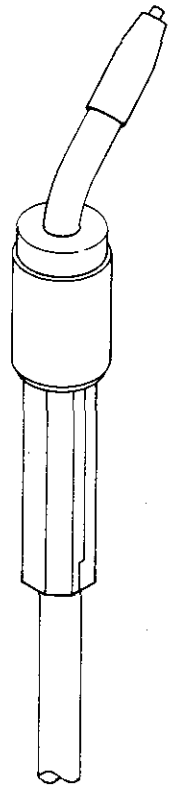
Miller®

August 1988 FORM: OM-1026
Effective With Serial No. JD-20

MODEL: GA-15C



OWNER'S MANUAL

IMPORTANT: Read and understand the entire contents of both this manual and the power source manual used with this unit, with special emphasis on the safety material throughout both manuals, before installing, operating, or maintaining this equipment. This unit and these instructions are for use only by persons trained and experienced in the safe operation of welding equipment. Do not allow untrained persons to install, operate, or maintain this unit. Contact your distributor if you do not fully understand these instructions.

MILLER ELECTRIC Mfg. Co.
A Miller Group Ltd., Company

P.O. Box 1079
Appleton, WI 54912 USA
Tel. 414-734-9821

LIMITED WARRANTY

EFFECTIVE: FEBRUARY 16, 1988

This warranty supersedes all previous MILLER warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions hereof, Miller Electric Mfg. Co., Appleton, Wisconsin warrants to its Distributor/Dealer that all new and unused Equipment furnished by Miller is free from defect in workmanship and material as of the time and place of delivery by Miller. No warranty is made by Miller with respect to engines, trade accessories or other items manufactured by others. Such engines, trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any. All engines are warranted by their manufacturer for one year from date of original purchase, except Tecumseh engines which have a two year warranty.

Except as specified below, Miller's warranty does not apply to components having normal useful life of less than one (1) year, such as spot welder tips, relay and contactor points, MILLERMATIC parts that come in contact with the welding wire including nozzles and nozzle insulators where failure does not result from defect in workmanship or material.

Miller shall be required to honor warranty claims on warranted Equipment in the event of failure resulting from a defect within the following periods from the date of delivery of Equipment to the original user:

1. Arc welders, power sources, robots, and components ..... 1 year
2. Load banks ..... 1 year
3. Original main power rectifiers ..... 3 years (labor – 1 year only)
4. All welding guns, feeder/guns and torches .... 90 days
5. All other Millermatic Feeders ..... 1 year
6. Replacement or repair parts, exclusive of labor 60 days
7. Batteries ..... 6 months

provided that Miller is notified in writing within thirty (30) days of the date of such failure.

As a matter of general policy only, Miller may honor claims submitted by the original user within the foregoing periods.

In the case of Miller's breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore shall be, at Miller's option (1) repair or (2) replacement or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at Customer's risk and expense. MILLER's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a MILLER authorized service facility, therefore, no compensation for transportation costs of any kind will be allowed. Upon receipt of notice of apparent defect or failure, Miller shall instruct the claimant on the warranty claim procedures to be followed.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

EXCEPT AS EXPRESSLY PROVIDED BY MILLER IN WRITING, MILLER PRODUCTS ARE INTENDED FOR ULTIMATE PURCHASE BY COMMERCIAL/INDUSTRIAL USERS AND FOR OPERATION BY PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT AND *NOT* FOR CONSUMERS OR CONSUMER USE. MILLER'S WARRANTIES DO NOT EXTEND TO, AND NO RESELLER IS AUTHORIZED TO EXTEND MILLER'S WARRANTIES TO, ANY CONSUMER.

