Portable Automatic Gas Cutter

BGB01-50

AUTO PICLE-S

Automatic Pipe Gas-Cutter

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. Cooperation between colleagues in the workplace is essential for safe, smooth operation. Make sure you read, understand and take all 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 operates the machine can refer to it as necessary.

- Do not use the machine carelessly without following the instructions in the manual.
- Use the machine only after you have 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 to hand at all times and read it as many times as is 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 have either of the following qualifications:

1. Gas welding foremen's license
2. Completion of gas welding training course
3. Approval by the Minister 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 port
	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 damage.
	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

CONTENTS

1 Safety information

Many accidents are caused by operation, inspection, and maintenance which disregard the basic safety rules. 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 follows for machine safety labels:

■WARNING ⚠

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

■CAUTION ⚠

This word is used in a caution message and a caution label 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 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 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 in use.
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 protectors 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. Before connecting the power plug to the outlet, make sure that the power switch is in the OFF position (or the normal /reverse changeover switch is in the stop position)
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. Take great care of spatters and dross when operating the machine at a high position. They may injure people below.
7. Do not hit any object against the surface of the wheel to be in touch with pipes or drop the wheel so as not to scratch the surface; otherwise knocking will result.
8. **Week chain tension will make the machine slip. Give an appropriate tension to the chain.**
9. Be careful no to get your hand caught between the upper plate and slide bracket.
10. When stretching the chain, be careful not to get your hand caught in the wing bolt.
11. Do not insert your hand into rotary sections (sprocket and wheel).
12. Be careful not to drop the machine when changing the chain.
13. Do not use deformed or rusted chains; otherwise the chain may be disengaged.
14. Do not mistake the top and bottom sides of the chain.
15. The number of chains must match the pipes.
16. Be careful not to damage the wheel.
17. The planer deflection due to a worm wheel causes curved cutting surfaces and discrepancy between the first and last cutting positions.
18. Do not place the machine on pipes when it is unused.
19. Be sure to hold the handle when carring the machine.

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. Be sure to ground the cabtire 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) Water leakage from the machine or 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
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 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 is 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 naked 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 extinguishing 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 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.

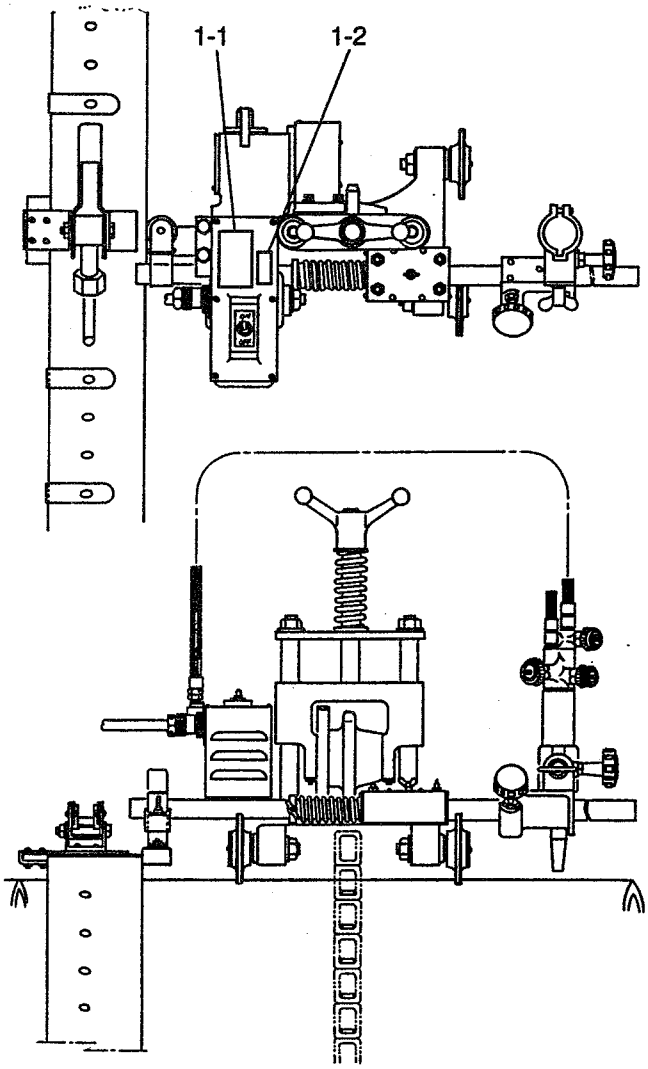
1.2.6 Safety precautions for skin burns 

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 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:
   - Place the torch on the torch holder before igniting.
   - Always wear the required protectors (gauntlets, goggles, helmet, 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.
10. Never move the machine while the preheat flame is on.

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.



AUTO-PICLE- S
SERIAL NO.
CUTTING CAPACITY (MM)
CUTTING SPEED (MM/MIN) 100~700
VOLTAGE(V) AC
KOIKE SANSO KOGYO CO., LTD.
MADE IN JAPAN

1-1

NET WEIGHT Kg

1-2

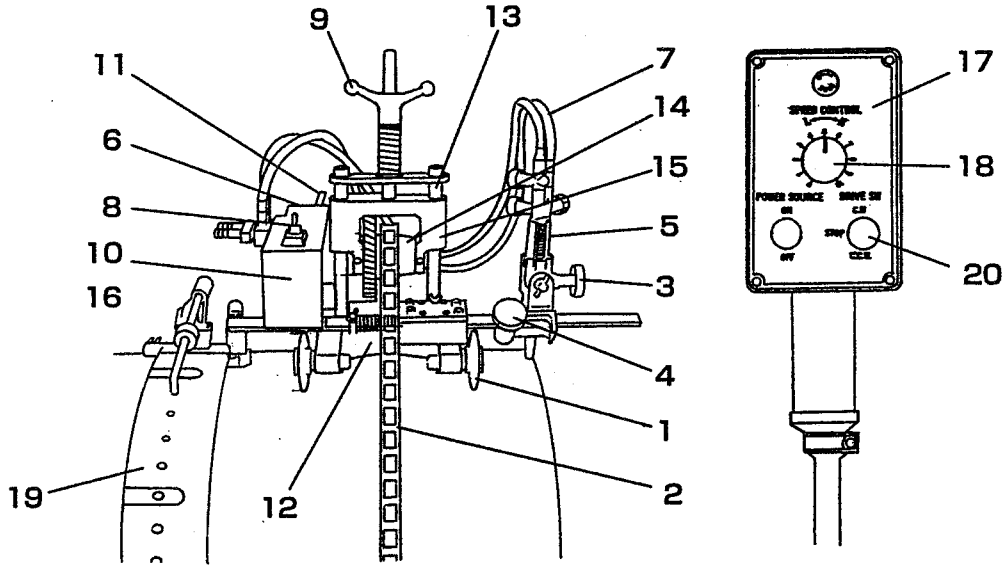
3 Outline of machine

3.1 Features of the machine

AUTO PICLE-S is a compact pipe cutter developed on the basis of the thoroughgoing examination of the actual conditions of pipeline installation work sites. Exhibiting its excellent performance in cutting pipes of various sizes to specified length and in bevel cutting, which are major job of pipe processing, the machine is habitually used by many users. The guide rail will permit pipe cutting in vertical position.

3.2 Name and function of each part

The machine is composed of the following parts:



1. Wheel
Four wheels permit the machine to run stably on pipes.

2. Chain
The machine attached to the rail runs along the chain.

3. Torch up/down handle
Changes the torch height.

4. Cross-feed handle
Changes the horizontal position of the torch.

5. Torch
Cutting thickness: 5-50 cm

6. Gear box
Voltage control by means of a speed-controlling resistor permits stepless speed change.

7. Hose
Installed between the gas distributor and the torch. Two hoses for oxygen and gas are combined as a set.

8. Motor switch
Power switch for the motor

9. Tightening handle.
Tighten the handle to secure the machine and pipe.

10. Gas distributor
Division into preheating oxygen, preheating gas, and cutting oxygen

11. Clutch lever
Used to let the machine run.

12. Main unit

13. Shaft column

14. Sprocket

15. Slide bracket

16. Motor
15 W; 5000 rpm

17. Control box
Permits remote control.

18. Speed control knob
For controlling the cutting speed from 100 to 700 mm/min.

19. Guide rail
There are four kinds of rails for respective effective pipe cutting diameters.

20. Directional changeover switch
For switching forward and backward traveling.

3.3 Specifications

Weight	15kg
Machine size	270×230×400
Power source	±10%
Speed control	SCR control with dial operation
Cutting speed	100~700mm/min
Cutting thickness	50mm
Bevel angle	0~45°
Tip	102 (for acetylene) 106 (for propane) #0, 1, 2
Gas	oxygen, acetylene gas, or LPG gas
Pipe cutting diameter	φ400~φ1500 (φ150~φ400)

●Accessories

· Tip102 (for acetylene) 106 (for propane) #0, 1, 2	each 1 pc
· Tip cleaner	1set
· Spanner (A,B,C)	1set
· Lighter	1pc
· Fuse (2A)	2pcs
· Chain (80pcs)	1set
· Control box	1set
· Slide bar	1pc

●Option

· Guide rail	Pipe cutting diameter
· D-600	φ400~φ600
· D-900	φ600~φ900
· D-1200	φ900~φ1200
· D-1500	φ1200~φ1500

4 Preparation for operation

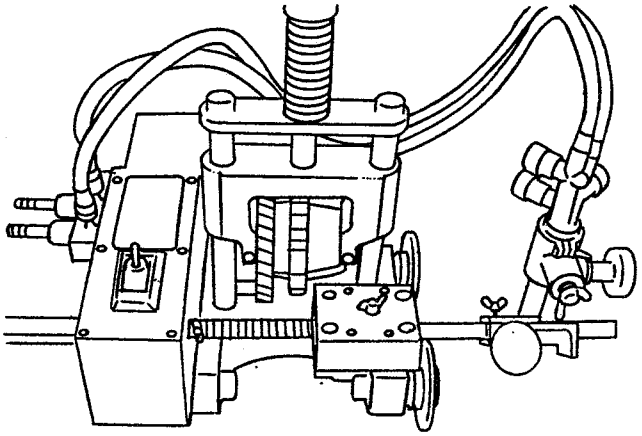
4.1 Contents of package

The standard pack contains the parts shown below. Check them before assembling.

