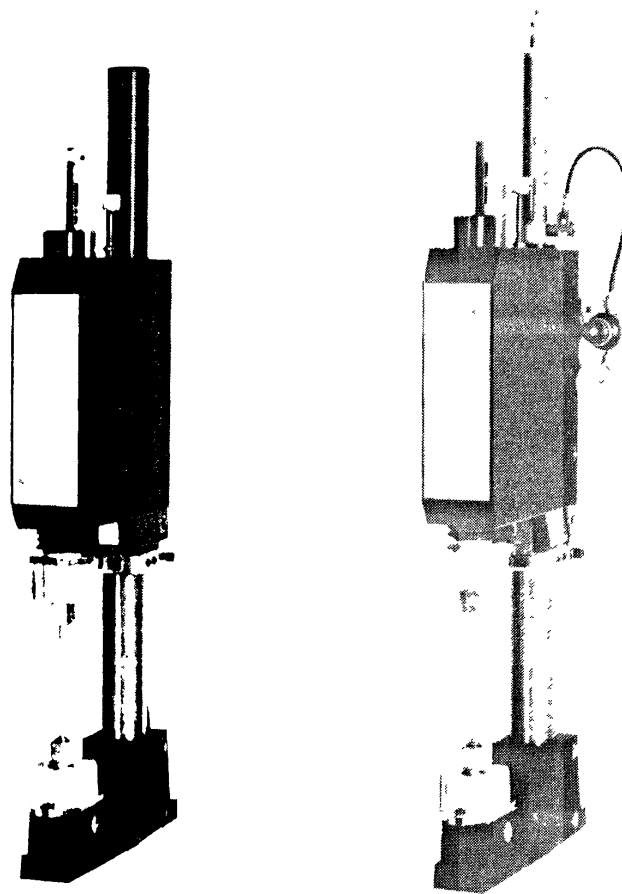


THIN-LINE® Series 90 Weld and Reflow Solder Heads



<u>MODEL NUMBER</u>	<u>STOCK NUMBER</u>	<u>MODEL NUMBER</u>	<u>STOCK NUMBER</u>	<u>MODEL NUMBER</u>	<u>STOCK NUMBER</u>
90F	2-150-XX	90F/DT	2-150-XX-01	90RF	2-150-XX-02
90A	2-151-XX	90A/DT	2-151-XX-01	90RA	2-151-XX-02

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Printed in the United States of America.

REVISION RECORD

Revision	EO	Date	Basis of Revision
			Original Release
A	19161	1/02	Added Unitek Peco™ name

FOREWORD

Thank you for purchasing a Unitek Peco™ THIN-LINE® SERIES 90 Weld Head.

Upon receipt of your equipment, please thoroughly inspect it for shipping damage before its installation. Should there be any damage, please immediately contact the shipping company to file a claim, and notify us at:

Unitek Miyachi Corporation
1820 South Myrtle Avenue
P.O. Box 5033
Monrovia, CA 91017-7133
Telephone: (626) 303-5676
FAX: (626) 358-8048
e-mail: info@unitekmiyachi.com

The purpose of this manual is to supply operating, maintenance and service personnel with the information needed to properly and safely operate and service the THIN-LINE® SERIES 90 Weld Heads.

We have made every effort to ensure that the information in this manual is accurate and adequate. Should questions arise, or if you have suggestions for improvement of this manual, please contact us at the above location/numbers.

Unitek Miyachi Corporation is not responsible for any loss due to improper use of this product.

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CHAPTER 1

DESCRIPTION

Section I: Features

Unitek Peco Thin-Line Series 90 Welding and Reflow Soldering Heads are precision, low inertia, force-fired designs with a narrow vertical profile. Depending on the model, their 3 inch width, 1 1/2 inch stroke, 7 to 100 or 150 pounds force range and 6 1/4 to 10 3/8 inch throat depth allows them to be used in a wide variety of precision resistance welding and reflow soldering applications. The Series 90 is a "production line" head. Bearing life is designed for a minimum of 10 million operations when used according to the specifications. The diameter of the mounting post and the main shaft have been selected to ensure that the electrodes do not "wipe" more than .001 inch at 150 pounds. This is an important consideration in critical welding applications such as hermetic seals and pressure transducers. Series 90 Thin-Line Heads have six mounting holes on the spine which allow them to be easily incorporated into custom welding machines. The aluminum base of the Model 90 can be modified by the user in order to provide additional space to accommodate custom fixtures and tooling. The Series 90 Head is available in three different electrode configurations. Each configuration can be foot pedal or air actuated.

Unitek Peco Series 90 Heads excel in their ability to precisely place consistent, high quality welds, even in complex welding applications. They feature low inertia, light weight designs which ensure fast dynamic response. This allows the electrodes to follow the minute expansion and contraction of the weld joint as it heats and cools. A "differential motion" Force-Firing System initiates the power source at the precise moment when the Preset Firing Force is applied to the workpieces. Rugged construction, linear ball bearing bushings and an over-sized, anti-rotation bearing system provide perfect in-line electrode travel which assures smooth vertical travel of the upper electrode arm. This system minimizes the wiping action of the electrodes during welding, even at maximum force settings.

The Firing force is continuously adjustable from a minimum of 7 to a maximum of 150 pounds using In-Line Electrode Holders or Thermode Adapter Block and a maximum of 100 pounds using Offset Electrode Holders. Settings are quickly reproduced by using the Force Adjustment Knob and easy-to-read visual scale. An adjustable Tare Spring allows the user to compensate for the weight of non-standard electrode holders. An adjustment screw is provided which allows the user to adjust the sensitivity of the Force Firing Switch.

All Series 90 Heads have adjustable Up Stops and Down Stops. The Down Stop can be used to limit excessive over-travel. The Up Stop can be used to reduce the stroke, and therefore the travel time, of the Weld Head. The stroke of these Weld Heads should not be reduced to less than 1/4 inch, when used in automated machines, in order to obtain long bearing life and ensure that the ball bearings recirculate properly.

CHAPTER 1: DESCRIPTION

The Terminal Block, Flexible Copper Strap and Upper Electrode Assembly are electrically insulated from the frame of the Weld Head. The Frame, Support Post and Support Base are grounded to the bench top.

Electrode Holders for the Models 90F, 90A, 90F/DT, and 90A/DT use 1/4 inch diameter, ES0800 Series Electrodes. These electrodes contain snap ring grooves. User ordered snap rings can be put on each electrode to prevent slipping in the electrode holder whenever the welding force exceeds 100 pounds. The Model ETB3 Table Electrode can be used with the Offset Electrode Holders. Models 90RF and 90RA use the 17BW Series of Blade Thermodes and 17FW2187 Fold-up Thermode for reflow soldering applications.

