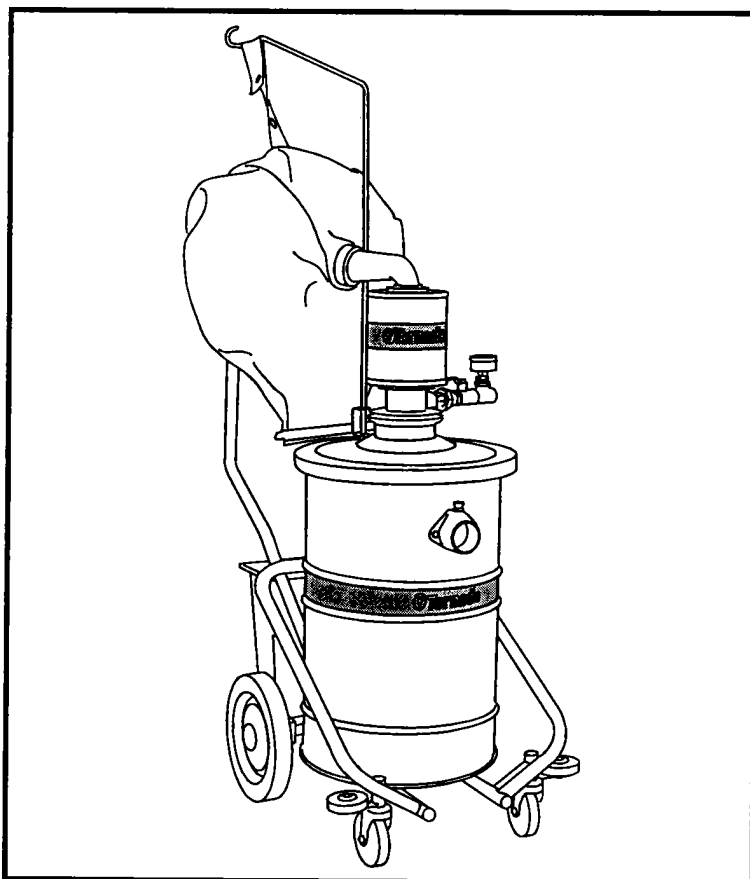


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Tornado®

Operation & Maintenance Manual For Commercial Use Only

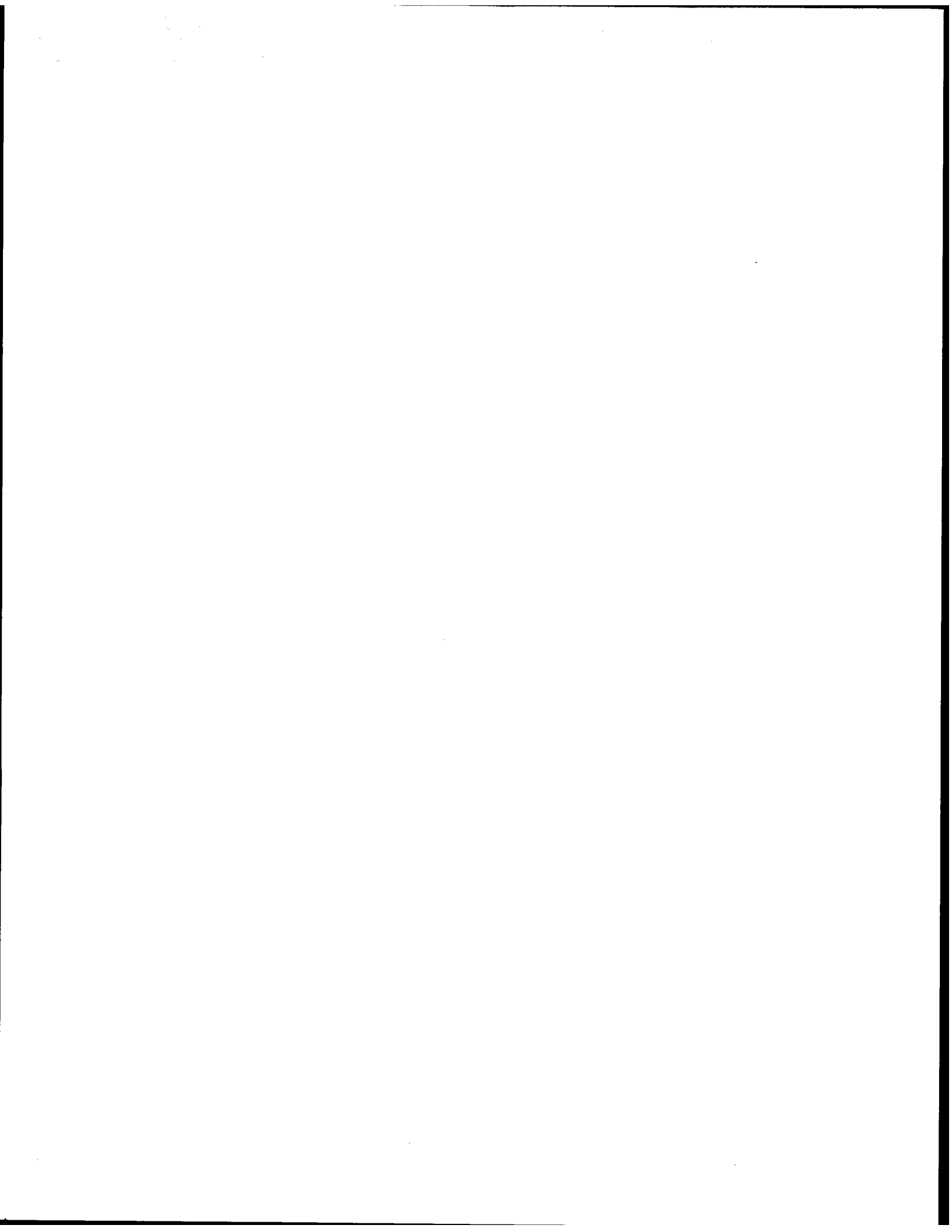


MODEL
95953

**18 GALLON EXTERNAL
FILTER AIR VACUUM**

L2730A B/T 2/99 FOR COMMERCIAL USE ONLY

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Tornado 18 Gallon External Filter Air Vacuum

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Features:

- Capable of simultaneous wet/dry pickup when using external filter.
- Ideal for materials from powder to oil covered metal chips, grindings and shavings.
- 3/16" (5mm) jets installed. 7/32" (5.5mm) and 1/4" (6mm) jets are included for heavier debris.
- 90 p.s.i at the gauge (valve fully open) allows for maximum pickup power.
- 60 p.s.i. at the gauge (valve fully open) allows for lighter liquid pickup power.

Tornado 18 Gallon External Filter Air Vacuum

General Specifications

This industrial Wet/Dry Vacuum is powered by compressed air. The patented Venturi Powerhead has no moving parts, thus eliminating any risk of creating sparks. This unit is covered by a 10 year warranty and requires no maintenance. The stainless steel tank has a 5 year warranty. This vacuum will pick up wet or dry waste simultaneously without changing any filters. It will efficiently pick up items ranging from light powders to heavy-grade viscosity liquids. The