



Tool Products

OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

SECTION M20
MANUAL 41

Released: 11/77

Revised: 1-27-95

Form: 1168-2

"2200" SERIES DRILLS

Models: 7844-E, 7845-E, 7846-E-(), 7847-E-(),
7848-E-(), 7849-E-(), 7850-E, 7851-E,
7852-E, 7853-E-(), 7854-E and 7855-E.



⚠ 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 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.
- 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>⚠ WARNING</p> <p>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. Built-in oiler reservoir (pistol grip models) should be filled with spindle oil (29665).

EVERY 160 HOURS OF TOOL OPERATION – Lubricate gearing. Pack bearings, coat shafts and lubricate gears with NLGI #1 "EP" grease (33153). Gearing should contain approximately 1/4 oz. (7 g) of grease per reduction.

AIR SUPPLY REQUIREMENTS

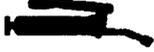
For maximum operating efficiency, the following air supply specifications should be maintained to this air tool:

- 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

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.

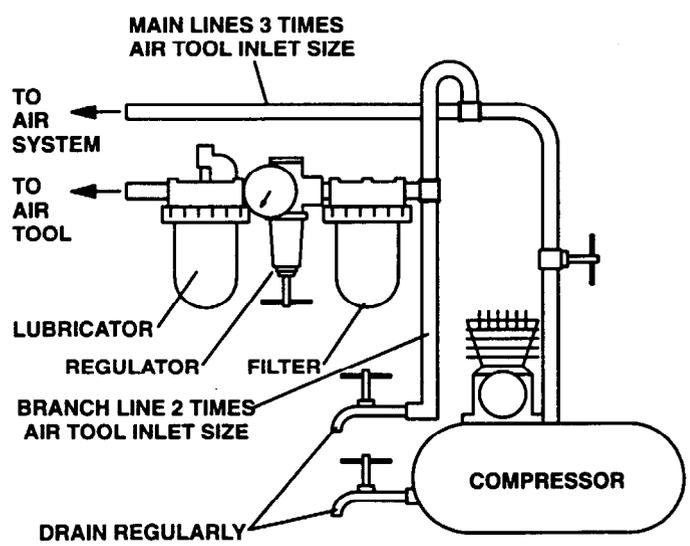
Tool maintenance and repair shall be performed by authorized, trained, competent personnel. Tools, hose and fittings shall be replaced if unsuitable for safe operation and responsibility should be assigned to be sure that all tools requiring guards or other safety devices shall be kept in legible condition.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

PISTOL GRIP TYPE THROTTLE							
MODEL NUMBER	R.P.M.	TOTAL REDUCTION	MOTOR ASSEMBLY	GEARING		CHUCK NUMBER	CHUCK CAPACITY
				DRIVE	AUXILIARY		
7844-E	18,000	1:1	41522	40821		33907	3/8"
7845-E	4,500	4:1	41522	41771		33907	3/8"
7846-E	2,400	7.43:1	41522	41770		33907	3/8"
7846-E-EU	2,400	7.43:1	41522	41770		33907	3/8"
7847-E	1,100	16:1	41522	41771	40825	30018	1/2"
7847-E-EU	1,100	16:1	41522	41771	40825	30018	1/2"
7848-E	600	29.7:1	41522	41770	40825	30018	1/2"
7848-E-EU	600	29.7:1	41522	41770	40825	30018	1/2"
7849-E	325	55.2:1	41522	41770	40826	30018	1/2"
7849-E-EU	325	55.2:1	41522	41770	40826	30018	1/2"

LEVER HEAD TYPE THROTTLE							
MODEL NUMBER	R.P.M.	TOTAL REDUCTION	MOTOR ASSEMBLY	GEARING		CHUCK NUMBER	CHUCK CAPACITY
				DRIVE	AUXILIARY		
7850-E	18,000	1:1	43139	41769		33907	3/8"
7851-E	4,500	4:1	43139	41771		33907	3/8"
7852-E	2,400	7.43:1	43139	41770		33907	3/8"
7853-E	1,100	16:1	43139	41771	40825	30016	3/8"
7853-E-EU	1,100	16:1	43139	41771	40825	30016	3/8"
7854-E	600	29.7:1	43139	41770	40825	30016	3/8"
7855-E	325	55.2:1	43139	41770	40826	30016	3/8"

CANCELLED MODELS

MODELS WITH -EU ARE "EC" COMPLIANT MODELS

GENERAL DESCRIPTION AND OPERATION

Aro "2200" series drills are available with either a lever or pistol grip type throttle and with 6 different speeds. The combination of free speeds, throttle type and chuck capacities appear as models above.

Lever throttle models feature a muffler, suspension bail, flush fittings for lubrication of gearing and a 1/4" N.P.T.F. female air inlet adapter.

Pistol grip models feature a built-in oiler, muffler, flush fittings for lubrication of gearing and a 1/4" N.P.T.F. female air inlet adapter.

All models have a 1/2" - 20 threaded drive spindle for mounting the chuck.

Safe and efficient operation of your Aro drill can best be attained by observing proper operating, inspection and maintenance procedures.

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:

GEARING SECTION

Secure the tool in a suitable holding device. Place a wrench on spacer (33697); place chuck key in chuck and strike key a sharp blow to loosen chuck. Remove chuck and spacer (33697). Using a wrench on flats of ring gear and a strap wrench on motor housing, unthread and remove gearing sections. Models having both drive and auxiliary gearing, separate using wrenches on flats of ring gears.

