



MJG Technologies Ltd – Canada



Bus Safety Solutions - USA



IC Bus Installation Manual

Extended Stop Arm v. 4.4E

ELECTRIC Actuator System – With Momentary ON/OFF Switch



Revised 07-21-2021

Contents:

- Tools Needed
- Removal of Specialty Stop Arm
- Run Electrical Power Connection
- Install Hinge Frame
- Install Control Box and Board
- Run Electrical Connections
- Install Frames & Signs
- Install Bumper
- Button Up

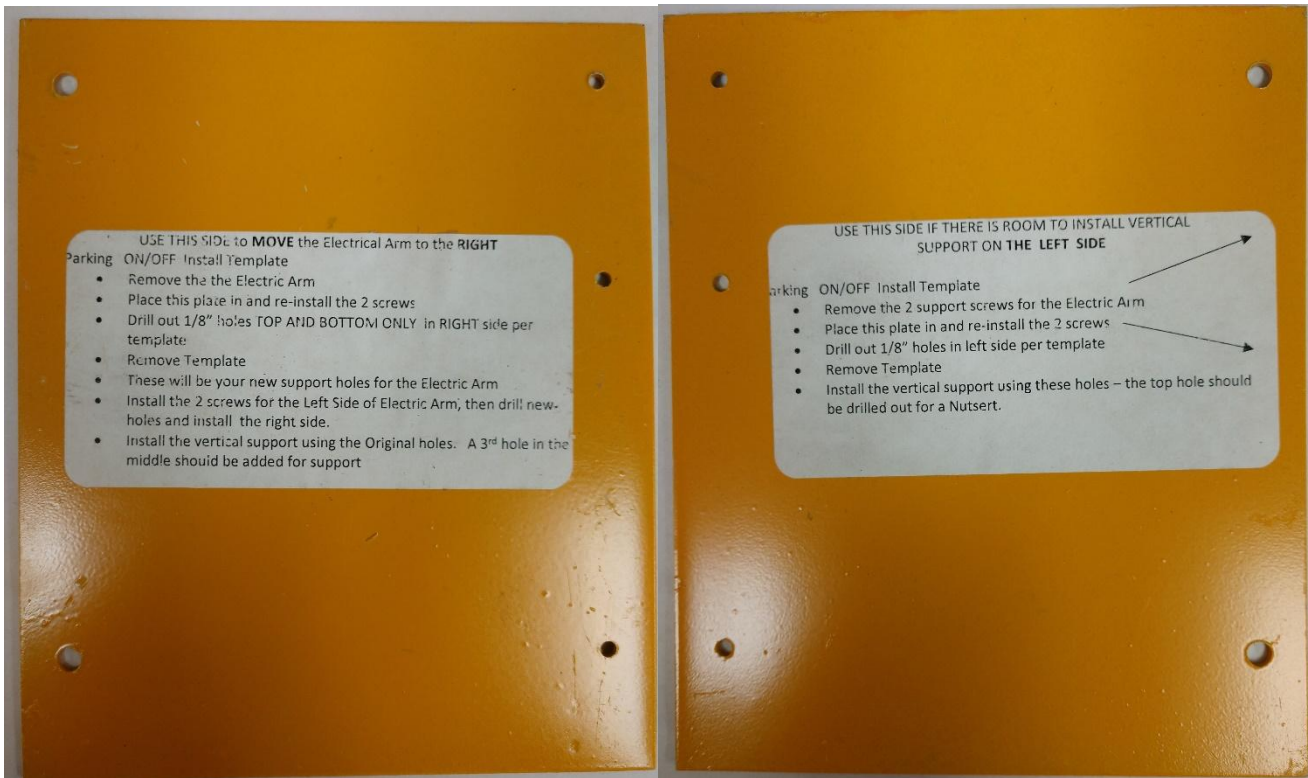
NOTE: Read this manual first and note the pre install instructions and check list.

