Series 500 Greenhouse Kit w/Blackout System, Ventilation & Evaporative Cooling

BLACK - Operational Blackout Components

©2019 GrowSpan
All Rights Reserved. Reproduction is prohibited without permission.

WARNING: Cancer and Reproductive Toxicity - P65Warnings.ca.gov

Revision date: 04.18.19

GB30PVBLACK
30' Wide Series 500 Operational Blackout Components: Motor, Drive Shaft, Leading Edges and Blackout Panels
Color Coding

READ THIS BEFORE YOU BEGIN

Purchased greenhouse and all accessories & systems require a specific installation sequence. All components have been separated into different categories based on common grouping and/or the chronology of installation. Each category has been color coded. All parts within any given color category will be labeled accordingly, and each color category will have its own respective instruction manual.

The following illustrates a highly recommended order in which all components should be installed.

IMPORTANT: There are some procedures that can occur simultaneously, depending on available assistants and equipment, but there are some procedures that MUST be done in chronological order. Before you begin, review below step recommendation and all technical documents to better understand overall building kit design.

1. **RED** - MAIN FRAME (Rafters, Purlins, Chord Support and Cabling)
2. **ORANGE** - END WALL FRAMING (Columns, Cross Beams and Door Framing)
3. **BLUE** - END WALL CLADDING (Polycarbonate, Termination and Flashing)
4. **PINK** - RIDGE VENT (Framing, Motor and Drive Shaft)
5. **GREEN** - ROOF CLADDING (Film, Inflation Kits and Termination)
6. **YELLOW** - EVAPORATIVE COOLING (Framing, Cooling Pads and Plumbing)
7. **BROWN** - END WALL VENT (Framing, Motor and Drive Shaft)
8. **WHITE** - ACCESSORIES (Exhaust Fans, Ceiling Fans and Light Traps)
9. **PURPLE** - STATIC BLACKOUT (Monofilament, Fixation and Sealing)
10. **BLACK** - MOVABLE BLACKOUT (Fabric, Leading Edge, Motor and Drive Shaft)
11. **GRAY** - BLACKOUT SIDE POCKET (Framing and Polycarbonate)

Near the beginning of each color-coded instruction guide, you will find information to lead you through the installation and assembly steps. This information identifies at what point during the assembly the respective components are installed or attached to the main building frame.

Since we cannot anticipate changes made by the customer/contractor, all instructions assume the use of accessories purchased from us to be used on the building the accessory was designed for. Each instruction guide presents the basic steps to install the color-coded components.

When in doubt, consult the services of a qualified contractor experienced with the assembly of similar structures.
All components that are color coded BLACK represent the operational blackout components, which are components of the system that move and drive the system.

***Color coded components that MUST be installed before installing BLACK:***

- RED
- ORANGE
- PURPLE

If above color coded components have not yet been installed, put this manual down and consult those manuals to install those components before returning.

If above color coded components have been installed, gather all components that have been color coded with a BLACK label or paint splotch, and continue on the next page with the blackout installation.

**ATTENTION:** Recommended installation order is not critically definitive. Installation of film cladding will protect the interior of the greenhouse from weather elements, but it will also increase the temperature. Depending on personal preference and/or availability of assistants and equipment, there are some procedures that can occur before or simultaneously with this procedure.

**Color coded components that can be installed before or at the same time as BLACK:**

- GRAY
- WHITE
- BLUE
- YELLOW
- PINK
- BROWN
- GREEN
Important Information

READ THIS DOCUMENT BEFORE YOU BEGIN

Thank you for purchasing a Series 500 greenhouse kit with a black-out system, ventilation & evaporative cooling. When properly assembled and maintained, this product will provide years of reliable service. These instructions include helpful hints and important information needed to safely assemble and properly maintain the system. Please read these instructions before you begin.

If you have any questions during the assembly, please contact customer service for assistance.

SAFETY PRECAUTIONS

- Wear eye protection.
- Wear head protection.
- Wear gloves when handling metal parts.
- Use a portable GFCI (Ground Fault Circuit Interrupter) when working with power tools and cords.
- Do not climb on the frame during or after construction. NEVER hang items from the system components!

