

Dry Bulk Blower Installation Manual



WARNING DO NOT OPERATE MACHINERY BEFORE READING MANUAL FULLY
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Table of Contents	Page
Safety Precautions	2
Safety Check List	2
Blower Specifications	3
Parts List	4-9
Mounting	10-12
Preventative Maintenance	13
Lubrication Instructions	13
Operation Instructions	13
Warranty	14

SAFETY INSTRUCTIONS

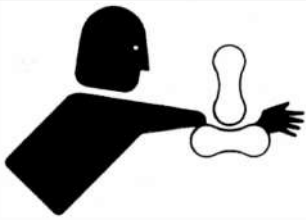
1. Do not operate before reading the enclosed instruction manuals.
2. Use adequate protection, warning and safety equipment necessary to protect against hazards involved in installation and operation of this equipment

! DANGER



Keep body and clothing away from drive shaft

! WARNING



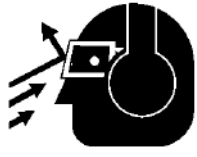
Keep body and clothing away from machine openings

! CAUTION



Do not touch hot surfaces

! WARNING



Hearing and Eye Protection Required

Safety Precautions

- Rotating shafts can be dangerous. You can snag clothes, skin, hair, and hands. This can cause serious injury or death.
- Do not work under the vehicle when the engine is running.
- Do not work on a shaft (with or without guard) when the engine is running.
- If the power take off and/or shaft are still exposed after installation, install a guard.
- Install a support strap when servicing a drive shaft to prevent personal injury.
- A serious or fatal injury can occur....
 - If you lack proper training.
 - if you fail to follow proper procedures.
 - if you do not use proper tools and safety equipment.
 - if you assemble driveline components improperly.
 - if you use incompatible driveline components.
 - if you use worn-out or damaged driveline components.
 - if you use driveline components in a non-approved application.

- This manual contains safety instructions.

Read, understand and follow this manual.

- Get proper training.
- Learn and follow safe operating procedures.
- Use proper tools and safety equipment.
- Use proper components in good condition.

Safety Check List

Complete prior to blower operation

Truck # _____

Transmission # _____

P.T.O. # _____

P.T.O. Ratio _____

Blower model # **P857** _____

Blower serial # _____

Date _____

Inspected by _____

- ☐ Is P.T.O. ratio, torque and rotation correct?
- ☐ Mount P.T.O. as per manufacturer's recommendations and refill transmission.
- ☐ Ensure oil level is at the center of the sight glasses.
- ☐ Driveline installed correctly and blower can be rotated by hand.
- ☐ Air inlet filter is connected and mounted away from tractor exhaust.
- ☐ Remove camlock dust cap, discharge pipework open to atmosphere.
- ☐ Tractor engine at idle. Slowly engage P.T.O. Check for correct rotation and airflow.
- ☐ Slowly take blower up to operating speed.
- ☐ Check for vibration, mechanical noise, oil leaks and mounting integrity.
- ☐ Stop blower. Connect blower discharge hose to trailer and run blower at operating pressure of trailer (15 psi) for 15 minutes at normal speed.
- ☐ Does relief valve allow 15 psi tank pressure?
- ☐ Does engine maintain correct rpm throughout the test?
- ☐ Turn off truck engine, wait for blower to stop turning. Check fusible plugs, relief valve, filter, pipework and oil sumps for integrity.
- ☐ Is correct engine speed label visible in cab?
- ☐ Install driveline warning labels to both sides of the frame.



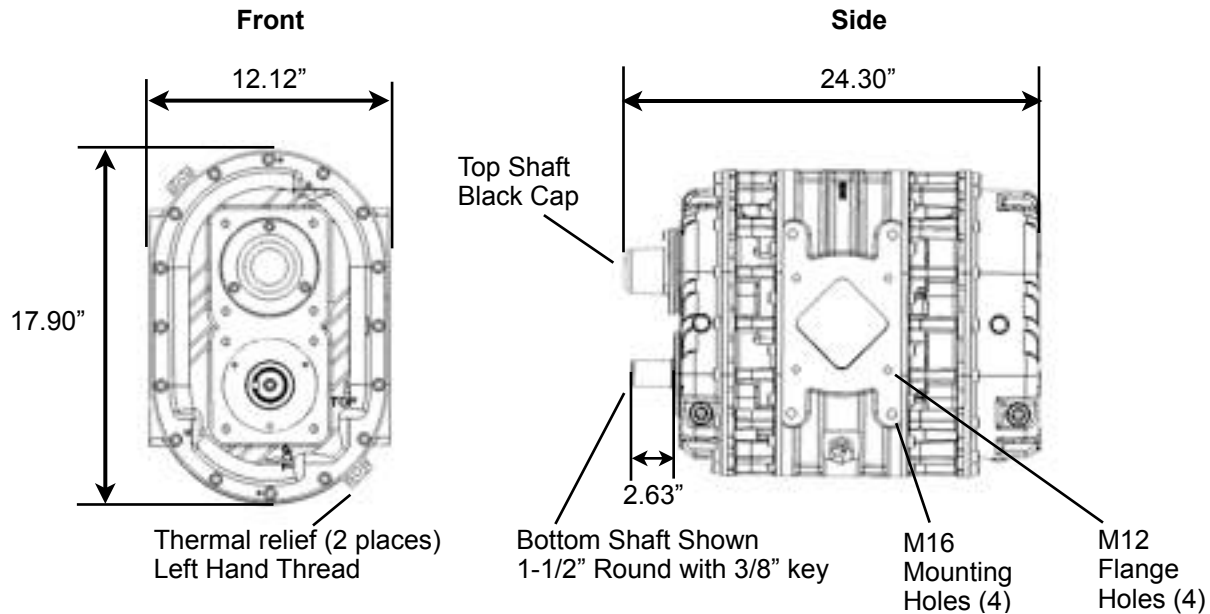
(800) 471-8769

Blower Specifications

	Air Flow CFM	Max. Pressure	Max. Vacuum	Speed Range	Weight
P857	390-1000	20 psi (see note 1)	17" Hg.	1800-3000 (see note 2)	361 lbs

Note:

