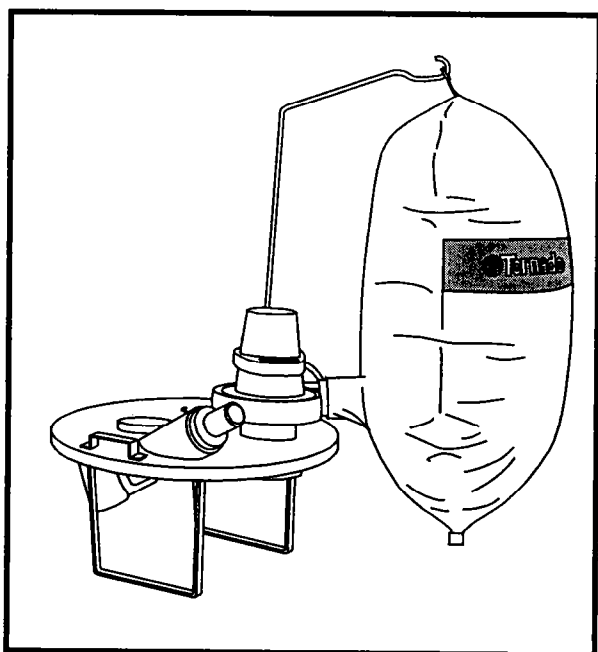


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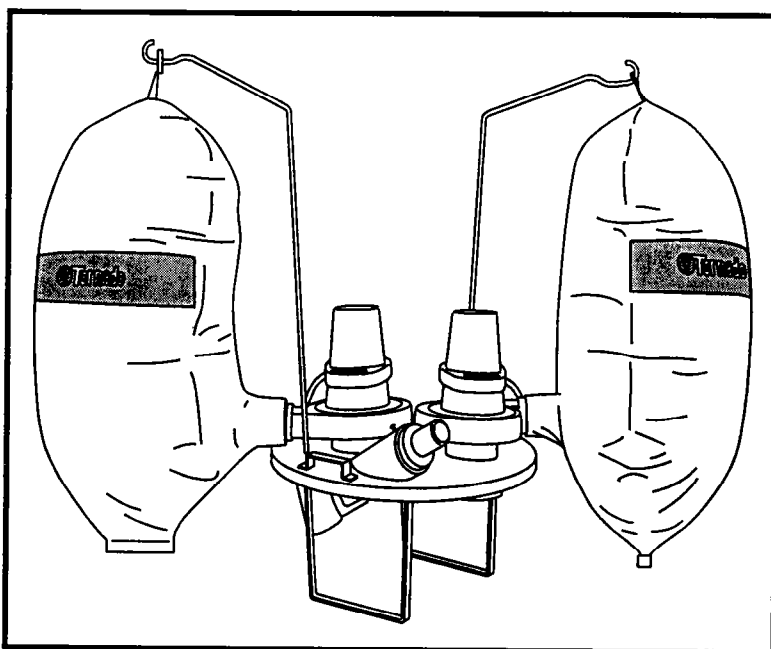


Operation & Maintenance Manual

For Commercial Use Only



MODEL
95954 (SINGLE)



MODEL
95960 (DUAL)

