



Straight Handle TECHNICAL GUIDE

Semi-Automatic MIG Gun CONSUMABLES & ACCESSORIES



FEATURES & BENEFITS

The highly-durable Lightning[®] series of MIG guns has been engineered and built for high production and comfort.

Contact Tip

Tapered seating tip allows for better conductivity, with a dual start-point thread that allows the tip to rotate 180° to a new wear point, allowing you to extend the life of the tip.

Handle

Ergonomic plastic handle is engineered with special impact additives that stand up to extreme contact, making it virtually indestructible. Lifetime Warranty on handle.

Trigger & Switch

The trigger is easy to pull, causing less welder fatigue. The switch is also guaranteed for life under normal conditions.

Interchangeability

Lightning[®] handles, spring guards, connector cones and cone nuts are interchangeable at both ends of the gun, allowing you to effectively double the life of the gun by flip-flopping the ends.

AMPERAGE RATINGS (DUTY CYCLE)

	100% [Outy Cycle	60% Duty Cycle		
Model	Co ²	Mixed	Co ²	Mixed	
250	250	120	300	250	
350	350	200	400	350	
450	450	300	525	450	
550	550	350	650	550	

SEMI-AUTOMATIC GUN ORDERING SYSTEM



STANDARD GUN CONFIGURATION (Lightning)

Description	Tips	Nozzles	Diffuser	Liner	Shock Washer	Gooseneck
250 AMP	63-11xx	63-2150	63-3103	64-4xxx	63-6103	63-5160
350 AMP	63-11xx	63-2150	63-3103	64-4xxx	63-6103	63-5160
450 AMP	63-11xx	65-2562	63-3103	64-4xxx	63-6202-HD	64-5160
550 AMP	63-11xx	65-2562	63-3103	64-4xxx	63-6202-HD	65-5160

* Extra-Heavy duty setup is available on request.

For more information on Flash[™] scan these codes for:



Flash Straight Handle



Handle

NOZZLES ID 63-2138 HD Flush 3/8" (09.5mm) HD 1/8" Stick-Out 63-2662 5/8" (15.9mm) HD 1/8" Tip Recess 1/2" (12.7mm) 63-2150 5/8" (15.9mm) HD 1/8" Tip Recess 63-2162 3/4" (19.1mm) HD 1/8"Tip Recess 63-2175 5/8" (15.9mm) 64-2562 Extra HD Cu 1/4" Tip Rec. 3/4" (19.1mm) 64-2575 Extra HD Cu 1/4" Tip Rec. 1/2" 65-2550 HD Cu 1/8" Tip Recess (12.7mm) 65-2562 HD Cu 1/8" Tip Recess 5/8" (15.9mm) 65-2575 HD Cu 1/8" Tip Recess 3/4" (19.1mm) 1/2" 64-2950 HD Bottleneck 1/8 Stick-out (12.7mm) 63-2950 HD Bottleneck 1/8 Recess 1/2" (12.7mm) Extra HD 1/8 Stick-out 65-2662 5/8" (15.9mm) 65-2362 Extra HD Brass 1/8 Stick-out 5/8" (15.9mm) Threaded versions available for all nozzles. Add the letter "T" to the end of the part number. **CONTACT TIPS** ID HD .030 (0.8mm) 63-1130 .037

