

LIGHTNING[®]
BY AMERICAN TORCH TIP



TECHNICAL GUIDE

Auto MIG Gun

CONSUMABLES & ACCESSORIES

Reliable Automatic Welding Equipment

The Lightning® AUTO MIG gun is made to stand up to the high heat conditions typical in the production environment. Lightning® precision consumables are designed to reduce change-out related downtime. All gun components and consumables are made in the USA.

High Strength Cable

The outer cover is strengthened using electron beam accelerators which cross-link the polymers and increase the tear, stretch and abrasion resistance of the cable. Hytrel inner tubing is kink and impact resistant for smooth and reliable wire feed. The copper strand count of our premium cable assures long life and maximum productivity.

Lightning® Contact Tips

Tapered seat designed to dissipate heat and maximize electrical conductivity. Our dual start-point thread allows re-seating of the tip. When wire wear begins to effect performance, simply rotate the tip 180° to a new wear-point and double the life of the contact tip.

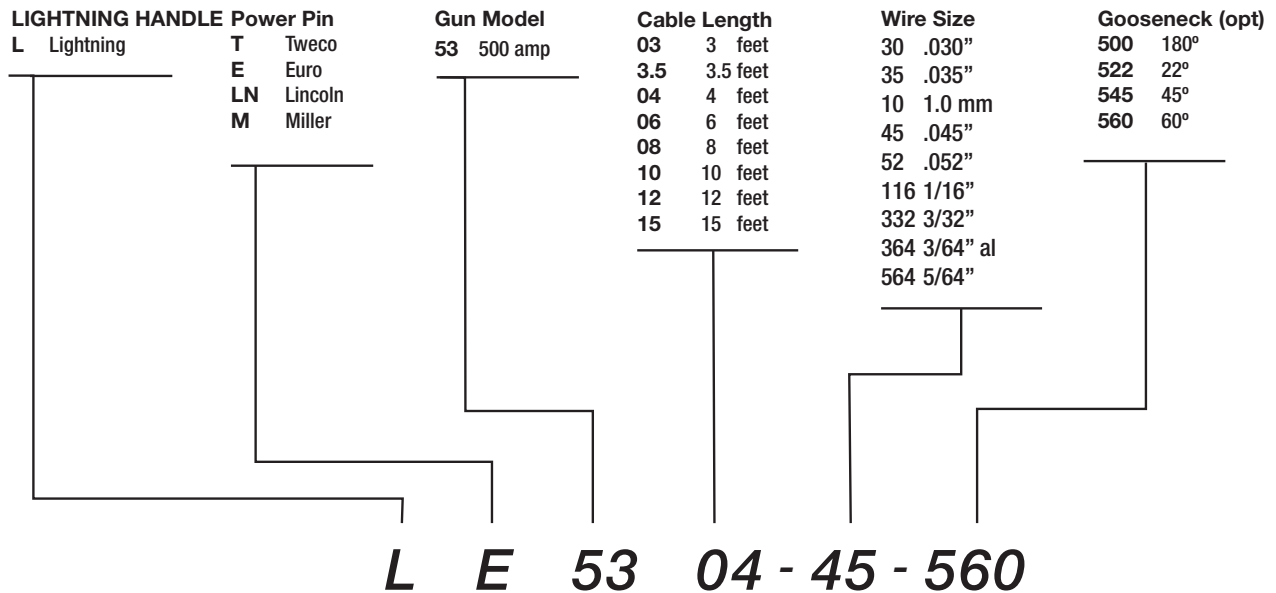
Heavy Duty Handle

Lifetime Warranty on gun body.
Fiber reinforced resin stands up to extreme heat and impact.
Slim compact design.

Amperage Ratings (duty cycle)

100% Duty Cycle		60% Duty Cycle	
Co2	Mixed Gas	Co2	Mixed Gas
500 amps	350 amps	650 amps	500 amps

