

Door Assembly Instructions

1. **SAFETY FIRST:** Your health and safety is more important than anything else. ALWAYS WEAR SAFETY GLASSES and other safety gear (use blade guards, handles, gloves, ear protection...). And always use best practices to avoid any injury or damage. YOU ARE RESPONSIBLE FOR YOUR SAFETY AND ASSUME ALL RISK ASSOCIATED WITH ASSEMBLY OR FABRICATION.
2. You may be able to do many steps in a different order.
3. **DO NOT DAMAGE THE OTHER DOOR SKIN WHEN DRILLING.** When drilling be sure to brace the drill so you only drill through the one door skin and do not damage the other surface or skin. Many times guys will push hard to drill through say the inside surface of the door but they are pushing so hard that the drill bit hits and damages/chips the outer door skin. So any time you are cutting or drilling be aware of what is on the other side (e.g. don't drill through and break the glass or other surface).
4. To get started mark to cut an access hole under where the metal door panel cover will go if it is not already marked. You may only want to cut the flat inward surface (see image ->) to leave a lot more strength in the door (years ago they used to cut all the way up to the window opening but you should be able to just cut in the innermost surface like in the images).
5. Before marking the access hole you will probably want to center the metal door panel cover based on the window opening. The goal is to cut the access hole wide enough to fit the glass but narrow enough to be covered under the metal door panel cover (see images). Years ago they used to cut all the way up to the window opening but you should be able to just cut in the innermost surface like in the images). Make sure to center the access hole below the window opening left to right. Only do the access hole wide enough to fit the glass and not too wide so the hole will be overlapped by the metal door panel cover. Normally the access hole is about 24.75" wide so the glass can fit down inside and you can't see the hole under the cover.
6. Position the metal door panel over the hole. The panels are made wider than the fiberglass sections so you can wrap in vinyl if desired. Use spacers to create a gap under the metal panels otherwise the door panels holes may not line up later if wrapped in vinyl. Gently clamp the metal into place on both ends to avoid the metal moving while marking. Mark the holes for mounting. You can also mark the edges to know where to cut the access hole.



7. Mark the access hole and cut the fiberglass (be very careful with power tools as your safety is of utmost importance:-).



8. Drill/cut some drain holes on the bottom of the doors up against the inside skin (like holes/slits in all car doors) so water can drain out the holes when water inevitably gets inside the door. Consider the location of the drain holes so the water drains outside of the vehicle (e.g. later cut a notch on the trim you stick to the door so the water can drain past the trim to the outside of the vehicle). You may want to center the hole about 14.5" from the front edge of the doors.



9. Position the outer door hinges in place centered in the indentations. You may want to use a deep-throat bar-clamp from the back to the front over the hinge plate to gently hold each hinge in place exactly where you want them so you can mark through the holes. Mark the holes then drill through the fiberglass.



10. Next you will want to mount the hinges using 1/4" - 20 bolts (1" long should be plenty so the bolts don't go in too far and break glass or get in the way later). So turn the door over and position the hinge backing plates into place. The top backing plate is easy to access and mount but the bottom one is more tricky. For the bottom one insert your arm and elbow into the door (e.g. if the cavity is on the right then use your left arm so you can rotate it into place). Hang the front of the door off the edge of the table so you have room to insert a bolt through a hole in the outer hinge plate then through the hole in the door. Then line up the end of the bolt into the corresponding hole in the backing plate and hand tighten a few turns. Repeat the process for the other two bolts.



Make sure the bolts are started properly (e.g. hand tighten most of the way). DO NOT OVERTIGHTEN and break the small bolts.



