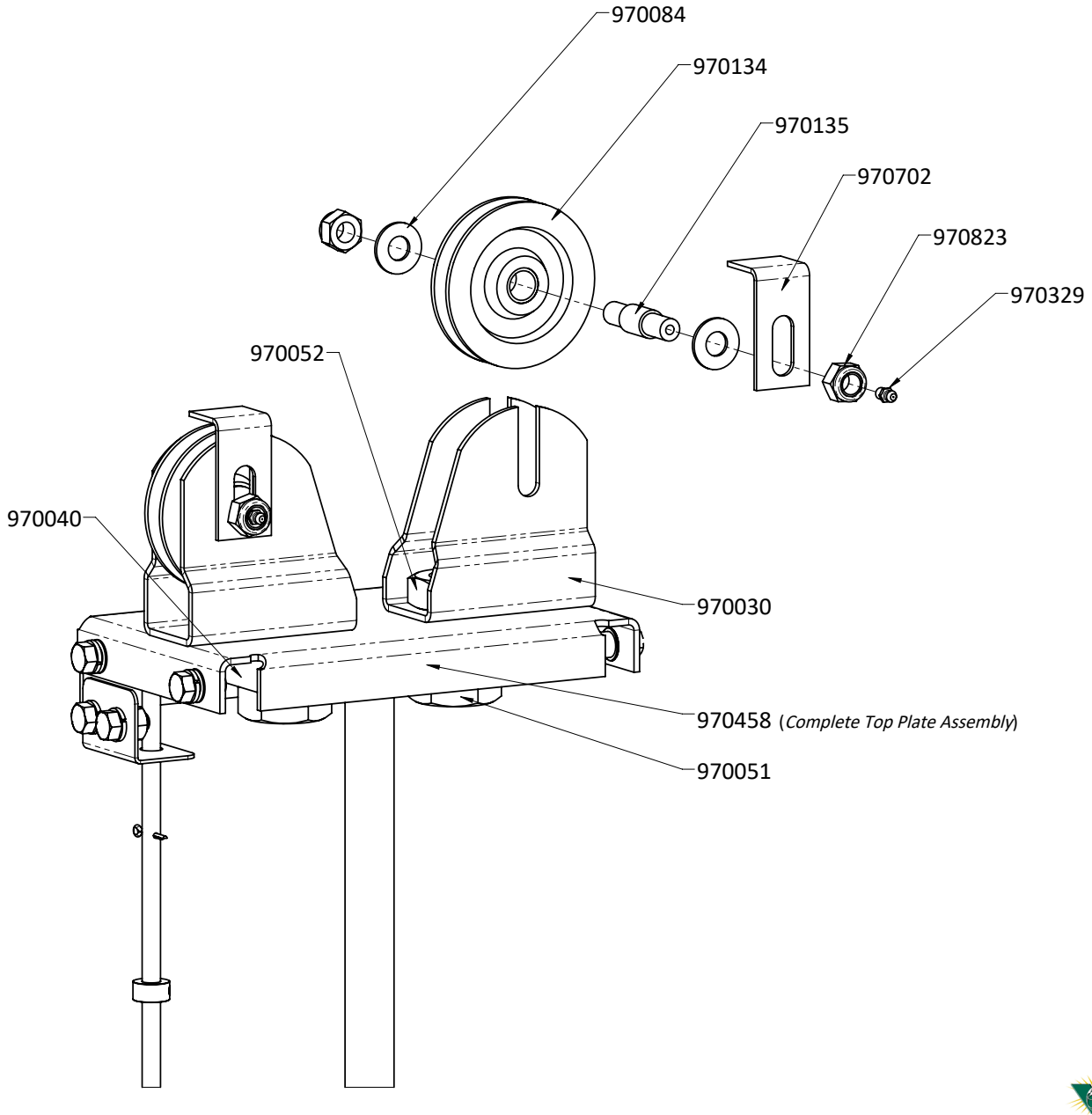
PART #	DESCRIPTION	QTY
CHAIN - ALL 24” & 36” CURTAIN MACHINES WITH SPROCKETS		
970095	CHAIN, RLR #40 X 48” W/CONN	2
CHAIN - ALL 48” & 72” CURTAIN MACHINES WITH SPROCKETS		
970096	CHAIN, RLR #40 X 84” W/CONN	2

