

PR-2000

High Frequency Inverter
Resistance Spot Welder



Instruction Manual

Version 2.0n 2/23/2010

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Quick start instructions



WARNING! Before turning the welder on, make sure it is connected to proper electricity by certified people. Connect air to the air inlet on back panel.



ATTENTION! Avant d'allumer le soudeur, vérifiez qu'il est connecté à l'électricité par des personnes certifiées. Connectez l'air à l'entrée d'air au panneau arrière.

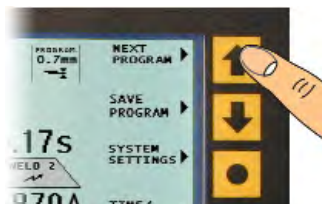
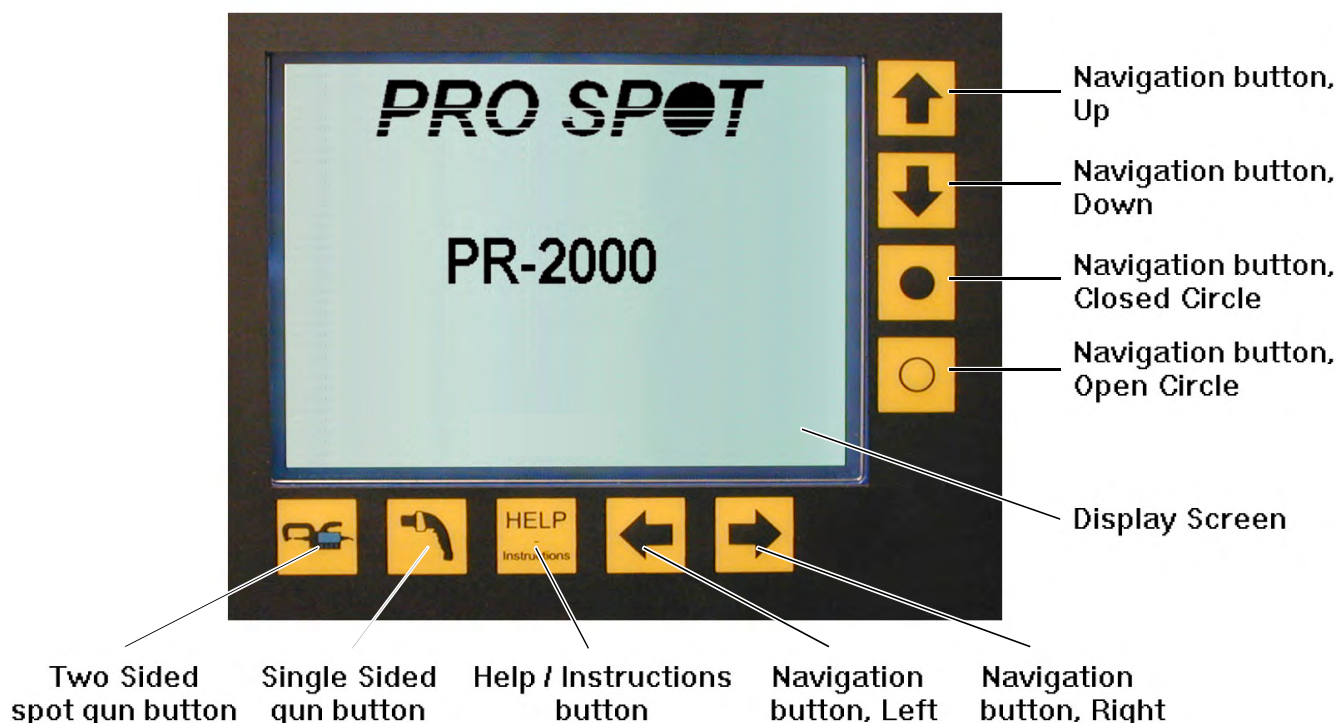


Figure 1.1



Figure 1.2

1. Turn the Power Switch on the front panel ON.
2. Connect Air to the air inlet located on the back panel.
3. During the test procedure a "Push Help to change language" prompt appears on the display screen . Click the Help button to acces the System settings screen where the language can be changed. Select desired language by clicking the "Change Language" button, then exit.
4. After test procedure, the software defaults to HSS/Galv. Two Sided weld mode.
5. The welder is now ready to operate. Make sure air pressure is set at 90 PSI. Place the welding gun at the weld area and press the lower trigger button to weld. The upper weld button is for spreading the electrodes open for better access.
6. There are 6 different power levels pre-programmed into the PR-2000. The software defaults to 0.7mm weld program. That is the thickness of one of the two layers of metal you are welding . To chage between pre-set power settings press Navigation button, Up (*fig. 1.1*). The programs will switch between 0.7, 1.0, 1.2, 1.5, 2.0 and 2.5mm.
7. To go to the next weld mode: "Mild Steel" press the Navigation button, Right (*fig. 1.2*). The same weld power levels are available in each weld mode. Navigate with the Right and Left arrow buttons and select weld power with the "Next Program" button (Navigation button, Up).
8. Press the "Help" button anytime for instructions.



1 Introduction

Congratulations on acquiring your new PRO SPOT PR-2000 welder!

Team Pro Spot looks forward to supporting you.

You have a welder and support group that will increase your productivity. The integrated features, ease of use, speed and quality welds that your PR-2000 offers will become an important part of your business.

The following information will be needed when you call Pro Spot:

* MODEL TYPE: PR-2000

* SERIAL NO: _____

The serial number is located on the back of the unit.

For parts or service contact your local distributor,

Local number: _____

or in the U.S. call: Toll free: 1-877 PRO SPOT or 1-760-407-1414

for a customer service representative.

Visit Pro Spot On-Line: www.prospot.com E-mail: info@prospot.com

NOTE: You can now order parts online at: prospot.com/store/

The PR-2000 Spot welder is used by body shops to duplicate the welding procedure used by the car manufacturers. Use of the equipment that is contrary to the instructions in this manual can cause personal injury and/or machine damage.

Pro Spot International, Inc. can in no way be held responsible for intentional or unintentional damage, and consequent unlimited loss of profit, loss of income, loss of business opportunity, loss of use, etc. that originates from incorrect use of this equipment in its use in a manner not intended.

Warranty

Pro Spot International, Inc. offers a two-year guarantee from the date of delivery of the new welder. This guarantee covers material defects and assumes normal care and maintenance.

The guarantee assumes that:

- the equipment is correctly installed and inspected
- the equipment has not been altered or rebuilt without approval from Pro Spot International, Inc.
- genuine Pro Spot International, Inc. spare parts are used to make repairs.
- operation and maintenance has been carried out according to the instructions in this manual.

All claims on warranty must verify that the fault has occurred within the guarantee period, and that the unit has been used within its operating range as stated in the specifications. All claims must include the product type and serial number. This data is stamped on the name plate.

Note: This instruction manual provides advice as well as instructions for installation, operation, maintenance and troubleshooting.



IMPORTANT! Read this manual carefully to become familiar with the proper operation of the welder. Do not neglect to do this as improper handling may result in personal injury and damage to the equipment.



IMPORTANT! Lisez ce Mode d'Emploi attentivement afin de vous familiariser avec le bon fonctionnement du soudeur. Ne négligez pas de le faire puisque une mauvaise manipulation peut conduire à des blessures et dommages à l'équipement.

The drawings in this manual are presented for illustrative purposes only and do not necessarily show the design of the equipment available on the market at any given time. The equipment is intended for use in accordance with current trade practice and appropriate safety regulations. The equipment illustrated in the manual may be changed without prior notice.

The contents in this publication can be changed without prior notice.

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Conformity with directives and standards:
 PR-2000 complies with CE standards.

2 Safety

2.0 Safety & Environmental Specifications

The PR-2000 Spot welder is designed for indoor use - Protection Degree IP21S. The PR-2000 Spot welder is designed to operate from -10° C to 40° C. The unit may be stored and transported in an ambient temperature from -20° C to +55° C. The unit can be operated at 95% Relative Humidity (RH). For operation above 1000m consult the manufacturer. Do not operate the unit on a slope of more than 10°. The unit meets the requirements of IEC|EN60974-1 2005 third edition and UL60974-1 2nd edition. E.M.C. classification is C1SPR11.

NOTE: Heating tests were performed at room ambient temperature and the duty cycle at 40° C has been determined by simulation.

2.1 General

The PR-2000 Spot welder has been designed and is tested to meet strict safety requirements. Please read the following instructions carefully before operating the PR-2000 and refer to them as needed to ensure the continued safe operation of the welder

Information provided in this manual describes the suggested best working practices and should in no way take precedence over individual responsibilities or local regulations.

The PR-2000 Spot Welder is designed to comply with all applicable safety regulations for this type of equipment. During operation, it is always each individual's responsibility to consider:

- Their own and other's personal safety.
- The safety of the welder through correct use of the equipment in accordance with the descriptions and instructions provided in this manual.

By observing and following the safety precautions, users of the PR-2000 Spot welder will ensure safer working conditions for themselves and their fellow workers.

2.2 Warnings and important notices

The following types of safety signs are used on the equipment and in Pro Spot's instruction manuals:



Caution.

Read instruction manual.



Prohibited.

Prohibits behaviour that can cause injury.



Command.

Calls for a specific action.



Warning.

Notice of personal injury risk and or damage to equipment.



Warning.

Some parts of the welder may become hot after prolonged use.



Attention!

Lire Mode d'Emploi.



Interdit.

Interdit aux comportements qui peuvent provoquer des blessures.



Commande.

Appelle à une action spécifique.



Avertissement.

Avis de risque de blessure personnelle et / ou d'endommager l'équipement.



Avertissement.

Certaines parties du soudeur peuvent devenir chaudes après une utilisation prolongée.

The following warnings and important notices are used in the instruction manual:

	WARNING! Do not operate or place the welder near water, in wet locations or outdoors. Risk for injuries or damage to the welder.		ATTENTION! Ne pas faire fonctionner le soudeur près de l'eau, en voie humide, ou à l'extérieur. Risque de blessures ou de dommages au soudeur.
	WARNING! Do not place the welder on unstable or uneven ground. The welder might tip causing personal injuries or serious damage to the welder.		ATTENTION! Ne placez pas le soudeur sur un sol instable ou irrégulière. Le soudeur peut basculer causant des lésions corporelles ou des dommages graves au soudeur.
	WARNING! All electrical connections must be made by a qualified electrician. Risk for electrical shock.		ATTENTION! Toutes les connexions électriques doivent être faites par un électricien qualifié. Risque de choc électrique.
	WARNING! Loose cables and hoses present tripping risks. Risk for injuries.		ATTENTION! Câbles et tuyaux lâches présentent des risques de déclenchement. Risque de blessures
	WARNING! Make sure to use welding goggles when spot welding. The sparks might otherwise injure the eyes.		ATTENTION! Veuillez utiliser des lunettes de soudeur sur place. Les étincelles pourraient autrement blesser les yeux.
	WARNING! Sparks from welding could start a fire. Risk for injuries.		ATTENTION! Étincelles de soudure pourrait provoquer une incendie. Risque de blessures.
	WARNING! Risk for damage to materials close to the weld, e.g to glass or textiles.		ATTENTION! Risque de dommages aux matériaux à proximité de la soudure, par exemple verre ou textiles.
	WARNING! For proper cooling efficiency, never operate the welder without connecting it to the compressed air source.		ATTENTION! Pour refroidissement efficace, ne jamais soudeur sans attacher à la source d'air comprimé.
	WARNING! All service and maintenance must be carried out by Pro Spot service personnel and service support. Risk for electrical shock.		ATTENTION! Tout le service et l'entretien doivent être effectués par personnel et soutien de service Pro Spot. Risque de choc électrique.
	WARNING! Unplug the welder from the wall outlet before servicing, cleaning or maintenance. Risk for electrical shock.		ATTENTION! Débranchez le soudeur de la prise murale avant l'entretien, ou nettoyage. Risque de choc électrique.
	IMPORTANT! The PR-2000 welder may only be used by qualified personnel. The user of the welder must have knowledge of spot welding and of alignment of collision-damaged vehicles.		IMPORTANT! Le soudeur PR-2000 peut seulement être utilisé par personnel qualifié. L'utilisateur du soudeur doit avoir une connaissance de soudage par points et l'alignement des véhicules endommagés par collisions.
	IMPORTANT! Do not turn off the welder while cooling is activated!		IMPORTANT! N'éteignez pas le soudeur pendant que le refroidissement est activé!
	IMPORTANT! The air must be clean and free from oil and moisture. Use filter.		IMPORTANT! L'air doit être propre et sans huile et humidité. Utilisez un filtre

2.3 Safety devices

When the Spot Gun is used continuously, the welding cables and the power transformer get hot. To prevent the welder from malfunctioning due to overheating, it is cooled using the built-in air system.

