

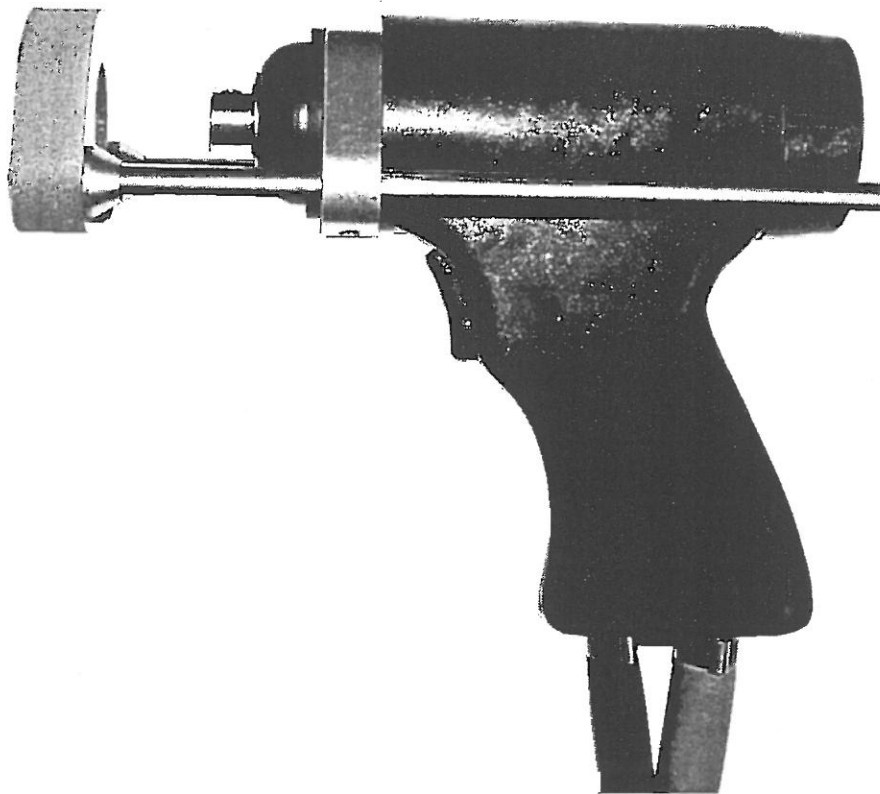
# PRO\*WELD

INTERNATIONAL

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## ***LD CD STUD WELDING GUN***



