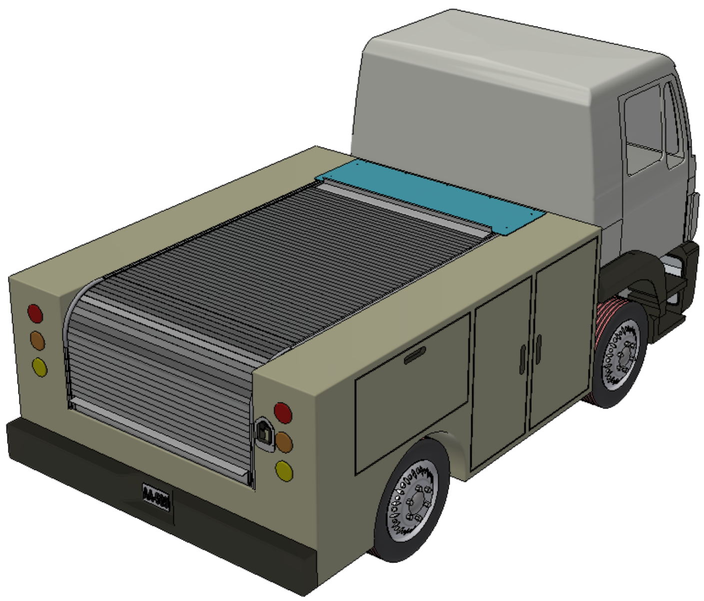
Gortite®
Motorized Bed Cover

Patent Pending



Product Guide

VPB0031

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Contact

Global Headquarters
2300 South Calhoun Road
New Berlin, WI 53151

Phone: +1 262 786 1500
Fax: +1 262 786 3280
Email: sales@dynatect.com

https://dynatect.com

CONTENTS

1. INTRODUCTION

a) Welcome!

Thank you for choosing Dynatect as your solution partner. This guide contains essential information on your new Gortite Motorized Bed Cover. Please take the time to thoroughly read and understand this guide prior to installation, operation, or maintenance of the equipment. Please consider filing this guide so that it can be referenced again for future adjustment or maintenance purposes.

Since Dynatect is continually improving its products and services, this guide may include updates from a previous version. If you need additional copies of any instructions or if you have questions, recommendations, or feedback regarding the safe and proper installation/operation of your Gortite Motorized Bed Cover, please contact a sales representative or Dynatect directly at 262-786-1500. We appreciate your business and the confidence you have placed in us. Please contact us if we can be of further assistance.

b) Inspect Your Shipment

Please thoroughly inspect the shipment and compare it to the bill of lading. Account for all items in the container or package and inspect the container and each item for damage and/or concealed damage. Notify the carrier immediately if there are any shortages, damages, or concealed damage; add any necessary notations to your bill of lading; and request that the carrier return and conduct an inspection.

File your claim with the carrier promptly and support it with photographs and all available documentation. Ensure all missing or damaged parts are replaced and that any mechanical problems are corrected prior to installing the unit. Dynatect is not responsible for collection of claims or replacement of lost or damaged materials due to carrier negligence.

c) Before beginning installation, please:

- Carefully read the complete installation manual.
- Make sure the bed cover mounting surfaces are square and free of weld crowns or other obstructions.
- When unpacking, be careful not to scratch the shade and/or other components.

d) Safety/Guarantee:

The guidelines and procedures in this book are published in good faith and have been checked for accuracy, however, no warranties, either expressed or implied, are made; nor are successful results guaranteed. The author and editors do not take any responsibility for human error, typographical mistakes, or variations in individual work. Nor shall they be liable for special, consequential, or exemplary damages resulting, in whole or part, from the reader’s utilization of, or reliance upon, this material. The reader is expressly warned to consider and adopt all safety precautions and activities presented herein to avoid potential hazards and liabilities. By following the instructions and guidelines contained herein, the reader willingly assumes all risks in connection with these instructions and guidelines.

2. TOOLS & EQUIPMENT

- Tape Measure
- Marking Pen
- Fasteners
- Drill
- Drill Bits
- Caulk
- Pliers
- Screwdriver
- Metric Allen Wrench Set
- Permabond® 910
- 1-5/8” Hole saw

MOUNTING HARDWARE:

- The installer may use any appropriate mounting hardware and any thread-locking technology to ensure the hardware (NOT INCLUDED) does not back out due to vibration (self-tapping, split washers, adhesives, etc.)
- For the canister and shade, M5 or #10 button head mounting hardware is recommended to minimize shade travel interference in the siderails
- The optional locked paddle handle for power loss includes modifying the service body to mount the paddle handle and may require specialized tools to cutout the body. The paddle handle option includes an extension cable and ratcheting cable adjusters. The cable should be routed through hole grommets and be secured with mounting hardware supplied by the installer.

CAULK: Some installers choose LORD 7610DTM White Direct to Metal Adhesive/Sealant as a caulk due to its ability to stay flexible after drying and its ability to adhere well to the metal and plastic parts.

ELECTRICAL: The controller comes with pre-attached automotive connectors. Dynatect also supplies mating connectors for use by the installer. Those mating connectors include ferrules which are crimped using industry standard universal tools:

- NEW-AS1 (Figure 2a)
  -or-
- a collection of more specialized tools like the IWD-12 and IWD-1620 (Figures 2b & 2c):

Figure # 2a

Figure # 2b

Figure # 2c

3. REFERENCE DRAWINGS

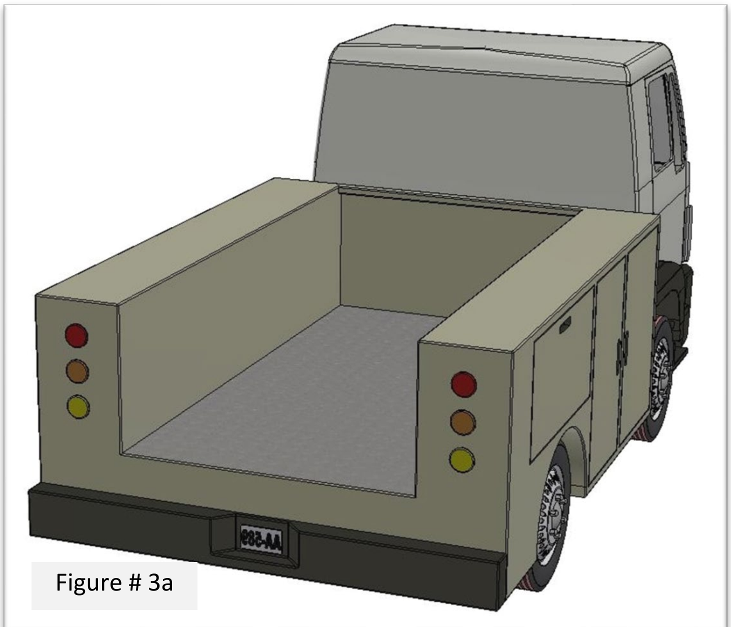


Figure # 3a

Example
Service Body with a rectangular opening ready for a motorized bed cover assembly (Figure 3a)

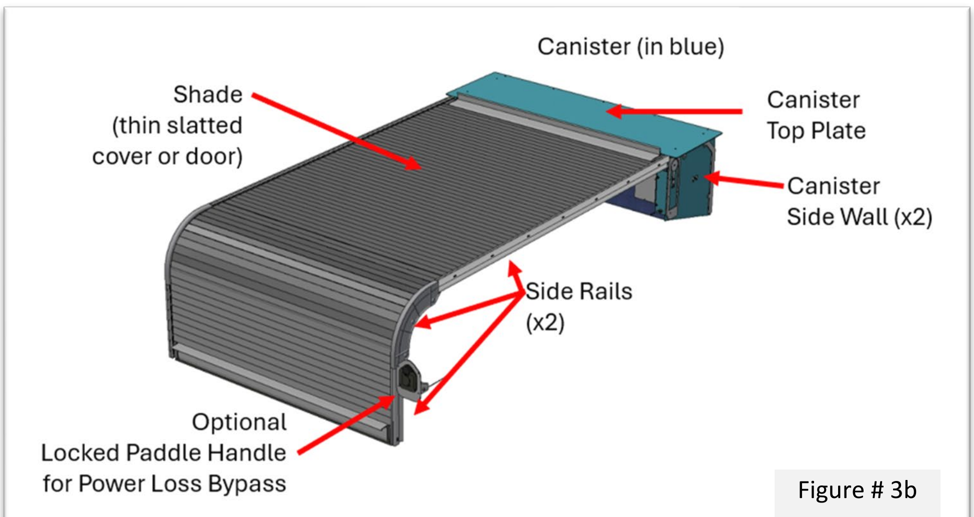


Figure # 3b

a) The “bed cover” is a system of canister, rails, and shade (slatted cover or door) – see Figure 3b
b) The canister will arrive with the bed cover installed and already pre-wound (pre-tensioned) on the spring roller
c) Water Mitigating:
   a. The canister ships from the factory with seams that are pre-sealed inside (caulked)
   b. Integrated canister and side rail gutters channel water out of the protected cargo area under the door. Together, these elements catch and channel water, ideal for work truck bed and machine tool applications in outdoor environments.
   c. Additional rib seal between door slats for added water resistance

4. BORE DRAINHOLES THROUGH BULKHEAD

a) The canister includes two ports to drain any accumulated water from the canister (green arrows, Figures 4a and 4b)

b) Prior to installing the canister into the bed, two drain holes will need to be cut in the bulkhead of the vehicle bed/front wall of box.

   a. The holes will be located symmetrically apart from each other on each side of the bed. Measure and mark holes positions 15.85" down from top edge of bed, and 1.81" in from inner wall as shown in Figures 4b, 4c & 4d.

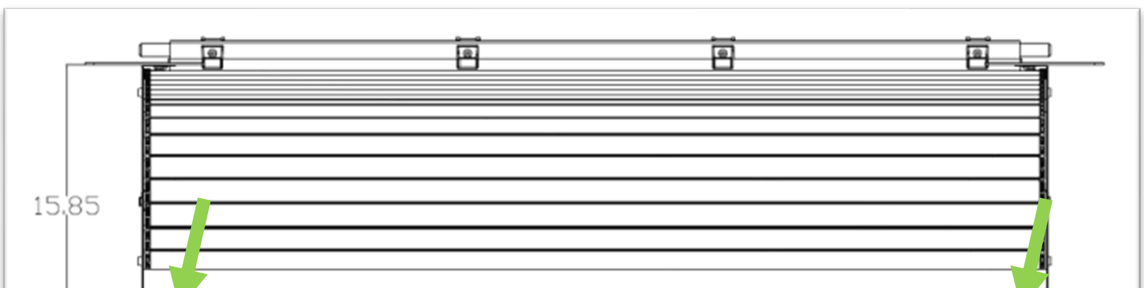


Figure # 4b

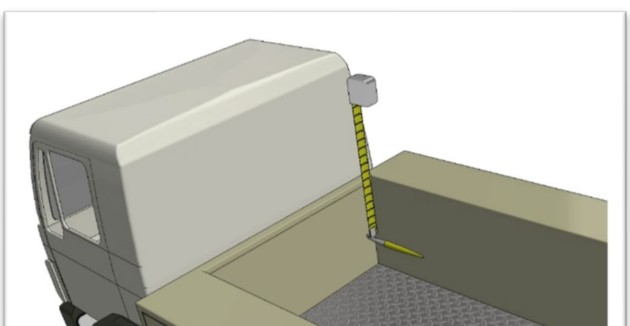


Figure # 4c

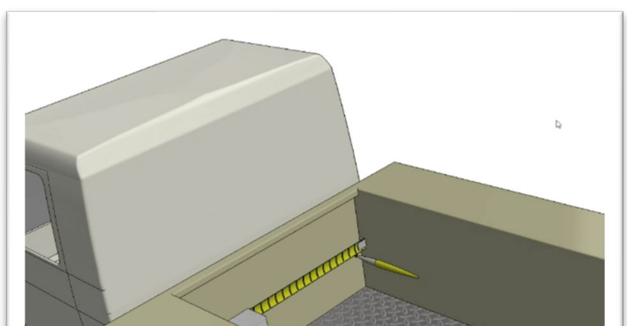


Figure # 4d

c) Drill holes slightly over 1.5” in diameter (like a 1-5/8” Hole saw). The resulting hole should accept the 1.5” diameter drainpipes on the rear of the canister (Figures 4e & 4f).

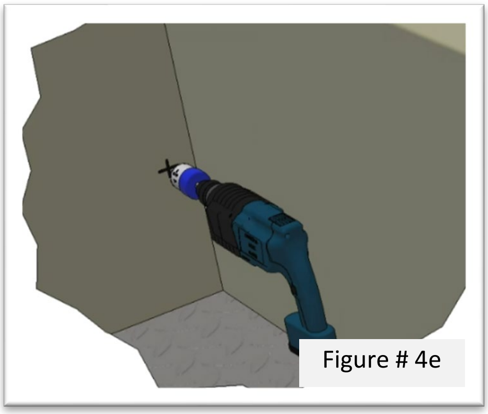


Figure # 4e


Figure # 4f

5. LAYOUT CANISTER MOUNTING HOLES

a) Side Plate Mounting Holes:
   a. Figure 5a shows the four mounting holes on each surface or the canister side walls
   b. For illustration purposes, this is shown WITHOUT the shade installed
   c. The canister ships with the shade installed and the shade open (shade fully rolled up in the canister). In this configuration, only the mounting holes circled in green are visible/accessible. Mount these visible holes in SECTION 6. POSITION CANISTER INTO BED (step 6.C.a.)

