

OPERATOR'S MANUAL

M110
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INCLUDING: INSTALLATION & MAINTENANCE

Released: 4-29-88

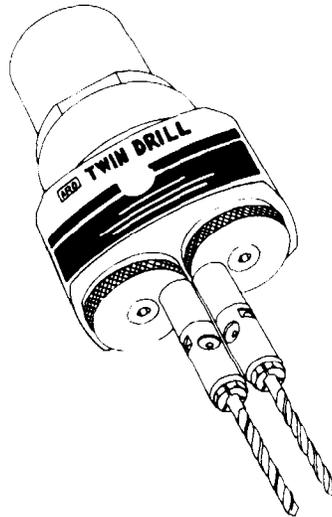
Revised: 3-8-96

Form: 1801-2

DUAL SPINDLE ATTACHMENT MODEL 46023

FOR USE WITH ARO® PAR-A-MATIC® SELF-FEED DRILL

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



DRILL SIZES UP TO:
1/4" (6.5 mm)

CENTER DISTANCES:
1/2" TO 2-1/2"
(12.7 TO 63.5 mm)

TO ATTACH TO TOOL

REMOVE DRILL CHUCK FROM GEAR SPINDLE, INSURE SPINDLE NUT (38893) IS IN PLACE ON GEAR SPINDLE AND THREAD DOG NUT (45979) TO SPINDLE AND TIGHTEN SECURELY. — R.H. THREADS. THREAD ADAPTER (46020) TO RING GEAR INSURING DRIVING SPINDLE (46021) PROPERLY ENGAGES WITH DOG NUT (45979) AND TIGHTEN SECURELY. ASSEMBLE DUAL SPINDLE ATTACHMENT (47980) TO ADAPTER ASSEMBLY (47283). IMPORTANT — ALTERNATELY TIGHTEN ADJUSTMENT SCREWS (45992) APPROXIMATELY 1/2 TURN AT A TIME TO PREVENT DAMAGING THE UNIT. SEE "SPINDLE ADJUSTMENT," PAGE 4.

RECOMMENDED METHOD FOR HOLDING DRILLS IN SPINDLES

TO PROPERLY HOLD DRILL BIT IN COLLET AND REDUCE THE CHANCE OF SLIPPAGE, A FLAT MUST BE GROUND ON THE SHANK END OF THE BIT. THE FLAT SHOULD BE APPROXIMATELY 5/16" (8mm) LONG AND THE DEPTH SHOULD BE 1/3 OF THE BIT DIAMETER. NOTE: IF BIT IS TOO LARGE TO FIT INTO LOCKING INSERT (SMALLER CAPACITY DUAL SPINDLES DO NOT HAVE INSERT), A SQUARE MUST BE GROUND ONTO THE SHANK END OF THE BIT. INSERT BIT INTO SPINDLE AND INTO LOCKING INSERT (WHERE APPLICABLE) INSURING THAT ONE OF THE SET SCREWS LOCATES SQUARELY ON THE FLAT OF THE BIT. TIGHTEN COLLET FIRMLY, THEN TIGHTEN SET SCREWS. NOTE: DO NOT OVERTIGHTEN COLLET. INTENT OF SET SCREWS IS ONLY TO KEEP BIT FROM TURNING IN COLLET.

LUBRICATION

OIL RESERVOIRS CAN BE REPLENISHED THRU EITHER SOCKET HEAD SET SCREW (45984) LOCATED ON OPPOSITE SIDES OF THE BODY. THE FELT TYPE OIL RESERVOIRS (46009) SHOULD BE SATURATED WITH A GOOD MULTIGRADE 10W/30 OIL AT APPROXIMATELY EVERY 160 HOURS OF USE. USE ONLY MULTIGRADE 10W/30. DO NOT USE GREASE.

