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TRUPACT-II Procedures and Maintenance Instructions

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Waste Isolation Pilot Plant

Attachment 1 - Change Notice

Section 1 - DOCUMENT INFORMATION

Doc. No.	Rev. No.	Document Title	Change No.
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Reason for Change PROVIDE CURRENT REVISION OF TRUPACT-II CERTIFICATE OF COMPLIANCE

Step/Section	Change	Step/Section	Change
ATTACHMENT F	REPLACE ATTACHMENT F WITH ATTACHED CURRENT TRUPACT-II CERTIFICATE of COMPLIANCE, REVISION 8		

Major/Minor Determination
- ☐ Major Change
- ☑ Minor Change

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- ☑ The proposed change does not result in a change in the process or activities as described in the SAR
- ☐ USQ Safety Evaluation Attached

Location change placed

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this document is to provide the technical requirements for operation, inspection and maintenance of a TRUPACT-II Shipping Package and directly related components. This document shall supply the minimum requirements as specified in the TRUPACT-II Safety Analysis Report for Packaging (SARP) and Certificate of Compliance (C of C) 9218. In the event there is a conflict between this document and the TRUPACT-II SARP (NRC Certificate of Compliance No. 9218), the TRUPACT-II SARP shall govern.

This document details the operations, maintenance, repair, replacement of components, as well as the documentation required and the procedures to be followed to maintain the integrity of the TRUPACT-II container. These procedures may be modified for site use, but as a minimum all parameters and format listed herein must be included in any site modified version. For convenience and where applicable steps may be performed out of sequence.

This document discusses operating procedures, required inspections and maintenance for the following:

- TRUPACT-II Packaging
- Miscellaneous Packaging Special Tools and Equipment

Also, packaging and payload handling equipment and transport trailers have been specifically designed for use with the TRUPACT-II Packaging. This document discusses the minimum required procedures for use of the following equipment in conjunction with the TRUPACT-II Packaging.

- Adjustable Center of Gravity Lift Fixture (ACGLF)
- TRUPACT-II Transport Trailer

Attachment F contains the various TRUPACT-II Packaging Interface Control Drawings, Leak Test and Vent Port Tool Drawings, ACGLF drawings, and tiedown drawings which provide identities of the various system components.

1.2 Conventions

The following conventions are used to standardize the language used in procedures and work instructions:

- The words "will" and "shall" and "must" denote requirements.

- The word "should" denotes a recommendation.
- The word "may" denotes permission, neither a requirement or a recommendation.
- The word "check" is used to determine the condition or status.
- The word "verify" is used to confirm a condition.
- Parts shall be identified with the part number and name as listed in the TRUPACT-II Work Instructions.
- Standard abbreviations (not symbols) will be written out to express measurements and dimensions. For example, use "feet" or "ft", but not "'".
- Acronyms will be identified fully in the first usage in the instruction.
- Cautions and notes, if used, shall always precede the pertinent step(s).
- Cautions and notes shall not be used as instruction steps.

1.3 Definitions

- **Assembly Verification Leak Test** includes all leak tests performed during assembly of a loaded TRUPACT-II package.
- **Certificate of Compliance (C of C)** is issued by the NRC, approving the design of a specific radioactive materials packaging for use with specified payload limitations.
- **Certified Waste** is waste that has been confirmed under a formal program to comply with disposal site waste acceptance criteria under an approved waste certification program.
- **Contact Handled Transuranic (CH TRU) Waste** is waste with an external beta-gamma-neutron radiation dose rate not exceeding 200 mrem/hr at the waste container's surface such that shielding beyond that provided by the packaging is not necessary. Containers of CH TRU waste may be handled directly without the need for remote handling or robotic equipment.
- **Containment Integrity Verification Leak Test** includes all leak tests performed after Structural Pressure Testing to verify containment boundary integrity (both metallic and elastomeric).

- **Maintenance Record** is a list of maintenance performed that becomes a permanent part of the TRUPACT-II packaging documentation record.

- **Major Maintenance** consists of all repairs requiring welding or machining to correct a deficiency that effects the integrity of the TRUPACT-II containers or its components. Note that major repairs and major component replacements are the responsibility of Waste Isolation Division/Waste Isolation Pilot Plant (WID/WIPP). These repairs/replacements will be performed at a TRUPACT-II Maintenance Facility as designated and approved by WID/WIPP.

- **Minor Maintenance** consists of all repairs that can be readily accomplished and require no special tools, supplies, equipment, or highly skilled personnel. Minor repairs would include scratches on the sealing surface. Note that minor repairs and minor component replacements shall be performed at user sites that have the necessary equipment and qualified personnel to perform these tasks.

- **Nonconformance Report (NCR)** is a document which is used to identify and record a nonconforming condition, and the action taken for the disposition of the nonconformance. Disposition of nonconforming items include review, accept, reject, rework, use-as-is, or repair in accordance with approved procedures. All occurrences of NCRs require formal disposition by the WIPP TRUPACT-II Maintenance Engineer.

- **Owner** is the organization to which the NRC C of C is issued (i.e., for the TRUPACT-II Shipping Package, the DOE-HQ).

- **Package** consists of the TRUPACT-II Shipping Package with it's contents or payload.

- **Packaging** consists of the TRUPACT-II Shipping Package without it's contents or payload (empty).

- **Periodic Maintenance (PM)** consists of all maintenance activities performed annually or other periodic time interval. Periodic maintenance activities listed in Section 4.1 will normally be performed at the WIPP site, unless otherwise specified.

- **Safety Analysis Report for Packaging (SARP)** is the official application to a packaging licensing agency (DOE or NRC) containing a demonstration of packaging effectiveness and ability in achieving the requirements delineated in 10 CFR 71. The SARP is the controlling document with regards to all packaging operations and maintenance.

- The Outer Containment Assembly (OCA) consists of a lid and body, each of which is composed primarily of an inner stainless steel shell which comprises the outer containment vessel (OCV) boundary, approximately ten inches of thermal and impact absorbing polyurethane foam, and an external stainless steel shell. The lid internal and external top surfaces are domed. The body internal surface is domed whereas the bottom is flat. Three lifting interfaces are supplied on the lid for handling the lid. Two fork lift slots in the body base are utilized for handling the entire loaded OCA. When the lid is installed on the body the overall height is approximately ten feet and overall diameter is approximately eight feet. A tapered sealing flange on the lid mates with a similar sealing flange on the body. The body sealing flange contains two main O-ring seals. A removable brass plug in a seal test port allows testing of the main O-ring seals during loading operations. The lid is secured to the body via a rotating locking ring located on the lid sealing flange. Six fasteners secure the lock ring from rotating during shipment. A single vent port comprises the only containment penetration into the OCV cavity. A removable brass plug in the vent port allows access to the cavity during loading and unloading operations.

- The Inner Containment Vessel (ICV) consists of a lid and body, each of which is comprised of stainless steel shells. Both the lid and body ends are domed to mate with the interior cavity of the OCA. Three lifting sockets in the lid provide the lifting interface for the lid or an empty (contents not installed) lid/body assembly. Aluminum honeycomb spacers inside the lid and body domes provide impact protection to the domes and a flat surface onto which to install the packaging contents. A tapered sealing flange on the lid mates with a similar sealing flange on the body. The body sealing flange contains two main O-ring seals. Both a silicone debris seal and an O-ring wiper seal are contained on the lid sealing flange to preclude debris ingress into the main O-ring seal areas. A removable brass plug in a seal test port allows testing of the main O-ring seals during loading operations. The lid is secured to the body via a rotating locking ring located on the lid sealing flange. Three fasteners secure the lock ring from rotating during shipment. A single vent port comprises the only containment penetration into the ICV cavity. A removable inner brass plug in the vent port allows access to the ICV cavity. A removable outer brass plug in the vent port allows for helium purging the ICV main O-ring seals and the volume between the inner and outer plug for subsequent leakage testing.

1.4.2 Seal Test Port and Vent Port Tools

NOTE: *The tool drawings listed in Attachment E were designed and used during the fabrication phase of the TRUPACT-II Packaging program. Users may choose to modify these tools to interface with equipment per individual site requirements. However, users shall not modify the TRUPACT-II Packaging fittings.*

Several tools have been designed specifically for the operation and leakage rate testing of the TRUPACT-II Shipping Package. Although the OCV and ICV seal test ports and vent ports are similar in design, the tools are designed for use in one port only and are not interchangeable. The functional description of each tool is listed as follows:

- OCV Vent Port Cover Removal Tool provides for remote removal and installation of the OCV Vent Port Cover through the Vent Port Access Port in the OCA lower assembly (see Figure 1-2; Part No. 2077-092).

- OCV Vent Port Plug Removal/Pressure Relief Tool provides for the removal and installation of the OCV Vent Port Plug, and access to the OCV cavity through the Vent Access Port in the OCA lower assembly (see Figure 1-3; Part No. 2077-091-A2). This tool is equipped with a quick-connect fitting to interface with gas sampling, vacuum, and helium backfill equipment, and is used for the following operations:

  - OCV annulus venting and gas sampling,

  - vacuum pump interface for OCA upper assembly installation and removal,

  - helium backfill during all OCV leakage testing, and

  - pressure fill during periodic OCV structural pressure testing and axial play measurements.

- OCV Vent Port Plug Leak Check Tool is used to check the OCV vent port plug seal for all leakage tests (see Figure 1-4; Part No. 2077-095-A1). Access is through the Vent Access Port in the OCA lower assembly. This tool is equipped with a quick-connect fitting to interface with the leak testing equipment.

- OCV Seal Test Port Plug Removal Tool provides for installation and removal of the OCV Seal Test Port Plug through the Seal

Test Access Port in the OCA upper assembly (see Figure 1-5; Part No. 2077-094-A2).

- OCV Seal Leak Check Tool is used to check the main O-ring seal for all leakage tests (see Figure 1-6; Part No. 2077-093-A2). Access is through the Seal Test Access Port in the OCA upper assembly. This tool is equipped with a quick-connect fitting to interface with the leak testing equipment.

- ICV Vent Port Cover Removal is performed using a standard, 3/8 inch square drive ratchet wrench, breakover bar, or T-handle wrench (see Figure 1-7).

- ICV Vent Port Plug Removal/Pressure Relief Tool provides for the removal and installation of the ICV Outer Vent Port Plug and, with an adapter (Part No. 2077-091-24), removal and installation of the ICV Inner Vent Port Plug thereby gaining access to the ICV cavity (see Figure 1-8; Part No. 2077-091-A1). This tool is equipped with a quick-connect fitting to interface with gas sampling, vacuum, and helium backfill equipment, and is used for the following operations:

  - ICV cavity venting and gas sampling (with the adapter),

  - vacuum pump interface for ICV lid installation and removal,

  - helium backfill during all ICV leakage testing, and

  - pressure fill during periodic ICV structural pressure testing and axial play measurements,

- ICV Vent Port Plug Leak Check Tool is used to check the ICV vent port plug seal for all leakage tests (see Figure 1-9; Part No. 2077-095-A2). This tool is equipped with a quick-connect fitting to interface with the leak testing equipment.

- ICV Seal Test Port Plug Removal Tool provides for installation and removal of the ICV Seal Test Port Plug (see Figure 1-10; Part No. 2077-094-A1).

- ICV Seal Leak Check Tool is used to check the main O-ring seal for all leakage tests (see Figure 1-11; Part No. 2077-093-A1). This tool is equipped with a quick-connect fitting to interface with the leak testing equipment.

1.4.3 Lock Ring Tools

NOTE: Lock ring tools are furnished by WID/WIPP.

The lock ring tools are designed for rotating the lock ring assemblies to either the locked or unlocked position (Part Nos. 2077-156-A6 for the ICV lock ring and 2077-156-A7 for the OCA lock ring). These tools are illustrated on sheet 3 of drawing 2077-300 in Attachment E.

1.4.4 Lower Spacer Removal Sling

One lower spacer removal sling is designed for installation and removal of the lower spacer (Part No. SK-1104).

1.4.5 Adjustable Center of Gravity Lift Fixture (ACGLF)

NOTE: The users of the TRUPACT-II Packagings are responsible for procurement of the ACGLF. Furnished for information in Attachment E are the latest "as-built" drawings of the ACGLF procured by WID/WIPP and include all changes that have been made since the original design. Drawings for the SWB and TDOP adapters are available from WID/WIPP.

The Adjustable Center of Gravity Lift Fixture (ACGLF) is used for loading and unloading payloads when the center of gravity is not on the vertical centerline of the payload. With an adaptor, the ACGLF may be used for loading and unloading SWBs and TDOPs.

The ACGLF is used in conjunction with a 5-ton crane (minimum) and is designed for the following general requirements:

- maximum rated capacity of the lift fixture is 10,000 pounds,
- system power is 115 VAC, 60 Hz, 20 amperes,
- minimum crane hook height is 20½ feet,
- maximum 7½ ton Crosby hook size interface,
- one (1), 14 drum payload assembly, two (2), SWB payload assemblies, or one (1), TDOP may be lifted at one time, and
- a 3.6 inch maximum lateral offset in the payload assembly center of gravity may be accommodated.

For facilities with overhead height limitations a second set of short length lift legs are available.

The ACGLF is designed to handle the weight of the following configurations without the need for adapters or reconfiguration of the lift fixture.

- an OCA lid assembly,
- an ICV lid,
- an empty ICV assembly, or
- a loaded payload pallet, SWBs, or TDOP.

The ACGLF is not designed to lift the weight of the following configurations:

- a loaded or empty TRUPACT-II package,
- a loaded or empty OCA, or
- a loaded ICV.

1.4.6 TRUPACT-II Transport Trailer

The TRUPACT-II Transport Trailer is specially designed for transportation of up to three fully loaded TRUPACT-II Shipping Packages. Air ride suspension and spring ride suspension trailers have been developed. All trailers are designed with a goose neck that is equipped with a standard king pin arrangement. Trailers are illustrated on drawing 2077-300 in Attachment F.

Each trailer is equipped with 12 special tiedown devices used for securing up to three TRUPACT-II Shipping Packages to the trailer (4 per package). The tiedowns are cam-operated, adjustable length U-bolts that interface with, and clamp down on corresponding lugs on the TRUPACT-II Packaging. Tiedowns are illustrated on drawing 2077-022 in Attachment F.

1.4.7 TRUPACT-II Spare Parts

A list of the TRUPACT-II Packaging spare parts is provided on drawing 2077-1120 in Attachment G.

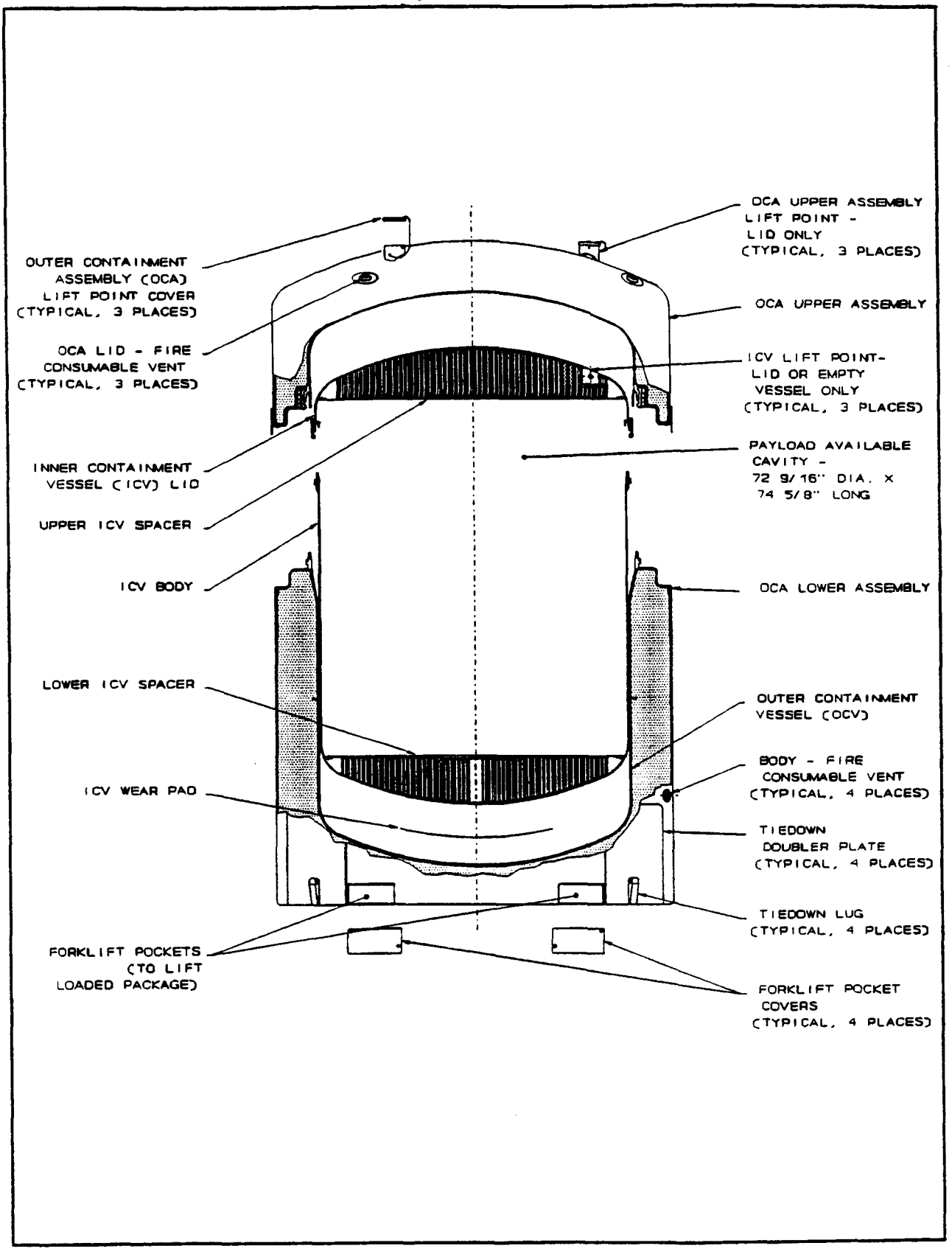

FIGURE 1-1 TRUPACT-II Shipping Package

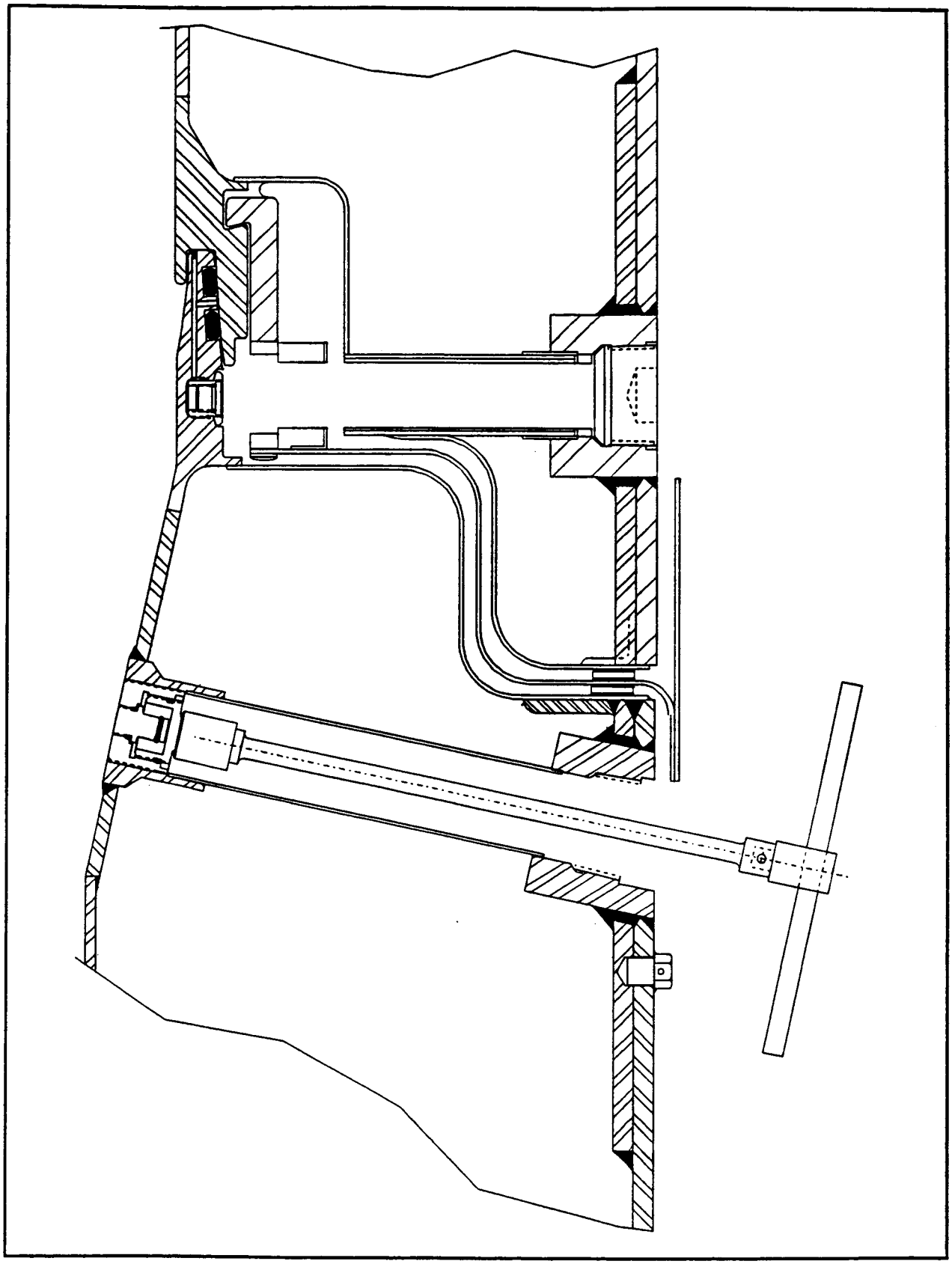

FIGURE 1-2 OCV Vent Port Cover Removal Tool (2077-092-A1)

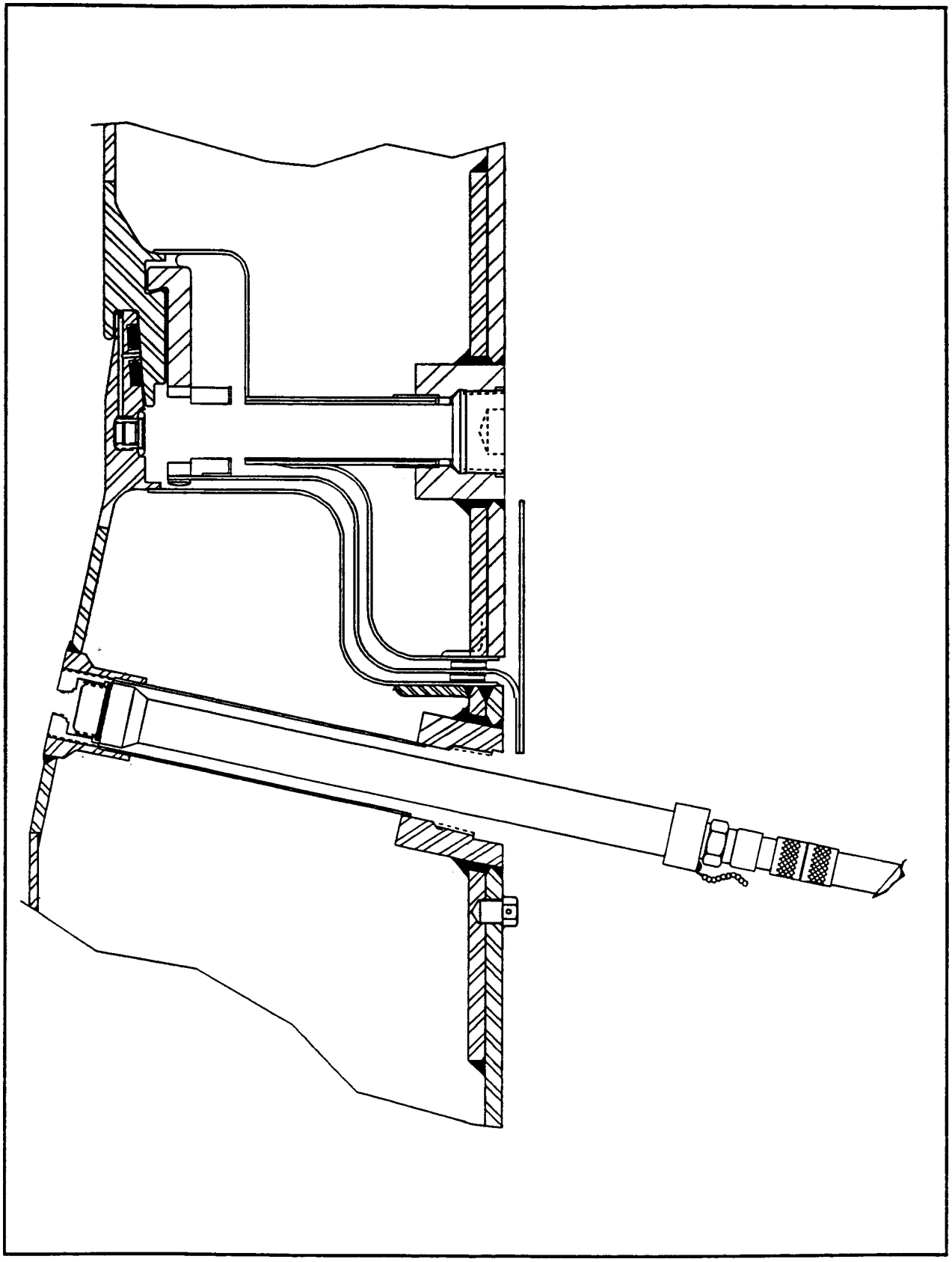

FIGURE 1-4 OCV Vent Port Plug Leak Check Tool (2077-095-A1)

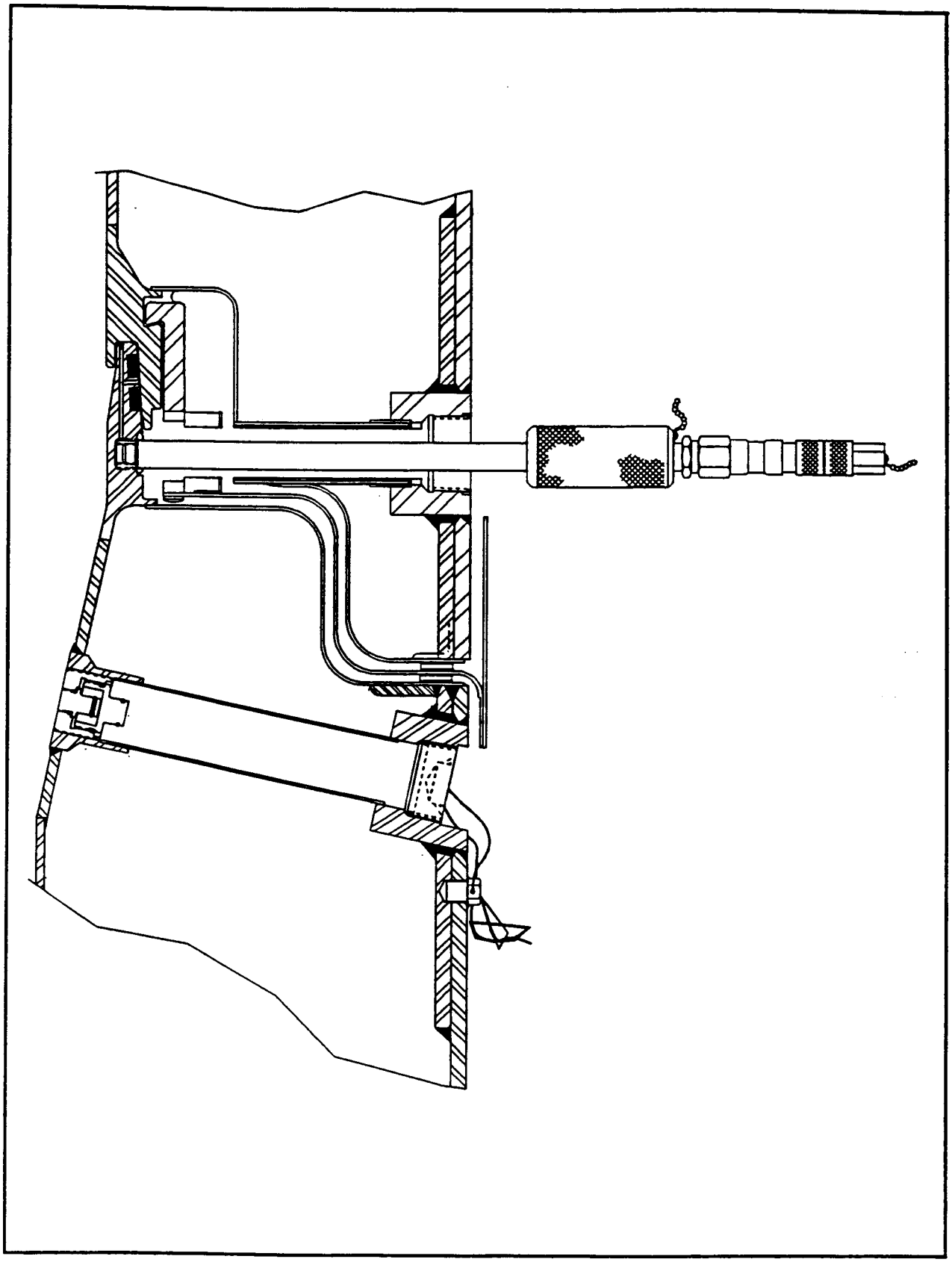

FIGURE 1-6 OCV Seal Leak Check Tool (2077-093-A2)

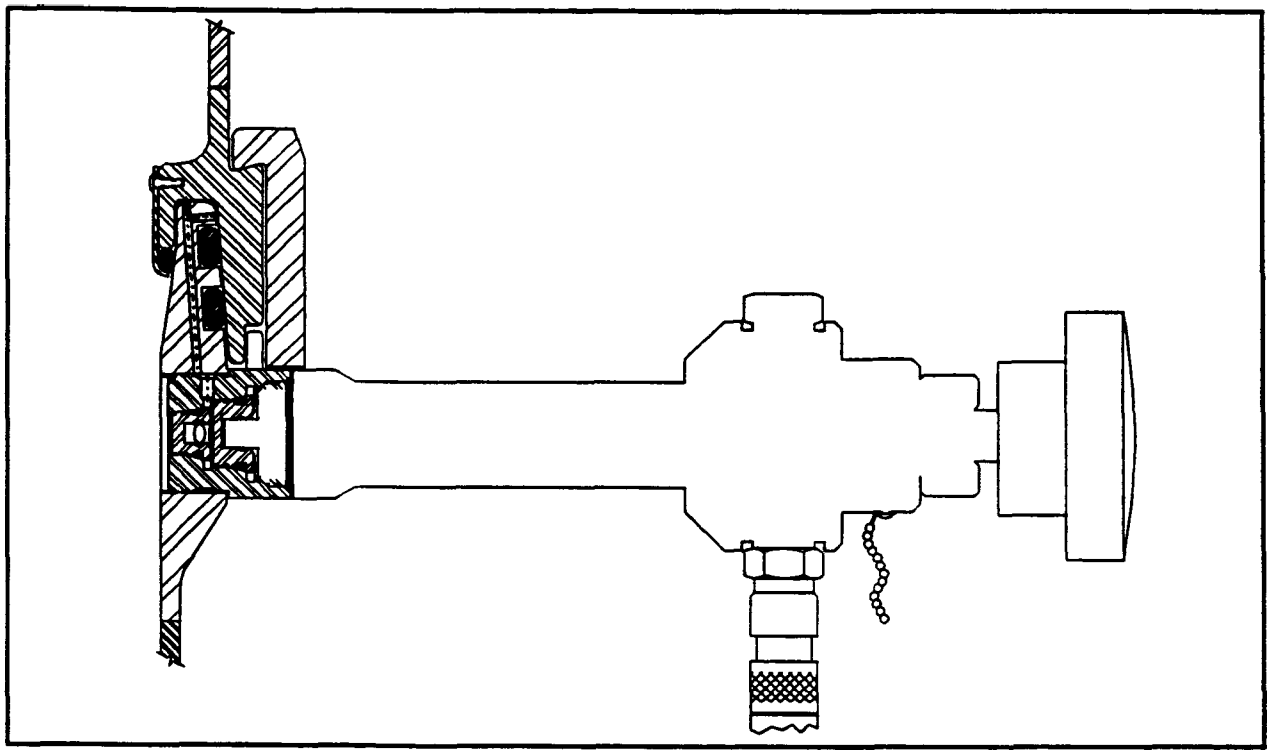

FIGURE 1-8(a) ICV Vent Port Plug Removal/Pressure Relief Tool (2077-091-A1)

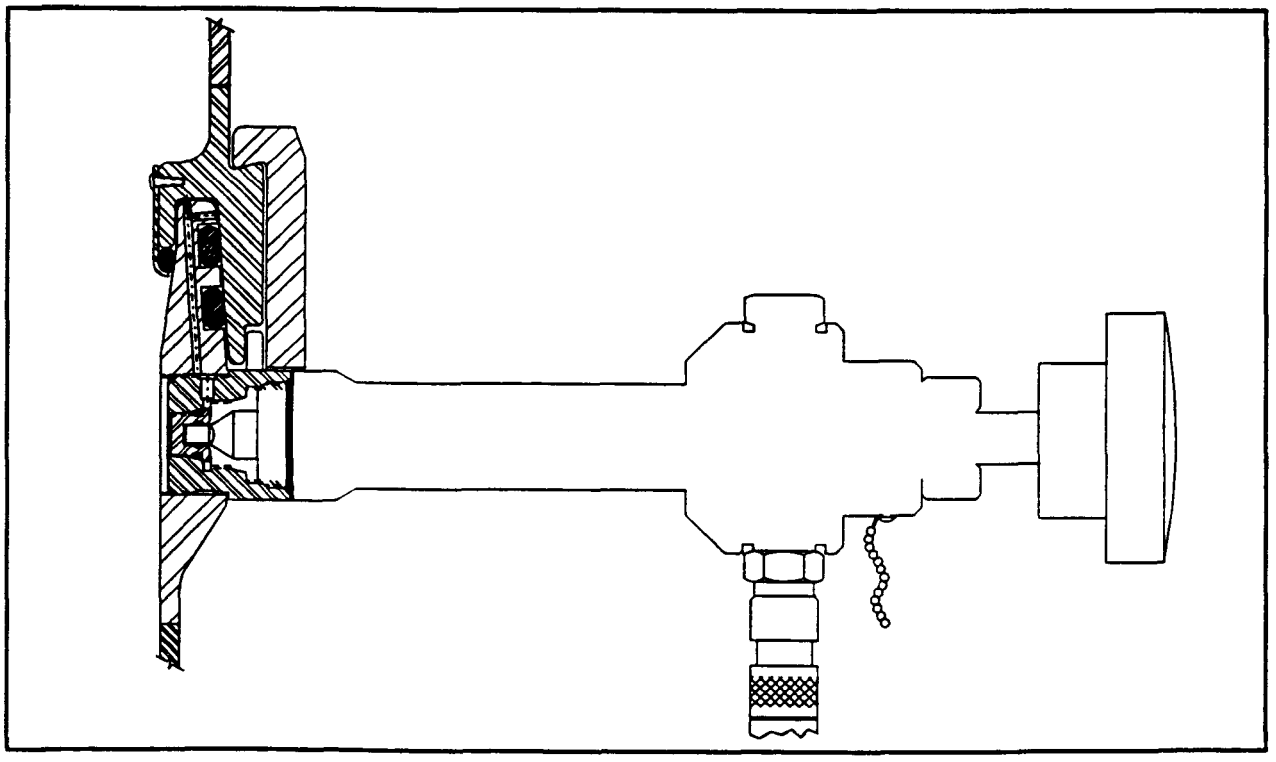

FIGURE 1-8(b) ICV Vent Port Plug Removal/Pressure Relief Tool (with adapter)

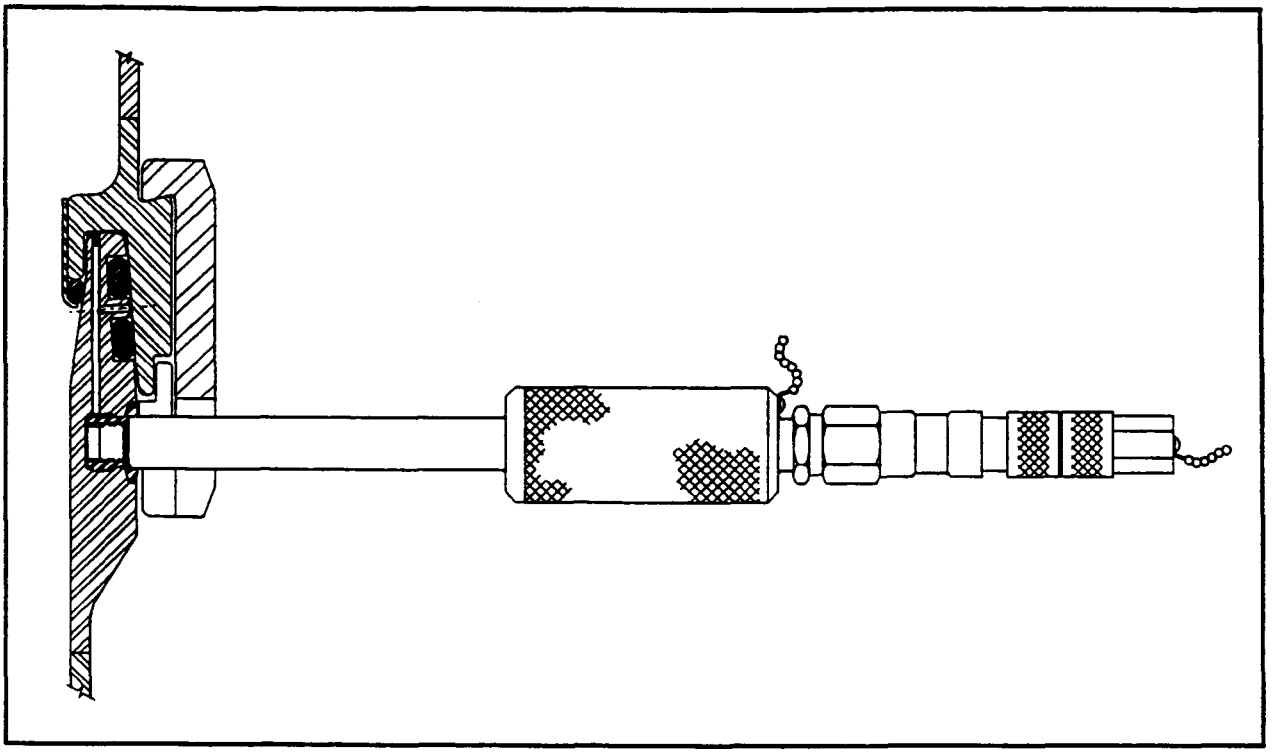

FIGURE 1-11 ICV Seal Leak Check Tool (2077-093-A1)

2.0 GENERAL REQUIREMENTS

2.1 Record Maintenance

All records of maintenance activities performed on the TRUPACT-II Packagings will be maintained by WID/WIPP for retention and distribution. Records will be designated as QA records and will be maintained as permanent records. WIPP Engineering (Packaging and Transportation Section) will maintain records in accordance with DOE Order 1324.2.

2.2 Document Distribution

Original TRUPACT-II Maintenance Records will be transmitted to WIPP TRUPACT-II Maintenance Engineer and become a part of the permanent TRUPACT-II System record.

The user preparing the TRUPACT-II Maintenance Record should retain a copy for their file. WIPP Engineering (Packaging and Transportation Section) will retain the original and distribute copies, as appropriate.

The Work Instruction copy used for a check list by a user, will be transmitted to WIPP with the original TRUPACT-II Maintenance Record.

The user should retain a copy of the check sheet for their file.

2.3 Approved Work/Periodic Maintenance Instructions

Approved work and periodic maintenance instructions and revisions will be retained by WIPP Engineering (Packaging and Transportation Section) and copies will be distributed to all users of TRUPACT-II. The original will be filed with and become part of the TRUPACT-II System permanent record. For approved work instructions intended for one-time use, the original will become part of the TRUPACT-II System permanent record.

2.4 Material Control

All replacement components are procured by WIPP and shall be verified as complying with applicable material requirements as specified in SARP Drawings. Inspection reports, applicable Certified Material Test Reports and Material Certificates of Conformance shall be maintained by the WIPP TRUPACT-II Maintenance Engineer.

All replacement components will be furnished by the WIPP TRUPACT-II Maintenance Engineer to user sites. The parts will be labeled with part number and WIPP Purchase Order number. Users will segregate and store parts by purchase order number.

All replaced (used) components should be disposed of per site discard procedures. It is not necessary to ship used components to WIPP. If return of used components is deemed necessary for analysis, usage trends, or investigation, a formal request for return will be issued to user sites.

2.5 Quality Assurance Requirements

Quality Assurance (QA) system meeting controlling functions of the applicable 18 criteria of 10 CFR 71, Subpart H, shall be in place at the loading and unloading facilities per DOE Order 1540.2. Annex 2 of the NRC Regulatory Guide 7.10 shall be used as a guideline. These requirements also apply to maintenance, repair, replacement, and/or modifications as approved by the owner.

Existing QA Programs may be utilized to satisfy the above requirements provided a review has been made as to its applicability to the scope of activities performed by each participant. It is the responsibility of the involved participant to obtain approval of their QA Program from the appropriate DOE Field Office.

2.6 Training Requirements

Users shall have the responsibility for a training program specific to this work scope to ensure that qualified personnel experienced in their assigned tasks perform maintenance, test, replacement, and related operations.

2.7 Maximum Packaging and Trailer Weights

The maximum gross shipping weight of a TRUPACT-II Shipping Package is 19,250 pounds when loaded with the maximum allowable contents weight of 7,265 pounds.

The maximum DOT legal gross weight for highway transport without permit is 80,000 pounds. The maximum allowable gross weight for three loaded TRUPACT-II Shipping Packages, including the trailer, is 80,000 pounds, less the weight of the tractor. Tables 2-1 and 2-2 provide a serialized listing of packaging and trailer weights, respectively.

TABLE 2-1 TRUPACT-II Packaging Component Weights (pounds)

Serial Number	ICV			OCA			TOTAL
	Lid	Body	Total	Lid	Body	Total	
125	922	1,894	2,816	3,604	6,136	9,740	12,556
126	924	1,890	2,814	3,532	6,130	9,662	12,476
127	912	1,872	2,784	3,630	6,098	9,728	12,512
128	930	1,938	2,868	3,642	6,229	9,871	12,739
129	922	1,912	2,834	3,610	6,365	9,975	12,809
130	900	1,932	2,842	3,700	6,300	10,000	12,842
131	906	1,900	2,806	3,594	6,230	9,824	12,630
132	914	1,932	2,846	3,596	6,214	9,810	12,656
133	900	1,900	2,800	3,624	6,246	9,870	12,670
134	902	1,882	2,784	3,600	6,250	9,850	12,634
135	906	1,900	2,806	3,600	6,150	9,750	12,556
136	906	1,884	2,790	3,750	6,600	10,356	13,140
137	900	1,850	2,750	3,650	6,700	10,350	13,100
138	900	1,800	2,700	3,600	6,400	10,000	12,700
139	900	1,850	2,750	3,600	6,200	9,800	12,550
SN101	850	1,730	2,580	3,440	5,818	9,258	11,838
SN102	825	1,720	2,545	3,465	5,845	9,310	11,855
SN103	825	1,720	2,545	3,470	5,827	9,297	11,842
SN104	842	1,723	2,565	3,380	5,744	9,124	11,689
SN105	800	1,750	2,550	3,760	5,850	9,610	12,160
SN106	837	1,769	2,606	3,810	6,350	10,160	12,766
SN107	844	1,727	2,571	3,372	5,772	9,144	11,715
SN108	841	1,718	2,559	3,414	5,806	9,220	11,779
SN109	866	1,775	2,641	3,310	5,700	9,010	11,651
SN112	860	1,640	2,500	3,310	5,700	9,010	11,510

3.0 TRUPACT-II PACKAGE OPERATING INSTRUCTIONS

This section provides the user with the unloading and loading instructions for the TRUPACT-II Shipping Package (hereafter referred to as "package" within this section). Each facility shall use detailed written procedures to ensure the safe and effective handling of the package. In general, unloading or loading a package takes place in a controlled environment.

Utilize copies of the data sheets in Attachment A to document package unloading and loading operations. The following list summarizes the package unloading (Sections 3.1 through 3.5) and loading (Sections 3.6 through 3.11) sequence:

1. Receiving a Package for Unloading
2. Removal of a Package from the Transport Trailer
3. OCA Lid Removal
4. ICV Lid Removal
5. Unloading the Payload
6. ICV Lid and Body Inspections
7. OCA Lid and Body Inspections
8. Loading the Payload into the Package
9. ICV Lid Installation
10. OCA Lid Installation
11. Installation of the Package onto the Transport Trailer

3.1 Receiving a Package for Unloading

This section initializes the package unloading sequence. For Sections 3.1 through 3.5, record all sign-offs on the "TRUPACT-II Package Receipt and Unloading Data Sheet" found in Attachment A.

NOTE: *The package loading/unloading operation shall only be performed in a dry environment. In the event of precipitation during outdoor unloading or loading operations, precautions, such as covering the OCV and ICV cavities, shall be implemented to prevent precipitation from entering the package interior cavities. If precipitation does enter the interior cavities, all free-standing water shall be removed prior to loading the package for shipment.*

3.1.1 Review all shipping documents to determine the condition of the package and that all necessary documentation is completed.

3.2.5 Remove four (4) access covers from each end of the two (2) forklift pockets. Store in a designated area.

NOTE: *Forks shall have a minimum bearing area of 960 square inches (two forks: 8 inches wide by 60 inches long). The forks shall be at the minimum spread to ensure the package is centered with respect to the direction of the forklift.*

CAUTION: *Do not cause damage to the exterior surfaces of the package with the forks.*

3.2.6 Operate a forklift (10 ton minimum capacity) to fully engage the package forklift pockets.

CAUTION: *Failure to fully disengage all four (4) package tiedown devices prior to removal from the trailer may damage the tiedown devices, trailer, and/or package.*

3.2.7 Verify disengagement of all tiedown devices prior to lifting the package.

SIGN-OFF REQUIRED

CAUTION: *Tip-back may damage the package exterior surface. Bumper pads should be provided on the face of the forklift if tip-back is used. A suitable bumper pad would be a 62 inch long stainless steel plate 24 inches high with a 48 inch radius. A thin pad of neoprene, rubber, or similar material would further preclude damage. The bumper should be located at the upper surface of the fork tine at the appropriate angle to the face of the forklift.*

3.2.8 Lift the forks vertically until the package is clear of the trailer frame.

CAUTION: *Handling operations shall preclude tip-back as a means of controlling the load during downhill movements. Downhill operations should be prohibited or positive restraints (straps) must be used to control the load.*

3.2.9 Transport the package to a designated area. Exercise careful handling procedures regarding forklift speed, lift height, and terrain traversed.

CAUTION: *The package should be supported across the full bottom surface for stability during loading.*

3.3.8 Using up to three OCV T-handle tools, attempt to manually rotate the OCV locking ring assembly counterclockwise until the "UNLOCKED" arrows are aligned with the "Seal Test Port" position marks on the OCA exterior. If locking ring cannot be rotated, then proceed to step 3.3.9. If ring can be rotated, proceed to step 3.3.13.

NOTE: *The OCV is designed for safe operation with a full internal vacuum. However, rotation of the OCV locking ring should be able to be accomplished using less than 12 in-Hg vacuum.*

3.3.9 Install a vacuum pump system to the OCV vent port plug removal tool and evacuate the OCV cavity to allow the OCA locking ring to rotate freely.

CAUTION: *Do not attempt to rotate the OCV locking ring assembly with mechanical force. Three operators should be able to rotate the locking ring with reasonable effort (i.e., 200 pounds total maximum force on the locking ring tools). Only use up to three OCV locking ring tools.*

3.3.10 Using up to three OCV T-handle tools, manually rotate the OCV locking ring assembly counterclockwise until the "UNLOCKED" arrows are aligned with the "Seal Test Port" position marks on the OCA exterior.

3.3.11 Secure the vacuum system and disconnect the vacuum assembly.

3.3.12 Vent the OCV cavity to atmospheric pressure by letting ambient air return into the vessel through the OCV vent port plug removal tool.

CAUTION: *Verify the Adjustable Center of Gravity Lift Fixture (ACGLF) counterweights are located at 180° and 360°/0° respectively.*

3.3.13 Rig an overhead crane with the Adjustable Center of Gravity Lift Fixture (ACGLF) and position over the OCA lid.

NOTE: *Reference a site-specific ACGLF Operation and Maintenance Manual for detailed ACGLF operating instructions.*

3.3.14 Lower the ACGLF legs into the lift pockets on the OCA lid.

3.3.15 Verify the ACGLF legs are locked by checking that the green "LOCKED" lights are on and the amber "UNLOCKED" lights are off at the ACGLF console.

CAUTION: *When lifting the OCA lid by the lift pockets, ensure that the load exerted on the lift pockets does not exceed 7,500 pounds through the use of a load cell or other means. An indication of 7,500 pounds or greater may indicate OCA lid binding. Force may be applied to either side of the OCA lid to help prevent binding.*

3.3.16 Using the crane, apply a straight and upward tension to remove the OCA lid from the OCA body.

3.3.17 Raise the OCA lid approximately two (2) feet two allow sufficient clearance above the ICV for radiation contamination surveys.

HOLD POINT

3.3.18 For a loaded package only or unless directed by site-specific policy, HPT personnel shall perform radiation contamination surveys of the OCV lid interior surface and the ICV lid exterior surface.

SIGN-OFF REQUIRED

CAUTION: *Do not place the OCA lid on a surface that may damage the OCV locking ring assembly. Use of a storage stand that supports the OCA lid on the inside domed surface is required. See the Interface Control Drawing 2077-300, Attachment E.*

3.3.19 Place the OCA lid on its designated storage stand, exercising care not to damage the OCV locking ring assembly or sealing surface on the OCV lid flange.

3.3.20 Release the ACGLF from the OCA lid as follows:

- Ensure NO LOAD is indicated on the crane load cell,
- Ensure the ACGLF counterweights are rotated to the 180° and 360°/0° positions, and
- Verify the legs are unlocked by checking that the green "LOCKED" lights are OFF and the amber "UNLOCKED" lights are ON at the ACGLF console.

3.4 ICV Lid Removal

3.4.1 Prepare the ICV lid for removal by removing the following:

- Three (3) ICV locking ring fasteners,
- ICV vent port cover, and
- ICV outer vent port plug.

3.4.2 Install the following into the proper locations on the ICV:

- ICV vent port plug removal tool, and
- Four (4) ICV locking ring (T-handle) tools.

3.4.3 If required for a loaded package only directed by site-specific policy, install a radiation assessment filter (RAF) assembly in-line between the vacuum line and ICV vent port plug removal tool.

3.4.4 Retrieve the ICV inner vent port plug into the ICV vent port plug removal tool.

3.4.5 Vent the ICV cavity to atmospheric pressure.

3.4.6 Using up to four ICV T-handle tools, attempt to manually rotate the ICV locking ring counterclockwise to the "UNLOCKED" position. If the locking ring cannot be rotated, then proceed to step 3.4.7. If the locking ring can be rotated, proceed to step 3.4.14.

NOTE: The ICV is designed for safe operation with a full internal vacuum. However, due to the possible presence of volatile organic compounds in the payload, general operations of the ICV should be accomplished using less than 8 in-Hg vacuum.

3.4.7 Install a vacuum pump system to the ICV vent port plug removal tool and evacuate the ICV cavity to allow the ICV locking ring to rotate freely.

CAUTION: Do not attempt to rotate the ICV locking ring with mechanical force. Four operators should be able to rotate the locking ring with reasonable effort (i.e., 200 pounds total maximum force on the locking ring tools). Only use up to four ICV locking ring tools.

3.4.8 Using up to four ICV T-handle tools, manually rotate the ICV locking ring counterclockwise until the ICV is unlocked.

SIGN-OFF REQUIRED

CAUTION: *Do not place the ICV lid on a surface, that may damage the ICV locking ring. Use of a storage stand that supports the ICV lid on the inside domed surface is required (see the TRUPACT-II Interface Control Drawing 2077-300, Attachment A).*

3.4.20 Place the ICV lid on its designated storage stand, exercising care not to damage the ICV locking ring assembly or sealing surface on the ICV lid flange.

3.4.21 Release the ACGLF from the ICV lid as follows:

- Ensure NO LOAD is indicated on the crane load cell,
- Ensure the ACGLF counterweights are rotated to the 180° and 360°/0° positions, and
- Verify the legs are unlocked by checking that the green "LOCKED" lights are OFF and the amber "UNLOCKED" lights are ON at the ACGLF console.

3.4.22 If empty, remove any payload pallets, guide tubes and/or strapping and proceed to Section 3.6.

3.5 Unloading the Payload

NOTE: *The following sequence assumes that a 14-drum pallet with 55-gallon drums has been loaded into the package. Procedures for unloading SWBs or a TDOP shall be developed by the user and will follow the guidelines established in this document.*

3.5.1 Remove the short legs from the ACGLF, and attach the long lifting legs.

CAUTION: *Verify the ACGLF counterweights are located at 180° and 360°/0° respectively.*

3.5.2 Position the crane and ACGLF over the payload.

3.5.3 Lower the ACGLF legs into the three (3) guide tubes until:

- The red stripes on the legs are no longer visible, and
- NO LOAD is indicated on the crane load cell.

3.5.4 Lock the ACGLF Legs into the payload pallet.

3.5.12 Disassemble and store the drum payload in accordance with site-specific procedures.

3.5.13 HPT shall perform radiation contamination survey of the ICV body interior.

3.5.14 Remove the long legs from the ACGLF, and re-attach the short lifting legs.

3.6 ICV Lid and Body Inspections

This section initializes the package loading sequence. For Sections 3.6 through 3.11, record all sign-offs on the "TRUPACT-II Package Inspection and Loading Data Sheet" found in Attachment B.

NOTE: *If required by site-specific policy to ensure personnel safety, HPT shall perform a radiation contamination survey of the ICV interior prior to initiating the ICV inspection process.*

3.6.1 Visually inspect or swab for the presence of free-standing water in the bottom of the ICV. A three (3) inch diameter hole in the lower ICV spacer assembly is available for performing the inspection. If free-standing water is NOT observed in the bottom of the ICV body, proceed to Step 3.6.7.

CAUTION: *Operator shall obtain suitable protective clothing and equipment prior to entering the ICV cavity. Operator shall also enter the ICV cavity using precautions to preclude damage the ICV body sealing flange.*

3.6.2 Visually inspect the bottom of the ICV lower head to re-verify the presence of free-standing water.

3.6.3 Through the three (3) inch hole in the lower ICV spacer assembly, utilize a vacuum system hose or absorbent materials attached to the end of a rod to remove free-standing water.

3.6.4 Withdraw the water removal device from the three inch diameter hole and re-inspect for the presence of free-standing water.

3.6.5 Repeat Steps 3.6.3 and 3.6.4 until all free-standing water has been removed from the bottom of the ICV body.

3.6.6 Remove the water removal equipment and exit from the ICV cavity using precautions not to damage the ICV body sealing flange.

3.7.7 Install a vacuum pump system to the ICV vent port plug removal tool and evacuate the ICV cavity to allow the ICV locking ring to rotate freely.

CAUTION: *Do not attempt to rotate the ICV locking ring with mechanical force. Four operators should be able to rotate the locking ring with reasonable effort (i.e., 200 pounds total maximum force on the locking ring tools). Only use up to four ICV locking ring tools.*

3.7.8 Using up to four ICV T-handle tools, manually rotate the ICV locking ring clockwise until the ICV is locked.

3.7.9 Secure the vacuum system and disconnect the vacuum assembly.

3.7.10 Vent the ICV cavity to atmospheric pressure by letting ambient air return into the vessel through the ICV vent port plug removal tool.

3.7.11 Install the three (3) ICV locking ring fasteners and tighten to 28-32 ft-lbs torque each.

3.7.12 Using the crane, remove the empty ICV assembly from the OCV body and place in a safe location.

NOTE: *If required by site-specific policy to ensure personnel safety, HPT shall perform a radiation contamination survey of the OCV interior prior to initiating the OCV inspection process.*

3.7.13 Visually inspect or swab for the presence of water in the bottom of the OCV. If free-standing water is NOT observed in the bottom of the OCV body, proceed to Step 3.7.17.

CAUTION: *Operator shall obtain suitable protective clothing and equipment prior to entering the OCV cavity. Operator shall also enter the OCV cavity using precautions to preclude damage the OCV body sealing flange.*

3.7.14 Visually inspect the bottom of the OCV lower head to re-verify the presence of free-standing water.

3.7.15 Utilize a vacuum system hose or absorbent materials remove free-standing water.

3.7.16 Remove the water removal equipment and exit from the OCV cavity using precautions not to damage the OCV body sealing flange.

3.7.26 Vent the ICV cavity to atmospheric pressure by letting ambient air return into the vessel through the ICV vent port plug removal tool.

CAUTION: *When lifting the ICV lid, ensure that the load exerted to the ICV lifting sockets does not exceed 5,000 pounds through the use of a load cell or other means. An indication of 5,000 pounds or greater may indicate ICV lid binding. Force may be applied to either side of the ICV lid to help prevent binding.*

3.7.27 Using the crane, apply a straight, upward tension and remove the ICV lid from the ICV body.

CAUTION: *Do not place the ICV lid on a flat surface or damage to the ICV locking ring assembly could occur. Use of a storage stand that supports the ICV lid on the inside domed surface is required. See the Interface Control Drawing 2077-300, Attachment A.*

3.7.28 Place the ICV lid on its designated storage stand, exercising care not to damage the ICV locking ring assembly or sealing surface on the ICV lid flange.

3.7.29 Release the ACGLF from the ICV lid as follows:

- Ensure NO LOAD is indicated on the crane load cell,
- Ensure the ACGLF counterweights are rotated to the 180° and 360°/0° positions, and
- Verify the legs are unlocked by checking that the green "LOCKED" lights are OFF and the amber "UNLOCKED" lights are ON at the ACGLF console.

3.8 Loading the Payload into the Package

NOTE: *The following sequence assumes that fourteen (14) 55-gallon drums have been pre-loaded onto a package pallet and the pallet drum loading is in accordance with the limitations delineated in Appendix 1.3.7 (TRAMPAC) of the TRUPACT-II SARP regarding weight and center of gravity location within the package. The user shall develop detailed payload procedures to meet the configuration restrictions delineated in Appendix 1.3.7 (TRAMPAC) of the TRUPACT-II SARP. No dunnage is necessary for the 14 drum payload configuration. For less than 14 drums of waste, use empty (vented) drums in the top drum layer to complete the payload. Two SWBs or one TDOP may also be shipped in the package. For shipping one loaded or partially filled*

3.8.10 Using the weights provided in Table 2-1, locate the appropriate package unit numbers (lid and body) and record the empty package weight.

SIGN-OFF REQUIRED

3.8.11 Sum and record the two previously recorded weight values to calculate the total package weight.

SIGN-OFF REQUIRED

3.8.12 Verify the total loaded package weight is below 19,250 pounds.

SIGN-OFF REQUIRED

3.8.13 Using the crane, raise and position the payload assembly over the ICV cavity.

3.8.14 Orient the payload assembly so that its center of gravity will be located on the centerline of the trailer.

CAUTION: *Verify correct alignment of the ACGLF within the ICV prior to lowering the load. The pallet assembly fits into the ICV with a small diametrical (i.e., 5/16 inch nominal) clearance. Caution should be exercised to avoid hitting, scraping, or binding the payload assembly against the ICV body flange, as damage could result.*

3.8.15 Lower the payload assembly into the package.

3.8.16 Release the ACGLF from the payload pallet assembly as follows:

- Ensure NO LOAD is indicated on the crane load cell,
- Ensure the ACGLF counterweights are rotated to the 180° and 360°/0° positions, and
- Verify the legs are unlocked by checking that the green "LOCKED" lights are OFF and the amber "UNLOCKED" lights are ON at the ACGLF console.