Tools and Supplies Needed

- | | |
|----------------------------------|---|
| • Safety Glasses | • Needle Nose Pliers |
| • Work Cart | • Cold Chisel |
| • Magnetic dish | • #2 Philips head screwdriver |
| • Tape measure | • #3 Phillips head screwdriver |
| • Small Level | • Flathead screwdriver |
| • Impact Driver | • 2 - ½" Wrenches |
| • Drill Motor | • 2 – 5/8" Wrenches |
| • Assorted nut drivers | • 2 – 7/8" Wrenches |
| • #2 Philips Bit, #3 Philips Bit | • 1/8" Allen Wrench |
| • Assorted drill bit set | • Socket Set |
| • 7/8" Conduit Hole bit | • 1/2" NPT Steel Pipe (7/8" diameter) 8" Long |
| • 9/64" Steel bit | • Electrical Wire Crimping Tool |
| • ¼" Steel Bit | • Electrical Wire Stripping Tool |
| • 5/16" Steel Bit | • Electrical Multi-Meter |
| • Hammer (14 oz) | • Clear Exterior Silicone |
| • Hammer (2 lb) | • School Bus Yellow Exterior Silicone |
| • Vice Grip – Small & Large | • Nutsert tool |
| • Utility Knife | |

Depending on the original bus installation of the stop arm, you might be able to install the Extended Stop Arm without moving the original. This is shown in the picture on the cover. But in some cases due to the electrical panel door you will have to move the original stop arm.

Use the INSTALL TEMPLATE to align both stop arms. This is used regardless of whether the Extended Stop Arm is mounted towards the front, or the older unit has to be moved to the rear. The pictures below are of the template for moving either the Original sign or the new arm to correctly fit the situation. There are 2 sides, use the correct one.



Removal of Electric Specialty Stop Arm

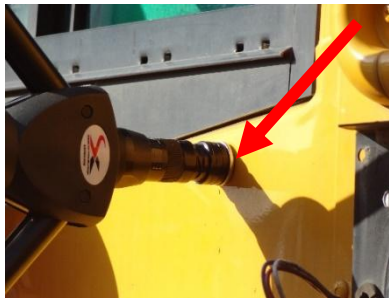
- Carefully remove the entire existing Specialty stop arm.
- The original sign and wiring harness will be re-used with the Extended Stop Arm.

Install Vertical Support

- PRIOR TO INSTALL, MAKE SURE NO SCREWS WILL PENETRATE A CABLE WITHIN THE BUS!
- Install Vertical Support Bar, must be vertical, use yellow bus siding panels as guide. Pre-drill with 9/64" drill bit as needed.
- In the picture below, the original sign has been removed and the vertical support has been installed using the original holes. In some cases a new electrical supply hole will have to be drilled 4.5" towards the rear, and fish over the supply cables.



- Use $\frac{3}{4}$ " x 12 self-tapping stainless steel screws or 1-1/4" x 12 if necessary. Be sure no rivets or screws interfere with a tight fit against the side of the bus, if so remove them.
- The top left attachment should be marked, drilled, and a Nutsert used to securely anchor the vertical bracket. Carefully follow Nutsert tool instructions.



- Once the vertical support bar is attached with Nutsert bolt and sheet metal screws, attach the hinge plate.



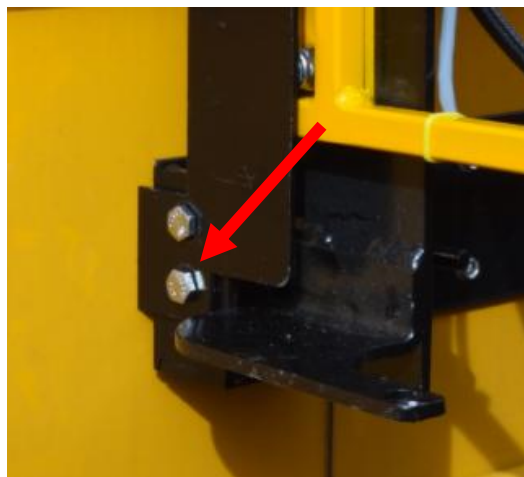
- Remove the top collar and nylon washer.
- Push the hinge pin through the top bearing, add nylon washer and shaft collar with pre-drilled hole.
- Insert cotter key and tighten shaft collar with red Locktite using an Allen wrench.