convenient tip and pour tank makes emptying of wet and dry material easy. The steel carrier protects the stainless steel tank and has a basket for attachment storage. Large rear wheels and front 360 degree swivel caster wheels make operation and transportation easy. Unit accepts 1.5" to 2" hoses and attachments. Options include a wide variety of 1.5" and 2" hoses and attachments, and #90573 Liquid Shut Off.

Unit Specifications

95953 INCLUDES:

- 95993 Venturi Powerhead (External Filter) (1)
- 98186 4 Wheel Steel Carrier (1)
- 90377 1268 sq. in. Poly Filter (1)
- 95996 Medium Filter Support Rod (1)
- 95991 Single Head Line Connector (1)
- 98850 16 Gallon Tank Cover (1)
- 92650 18 Gallon 22 gauge Stainless Steel Tank (1)

EXTERNAL FILTER AREA	1268 sq. in.
HORIZONTAL RECOVERY (reach)	30 ft.
VERTICAL RECOVERY (lift)	15 ft.
REQUIRED COMPRESSOR	15 h.p.
AIR LINE AND COUPLINGS	1/2" I.D. (minimum)
COLOR	Tornado Grey
WEIGHT	54 lbs.
TANK SIZE	18 Gal. Stainless Steel
3/16" JET (installed) w/1.5" HOSE	82 CFM/185" Static Waterlift
3/16" JET (installed) w/2" HOSE	79 CFM/185" Static Waterlift
COMPRESSOR CFM	47 @ 90 p.s.i.
7/32" JET (included) w/1.5" HOSE	73 CFM/223" Static Waterlift
7/32" JET 2" HOSE	74 CFM/223" Static Waterlift
COMPRESSOR CFM	61 @ 90 p.s.i.
1/4" JET (included) w/1.5" HOSE	70 CFM/242" Static Waterlift
1/4" JET 2" HOSE	67 CFM/242" Static Waterlift
COMPRESSOR CFM	76 @ 90 p.s.i.

