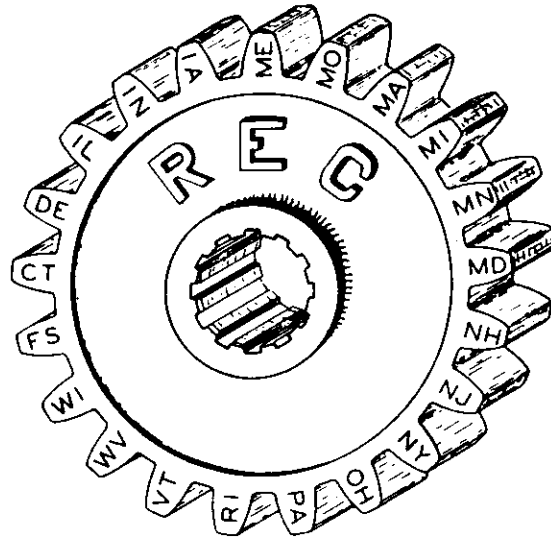


Roscommon  
Equipment  
Center  
Program

Project No. 51



*Wisconsin Fire Control logo  
introduced in 1979*

## WISCONSIN FOAM MODULE

RELEASED JANUARY 1989

Updated, September 1989

Northeast Forest Fire Supervisors

in Cooperation with

Michigan's Forest Fire Experiment Station



# WISCONSIN FOAM MODULE

## REC PROJECT 51

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### DISCLAIMER

This report has been developed for the guidance of member States, Provinces, Federal Agencies, and their cooperators. The Northeast Forest Fire Supervisors assume no responsibility for the interpretation or use of this information.

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ROSCOMMON EQUIPMENT CENTER

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

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

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

## REC PROJECT 51

### WISCONSIN FOAM MODULE

The use of foam for the suppression of wildfires has produced considerable interest in recent years. The latest trend received a boost from the development of the so-called "Texas Snow Job", the water expansion pumping system (WEPS) designed by the Texas Forest Service. The WEPS equipment combines air and water with a foaming additive to create a foam. Water expansion of 5 to 20 times in volume is typical. Many foaming additives have been used by the agencies that have experimented with the WEPS. "Soapskim", a by-product of Kraft-Sulfide paper making process was sought as one alternative. Dishwashing soaps and foaming products developed primarily for forest fire use have been other alternatives. Selection of a foaming additive can be a lengthy and controversial topic itself. Each agency will need to weigh cost, handling safety, foam effectiveness and various logistic factors before deciding on the particular foaming product they will use.

In this REC report the WEPS design of the Wisconsin Department of Natural Resources is shown. The module is self-contained; it can be attached to a pumping unit or it can be used separately. The main components of a water expansion system is a water pump to pump the fluid to the nozzle, and an air compressor to inject air into the water-foam additive solution. A well designed system will allow the operator to regulate the air and water flow to get the desired consistency of volume and foam.

Rigorously conducted studies evaluating the effectiveness of foam for wildfire use have been limited. Effective use of foams in wildfire situations is not well documented. Several research projects are currently being developed to help agencies in this evaluation. The reader should keep an eye open for their conclusions. The reader is also referred to REC Report #7 "High Density Foam" and REC report #41 B, comparing foams to other forest fire chemicals.

### SPECIFICATIONS

The Wisconsin foam module consists of the following major elements: an air compressor, a water pump, and a gasoline engine to power the pump and compressor. These are mounted on a steel frame base and are enclosed in an expanded metal steel framework cage for protection. The enclosed design prints will show the fabricator how to make this unit. If users are interested in a smaller foam unit they may consider looking for a smaller compressor, pump and engine and reduce the size of the base and cage framework.

For the Wisconsin foam module, the major purchased components are as follows:

Compressor - Manufacturer: Kellogg-American  
Model: 452TVX  
Specification: 2-stage, 4 cylinder,  
7-1/2 to 10 HP,  
590 to 930 RPM,  
36 to 57 cu. ft. per minute.

Other Requirements:  
Pulley grooved flywheel,  
Head unloaders,  
Pressure regulating pilot valve set at  
110 to 125 PSI.

Pump - Manufacturer: Viking Pump Division,  
Houdaille Ind.  
Model: AK495  
Specification: 50 GPM at 1200 RPM,  
Port size 2-1/2" NPT female,  
Max. hydrostatic pressure: 400 PSI,  
Weight: 85 Lbs.

Other Requirements:  
Bronze pressure release valve with  
stainless steel spring, rated 100 PSI or  
greater.  
(2) 1/4" NPT plugs for pressure taps, &  
(1) 1/4" NPT plug for drain

Engine - Manufacturer: Briggs & Stratton  
Specification: 4-stroke, 18 HP, 2 Cyl.  
694 cc.

Some modifications are made to the compressor and engine. Compressor modifications are shown on drawing T-A015-501. Engine modifications are shown on drawing T-C013-501.

Additional information can be obtained from:

Wisconsin Department of Natural Resources,  
Tomahawk Equipment and Training Center,  
518 S. Somo Avenue  
Tomahawk, Wisconsin 54487  
(715) 453-2188

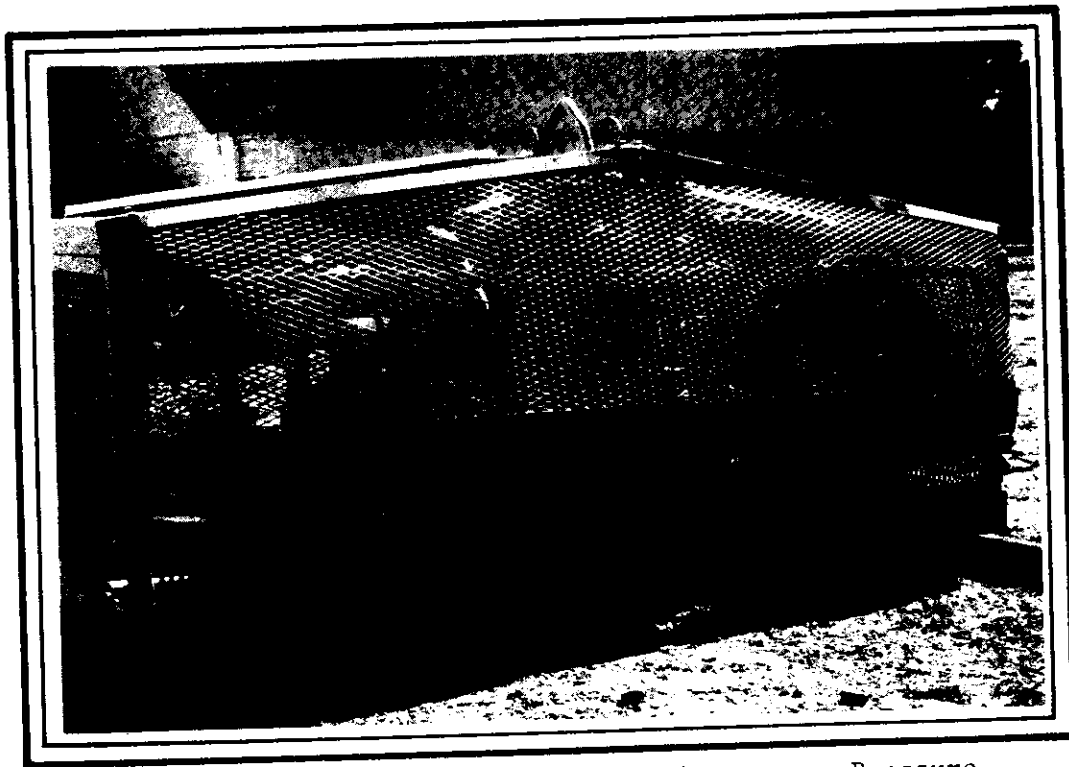


Photo 1. Front view of Foam Module with cage. Pressure gauges (water & air) and start switches are located at lower center.

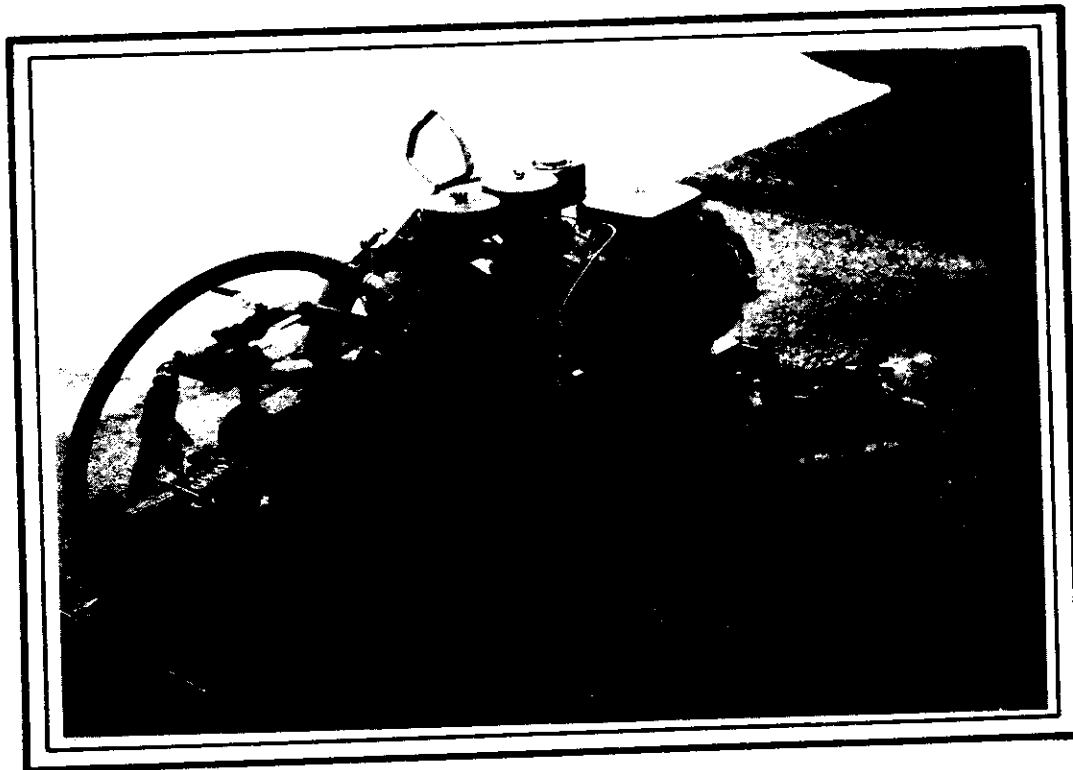


Photo 2. Front view of Foam Module without cage showing suction line location and auxiliary fuel supply. Note discharge port near battery. Engine is on right; compressor is located in center and pump is on the left.

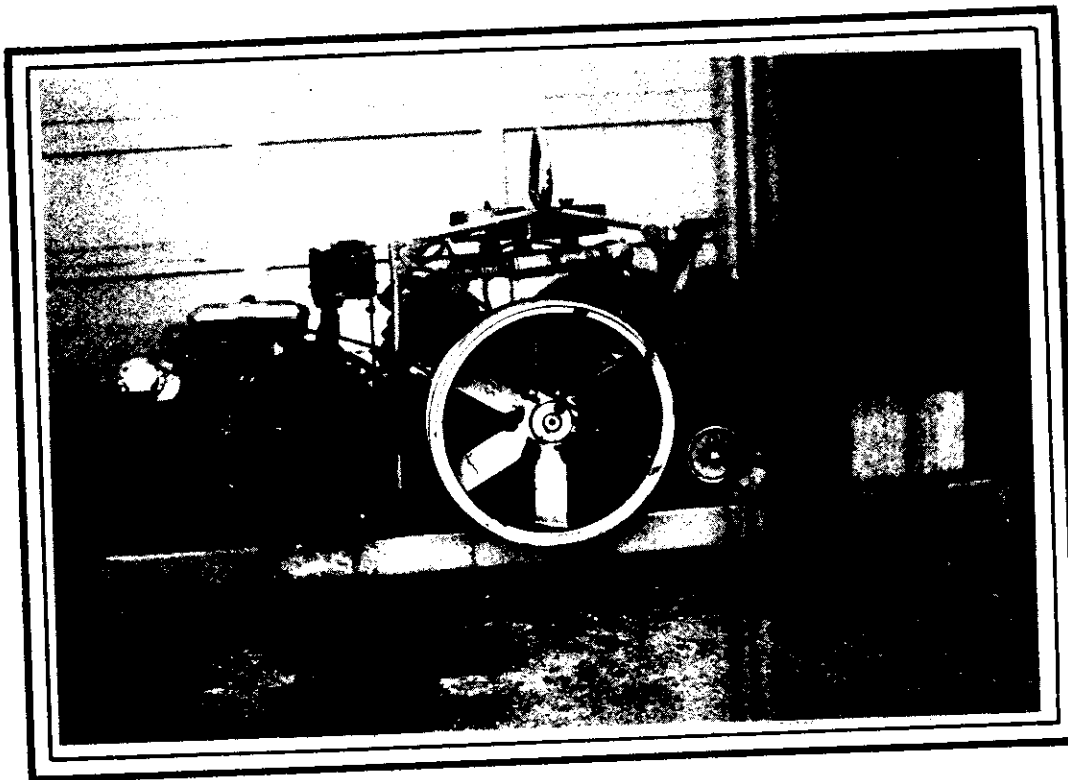


Photo 3. Rear view of Module. Compressor (center) is belt driven directly from engine (left). Pump (right) is belt driven from the compressor shaft. Lift harness assembly is located above and around compressor.