Foot Actuated Series 90 Heads

Targeting of the work pieces is generally easier using foot actuation since foot actuation allows the operator to easily control the rate of electrode descent. Table 1-1 lists the features of each model:

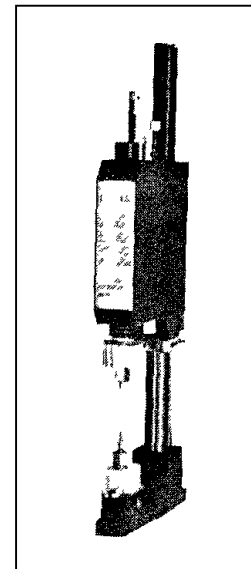
Table 1-1. Foot Actuated Model Features

Model	Stock Number	Electrode Holder	Electrode Type	Application
90F	2-150-01	HEU90K	ES0800 series	Welding
90F/DT	2-150-01-01	HE90ABK	ES0800 series	Welding
90RF	2-150-01-02	HE90TAB	17BW or 17FW	Reflow

Model 90F, In-line Electrode Weld Head

The Model 90F, as shown in Figure 1-1, is a conventional opposed "In-Line" electrode welding head. The mechanism in the Series 90 provides a three-to-one mechanical advantage in addition to the three-to-one advantage provided by the Model MSP Footpedal. This means that the operator must apply approximately 17 pounds to the Footpedal in order to obtain a welding force of 150 pounds. The Model 90F includes the Linkage and Hardware Kit required to install the Model MSP Footpedal. Also included are one pair of 1/4 inch diameter RWMA-2 Electrodes and #2 AWG Welding Cables.

The In-Line Model HEU90 Electrode Holder Housings are designed with cooling fins which radiate heat and reduce the necessity for forced cooling. The Electrode Holders can be forced air or water cooled by drilling and tapping a hole in the Housing as illustrated in Figure 13. In-Line Electrode Holders use a collet to clamp 1/4 inch diameter, ES0800 Series Electrodes. The Lower Electrode Assembly can be easily aligned with the Upper Electrode Assembly.



**Figure 1-1.
Model 90F In-line
Electrode Weld Head**

THINLINE® SERIES 90 WELD AND REFLOW SOLDER HEADS

Model 90F/DT, Offset Electrode Weld Head

Figure 1-2 shows the Model 90F/DT which uses the HE90ABK Offset Electrode Holder Block in both the upper and lower electrode position. The offset configuration provides a throat depth of 10 3/8 inches. Welding force is limited to 100 pounds.

The Model HE90ABK Offset Electrode Holder Block accepts 5/8 inch diameter, Model HE2000 Electrode Holders, which use the 1/4 inch diameter, ESO800 Series Electrodes. The Model HE2000 Electrode Holders can be replaced with the Model HE2000WC Water Cooled Electrode Holders.

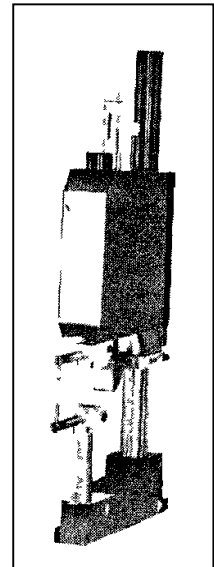


Figure 1-2.
Model 90F/DT Offset Electrode Weld Head

Model 90RF, Reflow Soldering Head

Reflow soldering ribbon cables or printed circuit connectors can be accomplished by using the Model 90RF Reflow Soldering Head with Blade Thermodes as shown in Figure 1-3.

The 17BW Series of Blade Thermodes can be mounted using pivot or fixed mounting hardware attached to the Model HE90TAB Thermode Adapter Block. The single 17FW2187 Fold-up Thermode only uses the pivot mounting hardware. See Chapter 2, Section III for detailed thermode mounting instructions.

Air Actuated Series 90 Heads

All Series 90 Foot Actuated Heads can be ordered with air actuation already installed. Air actuation makes it easier to incorporate the Series 90 Heads into automated systems. An air cylinder replaces the Model MSP Footpedal as the actuation source. The speed of the air actuation system is limited by the speed at which the electrode holder can move without damaging the electrodes, thermodes or workpieces as a result of the impact. Welding rates of 1 per second are possible. Table 1-2 lists the features of each model, shown in Figure 1-4.

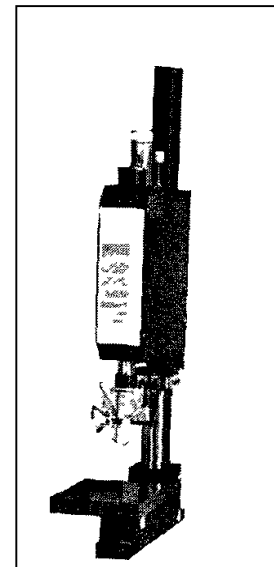


Figure 1-3.
Model 90RF Thermode Adapter Reflow Soldering Head

CHAPTER 1: DESCRIPTION

Table 1-2. Air Actuated Model Features

Model	Stock Number	Electrode Holder	Electrode Type	Application
90A	2-151-01	HEU90K	ES0800 series	Welding
90A/DT	2-151-01-01	HE90ABK	ES0800 series	Welding
90RA	2-151-01-02	HE90TAB	17BW or 17FW	Reflow

The top mounted 1 1/16 inch diameter Air Cylinder is supplied with two gauges, Pressure Regulators and Flow Controls. The four-way Air Solenoid, which controls the direction of air flow to the Air Cylinder, is available with either 24 (standard) or 115 VAC ratings. The Pressure Regulators and Flow Controls allow independent adjustment of the up and downspeed of the upper electrode. The Solenoid and Regulator Assembly is contained in a separate package that mounts on the spine of the Weld Head.

The Models 250, 500 and 800 Stored Energy Power Supplies require that the Model FSAC Footswitch be used to energize the Four-Way Air Solenoid Valve.



Model 90A In-Line
Electrode Weld
Head



Model 90A/DT
Offset Electrode
Weld Head



Model 90RA Thermode
Adapter Reflow Soldering
Head

Figure 1-4. Air Actuated Series 90 Models

CHAPTER 1: DESCRIPTION

The Phasemaster IV Time-At-Temperature Control (PM4), the Phasemaster series of direct energy welding controls and the microprocessor controlled series of stored energy power supplies. Each of these controls or power supplies has a 24/115 VAC Valve Output for energizing and controlling the timing of the Air Solenoid Valve. The Model FS2L Footswitch is used to initiate all controls.

