

SERIES 40 WELD HEAD



USER'S MANUAL

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S E R I E S 4 0 W E L D H E A D

Swagelok series 40 welding system components deliver consistent, precise welds for outside tube diameters ranging from 1 1/2 to 4 in. and 38.1 to 114.3 mm and pipe diameters ranging from 1 1/4 to 4 in. and 42.2 to 114.3 mm.

A dc motor in the weld head drives a rotor, which revolves the tungsten electrode around the weld joint. Optical circuitry in the weld head sends precise feedback to the power supply to control the speed of the rotor.

All moving parts in the weld head are mounted in low-friction devices to provide smooth, consistent operation.

A spring-loaded, floating brush maintains contact with approximately two-thirds of the circumference of the rotor. This configuration ensures consistent, uniform electrical conductance to the rotor and electrode.

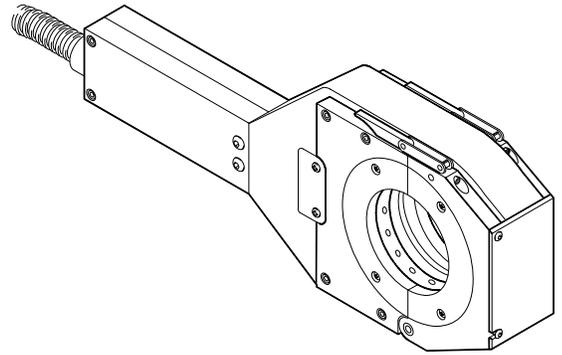


Figure 1 Series 40 Weld Head

Unpacking the Weld Head Components

The weld head assembly and tool package are packaged in a foam-lined shipping container. Perform the following steps when your Swagelok series 40 weld head arrives.

1. Inspect the container for damage.
2. Remove the components from the container.
3. Check the items for any damage.
4. Verify that the weld head serial number matches the serial number on the shipping container.
5. Record the model and serial numbers, and the delivery dates on the Registration Information page of your power supply user's manual.

Installing the Weld Head

The weld head assembly has four connectors that plug into the power supply. See Figure 2.

The four connectors on the cable are:

- weld head
- electrode (red)
- work (green)
- weld head shielding gas

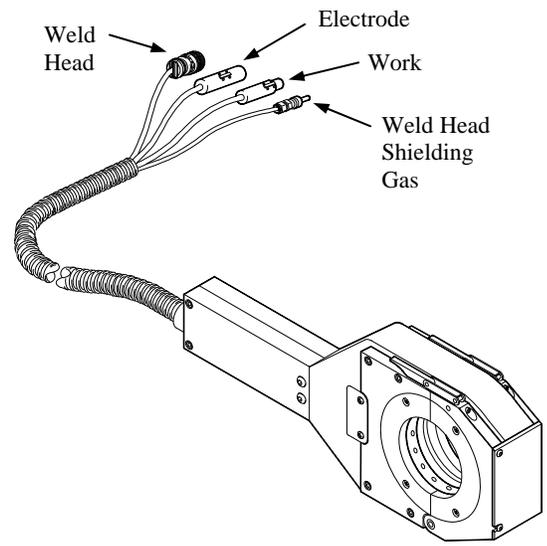


Figure 2 Weld Head Assembly

Connect the four connectors to the side panel of the power supply by performing the following steps. See Figure 3.

1. Locate the weld head cable assembly.
2. Align the notch on the one-quarter turn connector with the small tab in the mating socket on the side panel labeled **WELD HEAD**. Insert the connector in the socket. Turn the connector sleeve clockwise by hand until it is tight. This connection provides the control signals to drive the weld head.
3. Insert and fully seat the red connector into the socket on the side panel labeled **ELECTRODE**. Twist the connector 1/4-turn clockwise to lock it into place. This connection is the negative (-) terminal of the weld head.
4. Insert the green connector into the socket on the side panel labeled **WORK**. Twist the connector 1/4-turn clockwise to lock it into place. This connection is the positive (+) terminal of the weld head.
5. Insert the weld head shielding gas connector into the Swagelok Quick-Connect stem labeled **TO WELD HEAD**. Ensure that the connector is firmly attached. This connection provides shielding gas to the weld head through a mass flow controller in the power supply.

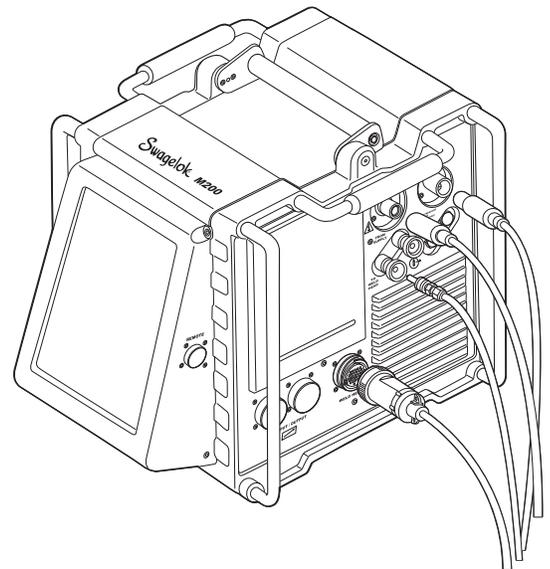


Figure 3 Weld Head Connectors



Caution!

Ensure that the weld head connector is fully seated in the mating socket and the threaded sleeve is tight.

Note: The weld head shielding gas connector must be a single-end shut-off (SESO) Swagelok Quick-Connect stem (SS-QC4-S-400).

Selecting the Electrode

Electrode length depends on the desired arc gap and outside diameter of the work piece being welded. To select the correct electrode use the Tungsten Electrode Length Calculation. Once you have the correct length calculated either select an electrode from stock using the Electrode Selection Table or place a special order.

Tungsten Electrode Length Calculation

To determine the tungsten electrode length for a specific arc gap, use the formula below:

$$(\text{Rotor OD} \div 2) - (\text{Tube OD} \div 2) - \text{Arc Gap} = \text{Electrode Length}$$

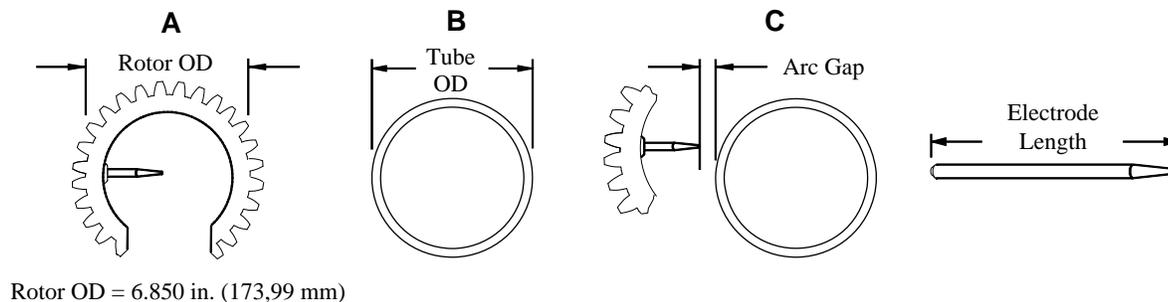


Figure 4 Electrode Length Calculation Parameters

Example No. 1: (1.5 in. to 1.5 in. tube butt weld)

Rotor OD	A = 6.850 in.
Tube outside diameter	B = 1.500 in.
Desired arc gap	C = 0.060 in.

$$(6.850 \div 2) - (1.500 \div 2) - 0.060 \text{ in.} = 2.615 \text{ in.}$$

Example No. 2: (38,1 mm to 38,1 mm tube butt weld)

Rotor OD	A = 173,99 mm
Tube outside diameter	B = 38,10 mm
Desired arc gap	C = 1,52 mm

$$(173,99 \div 2) - (38,10 \div 2) - 1,52 \text{ mm} = 66,425 \text{ mm}$$

Installing the Electrode

1. With the weld head in the open position, press **JOG** or **ELECTRODE CHANGE** on the operator panel until the tungsten electrode is in the position shown in Figure 6.
2. Loosen the electrode set screw. Remove the electrode if you are replacing it.
3. Insert the new electrode until it is flush with the outside edge of the rotor.
4. Tighten the electrode set screw to secure the electrode.
5. Press **HOME** or **ELECTRODE CHANGE** on the operator front panel to return rotor to the home position.

