

Automatic Welding Booth Installation

Safety

Safety when working with any components of the automated welding system is most important. The Automated Welding workstation is a complex system containing potentially dangerous machinery if proper safety practices are not followed. Certain safe operating practices apply to all, while others are more specific.

For more extensive safety instructions, refer to the *SCORBOT-ER 4pc User's Manual*, the *Controller-PC User's Manual*, and to the *Millermatic® Welder and Gun Owner's Manual*.

Emergency and Safety Procedures During Welding

Safety Procedures

1. When welding you must understand the robots expected motions.
2. Observe the welding gun only through the safety window on the doors of the welding booth.
3. You must be in visual contact with the welding gun at all times.
4. Be sure you are in reach of an emergency stop button at all times.

Emergency Procedure

1. Press the emergency stop button on the welding booth.

The robot motion and welding machine will immediately stop when the emergency stop button is pressed.

The emergency button disconnects the welding, but does not turn off the controller output. The output that turns on the welding will continue to be active after the emergency button is pushed.

Pressing the emergency button on the controller will not stop the welding. It only shuts down the motors on the robot.

2. Open the door to the welding booth. Do not touch anything. Parts in the welding area may be extremely hot.
3. From SCORBASE, open the digital I/O dialog box.
4. Turn off the welding machine output (it should be output 1).
5. If necessary, release the gun from any attached parts. Use a vise if necessary.
6. Release the emergency button.
7. Home the robot.

General Safety Guidelines

For proper and safe use, observe the following guidelines:

- Be sure that you know the location of the main power switches, and any emergency shutoff switches, of all the equipment.

The entire system can be aborted by pressing one of the red EMERGENCY buttons on either side of the welding booth.

The welding robot can be aborted by doing any of the following.

- Pressing the red EMERGENCY button on the robot controller.
- Pressing the one of the red EMERGENCY buttons on the either side of the welding booth.
- Pressing F9 or clicking on the Stop icon in SCORBASE.
- Make sure you know the location of the fuse box in your classroom or laboratory.
- Never disconnect safety devices. *Make sure that the microswitches on the booth doors are operative.*
- Do not stick your fingers into a device while it is in operation; they may get caught in the mechanism.
- Never touch metal sheets that have just been welded without wearing workgloves.
- Welding should not be done in dusty areas containing flammable gases, vapor or liquids, where an explosion is possible.
- Be alert; any idle piece of equipment could start up suddenly. The robot is operated remotely from the computer.
- Do not come near a moving device when it is in operation.
- Exercise special caution when near the robot; it could be activated from afar and move in unexpected ways.
- Only use shielding gas pressures recommended in this book or in the user manual of the gas cylinder.
- Dress properly. Tie back loose hair and clothing. Remove all jewelry (rings, bracelets, necklaces) and wristwatches.

Safety When Working with MIG Welder

- Be sure that the welding machine is installed and grounded according to this manual.
- Protect yourself from flying sparks and metal, which may be caused by welding, chipping, wire brushing and grinding.
- Never touch the electrode, electrode wire or any conducting object in contact with the electrode circuit, unless the welding power source is off.
- Do not touch live electrical parts.

- Never point gun toward any part of the body, other people, or any metal when threading welding wire.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammable material within 35 feet of the welding arc.
- Never disconnect safety devices. Before inspecting equipment, shut off all power and remove line fuses to prevent power from being turned on accidentally. Disconnect all cables from the welding power source, and disconnect all plugs.
- Watch for fire; keep the fire extinguisher handy.
- Overuse can cause overheating. Allow cooling period; follow rated duty cycle.
- Do not block or filter airflow to unit.
- Keep welding cables as short as possible, close together and down low.
- Inspect the electrode wire drive rolls periodically. If dirty, remove the drive rolls and clean them with a wire brush. If the drive rolls are deformed, replace them. Drive rolls should be changed, adjusted or cleaned only when the wire feeder is shut off.
- Keep the welding gun in proper working order. Only use the gun with the gases for which it is designed.
- Only use shielding gas pressures recommended by the manufacturer.
- Before operation, always inspect cables for wear, cracks and damage. Immediately replace those with excessively worn or damaged insulation, to avoid the possibility of lethal shock. Also, keep the cable dry, free of oil and grease, and protected from hot metal and sparks.
- Do not drape cables over your body.
- Do not connect more than one electrode or work cable to any single weld output terminal.

Safety When Working with Robot

The following safety guidelines are specific to operation of the welding robot:

- Extreme caution must be exercised in the use of robots. Recklessness may cause physical harm to the operator and other people in the vicinity.
- Make sure the robot base is properly bolted down. Otherwise the robot may become unstable and topple during operation.
- Do not use physical force on the robot arm to change its position, or for any other reason.
- Be sure the robot arm has sufficient space in which to operate freely (Free Movement Zone), especially during homing.

The welding robot can be aborted by doing any of the following.

- Pressing the red EMERGENCY button on the robot controller.
- Pressing the one of the red EMERGENCY buttons on either side of the welding booth.
- Pressing F9 or clicking on the Stop icon in SCORBASE.

Safety When Working with Gas

Shielded gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Therefore, it is extremely important when working with shielded gas specific safety procedures are followed:

- Keep your head out of the fumes. Do not breathe the fumes.
- Ventilate the area to remove fumes and gases.
- Work in a confined space only if it is well ventilated. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Shut off shielding gas supply when not in use.
- Never weld on a pressurized cylinder – explosion will result.
- Keep the protective cap in place over valve except when cylinder is in use or connected for use.
- Always purge the gas hoses to expel all air and moisture condensation from lines before welding.
- Use only correct shielding gas cylinders, regulators, hoses and fittings designed for the specific application; maintain them and associated parts in good condition.
- Hoses should be connected to fittings only with special clamps designed for the hose--never with ordinary wire or other substitutes. Avoid long runs to prevent kinks and abuse. Don't let hoses run on the ground; they can be run over, stepped on or otherwise damaged. Coil up excess hose to prevent kinks and tangles.
- Regulators should be removed from service immediately if faulty. Always close the cylinder valve before doing so. A faulty regulator could be indicated by any of the following:

Safety When Working with Electricity

There is always a concern about the possibility of electrical shock. Several precautions must be taken in order to work with high voltage electricity safely:

- Never touch the electrode unless the electric power source is off.
- Never touch an open wire.
- Avoid working in wet conditions. Even a person's perspiration can lower the body's resistance to electrical shock.
- Always wear insulated rubber shoes.
- All items in the welding workstation must be grounded. Routinely check for proper ground connections and ensure continuity.
- Always check that connections are stable.

Protection Against Eye Injury and UV Rays

The Automated Welding tekLINK hardware was designed such that viewing windows are fitted on the metal booth with filters of SHADE 10 to protect you from UV. Arc rays produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Any exposed eyes can be burned quickly by these rays. To avoid all such irreversible eye injuries and burns, you **MUST** do the following:

- Ensure that the booth door is always closed before any welding procedures commence. If not, you must immediately abort the system by pressing one of the two red emergency abort buttons fitted on the booth.
- Only view the welding process through the filter plates fitted on the welding booths.
- Do not interfere with screens and barriers installed to protect you from the flashes and glares during welding. They are there to protect you!

Protection Against Burns

To protect against burns and other injuries, always do the following:

- Wear only flame-resistant clothing and gloves. We recommend that the clothing be made from a dark-colored, tightly woven material.
- Never touch hot parts bare handed. Either use pliers or wear gauntlet-type leather gloves to protect the hands and wrists.
- Welding should not be done in dusty areas containing flammable gases, vapor or liquids, where an explosion is possible.
- Allow cooling period before working on gun or torch.
- Never keep matches or lighters in your pockets.
- Shirt collars and shirt cuffs should be buttoned, and open front pockets are not advisable as they may catch sparks.

