Portable Automatic Gas Cutter

BAA00B12

HANDY AUTO

OPERATION MANUAL

For every person who will be engaged in operation and maintenance supervision, It is recommended to read through this manual before any operations, so as to permit optimum operation of this machine.

KOIKE SANSO KOGYO CO.,LTD.

INTRODUCTION

Thank you very much for purchasing this product. Read this instruction manual thoroughly to ensure 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 the 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 or sales service office.

■Keep the manual near by at all times and read it as many times as necessary for a complete understanding.

■If the manual becomes 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.

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 information

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 fully 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.When changing the travel direction, make sure that the direction switch is in the neutral (stop) position, and operate the direction switch after the machine has stopped.
7.Always turn the power off when not used.
8.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. Mount and center the machine correctly and confirm correct motion before operation.
3. Check that the drive knob is at "0" before supplying power.
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 a large-circle cutting attachment is used and the magnet is attached to the steel plate, be careful not to get your fingers caught between the magnet and the steel plate. The magnet is powerful.
7. Be careful that the center of the small-circle cutting attachment is pointed.
8. The stopper spring is very strong, so be very careful not to get your fingers caught when attaching the standard wheel and small circle cutting attachment.
9. When cutting along a straight line, be sure to tighten the wheel lock knob; otherwise the wheel position will change.
10. When a large-circle cutting is about to be completed, be careful that the machine and cut material do not drop.
11. Be sure to tighten the adjustment screw for locking accessories (standard wheel and small-circle cutting attachment).
12. Traveling direction changeover switch.
    - ●The traveling direction changeover switch on the machine is used to change forward/backward movement to linear cutting and clockwise/counterclockwise turning for circular cutting. Check the traveling direction or turning direction before cutting.
    - ●To change the traveling direction, set the drive knob to the stop position. Then after the machine has stopped completely, change the traveling direction.

Note: Before turning on the power, be sure to check that the drive knob is in the stop position. If the drive knob is on, it is dangerous to start the machine.

13. Never touch the rotary section (universal joint) when the machine is travelling. It is very dangerous.
14. The area near the gas hose joint will be gripped, so connect the gas hose correctly.
15. Be sure the preheat oxygen and gas valves when checking the motion of machine before operation and cutting position.
16. After cutting, the wheels, bracket, head cover, locking knob, etc. will be very hot. Be sure to wear gloves when touching them.
17. After cutting, do not strike the material with the tip, wheel or head.
18. When thrown or dropped, the machine life will be shortened, and the possible damage to the valve will cause gas leakage.
19. Never pull the power cable.
20. Do not place the machine directly on sand or mud.
21. Do not lay the machine on its side with the preheat flame on.
22. Be sure to use a hose band to prevent danger.
23. Do not hold the turning of the universal joint or insert an object between the joint and conduit tube; otherwise motor trouble will occur.
24. When the fuse is blown out frequently, never use a fuse for higher amperage without confirming the cause.

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 ±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. **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 that requires repair

4.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 repairing the machine.

3.Maintain the machine periodically.

1.2 Gas cutting safety precautions

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, nor 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 are leaking.
2. Install cylinders 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 precautions 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 resistance.

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.

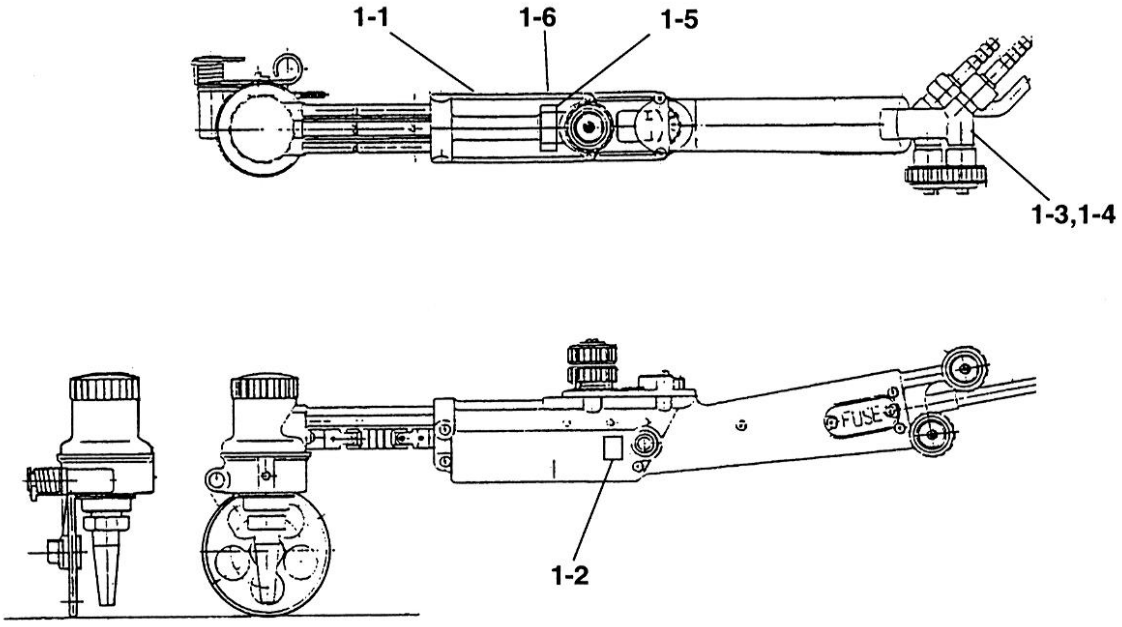
1.2.6 Safety precautions for skin burns

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 tightened 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, hose 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:
   - ●Always wear the required protectors (gauntlets, helmet, goggles, etc.)
   - ●Check for any obstacles, dangerous materials and flammables near or in the direction of cutting. Determine the gas pressure.
   - ●The gas pressure must be within the appropriate range. (For the gas pressure, refer to the Cutting Data.)
9. The torch, tip and heat shield are heated to a very high temperature. Always wear gauntlets when handling them. Also the surface after cutting is very hot so do not touch it even while wearing gauntlets.

2 Locations of safety labels

Safety labels and other labels for correct operation are affixed to the machine.
Carefully read the labels and follow the instructions on them when operating the machine.
Never remove the labels. Keep them clean and legible at all times.