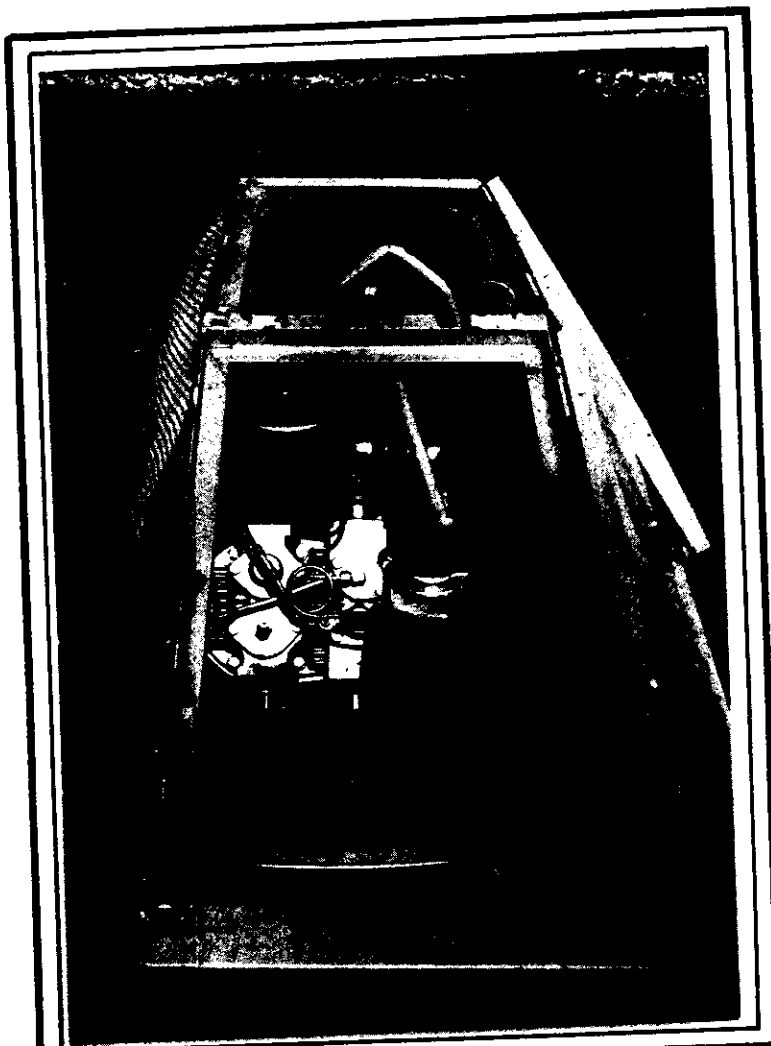


Photo 4. Some service access to the engine, compressor, pump, battery and valves is available through the upper cage doors.

## OPERATING PROCEDURE FOR WISCONSIN FOAM MODULE

1. Observe safety rules. This unit has a belt driven air compressor and water pump, powered by a 4-cycle, 2-cylinder gasoline engine. Check that belts are tight and machinery is free to rotate. Make sure all guards are in place.
2. Check all oil levels (see the service manuals provided by manufacturers for correct oil). Compressor oil is checked by unscrewing knurled cap nut located above air pressure gauge.  
  
Engine: 30W or 10W-30W heavy duty detergent oil.  
Change oil after 25 hours use, and yearly.  
  
Compressor: Change oil at least yearly; use special compressor oil.
3. Check fuel tank. No oil mixing is required. Leaded or unleaded regular gasoline is required.

### BEFORE STARTING ENGINE:

1. Close drain cocks on water pump and water control valve.
2. Pour foam into water tank. Check manufacturer's suggested mix rate (mixtures range from 1 to 3percent foam to water). Factors governing this mixture are water hardness and mineral content. Change mixture percentage accordingly.
3. Thoroughly mix solution by agitating with suction hose and screen by driving truck around, or circulating with pump.
4. Immerse suction hose and screen into tank solution.
5. Open air and water control valves.

### STARTING ENGINE

1. Connect engine fuel line to auxiliary gas tank. Squeeze fuel bulb in line until resistance is encountered.
2. Turn ignition switch on. Pull choke lever to "OUT" position. Press starter button and, as engine runs, adjust choke. Release choke as engine warms.



## FOAM APPLICATION

1. Close air valves and when hose discharge is a colored mixture, open air valve completely. Adjust water valve to approximately 30 degrees from closed position. If discharge mixture is dry, add water by adjusting water valve; if too wet, reduce the water flow. Adjust water valve at approximately 5 degree intervals, until the desired foam consistency is reached. Leave air valve open.

Normal gauge readings: Water . . . 100 PSI  
Air . . . 90 - 100 PSI.

2. No nozzle is required at end of hose to apply air injected foam.

## OTHER CONSIDERATIONS

1. To prime pump - close air control valve momentarily and, when water pressure is indicated, immediately open air valve.
2. If hose end vibrates excessively, this indicates insufficient or poorly mixed foam solution.
3. Use suction screen for pick-up, unless hose is permanently attached to tank.

## SHUTDOWN

1. Foam solution can be corrosive - thoroughly flush out entire system with fresh water as many times as necessary to remove all solution.
2. Open drain cocks on water pump and water control valve.
3. In freezing weather, use air pressure to remove any system water. Close drain cock on water pump. Pour one cup of anti-freeze into pump by removing suction hose and pouring into suction pipe. With ignition switch OFF, push start button several times to turn over pump.
4. When unit is not in use, check battery charge and recharge as required.

*REC Project #51*  
*Wisconsin Foam Module*  
 DRAWING LIST

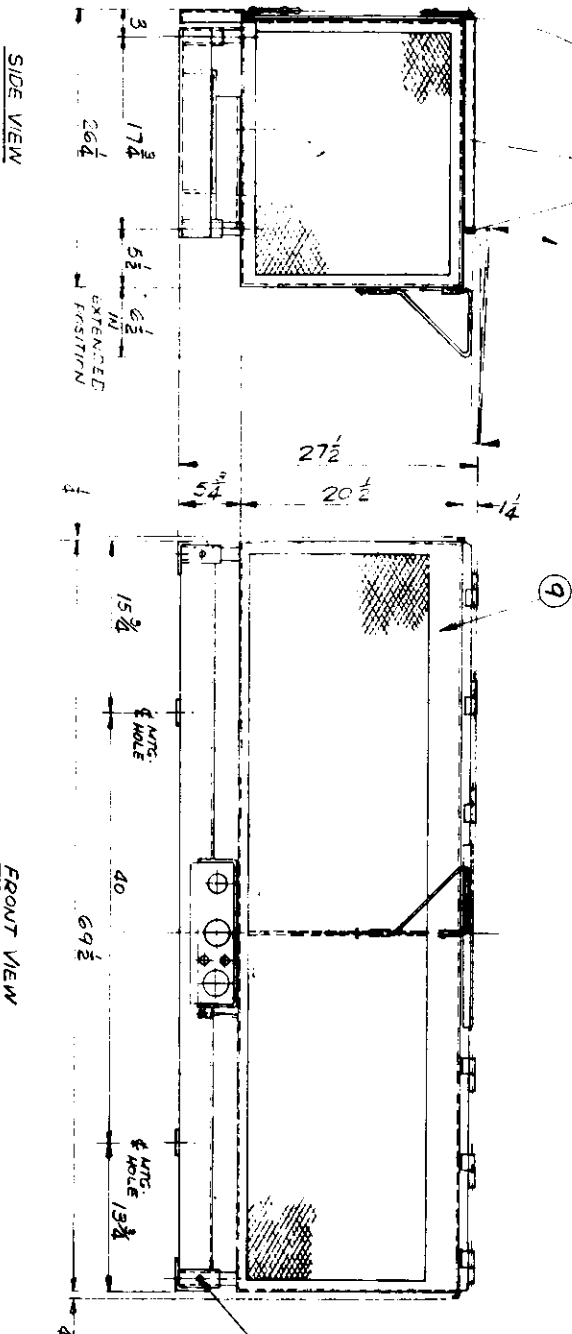
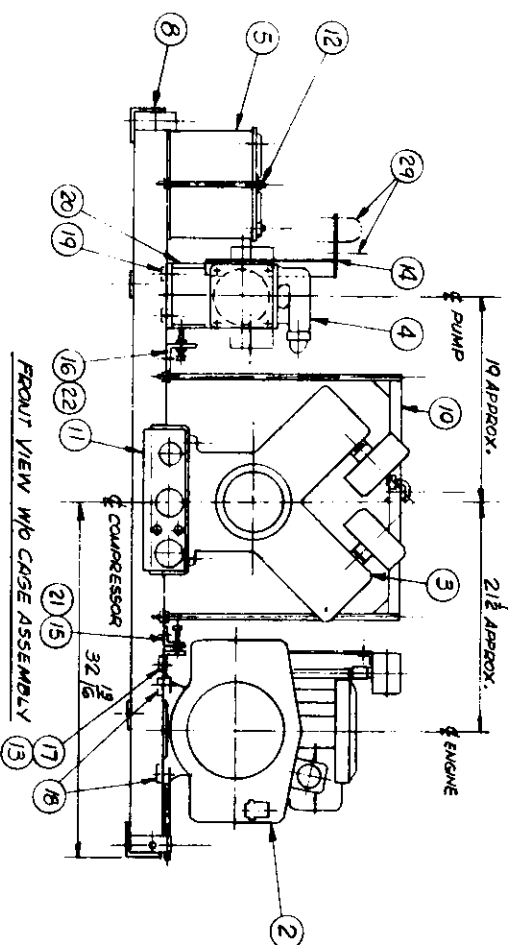
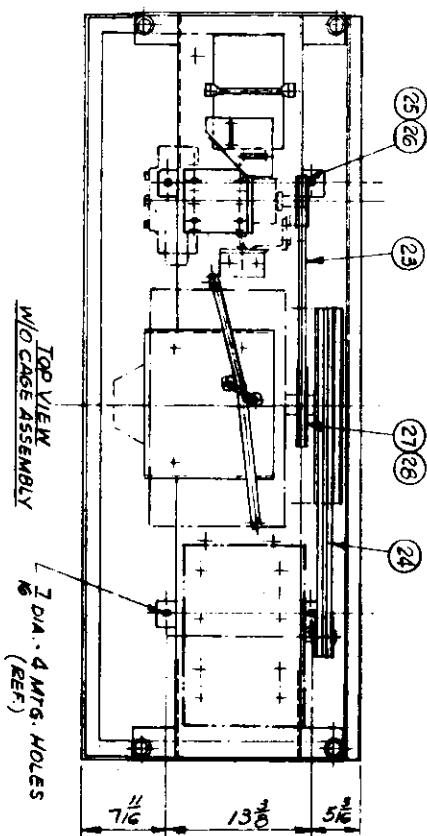
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PART SCHEDULE	T-A058-501	8
PART SCHEDULE	T-A057-501	8
ASSEMBLY	T-D001-402	9
BASE	T-D003-501	10
BASE DETAILS	T-D003-006	11
ENGINE REMACHINING	T-C013-501	12
DETAILS	T-C005-010	13
PUMP MTG. BRACKET	T-C001-501	14
HOSE SUPPORT BRACKET	T-C002-501	15
IDLER & PUMP BRACKET	T-C017-502	16
BATTERY MTG.	T-C005-501	17
INSTRUMENT PANEL	T-C007-501	18
PANEL DETAIL	T-C006-501	19
LIFTING BAR	T-C003-502	20
DOOR REST	T-C049-601	21
PLUMBING SYSTEM	T-C004-601	22
WIRING DIAGRAM	T-C014-401	23
CAGE FRAME	T-D006-402	24
DETAILS	T-D087-009	25
DOOR ASSEMBLY	T-D006-403	26
DOORS	T-D088-505	27
DOORS II	T-D088-505	28
DETAILS	T-B004-003	29
PIN HINGE	T-B042-503	29
SLIDE BARS	T-B001-503	29
ENGINE SLIDE	T-B002-501	29
COMPRESSOR SHAFT MACH.	T-A015-501	30
BELT TENSION BOLT	T-A007-502	30
HOSE ASSEMBLY	T-A009-502	30
COVER	T-B026-402	30

**REC Project #51  
Wisconsin Foam Module**

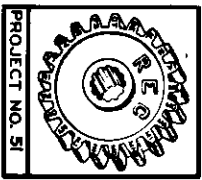
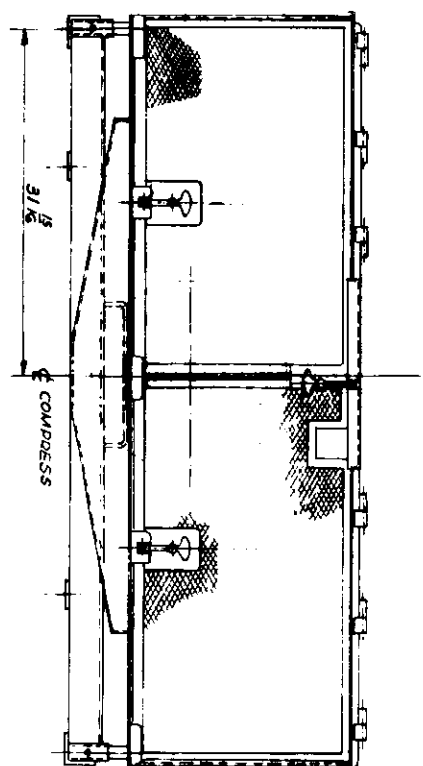
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REQD	ITEM	DESCRIPTION	MATL	PART NO
-	1	ASSEMBLY PIX		T-0006-403
1	2	TOP CENTER DOOR		T-0088-501
1	3	FOLDING DOOR R.H.		T-088-502
1	4	FOLDING DOOR L.H.		T-0088-503
1	5	TOP DOOR R.H.		T-088-504
1	6	TOP DOOR L.H.		T-0088-505
3	7	PIN HINGE R.H.		T-8042-501
3	8	PIN HINGE L.H.		T-8042-502
3	9	RUBBER HOOD LATCH	*	
6	10	#8-32 UNC x 1/4 LG PAN HD SCR	PLATED STL	
9	11	#8-32 UNC x 1/2 LG PAN HD SCR	PLATED STL	
15	12	#8 LOCKWASHER	PLATED STL	
9	13	#8-32 UNC HEX NUT	PLATED STL	
1	15	FRAME ASSEM		T-A057-501
* AUSTIN HARDWARE #35R				

DRAWING NO. T-A057-501				
REQD	ITEM	DESCRIPTION	MATERIAL	PART NO.
-	1	ASSEMBLY PIX		T-0006-402
4	2	3/4" PIPE x 5.5" SCH 40	STL	T-A057-003
1	3	FRONT ANGLE		T-0087-001
1	4	ANGLE 1.5 x 1.5 x .25 x 68.5 LG	H.R. STL	T-A057-004
1	5	ANGLE L.H. BASE		T-0087-002
1	6	ANGLE R.H. BASE		T-0087-003
1	7	ANGLE L.H. UPRIGHT		T-0087-004
1	8	ANGLE R.H. UPRIGHT		T-0087-005
2	9	ANGLE 1.5 x 1.5 x 1/8 x 17.5 LG	H.R. STL	T-A057-009
2	10	ANGLE 1.5 x 1.5 x 1/8 x 24.75 LG	H.R. STL	T-A057-010
1	11	TOP SHEET		T-0087-006
1	12	PIPE, 3/4" x 68.75 SCH 40	STL	T-A057-012
3	13	BAR DOOR GUIDE		T-0087-007
2	14	BAR, DOOR LATCH		T-0087-008
2	15	BAR, 1/4 x 5/8 x 3/4 LG	STL	T-A057-015
1	16	BAR 1/4 x 1 x 20.25 LG	STL	T-A057-016
1	17	GUARD		T-0087-009
2	18	GUARD ENDS #14 x 1.25 x 1.38	SHT STL	T-A057-018
1	19	BAR 1/4 x 1 x 5.25 LG		T-A057-019
2	21	EXP METAL #16 x 19 x 24	EXP METAL	T-A057-021
1	22	EXP METAL #16 x 17.5 x 68	EXP METAL	T-A057-022

BILL OF MATERIAL - T-A001-502



USE HOLE AS TEMPLATE  
1/2 DIA. 4 THRU HOLES.



