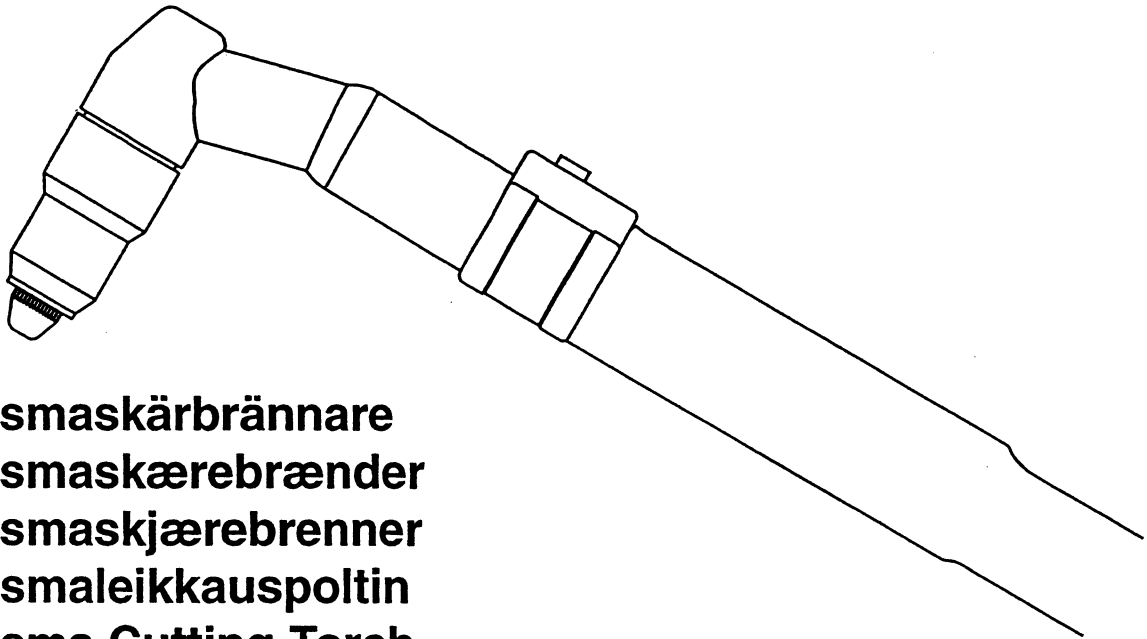


PT-25



**Plasmaskärbrännare
Plasmaskærebrænder
Plasmaskjærebrenner
Plasmaleikkauspoltin
Plasma Cutting Torch
Plasmaschneidbrenner
Chalumeau coupeur au plasma
Plasmasnijbrander
Soplete de corte de plasma
Cannello da taglio a plasma
Maçarico de Corte a Plasma
Κόπτης Πλάσματος**

**Instruktionshandbok
Brugsanvisning
Bruksanvisning
Käyttöohjeet
Instruction Manual
Betriebsanweisung**

**Manuel d'instruction
Gebruiksaanwijzing
Manual de Instrucciones
Manuale d'istruzioni
Manual de Instruções
Εγχειρίδιο Οδηγιών**

DECLARATION OF CONFORMITY
according to the EC Low Voltage Directive 73/23/EEC
FÖRSÄKRAN OM ÖVERENSSTÄMMELSE
enligt lågspänningsdirektivet 73/23/EEG

Fill in and put a cross in appropriate boxes Fyll i och kryssa tillämpliga rutor

Type of equipment Materialslag

Plasma Cutting Torch

Brand name or trade mark Fabrikatnamn eller varumärke

ESAB

Type designation etc. Typbeteckning etc.

PT-25 21650 (558 000 724) and 21651 (558 000 725)

Manufacturer's name, address, telephone No, telefax No: Tillverkarens namn, adress, telefon, telefax:

ESAB Welding & Cutting Products

411 South Ebenezzer Road, Florence, South Carolina 29501

Phone: +1 803 669 4411, Fax: +1 803 664 4258

Manufacturer's authorised representative established within the EEA; Name, address, telephone No, telefax No:

Tillverkarens representant inom EES; Namn, adress, telefon, telefax:

Esab Welding Equipment AB

Walter Edströms väg, 695 81 LAXÅ, SWEDEN

Phone: +46 584 81 000, Fax: +46 584 411 924

The following harmonised standards or technical specifications (designations) which comply with good engineering practice in safety matters in force within the EEA have been used in the design:

Följande harmoniserande standarder eller tekniska specifikationer (beteckningar) som uppfyller god säkerhetsteknisk praxis inom EES har använts i konstruktionen:

EN 50 078 Torches and Guns for Arc Welding

EN 50 192 Arc Welding Equipment - Plasma Cutting Systems

1. The equipment conforms completely with the above stated harmonised standards or technical specifications.

Materielen överensstämmer helt med ovan angivna harmoniserade standarder eller tekniska specifikationer.

OR ELLER

2. The equipment conforms only partially with the above stated harmonised standards or technical specifications but complies with good engineering practice in safety matters in force within the EEA.

