



**AGM Pin Welder  
Instruction Manual  
Model 250C**

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Read equipment manufacturer's manual before using this product. Failure to do so can result in serious injury or death.

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## Model 250C Weld Gun

The AGM Model 250C weld gun is a semi-automatic, contact welding tool that has been carefully engineered and designed for use with a wide variety of AGM accessories. Given normal care and use, this weld gun will require very little maintenance. When repairs are required, the complete disassembly of the weld gun can be accomplished in a matter of minutes.

Following is a description of the various accessories available. The application sheets list the recommended accessories and their part numbers.

**COLLET\*** - This is *always* required for welding. It is very important that the correct size be used and that it is in good condition. A loose fitting collet will cause arcing on the stud or pin and possibly cause poor welds.

**COLLET PROTECTOR\*** - This is used when welding flanged studs or weld pins. It allows you to weld various lengths of studs or pins without changing the gun set up. It also helps to keep splatter away from the collet. It is important the collet protector be used whenever recommended. Protectors are not required when using stops, except when welding Powerbase pins.

**STOP\*** - This is required when welding non-flanged studs, or when the adjustable foot assembly is used. Its purpose is to back up the pin or stud to prevent it from being inserted too far into the gun. The Model 250C gun utilizes two types of stops; the 437G and the 250C-G. Both are easily installed.

**COLLET ADAPTER ASSEMBLY** - This is used as a holder for the collets, stops and collet protectors. It allows for rapid interchange of collets and it is easily removed by the tapered wedge that is supplied with the gun.

It has been found to be good practice to keep extra collets, protectors, stops and adapters on hand.

**LEGS** - They are used to provide correct weld gun spring pressure while keeping the stud or pin perpendicular to the work. They are normally mounted 120 degrees apart on the weld gun face plate.

**LEG SUPPORT RING** - This is used when welding on a curved surface, such as corrugated metals or round tanks. It is placed over the three legs, and aligns the stud or pin when the ring is held firmly against the work.

**ADAPTER RING** - This is used to extend the three legs for certain applications, such as when a longer collet protector is used to weld aluminum pins.

\* Specify stud or pin diameter and length when ordering.

(CONTINUED)

Model 250C Weld Gun  
(CONTINUED)

**ADJUSTABLE FOOT ASSEMBLY** - This is necessary when welding Powerbase pins and large diameter studs and may also be used for welding very long CD pins. It is used in conjunction with a stop and spark shield to stabilize the pin or stud.

**SPARK SHIELD\*** - This protects the collet, collet adapter assembly, etc. from weld splatter, while stabilizing the pin or stud during the weld cycle. It will require occasional cleaning and periodic replacement.

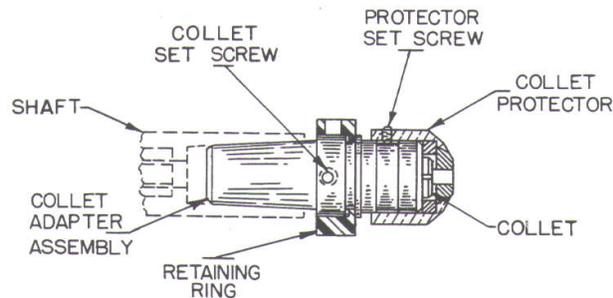
\* Specify stud or pin diameter and length when ordering.

Model 250C Weld Gun  
(CONTINUED)

**INSTALLATION AND REMOVAL PROCEDURES**

**INSTALLING COLLET AND COLLET PROTECTOR**

- A. Examine the inside of the *collet adapter assembly* for pitted areas or splatter. Clean by scraping with a sharp object, or replace if necessary.
- B. Insert the collet into the collet adapter assembly, making sure that it seats against the shoulder.
- C. Locate the two (2) collet holding set screws and *tighten them securely*. These screws should be checked daily for tightness.
- D. Slide the collet protector over the collet adapter assembly, making sure that it seats properly. Tighten the set screws securely.



**COLLET REMOVAL**

- A. Remove the collet protector by loosening the two (2) protector holding set screws approximately 1-1/2 turns.
- B. Loosen both collet holding set screws approximately 1-1/2 turns.
- C. Grasp the collet by its end and remove it.

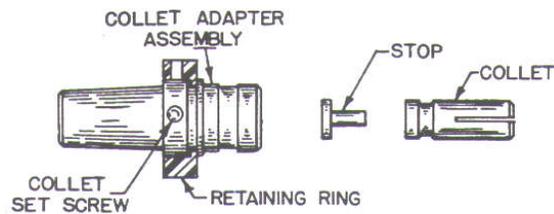
If you have difficulty removing the collet, the following procedures may be helpful:

- 1. Manually rotate the collet.
- 2. Insert the proper size stud or pin into the collet and attempt to remove the collet and fastener together.
- 3. If the above suggestions do not work, pliers may be used. Insert the proper size pin or stud into the collet and rotate until the collet is loose.

Model 250C Weld Gun  
(CONTINUED)

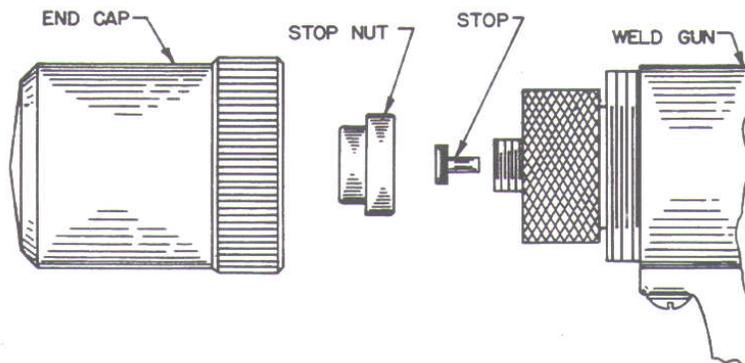
**INSTALLING TYPE 437G STOP**

- A. Place the stop inside the rear of the collet.
- B. Insert the collet, with stop, into the collet adapter assembly.
- C. Locate and tighten the collet holding set screws, as previously described.
- D. **DO NOT** use a collet protector.



**INSTALLING TYPE 250C-G STOP**

- A. Remove end cap and stop nut from rear of weld gun.
- B. Insert stop inside gun shaft.
- C. Screw stop nut down securely over the end of the shaft.
- D. Replace end cap onto gun housing.
- E. **DO NOT** use a collet protector.
- F. See chart on the next page for stop numbers.



## 250C-G TYPE STOP

<u>STUD LENGTH</u>	<u>CATALOG NUMBER</u>	<u>STOP LENGTH</u>
1/4" – 5/16"	250C-G-*-0250	7"
3/8" – 7/16"	-0375	6.875"
1/2" – 9/16"	-0500	6.750"
5/8"	-0625	6.625"
3/4"	-0750	6.500"
7/8"	-0875	6.375"
1"	-1000	6.250"
1-1/4"	-1250	6.000"
1-1/2"	-1500	5.750"
1-3/4"	-1750	5.500"
1-7/8"	-1875	5.375"
2"	-2000	5.250"
2-1/4"	-2250	5.000"
2-1/2"	-2500	4.750"
2-3/4"	-2750	4.500"
2-7/8"	-2875	4.375"
3"	-3000	4.250"
3-1/4"	-3250	4.000"
3-1/2"	-3500	3.750"
3-7/8"	-3875	3.375"
4"	-4000	3.250"
4-1/2"	-4500	2.750"
4-7/8"	-4875	2.375"
5"	-5000	2.250"
5-1/2"	-5500	1.750"
5-7/8"	-5875	1.375"
6"	-6000	1.250"
6-1/2"	-6500	0.750"
7"	-7000	0.250"

## 437G TYPE STOP

<u>STUD LENGTH</u>	<u>CATALOG NUMBER</u>	<u>STOP LENGTH</u>
** 3/16"	437G-*-0187	1.230"
** 1/4"	-0250	1.168"
** 5/16"	-0312	1.106"
** 3/8"	-0375	1.043"
7/16"	-0437	0.981"
1/2"	-0500	0.918"
9/16"	-0562	0.856"
5/8"	-0625	0.793"
3/4"	-0750	0.668"
7/8"	-0875	0.543"
1"	-1000	0.418"
1-1/8"	-1125	0.293"
1-1/4"	-1250	0.168"
1-3/8"	-1375	0.043"

\*Specify diameter of stud (i.e. 6-32, 8-32, 10-32 etc.)