Section II: Accessories

Model	Description
BLCS	Microscope, .3X objective, 20X eyepieces, 4 to 18X magnification. Includes Arm and Porthole Assembly.
DFS	Dual Firing Switch Junction Box. Connects two firing switch cables to a single power source.
ES0802	Electrode, RWMA-2, 1/4 inch diameter x 2 inches long.
ES0803	Electrode, RWMA-3, 1/4 inch diameter x 2 inches long.
ES0811	Electrode, RWMA-11, copper tungsten insert, 1/4 inch diameter x 2 inches long.
ES0813	Electrode, RWMA-13, tungsten insert, 1/4 inch diameter x 2 inches long.
ES0820	Electrode, RWMA-14, molybdenum insert, 1/4 inch diameter x 2 inches long.
ES0850	Electrode, Glidcop, 1/4 inch diameter x 2 inches long.
ETB3	3 inch Table Electrode, RWMA-2 for use with Offset Electrode Holders.
FG100	100 lb Electrode Force Gage. 1 lb x 100 lb scale.
FG100KG	100 kg Electrode Force Gage. 1 kg x 100 kg scale.
FG200	200 lb Electrode Force Gage. 2 lb x 200 lb scale.
FSAC	Medium duty Single Level Footswitch which switches 115 VAC to air heads. Use with Stored Energy Power Supplies.
FS2L	Footswitch for controlling Phasemaster controls.
HE2000	Electrode Holders, 5/8 inch diameter, 2 inch long. Holds 1/4 inch diameter electrodes.
HE2000WC	Water/Air Cooled Electrode Holders, 5/8 inch diameter, 2 inch long. Holds 1/4 inch diameter electrodes.
HE90ABK	Offset Upper and Lower Electrode Adapter Blocks for 90F Weld Head. Not for use over 100 pounds. Includes Lower Electrode Mounting Post, 1 pair HE2000 Electrode Holders, 1 pair ESO802 Electrodes and Hardware.
HE90C	Collet and Nut Assembly for the Model 90 In-Line Electrode Holders.
HE90TAB	Thermode Adapter Block for 90RF and 90RA Reflow Soldering Heads.
HEL90K	In-Line LOWER Electrode Holder Assembly for 90 Series Weld Head. Includes hardware.
HEU90K	In-Line UPPER Electrode Holder Assembly for 90 Series Weld Head. Includes hardware.
MSP	Medium Force Swing type Footpedal. Rated 100 pounds.
OMAA90	Allows the use of Model BLCS Microscope with Series 90 Heads.

THINLINE® SERIES 90 WELD AND REFLOW SOLDER HEADS

CHAPTER 1: DESCRIPTION

Model	Description
PD	Polishing Disks, package of 50.
17BW1200	Blade Thermode, 1.20 inches wide x .060 inches thick, with thermocouple and air cooling tube.
17BW2187	Blade Thermode, 2.18 inches wide x .060 inches thick, with thermocouple and air cooling tube.
17BW2500	Blade Thermode, 2.50 inches wide x .060 inches thick, with thermocouple and air cooling tube.
17FW2187	Fold-up Thermode, 2.18 inches wide x .060 inches thick, with thermocouple and air cooling tube. Not for use over 350°C.
2AA16	Welding Cable, #2, 16 inches long.
570-2-040	Retaining Ring for 1/4 inch diameter electrodes.
325-1-119	1/4 inch O.D. Plastic Tube Fitting with 1/4 NPT pipe thread. Use to convert HEL90K and HEU90K In-Line Electrode Holders for water cooling.

CHAPTER 2

INSTALLATION

Section I: Physical Installation

Foot Pedal Actuated Weld Heads

- 1 Position Mounting Template, located in the Ship Kit, in the desired location on the workbench. Make certain that sufficient working space is provided from front edge of the bench to the Mounting Base. This permits operator to use the bench as a support when positioning parts. Most applications require about six to ten inches from edge of the bench to front of the Support Base.

NOTE: All dimensions use inches and all mounting hardware is American standard unless specified otherwise.

- 2 Drill six 3/8 inch diameter mounting holes as shown on the Mounting Template. Drill the 2.00 DIA. hole for all models. Drill the 1.25 DIA hole for the Model 90F/DT.

CAUTION: Use a 1/4 inch hex driver to tighten the support post locking screws location on the back of the right side of the support base to ensure that the weld head does not slip and pinch your fingers!

NOTE: All mounting hardware such as screws, lock washers, and washers are contained in the Ship Kit.

- 3 Reference Figure 2-1 for the following instructions. Remove the PEDAL ACTUATOR, item [1], by removing the BELLCRANK NUT, item [2], and the BELLCRANK BOLT, item [3].
- 4 Remove the BUSHING BOLT, item [4], and BUSHING WASHER, item [5].
- 5 Remove the BELLCRANK SPRING, item [6]. Slip the BUSHING, item [7], inside the BELLCRANK SPRING, replace the BELLCRANK SPRING and secure in position using the BUSHING WASHER and BUSHING BOLT.
- 6 Slide the EXTENSION ARM, item [8], over the end of the Bellcrank Arm and secure with two 10-32 X 3/4 CAP HEAD SCREWS, item [9].

NOTE: The middle screw must pass through the clearance hole in the Bellcrank Arm.

- 7 Line up the weld head with the correct holes in the Mounting Template. **CAUTION:** Be careful not to bend the LINK ASSEMBLY, item [18]. Attach the SPACER PLATE, item [10], to the WORKBENCH, item [11], using two 5/16-18 x 2 3/4 CAP HEAD SCREWS, item [13], LOCK WASHERS, item [14], and WASHERS, item [15]. **NOTE:** The CAP HEAD SCREWS must pass through the SPACER PLATE and WORKBENCH and thread into the two rear mounting holes on the weld head support base.
- 8 Attach the FOOTPEDAL MOUNTING PLATE, item [12] to the SPACER PLATE, item [10], using two 5/16-18 x 3/4 HEX HEAD SCREWS, item [16], ITL WASHERS, item [17], and WASHERS, item, [15].

