

INSTRUCTION

Thank you very much for purchasing this product. Read this instruction manual thoroughly to insure correct, safe and effective use of the machine. Read the manual first to understand how to operate and maintain the machine.

Make sure you read, understand and take all the necessary safety precautions.

SAFETY PRECAUTIONS

This product is designed to be safe, but it can cause serious accidents if not operated correctly. Those who operate and repair this machine must read this manual thoroughly before operating, inspecting and maintaining the machine. Keep the manual near the machine so that anyone who operates the machine can refer to it if necessary.

- Do not use the machine carelessly without following the instructions in manual.
- Use the machine only after you completely understood the contents of the manual.
- If an explanation in the manual is difficult to understand, contact our company of sales service office.
- Keep the manual nearby at all times and read it so many times as necessary for a complete understanding.
- If the manual become lost or damaged, place an order with our company or sales service office for a new one.
- When transferring the machine to a new owner, be sure to hand over this instruction manual as well..

QUALIFICATIONS FOR MACHINE OPERATOR

Operators and repair staff of this machine must completely understand the contents of the instruction manual and they must be qualified and educated to handle this equipment.

1. The license for gas welding ganger
2. The diploma of the training course on gas welding.
3. The qualification certificate approbated by the ministry of labor.

| Symbol | Title | Meaning |
|---|--|--|
|  | General | General caution, warning and danger |
|  | Be careful not to get your fingers caught. | Possible injury to fingers if caught in the insertion part. |
|  | Caution: Electric shock! | Possible electric shock under special conditions. |
|  | Ground this equipment. | Operators must ground the equipment using the safety grounding terminal. |
|  | Pull out the power plug from the outlet. | Operators must unplug the power plug from the outlet when a failure occurs or when there is a danger of lightning. |
|  | Caution against bursting | Possible bursting under certain conditions. |
|  | General | General warning. |
|  | Caution: Hot ! | Possible injury due to high temperature under certain conditions. |
|  | Caution: Ignition! | Possible ignition under certain conditions. |

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1 Safety instruction

Operation, inspection, and maintenance that disregard the basic safety rules cause many accidents. Carefully read, understand, and master the safety measures and precautions described in this instruction manual and on the machine before operating, inspecting, and maintaining the machine. The safety messages are classified as indicated on the machine safety labels:

■ WARNING

This word is used in a warning message and a warning label is positioned at places that could cause injury or serious accident.

■ CAUTION

This word is used in a caution message and a caution label is positioned at places that could cause slight injury or machine damage. This is also used as a caution for frequent dangerous actions.

■ NOTICE SIGNS

This is a sign to show machine operators and maintenance engineers items that relate directly to damage of machines and surrounding facilities and equipment.

1.1 General machine safety precautions

Read and understand the following important safety information:

1.1.1 Machine safety

1. The machine casing is mainly made of aluminum alloy to reduce weight. For this reason, be careful not to drop a heavy item on the machine, or not drop the machine when carrying it, since the alloy is not designed to withstand such impact.
2. When mounting hoses to the torch and distributor, tighten the nut with the attached wrench. After mounting, be sure to check there is no gas leak with a detection liquid. If a gas leak is found, retighten the nut firmly.
3. When fixing a tip to the torch, tighten the nut with the two wrenches attached. In addition, avoid damaging the taper part of the tip since this may cause backfire.
4. Never disassemble the machine other than during maintenance and inspection. Otherwise, malfunction will result.
5. Never remodel the machine. Remodeling is very dangerous.
6. Always turn the power off when not in use.
7. Never use the machine outdoors when the weather is wet. This will cause failure of the machine and could cause a fatal accident by electric shock.

1.1.2 Safety clothing

1. Be sure to wear protector' s gauntlets, goggles, helmet, and safety shoes during operation.
2. Avoid operating the machine with wet clothes or hands in order to prevent electric shock.

1.1.3 Operation and handling safety precautions

1. Read this instruction manual before operating the machine.
2. Make sure the machine runs normally and perches rightly before operation.
3. Before opening power, make sure the drive knob is in the stop position which is in the middle.
4. Prior to operating the machine, check the safety of the surroundings to avoid accidents.
5. Never move the machine while the preheat flame is on.
6. When use track to cut, clear groove of track. Otherwise, it will affect track of machine and cutting quality.
7. Notice: Don' t bump or knock track.
8. Lifting device of machine has device to avoid knocking. If torch is knocked, small gear disengages from vertical gear rack and does not damage mechanic parts.
 - 1) Close quadruple switch to stop vertical drive.
 - 2) Hold lifting bar to arise torch. When low lifting bar, gear and gear rack engages automatically. Low lifting bar slowly, otherwise, impact of falling damages rolling pin.
12. Direction changeover switch
 - The direction changeover switch is used to change the direction of cutting between clockwise and anticlockwise. Check the running direction or the direction of revolution button before cutting.
 - When changing the direction of running, make the driving button in the stop position. And change the direction of running after the machine comes to a full stop.
Instruction: Before electrifying, it is necessary to check if the driving button is in the stop position. It is very dangerous to turn on the machine when the driving button is in the open position.
13. Do not touch the revolution parts during the operation process, because it is very dangerous!
14. Keep the machine from vibrating during the cutting process.
15. The gas used for the cutting process is dangerous in the case of wrong operation, so it is necessary to connect the fuel gas hose correctly..
16. You must close preheat valve and fuel gas valve when checking the running of the machine before operation and cutting allocation.
17. The bottom of the tip, torch and the butterfly-screws etc are very hot after cutting, so it is necessary to wear gloves if you want to touch them.

18. You must not drag the cable conductor of power supply.
19. Don't leave the machine alone before it flames out.
20. The gas-in junction must be locked tightly used the hose-hoop in order to prevent serious accident caused by gas leakage.
21. When the fuse burns out frequently, it is not allowed to use the fuse bearing high-current before finding out the cause.
22. When moving the machine it is not allowed to drop, bump or shake it strongly.

1.1.4 Electrical system precautions



1. Be sure to check the input power voltage of the machine before operation. The input power voltage should be in the range of $\pm 10\%$ of the rated voltage. The machine should not be operated out of this range.
2. The metal plugs are screw-threaded, therefore, fully tighten them so that they will not come loose during operation.
3. Be sure to ground the power cable of the machine.
- 4. Stop operation and turn off the power in the following cases, and ask a qualified electrician to repair the machine.**

- 1) Broken or abraded cables
- 2) When the machine has been in contact with water, or in case of liquid damage to the machine.
- 3) Abnormal machine operation despite operating the machine according to the instruction manual
- 4) Machine breakdown
- 5) Poor machine performance the requires repair

5. Periodically inspect the electrical system.

1.1.5 Maintenance and inspection precautions



1. Ask a qualified electrician to perform repair and inspection service.
2. Disconnect the power plug before inspecting and repair the machine.
3. Maintain the machine periodically.