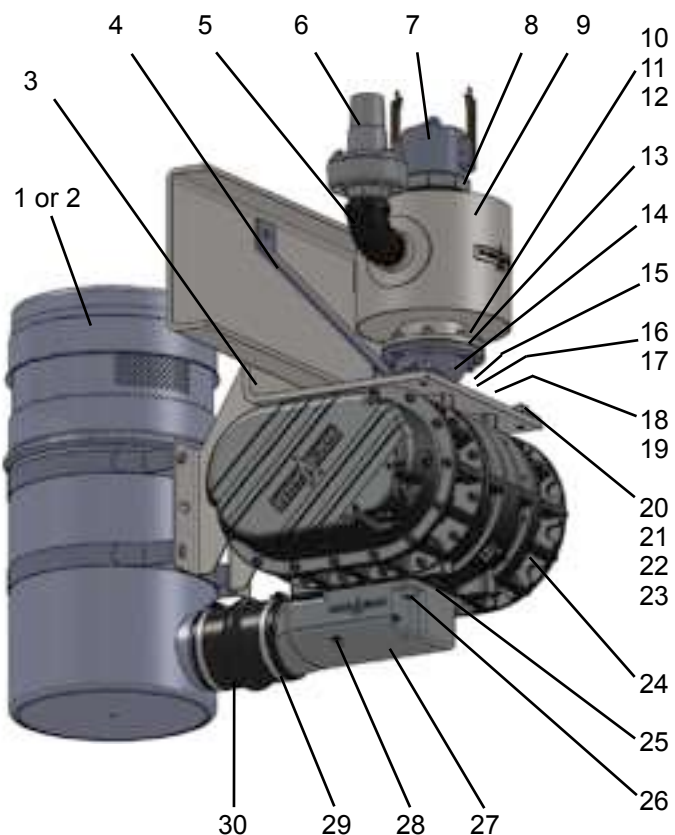
- 1) Reduce the maximum operating pressure by 1 psi for each 2000 feet of altitude.
(Example: at an altitude of 4000 feet, the maximum working pressure of the blower will decrease by 2 psi)
- 2) Check max P.T.O. RPM for speeds above 2500.



Performance Chart for Power Take-off Operation

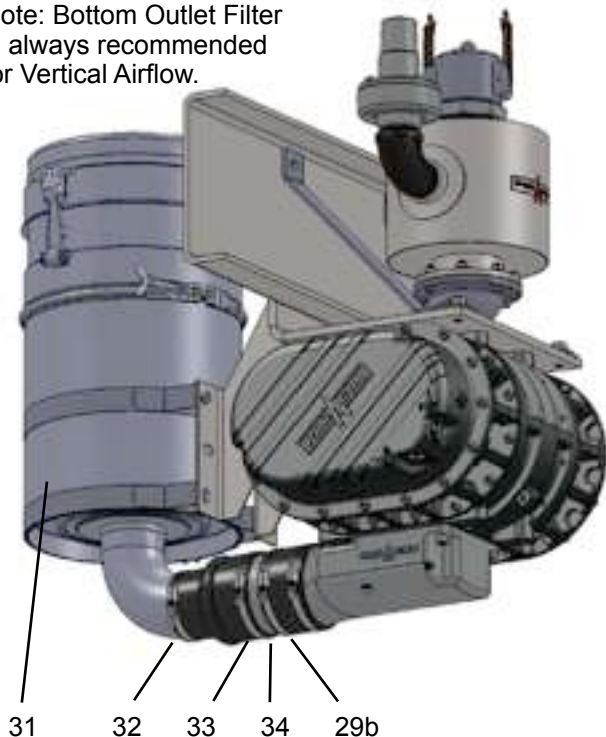
Blower Speed RPM	Pressure Performance and Horsepower						Vacuum Performance and Horsepower					
	12 PSIG		16 PSIG		20 PSIG		12" of Hg.		16" of Hg.		17" of Hg.	
	CFM	HP	CFM	HP	CFM	HP	CFM	HP	CFM	HP	CFM	HP
1800	473	36	446	47	424	59	482	19	436	22	418	25
1900	510	38	480	50	460	63	520	20	475	25	460	27
2000	545	40	518	52	496	65	559	21	515	27	494	29
2100	580	42	555	55	530	69	595	22	545	28	530	30
2200	618	44	590	58	568	72	632	23	571	29	555	31
2300	645	46	625	60	605	75	665	24	610	30	695	33
2400	690	48	662	63	640	78	697	25	655	31	636	34
2500	718	50	690	66	675	81	740	26	690	33	670	36

Vertical Airflow Pressure Only Filter Connection



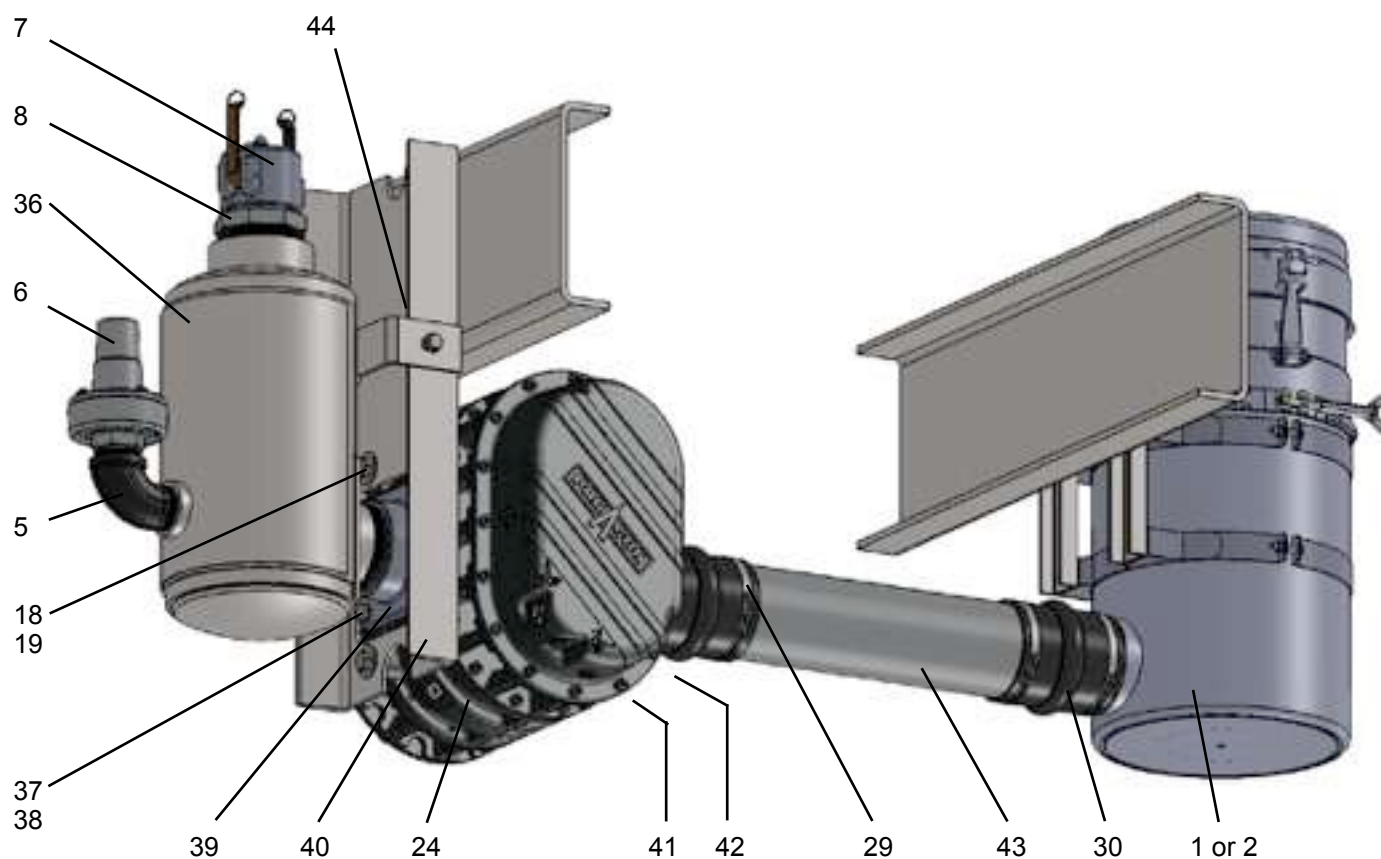
Vertical Airflow Pressure/Vacuum Filter Connection

Note: Bottom Outlet Filter is always recommended for Vertical Airflow.



