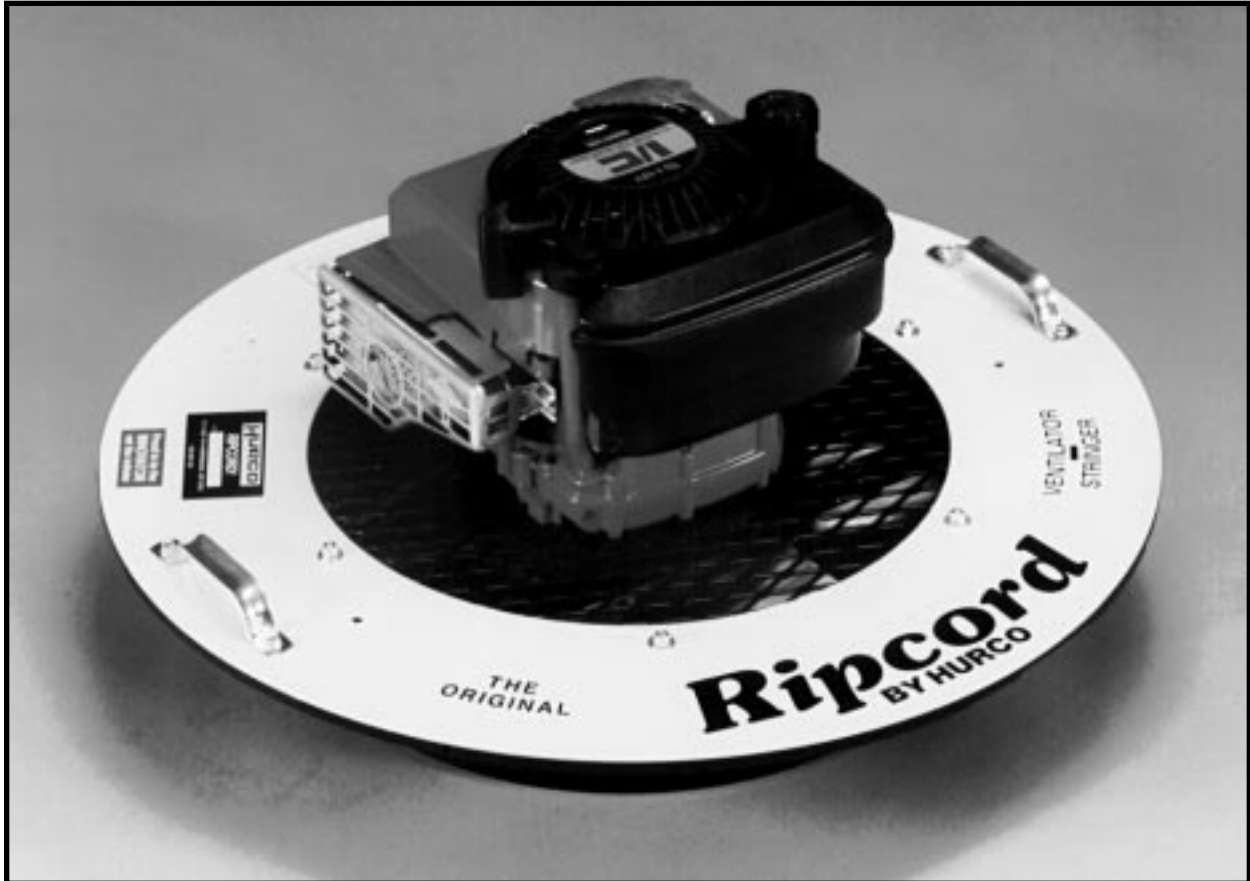


HURCO

TECHNOLOGIES, INC.



RIPCORD & SUPER RIPCORD Owners Manual

Proud to be the INNOVATOR, not the imitator!

These are the warning labels found on the RIPCORDER and its accessories:

All Uses

STOP!

READ ALL WARNING LABELS ON RIPCORDER UNIT BEFORE STARTING ENGINE.



