5. TROUBLESHOOTING

PROBLEM	CAUSE
The wire does not move or wire feed entangles	Feed rolls, wire conduit or contact tips are defective • Check that feed rolls are not too tight or too loose • Check that the feed roll groove is not too worn • Check that the wire conduit is not blocked • Check that there are no spatters on the conduit tip and that the hole is not cramped or worn loose
Main switch indicator light does not switch on	The machine has no supply voltage • Check supply voltage fuses • Check supply voltage cable and plug
Welding is not good	Welding outcome is influenced by several factors • Check the welding voltage and wire speed setting • Check that the earth clamp is fixed properly. Fixing point is clean, and both cable and its connections are undamaged • Check the flow of shielding gas from the tip of the welding gun • Supply voltage is uneven, too low or too high
Over-heating indicator light up	The machine is over-heat • Check that cooling air can flow without obstructions • Machine's volume-capacity ratio has been exceeded; wait for the indicator light to switch off • The supply voltage is too low or too high

USER'S MANUAL

MIG120/140/160 180/200/250 200(4 IN 1)

1. INTRODUCTION

This is an easy-to-use MIG welding machine suitable for professional-industrial use. Before using or doing any maintenance work on the machine, please read the operating manual and keep it for further reference.

1.1 PROPERTIES

The machine is suitable for a range of different purposes and the possibility to use a long extension cord eases operation in various sites. It is also suitable for generator use on construction sites.Could do synergic or manual welding .

When under synergic model,the welding voltage and wire feeding speed are adjusted with knobs control according to the thickness of the welded sheet. Thus, selecting the right parameters is easy.

1.2 ABOUT WELDING

In addition to the welding machine, welding outcome is influenced by the piece being welded and the welding environment. Therefore, recommendations in this manual must be followed.

During welding electric current is led with the welding gun's current nozzle to the filler wire and via that to the welded piece. Earthing cable attached to the workpiece guides the current back to the machine, forming the needed closed circuit, unrestricted current flow is possible when the earthing clamp is properly attached to the workpiece and the fixing point of the clamp on the workpiece is clean, paintless and rust-free.

Shielding gas must be used during welding in order to prevent air from mixing with the weld pool. Carbon dioxide or a mixture of carbon dioxide and argon is suitable for shielding gas. Some filler wires form a shielding gas from the wire's filling as it melts thus eliminating the need for a separate shielding gas.

2. SAFETY INSTRUCTIONS

The welding gun has an overheating protector which prevents operation when the machine is overheated. The machine is also protected from too low or too high supply voltage.

However, there are some risk factors connected to welding. You should therefore read and follow the following safety instructions carefully.

2.1 USE OF PROTECTIVE ACCESSORIES

The arc and its reflecting radiation damage unprotected eyes. Always protect your eyes and face with an appropriate welding mask. The arc and welding spatters burn unprotected skin. When welding, always use protective gloves and clothing.

2.2 SAFE USE OF THE WELDING GUN

Parts of the machine, such as the end of the filler wire and welding gun become burning hot during use. The wire is also sharp and moves quickly, so be careful when threading it to place.

Never carry the machine on your shoulder during welding, but place it on an even surface.

Do not keep the machine near or on hot objects, as the plastic cover may melt. Do not move the shielding gas bottle when the control valve is in place. Fix the gas bottle securely in an upright position to a separate wall rack or bottle cart. Always close the gas bottle after use.

2.3 FIRE SAFETY

Welding is always classified as hot work.so pay attention to fire safety regulations. Protect the environment from welding spatters. Remove inflammable material, such as burning fluids, from the vicinity of the welding site and supply the site with adequate fire-fighting equipment.

Take into account dangers caused by special workplaces, such as firs risk and danger of explosion, when welding container-like pieces.

NOTE! Fire caused by sparks may break out even after several hours!

CAUTION! Welding in inflammable and explosive sites is strictly forbidden!

