

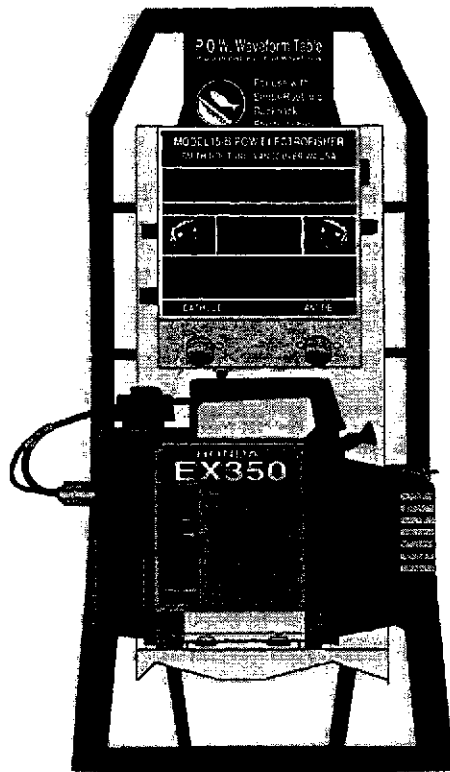
Model 15B POW Generator Backpack Electrofisher

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Model 15B Backpack Manual

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Model 15B POW generator powered backpack electrofisher

1. Introduction

The Model 15-B electrofisher is a generator powered, backpack mounted, high energy electrofisher. It is designed for use in low to medium conductivity waters.

The generator is the Honda model EX350, capable of delivering 300 watts continuously and 350 watts intermittently. The output is 120 VAC at 60 Hertz, and 12 VDC rated at 6 amps. The 12 volt output can be used to charge 12 volt batteries. The 120 volts can be used to power lights and hand tools, if they draw less than 300 watts total. The generator is mounted so that the exhaust is directed away from the operator.

The electrofisher transforms the generator's output to higher voltages. A range of 150 to 1100 volts is produced for the best fish attraction over a wide range of water conductivities. The electrofisher is mounted in a gasket-sealed case above the generator for good weight distribution. As a safety feature, an audio tone is provided giving the operator and crew positive indication that an output voltage is present. The timer indicates true shocking time in seconds.

The Coleman pack frame is of reinforced plastic, that not only provides excellent electrical insulation, but is also much more durable than aluminum. The straps may be adjusted to provide a comfortable fit for almost any size person. For added safety an instant pack release is provided for emergency situations. Just pull on two rings and the whole backpack drops instantly.

A lightweight fiberglass anode pole and pull-behind cathode are supplied with each new unit. An optional second pole can be plugged into the cathode receptacle for use as a cathode, to probe on each side of brushy habitat.

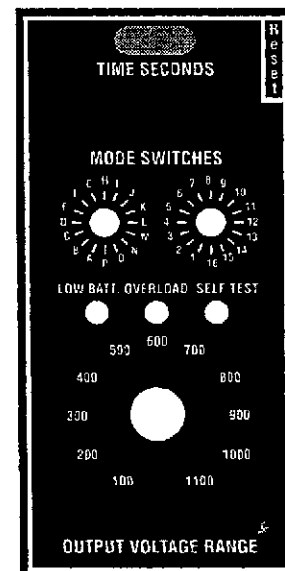
2. Controls and Features

The control panel for the Model-15B is located on the left side of the box.

Voltage Range Switch: This switch is located at the bottom. The switch has eleven voltage ranges. The 100 to 400 volt ranges are for high conductivity waters (>300 microsiemens). The 500 to 800 volt ranges are for medium conductivities (100 to 300 microsiemens). The 900 to 1100 volt ranges are for low conductivities (10 to 100 microsiemens). The zero volt setting provides no output and is used only in testing the unit.

Mode Switches: These switches are located in the middle. One switch is labeled A-P and the other 1-16. Together, they select one of the 256 available pulse waveform settings from the table given in the P.O.W. manual attached. Four of the settings are for custom waveforms, and default to smooth DC if not re-programmed.

Output Voltage Indicator: The audio indicator provides a strong audio tone to give positive indication to all crew members that an output voltage greater than 30 volts is present between the anode and cathode. This indicator also serves as an input current indicator for pulse cycles greater than 5Hz. It starts as a constant tone, then



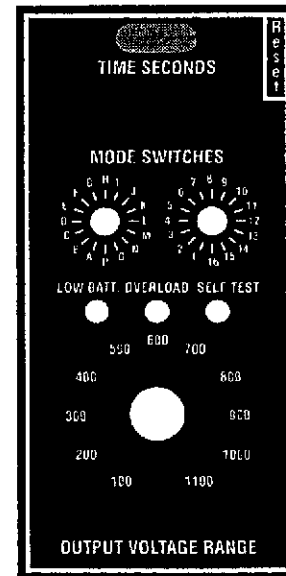
Electrofishers continue to be the most effective and reliable tool

begins to slowly beep at an input current of 1.25 amps and beeps faster as the input current goes up. Below 5Hz, the duty cycle is not long enough to keep the audio tone on and it will beep as each pulse is produced, regardless of the load.

Overload Indicator: An overload condition will be noted by a rapid beep rate of the audio tone and the LED indicator will turn on. The output is disabled when the current drawn from the generator exceeds 3 amps. If the electrofisher is overloaded, but the generator is still OK, the condition can be cleared by releasing the anode pole switch. If the generator overload kicks out first, it must be shut down and re-started to be reset. It is recommended that a lower output voltage range be selected if an overload condition occurs.

Self Test Indicator: The LED indicator comes on to verify that the unit is functioning and the anode and cathode are properly connected. If this indicator fails to turn on when the anode pole switch is pressed and the generator is running normally, it indicates that an anode or cathode connection may be bad, or an internal problem exists. This indicator will flash and the output will be disabled if the unit is tilted beyond its allowed limits while operating. This condition is cleared by placing the unit in an upright position and releasing the anode pole switch.

Timer: The six-digit timer totals seconds of shocking time while the anode pole switch is closed and the output is activated. A view window is located at the top of the panel. The timer can be reset by placing a magnet over the word "Reset" next to the timer. The magnet is found on its keeper on the left side of the shocker near the generator. It is also possible to use the anode pole switch magnet to reset the counter.



The control panel is on the left side of the box.

	20	22	24	26	28	
INPUT	_____					VOLTS
	19	22	23	25	27	
INPUT	_____					AMPS
	4	8	12	16	20	
	2	6	10	14	18	
OUTPUT	_____					AMPS
	.12	.25	.50	1.0	2.0+	
	.09	.17	.35	.70	1.4	

The optional digital metering panel is on the front of the box

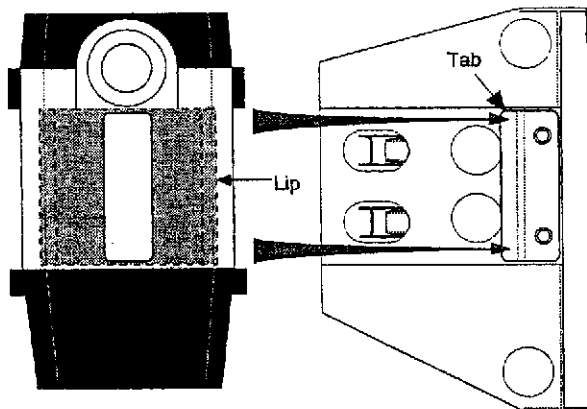
Model 15B POW generator powered backpack electrofisher

3. Generator Operation

Refuelling: Disconnect the electrical connections from the generator and remove it from the electrofisher. This is done by releasing the latches on the bottom of the unit. Place the generator in an upright position on a stable surface. Fill the tank with 50:1 fuel mixture. The recommended fuel mixture is 50 parts unleaded regular gasoline to 1 part TC-W two-cycle chain saw oil. A good TC-W two-cycle chain saw oil should be used to prevent problems with carbon buildup. Do not use outboard motor oil. For example, 1/2 oz of oil mixed with one quart of gasoline. A full tank provides about 1 1/2 hours of continuous operation.

Allow enough time for any spilled gasoline to evaporate before mounting the unit back on the electrofisher.

Starting the Generator: After filling the fuel tank, remounting the generator on the backpack and re-connecting it to the electrofisher, set the fuel cap lever to the on position. Then locate the engine switch on the right side of the generator below the fuel cap. For a cold engine, raise the switch to the choke position. For a warm engine, raise the switch to the on position. After taking up the slack, pull the starter rope quickly. When the engine has started and warmed up, move the engine switch from choke to on, if not already there. To kill the engine, set the engine switch to the off position.

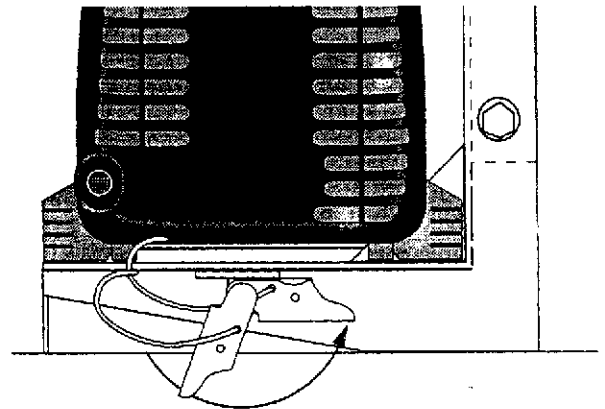


4. Generator Trouble-shooting

- If the generator is overloaded, turn it off, then re-start it to reset its overload protector. The generator output selector should be set to the 300VA position.
- Check for water in the fuel. If water is found, the entire fuel system must be drained and refilled with fresh, uncontaminated fuel.
- Check for a dirty air cleaner, if the cleaner is dirty the engine may become flooded.
- Check for a clogged muffler. Usually carbon attaches to the exhaust port, tail pipe and muffler wire gauze. Do not check these parts until they are cool. See Honda Owner's manual for details.
- Check for a spark at the spark plug. Clean or replace as necessary.