PROJECT NO. 51

D. N. R. EQUIPMENT & TRAINING CENTER  
TOMAHAWK, WI.

DATE: 12-11-66

FOAMER ASSEMBLY

W. HINGEL, CIVIL

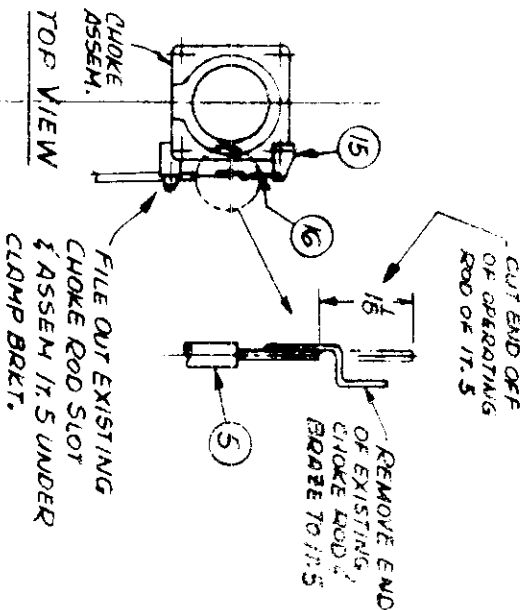
ISSUE: 1 OF 1

1598

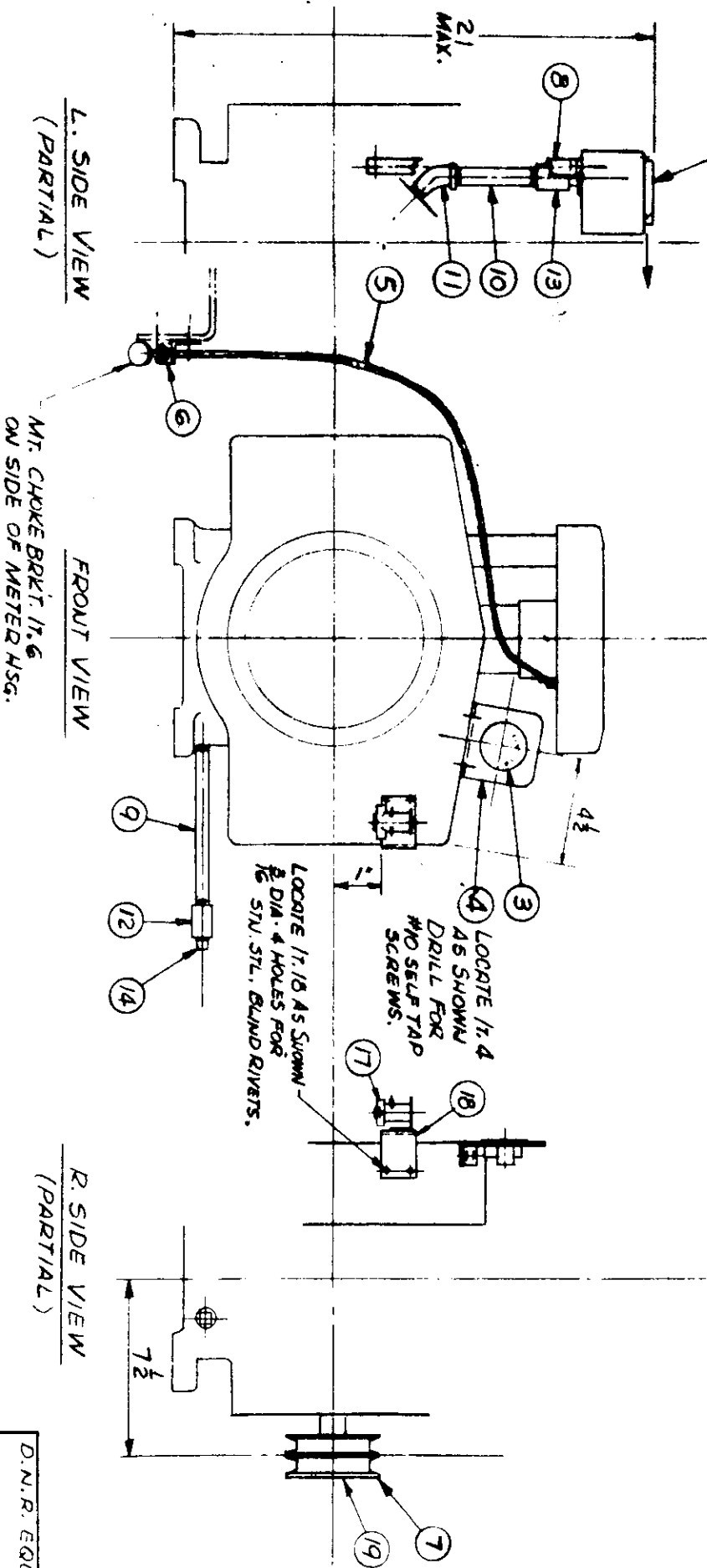




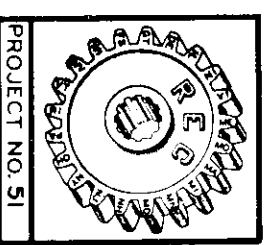
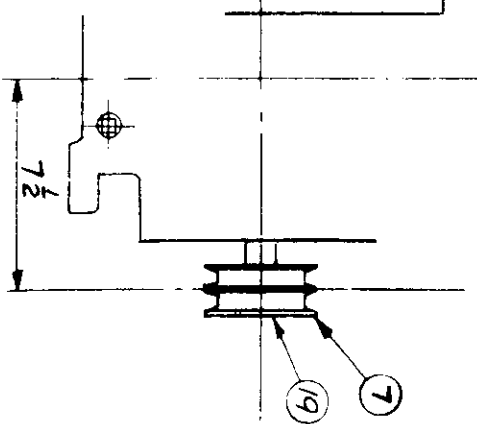
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1	ENGINE RE-MACH. FOR FORM UNIT		DWG T-C013	561
2	ENGINE DRING STRATION GALL 18HP	2-CVL.		
3	AMMETER 30-0-30 D.C. MICHRO MG-1		T-C005 002	.2
4	METER BRKT.			
5	CHOKE CABLE		T-C005 007	.1
6	CHOKE BRKT.			
7	PULLEY 2" DIA. 2 GROOVES AND 1/4" BORE		T-C005 004	.5
8	EXHAUST SUPPORT		T-C013 009	
9	3/4" NPT X 7/8 LG PIPE SCH. 40 (TWO BOW ENDS)	GALL. STL.	T-C013 010	
10	3/4" NPT X 2 1/2 LG PIPE SCH. 40 (TWO BOW ENDS)	GALL. STL.	T-C013 010	
11	3/4" STREET ELBOW 45°			
12	3/4" NPT COUPLING			
13	3/4" NPT COUPLING			
14	3/8" NPT PLUG		T-C005 008	.1
15	CHOKE SPRING BRKT.		T-B004 002	.1
16	CHOKE SPRING			
17	SOLENOID 12VDC		T-C005 010	
18	SOLENOID MTG BRKT.		T-C013 019	
19	1/4" X 1/4" X 1/4" LG KEY	KEY STOCK	T-C014 401	
20	WIRING DIAGRAM			



RE-ASSEM. EXHAUST DEFLECTOR TO MOVE EXHAUST IN DIRECTION SHOWN.



R. SIDE VIEW (PARTIAL)



PROJECT NO. 51  
D.N.R. EQUIPMENT & TRAINING CENTER  
TOMAHAWK, WI.

DATE: 9-26-85  
APPROVED BY: RMK  
ENGINE, REMACHING FOR FORMER UNIT  
ISSUE: 02 T-C013-501

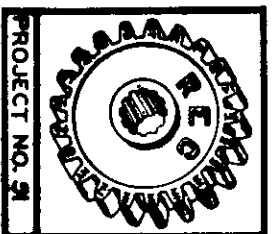
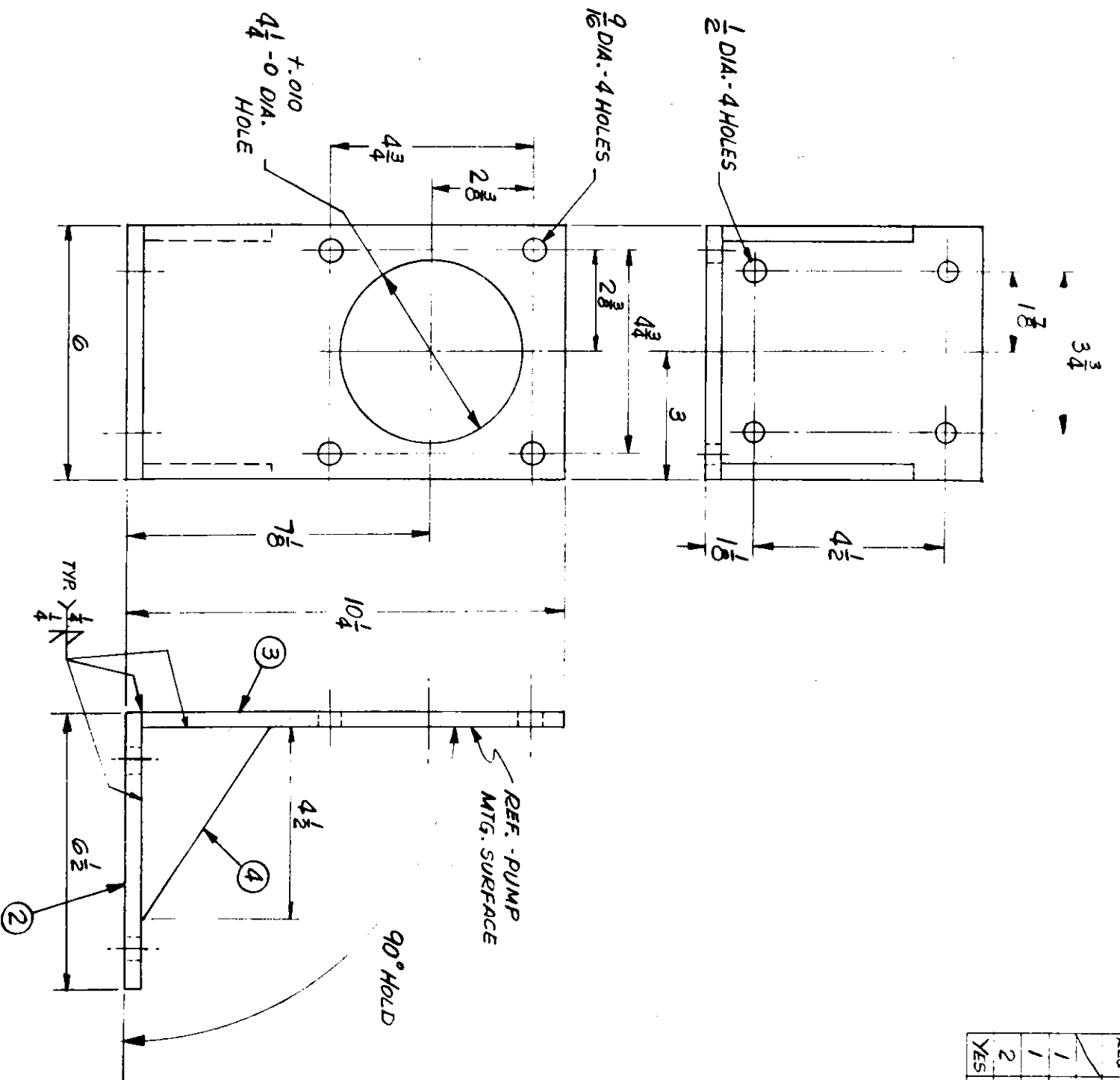
01 SEPT. 26, 1985  
02 JAN. 23, 1987