Basic First Aid

Basic First Aid Procedures

- Keep calm. Remaining calm while helping the victim will help he/she to keep calm and cooperate. If the victim becomes anxious or excited the extent of the damage from the injury could be increased.
- Quickly plan your course of action. Learn basic procedures, or have your first aid manual available, so you can care for the victim.
- Immediately send for professional help. Reaching help quickly could save a life. Know your local emergency telephone numbers.

- Encourage the injured person. Let the victim know that help is on the way and try to make them as comfortable as possible. Showing care and concern for the victim can give them hope during their circumstances.

First Aid for Eye Injuries

Adhere to the following first aid procedures in the case of eye injuries:

- Be extremely careful and gentle when treating eye injuries.
- Floating objects in the eye may be flushed with water. If the object cannot be removed in this manner, the victim should seek medical attention.
- Never attempt to remove objects imbedded in the eye!
- Bandage both eyes and seek professional care immediately! An inverted paper cup covered with a bandage is appropriate for serious eye injuries while the victim is transported to the hospital.

Eyes are delicate and sight is precious! Prompt professional attention to eye injuries is required to preserve sight!

First Aid for Burns

Burns can result in pain, infection and shock. Adhere to the following first aid procedures in the case of burns:

- First-degree burns are characterized by redness, discoloration, mild swelling and pain. Flush with cool running water, apply moist dressings & bandage loosely
- Second-degree burns are usually the most painful because nerve endings are usually intact, despite severe tissue damage. Apply dry dressings and bandage loosely. Do not use water as it may increase risk of shock
- Third degree burns may look white or charred. Treat like a second-degree burn and seek medical attention immediately.
- Never put butter or greasy ointments on a burn. They seal heat into the wound and may cause infection.
- Always seek medical attention if the burn:
 - Covers more than one body part.
 - Is located on any sensitive area of the body (hands, face, feet, etc.).
 - Is third degree.
 - Is caused by chemicals.

Parts List

The figure below identifies the parts required to install the automatic welding booth. Refer to the table below for a description of each part. These numbers will be used throughout this manual to identify the parts needed in the assembly of the welding booth.

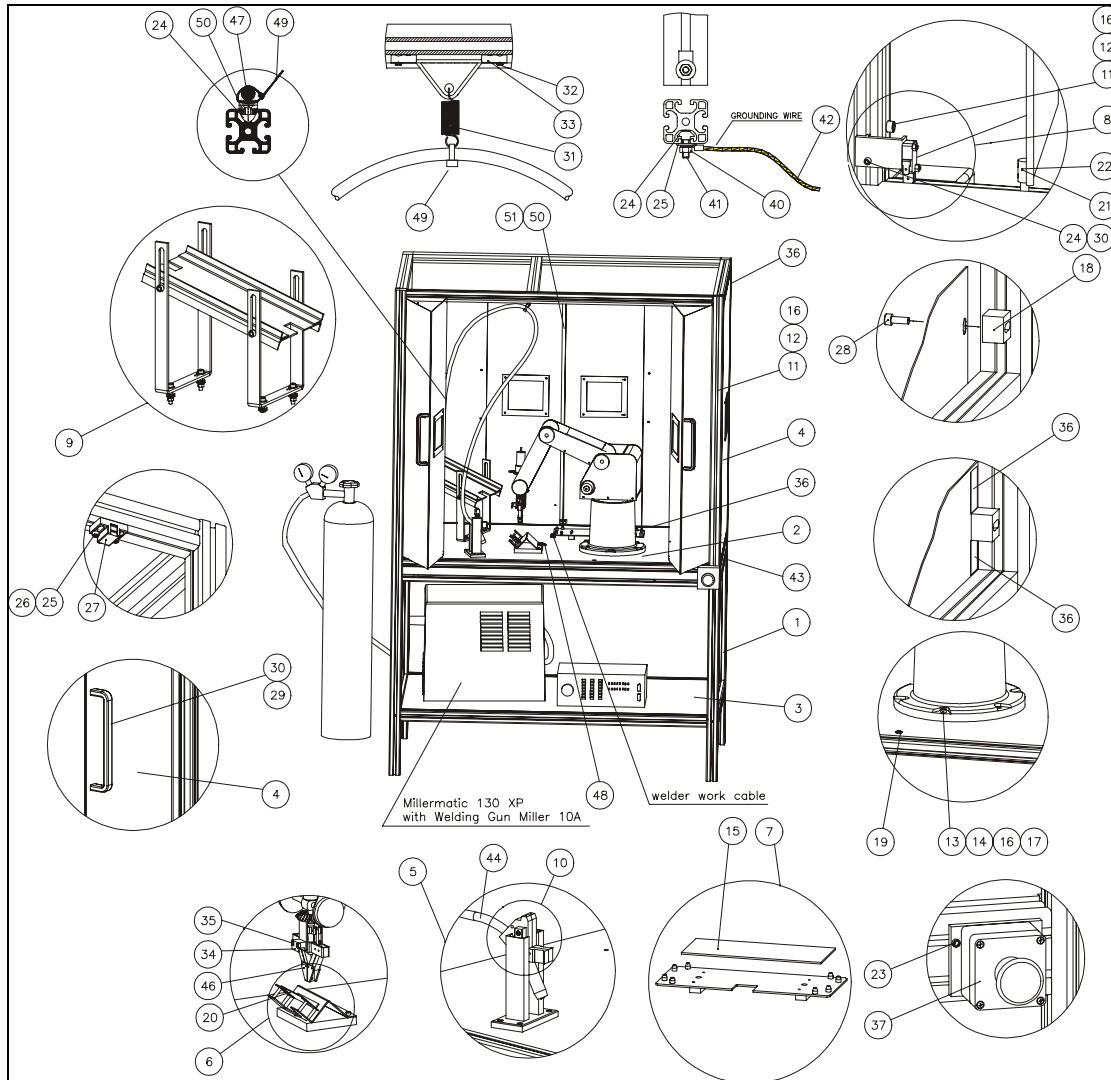


Figure 1: Parts needed for the welding booth

Part Number	Catalog Number	Part Name	Qty.
1	114067	Welding station frame	1
2	110298	Welding plate	1
3	110299	Shelf	1
4	10050	Doors and slides	1
5	10058	Welding gun holder	1

Part Number	Catalog Number	Part Name	Qty.
6	10059	Jig for T – butt welding	1
7	10060	Jig for name plates	1
8	10061	Microswitch assembly	1
9	10062	Gravity feeder	1
10	10063	Welding gun adapter	1
11	312017	Slot nut M6	12
12	301209	Bolt M6X16	12
13	310201	Nut M6	6
14	301221	Screw M6X30	6
15	110874	Name plate	30
16	313005	Washer for M6	18
17	314009	Spring washer for M6	6
18	114031	Multiblock	16
19	301251	Screw M6X20	8
20	110875	Plate for T welding	600
21	112913	Plastic door guide pins	8
22	301029	Screw M4x8	16
23	301243	Screw M5X20	4
24	312009	Slot nut zn M5	18
25	313012	Washer for M5	9
26	301205	Screw M5X20	8
27	410437	Magnetic catch	4
28	302405	Phillips screw M6X20	8
29	324908	Handle	4
30	301242	Screw M5X10	12
31	113515	Spring	1
32	301237	Screw M6X6	2
33	312006	Slot nutM6	2
34	112916	Adapter	1
35	306405	Screw for adapter	2
36	410455	Magnetic strips set	1
37	40338	Wire bundle microswitch	1
38	100428	Installation manual	1
39	103057	Box	1

Part Number	Catalog Number	Part Name	Qty.
40	310203	Nut M5	1
41	301241	Bolt M5X30	1
42	40340	Grounding wire cable	1
43	113108	Cover profile	2
44	411308	Shrink Wrap 1"	0.25
45	328011	Welding jell	1
46	20012	Gripper pads	2
47	301226	Screw M5X12	1
48	40339	Short grounding cable	1
49	300005	Tie – wrap	2
50	312018	Tie – wrap Pasteur	1
51	110883	Door seal	2
52	328216	Two sided tape (roll)	1

In addition, the following must be installed in the welding workstation. Refer to the instruction manual fore each component before installing.

