

CALCULATION TITLE PAGE

*SEE INSTRUCTIONS ON REVERSE SIDE

A 5010 64 (FRONT)

CLIENT & PROJECT NIAGARA MOHAWK - NMP2		PAGE 1 OF 38
CALCULATION TITLE (Indicative of the Objective): VERIFICATION OF STRUCTURAL INTEGRITY OF THE MODIFIED MSIV ACTUATOR - SPEC. P303D		QA CATEGORY (✓) <input type="checkbox"/> I - NUCLEAR SAFETY RELATED <input checked="" type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> OTHER

CALCULATION IDENTIFICATION NUMBER				OPTIONAL WORK PACKAGE NO.
J. O. OR W. O. NO.	DIVISION & GROUP	CURRENT CALC. NO.	OPTIONAL TASK CODE	
12177.92	EMD	MS-2122		

* APPROVALS - SIGNATURE & DATE			REV. NO. OR NEW CALC NO.	SUPERSEDES * CALC. NO. OR REV. NO.	CONFIRMATION * REQUIRED (✓)	
PREPARER(S)/DATE(S)	REVIEWER(S)/DATE(S)	INDEPENDENT REVIEWER(S)/DATE(S)			YES	NO
Gary L. Stathes 2/9/86 & Nuyogi 9/9/86 (Pg 10, 13, 15)	Nuyogi 9/9/86 P. Teperov 10/24/86		0.			✓

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STATEMENT OF REVIEW
CALCULATION NUMBER MS-2122

This calculation has been reviewed in accordance with EMP 8.26-2 and was found to be adequate. The method of review was: (list the appropriate items)

- a. Review of Calculation
 b. Comparison with a similar previous calculation

1.	<u>Neyzi</u>	<u>9/9/86</u>	<u>b</u>	<u>0</u>
	REVIEWER	DATE	METHOD	REV.
2.	<u>Teperel</u>	<u>10/24/86</u>	<u>a</u>	<u>0</u>
	REVIEWER	DATE	METHOD	REV.
3.				
	REVIEWER	DATE	METHOD	REV.

The statement below applies to Nuclear Safety Related QA Category I calculations only.

This calculation has been INDEPENDENTLY reviewed in accordance with EMP 8.26-2 and was found to be adequate. The method of review was: (list appropriate items)

- a. Comparison with prequalified methods and assumptions
 (prequalified document number(s))

- b. Addressing the key questions appearing in EAP-5.3, and EAP-3.1 (latest revisions)

1.	INDEPENDENT REVIEWER	DATE	METHOD	REV.
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3.	INDEPENDENT REVIEWER	DATE	METHOD	REV.

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STONE & WEBSTER ENGINEERING CORPORATION
CALCULATION SHEET

▲ 9010.05

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REVISION STATUS TABLE

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OBJECTIVE

THE PURPOSE OF THIS CALCULATION IS TO DESIGN AND ANALYZE THE ADDED ACTUATOR COMPONENT SUPPORTS DUE TO MSIV MODIFICATIONS, AND TO VERIFY THE STRUCTURAL ADEQUACY OF THESE SUPPORTS DUE TO DEAD WEIGHT, HYDRODYNAMIC, AND SEISMIC LOADS. THIS IS NECESSARY TO ENSURE THAT DAMAGE OF THE MSIV OPERATOR WILL NOT OCCUR UNDER THE ABOVE STATED LOAD CONDITIONS.

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ASSUMPTIONS

1. CONSERVATIVELY, THE ACCUMULATOR IS ASSUMED TO BE SIMPLY SUPPORTED.
2. ALL OTHER ASSUMPTIONS ARE STATED IN THE BODY OF CALCULATION

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METHOD

HAND CALCULATION IS PROVIDED TO DETERMINE MAXIMUM STRESSES IN SELECTED (GOVERN) MEMBERS AND THE RESULTS ARE COMPARED TO THE ALLOWABLE STRESSES.

ALL OTHER STRUCTURAL MEMBERS HAVE BEEN QUALIFIED BY ENGINEERING JUDGEMENT

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DESIGN INPUT

DESIGN INPUT IS TAKEN FROM ATTACHMENTS TO
REF. #4 AND FROM REF. # 1. & REF # 2.

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REFERENCES

1. S&W CALCULATION MS-2006 REV 1 'GENERATION OF
ARS FOR MSIV AND SRV - UTILIZING THE AS-BUILT CONFIGURATION OF
THE MAIN STEAM SYSTEM' DATED 10/25/86 FILED IN EM-2
2. S&W CALCULATION MS-2121 REV 1
"HYDRAULIC ANALYSIS - MSIV" DATED 10/21/86 FILED IN EM-2
3. AISC MANUAL .. 8-TH EDITION.
4. E & DCR M 10030A (ATTACHMENT 1)
5. O.W. BLODGETT "DESIGN OF WELDED STRUCTURES"
THE JAMES F. LINCOLN ARC WELDING FOUNDATION
6. 1980 ASME BOILER AND PRESSURE VESSEL CODE,
ASME 7/1/80

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MATERIALS AND ALLOWABLES

HEX HEAD BOLTS:

ASTM A307 GR B [REF 3, SECT 4]

ALLOWABLE TENSION, $S_T = 20 \text{ KSI}$

ALLOWABLE SHEAR, $S_S = 10 \text{ KSI}$

SLOTTED HEX HEAD BOLTS:

ASTM A193 GR B7 [REF 6, SECT II, PART C]

$S_y = 105 \text{ KSI}$

$S_u = 125 \text{ KSI}$

ALLOWABLE TENSION, $S_T = 0.33 S_u = 41.25 \text{ KSI}$

ALLOWABLE SHEAR, $S_S = 0.22 S_u = 27.5 \text{ KSI}$

} [REF 3,
SECT 4]

STRUCTURAL SHAPES AND PLATES:

ASTM A36 [REF 3, SECT 5]

$S_y = 36 \text{ KSI}$

$S_B, S_T = 0.6 S_y = 21.6 \text{ KSI}$

$S_S = 0.4 S_y = 14.4 \text{ KSI}$

WELDS

E-70XX ELECTRODES [REF 6, SECT II, PART C]

$S_y = 60 \text{ KSI}$

$S_u = 72 \text{ KSI}$

FILLET WELD SHEAR ALLOWABLE; $S_A = 0.3 S_u = 21.6 \text{ KSI}$

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CONCLUSIONS

ALL ADDED STRUCTURAL COMPONENTS DUE TO MSIV
ACTUATOR MODIFICATION HAVE BEEN VERIFIED AND
FOUND TO BE ADEQUATE.

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RESULTS SUMMARY

MAXIMUM STRESSES (ACCUMULATOR SUPPORT)

1. $\frac{3}{8}$ " DIA BOLT

TENSION : $\sigma_T = 7452$ PSI [Pg. 15]

SHEAR : $\tau_s = 1218$ PSI [Pg. 15]

2. $\frac{1}{4}$ " DIA SLOTTED HEX HEAD BOLT

TENSION (DUE TO PRELOAD) : $\sigma_T = 78616$ PSI [Pg. 14]

SHEAR : $\sigma_s = 3373$ PSI [Pg. 14]

3. $\frac{3}{16}$ " THK X 4" WIDE STRAP

TENSION : $\sigma_T = 339$ PSI [Pg. 14]

4. WELDS

$\sigma_{MAX} = 2104$ PSI [Pg. 17]

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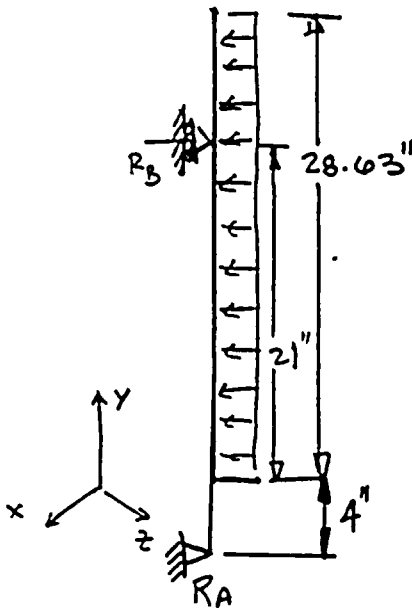
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12177.92	EMD / MECH	MS-2122-0		

Analysis:

1. Accumulator Supports:

Wt. of the accumulator = 101 lb. (Ref. 2)



Accumulator itself is very rigid.
From engineering judgement it has very high natural frequency. For conservatism peak ARS 'g' values are used. (Ref. 1)

$$g_y = 4.75 g$$

$$g_x = g_z = 4.1 g$$

$$R_B = \frac{101 \times 4.1 \times 1.414 \times 18.32}{25}$$

$$= 429 \text{ lb}$$

$$R_A = 157 \text{ lb}$$

$$\text{VERTICAL TENSION LOAD ON THE VERTICAL RESTRAINT} = 101 \times 3.75 = 379 \text{ lb}$$

Upper Support:

4 bolts carry $R_B = 429 \text{ lb}$

\therefore tension in each bolt = 107 lb

$3/8$ " bolt stress area = 0.078 in²

$\therefore \sigma = 1375 \text{ psi} < S_T - \text{O.K.}$

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STONE & WEBSTER ENGINEERING CORPORATION
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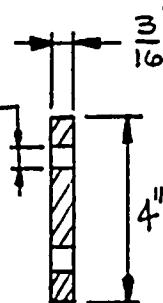
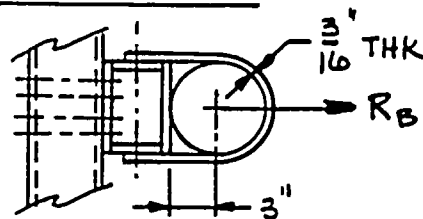
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ANALYSIS

UPPER SUPPORT (CONT'D)

$\frac{3}{16}$ " THK X 4" WIDE STRAP

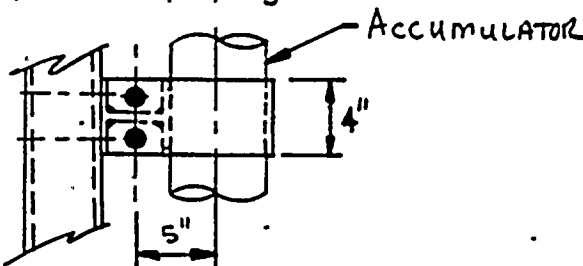
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TENSION AREA, A_T

$$A_T = .1875(4 - .625)$$

$$A_T = 0.633 \text{ IN}^2$$



TENSION LOADING

EACH SIDE OF THE STRAP TAKES $\frac{1}{2} R_B$ IN TENSION

$$\therefore \sigma_T = \frac{R_B}{2A_T} = \frac{429}{2(0.633)} = 339 \text{ PSI} < S_T \text{ O.K.}$$

ALL BENDING IS RESISTED BY ACCUMULATOR TOP BRACKET

$\frac{1}{4}$ " DIA SLOTTED HEAD BOLT - ASTM A193 GR B7

SHEAR

STRESS AREA = 0.0318 IN²

4 BOLTS RESIST SHEAR \therefore

$$\sigma_s = \frac{R_B}{4A_s} = \frac{429}{4 \times 0.0318} = 3373 \text{ PSI} < S_s$$

TENSION - DUE TO TORQUING (PRELOAD)

$$T = 0.2 F d$$

$$\therefore F = \frac{T}{0.2d} = \frac{125}{.2(.25)} = 2500 \text{ lbs}$$

$$\sigma_{TOR} = \frac{F}{A} = \frac{2500}{.0318} = 78316 \text{ PSI}$$

$\sigma_{TORQUE} < \sigma_{PRELOAD}$ O.K.

ALLOWABLE PRELOAD STRESS = $0.7 S_u = 87,500 \text{ PSI}$



1. The first part of the document discusses the importance of maintaining accurate records of all transactions. This is essential for ensuring the integrity of the financial data and for providing a clear audit trail.

2. The second part of the document outlines the various methods used to collect and analyze data. These methods include direct observation, interviews, and the use of specialized software tools. Each method has its own strengths and limitations, and they are often used in combination to provide a comprehensive view of the data.

3. The third part of the document describes the process of data analysis and the interpretation of the results. This involves identifying patterns, trends, and anomalies in the data, and then using statistical techniques to test hypotheses and draw conclusions. The final step is to communicate the findings to the relevant stakeholders in a clear and concise manner.

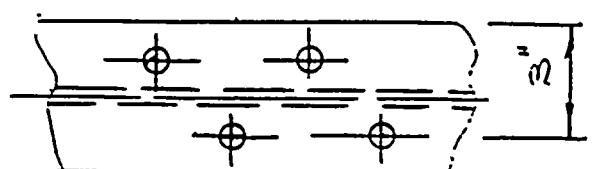
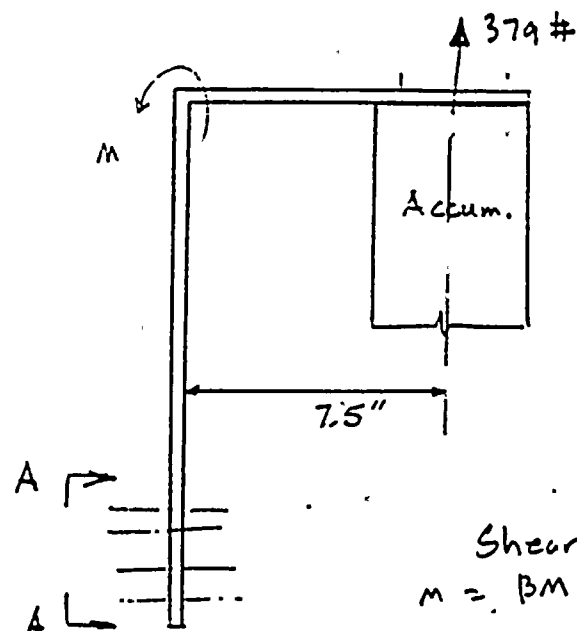


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SECT. A-A

3/8" DIA BOLT (CONT'D)

Shear per bolt = $379/4 = 95\#$
 $m = BM = 379 \times 7\frac{1}{2} = 2843 \text{ inlb.}$

Load on upper support bolt = $\frac{2843}{2 \times 3} = 474 \text{ lb}$

\therefore TOTAL TENSILE STRESS = $1375 + \frac{474}{0.078} = 7452 \text{ PSI} < S_T \text{ O.K.}$

SHEAR = $\frac{95}{0.078} = 1218 \text{ PSI} < S_S \text{ O.K.}$

Lower Support

LOAD IS ONLY 157 lb. BASED ON ENGINEERING JUDGEMENT, THIS SUPPORT IS STRUCTURALLY ADEQUATE. NO FURTHER ANALYSIS IS REQUIRED.

2. Pump-Motor Support :

Pump-motor assy weighs 50 lb which is less than original wt. of the solenoids. Therefore no further analysis is required.

Other structural parts are not analyzed but accepted based on engineering judgement.