2.3.1 Cooling



Figure 2.1

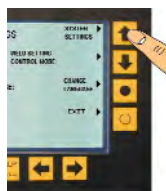


Figure 2.2

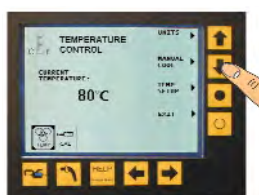


Figure 2.3

PR-2000 features an air cooling system that cools all four welding cables. There are two different Cooling Modes: "AUTO" (default) and "MANUAL". In the "AUTO" mode, the air cooling system turns on automatically after 15-30 welds and forced air starts to flow through the cable. In the "MANUAL" mode the cooling system operates continuously.

To switch to "MANUAL" mode:

- 1) Restart the software and press "HELP" button while start-up screen is displayed. "System Settings" screen will display (*fig. 2.1*).
- 2) Select "System Settings" by pressing the Navigation button, Up (*fig. 2.2*).
- 3) Select "Manual Cooling" by pressing the Navigation button, Down (*fig. 2.3*). AIR COOLING will activate.

2.3.2 Overheat protection

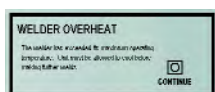


Figure 2.4

The built-in overheat protection is designed to prevent damage to the welder caused by overheating. The system will automatically shut off the welder when a pre-programmed temperature is reached (*fig.2.4*). **DO NOT** turn off the welder! It needs the cooling air to cool the machine faster. Wait until the display returns to normal (usually 4-8 min.) Shorter duty cycles (due to short weld times and "rest" periods between welds) will allow the cooling system to function better and may prevent the auto-shut-off. (Consistently check weld strength by performing destructive tests).



IMPORTANT! Do not turn off the welder while the cooling system is activated!



IMPORTANT! N'éteignez pas le soudeur pendant que le système de refroidissement est en marche!



IMPORTANT! If the thermal breaker has switched off the welder, please contact Pro Spot's authorized service personnel



IMPORTANT! Si le disjoncteur thermique a éteint le soudeur, contactez le personnel de service recommandé par PROSPOT.

3 Installation

3.1 General

The PR-2000 Spot welder is inspected and tested prior to leaving the factory to guarantee consistent quality and the highest possible reliability. Follow the installation tips and operating instructions below to ensure user safety and proper welder performance.



WARNING! Do not operate or place the welder near water, in wet locations or outdoors. Risk for injuries or damage to the welder.



ATTENTION! Ne pas faire fonctionner le soudeur près de l'eau, en zone humide ou à l'extérieur. Risque de blessures ou de dommages au soudeur.



WARNING! Do not place the welder on unstable or uneven ground. The welder might fall causing personal injuries and damage to the welder. Do not operate on a slope of more than 10°.



ATTENTION! Ne placez pas le soudeur sur un sol instable ou irrégulier. Le soudeur peut tomber causant des dommages graves au soudeur. Ne pas utiliser sur une pente de plus de 10°



IMPORTANT! It is the responsibility of the owner to ensure that the equipment has been installed as specified in the instructions provided. It is also the owner's responsibility to ensure that the welder is inspected in accordance with applicable regulations before it is put into service. Do not use for thawing out frozen water pipes (17.1)



IMPORTANT! Le propriétaire doit s'assurer que l'équipement a été installé conformément aux instructions fournies. Le propriétaire est également responsable de l'inspection du soudeur conforme à la réglementation applicable avant qu'il ne soit mis en service. Ne pas utiliser pour dégelier les conduites d'eau congelées (17.1)

A grounded electrical plug must be installed (*refer to section 3.4 "Connection of electrical supply"*).

3.2 Packaging and delivery inspection

Check the contents of the shipping container against the packing list, consignment note, or other delivery documentation to verify that everything is included and in the correct quantity. Check the PR-2000 Spot Welder carefully to make sure that no damage has occurred during transport. If anything is damaged or missing, the welder may be unsafe to use till the part is repaired or replaced. If anything is missing, please contact your supplier. Remove all packaging material from the welder.

3.3 Welder assembly



Figure 3.1

For your convenience, PR-2000 welder ships fully assembled.

Due to differences in wiring codes and connection methods, no electrical plug comes with the welder. Consult a certified electrician for proper installation of the electrical plug.

Insert the support arm (boom) as shown in *Figure 3.1*

3.4 Connection of electrical supply

The PR-2000 Spot Welder requires one of the following voltage / frequency combinations:

- ✓ 208-240V 50/60 Hz U.S.A., Canada, Japan OR
- ✓ 400-420V 50/60 Hz Europe, Australia

Note: Make sure that the facility supply voltage and frequency are the same as shown on the welder name plate (see section 4.2 “About your welder”).

The power supply must have a ground connection. The supply must also be protected as follows:

- ✓ The 208-240V 3-Phase or Single-Phase require 60A breaker.
- ✓ The 400V and 420V supply require a 32A slow blow fuse (Circuit breaker 32D).



WARNING! All electrical connections must be made by a qualified electrician. Risk for electrical shock.



ATTENTION! Toutes les connexions électriques doivent être faites par un électricien qualifié . Risque de choc électrique.

1. Connect the green wire to ground.

Note: Make sure that the supply cable is at least 6 AWG at 208V and 400 V. The PR-2000 is rated for over voltage category III and pollution degree 3.

3.4.1 Electrical Plug / Extension cords

2. If an extension cord is used with the welder, ensure that the length of the extension cord does not exceed 10 m (30 ft) and it meets the specifications of Item 1 above. The cord must also be grounded. Consult an electrician for safe and proper installation of the electrical plug.

NOTE: When connecting the welder to Single-Phase input power, install Red and White wires. Connect Green to earth ground! **Leave out the black wire.** Insulate and store the black wire properly.

3.5 Connection of pneumatic air supply

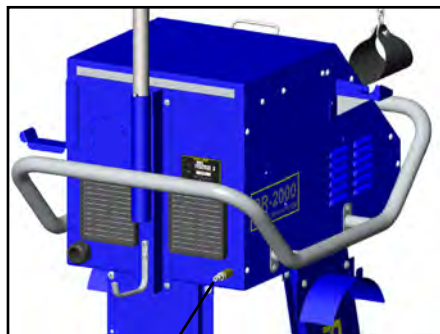


Figure 3.2

Air supply port

The PR-2000 Spot welder must be connected to a pneumatic air network. (100 PSI to 130 PSI)

1. Connect the PR-2000 to the air supply via the threaded input port at the rear of the welder using a standard connector.
2. If not already set, adjust the air pressure setting on the welder front panel to 60 PSI (4-5 bar) (refer to section 4.5 “Setting the pneumatic air pressure”).



IMPORTANT! The air must be clean and free from oil and moisture. Use a filter.



IMPORTANT! L'air doit être propre sans huile et humidité. Utilisez un filtre.

4 Operation

4.1 Before you begin welding

Before you begin welding, be sure to read and understand the following instructions.

The Pro Spot PR-2000 is a state-of-the-art Inverter Resistance Spot Welder that was designed for the collision repair industry. It duplicates the welding procedure used by the car manufacturers. It is important to understand the design and function of this welder before operating it.

ELECTRICITY ONLY: The PR-2000 uses only electricity to create the welds unlike the MIG welder which uses an arc from a feeding wire to build a weld nugget using inert gas and the feeding wire material.

PRESSURE: The PR-2000 has a built in air cylinder that compresses the Double-Sided Gun's welding tips together automatically when triggered. The compression is an important part of a good resistance weld. The pressure is adjustable from the Control Panel. The optimum welding pressure varies between 60-90 PSI (4-6.5 BAR). 90 PSI seems to be a common starting pressure. As a rule, increase pressure with thicker metals but remember that too much pressure could decrease the resistance of the metal between the electrodes, resulting in poor weld penetration.

CURRENT: Another important aspect of a weld is the current applied through the work piece. A weld is created when a large current is transferred through the layers of sheet metal. The resistance in the metal causes the area to heat up and fuse the sheets together in a nugget.

WELD PROGRAM: Maintaining the air pressure after the current shuts off makes the weld cool down under pressure resulting in a harder, stronger weld. This feature is built in to the PR-2000's weld control program and is engaged automatically during a weld cycle.

TIME: The Timer controls the duration of the current applied during the weld cycle. The ideal is to get a weld that uses higher current and shorter time to control heat buildup.

4.2 About your welder

4.2.1 Welder Overview & Technical Specifications

The welder is supplied with one of the following voltage and frequency combinations:

Input voltage: 1 or 3 phase
 208-240V 50/60 Hz. OR
 400-420V 50/60 Hz.

The actual voltage and frequency is stated on the rear panel name plate.

Open circuit output voltage 20v max. E.M.C. classification is C1SPR 11.

Note: For 1-phase installation leave out black wire.

Welding amperage: 9500A max (3-phase)
 6300A max (1-phase)

Cable length: 8' (2.5m) standard

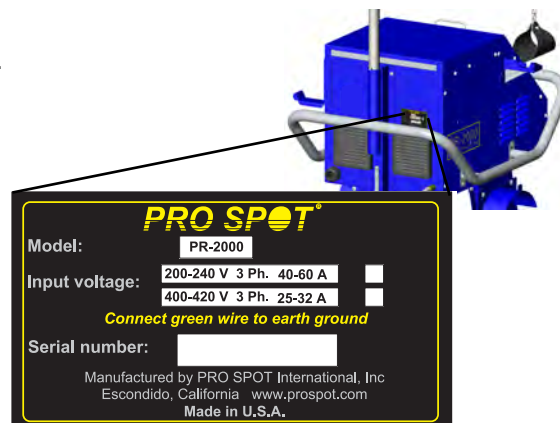
Electrode Pressure: At 7 bars (90 PSI)-280 DaN (616 Lb)

Cooling system: Air (2 fans)

Welding cable cooling: Air cooling

Microprocessor program: Digital control

Weight (standard): 213lb (97kg)



The name plate is at the rear of the welder unit.
 The required voltage is indicated with a check mark.
 Welding output is rated at 15V.