Connect the Lower Support Bar

- This bar should be attached below the rib, and at a 90-degree angle to the vertical frame.
- Remove any rivets or screws that may be behind the bar.
- You may have to move any side lights or cameras that may be mounted in the way of the bar. The mid ship light usually can be moved down easily as there is plenty of cable inside the bus. The same with a camera.
- Install lower support bar with a shaft collar and nylon washer. The hinge shaft should be flush to the bottom of the bearing when installed. Install 2 of the 1" x 12 self-tapping screws in the middle area of the lower support, and then test hinge to make sure it is swinging freely.
- Lower support must be parallel to bus ribs and tight to Vertical Support Bar at left side. Press up slightly to make lower shaft collar hold some of the support before tightening.
- Attach the bar to the bus using #12 x 1" sheet metal screws or rivets.
- Bottom shaft collar should rest on nylon washer
- Tighten the bottom shaft collar with Allen wrench



- The Vertical Support Bar has 2 pre-drilled holes at the bottom left corner. Using one of these holes as a guide, drill a 1/4" hole in Lower Support to attach to Vertical Support Bar and install 1/4" x 3/4" bolt and nut with nylon insert lock nuts. Make sure that the vertical piece does not protrude beyond the lower brace or it will interfere with the operation of the arm.



Install Control Box and Board

- Drill a 7/8" hole in the rear end of the electrical arm box cover to allow for the electric conduit.
- Install the Yellow PVC electrical box by inserting the flex conduit into the hole you just made.
- Use 4 #12 x 1" ss screws
- Run the wiring harness and cables through the hole and attach control box to the bus using 4 screws.
- If the control box covers any numbers, new decals will need to be applied.



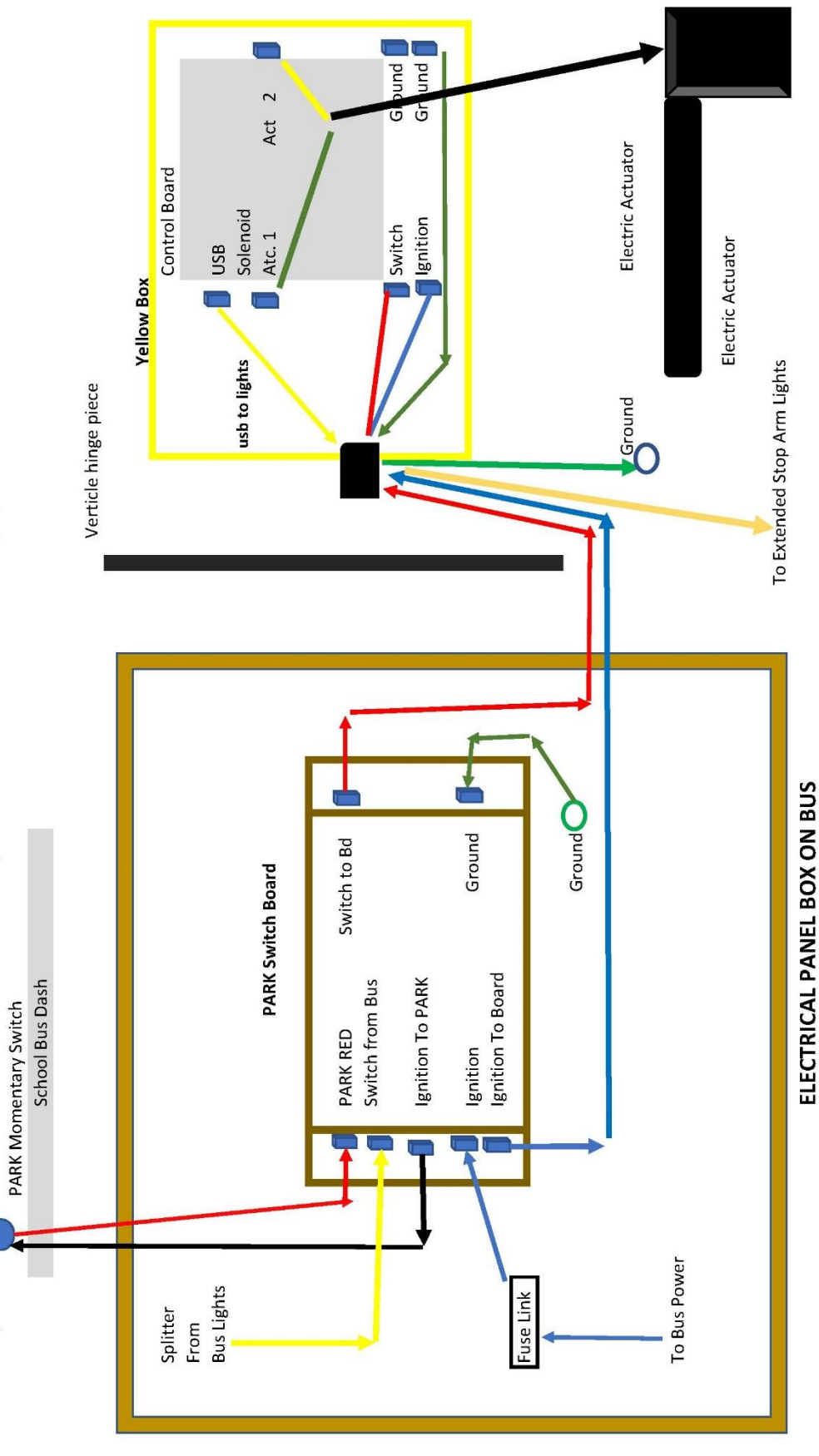
Install control box behind the original sign