SECTION 1 – INTRODUCTION

Table 1-1. Specifications

Ampere Rating 60% Duty Cycle	Wire Diameter	Cable Length	Cooling Method	Weight	
				Net	Ship
150 Amperes With CO_2	0.023 - 0.035 in. (0.6 - 0.9 mm)	10 ft. (3.0 m) 12 ft. (3.7 m) 15 ft. (4.6 m)	Air	3.5 lbs. (1.6 kg) 4 lbs. (1.8 kg) 4.5 lbs. (2 kg)	6 lbs. (2.7 kg) 6.5 lbs. (3 kg) 7 lbs. (3.2 kg)

1-1. DUTY CYCLE

The duty cycle of a welding gun is the percentage of a ten minute period that a gun can be operated at a given load. This gun is rated at 60% duty cycle using CO_2 shielding gas. This means the gun can be operated at rated amperage for six minutes out of ten with CO_2 shielding gas. During the remaining four minutes, the unit must idle to permit proper cooling. If rated amperage is exceeded, the duty cycle must be reduced.

CAUTION: EXCEEDING THE RATED AMPERAGE WITH CO_2 OR FAILING TO REDUCE THE WELDING AMPERAGE OR DUTY CYCLE WHEN USING A MIXED SHIELDING GAS can result in damage to the gun.

- *Do not exceed rated amperage when using CO_2.*
- *Operate at 30% duty cycle when using mixed shielding gas.*

1-2. GENERAL INFORMATION AND SAFETY

A. General

Information presented in this manual, and on various labels, tags, and plates on the unit pertains to equipment design, installation, operation, maintenance, and troubleshooting which should be read, understood, and followed for the safe and effective use of this equipment.

B. Safety

The installation, operation, maintenance, and troubleshooting of arc welding equipment require practices and procedures which ensure personal safety and the safety of others. Therefore, this equipment is to be installed, operated, and maintained only by qualified persons in accordance with this manual and all applicable codes such as, but not limited to, those listed at the end of Section 1 – Safety Rule For Operation Of Arc Welding Power Source in the welding power source Owner's Manual.

Safety instructions specifically pertaining to this unit appear throughout this manual highlighted by the signal words **WARNING** and **CAUTION** which identify different levels of hazard.

WARNING statements include installation, operation, and maintenance procedures or practices which if not carefully followed could result in serious personal injury or loss of life.

CAUTION statements include installation, operation, and maintenance procedures or practices which if not carefully followed could result in minor personal injury or damage to this equipment.

A third signal word, **IMPORTANT**, highlights instructions which need special emphasis to obtain the most efficient operation of this equipment.

1-3. RECEIVING-HANDLING

Before installing this equipment, clean all packing material from around the unit and carefully inspect for any damage than may have occurred during shipment. Any claims for loss or damage that may have occurred in transit must be filed **by the purchaser with the carrier**. A copy of the bill of lading will be furnished by the manufacturer on request if occasion to file claim arises.

When requesting information concerning this equipment, it is essential that Model Description and Style Numbers of the equipment be supplied.

1-4. DESCRIPTION

This unit is an air-cooled semiautomatic Gas Metal Arc Welding (GMAW) gun with a circular gun switch.

The alpha-numeric designation refers to the following:

G – Gun
A – Air Cooled
15 – Ampere Rating: 150 Amperes
C – Curved Head Tube

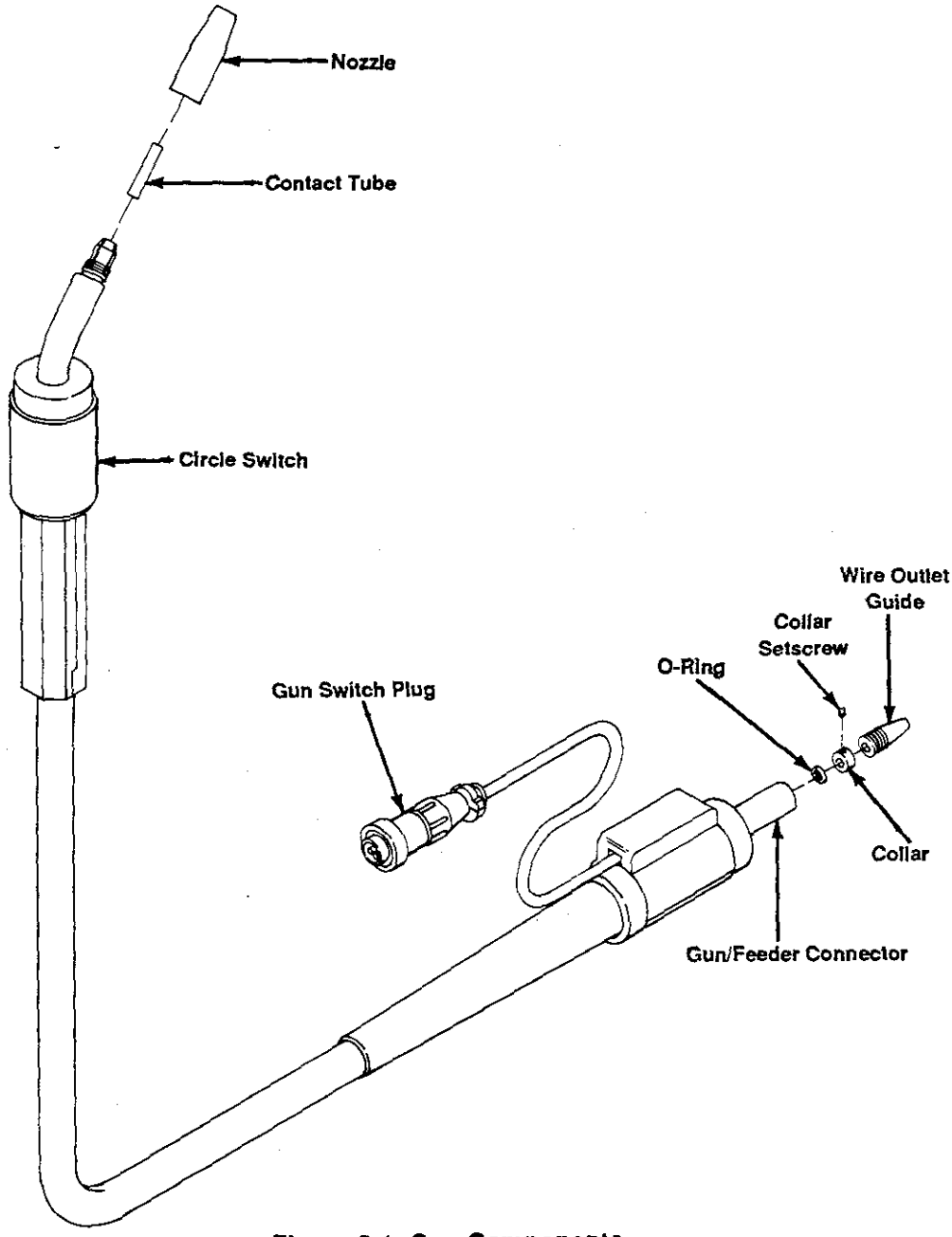


Figure 2-1. Gun Components TC-090 448

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source and wire feeder, and disconnect input power employing lockout/tagging procedures before inspecting or installing gun.*

Lockout/tagging procedures consist of removing input power plug from receptacle, padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

2-1. GUN/WIRE FEEDER CONNECTIONS (Figure 2-1)

Install the gun/feeder connector into the drive assembly on the wire feeder as follows:

IMPORTANT: *The wire outlet guide is provided as part of the gun assembly.*

1. Loosen the gun/feeder connector securing knob on the wire drive assembly.

IMPORTANT: *Wire guides should be positioned as close as possible to the drive rolls without touching them. This gives wire maximum column strength thus eliminating waves.*

2. Insert gun into wire drive assembly until gun/feeder connector hex-jam nut is flush against wire drive assembly.
3. Tighten gun/feeder connector securing knob.

2-2. GUN SWITCH CONNECTION (Figure 2-1)

Connect gun switch into TRIGGER receptacle on wire feeder as follows: align keyways, insert plug, and rotate threaded collar fully clockwise.

SECTION 3 – SEQUENCE OF OPERATION

3-1. CIRCLE SWITCH (Figure 2-1)

Applying minimal pressure on the circle switch, from any direction around circumference of gun, closes the gun switch. When the gun switch is closed, shielding gas flows, wire feeds, and weld output is available.