\*\* Requires 375-SP series collet for studs 3/8" long and shorter.

## MODEL 250-C WELD GUN

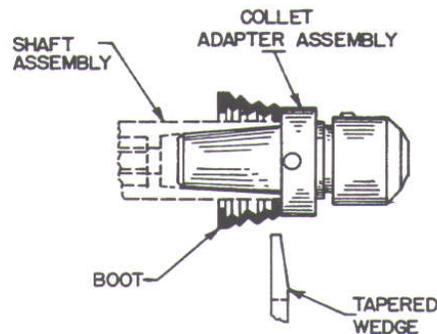
### INSTALLATION OF COLLET ADAPTER ASSEMBLY

This procedure can be accomplished with a collet and stop, or collet protector already installed.

- A. Before installing, be sure that the tapered surface of the collet adapter and shaft assembly are clean. Wipe with a clean cloth if necessary.
- B. Insert the collet adapter assembly into the shaft assembly, turning the adapter as it is pushed down. This will ensure that it is seated securely.

### REMOVAL OF COLLET ADAPTER ASSEMBLY

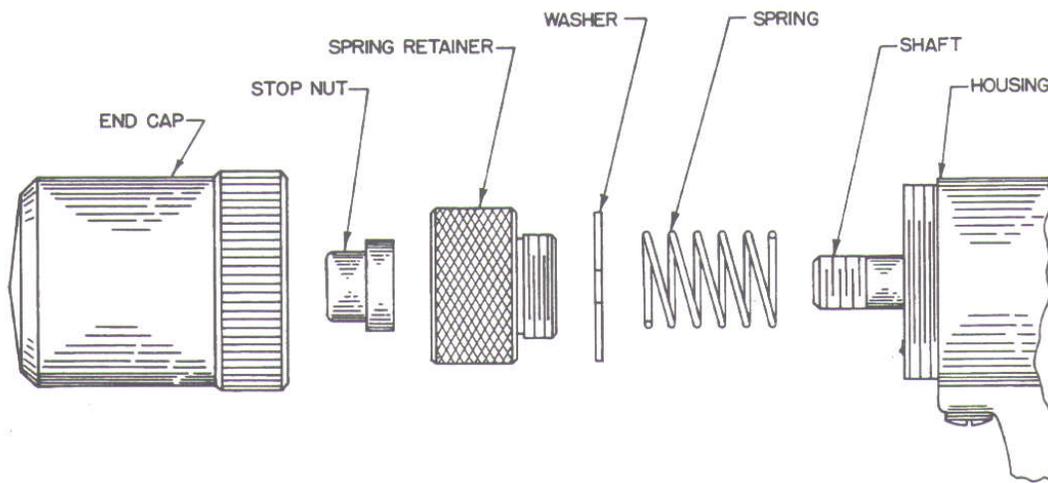
- A. Slide the rubber dust boot toward the faceplate to expose the shaft assembly.
- B. Insert the tapered wedge between the shaft assembly and the collet adaptor assembly. The flat side of the wedge should go toward the shaft.
- C. Tap the wedge lightly to release the adapter assembly from the tapered seat of the gun shaft.



## MODEL 250-C WELD GUN

### INSTALLING OR CHANGING SPRING

- A. Unscrew the end cap from the gun housing.
- B. Unscrew stop nut from the end of gun shaft.
- C. Unscrew the spring retainer and remove the washer from the housing.
- D. Remove the spring from the shaft.
- E. Slide the desired spring over the shaft.
- F. Replace the washer onto the end of the gun housing.
- G. Screw the spring retainer into the housing.
- H. Screw the stop nut onto the end of the gun shaft.
- I. Screw the end cap onto the gun housing.



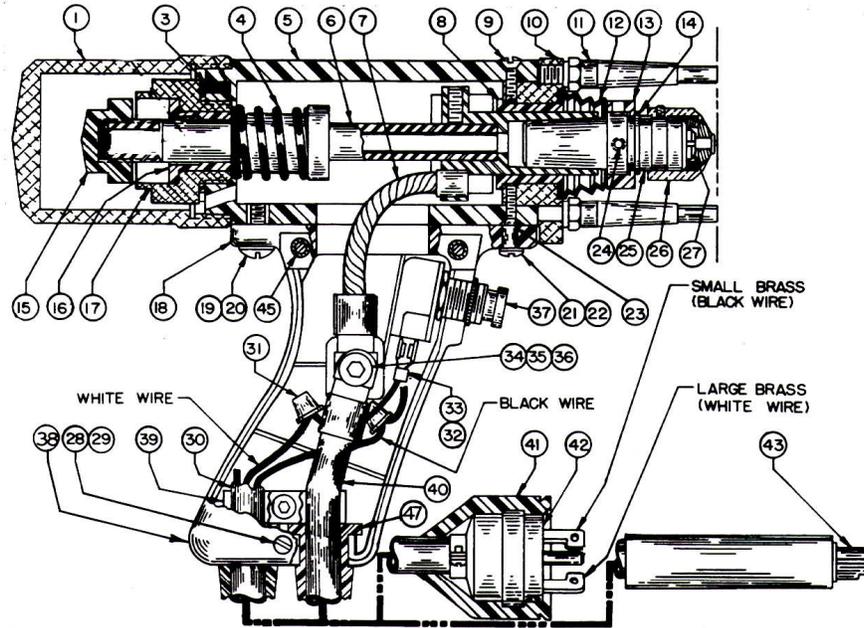
## **MODEL 250C WELD GUN**

### **DISASSEMBLY OF THE WELD GUN**

- A. Remove handle cover screws (items 28, 29 & 45)
- B. Lift off the handle cover (item 38)
- C. Remove the nut, washer and cap screw (items 34, 35 & 36) from the welding lead (item 40)
- D. Remove the control wires (items 32 & 33) from the trigger switch (item 37) and remove the switch from the handle
- E. Lift out the welding and control lead assemblies (items 40 & 30), from the handle
- F. Loosen the cap screw of the cable clamp assembly (item 39) and slide both wires out of the clamp
- G. Unscrew the end cap (item 1) from the gun housing
- H. Unscrew the stop nut (item 15) from the end of the shaft
- I. Unscrew the knurled spring retainer (item 17) from the gun housing
- J. Remove the washer (item 3)
- K. Remove the spring (item 4) from the gun shaft
- L. Unscrew the three (3) screws (items 9 & 22) from the housing
- M. Remove the collet adaptor assembly and dust boot (items 25 & 12) from the shaft assembly (item 6)
- N. Check to be sure there are no burrs on the end of the gun shaft. If necessary use a file or emery paper to smooth it off. Slide the face plate (item 10) off of shaft assembly
- O. Slide the shaft assembly (item 6) out of the gun housing, making sure the pigtail assembly (item 7) feeds through the slot in the housing and handle.

To assemble the gun repeat these operations in the reverse order.