- SCORBOT-ER 4PC robot
- Millermatic 130 xp MIG welder
- Miller 10A welding gun and holder
- Shielded gas tank

Assembly

Frame Assembly

Parts Required:

- 2 pre-assembled side beams
- 2 pre-assembled H-beams (top and middle)
- 2 straight beams (bottom)
- 16 standard fasteners
- 4 adjustable feet
- 4 plastic caps

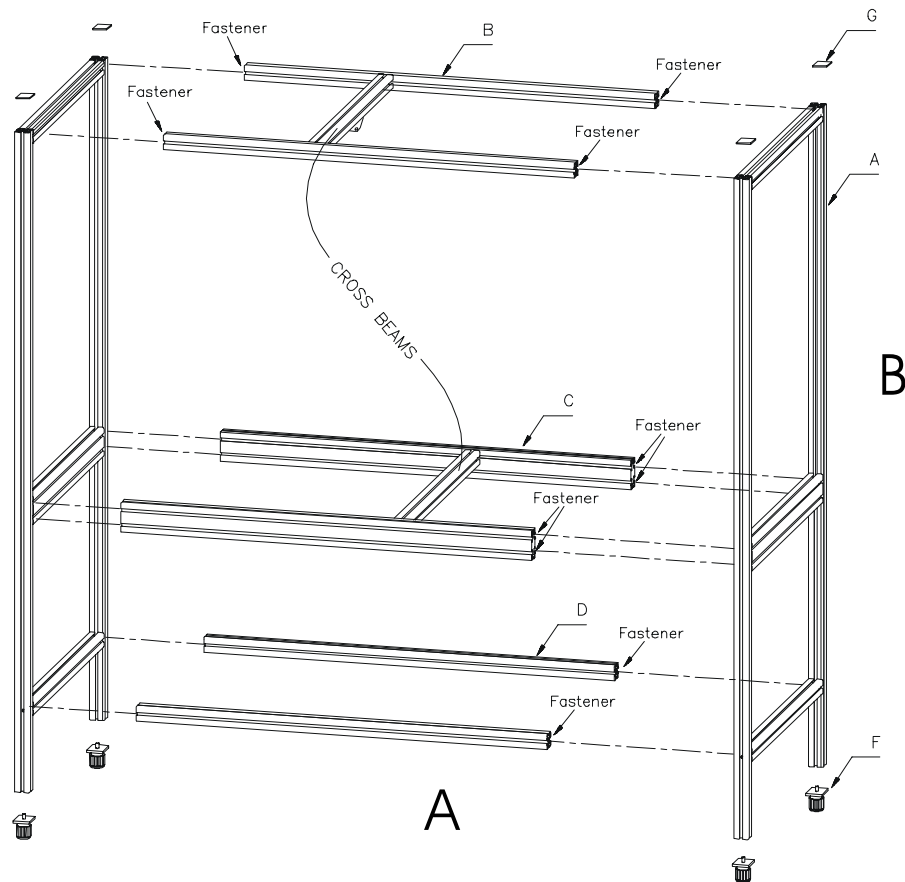


Figure 2: Frame Assembly

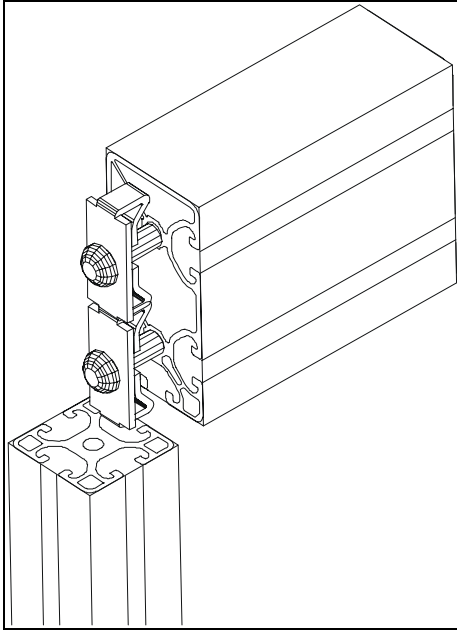


Figure 3: Connecting the profiles

See Figures 2 and 3. Use a 5 mm hex wrench with T-handle to secure the fasteners used in the frame assembly.

1. Make sure all fasteners are attached and positioned correctly at the ends of the beams (B, C and D). Also, make sure the fasteners are loose enough to slide freely within the T-slots of the side beams.
2. Attach the middle beams (C) to the side beams (A).
Attach the top beams (B) to the side beams.
Attach the bottom beams (D) to the side beams.

Make sure the two crossbeams are on opposite sides, as shown in Figure 2.

Securely tighten all fasteners.

3. Attach the caps (G) to the upper ends of the side beams.
4. Attach the feet (F) to the legs of the frame.
5. Rotate the feet to adjust their height and level the frame.

Tabletop and Shelf Assembly

Parts Required:

- Metal tabletop
- Metal service shelf
- 8 Multiblocks
- 8 M6 x 20 flat head screws

Note that the multiblock can be configured in two ways. The tabletop and shelf assembly requires multiblocks configured as shown in Figures 4 and 5. If necessary, use a screwdriver to separate the two parts of the multiblock and reverse its orientation.

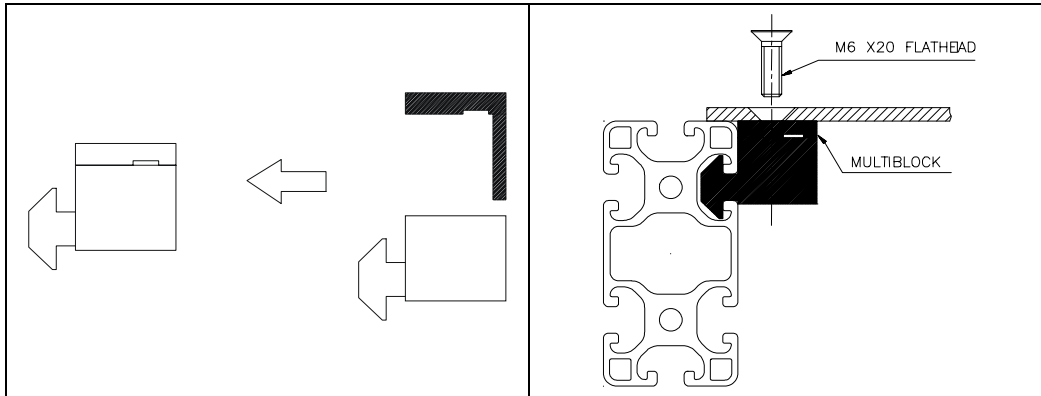


Figure 4:
Multiblock Fastener Configuration for
Tabletop and Shelf Assembly)

Figure 5:
Attaching Tabletop and Shelf to Frame

Note that the tabletop has beveled corners and a number of predrilled holes for attaching the robot and welding station devices, as shown in Figure 6. (The service shelf has only 4 holes for fasteners).

Be sure the tabletop sides A and B are attached and positioned as shown in Figures 2 and 6.

