

INSTRUCTIONS AND PARTS MANUAL

K-BUG 1200

K-BUG 1200

K-BUG 1202

K-BUG 1204

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Model Number _____

Serial Number _____

Date of Purchase _____

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above.

LIT-KBUG-1200-IPM-0414

Bug-O Systems is guided by honesty, integrity and ethics in service to our customers and in all we do.

B U G - O S Y S T E M S

A DIVISION OF WELD TOOLING CORPORATION



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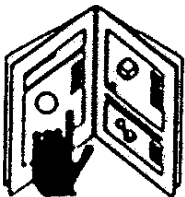
SAFETY

PROTECT YOURSELF AND OTHERS FROM SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.



ELECTRIC SHOCK can kill.

- 1) The equipment is not waterproof. Using the unit in a wet environment may result in serious injury. Do not touch equipment when wet or standing in a wet location.
- 2) The unused connectors have power on them. Always keep the unused connectors covered with the supplied protective panels. Operation of the machine without the protective panels may result in injury.
- 3) Never open the equipment without first unplugging the power cord or serious injury may result.
- 4) Verify the customer-supplied power connections are made in accordance with all applicable local and national electrical safety codes. If none exist, use International Electric Code (IEC) 950.
- 5) Never remove or bypass the equipment power cord ground. Verify the equipment is grounded in accordance with all applicable local and national electrical safety codes. If none exist, use International Electric Code (IEC) 950.



READ INSTRUCTIONS.

Read the instruction manual before installing and using the equipment.



EQUIPMENT DAMAGE POSSIBLE.

- 1) Do not plug in the power cord without first verifying the equipment is OFF and the cord input voltage is the same as required by the machine or serious damage may result.
- 2) Always verify both the pinion and wheels are fully engaged before applying power or equipment damage may occur.
- 3) Do not leave the equipment unattended.
- 4) Remove from the work site and store in a safe location when not in use.



FALLING EQUIPMENT can cause serious personal injury and equipment damage.

Faulty or careless user installation is possible. As a result, never stand or walk underneath equipment.



MOVING PARTS can cause serious injury.

- 1) Never try to stop the pinion from moving except by removing power or by using the STOP control.
- 2) Do not remove any protective panels, covers or guards and operate equipment.

HIGH FREQUENCY WARNINGS

SPECIAL PRECAUTIONS ARE REQUIRED WHEN USING PLASMA, TIG OR ANY WELDING PROCESS THAT USES HIGH FREQUENCY TO STRIKE AN ARC.



WARNING: HIGH FREQUENCY CAN EFFECT MACHINE OPERATION AND THEREFORE, WELD QUALITY.

Read the precautions below before installing and using the equipment.

PRECAUTIONS:

- 1) Some plasma or welding cables are strong sources of high frequency interference. NEVER lay a plasma or welding cable across the controls of the machine.
- 2) Always physically separate the plasma or welding cable leads from the machine cables. For example, the plasma or welding cable leads should NEVER be bundled with a pendant cable or the machine power cord. Maximize the separation between any machine cables and the plasma or welding cables.
- 3) Strictly follow the grounding procedures specified for the plasma or welding unit.
NOTE: Some plasma and welding units produce exceptionally large amounts of high frequency noise. They may require a grounding rod be driven into the earth within six feet (2 meters) of the plasma or welding unit to become compatible with an automatic cutting or welding process.
- 4) If the high frequency is produced using a spark gap, adjust the points so the gap is as small as possible. The larger the gap, the higher the voltage and the higher the interference.
- 5) Some plasma or welding units will inject high frequency interference into the AC power line. Use separate power line branches whenever possible to power the plasma or welding source and the machine. Do not plug them into the same outlet box.
- 6) High frequency noise may enter the machine through the plasma or welding supply remote contactor leads. Some plasma and welding sources can produce noise spikes of up to several thousand volts. These sources are not compatible with automated cutting and welding equipment. It is recommended that the remote contactor leads on these plasma or welding sources not be connected to the machine. An alternate solution is to purchase a separate remote contactor isolation box.

K-BUG 1200

K-BUG 1200, K-BUG 1202, KBUG-1204

INSTRUCTIONS AND PARTS MANUAL

TABLE OF CONTENTS

PAGE

5.....	Introduction
5.....	Features
5.....	Technical Data
5.....	Dimensions
6.....	Illustration of Typical Applications
6.....	User Interface
7.....	Welding Modes
7.....	Intermittent Welding
7.....	Continuous Welding (Intermittent Welding Lock-Out)
8.....	Time Settings
8.....	Stop Sensor Operation
9.....	Global Parameters
9.....	Converting Units
10.....	Installation and Operation
10.....	Cable Interconnect Diagram
11.....	Maintenance
11.....	Troubleshooting
12.....	Troubleshooting, Cont'd.
13.....	K-BUG 1200 Assembly View
14.....	K-BUG 1200 Wiring Diagram
15.....	KBUG-1210 Carriage Assembly / Exploded View
16.....	KBUG-1210 Carriage Assembly / Parts List
17.....	KBUG-1060 Guide Arms / Exploded View / Parts List
17.....	KBUG-1230 Angle Slide Assembly / Exploded View / Parts List
18.....	KBUG-1100 Torch Clamp Assembly / Exploded View / Parts List
18.....	KBUG-1120 Control Panel Assembly / Exploded View / Parts List
19.....	SBG-450-__-__-__ Gun & Cable Assembly / Exploded View / Parts List
20.....	Accessories
21.....	Warranty

INTRODUCTION

The K-BUG 1200 is a compact, light weight unit designed to mechanize horizontal fillet welding. The machine is capable of performing continuous and intermittent (stitch) welds.

FEATURES

- Compact - 12.4 x 7.8 x 11.1 in (31.4 x 19.8 x 28.1 cm)
- Lightweight - 13 lb (5.9 kg)
- Continuous and intermittent welds
- Digital speed display
- Precision speed control for consistent weld quality
- User adjustable time settings for puddle build-up, pause time and crater-fill
- Will climb up to a 75° incline
- Drive wheels rated to 400 °F (204 °C)

TECHNICAL DATA

Power Input:	K-BUG 1200	120VAC / 50-60 Hz / 1 Phase
	K-BUG 1202	240VAC / 50-60 Hz / 1 Phase
	K-BUG 1204	42VAC / 50-60 Hz / 1 Phase
Weight:		13 lb (5.9 kg)
Drive Motor:		24 VDC, 12 W, 5000 RPM
Travel Speed:		0.3 - 37 in/min (0.1 - 95 cm/min)
Torch Angle:		Adjustable
Running Angle:		90°

