ARO
Tool Products

# OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

## "OOO" SERIES "QRT" SCREWDRIVERS

| | |
|---|---|
| SECTION | M30 |
| MANUAL | 24 |
| Released: | 4–1–88 |
| Revised: | 9–23–94 |
| Form: | 3291–2 |

**Models: 8683–BPR–( ) and 8684–BPR–( )**

## ⚠ WARNING

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

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

Pneumatic tools should always be installed and used in accordance with A.N.S.I. B186.1 "Safety Code For Portable Air Tools."

**⚠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 bit, socket or device attached to tool or performing 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.
- 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 servicenter.
- 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**
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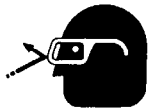
## FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

### ⚠ WARNING

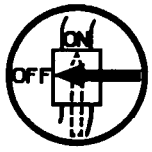


Wear eye protection when operating or performing maintenance on this tool.

### ⚠ 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.

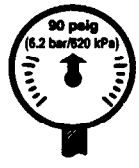
### ⚠ WARNING

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

### ⚠ WARNING

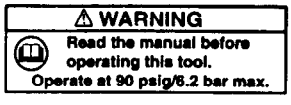
Do not overreach when operating this tool. Keep body stance balanced and firm.

### ⚠ WARNING




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

### NOTICE




PN 48176–1 LABEL

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 160 HOURS OF TOOL OPERATION** – Lubricate clutch parts with molybdenum grease (40036–1). Lubricate gearing. Pack bearings, coat shafts and lubricate gears with NLGI #1 "EP" grease (33153). Gearing should contain approximately 1/8 oz. (3.5 g) of grease per reduction. Clutch assembly should contain approximately 1/16 oz. (1.8 g) of grease.

## 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 – 5/16" (8 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 |
| Clutches | 40036–1 | 1 lb. "EP" Molybdenum Disulfide |

## 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.

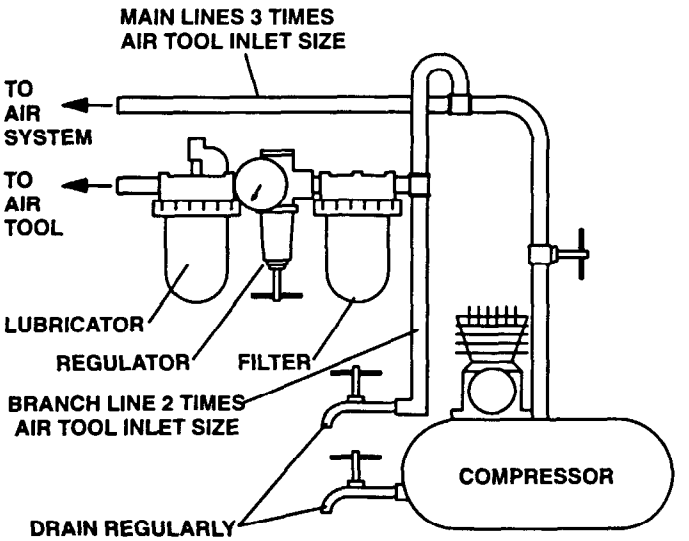
Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition. 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.

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. | CLUTCH ASSEMBLY | CLUTCH HOUSING ASSEMBLY | AUXILIARY GEARING | DRIVE GEARING | MOTOR ASSEMBLY | GEARING RED. |
|---|---|---|---|---|---|---|---|
| 8683-BPR-A | 750 | 36511-1 | 36795 | 36017 | 37168 | 37180-1 | 23.3:1 |
| 8683-BPR-D | 750 | | | 36017 | 45817 | 37180-1 | 23.3:1 |
| 8683-BPR-F | 750 | 45629-2 | 45630 | 36017 | 37168 | 37180-1 | 23.3:1 |
| 8683-BPR-P | 750 | 37018 | 37026 | 36017 | 37168 | 37180-1 | 23.3:1 |
| 8684-BPR-A | 2300 | 36511 | 36795 | | 36524 | 34082-1 | 8:1 |
| 8684-BPR-D | 2300 | | | | 45813 | 34082-1 | 8:1 |
| 8684-BPR-F | 2300 | 45629-1 | 45630 | | 36524 | 34082-1 | 8:1 |
| 8684-BPR-P | 2300 | 37018 | 37026 | | 36524 | 34082-1 | 8:1 |

CANCELLED

# DISASSEMBLY AND ASSEMBLY OF TOOLS

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:

### DRIVE SECTION

Remove clutch housing from tool (left hand threads); grasp clutch assembly and pull from gearing.