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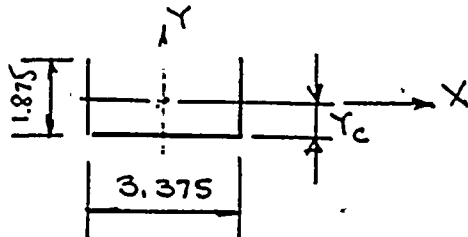
CALCULATION IDENTIFICATION NUMBER				PAGE <u>6</u>
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WELDS

A. UPPER SUPPORT

1. $\frac{3}{8} \times 3\frac{3}{8}$ PL. TO W4x13[#]

WELD PROPERTIES (TREATED AS LINE) - [REF. # 5]



$$Y_c = \frac{1.875^2 \cdot \frac{1}{2} \times 2}{2 \times 1.875 + 3.375}$$

$$= 0.49 \text{ IN}$$

$$A_w = 2 \times 1.875 + 3.375$$

$$= 6.875 \text{ IN}$$

$$S_{w_y} = bd + \frac{d^2}{6}$$

$$= 1.875 \times 3.375 + \frac{3.375^2}{6} = 8.2 \text{ IN}^2$$

$$S_{w_x} = \frac{d^2(2b+d)}{3(b+d)}$$

$$= \frac{1.875^2(2 \times 3.375 + 1.875)}{3(3.375 + 1.875)} = 1.9 \text{ IN}^2$$

$$J_w = \frac{(b+2d)^3}{12} - \frac{d^2(b+d)^2}{(b+2d)}$$

$$= \frac{(3.375 + 2 \times 1.875)^3}{12} - \frac{1.875^2(3.375 + 1.875)^2}{(3.375 + 2 \times 1.875)} = 16.5 \text{ IN}^3$$

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WELDS (CONT'D)

FORCES IN WELD

$$f_x = \frac{429}{6.875 \times 2} = 31.2 \text{ (lb/in)}$$

$$f_y = \frac{379}{6.875 \times 2} = 27.6 \text{ (lb/in)}$$

$$f_z = \frac{429}{6.875 \times 2} = 31.2 \text{ (lb/in)}$$

$$f_{b_y} = \frac{429 \times 5.5}{8.2 \times 2} = 144 \text{ (lb/in)}$$

$$f_T = \frac{379 \times 5.5 \times \sqrt{(1.875 - 0.49)^2 + \left(\frac{3.375}{2}\right)^2}}{16.5 \times 2} = 138 \text{ (lb/in)}$$

TOTAL FORCE IN WELD (CONSERVATIVE)

$$f_T = 31.2 + 27.6 + 31.2 + 144 + 138$$

$$= 372 \text{ (lb/in)}$$

MAX. STRESS IN WELD ($\frac{1}{4}$ " FILLET)

$$G_w = \frac{372}{0.25 \times 0.707}$$

$$= 2104 \text{ PSI} < S_A \quad \underline{OK}$$

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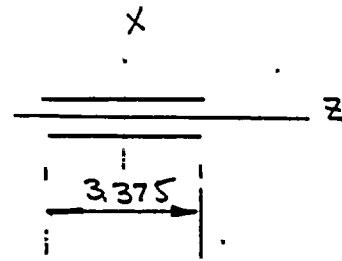
WELDS (CONT'D)

2 TOP. PLATE - TO - 3/8 x 3 3/8 PL

WELD PROPERTIES :

$$A_w = 4 \times 3.375 = 13.5 \text{ IN}$$

$$S_x = \frac{4 \times 3.375^2}{6} = 7.59 \text{ IN}^2$$



FORCES IN WELD

$$f_y = \frac{379}{13.5} = 28 \left(\frac{\text{lb}}{\text{IN}} \right)$$

$$f_{bx} = \frac{379 \times 5.5}{7.59} = 275 \left(\frac{\text{lb}}{\text{IN}} \right)$$

TOTAL FORCE IN WELD

$$f_{tw} = 275 + 28 = 303 \left(\frac{\text{lb}}{\text{IN}} \right)$$

MAXIMUM STRESS IN WELD (1/4" FILLET)

$$\sigma_w = \frac{303}{0.25 \times 0.707}$$

$$= 1714 \text{ PSI} < S_A \text{ OK}$$

ALL OTHER WELDS ARE OK BY ENGINEERING JUDGEMENT.

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STONE AND WEBSTER ENGINEERING CORPORATION
 ENGINEERING & DESIGN COORDINATION REPORT

PROJECT/CLIENT: NINE MILE POINT NUCLEAR STATION - UNIT 2 NIAGARA MOHAWK POWER CORPORATION

NO. 1: P309D REASON CODE: F EQUIP IC NO (S1/SVS CODE (S1): 2MSS*HYV6A,B,C,D*7A,B,C,D/2MSS/001.000

REFERENCE DOCUMENTS: S/W File No. 5.360-180-398A, 1716, 191F SUPPLIER(S) SUBSUPPLIER NAME: Energy Products Group

DESCRIPTION SUMMARY: Modification, to MSIV actuators REMARKS: Supersedes E&DCR M10030

PROBLEM DESCRIPTION: (PN 2786MIR) AREA 1/REACTOR MOD

Original Problem-
 The MSIV latching mechanism performance is inconsistent. The valve's closing time can not meet specification requirements. The MSIV actuators need to be hydraulically modified to allow the valves to remain open.
This E&DCR-
 The notes on pg 2 need to be expanded, getting details need to be revised. Tolerances are required.

INITIATOR: F. B. ... AREA/OBJ: ... DATE: ... DATE RECEIVED: ... APPROVED: ... ENGR RESP: XP

PROBLEM SOLUTION
 Supersedes E&DCR M10030
 Modify MSIV's 2MSS*HYV6A,B,C,D & 7A,B,C,D. Remove all mechanical latching components per note B on pg 2 of this E&DCR. Rework hydraulic return header to allow clearance for cylinder removal per pg 12 of this E&DCR. Add new hydraulic system and revise S/W File no. 5.360-180-398 as per pgs 2 thru 14 of this E&DCR. Revise S/W File No's 5.360-180-171 & 191 as per pgs 9 of 14 of this E&DCR.

ENGR QUAL	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	INTERDISCIPLINE CONCURRENCE	ENGR	DATE	ASME	NON ASME
SEISMIC QUAL	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	R. M. ...		10/20/78	CEP RECD	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
AFFECTED DOCUMENT NUMBERS	TYPE	STATUS	RELATED ACTIVITIES	QA CAT	CLIENT APP	REQ D	NR
5.360-180-398	M	C	B	I, II	L. D. Thum...	10/23/78	
5.360-180-171	M	C					
5.360-180-191	M	C					
P309D	S	N					
COBIA	S	N					
P301P	S	N					
P275D	S	N					
STATUS			QSD OR EA TELECON	DATE	INSR REPORT NO/810	DATE	
C-W WILL BE INCORPORATED			P. G. ...	10/23/78			
N-WILL NOT BE INCORPORATED			PROJ. ENGR. TELECON	DATE	FINAL WORK TRACKING CLOSURE	DATE	
I-NO CHANGE			E. M. ...	10/23/78			

Modification, to MSIV actuators SUPERSEDES E&DCR M10030

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NOTES:

- 5. Tubing and fittings to be installed and field routed per C081A (Cat II).
- 6. All O-Rings (seals) on equipt. and tube fittings to be EPDM (EPR) on viton unless otherwise specified.
- 7. Material: Plate - Steel ASTM A36.
 Struc. shapes - Steel ASTM A36.
 "U" bolts - Steel A 36. *
 Bolts - Steel ASTM A307
 Nuts - Steel ASTM A307
- 8. Remove pivot door, blocking lever, blocking lever support bracket, trip solenoids and all associated hardware. Components to be tagged, boxed and stored.
- 9. All hydraulic components are Cat II, except SOV A & B which are Cat I.
- 10. Mechanical components (pump, accumulator, cylinder, etc.) to be installed per reqts. of P275D.
- 11. Relief valve (RV) shall be set at 1500 psi.
- 12. An in service leak test shall be performed on the modified hydraulic return header in lieu of a hydrostatic test.
- 13. Prior to heat up, it shall be verified that the accumulator charge is 825 psi.
- 14. Pressure switches shall be set so that the jockey pump maintains a hydraulic system pressure of between 1100 psi and 1300 psi.
- 15. The flow control valve shall be so adjusted as to provide a flow rate of $1 \frac{1}{2}$ GPM from the accumulators to the hydraulic system.

WELDING AS FOLLOWS:

- W3-01 for Carbon to Carbon
- W3-52 for Stainless to Stainless

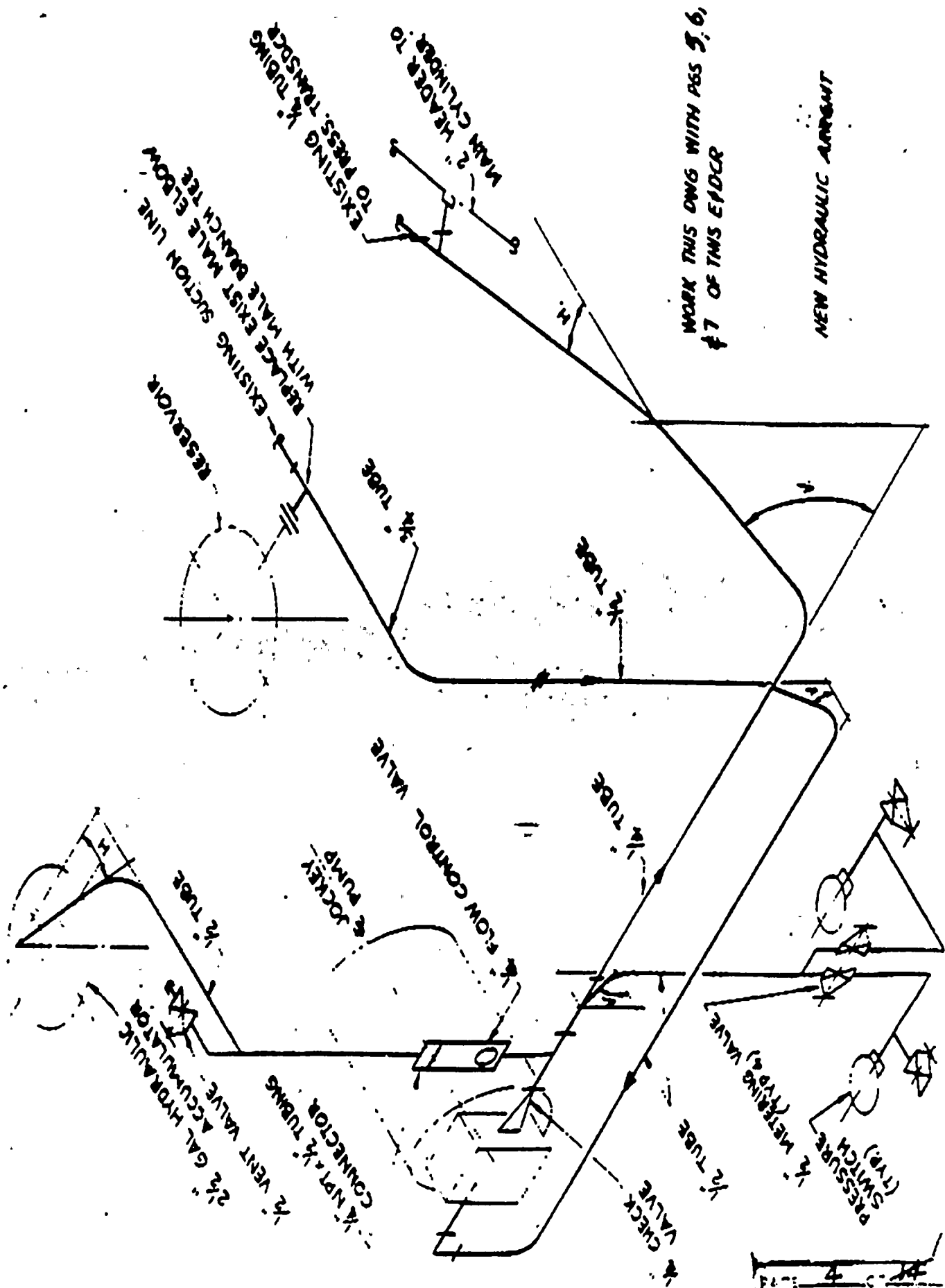
* U-BOLTS FOR PRESSURE SWITCHES
 MAY BE FABBED FROM ALL-THREAD
 ROD A-36 OR EQUIV.

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 PAGE 2 OF 4
 E & OCR M10030A

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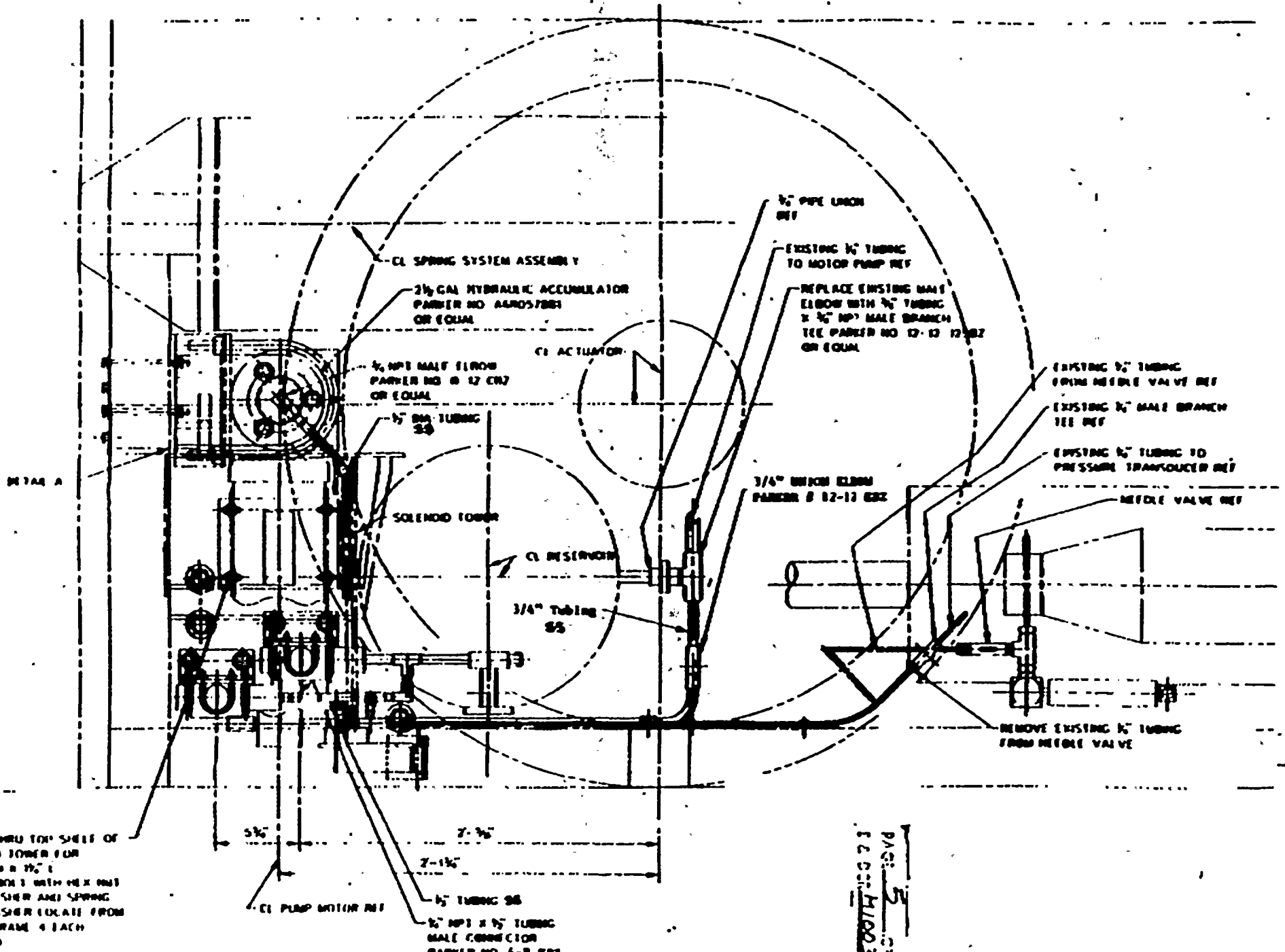