#	P/N	Description	QTY
1	625-006	Filter, Assy S/S T850/T1050/ P857 psi only	1
2	625-002	Filter, Assy S/S T850/T1050/ P857, psi/vac	1
3	508-029	Bracket- Mounting no holes- P857 VA	1
4	508-021	Angle Strap	2
5	533-005	2" Street Elbow	1
6	610-012	Relief Valve 16 psi	1
6	610-013	Relief Valve 18 psi	1
6	610-014	Relief valve 20 psi	1
7	565-001	Dustcap 3"	1
7	565-002	Dustcap 4"	1
8	567-002	Camlock 3" male x 4" NPTM	1
8	533-045	Camlock 4" male x 4" NPTM	1
9	563-002	Muffler, 4" TTMA x 4" FNPT - steel	1
10	228-105	3/8" Bolt 1-1/2" long	2
11	294-009	3/8" Washer	2
12	284-008	3/8" Nut GR5 plated	2
10	228-066	7/16" Bolt TTMA Flange	6
11	296-011	1/2" Washer Plain Flat (for TTMA Flange)	6
12	284-007	7/16" Nut TTMA Flange	6
13	526-011	TTMA Gasket	1
14	509-010	Discharge Flange	1
15	526-002	Flange Gasket	1
16	128-025	M12 x 30 Bolt- Discharge Flange	4
17	196-008	M12 Washer- Discharge Flange	4
18	128-037	Cap Screw M16 x 35mm	4
19	194-007	M16 Lock Washer	4
20	228-095	5/8" Cap Screw Angle Strap	2
21	294-011	5/8" Lock Washer Angle Strap	2
22	296-014	5/8" Flat Washer Angle Strap	2
23	284-015	5/8" Nut Angle Strap	2
24	601-000	P857 Blower	1
25	526-002	Flange Gasket	1
26	124-020	Cap Screw M12 x 25mm	2
27	509-005	Suction Flange	1
28	124-023	Cap Screw M12 x 85mm	2
29	291-012	4"-6" Hose Clamp	2
30	587-002	Hump hose- 5"	1
31	625-003	Filter Assy S/S CDL9, PSI/VAC	1
32	587-000	Hump Hose Reducer- 4" x 5"	1
33	588-003	Tube, Aluminum 5" x 5" long	1
34	587-005	Hose, 3-1/2" long x 5" ID-EPDM	1
29b	291-012	4"-6" Hose Clamp	4

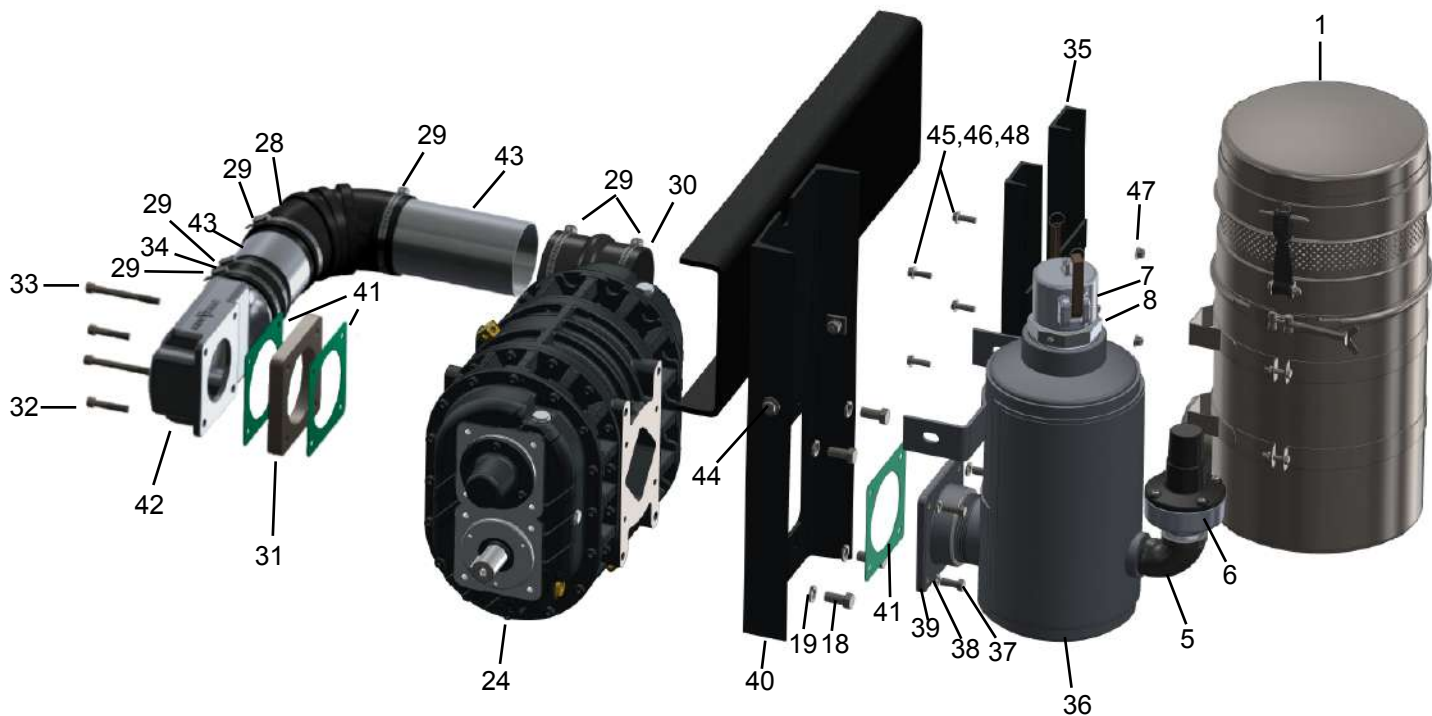
Horizontal Airflow Pressure/Vacuum or Pressure Only Filter Connection



#	P/N	Description	QTY
1	625-006	Filter, Assy S/S T850/T1050/ P857 psi only	1
2	625-002	Filter, Assy S/S T850/T1050/ P857, psi/vac	1
5	533-005	2" Street Elbow	1
6	610-012	Relief Valve 16 psi	1
6	610-013	Relief Valve 18 psi	1
6	610-014	Relief valve 20 psi	1
7	565-001	Dustcap 3"	1
7	565-002	Dustcap 4"	1
8	567-002	Camlock 3" male x 4" NPTM	1
8	533-045	Camlock 4" male x 4" NPTM	1
18	128-037	Cap Screw M16 x 35mm	4
19	194-007	M16 Lock Washer	4
24	601-000	P857 Blower	1