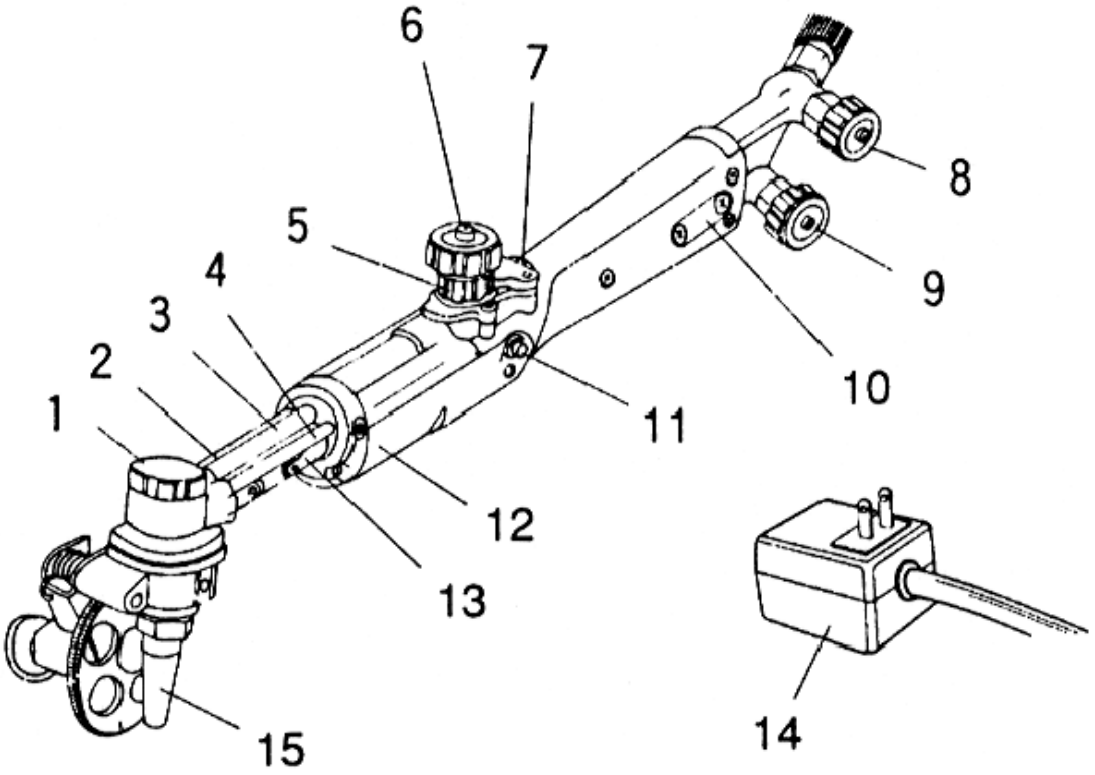
HANDY AUTO MODEL K-1 NO. D.C.12V KOIKE SANSO KOGYO CO., LTD. MADE IN JAPAN	PUSH	FG	NET WEIGHT ____kg
1-1	1-2	1-4	1-6
	OX	ON OFF	
	1-3	1-5	

3 Outline of machine

3.1 Features of machine

The "HANDY AUTO" is a portable automatic gas cutter developed on the basis of a novel idea for the purpose of automatization of portable cutters used in all work sites, incorporating their merits.
The "HANDY AUTO" automatically moves as the wheel on the side of the tip turns. An operator can cut material in any shape by controlling the direction of the wheel.
The machine can cut only flat material but also vertical material, angle bars, light section steel, round bars, pipes and deformed steel sheets.
Even a beginner can cut material smoothly by simple operation.

3.2 Name and function of each section



1.Wheel locking knob

The wheel can change the position by 360° when the knob is loosened.

2.Fuel gas tube

3.Cutting oxygen tube

4.Preheating oxygen tube

5.Drive switch

The drive switch is interlocked with the cutting oxygen valve.

6.Cutting oxygen valve

Turn the valve to feed cutting oxygen.

7.Spped control knob

Turn the knob in the direction of H to move the machine quickly and to L to move slowly.

8.Preheating oxygen valve

Turn the valve to feed preheating oxygen.

9.Fuel gas valve

Turn the valve to feed fuel gas.

10.Fuse

11.Normal/reverse rotation changeover button switch

The switch changes the direction of the rotation and traveling.

12.Motor

Mounted inside the HANDY AUTO.

13.Universal joint

14.AC adapter

Insert the adapter into the power supply.

※ Adapters contain electronic components inside. dropping or hitting them can cause the internal electronic parts to break.

Please handle with care.

15.Tip

3.3 Specifications

1.Weight(main unit)	: 2.7kg
Handy auto kit	: 7.8kg
2.Machine size	: 500mm×70mm×147mm (With standard wheel assembly)
3.Wheel drive	: Friction drive
4.Power source	:±10%
5.Speed control method	: Transistor control

6.Cutting speed : 150～530mm/min
7.Cutting Thickness : 5～30mm (by standard accessories)
8.Motor : DC 12V 7200 r.p.m. reducer 1/400

Optional attachments : Auxiliary wheel assembly
: Beveling wheel assembly (22° ～45°)
: Small circle cutting attachment (ϕ 30mm ～ ϕ 200mm)
: Guide lever
: Large circle cutting attachment (ϕ 120mm ～ ϕ 500mm)
: Straight rail (500mm)

4 Preparation for operation

4.1 Contents of package

Carefully take the machine out of the case.
First, please check your unit to make sure it is complete.
The following is a list of the standard parts you should receive.

STANDARD PACK

1) Main unit	:1 set
2) Standard wheel assembly	:1 set
3) Spanner	:1 pc
4) Fuse(mizett, 1A)	:2 pcs
5) Tip (102 or 106 type #0,1,2, one each)	:3 pcs

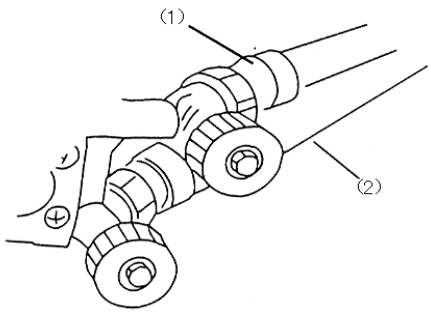
HANDY AUTO KIT

1) Main unit	:1 set
2) Standard wheel assembly	:1 set
3) Auxiliary wheel assembly	:1 set
4) Beveling wheel assembly	:1 set
5) Small circle cutting attachment	:1 set
6) Guide lever	:1 pc
7) Spanner	:1 pc
8) Fuse(mizett, 1A)	:2 pcs
9) Tip (102 or 106 type #0,1,2, one each)	:3 pcs
10) Steel carrying case	:1 pc
11) Tip Cleaner	:1 pc

4.2 Machine assembly

1.Carefully take the machine out of its case.
2.Attach the primary hose to the gas distributor.

(1)Oxygen hose (green) to the top position hose nipple
(2)Gas hose (red) to the bottom position hose nipple



4.3 Preparation for operation

4.3.1 Connecting the power cable

1. Connect the metallic plug on the AC adapter side with the metallic receptacle on the machine side. Before connection, check that there is no foreign substances or dust.
2. The metal plugs are screw-threaded, therefore, fully tighten them so that they will not come loose during operation.

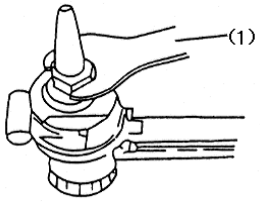
4.3.2 Connecting the tip

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 table 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.

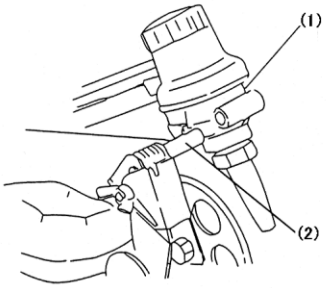


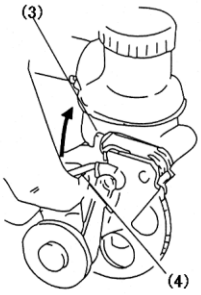
(1) Spanner

4.3.3 Installing the wheel

Insert the wheel bracket shaft into the gear cover. Pull up spring lever and hang it on the stopper.

(1)Gear cover
(2)Bracket shaft
(3)Stopper
(4)Spring



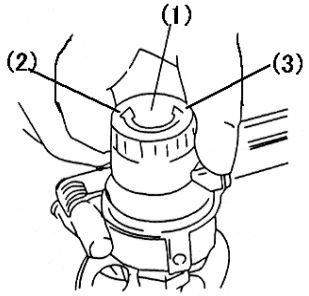


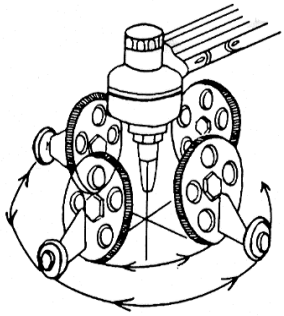
4.3.4 Fitting the wheel

As the wheel rotates a fully 360° from the center of the tip, all direction cutting is possible. Decide the position of the wheel as you like according to the material to be cut or for your positional comfort during the cutting operation.