CHAPTER 2: INSTALLATION

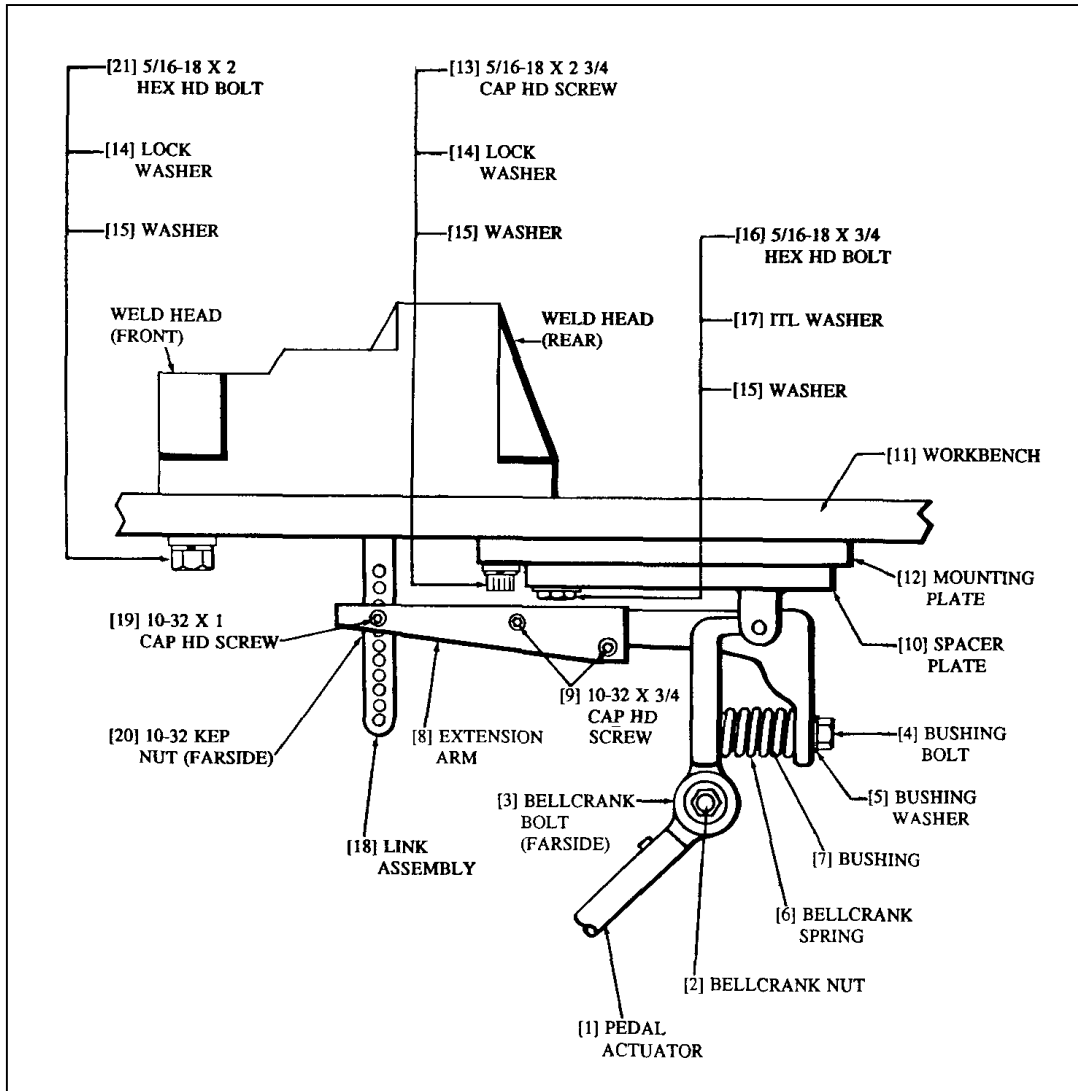


Figure 2-1. Model 90F and MSP Footpedal installation

- 9 Secure the front of the weld head to the WORKBENCH using two 5/16-18 x 2 HEX HEAD BOLTS, item 21, LOCK WASHERS, item [14], and WASHERS, item [15].
- 10 Connect the EXTENSION ARM, item [8], to the LINK ASSEMBLY, item [18] using the 10-32 X 1.00 CAP HEAD SCREW, item [19], and KEP NUT, item [20]. The ADAPTER ARM should be parallel to the bottom of the work bench. Re-attach the PEDAL ACTUATOR and set it to the desired operating angle.

CHAPTER 2: INSTALLATION

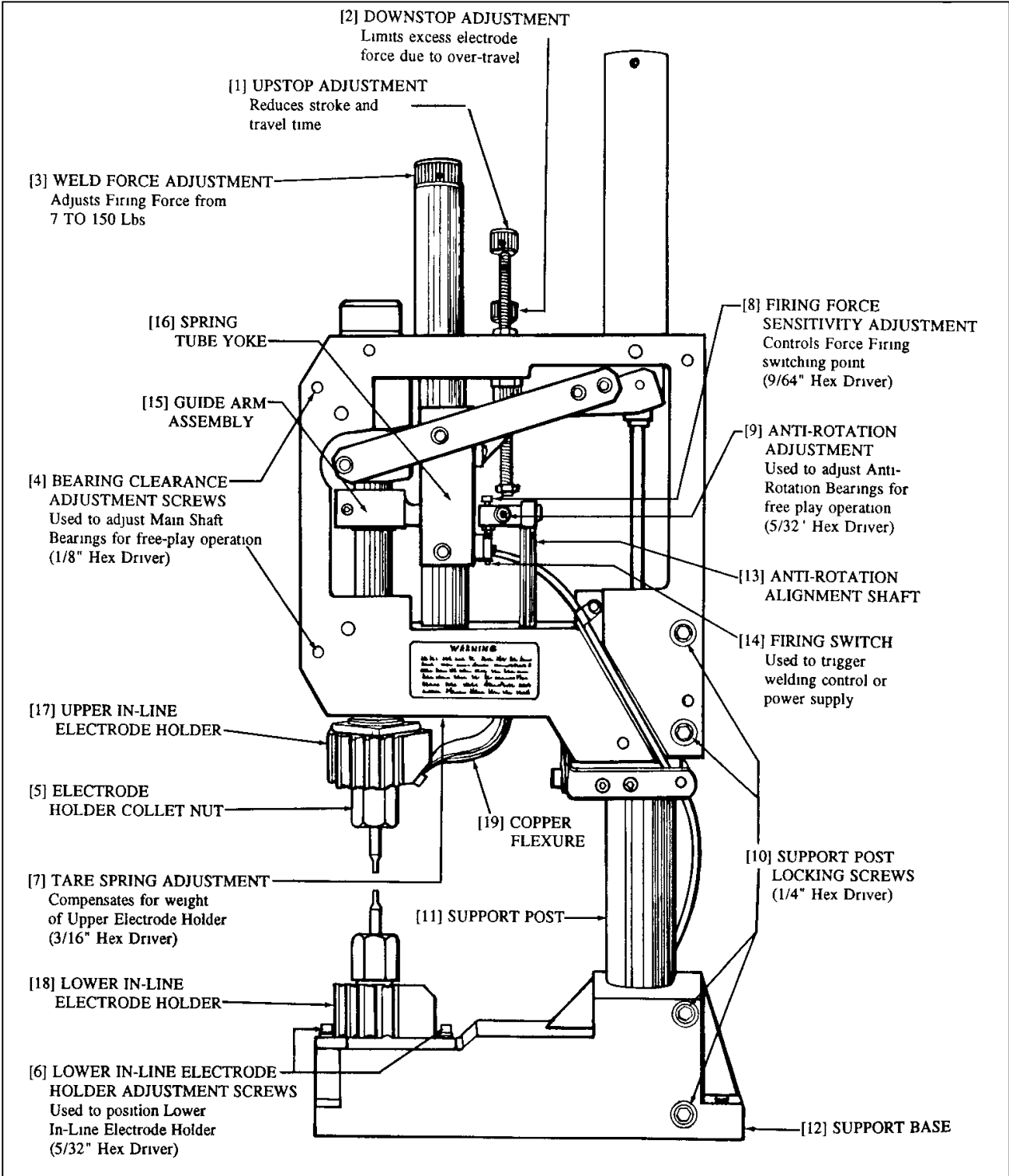


Figure 2-2. Series 90 Cutaway Illustrates Location and Size of Adjustment Screws

THINLINE® SERIES 90 WELD AND REFLOW SOLDER HEADS

CHAPTER 2: INSTALLATION

Air Actuated Weld Heads

- 1 Position Mounting Template, Figure 43, in the desired location on the workbench. Make certain that sufficient working space is provided from the front edge of bench to the Support Base. This permits operator to use the bench as a support when positioning parts. Most applications require about six to ten inches from edge of the bench to front of the Support Base.
- 2 Drill six 3/8 inch diameter mounting holes as shown on the Mounting Template. Drill the 2.00 DIA. hole for all models. Drill the 1.25 DIA hole for the Model 90A/DT.