PART NUMBERING SYSTEM



NOZZLES

ID

63-2138	HD * Flush	3/8"	(09.5mm)
63-2662	HD 1/8" Stick-Out	5/8"	(15.9mm)
63-2150	HD 1/8" Tip Recess	1/2"	(12.7mm)
63-2162	HD 1/8" Tip Recess	5/8"	(15.9mm)
63-2175	HD 1/8" Tip Recess	3/4"	(19.1mm)
64-2562	Extra HD Cu 1/4" Tip Rec.	5/8"	(15.9mm)
64-2575	Extra HD Cu 1/4" Tip Rec.	3/4"	(19.1mm)
65-2550	HD Cu 1/8" Tip Recess	1/2"	(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)
64-2950	HD Bottleneck 1/8 Stick-out	1/2"	(12.7mm)
63-2950	HD Bottleneck 1/8 Recess	1/2"	(12.7mm)
65-2662	Extra HD 1/8 Stick-out	5/8"	(15.9mm)
65-2362	Extra HD Brass 1/8 Stick-out	5/8"	(15.9mm)

*Threaded versions available for all nozzles.
Add "T" to part number.*

CONTACT TIPS

ID

63-1130	HD*	.030	(0.8mm)	.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)	.070
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		.073
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		.070

NOTE: 65-11xx series tips are only to be used with 65 series Lightning® diffusers.

GAS DIFFUSERS & RETAINER

63-3201	Diffuser for HD Contact Tip
63-3104	Nozzle Retainer (for 63-3201 above)
63-3103	Diffuser HD
63-3116	R/M Thread-on Diffuser HD
65-3116	R/M Thread-on Extra Heavy Duty Diffuser
65-3103	Diffuser Extra HD
65-3103-2	Robotic Extra HD
63-3301	Gas Diffuser O-Ring

SHOCK WASHERS

63-6202	
63-6202HD	(Heavy Duty)

LIGHTNING® GOOSENECKS

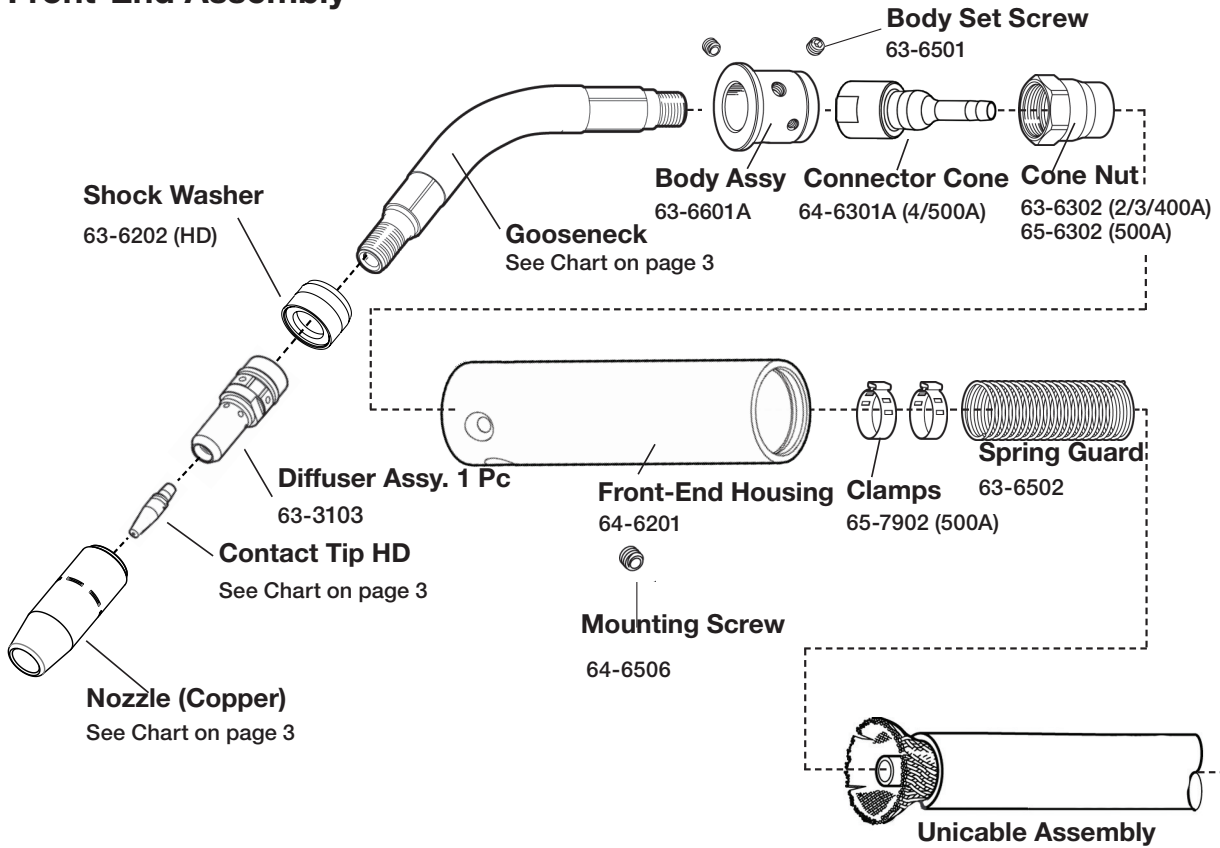
65-5100A	Fixed	180°
65-5122A	Fixed	22°
65-5145A	Fixed	45°
65-5160A	Fixed	60°

