



Tool Products

# OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

SECTION M10  
MANUAL 32

Released: 10/72

Revised: 3-10-95

Form: 006-2

## "000-1" SERIES GRINDERS

Models: 8475-A-( ), 8475-A1, 8476-A, 8476-A1,  
8477-A, 8477-A1, 8478-A and 8478-A1.



### ⚠ WARNING

**READ THIS MANUAL CAREFULLY BEFORE INSTALLING,  
OPERATING OR SERVICING THIS EQUIPMENT.**

#### FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

To aid the operator's understanding of proper and safe use of grinders, the publications, "Use, Care and Protection of Abrasive Wheels", A.N.S.I. B7.1, and "Safety Code for Portable Air Tools", A.N.S.I. B186.1, can be purchased from:

American National Standards Institute, Inc.  
1430 Broadway  
New York, New York 10018

#### ⚠ WARNING

- Operate this tool at 90 p.s.i.g. (6.2 bar) maximum air pressure at the air inlet of the tool.
- Disconnect air supply from tool before removing/installing grinding wheel, wire brush or performing other maintenance procedures.
- Keep hands, clothing and long hair away from rotating end of tool.
- Anticipate and be alert for sudden changes in motion during start up and operation of any power tool.
- Never exceed rated r.p.m. of tool.
- Wear suitable eye and hearing protection while operating tool.
- Tool shaft can continue to rotate briefly after throttle is released.
- Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.
- Use tool only for purposes for which it was intended.

- Do not use excessive work pressure.
- Do not remove any labels. Replace any damaged label.
- Use only accessories recommended by ARO.

#### ⚠ WARNING

Repeated prolonged operator exposure to vibrations which may be generated in the use of certain hand-held tools may produce Raynaud's phenomenon, commonly referred to as Whitefinger disease. The phenomenon produces numbness and burning sensations in the hand and may cause circulation and nerve damage as well as tissue necrosis. Repetitive users of hand-held tools who experience vibrations should closely monitor duration of use and their physical condition.

#### NOTICE

- The use of other than genuine ARO replacement parts may result in safety hazards, decreased tool performance and increased maintenance and may invalidate all warranties.
- ARO is not responsible for customer modification of tools for applications on which ARO was not consulted.
- Tool maintenance and repair should be performed by authorized, trained, competent personnel. Consult your nearest ARO authorized servicer.
- It is the responsibility of the employer to place the information in this manual into the hands of the operator.

For parts and service information, contact your local ARO distributor, or the Customer Service Dept. of the Ingersoll-Rand Distribution Center, White House, TN at PH: (615) 672-0321, FAX: (615) 672-0601.

ARO Tool Products

Ingersoll-Rand Company

1725 U.S. No. 1 North • P.O. Box 8000 • Southern Pines, NC 28388-8000

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**FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.**

**⚠ WARNING**



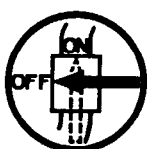
Wear eye protection when operating or performing maintenance on this tool.

**⚠ WARNING**



Wear hearing protection when operating this tool.

**⚠ WARNING**




Turn off air supply and disconnect air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.

**⚠ WARNING**




Air powered tools can vibrate in use. Vibration, repetitive motions or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advice before resuming use.

**⚠ WARNING**




Do not carry the tool by the hose.

**⚠ WARNING**




Do not use damaged, frayed or deteriorated air hoses and fittings.

**⚠ WARNING**




Do not overreach when operating this tool. Keep body stance balanced and firm.

**⚠ WARNING**



Operate at 90 p.s.i.g. (6.2 bar/620 kPa) maximum air pressure.

**NOTICE**

<p><b>⚠ WARNING</b> Read the manual before operating this tool. Operate at 90 psig/6.2 bar max.</p>	
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PN 48176-1 LABEL (NON-EU MODELS)      PN 49883 LABEL (-EU MODELS)

This label must appear on the tool at all times. If it is lost or damaged, a replacement label is available at no cost.

**WARNING** = Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage.

**CAUTION** = Hazards or unsafe practices which could result in minor personal injury or product or property damage.

**NOTICE** = Important installation, operation or maintenance information.

## ROUTINE LUBRICATION REQUIREMENTS

Lack of or an excessive amount of lubrication will affect the performance and life of this tool. Use only recommended lubricants at below time intervals:

**EVERY 8 HOURS OF TOOL OPERATION** – Fill lubricator reservoir of recommended F.R.L. with spindle oil (29665). If an in line or air line lubricator is not used, apply several drops of spindle oil (29665) in air inlet.

**EVERY 40 HOURS OF TOOL OPERATION** – Flush tool with a solution of three (3) parts cleaning solvent to one (1) part spindle oil. After flushing, apply a small amount of spindle oil in air inlet and run tool for one minute to insure proper lubrication.

## AIR SUPPLY REQUIREMENTS


For maximum operating efficiency, the following air supply specifications should be maintained to this air tool:

- AIR PRESSURE – 90 p.s.i.g. (6.2 bar)
- AIR FILTRATION – 50 micron
- LUBRICATED AIR SUPPLY
- HOSE SIZE – 3/8" (10 mm) I.D.

An ARO® model C28231–810 air line FILTER/REGULATOR/LUBRICATOR (F.R.L.) is recommended to maintain the above air supply specifications.

## RECOMMENDED LUBRICANTS

After disassembly is complete, all parts, except sealed or shielded bearings, should be washed with solvent. To relubricate parts, or for routine lubrication, use the following recommended lubricants:

 Where Used	ARO Part #	Description
Air Motor	29665	1 qt Spindle Oil
"O" Rings & Lip Seals	36460	4 oz. Stringy Lubricant
Gears and Bearings	33153	5 lb. "EP" – NLGI #1 Grease

## INSPECTION, MAINTENANCE AND INSTALLATION

Disconnect air supply from the tool or shut off air supply and exhaust (drain) line of compressed air before performing maintenance or service to the tool.

It is important that the tools be serviced and inspected at regular intervals for maintaining safe, trouble-free operation of the tool.

Be sure the tool is receiving adequate lubrication, as failure to lubricate can create hazardous operating conditions resulting from excessive wear.