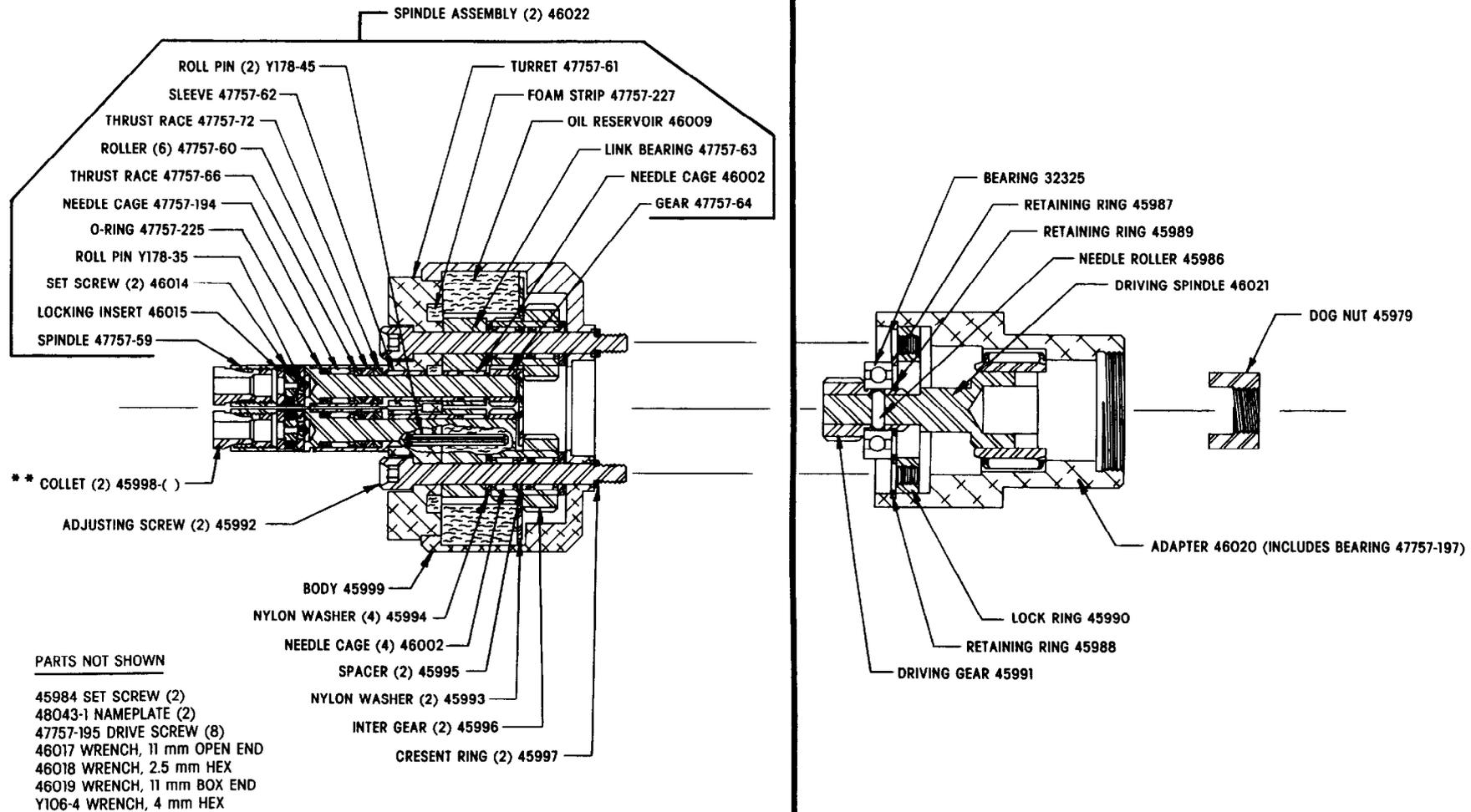
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DUAL SPINDLE ATTACHMENT MODEL 46023



PARTS ON THIS SIDE OF HEAVY LINE ARE INCLUDED IN TWIN SPINDLE HEAD ASSEMBLY 47980.

PARTS ON THIS SIDE OF HEAVY LINE ARE INCLUDED IN ADAPTER ASSEMBLY 47283.