63-1135	HD	.035	(0.9mm)	.043
63-1140	HD	.040	(1.0mm)	.048
63-1145	HD	.045	(1.2mm)	.055
63-1152	HD	.052	(1.3mm)	.063
63-1178	HD	5/64	(2.0mm)	.093
63-1193	HD	3/32	(2.4mm)	.110
63-1162	HD	1/16"	(1.6mm)	.073
63-1230	HD Tapered	.030	(0.8mm)	.037
63-1235	HD Tapered	.035	(0.9mm)	.043
63-1245	HD Tapered	.045	(1 .2mm)	.055
63-1252	HD Tapered	.052	(1 .3mm)	.063
63-1335	HD CuCr **	.035	(0.9mm)	.043
63-1345	HD CuCr	.045	(1.2mm)	.050
63-1352	HD CuCr	.052	(1.3mm)	.059
63-1362	HD CuCr	1/16"	(1 .6mm)	.073
63-1378	HD CuCr	5/64"	(2.0mm)	.093
63-1394	HD CuCr	3/32"	(2.4mm)	.110
65-1130	Extra HD	.030		.037
65-1135	Extra HD	.035		.043
65-1145	Extra HD	.045		.055
65-1162	Extra HD	1/16		.067
65-1178	Extra HD	5/64		.093
65-1193	Extra HD	3/32		.110
65-11120	Extra HD	7/64		.120
65-11125	Extra HD	1/8		.136
65-1235	Extra HD	.035 tprd		.043
65-1245	Extra HD	.045 tprd		.055
65-1252	Extra HD	.052 tprd		.063
65-1335	Extra HD CuCr	.035		.040
65-1345	Extra HD CuCr	.045		.050
65-1352	Extra HD CuCr	.052		.060
65-1362	Extra HD CuCr	1/16		.060
NOTE: 65-11xx	series tips are only to be	e used with 6	5 series Lightni	ing® diffusers.

GAS DIFFUSERS & RETAINER

63-3201	Diffuser for HD Contact Ti	p 2-Piece
63-3104	Nozzle Retainer (for 63-32	01 above)
63-3103	Diffuser HD*	·
63-3103-2	Tapered HD Diffuser	*Copper Zirconium Chromium



Diffuser Extra HD

Robotic Extra HD

UD Diffuser Threaded

65-3103

60 0116

65-3103-2

3

65-3116 63-3301	Tapered Gas Dif	Tapered Extra HD Diffuser, Threaded Gas Diffuser O-Ring				
SHOCK V	VASHER	S				
63-6103 Plastic 63-6202 HD (Heavy Duty) 63-6202						
GOOSEN	ECKS (II	NCLUDES	BODY AS	SEMBLY)		
Add LF to th	e end of pa	art number for	Flash Goos for Flash Cu	enecks rve Goosenecks		
62-5160 63-5100 63-5145 63-5160 64-5100	Fixed Fixed Fixed Fixed Fixed		60° 180° 45° 60°	250 250-350 250-350 250-350 450		
64-5100 64-5145 64-5160 65-5100	Fixed Fixed Fixed Fixed		45° 60° 180°	450 450 450 550		
65-5145	Fixed		45°	550 550		
Swivel Go	oseneck	s for Straig	ght and C	urve Handle		
63-5160S 64-5160S 65-5160S	Swivel Swivel Swivel		60° 60° 60°	250-350 450 550		
LINERS						
Wire Size	L	ength	Part#	OD		
.023 (.6 .035" (.9 .035" (.9 .045" (1. .045" (1. .030" (.8 .035" (.9 .035" (.9) .045" (1.	mm) mm) 6mm) 6mm) 6mm) mm) mm) mm) mm) m	15 15' 25' 15' 25' 15' 10' 15' 25' 25' 25' 15' 10'	62-4315 62-4325 62-4515 62-4525 64-4215 64-4310 64-4315 64-4325 64-4325 64-4325 64-4415 64-4510 64-4515	0.150 0.156 0.156 0.156 0.156 0.182 0.175 0.175 0.175 0.175 0.175 0.175 0.175 0.189 0.189 0.189 0.180		
.045 (1. .045" (1. 3/64" (1. 3/64" (1. .52" (1. .52" (1. .52" (1. .52" (1. .1/16" (1. 1/16" (1. 1/16" (1.	6mm) 6mm) 6mm) 6mm) 6mm) 6mm) 6mm) 6mm)	15 25' 10' 15' 25' 10' 15' 25' 10' 15' 25'	64-4515 64-4525 64-4515 64-4515 64-4525 64-4515 64-4525 64-4525 64-4515 64-4525	0.189 0.189 0.189 0.189 0.189 0.189 0.189 0.189 0.189 0.189 0.189 0.189		
3/64-1/16a 5/64-3/32	l	15' 15' Flat	64-4615 64-4715	0.189 0.189		

25' Flat

FC 10'

15'

64-4725 0.21

64-4815 0.21

64-4915 0.192

(for S.S. Wire)

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5/64-3/32

5/64 & 1/16"

