

Bus Safety Solutions



Installation Manual

Extended Stop Arm v. 4.0

AIR System

Blue Bird



NOTICE: BEFORE STARTING YOU MUST HAVE AN AUXILIARY AIR SOURCE TO INSTALL A PNEUMATIC – AIR OPERATED SYSTEM. That could be a currently operated bellows unit, or you might have to run the air off of a tee from under the driver's seat or even over to the door unit. You must obtain a full pressure of at least 60# to 125# source.

PLEASE TAKE 5 MINUTES AND READ THE ENTIRE INSTRUCTIONS BEFORE STARTING, so as to get an overall picture of the process. Then follow page by page. Please call if you have any questions.

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Tools and Supplies Needed

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

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Removal of Specialty Stop Arm

- Disconnect sign from the specialty box by removing the four nuts connecting the sign.



- Pull out as much cable to the lights as you can. If an electrical unit, they will be tied up inside the box, if an air bellows unit it will be tied up inside the control panel.
- Remove the old sign unit whether electric or air bellows unit.
- Cut the electrical light harness cable and air hose. This will need to be spliced later. OR disconnect the male/female connection.
- If there is a back sign on the bus and is operated by an air bellows unit, then cap the front line off.



Assemble the Hinge Frame

- Here is the hard part, you are going to loosely assemble the 3 frame pieces, and then place against the bus so that you can mark a hole or two for the lower support bar. At this point you might need an assistant for a minute to hold the lower piece in place.
- The lower support frame needs to be aligned so that the holes will be on the tops of the ribs.
- Be sure that the ½" rod is flush with the lower support bearing.
- Align the Vertical support on the left side parallel to the seam in the bus. Mark a hole for the nutsert.
- On Bluebird Buses use the Bluebird spacer (included) with the Vertical Support bar to compensate for the lower support bar being mounted atop a rib.



Attach the Lower Support Bar

- PRIOR TO INSTALL, MAKE SURE NO SCREWS WILL PENETRATE A CABLE WITHIN THE BUS!
- Now that you know where to attach the lower support bar, you will most likely need to drill pilot holes for each screw into the rib. The holes in the lower support are drilled to match the ribs on the Blue Bird. These should be drilled at the highest point of each rib.



Install Hinge Frame



- The top right attachment should be marked, drilled, and a Nutsert used to securely anchor the vertical bracket. Carefully follow Nutsert tool instructions.



- Install Vertical Support Bar, must be vertical, use yellow bus siding panels as guide. Pre-drill with 9/64" drill bit.
- Use 1-3/4" x 12 self-tapping stainless steel screws on the vertical bar where spaced out. Be sure no rivets or screws interfere with a tight fit against the side of the bus, if so remove them.

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

- Remove the top collar and nylon washer.
- Push the 1/2" shaft of the hinge plate through the top bearing, add nylon washer and shaft collar with pre-drilled hole.
- Insert cotter key and bend back. Put red Locktite on Allen screw and tighten shaft collar with an Allen wrench.

Bottom shaft collar should rest on nylon washer

- Tighten the bottom shaft collar with Allen wrench
- The lower support should be flush at the bottom



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



Attach Air Cylinder

- Connect front cylinder rod to steel hinge frame using clevis pin.
- Connect rear of cylinder using 7/16" bolt and nut
- The air system solenoid, hoses, and cylinder have been pre-assembled and tested in our shop.
- However if you adjust any hoses , you will need to adjust any fittings for tightness