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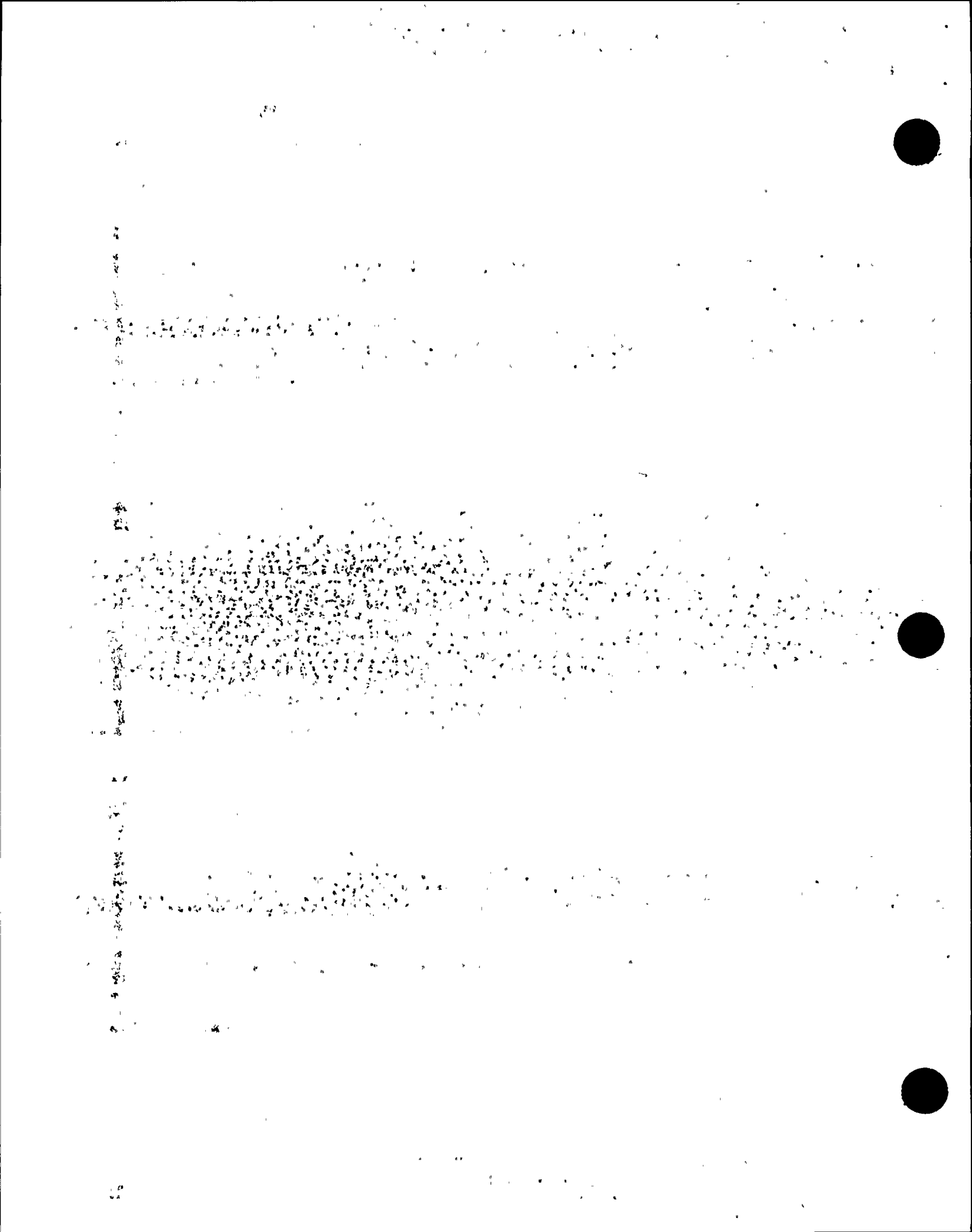


PLAN

DRILL 1/2" DIA. HOLES THROUGH TOP SHEET OF
 HOOD TOWER FOR
 1/2" DIA. HOLES
 TO BOX 1 WITH 1/2" DIA.
 WASHER AND SPRING
 WASHER LOCATE FROM
 FRAME EACH
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1/2" TUBING 96
 1/2" NPT x 1/2" TUBING
 MALE CONNECTOR
 PARKER NO. 4-8 822
 OR EQUAL (Typ of 7)

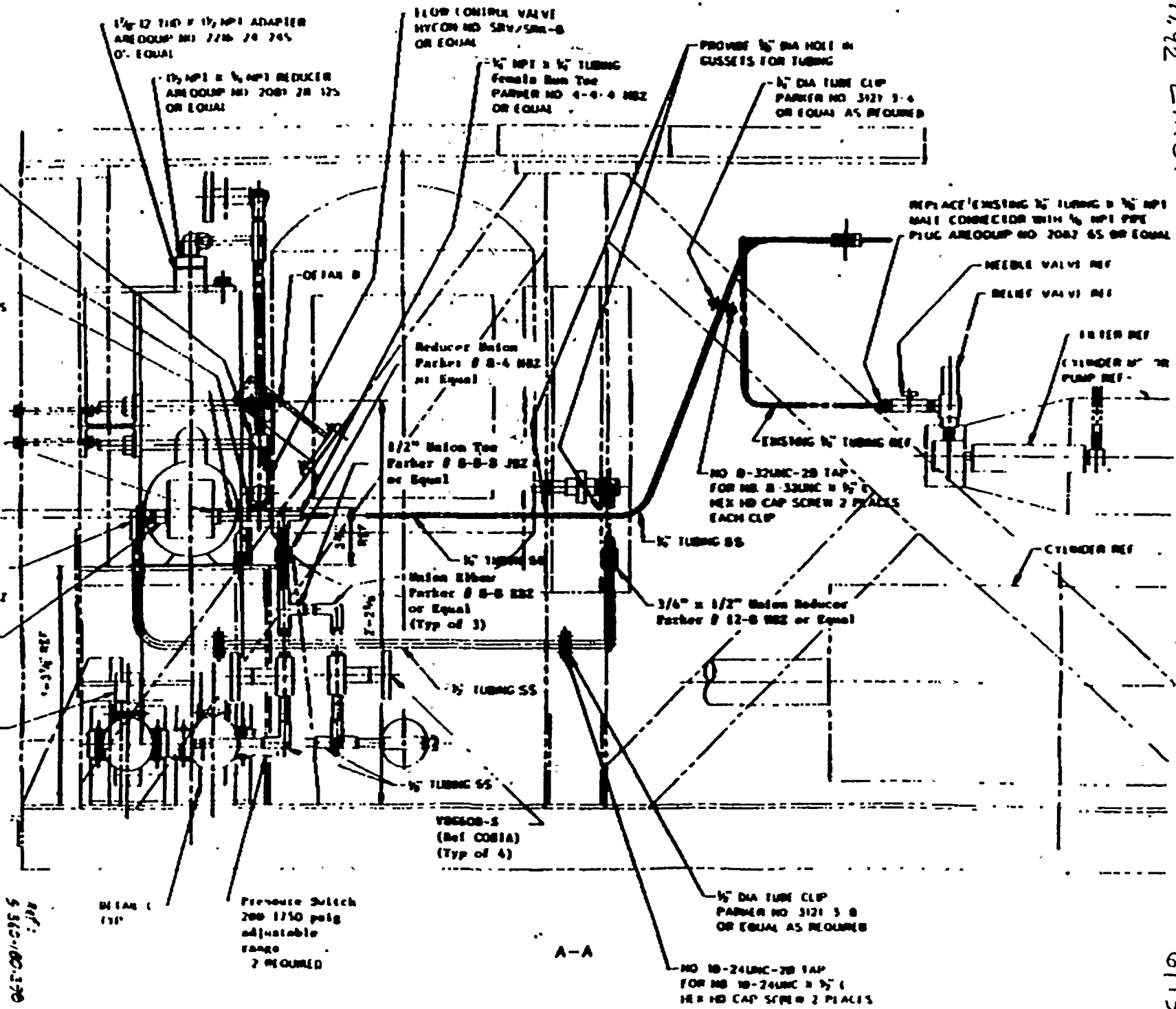
PAGE 5
 E.C. 10030A



P.07

OCT. 14 '86 13:55 STONE & WEBSTER #2 LYCOMING N.Y.

PAGE 6 OF 13
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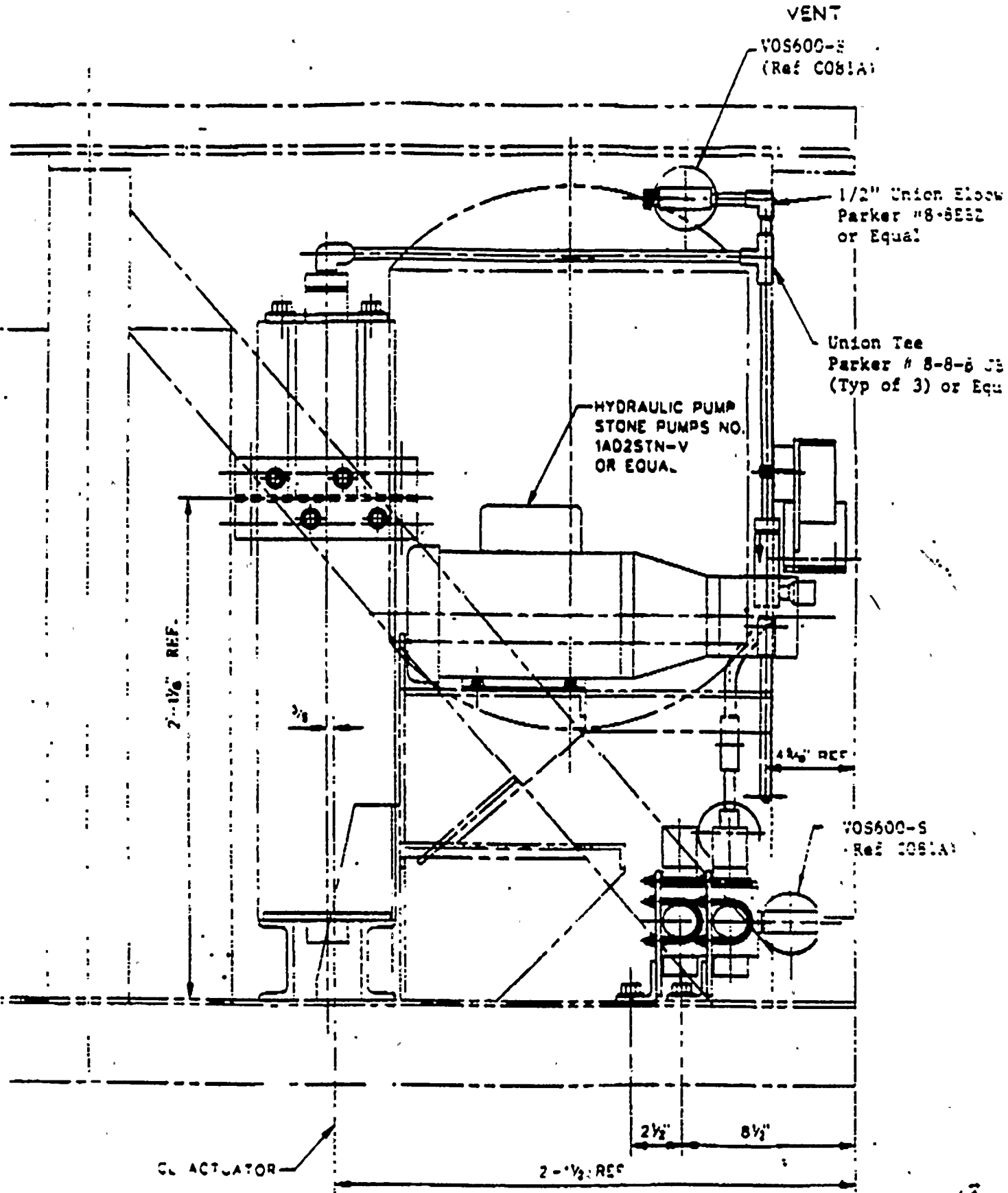
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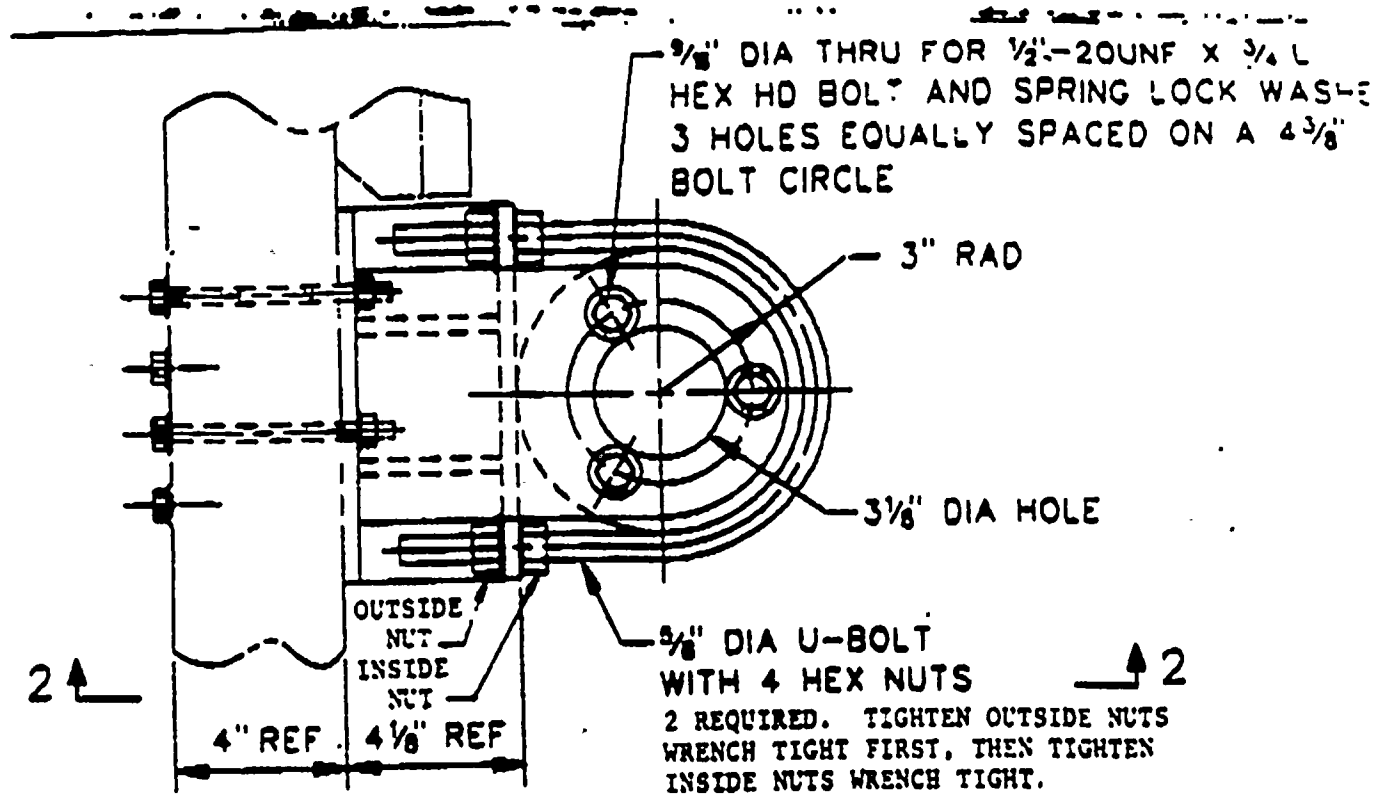
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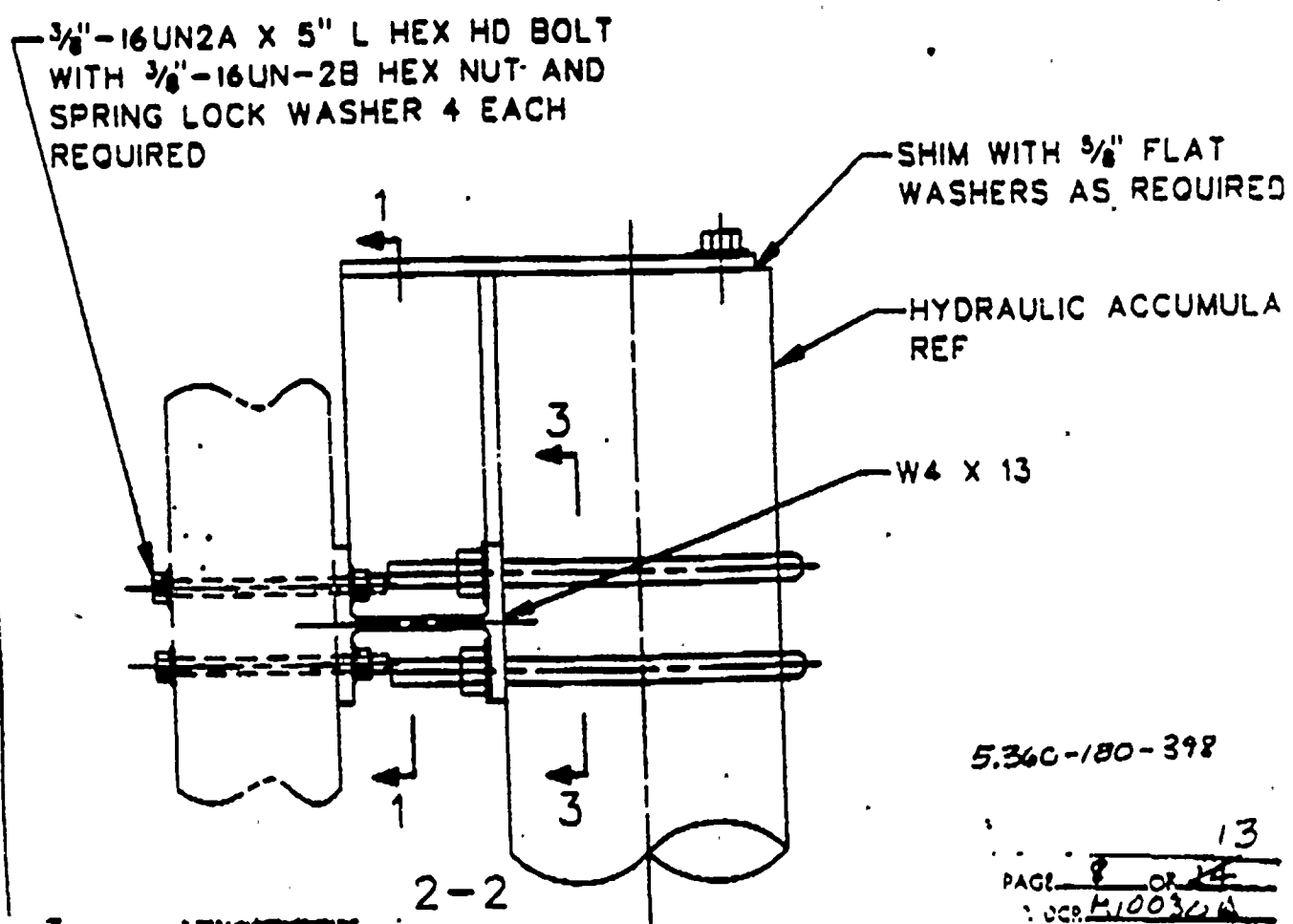
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DETAIL A