4.2.2 Getting familiar with your welder

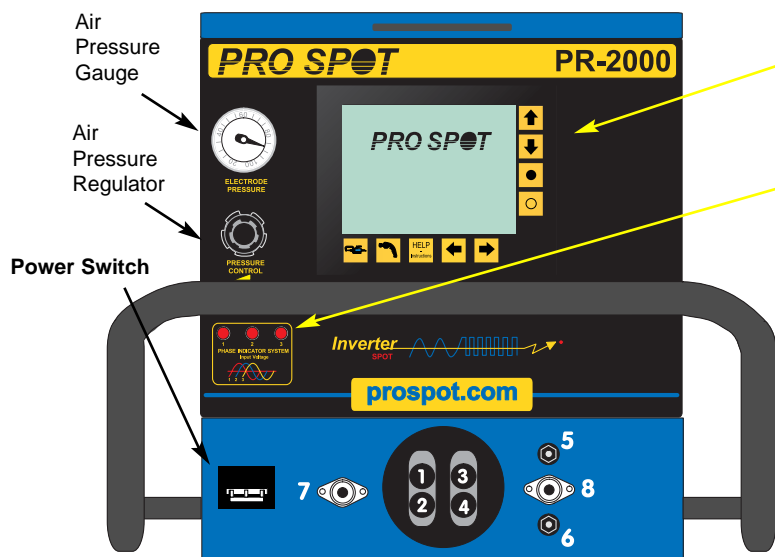


Figure 4.1 PR-2000-Front View

WELD CABLES CONFIGURATION

- ① Single-Sided Weld Gun cable
- ② Single-Sided ground cable
- ③ Two-Sided spot gun cable
- ④ Two-Sided ground cable

AIR HOSE AND COMMAND CABLE CONFIGURATION

- 5 Air Supply to 2-sided spot gun (compress)
- 6 Air Supply to 2-sided spot gun (release)
- 7 Command cable 1-sided gun
- 8 Command cable 2-sided spot gun

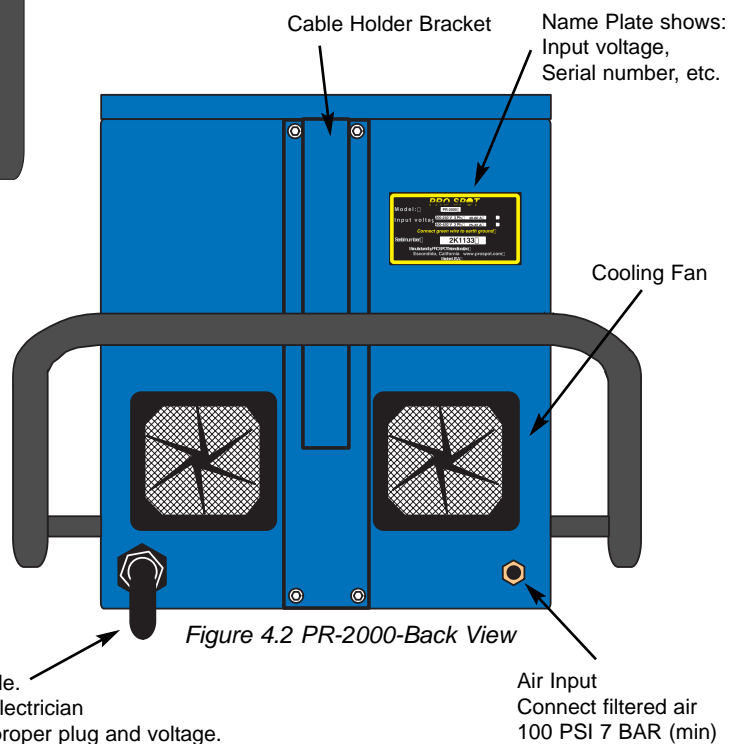


Figure 4.2 PR-2000-Back View

4.2.3 PR-2000 Control Panel

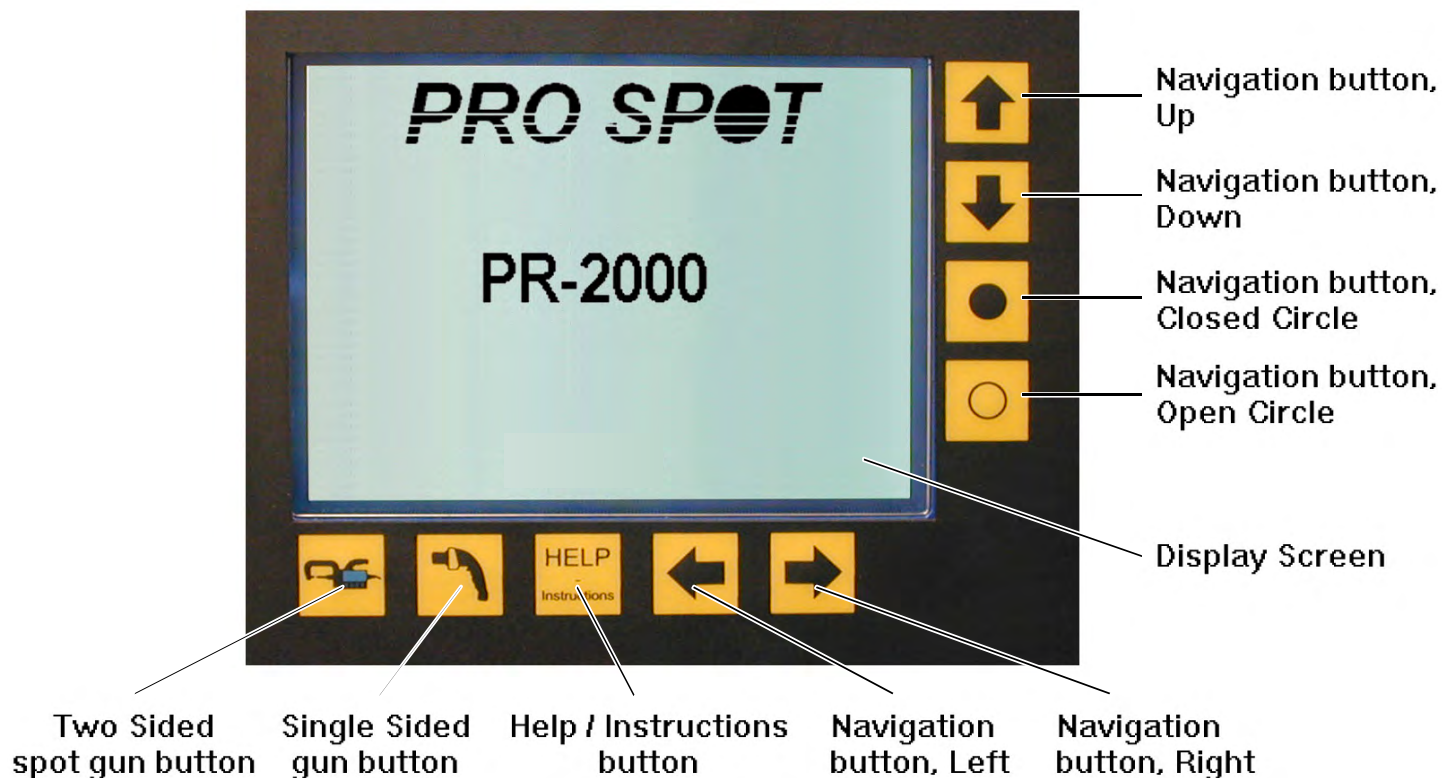


Figure 4.3 The PR-2000 Control Panel

4.2.4 Indications on the Control Panel



Figure 4.4



Figure 4.5

When two sided welding is selected, a spot gun graphic appears in the upper-left corner of the display screen (fig. 4.4).

When single sided welding is selected, a single sided gun graphic appears in the upper-left corner of the display screen (fig. 4.5).

4.3 Turning on the welder

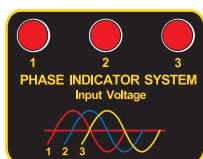


Figure 4.5.1

1. Toggle the circuit breaker on the front panel to "ON". Three lights on the front panel should illuminate indicating 3-phase installation, 2 lights for 1-phase installation (fig. 4.5.1)

2. The display will go through the start-up procedure and automatically default to Two-Sided welding.

3. The PR-2000 is now ready to use.



IMPORTANT! Make sure to read the instruction manual before operating the welder. Only trained personell should use this welder.



IMPORTANT! Assurez-vous de lire le Mode d'Emploi avant d'opérer le soudeur. Seules, les personnes qualifiées devraient utiliser ce soudeur.

4.4 Choosing the weld mode



Figure 4.6

The PR-2000 is a multi-functional resistance spot welder. It is equipped with a four weld cable system for your convenience. Two of the weld cables are connected to the Two-Sided Spot Gun and the other two are connected to the Single-Sided Weld Gun.

To select a weld mode, press the respective mode button (*fig. 4.6*)

Once the welding mode is selected, a group of related weld programs become available to the user (*see section 4.8 "Setting the default weld programs"*)

4.5 Setting the pneumatic air pressure

Pneumatic air is used for:

- forcing the spot gun to close and open.
- cooling the welding cables that are connected to the spot gun.

The air pressure is regulated with the air regulator, and the set pressure is indicated on the pressure gauge. Default pressure is 90 PSI.

Change the air pressure as follows:

1. Unlock the pressure regulator by pulling on the adjustor knob till it snaps into the unlocked position.
2. Turn the pressure regulator knob clockwise to increase or counter-clockwise to decrease the air pressure.
3. Lock the pressure regulator by returning the knob to the lock position.

4.6 Setting the weld program

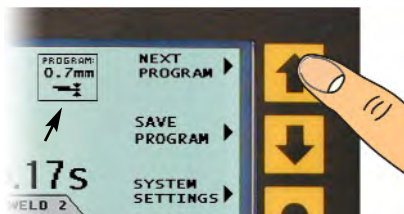


Figure 4.7

The PR-2000 features 6 different strength weld power modes. It defaults to 0.7mm program. To change weld program press "Next Program" (*fig. 4.7*).

The program box indicates the weld power (thickness).

For example, when welding two HSS Galv. metals that are 1.2mm thick, you should use the 1.2mm program.

If more power is desired, press "Next Program" to reach the next level.

4.7 Setting the weld time and current

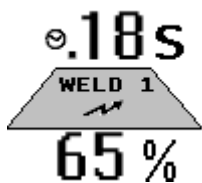


Figure 4.8

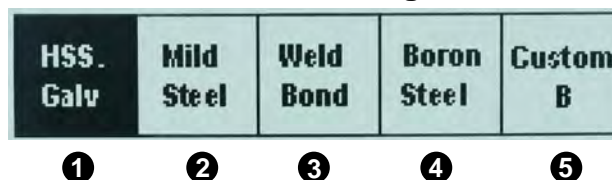
The time and current automatically change with each respective weld power mode.

Referring to *fig. 4.8*: The top value indicates the time duration that will be applied during the weld and the bottom value indicates the weld power in weld amperage that will be applied during the weld.

