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Finnigan-Mat

Subj: Proposed Drive Mechanism Cleaning, Inlet Variable Volume  
on Finnigan-Mat Delta-s/MAT-252.

DISCLAIMER

GREASING THE DRIVE MECHANISM IS DONE AT THE RISK OF THE  
USER. THE LONG-TERM CONSEQUENCES OF GREASING THE COLLAR  
THREADS ARE UNKNOWN.



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PRELIMINARY VERSION ..V2..08-2000



## SPECIAL NOTES

DRAWINGS ARE NOT TO SCALE, AND MAY NOT BE 100% ACCURATE REGARDING POSITION OR REPRESENTATION.

IN SOME DRAWINGS, SOME DETAIL WAS OMITTED IF DEEMED UN-NECESSARY FOR A PARTICULAR WORK STEP, WHILE IN OTHER DRAWINGS MORE DETAIL THAN NEEDED WAS SHOWN FOR ADDITIONAL CLARITY FOR THE BENEFIT OF THE NON-SERVICE ENGINEER.

IN ALL DRAWINGS EXCEPT [A], PART POSITION NUMBERING WAS ASSIGNED SO AS TO MATCH THE STEP FOR WHICH THAT DRAWING IS BEING USED.

\* IT SHOULD NOT BE NECESSARY TO REMOVE THE VOLUME ASSEMBLY FROM THE INLET PLATFORM TO PERFORM THIS PROCEDURE.

\*\* IF YOUR INSTALLATION HAS A CLIPPARD CARD LOCATED BEHIND AND BELOW THE DRIVE MECHANISM,

OR

IF YOUR INSTALLATION HAS A CLIPPARD CARD LOCATED VERTICALLY BESIDE THE DRIVE MECHANISM,

THEN:

YOU MAY WISH TO REMOVE THE CLIPPARD CARD TO PREVENT METAL FILINGS, DIRT, OR PARTS FROM DROPPING ONTO THE CARD.

\*\*\*\* FAILURE TO COVER OR REMOVE THE CLIPPARD CARD MAY LEAD TO DAMAGE TO THE CARD OR POWER SUPPLY.

MAKE SURE THAT THE CABLE CONNECTIONS ARE PROPERLY MARKED. UNPLUG THE RIBBON CABLE FROM THE CLIPPARD CARD. REMOVE THE FOUR (4) MOUNTING BOLTS AND MOVE THE CARD OUT OF THE WAY.

\*\*\*\*\* THIS PROCEDURE ALLOWS THE POWER CABLE FOR THE MOTOR DRIVE TO REMAIN CONNECTED. HOWEVER, IF YOU DO NOT FEEL COMFORTABLE PERFORMING THIS PROCEDURE WITH POWER CONNECTED TO THE UNIT, THEN DISCONNECT THE ROUND DIN POWER CABLE BEFORE STARTING.

THERE IS +24VDC SUPPLIED TO THE DRIVE MOTOR. TAKE CARE NOT TO SHORT ANY LEADS ON THE CONNECTOR. DAMAGE TO THE POWER SUPPLY MAY RESULT IF CAUTION IS NOT OBSERVED.



## TOOLS AND SUPPLIES

SMALL FLAT TIP SCREW DRIVER OR MEDIUM JEWELERS DRIVER.

MEDIUM FLAT TIP SCREW DRIVER OR LARGE JEWELERS DRIVER.

1/4 " DRIVE SOCKET SET, SAE AND METRIC.

WRENCH SET, SAE.

90 deg AND STRAIGHT SCRIBE POINT.

\*SPECIAL TOOL FOR PRESSING OUT DRIFT PIN IN VOLUME SHAFT.

\*6-8 " PLIERS OR CHANNEL LOCKS.

TABLE WITH PAPER TO LAY PARTS ON.

DEGREASER, FREON, ACETONE etc.

MEDIUM GREASE.

RAGS OR TOWELS.

\*CHECK WITH FINNIGAN SERVICE FOR SPECIAL TOOL



## DRIVE MECHANISM DISASSEMBLY

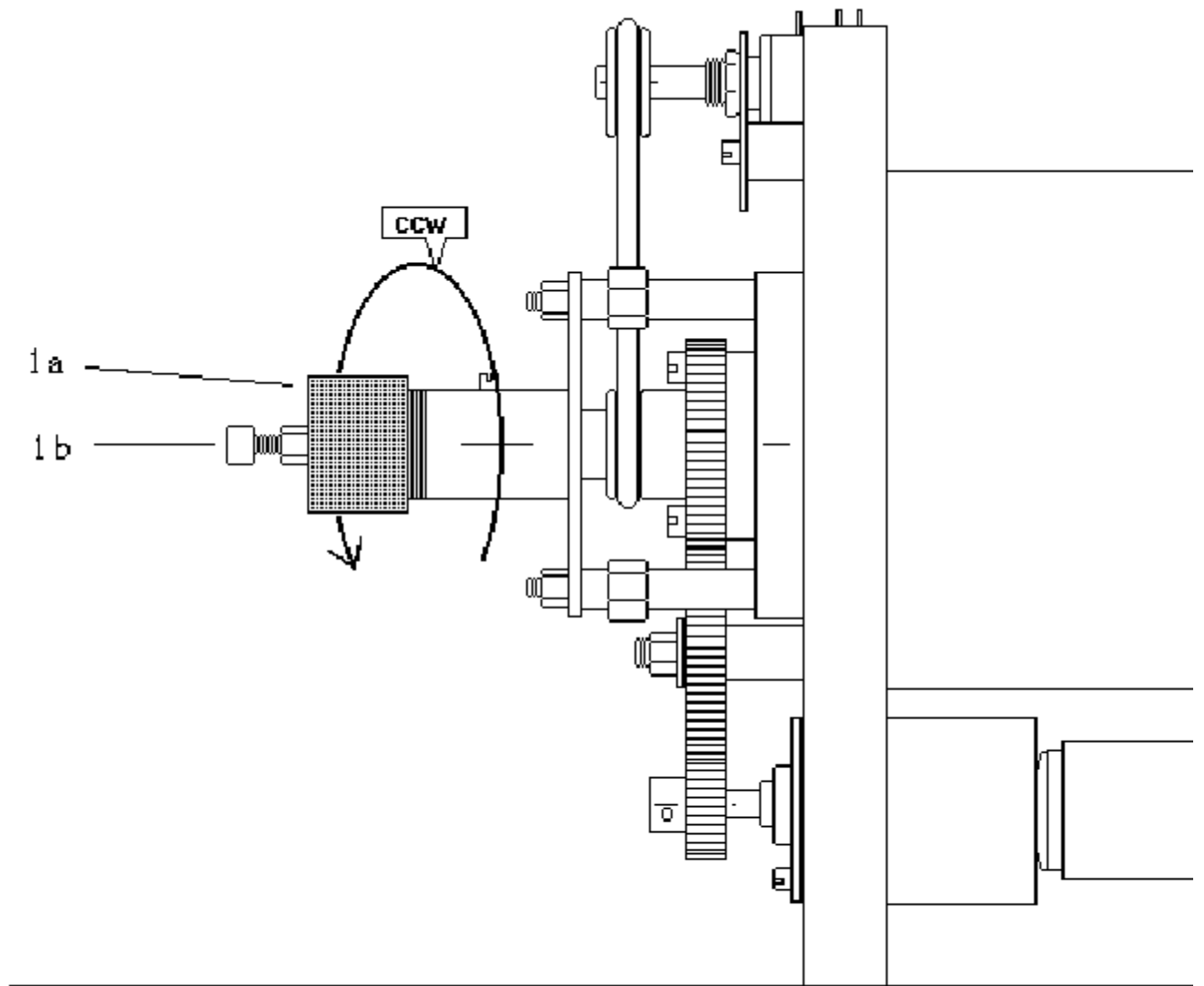
BEFORE STARTING, STUDY THE MECHANICAL DRAWING OF THE UNIT, WHEN NECESSARY REFER BACK TO DRAWING [A] ON ANY STEP.