NEVER ENTER MANHOLE WHERE RIPCORDER IS LOCATED AS SERIOUS HARM COULD OCCUR.

For Ventilation

WARNING

IF THE RIPCORDER UNIT IS USED FOR VENTILATION, THE USER MUST FIRST TEST THE MANHOLE FOR DANGEROUS GASES AND OXYGEN DEFICIENCIES BEFORE ENTERING IT USING PROPER TESTING EQUIPMENT. MANHOLE MUST ALSO BE MONITORED CONTINUALLY FOR DANGEROUS GASES AND OXYGEN DEFICIENCIES. REFER TO INSTRUCTION MANUAL FOR DETAILS ON PROPER VENTILATION TECHNIQUES. FOR SAFE OPERATION, YOU MUST PERIODICALLY CHECK AND TIGHTEN BOLTS AND SET SCREWS ON PROPELLER. RIPCORDER UNIT IS NOT SPARK-PROOF. DO NOT USE NEAR VOLATILE GASES.

For RIPCORDER
Smoker and
Smoke Cover

WARNING

DO NOT USE AS A VENTILATOR
If used for smoke testing, first test sewer lines for volatile gases. RIPCORDER unit is not spark-proof. Do not use near volatile gases.

The ventilation procedures on the following pages are suggestions. Other procedures may work better in certain situations. Please follow all NIOSH and OSHA recommendations and warnings to ensure your safety.

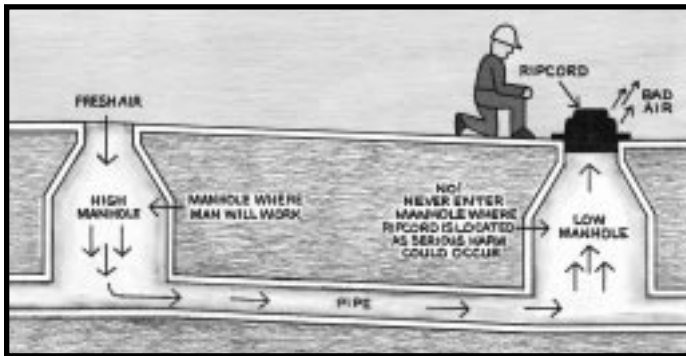
All Uses

CAUTION

**DO NOT OPERATE
WITHOUT EYE
PROTECTION**

Ripcord for Suction Ventilation

- Will draw away harmful gases and pull in fresh air for the safety of the worker.
- Two units can be used in areas of extremely high concentrations of lethal gases—one on the low manhole, one on the high manhole, and the worker is in the middle manhole.
- When used as a suction ventilator, RIPCORDER can provide up to 4130 CFM (cubic feet per minute) of fresh air to work area. SUPER RIPCORDER can provide up to 8761 CFM.



Typical set-up for suction ventilation

Operation for Suction Ventilation

1. Read all warnings on the RIPCORDER before operation.
2. Check oil and gas before starting RIPCORDER.
3. Place RIPCORDER on first manhole above or below the manhole to be worked in.
Open only the manhole where the RIPCORDER is located and the manhole to be worked in.
4. Start RIPCORDER and operate at full throttle.

Refer to chart on lower right hand side of this page for ventilation times.

It should not be necessary to block pipes entering either the manhole where the RIPCORDER is or the manhole where the worker is **if all manhole covers in the immediate area are kept closed**. In certain situations where it is impossible to stop air flow from other areas, you may need to block incoming pipes or use the blow-in feature of the RIPCORDER.

Always use a gas monitor before and during work in a confined space. Conditions can change rapidly in a confined space and may require a change in procedure to make the confined space safe.

Suction Ventilation Time

- The chart below is based on ideal circumstances. It is for the RIPCORDER model — chart for the SUPER RIPCORDER is not available.
- Variations in atmospheric conditions, plugged or partially plugged pipelines, manhole depths and diameters, and other such conditions will dictate additional ventilation time.
- It should also be noted that certain gases, such as hydrogen sulfide, are heavier than air and will require additional ventilation time.
- Under no circumstances should a person ever enter a manhole without first testing with proper testing equipment to determine if a safe environment exists.
- **NEVER** enter a manhole where RIPCORDER is located as serious harm could occur.