## AGM STUD WELD GUN MODEL 250C-CONTACT



SYMBOL	PART NO.	DESCRIPTION	No. REQ'D	SYMBOL	PART NO.	DESCRIPTION	No. REQ'D
-	2500-MC	Weld Gun, Contact	1	23	2520-M	Contact, Sleeve	1
1	2501-MC	Cap, End	1	24	1204-M-312	Screw, Set	2
2				25	2513-M	Collet Adapter	1
3	2505-M	Washer	1	26	437-P**	Protector	1
4	2506-M-300	Spring (Heavy 3")	1	27	437-**	Collet	1
-	2506-M-200	Spring (Medium 2")	1	28	2004-M-1000	Nut, Sleeve	1
5	2511-M	Housing	1	29	2024-M-500	Screw, Truss Head	2
6	2507-M	Shaft Assembly	1	30	1979-E	Control Lead (Ass'y)	1
*	1213-M-250	Screw, Set	1	31	1959-E	Connector, Wire	2
7	2517-E	Pigtail Assembly	1	32	2215-EW	Switch Lead, White	1
8	2512-M	Bearing, Lower	1	33	2215-EB	Switch Lead, Black	1
9	1201-M-437	Screw, Oval Head	2	34	1216-M	Nut	1
10	2516-M	Face Plate	1	35	1217-M	Washer, Lock	1
*	1231-M-250	Screw, Set	2	36	1226-M-500	Screw, Cap	1
11	1151-M	Legs, Stationary	3	37	2117-E	Switch	1
12	1075-M	Boot	1	38	2118-MP	Handle, Cover Section	1
13	2522-M	Ring, Retainer	1	39	2165-M	Clamp Assembly	1
14	1242-M	Ring, Snap	1	40	2168-E	Welding Lead Assembly	1
15	2502-M	Nut, Stop	1	41	2720-E	Cover, Protective	1
16	2504-M	Bearing, Upper	1	42	2718-E	Cap, Male	1
17	2503-M	Spring Retainer	1	43	1047-E-RP	Plug, Male (Repair)	1
18	2108-MP	Handle, Mounting Section	1	44			
19	1230-M	Washer, Lock	1	45	2024-M-375	Screw, Truss Head	2
20	2034-M-500	Screw, Truss Head	1	46	2521-M*	Tapered Wedge	1
21	1207-M	Washer, Lock	1	47	2381-M1	Strain Relief, Weld	1
22	2024-M-750	Screw, Truss Head	1	-	2381-M2	Strain Relief, Control	1

\* Not Shown

\*\* Specify stud/pin size when ordering

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**2615-M ADAPTER ASSEMBLY INCLUDES ITEMS #25, 13, 14 & 24**

**SET UP FOR WELDING STEEL/STAINLESS STEEL WELD PINS**

**GUN SET UP WITH HEAVY (3”) SPRING & 1151-M STATIONARY LEGS**

- 1. 12 & 10 gauge pins to galvanized steel
  - A. Install collet and protector as described on page 3. Refer to the chart below for part numbers. Be sure the collet holding set screws are tightened securely. Install (3) 1151-M stationary legs into the equally spaced threaded holes in the faceplate.
  - B. Welding cables should be connected for “Reverse Polarity” (Ground to “Negative”).
  
- 2. 12 & 10 gauge pins to un-plated steel /stainless steel
  - A. Set up gun as described above.
  - B. Welding cables should be connected for “Straight Polarity” (Ground to “Positive”).

For welding pins over 7” in length, see page 13.

Steel/Stainless Weld Pin	Collet	Collet Protector
12 Ga. (2.69mm)	437-106	437-P-106
10 Ga. (3.42mm)	437-135	437-P-135

Note: 1. Cables - Ground.....1142-E (#6)  
Gun Lead Extension.....1279-E (#6)

**WELDING PROCEDURE**

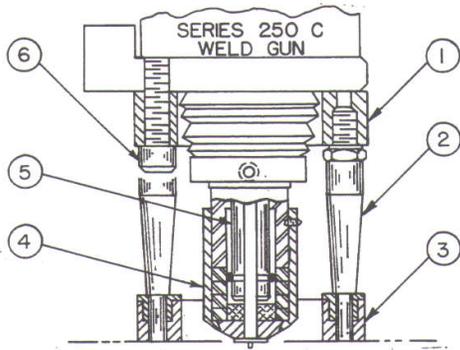
Set voltage and ground polarity as directed on Page 30 or 31. Once the pin is loaded into the gun, position on the work piece and depresses the gun until the stationary legs contact the base metal. While holding the gun firm and steady, pull the trigger. Remove the gun from the welded pin in a straight line motion so as not to bend the pin or damage the collet and protector.

**SET UP FOR WELDING ALUMINUM WELD PINS**

**GUN SET UP WITH HEAVY (3") SPRING & 2367-M ADAPTER ASSEMBLY**

- A. If previously installed, remove legs (2) and dust boot from gun.
- B. Install proper collet (5) and protector (4), being sure collet holding set screws are tightened securely.
- C. Place adapter ring (1) over face plate and line up the two clearance holes with the corresponding tapped holes in the face plate. Install the two socket head cap screws (6) and tighten securely.
- D. Insert a leg (2) into each of the three equally spaced tapped holes in the adapter ring.
- E. Slide the leg support ring (3) over the ends of the three legs. The metal inserts should face down towards the legs. This ring ensures proper alignment of the gun when welding to curved or narrow surfaces.

For welding pins over 7" in length, see Page 13.



**LEGEND DESCRIPTION PART NO. QTY.**

1** Adapter Ring	1358-M-XL	1
2** Legs	1151-M	3
3** Leg Support Ring	1628-M	1
4 Collet Protector	437-P-*AL	1
5 Collet	437-*AL	1
6** Cap Screw	1212-M-0750	2

\* Specify pin diameter when ordering these items.  
**\*\* Part of 2367-M Adapter Assembly**

Aluminum WELD PIN	Collet / Protector	Base Material	Ground Polarity	Approximate Welding Voltage
12 Ga. (2.69mm)	437-106AL 437-P-106AL	Embossed Aluminum	POS.	200
10 Ga. (3.42mm)	437-135AL 437-P-135AL	Embossed Aluminum	POS.	215

Note: 1. Cables - Ground .....1142-E (#6)  
 Gun Lead Extension.....1279-E (#6)

**WELDING PROCEDURE**

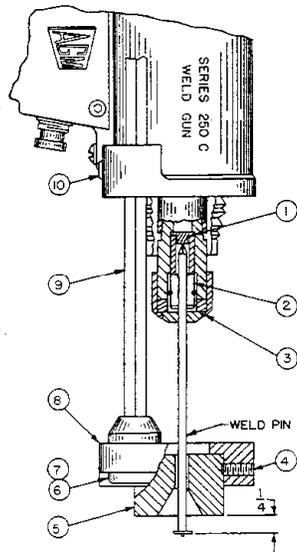
Set voltage and ground polarity as directed on page 32. Once the pin is loaded into the gun, position on the work piece and depress until the leg support ring rests on the base metal. While holding the gun firm and steady, pull the trigger. Remove the gun from the welded pin in a straight line motion, so as not to bend the pin or damage the collet and protector.

*CAUTION: Take care not to move the gun once put to the work, as this could damage the tip of the pin and cause poor welds.*

## SET UP FOR WELDING PINS OVER 7" LONG

### GUN SET UP WITH HEAVY (3") SPRING & 2318-M FOOT PIECE ASSEMBLY

- A. Install proper collet (2), stop (1) and protector (3), being sure collet holding set screws are tightened securely. See pages 12 or 13 for part numbers.
- B. If previously installed, remove legs (1151-M) from face plate.
- C. Insert adjustable legs (9) of foot piece assembly into the holes provided in the face plate.
- D. Insert proper spark shield (5) into the foot piece (8) and tighten set screws (4). Be sure to install with concave side facing away from the gun, as shown.
- E. Insert weld pin through spark shield and into the collet until it rests against the stop.
- F. Adjust the foot piece by loosening the two set screws (10) and sliding the assembly as required. The pin should extend beyond the spark shield approximately 1/4" as shown. Once set tighten the set screws securely.
- G. Check for freedom of movement between the spark shield and the weld pin. If they bind, loosen the two cap screws (6) and move the foot piece until the pin is centered in the spark shield. Once set, tighten the cap screws securely.