Figure # 5a

b) Dynatect recommends pre-drilling the side plate pilot holes for self-tapping screws for all bed cover components. Two methods for pre-drilling:
   a. Method 1, Recommended: Dynatect provides a drilling template for the left and right mounting plates of the canister. Used these templates to pre-drill the mounting holes (Figure 5b)

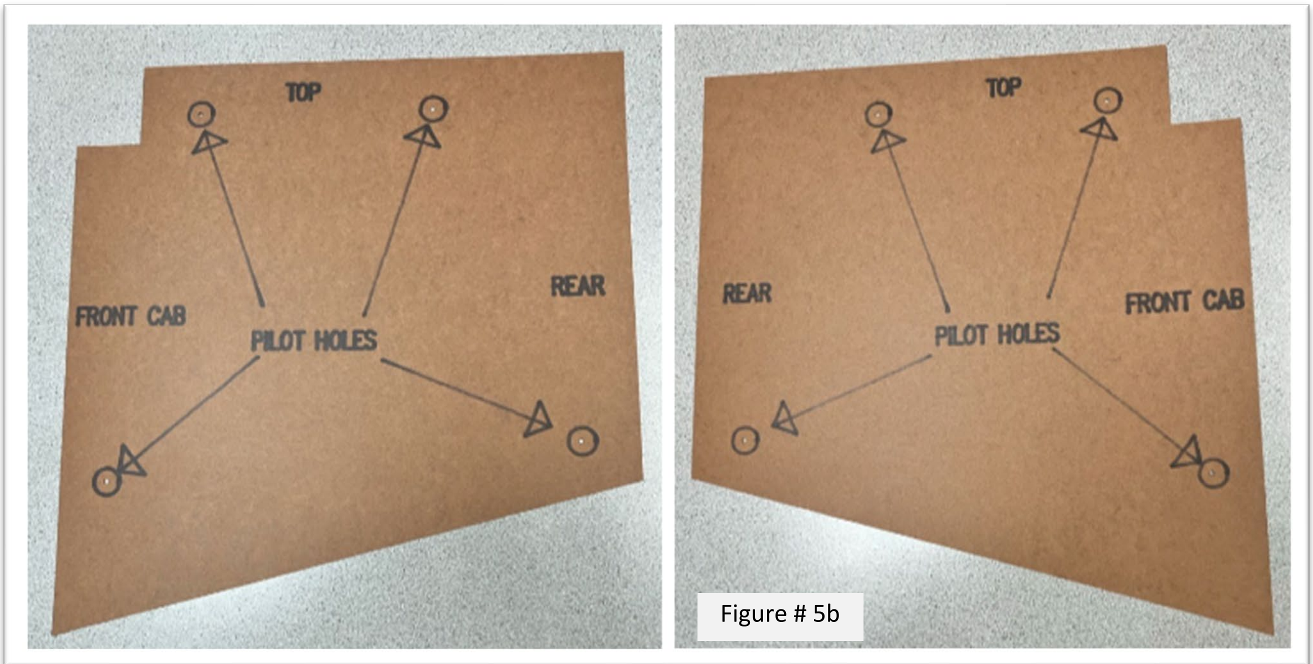


Figure # 5b

   b. Method 2, Alternate: Pre-drilling the holes requires temporarily mounting the bed cover components in their respective locations, drilling holes, removing the component and then reinstalling when required.

6. POSITION CANISTER INTO BED

a) The canister ships with the canister top plate installed for rigidity (see Figure 6a).
   a. Remove this plate, saving the bolting hardware
   b. Replace with the two temporary mounting plates, which are shipped loose (see Figure 6b)
   c. The mounting plates at the top will ensure the canister is positioned correctly for height in the bed

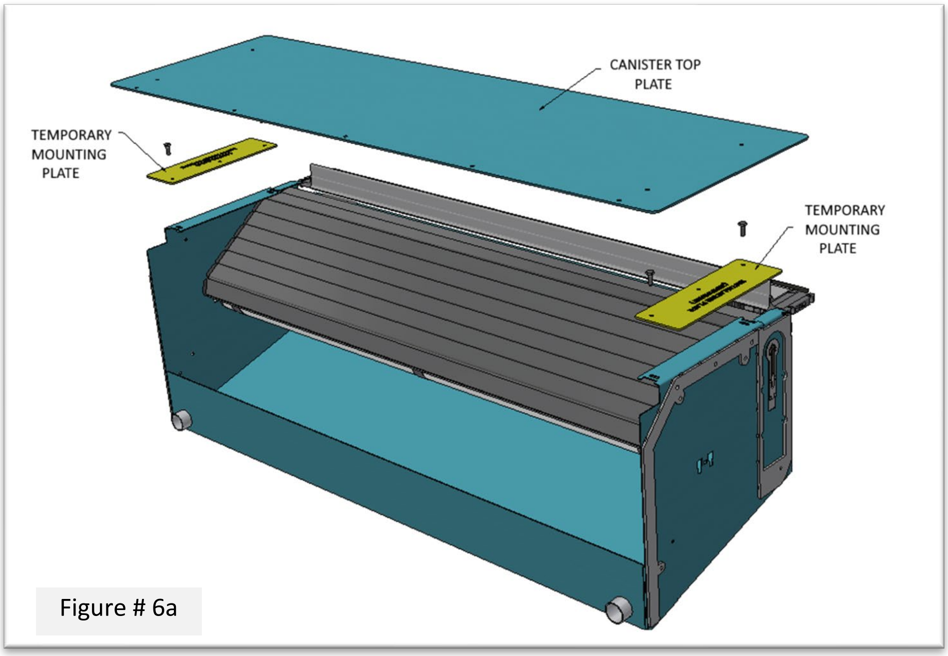


Figure # 6a

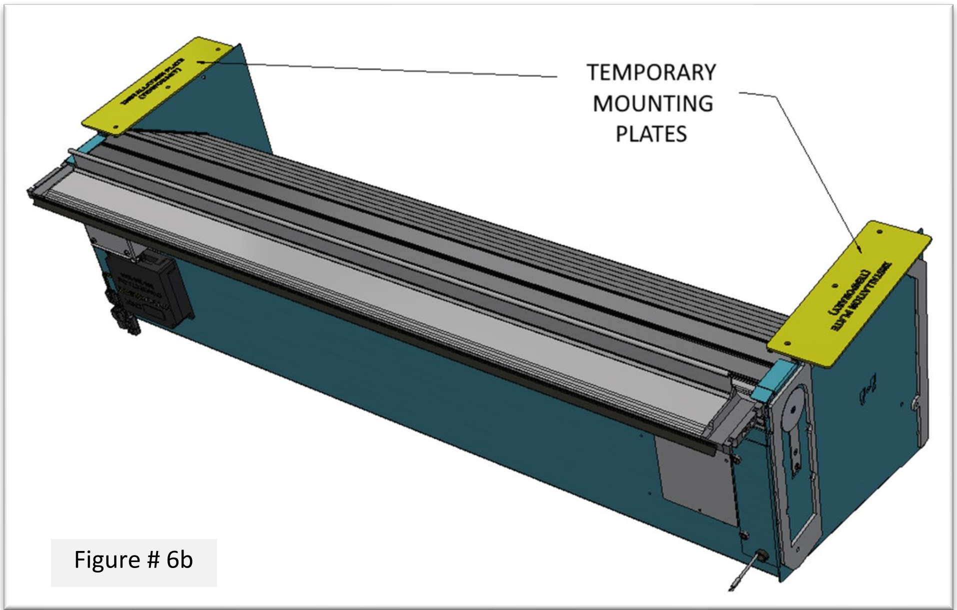


Figure # 6b

b) Lower the canister into the bed until it is resting on these temporary mounting plates, and the drainpipes are through the holes previously bored through the bulkhead.

   a. Make sure that the rear edge of the canister can be mounted flush against the bulkhead of the service body bed
   b. Back out the canister and apply caulk around the drainpipe holes (Figure 6c)

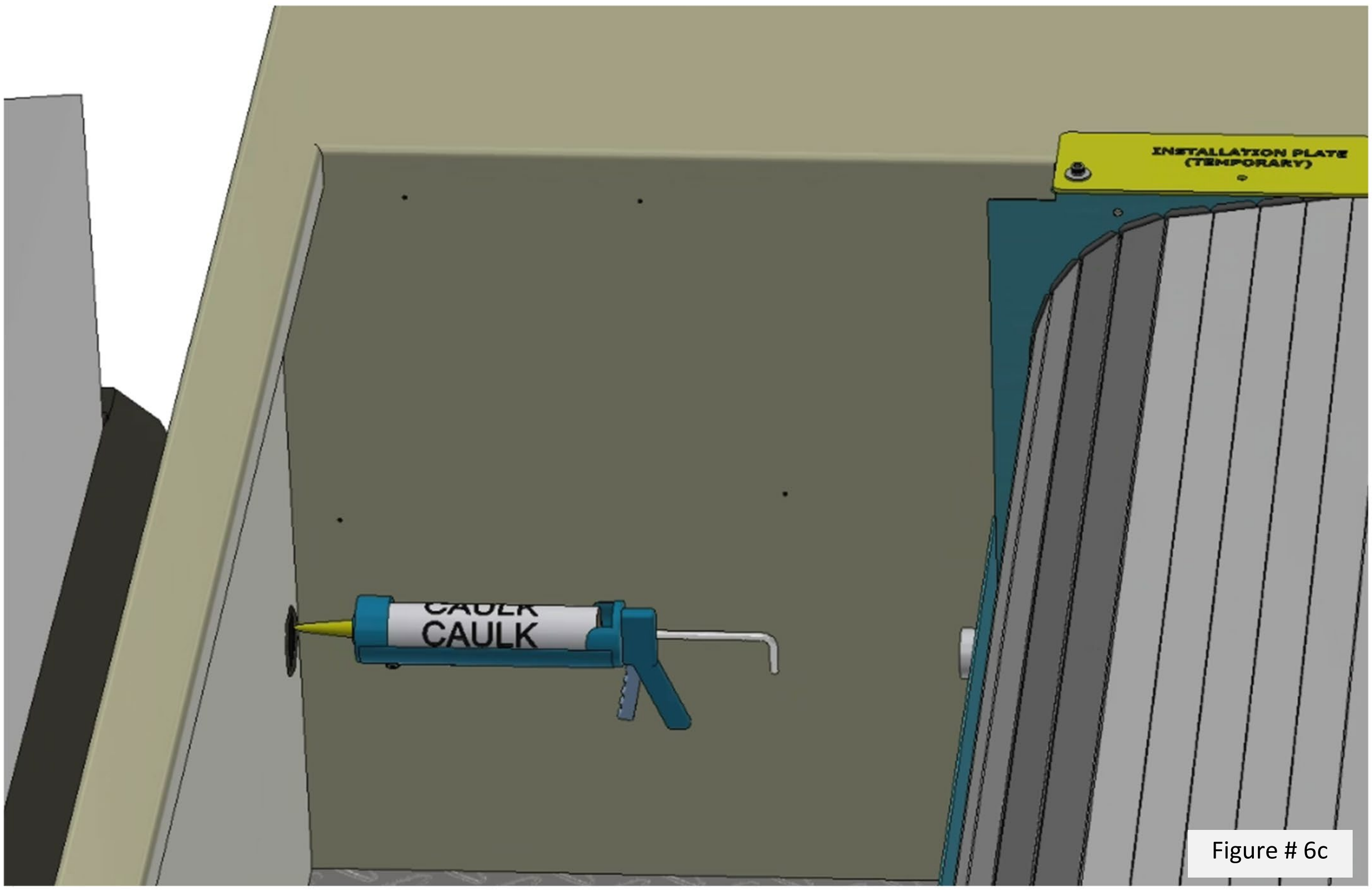


Figure # 6c

   c. Re-mount the canister against the bulkhead so the drainpipes are through the holes previously caulked

c) There are (4) mounting holes on each of the canister side walls (circled in Figure 5a).

   a. Only 1 of those mounting holes on each side is visible/accessible when the shade is fully rolled up in the canister (circled in green in Figures 5a and 6d)
   b. Ensure that the visible hole on each side aligns with any pre-drilled pilot holes from SECTION 5. LAYOUT CANISTER MOUNTING HOLES
   c. Secure the 1 mounting hole on each side (circled green in Figures 5a and 6d) using fasteners selected/provided by the installer