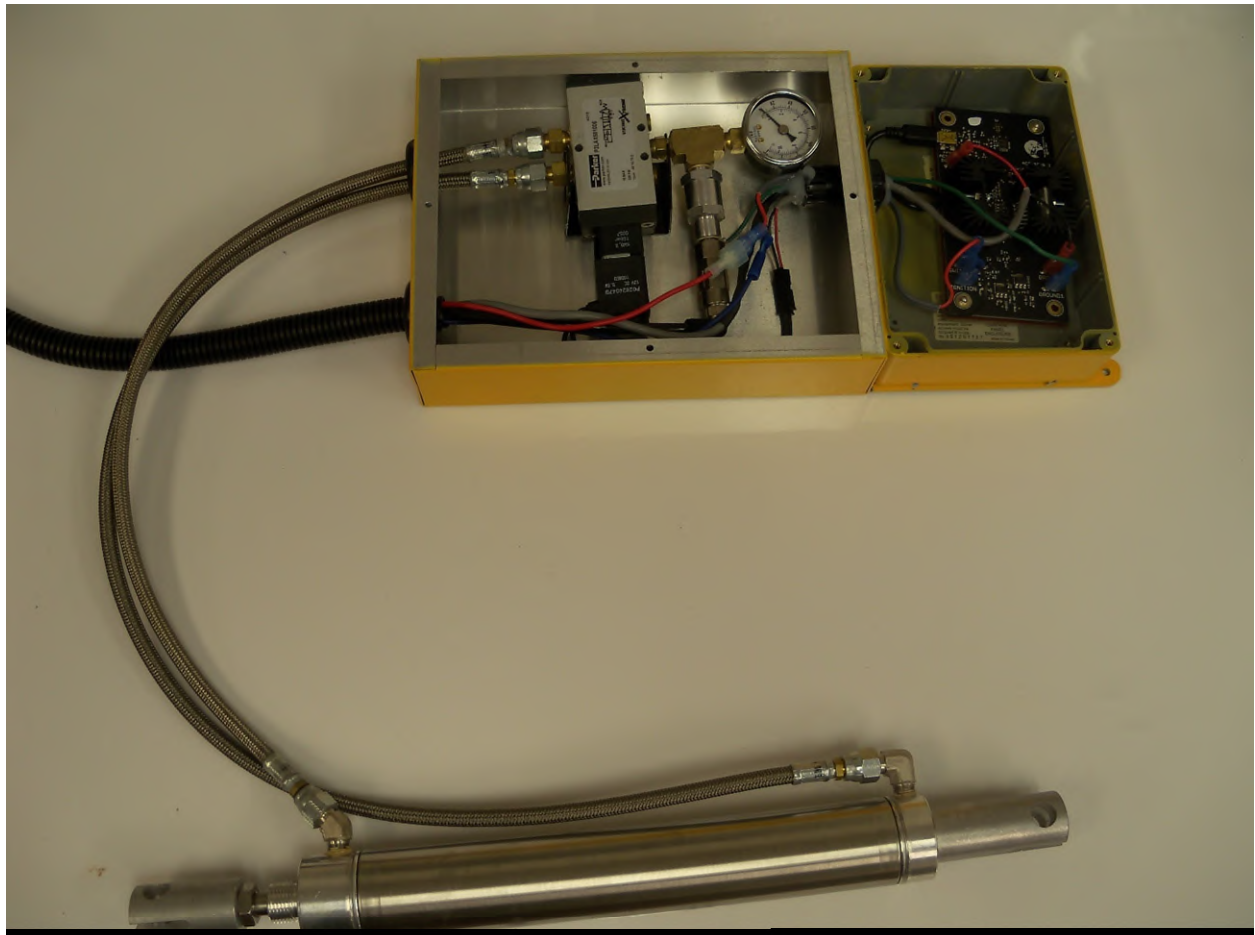
- Wait till end to tighten bolts until end of install once you have confirmed arm is working well.