1.2 Notice instruction before the operation of air cut.

Strictly observe the safety rules and precautions to ensure the safety of gas cutting operations.

Operators and supervisors MUST keep safety in mind.

1.2.1 Prevention of explosion



1. Never cut pressurized cylinders or hermetically sealed containers.
2. Ensure sufficient ventilation for gas cutting to prevent the air from becoming stale.

1.2.2 Pressure regulator safety precautions



1. Before starting operation, check that all pressure regulators are operating correctly.
2. Ask a skilled repair engineer to perform maintenance and inspection service.
3. Do not use pressure regulators from which gas is leaking, or malfunctioning pressure regulators.
4. Do not use pressure regulators smeared with oil or grease.

1.2.3 High pressure gas cylinder safety precautions



1. Never use broken cylinders or cylinders from which gas is leaking.
 2. Install cylinder upright and take measures to prevent them from falling.
 3. Use cylinders only for specified purposes.
 4. Do not smear container valves with oil or grease.
 5. Install cylinders in a place free from heat, sparks, slag, and open flame.
 6. Contact the distributor if the container valves will not open.
- Never use a hammer, wrench, or other tools to forcibly open container valves.

1.2.4 Safety precaution for hoses



1. Use the oxygen hose for oxygen gas only.
2. Replace cracked hoses or other hoses damaged by sparks, heat, unshielded fire, etc.
3. Install hoses without twisting.
4. To prevent breakage of hoses, take great care during operation and transportation.
5. Do not hold the hoses when moving the machine.
6. Periodically check the hoses for damage, leakage, fatigue, loose joints, etc, to ensure safety.
7. Cut hoses to the minimum possible length. Short hoses reduce hose damage and pressure drop, as well as reduce the flow resistances.

1.2.5 Safety precautions for fire



Take safety precautions to prevent fire prior to gas cutting.

Ignoring hot metal, sparks, and slag could cause a fire.

1. Keep a fire extinguisher, fire extinguish sand, bucket full of water, etc. ready on the site where gas cutting is performed.
2. Keep flammables away from the cutting area to avoid exposure to sparks.
3. Always cool down steel plates that have become hot after cutting, as well as hot cut parts or scrap, before bringing them close to flammables.
4. Never cut containers to which flammable materials are stuck.

1.2.6 Safety precautions for skin burns



Observe the safety precautions to prevent skin burns. Ignoring heat, spatter, and sparks during operation could cause a fire or burned skin.

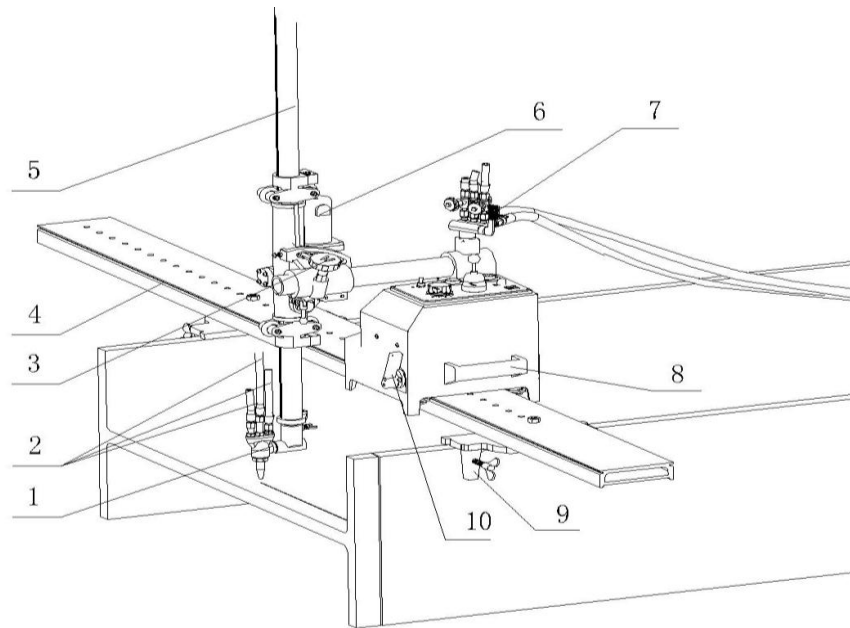
1. Do not perform cutting near flammables. (Move flammables well away from the sparks.)
2. Do not cut containers filled with flammables.
3. Do not keep lighters, matches, and other flammables nearby.
4. Flames from the torch will burn the skin. Keep your body away from the torch and tip, and check the safety before operating the switches and valves.
5. Wear the correct protectors to protect your eyes and body.
6. Correctly tighten the tip to prevent backfire.
 - When fixing a tip to the torch, tighten the nut with the two wrenches attached.
 - If the tip is tighten excessively, it will be heated during cutting and tightened still more, making it difficult to remove the tip.
 - Avoid damaging the taper of the tip since this may cause backfire.
7. Check with soapsuds for any leakage of gas from the connection part of the distributor, hoses and torch. Never use oil or grease on the connection of the oxygen pipe to avoid backfire which may lead to explosion.
8. Be sure to check the following when igniting:
 - Place the torch on the torch holder before igniting.
 - Wear the required protectors (gauntlets, helmet, goggles, etc.)
 - Check for any obstacles, dangerous materials and flammables near or in the direction of cutting.
 - The surface temperature is very high, so do not touch it even you wear gauntlets.

2 Outline of machine

2.1 Features of machine

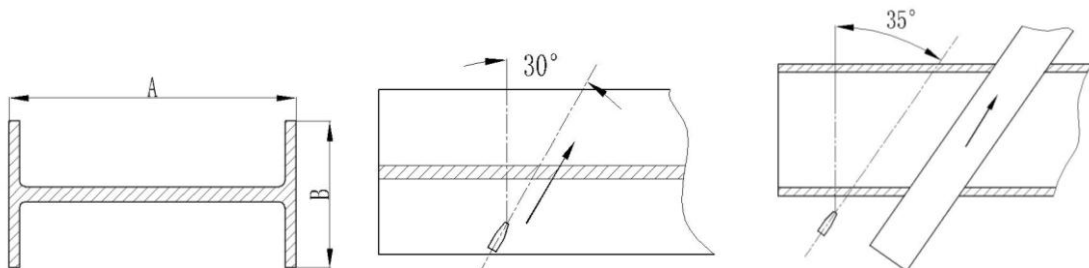
“ CG1-2A” portable H Structural section gas cutter is designed for cutting large-sized structural section. The cutter is constituted of web plate cutting mechanism, wing plate cutting mechanism, control box, gas distributor and torch. The shell of cutter is made of aluminum. Every section is connected with web plate cutting mechanism. The web plate mechanism is composed of box of reducing speed, motor and clutch. The web plate cutting mechanism walks on the track with four rollers. The wing plate cutting mechanism is installed on one side of the web plate and four pulley sustaining bars move vertically in the way that gear moves with gear rack. Design of the cutter is reasonable and the cutter is easy to check and repair. All operations are completed on the control panel such as quadruple switches, quick return push-button, speed modulation, power source switch. It is easy to master the operations even if freshman.