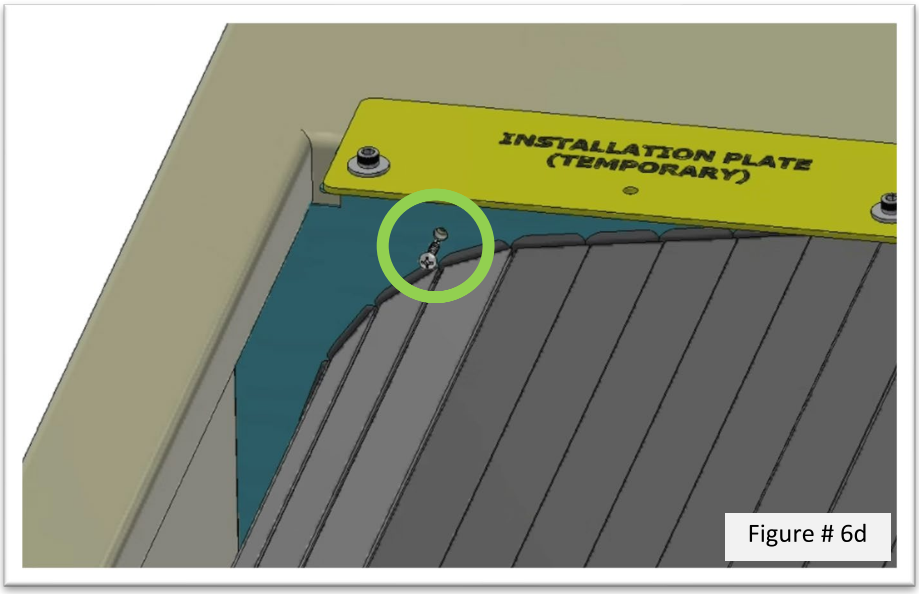


Figure # 6d

   d. The installer may use any appropriate mounting hardware and any thread-locking technology to ensure the hardware does not back out due to vibration (self-tapping, split washers, adhesives, etc.).
   e. Remainder of mounting holes will be secured in SECTION 17. COMPLETE SECURING CANISTER INTO BED

7. TEST FIT AND INSTALL SIDE RAILS

a) With the canister positioned but not mounted, remove side rails and transition corners from the shipping box
   a. The (2) horizontal side rails are longer
   b. The (2) vertical side rails are shorter
   c. The (2) transition corner pieces (Figure 7a) are each composed of two pieces which need to be fastened together during assembly
      i. One for the shade to travel
      ii. One for the water to travel

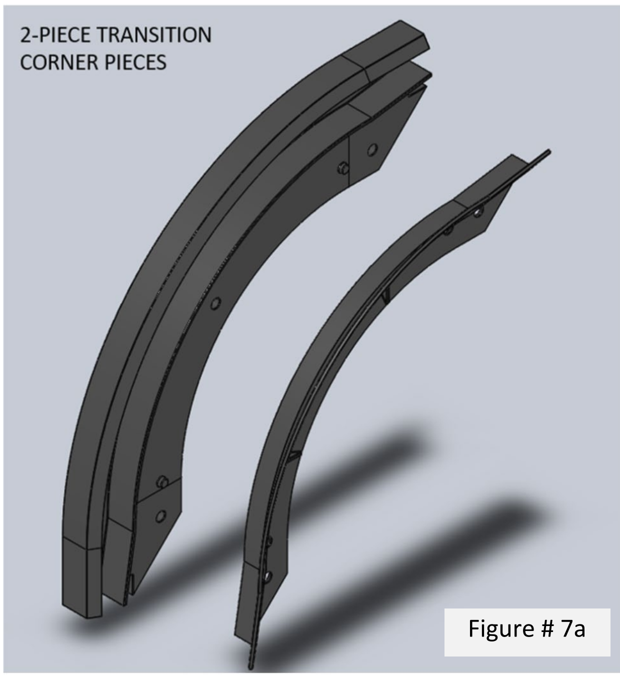


Figure # 7a

b) Before securing the side rails:

   a. Assemble the side rail for each side, connecting the vertical side rails, transition corners, and horizontal rails

      i. To maximize water mitigation, the rails and transition corners must be flush against each other and their channels need to line up (circled in red Figure 7b)

   b. Float* those rail-assemblies against the side walls and adjust fitment (Figure 7b):

      i. *floating refers to resting pieces without securing them; they are balanced or floated during fitment in such a way that it has some degree of freedom of movement relative to its supporting structure or other connected parts

      ii. Stand the vertical rails at the rear of the bed

      iii. The top edge of each horizontal side rail should be flush with the top of the service body box (circled in blue Figure 7b)

      iv. Insert the horizontal rails into the canister (circled in green Figure 7b)

         1. The rails are temporarily supported by the canister during floating fitment
         2. The rear of the horizontal side rails enter the canister near the vehicle bulkhead to facilitate smooth operation of the shade and water mitigation
         3. Ensure the rails enter the canister an equal amount on both sides to prevent window locking during operation

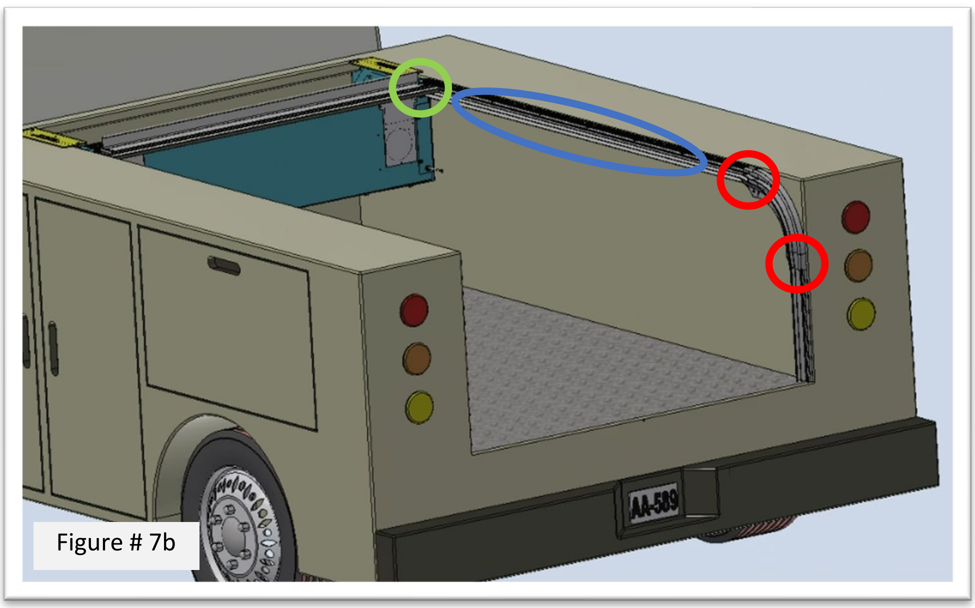


Figure # 7b

c. Establish rear drains for water that gets channeled down the vertical gutter
   i. Mark the location to drill a hole in the floor of the bed where the gutter of the vertical rail meets it (shown as an "X" in Figure 7c)

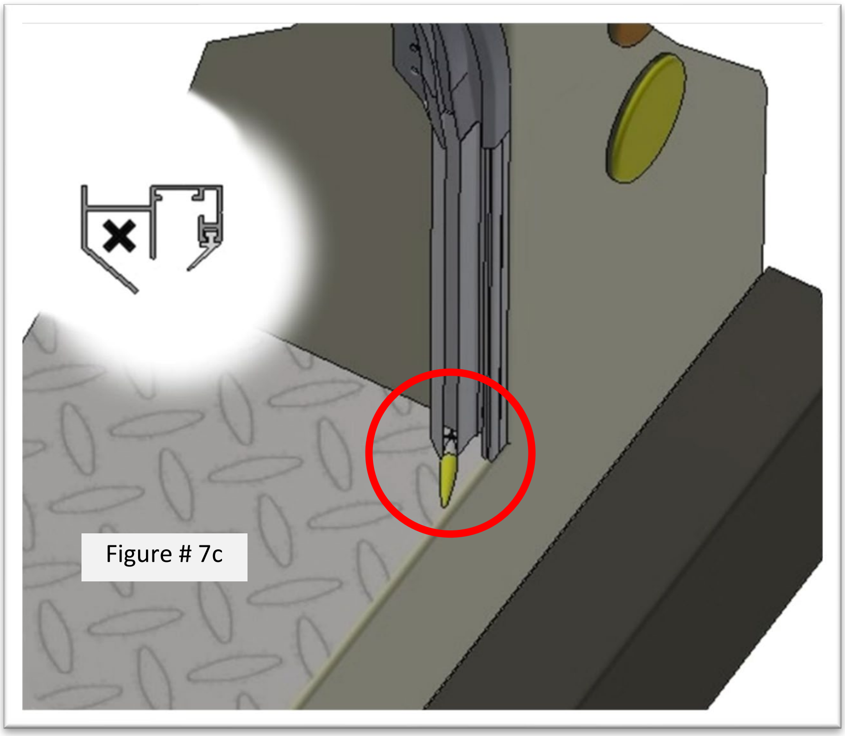


Figure # 7c

   ii. Temporarily move the rail-assemblies and drill a 0.5" hole (black hole on Figure 7d)

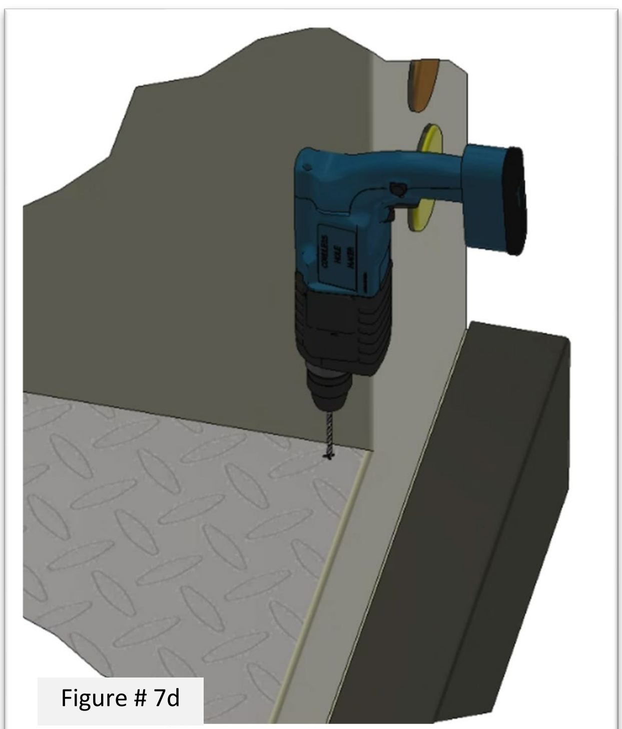


Figure # 7d

   iii. Re-float the rail-assemblies, repeating the above alignment steps

c) Once a good, smooth fit between all rails is achieved, tighten down all rail mounting points, ensuring their squareness along the way
   a. Secure the mounting holes on each side using fasteners selected/provided by the installer
   b. The installer may use any appropriate mounting hardware and any thread-locking technology to ensure the hardware (NOT INCLUDED) does not back out due to vibration (self-tapping, split washers, adhesives, etc.). M5 or #10 button head mounting hardware is recommended to minimize shade travel interference in the siderails.

d) Option: Some installers choose to add caulk around where the hole and the rail meet to form a dam and maximize water flow out the rear of the truck bed, as illustrated in Figure 7e

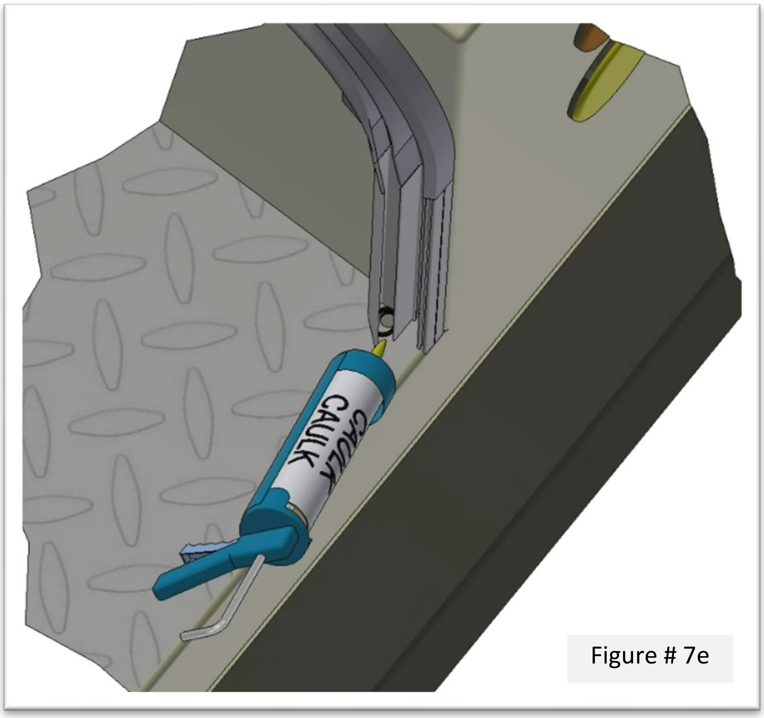


Figure # 7e

8. MANUAL CLUTCH BYPASS

a) Dynatect's Motorized Bed Covers feature a manual clutch bypass. This manual clutch uncouples the motor from the drive drum to allow manual operation during commissioning or due to a power loss (shade release).