PULL OFF THE SIDE PANEL OF THE INSTRUMENT TO EXPOSE THE ASSEMBLY.

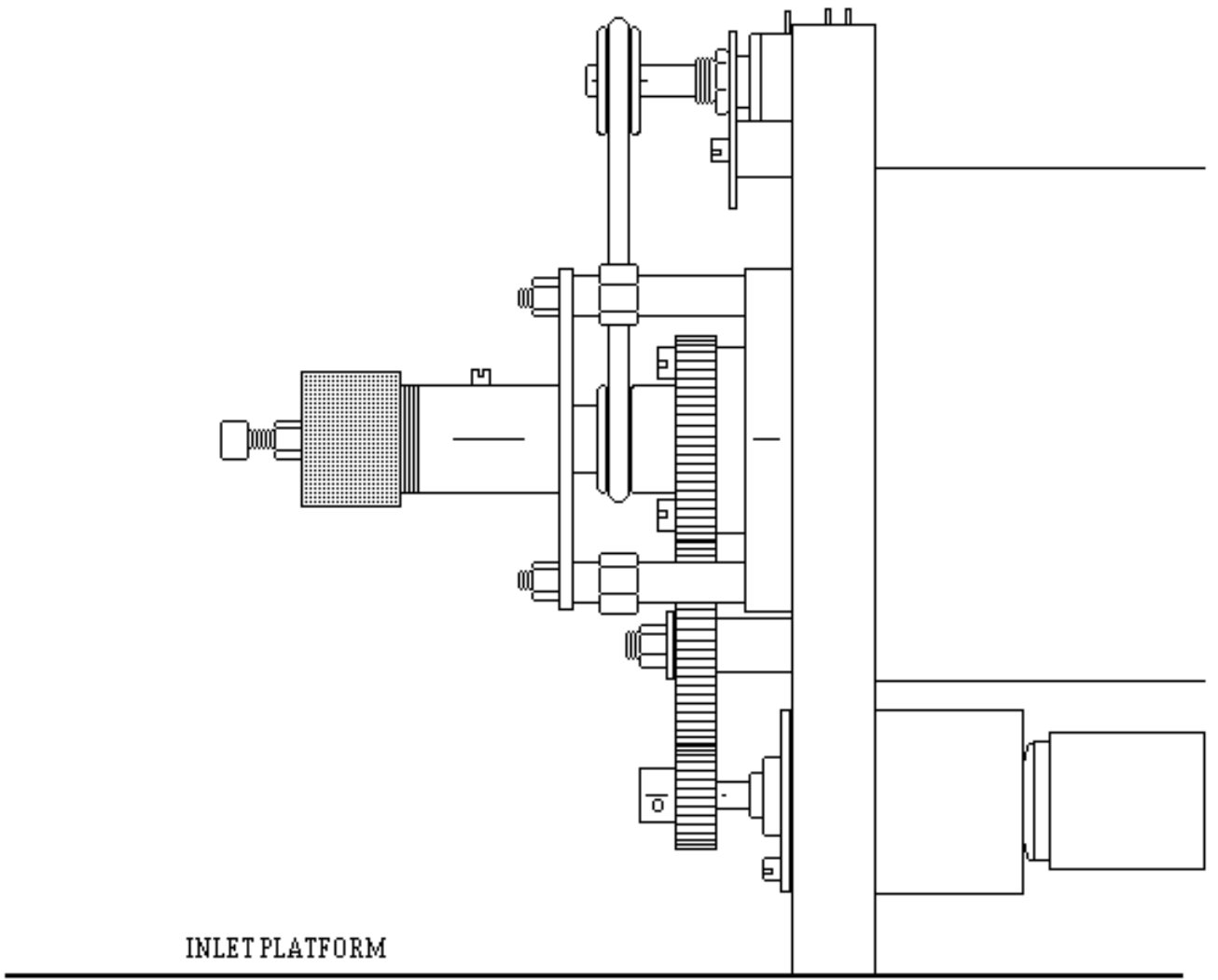
LAY ASIDE ALL PARTS IN SEQUENTIAL ORDER TO AID IN THE RE-ASSEMBLY PROCESS.

REFER NOW TO DRAWING [B].

- 1.0 THE BRASS CAP [1a] CONTAINING THE TRAVEL ADJUSTMENT SET SCREW MUST BE REMOVED. DO NOT MOVE THE SET SCREW [1b] WHEN PERFORMING THIS STEP. THE CAP MAY BE REMOVED BY HAND IN A CCW DIRECTION. IF THE CAP WILL NOT TURN, TRY COMPRESSING THE VOLUME SLIGHTLY SO THAT THE VOLUME SHAFT IS NOT AT REST AGAINST THE SET SCREW. AVOID MECHANICAL FORCE IF POSSIBLE. AS A LAST RESORT GENTLY TRY A PAIR OF SLIP JOINT PLIERS.



DRAWING [B]