LINERS

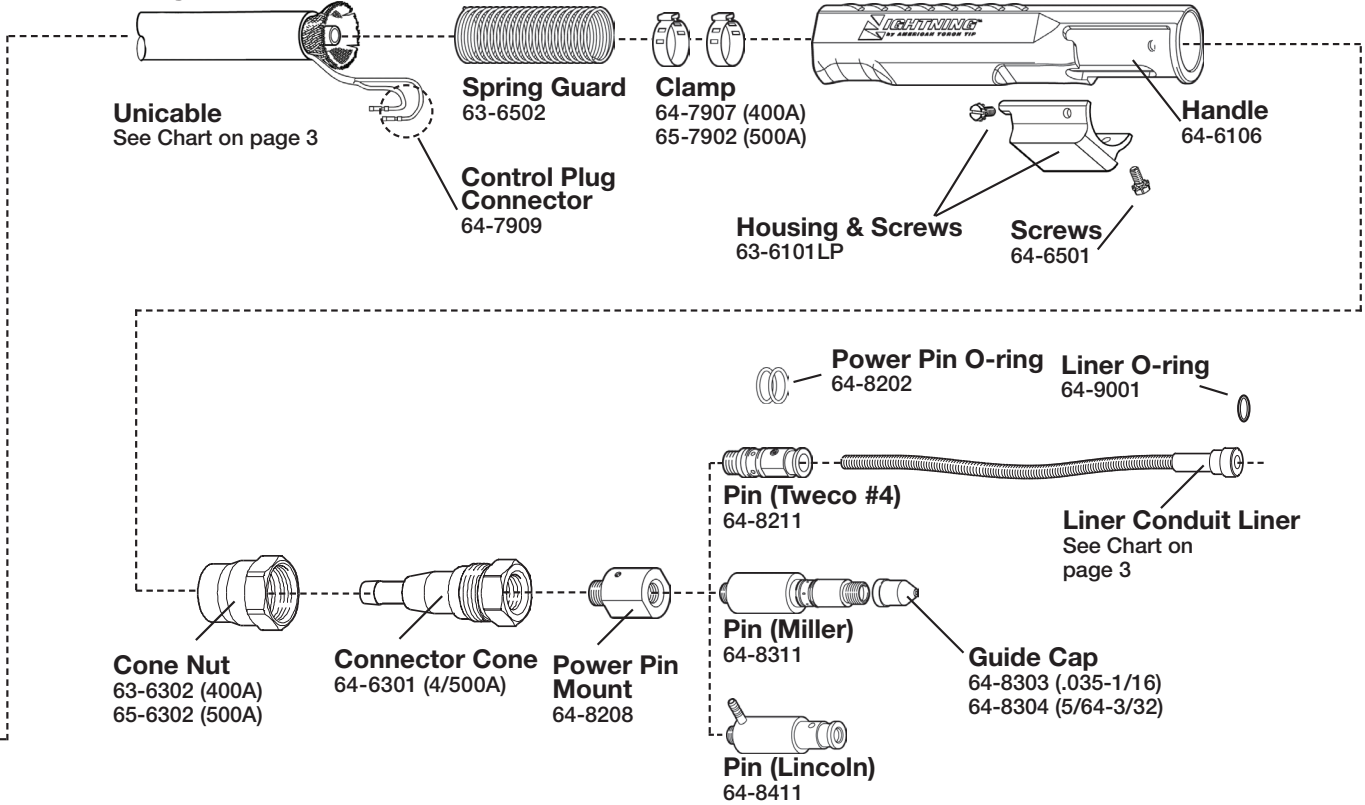
Wire Size	Length	Part#	OD
.023" (.6mm)	15'	64-4115	0.150
.035" (.9mm)	15'	62-4315	0.156
.035" (.9mm)	25'	62-4325	0.156
.045" (1.6mm)	15'	62-4515	0.156
.045" (1.6mm)	25'	62-4525	0.156
.030" (.8mm)	15'	64-4215	0.182
.035" (.9mm)	10'	64-4310	0.175
.035" (.9mm)	15'	64-4315	0.175
.035" (.9mm)	25'	64-4325	0.175
.035" (.9mm)	25'	64-4325	0.175
.035" (.9mm)al	15'	64-4415	0.189
.045" (1.6mm)	10'	64-4510	0.189
.045" (1.6mm)	15'	64-4515	0.189
.045" (1.6mm)	25'	64-4525	0.189
3/64" (1.6mm)	10'	64-4510	0.189
3/64" (1.6mm)	15'	64-4515	0.189
3/64" (1.6mm)	25'	64-4525	0.189
.52" (1.6mm)	10'	64-4510	0.189
.52" (1.6mm)	15'	64-4515	0.189
.52" (1.6mm)	25'	64-4525	0.189
1/16" (1.6mm)	10'	64-4510	0.189
1/16" (1.6mm)	15'	64-4515	0.189
1/16" (1.6mm)	25'	64-4525	0.189
3/64-1/16al	15'	64-4615	0.189
5/64-3/32	15' Flat	64-4715	0.189
5/64-3/32	25' Flat	64-4725	0.21
5/64 & 1/16"	FC 10'	64-4815	0.21
.035 - .045	15'	64-4915	0.192