.035 - .045



For more information on Flash[™] scan these codes for:



Handle



Flash Curve Handle

UNICABLE CUT LENGTHS

250A 250A 250A 250A 250A	10' 12' 15' 20' 25'	62-7110 62-7112 62-7115 62-7120 62-7125	350A 350A 350A 450A 450A	15' 20' 25' 10' 12'	63-7115 63-7120 63-7125 64-7110 64-7112	450A 550A 550A 550A 550A	25' 10' 12' 15' 20'	64-7125 65-7110 65-7112 65-7115 65-7120	Unicabl 250A 350A 450A 550A	e <i>Bulk (F</i> Bulk Bulk Bulk Bulk Bulk	Per foot) 62-7300 63-7300 64-7300-1 65-7300-1
250A 350A 350A	25' 10' 12'	62-7125 63-7110 63-7112	450A 450A 450A	12' 15' 20'	64-7112 64-7115 64-7120	550A	20'	65-7120	550A 550A	Bulk 25'	65-7300-1 65-7125



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NOZZLE AND CONTACT TIP SYSTEMS

REMOVAL AND REPLACEMENT

Pull slip-on nozzles off with a clockwise twisting motion.

When installing nozzle, exposed insulator should nest inside shock washer to assure concentricity.

Shock washers are positioned on the end of the gooseneck with the large insulated counterbore facing the nozzle.

Replace nozzle retainer with deep counterbore toward the gooseneck.

Tighten until retainer and shock washer are secure.

IMPORTANT

Shock washer must be in place before welding to maintain insulation of gooseneck. Be sure all parts are tightened well before welding.

When using the heavy duty retaining head make sure it is tightened with a 11/16" wrench to prevent overheating of diffuser and contact tip.

To prevent scoring on heavy duty retaining head, do not use pliers. Welding pliers, however, are recommended for tip installation and removal.



1.1 LINER REPLACEMENT

TOOLS REQUIRED

Vise Lineman pliers

- 1. Remove nozzle, contact tip and tip holder from gooseneck. (Not shown)
- 2. Using pliers, grip liner and remove from gun.
- 3. Install new liner by feeding through gun. Use short strokes to avoid kinking. Use clockwise rotation as needed.
- 4. Be sure o-rings on liner head seats into inside bore of power pin.

Continued on next page.



1.1 LINER REPLACEMENT continued

- 5. Using pliers, trim liner to extend to 3/4" (20mm) from end of gooseneck.
- 6. Remove any burrs on the inside and outside of liner to ensure smooth wire flow and proper seating inside diffuser.
- 7. Reinstall tip holder, contact tip and nozzle onto gooseneck. Note: Liner should be visible through gas holes of tip holder.
- 8. Install gun to feeder.



* Trim dimension may change depending on front end consumables being used.

1.2 SWITCH REPLACEMENT

Note: Turn off power to gun.

- 1. Remove two (2) mounting screws using a 5/16" nut driver.
- 2. Remove switch housing from handle.
- 3. Carefully remove defective switch from switch housing by pulling on switch leads.
- 4. Remove switch lead connectors with needle nose pliers.
- 5. Install switch lead connectors firmly onto new switch using needle nose pliers.
- 6. Install new switch into switch housing by depressing switch plunger and nesting into housing. Note: Use caution to ensure switch leads are parallel with the tab and are not pinched.
- 7. Align mounting holes in switch housing with handle and threaded holes in body. Insert mounting screws and turn screws to engage threads.
- 8. Both mounting screws must be engaged before tightening with 5/16" nut driver. Note: For complete list of part numbers see page 3.



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1.3 GOOSENECK REPLACEMENT

Note: Turn off power to gun.

- 1. Thread gooseneck tighly into connector cone by hand.
- 2. Place gooseneck in vise and tighten connector cone using a 7/8" wrench to with in 1/8" of body. Note: Allow cone nut and cable assembly to rotate.
- 3. Slide handle forward until it stops on shoulder of body.
- 4. Align mounting holes in switch housing with handle and threaded hole in body. Insert mounting screws and turn screws to engage threads.
- 5. Both mounting screws must be engaged before tightening with 5/16" nut driver.