To set the position of the wheel, loosen the wheel setting knob a little, set the position and tighten the knob up well.

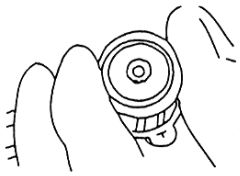
(1)Position setting knob
(2)Direction for tightening
(3)Direction for loosening

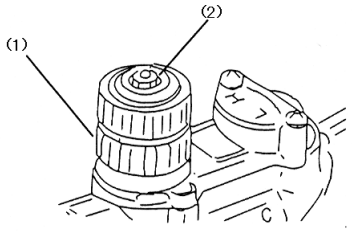




4.3.5 Cutting processes

Open the cutting oxygen valve more than 1/8 turn. This starts the motor, as the drive switch and the cutting oxygen valve are linked together. Both the drive switch and the cutting oxygen valve, however, can operate independently.

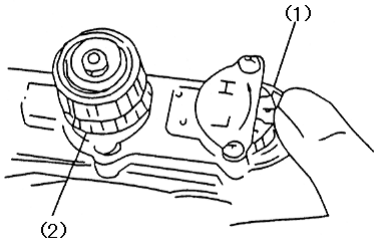




(1) Drive switch
(2) Cutting oxygen valve

4.3.6 Speed setting

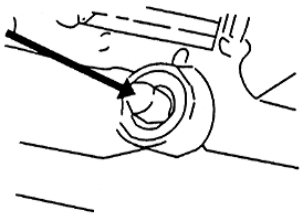
Adjust the cutting speed with the speed adjustment knob according to the thickness of material immediately after the wheel has started rotating. Turn the knob toward the H to increase the cutting speed, and to L to decrease.



(1) Speed adjustment knob
(2) Drive switch

4.3.7 Changing over direction of motor rotation

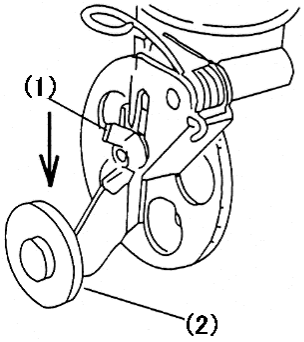
To switch the direction of motor rotation, push and hold the button on the left side of the main unit until you hear a clink. Stop the motor beforehand, or the service life of the motor will be shortened, the fuse may blow, etc.

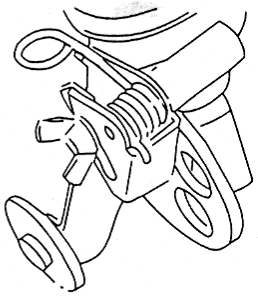


4.3.8 How to use guide roller

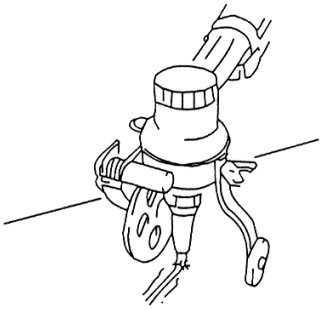
A guide roller is attached to the side of the wheel to stabilize the tip angle. The height of the guide roller can be adjusted by loosening the wing nut. Set it in the lower position for right-angle cutting. Select a proper height for bevel cutting in accordance with the angle to incline the machine and fix it with the wing nut.

(1) Butterfly nut
(2) Guide roller



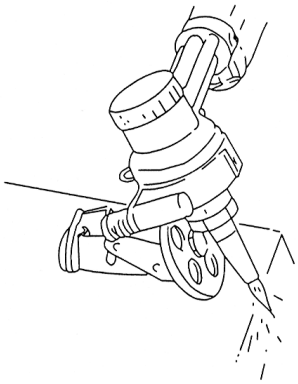


4.4 Optional attachments



4.4.1 Auxiliary wheel

This is used to add further stability to the cutting operation. To install, lift the guide roller of the square cutting attachment from the cutting material.
Then, fix the wheel with a butterfly nut.

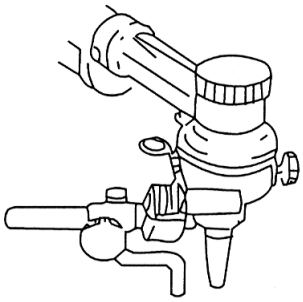


4.4.2 Beveling wheel

This is used for bevel cuts at an angle range of 22° -45 ° . To install, remove the square cutting attachment. Then loosen the guide roller fixing butterfly nut, adjust the position of the guide roller and set the bevel angle.

In bevel-cutting at a comparatively large angle, watch out for slip caused by dragging hoses or the condition of the material. For beveling, the use of the straight line cutting rail is recommended as this will give more stability than a hand-held operation.

For large angle beveling, use a tip one grade larger than that for straight cutting or pre-heat more thoroughly.



4.4.3 Small circle cutting attachment

This is used for cutting small circles of 30-200 ϕ mm

1) Remove the square cutting attachment.
2) Loosen the wheel setting knob.
3) Fasten the clutch knob to the gear cover firmly.
4) Loosening the radius setting knob, set the cutting radius and tighten the knob.
5) Put the drive switch to ON, and adjust the cutting speed.
6) The circle cutting attachment can be operated manually, by loosening the clutch knob. Decide the initial cutting position and set the attachment firmly in position.

During the circle cutting operation there may be fluctuations in the cutting speed . These are caused by hose drag, changes in the way or position the machine is held and the like being transmitted to rotation mechanism.

In cutting small circles with the small circle cutting attachment, be sure to loosen the wheel setting knob.

When cutting circles, always make sure the clutch knob is tightened.

When not cutting circles loosen or remove the clutch knob.

When you start a cut by piercing, open the cutting oxygen valve slowly after preheating to prevent cutting errors.

<A setup of cutting speed>

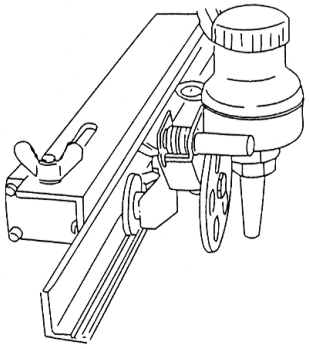
- Cutting speed differs in speed (number of rotations) by the diameter of a cutting circle, and plate thickness.
- The specification range of the small circle cutting attachment of HANDY AUTO Ⅱ,
  They are 1.2rpm - 4.2rpm.
- Please set up from the following "related tables of cutting thickness and the diameter of cutting."

		5	5-10	10-15	15-30	Cutting thickness [㎜]
		660	550~660	490~550	400~490	Cutting speed [㎜/min]
Cutting diameter	30	———	———	———	4.24	
	40	———	———	3.90	3.18	
	50	4.20	3.50	3.12	2.55	
	60	3.50	2.92	2.60	2.12	
	70	3.00	2.50	2.23	1.82	
	80	2.63	2.19	1.95	1.59	
	90	2.33	1.95	1.73	1.41	
	100	2.10	1.75	1.56	1.27	
	120	1.75	1.46	1.30	1.06	
	140	1.50	1.25	1.11	———	
	160	1.31	1.09	———	———	
	180	1.17	———	———	———	
	200	1.05	———	———	———	

This table is computing the number of rotations based on the speed of the cutting tip capability table when using a standard cutting tip. High speed divergent cutting tips should not be used, as the preheat oxygen pressure and cutting oxygen pressure can not be obtained for such use. Moreover, the above-mentioned number of rotations may change according to conditions, such as a preheat pressure values varying, the condition of the plate and the type of gas used.
Please observe the state of cutting and adjust the speed accordingly.