MOTOR SECTION

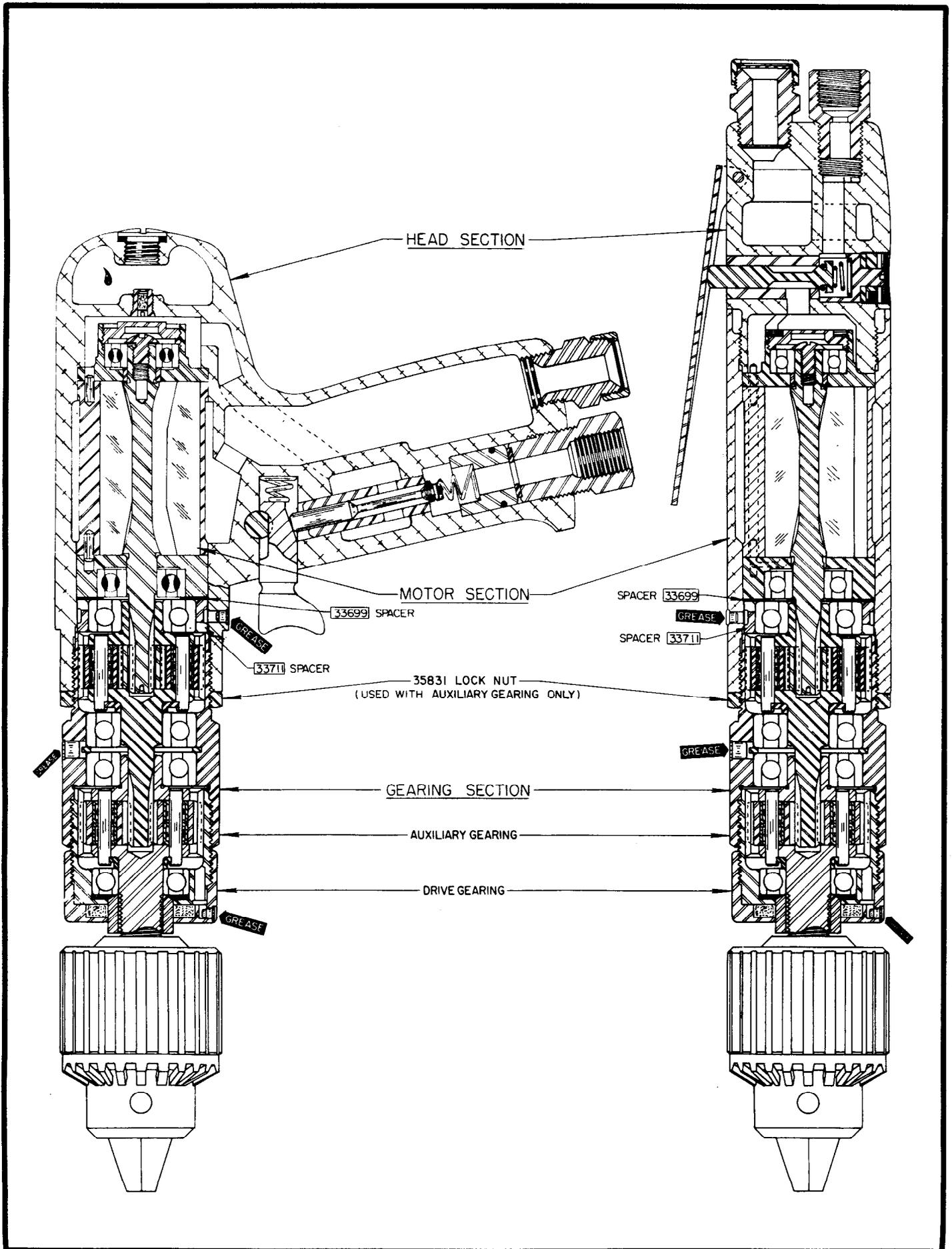
With head of tool in a suitable holding device, remove motor housing with a strap type wrench (lever head tool only). On pistol grip head tool, it may be necessary to tap open end of housing with a soft face hammer to loosen motor from housing.

HEAD SECTION

Follow disassembly procedures as outlined in the preceding sections. Valve parts may be removed from head without removal of head from tool.