Figure 3



•
Vise
5/16" Nut driver
7/8" Wrench



UNICABLE REPAIR / REPLACEMENT

STEP 1

- 1. Using the cable cutter, cut cable to the desired length past the damaged area. Discard the damaged cable.
- 2. Slide (2) outer clamps over unicable.
- 3. Using the utility knife, cut outer jacket of unicable 6" from ends and remove. Take care not to slice into the unicable copper strands or switch leads.



STEP 2

- 4. Carefully pull back (4) switch leads away from cable assembly and temporarily tape to outer cable.
- 5. Cut copper strands and core tube 3-1/2" from black outer cable cut. Keep copper strands straight and not frayed. (Copper strands and core tube will measure 3-1/2" from original cut on outer cable cover.)
- 6. Carefully spread the copper strands to expose the core tube of the unicable. Using the cable cutter, trim 3/4" from inner tube. (Tube will be 3/4" shorter than copper strands.) Keep copper strands straight as possible and not frayed.
- 7. Carefully realign copper strands around the core tube.
- 8. Slide Cone Nut over copper strands. Use twisting motion to avoid fraying copper strands. Do not allow switch leads inside the cone nut.



STEP 3

9. Carefully insert the cable assembly onto Connector Cone. Push core tube of unicable to shoulder on the connector cone. Spread cable strands evenly around Connector Cone and draw Cone Nut to engage thread on cone nut (by hand). Use caution not to cross threads. (See Figure 6)



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UNICABLE REPAIR / REPLACEMENT

STEP 4

- 10. Tighten Cone nut to Connector Cone. When tightening, allow unicable assembly to rotate. When fully tightened, there must be a gap between the end of the Cone nut and the lip on the Connector Cone. (See Figure 8)
- 11. With the Connector and nut secure, remove the tape from the (3) switch lead wires and fold "red" wire onto the copper strands and tape to the copper strands.
- 12. Insert the switch lead insulator (64-7902) over the "white and black" switch wires.
- Tape the entire exposed copper strand area. Overlap taping onto the outer cable cover by approximately

 from initial cut. Do not tape the entire switch leads and insulator; allow them to move freely. (Approx 1/2"
 distance is taped).
- 14. Slide the first outer clamp forward over the taped area to with in 1/4" of the original cut on the outer cable. Align with gooseneck and crimp using the Oetiker crimping tool. Slide the second outer clamp within 1/2" of first clamp and crimp using the Oetiker crimping tool. Outer clamps must be aligned. (See Figure 7)
- 15. Slide the Spring Guard (63-6502) forward and rotate over outer clamps. Use a flat head screwdriver to pry into position and, using a twisting motion, screw the spring guard over clamps.
- 16. Carefully slide handle (64-6106) forward and slip switch leads through slot in handle.
- 17. Strip 3/16" of insulation on the ends of the "white and black" switch leads and install (2) switch connectors (64-7901) using the crimping tool.
- 18. Attach the switch to the leads and insert into switch housing.
- 19. Line up mounting screws into body through housing and handle and secure using (2) mounting screws. Remove from vise.



20. Follow identical procedure on rear of gun. (See Figure 9)





Lightning[®] Troubleshooting

A. Wire not feeding or bumpy feeding

Pos	sible Cause	Possible Solution
1.	Feeder relay / malfunction	Consult feeder manufacturer.
2.	Broken control lead	Connect spare control leads.
3.	Poor adaptor connection	Test and replace leads and/or contact pins.
4.	Incorrect type of drive roll	Use manufacturers recommended drive rolls
5.	Improper drive rolls size	Replace with proper size.
6.	Drive roll tension misadjusted	Adjust tension at feeder.
7.	Burn back to contact tip	See "E. Contact tip burn back."
8.	Wrong size liner	Replace with correct size.
9.	Buildup inside of liner	Replace liner, check condition of electrode.
10.	Worn drive roll	Replace with new drive roll.
11.	Improper guide tube relationship	Eliminate all gaps in electrode path.
12.	Improper wire guide diameter	Replace with proper guide diameter.
13.	Gaps at liner into gas diffuser	Reset liner and lock or replace with new liner

B. Premature contact tip failure

Pos	sible Cause	Possible Solution
1.	Improper voltage or wire feed speed	Set parameters.
2.	Erratic wire feeding	See "G. <u>Erratic arc</u> ."
3.	Improper tip stickout	Adjust nozzle/tip relationship.
4.	Improper electrode stickout	Change length of wire stickout.