Tornado 18 Gallon External Filter Air Vacuum

Tornado® Standard Warranty Program*

10 Years: All plastic tanks and rotationally-molded bodies

2 Years: Parts and Labor on all Tornado and Tornado/Karcher cleaning equipment **

1 Year: Warranty on batteries, one full year, not pro-rated.

Warranties do not cover components subject to normal wear or abuse and misuse, and have other limitations not specified here. For full details, contact your Authorized Tornado Distributor, Service Center, or the Tornado Technical Service Department.

* Effective January 1st, 2000. Terms subject to change without notice.

** Windshear™ Blower-Dryer, Insulation Blowers, CW 50, CW 100, and Duo Upright Carpetkeepers™ are warranted for 1 (one) year for parts and labor.

Tornado 18 Gallon External Filter Air Vacuum

Safety Instructions

When using this unit, basic precautions should always be followed. Read all instructions before using this unit.



WARNING: To reduce the risk of fire, electric shock or injury:

Do not leave machine unattended when running. Turn off when not in use.

Before attempting any maintenance or adjustment, disconnect air lines.

Do not expose to rain.

Do not allow to be used as a toy. Close attention is necessary when used by or near children.

Use only as described in this manual. Use only manufacturer's recommended attachments.

If machine is not working as it should, has been dropped, damaged, left outdoors, or dropped into water, return it to a service center.

Keep hair, loose clothing, fingers, and all parts of body away from openings and moving parts.

Turn off all controls before disconnecting air lines.

Do not put any object into openings. Do not use with any opening blocked. Keep openings free of dust, lint, hair, and anything that may reduce air flow.

Do not pick up anything that is burning or smoking, such as cigarettes, matches, or hot ashes.

Do not pick up flammable or combustible liquids, such as gasoline, or use machine where they may be present.

Do not use without filters in place.

Use extra care when cleaning on stairs.

Always replace worn or torn external filters immediately. This will prevent possible injury due to flying objects.

Never operate with intake unguarded. Strong suction will pull fingers and/or clothing into hose and other parts.

Always wear safety glasses when in vicinity of this unit.

Never operate above 100 p.s.i. (8 BAR) pressure.

Always turn off your air line supply at the drop before disconnecting the air line.

Tornado Model 98690 18 Gallon External Filter Air Vacuum w/Accessories



WARNING: Failure to adhere to these instructions could result in serious bodily injury or property damage.

BEFORE OPERATING MACHINE:

Read this manual completely before attempting to operate machine. This manual has important information for the use and safe operation of the machine. Keep this manual on file and handy. If additional information is needed, please contact your local distributor or write to:

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Tornado 18 Gallon External Filter Air Vacuum

Head Assembly Setup and Operation

ASSEMBLY OF HEAD UNIT AND DRUM

1. Remove all components from package. NOTE: The carrier, tank, and tank cover assembly all come pre-assembled to each other.
2. The Venturi Powerhead comes already attached to the tank cover. To detach, remove the unit air connector, then turn powerhead counterclockwise and it will unlock from tank cover.
3. Install external filter support rod by placing in access bracket located on tank cover.
4. Attach external filter by attaching to filter support rod and installing inlet collar onto exhaust nozzle. Turn collar clockwise to lock. Do not twist filter.

MAINTENANCE OF EXTERNAL FILTER

For maximum operating efficiency and to insure longer wear, remove filter and empty by detaching the bottom clamp after every use.

Empty and clean vacuum, filter, and attachments after each days use for maximum performance.

STARTING/STOPPING MACHINE

1. Connect air supply line to head line connector.
2. Start vacuum by turning air valve located on line connector to its ON position.
3. Stop vacuum by turning air valve located on line connector to its OFF position.