## ***OPERATION/MAINTENANCE MANUAL***

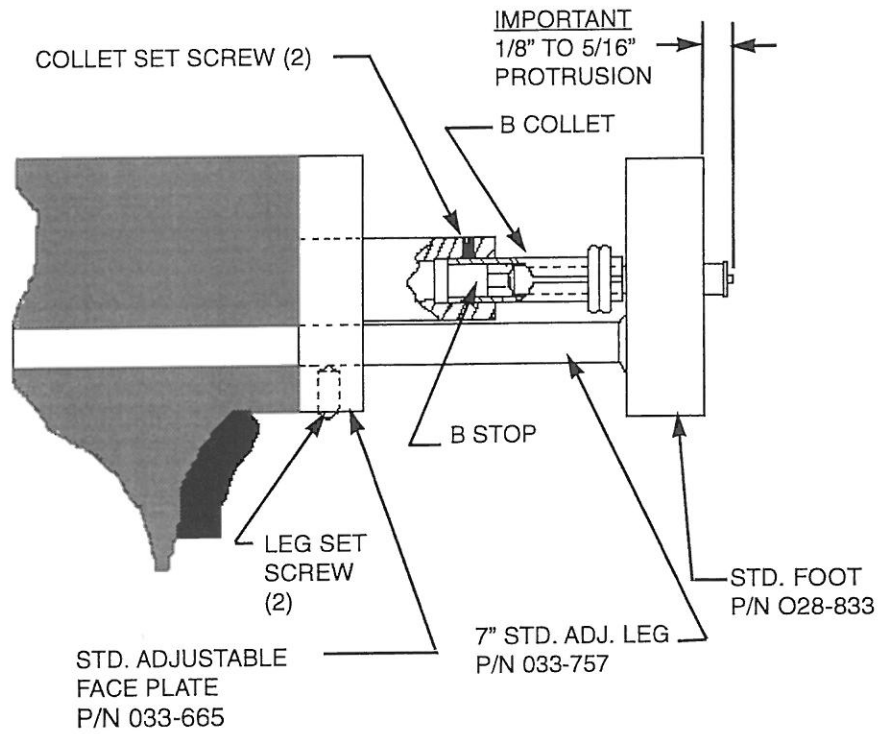


Figure 6-1 Standard Gun Setup

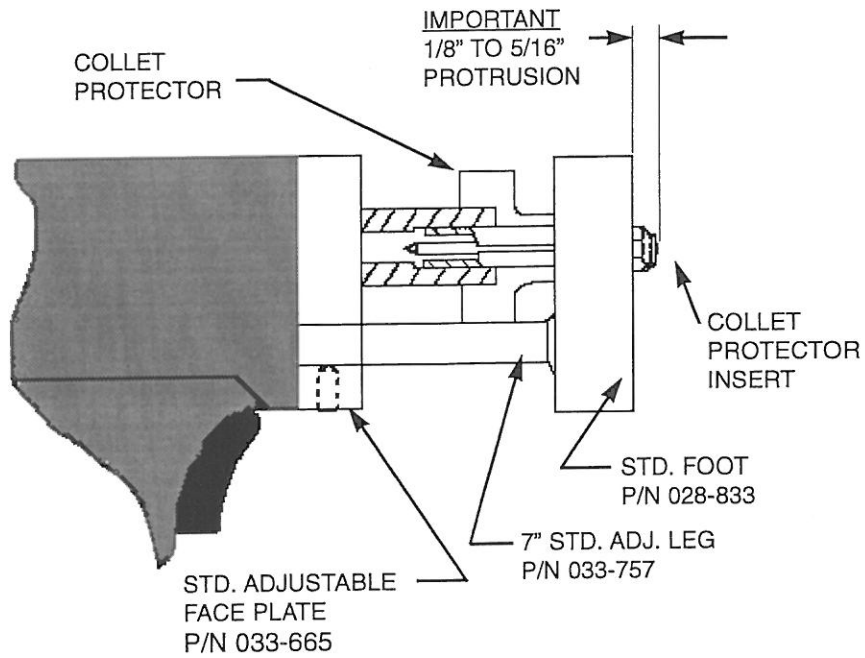


Figure 6-2 Gun Setup w/ Collet Protector and Standard Legs

When you change the size of the stud you are welding, you must also change to the appropriate collet. If a collet becomes damaged or broken, it must be replaced. You may also need a stop. Refer to Section 11 (Common Accessories) for a description and selection.

### 6.3 Spring Pressure

There are three different shaft springs that can be used by portable CD weld guns. These are silver (001-800), which develops 6 lbs of pressure, black (001-801), which develops 10 lbs. of pressure, and red (001-802), which develops 25 lbs. of pressure. Only one is selected, depending on stud size and material. Read the set-up chart in the equipment manual to pick the right one.

The function of the spring is to force the stud into the molten metal during the weld. The stronger the spring, the faster the stud reaches the weld area and therefore, the colder the weld becomes.

Aluminum and brass are alloys that cool very quickly, and for this reason you want the stud to reach the weld area as quickly as possible. Therefore, the red spring is recommended for these metals.

#### NOTE

Refer to the SMI Fastening Systems' "CD Stud Welding Accessories Guide". to choose the collet stop, leg, and footpiece to be used with your specific stud size.

### 6.4 Gun Set-up For Weld Pins With Collet Protector and Standard Legs (see Figure 6-2)

The collet protector has several advantages over the standard set-up.

1. It does not require a pin stop. therefore, the same setup is applicable for a range of pin lengths.
2. There is a fixed plunge, no gun adjustment is necessary.
3. It provides stability at the weld end of the pin.

There are two standard sizes available: 12 ga. and 10 ga. It is used with the round faceplate and three blunt legs. The collet protector slides over the collet and fastens to the chuck with three allen set screws. The insert, which takes the place of the internal stop, is replaceable.

The stud is pushed into the chuck until the flange bottoms out on the insert. The collet protector is not available for studs larger than 10 gauge.

### 6.4 Template Adapter (see Figure 6-3)

The template adapter is used when precise location or positioning of the CD stud is required. It is used with the round faceplate and does not require a footpiece or legs. The adapter is fastened to the faceplate and provides a fixed distance between the collet and work. The plunge is set by using the correct stop in the collet. A template can then be fabricated to enable very precise locating of a particular stud. The template adapter is available in two sizes, (1" and 1-1/4" diameter).