(for S.S. Wire)

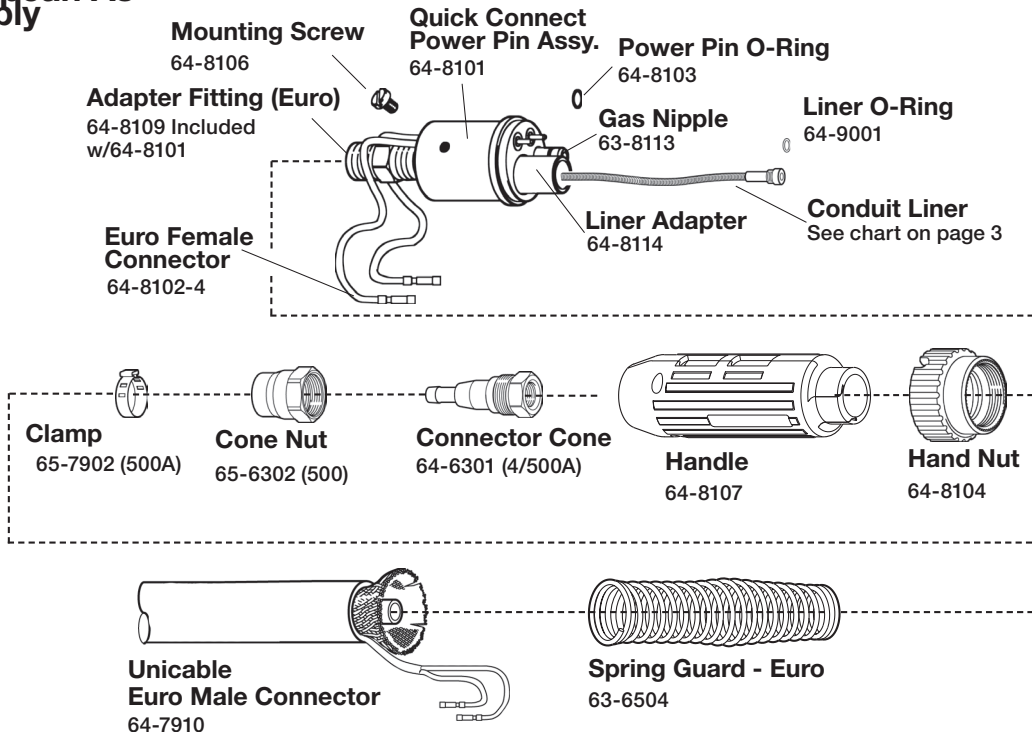
Front-End Assembly



Back-End Assembly



European Assembly



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.

THREAD-ON (OPTIONAL FOR TWECO HD)

Thread-on nozzle system does not require nozzle retainer and cannot be used with heavy duty head.

Shockwasher must be in place.