- Secure clevis pin with cotter key at end of install

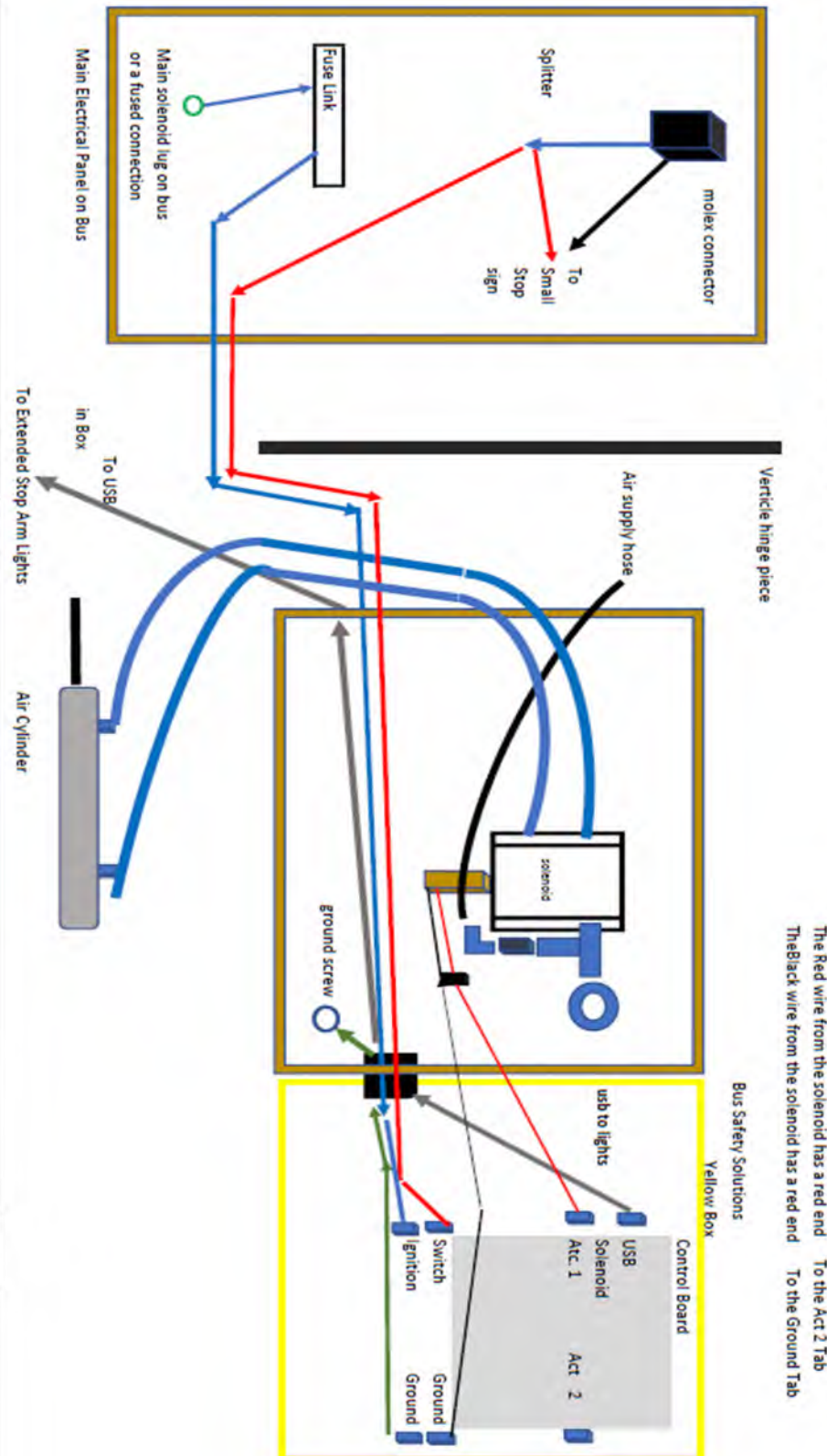
Attach Solenoid / Control Box

After you connect the Air cylinder at the rear end and locate the new control box a few inches from the hinge plate. Secure with 4 #12 self drilling screws. 2 of them in the aluminum box and 2 of them on the right out side of the plastic box in the tabs.