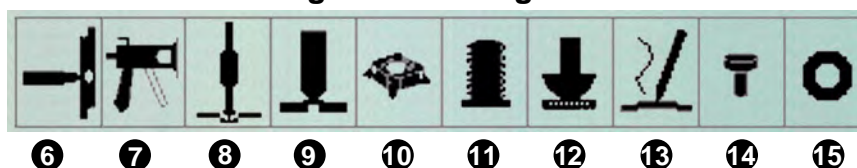
4.8 Setting the default weld programs

There are 15 weld programs featured in the PR-2000 Spot Welder. Ten of these programs are associated with the Single-Sided Gun and five are associated with the Two-Sided Spot Gun.

Two-Sided Programs



Single-Sided Programs



- | | |
|-----------------------------------|------------------------|
| ❶ HSS Steel / Galv. Steel Welding | ❿ Nut Welding |
| ❷ Mild Steel Welding | ⓫ Bolt Welding |
| ❸ Weld Bonding | ⓬ Stitch Welding |
| ❹ Boron Steel | ⓭ Carbon Rod Shrinking |
| ❺ Custom Program | ⓮ Rivet Welding |
| ❻ Single-Sided Spot Welding | ⓯ Washer Welding |
| ❼ Pro Pull Dent Removal | |
| ❽ Pulling | |
| ❾ Contact Shrinking | |



Figure 4.9



Figure 4.10

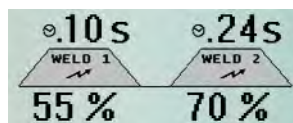


Figure 4.11

The welding programs are selected on the Control Panel. Select the welding program by using the Left and Right navigation buttons (*fig. 4.9*).

The selected program is indicated by a highlighted black box over the program name (*fig. 4.10*).

In any welding mode there are 6 power level programs: 0.7mm - 2.5mm. To switch between programs press the "Next Program" button (*fig. 4.7*).

Some programs require a double-weld in one cycle (*fig. 4.11*). Those welds automatically deliver Weld 1, programmed delay, then Weld 2. This is a very sophisticated weld feature for controlling exact temperature into the weld area and to pre-heat it.



Note: Two-Sided welding mode and Program No. 1 are set by default when the PR-2000 is turned on.



Note: Mode recto- verso de soudage et le programme de soudage n° 1 sont définies par défaut lorsque le PR-2000 est allumé.

5 Double-Sided Welding

5.1 PS-500 Double-Acting Spot Gun

The spot gun is used for the following weld programs:

- Two-Sided spot welding - HSS Galvanized steel, Mild steel, Weld Bonding, Boron Steel, Pulse welding and OEM, Custom Modes

(see section 4.8 "Setting the default welding programs")

5.1.1 PS-500 Component Diagram

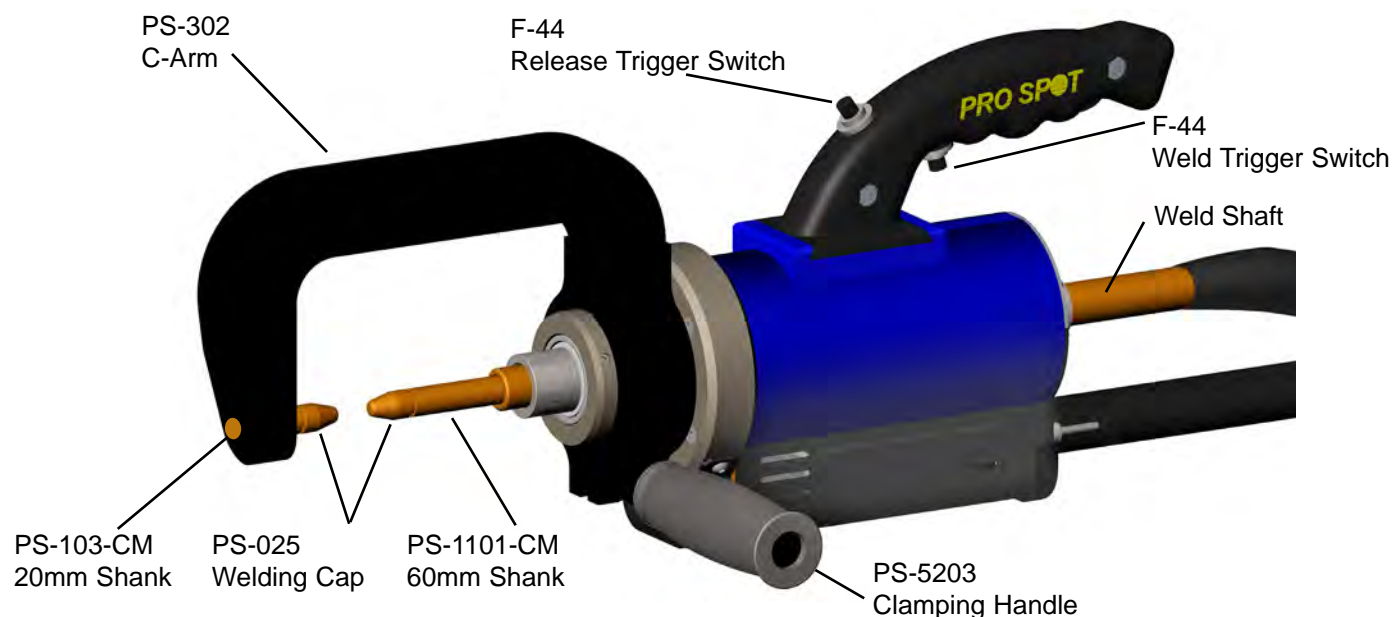
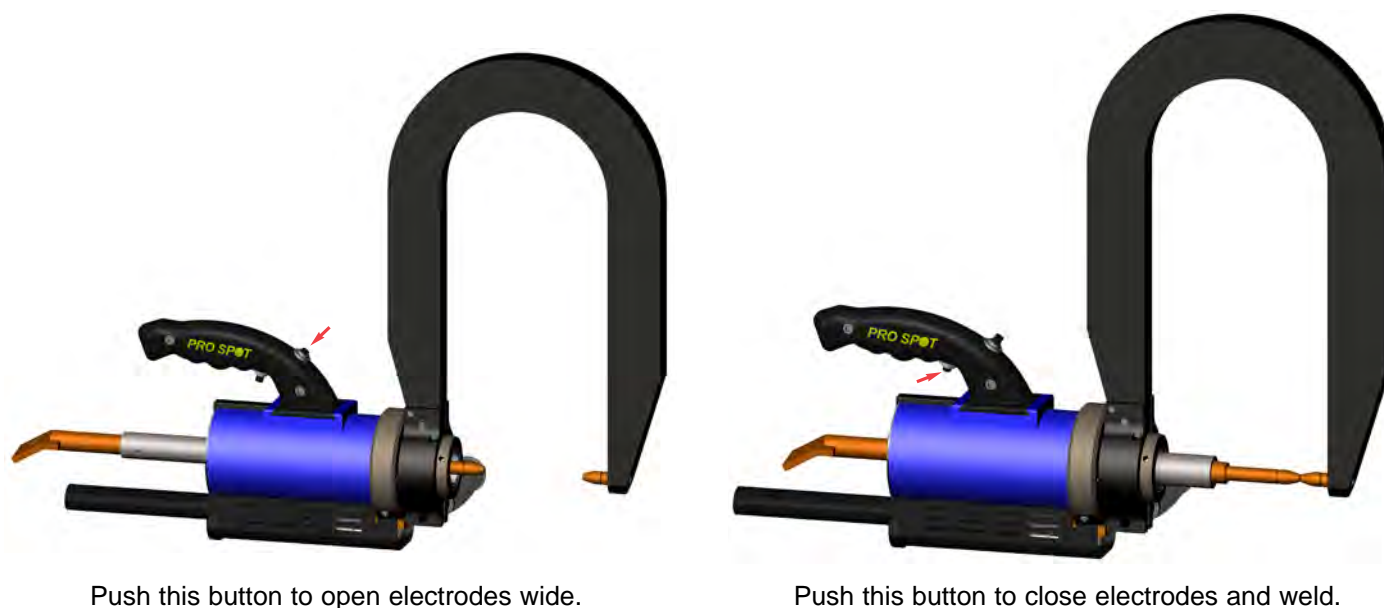


Figure 5.1 PS-500 Spot Gun - Component Diagram

5.1.2 Using the Double-Acting Gun



5.2 Extension Arms

The Pro Spot PR-2000 comes with a variety of extension arms to accommodate any welding job situation.

Please refer to *fig. 5.3* for details on what welding electrodes to use with each extension arm.



NOTE: Extension arms marked “*optional*” are available from your local distributor or online at www.prospot.com

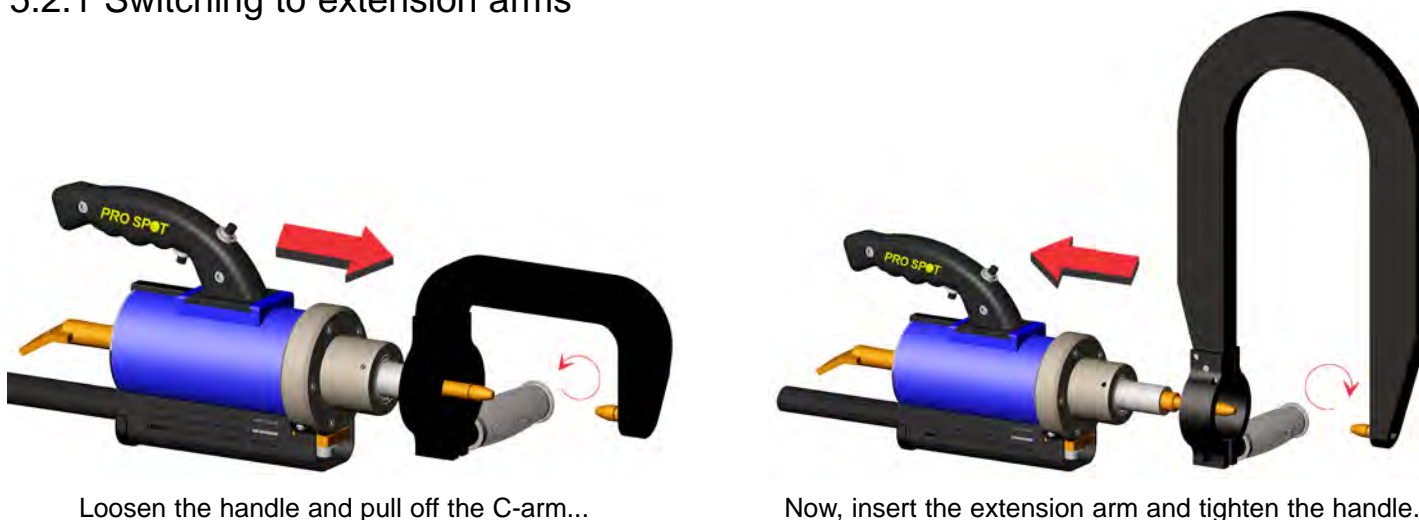


REMARQUE: Bras d'extension portant la mention «*facultatif*» sont disponibles chez votre Distributeur régional ou en ligne à www.prospot.com



Figure 5.2 PR-2000 Extension Arms

5.2.1 Switching to extension arms



5.2.2 Extension Arms and Welding Electrodes

Different extension arms require the use of different welding electrodes. Use charts in *fig. 5.3 and 5.4 to determine the correct combination of extension arms and welding electrodes.*



IMPORTANT! Using incorrect welding electrodes with extension arms may result in weak welds and/or damage to your welder.



IMPORTANT! Utiliser des électrodes de soudage inexactes avec le bras d'extension peut donner des soudures faibles et / ou endommager votre soudeur.