17 SWAS M.T.D.  
70 Compression





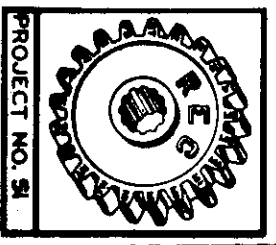
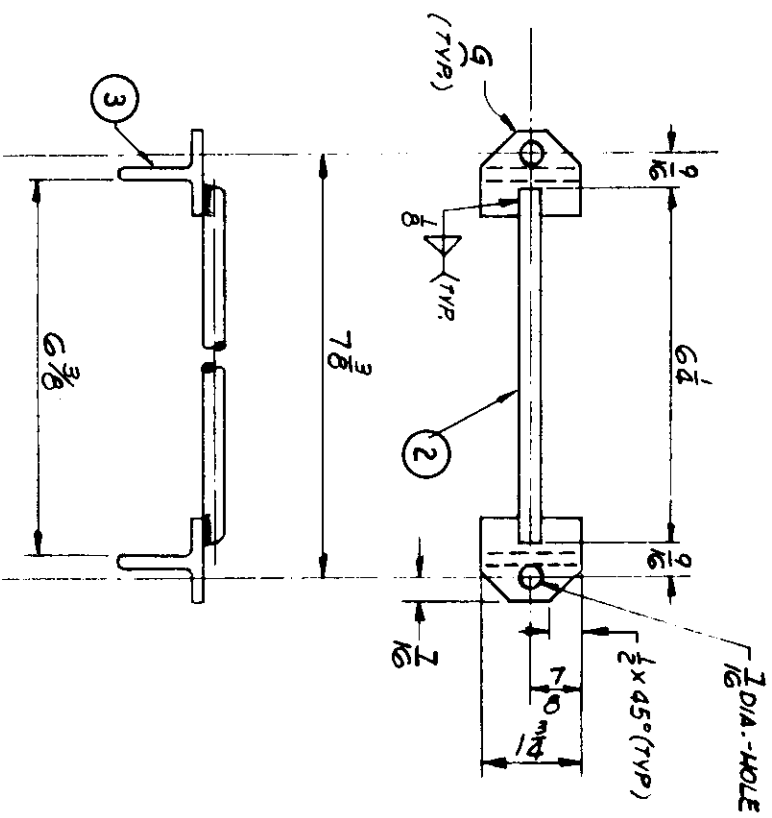
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1	MTG. BRKT. ASSEM.		T-C001	11.7
2	3/8 X 6 X 6 1/2 LG. BAR	A.R. STL.	501	4.1
3	3/8 X 6 X 9 7/8 LG. BAR		003	6.3
4	3/8 X 3 X 4 1/2 LG GUSSET PLATE		004	1.3
5	PAINT SPEC.			



TITLE		PROJECT NO. 51	
MOUNTING BRACKET FOR FOAMER PUMP		PROJECT NO. 51	
DATE	SCALE	DWG	ISSUE
AUG. 9, 1965	1" = 1"	T-C001-501	01
DESIGNED BY	APPROVED		
RMK 8-9-65			
DRAWN BY		SCALE	
RMK 8-9-65		1" = 1"	
TOL. DIM. ± 1/16		SCALE 1" = 1"	
ANG. 1/2°			
DRAWN BY		SCALE	
RMK 8-9-65		1" = 1"	
DATE		SCALE	
AUG. 9, 1965		1" = 1"	



PKG NO.	ITEM	DESCRIPTION	MATL	PART NO DWG	MK	EST MT.
1	1	BATTERY MOUNTING BRACKET		T-C005	501	.7
2	2	3/8 DIA. ROD X 6 1/4 LG.	H.R. STL.		002	.2
3	3	1 1/2 X 1 1/2 TEE X 1 3/4 LG.	STL.		003	.5
4	4					
5	5					
6	6	PAINT		T-A032	702	



D.N.R. EQUIPMENT & TRAINING CENTER  
TOMAHAWK, WI.

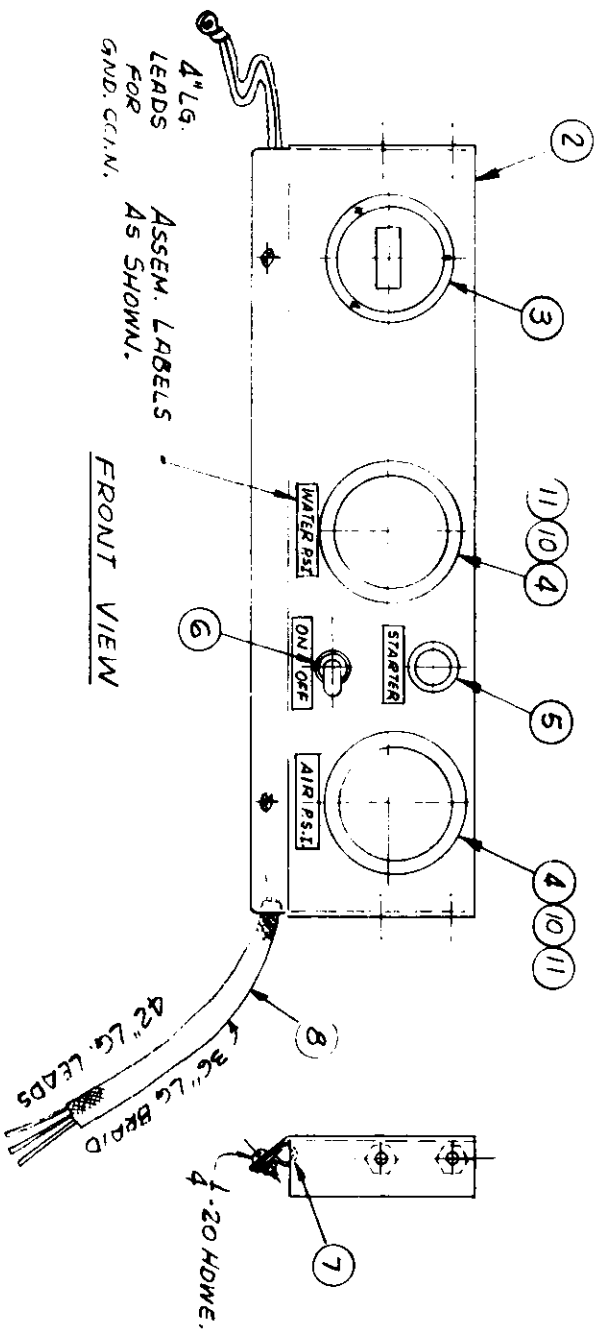
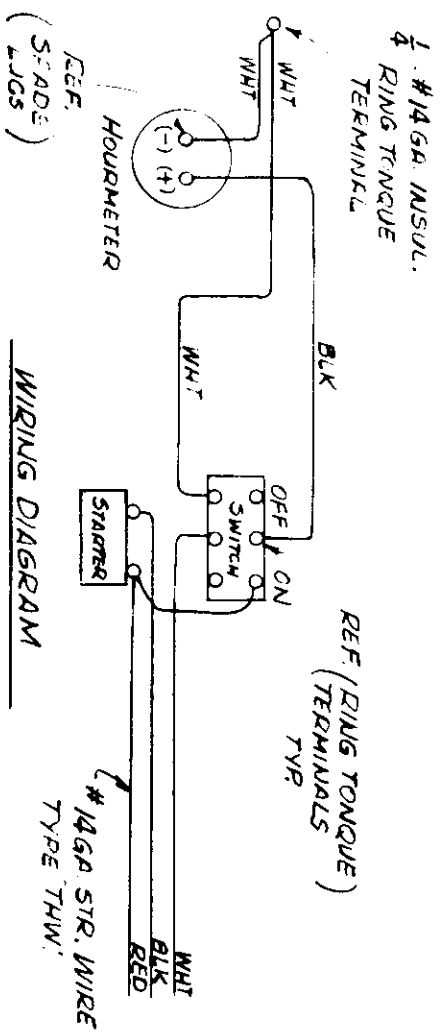
APPROVED BY: *RMK*  
DRAWN BY: *RMK*

SCALE:  $\frac{1}{2}'' = 1''$   
DATE: 1-26-87

BATTERY MOUNTING BRACKET

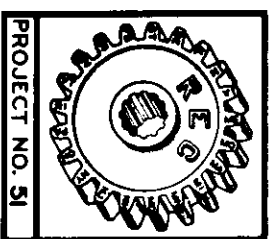
ISSUE: 01  
DRAWING NUMBER: T-C005-501

JAN. 26, 1987

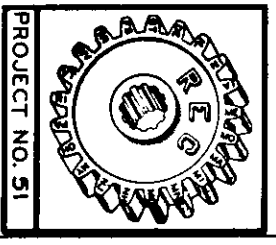
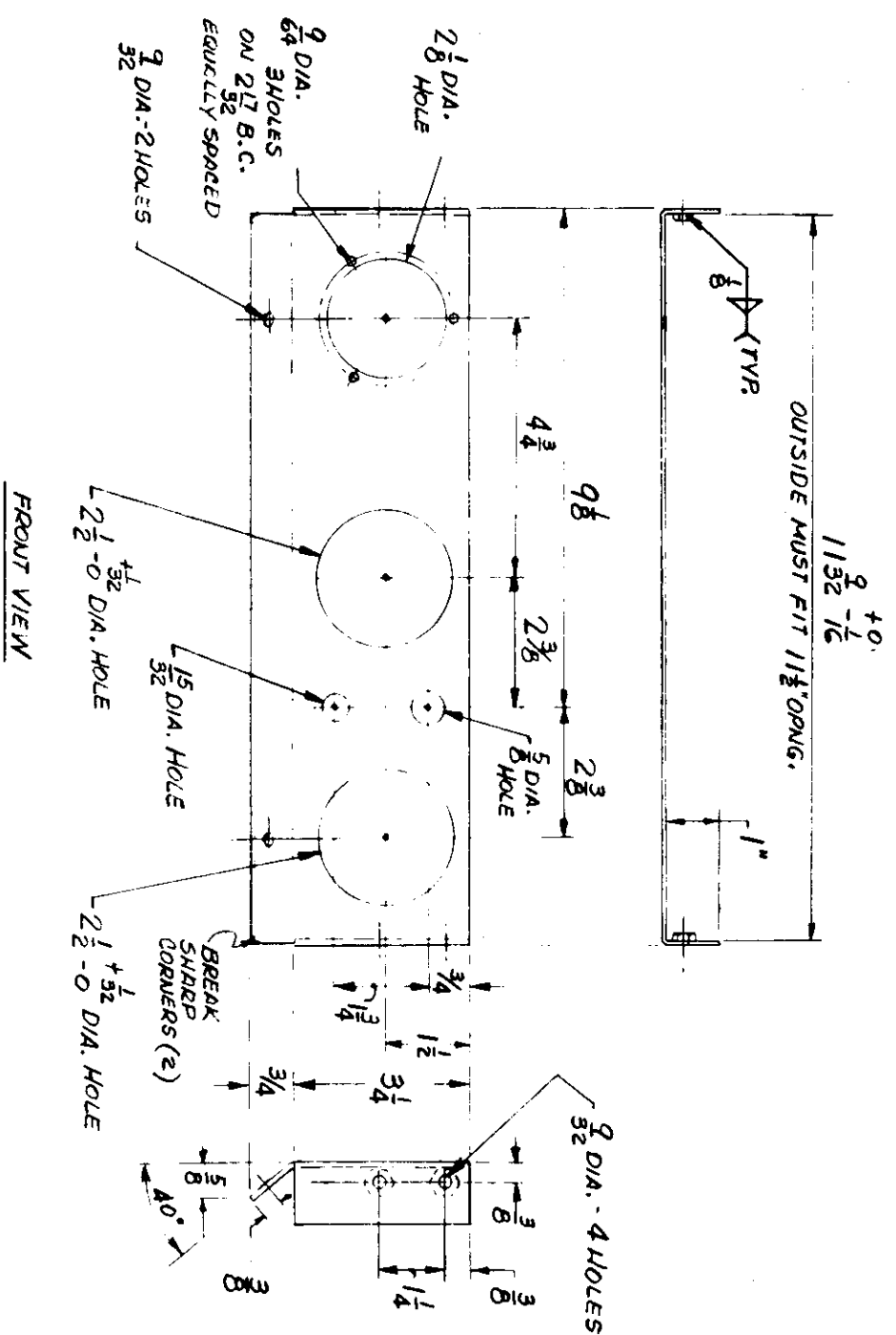


REQ. QTY.	DESCRIPTION	MATERIAL	PART NO.		EST. WT.
			DWG	MK	
1	INSTRUMENT PANEL		T-C007	501	4.0
1	PANEL		T-C006	501	1.7
1	HOURMETER	HOBBS		15001-2	
2	LIQUID FILLED GAUGE	ASCROFT		100084L	
1	PUSHBUTTON W/BOOT	NIEHOFF		UN-1455	
1	SWITCH 2PDT W/BOOT	McGILL		0121-0003	
2	5/16" ID x 9/32" HOLE INSUL. TUBING CLAMP				
1	1/2" ID x 42 LG TUBING LOOM				
9	WIRE & TERMINALS - SEE WIRING DIAGRAM				
2	MTG. BRACKET		T-C005	009	
2	SPECIAL NUT		T-B004	003	

01	AUG. 13, 1985	D. U. R. EQUIPMENT & TRAINING CENTER TOMAHAWK, WI.	TITLE INSTRUMENT PANEL FOR FOAMER
DRW.	RMK B-13-85	APPVD.	DWG. T-C007-501
			MK 01
			ISSUE



REQ	ITEM	DESCRIPTION	MATL.	PART NO.			EST
				DWG	MK	NR	
	1	PANEL FOR INSTR.		T.0006	501	1.7	
1	2	#12 GA. (.1046) X 4 1/2 X 13 3/8 LG SHEET	H.R. STL.		1	002	1.7
2	3	1/4 - 20 UNC - 28 HEAVY HEX NUT	STL.				
YES	4	PAINT SPEC. (NO PAINT ON THDS.)					