2.2 Name and function of each section



- | | |
|--|--|
| <p>1. Torch</p> <p>2 . Gas hose: connected between torch and gas distributor to deliver gas ,</p> <p>3. Adjusting pilot wheel for transverse: It is to control torch transverse movement.</p> <p>4.Track</p> <p>5.Vertical moving bar</p> <p>6.Reduce speed motor of web plate cutting equipment</p> | <p>7. Quick distributor: Flame is adjusted only once and not adjusted again.</p> <p>8.Handle: It is to move machine</p> <p>9. Track pressure plate: Locate machine on the H structural section</p> <p>10. Clutch knob: Pulling knob on the left side is off, pulling knob on the right side is on.</p> |
|--|--|

2.3 Specifications



| | |
|---------------------------|--|
| 1.Weight (body) | : 21.5kilograms |
| Accessory(track sections) | : 15.5 kilograms |
| 2.Machine dimension | : 400mm×340mm×440mm(Body) ; : 270mm×220mm×2200mm(Track) |
| 3.Speed control | : SCR control |
| 4.Power source | : AC 220V±10% |
| 5.Cutting speed | : 50 ~ 750 mm/min |

| | |
|---|---|
| 6.Cutting thickness | : 5-50mm |
| 7.Bevel angle | : 0 ~ 30° (wing plate; web plate) |
| 8.Maximum fly past of web plate cutting | : A=1600mm |
| 9.Maximum fly past of wing plate cutting | : B=800mm |
| 10.Maximum angle of wing plate slanting cutting | :30°(maximum height of slanting cutting 690mm) |
| 11.Maximum angle of web plate slanting cutting | :35°(maximum length of slanting cutting 1300mm) |
| 9.Tip | :G02(for acetylene) or G03(for propane) |
| 10.Motor | : 1) web plate motor 110V 50HZ 30W Rotational speed,3600 rpm : 2) wing plate motor 110V 50HZ 40W Rotational speed,2200 rpm |

3 Preparation for operation

3.1 Contents of package

Carefully take the machine out of its case. Check them carefully before assembling the machine. The contents of the standard package are shown in the following list.

| | |
|--|---|
| 1) Body | 1 |
| 2) Standard torch and sections | 1 |
| 3) Wing plate mechanism | 1 |
| 4) Tip (G02 or G03 # 1 , 2、 3 ,) | 1 |
| 5) Track(include track pressure plate) | 1 |
| 6) Inlet gas joint | 1 |
| 7) Spanner | 1 |
| 8) Specification sheets and certificate of qualification | 1 |
| 9) Power cable | 1 |
| 10) M5 inner hexagon spanner | 1 |
| 11) Phillips screwdriver | 1 |
| 12) Needle | 1 |

3.2 Introduction of section function

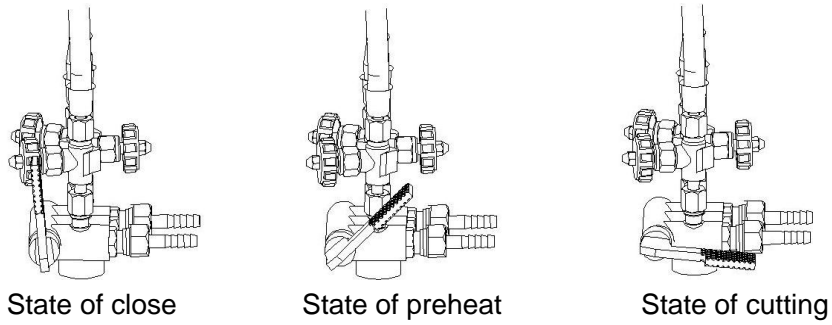
1) Quick distributor

Gas distributor uses integrated flame adjuster. Preheating flame and cutting oxygen are adjusted once. After that, property of flame keeps same with adjusting rotating angle of knob to turn on or off gas source when each cutting is finished.

Turn off position: cut off gas and oxygen

Preheating position: connect preheating flame and keep same

Cutting position: preheating flame and cutting oxygen turn on and cutting begins.

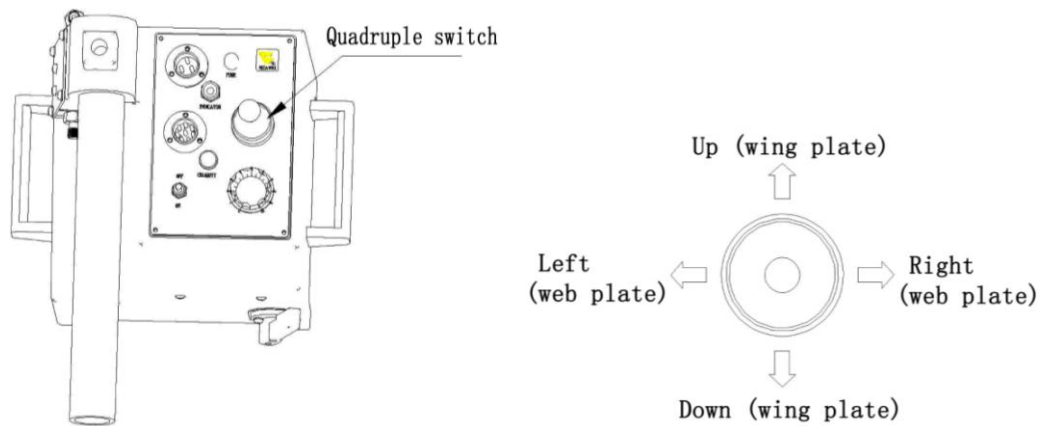


2) Application introduction

Pull quick distributor switch knob in the preheating position, ignition and adjust flame. Adjust valve to get best preheating flame. According to recent pressure, pull the knob in the cutting position and adjust oxygen flow when preheating flame is on. After these operations, pull the knob in the off position, repeat adjusting from preheating flame to cutting oxygen until be sure that flame is on normally. If pressure verifies, adjusting is needed again.

