

OPERATOR'S MANUAL

Rail Bull WELDING AND CUTTING CARRIAGE



ul. Elewatorska 23/1, 15-620 Białystok, Poland Phone: +48 85 678-34-00, Fax: +48 85 651-15-31 <u>www.promotech.eu</u> e-mail: <u>office@promotech.eu</u>

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1. GENERAL INFORMATION

1.1. Application

The Rail Bull welding and cutting carriage is a track carriage designed to produce butt and fillet welds by using MIG/MAG torches with the handle diameter of 16–22 mm (0.63–0.87"), and can cut steel by using oxy-fuel or plasma torches. The carriage can work in the following welding positions: PA/1F/1G, PB/2F, PC/2G, PD/4F, PE/4G, and PG/3F/3G. It travels on a track fixed by using dual magnetic units to ferromagnetic surfaces that are flat or curved with a radius of at least 5 m (16 ft).

Accessories allow, for instance, using a welding torch with the handle diameter larger than 22 mm (0.87") and guiding the carriage on a semi-flexible or rigid track. Using a vacuum track fixing system allows the track to be fixed to surfaces that are non-ferromagnetic.

1.2. Technical data

Voltage	1~ 115–230 V, 50–60 Hz	
Power	100 W	
Welding position (according to EN ISO 6947 and AWS/ASME)	horizontal	PA / 1F / 1G PB / 2F PC / 2G PD / 4F PE / 4G
	vertical	PG / 3F / 3G (contact your dealer)
Minimum curvature radius of a ser	5 m (16 ft)	
Torch type	MIG/MAG oxy-fuel/plasma cutting torch	
Torch diameter	16–22 mm (0.63–0.87")	
Minimum workpiece thickness	5 mm (0.2'')	
Horizontal pulling force	350 N	
Vertical pulling force	150 N	
Horizontal speed	0–120 cm/min (0–47.2 in/min)	
Vertical speed	0–110 cm/min (0–43.3 in/min)	
Geared rack stroke	0–190 mm (0–7.5")	
Maximum permitted ambient temp	50°C (122°F)	
Maximum permitted ambient humi	85%	
Weight	18 kg (40 lbs)	



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1.3. Design

The Rail Bull carriage consists of a chassis, a drive system, a controller, a 540 mm (21") geared rack, a cable anchor, a slide, a 300 mm (12") vertical geared rack, and a torch holder. A cam mechanism enables the carriage to be installed on a track, onto which dual magnetic units may be attached to allow the track to be fixed to the surface.

The drive system incorporates a gear-motor that drives a gear wheel cooperating with the gear rack of the track. The position of the 540 mm geared rack is adjusted by using the knob, and the slide with the vertical geared rack enables the adjustment of the vertical position of the torch holder. Additionally, connecting the arc ignition cable will enable the carriage to ignite an arc when selecting a travel direction.



Fig. 1. View of the Rail Bull

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Fig. 2. View of the control panel

1.4. Equipment included

The Rail Bull is supplied including the following elements.

Carriage	1 unit
Metal box	1 unit
540 mm (21") geared rack	1 unit
Slide	1 unit
300 mm (12") geared rack	1 unit
Short rod torch holder with clamp	1 unit
Clamping block	1 unit
Cable anchor	1 unit
3 m (10 ft) power cord	1 unit
6.5 m (21 ft) arc ignition cable	1 unit
Gas manifold bracket	1 unit
3 mm hex wrench	1 unit
4 mm hex wrench	1 unit
Operator's Manual	1 unit