2.4 SUPPLY VOLTAGE

- Do not take the welding machine inside a workpiece, for example in to a container or a car.
- Do not place the welding machine on a wet surface.
- Change faulty cables immediately for they are life-threatening and may cause a fire.

- Ensure that cables are not squeezed or in contact with sharp edges or a hat workpiece.

2.5 WELDING CIRCUIT

- Insulate yourself from the welding circuit by using dry and undamaged protective clothing.
- Do not work on a wet surface.
- Do not use damaged welding cables.
- Do not place the welding gun or earth clamp on the welding machine or other electrical device.

2.6 WELDING FUMES

Make sure ventilation is sufficient. Take special precautions when welding metals containing lead, cadmium, zinc, mercury or beryllium.

Supply of sufficient clean air can also be ensured with the use of a fresh air mask.

3. MACHINE USE

The machine is delivered ready for operation without adjustments with 0.8 mm diameter filler wire.

If you use different filler wire, make sure that the feed roll groove welding gun contact tip and machine polarity are suited for the used wire size and type.

3.1 BEFORE IMPLEMENTATION

The products are packed to durable packages especially designed for them. However, always make sure before use that products have not been damaged during transportation. Check also, that you have received the products you ordered and the instruction manuals needed.

Transportation

The machine should be transported in an upright position.

NOTE! Always move the welding machine by lifting it from the handle.

Never pull it from the welding gun or other cables.

Environment

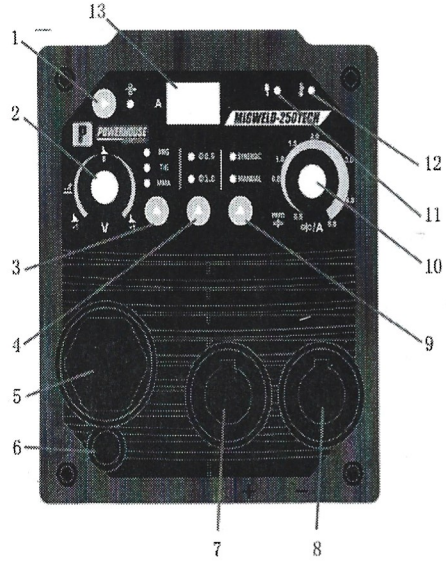
The machine is suitable for both indoor and outdoor use. But it should be protected from heavy rain and sunshine. Store the machine in a dry and clean environment and protect it from sand and dust during use and storage. The recommended operating temperature range is -20℃ to -+40℃.

Place the machine in such a way that it does not come in contact with hot surfaces, sparks and spatters.

Make sure the air flow in the machine is unrestricted.

3.2 GENERAL VIEW OF THE MACHINE

MIG120/140



1,QUICK WIRE FEED

2,OUTPUT VOLTAGE

3,BUTTON (MIG/TIG/MMA)

4,BUTTON(0.8/1.0MM)

5,MIG TORCH

6,MALE CONNECTOR

7,"+" CONNECTOR (When "6" plug into "7", it is for gas MIG welding).

8,"-" CONNECTOR(When "6" plug into "8", it is for gasless MIG welding).

9,BUTTON(Synergic/ manual MIG welding).

Synergic MIG welding means only need to adjust "10" volume(output volt/current/wire speed are all in 1 knob) ,base on the metal's thickness ; meanswhile "2" is for micro adjusting for the output volt (from -1 ~ 1V).

Manual MIG welding means,the "2" & "10" could be seperated adjusting.