11. On this next step with HMMWV's you may want to rough trim the sharp corners to fit the rounded door openings before you can positioning the doors how you want then weld the hinge pins into place. Hold the door in place pressed against the body and position over the door opening where you will want it (see about the hinge plate alignment to where the hinge pin receivers are located, note the gaps and body lines on the doors and body). Then when things are lined up about where you want you can mark the corners to trim off just enough to get the door into the door opening (you can trim and gap the doors later - for now you just want to be able to trim the absolute minimum necessary to get the door into place to weld on the hinge pins).
12. Next position the door where you want it inside the door openings and wedge, shim, &/or hang in place with some bar clamps from above. You can adjust corners in or out to try and balance the outer surface of the door (e.g. if the top left and bottom right are both sticking out then you can balance so they both are about the same or favor the top being in better alignment).
13. Now that the door is in place you can tack weld the hinge pins. Some may use bolts with the head cut off to weld on as hinge pins that way you can use a nylock nut to hold the doors to the hinge receiver tubes. If you are using the provided weld-on hinge pins you will probably want to weld the cup side onto the hinges and the pin side on the body side so that water will not get into the cups and rust. When you tack weld the hinge pins in place you may want to put a little rotation on the hinge pins so there is not slack so the back of the door doesn't drop/rotate when the pins take up the slack when you remove the clamps. Once everything is where you want it and you have tested the doors to make sure they open and close without issues/binding, then you can finish weld the hinge pins. If you are also welding the hinge-pin receivers/cups you need to be careful to not weld the pins to the receivers/cups(a couple of extra weld-on hinge pins are included in case there are any problems).
14. With the doors in place you can double check the latch mounting for any potential issues. You can use the right hand latch on the left hand side for positioning so the levers aren't in the way while you mark) on the striker bolts and mark the exact mounting location onto the door. Remember to make sure the latch opens horizontally when the door swings open and isn't rotated or it could bind on the striker bolt. If you won't be using power locks then you will want to remove the locking tab off of the latches so the door won't accidentally lock and you have no way of unlocking the latch (you could always put the locking levers back on at a later date if desired).



15. If your doors are not pre-marked then there are templates at the back of this guide that you can fold and use to mark to position your latches with the dimensions used on the pre-assembled doors. Always do a reality check to make sure the latches will work where you have marked (e.g. the latches on the doors will not collide with the door openings or supports). The templates are designed to have the bottom of the latch approximately 18.75" from the bottom on the front doors to clear the sloped support/triangular piece in the lower rear front door opening. The center of the striker catch on the latch is approximately 2 inches from the outside surface of the door.



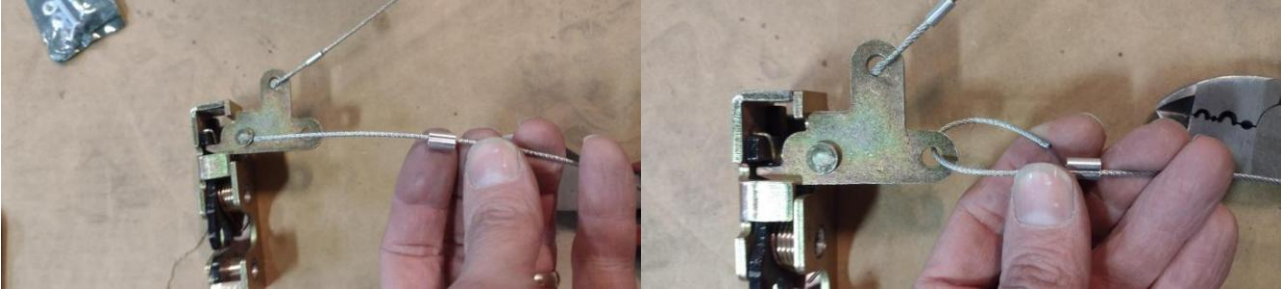
16. Once you have marked the holes for the latches and double checked to make sure they are where they will work, you can then drill holes for the screws (many times it is a good idea to use a small drill bit to start because even if you are off by half the diameter it isn't a bit deal like if you are off half the diameter on the large bits). You can also cut the hole for the latch arm (and a hole for the locking arm if you will be using power locks). To cut the rectangular-shaped hole for the latch arm you can drill two large holes and then cut straight lines between the outsides of the holes to make an elongated hole with rounded ends. Be sure to test clearance with the latches to make sure there isn't any interference with the latch arms opening or closing.