3.8.17 Using the crane, raise and remove the ACGLF from the payload assembly and out of the ICV cavity.

3.8.18 Remove the long legs from the ACGLF, and re-attach the short lifting legs.

CAUTION: *Do not attempt to rotate the ICV locking ring with mechanical force. Four operators should be able to rotate the locking ring with reasonable effort (i.e., 200 pounds total maximum force on the locking ring tools). Only use up to four ICV locking ring tools.*

3.9.8 Using up to four ICV T-handle tools, manually rotate the ICV locking ring clockwise until the ICV is locked.

3.9.9 Secure the vacuum system and disconnect the vacuum assembly.

3.9.10 Vent the ICV cavity to atmospheric pressure by letting ambient air return into the vessel through the ICV vent port plug removal tool.

3.9.11 Install the three (3) ICV locking ring fasteners and tighten to 28-32 ft-lbs torque each.

SIGN-OFF REQUIRED

3.9.12 Rotate the handle of the ICV vent port plug removal tool clockwise to install and seat the ICV inner vent port plug, hand tight.

3.9.13 Remove the vent port plug removal tool and tighten the inner vent port plug to 8-10 ft-lbs torque with an appropriate torque wrench.

SIGN-OFF REQUIRED

3.9.14 Perform the Assembly Verification Leak Test for the ICV containment seals per Section 5.1.

SIGN-OFF REQUIRED

3.9.15 Release the ACGLF from the ICV lid as follows:

- Ensure NO LOAD is indicated on the crane load cell,
- Ensure the ACGLF counterweights are rotated to the 180° and 360°/0° positions, and
- Verify the legs are unlocked by checking that the green "LOCKED" lights are OFF and the amber "UNLOCKED" lights are ON at the ACGLF console.

3.10.10 Vent the OCV cavity to atmospheric pressure by letting ambient air return into the vessel through the OCV vent port plug removal tool.

3.10.11 Install the six (6) OCA locking ring fasteners and tighten to 28-32 ft-lbs torque each.

SIGN-OFF REQUIRED

3.10.12 Perform the Assembly Verification Leak Test for the OCV containment seals per Section 5.2.

SIGN-OFF REQUIRED

3.10.13 Release the ACGLF from the OCA lid as follows:

- Ensure NO LOAD is indicated on the crane load cell,
- Ensure the ACGLF counterweights are rotated to the 180° and 360°/0° positions, and
- Verify the legs are unlocked by checking that the green "LOCKED" lights are OFF and the amber "UNLOCKED" lights are ON at the ACGLF console.

3.10.14 Install a tamper-indicating security seal in the lock ring bolt on the OCA locking ring assembly and in the OCA vent port access plug.

SIGN-OFF REQUIRED

3.10.15 Optionally install the neoprene weather seal over the OCV locking ring assembly (i.e., at the separation of the OCA lid and body).

3.10.16 Install OCA lid lift pocket covers to preclude their use as a tiedown device.

3.11 Installation of the Package onto the Transport Trailer

NOTE: *If only one package is in the shipment, locate the package at the front position on the trailer. If only two packages are in the shipment, locate the packages at the front and middle positions. In all cases, the packages shall be loaded according to weight, with the heaviest package located in the front position and the lightest package located in the rear position.*

3.11.1 If the package was not removed from the trailer for the unloading and loading operations, proceed directly to Step 3.11.16.

3.11.9 Slowly lower the package until it engages the trailer alignment guides.

3.11.10 Remove the forklift from the package fork pockets.

3.11.11 Rotate the four (4) tiedown cam handles to the "UP" position.

3.11.12 Lift up and position each of the four (4) U-bolts toward and over the package tiedown lugs, engaging the U-bolt into the package tiedown lug recess.

3.11.13 Rotate the four (4) tiedown cam handles to the "DOWN" position.

3.11.14 Tighten the two adjustment nuts on each tiedown device to obtain a gap condition of 0.070 to 0.100 inches.

3.11.15 Install and secure the spring safety pins, padlocks or other devices into each of the four (4) tiedown cam handles.

3.11.16 Verify all transport trailer tiedown devices are adjusted to the correct gap.

SIGN-OFF REQUIRED

3.11.17 Install the package forklift pocket access covers to preclude their use as a tiedown device.

SIGN-OFF REQUIRED

3.11.18 Perform pre-shipment radiation and contamination surveys in accordance with the requirements of 49 CFR §173.441 and 49 CFR §173.443, Subpart I, respectively.

SIGN-OFF REQUIRED

3.11.19 Verify that package marking is in accordance with Subpart D, labeling is in accordance with Subpart E, and placarding is in accordance with Subpart F of 49 CFR 172.

SIGN-OFF REQUIRED

3.11.20 Complete information transfer to shipping documents as required for the specific shipment. Verify that shipping papers are in accordance with Subpart C of 49 CFR 172.

SIGN-OFF REQUIRED

TABLE 3-1 Routine ICV Visual Inspections (continued)

Component	Acceptance Criteria	Corrective Action
ICV Lid Debris Seal	No damage affecting operation	Replace per WI-4.2
ICV Upper and Lower Flange Sealing Surfaces (Grooves and Flats)	No scratch(es) causing leakage or finish >125 RMS micro-finish	Repair per WI-4.12
ICV Upper and Lower Visible Shell Surfaces	No dents over 0.5 inch deep, gouges causing wall thickness under 0.240 inch, weld cracks or punctures	NCR for disposition
ICV Locking Ring Fasteners (2077-156-A1)	No damaged threads or damaged recessed head, welds intact	Replace per WI-4.6
ICV Locking Ring Inserts (2077-160-28)	No damaged threads or missing insert lock keys	Replace per WI-4.6
ICV Locking Ring (2077-182-1)	No defects that impair general operation	NCR for disposition
ICV Upper Spacer (2077-053-A1)	No damaged or missing fasteners	Replace per WI-4.13
	No punctures in plate	Replace per WI-4.13
ICV Lower Spacer (2077-053-A2)	No damaged or missing fasteners	Replace per WI-4.13
	No punctures in plate	Replace per WI-4.13
ICV Polyethylene Filters (2077-183-4)	Not damaged or missing	Replace per WI-4.5

TABLE 3-2 Routine OCA Visual Inspections (continued)

Component	Acceptance Criteria	Corrective Action
OCV Seal Test Port Insert (2077-156-5)	No damaged threads or damaged sealing area	NCR for disposition
OCV Seal Test Port Plug (2077-156-7)	No damaged threads or damaged recessed head	Replace per WI-4.1
OCV Seal Test Port O-ring Seal (2077-160-26)	No damage affecting operation	Replace per WI-4.1
OCV Upper and Lower Flange Sealing Surfaces (Grooves and Flats)	No scratch(es) causing leakage or surface finish >125 RMS micro-finish	Repair per WI-4.12
OCV Upper and Lower Visible Shell Surfaces	No dents over 0.5 inch deep, gouges causing wall thickness under 0.240 inch for 1/4 inch material or 0.365 inch for 3/8 inch material, weld cracks or punctures	NCR for disposition
OCV Locking Ring Fasteners (2077-156-A2)	No damaged threads or damaged recessed head, welds intact	Replace per WI-4.6
OCV Locking Ring Inserts (2077-160-28)	No damaged threads or missing insert lock keys	Replace per WI-4.6
OCV Locking Ring (2077-162-3)	No defects that impair general operation	NCR for disposition
OCV Locking Ring Actuator Assembly (2077-161-A1)	No defects that impair general operation	Clean or replace per WI-4.7
OCA Ceramic Fiber Gaskets (2077-160-27)	No tears or excessive wear	Replace per WI-4.2
OCA Upper Burn-Out Plugs (2077-163-13)	Properly tightened and not missing	Tighten or replace per WI-4.3
OCA Lower Burn-Out Plugs (2077-170-6)	Properly tightened and not missing	Tighten or replace per WI-4.3

4.0 TRUPACT-II PACKAGE MAINTENANCE INSTRUCTIONS

All maintenance, repairs performed, or components replaced will be documented using WP Form 1709, "TRUPACT-II Maintenance Record". Information regarding preparation of the TRUPACT-II Maintenance Record is outlined in Section 4.8. Pre-numbered forms (WP Form 1709) will be furnished to each user. Proper records shall be maintained by the TRUPACT-II Packaging owner to document completion of the maintenance schedule.

If a deficiency is found that is not covered by this document, or that is beyond repair capability of the discovering site, that site will follow their approved procedure for reporting deficiencies and contact WID/WIPP within 24 hours for disposition. All questions regarding the continued integrity of TRUPACT-II containers shall be addressed, in writing, to the WIPP TRUPACT-II Maintenance Engineer, P.O. Box 2078, Carlsbad, New Mexico 88221.

The Work Instructions listed in Attachment D are approved work instructions. Work Instructions not listed must have approval by WID/WIPP. Recommendations for new work instructions or modifications to existing work instructions should be forwarded to the WIPP TRUPACT-II Maintenance Engineer.

NOTE: *The Inspections required in 4.1 thru 4.5 are normally done at the WIPP. Those items that can be easily replaced or corrected if found to be damaged during routine operations are the responsibility of the user.*

4.1 Annual Visual Inspections

Tables 3-1 and 3-2 denote the annual visual inspections to be performed on the ICV and OCA, respectively. General cleanliness should be observed for all components. Use cloths or towels and a compatible, low-chloride cleaning solution to enable proper visual inspection of the components. Visual inspections shall determine that surfaces are free of excessive deformation, sliding surfaces do not have excessive wear, and all threaded components are as specified and in good operating condition. Should components fail to meet the defined acceptance criteria following any corrective action(s), prepare an NCR for disposition. All NCRs shall be dispositioned by the WIPP TRUPACT-II Maintenance Engineer.

4.2 Annual Dimensional Inspections

Table 4-1 denotes the annual dimensional inspections to be performed on the ICV and OCA. General cleanliness should be observed for all components. Use cloths or towels and a compatible, low-chloride cleaning solution to enable proper dimensional inspection of the components. Should components fail to meet the defined acceptance criteria following any corrective action(s), prepare an NCR for disposition. All NCRs shall be dispositioned by the WIPP TRUPACT-II Maintenance Engineer.

4.7 Periodic Lift Fixture Inspections and Component Replacement Schedule

Periodic lift fixture inspections, development of a component replacement schedule, and maintenance activities are the responsibility of the individual user sites.

4.8 TRUPACT-II Maintenance Records

All maintenance records will be written using pre-numbered WP Form 1709, "TRUPACT-II Maintenance Record." Figure 4-1 and the following descriptions and examples will aid in completing WP Form 1709.

- Minor or Major Maintenance Block
  - *Minor Maintenance* replacement components are as follows:
    - all ICV and OCV O-ring seals, including the ICV debris seal,
    - all removable ICV and OCV seal test port plugs, vent port plugs, vent port covers, and OCA seal test port and vent port access plug assemblies,
    - all ICV and OCA fasteners and replaceable threaded inserts,
    - the ICV polyethylene filters and aluminum honeycomb spacers,
    - the OCA lid guide plates, the plastic burn-out plugs, the ceramic fiber gaskets, the lifting pocket tubes and covers, the forklift pocket covers, the OCA locking ring actuator assembly, the weather seal, and the wear pad.
  - *Major Maintenance* replacement components consist of those components not listed above and require an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.
- Initiated at Block

  The DOE Facility at which the TRUPACT-II Maintenance Record was initiated. (e.g., if initiated at Idaho National Engineering Laboratories, write INEL here)
- Date Initiated Block

  The date the form is being initiated.

- Discovered By Block

  The name of the person initiating the TRUPACT-II Maintenance Record. The name is required in the event further information needs to be obtained by the WIPP TRUPACT-II Maintenance Engineer.

- When Discovered Block

  - Check the "SCHED PM" block if TRUPACT-II Maintenance Record is generated because of findings from one of the scheduled preventative maintenance activities.

  - Check the "UNLOADING" block if the discrepancy was discovered upon receipt at the user site or during package unloading operations.

  - Check the "LOADING" block if the discrepancy was discovered during package visual inspections in preparation for package loading or package during loading operations.

- Work Instructions Number(s) Block

  - For minor maintenance, enter the number of the work instruction which applies. No other instructions or approvals are required.

  - For major maintenance or work that does not have previously written and approved work instructions, detailed work instructions must be written and approved by WID/WIPP.

  - For complex jobs, additional work instructions may be added by the use of a continuation sheet, as long as each new set of instructions is approved in writing.

- Spare Parts Used Block

  List any parts that were used by part number, description, and WIPP Purchase Order number. Do not list things such as alcohol, rags, tools, etc., that are not controlled as TRUPACT-II Packaging spare parts.

- Maintenance Not Performed Block

  This section is to be used when a repair cannot be accomplished (i.e., no parts, no qualified personnel, no special tools or other reason for not accomplishing the maintenance activity).

- Work Instructions Complete and Date Block

  This block shall be signed and dated by the supervisor in charge of personnel performing corrective actions. The signature verifies that actions taken were within the scope of work instructions and that the package can be returned to service. The signature also indicates that all the entries to this form and its attachments have been properly made and could be easily read and understood by a review board at a later date. The supervisor signing this block should verify that the applicable approved Work Instruction, with signatures, is attached to the completed copy of the TRUPACT-II Maintenance Record for transmittal to the WIPP TRUPACT-II Maintenance Engineer. If the supervisor determines that there may be conflicting or confusing information on this TRUPACT-II Maintenance Record, the supervisor should attach a narrative report to clarify this information.

- Verification Requirements Complete and Date Block

  The Inspection Supervisor shall sign and date this line when the Assembly Verification Leak Test (Section 5.1) is successfully completed as part of a corrective action for maintenance on the package and the required documentation is attached to the TRUPACT-II Maintenance Record.

- Work Inspected By and Date Block

  The Inspection Supervisor shall sign and date this block if work instructions required inspections as part of the work steps.

- Man Hours Expended Block

  This block shall be used to record hours required to accomplish the work instructions.

TRUPACT-II MAINTENANCE RECORD

Minor Maint: _____ Initiated At: _____ Job Number: _____

Major Maint: _____ Date Initiated: _____ TRUPACT-II SN: _____

ICV Body SN: _____ ICV Lid SN: _____ Continuation Sheets Used: Yes ☐ No ☐

OCA Body SN: _____ OCA Lid SN: _____ Supervisor Initials _____

Discrepancy Description: _____

_____

_____

Discovered By: _____

WHEN DISCOVERED

Sched PM: _____

Unloading: _____

Loading: _____

Work Instruction Number(s) Used This Maint.: _____

SPARE PARTS USED

Description	Part Number	WIPP Purchase Order Number

Maintenance Not Performed: _____ Date: _____

Reason: _____

_____

_____

_____

Work Instructions Complete: _____ Date: _____

Verification Requirements Complete: _____ Date: _____

Work Inspected By: _____ Date: _____

Man Hours Expended: _____

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FIGURE 4-1 Example TRUPACT-II Maintenance Record

TABLE 4-1 Annual Packaging Dimensional Inspections, Acceptance Criteria, and Corrective Action

Component	Acceptance Criteria	Corrective Action
ICV/OCV Lid to Body Axial Play	Inspect and accept per WI-4.8	If acceptance criteria cannot be met, prepare NCR for disposition
ICV/OCV Lid and Body Flange Tab Widths	Inspect and accept per WI-4.9	If acceptance criteria cannot be met, prepare NCR for disposition
ICV/OCV Lid and Body Flange Groove Widths	Inspect and accept per WI-4.10	If acceptance criteria cannot be met, prepare NCR for disposition
ICV/OCV Upper Main O-Ring Seal Groove Depth	Inspect and accept per WI-4.11	If acceptance criteria cannot be met, prepare NCR for disposition
ICV/OCV Seal Surface	Inspect and accept per WI-4.11	If acceptance criteria cannot be met, prepare NCR for disposition
ICV Upper and Lower Spacers	Inspect and accept per WI-4.13	If acceptance criteria cannot be met, prepare NCR for disposition
ICV Lid and Body Inner Surface Liquid Penetrant Inspection	Inspect and Accept Per WI 4-12	If acceptance criteria cannot be met, prepare NCR for disposition

TABLE 4-2 Packaging Component Replacement Schedule

Component	Frequency	Work Instruction
OCV Upper Main O-Ring (2077-160-15)	Annual	WI-4.2
OCV Lower Main O-Ring (2077-160-24)	Annual	WI-4.2
OCV Seal Test Port Plug O-Ring (2077-160-26)	Annual	WI-4.1
OCV Vent Port Plug Seal O-Ring (2077-160-17)	Annual	WI-4.1
OCV Vent Port Plug Cover O-Ring (2077-160-16)	Annual	WI-4.1
OCV Locking Ring Bolts (2077-156-A2)	5 years	WI-4.6
ICV Upper Main O-Ring (2077-180-9)	Annual	WI-4.2
ICV Lower Main O-Ring (2077-180-19)	Annual	WI-4.2
ICV Seal Test Port Plug O-Ring (2077-180-24)	Annual	WI-4.1
ICV Outer Vent Port Plug O-Ring (2077-180-21)	Annual	WI-4.1
ICV Inner Vent Port Plug O-Ring (2077-180-22)	Annual	WI-4.1
ICV Vent Port Cover Gasket (2077-180-16)	Annual	WI-4.1
ICV Wiper O-Ring (2077-180-27)	Annual	WI-4.1
ICV Lid Debris Seal (2077-180-25)	Annual	WI-4.1
ICV Locking Ring Bolts (2077-156-A1)	5 years	WI-4.6
OCV Vent Port Plug Handling O-Ring (2077-160-18)	Annual	WI-4.1
OCV Vent Port Cover Handling O-Ring (2077-160-19)	Annual	WI-4.1

5.0 TRUPACT-II PACKAGE LEAKAGE TESTING

5.1 Assembly Leak Testing the ICV Containment Seals

NOTE: *The following leak test procedures are for reference only. Each user shall develop and qualify procedures to perform this test by qualified personnel by following the guidelines of ANSI N14.5-1987, "American National Standard for Radioactive Materials - Leakage Tests on Packages for Shipment."*

5.1.1 Testing Prerequisites:

- To be acceptable, the containment vessel shall have a leakage rate of 1.0×10^{-7} standard cubic centimeters per second (leaktight), air (i.e., 2.6×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or less.

- Record the ICV lid and body serial numbers on the "ICV Containment Seals Leakage Test Data Sheet" found in Attachment B.

SIGN-OFF REQUIRED

- Obtain a helium mass spectrometer leak detector capable of detecting a leakage rate of 5.0×10^{-8} standard cubic centimeters per second (scc/s), air (i.e., 1.3×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or better. Record the leak detector's serial number.

SIGN-OFF REQUIRED

- Obtain a calibrated standard leak and calibrate the leak detector according to the manufacturer's recommendations such that the leak detector's sensitivity is 5.0×10^{-8} scc/s, air (i.e., 1.3×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or better. Record the calibrated standard leak serial number.

SIGN-OFF REQUIRED

- Obtain calibrated atmospheric (barometric) pressure and ambient temperature measuring devices and record the device's serial numbers, barometric pressure and ambient temperature.

SIGN-OFF REQUIRED

5.1.2 Visually verify the ICV lid has been assembled in accordance with the guidelines of Steps 3.9.2 through 3.9.13.

SIGN-OFF REQUIRED

5.1.3 Remove the ICV seal test port plug using the ICV seal test port plug removal tool (see Figure 1-10).

5.1.4 Install the ICV seal leak check tool (see Figure 1-11).

5.1.5 Attach the leak detector to the ICV seal leak check tool (see Figure 5-1).

5.1.6 Evacuate the ICV seal test port until the vacuum is sufficient to operate the leak detector per the manufacturer's recommendations.

5.1.7 Install the ICV vent port plug removal/pressure relief tool (see Figure 1-8) into the ICV vent port, with the ICV outer vent port plug retracted into the tool.

5.1.8 Using appropriate fittings, attach in parallel a vacuum pump assembly and helium gas supply assembly to the ICV vent port plug removal/pressure relief tool; install an isolation valve into each line to allow independent closure of each line.

NOTE: *If evacuation of the ICV vent port cavity is not able to achieve a 90% vacuum (i.e., a vacuum ≤90% of atmospheric pressure) and provide a seal sufficient to backfill with helium, disconnect the leak detector and vacuum pump/helium supply assemblies. Vent to atmosphere, remove the ICV lid, inspect the ICV wiper O-ring seal, ICV inner vent port plug O-ring seal, and the ICV upper main (containment boundary) O-ring seal and sealing areas for damage. If necessary, replace the damaged seal(s) and/or repair the sealing areas, and return to Step 5.1.1.*

5.1.9 Close the valve to the helium gas supply, open the valve to the vacuum pump, and evacuate the ICV vent port cavity to a 90% vacuum, or better. Record the vacuum pressure level.

SIGN-OFF REQUIRED

5.1.10 Record the leak detector's background leak rate reading.

SIGN-OFF REQUIRED

NOTE: *After helium pressure is stabilized within the ICV vent port cavity, monitor the leak detector for a period of three (3) minutes.*

5.1.11 Close the isolation valve to the vacuum pump and open the isolation valve to the helium source. Backfill the ICV vent port cavity with helium gas to atmospheric pressure (i.e, 0 to 10% vacuum relative to atmospheric pressure). Record the backfill pressure. Begin timing for helium leak testing of the ICV main O-ring seal.

SIGN-OFF REQUIRED

5.1.12 Rotate the ICV vent port plug removal/pressure relief tool handle clockwise to install the ICV outer vent port plug hand tight.

5.1.13 Remove the ICV vent port plug removal/pressure relief tool and tighten the ICV outer vent port plug to 10-13 ft-lbs torque with an appropriate torque wrench.

SIGN-OFF REQUIRED

5.1.14 At the end of three (3) minutes, record the leakage rate.

SIGN-OFF REQUIRED

5.1.15 Determine the actual leakage rate by subtracting the background reading (Step 5.1.10) from the leakage rate (Step 5.1.14). If the ICV main O-ring seal fails to pass the leak test, isolate the leak path, replace the O-ring seal(s) per Work Instruction WI-4.2 and/or repair the seal surface(s) per Work Instruction WI-4.12, and repeat the leak test. If, after repeated attempts, the system cannot be made to pass the leak test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

5.1.16 Remove the ICV seal leak check tool and associated leak test equipment from the ICV seal test port.

5.1.17 Install the ICV seal test port plug using the ICV seal test port plug removal tool (see Figure 1-10), and tighten to 6-8 ft-lbs torque with an appropriate torque wrench.

SIGN-OFF REQUIRED

5.1.18 Install a helium-free (clean) ICV vent port plug leak check tool (see Figure 1-9) into the ICV vent port (see Figure 5-2).

5.1.19 Attach the leak detector to the ICV vent port plug leak check tool.

5.1.20 Evacuate the ICV vent port plug leak check tool until the vacuum is sufficient to operate the leak detector per the manufacturer's recommendations.

NOTE: *Initial spurious leakage rate readings on the leak detector do NOT necessarily indicate a leak. Some residual helium gas may still be entrapped around the vent port plug seal and threaded areas.*

5.1.21 When the leak detector reading is within the test range (i.e., less than 2.6×10^{-7} scc/s, helium), begin timing the leak test. At the end of three (3) minutes, record the leakage rate. If the ICV outer vent port plug seal fails to pass the leak test, isolate the leak path, replace the O-ring seal per Work Instruction WI-4.1 and/or repair the seal surface(s) per Work Instruction WI-4.12, and repeat the leak test. If, after repeated attempts, the system cannot be made to pass the leak test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

5.1.22 Remove the ICV vent port plug leak check tool and associated leak test equipment from the ICV vent port.

5.1.23 Install the ICV vent port cover using the ICV vent port cover removal tool (see Figure 1-7), and tighten to 13-16 ft-lbs torque with an appropriate torque wrench.

SIGN-OFF REQUIRED

5.1.24 This concludes leak testing of the ICV main O-ring and vent port plug seals.

5.2 Assembly Leak Testing the OCV Containment Seals

NOTE: *The following leak test procedures are for reference only. Each user shall develop and qualify procedures to perform this test by qualified personnel by following the guidelines of ANSI N14.5-1987, "American National Standard for Radioactive Materials - Leakage Tests on Packages for Shipment."*

5.2.1 Testing Prerequisites:

- To be acceptable, the containment vessel shall have a leakage rate of 1.0×10^{-7} standard cubic centimeters per second (leaktight), air (i.e., 2.6×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or less.

- Record the OCA lid and body serial numbers on the "OCV Containment Seals Leakage Test Data Sheet" found in Attachment C.

SIGN-OFF REQUIRED

- Obtain a helium mass spectrometer leak detector capable of detecting a leakage rate of 5.0×10^{-8} standard cubic centimeters per second (scc/s), air (i.e., 1.3×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or better. Record the leak detector's serial number.

SIGN-OFF REQUIRED

- Obtain a calibrated standard leak and calibrate the leak detector according to the manufacturer's recommendations such that the leak detector's sensitivity is 5.0×10^{-8} scc/s, air (i.e., 1.3×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or better. Record the calibrated standard leak serial number.

SIGN-OFF REQUIRED

- Obtain calibrated atmospheric (barometric) pressure and ambient temperature measuring devices and record the device's serial numbers, barometric pressure and ambient temperature.

SIGN-OFF REQUIRED

5.2.2 Visually verify the OCA lid has been assembled in accordance with the guidelines of Steps 3.10.2 through 3.10.11.

SIGN-OFF REQUIRED

5.2.3 Remove the OCV seal test port plug using the OCV seal test port plug removal tool (see Figure 1-5).

5.2.4 Install the OCV seal leak check tool (see Figure 1-6).

5.2.5 Attach the leak detector to the OCV seal leak check tool (see Figure 5-3).

5.2.6 Evacuate the OCV seal test port until the vacuum is sufficient to operate the leak detector per the manufacturer's recommendations.

5.2.7 Install the OCV vent port plug removal/pressure relief tool (see Figure 1-3) into the OCV vent port, with the OCV vent port plug retracted into the tool.

5.2.8 Using appropriate fittings, attach in parallel a vacuum pump assembly and helium gas supply assembly to the OCV vent port plug removal/pressure relief tool; install an isolation valve into each line to allow independent closure of each line.

NOTE: *If evacuation of the OCV annulus is not able to achieve a 90% vacuum (i.e., a vacuum ≤90% of atmospheric pressure) and provide a seal sufficient to backfill with helium, disconnect the leak detector and vacuum pump/helium supply assemblies. Vent to atmosphere, remove the OCA lid, inspect the OCV upper main (containment boundary) O-ring seal and sealing area for damage. If necessary, replace the damaged seal(s) and/or repair the sealing areas, and return to Step 5.2.1.*

5.2.9 Close the valve to the helium gas supply, open the valve to the vacuum pump, and evacuate the OCV annulus to a 90% vacuum, or better. Record the vacuum pressure level.

SIGN-OFF REQUIRED

5.2.10 Record the leak detector's background leak rate reading.

SIGN-OFF REQUIRED

NOTE: *After helium pressure is stabilized within the OCV annulus, monitor the leak detector for a period of three (3) minutes.*

5.2.11 Close the isolation valve to the vacuum pump and open the isolation valve to the helium source. Backfill the OCV annulus with helium gas to atmospheric pressure (i.e, 0 to 10% vacuum relative to atmospheric pressure). Record the backfill pressure. Begin timing for helium leak testing of the OCV main O-ring seal.

SIGN-OFF REQUIRED

5.2.12 Rotate the OCV vent port plug removal/pressure relief tool handle clockwise to install the OCV vent port plug hand tight.

5.2.13 Remove the OCV vent port plug removal/pressure relief tool and tighten the OCV vent port plug to 10-13 ft-lbs torque with an appropriate torque wrench.

SIGN-OFF REQUIRED

5.2.14 At the end of three (3) minutes, record the leakage rate.

SIGN-OFF REQUIRED

5.2.15 Determine the actual leakage rate by subtracting the background reading (Step 5.2.10) from the leakage rate (Step 5.2.14). If the OCV main O-ring seal fails to pass the leak test, isolate the leak path, replace the O-ring seal(s) per Work Instruction WI-4.2 and/or repair the seal surface(s) per Work Instruction WI-4.12, and repeat the leak test. If, after repeated attempts, the system cannot be made to pass the leak test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

5.2.16 Remove the OCV seal leak check tool and associated leak test equipment from the OCV seal test port.

5.2.17 Install the OCV seal test port plug using the ICV seal test port plug removal tool (see Figure 1-5), and tighten to 6-8 ft-lbs torque with an appropriate torque wrench.

SIGN-OFF REQUIRED

5.2.18 Install a helium-free (clean) OCV vent port plug leak check (see Figure 1-4) into the OCV vent port (see Figure 5-4).

5.2.19 Attach the leak detector to the OCV vent port plug leak check tool.

5.2.20 Evacuate the OCV vent port plug leak check tool until the vacuum is sufficient to operate the leak detector per the manufacturer's recommendations.

NOTE: *Initial spurious leakage rate readings on the leak detector do NOT necessarily indicate a leak. Some residual helium gas may still be entrapped around the vent port plug seal and threaded areas.*

5.2.21 When the leak detector reading is within the test range (i.e., less than 2.6×10^{-7} scc/s, helium), begin timing the leak test. At the end of three (3) minutes, record the leakage rate. If the OCV vent port plug seal fails to pass the leak test, isolate the leak path, replace the O-ring seal per Work Instruction WI-4.1 and/or repair the seal surface(s) per Work Instruction WI-4.12, and repeat the leak test. If, after repeated attempts, the system cannot be made to pass the leak test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

5.2.22 Remove the OCV vent port plug leak check tool and associated leak test equipment from the OCV vent port.

5.2.23 Install the OCV vent port cover using the OCV vent port cover removal tool (see Figure 1-2), and tighten to 13-16 ft-lbs torque.

SIGN-OFF REQUIRED

5.2.24 Install the OCA seal test port access cover/thermal plug assembly and tighten to 35-45 ft-lbs torque with an appropriate torque wrench (lubricated with a suitable stainless steel compatible, nickel bearing lubricant).

SIGN-OFF REQUIRED

5.2.25 Install the OCA vent port access cover/thermal plug assembly and tighten to 35-45 ft-lbs torque with an appropriate torque wrench (lubricated with a suitable stainless steel compatible, nickel bearing lubricant).

SIGN-OFF REQUIRED

5.2.26 This concludes leak testing of the OCV main O-ring and vent port plug seals.

5.3 Assembly Leak Testing the ICV Containment Seals and Structure

NOTE: *The following leak test procedures are for reference only. Each user shall develop and qualify procedures to perform this test by qualified personnel by following the guidelines of ANSI N14.5-1987, "American National Standard for Radioactive Materials - Leakage Tests on Packages for Shipment."*

5.3.1 Testing Prerequisites:

- To be acceptable, the containment vessel shall have a leakage rate of 1.0×10^{-7} standard cubic centimeters per second (leaktight), air (i.e., 2.6×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or less.

- Record the ICV lid and body serial numbers on the "ICV Containment Structure Leakage Test Data Sheet" found in Attachment C.

SIGN-OFF REQUIRED

- Obtain a helium mass spectrometer leak detector capable of detecting a leakage rate of 5.0×10^{-8} standard cubic centimeters per second (scc/s), air (i.e., 1.3×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or better. Record the leak detector's serial number.

SIGN-OFF REQUIRED

- Obtain a calibrated standard leak and calibrate the leak detector according to the manufacturer's recommendations such that the leak detector's sensitivity is 5.0×10^{-8} scc/s, air (i.e., 1.3×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or better. Record the calibrated standard leak serial number.

SIGN-OFF REQUIRED

- Obtain calibrated atmospheric (barometric) pressure and ambient temperature measuring devices and record the device's serial numbers, barometric pressure and ambient temperature.

SIGN-OFF REQUIRED

5.3.2 Remove the ICV honeycomb spacers in accordance with the guidelines of Work Instruction WI-4.13.

SIGN-OFF REQUIRED

5.3.3 Assemble the ICV lid in accordance with the guidelines of Steps 3.9.2 through 3.9.13.

SIGN-OFF REQUIRED

5.3.4 Install the ICV vent port plug removal/pressure relief tool, with the ICV inner vent port plug adapter (see Figure 1-8), and rotate the handle counter-clockwise to remove the ICV inner vent port plug. Remove the ICV vent port plug removal/pressure relief tool from the ICV vent port.

SIGN-OFF REQUIRED

5.3.5 Remove the ICV seal test port plug using the ICV seal test port plug removal tool (see Figure 1-10).

5.3.6 Install the ICV seal leak check tool (see Figure 1-11).

5.3.7 Attach the leak detector to the ICV seal leak check tool (see Figure 5-1).

5.3.8 Evacuate the ICV seal test port until the vacuum is sufficient to operate the leak detector per the manufacturer's recommendations.

5.3.9 Install the ICV vent port plug removal/pressure relief tool (see Figure 1-8) into the ICV vent port, with the ICV outer vent port plug retracted into the tool.

5.3.10 Using appropriate fittings, attach in parallel a vacuum pump assembly and helium gas supply assembly to the ICV vent port plug removal/pressure relief tool; install an isolation valve into each line to allow independent closure of each line.

NOTE: *If evacuation of the ICV cavity is not able to achieve a 90% vacuum (i.e., a vacuum ≤90% of atmospheric pressure) and provide a seal sufficient to backfill with helium, disconnect the leak detector and vacuum pump/helium supply assemblies. Vent to atmosphere, remove the ICV lid, inspect the ICV upper main (containment boundary) O-ring seal and sealing area for damage. If necessary, replace the damaged seal(s) and/or repair the sealing areas, and return to Step 5.3.1.*

5.3.11 Close the valve to the helium gas supply, open the valve to the vacuum pump, and evacuate the ICV cavity to a 90% vacuum, or better. Record the vacuum pressure level.

SIGN-OFF REQUIRED

5.3.12 Record the leak detector's background leak rate reading.

SIGN-OFF REQUIRED

NOTE: *After helium pressure is stabilized within the ICV cavity, monitor the leak detector for a period of three (3) minutes.*

5.3.13 Close the isolation valve to the vacuum pump and open the isolation valve to the helium source. Backfill the ICV cavity with helium gas to atmospheric pressure (i.e, 0 to 10% vacuum relative to atmospheric pressure). Record the backfill pressure. Begin timing for helium leak testing of the ICV main O-ring seal.

SIGN-OFF REQUIRED

5.3.14 Rotate the ICV vent port plug removal/pressure relief tool handle clockwise to install the ICV outer vent port plug hand tight.

5.3.15 Remove the ICV vent port plug removal/pressure relief tool and tighten the ICV outer vent port plug to 10-13 ft-lbs torque with an appropriate torque wrench.

SIGN-OFF REQUIRED

5.3.16 At the end of three (3) minutes, record the leakage rate.

SIGN-OFF REQUIRED

5.3.17 Determine the actual leakage rate by subtracting the background reading (Step 5.3.12) from the leakage rate (Step 5.3.16). If the ICV main O-ring seal fails to pass the leak test, isolate the leak path, replace the O-ring seal(s) per Work Instruction WI-4.2 and/or repair the seal surface(s) per Work Instruction WI-4.12, and repeat the leak test. If, after repeated attempts, the system cannot be made to pass the leak test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

5.3.18 Remove the ICV seal leak check tool and associated leak test equipment from the ICV seal test port.

5.3.19 Install the ICV seal test port plug using the ICV seal test port plug removal tool (see Figure 1-10), and tighten to 6-8 ft-lbs torque with an appropriate torque wrench.

SIGN-OFF REQUIRED

5.3.20 Install a helium-free (clean) ICV vent port plug leak check tool (see Figure 1-9) into the ICV vent port (see Figure 5-2).

5.3.21 Attach the leak detector hose assembly to the ICV vent port plug leak check tool.

5.3.22 Evacuate the ICV vent port plug leak check tool until the vacuum is sufficient to operate the leak detector per the manufacturer's recommendations.

NOTE: *Initial spurious leakage rate readings on the leak detector do NOT necessarily indicate a leak. Some residual helium gas may still be entrapped around the vent port plug seal and threaded areas.*

5.3.23 When the leak detector reading is within the test range (i.e., less than 2.6×10^{-7} scc/s, helium), begin timing the leak test. At the end of three (3) minutes, record the leakage rate. If the ICV outer

vent port plug seal fails to pass the leak test, isolate the leak path, replace the O-ring seal per Work Instruction WI-4.1 and/or repair the seal surface(s) per Work Instruction WI-4.12, and repeat the leak test. If, after repeated attempts, the system cannot be made to pass the leak test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

5.3.24 Remove the ICV vent port plug leak check tool and associated leak test equipment from the ICV vent port.

5.3.25 Install the ICV vent port cover using the ICV vent port cover removal tool (see Figure 1-7), and tighten to 13-16 ft-lbs torque with an appropriate torque wrench.

SIGN-OFF REQUIRED

5.3.26 Assemble the OCA lid onto the OCA body following the guidelines of Steps 3.10.2 through 3.10.11.

SIGN-OFF REQUIRED

5.3.27 Install the OCV vent port plug leak check tool (see Figure 1-4) into the OCV vent port.

5.3.28 Attach the leak detector hose assembly to the OCV vent port plug leak check tool (see Figure 5-5).

5.3.29 Evacuate the OCV annulus until the vacuum is sufficient to operate the leak detector per the manufacturer's recommendations.

NOTE: *Initial spurious leakage rate readings on the leak detector do NOT necessarily indicate a leak. Some residual helium gas may still be entrapped around the external ICV structure and threaded areas.*

5.3.30 When the leak detector reading is within the test range (i.e., less than 2.6×10^{-7} scc/s, helium), begin timing the leak test. At the end of thirty (30) minutes, record the leakage rate. If the ICV containment structure fails to pass the leak test, isolate the leak path, perform necessary repairs, and repeat the leak test. If, after repeated attempts, the system cannot be made to pass the leak test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

5.3.31 Remove the OCV vent port plug leak check tool and associated leak test equipment from the OCV vent port.

5.3.32 This concludes leak testing of the ICV main O-ring and vent port plug seals, and ICV containment structure.

5.4 Assembly Leak Testing the OCV Containment Seals and Structure

NOTE: *The following leak test procedures are for reference only. Each user shall develop and qualify procedures to perform this test by qualified personnel by following the guidelines of ANSI N14.5-1987, "American National Standard for Radioactive Materials - Leakage Tests on Packages for Shipment."*

5.4.1 Testing Prerequisites:

- To be acceptable, the containment vessel shall have a leakage rate of 1.0×10^{-7} standard cubic centimeters per second (leaktight), air (i.e., 2.6×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or less.

- Record the OCA lid and body serial numbers on the "OCV Containment Structure Leakage Test Data Sheet" found in Attachment C.

SIGN-OFF REQUIRED

- Obtain a helium mass spectrometer leak detector capable of detecting a leakage rate of 5.0×10^{-8} standard cubic centimeters per second (scc/s), air (i.e., 1.3×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or better. Record the leak detector's serial number.

SIGN-OFF REQUIRED

- Obtain a calibrated standard leak and calibrate the leak detector according to the manufacturer's recommendations such that the leak detector's sensitivity is 5.0×10^{-8} scc/s, air (i.e., 1.3×10^{-7} scc/s, helium, at an ambient temperature of 40 °F, or above), or better. Record the calibrated standard leak serial number.

SIGN-OFF REQUIRED

- Obtain calibrated atmospheric (barometric) pressure and ambient temperature measuring devices and record the

device's serial numbers, barometric pressure and ambient temperature.

SIGN-OFF REQUIRED

5.4.2 Assemble the ICV lid in accordance with the guidelines of Steps 3.9.2 through 3.9.13.

SIGN-OFF REQUIRED

5.4.3 Leak test the ICV main O-ring and vent port plug seals per Section 5.3.

SIGN-OFF REQUIRED

5.4.4 Assemble the OCA lid in accordance with the guidelines of Steps 3.10.2 through 3.10.11.

SIGN-OFF REQUIRED

5.4.5 Fabricate a close-fitting, sealed plastic tent around the OCA exterior.

5.4.6 Install a helium gas supply line through the bottom of the plastic tent and seal around the hose. Provide a vent hole through the plastic tent opposite the location of the helium supply line.

5.4.7 Install a helium-free (clean) OCV vent port plug leak check (see Figure 1-4) through the plastic tent and into the OCV vent port. Seal around the OCV vent port plug leak check tool (see Figure 5-6).

5.4.8 Attach the leak detector to the OCV vent port plug leak check tool.

5.4.9 Evacuate the OCV annulus until the vacuum is sufficient to operate the leak detector per the manufacturer's recommendations.

5.4.10 Record the leak detector's background leak rate reading.

SIGN-OFF REQUIRED

NOTE: *After helium gas is installed outside the OCA, monitor the leak detector for a period of thirty (30) minutes.*

5.4.11 Purge the plastic tent with helium gas for a period of time equal to three times the tent fill time. Record the helium purge time. Begin timing for helium leak testing of the OCV containment structure.

SIGN-OFF REQUIRED

5.4.12 At the end of thirty (30) minutes, record the leakage rate.

SIGN-OFF REQUIRED

NOTE: *The helium gas concentration within the plastic tent is conservatively assumed to be 50%. Therefore, the measured leakage rate must be multiplied by a factor of two (2) to account for less than a pure (100%) concentration of helium gas.*

5.4.13 Determine the actual leakage rate by subtracting the background reading (Step 5.4.10) from the leakage rate (Step 5.4.12), and multiplying the difference by two (2). If the OCV containment structure fails to pass the leak test, isolate the leak path, perform necessary repairs, and repeat the leak test. If, after repeated attempts, the system cannot be made to pass the leak test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

5.4.14 Remove the OCV vent port plug leak check tool and associated leak test equipment from the OCV vent port.

5.4.15 Remove the helium gas supply and plastic tent.

5.4.16 Remove the OCV seal test port plug using the OCV seal test port plug removal tool (see Figure 1-5).

5.4.17 Install the OCV seal leak check tool (see Figure 1-6).

5.4.18 Attach the leak detector to the OCV seal leak check tool (see Figure 5-3).

5.4.19 Evacuate the OCV seal test port until the vacuum is sufficient to operate the leak detector per the manufacturer's recommendations.

5.4.20 Install the OCV vent port plug removal/pressure relief tool (see Figure 1-3) into the OCV vent port, with the OCV vent port plug retracted into the tool.

5.4.21 Using appropriate fittings, attach in parallel a vacuum pump assembly and helium gas supply assembly to the OCV vent port plug removal/pressure relief tool; install an isolation valve into each line to allow independent closure of each line.

5.4.22 Close the valve to the helium gas supply, open the valve to the vacuum pump, and evacuate the OCV annulus to a 90% vacuum, or better. Record the vacuum pressure level.

SIGN-OFF REQUIRED

5.4.23 Record the leak detector's background leak rate reading.

SIGN-OFF REQUIRED

NOTE: *After helium pressure is stabilized within the OCV annulus, monitor the leak detector for a period of three (3) minutes.*

5.4.24 Close the isolation valve to the vacuum pump and open the isolation valve to the helium source. Backfill the OCV annulus with helium gas to atmospheric pressure (i.e, 0 to 10% vacuum relative to atmospheric pressure). Record the backfill pressure. Begin timing for helium leak testing of the OCV main O-ring seal.

SIGN-OFF REQUIRED

5.4.25 Rotate the OCV vent port plug removal/pressure relief tool handle clockwise to install the OCV vent port plug hand tight.

5.4.26 Remove the OCV vent port plug removal/pressure relief tool and tighten the OCV vent port plug to 10-13 ft-lbs torque with an appropriate torque wrench.

SIGN-OFF REQUIRED

5.4.27 At the end of three (3) minutes, record the leakage rate.

SIGN-OFF REQUIRED

5.4.28 Determine the actual leakage rate by subtracting the background reading (Step 5.4.23) from the leakage rate (Step 5.4.27). If the OCV main O-ring seal fails to pass the leak test, isolate the leak path, replace the O-ring seal(s) per Work Instruction WI-4.2 and/or repair the seal surface(s) per Work Instruction WI-4.12, and repeat the leak test. If, after repeated attempts, the system cannot be made to pass the leak test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

5.4.29 Remove the OCV seal leak check tool and associated leak test equipment from the OCV seal test port.

5.4.30 Install a helium-free (clean) OCV vent port plug leak check tool (see Figure 1-4) into the OCV vent port.

5.4.31 Attach the leak detector to the OCV vent port plug leak check tool.

5.4.32 Evacuate the OCV vent port plug leak check tool until the vacuum is sufficient to operate the leak detector per the manufacturer's recommendations.

NOTE: *Initial spurious leakage rate readings on the leak detector do NOT necessarily indicate a leak. Some residual helium gas may still be entrapped around the vent port plug seal and threaded areas.*

5.4.33 When the leak detector reading is within the test range (i.e., less than 2.6×10^{-7} scc/s, helium), begin timing the leak test. At the end of three (3) minutes, record the leakage rate. If the OCV vent port plug seal fails to pass the leak test, isolate the leak path, replace the O-ring seal per Work Instruction WI-4.1 and/or repair the seal surface(s) per Work Instruction WI-4.12, and repeat the leak test. If, after repeated attempts, the system cannot be made to pass the leak test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

5.4.34 Remove the OCV vent port plug leak check tool and associated leak test equipment from the OCV vent port.

5.4.35 This concludes leak testing of the OCV main O-ring and vent port plug seals, and OCV containment structure.

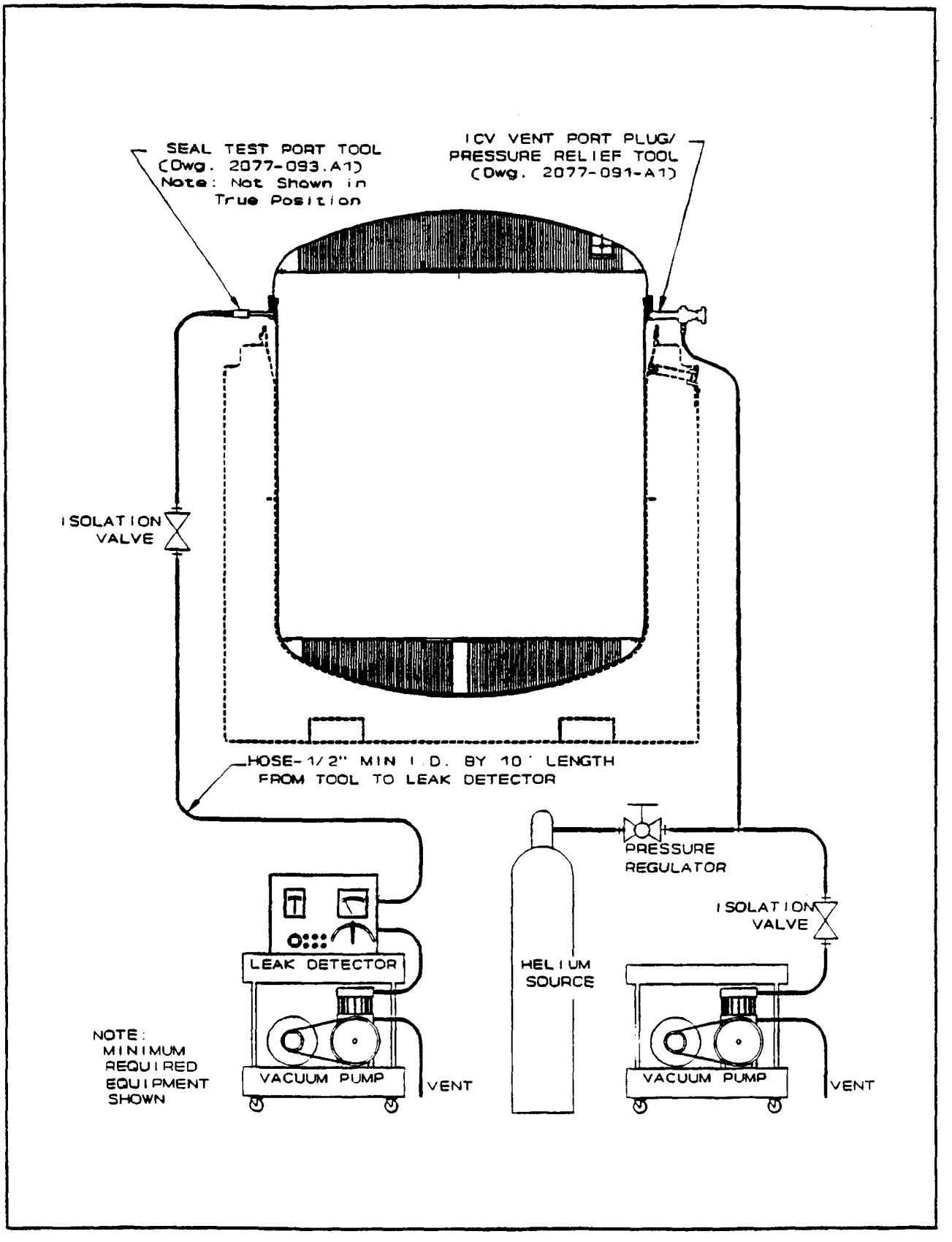


FIGURE 5-1 O-Ring Seal Leak Test Setup Support Arrangement for Assembled ICV

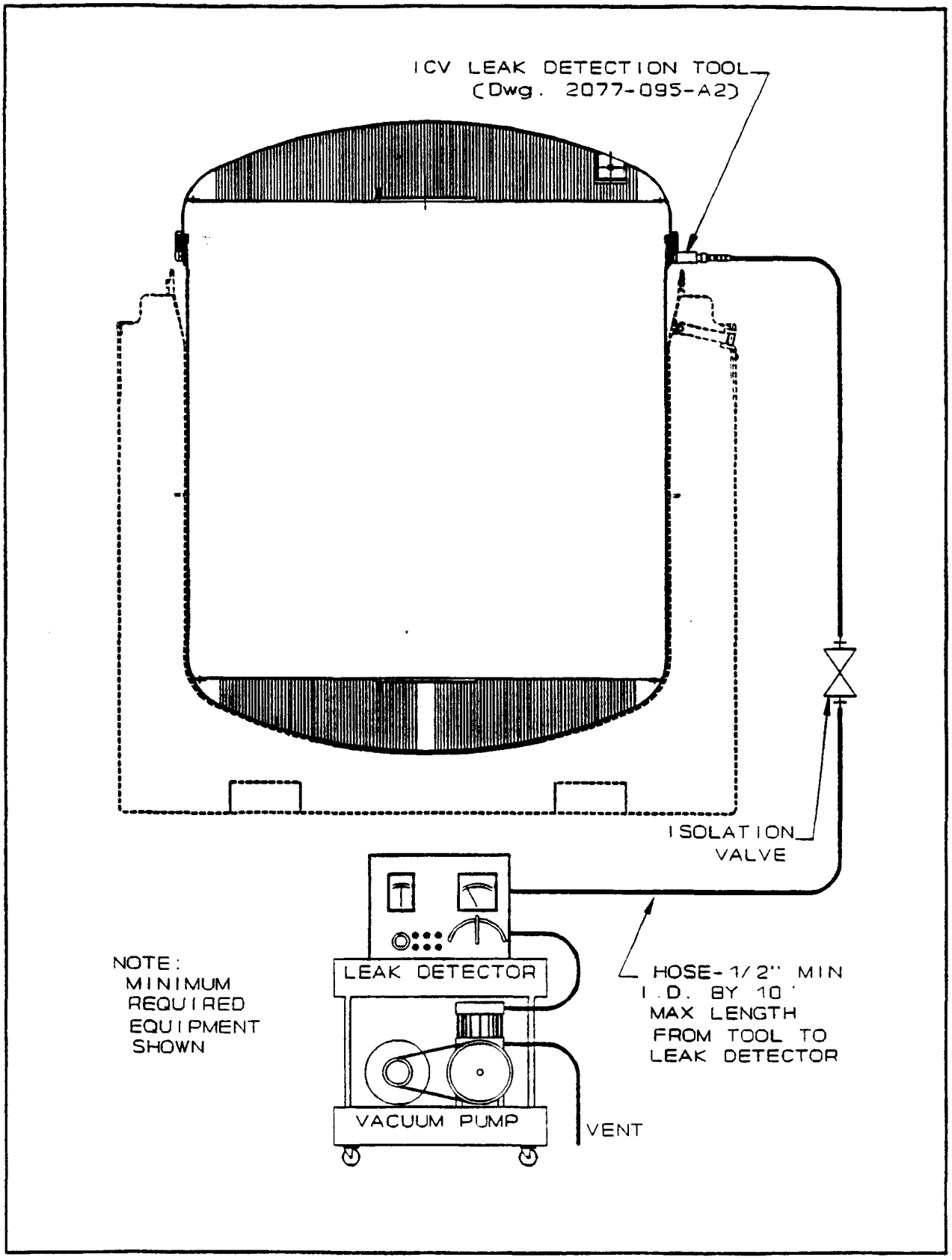


FIGURE 5-2 Vent Port Plug Seal Test Setup Support Arrangement for ICV

6.0 TRUPACT-II PACKAGE STRUCTURAL PRESSURE TESTING

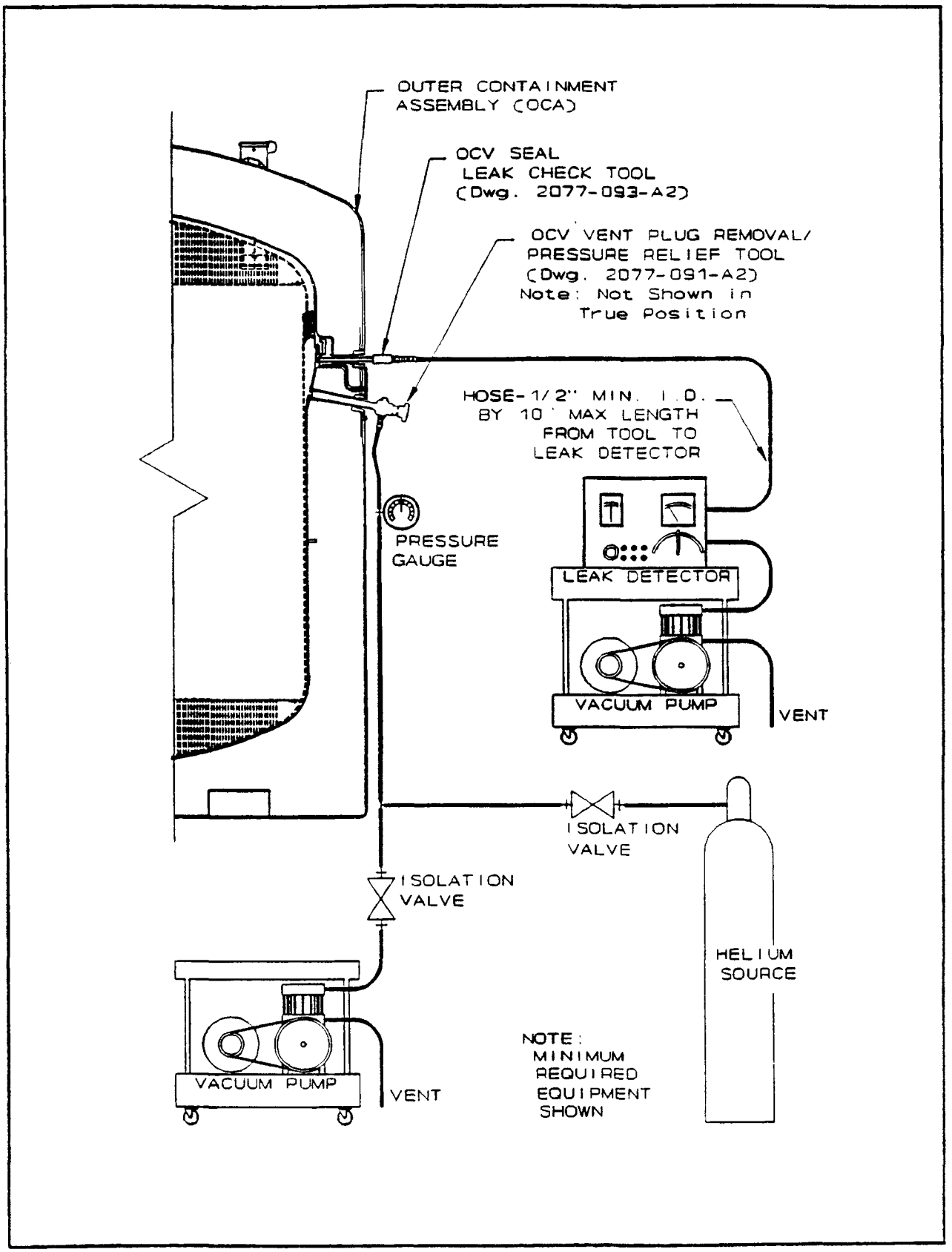


FIGURE 5-3 O-ring Seal Leak Test Setup Support Arrangement for Assembled OCV

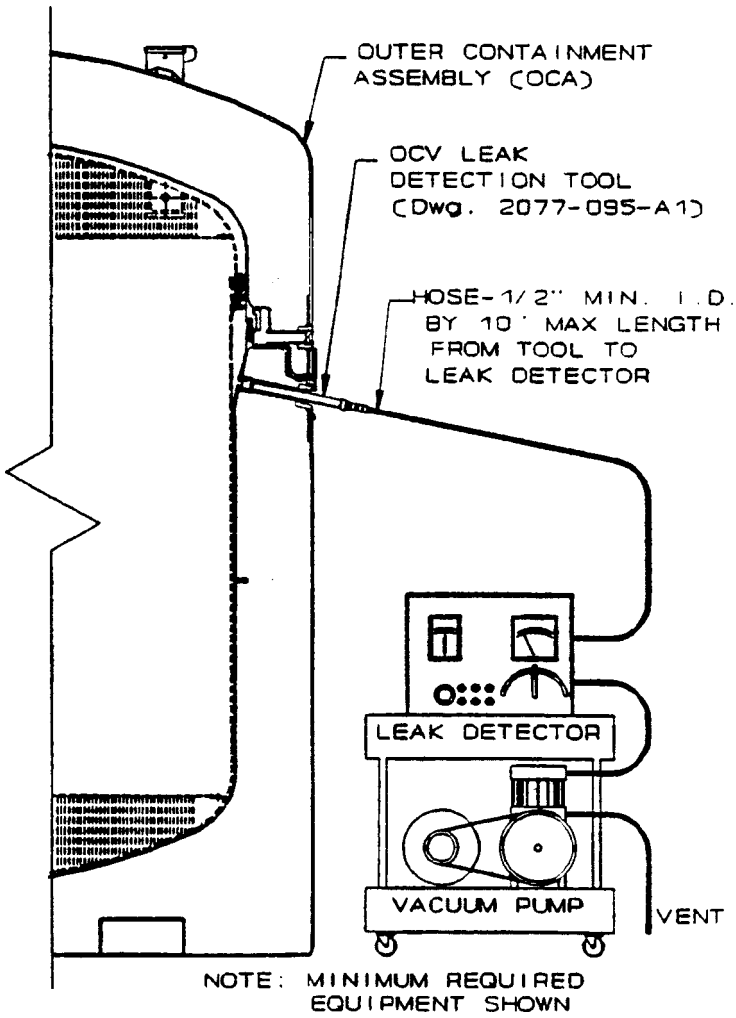


FIGURE 5-4 Vent Port Plug Seal Test Setup Support Arrangement for OCV

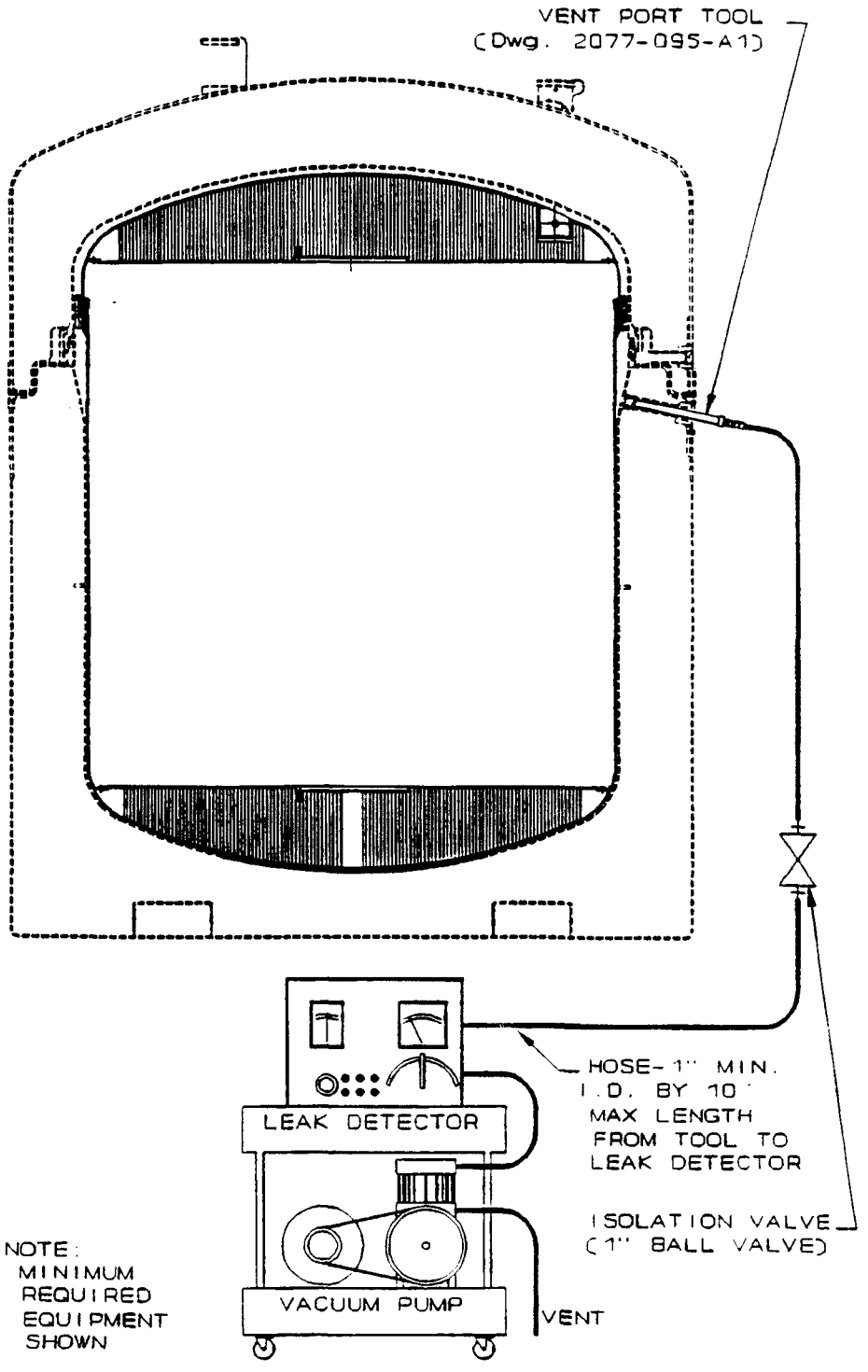


FIGURE 5-5 Vessel Weld Leak Test Setup Support Arrangement for Assembled ICV

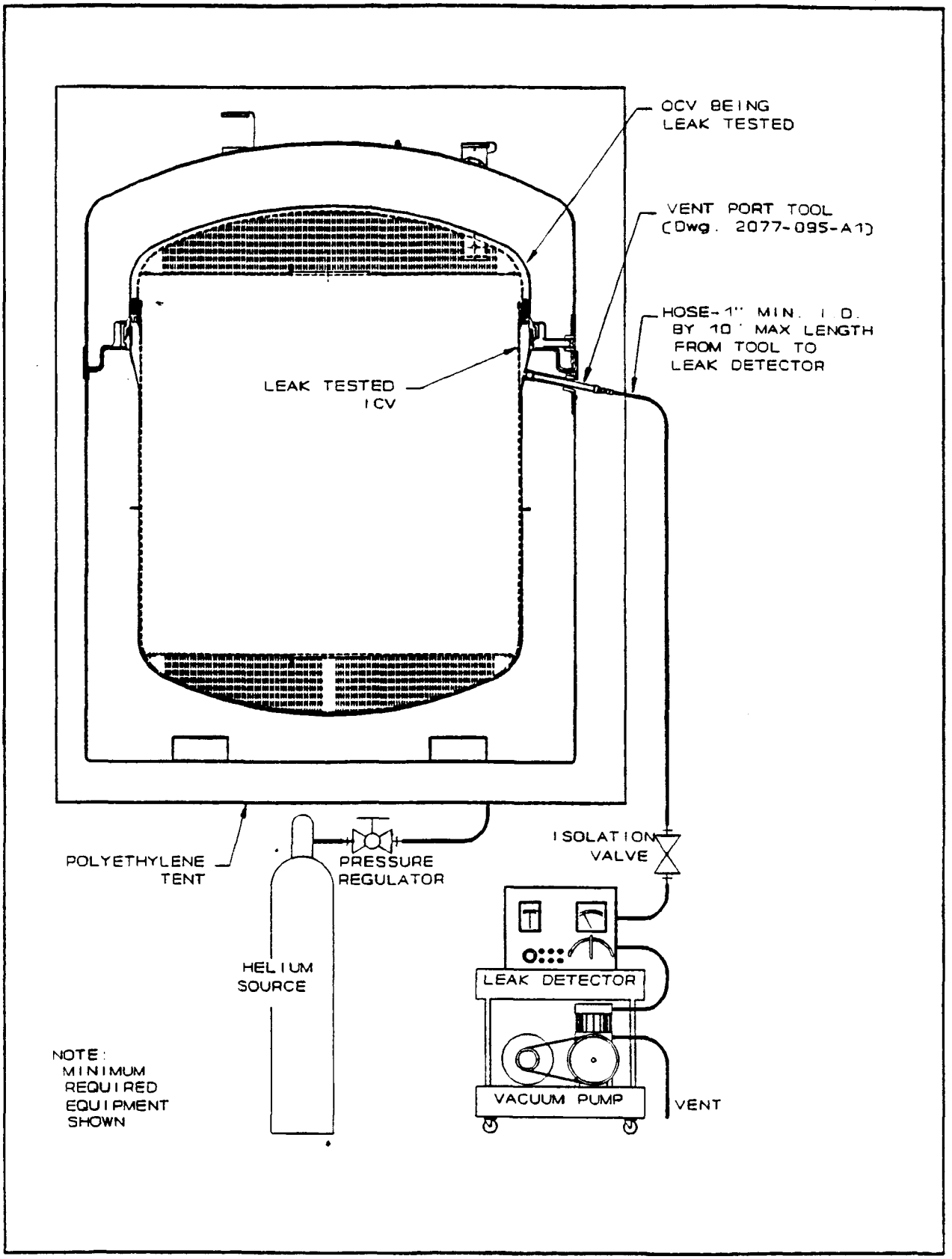


FIGURE 5-6 Vessel Weld Leak Test Setup Support Arrangement for Assembled OCV

6.1 Structural Pressure Testing the ICV

NOTE: *The following structural pressure test procedures are for reference only. Each user shall develop and qualify procedures to perform this test by qualified personnel.*

CAUTION: *Pneumatic testing of the containment vessel creates a condition where catastrophic failure of the containment vessel, should it occur, would create an explosion of considerable force. Thus, this test shall be conducted within the confines of a safety enclosure to minimize the possibility of personnel injury or death.*

6.1.1 Testing Prerequisites:

- To be acceptable, the containment vessel shall be pressurized to 75-80 psig air, and shall maintain a test pressure of 70 psig or greater for ten (10) minutes.