Pipe Diameter	Pipe Length						
	50 ft.	100 ft.	200 ft.	300 ft.	400 ft.	500 ft.	1,000 ft.
4"	.41	.42	.44	.46	.47	.49	.58
6"	.21	.22	.22	.26	.28	.30	.40
8"	.16	.17	.17	.22	.24	.27	.39
10"	.13	.14	.14	.20	.23	.26	.41
12"	.11	.13	.13	.20	.23	.27	.45
15"	.11	.13	.13	.23	.28	.33	.58
18"	.11	.14	.14	.28	.35	.42	.76
21"	.12	.16	.16	.34	.43	.52	.96
24"	.13	.18	.18	.41	.52	.63	1.19
27"	.14	.21	.21	.48	.62	.75	1.44

Minutes or fractions required

Time to accomplish one complete air change in two 48" x 96"-deep manholes and a sewer line of the diameter and length indicated when operating the unit at 3600 RPM. The above chart is based on the RIPCORDER model. Chart for SUPER RIPCORDER model is not available.

SAFETY FIRST! Simply opening manholes to air them out will not insure a safe work environment. **ALWAYS ventilate and test** your work area before entering any confined space. **Refer to these NIOSH recommendations for confined space entry:**

- Always test confined spaces for oxygen content and the presence of toxic or flammable gases or vapors before entry. This would mean an oxygen supply of at least 19.5%, flammable range less than 10% of the lower explosive limit, and an absence of toxic air pollutants.

For further information concerning confined space entry, write to: Publications Dissemination, National Institute for Occupational Safety and Health, 4676 Columbia Parkway, Cincinnati, OH 45226-1998, or call 1-800-356-4674 or visit their website at www.cdc.gov/niosh

- Test the air quality of the confined space. Ventilate with the proper ventilation equipment, then test again before entry.
- No one should ever enter a confined space without an observer posted outside with the appropriate rescue equipment (safety belt/harness, lifeline, respirators, etc.).
- Contractors should also ensure that all subcontractors they employ have a safety program which addresses the hazards to which they will be exposed. All employees at the work site should be trained.

Ripcord for Blow-in Ventilation



RIPCORDER assembled for blow-in ventilation

- For use in areas where suction ventilation is not practical or blow-in ventilation is more desirable.
- Can be used in combination with suction ventilation—use suction ventilation to clear the work area of harmful gases, then blow in fresh air.
- **Ventilation hose must go all the way to the bottom of the manhole for proper ventilation.**
- It is important to understand that some gases or vapors are heavier than air and will settle to the bottom of a confined space. Also, some gases are **lighter** than air and will be found around the top of the confined space. Therefore, it is necessary to test all areas (top, middle, bottom) of a confined space with properly calibrated testing instruments to determine what gases are present.

NEVER trust your senses to determine if the air in a confined space is safe. You CANNOT see or smell many toxic gases and vapors, nor can you determine the level of oxygen present. Follow the NIOSH recommendations listed above.

Operation for Blow-in Ventilation

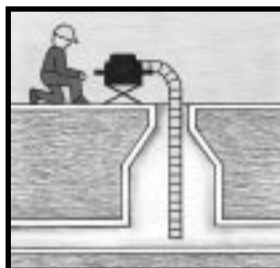
1. Read all warnings on the RIPCORDER before operation.
2. Check oil and gas before starting the RIPCORDER.
3. Place RIPCORDER on folding stand. Slide fiberglass cowl on front of RIPCORDER and secure with wing nuts. (See back cover.)
4. Attach the vent duct to the fiberglass cowl and lower to the bottom of the manhole.

Refer to the NIOSH recommendations and safety information on this page.

