

Section 5

Trouble Shooting

	Observed Problem	Possible Remedy
1	Hang Up. Stud Looks like it's sitting on a pedestal with an hour glass shape.	Check alignment of the foot.
		Service the weld tool to ensure lift/release actions are functioning properly.
2	Undercutting or lack of fillet.	Too Little Plunge. Increase the amount of stud extending past the end of the ferrule or spark shield.
		Too little weld time or current. Check section 3 for base line power recommendations.
3	A lot of splatter or bb's shoot out from the weld zone.	Too much plunge. Decrease the amount of stud extending past the end of the ferrule or spark shield.
		Dampener Required. If you have a dampener the dampener may have worn out and need replacement. See optional equipment in Section 4.
		Too much Current or Time. Check section 3 for base line power recommendations.
4	Stud Breaks off and weld zone looks "crystallized".	Not enough weld current or time. Check section 3 for base line power recommendations.
5	Bubbles in weld fillet.	If you are attempting short arc you may not be able to eliminate this condition. To improve this situation shorten time and increase current. If the results continue to be unsatisfactory then you may need to add a shielding gas.
		Check your gas flow / type of shielding gas.
		If you are using flux loaded studs, check to make sure there is a flux load present in the end of the stud. If there is flux present, follow recommendations in #4
6	No Lift.	Check weld tool coil connections.
		Check for weld tool coil short or open. There should be 19 ohms of resistance in the weld tool coil.
		Check adjustable core and make sure it is not bottomed out (turned in too far clockwise).
		Check trigger circuit for opens or shorts.
7	Short Stud and can't get enough to extend past the ferrule.	Adjust the internal stop in the chuck.
8	Arc Extinguishes, or just get a tiny arc but no weld.	Too much lift. Review set up procedures in Section 1.
		Check Ground path from the power supplies. All joints must be very tight.
9	No Weld.	Broken Weld Cable.
		Broken or bad Ground Cable/connection.
		Check weld tool lift.
10	Weld Tool Shaft does not move freely when compressed by hand.	Dirt is binding the mechanism. Service weld tool.
11	Weld Tool Spindle is sloppy and has a lot of free play.	The front bearing may be worn out or missing. Replace bearing.
		Front cover may be loose. Tighten nuts.

WHEN IS MAINTENANCE REQUIRED?

Maintenance requirements will vary with environment and usage. Dirty work areas or high volume stud welding will require more frequent maintenance.

There are three prime reasons for maintenance:

1. **Dirt.** Dirt can enter the lifting mechanism and cause erratic lift and plunge operations. Typically, cleaning is all that is required.
2. **Wear.** Components do wear out over time. Typically, items such as the plastic bearings or cables wear out and need to be replaced for good weld results and SAFETY.
3. **Improper Use.** Components can arc out by inadvertently placing them against grounded materials during a weld sequence. Also using the tool itself as a hammer to test welds will damage parts and require maintenance.

Maintenance Steps

The proper maintenance procedure is to:

1. Disassemble the tool.
2. Inspect all parts for wear or damage.
3. Replace worn or damaged components.
4. Clean all components
5. Reassemble
6. Adjust settings and test.

Disassembly / Assembly Instructions

The item numbers referenced here are from the exploded diagram on page 20. Assembly is the reverse of disassembly.

1. Be sure and disconnect the weld tool from the power supply before adjusting or servicing the tool. This is a safety precaution to prevent accidental activation.



2. Remove all accessories from the weld tool before servicing.
To remove the legs loosen the set screws (23) in the side of the tool body that retain the legs and pull them straight out. Inspect the legs for damage and straightness. Bent legs should be replaced.

To remove the chuck insert the chuck ejection key (50) into the chuck adapter (02) and turn the key 180 degrees. Inspect the chuck for damage. Pay special attention to where the stud seats. If it looks like there are threads inside of the chuck then the chuck is worn out and needs to be replaced.

3. Remove the dust bellows (03)
The rubber dust bellows just slides over the end of the chuck adapter. It is a snug fit so it may take a bit of work. The dust bellows is important because it keeps dirt and other contaminants out of the internal mechanisms of the tool. If the bellows has holes in the sides or is torn or missing, it should be replaced.
4. Remove the chuck adapter (02)
The chuck adapter is unscrewed counter clockwise off the cable clamp adapter. It is very important that the chuck adapter be very tight on the cable clamp adapter so it will be a good electrical connection. An effective way of removing it is to insert a round rod (a phillips screw driver works well) through two of the chuck eject holes. There is .5 inches of threads so it will take several turns to remove the chuck adapter from the cable clamp adapter.