DIMENSIONS

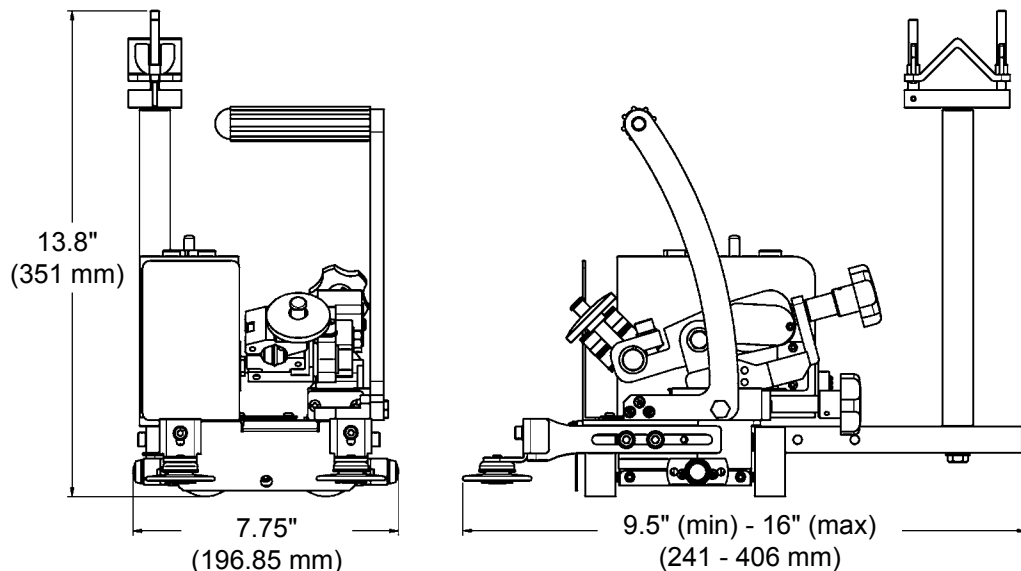
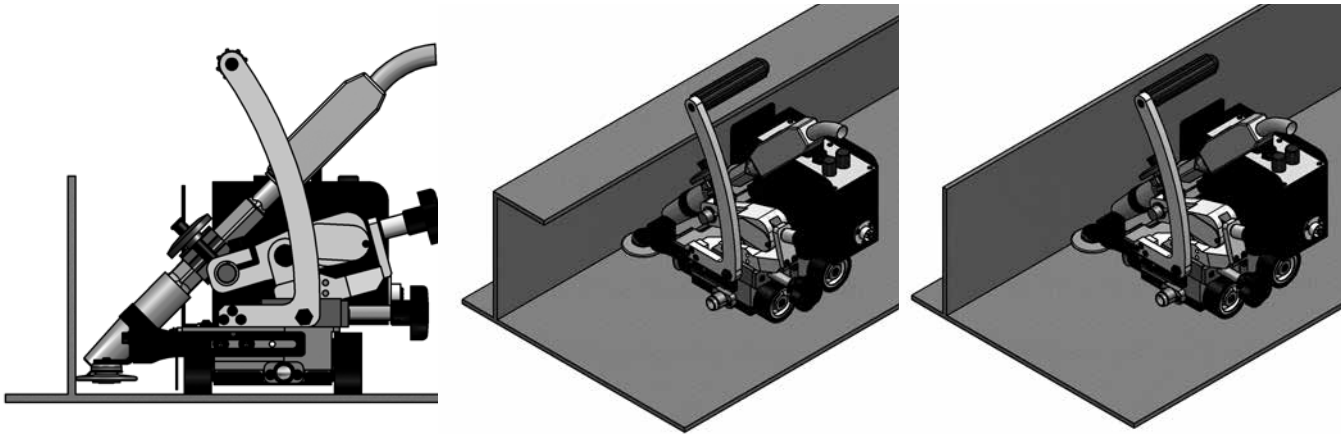
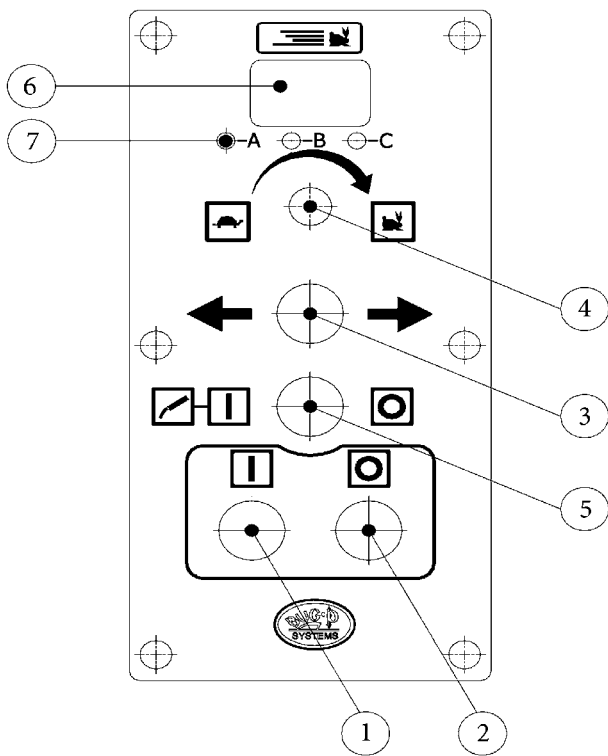


ILLUSTRATION OF TYPICAL APPLICATIONS



USER INTERFACE



1. **Cycle Start Button** - Push button to initiate weld cycle. Weld contact will close, according to time settings, if the Weld Switch is set to Auto, the carriage will travel in the direction selected by the Travel Direction Switch.
2. **Cycle Stop Button** - Push button to stop welding cycle.
3. **Travel Direction Switch** - Set switch to determine direction of carriage travel.
4. **Speed Adjustment Dial** - Rotate knob to adjust carriage travel speed. Turning clockwise (right) will INCREASE speed.
NOTE: Travel Speed Adjustment Knob is also used for setting the INTERMITTENT WELDING function (pg.7) and the time settings.
5. **Weld Auto / Off Contactor** - When switched to AUTO, weld contact will close with cycle start. Switched to the right, weld contact will remain open upon cycle start.
6. **Digital Speed Display** - Numerically displays real-time travel speed in in/min. (cm/min). Also displays parameters during setup of intermittent function and time settings
7. **Indicator LED's** - Indicate active parameter during intermittent welding.
 - A. Weld Length
 - B. Non-Weld Length
 - C. Total Length

WELDING MODES

The K-BUG 1200 offers three weld modes - Continuous, Total Length Intermittent and User Defined Intermittent. The value shown in the speed display will vary based on what welding mode the machine is operating in. Speed is displayed *only* during Continuous welding.

1. Continuous Welding
 - No LED's lit when Cycle Start button is pressed
 - Displays speed while welding (0.1 in/min)
2. User Defined Intermittent Welding
 - A or B LED lit when Cycle Start button is pressed
 - User sets Welding Speed before pressing Cycle Start button
 - Display will countdown each program parameter in order
 - With A LED lit, the display will countdown Puddle Build-up timer, u, then Weld On distance, A, then Crater Fill timer, n.
 - With B LED lit, the display will countdown Weld Off distance, B
 - **NOTE:** Machine travels at higher speed during Non-Welding travel
 - The intermittent cycle will repeat until the user presses Cycle Stop button or the Stop Sensor is tripped
3. Total Length Intermittent Welding
 - C LED lit when Cycle Start button is pressed
 - User sets Welding Speed before pressing Cycle Start button
 - Display will countdown total distance remaining (1.0)
 - A or B LED will light as appropriate for welding mode
 - **NOTE:** Machine travels at higher speed during Non-Welding travel
 - The intermittent cycle will continue until the Total Length is satisfied or the Stop Sensor is tripped

INTERMITTENT WELDING

The Travel Speed Adjustment Knob is used for entering the parameters for intermittent or stitch welding. Follow the steps below to enter the welding parameters.

1. Press the Travel Speed Adjustment Knob. The A LED will illuminate.
2. Turn the Travel Speed Adjustment Knob (clockwise + / counterclockwise -) to set the WELD LENGTH. The length adjusts.*
3. Press the Travel Speed Adjustment Knob again. The B LED will illuminate.
4. Turn the Travel Speed Adjustment Knob to set the NON-WELD LENGTH. The length adjusts.*
5. Press the Travel Speed Adjustment Knob again. The C LED will illuminate.
6. Turn the Travel Speed Adjustment Knob to set the TOTAL LENGTH. The length adjusts.*
7. Press the travel Speed Adjustment Knob again. All LEDs are unlit.

*Note: measurement is in inches or cm. according to your unit setting - refer to Converting Units on p.9.

Intermittent Welding is available in two forms - User Defined and Total Length. With User Defined welding, user enters values for Weld Length and Non-Weld Length. Either A or B LED must be lit when pressing Cycle Start Button. Intermittent Weld continues until user presses Cycle Stop Button.

For Total Length welding, user enters values for all three stitch parameters. C LED must be lit when pressing Cycle Start Button. Intermittent welding ends when Total Length has been met.

CONTINUOUS WELDING (INTERMITTENT WELDING LOCK-OUT)

To lock out the intermittent (stitch) welding controls, press and hold the Travel Speed Adjustment knob for three (3) seconds. All of the LEDs will flash. To unlock the intermittent welding controls, press and hold the Travel Speed Adjustment Knob for three (3) seconds. While in lockout, the machine will be unable to perform intermittent welding.

TIME SETTINGS

The K-BUG 1200 offers three adjustable time settings - Puddle Build-Up, Pause Time and Crater Fill. The Travel Speed Adjustment knob is used for setting each of the timers, as described below.