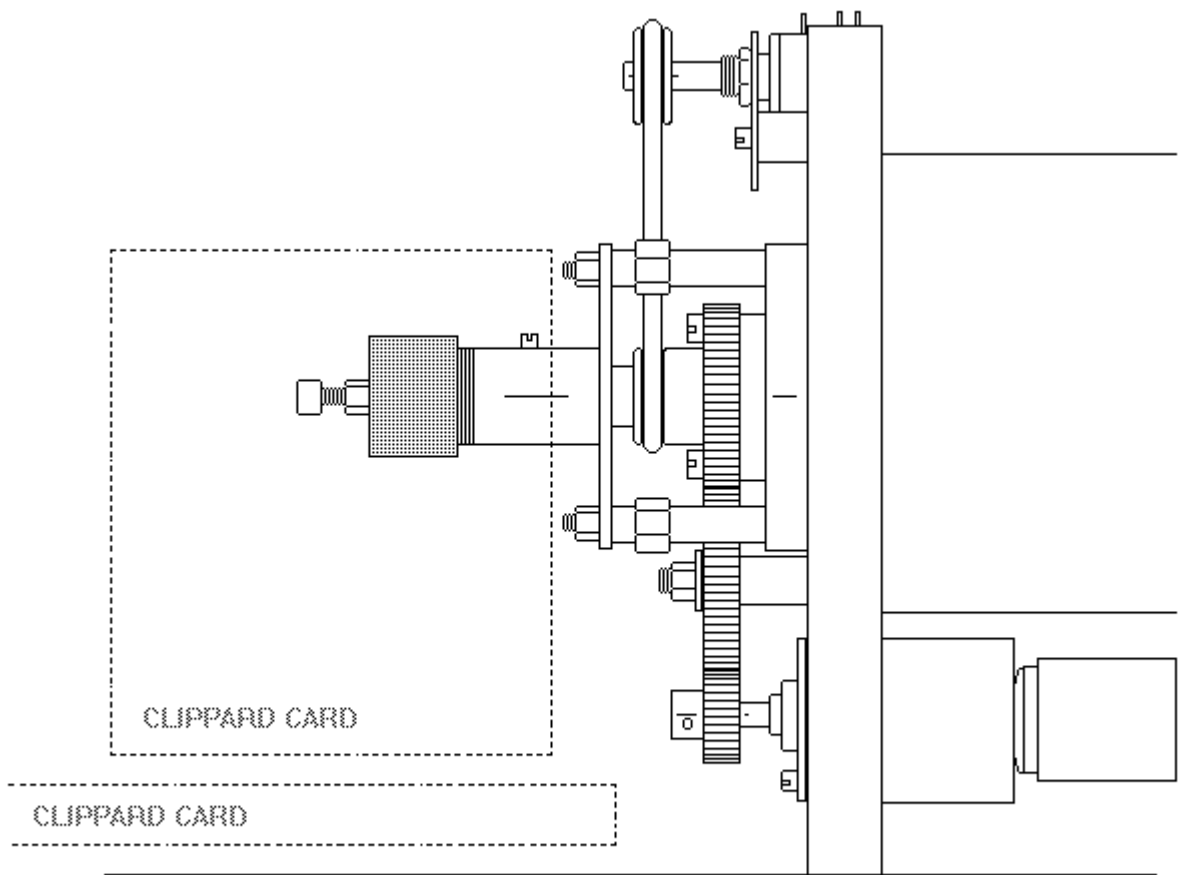
INLET PLATFORM

DRAWING [A]