Generator mounting

Slide the generator onto the support plate. Make sure the lip of the generator mount is engaged under the tab on the support plate. Once generator is properly in position on the support plate, place the latch hooks over the base plate lip, and rotate the latch hook and handle



5. Using the Electrofisher

- A. Plug the anode pole and cathode into their respective connectors on the bottom of the instrument case. A reed switch, located inside the anode pole handle, is activated by a magnet within the rubber flapper. By simply pressing the flapper forward against the pole, the reed switch will close and activate the output. Releasing the rubber flapper opens the switch and deactivates the output.
- B. Start the generator according to the instructions given in the previous section. The output selector switch, located above the engine switch, should normally be set in the 300VA position for full generator output capacity. If full capacity is not needed, and quieter operation is desired, it may be switched to the 150VA position. However, if the load exceeds this level, it is likely the generator will overload well before the electrofisher can shut down the output.
- C. Select the desired voltage and waveform mode setting. When water conductivity is unknown, select the lowest voltage range to start with. Press the anode pole switch and observe the reaction of the fish. If this voltage range is not producing satisfactory results release the anode pole switch and increase the voltage one range and try again. Repeat this procedure until satisfactory results are obtained. Never change voltage ranges while the anode pole switch is pressed, as this may damage the electrofisher.

Caution

If you have been shocking small fish, reduce the voltage range 2 or 3 positions before shocking large fish. Large fish are more sensitive to being shocked than small fish. In general, low frequencies are more effective for large fish and high frequencies for small fish.

6. Electrofisher Trouble-shooting

The Model-15B electrofisher has been designed to provide years of trouble free operation, but problems can occur. The following section should help you to correct some of the more common problems and prevent others from occurring.

- A. Check the overload indicator. If the overload light turns on when the output is activated, reduce the voltage selector until the overload indicator no longer turns on. The overload is automatically reset each time the anode pole switch is released. If the overload continues even with the anode out of the water, return the unit for service.
- B. Check the self-test indicator. The light should turn on when the anode pole switch is activated. If the light fails to turn on, check the anode and cathode connectors on the box, to be sure that they are properly seated. If you are sure that the connectors are hooked together properly and the self-test indicator still doesn't turn on, check the switch circuit on the anode and cathode with an ohm meter. From pin B to pin C should measure approximately zero ohms when the anode pole switch is activated, and zero ohms at all times on the rat-tail cathode. If it doesn't measure zero ohms, there is either a broken wire or a bad switch in the electrode.
- C. The Model-15B contains a safety tilt switch that renders the electrofisher inoperable if the unit is tipped beyond normal operating positions. The normal operating position for the electrofisher is vertical. A tilted condition is indicated by the self-test light flashing when the anode pole switch is engaged.

Model 15B POW generator powered backpack electrofisher

7. Model-15B Specifications

Conductivity range... 10-400 microsiemens/cm³
Output voltage 150-1100 VDC in 10 steps.
Output current..... 40 amp peak, 4 amp average on 150 volt range.
Output frequencies .. DC through 120 Hz.
Output protection Output disabled on over-current condition, automatically reset by releasing anode pole switch.
Overload indicator .. LED on side of unit.
Output pulse shape .. Rectangular pulsed DC.
Output indicator Audio tone for 30 VDC and greater.
Self test..... Continuity of anode and cathode wires and switches and integrity of controller indicated by LED.
Tilt switch..... Automatically shuts output off when electrofisher is tipped beyond allowable operating angle.
Input current Indicated by audio ammeter above 1.25 amps. Beep rate changes in proportion to input current.
Timer 0 - 999,999 seconds. Accuracy: 2.5%.
Construction Sealed weatherproof case.
Mass 14.5 kg.
Anode pole 1.82m long 2.5 cm diameter fiberglass, with 1.82 m curl cord.
Electrode supplied ... Round aluminum ring, 30.5 cm diameter.
Cathode supplied..... Rat-tail, 2.44 m long.
Pack frame Coleman, reinforced plastic with emergency quick release.

8. Standard Equipment Supplied

Model-15B Electrofisher and Honda Generator, mounted on a Coleman pack frame, with single-piece 1.82m anode pole, anode ring, and pull-behind cathode.

9. Optional Equipment

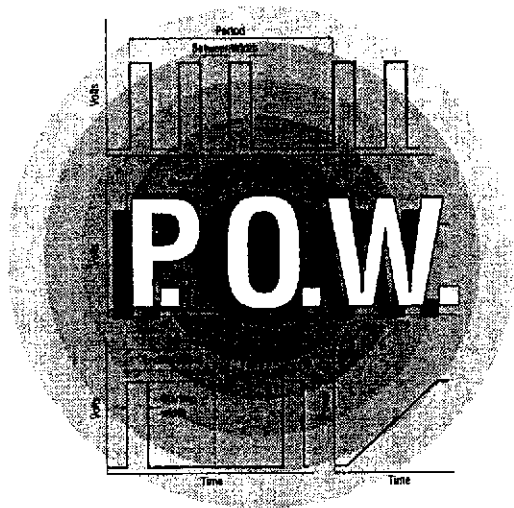
Metering package Input and output current, and input voltages.
Custom output DC to 1000 Hz.
Anode arrays Diamond shape, cat whisker or ring
Electro dip-nets..... Tear-drop shape, 28cm W x 46cm L x 10cm D, 47mm mesh, with protector and quick disconnect.
Electrical gloves..... 5000 volt or 10,000 volt rated.

Anode or cathode poles:

1 piece	1.82m, 2.5cm diameter
2 piece	1.82m, 2.5cm diameter
2 piece	2.74m, 2.5cm diameter
3 piece	2.74m, 2.5cm diameter

Fiberglass dip-net handles:

1 piece	1.82m
2 piece	1.82m
2 piece	2.74m



Programmable Output Waveforms for Backpack Electrofishers

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Programmable Output Waveforms

INTRODUCTION

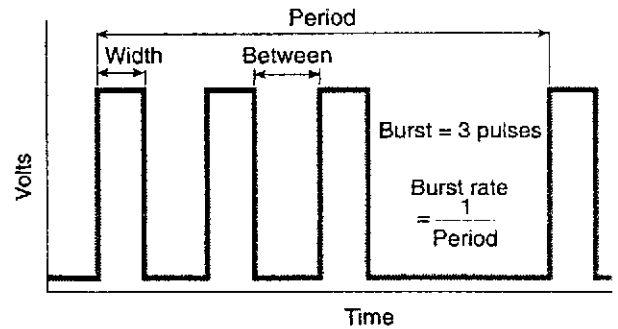
Your P.O.W. electrofisher incorporates the latest microcontroller technology, to give you the widest range of output waveforms available on any electrofisher. It can not only produce smooth DC output, but a whole new series of very effective and efficient pulsed waveforms. 256 waveforms are available, and three are custom waveforms that can be programmed for your own particular conditions.

WHAT IS P.O.W. AND WHY DO I NEED IT?

P.O.W. (Programmable Output Waveforms), prevents damaged fish, increases electrofishing time per battery, and extends the range of water conductivities for electrofishing.

P.O.W. gives you complete control over how the output pulses are produced. This lets you do things like using groups of narrow pulses to induce the same physiological responses as wider more powerful pulses. You can also vary the width of the pulses as they are applied, to reduce the initial impact on the fish. This method of synthesizing waveforms makes it possible to simulate virtually any low frequency waveforms with P.O.W. Some recent research has suggested that frequencies much higher than those traditionally used in electrofishing may be more effective and less damaging still. P.O.W. supports frequencies from smooth DC to 250 pulses per second (pps). However, with some slight additional modifications to your electrofisher it will support frequencies up to 1,500 pps. This is far more than is available with electrofishing equipment supplied by other manufacturers.

P.O.W. is safer for the fish because it allows you to use narrower less damaging pulses to achieve the same results as earlier electrofishing equipment. Narrower pulses mean that you put less electrical power into the water and into the fish. Less power means less damage to the fish. It also means your batteries will last longer on a single charge. Other benefits of P.O.W. include shocking in water that overloads electrofishers without P.O.W, because of the narrower pulses that can be used. This



makes it possible to electrofish in waters that were too conductive before. P.O.W. does not abandon the wider pulses, they are all still available, you simply have a greater array of waveforms to choose from (256 total).

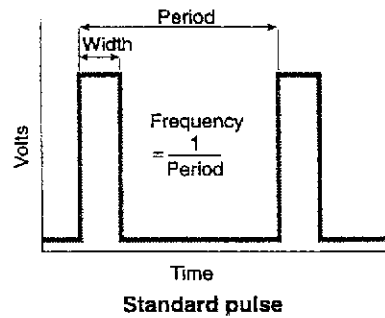
If P.O.W. is so great why didn't we offer it before? The components that allow us to offer you P.O.W. have only very recently become available. New high power transistors are now being made that can deliver the performance necessary for P.O.W.