Puddle Build-up Time (u)

1. While pressing the Cycle Start button, connect the power cord to an appropriate power supply.
2. The Display will show "u0.0" flashing.
3. Turn the Travel Speed Adjustment knob until the desired build-up time is displayed.
4. Default setting is 1.0 seconds. Available range is 0.0 - 9.9 seconds.

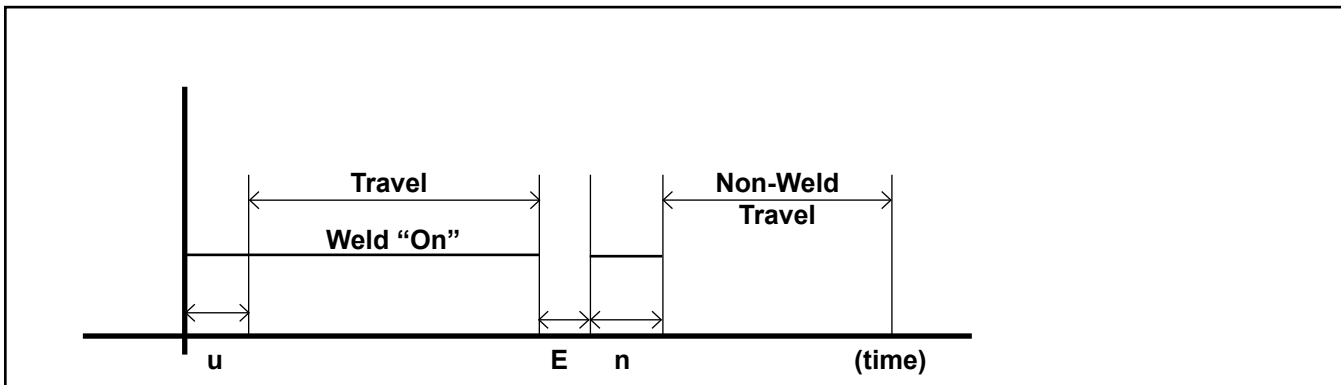
Crater Fill Time (n)

1. Press Cycle Start button once more.
2. The Display will show "n0.0" flashing.
3. Turn the Travel Speed Adjustment knob until the desired crater fill time is displayed.
4. Default setting is 1.0 seconds. Available range is 0.0 - 9.9 seconds.

Pause Time (E). After welding, a brief rest before Crater Fill.

1. Press the Cycle Start button once more.
2. The Display will show "E0.0" flashing.
3. Turn the Travel Speed Adjustment knob until the desired stop time is displayed.
4. Default setting is 0.5 seconds. Available range is 0.0 - 9.9 seconds.

When finished setting times, press the Cycle Stop button to exit time setup mode. The machine is now ready to be setup for welding.



A graphic display of the user adjustable time settings.

STOP SENSOR OPERATION

The K-BUG 1200 is equipped with two (2) Stop Sensors. One sensor is placed on the right side of the carriage, the other is placed on the left. The Stop Sensors are normally open switches that engage or close when depressed. If a sensor is tripped during welding, carriage travel will immediately stop and Crater Fill will be performed. Remove the obstacle to reset the Stop Sensor. Press Cycle Start button to begin weld cycle again. **NOTE:** If Stop Sensor is tripped during intermittent welding, program will reset, NOT resume.

GLOBAL PARAMETERS

A menu of Global Parameters is maintained in the K-BUG 1200. The menu consists of six (6) items as described in Table 1, below. Access to the menu is locked when DIP Switch #1 is in the OFF Position.

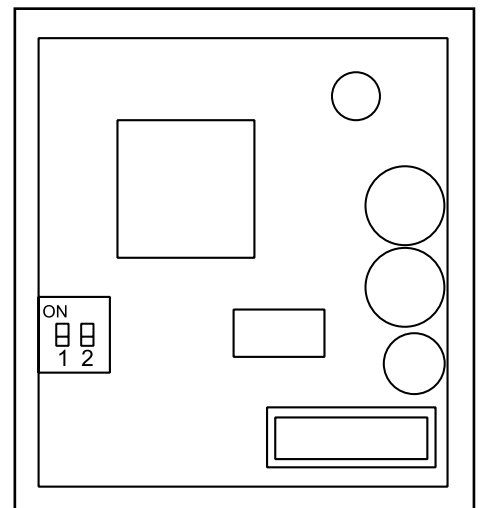
Table 1: Global Parameters

Display	Description	Default	Range	Units
n.0*	Travel Speed Coefficient	20.0	0.1 - 50	
n.1	Motor Overload Stop Time	2	0.0 - 9.9	sec
n.2*	Travel Motor Reduce Ratio	80	20 - 200	base fig x 10 : 1
n.3*	Diameter of Travel Wheel	50	0.0 - 99.9	mm
n.4	Show Mode	off	off / on	
n.5	Operating Units	U2	U1 / U2	U1 (cm/min), U2 (in/min)

* Indicates parameters NOT to be changed by the User. Changing these parameters can harm machine performance.

ACCESS THE GLOBAL PARAMETER MENU

1. With machine unplugged from A/C power supply, remove the six (6) screws securing the Control Interface (Legend Plate and Main PCB) to the Control Panel.
2. Remove the Control Interface and turn it over.
3. Locate DIP Switch 1 and 2 on the Main PCB, see illustration at right.
4. Turn DIP Switch 1 to the "ON" position.
5. Turn over Control Interface. And secure to Control panel.
6. Plug in machine to A/C power supply of appropriate voltage.
7. "0" should be shown in the Display.
8. Press and release Cycle Start button to cycle through the six parameters (0, 1, 2, 3, 4, 5).
9. Use the Travel Speed Adjustment knob to change the parameter setting.
10. When finished, unplug machine, remove Control Interface and turn it over.
11. Turn DIP switch 1 to the "OFF" position to lock global parameter menu.
12. Re-assemble Control Panel and plug in machine to begin operation.



Rear of Main PCB. Note DIP switch placement on left hand side. Move Switch 1 up to the ON position.

CONVERTING UNITS

By default, the K-BUG 1200 will be factory set to operate in English units (in/min) and the K-BUG 1202 will be set to operate in Metric units (cm/min). If it is necessary to change units, follow the steps to access the Global Parameters Menu, above. Use the Cycle Start button until "5" is shown on the Display. Turn the Travel Speed Adjustment knob right or left to select the desired Units. Choose "U1" for Metric (cm/min) or "U2" for English (in/min).

