



Air Compressors

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Equipment Description

An air compressor compresses ambient air to a much higher pressure, and stores it in a pressurized holding tank. The high-pressure air is used to inflate truck and tractor tires, operate air-powered tools, process controls, spray painters, sand blasters, a carpenter's nail gun, or to blow-clean farm machinery and tools. A farm air compressor is usually found in the farm maintenance shop, but portable air compressors are commonly used in the field. Air compressors have intake and exhaust discharge, a crank shaft, pistons and valves. The crank shaft is rotated by an electric motor or internal combustion engine makes the pistons and valves move while air enters the intake. The air is then compressed by the pistons and discharged out of exhaust and into the holding tank. The valves prevent the compressed air from escaping. Low and high-pressure controls maintain a pre-set storage pressure. There are also other types of compressors such as rotary screw compressors. The reciprocating compressor is the most common. Air compressors can vary in size but a typical unit may be up to 5 HP with a 60-gallon capacity tank. Smaller portable units using electric motors or a direct-coupled engine are also used in the field, such as what a carpenter would use.

Tips

Failure/Loss Prevention

- If the compressor is equipped with a water-separator, be sure to keep it drained, especially in humid conditions.
- Keep all air-line fittings tight and leak free. This will prevent needless operation of the compressor to make up for leaking air.
- Replace any air hoses that may be broken or leaking. Do not allow hoses to become knotted or kinked.
- Make sure the air compressor is equipped with a pressure gauge and safety-relief valve. Also, the air storage tank should be ASME certified.
- Do not use any tank for holding compressed air that was not designed and intended for that purpose. A damaged or improper storage tank can burst causing serious personal injury.
- During normal operation, and especially during humid times, be sure to regularly inspect the storage tank and drain any condensed water. Water in the tank not only damages air-powered tools but it can also rust the tank from the inside, out.
- Vibration is a major source of equipment failure. Equipment not properly secured will vibrate. This vibration causes loosening of components and possible misalignment of parts, leading to more serious problems. Check the bearings, compressor housing and motor casing for any unusual sound, vibration or motion. Take immediate action to correct any problems.
- Be sure to operate the compressor in an area that is not very dusty. A clogged intake air filter can starve air from the compressor and reduce the output capacity. Dust and dirt on the motor can also cause the motor to overheat and fail prematurely.
- Inspect drive belts and pulleys. Worn and slipping drive belts can cause additional wear to drive pulleys and bearings resulting in failure.
- Periodically blow-clean the cooling fins around the cylinders to keep the compressor from overheating. The fins that surround the air compressor's cylinders should be clean and free of dirt and dust.

Maintenance

- Change compressor oil regularly according to manufacturer's guidelines.
- Inspect, clean and replace air intake filters regularly following the manufacturer's guidelines.
- Drain any accumulated water from the storage tank per the manufacturer's guidelines.

Energy Savings/Conservation

- Air compressors consume a large amount of electricity. A 5-HP, 240 VAC/30 Amp compressor can cost almost \$1 per hour to operate.
- Run air compressors only when needed. Take measures to prevent small air leaks that can cause the compressor to run more often. Keeping a compressor running needlessly will waste electricity.
- Keep the pressure regulator adjusted to as low a setting as possible for the job. Producing higher pressures will make the compressor work harder and needlessly consume electricity.

Safety

- Always wear eye and hearing protection when operating air-powered tools.
- Never point air nozzles or air-powered tools at yourself or another person. The high velocity air can tear skin or carry debris that can become embedded in eyes or elsewhere in the body.
- Always use safety nozzles on the blow gun that conform to current O.S.H.A. Directive No. 100-1.
- Protect face, head and skin when coupling and uncoupling air lines. Sudden bursts of compressed air can pierce skin, damage hearing, and cause flying projectiles to become embedded in your skin or eyes.
- Only use air hoses that are in good condition. Inspect and discard air hoses with cracks and tears.

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