



Tool & Hoist Products

# OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

## 2200 SERIES POWER MOTORS (44 SERIES GEARING)

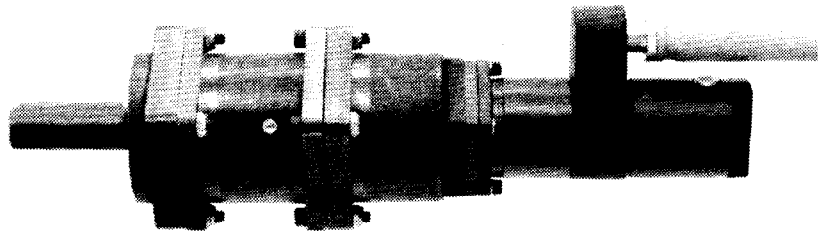
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| SECTION   | M40    |
| MANUAL    | 46     |
| Released: | 4/73   |
| Revised:  | 8-2-93 |
| Form:     | 286-2  |

Models 8274-( )A and 8276-( )A

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

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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.

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**INGERSOLL-RAND®**  
**PROFESSIONAL TOOLS**

## MODEL IDENTIFICATION

| MODEL NO. | MOTOR ASS'Y. | R.P.M.<br>(FREE SPEED) |         | GEARING       |                   |           | HEAD ASS'Y. | TOTAL REDUCTION |
|-----------|--------------|------------------------|---------|---------------|-------------------|-----------|-------------|-----------------|
|           |              | FORWARD                | REVERSE | "2200" SERIES | "44" SERIES DRIVE | AUXILIARY |             |                 |
| 8273-A    | 38302-1      | 700                    | 1000    | 41305         | 36162             |           | 34497       | 16:1            |
| 8273-1A   | 38302-1      | 375                    | 550     | 41305         | 36163             |           | 34497       | 28:1            |
| 8273-2A   | 38302-1      | 210                    | 300     | 41002         | 36163             |           | 34497       | 52:1            |
| 8273-3A   | 38302-1      | 170                    | 250     | 41305         | 36162             | 36165     | 34497       | 64:1            |
| 8273-4A   | 38302-1      | 95                     | 140     | 41305         | 36163             | 36165     | 34497       | 112:1           |
| 8273-5A   | 38302-1      | 55                     | 80      | 41305         | 36163             | 36164     | 34497       | 196:1           |
| 8273-6A   | 38302-1      | 30                     | 40      | 41002         | 36163             | 36164     | 34497       | 364:1           |
|           |              |                        |         |               |                   |           |             |                 |
| 8274-A    | 41523        | 800                    |         | 41305         | 36162             |           | 34497       | 16:1            |
| 8274-1A   | 41523        | 475                    |         | 41305         | 36163             |           | 34497       | 28:1            |
| 8274-2A   | 41523        | 250                    |         | 41002         | 36163             |           | 34497       | 52:1            |
| 8274-3A   | 41523        | 200                    |         | 41305         | 36162             | 36165     | 34497       | 64:1            |
| 8274-4A   | 41523        | 120                    |         | 41305         | 36163             | 36165     | 34497       | 112:1           |
| 8274-5A   | 41523        | 65                     |         | 41305         | 36163             | 36164     | 34497       | 196:1           |
| 8274-6A   | 41523        | 35                     |         | 41002         | 36163             | 36164     | 34497       | 364:1           |
|           |              |                        |         |               |                   |           |             |                 |
| 8276-A    | 41522        | 1200                   |         | 41305         | 36162             |           | 34498       | 16:1            |
| 8276-1A   | 41522        | 700                    |         | 41305         | 36163             |           | 34498       | 28:1            |
| 8276-2A   | 41522        | 350                    |         | 41002         | 36163             |           | 34498       | 52:1            |
| 8276-3A   | 41522        | 300                    |         | 41305         | 36162             | 36165     | 34498       | 64:1            |
| 8276-4A   | 41522        | 160                    |         | 41305         | 36163             | 36165     | 34498       | 112:1           |
| 8276-5A   | 41522        | 100                    |         | 41305         | 36163             | 36164     | 34498       | 196:1           |
| 8276-6A   | 41522        | 50                     |         | 41002         | 36163             | 36164     | 34498       | 364:1           |

 CANCELLED

This Parts List and Service Instruction Manual is composed of four sections:

GENERAL DESCRIPTION AND OPERATION  
AIR AND LUBE REQUIREMENTS  
MAINTENANCE  
DISASSEMBLY AND REASSEMBLY OF TOOL

A complete Parts List will be found on the various drawings contained in this Manual.

This Manual is provided to serve as an aid in obtaining the maximum service from this tool.

After carefully reading this manual, file for future reference.

## GENERAL DESCRIPTION AND OPERATION

The ARO Models 8274-( )A and 8276-( )A Power Motors feature "2200" series motors with "44" series gearing. Models 8274-( )A are reversible rotation models with a balanced cylinder which produces the same power in either forward or reverse rotation. Models 8276-( )A are single direction models.

All models have an adjustable exhaust manifold with muffler, flush fittings for lubrication, 1/4" female n.p.t.f. air inlet and optional air inlets at end of side of head housing with necessary hex socket screw plugs for closure of unused inlets.