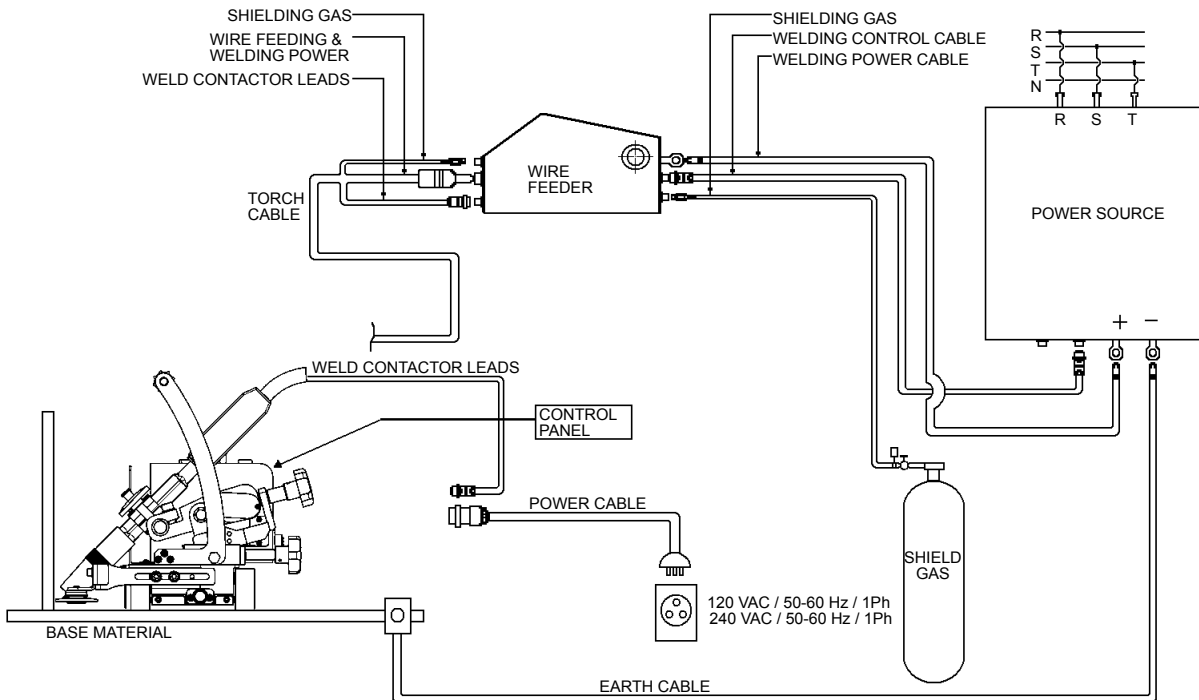
INSTALLATION AND OPERATION

1. Welding Preparation - Secure the necessary welding supplies
 - Welding Power Source (3 phase, 440/380/220V AC)
 - Wire Feeder
 - Tank of appropriate shielding gas, with pressure and flow regulators and appropriate fittings
 - Torch for gas shielded automated welding
 - Basic Weld Prep Tools
2. Cable Connections
 - Connect welding torch conduit cable to wire feeder
 - Connect Weld Contactor lead from Torch to Main Cable Connector on machine body
 - Connect Control Cable to the Control Box Connector on the machine body
 - Connect Control Power Source Cable to the Welding Power Source

CAUTION: Carefully route power cable as it may become entangled during operation, resulting in damage to people or equipment.

3. Welding Process
 - Switch ON the Primary Side Distribution Board of the Welding Power Source
 - Switch ON the Control Power Source on the front panel of the Welding Power Source
 - Equip the Wire Feeder with wire
 - Set the Carriage so the torch is at the weld starting point
 - Install the Guide Arms offset in the direction of travel (leading arm slightly shorter than following arm) for better positioning of the electrode in the joint
 - Adjust the target angle and position of the Torch using the Torch Adjustment Slider
 - Verify machine is in the proper welding mode. Set stitch welding parameters, if needed
 - Verify adequate Shielding Gas Supply
 - Start Welding - Switch Welding Switch to AUTO, verify desired travel direction is set and travel speed is > 0 and press Cycle Start button
 - Press Cycle Stop button when welding is complete. Turn Welding Switch to OFF
 - Confirm Welding End

CABLE INTERCONNECT DIAGRAM



MAINTENANCE

The K-BUG carriage should be periodically checked and cleaned to maximize service life.

Before use:

Check all screws in the torch clamp and guide rollers. Tighten as needed. Loose fasteners may cause uneven travel or inconsistent weld quality.

During use:

Monitor wheels, motor and welding torch for abnormal noise or overheating.

After each use:

1. Clean control panel to remove dust and other debris.
2. Inspect carriage base, wheels, guide rollers, slide adjustment, magnets and torch for weld spatter or other debris. Clean as needed.
3. Inspect power cable and torch cable for cracked, cut or damaged insulation. Replace as needed.
4. Inspect connectors for damaged pins or loose connections. Replace as needed.

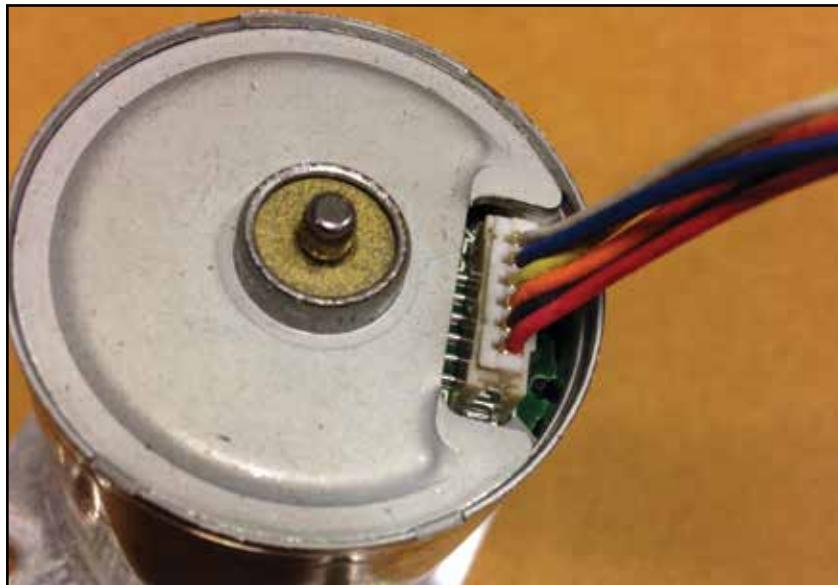
TROUBLESHOOTING

Symptom	Cause	Repair
Control panel Display is not LIT when machine is plugged in	Disconnected Control Cable	Verify control cable is properly connected to machine
	Faulty Control Cable	Replace Cable
	Control Box Fuse Tripped or Disconnected	Replace fuse. If problem persists, contact service rep.
No Arc when Welding Auto/Off Switch turned to AUTO	Weld Auto/Off Switch set to OFF	Turn Weld Auto/Off Switch to AUTO
	Loose contact of Welding Leads	Check ground connections. Verify good contact on clean, unpainted surface.
	Faulty or incorrectly wired Welding Auto/Off Switch	Check Wiring. Replace Switch, if needed
	Stop Sensor Engaged	Disengage Stop Sensor
Carriage does not travel when Cycle Start Button is pushed	Failed drive component	Check Motor and Gearbox. Replace as needed
	Faulty or incorrectly wired Cycle Start Button	Check Wiring. Replace button , if needed
	Faulty MAIN PCB	Replace MAIN PCB
Torch targets wrong position	Loose fastener on Torch Clamp or Torch Adjustment Slider	Check and tighten screws, replace if needed.
Slide is hard to adjust	Dust or other debris on slide parts	Clean slide parts. Lubricate with light oil
Carriage stops during automatic welding	Obstacle in carriage path	Remove obstacles
	Stop Sensor engaged	Disengage Stop Sensor
	Distance traveled exceeds Total Length	See "Intermittent Welding" on page 7 for instructions to set Total Length
Arc continues after Welding Auto/Off Switch is set to OFF	The Welding Auto/Off Switch is still set to Auto	Turn Weld Auto/Off Switch to OFF
	Faulty or incorrectly wired Welding Auto/Off Switch	Check Wiring. Replace Switch, if needed.
Unable to perform Intermittent Welding	Intermittent Welding is locked	Press and hold Travel Speed Adjustment knob for 3 seconds.