SINGLE AND DUAL EXTERNAL FILTER 2.25 H.P. HEAD ASSEMBLIES

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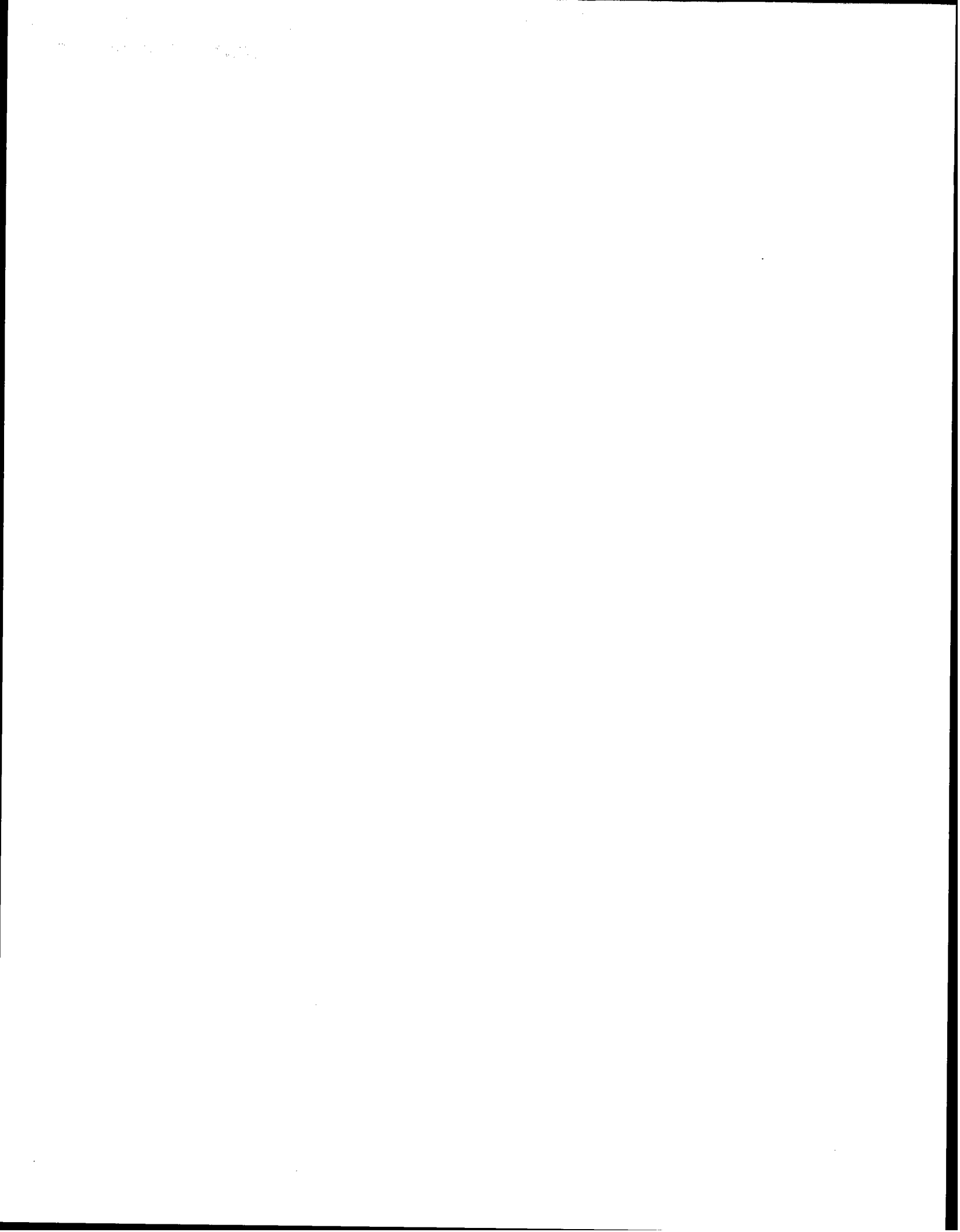


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Features:

- Capable of simultaneous wet/dry pickup when using external filter(s).
- This unit is constructed for recovering water or other solutions without any adjustments. Liquid shutoffs are available.
- Ideal for materials from powder to oily metal chips.
- Recovers fluids from water to medium weight oils.
- External filter(s) collect lighter particles and resist clogging.
- A heavy duty 55-gallon rolled top drum is required, and is available from Tornado.
- Drum collects heavier waste (approximately 95% of all pickup); light particles collect in large external filters.
- Known for high C.F.M. (cubic feet of air per minute) and moderate suction (static water-lift).

Tornado Single and Dual External 2.25 H.P. Head Assemblies

General Specifications

The Single and Dual External Head Assemblies are heavy duty wet/dry industrial vacuums. They pick up wet and dry waste simultaneously without the need to change any filters. Both units are designed to fit onto a 55-gallon rolled top steel drum (Tornado # 95942) for volume pick-up with maximum efficiency. Heavier waste settles in the drum, while lighter particles are trapped in the large external filters. The 2.25 h.p. vacuum motors create tremendous CFM for pick up power. Both units handle a wide variety of waste with ease, ranging from fine powders to medium-grade viscosity products. Accommodates 1.5" to 3" hose and attachments, depending on the model (refer to attachments section of this manual).