b) The factory installed manual clutch is always on the opposite side of the motor wiring (also illustrated in Figure 5a). The motor/clutch orientation was specified at time of order:

1. APPLICATION AND DESIGN OPTIONS (check all that apply)

☐New Design ☐Replacement ☐Vehicle/Truck Application ☐Other: ______

☐Conventional Bed Cover Design ☐Water-Mitigating Design ☐*Motorized Door ... ☐12VDC ☐ 24 VDC Est. Annual Cycles ______

*Desired Wiring Location: ☐Left ☐Right

Figure # 8a

c) Manual Clutch Bypass is activated by pulling the bypass cable (cable/eyelet) extending out of the canister into the bed of the vehicle (Figures 8b and 8c). This may also be attached to an optional paddle actuator mounted on the exterior of the vehicle (see Section 9. EXTERIOR MANUAL OVERRIDE)

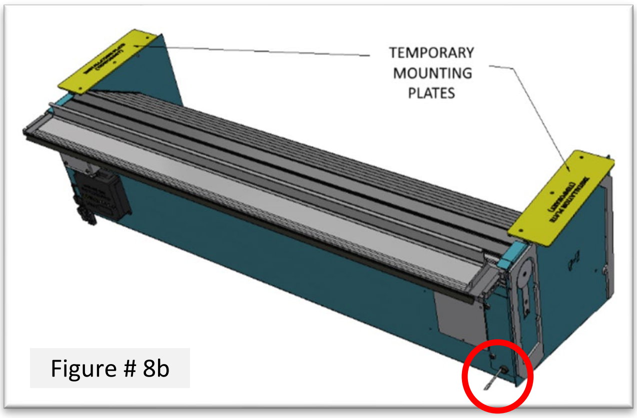


Figure # 8b

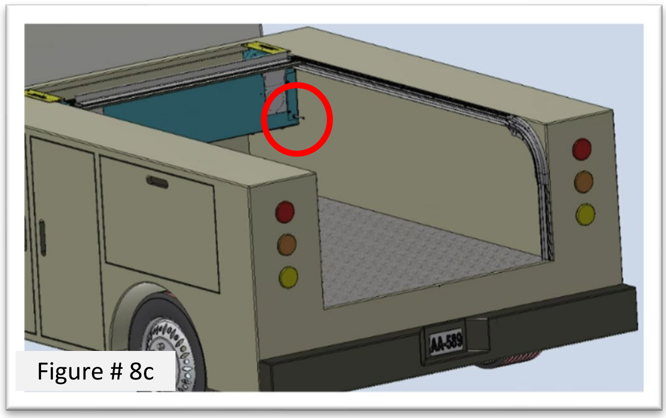


Figure # 8c

d) This video link is for a vertical door, but illustrates the concept of activating the Manual Clutch Bypass and opening the shade:
https://youtu.be/4aFc7qaDO3c?si=4-zK1-v-KGvPPVdX&t=350

Bypass Video

e) For the standard offering, this bypass cable can only be accessed from inside the vehicle bed. Activation from outside the bed requires the optional Locked Paddle Handle for Power Loss Bypass (see SECTION 9. EXTERIOR MANUAL OVERRIDE).

f) Dynatect provides this sticker to label the Manual Clutch Bypass:

Figure # 8d

g) Test Manual Clutch Bypass
   a. Using a pliers or other apparatus, uniformly hold the bypass cable eyelet and pull (typically <0.25”) which releases the clutch and allows the shade to move freely
   b. While holding the cable out, manually pull out the shade a few inches to confirm that it moves
   c. Release the eyelet, and confirm that the clutch has re-engaged and the shade does not move
   d. Pull the eyelet and return the shade to the original open position

9. EXTERIOR MANUAL OVERRIDE*

*Optional (if ordered)

a) The "Exterior Manual Override" is specified at time of order as a "Locked Paddle Handle for Power Loss Bypass"
   a. Before manufacturing, Dynatect recommends installer engagement and approval drawings on where they intend to mount the external manual keyed paddle handle for power loss bypass
   b. The Exterior Manual Override option includes:
      i. (1) keyed paddle handle
         1. With four mounting through holes shown on front image (Figure 9a)
         2. Cable/eyelet shown on rear (Figure 9b)
      ii. (1) extension cable and (2) ratcheting cable adjusters (Figure 9c)


Figure # 9a front

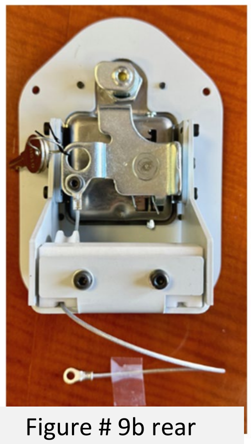


Figure # 9b rear


Figure # 9c

   c. The paddle handle is shipped loose. The mounting location is selected by the installer and is field mounted by the installer. Figure 9d shows an example of a paddle handle mounting location. This example is ideal because it allows one operator to both activate the paddle handle and at least partially lift the shade. This may also allow a straight routing of the extension cable. Depending on the size of the shade, the power-loss bypass operation may require two operators.

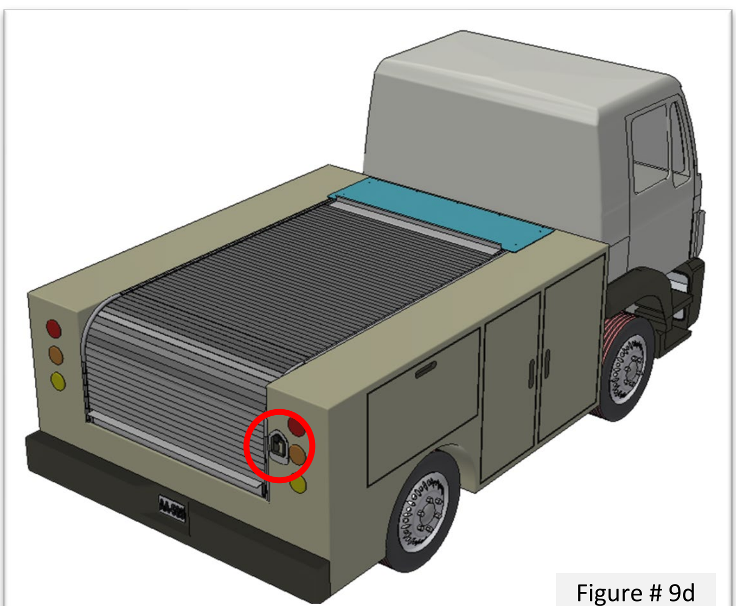


Figure # 9d

b) The extension cable needs to connect the existing canister bypass cable (Figure 8c) and the paddle handle
   a. Installer needs to consider the routing of the extension cable, and any adjustable length of the extension cable
   b. Depending on position, routing may include drilling through walls of the service body
   c. If routing the extension cable through holes in the service body, consider hole grommets/guards to protect the cable from friction. Note that use of the Locked Paddle Handle for Power Loss Bypass is an exceptional use system just for when the vehicle loses power AND the bed must be accessed. This is not used for regular access, only very exceptional access.

c) Establish the mounting location for the paddle handle that joins with the extension cable
   a. Paddle handle installation will always require drilling mounting holes for the paddle handle, and (4) pilot holes to secure the paddle handle (Figure 9e).

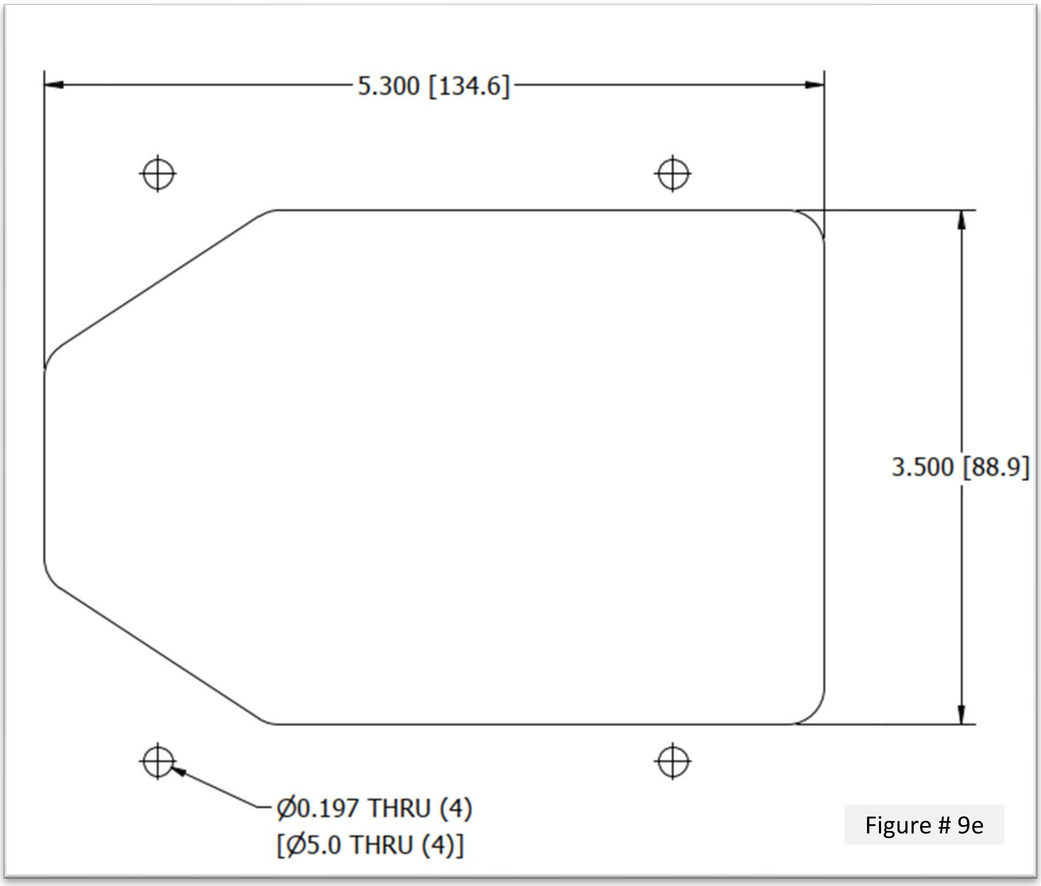


Figure # 9e

   b. Mount the paddle handle and secure using fasteners selected/provided by the installer

d) Connecting bypass system
   a. Route the extension cable, connecting each end to:
      i. The bypass cable sticking out from the canister (Figure 8c)
      ii. The bypass cable sticking out from the paddle handle (Figure 9b)

e) Facilitate connecting the extension cable through each eyelets using the ratcheting cable adjusters as illustrated in Figure 9f

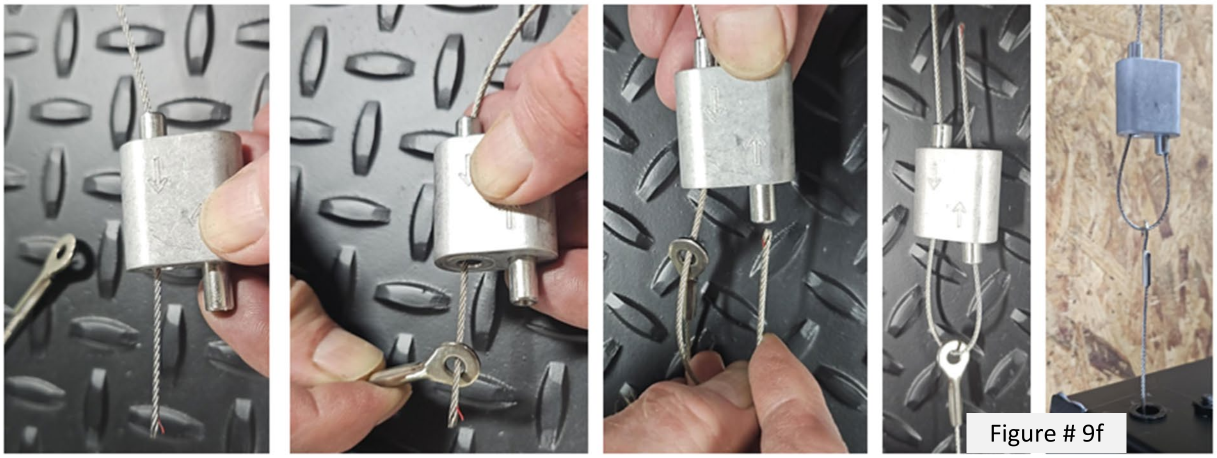


Figure # 9f

a. Adjust the length of the extension cable as needed to ensure the cable is under continuous tension, and will release the bypass clutch when the paddle handle is activated
b. Secure the extension cable along the length of the routing using fasteners selected/provided by the installer – typically a P-type cable clamp fastener or an eye bolt that allows smooth travel of the extension cable

f) Testing bypass system
a. Unlock, pull, and hold the paddle handle to release the bypass clutch
b. Ensure the shade moves when the handle is pulled, and does not move when the handle is not pulled.
c. If the above operations are not sufficiently easy or repeatable, re-evaluate the routing of extension cable and any associated cable length/tension. Adjust until sufficient.
d. Ensure ratcheting cable adjusters are tightened and secure or trim excess extension cable
e. Using the paddle handle, return the shade to the original open position

10. OPTIONAL RE-MOUNTING THE CONTROLLER

1) This section is an overview only – **no installer actions required in this education section.**

a) **In most installations, the controller does not need to be re-mounted.**

b) The controller ships pre-mounted to the motorized bed cover and the full electro-mechanical assembly is factory pre-tested before shipping. The standard position has been selected to minimize interference during installation (Figure 10a). The controller may be factory-mounted on either side of the canister, matching the side requested in the RFQ (see Figure 8a).