- Body ····· 1set
- Gas distributor ····· 1set
- Torch ····· 1pc
- Torch holder ····· 1set
- Hose
  Distribution hose (3pcs set:900L) ····· 1set
- Slide bar ····· 1pc
- Control box ····· 1set
- Tip 102 (for acetylene) 106 (for propane) #0, 1, 2 ····· each 1 pc
- Tip cleaner ····· 1set
- Screw driver ····· 1pc
- Spanner (A, B, C) ····· 1set
- Fuse (2A) ····· 2pcs
- Chain (80pcs) ····· 1set
- Lighter ····· 1pc

4.2 Assembling the machine

1. Take out the main unit from the box.
2. Remove the slide spring and stopper attached to the slide bar, and put the slide spring and stopper backe to their original positions in this order. Then insert the slide bar into the slide cover and cross feed bar in this order, and tighten the wing bolts (M4 x 10 and M4 x 15).



4.3 Preparation for operation 

4.3.1 Connection of power cable

1. Insert the metal plug (5p) of the control box into the metal socket (5p) of the machine.
2. Connect the rubber plug on the power supply side. (Never forget grounding.)
3. The metal plugs are screw-threaded, therefore, fully tighten them so that they will not come loose during operation.

4.3.2 Connecting the gas supply hose

1. Connect the respective gas supply hoses to the primary hose.
2. Securely tighten the joints and check there is no gas leak.

4.3.3 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.

4.3.4 Determination of number of chains

The relationship between the pipe O.D. and the number of chains is as follows:

y = x + 11

where, y = The number of chains

x = Pipe O.D. (Unit: cm; Round off the value in mm to the next value in cm.)

For example, pipe O.D. 114.3 mm 11.43 cm 12

y = x+11

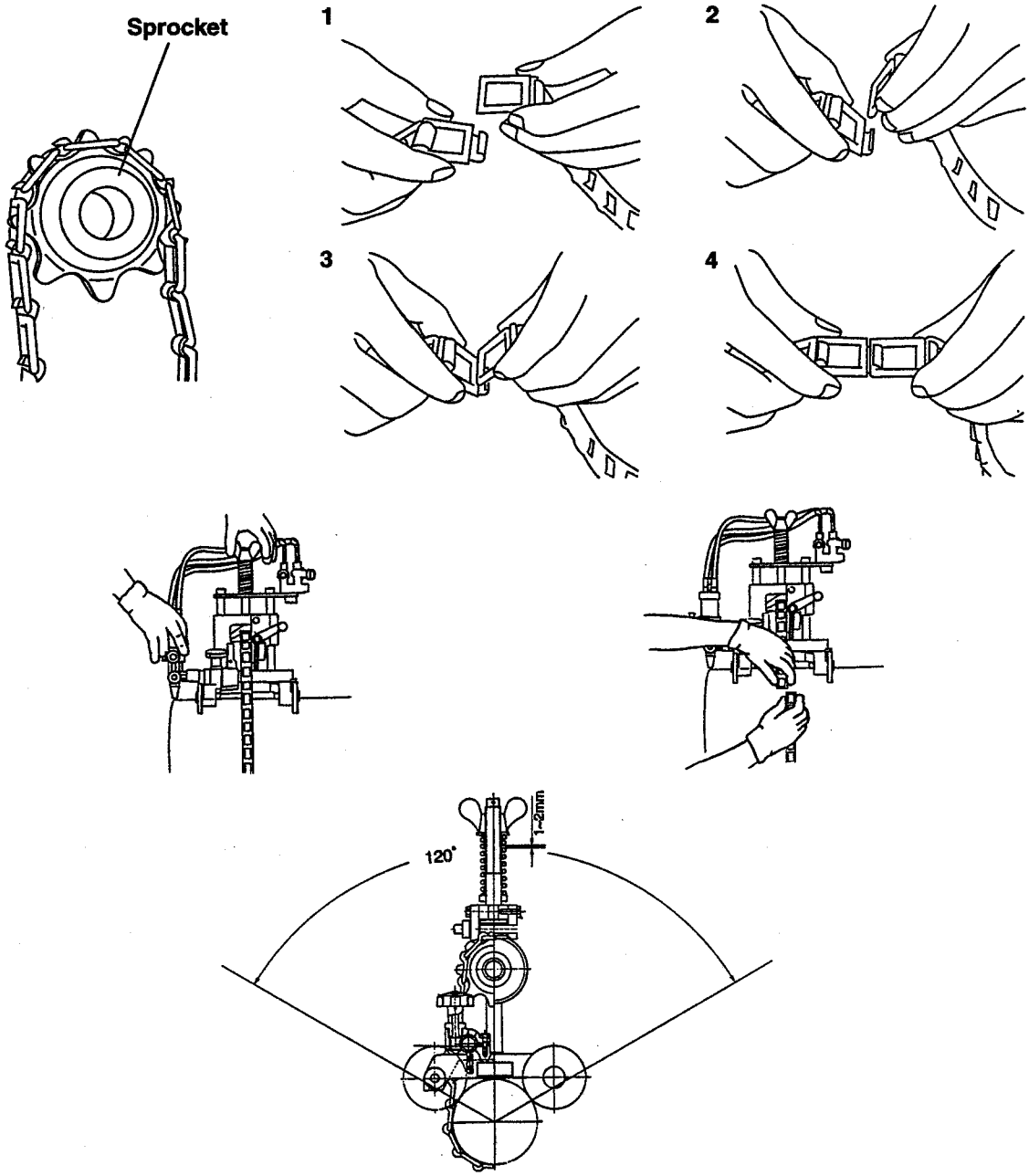
= 12+11

=23

Therefore, about 23 chains are necessary.

4.3.5 Securing machine to pipe

1. Calculate the necessary number of chains, place the main unit on the pipe to cut, and turn the tightening handle counterclockwise to lower the slide bracket.
2. Engage the chain with the sprocket and attach the chain as shown in the figure to set it on the pipe. (Do not confuse the right side of the chain with its wrong side.)
3. Turn the tightening handle clockwise and fix the main unit to the pipe. When turning the tightening handle, exercise care so that the spring will not be in close contact, leaving a clearance of 1-2 mm.
4. To avoid a chain engagement error or chain loosening, hold the machine by hand, disengage the clutch, and turn the handle to the right and left within the range of approx. 120 degrees two or three times, tensioning the chain gradually. Secure the guide roller of the main unit with the stopper so that the guide roller will be press-fit to the guide rail.
5. After setting, turn the handle by one turn, and check to see if the hose length is sufficient and the nozzle returns to the original position.



4.3.6 Assembling and mounting the guide rail

1. Assembling the rail

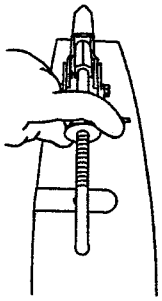
   Attach supporting bases (set) at intervals of 120 mm to the guide rail that matches the pipe diameter. Change the number of supporting bases (set), taking into consideration the overlapping sections of the guide rail.

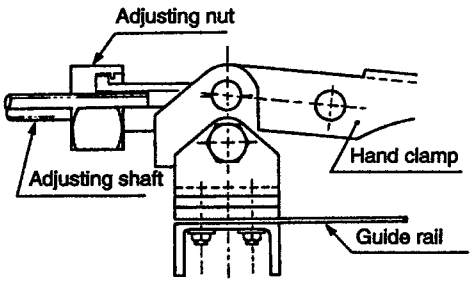
2. Installation of guide rail

   1) Secure the pipe to cut and mark a line 450 mm away from the cutting position. (4 locations along the periphery)

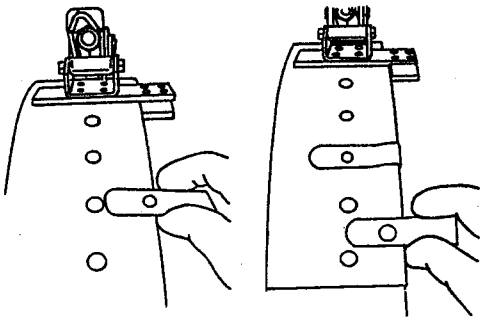
   2) Wind the guide rail along the marked line, set the adjusting shaft (B) in alignement with the hole (while the hand clamp is being tightened), and secure the guide rail by tightening the adjusting nut.

