Gardner Denver

Truck Blower Guide

Contents

*This is a general guide, follow owners manuals for details.

Sizing

Select the proper size and speed to get proper performance and high reliability.

- Determine what products are conveyed
- Using the blower selection tool, check charts for option flow per product
- Determine maximum flow and pressure required
- If multiple products, pick worst case (highest flow and pressure)

Bigger is not necessarily better, or faster.

- Check blower performance curves and follow guidelines
- Too much air extends unloading time

Run the blower to minimize the operating temperature. (Slow speeds increase operating temperature due to increased slip while reducing efficiency.)

- Determine the discharge temperature from performance curves
- Keep blower speed in recommended limits
- Check product for any temperature limitations (e.g. plastic pellets)

Use proper gear ratios to keep engine speed down. PTO speeds should be moderate and blower speeds in specification.

- Determine maximum BHP of blower from performance curve
- Select engine speed which will provide adequate power (normally 1000 to 1250 CFM)
- Select PTO ratio to get correct output speed (normally 1600 to 1800 RPM)
- Consult supplier for driveshaft angle to PTO. Reduced operating speeds and pressure may be required

Do not undersize the PTO!!

- Get transmission model number
- Select blower and gear ratios based on previous steps
- Check torque ratings for correct start-up
- Reference blower torque ratings
- Have your distributor or PTO manufacturer properly specify the PTO
- For EXTRA protection, use a universal joint with a shear pin or a torque limiter to prevent damage from excessive torque or foreign matter plugging blower

Installation

Keep it simple & safe.

- Use pre-engineered blower mounting kits. (Backyard engineering to save a few dollars, can lead to problems)
- Make sure safety valves are pointed in a safe direction
- Keep inlet filters away from hot areas like exhaust pipes
- Driveshaft guards/safety loops are always recommended, especially for driveshaft speeds over 1800 RPM, 6° angles or high universal joint loadings

Provide enough instrumentation to properly operate and maintain the blower systems.

- Pressure gauges on tank and blower discharge line
- Thermometer in discharge line to indicate any operating problems
- Differential pressure indicator on inlet filter

Pay attention to the details.

- Always mount the pressure relief vale as close to the blower as possible
- Ensure the relief valve is of adequate size to relieve 100% of the blower flow with minimal pressure drop
- Always mount the check valve after the pressure relief valve
- Mount the blower at 2.5–3.5° incline front-to-back to keep the drive line yokes in phase
- Fit the drive line with the slip yoke closest to the PTO
- Fit the drive line with a safety loop to control the drive line in the event of u-joint failure
- Use minimum grade five fasteners to mount the blower and bracketry
- Verify input RPM with a tachometer, do not simply trust the calculations
- Whenever possible use electronic engine governor to control blower speed preventing over and under speeding of the unit
- Place PTO speed decal in visibility of the operator, place all PTO safety information in supplier recommended locations
- Keep the inlet and delivery piping as short as possible
- Limit 90° piping bends to as few as possible, use long radius elbows when a bend is necessary
- If extended piping is necessary, use flexible joint to reduce housing load, also allowing for thermal expansion
- Place copy of blower and PTO manuals in cab of truck for operator reference
- Keep additional blower lubricant in truck in the event unit is operated on incline requiring additional lubricant

Do's & Don'ts

NEVER improperly adjust, remove, make inoperable, tamper with, or inappropriately replace your safety items. This includes safety valves and fusible plugs.

- Safety valves should not be used as control valves. If they are continuously blowing, there is too much air or a restriction problem. If there is a restriction (i.e. plugged line) follow proper procedures to relieve restriction or blockage. If the system is working properly, then slow the blower down being mindful of minimum operating speed. If condition persists, vent air to atmosphere with blow down valve
- Do not reset safety valve on truck by tightening until it stops popping. If the safety valve is not operating properly, replace it
- Safety valves at the blower are meant to protect the blower only. The trailer should have its own separate safety valve.
- If a fusible plug activates, it is because of high discharge temperature. Find the cause and correct it (i.e. dirty inlet filter or over pressure) before operating again
- Some blowers have two fusible plugs as it is capable of bi-rotation. Replace blown fusible plug with one from suction side or a spare as soon as possible
- NEVER replace with a non-duplicate fusible plug or a pipe plug

Routinely inspect check valves, safety relief valves, filters, oil levels, and hose couplings.