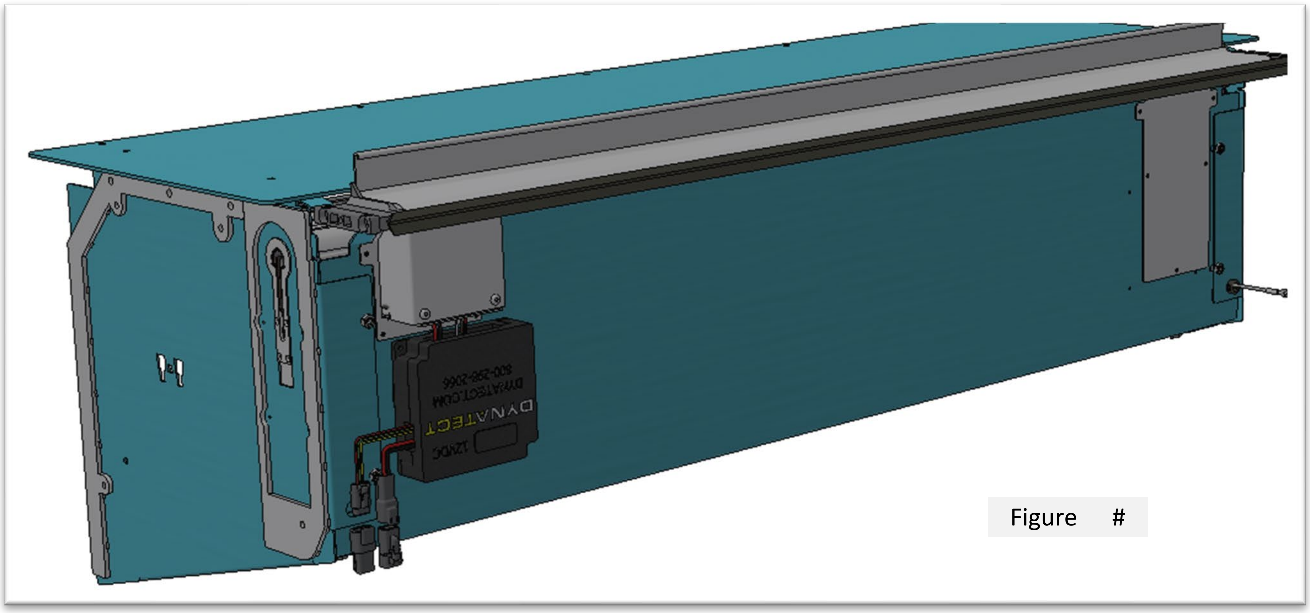


Figure #

c) The controller features a **removable configuration cover which must be accessible** during commissioning (Figure 10b).

d) The controller dimensions are ~5” x ~5” x ~1.6” (Figure 10c)

Figure # 10b

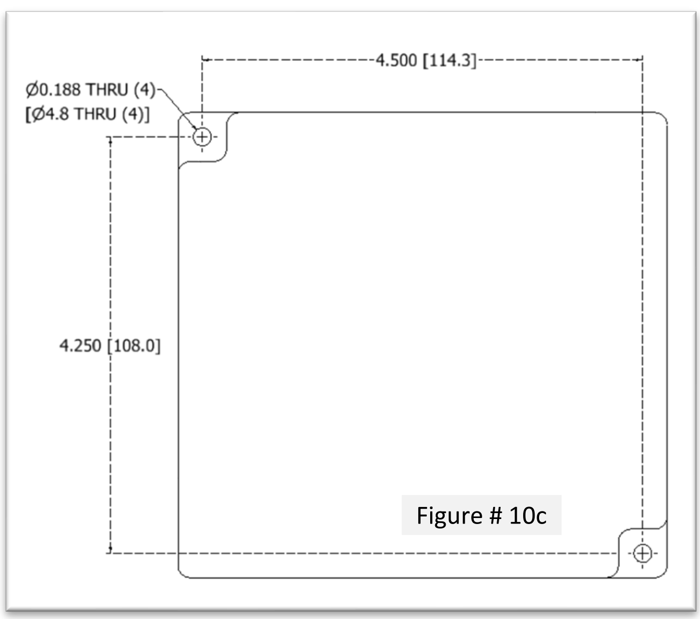


Figure # 10c

e) In some cases, the position of the controller could be an impact point for cargo/materials inside the service body if they are not secured and slide around. If a specific application is subject to this hazard, the installer may choose to make accommodations for mechanical shielding or re-locate the controller. **The controller can be re-located anytime during the installation process.**
   i) The controller is not orientation dependent. It can be attached on any surface horizontally, vertically, diagonally, or in any rotation.
   ii) The controller can be mounted over an existing unused hole or cutout, it does not require a solid surface.
   iii) The installer will need two pre-drill two holes into the mounting surface to accommodate the two mounting holes of the controller (Figures 10b & 10c).
   iv) The installer may use any appropriate mounting hardware and any thread-locking technology to ensure the hardware (NOT INCLUDED) does not back out due to vibration (self-tapping, split washers, adhesives, etc.).
   v) If the controller is re-located, consider access to the removable configuration cover for commissioning. Consider if the controller could hang loose until the controller configuration is complete (SECTION 16. CONFIGURING SHADE TRAVEL), then mount the controller in a tighter/more-obscure location.
   vi) Relocating the controller may require extending cables (see SECTION 23. EXTENDING CABLES).
   vii) After the shade installation is complete, ensure that all power and control wiring is appropriately secured to prevent a snag-hazard. Cover with sleeving/looms as needed.

11. CONNECTING THE CONTROLLER

a) Voltage Tolerances:
   a. 12 VDC controller range: 9.3 - 14.4 VDC
   b. 24 VDC controller range: 20 - 28 VDC
   c. The controller has a low voltage cutoff and will stop operating when the voltage dips below the low-voltage thresholds shown above. If the voltage returns from a low voltage back to nominal voltage, the controller will not automatically restart. In those exceptional circumstances, the controller will only operate again when the voltage is completely removed (disconnected) and re-applied. **For applications which may suffer from exceptional low voltage conditions, the installer may want to insert an inline disconnect/switch to the controller power for convenience of resetting the controller.**
   d. For applications which may suffer from exceptional loss of voltage, when the voltage goes to zero and returns to nominal, the controller will automatically restart.

b) Each wire harness on the controller has a unique connector.

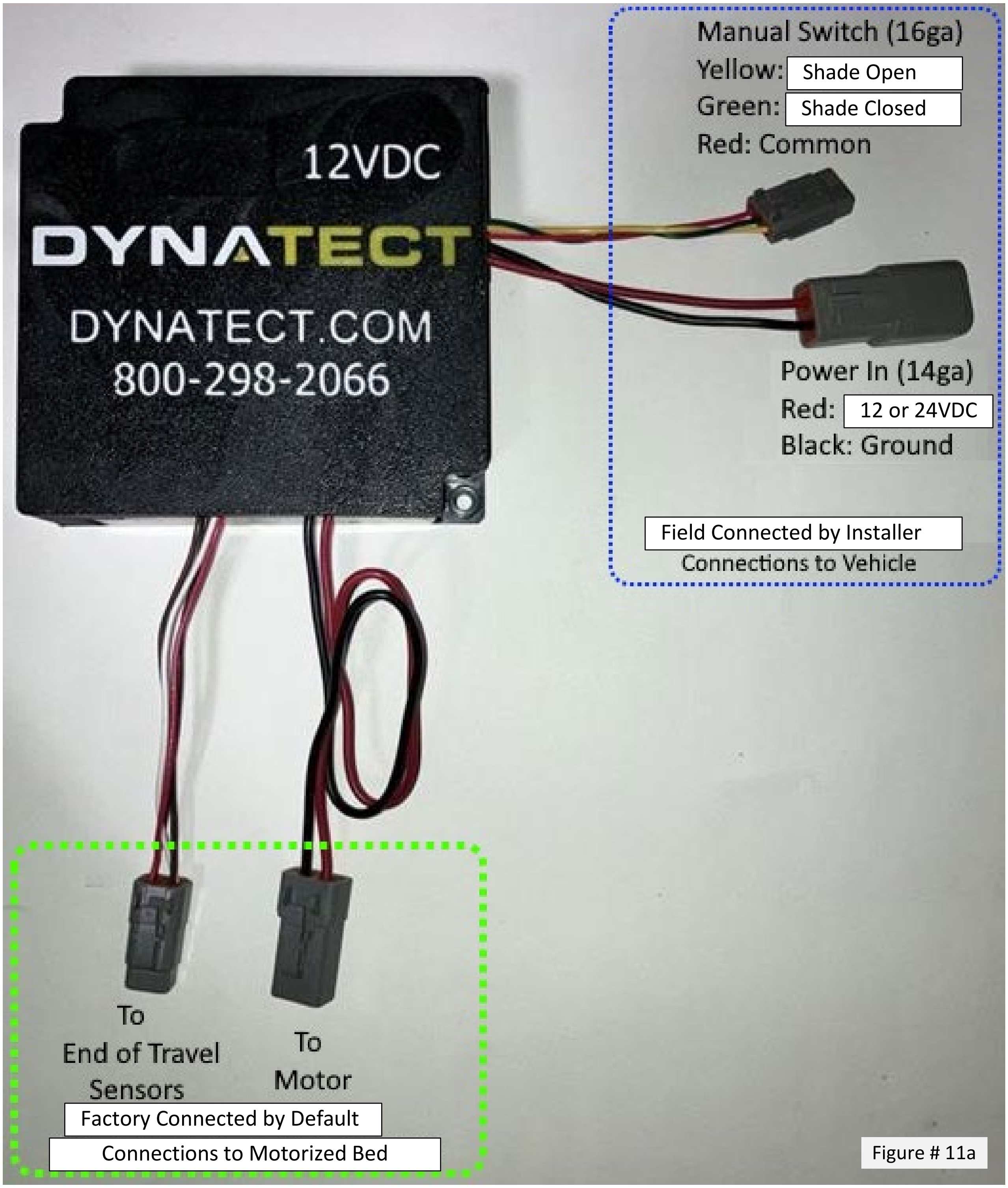


Figure # 11a

c) The installer should use any appropriate wire-ties and wire-mounts to secure wiring, minimize friction points, and avoid any mechanical interference (including moving parts).
d) The wires/connectors to the factory-supplied Motorized Bed Cover components (circled in green, Figure 11a) all exit the same side of the controller and match pre-crimped connectors for the sensors and motor. These are factory connected by default. No additional installer action needed.
e) The wires/connectors to the vehicle-supplied power and manual switches (circled in blue, Figure 11a) all exit the same side of the controller. They will require matching connectors shown with asterisk in Figure 11b. These connectors are supplied loose by factory or supplied by installer using industry-standard Deutsch-style connectors.
f) All controller cables are 6" long. Any additional cable extensions/connectors are the responsibility of the installer (see SECTION 23. EXTENDING CABLES).
g) More information on manual switches in SECTION 12. MANUAL SWITCHES
h) The vehicle 12 or 24 VDC supplied power should only be applied in SECTION 15. ACTIVATING THE CONTROLLER

Function	Power In***	Manual Switch (Shade-Open / Shade-Close)**	End of Travel Sensors (Shade-Opened/ -Closed)	Motor
Connector Positions	2	3	4	2
Controller Connector	DTP04-2P	DTM06-3S	DTM06-4S	DTP06-2S
Controller Pins/Sockets	1060-12-0166	1062-20-0122	1062-20-0122	1062-12-0166
Mating Connector	DTP06-2S*	DTM04-3P*	DTM04-4P	DTP04-2P
Mating Pins/Sockets	0462-203-12141*	0462-202-20141*	0462-202-20141	0460-204-12141
Wire Gauge	14GA	20GA	20GA	14GA
Pin1	Red/+12or 24 VDC	Red/+12 or 24 VDC	Red/+12 or 24 VDC	Red/+12 or 24 VDC
Pin2	Black/Ground	Green/Close	Black/Ground	Black/Ground
Pin3	NA	Yellow/Open	White/Opened Limit	NA
Pin4	NA	NA	Brown/Closed Limit	NA

*This connector and associated pins/sockets are supplied by Dynatect for installer to wire to the 12 or 24VDC source and two switches/contactors. Should the installer require additional connectors or pins/sockets, these are standard industry available parts that any installer/upfitter can access. The installer may require specialty tools for applying the Deutsch-style connectors Dynatect provides. Alternately, the installer may remove the existing connectors and replace with connectors compatible with the installer's standard.