NOTE: All mounting hardware such as screws, lock washers, and washers are contained in the Ship Kit.

- 3 Reference Figure 2-2 for the following instructions.

CAUTION: use a 1/4 inch hex driver to tighten the support post locking screws location on the back of the right side of the support base to ensure that the weld head does not slip and pinch your fingers!

- 4 Align the SUPPORT BASE, item [11], over the mounting holes. Attach the SUPPORT BASE to the workbench using four 5/16-18 x 1 1/2 inch hex head bolts with lock washers and washers (not shown) to secure the front and rear of the SUPPORT BASE.

- 5 Reference Figure 2-3 for the following instructions. Insert a 0.25 inch outside diameter plastic hose, with a rated burst pressure of 250 psi, into the AIR INPUT, item [6], located on the bottom of the Solenoid Air Valve Assembly. The AIR INPUT uses a "quick release" connector so special tools are not needed. Simply push the hose into the "quick release" fitting as far as it will go. Connect the other end to a FILTERED AIR SUPPLY (100 psig maximum). UNITEK suggests that in-line lubricators not be used since excess oil can blow-by worn seals in the AIR CYLINDER, item [1], ending up on the workpieces. Every one million cycles, the user should put a few drops of oil in the AIR CYLINDER. The tubing connecting the TOP AIR PRESSURE REGULATOR, item [4], with the UPSPEED AIR FLOW VALVE, item [2], and BOTTOM AIR PRESSURE REGULATOR, item [5], with the DOWNSPEED AIR FLOW VALVE, item [3], has been pre-assembled at the factory.

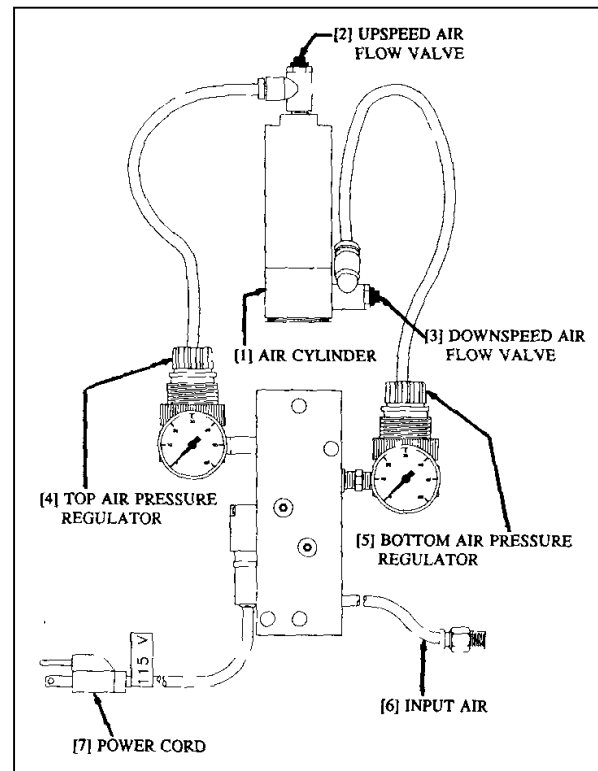


Figure 2-3. Solenoid Air Valve Assembly

- When dressing electrodes, the TOP AIR PRESSURE REGULATOR must be turned down. An auxiliary regulator, or a customer supplied bleeder valve connected to output of the of the TOP AIR PRESSURE REGULATOR, can also be used to lower air pressure to facilitate dressing the electrodes.

Additional Attachments

Solenoid Air Valve Power Connection

Stored Energy Power Supplies require a 115 VAC Solenoid Air Valve Assembly for plugging directly into a Model FSAC Foot Switch receptacle.

7500A - Both the 115 VAC and 24 VAC Solenoid Valve Assemblies plug directly into the 115 VAC receptacle on the back of the 7500A. An internal switch, set by the user, applies 115 or 24 VAC to the receptacle.

PHASEMASTER^(TM) Controls - The 115 VAC Solenoid Air Valve Assembly plugs directly into the 115 VAC VALVE receptacle on the rear panel. The 24 VAC Solenoid Valve Assembly requires that the user replace the 115 VAC connector with the 24 VAC connector provided in the Phasemaster Shipping Kit. The new connector plugs into the 24 VAC VALVE located on the rear panel.

Install the system in accordance with established safety practices and standards. Anti-Tie-Down Palm Buttons are not usually required if the electrode spacing is insufficient to allow the operator's fingers to fit between them.

In-line Water Cooled Electrode Holders

If forced cooling is required, drill a .399 inch diameter hole in the Upper and Lower In-Line Electrode Holder as shown in Figure 2-4. Tap a 1/4 NPT standard pipe thread into both ends of the hole.

Order four 1/4 inch O.D. Plastic Tube Fittings from Unitek Peco (P/N 325-1-119). Apply pipe sealant to each tread and then thread two fittings into the Upper and Lower Electrode Holders. Connect 1/4 inch O.D. plastic tubing to the fittings as shown in Figure 2-5. Support the tubing on the Upper In-Line Electrode Holder using a cable clamp placed under one of the weld head side cover screws. Be sure to leave an adequate service loop.