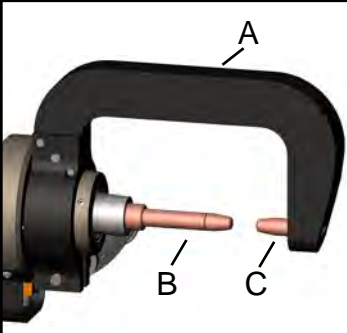
	A	B	C
	PS-302	PS-1101-CM	PS-103-CM
	PS-52-5/8	PS-1101-CM	PS-1133-5/8
	PS-403	see Sec. 5.7.3	see Sec. 5.7.3
	PS-305	PS-1101-CM	PS-129-CM
	PS-503-W	PS-1101-CM	PS-128-CM

Figure 5.3 Extension arm - Welding electrode configuration chart



Electrode Shank PS-025: Welding Cap

PS-103-CM	← 40 mm* →	
PS-102-CM	← 60 mm* →	
PS-1101-CM	← 80 mm* →	
PS-128-CM	← 100 mm* →	
PS-129-CM	← 120 mm* →	
PS-130-CM	← 160 mm* →	

* length with Welding Cap attached. -20mm w/o cap

Figure 5.4 Welding electrode selection chart



NOTE: PS-025 Welding Caps can be purchased in packages of 15 from your local distributor or online at www.prospot.com



REMARQUE: Des bouchons de type PS-025 peuvent être achetés en paquets de 15 chez votre distributeur local ou en ligne à www.prospot.com

5.3 PS-500 Electrode Alignment

Use the set screws (A, B, C) to align the electrodes. Ex: to move electrode down, loosen screw (C) and tighten screws (A and B).

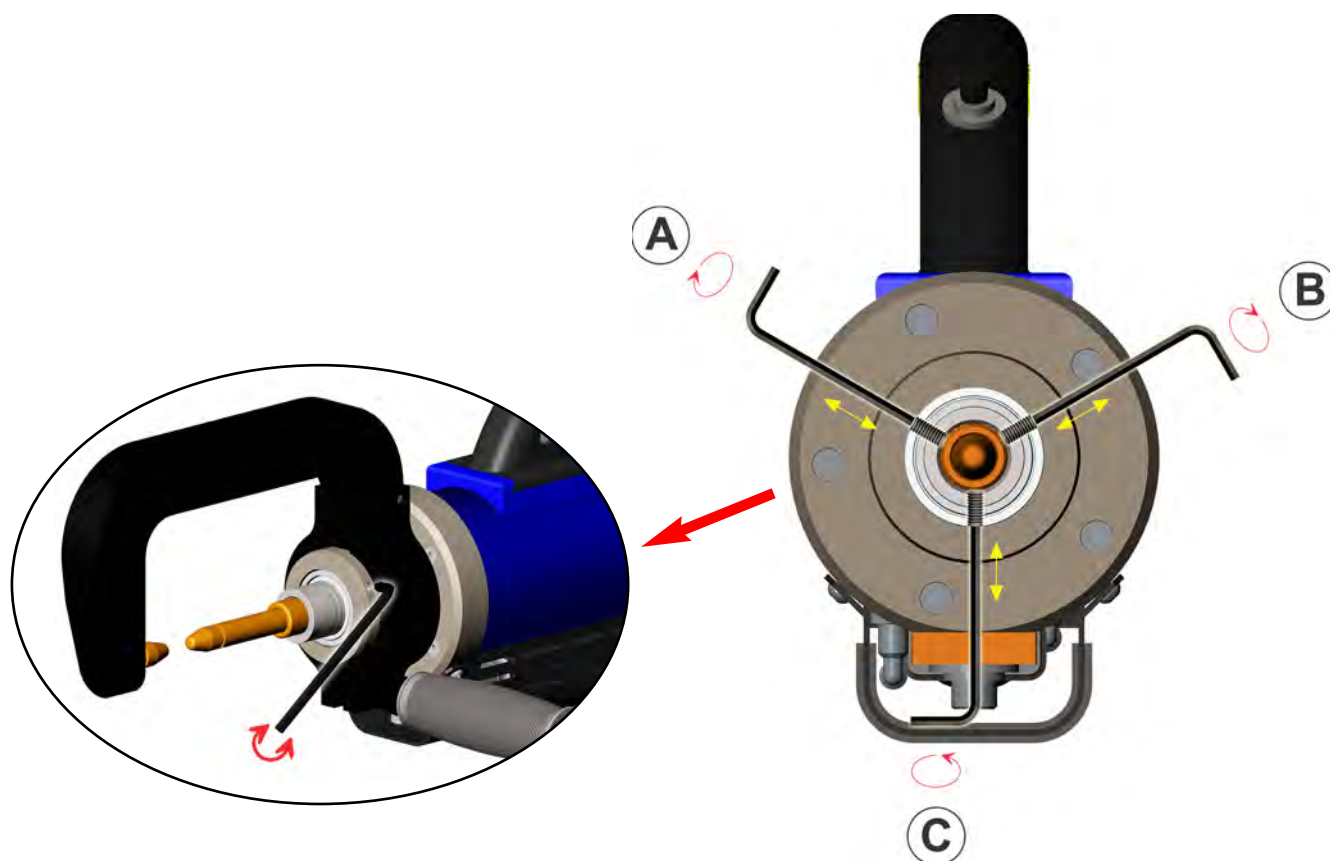
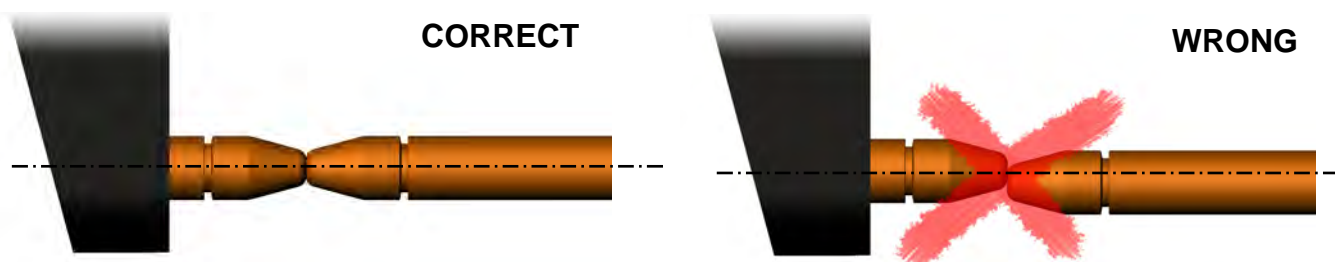


Figure 5.5 Electrode Alignment



IMPORTANT! Always maintain proper electrode alignment. Not doing so may result in weak, substandard welds!



IMPORTANT! Toujours maintenir l'alignement des électrodes appropriées. Ne pas le faire entraînerait des soudures faibles, de qualité inférieures!

5.4 Removing Welding Electrodes



Figure 5.6a: Removing Piston Electrode



Figure 5.6b: Removing Welding Cap



Figure 5.6c: Optional Weld Cap Removal Tool

Removing Extension Arm Electrode

The extension arm electrodes can be easily removed by lightly tapping them with a pin and hammer as shown in *fig. 5.6*

Removing Piston Electrode

To remove the piston electrode:

1. Grip piston electrode with a set of pliers or vise-grips (*fig. 5.6a*).
2. Rock the pliers back and forth to loosen the electrode from the holder.
3. Remove the electrode

Note: Vise-Grips shown in *fig. 5.6a* are specially designed to hold round objects without damaging or scarring them. You can purchase a set from your local distributor or online at: www.prospot.com



IMPORTANT! Do not attempt to remove the electrode by hitting it. This could damage the electrode and the spot gun.



IMPORTANT! N'essayez pas de retirer l'électrode en la frappant. Cela pourrait endommager l'électrode et le "pistolet".

Removing Welding Caps

To remove a welding cap:

1. Hold piston electrode with a set of pliers or vise-grips.
2. Grip welding cap with another set of pliers or wedge side cutters between cap and shank as shown in *fig. 5.6b*
3. Twist the two to loosen and remove the welding cap.



NOTE: An optional welding electrode cap removal tool is available, which makes cap removal easy (*fig. 5.6c*). You can order the cap removal tool from your local distributor or online at: www.prospot.com



REMARQUE: Un outil optionnel pour enlever le bouchon est disponible, pour faciliter le retrait du bouchon (*fig. 5.6c*). Vous pouvez commander cet outil chez votre distributeur local ou en ligne à l'adresse: www.prospot.com

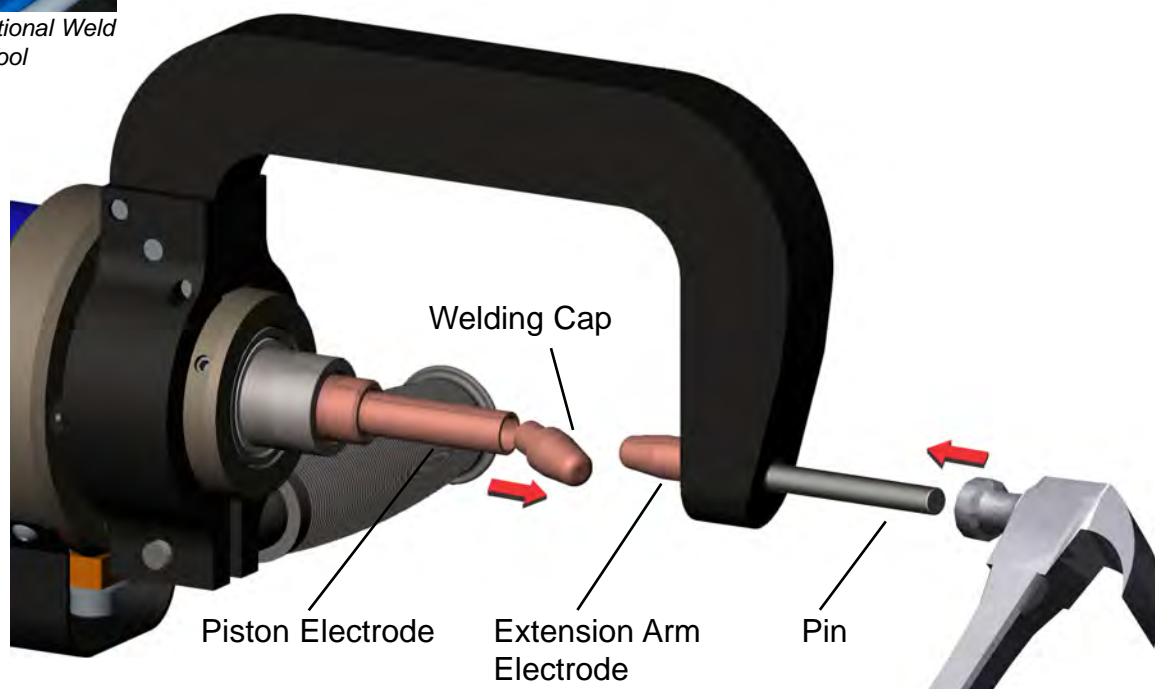


Figure 5.6 Removing Welding Electrodes

5.5 Welding Electrode Maintenance

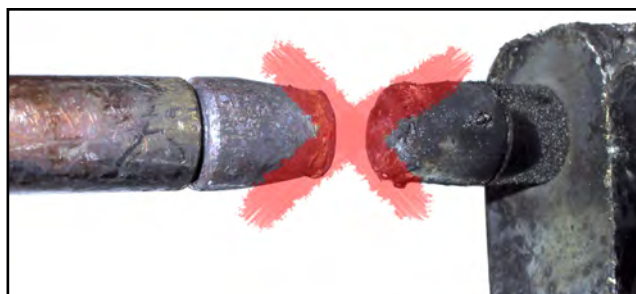
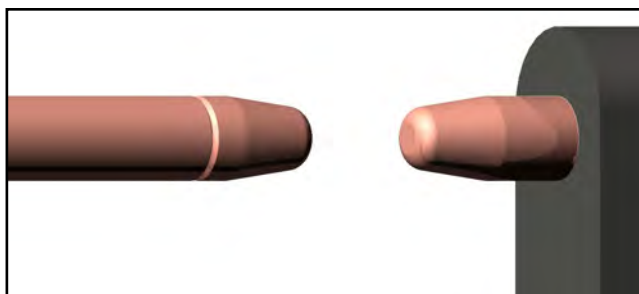
To maintain structurally-sound welds it is important to keep your welding electrodes clear from build-up. It is also important to maintain a 6mm weld nugget diameter. Clean electrodes with a file and periodically replace welding caps as explained in Section 5.4 *“Removing Welding Electrodes”*



WARNING! The electrodes may be hot. Use caution when handling them.