WARNING: ELECTRIC SHOCK can kill; MOVING PARTS can cause serious injury; IMPROPER AIRFLOW AND EXPOSURE TO ENVIRONMENT can damage internal parts.

- *Do not touch live electrical parts.*
- *Do not touch welding wire or any metal part in contact with the wire while welding.*

The welding wire and all metal parts in contact with it carry weld output when the gun switch is depressed.

- *Keep all covers and panels in place while operating.*

Warranty is void if the welding power source is operated with any portion of the outer enclosure removed.

ARC RAYS, SPARKS, AND HOT SURFACES can burn eyes and skin; NOISE can damage hearing.

- *Wear correct eye, ear, and body protection.*

FUMES AND GASES can seriously harm your health.

- *Keep your head out of the fumes.*
- *Ventilate to keep from breathing fumes and gases.*
- *If ventilation is inadequate, use approved breathing device.*

WELDING WIRE can cause puncture wounds.

- *Do not point gun toward any part of the body, any conductive surface, or other personnel.*

HOT METAL, SPATTER, AND SLAG can cause fire and burns.

- *Watch for fire.*
- *Keep a fire extinguisher nearby, and know how to use it.*
- *Do not use near flammable material.*
- *Allow work and equipment to cool before handling.*

MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.

- *Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.*

See Section 1 - Safety Rules For Operation Of Arc Welding Power Source in welding power source Owner's Manual for basic welding safety information.

3-2. GAS METAL ARC WELDING (GMAW)

1. Be sure that proper electrical connections have been made to the welding power source and the wire feeder.
2. Be sure that the welding wire has been properly threaded and that correct initial tensions have been set on the drive rolls (refer to the appropriate Owner's Manual).
3. Be sure that the proper shielding gas is connected to the shielding gas valve.
4. Place the wire feed control(s) in the required position for the welding setup.
5. Place the controls on the welding power source in the required position for the welding setup (refer to welding power source Owner's Manual).
6. Turn on the shielding gas supply.
7. Energize the welding power source and the wire feeder (refer to the respective Owner's Manual).

IMPORTANT: *When installing new equipment, or after prolonged shutdown, allow shielding gas to flow continuously for at least one minute before welding to purge the shielding gas line. To avoid wasting wire while purging, open the drive roll housing.*

8. Press Purge button on the wire feeder (if applicable) or the gun switch to purge the gas line.
9. Close drive roll housing, and adjust tension (see appropriate Owner's Manual).
10. Press the circle switch, and run the welding wire out beyond the end of the gas nozzle. Cut the wire off so it extends out 1/4 to 3/8 in. (6.4 mm to 9.5 mm) from end of nozzle.
11. Set the Wire Speed control slightly higher than anticipated wire speed.
12. Hold the end of the gas nozzle approximately 1/2 in. (12.7 mm) from the workpiece.
13. Press the circle switch. Gas will start to flow, wire will start to feed, and the arc will be established. If

the welding wire appears to slip, adjust drive roll tension according to wire feeder Owner's Manual.

14. After the controls on the welding power source and the wire feeder (if applicable) have been adjusted for normal operation, the welding power source (and wire feeder) will function automatically when the circle switch is pressed. Releasing pressure from the circle switch will extinguish the arc and cause the wire feed and gas flow to stop.

3-3. SHUTTING DOWN

1. Stop welding.
2. Turn off welding power source and wire feeder.
3. Turn off the shielding gas at its source.

WARNING: HIGH CONCENTRATION OF SHIELDING GAS can harm health or kill.

- *Shut off gas supply when not in use.*

SECTION 4 – MAINTENANCE

4-1. INSPECTION AND UPKEEP

Usage and shop conditions will determine frequency and type of maintenance required.

WARNING: ELECTRIC SHOCK can kill; WELDING WIRE can cause puncture wounds; HOT SURFACES can cause severe burns.