Notes: · Take care that the hand clamp will not be unclamped while tightening the adjusting nut.
· Tighten the adjusting nut to the extent that the set hole in the adjusting shaft (B) of the guide rail will not be deformed. (Tension: Approx. 8 kg or less)





3) Insert two hand clips alternately into the hole in the overlapping section of the upper and lower guide rails as shown in the figure in order to prevent lateral misalignment of the guide rails.



4) Tightening the adjusting nut is necessary only once for cutting pipes of the same diameter. From the second time onward, operartion of the hand clamp alone will permit mounting.

4.3.7 Trial operation

After setting, turn the machine once to check the secured condition of the machine and the length of hoses and cabtyre cable.

The machine can be turned automatically or by hand in the manual mode after disengaging the clutch.

■Automatic turning

Final operation can be checked by means of the main unit of the machine or the operation box.

- **Main unit**

  Turn on the rotational direction switch in the operation box, and operate the motor switch on the main unit of the machine for final operation.

- **Operation box**

  Turn on the motor switch on the main unit, and operate the rotational direction switch in the operation box for final operation.

  While the machine is traveling, adjust the cutting speed.

■Manual turning

In the case of the manual mode, disengage the clutch of the drive unit, and gently turn the machine while holding it by hand.

Be sure to engage the clutch after completely confirming the operation.

5 Cutting operation ⚠

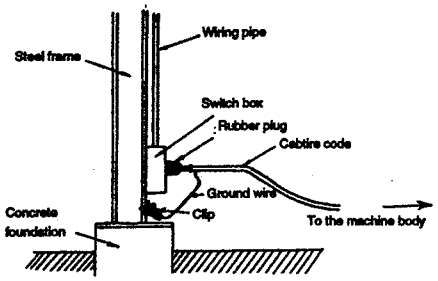
5.1 Safety measures prior to operation

5.1.1 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.

■Method to ground the machine

- The simplest way of grounding the wire is to connect the clip to the steel frame as shown in the diagram.
- If a grounding wire is already provided at the site, connect the clip to the wire.



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 Operation of running direction changeover switch ⚠

- By changing the direction switch, the machine can move forward and backward. The stop position on the switch is the stop position of the machine.
- When changing the direction, make sure that the direction switch is in the stop position, and operate the direction switch after the machine has stopped.
- Be sure that the switch is in the stop position before starting the machine.
- Make sure that the switch is in the stop position before turning the power on. If the switch is in the forward or backward position, the machine will start as soon as the power is turned on, which could cause serious accidents.
- Never put your hands in the space between the guide roller and rail, as well as between the body and the rail, while the machine is running, otherwise, your hands may be caught.

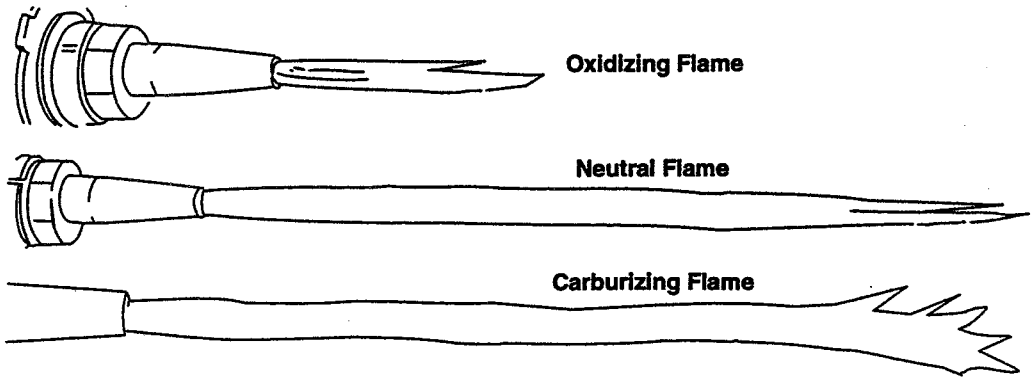
5.2 Ignition and flame adjustment

- 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 valve 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 has been obtained. (The incandescent area should be uniform and about 5-6 mm (3/16-1/14") in length.)
3. Open the jet oxygen valve 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 gas ·····8-10 mm
   - LPG gas ·····5-8 mm

Neutral 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.



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.

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 preheating, supply oxygen and simultaneously turn on the motor switch or the turning direction switch to start cutting.
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.

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.

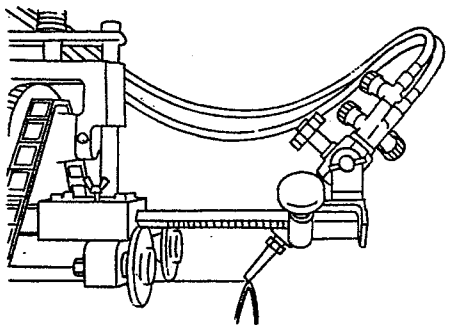
5.6 Cutting operation

1. Attach the chain to the section to cut, and align the tip with the cutting start-up point.
2. Bring a flame close to the tip for ignition and ensure sufficient preheating.
3. Open the cutting oxygen valve and turn on both motor switch and directional changeover switch simultaneously to begin cutting.
4. While checking the cutting condition, select the optimal cutting speed with the speed adjuster.
5. After cutting, turn off the switch and close the cutting oxygen valve, fuel gas valve, and preheating oxygen valve in this order.

* Thereafter, repeat operations from step 1.

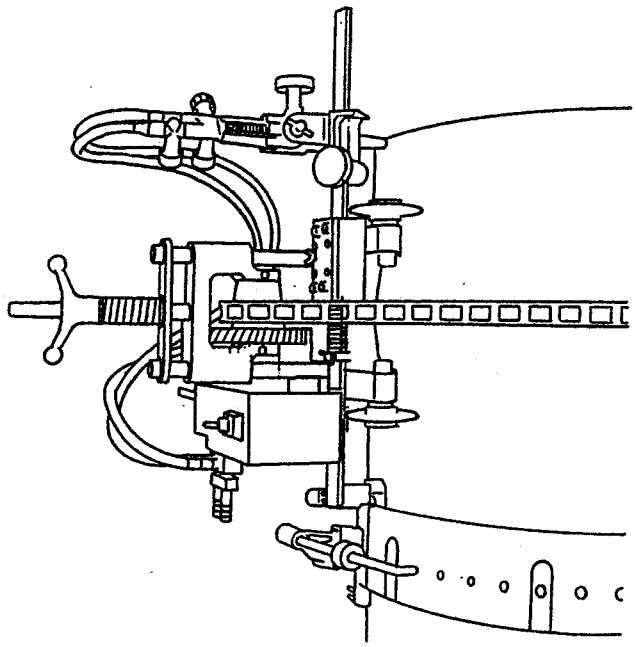
5.6.1 Bevel cutting

1. Loosen the torch securing thumbscrew and set the angle for bevel cutting.
2. For internal bevel cutting, remove the torch from the torch holder, and reversely attach the torch holder.
3. To reduce the effect of flame on the main unit, position the torch away from the main unit as much as possible during cutting operation.
4. Avoid piercing when starting cutting operation.



5.6.2 Vertical cutting

1. Vertical cutting is possible for max. 500 dia. pipes.
2. Be sure to firmly set the guide rail at that time.



6 Maintenance and inspection

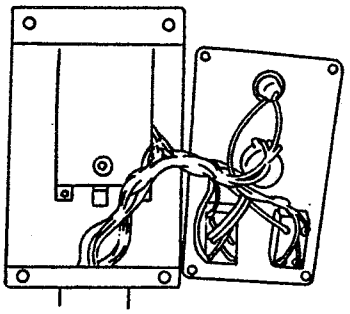
Refer to the following for inspection and maintenance of the machine, and operate the machine under the best conditions at all times.

6.1 Disassembly

6.1.1 Disassembly for maintenance and inspection of electric parts

■Control box

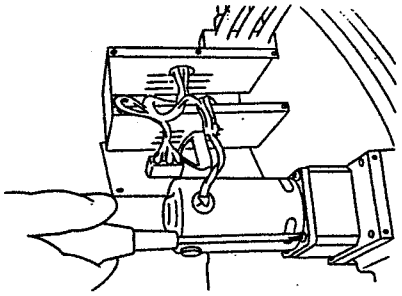
Remove the four (+) round head screws (M4 x 6) that are securing the operation panel sheet, and the maintenance and inspection of electric parts will be possible as shown in the figure.



■Motor

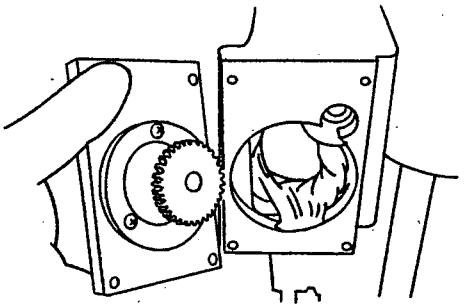
Remove the four (+) round head screws (M4 x 6) and four (+) round head screws (M3 x 6) that are securing the motor covers A and B, and remove the motor cover.

By removing the four (+) round head screws (M4 x 16) that are securing the motor, maintenance and inspection of the motor will be possible as shown in the figure.