We are constantly looking for ways to improve our products and find your suggestions very helpful. P.O.W. is a result of feedback from many of our customers. Let us know if there are any special waveforms you would like us to implement.

PROGRAMMABLE OUTPUT WAVEFORMS

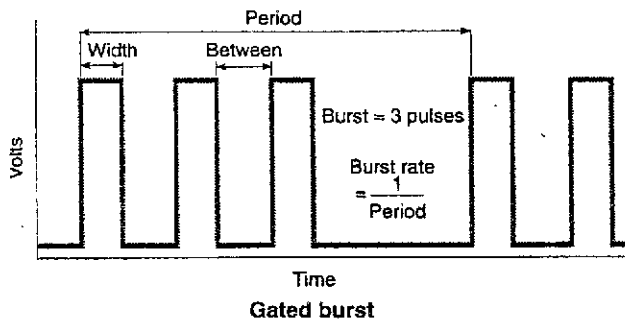
By varying the width and frequency of the output pulses over time, Smith-Root electrofishers are capable of generating a wide variety of pulse waveforms. Using this pulse modulation technique we simulate the effect of more complex waveforms while reducing the drain on the power supply. Smith-Root electrofishers are programmed with a sampling of these waveforms for your use and experimentation. You will find several that will be the most effective for your particular situation. What follows is a brief explanation of how P.O.W. works. We will start by describing a standard waveform, and work up to more complex ones.

Programmable Output Waveforms



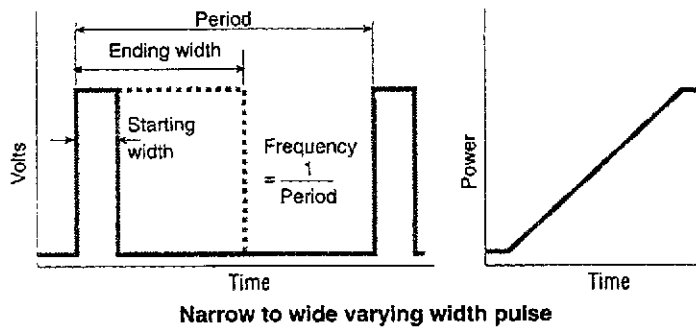
STANDARD PULSE

A standard pulse is a repeating cycle of the output voltage being turned on and off. The amount of time the current is turned on is called the pulse width. The time from the start of one pulse cycle to the start of the next one is called the cycle period. The number of pulses produced in a second is the pulse frequency, and is related to the cycle period as shown in the diagram below left.



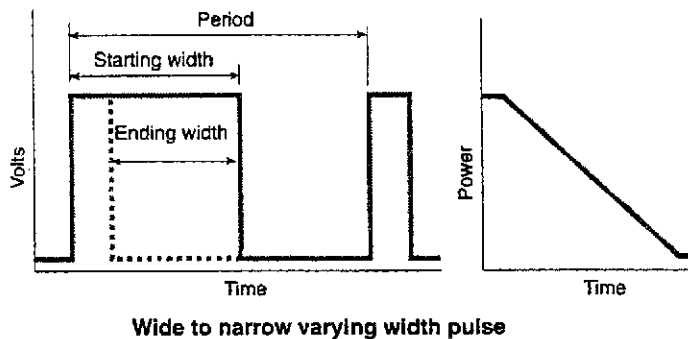
GATED BURST

By modifying the pulse cycle, we can produce a group of fast pulses followed by a short off-time. This is just as effective as a pulse with a much longer on-time. However less power is applied to the water, and less is drawn from the power source. This grouping of pulses is known as a burst. It is a product of the width of the individual pulses, the time between pulses in the burst, and the period between the bursts. These bursts are produced by feeding the pulses through a switch or gate, hence this waveform is called a gated burst. This is illustrated below.

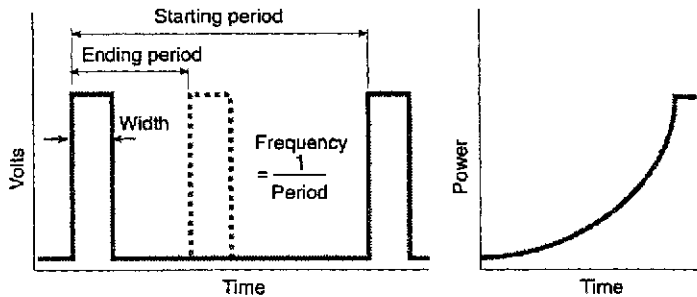


VARYING WIDTH PULSES

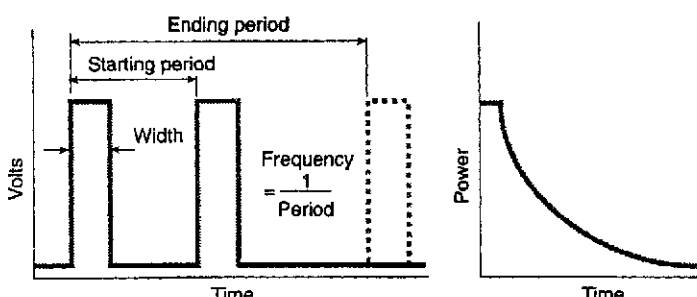
Often it is desirable to change the amount of power applied to the water while electrofishing. This can be done in a variety of ways. One way is to hold the cycle period constant but change the pulse-width over time. The time it takes to go from the starting pulse-width to the ending pulse-width is called the sweep time. The average power applied to the water varies linearly with the width of the pulse. This is shown in the graphs on the right. One set shows a pulse that starts narrow and goes to a wider value, and the other shows a wide pulse that gets narrower.



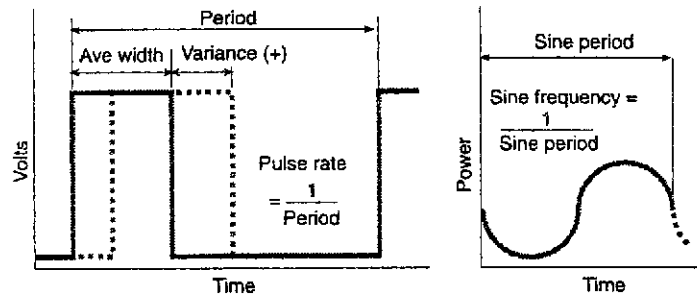
Programmable Output Waveforms



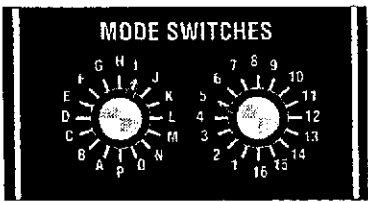
Low to high frequency, fixed width pulses



High to low frequency, fixed width pulses



PWM sine wave



The mode switches

FIXED WIDTH PULSES

Another way to vary the average power is to hold the pulse width constant, but change the cycle period. This produces an exponential change in the applied power as the cycle time or frequency is changed. This is shown in the graphs on the right for a low-to-high and a high-to-low frequency change.

PULSE WIDTH MODULATION

We can also vary the width of the pulses so the average power produced looks like a more complex waveform. This is called Pulse Width Modulation. We use this technique to produce a power output waveform that looks like a sine wave, as shown above.

CUSTOM WAVEFORMS

This technique can be used to produce a wide variety of waveform types. The range is limited only by the maximum pulse rate the unit can produce, and the memory needed to describe it in the computer.

Please contact Smith-Root if you have any special waveform that you would like us to implement.

SETTING THE MODE SWITCHES

The table on the next page shows how to set the mode switches to produce any of the 256 available waveforms. The entries shown in bold italics are the settings that have always been available on Smith-Root electrofishers.

After using P.O.W. for a while you will find that you have a few favorite settings. For example many people like 60Hz at 6ms, which would be setting J8. The waveforms are selected via switch settings, so they can be easily repeated by other field personnel. Note that three entries are marked custom. These settings are available for any special waveforms you may wish to program yourself or have us program for you.

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Programmable Output Waveforms

Standard Pulse Table

Width	100µs	500µs	1ms	2ms	3ms	4ms	5ms	6ms	7ms	8ms	9ms	10ms	
	1	2	3	4	5	6	7	8	9	10	11	12	
A	1Hz	1Hz	1Hz	1Hz	1Hz	1Hz	1Hz	1Hz	1Hz	1Hz	1Hz	1Hz	
B	5Hz	5Hz	5Hz	5Hz	5Hz	5Hz	5Hz	5Hz	5Hz	5Hz	5Hz	5Hz	
C	10Hz	10Hz	10Hz	10Hz	10Hz	10Hz	10Hz	10Hz	10Hz	10Hz	10Hz	10Hz	
D	15Hz	15Hz	15Hz	15Hz	15Hz	15Hz	15Hz	15Hz	15Hz	15Hz	15Hz	15Hz	
E	20Hz	20Hz	20Hz	20Hz	20Hz	20Hz	20Hz	20Hz	20Hz	20Hz	20Hz	20Hz	
F	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz	
G	30Hz	30Hz	30Hz	30Hz	30Hz	30Hz	30Hz	30Hz	30Hz	30Hz	30Hz	30Hz	
H	40Hz	40Hz	40Hz	40Hz	40Hz	40Hz	40Hz	40Hz	40Hz	40Hz	35Hz	35Hz	35Hz
I	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	40Hz	40Hz	40Hz
J	60Hz	60Hz	60Hz	60Hz	60Hz	60Hz	60Hz	60Hz	60Hz	60Hz	50Hz	45Hz	45Hz
K	70Hz	70Hz	70Hz	70Hz	70Hz	70Hz	70Hz	70Hz	70Hz	70Hz	60Hz	50Hz	50Hz
L	80Hz	80Hz	80Hz	80Hz	80Hz	80Hz	80Hz	80Hz	80Hz	80Hz	70Hz	60Hz	55Hz
M	90Hz	90Hz	90Hz	90Hz	90Hz	90Hz	90Hz	90Hz	90Hz	90Hz	80Hz	70Hz	60Hz
N	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	90Hz	80Hz	70Hz
O	110Hz	110Hz	110Hz	110Hz	110Hz	110Hz	110Hz	110Hz	110Hz	110Hz	100Hz	90Hz	80Hz
P	120Hz	120Hz	120Hz	120Hz	120Hz	120Hz	120Hz	120Hz	120Hz	120Hz	110Hz	100Hz	90Hz

Note: Settings available on previous electrofishers are in **Bold Italic**.