5. Start RIPCORDER and operate at full throttle.

Ventilation times will vary. **Use your gas monitor to determine if the confined space is safe.**

Always use a gas monitor before and during work in a confined space. Conditions can change rapidly in a confined space and may require a change in procedure to make the confined space safe.

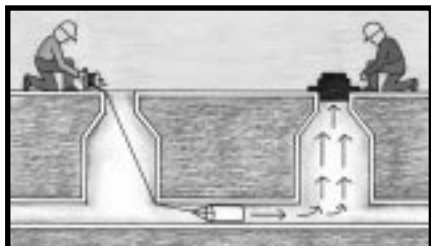


RIPCORDER provides up to 2100 CFM as a blow-in ventilator. SUPER RIPCORDER provides up to 4500 CFM.

RIPCORD for Pipeline Stringing

Operation for Pipeline Stringing

1. Read all warnings on the RIPCORD before operation.
2. Check oil and gas before starting the RIPCORD.
3. Remove manhole covers on section to string and set RIPCORD on one manhole. Insert parachute in pipe in opposite manhole.
4. Start RIPCORD and operate at full throttle. Parachute will inflate and start moving.



Parachute will stop when it reaches manhole with RIPCORD.

Read all warnings and follow NIOSH and OSHA regulations before entering a confined space.

Other Important Information on Operating the RIPCORD

1. It should not be necessary to plug other pipes in manhole when using RIPCORD.
2. **DANGER!! Never run RIPCORD on the ground—suction may cause objects to fly in operator's face. Run only when inserted in the manhole. Only operate with eye protection.**
Never enter manhole where RIPCORD is located as serious harm could occur. Refer to warning labels on the RIPCORD unit.
3. If parachute does not inflate, try starting it deeper in the pipe. If the parachute does not move, your problem may be a plugged line or a line with too many areas to draw air from: (i.e. too many lateral connections in a run, broken or damaged pipe, too many open manhole covers, etc.)

RIPCORD for Smoke Testing

Operation for Smoke Testing

1. Read all warnings on the RIPCORD before operation.
2. Check oil and gas before starting the RIPCORD.
3. Remove manhole covers on section to smoke test. Plug pipes and bypass if necessary to isolate the section being tested.
4. Replace all covers except the one where the RIPCORD Smoker is located.
5. Start RIPCORD and operate at full throttle.
6. **For RIPCORD LiquiSmoke Tester Operation:** Warm RIPCORD for about 1 minute.

Fill LiquiSmoke container. Place pump into tank opening and rotate clockwise until tightly locked and sealed in tank opening.

To pressurize LiquiSmoke container, disengage handle 1/4 turn and then pump plunger up and down until it works hard. Pumping too hard will damage plunger!

WARNING: The LiquiSmoke container is now under pressure and DANGEROUS. Always wear eye protection when using this container.

To start smoke: Turn knob on calibrated needle valve to left (counter clockwise) and line up the red line on the knob with the center line on the valve body. **NOTE:** This setting may need to be varied slightly depending on your location. If it appears that raw fluid is coming out of the exhaust, turn knob clockwise just slightly to reduce flow. If you are not getting enough smoke, turn knob counter clockwise just slightly to increase flow. The burn rate on the LiquiSmoke should be around 36-45 minutes per gallon.

To turn off smoke: Rotate knob on needle valve clockwise until tight.

To release pressure, lift up ring on relief valve located on top of canister. **WARNING: To avoid possible injury, never open canister without first releasing pressure.**

WARNING! Smoke testing can be dangerous. Do not use in areas of volatile gases. Do not allow a person in the section of pipe being tested.

Notify the fire department and all local residents of your plans before you start smoke testing.

Rules and regulations concerning smoke testing may vary from area to area. Be sure to check your local regulations before starting.

RIPCORD Smoker Cover — for set up, follow instructions for blow-in ventilation and add smoker cover (see photo at bottom left). Set only the smoker cover on the manhole. RIPCORD can set on the ground or in the back of a stationary truck. **Do not move vehicle when RIPCORD is running.**

WARNING!

