

**MOREHOUSE HYDRAULIC POWER CONTROL**

**OPERATION AND MAINTENANCE INSTRUCTIONS**

**FOR**

**MOREHOUSE HYDRAULIC POWER CONTROL**

**MOREHOUSE INSTRUMENT COMPANY**

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MOREHOUSE HYDRAULIC POWER CONTROL

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# MOREHOUSE HYDRAULIC POWER CONTROL

## GENERAL SPECIFICATIONS

1. Scope: This specification describes the Morehouse Hydraulic Power Control. This control is specifically designed to have a low rate of flow to control the hydraulic cylinders of Morehouse Universal Calibrating Machines. However, it additionally would have application wherever the loading of hydraulic cylinders must be precisely controlled, such as in non-destructive testing of structures.
2. Physical Characteristics:
  - 2.1 Design: The Hydraulic Power Control consists of a radial piston pump driven by an electric motor through a gear reduction unit, a hydraulic gauge, and a manually operated vernier screw pump. Because the pump is designed to operate at a relatively low speed, it is extremely quiet in operation. The steel cabinet which houses the Hydraulic Power Control is fitted with spring loaded chest handles to make the control easily portable.
  - 2.2 Maximum Working Pressure: 3,000 psi., intermittent to 5,000 psi.
  - 2.3 Rate of Flow: With motor driven pump - 32.78 cubic cm (2 cubic inch) per minute. With vernier screw pump - infinitely fine.
  - 2.4 Reservoir Volume: 9178.4 cubic cm (9.2 liters)  
(560 cubic inches (2.4 gallons))
  - 2.5 Hydraulic Connector: 1/4 inch N.P.T.
  - 2.6 Motor: 1/2 Horsepower, single phase
  - 2.7 Power Requirements: US 110 - 127 VAC, 60 cycle  
MOST NON-US & EUROPE 220 VAC, 50 cycle
  - 2.9 Length of Power Cord: 3657.6 mm (12 feet)
  - 2.8 Cabinet Size: 431.8 mm x 431.8 mm x 304.8 mm high  
(17 inches x 17 inches x 12 inches high)
  - 2.9 Weight: 54.5 kg (120 pounds)

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3. Operation: The electric motor driven pump is used to approach a specific pressure or force, and then the vernier screw pump is used to accurately approach and monitor the desired pressure or force. The hydraulic gauge can be calibrated to read in force units when used with a specific hydraulic cylinder.
4. Testing: Prior to shipping, the Hydraulic Power Control was tested by Morehouse at their plant in York, Pennsylvania. After testing the Hydraulic Power Control is prepared for shipping.

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## MOREHOUSE HYDRAULIC POWER CONTROL

### OPERATING INSTRUCTIONS

1. The Morehouse Hydraulic Power Control is ready to use as received. Simply remove the Hydraulic Power Control from the shipping box, check the level of the hydraulic fluid, remove the tagged screw to vent the reservoir, and connect the quick disconnect of the hydraulic hose to the hydraulic cylinder with which it is to be used. **The tagged screw on top of the control cabinet must be removed to vent the reservoir prior to operation of the control.**
2. To operate the Hydraulic Power Control the Hold/Release valve must be in the hold position for the control to pump hydraulic oil to the hydraulic cylinder. To release the load slowly turn the Hold/Release valve 1/4 turn counter-clockwise.
3. In operation, the Hydraulic Power Control is used to approach the desired pressure or force by actuating the spring loaded switch on the front of the control. The fine loading vernier screw pump is then used to accurately approach and maintain the desired pressure or force.
4. It is suggested that the vernier screw pump be kept at its mid-position of travel to allow small increments of pressure or force to be increased or decreased. Experience will dictate the best position for individual requirements.
5. The reservoir of the Hydraulic Power Control has been filled with petroleum base hydraulic fluid having an ISO Viscosity Grade of 22 or 32. For recommended hydraulic fluids please refer to the Maintenance Instructions in this manual. It is not necessary to drain the hydraulic fluid from the hydraulic cylinder with which the control is to be used unless a non-petroleum base fluid was used in the hydraulic cylinder. If a non-petroleum base fluid was being used, drain it from the cylinder and flush it with a petroleum base solvent before connecting the Hydraulic Power Control.
6. The worm gear drive has the proper oil in its housing. For lubrication and proper maintenance please refer to the Maintenance Instructions in this manual.