If the inside surface of the chuck adapter is pitted, it needs to be replaced. Also inspect the threads that hold the chuck adapter onto the cable clamp adapter. If the threads are pitted or damaged the chuck adapter should be replaced.
5. Remove the front cover nuts (01)
The front cover is held on with two nuts; use a 3/4 inch open end wrench and remove them.
6. Remove the front cover (05)
If the weld tool is equipped with a plunge dampener (07) it is housed in the front cover. Inspect the front cover. If the front cover is cracked it should be replaced. The front cover keeps dirt out of the internal mechanism and maintains alignment of internal components. Inspect the plastic bearing (04) for damage or excessive wear.
7. Remove the plunge dampener (07)
The dampener (optional) is simply placed inside the front cover. It pulls straight out and pushes straight back in. When the plunge dampener is activated by your finger it should offer continuous resistance over the entire range of travel. The plunger should then return, by itself, to full extension. If this is not the case the dampener needs to be replaced.
8. Remove the cable clamp adapter (08)
Remove two #10-32 x 5/8 socket head cap screws (06) from the cable clamp adapter. The cable clamp adapter will separate from the lifting rod. You should be able to maneuver the cable clamp adapter forward between the leg inserts in the tool body. Remove the #8-32 x 1/2 cap screw (11) on the back of the cable clamp adapter (08). There is a lock washer (10) on this screw so be careful not to loose it.

Inspect the threads on the cable clamp adapter. If the threads are damage replace the cable clamp adapter. This item transfers all the weld current. If there is damage on the threads the arcing will continue and potentially fuse all the components together.

9. Remove the lifting mechanism
The lifting mechanism consists of the lifting rod (12), main spring (13), lift release (14), moveable core (15-20) and core return spring (21). To disassemble press the lift release ring tight against the moveable core and pull the lifting rod out of the assembly. All of the components, listed above, will come apart.
10. The Lifting Rod (12)
Inspect the lifting rod for wear or damage. The brass inserts should show no signs of loosening. The steel shaft should not have any nicks on it. Run your fingers over the shaft. If you can feel grooves from the lifting bearing then the lifting rod is worn out. Typically the lifting rod and lift bearing should be replaced as a set. When reassembling, the shaft should have a light film of a light grease (a Teflon based grease).
11. Disassembly of the moveable core (15-20)
Remove the snap ring (20) on the shaft (18) of the core assembly. This snap ring acts as a spring seat and is important to maintain proper spring tension. Where the core assembles into the bearing housing there is another retaining ring (19). This retaining ring can be removed with a small flat bladed screw driver or a razor tip. After removing the second retaining ring the bearing housing (15) will separate from the core shaft. The lift bearing (16) and the lift bearing spring (17) can now be removed.

When reassembling the lift bearing cage must be oriented toward the lift bearing spring (balls toward the opening in the bearing housing). Put a light film of a light grease (such as a Teflon based grease) over the lift bearing and the lift bearing spring.

12. Remove the Handle Cover (35)
Remove 3 flat head screws (36-37) that retain the handle cover. Inspect the handle cover for breakage.
13. Remove the Weld cable (40)
The weld cable can slide out of the tool body. Be careful unthreading the internal weld cable (09) from inside the body. The internal and external weld cables can be unscrewed from the weld cable anchor plate (32). Note the orientation of the weld cable anchor plate. The radius corner goes toward the top of the body.