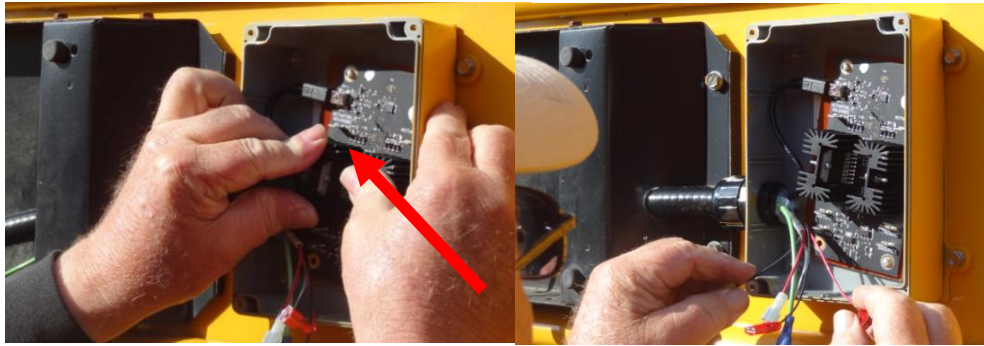
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Bus Safety Solutions

PARK Switch Layout

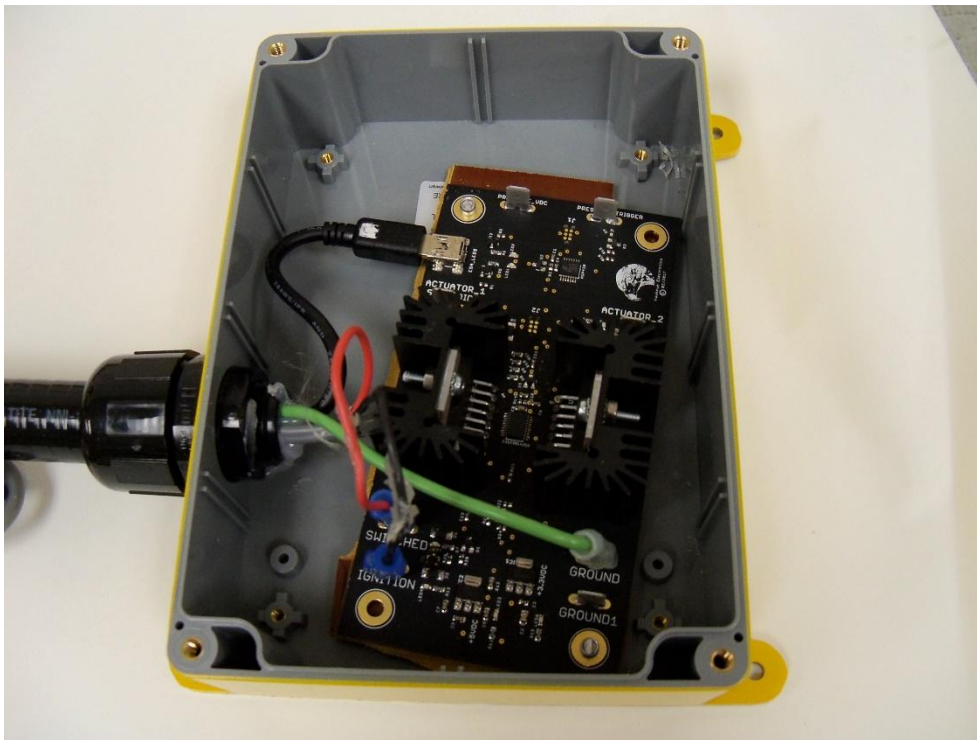


- FIRST, connect the Min-USB connector for the lights to the board, then attach the control board to the box using the double-sided tape pre-applied to the back of the electronic board. The board will typically be positioned in the box at an angle.



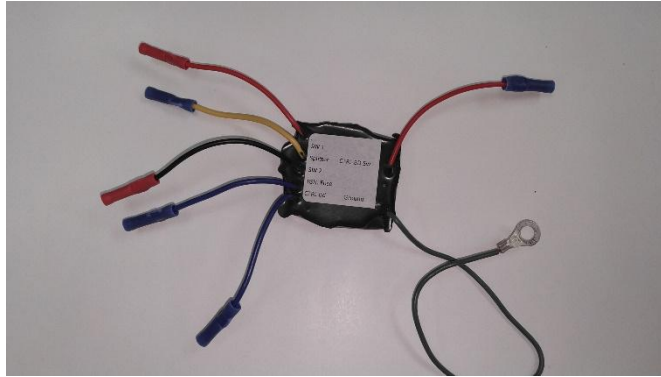
Connect the remaining wiring.

- The Green Ground wire connects to the GROUND terminal
- The thick red wire attaches to the SWITCHED terminal
- The thick black wire attaches to the IGNITION terminal



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- When attaching the two wires from the actuator, the green wire goes to ACTUATOR_1
- The Yellow wire goes to ACTUATOR_2
- Refer to diagram on page 7
- Screw on the cover plate using the provided screws.

Run Electrical Connections and Install Momentary Board



The Momentary Board needs to be located in the electrical panel on the side of the bus. This can be done with the RED double sided tape on the back or with a zip tie `

- The Momentary Board requires a 12-Volt power source. This can be found in the electrical panel of an **IC Bus**.
- If the accessory block is already in use, not present, or not functioning, find another power source and include an in-line 15-amp fuse.
- Inside the bus, connect the blue exterior wire to the 15 Amp Fuse link.
- Find a solid ground and connect the green “Ground” wire.