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PAGE 8 OF 14
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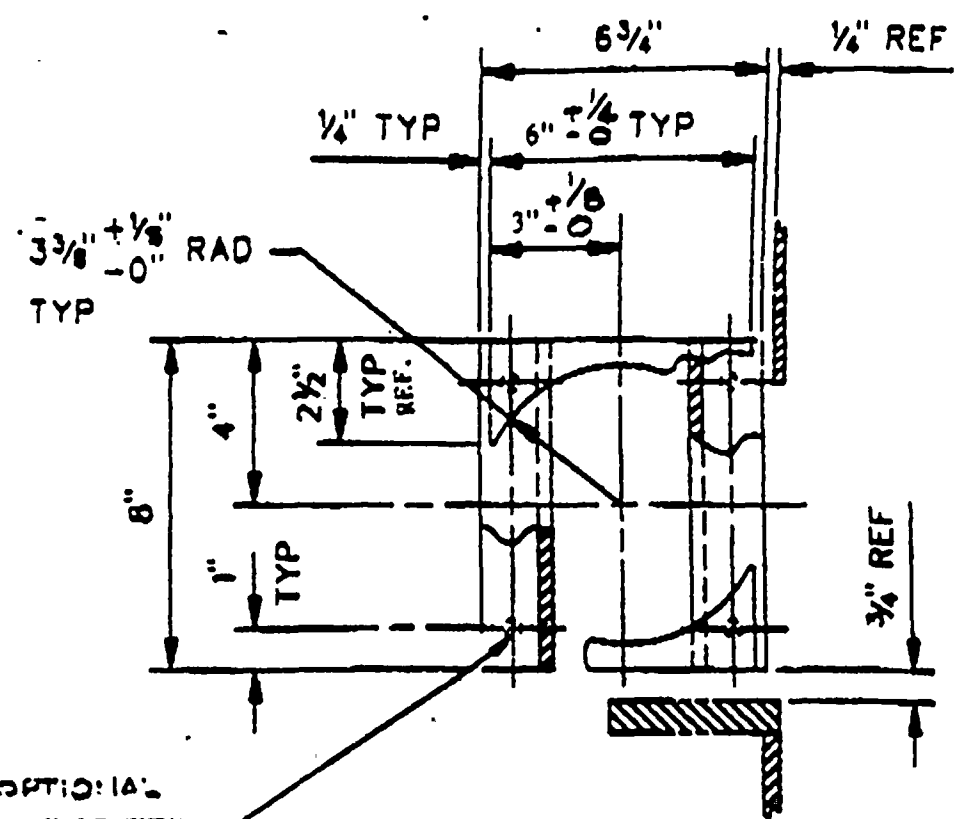
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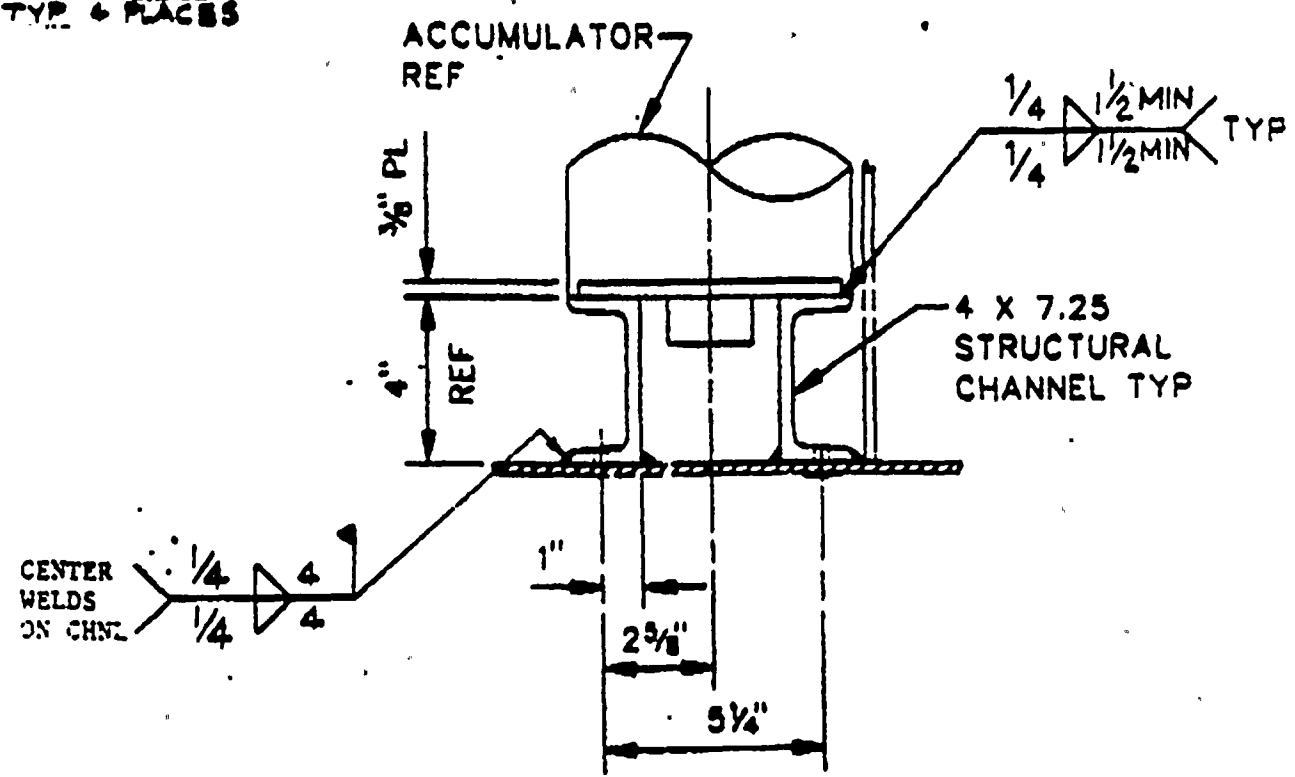
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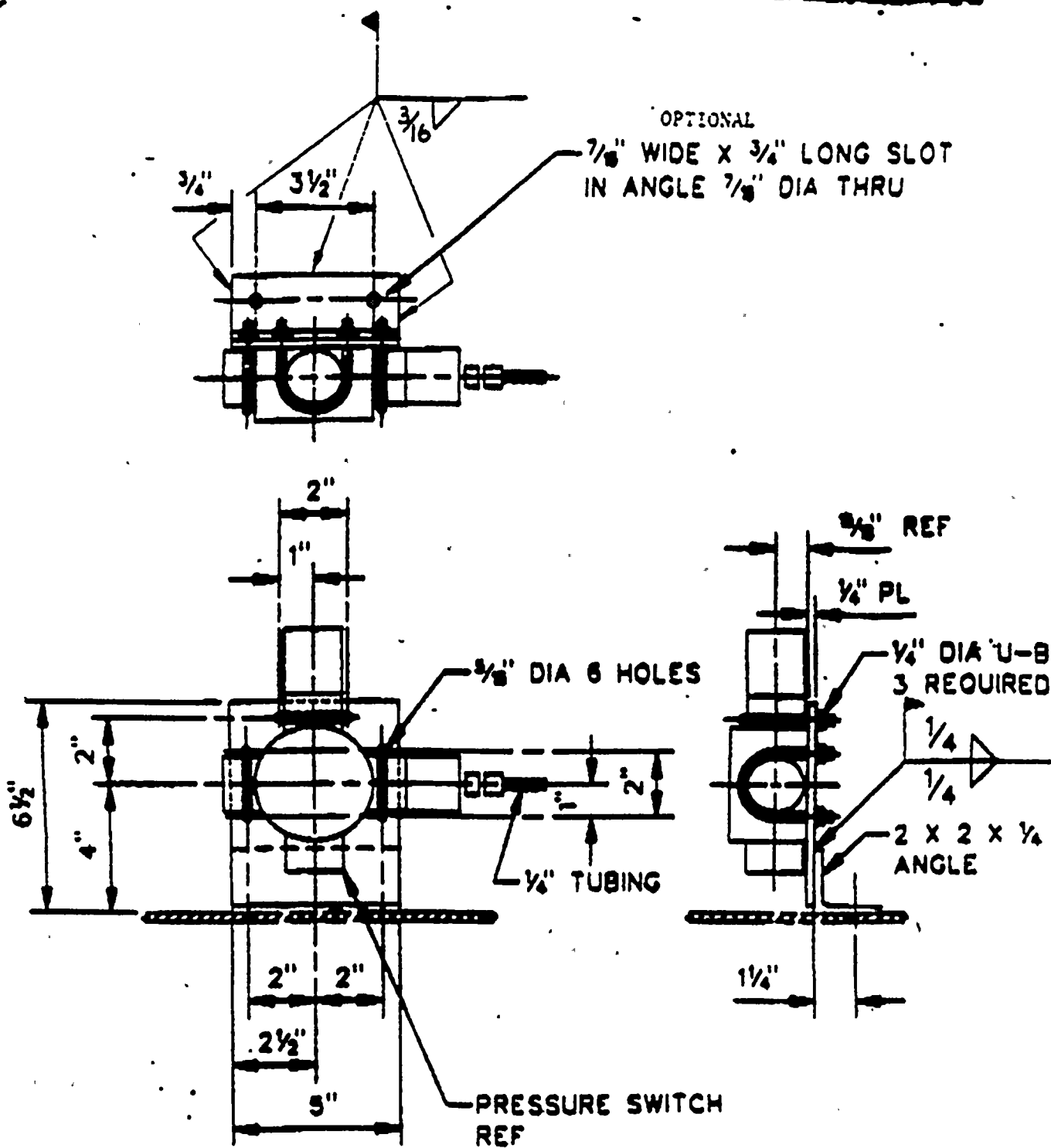
1/16" OPTIONAL
 1/16" DIA. HOLE THRU
 CHANNEL FLANGE
 TYP. 6 PLACES