The round faceplate, with blunt legs, can alternately be used with the collet protector as shown in Figure 6.4.

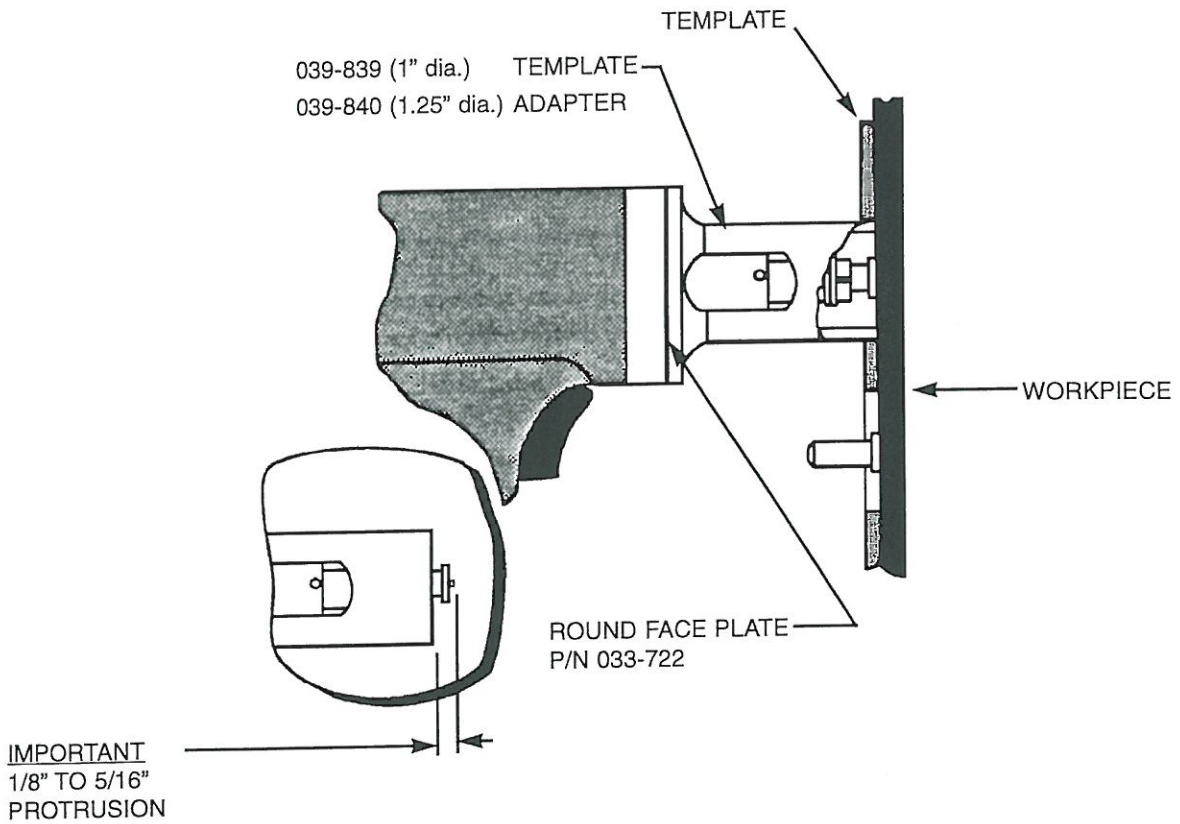


Figure 6-3 Template Adapter Gun Setup

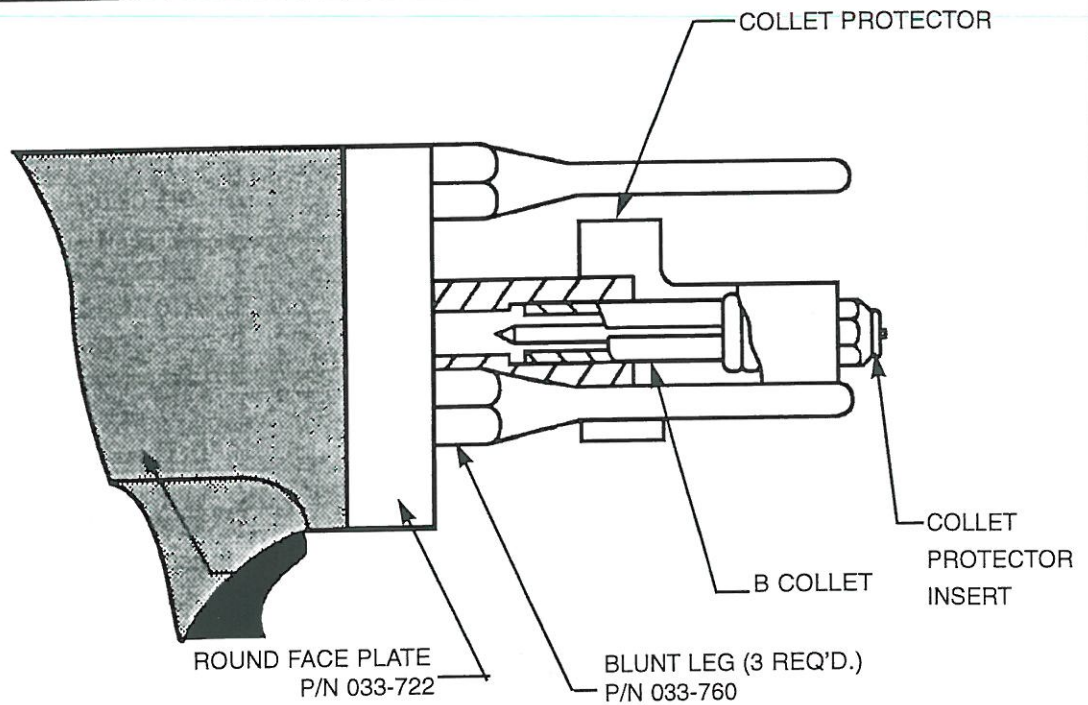


Figure 6-4 Gun Setup W/ Collet Protector

**7.0 WELDABLE MATERIAL COMBINATIONS**

**BASE MATERIAL**

Mild Steel (1008 - 1018)

Galvanized Sheet (Duct-"Q" Decking)

Structural Steel (Must be Clean)

Aluminum - Most alloys of the 1100, 3000 and, 5000 series.

Zinc Alloys (Die Cast)

Medium Carbon Steel (1030-1018)

Lead Free Brass  
Lead Free Rolled Brass  
Electrolytic Copper

**STUD MATERIALS**

Mild Steel 1008, 1018  
Stainless Steel 304, 305  
Brass 65-35, 70-30  
Copper, Silicon/Bronze

Mild Steel 1008 - 1018  
Stainless Steel 304, 305

Mild Steel 1008, 1018  
Stainless Steel 304, 305  
Brass 65-35, 70-30

Aluminum 1100, 5356

Aluminum 1100, 5356

Mild Steel 1008, 1018  
Stainless Steel 304, 305  
Brass 65-35, 70-30

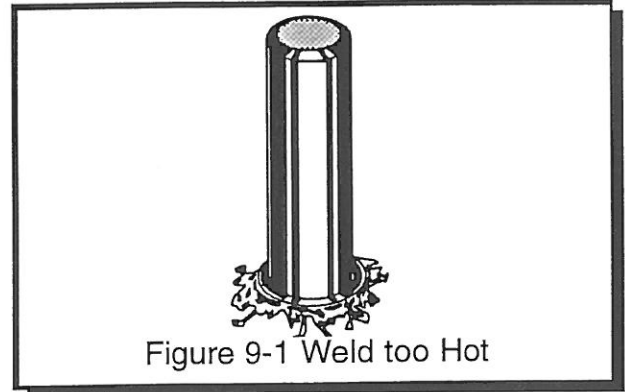
Mild Steel 1008, 1018  
Stainless Steel 304, 305  
Copper, Silicon/Bronze

**8.0 CAUSES OF POOR OR ERRATIC WELDS**

1. Loose collet. Does not grip stud tightly. (Replace) Not enough engagement of stud to collet. (Change stop)
2. Fault or loose ground connection. (Repair or tighten)
3. Poor surface condition of base material, excessive oil, grease, rust, ect. (Clean)
4. Voltage or capacitance setting too low or too high. (Adjust to diameter of stud)
5. Broken or loose cables. (Repair)
6. Dirt in gun. (Clean)
7. Incorrect polarity. (Cables hooked-up wrong)
8. Use of center punch or deep scribe. (Do not use center punch or deep scribes)
9. Cables too closely coiled.
10. Arc blow is evidenced by "one side" welds. In severe cases there will be no melting under one edge of flange while the opposite side is gouged out or appears excessively hot. The principle cause of arc blow is a magnetic field induced by the current flow during the weld. It occurs most often on long, narrow strips of metal or near edges of sheets or plates. In some cases, a change in grounding positions, or two grounds on the work piece, one at each end or edge of work, will correct the problem. For assistance in severe cases, contact your local sales representative.
11. Incorrect plunge setting. (Adjust to proper setting)