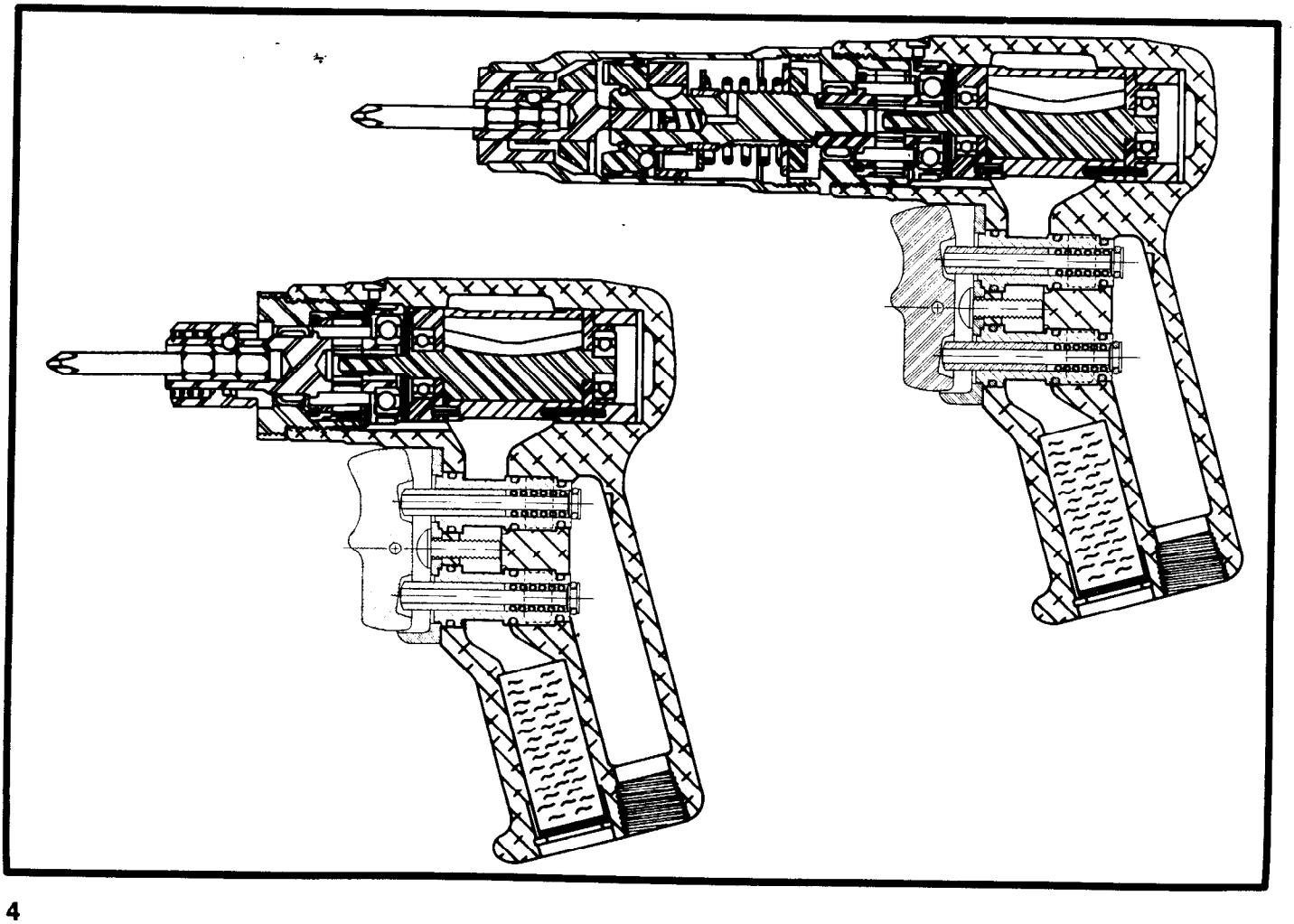
### GEARING SECTION

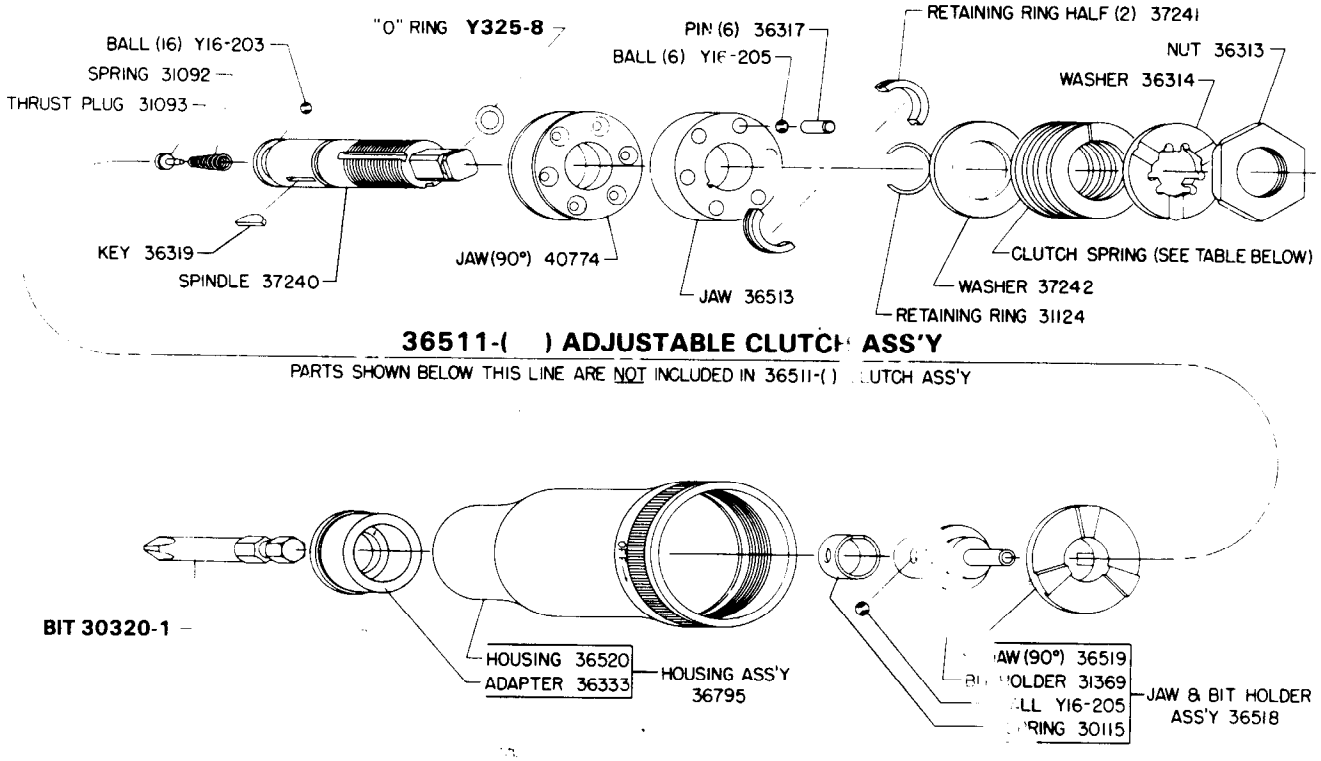
Remove drive section. Hold motor housing in a suitable fixture or strap wrench and remove gearing using a wrench on flats of ring gear.

