

# OPERATOR'S MANUAL

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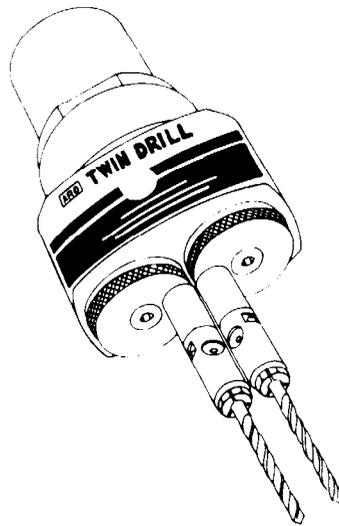
INCLUDING: INSTALLATION & MAINTENANCE

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## DUAL SPINDLE ATTACHMENT MODEL 46394

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

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



DRILL SIZES UP TO:  
5/32" (4 mm)

TAP SIZES UP TO:  
NO. 6 (3.5 mm)

CENTER DISTANCES:  
3/8" TO 2-1/8"  
(9.5 mm to 54 mm)

### TO ATTACH TO TOOL

REMOVE DRILL CHUCK FROM GEAR SPINDLE. REMOVE SPINDLE NUT (38893). USING A SPANNER TYPE WRENCH UNTHREAD AND REMOVE LOCK NUT (38250) AND FELT SEAL (38895) — R.H. THREADS. ASSEMBLE SPINDLE NUT (38893) TO SPINDLE AND THREAD DRIVING DOG (45979) TO SPINDLE AND TIGHTEN SECURELY — R.H. THREADS. THREAD ADAPTER (46394-2) TO RING GEAR AND BE SURE DRIVING DOG PROPERLY ENGAGES SPINDLE (46394-3). TIGHTEN SECURELY.

ASSEMBLE DUAL SPINDLE ATTACHMENT (48057-1) TO ADAPTER ASSEMBLY (48056-1). IMPORTANT — ALTERNATELY TIGHTEN ADJUSTMENT SCREWS (46394-20) 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 (46394-26) 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.