Wide to Narrow Varying Width Pulses

	10 to 1ms, 2 second sweep								5 to 1ms, 2 second sweep							
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
13	15Hz	20Hz	25Hz	30Hz	35Hz	40Hz	45Hz	50Hz	55Hz	60Hz	65Hz	70Hz	75Hz	80Hz	85Hz	90Hz

Narrow to Wide Varying Width Pulses

	1 to 10ms, 2 second sweep								1 to 5ms, 2 second sweep							
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
14	15Hz	20Hz	25Hz	30Hz	35Hz	40Hz	45Hz	50Hz	55Hz	60Hz	65Hz	70Hz	75Hz	80Hz	85Hz	90Hz

Varying Frequency; Fixed Width Pulses

	15 to 60Hz, 2 second sweep								60 to 15Hz, 2 second sweep							
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
15	1ms	2ms	3ms	4ms	5ms	6ms	7ms	8ms	1ms	2ms	3ms	4ms	5ms	6ms	7ms	8ms

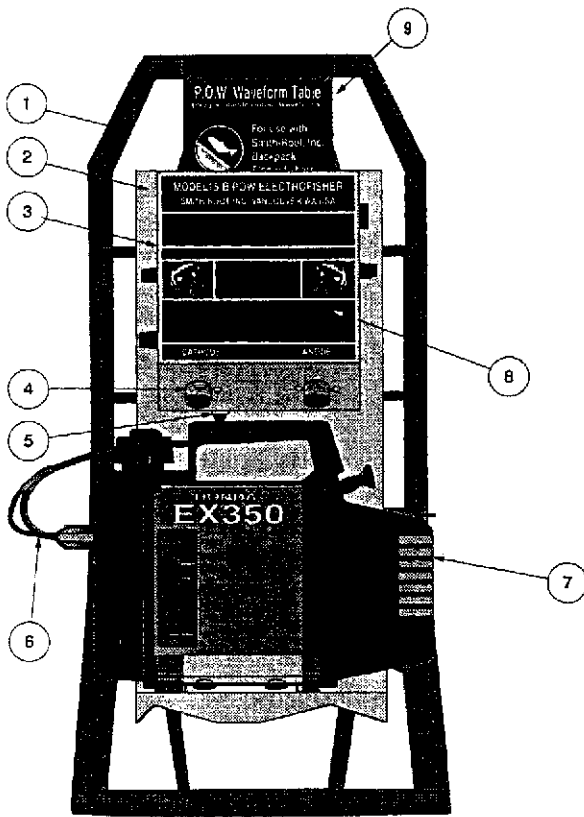
Gated Bursts of Pulses

	Number of pulses in burst, 1ms wide, 2ms between, 15Hz burst rate							
	A	B	C	D	E	F	G	H
16	2	3	4	5	6	7	8	9

PWM Sine Waves and Custom Waveforms

	4ms average, ±3ms variance, 60Hz pulse rate							
	I	J	K	L	M	N	O	P
16	0.25Hz	0.50Hz	1.00Hz	2.00Hz	Custom	Custom	Custom	DC

Note: custom waveforms default to DC



Model 15B Backpack Parts Identification

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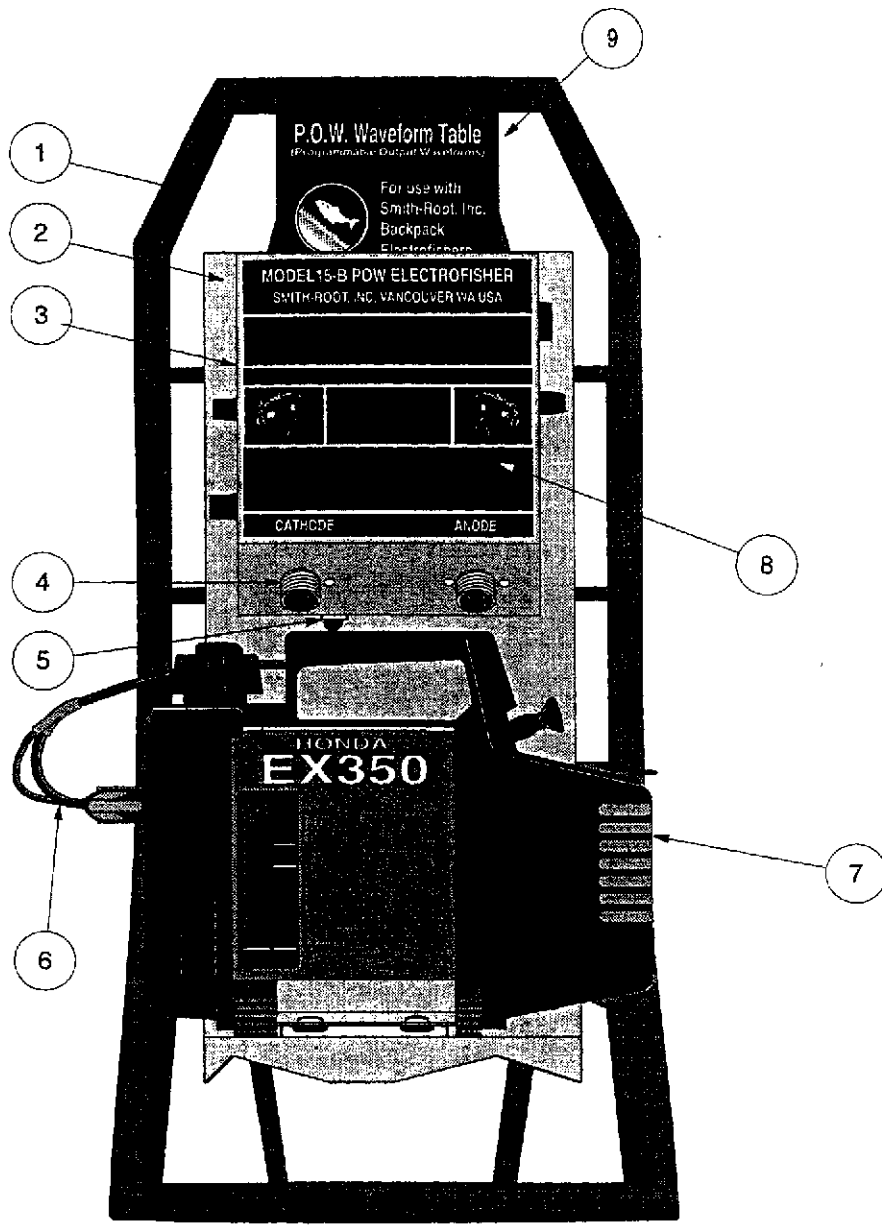


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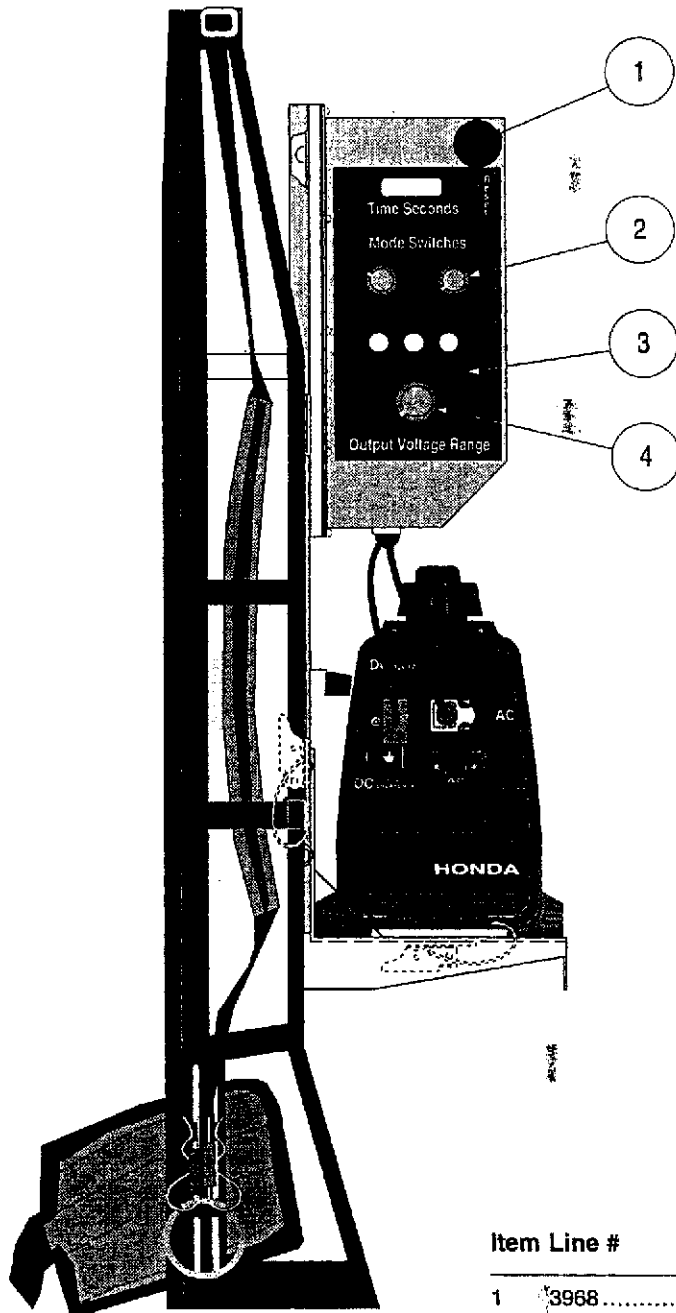
Back View Parts