<u>LEGEND</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>	<u>QTY.</u>
1	Stop	437G-1250	1
2	Collet	437-*	1
3	Collet Protector	437-P-*	1
4	Set Screw	1213-M-0500	2
5	Spark Shield	1835-M-*	1
6	Cap Screw	2000-M-1000	2
7	Washer	1993-M	2
8	Foot Piece	1999-M	1
9	Adjustable Leg	1991-M-8000**	2
10	Set Screw	1231-M-0250	2

\* Specify pin diameter, length and material when ordering these items.

\*\* For use with pins up to 8" long.  
For longer pins, use the 1991-M-14000.

**Items 4,6,7,8, & 9 Part of 2318-M Foot Piece Assembly**

### WELDING PROCEDURE

Set voltage and ground polarity as directed on page 30, 31, or 32. Once the pin is loaded into the gun, position on the work piece and depress the gun until the spark shield rests on the base metal. While holding the gun firm and steady, pull trigger. Remove the gun from the welded pin in a straight line motion so as not to bend the pin or damage the collet and protector.

**SET UP FOR WELDING FLANGED STEEL & STAINLESS STUDS THROUGH  
1/4-20 DIAMETER**

**GUN SET UP WITH HEAVY (3") SPRING & 1151-M STATIONARY LEGS**

- A. Install collet and protector as described on page 3. Be sure the collet holding set screws are tightened securely. Install (3) 1151-M stationary legs into the equally spaced threaded holes in the face plate.
- B. Refer to the chart below for collet and collet protector part numbers. For studs that are 3/8" long and shorter, use the type 375-SP collet with appropriate 437G- type stop. *DO NOT* use a collet protector.

Steel / Stainless Flanged Stud	Collet	Collet Protector
4-40 (M2.8)	437-110	437-P-110
6-32 (M3)	437-136	437-P-136
8-32 (M4)	437-159	437-P-159
10-24/32 (M5)	437-185	437-P-185
1/4-20 (M6)	437-246	437-P-246
Navy (3/16")	437-177	437-P-177

- Notes: 1. Cables - Ground.....1142-E (# 6 Standard)  
 Gun Lead Extension.....1279-E (# 6 Standard)
2. For alternate gun set up to weld studs longer than 1-3/8", see page 17.

**WELDING PROCEDURE**

Set Voltage and ground polarity as directed on page 30 or 31. Once the stud is loaded into the gun, position on the work piece and depress the gun until the stationary legs contact the base metal. While holding the gun firm and steady, pull trigger. Remove the gun from the weld stud in a straight line motion so as not to bend the stud or damage the collet and protector.

**SET UP FOR WELDING FLANGED & NON-FLANGED ALUMINUM STUDS  
AND HANGER STUDS (ALL WELDERS) & NON-FLANGED  
STEEL/STAINLESS STUDS THROUGH 1/4-20 DIAMETER (ALL WELDERS  
EXCEPT 320SS, LS-400 & JS-1 WILL NOT WELD 1/4-20 ALUMINUM STUDS)**

**GUN SET UP WITH HEAVY (3") SPRING & 1151-M STATIONARY LEGS**

- A. Install collet and stop as described on pages 5 & 6. Be sure the collet holding set screws are tightened securely. Do not use a protector. Install (3) 1151-M stationary legs into the equally spaced threaded holes in the face plate.
- B. Refer to the chart below for collet part numbers. *For studs 3/8" long and shorter, use the type 375-SP collet.*
- C. Use the type 437G-\* stop for studs up to 1-3/8" long, and type 250CG-\* for studs over 1-3/8" long. See page 7 for stop part numbers. See page 18 for an **alternate set up** for welding studs over 1-3/8" longs.

\* Specify stud length and diameter when ordering stops.

<b>Stud Size</b>	<b>Collet</b>
4-40 (M2.8)	437-110
6-32 (M3)	437-136
8-32 (M4)	437-159
10-24/32 (M5)	437-185
*** 1/4-20 (M6)	437-246
Hanger	437-HS**
Navy (3/16")	437-177

- Notes: 1. Cables - Ground.....1142-E (#6)  
           Gun Lead Extension.....1279-E (#6)
- 2. \*\* - Stop part number for the hanger stud is 437G-HS.
  - 3. \*\*\* - When welding flanged 1/4-20 aluminum studs, the 2506-M-200 medium spring and 2526-M spring locator installed in the end cap is recommended, in addition to the 2506-M-300 heavy internal spring.

To weld aluminum studs onto small pieces, special grounding techniques may have to be used. Please consult the factory.

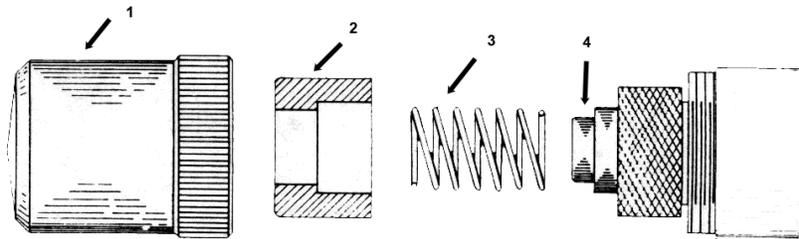
**WELDING PROCEDURE**

Set the voltage and ground polarity as directed on page 30, 31, or 32. Once the stud is loaded into the gun, position it on the work piece and depress until the stationary legs contact the base metal. While holding the gun firm and steady, pull the trigger. Remove the gun from the welded stud in a straight line motion so as not to bend the stud or damage the collet.

**SET UP FOR WELDING NON-FLANGED STEEL & STAINLESS STUDS  
THROUGH 1/4-20 DIAMETER (JS-1 320SS & LS-400 ONLY)**

**GUN SET UP WITH HEAVY (3") & MEDIUM (2") SPRING & 1151-M LEGS**

- A. Install collet and stop as described on pages 5 & 6. Be sure the collet holding set screws are tightened securely. Do not use a protector. Install (3) 1151-M stationary legs into the equally spaced threaded holes in the faceplate.
- B. Refer to the chart below for collet part numbers. *For studs 3/8" long and shorter, use the type 375-SP collet.*
- C. Use the type 437G-\* stop for studs up to 1-3/8" long, and type 250CG-\* for studs over 1-3/8" long. See page 7 for stop part numbers. See page 17 for an **alternate set up** for welding studs over 1-3/8" long.
- D. Remove end cap (1) from gun barrel.
- E. Place medium spring (3) over stop nut (4).
- F. Insert spring locator (2) into end cap, as shown, and replace cap onto gun barrel.



Stud Size	Collet
4-40 (M2.8)	437-110
6-32 (M3)	437-136
8-32 (M4)	437-159
10-24/32 (M5)	437-185
1/4-20 (M6)	437-246

**WELDING PROCEDURE**

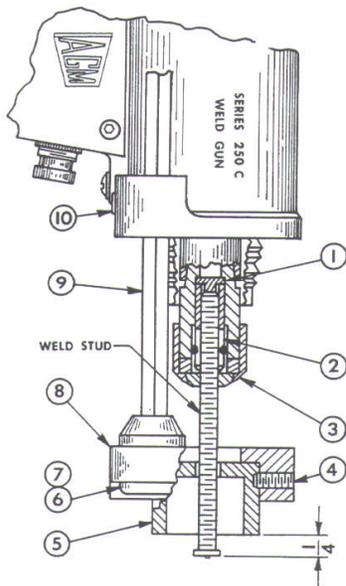
Set voltage and ground polarity as directed on page 30 or 31. Once the stud is loaded into the gun, position it on the work piece and depress until the stationary legs contact the base metal. While holding the gun firm and steady, pull the trigger. Remove the gun from the welded stud in a straight line motion so as not to bend the stud or damage the collet.