Unit Specifications

95954 SINGLE INCLUDES:

- 98900 2.25 h.p. Blower Motor (1)
- 90378 Large Poly External Filter (1)
- 98049 Support Rod for Large Filter (1)
- 95000 Jumbo Cover (1)
- 90442 Deflector (1)
- 90331 1.5" Hose Adaptor (1)

95960 DUAL INCLUDES:

- 98900 2.25 h.p. Blower Motor (2)
- 90378 Large Poly External Filter (2)
- 98049 Support Rod for Large Filter (2)
- 95000 Jumbo Cover (1)
- 90442 Deflector (1)
- 90332 2" Hose Adaptor (1)

	SINGLE	DOUBLE
AMPS	15	15 (per head)
RPM	15,750	15,750 (per head)
HORSEPOWER	2.25	2.25 (per head)
CFM	184 @ 1.5" hose	243 @ 2" hose, 340 @ 3" hose
STATIC WATER LIFT	51"	51"
EXTERNAL FILTER AREA	1874 sq. in.	1874 sq. in. (per head)
HORIZONTAL REACH	30 ft.	50 ft.
HOSE ADAPTOR	1.5" Included	2" Included
POWER CORD	50 ft. 14 Ga. 3 Wire	50 ft. 14 Ga. 3 Wire
COLOR	Tornado Grey	Tornado Grey
WEIGHT	84 lbs. (shipping wt.)	113 lbs. (shipping wt.)

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.

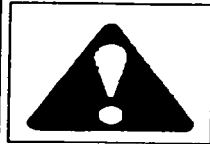
* Effective January 1st, 2000. Terms subject to change without notice.

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

Tornado Single and Dual External 2.25 H.P. Head Assemblies

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 plugged in. Unplug from outlet when not in use or attempting any maintenance or adjustment.

To avoid electrical shock, store indoors only. 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.

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

Do not pull or carry by cord, use cord as a handle, close a door on cord, or pull cord around sharp edges or corners. Do not run machine over cord. Keep cord away from heated surfaces. Do not unplug by pulling on cord. To unplug, grasp the plug not the cord. Do not handle plug or machine with wet hands.

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

Turn off all controls before unplugging.

Connect to a properly grounded outlet only. See Grounding Instructions.

Do not handle plug in appliance with wet hands.

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 blades and other moving parts.

Always point exhaust port in safe direction. Air exits blower at very high velocity.

Always wear safety glasses when in vicinity of this unit.

If unit is hand held, hold firmly when starting. High torque when starting will cause unit to jerk and cause injury and/or damage.

Use voltage and current listed on unit nameplate. When not in use, coil motor cord and place on blower unit.

Tornado Single and Dual External 2.25 H.P. Head Assemblies



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:

TORNADO INDUSTRIES (708) 867-5100
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Grounding Instructions

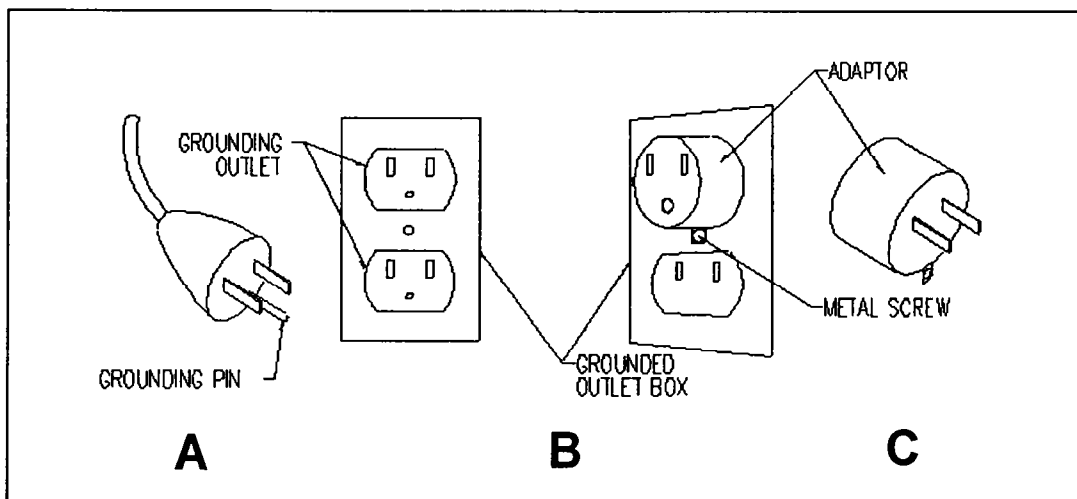


WARNING: Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service person if you are in doubt as to whether the outlet is properly grounded. Do not modify the plug provided with the appliance - if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

This appliance must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This machine is equipped with a cord having an equipment - grounding conductor and grounding plug. The plug must be inserted into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

This appliance is for use on a nominal 120-volt circuit, and has a grounding plug that looks like the plug illustrated in sketch A. A temporary adapter that looks like the adapter illustrated in sketches B and C may be used to connect this plug to a 2-pole receptacle (sketch B) if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet (sketch A) can be installed by a qualified electrician. The green-colored rigid ear, lug, or tab extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box cover. Whenever the adapter is used, it must be held in place by a metal screw.

