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CHARACTERISTICS AND DEVELOPMENT  
REPORT FOR THE  
H982 HYDRAULIC PRESS EXTENSION (U)

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October 1963

Approved by: H.H. Bueggemann  
for G. C. McDonald, 1550

ABSTRACT

This document contains a complete and authoritative record of the design and development program for the H982 hydraulic press extension.

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TABLE OF CONTENTS

	<u>Page</u>
Introduction	4
Description	4
Design Intent	4
Product Characteristics	5
Development History	5
Stress Calculations, H982	8

LIST OF ILLUSTRATIONS

<u>Figure</u>		
1	H982 Hydraulic Press Extension	6
2	H982 Hydraulic Press Extension Being Used During the Assembly and Disassembly of the TX-57 Weapon	6
3	H982 Hydraulic Press Extension Being Used During the Assembly and Disassembly of the TX-57 Weapon	7
4	The H982 Pressure Plate and MC1414 Being Removed From the TX-57 Weapon by an Overhead Crane	7

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## CHARACTERISTICS AND DEVELOPMENT REPORT FOR THE H982 HYDRAULIC PRESS EXTENSION

### Introduction

This document records the design intent, product characteristics, and development history of the H982 hydraulic press extension. The product definition drawings and specifications which are the basis of production contracts are listed on NX-320344.

### Description

The H982 hydraulic press extension, Figure 1, consists of a frame and a pressure plate. The frame is a tubular steel beam with two attached legs. A drilled foot is attached to each leg, and a plate is welded to the center of the beam.

The pressure plate has three legs and an attached bail. Fastened to two of the legs are rigid clamps. The third leg has an adjustable clamp with a knurled knob that locks it in position. The frame of the H982 weighs 5 pounds, and the pressure plate weighs 6 pounds.

### Design Intent

The H982 hydraulic press extension should be designed to transmit the necessary pressure to the MC1414 preflight section during disassembly or assembly of the TX-57. The screws that fasten the MC1414 to the MC1403 may then be removed or replaced. The H982 pressure plate should provide a lift point for removing or replacing the preflight section from the forward section by use of an overhead crane. The H982 should be light in weight to permit ease of handling yet rigid and strong enough to preclude yield or failure during use. It should be compatible with the MC1403 center section, the MC1414 preflight section, the H926 warhead stand, the H1083/1005 hydraulic ram, and an overhead crane.

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## Product Characteristics

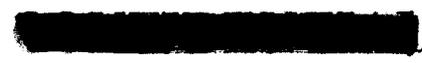
The H982 hydraulic press extension provides the capabilities listed under "Design Intent."

In use, the frame of the hydraulic press extension is fastened to two of the upright posts of the H926 warhead stand. The H982 pressure plate is then fastened to the top of the MC1414, and the H1083/1005 hydraulic ram is placed between the pressure plate and the frame (Figures 2 and 3). When the hydraulic ram is actuated, the O-ring seal between the MC1414 and the MC1403 is compressed; this permits removal or replacement of the screws. After the screws are removed, the H982 frame is removed from the warhead stand. An overhead crane, attached to the bail of the H982 pressure plate, is used to remove the MC1414 from the MC1403 (Figure 4). The maximum static load imposed on the H982 frame and support plate is 720 pounds. Inspection and tests of the H982 prototypes have shown them to be adequate.

## Development History

The requirement for the H982 hydraulic press extension was established by Division 1512. The present configuration of the H982 is essentially the same as that of the original design; however, a number of changes have been made. The frame was originally fabricated from aluminum but due to increased pressure requirements it was changed to steel. Some time after the H982 prototypes were made, the flange design on the MC1414 was changed by Organization 1512. This necessitated a redesign of the clamps on the H982 pressure plate. The knob on the adjustable clamp was redesigned, and other minor modifications have been made to improve functionability. A static test was conducted on April 19, 1962 (Test Report T-18677). At the time of the test, the maximum required pressure was 660 pounds. The H982 was loaded in a realistic manner and subjected to 4.6 times design load (3036 pounds). No yielding occurred. The load was increased in specified increments until yielding of the pressure plate occurred at 3500 pounds. This is 4.8 times the present load of 720 pounds (maximum).