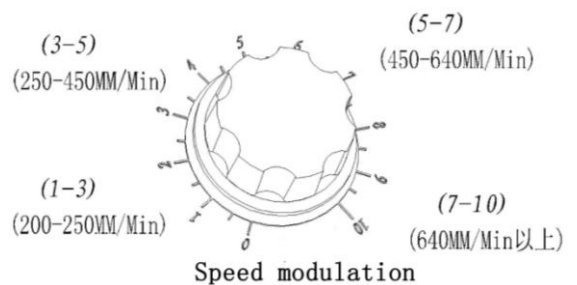
3) Quadruple switch

Sub switch is to control running direction of web plate motor and wing plate motor; interlocks with cutting oxygen. There are four arrows on the control panel. When operating bar of quadruple switch is pulled on the arrow side, it is running machine. Operating bar of switch returns to original position, machine stops running and cutting oxygen turns off.



4) Fast-moving switch

Switch is in the center of control panel. When press the switch, web plate motor and wing plate motor run at maximum speed (about 750MM/MIN). Sub function is convenient for torch going forward and back quickly. When handle of quick distributor is in the cutting position, cutting oxygen stops supplying in the work.



5) Pilot wheel for transverse: Tip is convenient to align mark line.

6) Wing plate angle control equipment

Set angle when slanting cut wing plate.

7) Speed modulation

Velocity label is divided ten grills. The relationship between grill and velocity is shown in the diagram.

8) Clutch knob

It is mainly used in web plate cutting automatic running, as well as adjusting distance between tip and wing plate and fixing the machine on the track.

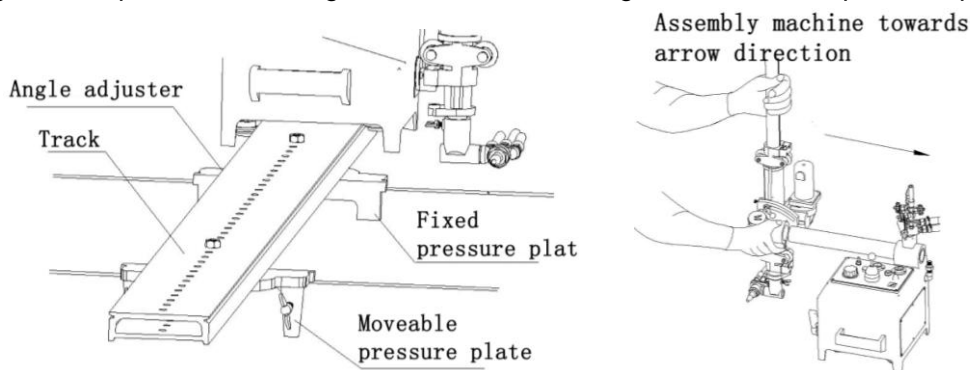
9) Lifting spacing switch of wing plate cutting

Adjust cutting position with height of wing plate. When cutting wing plate is completed, the machine stops running and cutting oxygen is cut off. At the same time, descending spacing switch is to insure machine is out of danger. When lifting bar elevates the limit position, the machine stops running.

10) Track equipment

Track system includes a fixed pressure plate, a movable pressure plate and a web plate angle adjuster. Butterfly screws of two pressure plates clamp wing plates which are in the both sides of H structural section. When size of web plate verifies, position of movable pressure plate can verify.

When cut web plate, release fixed angle screw and use hold down plate in line cutting. When slanting cut web plate, choose angle and label of track aligns scale of fixed pressure plate.



3.3 Assembly equipment

1. The machine is put into two boxes. Carefully take the machine out of its case.
2. Take out cutting equipment and insert traversing bar of body. Adjust pilot wheel in suitable position and locked tightly with slug screw. Connecting line of motor (eight-core plug) is connected on the control panel.
3. Take out torch and fix torch connector on the lifting bar whose mark aligns " 0" grill. And lifting bar is locked tightly with butterfly screw. Connect cutting oxygen hose of torch with inlet gas joint of electromagnetic valve. After that, check gas leakage with soapy water.

3.4 Preparation before operation

3.4.1 Connection of power cable

1. Before plugging the metal plug on the cabtyre code side into the socket on the machine side, check there is no sundries or dust.
2. The metal plugs are screw-threaded, therefore, fully tighten them so that they will not come loose during operation.

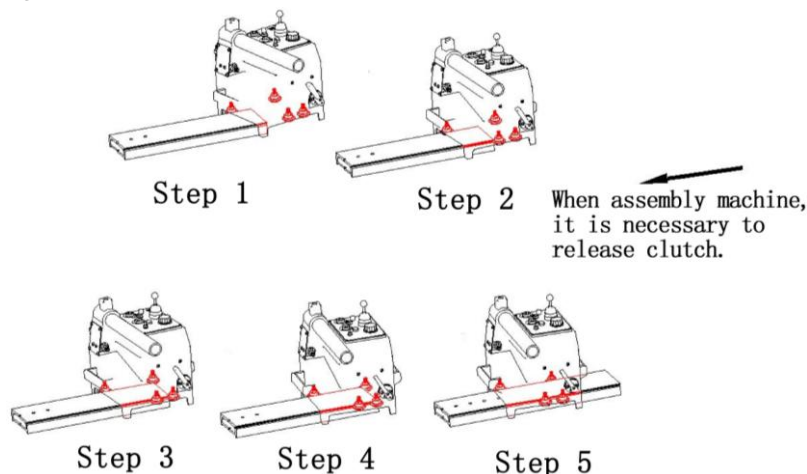
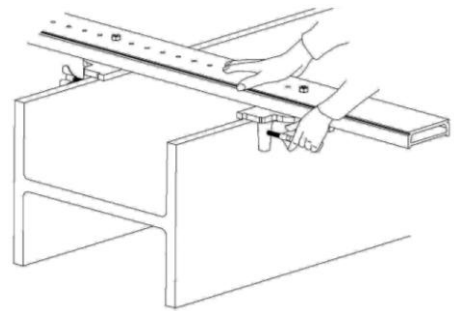
3.4.2 Connecting the tip

1. Select a proper tip according to the thickness of the steel plate and attach it to the torch. (To select a tip, refer to the cable of Cutting Data.)

- When fixing a tip to the torch, tighten the nut with the two wrenches attached.
- If the tip is tightened excessively, it will be heated during cutting and tightened still more, making it difficult to remove the tip.
- In addition, avoid damaging the taper of the tip since this may cause backfire.