Item Line #	Description	Qty
1	1542.....Backpack frame only	1
2	3936..... Packboard without generator support	1
3	2583..... Pulsator circuitry housing	1
4	0004..... 4-Pin circular receptacle	2
5	2035..... Liquid-tight connector	1

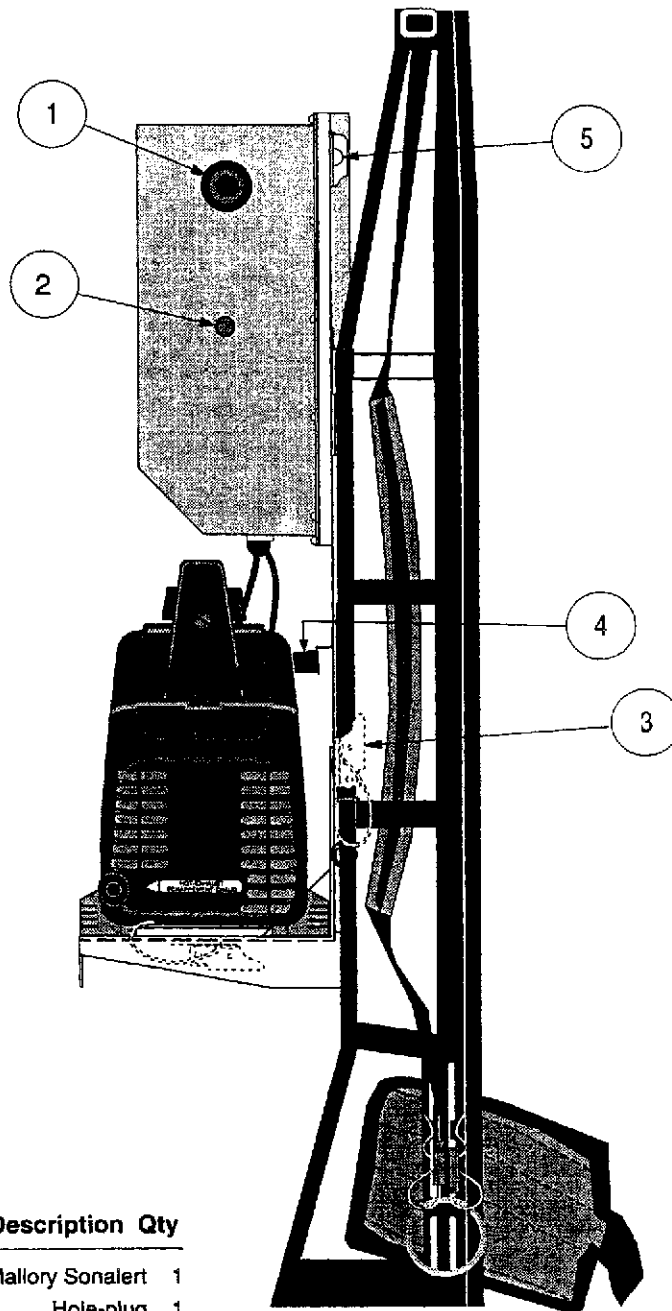
Item Line #	Description	Qty
6	4035..... Power cord	1
7	2585..... Generator	1
8	3459..... Front label	1
9	4034..... POW waveform table	1

Left Side View Parts List



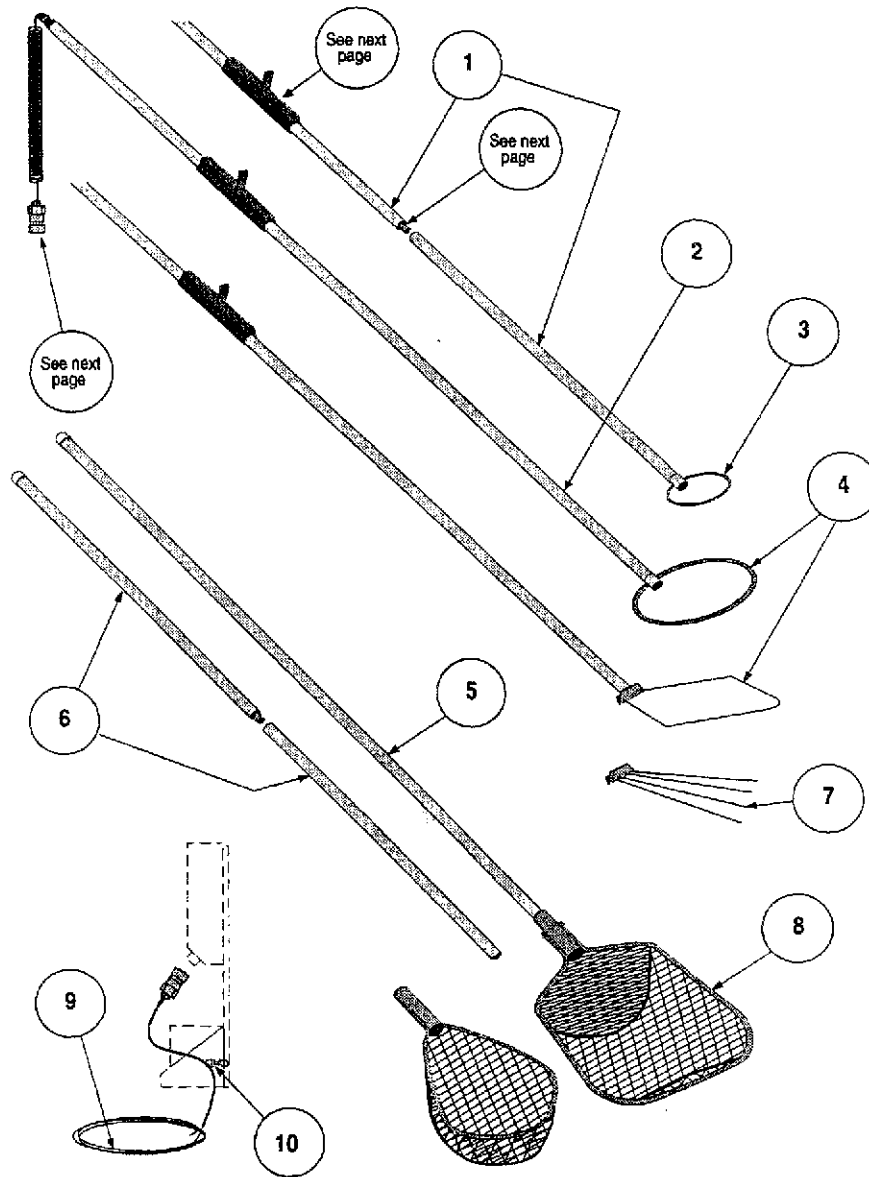
Item Line #	Description	Qty
1	3968..... Grommet hole plug	1
2	3947..... Pointer knob for mode switches	2
3	4036..... POW model label	1
4	1141..... Pointer knob for voltage range switch	1