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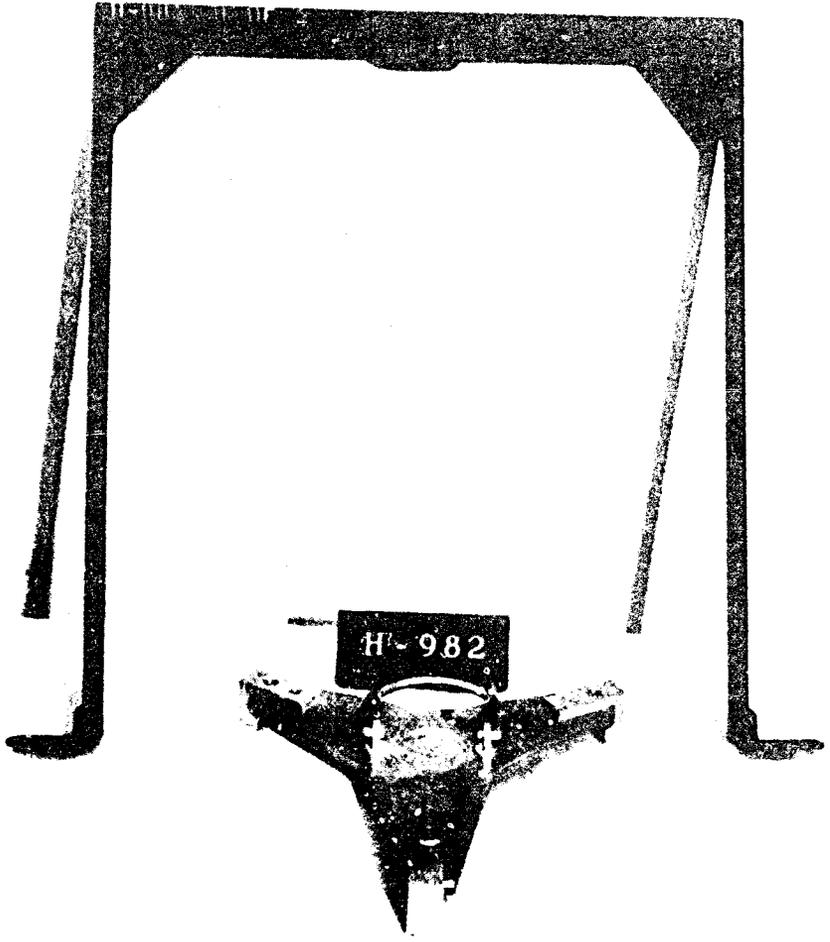


Figure 1. H982 Hydraulic Press Extension

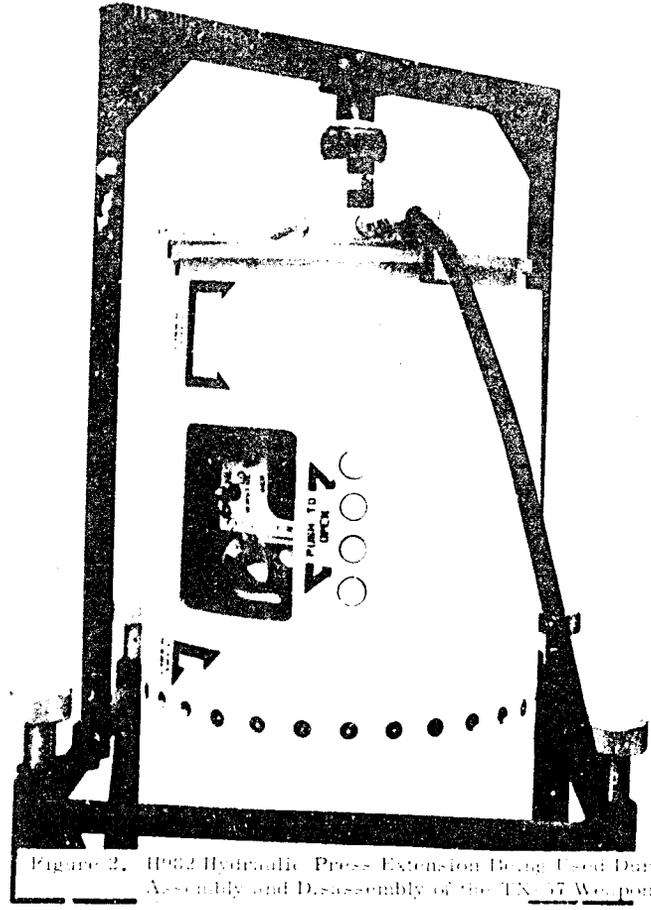


Figure 2. H982 Hydraulic Press Extension Being Used During the Assembly and Disassembly of the TX-67 Weapon