** The shade open and close conductors should be capable of conducting <0.1A at 12 or 24VDC (momentary contact).

*** The power conductors should be fused and capable of delivering at least 15A at 12 or 24 VDC.

Deutsch-Style Connector suffix:
P = Pin connector
S = Socket connector

Figure # 11b

12. MANUAL SWITCHES*

*Optional (if provided by installer)

a) The Dynatect Motorized Bed Cover can be operated by Open/Close commands from:
   a. Dynatect FOBs (one included with every Dynatect controller)
   b. Installer provided manual switches (switches are optional since FOB is included)
   c. Both Dynatect FOB and installer manual switches

b) The manual switch harness from the Dynatect controller contains +12 or 24 VDC (Pin 1) which should be integrated through installer-provided normally open dry contacts. Each contact would close to activate the respective command for "OPEN" (yellow wire), or "CLOSE" (green wire). These dry contacts could be a switch or relay possibly controlled by the Body Control Module. The shade open and close contacts should be capable of conducting <0.1A at 12 or 24VDC (momentary contact). Momentary signals must be at least 50 ms.

c) If switches are used, they are provided and wired by the installer. Typically, they are momentary switches, either:
   a. Separate momentary buttons/switches
   b. One momentary, spring return to center three-position switch

   No changes are required to the Dynatect controller for either of the above options.

   If a sustained switch is used, the Controller must be used in the "Discrete Shade Movement" mode outlined below.

d) Regardless of switch or contacts used, there is a 0.5 second delay that must be met after the motor turns off to activate the motor in the opposite direction.

e) The Controller can be factory programmed or field programmed for two different styles of shade control outputs:
   a. <u>**Full Travel Shade Movement** (typical for vehicle applications):</u>
      i. The shade will move to full-open or full-close after the corresponding input signal is momentarily applied (pulse).
         1. Example: The shade will move to the fully closed position when the FOB close button is pressed and immediately released.
      ii. The input signal can be from the hardwire input, the FOB, or the 12-button keypad.
      iii. The shade movement is still limited by any one of three safety conditions (end of travel sensors, maximum current, and max time).
   b. <u>**Discrete Shade Movement** (exceptionally used for specialty applications):</u>
      i. The shade will only move as long as an input signal is applied. When the input signal is released, the shade will stop moving.
         1. Example: The shade only moves while the manual switch or FOB button is pressed and held, then immediately stops when the button is released.
      ii. The input signal can be from either the hardwire input manual switch or the FOB. This mode does not work with a 12-button keypad.
      iii. The shade movement is still limited by any one of three safety conditions (end of travel sensors, maximum current, and max time).

Programming the controller for each mode does not need to be addressed at this stage, and is covered in SECTION 15. ACTIVATING THE CONTROLLER

13. END-OF-TRAVEL SENSORS AND TARGETS OVERVIEW

a) The section is an overview only – **no installer actions required in this education section.**

b) This page outlines the sensor functions to facilitate any exceptional troubleshooting.

c) Every shade has two factory-installed end-of-travel sensors (sensors – shown in Figures 13a & 13b) and metal end-of-travel targets. One sensor/target combination measures that the shade is fully open, and one sensor/target combination measures that the shade is fully closed. When either sensor sees the end-of-travel target, the shade quickly stops moving, subject to the weight and inertia of the shade.

Sensor Video

   a. This two-sensor system is illustrated in this video: https://youtu.be/4DPyw2fCtf8?t=74
   b. The system is wired through the normally closed contacts, any wire-break also results in a shade stop.
   c. Due to bed cover geometry, sometimes the leading-edge handle extrusion is close enough to the fully open sensor that no target is needed. In these cases, the motorized bed cover will have 2 sensors, and 1 movable target (Figure 13b).

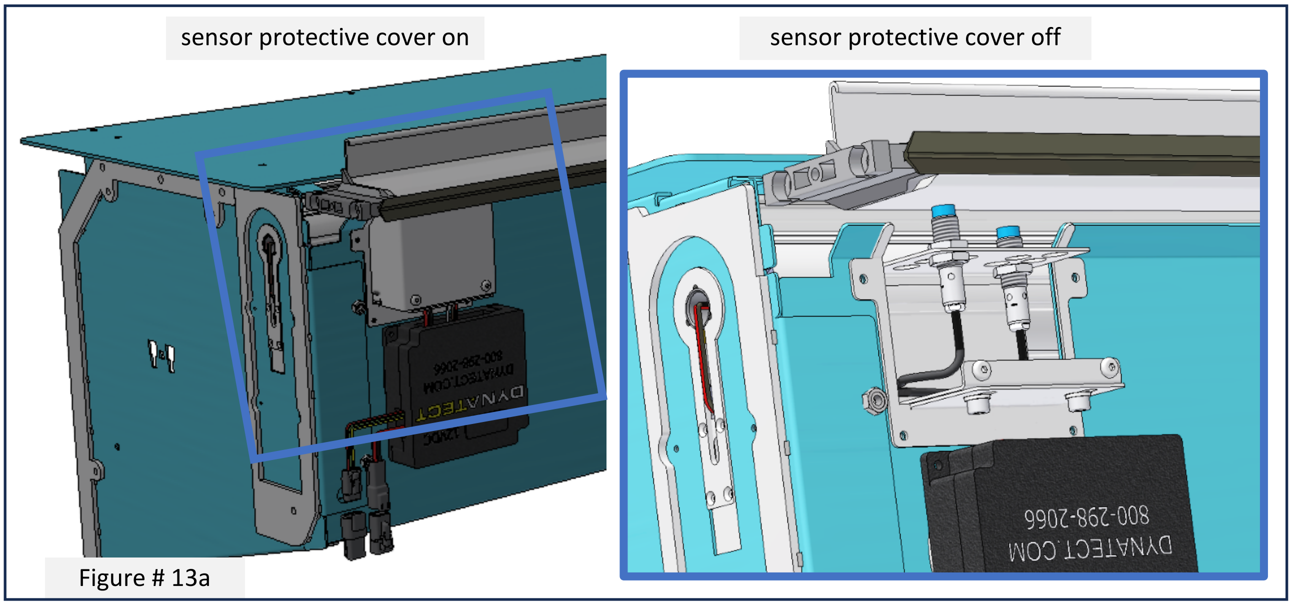


Figure # 13a

Figure # 13b

Figure # 13c

d) The targets are affixed using hook/loop fasteners. These are applied and tested at the factory before shipping and should not require field modification. In the unlikely case that the shade is not closing at the desired location, there is a strip of hook/loop pads applied across several slats of the shade (Figures 13b & 13c). The target can be removed from one location and moved anywhere along the fasteners, even across two slats.

e) In the unlikely event that further field modification is required, a new adhesive hook/fastener could be applied. As with any adhesive, it is important to prep the surface with rubbing alcohol or equivalent and use new adhesive for a permanent connection that will last the life of the shade.

f) In the unlikely event that the sensor positions have been changed from the factory tested positions, it is CRITICAL that the sensors positions be re-calibrated and secured in the field.
   a. Each sensor should be powered and evaluated for both:
      i. Position where the sensor does see the target (no light)
      ii. Position where the sensor does NOT see the target (with light – example on Figure 13b)
   b. This may span several millimeters for the sensor
   c. The sensor should then be re-secured at the mid-point of those two positions for reliability with varying field conditions
   d. The sensor is secured with two threaded nuts (Figure 13b). These nuts must be tightened with a tool to minimize loosening due to application vibration, possibly using a threadlocker product.

14. TRAVEL FAILSAFE OVERVIEW

a) This section is an overview only – **no installer actions required in this critical education section**

b) The controller (Figure 14a) has a removable configuration cover to access settings only used in the commissioning of the shade. This cover is friction fit, can be removed by gently prying with a small flat blade screwdriver at the far right or left side of the widest dimension.

c) NOTE: From the factory, the controller on motorized bed covers may be mounted upside down for most efficient wire routing. The relative positions of the switches remain the same, but the orientation may be rotated. (Figure 14b)

d) If there is an obstruction (like a box or misalignment) preventing the shade from <u>fully closing</u>, there are two additional safety systems that will turn off the motor:
   a. Maximum Current – when reached, the motor stops <u>and reverses</u>
   b. Maximum Time – when reached, the motor stops

e) If there is an obstruction (like misalignment) preventing the shade from <u>fully opening</u>, there are two additional safety systems that will turn off the motor:
   a. Maximum Current – when reached, the motor stops
   b. Maximum Time – when reached, the motor stops

f) The removable configuration cover includes the initials "T" and "C" – **when oriented with the text of the controller**, these are a shortcut guide to the "Time" and "Current" switches (Figures 14a &14b).

g) Maximum Current (Figure 14a):

a. This feature is a safeguard that senses if the motor is drawing too much current, an indication that the shade may have interference in the form of a blockage or obstruction. **If the current draw exceeds the Maximum Current switch setting while closing, then the shade will stop and reverse to the full-open position.** If the current draw exceeds the Maximum Current switch setting while opening, then the shade will stop.

b. The 16-position rotary hex switch ranges from 0.5 - 15 Amps (labeled 0-9, and A-F) in ~1 Amp increments

Maximum Current Rotary Switch Settings	
"0" = 0.5 Amps	"8" = 8 Amps
"1" = 1 Amp	"9" = 9 Amps
"2" = 2 Amps	"A" = 10 Amps
"3" = 3 Amps	"B" = 11 Amps
"4" = 4 Amps	"C" = 12 Amps
"5" = 5 Amps	"D" = 13 Amps
"6" = 6 Amps	"E" = 14 Amps
"7" = 7 Amps	"F" = 15 Amps

c. The lowest Amp setting results in the least force needed for obstruction detection/shade-reverse

d. Dynatect factory tests the motorized bed cover and applies the operable setting that worked with the factory test to this switch

h) Maximum Time (Figure 14a):

a. This feature is a safeguard that limits the time the shade continuously tries to close even if the shade is blocked and the Maximum Current has not activated. **If the shade operation time exceeds the Maximum Time switch setting while opening or closing, then the shade will stop.**

b. The 16-position rotary hex switch ranges from 2 - 18 seconds (labeled 0-9, and A-F) in varying increments

Maximum Time Rotary Switch Settings	
"0" = 2 Seconds	"8" = 8 Seconds
"1" = 2.5 Seconds	"9" = 9 Seconds
"2" = 3 Seconds	"A" = 10 Seconds
"3" = 3.5 Seconds	"B" = 11 Seconds
"4" = 4 Seconds	"C" = 12 Seconds
"5" = 5 Seconds	"D" = 14 Seconds
"6" = 6 Seconds	"E" = 16 Seconds
"7" = 7 Seconds	"F" = 18 Seconds

c. Dynatect factory tests the motorized bed cover and applies the operable setting that worked with the factory test to this switch

15. ACTIVATING THE CONTROLLER

a) Read this entire section before taking the actions, as several steps are time dependent.