Right side View Parts List



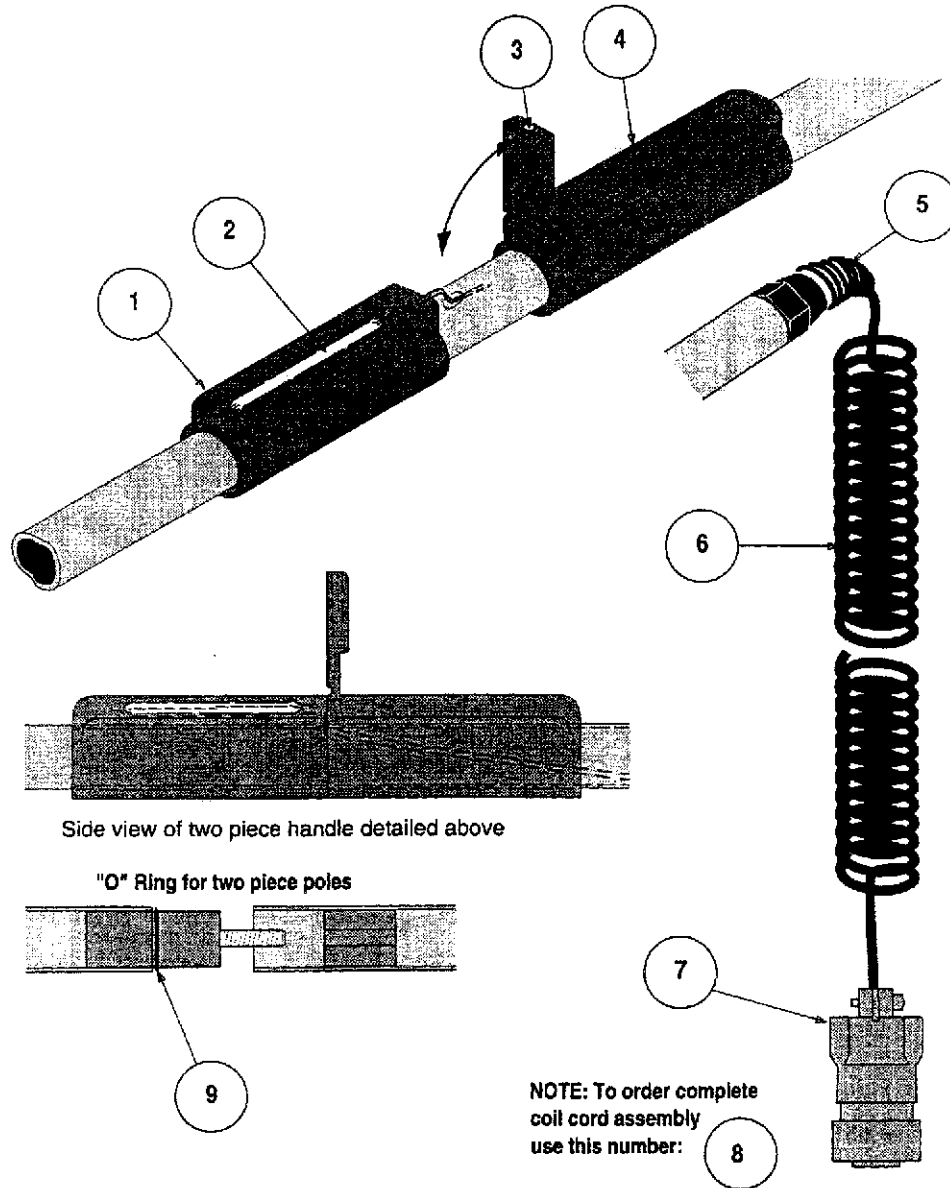
Item	Line #	Description	Qty
1	1144	Mallory Sonalert	1
2	3051	Hole-plug	1
3	2669	Over-center latch	4
4	0781	Rubber foot	2
5	1212	Screws to secure packboard	10

Anode Pole, Dip Net and Cathode Parts



Item Line #	Description	Qty	Item Line #	Description	Qty
1	1046 ... two-piece 6 foot pole with cord and 11" ring	1	6	2015 two-piece 6 foot dip net pole	1
	1045 ... two-piece 9 foot pole with cord and 11" ring	1		3294 two-piece 9 foot dip net pole	1
2	1047 ... one-piece 6 foot pole with cord and 11" ring	1	7	3939 Cat whisker anode	1
3	3584 6" anode ring	1	8	1378 Heavy duty dip net	1
4	3297 11" anode ring	1		2026 Tear-drop dip net	1
	or Diamond anode ring	1	9	2885 Rat tail pull-behind cathode	1
5	2074 one-piece 6 foot dip net pole	1	10	2960 Trigger snap for strain relief of cathode	1

Handle, "O" Ring, and Coil Cord Parts List

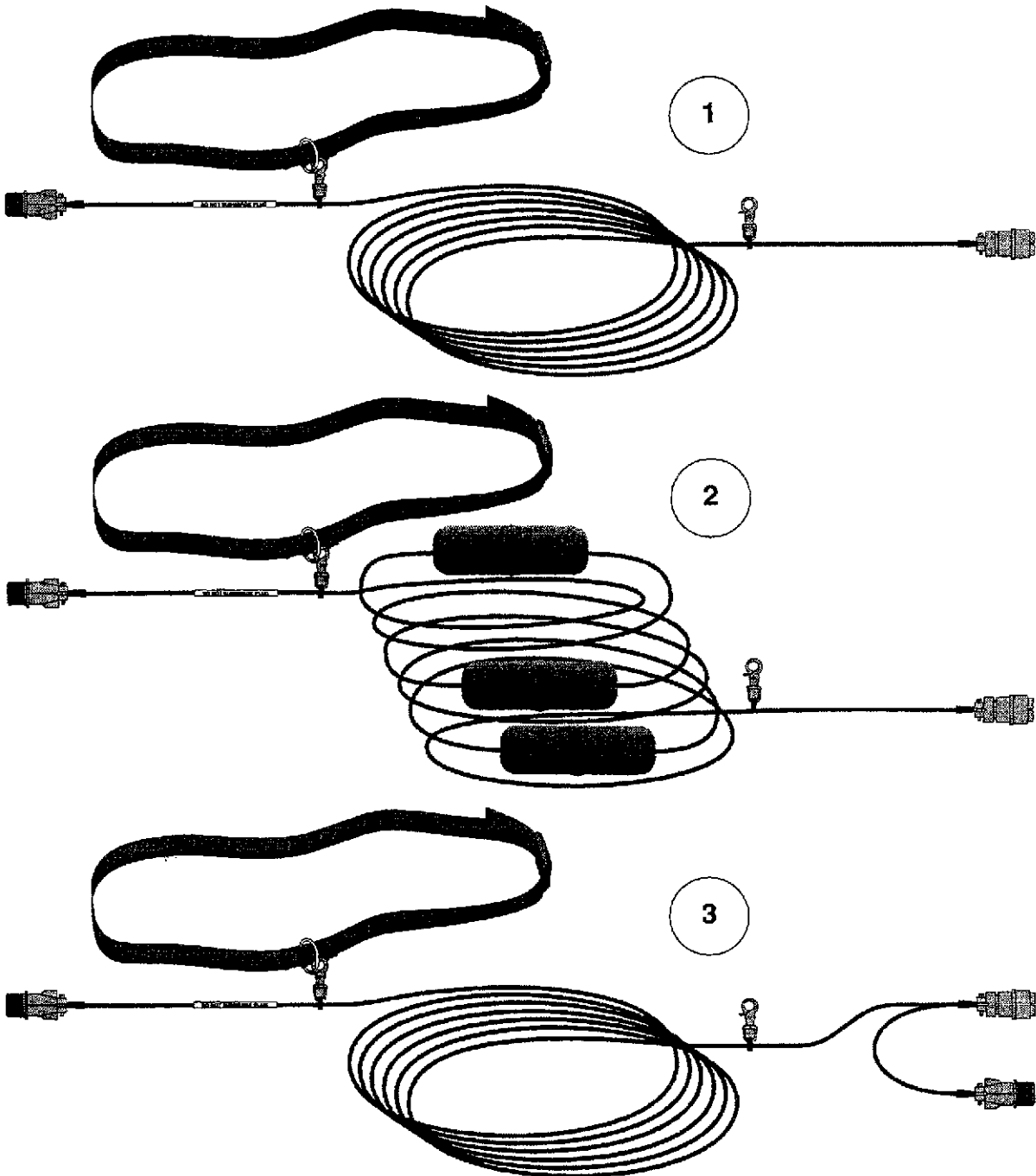


Item Line #	Description	Qty
1 3981	Molded handle for reed switch	1
2 1703	Reed switch	1
3 3065	Round rod magnet	1
4 3982	Molded handle for magnet	1
5 1523	Liquid-tight connector	1
6 1663	Coil cord, 14"	1

Item Line #	Description	Qty
7 1019	4-pin plug	1
1804	Cable clamp	1
2066	Rubber bushing	1
8 3295	Complete replacement coil-cord assembly	1
9 3412	"O" ring seal for two-piece pole (min. of 2")	2