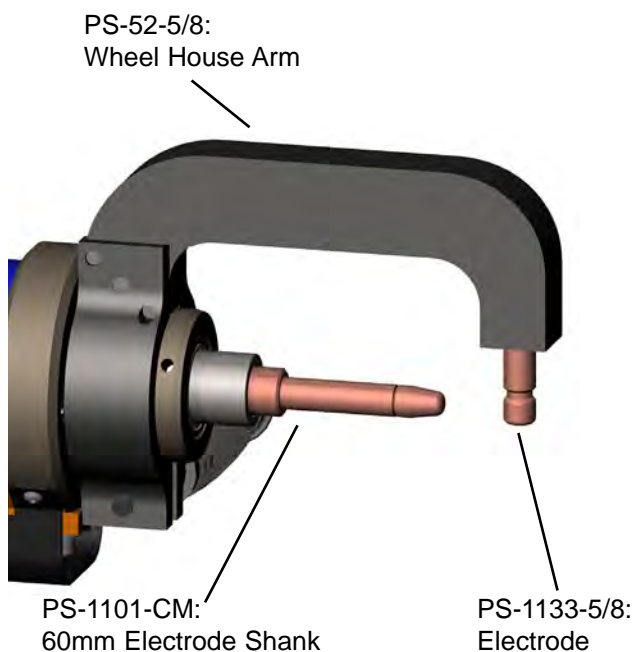


ATTENTION! Les électrodes peuvent être chaudes. Soyez prudent lors de leur manipulation .



5.6 Wheel House Arm

The wheel house adapter allows access to hard to reach areas such as the wheel house



5.7 X-Adapter (optional)



C-TYPE GUN

The advantage of the C-Type Spot Gun is that when making vertical pinch welds on quarter panels, rocker panels, door pillars, etc., the spot gun is positioned perpendicular to the work area. Easy to reach! Easy to use!



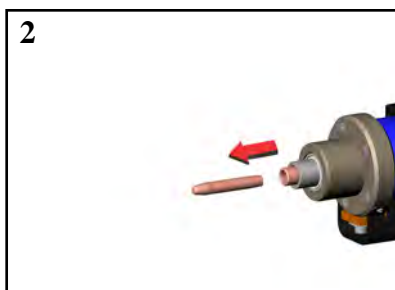
X-TYPE GUN

The X-type design is used on certain applications where the C-type can't reach. 90% of all welding needs can be done with the C-type but for some radiator support and truck bed pinch welds, the X-Adapter works better. This new invention from Pro Spot makes it possible to weld where you never could before!

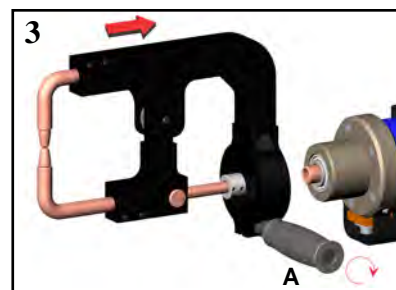
5.7.1 Attaching the X-Adapter



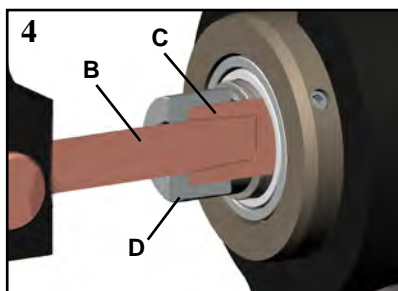
Loosen the handle and pull out C-arm...



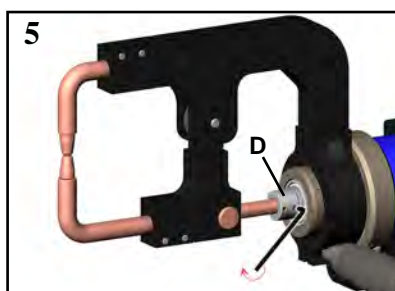
Follow instructions in **Sec. 5.4** to remove piston electrode



Insert the X-Adapter onto the gun. Tighten handle (A).



Insert the Tapered Electrode (B) into the Shaft (C). Apply air (carefully) to put pressure on the electrodes so that Tapered Electrode seats firmly in the shaft before tightening the Collar (D) set screw.



Tighten the Collar (D) set screw.



IMPORTANT! Do not tighten the Collar before the inserting Tapered Electrode into the shaft. The collar is designed to prevent the Tapered Electrode from falling out of the Shaft when the gun is fully opened.



IMPORTANT! Ne serrez pas le collier avant de glisser l'Électrode rétrécie dans le tube. Le collier est conçu pour empêcher l'Électrode rétrécie de tomber du tube quand le pistolet est complètement ouvert.

5.7 X-Adapter (optional) cont.

5.7.2 Using the X-Adapter



Push the upper switch to open electrodes wide.



Push the lower switch to close electrodes and weld.

5.7.3 X-Adapter Configurations

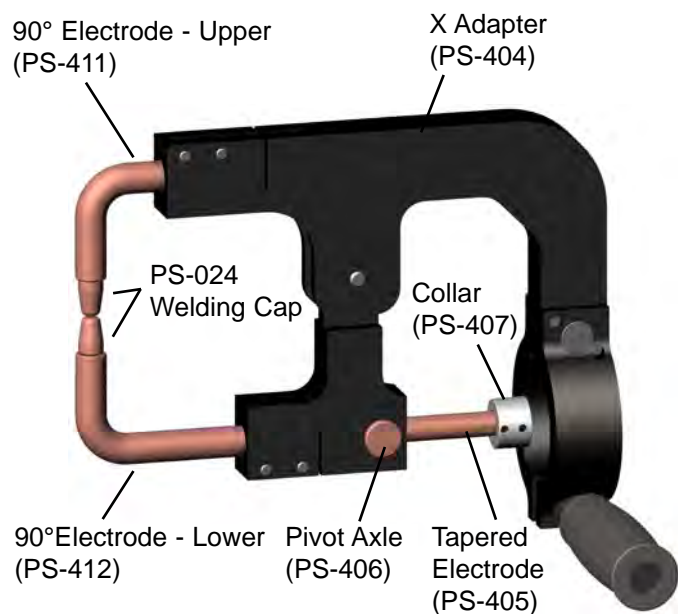


Figure 5.7 90° Arm Set

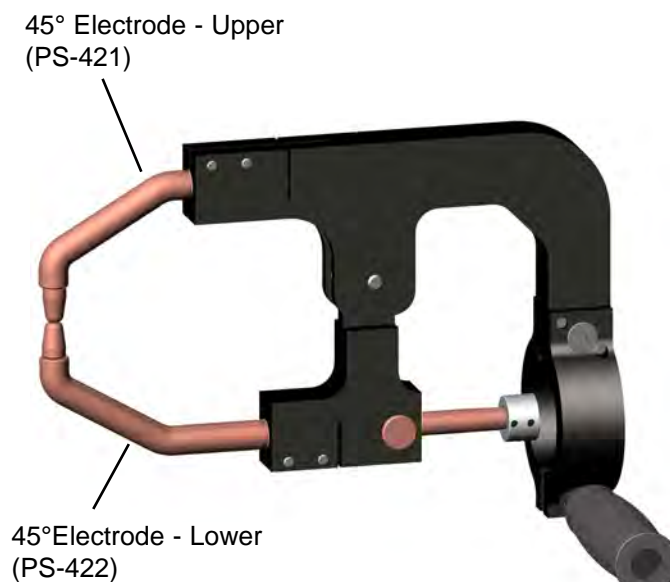


Figure 5.8 45° Arm Set

6 Single-Sided Welding

6.1 Single-Sided Welding Overview



Figure 6.1



Figure 6.1b

The Single-Sided Weld System allows the operator to carry out welding tasks using a Single-Sided Weld Gun. The Single-Sided weld procedure requires contact only from one side compared to two sides in Two-Sided welding. A ground plate must be connected to the panel to be welded for it to work (fig. 6.1).

You can also use an optional magnetic ground plate to easily attach the ground cable to the metal (fig. 6.1b).



NOTE: Make sure the ground plate is clamped firmly in place on the inside of a clean metal surface as near as possible to the weld location. Do not attach the ground to the metal you're about to weld on. When performing other weld tasks such as dent pulling, etc., the ground attachment location becomes less critical.



REMARQUE: Assurez-vous que la plaque de terre est fixée solidement en place à l'intérieur d'une surface métallique propre aussi près que possible du lieu de soudure. N'attachez pas la plaque de metal que vous êtes sur le point de souder. Quand vous effectuez d'autres tâches de soudures comme la traction d'impacts, etc le lieu de la prise de terre devient moins critique.