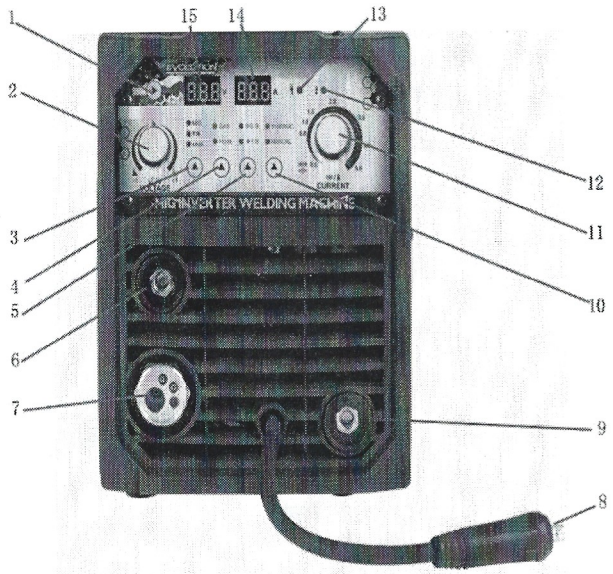
10,OUTPUT CURRENT

11,POWER LIGHT

12,OVER-HEAT/OVER CURRENT LIGHT

13,CURRENT METER

MIG160/180/ 200



1,QUICK WIRE FEED

2,OUTPUT VOLTAGE

3,BUTTON (MIG/TIG/MMA)

4,BUTTON(GAS/FLUX MIG welding)

5,BUTTON(0.9/1.0MM)

6,"+" CONNECTOR (When "8" plug into "6", it is for gas MIG welding).

7,MIG TORCH

8,MALE CONNECTOR

9,"-" CONNECTOR(When "8" plug into "9", it is for gasless MIG welding).

10,BUTTON(Synergic/ manual MIG welding).

Synergic MIG welding means only need to adjust "11" volume(output volt/current/wire speed are all in 1 knob) ,base on the metal's thickness ; meanswhile "2" is for micro adjusting for the output volt (from -1 ~ 1V).

Manual MIG welding means,the "2" & "11" could be seperated adjusting.

11,OUTPUT CURRENT

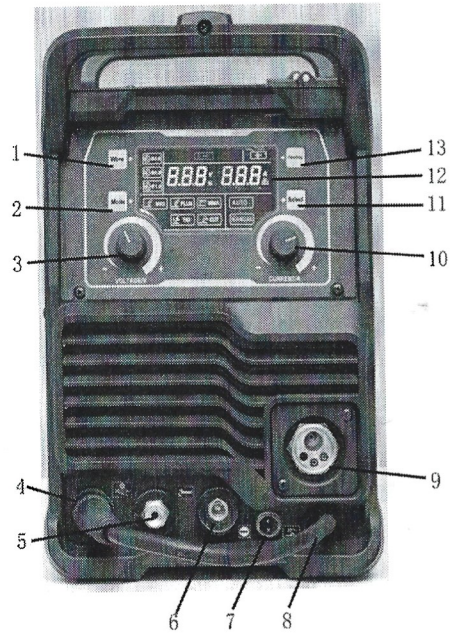
12,POWER LIGHT

13,OVER-HEAT/OVER CURRENT LIGHT

14,CURRENT METER

15,VOLT METER

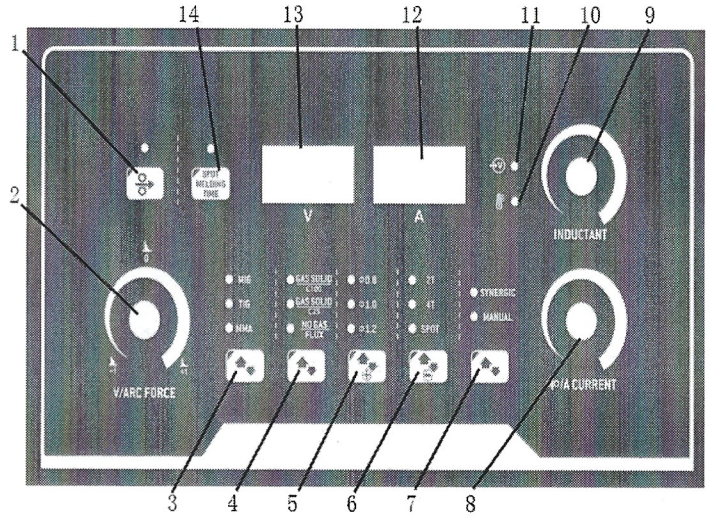
MIG200 (4 IN 1)