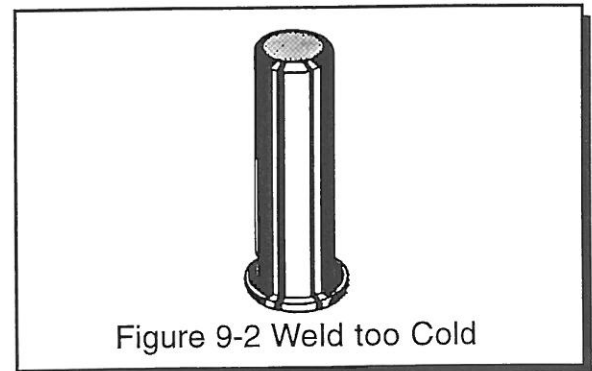
12. Incorrect spring. (Replace with proper spring)
13. Poor stud quality.

**9.0 TROUBLE SHOOTING POOR WELDS**



Weld too Hot

- A) Decrease voltage.
- B) Decrease capacitance.
- C) Increase stud protrusion.
- D) Increase spring pressure.



Weld too Cold

- A) Increase voltage.
- B) Increase capacitance.
- C) Decrease stud protrusion.
- D) Decrease spring pressure.

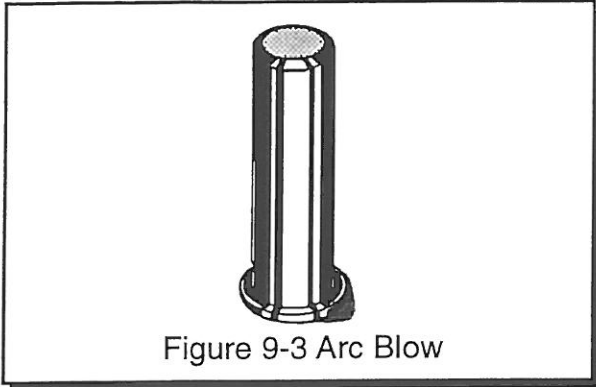


Figure 9-3 Arc Blow

Arc Blow

- A) Use double grounds.
- B) Ground too close or not spaced evenly.

Weld without footpiece

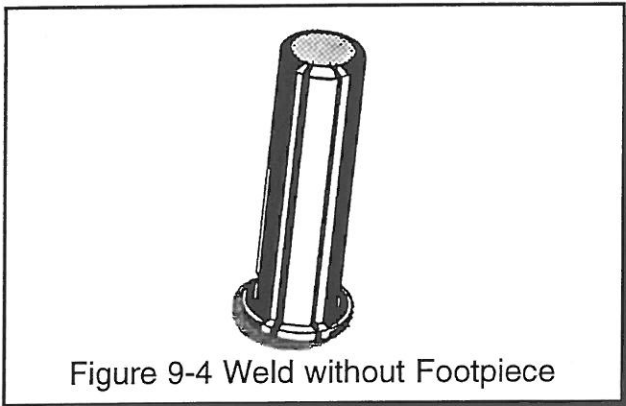


Figure 9-4 Weld without Footpiece

- A) Use standard footpiece.
- B) Use template adapter.
- C) Use tripod blunt legs.

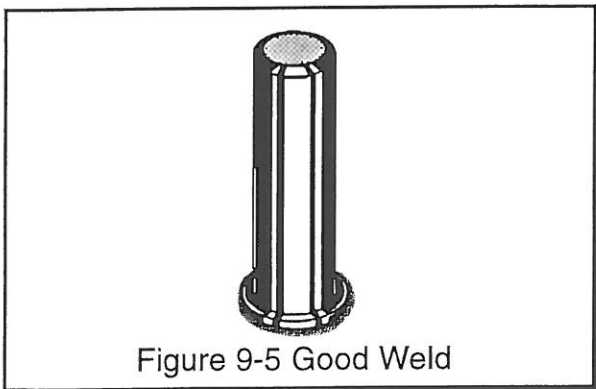


Figure 9-5 Good Weld

## 10.0 GUN MAINTENANCE

### NOTE

There are various ways to disassemble this gun. This outline is ment as a guide, and in some areas removal and reassembled sequence can vary, depending on your purpose.