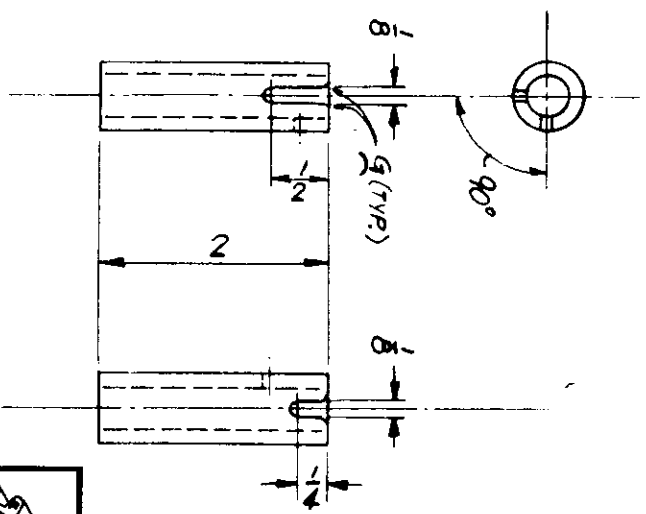
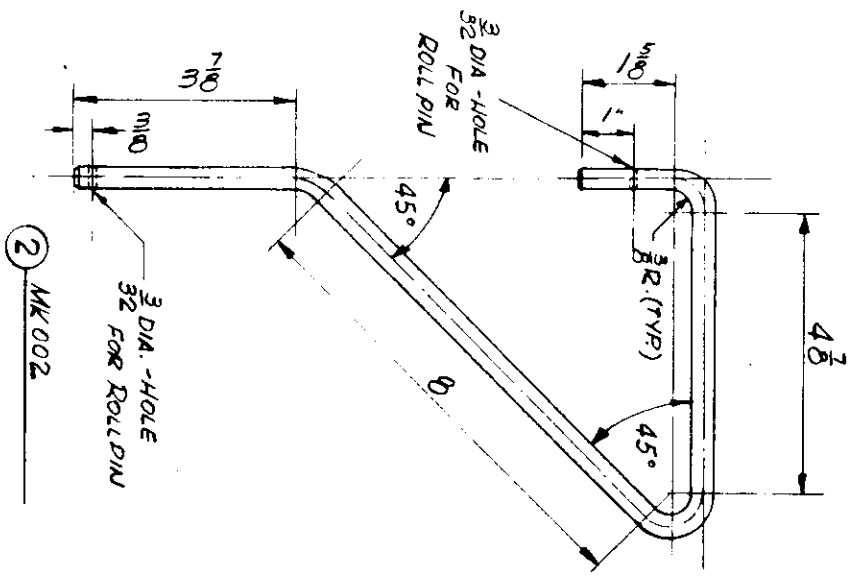
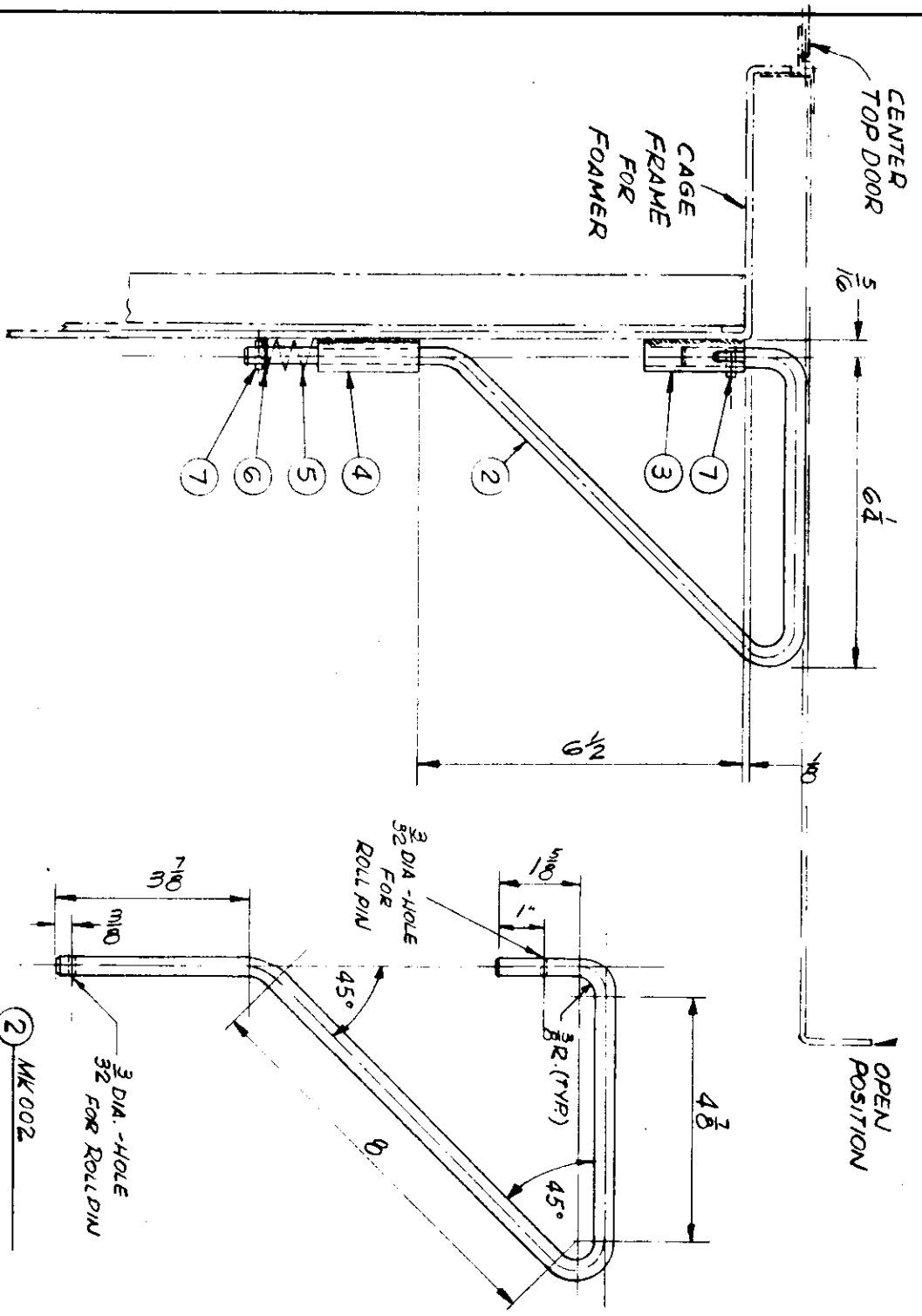
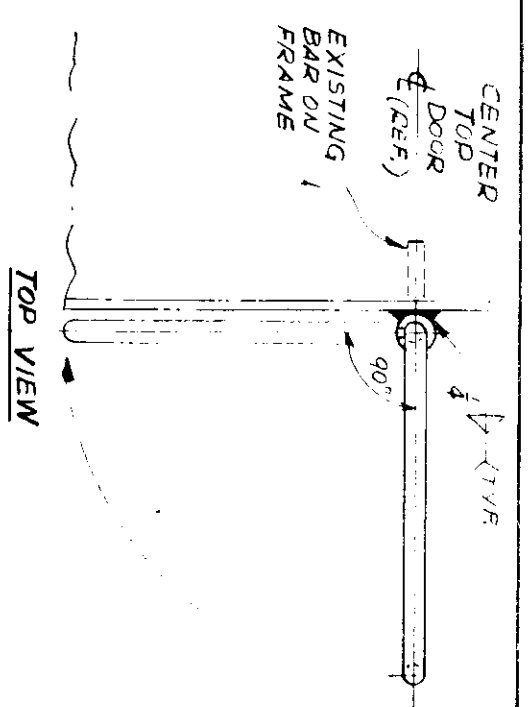


PROJECT NO. 51

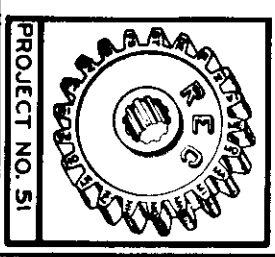
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BY	D.M.R. EQUIPMENT & TRAINING CENTER TOMAHAWK, WI.	SCALE	$\frac{3}{8} = 1$
DRAWN	RMK 8-13-85	APPROV.	
DWG	T-C006-501	ISSUE	01



MK 501	ITEM	DESCRIPTION	MATL	PART NO. DWG	MK	EST MT
	1	DOOR REST FOR FOAMER			601	
	2	RD. BAR, 3/8 DIA. X 21" LG.	A.R. STL.	T-CO49	002	
	3	PIPE 3/8" SCH 40 X 2' LG.			003	
	4	PIPE 3/8" SCH 40 X 2' LG.			004	
	5	SPRING - 7/16 ID X 1/2 LA WIRE	STN STL		005	
	6	WASHER - DRILL TO 19/32 I.D. 1/4" STD.	STL		006	
	7	ROLLPIN, 3/32 X 3/8" LG.			006	
	8					
	9					
	10					
	11					
	12					



SIDE VIEW



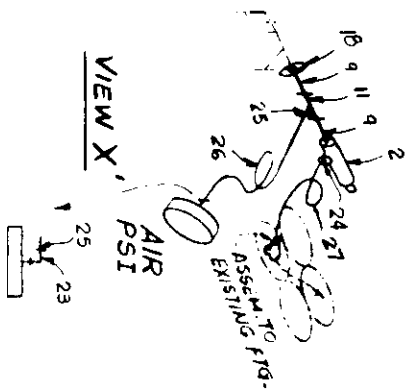
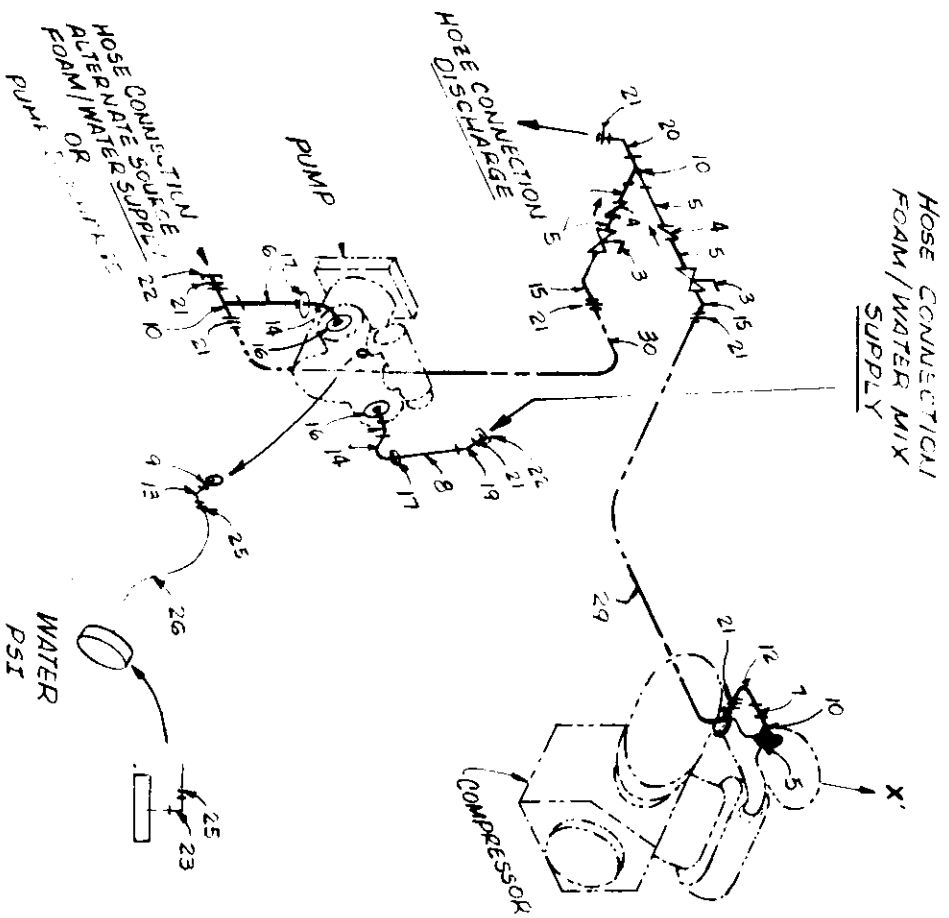
PROJECT NO. 51

D.N.D. EQUIPMENT & TRAINING CENTER  
TOMAHAWK, WI.

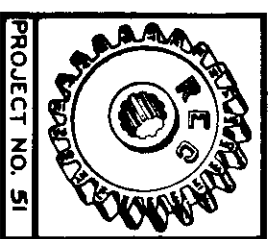
SCALE: 1/2" = 1"  
DATE: 1-15-87

APPROVED BY: [Signature]  
DRAWN BY: RMK  
REVISIONS

JAN. 16, 1987  
DRAWING NUMBER: TCO49-601



QTY	ITEM	DESCRIPTION	MATL.	PART NO.	EST.
1	1	PLUMBING SYSTEM ASSEM.		T-0004 601	4.5
1	2	BALL TYPE UNLOADER 150PSI MAX. 1/2" NPT TYPE NO. 9	BRASS		1.5
2	3	BALL VALVE 1"			5.0
2	4	CHECK VALVE 1"			4.5
5	5	PIPE NIPPLE 1" CLOSE			1.0
1	6	PIPE NIPPLE 1" X 3" LG.			.5
1	7	1" X 5 1/2" LG.			.8
1	8	1" X 8" LG.			1.1
3	9	1/2" CLOSE			.2
3	10	PIPE TEE 1"			1.5
1	11	PIPE TEE 1/2"			.2
1	12	PIPE ELBOW 1"			.5
1	13	PIPE ELBOW 1/2"			.1
3	14	PIPE STREET ELBOW 1 1/2"			3.0
2	15	PIPE STREET ELBOW 1"			1.4
2	16	REDUCING BUSHING 2 1/2-1 1/2			2.5
2	17	REDUCING BUSHING 1 1/2-1			2.0
1	18	REDUCING BUSHING 1-1/2			1.0
1	19	PIPE ELBOW 45° 1"			1.0
1	20	PIPE STREET ELBOW 45° 1"			1.0
7	21	1" NPT - 1" NPT ADAPTER, MALE-MALE	BRASS		3.5
2	22	1" NPT CAP W/O RAIN FEMALE	BRASS		1.2
2	23	1/2" NPT ELBOW 90° FEMALE	BRASS		.3
1	24	1/2" NPT TUBE COUPL. 1/4" O.D. (COOPER TUBE)	BRASS		.3
4	25	1/4" NPT TUBE CONN. 1/4" O.D. (PLASTIC TUBE)	BRASS		1.2
8 FT	26	1/4" O.D. AIR BRACKET TUBING SAE J584 TYPE 3A	PLASTIC		1.5
2 FT	27	1/4" O.D. TUBING	COPPER		.8
1	28	1/4" NPT DRAIN COCK (FOR PUMP)			.2
1	29	HOSE ASSEM. 4 1/2 LG.		T-A009 501	3.5
1	30	HOSE ASSEM. 4 1/2 LG.		T-A009 502	4.0
1	31				



D.N.R. EQUIPMENT  
& TRAINING CENTER  
TOMAHAWK, WI.