1	Wire size select :0.8/0.9/1.0MM
2	Welding mode:GAS MIG/Flux MIG/TIG/MMA/VUT
3	Voltage (for manual MIG)
4	Earth clamp connector
5	Cut torch connector
6	Holder connector
7	2 Pin connector (for Cut /TIG torch)
8	Welding cable connector
9	MIG torch connector
10	Current knob

11	Select:Manual/Synergic
12	LCD
13	Quick wire feeding

MIG250



1	Quick wire feed
2	When in Synergic model,it is for micro adjusting for output volt; When in Manual mode,it is for wide adjusting for outout volt; When in MMA mode,it is for adjusting Arc force.
3	Button for MIG/TIG/MMA
4	Button for Gas solid C100 (C100 means 100% pure CO2)/ gas solid C25(C25 means 25% CO2 mix with Argon)/NO gas flux
5	Button for 0.8/1.0/1.2MM wire
6	Button for 2T/4T/spot welding (when in spot welding mode,then touch “14” , and touch “5” or “6” to

	adjust the spot welding time
7	Button for synergic/manual operation
8	When in synergic mode, it means wire speed/output current/output volt are adjusting by 1 knob; When in Manual mode, it is only for adjusting output current
9	Inductant for MIG
10	Hot protection/over-current light
11	Power light
12	Show Amp/spot welding time
13	Volt meter
14	Button for spot welding time

GAS & NO GAS Application connection:

Gas application (using solid wire）: welding cable connector connects “+”，earth clamp connects“-”，torch connect to “ ” and fasten it.

No gas application (using flux cored wire）: welding cable connector connects“-”，earth clamp connects“+”，torch connect to “ ” and fasten it.

Note: Inductor adjustment is to set the welding arc force, 0 is standard setting value.

3.3 CABLE CONNECTIONS

Connection to the mains

The machine is equipped with power supply cable . Connect the supply voltage cable to the mains.
If you use an extension cord, its cross-sectional area should be at least as large as the power supply cable's (3 x 4mm^2). The maximum length for the extension cord is 50m.
The machine can also be used with a generator. The recommended power is 15KVA in order for the machine to be used at maximum capacity.

Earthing

Connecting the earth cable to the machine. Clean the workpiece surface and fix the earth cable clamp to the piece in order to create a closed and interference-free circuit needed for welding.

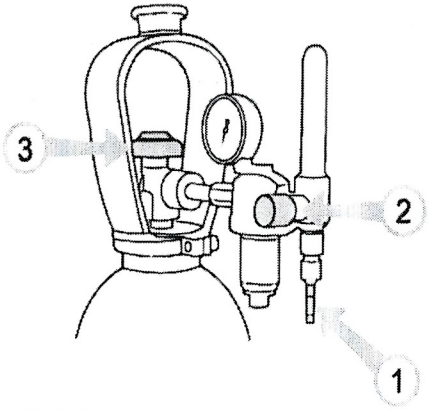
Welding gun

When the welding gun has been connected to the machine. The welding gun leads the filler wire, shielding gas and electric current to the weld. When you press the welding gun trigger, shielding gas flow and wire feed begin. The arc ignites, when the filler wire touches the welded piece.

The gun neck can be rotated 360° .When turning the neck, always makes sure that the neck is twisted almost all the way to the bottom. This prevents damaging and overheating the neck.

NOTE! If you use other than 0.8 mm diameter filler wire, change the welding gun contact tip to match the wire thickness.