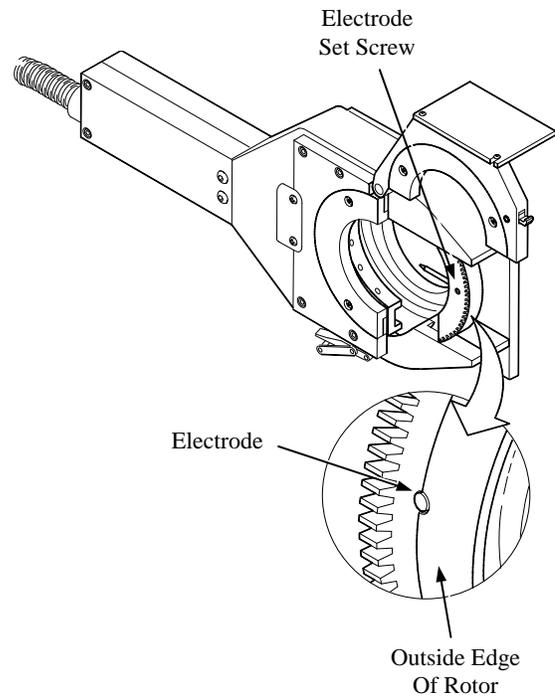


Figure 6 Electrode Installation



Caution!

The rotor will move when JOG or ELECTRODE CHANGE is pressed. The rotor is a potential pinch point.



Caution!

Do not jog or move the rotor unless the electrode is clamped in place.

Preparing the Work

It is important to prepare the tube pieces properly before welding. See Figure 7.

Tubing must be square and burr-free to ensure repeatable, high-quality autogenous fusion welds.

Cut the tubing to length with a hacksaw or tube cutter. Face the tube ends with a lathe or a portable facing tool. Deburr the ends, making sure that both the inside and outside diameters are square and burr-free. Clean the tube ends using an appropriate solvent.

Minimize the chance of a poor quality weld by following these guidelines:

- Tube ends must be square.
- Tube ends must not have a wall thickness variation exceeding $\pm 15\%$ of nominal.
- Tube ends must be burr-free.
- Tube ends must be free of any rust, grease, oil, paint, or other surface contaminants.

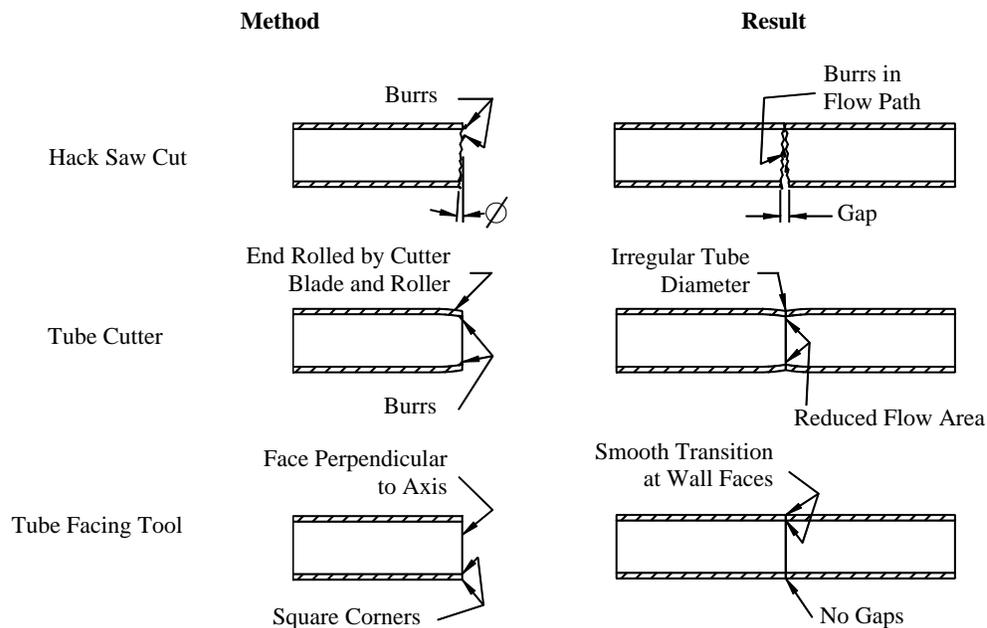


Figure 7 Tube Preparation

Operating the Weld Head

Operate the weld head using the following parameters:

Series 40

Shield gas flow rate std ft ³ /hr (std L/min)	30 to 50 ^① (14 to 23)
Prepurge and Postpurge minimum time in seconds	45 ^②
Maximum Recommended Average Amps	100 A ^③

^① Set flow to higher rates when welding at high current rates.

^② Flow should be continuous for cooling when welding at high current rates.

^③ When using optional weld lens over viewport, max is 120 A @ 50 % duty cycle.

Collet Installation

1. Select the appropriate set of collets according to the tube OD of the tubing to be welded.
2. Remove the four screws holding the collets on each side of the weld head.
3. Install the selected collet.
4. Reinstall the screws.

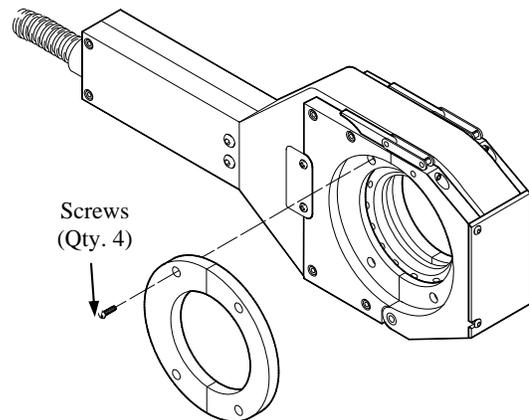


Figure 8 Installing the Collet

Work Piece Alignment

1. Open the window cover.
2. Open one of the fixture side plates.
3. Insert the first work piece aligning it with the tungsten electrode.
4. Close and latch the fixture side plate.
5. Open the other fixture side plate.
6. Insert the second work piece and butt the weld ends together.
7. Close and latch the fixture side plate.
8. Inspect the alignment by looking through the window cover to verify that the two work pieces are centered on the tungsten electrode.

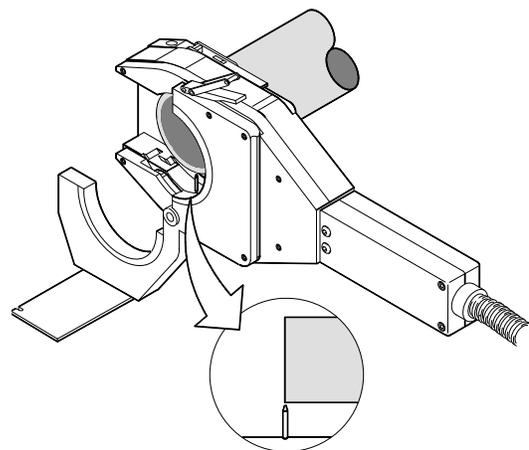


Figure 9 Aligning the Work Piece with the Electrode

Latch Tension Adjustment

1. Adjust the latch adjustment screws so that the latch is in position to exert appropriate tension on the tube.

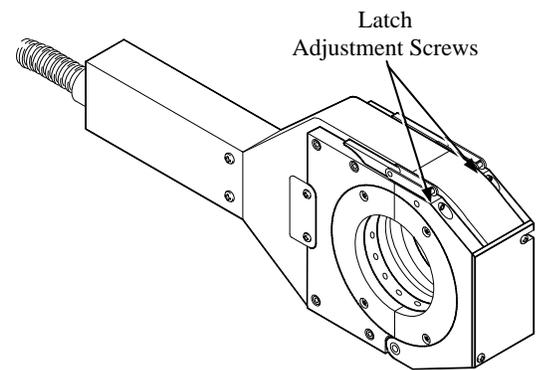


Figure 10 Adjusting the Latch Tension

Weld Head Mounting

1. Bolt the mounting bracket to the top of the bench.
2. Thread the power cord through the opening of the mounting bracket and seat the weld head in the position shown in Figure 11.

