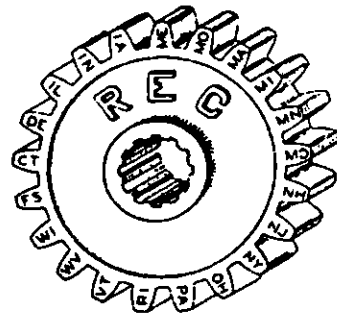
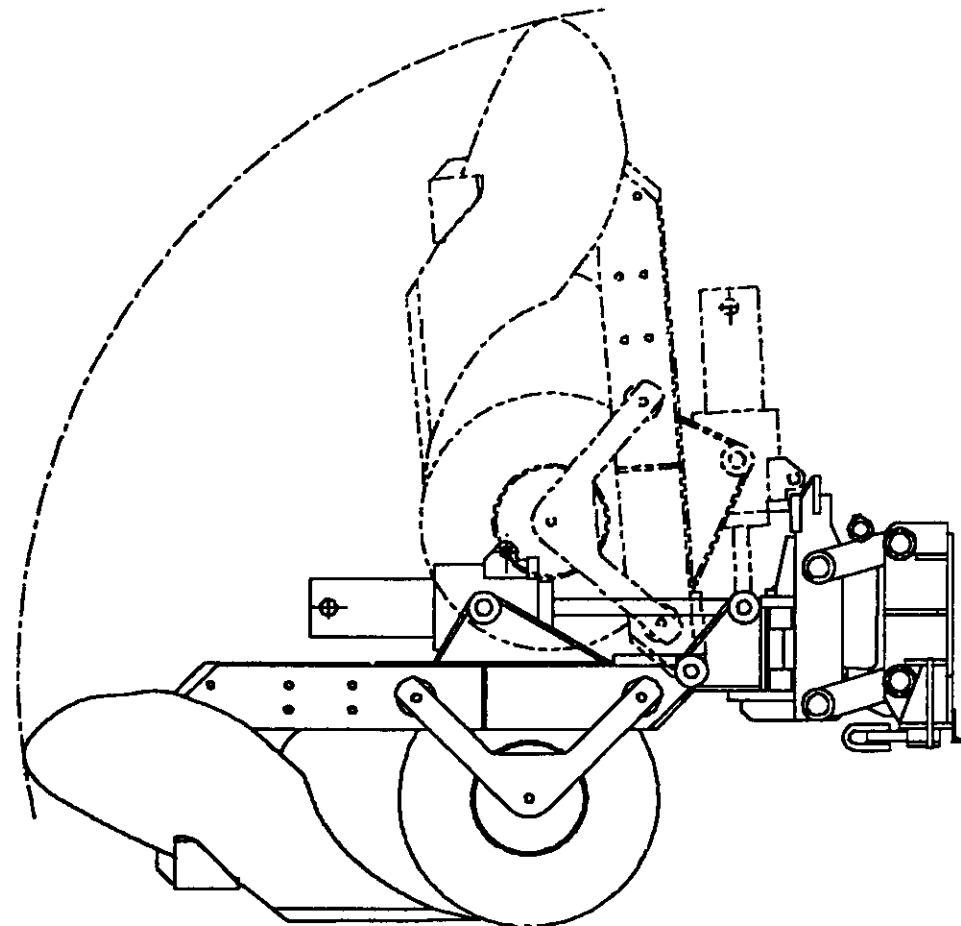


Project Number 29  
April 1991



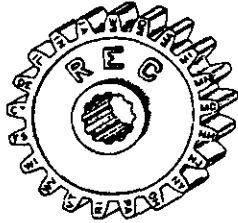
# Michigan Fireline Plow Design



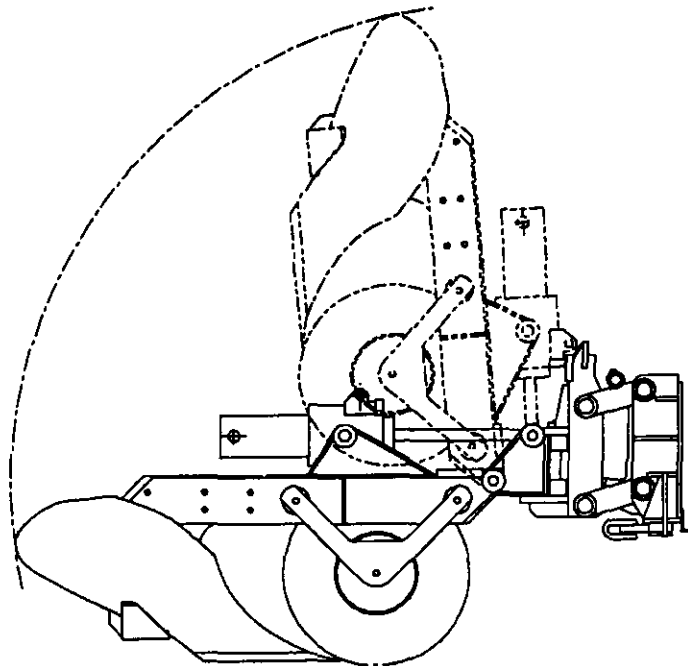
Roscommon Equipment Center  
Northeast Forest Fire Supervisors  
*In Cooperation with*  
Michigan's Forest Fire Experiment Station



Project Number 29  
April 1991



# Michigan Fireline Plow Design



*Roscommon Equipment Center*

Northeast Forest Fire Supervisors  
In Cooperation with  
Michigan's Forest Fire Experiment Station



**Inquires, comments and suggestions regarding this project may be directed to:**

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Fire Protection  
U.S. Forest Service, NA  
5 Radnor Corporate Center, Suite 200  
100 Matsonford Road  
Radnor, PA 19087

Roscommon Equipment Center  
c/o Forest Fire Experiment Station  
P.O. Box 68  
Roscommon, MI 48653

### **Disclaimer**

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The use of trade, firm or corporation names is for the information and convenience of the user. Such use does not constitute an official evaluation, conclusion, recommendation, endorsement or approval of any product or service to the exclusion of others which may be suitable.

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## Introduction

In the mid 1950's the Michigan Forest Fire Experiment Station developed the first hydraulically operated fireline plow. Its use and successful history was documented in several sources, including REC Project #18. The original design called for many of the larger components to be cast. Later, as the cost of casting rose dramatically and the small production foundries began to disappear, the cast parts were redesigned as weldments. Additionally the plow bottom, whose mouldboards and shares first were commercial agricultural purchase parts, became obsolete. The solution, again, was to make the assembly a weldment, using abrasion resisting steel in the areas of greatest wear. This welded plow bottom has proved to be easier to maintain and stronger than its forerunner.

The long history of the Michigan fireline plow included many small design changes that resulted in minimizing the number of maintenance and repair problems. Project #29 documents the design of this equipment, including the details necessary to produce it, as well as a discussion of its fabrication and use. The text that follows discusses plow nomenclature and notes for fabrication. It also highlights important dimensional considerations for those who wish to modify the design for their own needs. The assembly drawings 20-9800D and 21-9800D help define the terminology used for the various plow parts. Numbers refer to the drawing number of the part.

## System Design And Fabrication

### Plow Hitch Mounting:

The hitch mounting bracket attaches the plow's hitch to the crawler-tractor. In Project #29, the design of a hitch mounting bracket (21-9800D) for the John Deere 400-G tractor is shown. Each tractor model of each manufacturer will have its own implement attachment hole pattern on the rear housing. Hence, the plow hitch mounting bracket shown in this project is just a sample and each tractor will need its own specific design. Several dimensional relationships are important to hold for the hitch mounting bracket. These include the distances between the link pin bosses and the height of the link pin locations. The depth adjuster discussion will further elaborate on this. Also, the distance from the rear of the tractor to the link pin bosses is important. If it is mounted too close, the plow in its upright stored position may not clear the rear of the tractor or its cab. Con-

versely, the farther back from the tractor that the pin is located, the greater the rearward shift of the center of gravity of the tractor-plow system. This may affect the rear stability of the tractor when it is not plowing. It is best to locate the plow so that it mounts as close to the rear of the tractor as possible. Also note that some modification to existing drawbars and cover plates may be necessary to mount the hitch.

### Parallel Hitch Linkage:

The four links attach the depth adjuster to the hitch mounting bracket with 2-inch diameter pins. This forms the parallel linkage that allows the plow to maintain an optimum attack angle with the soil, despite changes in the angle of the terrain. The depth adjuster shown is designed for the JD-400G and JD-350 series tractors. The

top plane of the lower pivot plate of the depth adjuster (0-711 det. DA-9) should be about  $15\text{-}\frac{9}{16}$  inches above the ground when the parallel linkage is  $\frac{1}{3}$  of the way up its vertical travel. Drawing (21-9800D) shows the dimensions of this relationship as designed for the John Deere 400G tractor. Adjustment of the depth adjuster design or the hitch mounting bracket can be made for other tractors in order to maintain this height.

### **Pivot (20-0004D):**

The plow pivot allows the plow to swing from side to side. It is pinned to the depth adjuster and the plow beam is pinned to the pivot. In order for the hydraulic cylinder of the plow beam to operate properly, the dimensions shown on Drawing 20-0004D of the pivot are important to hold.

### **Plow Beam (20-0012D):**

Likewise, the geometry of the plow beam is important: in particular, the  $6\text{''} \times 19\frac{1}{2}\text{''}$  rectangular dimension between the plow attachment hole and the trunion mounting holes, as shown on Drawing 00-0458D. This distance is critical in the performance of the plow, both when plowing and in the latch-up position.

The plow beam channels can be rough cut, tack welded together and then machined as one piece. After, the tack welds are cut apart and the bosses that make up the rest of the lower beam assembly welded, with the beam channels  $1\text{-}\frac{9}{16}$  inch apart. The upper beam assembly is welded together with the trunion bosses aligned and spaced 9 inches apart. Upper and lower beam weldments are welded to form a complete beam.

### **Plow Bottom Weldment (20-0007D):**

The plow bottom fabrication is made difficult because of the curved structures that are involved. A  $5\text{'} \times 9\text{'} \times \frac{3}{8}\text{'}$  steel plate is rolled with the  $17\text{-}\frac{3}{4}\text{'}$  inside diameter (your local steel supplier can do this). Using the flat mouldboard layouts of Drawings 00-0240D and 00-0241D draw a full size layout to mark the cutting lines for flame cutting the mouldboards out of the rolled steel. For larger productions, a steel template made of  $\frac{1}{4}\text{'}$  stock, rolled at a  $17\text{-}\frac{3}{4}\text{'}$  inside diameter, can be used as a burn-out template. Undersize the burn-out template to account for the torch tip clearance. Cut left and right halves, **making sure that the bottom edge of the mouldboard is parallel to the rolling axis of the steel.** A fixture is essential for assembling the plow bottom. It is important to fix the mouldboards at a 45 degree angle from the plow standard. The plow shares (00-0418B & 00-0419B) and the turf cutting knives (20-0008B & 20-0009B) are made from medium hard, abrasion resisting steel (200/250 Brinnell hardness). This material normally comes in plate, but can be sheared to needed widths. The bevel edges can best be produced by flame cutting at an angle.

### **Hydraulic Cylinders:**

Drawings 22-0006 & 22-0018 show the minimum requirements for the plow and hitch hydraulic cylinder. Commercial cylinders may be available that can be adapted to the plow design. Inside the plow's trunion is a large spring that is compressed when the hydraulic cylinder is fully extended. The spring, in part, provides for force to keep the plow in the ground. Specifications for the spring are shown on Drawing 20-0011B. This can be made by a spring manufacturer.

### **Rolling Coulter Assembly (20-0019D):**

The coulter cuts the sod mat and other debris prior to the mouldboard's turning the furrow. The depth control flange attached to the coulter rides on top of the ground. When the plow's hitch cylinder is in the float position, a rise in the ground will force the coulter flange up which, in turn, forces the depth adjuster up at the parallel linkage of the hitch. This keeps the plow beam parallel to the surface of the ground and provides the optimum attack angle of the plow bottom. When a depression in the ground is encountered, the coulter flange again follows the ground and the parallel linkage drops to again keep the plow beam parallel. If the hitch is "locked" into position by removing it from the float, the spring provides some adjustment for the terrain differences.

### **Tractor Hydraulic System:**

The hydraulic system of the tractor needs to be adapted for a 2-spool hydraulic valve to operate the plow. The spool that actuates the plow beam cylinder must be 4-way and the spool that actuates the plow hitch cylinder

must be 4-way with float detent position. It should be an open center valve with relief set at about 1100 psi. Disconnect points should be located at the rear of the tractor so that the plow can be easily removed during seasons that it is not in use. Drawing 27-9803B shows a schematic of the hydraulics.

Contact your tractor dealer for advice on ordering or adapting hydraulic systems to operate the plow.

### **Organization of Drawings**

The following pages contain drawings for production of the plow. The drawings do not have page numbers. A list of the drawing order follows. The first drawing is 27-9803B; the schematics for hydraulics. The next is a flow chart of all drawings, 17-0003D. This chart groups the major assemblies in the plow construction. The drawings are generally ordered by these groups with the highest print in the hierarchy first followed by the drawings that complete that assembly.

## Final Assembly Drawing List

Drawing No	Description	Drawing No	Description
27-9803 B	Hydraulic Schematic: Fireline Plow	20-0003 B	Vertical Pin: 1-1/2"
17-0003 D	Drawing Flow Chart	00-0088 B	Pin Shank: 1-1/2" Dia.
10-0000 D	52 Plow / Hitch Assy.	00-0089 B	Pin Head: 2" Dia.
20-0001 B	Retainer, Pin		

## Plow Hitch Assembly Drawing List

Drawing No	Description	Drawing No	Description
21-9800 D	Hitch Assy: JD-400	00-0207 A	Gusset
21-0017 B	Drawbar Mod: JD-400G Tractor	00-0399 C	Hitch Side L.H. S/W
21-0009 B	Spacer: JD-400G Hitch	00-0400 C	Hitch Side R.H. S/W
21-0011 B	Pin, Cylinder Anchor End	00-0215 B	Bar, Hitch Side
21-0010 B	Pin, Hitch Link	00-0216 A	Boss: 3" O.D. X 9/16" Wall
21-0012 B	Pin, Cylinder Rod End	00-0208 B	Hitch Mounting Bar: Bottom
21-0016 C	Fuel Tank Gd. Modification: JD-400G	00-0209 A	Bar, Flat, 1/2" x 3" H.R.
33-0002 B	Shackle, Straight Forged - 3/4" Pin	00-0210 A	Bar, Flat, 1/2" x 4" H.R.
21-0006 D	Hitch Mounting Bracket W/C JD-400G	00-0211 B	Gusset
00-0205 B	Hitch Mounting Bar: Top	00-0212 A	Gusset
00-0228 C	Hyd. Cylinder Anchor S/W	00-0213 B	Flange
00-0401 B	Boss: 3" O.D. x 1.937" I.D.	00-0214 A	Bar, Flat, 1/2" x 4.1/2" HR
00-0402 B	Boss: 3" O.D. x 1.937" I.D.	00-0398 B	Angle, 3" x 2" x 1/4" H.R.
00-0403 B	Anchor Center Plate	22-0018 D	3" Tractor Hitch Cyl. Ass'y.
00-0206 A	Gusset	O-431	Hitch Links
00-0395 B	Drawbar Retainer Bracket S/W	O-711	JD-350 Depth Adjuster Assembly
00-0396 A	Bar, Flat, 1/2" x 3" H.R.	O-713	Depth Adjuster Details
00-0397 A	Bar, Flat, 1/2" x 3" H.R.	O-714	Depth Adjuster Side Plate



## Plow Assembly Drawing List

Drawing No	Description	Drawing No	Description
20-9800 D	52" Plow Assy	00-0368 A	Bar. Flat. 3/8" X 1" H.R.
20-0013 B	Spacer. Spring	00-0369 B	Trunion Support. Web
20-0017 B	Spring. Helical. Compression	00-0370 A	Gusset
20-0011 B	Trunion Spring Retainer Cap	00-0371 B	Trunion Support Mtg. Plate
20-0015 B	Pin. Rear Cylinder Trunion Sleeve	00-0381 B	Gusset
27-0042 B	Elbow, 90 deg ST w/Fem. Swivel: Steel Hyd Plated	00-0443 D	Trunion: 52" Plow, S/W
27-0040 B	Hose Assembly. Hydraulic	00-0427 A	Ear. Latch Retainer
27-0004 B	Hyd. Hose Clamp: SAE Type 100RT No. 6	00-0428 B	Ear. L.H.: Plow Latch
27-0041 B	Hose Assembly. Hydraulic	00-0429 B	Ear. R.H.: Plow Latch
20-0002 B	Horizontal Pin: 1-1/4"	00-0431 A	Bumper: Trunion Housing
20-0010 A	Pin. Latch	00-0441 B	Cap: Trunion
33-0014 B	Pin. 3/8" Dia. Quick Release	00-0442 C	Housing. Trunion
20-9801 C	Latch Adjustment	00-0440 B	Pin: Trunion
20-0007 D	Bottom: 52" Fireline Plow	20-0004 D	Pivot W/C
00-0406 D	Bottom: 52" Fireline Plow S/W	00-0357 C	Pivot Side. L.H.. S/W
00-0080 C	Standard: 52" Fireline Plow	00-0358 C	Pivot Side. R.H.. S/W
00-0005 C	Plate: Standard. 52" Fireline Plow	00-0127 B	Pivot Side
00-0240 D	Mouldboard. L.H.: 52" Plow	00-0346 B	Boss. 3" O.D. X 1.1/4" I.D.
00-0241 D	Mouldboard. R.H.: 52" Plow	00-0347 B	Boss. 3" O.D. X 1.1/4" I.D.
00-0081 B	Mouldboard. Blank: 3/8" Rolled Plate	00-0350 A	Bar. Flat. 3/8" X 1.1/4" H.R.
00-0407 B	Bottom: Plate	00-0351 A	Bar. Flat. 3/8" X 1.1/4" H.R.
00-0006 B	Bracker: Turf Knife Mounting	00-0126 B	Pivot Bottom
00-0415 B	Brace. Mouldboard: 52" Plow	00-0342 B	Hose Guide
00-0086 A	Gusset	00-0344 B	Upper Vertical Pin Mount
00-0084 B	Flange: Mouldboard Brace	00-0345 B	Lower Vertical Pin Mount
00-0418 B	Share. L.H.: 52" Fireline Plow	00-0349 B	Bar. Flat. 1/2" X 7" H.R.
00-0419 B	Share. R.H.: 52" Fireline Plow	00-0352 B	Bar. Flat. 3/8" X 3.1/2" H.R.
00-0408 B	Angle: Turf Knife Mounting	20-0000 C	Latch. Plow: W/C
20-0009 B	Knife. Turf: R.H.	00-0421 B	Handle: Plow Latch
00-0417 C	Knife. Turf: R.H. Blank	00-0422 B	Bar. Hinge: Plow Latch
20-0008 B	Knife. Turf: L.H.	00-0423 B	Claw: Plow Latch
00-0416 C	Knife. Turf: L.H. Blank	00-0424 A	Lug. Stop: Plow Latch
20-0014 C	Sleeve. 4-1/2" Hyd. Cyl. Adapter W/C	20-0019 D	Coulter Assembly: 52" Plow
00-0452 B	Sleeve: Tube	20-0028 C	Blade. Coulter: 52" Plow
00-0453 B	Sleeve: Flange	20-0024 A	Bearing Race Retainer
20-0016 C	Guard. Rear. 4-1/2" Hyd. Cyl. W/C	20-0025 B	Shaft. Coulter: 52" Plow
00-0456 B	Cap. End: Hyd. Cylinder Guard	33-0015 B	Washer. Hardened Steel. Finished
00-0457 C	Shroud. Side: Hyd. Cylinder Guard	20-0026 B	Bearing Block. Coulter: 52" Plow
20-0012 D	Beam. Trunion: 52" Plow. W/C	20-0018 A	Seal: Felt. 3/8" Square
00-0458 D	Beam: 52" Plow. S/W	33-0016 B	Felt. 3/8" Square
00-0372 D	Beam. 52" Fireline Plow S/W	20-0020 C	Coulter Arm W/C: 52" Plow
00-0373 B	Boss. 3.1/2" O.D. X 25/32" I.D.	00-0483 B	Coulter Arm
00-0374 B	Beam. Front End Cap	00-0484 A	Bar. Flat
00-0384 C	Channel. Beam 52" Plow L.H.	20-0023 C	Coulter Hub W/C: 52" Plow
00-0385 C	Channel. Beam 52" Plow R.H.	00-0487 B	Flange. Coulter Hub
00-0394 B	Boss/Bushing Assembly	00-0488 C	Housing. Coulter Hub
00-0377 A	Boss: 3" O.D. X 1.1/2" I.D.	20-0027 B	Bearing Race Modification
20-0006 A	Bushing: 1-1/2" O.D. x 1-1/4" I.D.	20-0005 B	Coulter Bearing & Race: 40"x52" Plow
00-0364 A	Bar. Flat. 3/8" x 1.1/4" H.R.	20-0021 C	Coulter Depth Control Flange W/C L.H.
00-0365 A	Bar. Flat. 1" X 3.1/2" H.R.	20-0022 C	Coulter Depth Control Flange W/C R.H.
00-0366 A	Bar. Flat. 3/8" X 1.1/4" H.R.	00-0485 B	Mounting Ring
00-0367 A	Boss. 3" O.D. X 1.1/2" I.D.	00-0486 A	Pipe. 10". Sch. 40. Black
		22-0006 D	4-1/2 Hyd. Cyl. Assembly

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## **Final Assembly Drawings**

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FROM POWER BEYOND  
PORT ON BLADE  
CONTROL VALVE

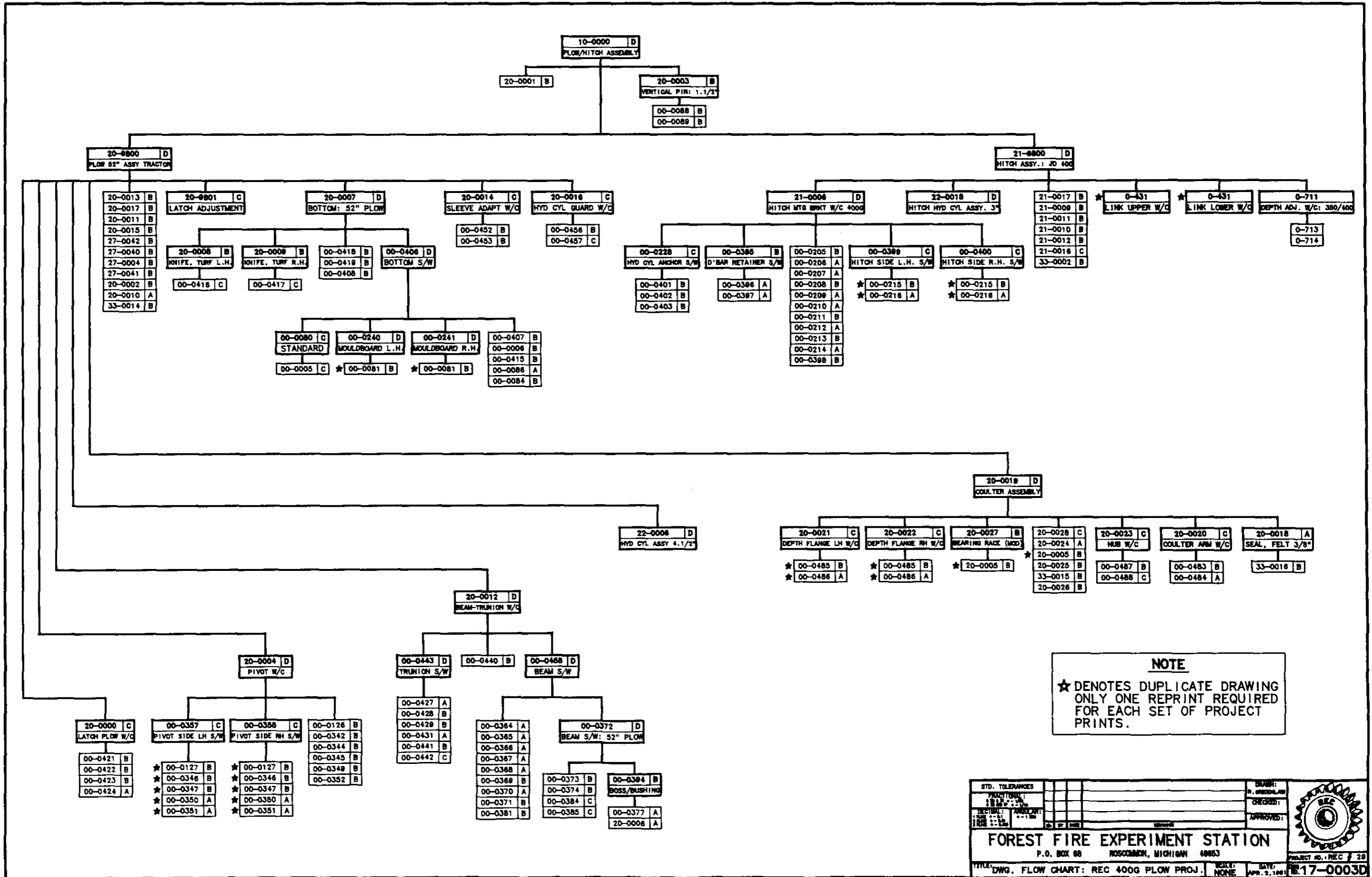
TO RESERVOIR  
VIA FILTER

PLOW  
VALVE  
W/ 1100 P.S.I.  
RELIEF

PLOW CYL.  
4.1/2" BORE

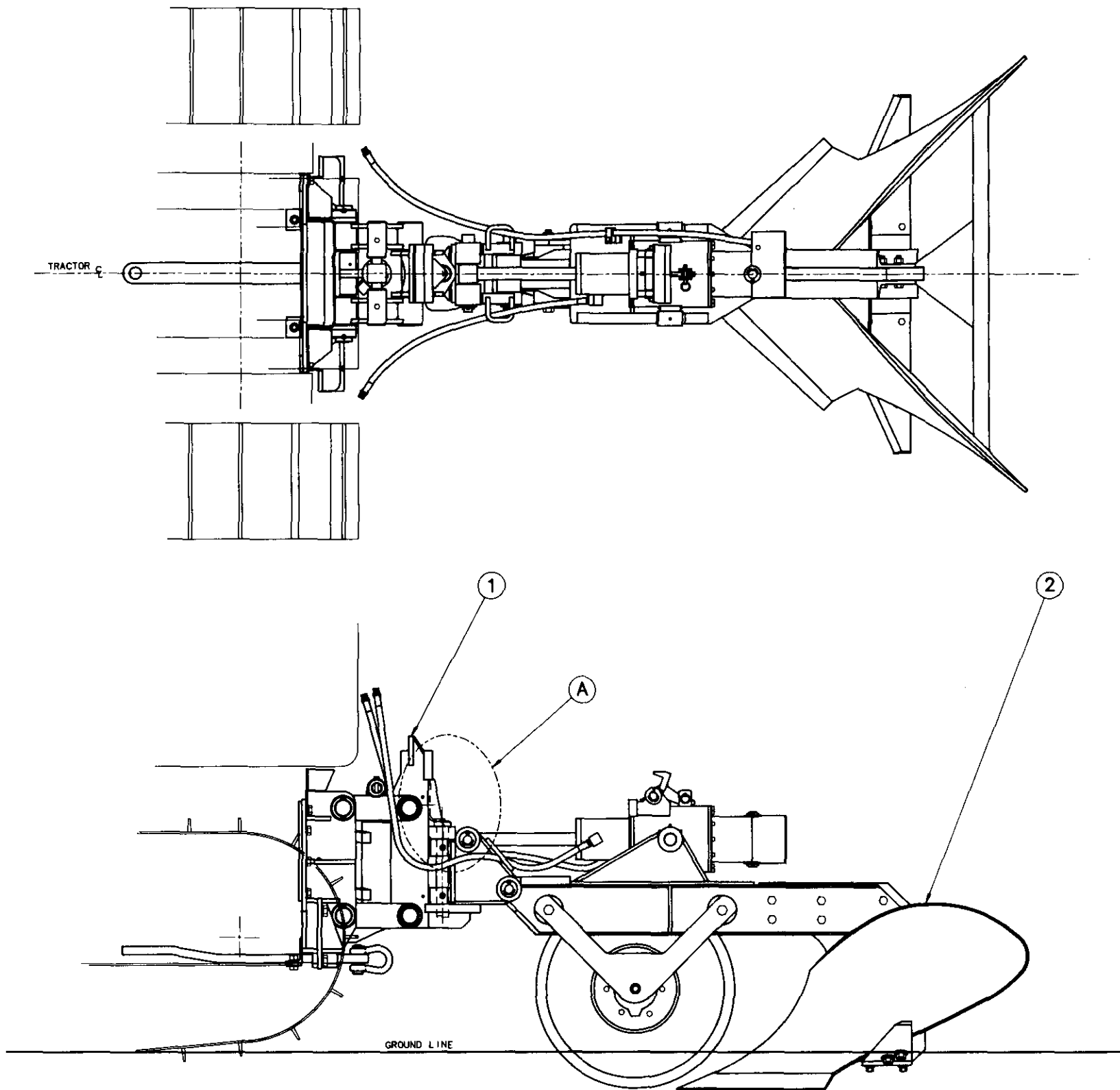
HITCH CYL.  
3" BORE

<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 0 TO 6 IN +- 1/32 6 IN AND UP +- 1/16 <b>DECIMAL:</b> 1 PLACE +- 0.1 2 PLACE +- 0.01 3 PLACE +- 0.005 <b>ANGULAR:</b> +- 1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b>  <b>FOREST MANAGEMENT DIVISION</b>	
NO.	BY	DATE		REVISION
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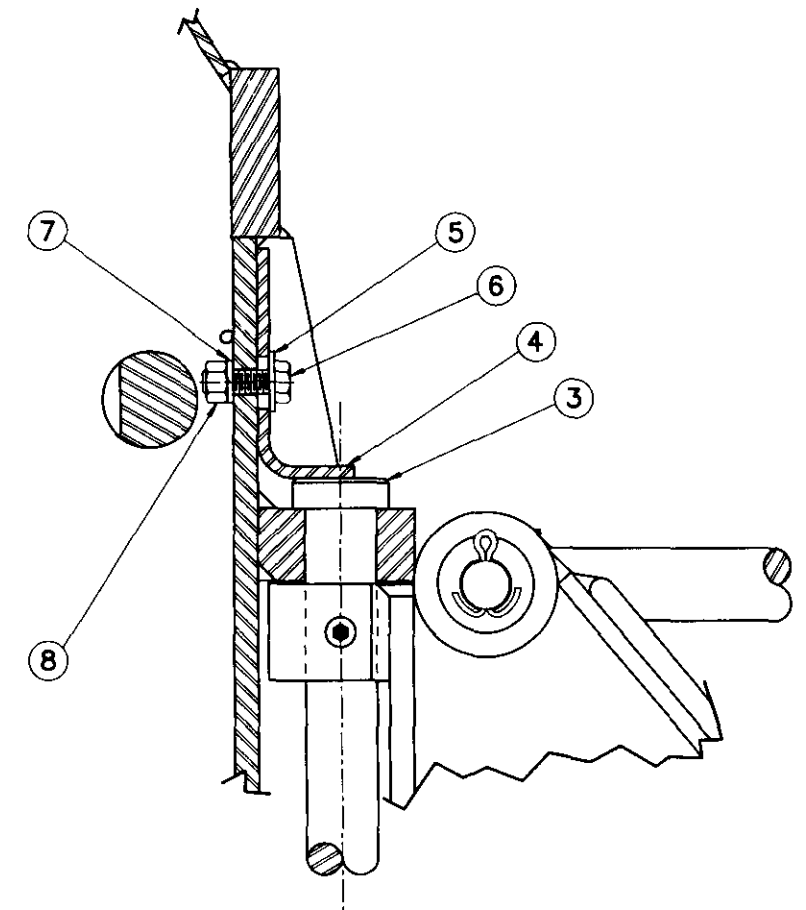


**NOTE**  
 ★ DENOTES DUPLICATE DRAWING  
 ONLY ONE REPRINT REQUIRED  
 FOR EACH SET OF PROJECT  
 PRINTS.

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FRACTIONS:		R. CHECKED:	
DECIMALS:		CHECKED:	
WELDS:		APPROVED:	
<b>FOREST FIRE EXPERIMENT STATION</b>			
P.O. BOX 68 ROSCOMB, MICHIGAN 48853			
TITLE: DWG. FLOW CHART: REC 400G PLOW PROJ.	SCALE: NONE	DATE: APR. 2, 1961	PROJECT NO. REC 400G 17-0003D



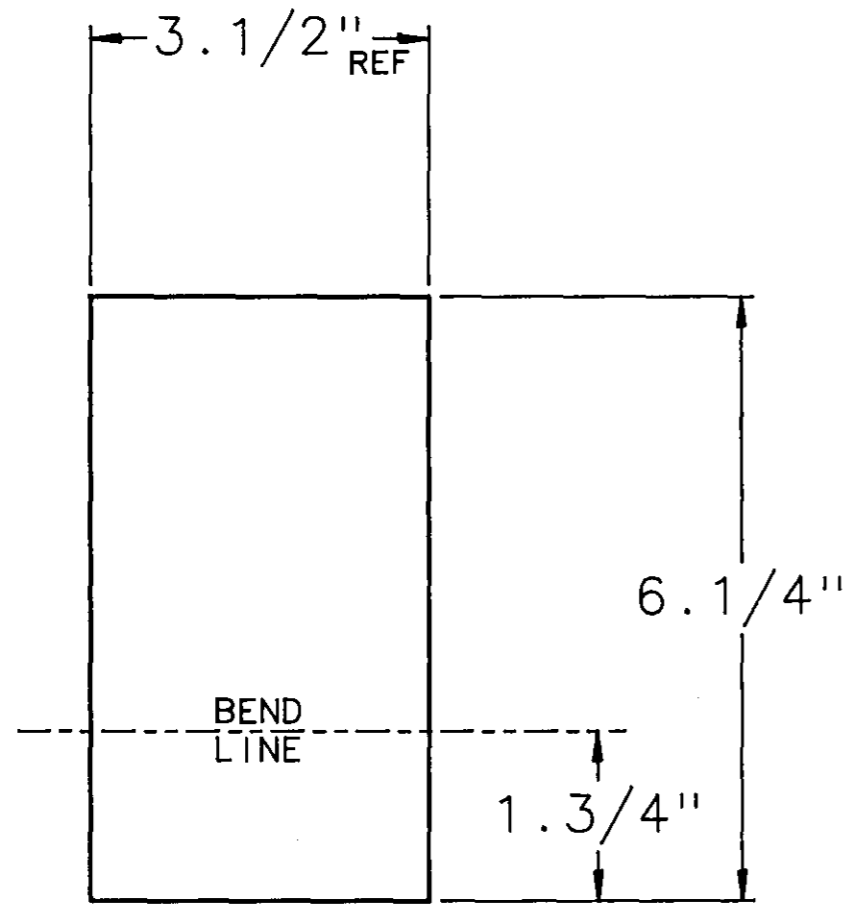
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1	21-9800	D	HITCH O.A. ASSEMBLY: J.D. 400G TRACTOR	1	378
2	20-9800	D	PLOW, 52" ASSEMBLY, TRACTOR MOUNTED	1	933
3	20-0003	B	VERTICAL PIN: 1.1/2"	1	6.13
4	20-0001	B	RETAINER, PIN	1	1.40
5	WS08-BA		WASHER, FLAT U.S.S.: 1/2" PLATED	1	0.02
6	TS-08GG12		SCREW, CAP, HEX. HD.: 1/2" - 13UN 1/2" - 13UN LNG. GR. 5, PLATED	1	0.11
7	WS08-BC		WASHER, SPRING LOCK, REG.: 1/2" PLATED	1	0.01
8	TS-08GP		NUT, HEX., DOUBLE CHAM.: 1/2" - 13UN PLATED	1	0.05



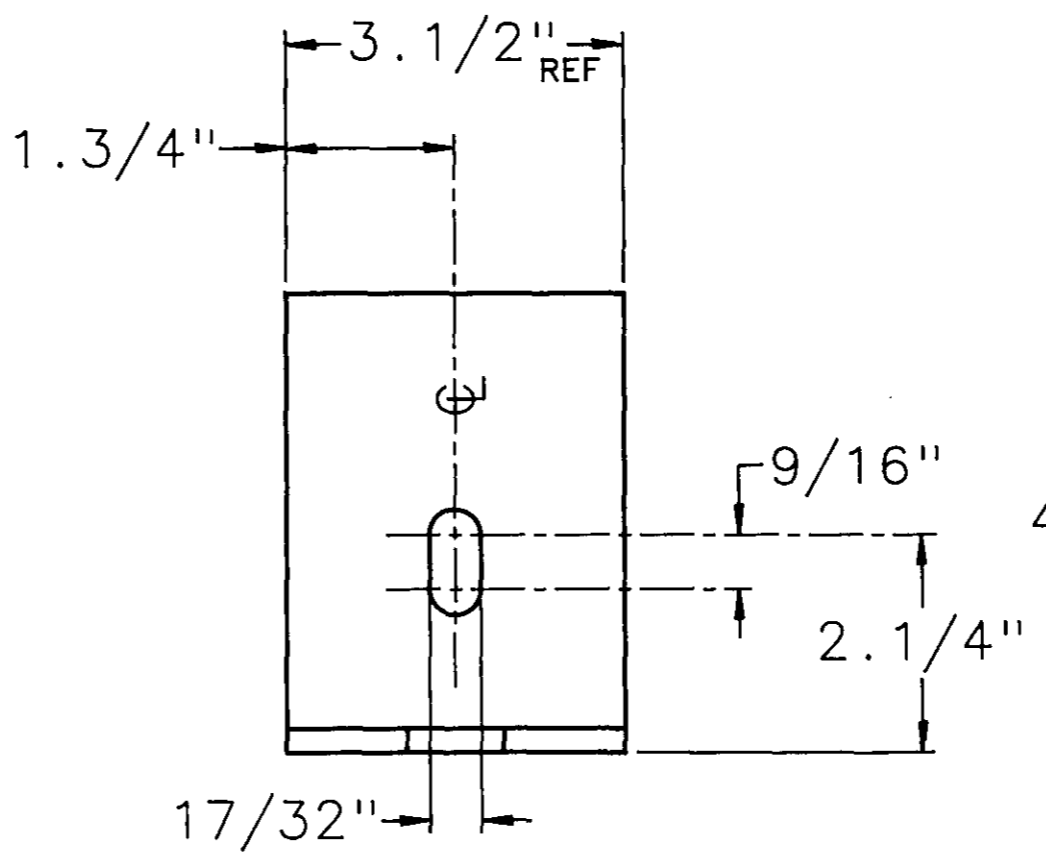
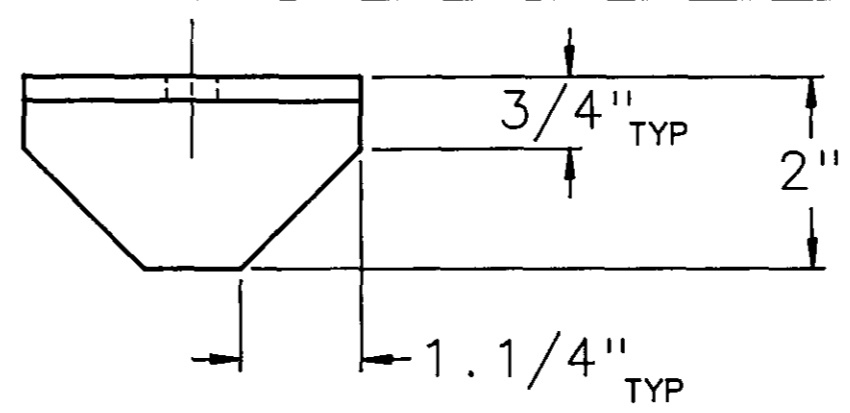
VIEW A  
SCALE: 1 = 2

PART NUMBER: 10-0000  
EST. WT.: 1319 LBS.

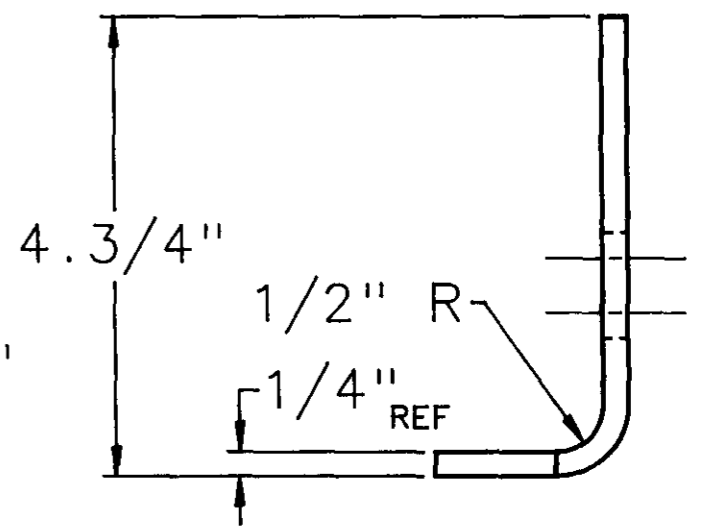
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<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		DATE: MAR. 06, 1991 DWG NO.: 10-0000
TITLE: PLOW/HITCH O.A. ASSEMBLY: J.D. 400G TRACTOR SCALE: 1 = 8		PROJECT NO.: 84-19 DWG NO.: 10-0000



FLAT LAYOUT



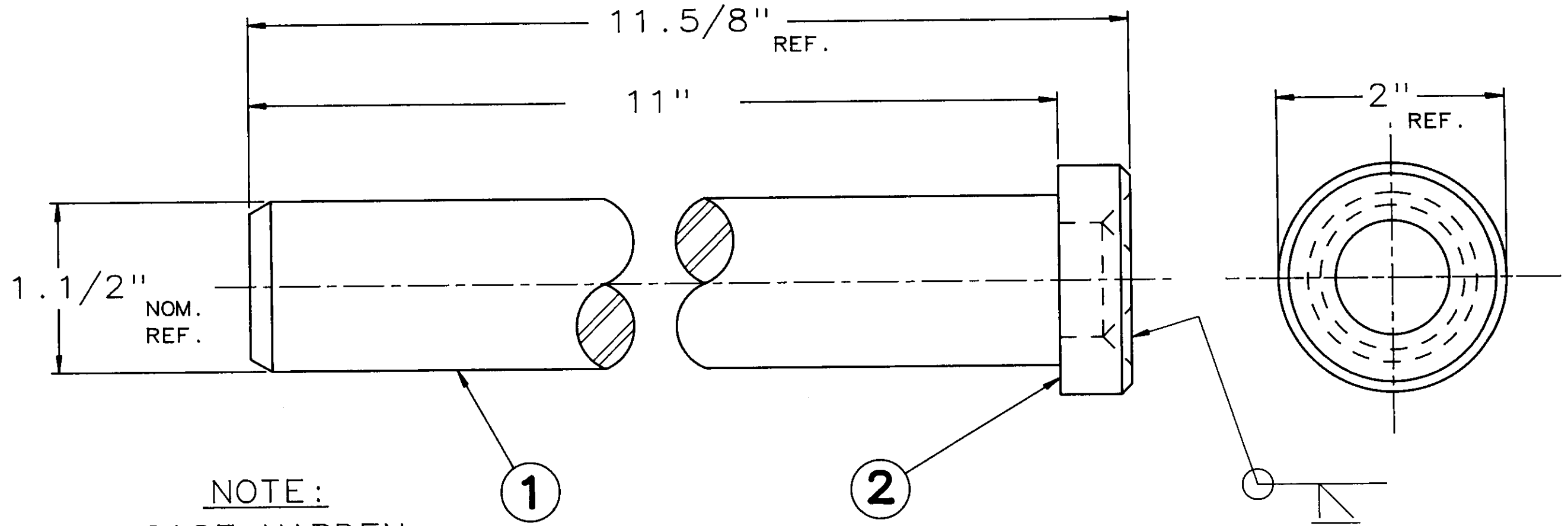
**NOTE!**  
BREAK ALL SHARP EDGES.



PART NUMBER: 20-0001  
 MAT'L.: BAR, FLAT, 1/4" X 3.1/2" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00414AA  
 EST. WT.: 1.40 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:			
ANGULAR: ±1 DEG				NO.	BY	DATE	
				REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b>							
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							
TITLE: <b>RETAINER, PIN</b>				SCALE: 1 = 2	DATE: FEB. 7, 1990	PROJECT NO.: 84-19	
				DWG. NO. <b>20-0001B</b>			

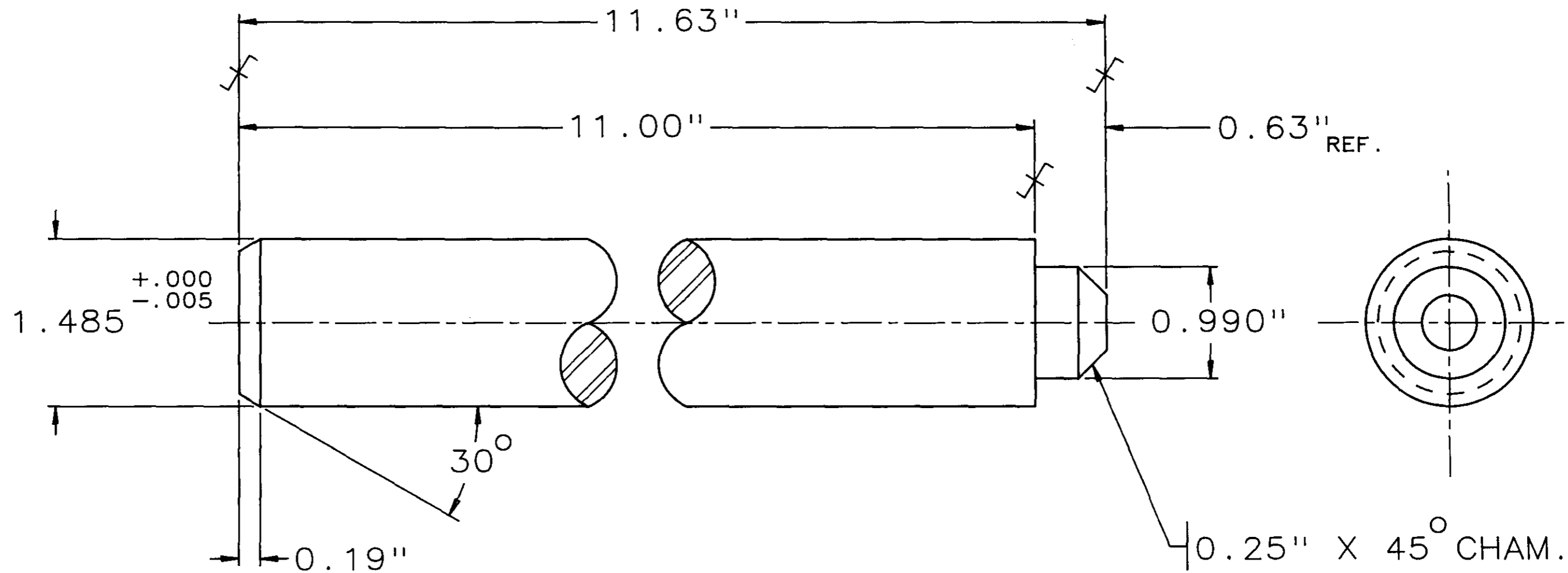
ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0088	B	PIN SHANK: BAR RD 1 1/2" OD	1	5.61
2	00-0089	B	PIN HEAD: BAR, RND, 2" DIA.	1	0.38



NOTE:  
CASE HARDEN  
TO ROCKWELL  
60 C X 0.03  
DEEP.

PART NUMBER: 20-0003  
EST. WT.: 6.13 LBS.

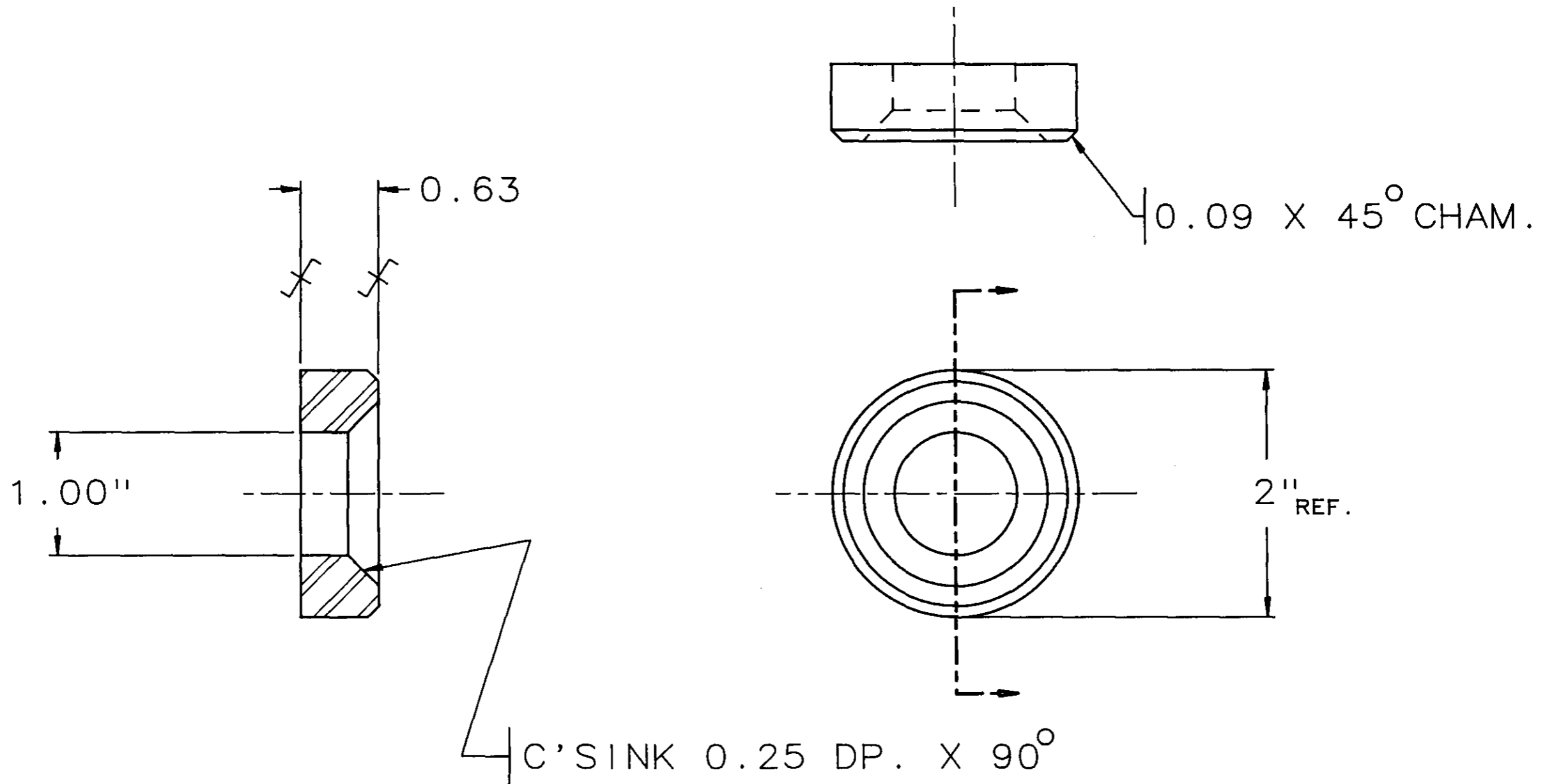
<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 8 TO 8 IN +1/32 6 IN AND UP +1/16 <b>DECIMAL:</b> 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005 <b>ANGULAR:</b> ± 1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19 DWG. NO. 20-0003B
1 REG 5/89 NO. BY DATE	UPDATED DWG. FORMAT: ORIG. DWN. 1/11/88 REVISION	<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653 TITLE: <b>PIN, VERTICAL: FIRELINE PLOW</b>	
		SCALE: <b>FULL</b> DATE: <b>MAY08, 1989</b>	



PART NUMBER: 00-0088  
 MAT'L.: BAR: RND., 1 1/2" DIA.  
 RYCASE/LEAD  
 UNS G11170/Pb  
 F.F.E.S. SPEC.: AC-00150AF  
 EST. WT.: 5.61 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$				DRAWN: R. GREENLAW		<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION	
DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$		ANGULAR: $\pm 1$ DEG		1 REG 5/89 UPDATED DWG. FORMAT: ORIG. DWN. 1/11/88			CHECKED: KDB
		NO. BY DATE		REVISION			APPROVED:
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							
TITLE: PIN SHANK: BAR, RND., 1 1/2" DIA.				SCALE: FULL		DATE: MAY 08, 1989	PROJECT NO.: 84-19 DWG. NO. 00-0088B





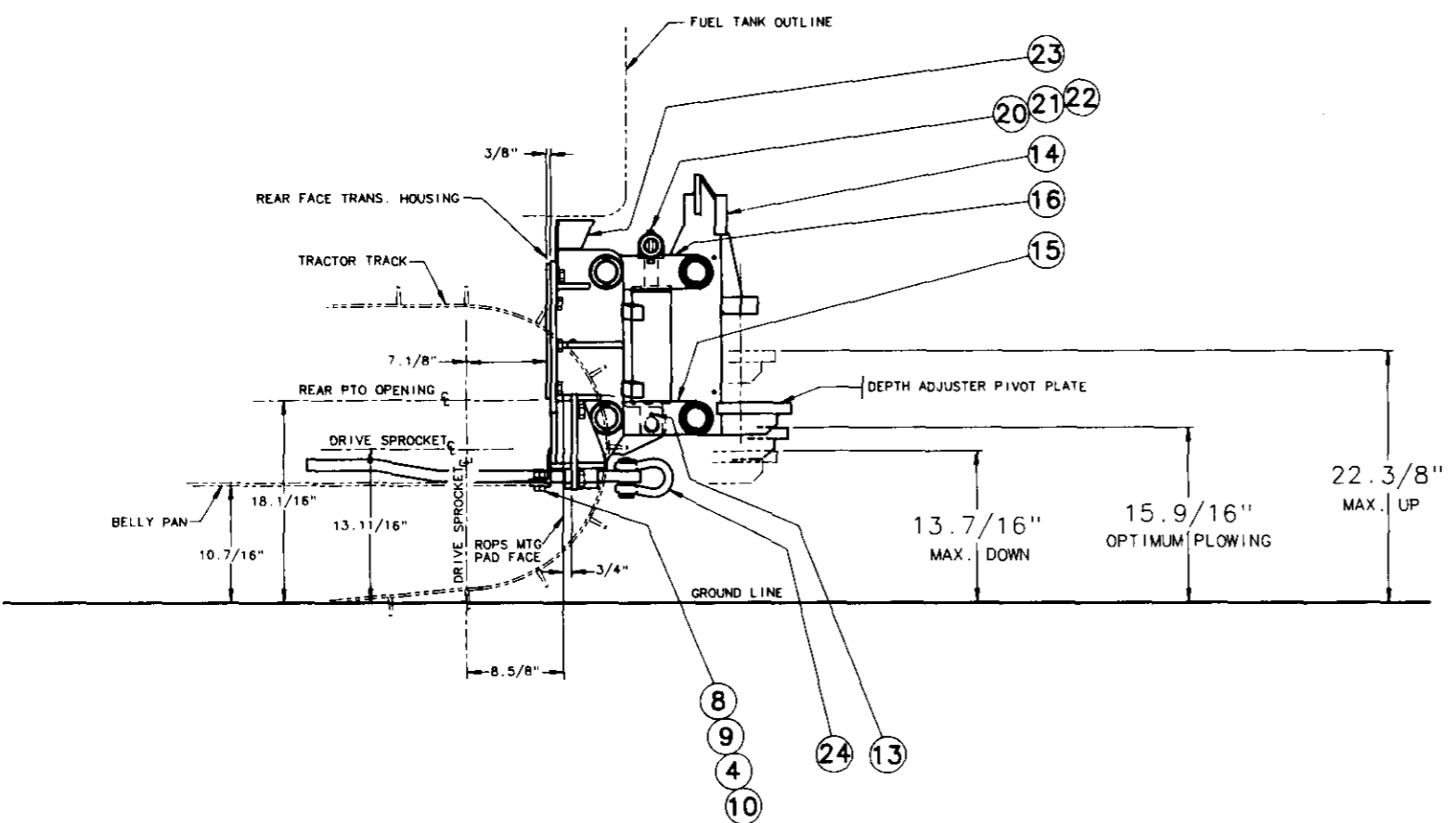
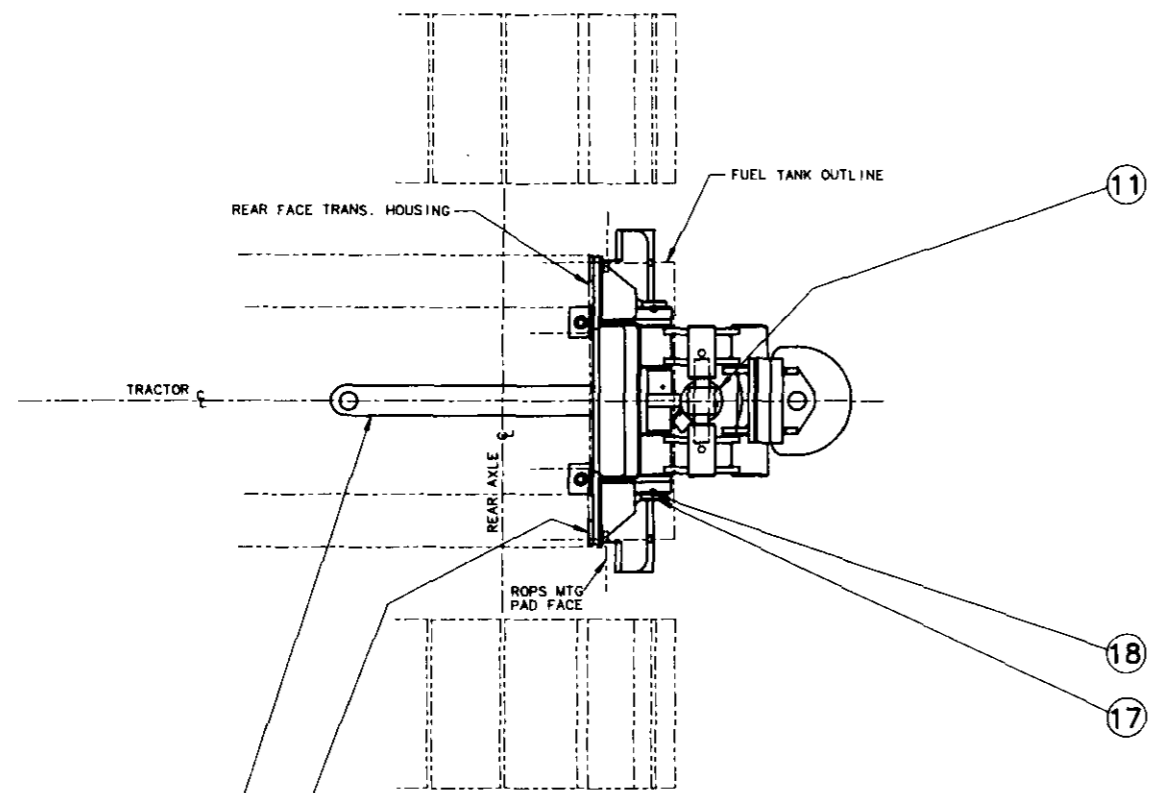
PART NUMBER: 00-0089  
 MAT'L.: BAR: ROUND, 2" DIA. C.D.  
 UNS G10180  
 F.F.E.S. SPEC. NO.: AC-00200AW  
 EST. WT.: .38 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN +1/32 6 IN AND UP +1/16 DECIMAL: 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005 ANGULAR: ± 1 DEG				DRAWN: R. GREENLAW CHECKED: KDB APPROVED:				<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION
1 REG 5/89 NO. BY DATE		UPDATED DWG. FORMAT: ORIG. DWN. 1/11/88 REVISION		PROJECT NO.: 84-19				
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653						DWG. NO. 00-0089B		
TITLE: PIN HEAD: BAR, RND., 2" DIA. C.D.			SCALE: FULL	DATE: MAY 08, 1989				

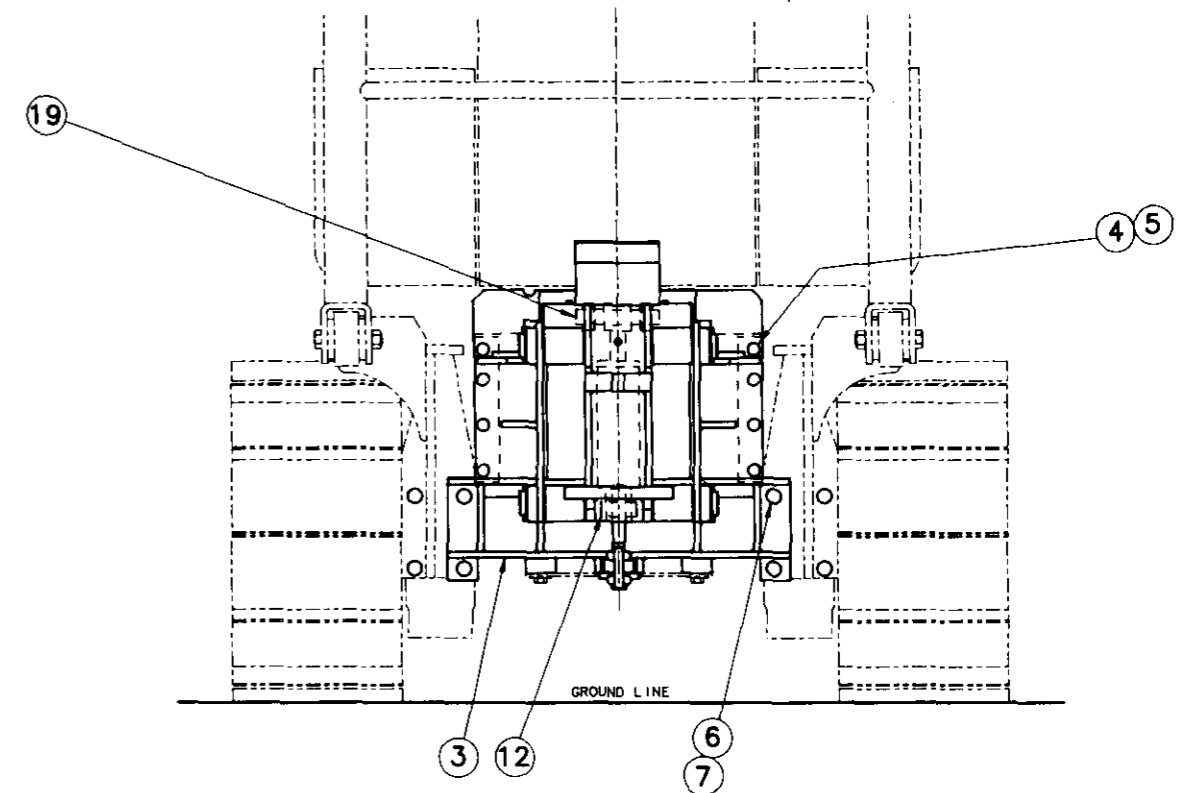
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## **Plow Hitch Assembly**

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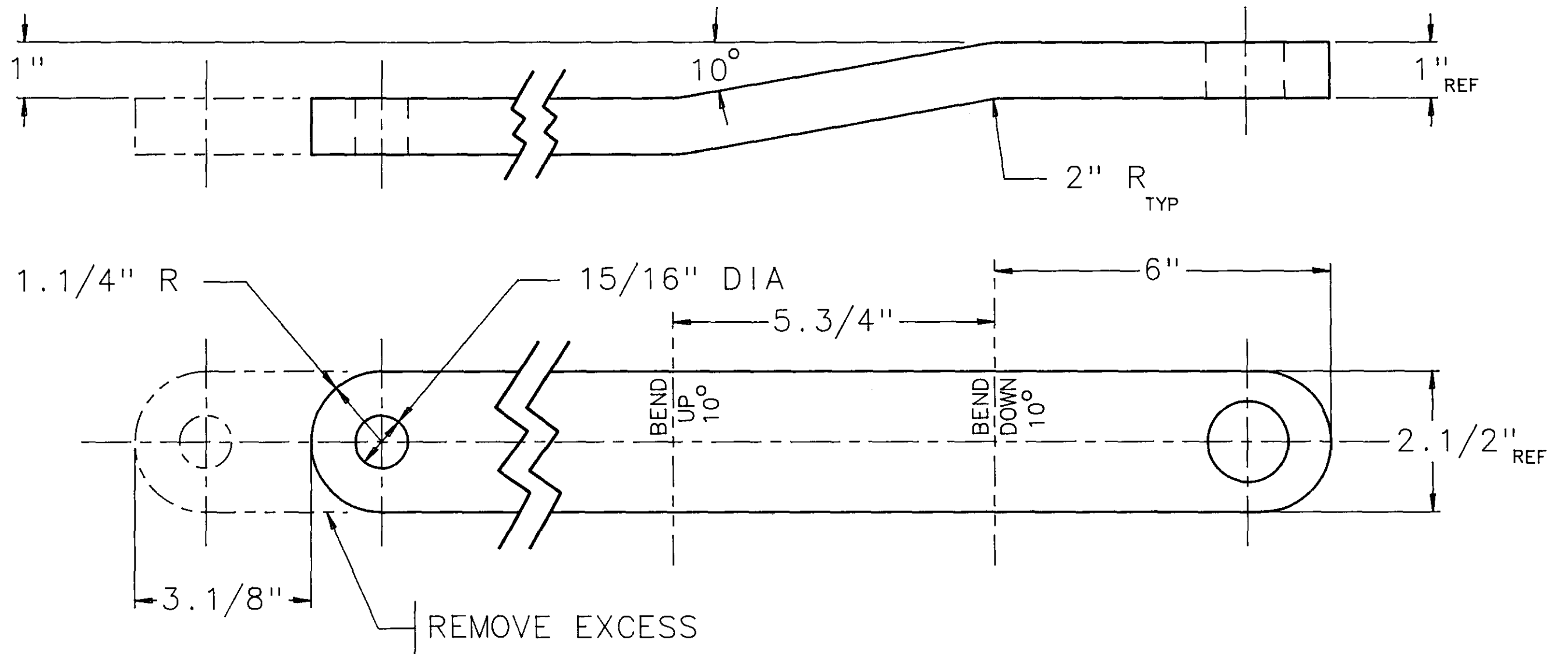


ITEM	PART NO	QWG	DESCRIPTION	QTY	EST WT
1	21-0017	B	DRAWBAR MODIFICATION: J.D. 400G	1	
2	21-0009	B	SPACER: J.D. 400G HITCH	2	2.39
3	21-0006	D	HITCH MOUNTING BRACKET W/C: J.D. 400G	1	158
4	WS10-BC		WASHER, SPRING LOCK, REG.: 5/8" PLATED	10	0.03
5	TS-10WG16		SCREW, CAP, HEX. HD.: 2" LONG, GR. 8, PLATED	8	0.23
6	WS12-BC		WASHER, SPRING LOCK, REG.: 3/4" PLATED	4	0.05
7	TS-12WG24		SCREW, CAP, HEX. HD.: 3" LONG, GR. 8, PLATED	4	0.47
8	WS10-BA		WASHER, FLAT U.S.S.: 5/8" PLATED	2	0.09
9	TS-10GG12		SCREW, CAP, HEX. HD.: 1.1/2" LONG, GR. 5, PLATED	2	0.19
10	TS-10GP		NUT, HEX., DOUBLE CHAM.: 5/8" PLATED	2	0.08
11	22-0018	D	TRACTOR HITCH HYD. CYL. ASSEMBLY: 3"	1	24.5
12	21-0011	B	PIN, CYLINDER ANCHOR END	1	0.95
13	R08-B128AB		PIN, COTTER: 1/8" X 2" LONG PLATED	2	0.01
14	O-711		DEPTH ADJUSTER W/C: J.D. 350/400G	1	
15	O-431		LINK, LOWER W/C	2	
16	O-431		LINK, UPPER W/C	2	
17	21-0010	B	PIN, HITCH LINK	2	14.5
18	R24-A192AA		PIN, ROLL: 3/8" DIA. X 3" LONG	4	0.06
19	21-0012	B	PIN, CYLINDER ROD END	1	2.32
20	TS-06GG22		SCREW, CAP, HEX. HD.: 2.3/4" LONG, GR. 5, PLATED	2	0.11
21	WS06-BC		WASHER, SPRING LOCK, REG.: 3/8" PLATED	2	0.01
22	TS-06GP		NUT, HEX. DOUBLE CHAM.: 3/8" PLATED	2	0.02
23	21-0016	C	FUEL TANK GD. MODIFICATION	1	
24	33-0002	B	SHACKLE, ANCHOR FORGED W/ LOOSE PIN: 3/4"	1	2.20



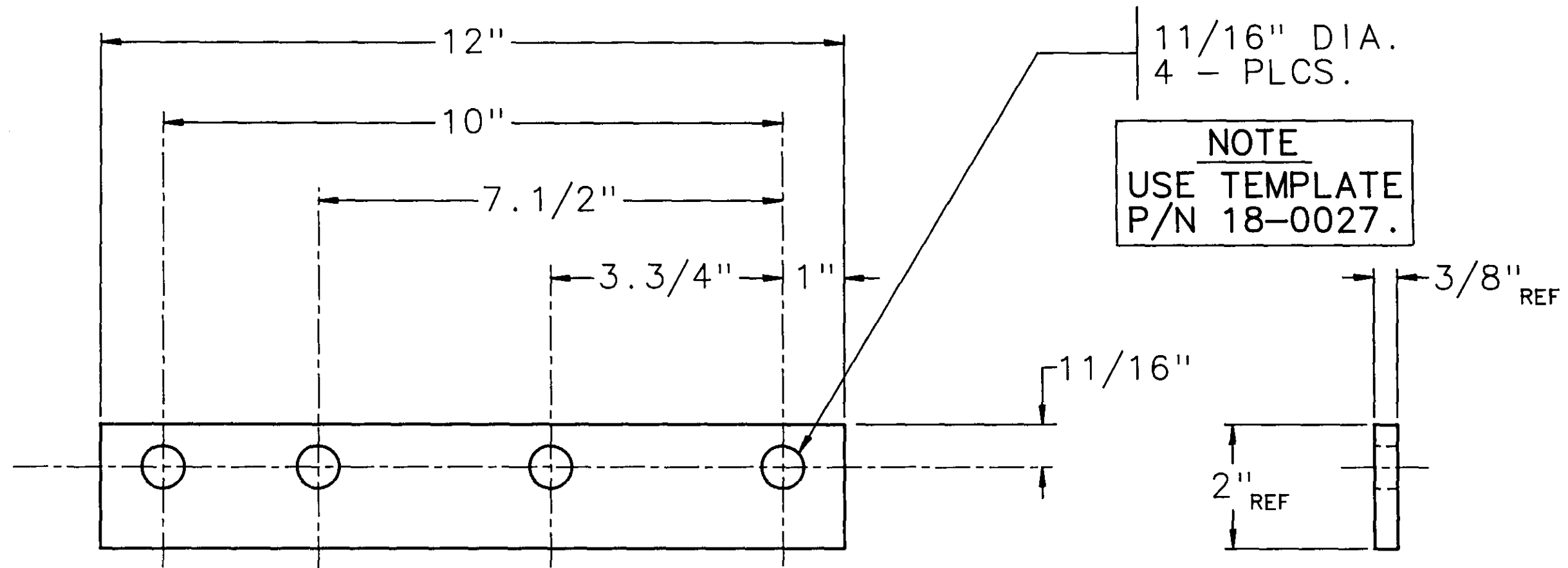
PART NUMBER: 21-9800  
EST. WT.: 378 LBS.

STD. TOLERANCES		DRAWN:	R. GREENLAW	MICHIGAN DNR FOREST MANAGEMENT DIVISION
FRACTIONAL:		CHECKED:	KDB	
DECIMAL:		APPROVED:		
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653				PROJECT NO: 84-19
TITLE: HITCH OVERALL ASS'Y.: J.D. 400G TRACTOR				SCALE: 1 = B DATE: MAR. 04, 1991 DWG. NO: 21-9800D



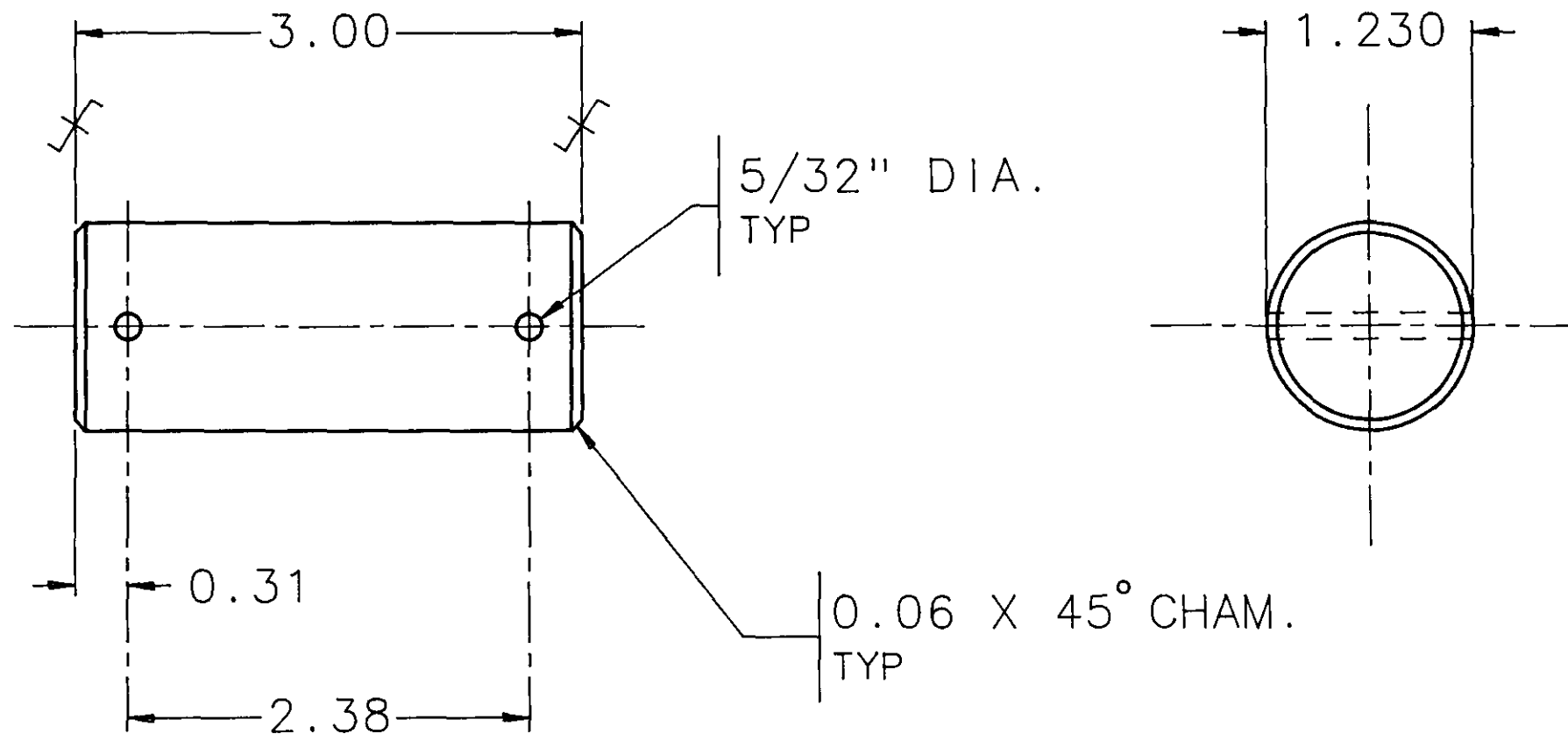
PART NUMBER: 21-0017  
 MAT'L.: PRODUCE FROM,  
 EXISTING J.D. 400G  
 TRACTOR DRAWBAR

<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 0 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ <b>DECIMAL:</b> 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ <b>ANGULAR:</b> $\pm 1$ DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION  PROJECT NO.: 84-19
NO.	BY	DATE	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			
TITLE: <b>DRAWBAR MODIFICATION: J.D. 400G TRACTOR</b>		SCALE: 1 = 2	DATE: FEB. 26, 1991
			DWG. NO. <b>21-0017B</b>



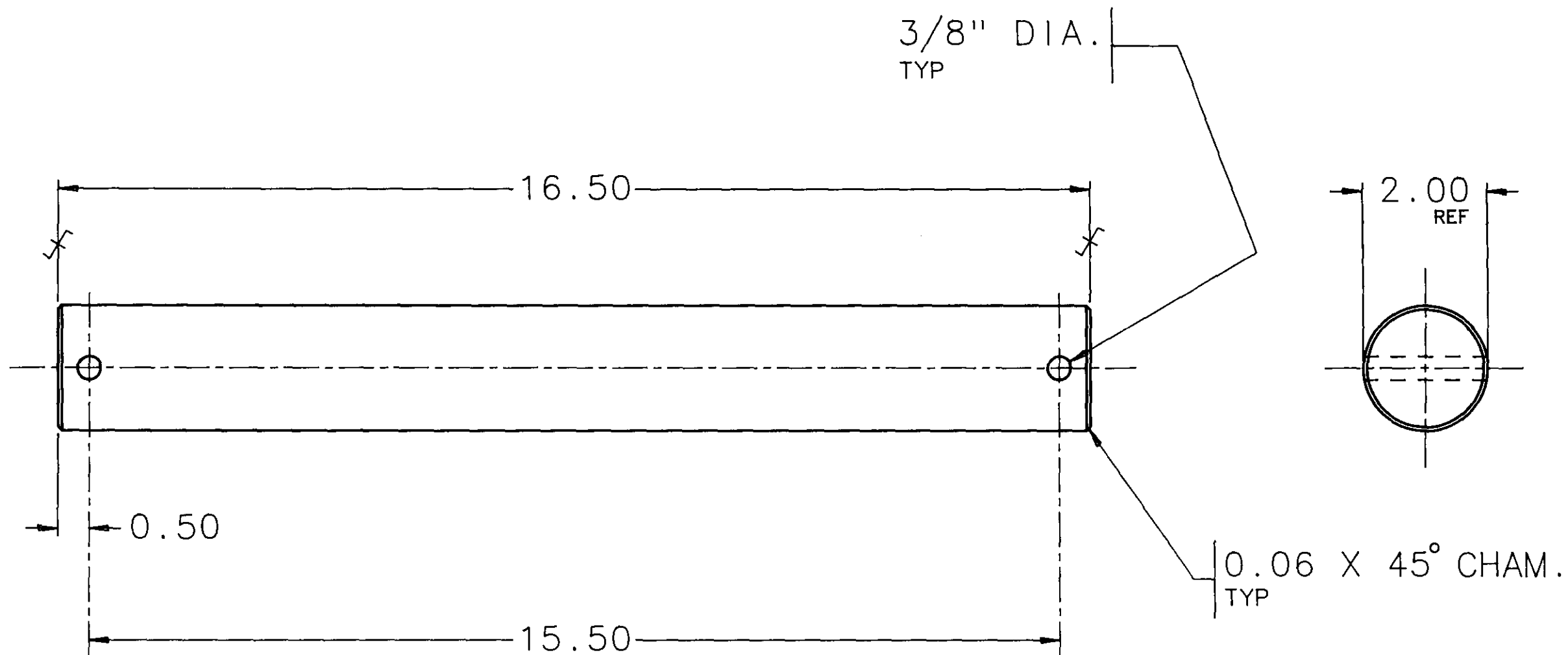
PART NUMBER: 21-0009  
 MAT'L.: BAR, FLAT, 3/8" X 2" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00608AA  
 EST. WT.: 2.39 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005		ANGULAR: ±1 DEG		APPROVED:			
NO.	BY	DATE	REVISION				
<b>FOREST FIRE EXPERIMENT STATION</b>							
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							
TITLE: SPACER: JD 400G HITCH					SCALE: 1 = 2	DATE: SEP. 05, 1989	PROJECT NO.: 88-4
						DWG. NO. 21-0009B	



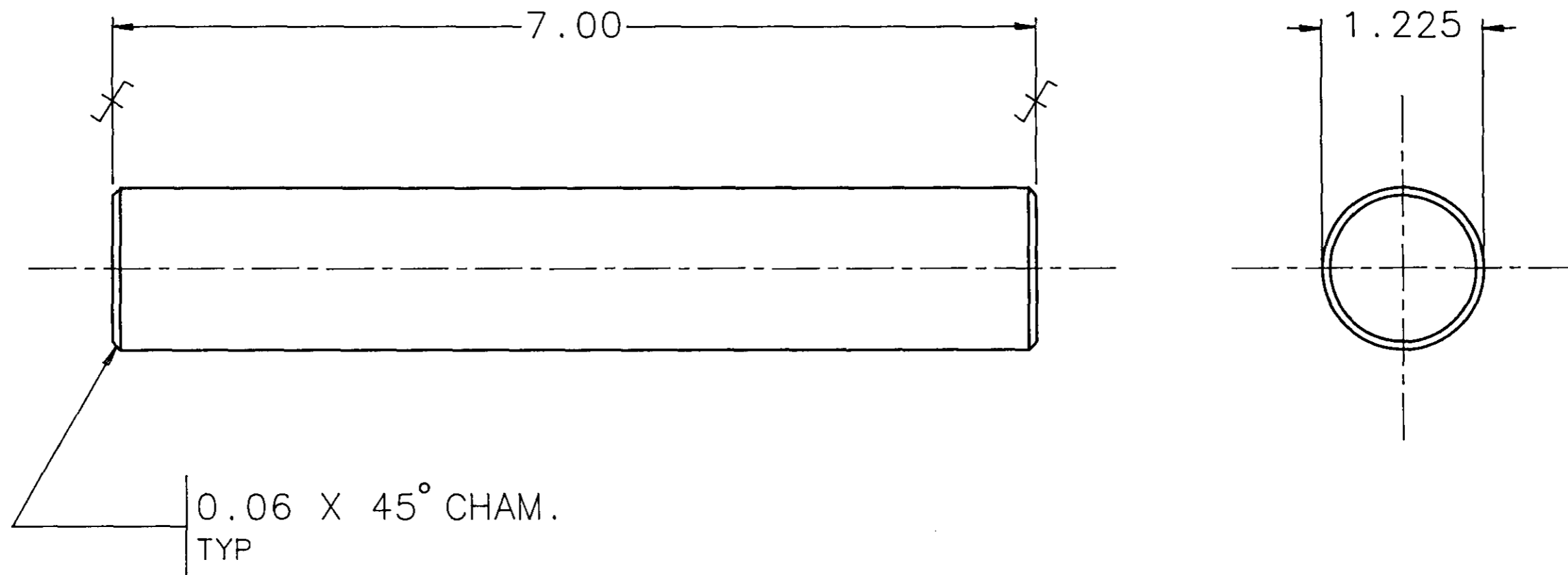
PART NUMBER: 21-0011  
 MAT'L.: BAR, RND., 1.1/4" DIA. C.D.  
 UNS G10180  
 F.F.E.S. SPEC. NO.: AC-00125AW  
 EST. WT.: 0.95 LBS.

STD. TOLERANCES				DRAWN: R. GREENLAW		MICHIGAN DNR FOREST MANAGEMENT DIVISION	
FRACTIONAL: 0 TO 6 IN + - 1/32 6 IN AND UP + - 1/16				CHECKED: KDB			
DECIMAL: 1 PLACE + - 0.1 2 PLACE + - 0.01 3 PLACE + - 0.005		ANGULAR: + - 1 DEG		APPROVED:			
NO.	BY	DATE	REVISION				
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN 48653							PROJECT NO.: 84-19
TITLE: PIN, CYLINDER ANCHOR END				SCALE: FULL	DATE: NOV. 9, 1990	DWG. NO. 21-0011B	



PART NUMBER: 21-0010  
 MAT'L.: BAR, ROUND, 2" DIA. C.D.  
 UNS G10180  
 F.F.E.S. SPEC. NO.: AC-00200AW  
 EST. WT.: 14.5 LBS.

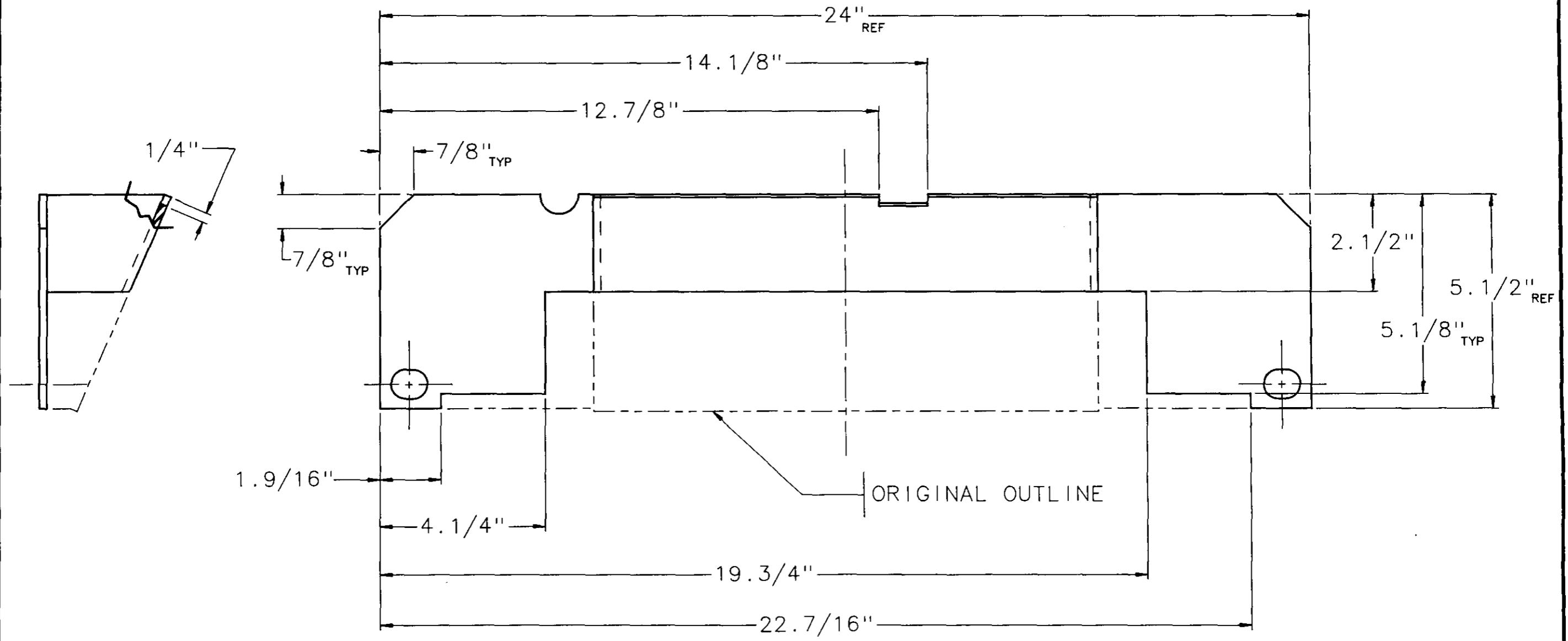
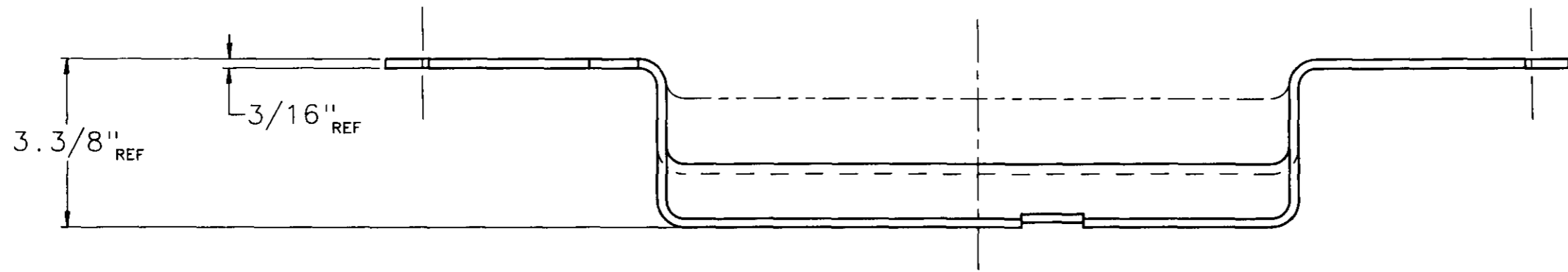
STD. TOLERANCES				DRAWN: R. GREENLAW		MICHIGAN DNR FOREST MANAGEMENT DIVISION	
FRACTIONAL: 0 TO 6 IN +- 1/32 6 IN AND UP +- 1/16				CHECKED: KDB			
DECIMAL: 1 PLACE +- 0.1 2 PLACE +- 0.01 3 PLACE +- 0.005		ANGULAR: +- 1 DEG		APPROVED:			
		1	REG	06 24/87	15.50" DIM. WAS 14.1/2", 16.50" DIM. WAS 15.1/2"		PROJECT NO.: 84-19
		NO.	BY	DATE	REVISION		
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							SCALE: 1 = 2
TITLE: PIN, HITCH LINK					DATE: NOV. 9, 1990		
							DWG. NO. 21-0010B



PART NUMBER: 21-0012  
 MAT'L.: BAR, RND., 1.1/4" DIA. C.D.  
 UNS G10180  
 F.F.E.S. SPEC. NO.: AC-00125AW  
 EST. WT.: 2.32 LBS.

STD. TOLERANCES				DRAWN: R. GREENLAW		MICHIGAN DNR FOREST MANAGEMENT DIVISION
FRACTIONAL: 0 TO 6 IN ± 1/32 6 IN AND UP ± 1/16				CHECKED: KDB		
DECIMAL: 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005		ANGULAR: ± 1 DEG		APPROVED:		
NO.	BY	DATE	REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN 48653						
TITLE: PIN, CYLINDER ROD END				SCALE: FULL	DATE: NOV. 9, 1990	PROJECT NO.: 84-19
						DWG. NO. 21-0012B





1.9/16"

4.1/4"

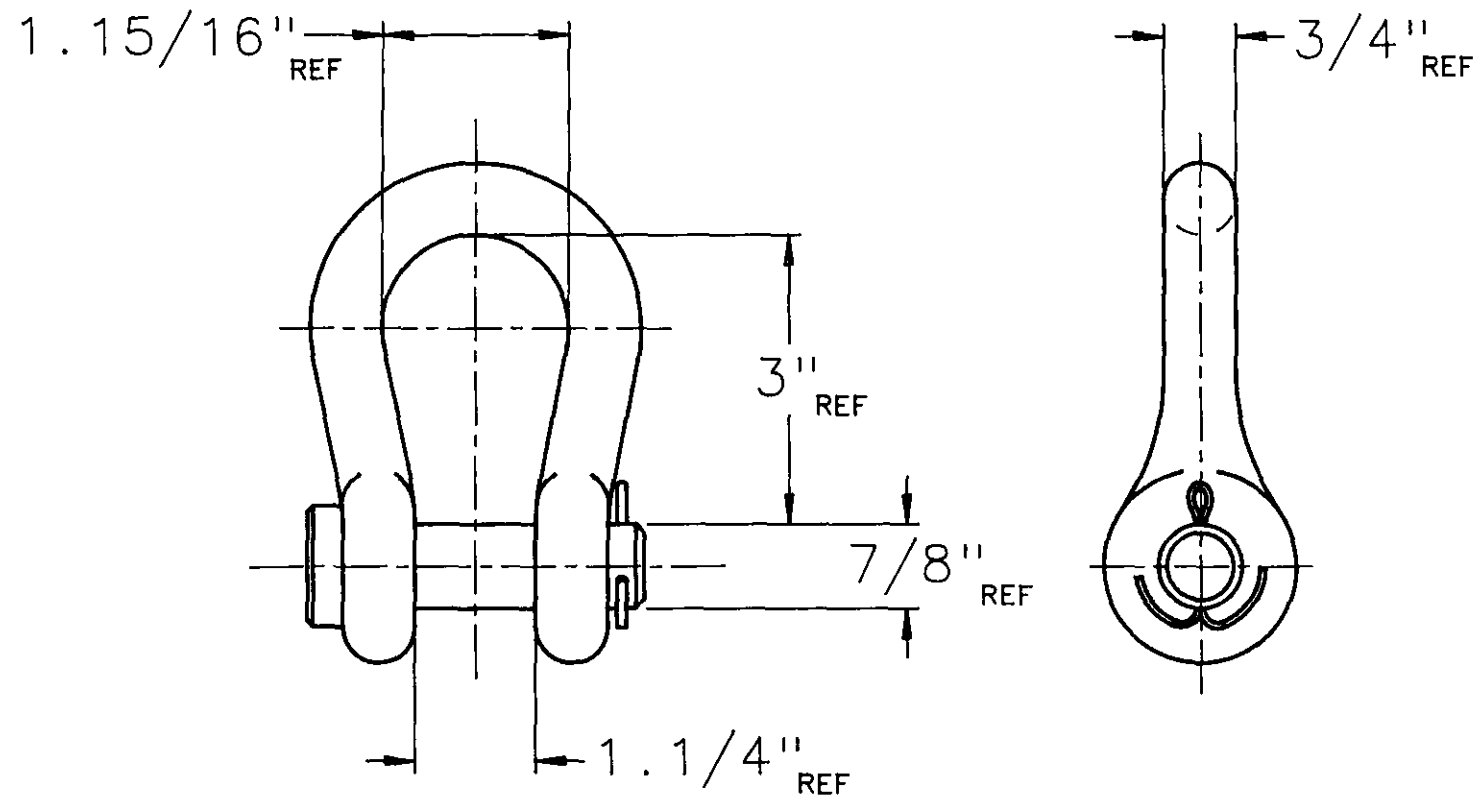
19.3/4"

22.7/16"

ORIGINAL OUTLINE

PART NUMBER: 21-0016  
 MAT'L.: PRODUCE FROM, EXISTING  
 J.D. 400G TRACTOR FUEL  
 TANK GUARD, JOHN DEERE  
 P/N T120082.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN. $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN          DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
FOREST FIRE EXPERIMENT STATION P.O. BOX 68    ROSCOMMON, MICHIGAN    48653		TITLE: FUEL TANK GD. MODIF.: J.D. 400G TRACTOR SCALE: 1 = 2 DATE: FEB. 26, 1991 DWG. NO. 21-0016C	



### SHACKLE W/ LOOSE PIN

NOMINAL SIZE: 3/4"  
 STYLE: ANCHOR (BOW STYLE) W/ LOOSE PIN  
 WORKING LOAD: 10,000 LBS.  
 MATERIAL: FORGED STEEL, GALV. FINISH  
 EST. WT.: 2.20 LBS.

APPROVED MANUFACTURERS

PART NO.