## AIR AND LUBE REQUIREMENTS

**AIR PRESSURE** of 90 pounds per square inch at the air inlet of the tool is required for maximum motor efficiency. If necessary, an air regulator should be installed to maintain this pressure when tool is in operation.

**FILTERED AND OILED AIR** will allow the tool to operate more efficiently and yield a longer life to operating parts and mechanisms. A line filter capable of filtering particles larger than 50 microns should be used with a line oiler.

**FILTER-REGULATOR-LUBRICATOR (F-R-L)** assembly Model 128231-300 is recommended for use with this Air Tool. The capacity of the individual Filter-Lubricator is adequate to provide clean (40 micron) oiled and regulated air for the tool. The Filter-Regulator-Lubricator must be installed on the stationary air line, in that order, with the Lubricator nearest to the tool. NEVER mount the unit on the detachable flexible hose to the tool.

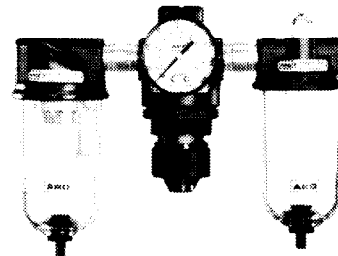
**FLUSH TOOL** with a solution of three parts cleaning solvent and one part light oil after each 40 hours of operation. After flushing, apply a small amount of Spindle Oil in air inlet and run free for one minute to insure proper lubrication.

**GEARING** should be grease lubricated to a minimum of once a month.

**CAUTION:** An excessive amount of lubricant in a tool will affect the speed and power, "2200" gearing should contain approx. 1/4 ounce of grease and "44" gearing should contain approx. 1/2 ounce of grease (per set of planetary gearing).

**RECOMMENDED HOSE SIZE** - 3/8" nominal inside diameter.

**RECOMMENDED LUBRICANTS:** Spindle Oil (29665), 1 qt. (.9 liter) container for oiler and air inlet; Grease 33153, 5 lb. (2.3 kg) can for gears and bearings; "O" Ring Lubricant 36460, 4 oz. (113 g) tube for lubrication and installation of "O" Rings; Grease 40036-1, 1 lb. (.45 kg) can for Clutch Mechanism and Hammer parts.



MODEL 128231-300  
FILTER-REGULATOR-  
GAUGE-LUBRICATOR.

## MAINTENANCE

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

**AIR TOOLS** are made of precision parts and should be handled with reasonable care when servicing. Excessive pressure exerted by a holding device may cause distortion of a part. Apply pressure evenly when disassembling (or assembling) parts which have a press fit. When removing or installing bearings, apply pressure to the bearing race that will be the press fit to the mating part; if this is not practiced, Brinelling of the bearing races may occur making replacement necessary. It is important that the correct tools and fixtures are used when servicing this Air Tool.

**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. When **REPLACEMENT PARTS** are necessary, consult drawing containing the part for identification.

**BEFORE 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 ORDERING PARTS**, be sure to list **PART NUMBER, PART NAME, MODEL NUMBER AND SERIAL NUMBER OF TOOL. USE ONLY GENUINE ARO REPLACEMENT PARTS.**

# DISASSEMBLY AND REASSEMBLY OF TOOLS

Before starting to disassemble or reassemble this tool (any part or completely) be sure to read Maintenance Section.

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

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

With tool disconnected from air service—

## GEARING SECTION

To remove drive gearing, remove Nuts (Y109-428) and Cap Screws (Y157-42-C). To remove auxiliary gearing, remove Nuts (Y109-428) and Cap Screws (Y157-43-C). Pull gearing from tool.

To remove "2200" series gearing, remove Cap Screws (Y154-55) with Washers (Y14-10) and separate Motor Housing and Adapter (41001). Pull gearing from tool.

## MOTOR SECTION

To remove Motor assembly, remove Cap Screws (Y154-55) with Washers (Y14-10) and pull Motor Housing from gearing. Grasp Rotor and pull motor assembly from housing.

## HEAD SECTION

To remove head from motor section; place head of tool in a suitable holding device and, using a strap wrench, unscrew motor housing from head.

