

We follow the way that wheel moving!

CAR COLLISION REPAIR MACHINE

HFM-60A



INSTRUCTION & MAINTENANCE MANUAL



Read this entire manual carefully and completely
before installation or operation of the wheel balancer

Car Collision Repair Machine

Manual




Please read this manual carefully before use our machine

Catalogue


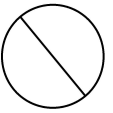
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1. Safety Precaution

- ★ please read and full understanding this manual before install and operate our machine.
- ★The manual safety precautions listed in is to allow you to secure and standardize the use of this product, and to keep you away from all hard.
- ★although our machine design and production strict compliance with national standards GB15579.1—2004Arc welding Equipment Part 1: GB/T8118—1995 arc welding power source and welding machines have been fully considered safe, but to avoid major personal injury during operation machine, please follow the safety instruction listed noted.
- ★use and operation of this product must be specially trained personnel that can understand and familiar with the welding operation.
- ★Do not put this product for purposes of other than welding.
- ★please notice wrong use and operation of this product may cause 3 different levels of injuries and accidents. This manual use attention words and warning language to remind and alert!

Mark	Alert Words	accidents and injuries may cause
	High risk	May lead to severe accident and injuries if misuse this machine!
	Dangerous	May lead to big accident and injuries if misuse this machine!
	Attention	May lead to moderate injuries or mild injuries if misuse this machine!

In additional, during use and operate this machine, there have below marks and attention words to indicate “the work must be done” and “the work prohibit to do”

	Forced	the work must be done, such as external protective conductor “ground connection”
	Prohibit	the work prohibit to do

	Dangerous In order to avoid electric touch, please follow below notes.	
		Touching live parts can cause fatal electrical shock or serious burns, when the machine is in working condition, as welding circuit is open, then both electrode or the workpiece will be electrified, while the power circuit, electrical main circuit and control circuit of machine all electrified. Wrong installation and not properly "ground connection", may lead to risk of electric shock.

- ★ This machine should be installed by professional electrical personnel in accordance with the instructions in the 8 Installation and Commissioning. Machine and workpiece must be reliable 'ground'.
- ★ Must ensure had cut off the input power in distribution box before operation of install, maintenance, repair this machine.
- ★ Do not touch live parts,
- ★ Please insulate cable connect part, ensure reliable insulation,
- ★ Always check the power input cable for damage, if damaged replace it immediately,
- ★ In the operation, please wear dry, no damage insulated gloves, shoes and work clothes,
- ★ Please keep workplaces clean and dry, avoid working in wet conditions;
- ★ Do not use this machine when the cover of this machine is removed.
- ★ When operation this machine in the high-altitude places, please wear safety equipment;
- ★ Cut off the power supply when not use this machine.



Dangerous

Please use protective tools in case dangerous fumes and toxic gas arising from welding.



During welding process will produce some smoke and toxic gas, inhalation of these fumes and gases will be harmful to health. Avoid operate this machine in narrow places, which will cause dangerous of suffocation.

- ★ To prevent gas poisoning and suffocation, please take adequate ventilation and take air-breathing apparatus.
- ★ during welding operations, keep the head away from the smoke as far as possible, do not inhale the smoke generated from welding;
- ★ when operated in narrow places, should be equipped with the ventilation equipment, if necessary, use respiratory protection equipment should be equipped.





Dangerous

To prevent fire, explosion and cracking, please follow below precautions.



Splash and workpiece just finished operation can cause fire., Cable connection, the negative clip if poor contact with the workpiece joint, will cause fire because heat from contacting with electric resistance, Do not weld sealed tank, fuel tank, otherwise will cause the risk of workpiece burst.

- ★ Protect ones own and others from flying and hot metal against the danger;
- ★ Avoid splash on combustible material, clear away the combustible materials. If you can not clear the material, please cover it with flame-retardant,
- ★ Do not work near flammable gases,
- ★ Cable connection must be firm and well insulated;
- ★ Please connect the clip as close as possible with workpiece,
- ★ Grinding and clean the workpiece during operations, try to avoid splashing,
- ★ Please place the fire extinguisher near the work site, just in case of any dangerous occurred.