17. Before you can mount the latches you need to install the pull cables for the handles. The lower lever-arm hole is for vertical pull and can be used with the outside handles. The upper hole is for horizontal pull and can be used with the inside handle.



18. The front latches use approximately 10" cables for the lower hole/outside handle and 24" cables for the inside handle. The rear latches use ~12" cables for the lower hole and 26" cables for the upper hole. Remember to do one of each length for the right-hand latches and one of each for the left-hand latches.



Insert the cable through a crimp and then fold over the cable with enough room to go through the hole and back through the crimp with some play so the cable won't bind on the lever arm.



If there is a loop left in the cable then it can act like a spring just flatten when the handle is pulled and not actually open the latch. So to prevent this you can flatten the cable or even better do a couple of bends (like a square-bottom U) so the cable won't have a loop. Then slide the cable end back through the eye/hole. Be sure to have the loose end of the cable to face to the back so the end of the cable doesn't catch on the inside door skin and bind up.



When the flattened cable is in place you can slide the loose end through the crimp and then crimp/clamp into place with crimpers.

19. Mount the latches by inserting the cables through the lever-arm hole and position into place. Make sure that everything looks correct. When you are finally ready you can use some thread lock on the mounting screws to put the handle into place.



Remember if the latch is rotated then the door can bind as it opens and closes. That can make the doors hard to close or open.

20. Next determine if you want the outside handles mounted vertically (probably will require adding extensions on the inside of the handles for better pull angle - see instructions below) or horizontally (tight

fit may not allow you to mount the cable normally with bolt as the window track gets in the way - also it is not a very good pull angle either). There are templates in the back of this guide for you to print and use for cutting the holes for your handles for mounting vertically. Before drilling or cutting always double check positioning to make sure you are working exactly where you want to be so you don't damage the door by cutting in the wrong place.



DO NOT CUT OUT THE WHOLE SIZE OF THE HANDLE you only need to cut the smaller hole for the recessed part of the handle (hole should only be about 3.1 inches x 4.4 inches - and then widen the hole later a little as necessary). When you are sure your hole is marked in the correct place you can cut the hole. To make sure to not over-cut the hole some may want to drill the corners and then use a straight cut between the edges of the drilled holes. Or you can carefully cut with a straight blade but be sure to not over-cut as that could show or could interfere with how you want to mount the handles.



21. Fine tune the hole as necessary to get the handle to fit properly and be aligned properly. Then you can gently clamp the handle into place and mark for the mounting holes. If the handle moves while marking it can make it difficult to mount the handles later. With any precise holes you may want to use a small bit to make a pilot hole (even if you are half off with a small bit that is not a big deal compared to being half off on a large bit!). You can mount the handles later after the extensions are installed and the latch is in place.



Decide how you are going to mount the handles and drill the appropriate size holes. Do not install the

handles yet as you need to do extensions on the handles and you can install the handles after the latches are installed.

22. The old style handles were discontinued but there is an even better solution with extensions to the new style handles so you can get better pull angle, better latch opening, and easier installation and adjustability (that also doesn't require any welding).

See the photo below to see how you may want to do the extensions (e.g. all of them angled away from the handles with the front ones angled to the sides to clear the window tracks). The photos feature using a 3 inch long 1/4 inch bolt with threads all the way to the bolt head (common size you can get from Home Depot). A slightly larger 5/16" washer is used so there is room to thread the cable through the washer. Then you can adjust the cable as desired and tighten the 1/4" nut to hold it in place.