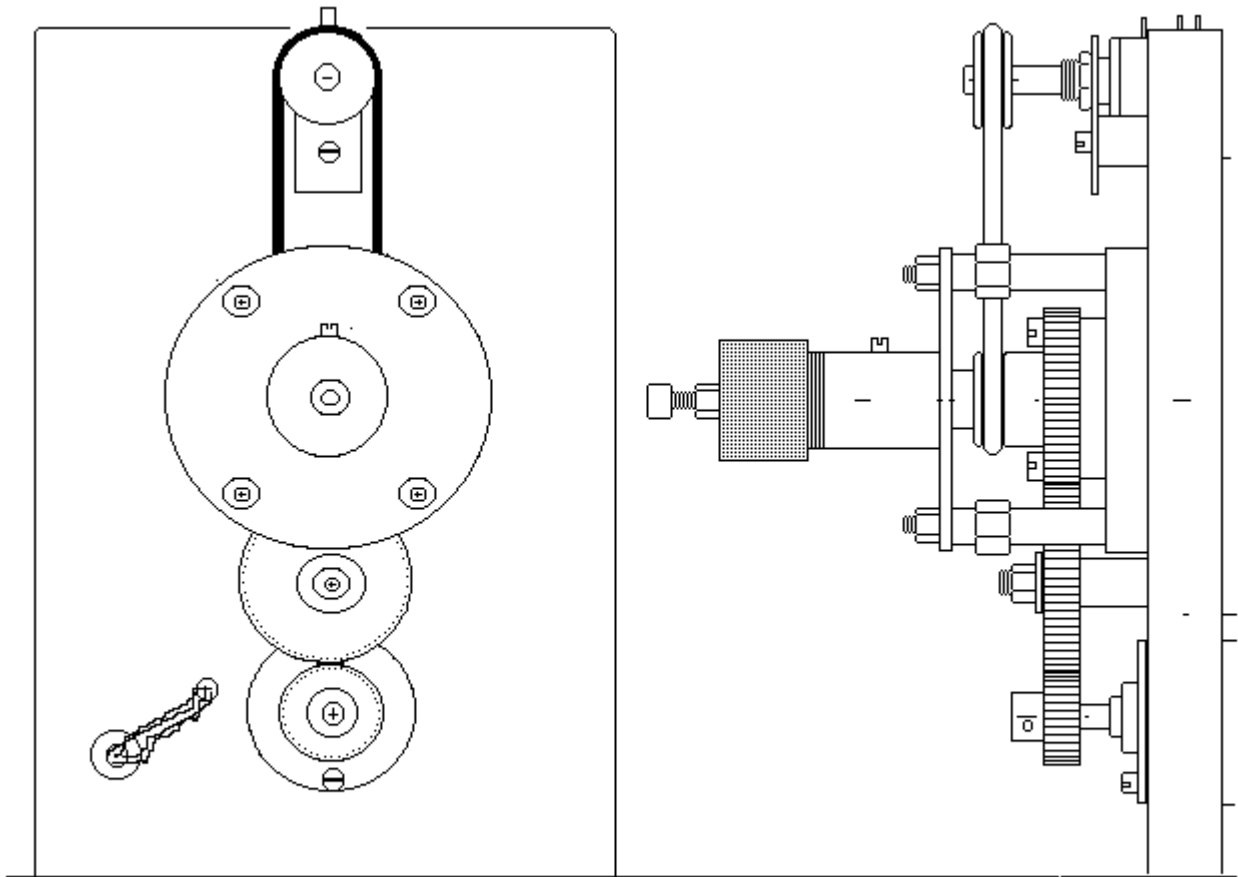


VOLUME MOUNT  
BOLTS, 2-EACH

f&



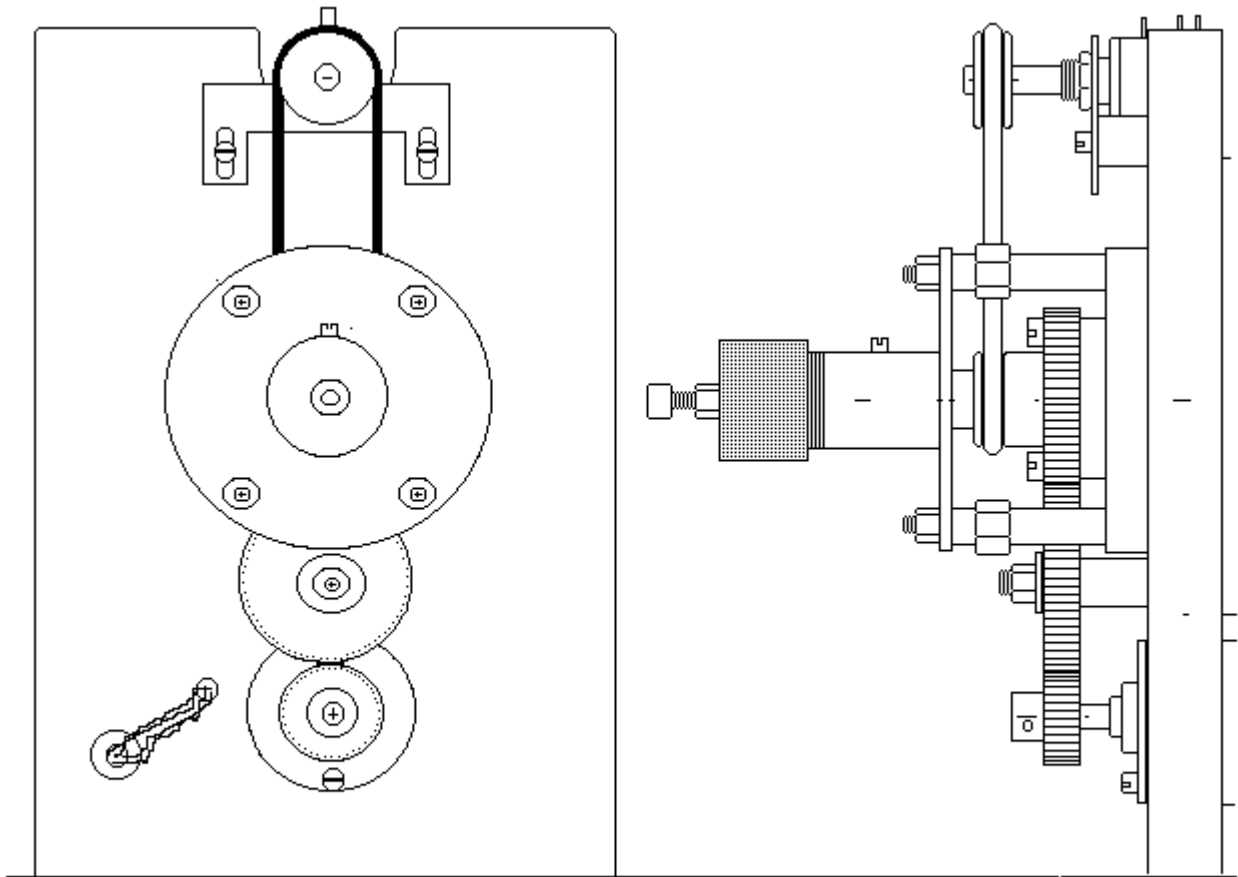
DRAWING [A 2 ]



Early Model 252

DRAWING [A-3]





Late Model 252

DRAWING [A-4]

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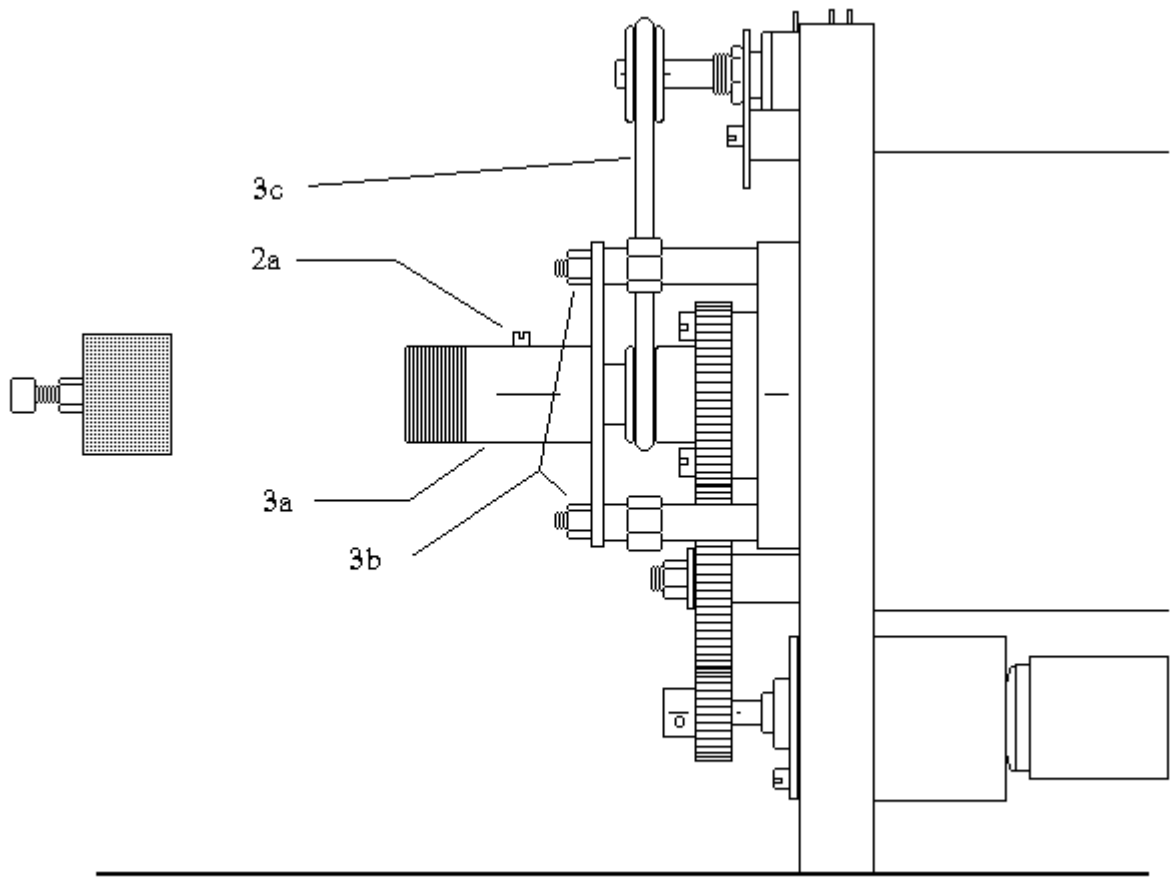
REFER NOW TO DRAWING [C] AND CUT-AWAY VIEW, DRAWING [D].

2.0 THE ANTI-SPIN GUIDE PIN [2a] MUST BE REMOVED. BEFORE THE GUIDE PIN CAN BE REMOVED, THE RETAINING NUT [2c] MUST BE REMOVED. USING A DEEP-WELL SOCKET, IN A CCW DIRECTION, REMOVE THE RETAINING NUT BY WAY OF THE LOWER ACCESS HOLE [2d]. NOW USING A MEDIUM FLAT TIP SCREW DRIVER, IN A CCW DIRECTION, UNSCREW AND LIFT OUT THE GUIDE PIN [2a].