Materielen överensstämmer endast delvis med ovan angivna harmoniserade standarder eller tekniska specifikationer men uppfyller god säkerhetsteknisk praxis inom EES.

Additional information Övriga uppgifter

By signing this document, the undersigned declares as manufacturer, or the manufacturer's authorised representative established within the EEA, that the equipment in question complies with the safety requirements stated above.

Genom att underteckna detta dokument försäkras undertecknad såsom tillverkare, eller tillverkarens representant inom EES, att angiven materiel uppfyller säkerhetskraven angivna ovan.

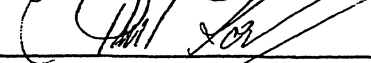
Manufacturer
Tillverkare

or
eller

Manufacturer's authorised representative
Tillverkarens representant

Date Datum
Laxå 97.10.15

Signature Underskrift



Position Befattning
Managing Director

Clarification namnförtydligande

Paul Karlsson

SVENSKA (SE)	4
DANSK (DK)	15
NORSK (NO)	26
SUOMI (FI)	37
ENGLISH (GB)	48
DEUTSCH (DE)	59
FRANÇAIS (FR)	70
NEDERLANDS (NL)	81
ESPAÑOL (ES)	92
ITALIANO (IT)	103
PORTUGUÊS (PT)	114
ΕΛΛΗΝΙΚΑ (GK)	125

Rätt till ändring av specificationer utan avisering förbehålles.
 Ret til ændring af specificationer uden avisering forbeholdes.
 Rett til å endre spesifikasjoner uten varsel forbeholdes.
 Oikeudet muutoksiin ilman tiedonantoa pidätetään.
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 Änderungen vorbehalten.
 Sous réserve de modifications sans avis préalable.
 Recht op wijzigingen zonder voorafgaande mededeling voorbehouden.
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 Reservamo-nos o direito de alterar as especificações sem aviso prévio.
 Διατηρείται το δικαίωμα τροποποίησης προδιαγραφών χωρίς προειδοποίηση.

1 INTRODUCTION**NOTE!**

This manual is intended for personnel with experience of plasma cutting. The operator using the cutting equipment must always be aware of the risks and safety regulations that this process entails.

National safety regulations for plasma cutting are generally recommended.

Unauthorized personnel are not permitted to install, use or service the equipment. It is important that the following instructions are read and properly understood before the equipment is installed and used.

In the event of uncertainty please contact ESAB AB or your nearest agent.

**WARNING**

ARC WELDING AND CUTTING CAN BE INJURIOUS TO YOURSELF AND OTHERS. TAKE PRECAUTIONS WHEN WELDING. ASK FOR YOUR EMPLOYER'S SAFETY PRACTICES WHICH SHOULD BE BASED ON MANUFACTURERS' HAZARD DATA.

ELECTRIC SHOCK—Can kill.

- Install and earth the welding unit in accordance with applicable standards.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from earth and the workpiece.
- Ensure your working stance is safe.

FUMES AND GASES—Can be dangerous to health.

- Keep your head out of the fumes
- Use ventilation, extraction at the arc, or both, to keep fumes and gases from your breathing zone and the general area.

ARC RAYS—Can injure eyes and burn skin.

- Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

FIRE HAZARD

- Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.

NOISE—Excessive noise can damage hearing.

- Protect your ears. Use ear defenders or other hearing protection
- Warn bystanders of the risk.

MALFUNCTION—Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

1.1 INTRODUCTION.

The PT-25 is a dual gas manual torch with a 90° head designed for use with ESP-100i plasma arc cutting package.



The plasma arc cutting process employs extremely high voltages. Contact with "live" parts of the torch

and machine must be avoided. Also, the improper use of any of the gases employed can present a safety hazard. Before beginning operation with the PT-25 Torch, refer to the safety precautions and operating instructions packed with your power source package.

Using the torch on any unit not equipped with a mating safety interlock circuit will expose operator to unexpected high voltage.

1.2 SPECIFICATIONS.

Current Capacity (100% Duty)	150 A DCSP (N ₂ , H-35, N ₂ /H ₂ Plasma) 100 A DCSP (Air Plasma)
Approved Service Gases:	
Plasma	Air, N ₂ , H-35, N ₂ /H ₂ Mixtures
Cooling	Air, N ₂ , CO ₂
Length of Service Lines:	7.5 m or 15 m
Weight	7.5 m—6.3 kg 15 m—11.3 kg
Min. Gas Flow Requirements:	
Cooling	170 l/min. at 4.8 bar
Plasma	97 l/min. at 4.8 bar

1.3 TECHNICAL DATA

The PT-25 Torch meets the requirements of instructions for Use of EN 50192 as follows:

- a. Process: Manual torch used for plasma arc cutting or gouging.
- b. Method of guidance: Manual.
- c. Voltage Class: M (113v peak to 400v peak).
Striking Voltage: 8000 VAC.
Stabilizing Voltage: 200 VDC.
- d. Maximum Rated Current: 150 amps, (N₂, H35, N₂/H₂ Plasma); 100 amps (Air Plasma).
Maximum Current at 100% Duty Cycle: 150 amps
Type Gas: Air 5.6 bar at 118 l/min.
- e. Maximum and Minimum Gas Pressure at inlet: 6.2 to 8.6 bar.
- f. Type of Cooling: Gas cooled.
- g. Rating of Auxiliary Electrical Control in Torch: N/A.
- h. Requirements for Connection of Torch: Wrenches and screwdriver.
- i. Essential information about Safe Operation of torch: Refer to all safety precautions in manual.
- j. Essential information about Safe Operation of the Plasma Cutting Torch and the Functioning of Interlocking and Safety Devices: Meets requirements by means of pneumatic interlock safety system. The interlocking device deenergizes the torch when parts, particularly protective cone, are removed to expose electrode con-

nection. For the interlocking device to function properly, the torch electrode must remain in the protective cone. Do not attempt to install the electrode into the torch without first placing it in proper position (with the other parts) within the protective cone.

- k. Type of Plasma Cutting Power Source that can form a Safe System with the Plasma Cutting Torch: ESP-100i.
- l. Plasma Cutting Ability: See Figures 3-1 and 3-2.
- m. Conditions under which Extra Precautions are to be observed during Plasma cutting:
 - 1. Refer to General Warning in Manual.
 - 2. Do not cut closed containers. An explosion may result.

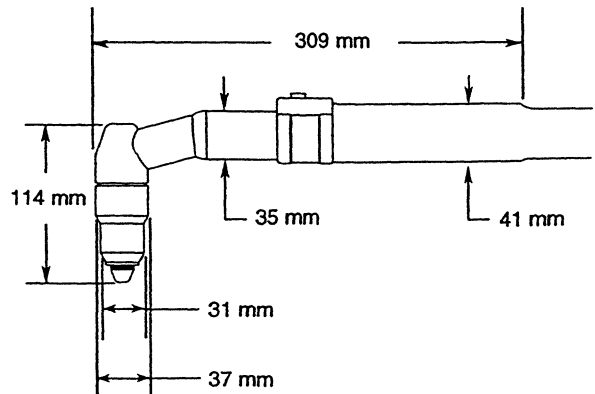


Figure 1-1 PT-25 Dimensions

2.1 ACCESSORIES

PT-25/100 amp Spare Parts Kit, 558000742

Quantity	Description	Part No.
5	Electrode Air/N ₂	558000732
2	Swirl Baffle	558000735
5	Nozzle-100A	558000727
2	Nozzle-Gouging	558000729
2	Heat Shield	558000730
1	Gouging Guard	558000737
1	Stand-Off Guide	558000736

PT-25/150 amp Spare Parts Kit, 558000743

Quantity	Description	Part No.
5	Electrode Ar/H ₂	558000733
2	Swirl Baffles	558000735
5	Nozzle-150A	558000728
2	Nozzle-Gouging	558000729
2	Heat Shield	558000730
1	Gouging Guard	558000737
1	Stand-Off Guide	558000736

Torch Guide Kit, 558000741 For circle and straight-line cutting.
 Plasma Flow Measuring Kit, 558000739 For checking gas flow through torch.

SECTION 3

INSTALLATION AND OPERATION

3.1 TORCH TO POWER SOURCE CONNECTIONS

Consult your power source instruction manual for access to the torch connections.



WARNING

Make sure the power switch on the console is in the off position and the primary input power is deenergized.

The PT-25 torch uses a "C" sized left hand thread fitting for the negative terminal and the plasma gas connection. Connect this fitting to the corresponding female fitting on the power source and tighten it firmly with a wrench. After tightening the fitting, slide the rubber boot on the power cable over the connection. The "B" sized right hand fitting is used to make the positive terminal and cooling gas connection. Tighten it firmly as well.

The safety sensor tube plugs into the small bulkhead fitting or tube union at the power source. Simply push it into the fitting or union until it is fully seated.



WARNING

The torch front end components are designed to send a gas pressure signal to the power source when the heat shield and nozzle are properly installed. This gas pressure operates in conjunction with circuitry provided in the power source. This patented system provides a safety interlock preventing the torch from being accidentally energized with high voltage when the heat shield is removed and the torch switch is accidentally closed. Occasionally check this system by removing the heat shield. Turn on power source. Do NOT touch the metallic parts on the torch front end. Close the torch switch and place the electrode in contact with a properly grounded work piece. If the torch energizes and arcing occurs between the electrode and work piece, DO NOT USE. Do NOT tamper with the torch or power source. Return torch and power source to your ESAB distributor for repair.

The torch switch connection is made with the 5-pin plug on the torch switch lead. Insert the plug into the socket on the power source and twist the locking ring to secure it in place.

3.2 GAS SELECTION

The PT-25 is a dual gas torch, allowing for one gas to be used for plasma gas and another to be used for cooling the torch as well as shielding the cut zone. Recommended combinations of gases are listed below.

! CAUTION

Use only those gases listed as approved in this manual. (See Section 1.2). Do not use Argon or Argon mixtures as cooling gas in the PT-25 as internal arcing in the torch head may occur. Do not use oxygen as cooling or plasma gas as the torch may catch fire.