DETAIL B

5340-1EC-398

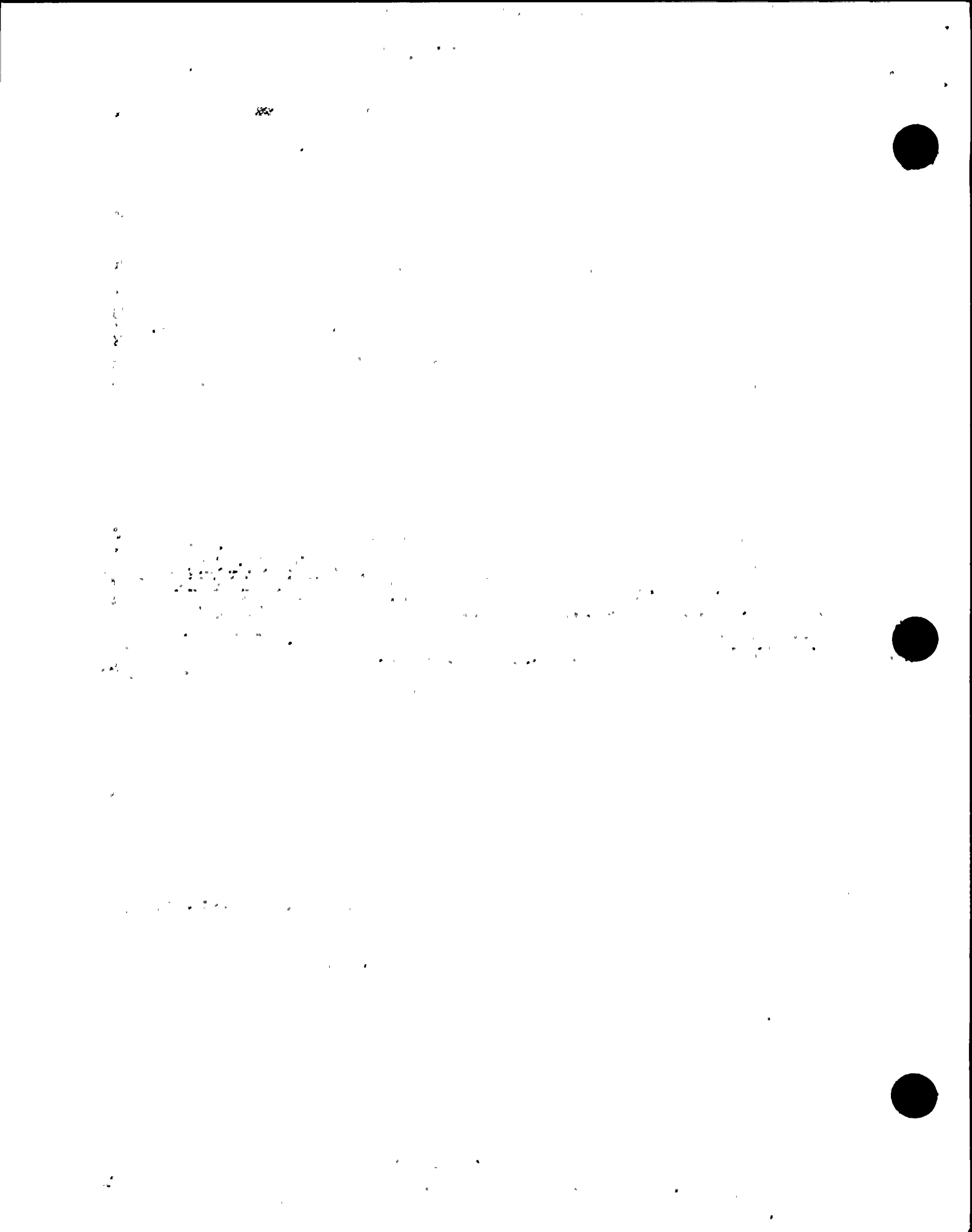
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 PAGE 9 OF 14
 E & DCR M10030A

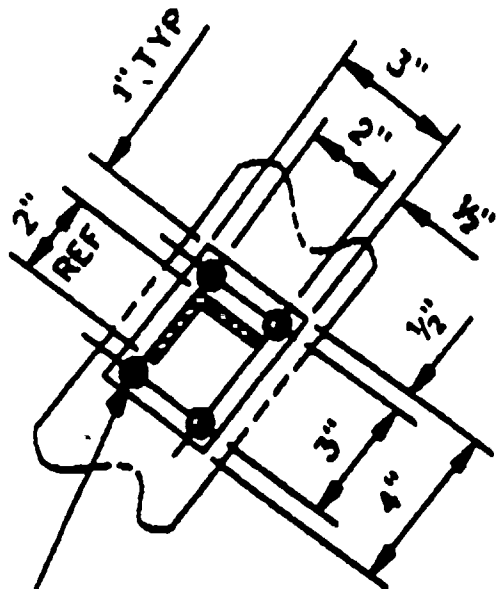


DETAIL C
2 REQUIRED

PAGE 10 OF 14
REV. 110030A

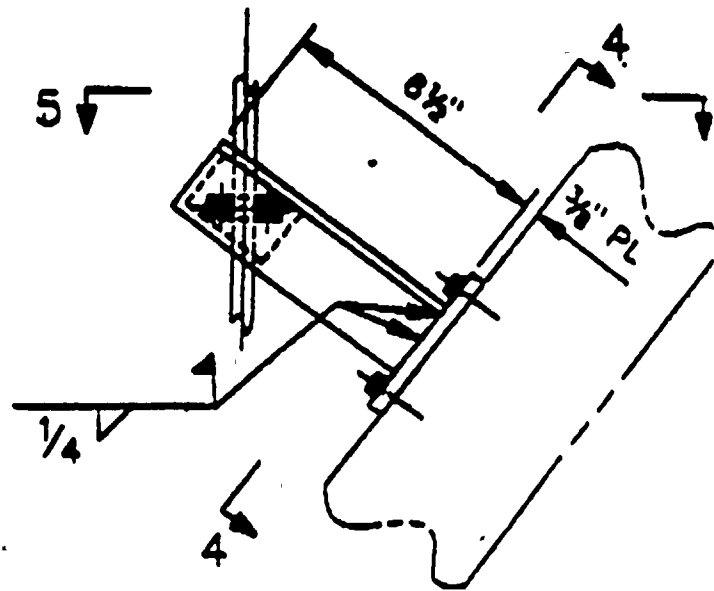
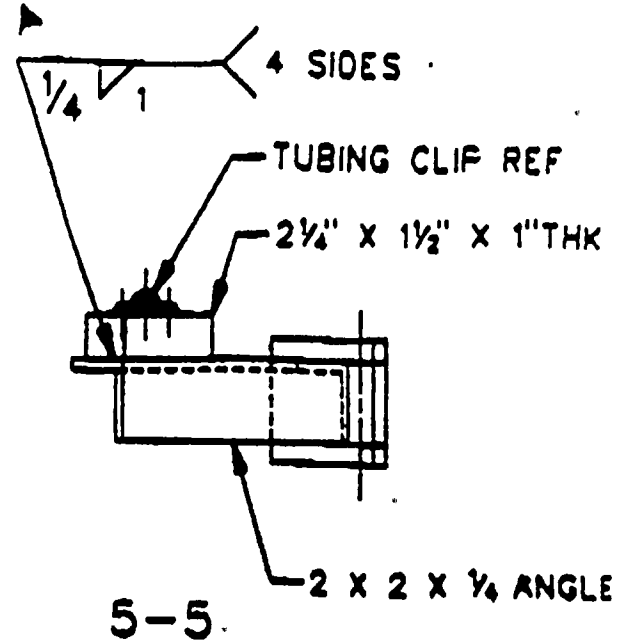
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3/8" DIA HOLE THRU PLATE.
 1/4"-20UNC TAP THRU STRL
 TUBING AT ASSEMBLY FOR
 1/4"-20UNC X 1" L HEX HD
 CAP SCREW WITH SPRING.
 LOCK WASHER 4 EACH
 REQUIRED

4-4



DETAIL D

5.360-180-578

PAGE: 11
 E & DES: M10030A 13

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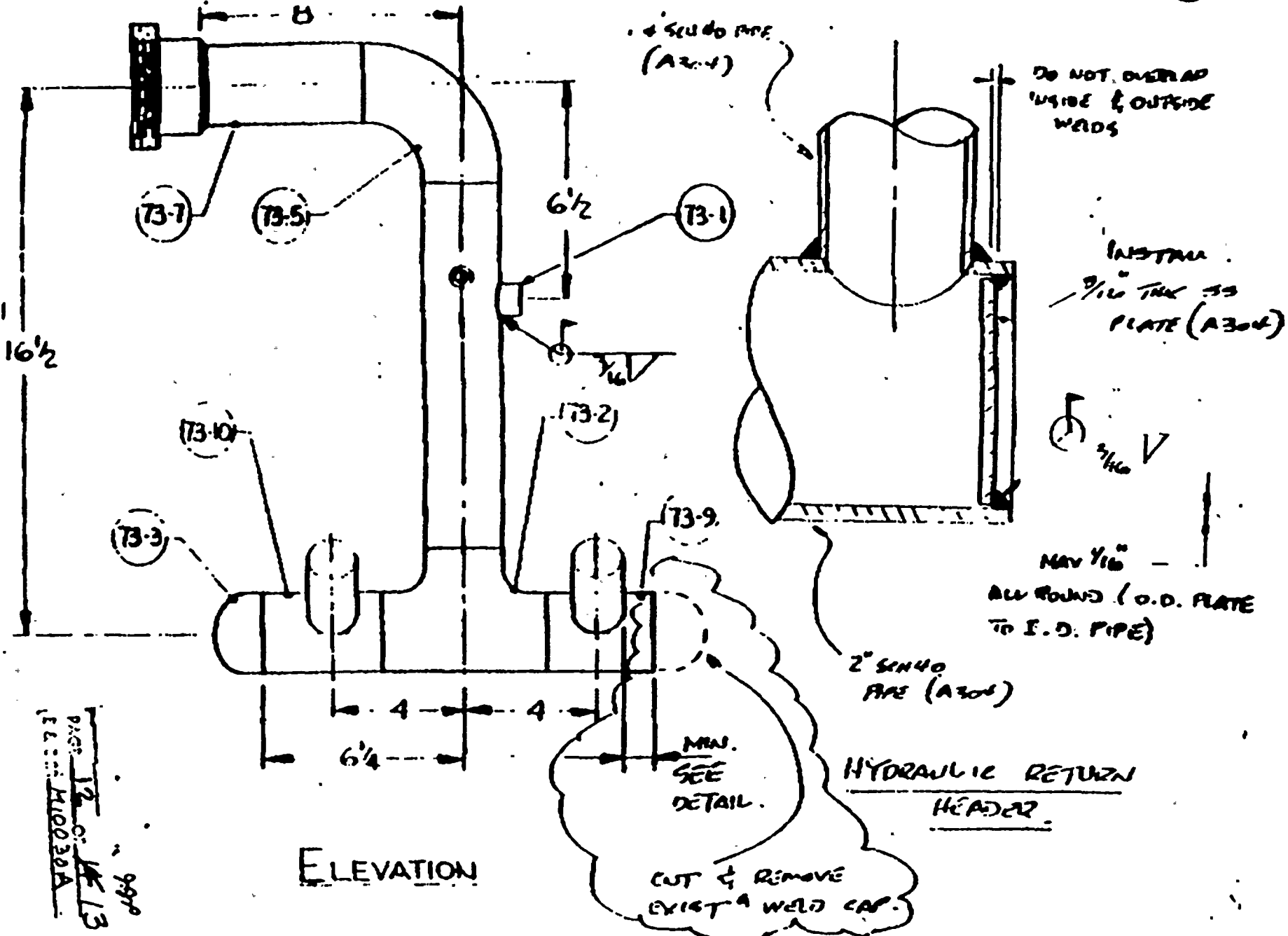
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OCT. 24 '86 13:38 STONE & WEBSTER #2 LYCOMING N.Y.

P.13



ELEVATION

PAGE 12 OF 13
 E.C. M10030A
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TOLERANCES	
ANGLES	± 1°
FRACTIONS	1/64
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FEATURE CONTROL SYMBOLS	
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FINISHES	
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SEE REPORT
 USE IN FIELD
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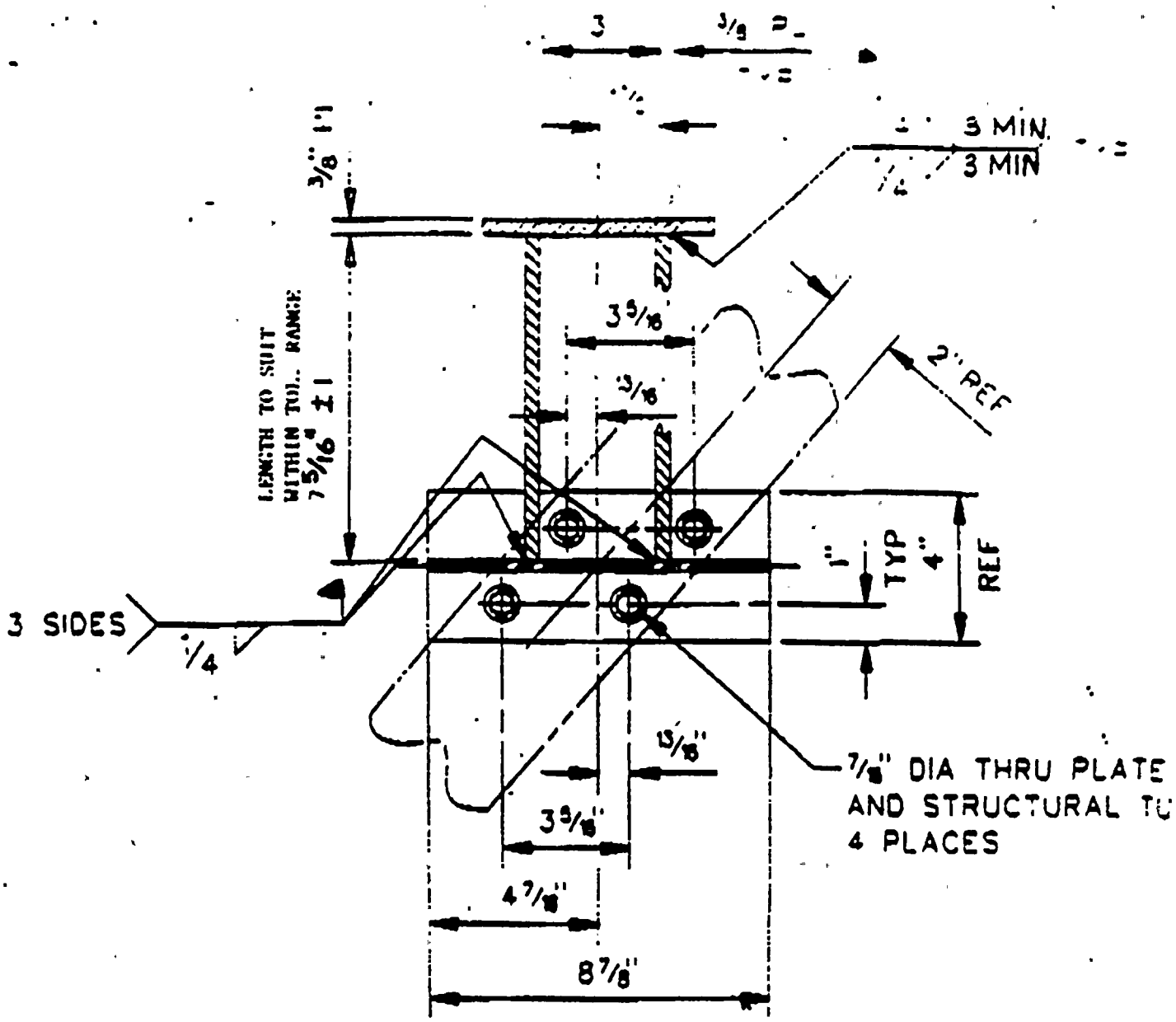
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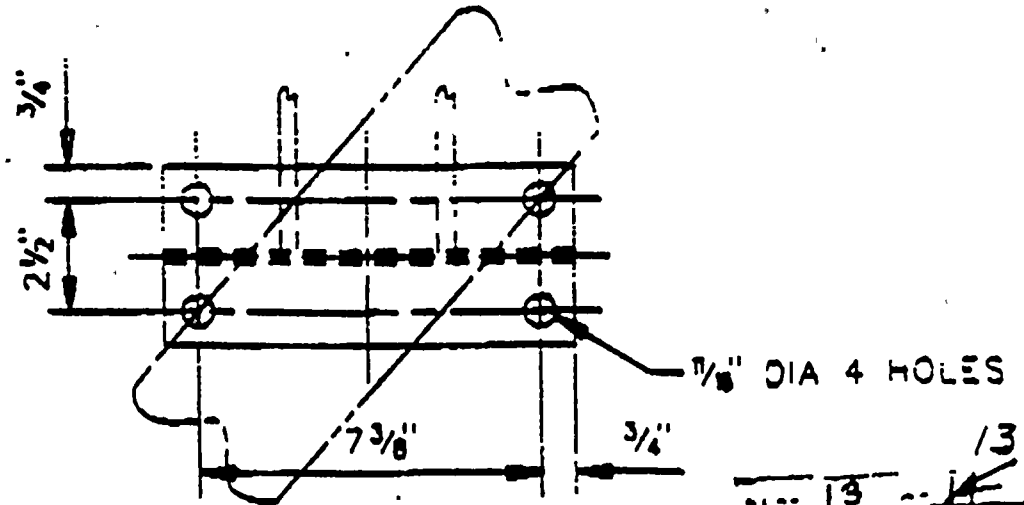
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OCT. 27 '86 10:12 STONE & WEBSTER 42 LYCOMING N.Y.