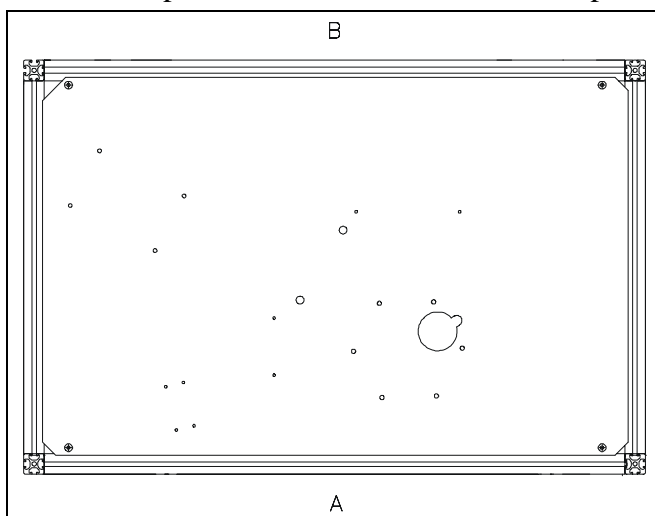


Figure 6: Tabletop (Top View)

6. Attach a multiblock (insert the peg and rotate) to the inner side of each of the beams on sides A and B (which support the table and the shelf), about 45 mm from the end of each beam.
7. Make sure the top of the multiblock is aligned with the top of the beam. (If not, reverse the multiblock configuration, as explained above.)
8. Align the bore and/or nut in the multiblock with the bore in the service shelf. Insert and tighten the multiblock screw to attach the service shelf to the frame.
9. Repeat Step 8 (previous step) for the tabletop.

Doors

Parts Required:

- 4 folding doors with hinges attached
- 4 door handles
- 8 M5 x 10 round head screws
- 12 T-slot nuts M6
- 12 M6 x 16 bolts
- 12 M6 washers
- 4 microswitch assemblies (2 for left doors and 2 for right doors)
- 8 plastic door guide pins
- 16 M4 x 10 flat head screws
- 4 magnets within T-slot nut assemblies
- 4 265 mm magnetic door strips (36)
- 2 Door seals (51)
- Double sided tape (52)

The four doors are identical. Be sure to assemble them so that the warning signs printed on them are oriented correctly.

10. See Figure 7. Using M5 screws, attach a door handle to each door.

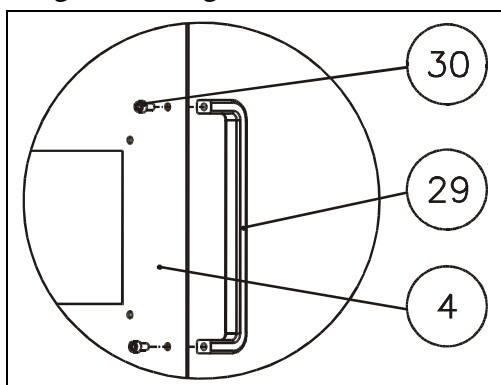


Figure 7: Attaching Door Handles

11. See Figure 8. Fit (swivel and insert) three T-slot nuts into the groove of each side beam. Adjust the location of the T-slot nuts according to the three holes in each door hinge.

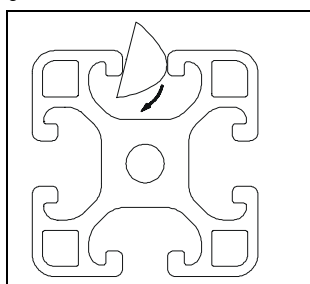


Figure 8: Fitting T-Slot Nut Into Groove

12. Using M6 bolts and washers, attach the door to the frame by tightening the T-slot nuts in the two upper holes in the door hinge.

13. See Figure 9. With its contact point facing outward (toward the door) fit the microswitch assembly onto the frame. Place the microswitch assembly under the pin on the welding booth frame. Tighten with a screw (30). See Figure 9. Make sure the microswitch clicks when the door closes, indicating that the actuator is depressed.

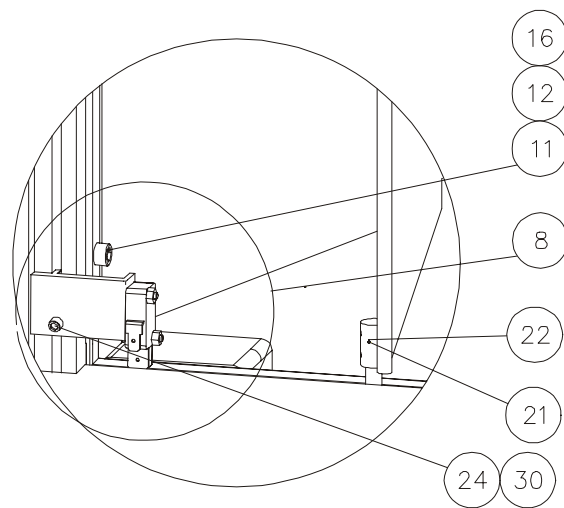


Figure 9: Attaching Microswitch and Guide Pin to Door

14. For each door, insert a door guide pin into the groove of the beam above and below each door. Using M4 screws attach the pin brackets to the doors.
15. See Figure 10. Insert the T-slot nuts of each magnet assembly into the groove of the upper beam, and position the magnet about 150 mm (6") from the side beam. Tighten the 2 bolts on each magnet assembly.

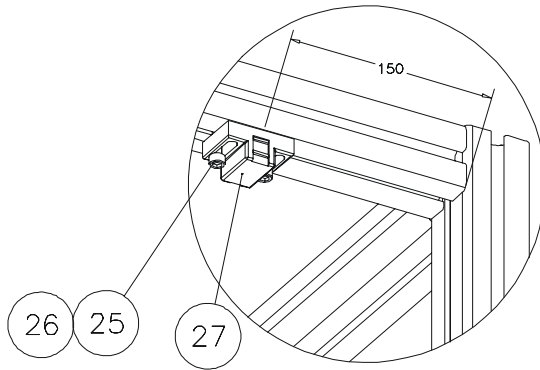


Figure 10: Attaching Magnet to Door

16. Magnetic door strips are used to prevent sparks from escaping the welding booth.
Place the magnetic strips on the doors in order to seal the gap between the lower edge of the door and the table top.
17. Cut three 1 inch strips from the roll of double sided tape (52). Place them evenly along the inside of the door seal (51).
18. Affix the door seal, to one of the doors on the assembly booth. Repeat this for one of the doors on the opposite side.

Side Panels

Parts Required:

- 2 Side panels
- 8 Multiblocks (18)
- 8 M6 x 20 round head screws
- 4 735 mm magnetic strips (36)
- 8 90 mm magnetic strips (36)

Note that the multiblock(18) can be configured in two ways. The side panel assembly requires multiblocks configured as shown in Figure 11 (the configuration opposite of that used in the tabletop and service shelf assembly). If necessary, use a screwdriver to separate the two parts of the multiblock and reverse its orientation.

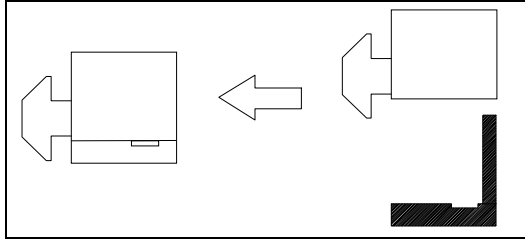


Figure 11:
Multiblock Configuration for Side Panel Assembly

19. See Figure 12. Attach a multiblock (18) (insert the peg and rotate) to the inner side of each side beam, about 100 mm from the top and bottom end of each beam.

Align the bore and/or nut in the multiblock with the bore in the side panel. Insert and tighten the multiblock screws (28) to attach each side panel to the frame.

