

### WARNINGS FOR PROPER USE OF AIR MOTORS AND SPINDLES

- Be sure to read and thoroughly understand these instructions before using an Air Motor or Spindle.
- Motors and Spindles are not designed to be used as hand held tools. They were designed to be mounted directly to a machine and are not to be touched while in use. The torque and speed of these units could cause serious injury if held by hand.
- The Motor or Spindle should not be modified in any way without the prior written permission from Finley Enterprises.
- A shield around the cutting tool is recommended to prevent broken tools or machining fragments from flying through the air and injuring anyone.
- When changing tools, be sure to remove the collet and clean both the collet and the collet taper in the Spindle. This is to prevent run out which could cause severe vibration and result in cutting tool failure and breakage which could injure people in the area.
- To be safe, disconnect the air line to the Air Motor or the electrical connector of an Electric Motor while changing a collet or tool.
- Be sure to keep your hands, clothing and hair away from rotating tools.
- Silencers should be used on the exhaust air from the Air Motor to reduce noise exposure and the potential damage to hearing.
- Be sure correct sized collet is used for the selected tool and that the collet is tightened firmly.
- Eye protection should always be used by personnel in the area where such tools are used.
- Always dress a grinding wheel at low speed, while it is mounted in the Spindle it will be running in, prior to using.
- Do not operate any cutting or grinding tool beyond it's recommended speed or load because it might break or explode

### AIR SUPPLY AND LUBRICATION OF AIR MOTOR

- For optimum performance and maximum life, we recommend use of compressed air with a dew point between +2°C & 10° C. Installation of a refrigerated cooler-dryer is recommended.
- Use a separate filter with an automatic dump connected to a pressure regulator which is connected to drip feed lubricator.
- The lubricator should have a low oil sensor that can be connected to the feed hold on the CNC Control or other relay that will shut the machine down until the oil is refilled.
- The air coming out of the lubricator must contain 60 to 90mg of high quality air tool oil per cubic meter of air. For Lubricators supplied by Finley Enterprises, this would equate to about 3 to 4 drops of oil per minute for Model 36-10 Air Motors and 6 to 8 drops per minute for Model 46-13 Air Motors. Some lubricators vary considerably in the number of drops per minute, so it is highly recommended that you contact your lubricator manufacturer to be sure you are supplying the correct amount of oil to the motor. Operating the Air Motor with the incorrect amount of oil will shorten it's life considerably.
- The Air Motor is designed for a maximum pressure of 7 bar = 102 psi.
- A reduction of the motor sound can be achieved by installing a silencer in the exhaust port. Further silencing can be had by attaching a hose to the exhaust port and leading it into a separate exhaust chamber in a remote area of the machine. The silencer should then be attached to the end of the hose.
- Planetary gears, ball and needle bearings in the Gear Reduction Unit should be lubricated with grease in conjunction with overhauls of the motor. Molykote BR2 Plus gives long intervals between lubrications.
- See list of recommended lubricants below.
- Always blow out the air line before connecting to the Air Motor.

### RECOMMENDED LUBRICANTS FOR AIR MOTORS

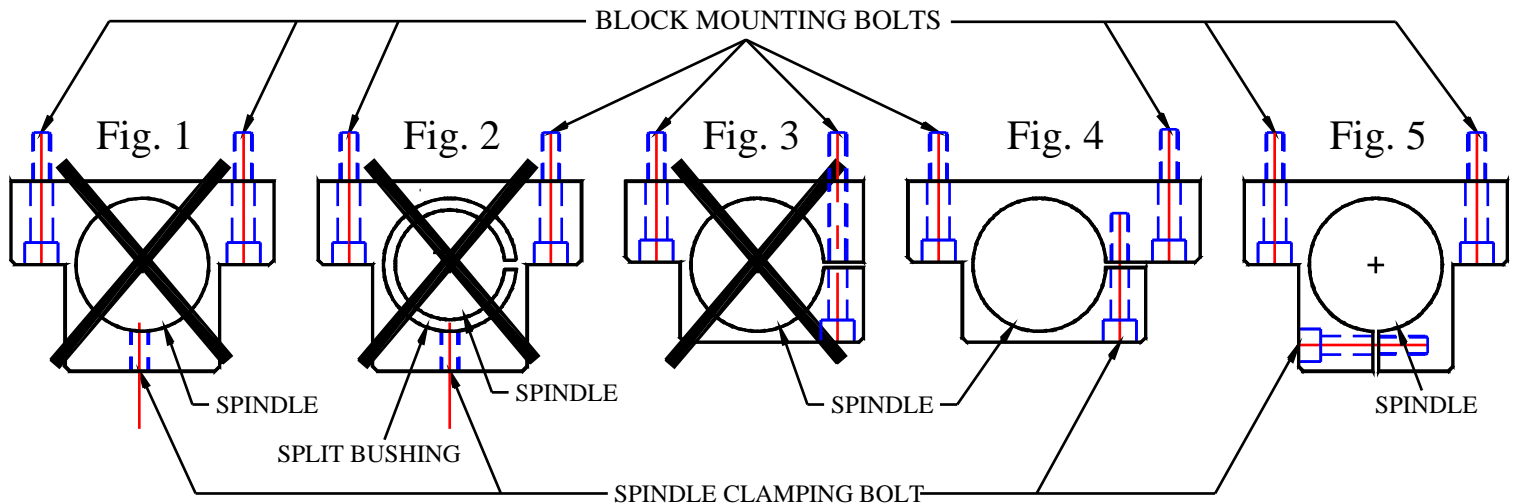
MAKE	AIR TOOL OIL	GREASE
BP	Energol RD-E46	Energrease LS-EP2
CASTROL		Spheerol SW 2 EP
Esso/Statoil	Rockway EP 68	Uniway EP2 N
Mobil	Almo Oil 525	Mobilux EP 2
Molykote		BR2 Plus
Shell	Torcula 68/ Torcula 32	Alvania Grease EP2
Texaco	Aries 32	Texando FO 20 S
Kluber		Isoflex NBU 15