PART #	DESCRIPTION	QTY
HARDWARE - ALL CURTAIN MACHINES WITH SPROCKETS		
610788	CONNECTOR LINK, #40 RLR CHAIN	2
690226	WASHER, LOCK 1/2 SPLIT ZP	2
690227	NUT HEX 1/2-13 ZP	2
690228	LINK, OFFSET #40 RLR CHAIN	2
970040	CABLE BUSHING	1
970051	BOLT, SWIVEL, PULLEY	2
970052	NUT, SWIVEL, PULLEY	2
970098	SCREW, DRILLED F/CHAIN CURT MACHINE	2
970217	BRACKET, SWIVEL, SPROCKET	2
970219	WASHER, FLAT .656 X 1.063	4
970220	SCREW, 5/8-11 X 2-1/2 HHCS W/1.5” THD	2
970221	NUT, 5/8-11, NYLOCK, ZP	2
970222	SPROCKET, IDLER 40A 17 X 5/8 FB	2
970223	PULLEY, GUIDE, SWIVEL, SPROCKET	2
970247	ACME NUT	1
970457	PLATE ASSY, TOP F/CHAIN	1



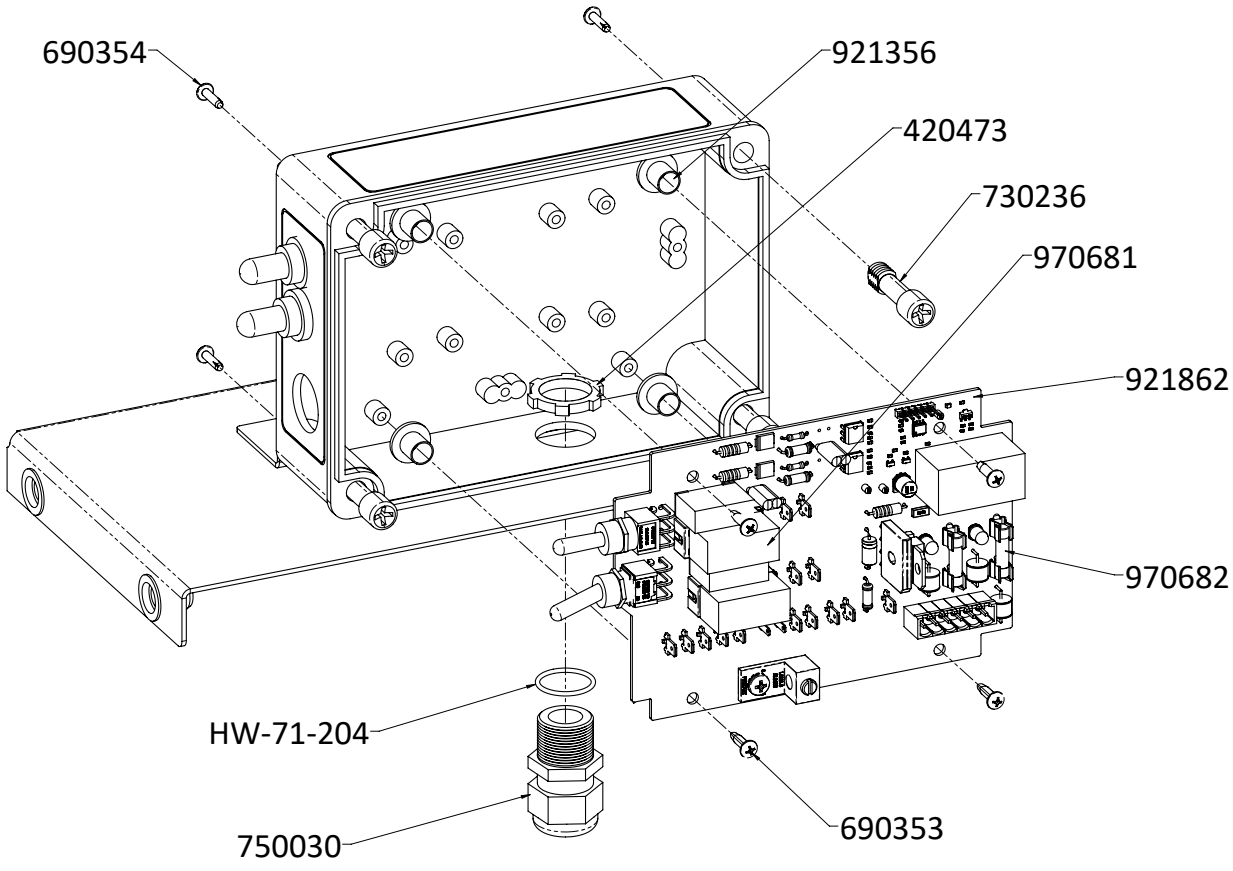
Header Assembly with Cable and Pulley

PART #	DESCRIPTION	QTY
HARDWARE - ALL CURTAIN MACHINES WITH PULLEYS		
970030	BRACKET, SWIVEL	2
970040	CABLE BUSHING	1
970051	BOLT, SWIVEL, PULLEY	2
970052	NUT, SWIVEL, PULLEY	2
970084	WASHER, .468 X 1.062	4
970134	PULLEY, F/CABLE CURTAIN MACHINE	2
970135	SHAFT, FOR PULLEY 970134	2
970329	GREASE FITTING, M6 X 1.0, BRASS	2
970702	PULLEY, GUIDE, SWIVEL	2
970823	NUT, 1/2-13 THIN NYLOCK	2
970458	PLATE ASSY, TOP F/CABLE	1