TITLE  
PLUMBING  
SYSTEM  
FOR FCAMEK

DATE  
SEPT. 25, 1985

SCALE  
1/8"

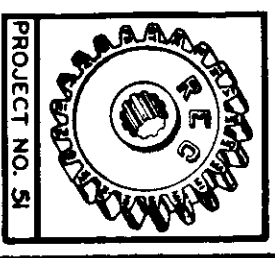
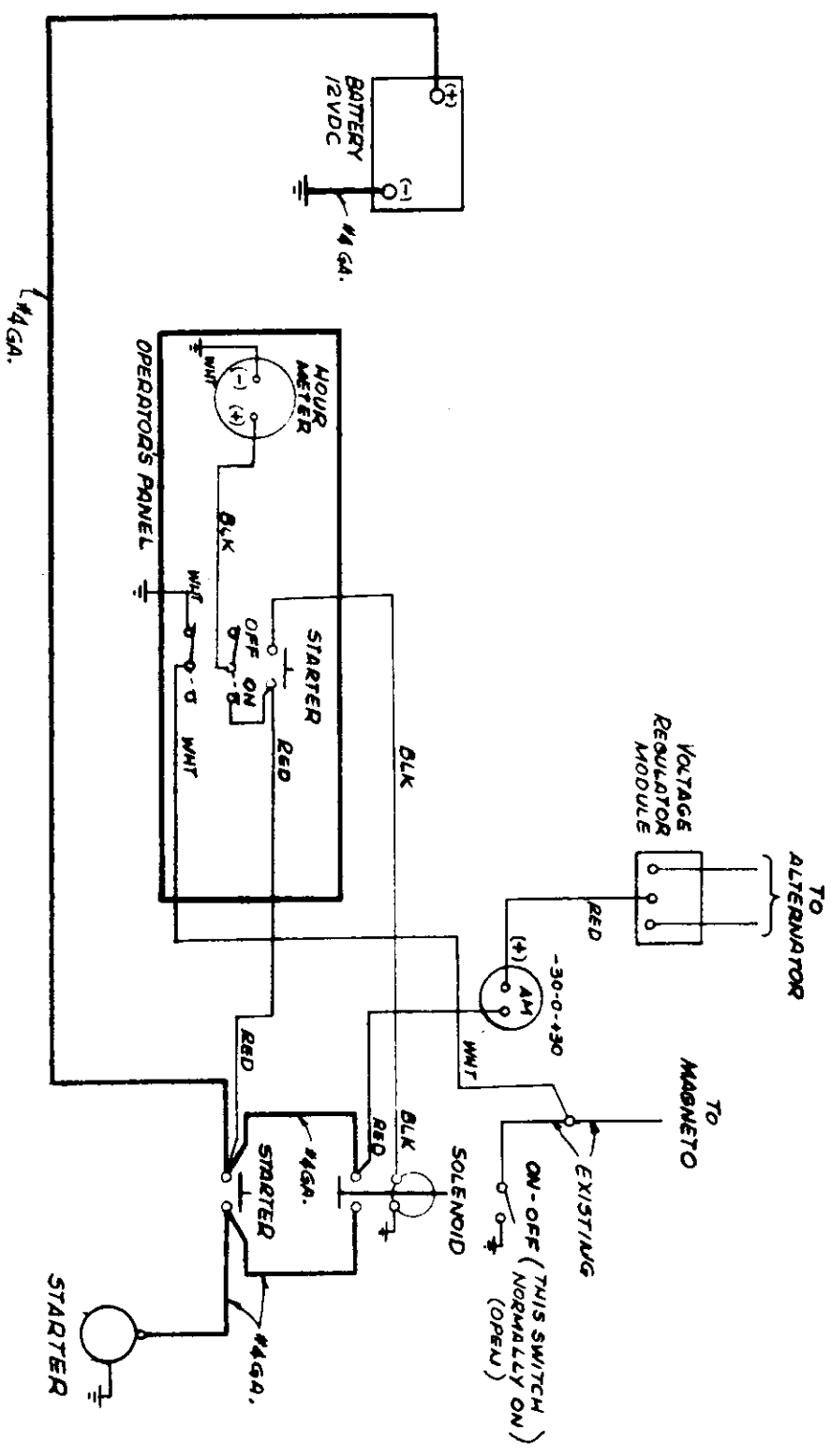
APP'D  
RMK 9-25-85

DWG. NO.  
T-C004-601

ISSUE  
01

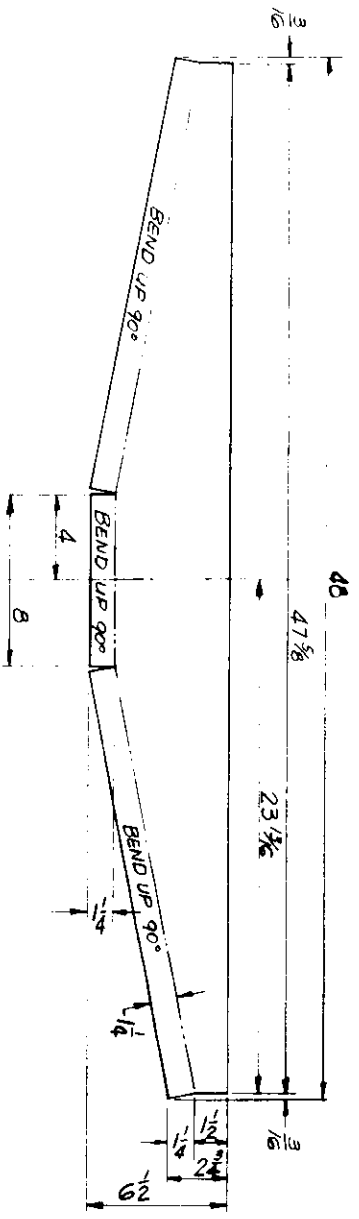
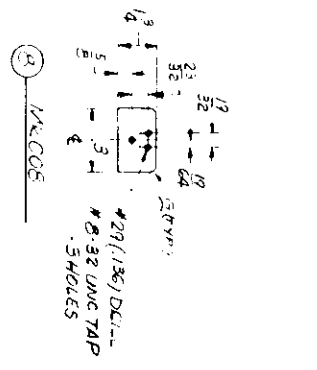
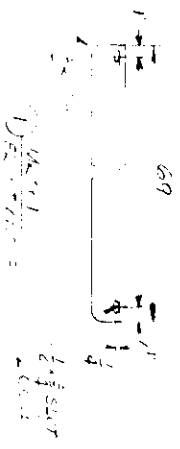
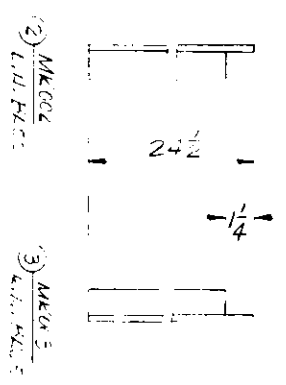
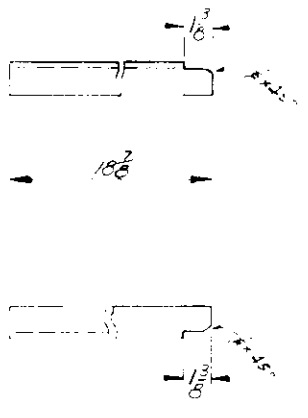
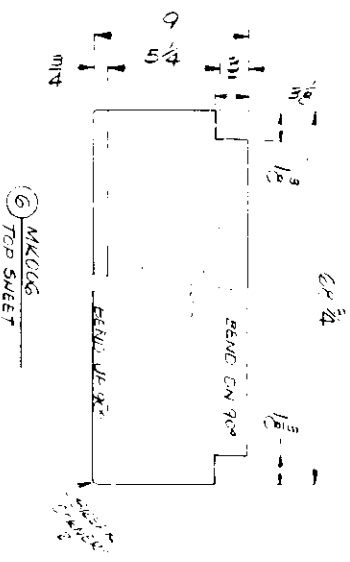


NOTE: WIRING TO BE: CONTROL . #16 AWG STRANDED THW . 75°C . DATED .  
 BATTERY #4 AWG BATTERY CABLE .  
 REMOVE PAINT WHEN CONNECTING GROUNDS TO FRAME .

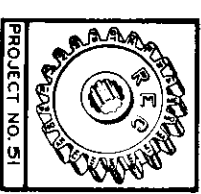


01	SEPT 27, 1985
D.N.R. EQUIPMENT & TRAINING CENTER TOMAHAWK, WI.	
SCALE: NTS	DRAWN BY: DMK
DATE: 9-27-85	REVISOR:
WIRING DIAGRAM FOR FORMER UNIT	
ISSUE	DRAWING NUMBER
01	T-COM-401





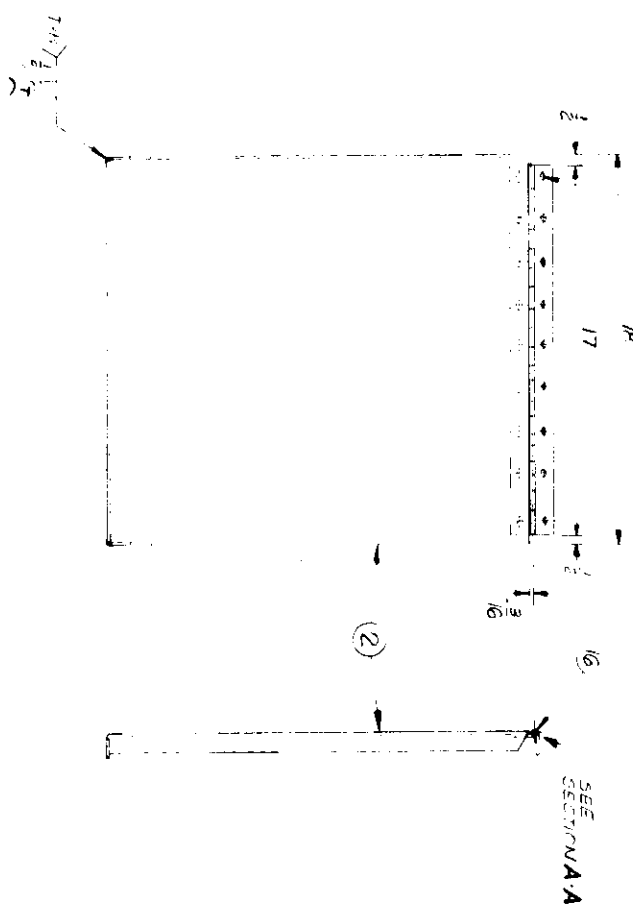
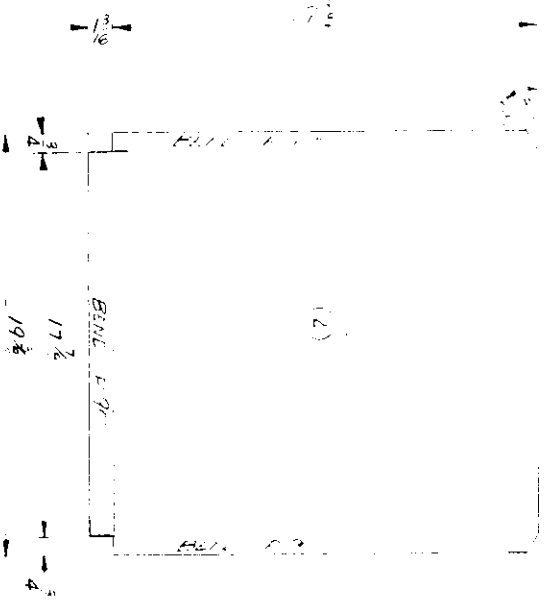
QTY	DESCRIPTION	MATL.	PART NO	EST
1	ANGLE 1 1/2 x 1 1/2 x 1/8 x 9 LG.	H.R. STL.	T D087	001 13.7
1	2			002 4.7
1	3			003 4.7
1	4			004 2
1	5			005 2
1	6			006 24
3	7			007 2
2	8			008 4
1	9			009 5.8
10				
11				
12				
13				
14				
15				
16				
17				



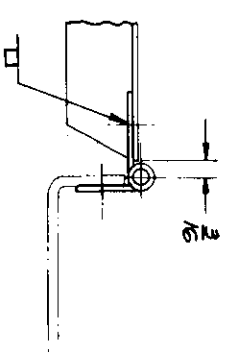
PROJECT NO. 51  
D.N.R. EQUIPMENT & TRAINING CENTER  
TOMAHAWK, WI.