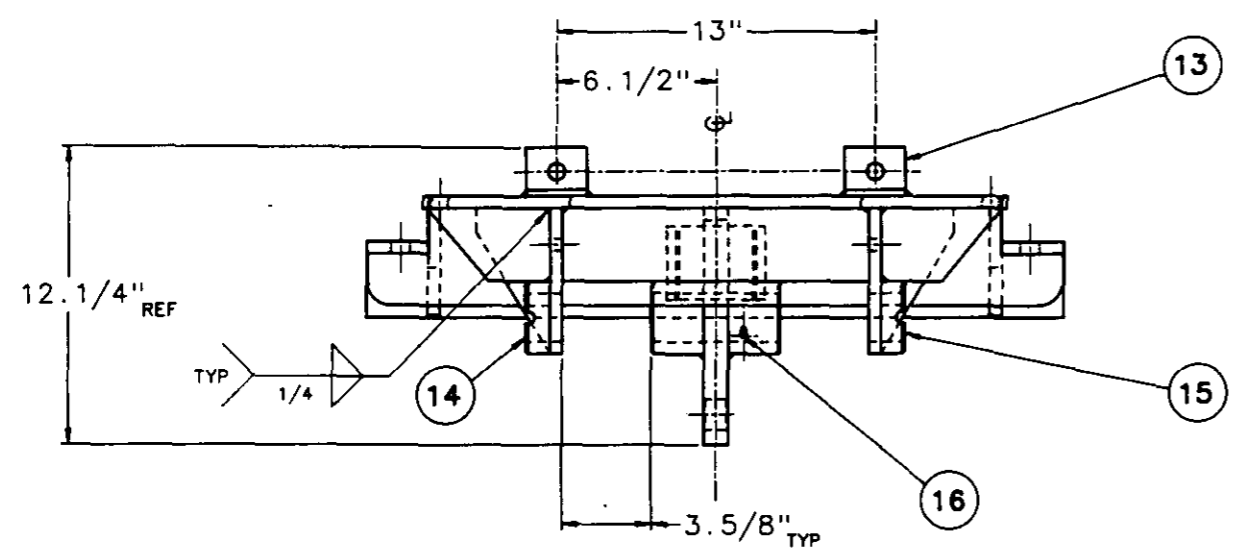
APPROVED MANUFACTURERS

PART NO.

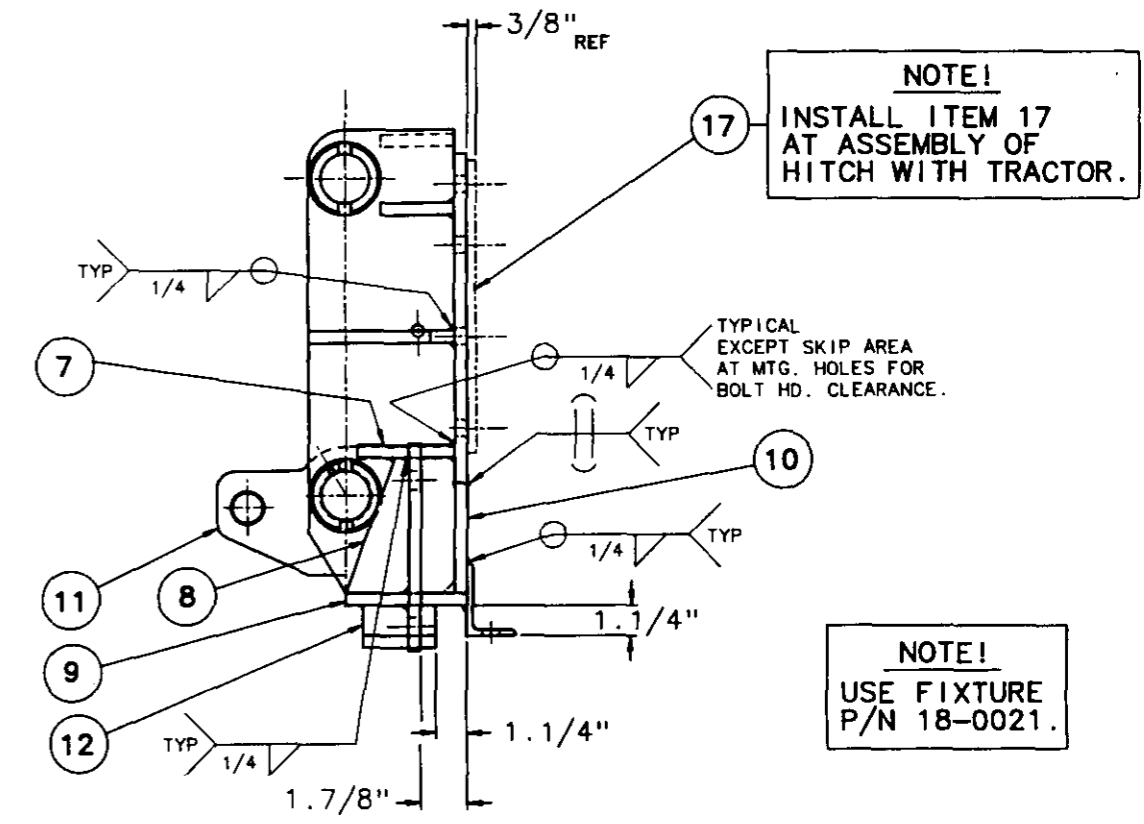
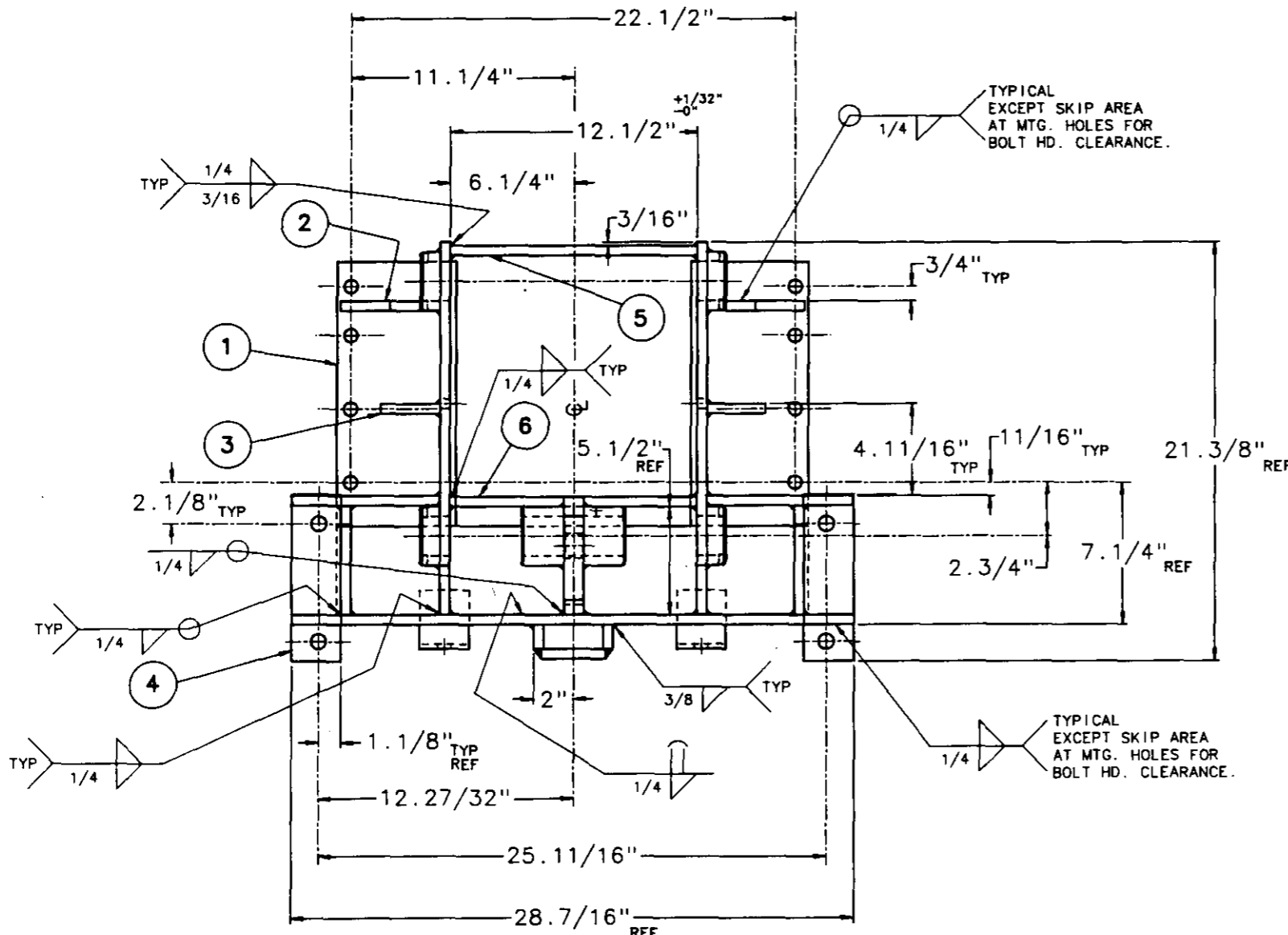
McMASTER-CARR SUPPLY CO.  
 P.O. BOX 4355  
 CHICAGO, ILLINOIS  
 60680-4355

3559T51

<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 0 TO 6 IN +- 1/32 6 IN AND UP +- 1/16 <b>DECIMAL:</b> 1 PLACE +- 0.1 2 PLACE +- 0.01 3 PLACE +- 0.005 <b>ANGULAR:</b> +- 1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19	
NO.	BY	DATE		REVISION
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653				
F.F.E.S. PART NO.: 33-0002		TITLE: SHACKLE, ANCHOR, FORGED W/ LOOSE PIN: 3/4"	SCALE: 1 = 2 DATE: FEB. 7, 1991	DWG. NO. 33-0002B

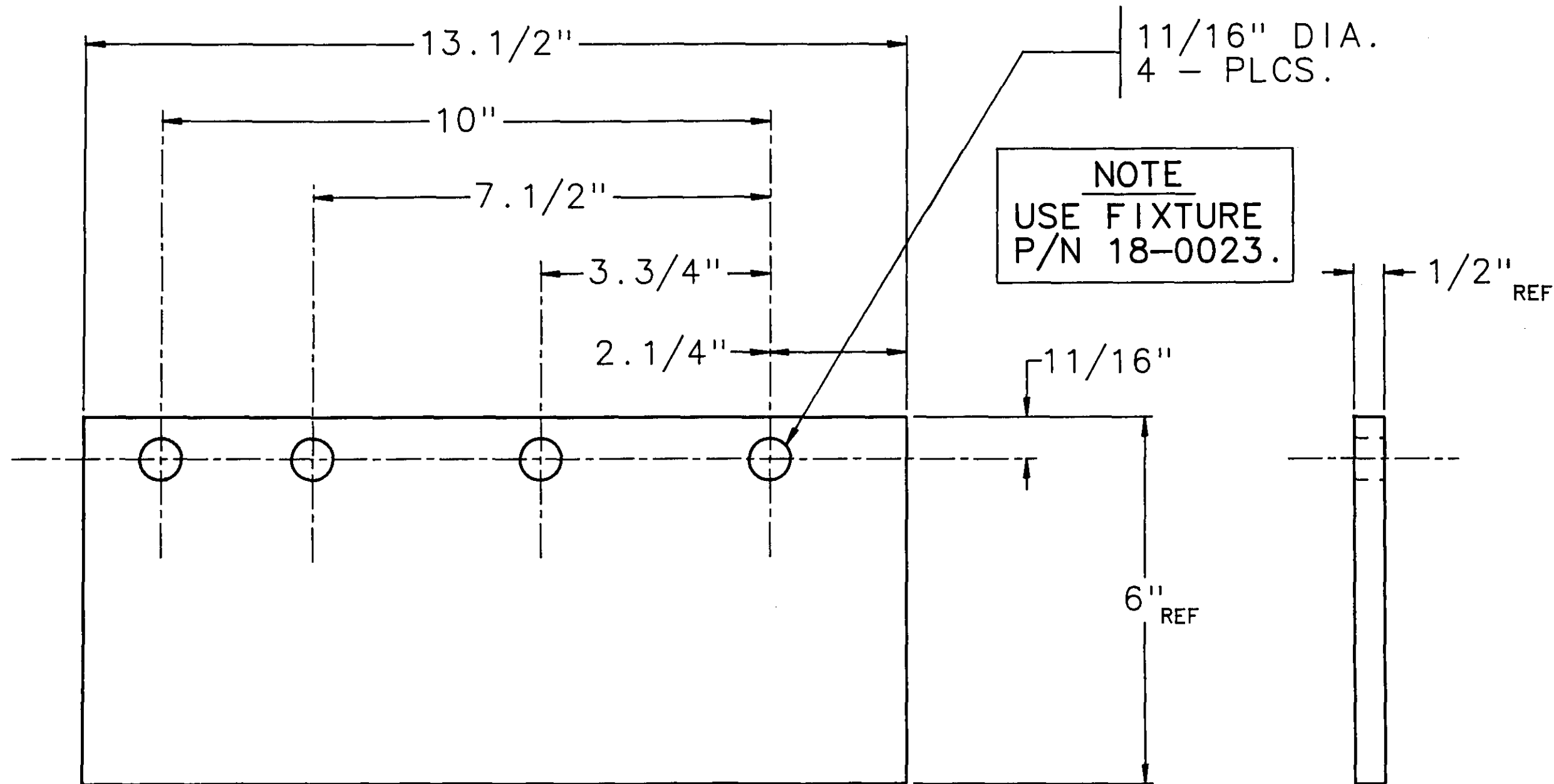


ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0205	B	HITCH MOUNTING BAR: TOP	2	11.2
2	00-0206	A	GUSSET	2	1.59
3	00-0207	A	GUSSET	2	1.49
4	00-0208	B	HITCH MOUNTING BAR: BOTTOM	2	2.86
5	00-0209	A	BAR, FLAT, 1/2" X 3" H.R.	1	5.31
6	00-0210	A	BAR, FLAT, 1/2" X 4" H.R.	1	7.07
7	00-0211	B	GUSSET	2	3.53
8	00-0212	A	GUSSET	2	2.74
9	00-0213	B	FLANGE	1	18.5
10	00-0214	A	BAR, FLAT, 1/2" X 4.1/2" HR	1	15.2
11	00-0228	C	HYD. CYLINDER ANCHOR S/W	1	16.3
12	00-0395	B	DRAWBAR RETAINER BRK'T. S/W	1	2.56
13	00-0398	B	ANGLE, 3" X 2" X 1/4" H.R.	2	0.83
14	00-0399	C	HITCH SIDE L.H. S/W	1	17.0
15	00-0400	C	HITCH SIDE R.H. S/W	1	17.0
16	P00-LAG		GREASE FTNG.: 1/4"-28 STR'T.	1	
17	21-0009	B	SPACER: J.D. 400G HITCH	2	2.39



PART NUMBER: 21-0006  
EST. WT.: 158 LBS.

STD. TOLERANCES	DRAWN	MICHIGAN DNR
FRACTIONAL: 1/16" - 1/8" ±0.005 3/16" - 1/4" ±0.004 1/2" - 3/4" ±0.003 1" - 2" ±0.002	CHECKED: KDB	FOREST MANAGEMENT DIVISION
DECIMAL: 1/16" - 1/8" ±0.005 3/16" - 1/4" ±0.004 1/2" - 3/4" ±0.003 1" - 2" ±0.002	APPROVED:	PROJECT NO.: 88-4
FOREST FIRE EXPERIMENT STATION P.O. BOX 88 ROBCONN, MICHIGAN 49853		DWG. NO. 21-0006D
TITLE: HITCH MTG. BRACKET W/C: J.D. 400G		SCALE: 1" = 4"

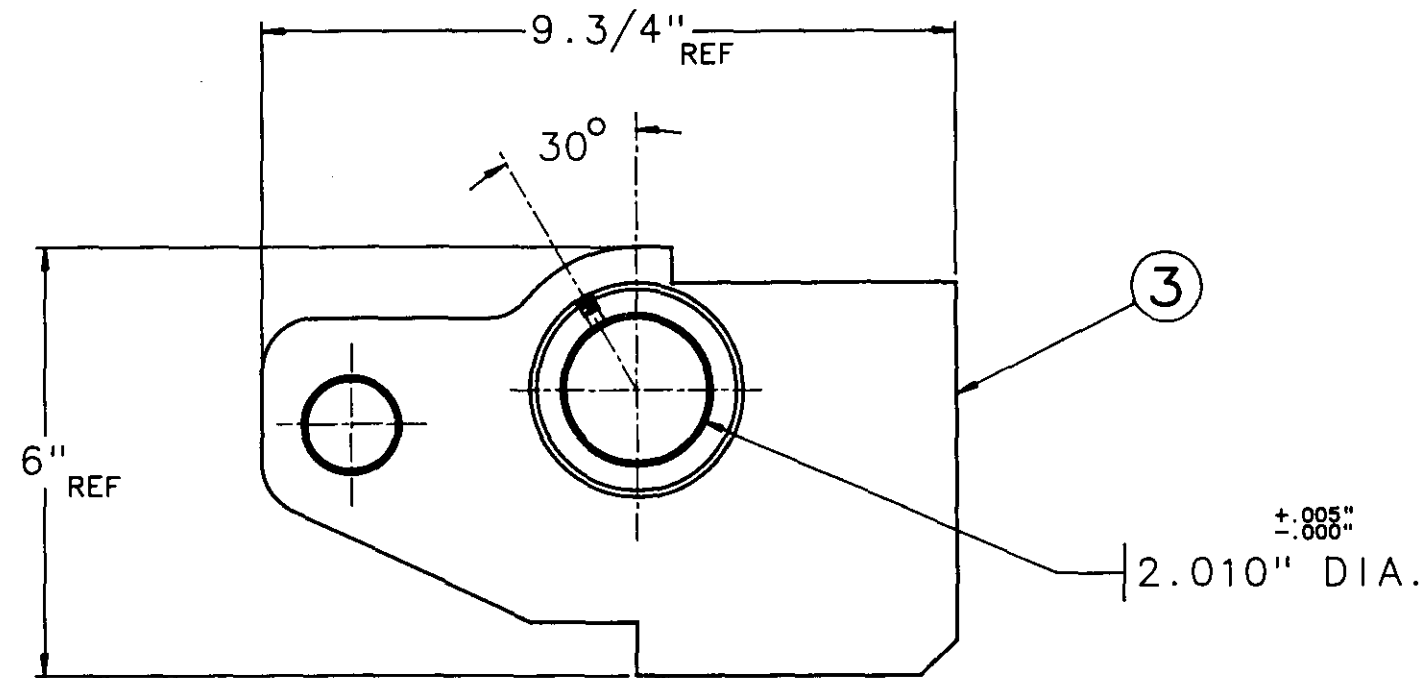
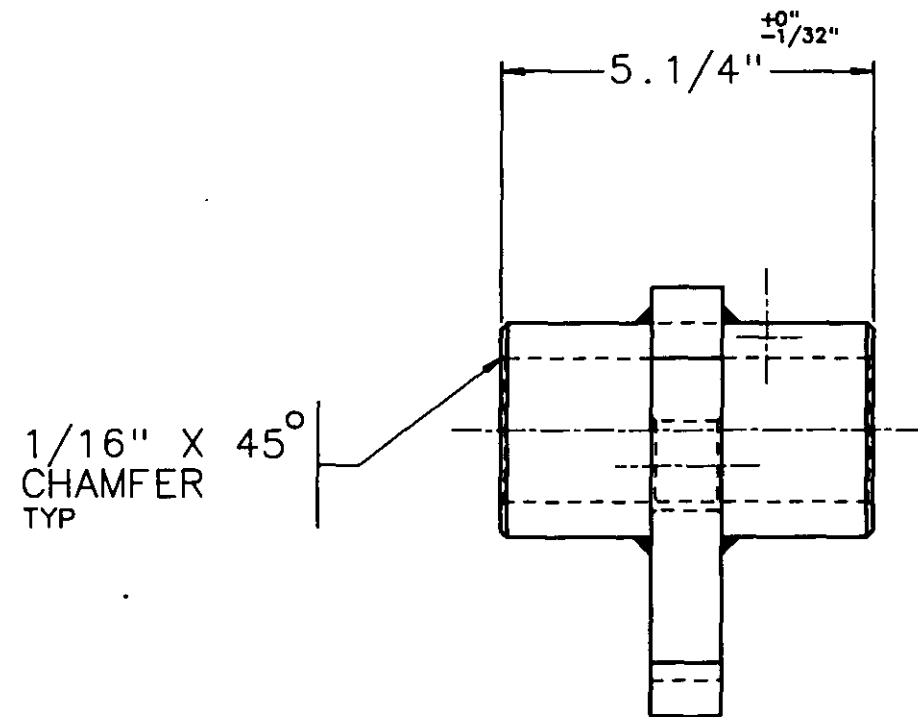
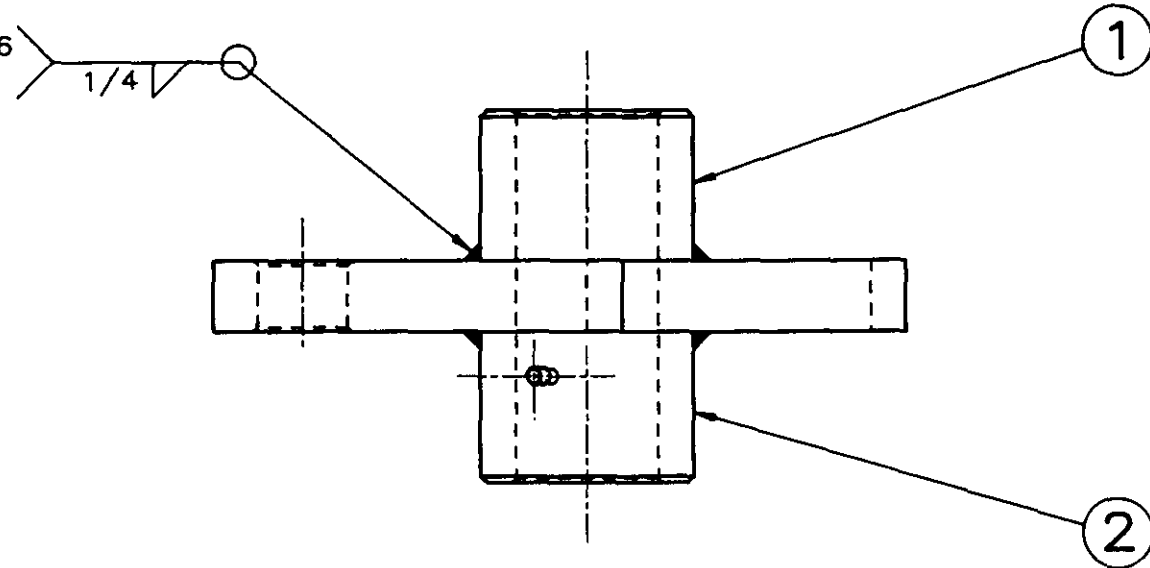


PART NUMBER: 00-0205  
 MAT'L.: BAR, FLAT, 1/2" X 6" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00824AA  
 EST. WT.: 11.2 LBS.

<b>STD. TOLERANCES</b>		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION								
FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16											
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005											
ANGULAR: ±1 DEG		<table border="1"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>REVISION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		NO.	BY	DATE	REVISION				
NO.	BY	DATE	REVISION								
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			PROJECT NO.: 88-4								
TITLE: <b>HITCH MTG. BAR: TOP</b>		SCALE: 1 = 2	DATE: AUG. 29, 1989								
DWG. NO. 00-0205B											

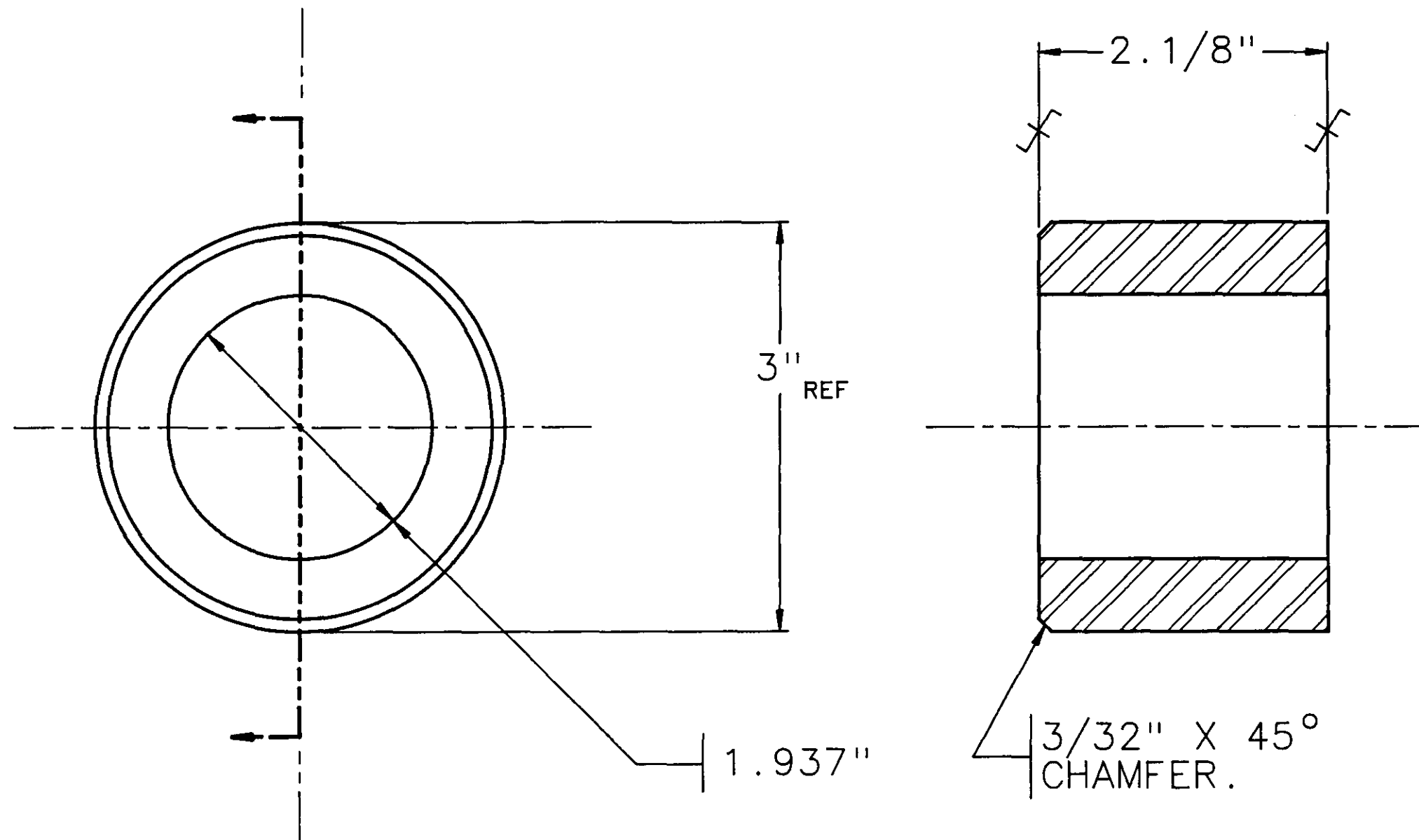
ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0401	B	BOSS: 3" O.D. X 1.937" I.D.	1	2.41
2	00-0402	B	BOSS: 3" O.D. X 1.937" I.D.	1	2.39
3	00-0403	B	ANCHOR CENTER PLATE	1	12.4

USE GAGE P/N 18-0026  
TYPICAL



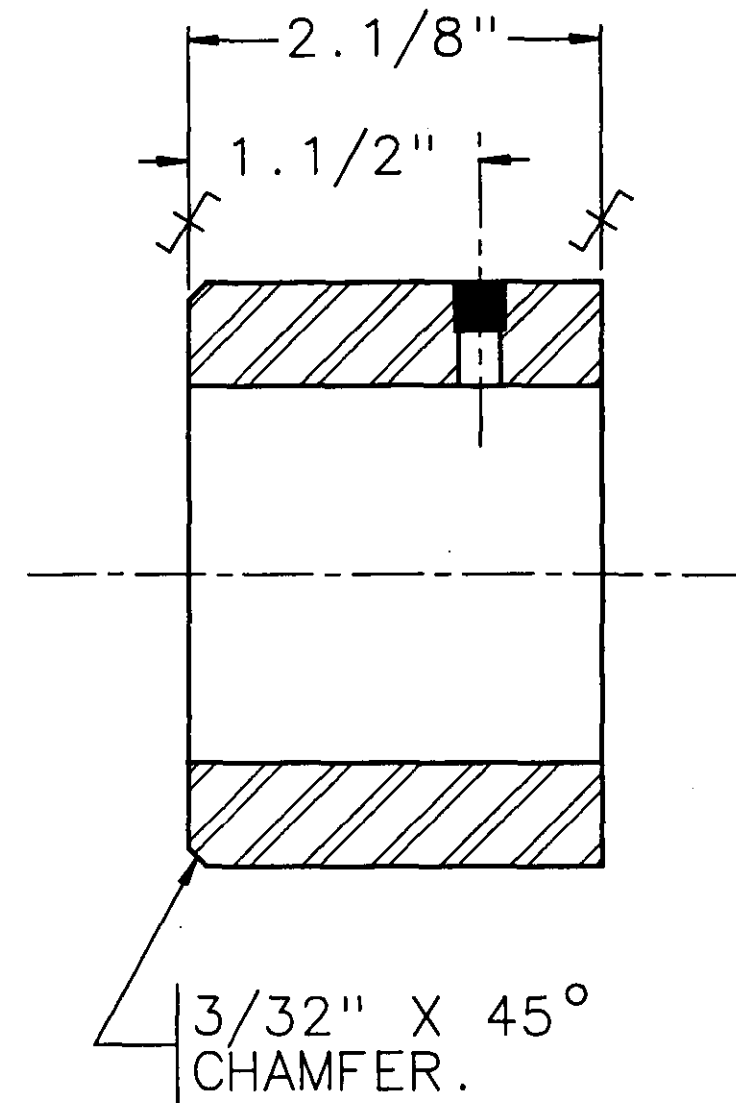
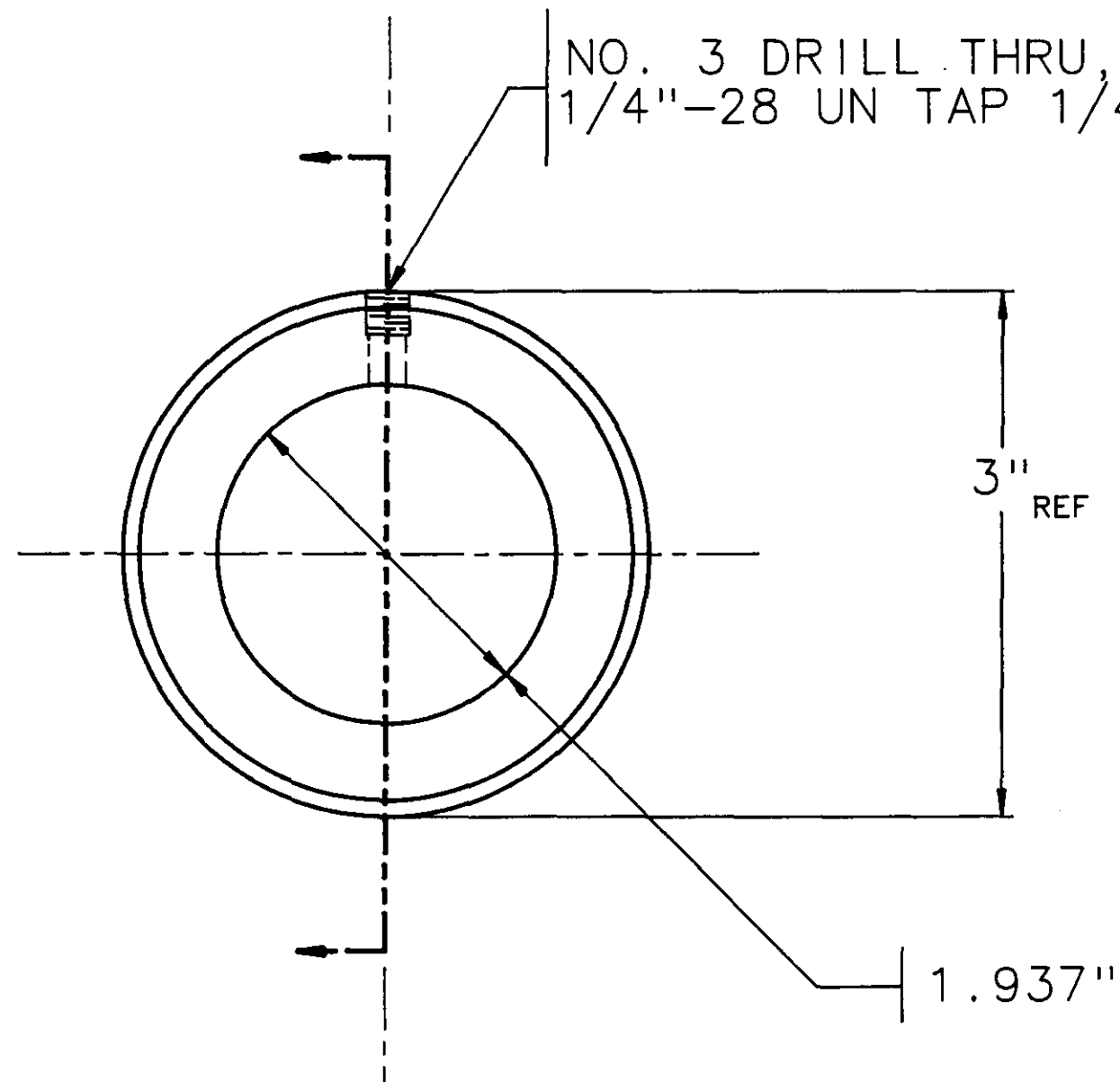
PART NUMBER: 00-0228  
EST. WT.: 16.3 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 9 TO 8 IN ±1/32 8 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.001		<b>ANGULAR:</b> ±1 DEG		DRAWN: R. GREENLAW CHECKED: KOB APPROVED:		<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 88-4
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653				TITLE: HYDRAULIC CYLINDER ANCHOR S/W SCALE: 1 = 2 DATE: AUG. 31, 1988		



PART NUMBER: 00-0401  
 MAT'L.: TUBE, RD. 3" OD X 9/16" WALL  
 COLD DRAWN SEAMLESS  
 UNS G10260  
 F.F.E.S. SPEC. NO.: AD-30015BB  
 EST. WT.: 2.41 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 5 IN ±1/32 6 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION	
NO.	BY	DATE		REVISION
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653				
TITLE: <b>BOSS: 3" O.D. X 1.937" I.D.</b>		SCALE: <b>FULL</b>	DATE: <b>AUG. 29, 1989</b>	PROJECT NO.: <b>88-4</b> DWG. NO. <b>00-0401B</b>



NO. 3 DRILL THRU, ONE WALL  
1/4"-28 UN TAP 1/4" DEEP.

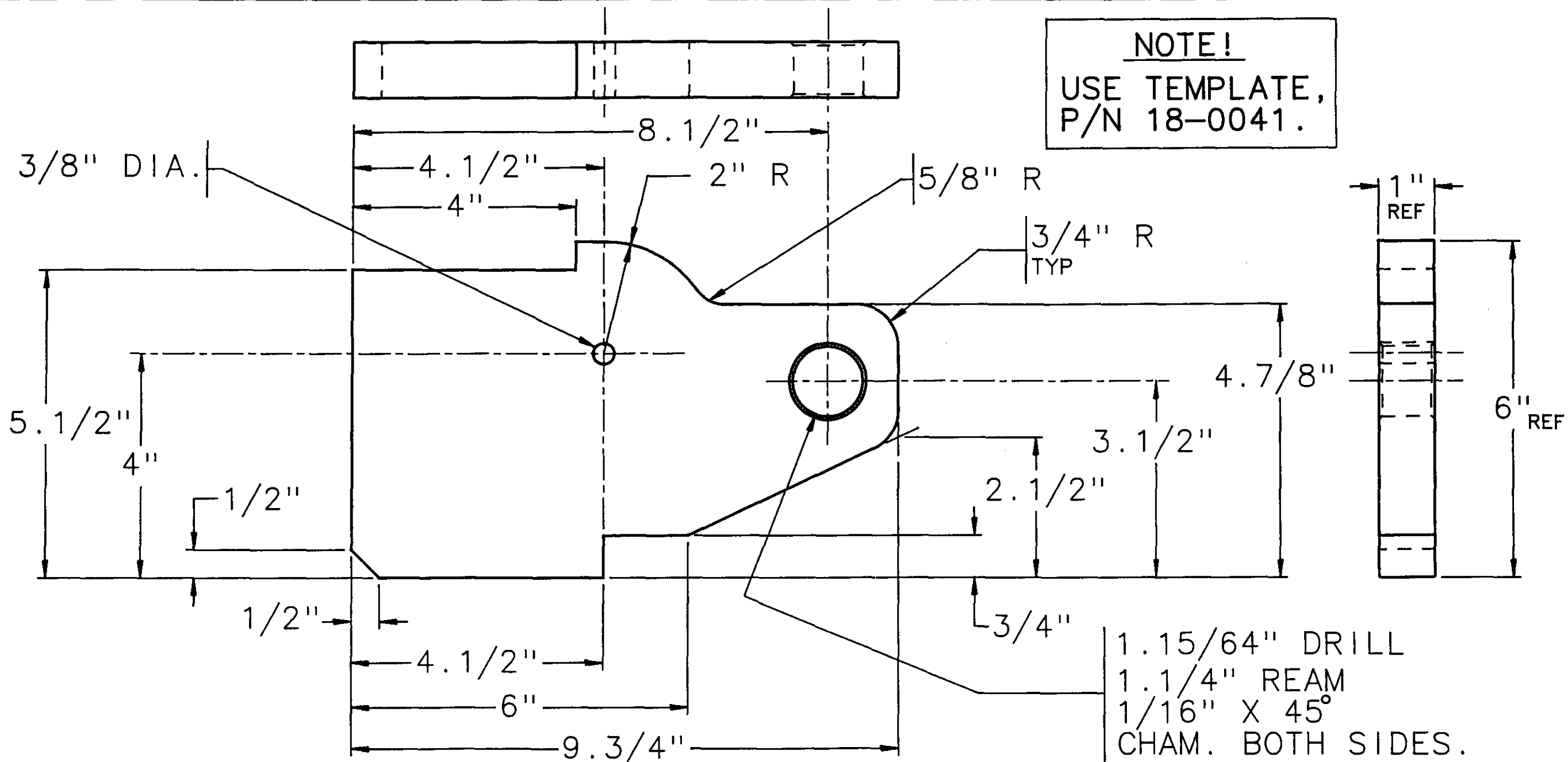
3" REF

1.937"

3/32" X 45°  
CHAMFER.

PART NUMBER: 00-0402  
 MAT'L.: TUBE, RD. 3" OD X 9/16" WALL  
 COLD DRAWN SEAMLESS  
 UNS G10260  
 F.F.E.S. SPEC. NO.: AD-30015BB  
 EST. WT.: 2.39 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 88-4
NO.	BY	DATE	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			
TITLE: <b>BOSS: 3" O.D. X 1.937" I.D.</b>		SCALE: <b>FULL</b>	DATE: <b>AUG. 29, 1989</b>
			DWG. NO. <b>00-0402B</b>



**NOTE!**  
USE TEMPLATE,  
P/N 18-0041.

1.15/64" DRILL  
1.1/4" REAM  
1/16" X 45°  
CHAM. BOTH SIDES.

PART NUMBER: 00-0403  
MAT'L: BAR, FLAT, 1" X 6" H.R.  
UNS G10200  
F.F.E.S. SPEC. NO.: AB-01624AA  
EST. WT.: 12.4 LBS.

STD. TOLERANCES		NO.	BY	DATE	REVISION
FRACTIONAL:					
8 TO 6 IN	+1/32				
6 IN AND UP	+1/16				
DECIMAL:					
1 PLACE	+0.1				
2 PLACE	+0.01				
3 PLACE	+0.005				
ANGULAR:					
	+1 DEG				

DRAWN:  
**R. GREENLAW**  
CHECKED:  
**KDB**  
APPROVED:

**MICHIGAN  
DNR**  
FOREST MANAGEMENT  
DIVISION

**FOREST FIRE EXPERIMENT STATION**

P.O. BOX 68      ROSCOMMON, MICHIGAN      48653

PROJECT NO.: 88-4

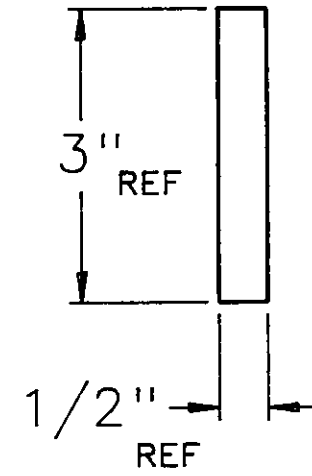
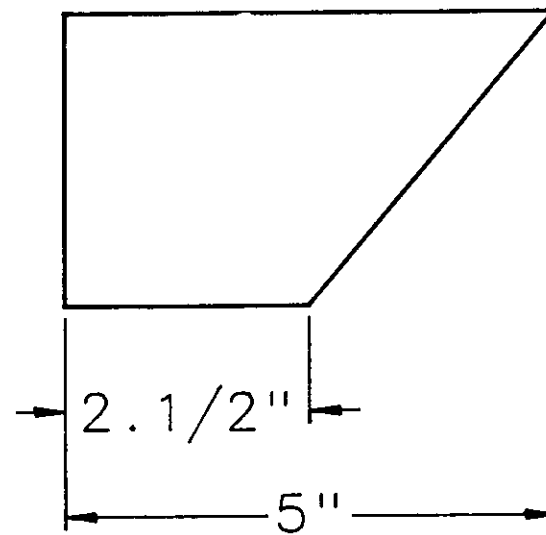
TITLE: **HYD. CYL. ANCHOR CENTER PLATE**

SCALE:  
1 = 2

DATE:  
AUG. 29, 1989

DWG. NO. **00-0403B**



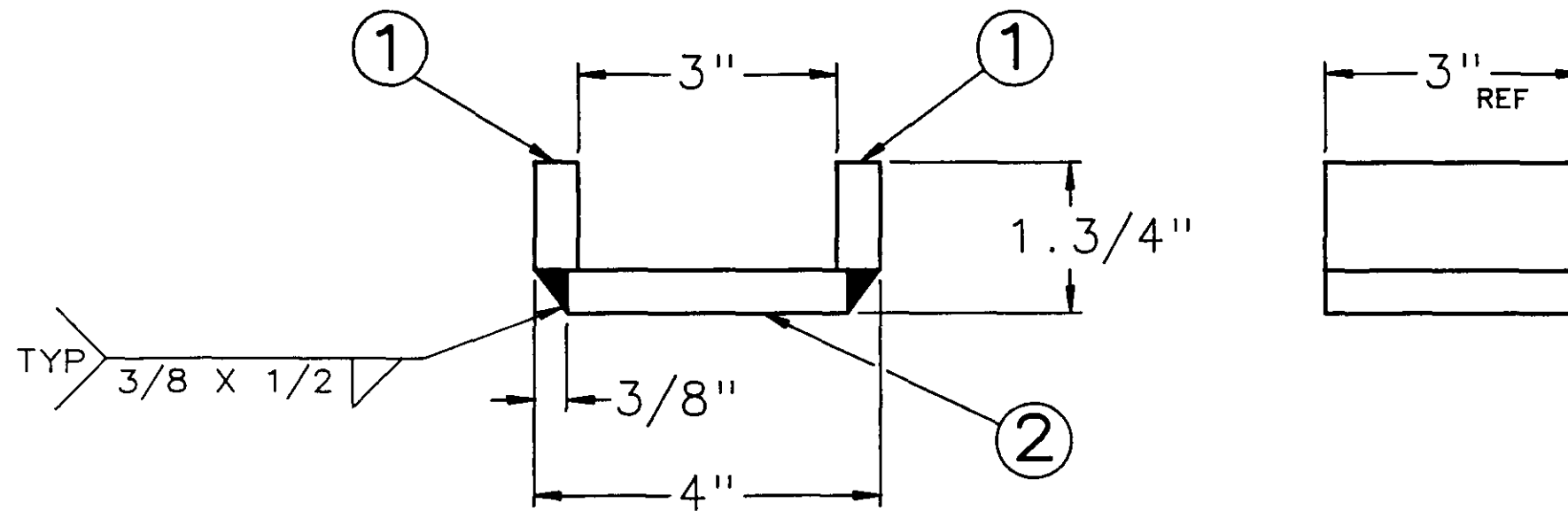
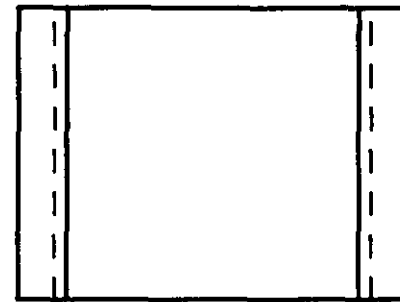


PART NUMBER: 00-0206  
 MAT'L.: BAR, FLAT, 1/2" X 3" HR  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00812AA  
 EST. WT.: 1.59 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b>  <b>FOREST MANAGEMENT          DIVISION</b>															
<table border="1"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>REVISION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>		NO.		BY	DATE	REVISION												
NO.	BY	DATE	REVISION															
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			TITLE: <b>GUSSET</b>															
SCALE: <b>1 = 2</b>		DATE: <b>AUG. 15, 1989</b>	DWG. NO. <b>00-0206A</b>															

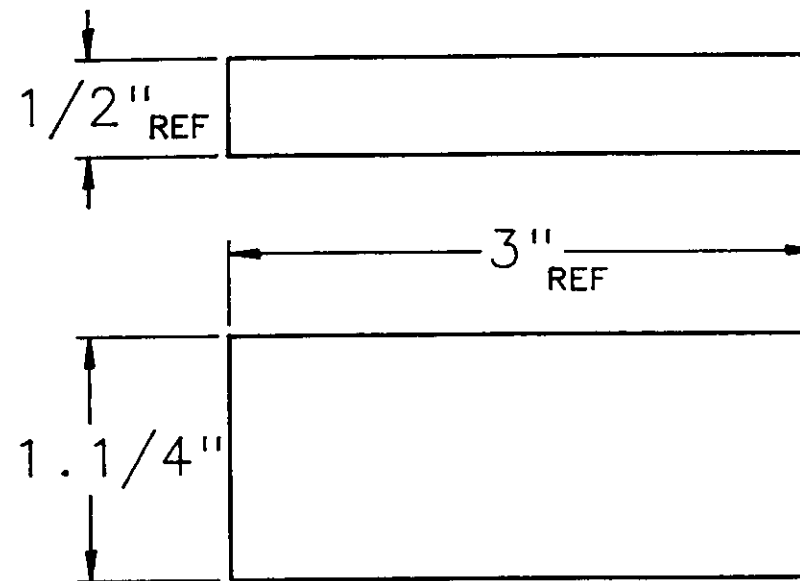
ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0396	A	BAR, FLAT, 1/2" X 3" H.R	2	0.53
2	00-0397	A	BAR, FLAT, 1/2" X 3" H.R.	1	1.38

**NOTE!**  
USE FIXTURE,  
P/N 18-0024.



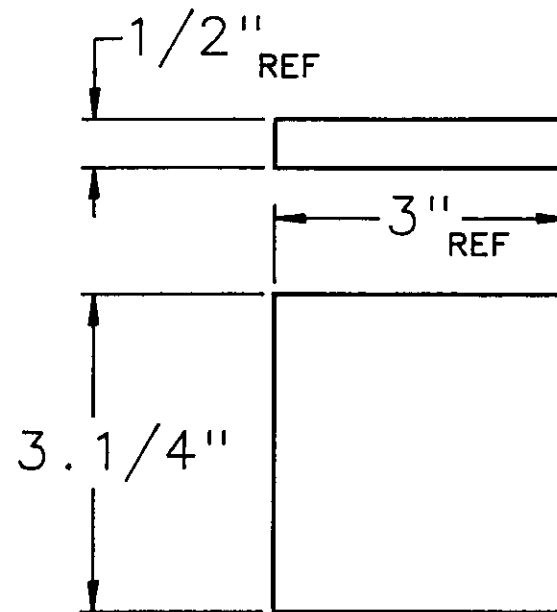
PART NUMBER: 00-0395  
EST. WT.: 2.56 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:			
ANGULAR: ±1 DEG				NO.	BY	DATE	
				REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b>							
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							
TITLE: DRAWBAR RETAINER BRACKET S/W				SCALE: 1 = 2	DATE: AUG. 10, 1989	PROJECT NO.: 88-4	
				DWG. NO. 00-0395B			



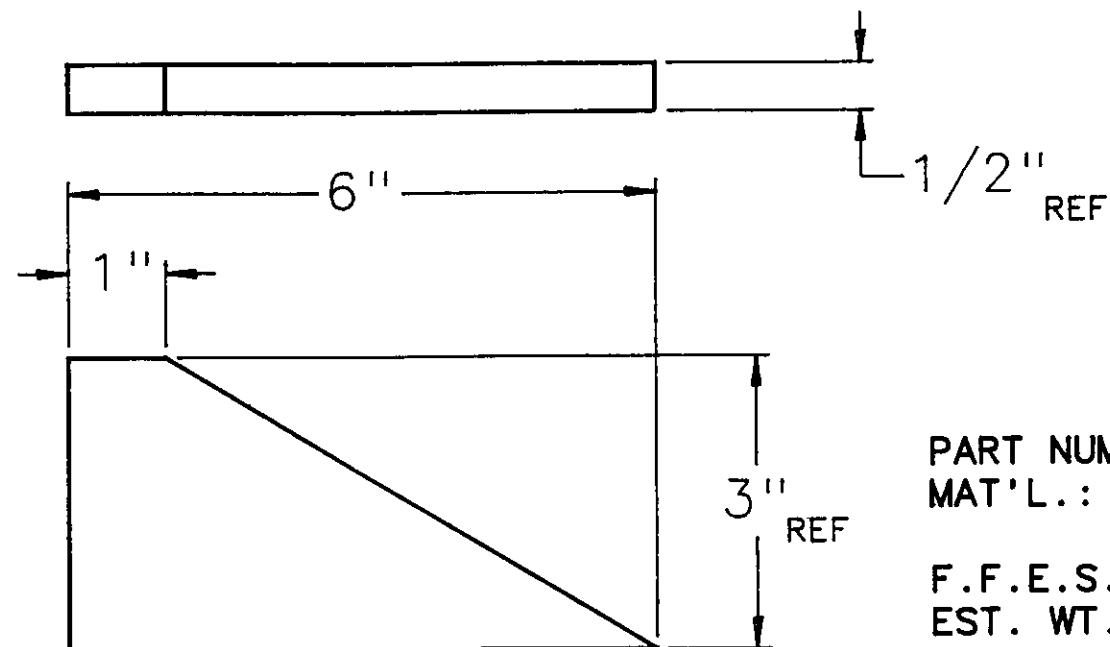
PART NUMBER: 00-0396  
 MAT'L.: BAR, FLAT, 1/2" X 3" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00812AA  
 EST. WT.: 0.53 LBS.

<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 8 TO 6 IN $\pm$ 1/32 6 IN AND UP $\pm$ 1/16 <b>DECIMAL:</b> 1 PLACE $\pm$ 0.1 2 PLACE $\pm$ 0.01 3 PLACE $\pm$ 0.005 <b>ANGULAR:</b> $\pm$ 1 DEG								DRAWN: <b>R. GREENLAW</b>	<b>MICHIGAN          DNR</b>  <b>FOREST MANAGEMENT          DIVISION</b>
								CHECKED: <b>KDB</b>	
								APPROVED:	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653									PROJECT NO.: 88-4
TITLE: <b>BAR, FLAT, 1/2" X 3" H.R.</b>						SCALE: <b>FULL</b>	DATE: <b>AUG. 10, 1989</b>	DWG. NO. <b>00-0396A</b>	



PART NUMBER: 00-0397  
 MAT'L.: BAR, FLAT,  $1/2''$  X  $3''$  H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00812AA  
 EST. WT.: 1.38 LBS.

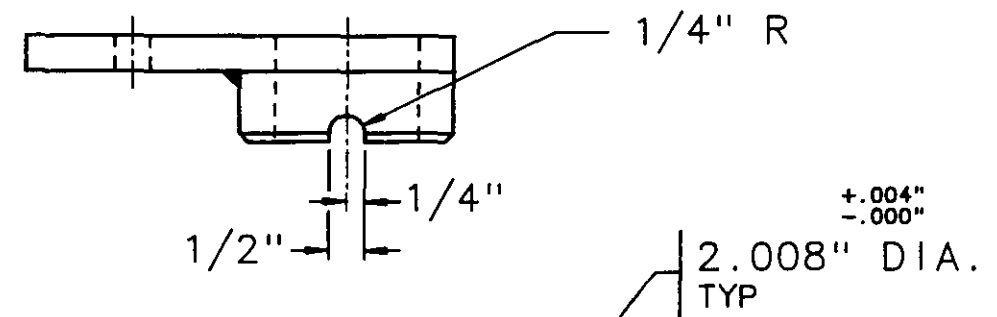
<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>
<b>FRACTIONAL:</b> 0 TO 6 IN $\leftarrow 1/32$ 6 IN AND UP $\leftarrow 1/16$				CHECKED: KDB		
<b>DECIMAL:</b> 1 PLACE $\leftarrow 0.1$ 2 PLACE $\leftarrow 0.01$ 3 PLACE $\leftarrow 0.005$				APPROVED:		
<b>ANGULAR:</b> $\leftarrow 1$ DEG		NO.	BY	DATE	REVISION	FOREST MANAGEMENT DIVISION
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN 48653						PROJECT NO.: 88-4
TITLE: BAR, FLAT, $1/2''$ X $3''$ H.R.			SCALE: 1 = 2	DATE: AUG. 10, 1989	DWS. NO. 00-0397A	



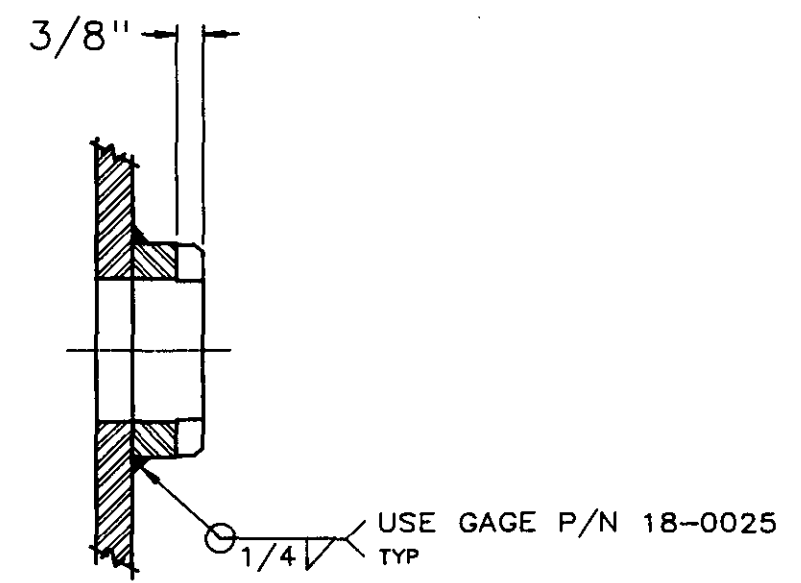
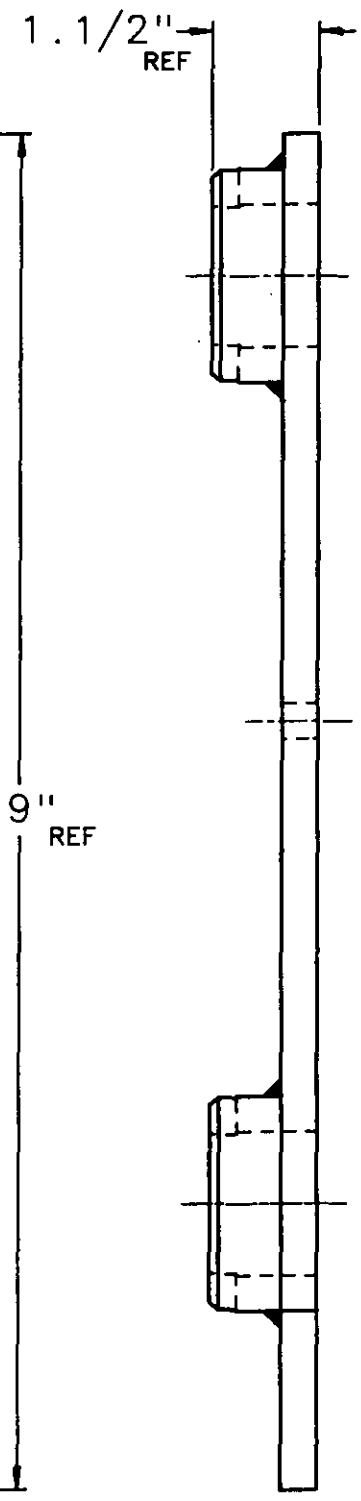
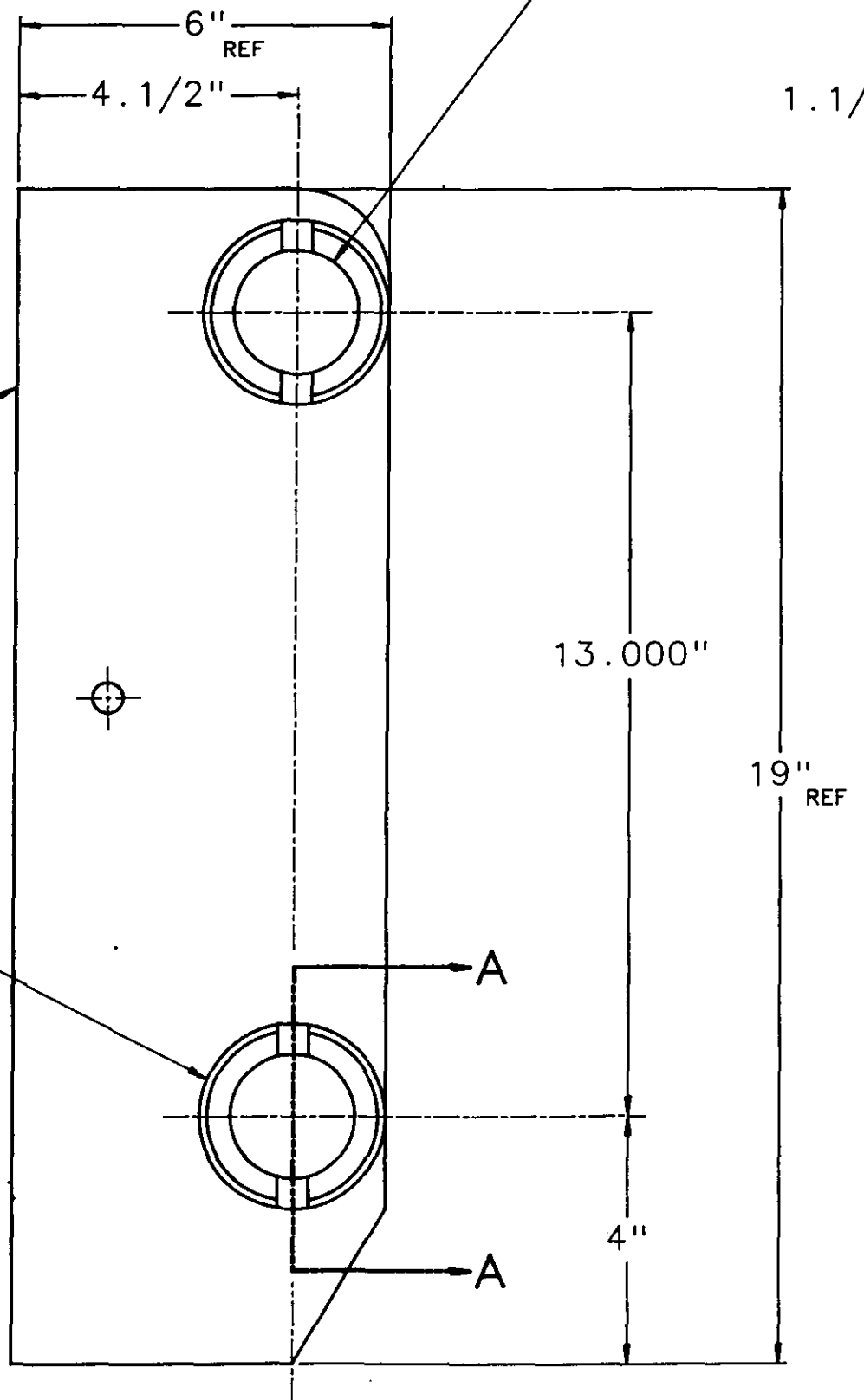
PART NUMBER: 00-0207  
 MAT'L.: BAR, FLAT, 1/2" X 3" HR  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00812AA  
 EST. WT.: 1.49 LBS.

<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 0 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ <b>DECIMAL:</b> 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ <b>ANGULAR:</b> $\pm 1$ DEG								DRAWN: <b>R. GREENLAW</b>	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION		
								CHECKED: <b>KDB</b>			
								APPROVED:			
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653								PROJECT NO.: 88-4			
TITLE: <b>GUSSET</b>						SCALE: 1 = 2		DATE: AUG. 17, 1989		DWG. NO. <b>00-0207A</b>	

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0215	B	BAR, HITCH SIDE	1	15.5
2	00-0216	A	BOSS: 3" OD X 9/16" WALL	2	1.12



**NOTE!**  
MACHINE IN PAIRS  
W/ P/N 00-0400.

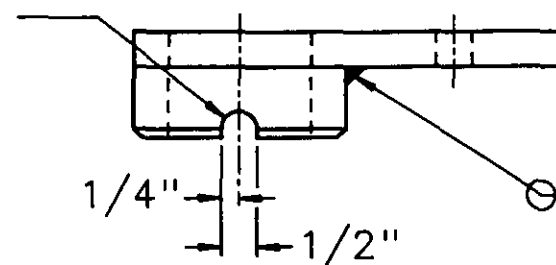


**SECTION A - A**  
TYPICAL

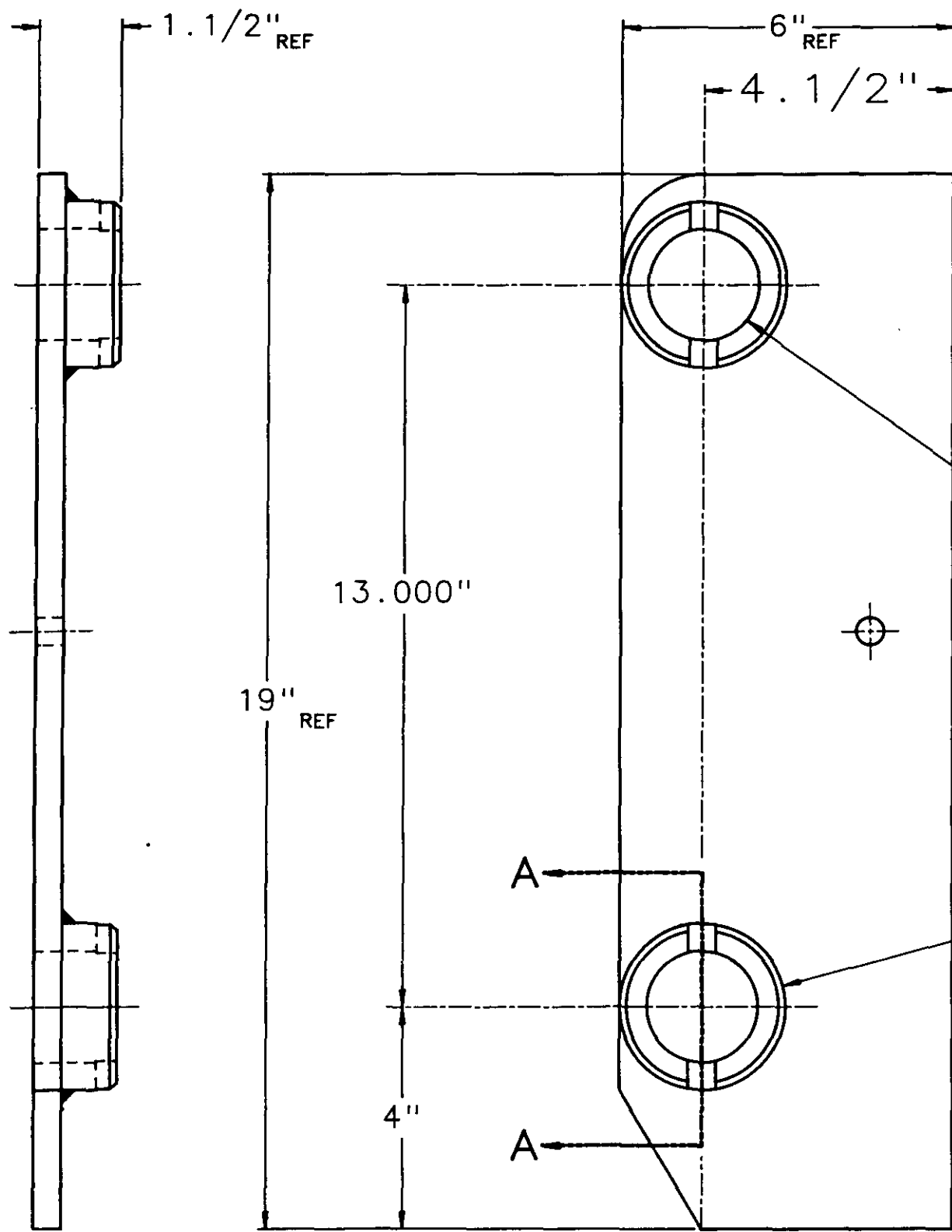
PART NUMBER: 00-0399  
EST. WT.: 17.0 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 3 TO 6 IN ±1/32 6 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 88-4
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		SCALE: 1 = 2 DATE: AUG. 18, 1988	
TITLE: HITCH SIDE, L.H. S/W		DWG. NO. 00-0399C	

1/4" R

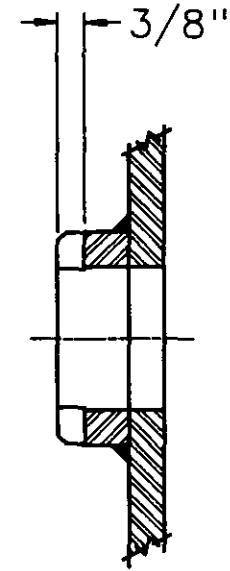


ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0215	B	BAR, HITCH SIDE	1	15.5
2	00-0216	A	BOSS: 3" OD X 9/16" WALL	2	1.12



+0.004"  
-0.000"  
2.008" DIA.  
TYP

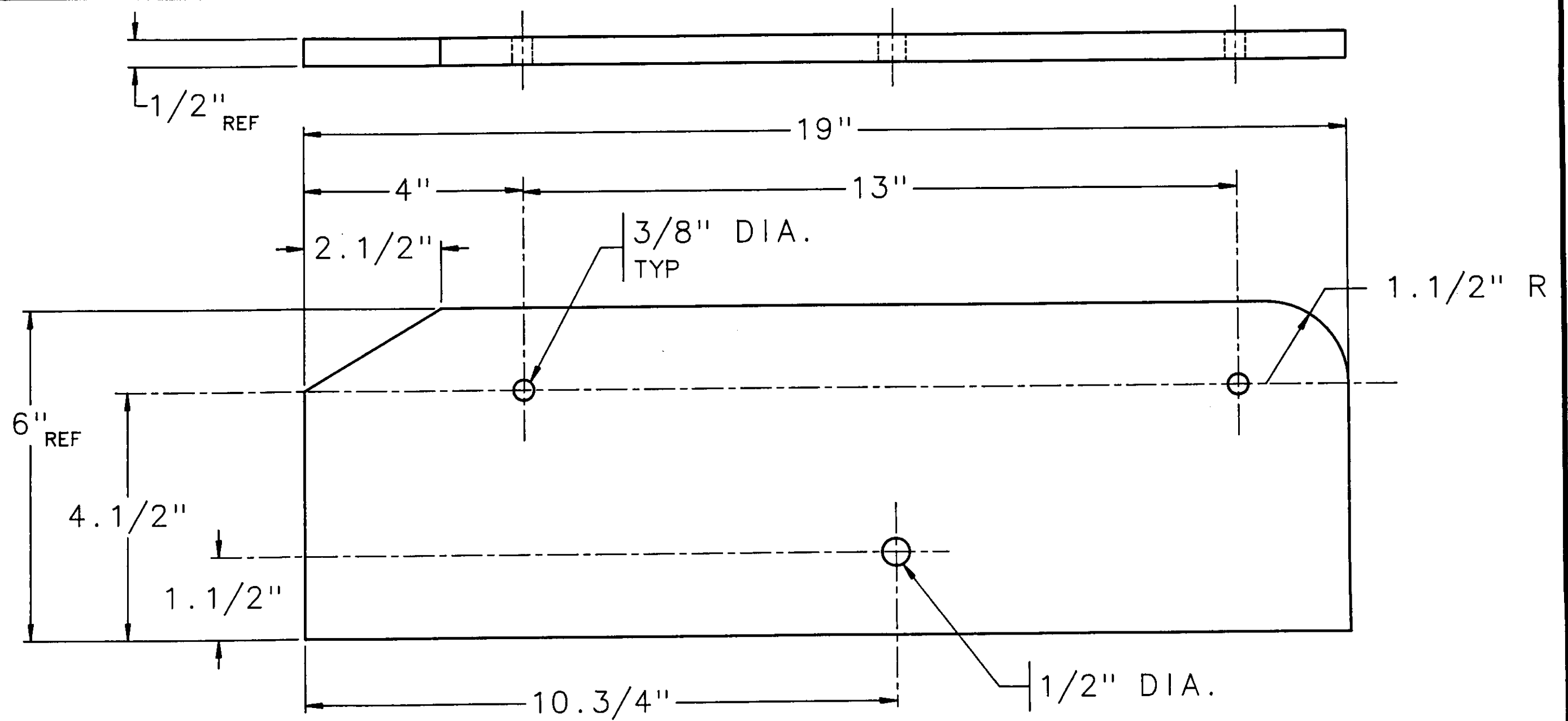
**NOTE!**  
MACHINE IN PAIRS  
W/ P/N 00-0399.



SECTION A - A  
TYPICAL

PART NUMBER: 00-0400  
EST. WT.: 17.0 LBS.

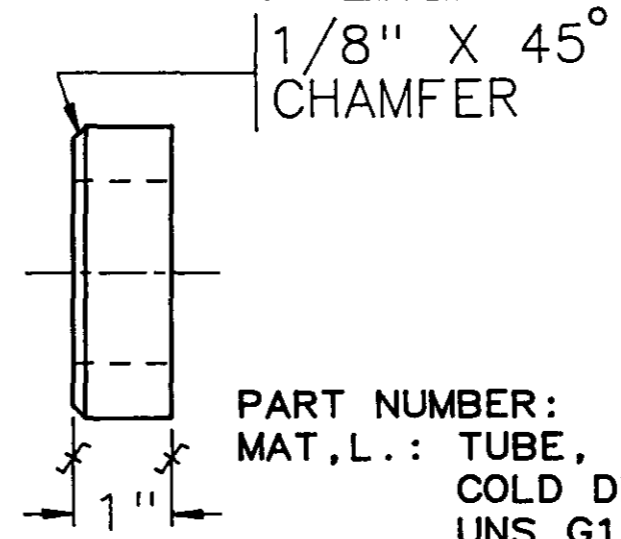
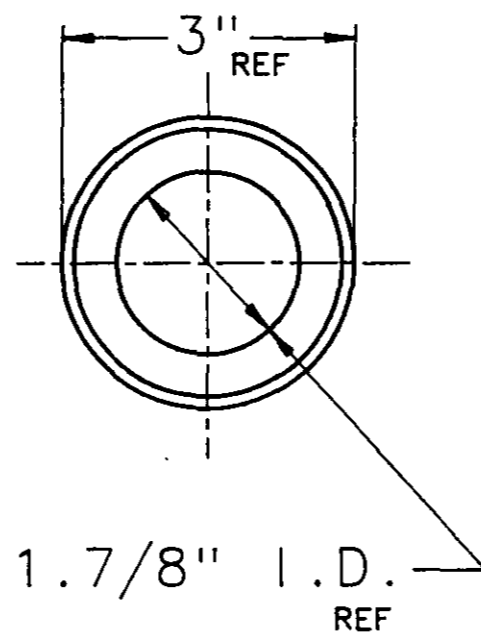
<b>STD. TOLERANCES</b> FRACTIONAL: 6 TO 8 24 -1/20 8 TO 16 48 -1/16 DECIMAL: 1 PLACE - 0.1 2 PLACE - 0.01 3 PLACE - 0.001 ANGULAR: -1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 88-4
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		TITLE: HITCH SIDE, R.H. S/W SCALE: 1 = 2 DATE: AUG. 18, 1988	



PART NUMBER: 00-0215  
 MAT. L.: BAR, FLAT, 1/2" X 6" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00824AA  
 EST. WT.: 15.5 LBS.

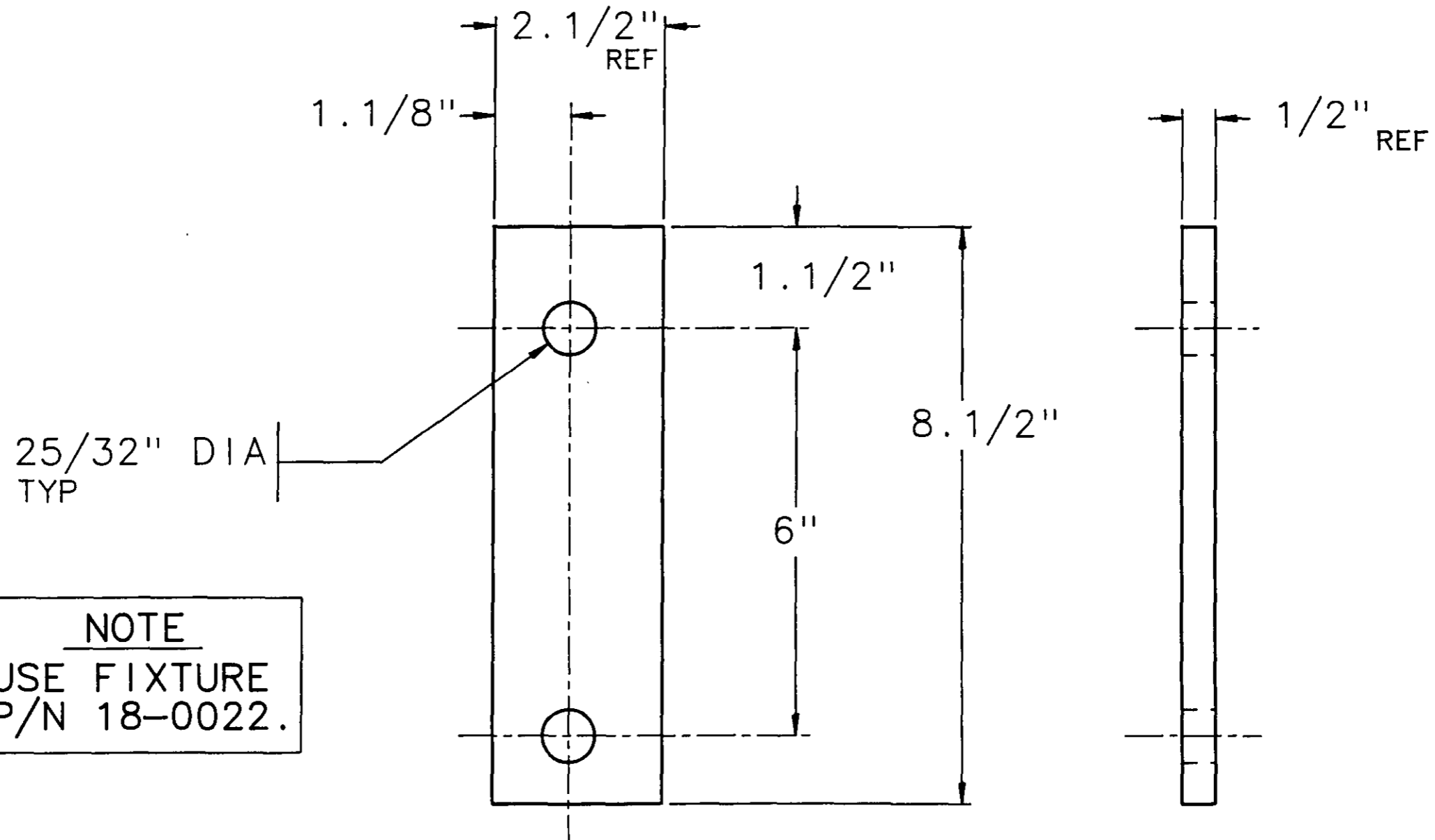
<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN. $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 88-4 DWG. NO. 00-0215B
NO.	BY	DATE	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			SCALE: <b>1 = 2</b> DATE: <b>AUG. 18, 1989</b>
TITLE: <b>BAR, HITCH SIDE</b>			





PART NUMBER: 00-0216  
 MAT. L.: TUBE, RD. 3" OD X 9/16" WALL  
 COLD DRAWN SEAMLESS  
 UNS G10260  
 F.F.E.S. SPEC. NO.: AD-30015BB  
 EST. WT.: 1.12 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b>  <b>FOREST MANAGEMENT          DIVISION</b>							
<table border="1"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>REVISION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		NO.		BY	DATE	REVISION				
NO.	BY	DATE	REVISION							
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			TITLE: <b>BOSS: 3" O.D. X 9/16" WALL</b>							
SCALE: <b>1 = 2</b>		DATE: <b>AUG. 21, 1989</b>	DWG. NO. <b>00-0216A</b>							

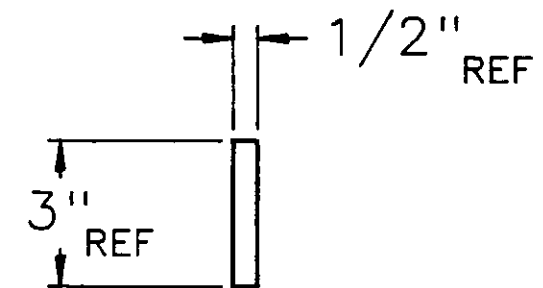
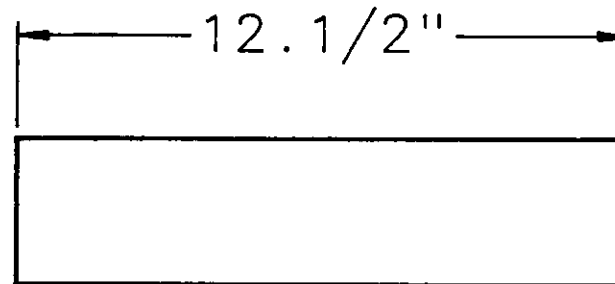


25/32" DIA  
TYP

**NOTE**  
USE FIXTURE  
P/N 18-0022.

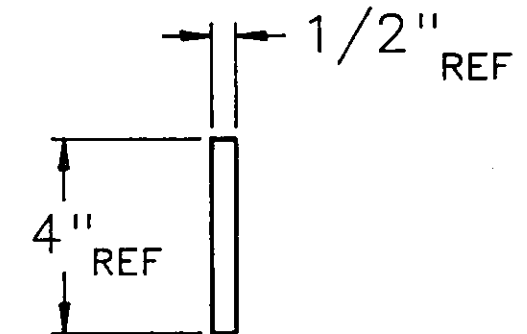
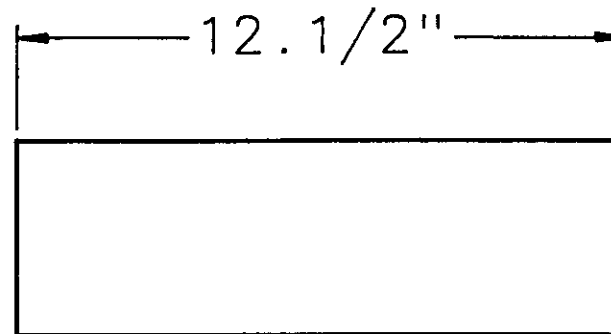
PART NUMBER: 00-0208  
 MAT'L.: BAR, FLAT, 1/2" X 2 1/2" HR  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00810AA  
 EST. WT.: 2.86 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
FRACTIONAL: 6 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB		
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:		
ANGULAR: ±1 DEG NO. BY DATE REVISION				<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		PROJECT NO.: 88-4
TITLE: HITCH MTG. BAR: BOTTOM				SCALE: 1 = 2	DATE: AUG. 25, 1989	DWG. NO. 00-0208B



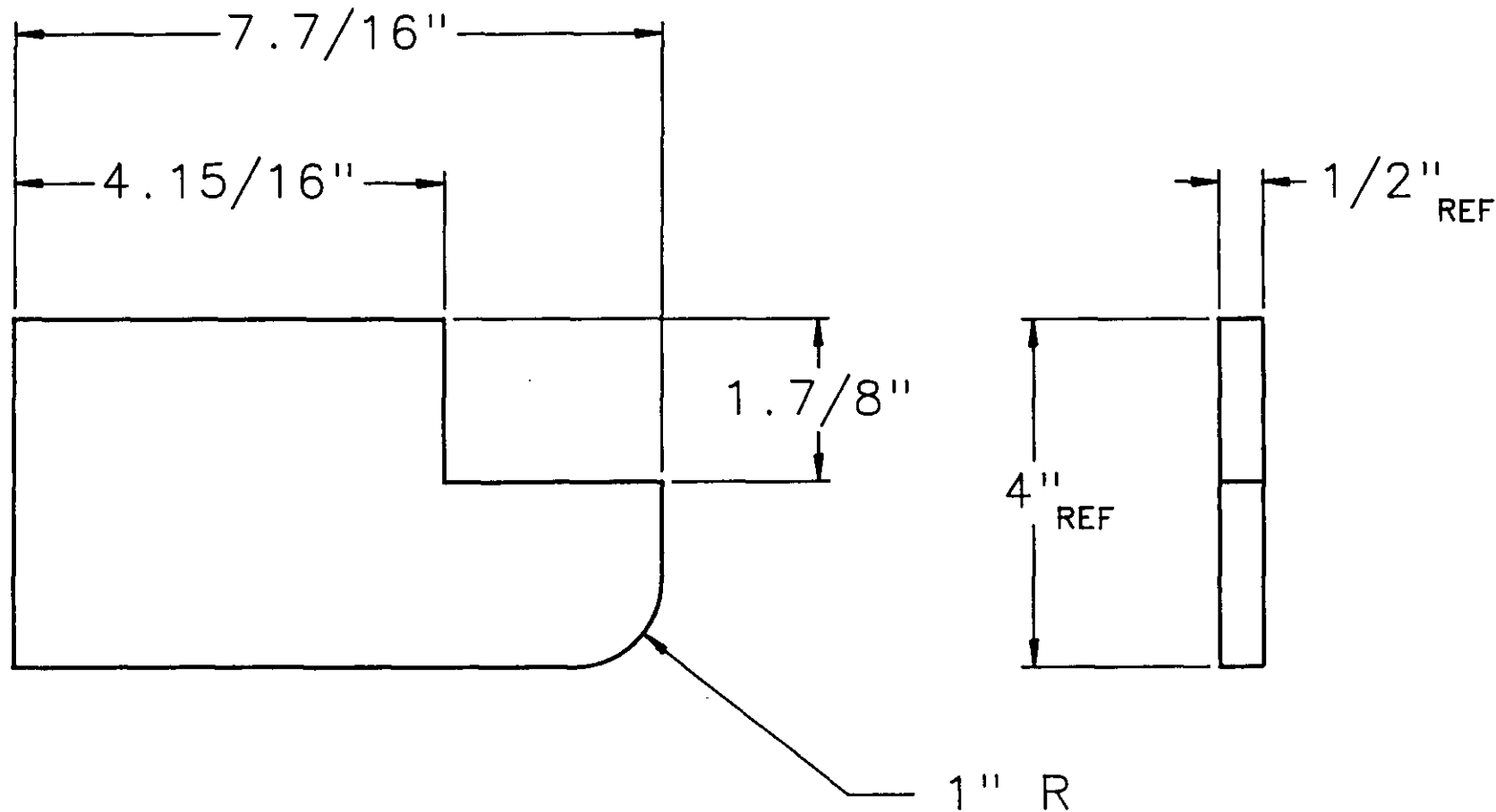
PART NUMBER: 00-0209  
 MAT'L.: BAR, FLAT, 1/2" X 3" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00812AA  
 EST. WT.: 5.31 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
NO. BY DATE	REVISION	PROJECT NO.: 88-4	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			DWG. NO. 00-0209A
TITLE: <b>BAR, FLAT, 1/2" X 3" H.R.</b>		SCALE: <b>1 = 4</b>	DATE: <b>AUG. 25, 1989</b>



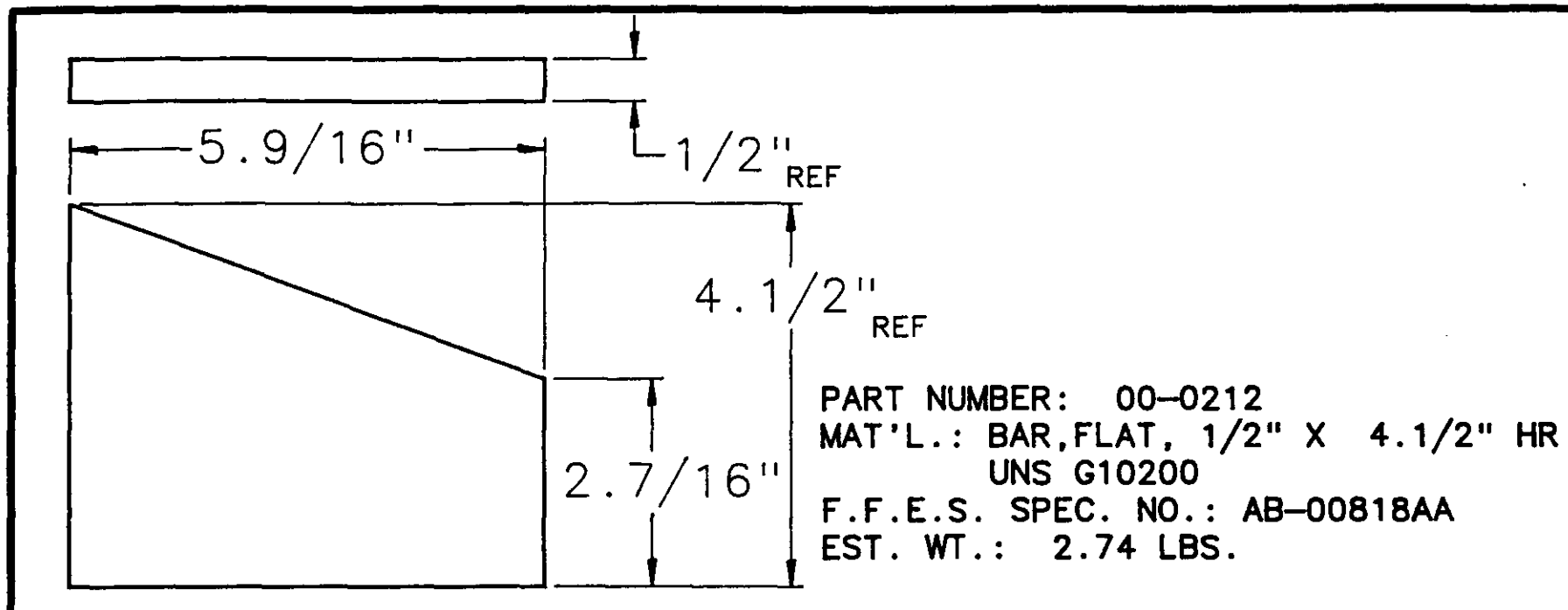
PART NUMBER: 00-0210  
 MAT'L.: BAR, FLAT, 1/2" X 4" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00816AA  
 EST. WT.: 7.07 LBS.

<b>STD. TOLERANCES</b>						DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16						CHECKED: KDB		
DECIMAL:      ANGULAR: 1 PLACE ±0.1      ±1 DEG 2 PLACE ±0.01 3 PLACE ±0.005						APPROVED:		
				NO.	BY	DATE	REVISION	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653								PROJECT NO.: 88-4
TITLE: BAR, FLAT, 1/2" X 4" H.R.						SCALE: 1 = 4	DATE: AUG. 24, 1989	DWG. NO. 00-0210A

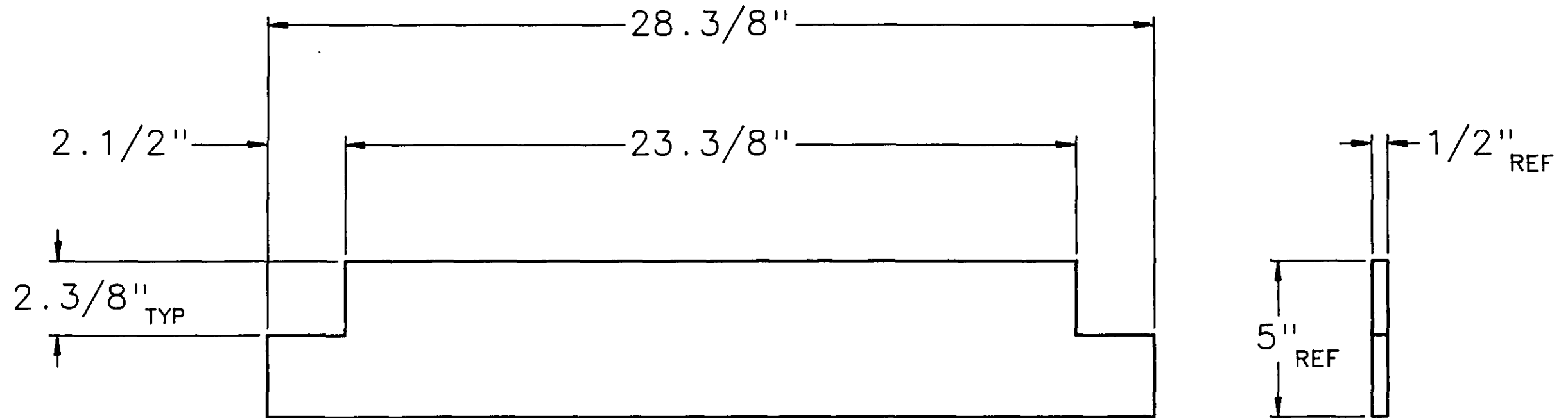


PART NUMBER: 00-0211  
 MAT'L.: BAR, FLAT, 1/2" X 4" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00816AA  
 EST. WT.: 3.53 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 8 IN $\pm 1/32$ 8 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG				DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:				<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION			
NO.		BY		DATE		REVISION					
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653								PROJECT NO.: 88-4			
TITLE: <b>GUSSET</b>						SCALE: 1 = 2		DATE: <b>AUG. 24, 1989</b>		DWG. NO. <b>00-0211B</b>	

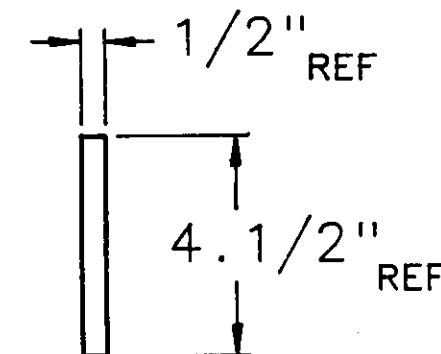
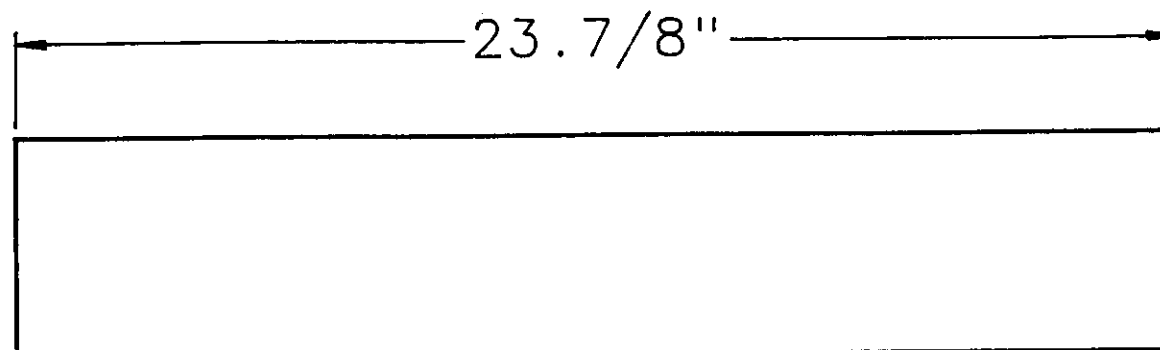


<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN. ±1/32 6 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION															
<table border="1"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>REVISION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>		NO.		BY	DATE	REVISION												
NO.	BY	DATE	REVISION															
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			TITLE: <b>GUSSET</b>															
SCALE: <b>1 = 2</b>		DATE: <b>AUG. 17, 1989</b>	DWG. NO. <b>00-0212A</b>															



PART NUMBER: 00-0213  
 MAT'L.: BAR, FLAT, 1/2" X 5" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00820AA  
 EST. WT.: 18.5 LBS.