NOTE: In Canada, the use of a temporary adapter is not permitted by the Canadian Electrical Code.



Tornado Single and Dual External 2.25 H.P. Head Assemblies

Head Assembly Setup and Operation

ASSEMBLY OF HEAD UNIT AND DRUM

1. Remove all components from package.
4. Attach blower motors(s) to Jumbo cover adapter ring(s) by turning clockwise and locking into place. Make sure exhaust nozzle(s) is facing outward.
3. Install external filter support rod(s) by placing in access hole(s) located in Jumbo cover.
4. Attach external filter(s) by attaching to filter support rod(s) and installing inlet collars onto exhaust nozzle(s). Turn collar(s) clockwise to lock. Do not twist filter.
5. Install hose adaptor onto jumbo housing. Lock in place by lining up adaptor indent with lock screw and tightening lock screw.
6. Place head unit onto drum (required accessory) by placing unit onto drum. The weight and suction power of the head unit will form a seal on the drum.

STARTING\STOPPING MACHINE

1. Plug blower motor power cord into 20 amp wall outlet.
2. Start by turning ON\OFF switch located on blower motor to ON position.
3. Stop by turning ON\OFF switch located on blower motor to OFF position.

OPERATING RULES

Use 1.5" to 3" I.D. hoses and attachments. **1.5" attachments are not recommended for dual model.**

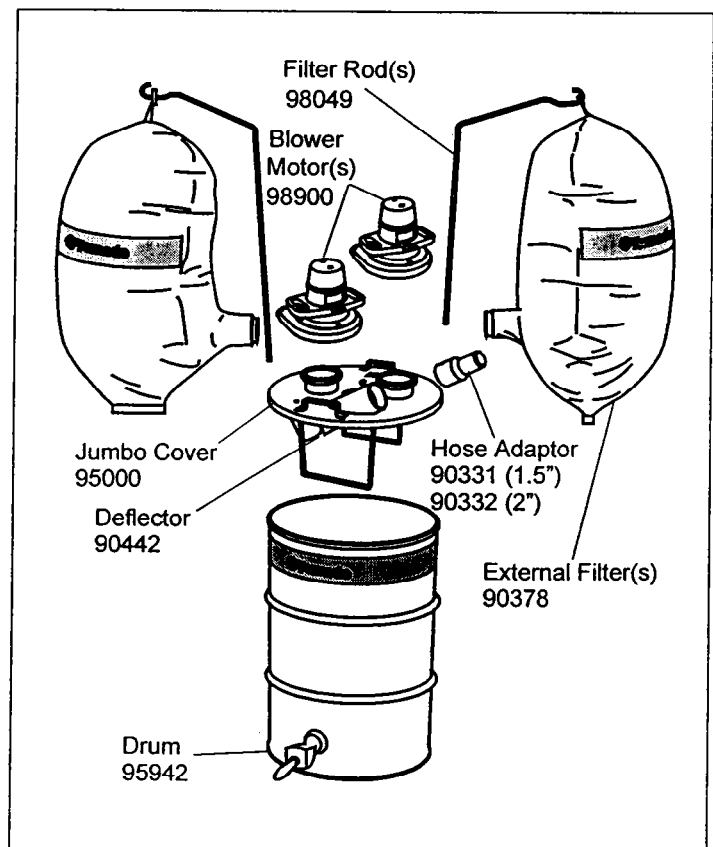
Use multiple 20 amp. outlets when operating Dual Electric Jumbo.

Use to recover water and light weight oils.

Use to recover 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 the vacuum head and tank assembly to an earth ground.

Extension cords must be equivalent to or heavier than the input cord, with a 50 foot maximum extension cord length.