UNPACK AND IDENTIFY PARTS

The following steps will ensure that you have all the necessary parts before you begin to assemble the shelter frame.

1. Unpack the contents of the shipment and place where you can easily inventory the parts. Refer to the Bill of Materials/Spec Sheets.
2. Verify that all parts listed on the Bill of Materials/Spec Sheets are present. If anything is missing or you have questions, consult the Pictorial Parts Guide and all diagrams for clarification, or contact Customer Service.

NOTE: You do not need to open the plastic bags containing smaller parts such as fasteners or washers.

REQUIRED TOOLS

The following list identifies the main tools needed to assemble the vent system and attach it to your building. Additional tools and supports may be needed.

- Tape measure and marker
- Variable speed drill (cordless with extra batteries works best) and drill bit set.
- Small hammer and gloves
- Level 6’ (or longer) preferred
- String line (or chalk line)
- Wrench or socket set (standard and metric)
- 5/16” and 3/8” nut driver (included)
- Scissors or utility knife to cut material
- Ladders, work platforms, and other machinery for lifting designed to work safely at the height of the building.
- Safety equipment to protect head, eyes, hands and feet.

RECOMMENDED INSTALLATION CHRONOLOGY

The blackout system requires a specific installation sequence. The follow pages illustrate a highly recommended order in which the blackout system components should be installed. This information identifies at what point during the assembly a particular component is to be installed or attached to the main building frame.

1. Motor and Drive Shaft components (DO NOT splice drive shaft components).
2. Drive Pipe Support components.
3. Horizontal Leading Edges.
4. Drive Pipe components
5. Splice Drive Shaft
6. Attach Leading Edges to Drive Pipe components
7. Side/Reinforcement Struts
8. Blackout Panels (all prior steps MUST be completed first)
Parts Identification

The following graphics will help identify the basic parts of the frame. (Some parts are not shown.)

- FA4482B Tek Screw
- 100441 Magnetic Nut Setter
- 115858 U-Bolt & FALB02B Nuts
- 115859 Drive Pipe Bracket
- 102198A Spring Wire
- 113314 Upper Wire Guide
- 113316 Cloth Fastener Clip
- 112567 Cloth Weight
- 113315 Wire Snap Clip
- 113318 Leading Edge
- 115818 Drive Rack
- 112571 Rack Drive Coupler
- 115859 Drive Pipe Bracket
- 115359 Motor Support Bracket
- 111676 Drive Motor

**ELECTRICAL WARNING**

Greenhouse frames are metal and will conduct electricity! Exercise caution if working around or on the frames with electric power tools. Use cordless, battery-powered tools.

CONSULT THE SERVICES OF A QUALIFIED ELECTRICAL TECHNICIAN WHEN INSTALLING ELECTRICALLY POWERED ACCESSORIES NEAR OR FOR THIS SYSTEM.
ASSEMBLE MOTOR SUPPORT

1. Locate the 115359 motor support bracket and the 113299 motor mounting plate.

2. Using 1/2"x3" bolts (112722), 1/2" flat-washers (106953) and 1/2" nuts (106977), attach the motor support bracket to the motor mounting plate as shown below.

3. Verify nuts & bolts are fully tightened, and continue with the motor support assembly installation on the following page.
INSTALL MOTOR SUPPORT ASSEMBLY

1. Establish the "power rafter", which will be the rafter under which all drive shaft components will be attached.

**ATTENTION:** If greenhouse is 48', 72', 96' or 120' in length, there will be a center chord rafter, which will also serve as the "power rafter". If greenhouse is 36', 60' or 84' in length, there will be two centermost chord rafters, either of which can serve as the "power rafter". See examples below.

2. Determine motor support location. It is recommended to install the motor as close to the center of the rafter as possible. Avoid obstructions, such as webbing clamps and monofilament wire paths.