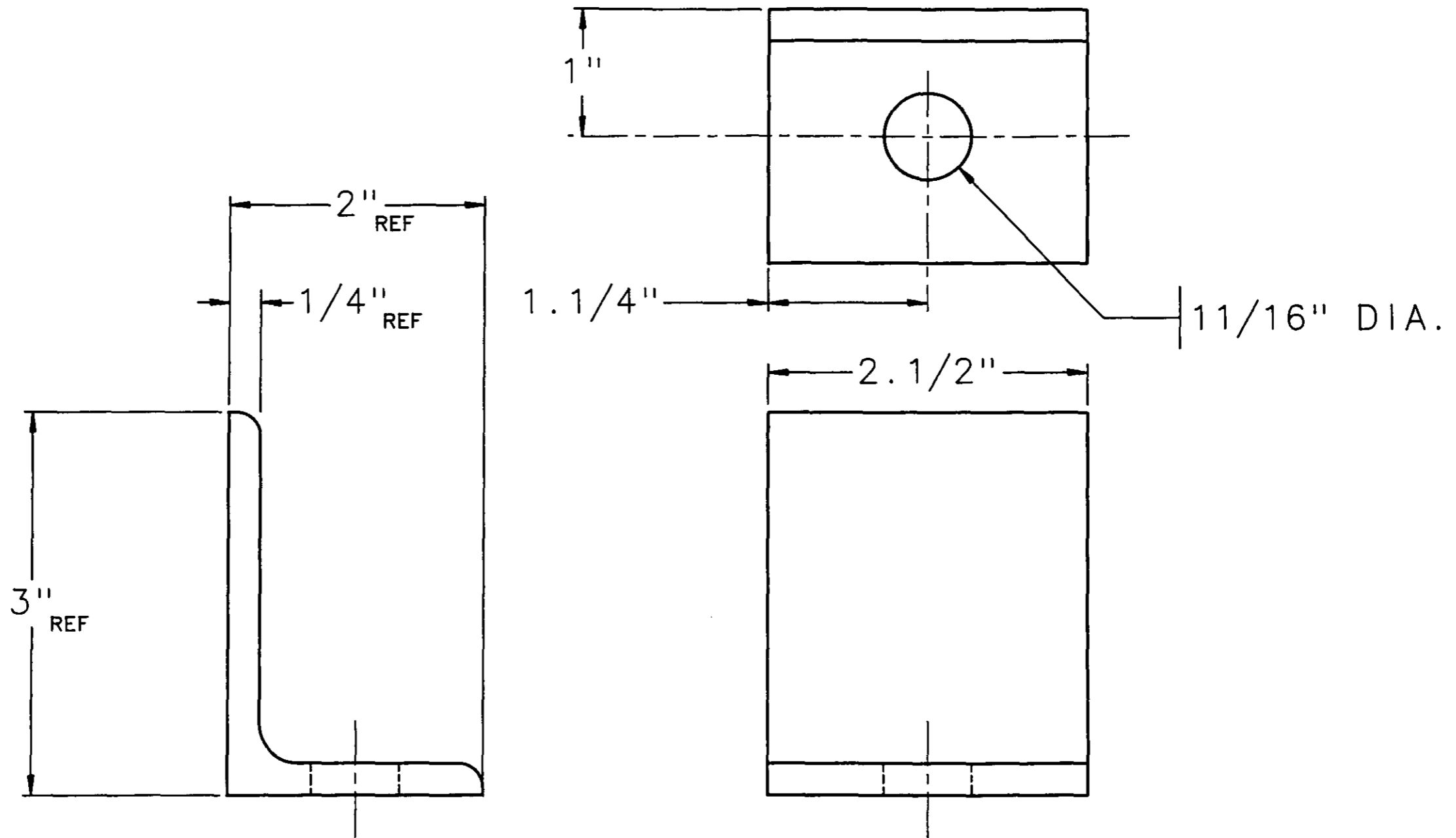
<b>STD. TOLERANCES</b>						DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16						CHECKED: KDB		
DECIMAL:      ANGULAR: 1 PLACE ±0.1      ±1 DEG 2 PLACE ±0.01 3 PLACE ±0.005				NO.	BY	DATE	REVISION	
<b>FOREST FIRE EXPERIMENT STATION</b>								PROJECT NO.: 88-4
P.O. BOX 68      ROSCOMMON, MICHIGAN 48653								DWG. NO. 00-0213B
TITLE: <b>FLANGE</b>						SCALE: 1 = 4	DATE: AUG. 24, 1989	



PART NUMBER: 00-0214  
 MAT'L.: BAR, FLAT, 1/2" X 4.1/2" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00818AA  
 EST. WT.: 15.2 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>  <b>FOREST MANAGEMENT DIVISION</b>
FRACTIONAL: 8 TO 6 IN. ← 1/32 6 IN AND UP ← 1/16				CHECKED: KDB		
DECIMAL: 1 PLACE ← 0.1 2 PLACE ← 0.01 3 PLACE ← 0.005		ANGULAR: ← 1 DEG		APPROVED:		
NO.	BY	DATE	REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653						PROJECT NO.: 88-4
TITLE: BAR, FLAT, 1/2" X 4.1/2" H.R.				SCALE: 1 = 4	DATE: AUG. 23, 1989	DWG. NO. 00-0214A

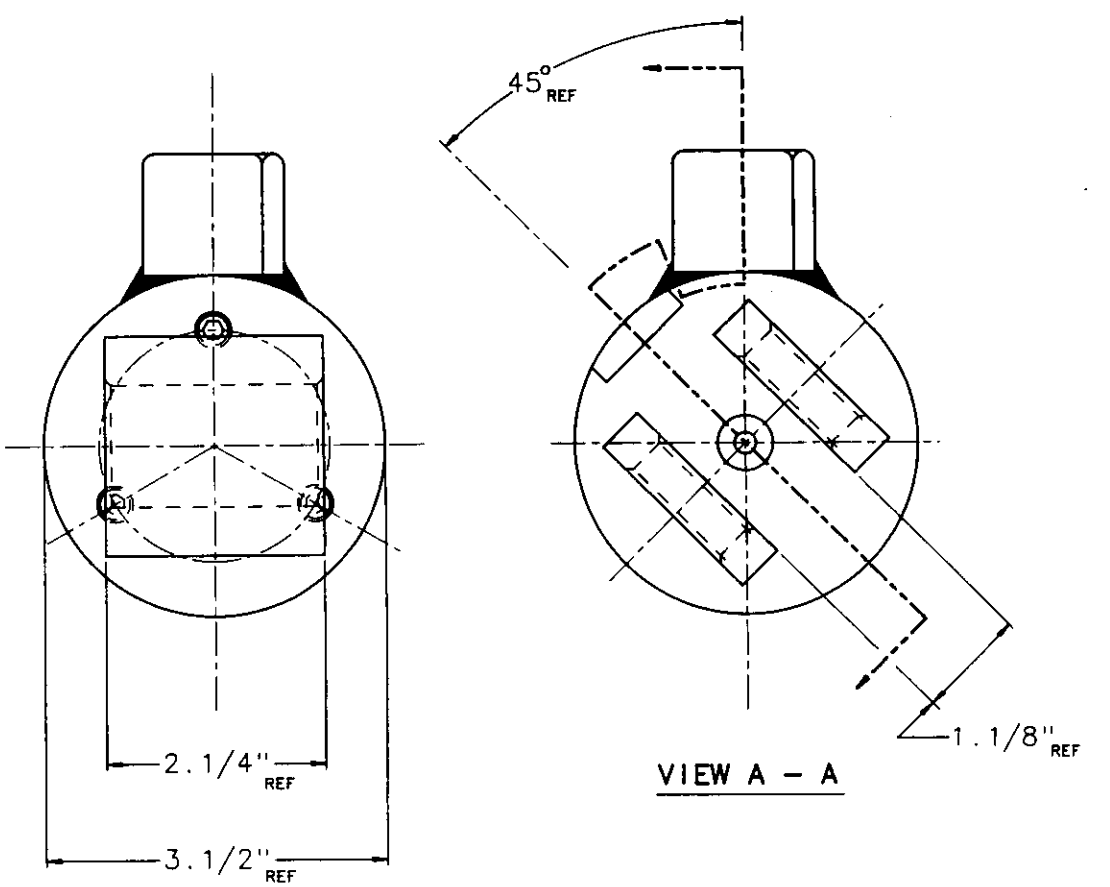
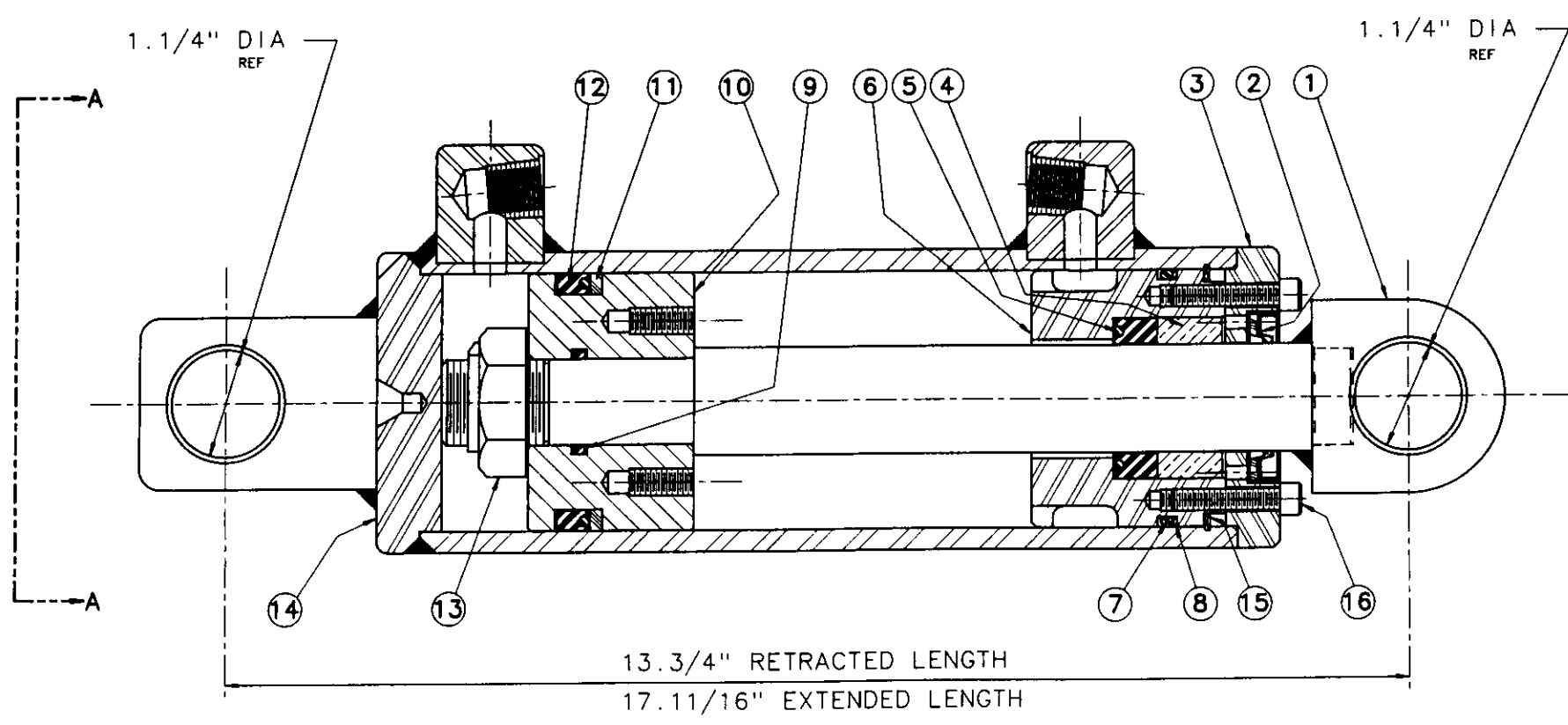
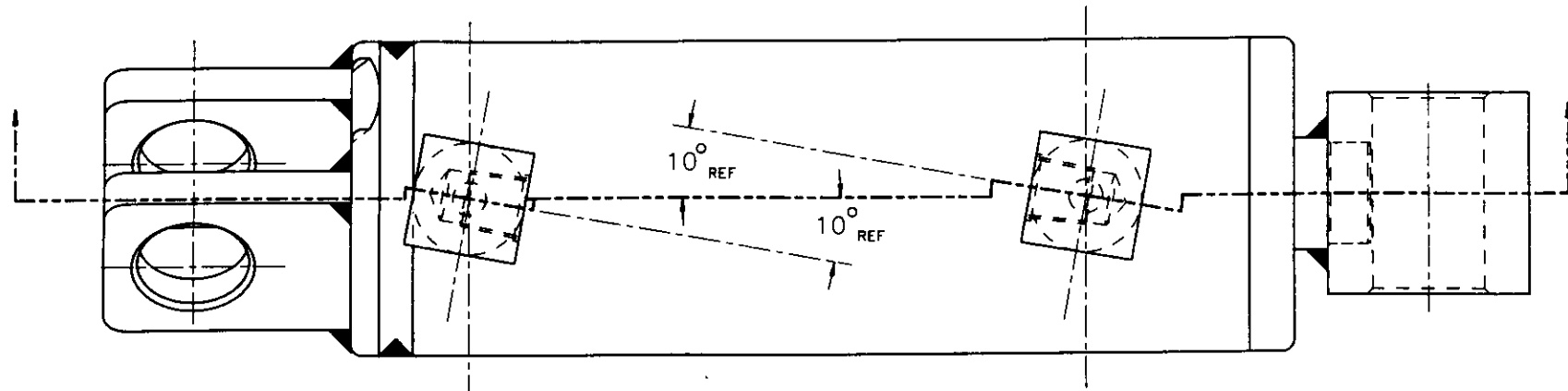




PART NUMBER: 00-0398  
 MAT'L.: ANGLE, 3" X 2" X 1/4" H.R.  
 UNS K02600  
 F.F.E.S. SPEC. NO.: AK-41208AG  
 EST. WT.: 0.83 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:			
ANGULAR: ±1 DEG				NO.	BY	DATE	
				REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b>							
P.O. BOX 68      ROSCOMMON, MICHIGAN 48653							
TITLE: ANGLE, 3" X 2" X 1/4" H.R.				SCALE: FULL	DATE: AUG. 11, 1989	PROJECT NO.: 88-4	
						DWG. NO. 00-0398B	

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	22-0019	B	ROD W/C	1	5.25
2	22-0024	B	OIL SEAL	1	0.06
3	22-0002	B	CAP, BOLTED END	1	1.15
4	22-0004	A	BUSHING, BRONZE	1	0.36
5	22-0023	B	ROD SEAL: "U-CUP"	1	0.05
6	22-0003	B	END GLAND	1	2.49
7	G232-AN70		"O"-RING: 2.3/4" I.D. X 3" O.D. NOM.	1	0.02
8	G232-BT		BACK-UP RING: 2.3/4" I.D. X 3" O.D. NOM.	1	0.01
9	G214-AN70		"O"-RING: 1" I.D. X 1.1/4" O.D. NOM.	1	0.01
10	22-0000	B	PISTON	1	2.77
11	22-0022	B	PISTON SEAL: "PIP RING"	1	0.02
12	22-0021	B	PISTON SEAL: "U-CUP"	1	0.05
13	33-0018	B	LOCKNUT	1	0.19
14	22-0020	C	CASE W/C	1	11.0
15	22-0025	B	RETAINER RING	1	0.03
16	TS-04VH10		SCREW, CAP HEX SOCKET HEAD: 1/4"-28UN X 1.1/4" LONG; BLACK FINISH	3	

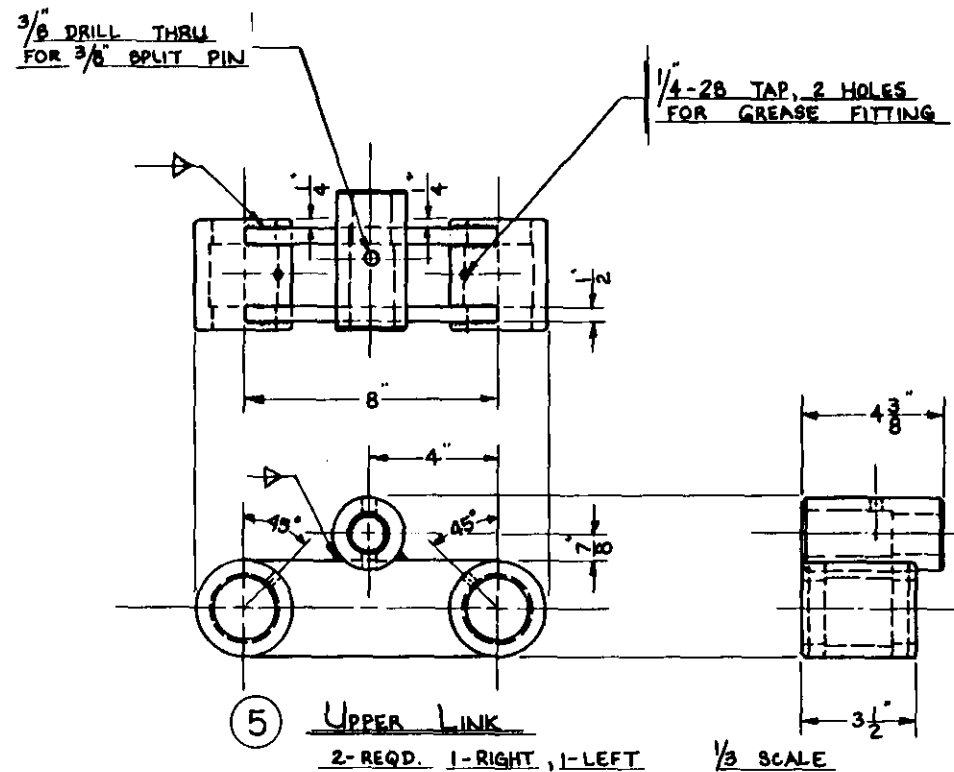


**NOTE !**  
 FOR INTERNAL COMPONENT INSTALLATION, USE TOOL P/N'S 18-0072, 18-0073, 18-0074 & 18-0075. TO EXTRACT THE END GLAND, USE P/N 18-0071.

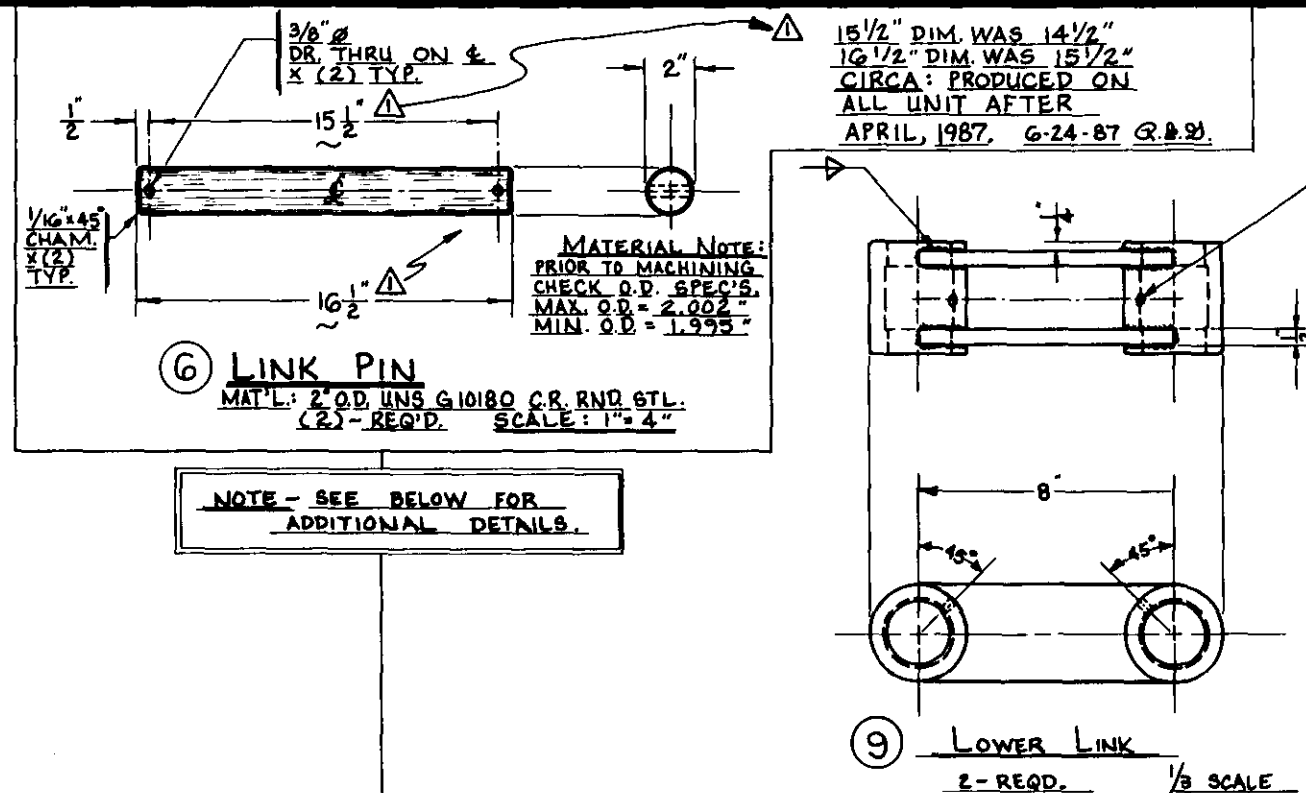
**NOTE**  
 ROD DIA. = 1.1/4"  
 STROKE = 3.15/16"  
 BORE = 3"  
 PORTS = 3/8" NPT FEMALE

PART NUMBER: 22-0018  
 EST. WT.: 24.5 LBS.

STD. TOLERANCES		DRAWN:		MICHIGAN DNR FOREST MANAGEMENT DIVISION
FRACTIONAL:		BY: R. GREENLAW		
DECIMAL:		CHECKED: KDB		
DATE:		APPROVED:		PROJECT NO.: 84-19
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653				DWG NO.: 22-0018D
TITLE: TRACTOR HITCH HYD. CYL. ASSEMBLY: 3" BORE SCALE: FULL DATE: DEC. 14, 1990				

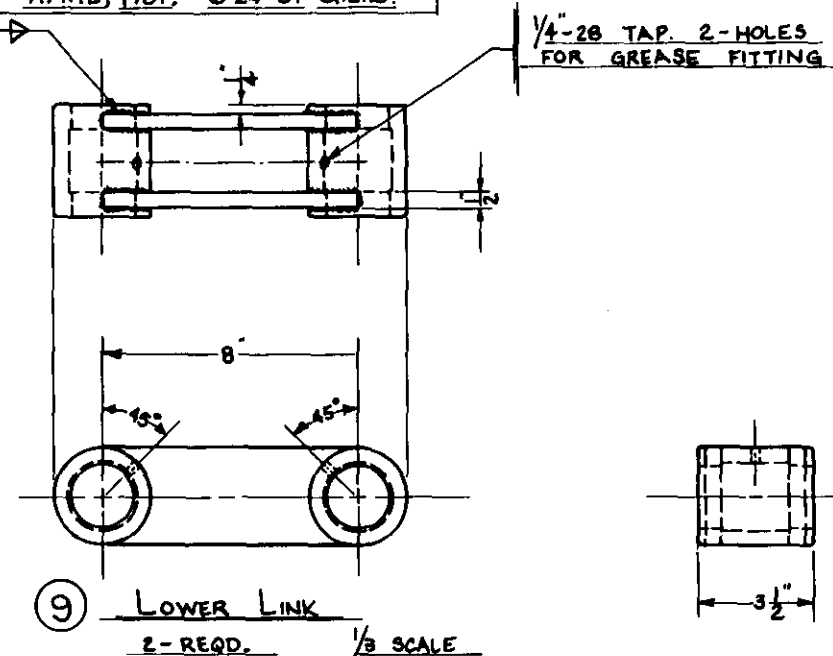


5 UPPER LINK  
2-REQD. 1-RIGHT, 1-LEFT 1/3 SCALE

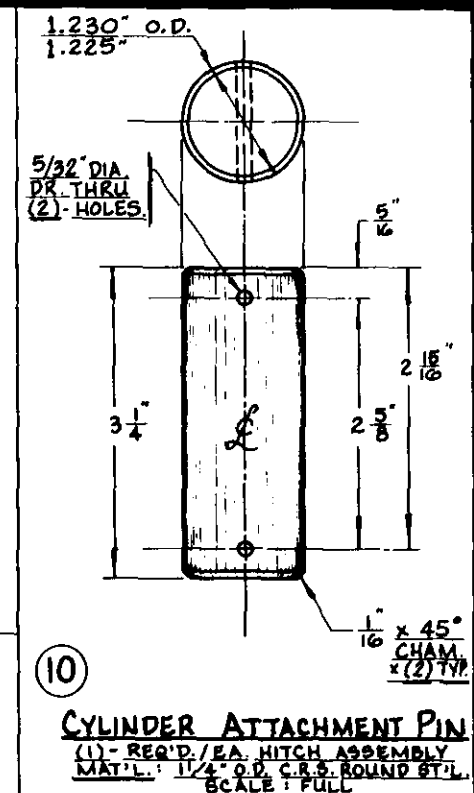


6 LINK PIN  
MAT'L: 2" O.D. UNS G10180 C.R. RND STL.  
(2) - REQ'D. SCALE: 1" = 4"

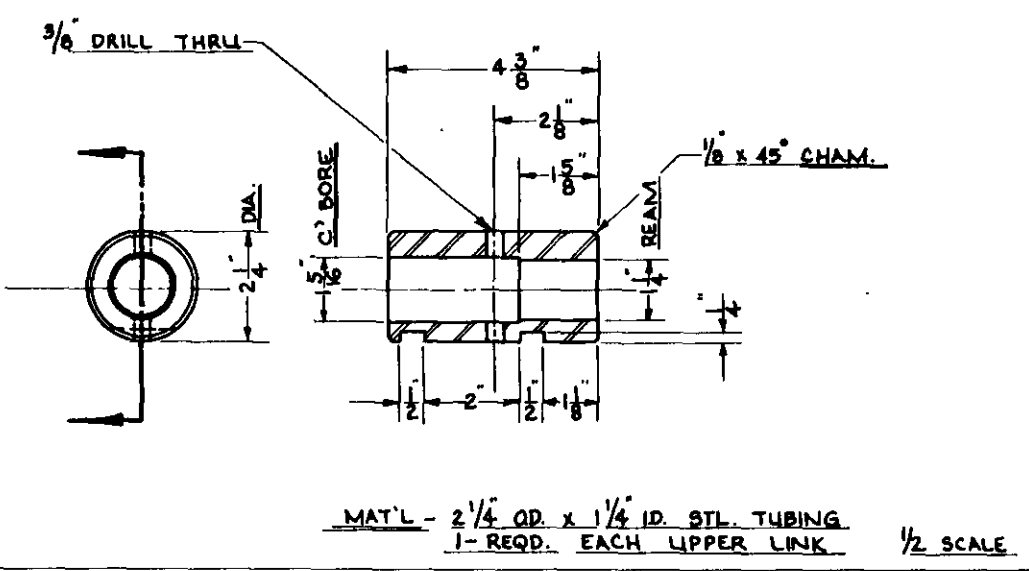
NOTE - SEE BELOW FOR ADDITIONAL DETAILS.



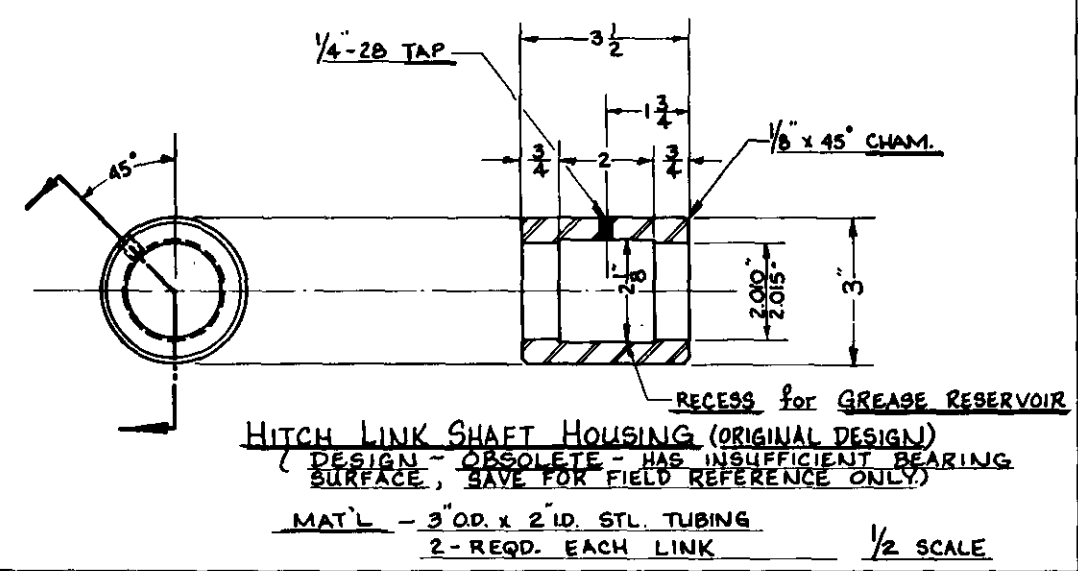
9 LOWER LINK  
2-REQD. 1/3 SCALE



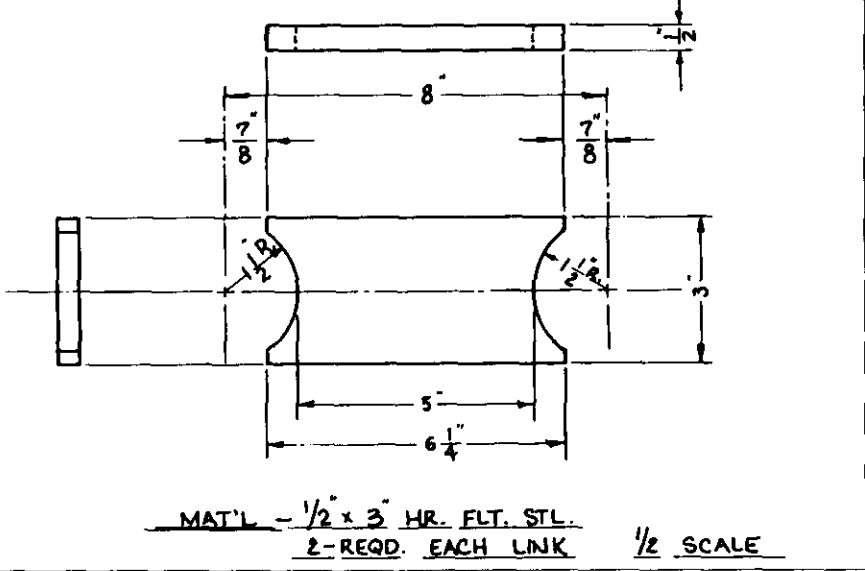
10 CYLINDER ATTACHMENT PIN  
(1) - REQ'D. / EA. HITCH ASSEMBLY  
MAT'L: 1 1/4" O.D. C.R. RND STL.  
SCALE: FULL



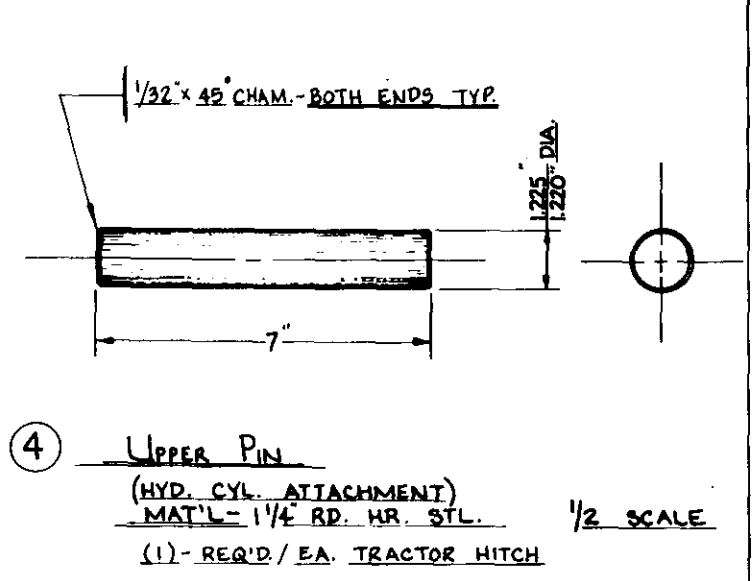
MAT'L - 2 1/4" O.D. x 1/4" I.D. STL. TUBING  
1-REQD. EACH UPPER LINK 1/2 SCALE



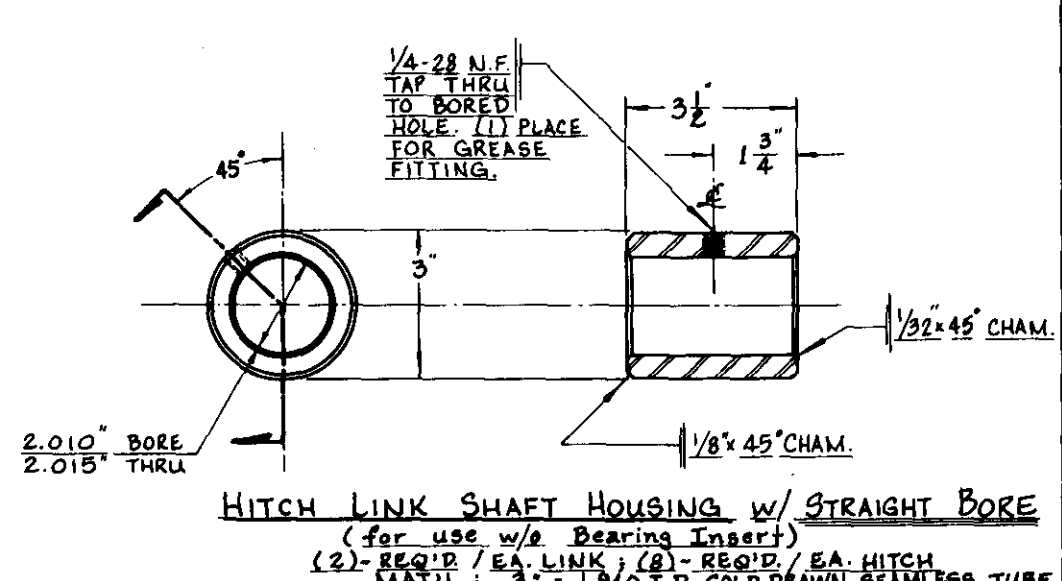
HITCH LINK SHAFT HOUSING (ORIGINAL DESIGN)  
(DESIGN - OBSOLETE - HAS INSUFFICIENT BEARING SURFACE, SAVE FOR FIELD REFERENCE ONLY)  
MAT'L - 3" O.D. x 2" I.D. STL. TUBING  
2-REQD. EACH LINK 1/2 SCALE



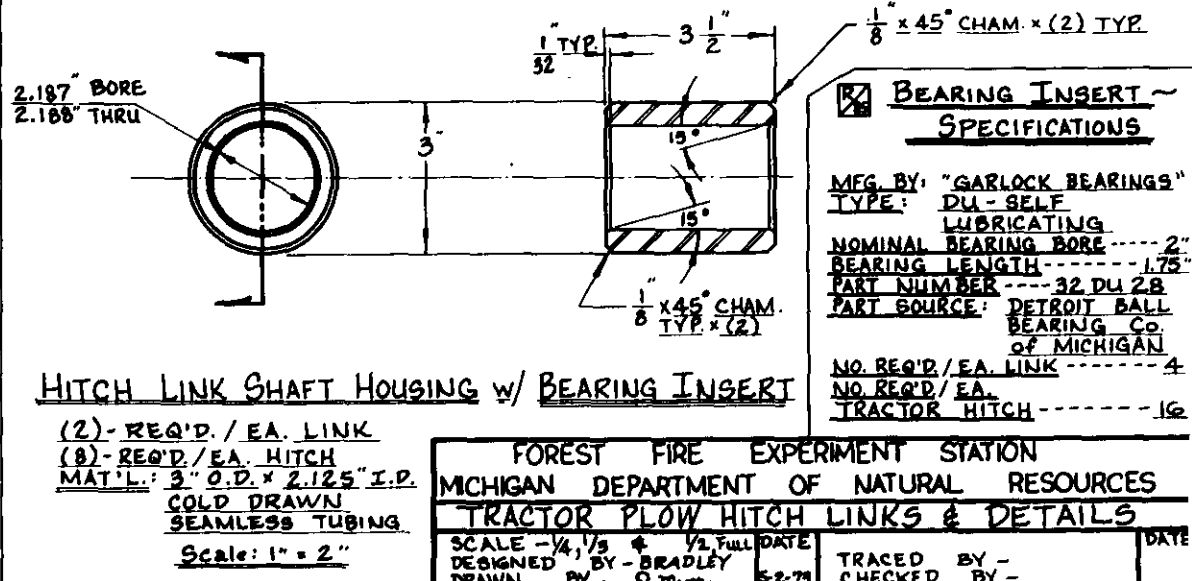
MAT'L - 1/2" x 3" HR. FLT. STL.  
2-REQD. EACH LINK 1/2 SCALE



4 UPPER PIN  
(HYD. CYL. ATTACHMENT)  
MAT'L - 1 1/4" RD. HR. STL.  
(1) - REQ'D. / EA. TRACTOR HITCH 1/2 SCALE



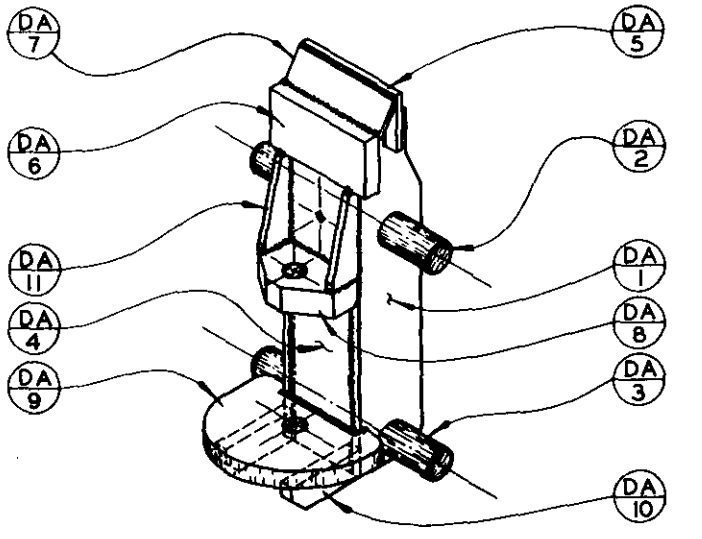
HITCH LINK SHAFT HOUSING w/ STRAIGHT BORE  
(for use w/o Bearing Insert)  
(2) - REQ'D. / EA. LINK; (8) - REQ'D. / EA. HITCH  
MAT'L: 3" x 1.940 I.D. COLD DRAWN SEAMLESS TUBE  
SCALE: 1" = 2"



HITCH LINK SHAFT HOUSING w/ BEARING INSERT  
(2) - REQ'D. / EA. LINK  
(8) - REQ'D. / EA. HITCH  
MAT'L: 3" O.D. x 2.125" I.D. COLD DRAWN SEAMLESS TUBING  
SCALE: 1" = 2"

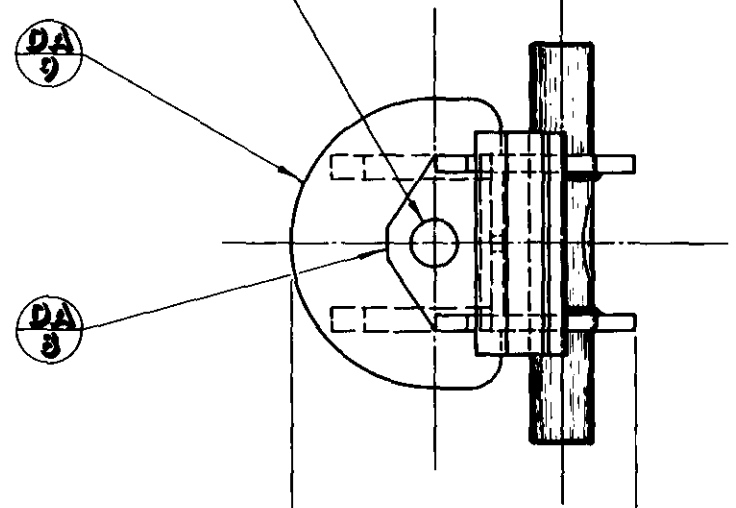
**BEARING INSERT - SPECIFICATIONS**  
 MFG. BY: GARLOCK BEARINGS  
 TYPE: DU-SELE LUBRICATING  
 NOMINAL BEARING BORE: 2"  
 BEARING LENGTH: 1.75"  
 PART NUMBER: 32 DU 2.8  
 PART SOURCE: DETROIT BALL BEARING CO. OF MICHIGAN  
 NO. REQ'D. / EA. LINK: 4  
 NO. REQ'D. / EA. TRACTOR HITCH: 16

FOREST FIRE EXPERIMENT STATION  
 MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
 TRACTOR PLOW HITCH LINKS & DETAILS  
 SCALE: 1/4, 1/8, 1/2, FULL DATE  
 DESIGNED BY: BRADLEY  
 DRAWN BY: [Signature]  
 REVISED BY: [Signature]  
 TRACED BY: [Signature]  
 CHECKED BY: [Signature]  
 APPROVED BY: [Signature]



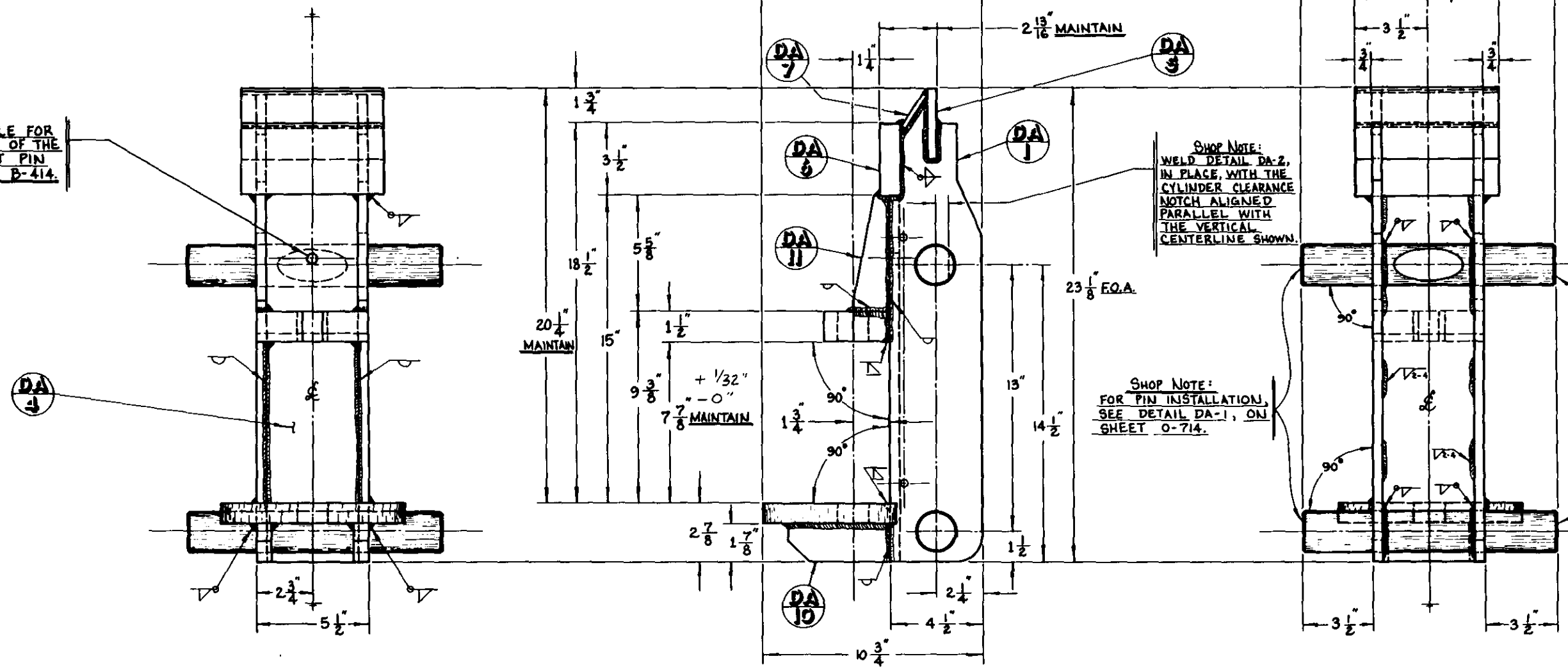
**PICTORIAL VIEW**  
JOHN DEERE 350 CRAWLER TRACTOR  
FLOW DEPTH ADJUSTER

1/2" DIA. BEAM THRU  
(2) PLACES TYP. IN-LINE.  
AFTER ALL WELDING IS COMPLETED.



PART NO.	TOTAL REQD.	EST. WEIGHT PER EA. IN Lbs.	PART NAME OR DESCRIPTION	PRINT
DA-1	2	11.72	DEPTH ADJUSTER SIDE PLATE	0-714
DA-2	1	11.00	TOP HORIZONTAL PIN	0-713
DA-3	1	11.12	LOWER HORIZONTAL PIN	0-713
DA-4	1	11.36	INTERNAL VERTICAL SPACER PLATE	0-713
DA-5	1	3.47	FLOW LATCH RETAINER PLATE	0-713
DA-6	1	6.94	FLOW LATCH BUMPER PLATE	0-713
DA-7	1	.99	FLOW LATCH GUIDE PLATE	0-713
DA-8	1	6.62	UPPER PIVOT PLATE	0-713
DA-9	1	13.54	LOWER PIVOT PLATE	0-713
DA-10	2	1.61	LOWER PIVOT PLATE GUSSET	0-713
DA-11	2	1.36	UPPER PIVOT PLATE GUSSET	0-713

17/32" DIA. HOLE FOR  
INSTALLATION OF THE  
VERTICAL PIVOT PIN  
RETAINER SEE B-414.



SHOP NOTE:  
WELD DETAIL DA-2,  
IN PLACE, WITH THE  
CYLINDER CLEARANCE  
NOTCH ALIGNED  
PARALLEL WITH  
THE VERTICAL  
CENTERLINE SHOWN.

SHOP NOTE:  
FOR PIN INSTALLATION,  
SEE DETAIL DA-1, ON  
SHEET 0-714.

BILL OF MATERIAL			
ITEM NO.	DESCRIPTION OF ITEM	AMOUNT IN INCHES	AMOUNT IN FEET
1	1/4" x 2" UNS G10200 H.R. FLAT STEEL	7"	.59'
2	1/2" x 1 1/2" UNS G10200 H.R. FLAT STEEL	12"	1.00'
3	1/2" x 3 1/2" UNS G10200 H.R. FLAT STEEL	7"	.99'
4	1/2" x 4 1/2" UNS G10200 H.R. FLAT STEEL	6 1/4"	5.34'
5	3/8" x 5" UNS G10200 H.R. FLAT STEEL	4"	.34'
6	1" x 3 1/2" UNS G10200 H.R. FLAT STEEL	7"	.99'
7	1" x 7" UNS G10200 H.R. FLAT STEEL	9"	.75'
8	1 1/2" x 5 1/2" UNS G10200 H.R. FLAT STEEL	3.25"	.28'
9	2" O.D. UNS G10180 C.R. ROUND STEEL	26"	2.17'

**J.D. 350 TRACTOR: DEPTH ADJUSTER WELDMENT**

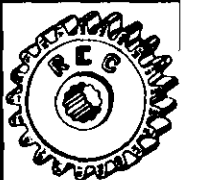
THIS FLOW DEPTH ADJUSTER IS  
DESIGNED FOR USE WITH THE JOHN  
DEERE 350 CRAWLER TRACTOR HITCH  
BRACKET, SEE DRAWING NO'S. O-368R  
& P-79.

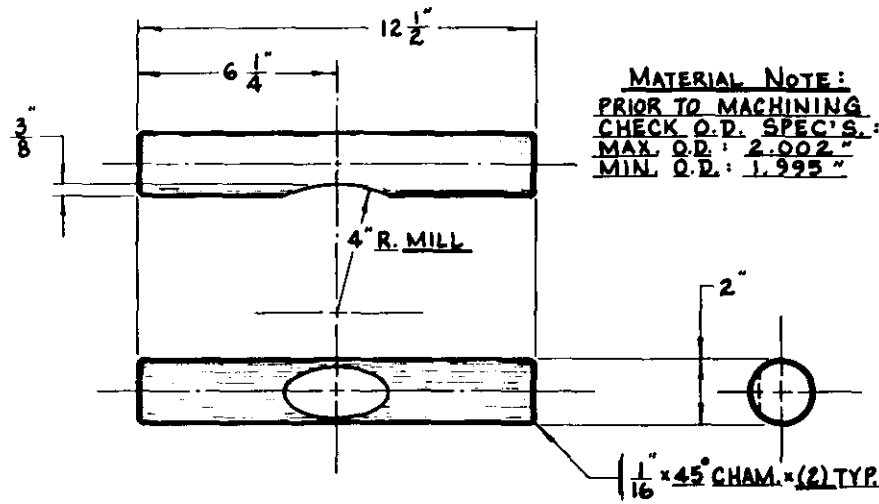
APPROX. FINISHED WEIGHT = 95.4 lbs.

MICHIGAN FOREST FIRE EXPERIMENT STATION  
ROSCOMMON EQUIPMENT CENTER PROJECT

J.D.-350 TRACTOR: HYDRAULIC DEPTH ADJUSTER ASS'Y.

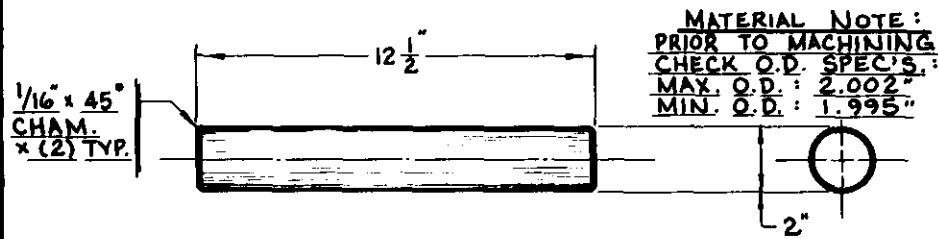
SCALE: 1" = 3"  
DESIGNED BY: MAX A. BRADLEY  
DRAWN BY: Richard E. Brennan  
TRACED BY:  
DATE: 1970  
3-27-86  
CHECKED BY:  
APPROVED BY:  
REVISOR: Richard E. Brennan  
DATE: 3-24-86





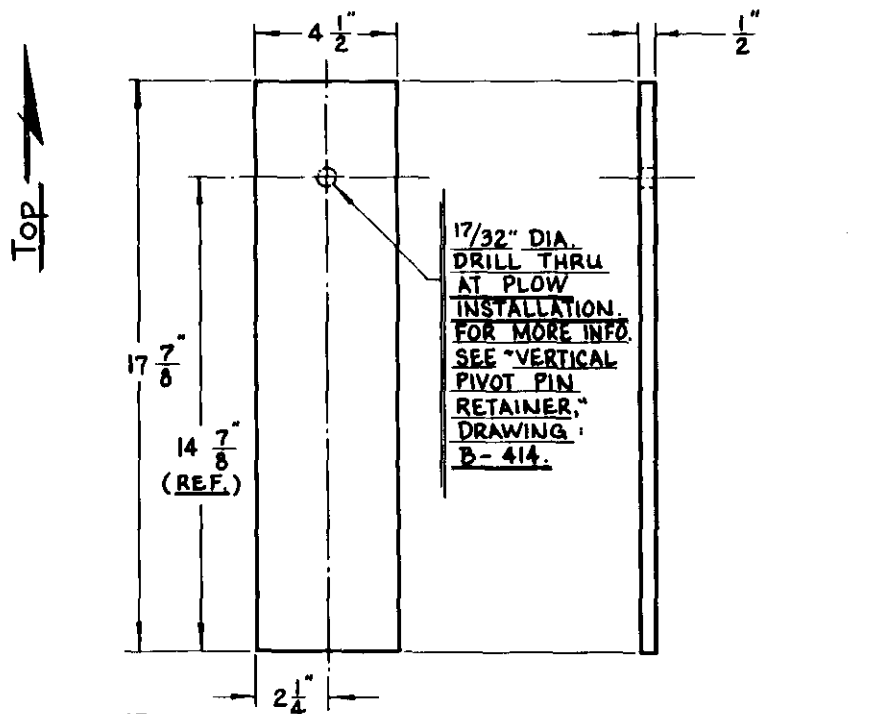
**MATERIAL NOTE:**  
 PRIOR TO MACHINING  
 CHECK O.D. SPEC'S:  
 MAX. O.D.: 2.002"  
 MIN. O.D.: 1.995"

**DA-2 TOP HORIZONTAL PIN**  
 (1) - REQ'D / EA. DEPTH ADJUSTER  
 MAT'L.: 2" O.D. UNS G10180 C.R. ROUND STEEL  
 SCALE: 1" = 3"  
 EST. WT. / EA. = 11.0 lbs.

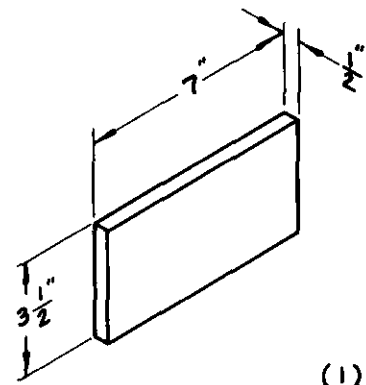


**MATERIAL NOTE:**  
 PRIOR TO MACHINING  
 CHECK O.D. SPEC'S:  
 MAX. O.D.: 2.002"  
 MIN. O.D.: 1.995"

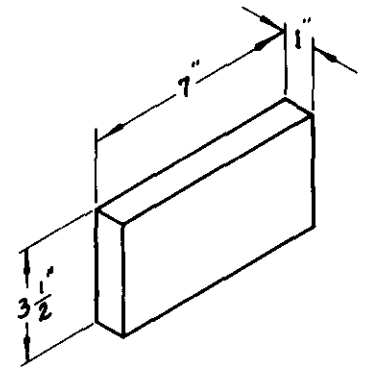
**DA-3 LOWER HORIZONTAL PIN**  
 (1) - REQ'D / EA. DEPTH ADJUSTER  
 MAT'L.: 2" O.D. UNS G10180 C.R. ROUND STEEL  
 SCALE: 1" = 3"  
 EST. WT. / EA. = 11.12 lbs.



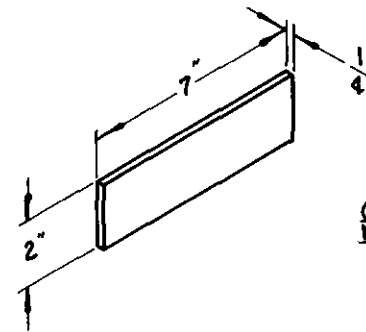
**DA-4 INTERNAL VERTICAL SPACER PLATE**  
 (1) - REQ'D / EA. DEPTH ADJUSTER  
 MAT'L.: 1/2" x 4 1/2" UNS G10200 H.R. FLAT STEEL  
 SCALE: 1" = 3"  
 EST. WT. / EA. = 11.36 lbs.



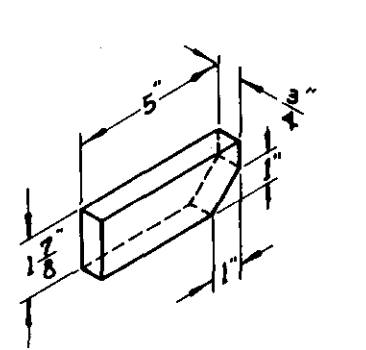
**DA-5 PLOW LATCH  
 RETAINER PLATE**  
 (1) REQ'D / EA. DEPTH ADJUSTER  
 MAT'L.: 1/2" x 3 1/2" UNS G10200  
 H.R. FLAT STEEL  
 SCALE: 1" = 3"  
 EST. WT. / EA. = 3.47 lbs.



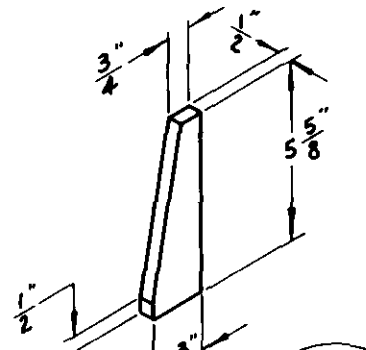
**DA-6 PLOW LATCH  
 BUMPER PLATE**  
 (1) REQ'D / EA. DEPTH ADJUSTER  
 MAT'L.: 1" x 3 1/2" UNS G10200  
 H.R. FLAT STEEL  
 EST. WT. / EA. = 6.94 lbs. SCALE: 1" = 3"



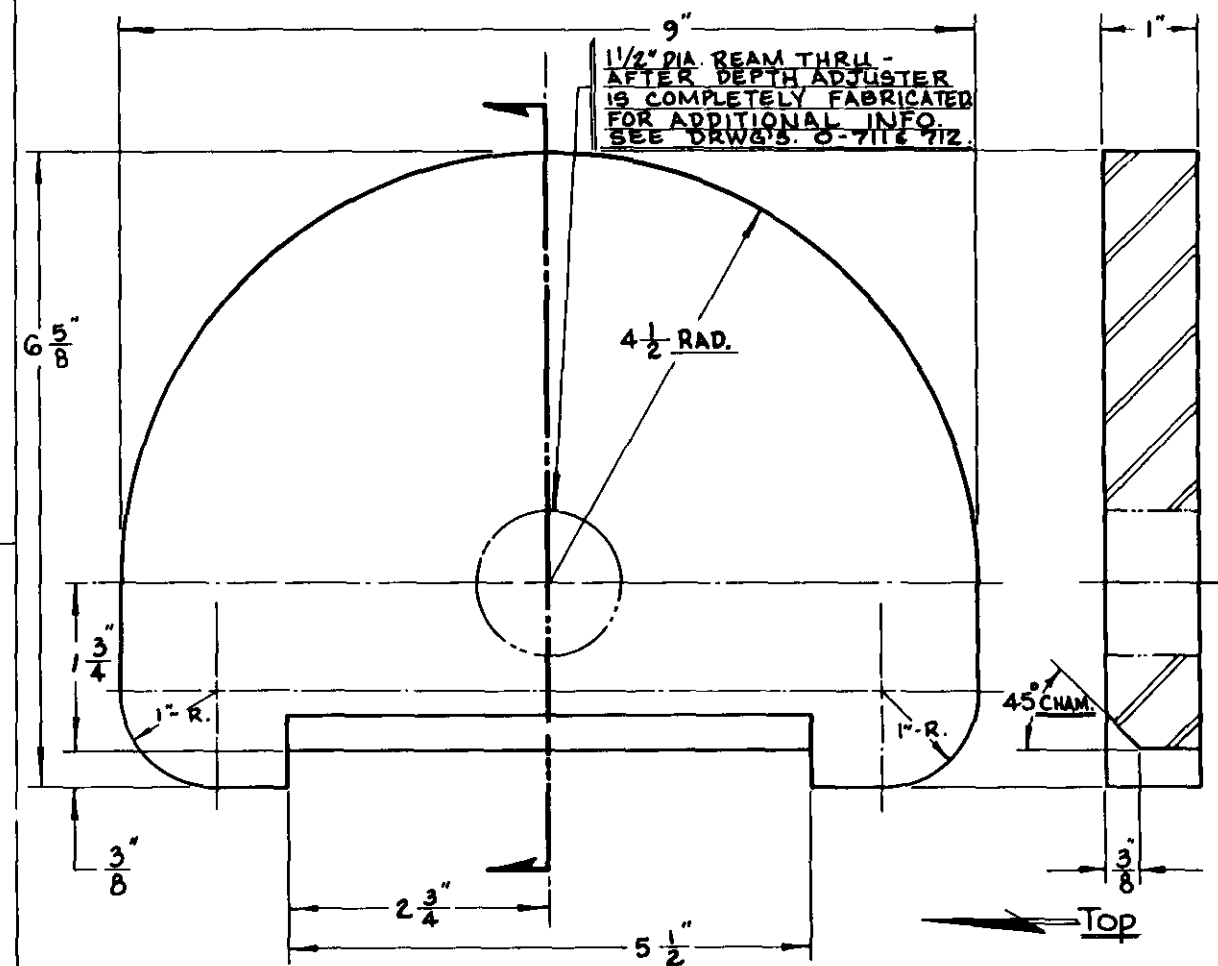
**DA-7 PLOW LATCH GUIDE PLATE**  
 (1) REQ'D / EA. DEPTH ADJUSTER  
 MAT'L.: 1/4" x 2" UNS G10200  
 H.R. FLAT STEEL  
 SCALE: 1" = 3"  
 EST. WT. / EA. = .99 lbs.



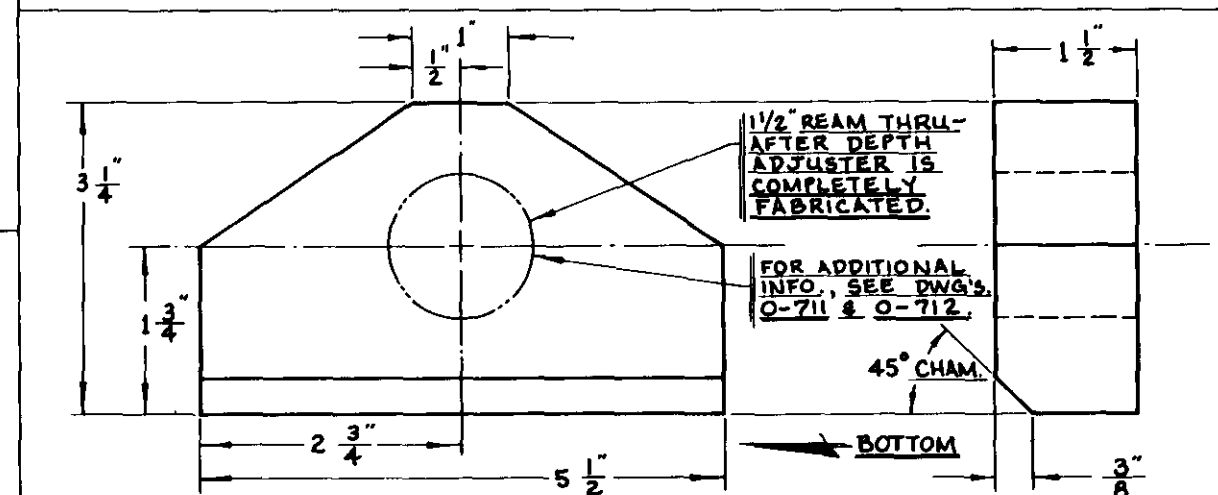
**DA-10 LOWER PIVOT PLATE GUSSET**  
 (2) - REQ'D / EA. DEPTH ADJUSTER  
 MAT'L.: 3/4" x 5" UNS G10200  
 H.R. FLAT STEEL  
 SCALE: 1" = 3"  
 EST. WT. / EA. = 1.61 lbs.



**DA-11 UPPER PIVOT PLATE GUSSET**  
 (2) - REQ'D / EA. DEPTH ADJUSTER  
 MAT'L.: 1/2" x 1 3/4" UNS G10200  
 H.R. FLAT STEEL  
 SCALE: 1" = 3"  
 EST. WT. / EA. = 1.36 lbs.



**DA-9 LOWER PIVOT PLATE**  
 (1) - REQ'D / EA. DEPTH ADJUSTER  
 MAT'L.: 1" x 7" UNS G10200 H.R. FLAT STEEL  
 SCALE: FULL EST. WT. / EA. = 13.54 lbs.

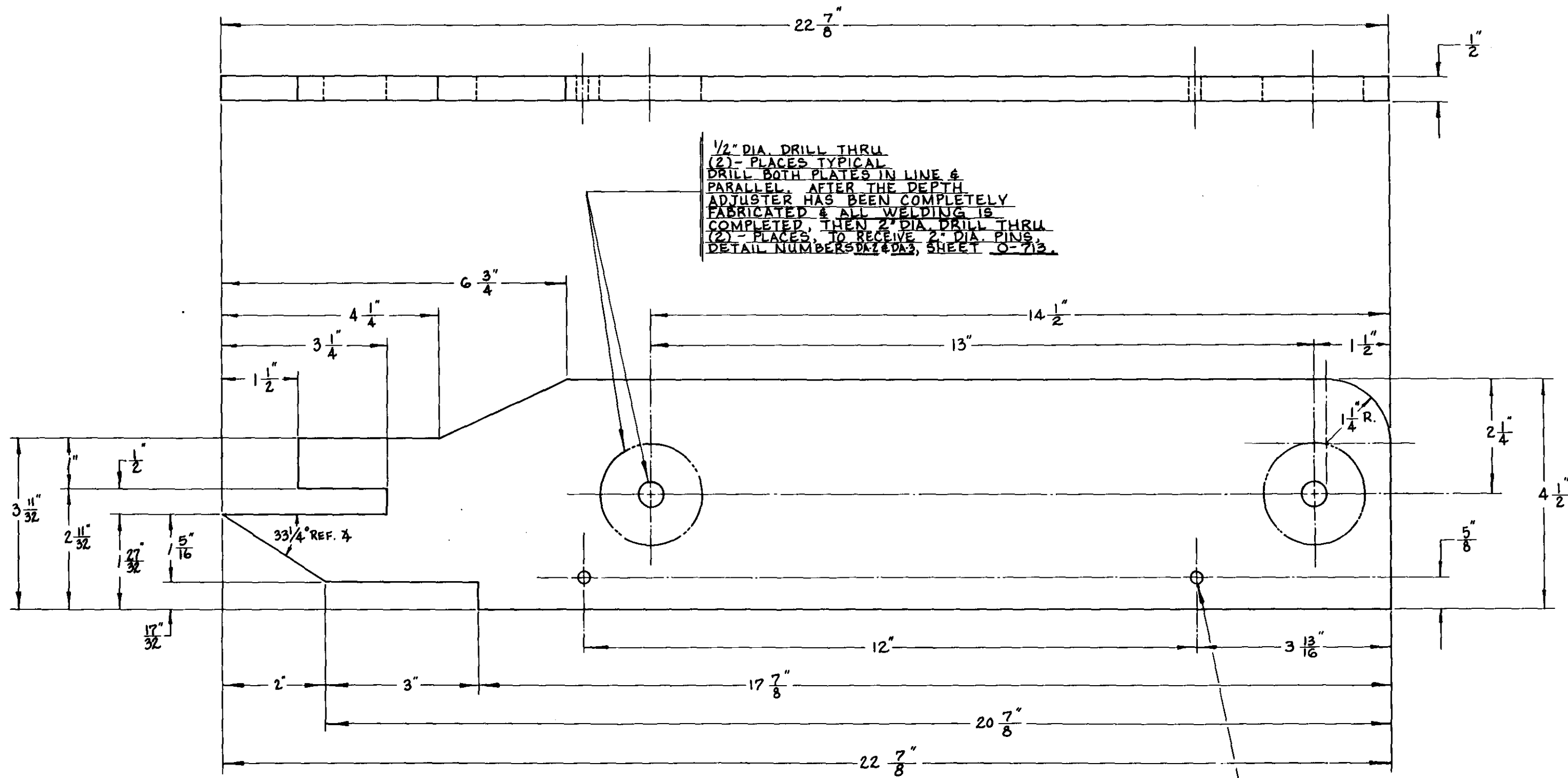


**DA-8 UPPER PIVOT PLATE**  
 (1) - REQ'D / EA. DEPTH ADJUSTER  
 MAT'L.: 1/2" x 5 1/2" UNS G10200 H.R. FLAT STEEL  
 SCALE: FULL EST. WT. / EA. = 6.62 lbs.

**SHOP NOTE:**  
 FOR COMPLETE  
 ASSEMBLY OF DEPTH  
 ADJUSTER WELDMENT,  
 SEE DRAWINGS:  
 JOHN DEERE:  
 350 TRACTOR... 0-711  
 450 TRACTOR... 0-712

**MICHIGAN FOREST FIRE EXPERIMENT STATION**  
 Roscommon Equipment Center Project  
**JOHN DEERE 350 & 450 TRACTOR DEPTH ADJ. DETS**  
 SCALE: 1" = 3" FULL  
 DESIGNED BY: MAX A. BRADLEY  
 DRAWN BY: Richard & Brantley  
 1975  
 CHECKED BY:  
 APPROVED BY:  
 REVISOR: Richard & Brantley  
 DATE





1/2" DIA. DRILL THRU  
 (2) - PLACES TYPICAL  
 DRILL BOTH PLATES IN LINE &  
 PARALLEL. AFTER THE DEPTH  
 ADJUSTER HAS BEEN COMPLETELY  
 FABRICATED & ALL WELDING IS  
 COMPLETED, THEN 2" DIA. DRILL THRU  
 (2) - PLACES, TO RECEIVE 2" DIA. PINS.  
 DETAIL NUMBERS DA2 & DA3, SHEET 0-713.

1/4" DIA. DRILL THRU  
 (2) - PLACES TYPICAL  
 BOTH PLATES IN LINE &  
 PARALLEL. TO RECEIVE  
 1/4" DIA. SPLIT PINS, TO  
 ASSIST IN PLATE LOCATION OF  
 DETAIL NO. DA-4 SHEET 0-713, IN  
 WELDING FIXTURE.

JD350  
 DA-1

**DEPTH ADJUSTER SIDE PLATE : JOHN DEERE 350 TRACTOR**

(2) - REQUIRED / EA. DEPTH ADJUSTER ASSEMBLY (PRODUCE AS IDENTICAL PAIRS)  
 MATERIAL: 1/2" x 4 1/2" H.R. LOW-CARBON FLAT STEEL ; UNS G 10200

SCALE : FULL  
 EST. WT. / EA. = 11.72 lbs.

NOTE:  
 FOR COMPLETE ASSEMBLY OF THE  
 JOHN DEERE 350 TRACTOR, DEPTH  
 ADJUSTER, SEE DRAWING #0-711.

MICHIGAN FOREST FIRE EXPERIMENT STATION		REG 
ROSCOMMON EQUIPMENT CENTER PROJECT		
JOHN DEERE 350 TRACTOR: DEPTH ADJ. SIDE PLATE		
SCALE: FULL	DATE: 1972	DATE:
DESIGNED BY: MAX A. BRADLEY	APPROVED BY:	PROJECT NO.:
DRAWN BY: Richard & Thornton	REVISOR: Richard & Thornton	3/24/72
TRACED BY:		

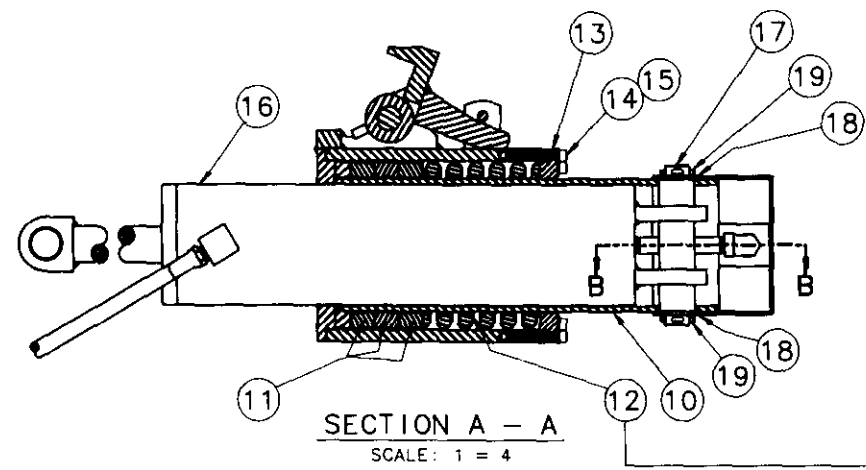
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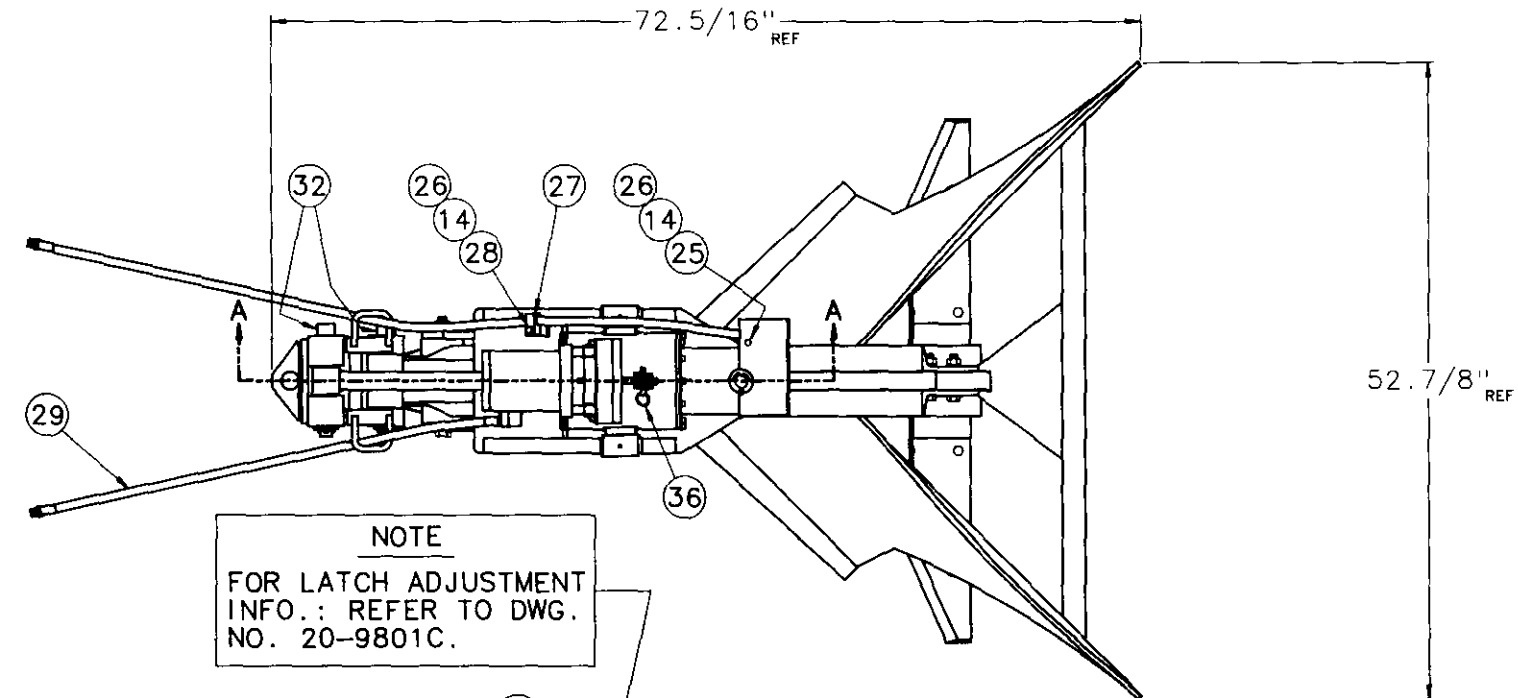
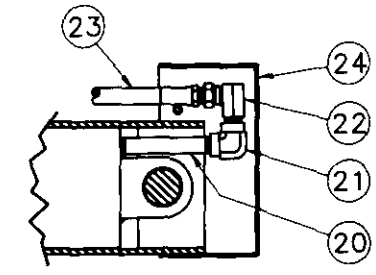
**Plow Assembly**

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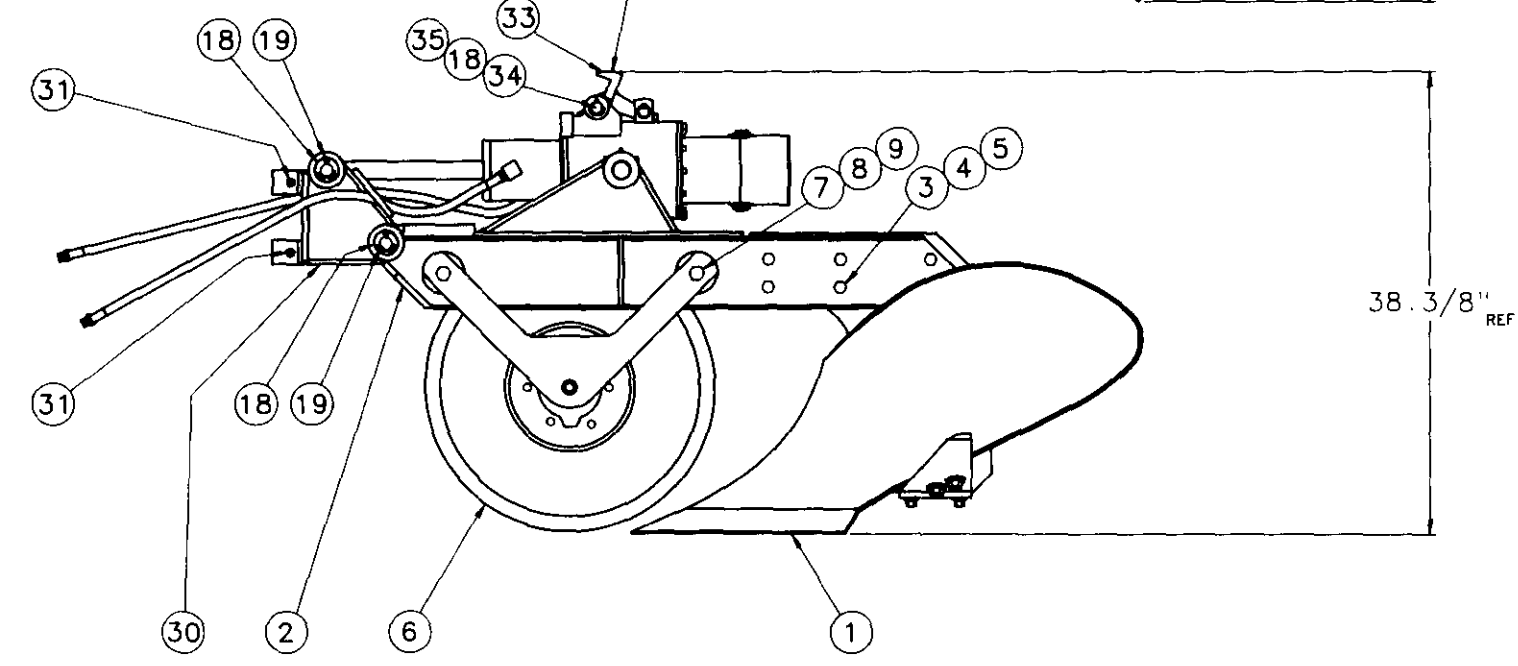
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NOTE  
TO INSTALL ITEM # 12,  
USE SPRING COMPRESSION  
TOOL P/N 18-0077.



NOTE  
FOR LATCH ADJUSTMENT  
INFO.: REFER TO DWG.  
NO. 20-9801C.



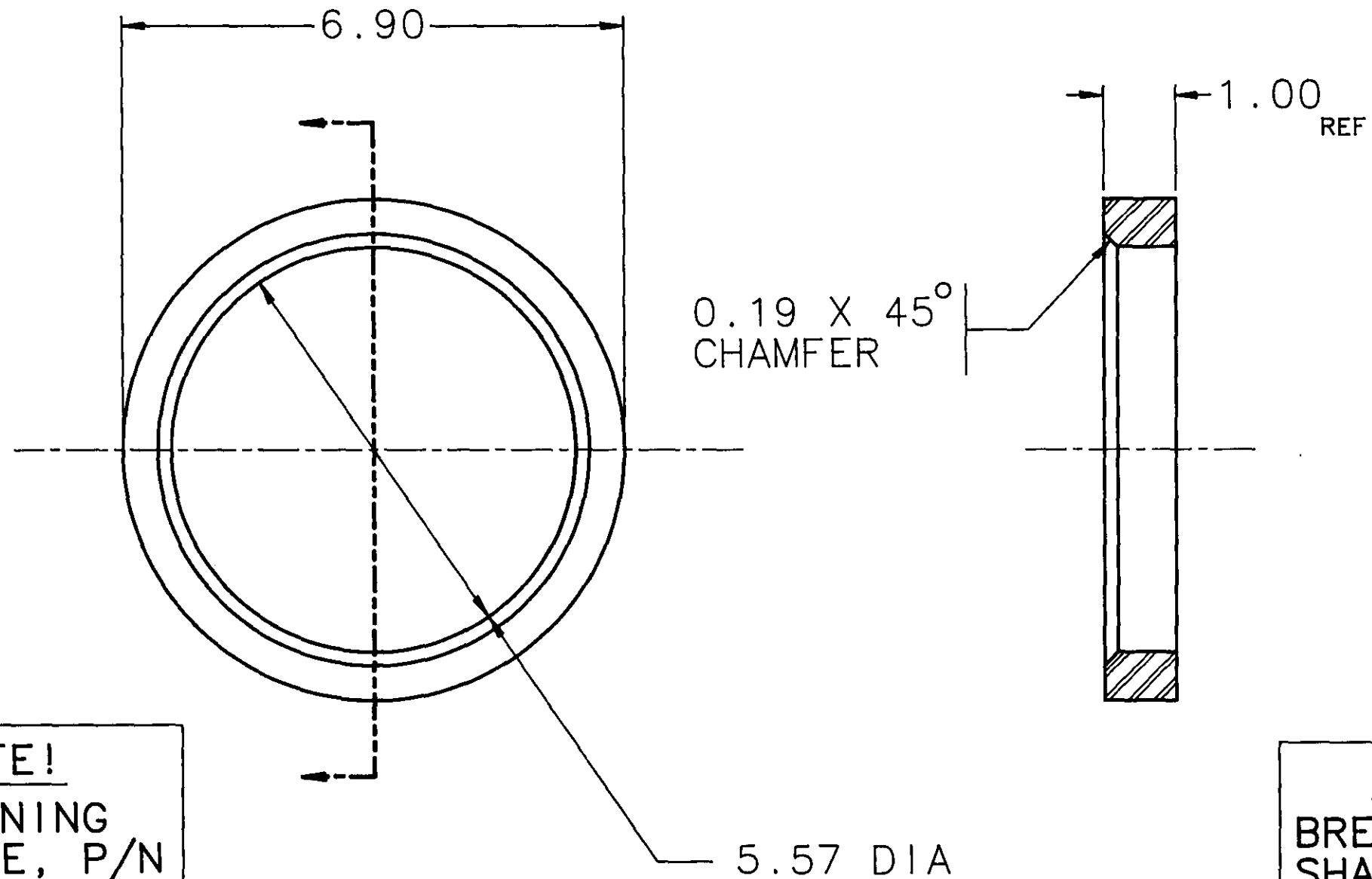
ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	20-0007	D	BOTTOM: 52" PLOW	1	369
2	20-0012	D	BEAM-TRUNION W/C: 52" PLOW	1	252
3	TS-10GG28		SCREW, CAP, HEX. HD.: 5/8" - 11UN X 3.1/2" LG., PLATED	6	0.34
4	WS10-BC		WASHER, SPRING LOCK, REG.: 5/8" PLATED	6	0.03
5	TS-10GP		NUT, HEX. DOUB. CHAM.: 5/8" - 11UN PLATED	6	0.08
6	20-0019	D	COULTER ASSEMBLY: 52" PLOW	1	128
7	TS-12GG76		SCREW, CAP, HEX. HD.: 3/4" - 10UN X 9.1/2" LG., PLATED	2	1.27
8	WS12-BC		WASHER, SPRING LOCK, REG.: 3/4" PLATED	2	0.05
9	TS-12GP		NUT, HEX. DOUB. CHAM.: 3/4" - 10UN PLATED	2	0.11
10	20-0014	C	SLEEVE, ADAPTER W/C: 4.1/2" HYD. CYL.	1	19.7
11	20-0013	B	SPACER, SPRING: 1" THICK	3	3.60
12	20-0017	B	SPRING, HELICAL COMPRESSION	1	9.50
13	20-0011	B	TRUNION SPRING RETAINER CAP	1	4.35
14	WS05-BC		WASHER, SPRING LOCK, REG.: 5/16" PLATED	14	0.01
15	TS-05VH12		SCREW, CAP, SOC. HD.: 5/16" - 24UN X 1.1/2" LG., BLACK FINISH	12	0.04
16	22-0006	D	HYD. CYL. ASSEMBLY: 4.1/2"	1	56.0
17	20-0015	B	PIN, PLOW CYLINDER BASE	1	2.92
18	WS16-BB		WASHER, FLAT, S.A.E.: 1" PLATED	6	0.08
19	R16-B128AB		PIN, COTTER: 1/4" X 2" LONG PLATED	4	0.03
20	P06-BAN36		NIPPLE, PIPE: 3/8" N.P.T. X 4.1/2" LONG SCHEDULE # 80, BLACK	1	0.28
21	P06-CHL		ELBOW, 90° STD.: 3/8" N.P.T. STEEL HYDRAULIC, PLATED	1	0.22
22	27-0042	B	ELBOW, 90° ST. W/ FEM. SWIV.: 3/8" N.P.T. STEEL HYDRAULIC, PLATED	1	0.33
23	27-0040	B	HOSE ASSEMBLY HYDRAULIC: 58"	1	1.49
24	20-0016	C	GUARD, W/C: 4.1/2": HYD. CYL	1	3.95
25	TS-05GG20		SCREW, CAP, HEX. HD.: 5/16" - 18UN X 2.1/2" LONG, PLATED	1	0.06
26	TS-05GP		NUT, HEX. DOUB. CHAM.: 5/16" - 18UN PLATED	2	0.02
27	27-0004	B	HYDRAULIC HOSE CLAMP	1	0.20
28	TS-05GG16		SCREW, CAP, HEX. HD.: 5/16" - 18UN X 2" LONG, PLATED	1	0.05
29	27-0041	B	HOSE ASSEMBLY HYDRAULIC: 38"	1	1.11
30	20-0004	D	PIVOT W/C	1	49.7
31	P00-LAG		GREASE FITTING: 1/4" - 28 TAPERED STRAIGHT TYPE	2	0.01
32	20-0002	B	PIN, HORIZONTAL	2	3.20
33	20-0000	C	LATCH, PLOW W/C	1	8.19
34	20-0010	A	PIN, LATCH	1	1.48
35	R08-B128AB		PIN, COTTER: 1/8" X 2" LONG PLATED	2	0.01
36	33-0014	B	PIN, 3/8" DIA., QUICK RELEASE	1	0.08

PAINT SPECIFICATIONS  
PAINT ITEM #6, COULTER ASSEMBLY, WITH BLACK GLOSS ENAMEL, F.F.E.S. SPEC. NO. 18-8000. ALL COMPONENTS, EXCEPT COULTER ARMS  
PAINT COULTER ARMS, AND ALL OTHER PLOW COMPONENTS WITH SPRINKLER RED GLOSS ENAMEL, F.F.E.S. SPEC. NO. 18-8001.

PART NUMBER: 20-9800  
EST. WT.: 933 LBS.

STD. TOLERANCES						DRAWN: R. GREENLAW	MICHIGAN DNR FOREST MANAGEMENT DIVISION	
FRACTIONAL: 1/16" - 1/8" - 1/4" - 3/8" - 1/2" - 3/4" - 1"						CHECKED: KDB		
DECIMAL: 0.0015" - 0.005" - 0.010" - 0.015" - 0.030" - 0.060" - 0.125" - 0.250" - 0.500" - 1.000"						APPROVED:		
FOREST FIRE EXPERIMENT STATION P.O. BOX 68 ROSCOMMON, MICHIGAN 48653							PROJECT NO.: 84-19	
TITLE: PLOW, 52" ASSEMBLY: TRACTOR MOUNTED							SCALE: 1 = 8	DWG NO. 20-9800D
DATE: JAN. 31, 1991								



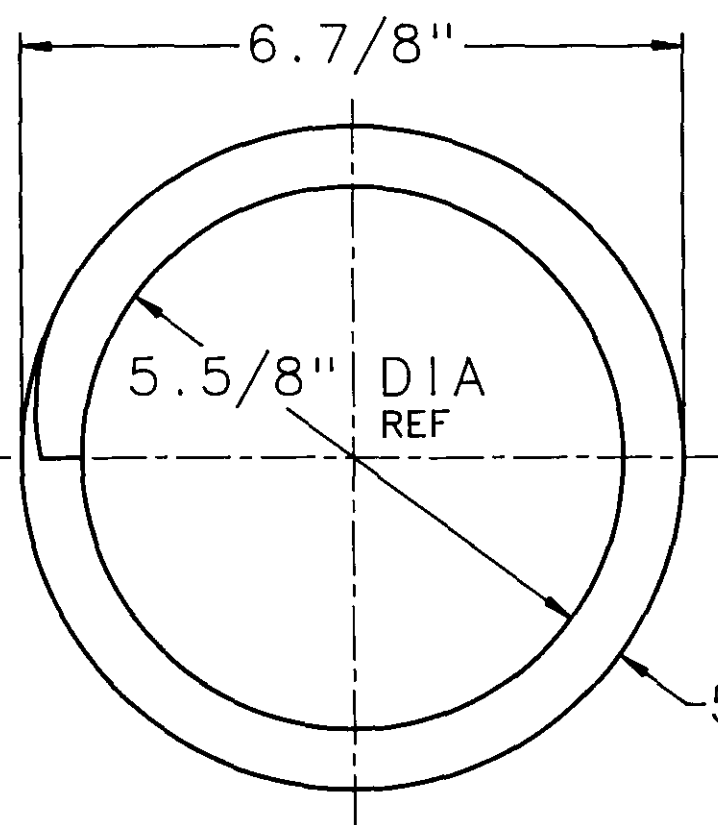
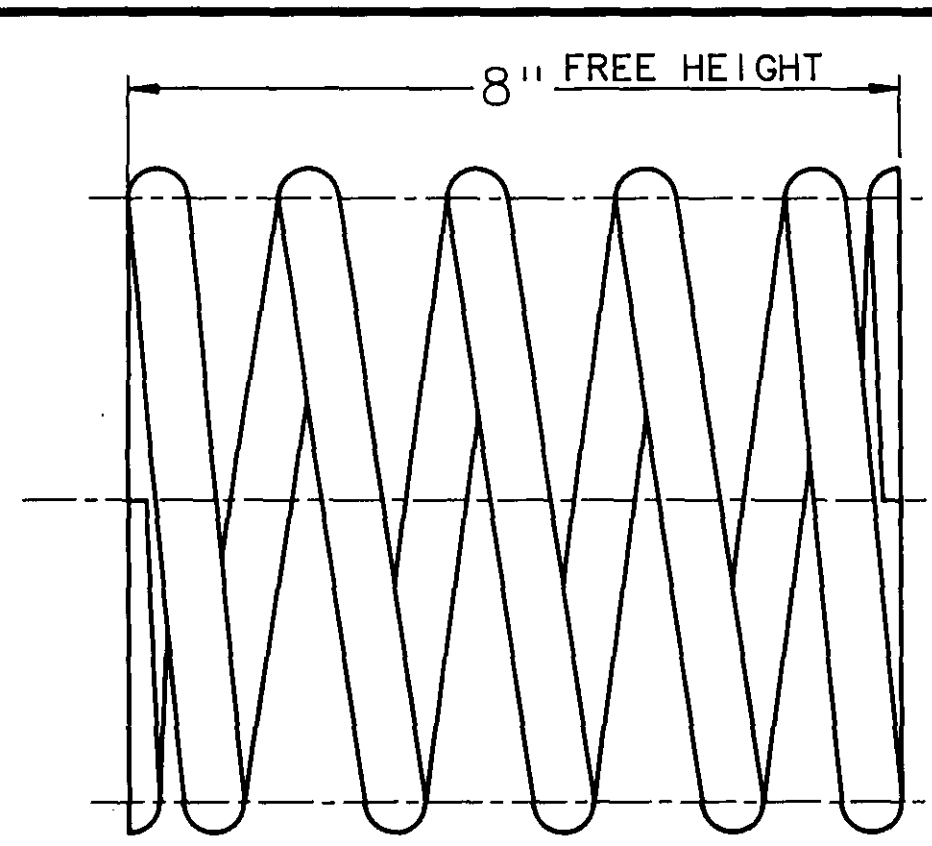


**NOTE!**  
 USE BURNING  
 TEMPLATE, P/N  
 18-0043.

**NOTE!**  
 BREAK ALL  
 SHARP EDGES.

PART NUMBER: 20-0013  
 MAT'L.: PLATE, 1" HOT ROLLED  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AA-01648AA  
 EST. WT.: 3.60 LBS.

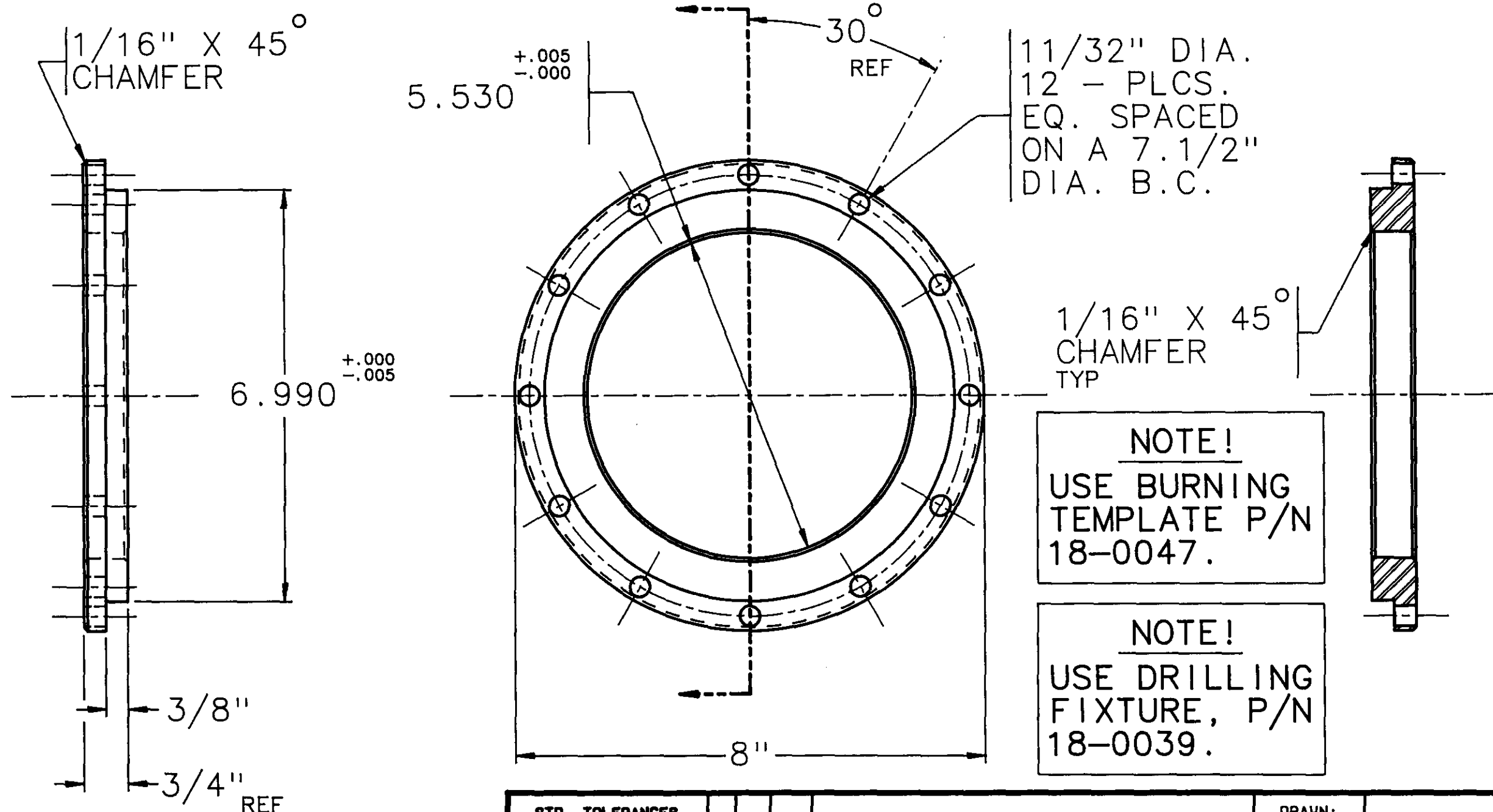
<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:			
ANGULAR: ±1 DEG				NO.	BY	DATE	
				REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b>							
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							
TITLE: <b>SPACER, SPRING</b>				SCALE: 1 = 2	DATE: DEC. 07, 1989	PROJECT NO.: 84-19	
						DWG. NO. <b>20-0013B</b>	



**SPRING**

TYPE: HELICAL COMPRESSION  
 MAT'L.: 5/8" O.D. STEEL WIRE  
 OUTSIDE DIAMETER: 6.7/8"  
 INSIDE DIAMETER: 5.5/8"  
 TOTAL COILS: 6  
 ACTIVE COILS: 4  
 FREE HEIGHT: 8"  
 SOLID HEIGHT: 3.1/2"  
 ENDS: SQUARED & GROUND  
 TESTING: SPRINGS TO BE MAGNAFLUXED  
 DOCUMENTATION OF TEST TO BE PROVIDED WITH SHIPMENT.  
 SPRING RATING: 225 LBS./IN.  
 EST. WT.: 9.1/2" LBS.

APPROVED MANUFACTURERS	PART NO.	APPROVED MANUFACTURERS	PART NO.
SAGINAW SPRING COMPANY P.O. BOX 328 11008 DIXIE HIGHWAY BIRCH RUN, MICHIGAN 48415		DESCRIPTION	
F.F.E.S. PART NO.: 20-0017		FOREST FIRE EXPERIMENT STATION P.O. BOX 68      ROSCOMMON, MICHIGAN      48653	
STD. TOLERANCES FRACTIONAL: 8 TO 8 IN ±1/32 8 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	
NO. BY DATE REVISION		MICHIGAN DNR FOREST MANAGEMENT DIVISION	
TITLE: SPRING, HELICAL COMPRESSION		PROJECT NO.: 84-19	
SCALE: 1 = 2		DATE: DEC. 27, 1989	
DWG. NO. 20-0017B		DATE: DEC. 27, 1989	



11/32" DIA.  
12 - PLCS.  
EQ. SPACED  
ON A 7.1/2"  
DIA. B.C.