P. 17

STONE AND WEBSTER ENGINEERING CORPORATION ENGINEERING & DESIGN COORDINATION REPORT		PAGE 1 OF 7 EDCR NO. M10030A JOB ORDER NO. 12177	
PROJECT/CLIENT NINE MILE POINT NUCLEAR STATION - UNIT 2 NIAGARA MOHAWK POWER CORPORATION			
P.O. NO. (S/W) P303D	REASON CODE(S) F, V	EQUIP. ID NO. (S/W) / SYB CODE (S/W) 2MSS & HXV 6A, B, C, D, 7A, B, C, D / 2MSS / 001-000	
REFERENCE DOCUMENTS EDCR M10030A		SUPPLIER (OR SUBSUPPLIER) NAME ENERGY PRODUCTS GROUP	
DESCRIPTION SUMMARY MID. PN2YPCMX118 TO MSIV ACTUATORS		REMARKS REVISE EDCR M10030A	
PROBLEM DESCRIPTION AREA 1 / REACTOR [PN2YPCMX118] THE FOLLOWING INTERFERENCES HAVE BEEN IDENTIFIED IN THE MSIV ACTUATOR MODIFICATIONS IDENTIFIED IN EDCR M10030A: 1. SLIDE ON SPRING SYSTEM ASSEMBLY WILL INTERFERE W/ THE ACCUMULATOR U-BOLTS WHEN VALVE IS IN THE FULL OPEN POSITION. (SEE PG. 2 OF THIS EDCR). 2. COVER R. ON ONE OF THE PRESSURE SWITCHES CANNOT BE REMOVED BECAUSE OF DIAG. TUBE STEEL. (SEE PG. 3 OF THIS EDCR). 3. BECAUSE OF PROXIMITY OF THE SPRING SYSTEM ASSEMBLY, THE WELD OF ACCUMULATOR CHNL TO ACTUATOR BASE (DETAIL B) CAN NOT BE CENTERED. REQUEST TO OFFSET WELD 2.1". 4. 5MM SIBB SHOWN IN SECT. 5-5 IN NOT ADEQUATE TO ALLOW BOLTING OF TUBING CLIP AS SHOWN ON PG. 11 OF EDCR M10030A.			
INITIATED BY R.T. Cooney	AREA/DEPT DIV 586	TEL. EXT 3563	DATE 10-25-86
PROBLEM SOLUTION (REVISE EDCR M10030A)		DATE REEDED 10-25-86	APPROVED BY [Signature]
1. REVISE ACCUMULATOR MOUNTING BRACKET AS SHOWN ON PGS. 5 & 6 OF THE EDCR. 2. REVISE PRESSURE SWITCH MOUNTING BRACKET FOR THE IDENTIFIED SWITCH AS SHOWN ON PG. 3 OF THIS EDCR. 3. CHANNEL ATTACHED WELD DT. SHALL BE REVISED AS SHOWN ON PG. 4 OF THIS EDCR. 4. REVISE SHIM BLOCK DIMENSIONS & WELDING IN SECT. 5-5 AS SHOWN ON PG. 7 OF THIS EDCR.			
INTERDISCIPLINE CONCURRENCE DISCIPLINE NR		ENGR. DATE 10-25-86	
AFFECTED DOCUMENT NUMBERS 17-5360-180-398 5360-180-111 5360-180-191 P303D COB1A P301P P303D P301P		CLIENT APP. REQ'D DATE 10-25-86	
TYPE STATUS M C S N S N S N S N S N		RELATED ACTIVITIES B I, II	
ANSWERED BY R.T. Cooney		DATE 10-25-86	
RESR. LEAD ENGR. [Signature]		WORK RESP. SUB ITEM 01	
MATERIALS ENGR. [Signature]		WORK RESP. SUB ITEM 02	
EQUIP. SPEC. [Signature]		WORK COMPLETION NWR <input type="checkbox"/> DATE	
ENGR. OR EA [Signature]		INSP. REPORT NO./SIC 01	
PROJ. ENGR. [Signature]		FINAL WORK TRACKING CLOSURE DATE	
DESCRIPTION (101) 18 MODIFICATION PN2YPCMX118 TO MSIV ACTUATORS		REMARKS (101) REVISE EDCR M10030A	
DESCRIPTION (001)		REMARKS (001) PN2YPCMX118 ACC 16734	

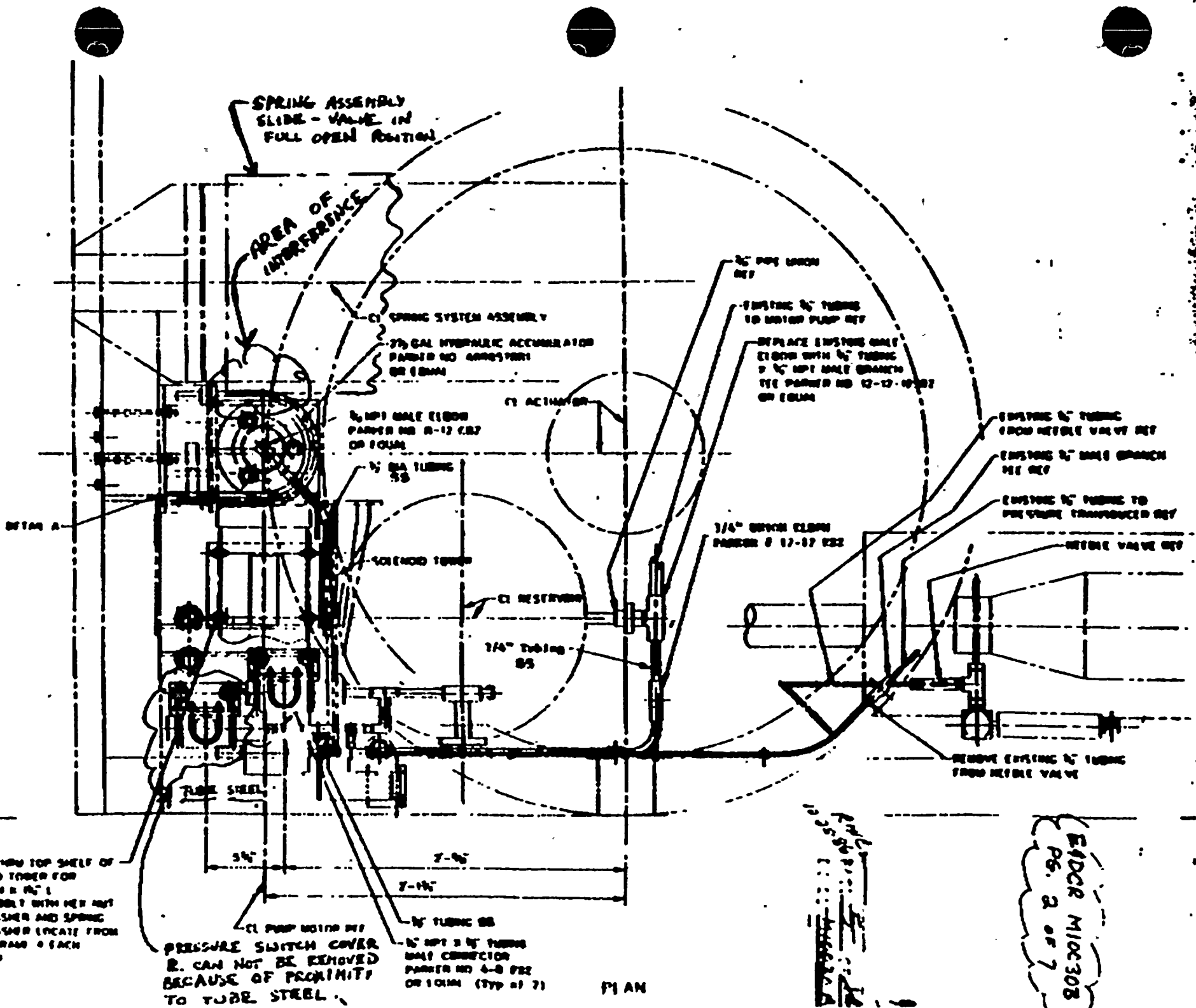


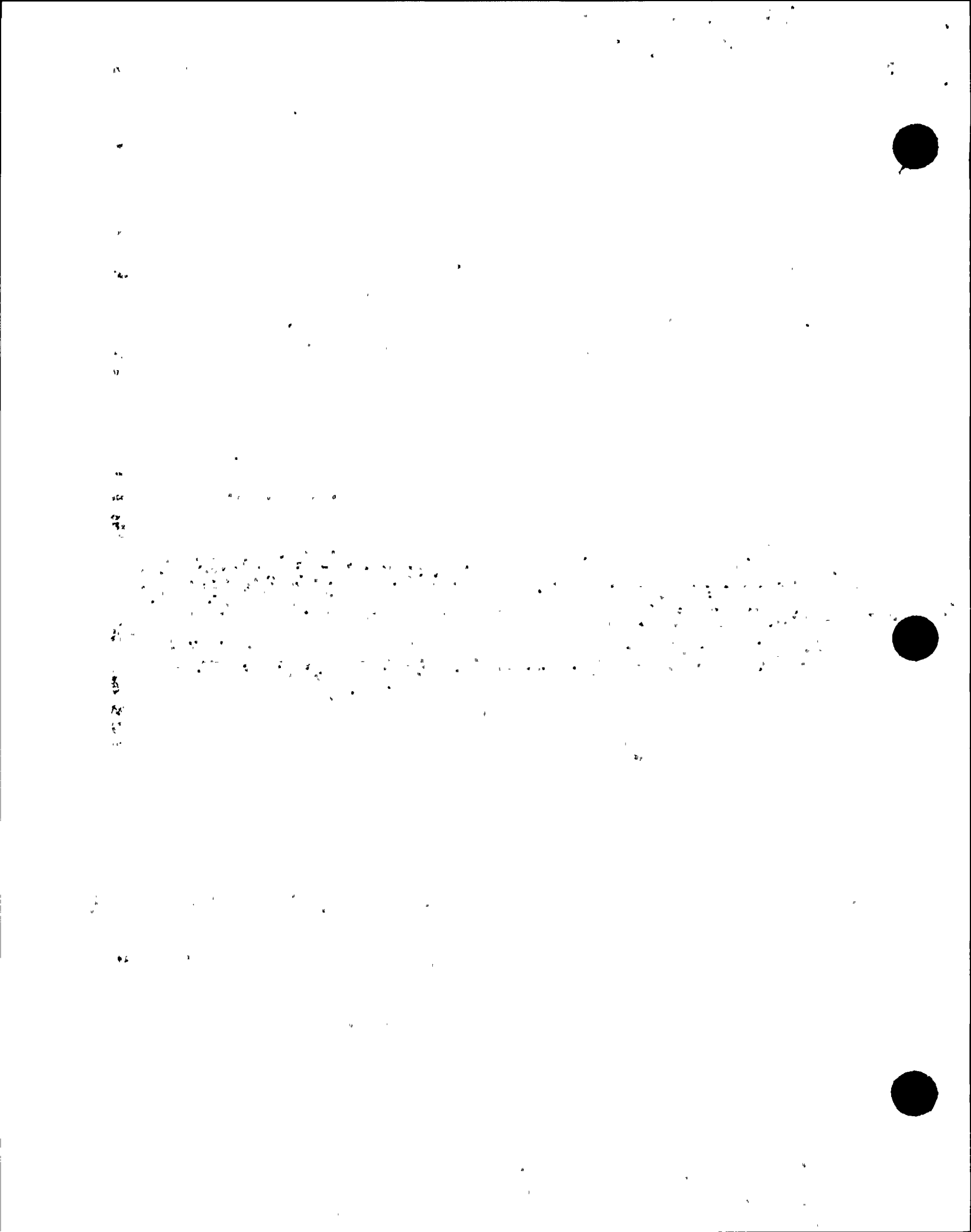
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OCT. 27 '86 10:13 STONE & WEBSTER #2 LYCOMING, N.Y.

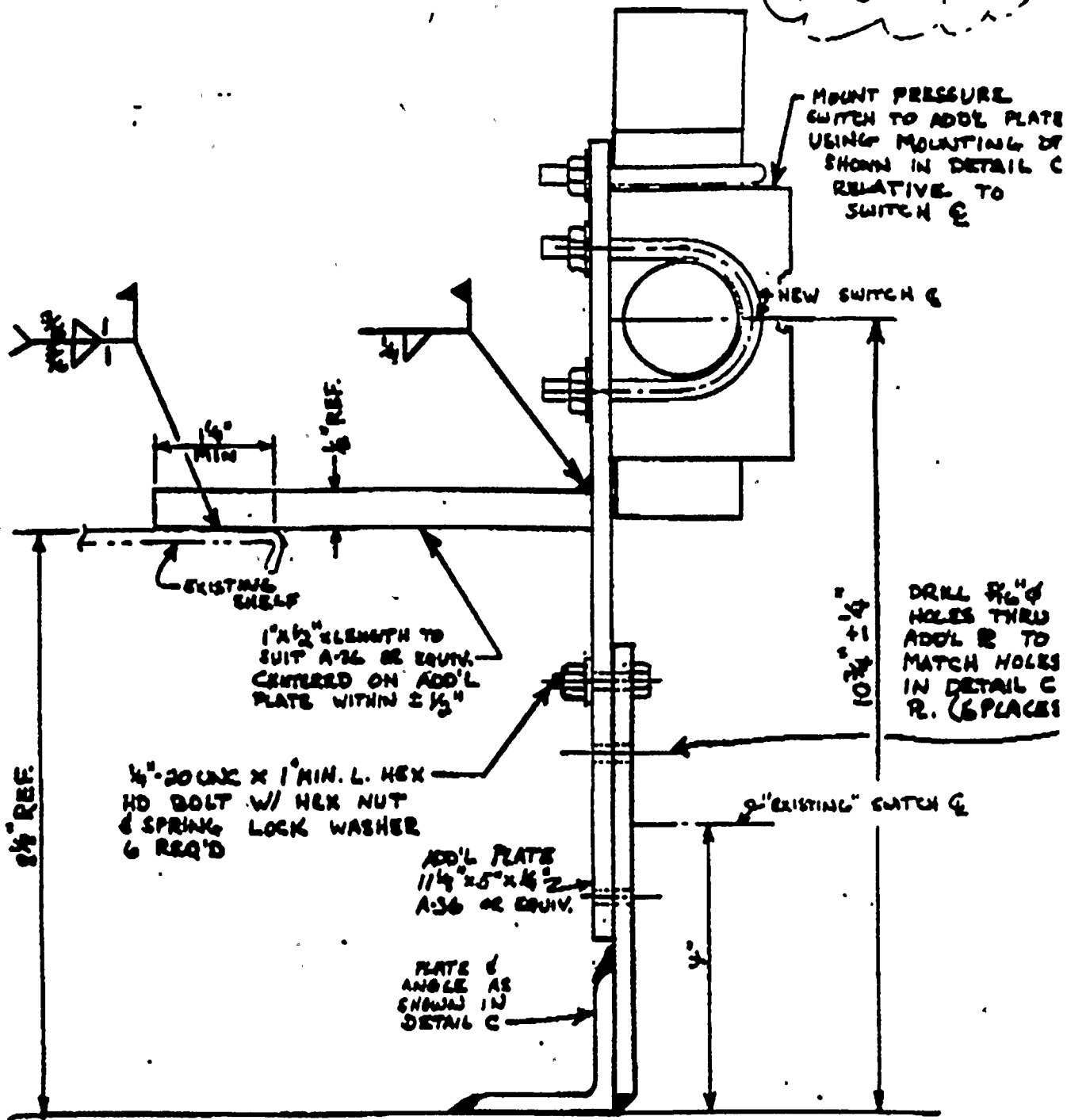




OCT. 27 '86 10:14 STONE & WEBSTER #2 LYCOMING N.Y.

