

# Instruction Manual

## CO<sub>2</sub> MAG Welding Torches

### Semi-Automatic Torches

#### CSL Series

180amp.

**CSL-18**

200amp.

**CSL-20**

**CSL-20F**

**CSL-20L**

350amp.

**CSL-35**

**CSL-35K**

**CSL-35F**

**CSL-35G**

#### CP Series

350amp.

**CP-35**

#### CSH Series

350amp.

**CSH-35**

**CSH-35K**

**CSH-35F**

**CSH-35L**

**CSH-35G**

450amp.

**CSH-45**

**CSH-45F**

**CSH-45L**

500amp.

**CSH-50**

**CSH-50F**

**CSH-50L**

Please read this instruction manual  
before using the product.

Please be sure to deliver this instruction manual  
to the end user of this product.

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# NOTES REGARDING SAFETY

## Be sure to read these instructions before using the welding torch.

- In order to ensure safe operation, this equipment should only be set up, inspected and maintained by a qualified person, or by someone who has a thorough understanding of the welding equipment and who has received sufficient training in its use.
- In order to ensure safe operation, this equipment should only be operated by people who have read these instructions thoroughly and understood their contents and who have the knowledge and ability to handle the equipment safely.
- It is recommended that instruction in all aspects of safe operation should be obtained from institutions and associations which provide courses in proper welding techniques taught by qualified welding instructors.
- After reread these instructions, keep them in a safe and easily-accessible place so that they can be reread at a later date as required.
- Please contact TOKIN CORPORATION or its dealer if there are any unclear points in this manual. If there are any questions regarding service, contact the dealer of your purchase or TOKIN CORPORATION. The contact address and the telephone number are printed on the rear cover of this instructions.


## 1. Precautions for safety

- Different degrees of personal injury or equipment damage can occur if this welding torch is used incorrectly. The terms and symbols which appear in the "NOTES REGARDING SAFETY" section of these instructions are classified into three ranks according to the possible degree of danger or injury that each one warns against.



Symbol	Term	Definition
	<b>DANGER</b>	The instructions which follow this term represent situations where failure to follow the instructions will almost certainly result in severe injury or death.
	<b>WARNING</b>	The instructions which follow this term represent situations where failure to follow the instructions can possibly result in severe injury or death.
	<b>CAUTION</b>	The instructions which follow this term represent situations where failure to follow the instructions may result in injury to the operator or physical damage.

In the above definitions, "severe injury" refers to cases of blindness, physical wounds, burns (high- and medium-temperature), electric shocks, fractures or poisoning which may leave scars or lasting ill-effects and for which medical treatment or prolonged hospitalization may be necessary. "Injury refers to cases of physical wounds, burns and electric shocks for which prolonged medical treatment and hospitalization are not necessary, and "physical damage" refers to extensive damage that may result in damaged property or broken equipment.

## 2. Items that must always be observed for safety



<b>WARNING</b> 	<b>These items should be observed at all times in order to prevent the possibility of serious personal injury.</b>
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- Welding torches have been designed and manufactured with full consideration given to safety; however, the warning and cautions given in this "Notes Regarding Safety" section must always be strictly observed during use. If they are not observed, severe injury or death through misoperation may result.
- Do not unauthorized personal come into the area where welding equipment is being used.
- When welding equipment is turned ON, it generates a magnetic field. This magnetic field may adversely affect the operation of some sensors and gauges. For the same reason, people who are using a heartbeat pace maker must not go close to operating welding equipment or go into workshops where welding equipment is being used unless prior medical approval has been obtained.
- In order to ensure safe operation, welding torch, wire feeder and the welding power supply equipment should only be set up, inspected, maintained and repaired by a qualified person, or by someone who has a thorough understanding of welding equipment and who has received sufficient training in its use.
- In order to ensure safe operation, welding torch should only be operated by people who have read these instructions and the instructions for the wire feeder and power supply equipment through and understood their contents and who have the knowledge and ability to handle the equipment safely.
- Do not use welding torch for any applications other than for arc welding as explained in these instructions and in the instructions for the wire feeder and power supply equipment.

<b>WARNING</b> 		<b>These items should be observed at all times in order to prevent the possibility of electric shocks.</b>
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- \*Touching the charged parts can cause fatal electric shocks or burns. Welding wire, contact tip and tip body are charged whenever the welding torch is turned ON and operating.
- Never Torch charged parts such as welding wire, or contact tip while welding torch is turned ON and operating.
- Grounding of welding power supply case and base metal and tools which are connected electrically to the base metal, must be carried out by a qualified electrician in accordance with the proper electrical engineering regulations.
- Turn OFF all input power supplies by turning OFF the switches in the distribution box before carrying out any inspections or maintenance.