NIOSH (National Institute for Occupational Safety and Health) says: If zinc chloride smoke generating devices are used to generate dense clouds, the smoke should be considered hazardous and participants who enter the smoke should wear a self-contained breathing apparatus (SCBA). Practices like "buddy breathing" should not be conducted in these dense smoke clouds. If individuals experience any breathing difficulties, they should receive medical evaluation as soon as possible.



RIPCORD assembled with Vent Kit, Vent Duct and Smoke Kit



RIPCORD Smoker

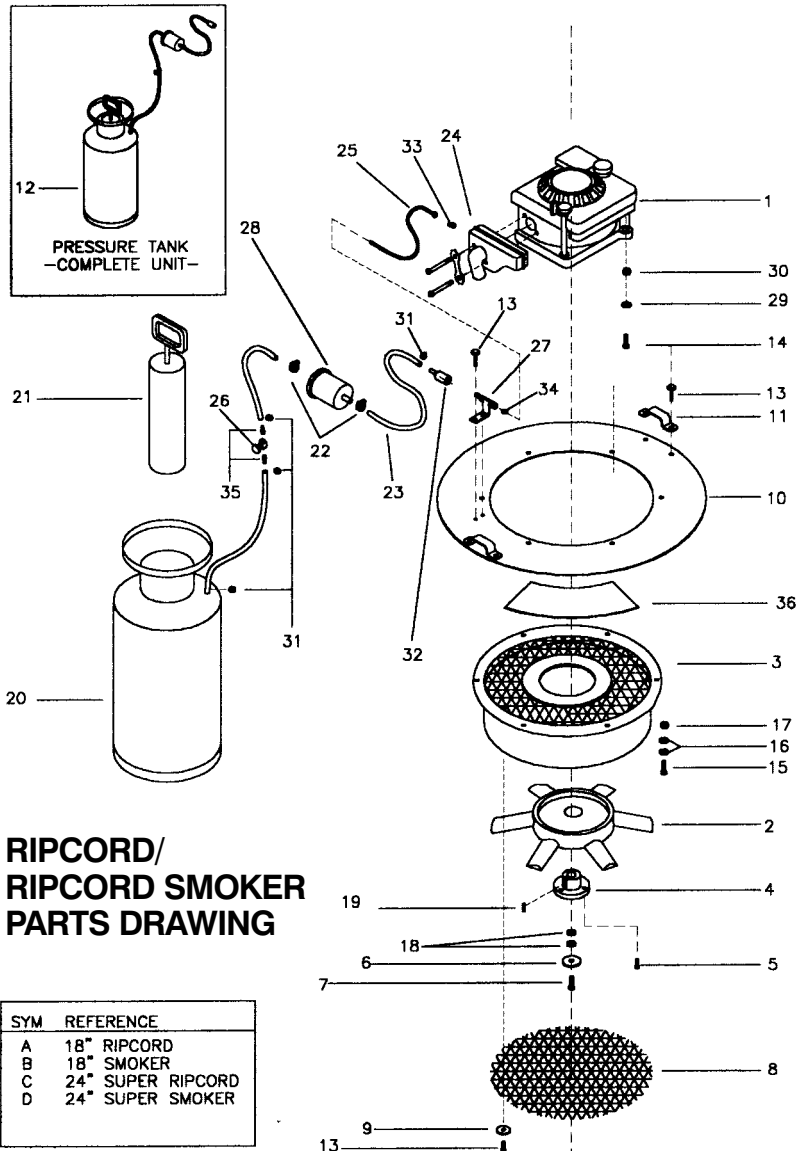
Installation Instructions for Mounting Cast Aluminum Impellers