3.4.3 Machine fixation

1. First, put fixed pressure plate and track on the H structural section and fixed pressure plate clamps wing plate of one side of H structural section.
2. According to web plate size, choose suitable position of wing plate which is on the other side of H structural section and fix movable pressure plate. Screw up butterfly screws of two sides of pressure plate to fix track on the wing plates which is on the two sides of H structural section.
3. Fix the machine on the track.
4. Connect primary hose with gas distributor and adjust pressure value to specified value in order to insure connection of hose without mistake.
5. Open source of power switch which is on the control panel and indicating lamp lights. Check operating bar of quadruple switch whether it is in the off position.



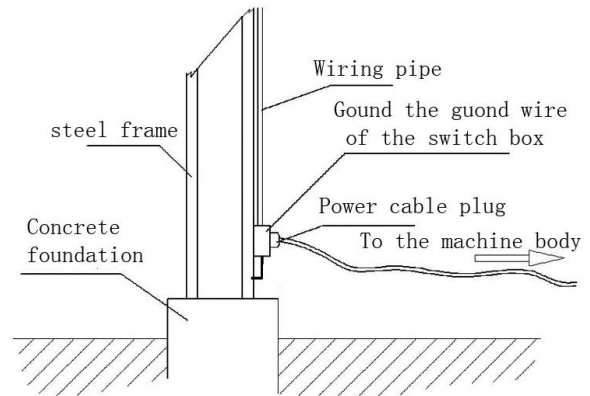
4 Cutting operation

4.1 Safety measures prior to operation

4.1.1 Safety precautions for grounding the machine



The cable of this machine is equipped with a grounding wire. For safety, be sure to ground the wire as follows, in addition to checking the connection of the power cable. (As shown in diagram)



4.1.2 Selection of tip

Referring to the Cutting Data, Select the suitable tip according to the plate thickness.

For a heavily rusted plate or for a bevel cutting angle of more than 20°, select the tip one grade higher than the one shown in the cutting Data.

4.1.3 Operation of quadruple switch

1. When machine needs to change direction, pull operating bar of quadruple switch in the off position. When machine stops running, change the position to run.
2. Move machine when operating bar of quadruple switch is in the off position.
3. Before open power, pull operating bar of quadruple switch in the off position. If it is in other position, machine runs when open power, which is dangerous

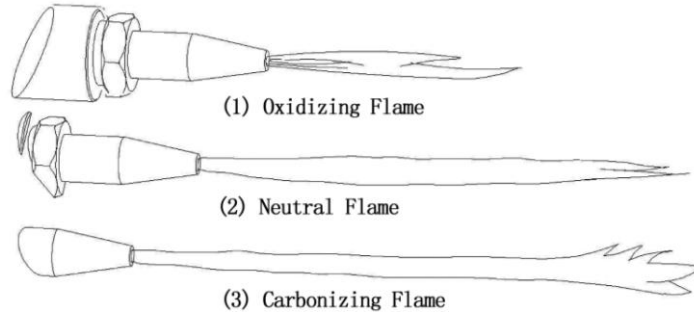
Notice: before open power, it is necessary to check whether drive knobs are in the off position. If drive switch is in the on position, it is dangerous to run machine.

4.2 Ignition and flame adjustment

NOTE: Adjust the gas pressure according to the Cutting Data. The data shows the pressure when all valves are open. Readjust the pressure after ignition.

1. Open the fuel gas valves 1/4 to 1/2 a turn, and light the torch with an igniter.
2. Then, open the preheating oxygen valve gradually until a white cone of the standard flame gas been obtained. (The incandescent area should be uniform and about 5-6 mm in length.)
3. Open the jet oxygen value fully. Readjust the flame if its condition has changed. A disorderly flow of the jet oxygen will adversely affect the quality of the cutting surface. In such a case, clean the tip with a suitable cleaning needle while the jet oxygen is flowing.
4. Appropriate distance between the tip end and cutting surface:
 - Acetylene gas8-10mm
 - LPG gas5-8mm

5. Neutral flame ensures good quality cut surfaces. (Oxygen flame may be used for bevel cutting.) Oxygen flame causes short cutting-oxygen current, allowing slugs to adhere, melting the upper edge of the cutting surface, and causing adverse effects on the cut surface. Similar defects will result when the cutting oxygen pressure is too high.



4.3 Cutting and piercing method

1. Cut in from the end of steel plate.
 2. Pierce steel plate before cutting.
 3. Drill a hole before cutting.
- Piercing method
 - 1) Ignite and adjust the flame.
 - 2) Thoroughly preheat the cut-in point until it is white hot.
 - 3) Open the cutting oxygen valve to pierce the steel plate. The tip should be about 15-20 mm from the plate to prevent slag from splashing onto the tip and adhering there, which will shorten the working life of the tip.

4.4 Beginning of cutting operation

1. Release clutch of machine and pull the torch on the edge of wing plate edge which is on one side of H structural section. Put torch horizontally. Then put quick knob in the preheating position. Ignite torch and adjust flame. (Refer to quick distributor adjustment in detail)
2. When use preheating flame, set quadruple switches in the descending position and push quick knob to low tip and be close to surface of wing plate. Adjust the distance between tip and wing plate. The distance range is about 7 to 10mm. Then close the clutch.
- 3 . Move tip center under the lower limb of wing plate 5mm and torch stops descending. At that moment, set torch descending spacing switch.
- 4 . Set cutting speed.
- 5 . Put quadruple switch in the ascending position. Tip center moves upwards and aligns cutting starting point which is near the wing plate. And preheat cutting starting point. (as shown in the diagram 1)

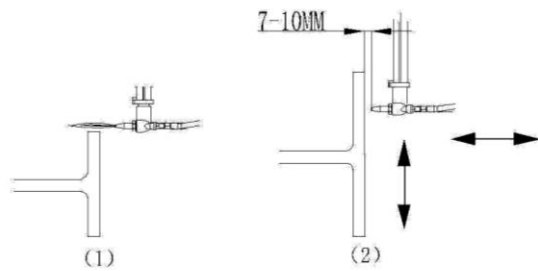


Diagram 1

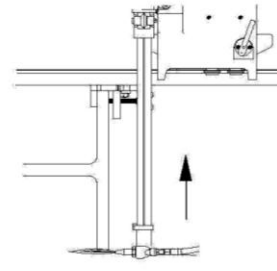


Diagram 2

6 . Preheat cutting starting point fully. Put quick knob in the cutting position and put quadruple switch in the ascending position. Torch moves upwards. Cutting oxygen ejects automatically through interlocking between electromagnetic valve and quadruple switch and cutting works automatically. (As shown in the diagram2.)