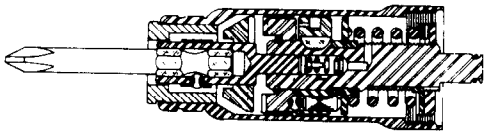
### MOTOR SECTION

Motor may be removed from housing after removal of gearing.

# TYPICAL CROSS SECTION OF TOOL





CROSS SECTION OF DRIVE END WITH 36511-( ) CLUTCH ASSEMBLY

| CLUTCH ASS'Y. NO. | TYPE | CLUTCH SPRING NO. | SPRING IDENTIFICATION TYPE WIRE | WIRE THICKNESS |
|---|---|---|---|---|
| 36511 | STANDARD DUTY | 36512 | ROUND | .080" DIAMETER |
| 36511-1 | HEAVY DUTY | 36315 | FLAT | .062" x .156" |

**NOTE: CLUTCH ASSEMBLY 36511 IS STANDARD ON MODELS WITH DRIVE GEARING ONLY. CLUTCH 36511-1 IS STANDARD ON MODELS HAVING BOTH DRIVE AND AUXILIARY GEARING.**

## CLUTCH ADJUSTMENT

Remove clutch assembly (36511– ) from the tool. Place a pin in hole of jaw (36513) or wrench on square end of spindle (37240) to adjust nut (36313). To adjust properly, release nut to least tension. Tighten nut one or two positions – each click = one position. Assemble clutch to tool and test torque on fastener to be tightened. Repeat until desired torque is obtained.

### DISASSEMBLY

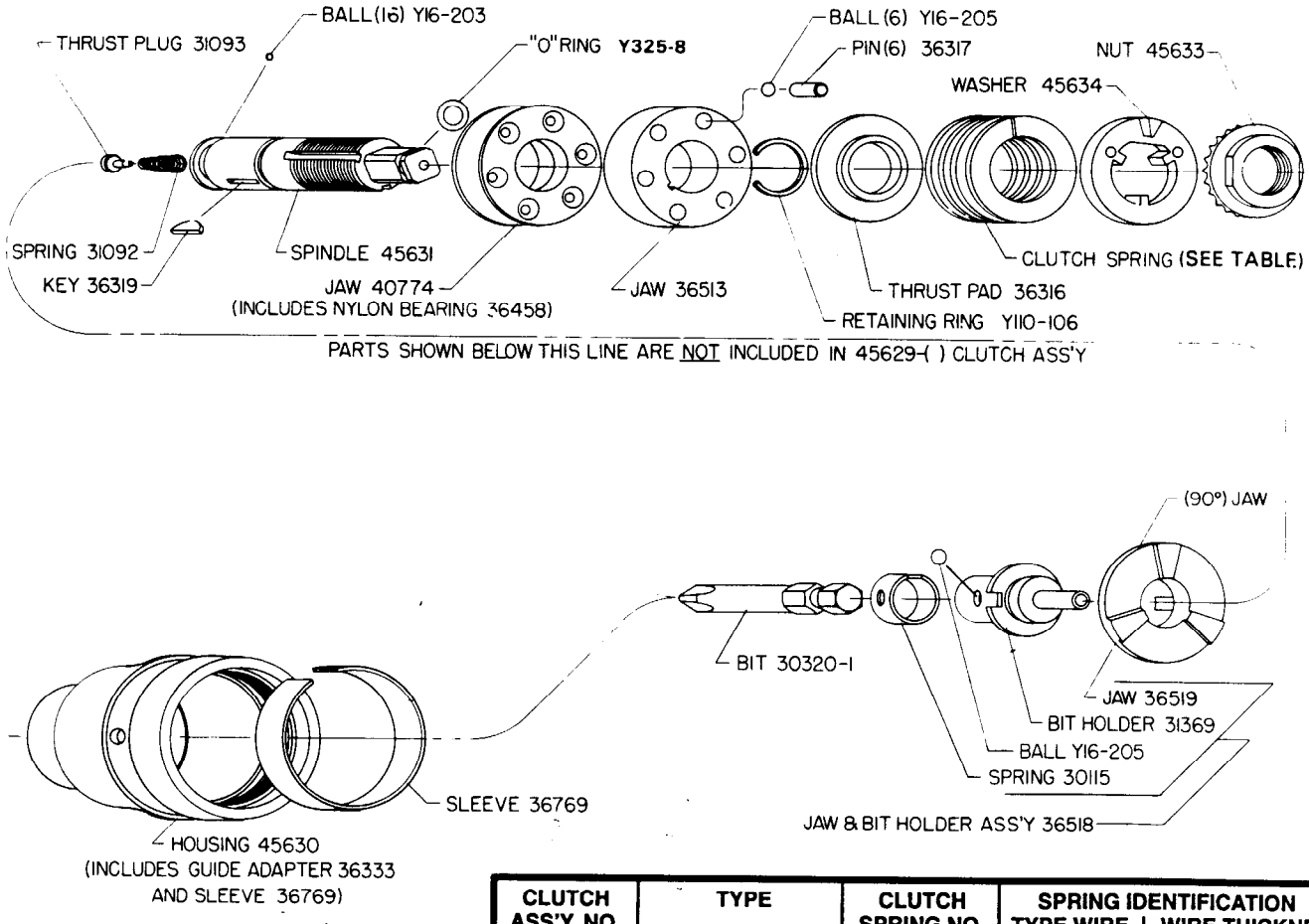
- Remove clutch housing (left hand threads) and bit holder assembly (36518) from tool. Grasp clutch assembly and pull from gearing.
- Remove adjusting nut (36313), releasing washer (36314), clutch spring, washer (37242), pins (36317) and balls (Y16–205).
- Remove retaining ring (31124) and retainer (37241), releasing jaw (36513), key (36319), jaw (40774) and balls (Y16–203). Remove adapter (36333).