TYPICAL CROSS SECTION OF TOOL

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GEARING SECTION

DRIVE GEARING

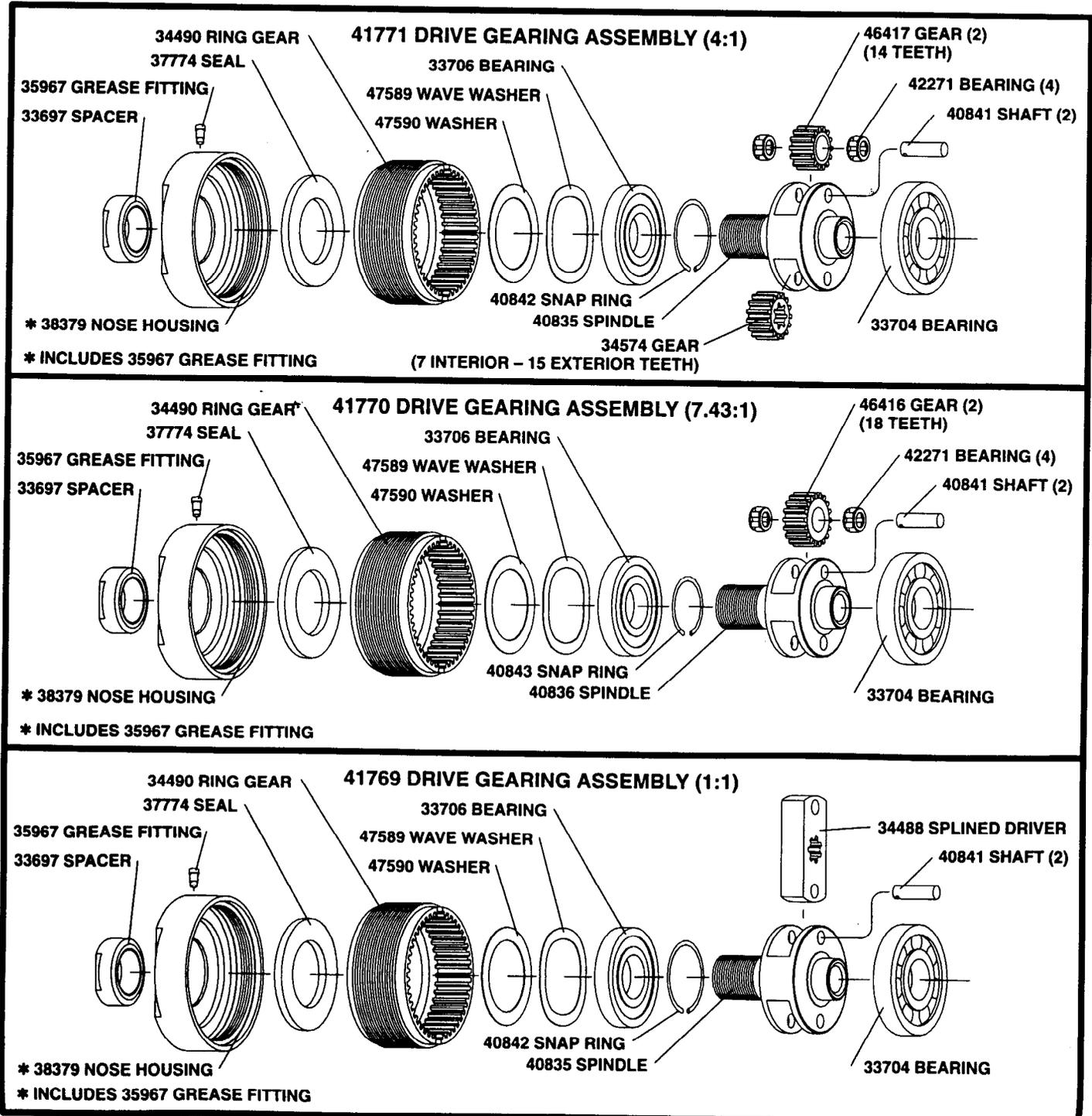
DISASSEMBLY

Remove nose housing (38379), seal (37774) and spacer (33697). Grasp ring gear in one hand and tap threaded end of spindle with a soft face hammer; spindle and components will loosen from ring gear. NOTE: Further disassembly should be done only if it should be necessary to replace a part, as Brinelling of the bearing races may occur, making replacement necessary. To disassemble completely, remove bearing (33706). Turn snap ring on spindle so the open portion of the ring will allow the removal of shaft. Remove shaft, releasing gear. Repeat for removal of opposite shaft and gear.

ASSEMBLY

NOTE: Pack bearings and lubricate gears and shafts with ARO 33153 grease, or equivalent, upon assembly. Gearing assembly should contain approximately 1/4 oz. grease.

Assemble snap ring to spindle. Rotate snap ring, allowing installation of shafts. After both gears and shafts have been assembled to spindle, rotate snap ring, locking shafts in place. Assemble bearing (33706) to spindle and assemble into ring gear (34490) with washer (47590) and wave washer (47589). Assemble seal, nose housing and spacer (33697) to gearing. Pack bearing (33704) with ARO 33153 grease and assemble, with spindle, to tool.



GEARING SECTION

AUXILIARY GEARING

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DISASSEMBLY

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.

Gearing should not be disassembled further unless it is necessary to replace a part, as Brinelling of the bearing races may occur, making replacement necessary.