## TYPICAL CROSS-SECTION OF TOOL

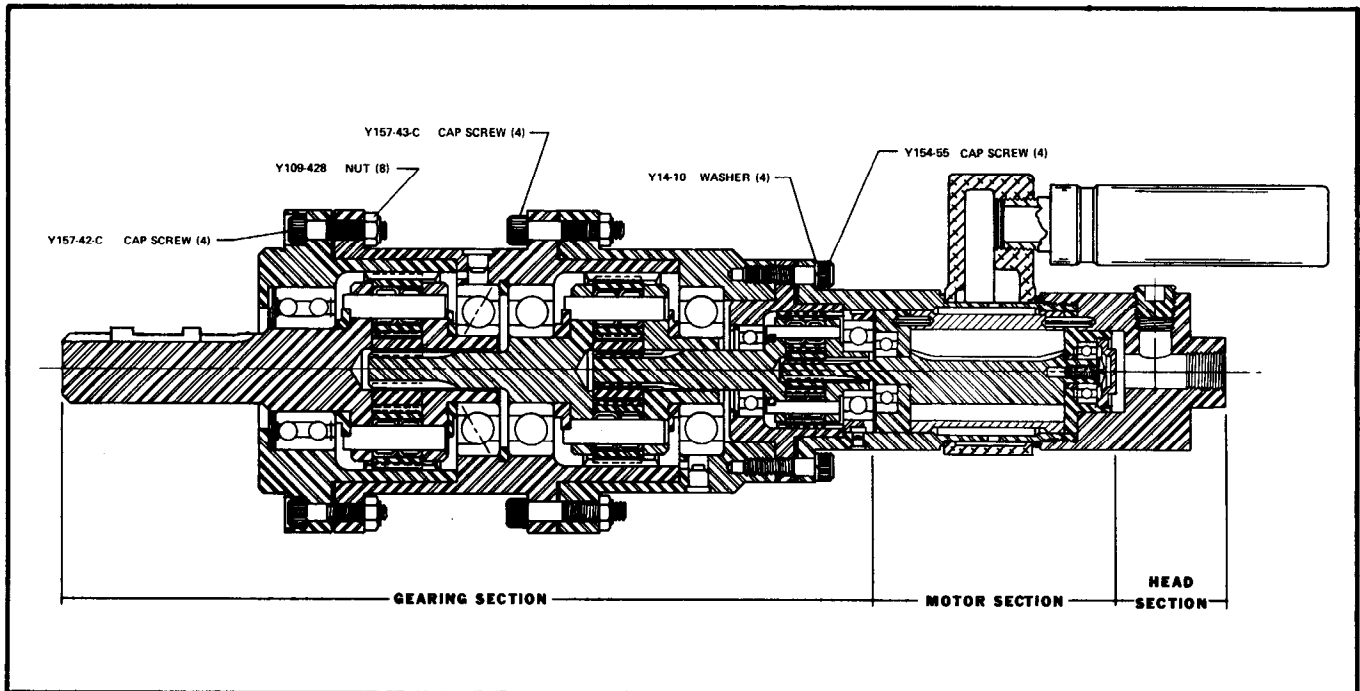


FIGURE 1

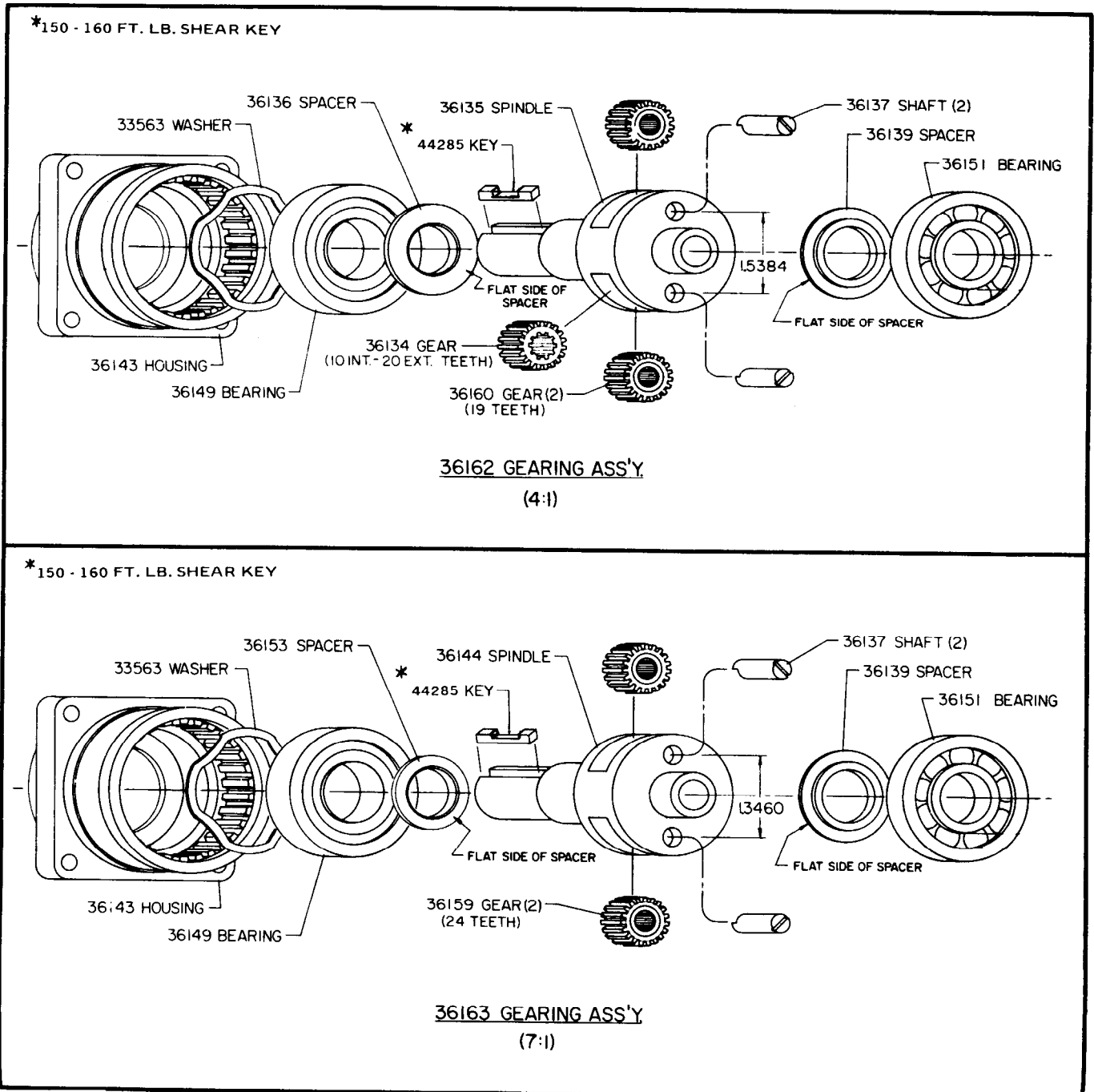
**GEARING SECTION**  
**DRIVE GEARING – "44" SERIES**  
**(36162 AND 36163)**