OPERATING RULES

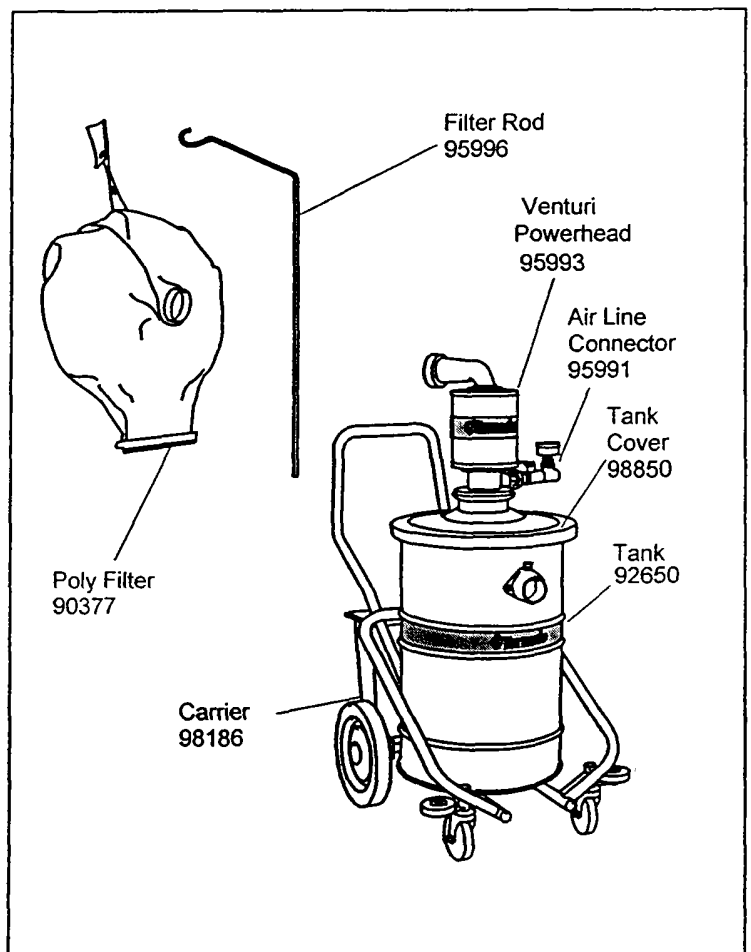
Use 1.5" to 2" I.D. hoses and attachments.

Use 1/2" I.D. air line hose and flow-thru quick connects (do not use ball style fittings).

90 p.s.i. (7 BAR) at gauge (valve open) for maximum pickup power, 60 p.s.i. (5 BAR) at gauge (valve open) for lighter debris recovery.

Use to recover water, heavy oils, powders, grindings, and metal shavings.

Use Tornado #94655 Add-A-Tank system when recovering fine dry powders. Grounding and static discharge are required when recovering powders. Use TORNADO brand static conductive hoses (urethane or neoprene), and ground vacuum head and tank assembly to an earth ground.



Tornado 18 Gallon External Filter Air Vacuum

Troubleshooting Guidelines

<u><i>Problem</i></u>	<u><i>Remedy</i></u>
1. Machine does not operate	<p>Make sure air line valve is in ON position.</p> <p>Inspect air regulators for interference of air flow.</p> <p>Inspect air compressor for adequate size, and verify that proper air pressure is available (60 to 90 p.s.i.)</p> <p>Inspect air line for proper size and/or damage.</p> <p>Always use flow thru connectors.</p>
2. Machine stops running	<p>Inspect tank level.</p> <p>Inspect air line for damage.</p> <p>Inspect air pressure.</p>
3. Machine has no suction	<p>Inspect for clogged hose, collapsed hose, defective tank, material too heavy for unit.</p>
4. Air pressure drops at gauge	<p>Inspect air compressor for proper free air consumption and resistance in air line size or connections.</p>
5. Machine has poor recovery	<p>Inspect for correct size hose and attachments, poor sealing, defective tank, material too heavy for unit.</p> <p>Inspect for proper tank cover seal (gasket).</p> <p>Inspect for damage and/or wear to hose and accessories.</p> <p>Inspect locked position of venturi powerhead to tankcover.</p> <p>Inspect all seals for wear and/or damage.</p>