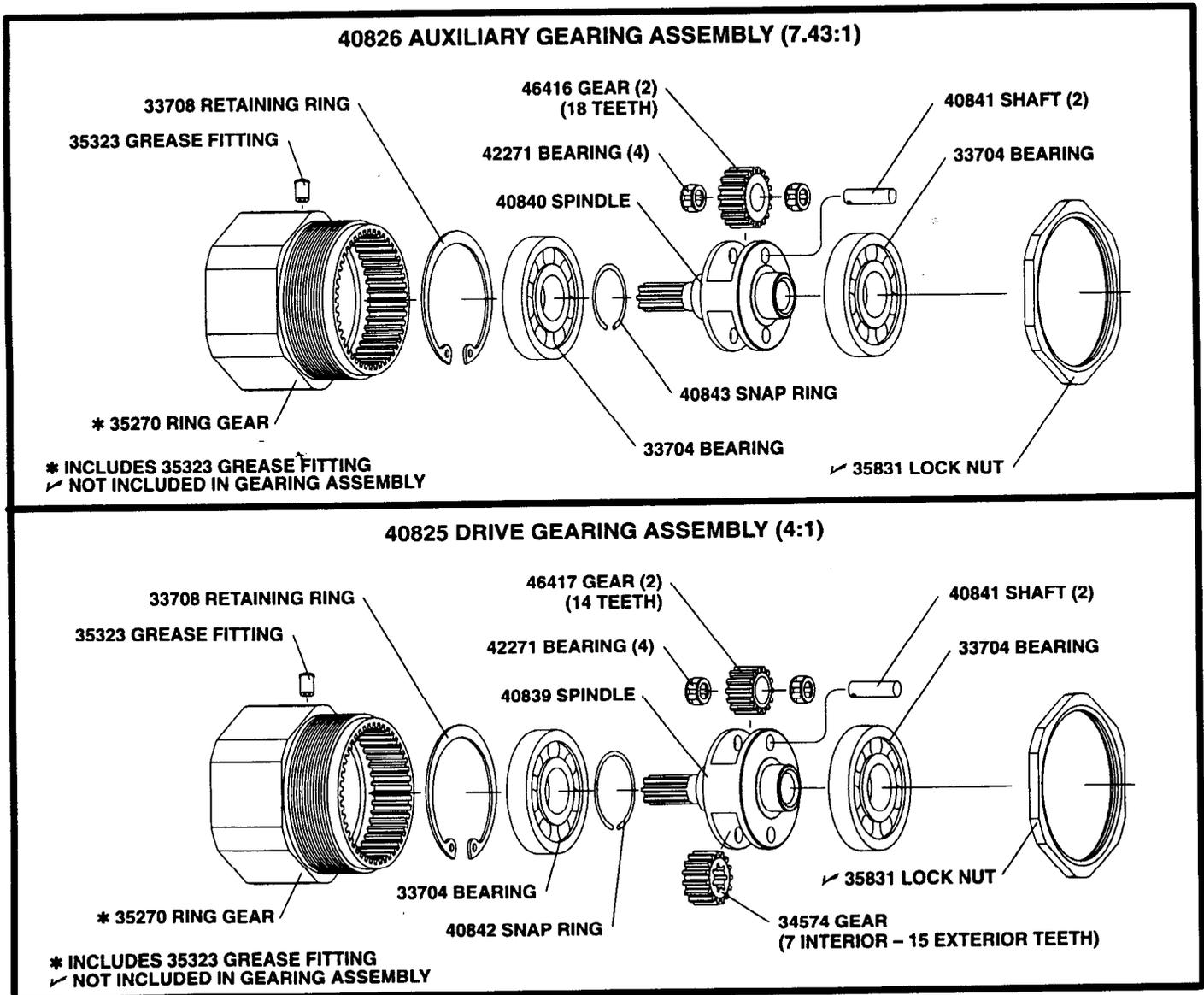
To further disassemble, remove bearing (33704), rotate snap ring so the open portion of the ring will allow the removal of shaft. Remove shaft, releasing gear. Repeat for removal of opposite shaft and gear.

ASSEMBLY

To assemble gears and bearings to spindle, reverse the procedure of disassembly. NOTE: After assembling gears and shafts to spindle, rotate snap ring, securing both shafts in place.

Assemble spindle and components to ring gear.

Pack bearings and lubricate gears with ARO 33153 grease upon assembly. Gearing assembly should contain approximately 1/4 oz. (7 g) of grease.



MOTOR SECTION

DISASSEMBLY

Remove motor assembly from housing. Using a spanner type wrench, remove nut (33694) and fastener (33700). Grasp cylinder in one hand and tap splined end of rotor with a soft face hammer; motor will come apart.