Figure 3.2. Connecting the gas hose to a typical control valve



1. Connect the hose to the gas bottle's control valve and tighten the connector.
2. Adjust the flow rate with the control valve screw.A suitable shielding gas flow rate is 8–15 l/min
3. Close the bottle's valve after use.

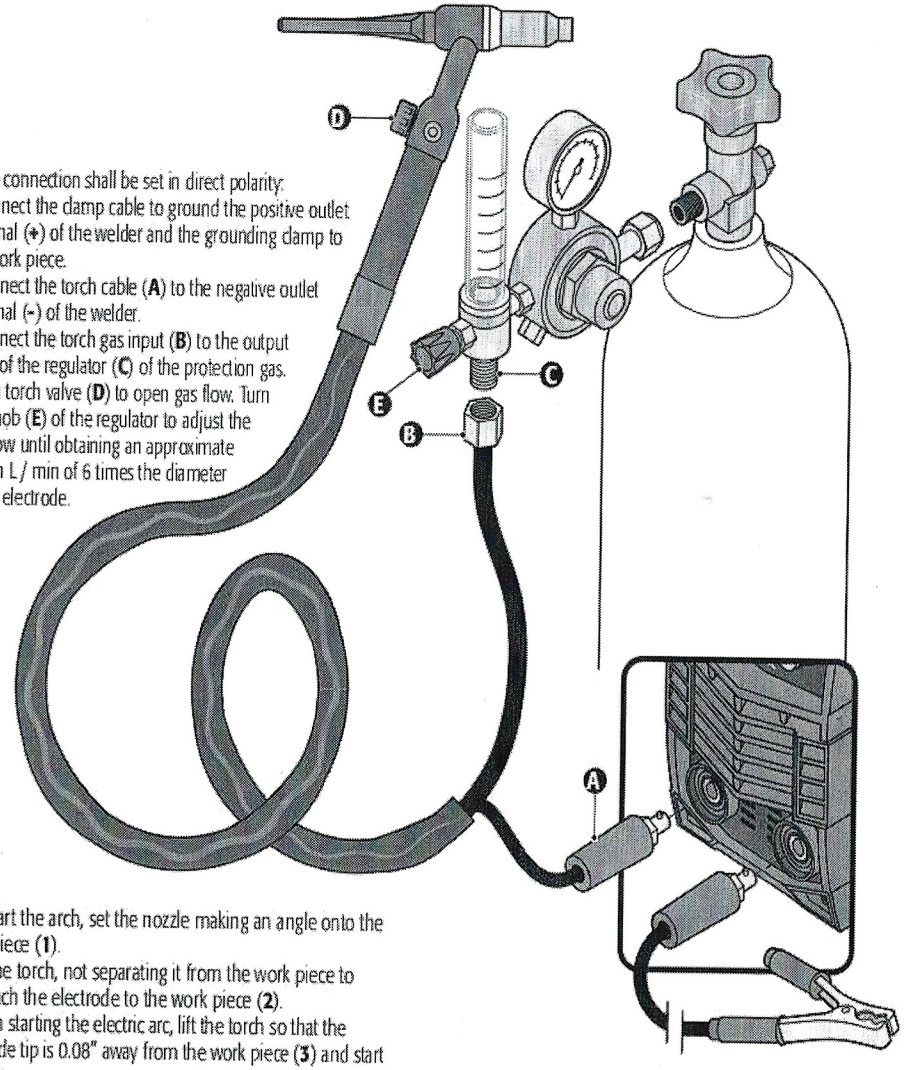
Shielding gas

The shielding gas used for steel wires is carbon dioxide or a mixture of argon and carbon dioxide which replaces air in the arc's area. Thickness of the welded sheet and welding power define the flow rate of the shielding gas.

Connect the bayonet socket of the shielding gas hose to the machine's hose connector and the hose connector end to the gas bottle's control valve.