C. MIG Gun running hot

Pos	sible Cause	Possible Solution
1.	Exceeding duty cycle	Replace with properly rated duty cycle MIG Gun. Decrease parameters to within Gun rating.
2.	Loose or poor power connection	Clean and retighten all electrical connection. Check rating and condition of ground clamp.

D. Porosity in weld

Ро	ssible Cause	Possible Solution
1.	Nozzle/Insulator/O-rings worn	Replace.
2.	Retaining head spring/band	Replace retaining head.
3.	Extreme heat or duty cycle	Use X-heavy-duty consumables.
4.	Gas not getting to the weld	Check gas regulator/flowmeter/cylinder
5.	Gas ports plugged	Clean or replace gas diffuser/nozzle.
6.	Loose fittings or cut gas hose	Tighten or repair hose lines.



Lightning[®] Troubleshooting

E. Contact tip burn back

Ро	ssible Cause	Possible Solution
1.	Improper voltage and/or wire feed speed	Set parameters.
2.	Erratic wire feeding	See "G. <u>Erratic arc</u> ."
3.	Improper tip stickout	Adjust nozzle / tip relationship.
4.	Improper electrode stickout	Adjust torch to base metal relationship.
5.	Faulty ground	Repair all cables and connectors.

F. Tip disengages from retaining head

Ро	ssible Cause	Possible Solution				
1.	Worn retaining head	Replace tip and/or retaining head.				
2.	Improper tip installation	Finger tighten then slightly tighten with correct tool.				

G. Erratic arc

Ро	ssible Cause	Possible Solution				
1.	Worn contact tip	Replace.				
2.	Buildup inside of liner	Replace liner, check condition of electrode.				
3.	Wrong tip size	Replace with correct tip size.				
4.	Incorrect welding parameters	Use wire manufacturers parameters.				

H. Excess spatter

Ро	ssible Cause	Possible Solution				
1.	Improper machine parameters	Adjust parameters.				
2.	Incorrect tip or installation	Adjust nozzle / tip relationship.				
3.	Incorrect nozzle or shielding	Use correct nozzle and shielding gas coverage.				
4.	Contaminated wire or work piece	Replace wire and clean work piece.				

I. Discolored Liner

Po	ssible Cause	Possible Solution				
1.	Short circuit to electrode	Check for wire short circuiting in feeder				
2.	Cuts in outer jacket, copper exposed	Replace gun.				

		Tip	Diffuser	Nozzle	Tip	Diffuser	Nozzle	
		63-11XX	63-3103	64-2387 7/8" Bore 1/4" Recess Brass 1.062" O.D. Straight Bore	63-12XX	63-3103-2	63-2138 3/8" Bore Flush Copper 0.938" O.D.	
Visit and help	All Li All no	63-11XX	63-3103	64-2950 1/2" Bore 1/8" Stickout Brass 0.938" O.D. Straight Bore	63-11XX	63-3103-2	63-2150 1/2" Bore 1/8" Recess Copper 0.938" O.D.	SHTN
AmericanT ful MIG res	ghtning® consi zzlec are avail	63-11XX	63-3103	64-2962 5/8" Bore Flush Copper 1.062" O.D. Bottle Neck	63-11XX	63-3103	63-2162 5/8" Bore 1/8" Recess Copper 0.938" O.D.	
orchTip.co	umables are in	63-11XX	63-3103	65-2562 5/8" Bore 1/8" Recess Copper 1.062" O.D.	63-11XX	63-3103	63-2175 3/4" Bore 1/8" Recess Copper 0.938" O.D. Straight Bore	1IG Co
m/lightning	iterchangable	63-11XX	63-3103	65-2362 5/8" Bore 1/8" Stickout Brass 1.062" O.D.	63-11XX	63-3103	63-2362 5/8" Bore 1/8" Recess Brass 1.120" O.D. Straight Bore	nsuma
for more in logs, video	for custom con	63-11XX	63-3103	65-2375 3/4" Bore 1/4" Recess Brass 1.120" O.D. Straight Bore	63-11XX	63-3103	63-2662 5/8" Bore 1/8" Stickout Copper 0.938" O.D.	ble Pa
formation s and articl	nfigurations.	63-11XX	63-3103	65-2575 3/4" Bore 1/8" Recess Copper 1.062" O.D.	63-11XX	63-3103-2	63-2950B 1/2" Bore 1/8" Recess Brass 0.938" O.D. Straight Bore	rts Ref
es.	X See chart c	63-11XX	63-3103	65-2662 5/8" Bore 1/8" Stickout Copper 1.062" O.D.	63-11XX	63-3103	64-2562 5/8" Bore 1/4" Recess Copper 1.062" O.D.	erence
GHTNING	X denotes wire size. n page 3 for details.	63-11XX	63-3103	65-2550 1/2" Bore 1/8" Recess Copper 1.062" O.D.	63-11XX	63-3103	64-2575 3/4" Bore 1/4" Recess Copper 1.062" O.D.	