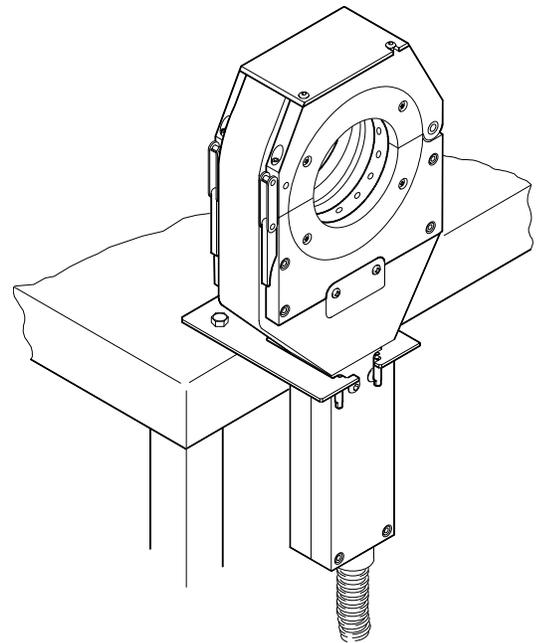


Figure 11 Mounting the Weld Head

Note: The weld head may be mounted as illustrated or turned 90°.

Performing Daily Maintenance

To keep your Swagelok welding system (SWS) equipment in proper working order, you must perform daily maintenance on the system components.

Store the weld head in a clean, dry place.

At the start of each workday remove dirt, carbon, and vapor deposits from the weld head rotor area with a clean, soft cloth and a solvent such as isopropyl alcohol.

Note: If you experience problems while performing the procedures in this section, refer to Troubleshooting in power supply user's manual or contact your authorized Swagelok representative.

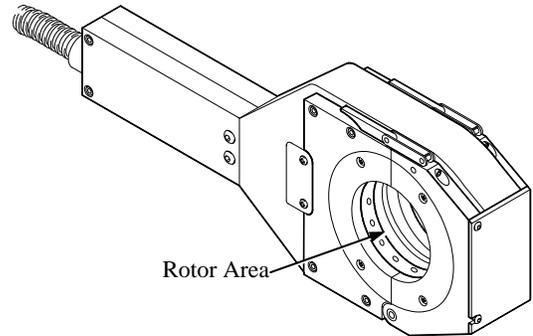


Figure 12 Inspect Exposed Surfaces of the Weld Head

Performing Periodic Maintenance

This section describes the procedures necessary for maintaining the weld head after every 400 to 500 welds.

Parts that are found to be defective during this procedure should be replaced. For detailed part drawings and ordering information, refer to the Part Drawings at the end of this manual. Spare parts are available through your authorized Swagelok representative.



WARNING!

DISCONNECT THE WORK AND ELECTRODE CABLES FROM THE POWER SUPPLY BEFORE PERFORMING MAINTENANCE.



Caution!

Do not use lubricants inside the weld head.

1. Verify the fixture side plate will properly secure the work piece.
 - a. Install collets into one side of the fixture side plate.
 - b. Insert nominal sized tubing and close the fixture side plate using the lever cams.
 - c. Verify the tubing does not rotate in the collets.
 - d. Verify the tubing does not slide side-to-side in the collets.
 - e. Verify the tubing does not move up and down or left to right in the collets.
 - f. Repeat for the other side of the fixture side plate.
 - g. Contact your authorized Swagelok representative to return the fixture side plate for service.

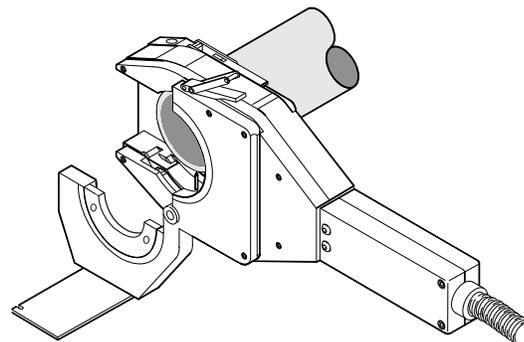


Figure 13 Verifying Work Piece is Secure

Weld Head Cleaning and Inspection

This section describes how to disassemble the weld head and rotor.

Weld Head

To disassemble the weld head, follow these steps:

1. Blow any loose material from the weld head assembly with clean, low-pressure air.
2. Remove the four screws from the left fixture side plate. See Figure 14.
3. Using a flat-bladed screwdriver, evenly pry the left fixture side plate off of the weld head housing being careful not to damage ends of threaded alignment studs.
4. Remove the long motor cover screws and the motor cover end screws. See Figure 15.

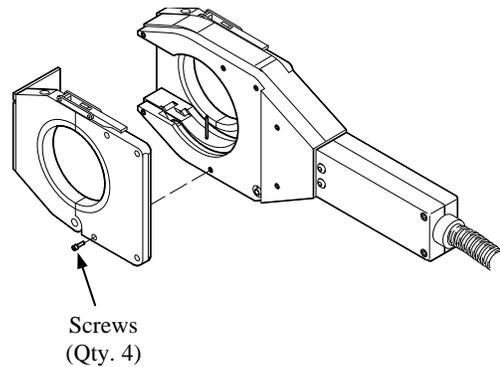


Figure 14 Removing the Left Fixture Side Plate

Note: As you remove the screws from the weld head organize them so that you can reinstall them in their original holes upon reassembly.

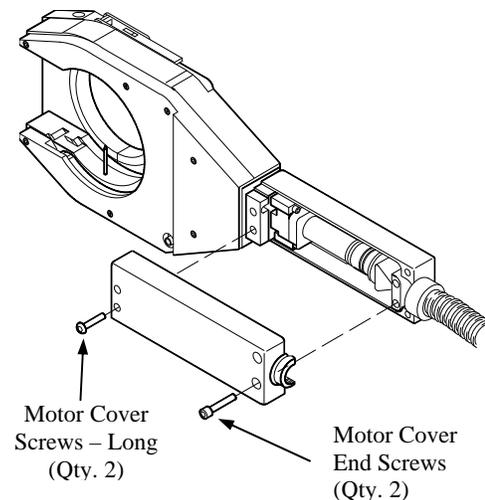


Figure 15 Removing the Motor Cover

5. Remove the four weld head housing screws from the housing. Using a flat blade screwdriver, carefully separate the brush side from the gear side. See Figure 16.
6. Carefully separate the weld head housing halves so that internal components, such as the ground pin insulators and fixture pin insulator are not damaged. See Figure 16.

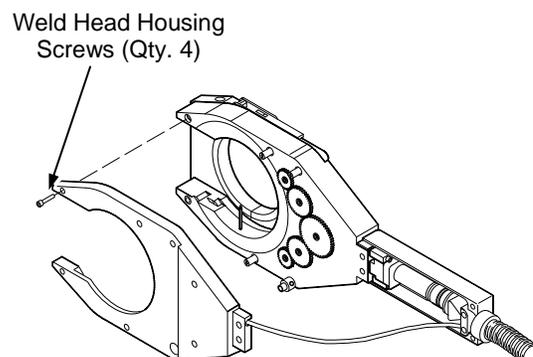


Figure 16 Disassembling the Weld Head Housing

Brush

1. Remove the three brush screws and the two clamping plate screws.
2. Remove the brush from the brush side of the housing assembly. See Figure 17.
3. Inspect and clean the brush using the following steps:
 - Check the brush for excessive wear. Contact your Swagelok representative if replacement is necessary.
 - Remove any oxidation from the brush surface and brush clamp plate with a nylon abrasive pad.
 - Turn the brush over and remove any oxidation from the area that contacts the brush clamp plate with a nylon abrasive pad.
 - Remove the residue left by the abrasive pad using isopropyl alcohol and a lint-free pad.
 - Remove residue from the brush groove with isopropyl alcohol and a lint-free pad.
4. Reinstall the brush making sure the springs are fully seated in the brush housing.
5. Screw the two short screws into the brush clamp plate.
6. Screw the three long screws into the brush housing.