20. Affix the magnetic strips (36) to the inside wall of the welding booth as shown in Figure 12.

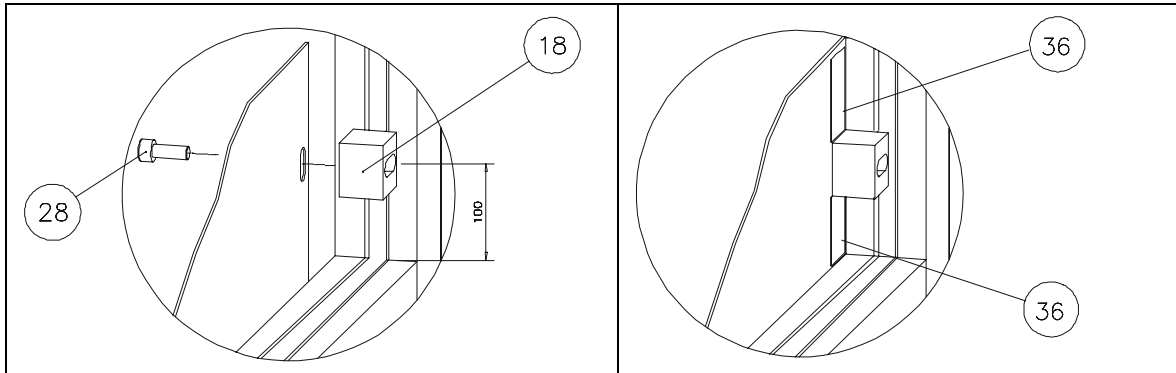


Figure 12: Attaching Side Panel to Frame

Mounting the Welding Cell Equipment

Components to be Mounted

- SCORBOT-ER 4pc
- Gravity feeder (9)
- Jig for name plates (7)
- Jig for T-butt welding (6)
- Welding gun holder (5)

Refer to Figures 1, 13 and 14.

21. The welding cell equipment is shipped with all fasteners attached. You need only to remove the bolts and nuts from the equipment, and mount on the welding booth tabletop.
22. After the equipment has been securely mounted, place the robot controller and the welder on the welding service shelf. Also, set the gas cylinder in place.