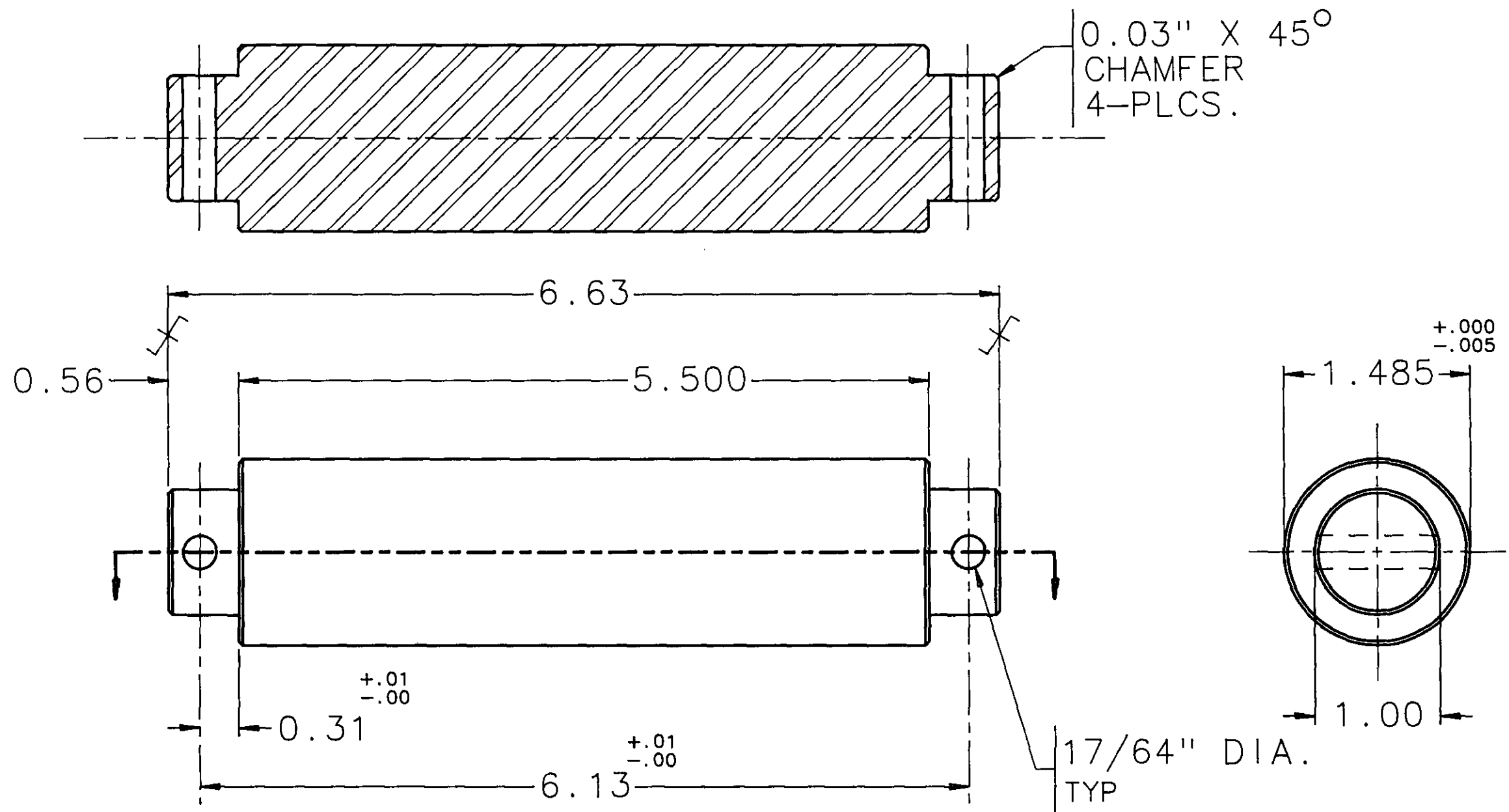
1/16" X 45°  
CHAMFER  
TYP

**NOTE!**  
USE BURNING  
TEMPLATE P/N  
18-0047.

**NOTE!**  
USE DRILLING  
FIXTURE, P/N  
18-0039.

PART NUMBER: 20-0011  
MAT'L.: PLATE, 3/4" H.R.  
UNS G10150  
F.F.E.S. SPEC. NO.: AA-01248BC  
EST. WT.: 4.35 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN +1/32 8 IN AND UP +1/16 DECIMAL: 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005 ANGULAR: ± 1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
NO. BY DATE REVISION		PROJECT NO.: 84-19	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			DWG. NO. 20-0011B
TITLE: TRUNION SPRING RETAINER CAP		SCALE: 1 = 2 DATE: NOV. 28, 1989	



PART NUMBER: 20-0015  
 MAT'L.: BAR, RD., 1.1/2" DIA.  
 RYCASE / LEAD  
 UNS G11170/Pb  
 F.F.E.S. SPEC. NO.: AC-00150AF  
 EST. WT.: 2.92 LBS.

STD. TOLERANCES	
FRACTIONAL:	
0 TO 6 IN $\pm 1/32$	
6 IN AND UP $\pm 1/16$	
DECIMAL:	ANGULAR:
1 PLACE $\pm 0.1$	$\pm 1$ DEG
2 PLACE $\pm 0.01$	
3 PLACE $\pm 0.005$	

NO.	BY	DATE	REVISION

DRAWN:  
R. GREENLAW  
 CHECKED:  
KDB  
 APPROVED:

**MICHIGAN  
DNR**

**FOREST FIRE EXPERIMENT STATION**  
 P.O. BOX 68      ROSCOMMON, MICHIGAN      48653

FOREST MANAGEMENT  
DIVISION

TITLE: PIN, PLOW CYLINDER BASE

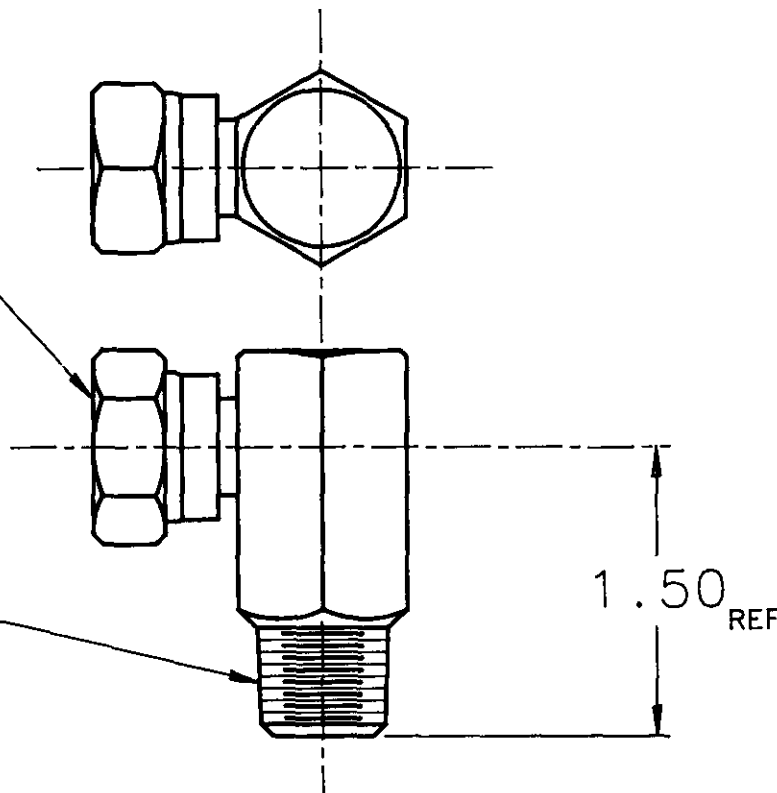
SCALE:  
FULL

DATE:  
DEC. 15, 1989

PROJECT NO.: 84-19  
 DWG. NO. 20-0015B

3/8" - 18 NPSM  
FEMALE SWIVEL  
REF

3/8" - 18 NPT  
MALE  
REF



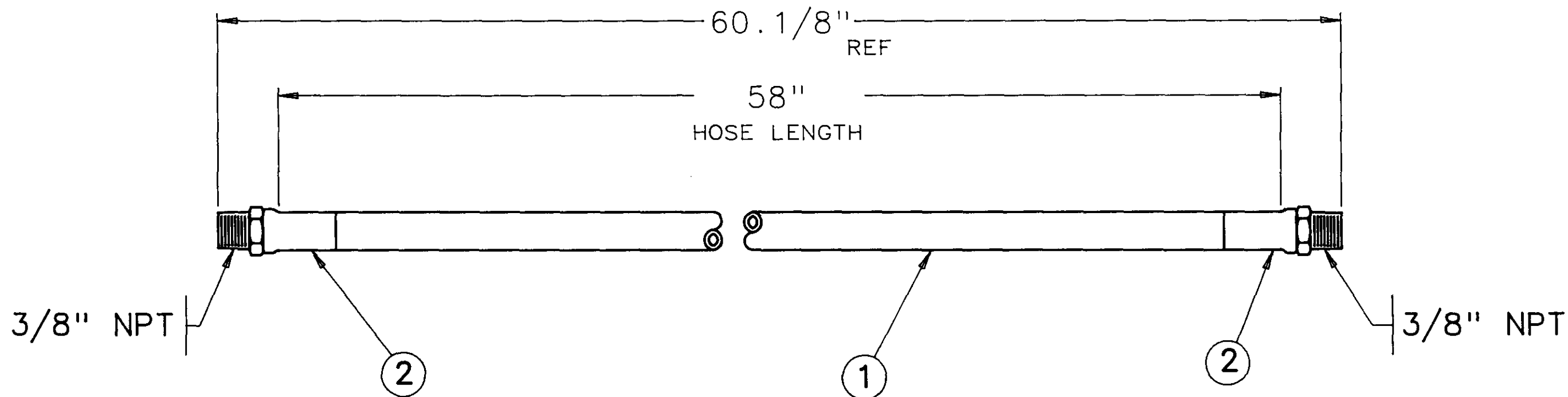
**ELBOW**

TYPE: SWIVEL ADAPTER, 90°  
INTERNAL THD.: 3/8" - 18 N.P.S.M.  
SWIVEL FEMALE  
EXTERNAL THD.: 3/8" - 18 N.P.T.  
MATERIAL: STEEL, PLATED  
EST. WT.: 0.33 LBS.

APPROVED MANUFACTURERS	PART NO.	APPROVED MANUFACTURERS	PART NO.
AEROQUIP CORPORATION INDUSTRIAL CONNECTORS DIVISION 1225 W. MAIN STREET VAN WERT, OHIO 45891-0389	2047-6-6S	IMPERIAL EASTMAN EASTMAN DIVISION 1440 NORTH 24th ST. P.O. BOX 847 MANITOWAC, WISCONSIN 54220-0847	60UA-06X06

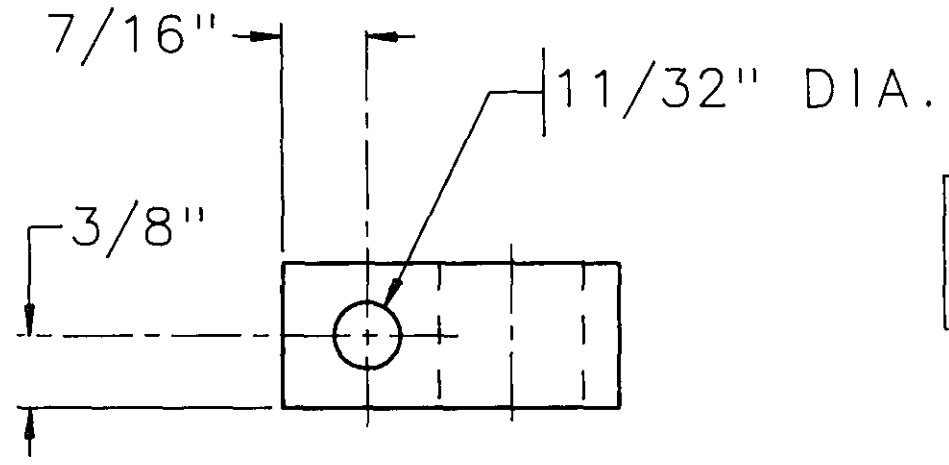
<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 8 TO 6 IN +-1/32 6 IN AND UP +-1/16 <b>DECIMAL:</b> 1 PLACE +- 0.1 2 PLACE +- 0.01 3 PLACE +- 0.005 <b>ANGULAR:</b> +- 1 DEG	NO.	BY	DATE	REVISION	DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
	<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN 48653				PROJECT NO.: 84-19 DWG. NO. 27-0042B	
F.F.E.S. PART NO.: 27-0042		TITLE: ELBOW, 90° STD. W/ FEM. SWIV.: 3/8" NPT		SCALE: FULL	DATE: JAN. 23, 1991	

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	27-9411		HOSE, HYD #6 SAE 100R1 TYPE AT	58"	1.11
2	J06-F06H27A		FTG, HYD CRIMP #6 HOSE X 3/8 NPT	2	0.19

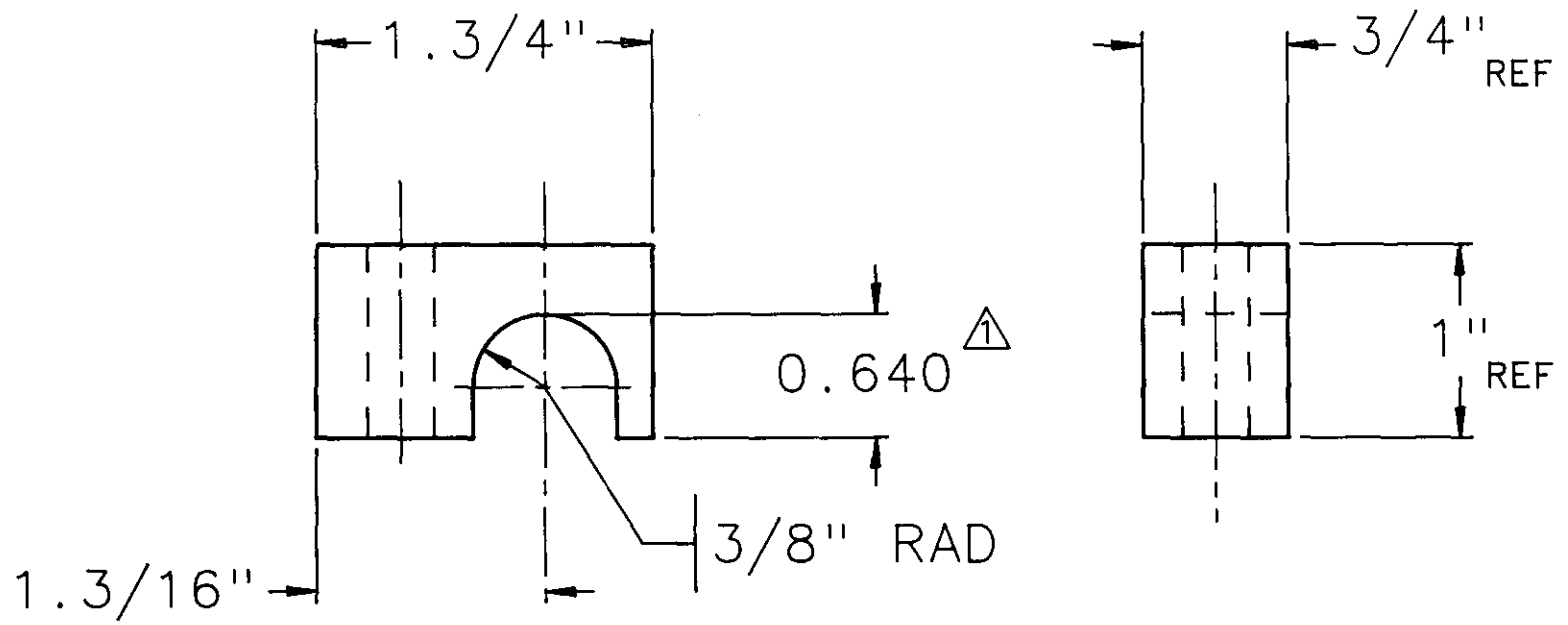


PART NUMBER: 27-0040  
 EST. WT.: 1.49 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
NO.	BY	DATE	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN 48653			PROJECT NO.: 84-19
TITLE: HOSE ASSY, HYDRAULIC		SCALE: NONE	DATE: JAN. 16, 1991 DWG. NO. 27-0040B



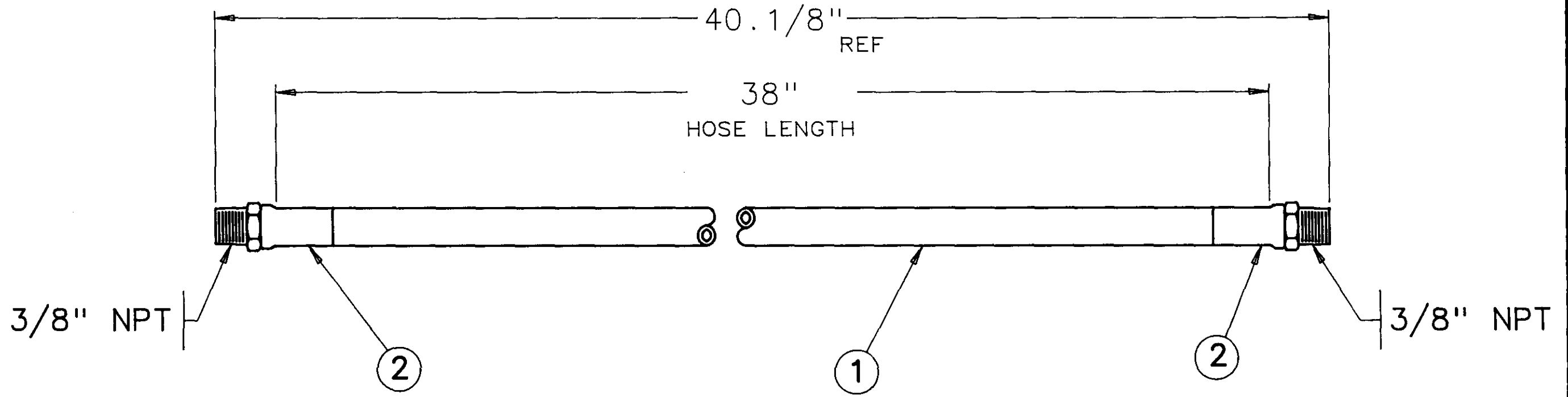
**NOTE**  
BREAK ALL SHARP EDGES.



PART NUMBER: 27-0004  
 MAT'L.: BAR, FLAT, 3/4" X 1" C.D.  
 UNS G10180  
 F.F.E.S. SPEC. NO.: AB-01204AW  
 EST. WT.: 0.20 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
<b>FRACTIONAL:</b> 0 TO 6 IN. ±1/32 6 IN AND UP ±1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
<b>DECIMAL:</b> 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005		<b>ANGULAR:</b> ±1 DEG		APPROVED:			
		1 KDB 3/25 1991		0.640" DIM. WAS 0.680", TO PROVIDE BETTER CLAMPING		PROJECT NO.: 84-19	
<b>FOREST FIRE EXPERIMENT STATION</b>							DWG. NO. 27-0004B
P.O. BOX 68      ROSCOMMON, MICHIGAN 48653							
TITLE: HYD. HOSE CLAMP: SAE TYPE 100R1 NO. 6				SCALE: FULL		DATE: JULY 31, 1989	

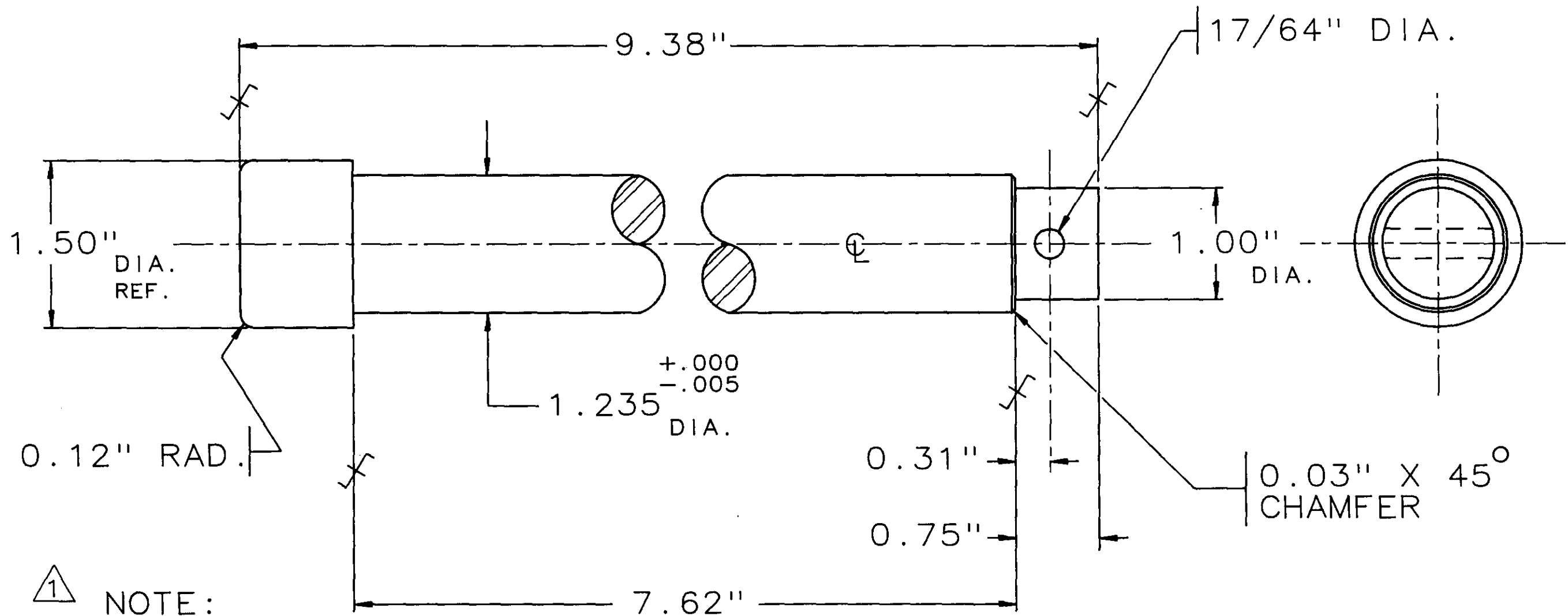
ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	27-9411		HOSE, HYD #6 SAE 100R1 TYPE AT	38"	0.73
2	J06-F06H27A		FTG, HYD CRIMP #6 HOSE X 3/8 NPT	2	0.19



PART NUMBER: 27-0041  
 EST. WT.: 1.11 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG	NO.	BY	DATE	REVISION	DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION  PROJECT NO.: 84-19 DWG. NO. 27-0041B	
	<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653				SCALE: NONE		DATE: JAN. 16, 1991
	TITLE: <b>HOSE ASSY, HYDRAULIC</b>						

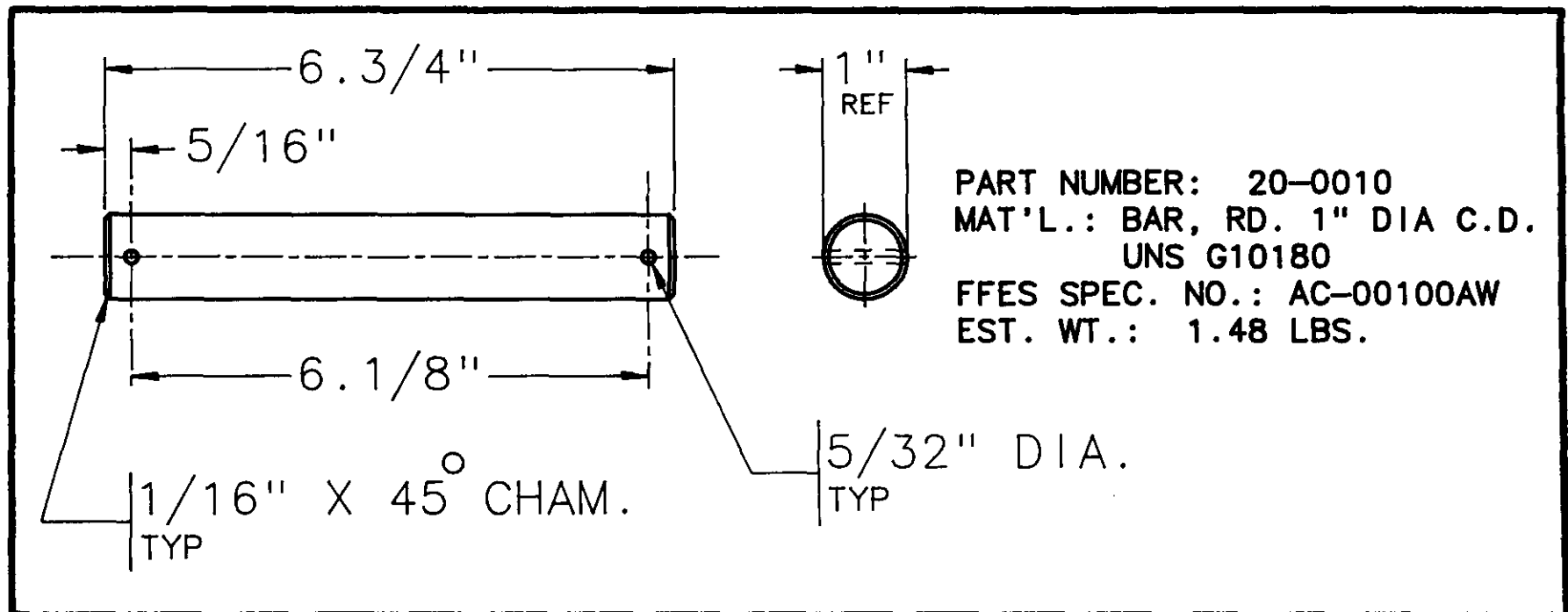




⚠ NOTE:  
 CASE HARDEN TO  
 ROCKWELL 60 C  
 0.03" DEEP.

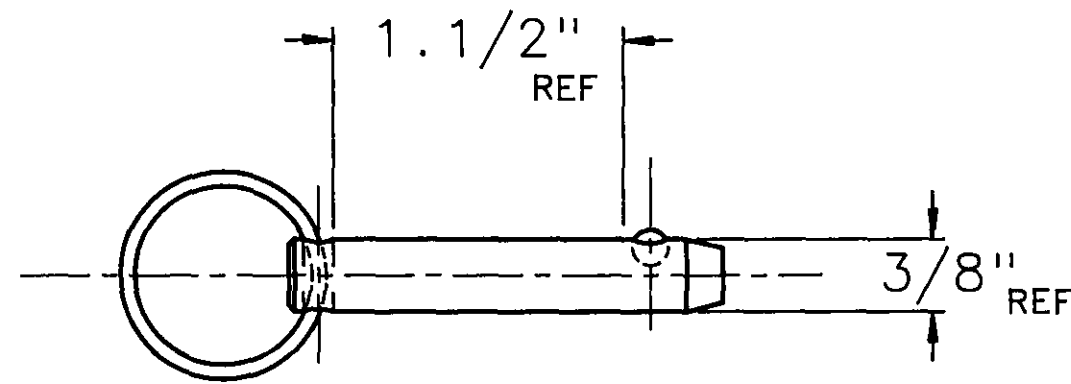
PART NUMBER: 20-0002  
 MAT'L.: BAR: RND., 1 1/2" DIA.  
 RYCASE/LEAD  
 UNS G11170/Pb  
 F.F.E.S. SPEC. NO: AC-00150AF  
 EST. WT.: 3.20 LBS.

STD. TOLERANCES				DRAWN: R. GREENLAW		MICHIGAN DNR FOREST MANAGEMENT DIVISION	
FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16				2 REG 5/08 1989 UPDATED DWG. FORMAT: ORIG. DWN. 8/12/87			CHECKED: KDB
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				1 KDB 10/6 1987 REVISED HARDENING NOTE FOR CLARITY			APPROVED:
ANGULAR: ±1 DEG				NO. BY DATE REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653							
TITLE: PIN HORIZONTAL: FIRELINE PLOW				SCALE: FULL	DATE: MAY08, 1989	PROJECT NO.: 84-19 DWG. NO. 20-0002B	



PART NUMBER: 20-0010  
 MAT'L.: BAR, RD. 1" DIA C.D.  
 UNS G10180  
 FFES SPEC. NO.: AC-00100AW  
 EST. WT.: 1.48 LBS.

<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 0 TO 6 IN $\pm$ 1/32 6 IN AND UP $\pm$ 1/16 <b>DECIMAL:</b> 1 PLACE $\pm$ 0.1 2 PLACE $\pm$ 0.01 3 PLACE $\pm$ 0.005 <b>ANGULAR:</b> $\pm$ 1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b>  <b>FOREST MANAGEMENT DIVISION</b>							
<table border="1"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>REVISION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		NO.		BY	DATE	REVISION				
NO.	BY	DATE	REVISION							
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			DWG. NO. 20-0010A							
TITLE: <b>PIN, LATCH</b>		SCALE: 1 = 2	DATE: OCT. 27, 1989							



## QUICK RELEASE PIN

TYPE: RING - GRIP QUICK RELEASE  
 SELF LOCKING PIN.  
 SIZE: 3/8" DIA.  
 GRIP LENGTH: 1.50"  
 BALL: SPRING LOADED  
 SHEAR: 11,020 LBS.  
 MAT'L. TYPE 303 STAINLESS STEEL  
 EST. WT.: 0.08 LBS.

APPROVED MANUFACTURERS

PART NO.

APPROVED MANUFACTURERS

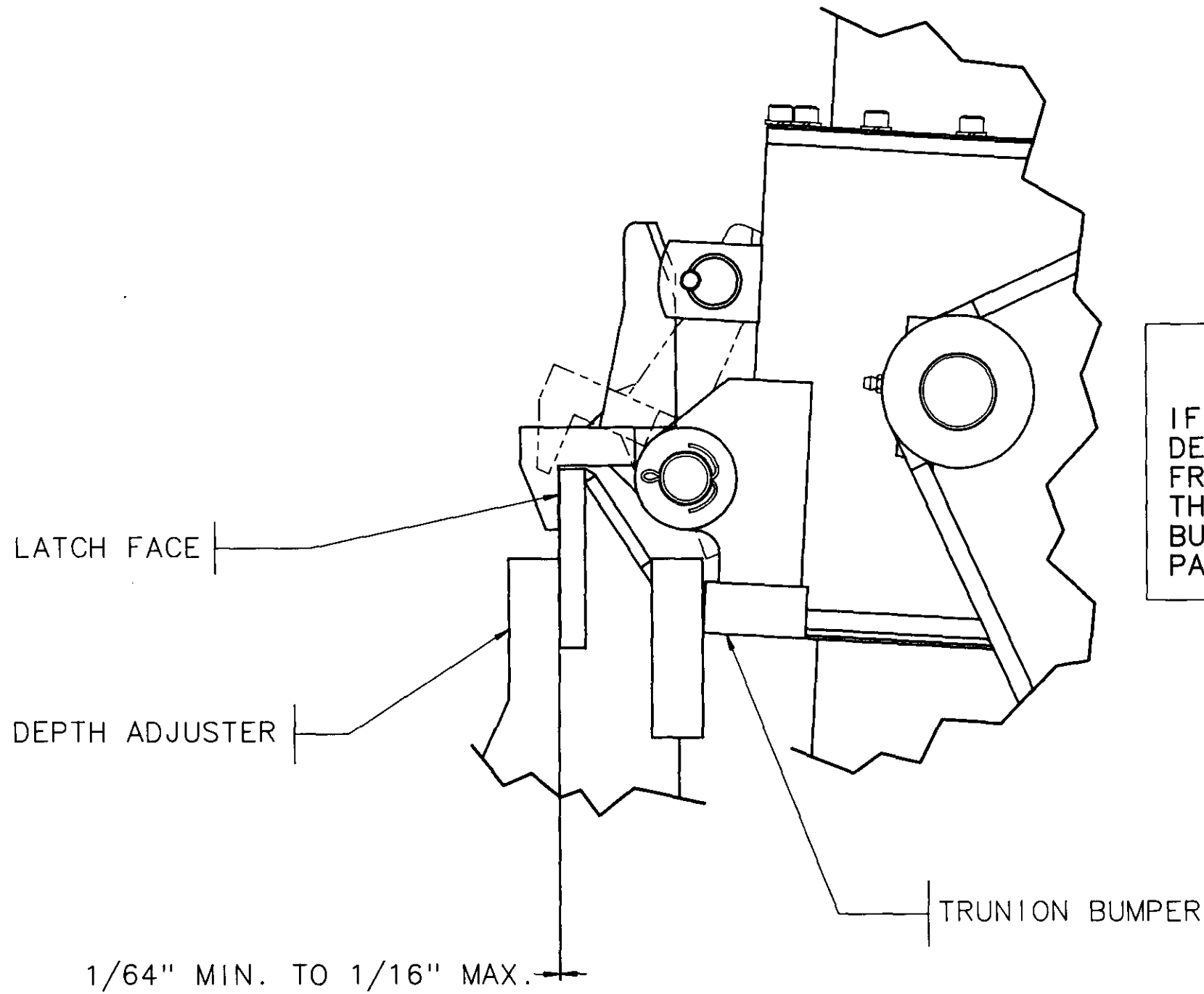
PART NO.

McMASTER-CARR SUPPLY CO.  
 P.O. BOX 4355  
 CHICAGO, ILLINOIS  
 60680-4355

98404A375

<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 0 TO 6 IN ±1/32 6 IN AND UP ±1/16 <b>DECIMAL:</b> 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 <b>ANGULAR:</b> ±1 DEG	NO.	BY	DATE	REVISION	DRAWN: <b>R. GREENLAW</b>	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
					CHECKED: <b>KDB</b>	
				APPROVED:	PROJECT NO.: 84-19	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653						DVG. NO. 33-0014B
TITLE: PIN, 3/8" DIA., QUICK RELEASE						SCALE: FULL
DATE: NOV. 07, 1989						

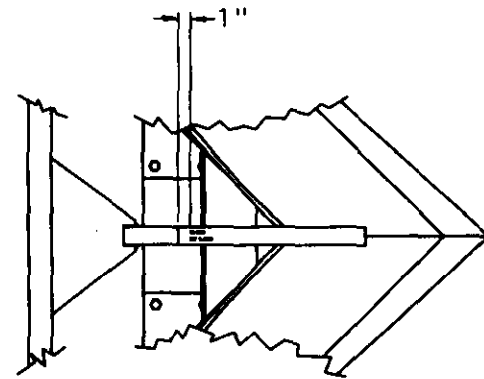
F.F.E.S. PART NO.: 33-0014



LATCH ADJUSTMENT

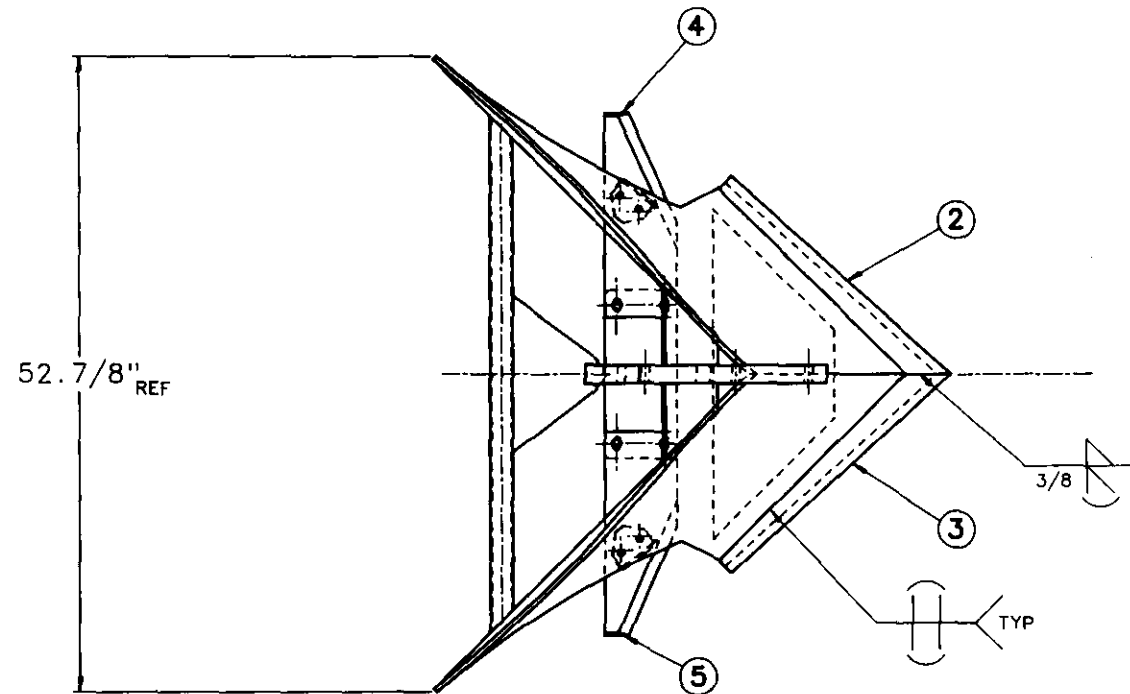
IF LATCH WILL NOT HOOK OVER TOP OF DEPTH ADJUSTER, GRIND EXCESS MATERIAL FROM TRUNION BUMPER. IF GAP IS GREATER THAN 1/16", ADD WELD MATERIAL TO TRUNION BUMPER SURFACE. TRUNION BUMPER MUST BE PARALLEL WITH LATCH FACE.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 8 IN. ± 1/32 8 IN AND UP ± 1/16 DECIMAL: 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005 ANGULAR: ± 1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68    ROSCOMMON, MICHIGAN    48653		PROJECT NO.: 84-19		
TITLE: <b>PLOW LATCH ADJUSTMENT</b>		SCALE: 1 = 2	DATE: FEB. 20, 1991	DWG. NO.: 20-9801C



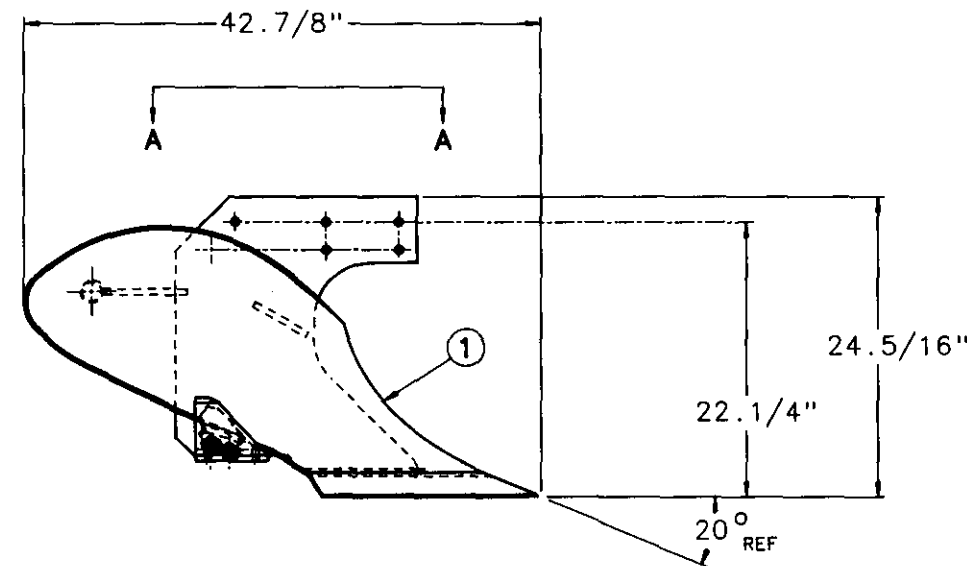
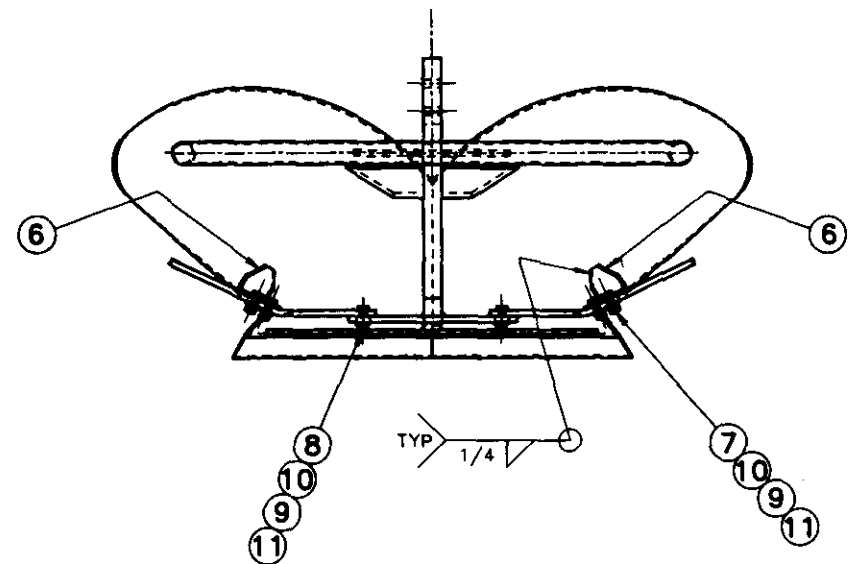
VIEW " A - A "

STAMP TOP EDGE OF PLOW STANDARD, USING 3/16" HIGH METAL STAMPS. PART NO. (20-0007) & DATE OF MANUFACTURE.



**NOTE!**  
TO LOCATE ITEM NO. 6, BOLT IN PLACE ON TURF KNIFE, MOUNT TURF KNIFE, THEN WELD TO REAR SURFACE OF MOULDBOARD.

**NOTE!**  
TO LOCATE ITEM NO.'S 2 & 3. USE SHARE LOCATING TABS, P/N 18-0052.



ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0406	D	BOTTOM, S/W: 52" PLOW	1	332
2	00-0418	B	SHARE, LEFT - HAND	1	4.73
3	00-0419	B	SHARE, RIGHT - HAND	1	4.73
4	20-0008	B	KNIFE, TURF, LEFT - HAND	1	9.76
5	20-0009	B	KNIFE, TURF, RIGHT - HAND	1	9.76
6	00-0408	B	ANGLE, TURF KNIFE MOUNTING	2	1.30
7	TS-08GG12		CAPSCREW, HEX. HEAD 1/2" - 13 UN PLATED GRADE 5	4	0.10
8	TS-08GG14		CAPSCREW, HEX. HEAD 1/2" - 13 UN PLATED GRADE 5	4	0.12
9	WS08-BC		WASHER, LOCK, 1/2" PLATED	8	0.05
10	WS08-BA		WASHER, FLAT, 1/2" PLATED	8	0.03
11	TS-08GP		NUT, HEX, 1/2" - 13 UN PLATED GRADE 5	8	0.02

PART NUMBER: 20-0007  
EST. WT.: 369 LBS.

STD. TOLERANCES				DRAWN:	R. BRIDGLAN
FRACTIONAL:	± 0.005			CHECKED:	KDB
DECIMAL:	± 0.005			APPROVED:	
ANGLE:	± 0.005				
SCALE:	1" = 8"	DATE:	MAY 07, 1988	MICHIGAN DNR FOREST MANAGEMENT DIVISION	
TITLE: BOTTOM: 52" PLOW				PROJECT NO.: 84-19	
				DWG NO: 20-0007D	

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0407	B	BOTTOM PLATE	1	18.7
2	00-0006	B	BRACKET, TURF KNIFE MTN'G.	1	11.6
3	00-0080	C	STANDARD	1	140
4	00-0415	B	BRACE, MOULDBOARD	1	9.23
5	00-0240	D	MOULDBOARD, LEFT-HAND	1	67.6
6	00-0241	D	MOULDBOARD, RIGHT-HAND	1	67.6
7	00-0086	A	GUSSET	2	2.39
8	00-0084	B	FLANGE, MOULDBOARD BRACE	1	7.45

**NOTE!**  
TO LOCATE ITEM NO.'S  
1, 2, 5 & 6. USE BASE  
FIXTURE, P/N 18-0005.

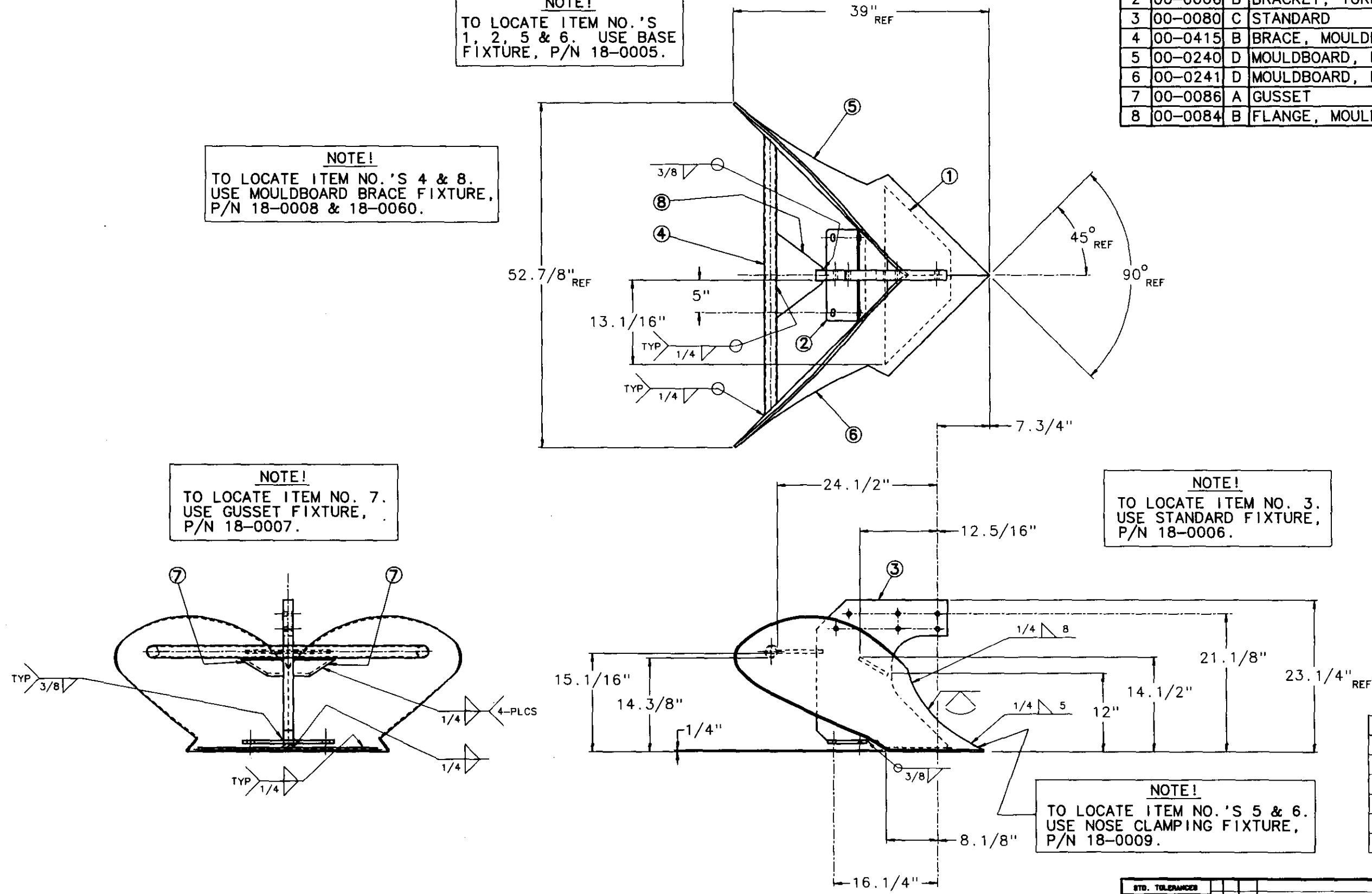
**NOTE!**  
TO LOCATE ITEM NO.'S 4 & 8.  
USE MOULDBOARD BRACE FIXTURE,  
P/N 18-0008 & 18-0060.

**NOTE!**  
TO LOCATE ITEM NO. 7.  
USE GUSSET FIXTURE,  
P/N 18-0007.

**NOTE!**  
TO LOCATE ITEM NO. 3.  
USE STANDARD FIXTURE,  
P/N 18-0006.

**NOTE!**  
TO LOCATE ITEM NO.'S 5 & 6.  
USE NOSE CLAMPING FIXTURE,  
P/N 18-0009.

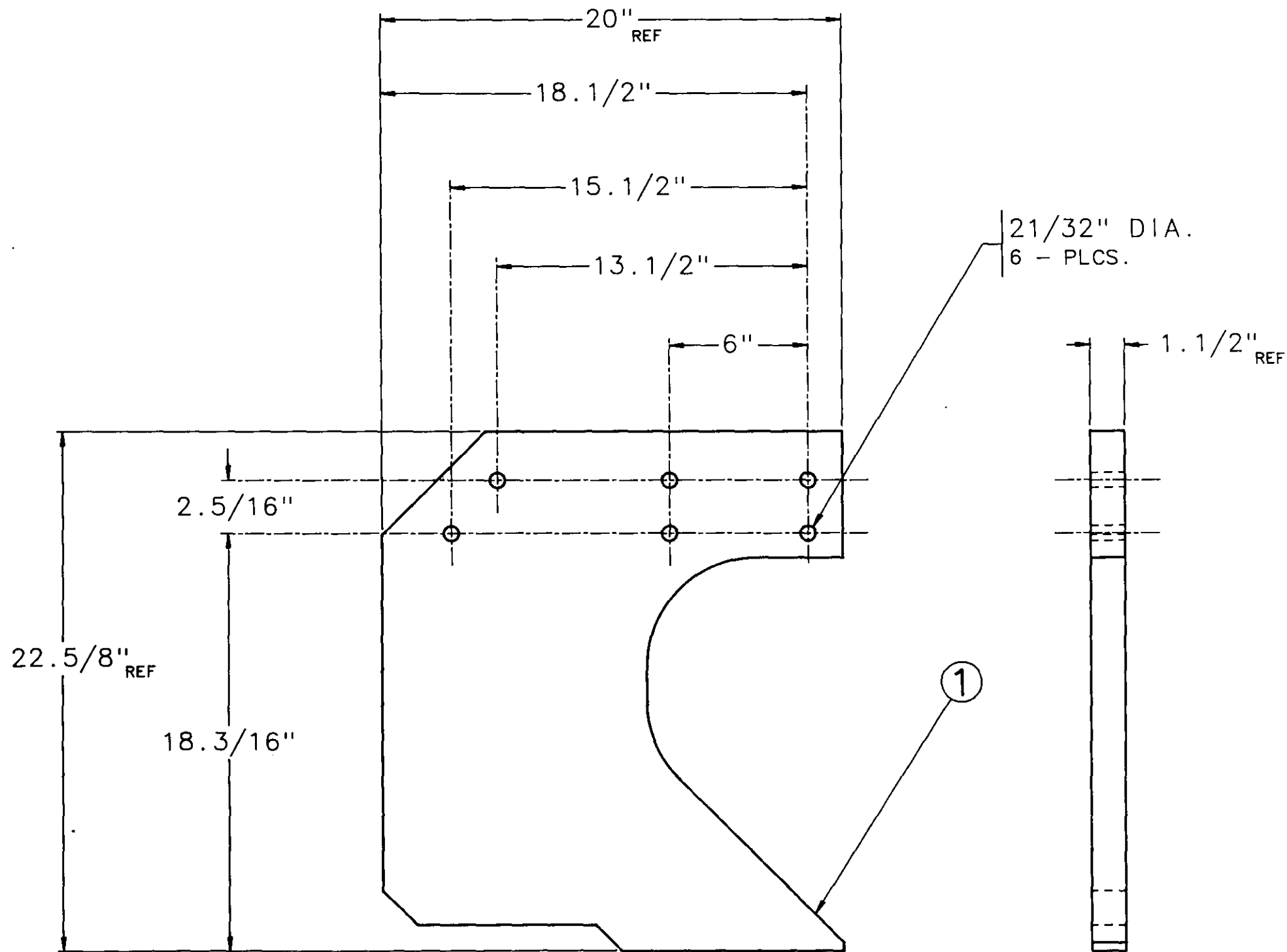
FIXTURES AVAILABLE
18-0005
18-0006
18-0007
18-0008
18-0009
18-0060



PART NUMBER: 00-0406  
EST. WT.: 332 LBS.

STD. TOLERANCES		FRAC.		DEC.		ANGULAR		DATE		DRW. BY		CHKD. BY		APPROVED BY		<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19 Dwg. NO. 00-0406
FUNCTIONAL																
FORM																
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653 TITLE: <b>BOTTOM, S/W: 52" PLOW</b> SCALE: 1 = 8 DATE: DEPT. 20, 1984																

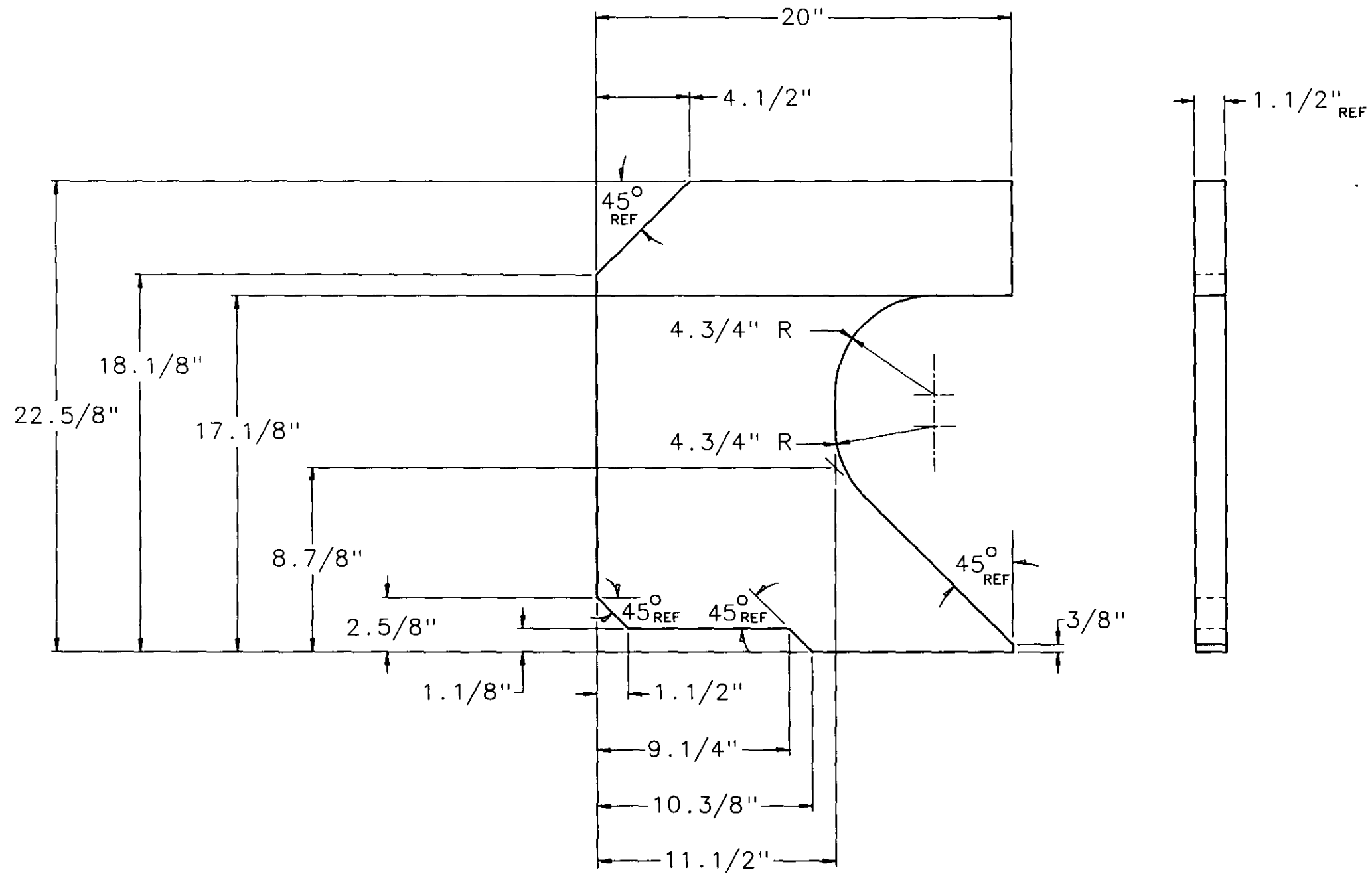
ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0005	C	STANDARD, BLANK, 52" PLOW	1	141



**NOTE:**  
USE DRILLING  
TEMPLATE P/N  
18-0030.

PART NUMBER: 00-0080  
EST. WT.: 140 LBS.

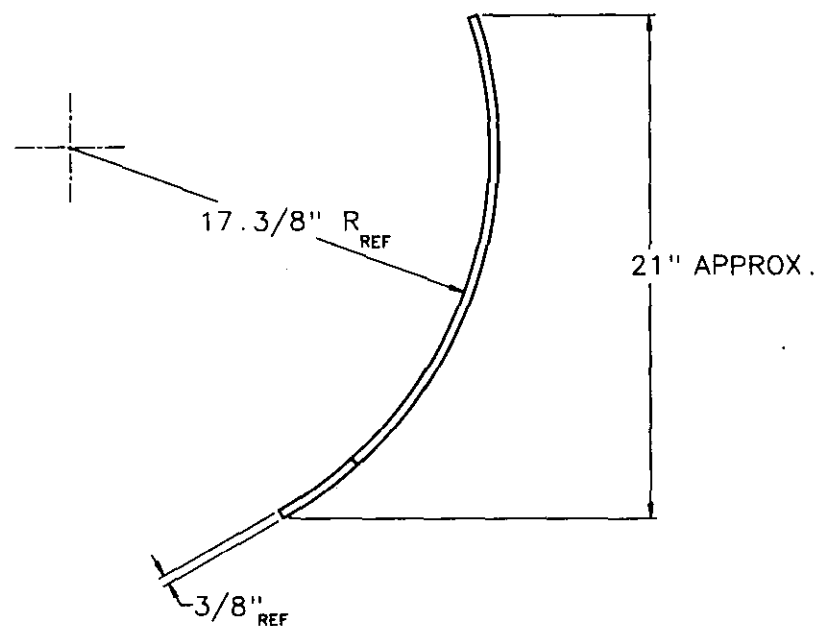
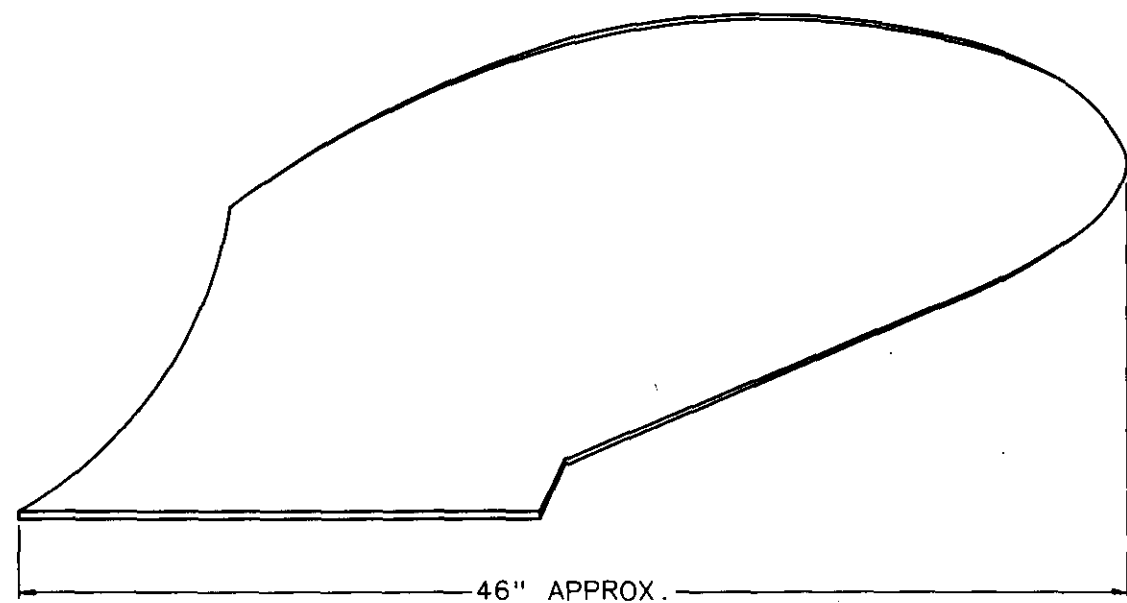
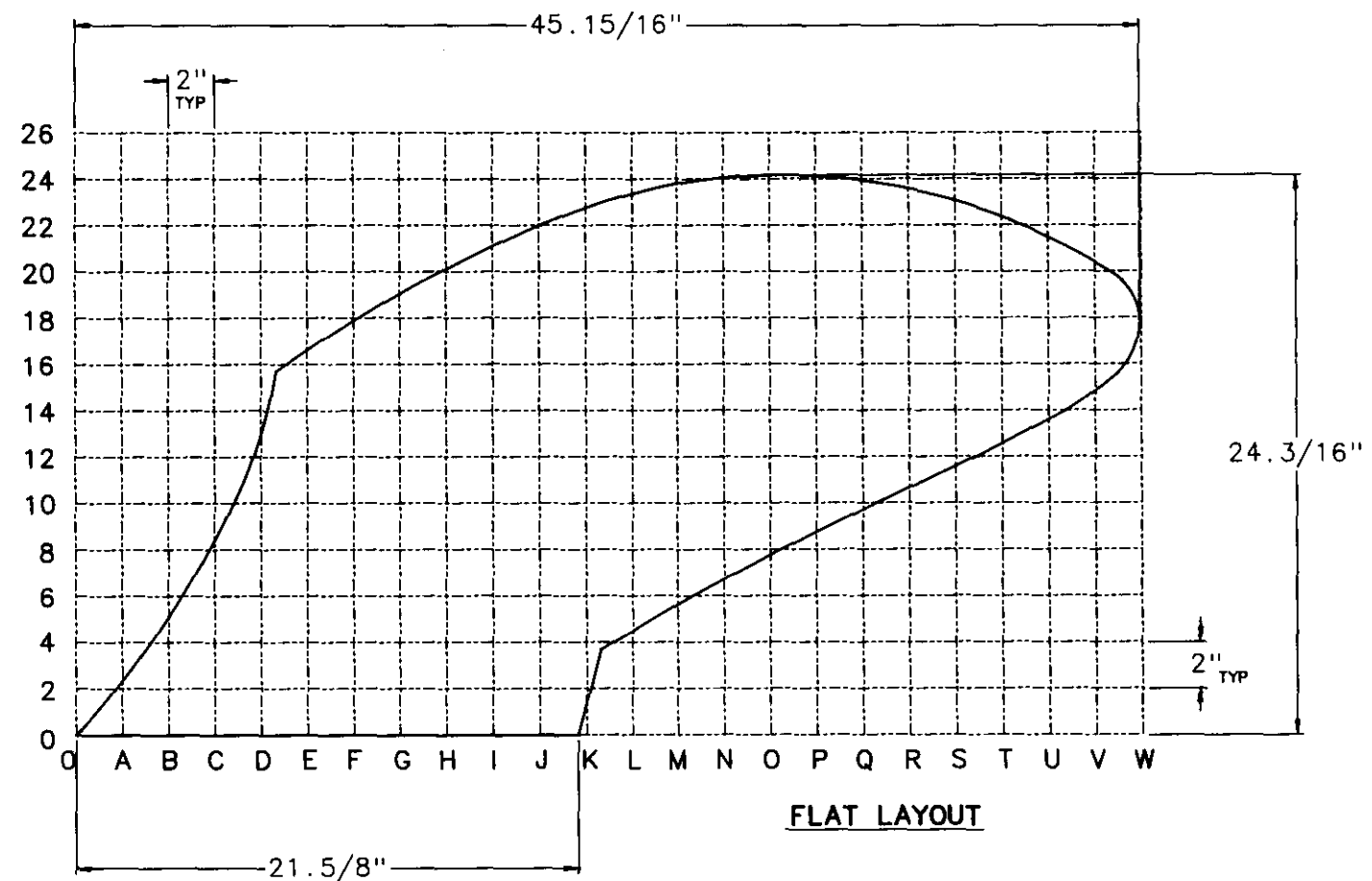
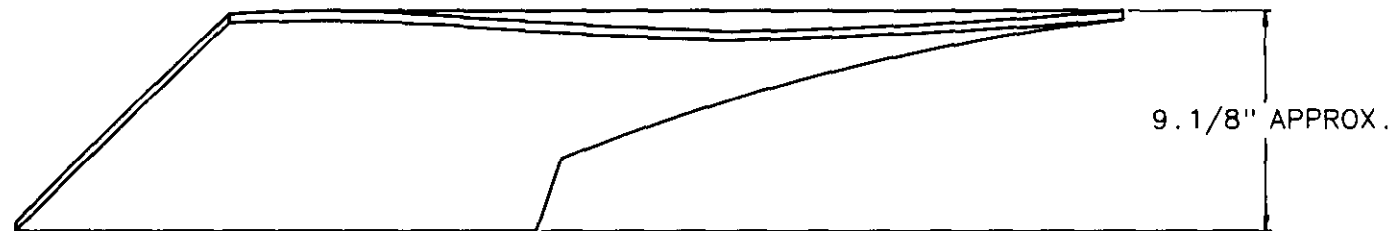
<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 8 IN -1/32 8 IN AND UP -1/16 DECIMAL: 1 PLACE - 0.1 2 PLACE - 0.01 3 PLACE - 0.005 ANGULAR: - 1.005		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		TITLE: <b>STANDARD: 52" FIRELINE PLOW</b> SCALE: 1 = 4 DATE: SEPT 20, 1988 DWG. NO. 00-0080C	



PART NUMBER: 00-0005  
 MAT'L.: PLATE, 1.1/2" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AA-02448AA  
 EST. WT.: 141 LBS.

STD. TOLERANCES		DRAWN: R. GREENLAW		MICHIGAN DNR FOREST MANAGEMENT DIVISION
FRACTIONAL: 0 TO 3/32" ± 1/32" 3/32" AND UP ± 1/16"		CHECKED: KDB		
DECIMAL: 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005		APPROVED:		
ANGULAR: ± 1.00°		NO.	BY	DATE
		REVISION		
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653				PROJECT NO.: 84-19
TITLE: STANDARD, BLANK, 52" FIRELINE PLOW			SCALE: 1 = 4	DATE: SEPT 20, 1988
				DWG. NO. 00-0005C

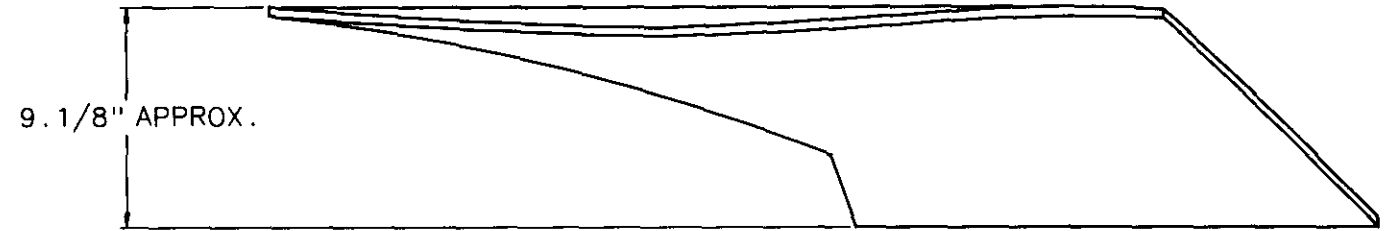
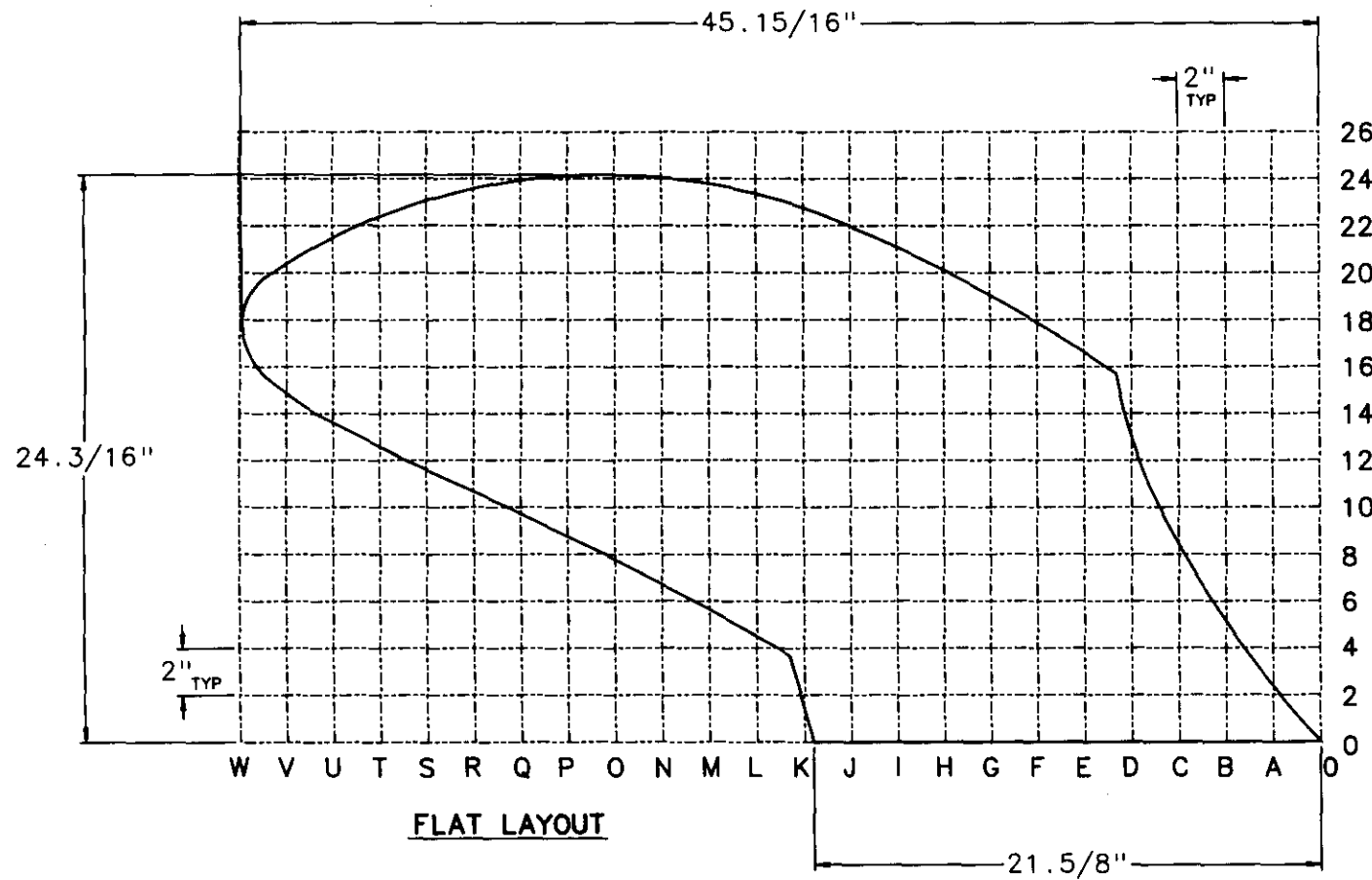




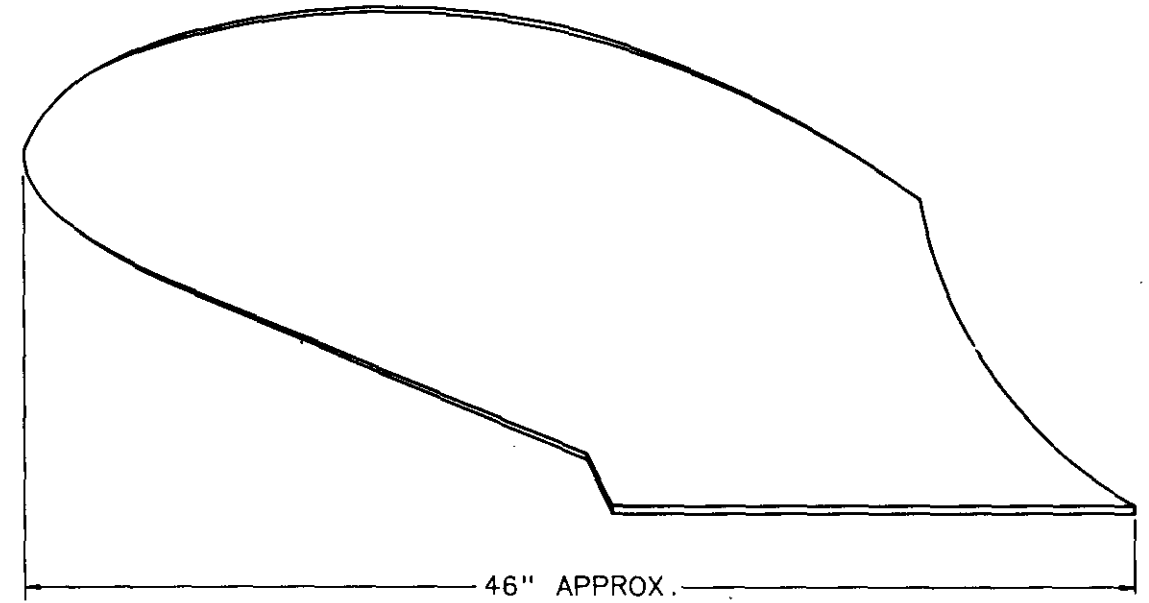
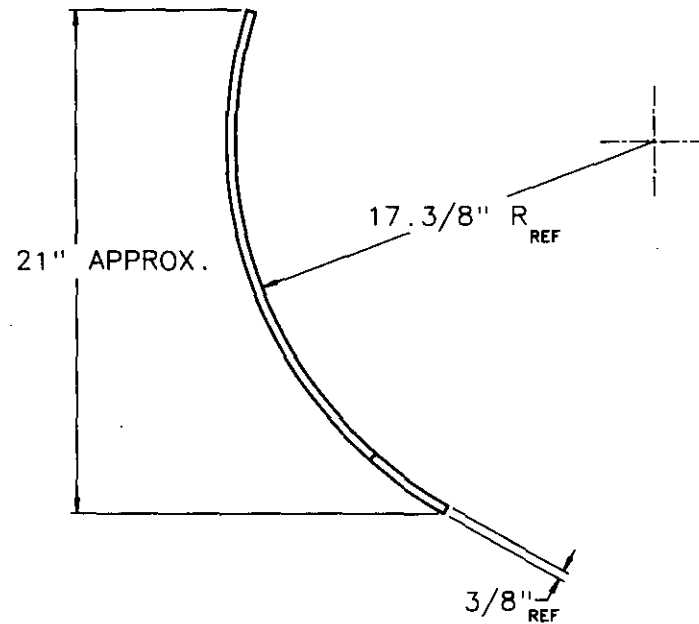
**NOTE!**  
 USE L.H. MOULDBOARD  
 BURNING TEMPLATE,  
 P/N 18-0003.

PART NUMBER: 00-0240  
 MAT'L.: MAKE FROM P/N 00-0081  
 EST. WT.: 67.6 LBS.

STD. TOLERANCES						DRAWN:	
FRACTIONAL						P. GREENLAND	
DECIMAL						CHECKED:	
ANGULAR						KDB	
APPROVED:							
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCONYON, MICHIGAN 49653							<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION
TITLE: MOULDBOARD, L.H.: 52" PLOW							PROJECT NO.: 84-19 Dwg. NO. 00-0240D
SCALE: 1" = 4"							DATE: FEB. 09, 1980

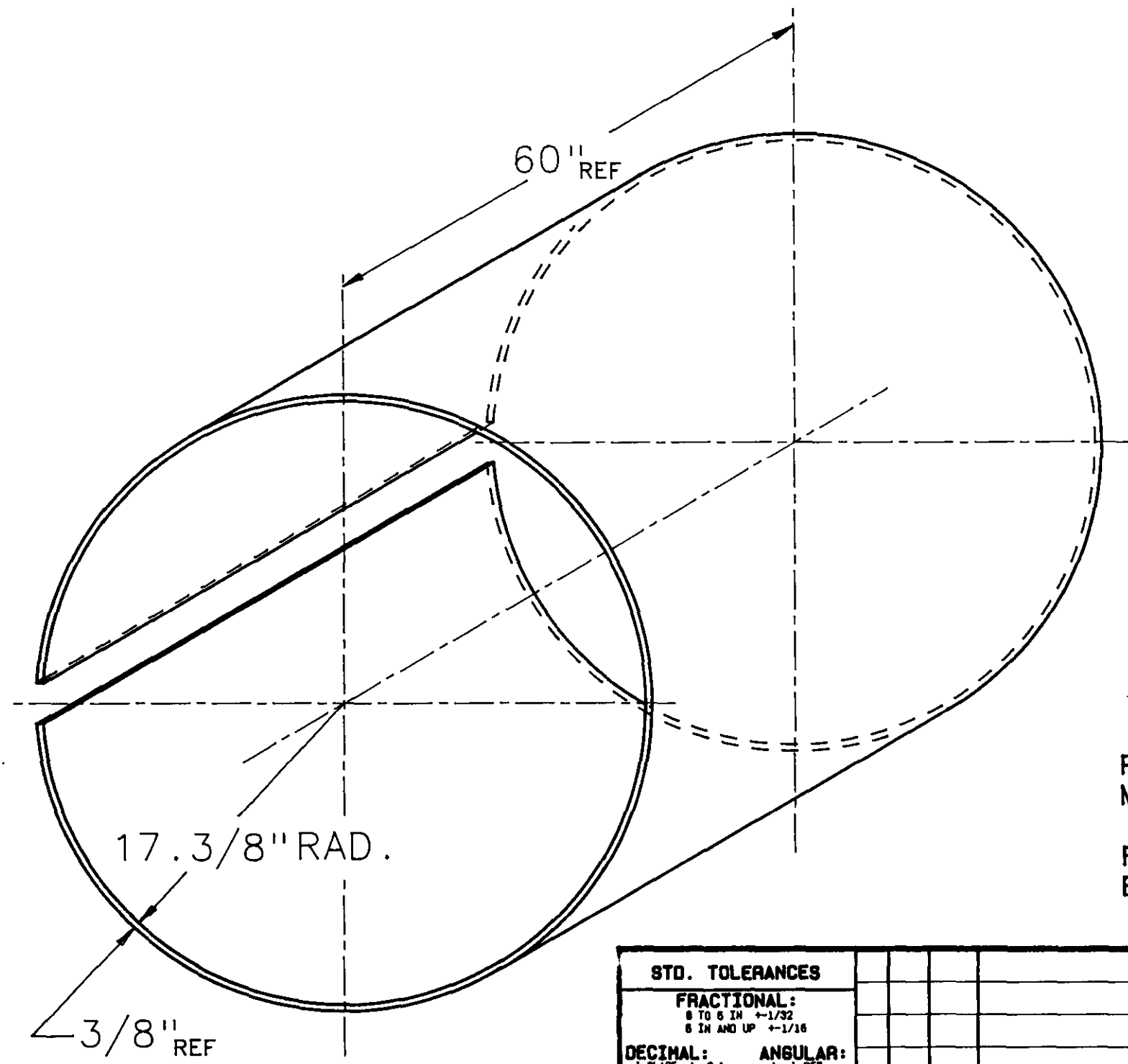


**NOTE!**  
USE R.H. MOULDBOARD  
BURNING TEMPLATE,  
P/N 18-0004.



PART NUMBER: 00-0241  
MAT'L.: MAKE FROM P/N 00-0081  
EST. WT.: 67.6 LBS.

STD. TOLERANCES	FRAC.	DEC.	ANGLES	DRY	DATE	APPROVED:	PROJECT NO.: 84-19
±.015	±.005	±.005	±.005				
±.030	±.010	±.010	±.010				
±.060	±.020	±.020	±.020				
±.125	±.040	±.040	±.040				
±.250	±.080	±.080	±.080				
±.500	±.160	±.160	±.160				
±1.000	±.320	±.320	±.320				
±2.000	±.640	±.640	±.640				
±4.000	±1.280	±1.280	±1.280				
±8.000	±2.560	±2.560	±2.560				
±16.000	±5.120	±5.120	±5.120				
±32.000	±10.240	±10.240	±10.240				
±64.000	±20.480	±20.480	±20.480				
±128.000	±40.960	±40.960	±40.960				
±256.000	±81.920	±81.920	±81.920				
±512.000	±163.840	±163.840	±163.840				
±1024.000	±327.680	±327.680	±327.680				
±2048.000	±655.360	±655.360	±655.360				
±4096.000	±1310.720	±1310.720	±1310.720				
±8192.000	±2621.440	±2621.440	±2621.440				
±16384.000	±5242.880	±5242.880	±5242.880				
±32768.000	±10485.760	±10485.760	±10485.760				
±65536.000	±20971.520	±20971.520	±20971.520				
±131072.000	±41943.040	±41943.040	±41943.040				
±262144.000	±83886.080	±83886.080	±83886.080				
±524288.000	±167772.160	±167772.160	±167772.160				
±1048576.000	±335544.320	±335544.320	±335544.320				
±2097152.000	±671088.640	±671088.640	±671088.640				
±4194304.000	±1342177.280	±1342177.280	±1342177.280				
±8388608.000	±2684354.560	±2684354.560	±2684354.560				
±16777216.000	±5368709.120	±5368709.120	±5368709.120				
±33554432.000	±10737418.240	±10737418.240	±10737418.240				
±67108864.000	±21474836.480	±21474836.480	±21474836.480				
±134217728.000	±42949672.960	±42949672.960	±42949672.960				
±268435456.000	±85899345.920	±85899345.920	±85899345.920				
±536870912.000	±171798691.840	±171798691.840	±171798691.840				
±1073741824.000	±343597383.680	±343597383.680	±343597383.680				
±2147483648.000	±687194767.360	±687194767.360	±687194767.360				
±4294967296.000	±1374389534.720	±1374389534.720	±1374389534.720				
±8589934592.000	±2748779069.440	±2748779069.440	±2748779069.440				
±17179869184.000	±5497558138.880	±5497558138.880	±5497558138.880				
±34359738368.000	±10995116277.760	±10995116277.760	±10995116277.760				
±68719476736.000	±21990232555.520	±21990232555.520	±21990232555.520				
±137438953472.000	±43980465111.040	±43980465111.040	±43980465111.040				
±274877906944.000	±87960930222.080	±87960930222.080	±87960930222.080				
±549755813888.000	±175921860444.160	±175921860444.160	±175921860444.160				
±1099511627776.000	±351843720888.320	±351843720888.320	±351843720888.320				
±2199023255552.000	±703687441776.640	±703687441776.640	±703687441776.640				
±4398046511104.000	±1407374883553.280	±1407374883553.280	±1407374883553.280				
±8796093022208.000	±2814749767106.560	±2814749767106.560	±2814749767106.560				
±17592186044416.000	±5629499534213.120	±5629499534213.120	±5629499534213.120				
±35184372088832.000	±11258999068426.240	±11258999068426.240	±11258999068426.240				
±70368744177664.000	±22517998136852.480	±22517998136852.480	±22517998136852.480				
±140737488355328.000	±45035996273704.960	±45035996273704.960	±45035996273704.960				
±281474976710656.000	±90071992547409.920	±90071992547409.920	±90071992547409.920				
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±36028797018963968.000	±11529215046068469.760	±11529215046068469.760	±11529215046068469.760				
±72057594037927936.000	±23058430092136939.520	±23058430092136939.520	±23058430092136939.520				
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±288230376151711744.000	±92233720368547758.080	±92233720368547758.080	±92233720368547758.080				
±576460752303423488.000	±184467440737095516.160	±184467440737095516.160	±184467440737095516.160				
±1152921504606846976.000	±368934881474191032.320	±368934881474191032.320	±368934881474191032.320				
±2305843009213693952.000	±737869762948382064.640	±737869762948382064.640	±737869762948382064.640				
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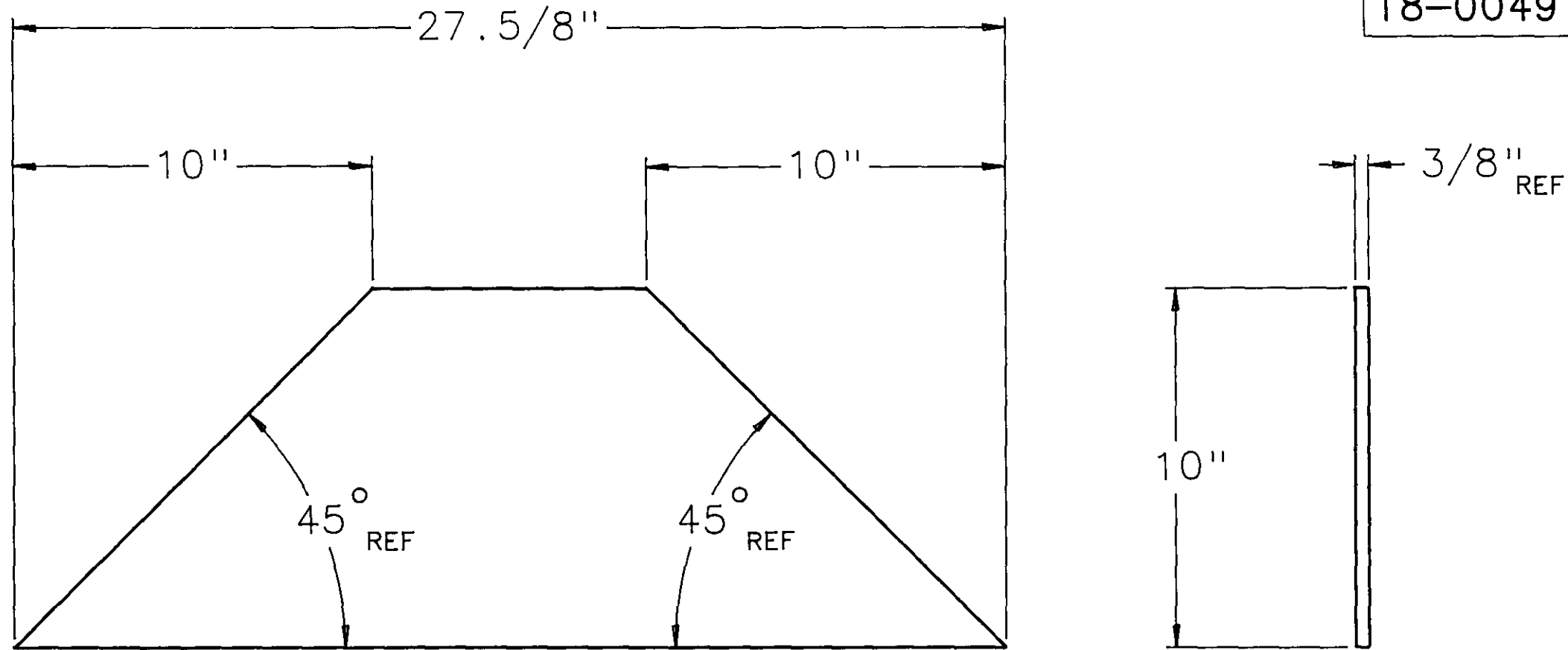


**NOTE:**  
 PRODUCE FROM ONE  
 3/8" X 60" X 108"  
 PLATE.  
 DO NOT EXCEED 5"  
 LONG FLAT AREA AT  
 ENDS OF ROLL.

PART NUMBER: 00-0081  
 MAT'L.: PLATE, 3/8" X 5' X 9' H.R.  
 UNS G10150  
 F.F.E.S. SPEC. NO.: AA-00659BC  
 EST. WT.: 688 LBS.

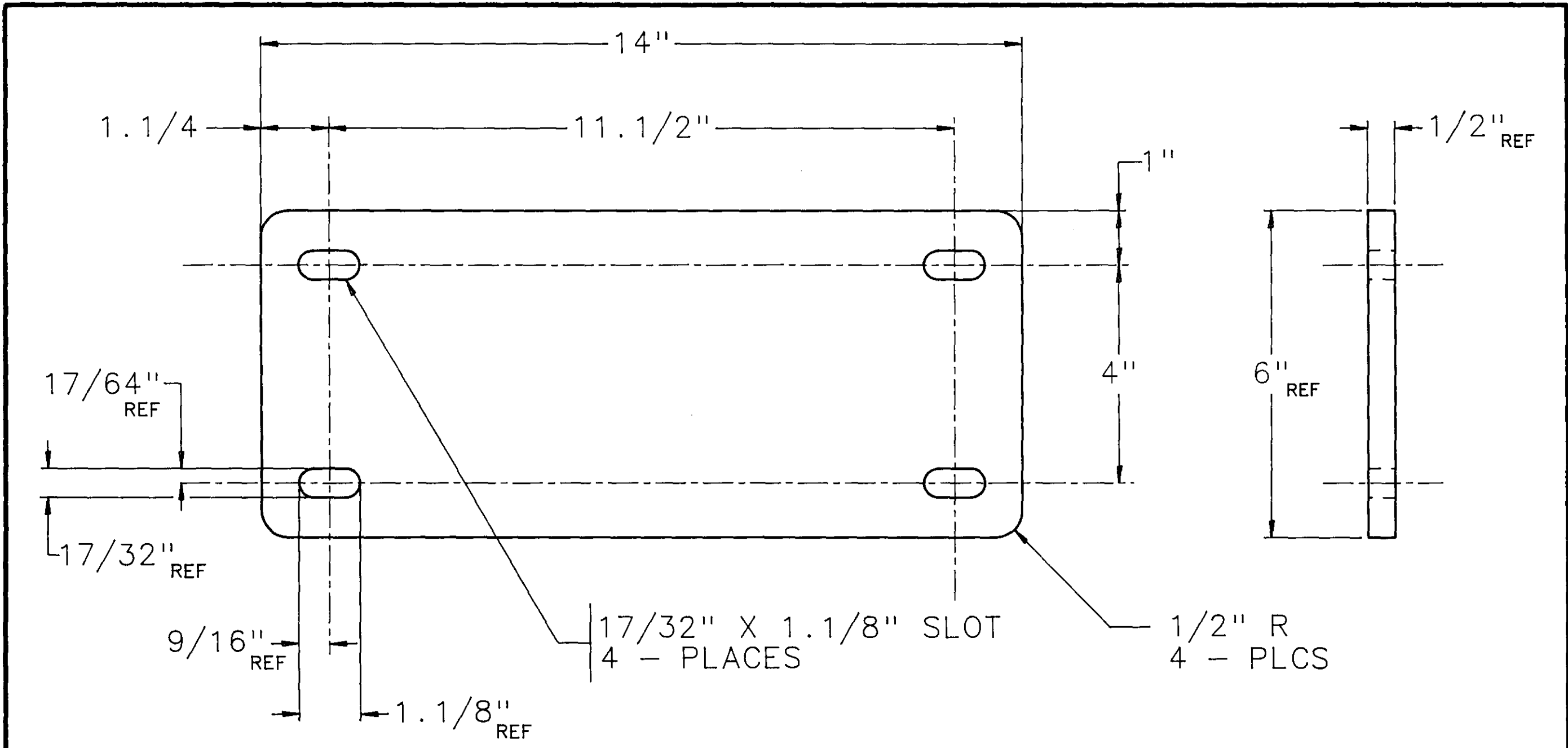
<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
FRACTIONAL: 8 TO 6 IN +-1/32 6 IN AND UP +-1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL: 1 PLACE +-0.1 2 PLACE +-0.01 3 PLACE +-0.005		ANGULAR: +-1 DEG		APPROVED:			
NO.	BY	DATE	REVISION				
<b>FOREST FIRE EXPERIMENT STATION</b>							
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653						PROJECT NO.: 84-19	
TITLE: MOULDBOARD, BLANK, ROLLED 3/8" PLATE				SCALE: 1/8	DATE: OCT. 04, 1989	DWG. NO. 00-0081B	

**NOTE!**  
 USE LAYOUT  
 TEMPLATE P/N  
 18-0049.



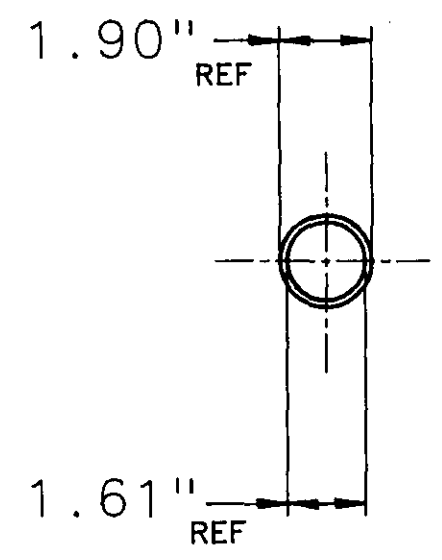
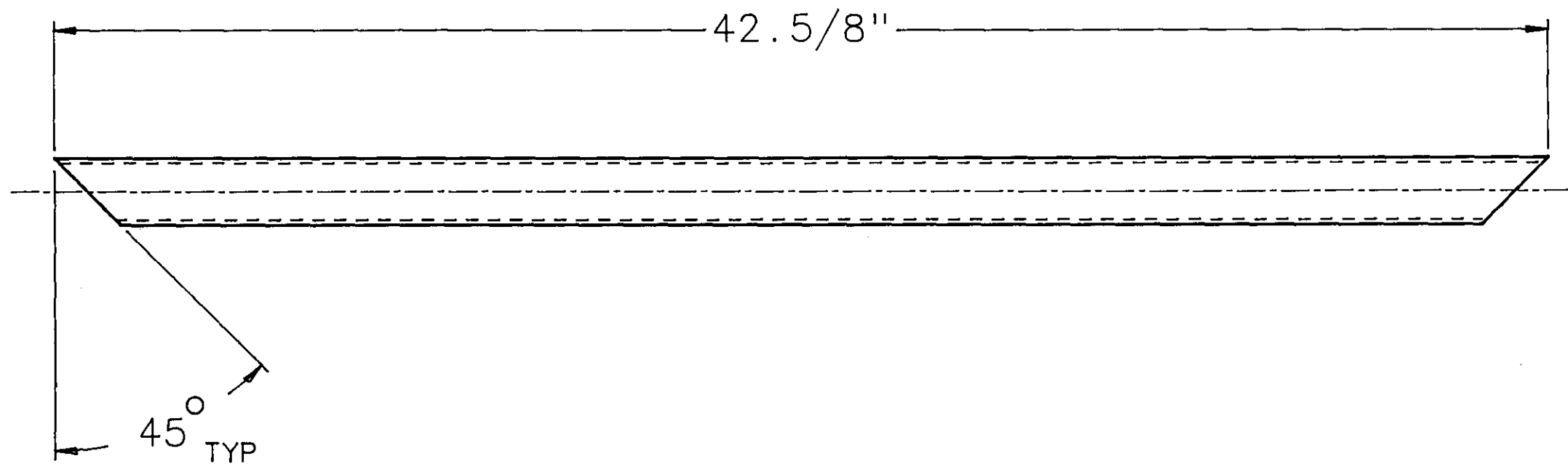
PART NUMBER: 00-0407  
 MAT'L.: PLATE, 3/8" H.R.  
 UNS G10150  
 F.F.E.S. SPEC. NO.: AA-00648BC  
 EST. WT.: 18.7 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
FRACTIONAL: 0 TO 6 IN +-1/32 6 IN AND UP +-1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL: 1 PLACE +-0.1 2 PLACE +-0.01 3 PLACE +-0.005		ANGULAR: +-1 DEG		APPROVED:			
NO.	BY	DATE	REVISION			PROJECT NO.: 84-19	
<b>FOREST FIRE EXPERIMENT STATION</b>						DWG. NO. 00-0407B	
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							
TITLE: <b>BOTTOM PLATE</b>				SCALE: 1 = 4	DATE: SEPT. 27, 1989		



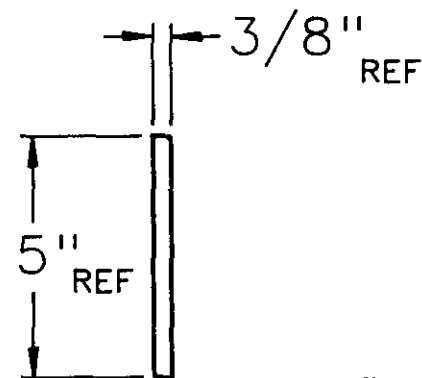
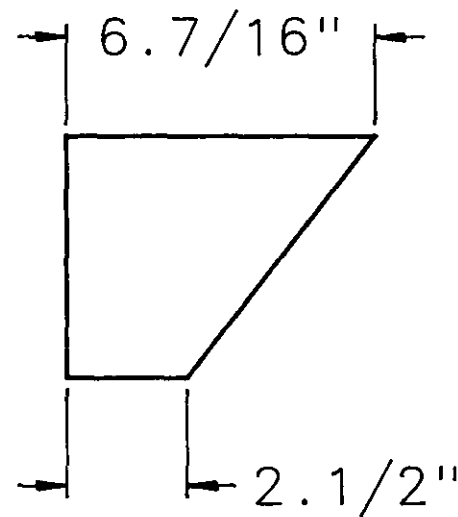
PART NUMBER: 00-0006  
 MAT'L.: BAR, FLAT, 1/2" X 6" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00824AA  
 EST. WT.: 11.6 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
<b>FRACTIONAL:</b> 6 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
<b>DECIMAL:</b> 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005		<b>ANGULAR:</b> ±1 DEG		APPROVED:			
NO.	BY	DATE	REVISION				
<b>FOREST FIRE EXPERIMENT STATION</b>							
P.O. BOX 68      ROSCOMMON, MICHIGAN 48653							
TITLE: <b>BRACKET, TURF KNIFE MOUNTING</b>				SCALE: 1 = 2	DATE: SEPT. 28, 1989	PROJECT NO.: 84-19	
						DWG. NO. 00-0006B	



PART NUMBER: 00-0415  
 MAT'L.: PIPE, 1.1/2" SCH. 40, BLACK  
 UNS K03000  
 F.F.E.S. SPEC. NO.: AF-04024AY  
 EST. WT.: 9.23 LBS.