Tornado 18 Gallon External Filter Air Vacuum

Things To Know

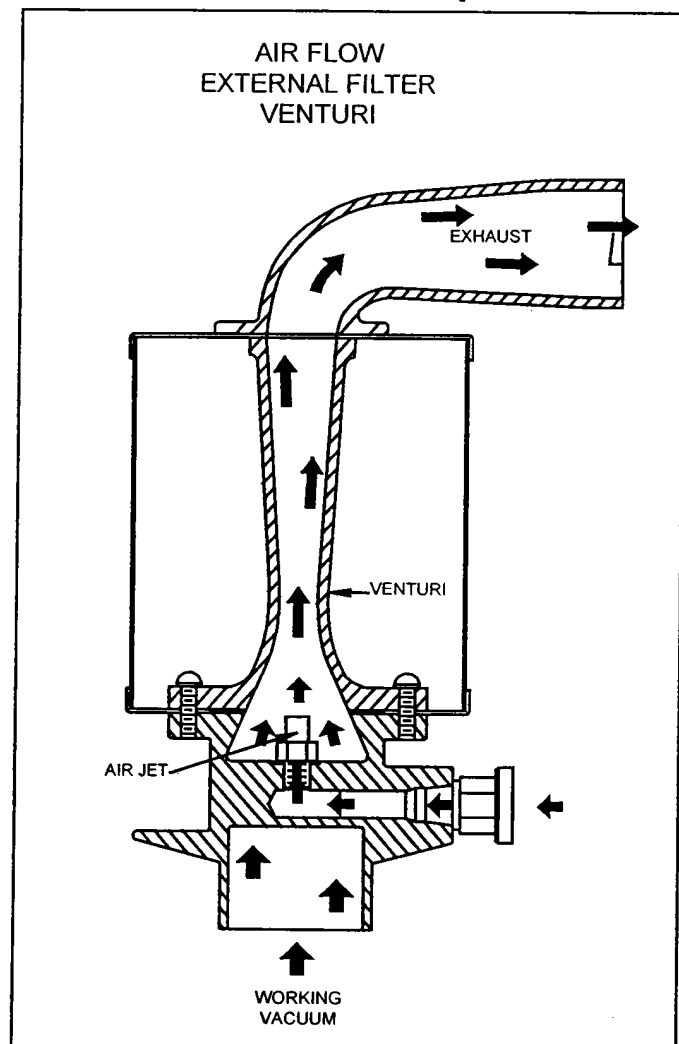
COMPRESSED AIR VACUUM FACTS

1. Use the smallest air jet possible to do the job. The smaller the jet, the lower the compressed air C.F.M. required.
2. Use a single venturi unit where liquid recovery is the primary application. A single venturi will recover liquids as fast as a double venturi will, yet consumes only one half as much compressed air.
3. Use a double venturi or quad venturi unit where higher volume of vacuum air is required. Remember, compressor overload is more likely to occur with a quad than a double venturi.
4. Use the lowest air line pressure possible per the given jet size to do the job. The lower the line pressure, the lower the compressed air consumption.
5. Air line **must** be maintained at the valve of the venturi unit. If pressure is not maintained at the unit, vacuum performance **will not** be reached. Be sure to use low line pressure for light liquid recovery, and high line pressure for liquids, sludge, and other heavy debris.
6. The air line hose should be as short as possible, and of maximum inside diameter (single 1/2", double 3/4", quad 1" recommended). Line air losses that occur are related to hose length and diameter, thus reducing performance.
7. Any air line moisture (condensation) should be eliminated. Using a water trap in the air line to the venturi unit will help maintain peak performance.
8. Air line components can reduce performance. Quick disconnect couplings and line filters, for example, may reduce compressed air delivery.
9. Factors that affect compressed air supply are compressor horsepower rating, compressor C.F.M. rating, and system resistance of installed air lines.

AIR COMPRESSOR EVALUATION

Independent of high horsepower or high compressor C.F.M. rating claims made by individuals, the final evaluation in determining if a compressor is capable of supplying enough compressed air, is to demonstrate the air vacuum with a pressure gauge at the venturi unit. This will show the actual pressure being maintained while the unit is operating (refer to fact #5). This approach will also compensate for air line system resistance losses. If the compressor cannot maintain the free air consumption necessary, the line pressure will drop. Consequently, the compressed air C.F.M. will also drop, thus reducing the vacuum or suction performance.

NOTE: The compressed air C.F.M. is not the same as the vacuum air C.F.M.