### ASSEMBLY

NOTE: Lubricate balls, jaw faces, bit holder shaft, pins and washer with ARO 40036–1 grease when assembling clutch. Clutch assembly should contain approximately 1/16 oz. (1.7 g) of grease.

- Assemble jaw (40774) to spindle (37240), aligning face of jaw with center of bearing groove in spindle. Assemble balls (Y16–203) into groove and slide jaw ahead to retain balls in groove.
- Assemble key (36319) and jaw (36513) to spindle and secure with retainers (37241) and retaining ring (31124). NOTE: Assemble jaw (36513) to spindle with small hole in face of jaw facing jaw (40774).
- Assemble balls (Y16–205), pins (36317), washer (37242), clutch spring, washer (36314) and nut (36313). Adjust to desired tension (see "Clutch Adjustment").
- Assemble spring (31092), plug (31093), bit holder assembly (36518) and bit to spindle and assemble to tool. Assemble clutch housing to tool.

# DRIVE SECTION




| CLUTCH ASS'Y. NO. | TYPE | CLUTCH SPRING NO. | SPRING IDENTIFICATION TYPE WIRE | WIRE THICKNESS |
|---|---|---|---|---|
| 45629–1 | STANDARD DUTY | 36512 | ROUND | .080" DIAMETER |
| 45629–2 | HEAVY DUTY | 36315 | FLAT | .062" x .156" |

## EXTERNAL CLUTCH ADJUSTMENT

Rotate sleeve (36769) and align open portion of sleeve with slot in housing (45630). Depress bit to engage clutch jaws and rotate bit until notch in side of adjusting washer (45634) aligns with slot in housing. Insert a no. 2 Phillips screwdriver thru slot in housing and into notch in adjustment washer and gear teeth in nut. Turn screwdriver counterclockwise to increase torque – clockwise to decrease torque.

### DISASSEMBLY

- Remove clutch housing (left hand threads) and bit holder assembly (36518) from tool. Grasp clutch assembly and pull from gearing.
- Remove adjusting nut (45633), washer (45634) and clutch spring.
- Remove thrust pad (36316), pins (36317) and balls (Y16–205).
- Remove retaining ring (Y110–106), releasing jaw (36513), key (36319), jaw (40774) and balls (Y16–203).

### ASSEMBLY

NOTE: Lubricate balls, jaw faces and bit holder shaft with ARO 40036–1 grease when assembling clutch. Clutch assembly should contain approximately 1/16 oz. (1.8 g) of grease.

- Assemble jaw (40774) to spindle (45631), aligning face of jaw with center of bearing groove in spindle. Assemble balls (Y16–203) into groove and slide jaw ahead to retain balls in groove.
- Assemble key (36319) and jaw (36513) to spindle and secure with retaining ring (Y110–106). NOTE: Assemble jaw (36513) to spindle with small hole in face of jaw facing jaw (40774).
- Assemble balls (Y16–205), pins (36317), thrust pad (36316), clutch spring, washer (45634) and nut (45633). Adjust to desired tension (see "External Clutch Adjustment").
- Assemble spring (31092), plug (31093), bit holder assembly (36518) and bit to spindle and assemble to tool. Assemble clutch housing to tool.