23. To tap the outer handles (make sure you are using the outer handles with the locking cylinders and not the inner handles without keys) you can start with the more angled ones for the front and if there is an issue you can drill new holes and use the handle with issues for the back doors that don't necessarily need angling to the sides. It may be smart to start with a smaller drill bit and center-punch a hole because the bits will have a tendency to want to walk on you. You might also start drilling straight in at the beginning to start a pilot divot hole. Then you can angle the bit to get the desired angle. Remember to not bend the bit after it starts down a hole. Also the drill bits (and thread taps) will get gummed up with the soft metal. You also don't want the metal to harden and lock the bit inside the hole so you may want to drill and then immediately reverse/pull out the bit before the metal cools and grips the bit in place.



So drill the pilot hole but try and avoid drilling all the way through and having the bit push against the handle on the other side and break the bit. Next drill the bigger hole the size for the threading tap you will use to thread the hole.

24. Next tap the threads. It is a good idea to use a clutch setting to ensure you do not over torque the tap as they are brittle and break very easily. It is also a good idea to add oil on the tap each time before starting to do threads. You may need to clean out the tap frequently (e.g. use utility knife tip to pop off the metal from the vertical grooves between the threads down the tap which usually pulls the other metal out from between the threads). You may not want to tap all the way through so when you tighten the bolt inside it can have pressure to hold it into place (don't over tighten the bolts as you can strip the soft metal). Once the holes are tapped you can test run the bolts in to make sure everything is correct (don't forget to put on the washer and nut before installing the bolts). Then you can put on some thread lock and put in the bolts permanently.



25. While working with drill bits and taps you can go ahead and tap the inside handles for attaching cables if necessary. The thickness of the new handles means you may not have clearance to use short 1/4" bolts with a washer to hold the cables on the inside handles if the handles are mounted on the front half of the door. Some have pre-drilled the correct hole size and used self tapping screws to hold the cables in place. Another possible way to hold the cables is by drilling and tapping to use say a #10 machine screw with a 1/4" split washer to hold the cable in place. This way makes it very easy to adjust the cables with a screwdriver from above when you are attaching the latch cable when installing the door panels.



Drill the right size hole in the end of the slam latch/wedge portion of the handles. Make sure the screw will not be in the way when you pull the handle to the open position (e.g. stay in the end part that never gets covered when the handle is pulled).



Next you can tap the threads in the holes. You will need to have 2 handles with the machine screws from the right and 2 from the left. Remember to not break bits when drilling and to quickly reverse to pull out the bit so it doesn't get stuck as the metal cools and hardens. Remember to frequently clean out the metal from the bit and the tap and dip in oil before drilling each time.

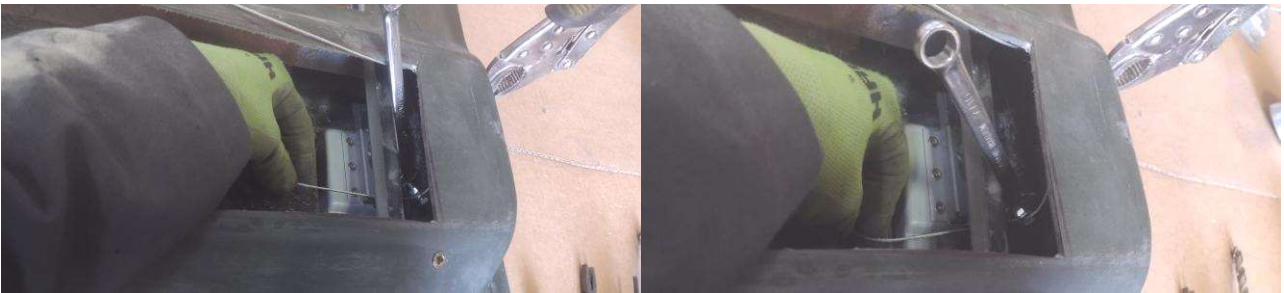
26. You can now install the outer handles.



Thread the cable through the washer on the side of the bolt so that later when you tighten the nut the cable will stay taught and not loosen as you turn the nut. Next you can attach the handle to the door as desired. You may not want to permanently mount as you may need to remove the handle later for adjustments or for painting, etc...