### 10.1 Disassembly

Refer to Figure 12-1 in Section 12 for part identification. Remove legs and footpiece via two 10-32 x 1/4" screws (7) at the bottom of the face plate (17) using 3/32" Allen wrench.

Remove the collet and stop(if applicable) via two set screws located at the front end of the gun shaft tube (4), using a 3/32" Allen wrench. Unscrew the back cap (1), keeping in mind that you are about to release a compressed spring. Once you have removed the cap, take care not to drop any parts.

Separation of the body halves (14) is next. Do this by first holding the boot (15) away from the faceplate (17). Using a 9/64" Allen wrench, remove the single 8-32 x 3/4" cap screw (5) on the left most side of the gun (left as you face the front of the upright gun). Now remove the two screws (20) in the handle. At this point, the gun body halves may be separated.

The weld cable can be removed from the shaft block (11) using a 3/32" Allen wrench to loosen the set screw securing the end of the weld cable in place. The crimped cable end simply pulls out.

The trigger button (10) and spring (6) may be lifted out now. To remove the trigger switch (9), insert a thin blade screw driver between the switch and the gun body and carefully pry the switch off of the two pins holding it in

place. The cable assembly may now be removed from the gun.

Removal the bearing assembly (3) is done by taking out the remaining two 8-32 x 3/4" cap screws (5) in the faceplate (17). Now the entire shaft assembly with bearing (3), faceplate (17), boot (15), weld cable block (11), and bushing may be lifted away from the gun body half (14).

To remove the faceplate (17) and boot (15) from the shaft (4), it will be helpful to first either recess or remove the two set screws that normally hold the collet. You must then remove the snap ring (18) holding this assembly together. This is tricky and will a degree of dexterity. The snap ring is spring steel and encircles the shaft almost two turns. Each end tapers to a point. The idea is to use this point by pulling it out and up, thereby dislodging it from the slot in the shaft. This can be accomplished by using a thin blade screw driver and your thumb. Once the end of the snap ring is dislodged, it is an easy matter to dislodge the rest of it. When this is done, the ring can be "walked" off the end of the shaft. With the snap ring removed, you can slid off the retaining ring (16), the boot (15) and the faceplate (17). The bearing (3) may also be slid off the shaft. DO NOT remove the shaft block (11) unless absolutely necessary. There is a pre-determined distance (1-5/16") from the end of the shaft to the block. This distance is critical. If you must remove the block, use a 5/32" Allen wrench to loosen and slide it off the shaft. When replacing, be certain to maintain exactly 1-5/16" from the end of the shaft to the block.

### 10.2 Cleaning

Ensure that all the parts are free of dirt, dust, lint, ect., and are working properly. Replace any broken or worn ut parts. Use a clean dry cloth to wipe the parts clean. Lightly lubricate

the shaft (4) where the bushing and bearing (3) ride, using "O" ring lubricant (p/n 002-914) before re-assembling.

### 10.3 Re-assembling

Onto the shaft, replace:

the bearing (3) put the longer reduced diameter toward the front.

Faceplate (17) replace properly

Boot (15)

Retaining Ring (16) slide over shaft

Snap ring (18) "walk" on and reseal

Place the assembled shaft in the gun body half having two screw holes for the faceplate, and seat and seat the bearing properly. Secure the faceplate (17) to the gun body half via two 8-32 x 3/4" cap screws (5). Use a 9/64" Allen wrench.

Reseat the crimped weld cable end into the shaft block (11) and tighten with a 3/32" Allen wrench. Slide bushing onto the shaft (slot toward rear) and seat properly.

Reseat trigger switch (9), spring (6), and button (10) into gun.

Rejoin the gun body halves taking care to seat all parts properly and to avoid pinching any wires. Verify easy travel of the gun shaft, as well as easy trigger movement. If all is well, replace the third 8-32 x 3/4" capscrew (5) into the faceplate and tighten. Also replace the two handle screws. Next, re-install the spring (2) and cap (1).

You may know replace the stop, collet, and leg assembly, if these were previously removed.



10.4 Recommended Spare Parts

ITEM	PART NUMBER	DESCRIPTION	QTY.
9	033-404	SWITCH	1
11	037-129	SHAFT BLOCK	1
18	033-446	SNAP RING	1

10.5 Spring Replacement

Each CD stud welding gun is supplied with one spring installed. When welding different size fasteners, it may become necessary to replace the spring with one of less or greater tension.