- Inspections and maintenance should be carried out at periodic intervals, and the equipment must not be used until any damaged parts found have been repaired or replaced.
- Do not use cables that are damaged or that have exposed conductors, or that are rated lower than the specified level.
- Make sure that the cable is connected securely and that it is insulated.
- Welding cable should be connected as close as possible to the base metal being welded and it should be connected securely.
- Do not wear gloves which are torn or wet.
- Use a safety strap if welding in raised places.
- Turn OFF all power switches and the input power supply when not using.



<b>CAUTION</b> 		<b>Wear protective equipment at all times to protect yourself and others against arc beam, welding flashes, flying spatter and slag, and noise.</b>
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\*Welding flashes contain harmful ultraviolet and infrared lights which can cause inflammation or burn to eyes.

\*Flying spatter and slag can hurt the eyes and cause serious burns.

\*The noise generated by welding can cause problems with hearing.



- Always wear protective goggles or welding masks which have sufficient shielding properties when doing welding or when observing welding being done.
- Wear protective glasses to protect the eyes from spatter and slag.
- Hang a curtain around the area where welding is being carried out to prevent welding flashes from affecting passers-by.
- Wear protective clothing such as leather gloves, longsleeves, leg covers and a leather apron for protection while welding.
- Wear noise proof ear protectors if the noise level is too high.

<b>CAUTION</b> 		<b>Use protective equipment at all times to protect yourself and others against any fumes and gases that may be generated from welding.</b>
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\*Fumes and gases are generated when welding is carried out. Inhaling fumes and gases can be dangerous to your health.



\*Welding in confined spaces can reduce the oxygen content in the air, which can result in suffocation.

- To prevent gas poisoning and suffocation, always use a proper ventilation equipment to vent gases locally or entirely as stipulated by labor safety regulations and air contamination prevention regulations, or use an adequate breathing apparatus.
- When welding in a confined space, make sure that the air is circulating freely, wear some kind of breathing apparatus, and work only under the supervision of a properly trained supervisor.
- Toxic gases may be generated if welding is carried out near where degreasing, cleaning or demisting operations are also being carried out. Avoid welding near places where such operations are being carried out.
- Welding metal which has been plated with zinc will cause toxic fumes. Remove the plating before welding, or wear adequate absorption equipment for protection.

<b>CAUTION</b> 		<b>Be sure to observe the following to avoid burns from the nozzle and tip or injury from fine wire ends.</b>
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\*The nozzle or contact tip becomes very hot after use, and it can cause serious burns if touched.

- Do not touch the nozzle or tip immediately after welding has been completed.
- Do not bring the tip of the welding torch close to your face during wire inching.

<b>CAUTION</b> 		<b>Be sure to observe the following to avoid fires, explosions and rupturing.</b>
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\*Fires can be caused by spatter and base metals which are hot after welding.

\*Fire can occur as a result of heat generated by the flow of current if the cable has not been correctly connected or there is an incomplete contact in the current path at the base metal being used.

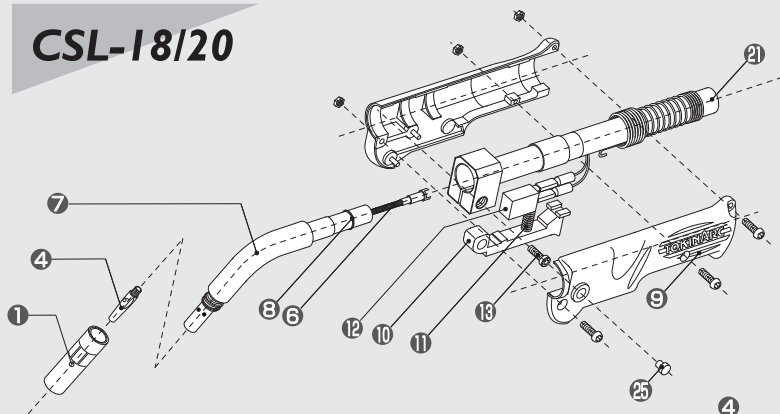
\*Explosions can occur if an arc is generated near containers that contain flammable substances such as gasoline.

\*Ruptures can occur if welding sealed objects such as tanks and pipes.