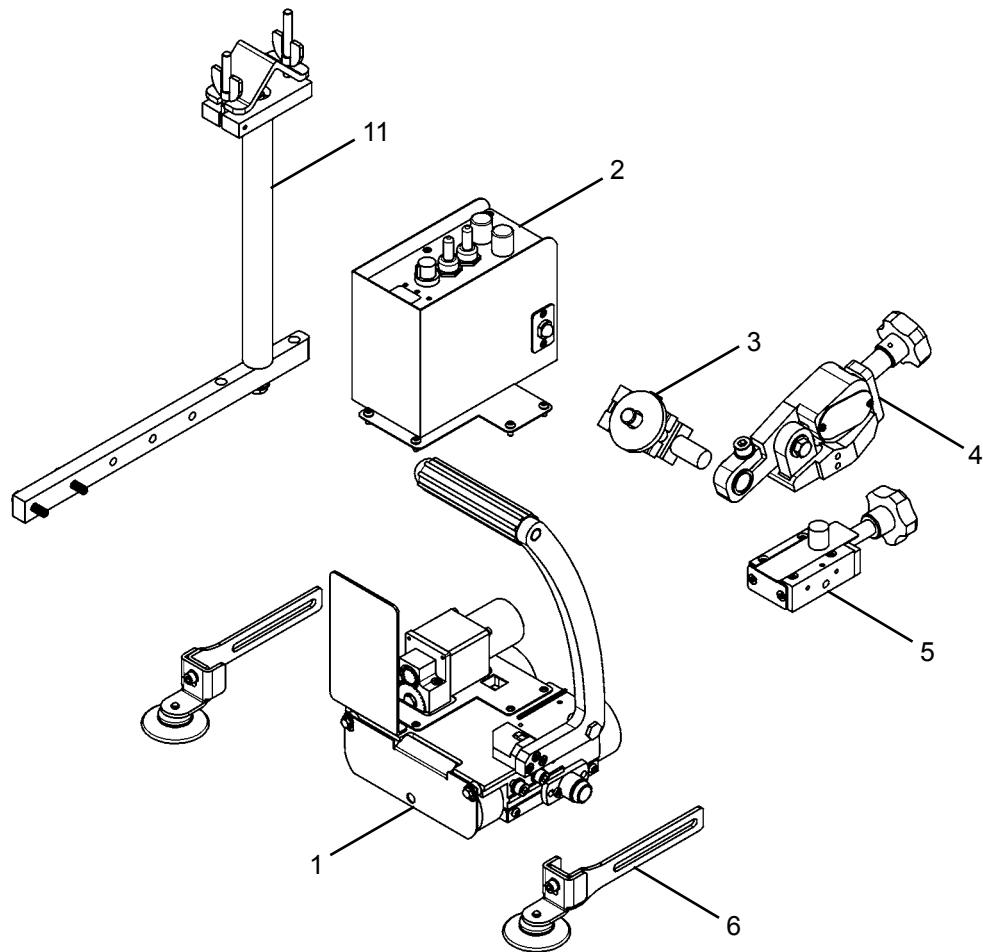
TROUBLESHOOTING, CONT'D.

K-BUG ERROR LIST

NO.	SYMPTOM	CAUSE	SOLUTION
E-03	Motion Stop	Main PCB EET ROM Error	Main PCB Replacement
E-05	Travelling Stop	Auto-Stop Travelling Motor may be overloaded / shorted	Push and release Stop Button IF UNRESOLVED: 1. Check for loose wiring connection at drive motor and weave motor if equipped (see below). 2. Replace motor or motor reducer 3. Replace main PCB



K-BUG 1200 ASSEMBLY VIEW

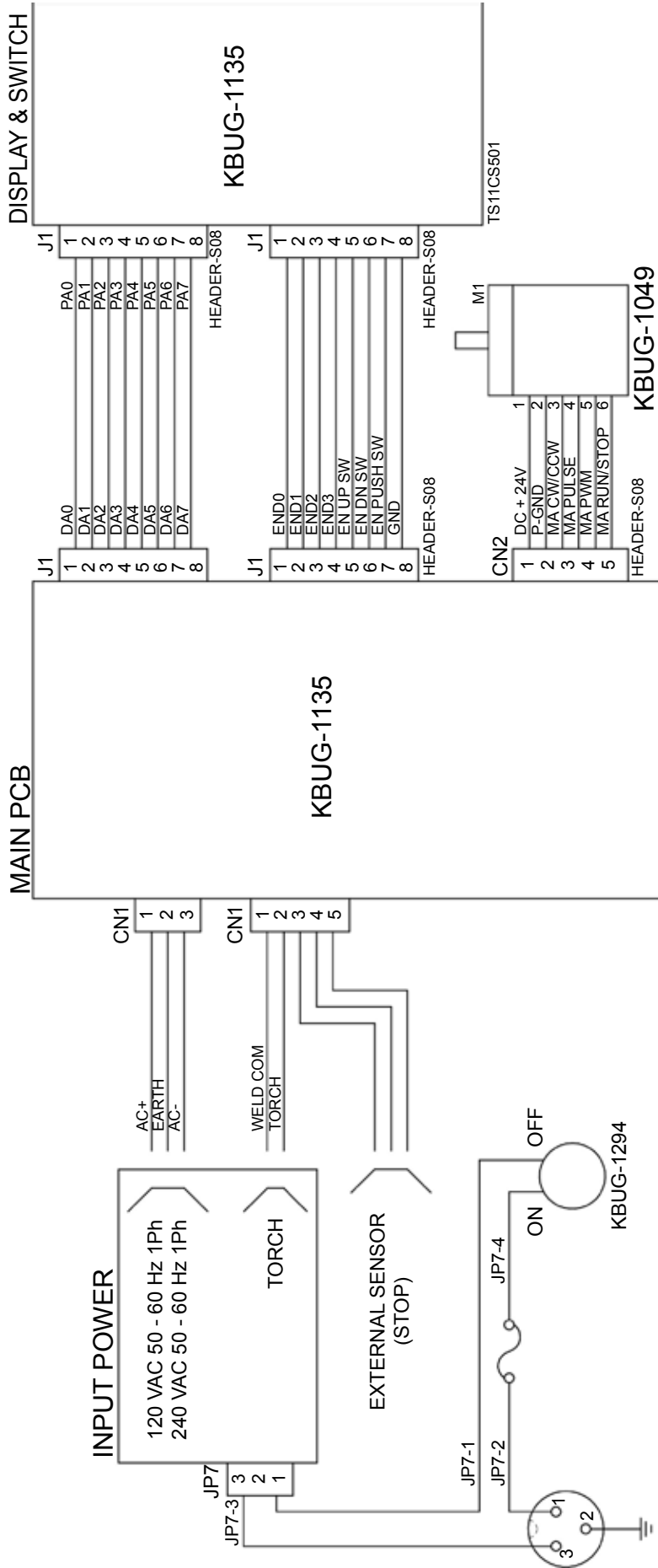


ITEM	QTY	PART NO.	DESCRIPTION
1	1	KBUG-1210	Carriage Assembly
2	1	KBUG-1120	Control Panel Assembly
3	1	KBUG-1100	Torch Clamp Assembly
4	1	KBUG-1230	Angle Slide Assembly
5	1	KBUG-1070	Y-Slide Assembly
6	2	KBUG-1060	Guide Arm Assembly
7	1	KBUG-1290	Cable Anchor Assembly
8*	1	KBUG-2274-XX	120 VAC Power Cord (KBUG-1200, only)
9*	1	KBUG-2273-XX	Weld Contact Cable
10*	1	KBUG-2272-XX	240 VAC Power Cord (KBUG-1202, only)
11*	1	KBUG-1003	Metric Hex Key Set