## POSITIVE CLUTCH

### DISASSEMBLY

- Remove clutch housing (left hand threads) and bit holder assembly (37022). Grasp clutch assembly (37018) and pull from gearing.

### ASSEMBLY

- Lubricate bit holder shaft and face of jaws with ARO 40036–1 grease. Clutch assembly should contain approximately 1/32 oz. (.9 g) of grease.
- Assemble jaw (37030), spring (31092), plug (31093) and "O" ring (Y325–8) to spindle (37033).
- Assemble bit holder assembly (37022) to clutch assembly and assemble to tool. Assemble clutch housing to tool.

## CHUCK AND GEARING

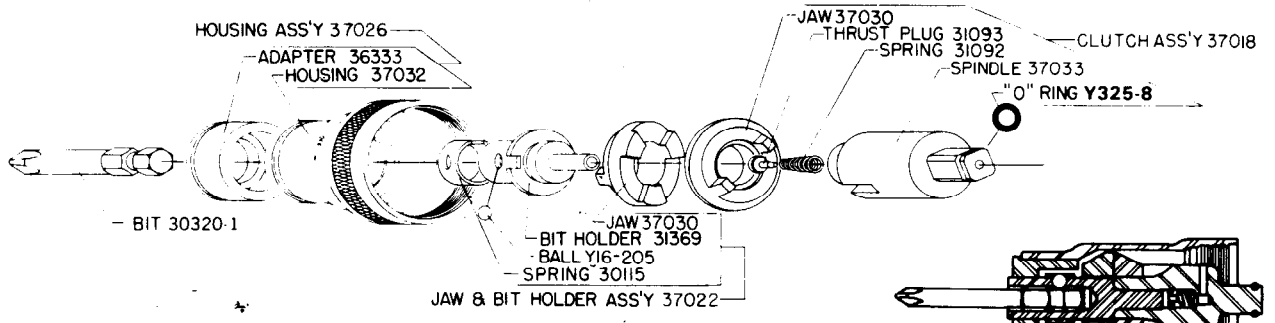
### DISASSEMBLY

- Remove gearing from tool as outlined on page 4
- Depress sleeve (45765) and collar (45766) and remove snap ring (Y111–5), collar, spring, sleeve and ball (Y16–5).
- Grasp ring gear in one hand and tap drive end of spindle with a soft face hammer; spindle and components will loosen from ring gear.
- To disassemble completely, remove spacer (36525) and alternately tap ends of shafts, loosening bearing (32850).
- Remove bearing from spindle.
- Remove shafts to remove gears.

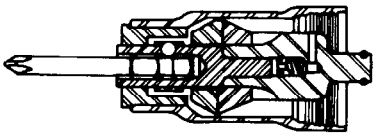
### ASSEMBLY

Pack bearings (lubricate needle bearing in ring gear) and lubricate gears liberally with ARO 33153 grease. Gearing assembly should contain approximately 1/16 oz. (1.8 g) of grease.

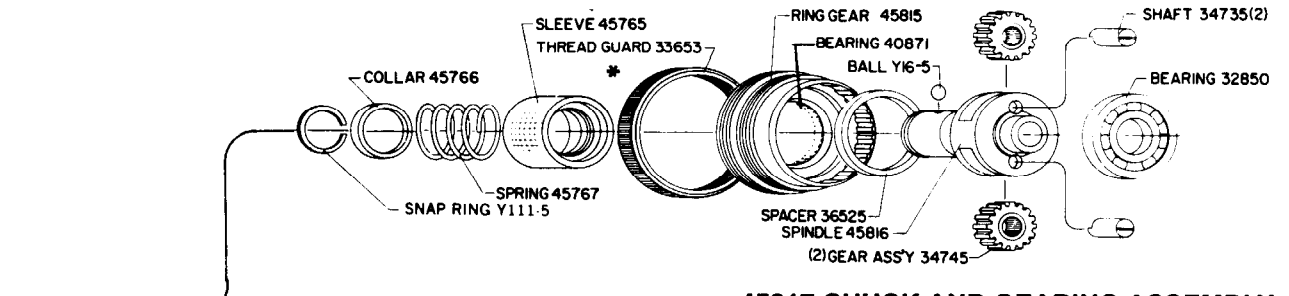
- Assemble gears to spindle and secure with shafts. Align notch at end of shafts with step on spindle.
- Assemble bearing (32850) and spacer (36525) to spindle and assemble into ring gear.
- Assemble ball (Y16–5), sleeve (45765), spring (45767) and collar (45766) to spindle and secure with snap ring (Y111–5).
- Assemble gearing to tool and tighten securely. Assemble thread guard to ring gear.