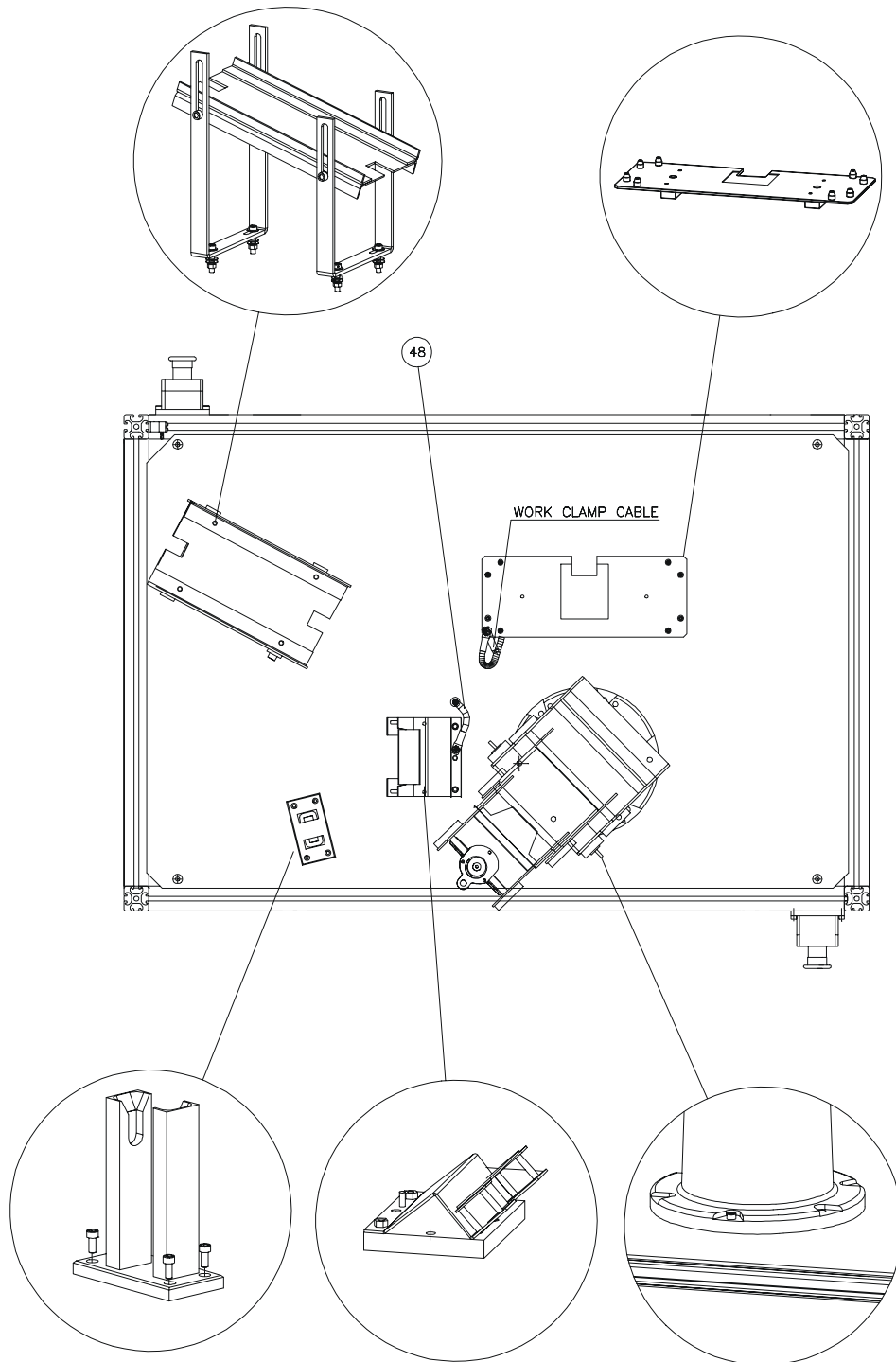


Figure 13: Welding Component Layout – Top View

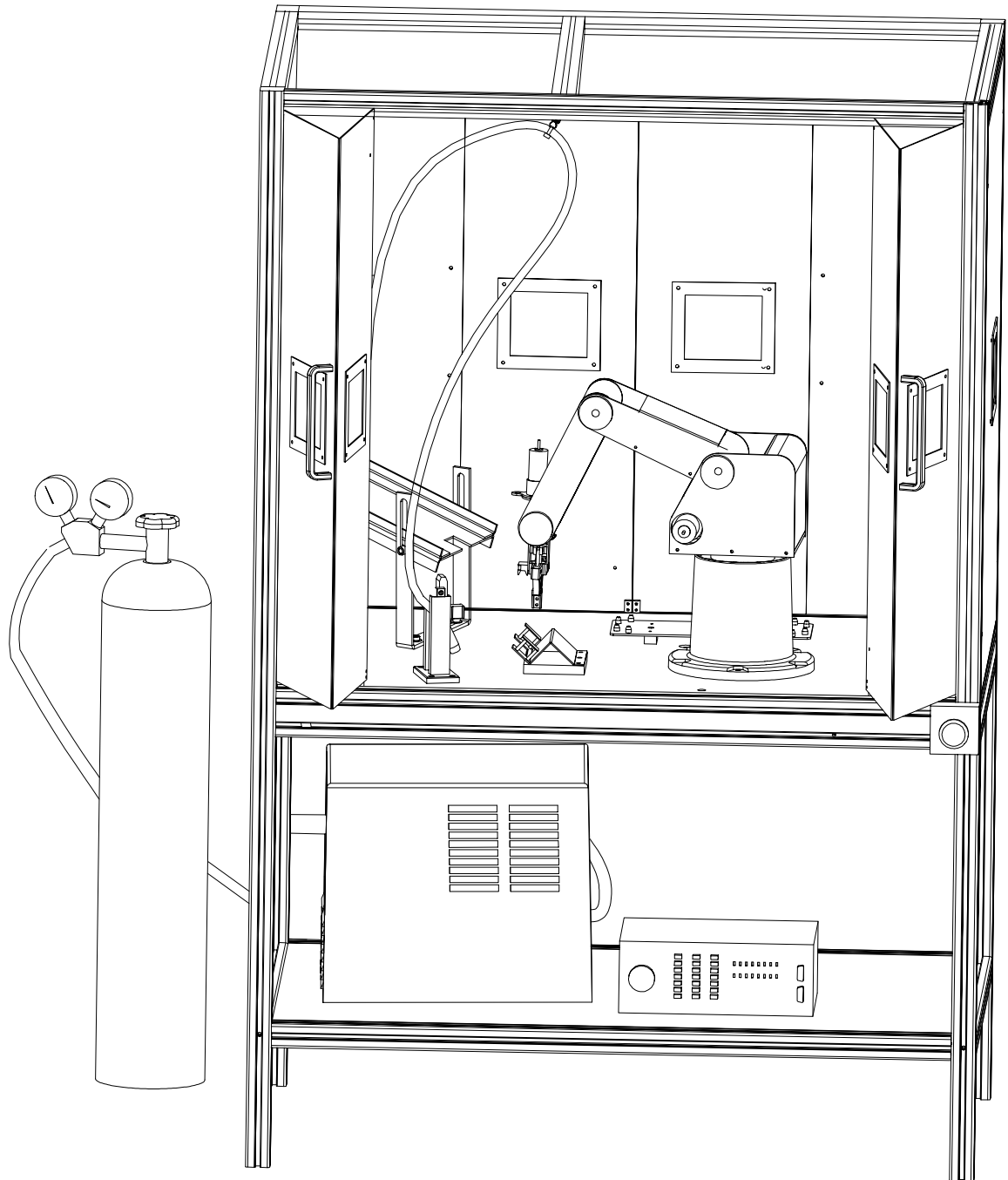


Figure 14: Assembled Welding Booth

Preparing the Welding Gun for Robotic Welding

23. Take out the screws and remove the plastic casing from the welding gun.
24. Remove the microswitch from the welding gun trigger.
25. See Figure 15. Run the welding gun cable through the opening in the left corner, side B, of the tabletop.

Attach the welding cable fastener (50) to the left beam of side B, about half-way between the table and the top of the welding booth.

Using a tie-wrap (49), **loosely** attach the welding cable to the fastener. Do not yet tighten the tie-wrap.

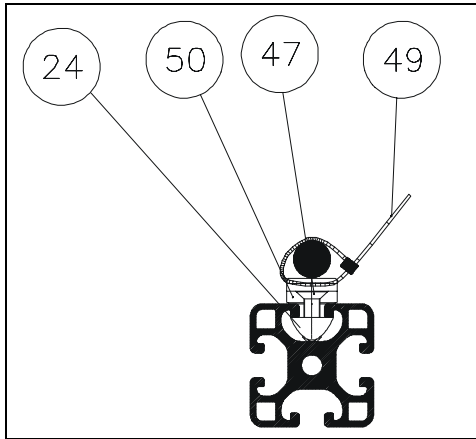


Figure 15: Securing Welding Cable to Side Beam (top view)

26. See Figure 16. The triangular hanger for the welding cable is already in the T-slot of the welding booth's upper crossbeam. Using two fastener sets (33), securely position the hanger in the middle of the crossbeam..

Attach the spring (31) to the hanger.

Using a tie-wrap, **loosely** attach the welding cable to the spring. Do not yet tighten the tie-wrap.

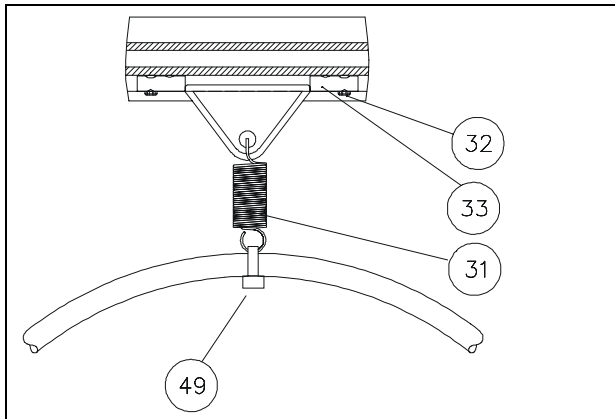


Figure 16: Welding Cable Hanger

27. Place the black shrink wrap (44) around the welding gun cable as shown in figure 18.
28. See Figures 17 and 18. Attach the gripper adapter to the welding gun. The inside tip of the adapter should be the correct distances from the edge of the welding gun nozzle as shown in figure 18. Tighten all screws.

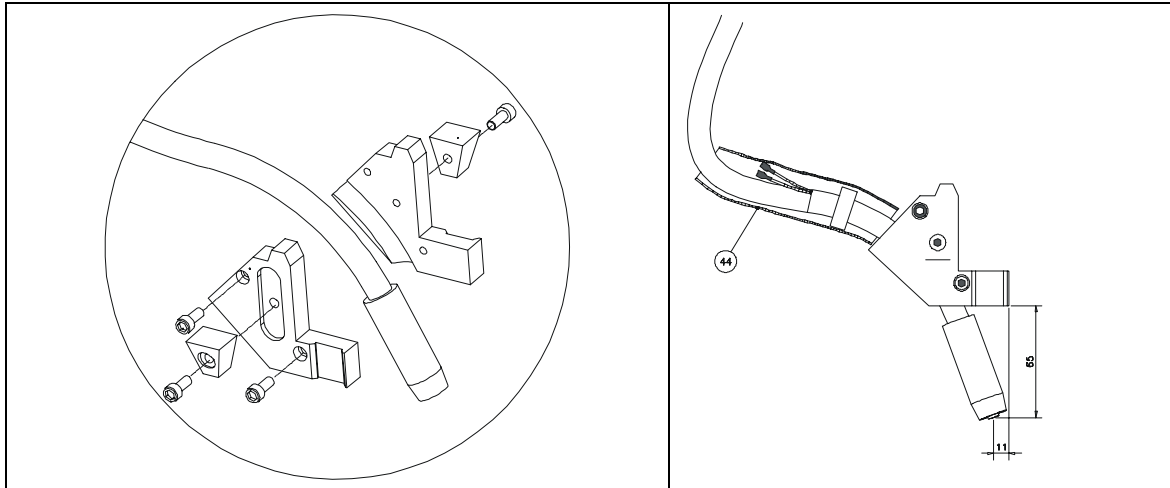


Figure 17

Figure 18

Attaching Gripper Adapter to Welding Gun

29. Use a blower to heat the shrink wrap on the welding gun cable. Make sure it fits around the cable correctly.
30. Place the welding gun in the gun holder on the tabletop. Then take hold of the adapter and move the welding gun to the points in the welding booth that it will need to reach during operation (i.e., the two jigs and the gun holder). Make sure the welding cable remains loose and will not cause any strain of the robot gripper.

You can relieve any strain by adjusting the position of the welding cable hanger and/or adding slack to the cable.

When you are certain that the cable is adjusted properly, securely fasten the two tie-wraps (on side beam and on hanger).

Do not attach the welding gun adapter to the gripper until after the robot has been homed.

Wiring

See Figure 19.

1. Attach the two emergency pushbuttons to the table support beams on sides A and B of the welding booth.
2. Attach each of the four wire pairs to the N.O. (and COM) terminals on the door microswitches.
3. Take the emergency switch wire bundle (37) and set it into the inner T-slot of the table support beams.
4. Cut the aluminum strips (43) into segments of about 50 cm in length. Fit the strips over the wires and firmly press them into the T-slots to keep the wires in place.
5. Connect the wire bundle's round plug into the socket on the front panel of the welder.
6. On the other end of the wire bundle, take the wire pair marked "Front" and connect the two pins to the NO and C terminals of Output 1 on the front of the robot controller.
7. Take the pair marked "Emergency" and connect it to the 2-pin Emergency connector on the rear of the robot controller.