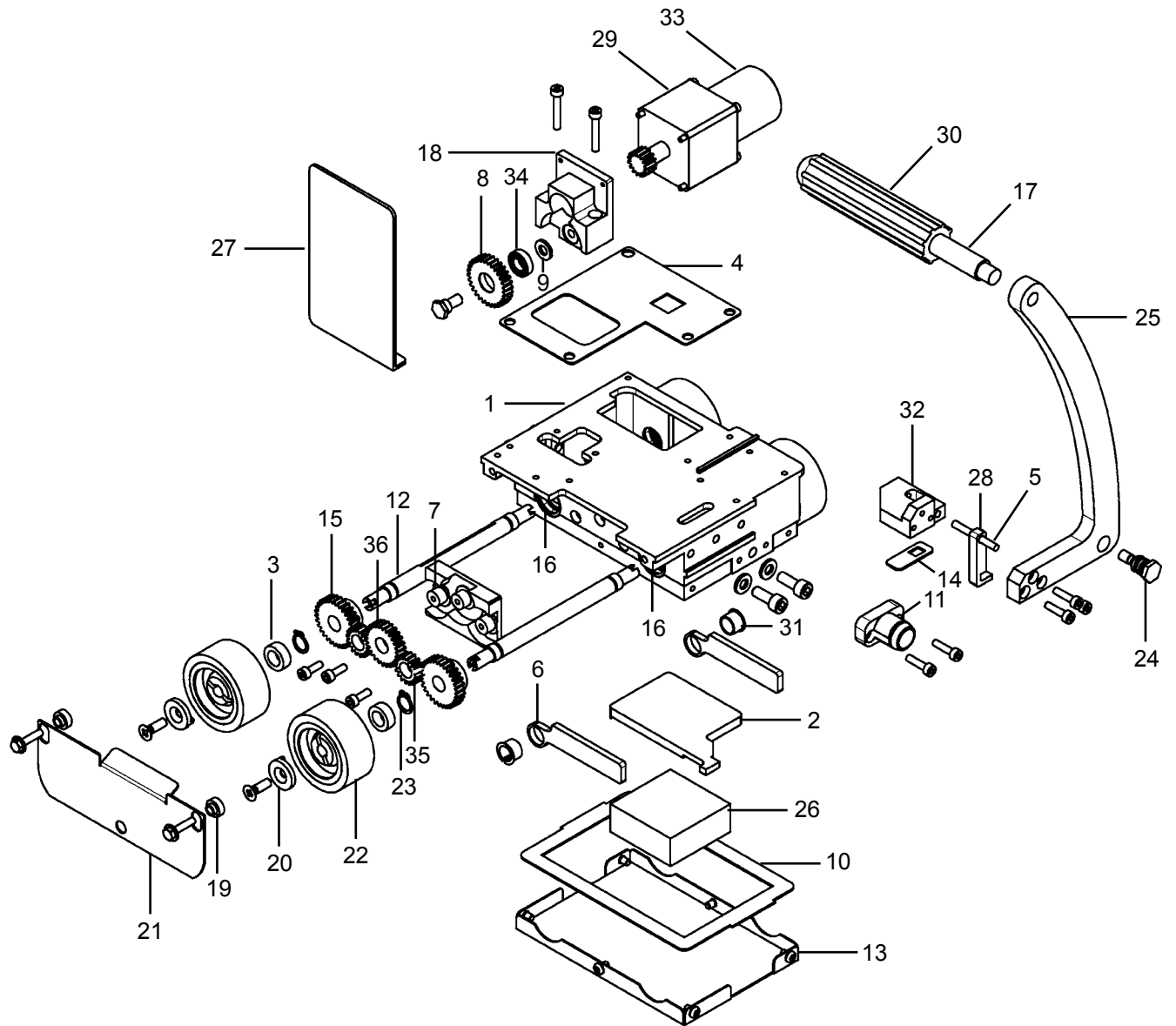
XX= Cable length: 15' is standard, 25' & 50' are optional

* = Not shown

K-BUG 1200 WIRING DIAGRAM



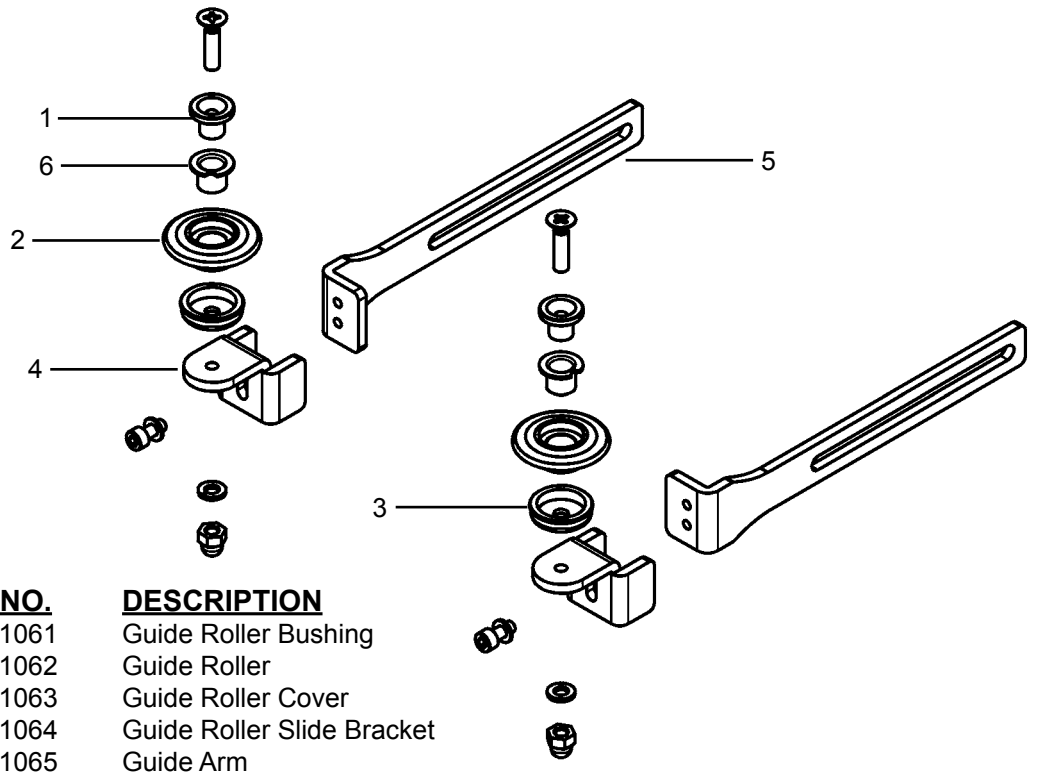
KBUG-1210 CARRIAGE ASSEMBLY / EXPLODED VIEW



KBUG-1210 CARRIAGE ASSEMBLY / PARTS LIST

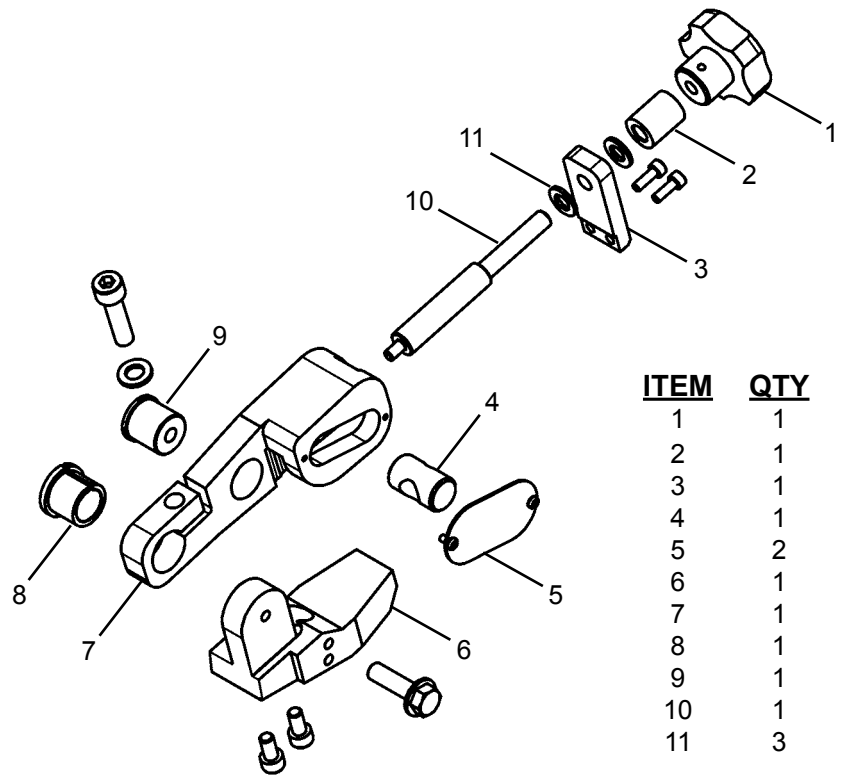
<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	KBUG-1216	Body
2	1	KBUG-1012	Magnet Plate
3	4	KBUG-1013	Shaft Bushing
4	1	KBUG-1222	Dust Cover -2
5	1	KBUG-1218	Lever Bracket Pin
6	2	KBUG-1224	Magnet Shaft Bracket
7	1	KBUG-1212	Gear Case
8	1	KBUG-1018	Center Gear
9	1	KBUG-1019	Gear Bushing
10	1	KBUG-1219	Dust Cover 1
11	2	KBUG-1185	Stop Sensor
12	2	KBUG-1023	Wheel Shaft
13	1	KBUG-1024	Bottom Cover
14	1	KBUG-1221	Dust Cover 4
15	2	KBUG-1223	Shaft Gear
16	4	KBUG-1029	Shaft Bearing
17	1	KBUG-1031	Grip
18	2	KBUG-1211	Motor Bk.
19	2	KBUG-1033	Spatter Cover Bushing
20	4	KBUG-1034	Wheel Cover
21	1	KBUG-1035	Spatter Cover
22	4	KBUG-1036	Wheel
23	4	KBUG-1037	Shaft Snap Ring
24	1	KBUG-1038	Lever Bolt
25	1	KBUG-1041	Lever - 2
26	1	KBUG-1042	Magnet
27	1	KBUG-1043	Motor Cover - 1
28	1	KBUG-1217	Lever Guide Key
29	1	KBUG-1045	Gearhead
30	1	KBUG-1046	Handle Cover
31	2	KBUG-1047	DU Bushing (M)
32	1	KBUG-1214	Lever Bracket -D
33	1	KBUG-1049	DC Brushless Motor
34	1	KBUG-1051	Motor Bearing
35	2	KBUG-1213	Spur Gear -S
36	1	KBUG-1215	Spur Gear -C