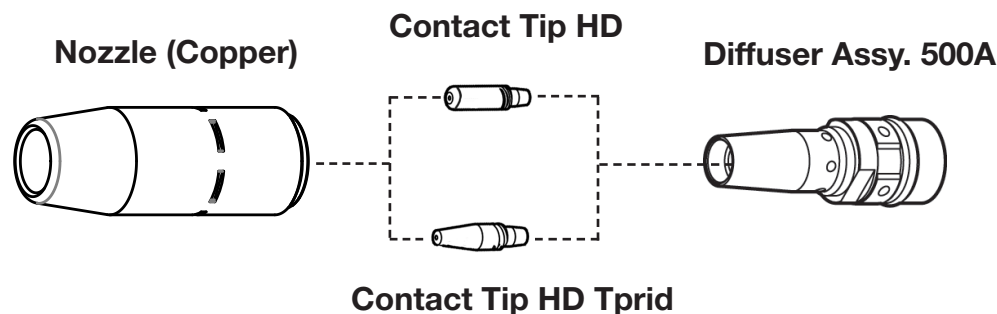
External gooseneck thread can be cleaned with a 9/16"-18 die.

IMPORTANT

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

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

To prevent scoring on heavy duty retaining head do not use pliers.



NOTE: Any of the above nozzle and contact tip systems can be used on the LIGHTNING GUN 50 AMP models. (See chart page 3)

1.1 LINER REPLACEMENT

TOOLS REQUIRED

Vise

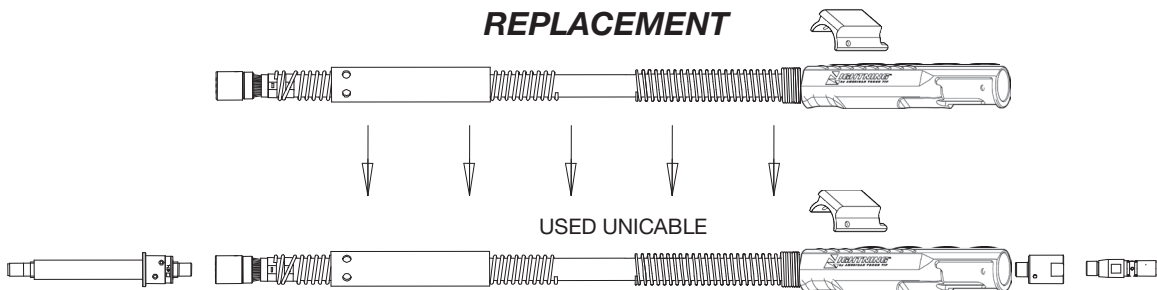
5/64 Allen wrench

Lineman pliers

1. Remove nozzle, contact tip and tip holder from gooseneck. (Not shown)
2. With gun straightened, loosen liner set screw on quick connect power pin at back end of gun using a 5/64" Allen wrench. (See Figure 1)
3. Using pliers, grip liner and remove from gun.
4. Install new liner by feeding through gun. Use short strokes to avoid kinking. Use clockwise rotation as needed.
5. Be sure o-rings on liner head seats into inside bore of power pin.
6. Tighten set screw on power pin to secure liner. Do not overtighten.

UNICABLE REPAIR / REPLACEMENT

STEP #1



- Remove liner from gun (See **Section 2.5 LINER REPLACEMENT**).
- Mount neck in vise.
- Remove housing screws and slide housing back (front and back).
- Loosen connector cone from neck using 1" (25 mm) wrench.
- Remove from vise and thread out neck by hand.
- Cable connection between cone and crimp ring should not be disturbed.
- Unthread power pin and remove using 1 1/4" (32 mm) on connector cone and a 5/8" (16 or 3/4" (19mm) wrench on power pin. Install new power pin.
- Retrieve front and rear housing. Slide housings onto new unicable assembly.
- Repeat procedure in reverse to assemble remaining components.

Lightning® Troubleshooting

A. Wire not feeding or bumpy feeding

Possible 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. <u>Contact tip burn back.</u> "
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

Possible 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

Possible 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

Possible 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

Possible Cause		Possible Solution
1.	Improper voltage and/or wire feed speed	Set parameters.
2.	Erratic wire feeding	See "G. Erratic arc."
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

Possible 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

Possible 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.