Affix the ground wire (green) to the bus using a #12 screw

- Ensure that a good ground connection is made



Install Frames & Signs

- Attach original sign to the hinge plate using 4 original ¼" nylon nuts

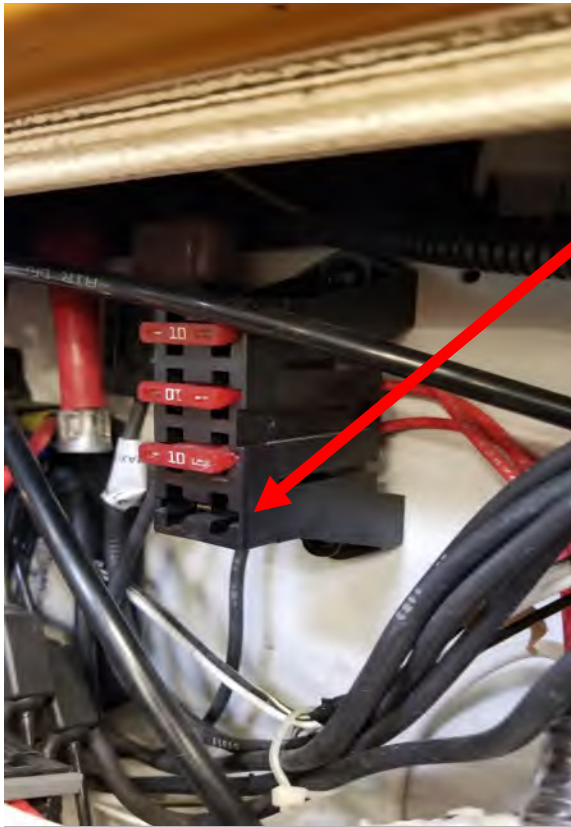


- Attach steel frame to the vertical frame using 3 - 3/8" nylon insert nuts found on hinge plate.
- Tighten with 9/16" nut driver.
- Alternate tabs on frame to either side of original stop sign.



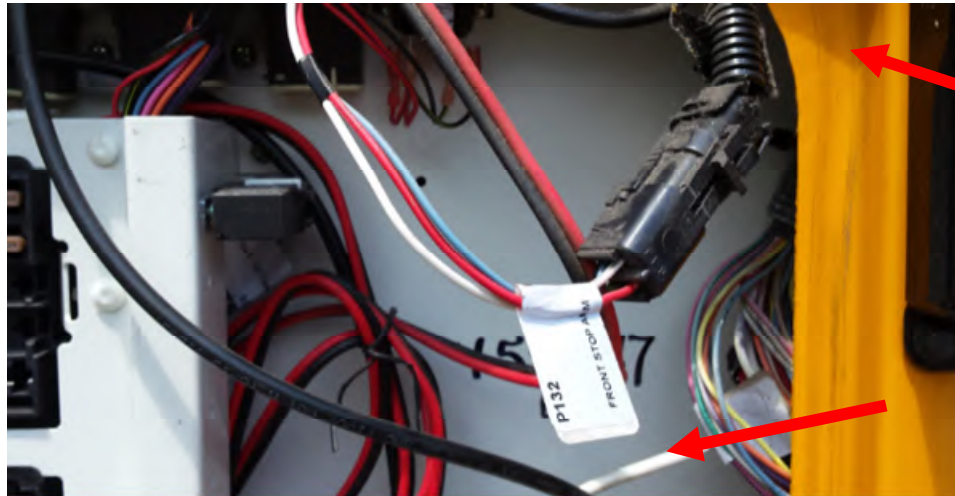
Run Electrical Power Connection

- The Extended Stop Arm requires a 12-Volt power source. This can be found in the panel box in Bluebirds.
- On a **Bluebird**, run the power wire through the same hole that the Specialty light wires are located.
- Connect the wire to an accessory block **THAT IS CONTROLLED BY THE IGNITION SWITCH** and insert a 15-amp fuse
- If the accessory fuse block is not present or functioning, connect to the main power and use an in-line 15-amp fuse.
- Run the power wire all the way into the control box with the Bus Safety Air Solenoid. Connect the black power line to the 12-Volt source using a butt connector.



Connect the Splitter

- The Extended Stop Arm is activated when it receives a signal from the wire going to the Blue Bird sign. In Bluebirds, this is frequently a blue wire inside the panel. On newer models this wire comes from the 8-way flasher control. It is marked "Red Lights". It may also be a wire labeled: Front Stop Arm



- Cut the blue wire and white wires coming out of the black mollex connector and attach male ends to them. Attach the the splitter to the blue wire. OR keep the mollex connector and add male ends to the wires.