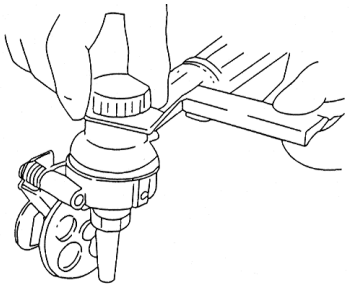
4.4.4 Straight line cutting rail

This is used for precise straight line cutting.
Loosen the butterfly nut and adjust the position of the magnet along the slot in the rail bracket according to the size of the material.
Set the rail parallel with the cutting line
Put the guide roller in the groove on the rail.
Be careful to maintain a horizontal grip position. Otherwise the guide roller may come off the groove, Spoiling the cut surface.



4.4.5 Manual guide lever

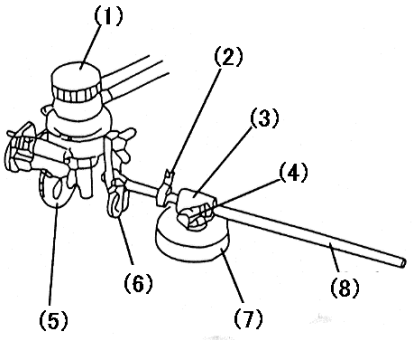
This is used to get further stability during the cutting operation. The use in combination with an auxiliary wheel is better.
Remove the wheel setting knob. Insert the guide lever into position.



4.4.6 Large circle cutting attachment

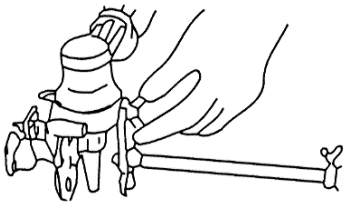
Large circle cutting attachment(ϕ 120 — ϕ 500)

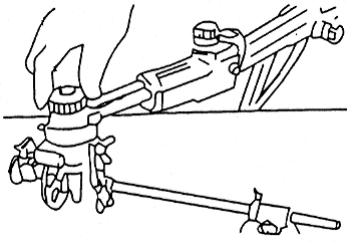
(1)Wheel position fixing knob
(2)Stopper
(3)Adjustable holder
(4)Radius fixing bolt
(5)Standard wheel
(6)Guide roller
(7)Magnet
(8)19.7 inch diameter Bar



●Usage

1)Be sure to use the standard wheel for cutting out large circles. Raise the guide roller so that it will not touch the Steel sheet.
2)Fix the 500 mm diameter bar to the main unit with a wing bolt.
3)Loosen the wheel position fixing knob.

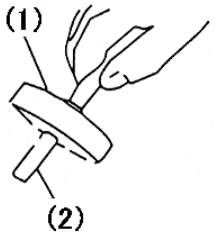




4) Use a magnet center to set the magnet in the center of the circle to be cut.
5) Set the adjustable holder in the magnet, loosen the radius fixing bolt, and adjust the cutting radius before fixing.

◎ Use a stopper for in-feed cutting. When a disc is a product, set the stopper as shown in the photo, and when the hole is to be made as a product, set the stopper on the side opposite to the side shown in the photo with respect to the adjustable holder.

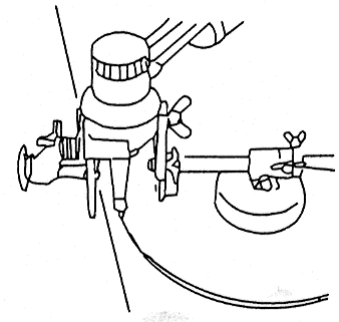
6) Turn on the drive switch, and adjust the speed.
7) Raise the main unit (standard wheel) form the steel sheet to move the main unit to any desired point on the circumference. Determine the cutting start position in this way.
8) Operation hereafter is the same as the line cutting operation. Open the Jox valve, and the standard wheel is driven automatically, to start circle cutting.



(1)Magnet
(2)Magnet center

●Notice

1) Loosen the wheel position fixing knob to cut out circles with the large circle cutting attachment.
2)The drive wheel may go beyond a steel sheet when cutting its edge. Therefore, use a support roller as a manual guide for cutting.
3) Remove the support roller for cutting out circles of 5.9 inch diameter or less.



5 Cutting operation

5.1 Safety measures prior to operation

5.1.1 Precautions for handling AC adapter

1. The AC adapter cannot be repaired. When it has failed, replace it with a new one.
2. The case of the AC adapter is made from synthetic resin.
   1)Do not place the case in a hot place.
   2)Do not drop a heavy object onto the case.
   3)Make sure that the supply voltage is correct. The operating voltage is 100～240 VAC 10%.

5.1.2 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.

5.1.3 Traveling direction changeover switch

1. The traveling direction changeover switch on the machine is used to change forward/backward movement for linear cutting and clockwise/counterclockwise turning for circular cutting. Check the traveling direction or turning direction before cutting.
2. To change the traveling direction, return the drive knob to the stop position. Then after the machine has stopped completely, change the traveling direction.

Note: Before turning on the power, be sure to check that the drive knob is on the stop position. If the drive knob is on, it is dangerous to start the machine.

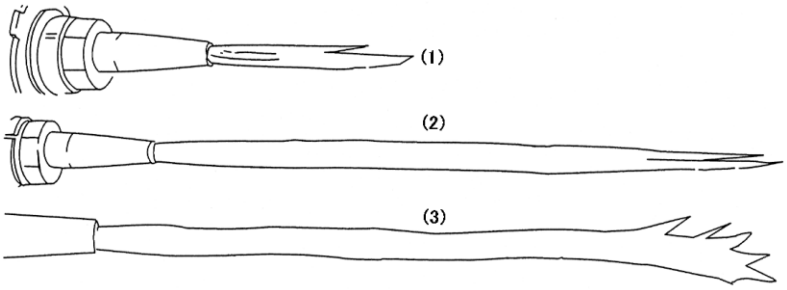
5.2 Ignition and flame adjustment

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

■Flame adjustment method

1. Open the fuel gas valves 1/4 to 1/2 a turn, and ignite the torch with an igniter.
2. Then, open the preheating oxygen valve gradually until a white cone of the standard flame has been obtained. (The incandescent area should be uniform and about 0.2-0.24 inch in length.)
3. Open the cutting oxygen valve fully. Readjust the flame if its condition has changed. A disorderly flow of the cutting oxygen will adversely affect the quality of the cutting surface. In such a case, clean the tip with a suitable cleaning needle with the cutting oxygen is flowing. (Please close gas and preheat oxygen valve before cleaning the cutting oxygen channel.)

Natural flame ensures a good quality cut surface. (Oxidized flames may be used for bevel cutting.)
The oxidized flame shortens the cutting oxygen flow, causing slug deposition or melting the upper edge of the cut surface. Excessively high cutting oxygen pressure will cause the same effect.



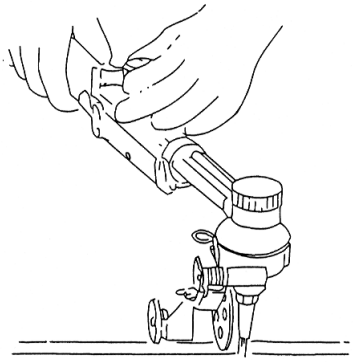
(1)Oxidizing Flame

(2)Neutral Flame

(3)Carbonizing Flame

●Preheating

For preheating, hold the grip with your right hand to support the HANDY AUTO and hold the cutting oxygen valve with the thumb and forefinger of the left hand to stabilize the HANDY AUTO.