 Attention	To prevent the electromagnetic field impact on o person or products, please follow the precautions.
	Electromagnetic fields may has undesirable impact on pacemaker, Electromagnetic fields may has unknown impact on human body, Electromagnetic fields may has electromagnetic interference with some electric equipment.
<p>★ Electromagnetic fields generated by the machine operation will has undesirable effect to operator's pacemaker. Operator with pacemaker should consult doctor first, and do not close machine and its workplace around if without doctor's permission.</p> <p>★ Electromagnetic fields generated by the machine operation on the health effects not confirmed and prove, does not exclude a negative impact on the body,</p> <p>★ Operating construction personnel shall follow below methods to achieve the reduction of electromagnetic fields on human hazards, take preventive measures:</p> <ul style="list-style-type: none"> ■ Try to reduce the welding cable and ground (piece) cable length, ■ Do not exposure on the middle of welding and earth cables, please place cables on one side of the operator, that is, if welding cable on the left of operator, then the grounding cable should also keep in the left and parallel to, and away from the operator, ■ Be sure not wrapped around cable to the body, the body exposed to electromagnetic fields in order to avoid health effects, ■ Do not sharing the ground connection of the workpiece and machine with other machine(equipment). ■ Do not use the machine when the cover of machine removed. <p>★ Electromagnetic fields may produce electromagnetic interference with some electrical equipment, should take appropriate precautions to guard against it.</p>	

2 Main usage and applicable scope

The auto sheet metal repair machine is the ideal product for auto maintenance. This series of machine adapted to shape sheet metal of repair cars. The repair cars to be flat pad with a bent area or melt steel needle to stretch after planning or carbon rod heated to reduce fire and quenched. use our company's equipment and accessories, body surface operations will be able to quickly perfect finishing recessed areas and damaged parts without dismantling the body, is related to auto repair industry and the best equipment used in sheet metal industry, we also produces chargers, car starter power, CO2 welding machine, short wave infrared heater, automatic car wheels and so on, welcome use our products.

3 Applied work environment and condition

Environmental conditions:

3.1.1 elevation is not more than 3000m,

3.1.2 ambient air temperature range,

During operation: -40 ~ +45 °C,

In the transport and storage conditions: -25 ~ +55 °C.

3.1.3 Relative humidity:

when temperature in 40 °C, humidity should less than 50%,

when temperature in 20 °C, humidity should less than 90%.

3.1.4 air dust, acids, corrosive gases or substances of around ambient do not exceed normal levels, except those substances produced due to process operations, the site should be no violent vibrations

and bumps.

3.1.5 should be placed in dry and ventilated place, and to prevent direct sunlight and rain.

3.1.6 The gradient of the product placement should not exceed 10 °C, when the product placed in the inclined plane, should pay attention to prevent dumping.

3.2 working conditions:

3.2.1 to meet the needs of work product distribution capacity, see "8.2 Installation";