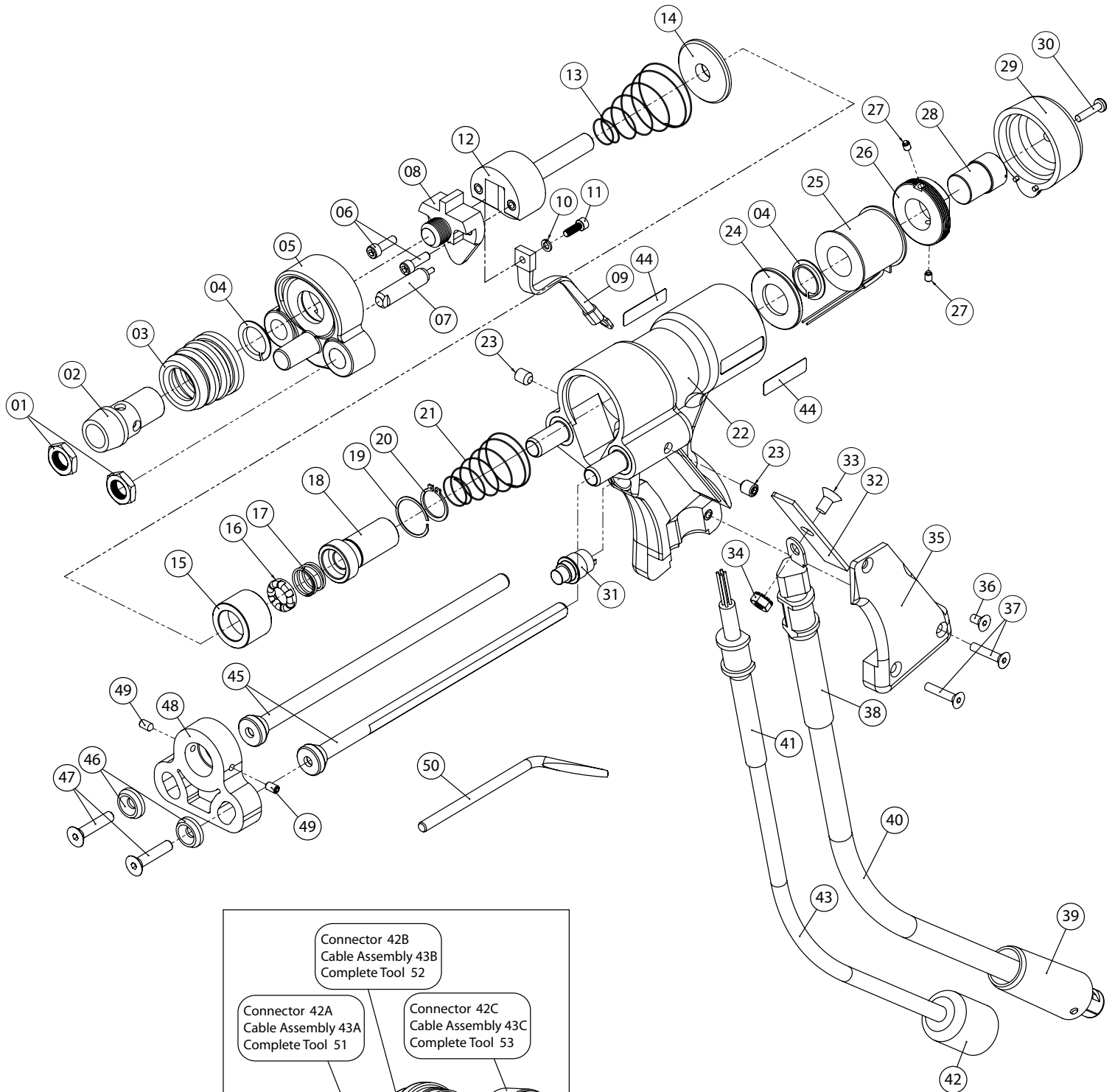
Inspect the internal weld cable for fraying or broken wires. If it is starting to fray, the internal cable should be replaced.

Inspect the weld cable for fraying. Also inspect the strain (38) relief for tears. Inspect the cable jacketing for breaks, cuts or tears. If the cable shows signs of damage or wear it should be replaced. Also inspect the Cam-lok connector (39). If brass connector is pitted or damaged it should be replaced. Inspect the weld cable to cam-lok joint to ensure there is no fraying of the weld cable.

14. Remove the Control Cable (43) (if desired)
The control cable is removed by snipping the wires by the splice connectors. Inspect the control cable for damage. This includes the strain relief (41) and the insulating jacketing. If damaged, replace the control cable.
When reinstalling the control cable, there are typically two different color schemes.
Black and White wires connect to the trigger.
Blue and Brown Wires connect to the coil (polarity does not matter).
the other scheme:
Black and White wires connect to the trigger.
Red and Green wires connect to the coil (polarity does not matter).
Make sure all crimp connections are tight and there is no opportunity for electrical shorting.
15. Remove the Trigger Switch (31)
The trigger switch is a screw in style. Grabbing it can be difficult. A 1/2" collect is the ideal removal tool. Use an ohm meter to check trigger functionality.
16. Unscrew and remove the rear cap (29)
The rear cap is important because it prevents dirt and other contaminants from entering into the tool mechanism. Many operators unfortunately use the rear of the tool as a hammer to "check" studs and this damages many rear caps.
17. Remove the Adjustable Core (28)
Loosen the nylon tipped set screw (27) in the rear coil yoke holding the adjustable core. Completely unscrew and remove the adjustable core.
18. Remove the Rear Coil Yoke (26)
Loosen the nylon tipped set screw (27) holding retaining the rear coil yoke. To do this the hex key will have to go into the opening at an angle to reach the set screw. Once the retaining screw is loosened use a large wrench to unscrew the rear coil yoke.
19. Remove the Coil (25)
The coil wires (black and red or green and red inside the tool handle) must be cut prior to coil removal. This is done inside the handle. After the coil wires are free, the coil can be pulled straight out of the rear of the tool. If there is a question of the coil condition check to make sure there is no varnish odor (a sign of overheating), heavy discoloration (another side of overheating) and verify coil resistance at 19 ohms +/- 1 ohm.
20. Remove the Front Coil Yoke (24)
In front of the coil is the front coil yoke. This is a tight fit and may be a little difficult to remove. The front coil yoke contains a plastic bearing (04). This bearing should be inspected for wear or damage and replaced if necessary. During reassembly, make sure the bearing flange is seated in the counter bore on the front coil yoke. When putting the front coil yoke back into the coil housing, make sure that the bearing flange is facing the rear of the weld tool.