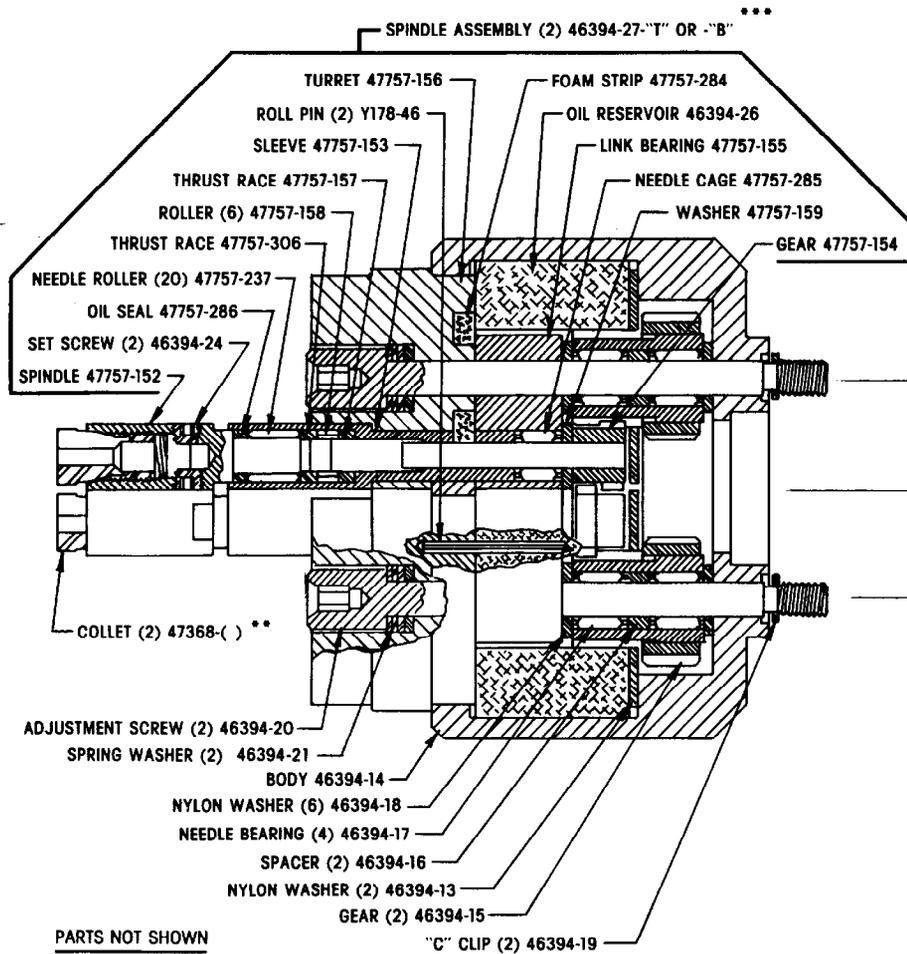
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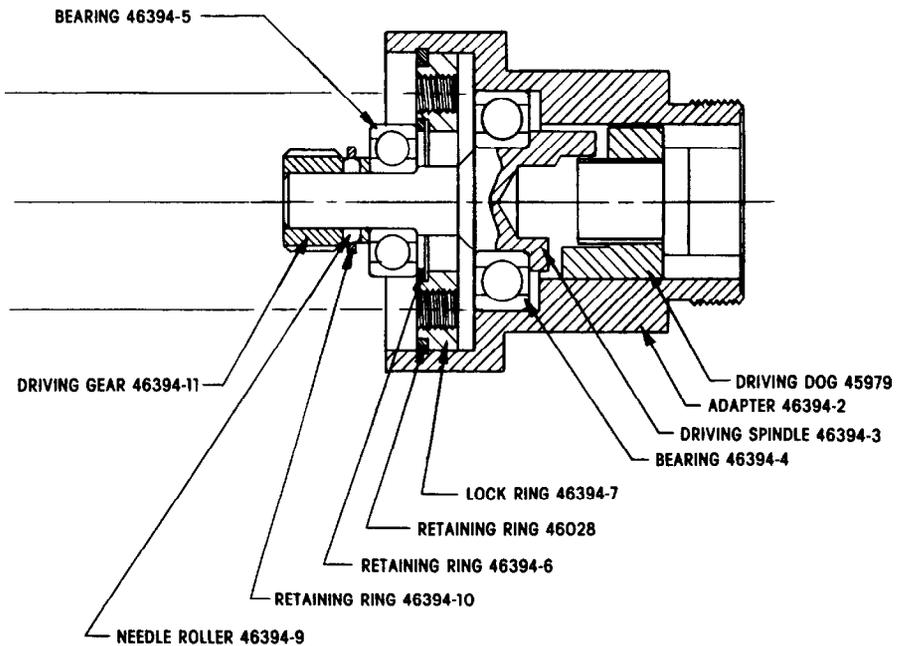
### PARTS NOT SHOWN

45984 SET SCREW (2)  
48043-1 NAMEPLATE (2)  
47757-195 DRIVE SCREW (8)  
46058 WRENCH, 3 mm HEX  
46394-29 WRENCH, 8 mm OPEN END  
46394-30 WRENCH, 8 mm BOX END  
46394-32 WRENCH, 2 mm HEX (2)

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

\*\*\* "T" OR "B" STAMPED ON HOUSING

PARTS ON THIS SIDE OF HEAVY LINE ARE INCLUDED IN TWIN SPINDLE HEAD ASSEMBLY 48057-1



PARTS ON THIS SIDE OF HEAVY LINE ARE INCLUDED IN ADAPTER ASSEMBLY 48056-1

## DUAL SPINDLE ATTACHMENT MODEL 46394

### DISASSEMBLY

The Dual Spindle Attachment can be serviced without removing the complete assembly from tool. Using 3 mm hex wrench supplied with unit, loosen both Adjusting Screws (46394-20) – **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.