Check cutting state carefully and use speed control device to control cutting speed. When torch cuts in the middle part of web plate, the torch should reduce speed slowly (1 to 1.5 graduations in degrees). When torch goes through surface of web plate, it returns to initial speed. The aim is to cut web plate in the suitable depth and it is convenient to cut next web plate. The ideal cutting depth is about 20mm. (as shown in the diagram 3)

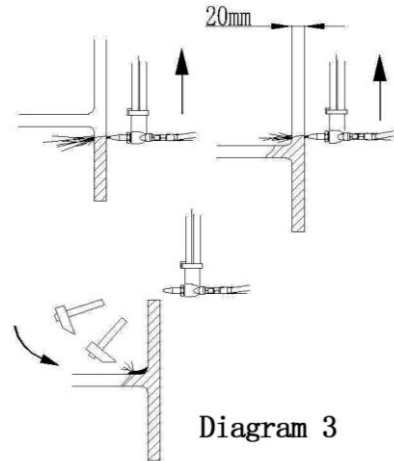


Diagram 3

7 . When tip leaves web plate edge, press quick knob quickly until torch center rises about 300mm over wing plate upper limb. Then put quadruple switch in the off position.

8 . Use pointed chipping hammer to clean slag on the web plate.

9 . Release clutch and pull machine to go forwards along with the track. Rotate torch 90 degree and keep torch vertical.10 Pull down quadruple switch and tip descends 7 to 10mm over web plate surface. It is convenient to use quick knob. Tip can not touch web plate.

11. Tip aligns web plate edge, then, close clutch. After preheating cutting starting point fully, put quadruple switch in the left position and machine starts cutting automatically. Cutting speed is faster than cutting wing plate. Because web plate is thinner than wing plate. (As shown in the diagram 4)

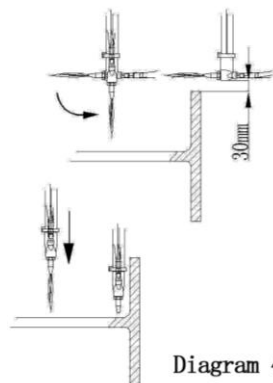


Diagram 4

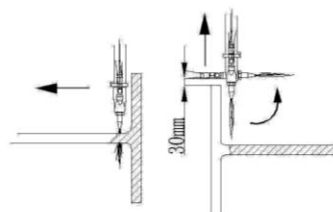
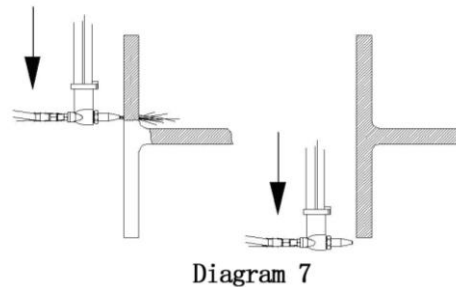
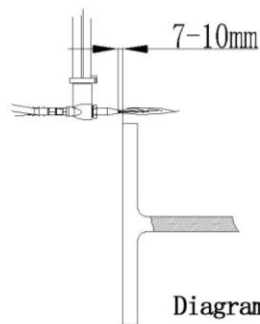
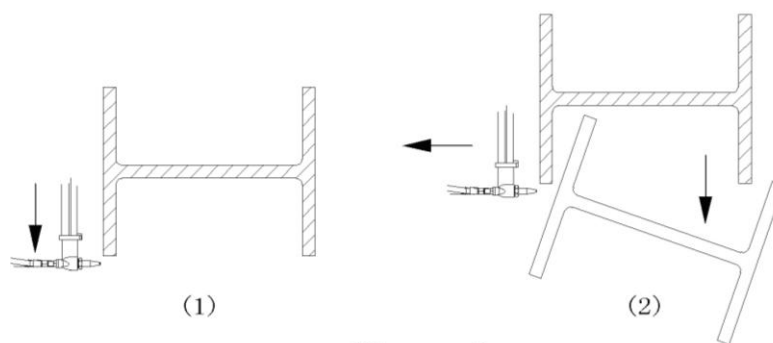


Diagram 5

12. When torch moves over the surface of wing plate 3mm to 4mm, pull up quadruple switch. Hold lifting bar to rise and rotate torch in order to keep horizontally. When torch center rises over wing plate upper limb 30mm, torch stops running.(as shown in the diagram 5)
- 13 . Release clutch and push the machine to go forwards and remove outboard of H structural section wing plate. Use quick knob to low torch and make tip center reach edge of wing plate.
- 14 .Adjust distance between tip and wing plate and the distance is about 7 to 10mm. Close clutch and lock cutting starting point and preheat wing plate.
- 15 . After preheating cutting starting point fully, pull down quadruple switch and machine descends and cuts automatically. (as shown in the diagram 7)



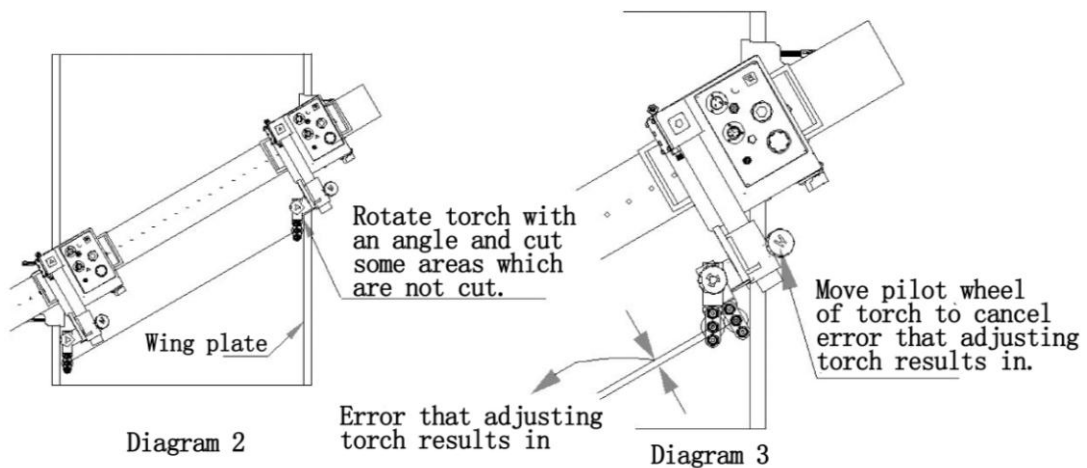
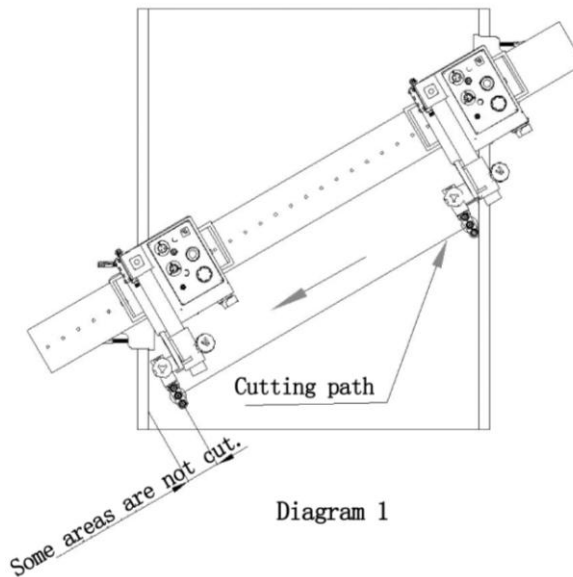
- 16 . When torch cuts middle part of web plate, the torch should reduce speed slowly (1 to 1.5 graduations in degrees). When torch goes through surface of web plate, it returns to initial speed.
- 17 . When cutting is completed, descending spacing switch stops wing plate running automatically. At the same time, cutting oxygen is cut off. Put quadruple switch in the off position.
Notice: avoid that cutting work piece falls and strikes tip in the process when cutting is completed. When work piece falls, release clutch and push machine to go forwards along the track or use other methods to protect tip.
18. After cutting, arise lifting bar and lifting bar stops until torch stops in the position of ascending spacing switch. Avoid knocking torch and damaging lifting sections, torch and some sections when take apart track and machine. (as shown in the diagram 8)