- Record the ICV lid and body serial numbers on the "ICV Containment Structure Pressure Test Data Sheet" found in Attachment B.

SIGN-OFF REQUIRED

- The ICV Containment Structure Pressure Test shall be performed every five (5) years after all other preventative maintenance activities have been completed for that year (with exception of the Annual ICV Interior Surfaces Inspection, per Section 4.3).

SIGN-OFF REQUIRED

- Obtain primary and secondary calibrated pressure gauges. Record the serial numbers of the calibrated pressure gauges.

SIGN-OFF REQUIRED

6.1.2 Assemble the ICV lid in accordance with the guidelines of Steps 3.9.2 through 3.9.13.

SIGN-OFF REQUIRED

6.1.3 Remove the assembled ICV from the OCA and locate the ICV inside the ICV work platform within a safety enclosure.

NOTE: *The pressure test manifold shall be equipped with a valve which can isolate the pressure gauge from the air supply but not from*

the ICV cavity. A secondary pressure gauge shall be used for primary pressure gauge verification.

6.1.4 Install the ICV vent port plug removal/pressure relief tool, with the ICV inner vent port plug adapter (see Figure 1-8), and rotate the handle counter-clockwise to remove the ICV inner vent port plug. Remove the ICV vent port plug removal/pressure relief tool from the ICV vent port (see Figure 6-1).

SIGN-OFF REQUIRED

6.1.5 Install the ICV vent port leak check tool (see Figure 1-9) into the ICV vent port.

6.1.6 Connect the air supply, manifold and the pressure gauges to the ICV vent port leak check tool.

6.1.7 Pressurize the ICV cavity to 75 psig, +5/-0 psig. Isolate the ICV cavity pressure gauges from the air supply after the correct pressure is achieved. Record the initial pressure reading. Begin timing for the containment structure pressure test.

SIGN-OFF REQUIRED

6.1.8 After ten (10) minutes, record the final pressure reading. If the cavity pressure drops below 70 psig in ten (10) minutes, isolate the leak path, replace the O-ring seal(s) per Work Instruction WI-4.2 and/or repair the seal surface(s) per Work Instruction WI-4.12, and repeat the pressure test. If, after repeated attempts, the system cannot be made to pass the pressure test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

6.1.9 Depressurize the ICV cavity and remove all pressure test equipment from the ICV.

NOTE: *ICV lid removal does not require the HPT inspections listed in Section 3.4. All actions requiring an HPT may be ignored.*

6.1.10 Remove the ICV lid in accordance with the guidelines of Steps 3.4.1 through 3.4.22.

6.1.11 Perform the Annual ICV Interior Surfaces Inspection per Section 4.3.

SIGN-OFF REQUIRED

6.1.12 This concludes pressure testing of the ICV containment structure.

6.2 Structural Pressure Testing the OCV

NOTE: *The following structural pressure test procedures are for reference only. Each user shall develop and qualify procedures to perform this test by qualified personnel.*

CAUTION: *Pneumatic testing of the containment vessel creates a condition where catastrophic failure of the containment vessel, should it occur, would create an explosion of considerable force. Thus, this test shall be conducted within the confines of a safety enclosure to minimize the possibility of personnel injury or death.*

6.2.1 Testing Prerequisites:

- To be acceptable, the containment vessel shall be pressurized to 75-80 psig air, and shall maintain a test pressure of 70 psig or greater for ten (10) minutes.

- Record the OCA lid and body serial numbers on the "OCV Containment Structure Pressure Test Data Sheet" found in Attachment B.

SIGN-OFF REQUIRED

- The OCV Containment Structure Pressure Test shall be performed every five (5) years after all other preventative maintenance activities have been completed for that year.

SIGN-OFF REQUIRED

- Obtain primary and secondary calibrated pressure gauges. Record the serial numbers of the calibrated pressure gauges.

SIGN-OFF REQUIRED

6.2.2 Assemble the OCA lid in accordance with the guidelines of Steps 3.10.2 through 3.10.11.

SIGN-OFF REQUIRED

6.2.3 Remove the assembled ICV from the OCA and locate the OCA within a safety enclosure.

NOTE: *The pressure test manifold shall be equipped with a valve which can isolate the pressure gauge from the air supply but not from*

the ICV cavity. A secondary pressure gauge shall be used for primary pressure gauge verification.

6.2.4 Install the OCV vent port plug removal/pressure relief tool (see Figure 1-3), and rotate the handle counter-clockwise to remove the OCV vent port plug. Remove the OCV vent port plug removal/pressure relief tool from the OCV vent port (see Figure 6-2).

SIGN-OFF REQUIRED

6.2.5 Install the OCV vent port leak check tool (see Figure 1-4) into the OCV vent port.

6.2.6 Connect the air supply, manifold and the pressure gauges to the OCV vent port leak check tool.

6.2.7 Pressurize the OCV cavity to 75 psig, +5/-0 psig. Isolate the OCV cavity pressure gauges from the air supply after the correct pressure is achieved. Record the initial pressure reading. Begin timing for the containment structure pressure test.

SIGN-OFF REQUIRED

6.2.8 After ten (10) minutes, record the final pressure reading. If the cavity pressure drops below 70 psig in ten (10) minutes, isolate the leak path, replace the O-ring seal(s) per Work Instruction WI-4.2 and/or repair the seal surface(s) per Work Instruction WI-4.12, and repeat the pressure test. If, after repeated attempts, the system cannot be made to pass the pressure test, prepare an NCR for disposition by the WIPP TRUPACT-II Maintenance Engineer.

SIGN-OFF REQUIRED

6.2.9 Depressurize the OCV cavity and remove all pressure test equipment from the OCV.

NOTE: *OCA lid removal does not require the HPT inspections listed in Section 3.3. All actions requiring an HPT may be ignored.*

6.2.10 Remove the OCA lid in accordance with the guidelines of Steps 3.3.2 through 3.4.20.

6.2.11 This concludes pressure testing of the OCV containment structure.

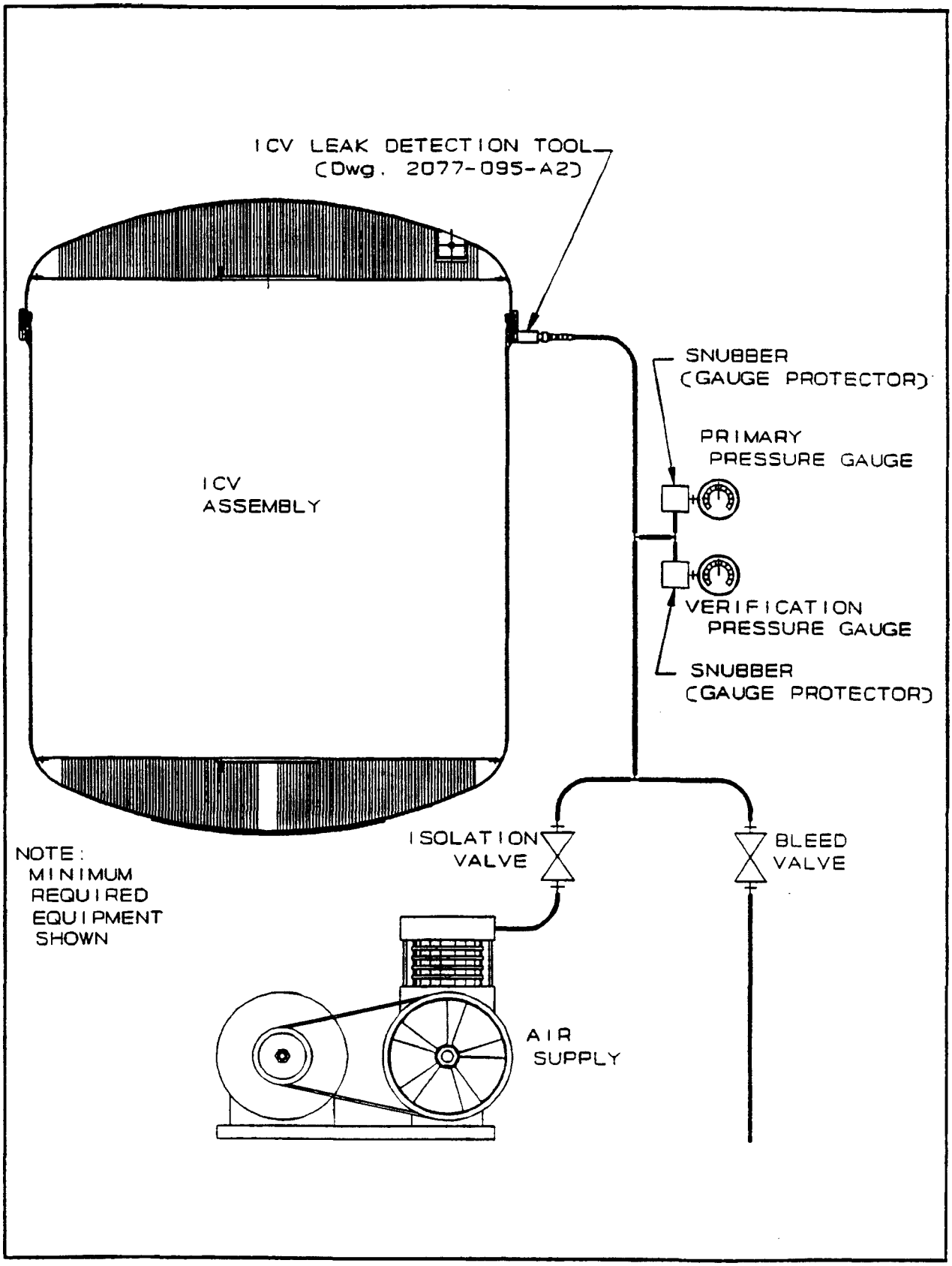


FIGURE 6-1 Verification Pressure Test Support Arrangement for Assembled ICV

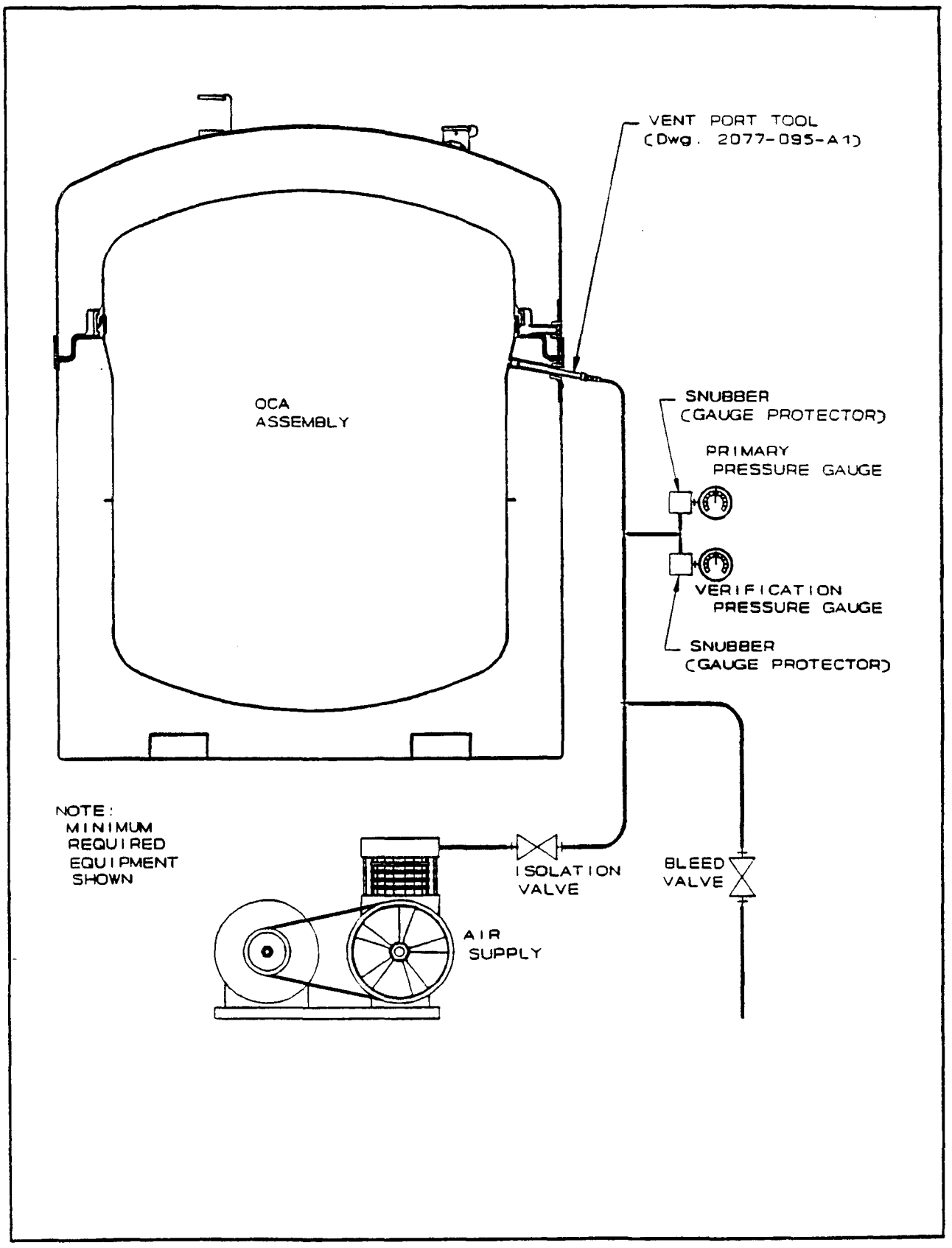


FIGURE 6-2 Verification Pressure Test Support Arrangement for Assembled OCV

ATTACHMENT A

TRUPACT-II Unloading and Loading Data Sheets

- TRUPACT-II Package Receipt and Unloading Data Sheet
- TRUPACT-II Package Inspection and Loading Data Sheet

TRUPACT-II PACKAGE RECEIPT AND UNLOADING DATA SHEET		
Facility: _____ **Date:** _____		
STEP	**DESCRIPTION**	**INITIALS**
3.1.1	Shipping documents reviewed	
3.1.2	Package radiation survey (≤limits) *HPT* Package contamination survey (≤limits) *HPT*	
3.1.3	Inspection completed (general condition)	
3.2.7	All tiedowns disengaged	
3.3.2	OCA lid serial number: _____ OCA body serial number: _____ OCA vent port seal serial number: _____ OCA lock ring bolt seal serial number: _____	
3.3.18	OCV lid interior survey (≤limits) *HPT* ICV lid exterior survey (≤limits) *HPT*	
3.4.11	Radiation assessment filter (≤limits) *HPT*	
3.4.19	ICV lid interior survey (≤limits) *HPT* Top of payload survey (≤limits) *HPT*	
3.5.7	Pallet assembly contamination survey (≤limits) *HPT*	
3.5.11	Guide tube contamination survey (≤limits) *HPT*	

Page 1 of 1

TRUPACT-II PACKAGE INSPECTIONS AND LOADING DATA SHEET

Facility: _____ **Date:** _____

STEP	DESCRIPTION	INITIALS
3.6.7	ICV free of standing water	
3.6.8	ICV lid and body inspections complete (Table 3-1)	
3.7.16	OCV free of standing water	
3.7.17	OCA lid and body inspections complete (Table 3-2)	
3.8.1	Payload meets the requirements of TRAMPAC	
3.8.2	Package visual inspections are complete	
3.8.9	Payload assembly weight: _____ lbs	
3.8.10	Package empty weight (see Table 2-1): _____ lbs	
3.8.11	Total loaded weight (sum 9 & 10): _____ lbs	
3.8.12	Total weight less than 19,250 pounds	
3.8.19	ACGLF lift leg contamination survey (≤limits) *HPT*	
3.9.1	ICV lid serial number: _____ ICV body serial number: _____	
3.9.11	ICV locking ring fasteners (28-32 ft-lbs torque)	
3.9.13	ICV inner vent port plug (8-10 ft-lbs torque)	
3.9.14	ICV Assembly Verification Leak Test complete	
3.10.1	OCA lid serial number: _____ OCA body serial number: _____	
3.10.11	OCA locking ring fasteners (28-32 ft-lbs torque)	
3.10.12	OCV Assembly Verification Leak Test complete	
3.10.14	OCA vent port tamper seal serial number: _____ OCA lock ring bolt tamper seal serial number: _____	
3.11.16	Tiedown gap set (0.070-0.100 inches)	
3.11.17	Package forklift covers installed	
3.11.18	Package exterior survey results (≤limits) *HPT*	
3.11.19	Package marking, labeling, placarding complete	
3.11.20	Package documents complete	

ATTACHMENT B

TRUPACT-II Leakage and Pressure Test Data Sheets

- TRUPACT-II ICV Containment Seals Leakage Test Data Sheet
- TRUPACT-II OCV Containment Seals Leakage Test Data Sheet
- TRUPACT-II ICV Containment Structure Leakage Test Data Sheet
- TRUPACT-II OCV Containment Structure Leakage Test Data Sheet
- TRUPACT-II ICV Containment Structure Pressure Test Data Sheet
- TRUPACT-II OCV Containment Structure Pressure Test Data Sheet

TRUPACT-II ICV Containment Seals Leakage Test Data Sheet		
Facility: _____ Date: _____		
STEP	**DESCRIPTION**	**INITIALS**
5.1.1	ICV lid serial number: _____ ICV body serial number: _____	
5.1.1	Leak detector serial number: _____ Calibrated leak serial number: _____ Barometric instrument serial number: _____ Temperature instrument serial number: _____	
5.1.1	Barometric pressure: _____ in-Hg Ambient temperature: _____ °F	
5.1.1	Leak detector calibrated	
5.1.2	Verify ICV lid installed per Steps 3.9.2 - 3.9.13	
5.1.9	Vacuum pressure level: _____ in-Hg	
5.1.10	Leak detector background reading: _____ He-cc/s	
5.1.11	Helium pressure level: _____ in-Hg	
5.1.13	ICV outer vent port plug at 10-13 ft-lbs torque	
5.1.14	Leak detector test reading: _____ He-cc/s	
5.1.15	ICV main O-ring seal leakage rate: _____ He-cc/s (Step 5.1.14 - Step 5.1.10)	
5.1.17	ICV seal test port plug at 6-8 ft-lbs torque	
5.1.21	ICV vent port plug seal leakage rate: _____ He-cc/s	
5.1.23	ICV vent port cover at 13-16 ft-lbs torque	

TRUPACT-II OCV Containment Seals Leakage Test Data Sheet		
Facility:_____ Date: _____		
STEP	**DESCRIPTION**	**INITIALS**
5.2.1	OCA lid serial number: _____ OCA body serial number: _____	
5.2.1	Leak detector serial number: _____ Calibrated leak serial number: _____ Barometric instrument serial number: _____ Temperature instrument serial number: _____	
5.2.1	Barometric pressure: _____ in-Hg Ambient temperature: _____ °F	
5.2.1	Leak detector calibrated	
5.2.2	Verify OCA lid installed per Steps 3.10.1 - 3.10.11	
5.2.9	Vacuum pressure level: _____ in-Hg	
5.2.10	Leak detector background reading: _____ He-cc/s	
5.2.11	Helium pressure level: _____ in-Hg	
5.2.13	OCV outer vent port plug at 10-13 ft-lbs torque	
5.2.14	Leak detector test reading: _____ He-cc/s	
5.2.15	OCV main O-ring seal leakage rate: _____ He-cc/s (Step 5.2.14 - Step 5.2.10)	
5.2.17	OCV seal test port plug at 6-8 ft-lbs torque	
5.2.21	OCV vent port plug seal leakage rate: _____ He-cc/s	
5.2.23	OCV vent port cover at 13-16 ft-lbs torque	
5.2.26	OCV seal test port access cover at 35-45 ft-lbs torque	
5.2.27	OCV vent port access cover at 35-45 ft-lbs torque	

TRUPACT-II ICV Containment Structure Leakage Test Data Sheet		
Facility: _____ **Date:** _____		
STEP	**DESCRIPTION**	**INITIALS**
5.3.1	ICV lid serial number: _____ ICV body serial number: _____	
5.3.1	Leak detector serial number: _____ Calibrated leak serial number: _____ Barometric instrument serial number: _____ Temperature instrument serial number: _____	
5.3.1	Barometric pressure: _____ in-Hg Ambient temperature: _____ °F	
5.3.1	Leak detector calibrated	
5.3.2	ICV honeycomb spacers removed per WI-4.13	
5.3.3	ICV lid installed per Steps 3.9.2 - 3.9.13	
5.3.4	ICV inner vent port plug removed	
5.3.11	Vacuum pressure level: _____ in-Hg	
5.3.12	Leak detector background reading: _____ He-cc/s	
5.3.13	Helium pressure level: _____ in-Hg	
5.3.15	ICV outer vent port plug at 10-13 ft-lbs torque	
5.3.16	Leak detector test reading: _____ He-cc/s	
5.3.17	ICV main O-ring seal leakage rate: _____ He-cc/s (Step 5.3.16 - Step 5.3.12)	
5.3.19	ICV seal test port plug at 6-8 ft-lbs torque	
5.3.23	ICV vent port plug seal leakage rate: _____ He-cc/s	
5.3.25	ICV vent port cover at 13-16 ft-lbs torque	
5.3.26	OCA lid installed per Steps 3.10.2 - 3.10.11	
5.3.30	ICV containment structure leakage rate: _____ He-cc/s	

TRUPACT-II OCV Containment Structure Leakage Test Data Sheet		
Facility: _____ **Date:** _____		
STEP	**DESCRIPTION**	**INITIALS**
5.4.1	OCA lid serial number: _____ OCA body serial number: _____	
5.4.1	Leak detector serial number: _____ Calibrated leak serial number: _____ Barometric instrument serial number: _____ Temperature instrument serial number: _____	
5.4.1	Barometric pressure: _____ in-Hg Ambient temperature: _____ °F	
5.4.1	Leak detector calibrated	
5.4.2	ICV lid installed per Steps 3.9.2 - 3.9.13	
5.4.3	ICV seals leak tested per Section 5.1	
5.4.4	OCA lid installed per Steps 3.10.2 - 3.10.11	
5.4.10	Leak detector background reading: _____ He-cc/s	
5.4.11	Helium purge time: _____ minutes	
5.4.12	Leak detector test reading: _____ He-cc/s	
5.4.13	OCV containment structure leakage rate: _____ He-cc/s ([Step 5.4.12 - Step 5.4.10] × 2)	
5.4.22	Vacuum pressure level: _____ in-Hg	
5.4.23	Leak detector background reading: _____ He-cc/s	
5.4.24	Helium pressure level: _____ in-Hg	
5.4.26	OCV vent port cover at 13-16 ft-lbs torque	
5.4.27	OCV main O-ring seal leakage rate: _____ He-cc/s	
5.4.28	OCV main O-ring seal leakage rate: _____ He-cc/s (Step 5.4.27 - Step 5.4.23)	
5.4.34	OCV vent port plug seal leakage rate: _____ He-cc/s	

Page 1 of 1

TRUPACT-II ICV Containment Structure Pressure Test Data Sheet		
Facility: _____		**Date:** _____
STEP	**DESCRIPTION**	**INITIALS**
6.1.1	ICV lid serial number: _____ ICV body serial number: _____	
6.1.1	All annual preventative maintenance activities completed	
6.1.1	Primary pressure gauge serial number: _____ Secondary pressure gauge serial number: _____	
6.1.2	Verify ICV lid installed per Steps 3.9.2 - 3.9.13	
6.1.4	ICV inner vent port plug removed	
6.1.7	Initial primary pressure gauge reading: _____ psig Initial secondary pressure gauge reading: _____ psig	
6.1.8	Final primary pressure gauge reading: _____ psig Final secondary pressure gauge reading: _____ psig	
6.1.11	Annual ICV interior surfaces inspection complete	

Page 1 of 1

TRUPACT-II OCV Containment Structure Pressure Test Data Sheet		
Facility: _____ Date: _____		
STEP	**DESCRIPTION**	**INITIALS**
6.2.1	OCA lid serial number: _____ OCA body serial number: _____	
6.2.1	All annual preventative maintenance activities completed	
6.2.1	Primary pressure gauge serial number: _____ Secondary pressure gauge serial number: _____	
6.2.2	Verify OCA lid installed per Steps 3.10.2 - 3.10.11	
6.2.4	OCV vent port plug removed	
6.2.7	Initial primary pressure gauge reading: _____ psig Initial secondary pressure gauge reading: _____ psig	
6.2.8	Final primary pressure gauge reading: _____ psig Final secondary pressure gauge reading: _____ psig	

ATTACHMENT C

TRUPACT-II Work Instruction Format

C.1 Preparing Work Instructions for Periodic Maintenance or Initial Release

All packaging work/periodic maintenance instructions will be written using "TRUPACT-II Work Instruction Format." The following descriptions and examples will aid in writing work instructions. The spaces listed in the examples may be increased or decreased as required.

- Title Block

  The title will be a very short description of the work or periodic maintenance to be performed.

- Instruction Number Block

  The instruction number will be assigned by the WIPP TRUPACT-II Maintenance Engineer. After the instruction number, enter the revision number.

- TRUPACT-II Serial Number Block

  Insert the appropriate serial number at the time of performance.

- Page Of Block

  Insert form page numbering information here.

- Applicable Drawings Block

  Drawings that apply to the work instruction may be SARP drawings or additional shop drawings required to complete the task.

- SARP Requirements Block

  Provide a short narrative of the SARP requirement, reference the appropriate SARP section(s), and applicable SARP section revision number.

- Special Tools Required Block

  List any special tools required to complete the task.

- Materials Required Block

  List all materials required to complete the task.

- Spare Parts Required Block

  List all TRUPACT-II Packaging spare parts required to complete the task.

- Safety Requirements Block

  List any special safety precautions needing to be followed to complete the task.

- Instruction Steps Block

  List the detailed procedural steps to follow to complete the task.

- Verification Requirements Block

  List the verification requirements (e.g, leak tests, material certification, etc.) required to complete the test.

- Signature Blocks

  Appropriate signatures shall be provided for all signature blocks.

C.2 Revising Existing Work Instructions

The revision will require the same approval as the original instruction. Revisions may be initiated via telephone or in writing from a user to the WIPP TRUPACT-II Maintenance Engineer. The WIPP TRUPACT-II Maintenance Engineer will approve tentative revisions by telephone, if necessary, and initiate the written revision.

The WIPP TRUPACT-II Maintenance Engineer can be reached during normal hours at 1-505-234-7500. After business hours, call the Central Monitoring Room (CMR) at 1-505-234-8125/8457 for communication of related items.

C.3 Cancellation of Existing Work Instructions

Approvals for cancellation will be made by the WIPP TRUPACT-II Maintenance Engineer. The cancellation letter shall be attached to the original Work Instruction and dispositioned per DOE Order 1324.2. The canceled work instruction and all references to the canceled Work Instruction shall be deleted from this document through the normal change and revision procedure, and changes will be distributed to all user sites.

TRUPACT-II WORK INSTRUCTION

Title:	Instruction No.: Rev
	TRUPACT-II SN:
	Page Of

Applicable Drawings:

SARP Requirements:

Special Tools Required:

Spare Parts Required:

Materials Required:

Safety Requirements:

TRUPACT-II WORK INSTRUCTION

Instruction No.	Continued	Page	Of

Pre-requisite Conditions:

Instruction Steps:

TRUPACT-II WORK INSTRUCTION

Instruction No.	Continued	Page	Of

Instruction Steps Continued:

TRUPACT-II WORK INSTRUCTION		
Instruction No.	Continued	Page Of
Instruction Steps Continued:		
Verification Requirements:		
Written By:		Date:
Approved By:	- QA	Date:
Approved By:	- Engineering	Date:
Approved By:	- Safety	Date:
Approved By:	- Operations/Maintenance	Date:
Approved By:		Date:

ATTACHMENT D

TRUPACT-II Approved Work Instructions

NOTE: *Working copies must be made of these Work Instructions; return original copies back into this document for future additional copies.*

- WI-4.1, Rev. 5, "Replacement of ICV/OCV Small Plugs, O-Rings, Gaskets"
- WI-4.2, Rev. 5, "Replacement of ICV/OCV Upper and Lower Main O-Rings, ICV Wiper O-Ring, OCA Fiber Gasket and ICV Debris Seal"
- WI-4.3, Rev. 5, "Replacement of Misc. Parts Not Requiring Detailed Instructions"
- WI-4.4, Rev. 5, "Cleaning Flange Threads for OCV Seal Test Port/Vent Port Access Covers"
- WI-4.5, Rev. 5, "Replacement of Polyethylene Filter in ICV Seal Flange"
- WI-4.6, Rev. 5, "Replacement of Threaded Inserts/Fasteners for TRUPACT-II"
- WI-4.7, Rev. 5, "Replacement of OCV Lock Ring Actuator"
- WI-4.8, Rev. 5, "Axial Play Measurement (OCV Lid-to-Body) (ICV Lid-to-Body) and Wear Pad Replacement"
- WI-4.9, Rev. 5, "ICV/OCV Lid and Body Seal Flange Tab Widths"
- WI-4.10, Rev. 5, "ICV/OCV Lid and Body Flange Groove Widths"
- WI-4.11, Rev. 5, "ICV/OCV Upper Main O-Ring Seal Groove Depth Measurement and Surface Finish"
- WI-4.12, Rev. 5, "Minor Repair of Vessel O-Ring Sealing Surface ICV/OCV, Minor Repair of Wall Surface ICV/OCA (Exposed Surfaces)"
- WI-4.13, Rev. 5, "Replacement/Inspection/Measurements ICV Honeycomb Spacers"

TRUPACT-II WORK INSTRUCTION

Title: Replacement of ICV/OCV Small Plugs, O-Rings, Gaskets	**Instruction No.: 4.1 Rev 5**
	TRUPACT-II SN:
	Page 1 Of 4

Applicable Drawings: 2077-500SNP, TRUPACT-II Packaging SARP Drawing
2077-1120, Quality Level
Spare Parts List TRUPACT-II

SARP Requirements:

The requirements for plugs and covers are to replace only if damaged - SARP Chapter 8.0, Para. 8.2.3.1. The requirements for O-Rings are to replace if damaged or annually - SARP Chapter 8.0, Para. 8.2.4.3.

Special Tools Required:

1. ICV & OCV Vent Port Plug Pressure Relief Tools - 2077-091, A1 & A2.
2. ICV & OCV Outer Vent Port Plug Removal & Installation Tool - 2077-092.
3. ICV & OCV Seal Leak Check Tools - 2077-093, A1 & A2.
4. ICV & OCV Seal Check Port Plug Installation/Removal Tool - 2077-094, A1 & A2.
5. ICV & OCV Leak Detection Tool - 2077-095, A1 & A2.
6. Stainless Steel Tube Brushes for cleaning ports 1 inch diameter, 7/8 inch diameter, 9/16 inch diameter, 1 1/2 inch diameter.
7. Torque Wrench capable of measuring 48-180 inch pounds.
8. Torque Wrench capable of measuring 0-50 foot pounds.

Spare Parts Required:

The spare parts required are identified in the work instruction steps. All spare parts listed are controlled and shall be recorded on the maintenance record.

Materials Required:

Dow Corning High Vacuum Grease or Equivalent
Solvent (Re-agent Alcohol) or cleaning agent containing no more than 250 PPM Chloride
Lint-Free Rags
Epoxy Adhesive
Anti Seize Thread Compound

Safety Requirements:

Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal Protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS.

Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.

Pre-requisite Conditions:

1. The O-Ring or gasket is always replaced if the plugs or cover are replaced.
2. There is no requirement to replace components in sequence listed.
3. The parts will have been removed and are accessible.
4. This work instruction is applicable to operational replacement requirements or preventive/periodic requirements.

Instruction Steps:

Indicate [✓] the applicable component(s) to be replaced. All others can be checked as "Not Applicable" (N/A).

NOTE: Handling O-Rings and gaskets are not to be lubricated. Torque wrenches may be in equivalent inch pounds.

[ ] OCV Vent Port Cover (PN 2077-156-18)
[ ] OCV Vent Port Cover O-Ring Seal (2077-160-16)
[ ] OCV Vent Port Cover Handling O-Ring (2077-160-19)

Record Torque Wrench SN and Cal. Due Date _____
Install and torque to 13-16 ft. pounds lubricated
Complete_____ Date_____

[ ] OCV Seal Test Port Plug O-Ring Seal (PN 2077-160-26)
[ ] OCV Seal Test Port Plug (PN 2077-156-7)
[ ] ICV Seal Test Port Plug O-Ring Seal (PN 2077-160-26)
[ ] ICV Seal Test Port Plug (PN 2077-156-7)

Record Torque Wrench SN and Cal. Due Date _____
Install and torque to 6-8 ft. pounds lubricated
Complete_____ Date_____

[ ] OCV Vent Port Plug (PN 2077-156-17)
[ ] OCV Vent Port Plug Seal O-Ring (PN 2077-160-17)
[ ] OCV Vent Port Plug Handling O-Ring (PN 2077-160-18)

Record Torque Wrench SN and Cal. Due Date _____
Install and torque to 8-10 ft. pounds lubricated
Complete_____ Date_____

Instruction Steps Continued:

Perform leak test and attach leak test documentation to maintenance record.

Complete_____ Date_____

[ ] ICV Vent Port Cover (PN 2077-156-11)
[ ] ICV Vent Port Cover Gasket (PN 2077-180-16)

Record Torque Wrench SN and Cal. Due Date _____
Install plug and torque to 13-16 ft. pounds lubricated

Complete_____ Date_____

[ ] ICV Outer Vent Port Plug (PN 2077-156-9)
[ ] ICV Outer Vent Port Plug O-Ring (PN 2077-180-21)

Record Torque Wrench SN and Cal. Due Date _____
Install plug and torque to 10-13 ft. pounds lubricated

Complete_____ Date_____

Leak test performed and documentation attached to maintenance record.

Complete_____ Date_____

[ ] ICV Inner Vent Port Plug (PN 2077-156-10)

1. Clean the port threads using appropriate size stainless steel tube brush.
2. Clean the brushed area using lint-free rags and solvent.
3. If only the O-Ring is to be changed, thoroughly clean plug or cover threads.
4. Lightly coat the new O-Ring with high vacuum grease and install on plug.
5. Lightly coat threads of brass plugs with vacuum grease.

[ ] ICV Inner Vent Port Plug O-Ring (PN 2077-180-22)

Record Torque Wrench SN and Cal. Due Date _____
Install plug and torque to 8-10 ft. pounds lubricated

Complete_____ Date_____

[ ] OCV Vent Port Access Cover SS Plug (PN 2077-156-13)
[ ] Foam Plug (PN 2077-156-15)

1. Clean back side of plug and apply epoxy adhesive.
2. Center foam plug and bond to back of threaded plug.
3. Coat plug threads with Anti Seize Thread Compound.
4. Record Torque Wrench SN and Cal. Due Date _____
5. Install assembly and torque to 35-45 ft. pounds lubricated.

Complete_____ Date_____

TRUPACT-II WORK INSTRUCTION

Instruction No. 4.1	Continued	Page 4 Of 4

Instruction Steps Continued:

[ ] OCV Seal Test Port Access Cover SS Plug (PN 2077-156-12)
[ ] Foam Plug (PN 2077-156-14)

1. Clean back side of plug and apply epoxy adhesive.
2. Center foam plug and bond to back of threaded plug.
3. Coat threads with Anti Seize Thread Compound.
4. Record Torque Wrench SN and Cal. Due Date _____
5. Install assembly and torque to 35-45 foot pounds lubricated.

Complete_____ Date_____

Verification Requirements:

Components used are listed on maintenance record. Leak test documentation is attached.
Work instructions complete, copy made for file, original attached to the maintenance record. Forward documentation to TPME. Per section 2.2 of the DOE/WIPP-93-1001.

Written By:	Don Roberts		**Date:** 9-7-94
Approved By:	Keith A. Lacy	**- QA**	**Date:** 9-7-94
Approved By:	Don Roberts	**- Engineering**	**Date:** 9-7-94
Approved By:	Carol Ripley	**- Safety**	**Date:** 9-7-94
Approved By:	Wade Wagoner	**- Oper./Maint.**	**Date:** 9-7-94
Approved By:			**Date:**

TRUPACT-II WORK INSTRUCTION

Title: Replacement of ICV/OCV Upper & Lower Main O-Rings, ICV Wiper O-Ring, OCA Fiber Gasket and ICV Debris Seal	**Instruction No.: 4.2 Rev 5** **TRUPACT-II SN:** **Page 1 Of 4**

Applicable Drawings: 2077-500SNP, TRUPACT-II SARP Drawing, Sheets 3, 4 and 7
2077-1120, Quality Level and Spare Parts List TRUPACT-II

SARP Requirements: Chapter 8.0, Section 8.2.4, Para. 8.2.4.3.
SARP requirements are that O-rings and gaskets be changed when damaged or annually.

Special Tools Required:
Adhesive Applicator (Caulking Gun)

Spare Parts Required:
Spare parts are listed in the work instruction.

Materials Required:
Dow Corning High Vacuum Grease or Equivalent
RTV Silicone Adhesive (2077-160-23) Dow Corning 732 or equivalent
Solvent (Re-agent Alcohol) or cleaning agent containing no more than 250 PPM Chloride
Lint Free Rags

Safety Requirements:
Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal Protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS.
Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.

Pre-requisite Conditions:

1. The O-ring or gasket to be replaced, has been removed and discarded.
2. O-ring grooves have been cleaned, inspected, or repaired as necessary.
3. There is no requirement to replace components in sequence listed.
4. This work instruction is applicable to operational replacement requirements or preventive/periodic requirements.

Instruction Steps:

Indicate [✓] the applicable component(s) to be replaced. All others can be checked as "Not Applicable" (N/A).

[ ] ICV Wiper O-Ring (PN 2077-180-27)

Lubricated and installed
Complete_____ Date_____

[ ] ICV Lower Main O-Ring (PN 2077-180-19)

Lubricated and installed
Complete_____ Date_____

[ ] ICV Upper Main O-Ring (PN 2077-180-9)

Lubricated and installed
Complete_____ Date_____

Leak test performed and documents attached to maintenance record.
Complete_____ Date_____

[ ] OCV Lower Main O-Ring (PN 2077-160-24)

Lubricated and installed
Complete_____ Date_____

[ ] OCV Upper Main O-Ring (PN 2077-160-15)

Lubricated and installed
Complete_____ Date_____

Leak test performed and documents attached to maintenance record.
Complete_____ Date_____

Instruction Steps Continued:

1. Thoroughly clean the O-ring grooves using solvent and lint-free rags.

2. Lightly coat the O-ring with Dow Corning High Vacuum Grease. This step usually requires two people with one person holding the O-ring above the floor and the other person drawing the O-ring through the palm of the hand until all surfaces of the O-ring are coated. One tablespoon of grease is normally sufficient to coat the O-ring.

3. Install the lubricated O-ring into the groove ensuring that it is seated around the entire circumference of the groove.

NOTE: Sign the completion blocks above as appropriate.

[ ] ICV Debris Seal (PN 2077-180-25)

Installed
Complete_____ Date_____

4. Remove the seal being replaced and discard.

5. Thoroughly clean the ICV lid groove using solvent and lint-free rags.

6. Prepare the replacement seal by installing double-sided tape (2077-180-26) to smooth side of material.

7. Install seal in groove ensuring it is seated around the entire circumference of the groove.

NOTE: Sign the completion blocks above as appropriate.

[ ] Ceramic Fiber Gasket (PN 2077-160-27)

Complete_____ Date_____

8. Remove the gasket being replaced by using a stiff blade scraper.

9. Thoroughly remove any adhesive residue using scraper, solvent and lint-free rags.

10. Apply adhesive using applicator and spread to a 1 inch band.

11. Bond the new gasket in place.

NOTE: Sign the completion blocks above as appropriate.

TRUPACT-II WORK INSTRUCTION

Instruction No. 4.2	Continued	Page 4 Of 4

Verification Requirements:

Components used are listed on maintenance record. Leak test documentation is attached.
Work instructions complete, copy made for file, original attached to the maintenance record. Forward documentation to TPME. Per section 2.2 of the DOE/WIPP-93-1001.

Written By: Don Roberts		**Date:** 9-7-94
Approved By: Kathi A. Lang	**- QA**	**Date:** 9-7-94
Approved By: Don Roberts	**- Engineering**	**Date:** 9-7-94
Approved By: Dana Kipley	**- Safety**	**Date:** 9-7-94
Approved By: Wade Mayerman	**- Oper./Maint.**	**Date:** 9-7-94
Approved By:		**Date:**

TRUPACT-II WORK INSTRUCTION

Title: Replacement of Misc. Parts Not Requiring Detailed Instructions	**Instruction No.: 4.3 Rev 5**
	TRUPACT-II SN:
	Page 1 Of 4

Applicable Drawings: 2077-1120, Quality Level and Spare Parts List TRUPACT-II
2077-500SNP, Sheets 2, 3, 5 and 6

SARP Requirements: There are no SARP requirements for this work instruction. Components will be replaced if damaged or as needed.

Special Tools Required:

1 inch Hex Wrench
Torque Wrench 21 - 82 in. lbs.
Lift Equipment
Lid Support Stands
Flat Blade Screwdriver (⅜ inch tip)
⅜ inch Hex Wrench or Socket
Stainless Steel Wire Brush

Spare Parts Required:

The spare parts are listed in the work instructions. All spare parts listed are controlled and shall be recorded on the maintenance record.

Materials Required:

Locktite #262 Thread Locking Compound or Equivalent
Anti Seize Thread Compound

Safety Requirements:

Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal Protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS.

Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.

Pre-requisite Conditions:

1. To replace OCA lid guide plates, the lid must be removed and set on the lid stand.
2. The component to be replaced has been removed and discarded.
3. There is no requirement to replace components in sequence listed.
4. This work instruction is applicable to operational replacement requirements or preventive/periodic maintenance requirements.

Instruction Steps:

Indicate [✓] the applicable component(s) to be replaced. All others can be checked as "Not Applicable" (N/A).

[ ] OCA Weather Seal (PN 2077-156-22)
[ ] Annulus Debris Seal (PN 2077-156-21)
[ ] OCA Burn Out Plug (PN 2077-163-13) (Tighten flush with flange to within ⅛ inch)
[ ] Fork Pocket Cover (PN 2077-171-11)
[ ] Fork Pocket Cover (PN 2077-171-12)
[ ] Fork Pocket Screws (PN 2077-160-30)

NOTE: The following steps apply to guide plates and screws.

1. Coat new screw threads with Anti Seize Thread Compound.
   Complete_____ Date_____

2. Record torque wrench data.
   S/N_____ Cal Due Date_____

3. Install new screw and torque to 75 - 82 in. lbs.
   Complete_____ Date_____

[ ] OCA Lid Guide Plates (PN 2077-163-11)
[ ] Guide Plate Screws (PN 2077-160-14)

4. Coat new screw threads with thread locking compound.
   Complete_____ Date_____

5. Record torque wrench data.
   S/N_____ Cal Due Date_____

6. Attach new plate, torque plate screws (2077-160-14) 21 - 24 in. lbs.
   Complete_____ Date_____

Instruction Steps Continued:

[ ] OCA Lift Pocket Cover Nut (PN 2077-163-9)
[ ] OCA Lift Pocket Fiberglass Tubes (PN 2077-163-2)
[ ] OCA Lift Pocket Cover (PN 2077-163-6)
[ ] OCA Lift Pocket Cover Clip (PN 2077-163-10)
[ ] OCA Lift Pocket Cover Lanyard (PN 2077-163-7)
[ ] OCA Lift Pocket Cover Fastener (PN 2077-163-5)
[ ] OCA Lift Pocket Tube Attachment Hex Head Cap Screw (PN 2077-163-3)
[ ] OCA Lift Pocket Star Lock Washer (PN 2077-163-4)

7. If cap screws are reusable or if new cap screws are used, thoroughly clean threads and coat with thread locking compound.
   Complete_____ Date_____

8. Place new lift pocket tube in proper orientation.
   Complete_____ Date_____

9. Record torque wrench data.
   S/N_____ Cal Due Date_____

10. Torque attachment screws (2077-163-3) 40 - 50 in. lbs.
    Complete_____ Date_____

[ ] ICV Wiper O-Ring Screw (PN 2077-180-11)

TRUPACT-II WORK INSTRUCTION

Instruction No. 4.3	Continued	Page 4 Of 4

Verification Requirements:

Components used are listed on maintenance record. Work instructions complete, copy made for file, original attached to the maintenance record. Forward documentation to TPME. Per section 2.2 of the DOE/WIPP-93-1001.

Written By: Don Roberts		**Date:** 9-4-94
Approved By: Kathi A. Lacy	- QA	**Date:** 9-7-94
Approved By: Don Roberts	- Engineering	**Date:** 9-7-94
Approved By: Doug Ripley	- Safety	**Date:** 9-7-94
Approved By: Wade Wagoner	- Oper./Maint.	**Date:** 9-7-94
Approved By:		**Date:**

TRUPACT-II WORK INSTRUCTION

Title: Cleaning Flange Threads for OCV Seal Test Port/Vent Port Access Covers	**Instruction No.: 4.4 Rev 5**
	TRUPACT-II SN:
	Page 1 Of 3

Applicable Drawings: 2077-500SNP, Sheet 9

SARP Requirements: There are no SARP requirements per this work instruction. Threads will be cleaned if damaged.

Special Tools Required:

1½ inch NPT 11 - ½ Pipe Tap (Modified Short)
Tap Handle
1½ inch Stainless Steel Tube Brush

Spare Parts Required: N/A

Materials Required:

Tapping Fluid (Anchor Lube N-661 or Equivalent)
Solvent (Re-agent Alcohol) or cleaning agent containing no more than 250 ppm Chloride Ion
Lint Free Rags
400 - 600 Grit Emery Cloth

Safety Requirements:

Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal Protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS.

Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.

Pre-requisite Conditions:

1. OCV Seal Test Port/Vent Port Access Cover(s) must be removed.
2. This work instruction is applicable to operational replacement requirements or preventive/periodic maintenance requirements.

Instruction Steps:

Indicate [✓] the applicable component(s) to be repaired. All others can be checked as "Not Applicable" (N/A).

[ ] OCV Seal Test Port Access Cover Flange (PN 2077-167-6)
[ ] OCV Vent Port Access Cover Flange (PN 2077-173-13)

1. Clean threads using solvent, 1½ inch stainless steel tube brush and lint free rags.
   Complete_____ Date_____

2. Apply tapping fluid to threads being cleaned.
   Complete_____ Date_____

3. Insert tap into threads by hand, rotating clockwise until snug. Ensure tap is engaged straight.
   Complete_____ Date_____

4. Install tap handle on tap and rotate ¼ turn clockwise, then reverse ⅛ turn to break edges.
   Complete_____ Date_____

5. Remove tap. Using emery cloth lightly polish threads to remove sharp edges.
   Complete_____ Date_____

6. Repeat steps 1 through 5 until flange threads are cleaned for use.

TRUPACT-II WORK INSTRUCTION

Instruction No. 4.4	Continued	Page 3 Of 3

Verification Requirements:
Work instructions complete, copy made for file, original attached to the maintenance record. Forward documentation to TPME. Per section 2.2 of the DOE/WIPP-93-1001.

Written By:	Don Roberts		**Date:** 9-7-94
Approved By:	Keith A. Lacy	- QA	**Date:** 9-7-94
Approved By:	Don Roberts	- Engineering	**Date:** 9-7-94
Approved By:	Randy Tripley	- Safety	**Date:** 9-7-94
Approved By:	Wade Wagner	- Oper./Maint.	**Date:** 9-7-94
Approved By:			**Date:**

TRUPACT-II WORK INSTRUCTION

Title: Replacement of Polyethylene Filter in ICV Seal Flange	**Instruction No.: 4.5 Rev 5**
	TRUPACT-II SN:
	Page 1 Of 3

Applicable Drawings: 2077-500SNP, Sheet 7
2077-1120, Quality Level and Spare Parts List TRUPACT-II

SARP Requirements: There are no SARP requirements for this work instruction. Filters will be changed as necessary.

Special Tools Required:
Pin Punch 3/32 inch dia.
Pliers, Slip Joint or Standard Tongue and Groove (Channel Locks)
Ball Peen Hammer, 12 to 14 oz.

Spare Parts Required:
Polyethylene Filter (PN 2077-183-4)
All spare parts listed are controlled and shall be recorded on the maintenance record.

Materials Required:
Air Supply
ICV/OCA Lid Stands
Solvent (Re-agent Alcohol) or cleaning agent containing no more than 250 ppm Chloride Ion
Lint Free Rags

Safety Requirements:

Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal Protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS.

Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.

Compressed Air for cleaning must not exceed 30 psi at nozzle.
Air nozzle should have OSHA approval stamped on body.

Pre-requisite Conditions:

1. ICV/OCA lids must be removed and placed on lid stands.
2. This work instruction is applicable to operational replacement requirements or preventive/periodic maintenance requirements.

Instruction Steps:

Indicate [✓] the applicable component(s) to be replaced. All others can be checked as "Not Applicable" (N/A).

[ ] Polyethylene Filter (PN 2077-183-4)

1. From inner side of ICV, drive filter to outside of seal flange using pin punch & hammer.
   Complete_____ Date_____

2. Using pliers, finish removal of filter.
   Complete_____ Date_____

3. Install new filter outside seal flange inward.
   Complete_____ Date_____

4. Stake both ends of filter.
   Complete_____ Date_____

5. Clean area with solvent & lint free rags.
   Complete_____ Date_____

6. Using air supply, ensure air passes through filter.
   Complete_____ Date_____

TRUPACT-II WORK INSTRUCTION

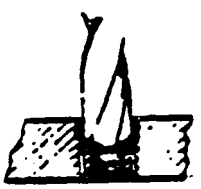
Instruction No. 4.5	Continued	Page 3 Of 3

Verification Requirements:
Components used are listed on maintenance record. Work instructions complete, copy made for file, original attached to the maintenance record. Forward documentation to TPME. Per section 2.2 of the DOE/WIPP-93-1001.

Written By:	Don Roberts		**Date:** 9-7-94
Approved By:	Keith A. Lang	- QA	**Date:** 9-7-94
Approved By:	Don Roberts	- Engineering	**Date:** 9-7-94
Approved By:	Danny Tipton	- Safety	**Date:** 9.7.94
Approved By:	Wade Wagner	- Oper./Maint.	**Date:** 9-7-94
Approved By:			**Date:**

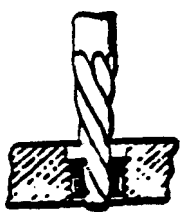
INSERT REMOVAL

1. Use STANDARD DRILL to remove insert material between "Kees."



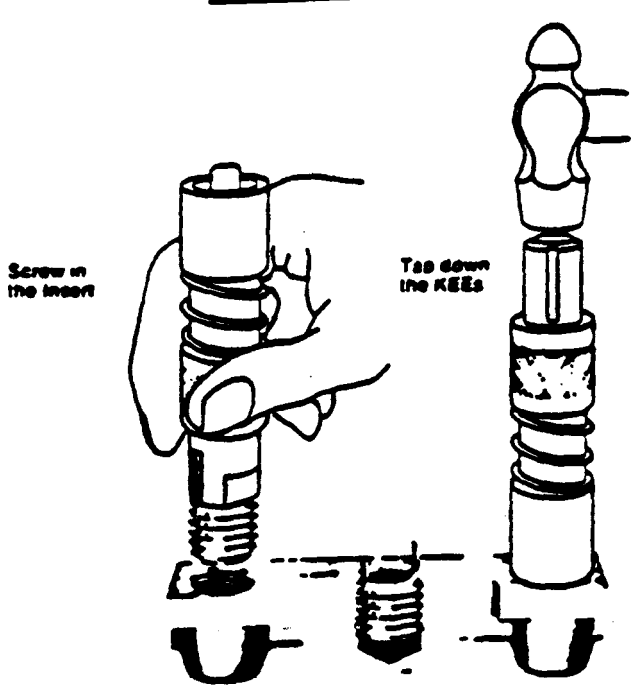
2. Deflect "Kees" inward and break off.

3. Remove insert with E-Z OUT type tool.



4. An identical insert can now be installed in the original hole. No re-work of the hole will be necessary.

INSERT INSTALLATION



Screw in insert with fingers or installation tool. Insert is designed to stop at the correct depth below the surface of the casting

TRUPACT-II WORK INSTRUCTION

Title: Replacement of Threaded Inserts/Fasteners for TRUPACT-II	**Instruction No.: 4.6 Rev 5**
	TRUPACT-II SN:
	Page 1 Of 3

Applicable Drawings: 2077-500SNP, TRUPACT-II SARP Drawing, Sheets 3, 5 and 9
2077-1120, Quality Level and Spare Parts List TRUPACT-II

SARP Requirements: Chapter 8.0, Section 8.2.3, Para. 8.2.3.1.
Threaded inserts/fasteners are to be inspected before each use and annually for stripped or deformed threads and replaced every five (5) years.