**DISASSEMBLY**

- Remove Key (44285) from Spindle. Tap drive end of Spindle with a non-metallic hammer to remove from housing.
- Remove Bearing (36151) and Spacer (36139).
- Remove Shafts (36137) releasing Gears from Spindle.
- If it should become necessary to remove Bearing (36149) and Spacer (36153 or 36136); after removal of Bearing (36151) and Spacer (36139), alternately tap ends of Shafts (36137) to remove Bearing and Spacer.

**REASSEMBLY**

- Assemble Spacer (36153 or 36136) and Bearing (36149) to Spindle.
- Assemble Gears to Spindle and secure with Shafts (36137). Use a small screwdriver in slot of Shafts to align Shafts to Spacer.
- Assemble Spacer (36139) and Bearing (36151).
- Assemble with Washer (33563) into housing.



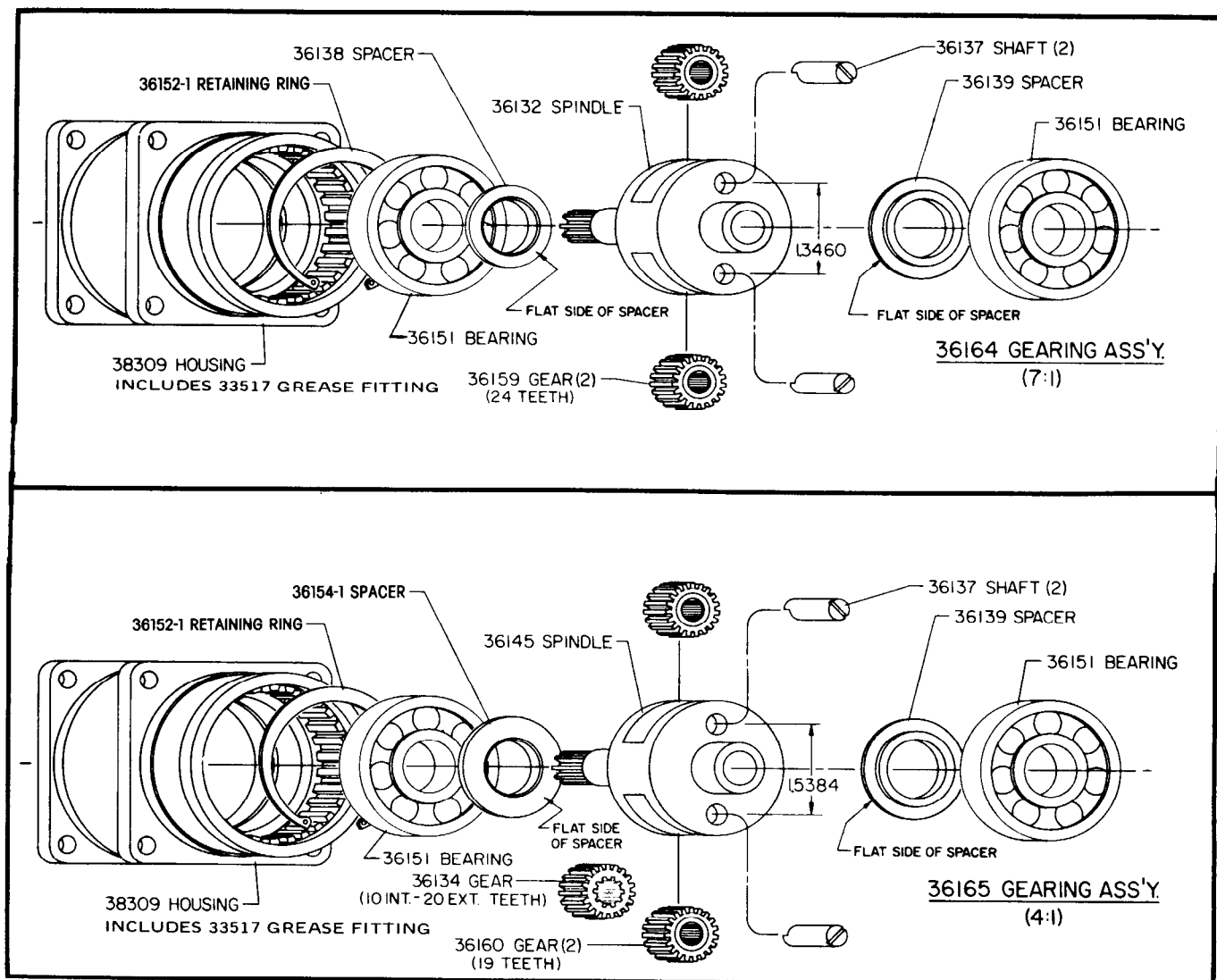
**AUXILIARY GEARING – "44" SERIES**  
**(36164 AND 36165)**