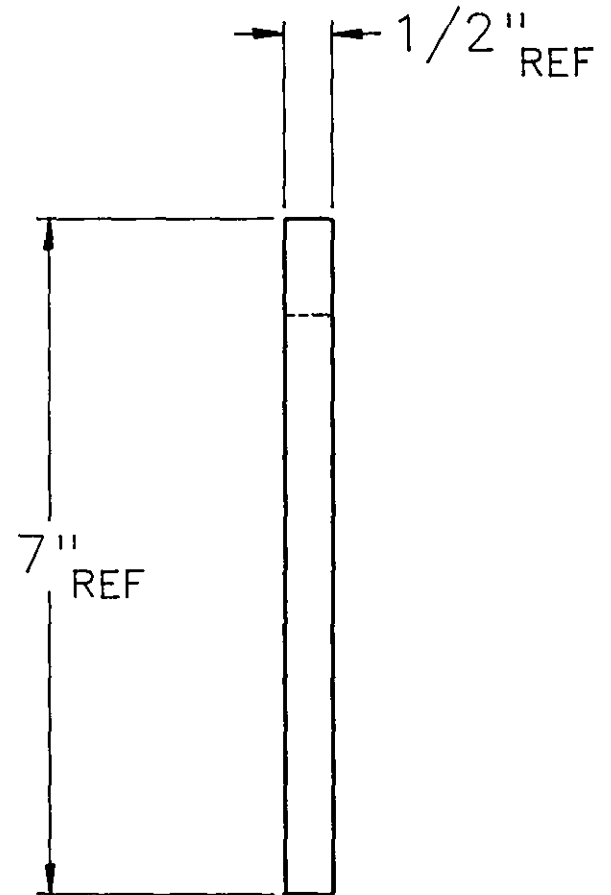
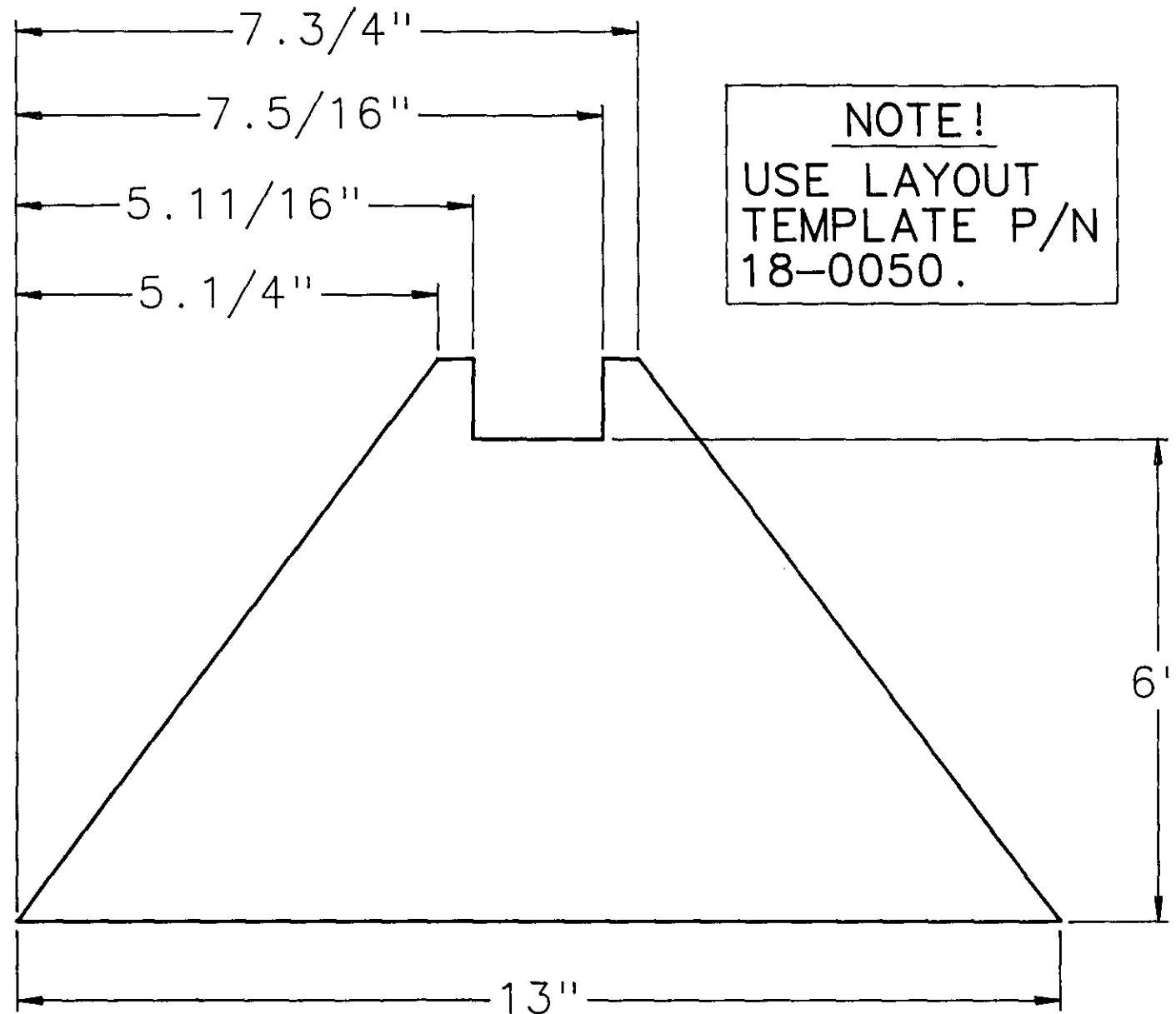
<b>STD. TOLERANCES</b>		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION	
<b>FRACTIONAL:</b> 8 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$	<b>ANGULAR:</b> $\pm 1$ DEG			PROJECT NO.: <b>84-19</b>
<b>DECIMAL:</b> 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$	NO. BY DATE REVISION			DWG. NO. <b>00-0415B</b>
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			SCALE: <b>1 = 4</b> DATE: <b>OCT. 16, 1988</b>	
TITLE: <b>BRACE, MOULDBOARD: 52" FIRELINE PLOW</b>				



**NOTE!**  
 USE LAYOUT  
 TEMPLATE P/N  
 18-0051.

PART NUMBER: 00-0086  
 MAT'L.: BAR, FLAT, 3/8" X 5" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00620AA  
 EST. WT.: 2.39 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION															
<table border="1"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>REVISION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>		NO.		BY	DATE	REVISION												
NO.	BY	DATE	REVISION															
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			SCALE: 1 = 4      DATE: SEPT. 27, 1989															
TITLE: <b>GUSSET</b>																		

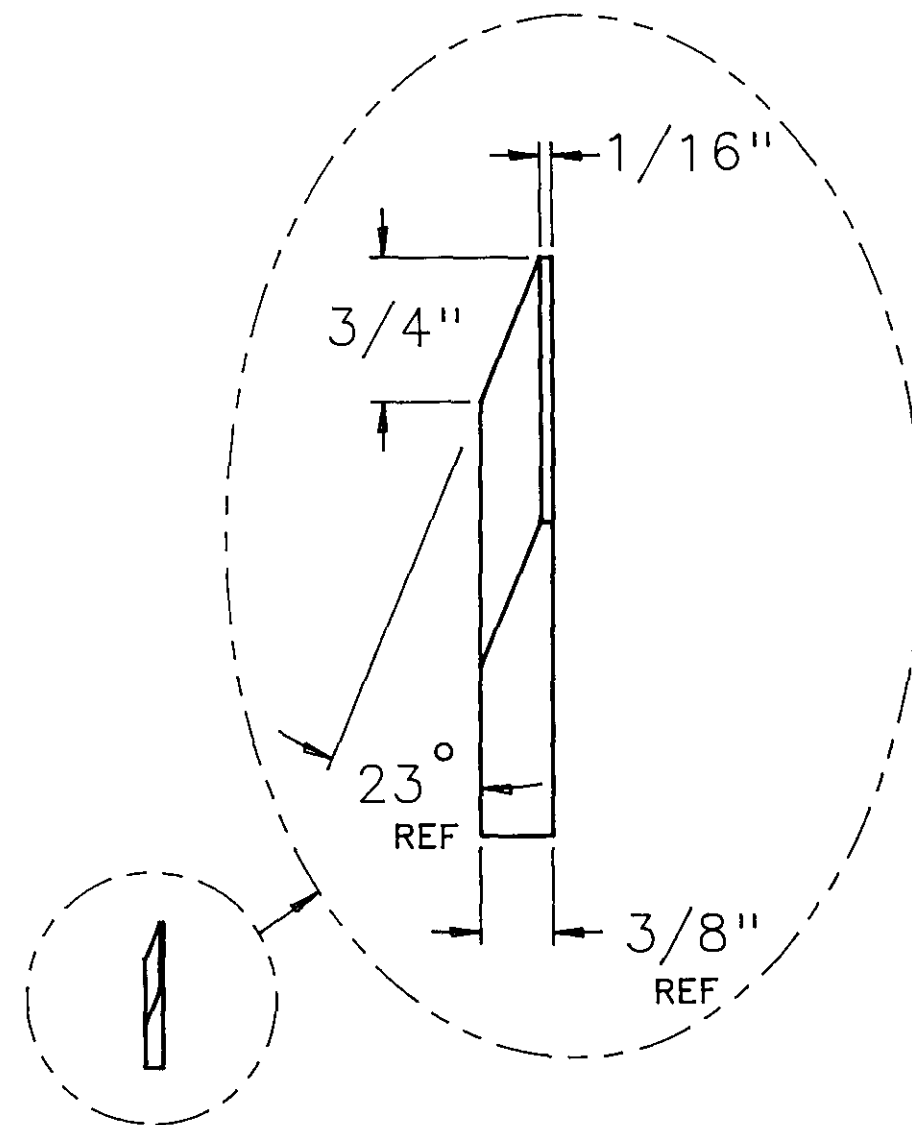
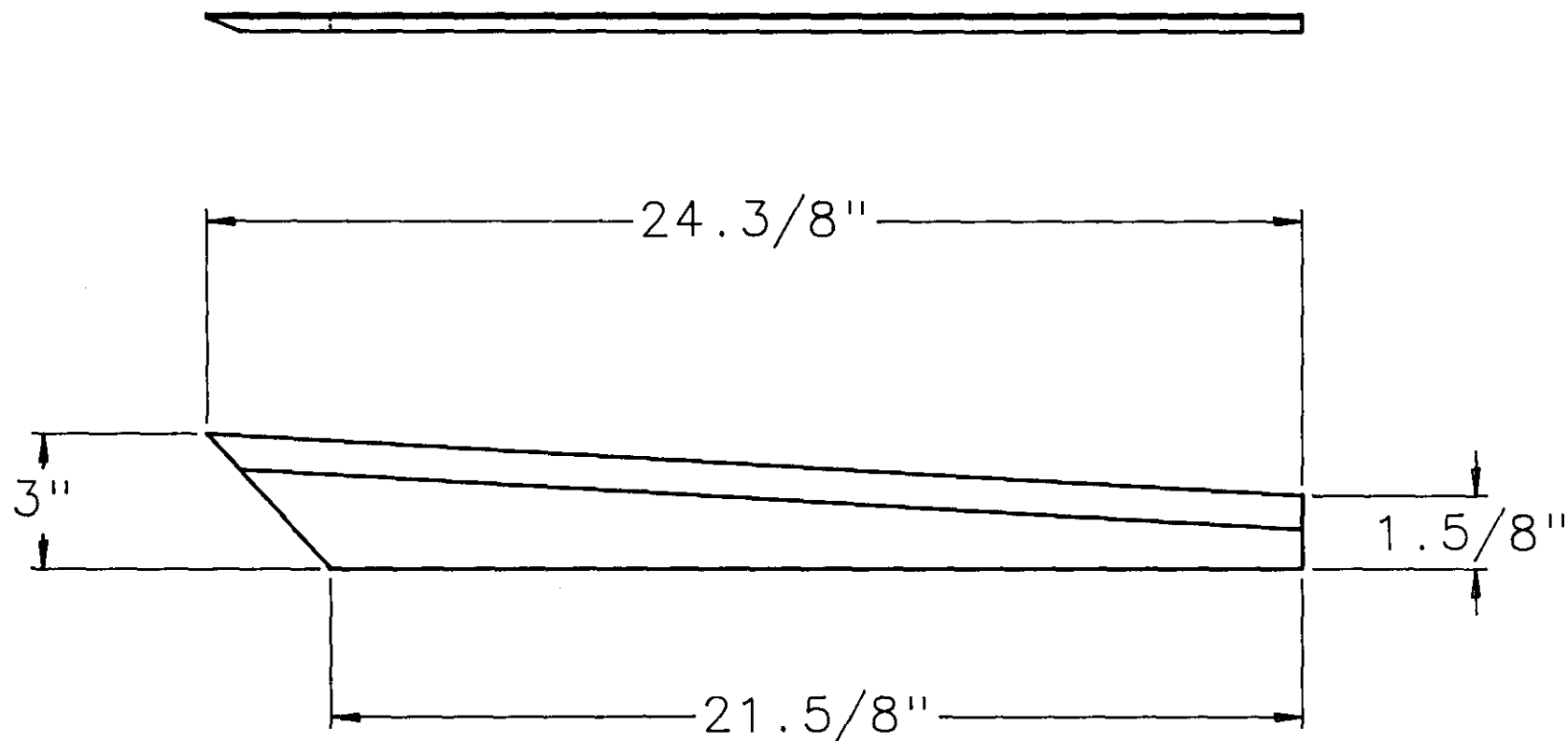


PART NUMBER: 00-0084  
 MAT'L.: BAR, FLAT, 1/2" X 7" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00828AA  
 EST. WT.: 7.45 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 6 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
NO. BY DATE REVISION		PROJECT NO.: 84-19	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			DWG. NO. 00-0084B
TITLE: <b>FLANGE, MOULDBOARD BRACE</b>		SCALE: 1 = 2 DATE: <b>SEPT. 27, 1989</b>	

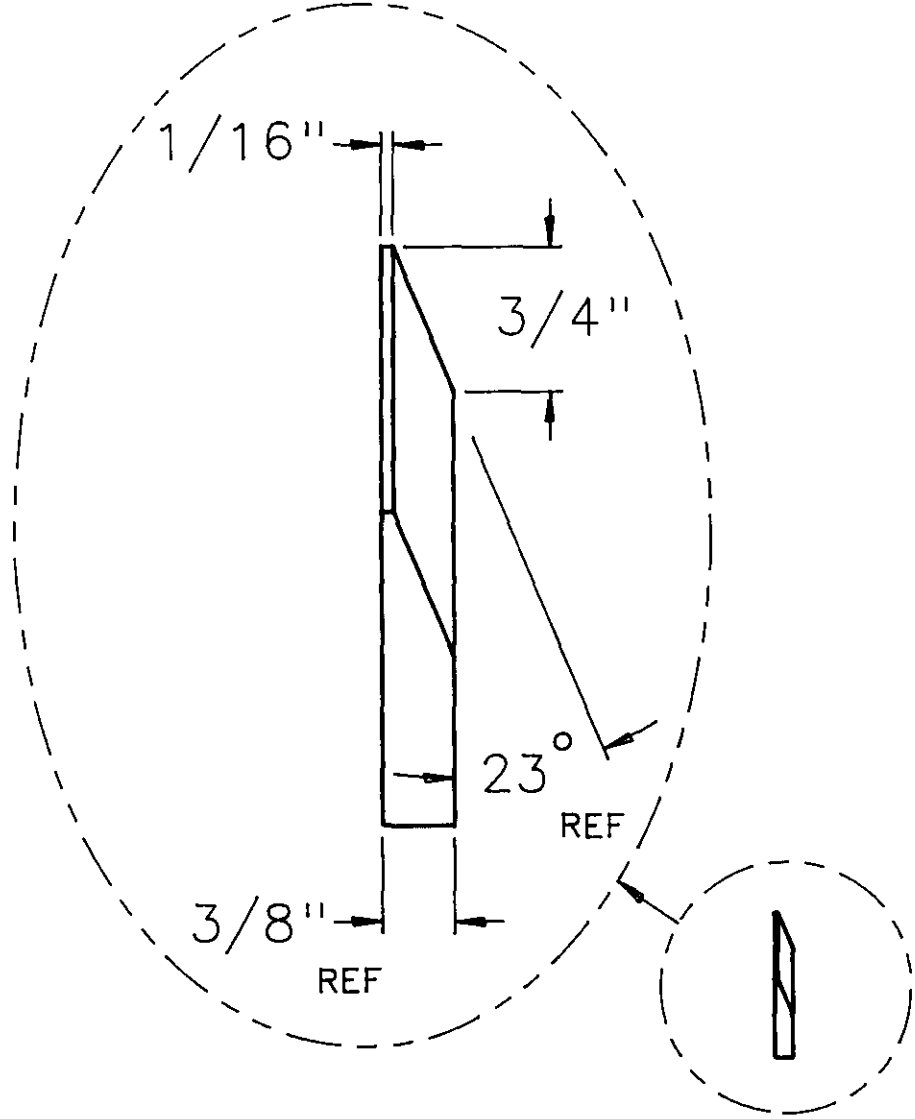


**NOTE!**  
 USE EDGE CUT FIXTURE  
 P/N 18-0033.

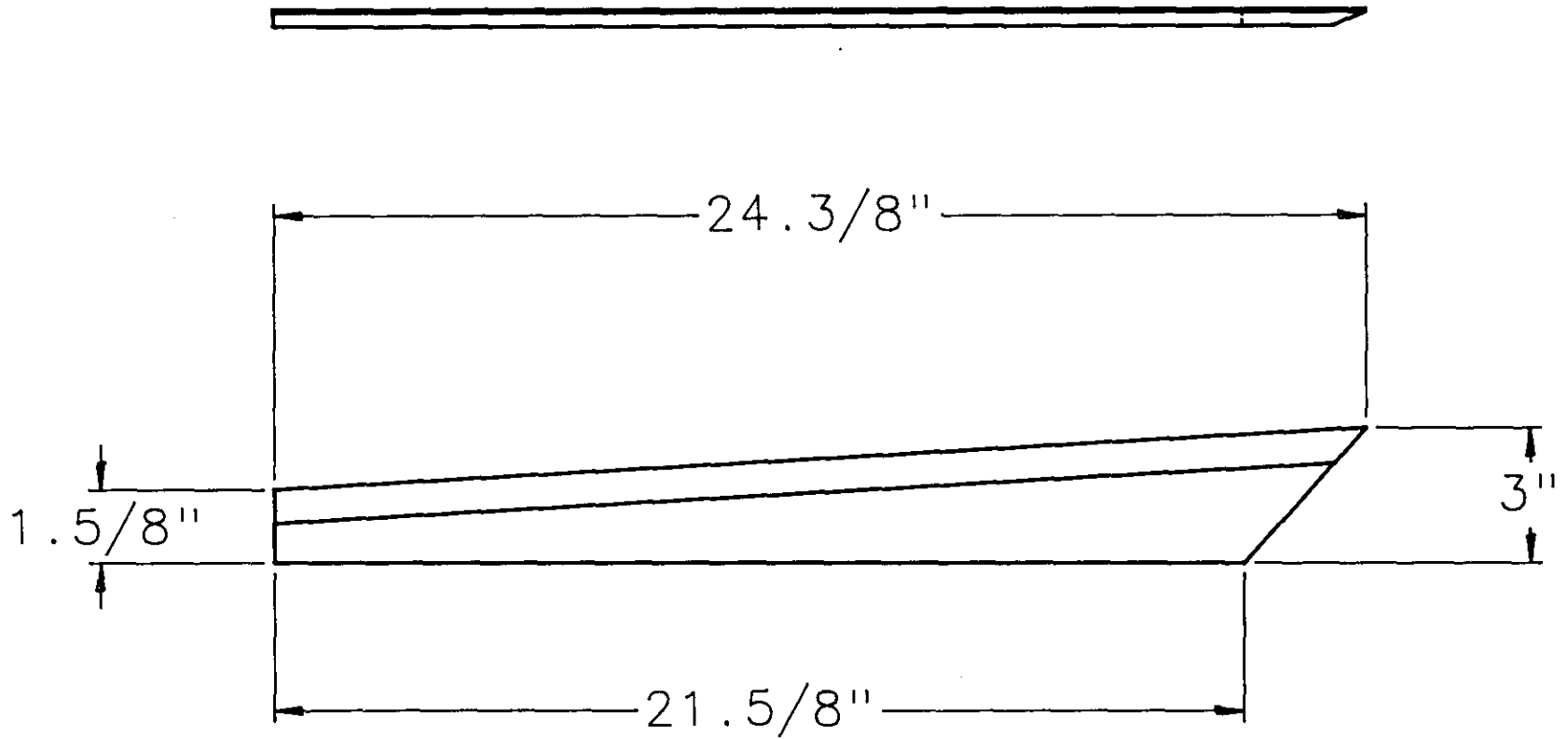


PART NUMBER: 00-0418  
 MAT'L.: PLATE, 3/8" H.R.  
 ABRASION RESISTING  
 BRINELL HARDNESS 200-250  
 F.F.E.S. SPEC. NO.: AA-00648BG  
 EST. WT.: 4.75 LBS.

<b>STD. TOLERANCES</b>		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b> FOREST MANAGEMENT DIVISION
<b>FRACTIONAL:</b> 0 TO 6 IN ±1/32 6 IN AND UP ±1/16			
<b>DECIMAL:</b> 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005	<b>ANGULAR:</b> ±1 DEG		
NO.	BY		
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			PROJECT NO.: 84-19
TITLE: <b>SHARE, L.H.: 52" FIRELINE PLOW</b>		SCALE: 1 = 4	DATE: OCT. 24, 1989
			DWG. NO. <b>00-0418B</b>

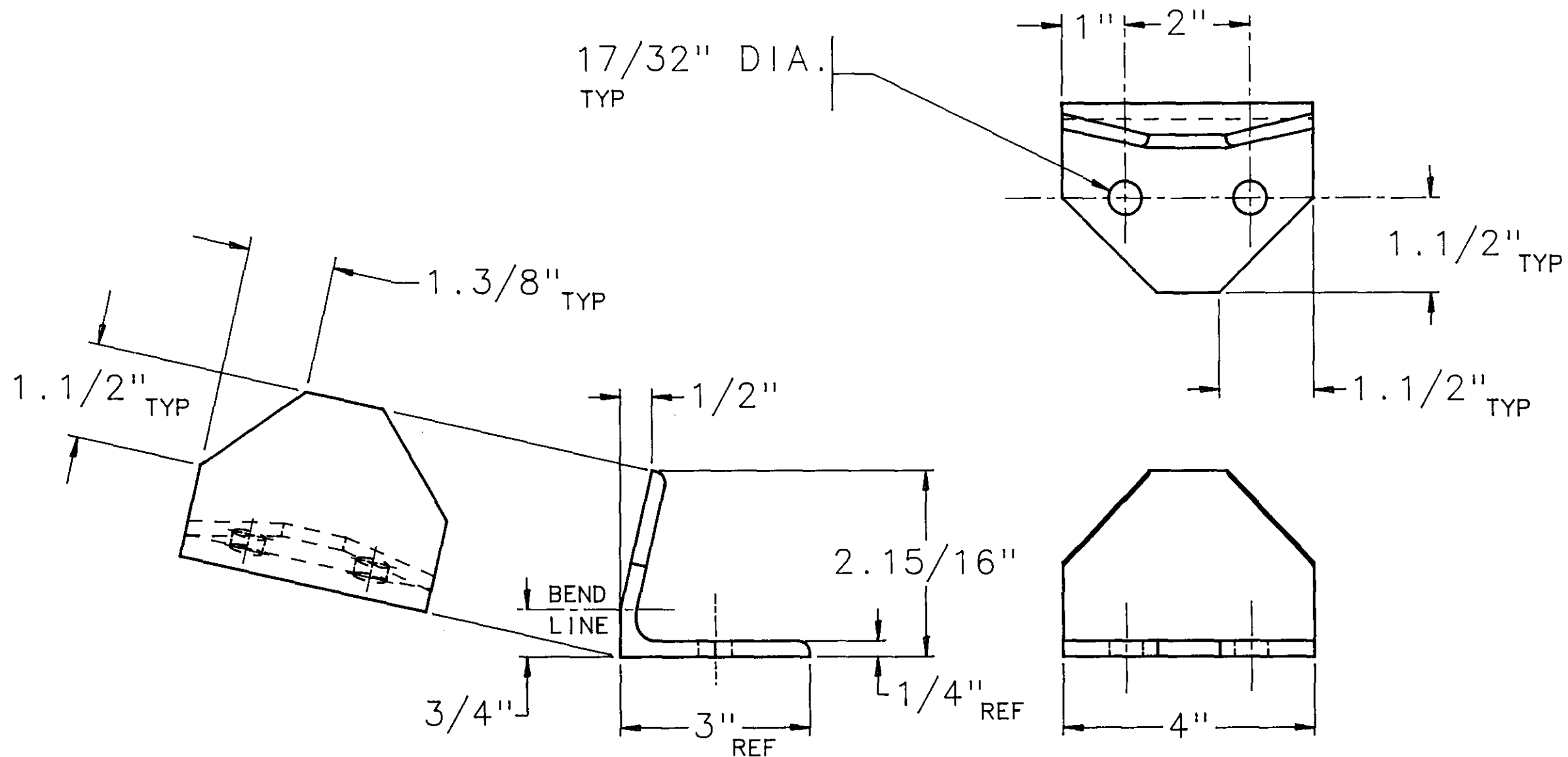


**NOTE!**  
 USE EDGE CUT FIXTURE  
 P/N 18-0033.



PART NUMBER: 00-0419  
 MAT'L.: PLATE, 3/8" H.R.  
 ABRASION RESISTING  
 BRINELL HARDNESS 200-250  
 F.F.E.S. SPEC. NO.: AA-00648BG  
 EST. WT.: 4.75 LBS.

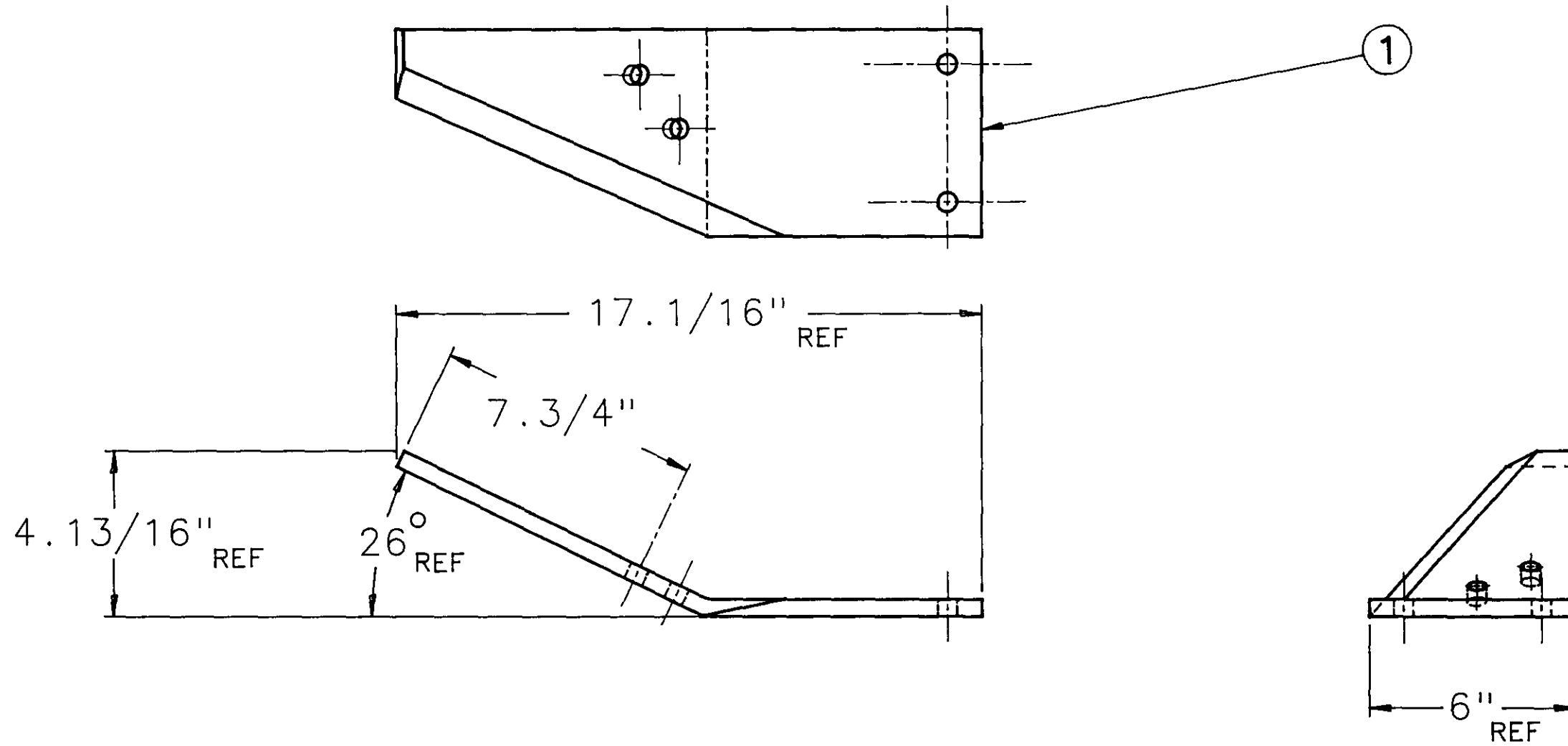
<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">NO.</th> <th style="width: 10%;">BY</th> <th style="width: 10%;">DATE</th> <th style="width: 75%;">REVISION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	BY	DATE	REVISION													DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION  PROJECT NO.: 84-19
NO.	BY	DATE	REVISION																
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN 48653			TITLE: <b>SHARE, R.H.: 52" FIRELINE PLOW</b>																
SCALE: 1 = 4		DATE: <b>OCT. 24, 1989</b>	DWG. NO. <b>00-0419B</b>																



PART NUMBER: 00-0408  
 MAT'L.: ANGLE, 3" X 3" X 1/4" H.R.  
 UNS K02600  
 F.F.E.S. SPEC. NO.: AK-41212AG  
 EST. WT.: 1.30 LBS.

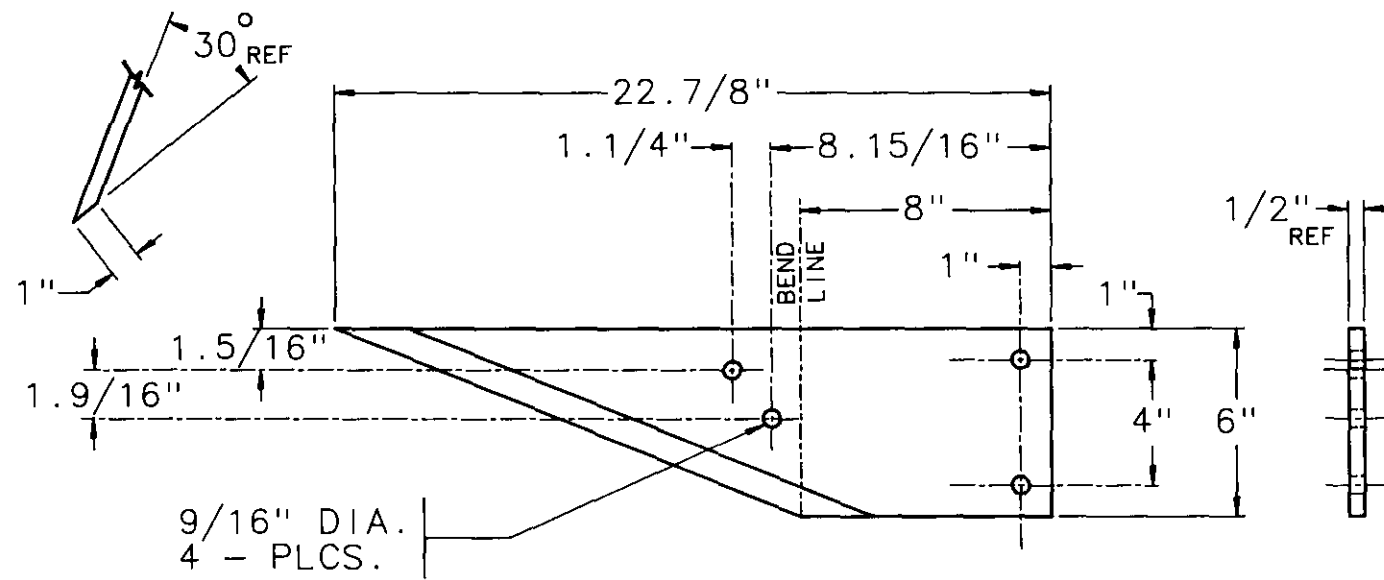
<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION							
<table border="1"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>REVISION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		NO.		BY	DATE	REVISION				
NO.	BY	DATE	REVISION							
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			DWG. NO. 00-0408B							
TITLE: <b>ANGLE, TURF KNIFE MOUNTING</b>		SCALE: 1 = 2	DATE: SEPT. 29, 1989							

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0417	C	KNIFE, TURF, R.H. BLANK	1	10.2



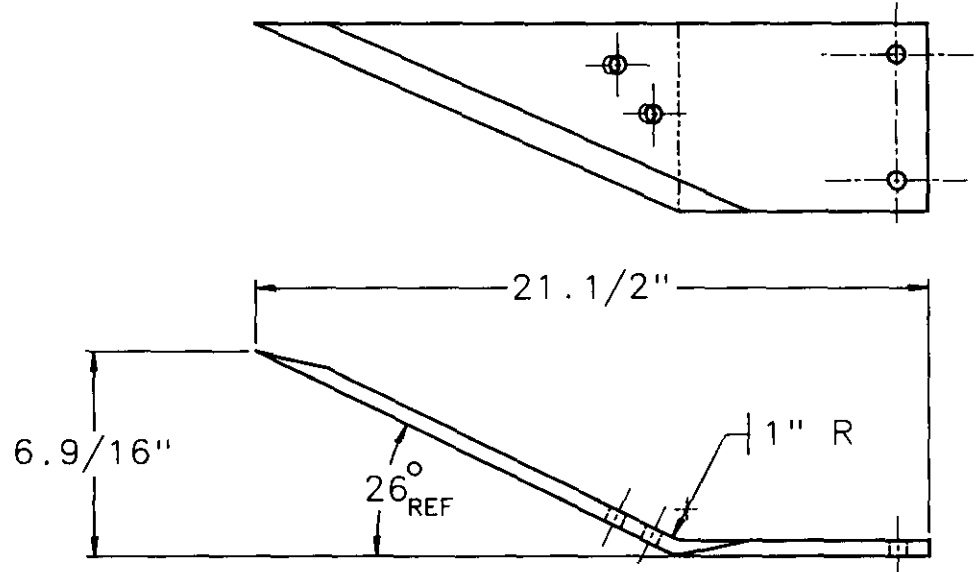
PART NUMBER: 20-0009  
EST. WT.: 9.76 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG		NO. BY DATE REVISION	DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			PROJECT NO.: 84-19	DWG. NO. 20-0009B
TITLE: <b>KNIFE, TURF: R.H.</b>		SCALE: 1 = 4	DATE: OCT. 17, 1989	

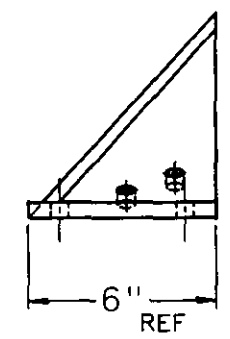


**NOTE!**  
USE DRILL/BEND  
TEMPLATE, P/N  
18-0031.

**FLAT LAYOUT**



**NOTE!**  
USE GAGE P/N  
18-0032.

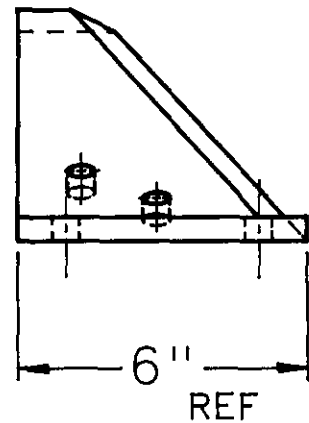
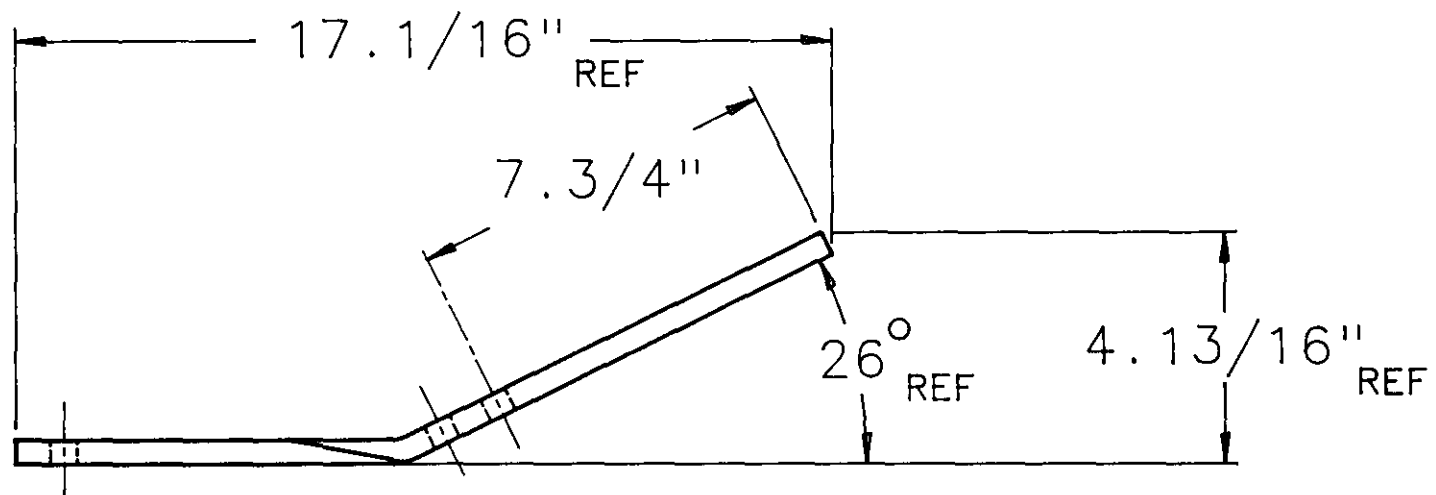
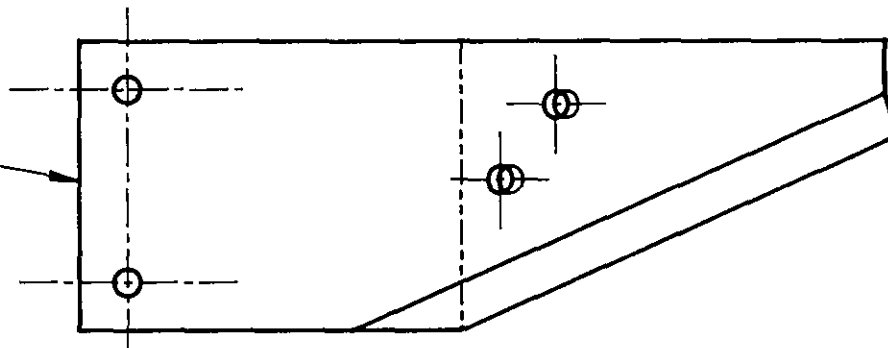


PART NUMBER: 00-0417  
MAT'L.: PLATE, 1/2" H.R.  
ABRASION RESISTING  
BRINELL HARDNESS 200-250  
F.F.E.S. SPEC. NO.: AA-00848BG  
EST. WT.: 10.2 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 8 DI -- 1/32 8 DI AND UP -- 1/16 DECIMAL: 1 PLACE -- 0.1 2 PLACE -- 0.01 3 PLACE -- 0.001 ANGULAR: -- 1 DEG		DRAWN: <b>P. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			PROJECT NO.: 84-19
TITLE: <b>KNIFE, TURF, R.H. BLANK</b>		SCALE: 1 = 4	DATE: OCT. 17, 1989
			DWG. NO. 00-0417C

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0416	C	KNIFE, TURF, L.H. BLANK	1	10.2

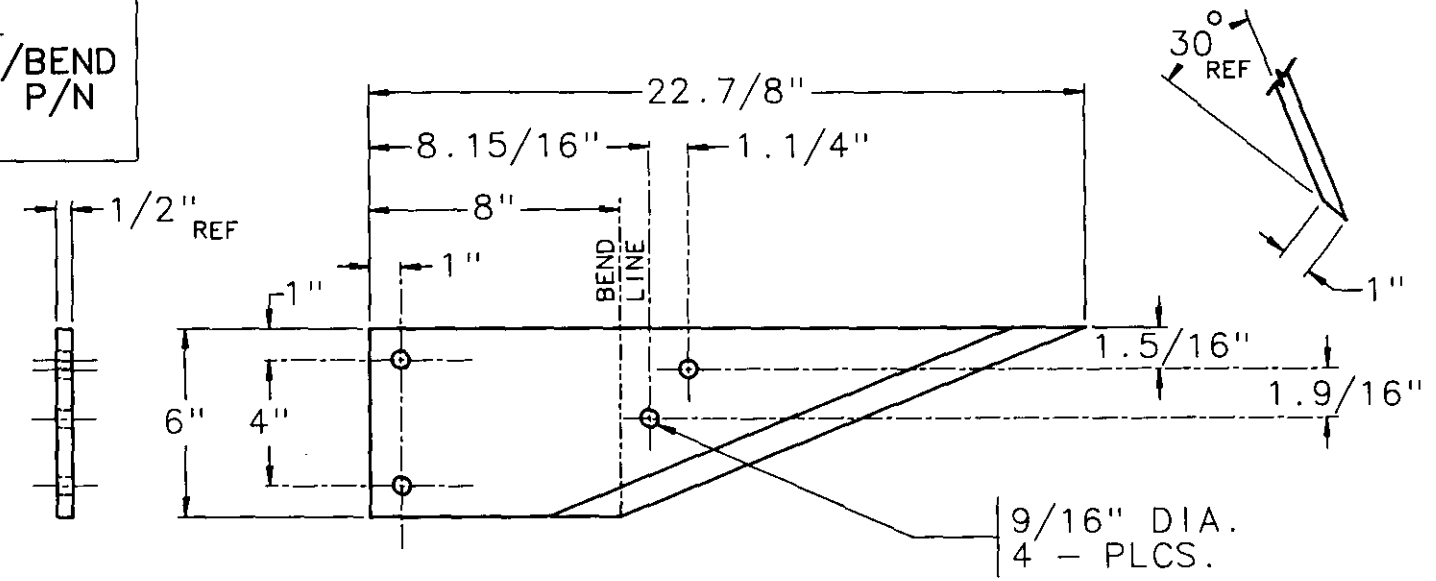
①



PART NUMBER: 20-0008  
EST. WT.: 9.76 LBS.

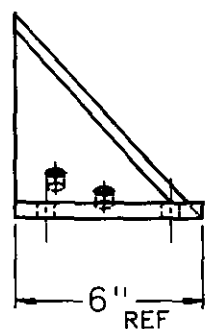
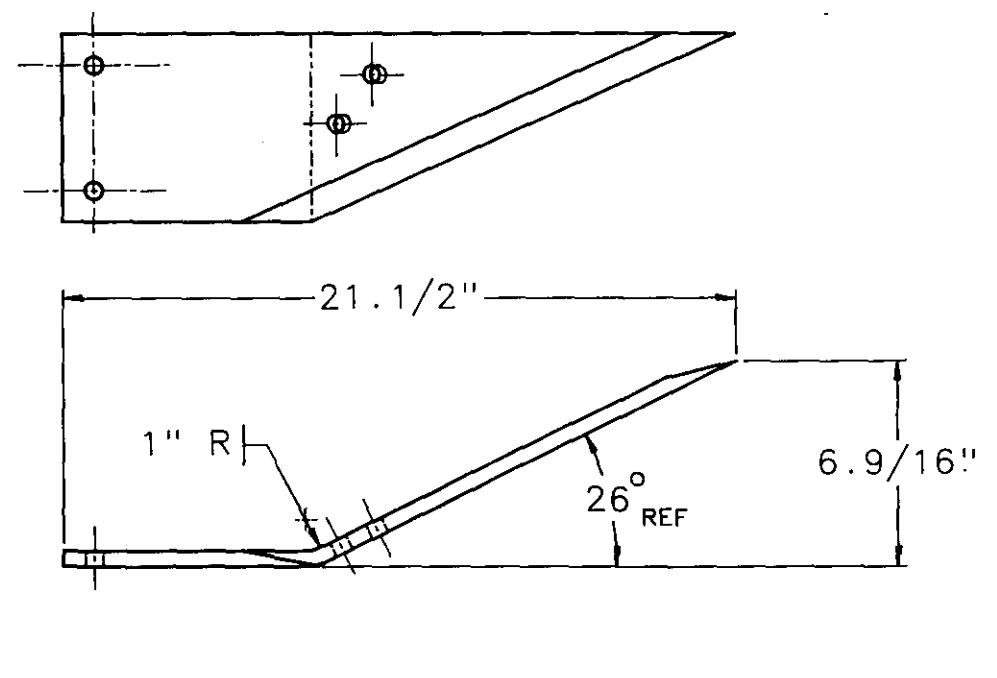
<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG	NO.	BY	DATE	REVISION	DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION  PROJECT NO.: 84-19	
	<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653				SCALE: 1 = 4		DATE: OCT. 17, 1989
	TITLE: <b>KNIFE, TURF: L.H.</b>				DWG. NO. <b>20-0008B</b>		

**NOTE!**  
USE DRILL/BEND  
TEMPLATE, P/N  
18-0031.



**FLAT LAYOUT**

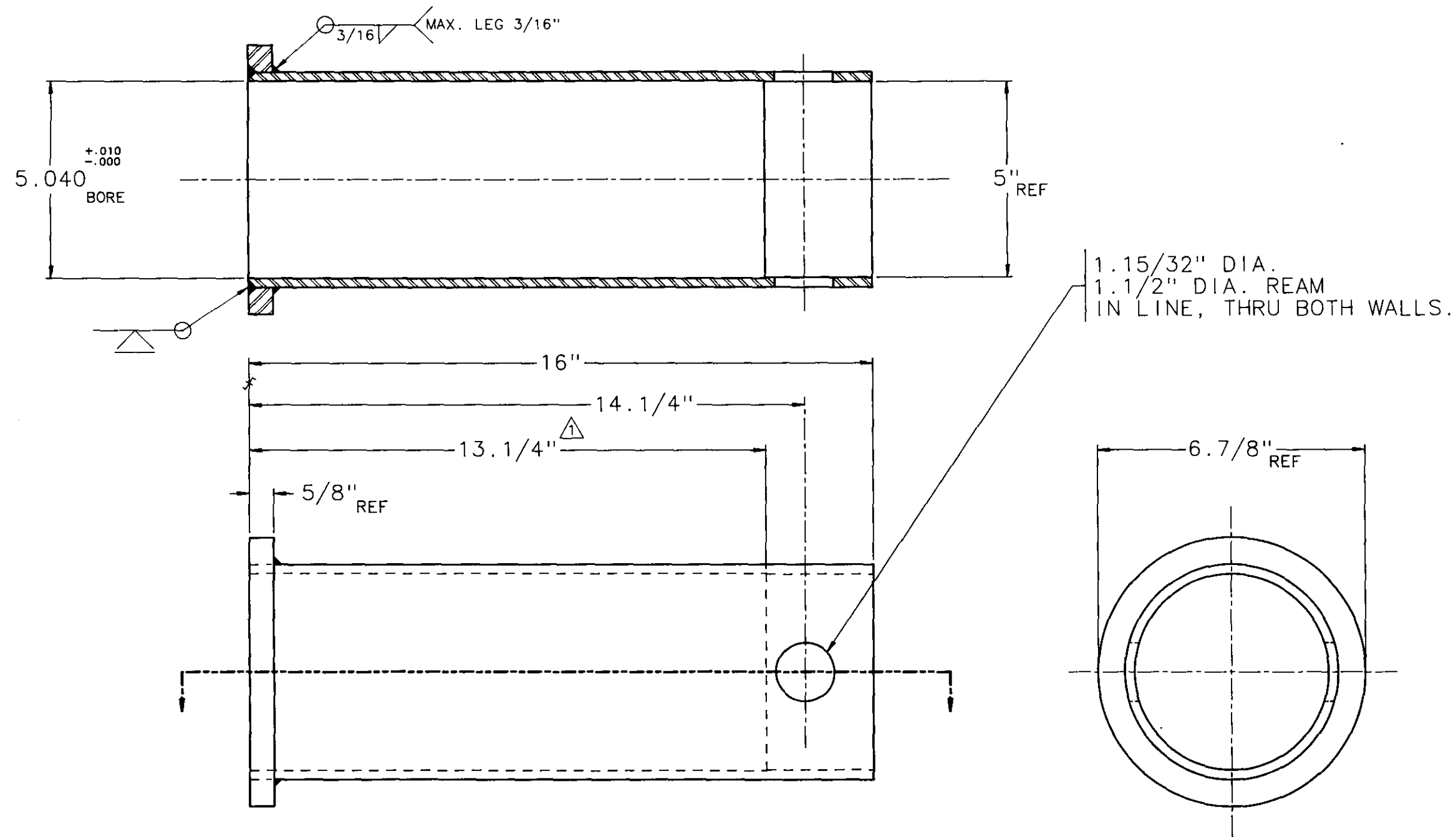
**NOTE!**  
USE GAGE P/N  
18-0032.



PART NUMBER: 00-0416  
MAT'L.: PLATE, 1/2" H.R.  
ABRASION RESISTING  
BRINELL HARDNESS 200-250  
F.F.E.S. SPEC. NO.: AA-00848BG  
EST. WT.: 10.2 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 0.25 ± 0.005 0.25 AND UP ± 0.010 DECIMAL: 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005 ANGULAR: ± 1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		TITLE: <b>KNIFE, TURF, L.H. BLANK</b> SCALE: 1 = 4 DATE: OCT. 17, 1988 DWS NO. 00-0416C	

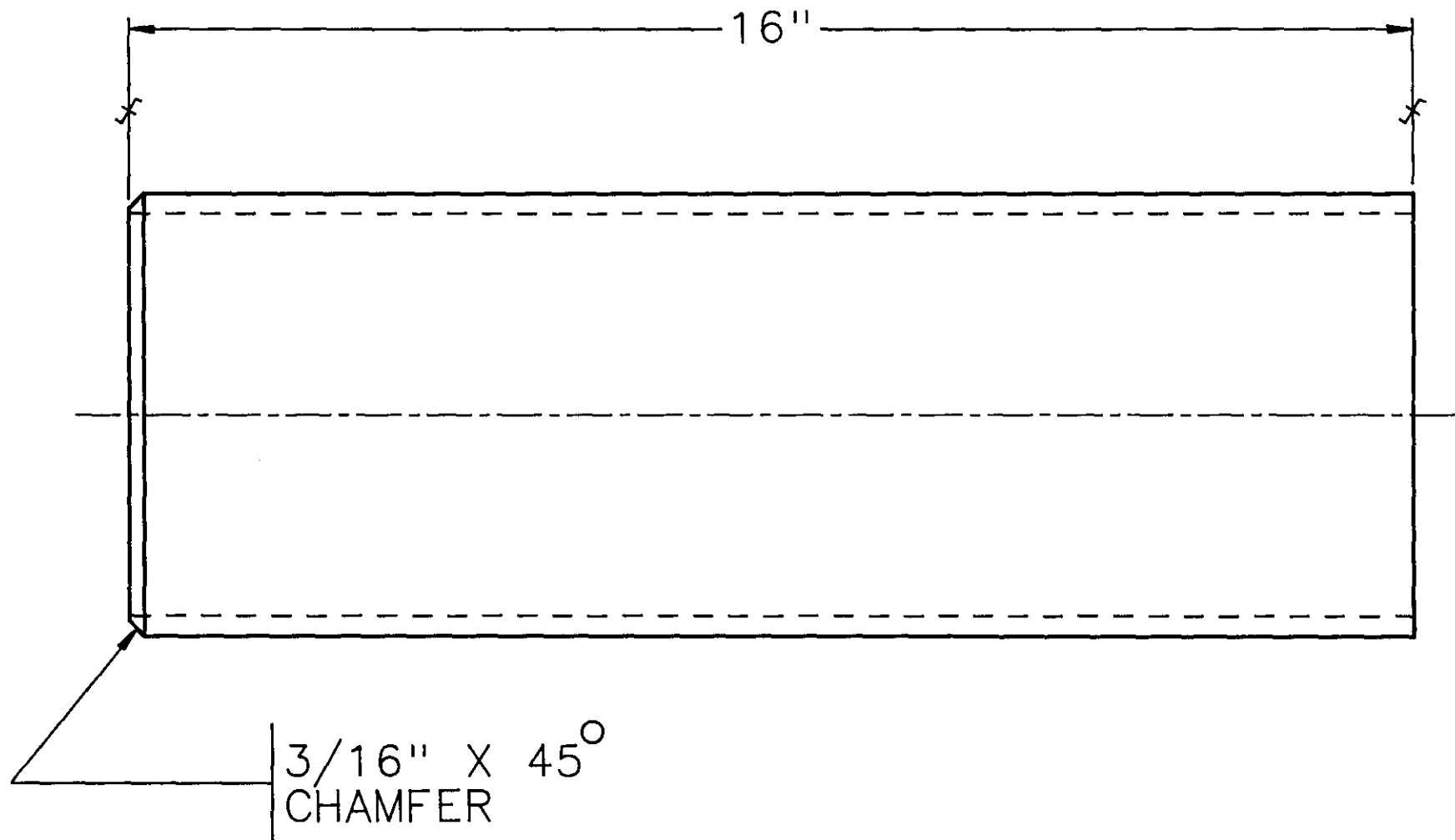
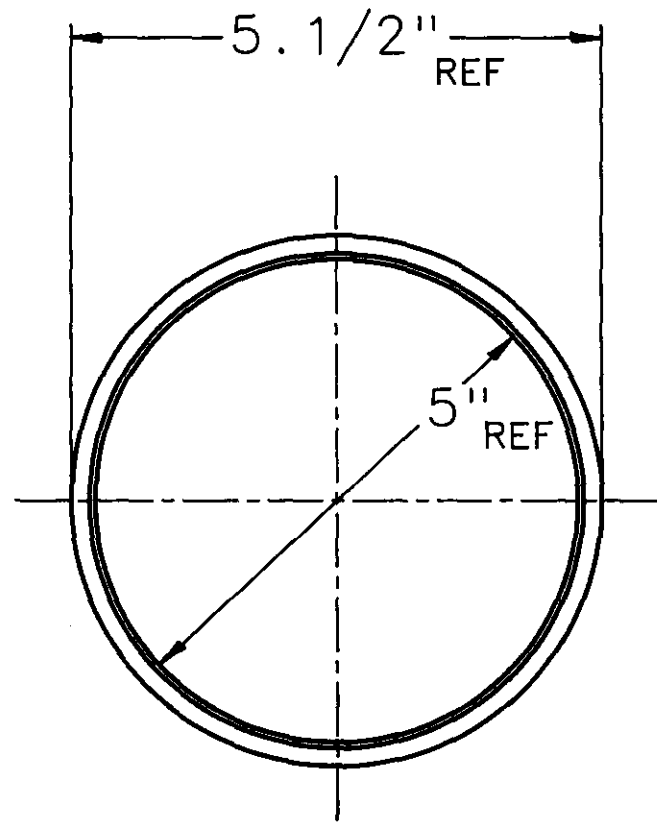
ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0452	B	SLEEVE TUBE	1	18.6
2	00-0453	B	SLEEVE FLANGE	1	2.27



PART NUMBER: 20-0014  
EST. WT.: 19.7 LBS.

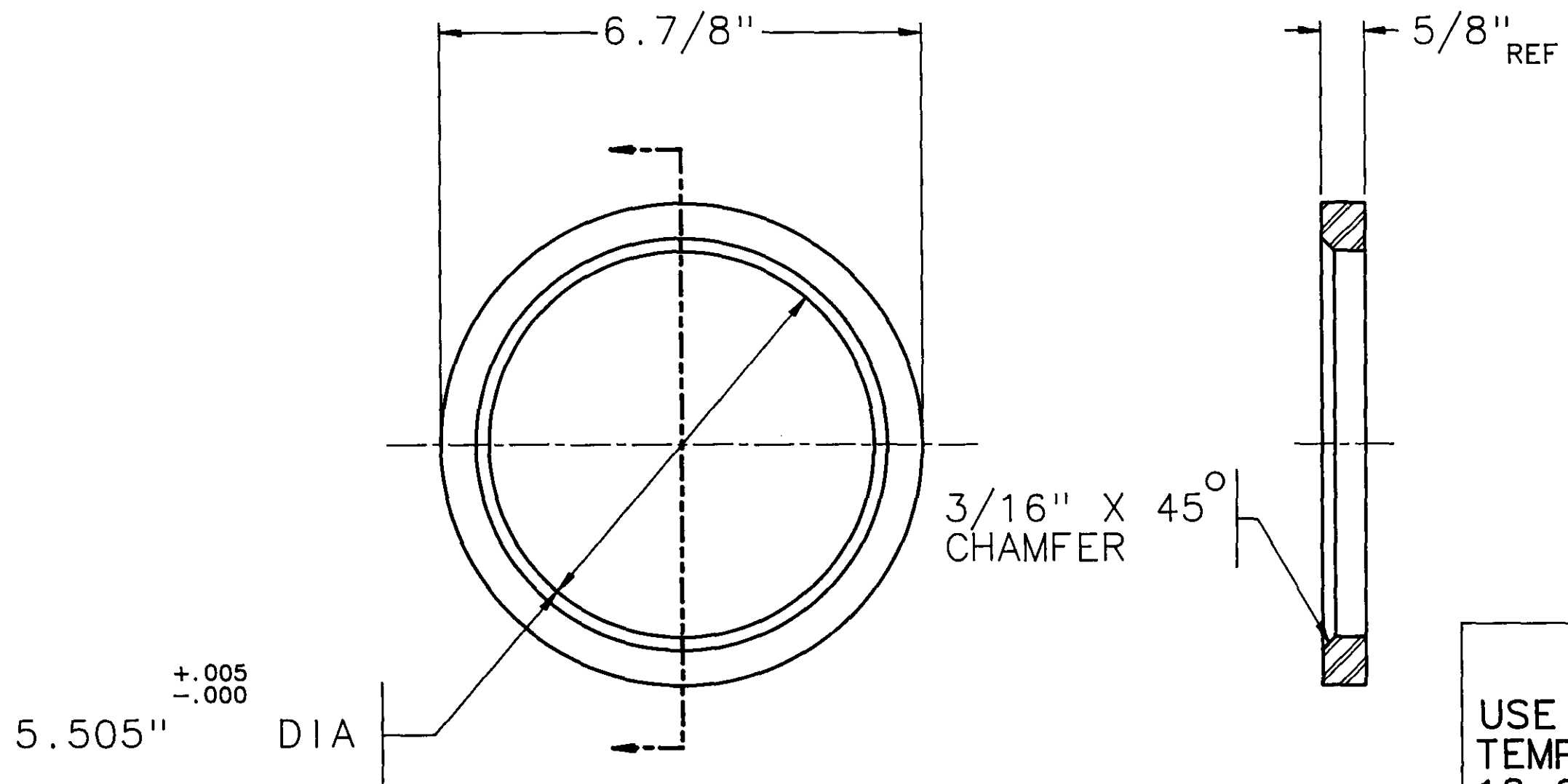
<b>STD. TOLERANCES</b> FRACTIONAL: 6 TO 8 IN. ±1/32 9 TO 12 IN. ±1/16 13 TO 18 IN. ±1/8 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1.00		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
1 REC. JULY 1987 13.1/4" DIMENSION WAS 11.1/4"		TITLE: <b>SLEEVE, 4.1/2" HYD. CYL. ADAPTER W/C</b>	
FOREST FIRE EXPERIMENT STATION P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		SCALE: 1 = 2 DATE: DEC. 07, 1988	DWG NO. 20-0014C





PART NUMBER: 00-0452  
 MAT'L.: TUBE, RD., 5.1/2" OD X 1/4" WALL  
 DOM  
 UNS G10260  
 F.F.E.S. SPEC. NO.: AD-55008AM  
 EST. WT.: 18.6 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
FRACTIONAL: 0 TO 5 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB		
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:		
ANGULAR: ±1 DEG				NO.	BY	DATE
				REVISION		
<b>FOREST FIRE EXPERIMENT STATION</b>						PROJECT NO.: 84-19
P.O. BOX 68      ROSCOMMON, MICHIGAN    48653						
TITLE: SLEEVE TUBE				SCALE: 1 = 2	DATE: DEC. 08, 1989	DWG. NO. 00-0452B

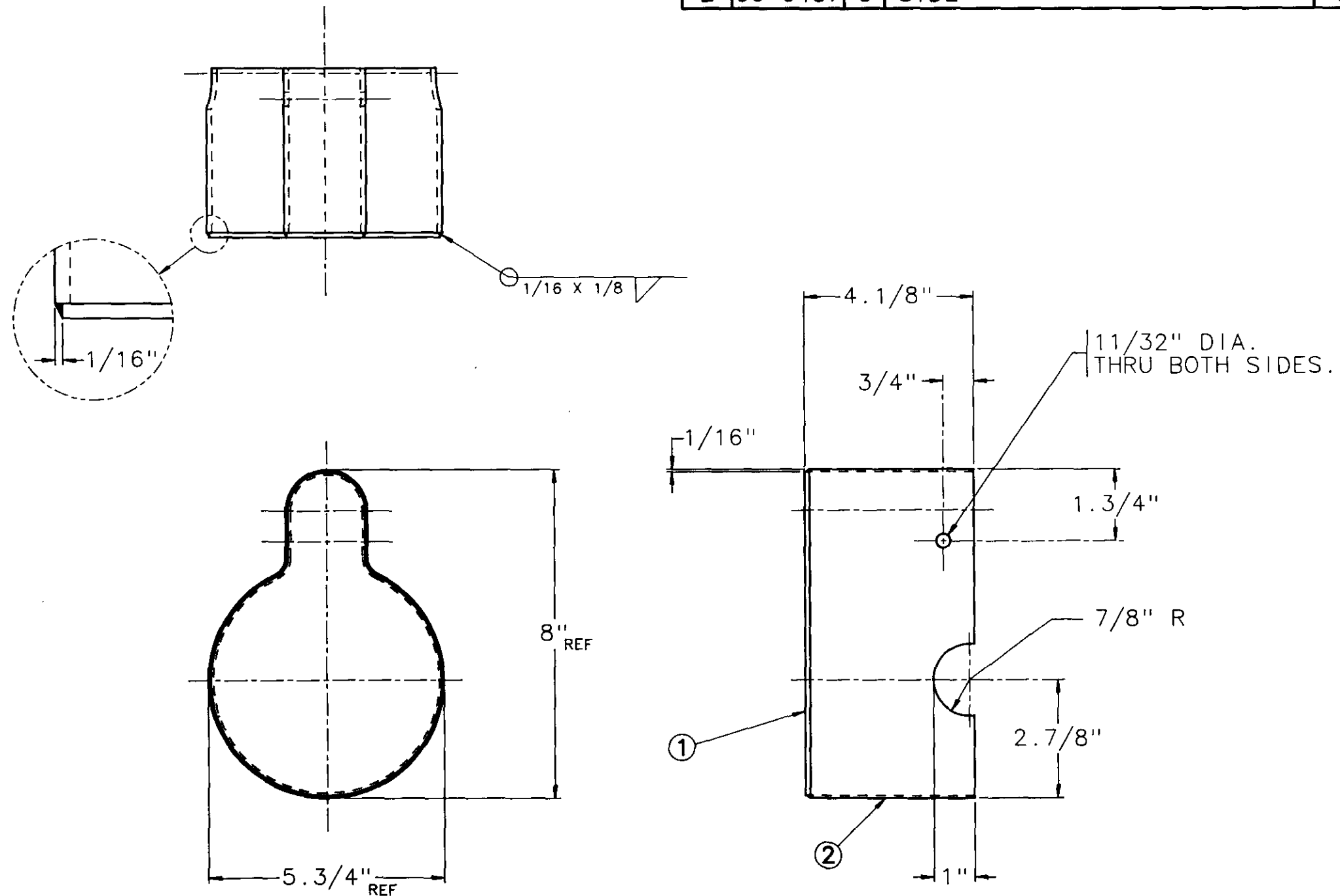


**NOTE!**  
 USE BURNING  
 TEMPLATE, P/N  
 18-0043.

PART NUMBER: 00-0453  
 MAT'L.: PLATE, 5/8" H.R.  
 UNS G10150  
 F.F.E.S. SPEC. NO.: AA-01048BC  
 EST. WT.: 2.27 LBS.

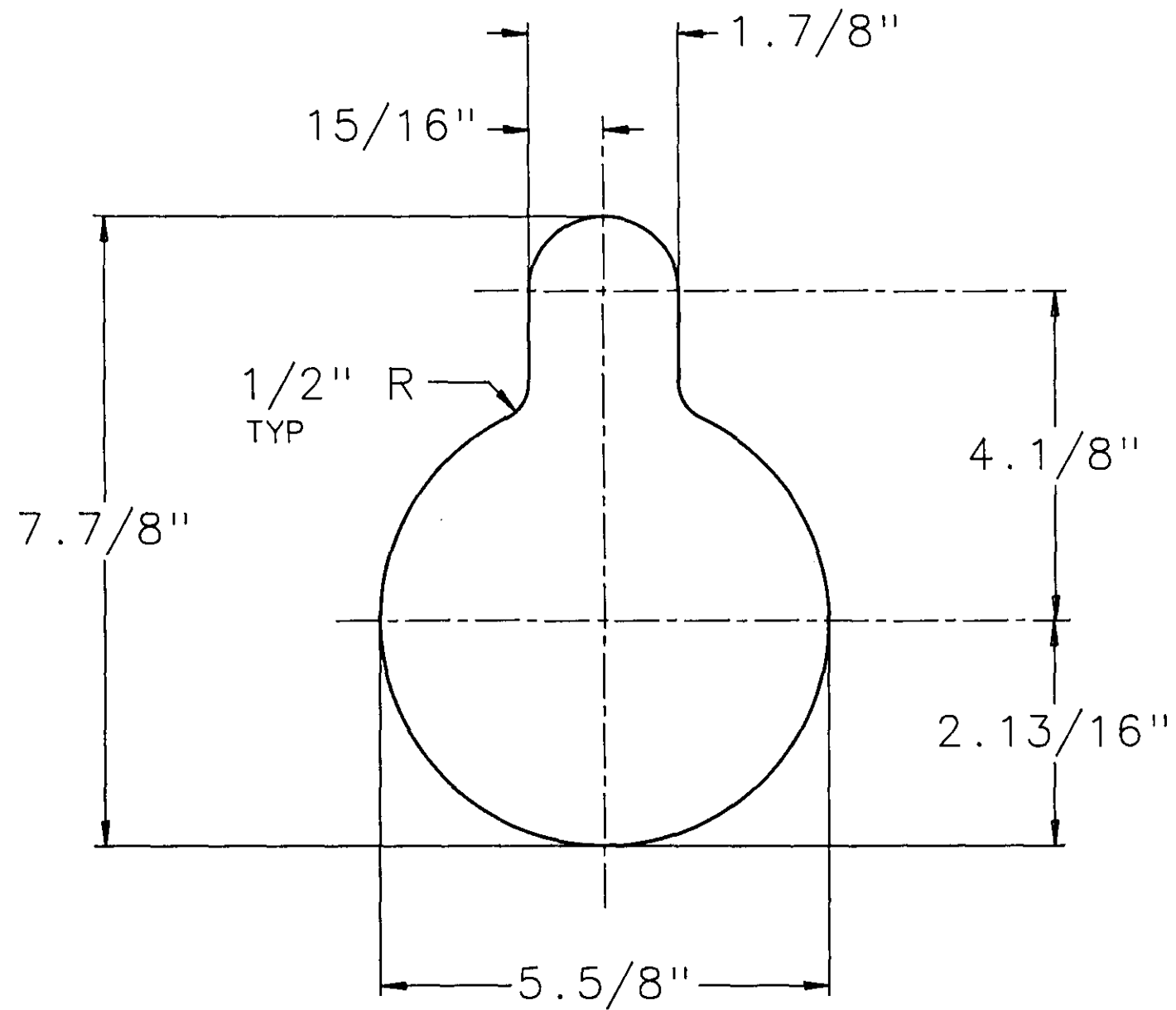
<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 8 IN $\pm 1/32$ 8 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG				DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:		<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION
NO.	BY	DATE	REVISION	PROJECT NO.: 84-19		
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653					DWG. NO. 00-0453B	
TITLE: <b>SLEEVE FLANGE</b>			SCALE: 1 = 2	DATE: DEC. 08, 1989		

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0456	B	END	1	0.98
2	00-0457	C	SIDE	1	2.95



PART NUMBER: 20-0016  
EST. WT.: 3.95 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 6 TO 8 DE -- 1/32 9 TO AND UP -- 1/16 DECIMAL: 1 PLACE -- 0.1 2 PLACE -- 0.05 3 PLACE -- 0.005 ANGULAR: -- 1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			DWG. NO. 20-0016C
TITLE: <b>GUARD, W/C: 4 1/2" HYD. CYL.</b>		SCALE: 1 = 2	DATE: <b>DEC. 28, 1988</b>



11 GA.  
(.1196)  
REF

**NOTE!**  
USE BURNING  
TEMPLATE, P/N  
18-0044.

PART NUMBER: 00-0456  
 MAT'L.: SHEET, 11 GA. H.R. PICK & OILED  
 ASTM A569  
 F.F.E.S. SPEC. NO.: AA-G1148AP  
 EST. WT.: 0.98 LBS.

STD. TOLERANCES	
FRACTIONAL:	
0 TO 6 IN	+/- 1/32
6 IN AND UP	+/- 1/16
DECIMAL:	
1 PLACE	+/- 0.1
2 PLACE	+/- 0.01
3 PLACE	+/- 0.005
ANGULAR:	
	+/- 1 DEG

NO.	BY	DATE	REVISION

DRAWN:  
R. GREENLAW  
 CHECKED:  
KDB  
 APPROVED:

**MICHIGAN  
DNR**

FOREST MANAGEMENT  
DIVISION

**FOREST FIRE EXPERIMENT STATION**

P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

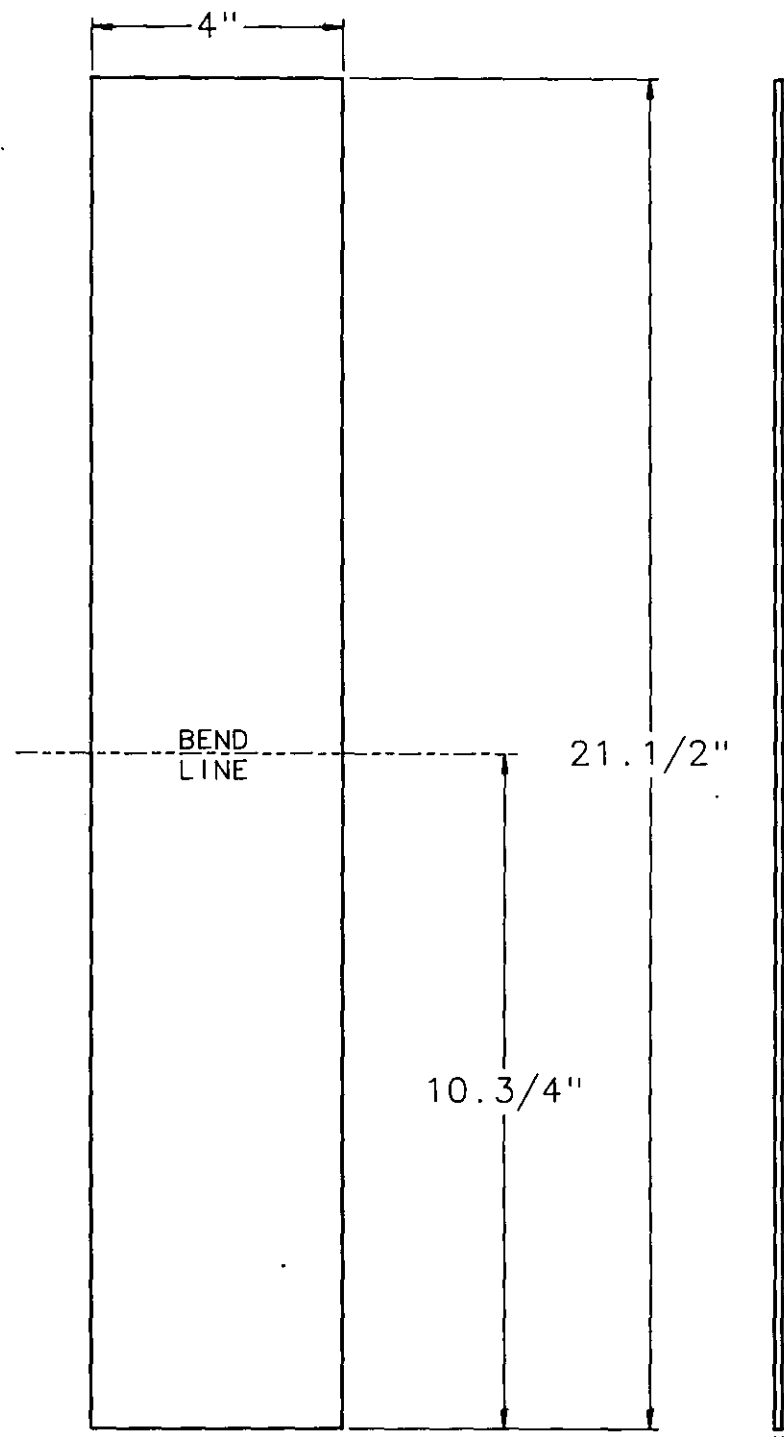
PROJECT NO.: 84-19

TITLE: END, GUARD: 4.1/2" HYD. CYL.

SCALE:  
1 = 2

DATE:  
DEC. 18, 1989

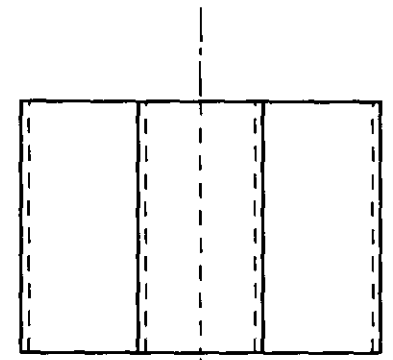
DWG.  
NO. 00-0456B



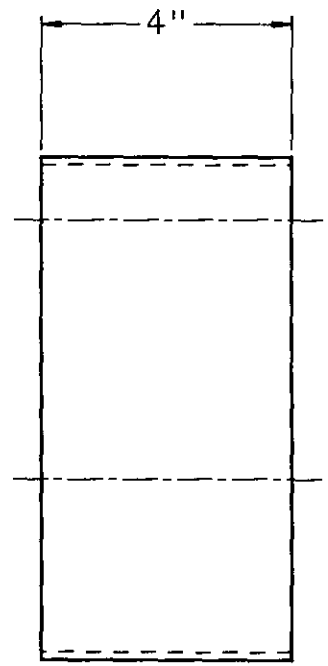
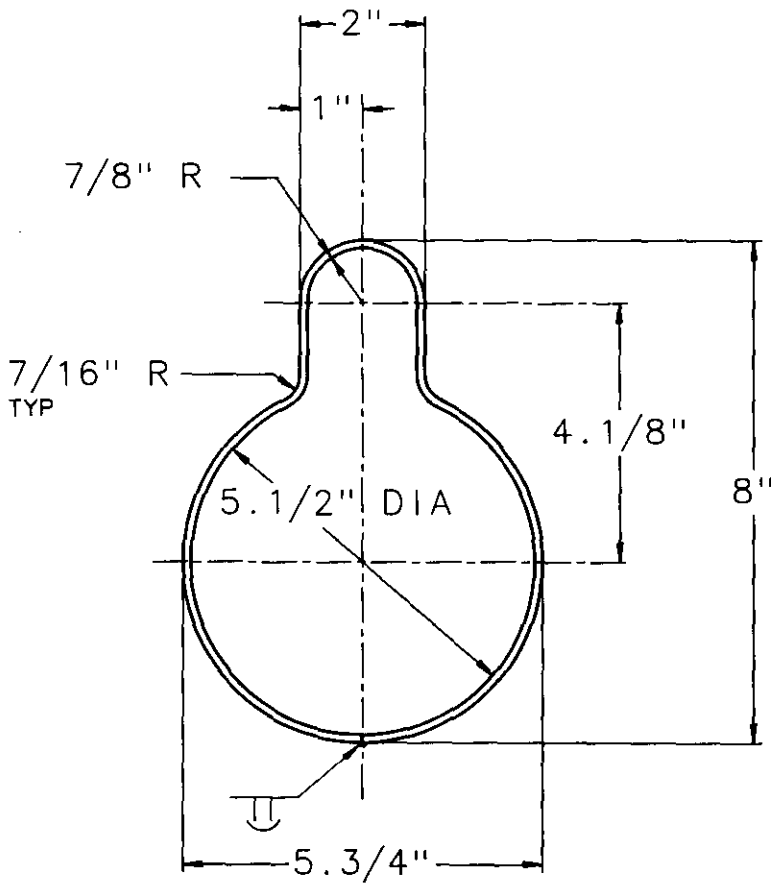
FLAT LAYOUT

11 GA.  
(.1196)  
REF

PART NUMBER: 00-0457  
 MAT'L.: SHEET, 11 GA. H.R. PICK & OILED  
 ASTM A569  
 F.F.E.S. SPEC. NO.: AA-G1148AP  
 EST. WT.: 2.95 LBS.

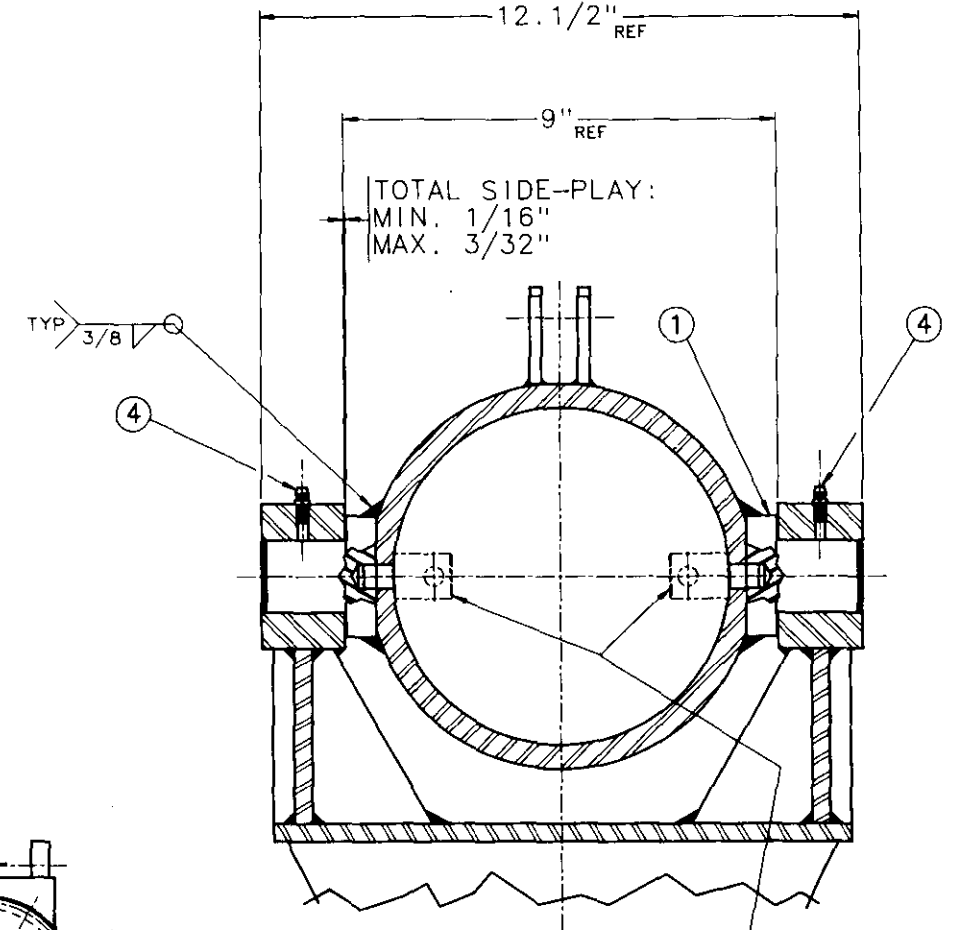
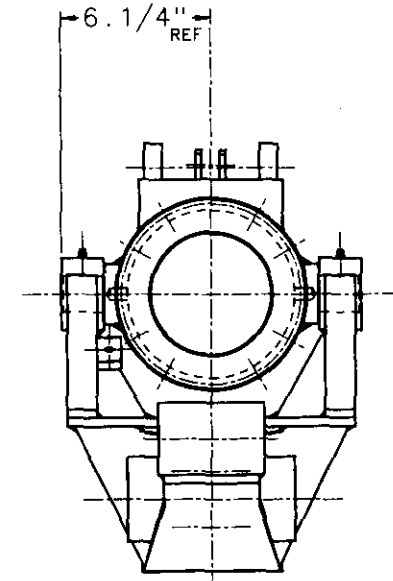
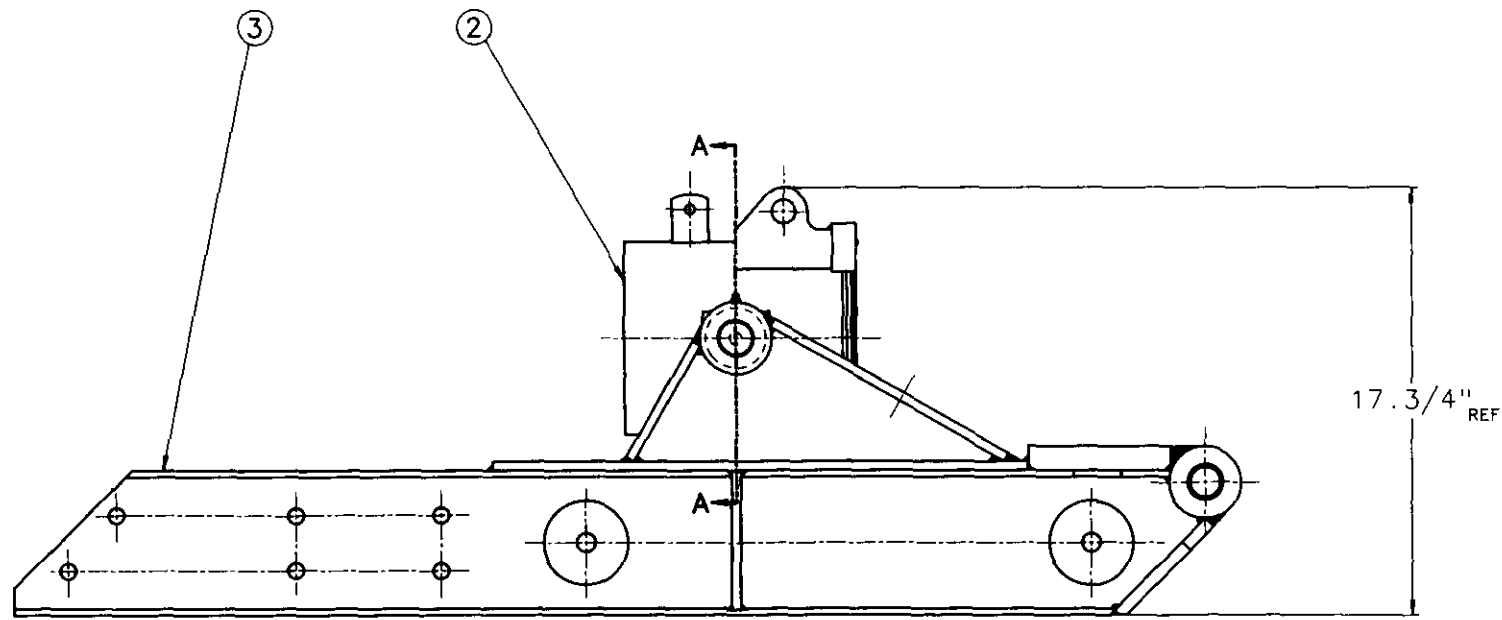
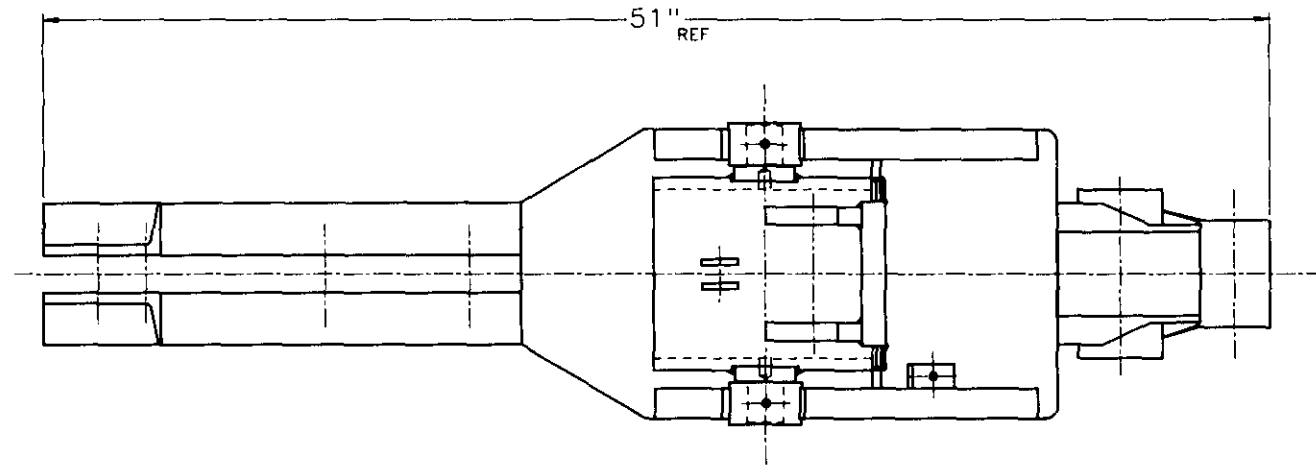


NOTE!  
 USE BENDING DIES,  
 P/N'S 18-0045 & 18-0046.



<b>STD. TOLERANCES</b> FRACTIONAL: 3 TO 1/2" ± 1/32" 3/16" AND UP ± 1/16" DECIMAL: 1 PLACE ± 0.01 2 PLACE ± 0.005 3 PLACE ± 0.0005 ANGULAR: ± 1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		TITLE: <b>SIDE, GUARD: 4.1/2" HYD. CYL.</b> SCALE: 1 = 2 DATE: DEC. 18, 1988	

ITEM	PART NO	QWG	DESCRIPTION	QTY	EST WT
1	00-0440	B	PIN, TRUNION	2	1.52
2	00-0443	D	TRUNION, 52" PLOW, S/W	1	41.2
3	00-0458	D	BEAM, 52" PLOW, S/W	1	206
4	P00-LAG		GREASE FITTING: 1/4"-20UN TAPERED STRAIGHT TYPE	2	0.01



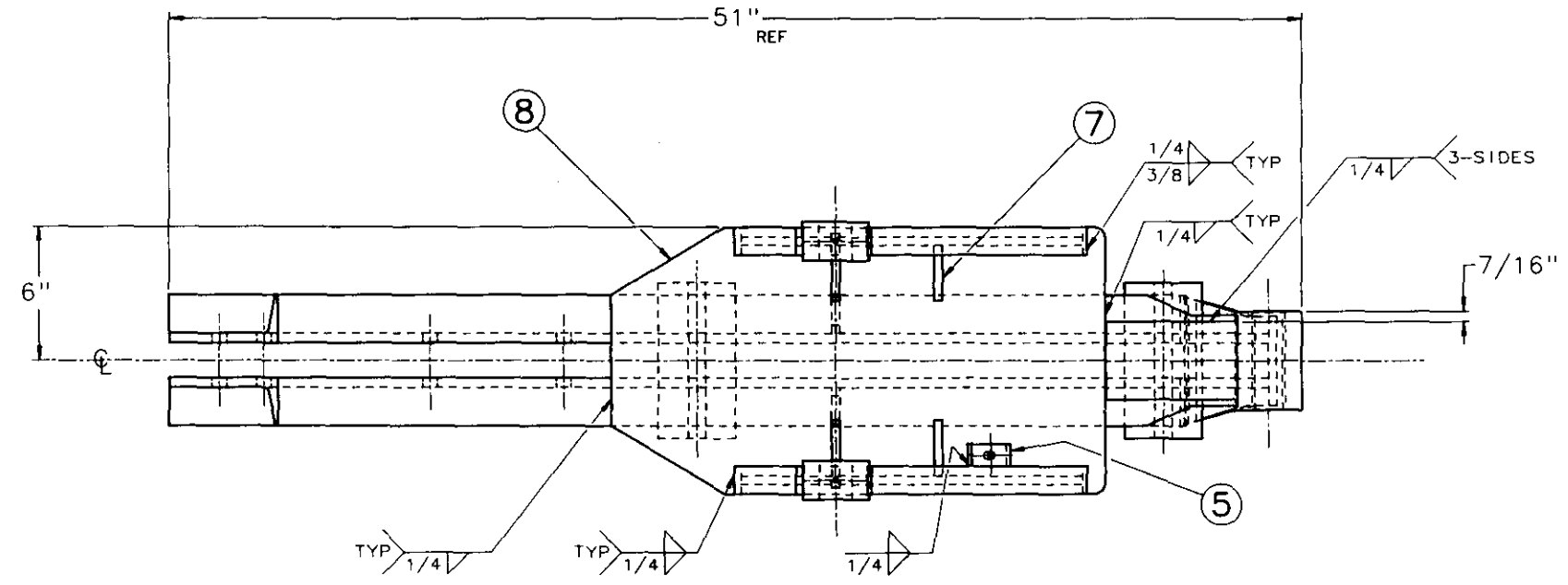
SECTION A - A  
SCALE: 1 = 2

**NOTE!**  
TRUNION INSTALLATION:  
USE LOCATING DOWELS,  
PART NUMBER 18-0040,  
TO LOCATE & WELD ITEMS  
NUMBER 1.

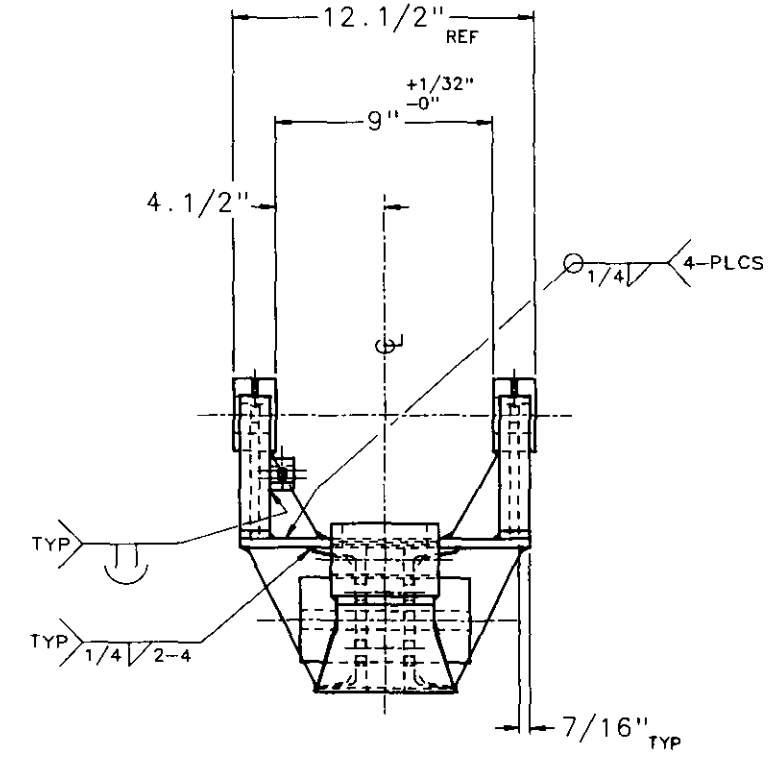
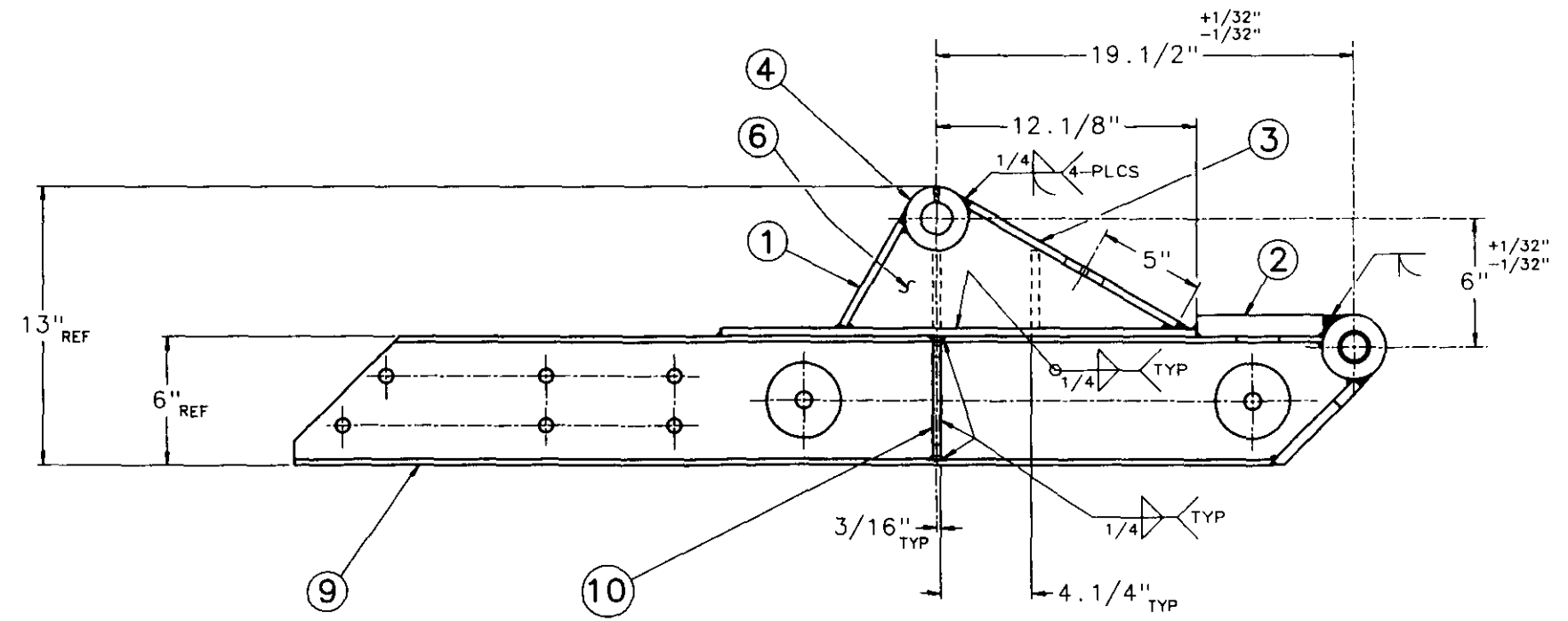
PART NUMBER: 20-0012  
EST. WT.: 252 LBS.