6.1.2 Disassembly for maintenance and inspection of gear case

Disassemble the gear case in the same manner as the maintenance and inspection of the motor in item 6.1.1, remove the four (+) round head screws (M6 x 16) that are securing the casing, and supply notemp grease to the gear case.



6.2 Daily inspection

Oil the threaded section of the lift shaft and the sliding section of the shaft column every week.

6.3 3-month or 1000-hour inspection

Remove the carbon cap and check the carbon brush for abrasion.

6.4 6-month inspection

Disassemble, clean, and oil the gear case. Refer to 6.1.2 for the disassembling procesure.

7. Troubleshooting

1) The machine will not move. (The motor will not run.)

Cause	Inspection point	Correction
1)Power is not supplied.	Check the power supply. Check the connections.	Replace the power supply if it is defective.
2)Fuse blown	Check the 2A fuse in the control box to see if it has blown.	Replace the blown fuse.
3)Disconnection of power cable	Check the cable with a tester. "∞" indicates disconnection.	Repair the disconnected cable.
4)Poor connection	Check that lead wires are correctly connected to the terminal block.	Connect the wires again.
5)Defective switch	Remove the switch and check for continuity between terminals with a tester.	Replace the switch if it is defective.
6)Defective speed controlling resistor	Check with a tester that the resistance is 50 kΩ.	Replace the resistor if it is defective.
7)Disconnection of lead wire	Check for continuity between the lead wires with a tester.	Replace disconnected lead wires.
8)Poor contact of motor carbon brushes	Remove the cap and pull out the carbon brushes to check the degree of abrasion. Check the spring action as well.	Replace with new brushes if abrasion is severe.
9)Defective motor	If all the above items are normal, the motor is defective.	Repair or replace the motor with a new one.
10)Defective controller	If all the above items are normal,the controller is defective.	Replace the defective controller.

2) Speed cannot be controlled. (The motor runs.)

Cause	Inspection point	Correction
1)Defective speed control resistor	Remove the connector of SCR control and apply the probes of a tester to resistor terminals ② and ① or ② and ③. If the pointer continuously moves from 0 to 50 kΩ when the handle is turned slowly, the resistor is normal.	Replace the defective resistor.
2)Defective controller	When 1) is normal, the controller is defective.	Replace the defective controller.

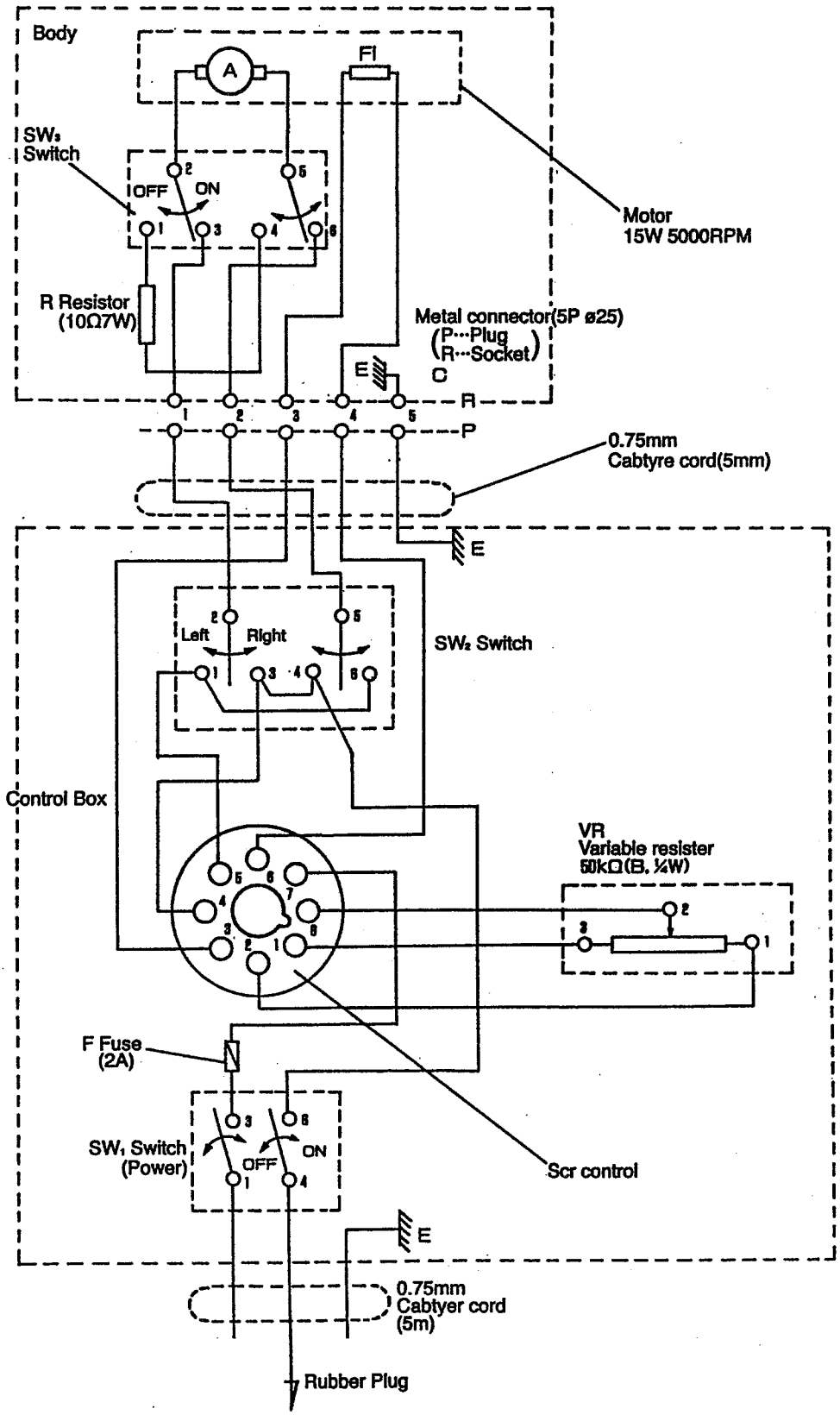
3) The machine will not move. (The motor runs.)

Cause	Inspection point	Correction
1)Malfunction	Remove the speed reducer box to check the clutch operation.	Disassemble and clean.
2)Idle rotation of reduction gear	The reduction gear is rotating idly when the motor keeps running even if the direction changeover switch is turned on or the drive wheel is stopped by hand.	Replacement of gears (set).

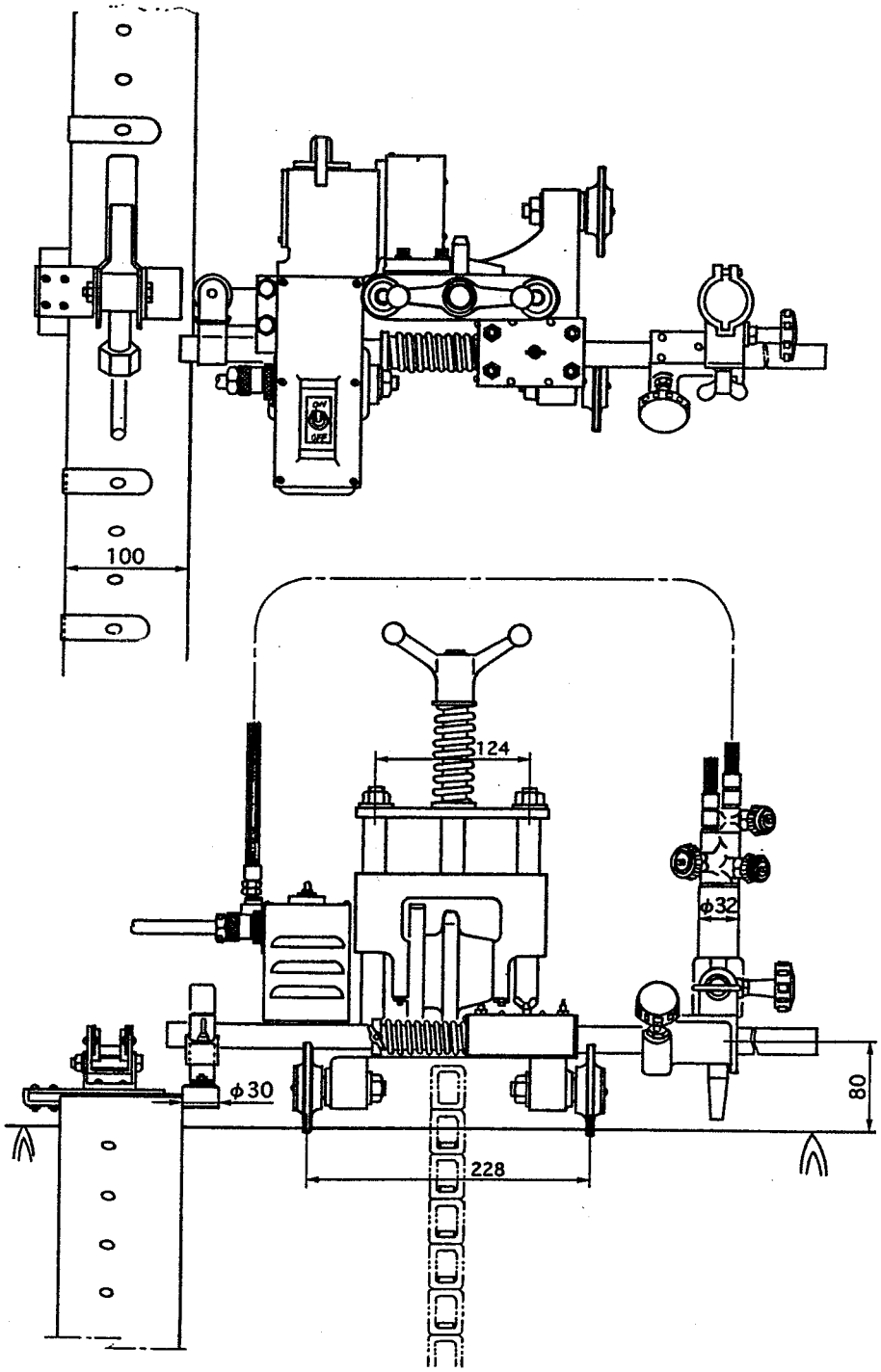
4) The machine runs incorrectly.