Be sure that the air supply lines and connectors are of proper size to provide a sufficient quantity of air to the tool.

Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should

be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition. Maintenance and repair records should be maintained on all tools. Frequency of repair and the nature of the repairs can reveal unsafe application. Scheduled maintenance by competent authorized personnel should detect any mistreatment or abuse of the tool and worn parts. Corrective action should be taken before returning the tool for use.

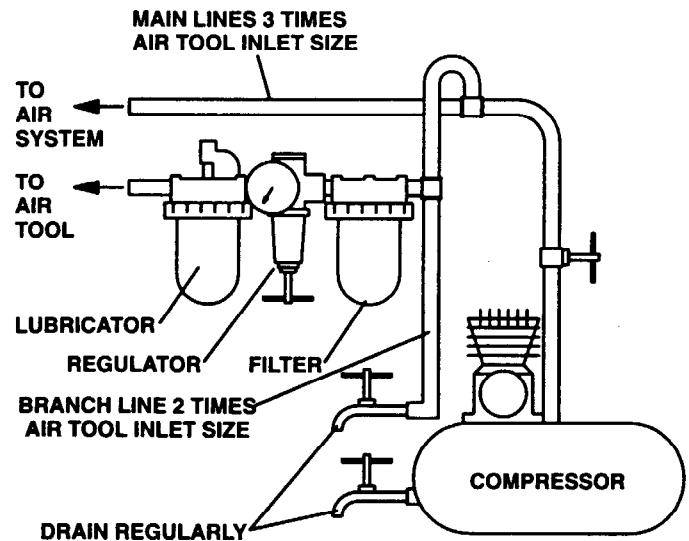
Disassembly should be done on a clean work bench with a clean cloth spread to prevent the loss of small parts. After disassembly is completed, all parts should be thoroughly washed in a clean solvent, blown dry with air and inspected for wear levels, abuse and contamination. Double sealed or shielded bearings should never be placed in solvent unless a good method of re-lubricating the bearing is available. Open bearings may be washed but should not be allowed to spin while being blown dry.

Upon reassembling, lubricate parts where required. Use 33153 grease, or equivalent, in bearings. Use 36460 lubricant for "O" ring assembly. When assembling "O" rings or parts adjacent "O" rings, care must be exercised to prevent damage to the rubber sealing surfaces. A small amount of grease will usually hold steel balls and other small parts in place while assembling.

Before mounting a wheel, after all tool repairs and whenever a grinder is issued for use, the speed of the grinder shall be checked with a tachometer to make certain that its actual speed does not exceed its rated speed.

When replacement parts are necessary, consult drawing containing the part for identification.

Always use clean, dry air. Dust, corrosive fumes and/or excessive moisture can damage the motor of an air tool. An air line filter can greatly increase the life of an air tool. The filter removes rust, scale, moisture and other debris from the air lines. Low air pressure (less than 90 p.s.i.g.) reduces the speed of the air tool. High air pressure (more than 90 p.s.i.g.) raises performance beyond the rated capacity of the tool and could cause injury. Shown below is a typical piping arrangement.



## MODEL IDENTIFICATION

MODEL NUMBER	R.P.M.	THROTTLE TYPE	LEVER	HEAD ASSEMBLY	MOTOR HOUSING	SPINDLE TYPE	COLLET ASSEMBLY SPINDLE NUMBER	COLLET	COLLET CAPACITY
8475-A	30,000	LEVER	43160	43174	43161	SHORT	43179-3	41750-3	7/32" - 1/4"
8475-A-EU	30,000	LEVER	45953	49909	49908	SHORT	43179-12	41750-12	6 mm
8475-A1	30,000	LEVER	43160	43174	43161	SHORT	44124-8	31812-8	7/32" - 1/4"
8476-A	30,000	BUTTON		43173	43176	SHORT	43179-3	41750-3	7/32" - 1/4"
8476-A1	30,000	BUTTON		43173	43176	SHORT	44124-8	31812-8	7/32" - 1/4"
8477-A	28,000	LEVER	43160	43174	43161	EXTENSION	44602	41750-3	7/32" - 1/4"
8477-A1	28,000	LEVER	43160	43174	43161	EXTENSION	44608	31812-8	7/32" - 1/4"
8478-A	28,000	BUTTON		43173	43176	EXTENSION	44602	41750-3	7/32" - 1/4"
8478-A1	28,000	BUTTON		43173	43176	EXTENSION	44608	31812-8	7/32" - 1/4"

☐ CANCELLED MODELS

☐ MODELS WITH -EU ARE "EC" COMPLIANT MODELS

The grinder models listed in the model identification table above are furnished with a collet as standard equipment and are intended for use with mounted wheels and shall not be used with other type grinding wheels. Other size collet inserts or other collet assemblies listed on page 10 can be furnished with the above listed models.

## OPERATION

Safe and efficient operation of your ARO grinder can best be attained by observing proper operating, inspection and maintenance procedures. Allow only competent and qualified people to operate grinder and subject each grinder to a regular inspection and maintenance procedure. The qualified grinder operator must be carefully instructed in the safe operation and use of the grinder, including a study of the manufacturer's literature. The grinder operator should have a good attitude regarding safety.

**Operator Safety Equipment.** The grinder operator shall wear safety goggles or face shield at all times the grinder is turned on. Other protective clothing shall be worn if necessary for spark deflection. Respirators shall be used in poorly ventilated areas. Adjacent personnel shall be protected from grinding sparks and wheel fragments by protective barriers.

**Starting and Stopping.** Before starting a grinder, the operator shall make sure that no one is in the unguarded plane of wheel rotation. Upon mounting a new wheel, grinder shall be run at operating speed with the safety guard in place or in a protected enclosure for at least one minute before applying the wheel to the work. Check speed and balance of wheel.

Before a grinder is put down, the throttle shall be released and the wheel shall come to a stop. Tool rests, hangers or balancers are recommended.

Use only wheels with adequate speed ratings. The maximum operating speed marked on the wheel, blotters or packaging, shall equal or exceed the rated speed stamped on the grinder.