NOTE! Use a shielding gas suitable for the material's welding. Fix the gas bottle securely in an upright position before installing the control valve.

Lift TIG torch connecting



- The connection shall be set in direct polarity.
- Connect the damp cable to ground the positive outlet terminal (+) of the welder and the grounding damp to the work piece.
- Connect the torch cable (**A**) to the negative outlet terminal (-) of the welder.
- Connect the torch gas input (**B**) to the output valve of the regulator (**C**) of the protection gas.
- Turn torch valve (**D**) to open gas flow. Turn the knob (**E**) of the regulator to adjust the gas flow until obtaining an approximate flow in L/ min of 6 times the diameter of the electrode.

- To start the arch, set the nozzle making an angle onto the work piece (**1**).
- Lift the torch, not separating it from the work piece to approach the electrode to the work piece (**2**).
- When starting the electric arc, lift the torch so that the electrode tip is 0.08" away from the work piece (**3**) and start welding.

3.4 Changing the feed roll groove

The feed roll groove is factory set for welding filler wires of 0.8-1.0 mm diameter. The feed roll groove must be changed if you use 0.6 mm thick filler wire.

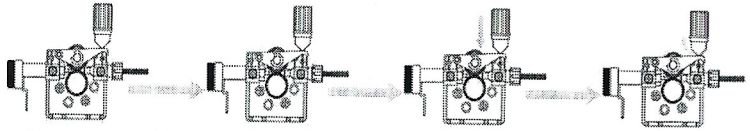


Figure 3.3. Changing the feed roll groove

1. Open the feed roll from the pressure control lever.
2. Switch the machine on from the main switch.
3. Press the welding gun trigger and drive the feed roll in such a position that its locking screw is up and can be opened.
4. Switch the power off from the main switch.
5. Open the feed roll locking screw with a 2.0 mm Allen wrench approximately half a turn.
6. Pull the feed roll from its shaft.
7. Turn the feed roll and reinstall it to its shaft all the way to the bottom making sure that the screw is on the shaft's level.
8. Tighten the feed roll locking screw.

3.4.1 Threading the filler wire

1. Open the reel housing by pressing on the opening button and install the wire reel in such a way that it rotates counter clockwise. You can use either a 5 kg or 15kg (diameter 200 mm) wire reel in the machine.
2. Attach the reel with a reel lock.
3. Unfasten the wire end from the reel, but hold on to it all the time.
4. Straighten the wire end for approximately 20 cm and cut the wire in the straightened location.
5. Open the pressure control lever which then opens the feed gear.
6. Thread the wire through the wire's rear guide to the gun's wire guide.
7. Close the feed gear and fasten it with the pressure control lever. Make sure that the wire runs in the feed roll groove.

8. Adjust the compression pressure with the pressure control lever no higher than to the middle of the scale .If the pressure is too high, it removes metal fragments from the wire surface and may damage the wire. On the other hand, if the pressure is too low, the feed gear slips and the wire does not run smoothly.
9. Press the welding gun trigger and wait for the wire to come out.
10. Close the reel housing cover.

CAUTION! When driving the wire in to the gun, do not point the gun at yourself or others or put, for example, your hand in front of the tip, because the cut wire end is extremely sharp. Also, do not put your fingers near the feed rolls, because they might get squeezed between the rolls.

3.5 CONTROLS AND INDICATOR LIGHTS

The welding power is adjusted according to the thickness of the welded sheet. Indicator lights display the machine's standby mode and inform of a possible overheating.
When you switch on the machine on, a green power light is on.
Simultaneously, the standby switch indicator light switches on. If the machine overheats or the supply voltage is too low or too high, the welding operation automatically switches off and the yellow overheating indicator light switches on. The light switches off when the machine is ready for operation again. Make sure that there is enough space around the machine allowing air to freely flow and cool the machine.