3. Using 3/8" x 3" bolts (FAG363B), 3/8" lock washers (FAME38B), 3/8" flat washers (FAME08B), and 3/8" nuts (FALB04B), attach the motor support assembly to the underside of the determined "power rafter".

**IMPORTANT:** Orient the motor support plate so that it points towards the end header where the 113694 wire brackets have been installed. Pre-drill attachment holes through the support chord.
ATTACH CHAIN COUPLINGS TO MOTOR

1. Set one 111676 motor on a flat surface and align 111675 coupling and motor sprockets with chain.

2. Wrap chain around the two separate sprockets.

3. Take connecting chain link and slide it through first chain until ends are flush with link of first chain section.

4. Locate the two (2) inner link spacers.

5. Using a needle-nosed pliers, add the two (2) inner link spacers to chain.

   **NOTE:** After adding one spacer, push connecting link through the chain a little to hold spacer in place. Then add the second spacer. Push connecting link through second spacer until ends of connecting link are visible. See arrow above.

6. Flip the link ends down and over the sprocket and push connecting link through the outer chain links until connecting link is tight to inside chain.
ATTACH CHAIN COUPLINGS TO MOTOR (continued)

7. Take outer spacer and place it over the ends of connecting link.

8. Check connecting link to ensure it is tight against chain.

9. Place locking clip over the ends of connecting link.

10. Using a pair of needle-nosed pliers, snap locking clip onto connecting link.

11. Verify that all spacers are in place and that locking clip is secure.

12. Repeat these steps to attach the remaining coupling to motor.
ATTENTION: Assistance required! Motor is heavy. Using a lift as a means of hoisting motor into position is highly recommended.

MOUNT MOTOR
Remove attachment bolts from motor, if necessary. Hoist and stabilize motor into motor mounting plate as shown. Attach using included bolts.

HELPFUL HINT: Do not fully tighten motor mounting bolts. It may be necessary to adjust the motor slightly when installing the drive shaft.

***CONTACT A LICENSED ELECTRICIAN FOR ALL MOTOR WIRING DETAILS***
INSTALL DRIVE RACKS

1. Reference technical documents for 115818 drive rack location dimensions. Measure and mark the locations for the drive racks as shown.

   ATTENTION: Temporarily install the 112591D2 double u-joints to each set of two corner drives to determine attach points. See details below.

2. Using the drive rack holes as a template, mark and field drill 3/8" attachment holes.

3. Using 5/16" x 3" bolts (FAG338B), 5/16" flat washers (FAME07B) and 5/16" lock nuts (FALF37B), attach the drive racks to the underside of the "power rafter" as shown below in diagram. **DO NOT TIGHTEN AT THIS TIME.**

   IMPORTANT: Orient drive racks so they point TOWARDS the end header with Tek screws and neo-bonded washers attached.

---

**Diagram Notes:**

- **Power Rafter Chord**: 2"x2"
- **Double U-Joint**: 112591D2
- **Attachment Holes**: Pre-drilled in center of rafter chord.
- **5/16" x 3" Bolt**: FAG338B
- **5/16" Flat Washer**: FAME07B
- **5/16" Lock Nut**: FALF37B

---

Revision date: 04.18.19
ASSEMBLE DRIVE SHAFT

1. Slide 112571 drive couplers fully onto the tabs of the previously installed 115818 drive racks. Reference technical documents for drive shaft connection details. Couplers are not required in corners, or on the open ends on the vertical planes. See diagram below.

2. For each span between the drive racks, measure the distance from the insides of the drive couplers. See diagram.

3. Once this distance is determined, locate a section of 1.315" pipe (131S147), and cut to this measurement. Verify that the PLAIN end of the tube is used, and NOT the swaged end. Repeat for each coupler-to-coupler section.

4. Once all drive shaft sections have been measured and cut, REMOVE the rack drives from the power rafter.

5. Loosely set the drive shaft pieces into the corresponding rack drives (temporarily secure with Tek screws if necessary), and then lift and slide the loosely assembled drive shaft components back into the motor couplers from either side. ASSISTANCE WILL BE REQUIRED!