3.2.2 Power supply is: 3 ~ 380V/50Hz; two-phase 190V/60Hz (Americas only).

3.2.3 Voltage fluctuation range: $(1 \pm 10\%)$ 110V;

3.2.4 Power frequency ranges of: $(1 \pm 1\%)$ 60Hz.

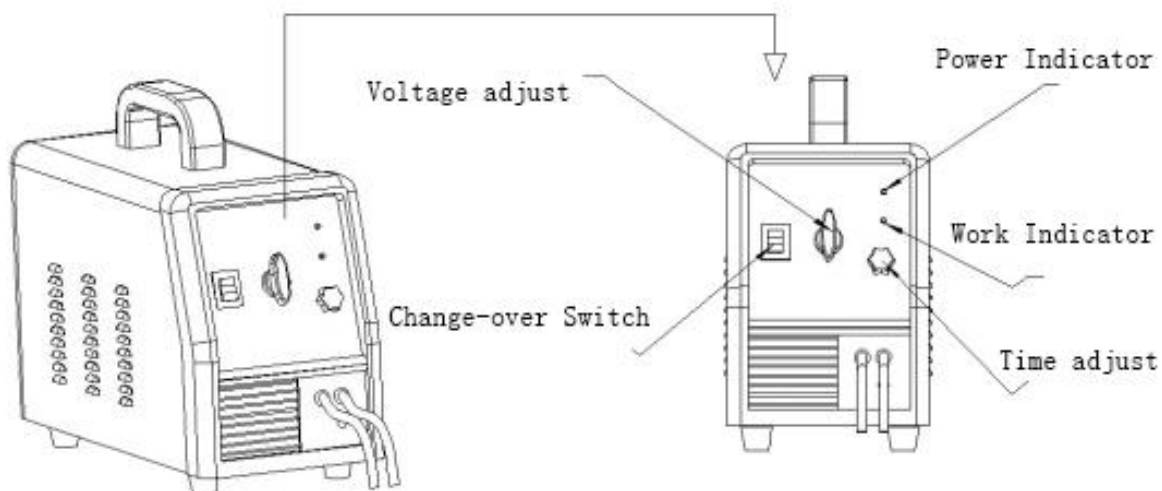
4. Main Tech Data

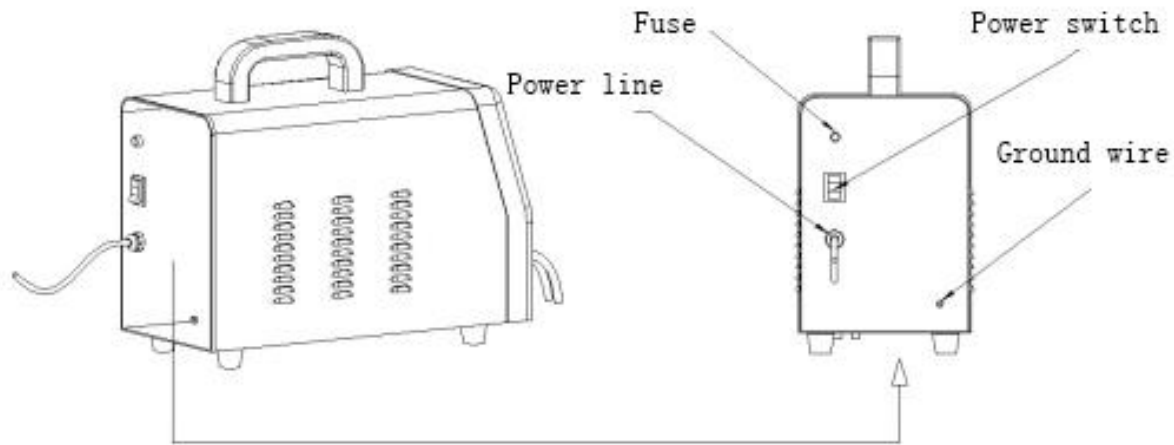
Model	HFM-60A
Input power(A.C)	Single phase 220V 50Hz
Output voltage (A.C)	6V-12V
Max. power(instant)	95KVA
second SCC	9800A
time adjust	0-1.8 s
one side metal thickness	0.8-1.5mm
Two side metal thickness	3.0+3.0mm

5. Main Structure

The products are mainly compose of movement, cover, handle, frame, wheels and other components. Movement composed of the control transformer, silicon controlled, transformer, control board. Shown in Figure 1.

The display shows:





6. power requirements

This series of collision repair machine has big input current during work. the power supply wire must adopts the copper wire bigger than section area of 10mm^2 , otherwise it will lead to great drop pressure, and the machine will can not output enough power. If use the air switch, the 380V voltage machine must use air switch at current over 60A, while the voltage of 220V should use air switch at current over 100A. In the use of this series repair machine, must be firmly connected covers with ground wire, to ensure the safety of the operator.