Air Plasma/Air Cooling

Best overall combination for cut quality, cut speed and economy on mild steel, stainless steel and aluminum. This combination causes some surface nitriding at cut face and some surface oxidation of alloying elements on stainless steels. Always use clean, dry air. Moisture or oil in the air supply will reduce torch parts life.

Nitrogen Plasma/Air Cooling

This combination provides improved parts life, especially for the electrode. Cut speeds will usually be slightly slower than with air plasma. It creates surface nitriding but provides cleaner cut face on stainless steels. Nitrogen or CO₂ may be substituted for air cooling.

H-35 Plasma/Nitrogen Cooling

This combination gives excellent parts life with minimum amount of cut surface contamination, providing excellent weldability. It is most often used for gouging on mild steel, aluminum, and stainless steel. It gives poor cut quality on mild steel, good cut quality on aluminum and stainless, particularly on thicker sizes.

40% Hydrogen-60% Nitrogen Plasma/Air Cooling

This combination is used on aluminum only for increased speed and thickness capability. This combination offers no real advantage on stainless and mild steels.

3.3 OPERATING PARAMETERS

Recommended Gas Pressures

Plasma (Cutting) 4.5–5.2 bar
Plasma (Gouging) 2.8–3.1 bar
Cooling 4.5–5.5 bar

Recommended Stand-off
5–13mm

Recommended Current Settings

Air Plasma—100A maximum
N₂, Ar-H₂, N₂-H₂ Plasma—150 A maximum

Travel Speeds

Travel speeds for the PT-25 are given in the charts shown in figures 3.1 and 3.2.

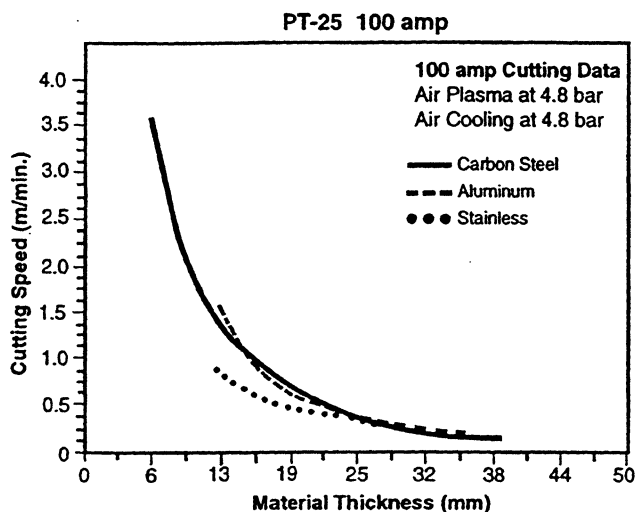


Figure 3-1. PT-25 Cutting Data, Air/Air

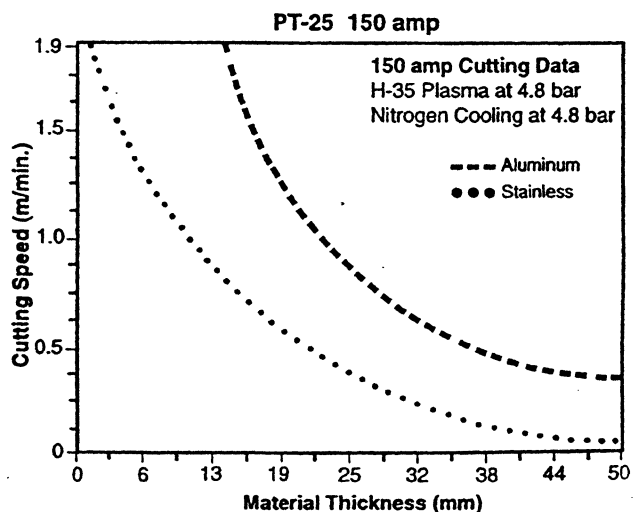


Figure 3-2. PT-25 Cutting Data, H-35/N₂

3.4 GAS CONNECTIONS

After the gases for the job have been selected, connect the gas supply hoses to the fittings at the back of the power source. Note there are two fittings for each gas. Use the fitting which best matches your hose. **Do not use oxygen as plasma or cooling gas for the PT-25. Do not use argon or argon mixtures for cooling gas.** Make sure that the fitting not used for each gas is plugged with the plug attached to the power source.

3.5 ASSEMBLING FRONT END PARTS



Make sure power switch on power source is in the OFF position and primary input power is deenergized. Failure to install front end parts properly can expose you to high voltage or fire.

BE SURE:

- Electrode holder assembly is tight.
- Swirl baffle is installed
- Electrode is installed and tight.
- Nozzle is installed.

Thread the electrode holder assembly (21657) into the torch body and tighten it securely in place using a 7/16" nut driver. Avoid overtightening and rounding off the hex on the electrode holder assembly.