STD. TOLERANCES		DRAWN:		MICHIGAN DNR FOREST MANAGEMENT DIVISION
FRACTIONAL:		R. GREENLAW		
DECIMAL:		CHECKED:	KDB	
1 PLACE ± 0.1		APPROVED:		PROJECT NO.: 84-19
2 PLACE ± 0.01		DATE:		DWG. NO.: 20-0012D
3 PLACE ± 0.001		<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		
TITLE: BEAM-TRUNION, 52" PLOW, W/C		SCALE: 1 = 4	DATE: JAN. 04, 1980	

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0364	A	BAR, FLAT, 3/8" X 1.1/4" H.R.	2	0.74
2	00-0365	A	BAR, FLAT, 1" X 3.1/2" H.R.	1	5.82
3	00-0366	A	BAR, FLAT, 3/8" X 1.1/4" H.R.	2	1.48
4	00-0367	A	BOSS, 3" O.D. X 1.1/2" I.D.	2	2.63
5	00-0368	A	BAR, FLAT, 3/8" X 1" H.R.	1	0.20
6	00-0369	B	TRUNION SUPPORT, WEB	2	4.79
7	00-0370	A	GUSSET	4	0.57
8	00-0371	B	TRUNION SUPPORT MTG. PLATE	1	26.6
9	00-0372	D	BEAM, 52" FIRELINE PLOW S/W	1	143
10	00-0381	B	GUSSET	2	1.76



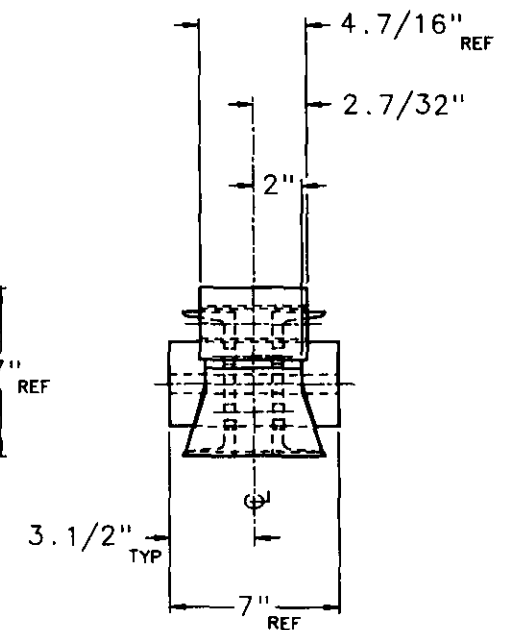
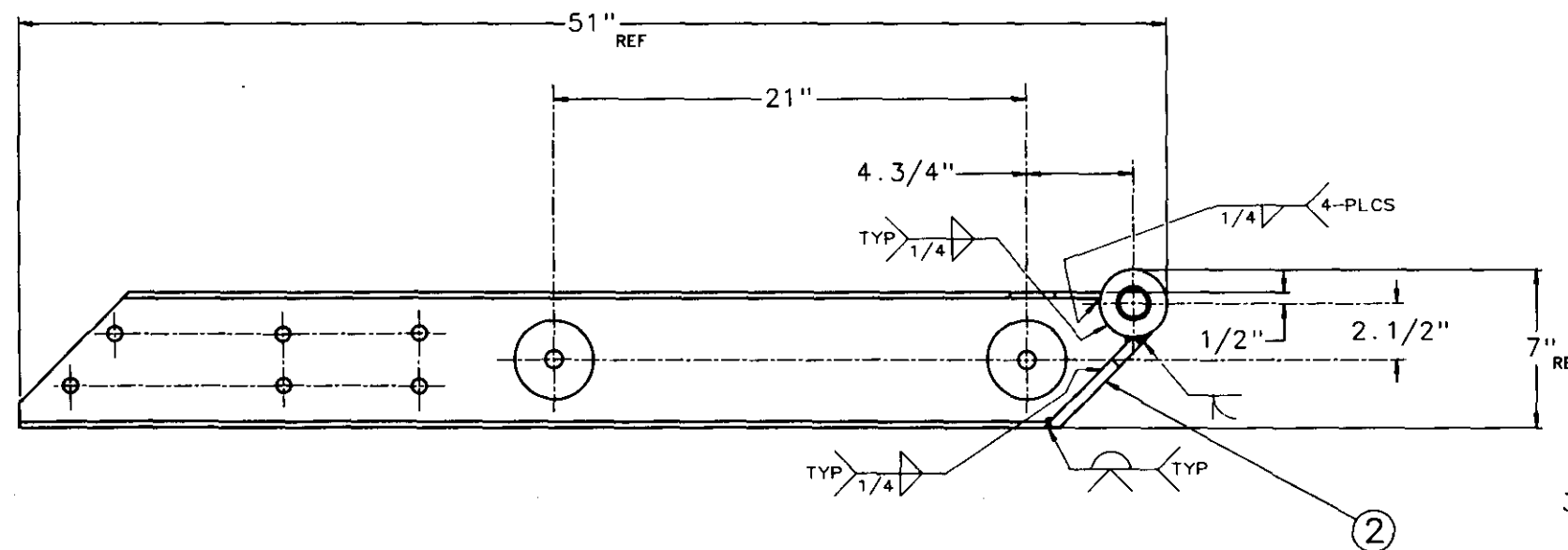
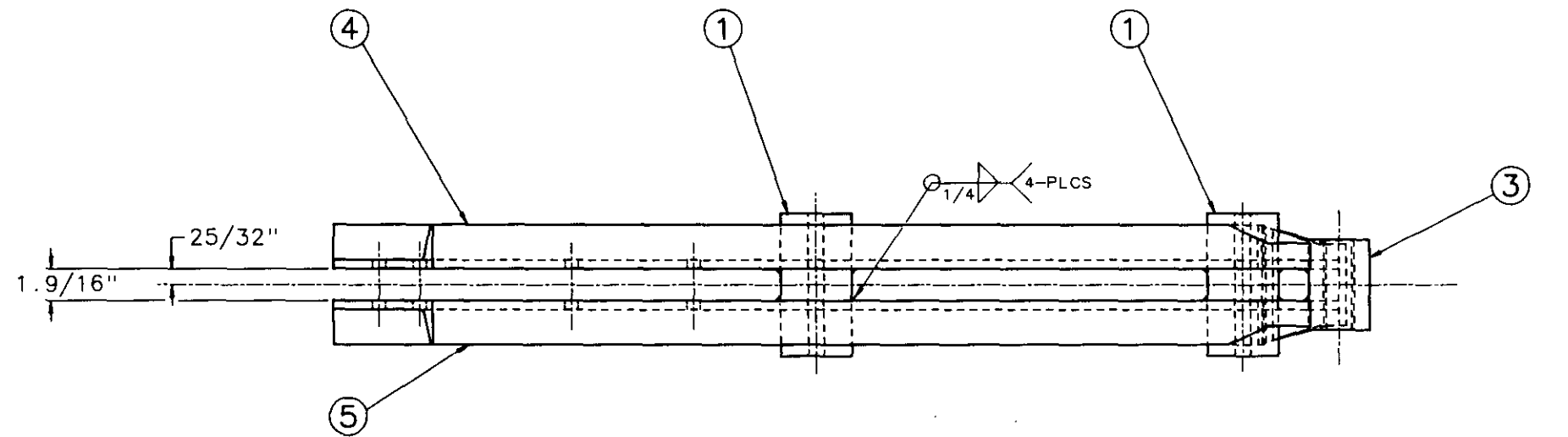
**NOTE!**  
USE LOCATING  
GAGE, P/N:  
18-0048.



PART NUMBER: 00-0458  
EST. WT.: 206 LBS.

STD. TOLERANCES		DRAWN:		<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION
FRACTIONAL:		R. GREENLAW		
DECIMAL:		CHECKED:	KDB	
PLATE:		APPROVED:		
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			PROJECT NO.: 84-19	
TITLE: BEAM, 52" PLOW, S / W		SCALE: 1 = 4	DATE: JAN. 08, 1990	DWG. NO. 00-0458D

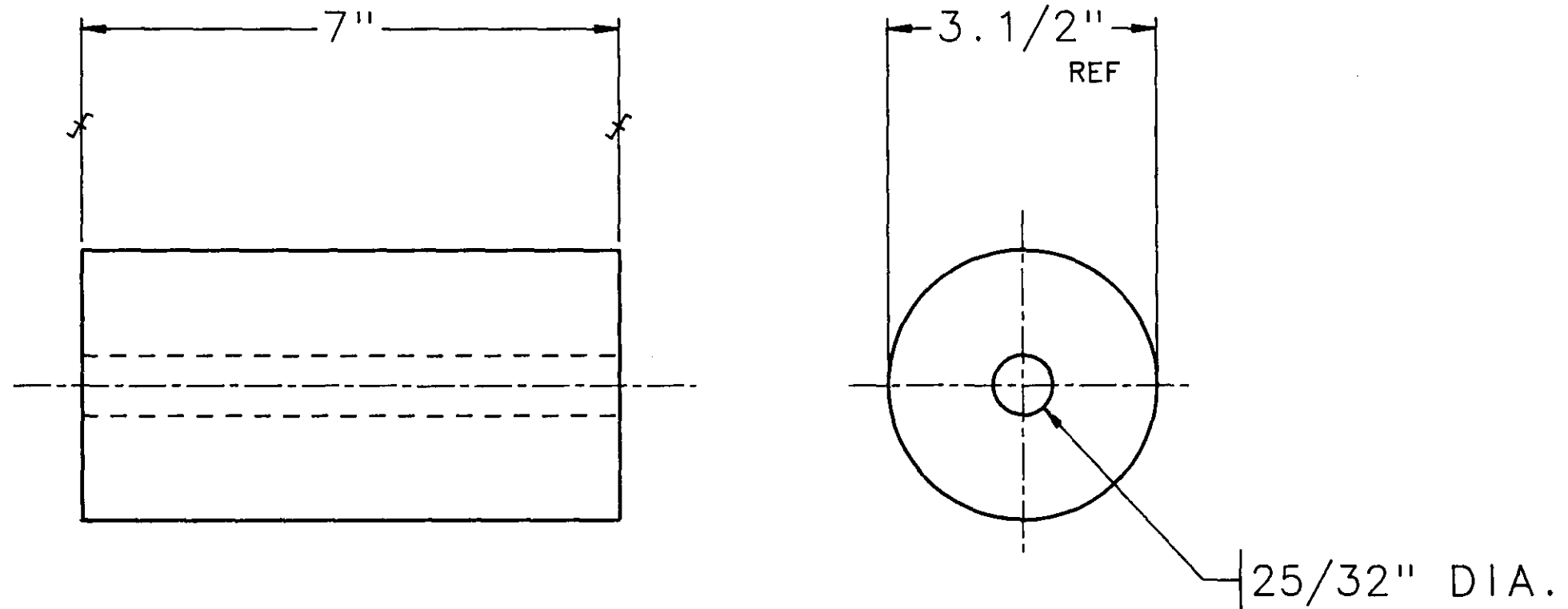
ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0373	B	BOSS, 3.1/2" OD X 25/32" ID	2	18.1
2	00-0374	B	BEAM, FRONT END CAP	1	3.43
3	00-0394	B	BOSS / BUSHING ASSEMBLY	1	7.34
4	00-0384	C	CHANNEL, BEAM 52" PLOW L.H.	1	46.1
5	00-0385	C	CHANNEL, BEAM 52" PLOW R.H.	1	46.1



PART NUMBER: 00-0372  
EST. WT.: 143 LBS.

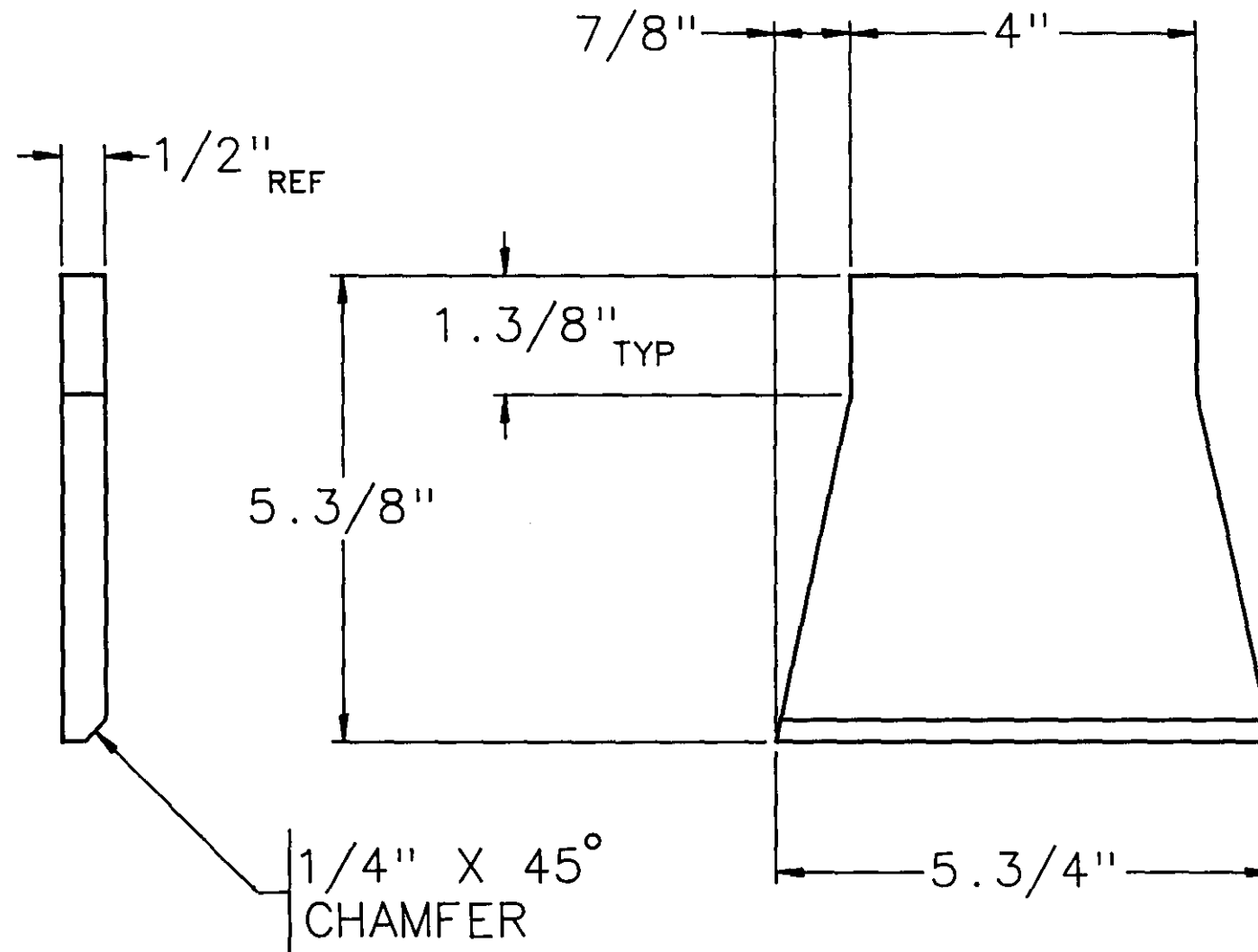
STD. TOLERANCES						DRAWN:		MICHIGAN DNR FOREST MANAGEMENT DIVISION	
FRACTIONAL						R. GIBSON	CHECKED:		
DIMENSIONAL							KDB		
DECIMAL							APPROVED:		
TITLE: BEAM, 52" FIRELINE PLOW, S / W							SCALE: 1 = 4		PROJECT NO.: 84-19
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653							DATE: JUNE 27, 1988		DWG. NO.: 00-0372D





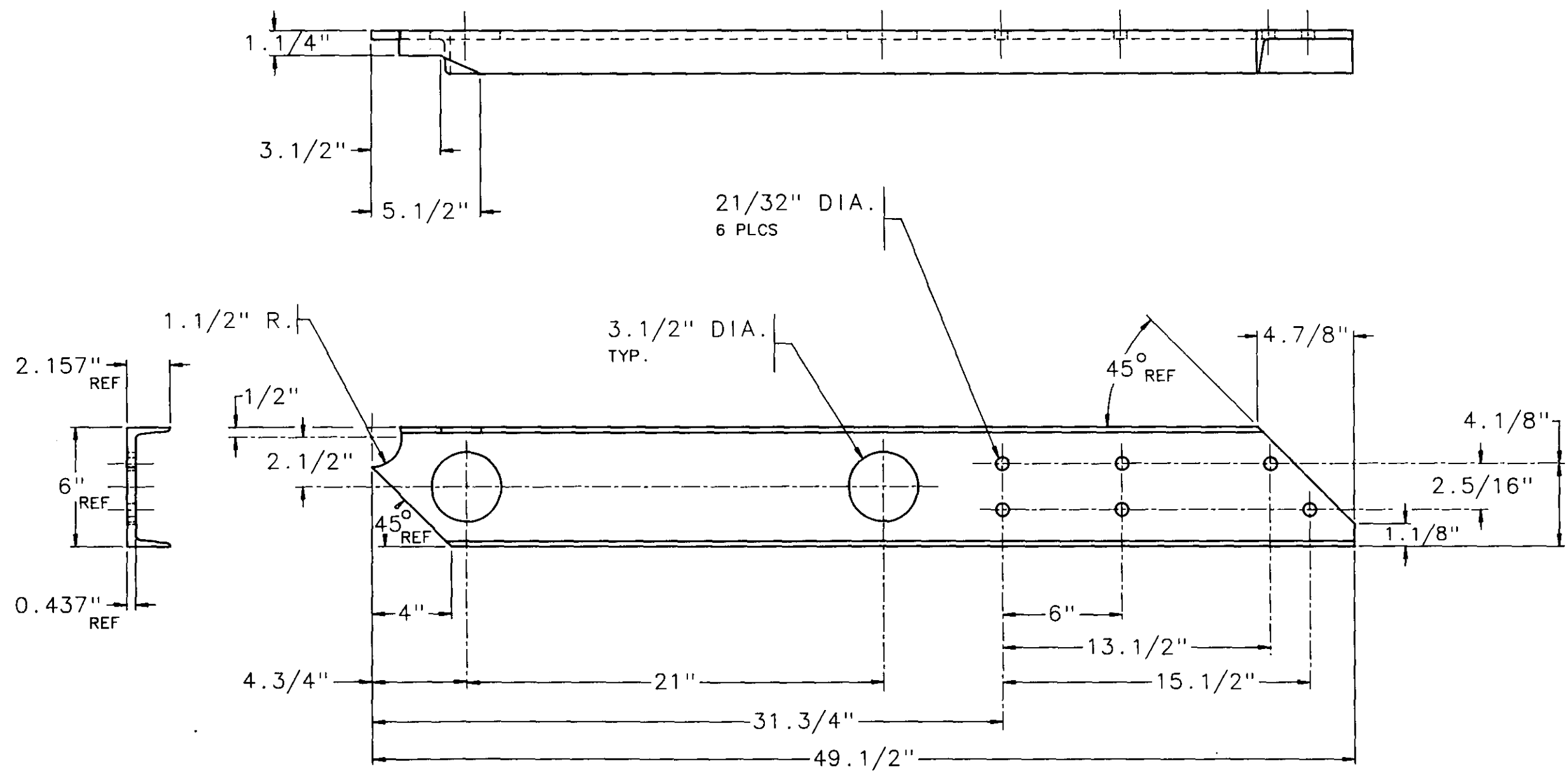
PART NUMBER: 00-0373  
 MAT'L.: BAR, RND., 3.1/2" DIA., C.D.  
 RYCASE / LEAD  
 UNS G11170Pb  
 F.F.E.S. SPEC. NO.: AC-00350AF  
 EST. WT.: 18.1 LBS.

<b>STD. TOLERANCES</b>		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b> FOREST MANAGEMENT DIVISION	
<b>FRACTIONAL:</b> 8 TO 8 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$				
<b>DECIMAL:</b> <b>ANGULAR:</b> 1 PLACE $\pm 0.1$ $\pm 1$ DEG 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$				
NO.	BY			DATE
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			PROJECT NO.: 84-19	
TITLE: BOSS, 3.1/2" O.D. X 25/32" I.D.		SCALE: 1 = 2	DATE: JUNE 27, 1989	DWG. NO.: 00-0373B



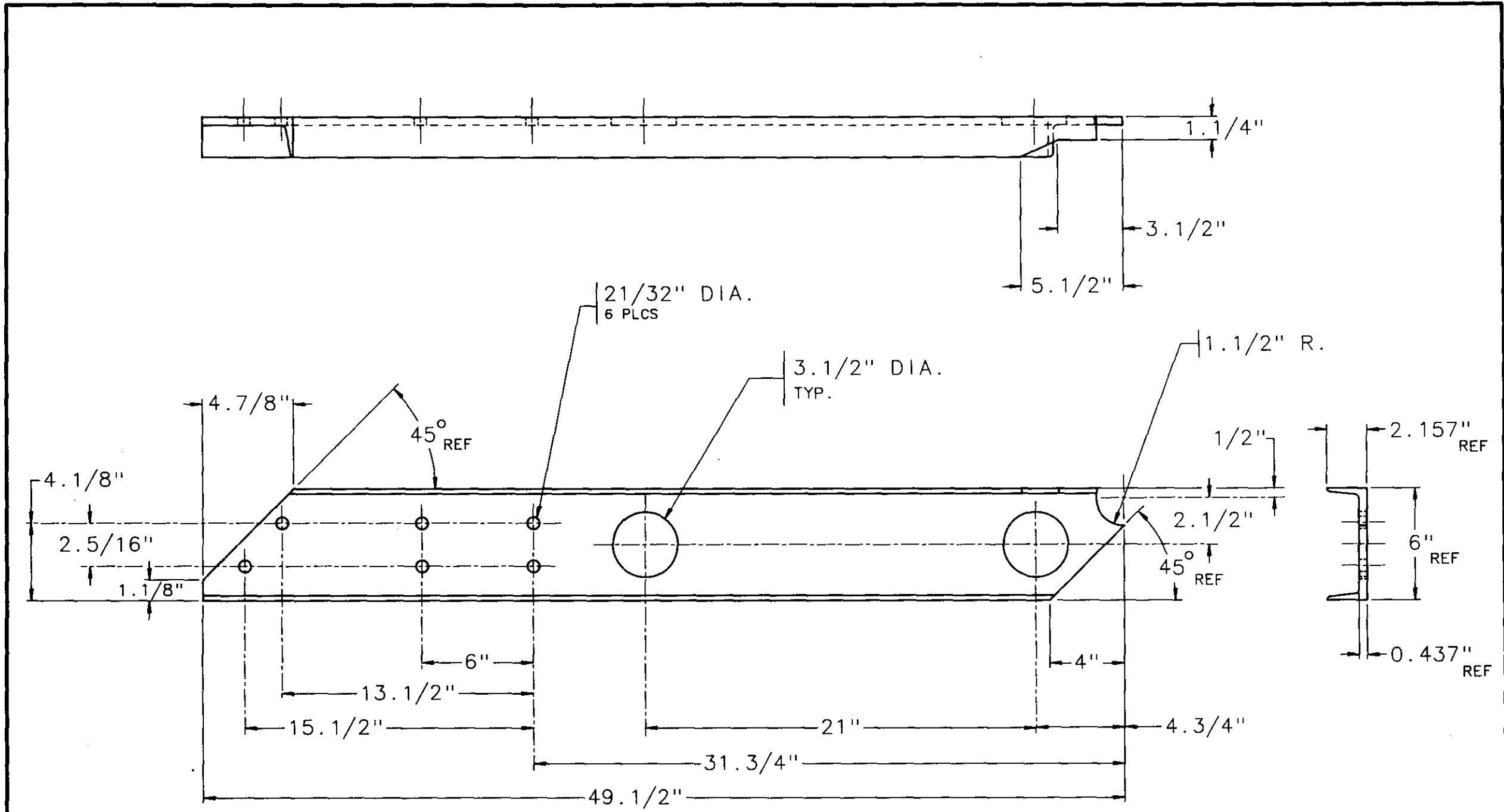
PART NUMBER: 00-0374  
 MAT'L.: PLATE, 1/2" H.R.  
 UNS G10080  
 F.F.E.S. SPEC. NO.: AA-00848AH  
 EST. WT.: 3.43 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION
NO. BY DATE REVISION		PROJECT NO.: <b>84-19</b>	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			DWG. NO. <b>00-0374B</b>
TITLE: <b>FRONT END CAP</b>		SCALE: <b>1 = 2</b>	DATE: <b>JUNE 27, 1989</b>



PART NUMBER: 00-0384  
 MAT'L.: CHANNEL, STD., 6" X 13.0 LB.  
 UNS K02600  
 F.F.E.S. SPEC. NO.: AH-06130AG  
 EST. WT.: 46.1 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 1 TO 16 IN. ± 1/32 1 TO 64 IN. ± 1/64 DECIMAL: 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005 ANGULAR: ± 1.0°		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b> FOREST MANAGEMENT DIVISION
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68    ROSCOMMON, MICHIGAN 48653		PROJECT NO.: 84-19 DWG. NO.: 00-0384C	TITLE: CHANNEL, BEAM, 52" PLOW L.H.    SCALE: 1 = 4    DATE: JUNE 20, 1988

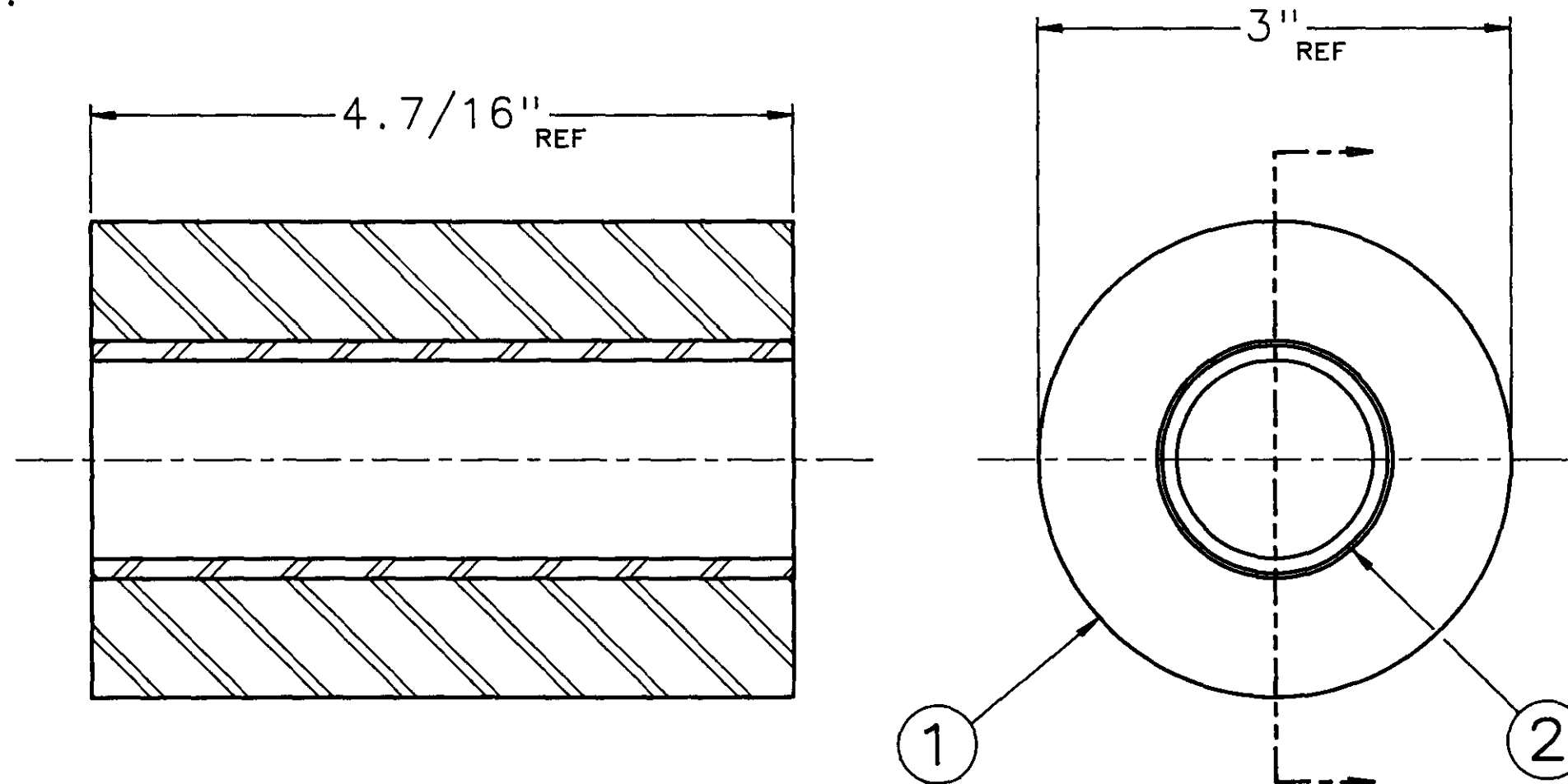


PART NUMBER: 00-0385  
 MAT'L.: CHANNEL, STD., 6" X 13.0 LB.  
 UNS K02600  
 F.F.E.S. SPEC. NO.: AH-06130AG  
 EST. WT.: 46.1 LBS.

STD. TOLERANCES		DRAWN: R. GREENLAW		MICHIGAN DNR FOREST MANAGEMENT DIVISION
FRACTIONAL: 6 TO 8 DP -- 1/32 9 DP AND UP -- 1/16		CHECKED: KDB		
DECIMAL: 1 PLACE -- 0.1 2 PLACE -- 0.01 3 PLACE -- 0.001		APPROVED:		
ANGULAR: 1 PLACE -- 0.1 2 PLACE -- 0.01		REVISION		PROJECT NO.: 84-19
FOREST FIRE EXPERIMENT STATION P.O. BOX 68 ROSCOMMON, MICHIGAN 48653				DWG. NO. 00-0385C
TITLE: CHANNEL, BEAM, 52" PLOW R.H.		SCALE: 1 = 4	DATE: JUNE 29, 1988	

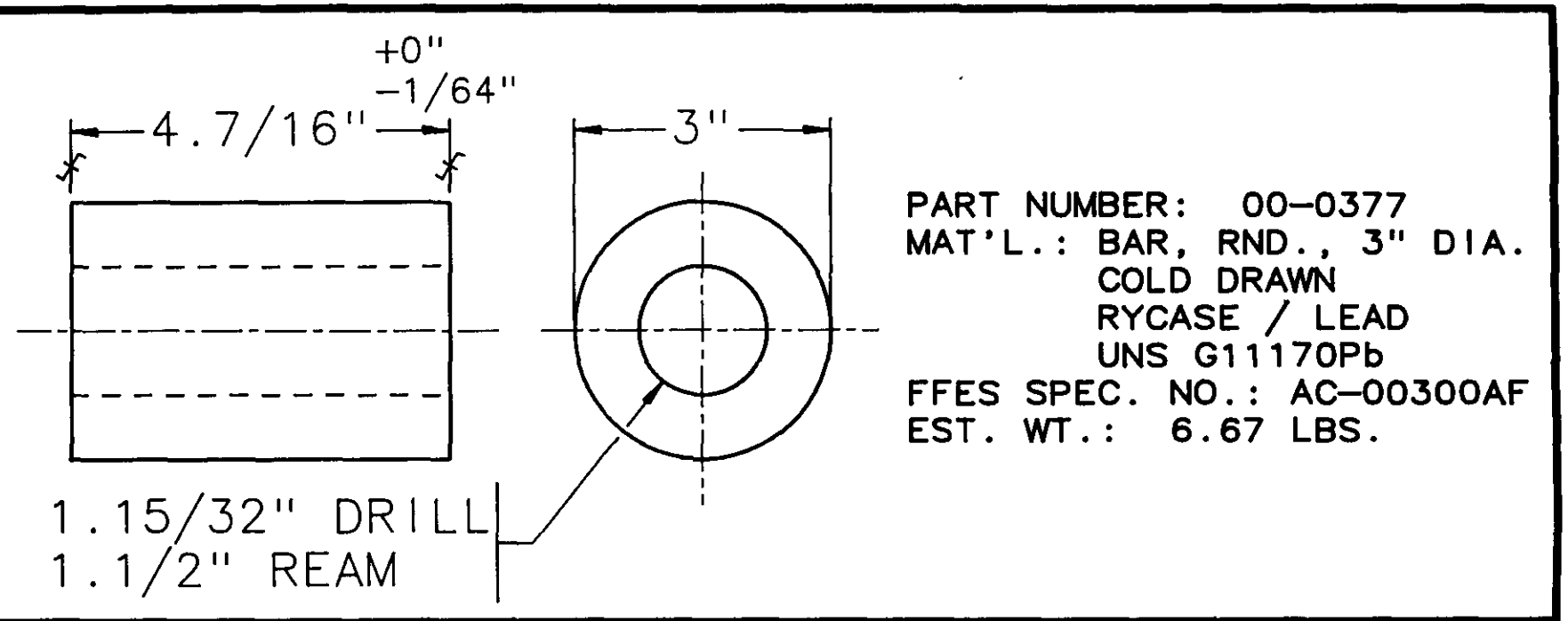
INSTALLATION NOTE  
 PRESS BUSHING INTO BOSS.  
 IF LOOSE FITTING THEN  
 SEAT WITH, "LOCTITE"  
 # RC/609.

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0377	A	BOSS, 3" O.D. X 1.1/2" I.D.	1	6.67
2	20-0006	A	BUSHING, 1.1/2"OD X 1.1/4"ID	1	0.67



PART NUMBER: 00-0394  
 EST. WT.: 7.34 LBS.

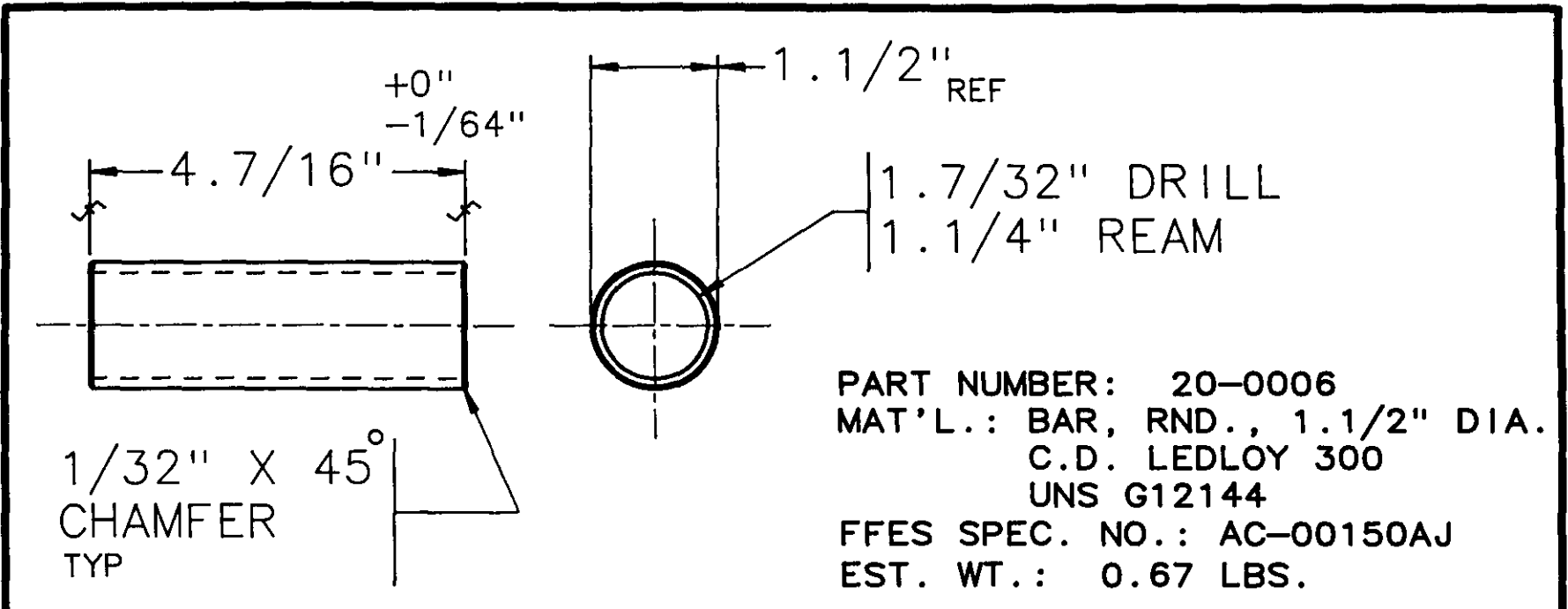
<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION	
FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB			
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005		ANGULAR: ±1 DEG		APPROVED:			
NO.	BY	DATE	REVISION				
<b>FOREST FIRE EXPERIMENT STATION</b>							PROJECT NO.: 84-19
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							
TITLE: BOSS / BUSHING ASSEMBLY				SCALE: FULL	DATE: JULY 26, 1989	DWG. NO. 00-0394B	



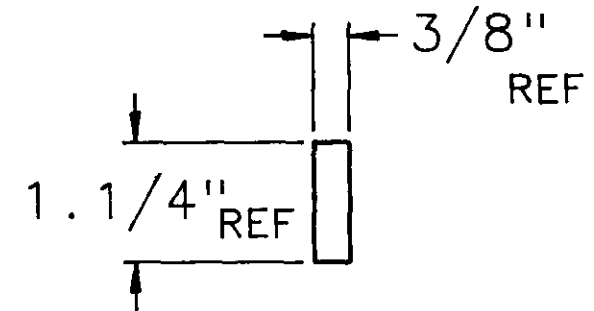
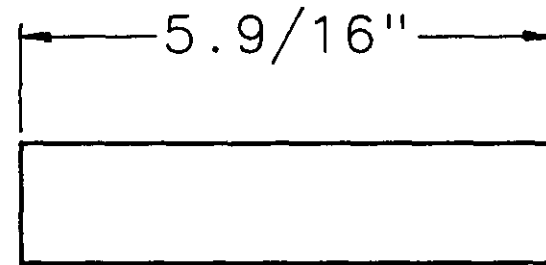
PART NUMBER: 00-0377  
 MAT'L.: BAR, RND., 3" DIA.  
 COLD DRAWN  
 RYCASE / LEAD  
 UNS G11170Pb  
 FFES SPEC. NO.: AC-00300AF  
 EST. WT.: 6.67 LBS.

1.15/32" DRILL  
 1.1/2" REAM

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN +1/32 6 IN AND UP +1/16 DECIMAL: 1 PLACE +0.1 2 PLACE +0.01 3 PLACE +0.005 ANGULAR: +1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:		<b>MICHIGAN          DNR</b>  <b>FOREST MANAGEMENT          DIVISION</b>			
NO. BY DATE REVISION		PROJECT NO.: <b>84-19</b>					
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653				TITLE: <b>BOSS, 3" O.D. X 1.1/2" I.D.</b>	SCALE: <b>1 = 2</b>	DATE: <b>JUNE 27, 1989</b>	DWG. NO. <b>00-0377A</b>



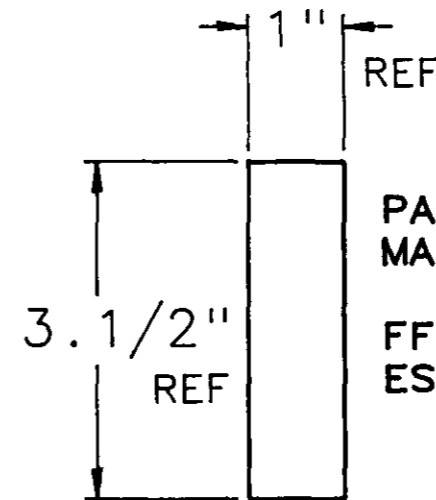
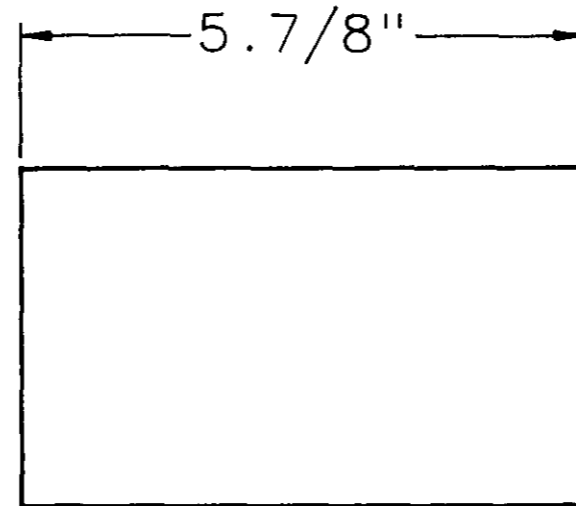
<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 6 TO 6 IN ← 1/32 6 IN AND UP ← 1/16 <b>DECIMAL:</b> 1 PLACE ← 0.1 2 PLACE ← 0.01 3 PLACE ← 0.005 <b>ANGULAR:</b> ← 1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:		<b>MICHIGAN DNR</b>  <b>FOREST MANAGEMENT DIVISION</b>			
NO. BY DATE REVISION		PROJECT NO.: <b>84-19</b>					
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653				TITLE: <b>BUSHING, 1.1/2" X 1.1/4" I.D.</b>	SCALE: <b>1 = 2</b>	DATE: <b>JUNE 28, 1989</b>	DWG. NO. <b>20-0006A</b>



PART NUMBER: 00-0364  
 MAT'L.: BAR, FLAT, 3/8" X 1.1/4" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00605AA  
 EST. WT.: 0.74 LBS.

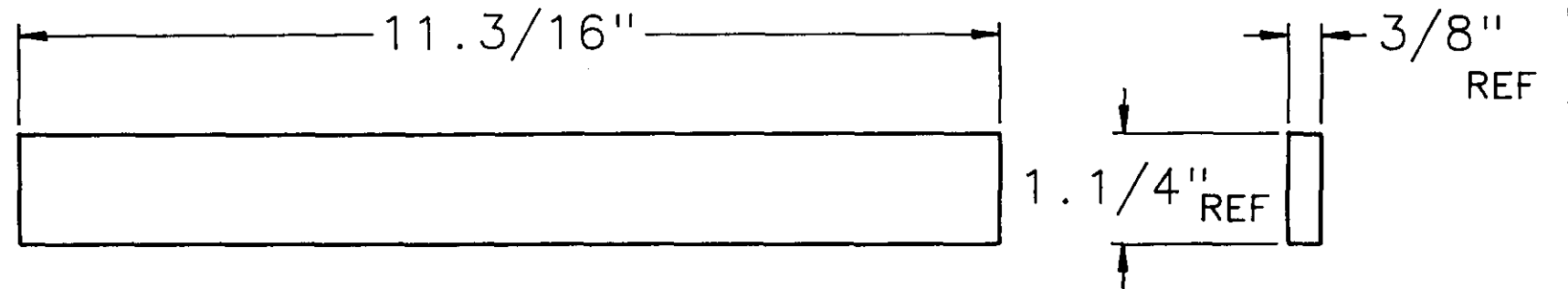
<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 8 TO 8 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ <b>DECIMAL:</b> 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ <b>ANGULAR:</b> $\pm 1$ DEG								DRAWN: <b>R. GREENLAW</b>	<b>MICHIGAN          DNR</b>  <b>FOREST MANAGEMENT          DIVISION</b>
								CHECKED: <b>KDB</b>	
								APPROVED:	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653									PROJECT NO.: <b>84-19</b>
TITLE: <b>BAR, FLAT, 3/8" X 1.1/4" H.R.</b>						SCALE: <b>1 = 2</b>	DATE: <b>JUNE 19, 1989</b>	DWG. NO. <b>00-0364A</b>	





PART NUMBER: 00-0365  
 MAT'L.: BAR, FLAT, 1"X3.1/2"  
 UNS G10200  
 FFES SPEC. NO.: AB-01614AA  
 EST. WT.: 5.82 LBS.

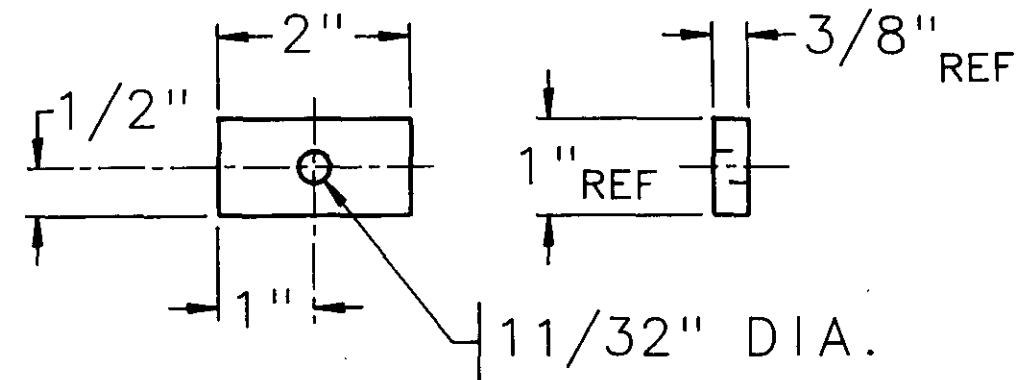
<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION	
NO. BY DATE REVISION	<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			PROJECT NO.: 84-19
TITLE: <b>BAR, FLAT, 1" X 3.1/2" HR</b>		SCALE: <b>1 = 2</b>	DATE: <b>JUNE 21, 1989</b>	DWG. NO. <b>00-0365A</b>



PART NUMBER: 00-0366  
 MAT'L.: BAR, FLAT, 3/8" X 1.1/4" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO. AB-00605AA  
 EST. WT.: 1.48 LBS.

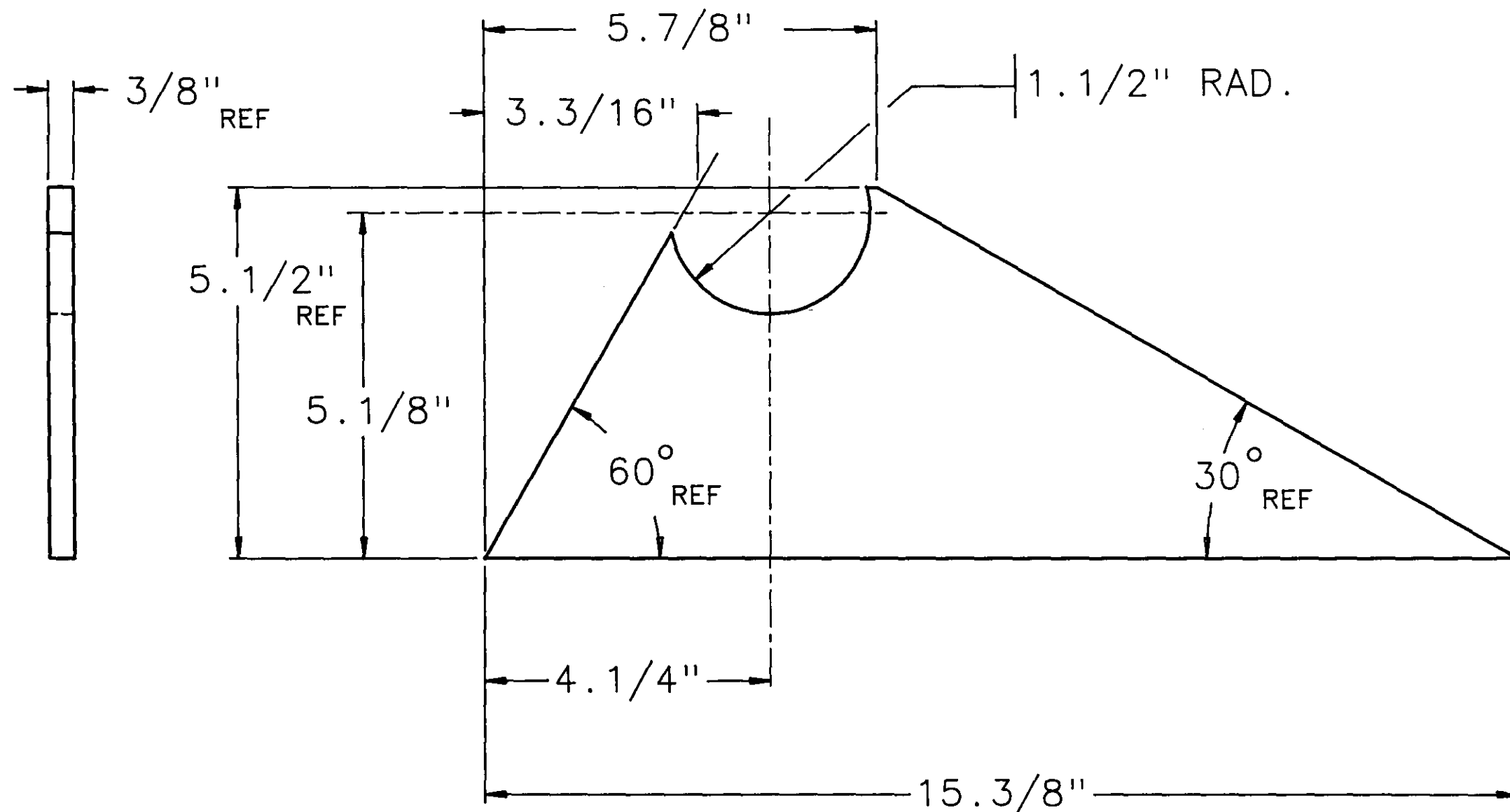
STD. TOLERANCES				DRAWN: R. GREENLAW		MICHIGAN DNR  FOREST MANAGEMENT DIVISION	
FRACTIONAL: 0 TO 8 IN ±1/32 8 IN AND UP ±1/16				CHECKED: KDB			
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005		ANGULAR: ±1 DEG		APPROVED:			
NO.	BY	DATE	REVISION				
FOREST FIRE EXPERIMENT STATION							
P.O. BOX 68      ROSCOMMON, MICHIGAN    48653						PROJECT NO.: 84-19	
TITLE: BAR, FLAT, 3/8" X 1.1/4" H.R.				SCALE: 1 = 2	DATE: JUNE 21, 1989	DWG. NO. 00-0366A	





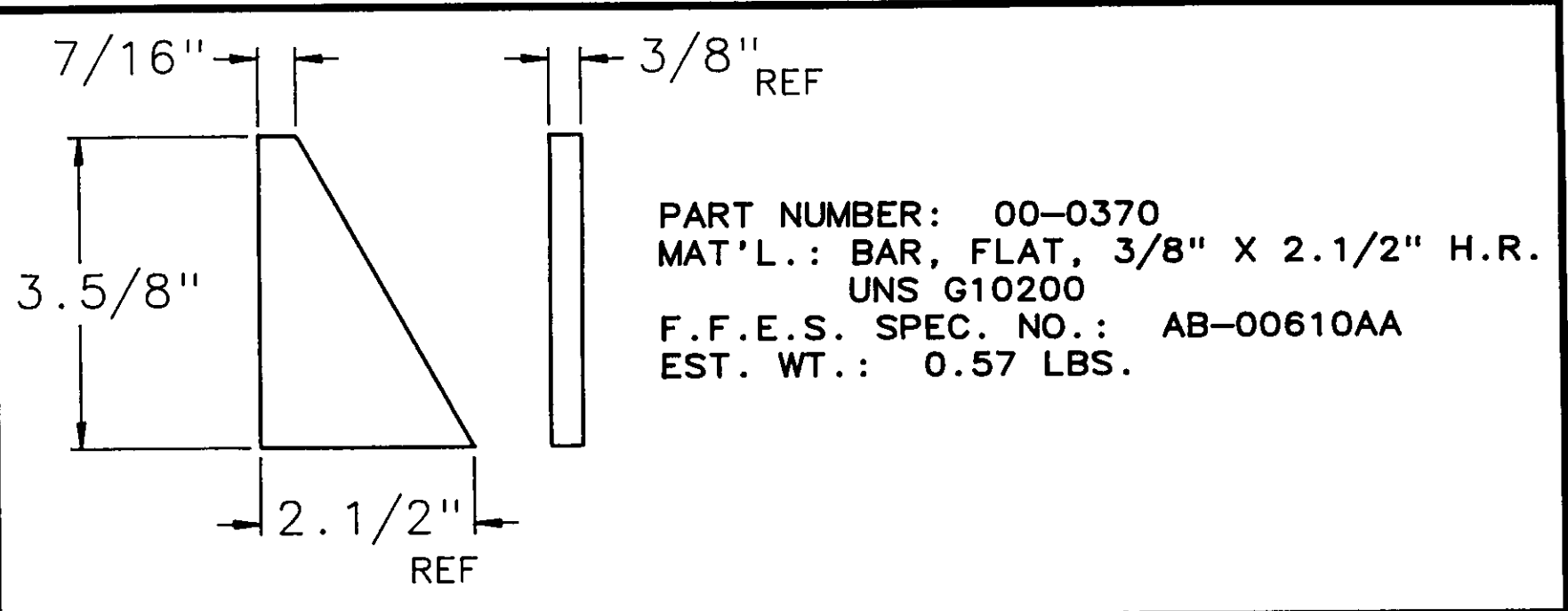
PART NUMBER: 00-0368  
 MAT'L.: BAR, FLAT, 3/8" X 1" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00604AA  
 EST. WT.: 0.20 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
FRACTIONAL: 6 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL:      ANGULAR: 1 PLACE ±0.1      ±1 DEG 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:			
NO.	BY	DATE	REVISION				
<b>FOREST FIRE EXPERIMENT STATION</b>							
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							
TITLE: BAR, FLAT, 3/8" X 1" H.R.						SCALE: 1 = 2	DATE: JUNE 23, 1989
						PROJECT NO.: 84-19	DWG. NO. 00-0368A



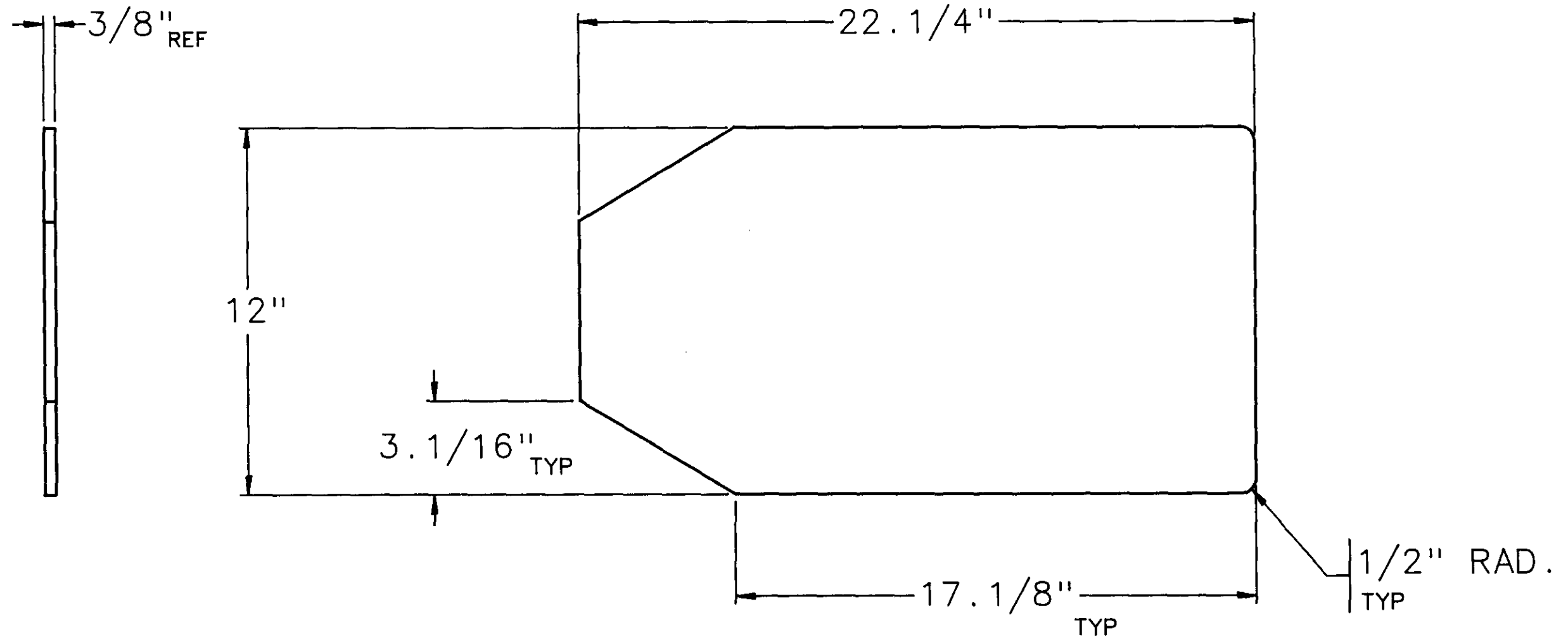
PART NUMBER: 00-0369  
 MAT'L.: BAR, FLAT, 3/8" X 5.1/2" HR  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00622AA  
 EST. WT.: 4.79 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
FRACTIONAL: 0 TO 8 IN ±1/32 8 IN AND UP ±1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:			
ANGULAR: ±1 DEG				NO.	BY	DATE	
				REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b>							
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							
TITLE: TRUNION SUPPORT WEB				SCALE: 1 = 2	DATE: JUNE 23, 1989	PROJECT NO.: 84-19	
						DWG. NO. 00-0369B	



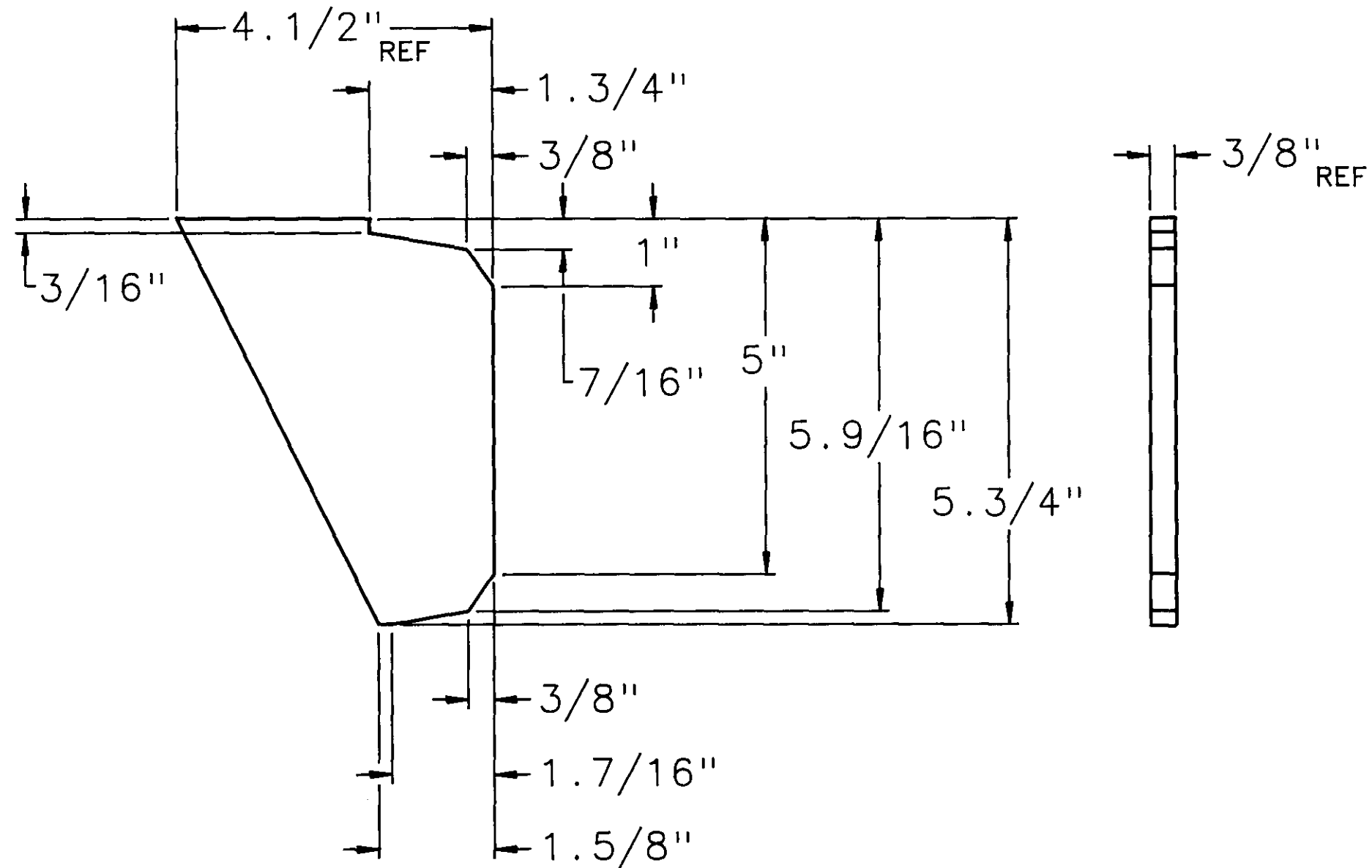
PART NUMBER: 00-0370  
 MAT'L.: BAR, FLAT, 3/8" X 2.1/2" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00610AA  
 EST. WT.: 0.57 LBS.

<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 8 TO 6 IN ±1/32 6 IN AND UP ±1/16 <b>DECIMAL:</b> 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 <b>ANGULAR:</b> ±1 DEG						DRAWN: <b>R. GREENLAW</b>	<b>MICHIGAN          DNR</b>  <b>FOREST MANAGEMENT          DIVISION</b>
						CHECKED: <b>KDB</b>	
						APPROVED:	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							PROJECT NO.: <b>84-19</b>
TITLE: <b>GUSSET</b>					SCALE: <b>1 = 2</b>	DATE: <b>JUNE 26, 1989</b>	DWG. NO. <b>00-0370A</b>



PART NUMBER: 00-0371  
 MAT'L.: PLATE, 3/8" H.R.  
 UNS G10080  
 F.F.E.S. SPEC. NO.: AA-00648AH  
 EST. WT.: 26.6 LBS.

STD. TOLERANCES				DRAWN: R. GREENLAW	
FRACTIONAL:				CHECKED: KDB	
6 TO 8 IN ±1/32				APPROVED:	
6 IN AND UP ±1/16				<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION  PROJECT NO.: 84-19	
DECIMAL:		ANGULAR:			
1 PLACE ±0.1		±1 DEG			
2 PLACE ±0.01					
3 PLACE ±0.005		NO.	BY	DATE	REVISION
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653					
TITLE: TRUNION SUPPORT, MTG. PLATE				SCALE: 1 = 4	DATE: JUNE 27, 1989
				DWG. NO. 00-0371B	

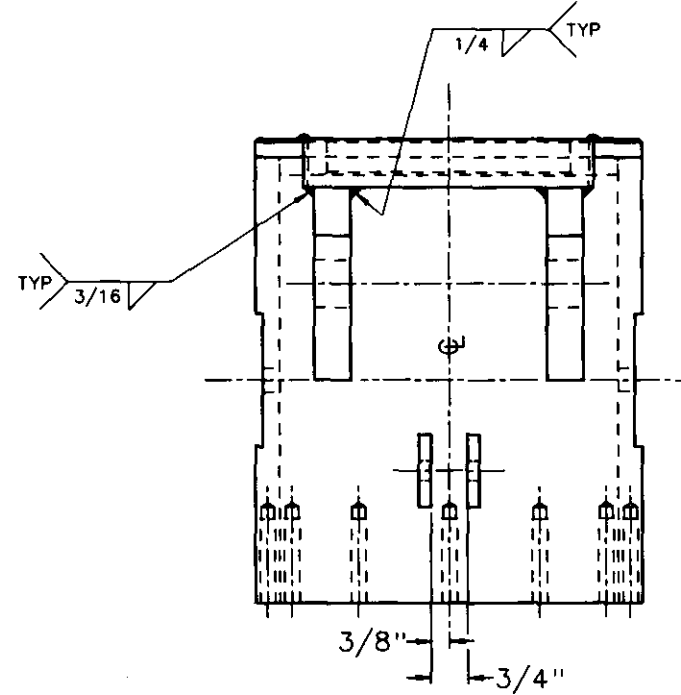


PART NUMBER: 00-0381  
 MAT'L.: BAR, FLAT, 3/8" X 4.1/2" HR  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00618AA  
 EST. WT.: 1.76 LBS.

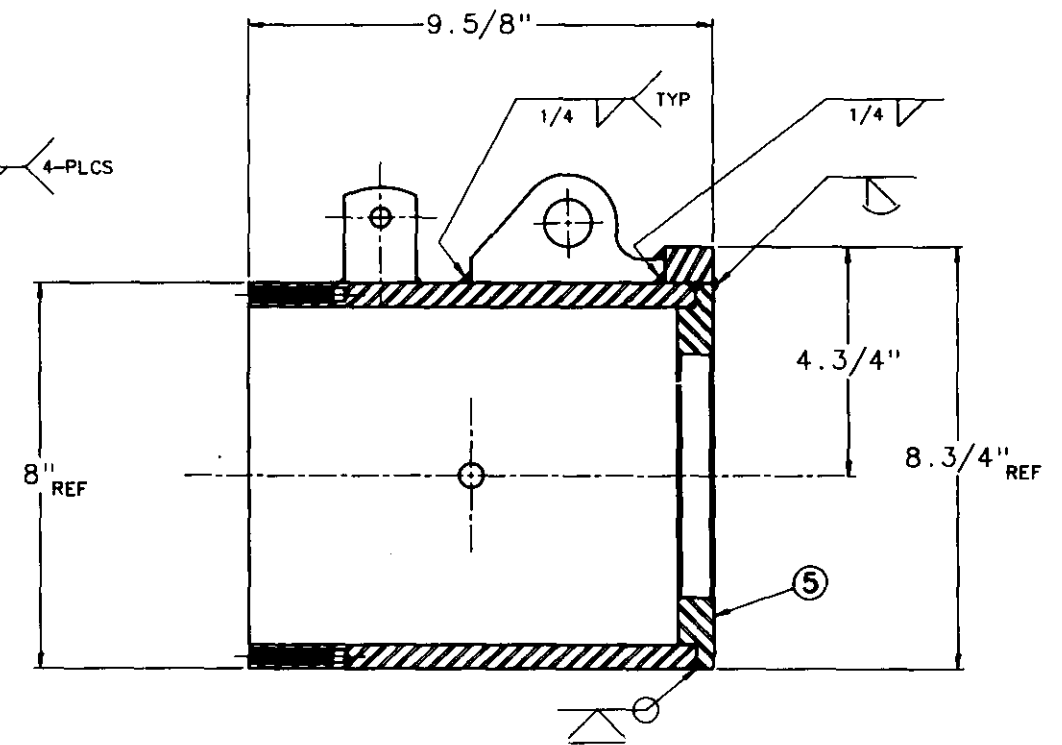
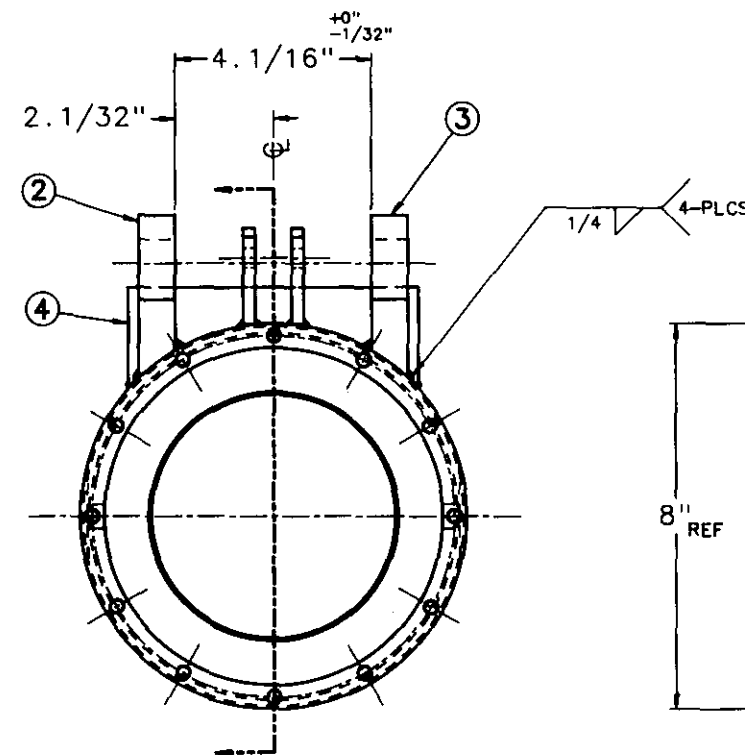
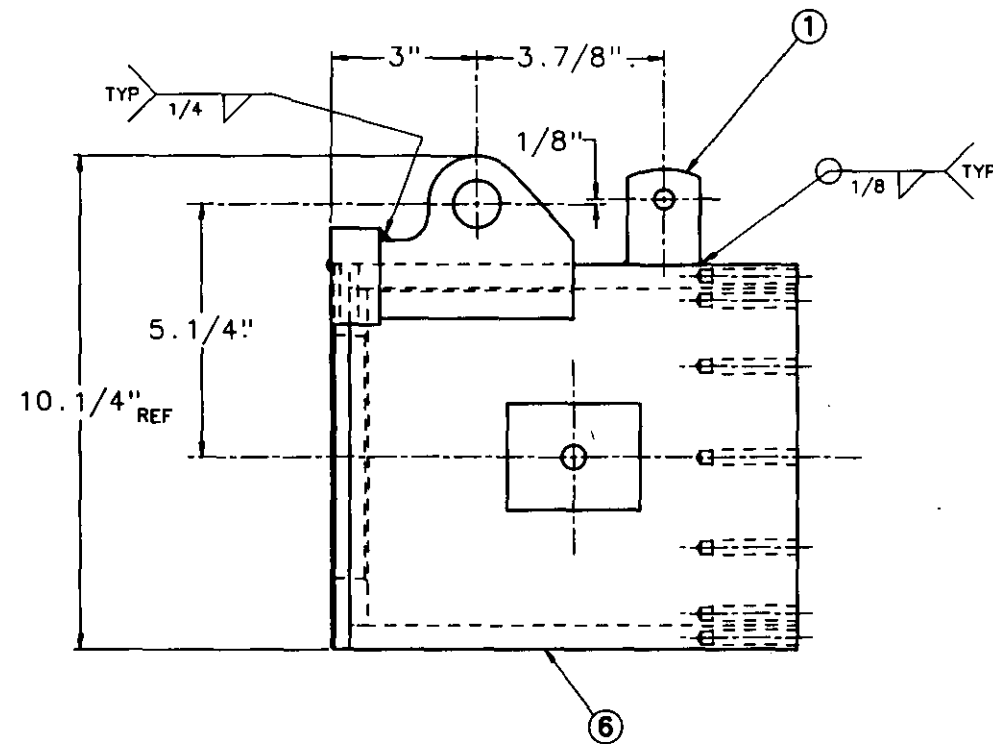
STD. TOLERANCES				DRAWN: R. GREENLAW		MICHIGAN DNR FOREST MANAGEMENT DIVISION
FRACTIONAL: 8 TO 8 IN ±1/32 8 IN AND UP ±1/16				CHECKED: KDB		
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005		ANGULAR: ±1 DEG		APPROVED:		
NO.	BY	DATE	REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653						
TITLE: GUSSET				SCALE: 1 = 2	DATE: JUNE 29, 1989	PROJECT NO.: 84-19
				DWG. NO. 00-0381B		



ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0427	A	EAR, LATCH RETAINER	2	0.19
2	00-0428	B	EAR, L.H.: PLOW LATCH	1	1.36
3	00-0429	B	EAR, R.H.: PLOW LATCH	1	1.36
4	00-0431	A	BUMPER, TRUNION HOUSING	1	1.98
5	00-0441	B	CAP	1	4.95
6	00-0442	C	HOUSING	1	29.2

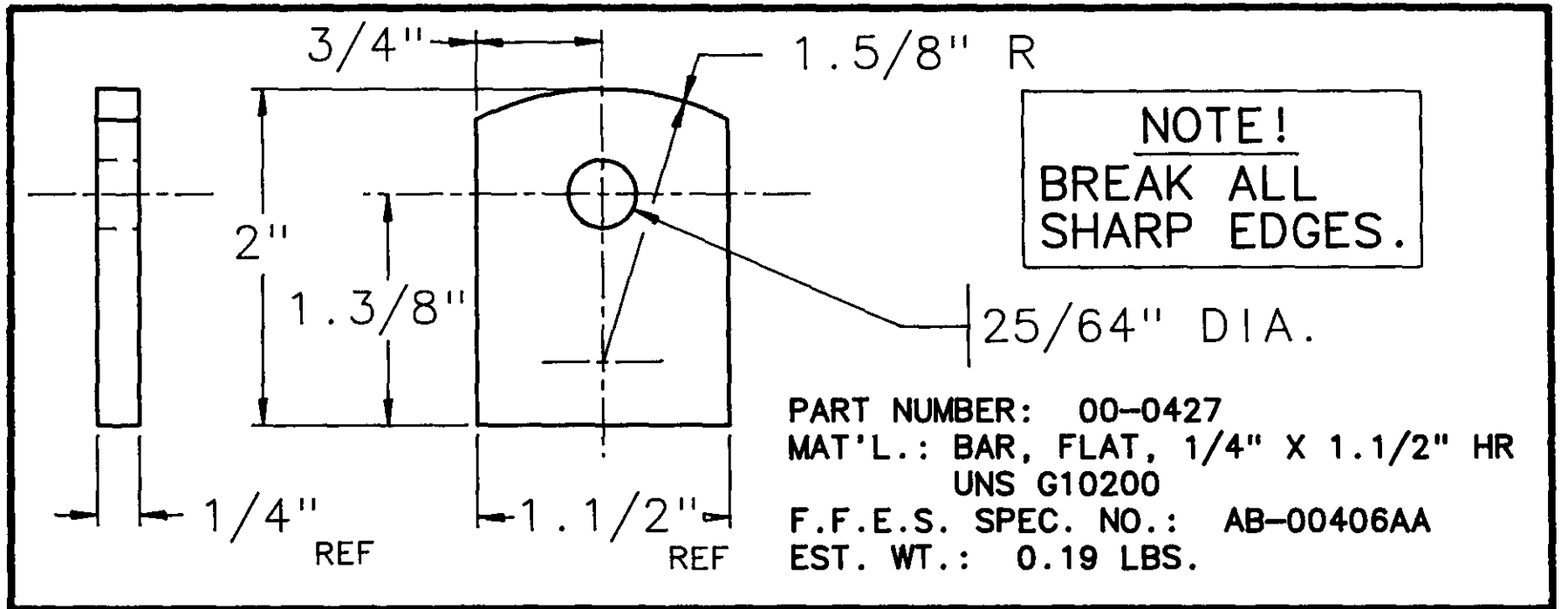


NOTE:  
USE WELDING  
FIXTURE, P/N  
18-0042.



PART NUMBER: 00-0443  
EST. WT.: 41.2 LBS.

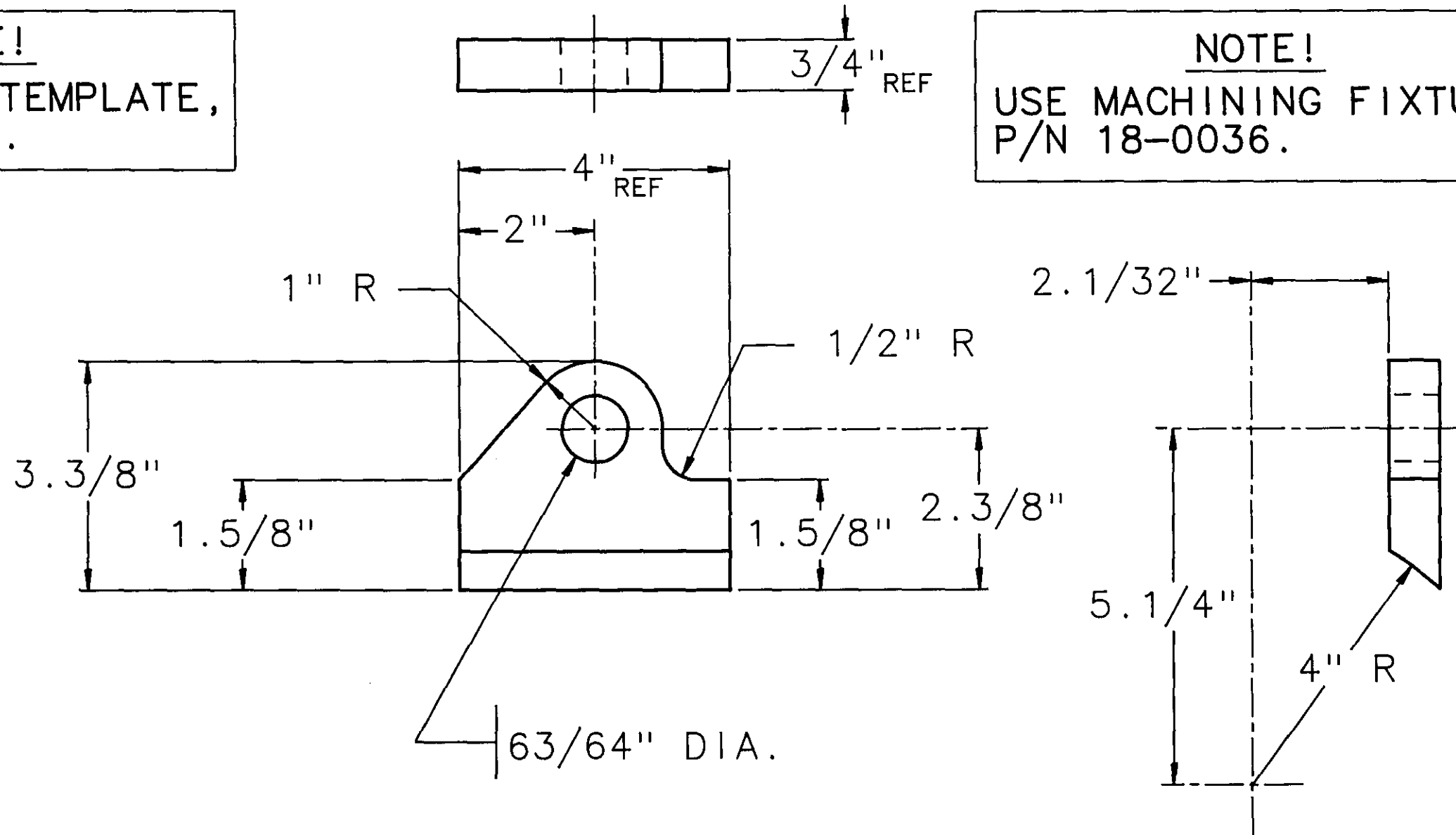
STD. TOLERANCES	DRAWN:	MICHIGAN DNR FOREST MANAGEMENT DIVISION
FRACTIONAL	R. GREENLAW	
DECIMAL	CHECKED:	
ANGLE	KDB	
APPROVED:		PROJECT NO.: 84-19
FOREST FIRE EXPERIMENT STATION		DWG. NO. 00-0443D
P. O. BOX 68 ROSCOMMON, MICHIGAN 48653		
TITLE: TRUNION, 52" PLOW, S/W		SCALE: 1 = 2
		DATE: JAN. 04, 1980



<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 0 TO 6 IN ±1/32 6 IN AND UP ±1/16 <b>DECIMAL:</b> 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 <b>ANGULAR:</b> ±1 DEG							DRAWN: <b>R. GREENLAW</b>	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION
							CHECKED: <b>KDB</b>	
							APPROVED:	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653								PROJECT NO.: 84-19
TITLE: <b>EAR, LATCH RETAINER</b>						SCALE: <b>FULL</b>	DATE: <b>NOV. 06, 1969</b>	DWG. NO. <b>00-0427A</b>

**NOTE!**  
USE LAYOUT TEMPLATE,  
P/N 18-0035.

**NOTE!**  
USE MACHINING FIXTURE  
P/N 18-0036.

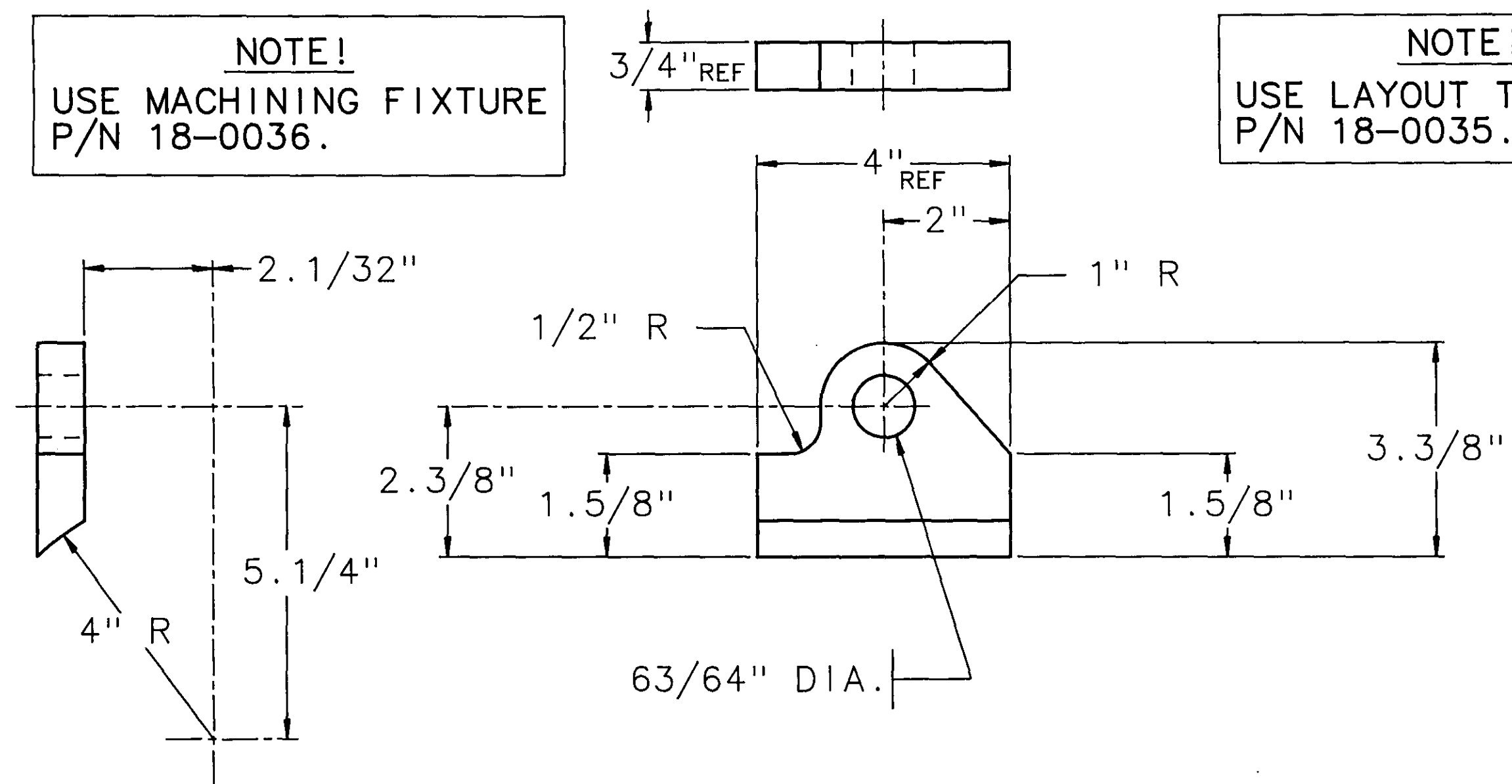


PART NUMBER: 00-0428  
MAT'L.: BAR, FLAT, 3/4" X 4" H.R.  
UNS G10200  
F.F.E.S. SPEC. NO.: AB-01216AA  
EST. WT.: 1.36 LBS.

<b>STD. TOLERANCES</b>		DRAWN: R. GREENLAW	MICHIGAN DNR
FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16			
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005		APPROVED:	FOREST MANAGEMENT DIVISION
ANGULAR: ±1 DEG		PROJECT NO.: 84-19	
NO.	BY	DATE	REVISION
<b>FOREST FIRE EXPERIMENT STATION</b>			
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			
TITLE: EAR, L.H.: PLOW LATCH		SCALE: 1 = 2	DATE: NOV. 08, 1989
		DWG. NO. 00-0428B	

**NOTE!**  
USE MACHINING FIXTURE  
P/N 18-0036.

**NOTE!**  
USE LAYOUT TEMPLATE,  
P/N 18-0035.



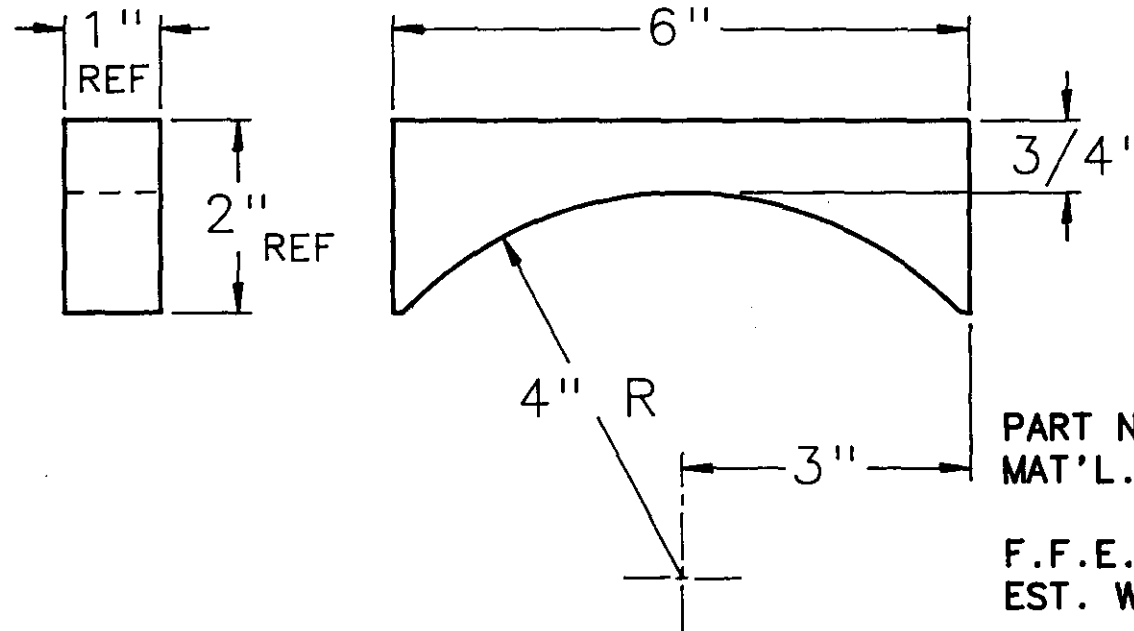
PART NUMBER: 00-0429  
MAT'L.: BAR, FLAT, 3/4" X 4" H.R.  
UNS G10200  
F.F.E.S. SPEC. NO.: AB-01216AA  
EST. WT.: 1.36 LBS.