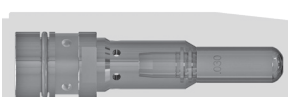
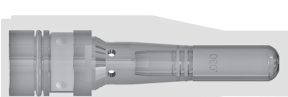
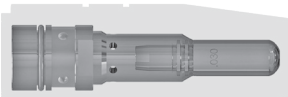
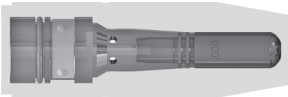
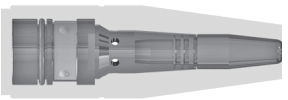
H. Excess spatter

Possible 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.

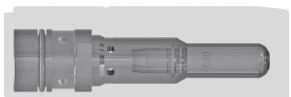
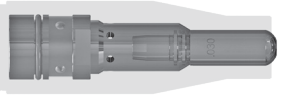
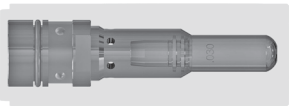
I. Discolored Liner

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

LIGHTNING® MIG Consumable Parts Reference



Nozzle	63-2138 3/8" Bore Flush Copper 0.938" O.D.	63-2150 1/2" Bore 1/8" Recess Copper 0.938" O.D.	63-2162 5/8" Bore 1/8" Recess Copper 0.938" O.D.	63-2175 3/4" Bore 1/8" Recess Copper 0.938" O.D. Straight Bore	63-2362 5/8" Bore 1/8" Recess Brass 1.120" O.D. Straight Bore	63-2662 5/8" Bore 1/8" Stickout Copper 0.938" O.D.	63-2950B 1/2" Bore 1/8" Recess Brass 0.938" O.D. Straight Bore	64-2562 5/8" Bore 1/4" Recess Copper 1.062" O.D.	64-2575 3/4" Bore 1/4" Recess Copper 1.062" O.D.
Diffuser	63-3103-2	63-3103-2	63-3103	63-3103	63-3103	63-3103	63-3103-2	63-3103	63-3103
Tip	63-12XX	63-11XX	63-11XX	63-11XX	63-11XX	63-11XX	63-11XX	63-11XX	63-11XX



Nozzle	64-2387 7/8" Bore 1/4" Recess Brass 1.062" O.D. Straight Bore	64-2950 1/2" Bore 1/8" Stickout Brass 0.938" O.D. Straight Bore	64-2962 5/8" Bore Flush Copper 1.062" O.D. Bottle Neck	65-2562 5/8" Bore 1/8" Recess Copper 1.062" O.D.	65-2362 5/8" Bore 1/8" Stickout Brass 1.062" O.D.	65-2375 3/4" Bore 1/4" Recess Brass 1.120" O.D. Straight Bore	65-2575 3/4" Bore 1/8" Recess Copper 1.062" O.D.	65-2662 5/8" Bore 1/8" Stickout Copper 1.062" O.D.	65-2550 1/2" Bore 1/8" Recess Copper 1.062" O.D.
Diffuser	63-3103	63-3103	63-3103	63-3103	63-3103	63-3103	63-3103	63-3103	63-3103
Tip	63-11XX	63-11XX	63-11XX	63-11XX	63-11XX	63-11XX	63-11XX	63-11XX	63-11XX

All Lightning® consumables are interchangeable for custom configurations. All nozzles are available in threaded versions for use with threaded diffuser.

XX denotes wire size. See chart on page 3 for details.



Visit AmericanTorchTip.com/Lightning for more information and helpful MIG resources, including catalogs, videos and articles.





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
GAS APPARATUS	TIG
THREE YEARS *Complete Oxy-Fuel Kit Components *Regulators/Flowmeters/Flowregulators *Torches, Handles & Cutting Attachments	ONE YEAR *TIG Torches
THERMAL SPRAY	
ONE YEAR *Thermal Spray Guns	

*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, warranties and representations express or implied by statute, 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 0516

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

VIRTUALLY INDESTRUCTIBLE

Inner Armor
Protective inner armor – a brass alloy insert – guards against wear and extends nozzle life.
The cool-running Lightning® tapered-seat contact tip is designed to dissipate heat quickly through increased surface area, and maximize electrical conductivity.
Dual start-point threads allow re-seating of the tip when wire wear begins to affect performance. Just rotate the tip counter-clockwise 180° to a new wear-point and double the life of the contact tip.
Insulated aircraft aluminum protects the 600 AMP capacity gooseneck.

Hard Body
High-strength plastic handle is engineered with special impact additives and reinforcing ribs, making it virtually indestructible. The solid construction puts Lightning® in a class of its own.