Special Tools Required:
Stainless Steel Tube Brush 1/2 inch Diameter
Stainless Steel Tube Brush 1/4 inch Diameter
Torque Wrench (capable of showing 28-32 foot pounds with 9/16 inch hex male socket)
Keensert Installation Tools (PN TD-420L or PN TD-818L)
9/32 inch Diameter Drill Bit with Collar or
17/32 inch Diameter Drill Bit with Collar
#4 or #5 "E-Z Out" Tool
1/4 inch Diameter Punch
Power Drill
12-14 ounce Ball Peen Hammer

Spare Parts Required:
Threaded Insert (PN 2077-160-29) (Fork Lift Pocket)
Threaded Insert (PN 2077-160-28) (OCV/ICV Locking Ring Bolts)
Bolts (PN 2077-156-A1 [ICV] & 2077-156-A2 [OCV])

Materials Required:
Solvent (Re-agent Alcohol) or a cleaning agent that contains no more than 250 PPM Chloride
Lint-Free Rags
Anti Seize Thread Compound

Safety Requirements:
Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal Protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS.
Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.

Pre-requisite Conditions:

1. To replace the locking ring inserts, the ICV lid or OCA lid must be removed.
2. For fork lift pocket inserts, there is no pre-requisite, these items can be replaced as long as they are accessible.
3. There is no requirement to replace components in sequence listed.
4. This work instruction is applicable to operational replacement requirements or preventive/periodic requirements.

Instruction Steps:

Indicate [✓] component(s) being replaced.

NOTE: Torque wrenches may be in equivalent inch pounds.

[ ] Locking Ring Bolt Insert (PN 2077-160-28)

1. Obtain power drill and install 17/32 inch diameter drill bit.
2. Install drill bit collar on drill bit and set to 3/16 inch maximum drill depth.
3. Follow steps outlined in Figure 1 on page 4.

Complete_____ Date_____

[ ] Locking Ring Bolts - ICV (PN 2077-156-A1)
[ ] Locking Ring Bolts - OCV (PN 2077-156-A2)

4. Clean threads of the insert using 1/2 inch tube brush. Wipe clean using solvent and lint-free rags.
5. Clean threads of replacement bolt using solvent and lint-free rags.
6. Lightly coat bolt threads with Anti Seize Thread Compound.
7. Record torque wrench SN _____ and Cal. Due Date _____.
8. Install bolt and torque to 28-32 foot pounds lubricated.

Complete_____ Date_____

[ ] Fork Lift Pocket Insert (PN 2077-160-29)

9. Obtain power drill and install 9/32 inch diameter drill bit.
10. Install drill collar on drill bit and set to 3/16 inch maximum drill depth.
11. Follow steps outlined in Figure 1 on page 4.

Complete_____ Date_____

TRUPACT-II WORK INSTRUCTION

Instruction No. 4.6	Continued	Page 3 Of 3

Verification Requirements:
Components used are listed on maintenance record.
Work instructions complete, copy made for file, original attached to the maintenance record. Forward documentation to TPME. Per section 2.2 of the DOE/WIPP-93-1001.

Written By: Don Roberts		**Date:** 9-7-94
Approved By: Kooch A. Lary	- QA	**Date:** 9-7-94
Approved By: Don Roberts	- Engineering	**Date:** 9-7-94
Approved By: Doug Tipley	- Safety	**Date:** 9-7-94
Approved By: Wade Wegener	- Oper./Maint.	**Date:** 9-7-94
Approved By:		**Date:**

TRUPACT-II WORK INSTRUCTION

Title: Replacement of OCV Lock Ring Actuator	**Instruction No.: 4.7 Rev 5** **TRUPACT-II SN:** **Page 1 Of 3**

Applicable Drawings: 2077-500SNP, Sheets 2, 3 and 6
2077-1120, Quality Level & Spare Parts List TRUPACT-II

SARP Requirements: There are no SARP requirements for this work instruction. The actuator will be replaced as necessary.

Special Tools Required:
Lift Equipment
Lid Stand
Flat Blade Screwdriver - ⅜ in. tip
Torque Wrench - 22 - 28 in. lbs. with flat tip screwdriver socket

Spare Parts Required:
The spare parts are listed in the instruction steps. All spare parts listed are controlled and shall be recorded on the maintenance record.

Materials Required:
Locktite #262 thread locking compound or equivalent

Safety Requirements:
Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS>
Standard Safety Requirements
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.

Pre-requisite Conditions:
1. The OCA lid must be removed and set on the lid stand.
2. This work instruction is applicable to operational replacement requirements or preventive/periodic maintenance requirements.

Instruction Steps:

Indicate [✓] the applicable component(s) to be replaced. All others can be checked as "Not Applicable" (N/A).

[ ] OCV Lock Ring Actuator (PR 2077-161-1)
[ ] Lock Ring Actuator Screw (PR 2077-160-13)
[ ] Microlite Insulation (PR 2077-160-10)
[ ] Ceramic Fiber Gasket (PR 2077-160-27)

1. Loosen and remove the 36 pan head screws that fasten the actuator to the lock ring. Lower the actuator ring to the floor. (2 or more people required)
   Complete_____ Date_____

2. Lift the OCA lid clear of the lid stand. Remove old actuator, place new actuator over stand and place on floor.
   Complete_____ Date_____

3. Place OCA lid back on lid stand.
   Complete_____ Date_____

4. Install new ceramic fiber gasket per W.I. 4.2.
   Complete_____ Date_____

5. Inspect and replace microlite insulation if required.
   Complete_____ Date_____

6. Coat threads of screws with thread locking compound and attach new actuator to locking ring.
   Complete_____ Date_____

7. Record torque wrench data.
   S/N_____ Cal Due Date_____

8. Torque screws 22 - 28 in. lbs.
   Complete_____ Date_____

TRUPACT-II WORK INSTRUCTION

Instruction No. 4.7	Continued	Page 3 Of 3

Verification Requirements:

Components used are listed on maintenance record. Work instructions are complete, copy made for file, original attached to the maintenance record. If any additional work instructions were used, ensure they are also attached to maintenance record. Forward documentation to TPME. Per section 2.2 of the DOE/WIPP-93-1001.

Written By:	Don Roberts		**Date:** 9-7-94
Approved By:	Keith A. Lang	- QA	**Date:** 9-7-94
Approved By:	Don Roberts	- Engineering	**Date:** 9-7-94
Approved By:	Doug Tipley	- Safety	**Date:** 9.7.94
Approved By:	Wade Mayeux	- Oper./Maint.	**Date:** 9-7-94
Approved By:			**Date:**

TRUPACT-II WORK INSTRUCTION

Title: Axial Play Measurement (OCV Lid to Body) (ICV Lid to Body) and Wear Pad Replacement	**Instruction No.: 4.8 Rev 5** **TRUPACT-II SN:** **Page 1 Of 5**

Applicable Drawings: 2077-500SNP, Sheet
2077-1120, Quality Level and Spare Parts List TRUPACT-II

SARP Requirements: Chapter 8.0, Section 8.2.3.4, Para. 8.2.3.4.2.3. Annual or after repairs. Wear pad replacement has no SARP requirements.

Special Tools Required:

OCA Lid Measuring Band (Attachment 1, Figure A)
OCA Body Measuring Band (Attachment 1, Figure A)
ICV Lid Measuring Band (Attachment 1, Figure A)
ICV Body Measuring Band (Attachment 1, Figure A)
Optical Comparator
ICV Lid Stand
ICV Work Platform
OCA Lid Stand
Trammel Beam with Points
Straight Edge
Level
Vacuum/Pressure Gauge

Spare Parts Required: Wear Pad (PN 2077-156-23)

Materials Required:

Low Chloride Non-permanent Marker
Lint Free Rags
Solvent (Re-agent Alcohol or equivalent) containing no more than 250 ppm Chloride Ion

Safety Requirements:

Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal Protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS.

Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.

Compressed Air for cleaning must not exceed 30 psi at nozzle.
Air nozzle should have OSHA approval stamped on body.

Pre-requisite Conditions:

Empty TRUPACT-II is fully assembled, has been radiological surveyed and decontaminated if required; locking rings are in the locked position. The ICV may be removed from the OCV prior to start of OCV measurements or the OCV measurement may be performed with ICV installed.

Instruction Steps For Axial Play Measurements:

NOTE: The measuring bands have been designed so that the numbers are located at the approximate center of the locking lugs. Figures in the attachment shows correct set-up for applicable steps.

1. Install OCA body measuring band (Attachment 1, Figure B) approximately 1 inch below the locking ring actuator. Ensure that the band fastening device gap is located at the approximate center of the vent port access and that the top edge of the measuring band is approximately parallel to the bottom edge of the actuator ring. Tighten the fastener so that the band will not slip during measurement operations.

2. Install the OCA lid measuring band (Attachment 1, Figure B) approximately 1 inch above the actuator ring. Ensure that the numbers are axially aligned with the numbers on the OCA body measuring band and that the bottom edge of the lid measuring band is approximately parallel to the top edge of the actuator ring. Tighten the fasteners on the band so that the band will not slip during measurement operations.

3. Using the straight edge or level, draw a vertical line from the numbers on the OCA lid across the OCV actuator ring to numbers on the OCA body measuring band.

4. If not already in place, install vent port tool and vacuum source and evacuate vessel to 10 inches Hg and record gauge reading _____ (See Attachment 1, Figure C).

   Record Gauge SN_____Cal Due Date_____

   Complete_____Date_____

   QA Witness_____Date_____

5. Using the trammel, place one point in the indentation above the numbers on the OCA body band and with the other point, scribe a mark approximately 2 inches long which intersects with the vertical line on the lid band at locations 2, 4, 6, 8, 10, 12, 14, 16 & 18 (See Attachment 1, Figure D).

6. Release vacuum and disconnect the vacuum source.

7. Install air supply source to vent port tool and pressurize vessel to 10 PSIG and record gauge reading _____ (See Attachment 1, Figure E).

   Record Gauge SN_____Cal Due Date_____

   Complete_____Date_____

   QA Witness_____Date_____

8. Repeat step #5. Ensure that scribe marks are below those already made (See Attachment 1, Figure F).

9. Release pressure and disconnect air supply.

Instruction Steps Continued:

10. Using the optical comparator measure to the nearest .005 inch, the distance between the 2 scribe marks at locations 2, 4, 6, 8, 10, 12, 14, 16 & 18 and record. (Attachment 1 shows scribe marks after completion of Steps 4 through 8).

    2_____ 4_____ 6_____ 8_____ 10_____
    12_____ 14_____ 16_____ 18_____

    Complete_____Date_____

    QA Witness_____Date_____

NOTE: If measurement at any location is greater than .150 inch, notify TPME for resolution.

11. Remove OCA lid assembly with the measuring band installed and place on stand. Rotate actuator ring to lock position.

12. This completes OCA axial play.

13. If not already done, remove the ICV from the OCV and place in work stand.

NOTE: The wear pad is only replaced if worn or damaged.

14. Remove the wear pad to be replaced and discard.

15. If not already marked, locate the center of OCV lower head and mark a 3 in. diameter circle from center mark using a low chloride marking pen.

16. Remove backing from wear pad, place pad with adhesive side down so that the 3 in. diameter hole matches the circle on OCV lower head; press firmly from center outward. Ensure that the pad has no excessive wrinkles.

    Complete_____Date_____

17. Remove ICV lid and place on stand.

18. Remove debris seal from lid and clean the groove using solvent and lint-free rags.

19. Reinstall ICV lid on ICV body.

20. Install ICV body measuring band (Attachment 1, Figure B) approximately 1 inch below the locking ring. Ensure that the fastening device gap is aligned underneath the vent port with the top edge of the measuring band approximately parallel with bottom edge of locking ring. Tighten the fastener on band so that the band will not slip during measurement operations.

Instruction Steps Continued:

21. Install ICV lid measuring band (Attachment 1, Figure B) approximately 1 inch above the locking ring. Ensure that numbers are axially aligned with the ICV body measuring band, with the bottom edge of lid measuring band approximately parallel with the top edge of the locking ring. Tighten the fastener on the band so that the band will not slip during measuring operations.

22. Using the straight edge or level, draw a vertical line from the numbers on the ICV lid measuring bands across the ICV locking ring to the numbers on the ICV body band.

23. If not already in place, install vent port tool and vacuum system and evacuate vessel to 10 inches Hg and record gauge reading _____ (See Attachment 1, Figure C).

    Record Gauge SN_____Cal Due Date_____

    Complete_____Date_____

    QA Witness_____Date_____

24. Using the trammel, place one point in the indentation above the numbers on the ICV body band and with the other point, scribe a mark approximately 2 inches long that intersects with the vertical line on the lid band at locations 2, 4, 6, 8, 10, 12, 14, 16 & 18 (See Attachment 1, Figure D).

25. Release vacuum and disconnect the vacuum system.

26. Install air supply and pressurize vessel to 10 PSIG and record gauge pressure _____ (See Attachment 1, Figure E).

    Record Gauge SN_____Cal Due Date_____

    Complete_____Date_____

    QA Witness_____Date_____

27. Repeat Step #25. Ensure scribed marks are below those already made (See Attachment 1, Figure F).

28. Release pressure and disconnect air supply.

29. Using the optical comparator measure the distance between the 2 scribe marks and record to the nearest .005 inch and record (Attachment 1 shows scribe marks after completion of Steps 24 through 28). This Step will be performed by QA.

    2_____ 4_____ 6_____ 8_____ 10 _____
    12_____ 14_____ 16_____ 18_____

    (QA) Complete_____Date_____

NOTE: If measurement at any location is greater than .150 inch, notify TPME for resolution.

30. Remove ICV lid with measuring band in place and place on work stand. Rotate lock ring to locked position.

31. This completes ICV axial play.

TRUPACT-II WORK INSTRUCTION

Title: ICV/OCV Lid & Body Seal Flange Tab Widths	**Instruction No.: 4.9 Rev 5**
	TRUPACT-II SN:
	Page 1 Of 2

Applicable Drawings: 2077-500SNP, Sheets 7 and 8

SARP Requirements: Annual or after repairs. Chapter 8.0, Section 8.2.3.4, Para. 8.2.3.4.2.2

Special Tools Required:
ICV/OCV GO NO-GO Gauge (Attachment 1, Figure A and Figure B)
Calipers (Attachment 2, Figure C)

Spare Parts Required: N/A

Materials Required: N/A

Safety Requirements:
Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.

Pre-requisite Conditions:
Axial play measurements have been completed per WI-4-8, lid and body measuring bands are installed, locking rings are in locked position.

Figure A

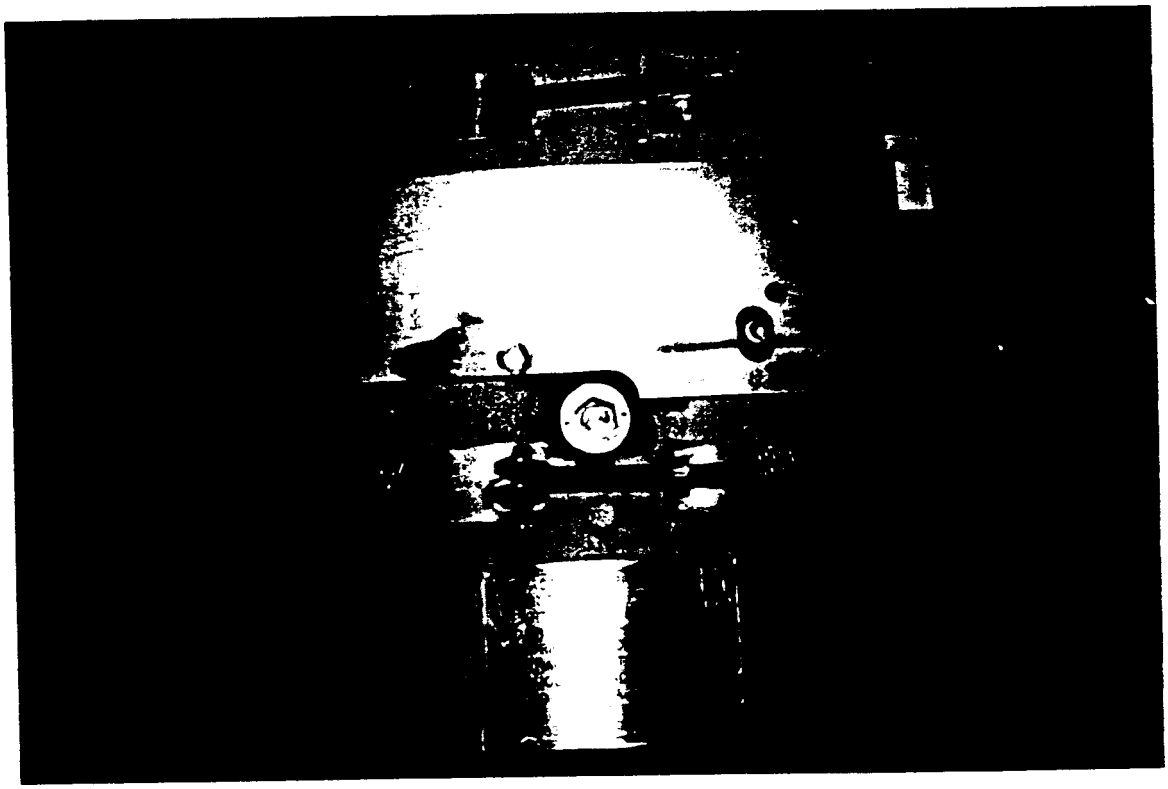


Figure B

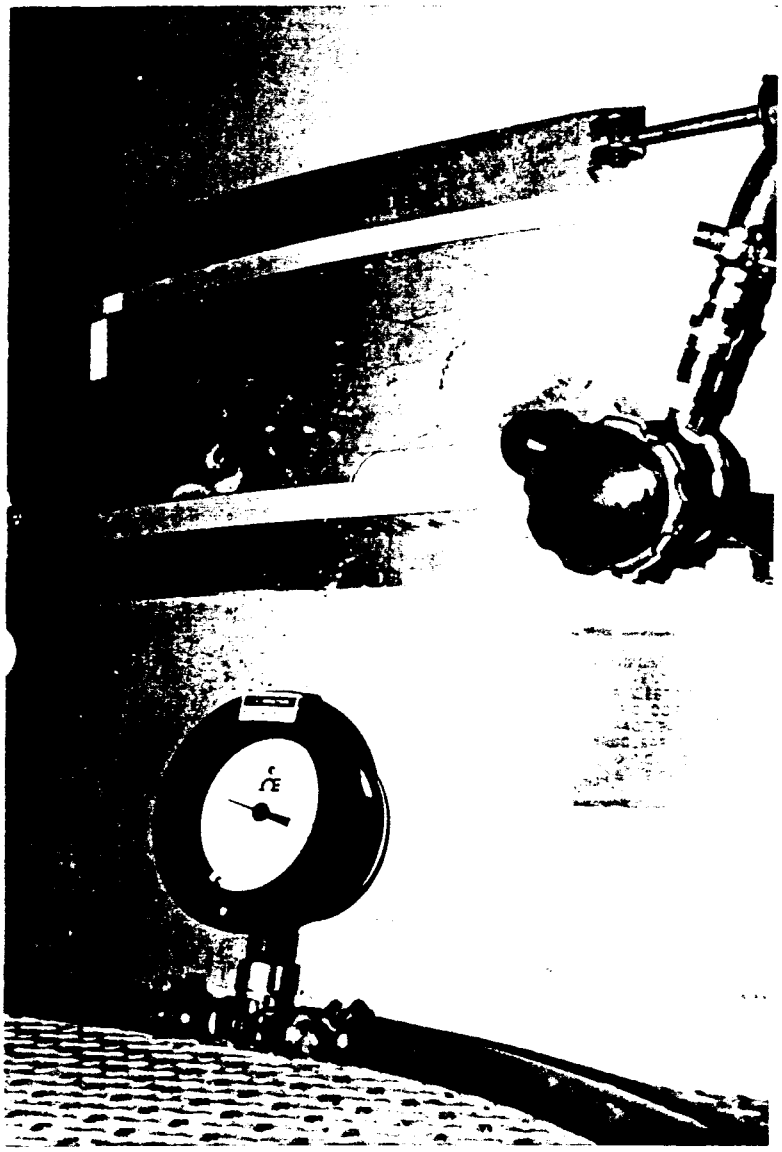


Figure C

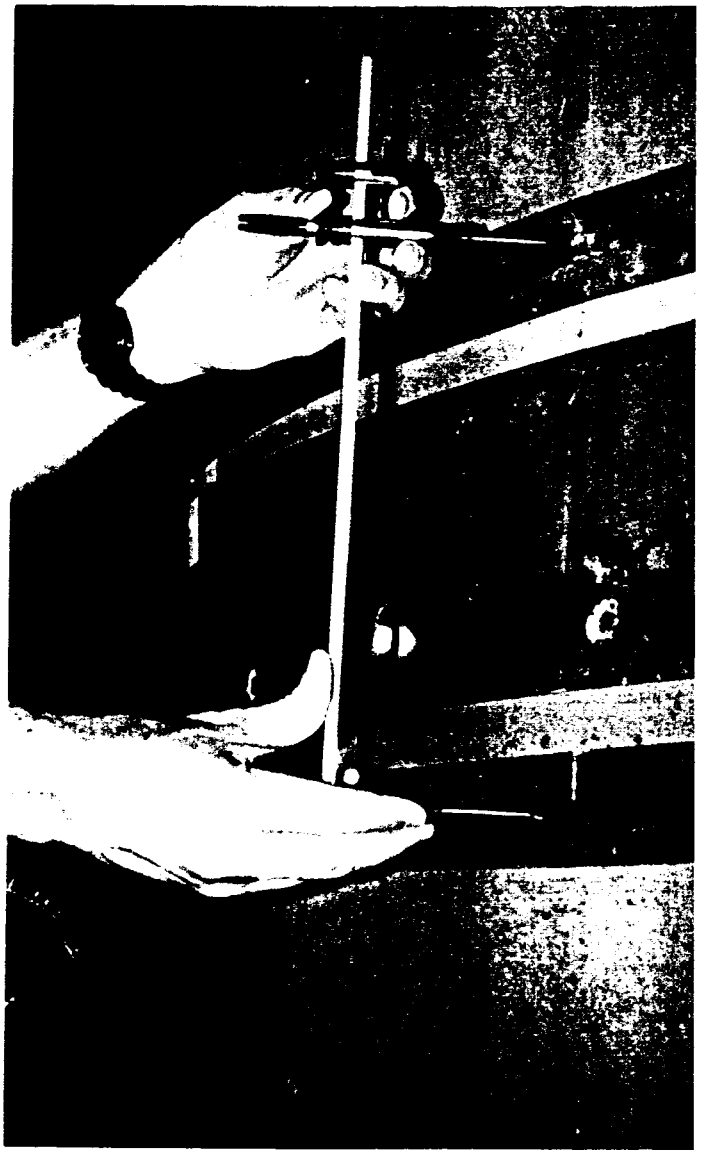


Figure D

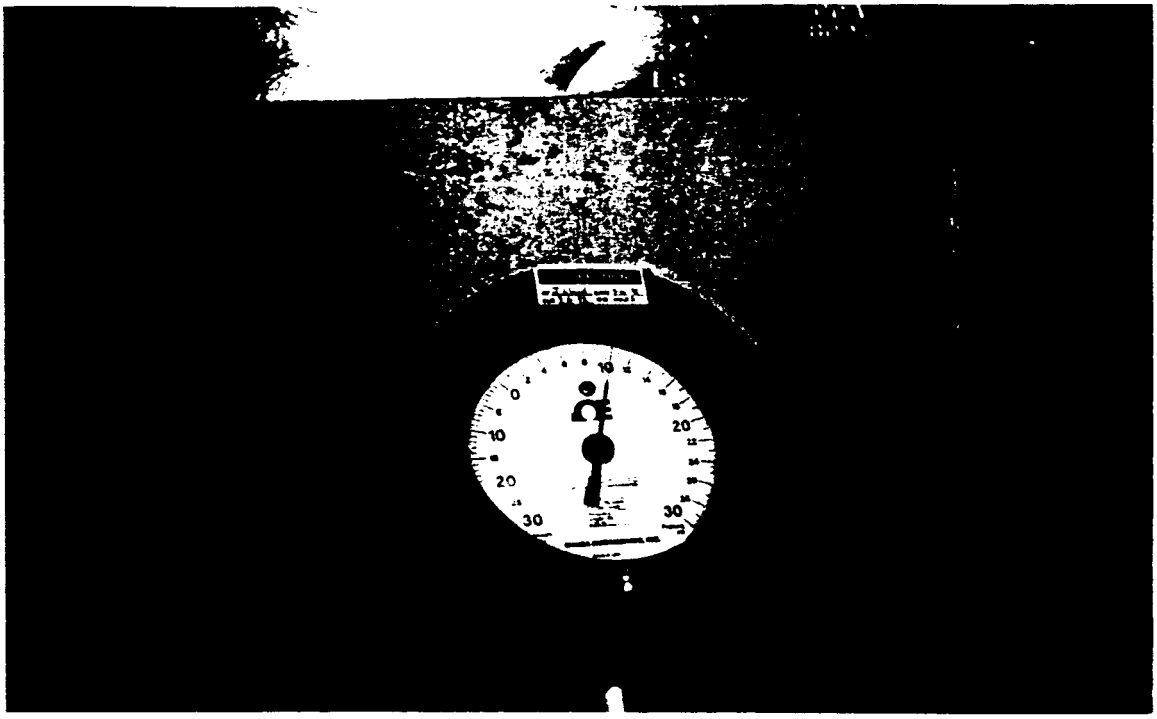


Figure E

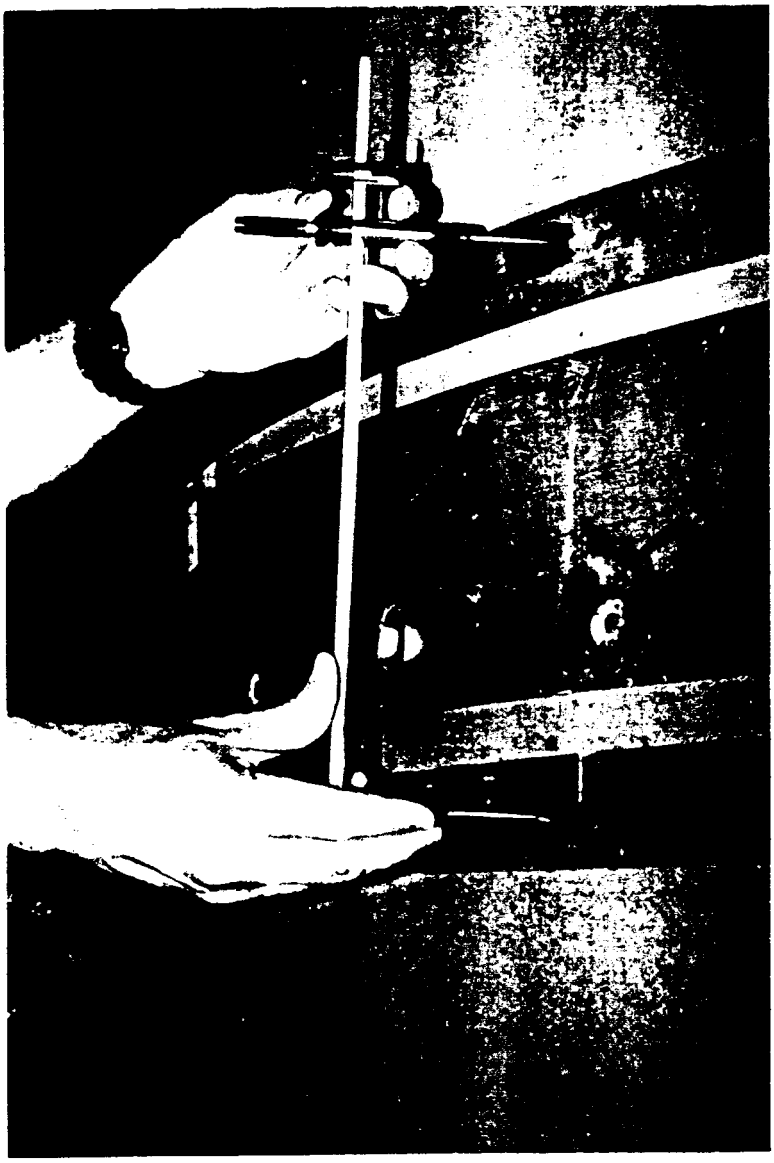


Figure F

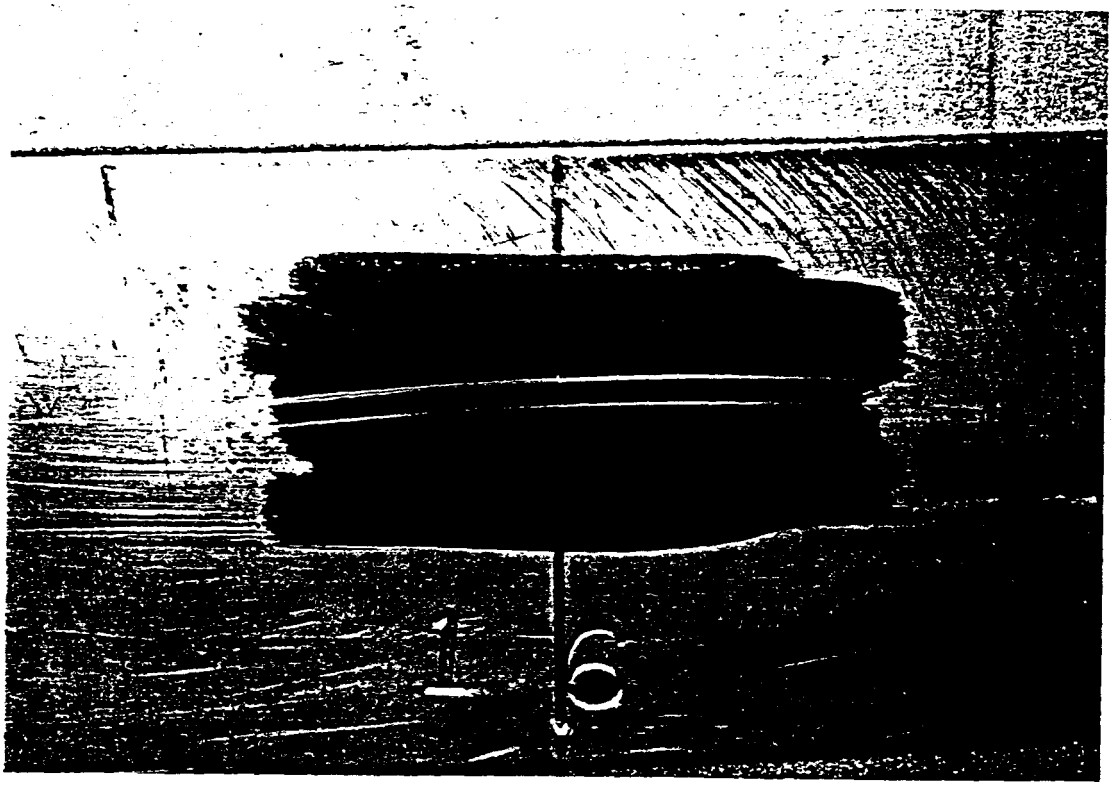


Figure G

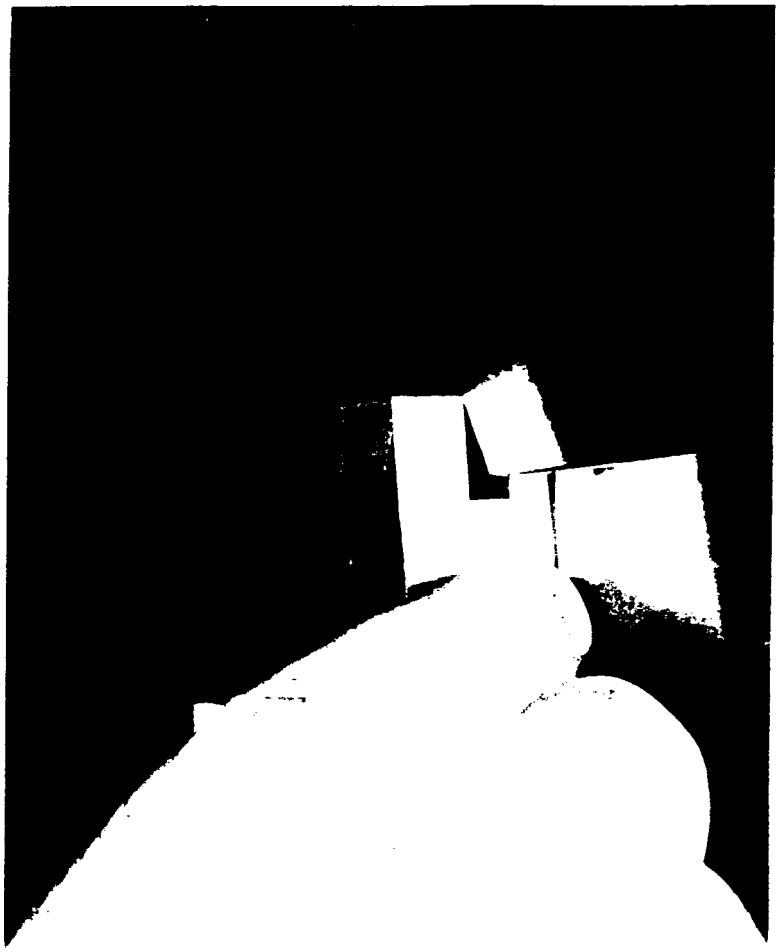


Figure A

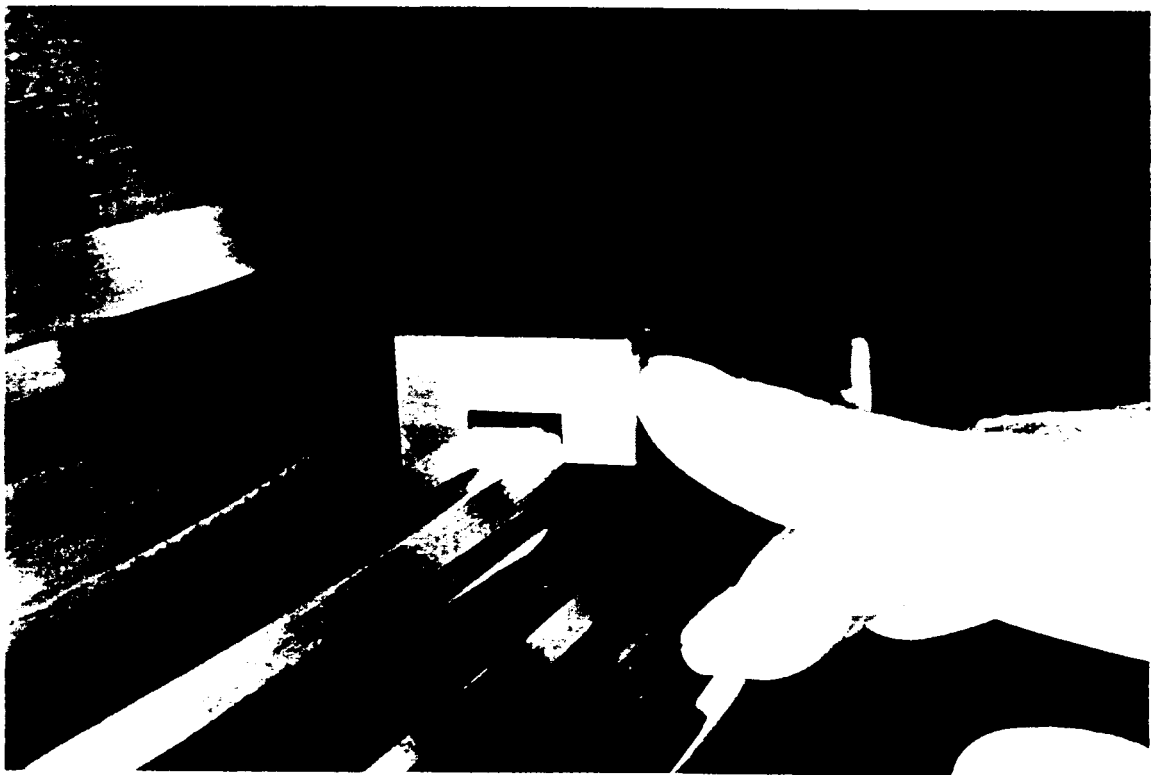


Figure B

TRUPACT-II WORK INSTRUCTION

Title: ICV/OCV Lid & Body Seal Flange Tab Widths	**Instruction No.:** 4.9
	Revision No. 4
	Page 1 **Of** 2

Applicable Drawings: 2077-500SNP, Sheets 7 and 8

SARP Requirements: Annual or after repairs. Chapter 8.0, Section 8.2.3.4, Para. 8.2.3.4.2.2

Special Tools Required:
ICV/OCV GO NO-GO Gauge (Attachment 1)

Spare Parts Required: N/A

Materials Required: N/A

Safety Requirements:

Standard Safety Requirements:

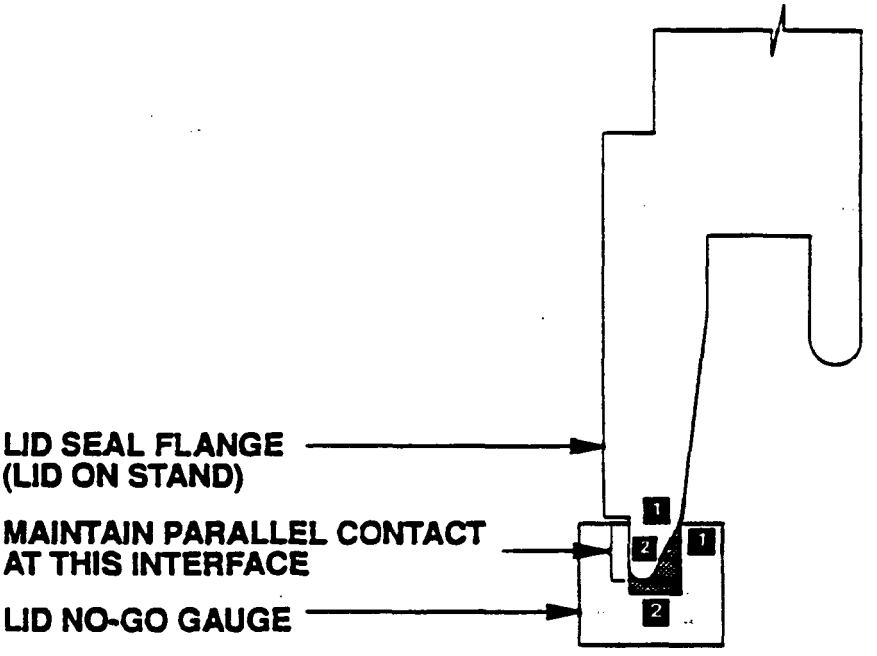
Safety glasses with side shields, use of chemicals requires side shields.

Hard toe shoes/boots required in all operating areas.

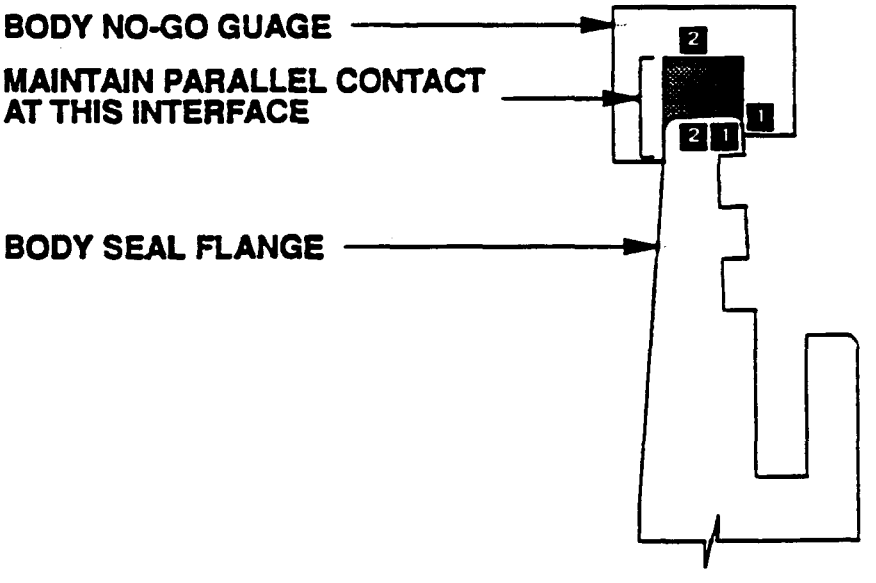
Hard hat required where possible injury from impact or falling objects.

Pre-requisite Conditions:
Axial play measurements have been completed per WI-4-8, lid and body measuring bands are installed, locking rings are in locked position.

METHOD OF MEASURING TAB WIDTHS



ICV/OCV UPPER SEAL FLANGE (LID) TAB WIDTH MEASUREMENT (FIGURE A)

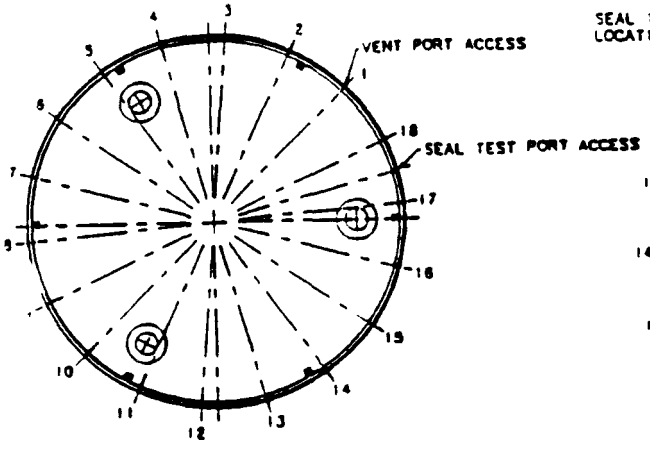


ICV/OCV LOWER SEAL FLANGE (BODY) TAB WIDTH MEASUREMENT (FIGURE B)

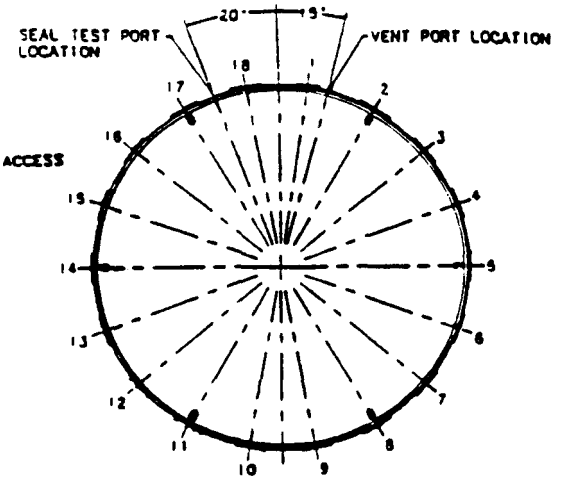
Note: Contact at location 1-1 and gap at location 2-2 is a No-Go condition indicating that the tab width is acceptable

Contact or a gap at location 1-1 and contact at location 2-2 is a Go condition indicating that the tab width is unacceptable

ICV Tab Width Measurement Locations



ICV Upper Lid



ICV Lower Body

ICV Upper Lid S.N. _____

Location	Accept
1.	Yes__ No __
2.	Yes__ No __
3.	Yes__ No __
4.	Yes__ No __
5.	Yes__ No __
6.	Yes__ No __
7.	Yes__ No __
8.	Yes__ No __
9.	Yes__ No __
10.	Yes__ No __
11.	Yes__ No __
12.	Yes__ No __
13.	Yes__ No __
14.	Yes__ No __
15.	Yes__ No __
16.	Yes__ No __
17.	Yes__ No __
18.	Yes__ No __

ICV Lower Body S.N. _____

Location	Accept
1.	Yes__ No __
2.	Yes__ No __
3.	Yes__ No __
4.	Yes__ No __
5.	Yes__ No __
6.	Yes__ No __
7.	Yes__ No __
8.	Yes__ No __
9.	Yes__ No __
10.	Yes__ No __
11.	Yes__ No __
12.	Yes__ No __
13.	Yes__ No __
14.	Yes__ No __
15.	Yes__ No __
16.	Yes__ No __
17.	Yes__ No __
18.	Yes__ No __

TRUPACT-II WORK INSTRUCTION

Instruction Steps:

NOTE: Gently set gauge down onto body seal flange. Do not slide gauge around flange or exert downward pressure. See Attachment 1, Figure A for Lid Tab and Figure B for Body Tab Measurements. See Attachment 2, Figure C, for caliper measurement for ICV lid tab measurement.

1. At each of the 18 locations on the lid and body (does not have to be exact - the numbers should be at the approximate center of the locking lugs) perform the tab width measurement per attachment one and record using Form 1. This Step will be performed by QA.

   Record Caliper SN_____ Cal Due Date_____

   (QA) Complete_____ Date_____

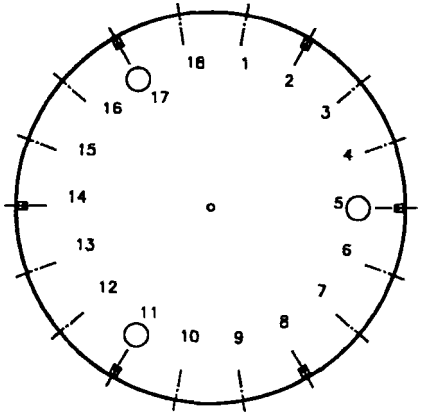
NOTE: If any location is found to be marginal using the no-go guage then use the measuring method in Attachment 2, Figure C.

Verification Requirements:
Work instructions complete, copy made for file, original attached to the maintenance record. Forward documentation to TPME. Per section 2.2 of the DOE/WIPP-93-1001.

Written By:	Don Roberts		**Date:** 9-7-94
Approved By:	Kathy A. Lacy	- QA	**Date:** 9-7-94
Approved By:	Don Roberts	- Engineering	**Date:** 9-7-94
Approved By:	Doug Kipley	- Safety	**Date:** 9-7-94
Approved By:	Wade Wegener	- Oper./Maint.	**Date:** 9-7-94
Approved By:			**Date:**

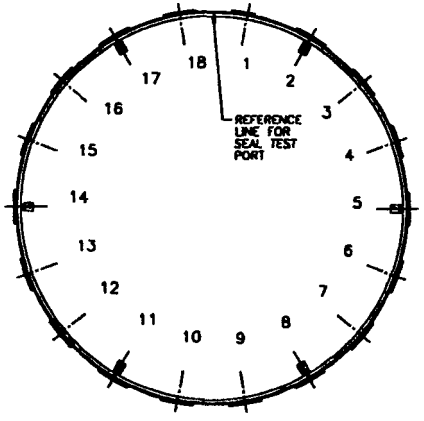
ICV/OCV LID AND BODY TAB WIDTHS
WORK INSTRUCTION 4-9 FORM 1

ICV Lid S/N:_____



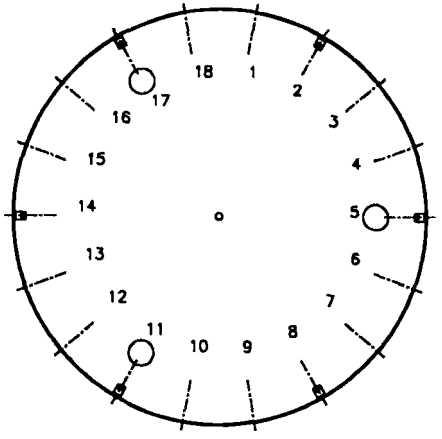
LOCATION	ACCEPT	
1.	___YES	____NO
2.	___YES	____NO
3.	___YES	____NO
4.	___YES	____NO
5.	___YES	____NO
6.	___YES	____NO
7.	___YES	____NO
8.	___YES	____NO
9.	___YES	____NO
10.	___YES	____NO
11.	___YES	____NO
12.	___YES	____NO
13.	___YES	____NO
14.	___YES	____NO
15.	___YES	____NO
16.	___YES	____NO
17.	___YES	____NO
18.	___YES	____NO

ICV Body S/N:_____



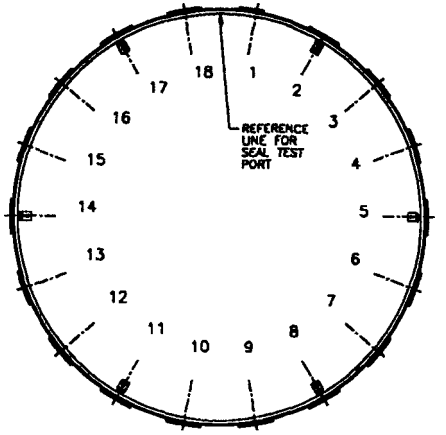
LOCATION	ACCEPT	
1.	___YES	____NO
2.	___YES	____NO
3.	___YES	____NO
4.	___YES	____NO
5.	___YES	____NO
6.	___YES	____NO
7.	___YES	____NO
8.	___YES	____NO
9.	___YES	____NO
10.	___YES	____NO
11.	___YES	____NO
12.	___YES	____NO
13.	___YES	____NO
14.	___YES	____NO
15.	___YES	____NO
16.	___YES	____NO
17.	___YES	____NO
18.	___YES	____NO

OCV Lid S/N:_____



LOCATION	ACCEPT	
1.	___YES	____NO
2.	___YES	____NO
3.	___YES	____NO
4.	___YES	____NO
5.	___YES	____NO
6.	___YES	____NO
7.	___YES	____NO
8.	___YES	____NO
9.	___YES	____NO
10.	___YES	____NO
11.	___YES	____NO
12.	___YES	____NO
13.	___YES	____NO
14.	___YES	____NO
15.	___YES	____NO
16.	___YES	____NO
17.	___YES	____NO
18.	___YES	____NO

OCV Body S/N:_____



LOCATION	ACCEPT	
1.	___YES	____NO
2.	___YES	____NO
3.	___YES	____NO
4.	___YES	____NO
5.	___YES	____NO
6.	___YES	____NO
7.	___YES	____NO
8.	___YES	____NO
9.	___YES	____NO
10.	___YES	____NO
11.	___YES	____NO
12.	___YES	____NO
13.	___YES	____NO
14.	___YES	____NO
15.	___YES	____NO
16.	___YES	____NO
17.	___YES	____NO
18.	___YES	____NO

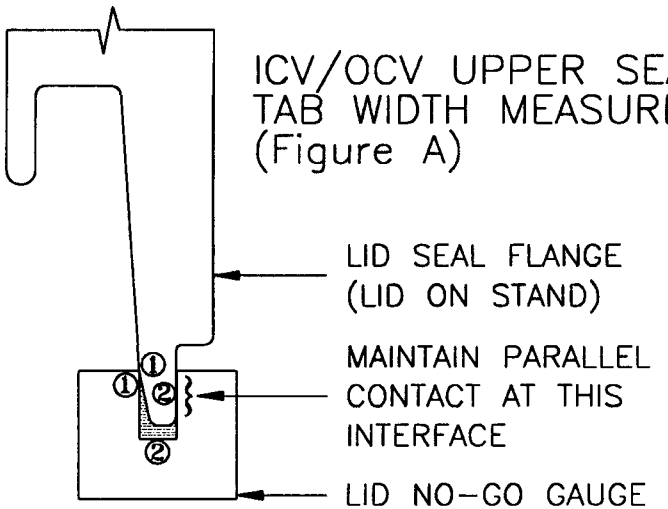
QA SIGNOFF:_____

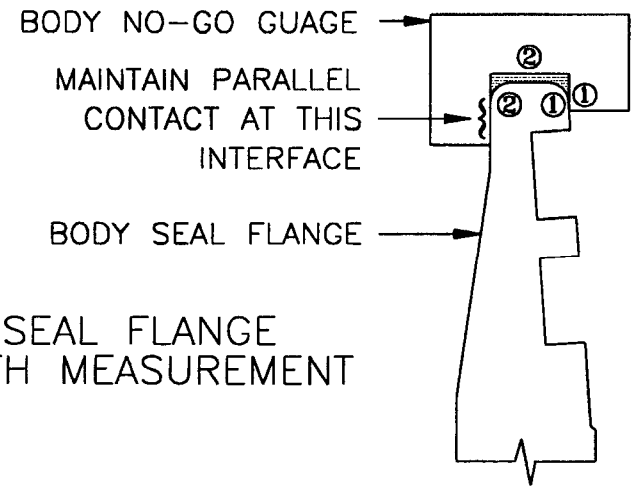
SIGNATURE

DATE:____/____/____

ATTACHMENT 1
TO WORK INSTRUCTION 4-9

ICV/OCV UPPER SEAL FLANGE (LID)
TAB WIDTH MEASUREMENT
(Figure A)

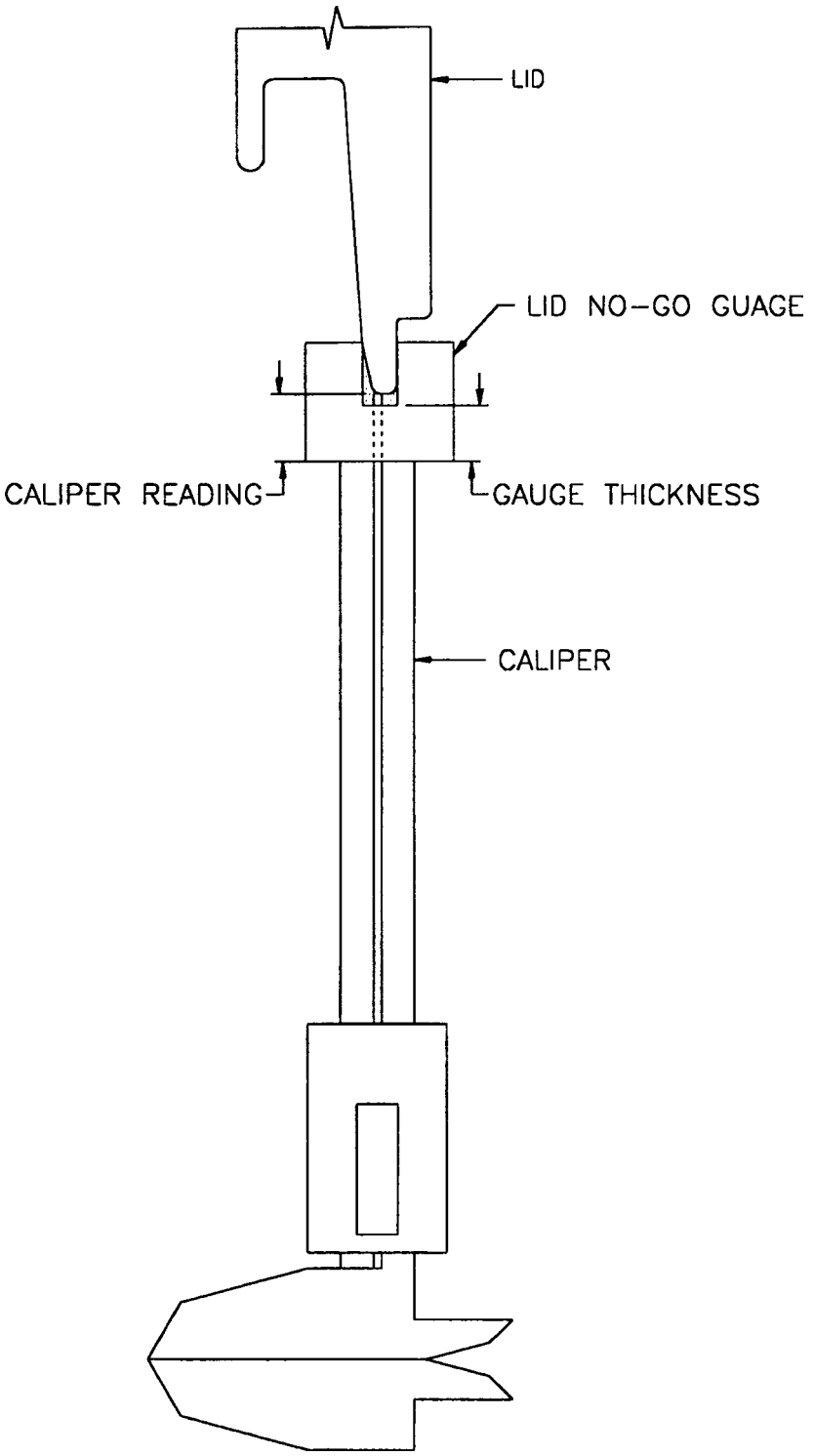




ICV/OCV LOWER SEAL FLANGE
(BODY) TAB WIDTH MEASUREMENT
(Figure B)

Note: Contact at location 1-1 and gap at location 2-2 is a No-Go condition indicating that the tab width is acceptable.
Contact or a gap at location 1-1 and contact at location 2-2 is a Go condition indicating that the tab width is unacceptable.

ATTACHMENT 2 TO
WORK INSTRUCTION 4-9



If a caliper reading is greater than guage thickness then tab width is acceptable. (Figure C)

TRUPACT-II WORK INSTRUCTION

Title: ICV/OCV Lid & Body Flange Groove Widths	**Instruction No.: 4.10 Rev 5**
	TRUPACT-II SN:
	Page 1 Of 3

Applicable Drawings: 2077-500SNP, Sheet 7

SARP Requirements: Annual or after repairs. Chapter 8.0, Section 8.2.3.4, Para. 8.2.3.4.2.1

Special Tools Required:

Plug Gauge (0.553)	Softener Blocks (Brass or Aluminum) 1/4" Thick X 1" Square Minimum
Plug Gauge (0.273)	
Precision Pin (.250)	
C-Clamp 4" Minimum	6" to 10" Adjustable Wrench

Spare Parts Required: N/A

Materials Required: N/A

Safety Requirements:

Standard Safety Requirements:

Safety glasses with side shields, use of chemicals requires side shields.

Hard toe shoes/boots required in all operating areas.

Hard hat required where possible injury from impact or falling objects could occur.

Pre-requisite Conditions:

Axial play measurements and tab width measurements have been made and ICV and OCA lids have been removed and are on stands.

Instruction Steps:

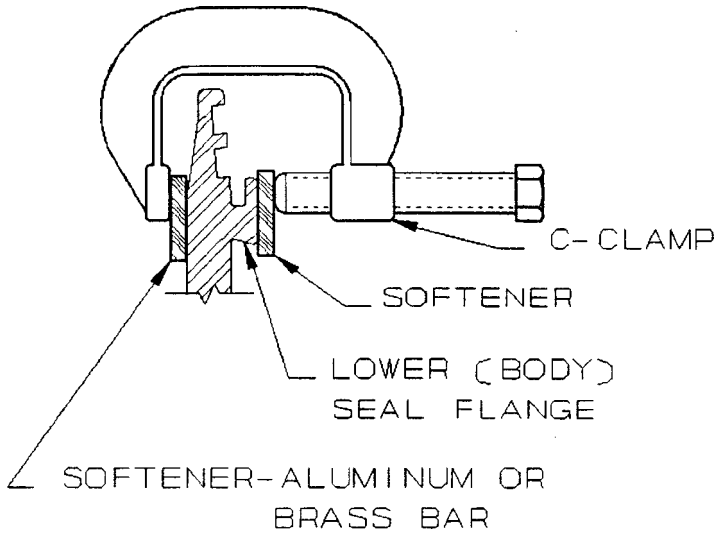
1. At each of the 18 locations (does not have to be exact) insert the plug gauge (0.553) for lids and (0.273) for body and pass pin (.250) under plug gauge as defined in attachment one and record using Form 1. See Attachment 1, Figure A for Lid Groove and Figure B for Body Groove Measurements. This Step will be performed by QA.

   (QA) Complete_____ Date_____

   NOTE: If any location is unacceptable, proceed to step 2.