**DISASSEMBLY**

- a. Tap drive end of spindle with a soft face hammer to remove from housing.
- b. Remove bearing (36151) and spacer (36139).
- c. Remove shafts (36137), releasing gears from spindle.
- d. If it should become necessary to remove front bearing (36151) and spacer (36138 or 36154-1); after removal of rear bearing (36151) and spacer (36139), alternately tap ends of shafts (36137) to remove front bearing and spacers.

**REASSEMBLY**

- a. Assemble spacers (36138 or 36154-1) and bearing (36151) to spindle.
- b. Assemble gears to spindle and secure with shafts to align shafts to spacer.
- c. Assemble spacer (36139) and bearing (36151) to rear of spindle.
- d. Assemble with retaining ring (36152-1) into housing.



**FIGURE 3**

# GEARING SECTION "2200" SERIES GEARING

M 40  
46

## DISASSEMBLY

(41002 AND 41305)

## REASSEMBLY

- a. Tap drive end of Spindle with a non-metallic hammer to remove from housing.
- b. Remove Bearing (33706). Rotate Snap Ring (40842 or 40843) so open portion of ring will allow the removal of one Shaft (40481). Remove Shaft releasing Gear. Repeat for opposite Shaft and Gear.
- c. Remove Bearing (33704).

- a. Assemble Snap Ring to Spindle.
- b. Assemble Gears to Spindle and secure with Shafts (40841). Rotate Snap Ring allowing the installation of Shafts. After both Gear assemblies and Shafts have been assembled to Spindle, rotate Snap Ring locking Shafts in place.
- c. Assemble Bearings to Spindle and assemble with Washer (47590) and Wave Washer (47589) into housing.

