Air Tools Maintenance Information

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Cutting, grinding, sanding, drilling, Reinforced Plastics Composites can be a very damaging experience for any air operated trimmer, grinder, sander, or drill. Proper preparation in setting up your compressor and air lines before using your tools and investing a small amount of time and money in maintaining your tools can extend their life up to **FIVE TIMES**.

We have listed a few recommendations which should definitely help in improving the life and efficiency of your air tools.

MAINTENANCE PROCEDURES FOR AIR TOOLS

There are two basic ways to control the maintenance of air tools :

1. Operate the air tool until it ceases to run, then overhaul.

2. Follow a program for periodic inspection and overhauling of air tools.

The first method can obviously be very costly in terms of repairs and down time. When tools are operated until critical parts are worn out, the cost of parts replacement can be higher than necessary. A tool seldom fails when it is least needed in production. Failure usually occurs in peak production periods.

The second method requires a program for inspecting each tool at regularly scheduled intervals. The length of this interval will be determined by operating conditions, and where extreme conditions prevail, tools should be examined more often**.**

- **Improperly maintained air tools will cause excessive down time which affects your production schedule.**

RECOMMENDATION FOR AIR LINE INSTALLATION

Main air lines should have the larger diameter, with branch lines slightly smaller. The installation costs for large pipe are probably no greater than the smaller pipe, and material costs are not too much higher.

To insure an adequate flow of air, there should be only the least possible drop permitted between the air compressor and the tool inlet. Usually such drops can be expected from normal friction of air flowing along the pipe walls. This friction should not exceed 10 pounds per square inch. Thus, a pressure of 100 P.S.I. at the compressor should drop to no more than 90 P.S.I. at the tool inlet.

- **Proper air line installation will increase efficiency and life**

Correct sizes of piping and hose should provide adequate volume and pressure to present tools and provide a margin for additional tools. A 3" diameter pipe, 1000' long, will deliver 500 cubic feet of air at 90 P.S.I. in one minute, with a pressure drop of less than 2 pounds. A 2" line of the same length will show a pressure drop of 6 pounds, or three times as much. A 4" diameter pipe will carry twice the volume of a 3" pipe, delivering 1000 C.F.M. With less than 2 pounds pressure drop.

In most cases it will be found that larger pipe sizes are both economical and necessary. Long pipe runs will require large sizes if excessive pressure drop is to be avoided. Main lines should have frequent outlines for branch lines, and these should be positioned at the top to minimize moisture transmission. Provide frequent outlets on air lines for hose connections. Always install outlets on the top (see illustration) of the air line, since this will allow normal gravity to flush away dirt and water. If several air tools must be supplied from single outlet, be sure that air supply is adequate to sustain all tools when they are running simultaneously.

LUBRICATION ELIMINATES WEAR

Correct lubrication is a major requirement in preventative maintenance. It is likely that some 80% of tool failures can be traced back to inadequate lubrication. The absolute necessity of oil in any automobile engine crankcase is accepted without question. Application of the same standard to air tools would eliminate the primary cause of faulty performance and early tool failure. Many types of precision built air tools develop a motor speed of 12 500 R.P.M. or more. Sustained operation at such speeds require filtered air and correct lubrication

Most portable air tools have built-in reservoirs, but in practice these features are almost never utilized. It is not practical to attempt to incorporate reservoirs in smaller portable tools. Therefore, air motors can be lubricated most efficiently by means of standard air line oilers. Such oilers usually have a minimum capacity of a pint or more, with a transparent bowl which allows visual inspection of the oil level. Responsibility for replenishing air line oilers should be clearly assigned. An air tool may run for many hours without lubrication, but with decreased efficiency and eventually a critical part will wear out and fail.

CHECK TO SEE IF OILER IS FUNCTIONING

As final precaution, a check should be made to insure that air tools are actually receiving oil from the air line lubricator. Simply place a piece of white paper over the exhaust port and with the tool running for a few moments, there should show a slight discoloration of the paper when oil is being supplied to the air motor. Also, certain types of oilers are provided with sight gauges for visual check of the flow.

- **Proper lubrication will greatly reduce repair cost and add long life expectancy.**

AN AIR LINE FILTER

A filter should be installed in an air line to trap water, dirt, rust and scale normally present in compressed air lines. The filter should be drained as often as necessary through the valve at the bottom of the bowl. Always install a filter ahead of an oiler.

- **Any little air leak can add to your overhead - Stop this needless waste.**

AIR LINE PRESSURE

Efficient performance of air tools depends first of all upon an adequate level of air pressure. The air pressure at the tool should measure approximately 90 P.S.I.

If air pressure is less than this amount, the possible cause may be system leakage, faulty airline distribution or inadequate compressor capacity.

- **Correct air pressure is vital for top efficiency.**

HOSE SIZE RECOMMENDED FOR TRANSMISSION OF COMPRESSED AIR AT 80-100 P.S.I.

RATE OF AIR FLOW (CFM)	TYPES OF AIR TOOLS	RECOMMENDED HOSE SIZES (I.D.)		
		0 - 25'	25 - 50'	50 - 200'
0 - 20	Small Die Grinders 1/4" Drills Small Trimmer 2" - 3" Small Routers	5/16"	3/8"	1/2"
20 - 30	Trimmers 4" - 5" Backfacing Motors 1/2" Drills Large Die Grinders Medium Routers	3/8"	1/2"	1/2'
30 - 60	Trimmer 6" - 7" 5/8" Drills 5" - 7" Disc Sanders	1/2"	3/4"	3/4"

REPAIR OR REPLACEMENT OF AIR TOOLS

The question of whether to repair or replace an air tool is a problem common to all users, but there are wide differences in prevailing practices. Most companies, for example, have an amortization program in which they write off all air tools in a five-year period. Yet many users are reluctant to scrap an air tool after a five-year period, and it is not uncommon to find tools in use for periods up to 10 and 12 years. Such tools cannot be expected to perform as efficiently as newer models, nor do they incorporate the engineering improvements constantly being made in air tools. Retention of old air tools in a plant can be uneconomical, particularly if the tool is being used constantly. Cost studies have shown that a power tool performing at less than 90% efficiency is actually costing money. An actual survey in a typical plant showed that about 25% of their air tools were performing well below their rated efficiency. Where systematic maintenance is not practiced, it is not uncommon to find the average air tool running at about 60% of maximum efficiency. This condition is found in some of the most modern and well-equipped plants. Lack of tool maintenance can and does result in lost production time and increased costs.

A repairman can be trained to help segregate such substandard tools. A helpful rule for the maintenance department would be that a tool should be scrapped if its repair cost exceeds 50% of the cost of a new replacement. A determined application of such a program can lead to a marked reduction in costs.

SPARE TOOLS CAN CUT MAINTENANCE COSTS

Spare tools are commonly called *back-up* tools, since their basic purpose is to support production and assembly schedules. The experience of many manufacturers has shown the necessity and economy of such tools. The failure of a single air tool can halt a production line unless there is an emergency tool instantly available for use. The cost of a *back-up* tool is far less than the cost of down time and lost production.

It is not necessary, however, to have a large stock of emergency spare tools on hand, particularly if production tools are being handled with reasonable care and given periodic maintenance. One spare tool for every 10 production tools may be considered a good average, and the ratio should be determined by individual plant requirements.

Spare tools can and should be used for regular substitution on the production line while an active tool is returned to the maintenance department for overhauling.

We hope that the basic information outlined on the above air tool maintenance sheets will help to improve the performance of your air tools. More detailed information may be obtained by contacting:

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