Section 7

Parts List



Section 7

Parts List

	Part Description		Part Number	Item	Part Description		Part Number
1	Front Cover Jam Nut	2	NJC50FZP	34	Anchor Plate Kep Nut	1	NKC25ZP
2	Chuck Adapter	1	GAM12	35	Handle Cover	1	10308
3	Dust Bellows	1	GAM14	36	Handle Cover Upper Screw	1	FHC19-37
4	Nylon Bushing	2	GAM15	37	Handle Cover Lower Screw	2	FHC19-1
5	Front Cover	1	GAB16	38	Weld Cable Strain Relief	1	GAM50
6	Cable Clamp Adapter Screw	2	SHC19-62	39	Male Weld Cable Connector	1	CCL1/0AMB
7A	Plunge Dampener Soft (optional)	1	GAM21D	40	External Weld Cable Complete	1	CW2FC-09
7B	Plunge Dampener Medium (optional)	1	GAM21E	41A	Cable Strain Relief (.340 Dia black control wire)	1	GAM51
7C	Plunge Dampener Hard (optional)	1	GAM21F				
8	Cable Clamp Adapter	1	GAM18	41B	Cable Strain Relief (.280 Dia yellow control wire)	1	GAM52
9	Internal Weld Cable	1	GAE29				
10	Internal Weld Cable Lock Washer	1	WLC16BO	42A	Screw Style Connector	0	CSS4AM
11	Internal Weld Cable Screw	1	SHC16-50	42B	Control Connector (R&S)	0	CRS4AM
12	Lifting Rod	1	GAM22	42C	Control Connector (2 Wire Nelson)	0	CHB2GAM
13	Main Spring	1	GAM23	43A	Control Cable (Screw Style) Complete	1	CC2BA-10
14	Lift Release	1	GAM24	43B	Control Cable (R&S) Complete	0	CC1B2-09
15	Moveable Core Bearing Retainer	1	GAM10A	43C	Control Cable (2 Wire Nelson) Complete	0	CC1C8-09
16	Lift Bearing	1	GAM8	44	Decal, Weld Tool Model	2	GAD1
17	Lift Bearing Spring	1	GAM9	45	Leg Assembly Complete	2	L37-9
18	Moveable Core Shaft	1	GAM10B	46	Leg Washer	2	LWB37
19	Shaft Retainer	1	VH-100	47	Leg Screw	2	FHC25-125
20	Shaft Spring Seat	1	SHI-75	48	Foot, Small Complete	1	FTS20
21	Core Return Spring	1	GAM11	49	Foot, Grip Retention Screw	2	SSC19F-37P
22	Gun Body	1	10301	50	Chuck Ejection Key	1	CEK
23	Leg Set Screw	2	SSC31-37C	51A	Weld Tool Complete (Screw Style)	0	WTSSC-09
24	Front Coil Yoke	1	GAM2	51B	Weld Tool with Dampener Complete (screw style)	0	WTSSCS-09
25	Gun Coil	1	GAE3				
26	Rear Coil Yoke	1	GAM4	52A	Weld Tool Complete (R&S)	0	WTSRC-09
27	Rear Coil Yoke Set Screws	2	SSC16-18N	52B	Weld Tool with Dampener Complete (R&S)	0	WTSRCS-09
28	Adjustable Core	1	GAM5				
29	Rear Cap	1	10307	53A	Weld Tool Complete (2 Wire Nelson)	0	WTSHC-09
30	Rear Cap Screw	1	PSC16-75ZP	53B	Weld Tool Complete with Dampener (2 Wire Nelson)	0	WTSHC-09
31	Trigger Switch Complete	1	GAE1				
32	Weld Cable Anchor Plate	1	GAM31	54	Trigger Module (2 Wire Nelson) Not Shown	0	GAE27B
33	Anchor Plate Screw	1	FHC25-50				

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