7. Storage and transportation

This machine should be avoid rain and snow soaked attack during storage and transport. Avoid corrosive medium. The storage temperature is $-25\sim+55\text{ }^{\circ}\text{C}$. The machine is packed in carton, when it delivered to the user site, the user can use lift truck or crane to unpack after moving in place. In transit must be taken to avoid product tilt, fall or collision, so as to avoid injury of personnel or products.

8. Installation and commissioning

8.1 Open case inspection

Users receive the products and open the case, first should check the appearance of the product if have serious collision and fall injuries. Then check the integrity of the product of the number of the parts, accessories(see paragraph 13) according to described in manual. If as normal, please operate as follow requirements and standards.

8.2 Installation


8.2.1 Distribution and capacity requirements

The power of this product is $3 \sim 380\text{V} / 50\text{Hz}$ (in the Americas with $2 \sim 190\text{V}/60\text{Hz}$) AC power. Users should have the appropriate power distribution devices such as power distribution boxes, etc., and should install the appropriate circuit breaker (air switch) or switch and fuse (fuse) and ground wire (protective earth). Grounding wire with plastic multi-core copper wire, all wiring must be firm and reliable and should be insulated. Specifications required parameters as Tables 8.2.1



Welder distributor, capacity, wire connection requirement tech data



Input Power Supply		1 ~ 220V/50Hz
Min. distribution capacity(KVA)		60-100
Input protection	fuse(A)	60
	breaker(A)	63
distribution input and output min. section	Input side cable section (mm ²)	10
	Output side cable section (mm ²)	70 (positive and negative pole, copper)
	Ground connection side cable section (mm ²)	6

8.2.2 place requirement

 Attention	When place machine, please follow below notes
	<ul style="list-style-type: none"> ★ Do not place heavy objects on the product, ★ Please place the product in dry, ventilated environment, ★ The product shell protection grade is IP21S, not suitable for use in the rain, ★ Please place the product at the environment no direct sunlight, wind and rain, ★ please place the product in leveled ground., ★ When the products placed in the tilt plane, should take to prevent the dumping, ★ Please place the product in ambient air temperature is -10 ~ +40 °C , ★ Product placement sites should be no violent vibrations and bumps, ★ Please place the product in ambient air in the dust, acids, corrosive gases or substances do not exceed normal levels, ★ Keep the appliance and the wall or other equipment to maintain spacing between the position in more than 30cm.

8.2.3 Connection and safety ground connection

 Enforced	Machine power input earth wire and workpiece must be reliable ground.
 Dangerous	For your safety of use electric and not electric shock, please follow below attention

		<p>Touching live parts can cause fatal electrical shock or serious burns. For the welding circuit is open, so when the machine is in working condition, both parts, electrode or the other workpiece, machine input circuit, and electric main circuit and control circuit are all in charged state. Installation not properly and not properly protected, "ground", can also lead to risk of electric shock.</p>
<p>★ Machine should be installed by professional electric technician according to Installation and Commissioning of this manual. Machine and workpiece must be reliable ground.</p> <p>★ Must disconnected the input power in the distribution box during installation, maintenance and repair products ,</p> <p>★ If the construction site is wet , please install leakage circuit breakers;</p> <p>★ Do not touch live parts;</p> <p>★ Ensure reliable insulation of the cable connection parts,</p> <p>★ Always check the power input cable for damage, if damaged replace it immediately;</p> <p>★ Please cut off power supply when not use products.</p>		

For machine connect please refer to distribution and capacity of wiring required specification provided in the tech data. before you connect, please cut off the power supply and checking whether the cable damaged or not, all connections must be firm and should be insulated. machine Input power ground wire and the workpiece must be reliable "ground"; welding cable connections must be solid and reliable firm, please check whether the standard welding wire and placed of machine is correct, if this meet the "9.2" article requests can be combined on the power distribution box power switch, make power supply to the product.