#	P/N	Description	QTY
29	291-012	4"-6" Hose Clamp	4
30	587-002	Hump hose- 5"	2
36	563-000	Muffler, 4" MNPT x 4" FNPT - steel	1
36	563-001	Muffler, 4" MNPT x 4" FNPT - S/S	1
37	128-025	Capscrew 8.8 M12 x 30mm	4
38	196-008	Flat Washer, M12	4
39	509-001	Flange, Delivery CI, H/A	1
40	508-024	Mounting Bracket - HYD Drive	1
40	508-025	Mounting Bracket - Driver Side	1
41	526-002	Gasket- Flange	1
42	509-002	Flange-Suction AI	1
43	588-002	Suction Pipe AI. 20"	1
44	90525-2	Bevel Washer 1/2"	2

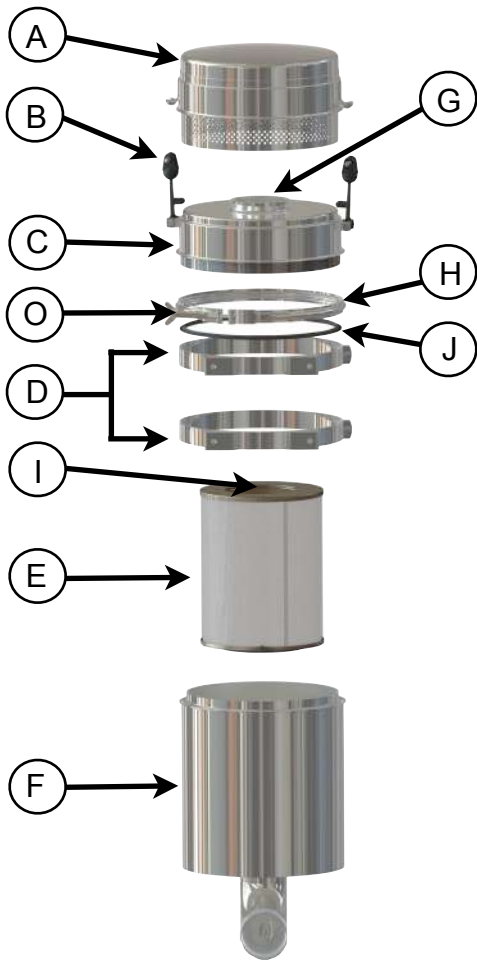
Side by Side Horizontal Airflow Filter Connection



#	P/N	Description	QTY
1	625-006	Filter, Assy S/S T850/T1050/ P857 psi only	1
1	625-002	Filter, Assy S/S T850/T1050/ P857, psi/vac	1
5	533-005	2" Street Elbow	1
6	610-012	Relief Valve 16 psi	1
6	610-013	Relief Valve 18 psi	1
6	610-014	Relief valve 20 psi	1
7	565-001	Dustcap 3"	1
7	565-002	Dustcap 4"	1
8	567-002	Camlock 3" Male x 4" NPTM	1
8	533-045	Camlock 4" Male x 4" NPTM	1
18	128-037	Cap Screw M16 x 35mm	4
19	194-007	M16 Lock Washer	4
24	601-000	P857 Blower	1
28	16937	Elbow , Rubber - 5"	1
29	291-012	4"-6" Hose Clamp	6
30	587-002	Hump Hose- 5"	2
31	571-019	Spacer, 1" thick - P857 Port VA Flange	1
32	124-021	Capscrew Skt Hd M12 X 55mm	2
33	124-025	Capscrew Skt Hd M12 X 110mm	2

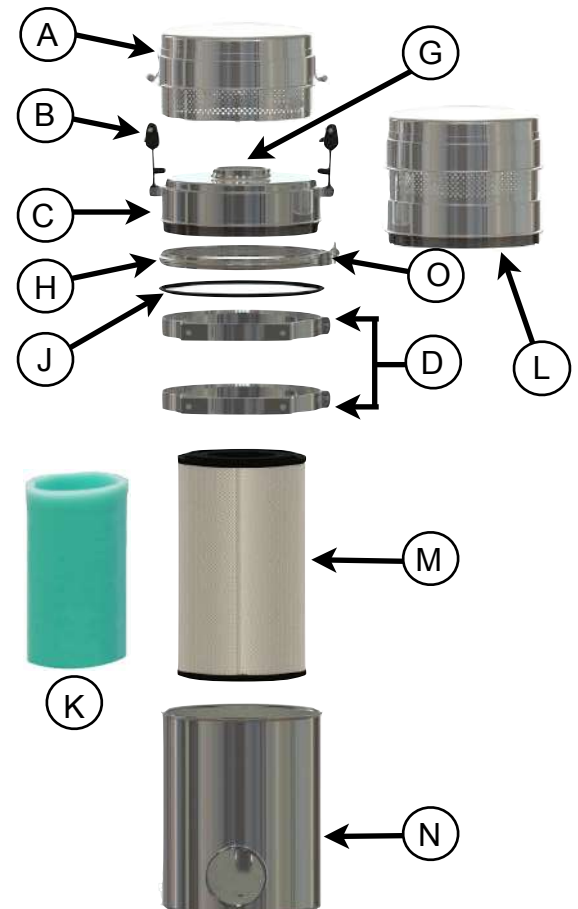
#	P/N	Description	QTY
34	587-005	Hose, 3-1/2" long x 5" ID - EPDM	1
35	508-058	Bracket - Mounting Paragon Air Filters	1
36	563-000	Muffler, 4" MNPT x 4" FNPT - Steel	1
36	563-001	Muffler, 4" MNPT x 4" FNPT - S/S	1
37	228-065	1/2" Bolt - Discharge Flange	4
38	294-010	1/2" Washer - Discharge Flange	4
39	509-001	Flange, Delivery CI, H/A	1
40	508-024	Mounting Bracket - HYD Drive	1
40	508-025	Mounting Bracket - Driver Side	1
40	508-061	Mounting Bracket -Passenger Side	1
41	526-002	Gasket- Flange	3
42	509-005	Flange-Suction AI - Elbow	1
43	588-002	Suction Pipe AI. 20" (Cut to length)	1
44	90525-2	Bevel Washer 1/2"	2
45	228-052	Capscrew Hex Hd Gr5 3/8"-16 X 1-1/4 PI	4
46	196-008	Washer, Flat M12 Plated	4
47	284-009	Nut Hex Gr5 3/8-16 Nyloc PI	4
48	85249	Washer Lock GR5 3/8" Zinc Plated	4