In the Single-Sided weld mode the following weld procedures are available for the PR-2000:

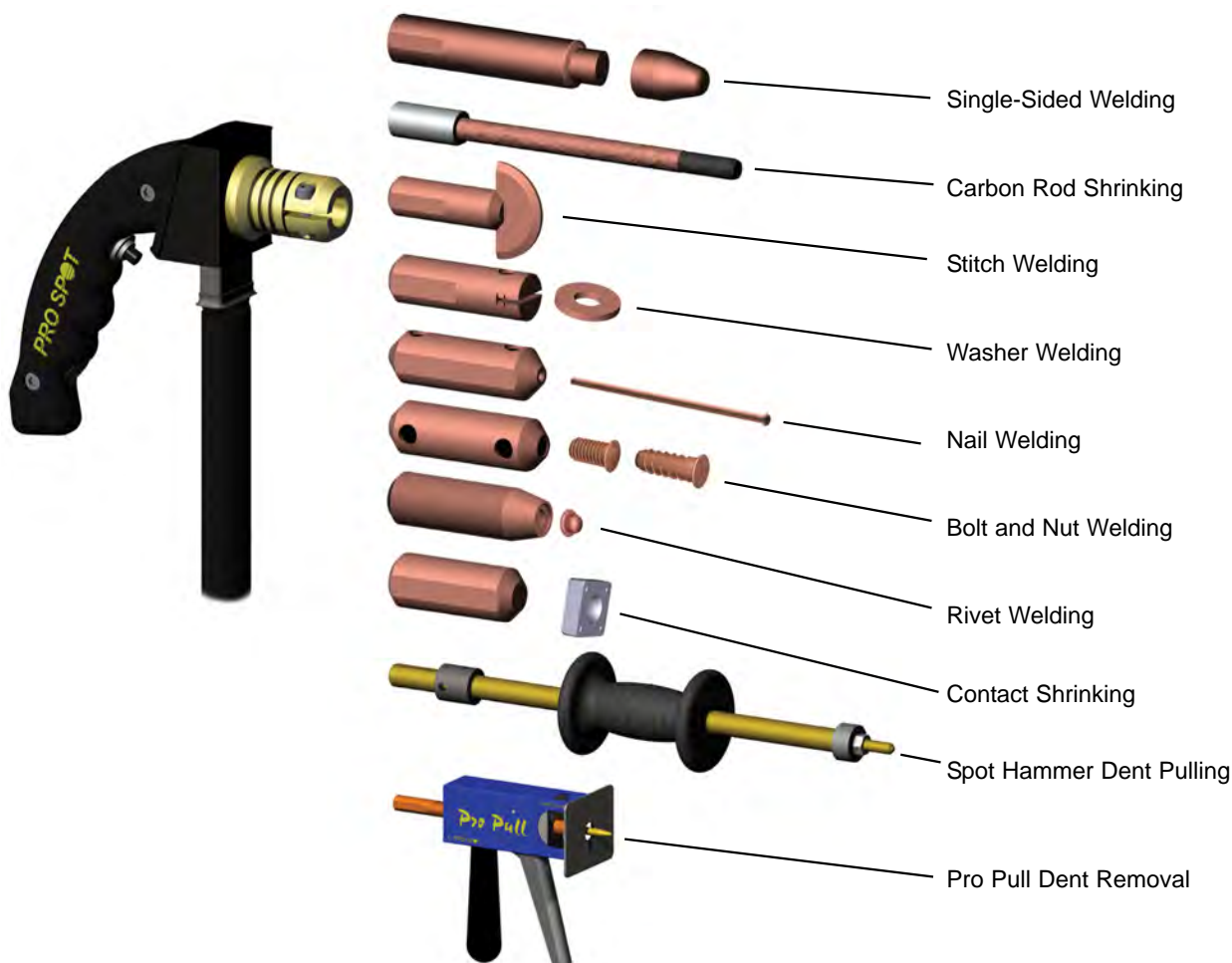


Figure 6.2 Single-Sided applications



Figure 6.3: Selecting Single -Sided weld mode

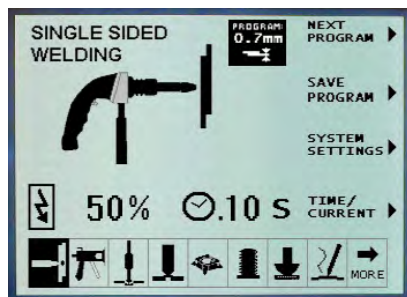


Figure 6.4

1. Make sure the welder is turned on. Push the Single-Sided weld mode button (fig 6.3). Single Sided Weld Programs will display on the screen (fig. 6.5).

2. Use the navigation buttons, Left or Right to select desired weld program (refer to section 4.8 "Setting the default weld program" or fig.4.9). The display screen shows the currently selected program (fig. 6.4).

Single-Sided Programs

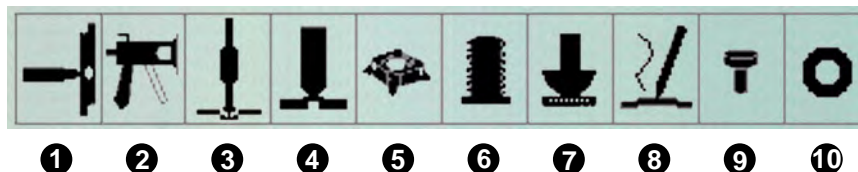


Figure 6.5 PR-2000 Single Sided Weld Programs

- ① Single-Sided spot welding
- ② Pro Pull Dent Removal
- ③ Dent Pulling
- ④ Contact Shrinking
- ⑤ Nut Welding
- ⑥ Bolt Welding
- ⑦ Stitch Welding
- ⑧ Carbon Rod Shrinking
- ⑨ Rivet Welding
- ⑩ Washer Welding

6.2 Single-Sided Spot Welding

 SINGLE SIDED
WELDING


Figure 6.6



Figure 6.9

Single-Sided spot welding is used where Two-Sided spot welding cannot be used.



Important: The Single-Sided spot welding is not permitted on supporting frameworks of a vehicle. It is only permitted for cosmetic purposes.



Important: Le soudage de Côté Unique par points n'est pas autorisée sur les cadres de soutien d'un véhicule. Il est seulement permis à des fins cosmétiques.

1. Push the Single-Sided weld mode button (fig 6.3). Single Sided Weld Programs will display on the screen (fig. 6.5). The PR-2000 software defaults to Single Spot Weld Mode (fig. 6.6).
2. Choose weld power level by pressing the "Next Program" button repeatedly. (refer to section 4.6 "Setting the weld program").
3. Fit the Single-Sided Gun with Single-Sided electrode (fig.6.9).
4. Grind between the inner and the outer body sheets to remove paint, primer and rust. This ensures good electrical contact when performing Single-Sided welding.
5. Ground the working area (refer to section 6.1 "Single-Sided Welding Overview").
6. Apply about 33-44 lbs of pressure on the Single-Sided gun and push the trigger to weld. Reposition and weld again.



Note: Make sure that Single-Sided electrode is clean. If it isn't, use a file or tip dresser to clean it. If the weld cap shows considerable wear, it should be replaced (refer to section 5.4 "Removing Welding Electrodes")



Remarque: Assurez-vous que l'électrode Côté Unique est propre. Si ce n'est pas le cas, utilisez une lime pour le nettoyer. Si le bouchon de soudure est considérablement usé, il devrait être remplacé (voir la section 5.4 "Enlèvement d'Electrodes de soudage")

6.3 Bolt Welding

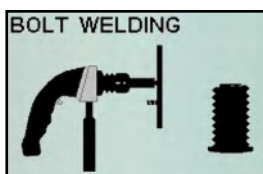


Figure 6.10

Many of today's car bodies come with factory equipped threaded studs. After a collision, the studs may be lost or do not accompany the replacement part. With the PR-2000, threaded studs can be welded-on in factory style. This type of stud is also common throughout the car body for attachments of interior, tail lights, door moldings, etc.



Tip: A threaded stud can also be used to fasten the ground clamp directly to the panel, minimizing the area needed for grinding.



Suggestion: Un goujon fileté peut également être utilisé pour fixer la pince directement sur le panneau, ce qui réduit la surface nécessaire au broyage.



Figure 6.12

Studs are held in place during welding with magnetic adapter electrode.

1. Push the Single-Sided weld mode button (fig 6.3). Single Sided Weld Programs will display on the screen (fig. 6.5). The PR-2000 software defaults to Single Spot Weld Mode (fig. 6.6).
2. Select Bolt Welding Program by pressing the Left or Right Navigation Buttons (fig. 4.9). Make sure that Bolt Welding graphic appears on the screen (fig. 6.10)
3. Choose weld power level by pressing the "Next Program" button repeatedly. (refer to section 4.6 "Setting the weld program").
4. Fit Single Sided gun with the magnetic stud adapter (fig. 6.12).
5. Insert stud into the adapter (fig. 6.12).
6. Prepare the surface area by removing paint and primer.
7. Ground the working area (refer to section 6.1 "Single-Sided Welding Overview").
8. Position single sided gun over work area and push the trigger to weld.
9. Repeat as needed.

6.4 Nut Welding

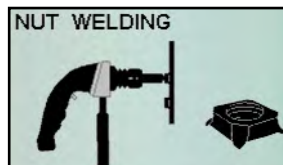


Figure 6.13



Figure 6.15

Weld-on nuts are common throughout the car body for attachments of interior, tail lights, door moldings, etc. and are applied with ease using the PR-2000.



Tip: Different size nuts are available from your local Pro Spot distributor or on the web at Pro Spot online store.



Suggestion: Des écrous de différentes tailles sont disponibles chez votre distributeur local Spot Pro ou sur le web à la boutique Pro Spot en ligne.

Nuts are held in place during welding with a shrinking electrode.

1. Push the Single-Sided weld mode button (fig 6.3). Single Sided Weld Programs will display on the screen (fig. 6.5). The PR-2000 software defaults to Single Spot Weld Mode (fig. 6.6).
2. Select Nut Welding Program by pressing the Left or Right Navigation Buttons (fig. 4.9). Make sure that Nut Welding graphic appears on the screen (fig. 6.13)
3. Choose weld power level by pressing the "Next Program" button repeatedly. (refer to section 4.6 "Setting the weld program").
4. Fit Single-Sided gun with the Shrink Electrode (fig. 6.15).
5. Prepare the surface area by removing paint and primer.
6. Ground the working area (refer to section 6.1 "Single-Sided Welding Overview").
7. Press weld-on nut to the metal with Contact Shrinking electrode, apply some pressure and push the trigger to weld.
8. Repeat as needed.

6.5 Dent Pulling with Spot Hammer



Figure 6.16

Spot hammer dent pulling is used to repair dents on a vehicle body. The spot hammer welds directly onto the work area and pulls the dent.



Tip: The replaceable welding tip should last for over one thousand welds. Contact your local distributor to order replacement tips, or order on the web at Pro Spot online store.



Suggestion: Le bout de soudage remplaçable devrait permettre d'accomplir plus de milles soudures. Contactez votre distributeur local pour commander pointes de rechange, ou commandez sur la Web Pro Spot au magasin en ligne.

1. Push the Single-Sided weld mode button (fig 6.3). Single Sided Weld Programs will display on the screen (fig. 6.5). The PR-2000 software defaults to Single Spot Weld Mode (fig. 6.6).
2. Select Spot Hammer Program by pressing the Left or Right Navigation Buttons (fig. 4.9). Make sure that Spot Hammer graphic appears on the screen (fig. 6.16)
3. Choose weld power level by pressing the "Next Program" button repeatedly. (refer to section 4.6 "Setting the weld program").
4. Fit Single-Sided gun with the spot hammer (fig. 6.18).
5. Prepare the dent surface area by removing paint and primer.
6. Ground the working area (refer to section 6.1 "Single-Sided Welding Overview").
7. Position the spot hammer tip at the bottom of the dent and push the trigger to weld the electrode onto the metal.
8. Pull out a dent then release by twisting the hammer.
9. If needed, reposition, weld, and pull again.
When more pulling power is needed, simply increase the current.



Figure 6.18



Note: Check spot hammer tip periodically to make sure it is in good working order. If the tip looks worn, replace it with a new one.



Remarque: Contrôlez le bout du marteau périodiquement pour s'assurer qu'il est en bon état de marche. Si le bout semble usé, le remplacer par un nouveau.

6.6 Moulding Clip Rivet Welding

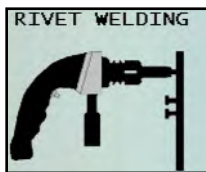


Figure 6.19



Figure 6.21

This function will weld on factory type clips for the window moulding. The clips that hold the moulding do not, usually, come on the replacement parts.

Rivets are held in place during welding with magnetic adapter electrode.