6. Reattach the rack drives to the power rafter, and tighten the lock nuts. Do not secure drive shaft to the couplers at this time.

**ATTENTION:** If necessary to splice the drive shaft at a swaged/plain connection point, do so using two (2) 5/16"x2" bolts (FAG334B), four (4) 5/16" flat washers (FAME07B) and two (2) 5/16" lock nuts (FALF37B).
**ASSEMBLE DRIVE PIPE SUPPORT COMPONENTS**

1. **Reference technical documents for drive roller location and connection details.** Using FA4482B Tek screws, attach the 115864 rotatable drive pipe rollers to ALL mid-rafter headers except for the power rafter in the locations indicated by technical documents sent with the system, and in diagrams below. **It is important that drive pipe roller locations on the mid rafters mirror the rack-drive locations on the power rafter.** If needed, snap chalk lines to ensure straight line locations.

2. Rotate the adjustable drive pipe rollers as needed on the angled and vertical planes of the mid rafter header. See diagrams below.

**IMPORTANT:** Circled drive rack locations act as anchors for the double joints only. Do NOT install drive rollers or any other drive components in these locations.

**NOTE:** Do not fully tighten the bolts to allow for adjustment when drive pipes are installed.

**NOTE:** Do not overtighten roller wheel bolt. Wheel needs to spin freely.
LEADING EDGES

Leading edge extrusions are installed at the "leading edges" of the black-out panels (installed later). Orient the leading edges so that the rubber sealing gasket will be FACING the keder sealing strip in each bay, as shown in diagram below.

IMPORTANT: Due to the 20' lengths of the 113318 leading edges, it will be necessary to angle and manuever the extrusions in through the already installed monofilament wires. Exercise care and caution.

ATTENTION: Reference diagrams below and on following page for further installation details.

1. Measure, cut to fit and mitre sections of 113318 leading edge as needed to create one full profile as indicated by the dashed line below. One profile should consist of three 113318 pieces: one piece cut in half for the vertical sides, and two pieces cut to equal length sections for the horizontal plane. File sharp edges of cut extrusion as needed.

2. At one bay, feed the two horizontal sections through the monofilament wires (between TOP and BOTTOM wires). Sections should rest on bottom monofilament wires. Verify that the orientation of the left and right sections reflects diagrams above, so that the rubber sealing gasket will be FACING the keder sealing strip.

3. Splice the two horizontal sections using 113311 splice brackets and reinforce with 107777 plates. Ensure that Tek screws do not protrude up through the 113318 extrusions. See diagrams below.

4. Feed the pre-cut, mitred vertical sections of leading edge through the monofilament wires and splice the mitred corners using 113311B50 brackets.
LEADING EDGES (continued)

5. Slide sections of 115226 rubber gasket into the gasket channel on the leading edges. If gasket should not transition smoothly from leading edge section to leading section at corner splices, gasket can be pushed into the channel with the assistance of a flathead screwdriver or similar tool. **It is highly recommended to install one continuous piece of rubber gasket per operational bay for optimal light sealing.**

6. Use 115198 blackout-tape to cover the bottom edge of the leading edge to prevent scratching and material damage. If necessary, apply 115198 blackout-tape and/or DE4009 sealing caulk at splices and in the corners to seal any gaps to prevent light leakage. See photos below.

7. Repeat all steps for each bay.

8. Fully assembled leading edge profiles should now be resting loosely on the bottom monofilament wires in each bay. Continue by attaching to monofilament wires on the following page.
SECURE LEADNG EDGES TO MONOFILAMENT WIRES

IMPORTANT: Before attaching leading edges to monofilament wires, verify that the leading edge profile is centered and that the bottom edge of the leading edge profile is flush with the bottom edge of the header profile along both the horizontal and vertical sections.

1. On the underside of the leading edges, snap one 113315 monofilament wire twist snap-clip at each intersecting bottom monofilament wire location, which is approximately every 18". Monofilament clip is guided over the monofilament wire, and then twist-snaps into the leading edge channel. See photos.