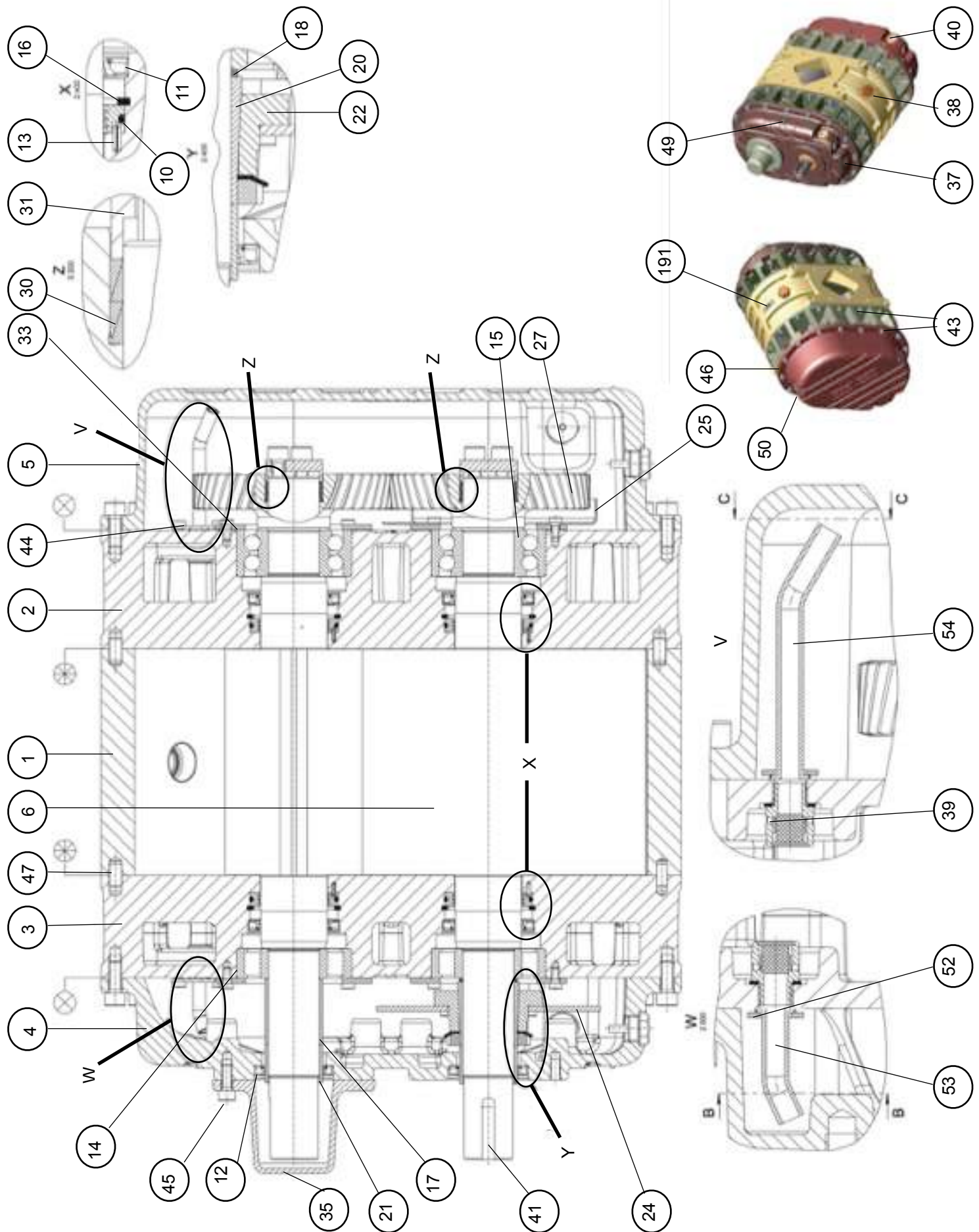
P857 Air Filter Assembly - Spare Parts



Item	P/N	Description	QTY
A	576-009	Cap Assembly	1
B	576-012	Rubber Flex Latch	2
C	576-011	Head Assembly - P857 / CDL9 / CDL12 / Latches	1
D	612-043	Kit, Bracket (set of 2) - S/S Air Filter Mounting	1
E	575-005	Filter Element - CDL9 / CDL12 / P857 *For Filter Assembly 625-003	1
F	576-007	Body - CDL9 / CDL12 / P857	1
G	533-045	Camlock 4" Male	1
H	576-008	Clamp Assembly 3/8" *Includes Wingnut (Item O)	1
I	284-019	Wing Nut, filter element - P857 / CDL9 / CDL12 (Not Shown)	1
J	526-000	Gasket	1
O	184-004	SS Wingnut - hex body for filter band clamp (H)	1

Item	P/N	Description	QTY
A	576-009	Cap Assembly (PSI/VAC)	1
B	576-012	Rubber Flex Latch	2
C	576-010	Head Assembly - P857 / Latches	1
D	612-043	Kit, Bracket (set of 2) - S/S Air Filter Mounting	1
G	533-045	Camlock 4" Male	1
H	576-008	Clamp Assembly 3/8" *Includes Wingnut (Item O)	1
J	526-000	Gasket	1
K	575-007	Filter Sock for 573-003 Element *Installs on the inside of the filter element	1
L	576-013	Cap Assembly (PSI only)	1
M	573-003	Filter Element - P857 *For Filter Assembly 625-006 & 625-002	1
N	576-006	Body - P857 Side Outlet	1
O	184-004	SS hex body for Filter Band Clamp	1





P857 Blower Spare Parts

Item	Part #	Description	QTY
1	500-001	Body	1
2	634-002	Sideplate - NDE (Includes Roll Pin)	1
3	634-001	Sideplate - DE (Includes Roll Pin)	1
4	523-002	Oil Tank - DE	1
5	523-001	Oil Tank - NDE	1
6	502-000	Rotor	2
10	556-037	Lab Seal	4
11	555-003	Oil tank seal	4
12	555-004	Shaft seal	2
13	174-002	Pin	4
14	512-000	Roller Bearing	2
15	510-002	Ball Bearing	2
16	197-001	Ring, Retaining	4
17	571-007	Spacer Bush	1
18	571-008	Spacer Ring	1
20	571-009	Adaptor Sleeve	1
21	571-025	Wear Sleeve	2
22	571-010	Oil Slinger Hub	1
24	527-005	Oil Slinger	1
25	527-006	Oil Deflector	1
27	529-000	Gear Set	1
30	582-009	Locking Element	4
31	582-012	Clamping Bush Kit	1
33	582-011	Tension Ring (brg Retainer)	4
35	522-002	Drive shaft cap	1
37	141-000	Magnetic Plug	2
38	543-003	Melt Plug	2
39	359-003	Breather	2
40	355-005	Oil Sight Glass	2
41	298-010	Key	1
43	124-004	Socket Head Capscrew M10 x 25	70
44	124-014	Socket Head Capscrew M6 x 12 8.8	28
45	124-003	Socket Head Capscrew M8 x 20	3
46	174-001	Pin	2
47	174-000	Pin	4
49	323-001	Plug G1/2 x 16	2
50	323-002	Plug G3/4 x 17	6
52	582-008	Clamping element (Old models only; obsolete for current breather tubes)	2
53	588-004	Breather tube	1
54	588-005	Breather tube	1
191	192-001	Pin	4
-	409-007	Oil, Quart P857*	3
-	558-000	Sealant, Anaerobic Red (Loc-tite) 2.0oz	

*Other oil volumes available upon request.