ASSEMBLY

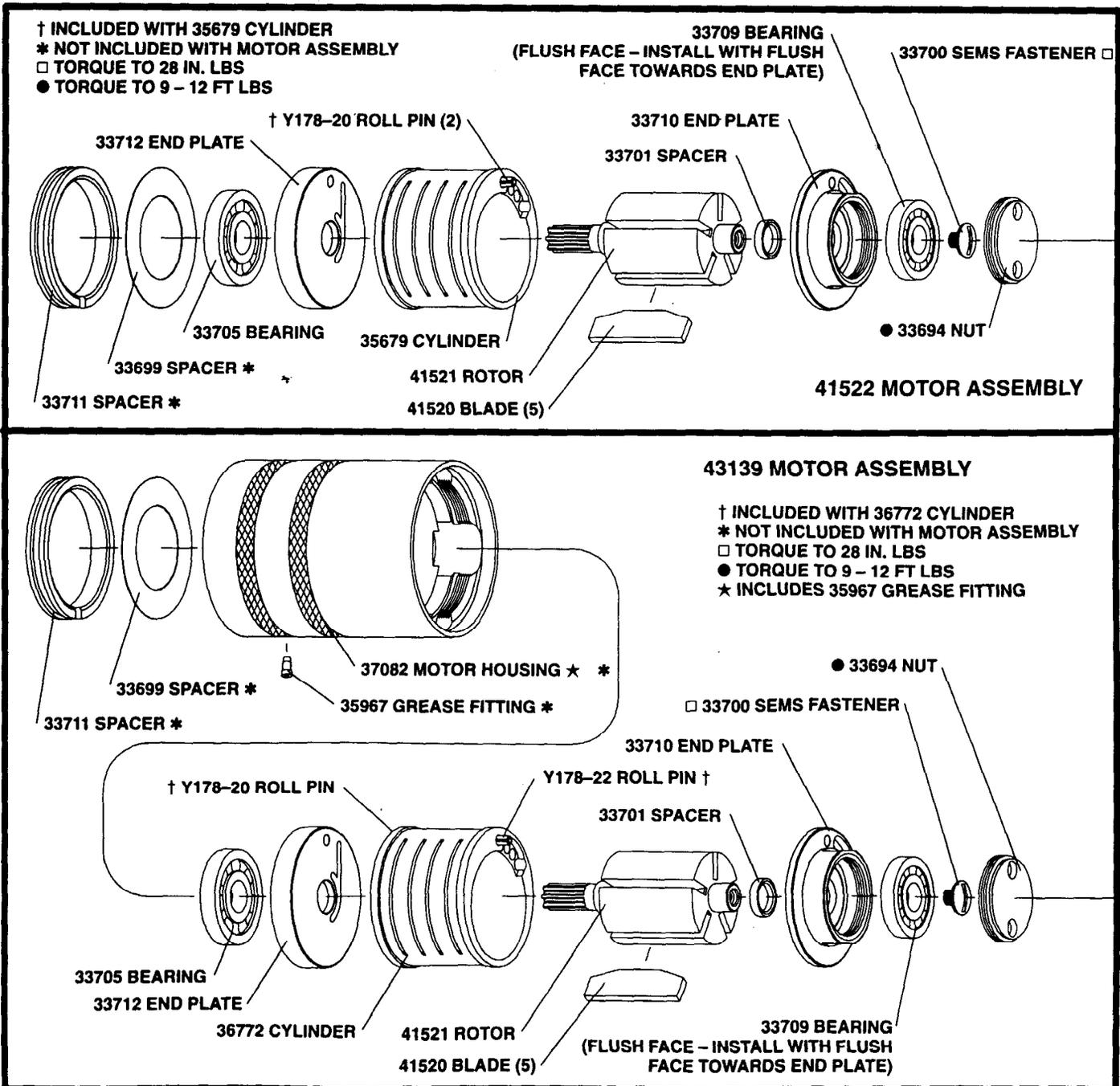
NOTE: Pack bearings with ARO 33153 grease, or equivalent, and coat i.d. of cylinder with ARO 29665 spindle oil upon assembly.

Assemble bearings into end plates, pressing on outer race of bearings. NOTE: Assemble bearing (33709) into end plate with the identification markings on the bearing facing "out". Assemble end plate (33710) to rotor and secure with sems fastener. NOTE: Torque fastener to 28 in. lbs. Assemble cylinder over rotor, aligning air inlet holes in cylinder with air inlet slot of end plate and as-

semble roll pin in hole of end plate. Assemble blades to rotor. Assemble end plate (33712) to rotor and cylinder, aligning hole in end plate with roll pin in cylinder. Assemble nut (33694) to end plate and torque to 9 - 12 ft lbs. Insure rotor does not bind (if rotor binds, lightly tap splined end of rotor with a soft face hammer to loosen) and assemble to tool.

ASSEMBLING MOTOR TO TOOL

LEVER THROTTLE MODELS: Remove motor housing (37082) from head. Place head in a suitable holding device with the "motor end" in an upright position. Assemble motor assembly to head, aligning roll pin in motor with hole provided in head (.125" diameter blind hole). Slip motor housing over motor and secure to head. Assemble spacers (33699 and 33711) and gearing to tool.