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### MAINTENANCE INSTRUCTIONS

1. The reservoir of the Hydraulic Power Control was filled with approximately 7.5 liters (2 gallons) of petroleum based hydraulic fluid (Paradene 22 AW petroleum base hydraulic fluid made by Drydene Oil Co. with corporate offices in Baltimore, Maryland U.S.A.) to a level of approximately 3/4 full prior to shipping. The reservoir of the control should be checked at least once every six months and maintained at this level. If hydraulic fluid must be added be sure to use petroleum base anti-wear hydraulic fluid with an ISO Viscosity Grade of 22 or 32. The following hydraulic fluids are recommended, but any equal hydraulic fluid may also be used:

Arco	Dutro AW 32
Conoco	Super Hydraulic 32
Drydene Oil Co.	Paradene 22 AW
Exxon	Nuto H 32
Gulf	Harmony 32 AW
Mobil	DTE 24
Texaco	Rando HD 32
Union	Unax AW 150

In choosing a hydraulic fluid be certain it is equal to one of the above listed recommendations. Many formulations may lack certain additives or are formulated for special reasons, such as lower cost, high detergency, leakage control, etc. Some of these specialty fluids can be used successfully, however, others may prompt malfunctions and high rates of wear.

2. The "Lubrication for Worm Gear Speed Reducer" table included with this manual indicates the type and viscosity of suitable lubricants and applicable AGMA numbers for speed reducers operating at various temperatures. It is important to use the proper type oil since many oils are not suitable for the lubrication of worm gears. Different types of gears require different lubricants.

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### 3. Recommended Oil-Change Interval:

3.1 Under normal environmental and operating conditions, such as when the control is used with a Morehouse Universal Calibrating Machine, oil changes are usually not required. However, the oil level of the speed reducer should be checked at least once every six months. If necessary, the oil level should be refilled to the proper level with a recommended gear oil.

3.2 If the control is used in harsh environments or in continuous operation it is suggested the oil be changed after the first 250 hours of operation, and thereafter at regular intervals of 2500 hours. Synthetic lubricants will allow extended lubrication intervals because of their increased resistance to thermal and oxidation degradation. If a synthetic lubricant is used, it should be changed after the first 1500 hours of operation, and thereafter at 5000-hour intervals.

3.3 The lubricant must remain free from oxidation and contamination by water or debris, since only a very thin film of oil stands between efficient operation and failure. If the lubricant should become contaminated, the speed reducer should be drained (preferably while warm) and refilled to the proper level with a recommended gear oil.

**CAUTION: Speed reducers must be relubricated more frequently when operated at high ambient or operating temperatures, in unusually contaminated environments or with high loads.**

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LUBRICANTS FOR WORM GEAR SPEED REDUCER

Ambient (Room) Temperature	Recommended Lubricant (or equivalent)	Viscosity Range SUS at 100° F	Lubricant AGMA No. (1)	ISO Viscosity Grade	Boston Gear Catalog No. of Standard Lubricant Container Sizes	
					1-quart	1-gallon
-30° to +125° F (2)	Mobil SHC 634 (3) Synthetic	1950/2150	-----	320/460	51493	51494
+40° to +90° F	Mobil 600W Cylinder Oil	1920/3200	7 or 7C	460	27300	51492
+80° to +125° F	Mobil Extra Hecla Super Cylinder Oil	2850/3600	8 or 8C	680	-----	-----

- (1) Other lubricants corresponding to AGMA numbers are available from most major oil companies.
- (2) Mobil SHC 634 lubricant will perform at oil temperatures exceeding 225° F. However, factory should always be consulted before operating at higher temperatures, since damage may occur to oil seals and other components.
- (3) Synthetic recommendation is exclusively for Mobil SHC 634.