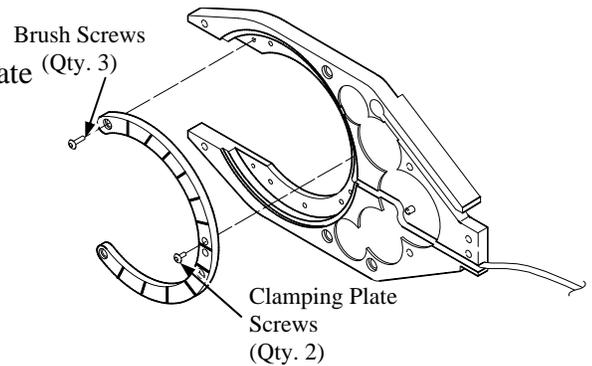


Figure 17 Removing the Brush

Note: The brush clamp plate is attached with two Torx Plus IP-8 screws. Use a Torx Plus T8 wrench to remove.



Caution!

Be careful not to strip the heads or screw threads.

Note: The brush should demonstrate a spring action if installed properly.

Rotor

1. Inspect the gears for wear and replace if damaged by referring to the Gear Side Assembly drawing on page 20.
2. Remove the rotor from the gear side of the housing assembly. See Figure 18.
3. Place the rotor on a clean, dry surface.
4. Inspect the rotor bearing assemblies for wear and damage. Contact your Swagelok representative if replacement is necessary.
5. If the rotor bearing assemblies are dirty, clean them with isopropyl alcohol.
6. Inspect the rotor for dirt and other deposits. Remove dirt or other deposits with a nylon abrasive pad.
7. Remove residue from the rotor track with isopropyl alcohol and a lint-free pad.
8. Remove the actuator tab. Inspect it for excessive wear. Replace if necessary.
9. Remove dirt or other deposits from the actuator tab with a nylon abrasive pad.
10. Remove residue left by the nylon abrasive pad from the actuator tab with isopropyl alcohol and a lint-free pad.
11. Reinstall the actuator tab.
12. Reinstall the rotor onto the rotor track making sure that it is centered.

Note: Make any necessary gear replacements before reinstalling the rotor.

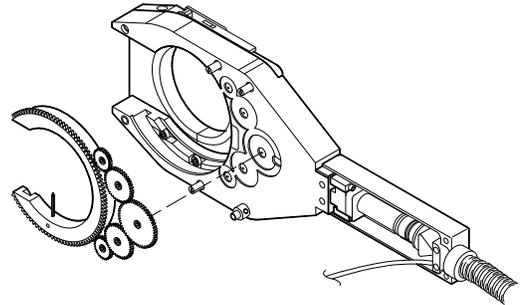


Figure 18 Removing the Rotor

Weld Head Reassembly

1. Reinstall the brush side assembly onto the gear side assembly.
2. Replace the left side of the motor cover making sure the cable cover is seated in the stress reliever.
3. Replace the left side fixture plate.

Note: If the fixture side plate screws thread into the alignment studs and cause both to rotate without tightening, insert an Allen wrench into the alignment stud to keep it in place while you finish tightening the fixture side plate screws.

Home Sensor Adjustment

Test the home sensor assembly for proper operation by pressing **HOME** on the power supply.

If the rotor rotates continuously you will need to adjust or replace the home sensor actuator.

1. Remove the actuator cover. See Figure 19.
2. Slightly loosen the actuator plate screws.
3. Slowly rotate the home actuator switch adjustment cam clockwise until the rotor finds the home position.
4. Rotate the home actuator switch adjustment cam an additional 5°.
5. Tighten the actuator plate screws.
6. Press **HOME** on the power supply to verify the adjustment.
7. Reinstall the actuator cover.

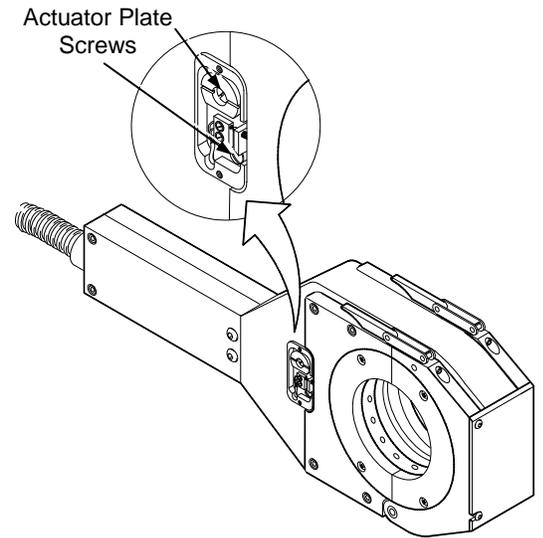


Figure 19 Adjusting the Home Sensor



Caution!

Over-adjustment of the cam will cause the home sensor to fail prematurely due to excessive pressure. Adjust the cam just past the point where the home sensor “clicks” when actuated.

Actuator Replacement

If adjusting the home sensor assembly does not activate the home sensor assembly, you will need to replace the actuator.

1. Remove the right fixture side plate. See Figure 20.
2. Remove and replace the home sensor actuator.
3. Repeat steps 1 to 7 of **Home Sensor Adjustment**.
4. Reinstall the right fixture side plate.

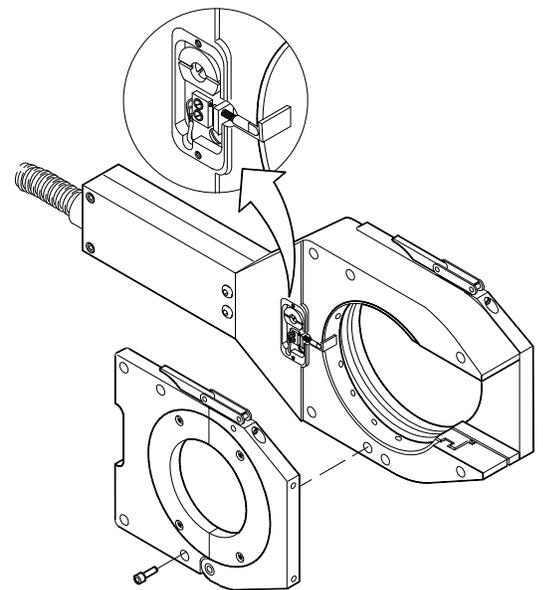


Figure 20 Replacing the Actuator

Specifications

Component	Dimensions	Weight
Weld Head	Length 19.2 in. (48,8 cm)	14.30 lbs (6,49 kg)
	Width 8.0 in. (20,3 cm)	
	Thickness 2.8 in. (7,1 cm)	
Power Cord	Length 15 ft. (457,2 cm)	4.5 lbs (2,04 kg)
	35 ft. (1066 cm)	10.28 lbs (4,66 kg)
	50 ft. (1524 cm)	14.5 lbs (6,58 kg)
Collets	Tube OD 2.0 in. set (5,08 cm)	7.58 lbs (3,44 kg)
	3.0 in. set (7,62 cm)	6.24 lbs (2,83 kg)
	4.0 in. set (10,16 cm)	4.38 lbs (1,99 kg)
Case	Length 23.25 in. (59,1 cm)	13 lbs (5,9 kg)
	Width 20.75 in. (52,7 cm)	
	Thickness 9.0 in. (22,86 cm)	

Parameter	Specification
Max Rotor Speed	2.5 r/min Maximum
E-distance	1.4 in. (35,56 mm) to the center of the electrode