Thread the electrode onto the electrode holder and tighten securely using the thumb and forefinger. The electrode is tightened properly when a slight snapping action is felt as one twists the electrode to remove it. Use electrode 558000732 for plasma gases of air, nitrogen or nitrogen/hydrogen mixtures. Use electrode 558000733 for argon/hydrogen (H-35) plasma gas.

Install the swirl baffle 558000735 by pressing it onto the torch insulator. The grooved face of the swirl baffle fits against the torch insulator and it should snap into place on the torch insulator.

Select the proper nozzle according to the cutting current which will be used, or select the gouging nozzle for gouging between 100 and 150 amps.

Drop the nozzle into the heat shield 558000730 so that the nozzle protrudes out of the shield's smaller end. Thread the heat shield onto the torch body, tightening it firmly by gripping it in the palm of the hand and twisting until the nozzle is fully secure and further twisting is noticeably more difficult.

If the optional gouging guard 558000737 or stand-off guide 558000736 is to be used, install it over the heat shield by pushing and twisting in the clockwise direction until it is fully seated on the shield.

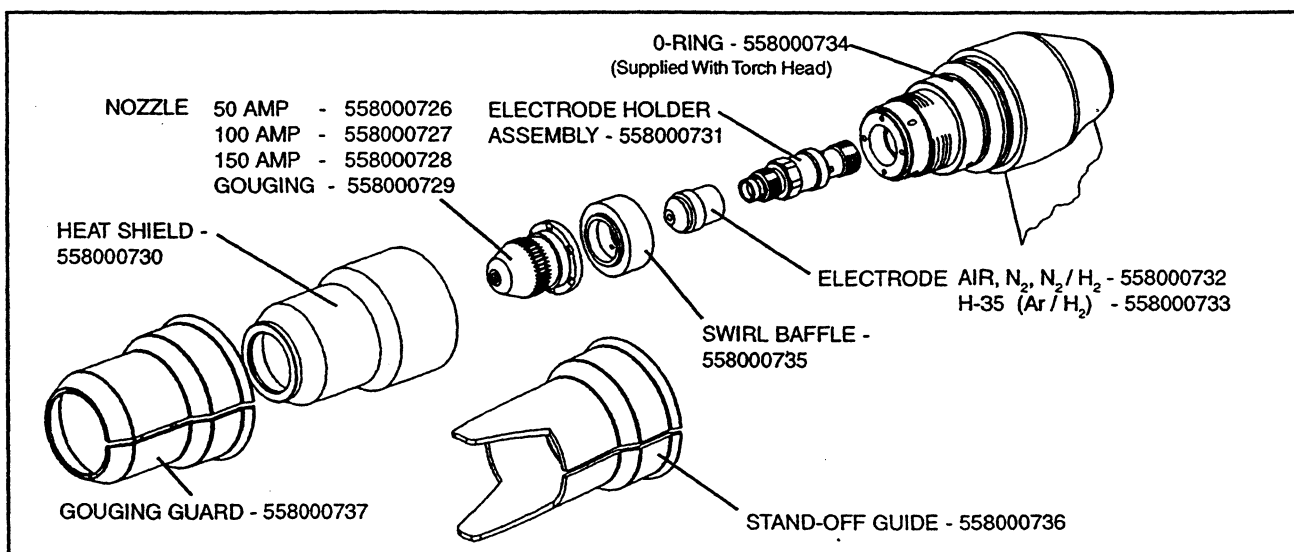


Figure 3-3, Assembly of PT-25 Front End Parts

IMPORTANT—Do not twist the gouging guard or stand-off guide in the counter-clockwise direction as this will loosen the heat shield.

Follow all instructions in the appropriate booklet packed with your power source package. Do NOT install or attempt to operate this torch without following these instructions. The torch front end design contains components which, working together with power source circuitry, prevent the torch from being accidentally energized when the heat shield is removed and the torch switch is closed.

3.6 GOUGING GUARD & STAND-OFF GUIDE

If desired, a metal gouging guard is available. It is used during plasma gouging and protects the torch by reflecting radiant heat and spatter produced during gouging.

The stand-off guide provides the operator with the ability to hold a consistent stand-off by keeping the guide's feet in contact with the work.

Install the guard or guide by sliding it onto the heatshield (heatshield should be in place on torch) with a clockwise twisting motion. Always install or adjust the guard or guide on the shield with a clockwise twisting motion to prevent loosening of the shield.

If the fit of the guard or guide is too tight on the shield, open the slot in the shield by twisting with a large flat blade screw driver. If the fit is too loose, close the slot by squeezing the guard or guide in a bench vise.

3.7 LOOSE CONSUMABLES

Proper performance of the torch will rely on proper and secured installation of the front end consumable parts, particularly the electrode holder, electrode, and heat shield.

1. Make sure that the electrode holder is fully threaded into the torch head and securely tightened using a 7/16" (11mm) nut driver.

Fully tighten the electrode onto the electrode holder using the thumb and forefinger (wrenches or pliers are not required). A correctly tightened electrode will come loose with a "snapping" action when it is removed using the thumb and forefinger.