Welding power adjustment

Adjusting the welding power according to sheet thickness affects simultaneously both wire feed speed and amount of current lead to the wire. This is a good starting point for welding in different operating situations. However, connection type and root opening may influence the amount of welding power needed.

Select the correct parameter with the welding power control according to the welded fillet weld's sheet thickness. If the fillet weld's sheets are of different thickness, use their average as a default parameter.

Sheet thickness scale has been given in millimeters and it is based on 0.8 mm wire diameter. When using a 0.6 mm wire, set the welding power control slightly higher than the used sheet thickness and correspondingly slightly lower with 0.9-1.0 mm wires.

4. MAINTENANCE

When servicing the machine, its utilization degree and environmental circumstances should be taken into account. If you use the machine

appropriately and service it regularly, you will spare yourself from unnecessary malfunctions.

CAUTION! Disconnect the machine from the mains before handing the electrical cables.

4.1 DAILY MANITENANCE

- Remove welding spatters from the welding gun's tip and check the condition of the parts. Change damaged parts to new ones immediately.
- Check that the insulating tips of the welding gun's neck are undamaged and in place. Change damaged insulation parts to new ones immediately.
- Check the tightness of the welding gun's and earth cable's connections.
- Check the condition of the supply voltage and welding cable and replace faulty cables.

4.2 MAINTENANCE OF THE WIRE FEED MECHANISM

Service the wire feed mechanism at least every time the reel is changed

- Check the wear of the feed roll groove and change the feed roll when necessary.
- Clean the welding gun wire guide with compressed air.

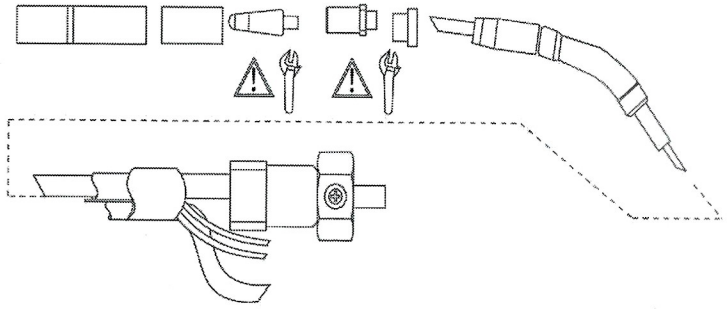


Figure 4.1. Parts of the welding gun and wire guide

Cleaning the wire guide

Pressure of the feed rolls removes metal dust from the filler wire's surface which then finds its way to the wire guide. If the wire guide is not clean, it gradually

clogs up and causes wire feed malfunctions. Clean the wire guide in the following manner:

1. Remove the welding gun's gas nozzle, contact tip and contact tip's adapter.

2. With a pneumatic pistol, blow compressed air though the wire guide.

3. Blow the wire feed mechanism and reel housing clean with compressed air.

4. Reattach the welding gun's parts, tighten the contact tip and contact tip's adapter to spanner tightness.

Changing the wire guide

If the wire guide is too worn or totally clogged, change it to a new one according to the following instructions:

1. Disconnect the welding gun from the machine.

   a. Disconnect the cable clamp of the gun's power cable by opening the screws.

   b. Disconnect the gun's power cable from the machine's pole.

   c. Disconnect the connector of the trigger conductors from the machine.

   d. Open the gun's mounting nut.

   e. Extract the gun gently from the machine whereupon all parts come through the front part's cable hole.

2. Open the mounting nut of the wire guide which exposes the end of the wire guide.

3. Straighten the welding gun's cable and withdraw the wire guide from the gun.

4. Push a new wire guide in to the gun. Make sure that the wire guide enters all the way into the contact tip's adapter and that there is an O-ring at the machine-end of the guide.

5. Tighten the wire guide in place with the mounting nut.

6. Cut the wire guide 2 mm from the mounting nut and file the sharp edges of the cut round.

7. Reattach the gun in place and tighten the parts to spanner tightness.