**POSITIVE CLUTCH**

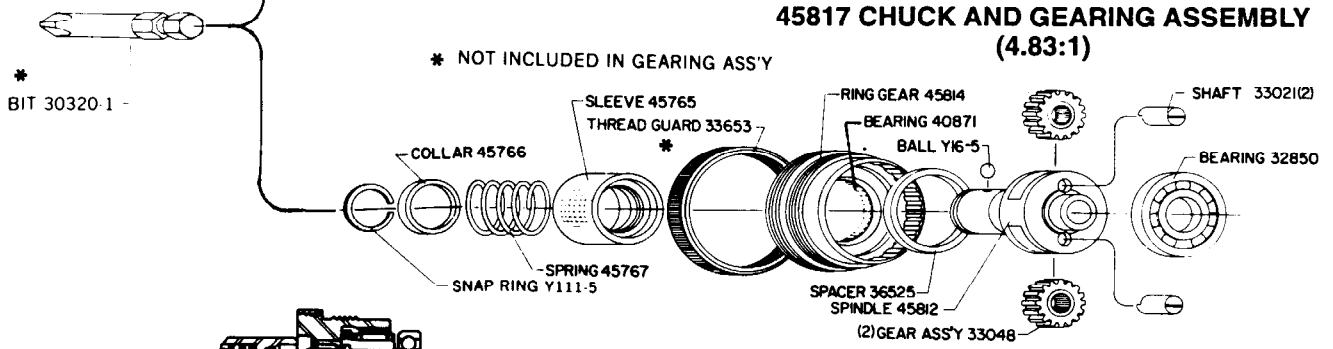


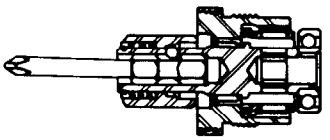
**CROSS SECTION OF DRIVE END WITH 37018 CLUTCH ASSEMBLY**




**45817 CHUCK AND GEARING ASSEMBLY (4.83:1)**

* NOT INCLUDED IN GEARING ASS'Y



**CROSS SECTION OF DRIVE END**

**45813 CHUCK AND GEARING ASSEMBLY (8:1)**

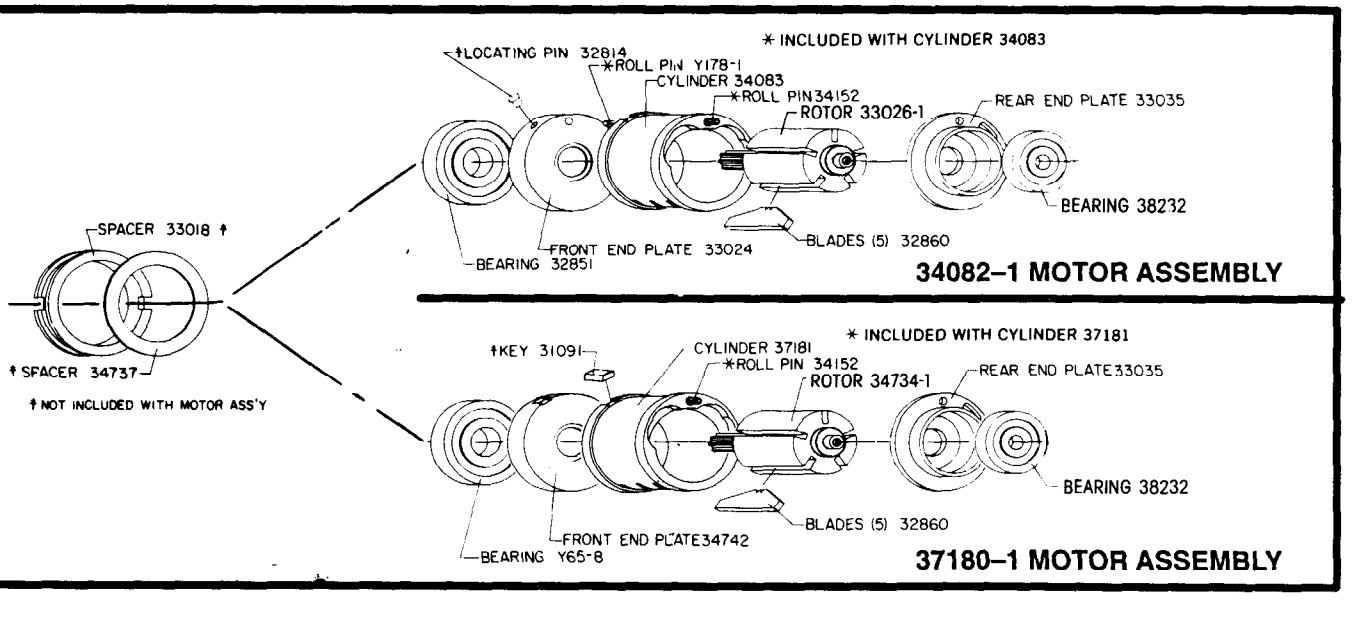
# MOTOR SECTION

## DISASSEMBLY

- _ Remove motor from housing.
- _ Grasp cylinder in one hand and tap splined end of rotor with a soft face hammer; motor will come apart.

## ASSEMBLY

- _ Pack bearings with ARO 33153 grease and assemble bearing (38232) into end plate (33035), pressing on outer race of bearing.
- _ Assemble end plate (33035) to rotor, pressing on inner race of bearing.
- _ Coat i.d. of cylinder with ARO 29665 spindle oil and assemble over rotor, aligning air inlet slots in end of cylinder with air inlet holes in end plate.
- _ Coat blades (32860) with ARO 29665 spindle oil and assemble to rotor slots – straight side out.
- _ Assemble bearing (Y65–8 or 32851) to front end plate, pressing on outer race of bearing.
- _ Assemble end plate to rotor, aligning roll pin in cylinder with hole in end plate.
- _ Be sure rotor does not bind (if rotor binds, tap splined end lightly with a soft face hammer).
- _ Assemble locating pin (32814) or key (31091) to front end plate and assemble motor assembly to tool.
- _ Assemble spacers (34737 and 33018) to tool.