**** NOTE: COLLETS ARE NOT FURNISHED WITH DUAL SPINDLE ATTACHMENT
-- COLLETS MUST BE ORDERED SEPARATELY.**

DUAL SPINDLE ATTACHMENT MODEL 46023

DISASSEMBLY

The Dual Spindle Attachment can be serviced without removing the complete assembly from tool. Using 4 mm hex wrench supplied with unit, loosen both Adjusting Screws (45992)—**IMPORTANT:** Alternately unthread Adjusting Screws approximately 1/2 turn at a time or unthread screws simultaneously to prevent damaging the unit and remove dual spindle unit from tool.

Remove Crescent Ring (45997). Rotate Spindle Turret and at the same time pull back slightly on Turret to locate alignment of Spindle with notch in Body (45999) and remove Spindle Assembly from Body. To remove Gear (45996) from Body, remove Oil Reservoir (46009) and Nylon Washer (45993)—bend washer slightly to remove. Needle Cage (46002), Spacer (45995) and Washer (45994) are loose parts and will drop out. **DO NOT** disassemble Spindle (46022) unless it is necessary to replace a part.

To disassemble Spindle Assembly (46022): Using a flat bottom type punch or similar tool and an arbor press, remove Gear (47757-64) from Spindle (47757-59). Remove Spindle from the Sleeve carefully because the six (6) Rollers (47757-60) are loose parts and will drop out. **NOTE:** Thrust Race (47757-66) is press fit on Spindle. Cut off O-Ring (47757-225) and using a "C" type washer that properly fits spindle, press Thrust Race and Needle Cage off Spindle. If Link Bearing (47757-63) and Sleeve (47757-62) are removed from Turret, it will be necessary to remove the Foam Strip (47757-227) first. Lift one end of Foam Strip and pull so it slides through notch under Link Bearing. Using a proper size punch and arbor press, remove Link Bearing. Press Sleeve through remaining distance in Turret.

After the Dual Spindle Head Assembly has been removed from the Adapter, the Driving Spindle (46021) and components can be removed from the Adapter (46020). To remove Bearing (32325) and/or Gear (45991), remove Driving Spindle from Adapter then remove Retaining Ring (45989). Press Bearing back on Spindle to expose Needle Roller (45986) and remove Roller and Gear from Spindle (47757-303). Remove Bearing (32325).

REASSEMBLY

Pack bearings and coat gears with a good grade of bearing grease when assembling. Saturate Oil Reservoirs with a good multigrade 10W/30 oil.

Assembling Spindle (46022): Press Sleeve (47757-62) into Turret. **IMPORTANT — SLOT IN THE SLEEVE MUST BE ALIGNED WITH THE NOTCH IN THE BACK FACE OF TURRET.** Push the Foam Strip (47757-227) into the notch in Turret with the widest side across the notch. The center of the strip should be under the sleeve and the two ends should meet at the point opposite the sleeve. Press the Link Bearing on Sleeve keeping the 10 mm hole in the Link Bearing in accurate alignment with the 10 mm hole in the Turret. Slide O-Ring (47757-225) and Needle Cage (47757-194) on Spindle. Slide Thrust Race (47757-66) on Spindle and press to location diameter up to shoulder adjacent to Bearing (47757-194). Be certain Thrust Race is pressed on and squarely seated or premature failure of the bearing may occur. Assemble Thrust Race (47757-72) and slide Spindle into Sleeve leaving approximately a 1/2" gap between end of Sleeve and Thrust Race and assemble the six (6) Rollers to Spindle. Be certain there are six rollers. Lubricate Rollers and bearings using a good grade of bearing grease and slide Spindle on into Sleeve. Assemble Needle Cage (46002) to Spindle and press Gear (47757-64) on Spindle leaving an end play of .001/.002".

Insert a dummy Adjusting Screw (45992) (or a shaft of same dia.) thru Adapter side of Body to maintain alignment of parts to be assembled into Body and assemble Nylon Washer (45994) to dummy screw. Assemble one Needle Cage (46002), Spacer (45995) and Needle Cage (46002) into Gear (45996) and assemble Gear to the dummy screw. Assemble Nylon Washer (45993) into Body — Bend Washer slightly to insert into Body and assemble Oil Reservoir (46009) into Body.