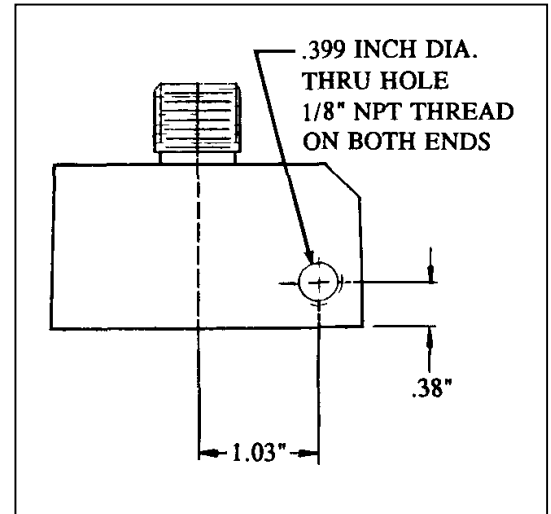


Figure 2-4. In-line Electrode Holder Modification for Water Cooling

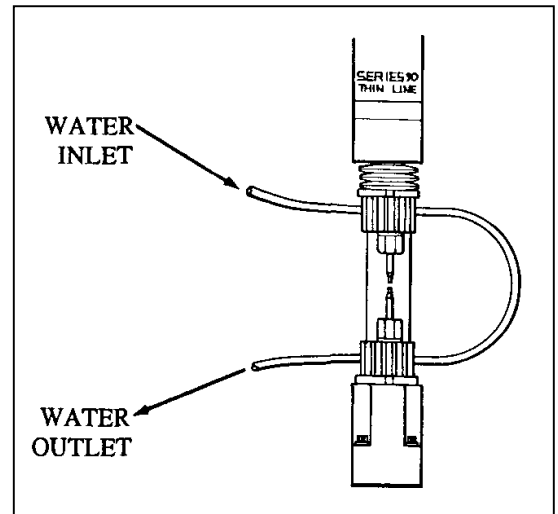


Figure 2-5. Tubing Path for Water Cooling In-line Electrode Holder

CHAPTER 2: INSTALLATION

Model HE2000WC, Offset Water Cooled Electrode Holders

Models 90A/DT and 90F/DT use the HE90ABK Offset Electrode Holders which in turn use Model HE2000, 5/8 inch diameter by 3 3/4 inch long, solid electrode holders for extending the weld head throat depth. In those applications where the duty cycle approaches 10 percent or where the electrodes are too hot to comfortably touch, the HE2000WC Water Cooled Electrode Holders should be used in place of the solid HE2000 holders. Electrode life is inversely proportional to Electrode Temperature. These holders can be cooled by connecting them to an air supply or a water supply as illustrated in Figure 2-6.

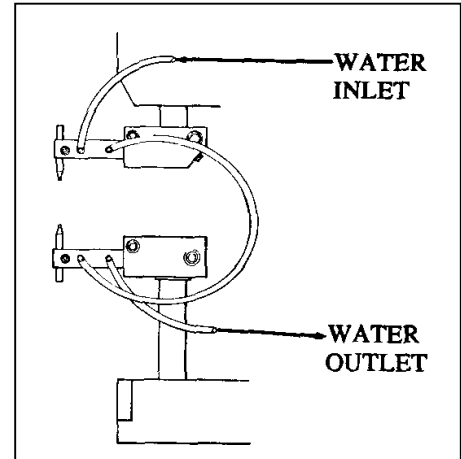


Figure 2-6. Water Cooled HE2000WC Offset Electrode Holders

Reducing the Length of the Support Base

The Support Base can be cut to provide additional room for tooling. It can be reduced to 5.5 inch by cutting the Base just in front of the support web that contains the mounting holes, as shown in Figure 2-7.

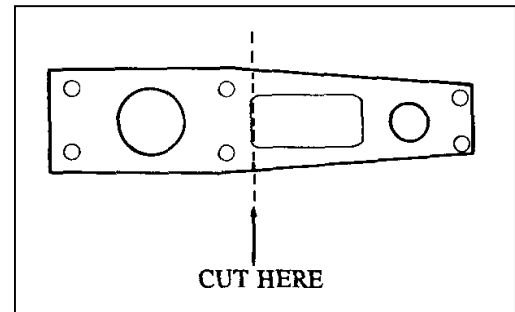


Figure 2-7. Bottom View of Support Base

Section II: Connection to Power Source

General

The Series 90 Heads come with the necessary fastening hardware for connecting the Welding already installed on the weld head power straps. The hardware for connecting the other end of the Welding Cables to the Power Supply or Welding Transformer can be found in the Power Supply or Welding Transformer Ship Kit.

CHAPTER 2: INSTALLATION

Connect the Weld Head Firing Switch Cable to the Firing Switch Receptacle located on the front panel of all Stored Energy Power Supplies or to the matching connector/cable found on all Direct Energy Power Supplies.

90F, 90A, 90F/DT, and 90A/DT Weld Head Connections

- 1 Reference Figures 2-8 AND 2-9. Position the Power Supply or Welding Transformer approximately 4 to 5 inch behind the Weld Head. Connect one 16 inch WELDING CABLE to the left side of the WELD HEAD POWER STRAP using a 5/16-18 x 1/2 CAP HEAD SCREW. The FLAT WASHER goes between the CAP HEAD SCREW and the WELDING CABLE terminal.
- 2 Connect the second WELDING CABLE to the left side of the LOWER ELECTRODE HOLDER using a 5/16-18 x 1/2 CAP HEAD SCREW. The FLAT WASHER goes between the CAP HEAD SCREW and the WELDING CABLE terminal.
- 3 Connect the opposite ends of each WELDING CABLE to the Power Supply or Welding Transformer using the hardware supplied with the Welding Transformer Ship Kit. The hardware is sized for each WELDING TRANSFORMER.

NOTES:

Do not put a flat or lock washer between the welding cable and the power terminal.

Be sure to place both cables on the same side of the support post. Failure to do so could dramatically increase the amount of energy required to make a satisfactory weld because of added inductive losses caused by the support post.

For the same reason, do not run welding cables through a steel workbench.