Tornado Single and Dual External 2.25 H.P. Head Assemblies

Troubleshooting Guidelines

<u>Problem</u>	<u>Remedy</u>
1. Machine does not start	Make sure power cord is plugged into working receptacle. Inspect for defective power cord.
2. Machine stops running	Make sure power cord is plugged into working receptacle. Check circuit breaker, inspect for armature brush wear or defective power cord.
3. Machine has no suction	Inspect for clogged hose, clogged motor intake, collapsed hose, defective drum, material too heavy for unit.
4. Blower Motor overheats	Inspect armature brushes for satisfactory length (Refer to Maintenance section), proper motor ventilation, extension cord proper size (12-3 minimum).
5. Machine has poor recovery	Inspect for correct size hose and attachments, poor sealing, defective drum, material too heavy for unit. Inspect external filter(s). Empty and clean if necessary. Inspect for proper drum cover seal (gasket). Inspect for damage and/or wear to hose and accessories. Inspect locked position(s) of blower motor(s) to Jumbo cover. Inspect locked position(s) of external filter(s) to blower motor(s). Inspect all seals for wear and/or damage.

Tornado Single and Dual External 2.25 H.P. Head Assemblies

Maintenance

MAINTENANCE OF MOTOR UNIT

Refer to Figure No. 2.

Damage to an armature invariably is caused by permitting carbon brushes to become worn to less than 1/4" in length. To prevent this from occurring, inspect brushes after the first 200 hours of operation and frequently thereafter, replacing when necessary. Failure to do so will nullify factory warranty.

HOW TO INSPECT BRUSHES

1. Unplug blower electrical cord from outlet.
2. Remove the two screws (39) located on the top cover (7).
3. Pull back U-clip (coil spring) (30) to release carbon brush (brush card assembly) (31).
4. Remove the two brushes (31) and inspect for length.
5. Replace if necessary.

NOTE: No other maintenance of motor should be attempted during the first year after purchase (refer to warranty). Any other type of service should be performed by an authorized TORNADO service representative.

MAINTENANCE OF EXTERNAL FILTER

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

ALL OTHER MAINTENANCE

Use only three wire extension cords which have three-prong grounding type plug caps and three-pole receptacles that accept units plug. Extension cords must be the equivalent or heavier than the input cord. Replace any damaged cords.