Figure # 15a


Figure # 15b

b) Descriptions:

a. Controller: Black square box with small removable panel to adjust rotary switches and pairing button (Figure 14a). The controller accommodates input through hardwire signal, the remote/FOB, or a 12-button keypad

   i. Cover: The controller has a removable configuration cover to access settings only used in the commissioning of the shade. This cover is friction fit, can be removed by gently prying with a small flat blade screwdriver at the far right or left side of the widest dimension.

   ii. Diagnostic LED – Education only – No installer Actions – located beneath the cover

      1. Power On: Light flashes once
      2. Motor On: Light steady on
      3. Obstruction Interference (Maximum Current) and Shade is Reversing to open position: Light flashes during reverse motion
      4. Program FOB Synchronization: Light steady on

b. FOB: Black rectangular remote with two pushbuttons (Figure 15b).

   i. Every controller comes with 1 remote control FOB.
   ii. Up/Open button on left
   iii. Down/Close button on right

c) The Controller can be factory-programmed or field-programmed for two different styles of shade control outputs:
   a. <u>**Full Travel Shade Movement** (typical for vehicle applications):</u>
      i. The shade will move to full-open or full-close after the corresponding input signal is momentarily applied (pulse).
         1. Example: The shade will move to the fully closed position when the FOB close button is pressed and immediately released.
      ii. The input signal can be from the hardwire input, the FOB, or the 12-button keypad.
      iii. The shade movement is still limited by any one of three safety conditions (end of travel sensors, maximum current, and max time).

   b. <u>**Discrete Shade Movement** (exceptionally used for specialty applications):</u>
      i. The shade will only move as long as an input signal is applied. When the input signal is released, the shade will stop moving.
         1. Example: The shade only moves while the manual switch or FOB button is pressed and held, then immediately stops when the button is released.
      ii. The input signal can be from either the hardwire input manual switch or the FOB. This mode does not work with a 12-button keypad.
      iii. The shade movement is still limited by any one of three safety conditions (end of travel sensors, maximum current, and max time).

d) To pair the FOB(s) to the controller:
   a. NOTE: **When the controller enters program mode (FOB pairing button), all previous FOB addresses that were programmed will be erased from the receiver's memory.** Each FOB has a unique internal address to pair with one or more controllers. The controller needs to be programmed to respond only to the specific FOB(s) it is intended to operate with.
   b. Disconnect vehicle power to the controller
   c. To prevent any unintended operation, disconnect the wiring harness between the controller and the motor
   d. Connect vehicle power to the controller
   e. Detach the removable configuration cover and **store in a safe place to re-apply**.
      i. The controller has a removable configuration cover to access settings only used in the commissioning of the shade
      ii. This cover is friction fit and can be removed by gently prying with a small flat blade screwdriver at the far right or left side of the widest dimension
   f. On the controller, press and hold the FOB pairing button until the red diagnostic LED is steady on, then release the button. Typically press and hold for 3 seconds to enter program mode.
   g. To pair FOB(s) and configure EITHER of the desired shade movement (definitions above):
      i. **Discrete Shade Movement**:
         1. Press and release the FOB UP/OPEN button **once** (blue FOB light will illuminate)
         2. Verify that the controller red diagnostic LED extinguishes and then illuminates (blinks off once)
         3. Proceed to Step-h

ii. **Full Travel Shade Movement:**
   1. Press and release the FOB UP/OPEN button **twice** in quick succession (blue FOB light will illuminate with each press)
   2. Verify that the controller red diagnostic LED extinguishes and illuminates several times (blinks rapidly)
   3. Proceed to Step-h

h. Quickly repeat Step-g for pairing any additional remotes (up to 30). The controller will wait ~5 seconds for any additional remote pairing before automatically exiting the pairing mode.
   i. If pairing a 12-button-keypad, execute the keypad pairing before the FOB pairing.
   ii. NOTE: Discrete or Full Travel Shade Movement is determined by the last FOB that is programmed to the controller.

i. With no remote input for ~5 seconds, the controller light will rapidly blink dimmer then off. The FOB(s) and controller are paired for operation. The controller is now in the normal mode of operation. The remote pairing is persistent, even if the controller loses power.

j. Disconnect vehicle power to the controller (the programming remains saved)

k. Reconnect the wiring harness between the controller and the motor

l. Connect vehicle power to the controller

m. **DO NOT ACTIVATE SHADE MOTION until instructed to do so in SECTION 16. CONFIGURING SHADE TRAVEL [step 16.b).c.ii.]**

n. Additional details about the FOB are included in SECTION 20. FOB Q&A

16. CONFIGURING SHADE TRAVEL

a) Introduction
   a. **SAFETY NOTES:**
      i. **Personnel should not be in the vehicle bed when operating the bed cover**
      ii. Shade should not be operated when covered with snow or ice. Snow or ice must be removed from cover before opening
         1. The cover is not designed to operate with the additional friction due to snow or ice load
         2. Removal prevents snow from being pushed on to equipment in the bed
   b. Dynatect factory assembles and tests all covers before shipping and sets the “Maximum Time” and “Maximum Current” switches to settings that worked in the factory environment.
      i. See Section 14. TRAVEL FAILSAFE OVERVIEW
      ii. Dynatect establishes the minimum settings of each switch for that exact door using our factory test station with a DC power supply and applied to a square/plumb installation.
      iii. To account for field installation variability, field voltage variability, or misalignments that may evolve during the life of the product, Dynatect further increments both the Current and Time setting +1 position.
      iv. The door controller ships with these Current and Time settings from the factory. These settings normally work without adjustment for field door installation.
      v. When signaled to open or close, if the door doesn’t move at all, verify if power polarity to the controller is reversed from intended polarity and apply correction. See SECTION 11. CONNECTING THE CONTROLLER.
   c. “End-of-travel sensors”, “Maximum Time”, and “Maximum Current” are redundant systems, and any one threshold being reached may cause the shade to stop.
      i. The rotary hex switches include a small arrow indicating the setting and can be adjusted with a small screwdriver (Figure 16a). Seeing these small letters and numbers recessed in the controller can be challenging and may require a flashlight.

Figure # 16a

         1. **MAKE A NOTE OF THE SETTING FOR EACH SWITCH to return to factory settings if ever needed**
         2. Actual field conditions may vary from factory conditions requiring the installer to modify these switches. See SECTION 14. TRAVEL FAILSAFE OVERVIEW
      ii. End of Travel Sensors
         1. The shade will stop with one of the end-of-travel sensors aligned with the end-of-travel target. It is possible that when stopping, due to the rate of deacceleration the target will drift slightly past the sensor. This can be normal, and the controller logic compensates for this.

2. The controller "remembers" the last sensor input. Once the shade stops opening, it will not accept a "shade open" signal again. This helps prevent over-traveling open. If the shade has been moved using the manual clutch bypass, and is no longer fully open, the operator will still need to send a "shade close" signal again, before a "shade open" signal is recognized.
3. **"Shade Open" or "Shade Close" movements can be manually halted mid-travel by sending the opposite signal (example: pressing the opposite button on the FOB)**

b) Commissioning Partial Shade-Open Movement:
   a. Pull the cable for the manual clutch bypass to release and extend the shade ~12" horizontally into the side rails. This requires using another hand to pull the shade. See SECTION 8. MANUAL CLUTCH BYPASS
   b. Despite manually moving the shade, the controller "remembers" last seeing the shade fully open, and won't accept an open command again. The following steps are TIME CRITICAL (read parts i through iv before executing):
      i. When signaled to open or close, if the shade doesn't move at all, verify if power polarity to the controller is reversed from intended polarity and apply correction. See SECTION 11. CONNECTING THE CONTROLLER.
      ii. Briefly signal the shade to close
         1. FOB -or- switch/relay contact -or- keypad
         2. The shade will travel a few inches, and it will reset the controller memory
      iii. Immediately signal the shade to open (which will stop the shade close travel)
      iv. Again, signal the shade to open (the shade will travel open)
   c. The shade should fully open and stop automatically.
   d. If the shade doesn't fully open,
      i. Evaluate voltage; the voltage at the input of the controller should remain a nearly steady 12 or 24VDC. If the voltage dips more than 1-volt during operation, consider:
         1. Supplying power with larger conductors to minimize voltage drop.
         2. If supplied by a DC power supply, ensure that power supply is sized correctly for the current drawn. Power supplies may have an adjustment to incrementally increase the voltage so there is 12 or 24VDC at the input of controller.
      ii. Corrections or adjustments may need to be made to ensure the door is square/plumb.
      iii. Repeat the opening test (16.b).b) and when triggering to power open, gently assist by pushing the shade open to feel any friction points (screw heads, sharp edges, etc). Check and correct any alignment or friction points.
      iv. If the above steps are insufficient, then increase the setting on the Maximum Current switch ONE INCREMENT. See SECTION 14. TRAVEL FAILSAFE OVERVIEW
         1. **Adjust the 16-position Maximum Current rotary hex switch in single increments (1A) clockwise**. At each 1A increment, reset the shade to 12" closed, and retest signaling the shade to open. Repeat until the shade travels fully opens. Larger shades require a higher Maximum Current setting (more weight = more amps).
      v. Since the shade is only opening ~12", the Maximum Time setting should not be a contributor to the shade stopping before fully open
   e. Next test shade closing movement

c) Commissioning Shade-Close Movement:

- a. With the shade fully open, signal the shade to close.
  - i. While closing, if the shade stops and reverses, then the Maximum Current setting has been triggered. There may be an obstruction (including side rail friction), or the setting may need to be increased one increment.
  - ii. While closing, if the shade stops without reversing, then the Maximum Time setting has been triggered. There may be an obstruction (including side rail friction), or the setting may need to be increased one increment.
  - iii. To make any setting adjustment, fully open the shade [see step b) above]
  - iv. Before each retesting of shade closed, return the shade to the fully open position either using the shade open command or the manual clutch bypass.
  - v. It is possible that when stopping, due to the weight the shade, the end-of-travel target will drift slightly past the end-of-travel sensor. This can be normal, and the controller logic compensates for this. This also helps seal the shade to the truck bed. If the shade and truck bed do not seal (exceptional condition), then move the end-of-travel target to a new location as outlined in SECTION 13. END-OF-TRAVEL SENSORS AND TARGETS OVERVIEW.
- b. Fully cycle the shade to test that the shade fully closes and fully opens, adjusting the settings for Maximum Current or Maximum Time as outlined above in single setting increments.
- c. Next test shade obstruction detection.

d) Commissioning Shade Obstruction Detection:

- a. This video illustrates how the shade should respond to an obstruction: https://youtu.be/4DPyw2fCtf8?t=56
- b. With the shade fully open, place a disposable object like a box squarely in the path of the shade
- c. Signal the shade to close. The shade will impact the object momentarily, then reverse
- d. Adjust the Maximum Current setting one increment at a time to balance the consistent, reliable travel of the shade with the least impact to the obstruction.

Obstruction Video

e) Once the shade fully open, fully closed, and obstruction detection features are all working, the two rotary hex switches have been tuned to their minimum operating value. Due to variations in operating conditions during the life of the cover (knocked out of plumb, varying voltages, varying temperatures, etc.), some installers choose to increase both rotary hex switches an additional **single** increment to minimize nuisance door stoppage. Considerations:

- a. The maximum time is a backup to the end-of-travel sensor. By adding a single increment, the Maximum Time limit will only deactivate the motor if the door is stalled beyond the normal travel time, plus ~1 second.
- b. Closing Force:
  - i. As outlined above, the installer has full adjustability of the Maximum Current settings to conform with their own objectives (closing force vs. nuisance tripping).
  - ii. The effective impact force varies by the surface area being applied. There is a polymer bumper on the bottom of the shade which disperses the force. The effective force is a unique combination of cover size/weight, installation alignment, wear/resistance changes over time, and the Maximum Current setting.

iii. If the shade, rails, or vehicle/application frame are knocked out of alignment, the current required to operate the door may increase. It is possible that this increased current demand exceeds the Maximum Current setting established during commissioning. The increased motor current consumption could create a false trigger (stop/reverse) on Maximum Current overload. Under these exceptional circumstances, the Maximum Current setting could be further adjusted by an authorized technician. This Maximum Current rotary switch is enclosed in the controller case and is not intended for modification by the vehicle/application operator.

c. Record the positions of the "Maximum Time" and "Maximum Current" switches for future reference.

d. Reinstall the removable configuration cover.

f) If the controller has not already been mounted, now mount the controller (see SECTION 10. OPTIONAL RE-MOUNTING THE CONTROLLER). Ensure that all power and control wiring is appropriately secured to prevent snags. Cover with sleeving/looms as needed.

17. CAULKING

a) Caulk all seams of canister and rails
   a. Once shade function is verified as satisfactory, fully caulk all seams around the shade and canister. This includes all seams around and between the side rails and transition corners, all seams between the rails and the sides of the cabinets, the seams/gaps between the canister and bulkhead, and any seams seen in the canister itself, in case they opened during installation.
   b. Some installers choose LORD 7610DTM White Direct to Metal Adhesive/Sealant as a caulk due to its ability to stay flexible after drying and its ability to adhere well to the metal and plastic parts
   c. Once caulked, allow the parts to sit for about an hour to give the adhesive a chance to dry and “skin over”
   d. Once the caulking dries, the shade will be able to effectively shed and channel water to keep the contents of the cabinet dry.
   e. If any leaks are present in or around the canister or side rails, re apply caulk as needed.