- Defective check valves often allow reverse free wheeling and/or product flow back into the blower during premature or improper shut down
- Listen to the blower inlet after the truck is unloaded and the blower is shut down Any air escaping through the blower indicates a leaking check valve
- Periodically remove the check valve and give a thorough examination & replace as needed
- If the safety valves start relieving at lower pressures, they need to be replaced. Some pressure relief valves may lose tension from repeated operation or heat exposure
- Filters, oil levels, hose couplings, and piping should be inspected daily

NEVER uncouple any hoses unless blower is stopped with the tank and all lines de-pressurized.

Lubrication

Follow service manual recommendations and change regularly.

- Use only factory approved lubricants. Not all lubricants are compatible with the application, and may damage bearings, seals or other components

For oil-end lubrication:

- A good guideline is to change the blower oil twice a year
- Run the blower until the lubricant is warm before draining
- Inspect and clean magnetic plug and filler breather cap before reinstalling
- On a level surface, fill oil case until oil covers half of the sight glass.
  DO NOT OVERFILL

For grease-end lubrication:

- Clean zerk fittings
- Grease bearing slowly through zerk fitting using manually operated grease gun until grease exits the relief hole

WARNING: Never use an air operated grease gun to lubricate bearings. It will inject grease too quickly for the relief fitting to operate and will damage grease seals.

- Re-grease bearings when the tractor is serviced or every 500 hours of operation, whichever is sooner