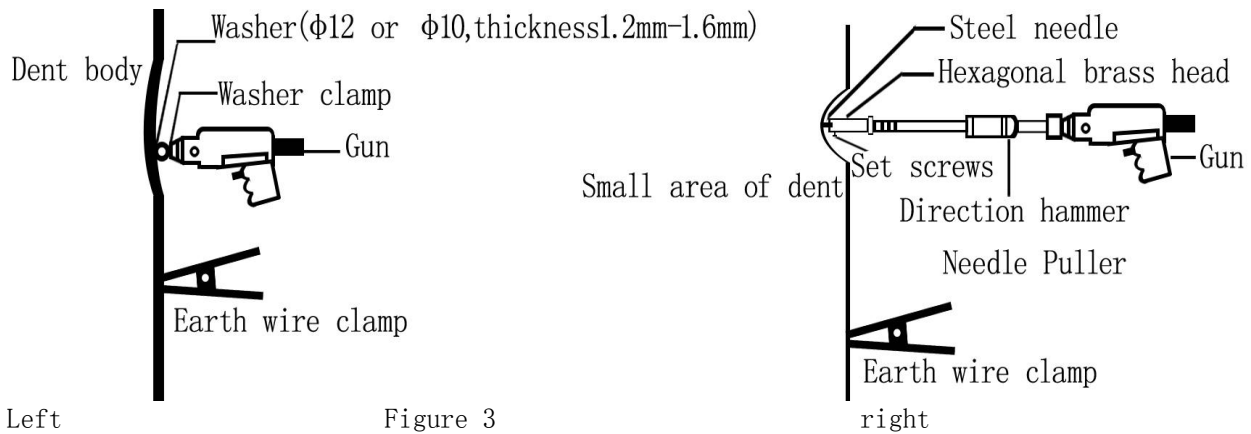
9. Use and operation

9.1. Light body gasket melting plant functions (repair dent part):

9.1.1 Paint rust sanding: grinding to clean with angle grinder at work piece before repair, also grinding the site near the work piece, and clamp this site with ground clamp. Clamp the clean site with ground clamp. Open the switch the indicator light on. Ajudst the current voltage.

9.1.2 Melting: according to work requirement, the function indicator light on. Adjust welding time and current voltage. Press the switch on the gun. Working indicator light on.(time adjust to 2.3 position, should accordance with current. Generally the big current has good effect in short time, this need learn from practice).

To clamp the clean site with ground clamp and be sure it can has good strong current through with the repair piece. And make it as near as possible with the work piece.(see Figure 3 left),



according to the body material thickness, adjust the time match with the current parameters, (should try several times to explore the experience of a more ideal value due to material differences). Pressing the Rotary Switch, No.6 light come on, the left meter shows the input voltage; rotating knob adjusts time and current intensity. Stuck the heads of copper melting plant (open copper head) on the gun, and make tighten with tightening screw. put flat washer ($\phi 10$ or $\phi 12$) into opening of copper head, hold the gun tightly, press lightly to the work piece with the flat washer, make welding gun close touch the workpiece, to finish a melting process.

9.2. Drawing of screw melt, needle and triangle: tight screw the needle puller to the welding gun. rotate knob to adjust time and currency intensity. Select high-current short time, or needle will melt and fail to get the desired effect. Pressing the gun switch, and stick with the workpiece, that is the machine automatically weld. then holding orientation hammer, strike the hammer pull along the axial direction to the car . (see figure 3 in right)

9.3 Usage of pull hammer: hook bright washer with pull hammer. then hold the direction hammer, strike the hammer pull along the axial direction to the car. repeat several times to make the dent parts recovery. If the dent area is large, should melting more washers. remove the bright washer by gently rotate the pull hammer after repair completed.