MOREHOUSE HYDRAULIC POWER CONTROL

**PARTS LIST**

ITEM	PART NO.	NOMENCLATURE	QUANTITY
1	398001	CONTROL CABINET.....	1
2	398002	MOUNTING PLATE.....	1
3	398003	VERNIER HANDLE ASSEMBLY.....	1
4	398004	VERNIER CAP.....	1
5	398005	VERNIER CYLINDER.....	1
6	398006	VERNIER PISTON.....	1
7	398007	MANIFOLD/PUMP BRACKET.....	1
8	398008	MOUNTING ANGLE.....	2
9	398009	FITTING PLUGS.....	2
11	398011	TUBING #1.....	1
12	398012	TUBING #2.....	1
13	398013	TUBING #3.....	1
14	398014	TUBING #4.....	1
15	398015	COVER PLATE GASKET.....	1
20	N/A	HOSE.....	1
22	N/A	T-RING PACKING.....	1
23	N/A	DOUBLE HANDLE LEVER.....	1
24	N/A	SINGLE HANDLE LEVER.....	1
25	N/A	THRUST BEARING.....	1
26	N/A	PRESSURE GAUGE.....	1
27	N/A	TOGGLE SWITCH.....	1
28	N/A	NEEDLE VALVE.....	1
29	N/A	CHECK VALVE.....	1
30	N/A	MALE 45° ELBOW.....	2
31	N/A	MALE CONNECTOR.....	1
32	N/A	MALE ELBOW.....	3
33	N/A	FEMALE ELBOW.....	1
35	N/A	MALE RUN TEE.....	1

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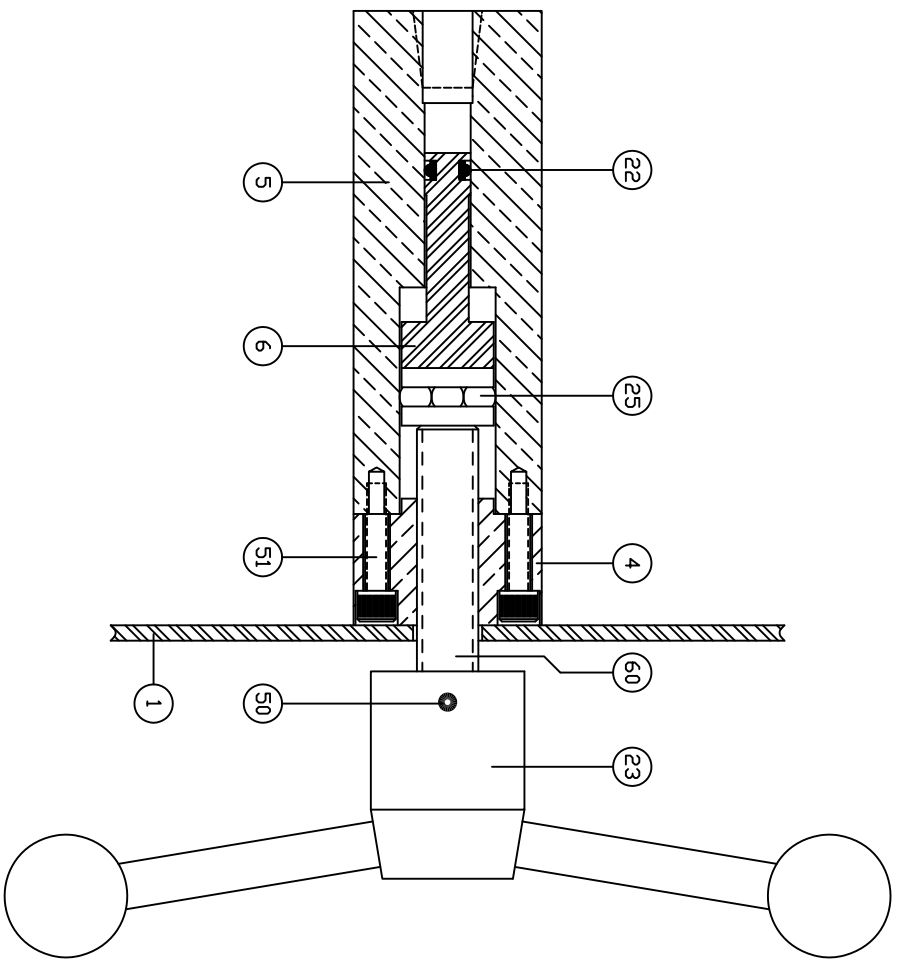
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**PARTS LIST**