2. SAFETY PRECAUTIONS

- 1. Before beginning, read this Operator's Manual and complete proper occupational safety and health training.
- 2. Use the carriage only in applications specified in this Operator's Manual.
- 3. The carriage must be complete and all parts must be genuine and fully operational.
- 4. The specifications of the power source must conform to those specified on the rating plate.
- 5. Connect the carriage into a properly grounded power source.
- 6. Never carry the carriage by the cords or arc ignition cable and never pull them as this may damage them and result in electric shock.
- 7. Untrained bystanders must not be present near the carriage.
- 8. Before beginning, make sure that the correct is the condition of the carriage, power source, cords, arc ignition cable, plugs, control panel, guiding rollers, and gear wheel.
- 9. Keep the carriage dry. Exposure to rain, snow, or frost is prohibited.
- 10. Keep the work area well lit, clean, and free of obstacles.
- 11. Never use near flammable liquids or gases, or in explosive environments.
- 12. Transport and position the carriage by using the carrying handles.
- 13. Install the carriage only on the supplied track.
- 14. Make sure that the gear wheel and guiding rollers are clean and not damaged.
- 15. Plug the cords and arc ignition cable into sockets only when the power switch is set to the position 'O'.
- 16. Keep the sockets clean. Do not use compressed air for cleaning.
- 17. Install only MIG/MAG welding torches or oxy-fuel/plasma cutting torches with the handle diameter corresponding to the torch holder in use.
- 18. Suspend cables to reduce the load of the carriage.
- 19. Do not bend the semi-flexible track to a radius less than 5 m (16 ft).
- 20. Use the rigid track only on flat surfaces.
- 21. When operating at heights, protect the carriage and the track from falling. To do this, fasten the track to a fixed structure with chains attached to the leftmost and rightmost dual magnetic units. Protect the carriage by attaching a chain to a carrying handle. The chains must not be loose.
- 22. Do not stay below the carriage or the track placed at heights.

- 23. Always use eye protection (helmet, shield, and screen), hearing protection, gloves, and protective clothing during operation. Do not wear loose clothing.
- 24. Before every use, inspect the carriage to ensure it is not damaged. Check whether any part is cracked or improperly fitted. Make sure to maintain proper conditions that may affect the operation of the carriage.
- 25. Never try to manually stop the motion of the carriage. To stop, set the travel direction switch to the position 'O'.
- 26. Maintain only when the carriage is unplugged from the power source.
- 27. Repair only in a service center appointed by the seller.
- 28. If the carriage falls from any height, is wet, or has any other damage that could affect the technical state of the carriage, stop the operation and immediately send the carriage to the service center for inspection and repair.
- 29. Never leave the carriage unattended during operation.
- 30. Remove from the worksite and store in a secure and dry location when not in use.

3. STARTUP AND OPERATION

3.1. Assembling the track

Connect dual magnetic units to the rail, and position it on the workpiece. Use the 4 mm hex wrench to attach additional rails (*1*, Fig. 3), and then switch the levers of the magnetic units to the position 'I', which will clamp the track to the surface.

When working in PC/2G welding position, place the track so that the teeth of the gear racks are directed downward.



Fig. 3. Interconnecting the rails and clamping the magnetic units to the surface Before attaching additional rails to a semi-flexible rail placed on a curvature, use the 4 mm hex wrench to loosen the screws of the connecting plates (1, Fig. 4) and of the gear racks (2). Next, attach the rails, clamp them with levers, and then tighten the connecting plates. Place the gear rack adjustment tool (not included) into the hole (3), rotate the tool to the left (4) to remove the gap (5) between the gear racks, and then tighten the leftmost screw and the rightmost screw of each gear rack (2).



Fig. 4. Removing the gap between the gear racks of a semi-flexible track

3.2. Assembling the holder

Assemble the vertical geared rack with the slide as shown in Fig. 5 and attach the slide to the 540 mm geared rack. Then, assemble the torch holder with the clamping block and attach the block to the vertical geared rack. Secure with levers. The slide, clamping block, and torch holder can be assembled in many ways to form different configurations.



Fig. 5. Sample methods of assembling the vertical geared rack with the torch holder

3.3. Positioning

Set the power switch, arc ignition switch, and travel direction switch to the position 'O'. Next, with the pressing lever in the position OFF (1, Fig. 6) loosen the drive clutch knob fully (2), and then set the carriage onto the track (3) so that the back rollers are placed in the groove (4).