Push back on head of Adjusting Screw (46394-21) to compress Spring Washer (46394-21) and expose "C" Clip (46394-19) out of counterbore of Body and remove "C" Clip. Rotate Spindle Turret and at the same time pull back slightly on Turret to locate alignment of Spindle with notch in Body (46394-14) and remove Spindle Assembly from Body. To remove Gear (46394-15) from Body, remove Oil Reservoir (46394-26) and Nylon Washer (46394-13) – bend washer slightly to remove. Needle Cage (46394-17), Spacer (46394-16) and Washer (46394-18) are loose parts and will drop out. **DO NOT** disassemble Spindle (46394-27-X) unless it is necessary to replace a part.

To disassemble Spindle Assembly (46394-27-X): Using a flat bottom type punch or similar tool and an arbor press, remove Gear (47757-154) from Spindle (47757-152). **CARE SHOULD BE TAKEN TO REPLACE GEAR (47757-154) IN THE SAME POSITION WHEN REASSEMBLING.** Turret stamped "T", the Gear is assembled with gear teeth up. Turret stamped "B" the Gear is assembled with gear teeth down. Remove Spindle from the Sleeve carefully because the six (6) Rollers (47757-158) are loose parts and will drop out. **NOTE:** Thrust Race (47757-306) is press fit on Spindle. Using a "C" type washer that properly fits spindle, press Thrust Race off Spindle. Remove Oil Seal (47757-286). If Link Bearing (47757-155) and Sleeve (47757-153) are removed from Turret, it will be necessary to remove the Foam Strip (47757-284) first. Lift one end of Foam Strip and pull so it slides through notch under Link Bearing. Using a proper size punch and an arbor press, remove Link Bearing. Press Sleeve through remaining distance in Turret.

To disassemble the Adapter Assembly (48056): Using wrenches on flats of Adapter (46394-2) and Ring Gear of tool, unthread and remove Adapter from gearing. Remove Retaining Ring (46028). Using a suitable rod against end of Driving Spindle (46394-3), from threaded end of Adapter tap on rod to loosen Spindle and components from Adapter. Remove Retaining Ring (46394-10), Needle Roller (46394-9) and Gear (46394-11) from Spindle. Bearings (46394-5) and (46394-4) are press fit on Spindle.

### 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 (46394-27-X): When fitting the Sleeve (47757-153) it is important that the slot in the Sleeve lines up with the groove in the back face of the Turret. Push Foam Strip (47757-284) into the groove in the Turret (widest side across groove). 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 (47757-155) over the small end of the Sleeve keeping the 5 mm hole in the Link Bearing aligned with the 5 mm hole in the Turret. To maintain alignment, use a 5 mm pin inserted through the bore in the Link Bearing and the Turret. Assemble Oil Seal (47757-286) to Spindle. Assemble Thrust Race (47757-306) to Spindle and press on up to the shoulder. Be certain Thrust Race is pressed on and squarely seated or premature failure of the bearing may occur. Drop the Thrust Race into the bore of the Sleeve assembled in the Turret. Place a small amount of grease on Spindle and position the twenty (20) Needle Rollers (47757-237) between the Oil Seal (47757-286) and Thrust Race (47757-306). Place a small amount of grease on shoulder between the two Thrust Races and position the six (6) Rollers (47757-158) on Spindle. Slide Spindle into Sleeve insuring Foam Strip is kept out of the way. Place a few drops of oil into sleeve and push Spindle firmly down into Sleeve.

Hold Spindle in position and turn Turret assembly over with gear end up. Apply a small amount of grease to Needle Cage (47757-285) and slide cage over the end of the Spindle into the bore of the Link Bearing. Place Washer (47757-159) over Spindle. Be certain Gear is positioned correctly – position with gear teeth up on Turret stamped "T". Position Gear with gear teeth down on Turret stamped "B". Press Gear on Spindle. **IMPORTANT** – When pressing Gear on Spindle allow an end play of .001".