The procedure to change the spring is as follows:

1. Unscrew the rear cap, keeping in mind you are about to release a spring.
2. Change or replace the spring.
  - a. Slide spring over shaft in gun body.
  - b. Center spring in rear cap.
3. Apply constant inward pressure while aligning rear cap with threaded body.

**CAUTION**

Do not cross thread cap.

4. Hand tighten rear cap.
5. Depress shaft while listening and feeling for spring binding.
6. If binding occurs, red procedure.

**NOTE**

Keep the gun free of dust, dirt, or foreign materials.

11.0 COMMON ACCESSORIES

Collet Inserts

The use of a collet insert requires the use of a B-C1 adapter (pg 16-8 in CD Accessory Guide). The insert needs no stop because it is not drilled through. However, the depth of the stud engagement varies, so proper selection is important.

Stop and Collets

The purpose of any "stop" in CD welding is to give a firm backing to the fastener being welded. The LD standard CD guns can accommodate two different types of stop. The pin or stud length determines which to use: for lengths greater than 1-1/2", a holder (033-680) is used with stop of appropriate length. The holder and stop simply screw into the shaft until snug. For lengths 1-1/2" and less, a "B" stop is used. Select the correct "B" collet and stop from the chart on page 16-3 of the SMI Fastening Systems "CD Stud Welding Accessories Guide". A universal stop can be used by grinding it down to the required length. A "B" stop is inserted into the collet from the rear, and the collet is placed into the end of the gun shaft and secured by two set screws with a 3/32" Allen wrench.

Collet Protector

This device is made of teflon and extends a collet's life span. It slips over a collet and is secured to the gun shaft with three set screws.

Faceplate

The purpose of a faceplate is two fold: first to help hold the gun body halves together and second to provide a place for the legs. All CD guns normally come with the standard adjustable faceplate (033-665). The round

plate accommodates two legs. The round and tripod faceplates accommodate three.

#### Template Adapter

This device is used where precise stud location is necessary and also for welding through material in a hole. To use, replace the standard faceplate with the round faceplate (003-722) and fasten the adapter to the faceplate.

#### Spark Shields

These are used primarily for spark containment. They may also be used to stabilize the weld end of long pins and studs. The vented shield allows gasses formed during the weld to escape.

#### Legs

The purpose of the legs (in conjunction with the footpiece) is to provide a standoff plane to adjust the plunge of the pin or stud. Nearly all portable CD stud welding employ the standard legs. The blunt and pointed legs and leg extenders are for special applications.

#### Footpieces

The purpose of the footpiece (in conjunction with the legs) is to provide a standoff plane to adjust the plunge of the pin or stud. The standard footpiece (028-833) is used for most applications.

#### NOTE

The legs/footpiece assembly must be used at all time on all CD guns to assure proper and consistent weld results.