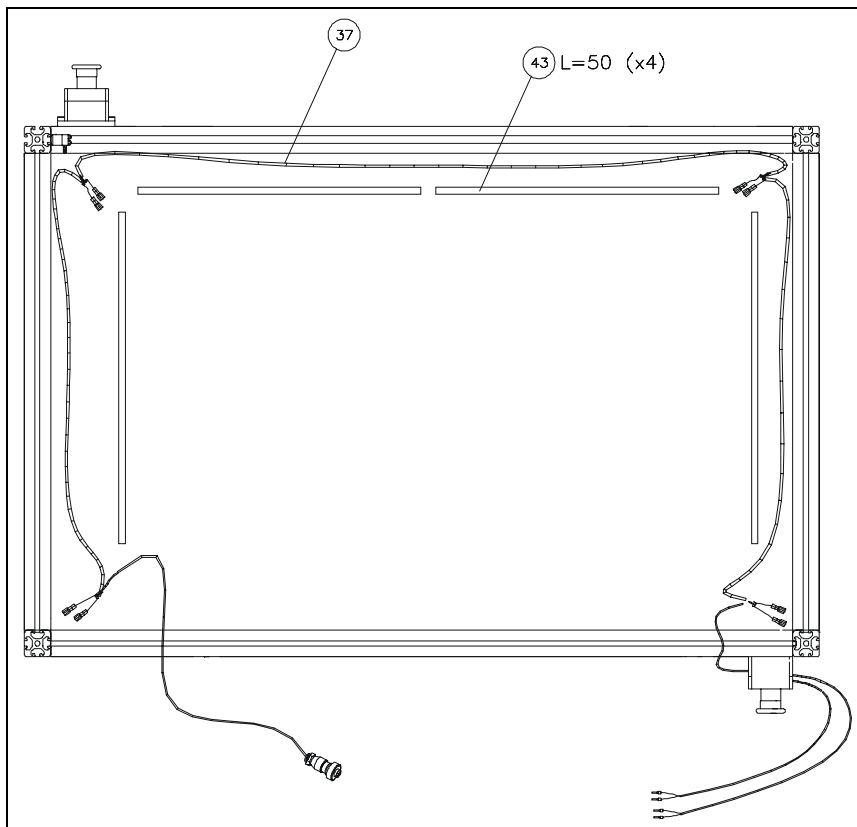


Figure 19: Safety Switch Wiring

8. See Figures 13 and 20. Remove the work clamp from the welder's work cable. Connect the work cable wires to the welding jigs (17), as follows:
Connect the cable lug to the stud on the name plate jig.
Connect the short cable to the stud on the name plate jig
Place the other end of the short cable through the hole in the table, and run it under the table to the hole next to the T-butt jig.
Connect the cable lug on the other end of the short cable to the T-butt jig.
Securely fasten the M6 nuts on both studs.

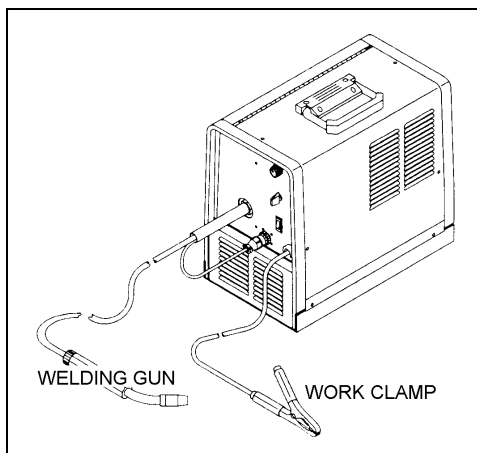


Figure 20: Welder Work Clamp

9. See Figure 21. Connect the grounding wire to the slotted aluminum frame of the welding booth. Then connect the grounding wire to a nearby grounding point.

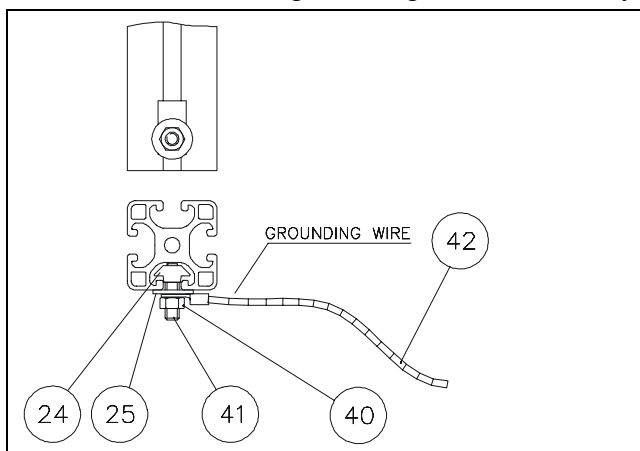


Figure 21: Grounding Wire

10. At this point you should finish connecting the robot and controller to each other and to the power. Install the RoboCell software. Home the robot.

11. See Figure 22. **After you have homed the robot**, attach the welding gun adapter to the robot gripper on its exterior side.
Remove the two screws in the robot gripper. Attach the adapter (34) with the screws provided.

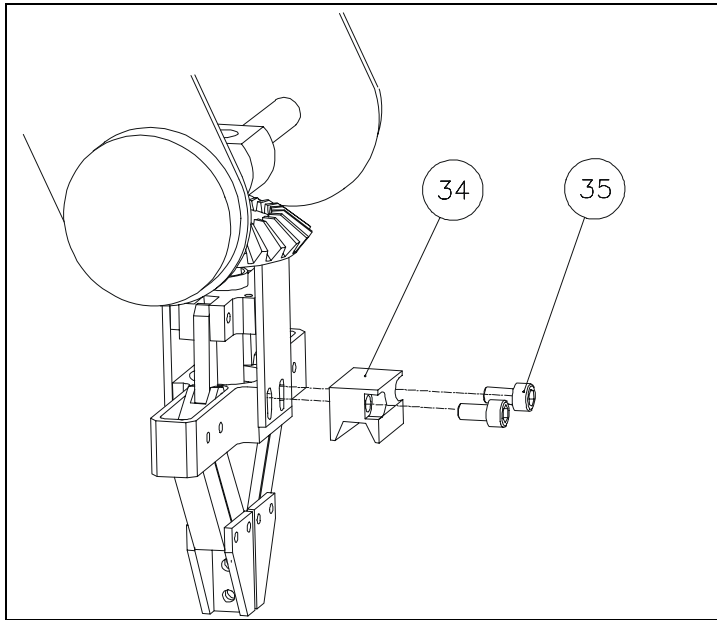


Figure 22: Attaching Welding Gun Adapter to Gripper

Welder and Gun Installation

These installation instructions are excerpted from the *Millermatic® Welder and Gun Owner's Manual*. For more complete installation instructions, refer to the manual.

Installing Gas Supply

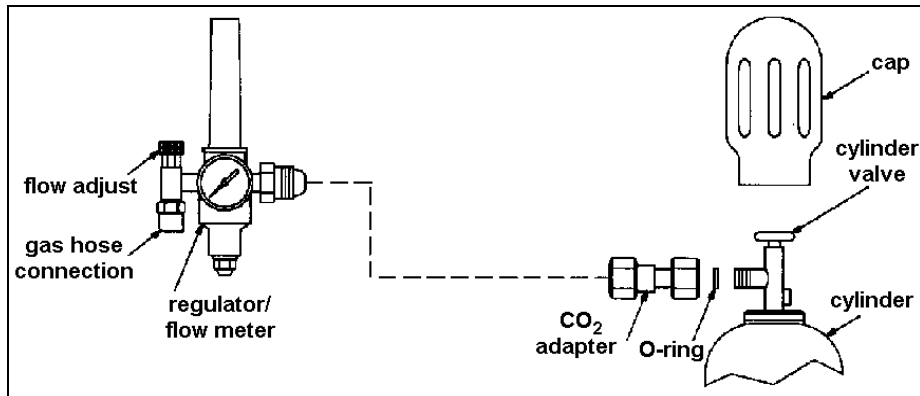


Figure 23

See Figure 23. To install the gas supply, do the following:

1. Obtain the gas cylinder and chain it to the running gear, wall or other stationary support such that the cylinder cannot fall and break off the valve.
2. Remove the cap.
3. Stand to the side of the valve and open the valve slightly.
4. Gas blows dust and dirt from the valve.
5. Close the valve.
6. Install so that the face is vertical.
7. The fitting has 5/8-18 right-hand threads. Install the gas hose.
8. Check the wire manufacturer's recommended flow rate.
9. Typical flow rate is 20 cfh (cubic feet per hour).
10. Install the adapter with the O-ring between the regulator/flow meter and the CO₂ cylinder.