1. Make sure engine shaft is clean and bore of bushing is clean. Clean and remove any burrs or nicks.
2. Align holes of bushing with tapered holes in impeller, being sure that keyway of shaft aligns with black balancing line on impeller when one is present.
3. Use Loc-Tite 609 on engine shaft, inside of hub and on all hub bolts.
4. When the impeller and bushing are properly placed on the engine shaft, the shaft should be approximately 1/8" to 1/4" inside the bushing. Remove spark plug wire and turn over engine and check for impeller clearance from engine mounting brackets.
5. Gradually and evenly tighten bolts rotating from bolt to bolt 1/4 turn at a time to prevent the bushing from tightening at an angle which can crack the hub. Do not attempt to use an impact wrench. All tightening must be done by hand.
6. Special bolts are furnished with the bushings when shipped from our factory. Do not attempt to use bolts other than those supplied because their use could result in stripped bolt holes in the impeller.
7. Do not use torque instructions on the box provided with the bushings. These specifications are designed for mounting cast iron, not aluminum. Recommended torque for taper-lock bushings on impeller is 10 ft. lbs.
8. **CAUTION:** Do not attempt to pull the head of the bushings flush with the casting. There should be a clearance of 1/8" to 1/4" when the bushing is properly tightened. In no case should the impeller be used if the bushing head is in contact with the impeller.
9. Install center bolt and washer and tighten. Use Loc-Tite on center bolt.

PLEASE NOTE: Use care when removing existing impeller. Damage caused by removal or installation is not covered under warranty!

PARTS LIST FOR RIPCORD AND SUPER RIPCORD

REF. NO.	NO. REQ'D.	DESCRIPTION	PART NO.
1A	1	Briggs & Stratton engine (5HP)	4300-101
1B	1	Honda engine (5HP)	4300-102
1C&D	1	Tecumseh engine (8HP)	4300-201
2A	1	Impeller	PRP18
2B	1	Impeller	PRP18S
2C	1	Impeller	PRP24
2D	1	Impeller	PRP24S
3A&B	1	Frame assembly	4300-103
3C&D	1	Frame assembly	4300-202
4A&B	1	Browning taper lock bushing (7/8" shaft)	4300-104
4C&D	1	Browning taper lock bushing (1" shaft)	4300-203
5	3	Bushing bolt	902
6	1	Flat washer	901
7	1	Center bolt	4300-106
8A&B	1	Bottom protection screen	4300-107
8C&D	1	Bottom protection screen	4300-225
9	6	Fender washer	904
10A	1	Flange	4300-108
10B	1	Flange	4300-109
10C	1	Flange	4300-207
10D	1	Flange	4300-208
11	2	Handle	909
12	1	Ripcord LiquiSmoke pressure tank (complete)	4300-300
13	12	1/4" self-tapping bolts	903
14A&B	4	Briggs & Stratton engine bolt	4300-118
14A&B	4	Honda engine bolt	4300-119
14C&D	4	Tecumseh engine bolt	911
15	6	Flange bolt	906
16	12	Flat washers	907
17	12	Nyloc nut	908
18	2	Flat washers	4300-120
19A&B	1	Key stock (Briggs & Stratton engine)	4300-105
19A&B	2	Woodruff Keys (Honda engine)	4300-110
19C&D	1	Key stock (Tecumseh engine)	4300-204
20	1	LiquiSmoke pressure tank (body only)	4300-301
21	1	LiquiSmoke pressure tank (plunger only)	4300-333
22	2	Hose clamps	4300-334
23	1	Hose	4300-302
24A&B	1	Muffler kit (Briggs & Stratton engine)	4300-306A
24A&B	1	Muffler kit (Honda engine)	4300-308A
24C&D	1	Muffler kit (Tecumseh engine)	4300-307A
25B	1	LiquiSmoke tubing (Briggs & Stratton engine)	4300-314
25B	1	LiquiSmoke tubing (Honda engine)	4300-328
25D	1	LiquiSmoke tubing (Tecumseh engine)	4300-329
26	1	LiquiSmoke valve	4300-303
27	1	Quick coupler mount	4300-309
28	1	In-line filter	4300-335
29	4	Flat washer	907
30	4	Nyloc nut	910
31	4	Crimp hose clamps	4300-330
32	1	Quick coupler	4300-304
33	1	1/4" tube compression fitting	4300-311
34	1	1/4" tube compression fitting	4300-312
35	2	3/8" hose nipple	4300-310
36	4	Rubber seal	4300-111



A=18" RIPCORD, B=18" SMOKER, C=24" SUPER RIPCORD, D=24" SUPER SMOKER

RIPCORDER Specifications

CFM specifications based on laboratory test. Copies available by request.