1. Push the Single-Sided weld mode button (fig 6.3). Single Sided Weld Programs will display on the screen (fig. 6.5). The PR-2000 software defaults to Single Spot Weld Mode (fig. 6.6).
2. Select Rivet Welding Program by pressing the Left or Right Navigation Buttons (fig. 4.9). Make sure that Rivet Welding graphic appears on the screen (fig. 6.19)
3. Choose weld power level by pressing the "Next Program" button repeatedly. (refer to section 4.6 "Setting the weld program").
3. Fit Single-Sided gun with the magnetic rivet adapter (fig. 6.21).
4. Insert rivet into the adapter (fig. 6.21).
5. Prepare the surface area by removing paint and primer.
6. Ground the working area (refer to section 6.1 "Single-Sided Welding Overview").
7. Position Single-Sided gun over work area and push the trigger to weld.
8. Repeat as needed.

6.7 Dent Pulling with Washers and Slide Hammer with Hook

The slide hammer with hook (optional) can be used in conjunction with washers to repair car body dents.



Figure 6.22



Tip: You can purchase a slide hammer with hook from your local Pro Spot distributor or on the web at Pro Spot online store.



Suggestion: Vous pouvez acheter un marteau glissant avec crochet chez votre votre distributeur local Pro Spot ou sur le web à la boutique Pro Spot en ligne.



Figure 6.24

Washers are held in place during welding with magnetic adapter electrode.

1. Push the Single-Sided weld mode button (fig 6.3). Single Sided Weld Programs will display on the screen (fig. 6.5). The PR-2000 software defaults to Single Spot Weld Mode (fig. 6.6).
 2. Select Washer Welding Program by pressing the Left or Right Navigation Buttons (fig. 4.9). Make sure that Washer Welding graphic appears on the screen (fig. 6.22)
 3. Choose weld power level by pressing the "Next Program" button repeatedly. (refer to section 4.6 "Setting the weld program").
 4. Fit Single-Sided gun with the magnetic washer adapter (fig. 6.24).
 5. Insert washer into the adapter (fig. 6.24).
 6. Prepare the dent surface area by removing paint and primer.
- When welding on washers, you only need to clean the area where the washer touches the metal since the grounding system is connected through a separate cable.
7. Ground the working area (refer to section 6.1 "Single-Sided Welding Overview").
 8. Position the washer at the bottom of the dent and push the trigger to weld the washer onto the metal.
 9. Hook the washer with the slide hammer and pull out the dent.
 10. Repeat as needed.



Tip: You can, also, pull multiple washers by welding on a row of washers at the bottom of the dent, inserting a rod through the washers and pulling the rod with the slide hammer with hook.



Suggestion: Vous pouvez, également, obtenir plusieurs rondelles par soudage sur une rangée de rondelles au bas de la Bosselure, en insérant une baguette a travers les rondelles et en tirant la tige avec le marteau glissant avec crochet.

6.8 Contact Shrinking



Figure 6.25



Figure 6.27

Dent pulling with washers creates high spots in the metal. Until now, the common practice would have been to grind the surface, resulting in a loss of sheet metal thickness. With the PR-2000, use the shrinking tip instead of a grinder to remove the high spots, leaving a smooth and clean surface that's every bit as thick and strong as before. Shrinking electrode also acts as a nut adapter (*refer to section 6.4 "Nut Welding"*). With this electrode you get two convenient tools in one.

1. Push the Single-Sided weld mode button (*fig 6.3*). Single Sided Weld Programs will display on the screen (*fig. 6.5*). The PR-2000 software defaults to Single Spot Weld Mode (*fig. 6.6*).
2. Select Contact Shrinking Program by pressing the Left or Right Navigation Buttons (*fig. 4.9*). Make sure that Contact Shrinking graphic appears on the screen (*fig. 6.25*).
3. Choose weld power level by pressing the "Next Program" button repeatedly. (*refer to section 4.6 "Setting the weld program"*).
4. Fit Single-Sided gun with the contact shrinking electrode (*fig. 6.27*).
5. Prepare the surface area by removing paint and primer.
6. Ground the working area (*refer to section 6.1 "Single-Sided Welding Overview"*).
7. Position the contact shrinking electrode over the high spot, apply some pressure and push the trigger to weld.
8. Repeat as needed.

6.9 Carbon Rod Shrinking / Stretching



Figure 6.28



Figure 6.30

Carbon Rod is used to shrink or stretch metal on a vehicle. The carbon rod can also be used on sharp dents caused by such things as hail.

1. Push the Single-Sided weld mode button (*fig 6.3*). Single Sided Weld Programs will display on the screen (*fig. 6.5*). The PR-2000 software defaults to Single Spot Weld Mode (*fig. 6.6*).
2. Select Carbon Shrink Program by pressing the Left or Right Navigation Buttons (*fig. 4.9*). Make sure that Carbon Shrink graphic appears on the screen (*fig. 6.28*).
3. Choose weld power level by pressing the "Next Program" button repeatedly. (*refer to section 4.6 "Setting the weld program"*).
4. Fit the Single-Sided Gun with Carbon Electrode (*fig. 6.30*).
5. Clean the metal surface area.
6. Ground the working area (*refer to section 6.1 "Single-Sided Welding Overview"*).
7. Position carbon rod over the work area and push the trigger to start welding. Keep trigger depressed to continue welding. Move the carbon rod in such a way as to heat up the entire working area to the appropriate temperature. Release the trigger to stop welding.
8. Cool the surface with a wet rag or compressed air.

6.10 Stitch Welding



Figure 6.31



Figure 6.33

The PR-2000 can also be fitted with a stitch weld adapter enabling the operator to lay staggered bead type welds. While rolling the tip on the sheet metal edge, the welder will automatically deliver an intermittent or pulsating current.

1. Push the Single-Sided weld mode button (*fig 6.3*). Single Sided Weld Programs will display on the screen (*fig. 6.5*). The PR-2000 software defaults to Single Spot Weld Mode (*fig. 6.6*).
2. Select Stitch Welding Program by pressing the Left or Right Navigation Buttons (*fig. 4.9*). Make sure that Stitch Welding graphic appears on the screen (*fig. 6.31*)
3. Choose weld power level by pressing the "Next Program" button repeatedly. (*refer to section 4.6 "Setting the weld program"*).
4. Fit Single-Sided gun with the stitch electrode (*fig. 6.33*).
5. Prepare the surface area by removing paint and primer.
6. Ground the working area (*refer to section 6.1 "Single-Sided Welding Overview"*).
7. Roll the tip on the sheet metal edge while keeping the trigger depressed. The welder will automatically deliver an intermittent or pulsating current.
8. Repeat as needed.

This procedure works well on stainless steel, and therefore lends itself well to rust repair and patching. It's easy to use and can be manipulated to fit any shape or form you require.

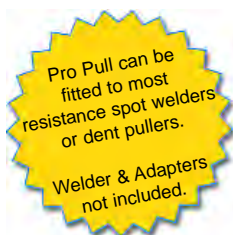


Tip: You can use stitch electrode to weld pulling tabs onto areas that need to be pulled.



Suggestion: vous pouvez utiliser l'électrode de point à souder en tirant des onglets sur des endroits qui ont besoin d'être tirés.

6.11 Pro Pull Dent Pulling (optional)



Pro Pull is a patented, innovative tool for fast and accurate dent pulling. It features paintless dent removal functionality (see sec. 6.3.5 "Paintless Dent Pulling With Pro Pull").



6.11.1 Selecting Pro Pull Weld Mode



Figure 6.6 Selecting Pro Pull weld mode

1. Push the Single-Sided weld mode button (fig 6.3). Single Sided Weld Programs will display on the screen (fig. 6.5). The PR-2000 software defaults to Single Spot Weld Mode (fig. 6.6).
2. Select ProPull Welding Program by pressing the Left or Right Navigation Buttons (fig. 4.9). Make sure that Pro Pull Welding graphic appears on the screen (fig. 6.6)



Make sure the ground plate is clamped firmly in place on the inside of a clean metal surface as near as possible to the weld location.

NOTE: Do not attach the ground to the metal you're about to weld on. When performing other weld tasks such as dent pulling, etc., the ground attachment location becomes less critical.



Assurez-vous que la prise/ plaque de terre est fixée fermement en place à l'intérieur d'une surface propre de métal le plus près possible du lieu de soudure.

Remarque: Ne fixez pas la prise the terre a la plaque de metal que vous êtes sur le point de souder. Lors de l'exécution d'autres tâches comme la soudure de traction des impacts, etc, la localisation de la prise de terre devient moins critique.

6.11.2 Pro Pull Component Diagram

Pro Pull comes with three different Blocking Plates with Quick-Connect design.

Block window size:
2.5"(63mm) x 1.5"(38mm)

PP-10-04

Block window size:
1.75"(44mm) x 1"(25mm)

PP-10-03

Block window size:
0.75" (19mm) dia.

PP-10-01

Large openings for great visual control of the pulling area.



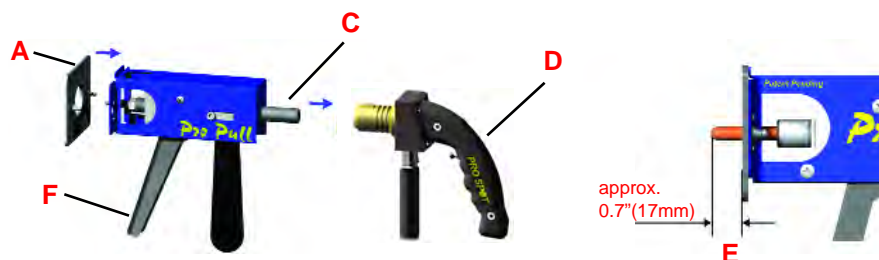
CLT-55
Electrode

N-38
Nut

Retrofit point for different end adapters. Available for most weld guns. (not included) See prospot.com for more information.

CLP-75
Removable weld shaft. The weld current is transferred through the shaft and NO CABLE is required to transfer the current

6.11.3 Pro Pull Assembly

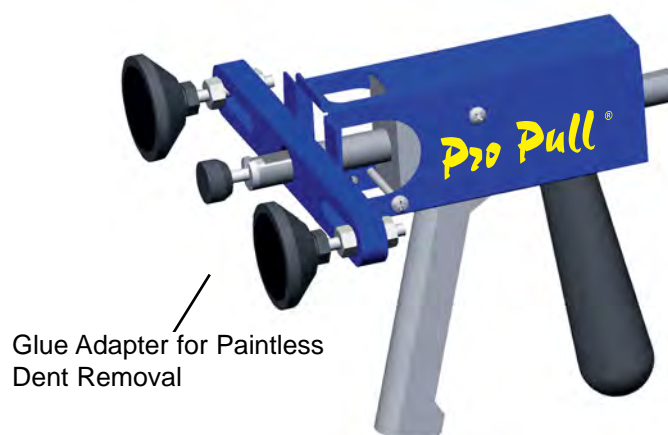


1. Attach the Weld Gun (D) to Weld Shaft (C). Secure Lock Bolt (G).
2. Slide weld shaft and gun to standard distance (E).
3. Attach desired block plate (A)
4. Position the weld tip in the "bottom" of the dent, weld, then pull the handle (F) to initiate the pulling action. Use the shortest weld TIME possible to prevent extensive weld marks.

6.11.4 Dent Pulling with Pro Pull



6.11.5 Paintless Dent Pulling With Pro Pull



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