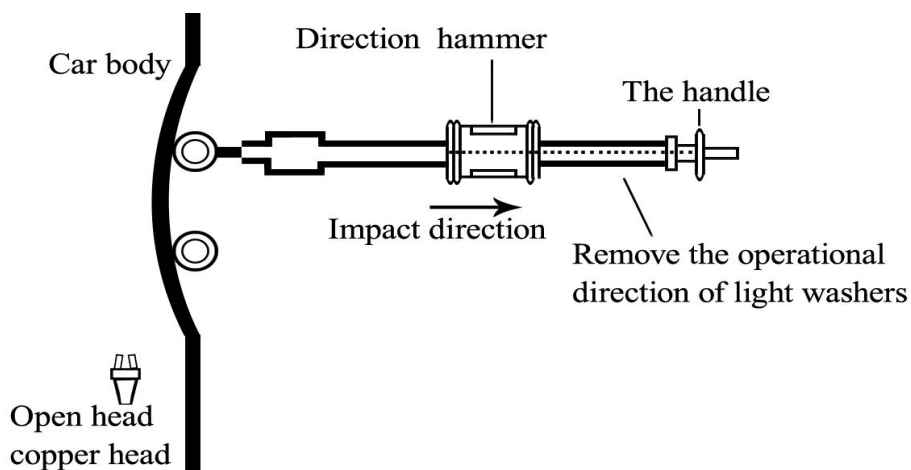


Figure 4

9.4 .Usage of snake rod:(see figure 5 left)

in order to improve repair efficiency, If work for a big area dent, please use the snake rod to repair. first head the flat cooper into the machine gun and screw it, the machine will in automatic state, gently press the flat cooper head on the snake rod, press the switch of welding gun(please pay attention adjust the current and time, or the snake rod will burned) and melting(see figure 5) completed each points of the snake many time, then use claw to draw the snake bar(replace the draw on the pull hammer with claw). strike outside with pull hammer(see figure 5 right)

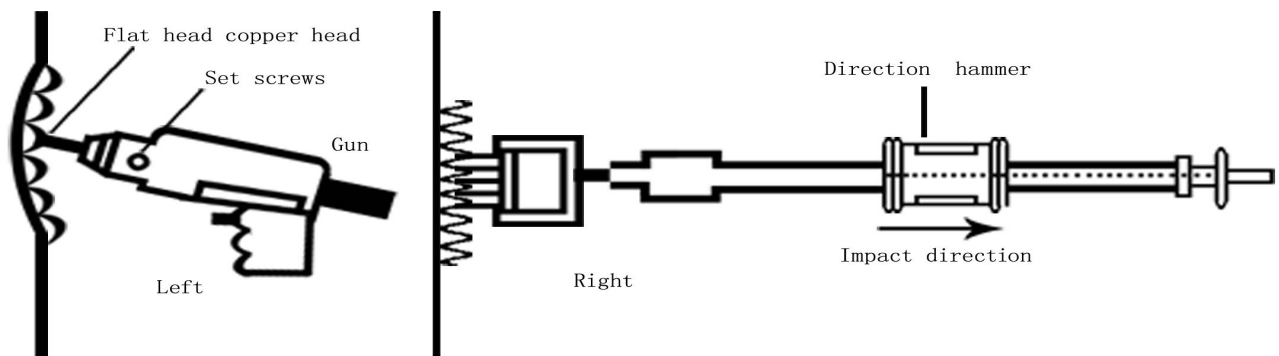


Figure 5

9.5 Usage of the vacuum chuck.

9.5.1. Installing the vacuum chuck first, and fix every screw, otherwise it will sliding, lead to damage.

9.5.2. Directly connect the vacuum chuck and connect with compressor, place the chuck at big flat and bigger part of denting area, it will absorb on car body.

9.5.3. Use the pull hammer strike outside, the dent part will recover.

9.5.4. hold the hole of the handle, the chuck will loose itself.

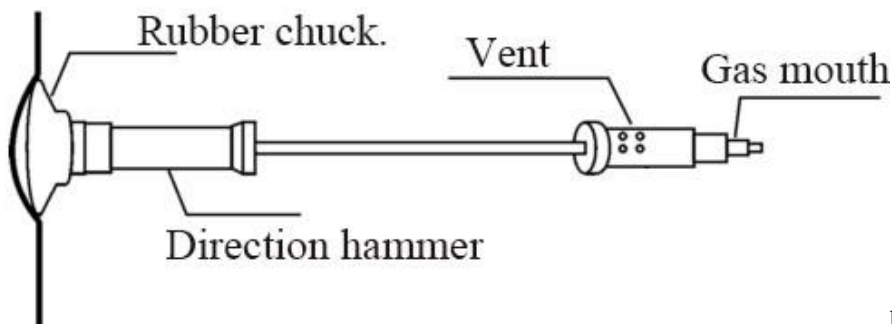


Figure 6

9.6 Repair of the hole on auto body or partial rust (one side welding function):

9.6.1 Grinding the rust around the hole or or rotten parts thoroughly, take a iron plate which little larger than hole as fillings pieces. Polished each sides of this iron plate and cover on the gap, the bonding for a single point (Figure 7, left);