<b>STD. TOLERANCES</b>		DRAWN: R. GREENLAW	
FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16			
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005		CHECKED: KDB	
ANGULAR: ±1 DEG		APPROVED:	
NO.	BY	DATE	REVISION

**MICHIGAN  
DNR**  
FOREST MANAGEMENT  
DIVISION

**FOREST FIRE EXPERIMENT STATION**  
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653

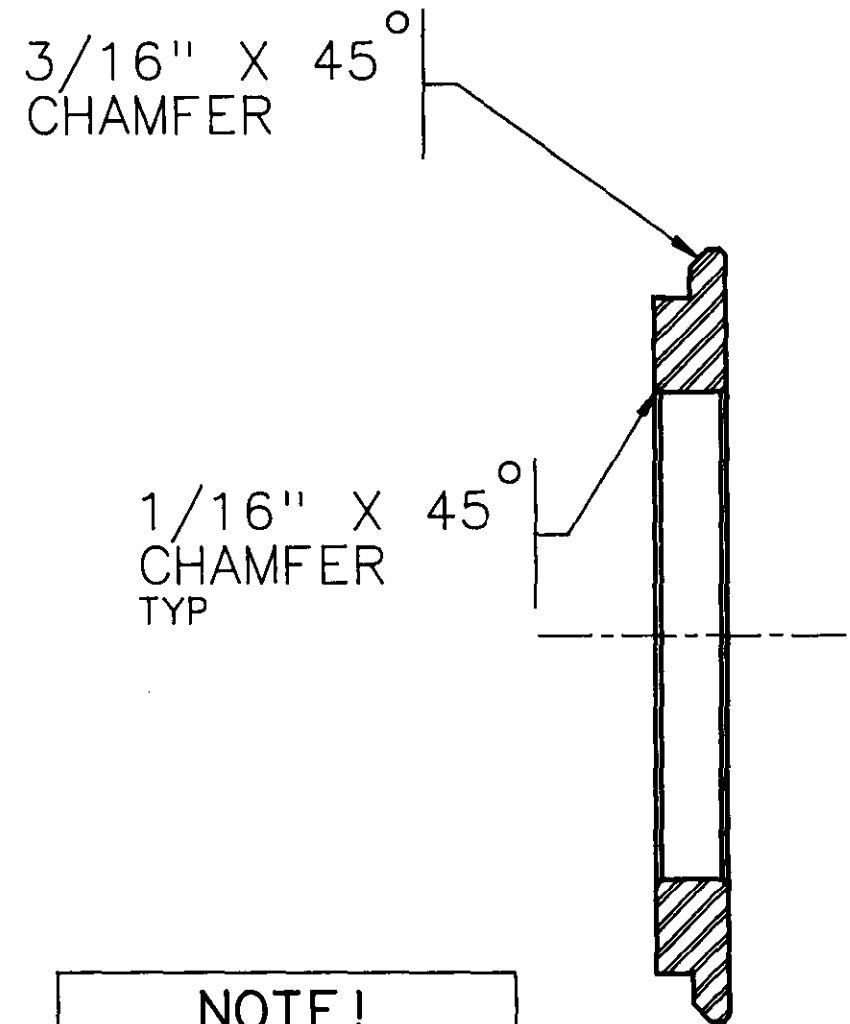
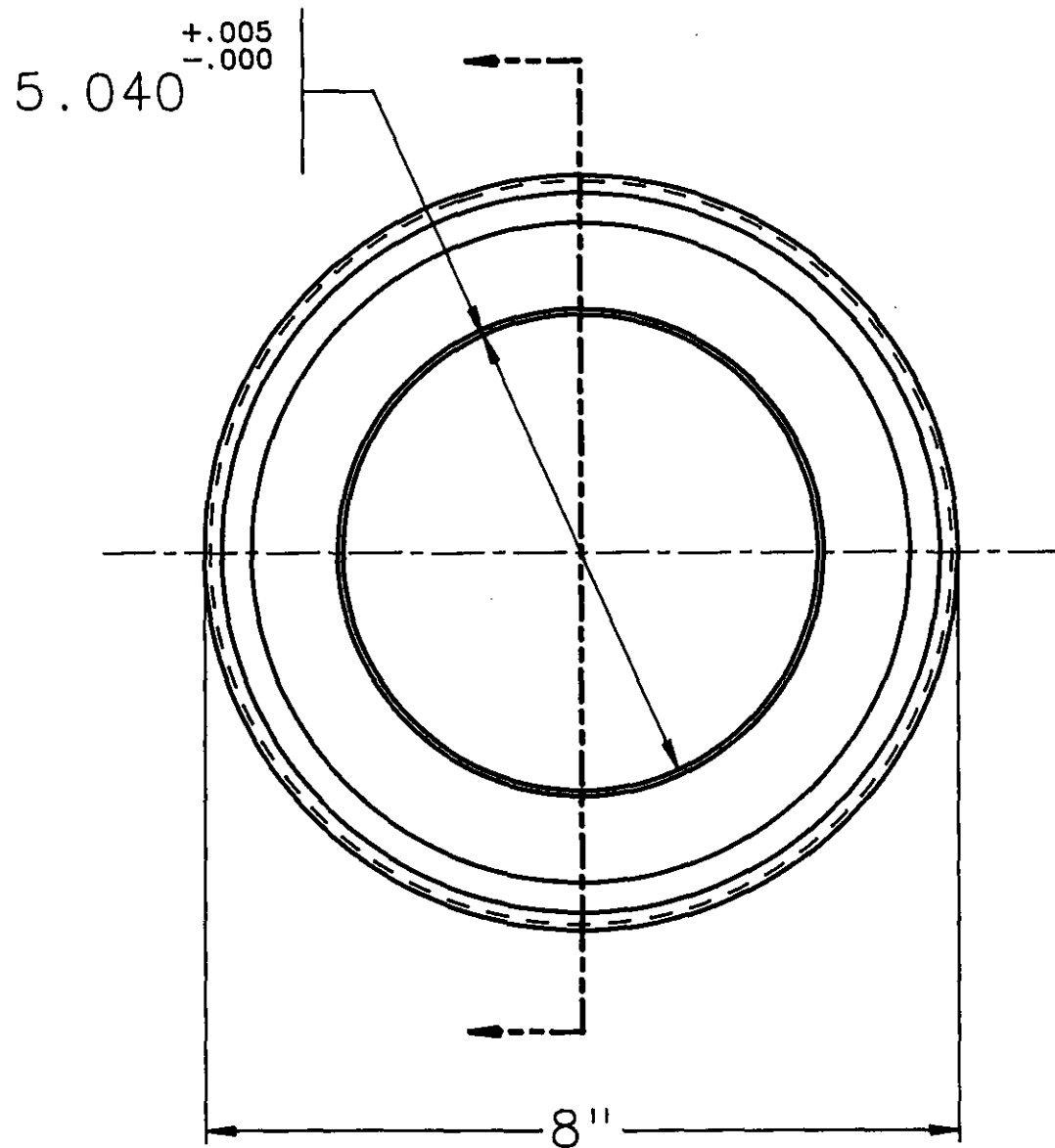
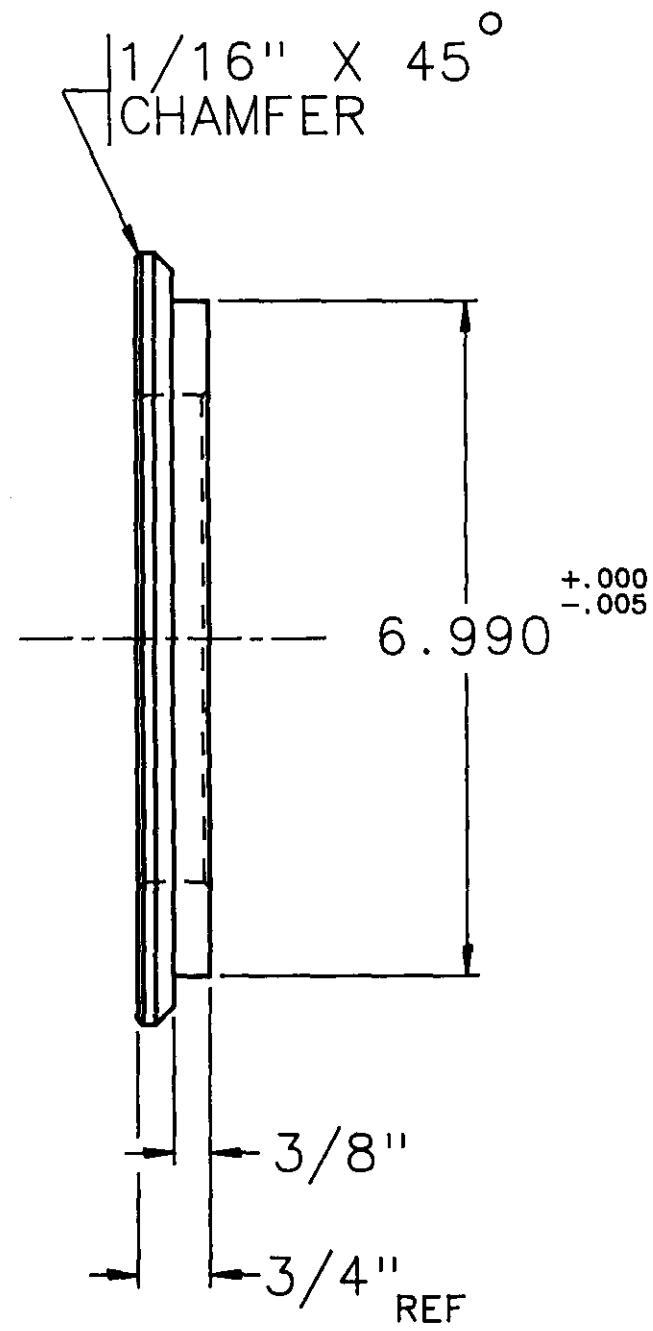
TITLE: **EAR, R.H.: PLOW LATCH**      SCALE: 1 = 2      DATE: NOV. 08, 1989      PROJECT NO.: 84-19      DWG. NO. 00-0429B



**NOTE!**  
 USE MACHINING  
 FIXTURE,  
 P/N 18-0037.

PART NUMBER: 00-0431  
 MAT'L.: BAR, FLAT, 1" X 2" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-01608AA  
 EST. WT.: 1.98 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
FRACTIONAL: 0 TO 6 IN. ← 1/32 6 IN AND UP ← 1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL: 1 PLACE ← 0.1 2 PLACE ← 0.01 3 PLACE ← 0.005		ANGULAR: ← 1 DEG		APPROVED:			
NO.	BY	DATE	REVISION				
<b>FOREST FIRE EXPERIMENT STATION</b>							
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							
TITLE: BUMPER, TRUNION HOUSING					SCALE: 1 = 2	DATE: NOV. 09, 1989	PROJECT NO.: 84-19
							DWG. NO. 00-0431A



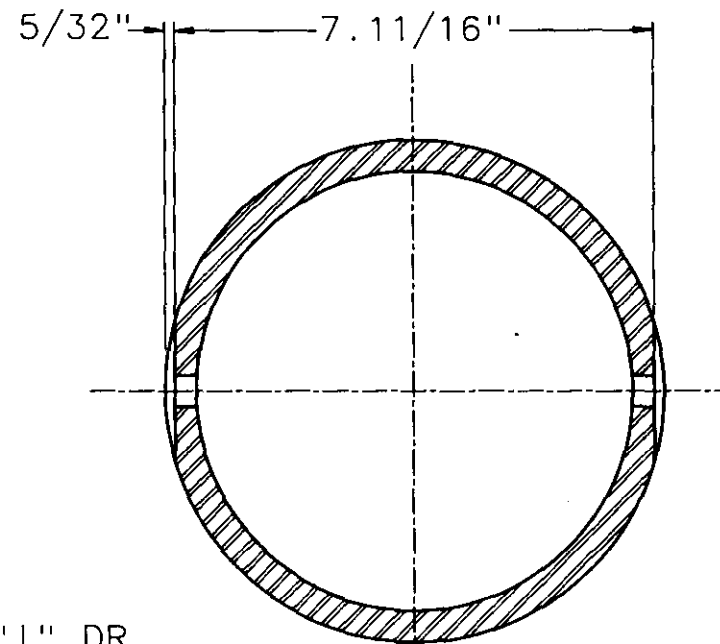
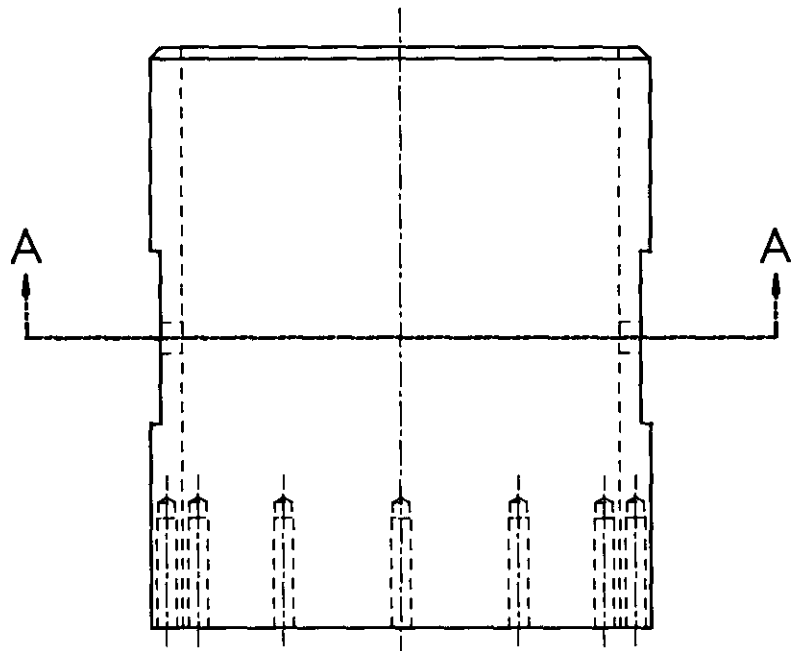
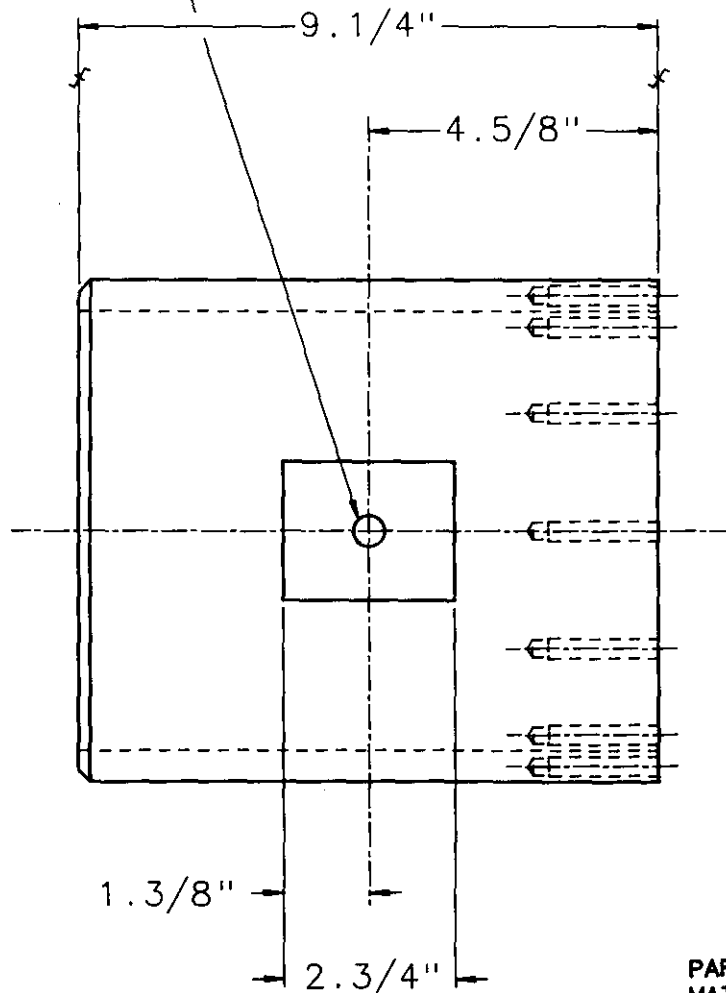
**NOTE!**  
USE BURNING  
TEMPLATE, P/N  
18-0047.

PART NUMBER: 00-0441.  
MAT'L.: PLATE, 3/4" H.R.  
UNS G10150  
F.F.E.S. SPEC. NO.: AA-01248BC  
EST. WT.: 4.95 LBS.

<b>STD. TOLERANCES</b>		DRAWN: R. GREENLAW	MICHIGAN DNR	
FRACTIONAL: 8 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$				CHECKED: KDB
DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$				APPROVED:
ANGULAR: $\pm 1$ DEG		FOREST MANAGEMENT DIVISION		
NO. BY DATE REVISION		PROJECT NO.: 84-19		
<b>FOREST FIRE EXPERIMENT STATION</b>				
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653				
TITLE: CAP, TRUNION		SCALE: 1 = 2	DATE: NOV. 28, 1989	
		DWG. NO. 00-0441B		

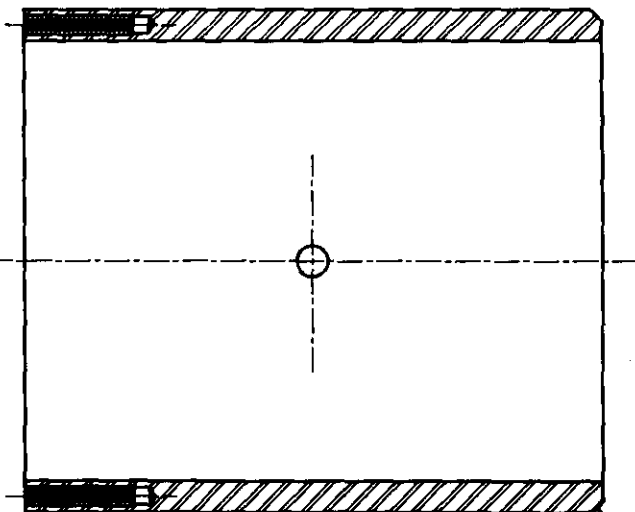
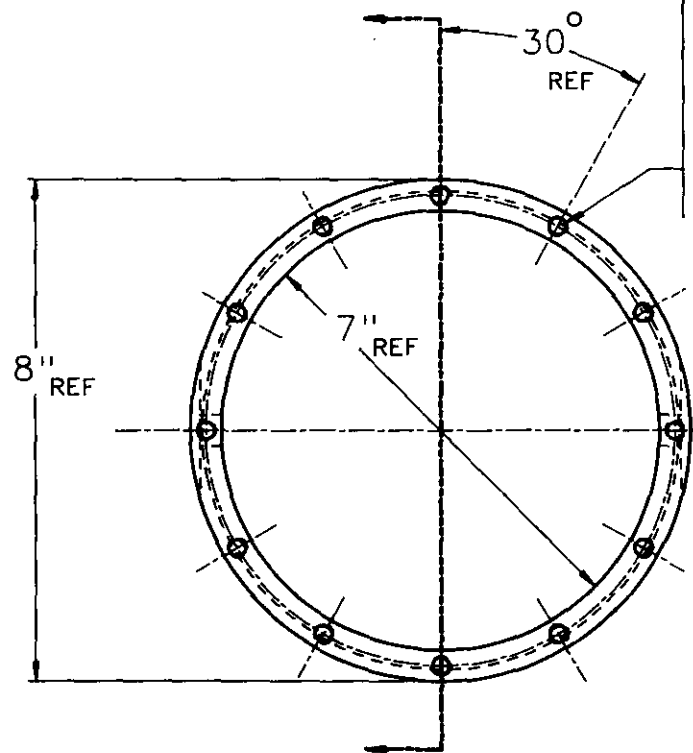
**NOTE!**  
USE DRILLING  
FIXTURE, P/N  
18-0039.

1/2" DIA.  
THRU BOTH WALLS  
IN LINE.  
TYP



SECTION A-A

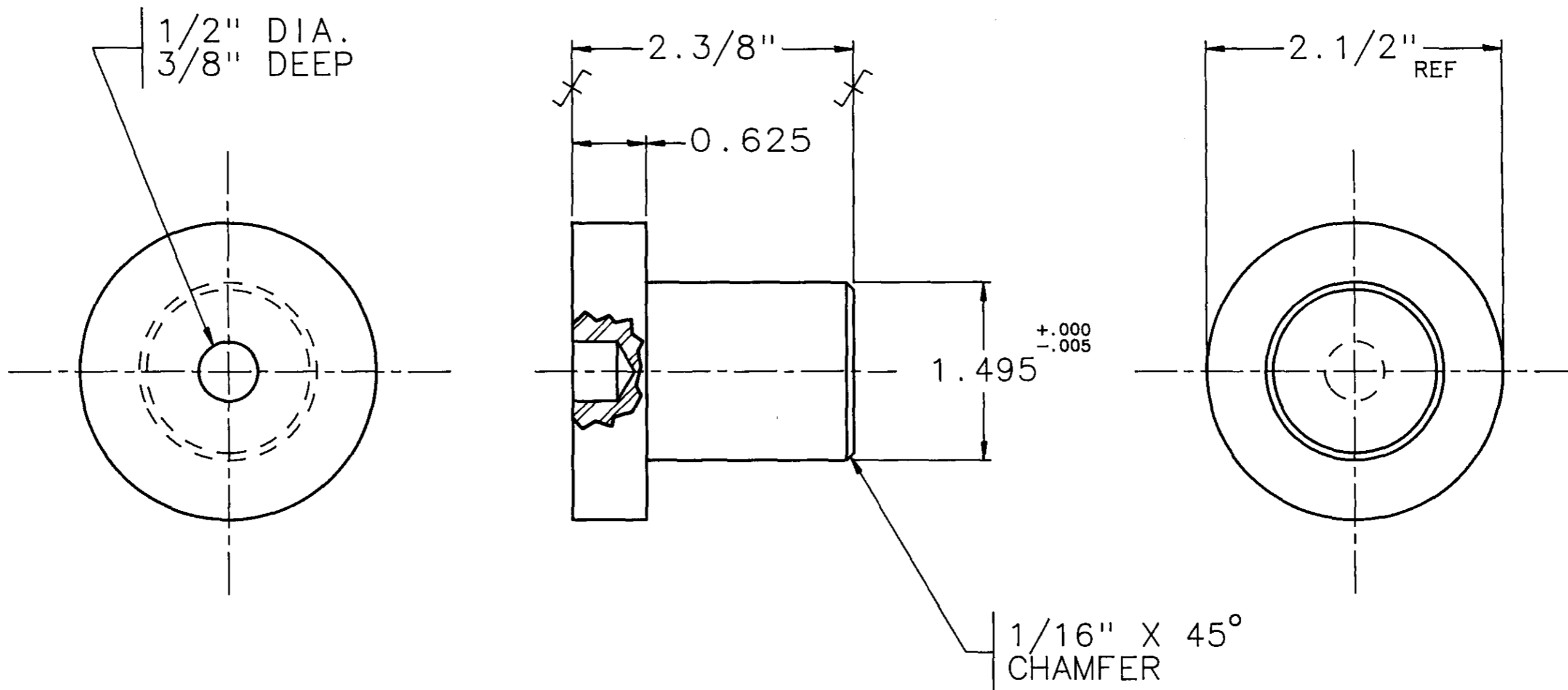
LETTER "I" DR.  
2" DEEP  
5/16"-24 NF TAP  
1 3/4" DEEP  
12-PLACES  
EQ. SPACED  
ON A 7 1/2"  
DIA. B.C.



3/16" X 45°  
CHAMFER

PART NUMBER: 00-0442  
MAT'L.: TUBE, RD., 8" O.D. X 1/2" WALL  
DOM  
UNS G10260  
F.F.E.S. SPEC. NO.: AD-80014AM  
EST. WT.: 29.2 LBS.

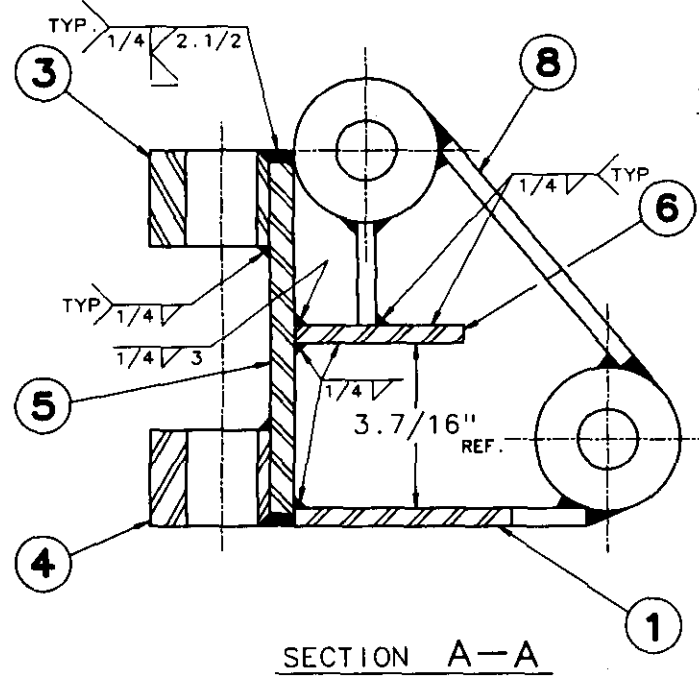
STD. TOLERANCES		DRAWN: R. GREENLAW		MICHIGAN DNR
FRACTIONAL: 6 TO 8 IN. -1/16 6 TO 8 IN. UP -1/32		CHECKED: KDB		
DECIMAL: 1 PLACE - 0.01 2 PLACE - 0.001 3 PLACE - 0.0005		APPROVED:		
ANGULAR: -1.00		REVISED:		FOREST MANAGEMENT DIVISION
FOREST FIRE EXPERIMENT STATION				PROJECT NO.: 84-19
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653				DWG. NO. 00-0442C
TITLE: HOUSING, TRUNION		SCALE: 1 = 2	DATE: NOV. 28, 1968	



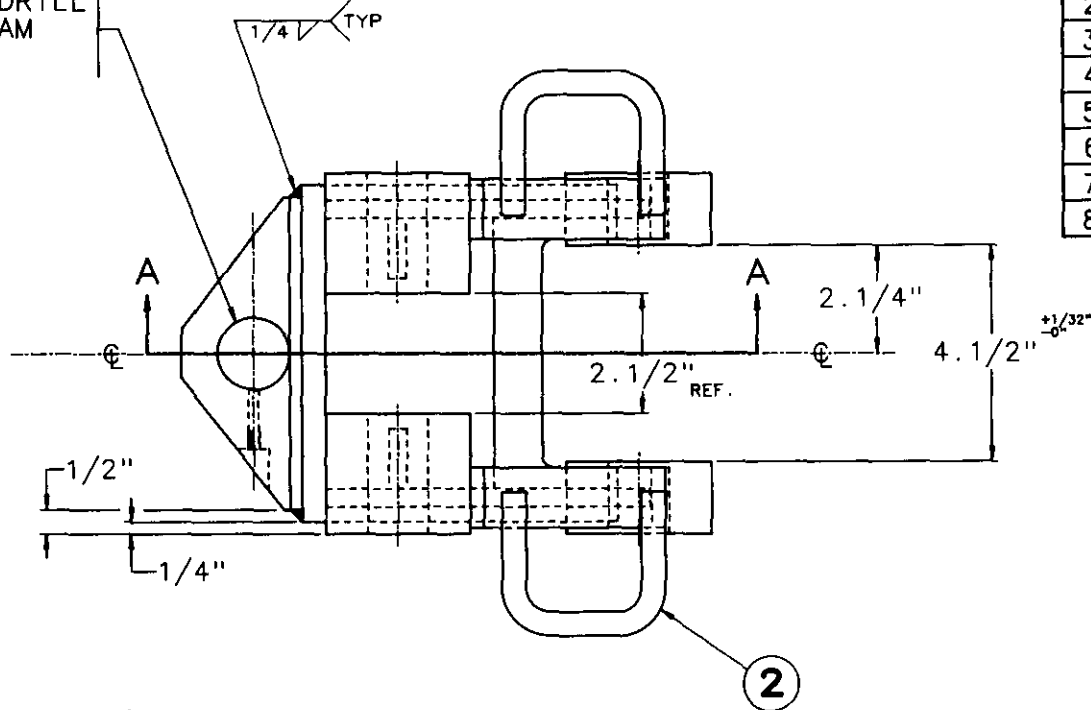
PART NUMBER: 00-0440  
 MAT'L.: BAR, RND., 2 1/2" DIA CRS.  
 RYCASE / LEAD  
 UNS G11170Pb  
 F.F.E.S. SPEC. NO.: AC-00250AF  
 EST. WT.: 1.52 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
FRACTIONAL: 6 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$				CHECKED: KDB		
DECIMAL:      ANGULAR: 1 PLACE $\pm 0.1$ $\pm 1$ DEG 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$				APPROVED:		
NO.	BY	DATE	REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b>						
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653						
TITLE: <b>PIN, TRUNION</b>				SCALE: FULL	DATE: NOV. 27, 1989	PROJECT NO.: 84-19 DWG. NO. 00-0440B

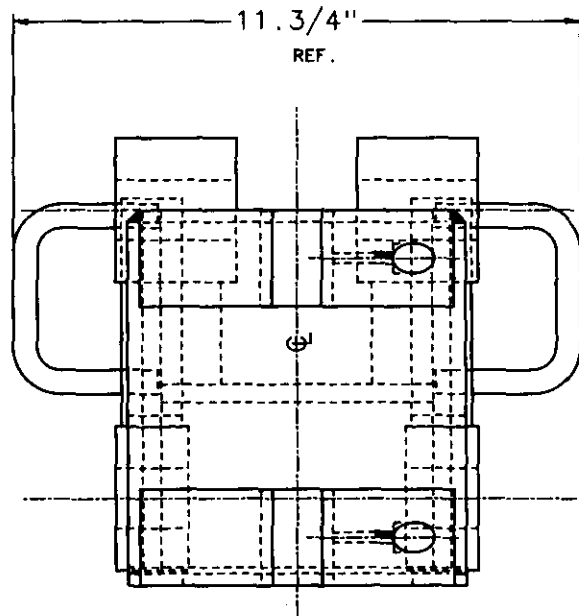




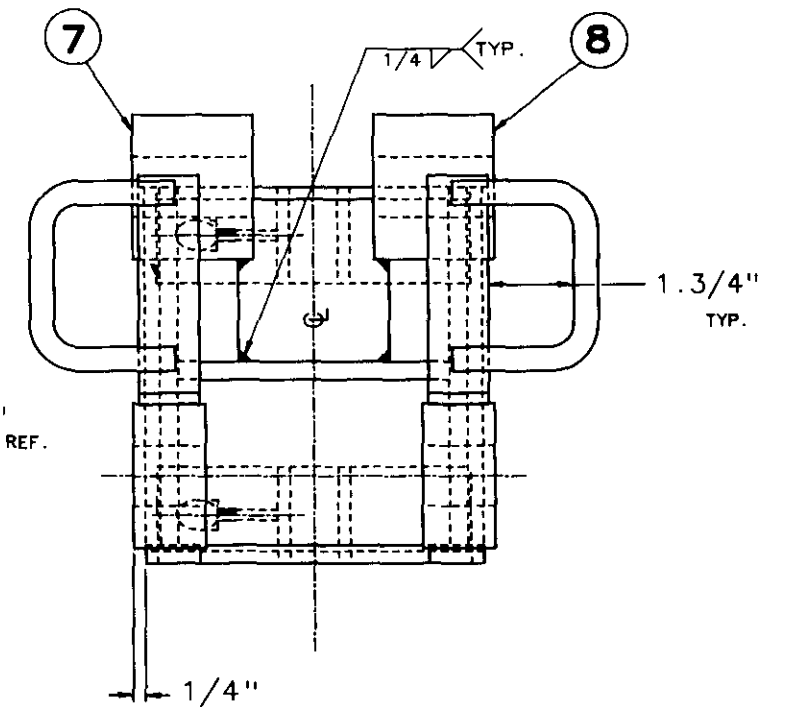
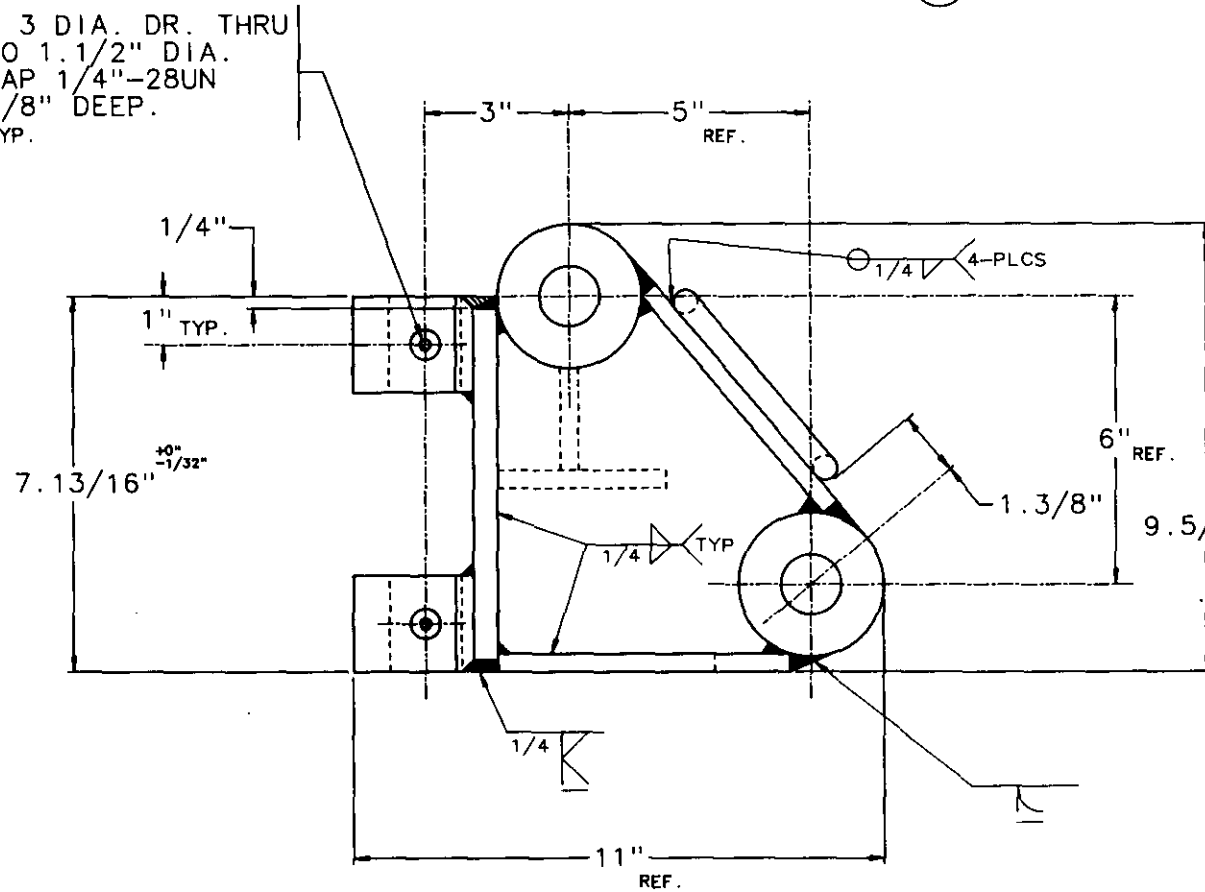
1.15/32" DIA. DRILL  
1.1/2" DIA. REAM  
THRU IN LINE.



SECTION A-A



# 3 DIA. DR. THRU  
TO 1.1/2" DIA.  
TAP 1/4"-28UN  
3/8" DEEP.  
TYP.



ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0126	B	PIVOT BOTTOM	1	3.74
2	00-0342	B	HOSE GUIDE	2	0.51
3	00-0344	B	UPPER VERTICAL PIN MOUNT	1	5.81
4	00-0345	B	LOWER VERTICAL PIN MOUNT	1	5.81
5	00-0349	B	BAR, FLAT, 1/2" X 7" H.R.	1	7.25
6	00-0352	B	BAR, FLAT, 3/8" X 3.1/2" H.R.	1	2.09
7	00-0357	C	PIVOT SIDE, L.H., S/W	1	11.8
8	00-0358	C	PIVOT SIDE, R.H., S/W	1	11.8

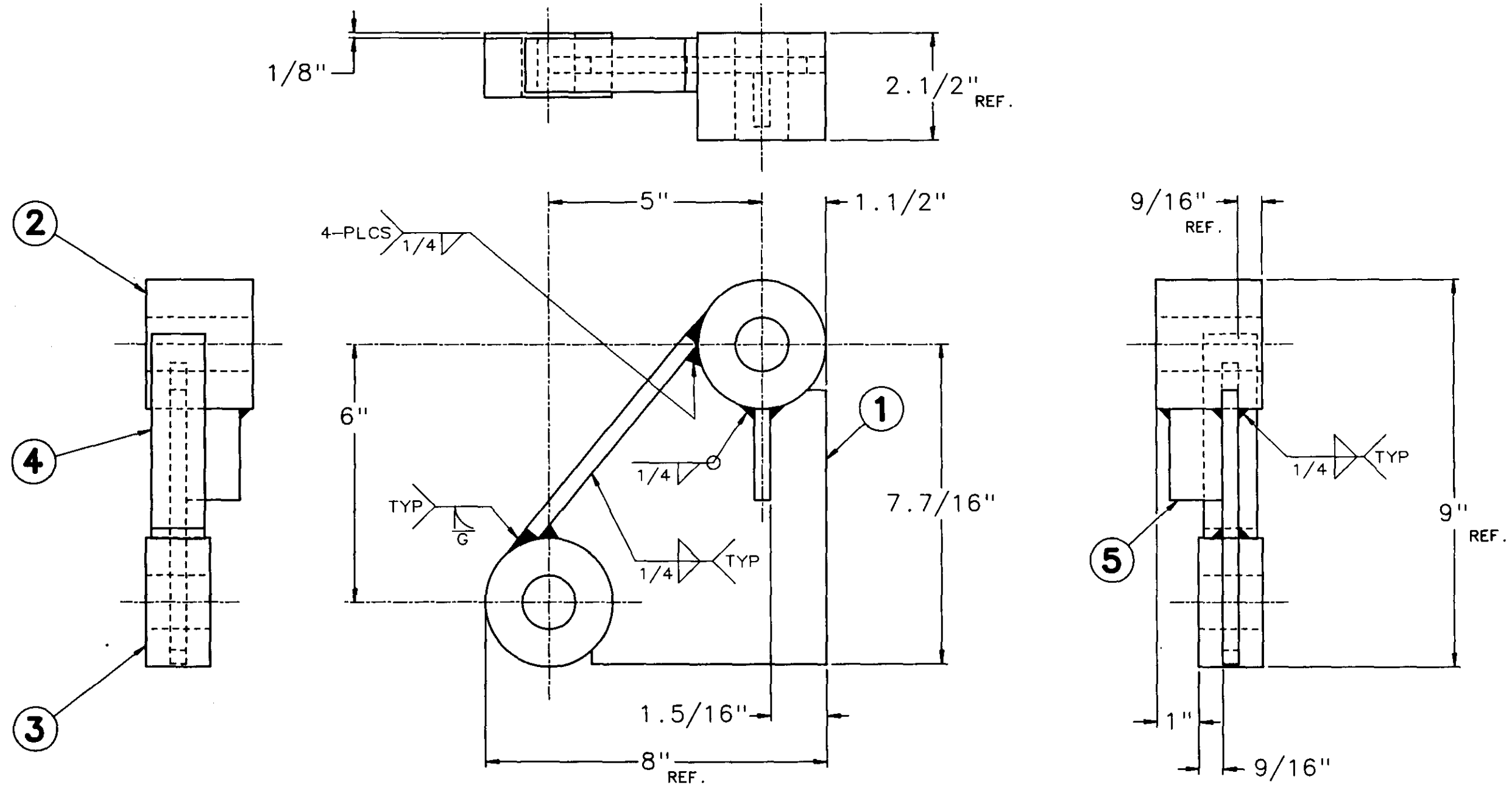
PART NUMBER: 20-0004  
EST. WT.: 49.7 LBS.

STD. TOLERANCES						DRAIN: R. GREENLAW
FRACTIONAL:						CHECKED: KOB
DECIMAL:						APPROVED:
ANGULAR:						
DATE:						
SCALE:						
MICHIGAN DNR FOREST MANAGEMENT DIVISION						
PROJECT NO.: 84-19						
TITLE: PIVOT, FIRELINE PLOW, W/C						
SCALE: 1 = 2						
DATE: MAY 08, 1988						
DWG NO: 20-0004C						

FOREST FIRE EXPERIMENT STATION  
P.O. BOX 68 ROSCOMMON, MICHIGAN 49853

NOTE:  
USE FIXTURE,  
P/N 18-0017.

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0127	B	PIVOT SIDE	1	3.58
2	00-0346	B	BOSS, 3" O.D. X 1.1/4" I.D.	1	4.13
3	00-0347	B	BOSS, 3" O.D. X 1.1/4" I.D.	1	2.48
4	00-0350	A	BAR, FLAT, 3/8" X 1.1/4"H.R.	1	0.78
5	00-0351	A	BAR, FLAT, 3/8" X 1.1/4"H.R.	1	0.28

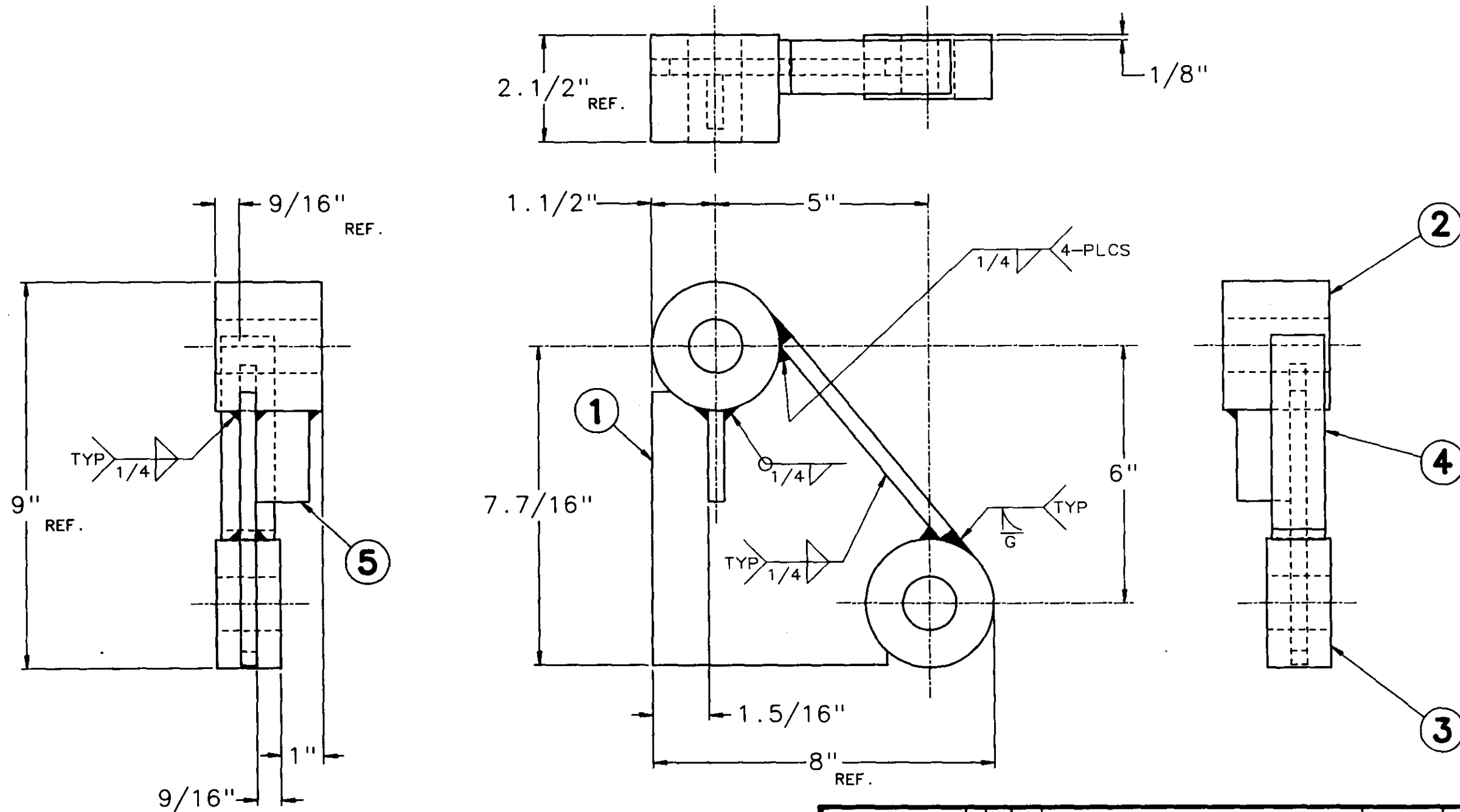


PART NUMBER: 00-0357  
EST. WT.: 11.8 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 0.25 ±1/32 0.25 AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1.0°		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDR</b> APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19 DWG. NO. 00-0357C
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		TITLE: <b>PIVOT SIDE, L.H. S/W</b> SCALE: 1 = 2 DATE: MAY 15, 1989	

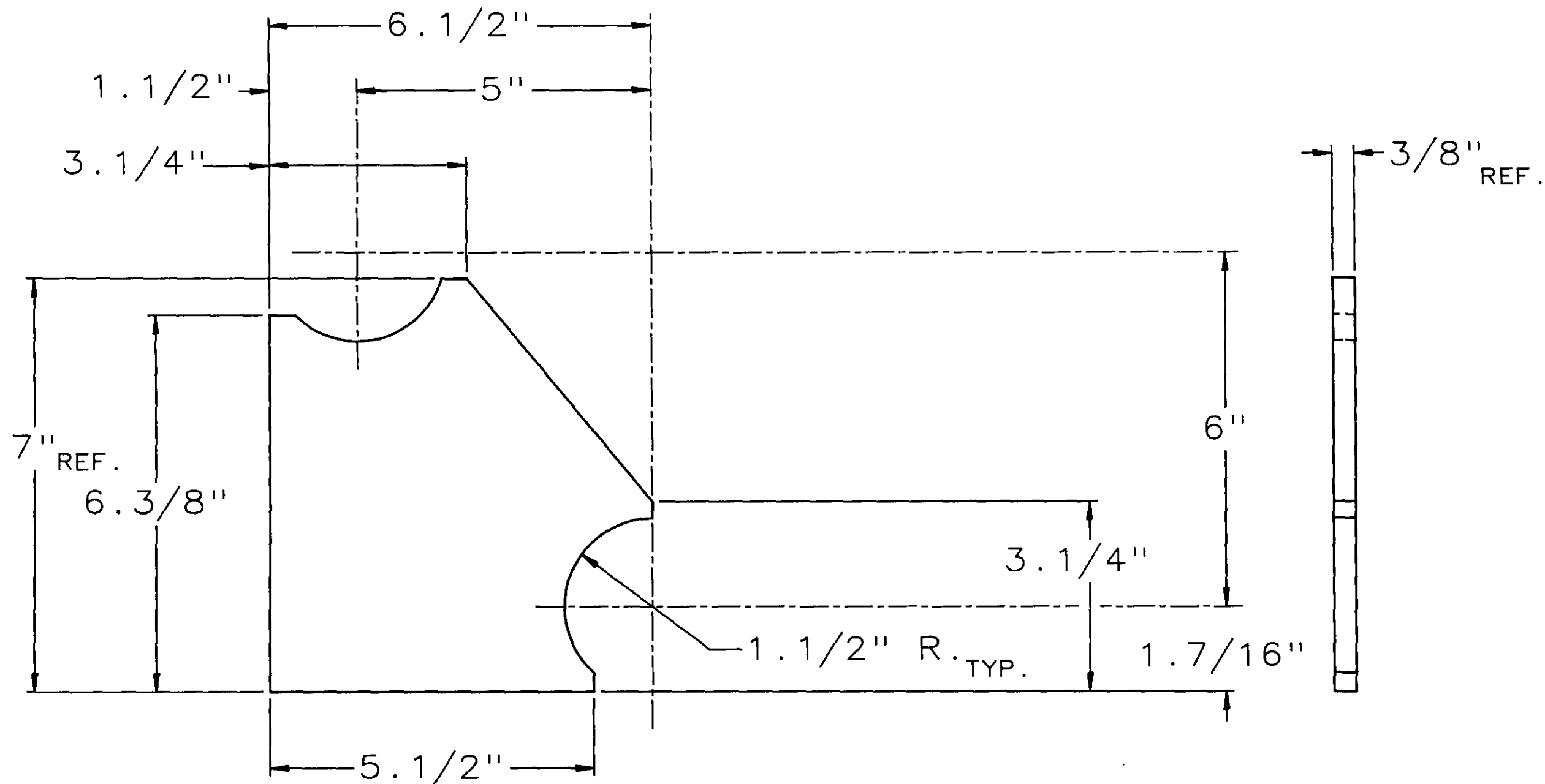
NOTE:  
USE FIXTURE,  
P/N 18-0017.

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0127	B	PIVOT SIDE	1	3.58
2	00-0346	B	BOSS, 3" O.D. X 1.1/4" I.D.	1	4.13
3	00-0347	B	BOSS, 3" O.D. X 1.1/4" I.D.	1	2.48
4	00-0350	A	BAR, FLAT, 3/8" X 1.1/4"H.R.	1	0.78
5	00-0351	A	BAR, FLAT, 3/8" X 1.1/4"H.R.	1	0.28



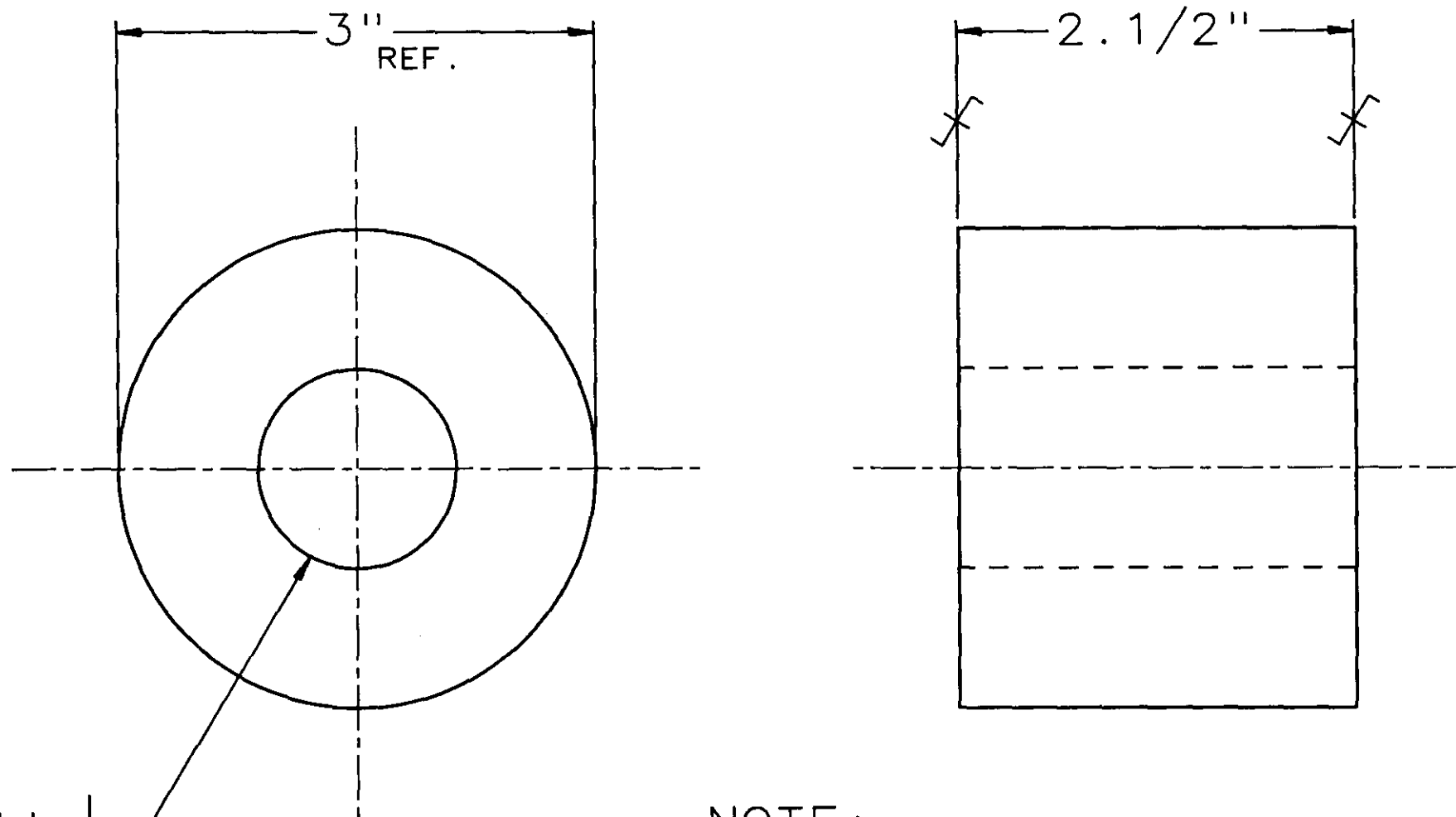
PART NUMBER: 00-0358  
EST. WT.: 11.8 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 6 TO 6.25 ± 1/32 6.25 AND UP ± 1/16 DECIMAL: 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005 ANGULAR: ± 1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		TITLE: PIVOT SIDE, R.H. S/W SCALE: 1 = 2 DATE: MAY 15, 1989	



PART NUMBER: 00-0127  
 MAT'L.: BAR: FLAT, 3/8" X 7" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00628AA  
 EST. WT.: 3.58 LBS.

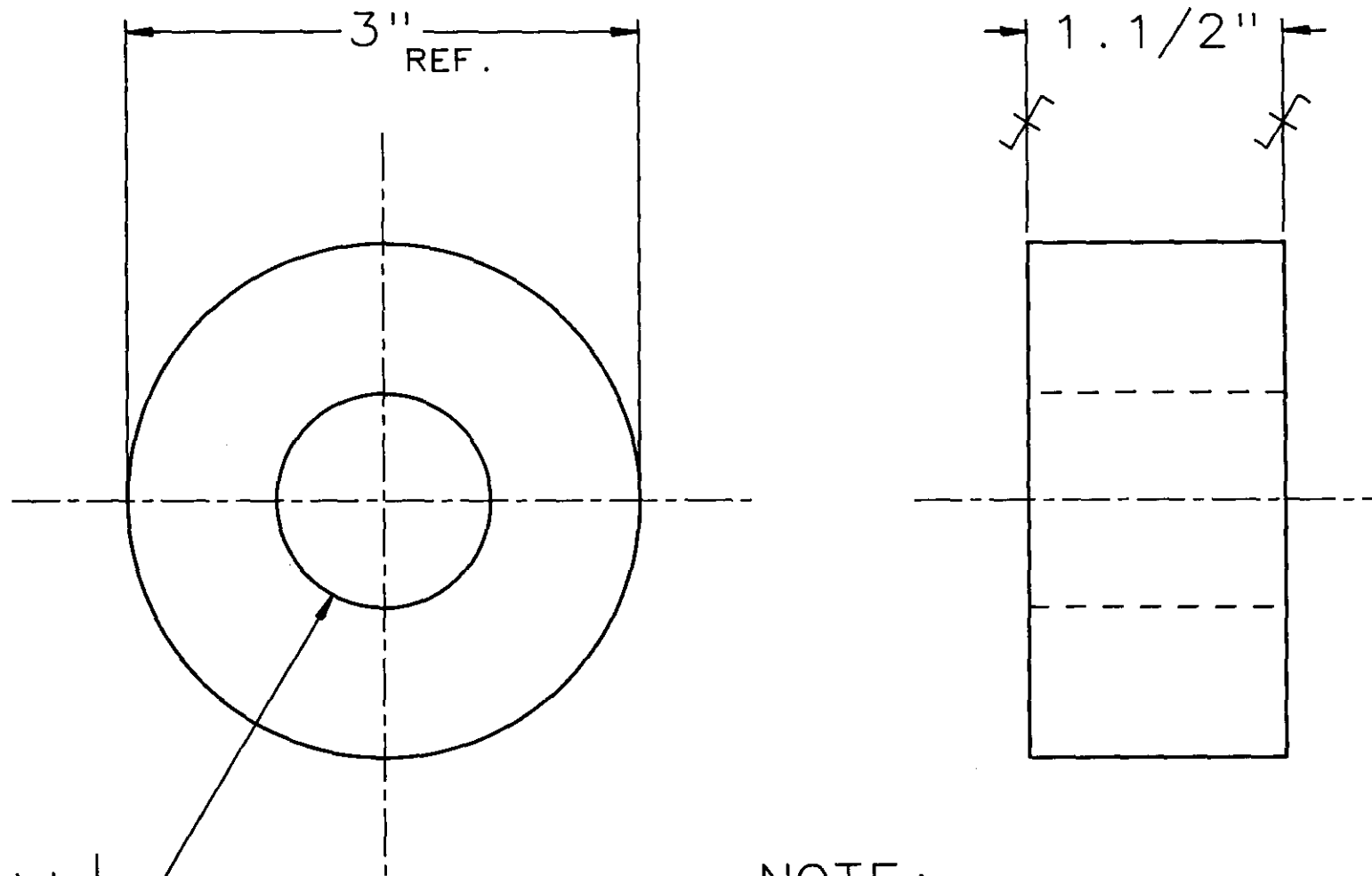
STD. TOLERANCES		DRAWN: R. GREENLAW		MICHIGAN DNR FOREST MANAGEMENT DIVISION	
FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16		CHECKED: KDB			
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005		APPROVED:			
ANGULAR: ±1 DEG		NO.	BY	DATE	REVISION
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653					
TITLE: PIVOT SIDE			SCALE: 1 = 2	DATE: MAY 10, 1989	PROJECT NO.: 84-19
					DWG. NO. 00-0127B



1.7/32" DIA. DRILL  
1.1/4" DIA. REAM

PART NUMBER: 00-0346  
 MAT'L.: BAR, RND., 3" DIA. C.D.  
 RYCASE / LEAD  
 UNS G11170Pb  
 F.F.E.S. SPEC. NO.: AC-00300AF  
 EST. WT.: 4.13 LBS.

STD. TOLERANCES				DRAWN: R. GREENLAW		MICHIGAN DNR FOREST MANAGEMENT DIVISION
FRACTIONAL: 8 TO 8 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB		
DECIMAL:      ANGULAR: 1 PLACE ±0.1      ±1 DEG 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:		
NO.	BY	DATE	REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN 48653						
TITLE: BOSS, 3" O.D. X 1.1/4" I.D.				SCALE: FULL	DATE: MAY 11, 1989	PROJECT NO.: 84-19 DWG. NO. 00-0346B

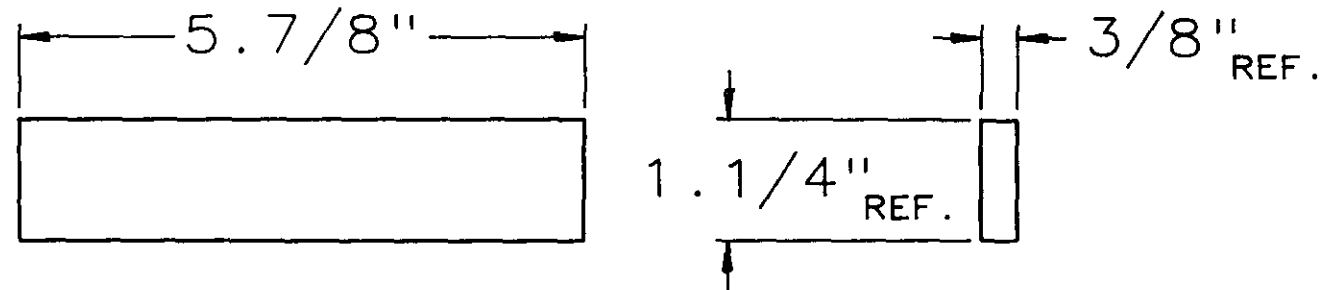


1.7/32" DIA. DRILL  
 1.1/4" DIA. REAM

NOTE:  
 BREAK ALL  
 SHARP EDGES.

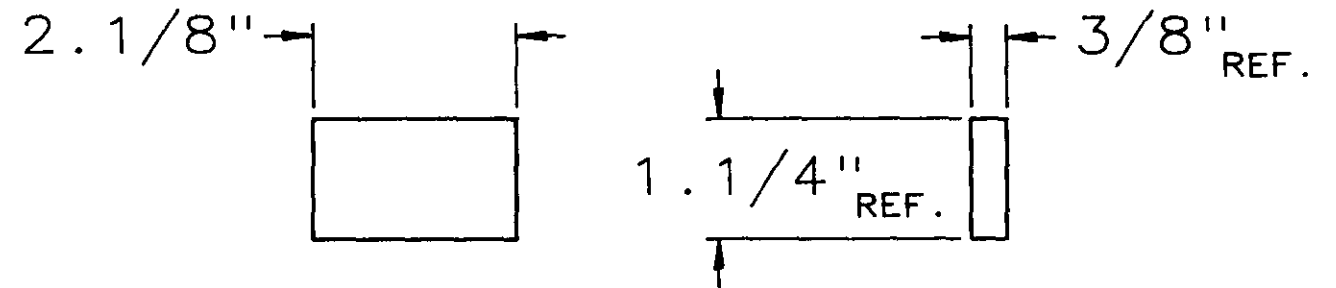
PART NUMBER: 00-0347  
 MAT'L.: BAR, RND., 3" DIA. C.D.  
 RYCASE / LEAD  
 UNS G11170Pb  
 F.F.E.S. SPEC. NO.: AC-00300AF  
 EST. WT.: 2.48 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN          DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
NO. BY DATE REVISION	<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		
TITLE: BOSS, 3" O.D. X 1.1/4" I.D.		SCALE: FULL	DATE: MAY 11, 1989
			DWG. NO. 00-0347B



PART NUMBER: 00-0350  
 MAT'L.: BAR: FLAT, 3/8" X 1 1/4" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00605AA  
 EST. WT.: 0.78 LBS.

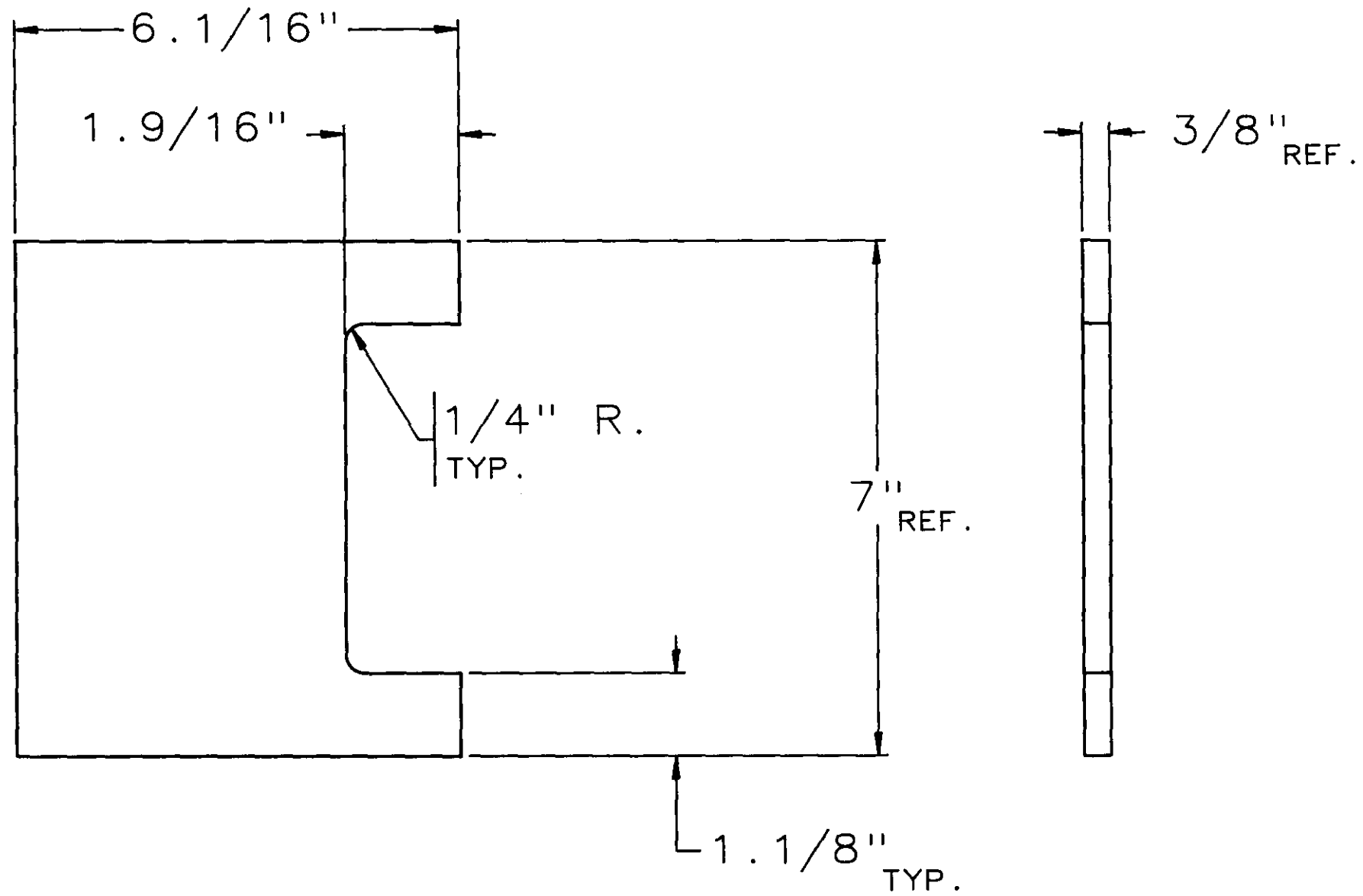
STD. TOLERANCES				DRAWN: R. GREENLAW		MICHIGAN DNR FOREST MANAGEMENT DIVISION
FRACTIONAL: 0 TO 6 IN. ±1/32 OVER 6" ±1/16				CHECKED: KDB		
DECIMAL:      ANGULAR: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:		
NO.	BY	DATE	REVISION			
FOREST FIRE EXPERIMENT STATION P.O. BOX 68      ROSCOMMON, MICHIGAN      48653						
TITLE: BAR, FLAT, 3/8" X 1 1/4" H. R.				SCALE: 1 = 2	DATE: MAY 12, 1989	PROJECT NO.: 84-19
						DWG. NO. 00-0350A



PART NUMBER: 00-0351  
 MAT'L.: BAR: FLAT, 3/8" X 1 1/4" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00605AA  
 EST. WT.: 0.28 LBS.

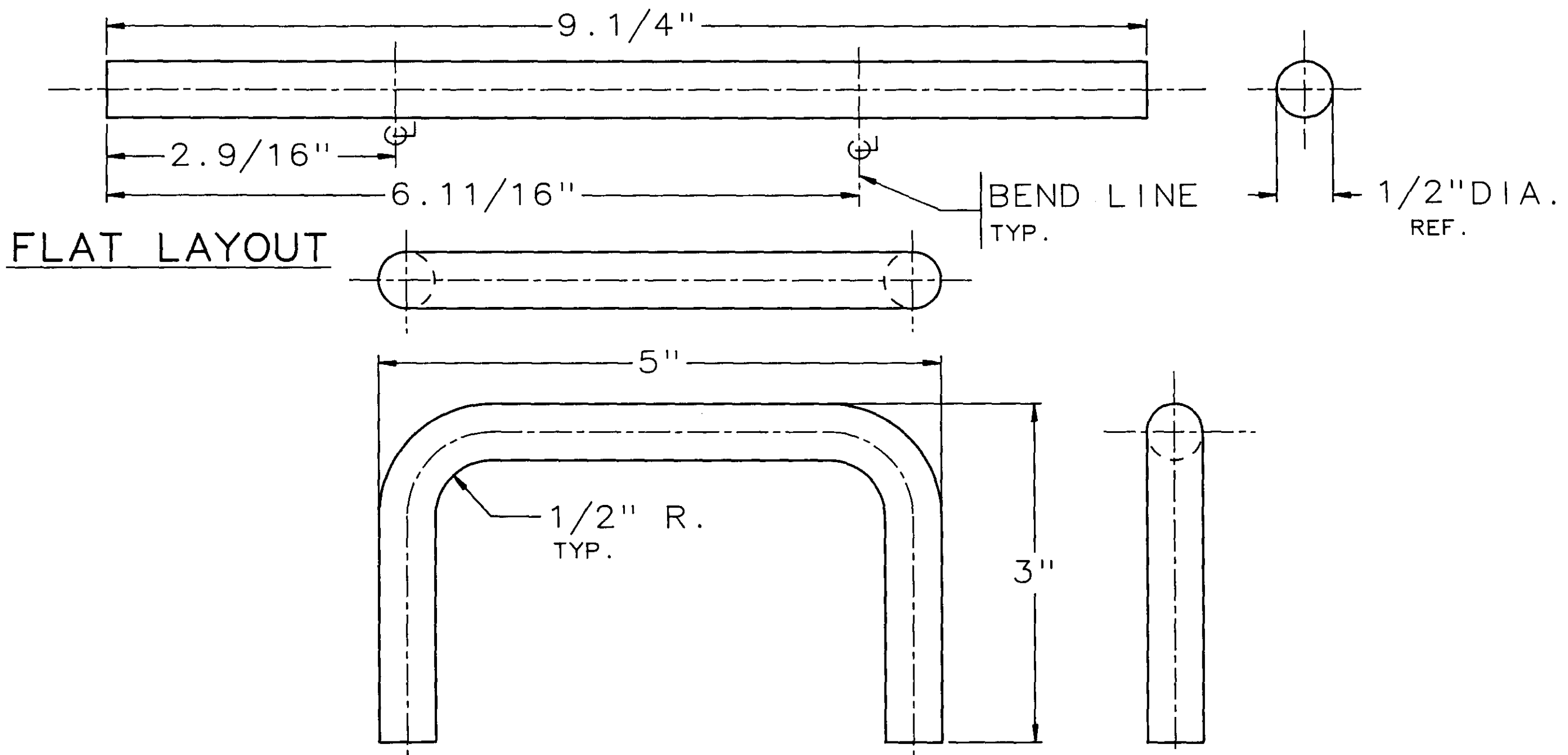
STD. TOLERANCES				DRAWN: R. GREENLAW		MICHIGAN DNR FOREST MANAGEMENT DIVISION
FRACTIONAL: 0 TO 5 IN ← 1/32 6 IN AND UP ← 1/16				CHECKED: KDB		
DECIMAL: 1 PLACE ← 0.1 2 PLACE ← 0.01 3 PLACE ← 0.005		ANGULAR: ← 1 DEG		APPROVED:		
NO.	BY	DATE	REVISION			
FOREST FIRE EXPERIMENT STATION						PROJECT NO.: 84-19
P.O. BOX 68      ROSCOMMON, MICHIGAN    48653						
TITLE: BAR, FLAT, 3/8" X 1 1/4" H. R.				SCALE: 1 = 2	DATE: MAY 12, 1989	DWG. NO. 00-0351A





PART NUMBER: 00-0126  
 MAT'L.: BAR: FLAT, 3/8" X 7" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00628AA  
 EST. WT.: 3.74 LBS.

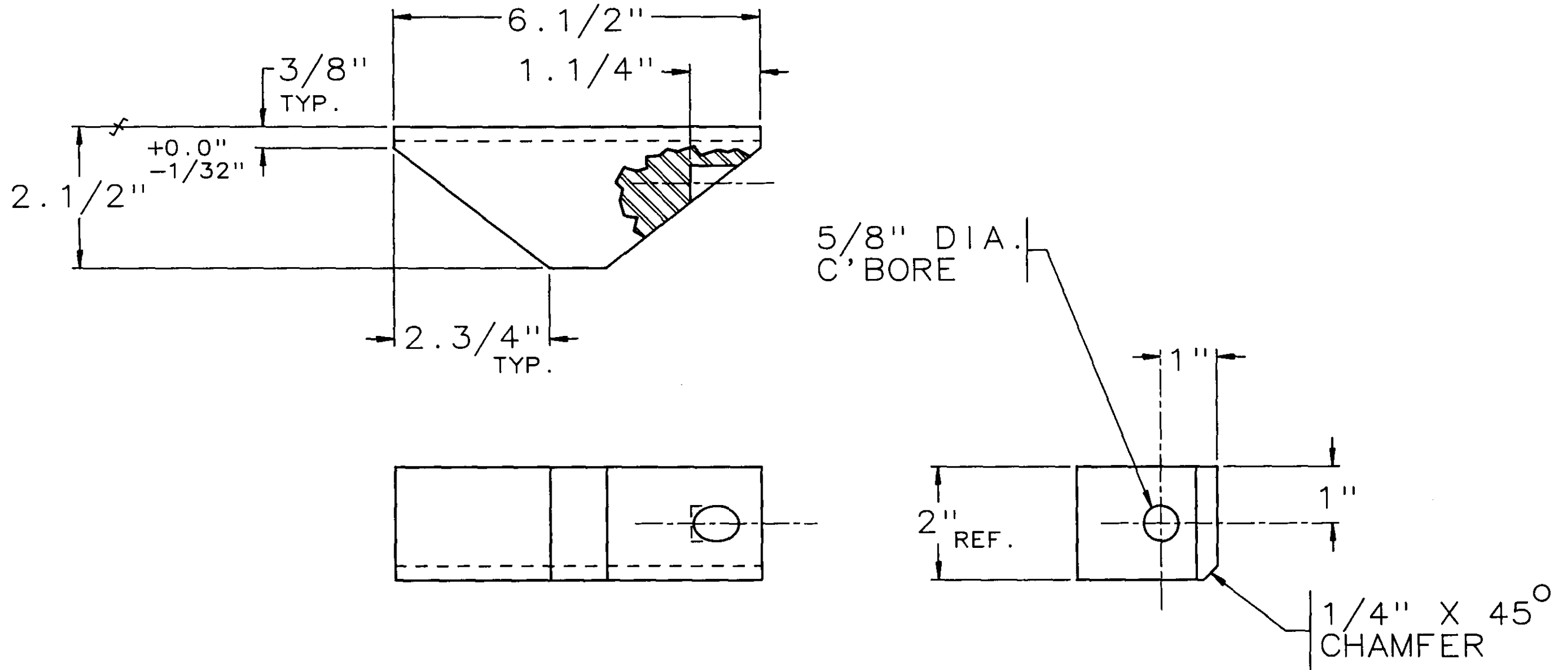
<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION
NO. BY DATE REVISION		PROJECT NO.: 84-19	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			DWG. NO.: 00-0126B
TITLE: <b>PIVOT BOTTOM</b>		SCALE: 1 = 2	DATE: MAY 10, 1989



PART NUMBER: 00-0342  
 MAT'L.: BAR: RND., 1/2" DIA. H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AC-00050AA  
 EST. WT.: .51 LBS.

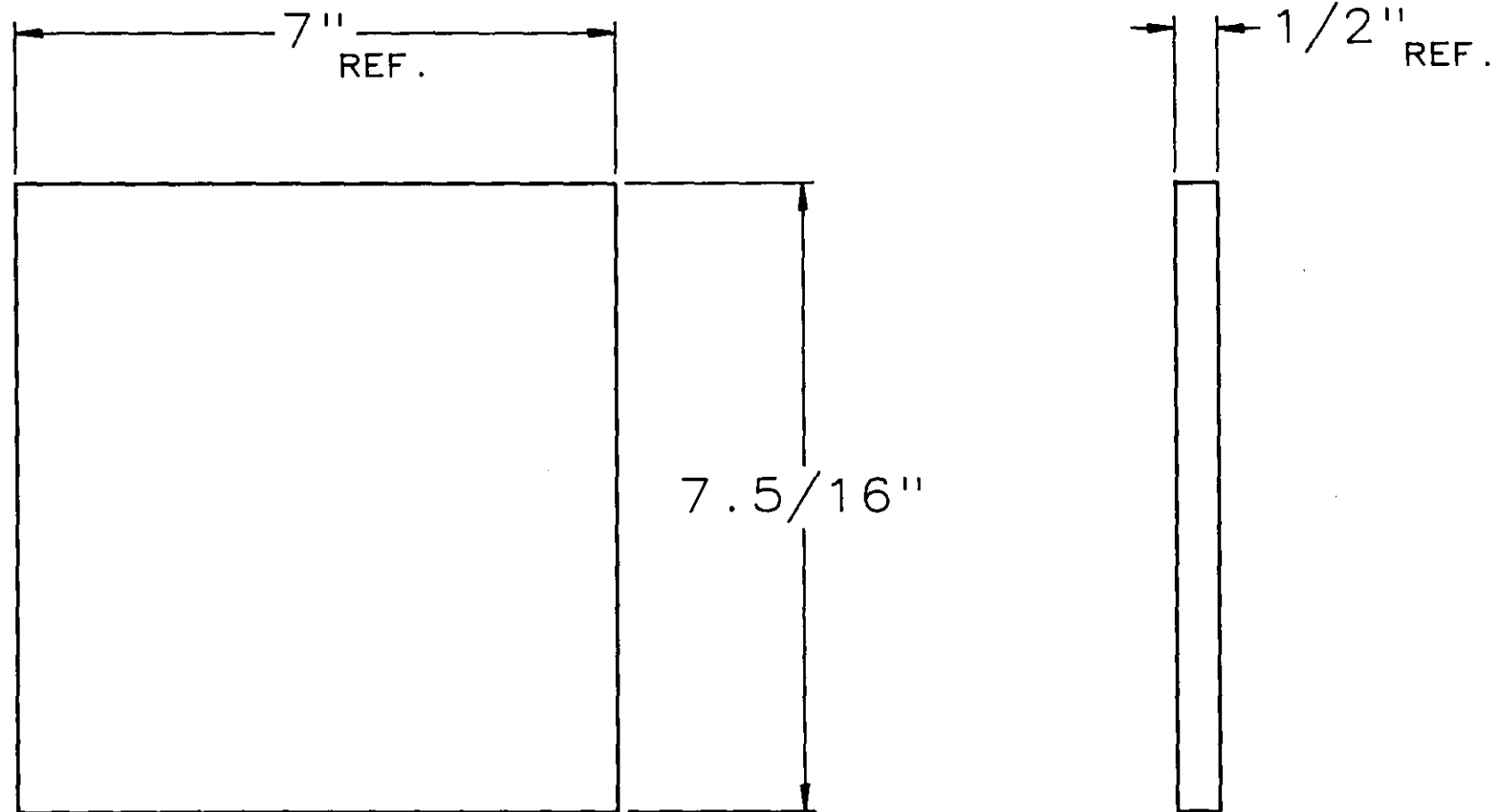
<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 8 IN ±1/32 8 IN AND UP ±1/16 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION
NO.	BY	DATE	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			PROJECT NO.: 84-19
TITLE: HOSE GUIDE		SCALE: FULL	DATE: MAY01, 1989
			DWG. NO. 00-0342B





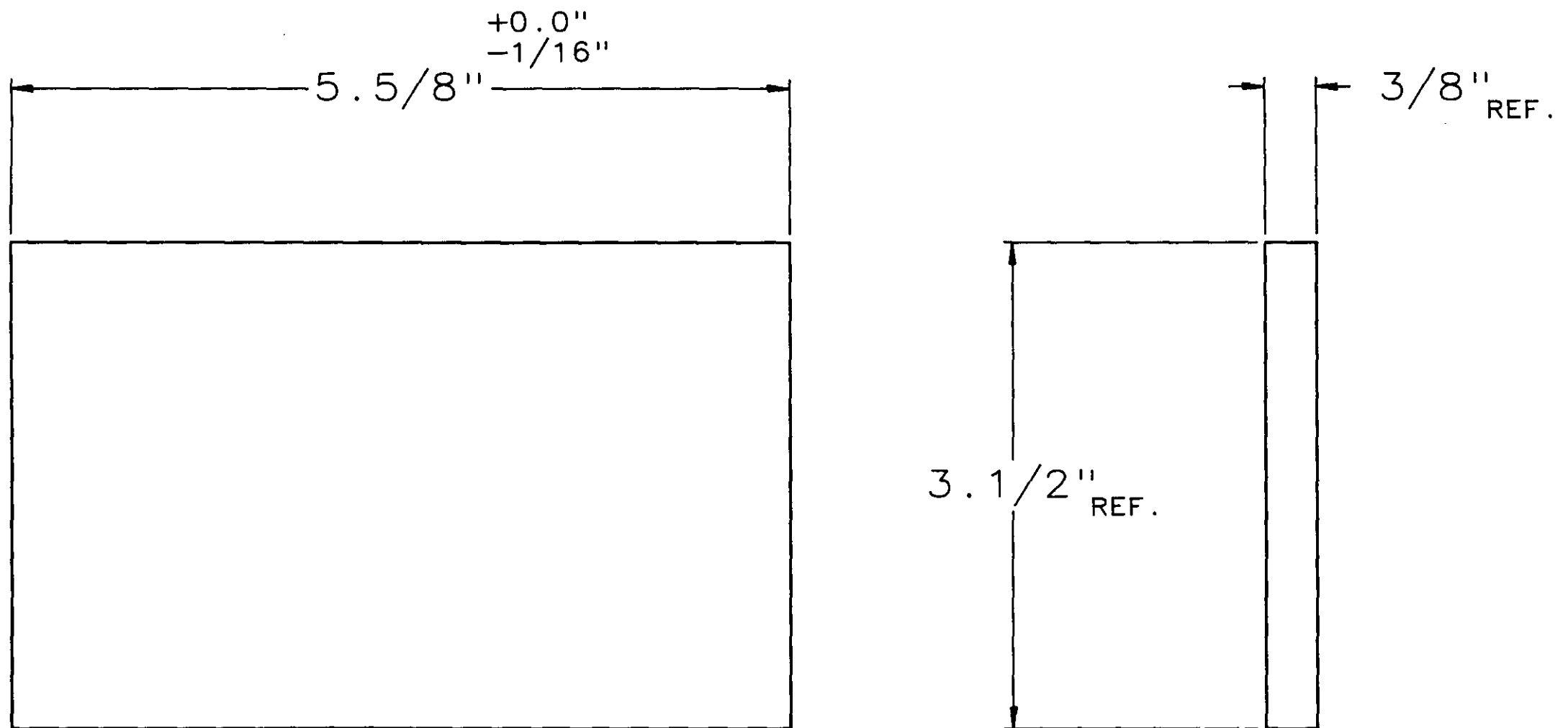
PART NUMBER: 00-0345  
 MAT'L.: BAR: FLAT, 2" X 2 1/2" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-03210AA  
 EST. WT.: 5.81 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
NO.	BY	DATE	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			PROJECT NO.: 84-19
TITLE: LOWER VERTICAL PIN MOUNT		SCALE: 1 = 2	DATE: MAY 10, 1989
			DWG. NO. 00-0345B



PART NUMBER: 00-0349  
 MAT'L.: BAR: FLAT, 1/2" X 7" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00828AA  
 EST. WT.: 7.25 LBS.

STD. TOLERANCES				DRAWN: R. GREENLAW	
FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB	
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005		ANGULAR: ±1 DEG		APPROVED:	
NO.	BY	DATE	REVISION		
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN 48653					
TITLE: BAR, FLAT, 1/2" X 7" H.R.				SCALE: 1 = 2	DATE: MAY 11, 1989
				PROJECT NO.: 84-19	
				MICHIGAN DNR FOREST MANAGEMENT DIVISION DWG. NO. 00-0349B	

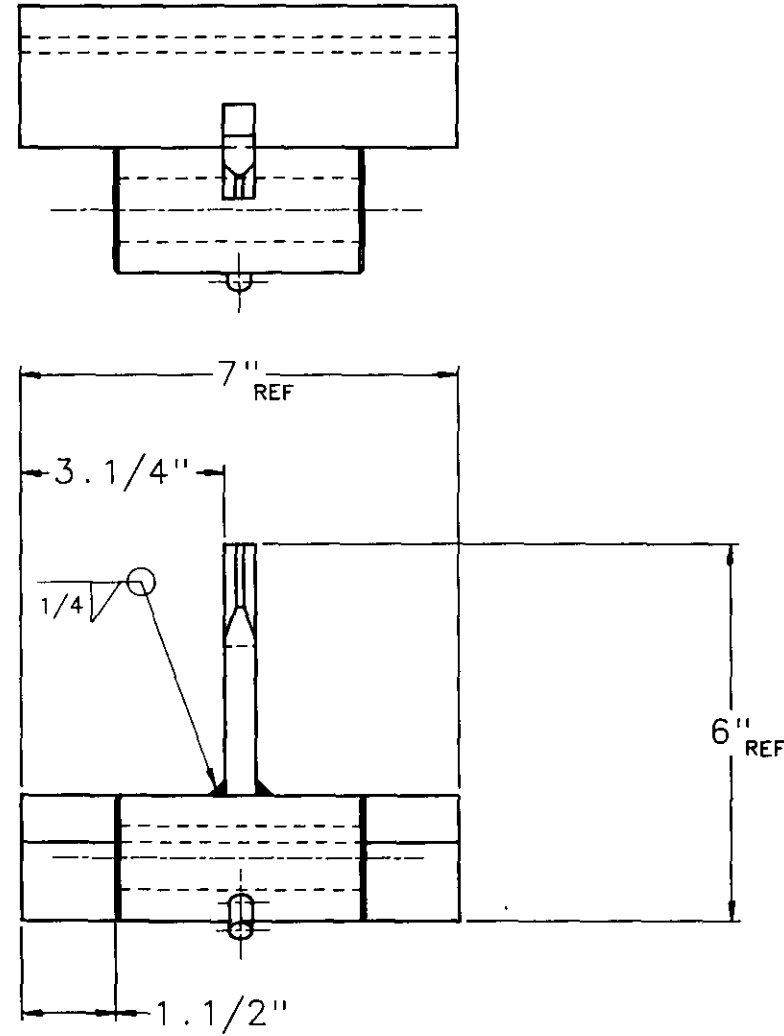
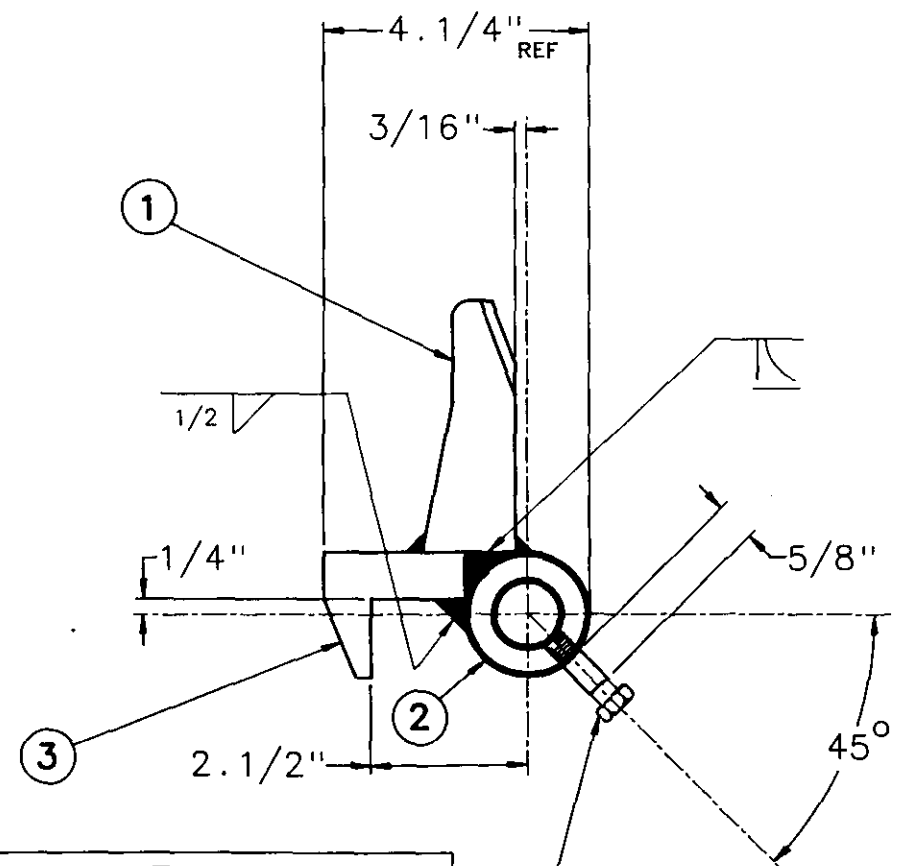


PART NUMBER: 00-0352  
 MAT'L.: BAR: FLAT, 3/8" X 3 1/2" HR  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00614AA  
 EST WT.: 2.09 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB		
DECIMAL:      ANGULAR: 1 PLACE ±0.1      ±1 DEG 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:		
NO.	BY	DATE	REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b>						
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653						
TITLE: BAR, FLAT, 3/8" X 3 1/2" H. R.				SCALE: FULL	DATE: MAY 12, 1989	PROJECT NO.: 84-19
						DWG. NO. 00-0352B

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0421	B	HANDLE	1	0.55
2	00-0422	B	HINGE	1	2.60
3	00-0423	B	CLAW	1	4.59
4	00-0424	A	STOP	1	0.06

**NOTE!**  
USE WELDING FIXTURE  
PART NUMBER, 18-0034.



**NOTE!**  
APPLY # 242 "LOCTITE"  
THREAD TIGHT AGAINST  
THREAD SHOULDER, CUT  
OFF TO DIMENSION SHOWN.

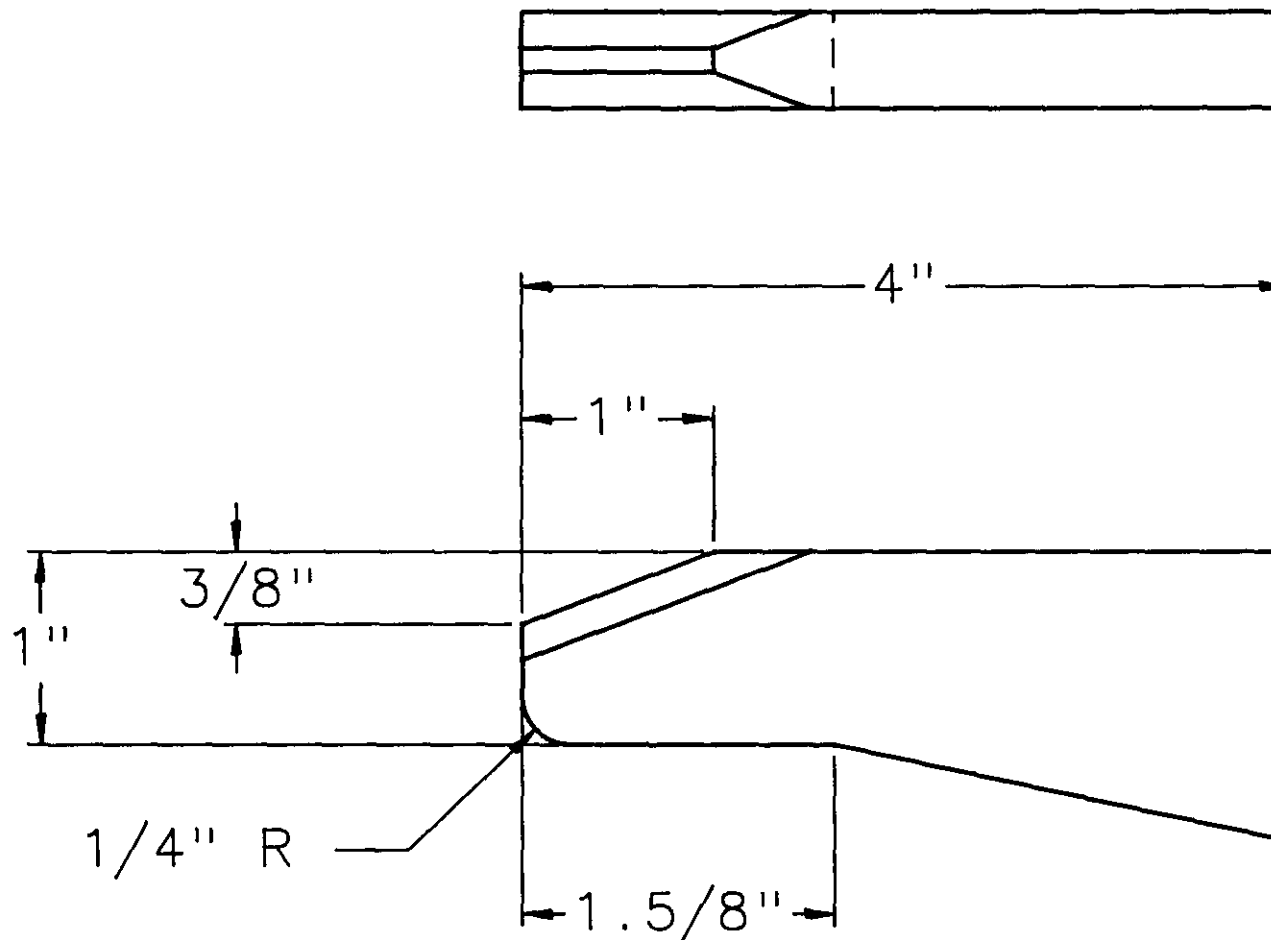
PART NUMBER: 20-0000  
EST. WT.: 8.19 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 8 IN. ±1/32 8 TO 1/2 IN. ±1/64 1/2 IN. AND UP ±1/32 DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 ANGULAR: ±1.00		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		SCALE: 1 = 2 DATE: OCT. 30, 1988 DWG. NO. 20-0000C	

3/16" X 45° CHAM.  
TYP

1.1/2" REF

1/2" REF



**NOTE!**  
BREAK ALL  
SHARP EDGES.

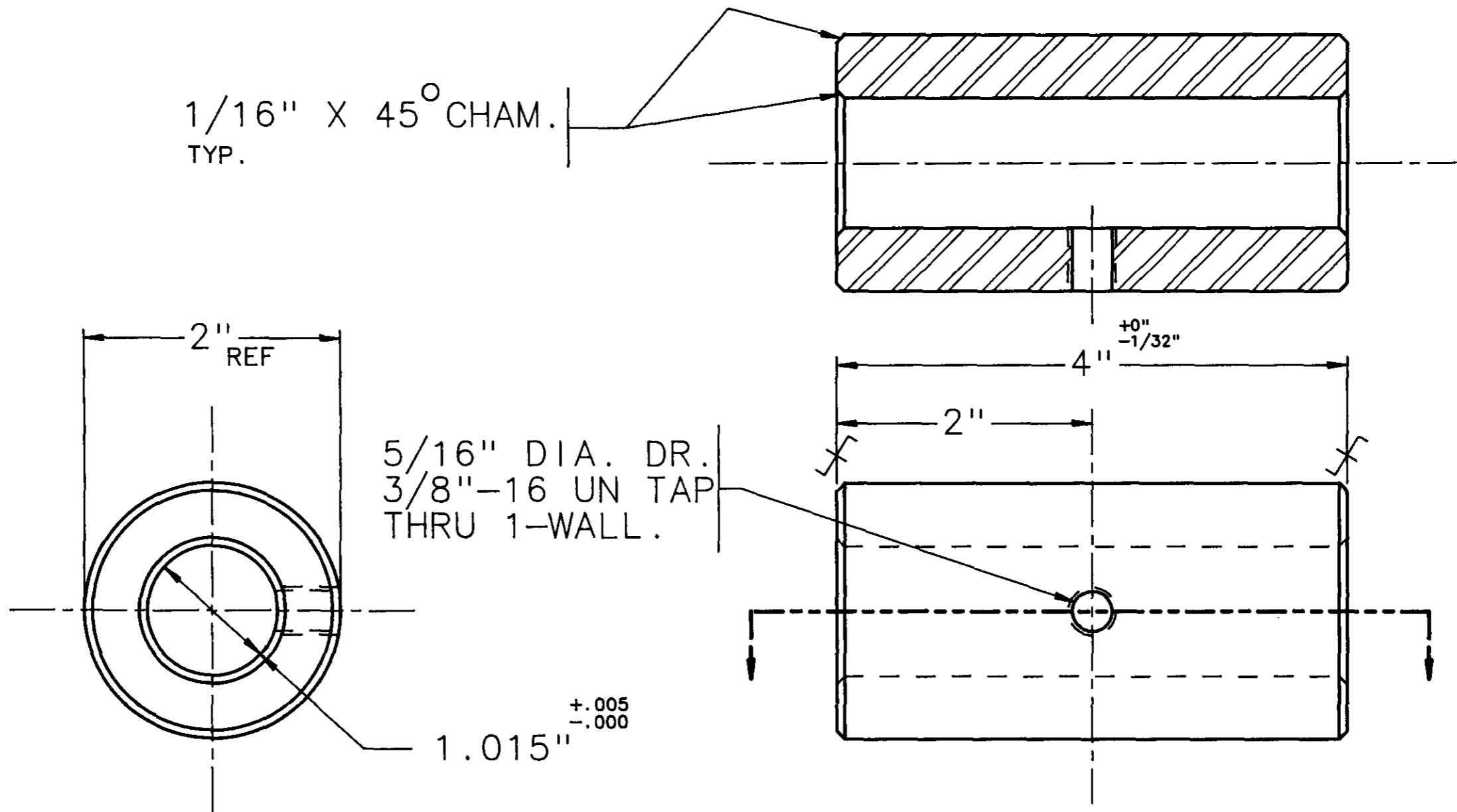
PART NUMBER: 00-0421  
MAT'L.: BAR, FLAT, 1/2" X 1.1/2" HR  
UNS G10200  
F.F.E.S. SPEC. NO.: AB-00806AA  
EST. WT.: 0.55 LBS.

<b>STD. TOLERANCES</b>		DRAWN: R. GREENLAW	MICHIGAN DNR	
FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:
ANGULAR: ±1 DEG		FOREST MANAGEMENT DIVISION		
NO.	BY	DATE	REVISION	
TITLE: HANDLE: PLOW LATCH			PROJECT NO.: 84-19	
SCALE: FULL		DATE: OCT. 30, 1989	DWG. NO. 00-0421B	

FOREST FIRE EXPERIMENT STATION

P.O. BOX 68 ROSCOMMON, MICHIGAN 48653

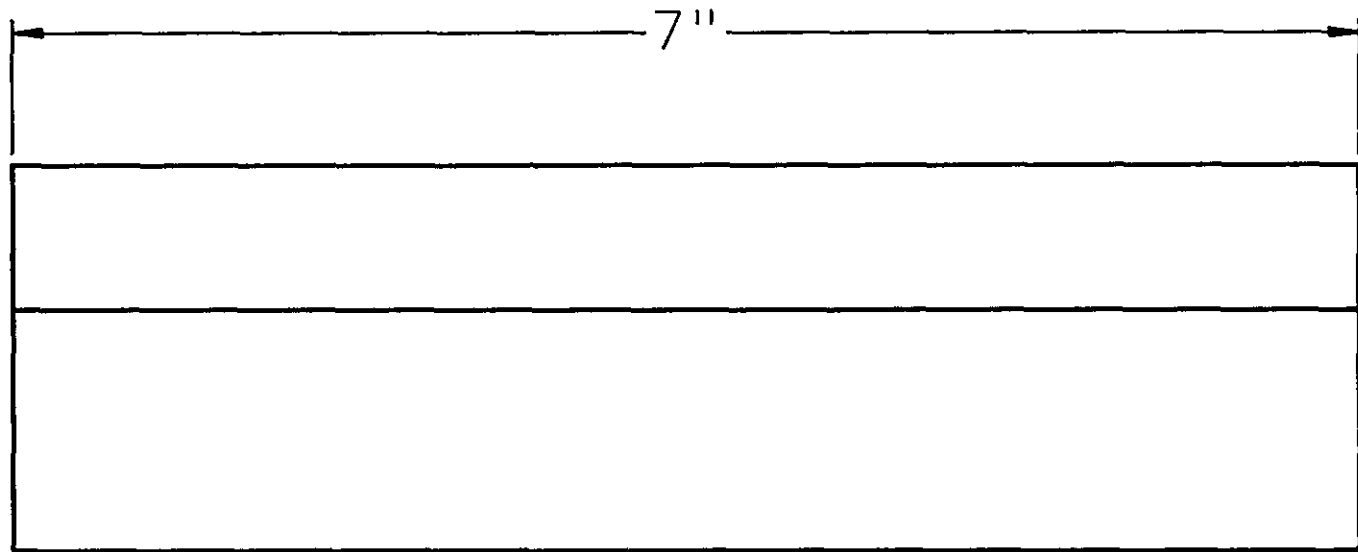
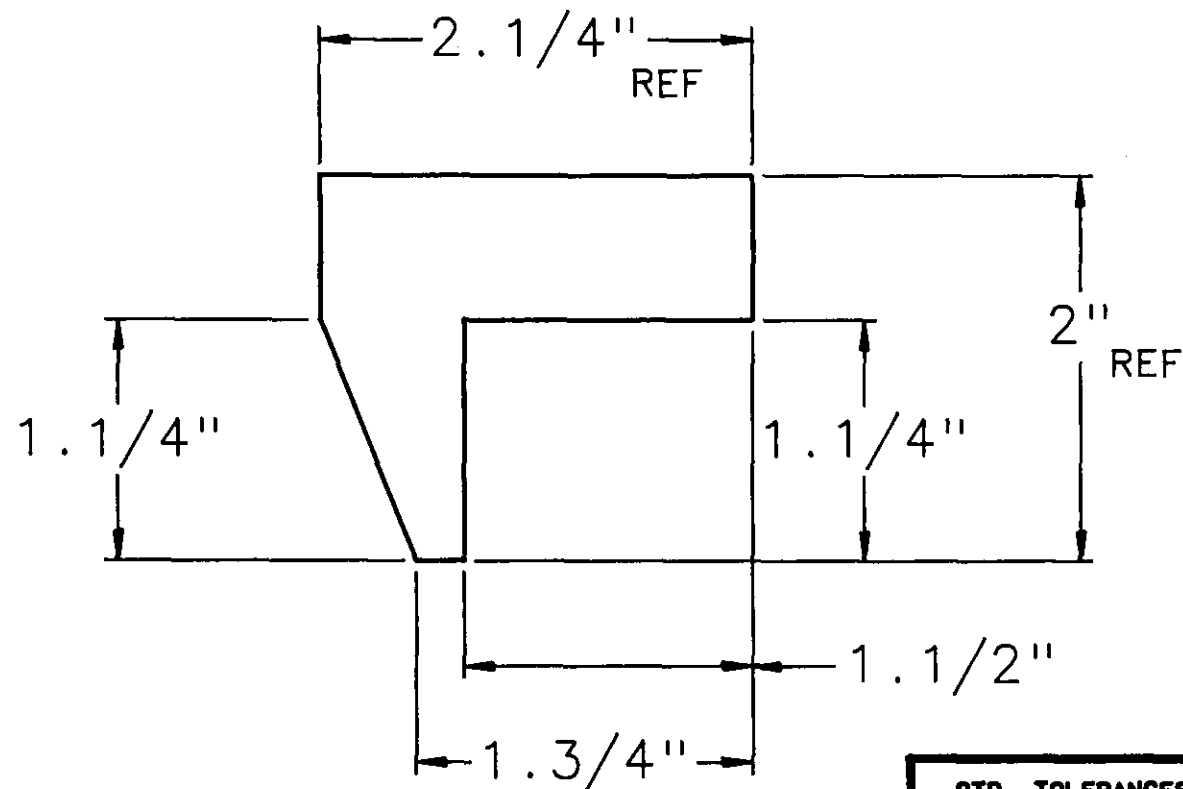
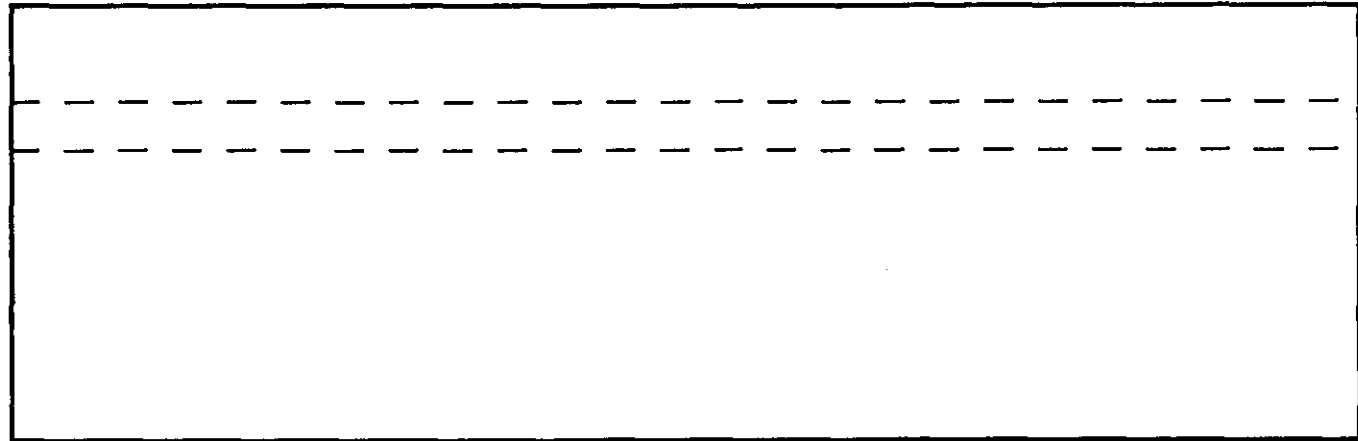




PART NUMBER: 00-0422  
 MAT'L.: BAR, RND, 2" O.D., C.D.  
 UNS G10180  
 F.F.E.S. SPEC. NO.: AC-00200AW  
 EST. WT.: 2.60 LBS.