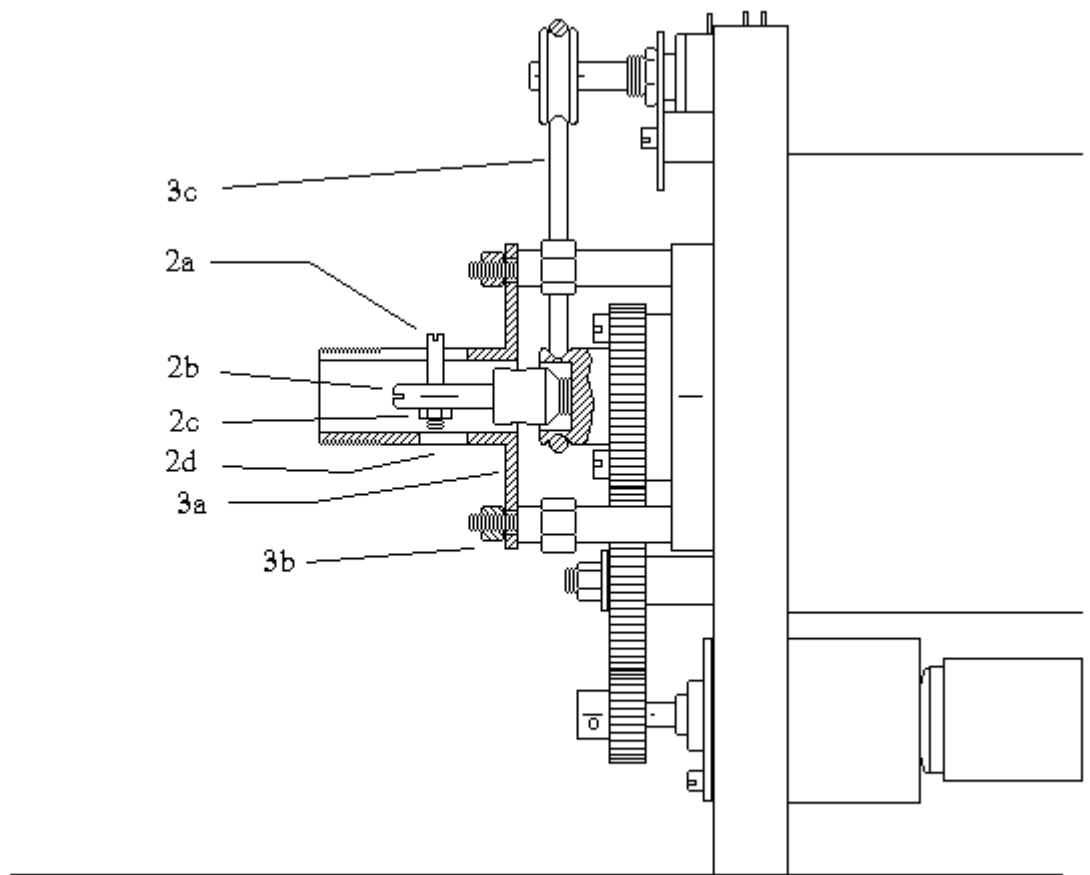
\*\*\*\*\* BE EXTRA CAREFUL NOT TO TURN THE GUIDE PIN [2a] IN THE WRONG DIRECTION. THE THREADED PART OF THE PIN IS SMALL AND EASY TO TWIST OFF. THE THREADS ARE RIGHT-HAND.

3.0 AFTER REMOVING THE GUIDE PIN, THE GUIDE PIN TUBE [3a] MAY BE REMOVED. USING A SOCKET OR WRENCH, IN A CCW DIRECTION, REMOVE THE FOUR (4) MOUNTING BOLT NUTS [3b]. GENTLY PULL THE GUIDE PIN TUBE OFF OF THE MOUNTING STUDS AND LAY IT ASIDE.

3.1 REMOVE THE O-RING DRIVE BELT [3c] FROM THE PULLEYS AND LAY IT ASIDE.



DRAWING [C]



DRAWING [D]

f&



REFER NOW TO DRAWINGS [E] AND [F].

PREPARATION FOR STEP 4.0.

[a] MEASURE AND RECORD THE POSITION [d] OF THE THREADED BUSH SLEEVE AS SHOWN AT [4d].

[b] FOR THIS STEP, THE VARIABLE VOLUME MUST BE AT ATMOSPHERE. OPEN THE APPROPRIATE INLET VALVES TO ACCOMPLISH THIS.

\*\*\*\*\* THE BELLOW MUST BE AT PHYSICAL EQUILIBRIUM TO RELIEVE AND PREVENT ANY FORCE FROM BEING APPLIED TO THE THREADED BUSH SET SCREW [4b].

\*\*\*\*\* ANY DAMAGE CAUSED TO THE VOLUME SHAFT WHILE REMOVING THE THREADED BUSH SET SCREW WILL CAUSE DIFFICULTY OR EVEN PREVENT THE REMOVAL OF THE THREADED BUSH FROM THE VOLUME SHAFT, REQUIRING REPAIR OR REPLACEMENT OF THE SHAFT.

[[\*\*]] SPECIAL NOTICE regarding Step 4.0 !!!!

Later model 252/DS instruments no longer use the set screw. The set screw [4b] has been replaced by a drift pin. This pin must be pressed in/out. Avoid using a hammer and punch. Using a hammer and punch will damage the threads of the bronze collar, the volume shaft, or shaft o-ring assembly at the rear of the bellow. See Fig [F-2].

4.0 THE THREADED BUSH SLEEVE SET SCREW [4b] MUST BE REMOVED FROM THE THREADED BUSH SLEEVE [4a]. USING A SMALL FLAT TIP SCREW DRIVER, IN A CCW DIRECTION, UNSCREW THE SET SCREW [4b]. LIFT THE SCREW OUT AND LAY IT ASIDE.