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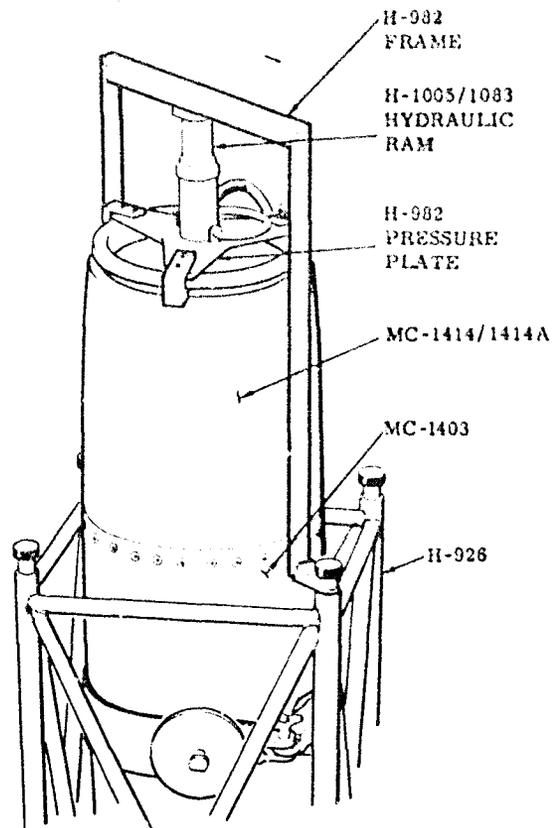


Figure 3. H982 Hydraulic Press Extension Being Used During the Assembly and Disassembly of the TX-57 Weapon