and helpful MIG resources, including catalogs, videos and articles.

AIGHTNING

LIMITED WARRANTY – Subject to the terms and conditions below



American Torch Tip Co. (ATTC) warrants its products to the original end user for the periods listed below:

PLASMA	MIG
LIFETIME *PHD and PHDX Torch Bodies	LIFETIME *Lightning® Handle and Trigger Switch
	ONE YEAR *Lightning® Semi-Automatic MIG Guns *Lightning® Robotic MIG Guns *Lightning® Fixed Automation MIG Guns 180 DAYS *All Other Gun Models
THERMAL SPRAY	TIG
ONE YEAR *Thermal Spray Guns	ONE YEAR *TIG Torches

*Limited Warranty on Manufacturing and Material Defects. Warranty Terms Do Not Apply to Consumable Products.

Warranty Terms

This warranty shall not apply to any product that has been modified or used in a manner inconsistent with ATTC's installation instructions and operating guidelines. Within the warranty periods listed above and at ATTC's sole discretion, ATTC will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. ATTC must be notified within thirty (30) days of such defect or failure, at which time ATTC will determine if a Return Goods Authorization (RGA) is justified and issue an RGA number, authorization of a RGA number shall not be unreasonably withheld. ATTC will supply a RGA form, which must be included with the returned products for inspection by ATTC. Shipping and packing costs shall be the responsibility of the party returning the goods. Once received, ATTC shall inspect and determine if a warranty claim is justified and at ATTC's sole discretion authorize a repair or replacement. Once authorization has been granted ATTC shall provide instructions on the warranty claim procedures to be followed. Where authorized, repair or replacement constitutes the sole remedy for breach of warranty and expressly excludes claims for lost revenue, down time and other consequential damages. The warranty is limited to the conditions stated above and excludes, to the fullest extent permitted by law, all conditions, warrantes and representations express or implied by statue, law or otherwise in relation to the supply or delay in supplying the goods/services. There are no agreements, promises or understandings, either verbal or written that are not fully expressed in this warranty. This warranty may be amended or altered only if agreed to in writing and signed by ATTC.

ATTC Limited Warranty 0418



THANK YOU

For selecting the Lightning® MIG Gun. The Lightning® Gun is for welding professionals who want durability and comfort while working in harsh welding environments. This technical guide with instructions and illustrations is designed to make it easy to maintain your Lightning® Gun. Please read and follow all the safety procedures. For technical support, please call our Customer Service department at 1-800-371-8477 between 8:00 AM and 5:00 PM EST Monday through Friday. We are committed to providing the best-quality products and services. We are constantly working to improve our products. We would appreciate hearing your suggestions.

The *LIGHTNING* Family of MIG Guns, Consumables and Accessories

Semi-Auto MIG Gun



Automatic MIG Gun IGHTNING AUTO MIG TUALLY INDESTRUCTIBLE AIGHTNING

Large Curve MIG Gun



Small Curve MIG Gun



Robotic MIG Gun



Made in the USA by American Torch Tip. ZZ-MAR-TECH-MIG-001 1023