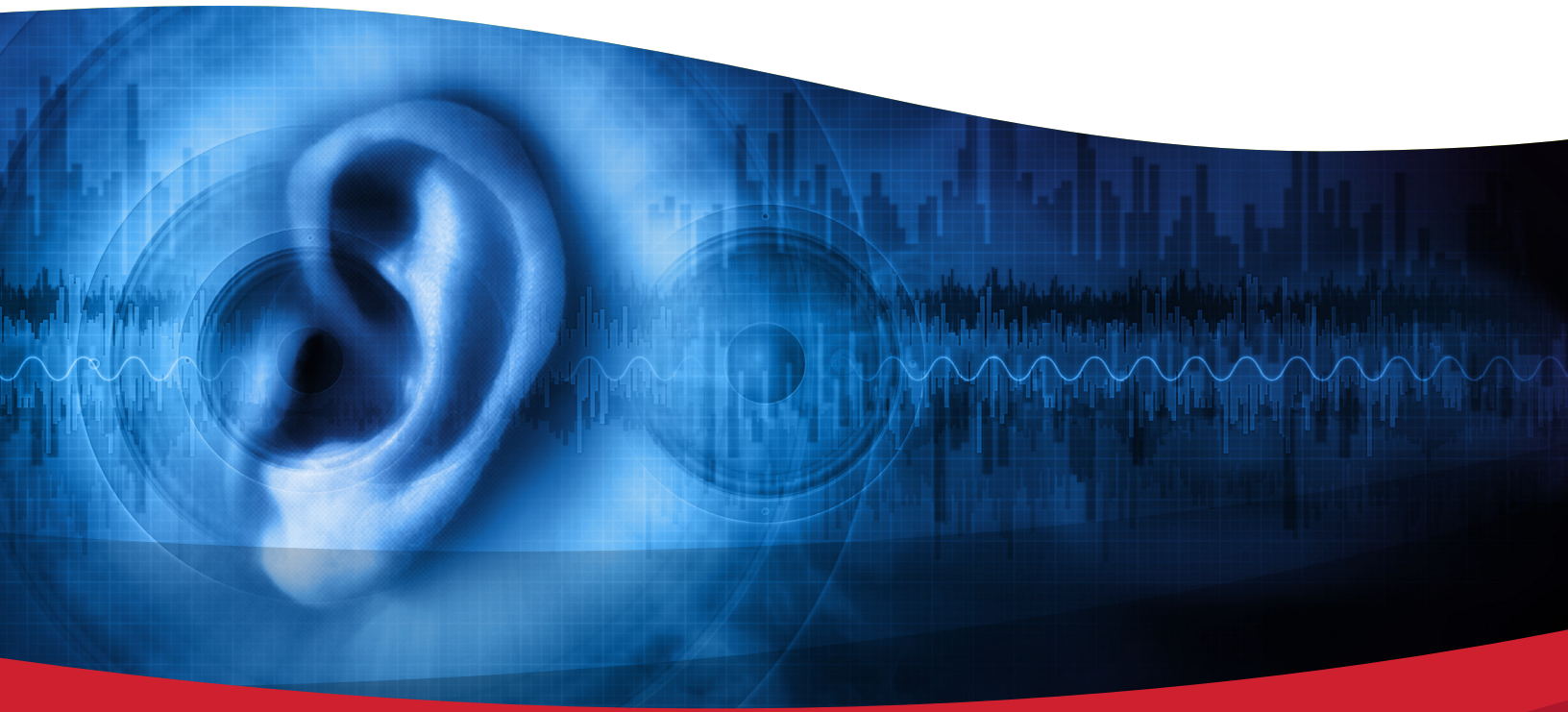
Noise Levels

Most noise in a positive displacement blower is generated at the ports and primarily at the discharge port.

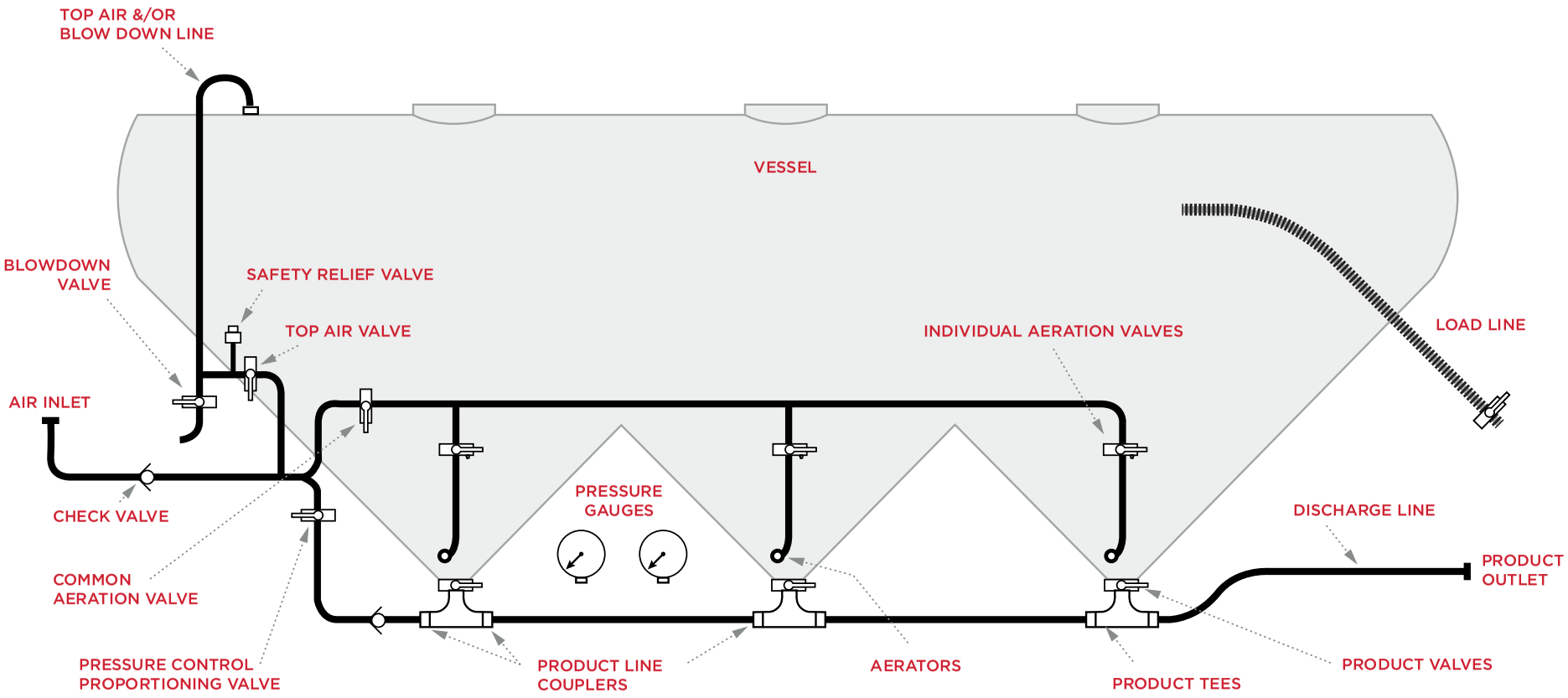
Noise levels vary with blower size, RPM, and discharge pressure. Without silencing, decibel levels can easily range from 105 to 120 dBA. Suction filter silencers and discharge silencers will lower the levels down to the low to mid-nineties. This is the noise level of the truck engine.