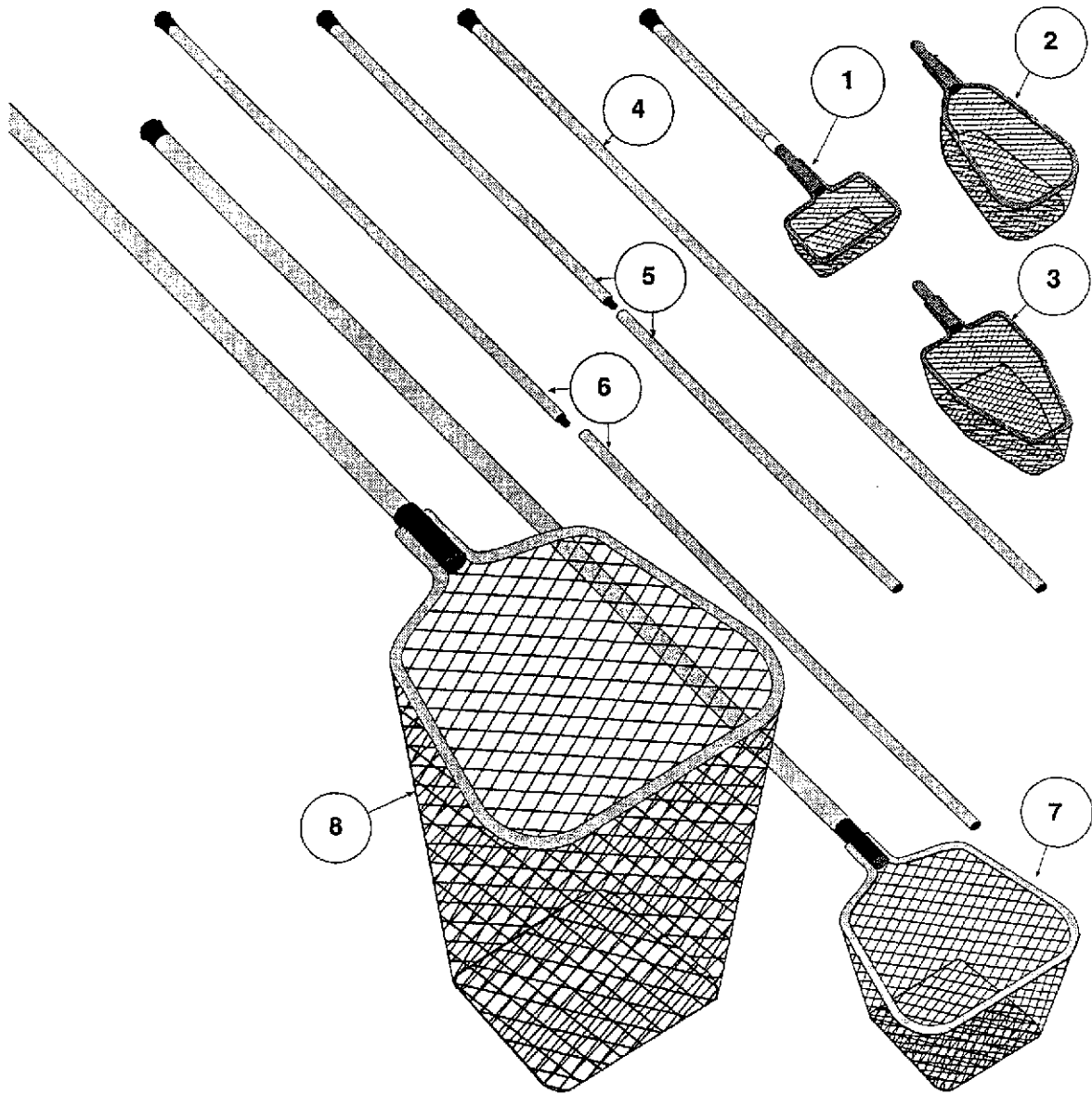
*WARNING there is a safety hazard if the "O" rings are missing or broken in a two-piece pole, so keep two extra "O" rings on hand.

Anode Extension Cables



Item	Line#	Description	Qty
1	3269	ACE-25 Anode/cathode extension cable, 25' with belt (additional cable @ .75¢ per foot, 100' max)	1
2	4071	ACE-25F Anode/cathode extension cable, 25' with belt and floats	1
3	4444	ACE-25-2 Anode/cathode extension cable, "Y" configuration for two anodes, 25' with belt	1

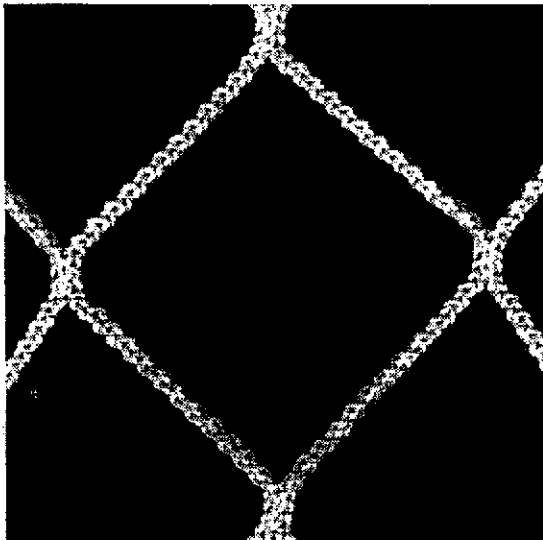
Dip Nets and Poles



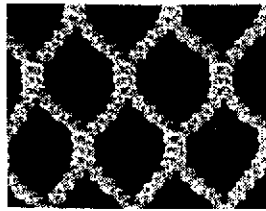
Item	Line#	Description	Qty
1	2016 TDN-SC	Tank Dip Net, Square Corner 12"W x 8"L x 4"D, 1/4"mesh, with 18"x 1"dia handle	1
2	2026 MDD-TD	Medium Duty Dip net, Tear-Drop shape 12"W x 18"L x 8"D, 1/4" mesh, no handle	1
3	4424 MDD-TZ	Medium Duty Dip net, Trapezoid shape 13"W x 15"L x 8"D, 1/4" mesh, no handle 1/8" mesh available as an option on MDD-TD and MDD-TZ only	1
4	2074 DNH-6-1	Dip Net Handle 6' long, one 72" section, fiberglass, 1" dia.	1
5	2015 DNH-6-2	Dip Net Handle 6' long, two 36" sections, fiberglass, 1" dia.	1
6	3294 DNH-9-2	Dip Net Handle 9' long, two 54" sections, fiberglass, 1" dia.	1
7	1378 HDD-10	Heavy Duty Dip net, 17"L x 17"W x 12"D, 1/2" mesh, with 8' x 1.25" dia fiberglass handle	1
8	3091 SDD-11	Super Duty Dip net, 29"L x 31"W x 36"D, 1-7/8" mesh, with 8' x 1.25" dia fiberglass handle	1

Dip Nets and Poles

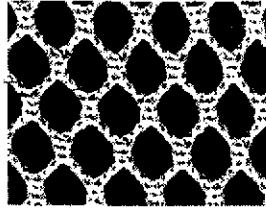
Dip Net Mesh Sizes Shown actual size



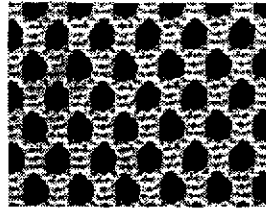
1 7/8" mesh on Super Duty Dip Net SDD-11



1/2" mesh on heavy duty dip net HDD-10.

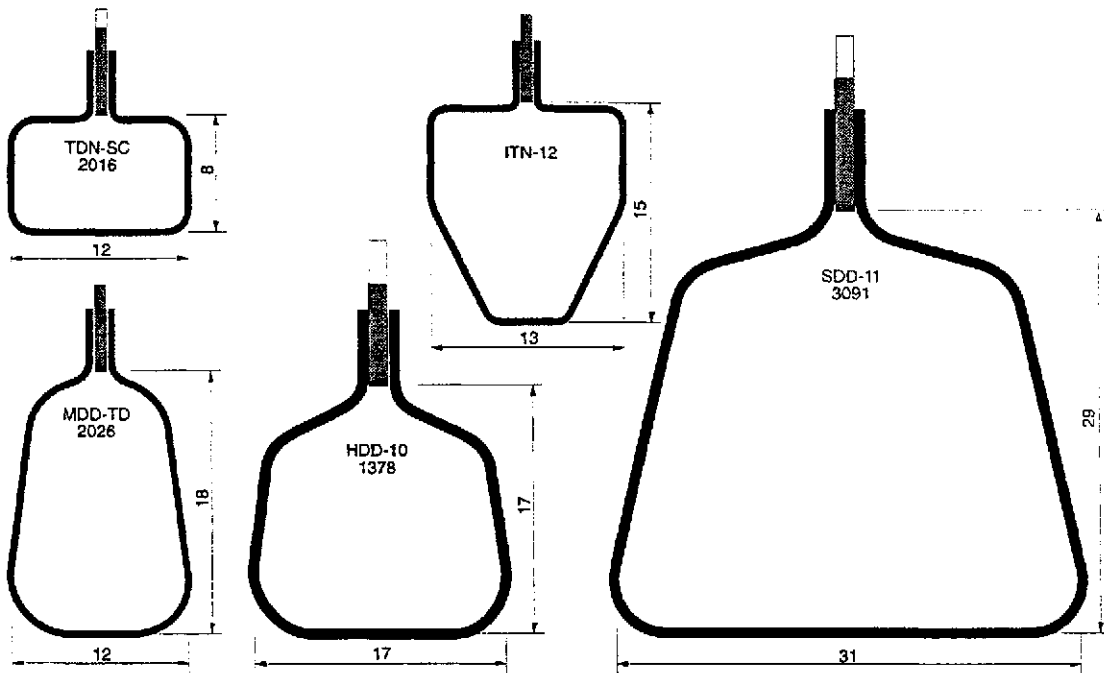


1/4" mesh is standard on tank dip net TDN-SC, medium duty tear-drop net MDD-TD and medium duty trapezoid net MDD-TZ.