Tornado 18 Gallon External Filter Air Vacuum

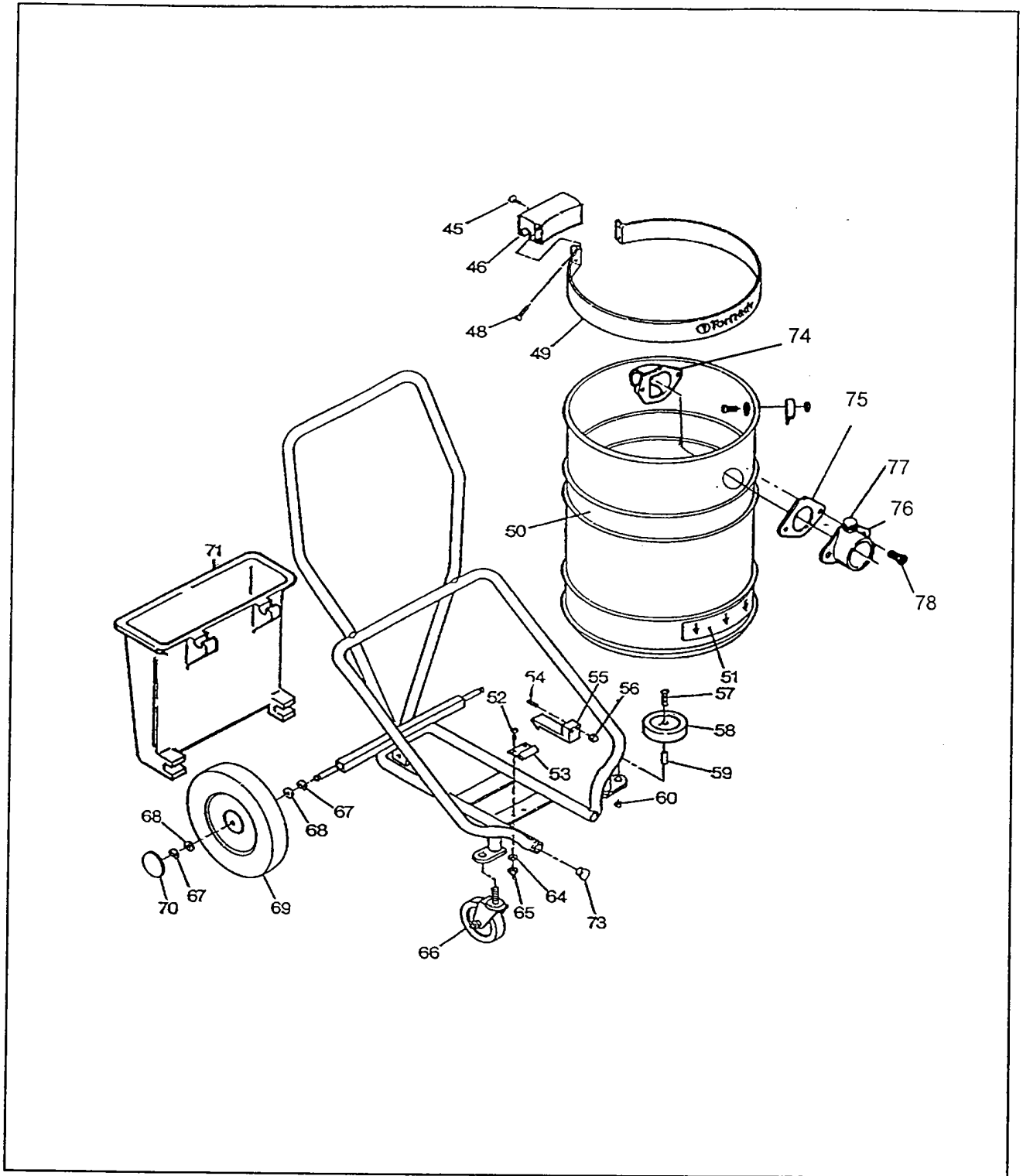


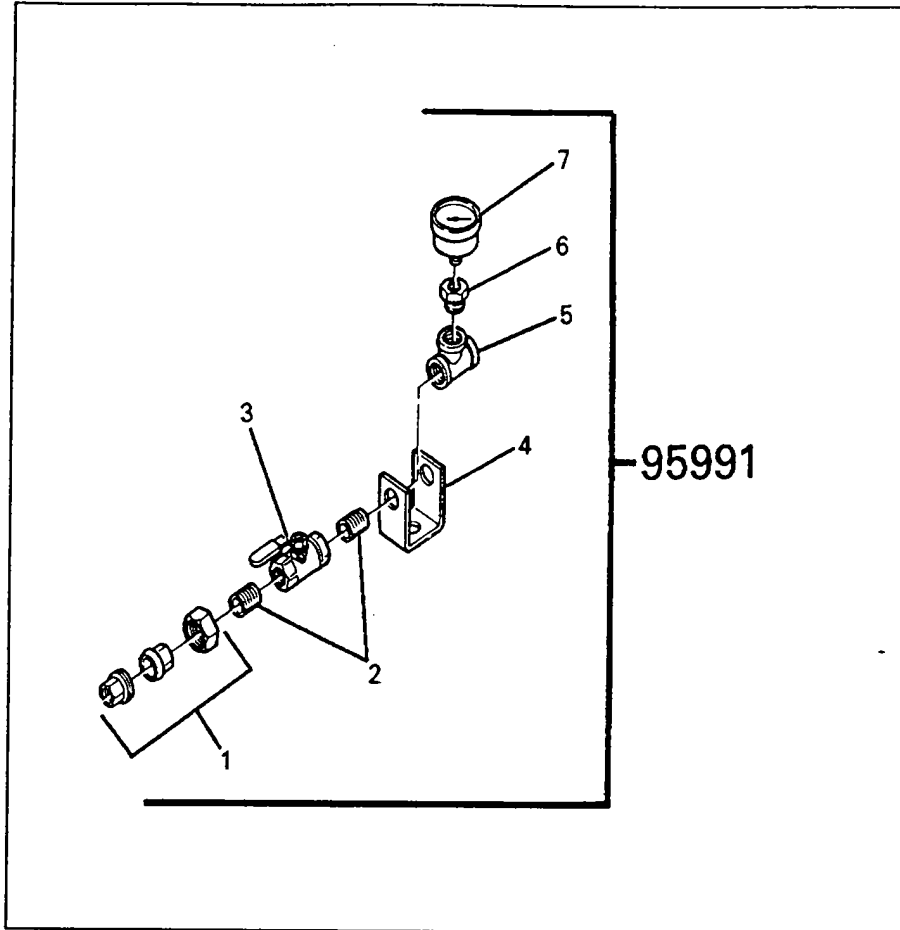
Figure No. 3 Carrier and Tank Assembly

Tornado 18 Gallon External Filter Air Vacuum

PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
45	03261	Screw 10-32X.38	1
46	17823	Pivot Block	1
48	11733	Screw 10-32X.88	4
49	18722	Tank Strap	1
18	92650	Tank, 18 gallon, Stainless w/Intake	1
50	11898	Decal	1
51	14676	Tank Decal	1
52	03660	Screw 10-24X.44	2
54	16316	Set Screw 10-24X.50	3
55	17246	Latch	1
56	02167	Nut, acorn 10-24	2
57	01978	Screw 1/4-20X1 1/2	2
58	03264	Rub Wheel	2
59	17400	Bushing	2
60	07533	Locknut 1/4-20	2