Silenced blowers provide the following advantages:

- Allows trucks to unload near residential areas
- Operator hearing is protected to a much greater degree
- Operator will not have as much tendency to leave operating truck
- Unloading times can be reduced because it is easier to hear when a chamber is unloaded to go on to the next
- Any problem such as an activated fusible plug is more readily apparent



DRY BULK PIPING



Operating Instructions

- Park your truck as level as possible. A 5-10% grade can cause surging or plugging while off-loading. If may even result in damage to the blower from inadequate lubrication
- With the PTO disengaged, check the blower drive line. Wiggle the drive shaft, there should not be excessive movement or noise
- Turn blower by hand. If blower is seized, do not engage clutch since the blower or driveline can be damaged
- Inspect filter and discharge piping for foreign material or damage. Clean filter or blower as required
- Inspect differential pressure indicator on air filter. If showing red, replace filter. Never step on the filter canister lid
- Check oil levels per specifications
- Close common aeration valve and product valves, fully open pressure control proportioning valve. Check to make sure line is clean and all hose connections are safe. Be sure there are no kinks or twists in the discharge hose
- Close pressure control proportioning valve and tank blowdown valve. Open common aeration valve and individual aeration valves. You are now ready to start the blower
- Always follow trailer manufacturer operating instructions

WARNING: Improper starting procedures cause most PTO and driveline failures. It can also cause blowers to lose rotor timing

- With engine at idle, parking brake engaged, transmission in neutral, and clutch depressed, now engage the PTO
- SLOWLY release the clutch. WARNING: it is extremely important not to release the clutch too quickly.
- Bring the engine up to recommended operating speed (normally 1000 to 1250 RPM). This should be done SLOWLY (3 to 5 seconds minimum.)

This procedure will give you the lowest start-up torque.

- If the blower is coated with ice or snow, run blower at idle until ice has melted
- Increase engine RPM until blower reaches correct operating speed.

Remember, engine RPM is not the speed of the blower.

- With blower running, check for severe vibration and air or oil leaks

Use EXTREME CAUTION near the rotating drive line.

- Pressurize tank to normal operating pressure (i.e. typically 14–15 PSIG at blower discharge)
- Start unloading by opening the pressure control proportioning valve and first product valve
- Adjust the control proportioning valve to keep the tank pressure slightly higher than discharge line. (Normally about 2 PSI higher than discharge line. A few trial and error runs with different settings will minimize the unloading times)
- Unload one hopper at a time but make sure product valves on unloaded hopper are fully closed before opening the next product valve
- The blower speed can also be adjusted to minimize the unloading times. The fastest unloading rate is obtained with minimum discharge air flow and maximum product feed rate
- When the trailer is empty close product valves and aeration valve. Open the blow down valve and fully open the pressure control proportioning valve
- Return the engine to idle, disengage the clutch and switch the PTO off
- Until the trailer is completely depressurized, don't disconnect the product hoses
- Replace dust cap on blower discharge pipe

This is a general guide to trailer operation, be sure to refer to trailer manufacturer's instructions for details.

Troubleshooting

Plugged Line

- The blower relief valve will fully open relieving total flow. Depending on the safety valve settings, you may either let the blower run at full speed or shut down completely. **DO NOT SLOW BLOWER DOWN BELOW MANUFACTURER RECOMMENDATIONS** while relief valve is blowing. This can quickly overheat and seize the blower
- Close aeration and product valves. Open proportioning valve all the way
- Rap on product pipe to loosen plug
- If pipe doesn't unplug, shut blower down. Manually open pipes and clean plug

Overspeed or Underspeed Blower

- Make sure PTO gear ratios are correct for the specified blower and product. Ensure engine is properly governed

Blower Filled with Product

- Blower shut down prematurely or incorrectly and check valve failed, allowing product to flow backward into blower
- Disconnect blower filter and lines. Blowout or flush out product. Do not run blower
- After blower can be turned by hand reassemble piping. Check oil condition. Jog blower to test before operating
- Follow proper shutdown procedure to prevent re-occurrence

Pipe Fittings/Gaskets Are Worn or Leaking

- Check piping for proper support and flexible joints, add or replace as necessary