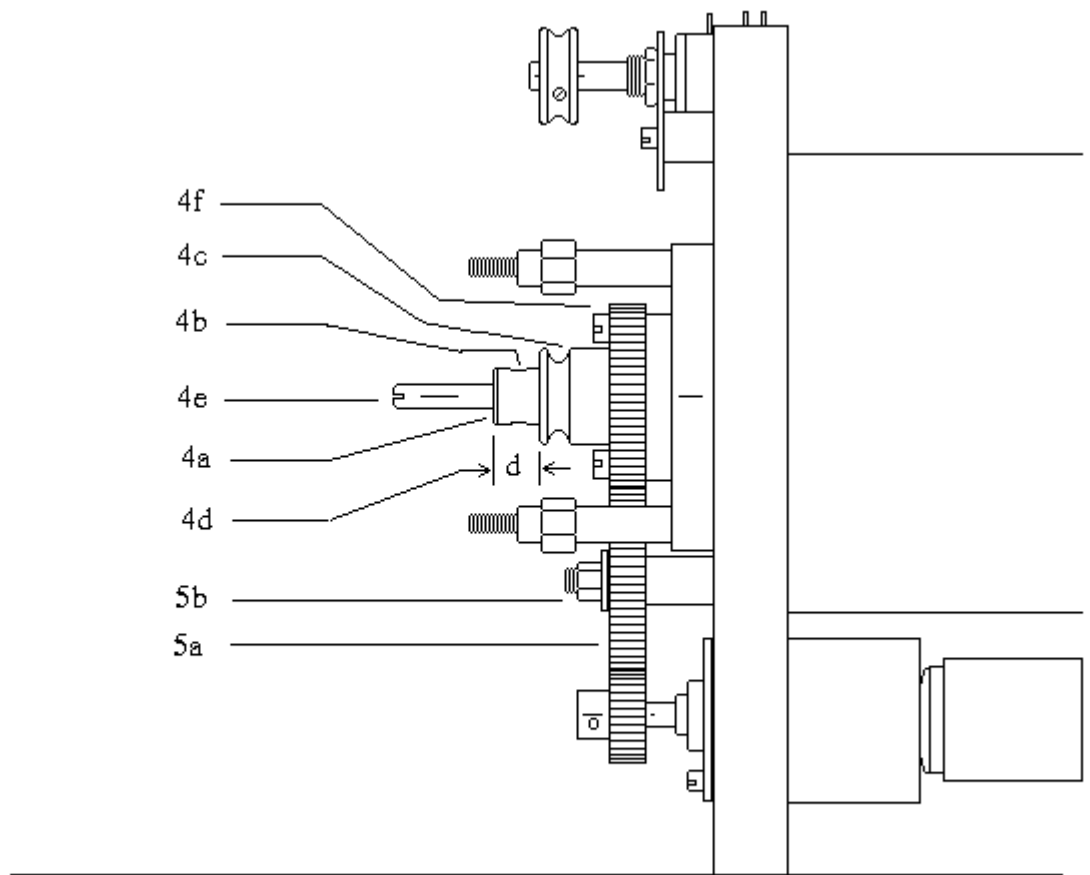
\*\*\* IF THE THREADED BUSH SLEEVE DOES NOT EXTEND FAR ENOUGH OUT OF THE BRONZE BUSH [4c] TO ALLOW REMOVAL OF THE SET SCREW, THEN :

INSERT A MEDIUM FLAT TIP SCREW DRIVER INTO THE SLOTTED END OF THE VOLUME SHAFT [4e]. WHILE HOLDING THE SHAFT IN PLACE, ACTUATE THE DRIVE MECHANISM [EXPAND THE BELLOW] UNTIL THERE IS ENOUGH CLEARANCE TO REMOVE THE SET SCREW.

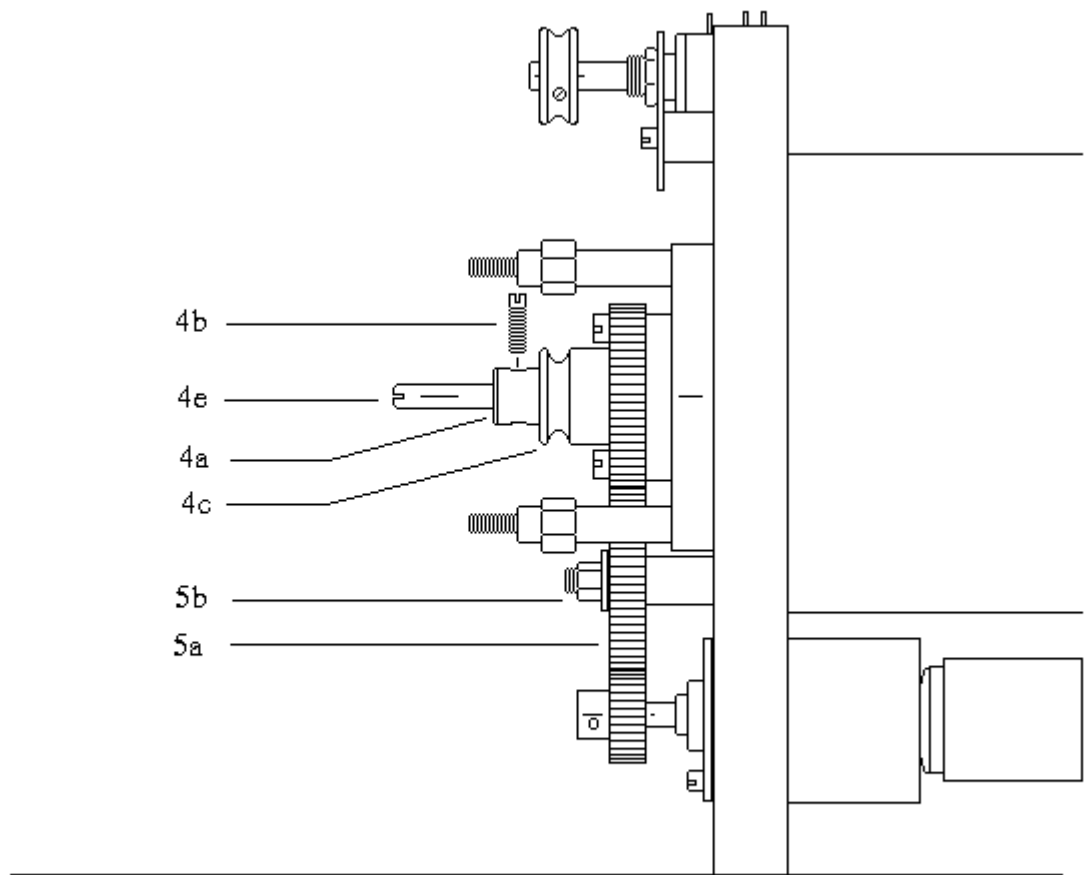
[[\*\*]] ALTERNATE STEP 4.0, FOR LATE MODEL DRIVE ASSEMBLIES.

[[4.0]] THE THREADED BUSH SLEEVE DRIFT PIN [4b] MUST BE REMOVED FROM THE THREADED BUSH SLEEVE [4a]. USING AN APPROPRIATE PRESS OUT DEVICE, PRESS THE DRIFT PIN [4b] OUT AND LAY IT ASIDE.

5.0 REMOVE THE IDLER GEAR RETAINING NUT [5b] AND IDLER GEAR [5a]. USING A SOCKET OR WRENCH, IN A CCW DIRECTION, REMOVE THE RETAINING NUT [5b] AND WASHER. NOW USING BOTH HANDS AND A ROCKING MOTION, GENTLY PULL THE IDLER GEAR [5a] OFF OF THE SHOULDERED MOUNTING STUD AND LAY IT ASIDE.