KBUG-1060 GUIDE ARMS / EXPLODED VIEW / PARTS LIST



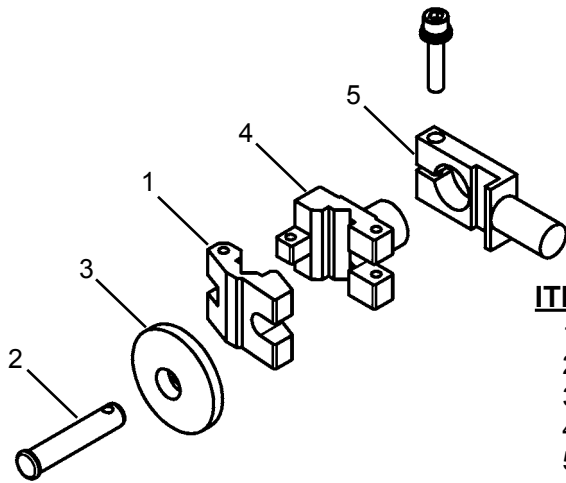
<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	2	KBUG-1061	Guide Roller Bushing
2	2	KBUG-1062	Guide Roller
3	2	KBUG-1063	Guide Roller Cover
4	2	KBUG-1064	Guide Roller Slide Bracket
5	2	KBUG-1065	Guide Arm

KBUG-1230 ANGLE SLIDE ASSEMBLY / EXPLODED VIEW / PARTS LIST



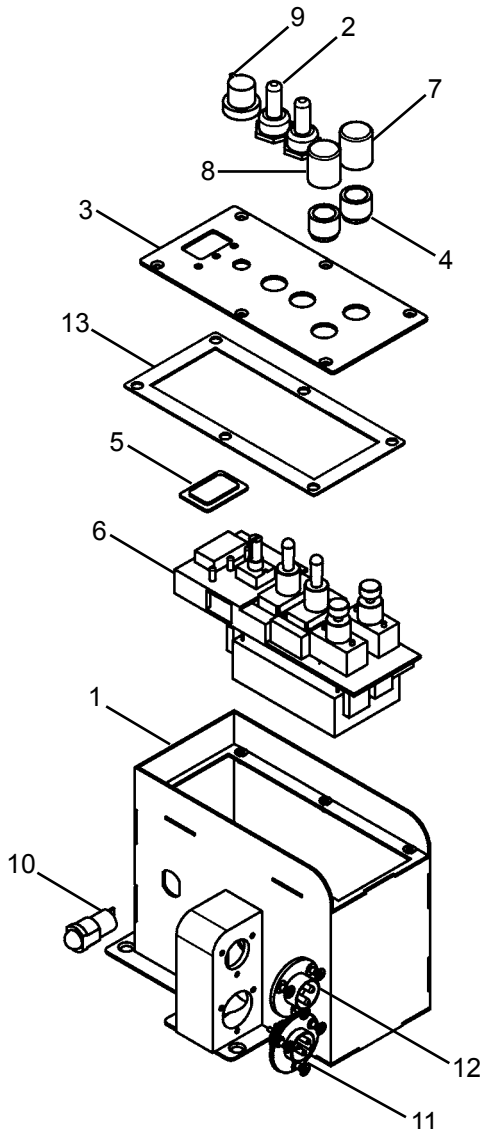
<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	KBUG-1134	Knob
2	1	KBUG-1238	Angle Slide Bolt Cover
3	1	KBUG-1233	Shaft Cover
4	1	KBUG-1235	Guide Shaft
5	2	KBUG-1236	Cover
6	1	KBUG-1231	Angle Base
7	1	KBUG-1232	Angle Body
8	1	KBUG-1237	Bushing
9	1	KBUG-1239	Angle Slide Bushing
10	1	KBUG-1234	Slide Bolt
11	3	KBUG-1241	Washer

KBUG-1100 TORCH CLAMP ASSEMBLY / EXPLODED VIEW / PARTS LIST



<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	KBUG-1111	Torch Clamp (U)
2	1	KBUG-1112	Clamp Fixed Bolt
3	1	KBUG-1113	Clamp Fixed Knob
4	1	KBUG-1114	Torch Clamp (D)
5	1	KBUG-1115	Torch Clamp Bracket

KBUG-1120 CONTROL PANEL ASSEMBLY / EXPLODED VIEW / PARTS LIST

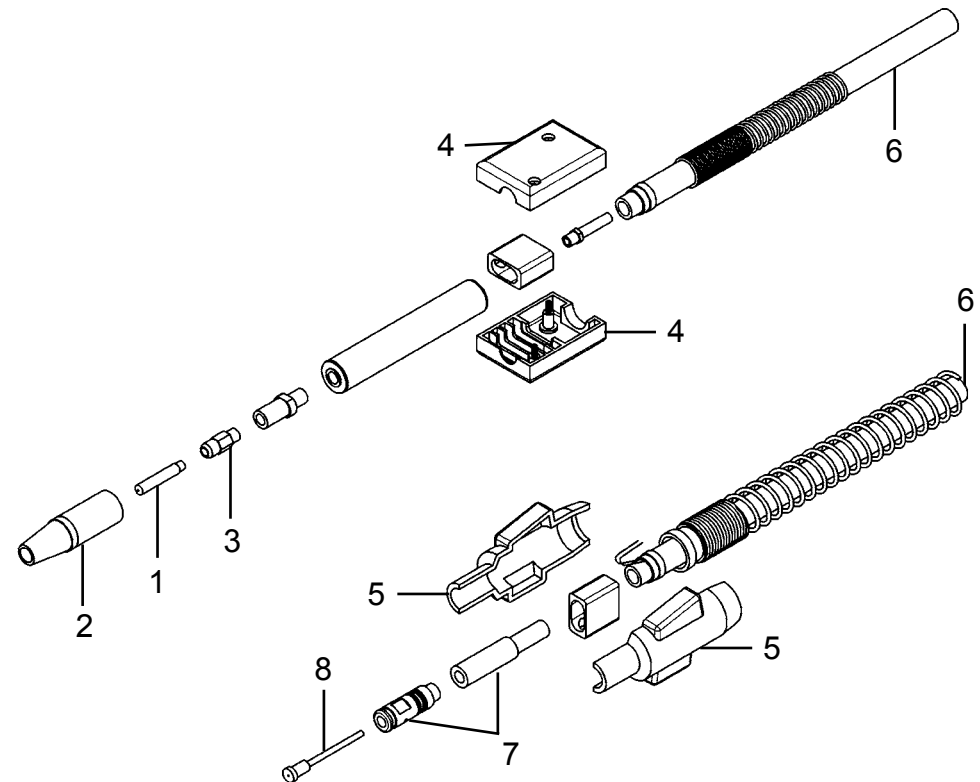


<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	KBUG-1121	Panel
2	2	KBUG-1122	Toggle Switch Cover
3	1	KBUG-1123	Legend Plate
4	2	KBUG-1124	Push Button Cover (BS)
5	1	KBUG-1125	Display Lens
6	1	KBUG-1126	Main PCB
7	1	KBUG-1127	Push Button Cover - 2
8	1	KBUG-1128	Push Button Cover - 1
9	1	KBUG-1129	Volume Knob
10	1	KBUG-1131	Fuse Holder w/ Fuse
11	1	KBUG-1132	Power Connector (Female)
12	1	KBUG-1133	Torch Connector (Female)
13	1	KBUG-1225	Dust Cover
14*	1	KBUG-1173	Weld Contact Connector (Male)
15*	1	KBUG-1174	Power Connector (Male)