2. On the topside of the leading edge, lock in one 113314 monofilament wire guide at each intersecting top monofilament wire location, which is approximately every 36". Monofilament wire guide is positioned OVER the monofilament wire, and then hook-locks into the leading edge channel.

ATTENTION: If possible, on the vertical sections, attach the 113314 wire guides in such a way that they act as weight deterrents from the corner cables. This will help to prolong the fabric by reducing the friction of the material against the corner cable.
**ASSEMBLE AND INSTALL DRIVE PIPE COMPONENTS**

1. Attach a 112583 drive rack coupler to each end of the 112586 rack arms using 113307 bolts & 115157 lock-nuts.

   **NOTE:** Square ends of the couplers will sit inside the rack arms as shown below.

2. At one end of each rack arm, add a section of drive pipe (131S147). Splice the ends of the drive pipe onto the rounded, open ends of the 112583 couplers using 1/4”x2” bolts (FAG108B) and 1/4” lock nuts (FALF15B).

**IMPORTANT:** Circed drive racks act as anchors for the double joints only. Do NOT install rack arms or any other drive components in these locations.

3. With assistance, or a lift, hoist the rack/pipe assembly into one drive rack, with the teeth of the rack arm facing DOWN to marry up with the drive rack gears. Push the rack/pipe assembly through the drive rack until the swaged end of the pipe section is able to be guided through the drive roller on the next rafter (see #1 & #2 in diagram above). Position so that the weight of the rack/pipe assembly is fully supported by the drive rack and the drive roller. Repeat for each drive rack location.
ASSEMBLE AND INSTALL DRIVE PIPE COMPONENTS (continued)

4. Each loosely suspended rack arm/drive pipe assembly will have the rounded ends of the 112583 couplers open at the rack arm end. With assistance, or a lift, guide the plain end of another cut section of 131S147 drive pipe through the drive roller of the next rafter. Splice onto the coupler using 1/4"x2" bolts (FAG108B) and 1/4" lock nuts (FALF15B). See diagram below.

5. Continue adding 131S147 drive pipes until run spans all but one end bay. See "Very Important" note below. Insert swaged ends into plain ends and secure with FA4482B Tek screws. **Install screw on top of drive pipes to prevent contact with drive rollers.**

6. Measure and cut the final plain section of 131S147 to fit between the two swaged drive pipe sections. **VERY IMPORTANT:** When fully assembled, a drive pipe section will span all but ONE end bay. Whether in the closed or open position, the drive pipe MUST extend into the open end bay 2". Verify the measurements of the two cut-to-fit plain drive pipe sections by moving the entire drive pipe in the open and closed positions to test locations.

7. Repeat for each of the drive pipe locations.

---

**Swaged end towards end wall**

**Cut-away side view**

Swaged end towards end wall

Guide through drive roller and splice to rack/drive coupler.

**131S147 Drive Pipe**

**FA4482B Tek Screw**

---

131S147

Slide the plain ends of each drive pipe into the swaged ends of the installed drive pipe as shown. If necessary, temporarily tape splices until ready to secure with FA4482B Tek screws.

Once all drive pipes sections are set and measured correctly, return to each drive pipe splice, untape (if applicable) and install two FA4482B Tek screws through the TOP of the pipes.
SPLICE DRIVE SHAFT

1. Position all six drive pipe runs in the CLOSED position. In this position, the open bay—or the bay without the drive pipes—will be the bay at the end wall to which the 113650 wire tensioners are attached. Verify that 2” of drive pipe extends into the open bay. See diagrams below.

2. Once in place, the six rack arms should be sitting in the rack drives in the same position across the power rafter. If not, adjust as needed so that all six rack arms are identically sitting in the six rack drives. Temporarily secure drive pipes in place.

3. Return to the drive shaft and motor couplers. Field drill through-holes and splice all coupler connections using 5/16"x2" bolts (FAG334B), 5/16" flat washers (FAME07B), and 5/16" lock nuts (FALF37B).

**IMPORTANT:** When splicing drive shaft components, verify that the drive pipe components DO NOT MOVE OR SHIFT from the position they have just been set.