2. Install Softeners and "C" Clamp as shown in the approximate center of the groove tab and tighten until the clamp will hold the softener in place. Complete_____ Date_____

3. Tighten "C" Clamp in 1/2 turns and measure groove per WI-10 until grooves are in conformance.
   Complete_____ Date_____



4. After grooves are in conformance, line through the no on original inspection report, date, then check the yes column.
   Complete_____ Date_____

Verification Requirements:

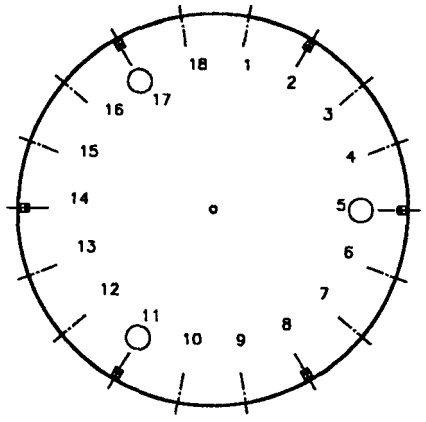
Work instructions complete, copy made for file, original attached to the maintenance record. Forward documentation to TPME. Per section 2.2 of te DOE/WIPP-93-1001.

TRUPACT-II WORK INSTRUCTION

Instruction No. 4.10	Continued	Page 3 Of 3
Written By: Don Roberts		Date: 9-7-94
Approved By: Keith A. Lang	- QA	Date: 9-7-94
Approved By: Don Roberts	- Engineering	Date: 9-7-94
Approved By: Craig Ridley	- Safety	Date: 9.7.94
Approved By: Wade Wagner	- Oper./Maint.	Date: 9-7-94
Approved By:		Date:

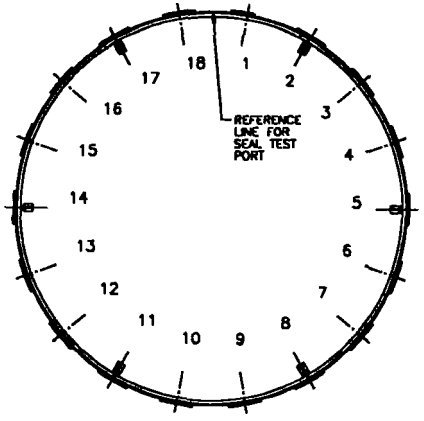
ICV/OCV LID AND BODY FLANGE GROOVE WIDTHS
WORK INSTRUCTION 4-10 FORM 1

ICV Lid S/N:_____



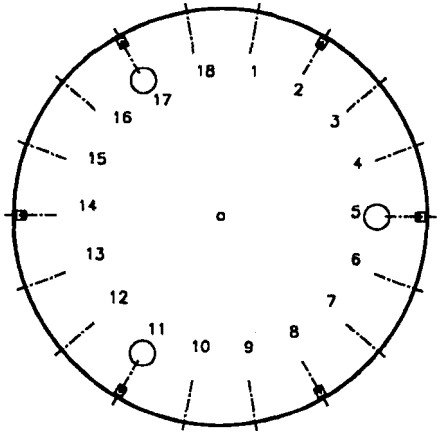
LOCATION	ACCEPT	
1.	___YES	____NO
2.	___YES	____NO
3.	___YES	____NO
4.	___YES	____NO
5.	___YES	____NO
6.	___YES	____NO
7.	___YES	____NO
8.	___YES	____NO
9.	___YES	____NO
10.	___YES	____NO
11.	___YES	____NO
12.	___YES	____NO
13.	___YES	____NO
14.	___YES	____NO
15.	___YES	____NO
16.	___YES	____NO
17.	___YES	____NO
18.	___YES	____NO

ICV Body S/N:_____



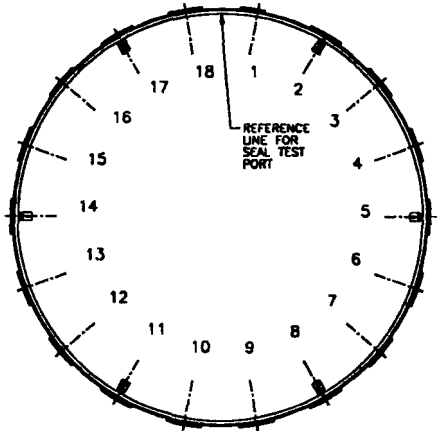
LOCATION	ACCEPT	
1.	___YES	____NO
2.	___YES	____NO
3.	___YES	____NO
4.	___YES	____NO
5.	___YES	____NO
6.	___YES	____NO
7.	___YES	____NO
8.	___YES	____NO
9.	___YES	____NO
10.	___YES	____NO
11.	___YES	____NO
12.	___YES	____NO
13.	___YES	____NO
14.	___YES	____NO
15.	___YES	____NO
16.	___YES	____NO
17.	___YES	____NO
18.	___YES	____NO

OCV Lid S/N:_____



LOCATION	ACCEPT	
1.	___YES	____NO
2.	___YES	____NO
3.	___YES	____NO
4.	___YES	____NO
5.	___YES	____NO
6.	___YES	____NO
7.	___YES	____NO
8.	___YES	____NO
9.	___YES	____NO
10.	___YES	____NO
11.	___YES	____NO
12.	___YES	____NO
13.	___YES	____NO
14.	___YES	____NO
15.	___YES	____NO
16.	___YES	____NO
17.	___YES	____NO
18.	___YES	____NO

OCV Body S/N:_____



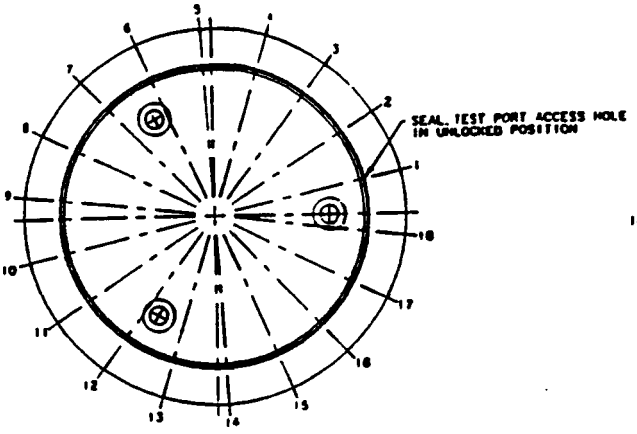
LOCATION	ACCEPT	
1.	___YES	____NO
2.	___YES	____NO
3.	___YES	____NO
4.	___YES	____NO
5.	___YES	____NO
6.	___YES	____NO
7.	___YES	____NO
8.	___YES	____NO
9.	___YES	____NO
10.	___YES	____NO
11.	___YES	____NO
12.	___YES	____NO
13.	___YES	____NO
14.	___YES	____NO
15.	___YES	____NO
16.	___YES	____NO
17.	___YES	____NO
18.	___YES	____NO

QA SIGNOFF:_____

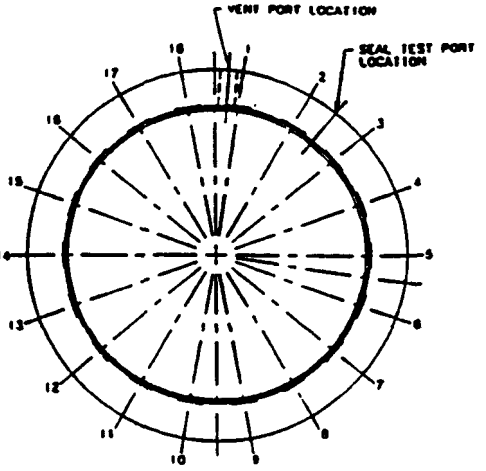
SIGNATURE

DATE:____/____/____

OCV Groove Width Measurement Locations



OCV Upper Lid



OCV Lower Body

OCV Upper Lid S.N. _____

Location	Accept
1.	Yes___ No ___
2.	Yes___ No ___
3.	Yes___ No ___
4.	Yes___ No ___
5.	Yes___ No ___
6.	Yes___ No ___
7.	Yes___ No ___
8.	Yes___ No ___
9.	Yes___ No ___
10.	Yes___ No ___
11.	Yes___ No ___
12.	Yes___ No ___
13.	Yes___ No ___
14.	Yes___ No ___
15.	Yes___ No ___
16.	Yes___ No ___
17.	Yes___ No ___
18.	Yes___ No ___

OCV Lower Body S.N._____

Location	Accept
1.	Yes___ No ___
2.	Yes___ No ___
3.	Yes___ No ___
4.	Yes___ No ___
5.	Yes___ No ___
6.	Yes___ No ___
7.	Yes___ No ___
8.	Yes___ No ___
9.	Yes___ No ___
10.	Yes___ No ___
11.	Yes___ No ___
12.	Yes___ No ___
13.	Yes___ No ___
14.	Yes___ No ___
15.	Yes___ No ___
16.	Yes___ No ___
17.	Yes___ No ___
18.	Yes___ No ___

Figure A

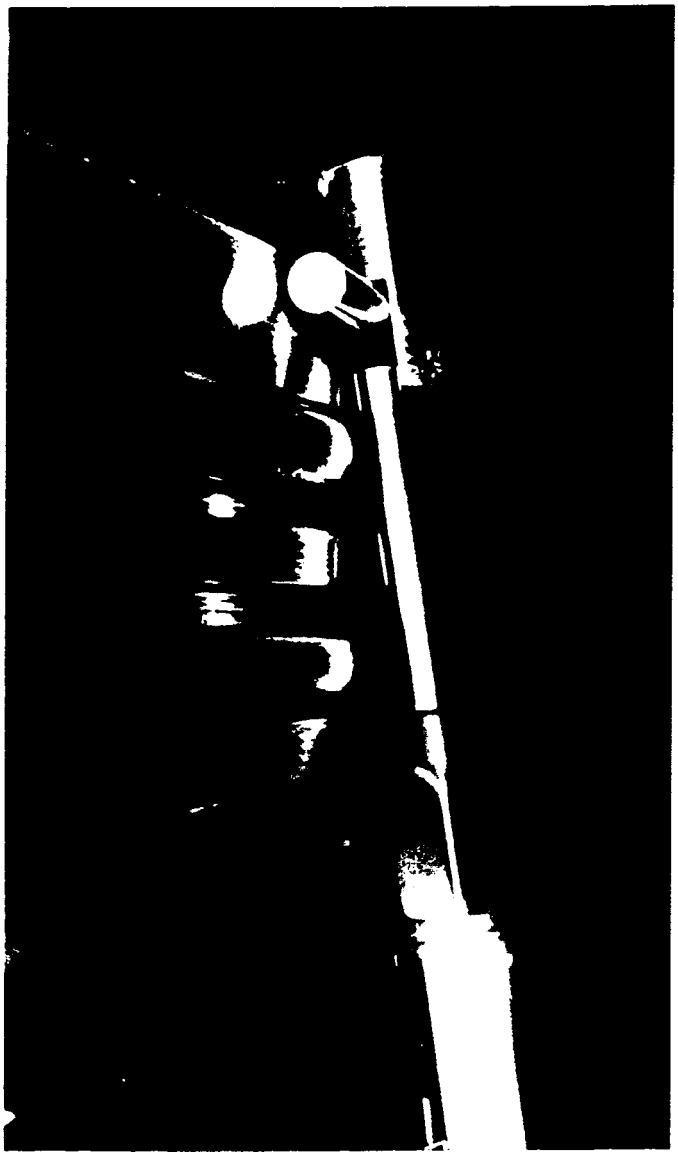


Figure B

TRUPACT-II WORK INSTRUCTION

Title: ICV/OCV Upper Main O-Ring Seal Groove Depth Measurement & Surface Finish	**Instruction No.: 4.11 Rev 5**
	TRUPACT-II SN:
	Page 1 Of 3

Applicable Drawings: 2077-500SNP, Sheet 7

SARP Requirements: Annual or after repairs. Chapter 8.0, Section 8.2.3.4, Para. 8.2.3.4.2.4

Special Tools Required:
Surface Finish Comparator Plate
Digital Depth Micrometer
Surftest 211 (finish tester) or equivalent

Spare Parts Required: N/A

Materials Required:
Solvent (Re-agent Alcohol) or cleaning agent containing no more than 250 PPM Chloride
Lint-Free Rags

Safety Requirements:
Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal Protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS.
Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.

Pre-requisite Conditions:
Axial play, flange, tab width and body flange widths have been taken and lids are on stands.

Instruction Steps:

1. If not already done, remove the ICV/OCV upper and lower main O-Rings.

NOTE: If O-Rings are being changed per annual requirement, discard. If not, clean thoroughly and place in plastic bag. Label the bag with "Upper Main, Lower Main O-Rings For Unit No. _____".

2. Using solvent and lint-free rags, thoroughly clean the grooves.

NOTE: Measurement applies to upper seal grooves only. Steps 3, 4 and 5 will be performed by QA. Also the associated Forms shall be signed by QA.

3. At the existing marks 2, 4, 6, 8, 10, 12, 14, 16 & 18 (does not have to be exact) insert the depth micrometer with the long side of the base up, maintain base flush, take reading and record using Form 1. If at any location reading is not between 0.253 inch and 0.247 inch, notify TPME (See Attachment 1, Figure A).
Record Micrometer SN_____Cal Due Date_____

4. Using the Comparator Plate or Surftest 211 instrument, check surface finish of the bottom of both upper and lower O-Ring grooves at locations 2, 4, 6, 8, 10, 12, 14, 16 & 18 and record using Form 2 (See Attachment 1, Figure B).

5. Using the Comparator Plate or Surftest 211 instrument, check surface finish of the seal flange surfaces of ICV and OCV lids at locations 2, 4, 6, 8, 10, 12, 14, 16 & 18 and record using Form 3 (See Attachment 1, Figure B).

NOTE: If surface finish at any location in either Step #4 or #5 exceed 125 micro inches, notify TPME.

NOTE: After completion of this instruction, remove measuring bands.

TRUPACT-II WORK INSTRUCTION

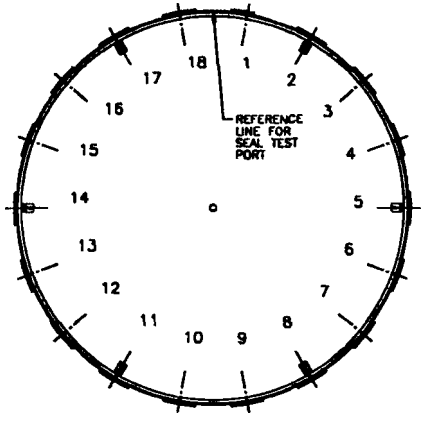
Instruction No. 4.11	Continued	Page 3 Of 3

Verification Requirements:
Work instructions complete, copy made for file, original attached to the maintenance record. Forward docmentation to TPME. Per section 2.2 of the DOE/WIPP-93-1001.

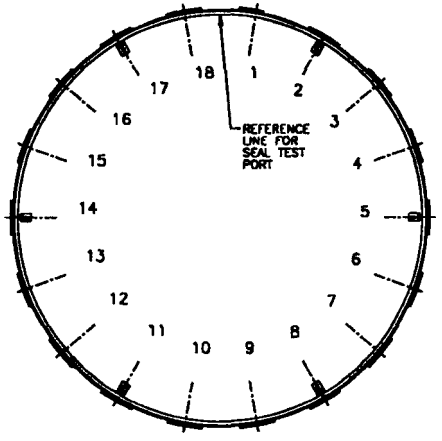
Written By: Don Roberts		**Date:** 9-7-94
Approved By: Keith A. Lewis	- QA	**Date:** 9-7-94
Approved By: Don Roberts	- Engineering	**Date:** 9.7.94
Approved By: Doug Tripley	- Safety	**Date:** 9.7.94
Approved By: Wade Wagenman	- Oper./Maint.	**Date:** 9-7-94
Approved By:		**Date:**

ICV/OCV UPPER MAIN O-RING SEAL GROOVE DEPTH MEASUREMENT
WORK INSTRUCTION 4-11 FORM 1

ICV Body S/N:_____



OCV Body S/N:_____



ICV UPPER MAIN O-RING LOCATION	ACCEPT		OCV UPPER MAIN O-RING LOCATION	ACCEPT	
2.	___YES	____NO	2.	___YES	____NO
4.	___YES	____NO	4.	___YES	____NO
6.	___YES	____NO	6.	___YES	____NO
8.	___YES	____NO	8.	___YES	____NO
10.	___YES	____NO	10.	___YES	____NO
12.	___YES	____NO	12.	___YES	____NO
14.	___YES	____NO	14.	___YES	____NO
16.	___YES	____NO	16.	___YES	____NO
18.	___YES	____NO	18.	___YES	____NO

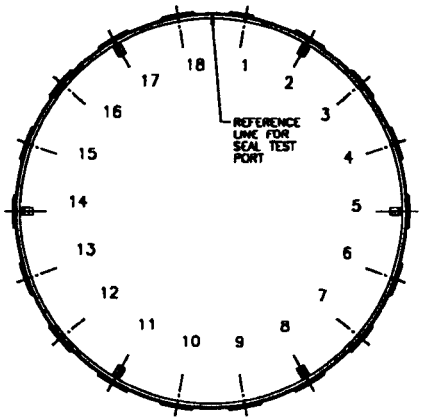
NOTE: Groove Depth Is 0.250 Inches ± 0.003 Inches (0.247 to 0.253 Inches) If Any Location is Not In Tolerance, Contact TPME.

QA SIGNOFF:_____ DATE:____/____/____

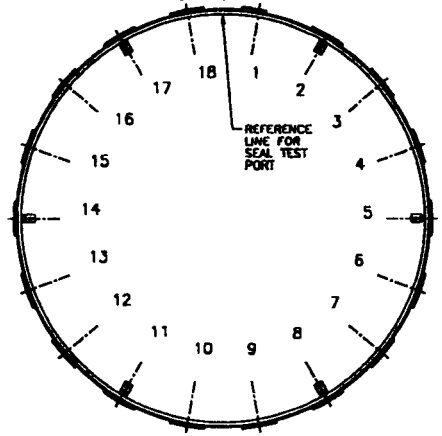
SIGNATURE

ICV/OCV UPPER/LOWER O-RING GROOVE SURFACE FINISH
WORK INSTRUCTION 4-11 FORM 2

ICV Body S/N:_____



OCV Body S/N:_____



ICV UPPER MAIN FINISH LOCATION	ACCEPT	ICV LOWER MAIN FINISH LOCATION	ACCEPT	OCV UPPER MAIN FINISH LOCATION	ACCEPT	OCV LOWER MAIN FINISH LOCATION	ACCEPT
2.	__YES ___NO	2.	__YES ___NO	2.	__YES ___NO	2.	__YES ___NO
4.	__YES ___NO	4.	__YES ___NO	4.	__YES ___NO	4.	__YES ___NO
6.	__YES ___NO	6.	__YES ___NO	6.	__YES ___NO	6.	__YES ___NO
8.	__YES ___NO	8.	__YES ___NO	8.	__YES ___NO	8.	__YES ___NO
10.	__YES ___NO	10.	__YES ___NO	10.	__YES ___NO	10.	__YES ___NO
12.	__YES ___NO	12.	__YES ___NO	12.	__YES ___NO	12.	__YES ___NO
14.	__YES ___NO	14.	__YES ___NO	14.	__YES ___NO	14.	__YES ___NO
16.	__YES ___NO	16.	__YES ___NO	16.	__YES ___NO	16.	__YES ___NO
18.	__YES ___NO	18.	__YES ___NO	18.	__YES ___NO	18.	__YES ___NO

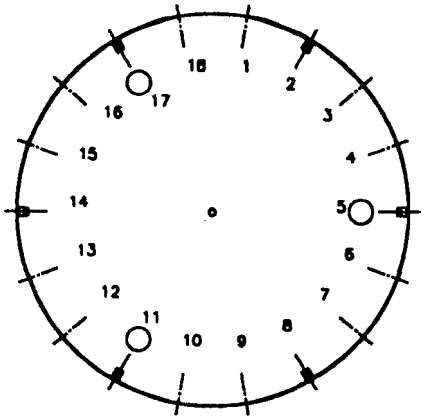
NOTE: If Surface Finish at any Location Exceeds 125 Micro Inches, Notify TPME.

QA SIGNOFF:_____ DATE:_____/_____/_____

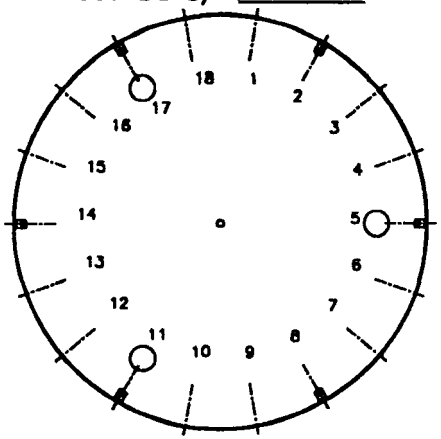
SIGNATURE

ICV/OCV LID SEAL FLANGE FINISH
WORK INSTRUCTION 4-11 FORM 3

ICV Lid S/N:_____



OCV Lid S/N:_____



ICV LID SEAL FLANGE LOCATION	ACCEPT		OCV UPPER SEAL FLANGE LOCATION	ACCEPT	
2.	__YES	___NO	2.	__YES	___NO
4.	__YES	___NO	4.	__YES	___NO
6.	__YES	___NO	6.	__YES	___NO
8.	__YES	___NO	8.	__YES	___NO
10.	__YES	___NO	10.	__YES	___NO
12.	__YES	___NO	12.	__YES	___NO
14.	__YES	___NO	14.	__YES	___NO
16.	__YES	___NO	16.	__YES	___NO
18.	__YES	___NO	18.	__YES	___NO

NOTE: If Surface Finish at any Location Exceeds 125 Micro Inches, Notify TPME.

QA SIGNOFF:_____ DATE:____/____/____

SIGNATURE

ICV UPPER/LOWER MAIN O-RING GROOVE SURFACE FINISH

Work Instruction No. 4.11

FORM 2

TRUPACT-II UNIT No. _____

Upper Main Surface Finish		Lower Main Surface Finish	
Location	/ Reading	Location	/ Reading
2	_____ inches	2	_____ inches
4	_____ inches	4	_____ inches
6	_____ inches	6	_____ inches
8	_____ inches	8	_____ inches
10	_____ inches	10	_____ inches
12	_____ inches	12	_____ inches
14	_____ inches	14	_____ inches
16	_____ inches	16	_____ inches
18	_____ inches	18	_____ inches

NOTE: If surface finish at any location exceeds 125 micro inches, notify **TPME.**

QA SIGN OFF _____/_____/_____

Signature Initials Date

OCV LID SEAL FLANGE SURFACE FINISH

Work Instruction No. 4.11

FORM 5

TRUPACT-II Unit No. _____

Seal Flange Surface Finish

Location	/	Reading
2		_____ inches
4		_____ inches
6		_____ inches
8		_____ inches
10		_____ inches
12		_____ inches
14		_____ inches
16		_____ inches
18		_____ inches

NOTE: If surface finish at any location exceeds 125 micro inches, notify **TPME.**

QA SIGN OFF _____ / _____ / _____

Signature Initials Date

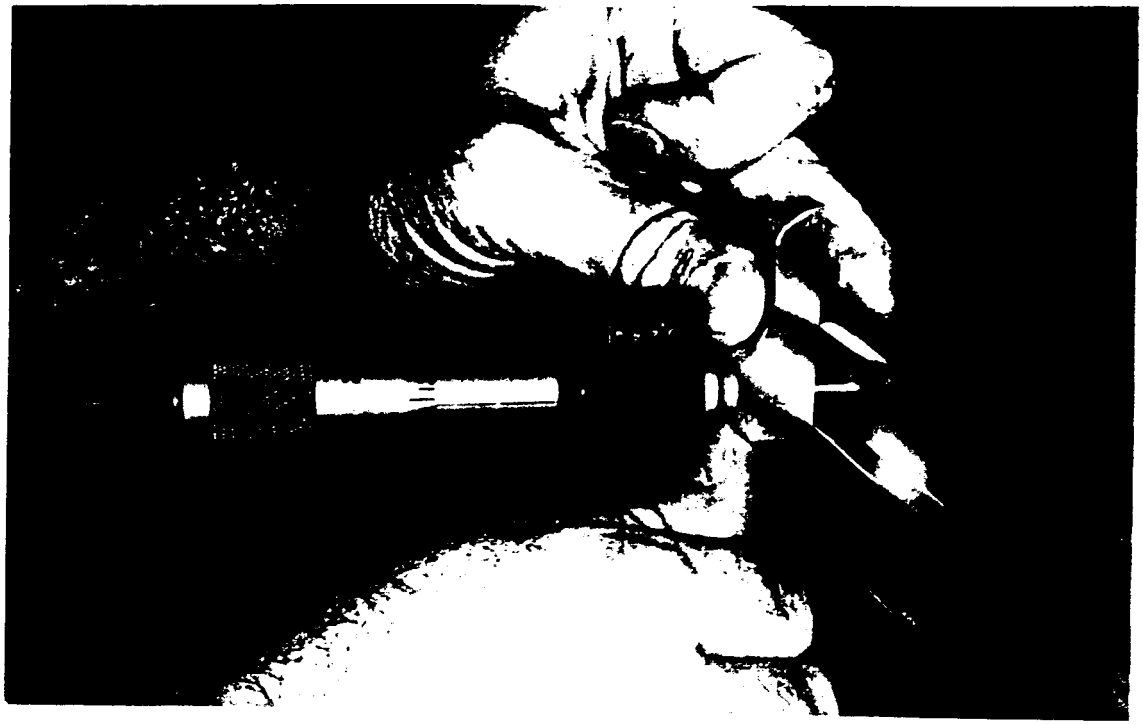


Figure A

Figure B

TRUPACT-II WORK INSTRUCTION

Title: Minor Repair of Vessel O-Ring Sealing Surface ICV/OCV, Minor Repair of Wall Surface ICV/OCA (Exposed Surfaces)	**Instruction No.: 4.12** **Revision No. 4** **Page 1 Of 3**

Applicable Drawings: 2077-500SNP, Sheet 7

SARP Requirements: As required, Chapter 8.0, Section 8.2.3.4, Para 8.2.3.4.2.4

Special Tools Required:

Lifting Equipment
Mass Spectrometer Leak Detector
Lid Stands
ICV/OCV Vent Port Pressure Relief Tools
ICV/OCV Leak Check Tools
Ultrasonic Thickness Gauge

Spare Parts Required: N/A

Materials Required:

400 - 600 Grit Emery Cloth (do not use emery cloth that has been used on dissimilar metal)
Solvent (reagent alcohol) or cleaning agent containing no more than 250 ppm chloride ion
Lint Free Rags
Helium

Safety Requirements:

Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal Protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS.

Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects.

Pre-requisite Conditions:

1. ICV/OCA lid(s) must be removed for seal surfaces.
2. This work instruction is applicable to operational replacement requirements or preventive/periodic maintenance requirements.

TRUPACT-II WORK INSTRUCTION

Title: Minor Repair of Vessel O-Ring Sealing Surface ICV/OCV, Minor Repair of Wall Surface ICV/OCA (Exposed Surfaces)	**Instruction No.: 4.12 Rev 5** **TRUPACT-II SN:** **Page 1 Of 3**

Applicable Drawings: 2077-500SNP, Sheet 7

SARP Requirements: As required, Chapter 8.0, Section 8.2.3.4, Para 8.2.3.4.2.4

Special Tools Required:

Lifting Equipment
Mass Spectrometer Leak Detector
Lid Stands
ICV/OCV Vent Port Pressure Relief Tools
ICV/OCV Leak Check Tools
Ultrasonic Thickness Gauge

Spare Parts Required: N/A

Materials Required:

400 - 600 Grit Emery Cloth (do not use emery cloth that has been used on dissimilar metal)
Solvent (reagent alcohol) or cleaning agent containing no more than 250 ppm chloride ion
Lint Free Rags
Helium

Safety Requirements:

Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal Protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS.

Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.

Pre-requisite Conditions:

1. ICV/OCA lid(s) must be removed for seal surfaces.
2. This work instruction is applicable to operational replacement requirements or preventive/periodic maintenance requirements.

Instruction Steps:

Indicate [✓] the applicable component(s) to be repaired. All others can be checked as "Not Applicable" (N/A).

[ ] ICV O-Ring Sealing Surface
[ ] OCV O-Ring Sealing Surface

1. Using solvent and lint free rags, thoroughly clean area to be repaired.
   Complete_____ Date_____

2. Using emery cloth, polish affected area until smooth. (Polish strokes should be limited to strokes that are parallel to machine marks.)
   Complete_____ Date_____

3. Clean repaired area to remove any residue.
   Complete_____ Date_____

4. Perform maintenance verification leak test.
   Complete_____ Date_____

[ ] ICV Exposed Surfaces
[ ] OCA Exposed Surfaces

Note: While performing step 2., take UT measurements to ensure acceptable wall thickness tolerance.

5. Using Attachment 1., record UT measurements prior to and after performing step 2.
   Complete_____ Date_____

6. Perform Steps 1 through 3 above.
   Complete_____ Date_____
   Record UT Instrument SN_____Cal Due Date_____

TRUPACT-II WORK INSTRUCTION

Instruction No. 4.12	Continued	Page 3 Of 3

Verification Requirements:
Work instructions complete, copy made for file, original attached to maintenance record. Leak test data sheets complete and attached to maintenance record. Forward documentation to TPME. Per section 2.2 of the DOE/WIPP-93-1001.

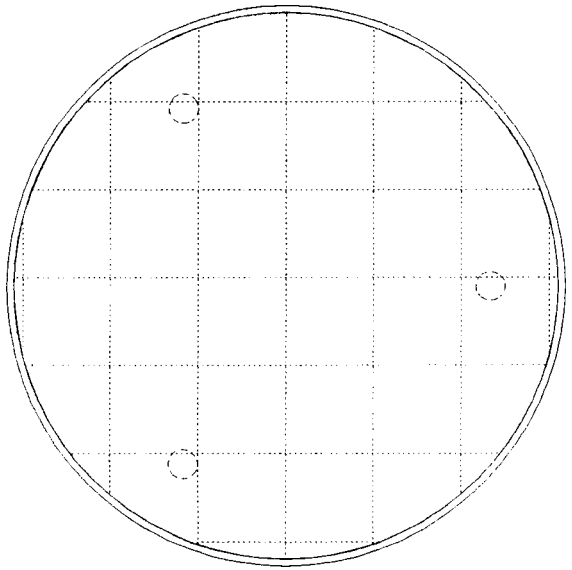
Written By:	Don Roberts		**Date:** 9-7-94
Approved By:	[signature]	- QA	**Date:** 9-7-94
Approved By:	Don Roberts	- Engineering	**Date:** 9-7-94
Approved By:	Doug Ripley	- Safety	**Date:** 9.7.94
Approved By:	Wade Wegener	- Oper./Maint.	**Date:** 9-7-94
Approved By:			**Date:**

ATTACHMENT 1. TO
WORK INSTRUCTION 4.12

ULTRASONIC TEST (UT) MEASUREMENTS

TRUPACT-II ICV No. _ _ _

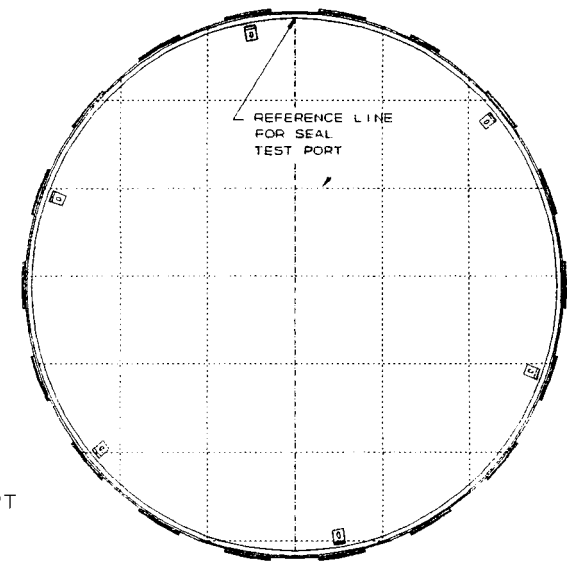
ICV LID



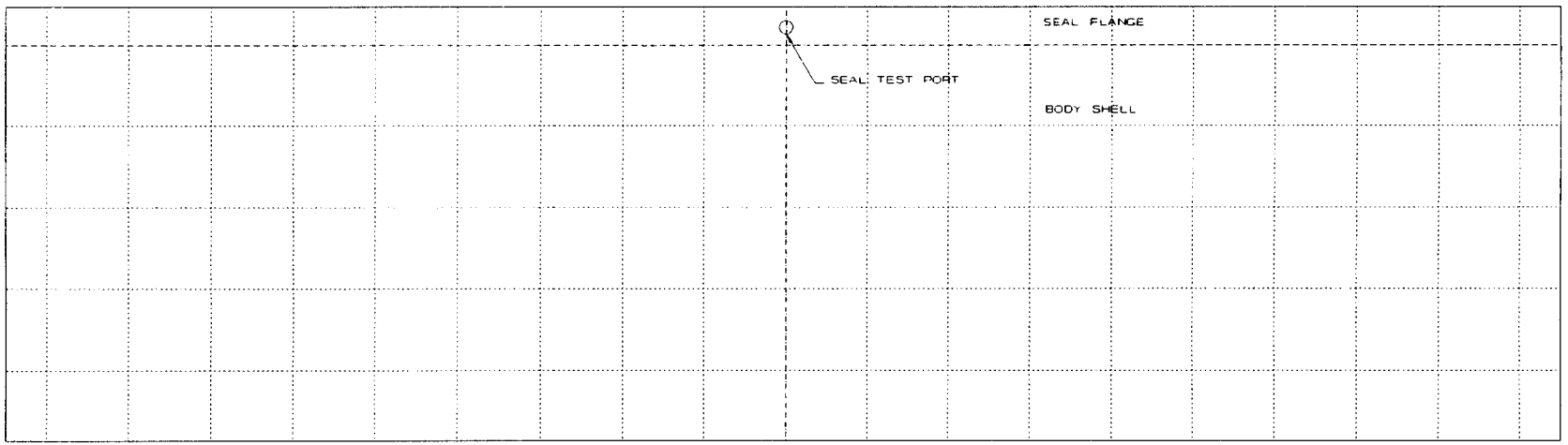
IND. No *	UT THICKNESS BEFORE	UT THICKNESS AFTER
1.	_._____In.	_._____In
2.	_._____In.	_._____In.
3.	_._____In	_._____In.
4.	_._____In	_._____In.
5	_._____In	_._____In.

* NOTE: SHOW LOCATION(S) OF INDICATION(S) ON FIGURES DOTTED LINES ARE 12" APART

ICV LOWER HEAD



ICV BODY



W14-12-1

TRUPACT-II WORK INSTRUCTION

Title: Replacement/Inspection/Measurements ICV Honeycomb Spacers	**Instruction No.: 4.13 Rev 5**
	TRUPACT-II SN:
	Page 1 Of 6

Applicable Drawings: 2077-500SNP, TRUPACT-II SARP Drawing, Sheets 3 and 6
2077-1120, Quality Level and Spare Parts List TRUPACT-II

SARP Requirements: There are no SARP requirements for this work instruction. The spacers are to be replaced if damaged and must be removed prior to the performance of the liquid penetrant requirements of Chapter 8.0, Para. 8.2.1.1.

Special Tools Required:

2 Each ICV Lid Stands
ICV Work Platform
OCA Work Platform
OCA Lid Stand
Lower Spacer Lifting Slings
8 Foot Aluminum Step Ladder
ACGLF Lift Fixture
Crane
Torque Wrench 22-28 inch pounds with Flat Blade 3/8 inch tip with Screwdriver Socket
8 Foot Aluminum Level
24 Inch Scale

Spare Parts Required:

Upper Honeycomb Spacer (PN 2077-053A1)
Lower Honeycomb Spacer (PN 2077-053A2)
6 Each Round Head Aluminum Screws 1/4 inch x 20 inch x 3/4 inch (PN 2077-180-20)
6 Each Flat Head Aluminum Screws 1/4 inch x 20 inch x 3/4 inch (PN 2077-180-10)
U Type Fasteners 1/4 inch x 20 inch (PN 2077-180-23)
Flat Washer Stainless Steel 5/16 inch Nominal (PN 2077-180-6)

Materials Required:

Double-sided Adhesive Tape (PN 2077-180-26)
Solvent (Re-agent Alcohol) or cleaning agent containing no more than 250 PPM Chloride Ion
Lint-Free Rags

TRUPACT-II WORK INSTRUCTION

Title: Replacement/Inspection/Measurements ICV Honeycomb Spacers	**Instruction No.: 4.13**
	Revision No. 4
	Page 1 Of 6

Applicable Drawings: 2077-500SNP, TRUPACT-II SARP Drawing, Sheets 3 and 6
2077-1120, Quality Level and Spare Parts List TRUPACT-II

SARP Requirements: There are no SARP requirements for this work instruction. The spacers are to be replaced if damaged and must be removed prior to the performance of the liquid penetrant requirements of Chapter 8.0, Para. 8.2.1.1.

Special Tools Required:

2 Each ICV Lid Stands
ICV Work Platform
OCA Work Platform
OCA Lid Stand
Lower Spacer Lifting Device
8 Foot Aluminum Step Ladder
ACGLF Lift Fixture
Crane
Torque Wrench 22-28 inch pounds with Flat Blade 3/8 inch tip with Screwdriver Socket
8 Foot Aluminum Level
24 Inch Scale
6 Each 3/16 inch by 7 ft. Alignment Rods

Spare Parts Required:

Upper Honeycomb Spacer (PN 2077-053A1)
Lower Honeycomb Spacer (PN 2077-053A2)
6 Each Round Head Aluminum Screws 1/4 inch x 20 inch x 3/4 inch (PN 2077-180-20)
6 Each Flat Head Aluminum Screws 1/4 inch x 20 inch x 3/4 inch (PN 2077-180-10)
U Type Fasteners 1/4 inch x 20 inch (PN 2077-180-23)
Flat Washer Stainless Steel 5/16 inch Nominal (PN 2077-180-6)

Materials Required:

Double-sided Adhesive Tape (PN 2077-180-26)
Solvent (Re-agent Alcohol) or cleaning agent containing no more than 250 PPM Chloride Ion
Lint-Free Rags

Safety Requirements:

Prior to use of handling of any chemical:
Review Material Safety Data Sheet (MSDS) for each chemical to be used. Use Personal Protective equipment/clothing specified in the exposure controls/personal protection section of the MSDS.

Standard Safety Requirements:
Safety glasses with side shields, use of chemicals requires side shields.
Hard toe shoes/boots required in all operating areas.
Hard hat required where possible injury from impact or falling objects could occur.
Leather palm gloves (Required while handling honeycomb).

Pre-requisite Conditions:

The ICV assembly contains no payload and has been radiological surveyed and certified clean. The ICV lid with spacer installed is on a stand.

Instruction Steps:

NOTE: This work instruction may be performed with the ICV body installed in the OCV but will normally be performed with the ICV body in the proper work stand.

NOTE: The upper and lower spacers may be replaced independently, therefore, sequence of work steps may be performed as conditions allow.

The following steps apply to the Upper Spacer.

1. Remove the 6 round head aluminum screws and store for possible further use.

2. Using appropriate lift fixture, raise lid to clear the spacer and place lid on an empty stand (See Attachment 1, Figure A).

NOTE: The following steps 3 through 6 may be performed at any time but must be completed before spacer is installed.

3. Remove the wiper o-ring. If o-ring is to be replaced per the annual requirement, discard. If not, thoroughly clean the o-ring using solvent and lint-free rags and place in plastic bag or other suitable protective cover and label "Wiper O-Ring For TRUPACT-II SN_____".

4. Thoroughly clean the wiper o-ring holder using solvent and lint-free rags.

5. Inspect the o-ring holder for deformation and verify that all screws are in place. Replace any missing screws. If deformation is found, notify TPME for resolution.

Instruction Steps Continued:

6. Inspect the U-type fasteners for thread or other visible damage. Replace as required using double-sided tape to hold in place.

   Complete_____ Date_____

7. Inspect the surface plate of the spacer for damage such as deep gouges or punctures.

NOTE: If damage is found, notify TPME for resolution.

8. Remove the spacer from the stand and place on a flat surface taking proper care not to damage the plate (See Attachment 1, Figure B).

NOTE: The spacer weighs approximately 100 pounds. Due to the bulk and shape of the spacer, 2 or more personnel should be assigned to handle the spacer. Personnel handling the spacer should wear leather gloves to prevent hand injury.

9. Place the 8 ft. aluminum level horizontally (Attachment 1, Figure C) across the top of the dome so that measurements can be taken from either end of the level. Place the level so that either end is approximately aligned with any of the 6 bolt holes. Maintain the level horizontal and using the scale, measure from the flat surface to the bottom edge of the level at all 6 bolt hole locations and record (See Attachment 1, Figure D).
   1_____ 2_____ 3_____ 4_____ 5_____ 6_____
   Add the measurements and divide by 6, if the result is less than 11 inches, notify the TPME for resolution .

   Complete_____ Date_____

NOTE: The following steps are valid for installing the inspected spacer or a replacement.

10. Place the spacer on an empty ICV lid stand.

NOTE: If liquid penetrant examination of the lid is to be performed, delay until PT is complete.

11. Place double sided tape on U type fasteners. Align washer holes with holes in the U type fasteners. Attach washers to double sided tape.

12. Return ICV lid to stand and lower into position over spacer ensuring that the bolt holes in spacer are aligned with the holes in the U type fasteners.

Instruction Steps Continued:

13. Inspect the screws for thread or head damage. If damaged, discard and obtain replacements.

14. Record the torque wrench SN _____ and Cal. Due Date _____.

15. Install screws and torque to 22-28 inch pounds.

16. Install wiper o-ring per work instruction WI-4-2. The ICV lid is now ready for installing to ICV body.

NOTE: The following steps may be performed any time the lower spacer is accessible.

17. Place 8 ft. aluminum ladder in ICV vessel to allow personnel to access the spacer lift attachment points.

18. Using an overhead crane, attach the spacer removal device and lower until aligned.

19. Attach removal slings (with the legs 120° apart) to the spacer at appropriate clip locations.

20. Remove the 6 flat head screws that hold the spacer to the clips.

21. Remove personnel and ladder from vessel.

NOTE: Personnel handling the spacer should wear leather gloves to prevent hand injury.

22. Slowly raise the spacer out of the cavity and move to an area with a flat surface and place with the surface plate down. This requires that the spacer be up-ended. The spacer weighs approximately 100 pounds and due to the bulk will require 2 or more people to handle.

23. Place the 8 ft. aluminum level horizontally across the dome so that the measurements can be made on either end (Attachment 1, Figure B). Move the level so that one end is approximately aligned with any bolt hole. Repeat until a measurement has been made at all 6 bolt hole locations and record.
    1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____

    Complete _____ Date _____

NOTE: If any measurement is less than 10 1/2 inches, notify TPME for resolution (See Attachment 1, Figures C and D).

NOTE: This step must be completed before installing lower spacer but can be performed at any time after initial removal.

Instruction Steps Continued:

24. Place 8 ft. aluminum ladder in vessel to allow personnel access.

25. Inspect bottom of vessel for moisture or water and if found, remove using absorbent material.

26. Inspect the U type fastener for thread or other damage and if damaged, discard and replace using double-sided tape to hold in place.

27. Place double sided tape on U type fasteners. Align 5/16 inch washer holes in U type fastener. Attach washers to double sided tape.

28. Remove the ladder from the vessel.

NOTE: If liquid penetrant exam is being performed, delay the following until completed.

NOTE: The following steps are valid for either an inspected spacer or a replacement.

29. Up-end the spacer and attach the removal device.

30. Raise the spacer and align with the ICV cavity.

31. Install the 6 alignment rods in the U type fasteners (See Attachment 1, Figure G). Align and lower spacer so that the alignment rods are in the screw slots. Continue to lower spacers until in place (See Attachment 1, Figures H and I).

32. Remove the alignment rods.

33. Place ladder in vessel for personnel access.

34. Install screws and torque to 22-28 inch pounds.

35. Detach the removal device and remove from cavity.

36. Remove personnel and ladder from vessel.

NOTE: The ICV is now ready for re-assembly.

TRUPACT-II WORK INSTRUCTION

Instruction No. 4.13	Continued	Page 6 Of 6

Verification Requirements:
Work instructions complete, copy made for file, original attached to the maintenance record. Forward documentation to TPME. Per section 2.2 of the DOE/WIPP-93-1001.

Written By: Don Roberts		**Date:** 9.7.94
Approved By: Keith A. Lacy	- QA	**Date:** 9-7-94
Approved By: Don Roberts	- Engineering	**Date:** 9.7.94
Approved By: Dana Kelley	- Safety	**Date:** 9.7.94
Approved By: Wade Wagner	- Oper./Maint.	**Date:** 9-7-94
Approved By:		**Date:**

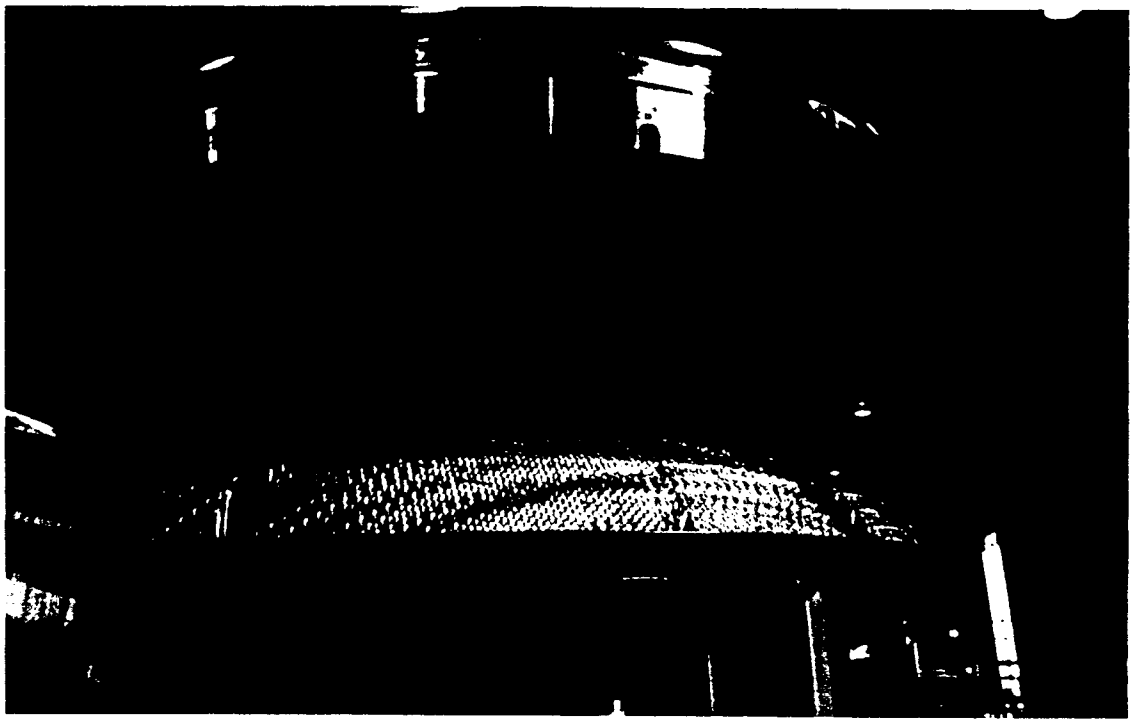


Figure A

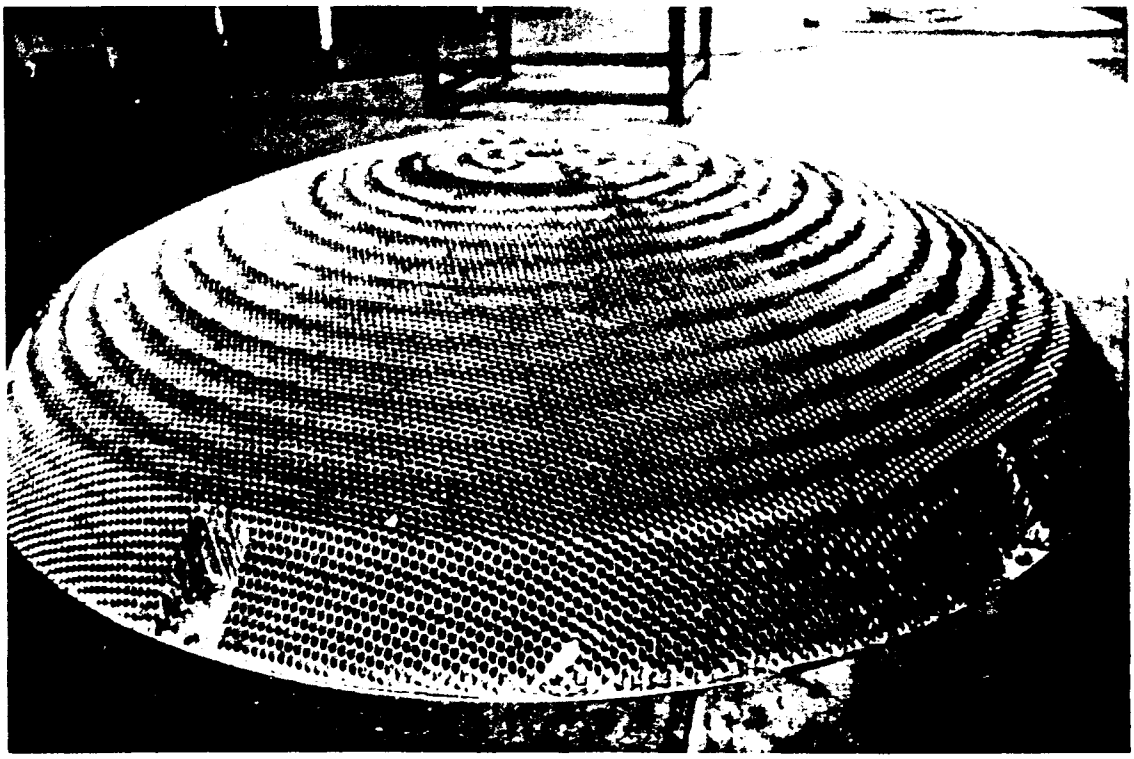


Figure B

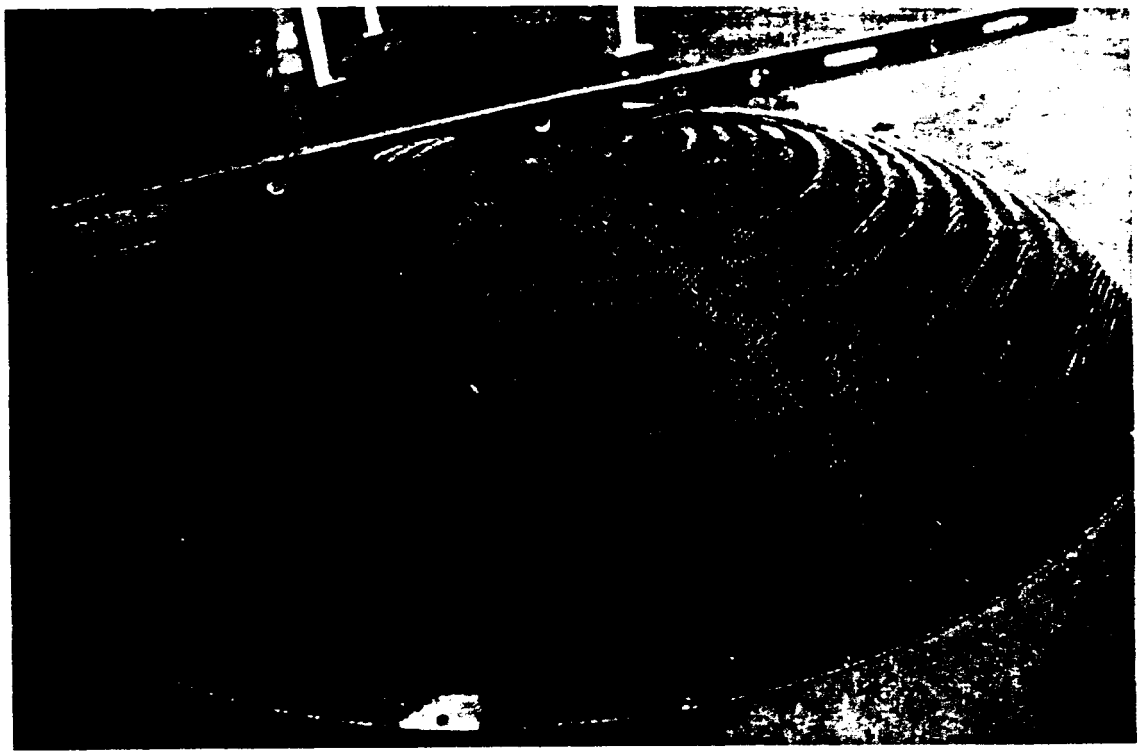


Figure C

Figure D

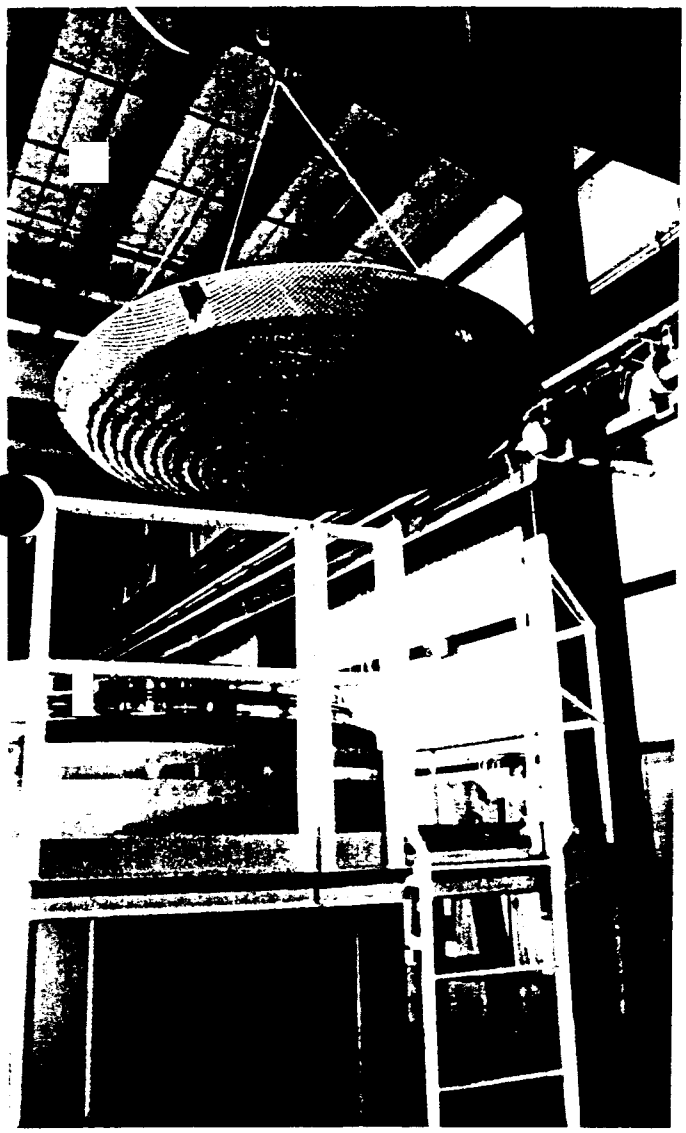


Figure F

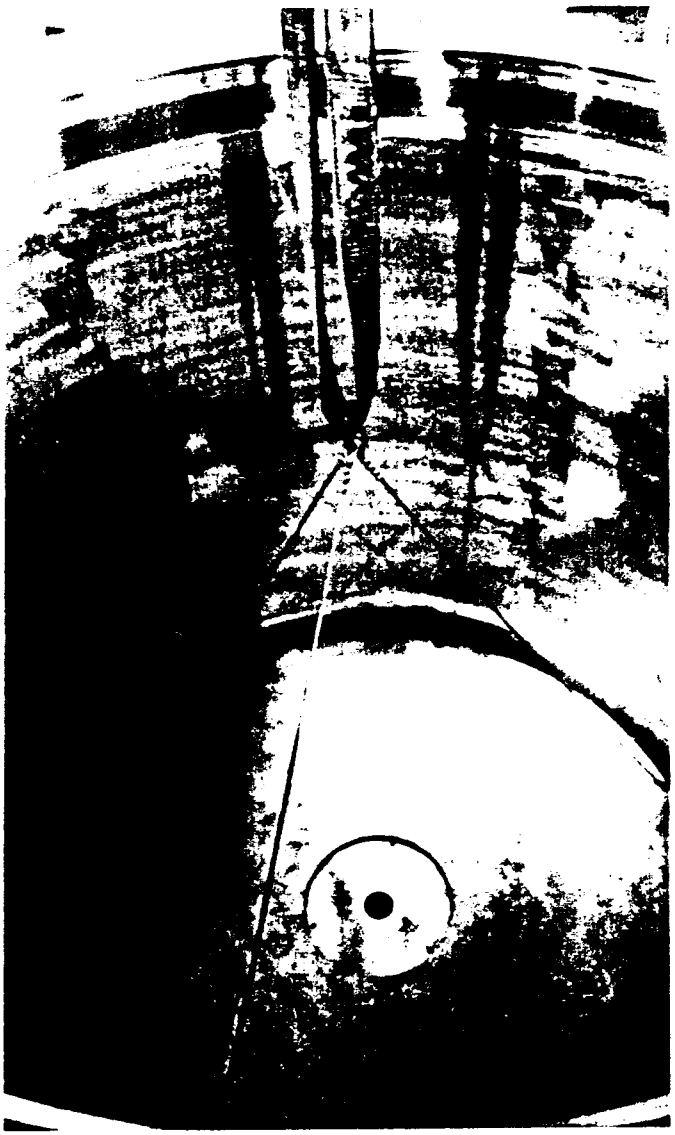


Figure E

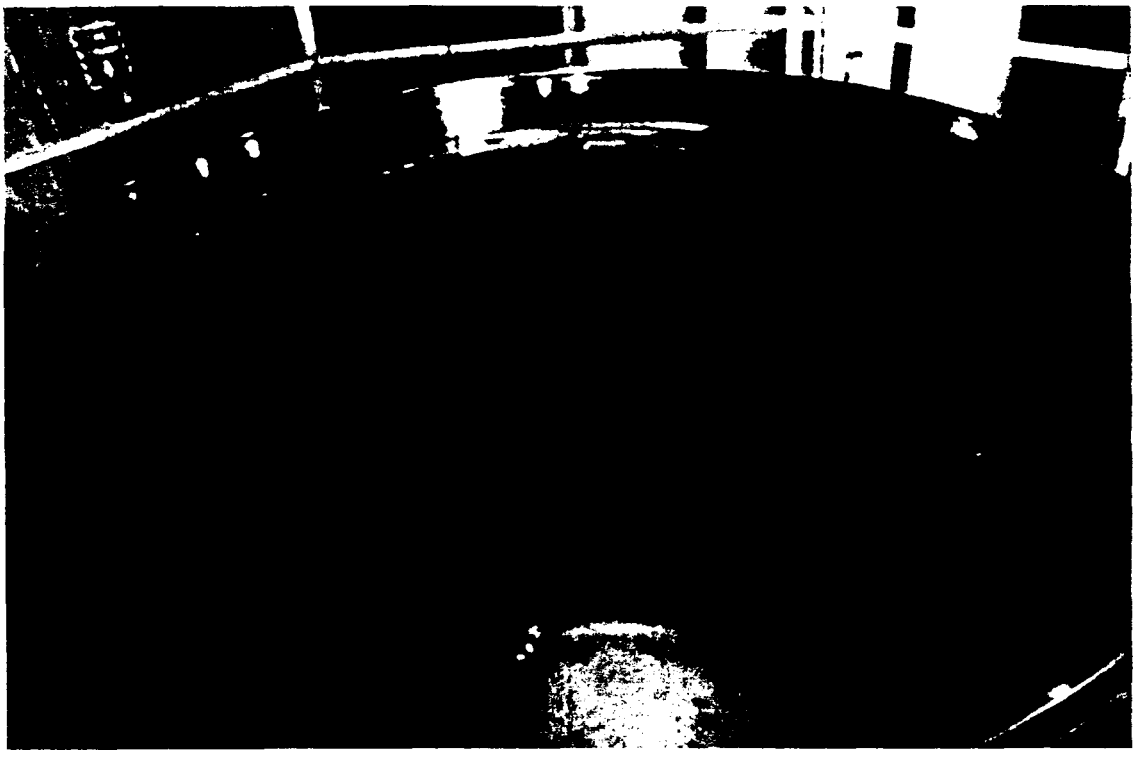


Figure G

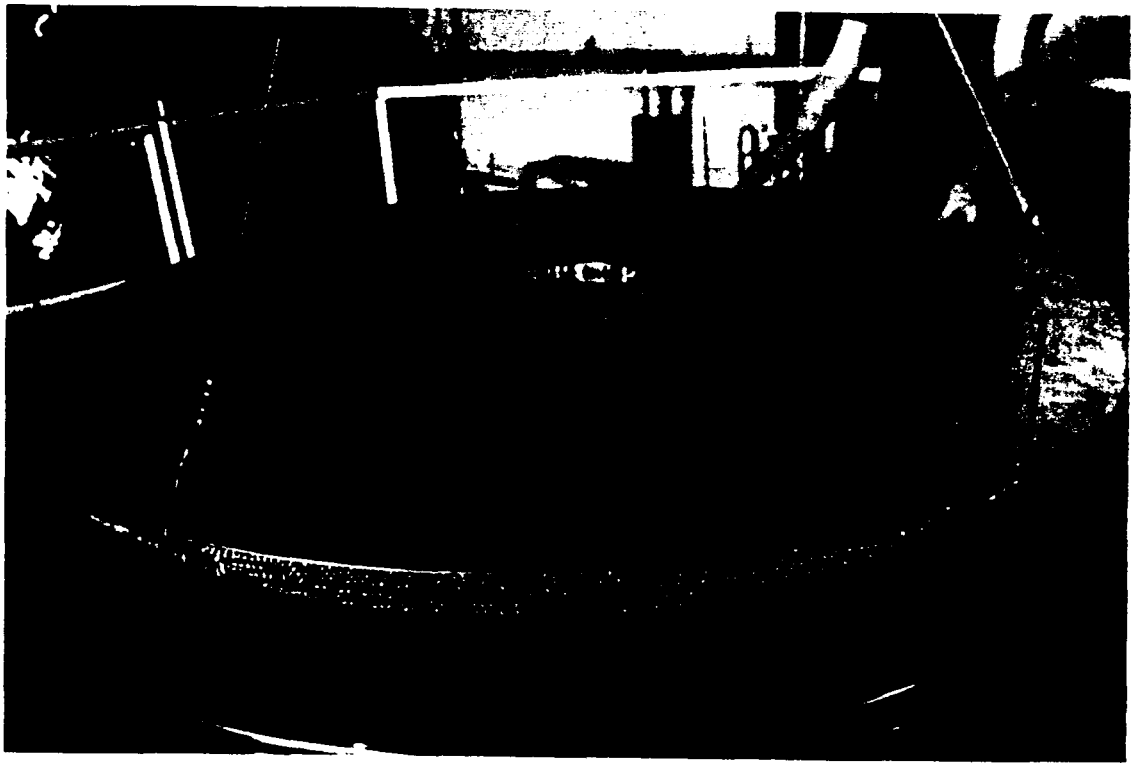


Figure H

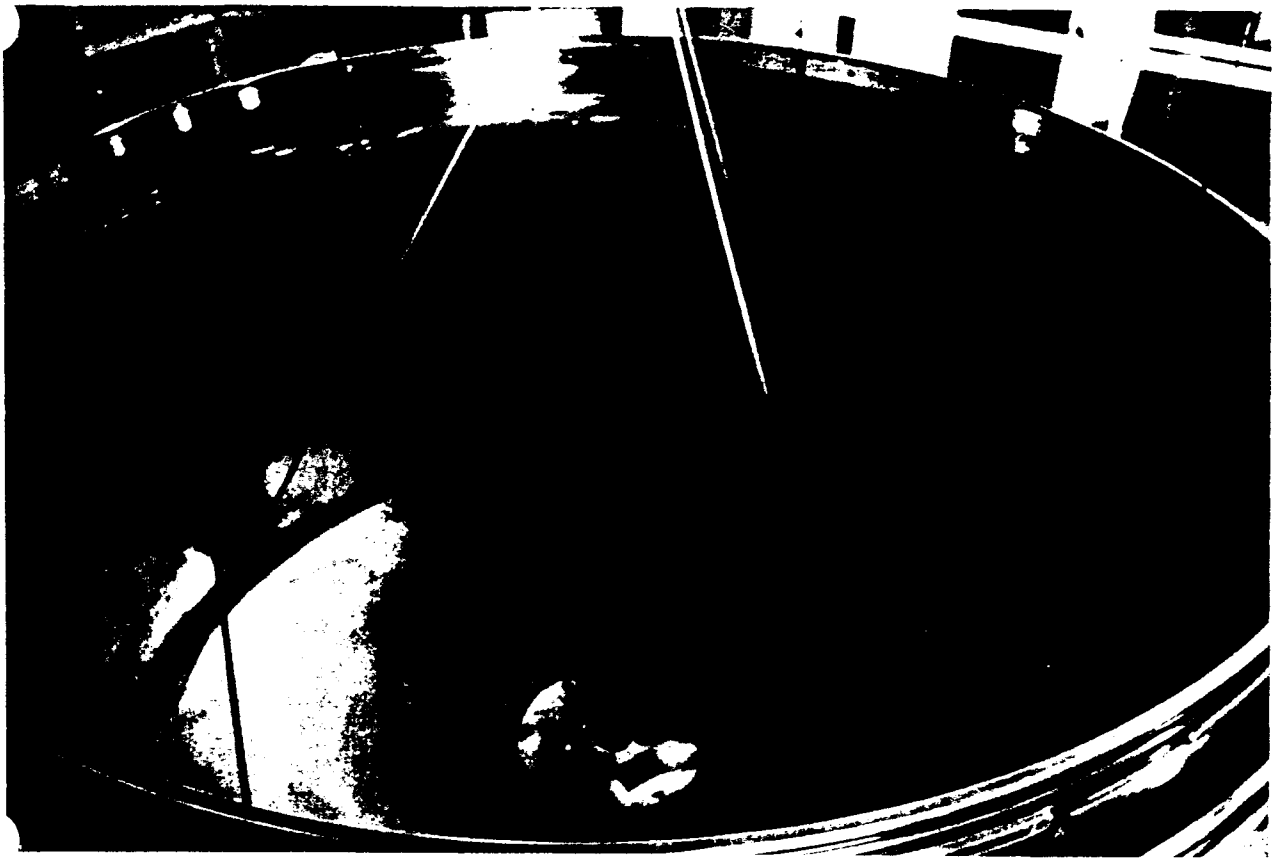
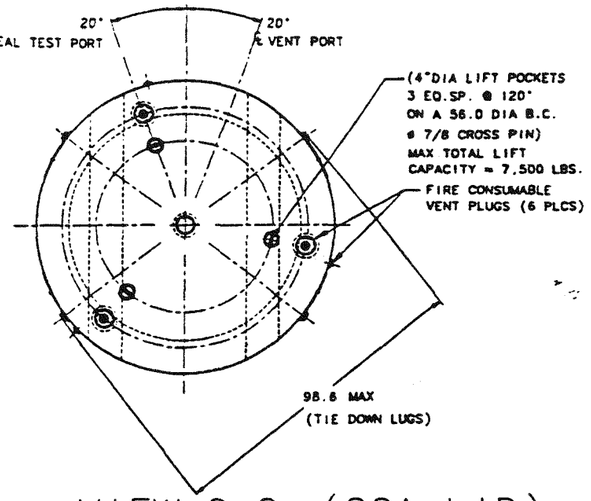