Install Momentary ON-OFF Switch

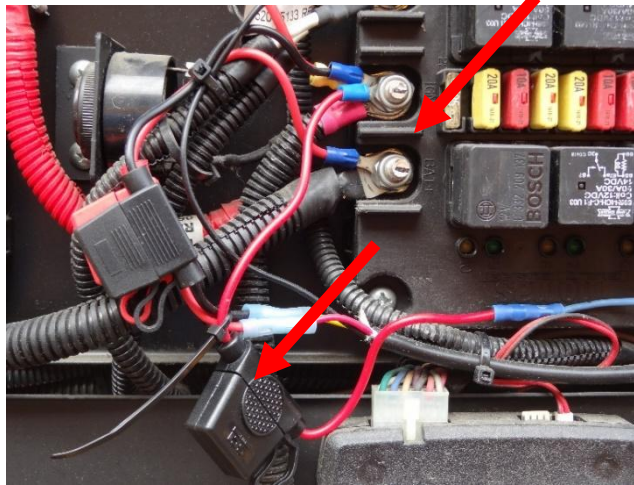
- On the control panel install the switch shown below. The most ideal place for the Momentary ON-OFF switch is usually as close to the warning light and door buttons as possible. When the switch is pushed to ON the light will be on showing that the Extended Stop Arm will now go out with the short arm when the red lights are turned on.



- Take the Momentary ON-OFF switch wiring and connect one RED to the red wire going to the Switched terminal on the new control board. The other RED wire goes to the splitter for the OEM stop arm light control.

Run Electrical Power Connection

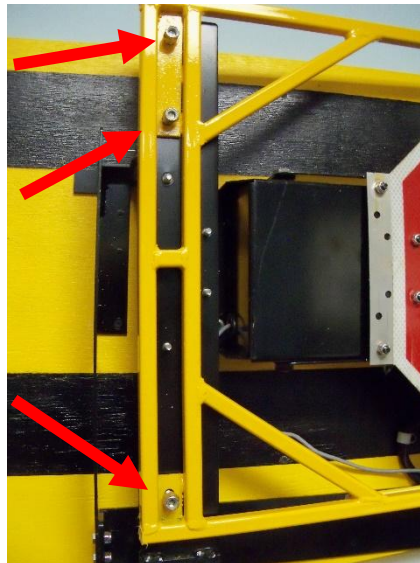
- The Extended Stop Arm requires a 12-Volt power source. This is connected to the Momentary Board
- On the **IC** equipped with an electric arm, run the power wire through the same hole that the Specialty light wires are located. This will typically require using a stiff wire to help fish the power wire through the siding and behind the rib of the bus.



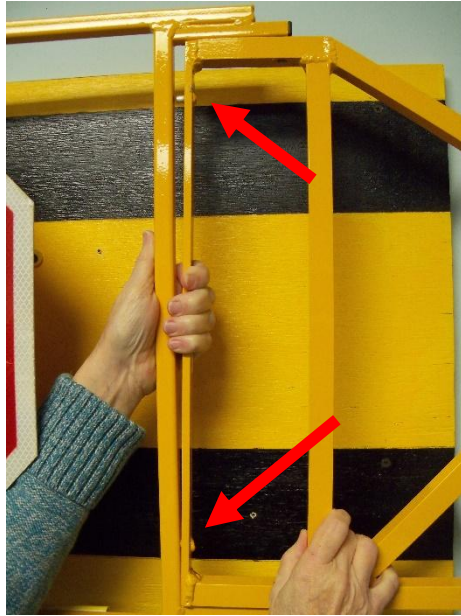
Run Electrical Connections

- Connect a splitter (supplied) to the blue switch wire for the Specialty lights.
- Attach the green ground connector using a self-tapping screw into the bus siding.