**ALTERNATE GUN SET UP FOR STUDS OVER 1-3/8" LONG**

**GUN SET UP WITH HEAVY (3") SPRING & 2318-M FOOT PIECE ASSEMBLY**

- A. Install proper stop (1), collet (2) and protector (3), being sure the collet holding set screws are tightened securely. See the chart below and previous page for part numbers.
- B. If previously installed, remove the 1151-M legs from the face plate.
- C. Insert adjustable legs (9) of the foot assembly into the holes provided on the face plate.
- D. Insert the proper spark shield (5) into the foot piece (8) and tighten the set screws (4).
- E. Insert the stud through the spark shield, protector and into the collet, until it rests against the stop.
- F. Check for freedom of movement between the spark shield and the stud. If they bind, loosen the two cap screws (6) and move the foot piece until the stud is centered in the spark shield. Once done, retighten the cap screws securely.
- G. Adjust the foot piece by loosening the two set screws (10) and sliding the assembly as required. The stud should extend beyond the spark shield approximately 1/4" as shown. Once done, retighten the set screws securely.

**The gun is now ready for welding.**



<u>LEGEND</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>	<u>QTY.</u>
1	Stop	437G-1250	1
2	Collet	437-*	1
3	Collet Protector	437-P-*	1
4	Set Screw	1213-M-0500	2
5	Spark Shield (For studs 2-1/2" long & under)	2144-M-250	1
	(For studs over 2-1/2" long)	2144-M-300-*	1
6	Cap Screw	2000-M-1000	2
7	Washer	1993-M	2
8	Foot Piece	1999-M	1
9	Adjustable Leg	1991-M-8	2
10	Set Screw	1231-M-0250	2

\* Specify stud diameter and length when ordering these items.

**Items 4,6,7,8, & 9 Part of 2318-M Foot Piece Assembly**

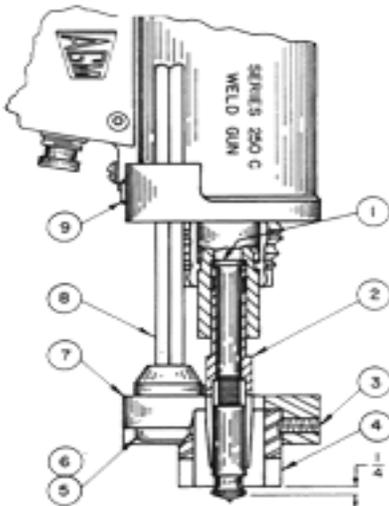
**SET UP FOR WELDING 5/16" DIAMETER AND LARGER STUDS**

**GUN SET UP WITH HEAVY (3") SPRING (SEE NOTE ON NEXT PAGE) AND 2318-M FOOT PIECE ASSEMBLY**

**(SEE PAGE 21 FOR ALTERNATE SET UP USING 2958-M FOOT PIECE ASSEMBLY)**

- A. Install proper stop (1) and collet (2), being sure that the collet holding set screws are tightened securely. Refer to the chart on the next page for collet part numbers, and to Note 2 for the stop part numbers.
- B. If previously installed, remove 1151-M legs from the face plate.
- C. Insert adjustable legs (8) of the foot piece assembly into the holes provided on the face plate.
- D. Insert proper spark shield (4) (see Note 3 for part number) into foot piece (7) and tighten the set screws (3).
- E. Insert stud through spark shield and into the collet until it rests against the stop.
- F. Check for freedom of movement between the spark shield and the stud. If they bind, loosen the two cap screws (5) and move the foot piece until the stud is centered in the spark shield. Once done, retighten the cap screws securely.
- G. Adjust the foot piece by loosening the two set screws (9) and sliding the assembly as required. The stud should extend beyond the spark shield approximately 1/4" as shown. Once done, tighten the set screws securely.

*The gun is now ready for welding.*



	DESCRIPTION	PART NO.	QTY.
1.	Stop	437-G-*	1
2.	Collet	437-**	1
3.	Set Screw	1213-M-0500	2
4.	Spark Shield	2144-M-*	1
5.	Cap Screw	2000-M-1000	2
6.	Washer	1993-M	2
7.	Foot Piece	1999-M	1
8.	Adjustable Leg	1991-M-8000	2
9.	Set Screw	1231-M-0250	2

\* See notes 2 & 3 on next page for part numbers.

\*\* See chart on next page for part numbers.

**Items 6,7,8 & 9 are part of 2318-M Assembly.**

(Continued)

## SET UP FOR WELDING 5/16" DIAMETER AND LARGER STUDS

(continued)

Stud Size	Collet
5/16-18 (M8)	437-S-307
5/16" Shoulder	437-S-312
3/8-16 (M10)	437-S-370
1/2-13 (M13)	437-S-495

**Notes:** 1. When welding flanged & non-flanged 5/16-18 and larger **aluminum** studs, the 2506-M-200 medium spring and 2526-M spring locator installed in the end cap is recommended, in addition to the 2506-M-300 heavy internal spring.

To weld aluminum studs onto small pieces, special grounding techniques may have to be used. Please consult the factory.

### 2. *Stop requirements*

A. For all SL516 shoulder studs, use 437SG-1375.

B. For all other 5/16-18 & larger threaded studs *over* 1" long, use the **437SG-1000** stop. Specify stud length for studs under 1" long (i.e. for S51618-1216L stud (3/4" long), use **437SG-0750** stop).

### 3. *Spark shield requirements*

A. For studs 2-1/2" long & shorter, use **2144-M-250** shield.

B. For studs over 2-1/2" long, use **2144-M-300-dia.**  
Specify stud diameter when ordering this spark shield.

### 4. *Cables*

A. Ground.....1507-E (#2 Heavy Duty)

B. Gun Lead Extension.....1506-E (#2 Heavy Duty)

## WELDING PROCEDURE

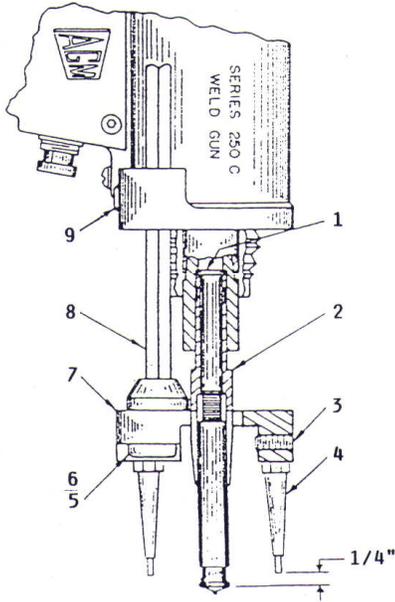
Set voltage and ground polarity as directed on page 30, 31, or 32. Once the stud is loaded into the gun, position on the work piece and depresses the gun until the park shield contacts the base metal. While holding the gun firm and steady, pull the trigger. Remove the gun from the welded stud in a straight line motion so as not to bend the stud or damage the collet.

Preparation of the weld surface is **strongly** recommended for this application. The weld area should be ground clean of all rust, scale, paint, etc. to ensure strong, reliable welds.

**ALTERNATE SET UP USING 2958-M FOOT PIECE ASSEMBLY**

If desired you may use the 2958-M Foot Piece Assembly instead of the 2318-M. The 2958-M uses the 3 standard 1151-M Stationary Legs, giving you added stability and the option to use a 1628-M Leg Support Ring if necessary.