For Suction Ventilation

RIPCORDER: 6211 CFM @ 0.001 static pressure (**FREE AIR**) (SUPER RIPCORDER: 12,987 CFM)

RIPCORDER: 5632 CFM @ 1.000 static pressure (SUPER RIPCORDER: 12,101 CFM)

RIPCORDER: 4130 CFM @ 3.000 static pressure (SUPER RIPCORDER: 8761 CFM)

For Blow-in Ventilation

RIPCORDER: Up to 2100 CFM (SUPER RIPCORDER: Up to 4200 CFM)

Engine Options

RIPCORDER: Briggs & Stratton 5HP Quantum Industrial/Commercial Engine
or Honda 5HP Overhead Valve Engine

SUPER RIPCORDER: Tecumseh 8HP Industrial/Commercial Engine

Refer to engine manual for warranty information and maintenance instructions.

Other Options

Stringer Kit—Includes rope reel and parachute for line stringing.

Vent Kit—Attachment that allows the RIPCORDER to be used as a blower.

Smoke Kit—The Smoke Kit is used in conjunction with the Vent Kit to smoke test sewer lines.

Vent Duct—Vent Duct can be used for both the Vent Kit and the Smoke Kit

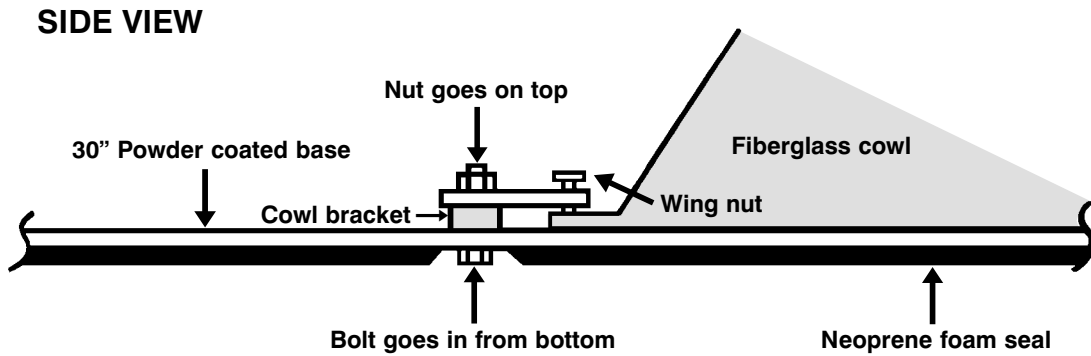
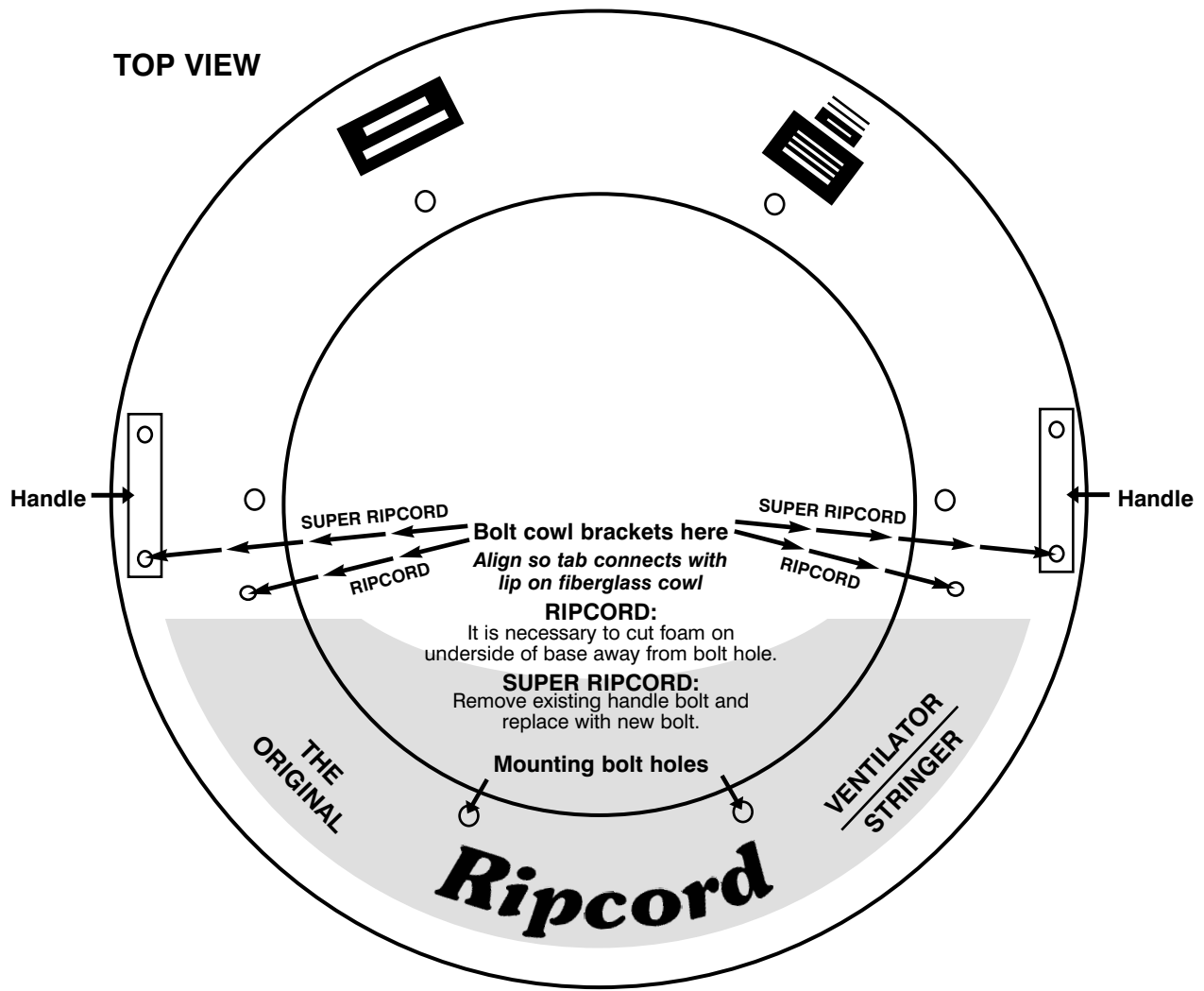
RIPCORDER Smoker—This is a RIPCORDER with a reverse pitch impeller and is set up specifically for smoke testing of sewer lines. In this configuration, the RIPCORDER cannot be used for ventilation. Smoke Kit is not needed with smoker.

LIMITED WARRANTY

For a period of one year from the date of purchase, HURCO Technologies, Inc. will replace to the original purchasers, free of charge, any part or parts of the RIPCORDER unit, excluding the engine, found to be defective in material or workmanship or both; this is the exclusive remedy. All transportation charges on parts submitted for replacement under this Warranty must be borne by the purchaser. The engine is warranted as outlined by the engine manufacturers limited warranty only. THERE IS NO OTHER EXPRESS WARRANTY. IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO ONE YEAR FROM THE DATE OF PURCHASE AND TO THE EXTENT PERMITTED BY LAW. ANY AND ALL SUCH IMPLIED WARRANTIES ARE EXCLUDED. LIABILITY FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES UNDER ANY AND ALL WARRANTIES ARE EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW.

12/00

Installation of Mounting Brackets for RIPCORD Vent Kit



HURCO

TECHNOLOGIES, INC.

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