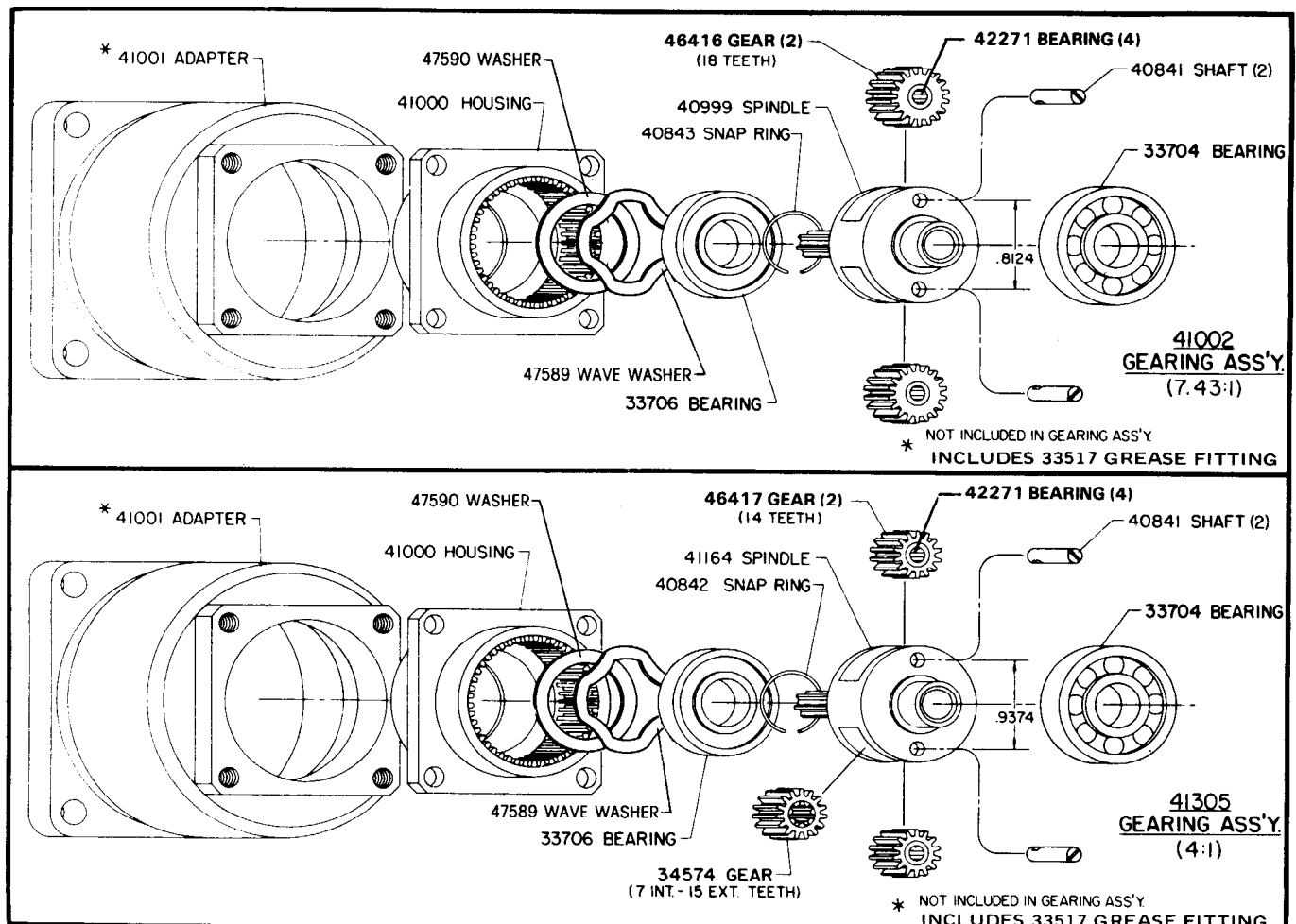


FIGURE 4

# MOTOR SECTION

## DISASSEMBLY

- a. Remove nut (33694) and sems fastener (33700).
- b. Grasp cylinder in one hand and tap drive end of rotor with a soft face hammer; motor will come apart.

## ASSEMBLY

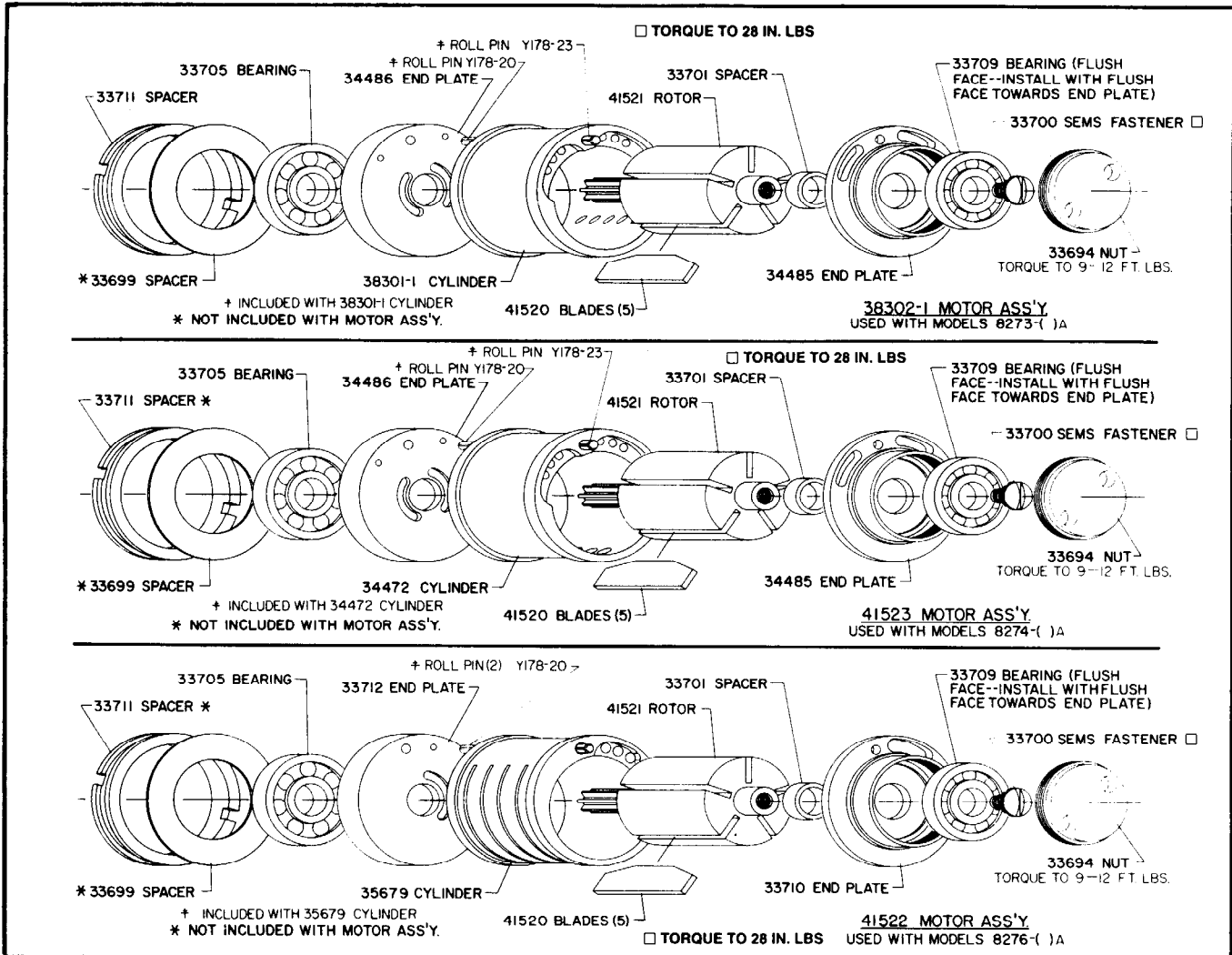
NOTE: Pack bearings with ARO 33153 grease, or equivalent, and coat i.d. of cylinder with ARO 29665 spindle oil upon assembly.