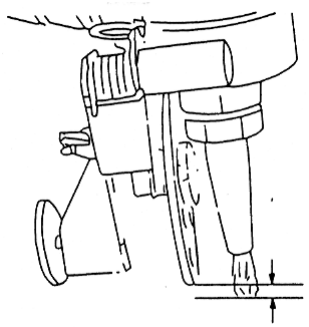
5.3 Cutting and piercing method

1. Cut in from the end of steel plate.
2. Pierce steel plate before cutting.
3. Drill a hole before cutting.

■Piercing method

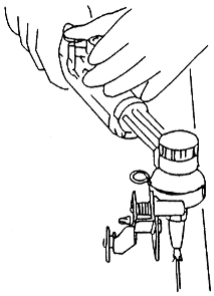
1) Ignite and adjust the flame.
2) Thoroughly preheat the cut-in point until it is white hot.
3) Open the cutting oxygen valve to pierce the steel plate. The tip should be about 15-20 mm from the plate to prevent slag from splashing onto the tip and adhering there, which will shorten the working life of the tip.
4) Piercing staring from the middle of the material is not recommended, since the result heat exposure will spoil the durability of the wheel. If such piercing is unavoidable, turn the drive switch on independently to rotate the wheel and start preheating, lifting the main unit up a little to prevent the heat affecting the wheel.

After cutting like this, the motor may not stop sometimes even after cutting is finished. This is not a fault but is caused by the valve not having been opened fully. The motor will stop, when the drive switch is tightened.



5.4 Procedures for starting cutting operation and extinguishing the flame

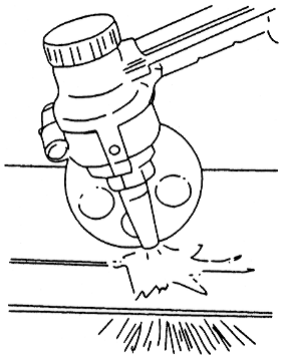
1. Align the tip with the cutting start point, ignite, and then adjust the flame.
2. Sufficiently preheat the cutting start point.
3. After heating, open the oxygen valve by turning it more than 1/8 turn, and the motor switch will be turned on, starting automatic cutting. When the valve opening angle is too small at that time, cutting operation will not be interlocked with the motor switch. When cutting an approx. 6 mm thick plate at a high oxygen pressure, the valve opening must be adjusted; therefore the motor switch may not be turned on. (Refer to the Cutting Data for pressure setting.)
4. Carefully check the cutting condition, and control the cutting speed with the speed adjuster. For the cutting speed, refer to the Cutting Data.
5. Extinguish the flame after cutting as follows:
   1) Turn off the motor switch (or turning direction switch).
   2) Close the cutting oxygen valve.
   3) Close the preheating oxygen valve.
   4) Close the fuel gas valve.
6. The guide roller is designed for stable and even cutting operation. But for preventing unstable tip movement such as might be caused by hose drag or the cutting travel, use of both hands, with the left hand supporting the cutting oxygen valve or the motor unit , when switching off the cutting oxygen.



5.4.1.Thin plate cutting

When you cut a thin plate, 6mm thick for instance, adjust for a slightly weak flame, after selecting the tip size and the pressure suitable for the job according to the cutting data. Tilt the tip top forward slightly, then start the cutting operation.

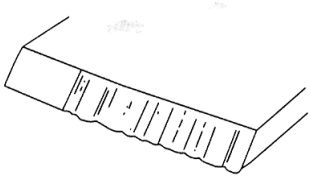
Cutting with a too high cutting oxygen pressure or with too much preheating will cause incomplete separation of the material, or cause slag to stick on the lower edge of the cut.



5.4.2.Bevel cutting

For bevel cutting, use a tip one grade above that for the specified thickness for straight cuts in the same thickness of plate in the cutting data, with a somewhat strong preheat flame and set the speed 20-30% lower.

The 0-22° bevel cutting is possible with the standard wheel, and the beveling wheel range is 22-45° . Insufficient preheating causes a cut surface in bevel cutting. Reselect the tip, readjusting the preheat and speed.



5.5 Safety measures against backfire and flashback

5.5.1 Prevention of backfire

Backfires may cause serious accidents or fires. 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 following are causes of backfire:

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

5.5.2 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 for inspection and maintenance of the machine and use the machine under the best operating conditions at all times.

6.1.Wheel Maintenance

As wheels are made of stainless steel (SUS-27), they are of rust-proof and have high heat and slag resistance. Even if slag sticks to the wheel, you can easily take it off with a wire brush or the like. Carry out periodic inspection and maintenance to prevent knocking or slag-sticking which may cause faulty power transmission to the wheel.
When the wheel knurls, become worn, replace the wheel. A worn wheel may cause slip and prevent operation.

6.2.Tip Maintenance

The tip used for the Handy Auto is designed for high durability combined with high safety. To maintain cutting quality, follow the correct instructions on maintenance and handling.

(1) In piercing, lift the machine body up a little to prevent damage caused by the flame being deflected upwards.
(2) Clean the orifice of the tip very carefully with a tip cleaner of the correct size.
(3) Be careful not to damage the tapered seating section.
Replace the tip when the following occur.
a. Even after cleaning, the cutting oxygen jet does not extend straight.
b. The cutting oxygen jet flares at its end.
c. During the cutting operation, clicking sounds are heard within the tip.
d. Gas leaks from the fixing nut and burns.
e. Pre-head flames are extremely uneven.

6.3.Lubrication

For greater safety, the Handy Auto has been designed so that lubrication is not necessary.

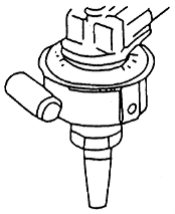
7 Trouble shooting

1) Motor does not run.

Possible Cause	Procedure	Remedy
1) No electrical power.	Check power circuit.	
2) Faulty fuse.	Check fuse.	Replace.
3) Faulty drive switch.	Check that clicking sound is heard by turning that the drive switch to the full extend. (This sound indicates the switch is not faulty.)	Repair.
4) Broken power cord.		Repair or replace.

2) Motor does not run. (Power is on.)

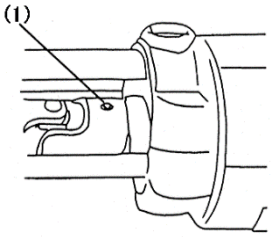
Possible Cause	Procedure	Remedy
Foreign matter on the beveling gears.	Check by removing the fixing knob and the head cover.	Clean.



3) Motor runs but rotation is not transferred to the universal joint.

Possible Cause	Procedure	Remedy
Screw holding the speed reducer shaft to the universal joint is loose.		Tighten the screw.

(1) Screw



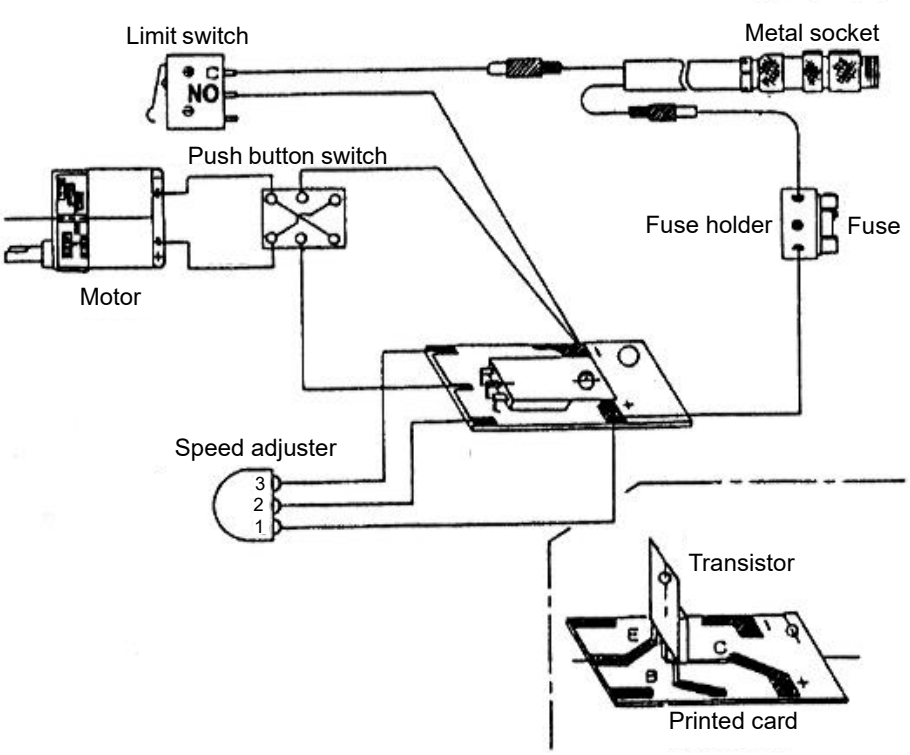
4) Beveling gear (Large) rotates but rotation is not transferred to the wheel or slipping and knocking occurs.