HEAD SECTION PISTOL GRIP

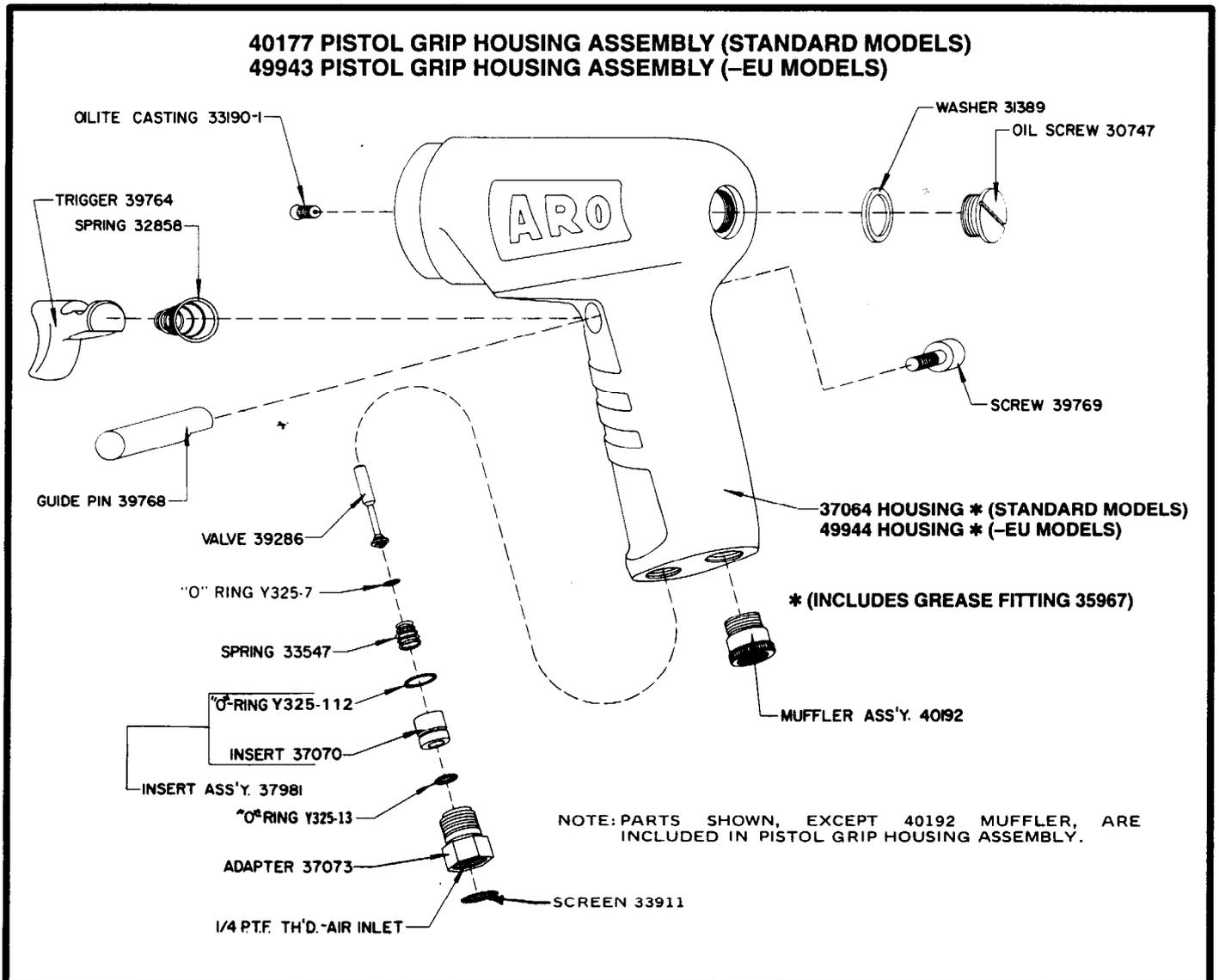
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DISASSEMBLY

- Remove adapter (37073), "O" ring (Y325-13), insert assembly (37981) and spring (33547).
- Depress trigger (39764) to release valve (39286) and "O" ring (Y325-7).
- To remove trigger (39764), remove locking screw (39769) and guide pin (39768), releasing trigger and spring (32858).
- To remove oilite casting (33190-1), insert screwdriver into motor end of housing and unscrew.

ASSEMBLY

- Assemble spring (32858) and trigger (39764) into housing and secure with guide pin (39768) and locking screw (39769).
- Assemble valve (39286) with "O" ring (Y325-7), spring (33547) and insert assembly (37981) into housing, securing with "O" ring (Y325-13) and adapter (37073).
- Assemble oilite casting (33190-1) into place in oil cavity, fill cavity with oil and seal with washer (31389) and screw (30747).



HEAD SECTION LEVER HEAD

DISASSEMBLY

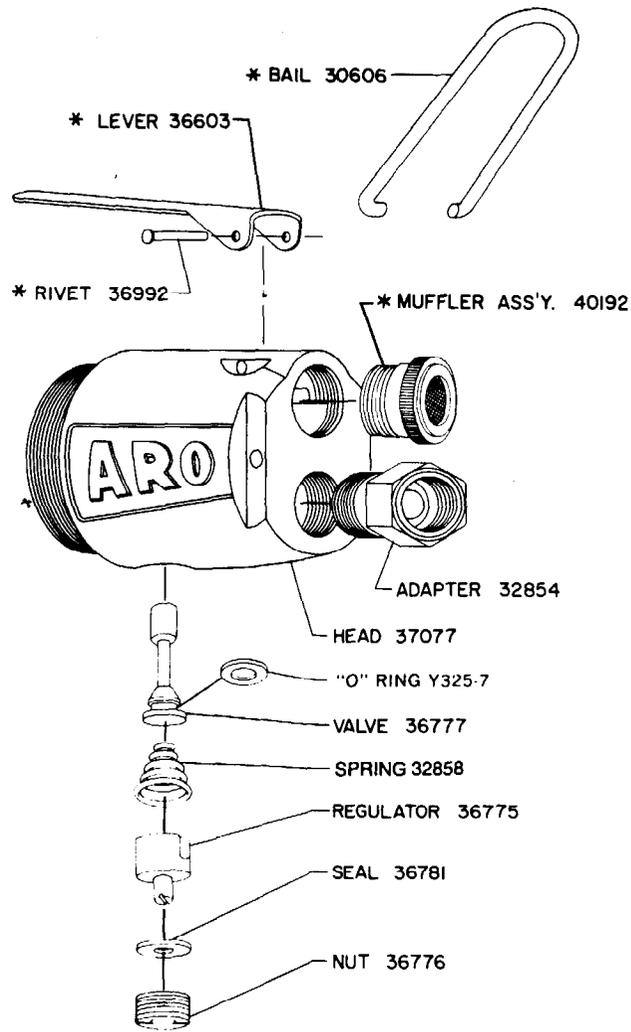
Remove nut (36776), releasing seal (36781), regulator (36775), spring (32858) and valve stem (36777).