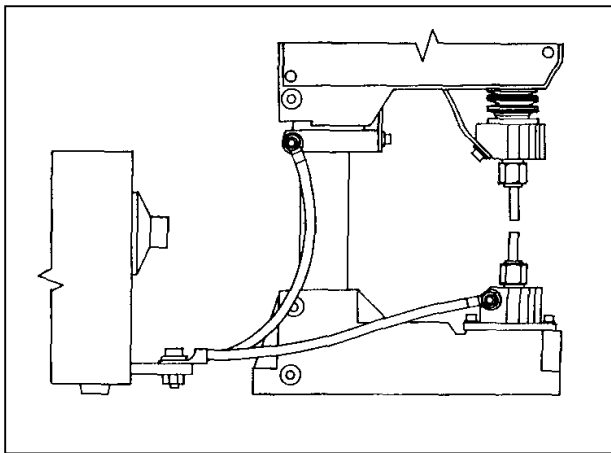


Figure 2-8. 90F and 90A In-line Weld Head Connections

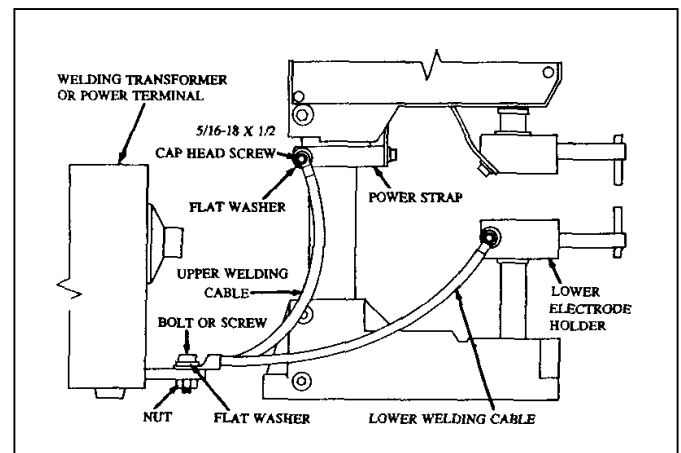


Figure 2-9. 90F/DT & 90A/DT Offset Weld Head Connections

THINLINE® SERIES 90 WELD AND REFLOW SOLDER HEADS

CHAPTER 2: INSTALLATION

90RF and 90RA Reflow Soldering Head Connections

- 1 Reference Figure 2-10. Position the Power Supply or Welding Transformer approximately 4 to 5 inch behind the Weld Head. Connect one 16 inch WELDING CABLE to the left side of the WELD HEAD POWER STRAP using a 5/16-18 x 1/2 CAP HEAD SCREW. The FLAT WASHER goes between the CAP HEAD SCREW and the WELDING CABLE terminal.
- 2 Connect the second WELDING CABLE to the right side of the POWER STRAP using a 5/16-18 x 1/2 CAP HEAD SCREW. The FLAT WASHER goes between the CAP HEAD SCREW and the WELDING CABLE terminal.
- 3 Connect the opposite ends of each WELDING CABLE to the Power Supply or Welding Transformer using the hardware supplied with the Welding Transformer Ship Kit. The hardware is sized for each REFLOW SOLDERING TRANSFORMER.

NOTES:

Do not put a flat or lock washer between the welding cable and the power terminal.

Do not run welding cables through a steel workbench.. Doing so could dramatically increase the amount of energy required to make a satisfactory weld because of added inductive losses caused by the table.

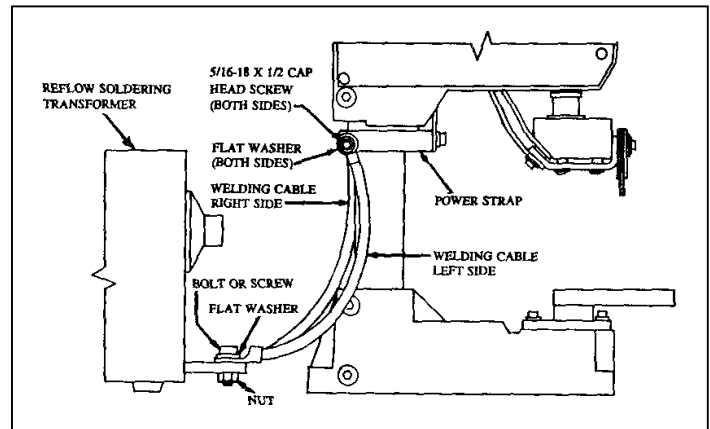


Figure 2-10. 90RF and 90RA Reflow Soldering Head Connections

Section III: Electrode and Thermode Installation

90F and 90A Electrode Installation

Verify that the COLLET is loose by turning it in the counter-clockwise direction. Insert the electrode into the COLLET. Tighten by turning clockwise as shown in Figure 2-11. Check the alignment of the electrodes. Loosen the three cap head screws holding the LOWER IN-LINE ELECTRODE HOLDER

ASSEMBLY, re-align the holder, and then tighten the screws.

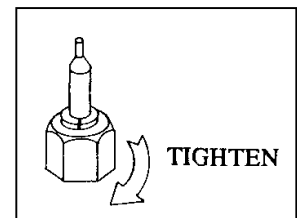


Figure 2-11. In-line Electrode Holder installation

90F/DT and 90A/DT Electrode Installation

Loosen the 10-32 CAP HEAD SCREW on the side of the HE2000 ELECTRODE HOLDER. Insert the electrode into the holder. Tighten by turning clockwise as shown in Figure 2-12. Check the alignment of the electrodes. Loosen the cap head screw in the SUPPORT BASE and then rotate the LOWER OFFSET ELECTRODE HOLDER ASSEMBLY into alignment with the upper electrode. Tighten the cap head screw.

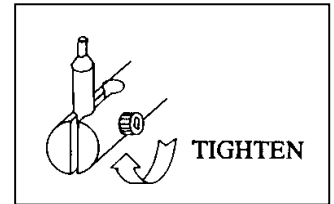


Figure 2-12. Offset Electrode Holder installation

90RF and 90RA Blade Thermode, Fixed Installation

- 1 Reference Figure 2-13. Verify that the THERMODE ADAPTER BLOCK, item [1], has two separate WELD TERMINALS, item [2] and [3]. The INSULATOR PLUG, item [4], should be positioned between the THERMODE ADAPTER BLOCK and both WELD TERMINALS. Attach the BLADE THERMODE, item [5] to the WELD TERMINALS using two 8-32x1/4 CAP HEAD SCREWS, item [6], and #8 ITL WASHERS, item [7]. Leave the screws loose.

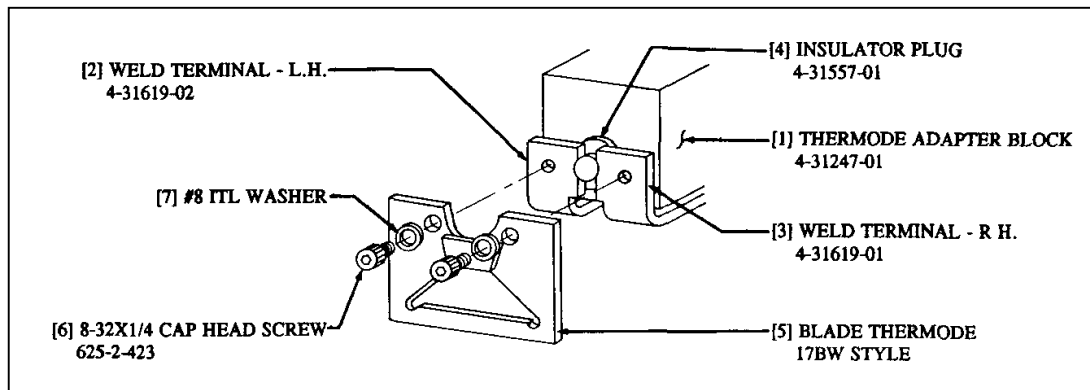


Figure 2-13. Blade Thermode, Fixed Installation

- 2 Reference Chapter 3 for operating instructions. Bring the BLADE THERMODE down onto the workpiece.

CAUTION: do not heat the thermode at this time or the loose screws will weld to the thermode and/or weld straps.

- 3 While applying pressure against the workpiece, tighten each 8-32x1/4 CAP HEAD SCREW. This action will ensure that the bottom of the BLADE THERMODE is parallel to the workpiece.

CHAPTER 2: INSTALLATION

90RF and 90RA Blade Thermode, Pivot Installation

- 1 Reference Figure 2-4. Verify that the THERMODE ADAPTER BLOCK, item [1], has a single separate WELD TERMINAL, item [2].