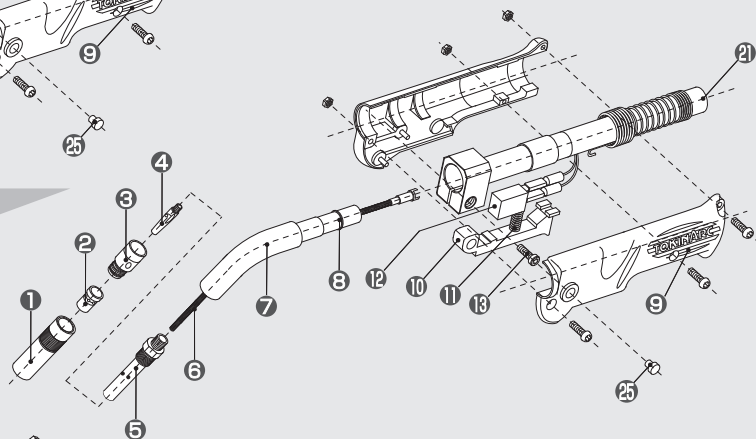
- Do not use the welding torch in places where flying spatter can cause flammable materials to ignite.
- Do not use the welding torch near places where flammable gases are present.
- Keep base metals away from flammable materials immediately after welding as they may have become hot.
- Remove any flammable materials on the other side of ceilings, floors and walls that are being welded as sparks from welding could cause such materials to ignite.
- The welding cable should be connected as close as possible to the base metal being welded, and it should be connected securely.
- Do not weld gas cylinders which still contain gas.
- Do not weld sealed tanks or pipes.
- Keep a fire extinguisher close by the place where welding is being carried out in case a fire starts.