4.5 Notice of slanting cutting web plate

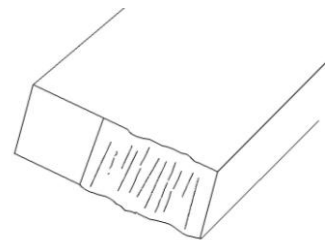
1 . There is an angle scale plate on the fixed track pressure plate. Track mark allocates on the specified angle which is locked with nuts. Use nuts to lock. Then fix track and machine on the H structural section.

2 . Slanting cutting is different from line cutting. Torch angle needs to be adjusted, otherwise, cutting is not whole. And some areas are not cut. As shown in the diagram 1. Adjusting method is shown in the diagram 2 and 3. When cut wing plates, only recover bevel graduations to zero.



4.6 Bevel cutting operation

When cutting bevel, use the angle (use 5° as its basic unit) on the torch holder and allocate the torch on an expected angle. When choosing a tip for bevel cutting, the thickness of the steel plate is L as shown in following picture. In order to compensate the over-dose heat loss due to the bevel cutting, the operator should choose an upper rank tip based on the Cutting Data. Slight



oxygenized flame will lead to an increase of efficiency and set the speed with a decrease of 20%~30%.The bevel cutting surface in the diagram is a result of inadequate preheating, which requires to change the tip and readjustment of the preheating and speed.

4.7 Safety measures against backfire and flashback

4.7.1 Prevention of backfire

Backfires may cause serious accidents or fire. Be careful to prevent such disaster. When a Backfire occurs, find the cause and inspect and maintain the machine correctly before using the machine again.

The followings are causes of backfire:

1. Improper gas pressure adjustment
2. Overheated tip
3. Slag clogged in tip
4. Damage to the tapered section of tip or torch will cause backfire.

4.7.2 Prevention of flashback

Flashback could cause fire and break the machine. Should there be a hissing sound in the torch, quickly take the following action:

1. Close the preheating oxygen valve.
2. Close the fuel gas valve.
3. Close the cutting oxygen valve.

Should flashback occur, find the cause and take appropriate action before using the machine again.

6 Maintenance and inspection

Refer to the following points for maintaining and inspecting the machine in order to use the machine under the best conditions.

6.1 Maintenance of the gear case

1. Because there are gears that run at a high speed in the gear case, so the operator should remove the shell of the machine, take out the gear case and wash the gears and the case with detergent every seven months. When reassembling, we should put new lubricant into the machine. If the turbine is abraded, we must change a new one.
2. The big rotary gear is an important part, so the gear slot should be kept clear and lubricated and the operator must add lubricant every time. If there are sundries in the gear slot, the operator must take them out immediately and wash the gear slot, and add new lubricant.

6.2 Maintenance of the tip

The durability and security of the tip used in HK-305 is very good. So the operator should abide the right maintenance and carriage precautions in order to ensure cutting quality.

1. Put the torch up a little and keep a 15mm distance from the plate when piercing, in order to avoid injury when the flame back up.
2. Clean the jet hole of the tip carefully use suitable dip washer.
3. Pay attention not to damage taper seat.

Replace the tip if the following cases occur.

- a. The injection stream of cutting oxygen can't extend straightly.
- b. The injection stream of cutting oxygen bifurcates at the end.
- c. The click may be heard in the tip when cutting.
- d. The gas leaks and burns at the hold-down nut.
- e. The preheat flame is out-of-flatness.

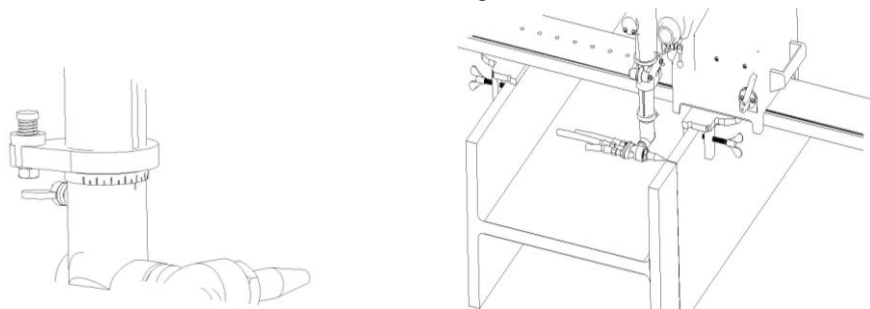
6.3 Maintenance of carbon brush

Remove the carbon brush cap to ensure the state of carbon brush every three months or 1000 hours. If the length of the carbon brush doesn't reach 3mm, the operator should change it to a new one. When change the carbon brush, the operator must check that whether put the carbon brush in right place. The direction of the carbon brush must be right and the flexure should be consistent with the commutation.

7 Troubleshooting

1) Wing plate does not align web plate in cutting.

- a. Do not set bevel angle of wing plate to zero or setting of angle is not right. Release butterfly screws of torch seat. Torch seat mark aligns " 0" scale on the scale disc.