- *Do not touch live electrical parts.*
- *Shut down welding power source and wire feeder before working on gun.*
- *Disconnect gun from wire feeder before inspecting, maintaining, or servicing.*
- *Allow a cooling period before servicing.*

1. Inspect gun for broken areas, cracks and loose parts: tighten, repair and replace as required.
2. Carefully remove any weld spatter or dirt that has accumulated around nozzle opening and inside nozzle.
3. Repair or replace as required all hose and cables; give particular attention to frayed and cracked insulation and areas where it enters equipment.
4. Remove grease and grime from components and moisture from electrical parts and cables.
5. Blow out casing with compressed air when changing wire. This removes any loose metal chips and dirt that may have accumulated.

CAUTION: FLYING DIRT AND METAL PARTICLES can injure personnel and damage equipment.

- *Point gun liner only in a safe direction away from personnel and equipment when cleaning with compressed air.*

4-2. CONTACT TUBE REPLACEMENT (Figure 2-1)

WARNING: ELECTRIC SHOCK can kill; WELDING WIRE can cause puncture wounds; HOT SURFACES can cause severe burns.

- *Do not touch live electrical parts.*
- *Shut down welding power source and wire feeder before working on gun.*
- *Disconnect gun from wire feeder before inspecting, maintaining, or servicing.*
- *Allow a cooling period before servicing.*

1. Remove nozzle.
2. Cut off any portion of electrode wire which extends beyond end of contact tube.
3. Remove contact tube, and replace with new contact tube.
4. Reinstall nozzle, and resume operation.

4-3. CHANGING WIRE SIZES AND REPLACING LINER (Figure 4-1)

WARNING: ELECTRIC SHOCK can kill; WELDING WIRE can cause puncture wounds; HOT SURFACES can cause severe burns.

- *Do not touch live electrical parts.*
- *Shut down welding power source and wire feeder before working on gun.*
- *Disconnect gun from wire feeder before inspecting, maintaining, or servicing.*
- *Allow a cooling period before servicing.*

IMPORTANT: *.030 and .035 in. (0.8 and 0.9 mm) diameter wires use the same monocoil liner and wire outlet guide. Changing from .030 in. (0.8 mm) wire to .035 in. (0.9 mm) wire or vice versa requires changing the contact tube only (see Section 4-2).*

To change from .030 in. (0.8 mm) wire and .035 in. (0.9 mm) wire to .023 in (0.6mm) wire or vice versa, or to replace monocoil liner, proceed as follows:

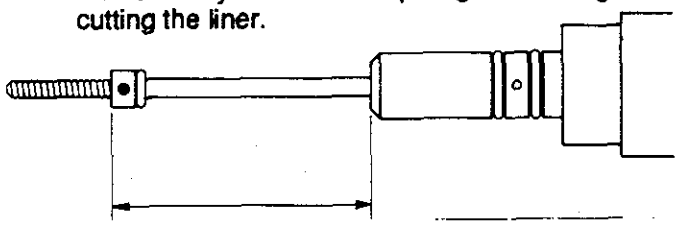
1. Remove nozzle.
2. Cut off any portion of electrode wire which extends beyond end of contact tube.

3. Manually retract wire onto wire spool (see wire feeder Owner's Manual).
4. Remove contact tube and contact tube adapter.
5. Disconnect gun assembly from wire feeder, if applicable, and lay it out flat (no coils in cable/conduit).
6. Remove wire outlet guide.
7. Loosen collar setscrew.
8. Pull out monocoil liner from gun/feeder connector end of gun assembly.

CAUTION: FLYING DIRT AND METAL PARTICLES can injure personnel and damage equipment.

- *Point gun liner only in a safe direction away from personnel and equipment when cleaning with compressed air.*

9. Clean gun casing or liner with compressed air while liner or welding wire is removed.
10. Insert new monocoil liner into gun/feeder connector end of gun assembly.
11. Measure the distance between the end of the gun/feeder connector and the back of the collar (see Figure 4-1)
12. Remove monocoil liner from gun.
13. Cut off the distance measured in Step 11 plus an additional 3/8 in. (10 mm) from the new monocoil liner. Remove any burrs or sharp edges resulting from cutting the liner.