# GEARING SECTION

## DRIVE GEARING

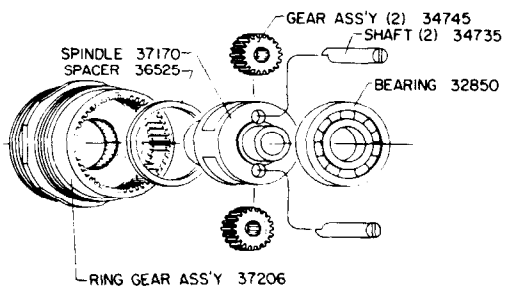
### DISASSEMBLY

- _ Remove gearing from tool as outlined on page 4.
- _ Grasp ring gear in one hand and tap drive end of spindle with a soft face hammer; spindle and components will loosen from ring gear.
- _ Remove spacer (36525) and alternately tap ends of shafts to loosen and remove bearing (32850).
- _ Remove shafts to remove gears from spindle.

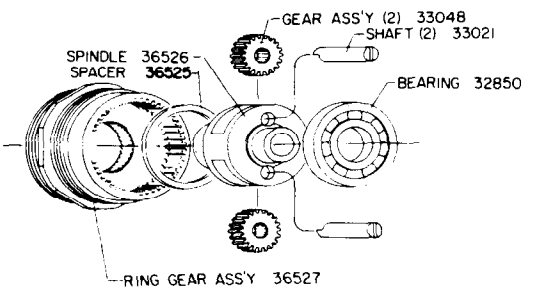
### ASSEMBLY

NOTE: Pack bearings and lubricate gears liberally with ARO 33153 grease. Gearing assembly should contain approximately 1/16 oz. (1.8 g) of grease.

- _ Assemble gears to spindle and secure with shafts. Align notch in ends of shafts with step on spindle.
- _ Assemble bearing (32850) to spindle and assemble spacer (36525) and spindle to ring gear.

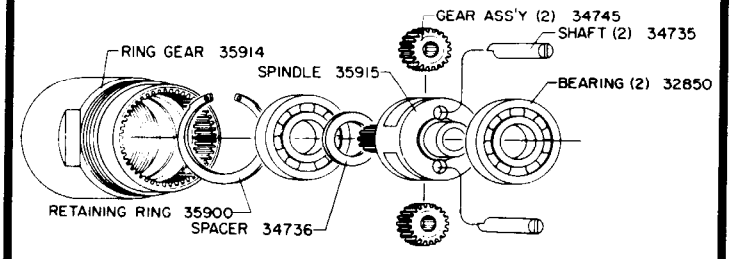



37168 GEARING ASSEMBLY (4.83:1)




36524 GEARING ASSEMBLY (8:1)

# GEARING SECTION




**36017 GEARING ASSEMBLY (4.83:1)**

## AUXILIARY GEARING

- Disassembly and assembly of the auxiliary gearing is similar to that of the drive gearing.
- Remove bearings, spacer and shafts to remove gears from spindle.