2. Make sure that the nozzle and swirl baffle are securely installed by fully tightening the heat shield. "Fully" means at least 5mm of rotation after the swirl baffle and nozzle make firm contact with each other.

Improperly installed front end parts will cause gas leaks which may cause poor cutting or gouging performance and may cause damage to the torch itself from internal arcing.

3.8 OPERATION

CAUTION

Wear the usual protective gloves, clothing, ear protection and helmet. Read Safety Precautions covered in the instruction manual packed with your power source.

The torch is now ready for cutting or gouging operation. Refer to the instructions for your power source for making any control adjustments.

WARNING

Never touch any parts forward of the torch handle (nozzle, heat shield, electrode, etc.) unless the power switch on the power source is in the OFF position.

1. Turn the gas test or gas mode switch to the test or set-up position.
2. Turn the power switch to the ON position. Gas should now flow through the torch.
3. Adjust the gas pressure settings at the gas supply regulators to the values given in the operating parameters section. Turn the gas test or gas mode switch to the operating position. Gas flow should now stop. Adjust the current control to the correct setting for the nozzle.
4. Bring the torch into the proper position for cutting or gouging. For cutting, the torch stand-off (nozzle-to-work distance) should be approximately 6mm. If possible, start the cut from an edge on the workpiece. If piercing must be done, tilt the torch at an angle to deflect the molten metal away from the torch and operator until the pierce is complete, then bring the torch back to 5° to 10° from the vertical and begin the cut. For gouging, place the torch over the work at an angle of 35° to 45° from the horizontal.
5. Lower your protective helmet.
6. Push down and hold the torch switch button. The gas should start flowing. Two seconds later, the main contactor should close and the arc should transfer to the workpiece.

NOTE: Your power source may allow the preflow time to be extended longer than two seconds, usually up to four or five seconds. If, at the end of the preflow time, the pilot arc does not ignite, release the torch switch and check the gas pressure settings. If the pilot arc does ignite but does not transfer to the work, release the torch switch and check to see that the torch is in the proper distance from the work and that the work clamp is firmly connected to the work piece.

7. When cutting, maintain the torch stand-off at a distance of between 5 mm and 13 mm. When cutting thinner plates, the stand-off should be closer to the lower end of the range and it should be closer to the upper end of the range for thicker plates. Maintain a cutting speed which gives a cut of the desired quality and produces a stream of molten metal emitting from the bottom of the workpiece.
8. When gouging, maintain an angle and speed which causes the desired amount of metal to be removed on each pass. Maintain the torch angle so that all the molten metal is blown directly away from the torch, along the top surface of the plate or down the groove of the previous pass. Gouging at too steep of an angle will cause molten metal to fly directly back at the torch.
9. If the main arc is lost during the cut (or gouge), the pilot arc will immediately reignite as long as the torch switch is depressed. At this time the torch should quickly be repositioned at the workpiece to re-establish the main arc or else the torch switch should be released.
10. The main arc will automatically extinguish at the end of the cut as the torch is moved away from the workpiece. The torch switch should be released immediately to keep the pilot arc from reigniting.
11. When cutting (or gouging) operations are completed, wait a few minutes before placing the power switch on the power source in the OFF position to allow the fan to remove heat from the unit. After this time, shut off the primary power at the main disconnect switch.

4.1 DISASSEMBLY OF FRONT END



Make sure power switch on power source is in the OFF position and primary input power is deenergized.

If the gouging guard or stand-off guide is being used, remove it by twisting clockwise and pulling it from the heat shield.

With the torch head in the downward position, unscrew the heat shield and remove it, allowing the nozzle to remain inside.

Inspect the nozzle. The orifice should be round at both the entrance and the exit. Replace the nozzle if the orifice is oval shaped or is damaged at either the entrance or exit. The nozzle may have grey to black deposits on the inside surfaces. They may be cleaned with steel wool but care must be taken to remove all traces of the steel wool afterward.

Inspect the heat shield. There should be no signs of arcing anywhere inside the shield. The outer insulating jacket should not be severely charred or worn. Replace the shield if any of the above damage is found.

Inspect the electrode. If it has a pit more than 2mm deep at its center, replace it. Remove the electrode by unscrewing it from the electrode holder assembly. After prolonged high current use, the electrode may require the aid of pliers for removal. (Do not use pliers for installation).

Inspect the swirl baffle. If any signs of arcing are found, replace it. The faces of the swirl baffle must be kept clean where they contact the torch insulator and nozzle. Dirt or grit on these faces will affect torch performance.

Inspect the electrode holder. Replace it if it shows signs of arcing or if the electrode threads are galled.

Inspect the o-ring 558000734. If it is worn or damaged, replace it. If it is dry, lubricate it with a thin film of silicone lubricant 558000443. Use just enough lubricant to make the o-ring appear wet or shiny but do not leave clumps of excess lubricant.

After all of the front end parts have been inspected and replaced as needed, reassemble the torch as described in the section "Assembling Front End Parts".

4.2 GENERAL

Periodically check the heat shield, electrode holder assembly and swirl baffle. If any of these parts are damaged or excessively worn, replace them.