Cause	Inspection point	Correction
1)The speed is too fast.	The supply voltage is abnormal.	Check the voltage.
2)Low speed is not possible.	①Speed control resistor is defective.	Replace with a new one.
	②Defective wiring	Correct the wiring.
	③Defective motor	Repair or replace the motor with a new one.
	④Defective controller	Replace with a new one.
3)High speed is not possible.	When the supply voltage has dropped.	Check with a tester.
4)Knocking occurs.	①Abrasion of gears	Replace.
	②Abrasion of clutch key	Replace or repair.
	③Excessive play between shaft and drive wheel	Replace or repair.
	④Hoses or cabtire cords hinder smooth running.	Consider during operation.
	⑤Flaws on the drive and drive wheel or adhesion of foreign material.	Replace or repair.
	⑥The chain tension is insufficient. The tracing roller does not move correctly.	Tension the chain properly. Check and correct the roller movement.

Wiring diagram

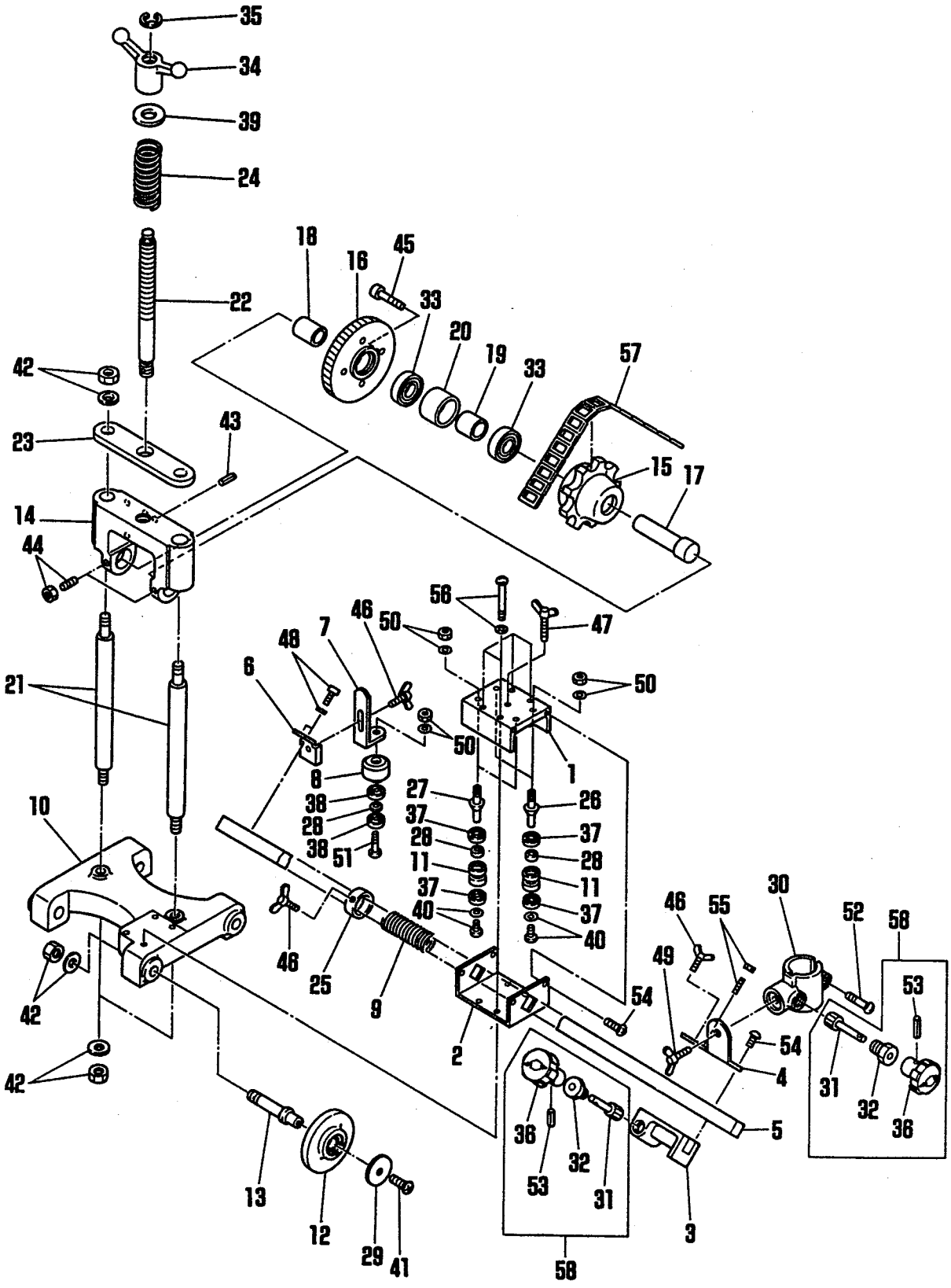


Assembly drawing of AUTO PICLE-Ⅱ



10 Parts list

10.1 Body unit

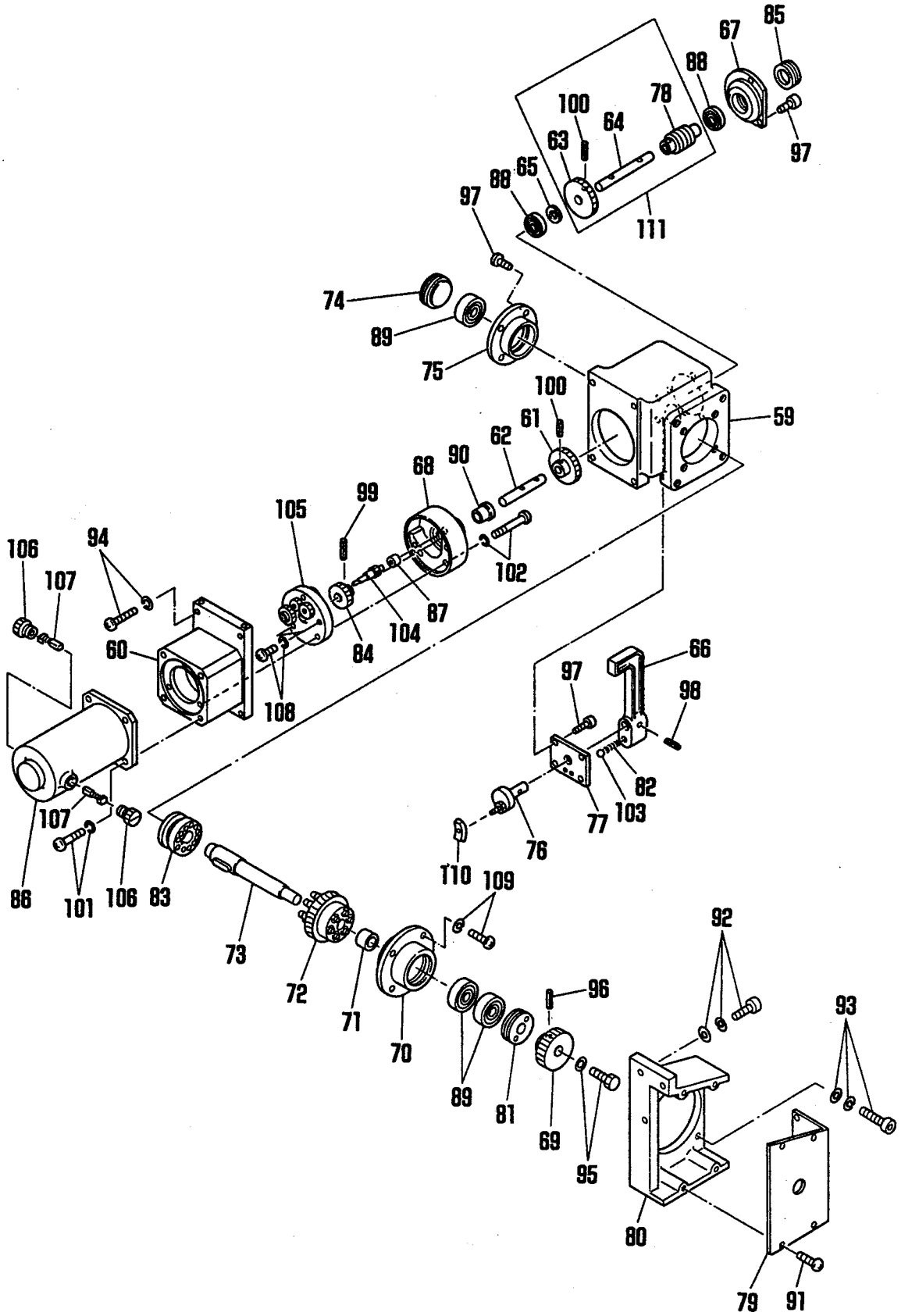


Body unit

ITEM NO.	PART NAME	QTY	STOCK NO.	REMARKS
1	Slide body	1	60032412	
2	Slide body cover	1	60032413	
3	Cross feed body	1	60032414	
4	Torch holder bracket	1	60032415	
5	Slide bar	1	60032416	
6	Guide roller base	1	60032417	
7	Guide roller bracket	1	60032418	
8	Guide roller	1	60032419	
9	Slide spring	1	60032420	
10	Body	1	60032421	
11	Roller	4	60032452	
12	Wheel	4	60031345	
13	Wheel shaft	4	60031346	
14	Slide bracket	1	60031339	
15	Sprocket	1	60031335	
16	Drive gear	1	60031333	
17	Sprocket shaft	1	60031334	
18	Collar(A)	1	60031338	
19	Collar(B)	1	60031336	
20	Collar(C)	1	60031337	
21	Slide shaft	2	60031340	
22	Lift shaft	1	60031341	
23	Upper plate	1	60031342	
24	Spring	1	60031343	
25	Stopper	1	60030912	
26	Side roller shaft(A)	2	60031612	
27	Side roller shaft(B)	2	60031613	
28	Collar	5	60032467	
29	Washer	4	60030667	
30	Torch holder	1	60031842	
31	Pinion(A)	2	60030910	
32	Pinion metal(A)	2	60030909	