Fig. 6. Positioning the carriage on the track

Set the pressing lever to the position ON (5) to press the front rollers to the track. Slide the carriage to the required position (6), and fully tighten the drive clutch knob (7) to engage the gear wheel of the carriage with the gear rack of the track. Then, loosen the knob by 1/4 rotation.

When operating at heights, protect the carriage and the track from falling. To do this, fasten the track to a fixed structure with chains attached to the leftmost and rightmost dual magnetic units. Protect the carriage by attaching a chain to a carrying handle. The chains (not included) must not be loose.

Plug the power cord into the power source, and then insert the torch into the torch holder and secure with the knob. Next, insert the torch cable into the cable anchor, secure with knobs, and then fix the anchor in the required position with levers.

3.4. Connecting to the welding or plasma cutting circuits

The carriage can control two torches by using the arc ignition cable plugged into the arc ignition socket. To do this, connect any blue-jacketed wire to any terminal of the welding / plasma cutting circuit, and then connect the second blue-jacketed wire to the second terminal of the same circuit, according to the diagram shown in Fig. 7. To control the second torch, connect the green-jacketed wires to the terminals of the second circuit.



Fig. 7. Connecting the arc ignition cable to welding / plasma cutting circuits

To make sure that the arc ignition cable is connected correctly, turn on the power of the carriage, and set the arc ignition switch to the position TEST, which should enable the arc for a while.

3.5. Adapting for cutting

To adapt the carriage for oxy-fuel or plasma cutting, remove the welding torch holder, and install a rod for cutting and a cutting torch holder (Fig. 8).

For oxy-fuel cutting, use the 3 mm hex wrench to unscrew three screws fixing the cable anchor, and use the same screws in the same position to secure the bracket of the gas manifold. Then, use the 4 mm hex wrench to attach a gas manifold to the bracket with the M5x45 screw.



Plasma cutting

Fig. 8. Installing a cutting torch holder, gas manifold, and arc ignition cable

For plasma-cutting, use the arc ignition cable to connect the carriage to the cutting circuits as shown in Fig. 7.

3.6. Operating

Set the power switch to the position 'I', to turn on the carriage and start the initialization of the control system. If the message ERROR #1 appears on the display, set the travel direction switch to the position 'O'. Then, use the travel speed knob to set the required speed of the carriage.

If the carriage is to control the torch, set the arc ignition switch to the position 'l'.

If the arc ignition switch is set to the position 'I', the torch starts welding / plasma cutting immediately after selecting a travel direction.

Use the travel direction switch to select a direction of motion, which will start the movement of the carriage with the speed shown on the display. The speed can be adjusted at any time.

To stop the motion, set the travel direction switch to the position 'O'.

After the work is finished, turn off the power with the power switch and unplug the carriage from the power source.

3.7. Changing the unit of measure

To change the unit of measure from centimeters to inches, or vice versa, unplug the power cord from the power source and follow the steps shown in Fig. 9.



Fig. 9. Changing the unit of measure

With the jumper cap connecting the top and center pin, the measurement system will be metric after the carriage is restarted. With the jumper cap connecting the center and bottom pin, the system will be imperial.

The 2.5 mm hex wrench needed to unscrew the control panel is not included in standard equipment.

3.8. Troubleshooting

Problem		Cause	Solution
ERROR 4	#1	Travel direction switch not in the position 'O' when powering.	Set the travel direction switch to the position 'O'.
ERROR :	#2	Malfunction of the travel direction switch wire set or the controller.	Contact service center for inspection and repair.
ERROR :	#2	Power not supplied to the main motor.	Contact service center for inspection and repair.
ERROR :	#6	Malfunction of the main motor encoder or the controller.	Contact service center for inspection and repair.
ERROR :	#7	Malfunction of the encoder board.	Contact service center for inspection and repair.

4. MAINTENANCE

Daily:

- 1. Clean the gear wheel of the carriage chassis and the gear rack of each rail.
- 2. Clean the guiding rollers and make sure that they rotate freely.
- 3. Clean the torch nozzle. Replace if damaged.