- a. Assemble bearings into end plates, pressing on outer race of bearings. NOTE: Bearing (33709) is a flush face bearing. Assemble into end plate with flush face of bearing towards end

plate (lettering on bearing facing away from end plate). See figure 5.

- b. Assemble end plate (33710 or 34485), with bearing (33709), to rotor.
- c. Assemble cylinder to end plate (33710 or 34485) and rotor.
- d. Assemble blades (41520) to rotor.
- e. Assemble end plate (33712 or 34486), with bearing (33705), to cylinder and rotor.
- f. Assemble sems fastener (33700) and nut (33694) to motor. NOTE: Torque fastener to 28 in. lbs and nut to 9 – 12 ft lbs.
- g. Insure that the motor does not bind and assemble with spacers (33699 and 33711) into housing.

## MOTOR SECTION



## MOTOR HOUSING & EXHAUST MANIFOLD

FIGURE 5

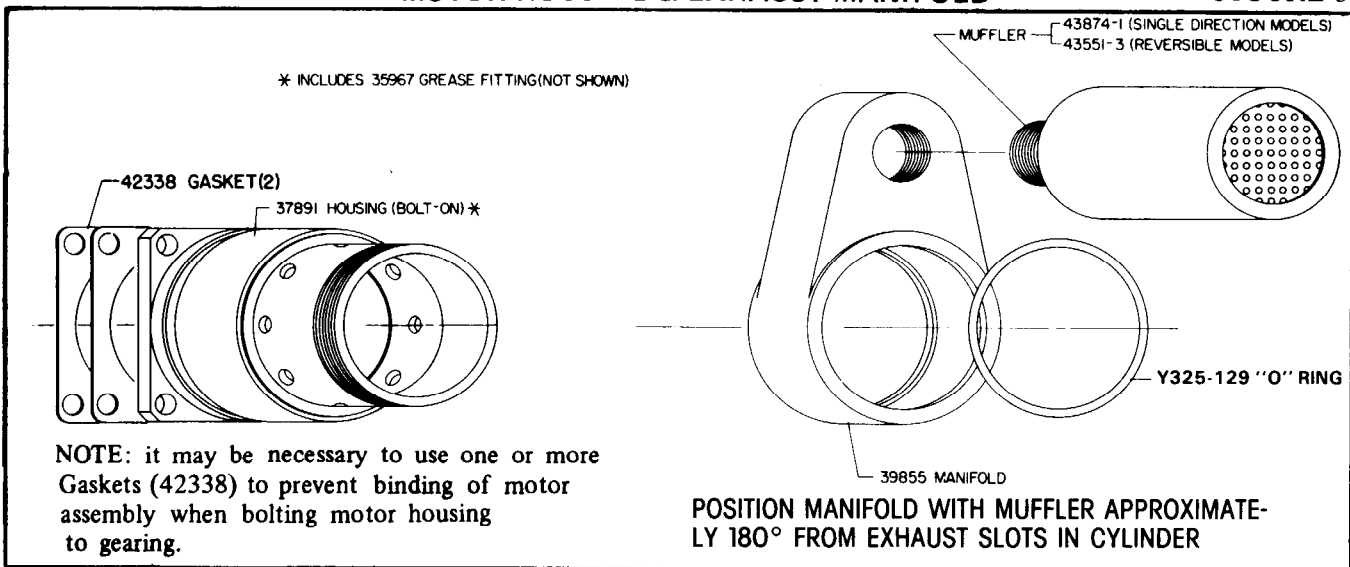


FIGURE 6

### DISASSEMBLY

- a. To remove Manifold, remove head and "O" Ring (Y325-129) and slip manifold off housing.

### REASSEMBLY

- a. Assemble Manifold and "O" Ring (Y325-129) to housing.

**NOTE:** On models with bolt-on type gearing it may be necessary to use one or more Gaskets (42338) to prevent binding of motor assembly when bolting motor housing to gearing.