(800) 471-8769

P857 Blower Maintenance Kits

**

Does not include oil

**

QTY	Part #	Description
1	620-000	Repair kit, Seal (Full) - P857 Includes the following:
	QTY 4 174-000	Pin 10mm x 20mm
	QTY 2 174-001	Pin 6mm x 16mm
	QTY 4 174-002	Spring Pin
	QTY 1 298-010	Key
	QTY 2 359-003	Breather
	QTY 2 526-002	Gasket, Flange - P857
	QTY 4 555-003	Oil Tank Seal
	QTY 2 555-004	Shaft Seal
	QTY 4 556-037	Lab Seal
	QTY 2 571-025	Wear Sleeve
1	620-001	Repair kit, Dust Seal (Shaft Seals) - P857 Includes the following:
	QTY 2 526-002	Gasket, Flange - P857
	QTY 2 555-004	Shaft seal
	QTY 2 571-025	Wear Sleeve
1	621-008	Repair kit, Bearing - P857 Includes the following:
	QTY 2 510-002	Ball Bearing
	QTY 2 512-000	Roller Bearing
1	621-027	Service Kit - Complete Includes the following:
	QTY 4 174-000	Pin 10mm x 20mm
	QTY 2 174-001	Pin 6mm x 16mm
	QTY 4 174-002	Spring Pin
	QTY 1 298-010	Key
	QTY 2 359-003	Breather
	QTY 2 510-002	Ball Bearing
	QTY 2 512-000	Roller Bearing
	QTY 2 526-002	Gasket, Flange - P857
	QTY 4 555-003	Oil Tank Seal
	QTY 2 555-004	Shaft Seal
	QTY 4 556-037	Lab Seal
	QTY 2 571-025	Wear Sleeve

P857 Blower Specialty Tools

Part #	Description	Part #	Description
564-005	Bearing Punch	564-013	Lip Seal Protector
564-006	Inner Lip Seal Punch	564-015	Feeler Gauge Set
564-007	Lock Collar	564-016	Mounting Arm & Dial Indicator
564-008	Crank Handle	564-017	Torque Wrench
564-009	Outer Lip Seal Punch	568-018	Bearing Heater
564-010	Locknut Socket	633-002	Puller Kit
564-011	Lab Seal Punch	124-006	Capscrew
564-012	Shaft Lock		



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Mounting the Blower

Caution:

Incorrect equipment will cause blower failure. If you are not using a Paragon kit, the following accessories should be installed:

Power Take Off For Transmission

- Horsepower and torque rating must be adequate for blower RPM and pressure.
- Select ratio for required engine speed and correct blower shaft speed.

Constant Engine Speed

- The selected engine speed must remain constant throughout the blower discharge cycle. This requires ECM programming or a trouble control system.
- Program ECM for max 100 RPM "ramp rate" per second.

Relief Valve

- Sized for correct CFM and blower pressure rating.
- Installed on delivery side before check valve.
- Use pipe compound on male pipe thread of relief valve.
- **DO NOT** use thread tape.

Air Filter

- Sized for correct CFM to suit application.
- Caution:** An undersized filter will cause immediate overheating of blower. The filter should not exceed 17" water restriction. Do not mount air inlet of the filter close to truck exhaust. This will increase the blower operating temperatures above the maximum limits.
- When vacuum loading, remove the air filter element.

Suction Delivery and Pipework

- Should be free of weld beads and foreign metal.
- During vacuum applications, **NEVER** use rubber elbows without internal support. **Rubber elbows will collapse under vacuum, restricting the airflow to the P857, and causing the P857 to overheat.**

Mounting Bracket

- Strong enough to support blower weight and torque
- Allow a minimum of 1/2" clearance between the blower and frame rail (or other non-moveable object) to prevent damage to the blower.

Check Valve

- Sized for maximum CFM with minimal restriction.
- Should have at least (1) check valve mounted on the trailer at the hot air hose connection.
- Must be inspected periodically for damage.

Mufflers

- Sized for maximum CFM with minimal restriction.
- Mounted downstream of the relief valve.
- Stainless steel is required for sensitive product applications

Vacuum Relief Valve

- Sized for correct CFM (Not to exceed 15" of Hg).
- This valve needs to be installed between the P857 Blower filter and the P857 inlet.
- This valve is normally mounted on the trailer and should be positioned between the filtration bag and the inlet of the blower.
- Must be fitted with a separate filter element to prevent Blower damage when it opens.

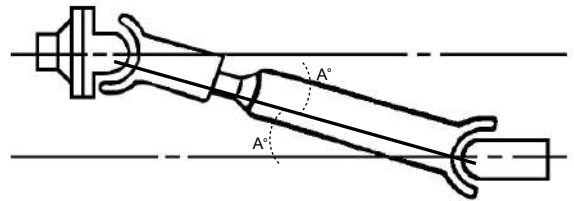
Note: When vacuum loading it is important that a vacuum valve is installed within the system.

P.T.O. Drive Shaft Single Piece

- Blower shaft must be parallel with the P.T.O. shaft axis within +/- 1 degree to minimize vibration.
- Use tubular, balanced drive shaft.
- Do not force end yokes into Blower or P.T.O. shaft.
- Blower shaft is 1-1/2" dia. with 3/8" key.
- Maximum driveline working angle - see table below:

Maximum Driveline Working Angle

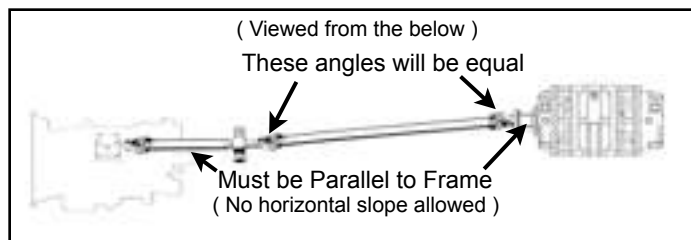
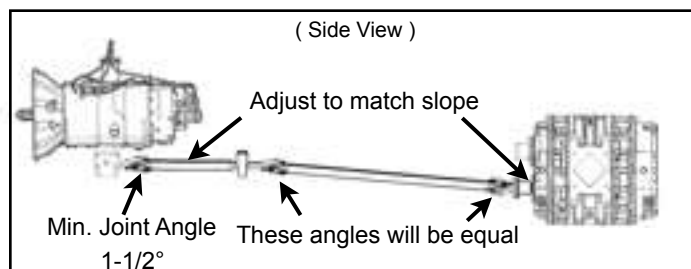
Speed	Angle "A"
3000 RPM	5 degrees
2500 RPM	7 degrees
2000 RPM	8 degrees
1800 RPM	9.5 degrees



P.T.O. Drive Shaft Two Piece

- **Consult local driveline specialist prior to operation**

Typical P857 Horizontal Installation



- Blower shaft to be parallel with first shaft to within 1 degree.