9.6.2 Insert conical copper head in the gun and tighten the tightening screw firmly, rotate knob switch to adjust time and current intensity, is generally make based on thickness of plate, tight pressed the

gun on the iron plate edge. iron plate must be tightly connected with the body, pressing the gun switch for a single point operation. Iron plate should be uniformly distributed around the melting point, that is machine automatically trigger and work, melting point uniform around iron plate (Figure 7 on right)

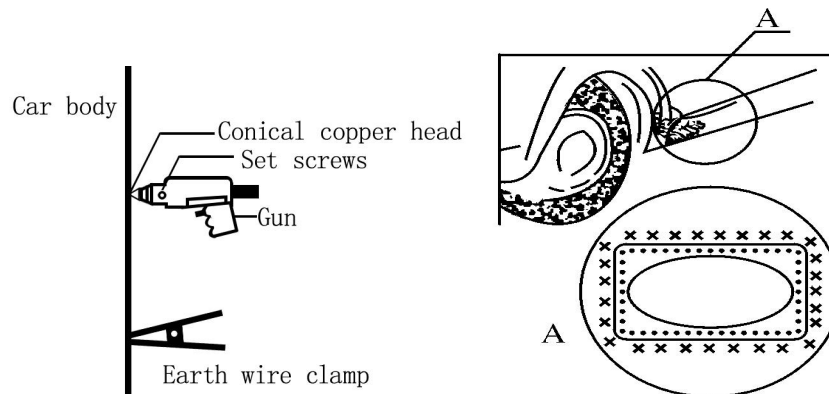


Figure 7

9.7 Usage of carbon rod:

Function switch downwards, adjust current ratio according to metal thickness. Insert the carbon rod to the gunpoint, and firm the carbon bar with screw (notice: can break off the carbon bar to make easy use if it too long to use). Make carbon rod directing to workpiece, then can melting, cut or heating to achieve purpose of shrink or quench. The usage of carbon rod has same function of oxygen weld, compare to oxygen weld, carbon rod has character of small transformation and easy operation.

9.7.1 if the metal too thick(thicker than the tech data), that cannot use insert function, can use carbon rod to bonding or cut.(two side welding function is optional accessories)

9.7.2 use carbon rod to melting or cut: can according to thickness of material to adjust current ratio, if the crack is large, can fill in iron wire, if fill in cooper rod, should add some borax at crack. Use carbon bar to touch directly with workpiece when it melting, slowly move carbon bar and melting them together to one piece. This operation should practice make right operation, can achieve better effect. (see photo 8)

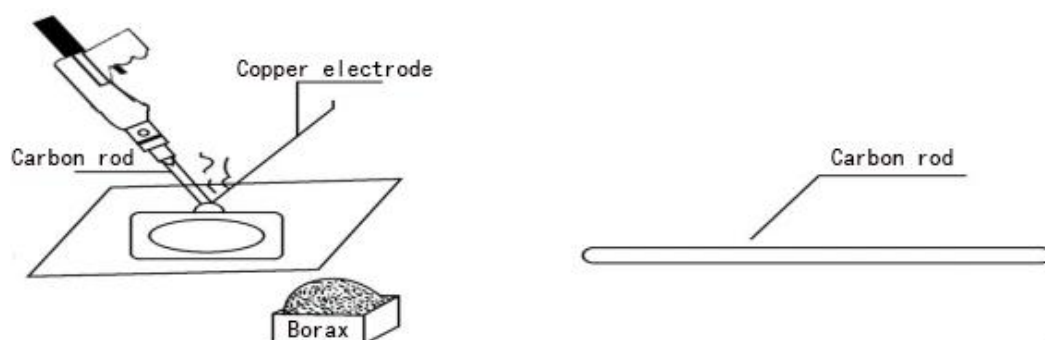


Figure 8

9.7.3if the dent after repair was shake or over stretched, can use carbon bar warming, and moving back and forth at this part. When it reaches certain temperature, can cooling with wet towel, that to achieve the purpose of quenching.