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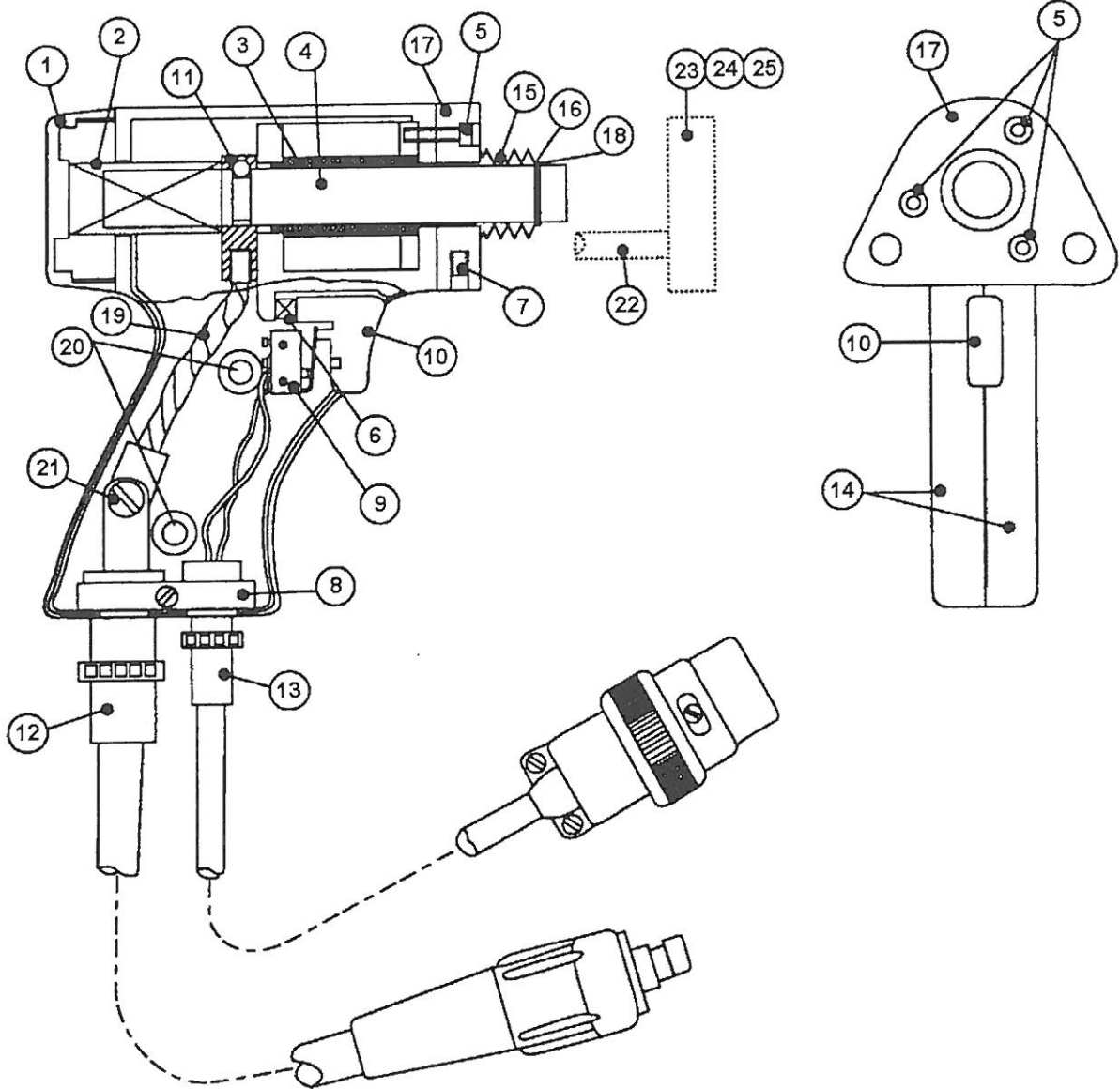


Figure 11-1 Light Duty CD Handgun

**12.0 PARTS LIST LIGHT DUTY (LD) CD HANDGUN**

Part No. 033-649

ITEM	PART NO.	DESCRIPTION	QTY
1	033-384	GUN (CD) REAR CAP MOLDED. ....	1
2	001-800	SPRING MAIN HEAVY SILVER . . . . .	1
3	033-610	GUN (CD/DA) BEARING ASSEMBLY . . . . .	1
4	033-799	GUN (CD) SHAFT TUBE . . . . .	1
5	033-016	HEX HEAD CAP SCREW . . . . .	3
6	033-382	GUN (CD/DA/FA) TRIGGER SPRING . . . . .	1
7	049-955	M SCREW SET MS, BRASS PLT . . . . .	2
8	033-383	GUN (CD/DA/FA) CABLE CLAMP (ALUM. BLOCK) . . . . .	1
9	033-404	TRIGGER SWITCH . . . . .	1
10	033-381	GUN (CD/DA/FA) TRIGGER BUTTON MOLDED . . . . .	1
11	036-496	GUN (FL) SHAFT BLOCK - A . . . . .	1
12	033-662	GUN WELD CABLE (25 Ft.) . . . . .	1
13	033-658	GUN CONTROL CABLE (25 Ft.) . . . . .	1
14	033-881	GUN BODY RH& LH STD. CD MACHINED . . . . .	1
15	033-445	GUN (CD/FL) SHAFT BOOT ASSY. . . . .	1
16	033-447	GUN (CD) SHAFT BOOT RETAINING RING . . . . .	1
17	033-665	GUN (CD) FACEPLATE - STD. ADJUSTABLE . . . . .	1
18	033 446	GUN (CD) SHAFT BOOT SNAP RING . . . . .	1
19	033-608	GUN (CD) WELD PIGTAIL ASSY. . . . .	1
20	018-375	SCREW PAN HEAD . . . . .	2
21	016-876	WASHED, LOCK INTO. TOOTH. . . . .	1
22	033-757	LEG (CD) STD. ADJ. 7". . . . .	2 REF.
23	009-929	FLAT WASHER . . . . .	2 REF.
24	016-378	SOCKET HEAD CAP SCREW. . . . .	2 REF.
25	028-833	STD. FOOTPIECE . . . . .	1 REF.

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