ITEM NO.	PART NAME	QTY	STOCK NO.	REMARKS
33	Bearing	2	60030830	6004ZZ
34	Wing handle	1	60031344	
35	Stop ring(E-10)	1	6B540100	E-10
36	Handle	2	60030223	ϕ40
37	Bearing	8	60032470	R1560ZZ
38	Bearing	2	60031266	626ZZ
39	Washer(WF-18)	1	6D500180	M18
40	Screw(SP-3×6)	4	6C520306	M3×6、With WF
41	Screw(SF-5×12)	4	6C500512	M5×12
42	Nut(NH-12)	8	6D010120	M12、With WF
43	Spring pin(PR-3×20)	1	6B023020	ϕ3×20
44	Screw(SS-6×15)	2	6C540615	M6 With Nut
45	Screw(BC-5×18)	4	6C030518	M5×18
46	Wing bolt(BS-4×10)	5	6C110410	M4×10
47	Wing bolt(BS-4×15)	1	6C110415	M4×15
48	Screw(BC-4×10)	2	6C030410	M4×10、With SW
49	Wing bolt(BS-8×15)	1	6C110815	M8×15
50	Nut(NH-6)	5	6D010060	M6、With WF
51	Screw(SP-6×30)	1	6C520630	M6×30
52	Screw(SP-6×25)	1	6C520625	M6×25
53	Spring pin(PR-2.5×16)	2	6B022516	ϕ2.5×16
54	Screw(SP-4×10)	8	6C520410	M4×10
55	Screw(SS-4×12)	1	6C540412	M4×12
56	Screw(SP-4×45)	4	6C520445	M4×45
57	Chain	1	60031101	2.4M
58	Pinion assembly	2	60030908	

10.2 Driving unit

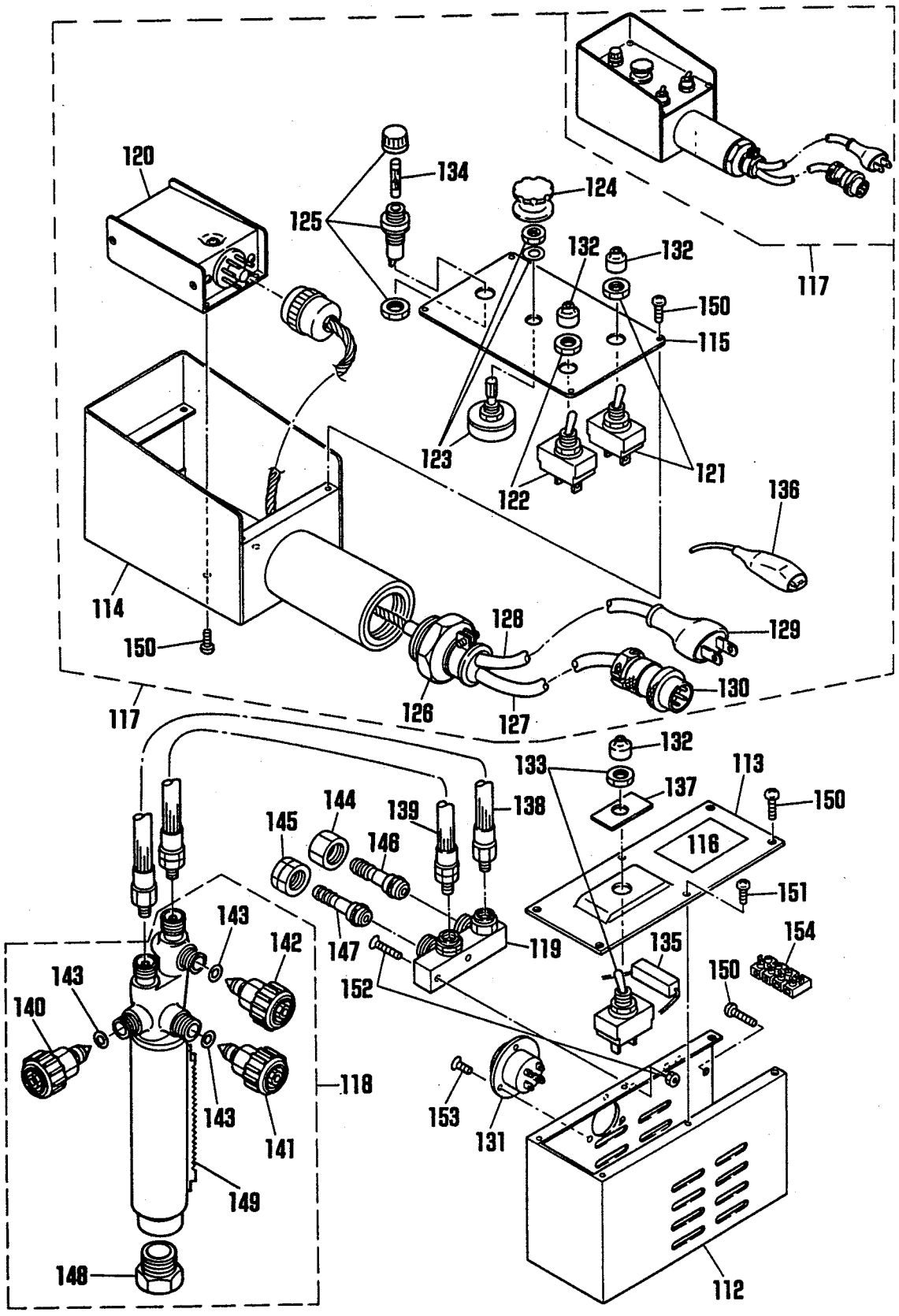


Driving unit

ITEM NO.	PART NAME	QTY	STOCK NO.	REMARKS
59	Reduction gear box	1	60032400	
60	Casing	1	60032401	
61	Gear(A)	1	60032402	
62	Gear shaft(A)	1	60032403	
63	Gear(B)	1	60032404	
64	Gear shaft(B)	1	60032405	
65	Collar(B)	1	60032406	
66	Cluth lever	1	60032407	
67	Casing(D)	1	60032408	
68	Gear assembly fixing cover	1	60032409	
69	Pinion	1	60031312	
70	Casing(A)	1	60031310	
71	Collar	1	60031309	
72	Worm wheel assembly	1	60032464	
73	Drive shaft assembly	1	60031318	
74	Bearing retainer	1	60031306	
75	Casing(B)	1	60031305	
76	Clutch lever shaft assembly	1	60031313	
77	Clutch lever metal	1	60031316	
78	No.2 worm	1	60032463	
79	Gear cover	1	60031319	
80	Gear bracket	1	60031320	
81	Bearing retainer	1	60031279	
82	Lever spring	1	60031236	
83	Clutch	1	60031307	
84	No.7 gear	1	60030676	
85	Bearing retainer	1	60031014	
86	Motor	1	60032816	
	Motor	1	60033602	42V (KE only)
87	Du-bush	1	6D700505	MB0505DU
88	Bearing	2	60030269	608ZZ
89	Bearing	3	60030252	6201ZZ