## ■ Parts List

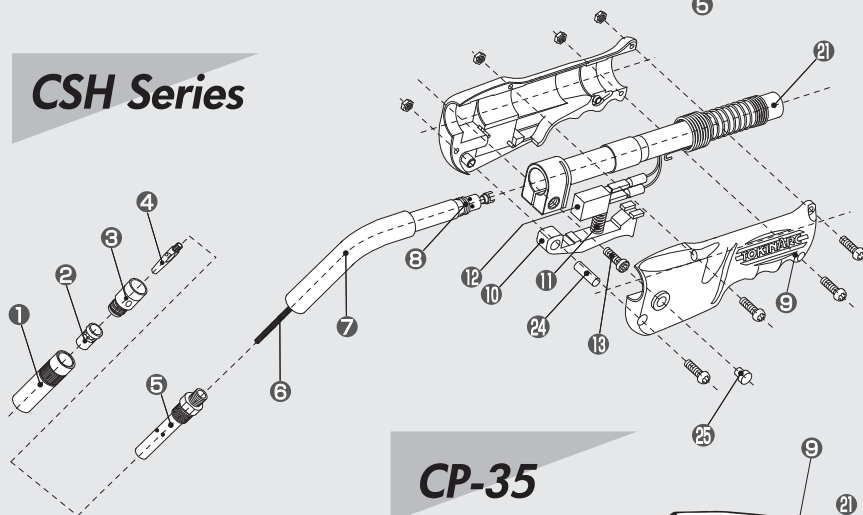
### CSL-18/20



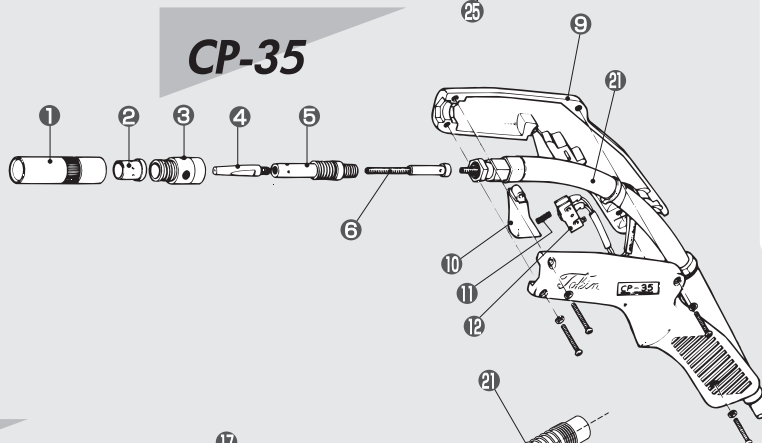
### CSL-35



### CSH Series

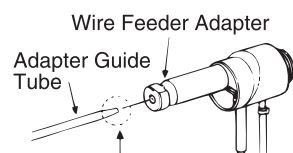


### CP-35



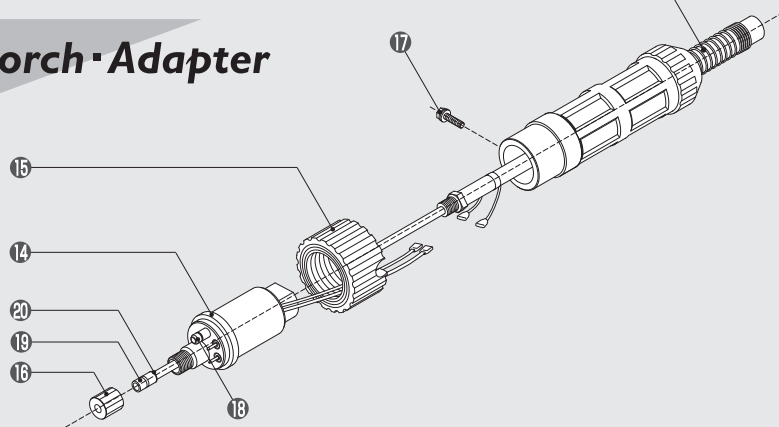
#### ■ Replace the guide tube

1. Push by screwdriver head and pull out old guide tube.

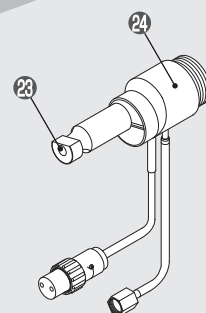


2. Insert new adapter guide tube from the sharpened tip.

### Torch Adapter



### Adapter



# Parts List

## 1 Nozzle

Part No.	Size • Applicable Torch Model
001 002	φ 16 (350A) 73L
001 003	φ 12 (350A) 73L
001 008	φ 18 (350A) 73L
001 009	φ 16 (350A thick 2.5t)
001 004	N Narrow Nozzle (350A)
001 007	350A Arc Spot Nozzle
001 001	φ 19 (500A) 88L
001 010	φ 16 (500A) 88L
001 005	φ 13 (500A) 88L
001 012	φ 19 (500A) 84L
001 015	φ 16 (500A) 84L
038 040	CSL-18/20 φ 13
038 041	CSL-18/20 φ 16
* 038 042	CSL-18/20 Narrow Nozzle

\* Use the nozzle in combination with a long tip.

## 2 Orifice

Part No.	Size • Applicable Torch Model
003 001	L (500A)
003 002	S (350A)

## 3 Insulator

Part No.	Size • Applicable Torch Model
004 001	L (500A)
004 002	S (350A)

## 4 Contact Tip

Part No.	Size • Applicable Torch Model
002 016	N Tip 0.6
002 005	N Tip 0.8
002 001	N Tip 0.9
002 002	N Tip 1.0
002 003	N Tip 1.2
002 017	N Tip 1.4
002 004	N Tip 1.6
002 018	N Tip 1.2 (for Aluminum Welding)
002 019	N Tip 1.6 (for Aluminum Welding)
002 013	N Tip 1.2 (for Flux Cored Welding)
002 011	N Long Tip 0.6
002 006	N Long Tip 0.8
002 007	N Long Tip 0.9
002 008	N Long Tip 1.0
002 009	N Long Tip 1.2
002 507	N MAG Tip 1.0
002 503	N MAG Tip 1.2
002 502	N MAG Tip 1.4
002 501	N MAG Tip 1.6
002 212	N P Tip 1.2

## 5 Tip Body

Part No.	Size • Applicable Torch Model
036 001	A (350,450A)
036 002	B (500A)

## 6 Inner Tube

Part No.	Size • Applicable Torch Model
038 053	CSL-18/20
038 072	CSL-18L/20L
038 061	CSL-20F
020 210	CSL-35/35K/35G
020 212	CSL-35F
036 011	CSH-35K/35/45/50
036 350	CSH-35F/45F/50F
050 310	CSH-35L/45L/50L
036 014	CP-35

## 7 Torch Body

Part No.	Size • Applicable Torch Model
038 054	CSL-18/20
038 060	CSL-20F
038 056	CSL-20L
020 306	CSL-35
038 070	CSL-35K
020 205	CSL-35F
020 202	CSL-35G
036 022	CSH-35/45/50
038 004	CSH-35K
036 024	CSH-35F/45F/50F
036 051	CSH-35G
050 302	CSH-35L/45L/50L

## 8 Torch Body O-Ring

Part No.	Size • Applicable Torch Model
038 055	CSL (P-8)
036 030	CSH (S-9)