SCALE 1/8" = 1"  
DATE 1-12-87  
DETAILS FOR CAGE  
FOR FORMER

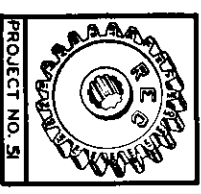
JAN 12 1987  
ISSUE NO. 01  
17-0087-009



QTY	UNIT	DESCRIPTION	MATL.	PART NO.	EST
				DWG	MT.
1	1	HINGED DOOR FOR FOAMER	A.R. STL.	T-DOOR	503
2	2	SHEET METAL (STD.) 1/8" X 19 3/8" X 20 1/2"			002 8.3
1	1	X 20 1/8 X 25 1/2			003 11.6
1	1	X 20 1/8 X 29			004 12.2
2	2	X 2 X 20			005 .8
2	2	X 2 X 32 1/4			006 1.4
1	1	X 2 X 35 3/4			007 1.5
1	1	X 2 X 28 3/4			008 1.2
1	1	X 2 X 3			009 .1
1	1	X 2 X 5			010 .2
1	1	X 2 X 3			011 .1
1	1	X 2 X 5			012 .2
1	1	X 4 X 5			013 .4
1	1	EXP. METAL (STD.) 1/8" (1/2) X 19 1/2 X 31 3/4 LG.			014 3.6
1	1	X 19 1/2 X 35 1/4 LG.			015 4.0
1	1	HINGE 2" WIDE 3/16" DIA. .067 THK X 17 LG.	SM. STL.		016 .8
1	1	X 22 LG.			017 1.1
1	1	X 26 LG.			018 1.2
3	3	HINGE HOLE (FEMALE)		T-BOAR	503 .4
1	1	ED. BAR 3/8 DIA. X 7 LG.	A.R. STL.	T-DOOR	020 .2
1	1	ED. BAR 1/4 DIA. X 3/8 LG.	A.R. STL.		021



SECTION A-A

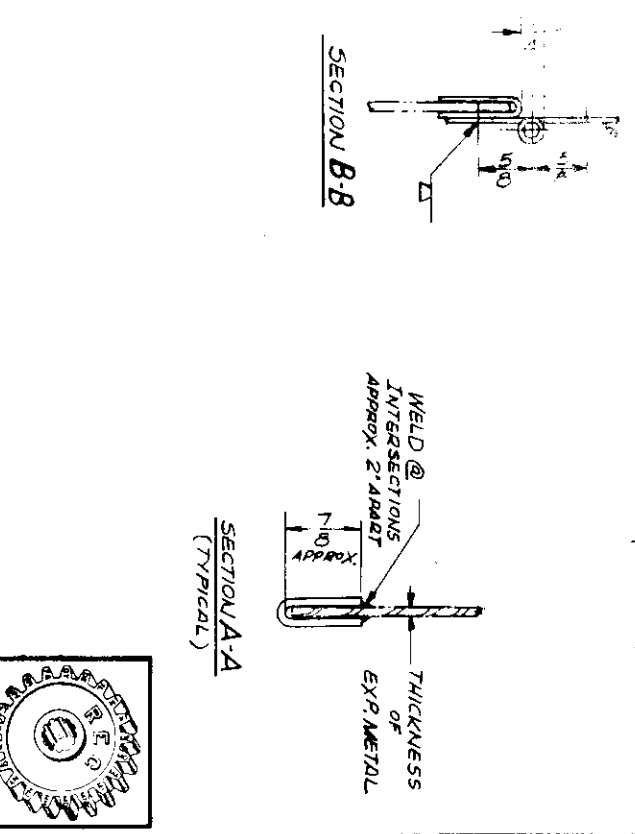
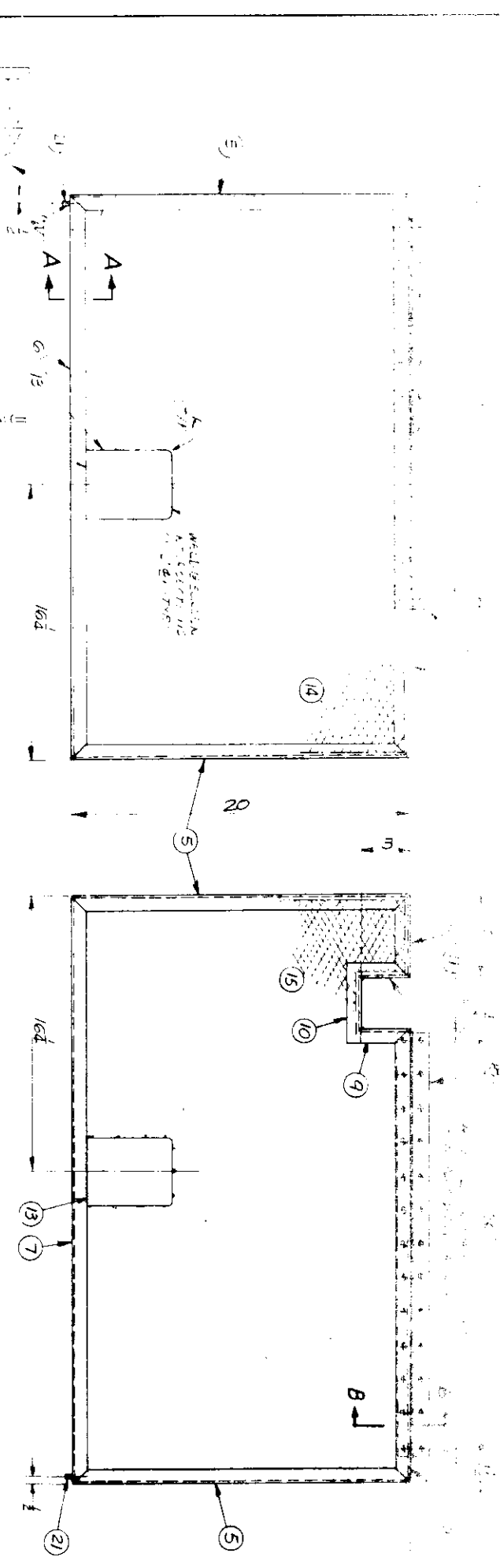
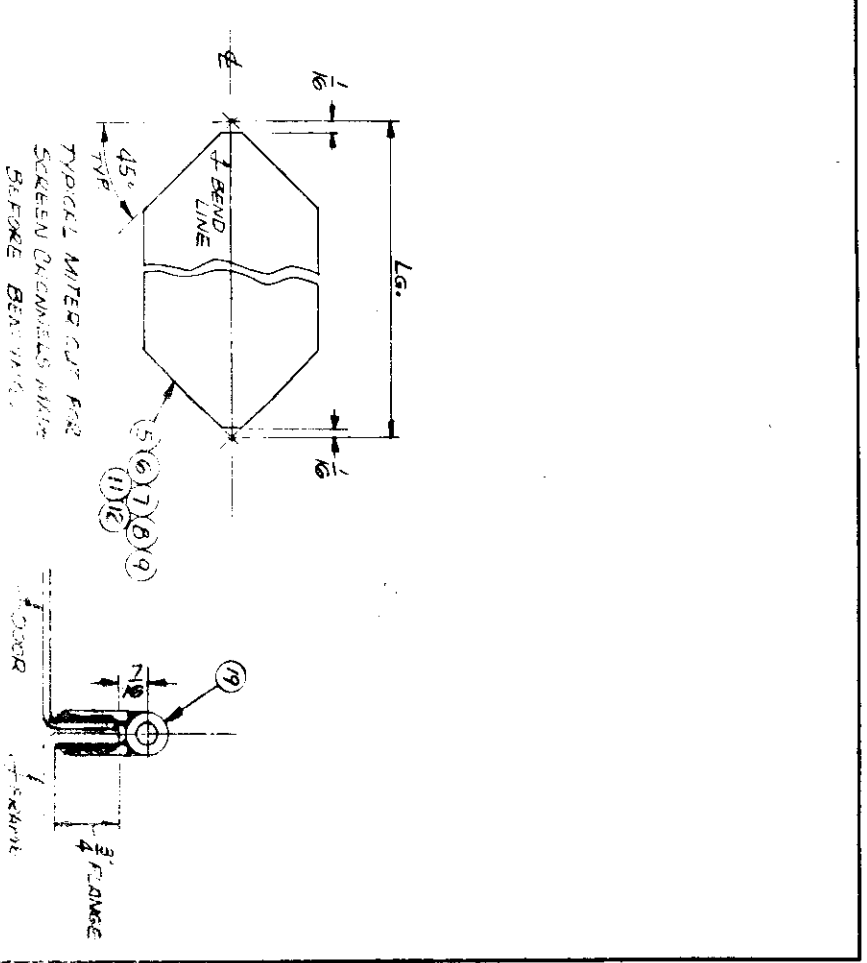
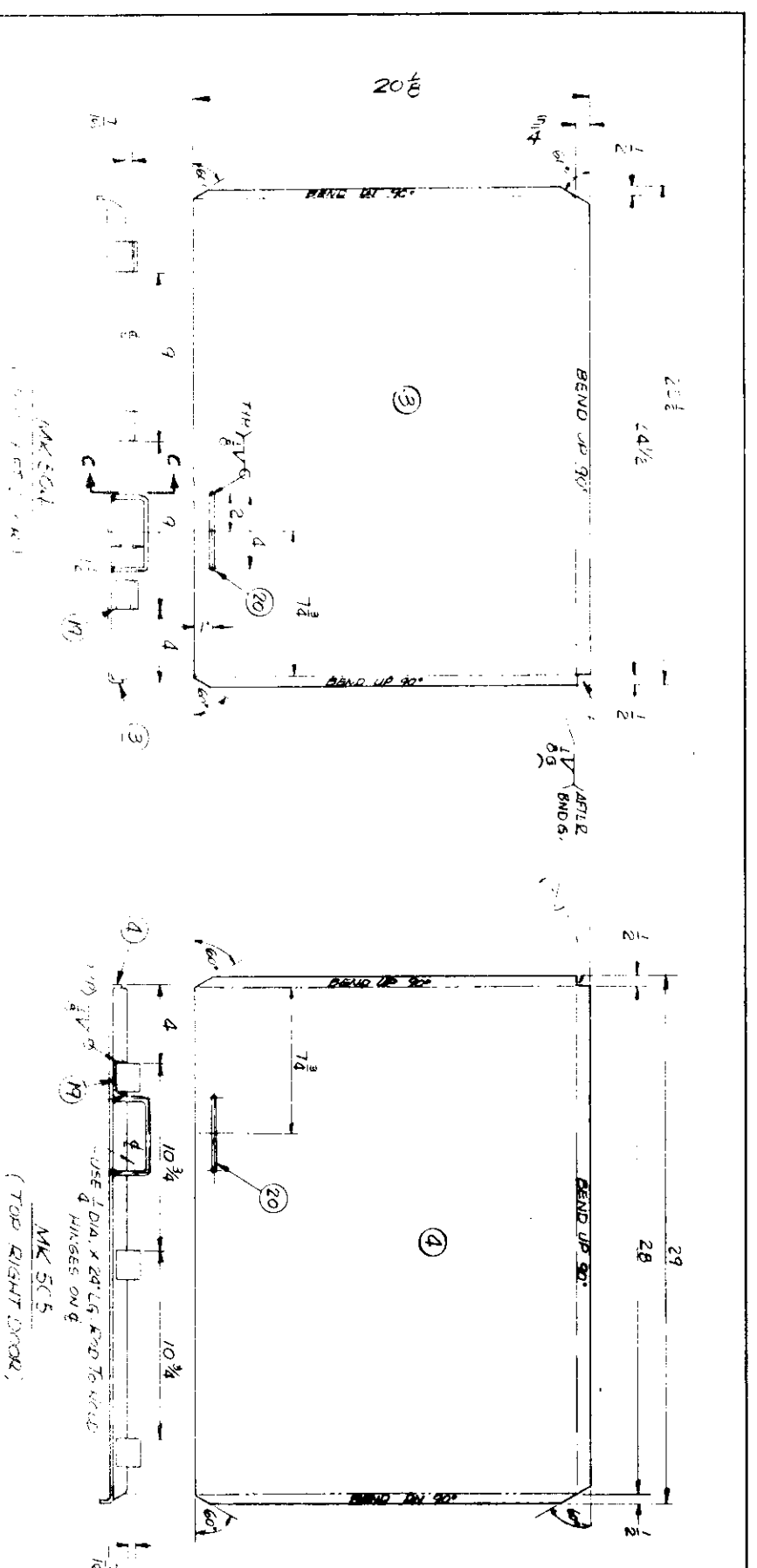


(CONTINUED ON SHEET 2.)

D. U. R. EQUIPMENT & TRAINING CENTER  
TOMAHAWK, WI.

SCALE 1/4" = 1'  
DATE 1-14-87  
DESIGNED BY D.H.K.  
CHECKED BY  
ISSUE 01  
REVISED 01

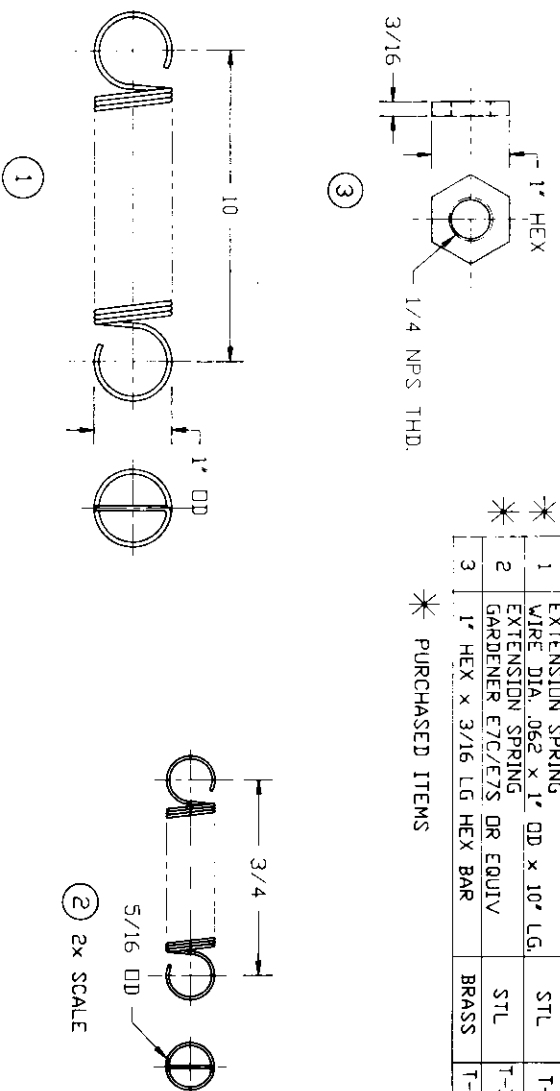
JAN 15, 1987  
PROJECT NO. 51  
D0088-505