ASSEMBLY

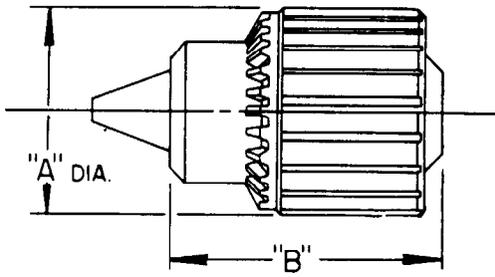
Assemble "O" ring (Y325-7) to valve stem (36777) and insert into valve opening. Assemble spring (32858), air regulator (36775) and seal (36781) into valve opening and secure with nut (36776).

See "ASSEMBLING MOTOR TO TOOL", page 8.

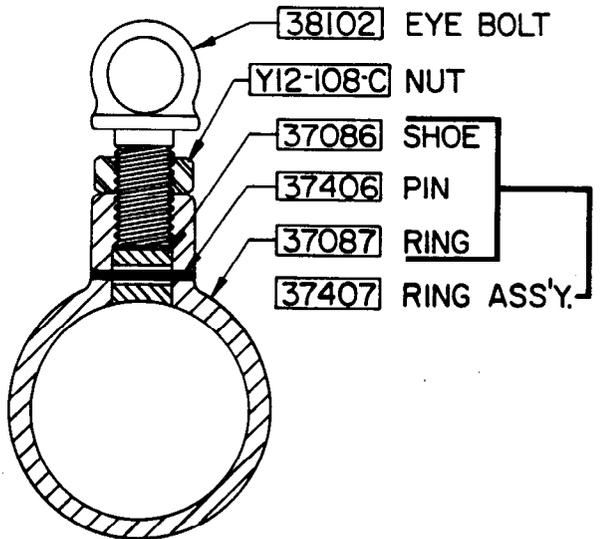
37079 LEVER HEAD ASSEMBLY



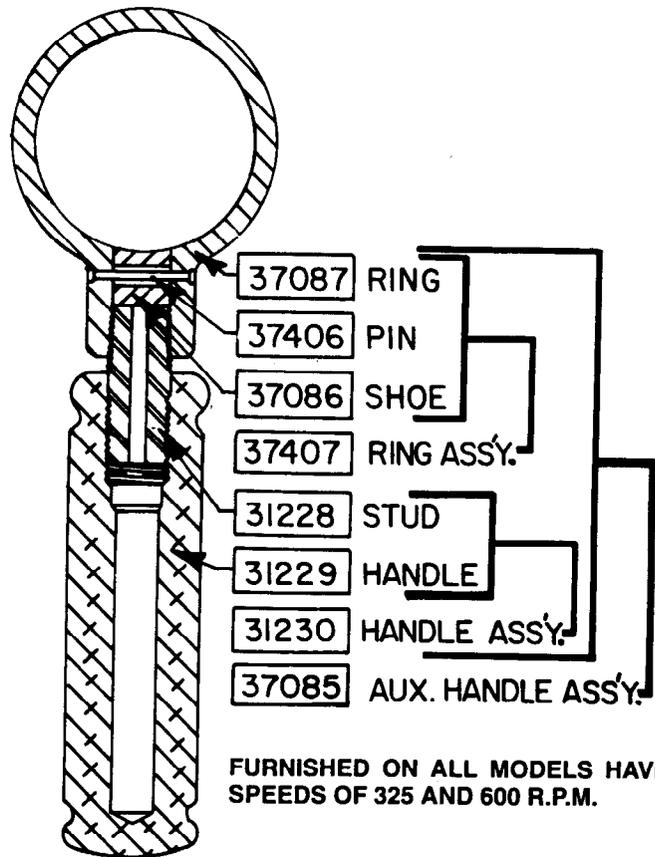
* PARTS NOT INCLUDED IN HEAD ASSEMBLY



CHUCK NO.	CHUCK CAPACITY	"A"	"B"	KEY NO.
33906	1/4"	1-5/16"	1-3/4"	30209 K
33907	3/8"	1-7/16"	1-29/32"	30510 K
30016	3/8"	1-13/16"	2-5/16"	30016 K
30018	1/2"	1-13/16"	2-5/16"	30016 K