At each wheel change, Aro recommends the free speed be checked by competent authorized personnel, using a good reliable tachometer, to assure that the maximum tool speed is lower than manufacturers rated speed for the wheel to be used. A speed check shall never be made with grinding wheel on the grinder.

Grinders shall not be operated at a speed exceeding its rated speed.

If a wire brush should ever be used with this tool; insure the speed rating of the brush is greater than the speed of the tool the brush is to be used with and insure the brush conforms to applicable safety standards. Be certain the brush is compatible with mounting of the tool. Always use a wheel guard.

## MOUNTING INSTRUCTIONS FOR MOUNTED WHEELS

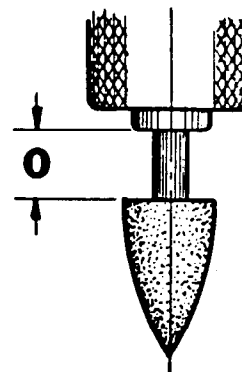
The collet shall be checked to assure it to be in good condition and properly affixed to the grinder spindle.

The mandrel shall be inserted to the full depth of the gripping jaws of the collet. At least 1/2 the mandrel length shall be inserted into the collet.

The maximum safe operating speed for mounted wheels shall be determined by the following: 1.) Shape and size of the mounted wheel, 2.) Size of mandrel and 3.) Overhang of mandrel. In no case shall the maximum safe operating speed recommended by the wheel manufacturer be exceeded.

**WARNING: Work pressure, if excessive, can be the cause of trouble and a source of danger, thru bending or fracture of the mandrel. Pressure between the wheel and the work should never be so heavy that springing of the mandrel will result.**

**IMPORTANT NOTICE:** Increasing the overhang of the mandrel will reduce the maximum wheel size that can be safely used with the speed of the tool (dimension "0", figure 1). Also, the length and diameter of mandrel combined with the size and shape of the wheel are determining factors which must be considered when selecting a mounted wheel that will be compatible with the rated free speed of the tool. It is recommended the "Tables of Maximum Operating Speeds for Mounted Wheels" of the American National Standard publication B7.1-1978 previously mentioned or other reliable source, be consulted to determine the safe operating speed of a particular size and shape of wheel combined with the size and overhang of mandrel.



MANDREL OVERHANG - DIMENSION "0"

FIGURE 1

# DISASSEMBLY AND ASSEMBLY OF TOOLS

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Disconnect air supply from tool or shut off air supply and exhaust (drain) line of compressed air BEFORE performing maintenance or service to tool.

Before starting to disassemble or assemble this tool (any part or completely), be sure to read "Inspection, Maintenance and Installation" section.

To minimize the possibility of parts damage and for convenience, the steps for disassembly or assembly listed on the following pages are recommended.

The basic sections and instructions for removing them from the tool are as follows:

## SPINDLE SECTION

Models with short spindle: Remove collet guard (43897) with diffuser (43893), "O" ring (Y325-22) and spring (43894). Remove

collet nut, collet and lock screw (43898).

Models with extension spindle: Remove spindle housing (44601) and exhaust diffuser (43168) with screen (43641). Remove spacer (43164) and drive coupling (43203).