2958-M Foot Piece Ass'y



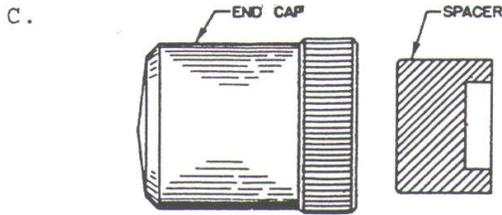
<u>LEGEND</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>	<u>QTY.</u>
1	Stop	437SG-*	1
2	Collet	437S-**	1
3	Set Screw	1213-M-0500	2
4	Stationary Legs	1151-M	3
5	Cap Screw	2000-M-1000	2
6	Washer	1993-M	2
7	Foot Piece	2957-M	1
8	Adjustable Leg	1991-M-8000	2
9	Set Screw	1231-M-0250	2

\* See note 2 on previous page for part numbers.

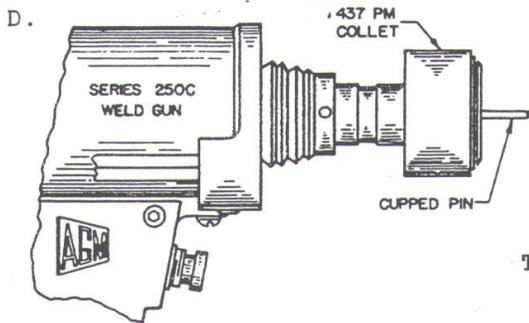
\*\* See chart on previous page for part numbers.

**SET UP FOR WELDING CUPPED HEAD/MINI CUP PINS IN THE FIELD  
GUN SET UP WITH LIGHT (1-1/4") SPRING (EXCEPT AS NOTED BELOW)\***

- A. If previously installed, remove the three 1151-M, as they will interfere with the proper gun shaft movement.
- B. Install the 2506-M-125 light spring as instructed on page 9 of this manual.



Install spacer (2525-M) inside the end cap, as shown, then screw the end cap back onto the housing.



Insert magnetic collet into the collet adaptor assembly in the same manner as a regular collet, and tighten the set screws securely.

The gun is now ready for welding.

*This set up is for welding to 22 gauge (.033") and thicker material. Do not try to weld through paint or rust.*

Pin Diameter	Collet
14 Gauge (2.03mm)	437-PM (rebuildable)
12 Gauge (2.63mm)	or
10 Gauge (3.42mm)	437-MC-M (non-rebuildable)

Notes: 1. Cables - 1279-E and 1142-E (standard #6 weld cables)  
Consult factory for use of additional lengths.

- 2. \* - 2506-M-200 Medium Spring should be used with JS-1 and for 10 ga. pins.

**WELDING PROCEDURE**

Set voltage and ground polarity as directed on page 30 or 31. Place a cupped pin against the face of the magnetic collet (437-PM or 437-MC-M), taking care that the washer is centered on the collet. Push the pin through the insulation until the gun shaft is fully depressed. Then, while holding the gun firmly and perpendicular, actuate the weld cycle. If weld cycle does not initiate, rotate the gun to break through scale, etc. and re-actuate the weld cycle. It is important that the gun is held firmly, but not forced against the work.

## CUPPED HEAD/MINI CUP PIN APPLICATION RECOMMENDATIONS

(continued)

### 3 lb. Density Insulation and under:

In most cases, the pin should be 1/8" shorter than the insulation thickness. In the case of long fiber 3 lb. density insulation, the pin may have to be the same length as the insulation thickness.

### 6 lb. Density Rigid Fiberglass Board:

In most cases, the pin should be 1/8" longer than the insulation thickness.

### 6 lb. to 9lb. Density Wool Blanket:

Although the density is high, the wool blanket will compress easily; therefore the pin should be 1/2" shorter than the insulation thickness.

### Calcium Silicate Block:

The pin should be 1/8" longer than the thickness of the block. This material must be pre-drilled with a 1/4" diameter drill wherever you want to locate a pin. In addition to it being very difficult to push a pin through the block, a great deal of material collects around the end of the pin. This interferes with the weld, hence the pre-drilling. After the pins are welded in place, cement is normally grouted around the washer of the pin.

### Foil Faced Insulation - Vapor Barrier:

When applying metallic-faced insulation, you **must use** insulated cupped head pins. If insulated pins are not used, arcing will take place between the head of the pin and the foil facing of the insulation, damaging the vapor barrier. AGM insulated cupped head pins are furnished with an insulator disc adhered to the underside of the washer. Be sure to specify "**insulated**" when ordering.

### Metallic Mesh-Faced Insulation:

When welding through insulation with a metal mesh covering (such as chicken wire, hardware cloth, perforated metal, expanded metal, etc.), **insulated** cupped pins should also be used as in the above application. If **insulated** pins are not used, the pin head is liable to arc across to the metal mesh. In cases where the pin must be put through small diameter openings in the mesh or perforated metal, we recommend the **additional** insulation of the pin shank to prevent arcing, should it touch the metal. This is done by the application of a small length of plastic tubing, approximately 1/2" long, over the shank of each pin. AGM can also furnish this type of insulated pin upon special request.

(continued)

**437-PM MAGNETIC COLLET**  
**INSTRUCTIONS FOR REPLACEMENT OF WORN OUT COLLET PARTS**

The 437-PM-RK Repair Kit should be used to rebuild the 437-PM Magnetic Collet. It includes the following: 437-PM-1 Collet Insert, 437-PM-2 Cap Screw, 437-PM-7 Insulator Disc, 437-PM-4 Sleeve Insulator, as well as the proper size Allen Wrench.

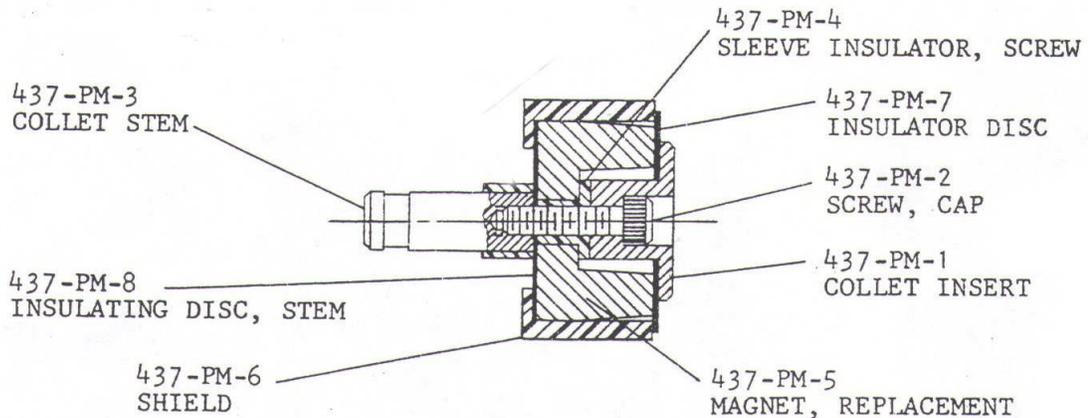
1. Remove the collet from the gun shaft.
2. Loosen and remove the 437-PM-2 Cap Screw.

**IMPORTANT:** Do not try to loosen the cap screw while the collet is still in the gun shaft, as this could damage internal parts of the weld gun. Be sure Step No.1 is followed.

3. Remove the worn Collet Insert, part no. 437-PM-1. Note that when the cap screw is removed, the 437-PM-3 Collet Stem is now detached from the magnet.
4. Place the assembly parts of the Repair Kit into the magnet.
5. Screw the 437-PM-3 Collet Stem onto the cap screw. A new Collet Stem should be used only if needed. (Note that this part is not included in the repair kit, and must be purchased separately). While holding the stem firmly, insert the Allen Wrench into the cap screw and tighten securely.

**IMPORTANT:** Be sure the cap screw is tight, otherwise arcing and burning may take place. This will result in the parts being damaged unnecessarily. This screw should be checked periodically for tightness. Also, be sure all insulating discs and sleeves are in the proper position, as shown in the sketch below. If not, the magnetic holding force will be affected.