Monthly:

- 1. Check whether the knob and the switches operate as intended. Replace if loose or damaged.
- 2. Inspect cables, cords, and hoses. Replace if damaged.
- 3. Tighten screws if loose.

5. ACCESSORIES

5.1. Semi-flexible track

Allows guiding the carriage along a curvature. The length of a single rail is 2 m (6.5 ft).



5.2. Rigid track

Allows guiding the carriage along a straight line. The length of a single rail is 2 m (6.5 ft).



5.3. Gear rack adjustment tool

Allows removing the clearance between the gear racks of two semi-flexible rails placed on a curvature.

Part number: PKT-0341-13-00-00-0



5.4. Dual magnetic unit

Allows clamping a semi-flexible track (by using a bracket) or rigid track to ferromagnetic surfaces. The holding force on a 5 mm (0.2") thick surface is 1200 N up to a temperature of 100°C (212°F). At 180°C (356°F) the force decreases to 720 N.



Attach the unit to a semi-flexible rail as shown in the left figure: use the 5 mm hex wrench to tighten the bracket to the unit with M6x20 screws and 6.4 mm washers, and then tighten the bracket to the rail with M6x16 screws and 6.4 mm washers.

Attach the unit to a rigid rail as shown in the right figure: use the 5 mm hex wrench to tighten the unit with M6x40 screws and 6.4 mm washers.



5.5. Narrow magnetic unit

Allows clamping a semi-flexible track (by using a bracket) or rigid track to ferromagnetic surfaces. The holding force on a 5 mm (0.2") thick surface is 750 N up to a temperature of 100°C (212°F). At 180°C (356°F) the force decreases to 450 N.



Part number (bracket): DYS-0582-10-00-00-0



Attach the unit to a semi-flexible rail as shown in the left figure: use the 5 mm hex wrench to tighten the bracket to the unit with M6x16 screws, and then tighten the bracket to the rail with M6x16 screws and 6.4 mm washers.

Attach the unit to a rigid rail as shown in the right figure: use the 5 mm hex wrench to tighten the unit with M6x40 screws and 6.4 mm washers.



5.6. Angle-adjustable dual magnetic unit

Allows clamping a semi-flexible track (by using a bracket) to ferromagnetic surfaces that are concave or convex, to pipes with outer diameters of at least 800 mm (31.5"), and on surfaces that differ in height up to 80 mm (3.1"). The holding force on a 5 mm (0.2") thick surface is 1200 N up to a temperature of 100°C (212°F). At 180°C (356°F) the force decreases to 720 N.

Install the unit in the same way as the dual magnetic unit is installed.



5.7. Spacing-adjustable dual magnetic unit

Allows clamping a semi-flexible track (by using a bracket) or rigid track to two ferromagnetic pipes with diameters of 25–230 mm (1–9") and the distance between pipe axes of 170–230 mm (6.7–9.1"). The holding force on a 5 mm (0.2") thick surface is 1200 N up to a temperature of 100°C (212°F). At 180°C (356°F) the force decreases to 720 N.

Install the unit in the same way as the dual magnetic unit is installed.



5.8. Semi-flexible track support

Allows supporting a semi-flexible track by using the support instead of a magnetic unit. To attach the support to a semi-flexible rail, use the 5 mm hex wrench, M6x16 screws, and 6.4 mm washers.



5.9. Geared rack

Changes the horizontal or vertical reach of the torch holder. To remove, loosen two levers securing the geared rack position and remove the standard geared rack in the direction shown in the figure. Install in reverse order. The teeth of the geared rack must be directed downward.



5.10. Transport attachment

Allows transporting the wire feeder.



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5.11. Cutting torch holder

5.11.1. Standard torch holder

Designed for torches with the handle diameter of 28–35 mm (1.10–1.38") and allows rough adjustment of the torch angle.



5.11.2. Precise torch holder

Designed for torches with the handle diameter of 28–35 mm (1.10–1.38") and enables precise adjustment of the torch angle. The knob can be installed at each side after loosening the set screw with the 2.5 mm hex wrench and is used to adjust the vertical position of the torch.