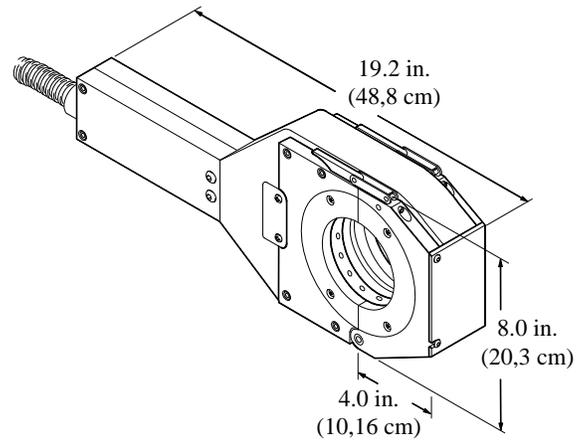


Figure 21 Specifications

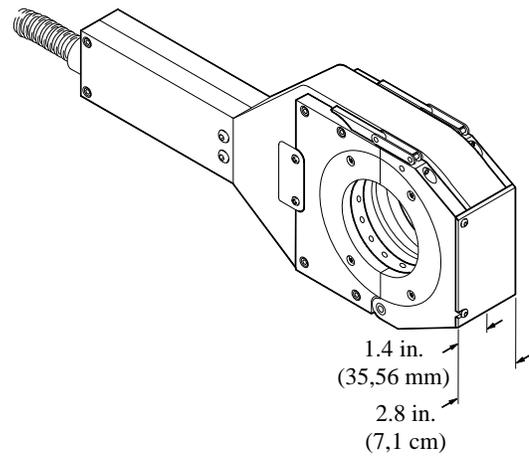


Figure 22 E-Distance

Parts Drawings

This section includes exploded assembly drawings and associated parts lists. These drawings are provided as a guide to identifying part names. For specific part ordering information, contact your Swagelok representative.

The parts identified in this section include:

- SWS-40H Weld Head Assembly
- SWS-40H Gear Side Assembly
- SWS-40H Brush Side Assembly
- SWS-40H Fixture Side Plate Assembly – Left
- SWS-40H Fixture Side Plate Assembly – Right
- SWS-40H Motor Drive Assembly

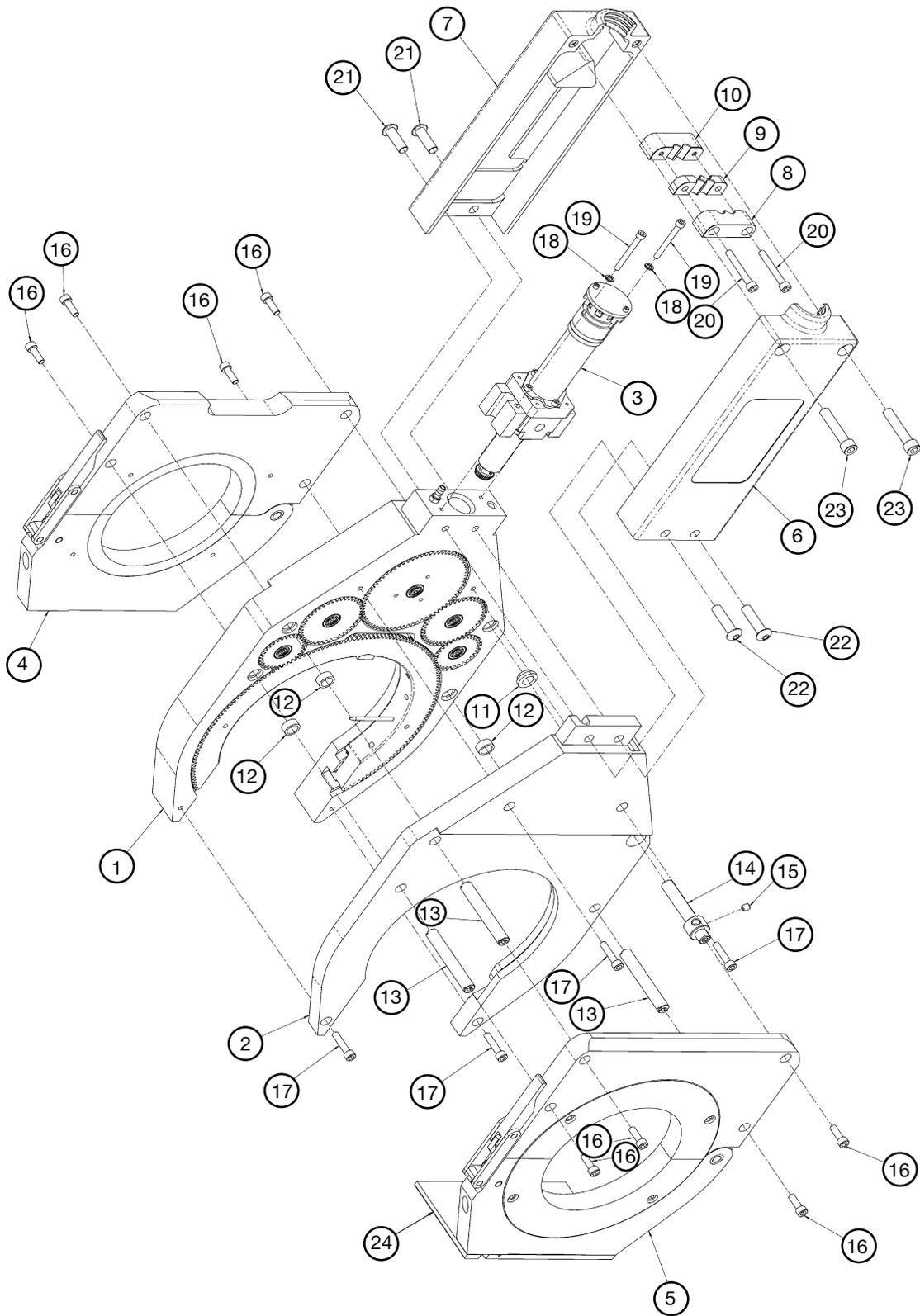


Figure 23 SWS-40H Weld Head

Table 4 SWS-40H Weld Head Parts List

Ref No.	Description	Ordering Number	Available in Kit No.	Minimum Order Quantity
1	Gear Side Housing Assembly	-	SWS-40H-D-GSA	1
2	Brush Side Housing Assembly	-	SWS-40H-D-BSA	1
3	Motor Drive Assembly	*	*	-
4	Fixture Side Plate Assembly - Right	-	SWS-40FSP1R	1
5	Fixture Side Plate Assembly - Left	-	SWS-40FSP1L	1
6	Motor Cover - Left	-	SWS-40H-MTR-CVR-LT	1
7	Motor Cover - Right	-	SWS-40H-MTR-CVR-RT **	1
8	Cord Strain Relief - Left	-	SWS-40H-STRN-RF	1
9	Cord Strain Relief - Middle	-		
10	Cord Strain Relief - Right	-		
11	Ground Pin Insulator	SWS-40H-GND-PIN-INSUL	-	1
12	Fixture Pin Insulator	SWS-40H-FXT-PIN-INSUL	-	1
13	Fixture Pin	SWS-40H-FXT-PIN	-	1
14	Ground Pin	-	SWS-40H-GND-PIN	1
15	Socket Head Set Screw 8-32 x 0.188 Cup Point	188-SSAC-164-32-188	-	10
16	Socket Head Cap Screw 8-32 x 0.500	188-SCSA-164-32-500	-	10
17	Socket Head Cap Screw 8-32 x 0.750	188-SCSA-164-32-750	-	10
18	Motor Drive Assembly Mounting Screw Lock Washers	*	*	-
19	Motor Drive Assembly Mounting Screws	*	*	-
20	Socket Head Cap Screw 8-32 x 1.250	188-SCSA-164-32-1250	-	10
21	Button Head Cap Screw ¼-20 x 0.750	188-SCBA-250-20-750	-	10
22	Button Head Cap Screw ¼-20 x 1.000	188-SCBA-250-20-1000	-	10
23	Socket Head Cap Screw ¼-20 x 1.250	188-SCSA-250-20-1250	-	10
24	Standard Window Cover	SWS-40H-WIN-CVR	-	1
25	Optional Weld Lens Window Cover ①	-	SWS-WIN-WL-CVR	1

* Not available as a field replacement spare part.

** Customer must provide model and serial number when ordering replacement part.

① Part is not shown in the drawing.