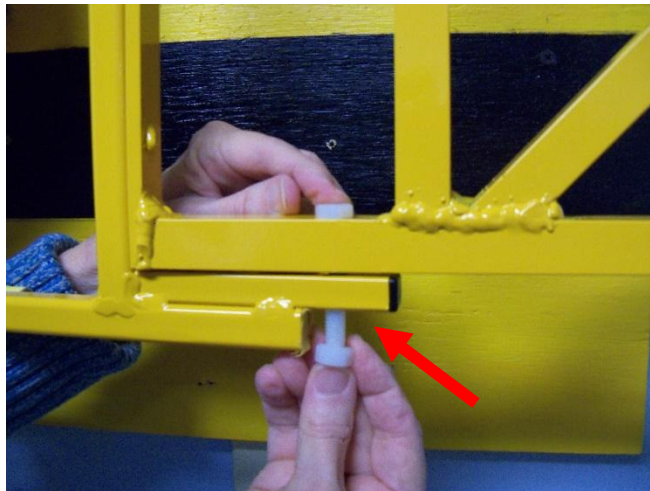
Install Frames & Signs



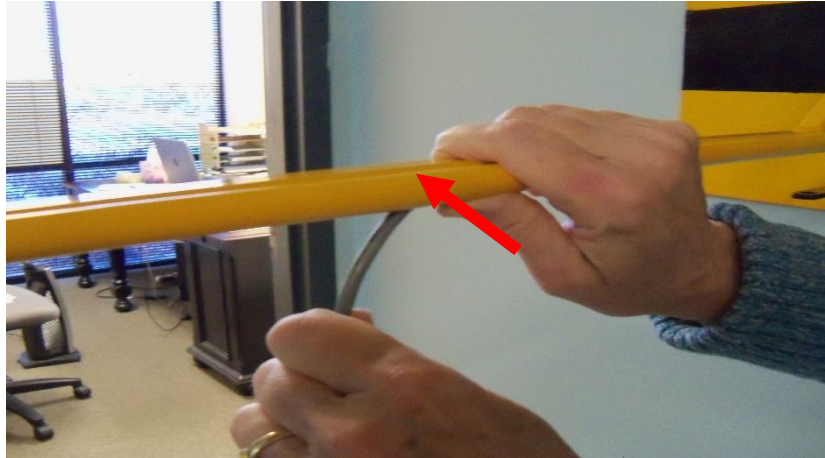
- Attach steel frame to the vertical frame using 3 3/8" nylon insert nuts found on hinge plate.
- Tighten with 9/16" nut driver.



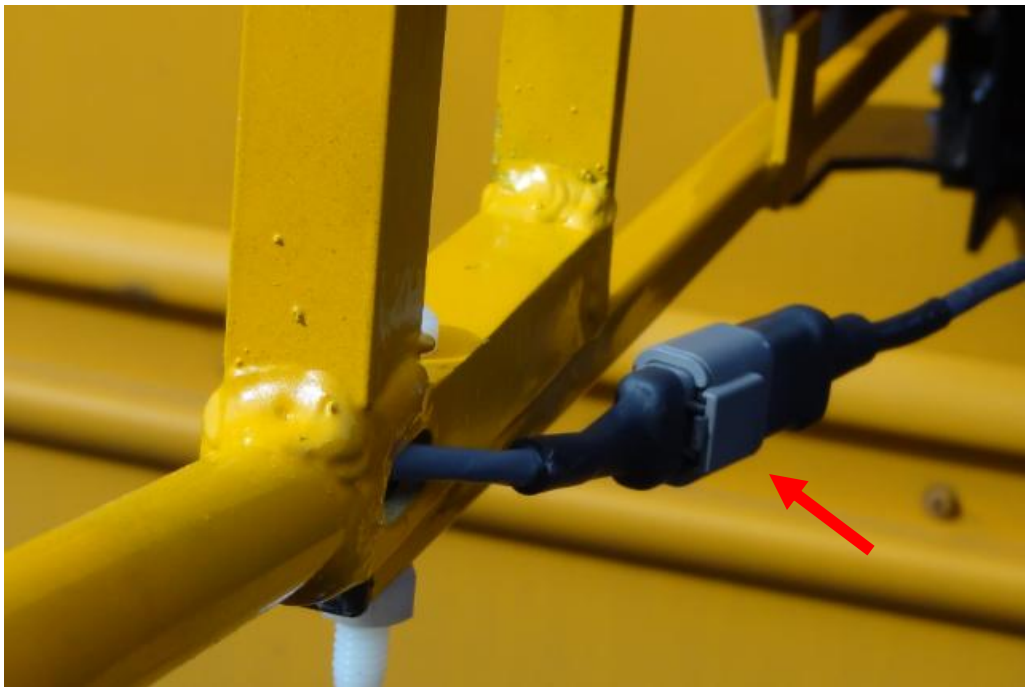
- Attach Extended Stop Arm to steel frame.
- Align using steel $\frac{1}{4}$ " round studs, once aligned, hold with vice grip, or an additional set of hands.
- Sometimes you have to use the vise grip to press the pins into the holes. If so apply pressure directly over the pins.
- Secure using the $\frac{5}{16}$ " nylon bolts and nylon nuts. These line up with the steel and aluminum parts being flush on the front side of the frame. The hole is off center in the aluminum deliberately. If these do not go in even with pressure, take a $\frac{5}{16}$ " drill and clean out the hole so that it does go through.