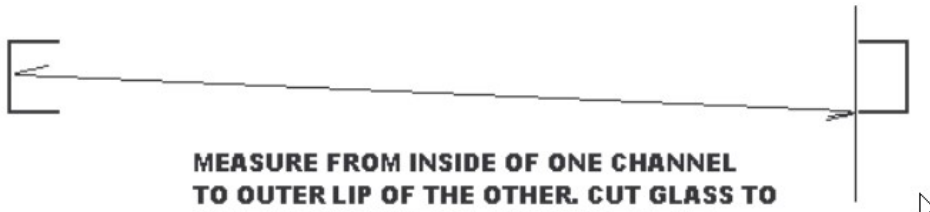
Close the latch and secure the tab with locking pliers to keep it from opening as you pull the cable to connect the handle.



Pull the cable and then tighten the nut to secure the cable in place. You don't want the cable too tight as the latch might not close all the way after you connect the second cable.

27. With the outer handles in place next it would be good to prepare for the windows. For the window glass there are normally two options. The most common is 1/4" laminate safety glass (two layers of glass with a plastic layer sandwiched in between so the glass doesn't break with large sharp pieces as the plastic holds it in place like windshields). The other option is to have the glass place cut regular glass and then send it off to be tempered (so it will shatter into small pieces and no large dangerous pieces - like most side windows on cars).

For the dimensions with the current window track design(2023) we are using 24.5" x 15.5" glass (see historical graphic below about how to measure glass size).



MEASURE FROM INSIDE OF ONE CHANNEL TO OUTER LIP OF THE OTHER. CUT GLASS TO THAT WIDTH. INSTALL GLASS INTO THE CHANNELS WITHOUT THE FELT. AFTER THE GLASS IS FLOATING INSIDE THE BARE CHANNELS INSTALL THE FELT DOWN THROUGH THE TOP. THE FELT ACTS AS A KEY.



28. At this point you may want to sand/trim the window openings so the inner and outer door skins match up around the window opening. You can also sand/trim the edges to remove any rough outer edges or internal high points that may interfere with the window track or that may be too thick for rubber edge trim you may want to use on the edges later. A flat sanding block, grinding/cutting disc, &/or file may work best to avoid damaging with a wobbly router.