Press Roll Pins (Y178-46) into 1/8" dia. holes in Turret. Assemble Set Screws (46394-24) to Spindle.

Insert a dummy Adjusting Screw (46394-20) (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 (46394-18) to dummy screw. Assemble one Needle Cage (46394-17), Spacer (46394-16) and a Needle Cage (46394-17) into Gear (46394-15) and assemble Gear to the dummy screw. Assemble Nylon Washer (46394-13) into Body – Bend Washer slightly to insert into Body and assemble Oil Reservoir (46394-26) into Body.

Assemble Spring Washer (46394-21) and Nylon Washer (46394-18) to Adjusting Screw (46394-20) and assemble adjusting Screw to Spindle Assembly. Assemble another Nylon Washer (46394-18) 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, depress head of Adjusting Screw and assemble "C" Clips to Screw securing Screw to Body.

Reassembly of the Driving Spindle and components to the Adapter (46394-2) will be the reverse of the disassembly procedure.

**NOTE:** When assembling Dual Spindle Attachment to Adapter assembly, alternately thread Adjusting Screws (46394-20) approximately 1/2 turn at a time to prevent damaging the unit.

## 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.

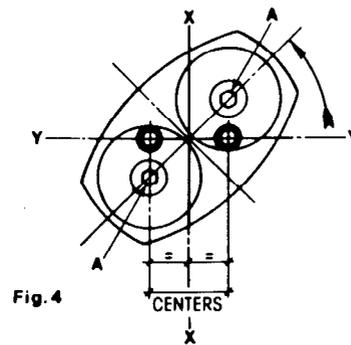
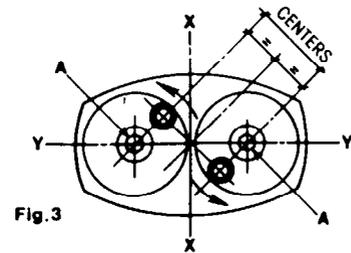
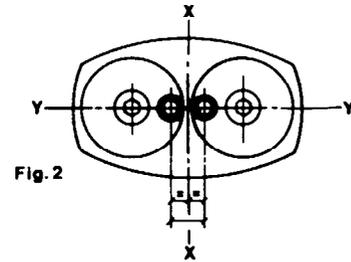
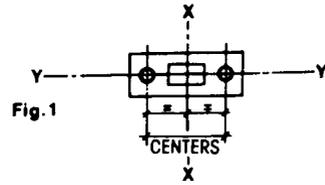
**IMPORTANT -**

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.



### 47368-( ) COLLETS

COLLET PART NUMBER	BORE DIA. (REF.)	ACCEPTS DRILL SIZE		COLLET PART NUMBER	BORE DIA. (REF.)	ACCEPTS DRILL SIZE	
		INCH	NO. MM			INCH	NO. MM
47368-1	.039		61 1.0	47368-17	.102		38 2.6
47368-2	.043		57 1.1	47368-18	.106		36 2.7
47368-3	.047	3/64	56 1.2	47368-19	.110	7/64	35 2.8
47368-4	.052		55 1.3	47368-20	.114		33 2.9
47368-5	.055		54 1.4	47368-21	.118		32 3.0
47368-6	.059		53 1.5	47368-22	.122		31 3.1
47368-7	.063	1/16	52 1.6	47368-23	.126	1/8	32 3.2
47368-8	.067		51 1.7	47368-24	.130		30 3.3
47368-9	.071		50 1.8	47368-25	.134		29 3.4
47368-10	.075		48 1.9	47368-26	.138		35 3.5
47368-11	.079	5/64	47 2.0	47368-27	.142	9/64	28 3.6
47368-12	.083		45 2.1	47368-28	.146		26 3.7
47368-13	.087		44 2.2	47368-29	.150		25 3.8
47368-14	.091		43 2.3	47368-30	.154		23 3.9
47368-15	.094	3/32	42 2.4	47368-31	.157	5/32	22 4.0
47368-16	.098		40 2.5				