## 9 Handle

Part No.	Size • Applicable Torch Model
072 001	CSL
072 005	CSH
039 041	CP-35

## 10 Switch Lever

Part No.	Size • Applicable Torch Model
072 003	CSL
070 002	CSH
039 001	CP-35

## 11 Switch Spring

Part No.	Size • Applicable Torch Model
032 016	CSL/CSH/CP-35

## 12 Micro Switch

Part No.	Size • Applicable Torch Model
032 014	CSL/CSH
039 003	CP-35

## 13 Hexagon Socket Head Bolt

Part No.	Size • Applicable Torch Model
020 123	CSL
036 033	CSH

## 14 Power Adapter

Part No.	Size • Applicable Torch Model
020 001	CSL/CSH/CP-35

## 15 Adapter Nut

Part No.	Size • Applicable Torch Model
072 004	CSL
020 002	CSH/CP-35

## 16 Liner Nut

Part No.	Size • Applicable Torch Model
020 003	Liner Nut

## 17 Screw

Part No.	Size • Applicable Torch Model
020 004	CSL/CSH/CP-35

## 18 Adapter O-Ring

Part No.	Size • Applicable Torch Model
020 005	CSL/CSH/CP-35

## 19 Liner

Part No.	Size • Applicable Torch Model
037 001	CSL 0.6 3m
037 002	CSL/CP 0.8-0.9 3m
037 045	CSL 0.8-0.9 4m
037 003	CSL/CSH-35/CP 1.0-1.2 3m
037 004	CSL/CSH-35 1.0-1.2 4m
037 046	CSL-35/CSH-35 1.2 4.5m
037 005	CSL-35/CSH-35 1.2 5m
037 006	CSL-35/CSH-35 1.2 6m
037 007	CSH-35 1.4 3m
037 008	CSH-35 1.4 4m
037 047	CSH-35 1.4 4.5m
037 009	CSH-35 1.4 5m
037 050	CSH-35 1.4 6m
036 044	CSH-45/50 1.2-1.6 3m
036 043	CSH-45/50 1.2-1.6 4m
036 047	CSH-45/50 1.2-1.6 4.5m
036 042	CSH-45/50 1.2-1.6 5m
036 041	CSH-45/50 1.2-1.6 6m

## 19 Teflon Liner

Part No.	Size • Applicable Torch Model
043 1030	CSL/CSH-35/CP 1.2 3m
044 1030	CSH 1.6 3m

## 20 Liner O-Ring

Part No.	Size • Applicable Torch Model
036 035	S-4

## 21 Power Cable

Part No.	Size • Applicable Torch Model
072 030	CSL-18/20 3m
072 040	CSL-20 4m
073 030	CSL-35 3m
073 040	CSL-35 4m
073 045	CSL-35 4.5m
073 050	CSL-35 5m
073 060	CSL-35 6m
074 030	CSH-35 3m
074 040	CSH-35 4m
074 045	CSH-35 4.5m
074 050	CSH-35 5m
074 060	CSH-35 6m
075 030	CSH-45 3m
075 040	CSH-45 4m
075 045	CSH-45 4.5m
075 050	CSH-45 5m
075 060	CSH-45 6m
076 030	CSH-50 3m
076 040	CSH-50 4m
076 045	CSH-50 4.5m
076 050	CSH-50 5m
076 060	CSH-50 6m
039 330	CP-35 3m

## 22 Adapter

Part No.	Size • Applicable Torch Model
020 030	N
020 031	D (500A)
020 029	D (350A)
020 033	H
020 036	T
020 037	B

## 23 Adapter Guide Tube

Part No.	Size • Applicable Torch Model
020 040	N
020 041	D
020 043	B
020 044	H
020 045	T

## 24 Swich Lever Pin

Part No.	Size • Applicable Torch Model
072 008	CSH

## 25 CSL/CSH Insulation Rubber

Part No.	Size • Applicable Torch Model
072 017	CSL/CSH

## Parts for D Adapter

Part No.	Size • Applicable Torch Model
020 050	Power Cable Adapter (500A)
020 054	Power Cable Adapter (350A)
020 052	Outlet Guide
020 053	Guide Adapter

## Arc Cover

Part No.	Size • Applicable Torch Model
072 007	CSH

# Specifications

Torch Model		CSL-18	CSL-20 CSL-20F CSL-20L	CSL-35 CSL-35K CSL-35F CSL-35G	CSH-35 CSH-35K CSH-35V CSH-35F CSH-35L CSH-35G	CSH-45 CSH-45V CSH-45F CSH-45L	CSH-50 CSH-50F CSH-50L	CP-35
Rated Current (A)	A	180	200	350	350	450	500	350
Applicable Wire Size (mm)	mm $\phi$	(0.6,0.8) 0.9	(0.8,0.9,1.0) 1.2	(0.8,0.9,1.0) 1.2	(0.9,1.0,1.4) 1.2	(1.4,1.6) 1.2	(1.2,1.4) 1.6	(0.8,0.9,1.0) 1.2
Cable Length (m)	m	3	3/4	3/4/4.5/5/6	3/4/4.5/5/6	3/4/4.5/5/6	3/4/4.5/5/6	3
Duty Cycle (%)	% (CO <sub>2</sub> )	40	40	35	60	60 (Type F:40)	60 (Type F:35)	60
	% (MAG)	20	20	20	35	35 (Type F:20)	35 (Type F:20)	35
Cooling Method		Air Cooled						
Total Weight(with 3m cable)	Kg	1.9	1.9	2.3	2.4	3.0	3.6	2.3