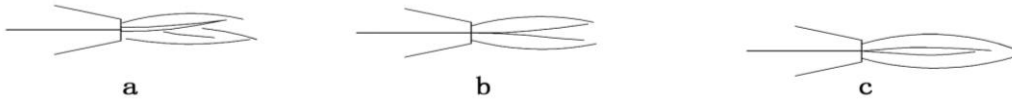
b. Torch mid-ship method

Fix center clamping fixture on the tip. Put torch horizontally and align one side of track. Put dividing ruler on one side of track and swing torch. If size of tip center line keeps same all the time, it indicates it is all right.

c. Mark parallel line on the H structural section. Low torch until torch touches upper limb of wing plate and swing torch. If tip center line is on the same marking line all the same, it indicates it is right. If tip centre line does not match marking line, bevel angle adjusting disk

of wing plate is not accurate. Calibrate as b step.

2) The injection stream of cutting oxygen is abnormal



a. The injection stream has offset angle

b. The injection stream has bifurcation.

c. The injection stream is too short (the length must be above 80mm.)

Clean tip or adjust cutting oxygen valve. If problems can not work out, a new tip is replaced.

Otherwise, web plate cutting and wing plate cutting can not work.

3) The wing plate motor and web plate motor do not run.

| Possible Cause | Inspection Step | Correction |
|----------------------------|--|-------------------|
| 1) Power is not supplied | Check the power supply | |
| 2) Fuse blown | Check the fuse | Replace |
| 3) Defective Drive-switch | Check that whether the click can be heard under the condition that the switch is on. (The click shows the switch doesn' t be damaged.) | Repair |
| 4) Broken power cable | Check the cable with a tester. | Repair or Replace |

2) The motor will not run while the power supply is on.

| Possible Cause | Inspection Step | Correction |
|---------------------------------|---|------------|
| Disconnection of 10Ω resistance | Remove the electric panel and check whether the resistance is good. | Replace |
| Carbon brush of motor is jammed | Take out the carbon brush, grind the forepart and fix it. If the problem can' t still be solved, then change a new one. | Replace |
| Motor is burnt out | Use the universal meter to check if the motor is good. | Replace |

3) During operation, the machine brings a big noise.

| Possible Cause | Correction |
|-------------------|--|
| 1) Skidding gear | Remove the gear case apart and rivet the gear again. |
| 2) Damaged gear | Check whether the turbine has been worn and worm has bad burr. Then replace the bad parts. |
| 3) Damaged motor | Change the motor. |

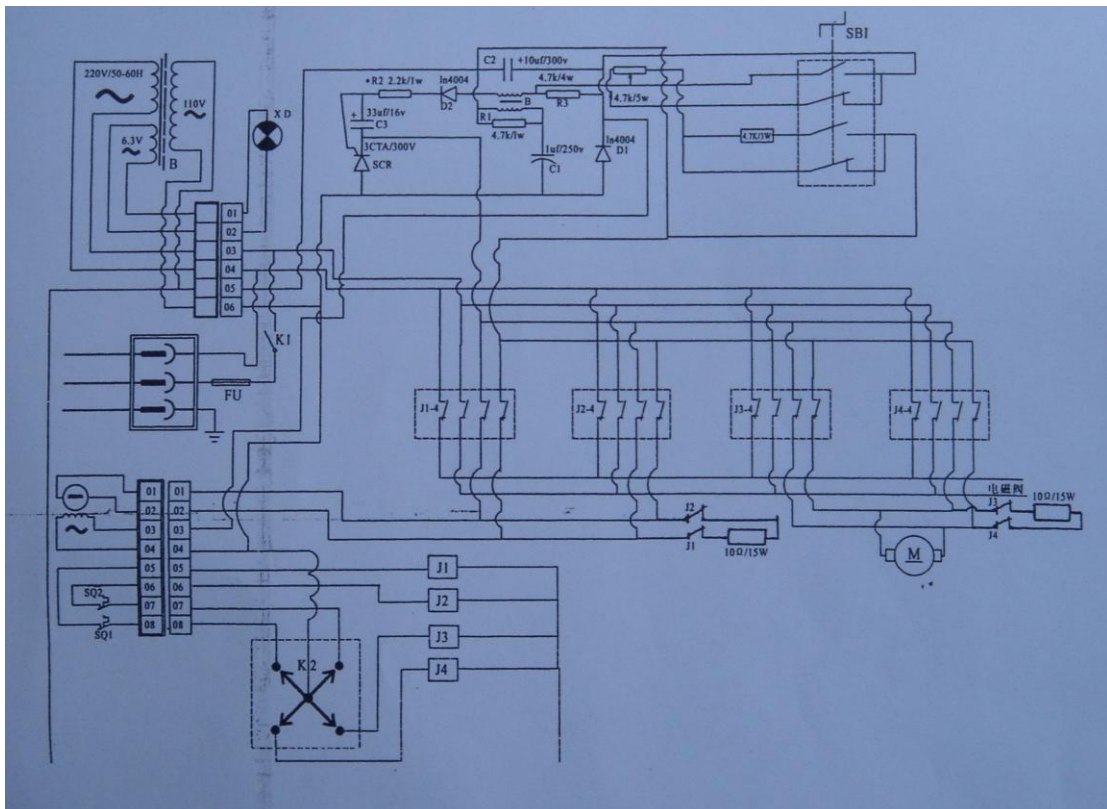
4) Gas leakage and fire leakage.

| Possible Cause | Correction |
|---|---|
| 1) The 30° taper is not contacted well due to incorrect usage. | Mend the 30° taper carefully with thin emery cloth to make it contacted well. |
| 2) The cater nut is not tightened. | Tighten the cater nut. |

5) The cutting flame is instable

| Possible Cause | Correction |
|--|---|
| 1) The duct tip is jammed by impurity. | Make the duct expedite with needle. |
| 2) The gas pressure is not enough and oxygen fineness is low. | Check air-feed pressure oxygen fineness whether in state confine. |
| 3) There is no injection stream of cutting oxygen. | Check gas distributor or electromagnetism valve. |

8 Wiring diagram



9 Maintenance illustration:

If you operate the machine according to the operating manual and the machine generates occurs accidents because of the product quality, we guarantee to keep the machine in good repair free of charge in half year based on invoice from the day we sell. According to the rules, if the following cases occur, we can't keep the machine in good repair free of charge:

- 1) The damages are leaded because of incorrect carriage or improper keeping.
- 2) The damages are leaded because of operating not according to the instruction manual and beyond the specified range of voltage.
- 3) The machine don't have maintenance card and receipt invoice.
- 4) The maintenance card don't match the machine.
- 5) The damages are leaded by natural disasters or some irresistible incidents.
- 6) The damages are leaded because the machine is token apart by unprofessional person
- 7) The damages are leaded because of using the fitting parts and accessories, which don't belong to our company.

(Illustration: Do not inform if the specifications and technical contents of the machine have been modified!)