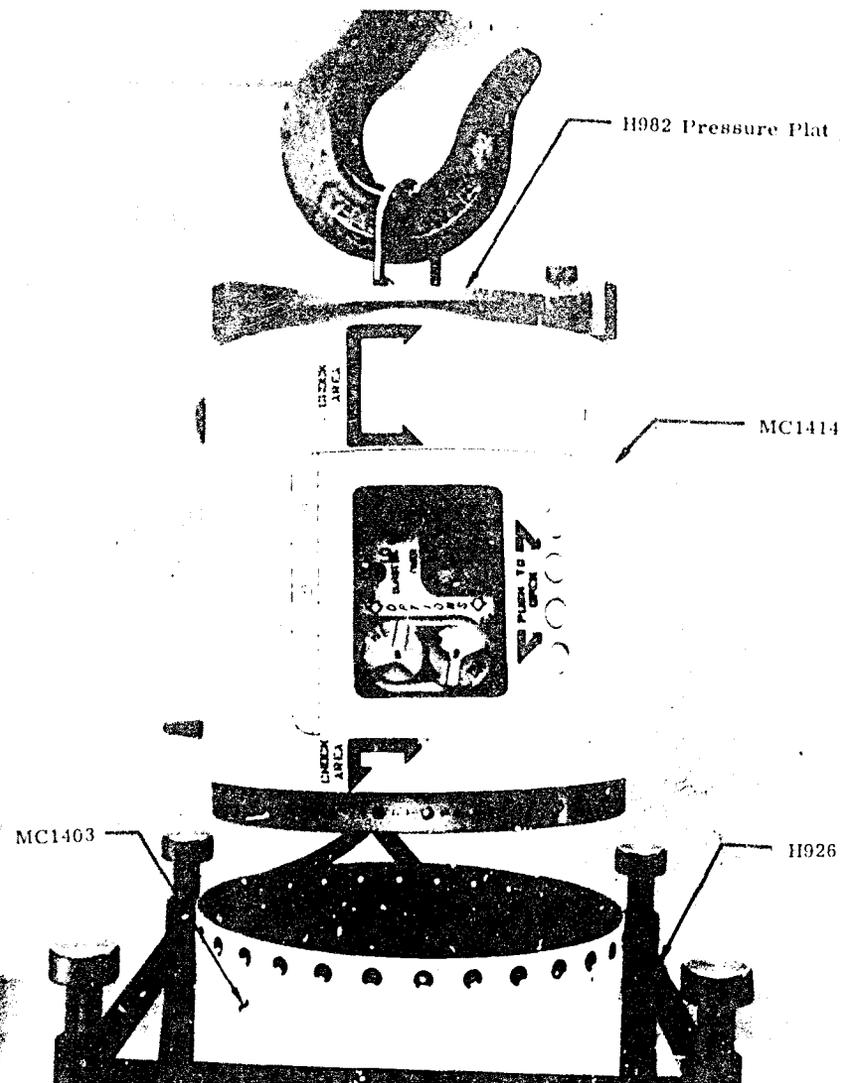


Figure 4. The H982 Pressure Plate and MC1414 Being Removed From the TX-57 Weapon by an Overhead Crane

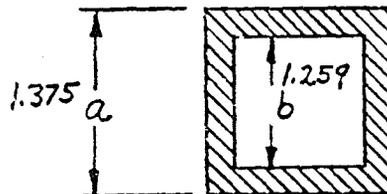
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PREPARED BY: <i>J.F. Durrie</i>	SANDIA CORPORATION	PAGE NO. _____ OF _____
CHECKED BY:	<b>UNCLASSIFIED</b>	REPORT NO. _____
DATE:	<i>STRESS CALCULATIONS H-982</i>	MODEL NO. <i>H982</i>

MAIN BEAM OF FRAME.

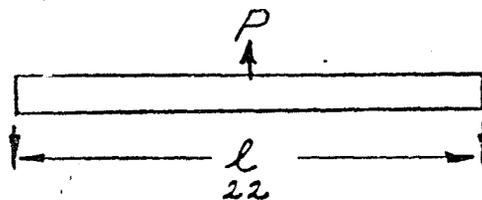
1.375 SQ. X .058 WALL STEEL TUBING

$$Z = \frac{a^4 - b^4}{6a} = .129$$



MAX. LOAD P IS 720 lbs.

$$f = \frac{Pl}{5Z} = \frac{720 \times 22}{5 \times .13} = 24369 \text{ PSI}$$



$f_{ty}$  4130 STEEL = 70 000 PSI       $\frac{70000}{24369} = \underline{\underline{2.87 \times \text{MAX. LOAD}}}$

$f_{tu}$  4130 STEEL = 90 000 PSI       $\frac{90000}{24369} = \underline{\underline{3.69 \times \text{MAX. LOAD}}}$

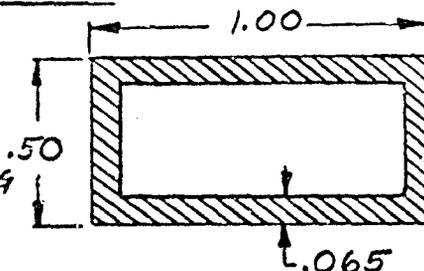
LEGS.

TOTAL AREA IN TENSION = .178 IN.<sup>2</sup>

LOAD 720 lbs ON TWO LEGS = 360 lbs./LEG

$360 \times 4.6 = 1656 \text{ lbs.} = f_{ty}$

$360 \times 6. = 2160 \text{ lbs.} = f_{tu}$



$f_{ty}$  4130 STEEL = 70 000 PSI

$f_{tu}$  4130 STEEL = 90 000 PSI       $70000 \times .178 \text{ IN}^2 = 12460 \text{ PSI}$

$90000 \times .178 \text{ IN}^2 = 16020 \text{ PSI}$        $\frac{12460}{360} = 34.6$

$\frac{16020}{360} = 44.5$

ALTHOUGH THE YIELD POINT IS 34.6 TIMES THE MAX. LOAD THE EXISTING SECTION IS NEEDED FOR RIGIDITY.

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