## CSH-35F-N-3

Torch Model

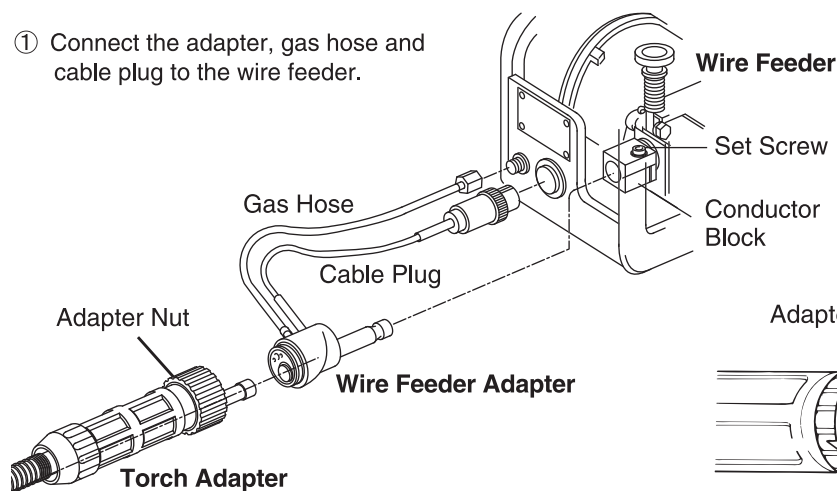
Cable Length (m)

The code used here is to specify the special type product.  
(Example: "EURO" for European specifications)

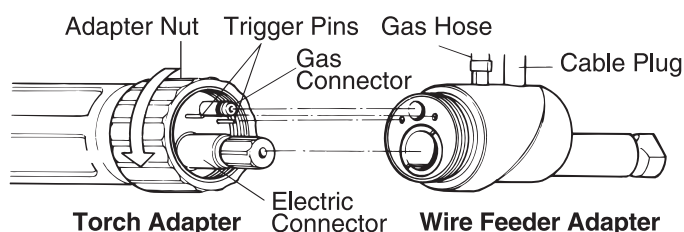
This alphabet code is used only for the direct use type of cable-end.  
**N Direct** : Panasonic Direct Use  
**D Direct** : DAIHEN Direct Use

## Preparation for Welding

- ① Connect the adapter, gas hose and cable plug to the wire feeder.



- ② Insert the electric connector and shielding gas connector of the torch into the holes in the adapter on the feeder side. Then firmly tighten the adapter nut.



## Connection to the Wire Feeder

Attach the "single operation adapter" to the wire feeder allows the torch to be connected easily.  
Following different types of adapters are available for connection to wire feeders.



▲ EURO

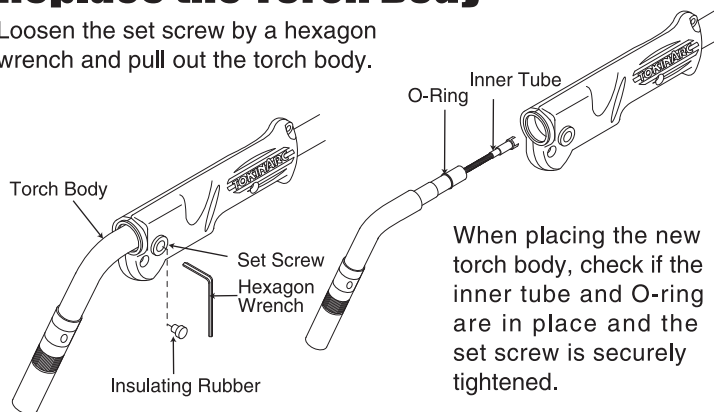
Adapter Type	Shape and Dimensions	Applicable Wire Feeder	Adapter Type	Shape and Dimensions	Applicable Wire Feeder
<b>N Adapter</b> (020030)		<b>Panasonic</b> For all Air-Cooled Wire Feeder  No adapter is needed when using a Uni-Con O series torch.	<b>H Adapter</b> (020033)		<b>HITACHI</b> For all Air-Cooled Wire Feeders
<b>D Adapter</b> <b>350A</b> (020029) <b>500A</b> (020031)		<b>DAIHEN</b> CM-231·CM-144· CML-23·CM-501  No adapter is needed when using a blue torch.	<b>T Adapter</b> (020036)		<b>NASTOA</b> For all Air-Cooled Wire Feeders
			<b>B Adapter</b> (020037)		<b>OSAKA DENKI</b> For all Air-Cooled Wire Feeders  No adapter is needed when using a GR·GH series torch.

■ Miller, Lincoln, Hobart and other manufactures' adapter are available on request.

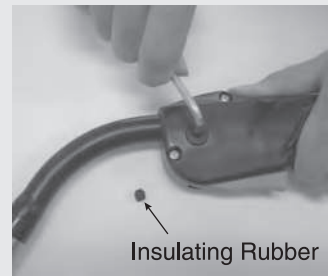
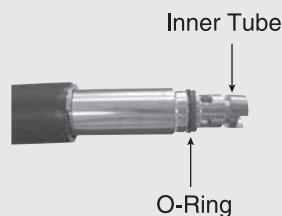


## Replace the Torch Body

Loosen the set screw by a hexagon wrench and pull out the torch body.



### NOTICE:



Insert the torch body all the way seated in and tighten a bolt. Inadequate tightening generates heat. Deteriorated O-ring, which leads to a gasleak, must be replaced.