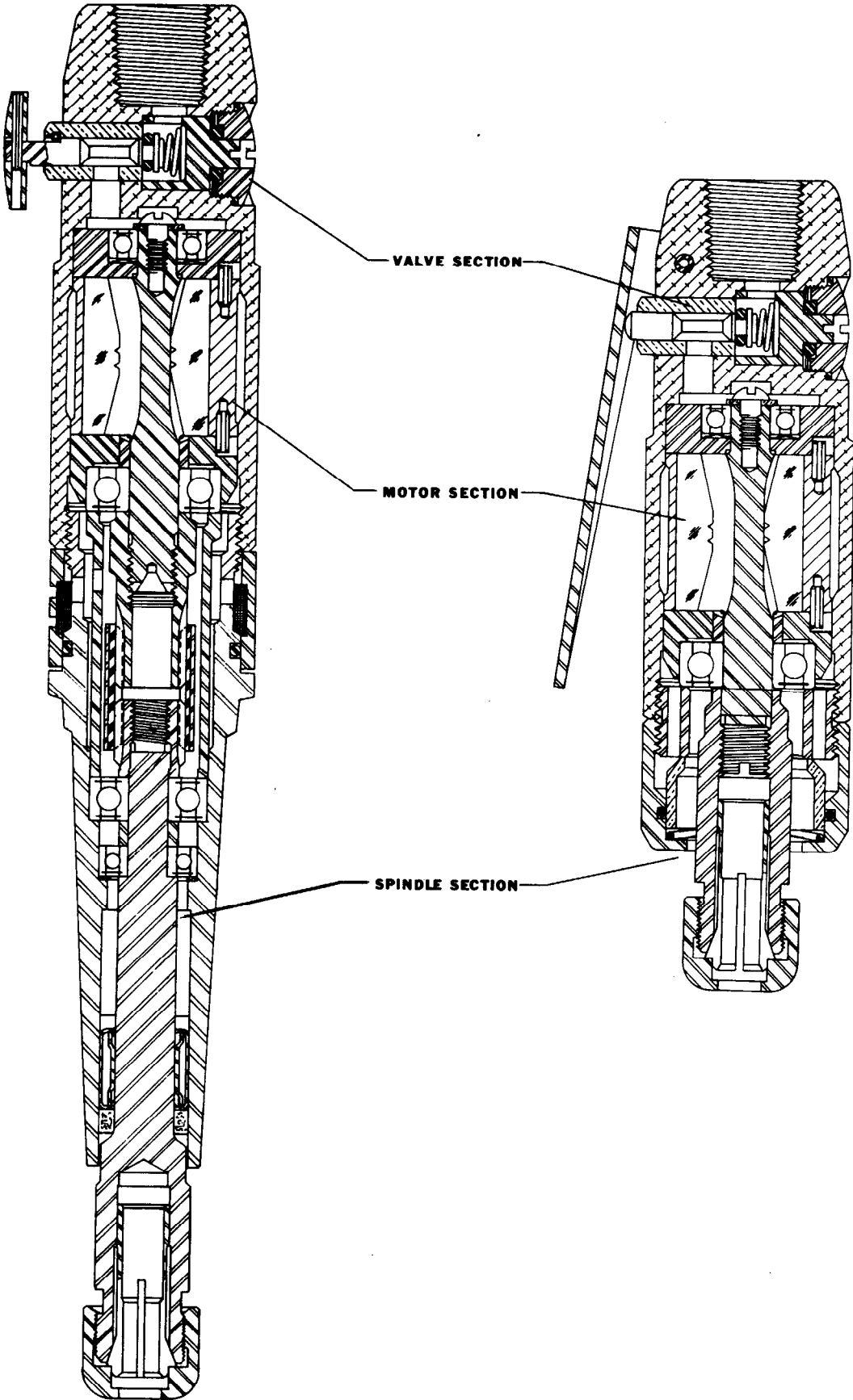
## MOTOR SECTION

Remove spindle section, grasp rotor and pull motor assembly from housing. Remove collet body or driver (43162). NOTE: Insert a screwdriver thru the end of the collet body or driver to hold spindle or rotor.