ITEM NO.	PART NAME	QTY	STOCK NO.	REMARKS
90	Du-bush	1	60033833	MB0812DU
91	Screw(SP-3×6)	6	6C520306	M3×6
92	Hex socket head screw(BC-6×25)	4	6C030625	M6×25, with WF,WS
93	Screw(SP-6×25)	4	6C520625	M6×25, with WS
94	Screw(SP-6×16)	4	6C520616	M6×16, with WS
95	Hexagon bolt(BH-6×10)	1	6C010610	M6×10, with WF
96	Spring pin(PR-4×20)	1	6B020420	ϕ4×20
97	Screw(SP-4×12)	11	6C520412	M4×12
98	Spring pin(PR-2.5×20)	1	6B022520	ϕ2.5×20
99	Spring pin(PR-2.5×14)	2	6B022514	ϕ2.5×14
100	Spring pin(PR-2.5×16)	2	6B022516	ϕ2.5×16
101	Screw(SP-4×16)	4	6C520416	M4×16, with WS
102	Screw(SP-4×50)	3	6C520450	M4×50, with WS
103	Steel ball(TB-1/4)	1	6F810104	ϕ1/4
104	No.6 gear	1	60032497	
105	Gear assembly	1	60032411	
106	Carbon cap	2	60033365	
107	Carbon brush	2	60030752	
108	Screw(SP-4×18)	1	6C520418	M4×18, with WS
109	Screw(SP-6×15)	4	6C520615	M6×15, with WS
110	Slider	1	60030265	
111	No.2 worm assembly	1	60032469	Double thred

10.3 Electorical and gas unit

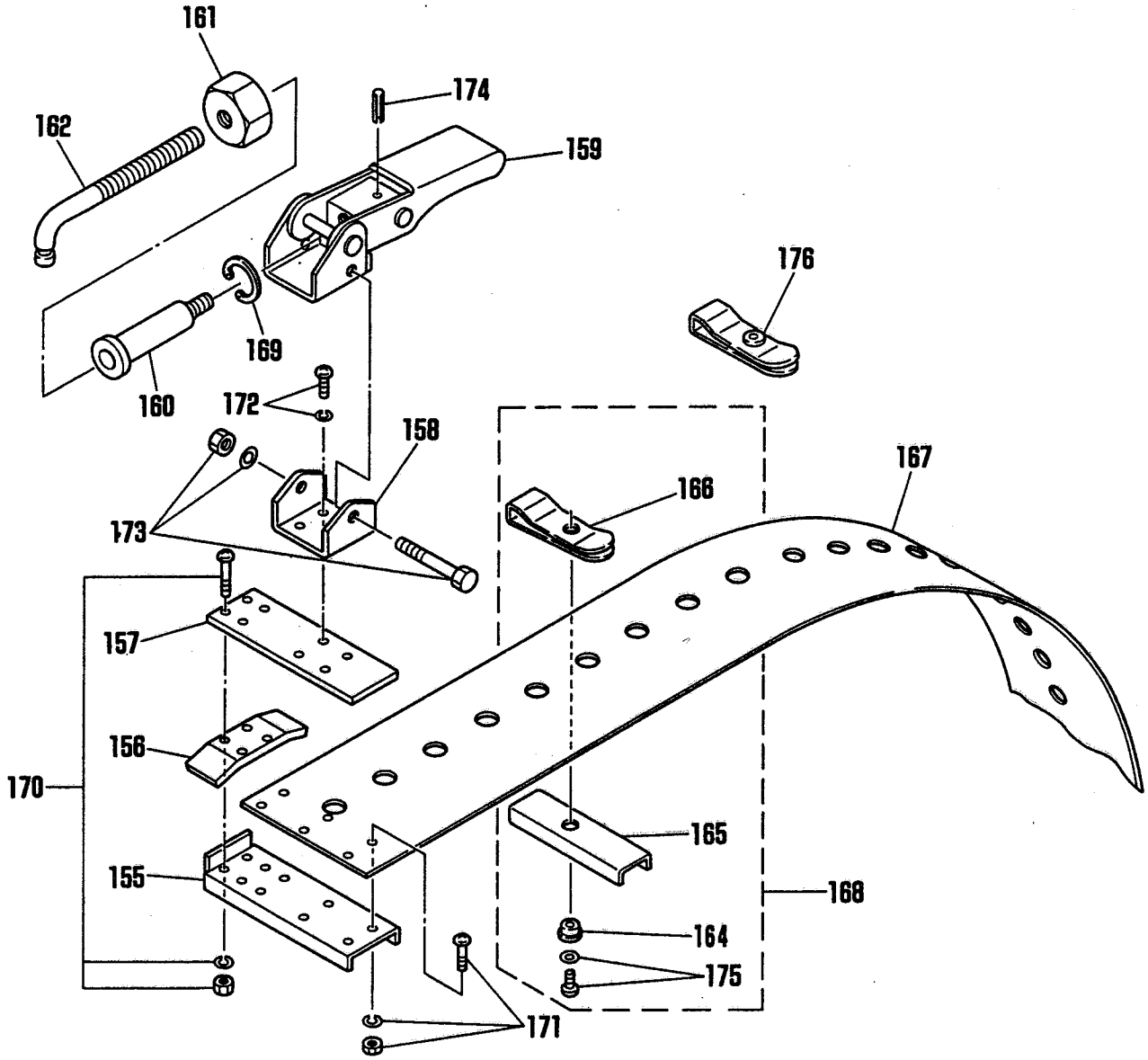


Electrical and gas unit

ITEM NO.	PART NAME	QTY	STOCK NO.	REMARKS
112	Motor cover(A)	1	60032422	
113	Motor cover(B)	1	60032423	
114	Control box	1	60032424	
115	Operation panel	1	60032450	
116	Name plate	1	60032451	
117	Control box assembly	1	60032461	
118	Torch	1	60010050	Except USA,KE
	Torch	1	60010051	USA only
	Torch	1	60010055	KE only
119	Distributor	1	60031846	Except USA
	Distributor	1	60031847	USA only
120	SCR control	1	60030740	
121	Switch	1	60035226	S-333
122	Switch	1	60032427	S-331
123	Variable resistor	1	60030745	50KΩ
124	Grip	1	60031332	
125	Fuse holder	1	60030749	F-7157
126	Cord rock	1	60032428	NC-2
127	Cabtyre cord	1	60032429	5P×5M
128	Cabtyre cord	1	60030278	3P×5M
129	Rubber plug	1	60030279	2P
130	Metal concent(plug)	1	60032430	5P×φ25
131	Metal concent(socket)	1	60032460	5P×φ25
132	Cap for dust protector	3	60032431	
133	Switch	1	60030822	S-332
134	Fuse	1	60031601	2A
135	Resistor	1	60031247	RGB-7、10Ω、7W
136	Earth clip	1	60030295	
137	Name plate for switch ON-OFF	1	60032433	
138	Hose for oxygen	1	60030322	Except USA,KE
	Hose for oxygen	1	60030323	USA only
	Hose for oxygen	1	60030324	KE only

ITEM NO.	PART NAME	QTY	STOCK NO.	REMARKS
139	Hose for gas	1	60030326	Except USA
	Hose for gas	1	60030327	USA only
140	Valve for jet oxygen	1	60015354	Except KE
	Valve for jet oxygen	1	60015358	KE only
141	Valve for preheat oxygen	1	60015355	Except KE
	Valve for preheat oxygen	1	60015358	KE only
142	Valve for gas	1	60015356	
143	O-ring	3	60005026	
144	Nut for oxygen	1	60015001	Except USA,KE
	Nut for oxygen	1	60015056	KE only
145	Nut for gas	1	60015002	Except USA,KE
	Nut for gas	1	60015054	KE only
146	Hose connector	1	60015003	Except USA,KE
	Hose connector	1	60015040	KE only
147	Hose connector	1	60015004	Except USA,KE
	Hose connector	1	60015062	KE only
148	Tip fixing nut	1	60005020	
149	Rack for torch	1	60010056	110
150	Screw(SP-4×6)	10	6C520406	M4×6
151	Screw(SP-3×10)	4	6C520310	M3×10
152	Screw(SM-5×20)	2	6C510520	M5×20
153	Screw(SM-3×4)	3	6C510304	M3×4
154	Terminal	1	60030656	4P

10.4 Guide rail



Guide rail

ITEM NO.	PART NAME	QTY	STOCK NO.	REMARKS
155	Guide rail base	1	60032434	
156	Liner	1	60032435	
157	Hand clamp base plate	1	60032436	
158	Hand clamp bracket	1	60032437	
159	Hand clampper	1	60032438	
160	Adjusting shaft(A)	1	60032439	
161	Adjusting nut	1	60032440	
162	Adjusting shaft(B)	1	60032441	
163	Setting shaft for spring plate(A)	2	60032442	
164	Setting shaft for spring plate(B)	~	60032443	Decide Q'Ty according to the length of rail
165	Sub base	~	60032444	
166	Spring plate for sub base	~	60032445	
167	Guide rail(D-1500)	1	60032446	4974m／m
	Guide rail(D-1200)		60032457	4014m／m
	Guide rail(D-900)		60032458	3094m／m
	Guide rail(D-600)		60032459	2174m／m
168	Sub base assembly	~	60032447	Decide Q'Ty according to the length of rail
169	Stop ring(IRTW-26)	1	6B510260	PR-26
170	Screw(SP-4×18)	6	6C520418	M4×18、with SW,Nut
171	Screw(SP-4×8)	6	6C520408	M4×8、with SW,Nut
172	Screw(SP-4×8)	4	6C520408	M4×8、with SW
173	Hexagon bolt(BH-6×50)	1	6C010650	M6×50、with WF
174	Spring pin(PR-2.5×16)	1	6B022516	ϕ2.5×16
175	Screw(SP-4×4)	~	6C520404	M4×4、with WF
176	Band clip	4	60032448	