---

**Some framing and drive components removed for clarity**
**Black-out System Installation**

**ATTACH LEADING EDGES TO DRIVE PIPES**

1. Leading edges are secured to the drive pipes with 115859 drive pipe brackets & 115858 u-bolts. Loosely install one bracket & u-bolt combo onto each of the drive pipes in each bay.

2. Push the leading edges tight against the sealing edge of the foam tape attached to rafter headers.

3. Using 115167 T-bolts and 115157 lock-nuts, secure the leading edges to the 115859 brackets for all leading edges in all bays.

   Heads of the T-bolts fit up into leading edge channel, and will grip when twisted into place when nut is tightened. Tighten all u-bolt nuts and t-bolt lock-nuts so drive pipe will not slip through during operation.

**IMPORTANT:** Verify that the rubber gasket of the leading edges remains tightly pressed against the fixed edges as the leading edges are attached to the drive pipe. This ensures an efficient light-seal when the system is operational. See diagrams below.
END BAY DRIVE SUPPORT

The weight of the drive pipes and attached leading edges is not supported in the end bays. Slipper rollers are attached to both the leading edges and the previously installed blackout purlins IN THE END BAYS ONLY to support the weight of the systems drive components.

1. Slide one (1) 116260 support pipe roller onto each section of support piping.
2. Attach leading edge to the 111620 rollers using 115167 t-bolts and 115157 lock-nuts as shown below.
BLACK-OUT PANEL INSTALLATION

1. Verify that the leading edges are still in the "closed" position, with the rubber gasket against the keder sealing edges of the header profiles.

2. Prepare a blackout panel roll (QSH115338Z47) to be pulled into place. See diagram below. Note that the material consists of three individual layers--two black and one silver--that are independent from one another. Take care to keep all three panels together as one entity.

**IMPORTANT:** When preparing to pull into place, verify that the BLACK side of the material will be TO THE INSIDE of the greenhouse when installed, and that the silver side will face towards the outside.

3. With assistance, and/or a lift machine, guide the 13’ side edge of the blackout panel up BETWEEN the top and bottom monofilament wires. Panel will go up one side wall, over top corner cable, across the horizontal header, over top the other corner cable, and down the other side wall.

4. Verify that the panel is centered, draping evenly on either side.

**IMPORTANT:** Black-out panel must be installed BETWEEN the top and bottom monofilament wires

**ATTENTION:** Black side of material is to be facing inward, and the silver side is to be facing outward.

**HELPFUL HINT:** Insert section of round tubing through the core of the roll-up panel, and secure the ends of the tube to allow panel to roll off the core and feed up into position.

*some components removed from diagram for clarity*
BLACK-OUT PANEL INSTALLATION (continued)

5. With the leading edges still in the "closed" position, overlap the edge of the panel 2"-3" past the cloth-clip flange of the leading edges.

6. Starting in the CENTER of the leading edge and moving outward, use 113316 cloth fastener clips to secure the panel to the leading edges. Space clips every 4".

**IMPORTANT:** Maintain the 2"-3" of panel that overlaps the leading edge along the entire leading edge profile to keep panel oriented correctly.

7. At the opposite end of the panel--or the edge next to the previously installed spring channel--starting in the CENTER of the header and moving outward, use 102198A spring wire to secure panel to the spring channel.

**VERY IMPORTANT:** DO NOT pull tight. Panels should NEVER be taut. Allow for some slack.

8. Once panel has been fixed along the horizontal header, use a putty knife or similar tool to slip the excess material under the panel tabs of the installed 113323 tube clips. See diagrams below.

9. Along the bottom edge of the panel at each side wall, attach 112567 cloth weights. Fastener pin for the weights are attached through black-out panel. Attach one cloth weight every 3'.

**NOTE:** Weighted edge of panel will ride INSIDE/BEHIND the side pocket. Pull panel out from behind the pocket to install the cloth weights and then position panel back behind the pocket.