DRAWING [E]

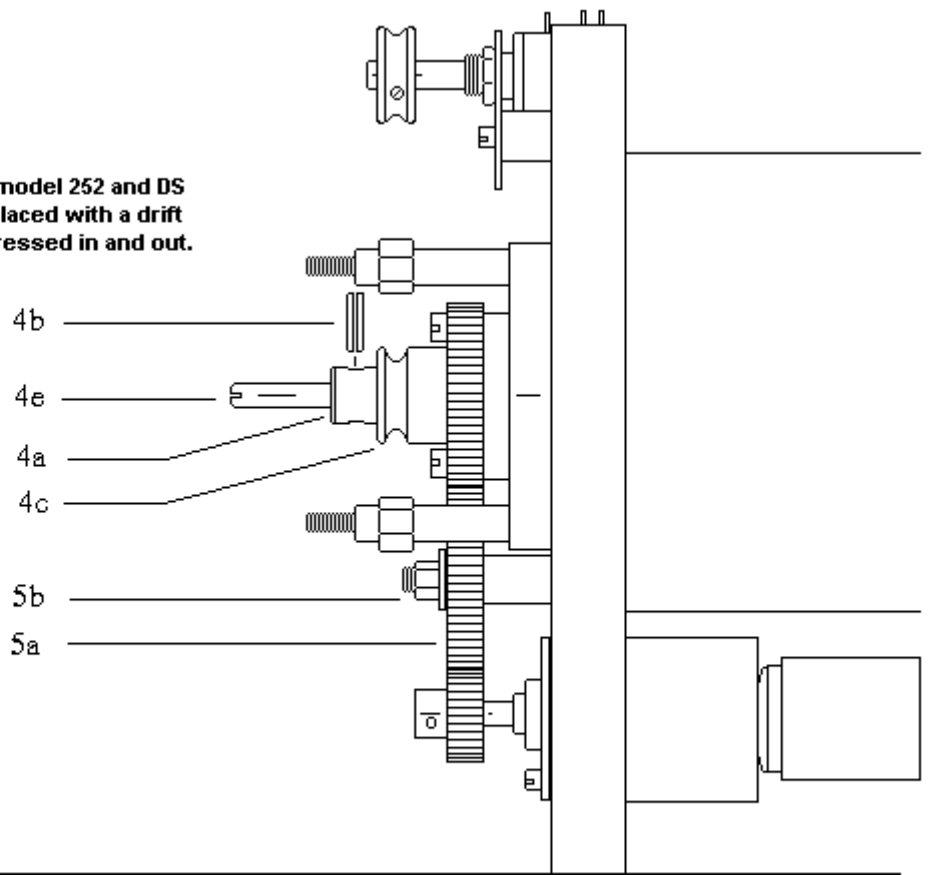


Early model 252/DS

DRAWING [F]

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**Please note that on late model 252 and DS that the set screw is replaced with a drift pin. This pin must be pressed in and out. Not hammered.**



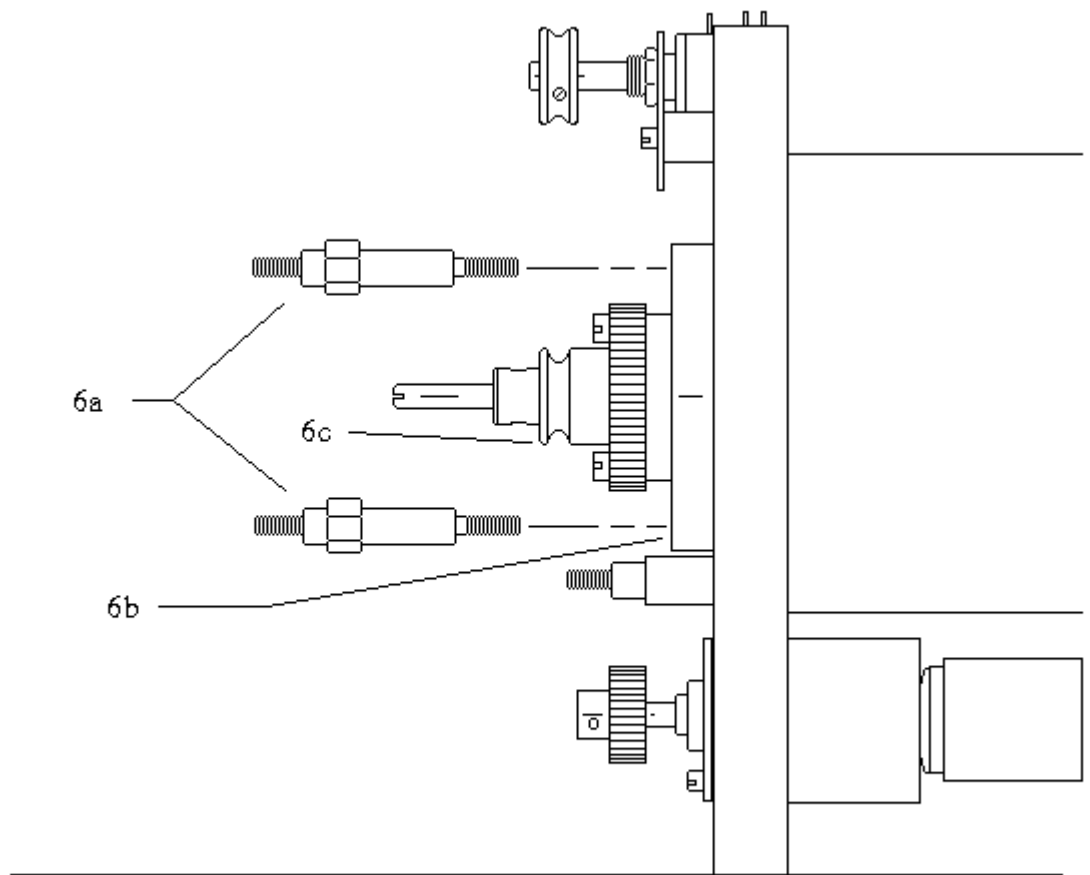


REFER NOW TO DRAWING [G] AND [H].

6.0 THE THREADED BRONZE BUSH [6c] AND BEARING MAY BE REMOVED. USING A DEEP-WELL SOCKET OR WRENCH, IN A CCW DIRECTION, REMOVE THE FOUR (4) MOUNTING STUD BOLTS [6a] FROM THE BEARING CARRIER PLATE [6b] AND LAY THEM ASIDE.