Check the torch o-ring daily. If the o-ring has nicks, cuts or other damage, replace it. If it is dry, lubricate it with a thin film of silicone lubricant. If no drag, caused by the o-ring, is felt when installing the heat shield, replace the o-ring.

The torch cable sleeving should be inspected periodically. If any damage to the sleeving is found, inspect the torch power and pilot arc cables for damage. If gas leaks or damage of any kind are found, replace the components in question.

4.3 DIRT OR CONTAMINATION

Dirt or other contamination can cause premature failure of the PT-25 torch through internal arcing. To avoid this, do the following:

1. Insure that clean, dry, oil-free air is used for plasma and/or cooling gas.
2. Avoid excessive use of the silicone o-ring grease on the torch o-ring. A thin film is sufficient.
3. Wipe the torch body insulator clean with a cloth before installing each fresh set of consumables. The ability of the insulator to resist arc tracking over its surface is reduced when dirt or other contamination is allowed to collect there.
4. When the torch is not in use, store it with a full set of front end parts installed. This will prevent dirt from collecting in the torch and will help protect the torch head if it is accidentally dropped.

4.4 REMOVAL AND REPLACEMENT OF THE TORCH HEAD

Note the position of all components and tape locations before performing disassembly to ensure proper positioning of components and tape during reassembly. Refer to Figure 5.1.

1. Slide the flex support rearward, onto the cable sleeving until it is approximately 450 mm to the rear of the handle.
2. Remove the tape near the end of the torch handle.
3. Slide the switch band and switch rearward and off of the handle.

4. Slide the cable sleeving rearward to expose the tube union for the safety sensor tube. Remove the torch end of the tube by pressing on the end of the union and pulling on the tube at the same time.
5. Unthread the handle from the torch head and slide it rearward to expose the torch cable connections.
6. Using two wrenches at each connection, unthread the two torch connections. The wrench sizes required are 3/8" (10mm) and 7/16" (11mm).
7. Pull the torch head away from the cable assembly, including the short piece of safety sensor tubing attached. Position the new torch head and safety sensor tube back into the assembly.
8. Using two wrenches at each connection, tighten the two torch connections securely. The torque value used at the factory for this step is 30–35 kg-cm.
9. Thread the handle back onto the torch head. Make sure the safety sensor tube on the torch passes through the handle.
10. Push the safety sensor tube into the union until it stops. Slide the switch band and switch onto the handle until it is 50 mm from the torch head. The red splice connections for the switch lead should be located just behind the handle end.
11. Pull the cable sleeving forward and tape in place behind the handle using vinyl electrical tape.
12. Slide the flex support back onto the handle until it contacts the switch band.

4.5 REMOVAL AND REPLACEMENT OF TORCH CABLES

1. Disconnect the torch cable assembly from the power source. Refer to your power source instruction booklet for detailed instructions.
2. Remove the torch head from the cable assembly as described in steps 1 through 7 of the previous section. Also remove the handle and flex support from the cable assembly.
3. Lay the cable assembly out straight. This should be done in an area about 1-1/2 times the length of the cables.
4. Using a piece of cord or sturdy twine about 1/2 the length of the torch cables, secure one end of the cord around all of the torch cables at the torch end and secure the other end of the cord to a stationary object.
5. Remove the tape from the cable sleeving at the power source end of the cables.
6. Push the switch out of the switch band and slide the handle, switch band and flex support to the far end of the cord used in step 4. Secure the power source end of the cables and pull the cable sleeving completely onto the cord.

7. Untie the cord from the cables and replace the damaged cable or cables. Be sure to replace the rubber boot on the power cable
8. Resecure the torch ends of the cables with the cord and pull the cable sleeving back onto the cables. Temporarily secure the sleeving to the cables near the torch head end with vinyl electrical tape.
9. Pull the flex support, switch band and handle back off the cord and onto the cable sleeving. Remove the tape.
10. Untie the cord from the cables and follow steps 7 through 12 of the previous section to secure the torch head to the cable assembly.
11. Secure the cable sleeving to the cables at the power source end with vinyl electrical tape.

4.6 REPLACEMENT OF FLEX SUPPORT, SWITCH BAND OR HANDLE.

If damage to the flex support, switch band or torch handle causes the need for replacement of any of these items, follow the procedure in the section "Removal and Replacement of the Torch Head" and replace the part(s) in question during step 7 prior to reattaching the torch head. This process will be made easier by temporarily securing the sleeving to the cables with vinyl electrical tape.

4.7 REPLACEMENT OF TORCH SWITCH

1. Follow steps 1 through 3 of the section "Removal and Replacement of the Torch Head".
2. Clip the black and white leads of the old switch as close as possible to the red splice connections. Strip 1/4" of insulation from the black and white leads.
3. Strip 1/4" of insulation from the new switch leads.
4. Attach the switch leads to the switch cable using the two new splice connections included with the replacement switch. Be sure to use a crimping tool made for crimping this type of splice connection.
5. Reverse steps 1 through 3 of the section "Removal and Replacement of the Torch Head" to finish.