PROJECT NO. 51  
 D.A.R. EQUIPMENT & TRAINING CENTER  
 TOMAHAWK, WI.  
 DATE 1-15-57  
 DRAWN BY R.L.K.  
 CHECKED BY M.L.K.  
 DATE 1-15-57  
 PROJECT NO. 51

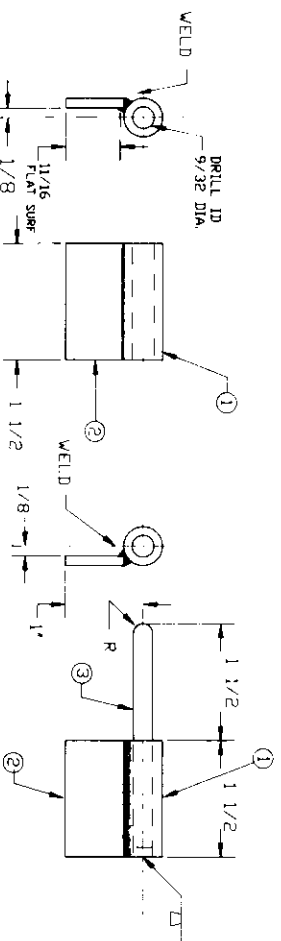
ITEM	DESCRIPTION	MAT'L	DRAW. NO.
1	EXTENSION SPRING WIRE DIA. .062 x 1" OD x 10" LG.	STL	T-B004-001
2	EXTENSION SPRING GARDENER E7C/E7S OR EQUIV	STL	T-B004-002
3	1" HEX x 3/16 LG HEX BAR	BRASS	T-B004-003

\* PURCHASED ITEMS



REC PROJECT #51  
WISC. FOAM MODULE  
DRAWING NO. T-B004-003  
SCALE FULL

REQ	S03	S02	S01	DESCRIPTION	MAT'L
1	1	1	1	TUBE 1/2" OD x 1/8" WALL	HR. STL
1	1	1	1	STRIP 1/8 x 3/4 x 1-1/2 LG	HR. STL
1	1	1	3	RD. BAR 1/4" DIA x 2-7/8 LG	HR. STL



HINGE HALF (FEMALE)  
T-B042-503

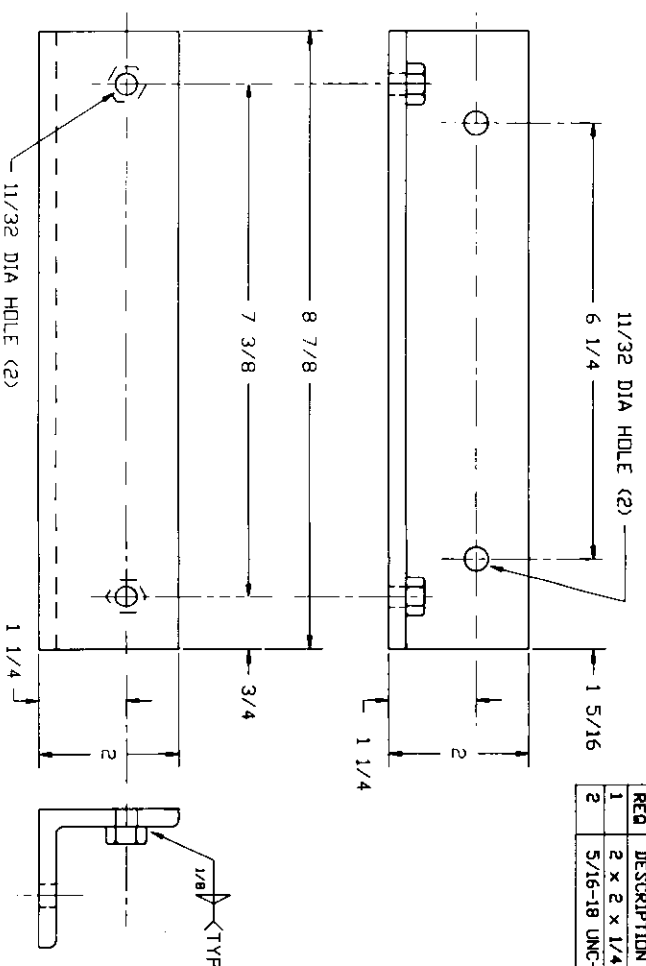
HINGE HALF R.H. (MALE)  
T-B042-501

HINGE HALF L.H. (MALE)  
T-B042-502

SAME AS T-042-501 EXCEPT  
PIN LOCATED OPPOSITE SIDE

REC PROJECT #51  
WISC. FOAM MODULE  
PIN HINGE  
DRAWING NO. T-B042-503  
SCALE FULL

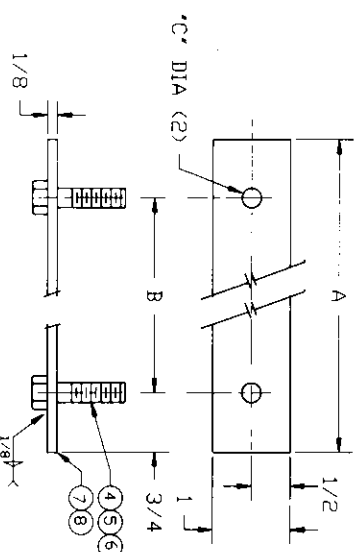
REQ	DESCRIPTION	MAT'L
1	2 x 2 x 1/4 ANGLE	A36
2	5/16-18 UNC-2B HEAVY HEX NUT	STL



REC PROJECT #51  
WISC. FOAM MODULE  
SLIDE ANGLE FOAM ENGINE  
DRAWING NO. T-B002-501  
SCALE NTS

PART NO	A	B	C
004	8-7/8	7-3/8	11/32
005	5-1/4	3-3/4	15/32

QTY.	REQ'D	ITEM	DESCRIPTION	MAT'L	PART NO.
1	1	1	SLIDE BAR ASSY 5/16 x 1	HR. STL	T-B001-501
2	2	2	SLIDE BAR ASSY 7/16 x 1-1/2	HR. STL	T-B001-502
1	1	4	SLIDE BAR ASSY 7/16 x 1-1/2	HR. STL	T-B001-503
1	1	5	1/8 x 1 x 8-7/8 LG BAR	HR. STL	T-B001-004
1	1	6	1/8 x 1 x 5-1/4 LG BAR	HR. STL	T-B001-005
2	2	7	5/16-18 x 1" LG HEX HD CAP SCR	STL	
7	7	7	5/16-18 x 1-1/2 HEX HD CAP SCR	STL	
8	8	8	7/16-14 x 1-1/2 HEX HD CAP SCR	STL	



REC PROJECT #51  
WISC. FOAM MODULE  
SLIDE BAR  
DRAWING NO. T-B001-503  
SCALE FULL

**MICHIGAN FOREST FIRE EXPERIMENT STATION**  
Roscommon Equipment Center Project

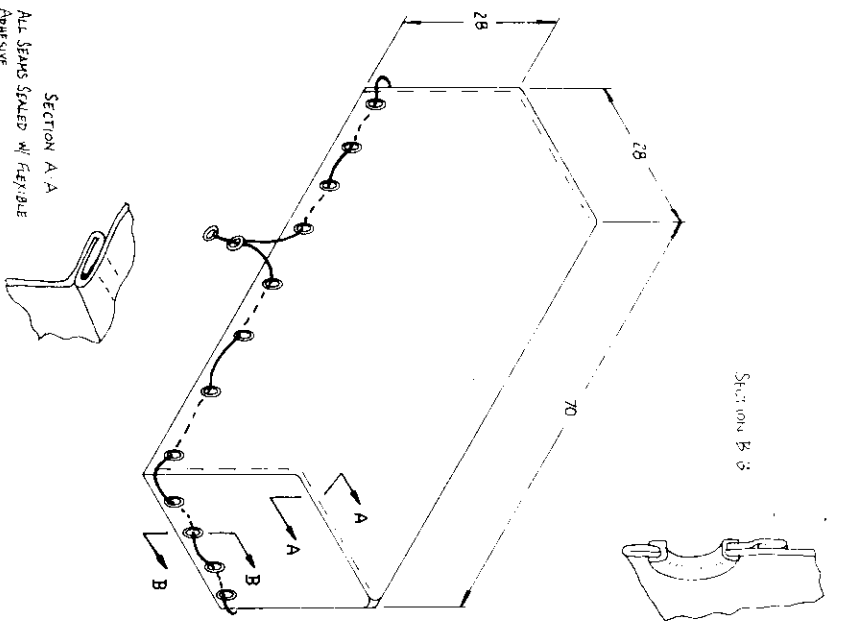
Wisconsin Foam Module

SCALE: 1/8" = 1"

DESIGNED BY: MNC, DNR  
DRAWN BY: BMJ  
CHECKED BY: MNC  
APPROVED BY: MNC  
REVISION: 1

DATE: 1985  
DATE: 5/87

PROJECT NO. 51



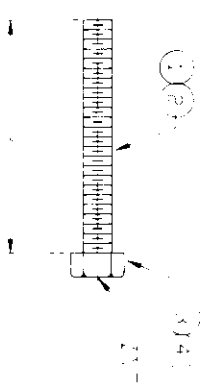
SECTION A-A  
ALL SEAMS SPALD W/ FLEXIBLE  
ADHESIVE

SECTION B-B  
DIMENSIONS ARE APPROXIMATE. ALL DIMENSIONS SHALL BE TO CENTER UNLESS OTHERWISE SPECIFIED.  
BRASS GRAPPLER IS - SIZE #4

SECTION A-A AREA  
3/8" DIA. NYLON BRATED FLEXIBLE HOSE WITH BRASS RINGS AT ENDS, ASSEMBLED AS SHOWN

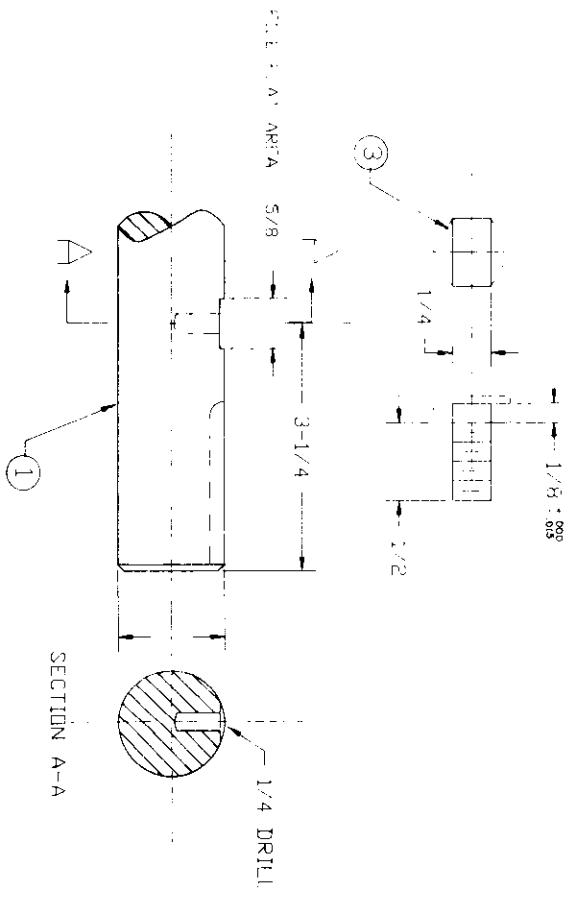
REC PROJECT #S1		SCALE
COVER, FOAM MODULE		NTS
DRAWING NO.	T-B026-402	

REQD	ITEM	DESCRIPTION	MATL
1	1	5/16-18 UNC-2 THRD RDD x 3-1/4	STL
1	2	3/8-16 UNC-2 THRD RDD x 3-5/16	STL
1	3	5/16-18 UNC-2 THRD RDD x 3-5/16	STL
1	4	3/8-16 UNC-2 HEX NUT	STL



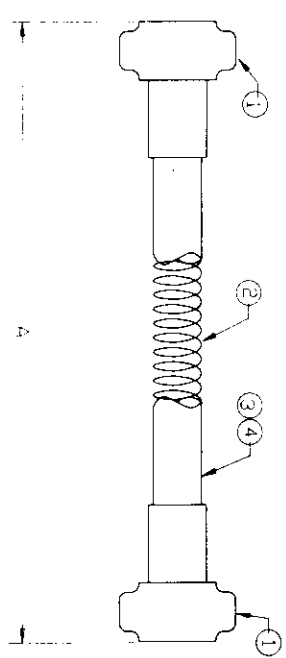
REC PROJECT #S1		SCALE
WISC. FOAM MODULE		NTS
DRAWING NO.	T-A015-501	

REQD	ITEM	DESCRIPTION	PART NO.
1	1	COMPRESSOR KELLIG-AMERICAN 4521VX	T-A015-501
1	2	1/4-20 x 1/2 LG HEX HD CAP SCREW	T-A014-001



REC PROJECT #S1		SCALE
COMPRESSOR SHAFT REMACHINING		NTS
DRAWING NO.	T-A015-501	

REQD	ITEM	DESCRIPTION	PART NO.
2	1	HOSE CONN. FEMALE 1" NH	T-B004-001
1	1	EXTENSION SPRING 10"	T-A009-004
1	3	HOSE 1" x 39 LG	T-A009-004
1	4	HOSE 1" x 43-3/4 LG	T-A009-005



NOTE:  
STRETCH SPRING ITEM 2  
TO LENGTH OF HOSE

REC PROJECT #S1		SCALE
WISC. FOAM MODULE		NTS
DRAWING NO.	T-A009-502	

**MICHIGAN FOREST FIRE EXPERIMENT STATION**  
ROSTOMON F. J. J. CENTER PROJECT

PROJECT NO. S1

WISCONSIN Foam Module  
T-A009-502, T-A007-502, T-A015-501

SCALE: 5/87  
DESIGNED BY: WISC. TRK  
CHECKED BY: GULLA  
DATE: 5/87