## Replace the Inner Tube

When inside of the inner tube has been worn, remove the torch body and replace the inner tube.

### ■ CP-35



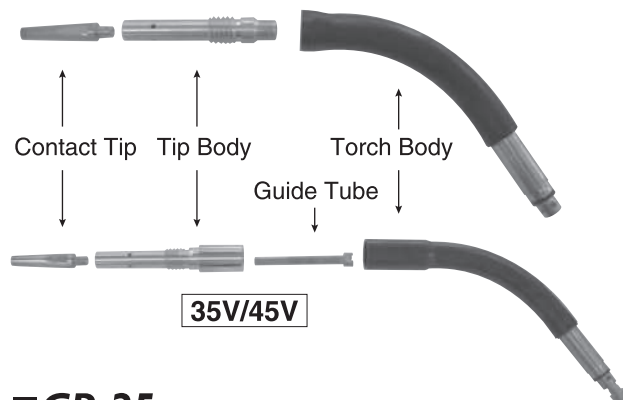
### Inner tube

Part No.	Torch Model
038 053	CSL-18/20
038 072	CSL-20L
038 061	CSL-20F
020 210	CSL-35/35K/35G
020 212	CSL-35F
036 011	CSH-35/45/50
036 350	CSH-35F/45F/50F
050 310	CSH-35L/45L/50L
036 014	CP-35

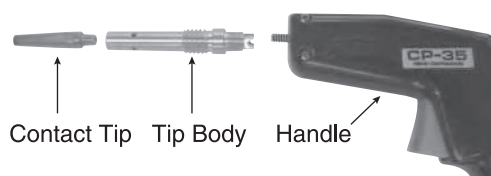
**NOTICE :** Adjust the length for replacing the inner tube. Cut the front end of new inner tube to adjust the length of torch body.

## Replace the Tip Body

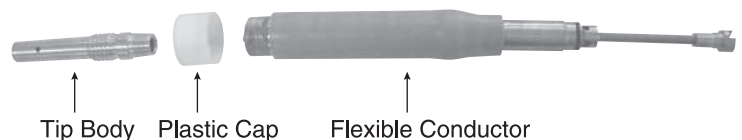
Unscrew the tip body with a wrench if damaged by heat and spattering. Keep the tip body tightened to the torch body all the time for longer life.



### ■ CP-35



### ■ CSL-20F,35F/CSH-35F,45F,50F



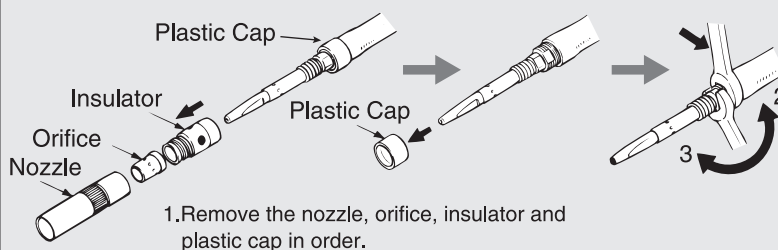
When replacing the tip body on flex torch, carefully unscrew the tip body with a wrench. Do not damage the flexible conductor part.

**NOTICE:** Tighten securely the tip body to avoid generating excess heat and unstable arc.



## Flex : Replacing the Tip Body

### Attention

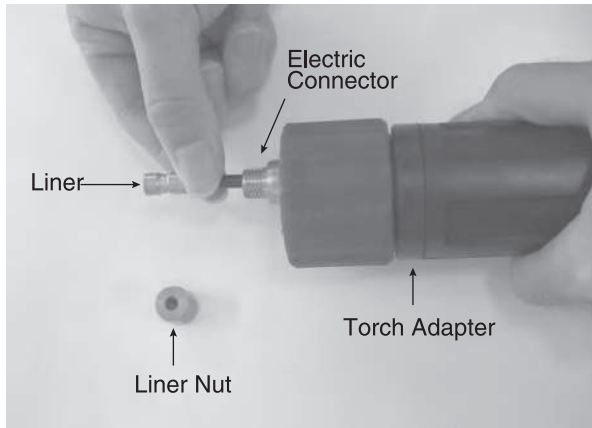


2. Hold the torch body with a wrench and remove the tip body by turning it counterclockwise with another wrench.

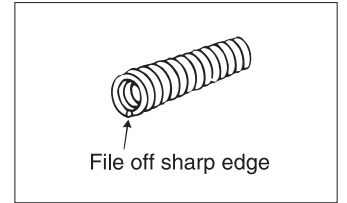
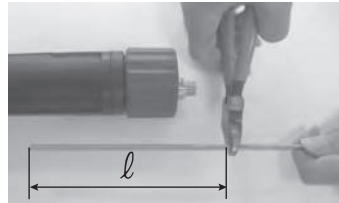
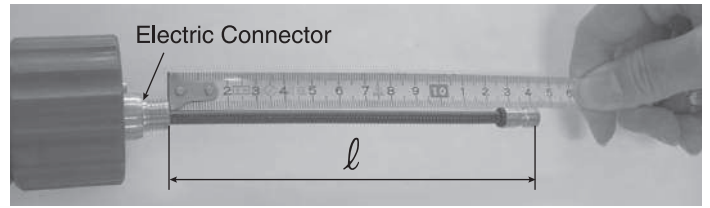
3. When replacing the tip body, be sure to hold the torch body with a wrench as well as removal procedure and tighten the tip body and put the plastic cap back.