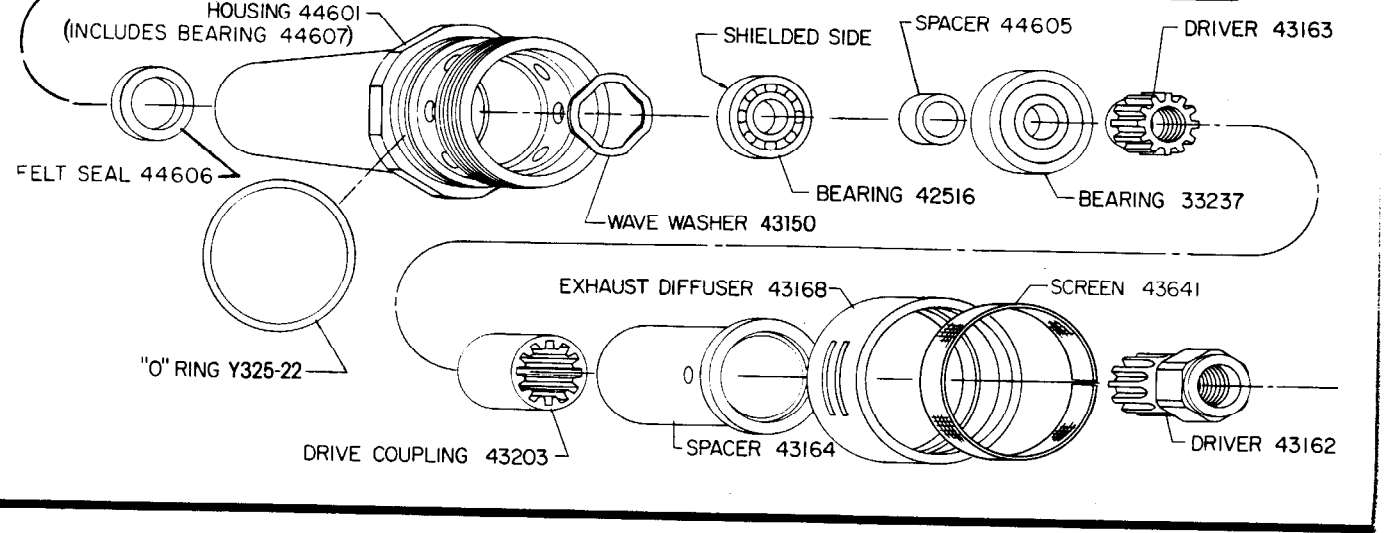
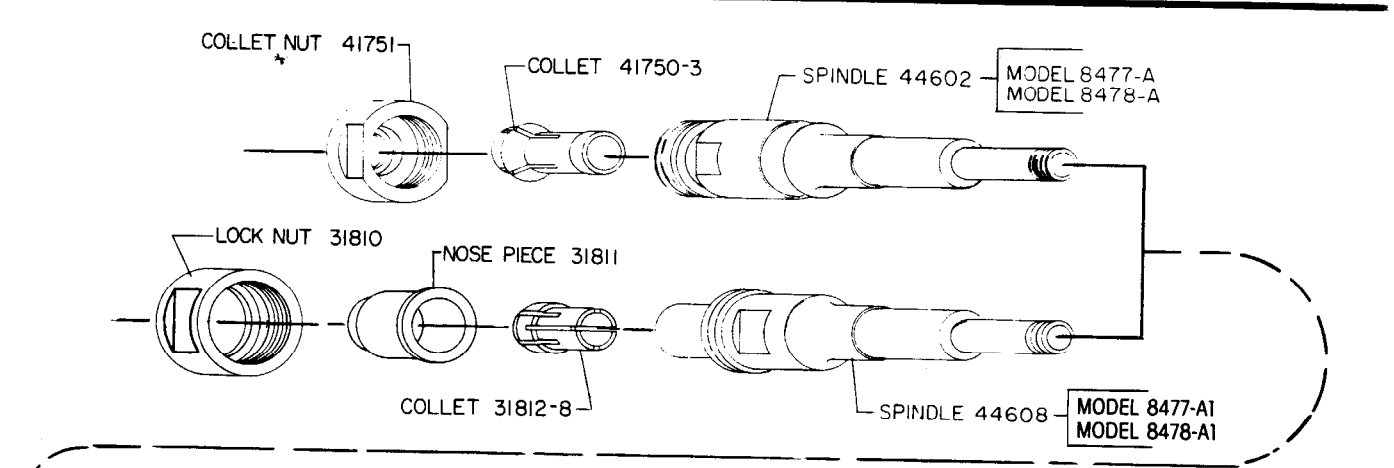
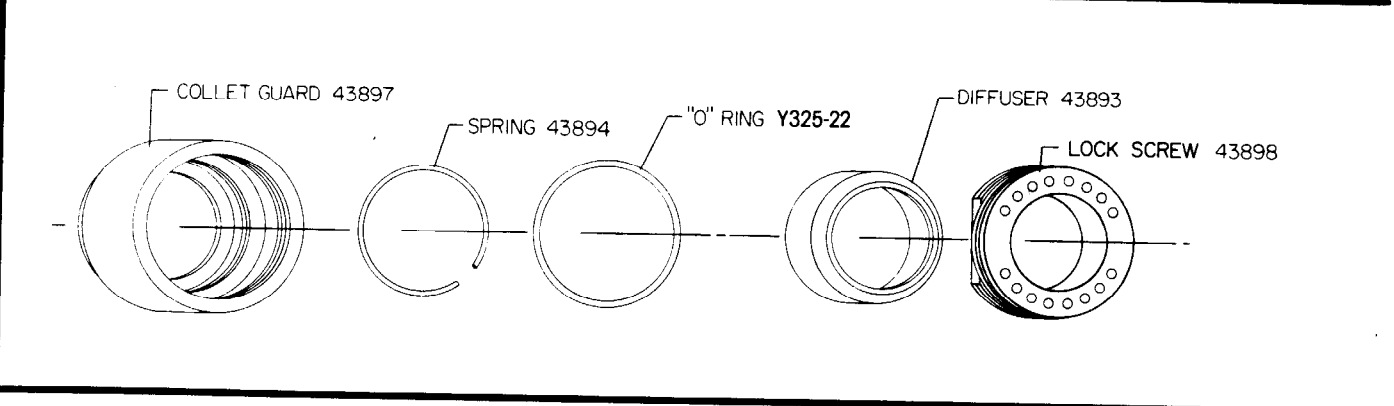
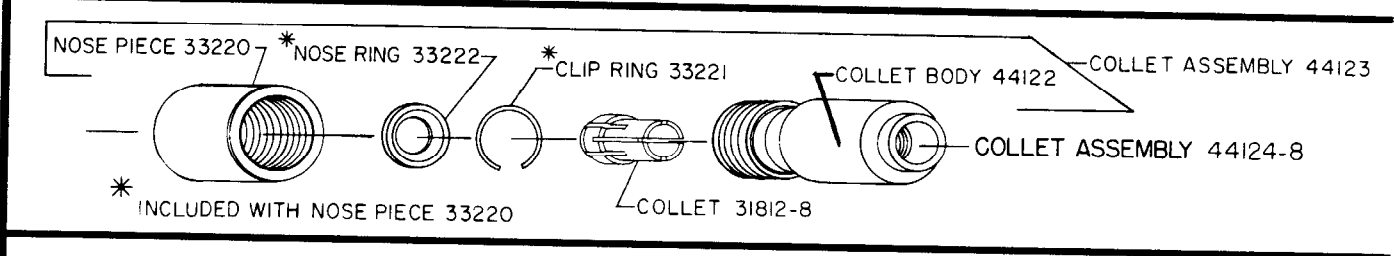
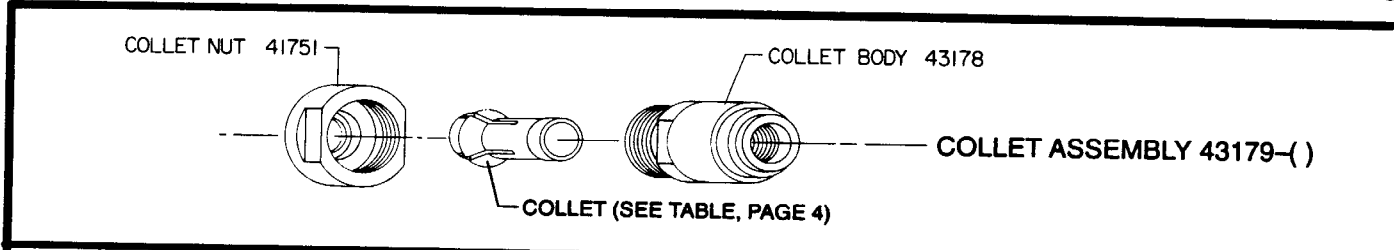
## VALVE SECTION