Assemble Adjusting Screw (45992) to Spindle Assembly (46022) and assemble Nylon Washer (45994) to Adjusting Screw. Assemble the Spindle Assembly into Body while holding Adjusting Screw in alignment with dummy screw to maintain parts alignment and using Adjusting Screw to push the dummy screw out of Body. **NOTE:** Align Spindle Assembly with notch in Body to assemble. After assembling Spindle to Body, assemble Crescent Ring (45997) to Adjusting Screw securing Screw to Body.

NOTE: When assembling Dual Spindle Attachment to Adapter assembly, alternately thread Adjusting Screws (45992) approximately 1/2 turn at a time to prevent damaging the unit.

Reassembly of the Driving Spindle and components to the Adapter (46020) will be the reverse of the disassembly procedure.

SPINDLE ADJUSTMENT

FOR SIMPLE SPINDLE ADJUSTMENT THE "X" "X" AND "Y" "Y" AXIS OF THE COMPONENT SHOWN IN FIG. 1 SHOULD COINCIDE WITH THE "X" "X" AND "Y" "Y" AXIS OF THE DRILL HEAD AND DRILLING UNIT AS SHOWN IN FIG. 2. THE SPINDLES SHOULD THEN BE ADJUSTED IN THE MANNER SHOWN IN FIGS. 3 AND 4.

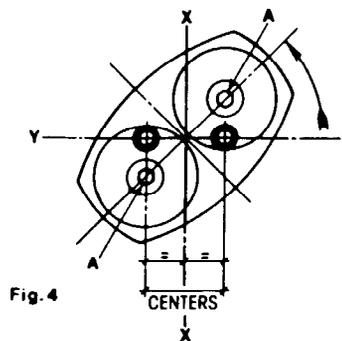
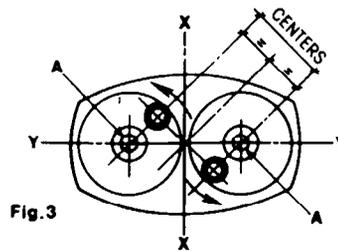
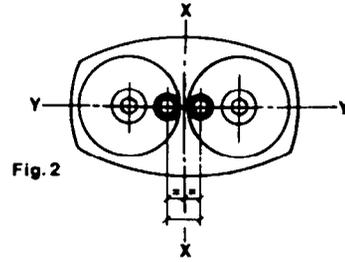
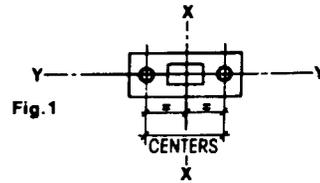
IMPORTANT -

IF THE PROCEDURE IS NOT FOLLOWED AND BOTH SPINDLES ARE MOVED OUT TO ONE SIDE OF THE HEAD, ANY SUBSEQUENT SPINDLE ADJUSTMENT WILL RESULT IN THE NECESSITY OF HAVING TO RE-ADJUST THE RELATIONSHIP BETWEEN THE DRILLING UNIT AND THE COMPONENT.

FIG. 2 SHOWS THE TWIN SPINDLE HEAD WITH THE SPINDLES SET TO THE MINIMUM CENTERS.

TO ADJUST THE SPINDLES AS SHOWN IN FIG. 3 LOOSEN BOTH SCREWS "A" AND ROTATE BOTH TURRETS IN THE DIRECTION INDICATED BY THE ARROWS TO THE APPROXIMATE CENTERS THAT ARE REQUIRED.

ROTATE THE COMPLETE DRILL HEAD ASSEMBLY TO BRING BOTH SPINDLES TO THE REQUIRED "Y" "Y" AXIS AS SHOWN IN FIG. 4. FINALLY ADJUST SPINDLE CENTERS ON AXIS "Y" "Y" TO SUIT GAUGE OR DRILL BUSHINGS AND TIGHTEN SCREWS "A" SECURELY.