Cut this distance plus 3/8 in. (10mm) off other end of liner (see Step 3). TA-090 446

Figure 4-1. Liner Installation

14. Insert new monocoil liner into gun/feeder connector end of gun assembly.
15. Install appropriate wire outlet guide.

CAUTION: OVERTIGHTENING WIRE OUTLET GUIDE will damage liner.

- *Do not overtighten wire outlet guide.*

16. Tighten collar setscrew.

CAUTION: OVERTIGHTENING COLLAR SETSCREW will damage liner.

- *Do not overtighten collar setscrew.*

17. Reinstall appropriate contact tube and nozzle.
18. Make gun connections as instructed in Sections 2-1 and 2-2.
19. Thread welding wire, and resume operation.

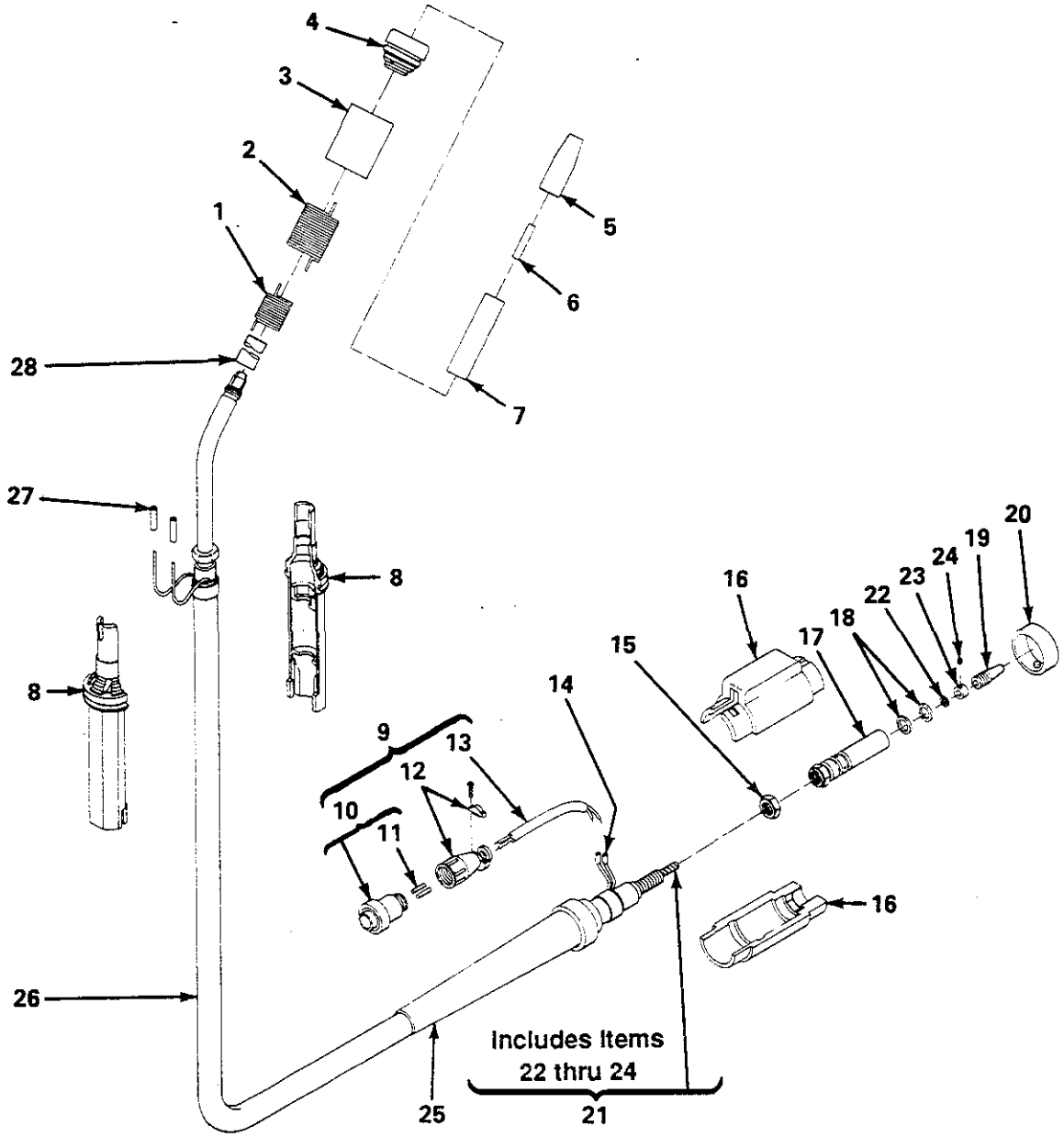


Figure A – Exploded View of GA-15C Gun

Item No.	Part No.	Description	Quantity
Figure A		**Exploded View of GA-15C Gun**	
1	090 366	SPRING, switch-inner	1
2	090 365	SPRING, switch-outer	1
3	089 811	BOOT, switch-gun	1
4	090 496	RING, locking-handle	1
5	090 202	NOZZLE, screw type 7/16 orifice	1
6	090 235	TUBE, contact .023/.025 wire	2
6	090 234	TUBE, contact .030 wire	2
6	090 233	TUBE, contact .035 wire	2
7	089 884	TUBING, neoprene 3/8 ID x 1/16 wall x 2-3/16	1
8	090 659	HANDLE, gun	1
9	049 872	CABLE, power (consisting of)	1
10	079 878	. HOUSING PLUG & PINS (consisting of)	1
11	079 535	.. TERMINAL, male	4
12	048 834	. CLAMP, cable	1
13	604 525	. CABLE, No. 18 2/c (order by ft)	2ft
14	081 909	SPLICE, parallel 20-16 wire	2
15	605 883	NUT, hex-jam 3/8-24	1
16	091 602	STRAIN RELIEF	1
17	090 198	ADAPTER, gun/feeder	1
18	079 974	O-RING, 1/2 ID x 0.103	2