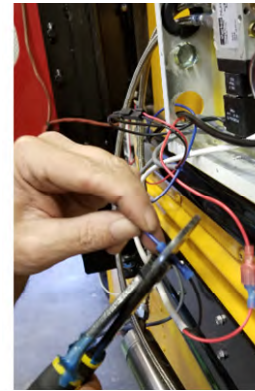
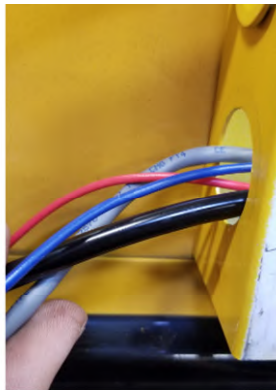


Connect the Blue Bird Arm Lights

- Run the Blue Bird Arm Light cable back into the wiring panel, attach the wires to one end of the splitter and the white power cable, red to splitter and black to White

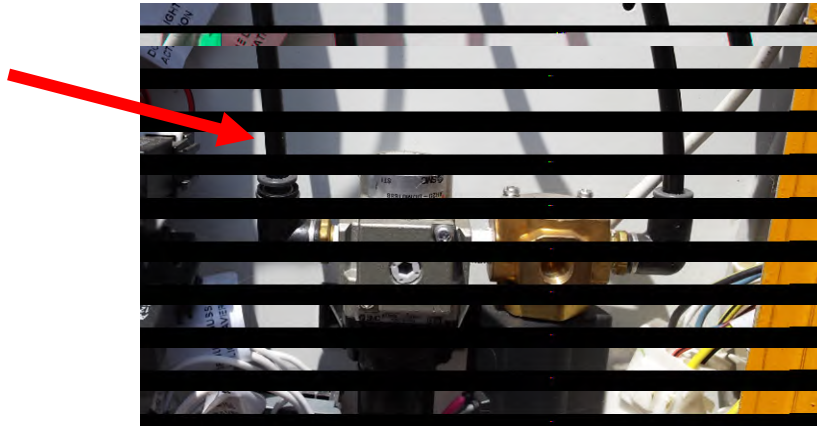
Connect Electrical Connections in the Bus Safety Air Solenoid box

- Connect the Molex connector to the air Solenoid module.
- Connect the black power line to the 12-Volt source using a butt connector.
- Attach the green ground connector using a self-tapping screw into the yellow aluminum box bus siding.



Run the Air Hose

- If the Blue Bird sign was powered by air, you should have air in the control panel, if not, you will need to run your air to the seat air, or even the door air. If you don't have air anywhere, give us a call and we can send you an electric actuator unit.
- Locate the input air line, disconnect from regulator, connect a tube-to-tube connector and run the line straight out to the solenoid in the box.
- IF you have 2 signs on the bus, and the back one is run by Air Bellows as well, then you will have to TEE off at the incoming side and run a new air line to the front unit. Cap off the old line at the side of the bus.
- The Extended Stop arm needs at least 60# pressure to operate and can handle 120#. That is why you by pass both the control solenoid and the pressure regulator.



Connect the remaining wiring in the Control Box

- The **Green Ground** wire connects to the GROUND terminal
- The **thin red** solenoid wire attaches to SOLENOID terminal.
- The **thin black** solenoid wire attaches to GROUND1 terminal.
- The **THICK Red** wire attaches to the SWITCHED terminal
- The **THICK Black** wire attaches to the IGNITION terminal



- 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.
- Secure using two $\frac{5}{16}$ " nylon bolts and two nylon nuts



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

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



- Attach electrical harness to bottom of steel frame using 3 yellow zip ties



Install Bumper

- 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.

Button Up

- Screw on the cover plate using the provided screws.
- Spray test all air fittings with soapy water for leaks.
- Attach new left cover plate using $\frac{3}{4}$ " x 12 self-tapping sheet metal screws.
- Ensure that electrical wires and air tubes are protected by rubber grommets
- Use black zip-ties to secure all cabling and hoses.
- 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.

Operating Procedures

- Come to a complete stop. Wait for traffic to stop.
 - Turn on reds. This will extend the arm
 - Open door.
 - Allow children to exit and cross the road completely.
 - Turn off reds. This will retract the arm.
 - Wait for arm to completely retract – typically 4 – 6 seconds (depends on pressure in the system)
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- If sign is hit or malfunctions for any reason or is being towed, the stop arm can be secured to the side of the bus with a zip-tie or cord.

From your Friends at Bus Safety Solutions

Please Call

if you have any problems with the installation 336-671-0838