# HEAD SECTION

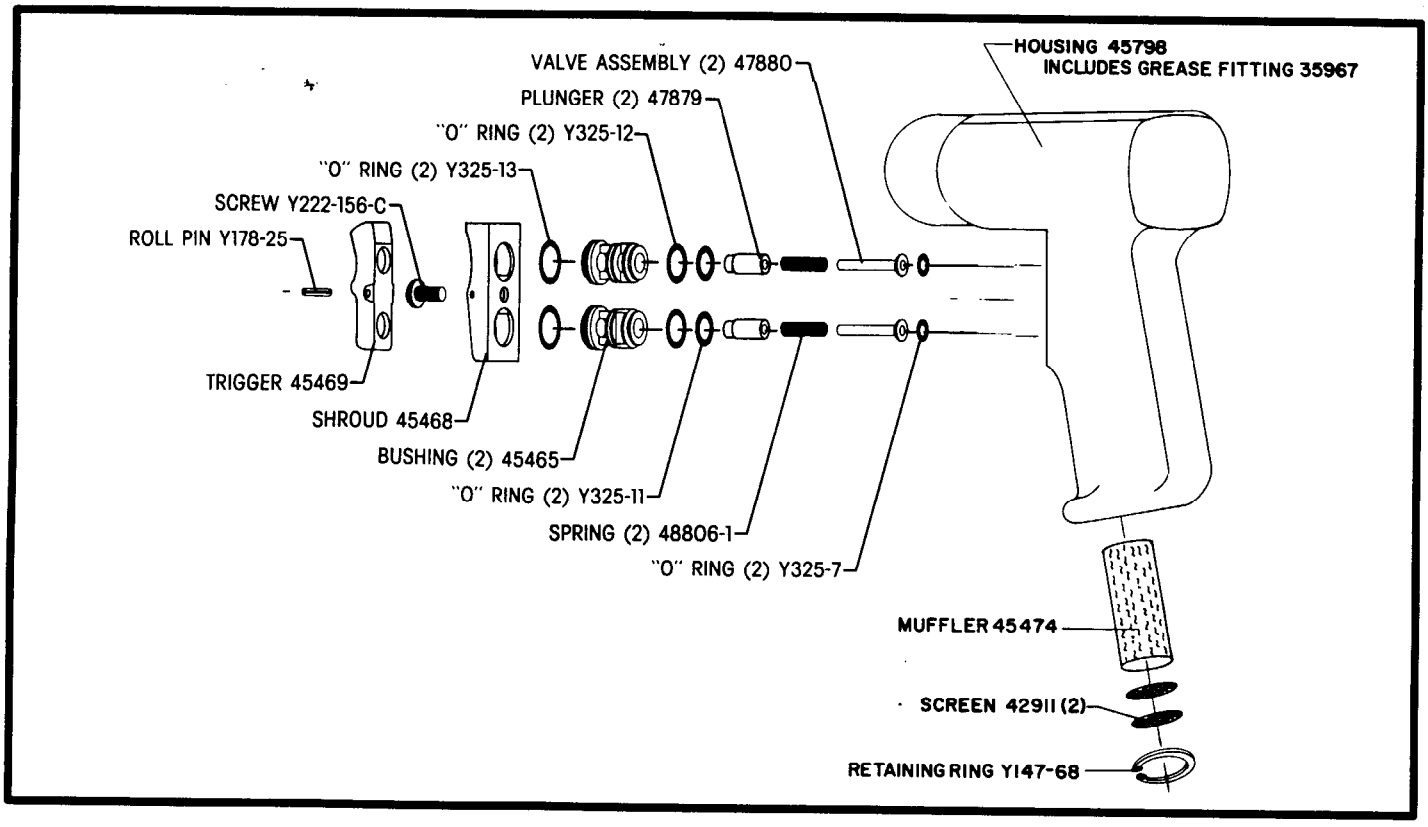
### DISASSEMBLY

- Remove roll pin (Y178–25), releasing trigger (45469).
- Remove screw (Y222–156–C), releasing shroud (45468).
- Grasp end of valve (47880) and pull to remove valve assembly and bushing (45465).
- Remove retaining ring (Y147–68) to remove screens (42911) and muffler (45474).

### ASSEMBLY

NOTE: When a part containing "O" rings has been removed from the tool, it is recommended the "O" rings be replaced upon assembly. Lubricate all "O" rings with ARO 36460 lube when assembling.

- Assemble "O" rings (Y325–13, Y325–12 and Y325–11) to bushing (45465).
- Assemble "O" ring (Y325–7) to valve (47880).
- Lubricate plunger (47879) and valve (47880) with ARO 29665 spindle oil.
- Assemble spring (48806–1) to valve (47880).
- Assemble plunger and valve to bushing (45465).
- Assemble bushings and shroud (45468) to tool, securing with screw (Y222–156–C). NOTE: Flats of bushings must be aligned with flats of shroud.
- Assemble trigger (45469) to tool, securing with roll pin (Y178–25).
- Assemble muffler (45474) and screens (42911) to tool, securing with retaining ring (Y147–68).



# TROUBLE SHOOTING

LISTED BELOW ARE SOME OF THE MOST COMMON CAUSES FOR THE SCREWDRIVER 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 OR FAILURE TO OPERATE. | 1. INADEQUATE AIR SUPPLY. | 1. CHECK AIR SUPPLY FOR CORRECT REGULATOR ADJUSTMENT (90 P.S.I.G. MAX. WHEN TOOL IS OPERATING). |
| | 2. CLOGGED AIR INLET, BADLY WORN OR DAMAGED THROTTLE COMPONENTS. | 2. DISASSEMBLE, CLEAN, INSPECT THROTTLE COMPONENTS, REPLACE WORN OR DAMAGED PARTS. |
| | 3. IMPROPER LUBRICATION OF UNIT (MOTOR AND/OR GEARING), DIRTY MOTOR (ROTOR BLADES STICKING, ETC.), OR BROKEN OR BADLY WORN ROTOR BLADES OR BEARINGS IN MOTOR. | 3. BE SURE LUBRICATOR IS FULL OF OIL AND GEARING IS LUBRICATED REGULARLY, REFER TO PAGE 3. DISASSEMBLE, CLEAN, INSPECT, REPLACE WORN OR DAMAGED PARTS, LUBRICATE. |
| | 4. BADLY WORN OR DAMAGED CLUTCH COMPONENTS. | 4. DISASSEMBLE CLUTCH. CLEAN, INSPECT, REPLACE WORN OR DAMAGED PARTS, LUBRICATE. |
| CLUTCH DISENGAGES TOO SOON OR FAILURE OF CLUTCH TO DISENGAGE. | 1. IMPROPER CLUTCH ADJUSTMENT. | 1. REFER TO CLUTCH ADJUSTMENT, PAGES 5 AND 6. |
| | 2. BADLY WORN OR DAMAGED CLUTCH COMPONENTS. | 2. DISASSEMBLE CLUTCH. CLEAN, INSPECT, REPLACE WORN OR DAMAGED PARTS, LUBRICATE. |

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