Mounting Plane

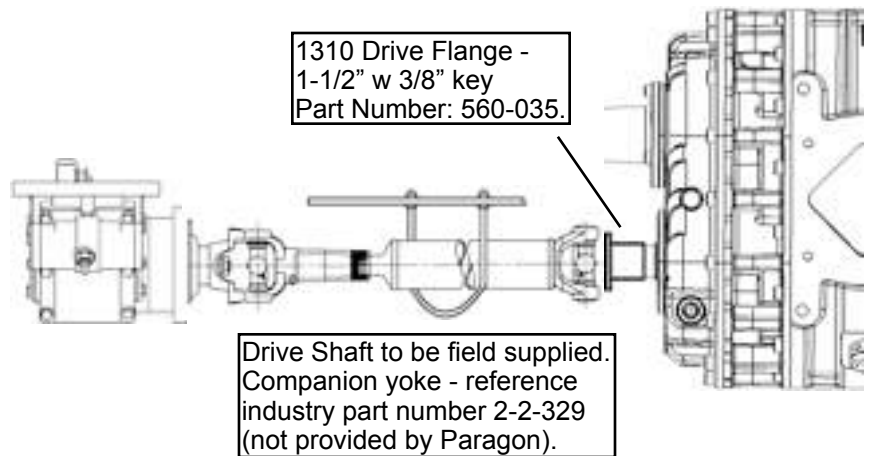
- Blower can mount in two planes for horizontal and vertical airflow. (see Figure 1, pg 10)

Note:

1. **Pre-cleaners are not recommended.**
2. **Use only stainless steel mufflers for contamination sensitive products.**

Mounting the Blower (Continued)

- Drive shaft should have a “U” bolt hanger bracket for safety.
- Drive shaft should be manufactured for a minimum RPM / Critical speed of 2500 RPM.



P857 Rotation

- The P857 can run in either rotation. Either drive shaft can be used by moving the cap.
- The P857 can be mounted horizontal or vertical to suit pipework configuration.

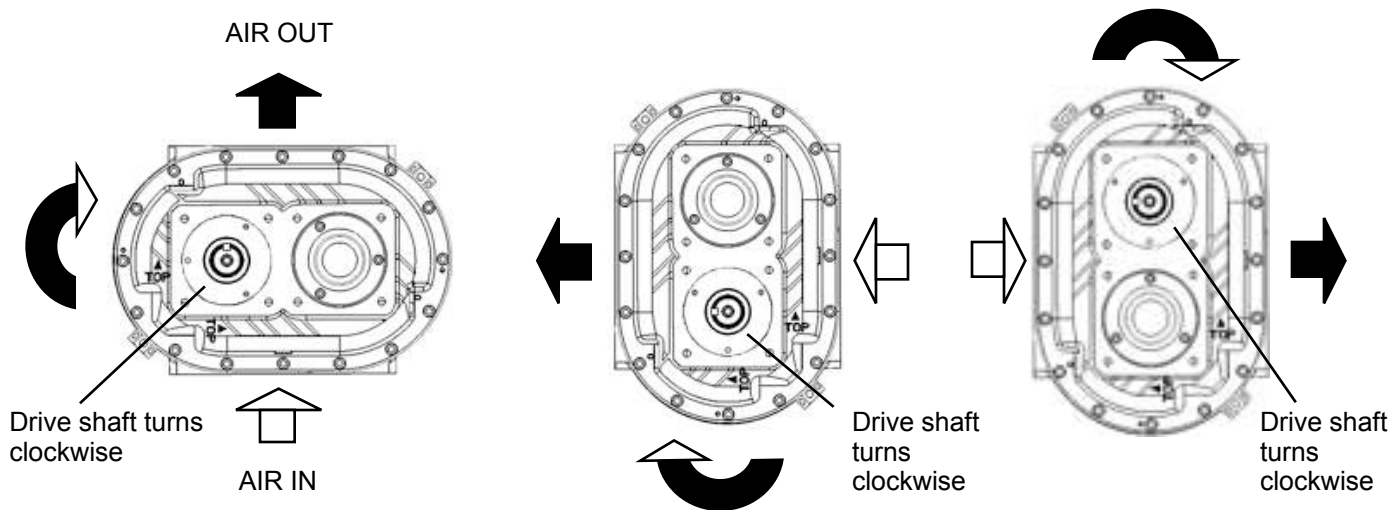
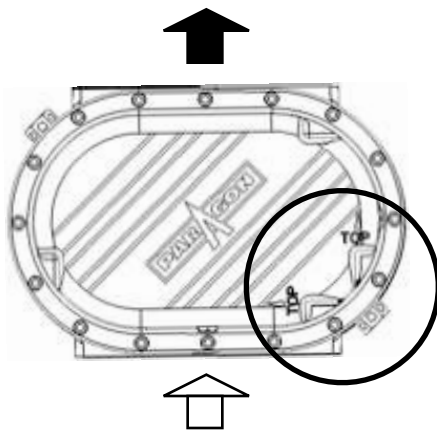
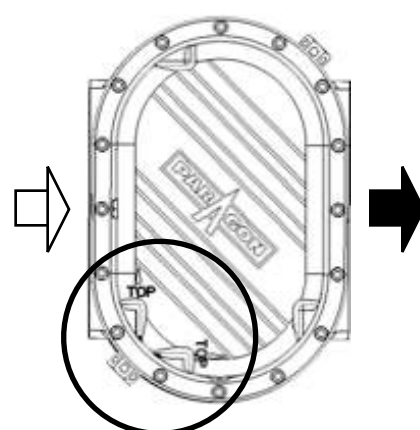


Figure 1

Vertical Airflow



Horizontal Airflow



Note: Vertical vs. Horizontal refers to airflow **not** drive shaft position.