Throttle valve and components may be removed from housing without disassembling any other part of the tool.

# TYPICAL CROSS SECTION OF TOOL



# SPINDLE SECTION



## SPINDLE SECTION

### DISASSEMBLY

- Remove driver (43163) from spindle. Tap end of spindle with a soft face hammer to loosen and remove spindle out nose end of housing.

(44605) and bearing (33237) to housing.

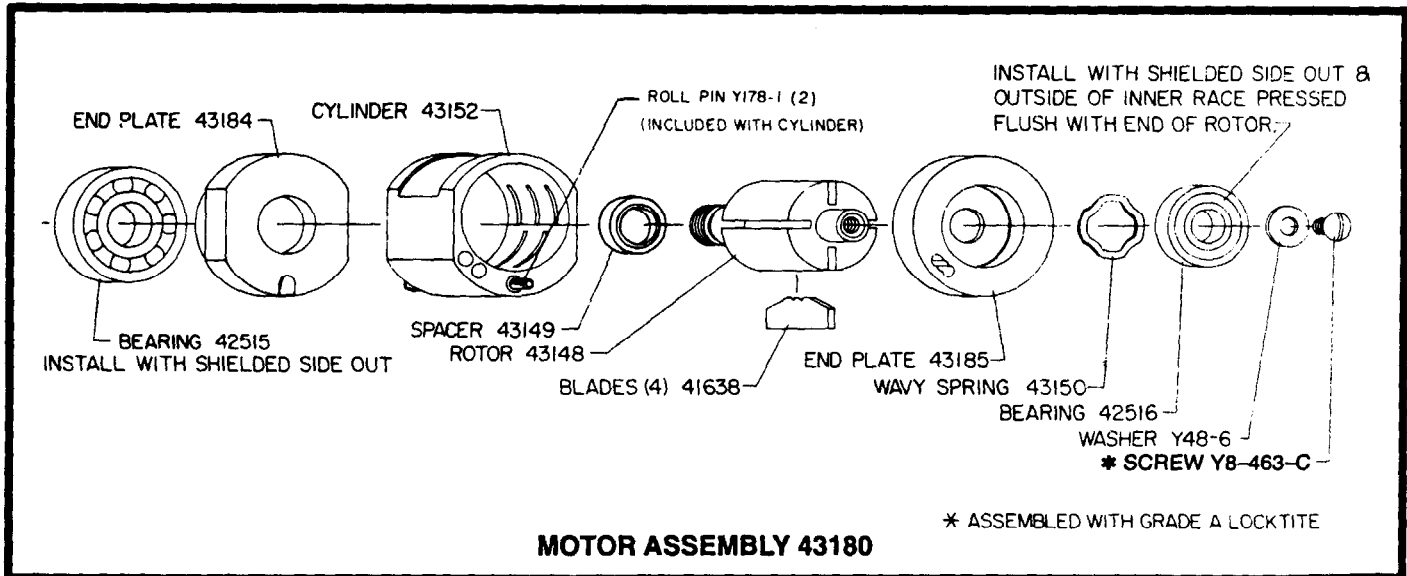
### ASSEMBLY

- Assemble felt seal (44606), wave washer (43150), bearing (42516) – shielded side towards nose end of housing – spacer

- Assemble spindle to housing and assemble driver (43163) to spindle.

- Assemble "O" ring (Y325-22), screen (43641) and diffuser (43168) to housing and assemble to tool with coupling (43203), spacer (43164) and driver (43162).

## MOTOR SECTION



### DISASSEMBLY

- Grasp cylinder (43152) in one hand and tap threaded end of rotor with a soft face hammer; motor will come apart.
- NOTE: Screw (Y8-463-C) is assembled to the rotor with a hard drying adhesive and should not be disassembled unless it is necessary to replace a worn part.

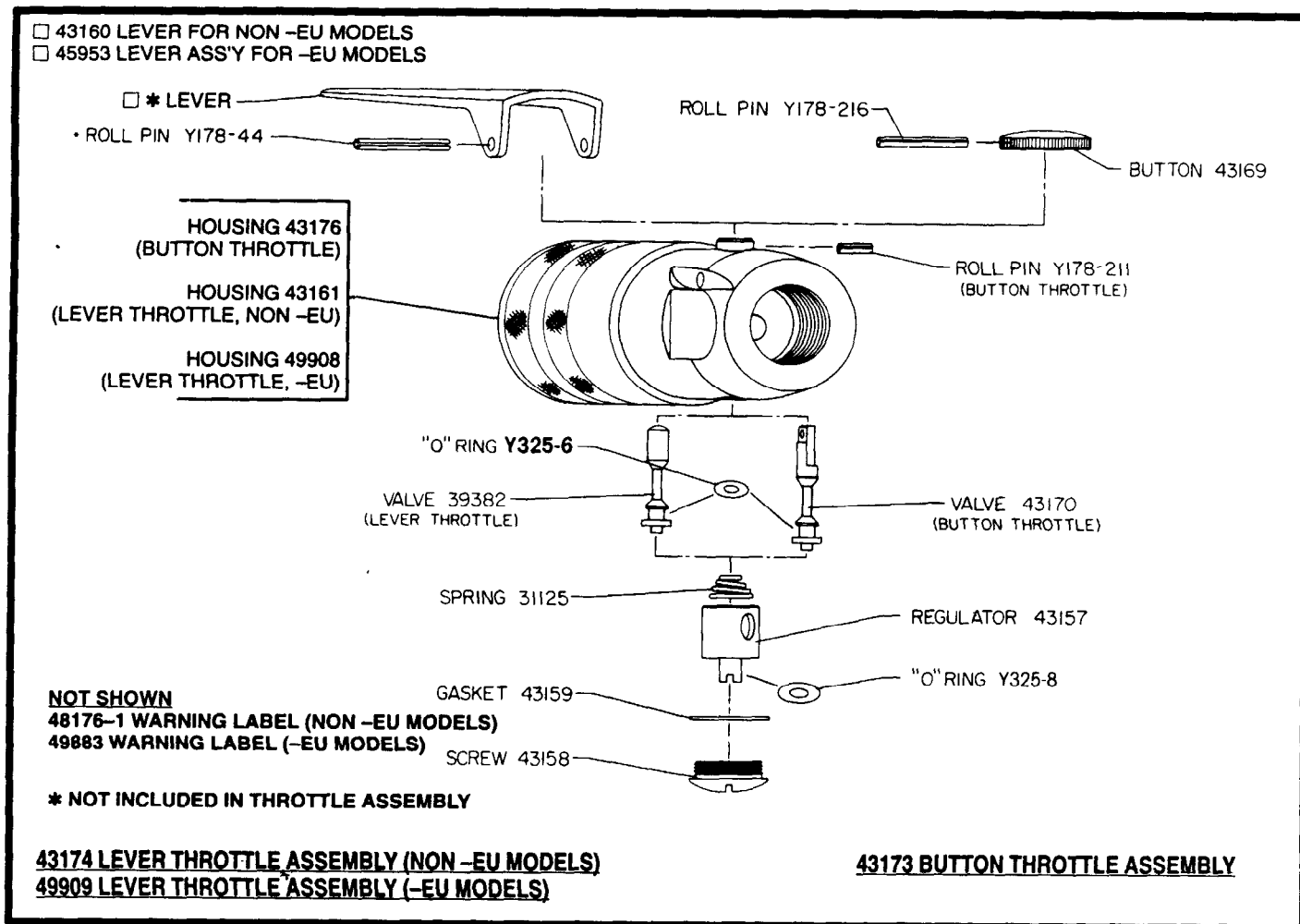
### ASSEMBLY

- Assemble wavy spring (43150) and bearing (42516) to end plate (43185). Assemble bearing to end plate with shielded side out.
- Assemble end plate (43185) to rotor and secure with washer

(Y48-6) and screw (8-463-C). NOTE: Bearing to be pressed on rotor with the outside face of the inner race flush with the end of rotor and assemble screw to rotor, using a good grade of adhesive.

- Assemble cylinder over rotor to end plate and assemble blades to rotor.
- Assemble bearing (42515) to end plate (43184), with the shielded side out, and assemble end plate over spacer (43149) to cylinder, aligning pin in cylinder with slot in end plate.
- Assemble collet body or driver (43162) to rotor.