Fusible Plugs Regularly Activate

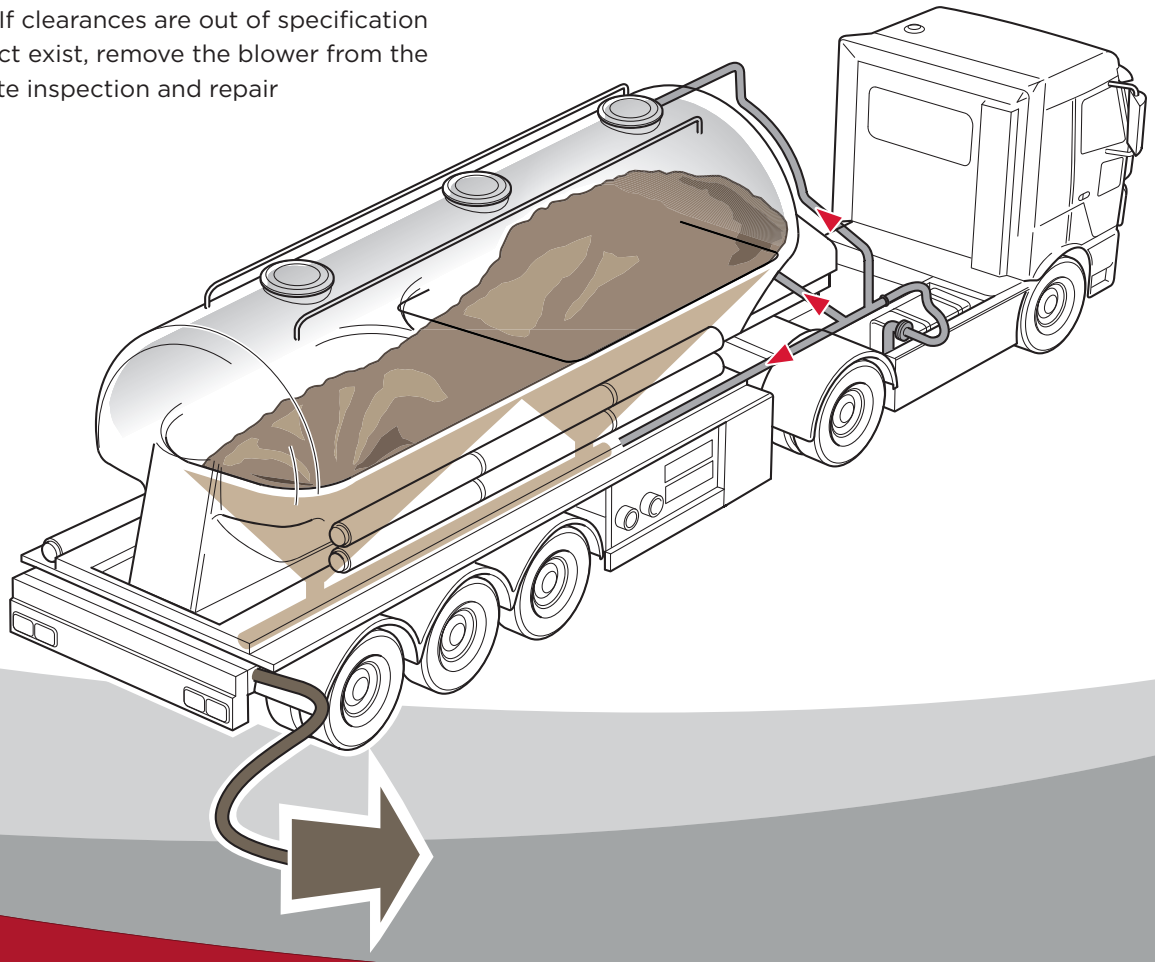
- Unit over heating likely due to excessive pressure differential or improper input speed
- Ensure inlet filters are clean
- Verify relief valves are operating properly
- Confirm correct input speed
- Consider effects of elevation

Blower Making Abnormal Knocking Sound

- Possible loss of rotor inter-lobe timing
- With the engine off and PTO disengaged, Remove piping to gain access to lobes, using feeler gauges verify internal clearances and look for evidence of internal contact. If clearances are out of specification or signs of contact exist, remove the blower from the truck for complete inspection and repair

Oil Is Coming Out of the Filler Cap

- Water contamination. Drain oil and flush if necessary. Refill with proper grade and quantity of oil
- Lubricant over fill. Drain lube to obtain proper fill level



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NTTC NATIONAL TANK TRUCK CARRIERS

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