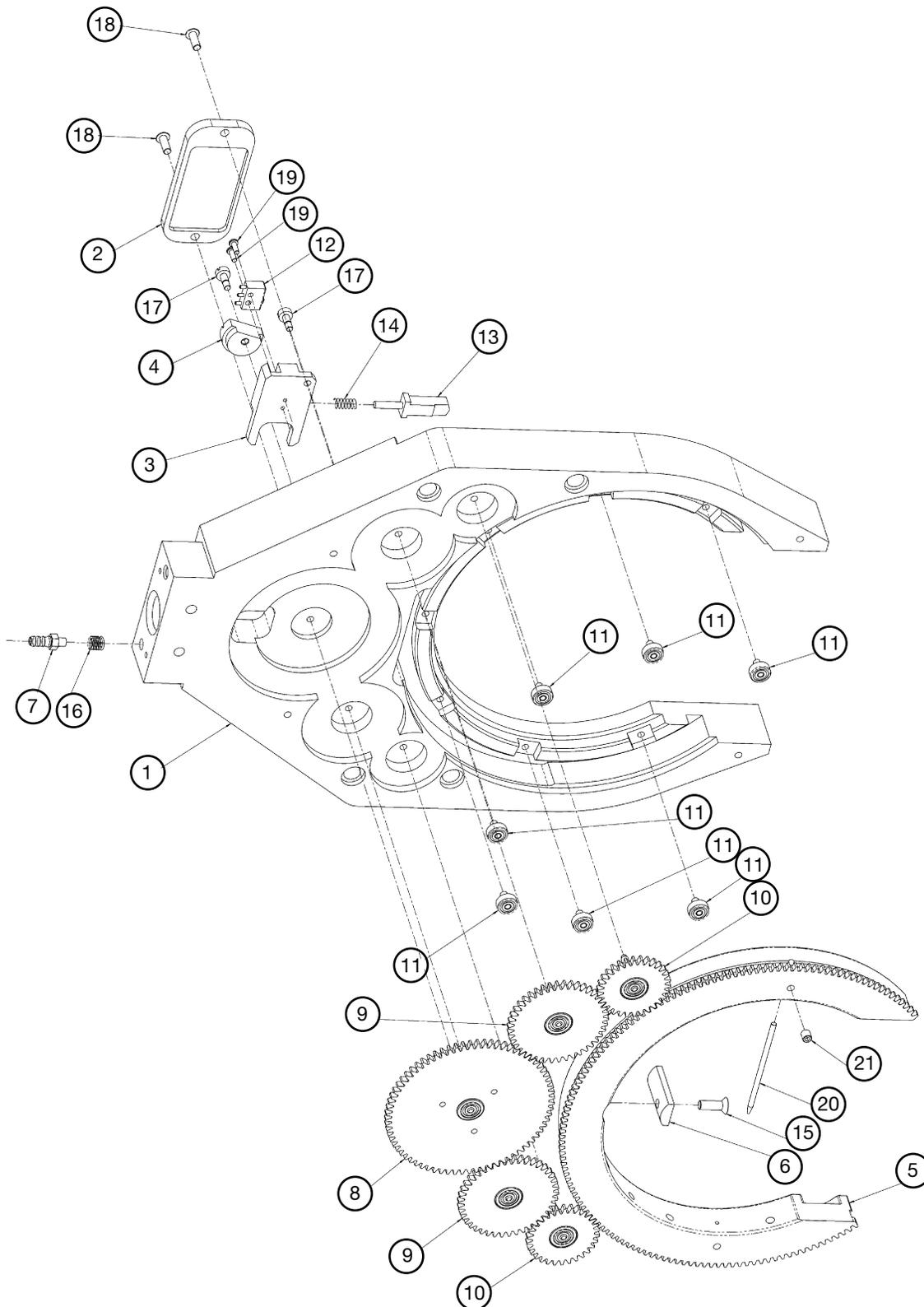


Figure 24 SWS-40H Gear Side Assembly

Table 5 SWS-40H Gear Side Assembly Parts List

Ref No.	Description	Ordering Number	Available in Kit No.	Minimum Order Quantity
1	Gear Side Housing Assembly	-	SWS-40H-D-GSA	1
2	Home Switch Cover	SWS-40H-HOM-SW-CVR	-	1
3	Actuator Mounting Plate	*	*	-
4	Actuator Switch Adjustment Cam	*	*	-
5	Rotor	SWS-40H-RTR	-	1
6	Actuator Tab	-	SWS-40H-ACT-TAB	1
7	Gas Bayonet	B-BN4-K62	-	1
8	Drive Gear Assembly	-	SWS-40H-DR-GR	1
9	Primary Gear Assembly	-	SWS-40H-PRM-DR-GR	1
10	Secondary Gear Assembly	-	SWS-40H-SCD-DR-GR	1
11	Rotor Bearing Assembly	-	SWS-40H-RTR-BRNG	1
12	Home Sensor Assembly	*	*	-
13	Home Sensor Actuator	-	SWS-40H-SENSOR-ACT	1
14	Actuator Spring	SWS-40H-ACT-SPNG	-	10
15	Flat Head Screw 8-32 x .500	188-SCFP-164-32-500	-	10
16	Helical Threaded Insert	*	*	-
17	Shoulder Screw 4-40 x .188	188-SHFS-1245-188-S	-	10
18	Button Head Cap Screw 6-32 x .380	188-SCBA-138-32-380	-	10
19	Machine Screw 2-56 x .380	NY-SCPS-086-56-380	-	10
20	2% Ceriated Tungsten Electrode	See Electrode Selection Section		
21	Socket Head Set Screw 8-32 x 0.188 Cup Point	188-SSAC-164-32-188	-	10

* Not available as a field replacement spare part.