## DISASSEMBLY

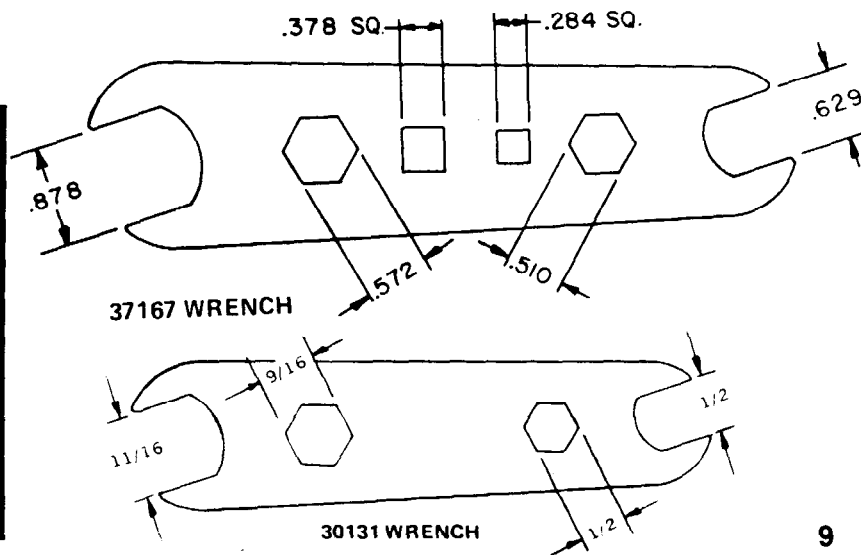
- a. Remove screw (43158) and gasket (43159).
- b. Air regulator, with "O" ring (Y325-8), and spring (31125) are free to be removed.
- c. Lever Throttle Models: Valve (39382), with "O" ring (Y325-6), is also free to be removed.
- d. Button Throttle Models: Remove roll pin (Y178-216) and button (43169) to remove valve (43170) with "O" ring (Y325-6).

## ASSEMBLY

- a. Assemble "O" ring (Y325-6) and spring (31125) to valve and assemble to housing. Button Throttle Models: Secure valve with button (43169) and roll pin (Y178-216).
- b. Assemble "O" ring (Y325-8) to regulator (43157) and assemble regulator to housing, aligning hole in side of regulator with air inlet of housing. Secure with gasket (43159) and screw (43158).

## WRENCHES FURNISHED

MODEL NUMBER	WRENCHES
8475-A	30131 & 37167
8475-A-EU	30131 & 37167
8475-A1	30131 & 37167
8476-A	30131 & 37167
8476-A1	30131 & 37167
8477-A	30131 & 37167
8477-A1	30131 & 39785
8478-A	30131 & 37167
8478-A1	30131 & 39785



## ACCESSORIES

### OPTIONAL COLLETS

COLLET NUMBER	COLLET ASSEMBLY NO.	SIZE	CAPACITY
41750-1	43179-1	1/8"	3/32" - 1/8"
41750-2	43179-2	3/16"	5/32" - 3/16"
41750-3	43179-3	1/4"	7/32" - 1/4"
41750-11	43179-11	3 mm	
41750-12	43179-12	6 mm	



#### SERIES 43179 3-PIECE COLLETS

COLLET NUT - 41751  
 COLLET BODY - 43178  
 5/16" - 24 THREAD  
 COLLET NUT DIA. - 3/4"  
 COLLET BODY DIA. - 19/32"  
 OVER ALL LENGTH - 2 1/4"

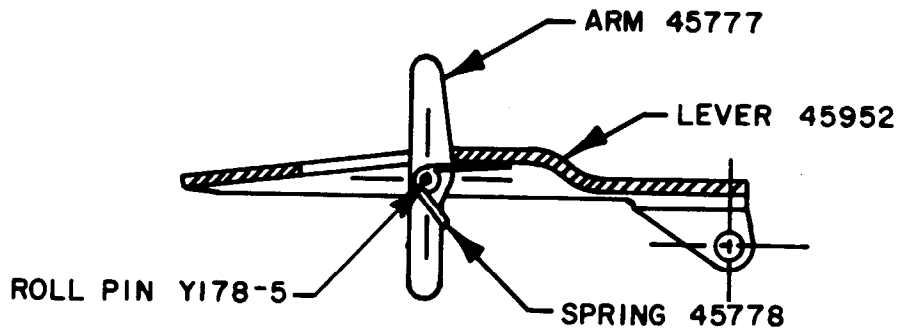
COLLET NUMBER	COLLET ASSEMBLY NO.	SIZE	CAPACITY
31812-1	44124-1	3/64"	1/64" - 3/64"
31812-3	44124-3	3/32"	1/16" - 3/32"
31812-4	44124-4	1/8"	3/32" - 1/8"
31812-5	44124-5	5/32"	1/8" - 5/32"
31812-6	44124-6	3/16"	5/32" - 3/16"
31812-7	44124-7	7/32"	3/16" - 7/32"
31812-8	44124-8	1/4"	7/32" - 1/4"



#### SERIES 44124 ERICKSON 3-PIECE COLLETS

COLLET NUT - 33220  
 COLLET BODY - 44122  
 5/16" - 24 THREAD  
 COLLET NUT DIA. - 25/32"  
 COLLET BODY DIA. - 5/8"  
 OVER ALL LENGTH - 2 1/8"

(SEE COLLET ASSEMBLIES, PAGE 7)