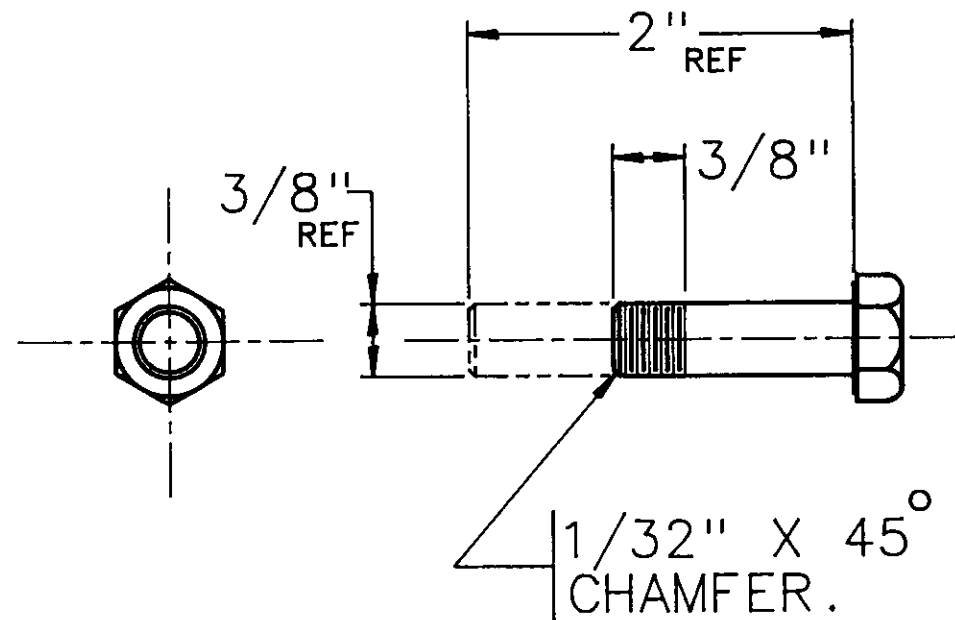
STD. TOLERANCES				DRAWN: R. GREENLAW		MICHIGAN DNR	
FRACTIONAL: 8 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:			
ANGULAR: ±1 DEG NO. BY DATE REVISION				FOREST FIRE EXPERIMENT STATION P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			
TITLE: HINGE: PLOW LATCH				SCALE: FULL	DATE: OCT. 30, 1989	PROJECT NO.: 84-19	
						DWG. NO. 00-0422B	

**NOTE!**  
BREAK ALL  
SHARP EDGES.



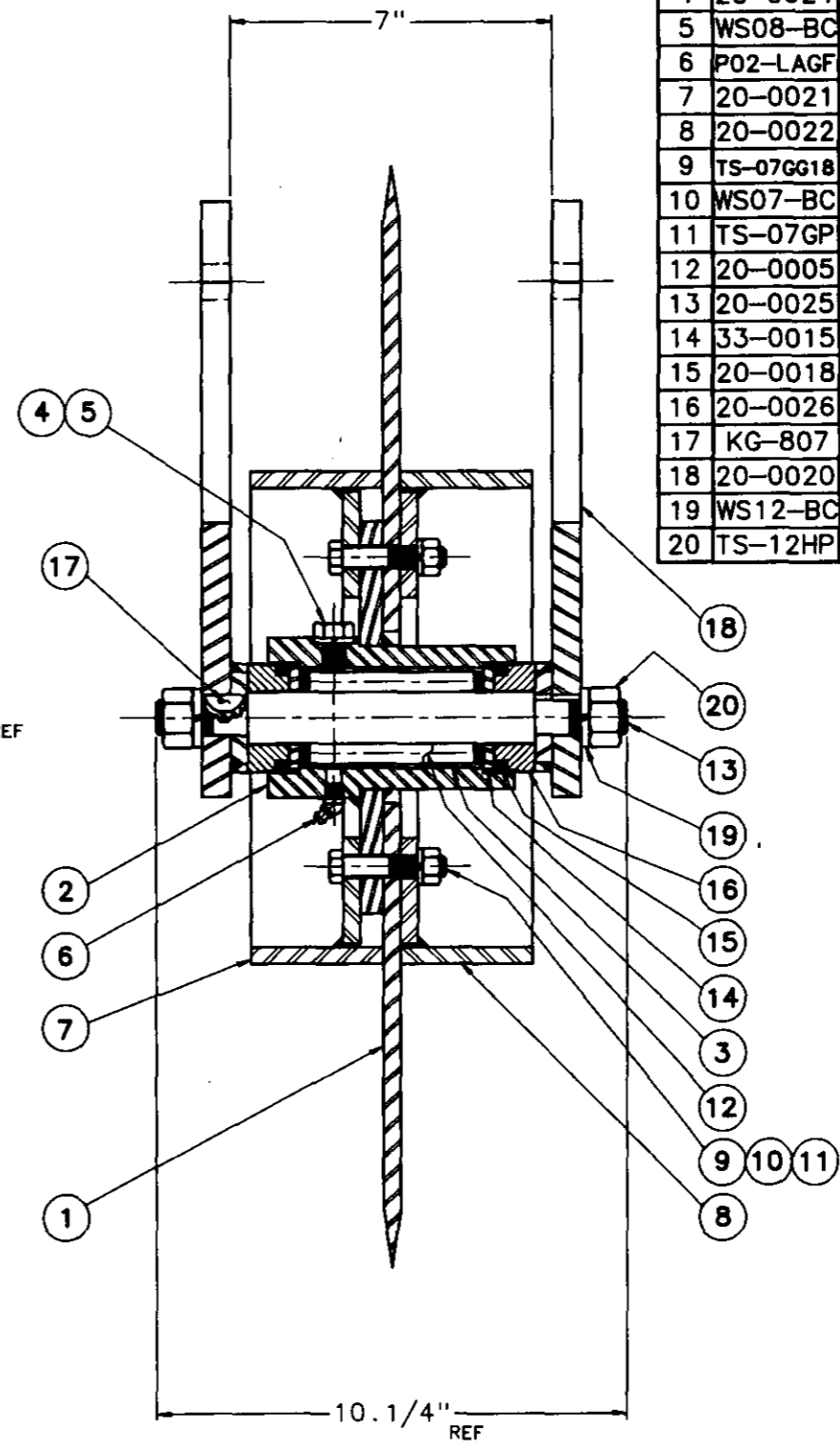
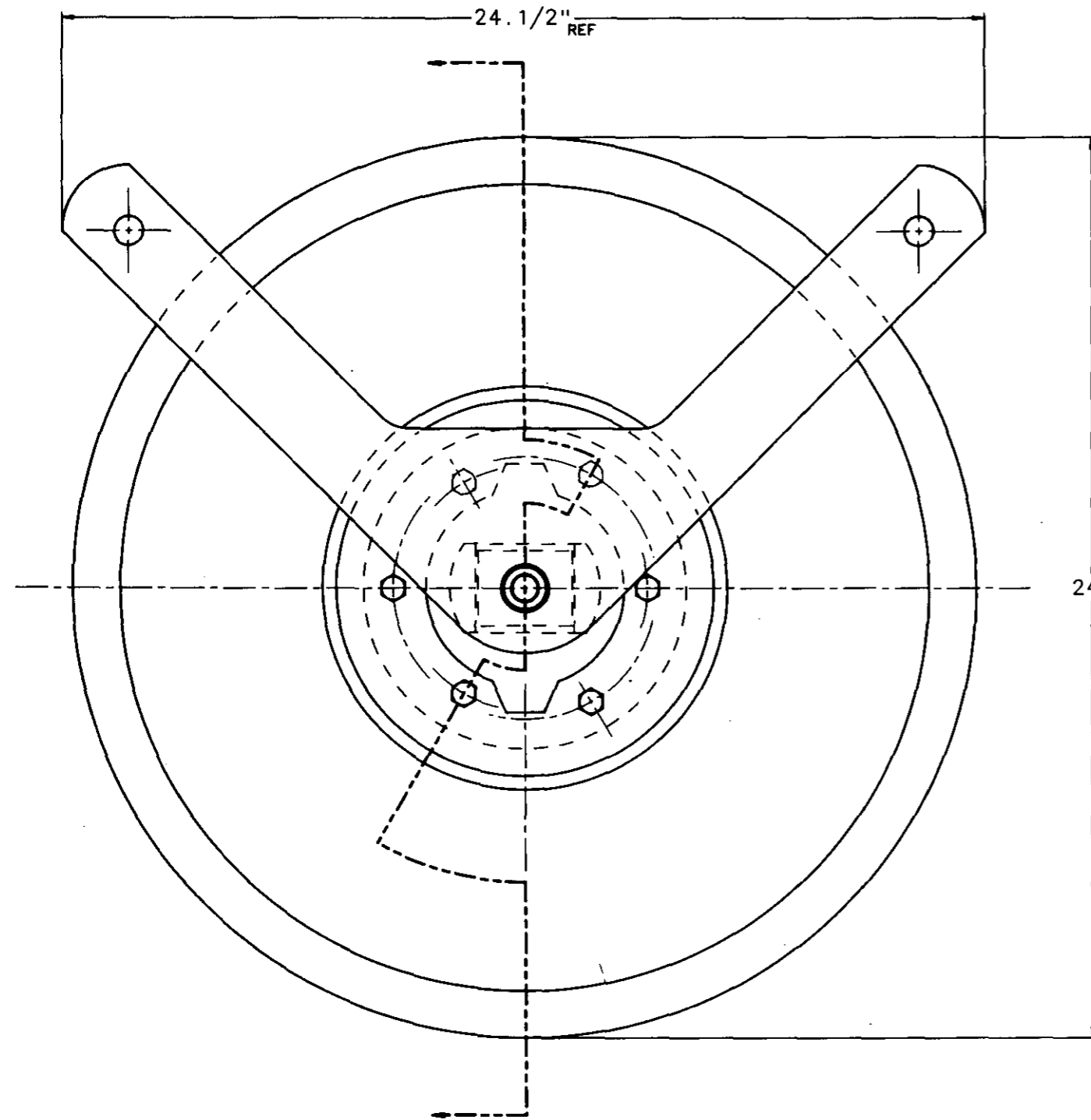
PART NUMBER: 00-0423  
MAT'L.: BAR, FLAT, 2" X 2.1/4" H.R.  
UNS G10200  
F.F.E.S. SPEC. NO.: AB-03209AA  
EST. WT.: 4.59 LBS.

<b>STD. TOLERANCES</b>		DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION	
FRACTIONAL: 6 TO 8 IN ±1/32 6 IN AND UP ±1/16		CHECKED: KDB			
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005		APPROVED:			
ANGULAR: ±1 DEG		NO.	BY	DATE	REVISION
<b>FOREST FIRE EXPERIMENT STATION</b>					
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653					
TITLE: CLAW: PLOW LATCH			SCALE: FULL	DATE: OCT. 30, 1989	PROJECT NO.: 84-19 DWG. NO. 00-0423B



PART NUMBER: 00-0424  
 MAT'L.: PRODUCE FROM  
 P/N TS-06GF16  
 3/8" UNC X 2" LONG  
 HEX. HD. CAP SCREW  
 PLATED  
 EST. WT.: 0.06 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 6 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION	
NO. BY DATE REVISION	<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			
<b>TITLE: STOP: PLOW LATCH</b>		SCALE: <b>FULL</b>	DATE: <b>OCT. 30, 1989</b>	PROJECT NO.: <b>84-19</b> DWG. NO. <b>00-0424A</b>

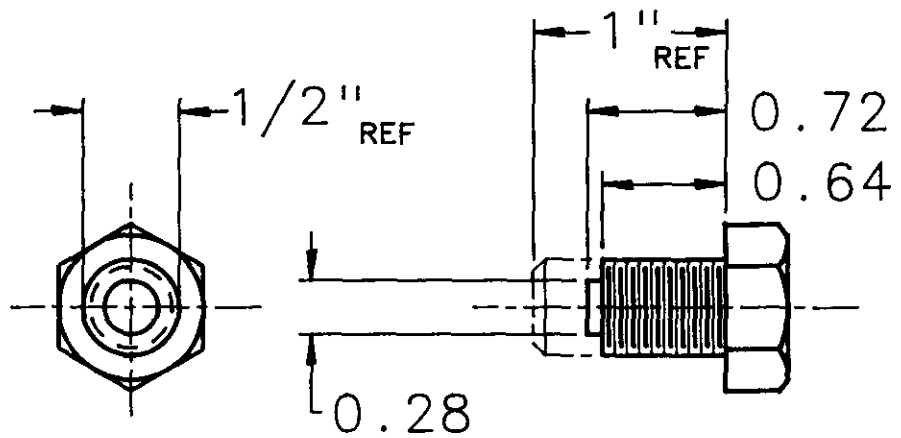


ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	20-0028		BLADE, COULTER, 24" O.D.	1	42.0
2	20-0023	C	HUB W/C	1	13.6
3	20-0027	B	BEARING RACE (MODIFIED)	1	0.63
4	20-0024	A	BEARING RACE RETAINER	1	0.06
5	WS08-BC		WASHER, LOCK: 1/2" PLATED STEEL	1	0.02
6	PO2-LAGF		GREASE FTNG.: 1/8" X 45°	1	0.01
7	20-0021	C	DEPTH CONTROL FLANGE, L.H. W/C	1	15.5
8	20-0022	C	DEPTH CONTROL FLANGE, R.H. W/C	1	15.5
9	TS-07GG18		CAPSCREW: 7/16" - 14UN X 2.1/4" LONG HEX. HEAD, GRADE 5, PLATED	6	0.11
10	WS07-BC		WASHER, LOCK: 7/16" PLATED STEEL	6	0.01
11	TS-07GP		NUT, HEX.: 7/16" - 14 UN GRADE 5, PLATED	6	0.03
12	20-0005	B	BEARING, ROLLER LEDS OUTER RACE	1	1.52
13	20-0025	B	SHAFT, COULTER	1	2.21
14	33-0015	B	WASHER, HARDENED STEEL	2	0.18
15	20-0018	A	SEAL, FELT, 3/8" SQUARE	2	0.02
16	20-0026	B	BEARING BLOCK	2	1.25
17	KG-807		KEY, WOODRUFF: 1/4" X 7/8" # 807	1	0.01
18	20-0020	C	COULTER ARM W/C: 52" PLOW	2	16.6
19	WS12-BC		WASHER, LOCK: 3/4" PLATED STEEL	2	0.05
20	TS-12HP		NUT, HEX.: 3/4" - 16 UN GRADE 5, PLATED	2	0.11

PART NUMBER: 20-0019  
EST. WT.: 128 LBS.

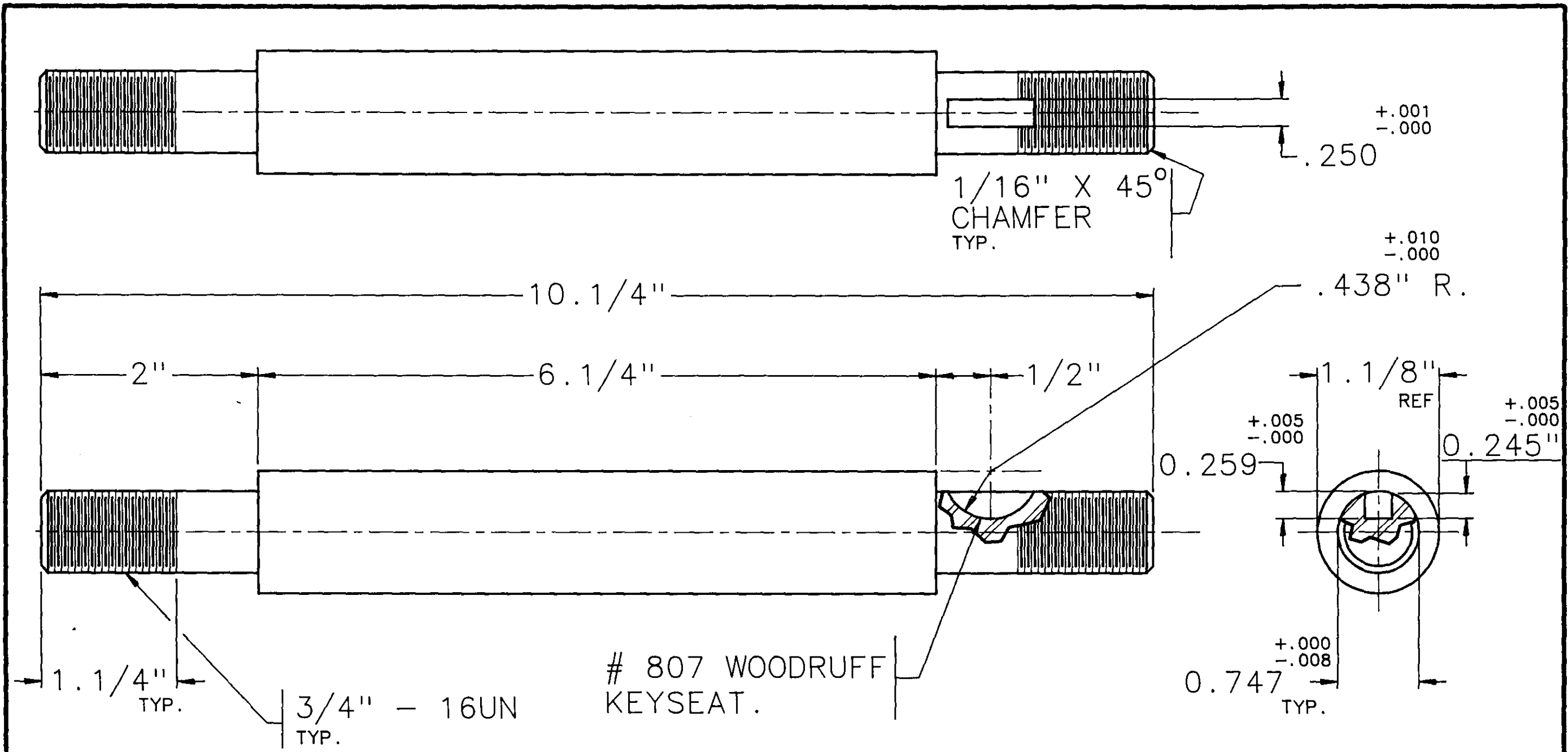
STD. TOLERANCES						DRAWN:	
FRAC TION:						CHECKED:	
DISTANCE:						APPROVED:	
SCALE:							
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 49853							<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION
TITLE: COULTER ASSEMBLY: 52" PLOW							PROJECT NO.: 84-19 DWG NO: 20-0019D
SCALE: 1 = 2							DATE: MAY 09, 1990





PART NUMBER: 20-0024  
 MAT'L.: MAKE FROM SCREW, CAP  
 HEX. HD. 1/2" - 13UN X  
 1" LONG  
 P/N: TS-08EG08  
 EST. WT.: 0.06 LBS.

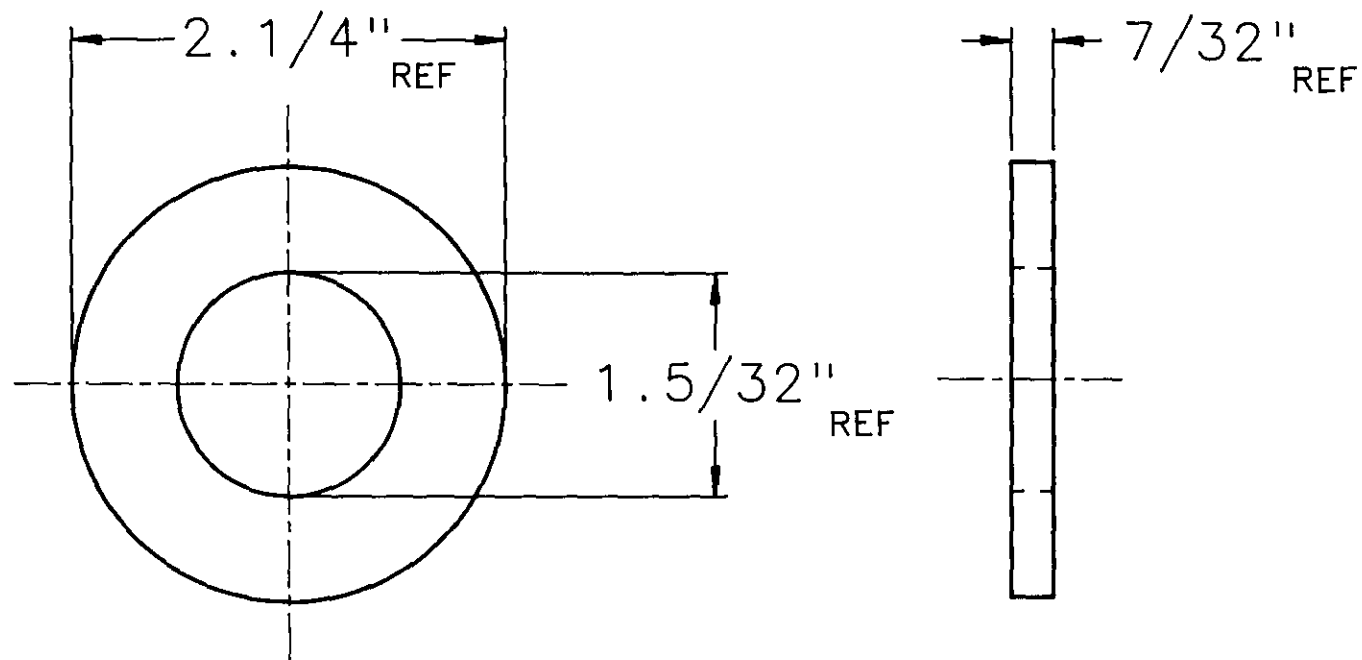
<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 8 TO 6 IN $\pm$ 1/32 6 IN AND UP $\pm$ 1/16 <b>DECIMAL:</b> 1 PLACE $\pm$ 0.1 2 PLACE $\pm$ 0.01 3 PLACE $\pm$ 0.005 <b>ANGULAR:</b> $\pm$ 1 DEG						DRAWN: <b>R. GREENLAW</b>	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
						CHECKED: <b>KDB</b>	
						APPROVED:	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							PROJECT NO.: 84-19
TITLE: <b>BEARING RACE RETAINER</b>					SCALE: <b>FULL</b>	DATE: <b>MAY 23, 1990</b>	DWG. NO. <b>20-0024A</b>



PART NUMBER: 20-0025  
 MAT'L.: BAR, RND., 1.1/8" DIA.  
 COLD FINISHED ALLOY  
 TURNED, GROUND & POLISHED  
 UNS G41420  
 F.F.E.S. SPEC. NO.: AC-00112BJ  
 EST. WT.: 2.21 LBS.

# 807 WOODRUFF  
 KEYSEAT.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN +-1/32 6 IN AND UP +-1/16 DECIMAL: 1 PLACE +-0.1 2 PLACE +-0.01 3 PLACE +-0.005 ANGULAR: +-1 DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
FOREST FIRE EXPERIMENT STATION P.O. BOX 68      ROSCOMMON, MICHIGAN      48653		TITLE: <b>SHAFT, COULTER: 40" &amp; 52" PLOW</b> SCALE: <b>FULL</b> DATE: <b>MAY 23, 1990</b>	



**WASHER**

TYPE: EXTRA THICK, FINISHED, HARDENED STEEL  
 NOMINAL BOLT SIZE: 1.1/8"  
 INSIDE DIA.: 1.5/32"  
 OUTSIDE DIA.: 2.1/4"  
 THICKNESS: 7/32"  
 FINISH: BLACK OXIDE  
 EST. WT: 0.18 LBS.

APPROVED MANUFACTURERS

PART NO.

APPROVED MANUFACTURERS

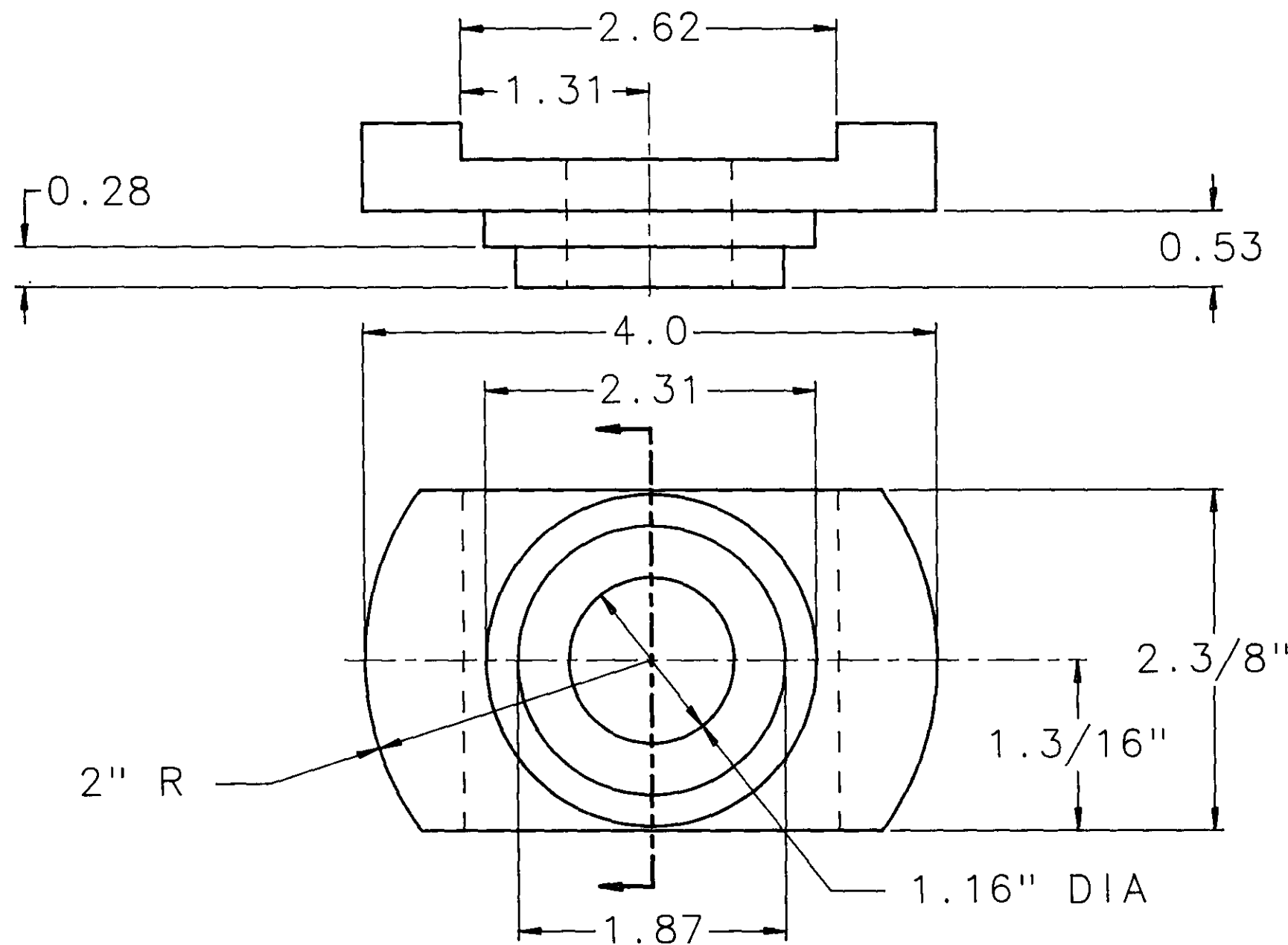
PART NO.

McMASTER-CARR SUPPLY CO.  
 P.O. BOX 4355  
 CHICAGO, ILLINOIS  
 60680-4355

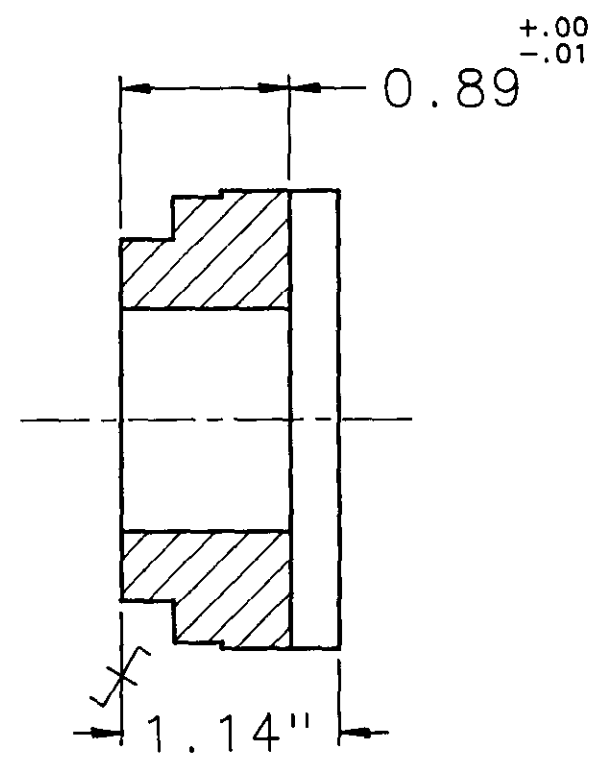
98029A039

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 8 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b> FOREST MANAGEMENT DIVISION	
NO. BY DATE REVISION	<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			
F.F.E.S. PART NO.: 33-0015		SCALE: <b>FULL</b>	DATE: <b>MAY 24, 1990</b>	PROJECT NO.: 84-19 DWG. NO. <b>33-0015B</b>
<b>TITLE: WASHER, HARDENED STEEL, FINISHED</b>		SCALE: <b>FULL</b>	DATE: <b>MAY 24, 1990</b>	DWG. NO. <b>33-0015B</b>



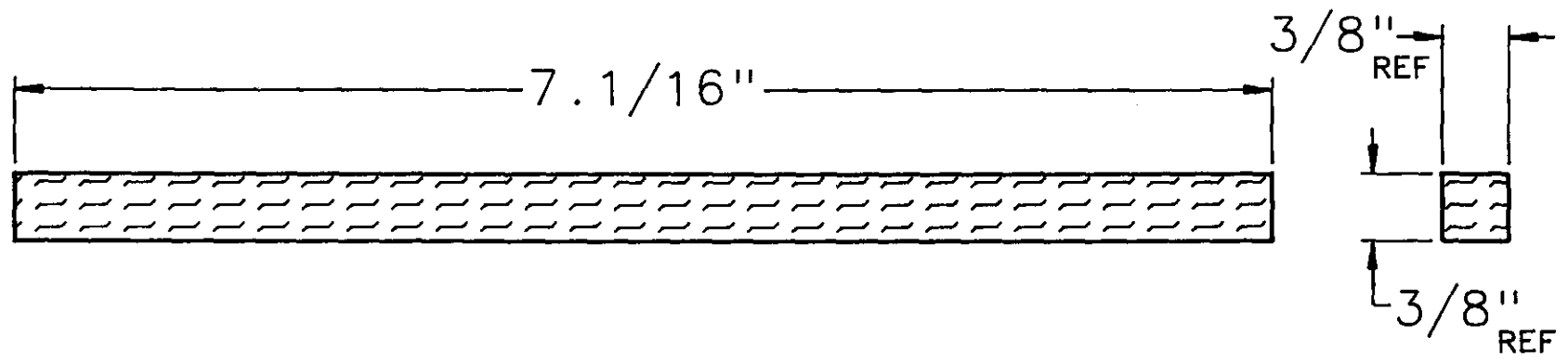


**NOTE!**  
BREAK ALL SHARP  
CORNERS.



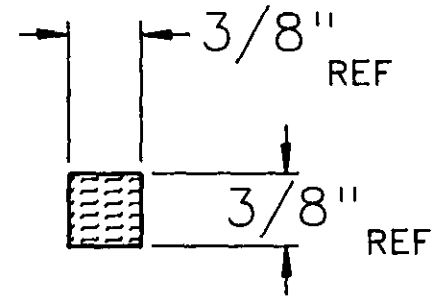
PART NUMBER: 20-0026  
 MAT'L.: BAR, RND., 5" DIA.  
 CONTINUOUS CAST GREY IRON  
 F.F.E.S. SPEC. NO.: AC-00500AV  
 EST. WT.: 1.25 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG				DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:		<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
NO. BY DATE REVISION		PROJECT NO.: 84-19				
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653					DWG. NO. <b>20-0026B</b>	
TITLE: <b>BEARING BLOCK, COULTER: 40" &amp; 52" PLOW</b>			SCALE: <b>FULL</b>	DATE: <b>MAY 23, 1990</b>		



PART NUMBER: 20-0018  
 MAT'L.: PRODUCE FROM F.F.E.S.  
 P/N 33-0016  
 EST. WT.: 0.02 LBS.

<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 8 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ <b>DECIMAL:</b> 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ <b>ANGULAR:</b> $\pm 1$ DEG						DRAWN: <b>R. GREENLAW</b>	<b>MICHIGAN          DNR</b>  <b>FOREST MANAGEMENT          DIVISION</b>
						CHECKED: <b>KDB</b>	
						APPROVED:	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							PROJECT NO.: 84-19
TITLE: <b>SEAL, FELT, 3/8" SQUARE</b>					SCALE: <b>FULL</b>	DATE: <b>JAN. 16, 1990</b>	DWG. NO. <b>20-0018A</b>



**FELT**

TYPE: OIL - GREASE SEAL  
 WIDTH: 3/8"  
 HEIGHT: 3/8"  
 MAT'L.: FELT COMPOUND  
 EST. WT.: 0.03 LBS. / FT.

APPROVED MANUFACTURERS

PART NO.

APPROVED MANUFACTURERS

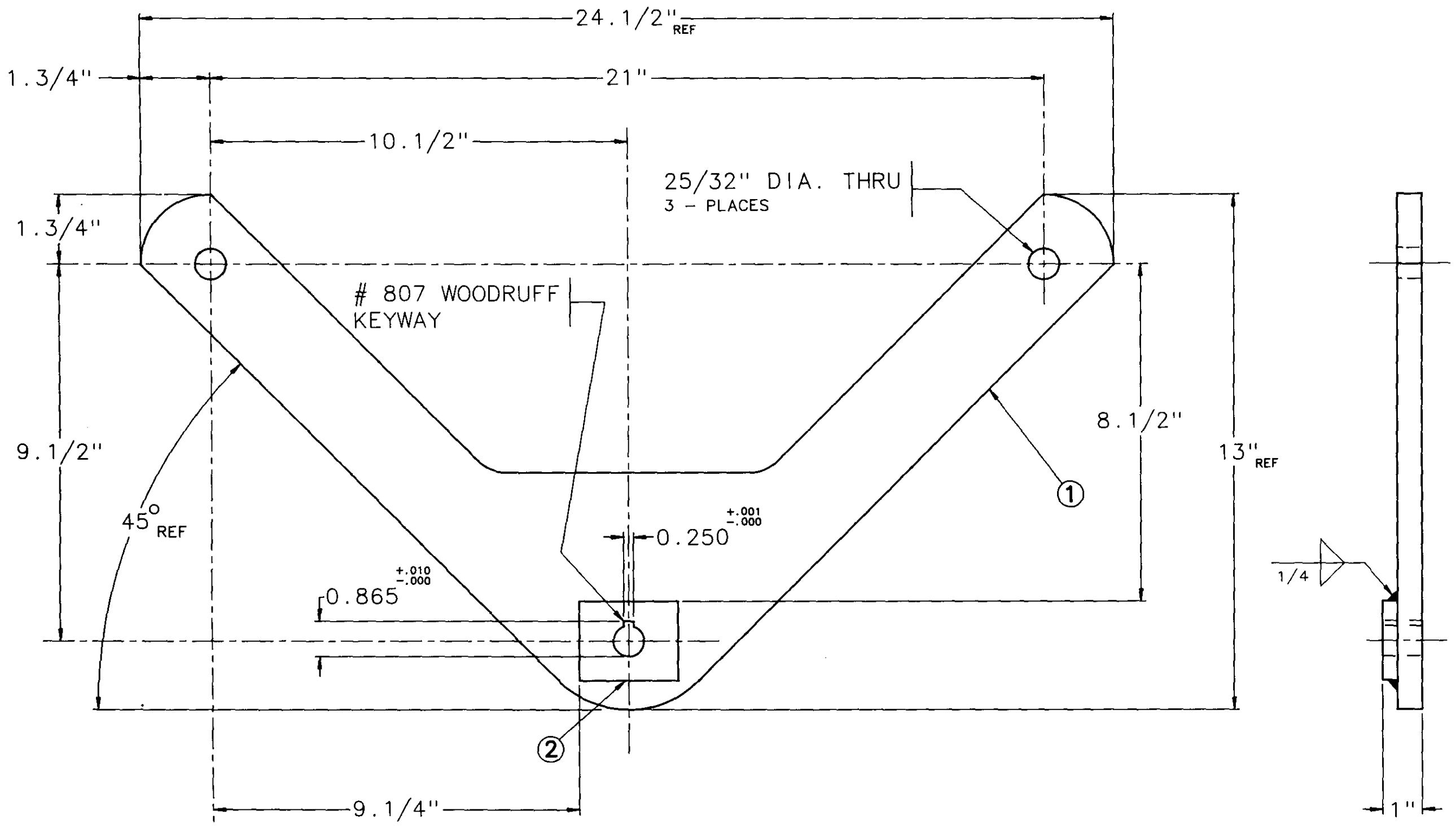
PART NO.

SKF BEARING INDUSTRIES  
 1100 FIRST AVENUE  
 KING OF PRUSSIA, PENNSYLVANIA  
 19406-1352

38188-5-SKF

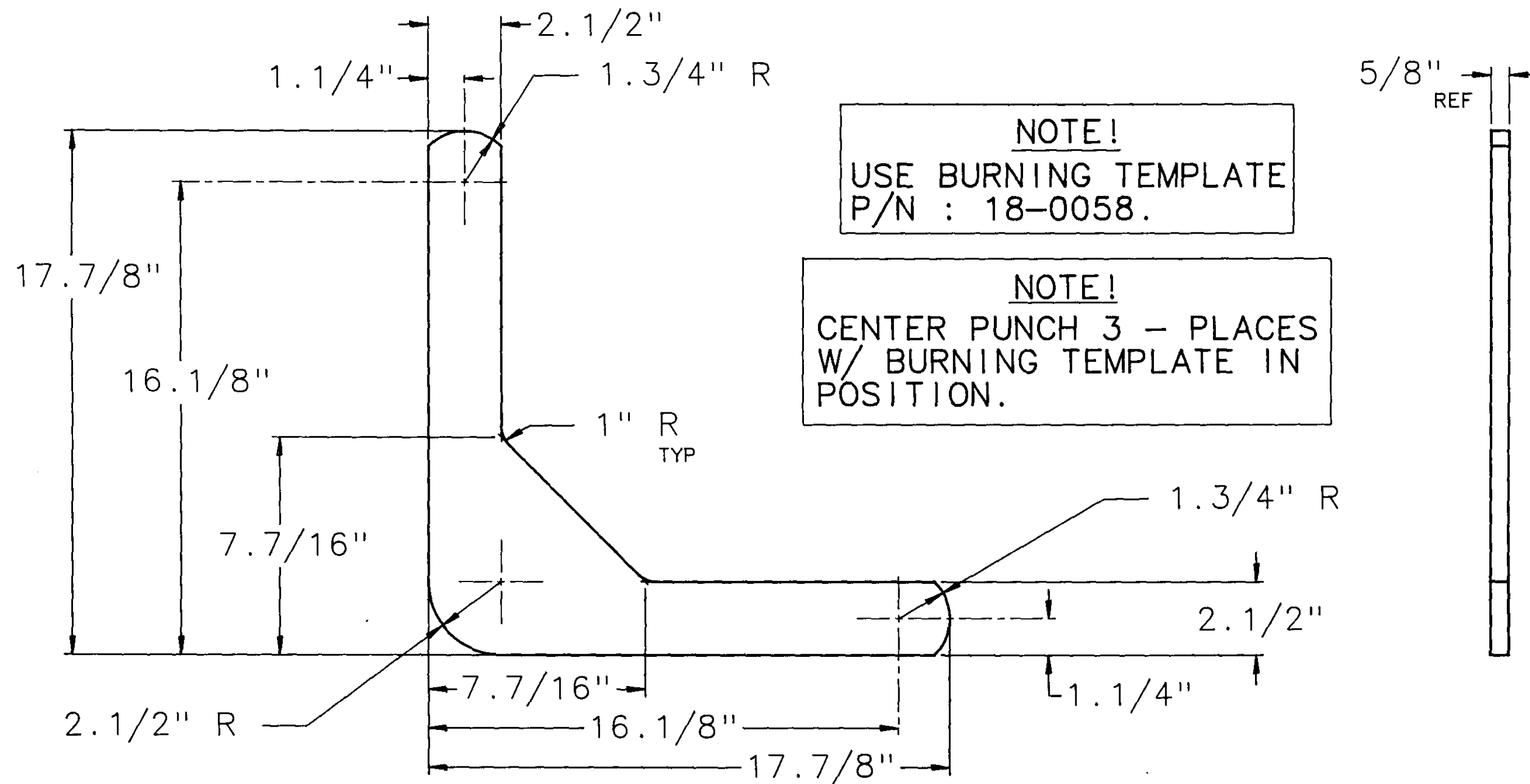
<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN          DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19 DWG. NO. 33-0016B
NO.	BY	DATE	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653			SCALE: FULL DATE: MAY 31, 1990
F.F.E.S. PART NO.: 33-0016		TITLE: FELT, 3/8" SQUARE	

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0483	B	COULTER ARM	1	16.4
2	00-0484	A	BAR, FLAT, 3/8" X 2"	1	0.53



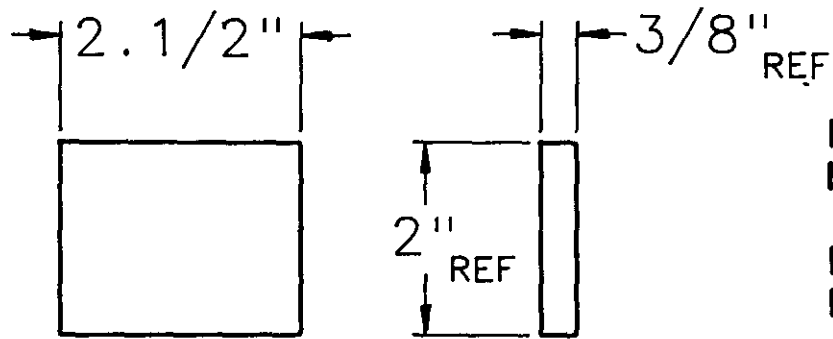
PART NUMBER: 20-0020  
EST. WT.: 16.6 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN +-.1/32 6 IN AND UP +-.1/16 DECIMAL: 1 PLACE +-.01 2 PLACE +-.001 3 PLACE +-.0005 ANGULAR: +-.1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
TITLE: <b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		SCALE: 1 = 2 DATE: MAY 14, 1990 DWG. NO.: 20-0020C	



PART NUMBER: 00-0483  
 MAT'L.: PLATE, 5/8" HOT ROLLED  
 UNS G10150  
 F.F.E.S. SPEC. NO.: AA-01048BC  
 EST.WT.: 16.4 LBS.

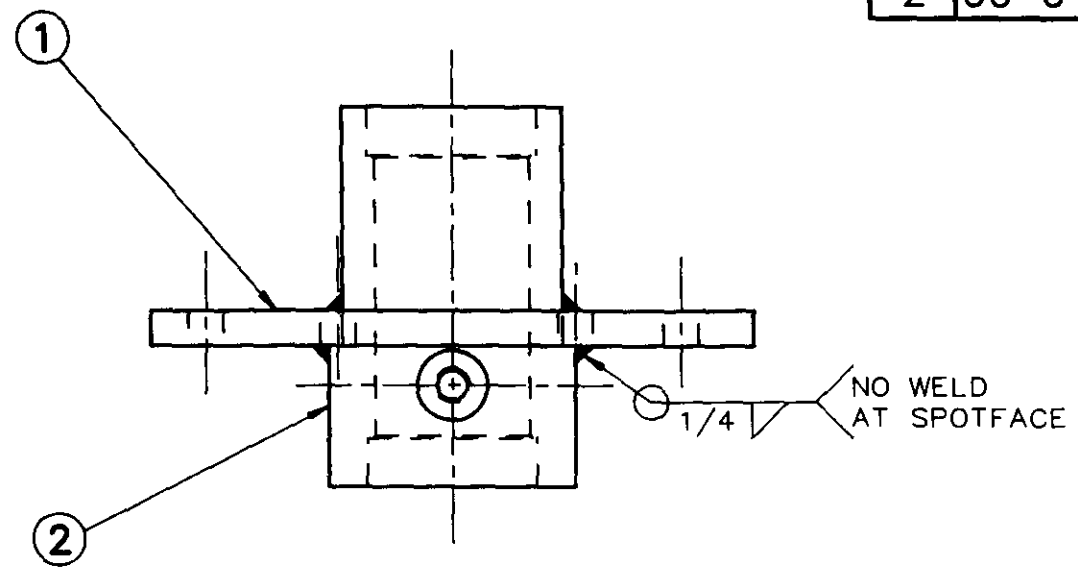
<b>STD. TOLERANCES</b> FRACTIONAL: 8 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ DECIMAL: 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ ANGULAR: $\pm 1$ DEG				DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:		<b>MICHIGAN          DNR</b> FOREST MANAGEMENT DIVISION
NO. BY DATE REVISION		PROJECT NO.: 84-19				
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653						
TITLE: <b>COULTER ARM: 52" PLOW</b>				SCALE: 1 = 4	DATE: MAY 14, 1990	DWG. NO. 00-0483B



PART NUMBER: 00-0484  
 MAT'L.: BAR, FLAT, 3/8" X 2" H.R.  
 UNS G10200  
 F.F.E.S. SPEC. NO.: AB-00608AA  
 EST. WT.: 0.53 LBS.

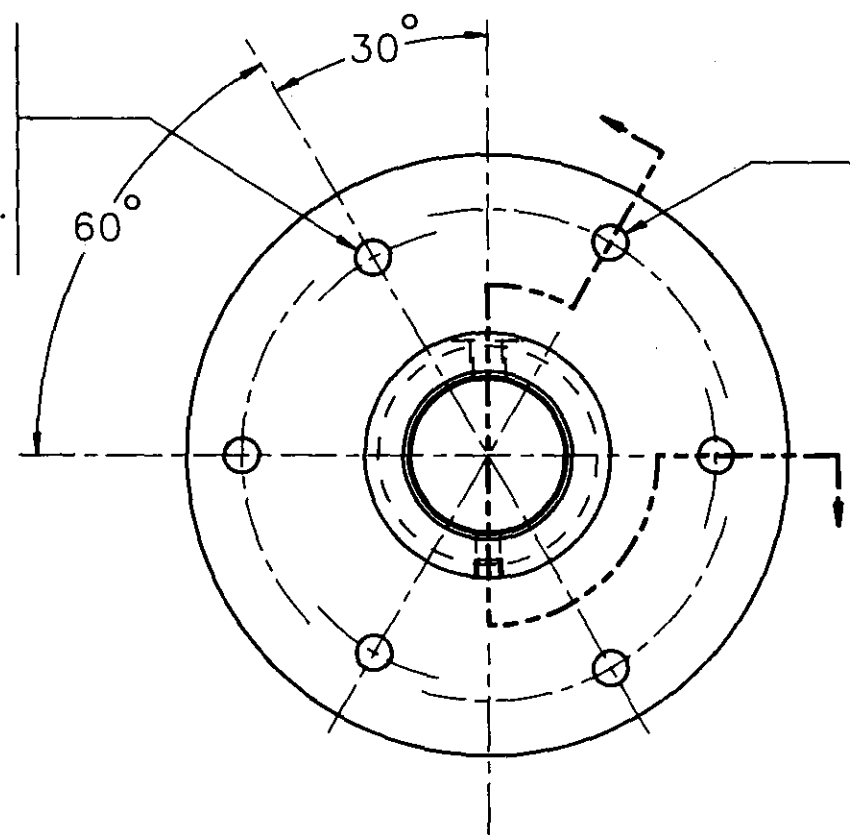
<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 8 TO 6 IN ±1/32 6 IN AND UP ±1/16 <b>DECIMAL:</b> 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005 <b>ANGULAR:</b> ±1 DEG								DRAWN: <b>R. GREENLAW</b>	<b>MICHIGAN          DNR</b>  FOREST MANAGEMENT DIVISION
								CHECKED: <b>KDB</b>	
								APPROVED:	
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN      48653									PROJECT NO.: 84-19
TITLE: <b>BAR, FLAT</b>							SCALE: <b>1 = 2</b>	DATE: <b>MAY 14, 1990</b>	DWG. NO. <b>00-0484A</b>

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0487	B	FLANGE	1	7.01
2	00-0488	C	HOUSING	1	6.62

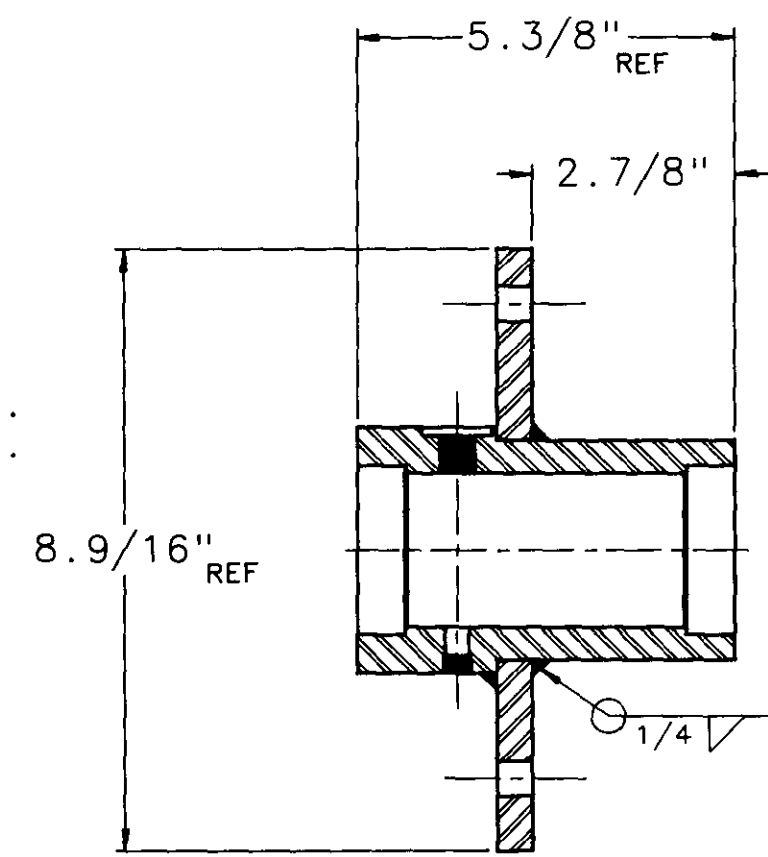


**NOTE!**  
USE DRILLING  
FIXTURE P/N  
18-0057.

1/2" DIA.  
3 - PLCS.  
EQ. SPC'D.  
120° APART  
ON A 6.1/2" DIA.  
BOLT CIRCLE.

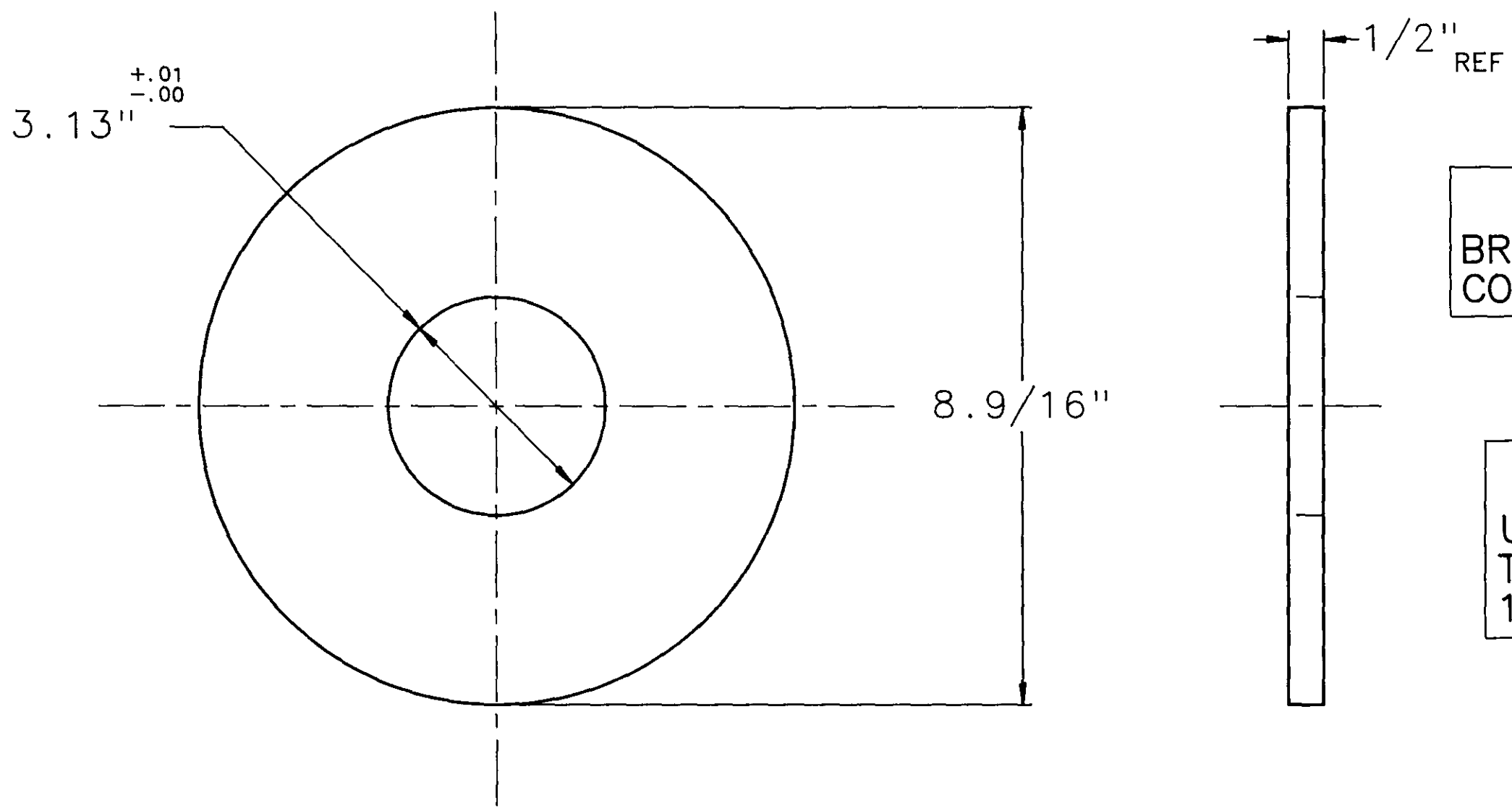


1/2" DIA.  
3 - PLCS.  
EQ. SPC'D.  
120° APART  
ON A 7" DIA.  
BOLT CIRCLE.



PART NUMBER: 20-0023  
EST. WT.: 13.6 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 6 IN ± 1/32 6 IN AND UP ± 1/16 DECIMAL: 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005 ANGULAR: ± 1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		TITLE: COULTER HUB W/C: 40 & 52" PLOW SCALE: 1 = 2 DATE: MAY 17, 1990	



**NOTE!**  
BREAK ALL SHARP  
CORNERS.

**NOTE!**  
USE BURNING  
TEMPLATE P/N  
18-0061.

PART NUMBER: 00-0487  
 MAT'L.: PLATE, 1/2" H.R.  
 UNS G10150  
 F.F.E.S. SPEC. NO.: AA-00848BC  
 EST. WT.: 7.01 LBS.

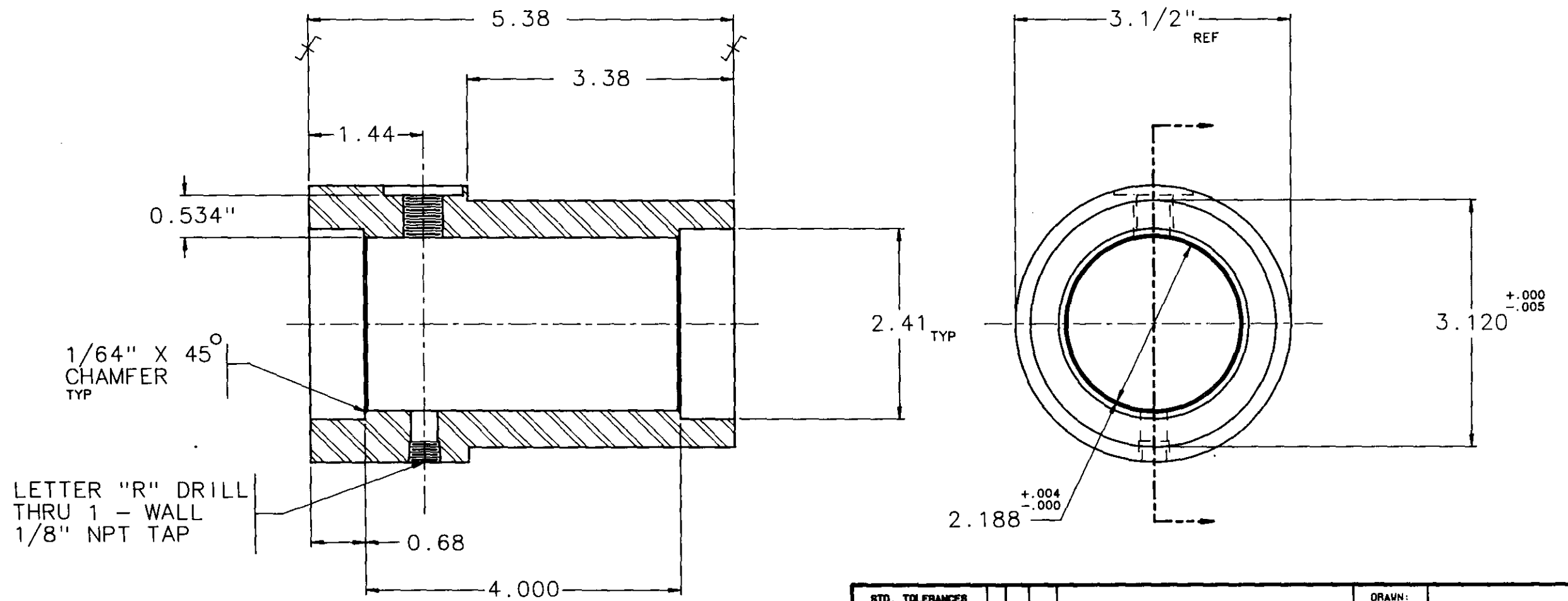
<b>STD. TOLERANCES</b>		DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>				
FRACTIONAL: 8 TO 6 IN +-1/32 6 IN AND UP +-1/16		CHECKED: KDB			FOREST MANAGEMENT DIVISION			
DECIMAL: 1 PLACE +- 0.1 2 PLACE +- 0.01 3 PLACE +- 0.005		APPROVED:						
ANGULAR: +- 1 DEG		NO.	BY	DATE	REVISION	<b>FOREST FIRE EXPERIMENT STATION</b>		PROJECT NO.: 84-19
						P.O. BOX 68      ROSCOMMON, MICHIGAN      48653		DWG. NO. 00-0487B
TITLE: FLANGE, COULTER HUB		SCALE: 1 = 2		DATE: MAY 17, 1990				



1" DIA.  
S'FACE

27/64" DRILL THRU  
1 - WALL  
1/2" - 13 UN TAP

**NOTE!**  
BREAK ALL  
SHARP EDGES.



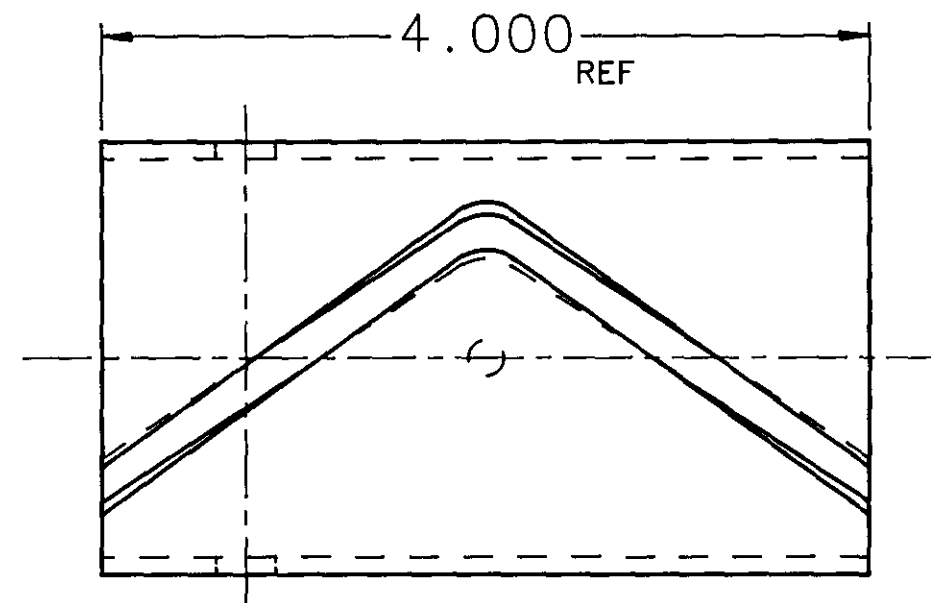
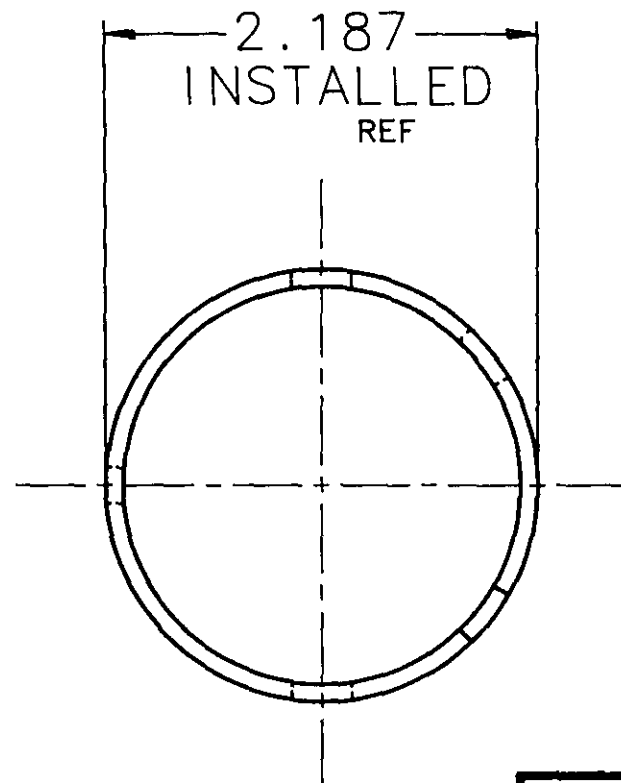
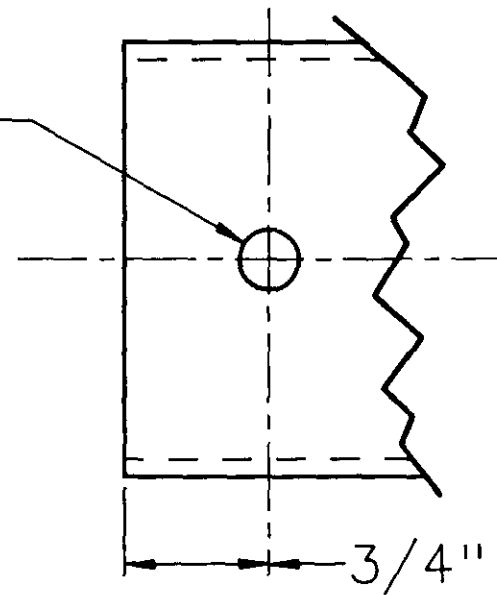
1/64" X 45°  
CHAMFER  
TYP

LETTER "R" DRILL  
THRU 1 - WALL  
1/8" NPT TAP

PART NUMBER: 00-0488  
MAT'L.: BAR, RND., 3.1/2" DIA. C.D.  
RYCASE / LEAD  
UNS G11170/Pb  
F.F.E.S. SPEC. NO.: AC-00350AF  
EST. WT.: 6.62 LBS.

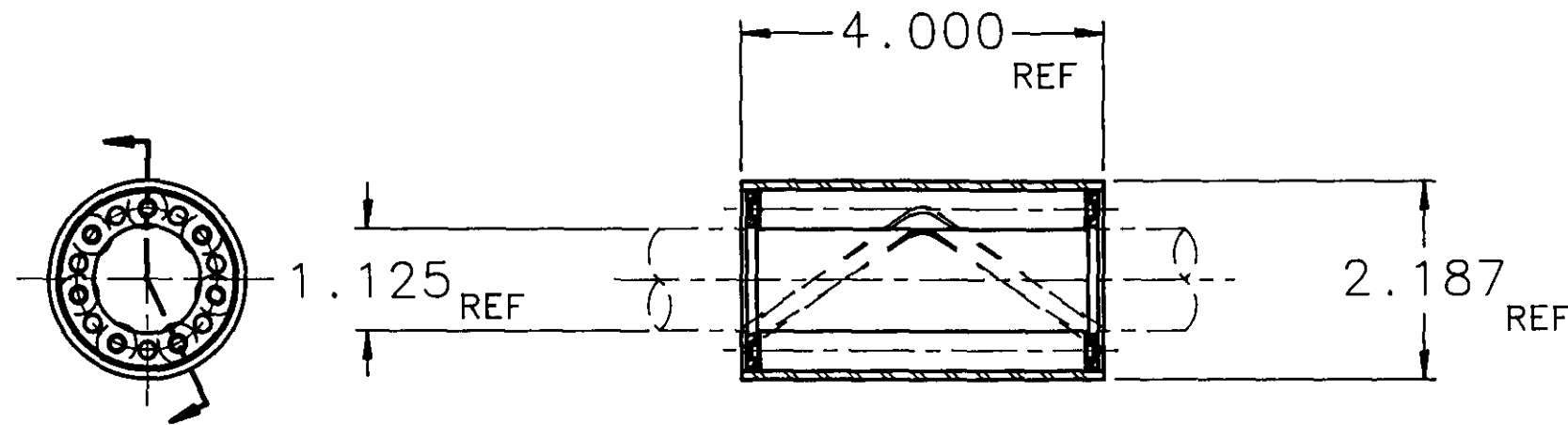
STD. TOLERANCES		DRAWN: R. GREENLAW	
FRACTIONAL: 1 TO 8 IN. ±1/16 9 TO 16 IN. ±1/32 17 TO 32 IN. ±1/64		CHECKED: KDB	
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.001		APPROVED:	
ANGULAR: ±1.00		MICHIGAN DNR FOREST MANAGEMENT DIVISION	
NO. BY DATE REVISION		PROJECT NO.: 84-19	
FOREST FIRE EXPERIMENT STATION P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			
TITLE: HOUSING, COULTER HUB		SCALE: FULL	DATE: MAY 17, 1980
		DWG NO. 00-0488C	

5/16" DIA.  
THRU BOTH WALLS



PART NUMBER: 20-0027  
 MAT'L.: PRODUCE FROM BEARING RACE  
 PROVIDED WITH F.F.E.S.  
 P/N 20-0005.  
 EST. WT.: 0.63 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 6 TO 6 IN +-1/32 6 IN AND UP +-1/16 DECIMAL: 1 PLACE +- 0.1 2 PLACE +- 0.01 3 PLACE +- 0.005 ANGULAR: +- 1 DEG				NO. BY DATE REVISION				DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION
<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68      ROSCOMMON, MICHIGAN 48653						PROJECT NO.: 84-19			
TITLE: <b>BEARING RACE (MODIFIED)</b>						SCALE: <b>FULL</b>	DATE: <b>MAY 30, 1980</b>	DWG. NO. <b>20-0027B</b>	



### ROLLER BEARING & RACE

BEARING TYPE: STANDARD SOLID ROLLER  
 TOTAL ROLLERS: 7  
 ROLLER DIA.: 0.4375  
 INSIDE DIA.: 1.125" NOM.  
 LOAD RATING @ 100 R.P.M.: 2950 LBS.  
 OUTSIDE DIA.: 2.187" INSTALLED NOM.  
 OPERATING SPACE: 4.000"  
 RACE TYPE: SPLIT OUTER  
 EST. COMBINED WT.: 2.15 LBS.

APPROVED MANUFACTURERS

PART NO.

APPROVED MANUFACTURERS

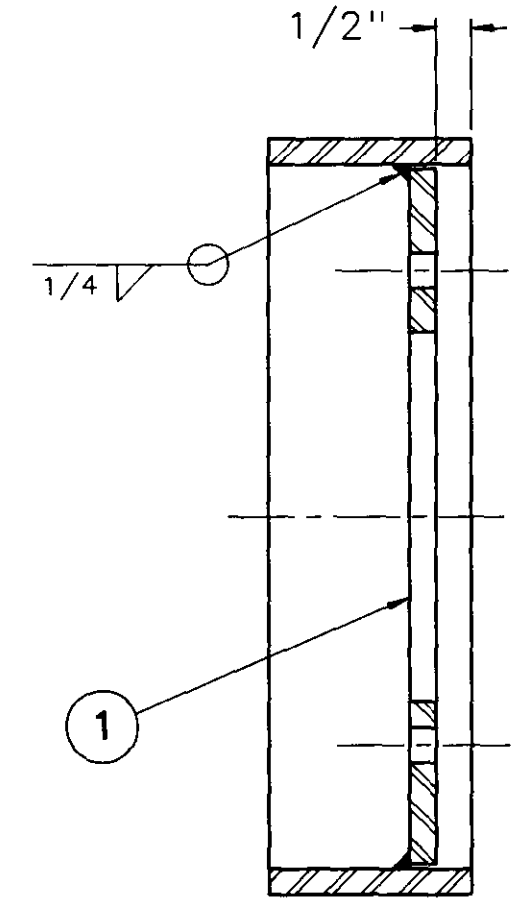
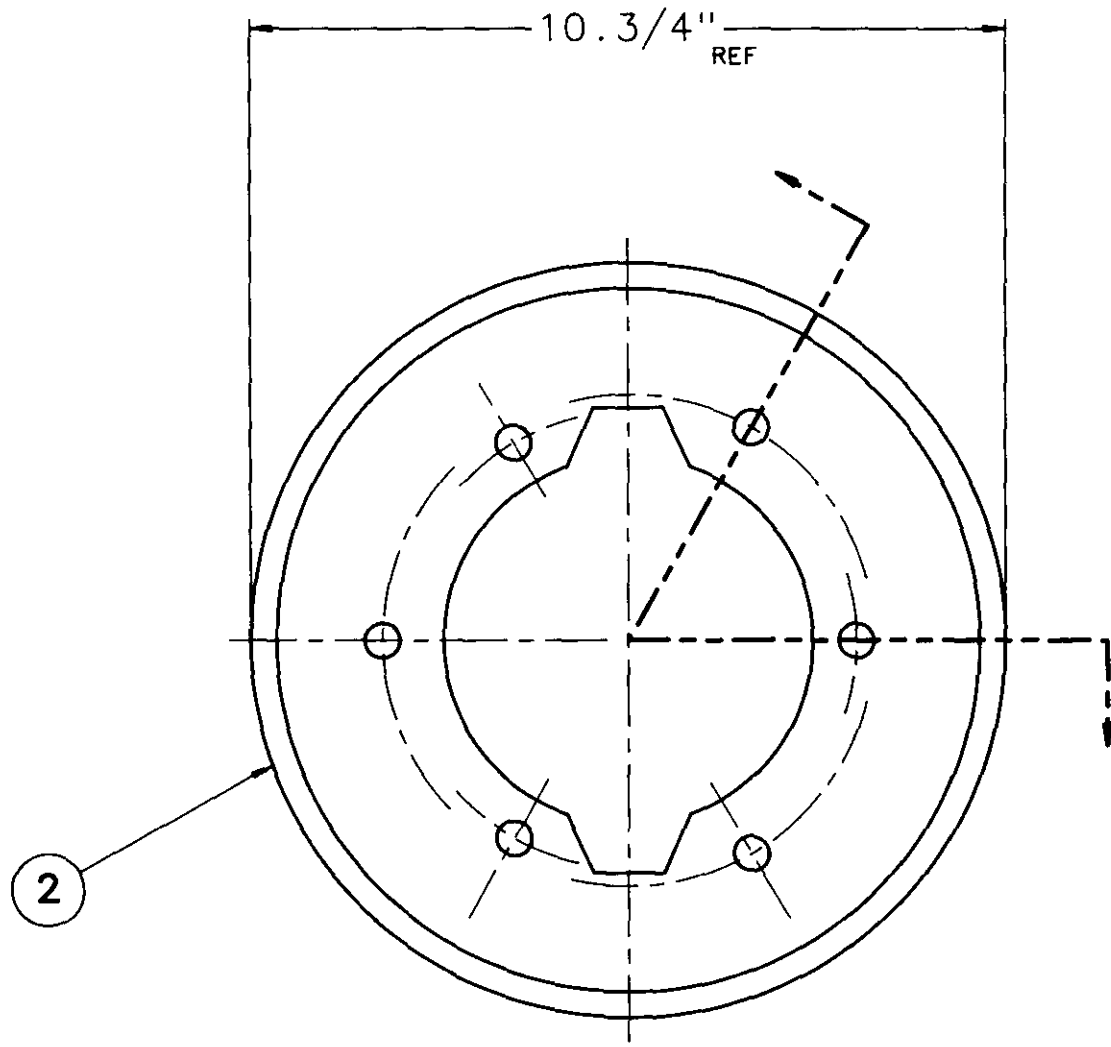
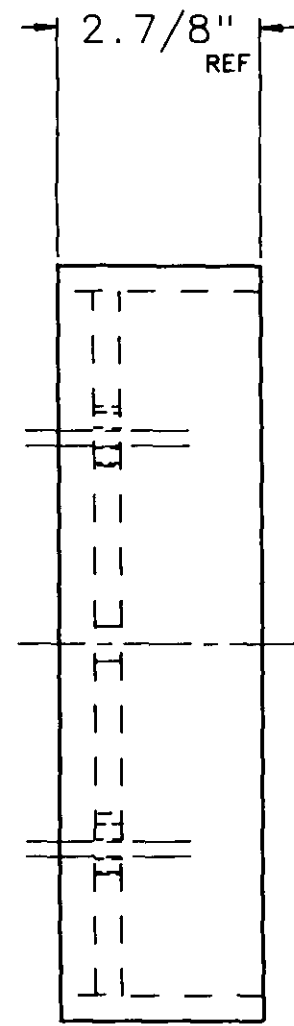
PART NO.

BERLISS BEARING COMPANY  
 644 ROUTE 10  
 P.O. BOX 45  
 LIVINGSTON, NEW JERSEY 07039

PA-97664

<b>STD. TOLERANCES</b> <b>FRACTIONAL:</b> 0 TO 6 IN $\pm 1/32$ 6 IN AND UP $\pm 1/16$ <b>DECIMAL:</b> 1 PLACE $\pm 0.1$ 2 PLACE $\pm 0.01$ 3 PLACE $\pm 0.005$ <b>ANGULAR:</b> $\pm 1$ DEG		DRAWN: <b>R. GREENLAW</b> CHECKED: <b>KDB</b> APPROVED:	<b>MICHIGAN DNR</b>  FOREST MANAGEMENT DIVISION	
NO. BY DATE REVISION	<b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			
F.F.E.S. PART NO.: 20-0005		SCALE: 1 = 2	DATE: MAY 25, 1990	PROJECT NO.: 84-19 DWG. NO. 20-0005B
<b>TITLE: COULTER BEARING &amp; RACE: 40" &amp; 52" PLOW</b>				

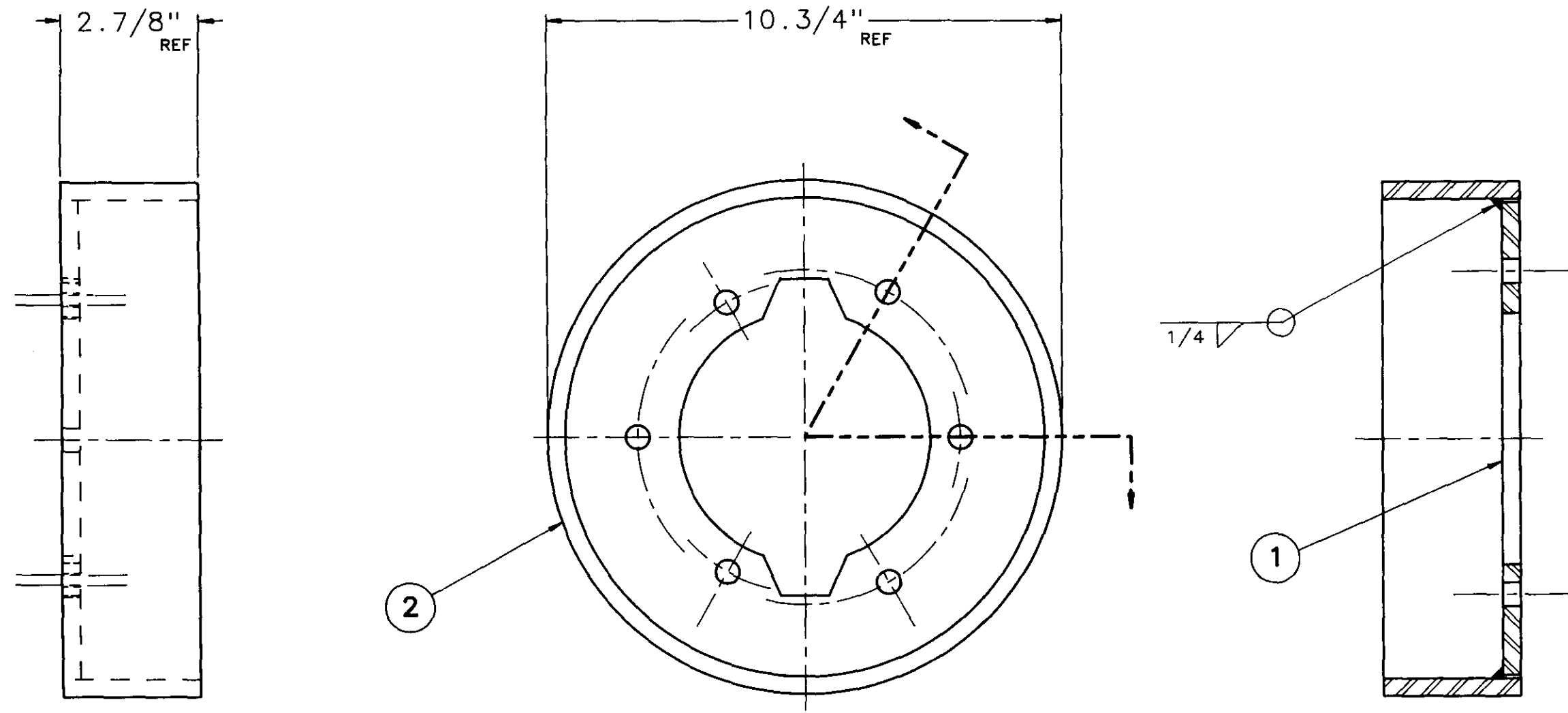
ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0485	B	MOUNTING RING	1	5.54
2	00-0486	A	PIPE, 10", SCH. 40, BLACK	1	9.69



PART NUMBER: 20-0021  
EST. WT.: 15.5 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 0.125 ± 1/32 0.125 IN AND UP ± 1/16 DECIMAL: 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005 ANGULAR: ± 1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
TITLE: <b>FOREST FIRE EXPERIMENT STATION</b> P.O. BOX 68 ROSCOMMON, MICHIGAN 48653		REVISION NO. BY DATE	
TITLE: <b>COULTER DEPTH CONTROL FLANGE L.H. W/C</b>		SCALE: 1 = 2	DATE: MAY 15, 1990 DWG. NO.: 20-0021C

ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	00-0485	B	MOUNTING RING	1	5.54
2	00-0486	A	PIPE, 10", SCH. 40, BLACK	1	9.69



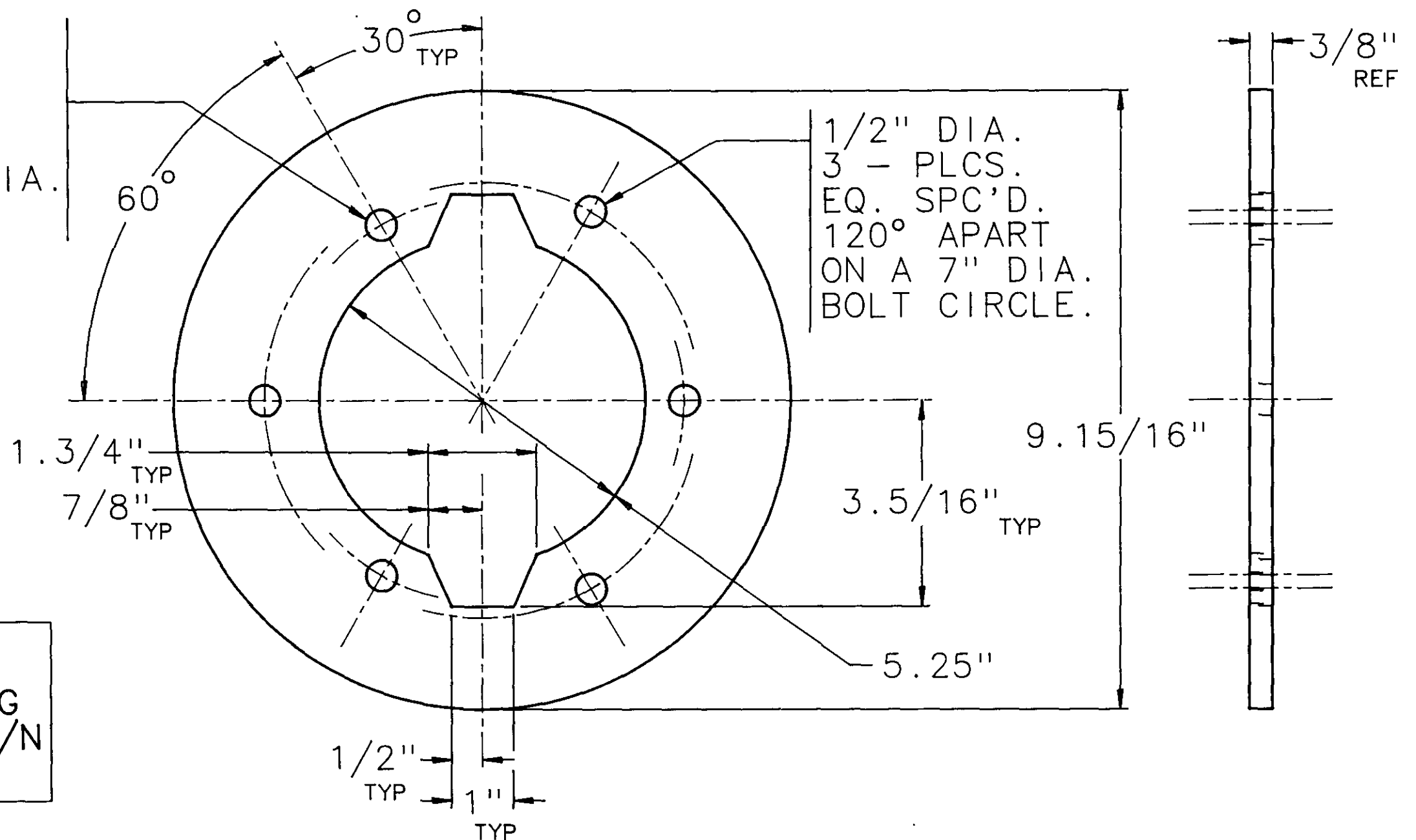
PART NUMBER: 20-0022  
EST. WT.: 15.5 LBS.

<b>STD. TOLERANCES</b> FRACTIONAL: 0 TO 0.125 ± 1/32 0.125 AND UP ± 1/16 DECIMAL: 1 PLACE ± 0.1 2 PLACE ± 0.01 3 PLACE ± 0.005 ANGULAR: ± 1 DEG		DRAWN: R. GREENLAW CHECKED: KDB APPROVED:	<b>MICHIGAN DNR</b> FOREST MANAGEMENT DIVISION PROJECT NO.: 84-19
TITLE: COULTER DEPTH CONTROL FLANGE R.H. W/C		SCALE: 1 = 2 DATE: MAY 15, 1990 DWG. NO.: 20-0022C	

1/2" DIA.  
 3 - PLCS.  
 EQ. SPC'D.  
 120° APART  
 ON A 6.1/2" DIA.  
 BOLT CIRCLE.

**NOTE!**  
 USE DRILLING  
 FIXTURE P/N  
 18-0056.

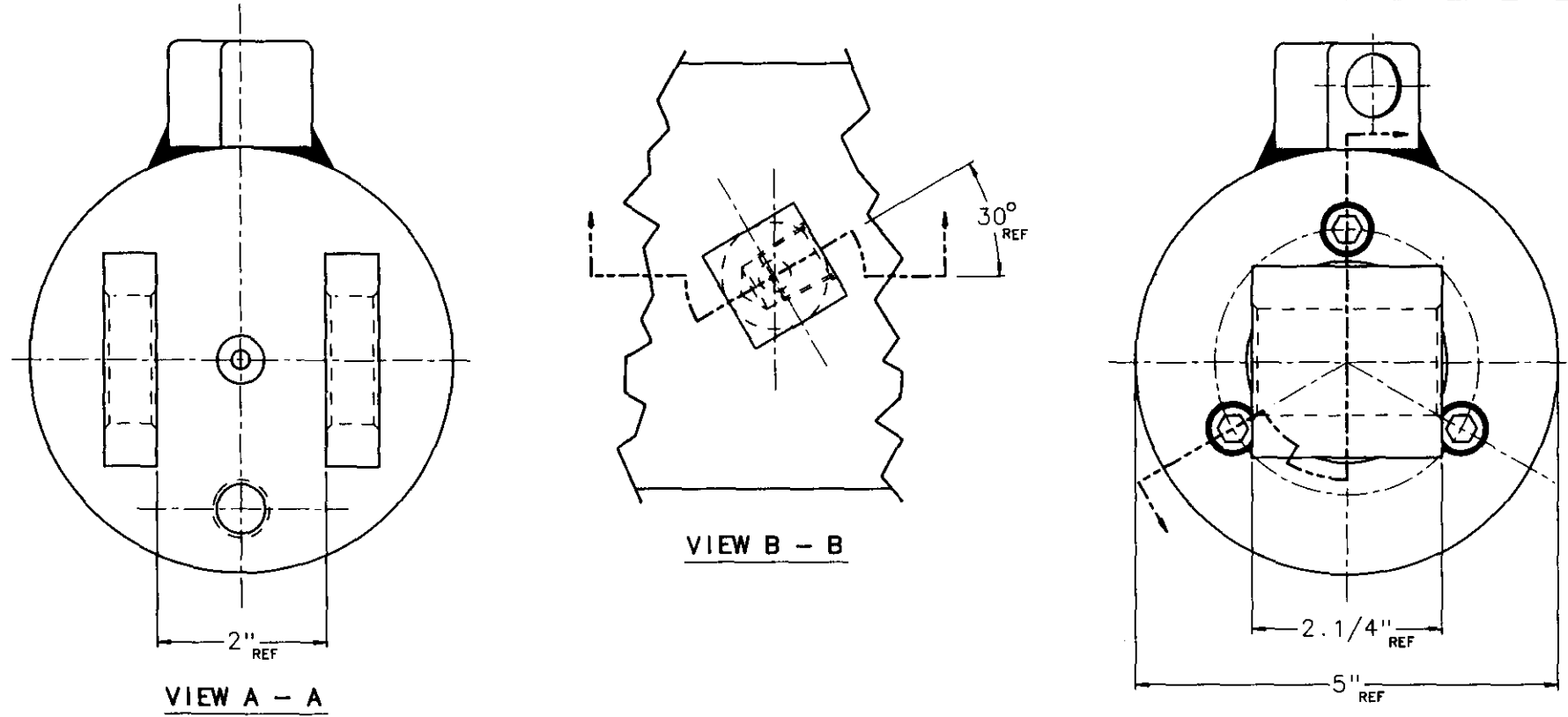
**NOTE!**  
 USE BURNING  
 TEMPLATE P/N  
 18-0059.



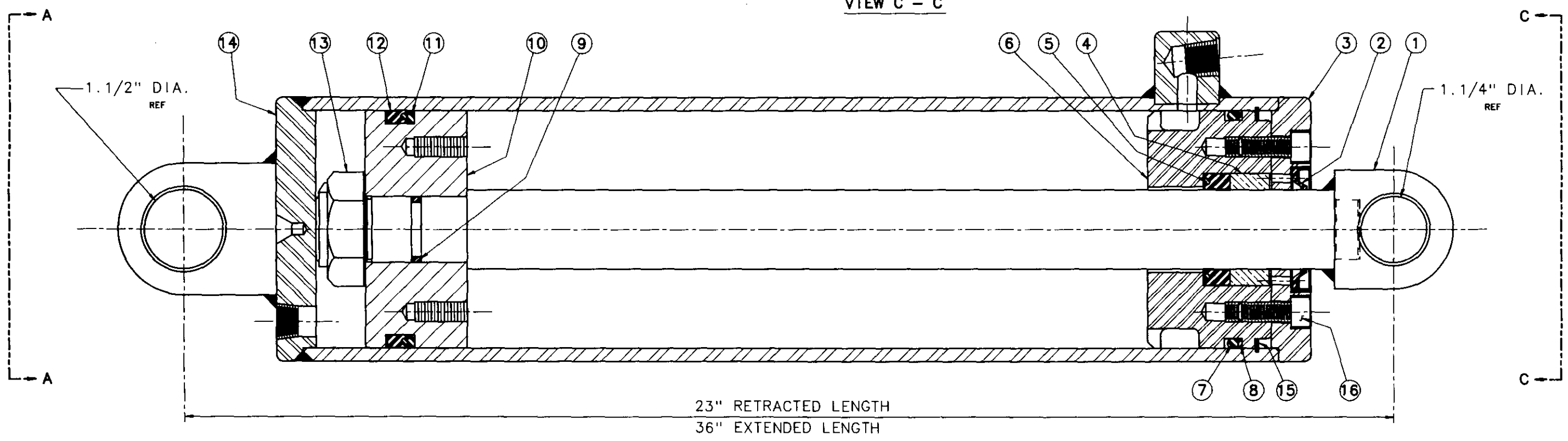
PART NUMBER: 00-0485  
 MAT'L.: PLATE, 3/8" H.R.  
 UNS G10150  
 F.F.E.S. SPEC. NO.: AA-00648BC  
 EST. WT.: 5.54 LBS.

<b>STD. TOLERANCES</b>				DRAWN: R. GREENLAW		<b>MICHIGAN DNR</b>	
FRACTIONAL: 0 TO 6 IN ±1/32 6 IN AND UP ±1/16				CHECKED: KDB			FOREST MANAGEMENT DIVISION
DECIMAL: 1 PLACE ±0.1 2 PLACE ±0.01 3 PLACE ±0.005				APPROVED:			
ANGULAR: ±1 DEG				NO.	BY	DATE	
				REVISION			
<b>FOREST FIRE EXPERIMENT STATION</b>							
P.O. BOX 68      ROSCOMMON, MICHIGAN      48653							
TITLE: MOUNTING RING: DEPTH CONTROL FLANGE				SCALE: 1 = 2	DATE: MAY 15, 1990	PROJECT NO.: 84-19	
				DWG. NO. 00-0485B			





ITEM	PART NO	DWG	DESCRIPTION	QTY	EST WT
1	22-0007	B	ROD W/C	1	11.4
2	22-0014	B	OIL SEAL	1	0.08
3	22-0009	B	CAP, BOLTED END	1	3.19
4	22-0012	A	BUSHING, BRONZE	1	0.42
5	22-0017	B	ROD SEAL: "U-CUP"	1	0.05
6	22-0010	B	END GLAND	1	7.02
7	G346-AN70		"O"-RING: 4.1/8" I.D. X 4.1/2" O.D. NOM.	1	0.03
8	G346-BT		BACK-UP RING: 4.1/8" I.D. X 4.1/2" O.D. NOM.	1	0.01
9	G214-AN70		"O"-RING: 1" I.D. X 1.1/4" O.D. NOM.	1	0.01
10	22-0001	B	PISTON	1	7.45
11	22-0016	B	PISTON SEAL: "PIP RING"	1	0.02
12	22-0015	B	PISTON SEAL: "U-CUP"	1	0.06
13	33-0017	B	LOCKNUT	1	0.41
14	22-0008	C	CASE W/C	1	25.8
15	22-0013	B	RETAINER RING	1	0.05
16	TS-06MH08		SCREW, CAP HEX SOCKET HEAD 3/8"-24UN 1" LNS BLK. OXIDE	3	



**NOTE 1**  
 FOR INTERNAL COMPONENT INSTALLATION, USE TOOL P/N'S 18-0063, 18-0064, 18-0065 & 18-0066. TO EXTRACT THE END GLAND, USE P/N 18-0067.

**NOTE**  
 ROD DIA. = 1.1/2"  
 STROKE = 13"  
 BORE = 4.1/2"  
 PORTS = 3/8" NPT FEMALE

PART NUMBER: 22-0002  
 EST. WT.: 56.0 LBS.

STD. TOLERANCES		DRAWN:	R. GREENLAW
FRACTIONAL:		CHECKED:	KDB
DECIMAL:		APPROVED:	
1 PLACE ±.1			
2 PLACE ±.05			
3 PLACE ±.01			
<b>FOREST FIRE EXPERIMENT STATION</b>			
P.O. BOX 68 ROSCOMMON, MICHIGAN 48653			
TITLE: HYDRAULIC CYLINDER ASSEMBLY: 4.1/2" BORE			SCALE: FULL DATE: OCT. 31, 1980
MICHIGAN DNR			PROJECT NO.: 84-19
FOREST MANAGEMENT DIVISION			DWG. NO.: 22-0006D