Possible Cause	Procedure	Remedy
1)Slag between the drive wheel and the beveling gear.		Clean

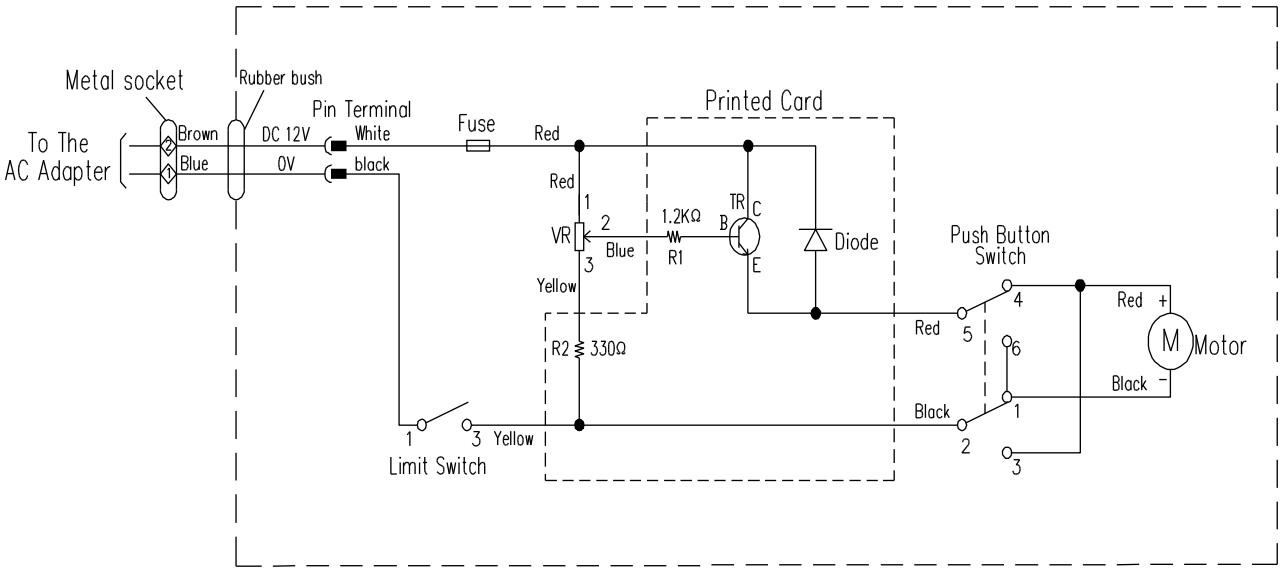
5) Wheel rotates but speed cannot be adjusted.

Possible Cause		Remedy
Faulty speed adjuster or transistor.		Repair or replace.