To adjust the resistance of the vertical motion, use the 2.5 mm hex wrench to unscrew all fixing screws and use the 2 mm hex wrench to adjust the adjusting screws.



5.11.3. Machine torch holder (fox oxy-fuel cutting)

Designed for torches with the handle diameter of 30 mm (1.18") or 35 mm (1.38") equipped with a rack. The holder allows adjustment of the vertical position of the torch by using the knob and rough adjustment of the angle.



5.11.4. Precise machine torch holder (for oxy-fuel cutting)

Designed for torches with the handle diameter of 30 mm (1.18") or 35 mm (1.38") equipped with a rack. The holder allows adjustment of the vertical position of the torch by using the knob and precise adjustment of the angle.



5.12. Rod (for cutting)

Allows using a cutting torch holder.



5.13. Gas manifold (for oxy-fuel cutting)

Provides safe gas delivery to 2- or 3-hose torches. Manifolds are available with or without gas cut-off valve in both metric and imperial versions.





5.14. Vacuum track fixing system

Dedicated to fixing the track to non-ferromagnetic surfaces.



5.15.16-22 mm torch clamp

Allows using a torch with the handle diameter of 16–22 mm (0.63–0.87").

O

Ø





The clip allows using a torch with the handle diameter of 16–22 mm (0.63–0.87"). Use the 4 mm hex wrench to tighten the torch in the clip.



5.17.22–35 mm torch clamp

Allows using a torch with the handle diameter of 22–35 mm (0.87–1.38").





5.18. Short rod

Provides a 120 mm (4.7") reach.



5.19. Long rod

Provides a 240 mm (9.4") reach.



5.20. Short rod torch holder with clamp

Allows using a torch with the handle diameter of 16–22 mm (0.63–0.87").



5.21. Short rod torch holder with clip

The holder allows using a torch with the handle diameter of 16–22 mm (0.63–0.87"). Use the 4 mm hex wrench to tighten the torch in the clip.



5.22. Short rod low torch holder with clip

The holder allows using a torch with the handle diameter of 16–22 mm (0.63–0.87"). Use the 4 mm hex wrench to tighten the torch in the clip.



5.23. Long rod torch holder with clamp

Allows using a torch with the handle diameter of 16-22 mm (0.63-0.87").



5.24. Long rod torch holder with clip

The holder allows using a torch with the handle diameter of 16–22 mm (0.63–0.87"). Use the 4 mm hex wrench to tighten the torch in the clip.

Part number: UCW-0466-22-00-00-0 0

6. WIRING DIAGRAM



7. DECLARATION OF CONFORMITY

EC Declaration of Conformity

We

PROMOTECH sp. z o.o. ul. Elewatorska 23/1 15-620 Białystok Poland

declare with full responsibility that:

Rail Bull Welding Carriage

is manufactured in accordance with the following standards:

- EN 50144-1
- EN 60974-10

and satisfies safety regulations of the guidelines: 2004/108/EC, 2006/95/EC, 2006/42/EC.

Białystok, 21 January 2013

Marek Siergiej CEO

8. QUALITY CERTIFICATE

Machine control card Rail Bull Welding Carriage

Serial number.....

Electric test

Type of test	Result	Name of tester
Test with sinusoidal voltage (voltage 1000 V, frequency 50 Hz)		Date
Resistance of the protective circuit	Ω	Signature

Quality control
Adjustments, inspections

Quality control

9. WARRANTY CARD

WARRANTY CARD No.....

..... in the name of Manufacturer warrants the Rail Bull Welding Carriage to be free of defects in material and workmanship under normal use for a period of 12 months from the date of sale.

This warranty does not cover guiding rollers as well as damage or wear that arise from misuse, accident, tempering or any other causes not related to defects in workmanship or material.

Date of production

Serial number

Date of sale

Signature of seller.....

1.05 / 12 September 2016

WE RESERVE THE RIGHT TO MAKE CHANGES IN THIS MANUAL WITHOUT NOTICE