Figure I

ATTACHMENT E

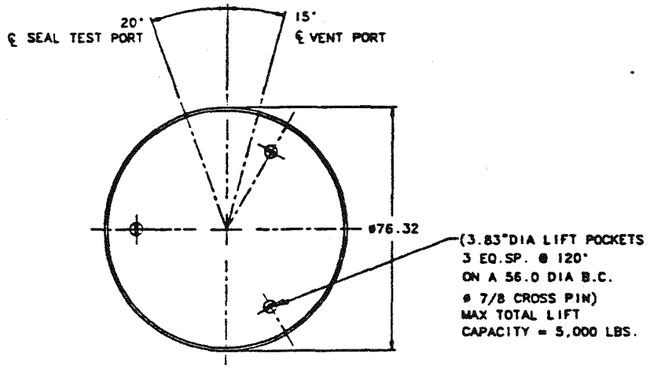
Miscellaneous System Interface and Tool Drawings

- Drawing No. 2077-300, Rev. B, 8 sheets, "TRUPACT-II Interface Control Drawings"
- TRUPACT-II Leak Test and Vent Port Tool Drawings:
  - Drawing No. 2077-091, Rev. E, 3 sheets, "TRUPACT-II ICV and OCV Vent Plug Removal/Pressure Relief Tools"
  - Drawing No. 2077-092, Rev. C, 1 sheet, "TRUPACT-II OCV and ICV Outer Vent Plug Removal and Installation Tool"
  - Drawing No. 2077-093, Rev. C, 1 sheet, "TRUPACT-II ICV/OCV Seal Leak Check Tools"
  - Drawing No. 2077-094, Rev. D, 1 sheet, "TRUPACT-II ICV and OCV Seal Check Port Plug Installation/Removal Tools"
  - Drawing No. 2077-095, Rev. F, 1 sheet, "TRUPACT-II ICV/OCV Leak Detection Tool"
  - Drawing No. SK-1104, Rev. None, 1 sheet, "Spacer Removal Sling"
- ACGLF drawings:
  - Drawing No. 2014-060, Rev. 0, 3 sheets, "(ACG) Lift Fixture Top Assembly"
  - Drawing No. 2014-061, Rev. 0, 3 sheets, "(ACG) Lift Fixture Frame Weldment"
  - Drawing No. 2014-062, Rev. 0, 3 sheets, "(ACG) Lift Fixture Upper Structure Turntable Weldment"
  - Drawing No. 2014-063, Rev. 0, 3 sheets, "(ACG) Lift Fixture Counterweight Fabrication and Assembly"
  - Drawing No. 2014-064, Rev. 0, 3 sheets, "(ACG) Lift Fixture Leg Weldment and Miscellaneous Details"
  - Drawing Nos. 2014-400-AB, Rev. 0, 1 sheet, 2014-410-AB, Rev. 0, 5 sheets, and 2014-420-AB, Rev. 0, 3 sheets, ACGLF Control Console
  - Drawing No. 2077-022, Rev. M, 3 sheets, "TRUPACT-II Tiedown Assembly"



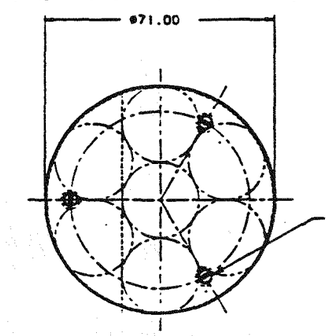
VIEW C–C (OCA LID)

(3520# – OCA LID ONLY)



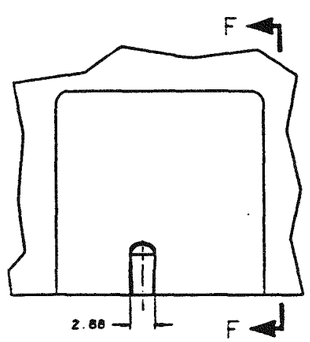
SECTION B–B (ICV LID)

(895# – ICV LID WITH UPPER SPACER)



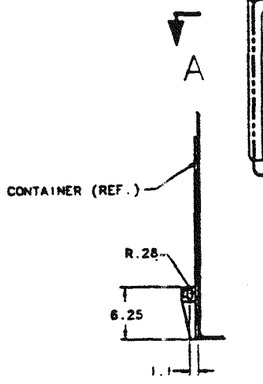
SECTION A–A (PALLET)

(160# – PALLET ONLY)



DETAIL G

TIE DOWN DETAIL



SECTION F–F

TIE DOWN DETAIL

NOTES, UNLESS OTHERWISE SPECIFIED.

1. INTERPRET DRAWING PER ANSI-Y14.5M.
2. THIS DRAWING DEPICTS USER RELATED INTERFACE CONTROL DIMENSIONS. DIMENSIONS SHOWN NOT TO BE USED FOR FABRICATION OR INSPECTION REQUIREMENTS.
3. USER SITES MUST LOAD THE PALLET TO ACHIEVE A LEVEL PALLET WITHIN ±0.5° BY THE FOLLOWING:
   a) LOAD MANAGE TO BALANCE PAYLOAD C.G.
   b) USE C.G. COMPENSATING LIFT FIXTURE.
4. EACH SHIPPING PACKAGE MAY BE INSTALLED ON TRAILER 180° ROTATED FROM VIEW SHOWN.

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
B	SEE DCN	9/16/88	RY

TRUPACT ELEVATION

	REL	N.J. SWANNACK	9-16-88
	APPD		
	APPD		
	APPD	W. HENKEL	9-16-88
	APPD	M.R. RICHARDS	9-16-88
	APPD	S.A. PORTER	9-16-88
	APPD	HERB WUNSCH	9-16-88
	APPD	D.L. SWANNACK	9-16-88
	QA	JOE R. OLIVADOTI	9-16-88
	CHECK	G.E. HILL	9-7-88
ITEM QTY	DRAWN	BRYAN	9-15-88

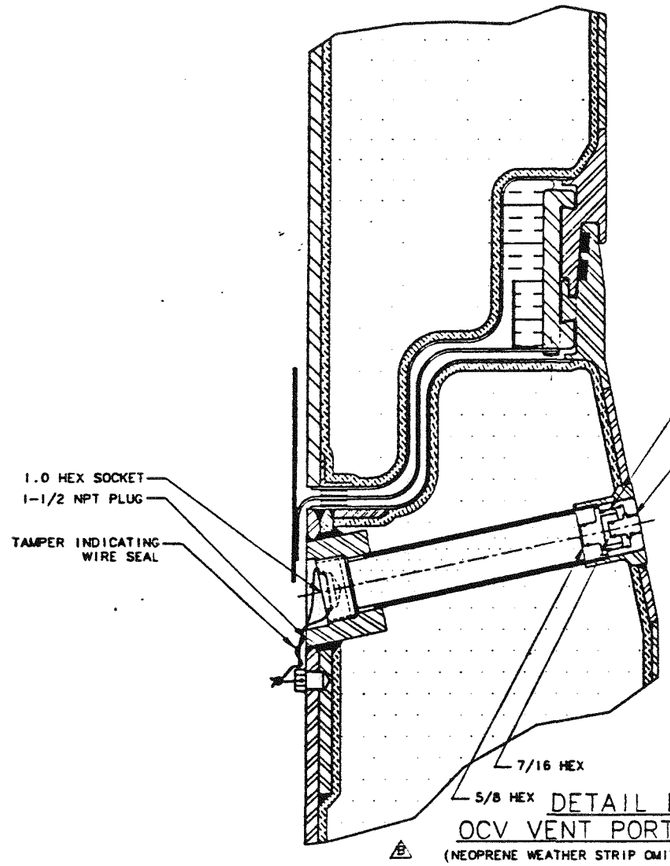
UNLESS OTHERWISE SPECIFIED
TOLERANCES
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

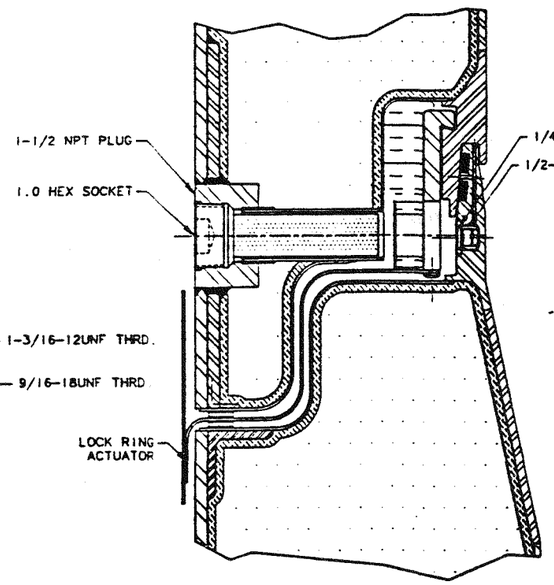
CONTAINER ELEVATIONS AND INTERIOR
TRUPACT II
INTERFACE CONTROL DRAWING

SCALE: NONE | WT. N/A
REV B | SHEET 1 OF 8
DWG SIZE D | DWG NO. 2077-300

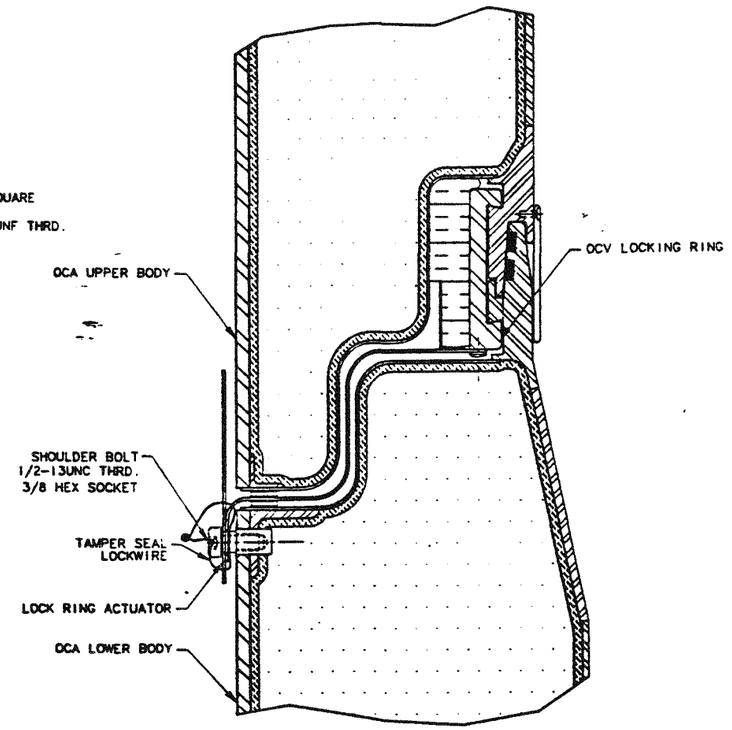
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
B	SEE DCN	9/27/88	WB



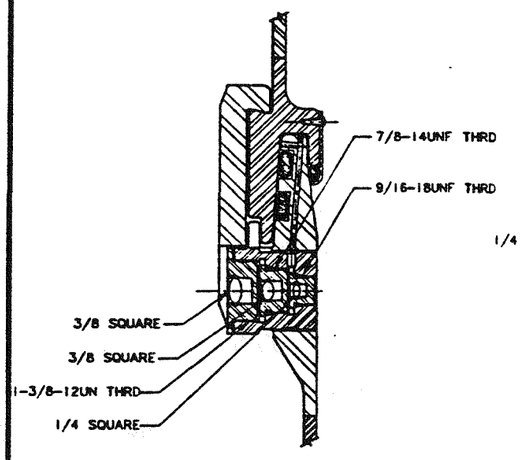
DETAIL D (SH 1)
OCV VENT PORT DETAIL
(B) (NEOPRENE WEATHER STRIP OMITTED FOR CLARITY)



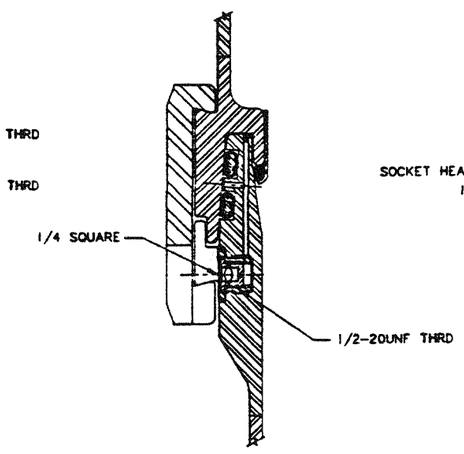
DETAIL D (SH 1)
(B) OCV SEAL TEST PORT DETAIL
(NEOPRENE WEATHER STRIP OMITTED FOR CLARITY)



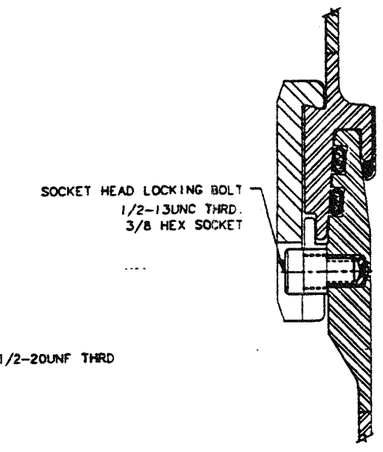
DETAIL D (SH 1)
(B) OCV LOCK DETAIL
(NEOPRENE WEATHER STRIP OMITTED FOR CLARITY)



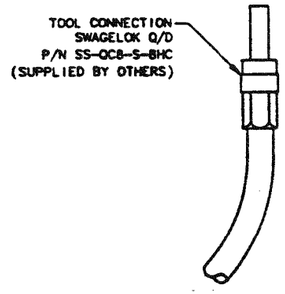
DETAIL-E (SH 1)
ICV VENT PORT



DETAIL-E (SH 1)
ICV SEAL TEST PORT



DETAIL-E (SH 1)
ICV LOCK DETAIL



	REL	N.J.SWANNACK	9-16-88
	APPD		
	APPD		
	APPD	W.HENKEL	9-16-88
	APPD	M.R.RICHARDS	9-16-88
	APPD	S.A.PORTER	9-16-88
	APPD	HERB WUNSCH	9-16-88
	APPD	D.L.SWANNACK	9-16-88
	QA	JOE R.OLIVADOTI	9-16-88
	CHECK	G.E.HILL	9-7-88
ITEM / QTY / NEXT ASSY	DRAWN	BRYAN	9-16-88

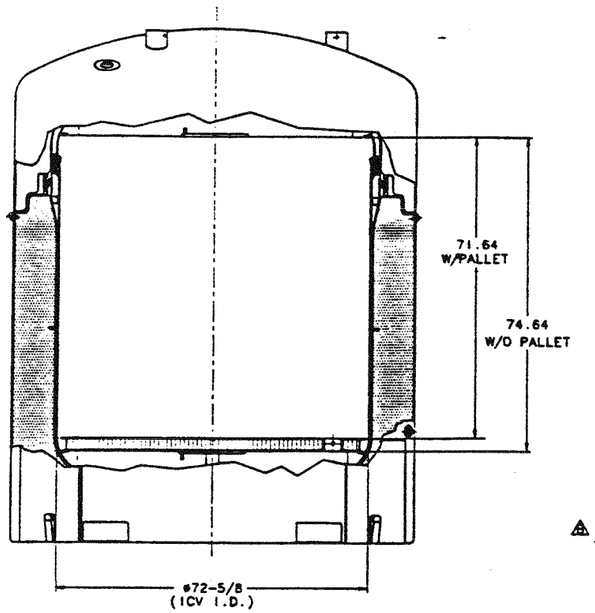
UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY WASHINGTON

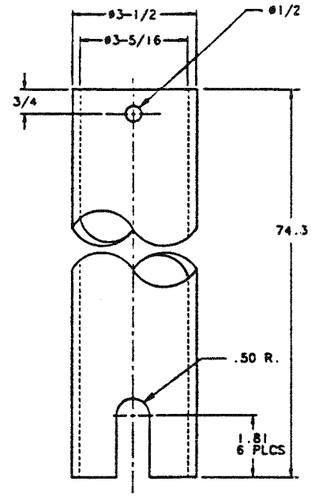
CONTAINER VENT, SEAL & LOCK RING FEATURES
TRUPACT II
INTERFACE CONTROL DRAWING

SCALE: NONE	WT: N/A
REV: B	SHEET 2 OF 8
DWG SIZE: D	DWG NO.: 2077-300

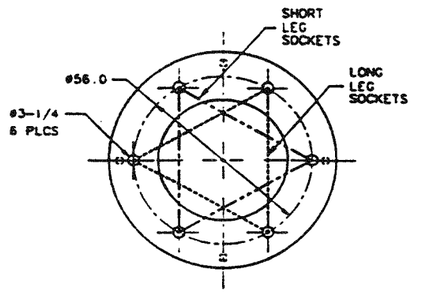
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
B	SEE DCN	9/19/88	RB

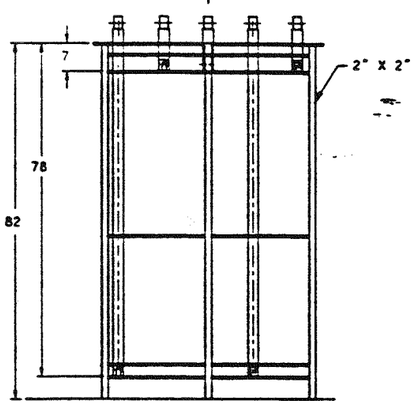


ICV PAYLOAD CAVITY



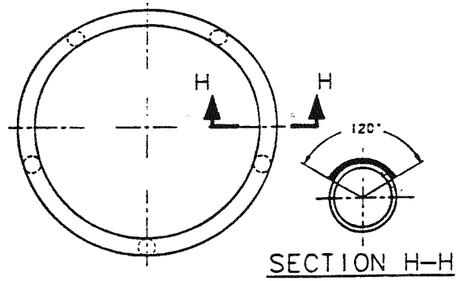
⚠ ALIGNMENT GUIDE TUBE



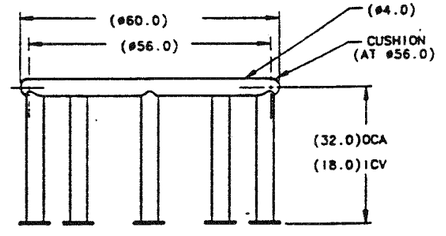


LEG SUPPORT STAND

(INTERFACE CONCEPT DESIGN)
(SUPPLIED BY OTHERS)

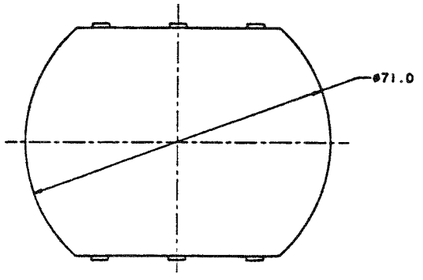


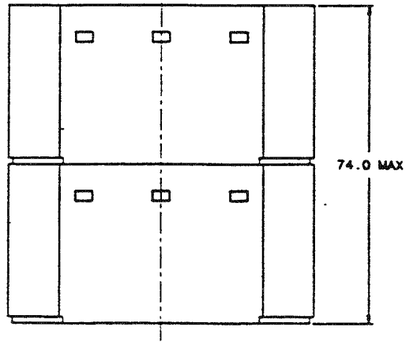
SECTION H-H



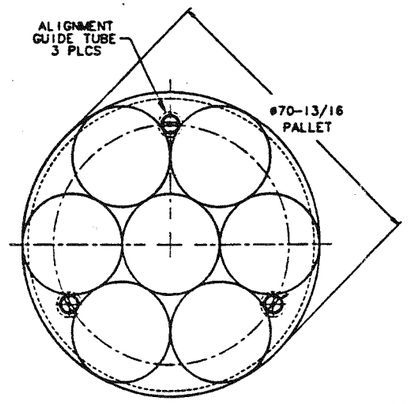
COVER SUPPORT STANDS

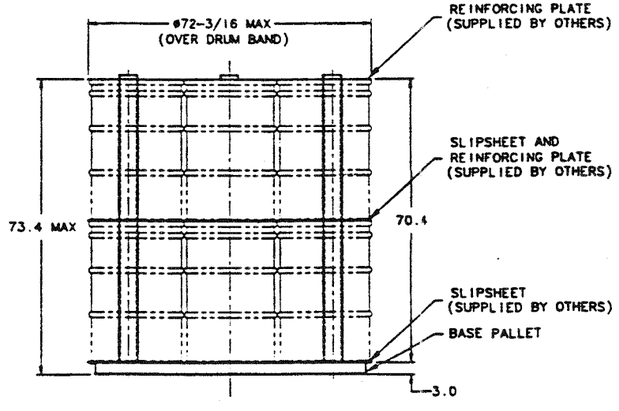
(INTERFACE CONCEPT DESIGN)
(SUPPLIED BY OTHERS)





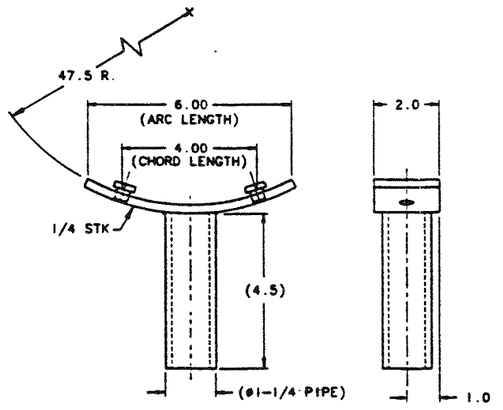
2-SWB PAYLOAD ENVELOPE 3



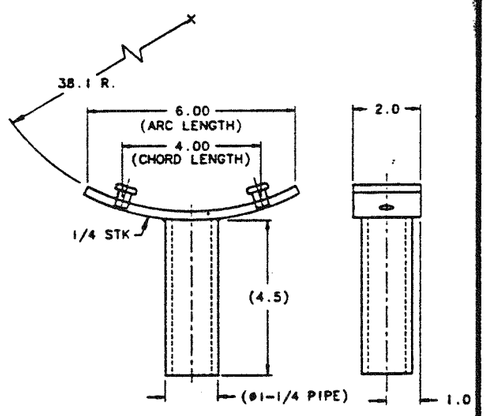


14-DRUM PAYLOAD PALLET ENVELOPE 3

(2 FRONT DRUMS OMITTED)



OCV CLOSURE TOOL B



ICV CLOSURE TOOL B

	REL N.J.SWANNACK	9-16-88
	APPD	
	APPD	
	APPD W.HENKEL	9-16-88
	APPD M.R.RICHARDS	9-16-88
	APPD S.A.PORTER	9-16-88
	APPD HERB WUNSCH	9-16-88
	APPD D.L.SWANNACK	9-16-88
	QA JOE R.OLIVADOTI	9-16-88
	CHECK G.E.HILL	9-7-88
ITEM QTY NEXT ASSY	DRAWN BRYAN	8-01-88

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

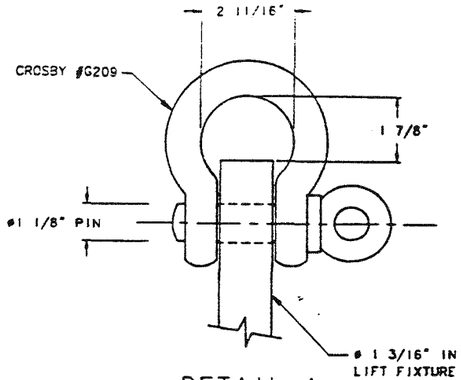
NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

ENVELOPE AND AUXILIARY EQUIPMENT SUPPORTS
TRUPACT II
INTERFACE CONTROL DRAWING

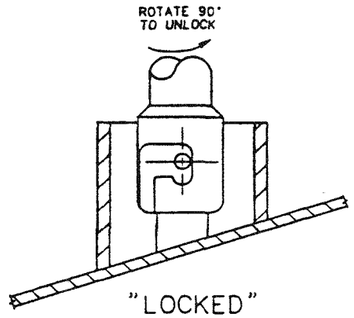
SCALE NONE WT. N/A
REV B SHEET 3 OF 8

DWG SIZE D
DWG NO 2077-300

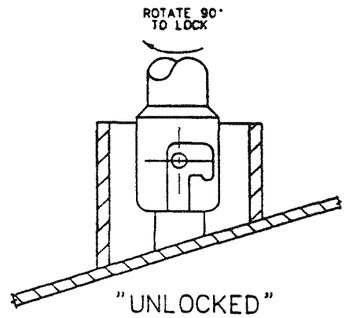
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
B	SEE DCN	9/21/88	JW



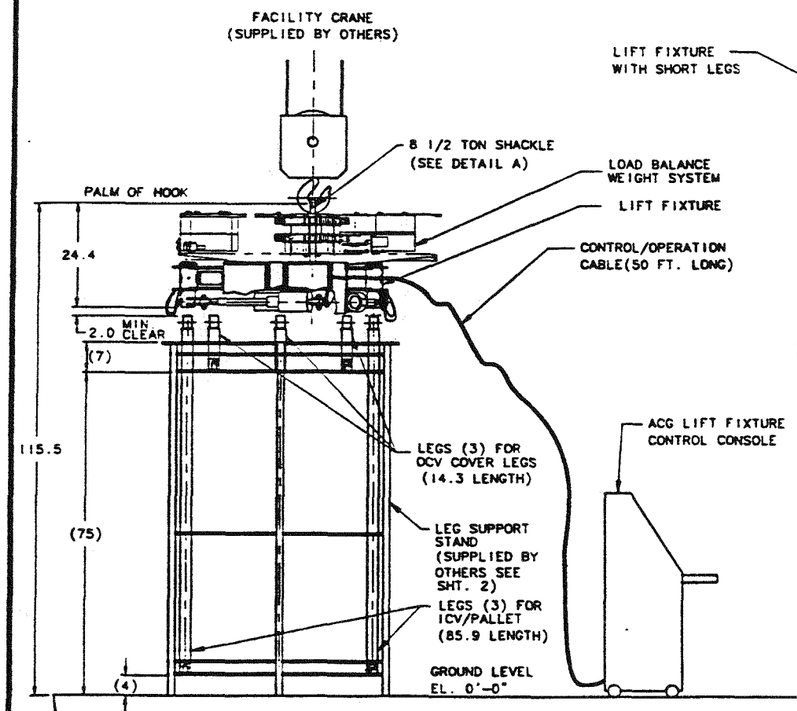
DETAIL A
(ROTATED 90°)



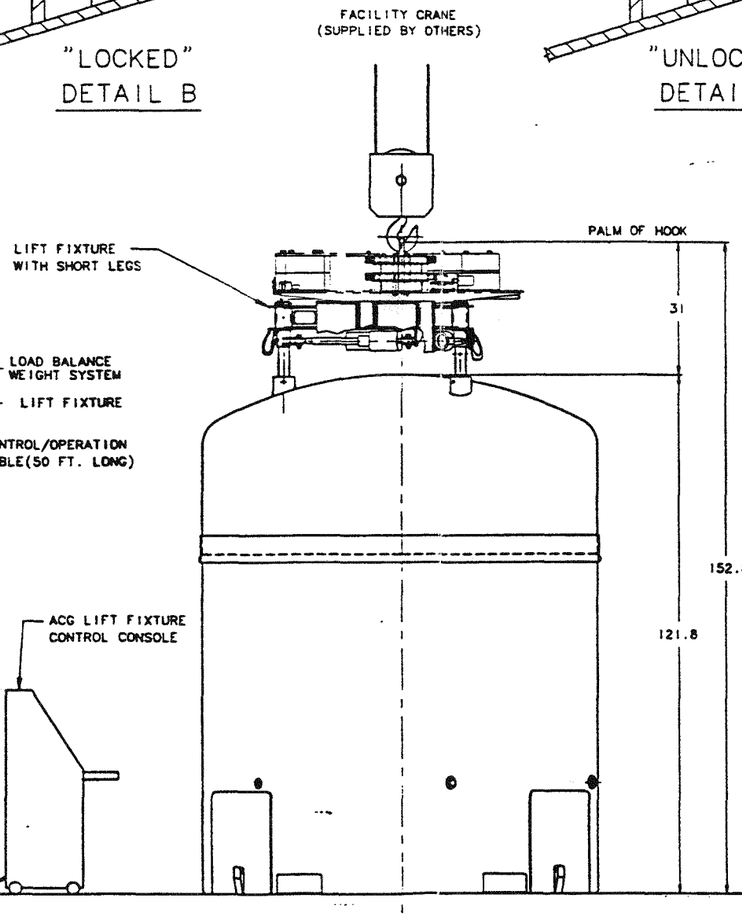
"LOCKED"
DETAIL B



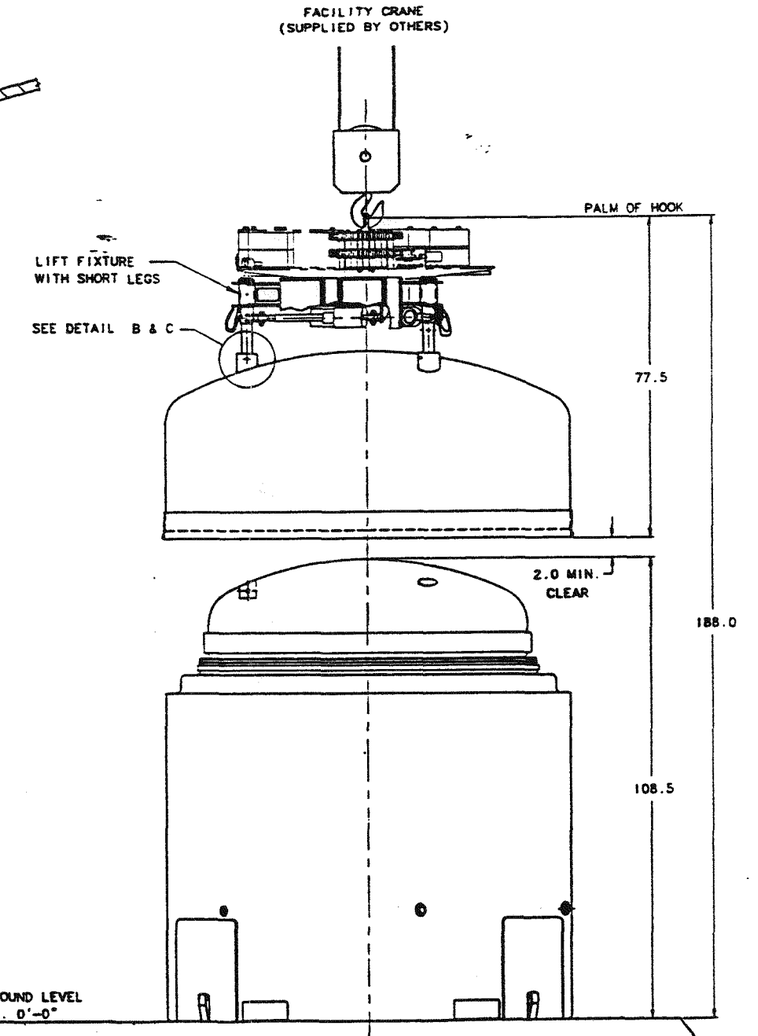
"UNLOCKED"
DETAIL C



LEG CHANGING SUPPORT STAND
(SUPPLIED BY OTHERS)



LIFT FIXTURE/OCA COVER



OCA COVER HANDLING

	REL	N.J. SWANNACK	9-16-88
	APPD		
	APPD		
	APPD	W. HENKEL	9-16-88
	APPD	M.R. RICHARDS	9-16-88
	APPD	S.A. PORTER	9-16-88
	APPD	HERB WUNSCH	9-16-88
	APPD	D.L. SWANNACK	9-16-88
	QA	JOE R. OLIVADOTI II	9-16-88
	CHECK	G.E. HILL	9-7-88
ITEM | QTY | NEXT ASSY	DRAWN	BRYAN	9-15-88

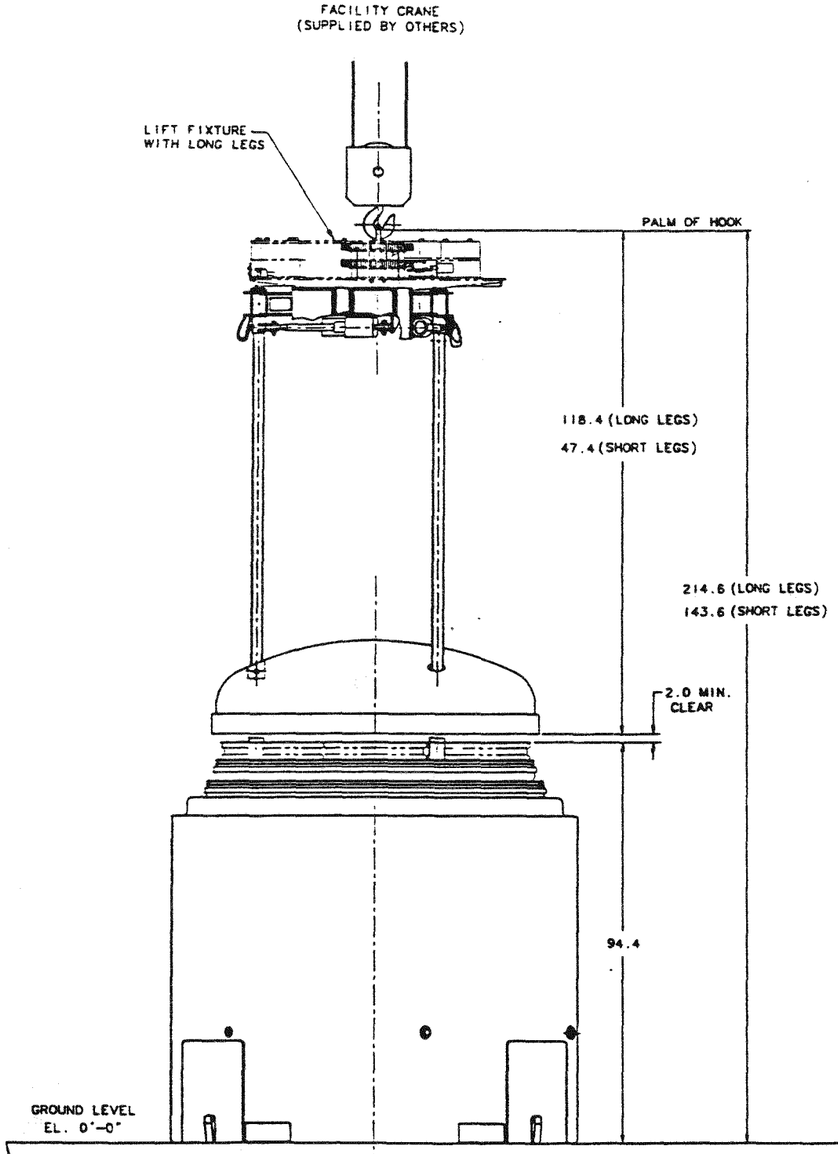
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

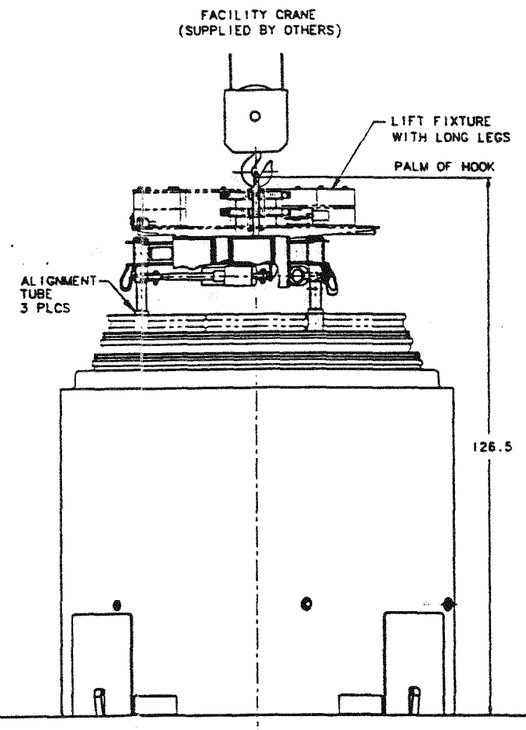
CONTAINER PAYLOAD LOADING/UNLOADING HANDLING -INSIDE FACILITY
LIFT FIXTURE - TRUPACT II
INTERFACE CONTROL DRAWING

SCALE	NONE	WT.	N/A
REV	B	SHEET	4 OF 8
DWG SIZE	D	DWG NO.	2077-300

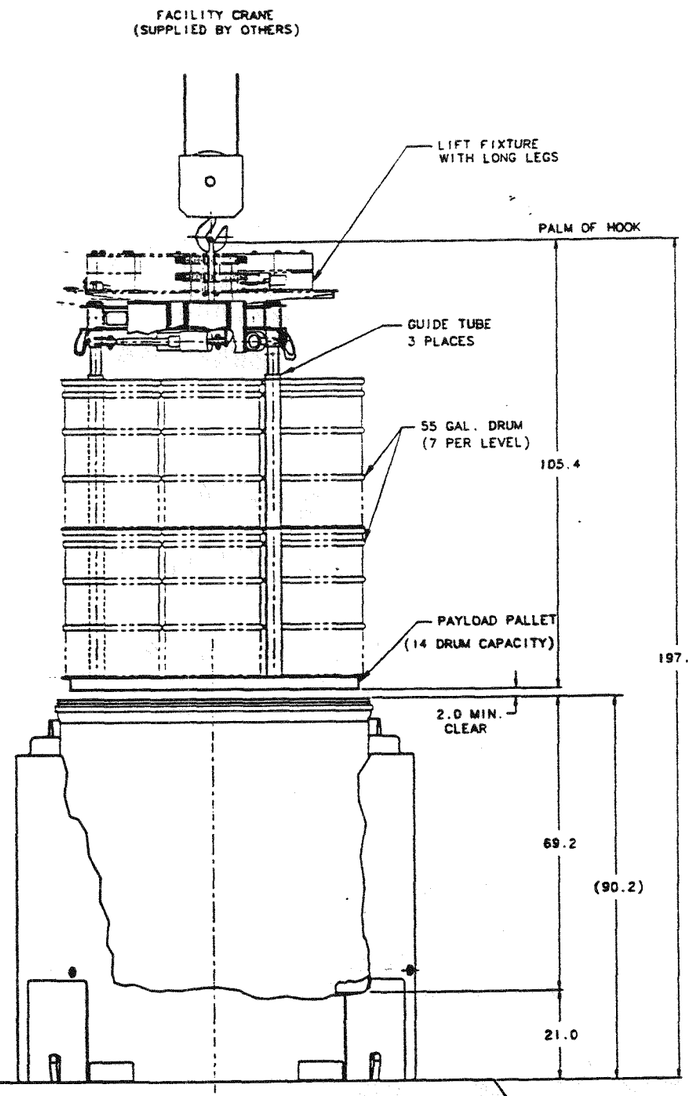
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
B	SEE DCN	9/15/88	JS



ICV COVER HANDLING



LIFT FIXTURE/PALLET CONNECTION



PAYLOAD HANDLING

	REL	N. J. SWANNACK 9-16-88
	APPD	
	APPD	
	APPD	W. HENKEL 9-16-88
	APPD	M. R. RICHARDS 9-16-88
	APPD	S. A. PORTER 9-16-88
	APPD	HERB WUNSCH 9-16-88
	APPD	D. L. SWANNACK 9-16-88
	QA	JOE R. OLIVADOTI 9-16-88
	CHECK	G. E. HILL 9-7-88
ITEM : QTY : NEXT ASSY	DRAWN	BRYAN 8-22-88

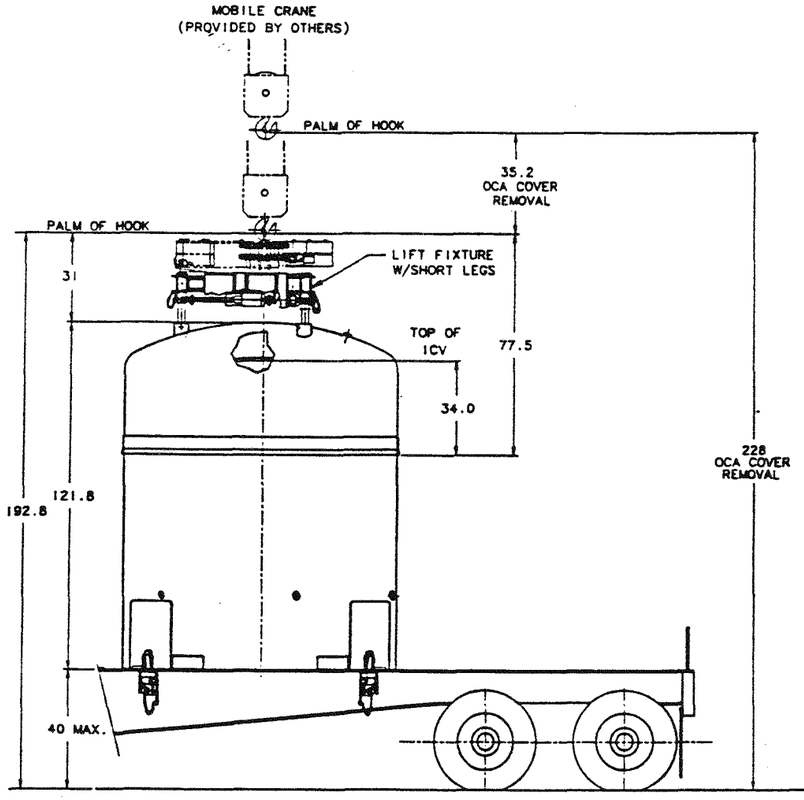
UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

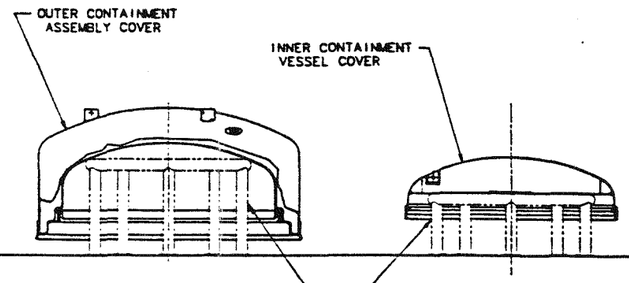
NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

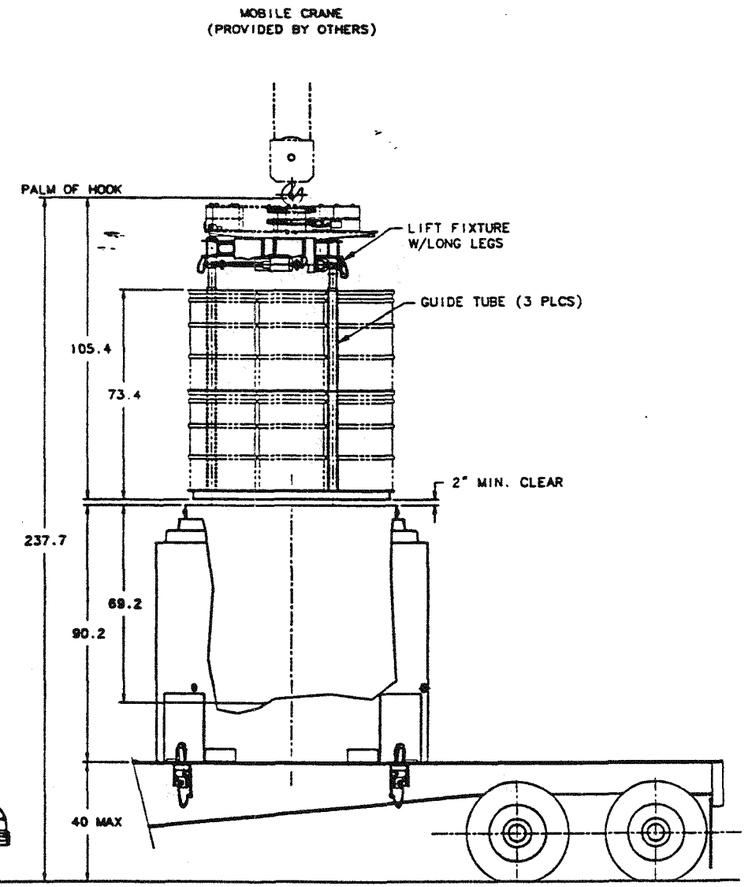
CONTAINER PAYLOAD LOADING/UNLOADING HANDLING-INSIDE FACILITY
LIFT FIXTURE - TRUPACT II
INTERFACE CONTROL DRAWING

SCALE 1/16 W N/A
REV B SHEET 5 OF 8
DWG SIZE D
DWG NO. 2077-300

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
B	SEE DCN	9/7/88	WJH







Ⓑ OCV & ICV COVER HANDLING

PAYLOAD HANDLING

	REL	N. J. SWANNACK 9-16-88
	APPD	
	APPD	
	APPD	W. HENKEL 9-16-88
	APPD	M. R. RICHARDS 9-16-88
	APPD	S. A. PORTER 9-16-88
	APPD	HERB WUNSCH 9-16-88
	APPD	D. L. SWANNACK 9-16-88
	QA	JOE R. OLIVADOTI 9-16-88
	CHECK	G. E. HILL 9-7-88
ITEM QTY NEXT ASSY	DRAWN	BRYAN 9-15-88

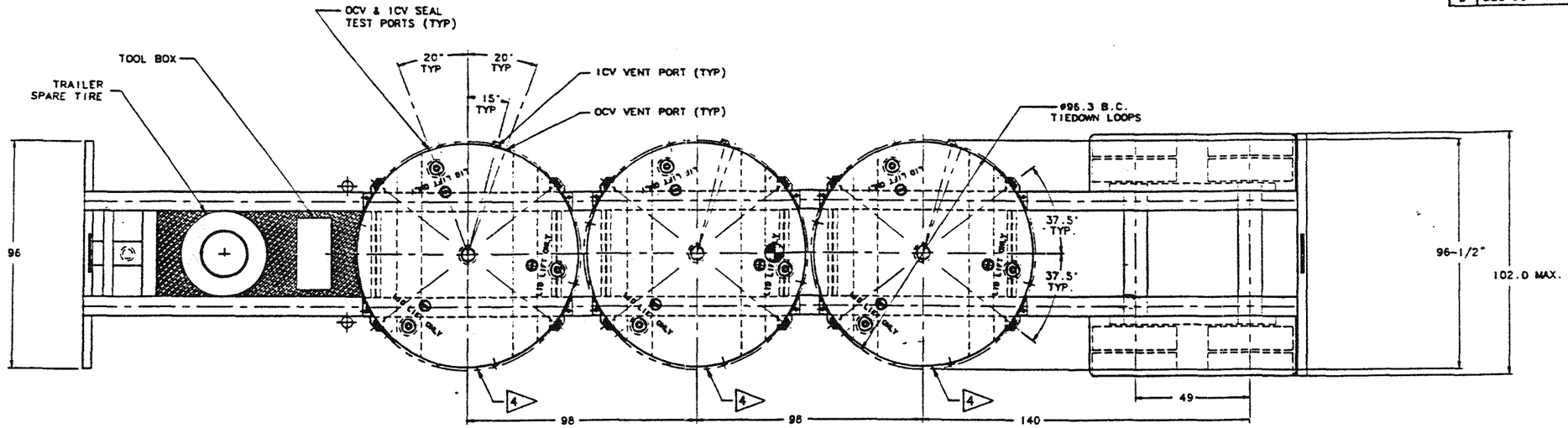
UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

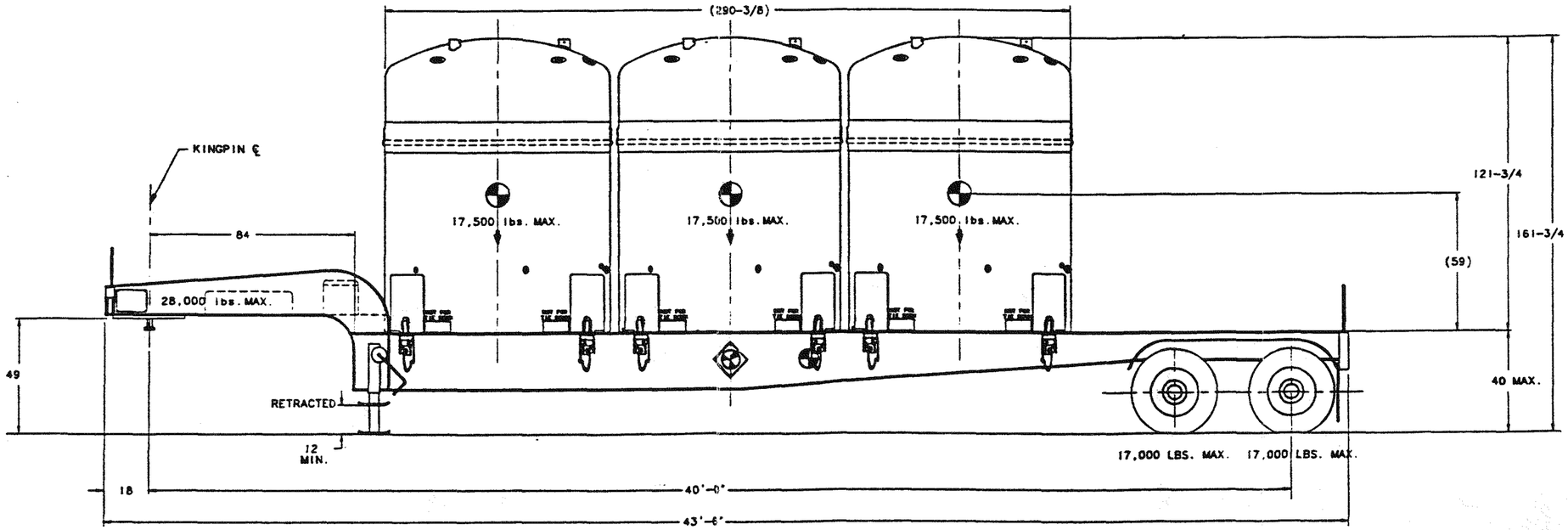
NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

CONTAINER PAYLOAD LOADING/UNLOADING HANDLING -OUTSIDE FACILITY
TRUPACT II
INTERFACE CONTROL DRAWING

SCALE: 1/24 | WT. N/A
REV: B | SHEET 6 OF 8
DWG SIZE: D | DWG NO. 2077-300

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
B	SEE DCN	9/21/88	JP





ESTIMATED WEIGHTS:

	SPRING RIDE	AIR RIDE
MAXIMUM TOTAL SYSTEM WEIGHT	62,000 lbs.	62,000 lbs.
TRAILER WEIGHT (W/TOOLS, SPARE TIRE & TIEDOWN BRKTS)	9,120 lbs.	10,020 lbs.
DIFFERENCE:	52,880 lbs.	51,980 lbs.
TOTAL CONTAINER WEIGHT W/O PAYLOAD (11,985 X 3 CONTAINERS)	35,955 lbs.	35,955 lbs.
MAXIMUM TOTAL PAYLOAD WEIGHT DIFFERENCE:	16,925 lbs.	16,025 lbs.
PAYLOAD WEIGHT PER CONTAINER	5,640 lbs.	5,340 lbs.