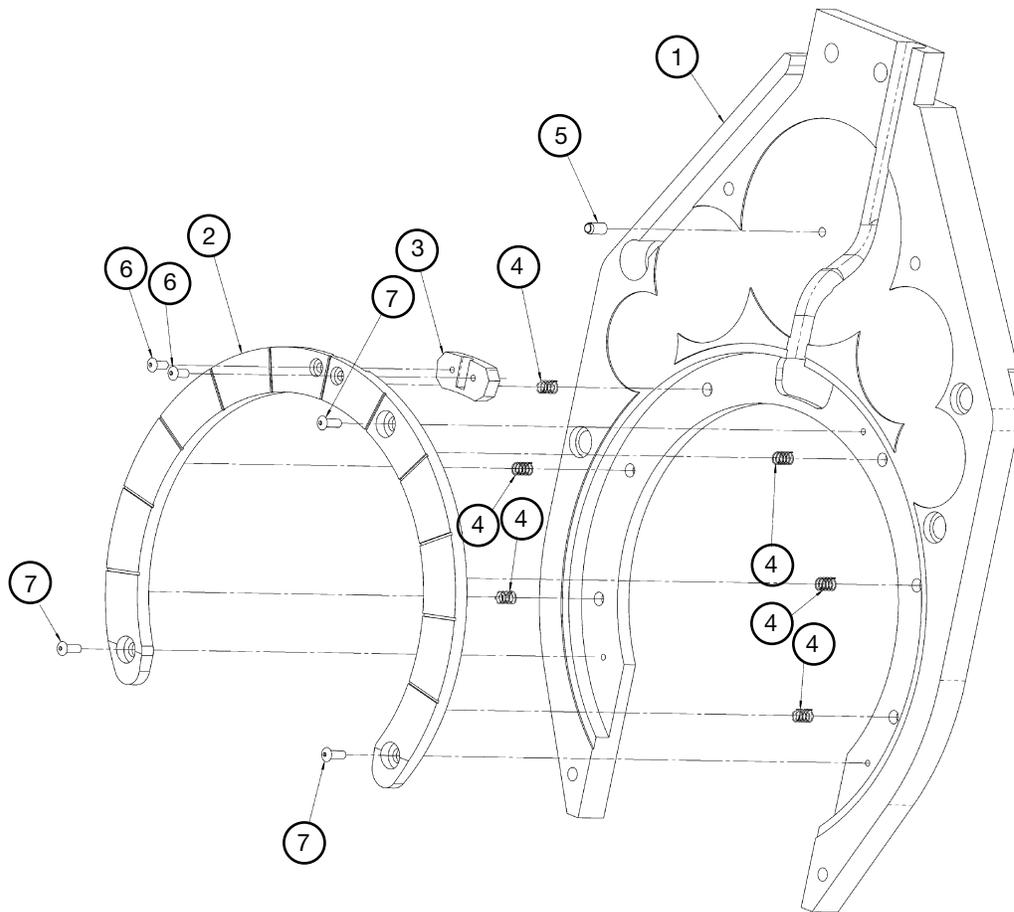


Figure 25 SWS-40H Housing – Brush Side Assembly

Table 6 SWS-40H Housing – Brush Side Assembly Parts List

Ref No.	Description	Ordering Number	Available in Kit No.	Minimum Order Quantity
1	Brush Side Housing Assembly	-	SWS-40H-D-BSA	1
2	Brush	*	*	-
3	Brush Clamp Plate	-	SWS-40H-BRSH-CLP-PLT	1
4	40H Brush Springs	*	*	-
5	Dowel Pin	*	*	-
6	Button Head Torx Socket Cap Screw 4-40 x .250	S-SCBT-112-40-250-BK	-	10
7	Button Head Cap Screw 4-40 x .312	188-SCBA-112-40-312	-	10

* Not available as a field replacement spare part.

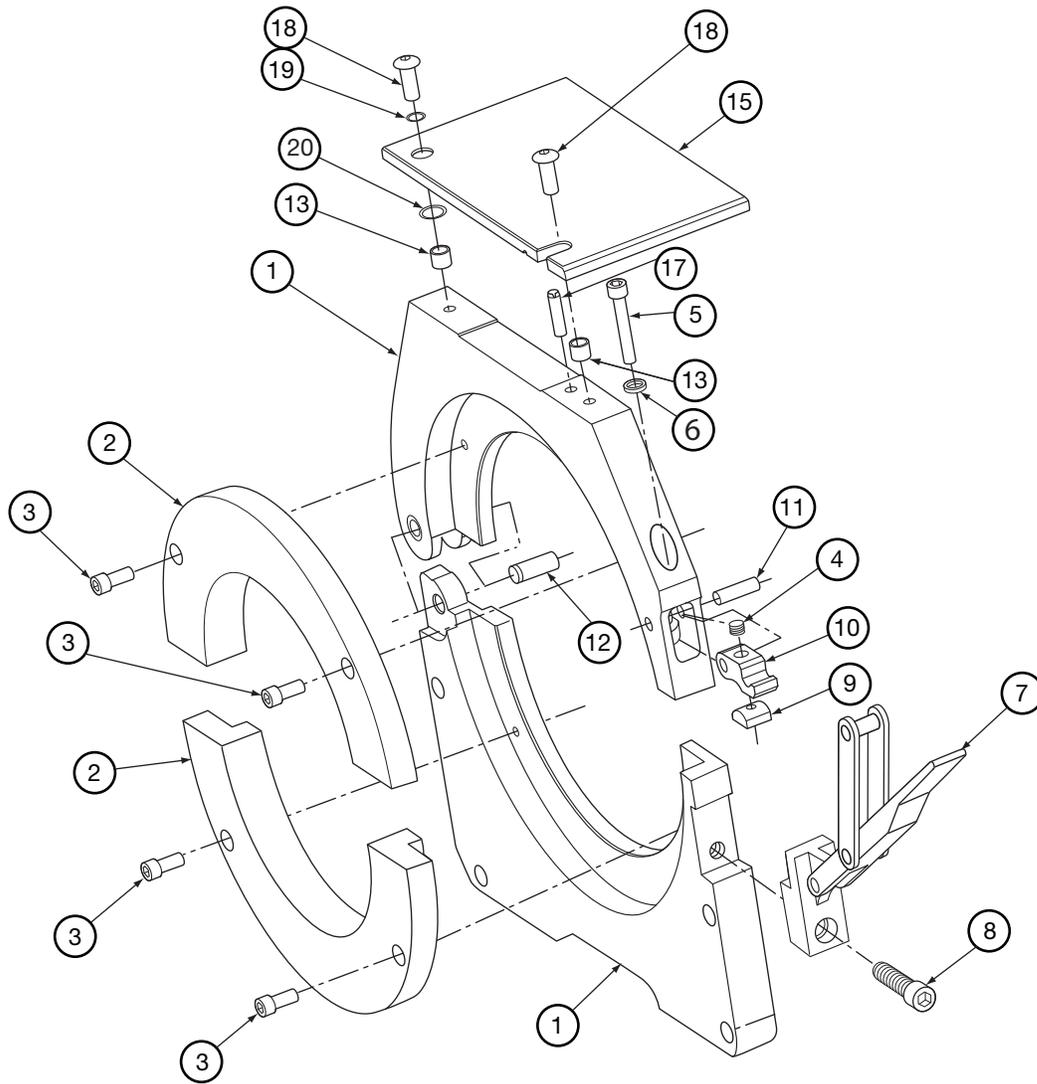


Figure 26 SWS-40H Fixture Side Plate Assembly – Left

Table 7 SWS-40H Fixture Side Plate Assembly – Left Parts List

Ref No.	Description	Ordering Number	Available in Kit No.	Minimum Order Quantity
1	Fixture Side Plate Assembly - Left	-	SWS-40FSP1L	1
2	40H Collets	See Collet Ordering Information		
3	Socket Head Cap Screw 8-32 x 0.382	188-SCSA-164-32-380	-	10
4	40H Latch Spring	SWS-40H-LATCH-SPNG	-	10
5	Socket Head Cap Screw 8-32 x 1.000	188-SCSA-164-32-1000	-	10
6	Lock Washer #8	188-WSLK-174-293-040	-	10
7	40H Latch Sub-Assembly	-	SWS-40H-LATCH	1
8	40H Latch Screw	188-SCSA-190-24-500	-	10
9	40H Latch Hook Cam	SWS-40H-LATCH-HK-CAM	-	1
10	40H Latch Hook	*	*	-
11	Dowel Pin	*	*	-
12	Dowel Pin	*	*	-
13	Standard Window Cover Sleeves	SS-SR-196-250-203	-	1
14	Weld Lens Window Sleeves ①	SS-SR-196-250-100	-	1
15	Standard Window Cover	SWS-40H-WIN-CVR	-	1
16	Optional Weld Lens Window Cover ①	-	SWS-WIN-WL-CVR	1
17	Hex Plunger 8-32 x .625	188-SPAR-164-32-625-NP	-	1
18	Button Head Cap Screw 10-32 x .500	188-SCBA-190-32-500	-	10
19	Window Cover Shim	188-WSFL-188-250-008	-	10
20	Wave Washer	188-WSWV-265-367-006	-	10

* Not available as a field replacement spare part.

① These parts are not shown in the drawing.