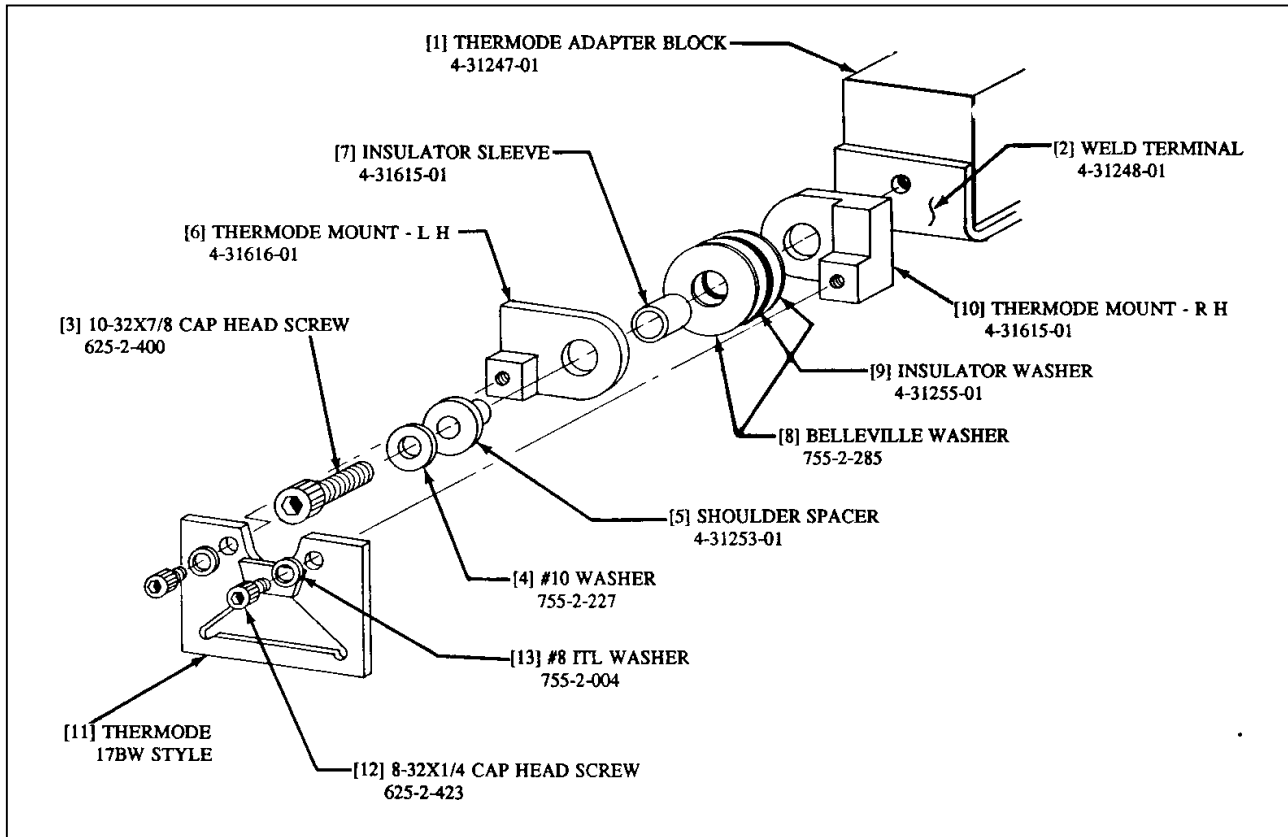


Figure 214. Blade Thermode, Pivot Installation

- 2 Assemble items [3] through [10] in numerical order.

NOTE: the convex surface of both BELLEVILLE WASHERS, item [8], must be placed against the face of the INSULATOR WASHER, item [9].

- 3 Attach the Blade Thermode Pivot Assembly to the THERMODE ADAPTER BLOCK using the single 10-32x7/8 CAP HEAD SCREW, item [3].

CAUTION: Tighten this screw securely or it will weld to the THERMODE ADAPTER BLOCK.

- 4 Attach the BLADE THERMODE, item [11] to the WELD TERMINALS using two 8-32x1/4 CAP HEAD SCREWS, item [12], and #8 ITL WASHERS, item [13].

CAUTION: Tighten both screws securely or they will weld to the THERMODE PIVOT MOUNTS.

90RF and 90RA Fold-Up Thermode, Pivot Installation

- 1 Reference Figure 2-15. Verify that the THERMODE ADAPTER BLOCK, item [1], has a single separate WELD TERMINAL, item [2].

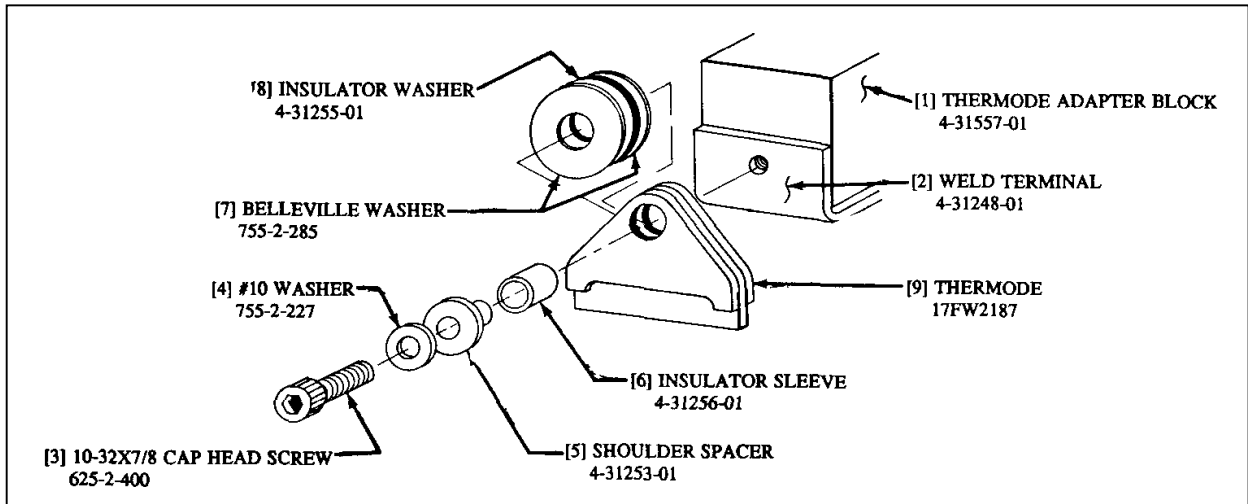


Figure 2-15. Fold-up Thermode, Pivot Installation

- 2 Assemble items [3] through [6] in numerical order.
- 3 Place the convex surface of both BELLEVILLE WASHERS, item [7], against the face of the INSULATOR WASHER, item [8]. Slip this "Belleville Sandwich" between the top sides of the FOLD-UP THERMODE, item [9].
- 4 Attach the Fold-up Thermode Pivot Assembly to the THERMODE ADAPTER BLOCK using the single 10-32x7/8 CAP HEAD SCREW, item [3].

CAUTION: Tighten this screw securely or it will weld to the THERMODE ADAPTER BLOCK.