45998-() COLLETS

| PART NO. | BORE DIA. (REF.) | INCH | ACCEPTS DRILL SIZES | | PART NO. | BORE DIA. (REF.) | INCH | ACCEPTS DRILL SIZES | | PART NO. | BORE DIA. (REF.) | INCH | ACCEPTS DRILL SIZES | |
|----------|------------------|------|---------------------|-----|----------|------------------|-------|---------------------|-----|----------|------------------|-------|---------------------|-----|
| | | | NO. | mm | | | | NO. | mm | | | | NO. | mm |
| 45998-1 | .039 | | 61 | 1.0 | 45998-20 | .114 | | 33 | 2.9 | 45998-39 | .189 | 3/16 | 12 | 4.8 |
| 45998-2 | .043 | | 57 | 1.1 | 45998-21 | .118 | | 32 | 3.0 | 45998-40 | .193 | | 10 | 4.9 |
| 45998-3 | .047 | 3/64 | 56 | 1.2 | 45998-22 | .122 | | 31 | 3.1 | 45998-41 | .197 | | 9 | 5.0 |
| 45998-4 | .052 | | 55 | 1.3 | 45998-23 | .126 | 1/8 | - | 3.2 | 45998-42 | .201 | | 7 | 5.1 |
| 45998-5 | .055 | | 54 | 1.4 | 45998-24 | .130 | | 30 | 3.3 | 45998-43 | .205 | 13/64 | 5 | 5.2 |
| 45998-6 | .059 | | 53 | 1.5 | 45998-25 | .134 | | 29 | 3.4 | 45998-44 | .209 | | 4 | 5.3 |
| 45998-7 | .063 | 1/16 | 52 | 1.6 | 45998-26 | .138 | | - | 3.5 | 45998-45 | .213 | | 3 | 5.4 |
| 45998-8 | .067 | | 51 | 1.7 | 45998-27 | .142 | 9/64 | 28 | 3.6 | 45998-46 | .216 | | - | 5.5 |
| 45998-9 | .071 | | 50 | 1.8 | 45998-28 | .146 | | 26 | 3.7 | 45998-47 | .220 | 7/32 | 2 | 5.6 |
| 45998-10 | .075 | | 48 | 1.9 | 45998-29 | .150 | | 25 | 3.8 | 45998-48 | .224 | | - | 5.7 |
| 45998-11 | .079 | 5/64 | 47 | 2.0 | 45998-30 | .154 | | 23 | 3.9 | 45998-49 | .228 | | 1 | 5.8 |
| 45998-12 | .083 | | 45 | 2.1 | 45998-31 | .157 | 5/32 | 22 | 4.0 | 45998-50 | .232 | | - | 5.9 |
| 45998-13 | .087 | | 44 | 2.2 | 45998-32 | .161 | | 20 | 4.1 | 45998-51 | .236 | 15/64 | A | 6.0 |
| 45998-14 | .091 | | 43 | 2.3 | 45998-33 | .165 | | 19 | 4.2 | 45998-52 | .240 | | B | 6.1 |
| 45998-15 | .094 | 3/32 | 42 | 2.4 | 45998-34 | .169 | | 18 | 4.3 | 45998-53 | .244 | | C | 6.2 |
| 45998-16 | .098 | | 40 | 2.5 | 45998-35 | .173 | 11/64 | 17 | 4.4 | 45998-54 | .248 | | D | 6.3 |
| 45998-17 | .102 | | 38 | 2.6 | 45998-36 | .177 | | 16 | 4.5 | 45998-55 | .252 | 1/4 | E | 6.4 |
| 45998-18 | .106 | | 36 | 2.7 | 45998-37 | .181 | | 14 | 4.6 | 45998-56 | .256 | | F | 6.5 |
| 45998-19 | .110 | 7/64 | 35 | 2.8 | 45998-38 | .185 | | 13 | 4.7 | | | | | |