9.7.4 Fill with fuel tank and water tank: when fill the fuel tank and water tank, should first empty the tank. Open the cover, fill proper amount of water, use iron wire in $\phi 2$ or $\phi 4$ mm as bonding article, melting iron wire at holes and filling it evenly.


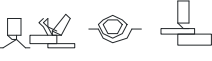
9.7.5 use carbon rod get small area cutting: the oxygen welding has big heating area, it not work with if there has rubber or electro circuit near workpiece. Cut with carbon rod, has small affect area, not need manual work when cutting, only need touch the metal with carbon rod, the cutting work is available.

9.8. Heating and flatten of the electrode: downwards of the function switch, replace the heating electrode copper head and fixed with screw. Electrode point need flatten workpiece. Press switch of gun, flatten when heating the workpiece.

9.9, the use of two-point clamp (optional):

9.9.1, Plug the two-point clamp into the fast socket of machine, pay attention to the correct bipolar.

9.9.2, insert air tube to air hole, be careful not to insert counter.

9.9.3, using the two-spot welding clamp, switch to  ; ; using other features, switch to  , and adjusting the time switch at same time.

9.9.4, pressing the switch on two-point clamp, two-point clamp first through the gas make bipolar clamp the workpiece to do melting work. Pay attention select the current and time according to the thickness of the metal.

10 Care and Maintenance

For your safe and efficient use this product, please maintain it regularly. Please first cut off the power supply if you want to maintain the machine. product maintenance and electrical maintenance should operate by professional personnel.

10.1 Users should always check the ground cable is connected securely.

10.2 check and clean the machine every three to six months. Clear away the dust inside of the machine with dry compressed air. The control circuit board need special treatment.

10.3 if machine have been sit idle, should be empty running not less than 2 hours every three months.

10.4 Check if the connector is loose or corroded regularly.


10.5 Check if the welding cables, products power input cable and grounding cable is old or damaged, if the insulation lower to avoid causing injury or product damage.

10.6 users must strict operate machine accordance with the provisions of this manual, Product warranty from one year from the date of delivery on the basis of proper installation and operation.

11 Commom fault and shooting methods

Fault symptom	reason	Shooting methods
Connect power, power indicate light not work	Power supply lacking phase or switch damaged	1. check power supply, replace switch.
every function	1. control circuit out of order	1. check and replace control circuit

indicate light not work	2. function botton switch damaged	board. 2. replace function botton switch.
Welding current cannot regulate	1. high current, breakdown car body 2. small current, cannot get firm welding.	1. check adjust rotate knob 2. check and replace
Machine not work after press the gun	1. switch of gun damaged or the control wire broke. 2. control board broken 3. Control transformer broken	1check control wire and replace switch. 2. replace control board. 3. replace control transformer
the machine work but not ignite after press the gun	1. output end not in good contact 2. control transformer broken	1. fix output end screw 2. replace control transformer

 Attention	If meet any problems not clear or exclusive, should cut off the machine and inform failure to technician, nonprofessional electrician not allowed disassembling this machine.
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12 product sets and accessories (packing list)

- 12-1. Main machine(including the output line and multifunction welding gun)
- 12-2. 4 wheel (including 2 flat wheel and 2 universal wheels)
- 12-3. chuck triangle drawing device 1 set
- 12-4. Driven pull hammer 1 set
- 12-5 Copper head cover, copper open head and copper cone each 1 piece.
- 12-6. Needle several, triangle plate several.
- 12-7. Carbon rod 2 pcs