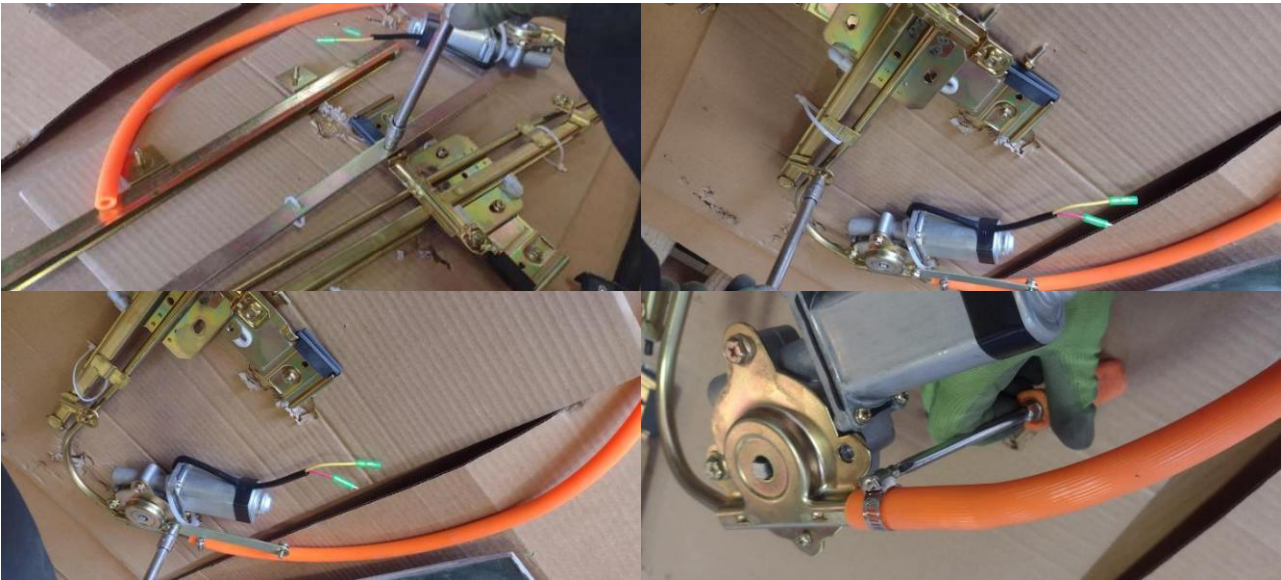


29. Check the window tracks for any fiberglass and for narrow spots.



- You may want to open up the window track for less friction on the glass by twisting a pry bar or using two pry bars leveraged against each other or any other method to open the inward edges of the window track.
30. Next prepare the power window mechanisms. Currently we are using the mechanisms with the motors facing forward when installed. In the past we did a unit with the motors facing rearward and were able to put 5x7 inch speakers in the doors (very tight fit). In that even you might need to run extensions for the power window motor wires.
31. You will not need the channel piece or the cross brace with two holes in it. Remove the bolts from the upper bracket and the bolt from the lower bracket. We also remove the metal piece and the sleeve by removing the bolt from the motor support (you may want to use that support to secure the motor from rattling or reuse the longer bolt to secure the motor through the door with the lower pre-marked hole if

applicable).



You can also reposition the hose further up the tubing and against the motor housing and secure the hose clamp in a position where it will not interfere on the bottom or front of the motor (could block motor from getting close to the inner door skin to bolt into place).

32. Remove the bracket that grips to the glass. Then remove the Allen-head machine screw and washer you will not be needing. Then straighten the bracket if necessary. You can also gently bend other pieces back to where they are supposed to go (avoid flattening or kinking the tubing).



33. Hook up the motor to 12 volts to lower the carriage out of the way (but not all the way down to leave room for the stop screw). Using two crescent wrenches you can bend the ends of the mounting brackets to match the lower angle of the door panel (the side with less bend - same angle as door below the access hole). Make sure to hold the main bracket in place and not bend it as the carriage can hit the bracket if it is bent inward and the window may not go up or down all the way.





Note the nut portion is parallel to the angle of the door panel cover (same as the angle on the door where you will mount).

34. If you are using our power window package and the holes are not pre-marked, you can mark and drill the holes for the window mechanisms. You can measure across between the bolt holes on the bracket (normally around $4 \frac{5}{8}$ ") to decide where to drill the holes in the door (if not already marked). So you can measure $2 \frac{5}{16}$ " to each side from the center of the window track and about $\frac{3}{4}$ " from the bend from the flat part of the lower inner door below the access hole. You may want to shake out the fiberglass dust &/or vacuum to not have that dust when you do the windows and felt trim.



35. You can insert the window mechanism into the door with the top of the tower extending through the window opening for some rough fitment. Then you can mark where you want to cut down the tower (make sure the carriage and the screw drive are lowered so you don't destroy the mechanism by cutting the screw/worm or up/down carriage). Or you can measure from the bolt holes upward to see where you may need to cut the tower down. Be mindful to not cut too much off as that could ruin the window mechanism or you might have to try and drill holes higher up the carriage to mount the window clamp piece higher up. On the units we have done the measurement from the top of the bracket to the cut point appears to be $6 \frac{1}{4}$ " to $6 \frac{3}{4}$ " for the different doors. It is often best to start with the longer length if you can't get an accurate measurement and then trim it down later to the desired length.



Be sure to cut the tower to match the door angle with the back side longer. The top white plastic pieces of

the carriage have a tendency to pop off the tower so having the back edges/lips higher helps keep that from happening. You can hook up power through a switch and test the mechanism if you so desire.