Preventative Maintenance

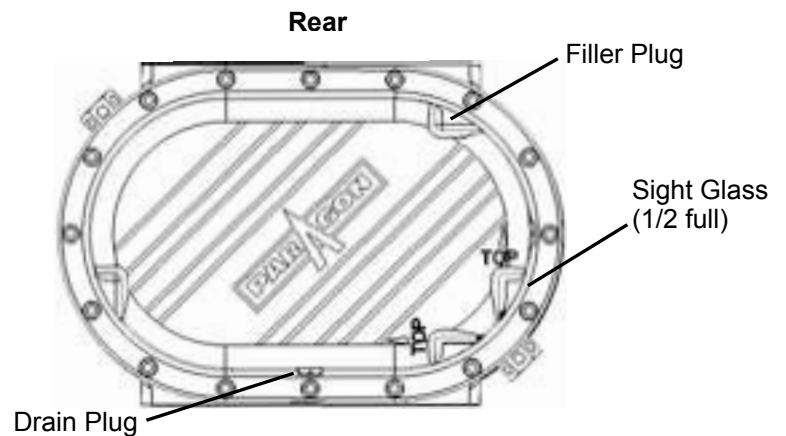
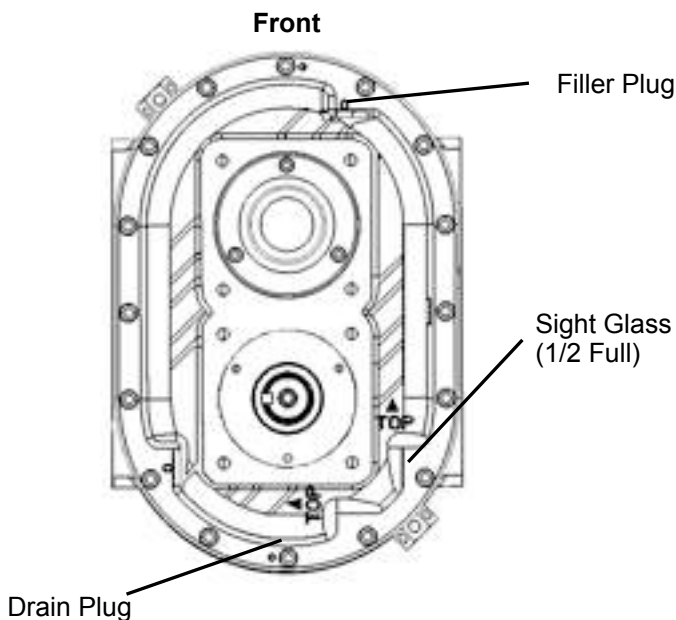
A good maintenance program will keep your P857 blower in top running condition. A newly installed P857 blower should be checked frequently during the first month of operation, especially lubrication. Check oil levels and add as needed. Complete oil changes are recommended **every 500 operating hours**, or more frequently (An oil analysis program is recommended). Below is Paragon's recommended minimum maintenance program.

Daily	Weekly	Monthly	Semi-Annually
1. Check and maintain oil level, add oil as necessary	1. Clean Air Filter. Clogged air filters can seriously affect the efficiency of the blower	1. Inspect the entire system for leaks	1. Inspect the drive line bearings
2. Check Air Filter restriction indicator	2. Check Relief Valve to assure it is operating properly	2. Inspect condition of oil and change if necessary	2. Change oil (even if 500 operating hours has not been reached.)

Lubrication Instructions

Standard Oil: P857 oil (Paragon part number: 409-001)

Caution: Mixing or incorrect oil can result in gear and bearing failure.



Oil Capacity	Horizontal Air Flow (Standard Mount)	Vertical Air Flow
Drive End	15 oz. (0.5qt.)	28 oz. (0.9 qt.)
Non-Drive End	25 oz. (0.9 qt.)	48 oz. (1.5 qt.)

Blower Operation

- Inspect blower mounting, driveline, P.T.O. and air filter for integrity.
- Remove camlock dust cap and connect the hot air hose.
- Follow trailer manufacturers recommendation regarding product hose connection and valve operation.
- Slowly engage P.T.O. with engine at idle.
- Bring up to operating speed and lock engine at recommended speed (shown in cab).
- Unload trailer as per trailer manufacturer's recommendation and **do not exceed** maximum tank pressure.
- While discharging, visually check blower for vibration, mechanical noise or excessive heat.
- If relief valve is operating adjust proportioning valve to reduce tank pressure.
- Reduce pressure to zero as per trailer manufacturers instructions.
- Disengage P.T.O (No cool down period required).
- Disconnect blower hose and replace camlock dust cap.

Caution:

- The blower and accessories will become hot enough to cause serious skin burns on contact
- Rotating machinery is dangerous.
- Always wear ear protection when in close proximity to blower.



(800) 471-8769

WARRANTY - TRUCK BLOWERS

Subject to the terms and conditions hereinafter set forth in General Terms of Sale, Paragon Tank Truck Equipment LLC (the Seller) warrants products and parts of its manufacturer, when shipped and its work (including installation and start-up) when performed, will be of good quality and will be free from defects in material and workmanship. This warranty applies only to Seller's equipment, under use and service of products, for a period as stated in the table below. Due to the varying condition of installation and operation, all performances claims are subject to a plus or minus 5% variation. (Non-standard materials are subject to a plus or minus 10% variation)

THIS WARRANTY EXTENDS ONLY TO BUYER AND/OR ORIGINAL END USER, AND IN NO EVENT SHALL THE SELLER BE LIABLE FOR THE PROPERTY DAMAGE SUSTAINED BY A PERSON DESIGNED BY THE LAW OF ANY JURISDICTION AS A THIRD PARTY BENEFICIARY OF THIS WARRANTY OR ANY OTHER WARRANTY HELD TO SURVIVE SELLER'S DISCLAIMER.

All accessories furnished by seller but manufactured by others bear only that manufacturer's standard warranty.

All claims for defective products, parts, or work under this warranty must be made in writing immediately upon discovery and, in any event within one year from the date of the shipment of the applicable item and all claims for defective work must be made in writing immediately upon discovery and in any event within one year from date of completion thereof by Seller. Unless done with prior written consent of Seller, any repairs, alterations, or disassembly of Seller's inspection and warranty. Installation and transportation costs are not included and defective items must be held for Seller's inspection and warranty. Installation and transportation costs are not included and defective items must be held for Seller's inspection and returned to Seller's Ex-works upon request.

THERE ARE NO WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE.

After Buyer's submission of claim as provided above and its approval, Seller shall either repair or replace its product, part, or work at the original Ex-works point of shipment, or refund an equitable portion of the purchase price.

The products and parts sold hereunder are not warranted for operation with erosive or corrosive materials or those which may lead to build up of materials within the product supplied, nor those which are incompatible with the materials of construction. The Buyer shall have no claim whatsoever and no product or part shall be deemed to be defective by reason of failure to resist erosive or corrosive action nor for problems resulting from build-up of material within the unit nor for problems due to incompatibility with the materials of construction.

Product Type	Warranty Duration
New	18 months from date of shipment, or 12 months after initial startup date, whichever occurs first.
Remanufactured	12 months from date of shipment, or 12 months after initial startup date, whichever occurs first.
Repair	12 months from date of shipment, or remaining warranty period, whichever is greater

Any improper use, operation beyond capacity, substitute of parts not approved by Seller, or any alteration or repair by others in such manner as in Seller's judgement affects the product materially and adversely shall void this warranty.

No employee or representative of Seller other than an Officer of the Company is authorized to change this warranty in any way or grant other warranty. Any such change by an Officer of the Company must be in writing.

The foregoing is Seller's only obligation and buyer's only remedy for breach of warranty, and except for gross negligence, willful misconduct and remedies permitted under the General Terms of Sale in the sections on **CONTRACT PERFORMANCE, INSPECTION AND ACCEPTANCE**, and the **PATENTS CLAUSE** hereof, the forgoing is **BUYER'S ONLY REMEDY HEREUNDER BY WAY OF BREACH OF CONTRACT TORT OR OTHERWISE, WITHOUT REGARD TO WORK WHETHER ANY DEFECT WAS DISCOVERED OR LATENT AT THE TIME OF DELIVERY OF THE PRODUCT OR WORK.** In no event shall Buyer be entitled to incidental or consequential damages. Any action for breach of this agreement must commerce within one year after the cause of action has occurred.

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