53	17247	Catch	1
65	10594	Nut, lock 10-24	2
64	00696	Washer	2
69	02661	Wheel, 10"	2
73	17784	Tube plug	4
71	17817	Tool Basket	1
68	16581	Washer 1/2	4
70	03084	Hub Cap	2
67	02663	Ring "E"	4
66	17373	Caster 4"	2
*	17784	Tube Plug	2
74	02916	Intake Deflector	1
75	02915	Gasket	1
76	02914	Intake	1
77	08080	Intake Lock Sub-assembly	1
78	00064	Screw	2

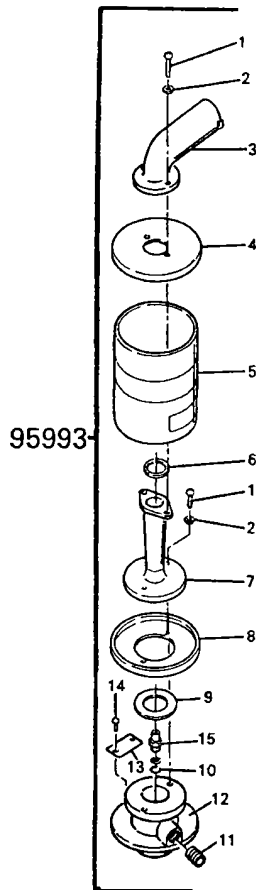
Tornado 18 Gallon External Filter Air Vacuum



(95991) CONNECTOR ASSY. SINGLE HEAD

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	06384	JOINT UNION
2	2	05730	NIPPLE
3	1	04985	VALVE
4	1	15163	BRACKET
5	1	05731	PIPE TEE
6	1	05733	PIPE BUSHING
7	1	05732	AIR PRESSURE GAUGE