ITEM	PART NO.	NOMENCLATURE	QUANTITY
36	N/A	FILTER.....	1
37	N/A	PUMP.....	1
38	N/A	RATIOMOTOR.....	1
39	N/A	COUPLING.....	1
40	N/A	COUPLING.....	1
41	N/A	COUPLING INSERT.....	1
42	N/A	POWER CABLE.....	1
43	N/A	CHEST HANDLES.....	2
44	N/A	MALE ELBOW.....	2
45	N/A	MALE CONNECTOR.....	1
46	N/A	MALE CONNECTOR.....	1
47	N/A	TUBING (NYLON).....	2

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3-000866  
A  
NUMBER



MATERIAL:

D	
C	
B	
A	

REQD. PER UNIT  
HEAT TREATMENT

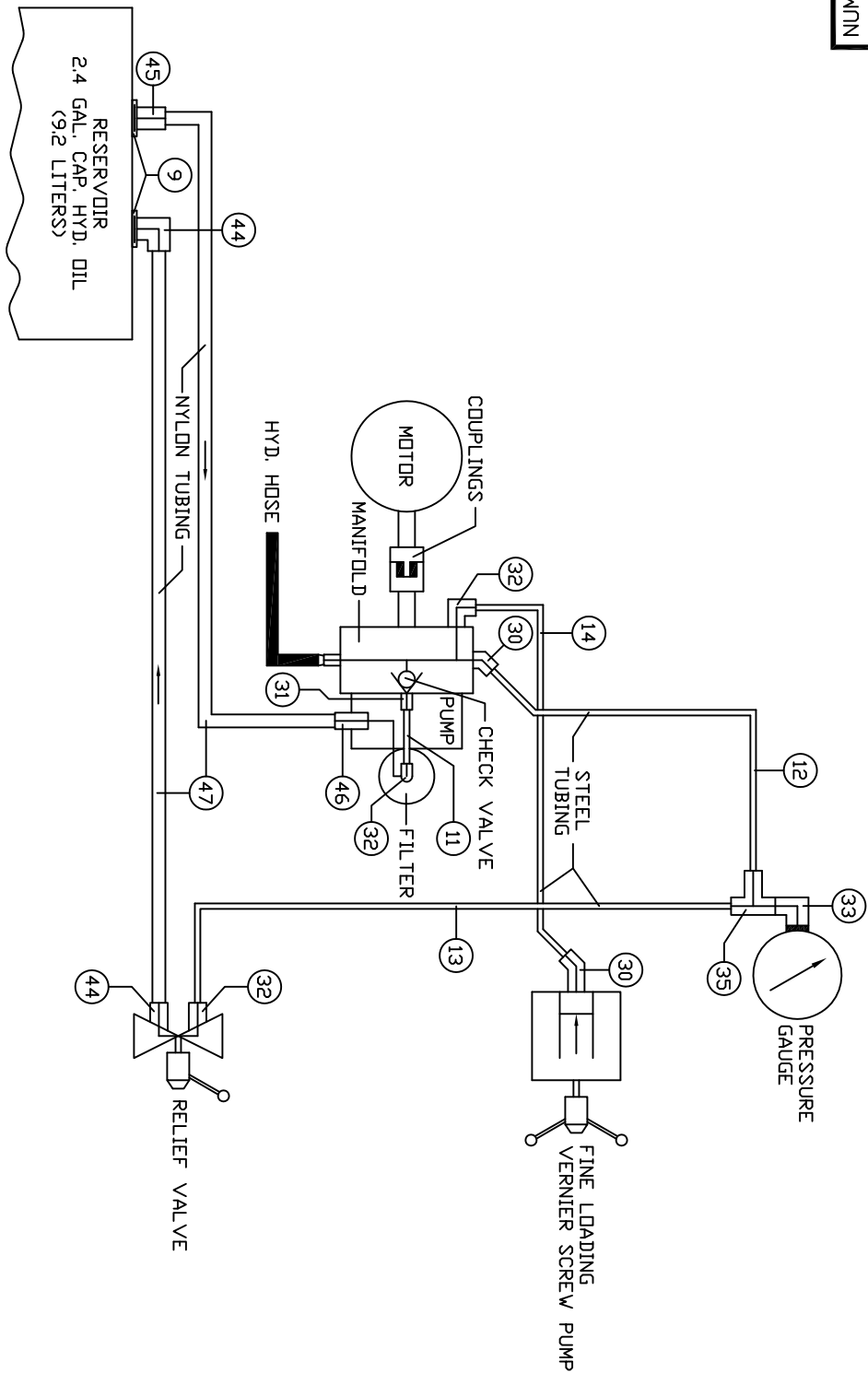
DESCRIPTION OF CHANGE  
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES  
REMOVE ALL BURRS  
ANGLES  $\pm 1/2^\circ$   
TOLERANCES DN: ANGLES  $\pm 1/2^\circ$   
DECIMALS  $\pm .005$   
FRACTIONS  $\pm 1/64$