6. Replace the collet in the gun shaft, **BE SURE** to check the collet holding set screws for tightness once or twice a day. They must be kept tight to prevent arcing inside the gun shaft.



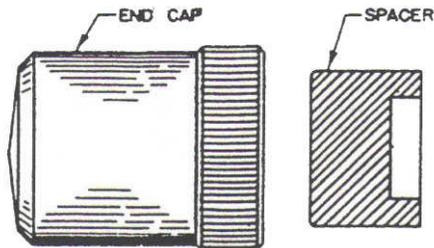
## SET UP FOR WELDING POWERBASE PINS

### GUN SET UP WITH LIGHT (1-1/4") SPRING AND 2318-M FOOT PIECE ASSEMBLY

The set up listed below is for pins 2-1/2" long and longer. For pins less than 2-1/2" long, see the note on the next page.

A. Install the 2506-M-125 light spring as instructed on page 9 of this manual.

B.



Install the 2525-M spacer inside the end cap, as shown, then screw the end cap back on the housing

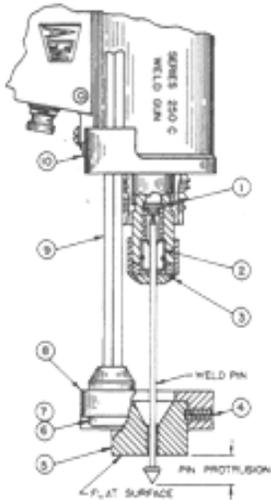
- C. Install stop (1), collet (2) and protector (3), being sure that the collet holding set screw are tightened securely. Refer to the chart on the next page for collet and protector part numbers.
- D. If previously installed, remove the 1151-M stationary legs from the face plate.
- E. Insert the adjustable legs (9) of the foot assembly into the holes provided on the face plate.
- F. Insert the proper spark shield (5) into the foot piece (8), and tighten the set screws (4). Install with the flat surface facing **away** from the gun, as shown on the next page.
- G. Insert the Powerbase pin through the spark shield and into the collet until it rests against the stop.
- H. Check for freedom of movement between the spark shield and the pin. If they bind, loosen the two cap screws (6) and move the foot piece until the pin is centered in the spark shield. Once done, retighten the cap screws securely.
- I. Adjust the foot piece for proper pin protrusion by loosening the two set screws (10) and sliding the assembly as required. The pin should extend beyond the spark shield **3/8" to 1/2" for 12 gauge pins**, and **5/8" to 3/4" for 10 gauge pins**, as shown on the next page. After adjusting, retighten the set screws securely.

The gun is now ready for welding.

(continued)

**SET UP FOR WELDING POWERBASE PINS**

(continued)



<u>LEGEND</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>	<u>QTY.</u>
1	Stop	437G-1250	1
2	Collet	437-*	1
3	Collet Protector	437-P-*	1
4	Set Screw	1213-M-0500	2
5	Spark Shield	1835-M-*	1
6	Cap Screw	2000-M-1000	2
7	Washer	1993-M	2
8	Foot Piece	1999-M	1
9	Adjustable Leg	1991-M-8**	2
10	Set Screw	1231-M-0250	2

\* Specify pin diameter, length and material when ordering these items.

\*\* For use with pins up to 8" long. For longer pins, use 1991-M-14.

**Items 4,6,7,8, & 9 Part of 2318-M Foot Piece Assembly**

Steel/Stainless Powerbase Pins	Collet	Collet Protector
12 ga. (2.69mm)	437-106	437-P-106
10 ga. (3.42mm)	437-135	437-P-135

Note: Cables.....1142-E and 1279-E (#6 Standard)

*Consult factory for information on use of Heavy Duty (#2) cables.*

**CAUTION: DO NOT USE POWERBASE PINS ON METAL LESS THAN 1/16" THICK.**

**WELDING PROCEDURE**

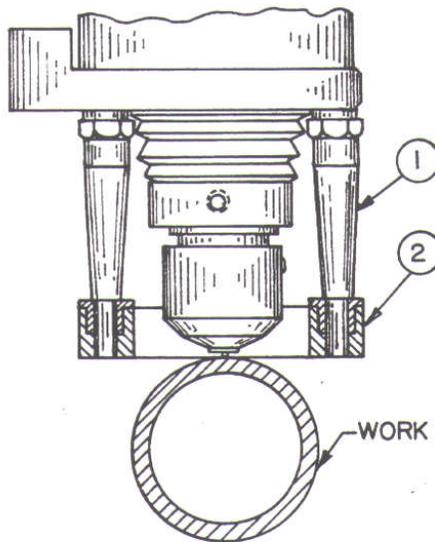
Set voltage and ground polarity as directed on page 30. Insert the weld pin, as previously instructed, and place it against the welding surface. Push the gun down until the shaft is fully depressed. Then, while holding the gun firmly and perpendicular to the weld surface, actuate the weld cycle. If the cycle does not initiate, the gun should be rotated around the weld pin point in order to penetrate surface scale, paint, etc. Then, while holding the gun firmly, as before actuate the weld cycle again.

NOTE: The 2318-M Adjustable Foot Piece Assembly is not required when welding Powerbase pins shorter than 2-1/2". For these shorter pins, use only the standard 10 or 12 gauge collet, proper collet protector and the 437G-1250 stop. For 1" long pin, use the 437G-0750 stop.

## SET UP FOR WELDING TO CURVED SURFACES

### GUN SET UP

- A. Set up the gun as described on pages 5 & 6, using the proper collet and collet protector (or stop if required). Be sure the collet holding set screws are tightened securely.
- B. Install the 1628-M leg support ring (2) over the three 1151-M legs (1). The metal insert should face **down** towards the legs. This ring ensures proper alignment of the stud or pin to the work.
- C. If a leg support ring is not available, two legs may be located, 180 degrees apart, on the face plate. When positioning the weld gun to the work piece, these two legs should be placed along the axis of the curvature. Care must be taken to hold the weld gun perpendicular to the weld surface.



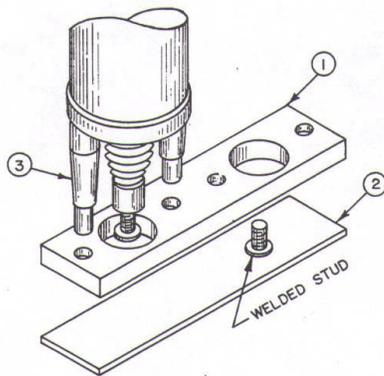
## SET UP FOR WELDING THROUGH A TEMPLATE

### GUN SET UP

- A. Set up the gun as described on pages 5 & 6, using the proper collet and collet protector (or stop, if required). Be sure the collet holding set screws are tightened securely.
- B. Install two 1151-M legs (3), 180 degrees apart, in the face plate of the weld gun.
- C. Install the third leg, which has been shortened by the thickness of the template material, into one of the remaining tapped holes (whichever one is more convenient).

*The gun is now ready for welding.*

For correct welder set up, refer to the proper gun set up sheet covering the stud or pin to be welded.