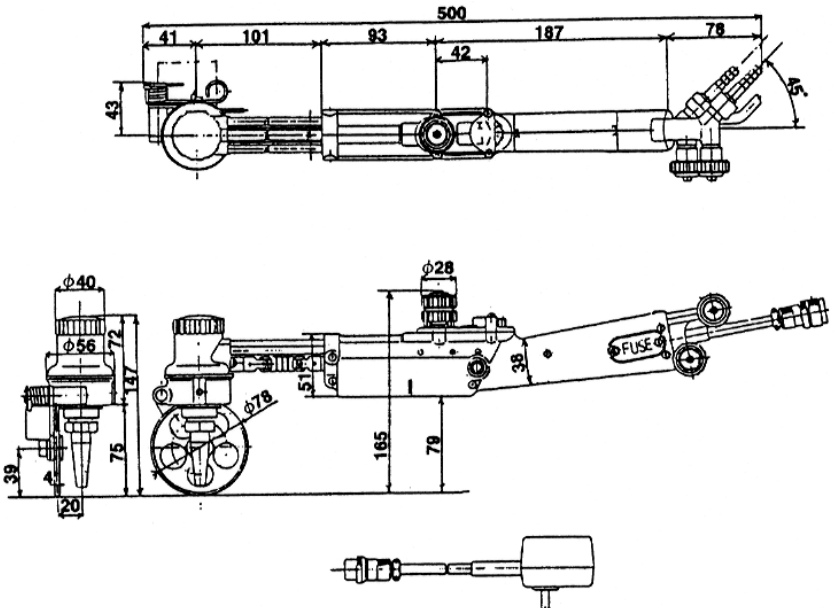
8 Wiring diagram



9 Electrical diagram

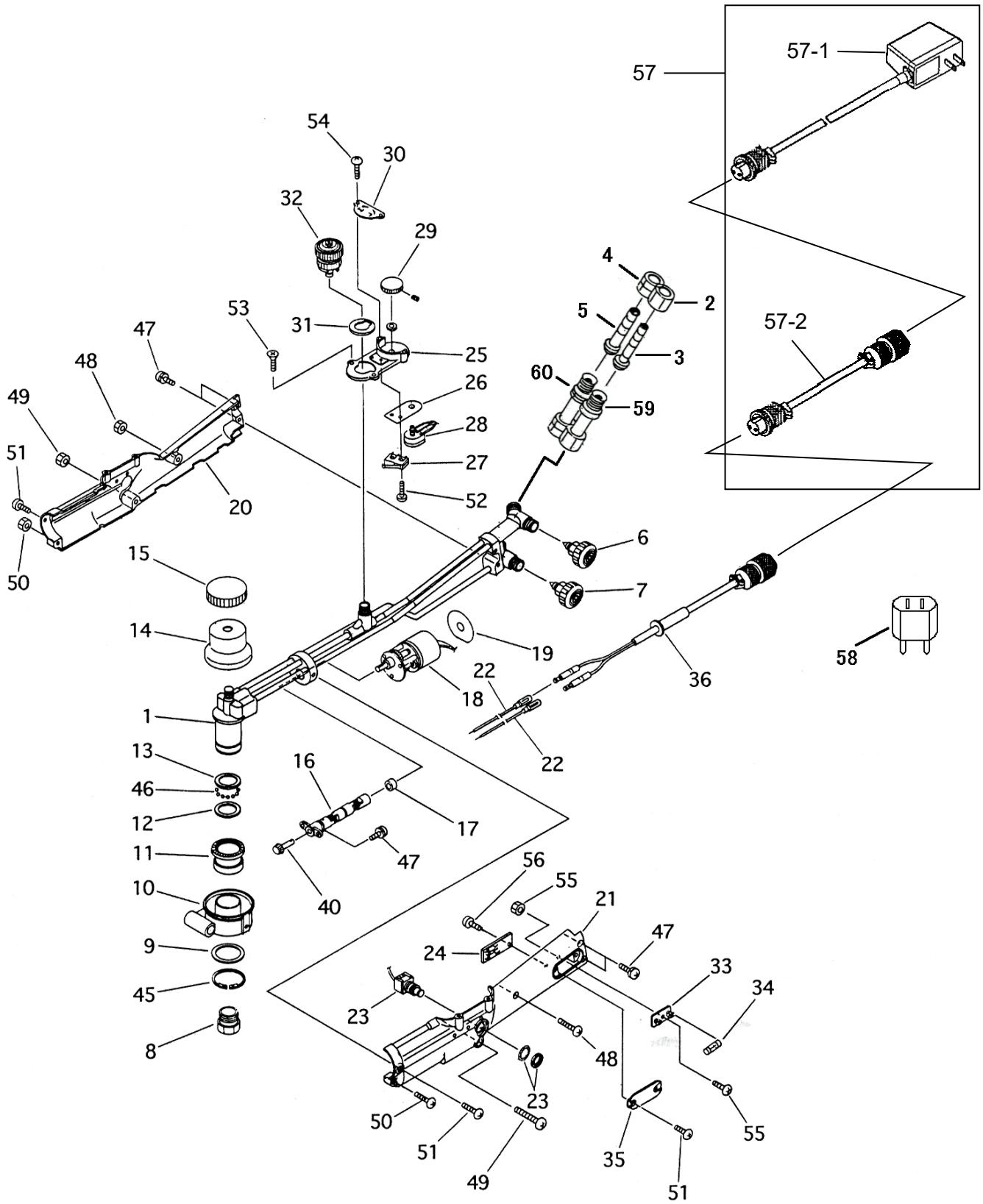


10 Assembly drawing of HANDY AUTO



11 Parts list

11.1 Main units



Main units

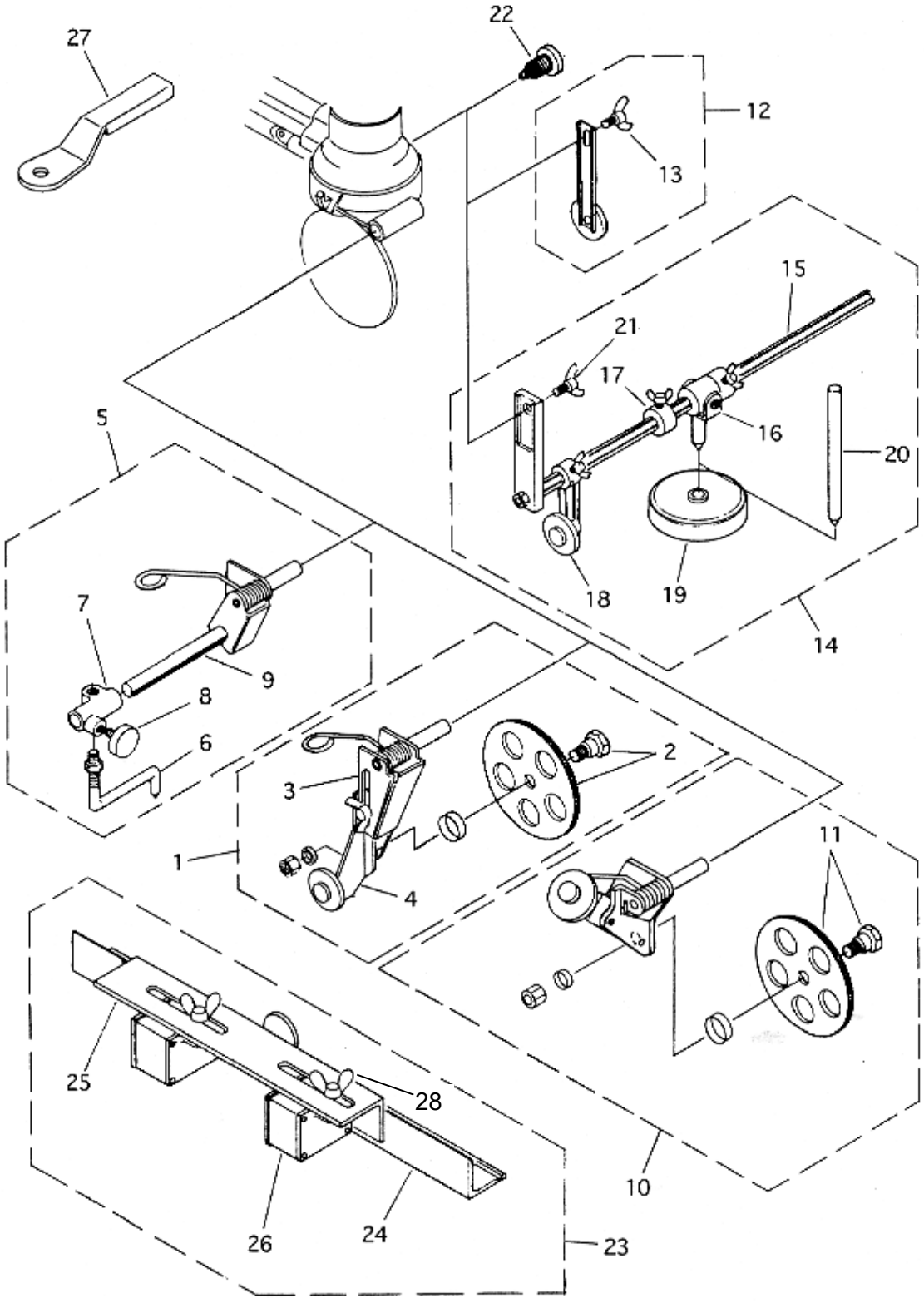
Item No.	Part name	Q'ty	Stock No.	Remarks
1	Torch	1	60030001	
2	Nut for oxygen(right)	1	60015001	M16
			60015057	BSPF3/8
			60015014	U5/8
			60015012	U9/16
3	Hose connector(OX)	1	60015003	M16(5/16)
			60015043	BSPF3/8(1/4)
			60015064	U5/16(1/4)
			60015007	U9/16(5/16)
4	Nut for Gas(left)	1	60015002	M16(L)
			60015058	BSPF3/8(L)
			60015015	U5/16(L)
			60015013	U9/16(L)
5	Hose connector(Gas)	1	60015004	M16(3/8)
			60015043	BSPF3/8(1/4)
			60015064	U5/16(1/4)
			60015007	U9/16(5/16)
6	Valve for preheat oxygen	1	60015255	Green
7	Valve for gas	1	60015256	Red
8	Tip fixing nut	1	60015032	
9	Torch head collar	1	60030003	
10	Gear cover	1	60030004	
11	Bevel gear	1	60030007	With DU bush
12	Thrust collar (Lower side)	1	60030008	
13	Thrust collar (Upper side)	1	60030009	
14	Torch head cover	1	60030005	
15	Position setting knob	1	60030006	
16	Universal joint	1	60030010	
17	Reduction gear collar	1	60030011	
18	Motor with speed reduction gear	1	61005294	
19	Motor insulating plate	1	60030038	
20	Main unit cover (right)	1	60030019	
21	Main unit cover (left)	1	60030020	
22	Mid way terminal	1	60030028	
23	Press button switch	1	60030022	
24	Printed circuit card	1	60030064	
25	Limit switch cover	1	20536556	

Item No.	Part name	Q'ty	Stock No.	Remarks
26	Limit switch insulating cover	1	60030017	
27	Limit switch	1	60030023	
28	Speed adjuster	1	20535930	
29	Speed adjuster knob	1	20537108	With screw
30	Speed adjuster cover	1	60030016	
31	Limit switch top	1	60030012	
32	Jet oxygen valve with knob	1	60030013	
33	Fuse holder	1	60030026	
34	Fuse	1	60030027	
35	Fuse cover	1	60030018	
36	Metal socket with cord	1	61004650	
40	Bevel gear (S)	1	60030062	
45	Stop ring	1	6B530280	ISTW-28
46	Steel ball	1	60030181	32Pcs/1Set
47	Screw	1	6C530410	SR-4x10,With WS
48	Screw	1	6C610425	SR-4x25,With NH
49	Screw	1	6C610435	SR-4x35,With NH
50	Screw	1	6C610418	SR-4x18,With NH
51	Screw	4	6C520408	SR-4x8
52	Screw	2	6C520210	SR-2x10
53	Screw	2	6C500408	SF-4x8
54	Screw	2	6C520418	SR-4x18
55	Screw	1	6C520306	SR-3x6
56	Screw	1	6C520406	SR-4x6
57	HA AC Adapter	1	20543811	※2
57-1	HA AC Adapter Cable	1	20543802	★
57-2	AC adapter extension cable	1	20543570	※1 ★
58	Adapter plug	1	64000025	Siemens
			64000026	New Zealand
			64000027	Singapore
			64000124	DIN
59	Adapter(OX)	1	60012911	BSPF
			60012907	U5/8
			60012909	U9/16
60	Adapter(Gas)	1	60012912	BSPF
			60012908	U5/8
			60012910	U9/16

※1 Please do not connect 20543570 together to extend the cable length.