10. Repeat all steps from this and the previous page for each bay.

11. Continue by testing system operate. See following page for details.

HELPFUL HINT: Use vice-grips to snap cloth weight pins together.
ATTENTION: To access upper suspension cables, panels need to be open to a point where a ladder or lift will allow for reach in 24" intervals.

1. Identify where hook will be installed. Pinch and pull up all three layers of blackout material. Using one hand, hold the top two layers together in "pinched up" position, and use the other hand to pull down the bottom layer.

2. Using a 112568 "suspension hook", puncture through ONLY the upper two layers of the black-out material, leaving the third, innermost layer unpunctured. Orient hook so that the sharp points stick up and away from the fabric.

3. Suspend the fabric by looping the hook over the previously installed upper suspension cable, and snapping the hook together. Repeat for each hook. Space the clips every 24" across the entire length of the building.
### OPERATION TESTING

1. With all blackout system components fully installed, it will be imperative to test the operation to verify functionality. If not already done so, **CONTACT A LICENSED ELECTRICIAN FOR ALL MOTOR WIRING DETAILS.** If electrical wiring is not completed, motor can be manually operated with a drill and a 115439 inserted in the center of the motor fan, though this will make operational test very slow-going.

2. Operate the motor to open and close the leading edges one or two times to test the operation. If all leading edges are not tightly sealed against the header in the "closed" position after opening and closing, return to all attachments and adjust and test again as needed before continuing.

**IMPORTANT:** Panels will not FULLY open. Due to the bunching properties of the blackout material, leading edges will need to stop closing between 5" and 8" away from the rafter header profile.

3. When satisfied with position of leading edges after opening and closing, set the limits of the motor. Consult the paperwork included with the motor for limit-setting procedures.

Verify that limits are set so that the rubber gasket of ALL leading edges is sealed tightly against the rafter headers uniformly across the entire header profile when in the "CLOSED" position. Also verify that the leading edges are limited to stop between 5" and 8" away from the chords when in the "OPEN" position.

Regular inspections of your blackout system helps to ensure dependable, safe, and efficient operation. Complete the following inspections at least once every 30 days. *If weather and environmental conditions are extreme in your area, inspect the system more frequently.*

**ATTENTION:** Disconnect main power before inspecting the drive motor, related drive components, and vent frame.

#### Drive Motor and Related Components

- Check system travel. Reset limiting switch settings to properly regulate system operation.
- Check mounting bracket and bolts for drive motor. Verify that all are tight.
- Lubricate rack arms and rack drive gear using a general multi-purpose grease.
- Inspect drive chain and sprocket. Clean and lubricate as needed.
- Visually inspect all electrical connections. If electrical issues exist, disconnect main power and contact an electrician to inspect and repair if necessary.

### MOTOR-DRIVEN SYSTEMS

If you are assembling a motor-driven system that includes an electric motor and related drive components, continue with the information below. Consult all drawings for your system before assembling drive components and attaching related hardware.

#### GENERAL SEQUENCE OF SYSTEM COMPONENTS

1. Attach chain bolt coupling(s) to motor as shown in this guide.
2. Mount motor to supports, rafters, or rafter chords. Consult diagrams. Adjust accordingly for ridge vent, end wall vent, and blackout system installations.

For all vents, create two drive tubes of similar length and center motor between separate tubes. **Do not mount drive motor at end of vent drive train.**

3. Determine locations of 111681 vent window connectors (ridge and end vent only) and attach these to bottom rail of assembled vent frame. Consult diagrams.
4. Determine the locations of the 1.315" drive tube and 111674 vent bearing plates.
5. Attach vent bearing plates to the underside of the rafters (ridge vent), or to support posts driven into site (end wall vent).
6. Take assembled drive tubes, slide 111679 vent rack drives onto tubes as you slide each tube through vent bearing plates. Slide plain end of each drive tube into chain bolt coupling attached to motor.

**ATTENTION:** Each rack (111673) will attach to a vent window connector and requires a vent rack drive.

7. Slide each rack through vent rack drive and attach rack to vent window connector.
Space below is reserved for customer notes.