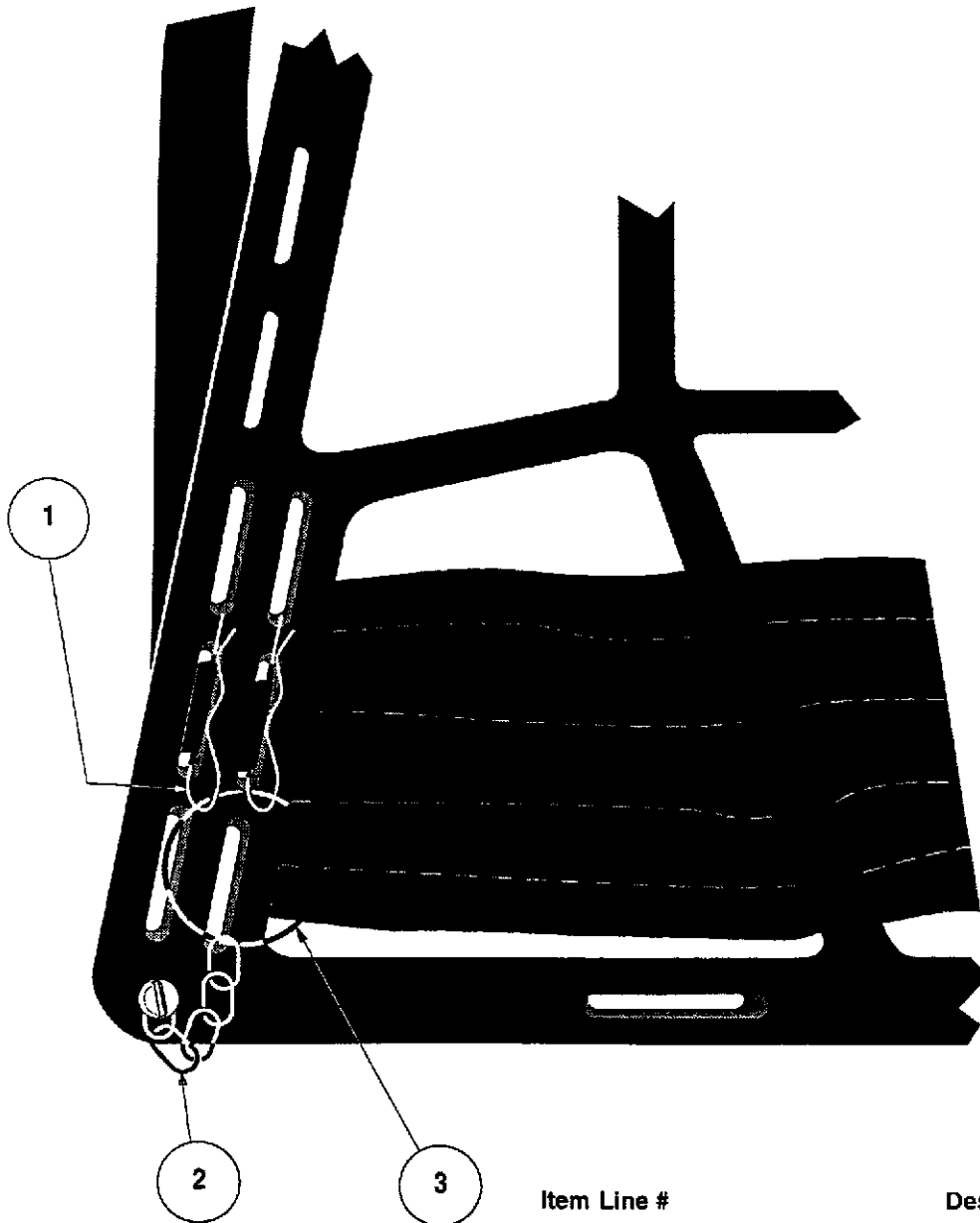


1/8" mesh available as an option only on tear-drop net MDD-TD, and trapezoid net MDD-TZ.

Dip Net Frame Sizes scale 1" = 1'-0"



Quick Release Parts



Item	Line #	Description	Qty
1	1673Hitch pin clip	4
2	2209	...#4 machine chain, two 4" pieces required	8"
3	16741-3/4" key ring	2
4	2111Shoulder strap	2
5	2112Waist belt	1
	2110Back-support mesh	1

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SMITH-ROOT, INC. (SRI) products are backed by SRI's reputation as a quality manufacturer, and often by years of proven reliable service.

In addition, the products are backed by the following SRI factory warranty:

Solely for the benefit of the original purchaser, SRI warrants all new products of its manufacture to be free from defects in material and workmanship; and will replace or repair, f.o.b. at its factories in Vancouver, Wash., or other location designated by it, any part or parts returned to it within one (1) year of original delivery, which SRI's examination shall show to have failed under normal use and service and non-corrosive application by purchaser. Such repair or replacement shall be free of extra charges for all items, and shall be return shipped pre-paid by SRI. SRI makes no warranty with respect to parts, accessories, or components manufactured by others. The warranty, if any, which applies to such items is that offered by their respective manufacturers.

SRI's obligation under this warranty is conditioned upon it receiving proper written notice of claimed defects which shall in no event be later than the one (1) year warranty period; and is limited to repair or replacement as aforesaid.

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Upon buying SRI products or parts, purchaser expressly agrees to the foregoing warranty provisions including limitations of remedies, and expressly waives any and all other warranties or undertaking in respect to such products.

Smith-Root, Inc.

DAILY FIELD CHECK SHEET
BACK PACK ELECTROFISHER
SAFETY INSPECTION

Unit ID# _____ Date: _____

MNR # _____ Time: _____

Crew Leader _____ Location _____

Crew Members _____

Log Book: Up to date Yes _____ No _____

Manual Present Yes _____ No _____

GENERATOR/ALTERNATOR (where applicable)

- _____ 1. Electrical connections secure and protected
- _____ 2. Mountings secure
- _____ 3. Exhaust directed away from operator
- _____ 4. Frame properly grounded to earth
- _____ 5. Unit electrically bonded/connected to frame
- _____ 6. Oil topped up
- _____ 7. Gas topped up
- _____ 8. Engine clean - no oil or gas leaks

BATTERY (where applicable)

- _____ 1. Clean and fully charged, gel cell type
- _____ 2. Terminals clean and tight

ELECTROFISHER

- _____ 1. Controls and gauges operational
- _____ 2. High voltage checks done
- _____ 3. Adequate protection of wiring
- _____ 4. Adequate connectors and interlocking
- _____ 5. Audible tone generator working
- _____ 6. High voltage flashing light working
- _____ 7. "KILL SWITCH" working
- _____ 8. Mercury tilt switch working
- _____ 9. Anode switch working
- _____ 10. Wiring to anode in good condition
- _____ 11. Anode in good condition fastened securely
- _____ 12. No screens or nets attached to anode or cathode

ELECTROFISHER (cont'd)

- ___ 12. Cathode cable in good condition
- ___ 13. Cathode clean secured tightly
- ___ 14. BackPack frame in good condition
- ___ 15. Quick release mechanism of BackPack frame working

ACCESSORY EQUIPMENT

- ___ 1. Dip net handles made of non-conductive material
- ___ 2. First aid kit present - fully replenished
- ___ 3. Gas containers - regulation style (where applicable)
- ___ 4. Fire extinguisher - present - correct type - fully charged (where applicable)

PERSONNEL/CREW MEMBERS

- ___ 1. Each crew member briefed on unit operation
- ___ 2. Minimum number of crew trained in CPR, first aid and basic electronics.
- ___ 3. Each crew member wearing rubber gloves (long arm)
- ___ 4. Each crew member wearing rubber boots, or waders (as applicable)
- ___ 5. Safety procedures covered
- ___ 6. Local arrangements covered, i.e., police, etc.
- ___ 7. Hospital route outlined

ANNUAL
BACK PACK ELECTROFISHER
SAFETY INSPECTION CHECKLIST

UNIT ID# _____ MNR # _____
Make _____ Model _____
Owner/Operator _____ Location _____
Inspection Date _____ Inspected by _____
Log Book: Up to date Yes _____ No _____
Manual Present: Yes _____ No _____

ELECTROFISHER

- ___ 1. Controls and gauges operational
- ___ 2. High voltage checks done
- ___ 3. Adequate protection of wiring
- ___ 4. Adequate connectors and interlocking
- ___ 5. Unit checked and overhauled by manufacturer in last two (2) years (check log book)
- ___ 6. Audible tone generator working
- ___ 7. High voltage flashing light working
- ___ 8. "KILL SWITCH" working
- ___ 9. Anode switch and mercury tilt switch working
- ___ 10. Wiring to anode in good condition
- ___ 11. Anode in good condition fastened securely
- ___ 12. No screens or nets attached to anode
- ___ 13. Anode handle of non-conductive material
- ___ 14. Battery fully charged, terminals clean
- ___ 15. Gel cell type battery
- ___ 16. Cathode cable in good condition
- ___ 17. Cathode clean and secured tightly
- ___ 18. BackPack frame in good condition
- ___ 19. Quick release mechanism of BackPack frame working

GENERATOR/ALTERNATOR (where applicable)

- ___ 1. Electrical connections secure and protected
- ___ 2. Mountings secure
- ___ 3. Exhaust directed away from operator
- ___ 4. Frame properly grounded to earth
- ___ 5. Unit electrically bonded/connected to frame
- ___ 6. Engine serviced to date/oil changed
- ___ 7. Engine clean and no oil or gas leaks

ACCESSORY EQUIPMENT

- ___ 1. Protective hand and head gear for max. crew members
- ___ 2. Dip net handles made of non-conductive material
- ___ 3. First aid kit present - fully replenished
- ___ 4. Gas containers - regulation style
- ___ 5. Fire extinguisher - present - correct type - fully charged (where applicable)



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