4.8 MEASURING TORCH GAS FLOWS

If low gas flow is suspected of causing poor cutting performance or short consumable life, the flow can be checked by using Plasma Torch Flow Measuring Kit (558000739). The kit includes a hand held rotameter (flowmeter) which will indicate the gas flow rate exiting the torch. The kit also includes a set of instructions which should be followed exactly to insure safe and accurate use of the rotameter.

The PT-25's air or nitrogen flow rates should be as follows:

Cooling Flow	280–360cfh at 70 psig (132–170 l/min. at 4.8 bar)
Plasma Flow	115–140 cfh at 70 psig (54–66 l/min. at 4.8 bar)
Total Flow	395–500 cfh at 70 psig (186–236 l/min. at 4.8 bar)

Measure the flow rates using a new 100 amp nozzle, a new electrode and a new heat shield. Make sure that all parts are properly installed and that the torch o-ring is in good condition and not leaking. Measure the flows individually if possible. If not possible, measure the total flow.

Low gas flow rates (lower than those given here) indicate a restriction or a leak in the gas plumbing of the torch or power source.

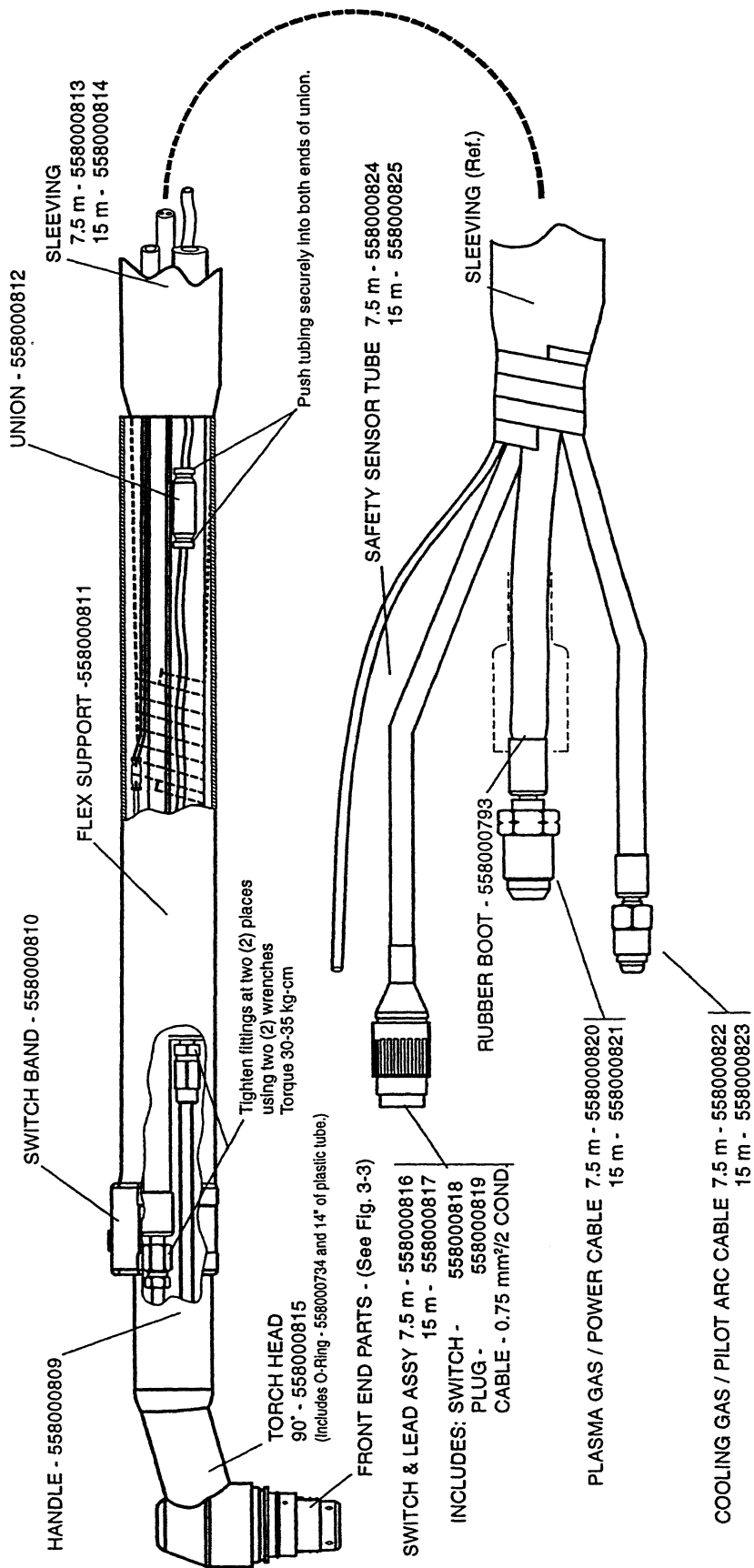


Figure 5-1. Replacement Parts - PT-25 Torch Assembly, 90° Head, 7.5 m lines - 58000724
PT-25 Torch Assembly, 90° Head, 15 m lines - 58000725