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

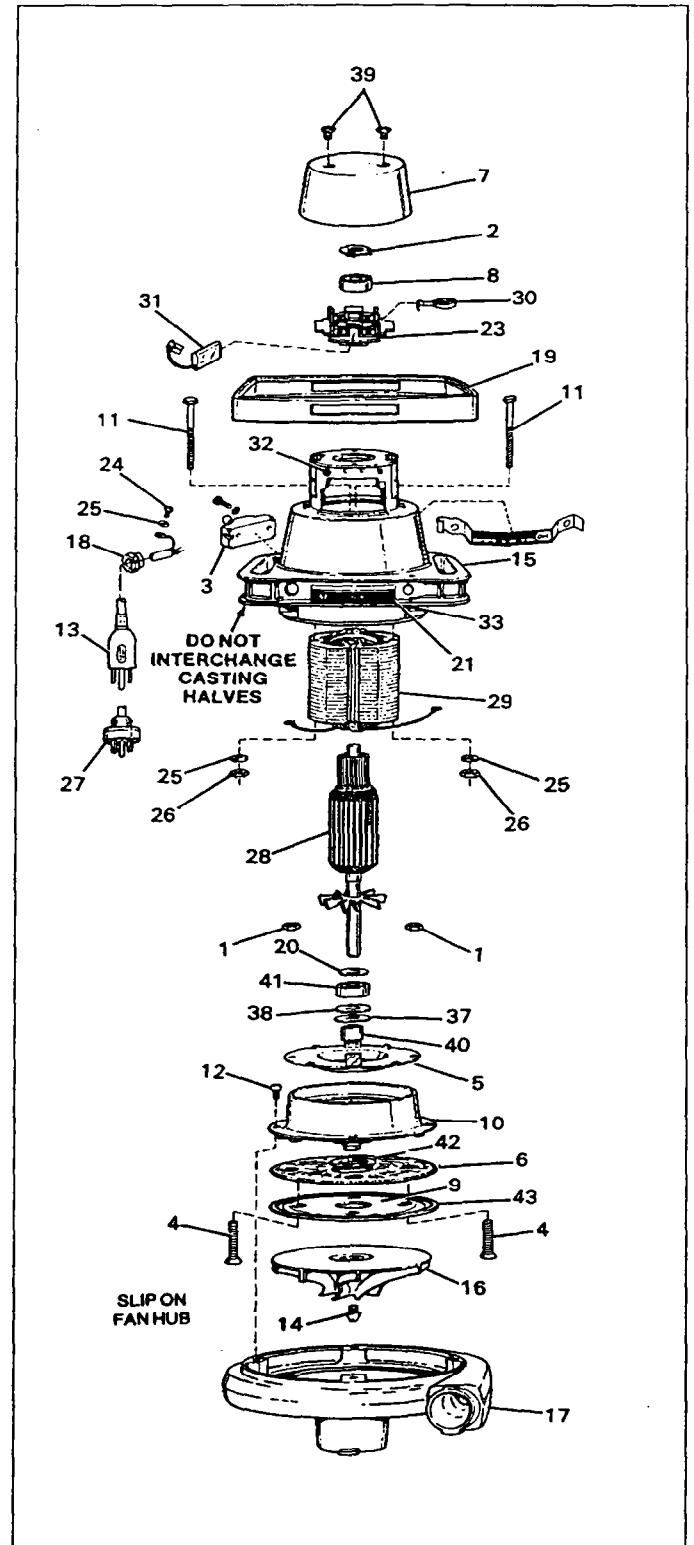
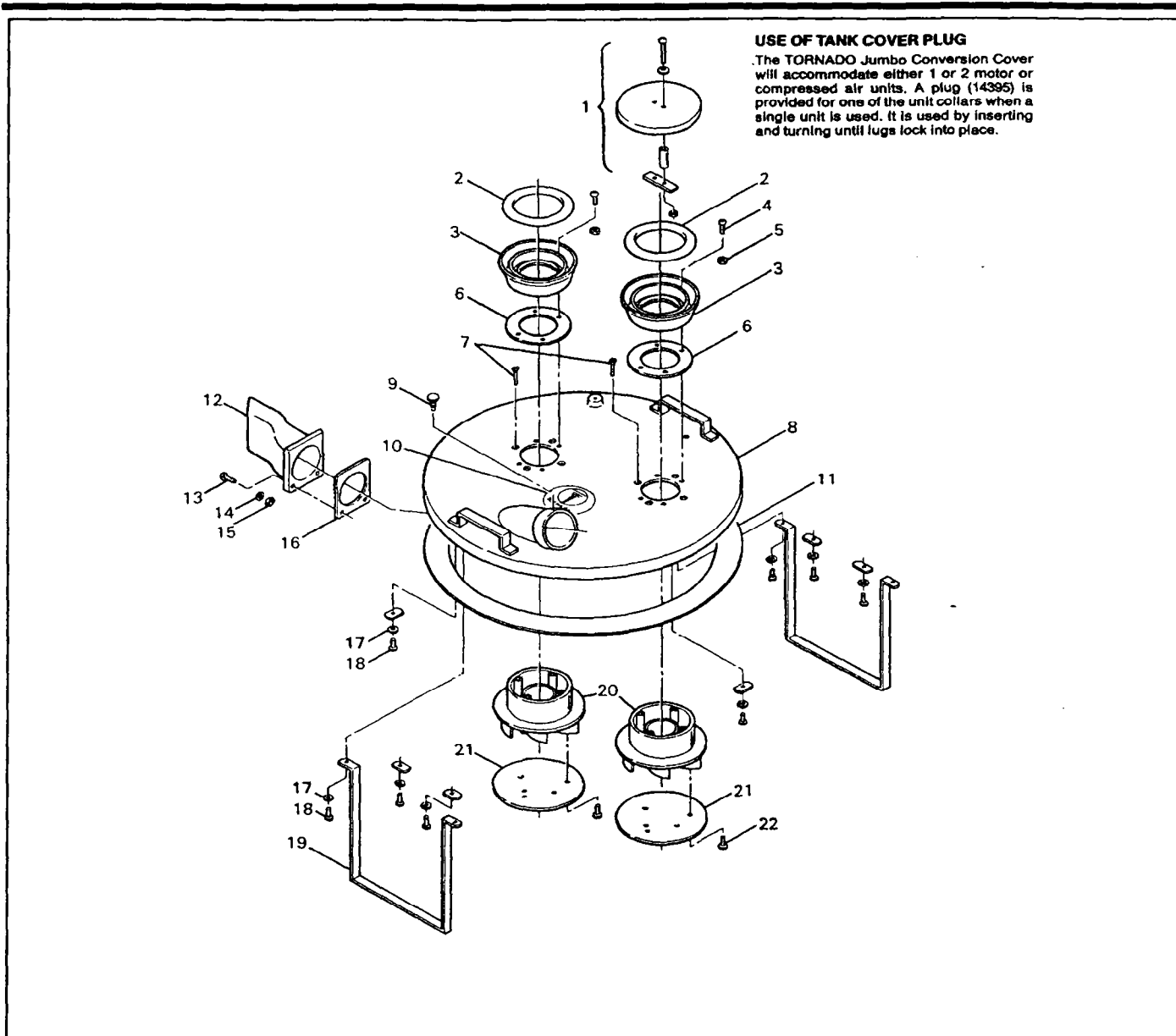