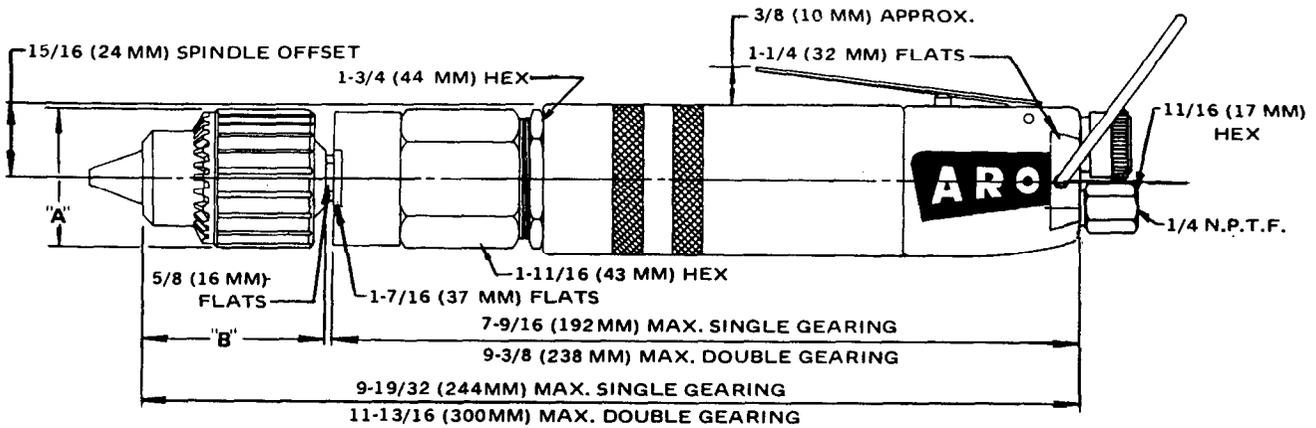


38103 BAIL ASSEMBLY
FURNISHED FOR PISTOL GRIP MODELS, WHEN REQUESTED, AT NO ADDITIONAL CHARGE.



FURNISHED ON ALL MODELS HAVING SPEEDS OF 325 AND 600 R.P.M.

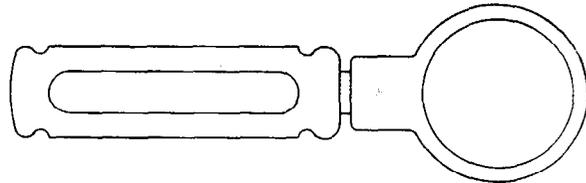
DIMENSIONAL DATA



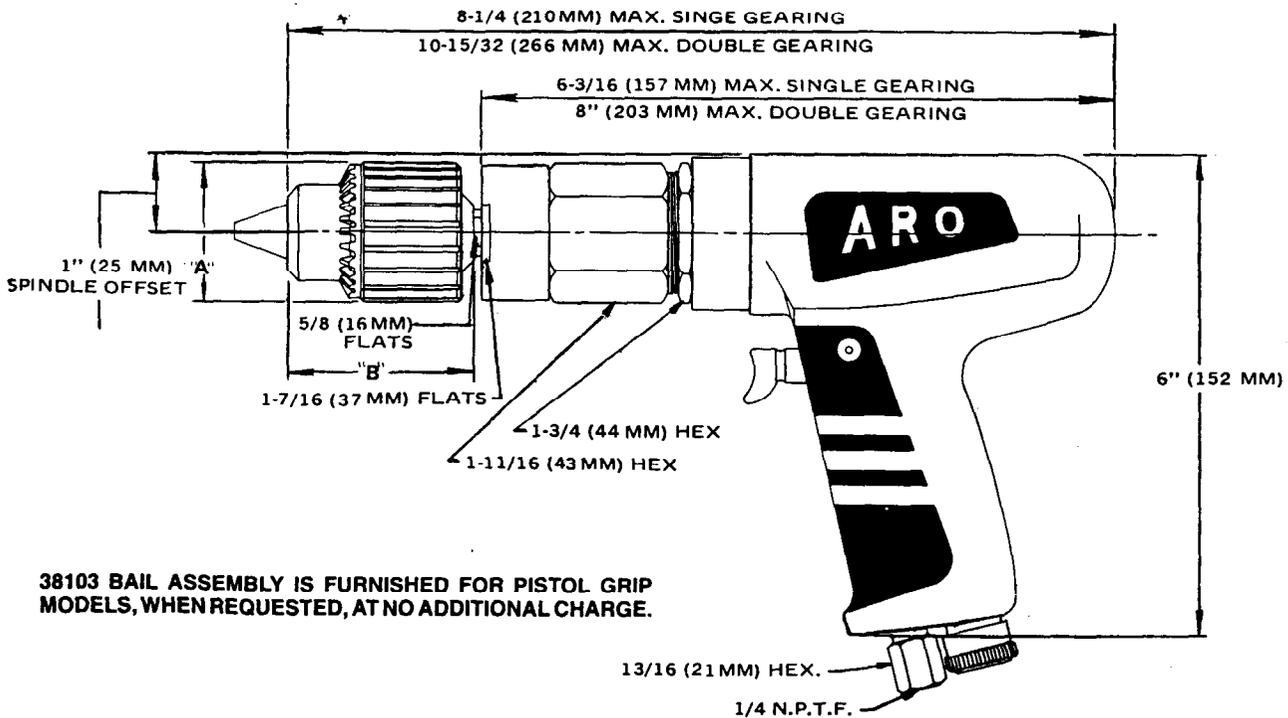
CHUCK NUMBER	CHUCK CAPACITY	"A"		"B"	
		INCHES	MM	INCHES	MM
33907	3/8"	1-7/16	36	1-29/32	48
30016	3/8"	1-13/16	46	2-5/16	59

CHUCKS LISTED IN CHART ARE FURNISHED AS STANDARD EQUIPMENT ON MODELS AS INDICATED - FOR OTHER CHUCK SIZES, SEE ACCESSORIES SECTION OF THIS MANUAL.

ALL MODELS HAVE 1/2" - 20 THREADED SPINDLE.



37085 AUXILIARY HANDLE IS FURNISHED ON ALL MODELS HAVING SPEEDS OF 325 AND 600 R.P.M. - SEE ACCESSORIES SECTION FOR PARTS BREAKDOWN.



38103 BAIL ASSEMBLY IS FURNISHED FOR PISTOL GRIP MODELS, WHEN REQUESTED, AT NO ADDITIONAL CHARGE.

13/16 (21MM) HEX.
1/4 N.P.T.F.