**45953 LOCK-OFF LEVER ASSEMBLY**

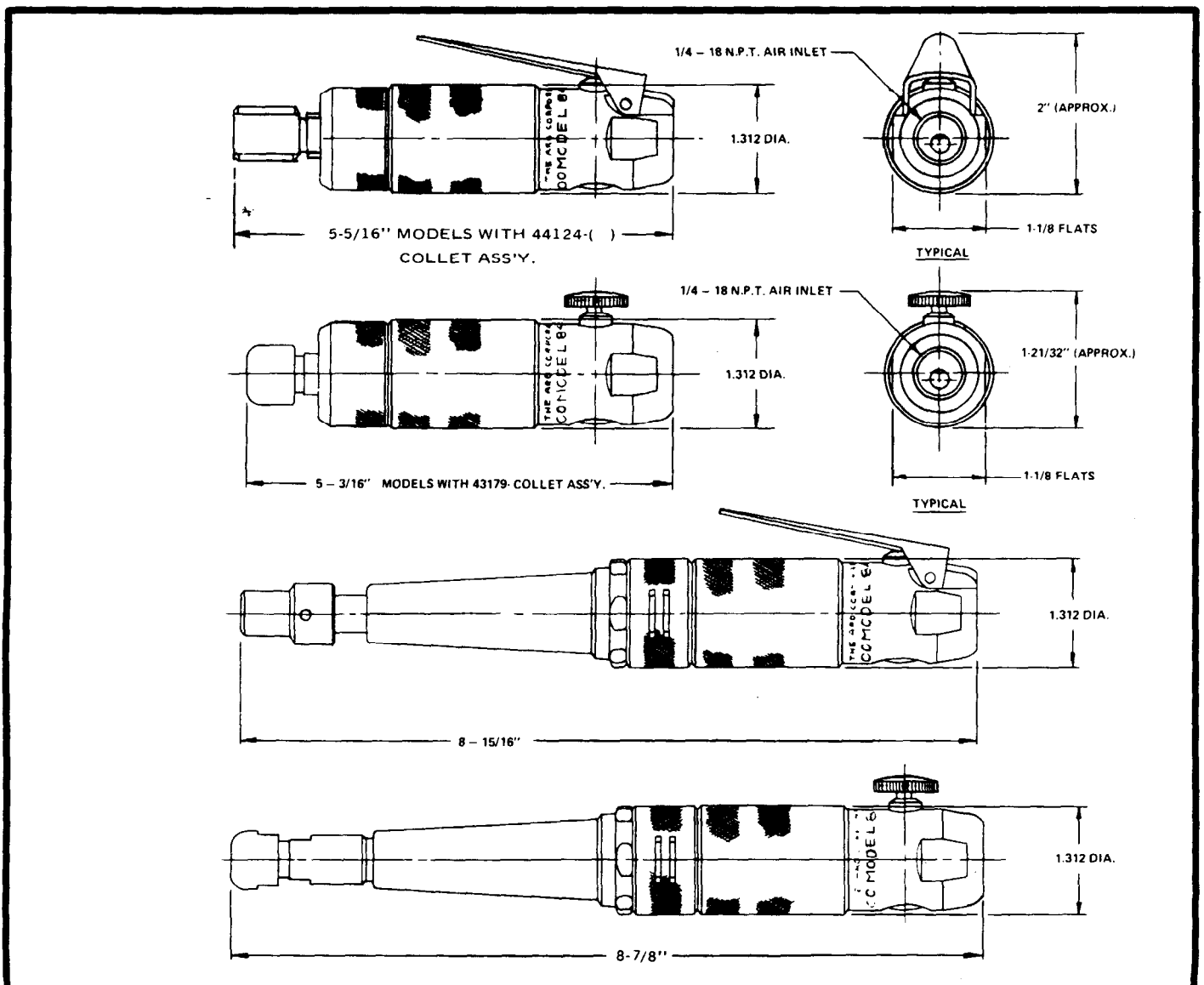
# TROUBLE SHOOTING

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LISTED BELOW ARE SOME OF THE MOST COMMON CAUSES FOR THE GRINDER TO MALFUNCTION. MALFUNCTIONS BEYOND THE SCOPE OF THIS MANUAL SHOULD BE BROUGHT TO THE ATTENTION OF YOUR ARO REPRESENTATIVE OR RETURN THE TOOL TO THE FACTORY FOR REPAIR.

CONDITION	POSSIBLE CAUSE	CORRECTIVE ACTION
LOW SPEED AND POWER OR GRINDER WILL NOT RUN.	<ol style="list-style-type: none"> <li>1. INADEQUATE AIR SUPPLY.</li> <li>2. AIR REGULATOR (43157) IMPROPERLY ADJUSTED.</li> <li>3. AIR INLET OR EXHAUST SCREEN PLUGGED.</li> <li>4. OBSTRUCTION IN THROTTLE VALVE OR VALVE NOT OPENING.</li> <li>5. MOTOR NOT BEING PROPERLY LUBRICATED.</li> <li>6. ROTOR BLADE IS MISSING, INCORRECTLY INSTALLED, BADLY WORN OR BEARING FAILURE.</li> </ol>	<ol style="list-style-type: none"> <li>1. CHECK AIR SUPPLY FOR CORRECT REGULATOR ADJUSTMENT (90 P.S.I.G. MAX. WHEN TOOL IS OPERATING).</li> <li>2. CHECK REGULATOR ADJUSTMENT TO BE SURE OF MAXIMUM AIR FLOW.</li> <li>3. INSPECT, WASH CLEAN.</li> <li>4. DISASSEMBLE THROTTLE, CLEAN, INSPECT FOR OBSTRUCTIONS OR DAMAGED PARTS.</li> <li>5. APPLY 2 OR 4 DROPS OF SPINDLE OIL IN AIR INLET. RUN TOOL TO ALLOW OIL TO ENTER MOTOR - BE CERTAIN OILER IS FULL OF OIL.</li> <li>6. DISASSEMBLE MOTOR, CLEAN AND INSPECT FOR PROPER INSTALLATION, REPLACE BLADES AND/OR BEARINGS IF NECESSARY.</li> </ol>
THROTTLE VALVE HARD TO OPERATE.	<ol style="list-style-type: none"> <li>1. DAMAGED VALVE PIN OR "O" RING.</li> </ol>	<ol style="list-style-type: none"> <li>1. DISASSEMBLE VALVE COMPONENTS, INSPECT, REPLACE IF NECESSARY.</li> </ol>
TOOL WILL NOT SHUT OFF.	<ol style="list-style-type: none"> <li>1. DAMAGED VALVE COMPONENTS.</li> </ol>	<ol style="list-style-type: none"> <li>1. DISASSEMBLE VALVE COMPONENTS, INSPECT, REPLACE PARTS IF NECESSARY.</li> </ol>

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