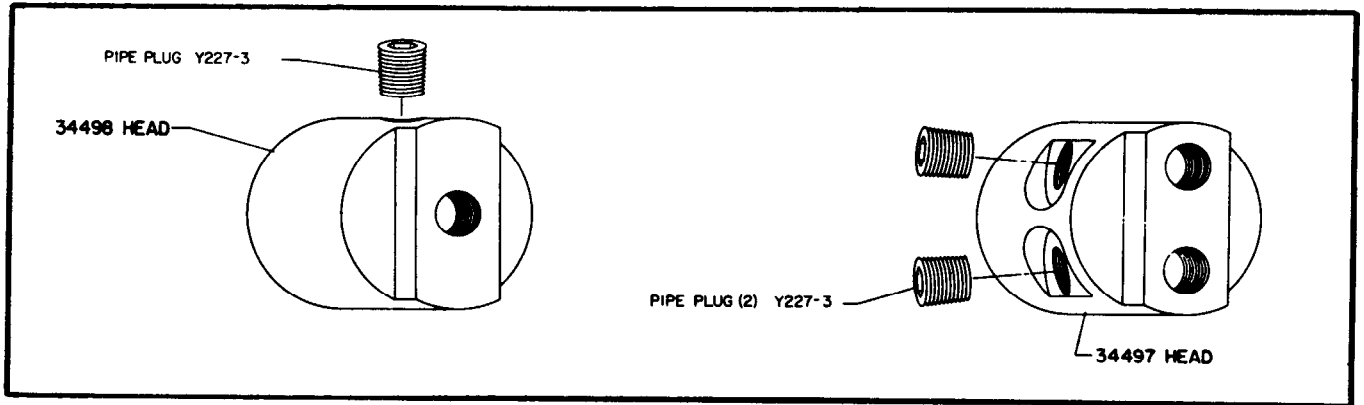


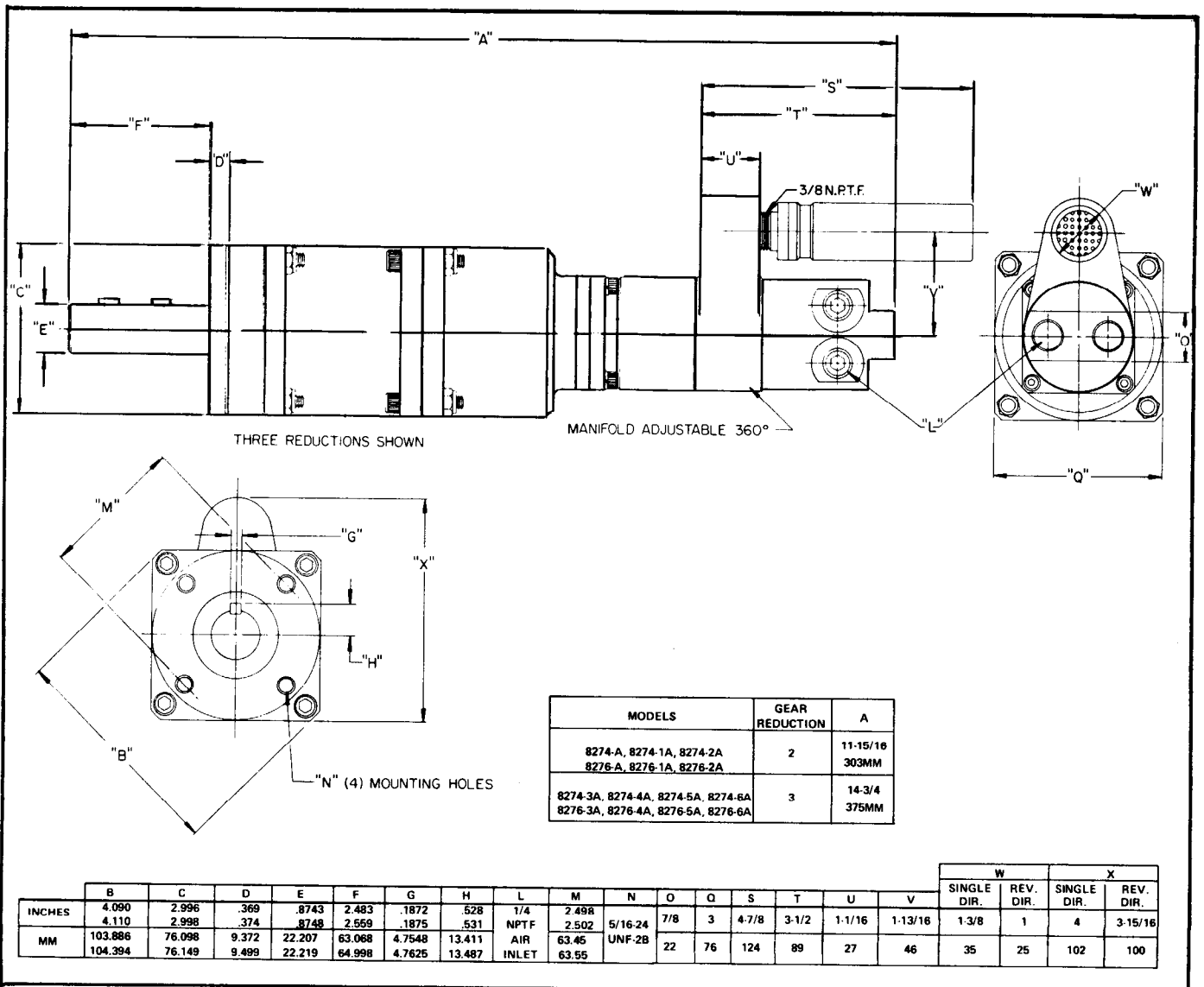
FIGURE 7

When assembling Head or Motor Section to models having reversible rotation motor assemblies the following method of assembly is recommended.

Place Head (flats of head) in a suitable holding device with threaded end in an upright position. Place motor assembly

on head aligning Roll Pin that extends through end plate with locating hole in head (center hole of 7 holes). Slip motor housing (with manifold and "O" Ring attached) over motor and secure to head. Assemble Spacers (33699), (33711) and gearing to tool.

DIMENSIONAL DATA









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