- Tighten nylon nuts to snug with a wrench. Do not overtighten.



- Insert the electrical cable for the lights into the wire mold as shown above



Install Bumper

- Connect electrical harness to extended stop arm using harsh environment ATM connector

- Position rubber bumper vertically at the point of the bar connecting sign to frame.



- Attach with 2 stainless steel sheet metal screws. One on either side of bumper.



- Adjust sign by bending it slightly away from bus to ensure lights do not hit the bus when closing.



Attach Electric Actuator

- Connect rear of actuator using 7/16" bolt, nylon washer and nut
- Connect front actuator to steel hinge frame using clevis pin.
- Nose piece may be unscrewed to adjust the tension of the actuator – adjust in closed position. This should be snug against the bus when the Extended Stop Arm is against the bus.



- Tighten bolt once you confirm arm is working well.
- Secure clevis pin with cotter key

Button Up

- Run through installation checklist to ensure that all items are complete.
- Ensure that bus driver is aware and trained on using their new Extended Stop Arm.
- Place driver placard on dash
- Return Registration Card to Bus Safety for Warranty Purposes

Extended Stop Arm Installation

Date of Install _____ Bus Number _____ Make / Model _____
 State _____ County _____ School _____

Wiring or Mechanical Issue	Recommendation

Checklist:

Part/Procedure	Check	Notes
New box & board with ground wire		
Ground wire screw does NOT have rubber washer		
Confirm conduit from control box is sealed		
Steel Black frame vertical NOT over any rivet or screw		
Install cotter key and apply Loctite to set screw		
Install lower support, NOT over screws		
Disconnect air or turn off old sign mechanism		
Install new black front cover – careful not to pinch wires		
Insert grommet into front cover		
Install rear bumper		
USB connection (Grease, Liquid Tape, Electrical Tape)		
Shim as necessary – Lock-Tite at shimmed nuts		
Lock-Tite actuator back bolt		
Clevis pin actuator front bolt		
Tighten watertight nut at box		
Ensure all bolts and nuts are tight		
Confirm bus runs and that lights work		
Confirm sign extends and retracts		
Check inside bus		
Drill two drain holes in control box		
Take picture of completed unit – send picture to Scott		
Double-Check Triple Check		

Installers

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From your Friends at CMVTC MJG Technologies Canada
and Bus Safety Solutions USA

Please Contact **Bus Safety Solutions**, the Manufacturer at
1 336-671-0838 if you have any issues with
your installation.

Attach Mini Poster to your bus bulkhead for the bus driver.

Your ESA

Operation of the ESA (Extended Stop Arm)
This ESA equipped with the Momentary
Cancel Switch. This prevents the ESA
from extending for a single stop.

How to use:

1. Depress the Momentary Rocker Switch.
2. Depress the Stop Arm Switch within 20 seconds.

When should you use the Momentary Cancel Switch?

- If there is another vehicle directly next to your bus.
- If there is another parked bus directly next to your bus.
- If you are in a garage and your ESA arm would hit a wall or person.
- If you are boarding or deboarding at a school, and your extended stop arm would hit other vehicles.

Potential Technical Issues:

- Do not repeatedly switch on and off the momentary switch without allowing it to reset – approximately 20 seconds. Doing so could cause the board to malfunction.



Thank You and Safe Driving