Cutting data

102(STANDARD SPEED) For Acetylene

Metric System

PLATE THICKNESS (mm)	TIP SIZE	CUTTING SPEED (mm/min)	OXYGEN PRESSURE (kg/cm²)		FUEL GAS PRESSURE (kg/cm²)	KERF WIDTH (mm)
			CUTTING	PR-HEAT		
3	00	680	1.5	1.5	0.2	1.0
6	0	610	2.0	2.0	0.2	1.3
10	0	560	2.0	2.0	0.2	1.5
12.5	1	530	2.5	2.5	0.2	1.8
19	2	460	3.0	3.0	0.25	2.0
25	2	430	3.0	3.0	0.25	2.0
38	3	355	3.0	3.0	0.25	2.3
50	4	320	3.0	3.0	0.25	2.8
60	5	280	4.0	4.0	0.3	3.0
75	5	250	4.0	4.0	0.3	3.0
100	6	200	4.0	4.0	0.3	3.6
125	6	180	4.0	4.0	0.4	3.6
150	7	150	4.5	4.5	0.4	4.1
200	7	130	4.5	4.5	0.4	4.3
250	8	80	4.5	4.5	0.4	5.6
300	8	50	4.5	4.5	0.4	6.6

Inch System

PLATE THICKNESS (Inches)	TIP SIZE	CUTTING SPEED (in/min)	OXYGEN P.S.I.G		FUEL GAS P.S.I.G	KERF WIDTH (inches)
			CUTTING	PR-HEAT		
1/8	00	27	20	20	2.8	0.04
1/4	0	24	30	30	2.8	0.05
3/8	0	22	30	30	2.8	0.06
1/2	1	21	40	40	2.8	0.07
3/4	2	18	45	45	3.6	0.08
1	2	17	45	45	3.6	0.08
1-1/2	3	14	45	45	3.6	0.09
2	4	12.5	45	45	4.3	0.11
2-1/2	5	11	45	45	4.3	0.12
3	5	10	55	55	4.3	0.12
4	6	8	55	55	4.3	0.12
5	6	7	55	55	5.7	0.14
6	7	6	55	55	5.7	0.14
8	7	5	65	65	5.7	0.16
10	8	3	65	65	5.7	0.17
12	8	2	65	65	5.7	0.23
					5.7	0.27

102-D7(HIGH SPEED) For Acetylene

Metric System

PLATE THICKNESS (mm)	TIP SIZE	CUTTING SPEED (mm/min)	OXYGEN PRESSURE (kg/cm²)		FUEL GAS PRESSURE (kg/cm²)	KERF WIDTH (mm)
			CUTTING	PR-HEAT		
3	00	800	7.0	1.5	0.2	0.8
6	0	740	7.0	2.0	0.2	1.0
10	0	680	7.0	2.0	0.2	1.3
12.5	1	630	7.0	2.5	0.2	1.3
19	2	580	7.0	3.0	0.25	1.5
25	2	510	7.0	3.0	0.25	1.8
38	3	460	7.0	3.0	0.25	2.0
50	4	410	7.0	3.0	0.25	2.6
60	5	360	7.0	4.0	0.3	2.8
75	5	320	7.0	4.0	0.3	2.8
100	6	250	7.0	4.0	0.3	3.3
125	6	230	7.0	4.0	0.3	3.6
150	7	180	7.0	4.5	0.4	3.6
200	7	140	7.0	4.5	0.4	4.6
250	8	100	7.0	4.5	0.4	5.1
300	8	80	7.0	4.5	0.4	6.1

Inch System

PLATE THICKNESS (Inches)	TIP SIZE	CUTTING SPEED (in/min)	OXYGEN P.S.I.G		FUEL GAS P.S.I.G	KERF WIDTH (inches)
			CUTTING	PR-HEAT		
1/8	00	31.5	100	20	2.8	0.03
1/4	0	29	100	30	2.8	0.04
3/8	0	27	100	30	2.8	0.05
1/2	1	25	100	40	2.8	0.05
3/4	2	22	100	45	3.6	0.06
1	2	20	100	45	3.6	0.07
1-1/2	3	18	100	45	3.6	0.08
2	4	16	100	45	4.3	0.10
2-1/2	5	14	100	55	4.3	0.11
3	5	12.5	100	55	4.3	0.11
4	6	10	100	55	5.7	0.13
5	6	9	100	55	5.7	0.14
6	7	7	100	65	5.7	0.14
8	7	5.5	100	65	5.7	0.18
10	8	4	100	65	5.7	0.20
12	8	3	100	65	5.7	0.24

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 cutting speed. Also, when precision cutting is required, adjust all data.

106(STANDARD SPEED) For Propane

Metric System

PLATE THICKNESS (mm)	TIP SIZE	CUTTING SPEED (mm/min)	OXYGEN PRESSURE (kg/cm²)		FUEL GAS PRESSURE (kg/cm²)	KERF WIDTH (mm)
			CUTTING	PR-HEAT		
3	00	680	1.5	1.5	0.2	1.0
6	0	610	2.0	2.0	0.2	1.3
10	0	560	2.0	2.0	0.2	1.5
12.5	1	530	2.5	2.5	0.2	1.6
19	2	460	3.0	3.0	0.2	2.0
25	2	430	3.0	3.0	0.2	2.0
38	3	355	3.0	3.0	0.2	2.3
50	4	320	3.0	3.0	0.25	2.8
60	5	280	4.0	4.0	0.3	3.0
75	5	250	4.0	4.0	0.3	3.0
100	6	200	4.0	4.0	0.35	3.6
125	6	180	4.0	4.0	0.35	3.6
150	7	150	4.5	4.5	0.4	4.1
200	7	130	4.5	4.5	0.4	4.3
250	8	80	4.5	4.5	0.4	5.6
300	8	50	4.5	4.5	0.4	6.6

Inch System

PLATE THICKNESS (Inches)	TIP SIZE	CUTTING SPEED (in/min)	OXYGEN P.S.I.G		FUEL GAS P.S.I.G	KERF WIDTH (Inches)
			CUTTING	PR-HEAT		
1/8	00	27	20	20	2.8	0.04
1/4	0	24	30	30	2.8	0.05
3/8	0	22	30	30	2.8	0.06
1/2	1	21	40	40	2.8	0.07
3/4	2	18	45	45	2.8	0.08
1	2	17	45	45	2.8	0.08
1-1/2	3	14	45	45	2.8	0.09
2	4	12.5	45	45	3.6	0.11
2-1/2	5	11	55	55	4.3	0.12
3	5	10	55	55	4.3	0.12
4	6	8	55	55	5.0	0.14
5	6	7	55	55	5.0	0.14
6	7	6	65	65	5.7	0.16
8	7	5	65	65	5.7	0.17
10	8	3	65	65	5.7	0.23
12	8	2	65	65	5.7	0.27

106-D7(HIGH SPEED) For Propane

Metric System

PLATE THICKNESS (mm)	TIP SIZE	CUTTING SPEED (mm/min)	OXYGEN PRESSURE (kg/cm²)		FUEL GAS PRESSURE (kg/cm²)	KERF WIDTH (mm)
			CUTTING	PR-HEAT		
3	00	800	7.0	1.5	0.2	0.8
6	0	740	7.0	2.0	0.2	1.0
10	0	680	7.0	2.0	0.2	1.3
12.5	1	630	7.0	2.5	0.2	1.3
19	2	560	7.0	3.0	0.2	1.5
25	2	510	7.0	3.0	0.2	1.8
38	3	460	7.0	3.0	0.2	2.0
50	4	410	7.0	3.0	0.2	2.6
60	5	360	7.0	4.0	0.25	2.8
75	5	320	7.0	4.0	0.25	2.8
100	6	250	7.0	4.0	0.3	3.3
125	6	230	7.0	4.0	0.3	3.6
150	7	180	7.0	4.5	0.3	3.6
200	7	140	7.0	4.5	0.3	4.6
250	8	100	7.0	4.5	0.4	5.1
300	8	80	7.0	4.5	0.4	6.1

Inch System

PLATE THICKNESS (Inches)	TIP SIZE	CUTTING SPEED (in/min)	OXYGEN P.S.I.G		FUEL GAS P.S.I.G	KERF WIDTH (Inches)
			CUTTING	PR-HEAT		
1/8	00	31.5	100	20	2.8	0.03
1/4	0	29	100	30	2.8	0.04
3/8	0	27	100	30	2.8	0.05
1/2	1	25	100	40	2.8	0.05
3/4	2	22	100	45	2.8	0.06
1	2	20	100	45	2.8	0.07
1-1/2	3	18	100	45	2.8	0.06
2	4	16	100	45	2.8	0.10
2-1/2	5	14	100	55	3.6	0.11
3	5	12.5	100	55	3.6	0.11
4	6	10	100	55	4.3	0.13
5	6	9	100	55	4.3	0.14
6	7	7	100	65	4.3	0.14
8	7	5.5	100	65	4.3	0.18
10	8	4	100	65	5.7	0.20
12	8	3	100	65	5.7	0.24

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 cutting speed. Also, when precision cutting is required, adjust all data.