### METHODS OF MODIFYING MOTOR OUTPUT

- THROTTLING - A throttle is usually fitted into the motor's inlet hose, although it can also be fitted into an exhaust hose. This will result in a high starting torque but reduced running speed.
- PRESSURE REGULATION - The pressure regulator should be fitted into the motor's inlet hose. This will result in reducing both starting torque and running speed.

# PROPER MOUNTING PROCEDURE FOR SPINDLE

THE BLOCK MOUNTING BOLTS MUST BE VERY TIGHT TO FASTEN THE BLOCK SECURELY TO THE MACHINE.



—The SPINDLE CLAMPING BOLTS should only be tight enough to prevent the spindle from moving in the mounting block during the machining process. Over tightening of the SPINDLE CLAMPING BOLTS will compress the Spindle housing and increase the preload on the spindle bearings which will cause overheating and lead to premature failure.

—Fig. 1 mounting should never be used. It is the most damaging to the Spindle.

—Fig. 2 mounting, although better than Fig. 1, should never be used as it will still apply uneven pressure to the Spindle housing.

—Fig. 3 mounting, although better than both Fig. 1 & Fig. 2, is not recommended because the BLOCK MOUNTING BOLT is being used as the SPINDLE CLAMPING BOLT which will result in the Spindle being clamped too tightly.

—Fig. 4 and 5 are the very best way to mount the Spindle because it allows for heavy tightening of the BLOCK MOUNTING BOLTS and gentle tightening of the SPINDLE CLAMPING BOLTS. This is the only recommended way to mount the Spindle.

## COOLANT

Coolant nozzles should be directed at the tool, not the spindle. Many spindles fail due to coolant ingress. Coolant enters the spindle through the front or rear thus contaminating the bearings. The coolant mixes with the grease and quickly destroys the lubricant which leads to premature bearing failure and the failure of the spindle. This problem is more severe with the use of the water based coolants. We strongly suggest customers take necessary steps to guard against coolant from entering spindle. The front bearings are protected with both a contact and a labyrinth seal and can be provided with a 1/8" NPT tapped hole to allow for pure and dry low pressure air to be introduced into the spindle between the front and rear bearings which allows for a small amount of air to weep past the contact seals and help keep the labyrinth seal free of coolant. However, some of the new high pressure (1,500. PSI and up) coolant systems can overcome the sealing ability of any seal if the coolant stream or spray hits the seal areas of the spindle. It is imperative that the customer prevent this from happening.

## WARRANTY

—Finley Enterprises LLC Products are warranted to be free from defects in materials and workmanship for 6 months provided that that the Product has been operated and maintained in accordance with the instructions provided in this Operation Manual and has not been subjected to apparent misuse, abuse, accident or incursion of coolant or other foreign matter into the bearings. The products should be promptly returned to Finley Enterprises LLC with transportation charges prepaid. If Finley Enterprises LLC inspection discloses no defect in material or workmanship, repair or replacement and return will be made at customary charges.

THE FOREGOING WARRANTY SUPERCEDED, VOIDS AND IS IN LIEU OF ALL OR ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE IS INTENDED OR MADE. FINLEY ENTERPRISES LLC'S SOLE OBLIGATION AND THE ORIGINAL USE PURCHASER'S SOLE REMEDY IS AS STATED ABOVE AND IN NO EVENT SHALL FINLEY ENTERPRISES LLC BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES OR EXPENSES OF ANY NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION TIME INCURRED BY THE ORIGINAL USE PURCHASER OR ANY OTHER PARTY.