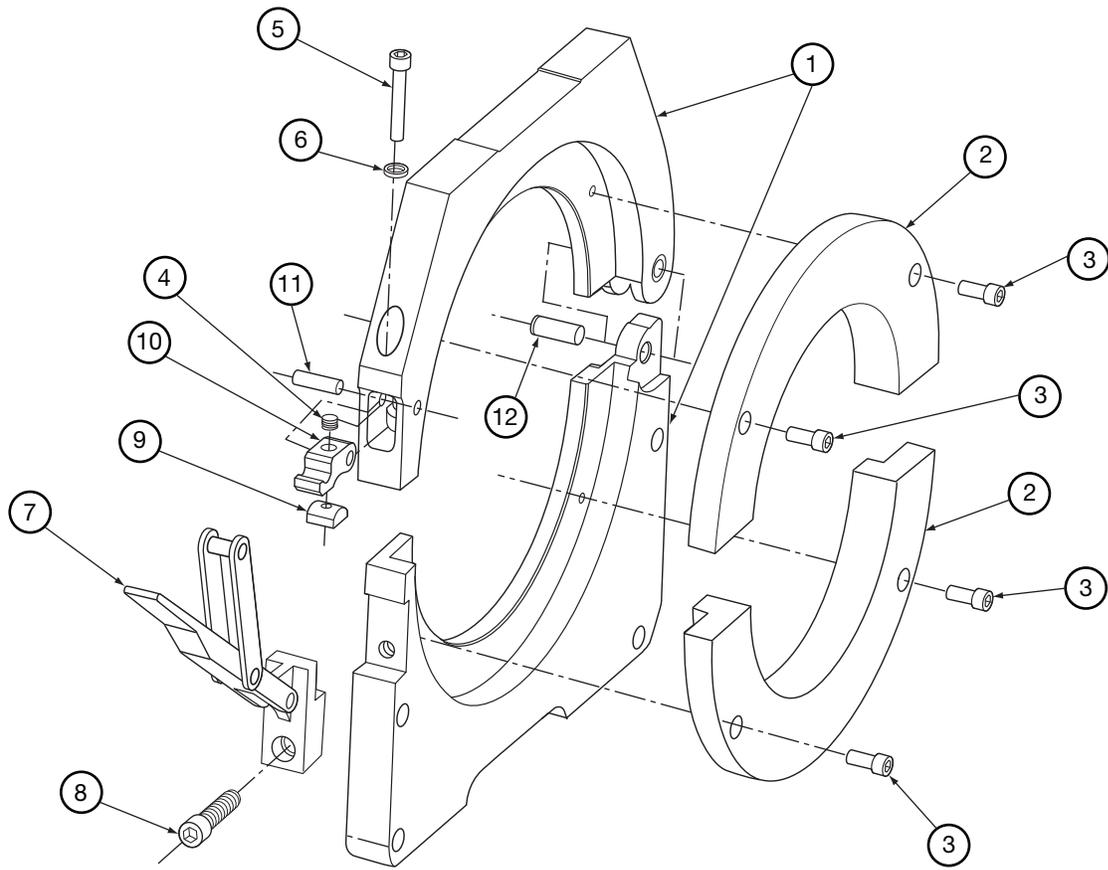


Figure 27 SWS-40H Fixture Side Plate Assembly – Right

Table 8 SWS-40H Fixture Side Plate Assembly – Right Parts List

Ref No.	Description	Ordering Number	Available in Kit No.	Minimum Order Quantity
1	Fixture Side Plate Assembly - Right	-	SWS-40FSP1R	1
2	40H Collets	See Collet Ordering Information		-
3	Socket Heap Cap Screw 8-32 x 0.380	188-SCSA-164-32-380	-	10
4	40H Latch Spring	SWS-40H-LATCH-SPNG	-	10
5	Socket Head Cap Screw 8-32 x 1.000	188-SCSA-164-32-1000	-	10
6	Lock Washer #8	188-WSLK-174-293-040	-	10
7	40H Latch Sub-Assembly	-	SWS-40H-LATCH	1
8	40H Latch Screw	188-SCSA-190-24-500	-	10
9	40H Latch Hook Cam	SWS-40H-LATCH-HK-CAM	-	1
10	40H Latch Hook	*	*	-
11	Dowel Pin	*	*	-
12	Dowel Pin	*	*	-

* Not available as a field replacement spare part.

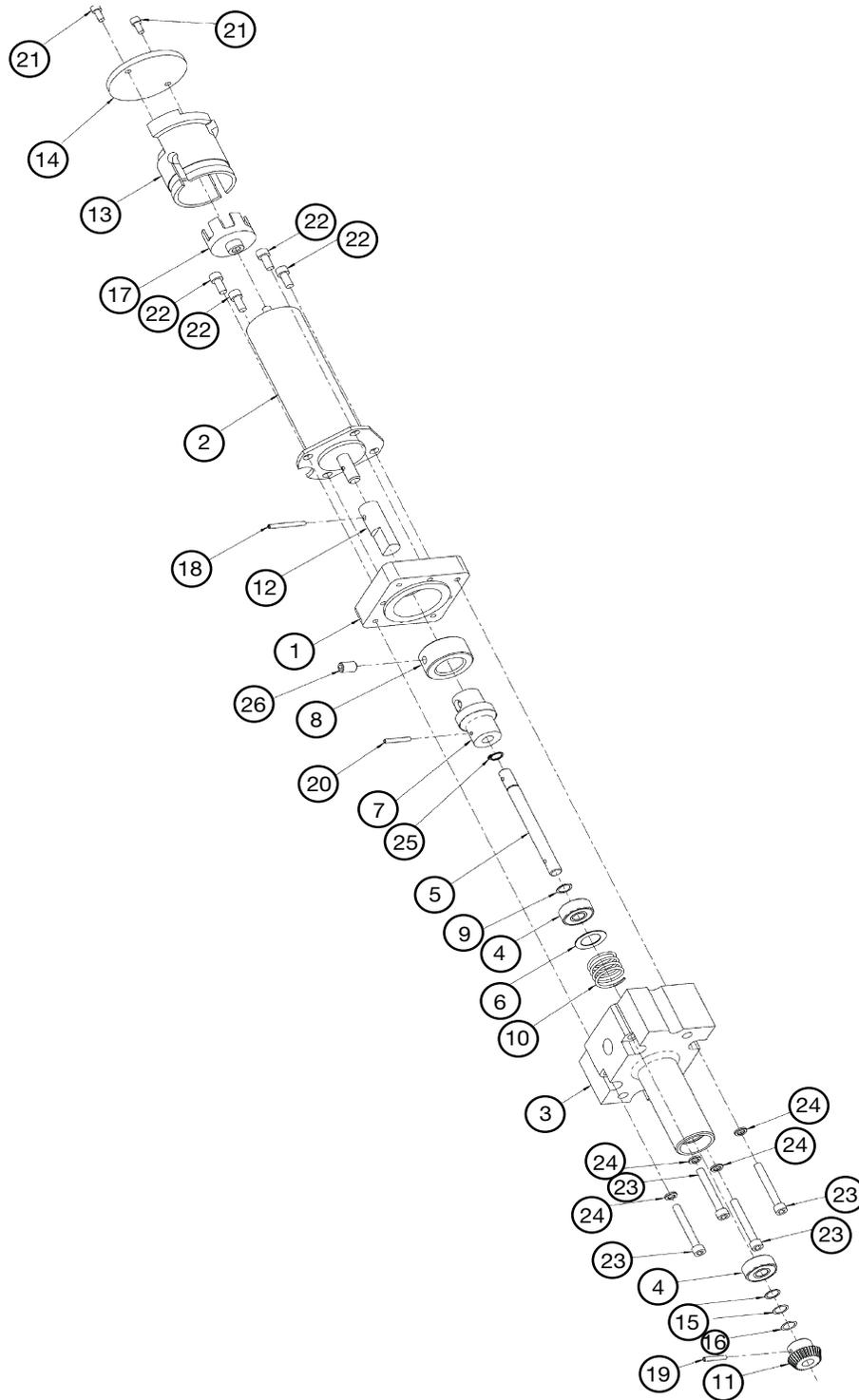


Figure 28 SWS-40H Motor Drive Assembly

Table 9 SWS-40H Motor Drive Assembly Parts List

Reference No.	Description	Available in Kit No. †
1	Motor Interface Mount	*
2	Motor	*
3	Drive Assembly Housing	*
4	Drive Assembly Bearings	*
5	Drive Shaft	*
6	Pressure Spring Washer	*
7	Drive Shaft Insulator Coupling	*
8	Coupling Locking Sleeve	*
9	Bearing Washer	*
10	Pressure Spring	*
11	Drive Pinion Gear	*
12	Motor Shaft Adapter	*
13	Encoder Sleeve	*
14	Encoder Board Assembly	*
15	Shim	*
16	Shim	*
17	Encoder Wheel	*
18	Motor Drive Coupler Pin	*
19	Pinion Coupler Pin	*
20	Drive Shaft Coupler Pin	*
21	Encoder Board Screws	*
22	Motor Screws	*
23	Motor Interface Screws	*
24	Motor Interface Washers	*
25	Drive Shaft Clip	*
26	Coupling Sleeve Set Screw	*

† For part ordering information, contact your Swagelok representative.

* Not available as a field replacement spare part.

Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit swagelok.com or contact your authorized Swagelok representative.

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