REL	R.J. SWANACK	9-16-88
APPD		
APPD		
APPD	W. HENKEL	9-16-88
APPD	M.R. RICHARDS	9-16-88
APPD	S.A. PORTER	9-16-88
APPD	HERB WARSCH	9-16-88
APPD	D.L. SWANACK	9-16-88
QA	JOE R. OLIVADOTI	9-16-88
CHECK	G.E. HILL	9-7-88
DRAWN	BRYAN	9-00-88

ITEM | QTY | NEXT ASSY

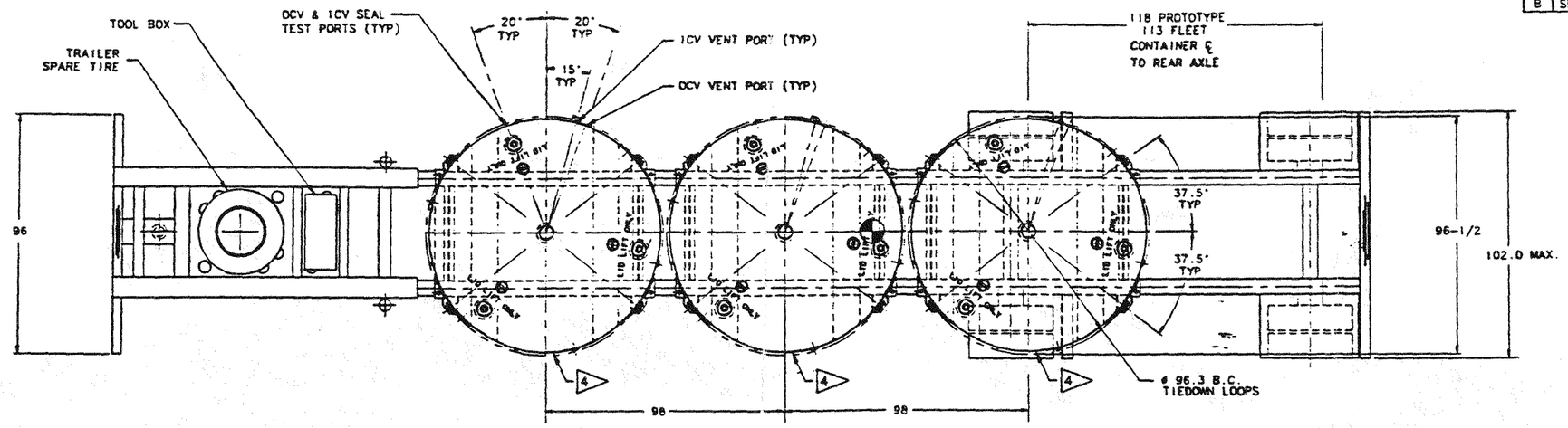
UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

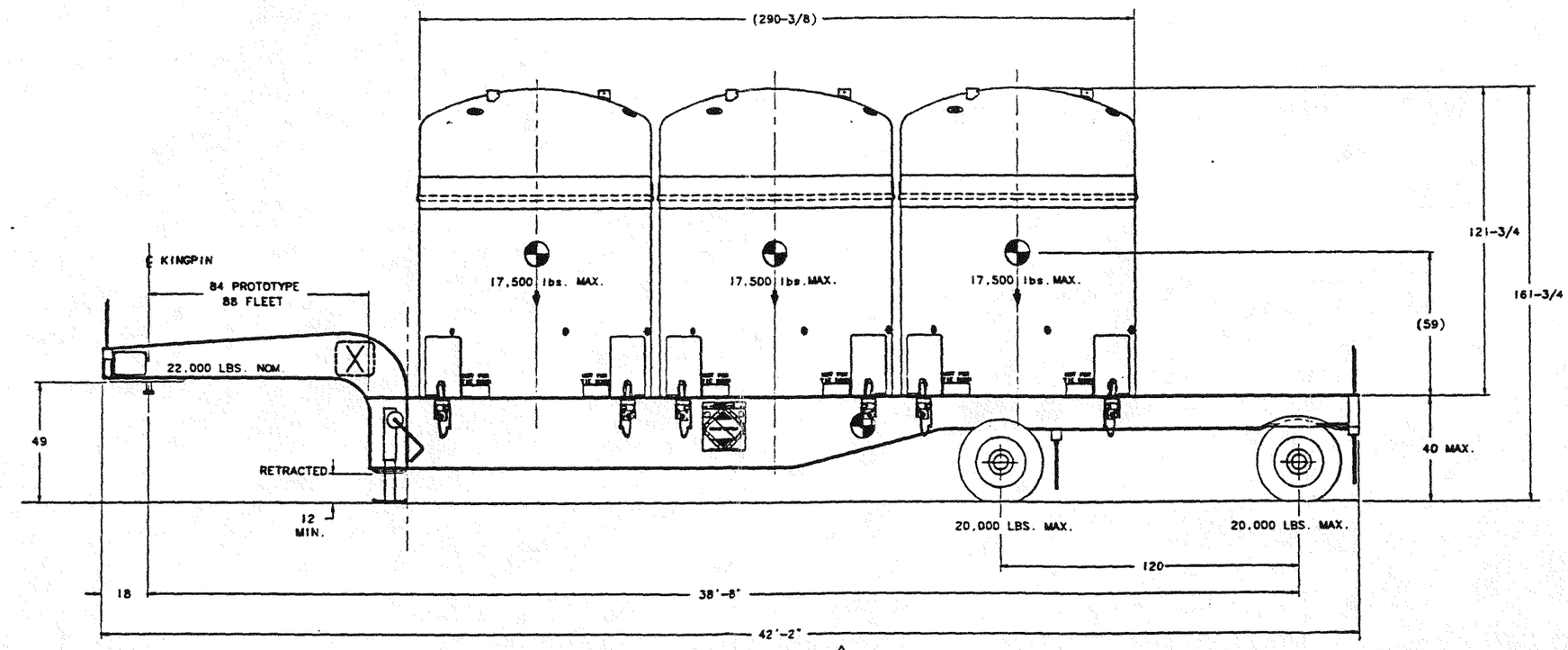
NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY WASHINGTON

CONTAINER/TRAILER ASSEMBLY (CLOSE AXLE)
TRUPACT II
INTERFACE CONTROL DRAWING

SCALE: 1/24 WT N/A
REV B SHEET 7 OF 8
DWG SIZE D
DWG NO. 2077-300

REVISION RECORD			
LTR	DESCRIPTION	DATE	BY
B	SEE DCN	11/17/93	[illegible]





ESTIMATED WEIGHTS:

	PROTOTYPE	FLEET
MAXIMUM TOTAL SYSTEM WEIGHT	62,000 lbs.	62,000 lbs.
TRAILER WEIGHT (W/TOOLS, SPARE TIRE & TIEDOWN BRKTS)	9,640 lbs.	9,800 lbs.
DIFFERENCE:	52,360 lbs.	52,200 lbs.
TOTAL CONTAINER WEIGHT W/O PAYLOAD (11,985 X 3 CONTAINERS)	35,955 lbs.	35,955 lbs.
MAXIMUM TOTAL PAYLOAD WEIGHT DIFFERENCE:	16,405 lbs.	16,245 lbs.
PAYLOAD WEIGHT PER CONTAINER	5,468 lbs.	5,415 lbs.

ITEM	QTY	NEXT ASSY

REL	W.J. SWANBACK	9-15-93
APPD		
APPD		
APPD	W. NEWKIRK	9-15-93
APPD	W.R. RICHARDS	9-15-93
APPD	S.A. PORTER	9-15-93
APPD	HERB WUNSCH	9-15-93
APPD	D.L. SWANBACK	9-15-93
QA	JOE R. GLOVADOTI	9-15-93
CHECK	G.E. HILL	9-15-93
DRAW.	BRYAN	9-15-93

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
FRACTIONS ± N/A
ANGLES ± N/A
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY WASHINGTON

CONTAINER/TRAILER ASSEMBLY (SPREAD AXLE)
TRUPACT II
INTERFACE CONTROL DRAWING

SCALE 1/24 WT N/A
REV B SHEET 8 OF 8

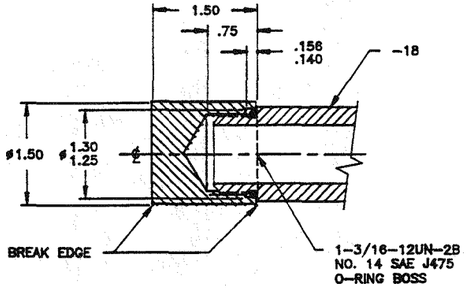
DWG SIZE D
DWG NO. 2077-300

NOTES, UNLESS OTHERWISE SPECIFIED:

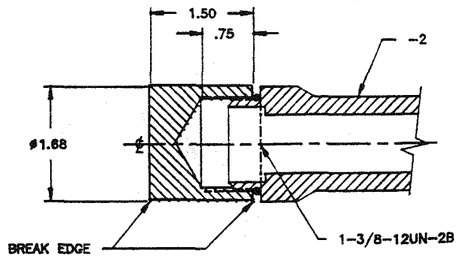
1. INTERPRET DRAWING PER MIL-STD-100 AND ANSI Y-14.5.
2. FABRICATE IN ACCORDANCE WITH NUPAC SPECIFICATION FS-01.
3. IDENTIFY ALL COMPONENTS, SUB-ASSEMBLIES, WLEDMENTS, ETC, DURING FABRICATION WITH A FELT TIP MARKER PER RDT-F7-3T-1969. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER AND DRAWING REVISION NUMBER. IDENTIFY ALL COMPLETED FABRICATED COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC, USING .25 INCH HIGH CHARACTER DIES. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER, DRAWING REVISION NUMBER AND A PROJECT UNIQUE SERIAL NUMBER (SUPPLIED BY NUPAC).
4. EQUIVALENT COMPONENTS AND/OR SOURCES OF SUPPLY MAY BE SUBSTITUTED UPON APPROVAL OF NUPAC ENGINEERING.
5. PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DIES, WELD FLUX, SPATTER, SCALE, GRIME, & ALL OTHER FOREIGN MATERIALS. FINISHED ASSEMBLY & ALL INTERIOR SURFACES SHALL BE CLEANED & VISUALLY OR WIPE TEST INSPECTED IN ACCORDANCE WITH ASTM-A380.
6. MATERIAL SIZES LISTED IN THE MATERIAL COLUMN ARE FOR REFERENCE ONLY. MANUFACTURER SHALL CONFIRM ACTUAL REQUIREMENTS PRIOR TO FABRICATION.
7. ALL BRAZING PROCEDURES AND PERSONNEL SHALL BE QUALIFIED IN ACCORDANCE WITH ASME CODE, SECTION IX. BRAZING PROCEDURES AND BRAZER QUALIFICATIONS SHALL BE AVAILABLE FOR AUDIT OR REVIEW.

8 COAT LIBERALLY WITH DOW CORNING VACUUM GREASE PRIOR TO ASSEMBLY.

9 USE EXTENSION (ITEM 23) FOR REMOVAL OF ICV MIDDLE VENT PORT PLUG. USE EXTENSION (ITEM 23) AND ADAPTER (ITEM 24) FOR REMOVAL OF ICV INNER VENT PORT PLUG.



DETAIL ITEM (16)
SCALE 1/1
ITEM #18 SHOWN FOR REF.



DETAIL ITEM (21)
SCALE 1/1
ITEM #2 SHOWN FOR REF.

REVISION HISTORY

LTR	DESCRIPTION	DATE	BY
E	REDRAWN WITH CHANGE -- SEE DCN		

ITEM	PART NO.	DESCRIPTION	ASSEMBLY & QUANTITY						
9		24	TMI	ADAPTER, 3/8F x 1/4M x 1-1/8 LONG	SNAP-ON			1	
9		23	FXI	EXTENSION, 3/8M x 3/8F x 1-1/2 LONG	SNAP-ON			1	
		22		REMOVED					
		21		RND BAR, ø1-3/4 x 1.5 LONG	BRASS UNS 36000, 1/2 HARD			1	
		20		TEFLON TAPE				AR	AR
		19		RND BAR, ø.875 x 15.50 LONG	SST ASTM A276, TYPE 304			1	
		18		CORED BRONZE BAR, 3/4 I.D. x 1-1/2 O.D. x 12.00 LONG	SAE 660			1	
		17		DRIVE SCREW, ø3/32 x 3/16 LONG	SST TYPE 304			1	1
		16		RND BAR, ø1-1/2 x 1.50 LONG	BRASS UNS 36000, 1/2 HARD			1	
		15	CL-68-PTK	PLASTIC TAPERED KNOB	CARR LANE			2	2
		14		STUDBOLT, 1/2-13UNC-2A x 1-1/4 LONG	SST TYPE 304			2	2
		13	SS-QC8-BP	QUICK CONNECT PLUG, 1/2, MALE x 11/16 HEX	SST SWAGELOK			1	1
		12	SS-QC8-8-8PM	QUICK CONNECT, 1/2, FEMALE x 1/2 MNPT	SST SWAGELOK			1	1
		11	SS-8-P	PLUG, 1/2-MNPT W/HEX SOCKET	SST SWAGELOK			1	1
		10	5/32 x 2 XLCK	SPIRAL PIN, EXTRA LIGHT 5/32 x 2.0 x XLCK	SST C.E.M. WEST			1	1
		9	CL-68-PFK	PLASTIC FLUTED KNOB	CARR LANE			1	1
		8		HEX BAR, 1-3/8 HEX x 1.75 LONG	ASTM A276, TYPE 304			1	1
		7	#AS-568-914	O-RING, BUNA-N	NATIONAL			2	2
		6	#AS-568-015	O-RING, BUNA-N	NATIONAL			2	2
		5		RND BAR, ø3.0 x 3.0 LONG	BRASS UNS 36000, 1/2 HARD			1	1
		4	5/32 x 3/4 XLCK	SPIRAL PIN, EXTRA LIGHT 5/32 x .75 x XLCK	SST C.E.M. WEST			1	1
		3		RND BAR, ø.875 x 9.5 LONG	SST ASTM A276, TYPE 304				1
		2		CORED BRONZE BAR, 3/4 I.D. x 1-3/4 O.D. x 6.00	SAE 660				1
		1	#43002	SOCKET, 7/16 HEX, 6 POINT, 3/8 SQ DRIVE	CRAFTSMAN			1	
		A2		OCV VENT PLUG REMOVAL/PRESSURE RELIEF TOOL					
		A1		ICV VENT PLUG REMOVAL/PRESSURE RELIEF TOOL					

REL		
APPD		
APPD	G J QUINN	6/28/88
APPD	H J WORSON	6/28/88
APPD	R A JOHNSON	6/28/88
APPD	W R BROWN	6/28/88
APPD	D L BENNACK	6/28/88
APPD	LARRY E. GLIMSETH	6/28/88
DA	JOE R. GUNDSETH	6/28/88
CHECK	G.E. HILL	6/28/88
DRAWN	TOM LEMON	6/28/88

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ±

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

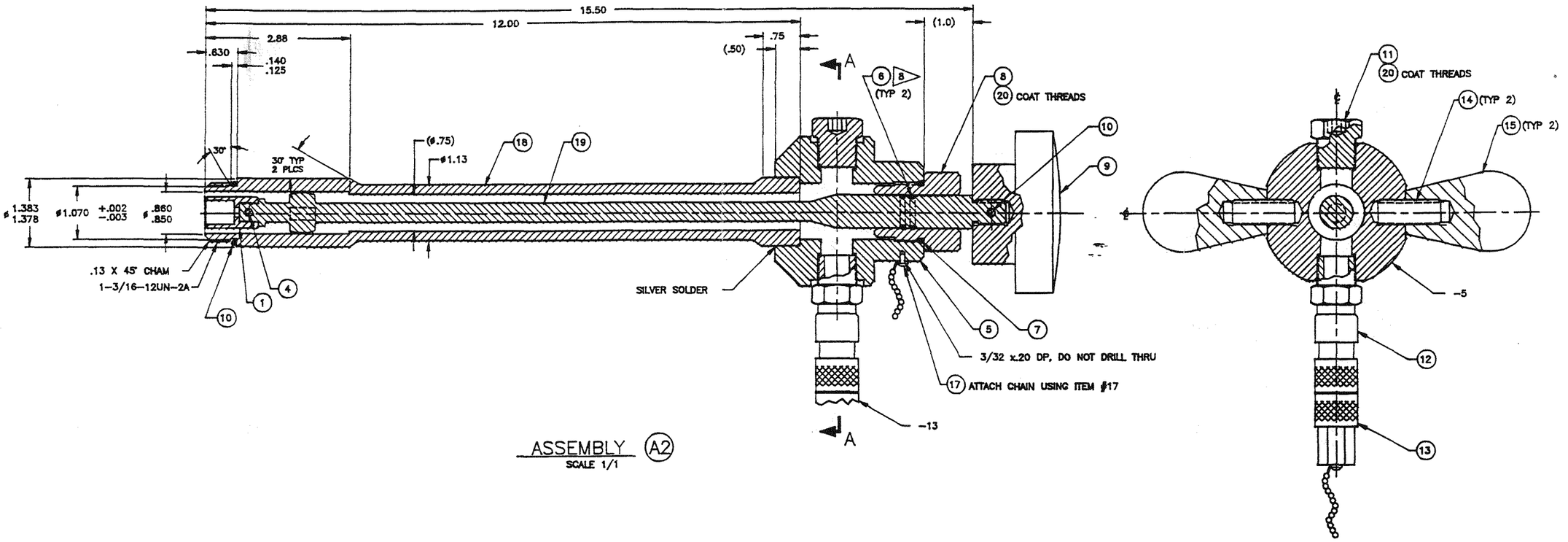
NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

ICV & OCV VENT PLUG REMOVAL/PRESSURE RELIEF TOOLS
•
TRUPACT - II

SCALE: AS NOTED | WT. 9.1 LBS
REV: E | SHEET 1 OF 3
DWG SIZE: D
DWG NO. 2077-091

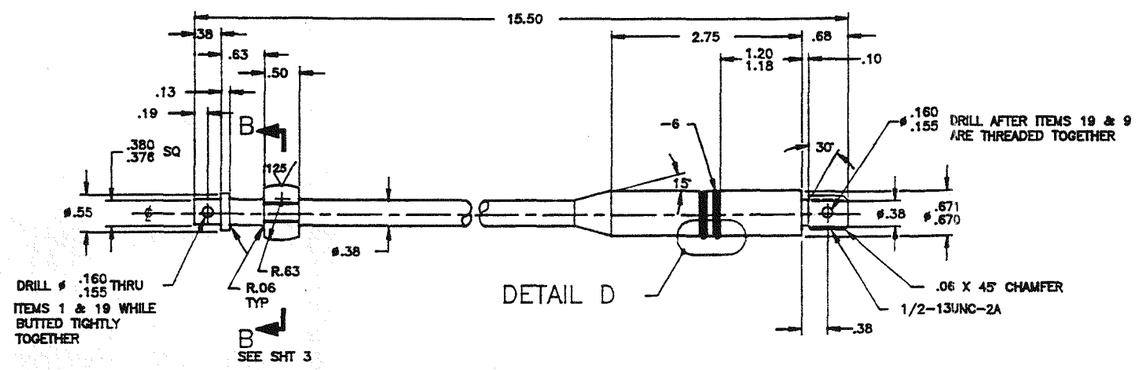
E 2077-091 1 3

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
E	REDRAWN WITH CHANGE – SEE DCN		

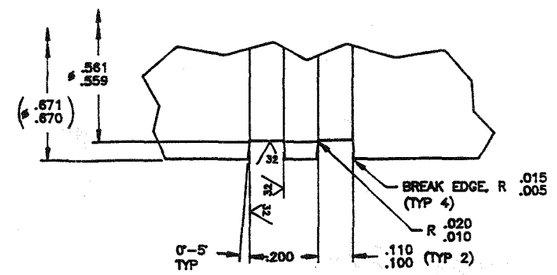


ASSEMBLY (A2)
SCALE 1/1

SECTION A–A
SCALE 1/1



DETAIL ITEM (19)
SCALE 1/1



DETAIL D
SCALE 5/1

ITEM	QTY	NEXT ASSY
•	•	•

REL.	W J SHERWOOD	5-25-95
APPD		
APPD	G J QUINN	5/25/95
APPD	H J WUNSCH	5/25/95
APPD	R A JOHNSON	5/25/95
APPD	W R BROWN	5/25/95
APPD	D L SHERWOOD	5/25/95
APPD	LARRY E. WUNSCH	5/25/95
QA	JOE B. GUARDOTI	5/25/95
CHECK	G.E. HILL	5/25/95
DRAWN	TOM LEMON	5/25/95

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1°
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

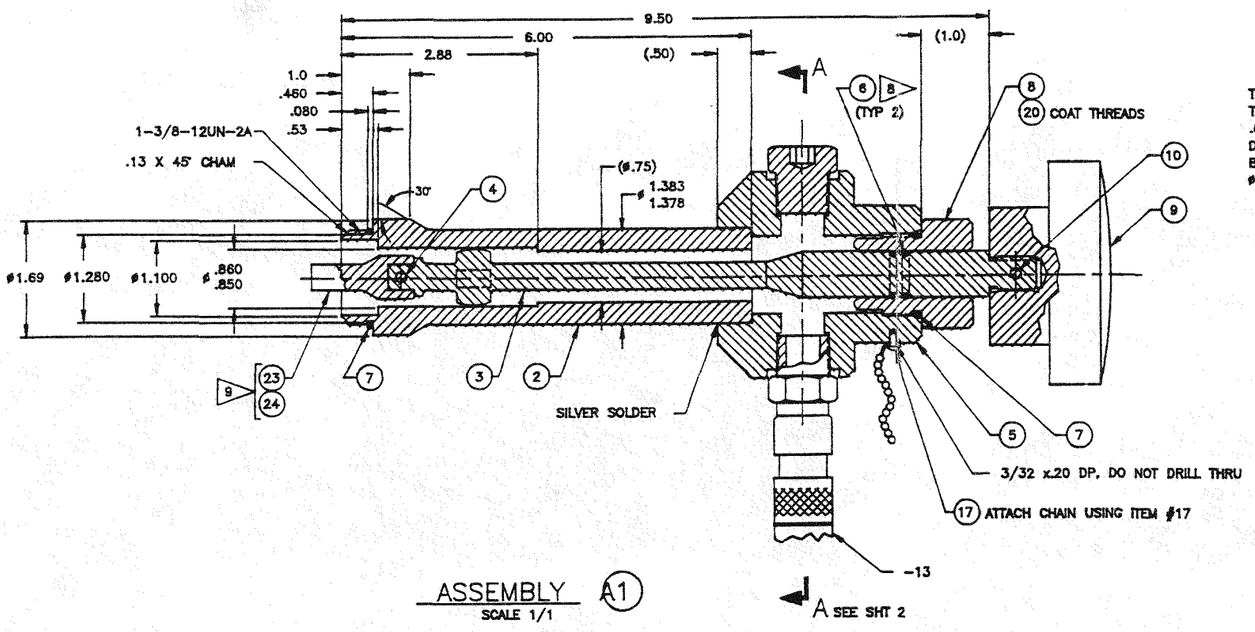
NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

ICV & OCV VENT PLUG REMOVAL/PRESSURE RELIEF TOOLS
*
TRUPACT – II

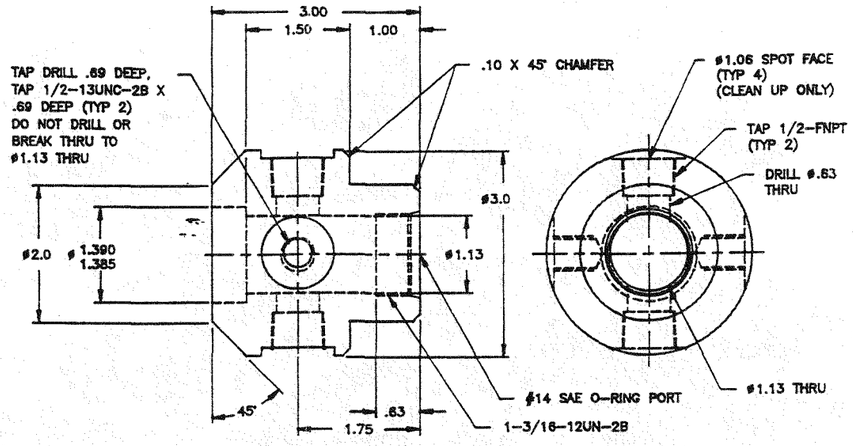
SCALE: AS NOTED | WT. N/A
REV: E | SHEET 2 OF 3
DWG SIZE: D | DWG NO. 2077-091

E 2077-091 2 3

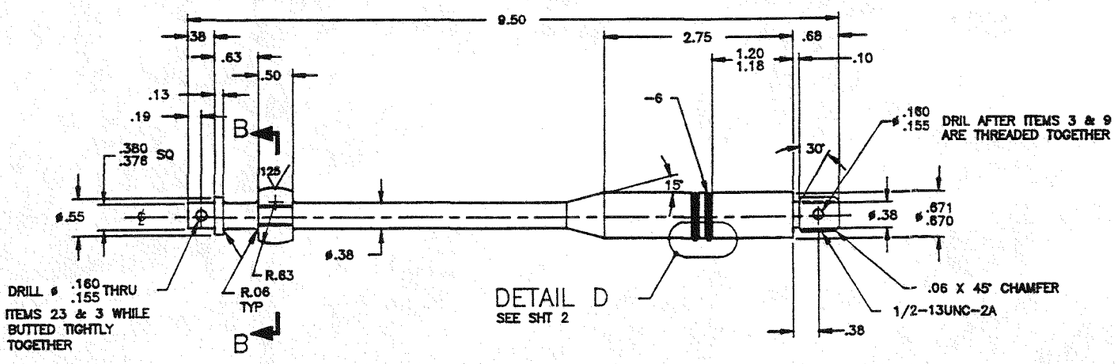
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
E	REDRAWN WITH CHANGE – SEE DCN		



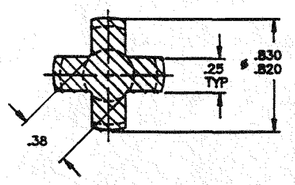
ASSEMBLY A1
SCALE 1/1



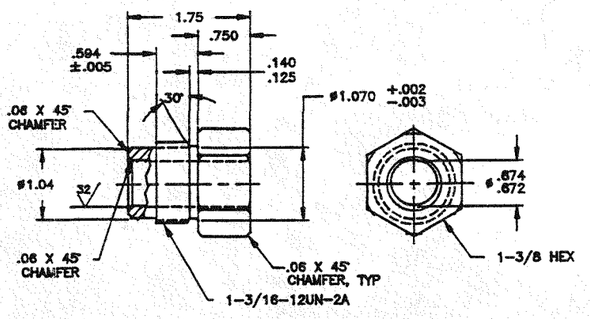
DETAIL ITEM 5 E
SCALE 1/1



DETAIL ITEM 3 E
SCALE 1/1



SECTION B–B
SCALE 2/1



DETAIL ITEM 8
SCALE 1/1

ITEM	QTY	NEXT ASSY
•	•	•

REL	CAROLYN CARMER	8/31/88
APPD	W HEINKEL	8/30/88
APPD	S. A. PORTER	8/31/88
APPD	H J WURSCH	8/30/88
APPD	W R BROWN by DLS	8/30/88
APPD	G J GUINN	8/30/88
APPD	M. RICHARDS	8/30/88
APPD	LARRY E. ULBRICHT	8/30/88
QA	JOE FRITH	8/30/88
CHECK	H. LEVITT	8/30/88
DRAWN	TOM LEMON	4/28/88

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ±

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

ICV & OCV VENT PLUG REMOVAL/PRESSURE RELIEF TOOLS

TRUPACT – II

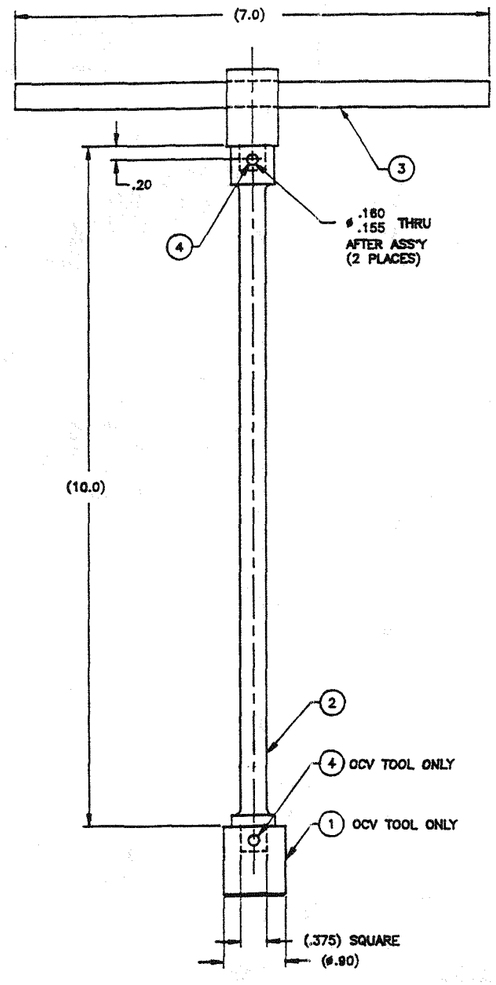
SCALE: AS NOTED | WT. N/A
REV: E | SHEET 3 OF 3
DWG SIZE: D
DWG NO. 2077-091

E 2077-091 3 3

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
C	REDRAWN WITHOUT CHANGE —	SEE	DCN

NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER MIL–STD–100 AND ANSI Y–14.5.
2. FABRICATE IN ACCORDANCE WITH NUPAC SPECIFICATION FS–01.
3. IDENTIFY ALL COMPONENTS, SUB–ASSEMBLIES, WLEDMENTS, ETC, DURING FABRICATION WITH A FELT TIP MARKER PER RDT–F7–3T–1969. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER AND DRAWING REVISION NUMBER. IDENTIFY ALL COMPLETED FABRICATED COMPONENTS, SUB–ASSEMBLIES, WELDMENTS, ETC, USING .25 INCH HIGH CHARACTER DIES. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER, DRAWING REVISION NUMBER AND A PROJECT UNIQUE SERIAL NUMBER (SUPPLIED BY NUPAC).
4. EQUIVALENT COMPONENTS AND/OR SOURCES OF SUPPLY MAY BE SUBSTITUTED UPON APPROVAL OF NUPAC ENGINEERING.
5. PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DIES, WELD FLUX, SPATTER, SCALE, GRIME, & ALL OTHER FOREIGN MATERIALS. FINISHED ASSEMBLY & ALL INTERIOR SURFACES SHALL BE CLEANED & VISUALLY OR WIPE TEST INSPECTED IN ACCORDANCE WITH ASTM–A380.
6. MATERIAL SIZES LISTED IN THE MATERIAL COLUMN ARE FOR REFERENCE ONLY. MANUFACTURER SHALL CONFIRM ACTUAL REQUIREMENTS PRIOR TO FABRICATION.



ASSEMBLY (A1)
OCV & ICV VENT PLUG TOOL

ITEM	QTY	NEXT ASSY	PART NO.	DESCRIPTION
		A1		OCV & ICV OUTER VENT PLUG REMOVAL/INSTALLATION TOOL ASSY.
1	1		ø43314	HEX 12 POINT SOCKET, 5/8" X 3/8" DRIVE — CRAFTSMAN
2	1		ø44262	EXTENSION BAR, 10" x 3/8" DRIVE — CRAFTSMAN
3	1		ø4428	SLIDE BAR, 7" x 3/8" DRIVE — CRAFTSMAN
4	2			EXTRA LIGHT SPIRAL PIN, 5/32 x 7/8 x XLCK — C.E.M. WEST SST

ASSEMBLY & QUANTITY — LIST OF MATERIAL

REL.			
APPD			
APPD			
APPD			
APPD			
APPD			
APPD			
APPD			
QA	JOE H. GUNNOE		5/28/96
CHECK	D.E. HILL		5/28/96
DRAWN	TOM LEMON		3/21/96

UNLESS OTHERWISE SPECIFIED: TOLERANCES: FRACTIONS ± 1/8, ANGLES ± 1°
DIMENSIONS ARE IN INCHES: 3 PLACE DECIMALS ± .010; 2 PLACE DECIMALS ± .03; 1 PLACE DECIMAL ± .1

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

OCV & ICV OUTER VENT PLUG REMOVAL & INSTALLATION TOOL

TROPACT — II

SCALE: 1/1 WT. 4.5 LBS
REV: C SHEET 1 OF 1
DWG SIZE: D
DWG NO. 2077–092

C 2077–092 1 1

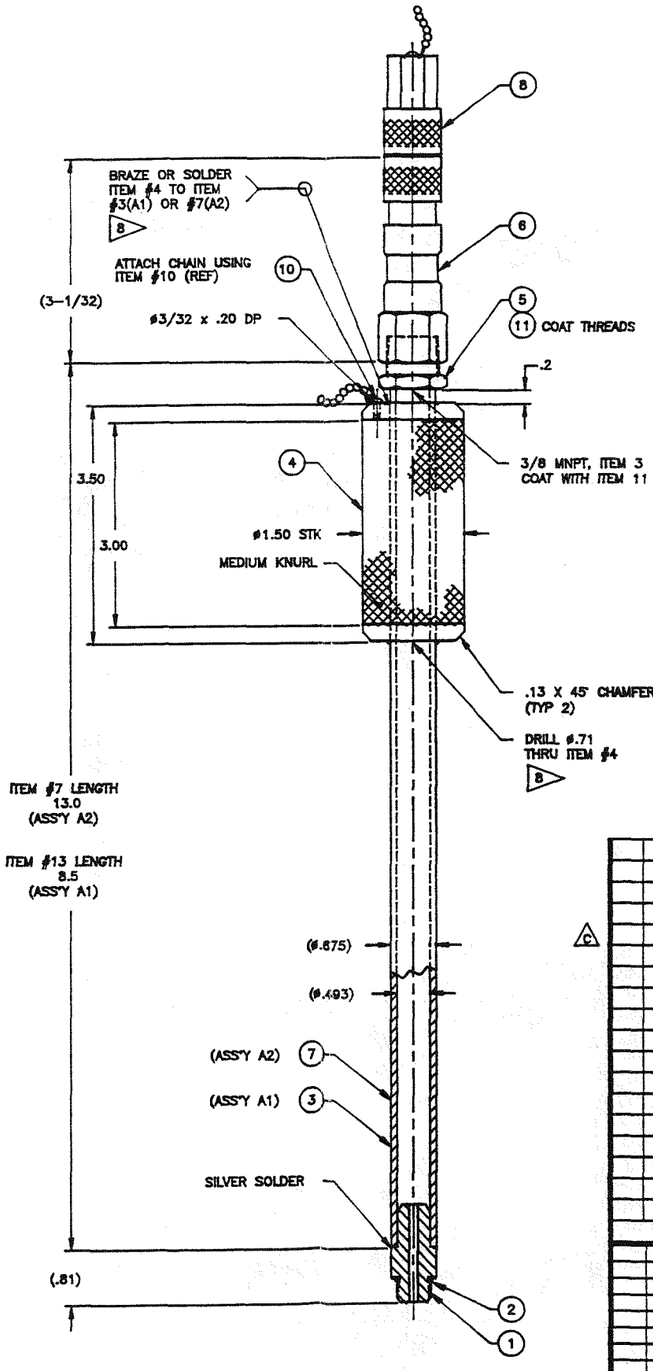
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
C	REDRAWN WITH CHANGE – SEE DCN		

NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER MIL–STD–100 AND ANSI Y–14.5.
2. FABRICATE IN ACCORDANCE WITH NUPAC SPECIFICATION FS–01.
3. IDENTIFY ALL COMPONENTS, SUB–ASSEMBLIES, WLEDMENTS, ETC, DURING FABRICATION WITH A FELT TIP MARKER PER RDT–F7–3T–1969. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER AND DRAWING REVISION NUMBER. IDENTIFY ALL COMPLETED FABRICATED COMPONENTS, SUB–ASSEMBLIES, WELDMENTS, ETC, USING .25 INCH HIGH CHARACTER DIES. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER, DRAWING REVISION NUMBER AND A PROJECT UNIQUE SERIAL NUMBER (SUPPLIED BY NUPAC).
4. EQUIVALENT COMPONENTS AND/OR SOURCES OF SUPPLY MAY BE SUBSTITUTED UPON APPROVAL OF NUPAC ENGINEERING.
5. MATERIAL SIZES LISTED IN THE MATERIAL COLUMN ARE FOR REFERENCE ONLY. MANUFACTURER SHALL CONFIRM ACTUAL REQUIREMENTS PRIOR TO FABRICATION.
6. PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DIES, WELD FLUX, SPATTER, SCALE, GRIME, & ALL OTHER FOREIGN MATERIALS. FINISHED ASSEMBLY & ALL INTERIOR SURFACES SHALL BE CLEANED & VISUALLY OR WIPE TEST INSPECTED IN ACCORDANCE WITH ASTM–A380.
7. ALL BRAZING PROCEDURES AND PERSONNEL SHALL BE QUALIFIED IN ACCORDANCE WITH ASME CODE, SECTION IX. BRAZING PROCEDURES AND BRAZER QUALIFICATIONS SHALL BE AVAILABLE FOR AUDIT OR REVIEW.

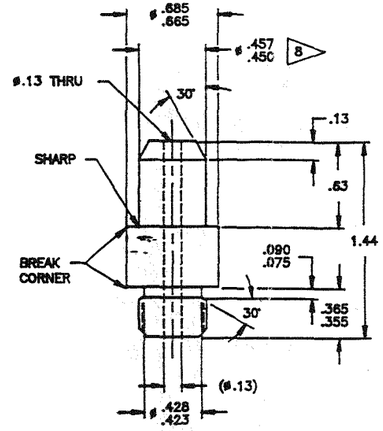
8 FIT KNURLED HANDLE (ITEM 4) AND THREADED FITTING (ITEM 1) TO TUBING (ITEM 3 OR 7) TO PROVIDE .0015/.0030 RADIAL CLEARANCE.

C OPTION: PROVIDE LIGHT PRESS FIT (FN1 PER ANSI B4.1) BETWEEN ITEM #4 & #3(A1) OR #7(A2). BRAZING OR SOLDERING OPTIONAL IF PROVIDING PRESS FIT.

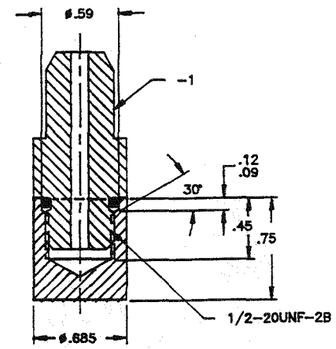


C ASSEMBLY A1 SCALE 1/1 AS NOTED

C ASSEMBLY A2 AS NOTED



DETAIL ITEM 1
SCALE 2/1



DETAIL ITEM 9 C
SCALE 2/1
ITEM #1 SHOWN FOR REF.

	A/R	A/R			
			11		TEFLON TAPE
	1	1	10		DRIVE SCREW, ø3/32 x 3/16 LONG — SST TYPE 304
C	1	1	9		RND BAR, ø11/16 x .8 LONG — BRASS UNS 36000, 1/2 HARD
	1	1	8	#SS–QC8–BP	QUICK CONNECT PLUG, 1/2 MALE x 11/16 HEX — SST SWAGELOK
	1		7		PIPE, 3/8 SCH 40 (.091 WALL THK) x 13.0 LONG — ASTM A312, TYPE 304
	1	1	6	#SS–QC8–B–BP	QUICK CONNECT, 1/2 FNPT x 1/2 SWAGELOK — SST SWAGELOK
	1	1	5	#312–8–6	BUSHING, 1/2 MNPT x 3/8 FNPT — WEATHERHEAD SST 316
	1	1	4		BAR, ø1.5 x 3.5 LONG — ASTM B211 6061–T6
		1	3		PIPE, 3/8 SCH 40 (.091 WALL THK) x 8.5 LONG — ASTM A312, TYPE 304
	1	1	2	#3–905	O–RING, BUNA–N — PARKER
	1	1	1		BAR, ø11/16 x 1.44 LONG — BRASS UNS 36000, FULL HARD
		X	A2		OCV SEAL LEAK CHECK TOOL
	X		A1		ICV SEAL LEAK CHECK TOOL
	A2	A1	ITEM	PART NO.	DESCRIPTION
			ASSEMBLY & QUANTITY		LIST OF MATERIAL

		ENG.	N J SHRAMACK
		APPD	
		APPD	G J GUNN
		APPD	N J MUNSCH
		APPD	R A JOHNSON
		APPD	W R BROWN
		APPD	D L SHRAMACK
		APPD	MARY E MUNSCH
		QA	JOE B. GIARDOTI
		CHECK	G.E. HILL
		DRAWN	TOM LEMON

ITEM	QTY	NEXT ASSY
•	•	•

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1°

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

ICV/OCV SEAL LEAK CHECK TOOLS
•
TRUPACT – II

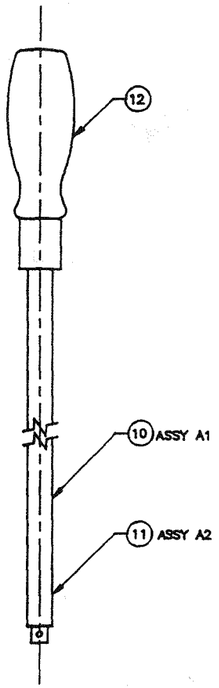
SCALE: AS NOTED | WT. 5.2 LBS
REV: C | SHEET 1 OF 1
DWG SIZE: D
DWG NO. 2077–093

C 2077–093 1 1

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
D	REDRAWN WITHOUT CHANGE —	SEE	DCN

NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER MIL–STD–100 AND ANSI Y–14.5.
2. REMOVED
3. IDENTIFY COMPONENTS USING VIBRO–ETCH OR DIE STAMP LETTERS. IDENTIFICATION SHALL CONSIST OF DRAWING NUMBER, APPLICABLE DASH NUMBER, AND DRAWING REVISION NUMBER.
4. EQUIVALENT COMPONENTS AND/OR SOURCES OF SUPPLY MAY BE SUBSTITUTED UPON APPROVAL OF NUPAC ENGINEERING.
5. REMOVED
6. REMOVED
7. REMOVED



OCV ASSEMBLY (A1)
SCALE 1/1

ICV ASSEMBLY (A2)

A2	A1	ITEM	PART NO.	DESCRIPTION	
			ASSEMBLY & QUANTITY	LIST OF MATERIAL	
	1	12	TM40A	SHORT SHANK DRIVER, 1/4 DRIVE, STD HANDLE	SNAP–ON
	1	11	TMX60	EXTENSION, 1/4 DRIVE, 6" LONG	SNAP–ON
	1	10	TMX140	EXTENSION, 1/4 DRIVE, 14" LONG	SNAP–ON
		9		REMOVED	
		8		REMOVED	
		7		REMOVED	
		6		REMOVED	
		5		REMOVED	
		4		REMOVED	
		3		REMOVED	
		2		REMOVED	
		1		REMOVED	
X		A2		ICV SEAL CHECK PORT PLUG INSTALLATION/REMOVAL TOOL	
	X	A1		OCV SEAL CHECK PORT PLUG INSTALLATION/REMOVAL TOOL	

REL	
APPD	
APPD	
APPD	
APPD	
APPD	
APPD	
APPD	
QA	
CHECK	
DRAWN	

ITEM	QTY	NEXT ASSY
°	°	°

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1°

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

ICV & OCV SEAL CHECK PORT PLUG INSTALLATION/REMOVAL TOOLS

TRIPACT – II

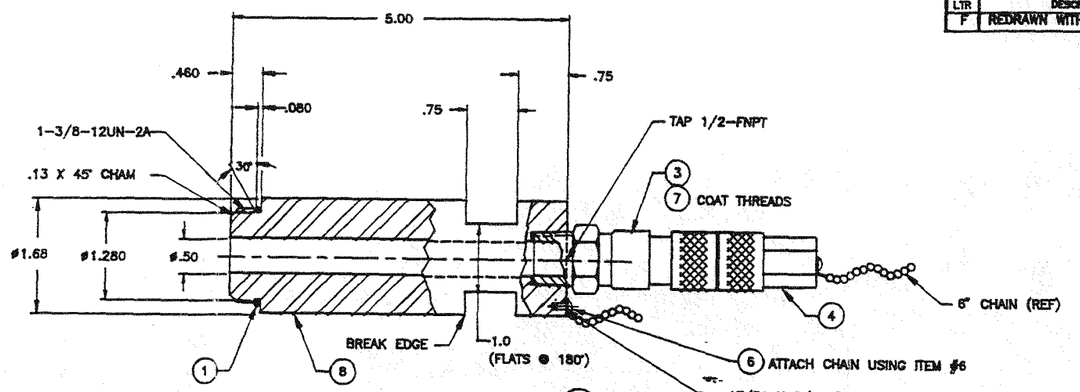
SCALE AS NOTED WT. 4.8 LBS
REV: D SHEET 1 OF 1
DWG SIZE D
DWG NO. 2077–094

D 2077–094 1 1

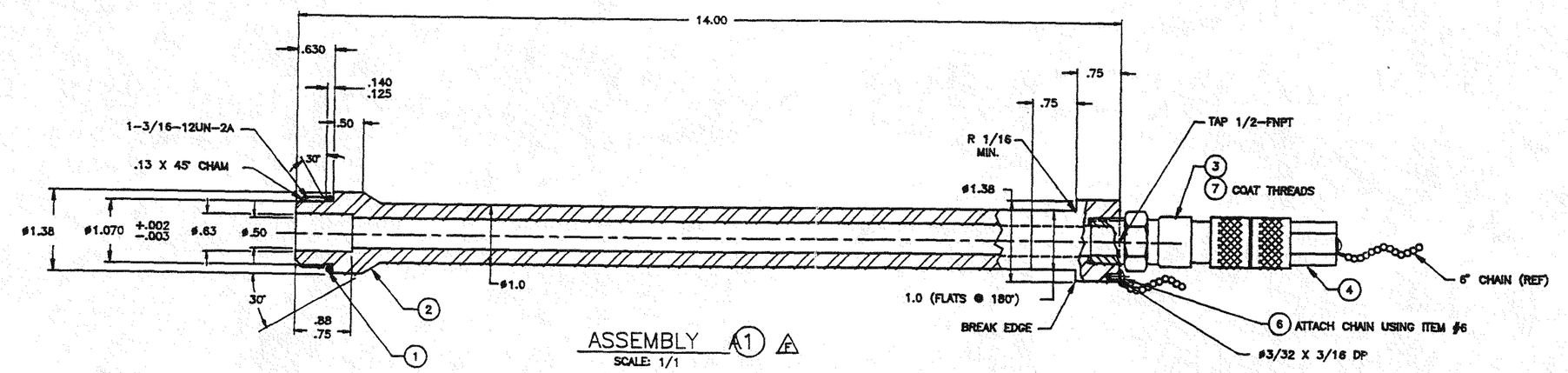
NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER MIL-STD-100 AND ANSI Y-14.5.
2. FABRICATE IN ACCORDANCE WITH NUPAC SPECIFICATION FS-01.
3. IDENTIFY ALL COMPONENTS, SUB-ASSEMBLIES, WLEDMENTS, ETC, DURING FABRICATION WITH A FELT TIP MARKER PER RDT-F7-3T-1969. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER AND DRAWING REVISION NUMBER. IDENTIFY ALL COMPLETED FABRICATED COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC, USING .25 INCH HIGH CHARACTER DIES. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER, DRAWING REVISION NUMBER AND A PROJECT UNIQUE SERIAL NUMBER (SUPPLIED BY NUPAC).
4. EQUIVALENT COMPONENTS AND/OR SOURCES OF SUPPLY MAY BE SUBSTITUTED UPON APPROVAL OF NUPAC ENGINEERING.
5. PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DIES, WELD FLUX, SPATTER, SCALE, GRIME, & ALL OTHER FOREIGN MATERIALS. FINISHED ASSEMBLY & ALL INTERIOR SURFACES SHALL BE CLEANED & VISUALLY OR WIPE TEST INSPECTED IN ACCORDANCE WITH ASTM-A380.
6. MATERIAL SIZES LISTED IN THE MATERIAL COLUMN ARE FOR REFERENCE ONLY. MANUFACTURER SHALL CONFIRM ACTUAL REQUIREMENTS PRIOR TO FABRICATION.

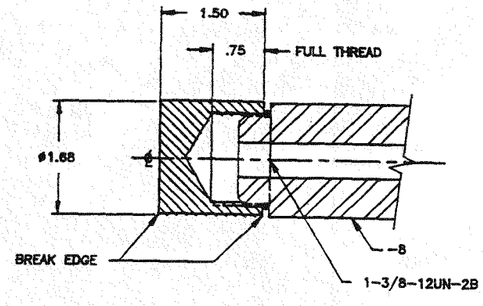
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
F	REDRAWN WITH CHANGE -- SEE DCN		



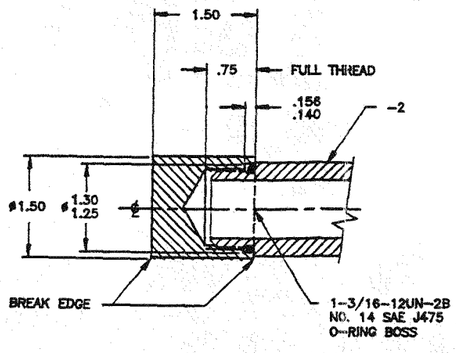
ASSEMBLY A2 (F)
SCALE: 1/1



ASSEMBLY A1 (F)
SCALE: 1/1



DETAIL ITEM 9
SCALE 1/1
ITEM -8 SHOWN FOR REF.



DETAIL ITEM 5
SCALE 1/1
ITEM -2 SHOWN FOR REF.

		ITEM	PART NO. / ASSEMBLY & QUANTITY	DESCRIPTION / LIST OF MATERIAL
		10		REMOVED
1		9		RND BAR, ø1.5 X 1.5 LONG — BRASS UNS 36000, 1/2 HARD
1		8		CORED BRONZE BAR, 1/2" I.D. X 1-1/2" O.D. X 5.00 — SAE 660
AR	AR	7		TEFLON TAPE
1	1	6		DRIVE SCREW ø3/32 X 3/16 LONG — SST TYPE 304
	1	5		RND BAR, ø1.5 X 1.50 LONG — BRASS UNS 36000, 1/2 HARD
1	1	4	ø SS-QC8-BP	QUICK CONNECT PLUG 1/2" MALE X 11/16" HEX HD SST — SWAGELOK
1	1	3	ø SS-QC8-8-8PM	QUICK CONNECT 1/2" FEMALE SWAGELOK X 1/2 MNPT — SST
	1	2		CORED BRONZE BAR, 1/2" I.D. X 1-1/2" O.D. X 14.00 — SAE 660
1	1	1	AS-568-914	O-RING BUNA-N — NATIONAL
X		A2		ICV LEAK DETECTION TOOL
	X	A1		OCV LEAK DETECTION TOOL
A2	A1	ITEM	PART NO. / ASSEMBLY & QUANTITY	DESCRIPTION / LIST OF MATERIAL

REL	R J SHANNACK	5-25-95	
APPD			
APPD	G J GUNN	5/25/95	
APPD	R J WORSCH	5/25/95	
APPD	R A JOHNSON	5/25/95	
APPD	W R BROWN	5/25/95	
APPD	-- D L SHANNACK	5/25/95	
APPD	LARRY E WRIGHT	5/25/95	
QA	JOE R. CLAMBOTI	5/25/95	
CHECK	G.E. HILL	5/25/95	
DRAWN	TOM LEMON	5/25/95	

ITEM | QTY | NEXT ASSY

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1°
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

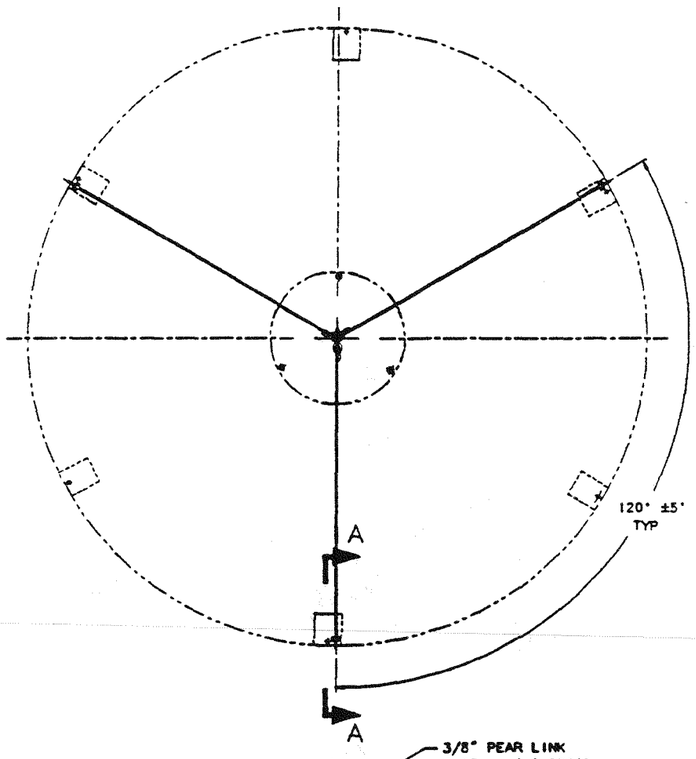
NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

ICV/OCV LEAK DETECTION TOOL
TRUPACT -- II

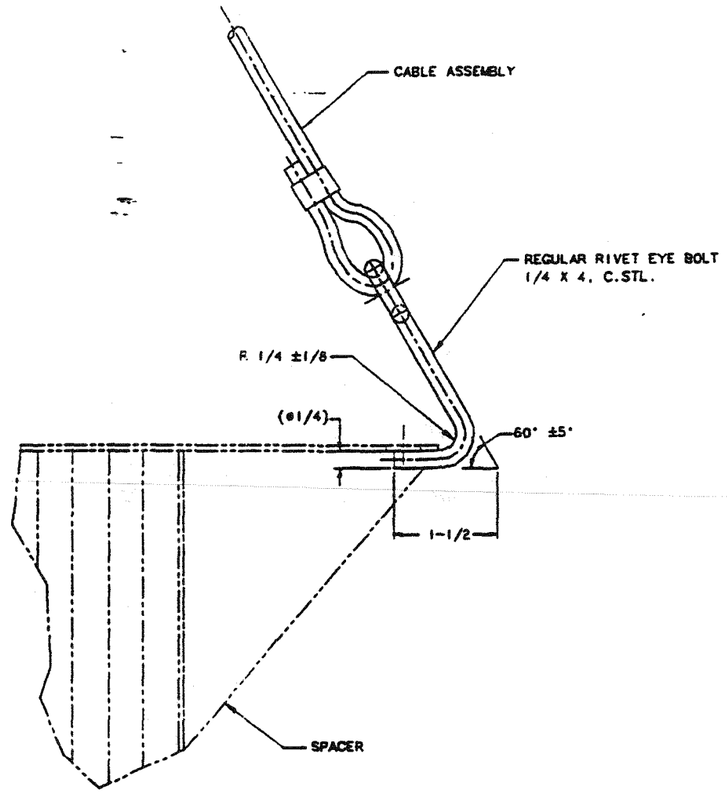
SCALE: NOTED | WT. N/A
REV: F | SHEET 1 OF 1
DWG SIZE: D
DWG NO. 2077-095

F 2077-095 1 1

REVISION HISTORY		
REV	DESCRIPTION	DATE



SPACER REMOVAL SLING ASSEMBLY



SECTION A-A
SCALE: FULL

			CHECK		
ITEM	QTY	NEXT ASSY	DRAWN M. RICHARDS		12-6-91

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1°
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

PANTEX NUCLEAR SYSTEMS
Pantex Production, Inc.

DETAIL & ASSEMBLY
SPACER REMOVAL SLING
TRUFACT-II

Replaces
2077-096 Rev B

SCALE: 1/8	WT. N/A
REV: NONE	SHEET 1 OF 1

DWG NO.
D SK-1104

9 SK-1104 SH 1 OF 1

REVISION HISTORY		
REV	DESCRIPTION	DATE

NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER ANSI Y14.5.
2. NOT USED
3. ALL WELDING PROCEDURES AND PERSONNEL SHALL BE QUALIFIED IN ACCORDANCE WITH AWS D1.1 OR ASME CODE, SECTION IX. (ALL STAINLESS STEEL MATERIAL WELDING SHALL BE PERFORMED PER ASME CODE, SECTION IX.) WELD PROCEDURES AND WELDER QUALIFICATIONS SHALL BE AVAILABLE FOR AUDIT OR REVIEW.
4. ALL WELDS SHALL BE VISUALLY EXAMINED IN ACCORDANCE WITH AWS D1.1, SECTION 8.15.1. VISUAL WELD INSPECTORS SHALL BE QUALIFIED PER AWS D1.1.
5. SURFACE PREPARATION PER SSPC-SP-6.
6. FINISH PAINT ALL CARBON STEEL SURFACES AFTER LOAD TEST WITH HIGH QUALITY, INDUSTRIAL ENAMEL, COLOR-WHITE. APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
7. EQUIVALENT COMPONENTS AND/OR SOURCES OF SUPPLY MAY BE SUBSTITUTED UPON APPROVAL OF CUSTOMER ENGINEERING.
8. PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DYES, WELD FLUX, SPLATTER, SCALE, GRIME AND ALL OTHER FOREIGN MATERIALS. FINISHED ASSEMBLY AND ALL INTERIOR AREAS SHALL BE CLEANED AND VISUALLY INSPECTED TO VERIFY THAT ALL SURFACES ARE FREE OF PARTICLES OR LIQUIDS.
9. MATERIAL SIZES LISTED IN THE MATERIAL COLUMN ARE FOR REFERENCE ONLY. MANUFACTURER SHALL CONFIRM ACTUAL REQUIREMENTS PRIOR TO FABRICATION.
10. LIFT FIXTURE WITH ITEMS 5 AND 63 SHALL BE LOAD TESTED IN ACCORDANCE WITH SPECIFICATION NUMBER LOT-70
11. WELDS SHALL BE MAGNETIC PARTICLE INSPECTED ON FINAL PASS IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000 AND SECTION V, ARTICLE 7. BEFORE AND AFTER LOAD TEST.
12. ALL FASTENERS AND WASHERS, 1/4 INCH OR GREATER DIAMETER SHALL BE ZINC OR CADMIUM PLATED. DO NOT PLATE ITEMS 44 & 45 SET SCREWS, AND ITEMS 46, 47 & 48 KEYSTOCK.
13. ASSEMBLE EXTENSION SHAFT TO GEAR REDUCER OUTPUT SHAFT WITH NO CLEARANCE GAP WHEN INSTALLING RIGID SLEEVE SLEEVE COUPLING (ITEM 67).
14. WITH LEG TURNING SLEEVE ITEM 6 POSITIONED UP AGAINST LIFT FRAME (ITEM 1), INSTALL ITEM 10 PROVIDING THE . CLEARANCE AS NOTED.
15. STENCIL 'LIFT CAPACITY' AND '10,000 LBS.' AS SHOWN USING 1 1/2' HIGH CHARACTERS. STENCIL WITH HIGH QUALITY INDUSTRIAL ENAMEL, COLOR-BLACK. APPLY PER MANUFACTURER'S INSTRUCTIONS.
16. EQUIPMENT SHALL BE PERFORMANCE TESTED IN ACCORDANCE WITH PROCEDURE PT-84.
17. NOT USED
18. IDENTIFY ALL COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC., DURING FABRICATION WITH A LOW CHLORIDE CONTENT FELT TIP MARKER. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER AND DRAWING REVISION NUMBER. IDENTIFY ALL COMPLETED FABRICATED COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC., USING .25 INCH CHARACTER DIES OR VIBRO ETCHING AS APPROPRIATE TO COMPONENT SIZE AND CONFIGURATION. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER, DRAWING REVISION NUMBER AND A PROJECT UNIQUE SERIAL NUMBER, (SUPPLIED BY CUSTOMER).
19. SHIM UNDER ITEM 16 AS REQ'D USING ITEM 41 WASHERS SINGLY OR IN PAIRS AT EACH ITEM 40 LOCATION TO ACHEIVE A NON-CONTACT NOMINAL ENGAGEMENT OF THE BEVEL GEAR TEETH.
20. COAT THREADS WITH LOCTITE #262 PRIOR TO FINAL ASSEMBLY.
21. COAT WITH CORROSION RESISTANT PLATING PRIOR TO FINAL ASSEMBLY.
22. STENCIL WITH 4-INCH HIGH LETTERING USING STANDARD INDUSTRIAL ENAMEL, COLOR:BLACK, TYPICAL LETTERS NEAR AND FAR SIDE, TOP AND OUTSIDE SURFACES APPROX. AS SHOWN.
23. METAL STAMP '180', 1/4-INCH HIGH LETTERS APPROX. AS SHOWN.
24. PUNCH TWO CENTER PUNCH MARKS ON PLATFORM (ITEM #2) APPROX. AS SHOWN.
25. SCRIBE 3/4-INCH LONG MARK ON COUNTERWEIGHT APPROX. 1/4-INCH FROM BOTTOM OF COUNTERWEIGHT.
26. LOAD TEST SCREW PIN SHACKLE IN ACCORDANCE WITH SPECIFICATION NUMBER LOT-0081-NP.
27. ITEM 67 SHALL BE ZINC OR CADMIUM PLATED.
28. METAL STAMP '360', 1/4-INCH HIGH LETTERS APPROX. AS SHOWN.
29. HEX HEAD BOLTS SHALL MEET REQ'MTS OF SAE STANDARD J429, GRADE 5 OR BETTER.
30. HEX NUTS SHALL MEET REQ'MTS OF SAE STANDARD J995, GRADE 5 OR BETTER.
31. SOCKET HEAD CAP SCREWS SHALL MEET REQ'MTS OF ASTM STANDARD A574.
32. ADJUST THE RETAINER ANGLE ON ITEM 3 AND ITEM 4 COUNTERWEIGHTS ON FINAL ASSEMBLY TO CLEAR THE LOWER SURFACE OF THE ITEM 2 TURNTABLE 1/8 TO 3/16 INCH.
33. POSITION ITEM 72 ON ITEM 8 TO ACHIEVE A NON-CONTACT NOMINAL ENGAGEMENT OF THE BEVEL GEAR TEETH.