19	087 331	GUIDE, wire outlet .023/.025 wire	1
19	049 310	GUIDE, wire outlet .030/.035 wire	1
20	049 312	RING, locking-handle	2
21	090 336	LINER, monocoil .023/.025 wire 15 ft (consisting of)	1
21	083 885	LINER, monocoil .030/.035 wire 15 ft (consisting of)	1
22	079 975	. O-RING, 3/16 ID x 0.103	1
23	087 310	. COLLAR, locking .023/.025 wire	1
23	049 307	. COLLAR, locking .030/.035 wire	1
24	081 959	. SCREW, set 6-32 x 3/32	1
25	088 122	STRAIN RELIEF, extension	1
26	090 212	CABLE, conduit 10 ft	1
26	090 213	CABLE, conduit 12 ft	1
26	090 214	CABLE, conduit 15 ft	1
27	089 902	TERMINAL, receptacle-pin 1/16	2
28	091 676	TUBING, glass-acrylic 5/16 x 1-1/4	1

Parts for Optional Equipment

Part No.	Description
090 203	NOZZLE, screw type .545 orifice x 1-7/8
090 209	NOZZLE, screw type .545 orifice x 2-5/8
090 205	NOZZLE, screw type 3/8 orifice x 1-7/8
090 207	NOZZLE, screw type 3/8 orifice x 2-5/8
090 210	NOZZLE, screw type 7/16 orifice x 2-5/8
090 235	TUBE, contact .023/.025 wire x 1-7/16
090 238	TUBE, contact .023/.025 wire x 1-9/16
090 242	TUBE, contact .023/.025 wire x 2-5/16
090 241	TUBE, contact .023/.025 wire x 2-7/16
090 234	TUBE, contact .030 wire x 1-7/16
090 237	TUBE, contact .030 wire x 1-9/16
090 243	TUBE, contact .030 wire x 2-5/16
090 240	TUBE, contact .030 wire x 2-7/16
090 233	TUBE, contact .035 wire x 1-7/16
090 236	TUBE, contact .035 wire x 1-9/16
090 244	TUBE, contact .035 wire x 2-5/16
090 239	TUBE, contact .035 wire x 2-7/16

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.