# Replace the Liner

If wire feeding is no longer smooth because the inside of the liner is clogged with wire shavings or dirt and rust.

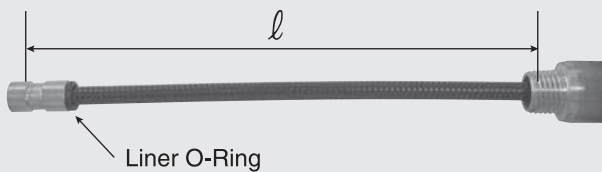


- ① Place the power cable in a straight line.
- ② Unscrew the liner nut. Rotate the torch end counter-clockwise so that the liner end comes out. Pull out the liner.

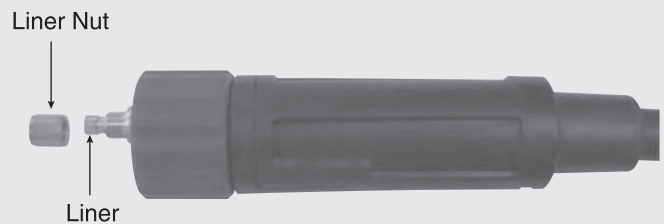


- ③ Insert the new liner fully into the cable. Measure the length "  $l$  " which protrudes from the end. Pull the liner out and cut off the same length "  $l$  " at the front. After cutting, file off sharp edge.
- ④ Insert the new liner adjusted in length into the cable. The O-ring at the end of liner prevents gas leak.

## NOTICE:

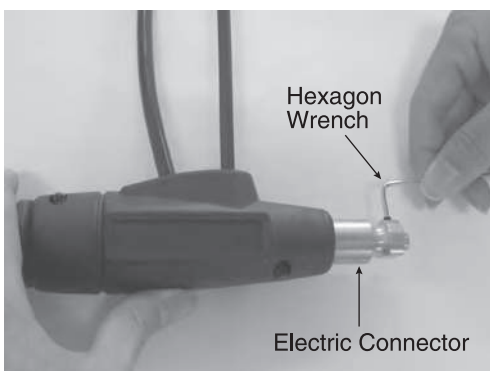


Carefully insert the liner which is properly cut to avoid bending.

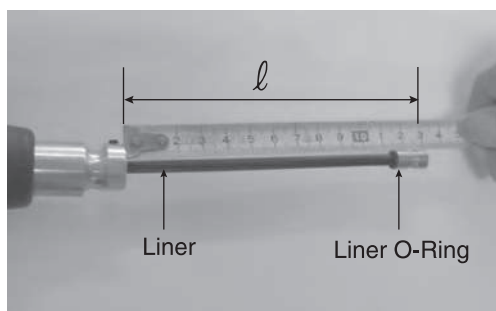


After setting the liner, screw on the liner nut by hand. Do not overtighten to prevent distortion of the liner. Tighten the liner nut by hand is adequate.

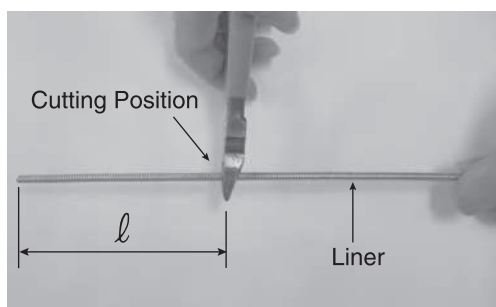
# Direct Connection Type



- ① Place the cable in a straight line.
- ② By a hexagon wrench, loose the socket head lock screw on the electric connector. Rotate the torch end counterclockwise so that the liner end comes out. Pull out the liner.



- ③ Insert the new liner fully into the cable. Measure the length "  $l$  " which protrudes from the end. Pull the liner out and cut off the same length "  $l$  " at the front. After cutting, file off any sharp edge.



- ④ Insert the new liner adjusted in length into the cable. The O-ring at the end of liner prevents gas leak. Tighten the hexagon socket head on electric connector. If the length of the liner is incorrect, this may hinder smooth wire feeding. Make sure to cut the liner in proper length.



# MEMO

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TC1504T05-01

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**CO<sub>2</sub> MAG Welding Torches**

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***TOKIN CORPORATION***

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