Electronic Controls for ATLAS™ Weather Resistant

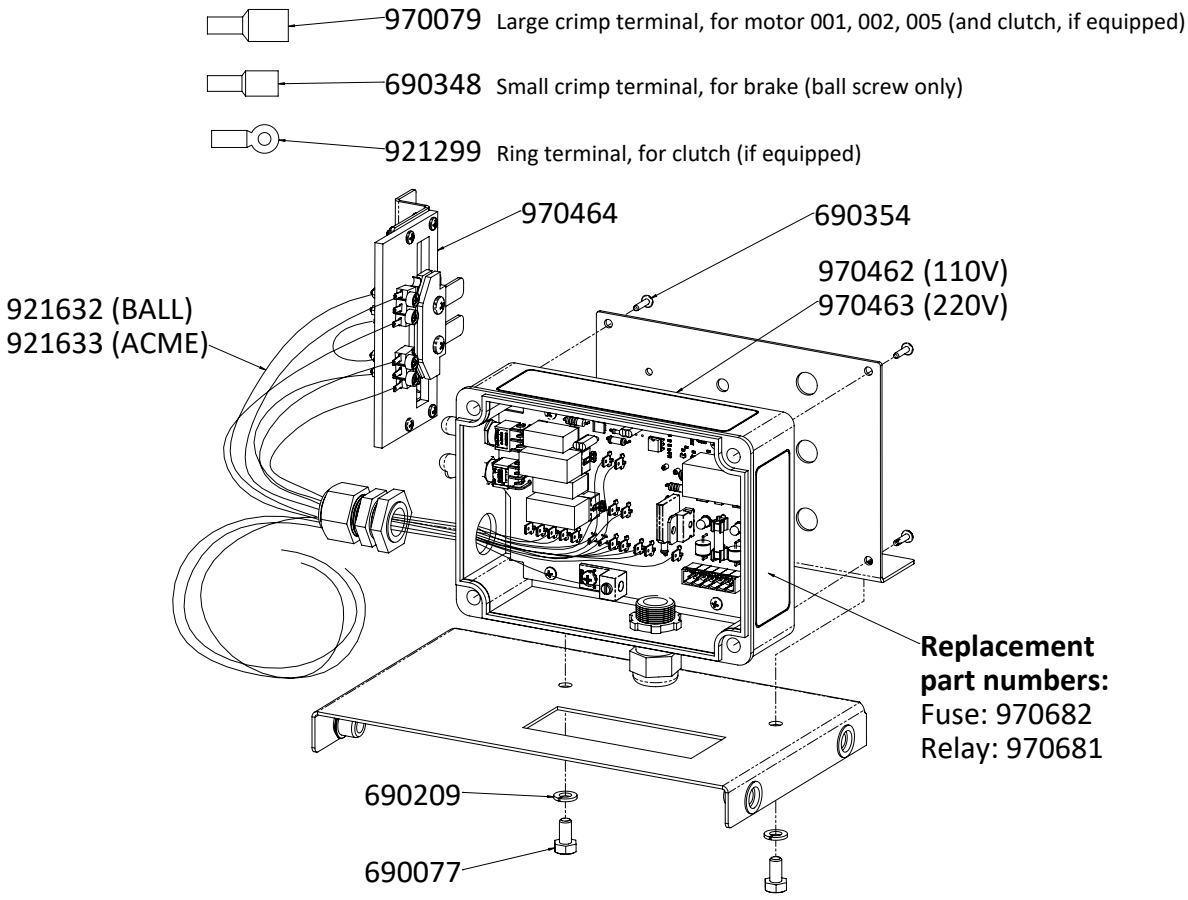
PART #	DESCRIPTION	QTY
HARDWARE - ALL CURTAIN MACHINES WITH CONTROLS		
420473	1/2” CONDUIT NUT	1
690353	SCREW, #6-19 X 1/2 PPHMS ZP	4
690354	SCREW #8-18 X 1/2” PPHMS ZP	4
730236	ENCLOSURE SCREW	4
750030	CORDGRIP, 1/2” NPT STRAIGHT	1
921356	SHOULDER SPACER 5/16X3/8 NYLON	4
921862	PCB CIRCUIT BOARD 120V/240V	1
970681	RELAY, 12VDC 20A, FORM A	2
970682	FUSE 3.15A 250VAC 5 X 20 MM	2
HW-71-204	O-RING, 11/16 ID, 13/16 OD	1



SafeTRAC™ Gen II Electronic Controls upgrade to ATLAS™

PART #	DESCRIPTION	QTY
COMMON PARTS		
690077	SCREW, 1/4-20 X 1/2 HHCS ZP	2
690209	LOCK WASHER, 1/4 ZP	2
690354	SCREW #8-18 X 1/2" PPHMS ZP	4
970464	LIMIT SWITCH ASSEMBLY	1
970545 - 220V BALL SCREW		
690348	CRIMP TERMINAL, SMALL (BRAKE)	3
921299	RING TERMINAL (CLUTCH)	2
921632	WIRE HARNESS, BALL SCREW	1
970079	CRIMP TERMINAL, LARGE (MOTOR)	5
970463	CONTROL ASSEMBLY, 220V PCB	1
970547 - 220V ACME		
921633	WIRE HARNESS, ACME SCREW	1
970079	CRIMP TERMINAL, LARGE (MOTOR)	4
970463	CONTROL ASSEMBLY, 220V PCB	1
970548 - 110V ACME		
921633	WIRE HARNESS, ACME SCREW	1
970079	CRIMP TERMINAL, LARGE (MOTOR)	4
970462	CONTROL ASSEMBLY, 110V PCB	1

NOTE:
Upgrade kits are ONLY for use with SafeTRAC Gen II Weather Resistant Models. Replacing the control box, limit switches, and wire harness is necessary to upgrade the electronic controls to an ATLAS. Refer to 990192 Quick Sheet for installation information.



Customer Service

Dealer Name: _____

Street / PO Box _____

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State / Province _____

Zip / Postal _____

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E-mail _____

Web site _____

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