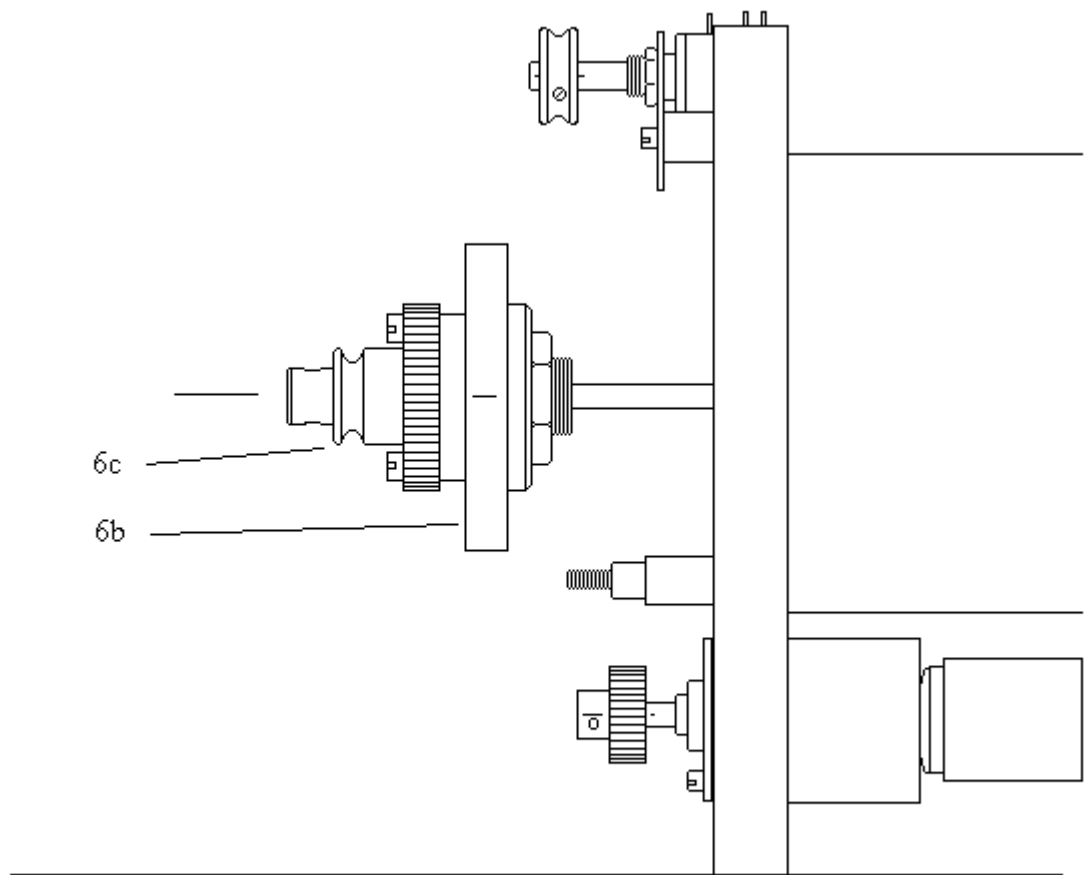
7.0 GENTLY SLIDE THE THREADED BRONZE BUSH [6c] AND THE BEARING CARRIER PLATE [6b] OFF OF THE VOLUME SHAFT AND LAY THEM ASIDE.

\*\*\*\*\* IF YOU FIND IT DIFFICULT TO SLIDE THE BUSH AND PLATE OFF OF THE VOLUME SHAFT, IT MAY BE THAT THERE HAS OCCURRED SOME DEFORMATION OF THE VOLUME SHAFT AT THE POINT WHERE THE THREADED COLLAR SET SCREW WAS LOCATED. IF SO, GREAT CARE MUST BE EXERCISED TO PREVENT ADDITIONAL DAMAGE TO THE ASSEMBLY. STOP AND CONTACT HIGHER QUALIFIED PERSONNEL FOR ASSISTANCE.



DRAWING [G]

f&



DRAWING [H]

REFER NOW TO DRAWING [I].

8.0 IN A CCW DIRECTION, SCREW THE THREADED COLLAR [8a] OUT OF THE THREADED BRONZE BUSH AND BEARING CARRIER [8b].

REMOVE ALL SHAVINGS FROM THE THREADS OF THE THREADED COLLAR [8a] AND FROM THE THREADS OF THE BRONZE BUSH [8c]. THIS MAY BE ACCOMPLISHED WITH A BRASS WIRE BUSH OR SCRIBE POINT. FINISH UP BY APPLYING A DEGREASING AGENT.

\*\*\*\*\* DO NOT ALLOW ANY OF THE DEGREASING AGENT TO ENTER THE CARRIER BEARING [8d].

9.0 AFTER THE THREADS ARE FREE OF ANY METAL FILINGS, SPARINGLY APPLY GREASE TO THE THREADS OF BOTH PARTS [8a] AND [8c]. RE-THREAD THE COLLAR [8a] INTO THE BRONZE BUSH [8c]. SCREW THE COLLAR INTO THE BUSH, BY HAND, AS FAR AS IT WILL GO, THEN REMOVE THE COLLAR FROM THE BUSH AGAIN. REPEAT THIS STEP SEVERAL TIMES TO DISTRIBUTE THE GREASE. WIPE OFF EXCESSIVE AMOUNTS.

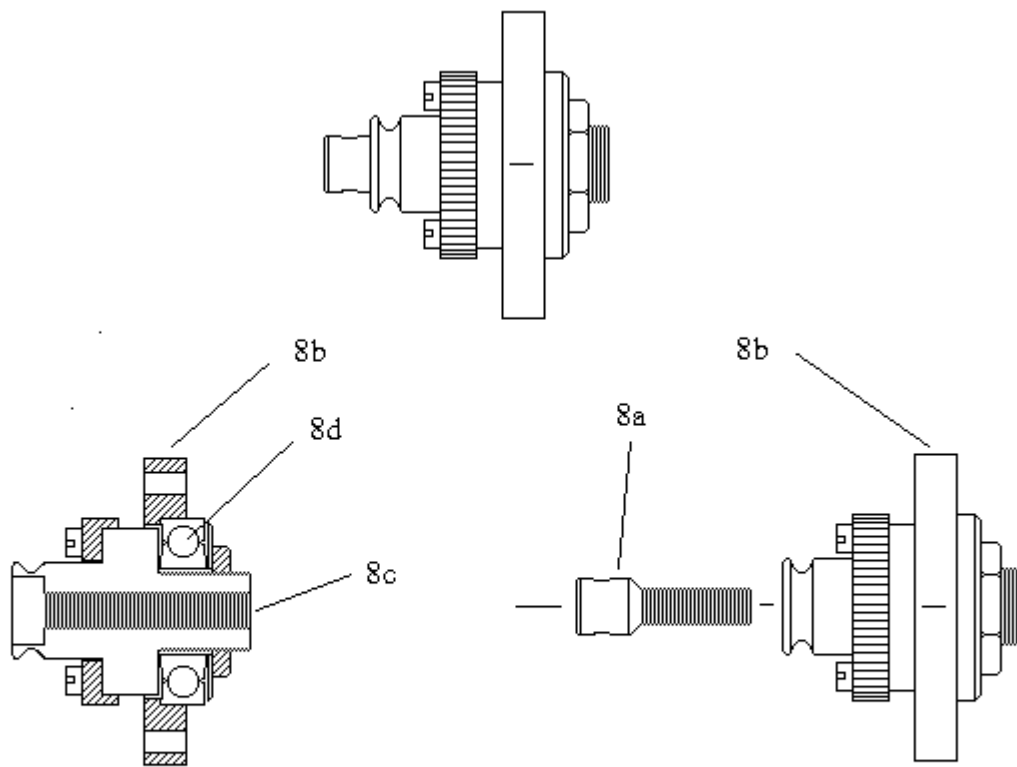
#### RE-ASSEMBLY AND CONCLUSION.

THE ASSEMBLY MAY BE RE-ASSEMBLED FOLLOWING THE DISASSEMBLY STEPS IN REVERSE ORDER.

\* DURING RE-ASSEMBLY, AT STEP 4.0; IF A DRIFT PIN WAS ENCOUNTERED, THIS PIN WILL HAVE TO BE PRESSED INTO THE THREADED COLLAR, USING THE APPROPRIATE SPECIAL TOOL.

\*\*\*WARNING:

\*\*\*BE SURE TO PERFORM THE VARIABLE VOLUME CALIBRATION IN ISODAT AS THE FINAL STEP OF THE ASSEMBLY.



DRAWING [J]