Lifetime Warranty on handle and trigger switch.

Defensive Shield
The secret behind Lightning®'s super tough cable is electron-beam accelerators that modify and strengthen the outer cover. This protective shield guards against tearing, stretching and abrasion.
Inner tubing, made of Hytel, is kink and impact resistant for smooth and reliable wire feed.
Copper strand-count and gauge is optimized for each cable's ampere rating, resulting in a perfect blend of flexibility and strength.

Plug-and-Play
Lightning® is ready to work right out of the box with most popular welding systems. Components are designed for quick, easy switch-outs.

Specs:
Type: Semi-automatic, Air-cooled MIG
Amperage: 250, 350, 450, 550
Cable Length: 9'-25'
Gooseneck: 180°, 22°, 45°, 60°
Wire Size: .030" – .092"
1/16" – 5/64"
Compatibility: Compatible with a complete range of welding machines and wire feeders.
Lifetime Warranty: Handle and trigger switch have a Lifetime Warranty.

Learn more at our website: AmericanTorchTip.com/Products/Lighting or call us at 800-342-8477

Large Curve MIG Gun

VIRTUALLY INDESTRUCTIBLE

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Inner Armor
Protective inner armor – a brass alloy insert – guards against wear and extends nozzle life.
The cool-running Lightning® tapered-seat contact tip is designed to dissipate heat quickly through increased surface area, and maximize electrical conductivity.
Dual start-point threads allow re-seating of the tip when wire wear begins to affect performance. Just rotate the tip counter-clockwise 180° to a new wear-point and double the life of the contact tip.
Insulated aircraft aluminum protects the 600 AMP capacity gooseneck.

Hard Body
Lifetime Warranty on gun body. Flow reinforced resin stands up to extreme heat and impact. Slim compact design. Lifetime Warranty on gun body.

Defensive Shield
The secret behind Lightning®'s super tough cable is electron-beam accelerators that modify and strengthen the outer cover. This protective shield guards against tearing, stretching and abrasion.
Inner tubing, made of Hytel, is kink and impact resistant for smooth and reliable wire feed.
Copper strand-count and gauge is optimized for each cable's ampere rating, resulting in a perfect blend of flexibility and strength.

Plug-and-Play
Lightning® is ready to work right out of the box with most popular welding systems. Components are designed for quick, easy switch-outs.

Specs:
Type: Automatic/ Machine, Air-cooled
Amperage: 500
Cable Length: 4' – 10', plus custom lengths
Gooseneck: 180°, 22°, 45°, 60°
Wire Size: .030" – .092"
1/16" – 5/64"
Compatibility: Compatible with a complete range of welding machines and wire feeders.

Learn more at AmericanTorchTip.com/Products/Lighting or call us at 800-342-8477

Robotic MIG Gun

VIRTUALLY INDESTRUCTIBLE

Inner Armor
Protective inner armor – a brass alloy insert – guards against wear and extends nozzle life.
The cool-running Lightning® tapered-seat contact tip is designed to dissipate heat quickly through increased surface area, and maximize electrical conductivity.
Dual start-point threads allow re-seating of the tip when wire wear begins to affect performance. Just rotate the tip counter-clockwise 180° to a new wear-point and double the life of the contact tip.
Insulated aircraft aluminum protects the 600 AMP capacity gooseneck.

Hard Body
Solid body design created from aircraft aluminum that stands up to extreme impact.

Lifetime Warranty on handle and trigger switch.

Defensive Shield
The secret behind Lightning®'s super tough cable is electron-beam accelerators that modify and strengthen the outer cover. This protective shield guards against tearing, stretching and abrasion.
Inner tubing, made of Hytel, is kink and impact resistant for smooth and reliable wire feed.
Copper strand-count and gauge is optimized for each cable's ampere rating, resulting in a perfect blend of flexibility and strength.

Plug-and-Play
Lightning® is ready to work right out of the box with most popular welding systems. Components are designed for quick, easy switch-outs.

Specs:
Type: Robotic, Air-cooled
Amperage: 500
Cable Length: 4' – 10', plus custom lengths
Gooseneck: 22°, 45°, plus custom angles
Wire Size: .030" – .092"
1/16" – 5/64"
Compatibility: Compatible with a complete range of welding machines. Adapters are also available for most wire feeders.

Learn more at AmericanTorchTip.com/Products/Lighting or call us at 800-342-8477

Made in the USA by American Torch Tip

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