36. Next cut the window track felt to the right size. From the three 96" long pieces you receive you need to cut 4 longer pieces for the top window tracks (normally 24.5 to 24.75" long). So you need to cut two of the longer from one of the three pieces (there should still be enough to cut two ~24" long pieces for the side tracks).
37. Install the felt in the top and upper sections. Be sure that the felt is flat in the tracks and not twisted or binding. We normally will install the felt all the way down on the hinge side but don't install the felt all the way down on the other side as you want to slide that down after you have the glass in position.



38. Some may do this step upside down while others may want to do it right side up. Either way CAREFULLY put the glass inside the door while trying to avoid dropping or banging the glass and chipping or breaking the edges. It can be difficult to hold the glass from dropping when there is very little clearance to hold the glass. So you may want to rotate slightly to have a way to hold on to one side of the glass and not drop it especially when lowering the glass (versus doing the installation upside down where you hold the glass with the fingers as you push it up).



39. Position one side of the glass into the window track (side without the felt installed all the way down). Then swing the other side into place into the felt.



40. Now slide the felt down around the glass and into the window track.



41. While supporting the glass from falling you can turn the door over to see how well the glass moves.



The glass should move rather well mostly just by gravity (be careful to not have the glass drop and chop fingers or break). Many times we have had to pull out the felt and widen the track (when the glass is not nearby of course) by twisting a pry bar in order for the glass to flow more freely with much less friction.

42. Next install the power window motor and bolt in to place (maybe just temporarily in case you need to remove it to make adjustments). Run the motor up until the carriage is right at the top of the door cavity (where you can see it through the access hole).



43. Loosen the clamp nuts then position over the glass. Put in the bolts to connect the glass-clamp bracket to the up/down carriage. Center the glass in between the side window tracks. Then center the glass-clamp

bracket left and right as compared to the carriage. Push the glass-clamp bracket on to the glass as much as possible then tighten the nuts to secure the glass-clamp bracket to the glass (don't over-tighten or break the glass!).

44. Turn the door upright then test the window mechanism up and down to make sure that everything is working. Many times the glass is slow to move up and you may want to see if there is a bind from how things are mounted or the tracks need to be opened up some to reduce friction.
45. Install the inside handles as desired. Remember to have the cable adjustment screw facing upward and towards the rear.



46. Mark the holes for the power window switches using the included templates.



Be sure to note which way is up with the arrows (very important). Remember the steeper bend is upward on the metal door panels. Also be sure that the template is held into place and doesn't move while marking. Then drill the holes to mount the switches.

47. You may want to use some edge trim or something to protect the wires from damage.



48. Install the switches with the bump/window-up part of the switch towards the front.



49. Connect the red wire from the motor to the blue wire from the switch for the correct up switch. Connect the yellow wire from the motor to the green wire from the switch. You may want to do the final wire connections properly while the motor is out (e.g. overlap the green sleeve over the clear sleeve to properly cover the wires). You will need to run the switch wiring harness as desired based on your chassis and route the wires through the doors at the desired location to connect the wiring.

50. Connect the inside handle by threading the pull cable through the washer on the side where it will tighten as you tighten the screw. Then connect any remaining electrical wires. Then loosely install a couple of screws on the back of the metal door panel so you can pivot the panel to tighten the cable. Close the latch and put locking pliers in place to hold the latch tab from opening the latch while you pull the cable snug. Pull the cable taut and tighten the screw to hold the cable in place. Put in the remaining screws on the door panel and test the inside and outside handles to make sure they function properly and open the latch properly.

That should complete the assembly of the doors. You can adjust the door gaps and trim as desired for good door gaps/alignment. You can install the limit straps as desired. You can do the body work and painting as desired. You can then install belt line trim and edge trim as desired as well.

Attach handle hole templates

Attach latch hole templates