P. 19

EPDCR M10030B
Pg. 3 OF 7

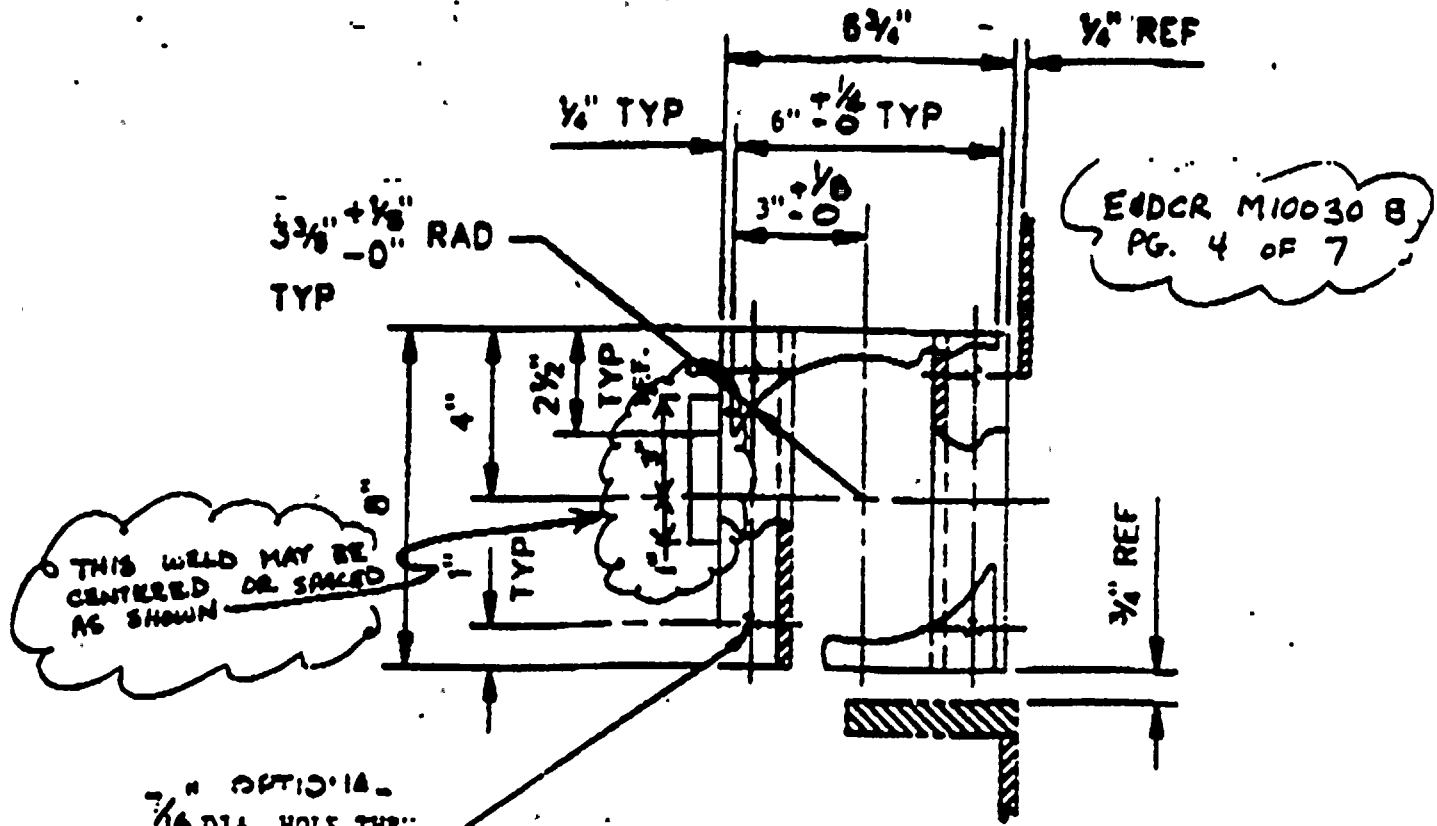


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U. S. DEPARTMENT
OF JUSTICE

WASHINGTON, D. C.

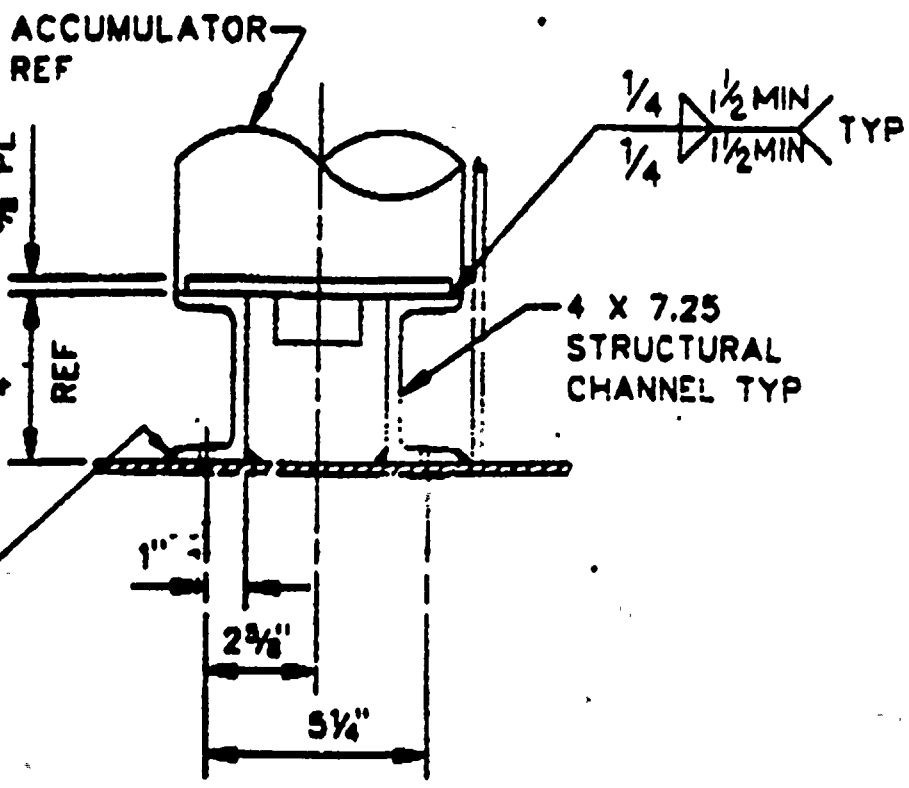




EDDCR M10030 B
PG. 4 OF 7

THIS WELD MAY BE
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AS SHOWN

OPTIONAL
 $\frac{7}{16}$ " DIA. HOLE THRU
CHANNEL FLANGE
TYP. & PLACES



CENTER
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ON CHNL
UNLESS
OTHERWISE
NOTED

DETAIL B

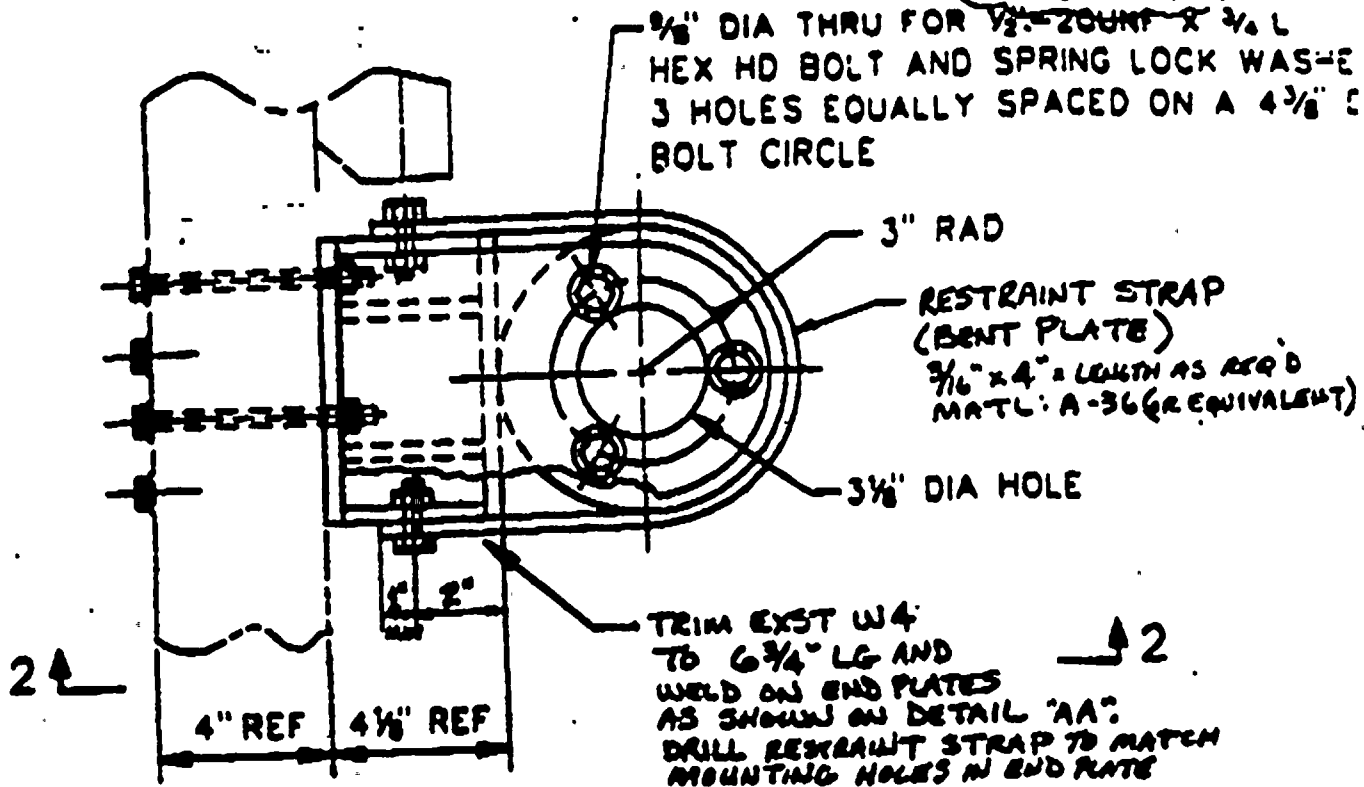
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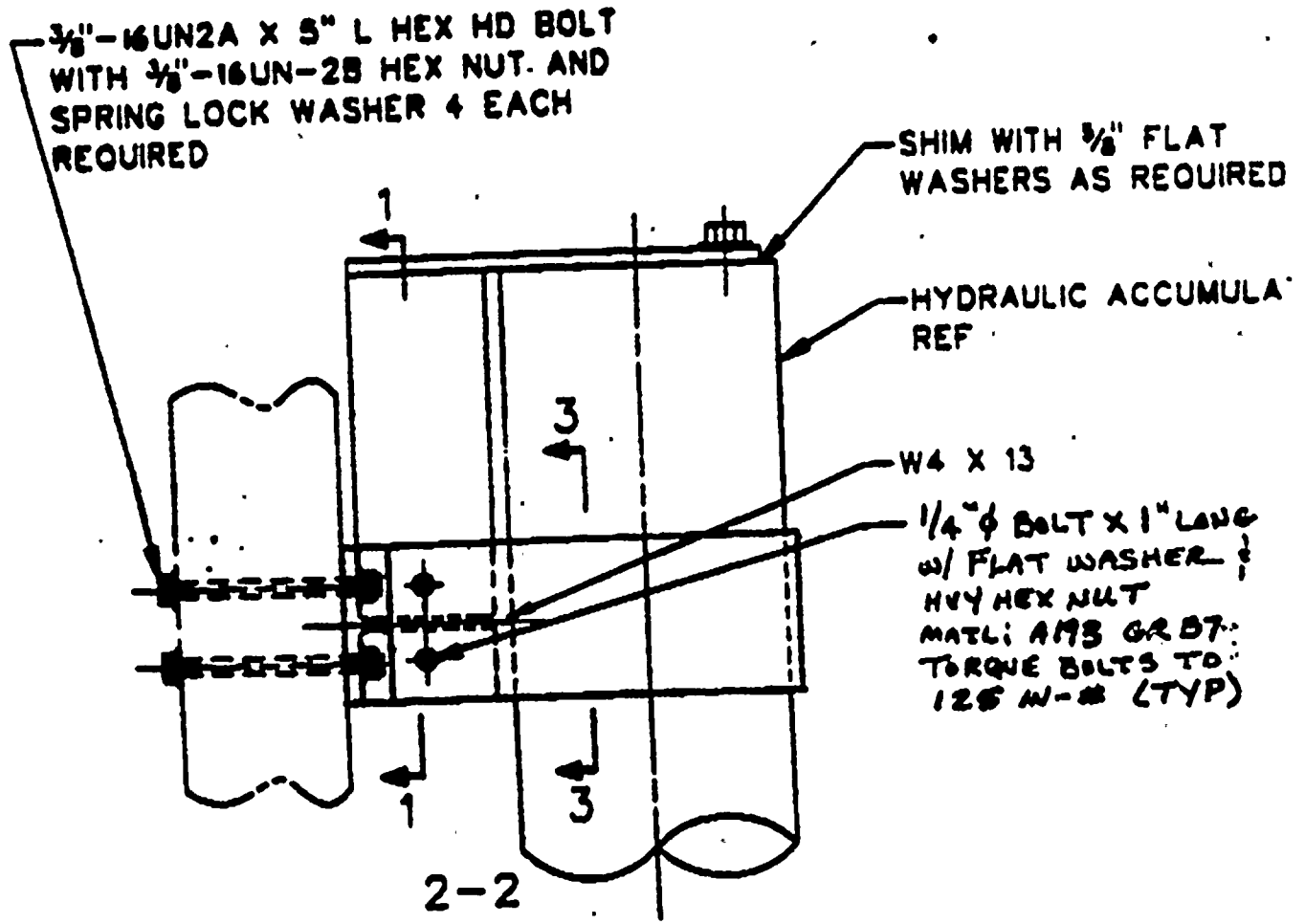
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PG. 5 OF P. 21