Figure No. 2 Blower Motor Assembly

Tornado Single and Dual External 2.25 H.P. Head Assemblies

ITEM NO.	CODE NUMBERS - BLOWER MOTOR ASSY.				VOLTAGE
	8800H		8900H		115V
	8801H				230V
	QTY.	PART NO.	QTY.	PART NO.	DESCRIPTION
1	4	7533	4	7533	Nut
2	1	7858	1	7858	Load Spring
3	1	8516	1	8516	Switch
4	4	11276	4	11197	Screw
5	1	11268	1	11198	Cooling Fan Baffle
6	1	11269	1	11199	Fiberglass Pad
7	1	12436	1	12436	Top Cover
8	1	11236	1	11236	Bearing
9	1	11274	1	11237	Fan Chamber Plate
10	1	12604	1	12644	Cover Plate S/A
11	2	11275	2	11239	Field Screw
12	4	11240	4	11240	Screw
13	1	11241	1	11241	Cable (115 Volt)
		11449			Cable (230 Volt)
14	1	11242	1	11242	Fan Spinner
15	1	11243	1	11243	Motor Fan Housing S/A
16	1	12605	1	12692	Fan
17	1	12641	1	12642	Fan Chamber
18	1	11252	1	11252	Strain Relief Bushing
19	1	11253	1	11253	Bumper
20	1	14322	1	14322	Ring
21	1	11900	1	11900	Nameplate (Logo)
23	1	11278	1	11278	Brush Card & Holder S/A (115 Volt)
	1	11781			Brush Card & Holder S/A (230 Volt)
24	3	7534	1	7534	Screw
25	3	1713	3	1713	Lock Washer
26	2	1477	2	1477	Nut
27	1	8220	1	8220	Plug (115 Volt)
	1	2563			Plug (230 Volt)
28	1	11270	1	11255	Armature (115 Volt)
		11272			Armature (230 Volt)
29	1	11271	1	11256	Field (115 Volt)
		11273			Field (230 Volt)
30	2	11415	2	11415	"U" Clip
31	2	11486	2	11251	Carbon Brush (115 Volt)
		11780			Carbon Brush (230 Volt)
32	2	11245	2	11245	Screw
33	4	11244	4	11244	Screw
34	1	940	1	940	Nut (Spaces Switch in Handle) Not Shown
35	1	5773	1	5773	Nut (Holds Switch to Handle) Not Shown
36	2	11570	2	11570	Brush Spg & Damper S/A
37	1	12602	1	12602	Felt Washer
38	1	12603	1	12603	Split washer
39	2	12439	2	12439	Screw
40	1	12601	1	12601	Bushing
41	1	11556	1	11556	Bearing
42	1	11555	1	11555	Gasket
43	1	11562	1	11563	Gasket
46	2	13022	2	13022	Brush Holder Pad