※2 Adapters contain electronic components inside. dropping or hitting them can cause the internal electronic parts to break. Please handle with care.

11.2 Option units



Option units

Item No.	Part name	Q'ty	Stock No.	Remarks
1	Standard wheel assembly	1	60030100	
2	Drive wheel (3inch diameter)	1	60030107	With shaft and nut
3	Standard wheel bracket	1	60030108	
4	Guide roller	1	60030109	
5	Small circle cutting attachment assembly	1	61001597	
6	Centering needle	1	61001556	
7	Centering needle holder	1	60030113	
8	Radius setting knob	1	60030114	
9	Bracket bar	1	61001599	
10	Beveling wheel assembly	1	60030102	
11	Beveling wheel	1	60030110	With shaft and nut
12	Auxiliary wheel assembly	1	60030101	
13	Wing bolt	1	60030126	
14	Large circle cutting attachment assembly	1	60030106	
15	Bar (19.7inch diameter)	1	60030120	
16	Free holder	1	60030121	
17	Stop collar	1	60030122	With wing bolt
18	Support roller	1	60038763	★
19	Magnet	1	60030124	
20	Magnet center	1	60030125	
21	Wing bolt	1	60030127	
22	Clutch knob	1	60030115	
23	Straight rail assembly	1	60030104	
24	Rail	1	60030117	
25	Rail bracket	1	60030118	
26	Magnet	2	61001160	
27	Guide lever	1	60030105	
28	Wing bolt	2	6C120510	BS-5×10

12 Cutting data

102(STANDARD SPEED) For Acetylene

PLATE THICKNESS (inches)	TIP SIZE	CUTTING SPEED (in/min)	OXYGEN PRESSURE (kg/c ㎡) / (Mpa)		FUEL GAS PRESSURE (kg/c ㎡) / (Mpa)	KERF WIDTH (inches)
			CUTTING	PREHEAT		
1/8	00	27	1.5 / 0.15	1.5 / 0.15	0.2 / 0.02	0.04
1/4	0	24	2.0 / 0.2	2.0 / 0.2	0.2 / 0.02	0.05
3/8	0	22	2.0 / 0.2	2.0 / 0.2	0.2 / 0.02	0.06
1/2	1	21	2.5 / 0.25	2.5 / 0.25	0.2 / 0.02	0.07
3/4	2	18	3.0 / 0.3	3.0 / 0.3	0.25 / 0.025	0.08
1	2	17	3.0 / 0.3	3.0 / 0.3	0.25 / 0.025	0.08
1-1/2	3	14	3.0 / 0.3	3.0 / 0.3	0.25 / 0.025	0.09
2	4	12.5	3.0 / 0.3	3.0 / 0.3	0.25 / 0.025	0.11

102-D7(HIGH SPEED) For Acetylene

PLATE THICKNESS (inches)	TIP SIZE	CUTTING SPEED (in/min)	OXYGEN PRESSURE (kg/c ㎡) / (Mpa)		FUEL GAS PRESSURE (kg/c ㎡) / (Mpa)	KERF WIDTH (inches)
			CUTTING	PREHEAT		
1/8	00	31.5	7.0 / 0.7	1.5 / 0.15	0.2 / 0.02	0.03
1/4	0	29	7.0 / 0.7	2.0 / 0.2	0.2 / 0.02	0.04
3/8	0	27	7.0 / 0.7	2.0 / 0.2	0.2 / 0.02	0.05
1/2	1	25	7.0 / 0.7	2.5 / 0.25	0.2 / 0.02	0.05
3/4	2	22	7.0 / 0.7	3.0 / 0.3	0.25 / 0.025	0.06
1	2	20	7.0 / 0.7	3.0 / 0.3	0.25 / 0.025	0.07
1-1/2	3	18	7.0 / 0.7	3.0 / 0.3	0.25 / 0.025	0.08
2	4	16	7.0 / 0.7	3.0 / 0.3	0.25 / 0.025	0.10

NOTE

1) All pressures are torch inlet pressures.
2) Oxygen purity is minimum of 99.7%.
3) Depending on the surface condition of the steel plate (scale, paint) either increase the fuel gas pressure or decrease the cutting speed. Also, when precision cutting is required, adjust all data.

106(STANDARD SPEED) For Propane

PLATE THICKNESS (inches)	TIP SIZE	CUTTING SPEED (in/min)	OXYGEN PRESSURE (kg/c㎡) / (Mpa)		FUEL GAS PRESSURE (kg/c㎡) / (Mpa)	KERF WIDTH (inches)
			CUTTING	PREHEAT		
1/8	00		1.5 / 0.15	1.5 / 0.15	0.2 / 0.02	0.04
1/4	0		2.0 / 0.2	2.0 / 0.2	0.2 / 0.02	0.05
3/8	0		2.0 / 0.2	2.0 / 0.2	0.2 / 0.02	0.06
1/2	1		2.5 / 0.25	2.5 / 0.25	0.2 / 0.02	0.07
3/4	2		3.0 / 0.3	3.0 / 0.3	0.2 / 0.02	0.08
1	2		3.0 / 0.3	3.0 / 0.3	0.2 / 0.02	0.08
1-1/2	3		3.0 / 0.3	3.0 / 0.3	0.2 / 0.02	0.09
2	4		3.0 / 0.3	3.0 / 0.3	0.25 / 0.025	0.11

106-D7(HIGH SPEED) For Propane

PLATE THICKNESS (inches)	TIP SIZE	CUTTING SPEED (in/min)	OXYGEN PRESSURE (kg/c㎡) / (Mpa)		FUEL GAS PRESSURE (kg/c㎡) / (Mpa)	KERF WIDTH (inches)
			CUTTING	PREHEAT		
1/8	00		7.0 / 0.7	1.5 / 0.15	0.2 / 0.02	0.03
1/4	0		7.0 / 0.7	2.0 / 0.2	0.2 / 0.02	0.04
3/8	0		7.0 / 0.7	2.0 / 0.2	0.2 / 0.02	0.05
1/2	1		7.0 / 0.7	2.5 / 0.25	0.2 / 0.02	0.05
3/4	2		7.0 / 0.7	3.0 / 0.3	0.2 / 0.02	0.06
1	2		7.0 / 0.7	3.0 / 0.3	0.2 / 0.02	0.07
1-1/2	3		7.0 / 0.7	3.0 / 0.3	0.2 / 0.02	0.08
2	4		7.0 / 0.7	3.0 / 0.3	0.2 / 0.02	0.10

NOTE

1) All pressures are torch inlet pressures.
2) Oxygen purity is minimum of 99.7%, propane is minimum of JIS Grade 3.
3) Depending on the surface condition of the steel plate (scale, paint) either increase the fuel gas pressure or decrease the cutting speed. Also, when precision cutting is required, adjust all data.

HANDY AUTO

OPERATION MANUAL

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