Installing Drive Roll, Wire Guide and Threading Welding Wire

See Figure 24. To install the drive roll, do the following:

11. Choose the correct drive roll for the wire type.
12. Align the drive roll with the flat spot on the shaft.
13. Slide the drive roll onto the shaft and secure with a screw.
14. Remove the guide by pressing on the barbed area or cutting of one end near the housing and pulling it out of the hole.

15. Push the new guide into the hole from the rear until it snaps in place.

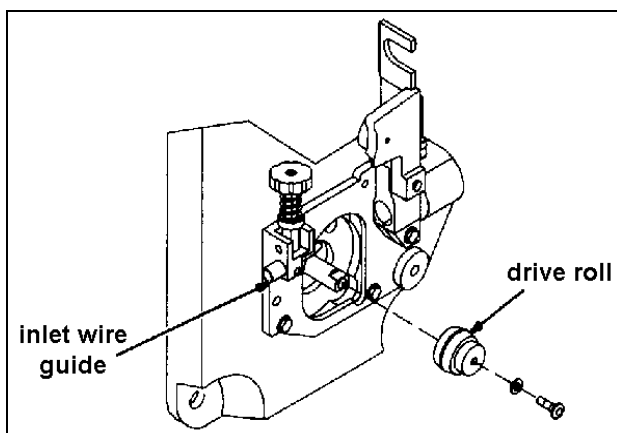


Figure 24

To install the wire guide and thread the welding wire, refer to Figure 25.

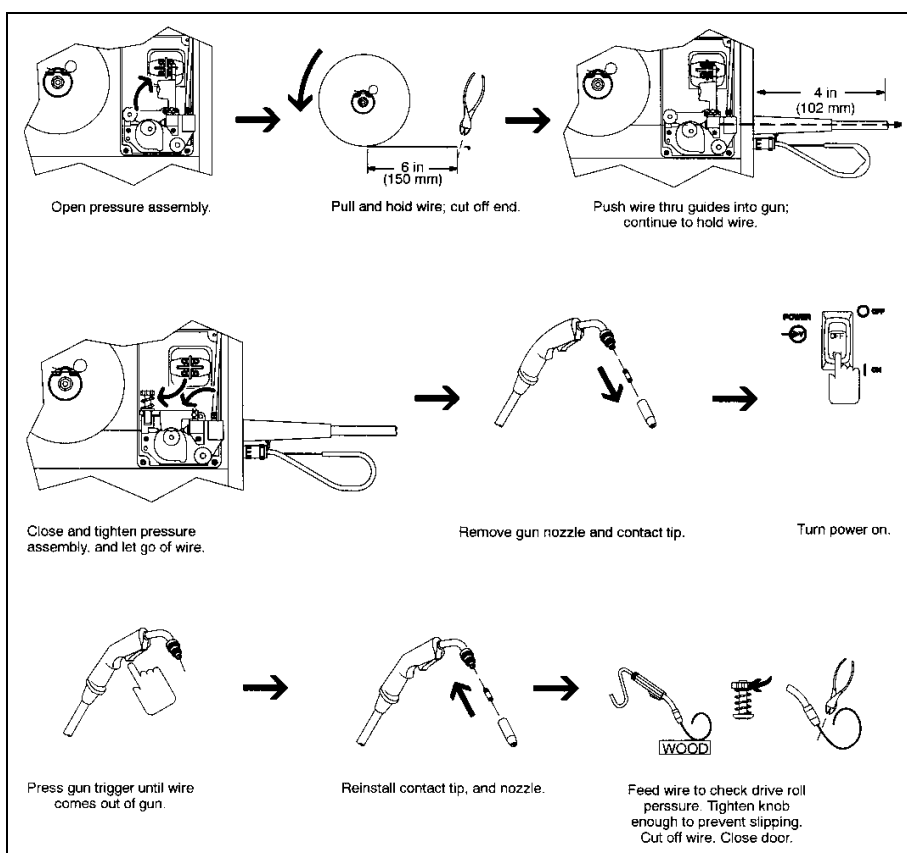


Figure 25

Testing the Welding System

1. Before beginning the test, read the section called “Emergency and Safety Procedures” at the beginning of this manual.
2. Make sure the safety wire is connected correctly. (See the section “Wiring”).
3. Make sure that all the welding booth parts are connected.
4. Install RoboCell for Welding.
5. From RoboCell, select Simulation.
6. Be sure the file ER4WELD1 is open in the graphic display.
7. From the SCORBASE menu, open the file “Eshed.”
8. Select On line.
9. Home the robot.
10. Open the gripper.
11. Send the robot to position 11 (approximately 100 mm above the gun holder).
12. Select Go Linear to position 1 (the gun holder).
13. If the robot does not move to the correct position, do the following:
 - Loosen the bolts from the robot base and turn the robot slightly until it is in the correct position.
 - Reconnect the bolts to the robot.
 - Send the robot to the home position, then resend it to positions 11 and 1.
 - If the robot does not get to the desired position after the adjustment, repeat the above process. If necessary, remove some of the bolts completely. Tighten the remaining bolts.
14. Make sure the welding cable is installed correctly (see “Wiring”).
 - All the cable connections must be connected as shown in the illustrations in the section “Wiring.”
 - Make sure the controller output for the welding cable is off (it should be connected to output 1).
 - The welding booth doors should be open.
 - The welding gun should be in the holder.
 - Select On line.
 - Home the robot.
 - Press each of the emergency buttons.
 - Check SCORBASE to be sure that Emergency mode is active. The word “Emergency” will be written in the lower right corner.

- Make sure the emergency light on the controller is on.
- Release the Emergency button.
- Send the robot to the home position.
- Turn on the welder.
- Open the valve on the gas tank.
- From SCORBASE digital IO dialog box, turn on the output for the welder. This should be connected to output 1.
- Wait at least one minute to be sure the welding wire is not released from the gun.
- If the wire is released, the microswitch is not connected correctly. Refer to the installation instructions for proper installation. If problems exist after connecting the microswitch correctly, contact Eshed customer support.
- When installation is complete, place two name plates on the jig.
- Make sure the program “Eshed” is open.
- Make a dry run of the program. Run the program with the doors open and Watch the operation of the program to be sure that the robot correctly reaches all of the positions.

15. Be sure the system emergency procedures are operating.

- Run the program again. Be sure the doors are closed. Observe the operation of the program through the windows on the doors. The welder should operate only if the doors are closed.
- Try each of the four doors on the welding booth separately and be sure the welding stops each time.
- With the doors closed, press and release each of the emergency buttons. Be sure the welding stops when the buttons are pushed.

The robot will fall each time you press the emergency button. Move the robot to about 20 cm above the name plates and resume operation. Be sure the doors are closed then push the other emergency button.

- If the welding does not stop with the doors open or the buttons pressed, call Eshed customer support.
- Note: the emergency button on the controller will only stop the robot motors. It will not turn off the outputs or the welder.

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