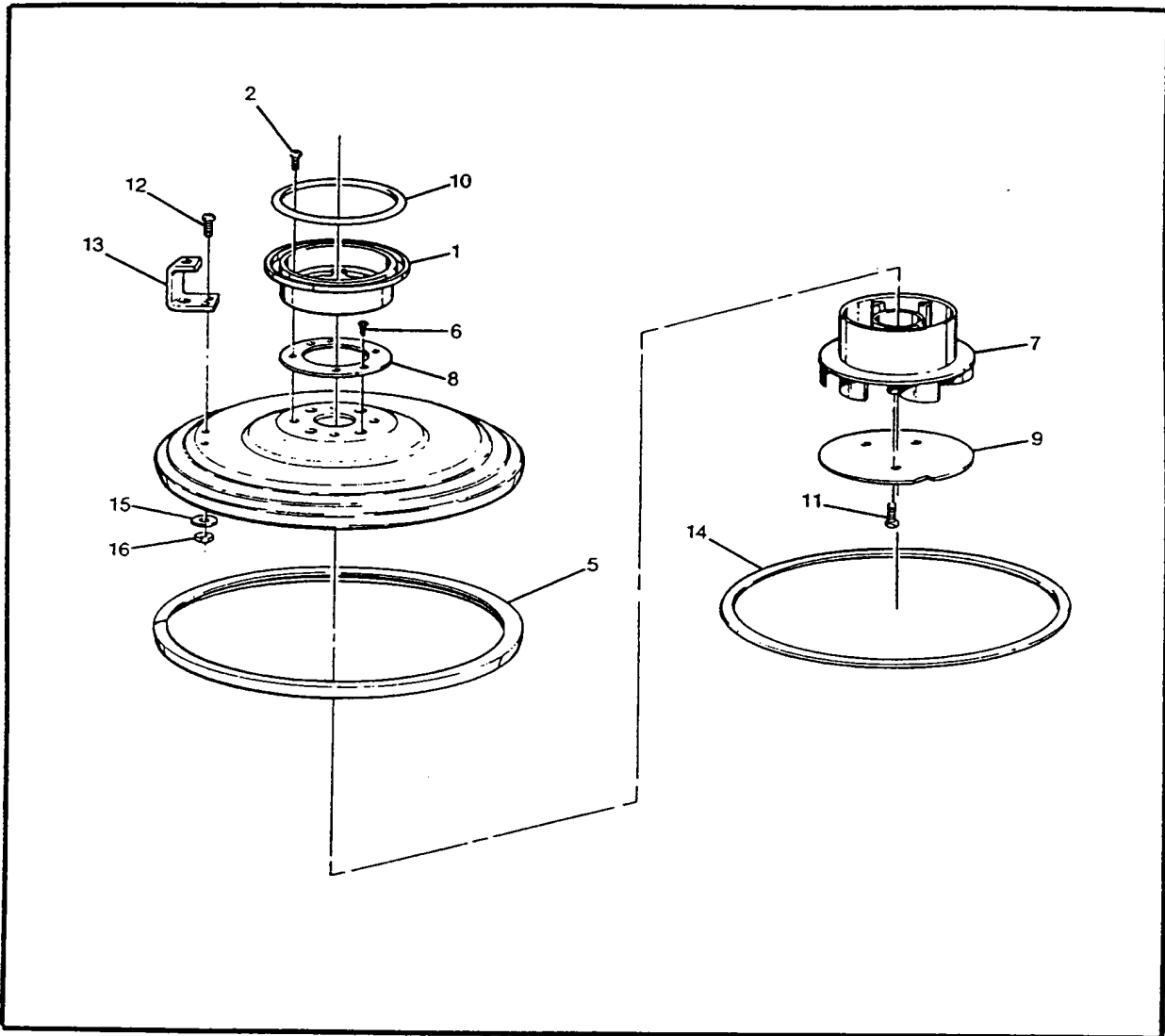
Tornado 18 Gallon External Filter Air Vacuum



(95993) EXTERNAL FILTER AIR VAC

NO.	QTY.	NO.	DESCRIPTION
1	4	02038	SCREW
2	4	01574	LOCKWASHER
3	1	05734	ELBOW-CONNECTING
4	1	05735	MUFFLER COVER
5	1	05736	MUFFLER SHELL
6	1	05737	GASKET
7	1	05723	NOZZLE
8	1	04927	MUFFLER BASE
9	1	05724	GASKET
10	3	02481	'O' RING
11	1	05730	NIPPLE
12	1	11407	BASE
13	1	04924	NAMEPLATE
14	2	02573	DRIVESCREW
15	1	04982	JET (3/16 DIA.) INSTALLED
		04983	JET (7/32 DIA.)
		04984	JET (1/4 DIA.)

Tornado 18 Gallon External Filter Air Vacuum



(98850) TANK COVER

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	90480	ADAPTOR ASS'Y
2	4	2053	SCREW
3	4	1497	NUT - WELD
5	1	11700	BUMPER
6	4	11394	SCREW
7	1	11358	INTAKE GUIDE
8	1	11386	GASKET
9	1	11366	PLATE
10	1	8004	GASKET
11	3	11390	SCREW
12	2	86	SCREW
13	1	11414	BRACKET
14	1	11356	GASKET
15	2	7741	SEALING WASHER
16	2	01604	NUT - HEX