DETAIL A



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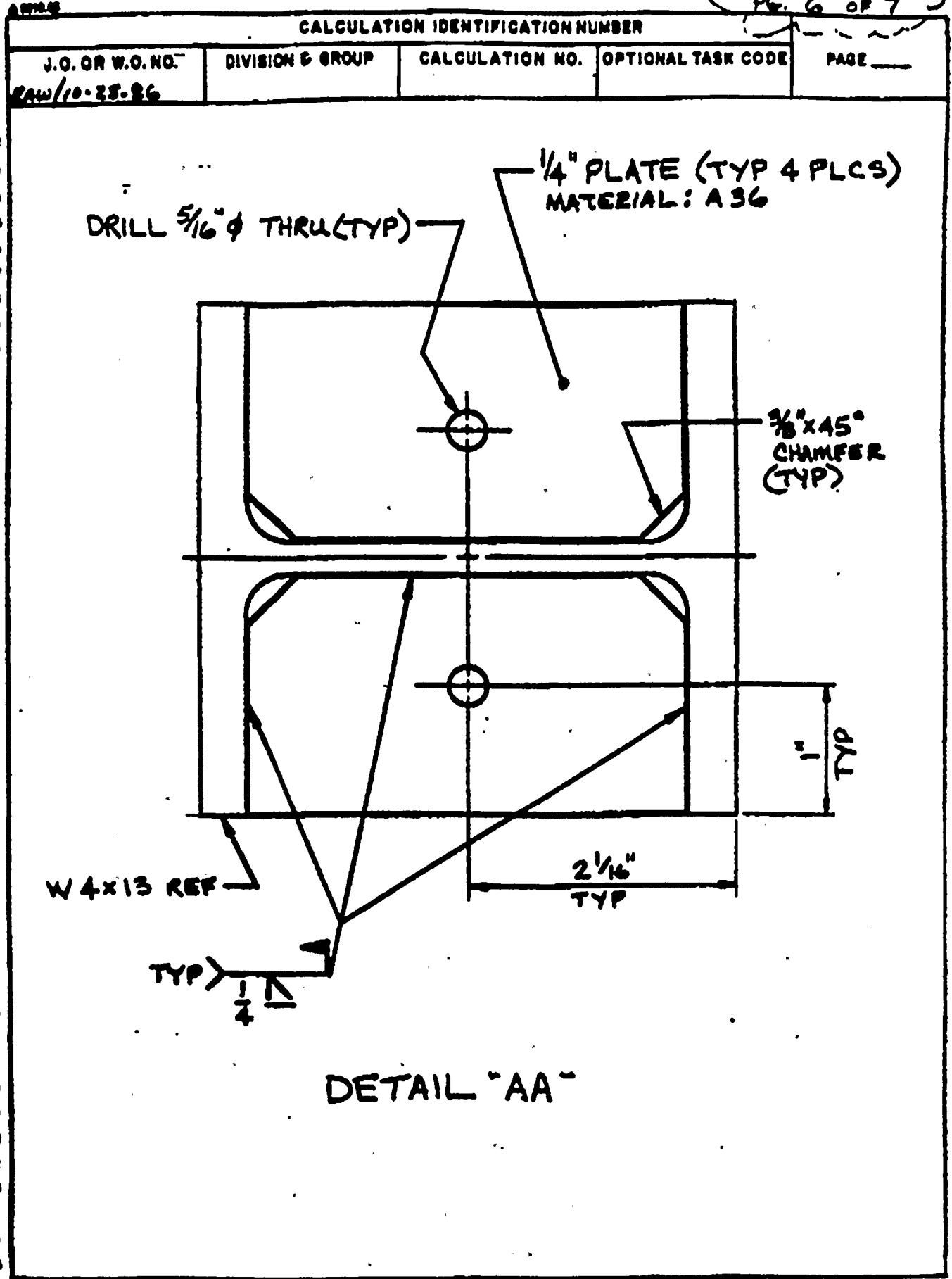


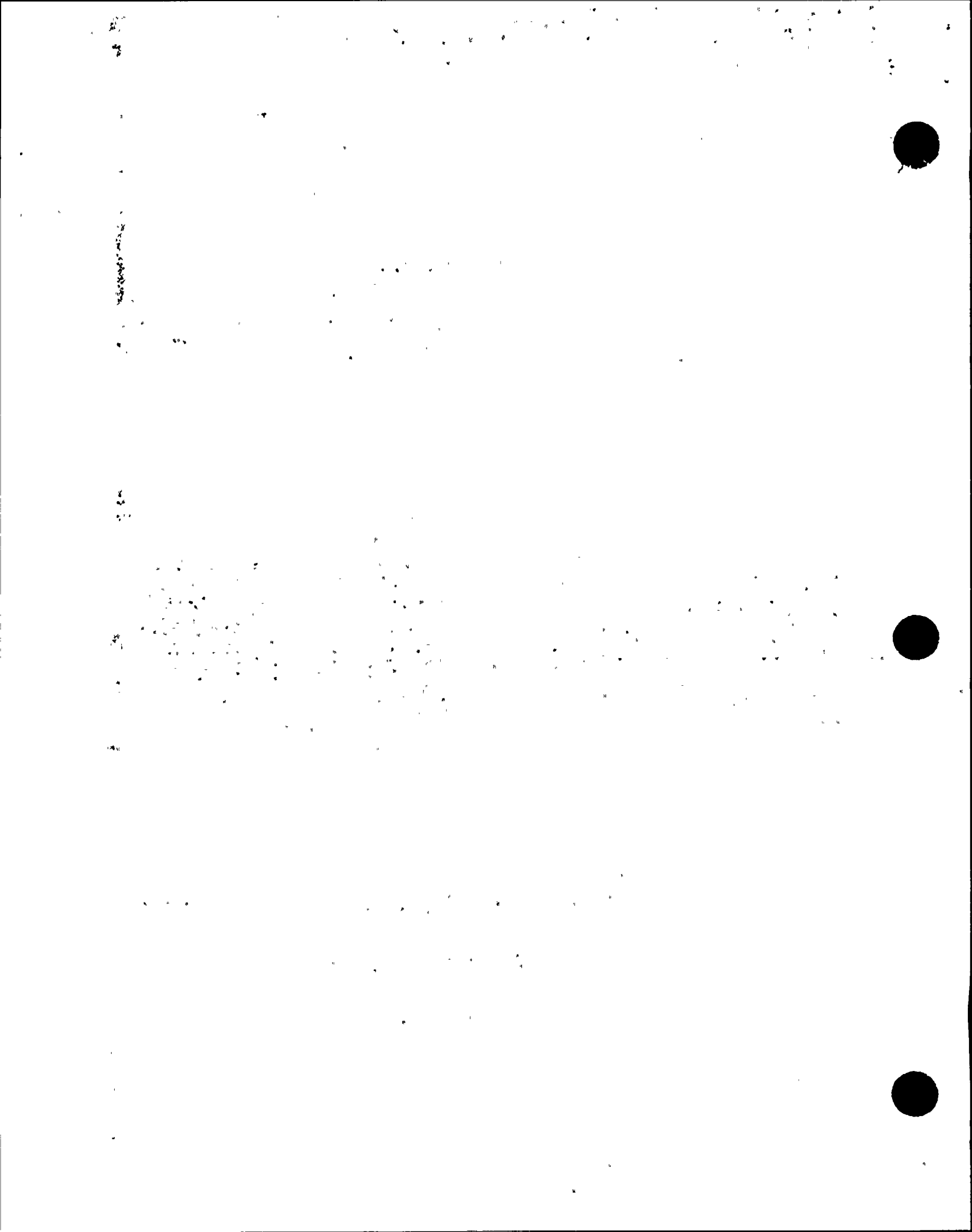
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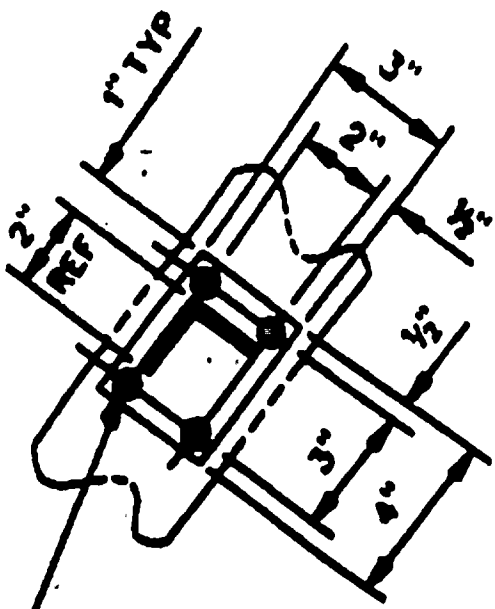
OCT. 27 '86 18:16 STONE & WEBSTER #2 LYCOMING N.Y.

CALCULATION SHEET

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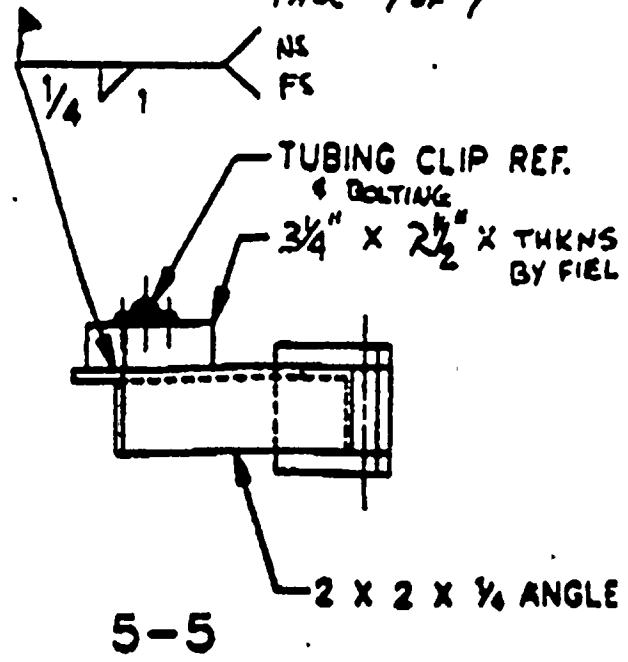




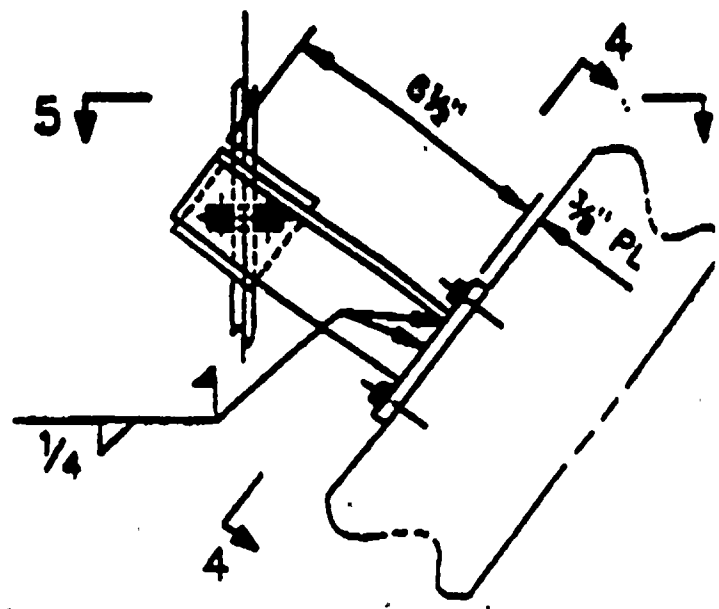


3/8" DIA HOLE THRU PLATE
 1/4"-20UNC TAP THRU STRL
 TUBING AT ASSEMBLY FOR
 1/4"-20UNC X 1" L HEX HD
 CAP SCREW WITH SPRING
 LOCK WASHER 4 EACH
 REQUIRED

4-4

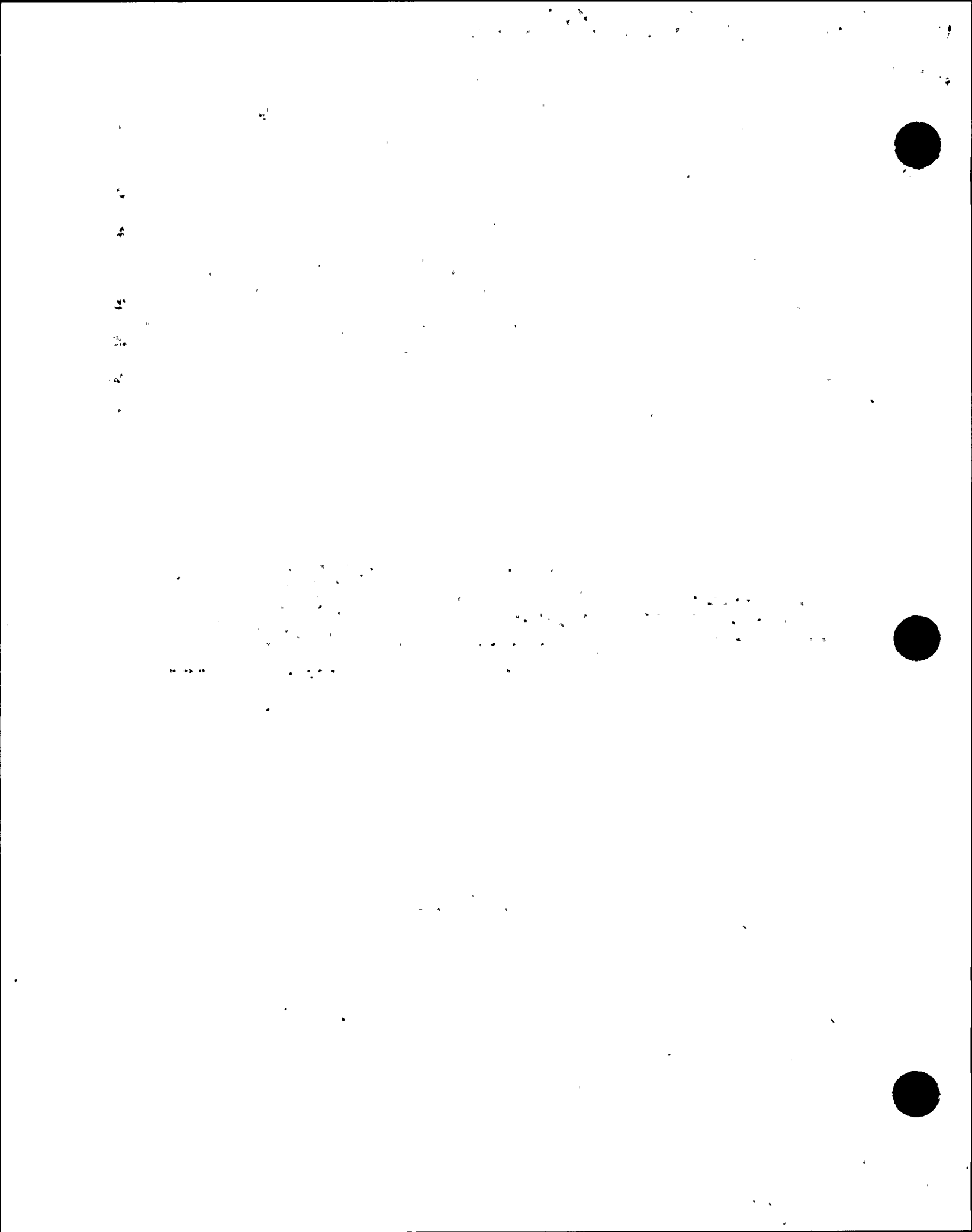


5-5



DETAIL D

E:DCR No. M10030 B
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Description of Reference 4

"Cycle Times for MSIV Actuators", Crosby Test Report No. 4330, Revision 2, dated November 10, 1986.

This report describes testing performed on the full size actuator at Crosby Valve over the period from August 1986 through October 27, 1986. It describes the test actuator configuration, discusses the developmental testing performed, and summarizes the testing results using the final SOV O-ring materials.