* Not Shown

SBG-450- - GUN & CABLE ASSEMBLY / EXPLODED VIEW / PARTS LIST

Whip Length: 15 (15 ft / 4.6 m) or 25 (25 ft / 7.6 m)
 Wire Size: 035, 040, 045, 052, 116, 564
 Connector Type: E (Euro), L (Lincoln 3/4"), M (Miller), T (Lincoln, small)



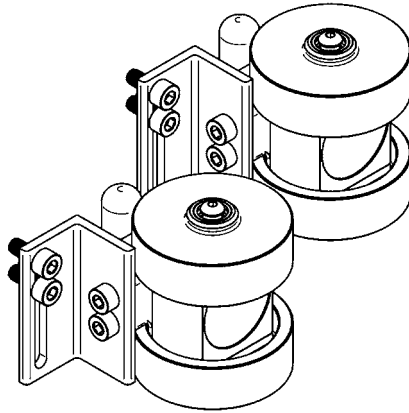
PARTS LIST				WIRE SIZE					
ITEM	QTY	PART NO.	DESCRIPTION	.035 (.9 mm)	.040 (1.0)	.045 (1.2)	.052 (1.4)	1/16 (1.6)	5/64 (2.0)
1	1	BUG-3159-35	16S-35 (.9 mm) Contact Tip	X					
1	1	BUG-3159-45	16S-45 (1.2 mm) Contact Tip			X			
1	1	BUG-3159-52	16S-52 (1.4 mm) Contact Tip				X		
1	1	BUG-3159-116	16S-116 (1.6 mm) Contact Tip					X	
1	1	BUG-3159-564	16S-564 (2.0 mm) Contact Tip						X
1	1	PWS-4436-1.0	16S-40 (1.0 mm) Contact Tip		X				
2	1	PWS-4447	27S62 H.D. Nozzle 5/8"	X	X	X	X	X	X
3	1	PWS-4449	PX57HD Gas Diffuser	X	X	X	X	X	X
4	1	CWO-8017	Case w/ Binder Screws (Front)	X	X	X	X	X	X
5	1	PWS-4411	Case w/ Binder Screws (Back)	X	X	X	X	X	X
6	1	STW-3044	450 Amp Cable	X	X	X	X	X	X
7	1	R174-T	Connector, Small Lincoln						
7	1	R174-L	Connector, 3/4" Lincoln						
7	1	R174-M	Connector, Miller						
7	1	R174-X	Connector, Euro						
8	1	CWO-8009	44-3545-15 Cable Liner	X	X	X			
8	1	CWO-8011	44-116-15 Cable Liner				X	X	
8	1	CWO-8012	44-564-15 Cable Liner						X
**	1	SBG-1004	Gas Hose Assembly	X	X	X	X	X	X
**	2	SBG-1005	Gas Hose Clamps	X	X	X	X	X	X

** Not shown. Required only with standard Lincoln guns (SBG-450-L).

ACCESSORIES

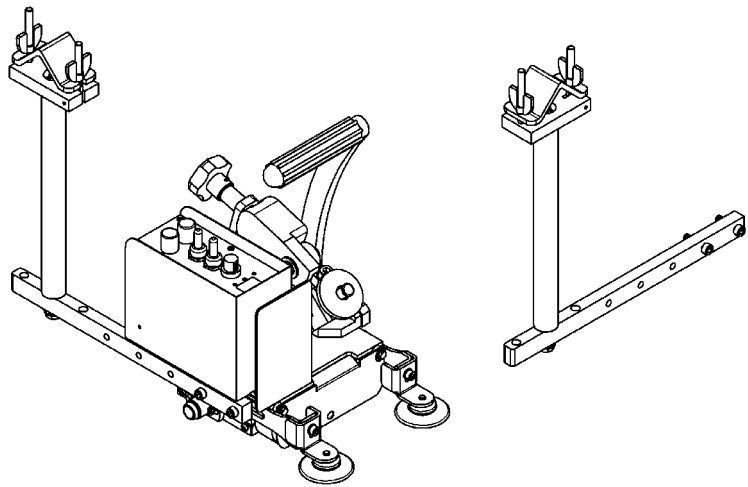
KBUG-1067 Magwheel Add-On Kit

Magnetic guide wheels available for curved or irregular seams.



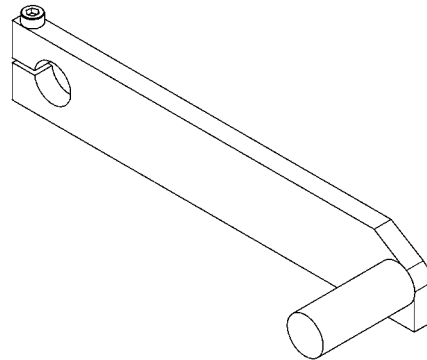
KBUG-1054 Cable Anchor

The cable anchor acts as a strain relief to keep the supply cable from dragging the torch out of position.



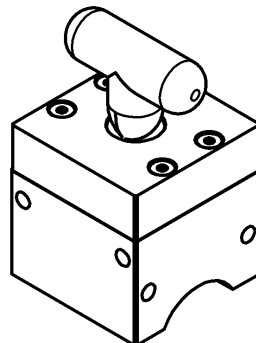
KBUG-1170 7" (178 mm) Long Arm Extension Kit

The long arm extension kit allows the user to relocate the welding torch away from the carriage body for welding special applications.



MSQ-150 30mm Magsquare

The Magsquare is used to activate the limit switch to stop machine travel and welding process.



WARRANTY

Limited 3-Year Warranty

MODEL _____
SERIAL NO. _____
DATE PURCHASED: _____
WHERE PURCHASED: _____

For a period ending one (1) year from the date of invoice, Manufacturer warrants that any new machine or part is free from defects in materials and workmanship and Manufacturer agrees to repair or replace at its option, any defective part or machine. HOWEVER, if the invoiced customer registers the Product Warranty by returning the Warranty Registration Card supplied with the product within 90 days of the invoice date, or by registering on-line at www.bugo.com, Manufacturer will extend the warranty period an additional two (2) years which will provide three (3) total years from the date of original invoice to customer. This warranty does not apply to machines which, after Manufacture's inspection are determined by Manufacturer to have been damaged due to neglect, abuse, overloading, accident or improper usage. All shipping and handling charges will be paid by the customer.

The foregoing express warranty is exclusive and Manufacturer makes no representation or warranty (either express or implied) other than as set forth expressly in the preceding sentence. Specifically, Manufacturer makes no express or implied warranty of merchantability or fitness for any particular purpose with respect to any goods. Manufacturer shall not be subject to any other obligations or liabilities whatsoever with respect to machines or parts furnished by Manufacturer.

Manufacturer shall not in any event be liable to Distributor or any customer for any loss of profits, incidental or consequential damages or special damages of any kind. Distributor's or customer's sole and exclusive remedy against Manufacturer for any breach of warranty, negligence, strict liability or any other claim relating to goods delivered pursuant hereto shall be for repair or replacement (at Manufacturer's option) of the machines or parts affected by such breach.

Distributor's Warranty:

In no event shall Manufacturer be liable to Distributor or to any customer thereof for any warranties, representations or promises, express or implied, extended by Distributor without the advance written consent of Manufacturer, including but not limited to any and all warranties of merchantability or fitness for a particular purpose and all warranties, representations or promises which exceed or are different from the express limited warranty set forth above. Distributor agrees to indemnify and hold Manufacturer harmless from any claim by a customer based upon any express or implied warranty by Distributor which exceeds or differs from Manufacturer's express limited warranty set forth above.

HOW TO OBTAIN SERVICE:

IF YOU THINK THIS MACHINE IS NOT OPERATING PROPERLY, RE-READ THE INSTRUCTION MANUAL CAREFULLY, THEN CALL YOUR AUTHORIZED BUG-O DEALER/DISTRIBUTOR. IF THEY CANNOT GIVE YOU THE NECESSARY SERVICE, WRITE OR PHONE US TO TELL US EXACTLY WHAT DIFFICULTY YOU HAVE EXPERIENCED. BE SURE TO MENTION THE MODEL AND SERIAL NUMBERS.