18. COMPLETE SECURING CANISTER INTO BED

a) On each side there are 4 mounting holes
   a. In SECTION 6. POSITION CANISTER INTO BED one of the 4 mounting holes on each side was fastened
   b. In this section the remaining 3 mounting holes on each side will be fastened
   c. With the shade fully rolled up in the canister, the side plate mounting hole locations are partially blocked.

b) To increase access to the side plate mounting holes, fully extend the shade into the side rails and down to the bed using the motorized feature and controls previously commissioned
   a. Secure the 3 remaining mounting holes on each side using fasteners selected/provided by the installer (see blue circles in Figure 5b)
   b. The installer may use any appropriate mounting hardware and any thread-locking technology to ensure the hardware (NOT INCLUDED) does not back out due to vibration (self-tapping, split washers, adhesives, etc.).

c) Once the canister is affixed to the side walls of the bed, remove the temporary mounting bracket
   a. Keep the screws and washers, as they will be used to mount the top cover
   b. Discard the temporary mounting bracket

d) Install canister lid:
   a. Lay the canister lid onto the canister
   b. The inner holes on the lid will match up with the four holes that were previously used to house the shipping mounting plates.
   c. Inspect the D-seal
      i. At the point where the front of the canister lid overhangs the front of the shade, there is a factory installed 12" piece of black foam rubber D-seal to the face of the shade (Figure 18a – circled in red)

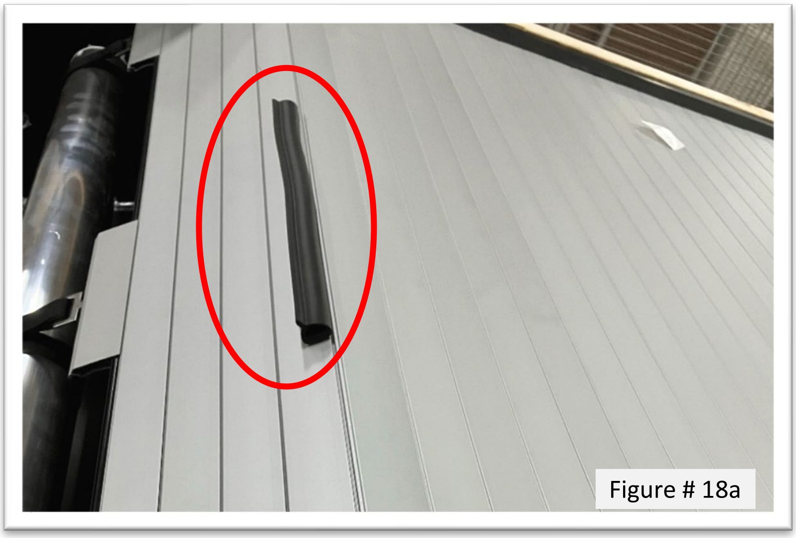


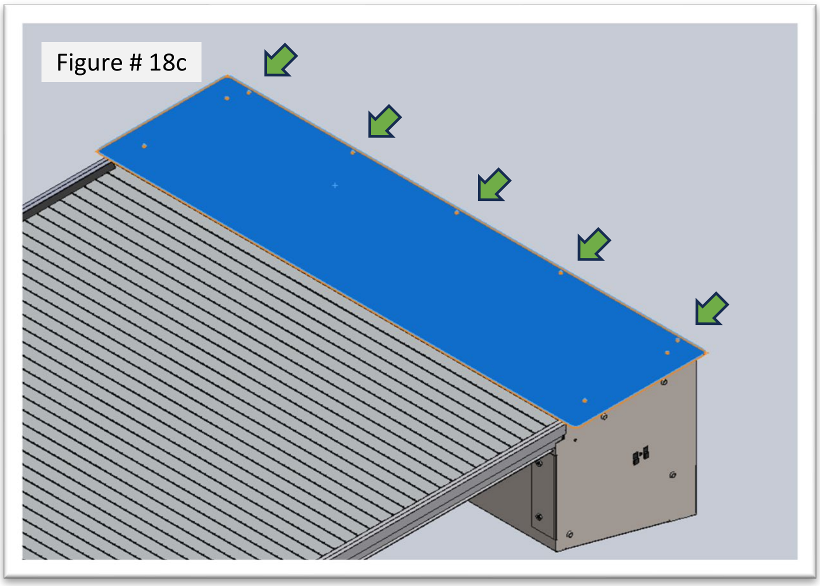
Figure # 18a

      ii. The D-seal should be hidden under the lid when the shade is closed, and centered on the face of the shade (Figure 18b – circled in red)

Figure # 18b

      iii. The D-seal will hold up the center of the lid when closed and allow water to channel into the canister
      iv. If this D-seal is ever compromised, contact the factory to purchase a replacement D-seal

d. Use the screws and washers to secure the lid to the canister mounting holes
e. Optional bulkhead/cabinet wall mounting
   i. The canister lid has a lip with a series of holes along the outer edge (see green arrows in Figure 18c)
   ii. The installer may optionally use these holes to further fasten the canister to the service body bulkhead
   iii. If so, drill pilot holes into the upper cabinet wall to apply mounting screws (provided by installer)



19. FOB Q&A


Figure # 19a

a) Pairing Remote(s) (FOB or Keypad)
   a. See SECTION 15. ACTIVATING THE CONTROLLER [step d]
   b. If also pairing a keypad, pre-read SECTION 20. 12-BUTTON KEYPAD

b) Q: How many FOBs can be synchronized to a single controller?
A: Up to 30 FOBs. Dynatect provides 1 FOB with each controller. Additional FOBs are also available for purchase directly from Dynatect. Repeat the programming process for each FOB being added.

c) Q: Can one FOB be linked to multiple shade controllers?
A: Yes, one FOB can be linked to multiple shade controllers (no functional limitation). Each controller needs to be linked through an independent process and requires access to the “program button” on each controller.

d) Q: What are the Dynatect FOB technical specifications?
A:
- Two button FOB @ 340 MHz
- Blue LED indicating transmission
- Uses (1) A23 12V battery. Lasts 45 minutes of continuous press. Typical usage is 1 year. FOB does not require re-pairing when replacing the battery.
- Typical transmit distance is 100’ – with some variation based on vehicle body material
- Dimensions: ~3”H x ~1.5”W x ~0.5”D (with antennae)

e) Q: Can installers provide their own FOBs that include other buttons?
A: Installers could implement their own FOB interface through the vehicle’s Body Control Module (BCM) which would then use relay outputs to the Motorized Bed Cover controller through the conductors used for “manual switch”.

20. 12-BUTTON KEYPAD*

*Optional (if ordered)

Figure # 20a

a) The Keypad is suitable for mounting inside or outside the vehicle (Figure 20a).

b) To the controller, there is no difference between the RF signal from FOB or Keypad. The keypad is subject to the same Q&A outlined in SECTION 20. FOB Q&A. Exception:
   a. The FOB will send a signal as long as a button is held (momentary pulse or sustained).
   b. The keypad will only send a momentary pulsed signal.
   c. This CAN impact the functionality of the shade, see SECTION 15. ACTIVATING THE CONTROLLER

c) All 12 buttons have a backlight. All button lights with illuminate when any key is pressed.

d) If Stop/Close button is pressed, the controller interprets this as a close command (there is no code needed to close the shade).

e) If the 4-digit pass code is entered, the controller interprets this as an open command.
   a. When the correct 4-digit pass code is entered, all the buttons will flash off, then on, confirming that the open command has been transmitted.
   b. If the wrong 4-digit pass code is entered, press “Clear” before re-entering the correct pass code.

f) BEFORE PAIRING the Keypad to the Controller
   a. Step A: Select and enter the desired 4-digit pass code
   b. Step B: All button lights will flash briefly, then off – confirming the 4-digit code is programmed.
   c. Step C: Proceed with “Pairing Remotes” as outlined in SECTION 15. ACTIVATING THE CONTROLLER
      i. During the pairing sequence for the keypad, only press the Stop/Close button for pairing
      ii. If in the future a different 4 -digit passcode is required, then repeat Steps A-C above. This requires re-pairing ALL desired remotes.

g) 12-button keypad technical specifications?
- 12 button FOB @ 340 MHz
- Each button illuminates when pressed
- Uses (1) A23 12V battery, typically lasting 1 years based on average use. Keypad does not require re-pairing when replacing the battery.
- Dimensions: ~4.5”H x ~2.5”W x ~0.75”D (excluding flanges)
- Supports 4-digit passcode

21. MECHANICAL Q&A

a) The Motorized Bed Cover utilizes a braked motor which functions as an autolock. Whenever the motor is not powered, the brake automatically engages. The combined geometry of the braked motor and shade retainers make the shade resistant to force open without tools. With tools, any shade can be opened.

b) Q: Can the Dynatect's traditional "manual key lock" or "power lock" be combined with the Motorized Bed Cover option?

- **Manual Key Lock** – Choice of standard cam locks – types: J236, B1250, CH751, CH501, J210. Lock is raised to allow easy access. Heavy-duty locks are available for large doors

- **Power Lock –** Compact design. Manual override in the event of a power failure.

Figure # 21a

A: No. These options are specifically left off the Motorized Bed Cover RFQ. The Motorized Bed Cover includes an auto-lock (braked motor). This lock is engaged at all times, except during the time the motor activates. Use of any other independent locking system risks having the lock engaged while the shade is attempting to move, creating a motor-stall condition.

22. ELECTRICAL Q&A

a) Q: What if the 12VDC or 24VDC inputs are reversed going into the controller?
A: The control has reverse polarity protection in the event the power is reversed when it is connected. The bed cover motor will not respond to a command to open or close

b) Q: Can Dynatect's controller operate on other DC voltages?
A: Controller will work over the standard automotive voltage compatibility range of
   i. 12 VDC controller range: 9.3-14.4 VDC
   ii. 24 VDC controller range: 20-28 VDC
- The controllers feature brownout protection and will not draw operate when the battery is below the minimum voltage (~9.3V or 20V) as this can cause erratic operation of the relays and other components).
- If the power to the controller goes below minimum voltage, then the controller will stop responding. Cycle the power off and on for the controller to resume normal operation.

c) Q: What is the idle current of the controller (power draw when not activating the motor)?
A: The controller idle current is 0.01 amps. Parasitic power draw for most vehicles is between 0.01 and 0.08 amps (retain radio memory, respond to key FOB, etc.) without adverse battery impact. Installers may choose to connect the controller as an accessory (powered when the vehicle is on), and the alternator can support the motor draw (up to 15 amps). The controller will accept commands <1 second after power-on. Installers may choose to leave the controller connected on electric vehicles with greater battery capacity.

d) Q: Is the PCB in the controller potted?
A: Yes

e) Q: What is the IP rating of the controller?
A: The controller/enclosure is intended to be mounted inside the vehicle. It is designed to meet IP67, "dust tight and protected against water splash". Dynatect adds a branded cosmetic cover to the IP67 controller which has no impact on the controller IP rating.

f) Q: Is there an encoder to know the position of the shade beyond full-open or full-close?
A: There is no standard encoder option. There are only three known states of the shade: open, closed, neither.

g) Q: If the motor gets too hot, is there a thermal overload protection mechanism?
A: No, the controller current overload is the overload protection mechanism.

h) Q: Can one controller control multiple shades?
A: No, the controller only has motor outputs and sensor inputs to support a single shade

i) Q: Can the network options be installed or activated in the field?
A: No, the network option must be specified at time of order for volumes 100+.

j) Q: Does the controller perform any logging?
A: No

23. EXTENDING CABLES

a) All controller cables are 6” long. Any additional cable extensions/connectors are the responsibility of the installer.
b) If the installer chooses to remove the factory installed connectors, the table below (Figure 23a) includes a list of Controller Pins/Sockets (green text) that will work with the tools outlined in SECTION 2. TOOLS & EQUIPMENT

Function	Power In***	Manual Switch (Shade-Open / Shade-Close)**	End of Travel Sensors (Shade-Opened/ -Closed)	Motor
Connector Positions	2	3	4	2
Controller Connector	DTP04-2P	DTM06-3S	DTM06-4S	DTP06-2S
Controller Pins/Sockets	0460-204-12141	0462-201-20141	0462-201-20141	0462-203-12141
Mating Connector	DTP06-2S	DTM04-3P	DTM04-4P	DTP04-2P
Mating Pins/Sockets	0462-203-12141	0462-202-20141	0462-202-20141	0460-204-12141
Wire Gauge	14GA	20GA	20GA	14GA
Pin1	Red/+12 or 24 VDC	Red/+12 or 24 VDC	Red/+12 or 24 VDC	Red/+12 or 24 VDC
Pin2	Black/Ground	Green/Close	Black/Ground	Black/Ground
Pin3	NA	Yellow/Open	White/Opened Limit	NA
Pin4	NA	NA	Brown/Closed Limit	NA

** The shade Open and Close conductors should be capable of conducting <0.1A at 12 or 24 VDC (momentary contact).

*** The power conductors should be fused and capable of delivering at least 15A at 12 or 24 VDC.

Deutsch-Style Connector suffix:
P = Pin connector
S = Socket connector

Figure # 23a

24. CLEANING & MAINTENANCE

a) Cleaning: Any shade with a painted surface should not be aggressively cleaned for 30 days from the time of shipment. When cleaning the anodized shade (shade slats), use only a mild non-abrasive soap and water. The side channels should also be inspected and cleaned periodically. Use the same type of soap as above and remove the dirt and grime from inside the channels. Cleaning any friction spots will help ensure smooth shade operation.

b) Lubrication: After cleaning, a dry silicone spray can be applied to the side channels and any friction spots to ensure smooth operation. Do not use lithium or grease to lubricate the track (these lubricants only attract dirt).

c) Inspection: Inspect the plastic endcaps at the end of each slat for any damage, beyond normal wear, that may hinder the shade operation. Replace with factory originals as needed (P/N: K25801). These endcaps engage metal cogs in the drive mechanism and are critical to consistent operation. In lab testing of 400k cycles, these plastic end caps showed some wear, but no cracking, and did not require replacement. Field conditions may vary.