### WELDING PROCEDURE

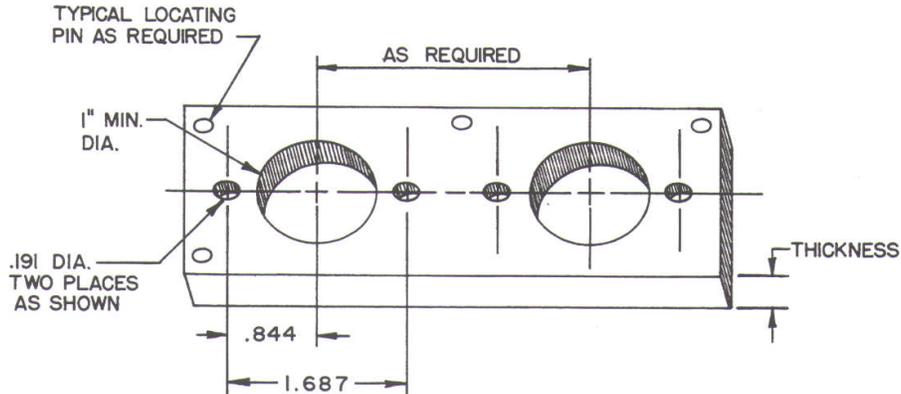
- A. Load the stud or pin into the gun as described in the "Welding Operation" section of this manual (page 6).
- B. Place the template (1) in position on the work (2).
- C. Insert both legs into the leg location holes and push down until the two legs make contact with the work. To ensure that the gun is perpendicular to the work surface, be sure that the third leg is in contact with the template.
- D. Perform the weld in the usual manner.

A typical template is shown on page 29.

## TYPICAL TEMPLATE SPECIFICATIONS

Material: Phenolic sheet, such as "Benelex".

Thickness: 1/8" min., 1/4" max



The above drawing shows the spacing and diameter of the leg location holes. The two standard 1151-M legs are inserted into these holes. To ensure that the welded stud is perpendicular to the work surface, a third leg, shortened by an amount equal to the template thickness, may be used in the weld gun. This leg is held in contact with the template during the weld cycle.

The typical locating pins shown are for locating the template onto the work. If there are holes punched into the work piece, it may be desirable to use them for locating.

**APPROXIMATE VOLTAGE SETTING & GROUND POLARITY**

BASE MATERIAL: MILD STAINLESS STEEL

STUD/PIN MATERIAL: 1008/1010 MILD STEEL OR 302 STAINLESS STEEL

GROUND POLARITY: POSITIVE

STUD/PIN SIZE		MODEL WELDER				
		320	400	575/580/600 1200 "LO"	1175 1200 "HI" PA15	JS1
"CD" PINS	12 GAUGE	150	140	120	100	120
	10 GAUGE	180	170	150	110	160
CUPPED HEAD/ MINI CUP PINS	14 GAUGE	XXX	XXX	130	115	130
	12 GAUGE	XXX	XXX	160	130	160
	10 GAUGE	XXX	XXX	210	170	210
POWERBASE PINS	12 GAUGE	XXX	XXX	195	150	XXX
	10 GAUGE	XXX	XXX	XXX	200	XXX
FLANGED STUDS	4-40	150	120	100	100	105
	6-32	180	135	110	100	120
	8-32	190	180	150	115	160
	10-24/32	200	195	175	130	180
	NAVY	XXX	205	185	140	190
	1/4-20	XXX	210**	200	160	220**
	5/16/18	XXX	XXX	220*	210*	XXX
NON-FLANGED STUDS	4-40	110	110	105	100	105
	6-32	130	125	115	105	115
	8-32	205	180	140	115	140
	10-24/32	210	200	160	130	160
	1/4-20	XXX	220	210	150	220**
	5/16-18	XXX	XXX	200*	185*	XXX
	SHOULDER	XXX	XXX	XXX	190*	XXX
	3/8-16	XXX	XXX	XXX	205*	XXX

\*Heavy Duty cables required for all except PA15.

\*\* Require Heavy Duty cables and extra spring set up.

**APPROXIMATE VOLTAGE SETTING & GROUND POLARITY**

BASE MATERIAL: GALVANIZED STEEL

STUD/PIN MATERIAL: 1008/1010 MILD STEEL OR 302 STAINLESS STEEL

GROUND POLARITY: NEGATIVE (EXCEPT AS NOTED BELOW\*\*)

STUD/PIN SIZE		MODEL WELDER				
		320	400	575/580/600 1200 "LO"	1175 1200 "HI" PA15	JS1
"CD" PINS	12 GAUGE	190	180	160	120	200
	10 GAUGE	XXX	215	190	160	215
CUPPED HEAD/ MINI CUP PINS**	14 GAUGE	XXX	XXX	130	115	140
	12 GAUGE	XXX	XXX	160	130	200
	10 GAUGE	XXX	XXX	100	170	220
POWERBASE PINS***	12 GAUGE	XXX	XXX	XXX	XXX	XXX
	10 GAUGE	XXX	XXX	XXX	XXX	XXX
FLANGED STUDS	4-40	XXX	180	150	130	165
	6-32	XXX	205	165	150	200
	8-32	XXX	XXX	185	165	XXX
	10-24/32	XXX	XXX	175	185	XXX
	NAVY	XXX	XXX	205*	205	XXX
	1/4-20	XXX	XXX	XXX	180*	XXX
	5/16-18	XXX	XXX	XXX	XXX	XXX
	3/8-16	XXX	XXX	XXX	XXX	XXX
NON-FLANGED STUDS	4-40	XXX	150	110	100	150
	6-32	XXX	210	130	120	200
	8-32	XXX	XXX	150	130	XXX
	10-24/32	XXX	XXX	175	145	XXX
	1/4-20	XXX	XXX	195*	200	XXX
	5/16-18	XXX	XXX	XXX	195**	XXX
	SHOULDER	XXX	XXX	XXX	205**	XXX
	3/8-16	XXX	XXX	XXX	XXX	XXX
	1/2-13	XXX	XXX	XXX	XXX	XXX

\* Heavy Duty cables required for all except the PA15.

\*\* When welding *Cupped Head/Mini Cup* pins to Galvanized steel, **POSITIVE** ground should be used.

**APPROXIMATE VOLTAGE SETTING & GROUND POLARITY**

BASE MATERIAL: ALUMINUM

STUD/PIN MATERIAL: STUDS - 1100 OR 5356 / PINS - 1100 ALUMINUM

GROUND POLARITY: POSITIVE

STUD/PIN SIZE		MODEL WELDER				
		320	400	575/580/600 1200 "LO"	1175 1200 "HI" PA15	JS1
"CD" PINS	12 GAUGE	XXX	205	175	125	200
	10 GAUGE	XXX	220	205	175	215
CUPPED HEAD/ MINI CUP PINS	14 GAUGE	XXX	XXX	XXX	XXX	XXX
	12 GAUGE	XXX	XXX	XXX	XXX	XXX
	10 GAUGE	XXX	XXX	XXX	XXX	XXX
POWERBASE PINS	12 GAUGE	XXX	XXX	XXX	XXX	XXX
	10 GAUGE	XXX	XXX	XXX	XXX	XXX
FLANGED STUDS	4-40	XXX	150	140	110	140
	6-32	XXX	190	180	135	180
	8-32	XXX	200	190	150	190
	10-24/32	XXX	210	200	160	210
	NAVY	XXX	XXX	XXX	XXX	XXX
	1/4-20	XXX	215	205	165	XXX
	5/16/18	XXX	XXX	XXX	165*/220 PA15	XXX
	3/8-16	XXX	XXX	XXX	205**	XXX
NON-FLANGED STUDS	4-40	XXX	XXX	XXX	XXX	XXX
	6-32	XXX	155	130	115	140
	8-32	XXX	180	160	120	160
	10-24/32	XXX	200	180	155	180
	1/4-20	XXX	XXX	215	175	XXX
	5/16-18	XXX	XXX	XXX	205*	XXX
	SHOULDER	XXX	XXX	XXX	XXX	XXX
	3/8-16	XXX	XXX	XXX	XXX	XXX
	1/2-13	XXX	XXX	XXX	XXX	XXX

\* Heavy Duty cables required for all except PA15.

\*\* PA15 only

## **NOTES**

Welder Serial Number \_\_\_\_\_

Gun Serial Number \_\_\_\_\_

AGM Industries, Inc. 16 Jonathan Drive, Brockton, MA 02301  
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