DATE BY  
LAYOUT ASSEMBLY

TITLE  
FINE LOADING  
VERNIER SCREW PUMP  
HYDRAULIC POWER CONTROL

DRAWN BY BKA  
CHECKED BY  
SCALE N.T.S.  
DATE 9-29-97  
REF. DWG. SIZE A  
DRAWING NO. 398000-3  
SHEET OF

MOREHOUSE INSTRUMENT CO.  
YORK, PA.



MATERIAL:

MOREHOUSE INSTRUMENT CO.  
YORK, PA.

REQD. PER UNIT

D	
C	
B	
A	

DESCRIPTION OF CHANGE

DATE BY LAYOUT ASSEMBLY

HEAT TREATMENT

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES  
REMOVE ALL BURRS  
ANGLES  $\pm 1/2^\circ$   
TOLERANCES DN: DECIMALS  $\pm .005$  FRACTIONS  $\pm 1/64$

DRAWN BY BKA

REF. HYDRAULIC POWER CONTROL

TOLERANCES DN:

DECIMALS  $\pm .005$  FRACTIONS  $\pm 1/64$

CHECKED BY N.T.S.

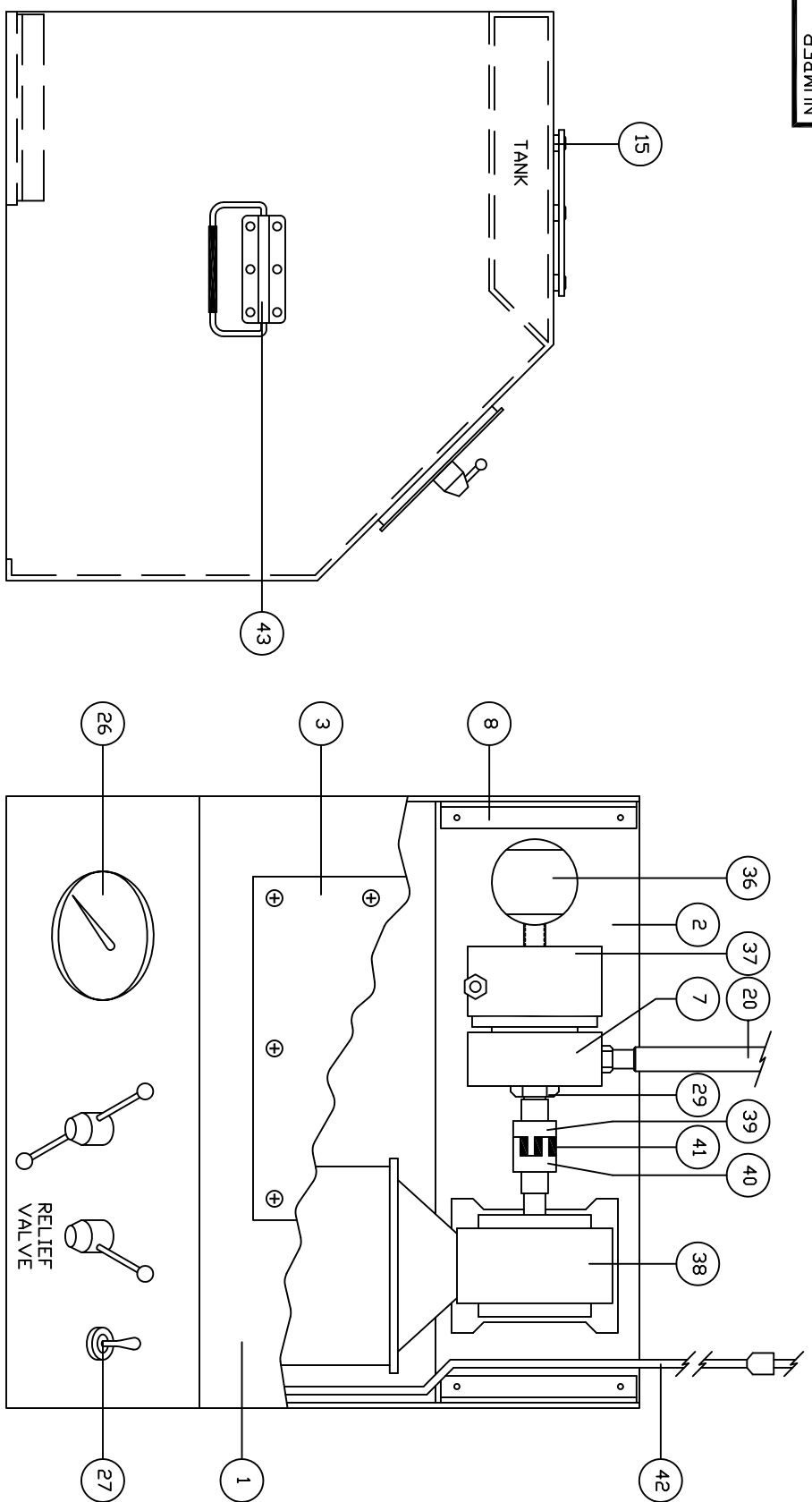
DWG. SIZE A DRAWING NO. 398000-02

DATE

10-10-97

DATE

SHEET OF



MATERIAL:

D	
C	
B	
A	

REQD. PER UNIT

HEAT TREATMENT

MOREHOUSE INSTRUMENT CO.  
 YORK, PA.

TITLE HYDRAULIC POWER CONTROL

DESCRIPTION OF CHANGE

LAYOUT

REF. DWG. SIZE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES  
 REMOVE ALL BURRS  
 ANGLES  $\pm 1/2^\circ$   
 TOLERANCES DN: DECIMALS  $\pm .005$  FRACTIONS  $\pm 1/64$

DATE BY ASSEMBLY

DRAWN BY BKA

DRAWING NO. 398000-01

DATE BY CHECKED BY

SCALE N.T.S.

SHEET OF