Tornado Single and Dual External 2.25 H.P. Head Assemblies

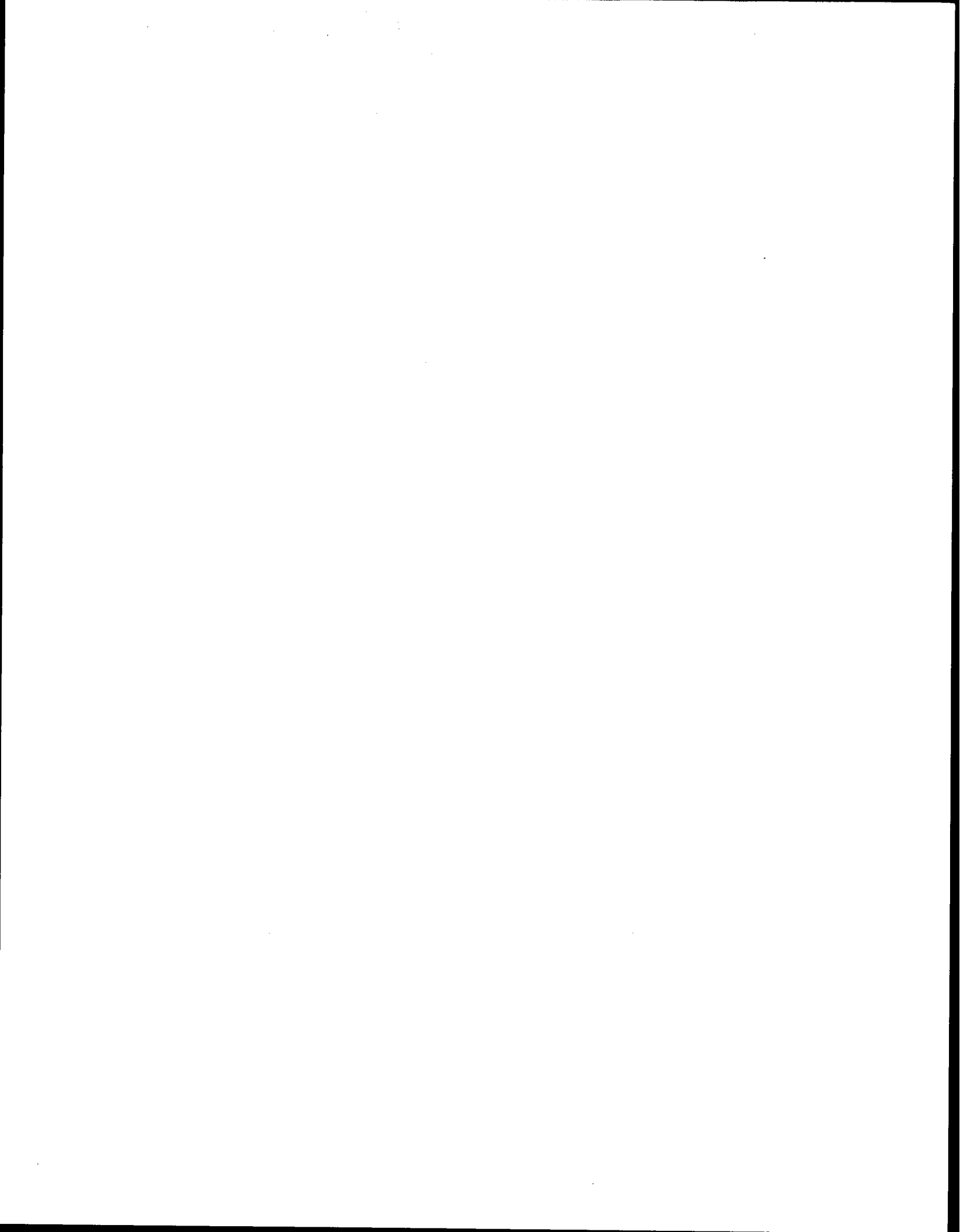


USE OF TANK COVER PLUG

The TORNADO Jumbo Conversion Cover will accommodate either 1 or 2 motor or compressed air units. A plug (14395) is provided for one of the unit collars when a single unit is used. It is used by inserting and turning until lugs lock into place.

ITEM NO.	QTY.	PART NO.	DESCRIPTION	ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	14395	TANK COVER PLUG ASSY.	14	2	01574	LOCKWASHER
2	2	08004	MOUNTING GASKET	15	2	01497	NUT
3	2	14415	ADAPTOR	16	1	04908	FLANGE GASKET
4	8	02053	SCREW	17	10	00851	WASHER
5	8	—	Nut	18	10	00086	SCREW
6	2	11386	GASKET	19	2	04997	STAND
7	8	11394	SCREW	20	2	11358	INTAKE GUIDE
8	1	13832	TANK COVER S/A	21	2	14731	TOP PLATE
9	1	08057	THUMB SCREW	22	6	11390	SCREW
10	1	07648	NAME PLATE				
11	1	17131	TANK COVER GASKET (6.5 FT.)				
12	1	90442	DEFLECTOR				
13	2	02038	SCREW				

Figure No. 3 Jumbo Cover Assembly



ADDENDUM: WARRANTY

Tornado® Standard Warranty Program*	
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.	10 Years: <i>All plastic tanks and Rotationally-molded bodies</i>
	2 Years: <i>Parts and Labor on all Tornado and Tornado/Karcher cleaning equipment**</i>
	1 Year: <i>Warranty on batteries, one full year, not pro-rated.</i>

* 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.