AR	50	38050	ADHESIVE, BLACK MAX	LOCKTITE
2	49		RUBBER PAD, 1/2 THK X 1.0 X 2.0, 40±5 DUROMETER	NEOPRENE
2	48		KEYSTOCK, 3/16" X 3/16" X 1"LG	C.STL.
4	47		KEYSTOCK, 3/16" X 3/16" X 2"LG	C.STL.
2	46		KEYSTOCK, 3/16" X 3/16" X 1 1/2"LG	C.STL.
2	45		SET SCREW, #10-24UNC X 1/4"LG., CUP POINT	COMM.STD.
4	44		SET SCREW, 5/16-18UNC X 3/4"LG., CUP POINT	COMM.STD.
8	43		SOCKET HD CAP SCREW, #10-24UNC-2A X 3/4"LG	SAE GRD 8
4	42		SOCKET HD CAP SCREW, 3/8-16UNC-2A X 1 1/2"LG	SAE GRD 8
20	41		FLATWASHER, 1/4"	C.STL.
4	40		HEX HD BOLT, 1/4-20UNC-2A X 1"LG	SAE GRD 5
12	39		HEX NUT, 3/8-16UNC-2B	SAE GRD 5
8	38		LOCKWASHER, 3/8"	C.STL.
8	37		HEX HEAD BOLT, 3/8-16UNC-2A X 4 3/4 (+1/4,-0) LG	SAE GRD 5
21	36		HEX NUT, 5/8-11UNC-2B	SAE GRD 5
16	35		LOCKWASHER, 5/8"	C.STL.
12	34		HEX HD BOLT, 5/8-11UNC-2A X 9 1/2"LG	SAE GRD 5
13	33		HEX HD BOLT, 5/8-11UNC-2A X 1 1/2"LG	SAE GRD 5
3	32	1792-B	GREASE FITTING, STRAIGHT, 1/4-28 UNF.	ALEMITE
1	31	G-209	SCREW PIN ANCHOR SHACKLE, 8 1/2 TON	CROSBY
1	30	3000-X237	SNAP RING, INTERNAL	IND. RETAINING RING CO.
1	29	BH-19LS	BEARING, SPHERICAL	MORSE
8	28		SOCKET HD SCREW, #4-40UNC-2B X 1/2 LG	C.STL
3	27	SP-A-6415 (AC)	LINEAR ACTUATOR, 12" STROKE	DUFF-NORTON
4	26	1635 DS	BEARING, 1 3/4"O.D. X 3/4"I.D.	NICE
2	25	TT1X	TORQUE TENDER, 1/2 BORE X 5/8 BORE, 20 IN-LB RELEASE	ZERO-MAX
2	24	2014-064-22	SLEWING RING	
2	23	2014-064-20	BEVEL GEAR	
2	22	FHP18	BUSHING, 1/2"O.D X 1/4"I.D.	BROWNING
2	21	2CVDMW, ASSY W/-LB CEILING MOUNT	GEAR MOTOR, DOUBLE REDUCTION, 750:1, 1/4 HP, 1Ø 115 VAC MOTOR	WINSMITH
1	20	2014-420-A2	DC ELECTRICAL JUNCTION BOX ASSEMBLY (INCLUDES LVLT SENSORS & TRANSDUCERS)	
1	19	2014-420-A1	AC ELECTRICAL JUNCTION BOX ASSEMBLY	
2	18	2014-064-16	BEVEL GEAR	
	17		NOT USED	
1	16	2014-064-11	ENCODER MOUNTING ANGLE BRACKET (SHORT)	
	15		NOT USED	
2	14	2014-064-9	MOTOR MOUNTING PLATE	
2	13	89-500-19-03	SPUR GEAR, .75 DIA BORE X 3/16 KEYWAY	DEFONTAINE
1	12	2014-064-7	LONG SHAFT	
1	11	2014-064-6	SHORT SHAFT	
3	10	2014-064-5	RING PLATE	
2	9	2014-064-A5	STOP ANGLE WELDMENT	
1	8	2014-064-A4	TALL BEARING SUPPORT	
1	7	2014-064-A3	SHORT BEARING SUPPORT	
3	6	2014-064-A2	LIFT LEG TURNING SLEEVE WELDMENT	
3	5	2014-064-A1	LONG LIFT LEG WELDMENT	
1	4	2014-063-A1	LOWER COUNTERWEIGHT ASSEMBLY	
1	3	2014-063-A2	UPPER COUNTERWEIGHT ASSEMBLY	
1	2	2014-062-A1	UPPER STRUCTURE TURNTABLE WELDMENT	
1	1	2014-061-A1	LIFT FRAME WELDMENT	
X	A1		(ACG) LIFT FIXTURE ASSEMBLY	
A1	ITEM	PART NO.	DESCRIPTION	
		ASSEMBLY & QUANTITY	LIST OF MATERIAL	

4	76		SOCKET HEAD SCREW, #4-40UNC-2B X 5/8 LG	C.STL.
2	75		FLATWASHER, 1/4" X .50 O.D. (TYPE B, NARROW)	C.STL.
2	74		HEX HD BOLT, 1/4-20UNC-2B X 3/4" LG	SAE GRD 8
1	73	2014-064-30	ENCODER MOUNTING PLATE	C.STL.
1	72	2014-064-A7	ENCODER MOUNTING BRACKET (TALL)	C.STS.
4	71	2014-064-27	MOTOR MOUNTING SPACER	C.STL.
4	70	2SSC75	CLAMP, SPLIT, STAINLESS STEEL	BOSTON
12	69		LOCKWASHER, #4 NOM.	C.STL.
4	68		RUBBER PAD, 1/2 THK X 2.0 X 2.0, 40±5 DUROMETER	NEOPRENE
2	67	CS-12K	COUPLING, 3/4 I.D. X 1-1/2 O.D. X 2.0 LG W/ KEYSEAT	BOSTON
4	66		NOT USED	
2	65		NOT USED	
24	64	18860	THRUST WASHER, 3/4" I.D. X 1 3/8" O.D. X 1/8"THK.	BOSTON
3	63	2014-064-A6	SHORT LIFT LEG WELDMENT	
3	62	LT1504-C6-12	LANYARD, 1/8" VINYL COATED CABLE W/CLIP, 12" LG	AVIBANK
	61		NOT USED	
	60		NOT USED	
7	59		DRIVE SCREW, #7 X 3/8", TYPE U	C.STL.
8	58		FLATWASHER, 5/16"	C.STL.
8	57		HEX HD BOLT, 5/16-18UNC-2A X 1"LG	SAE GRD 5
8	56		LOCKNUT, NYLOCK, 5/16-18UNC-2B	SAE GRD 2
6	55		LOCKNUT, NYLOCK, 3/4-10UNC-2B	SAE GRD 2
6	54		HEX HD BOLT, 3/4-10UNC-2A X 3-1/2"LG	SAE GRD 5
1	53	2014-2000-1	NAME PLATE	S.STL
3	52	92384A098	BALL LOCK PIN, RING HANDLE, 1/2"DIA. X 3"GRIP	McMASTER CARR
24	51	2014-064-21	SPACER	
A1	ITEM	PART NO.	DESCRIPTION	
		ASSEMBLY & QUANTITY	LIST OF MATERIAL	

THIS AS-BUILT DRAWING WAS PREPARED USING MoPac DRAWING 2150-060-A8 AS A BASELINE, AND REFLECTS THE MANUFACTURING AND MATERIAL CHANGES FROM AR/MR's GENERATED FROM WESTINGHOUSE PROCUREMENT.

AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
TOP ASSEMBLY
EQUIP. NO. 162-T-001, 002, 003

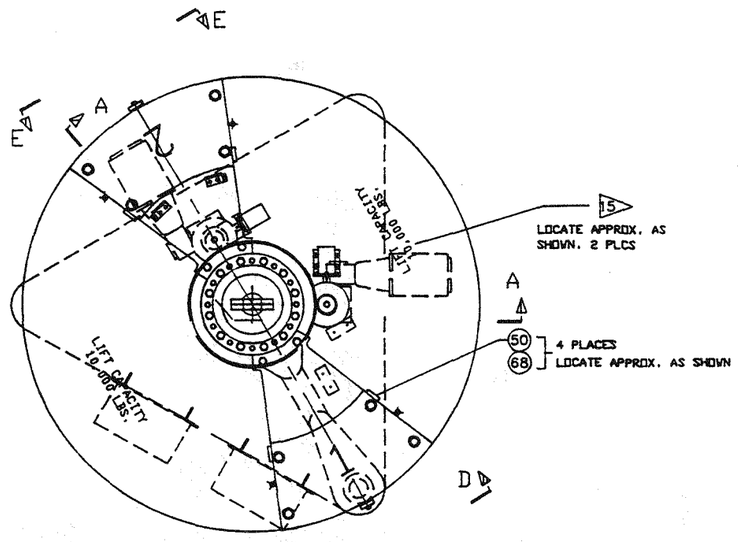
ITEM	QTY	NEXT ASSY	CHECK	D L SWANSON	5-25-99
			DRAWN	WEST	6-10-99

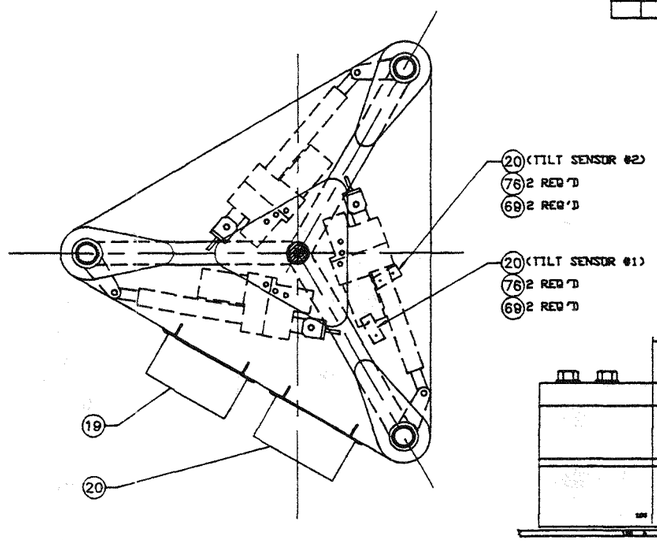
UNLESS OTHERWISE SPECIFIED TOLERANCES: FRACTIONS ± 1/8, ANGLES ± 1/2°
DIMENSIONS ARE IN INCHES: 3 PLACE DECIMALS ± .010; 2 PLACE DECIMALS ± .02; 1 PLACE DECIMAL ± .1

SCALE	NONE	WT.	2500
REV		SHEET	1 OF 3
SIZE	DWG NO.		
D	2014-060		

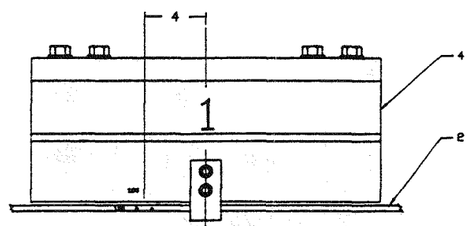
CU14-060 SH 1 OF 3

REVISION HISTORY		
REV	DESCRIPTION	DATE

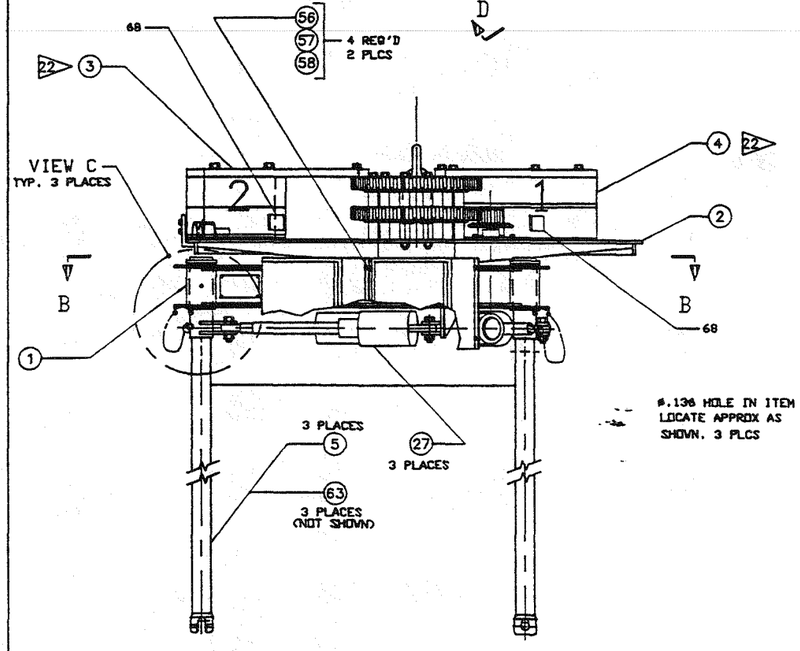




SECTION B-B

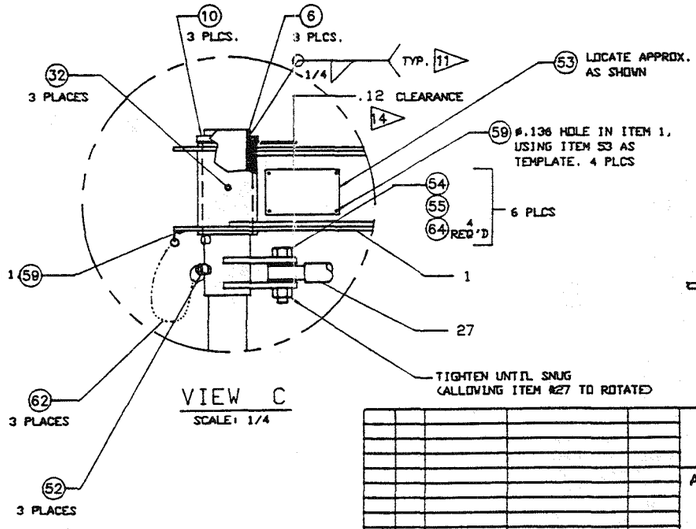


VIEW D-D 22 23 24 25 32
(#1 WEIGHT)
SCALE: 1/4

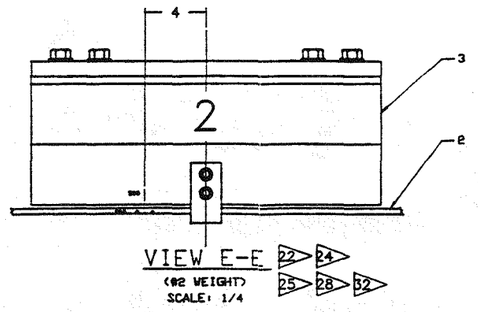


ASSEMBLY (A1)

(COUNTERWEIGHTS ROTATED FOR CLARITY)



VIEW C
SCALE: 1/4



VIEW E-E 22 24 25 28 32
(#2 WEIGHT)
SCALE: 1/4

ITEM	QTY	NEXT ASSY

CHECK	D L STANNARD	3-03-99
DRAWN	WCET	9-10-99

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1/2°
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

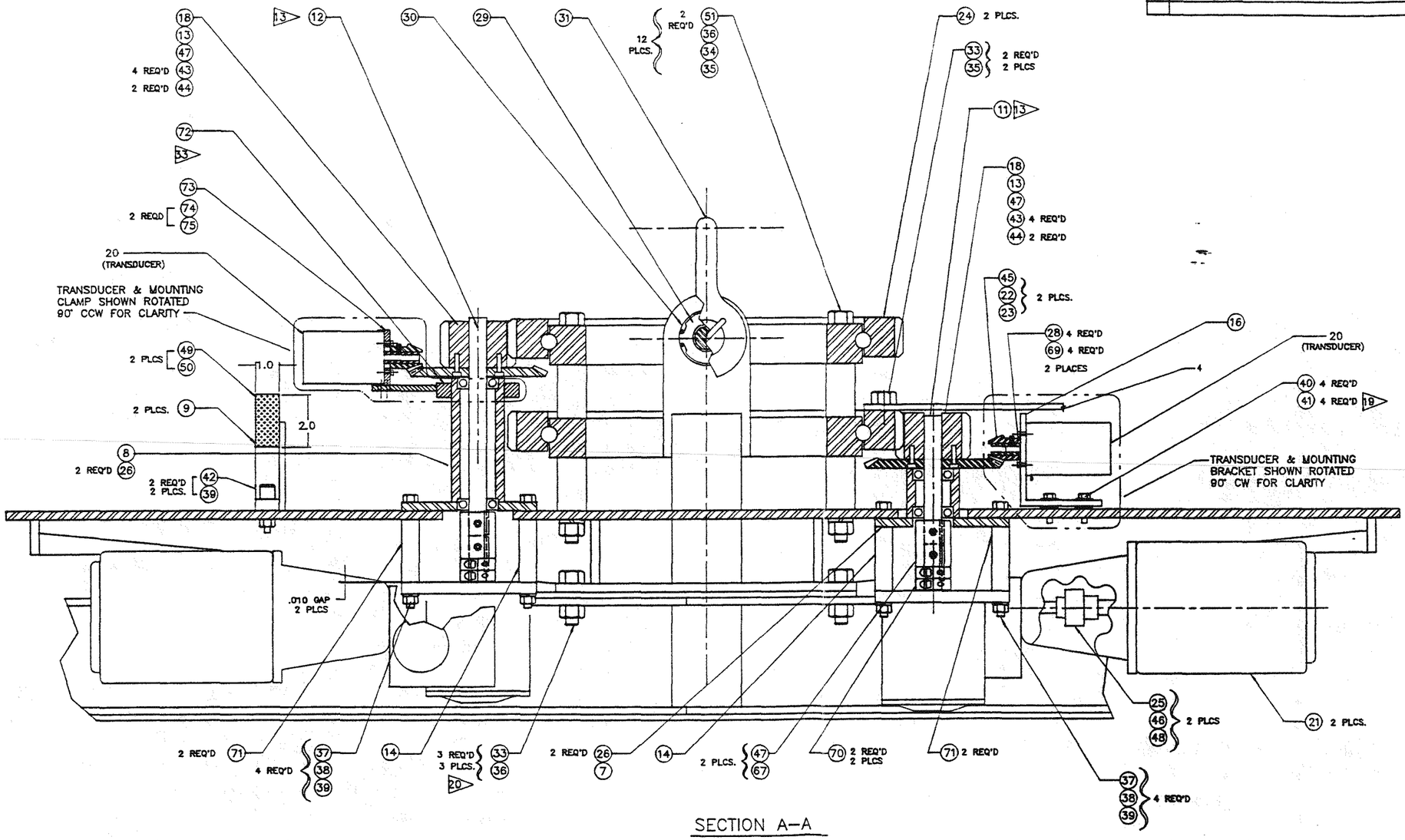
AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
TOP ASSEMBLY
EQUIP. NO. 162-T-001, 002, 003

SCALE:	1/8	WT.	N/A
REV		SHEET	2 OF 3
DWG SIZE	D	DWG NO.	2014-060

2014-060 H2 E03

REVISION HISTORY		
REV	DESCRIPTION	DATE



SECTION A–A

				CHECK	D L SWEENCE 5-05-03
ITEM	QTY	NEXT ASSY		DRAWN	WEST 5-16-03

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1/2

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

AS–BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
TOP ASSEMBLY
EQUIP. NO. 162–T–001, 002, 003

-

SCALE:	1/2	WT.	N/A
REV:		SHEET	3 OF 3
CAGE SIZE	D	DWG NO.	2014–060

2014–060 SH 3 OF 3

REVISION HISTORY		
REV	DESCRIPTION	DATE

NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER ANSI Y14.5.
2. NOT USED
3. ALL WELDING PROCEDURES AND PERSONNEL SHALL BE QUALIFIED IN ACCORDANCE WITH AWS D1.1 OR ASME CODE, SECTION IX. (ALL STAINLESS STEEL MATERIAL WELDING SHALL BE PERFORMED PER ASME CODE, SECTION IX.) WELD PROCEDURES AND WELDER QUALIFICATIONS SHALL BE AVAILABLE FOR AUDIT OR REVIEW.
4. ALL WELDS SHALL BE VISUALLY EXAMINED IN ACCORDANCE WITH AWS D1.1, SECTION 8.15.1. VISUAL WELD INSPECTORS SHALL BE QUALIFIED PER AWS D1.1.
5. SURFACE PREPARATION PER SSPC-SP-6.
6. EQUIVALENT COMPONENTS AND/OR SOURCES OF SUPPLY MAY BE SUBSTITUTED UPON APPROVAL OF CUSTOMER ENGINEERING.
7. PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DYES, WELD FLUX, SPLATTER, SCALE, GRIME AND ALL OTHER FOREIGN MATERIALS. FINISHED ASSEMBLY AND ALL INTERIOR AREAS SHALL BE CLEANED AND VISUALLY INSPECTED TO VERIFY THAT ALL SURFACES ARE FREE OF PARTICLES OR LIQUIDS.
8. MATERIAL SIZES LISTED IN THE MATERIAL COLUMN ARE FOR REFERENCE ONLY. MANUFACTURER SHALL CONFIRM ACTUAL REQUIREMENTS PRIOR TO FABRICATION.
9. WELDS SHALL BE MAGNETIC PARTICLE INSPECTED ON FINAL PASS IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION I, SUBSECTION NB, ARTICLE NB-6000 AND SECTION V, ARTICLE 7. BEFORE AND AFTER LOAD TEST.
10. CUT BRONZE BUSHING 6.0" LONG. PROVIDE LIGHT DRIVE FIT PER ANSI B4.1 FN1, BETWEEN ITEM #7 AND ITEM #11. FIT BUSHING INTO ITEM #7 FLUSH WITH TOP SURFACE. PROVIDE 3/16" DIA. HOLE THRU BUSHING AT GREASE FITTING HOLE. (IF I.D. OF ITEM #7 IS INSUFFICIENT FOR PRESS FIT, SUBSTITUTE BOSTON BUSHING #M4856-48 (3 1/2"O.D.) AND MACHINE TO FIT.)
11. MACHINE INSIDE DIA. OF ITEM #11 TO PROVIDE .002-.006 CLEARANCE BETWEEN I.D. OF ITEM #11 AND O.D OF 2014-064-A2.
12. IDENTIFY ALL COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC., DURING FABRICATION WITH A LOW CHLORIDE CONTENT FELT TIP MARKER. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER AND DRAWING REVISION NUMBER. IDENTIFY ALL COMPLETED FABRICATED COMPONENTS, SUB-ASSEMBLYS, WELDMENTS, ETC., USING .25 INCH CHARACTER DIES OR VIBRO ETCHING AS APPROPRIATE TO COMPONENT SIZE AND CONFIGURATION. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER, DRAWING REVISION NUMBER AND PROJECT UNIQUE SERIAL NUMBER, (SUPPLIED BY CUSTOMER).
13. FINISH PAINT ALL CARBON STEEL SURFACES AFTER LOAD TEST WITH HIGH QUALITY, INDUSTRIAL ENAMEL, COLOR-WHITE. APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTION.
14. LIFTING FIXTURE SHALL BE LOAD TESTED IN ACCORDANCE WITH SPECIFICATION NUMBER LOT-70.

THIS AS-BUILT DRAWING WAS PREPARED USING InFox DRAWING 2150-001-A0 AS A BASELINE, AND REFLECTS THE MANUFACTURING AND MATERIAL CHANGES FROM AR/VR's GENERATED FROM WESTINGHOUSE PROCUREMENT.

A2	A1	ITEM	PART NO.	DESCRIPTION	
			ASSEMBLY & QUANTITY	LIST OF MATERIAL	
	X	3	A2	ACTUATOR BASE PIVOT WELDMENT	
	X		A1	LIFT FRAME WELDMENT	
		1	3	PLATE, 3/8"THK X 17.6" X 19.7"	ASTM A36
		4	8	ANGLE, 2 1/2" X 2 1/2" X 3/16" X 12.0" LG	ASTM A36
		3	7	ROUND TUBE, 3 7/8"O.D. X 3 3/8"I.D. X 8.3" LG.	AISI 1020/1026
		1	6	ROUND BAR, 3.0 O.D. X 13.0" LG.	AISI 1018
		1	5	PLATE, 1 1/2"THK X 3.8" X 7.3"	ASTM A36
		3	4	PLATE, 3/8"THK X 7.0" X 15.0"	ASTM A36
		1	3	PLATE, 3/8"THK X 17.6" X 19.7"	ASTM A36
		1	2	PLATE, 3/8"THK X 49.0" X 55.5"	ASTM A36
		3	1	STANDARD BEAM, S5 X 10.0 X 28.0"	ASTM A36
		2		PLATE, 3/8"THK X 2.5" X 2.6"	ASTM A36
		3	11	M4854-64 BRONZE BUSHING, 3 3/8"O.D. X 3.0"I.D.	BUNTING
		1	10	PLATE, 3/8"THK X 2.0" X 4.2"	ASTM A36
		1	9	PLATE, 3/8"THK X 2.5" X 4.5"	ASTM A36

10

2014-001 REV 1 SH 1 OF 3

A1	1	2014-060-A1	CHECK D L SVANWICK	8-05-90
ITEM	QTY	NEXT ASSY	DRAWN WEST	8-10-90

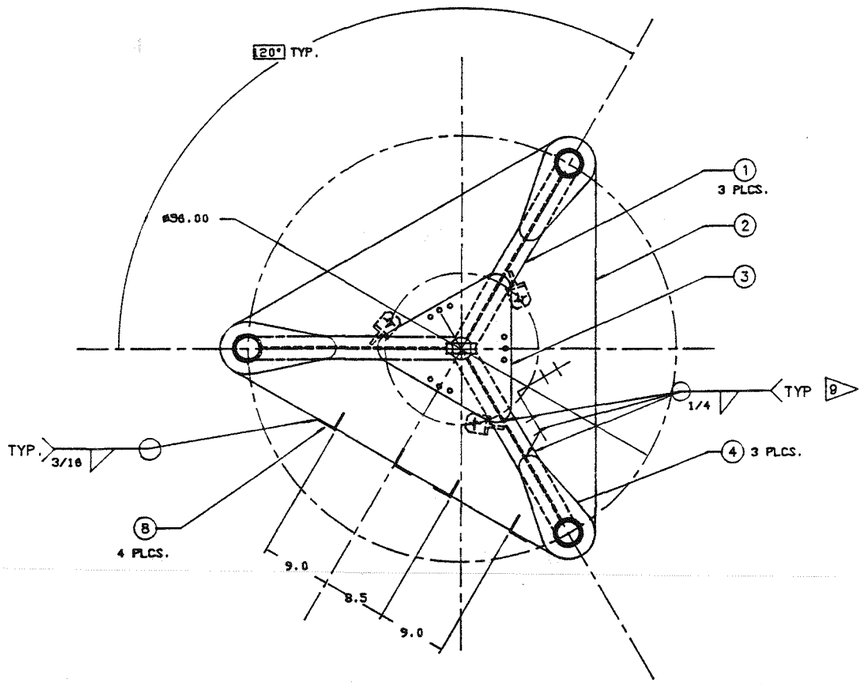
UNLESS OTHERWISE SPECIFIED TOLERANCES: FRACTIONS ± 1/8, 1/2"; ANGLES ±
DIMENSIONS ARE IN INCHES: 3 PLACE DECIMALS ± .010; 2 PLACE DECIMALS ± .03; 1 PLACE DECIMAL ± .1

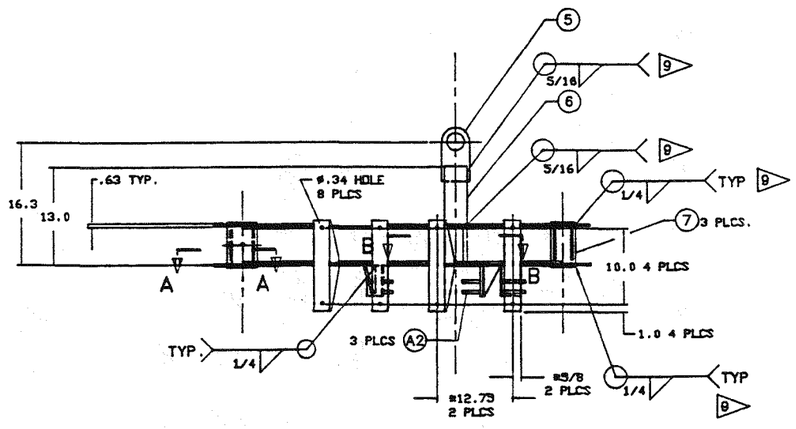
AS BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
FRAME WELDMENT
EQUIP. NO. 162-T-001, 002, 003

SCALE	NONE	WT.	310
REV:		SHEET	1 OF 3
DWG SIZE	D	DWG NO.	2014-061

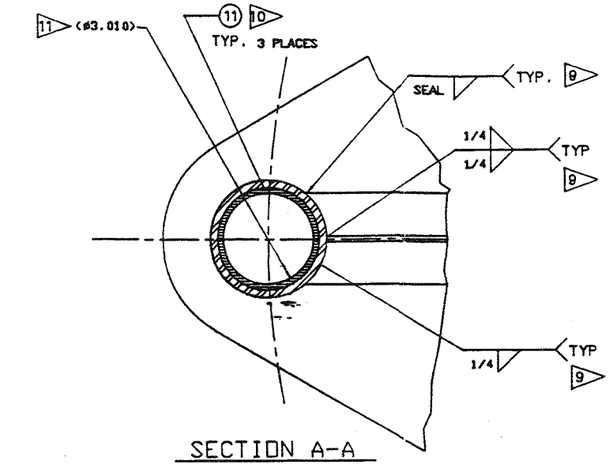
REVISION HISTORY		
REV	DESCRIPTION	DATE





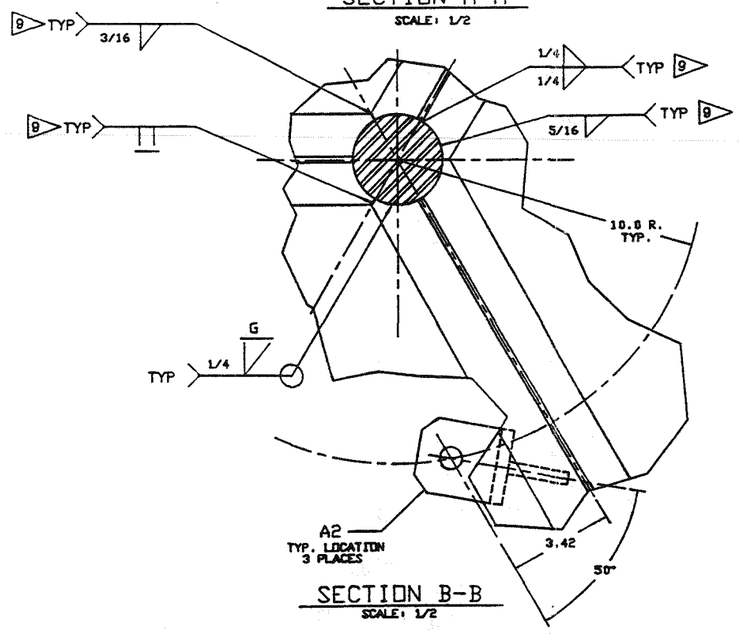
WELDMENT (A1)

ø - DIMENSION SHOWN IN PLANE OF PART



SECTION A-A

SCALE: 1/2



SECTION B-B

SCALE: 1/2

			CHECK	B L SWANBACK	5-05-93
ITEM	QTY	NEXT ASSY	DRAWN	BEST	6-10-93

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1/2°

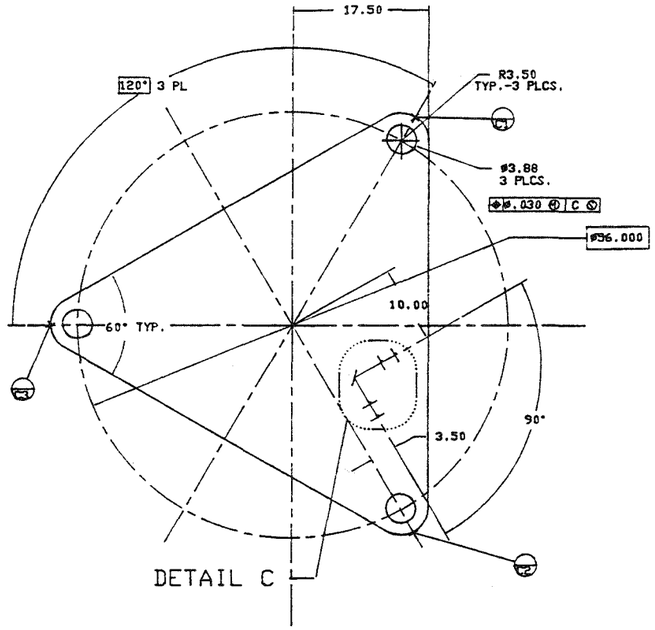
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .02
1 PLACE DECIMAL ± .1

AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
FRAME WELDMENT
EQUIP. NO. 162-T-001, 002, 003

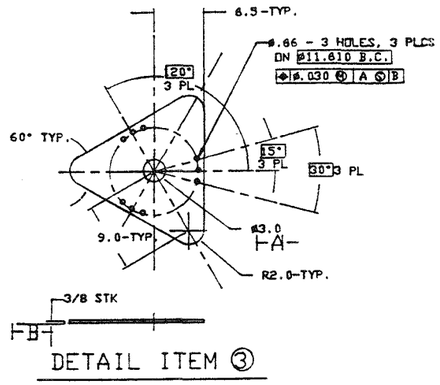
SCALE: 1/8	WT. N/A		
REV:	SHEET 2 OF 3		
CAGD SIZE: D	CAGD NO. 2014-061		

2014-061 SH 2 OF 3

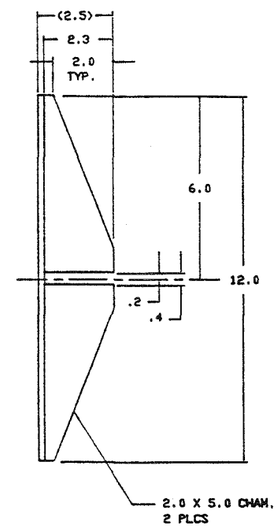


DETAIL C

DETAIL ITEM ②

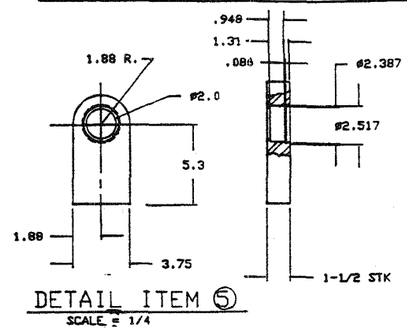


DETAIL ITEM ③



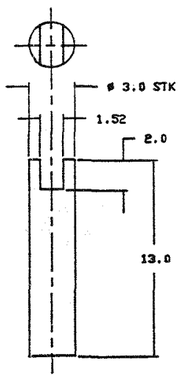
DETAIL ITEM ⑧

SCALE = 1/4



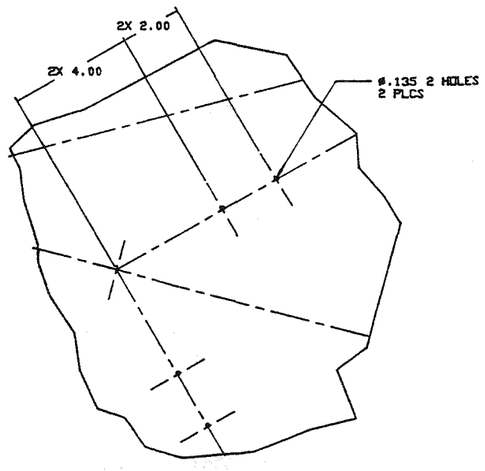
DETAIL ITEM ⑤

SCALE = 1/4



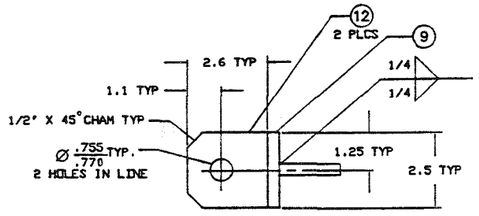
DETAIL ITEM ⑥

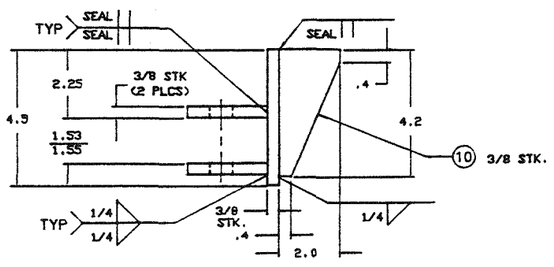
SCALE = 1/4



DETAIL C

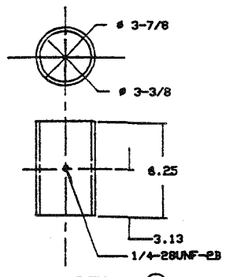
SCALE = 1/2





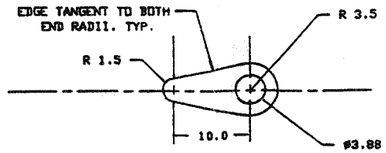
WELDMENT A2

SCALE = 1/2



DETAIL ITEM ⑦

SCALE = 1/4



DETAIL ITEM ④

REVISION HISTORY		
REV	DESCRIPTION	DATE

			CHECK	D L SWARRACK 6-28-93
ITEM	QTY	MDDT-ASSY	DRAWN	BEST 6-10-93

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: FRACTIONS ± 1/8, ANGLES ± 1/2°
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .02
1 PLACE DECIMAL ± .1

AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
FRAME WELDMENT
EQUIP. NO. 162-T-001, 002, 003

SCALE 1/8 | WT. N/A | SHEET 3 OF 3 | REV

SIZE D | DWG NO. 2014-061

2014-061 SH 3 OF 3

REVISION HISTORY		
REV	DESCRIPTION	DATE

NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER ANSI Y14.5.
2. NOT USED
3. ALL WELDING PROCEDURES AND PERSONNEL SHALL BE QUALIFIED IN ACCORDANCE WITH AWS D1.1 OR ASME CODE, SECTION IX. (ALL STAINLESS STEEL MATERIAL WELDING SHALL BE PERFORMED PER ASME CODE, SECTION IX.) WELD PROCEDURES AND WELDER QUALIFICATIONS SHALL BE AVAILABLE FOR AUDIT OR REVIEW.
4. ALL WELDS SHALL BE VISUALLY EXAMINED IN ACCORDANCE WITH AWS D1.1, SECTION 8.13.1. VISUAL WELD INSPECTORS SHALL BE QUALIFIED PER AWS D1.1.
5. SURFACE PREPARATION PER SSPC-SP-6.
6. FINISH PAINT ALL CARBON STEEL SURFACES AFTER LOAD TEST WITH HIGH QUALITY, INDUSTRIAL ENAMEL, COLOR-WHITE. APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
7. EQUIVALENT COMPONENTS AND/OR SOURCES OF SUPPLY MAY BE SUBSTITUTED UPON APPROVAL OF CUSTOMER ENGINEERING.
8. PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DYES, WELD FLUX, SPLATTER, SCALE, GRIME AND ALL OTHER FOREIGN MATERIALS. FINISHED ASSEMBLY AND ALL INTERIOR AREAS SHALL BE CLEANED AND VISUALLY INSPECTED TO VERIFY THAT ALL SURFACES ARE FREE OF PARTICLES OR LIQUIDS.
9. MATERIAL SIZES LISTED IN THE MATERIAL COLUMN ARE FOR REFERENCE ONLY. MANUFACTURER SHALL CONFIRM ACTUAL REQUIREMENTS PRIOR TO FABRICATION.
10. ALIGN HOLE PATTERN OF ITEM #2 WITH HOLE PATTERN OF ITEM #1
11. IDENTIFY ALL COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC., DURING FABRICATION WITH A LOW CHLORIDE CONTENT FELT TIP MARKER. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER AND DRAWING REVISION NUMBER. IDENTIFY ALL COMPLETED FABRICATED COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC., USING .25 INCH CHARACTER DIES OR VIBRO ETCHING AS APPROPRIATE TO COMPONENT SIZE AND CONFIGURATION. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER, DRAWING REVISION NUMBER AND A PROJECT UNIQUE SERIAL NUMBER, (SUPPLIED BY CUSTOMER).

THIS AS-BUILT DRAWING WAS PREPARED USING Mellon-- DRAWING 2150-062-AB AS A BASELINE, AND REFLECTS THE MANUFACTURING AND MATERIAL CHANGES FROM AR/VR's GENERATED FROM WESTINGHOUSE PROCUREMENT.

ITEM	QTY	PART NO.	DESCRIPTION	
		ASSEMBLY & QUANTITY	LIST OF MATERIAL	
A1	1		UPPER STRUCTURE TURNTABLE WELDMENT	
1	1		PLATE, 3/8" THK X 60.0" O.D. X 8.0" I.D.	ASTM A36
2	1		PLATE, 3/8" THK X 13.0" O.D. X 8.0 I.D.	ASTM A36
3	1		ROUND TUBE, 10" O.D. X 3/8" WALL X 2.75" LG	AISI 1026
4	6		PLATE, 3/8" THK X 2.8" X 23.5"	ASTM A36
5	1		PLATE, 3/8" THK X 1.5" X 180.3"	ASTM A36

A1	1	2014-061	CHECK D L SWARBACK	9-03-93
ITEM	QTY	NEXT ASSY	DRAWN BEST	9-10-93

UNLESS OTHERWISE SPECIFIED TOLERANCES: FRACTIONS ± 1/8, ANGLES ± 1/2°. DIMENSIONS ARE IN INCHES: 3 PLACE DECIMALS ± .010, 2 PLACE DECIMALS ± .03, 1 PLACE DECIMAL ± .1

AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
UPPER STRUCTURE TURNTABLE WELDMENT
EQUIP. NO. 162-T-001, 002, 003

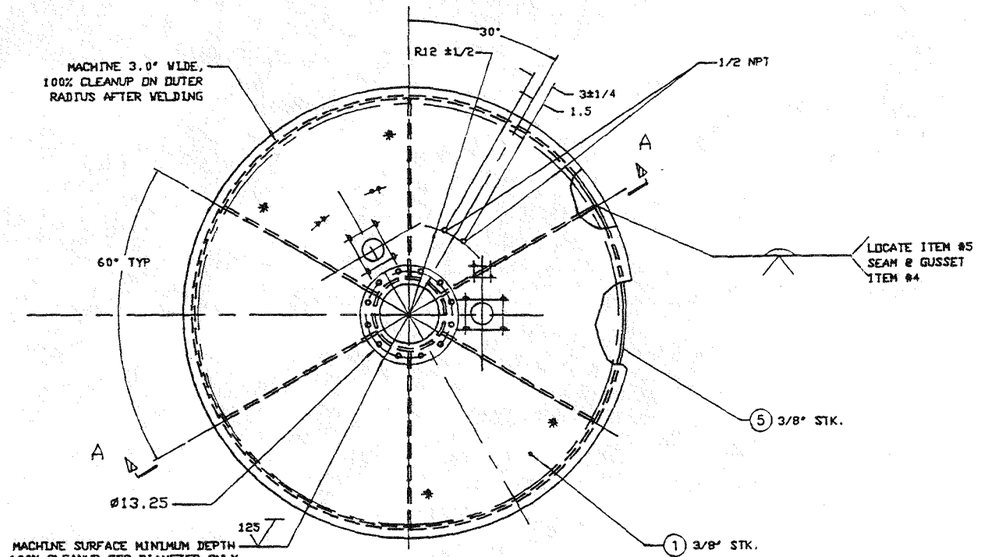
SCALE: NONE | WT. 369 | SHEET 1 OF 3

DWG SIZE: D | DWG NO. 2014-062

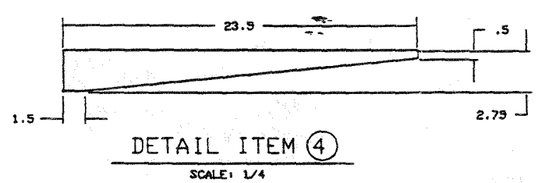
REV

2014-062 SH 1 REV

REVISION HISTORY		
REV	DESCRIPTION	DATE

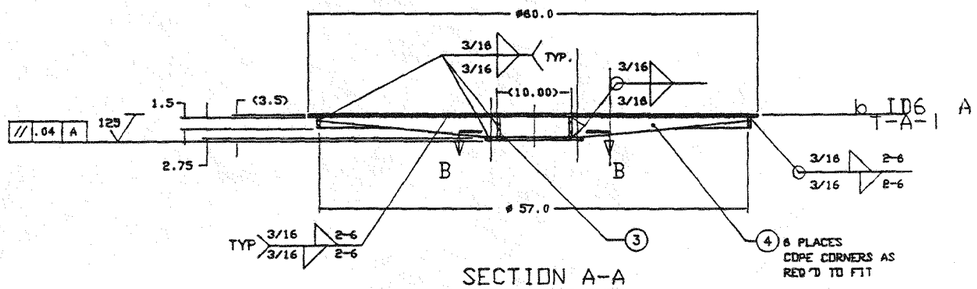


WELDMENT (A1)



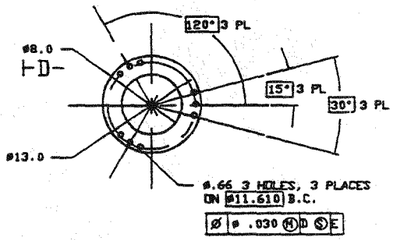
DETAIL ITEM (4)

SCALE: 1/4

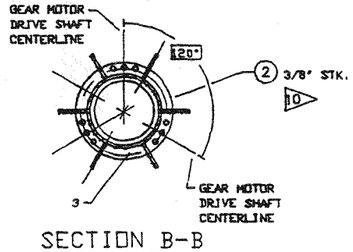


SECTION A-A

(ROTATED 30° CW)



DETAIL ITEM (2)



SECTION B-B

			CHECK	D. L. EVANSACK	5-25-22
ITEM	QTY	NEXT ASSY	DRAWN	WEST	5-19-22

UNLESS OTHERWISE SPECIFIED TOLERANCES: FRACTIONS ± 1/8, 1/2" ANGLES ± 1°

DIMENSIONS ARE IN INCHES: 3 PLACE DECIMALS ± .010; 2 PLACE DECIMALS ± .02; 1 PLACE DECIMAL ± .1

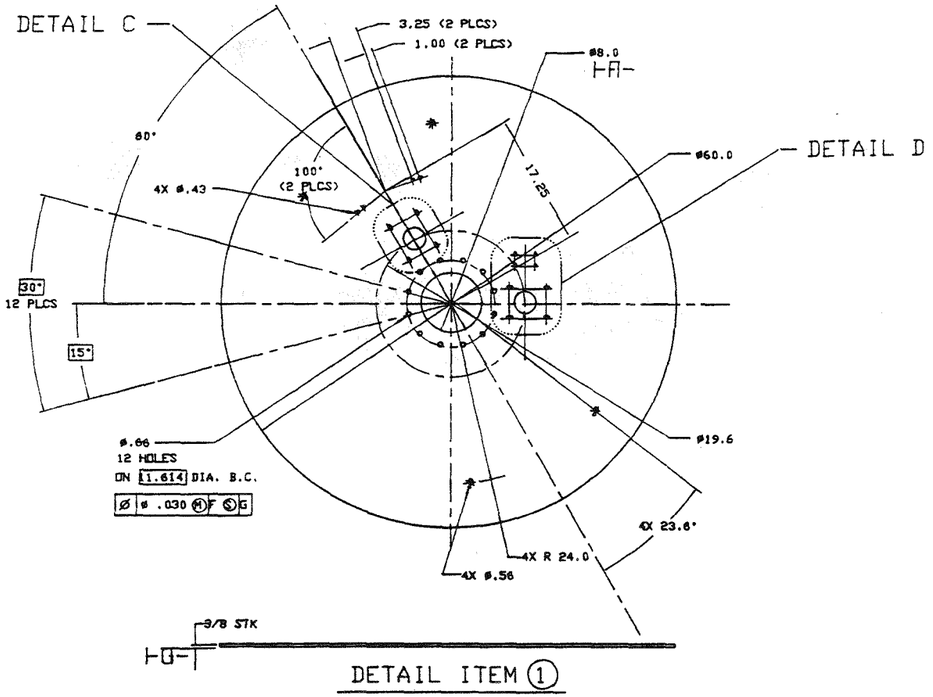
AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
UPPER STRUCTURE TURNTABLE WELDMENT
EQUIP. NO. 162-T-001, 002, 003

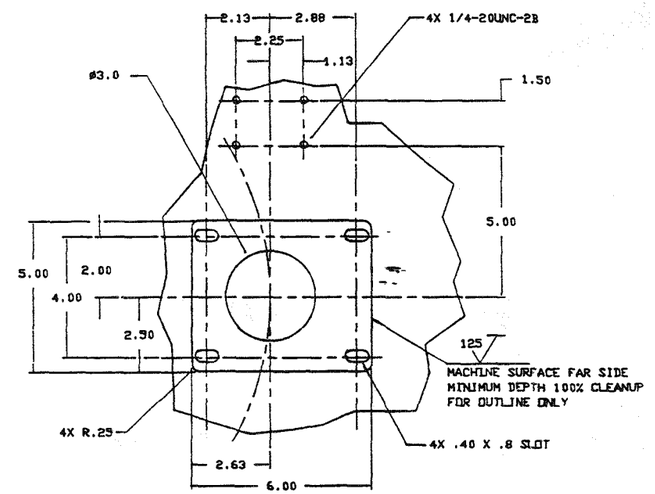
SCALE: 1/8	WT. N/A
REV	SHEET 2 OF 3
DWG SIZE: D	DWG NO. 2014-062

2014-062 SH 2 OF 3

REVISION HISTORY		
REV	DESCRIPTION	DATE

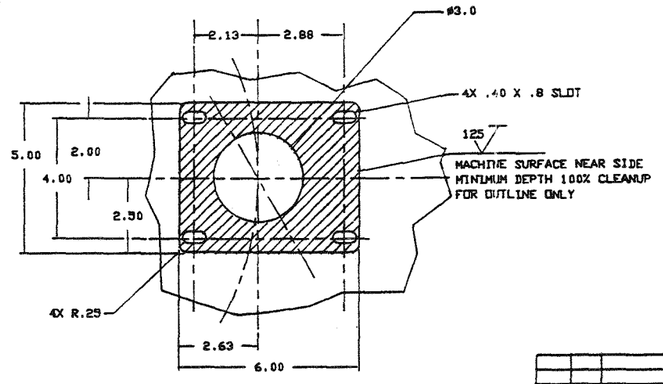


DETAIL ITEM (1)



DETAIL D

SCALE: 1/2



DETAIL C

SCALE: 1/2

SHOWN ROTATED 120° CW

			CHECK	D L SWARMACK	9-23-93
ITEM	QTY	NEXT ASSY	DRAWN	WEST	9-10-93

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1/2°
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
UPPER STRUCTURE FABRICATION DETAILS
EQUIP. NO. 162-T-001, 002, 003

SCALE 1/8 WT. N/A
REV SHEET 3 OF 3
SIZE D DWG NO. 2014-062

290-102 SH 3 OF 3

REVISION HISTORY		
REV	DESCRIPTION	DATE

NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER ANSI Y14.5.
2. NOT USED
3. SURFACE PREPARATION PER SSPC-SP-6.
4. FINISH PAINT ALL CARBON STEEL SURFACES AFTER LOAD TEST WITH HIGH QUALITY, INDUSTRIAL ENAMEL, COLOR-WHITE. APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
5. EQUIVALENT COMPONENTS AND/OR SOURCES OF SUPPLY MAY BE SUBSTITUTED UPON APPROVAL OF CUSTOMER ENGINEERING.
6. PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DYES, WELD FLUX, SPLATTER, SCALE, GRIME AND ALL OTHER FOREIGN MATERIALS. FINISHED ASSEMBLY AND ALL INTERIOR AREAS SHALL BE CLEANED AND VISUALLY INSPECTED TO VERIFY THAT ALL SURFACES ARE FREE OF PARTICLES OR LIQUIDS.
7. MATERIAL SIZES LISTED IN THE MATERIAL COLUMN ARE FOR REFERENCE ONLY. MANUFACTURER SHALL CONFIRM ACTUAL REQUIREMENTS PRIOR TO FABRICATION.
8. ALL FASTENERS SHALL BE ZINC OR CADMIUM PLATED.
9. NOT USED
10. IDENTIFY ALL COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC., DURING FABRICATION WITH A LOW CHLORIDE CONTENT FELT TIP MARKER. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER AND DRAWING REVISION NUMBER. IDENTIFY ALL COMPLETED FABRICATED COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC., USING .25 INCH CHARACTER DIES OR VIBRO ETCHING AS APPROPRIATE TO COMPONENT SIZE AND CONFIGURATION. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER, DRAWING REVISION NUMBER AND A PROJECT UNIQUE SERIAL NUMBER, (SUPPLIED BY CUSTOMER).

(11) ITEM 7 SHALL BE ZINC OR CAD PLATED.

(12) INSTALL 2 ITEM 8 WASHERS BETWEEN ITEM 7 AND ITEM 1.
INSTALL 1 ITEM 8 WASHER UNDER THE BOLT HEAD.

A2	A1	ITEM	PART NO.	DESCRIPTION	
			ASSEMBLY & QUANTITY	LIST OF MATERIAL	
		A2		UPPER COUNTERWEIGHT ASSEMBLY	
		A1		LOWER COUNTERWEIGHT ASSEMBLY	
1	1	10		PLATE, 1.0 THK. X 13.0 X 23.0	ASTM A36
2	2	9		HEX HD. BOLT, 5/16-18UNC-2A X 1 1/2" LG.	SAE GRD.5
6	6	8		FLAT WASHER, 5/16	C.STL.
1	1	7		ANGLE, 4 X 3 X 1/2 X 2" LG	ASTM A36
4	4	6		FLAT WASHER, 3/4, N-SERIES	C.STL.
4	4	5		HEX HD. BOLT, 3/4-10UNC-2A X 7-1/2" LG.	SAE GRD.5
2	2	4	PLR-2-20	CAMROLLER (WITH HEX RECESS IN STUD HEAD)	OSBORN
1	1	3		PLATE, .5 THK. X 23.0 X 24.2	ASTM A36
1	1	2		PLATE, 4.0 THK. X 13.0 X 23.0	ASTM A36
1	1	1		PLATE, 4.0 THK. X 13.0 X 23.0	ASTM A36

(11)

E90-1103 REV 1 08/3

THIS AS-BUILT DRAWING WAS PREPARED USING NuPac DRAWING 2150-063-AB AS A BASELINE, AND REFLECTS THE MANUFACTURING AND MATERIAL CHANGES FROM AR/NR's GENERATED FROM WESTINGHOUSE PROCUREMENT.

A3	1	2014-060		
A1	1	2014-063	CHECK D L SWINBACK	6-25-93
ITEM	QTY	NEXT ASSY	DRAWN WEST	6-18-93

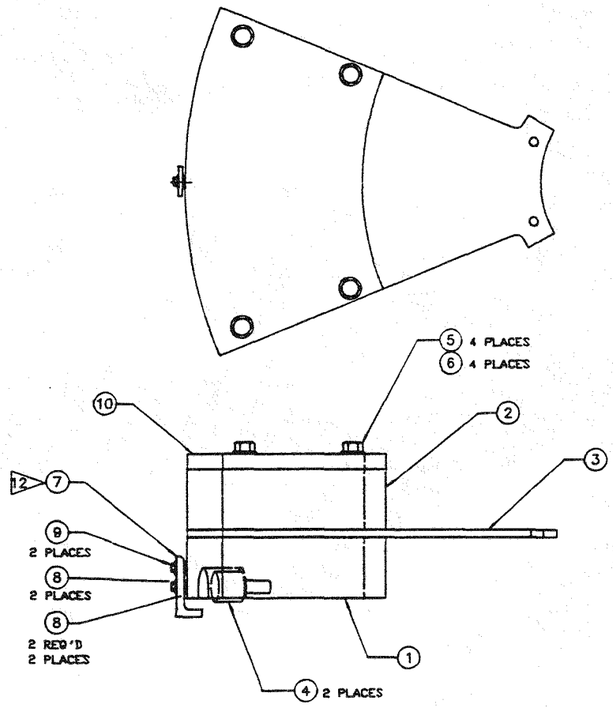
UNLESS OTHERWISE SPECIFIED TOLERANCES: FRACTIONS ± 1/8, ANGLES ± 1/2°. DIMENSIONS ARE IN INCHES: 3 PLACE DECIMALS ± .010, 2 PLACE DECIMALS ± .03, 1 PLACE DECIMAL ± .1

AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

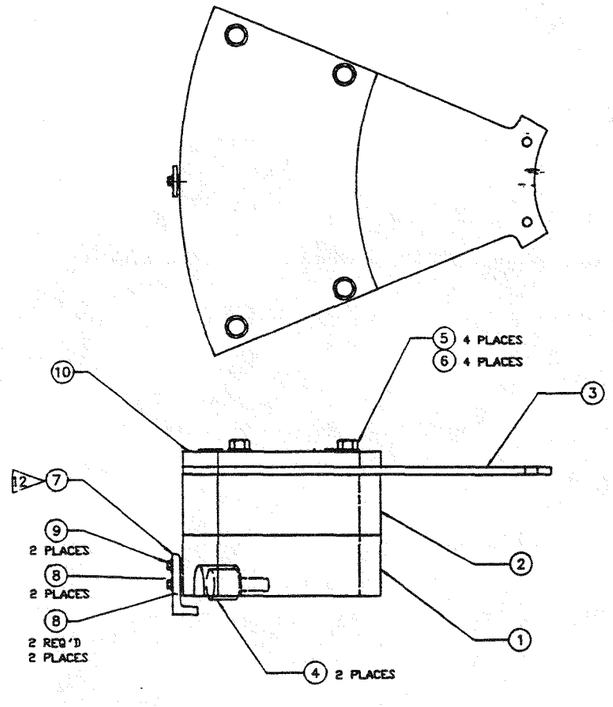
ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
COUNTERWEIGHT FABRICATION AND ASSEMBLY
EQUIP. NO. 162-T-001, 002, 003

		SCALE NONE	WT. 1185
		REV	SHEET 1 OF 3
		CAGE SIZE D	DWG NO. 2014-063

REVISION HISTORY		
REV	DESCRIPTION	DATE



ASSEMBLY A1



ASSEMBLY A2

				CHECK	D L SWARBACK 9-28-20
ITEM	QTY	NEXT ASSY		DRAWN	WEST 9-18-20

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1/2°

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

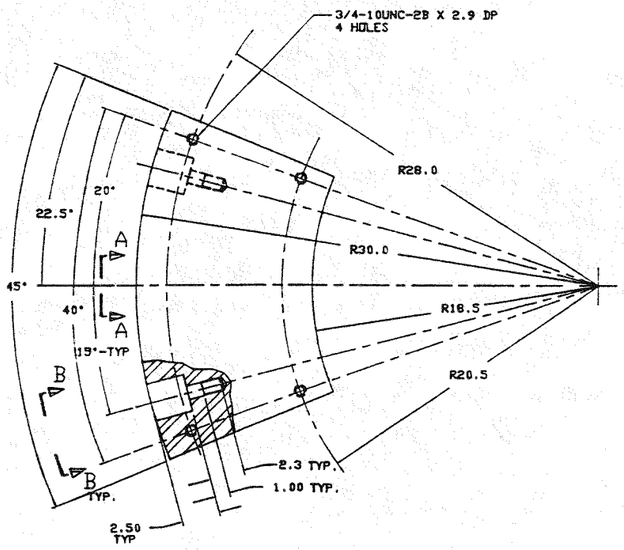
AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

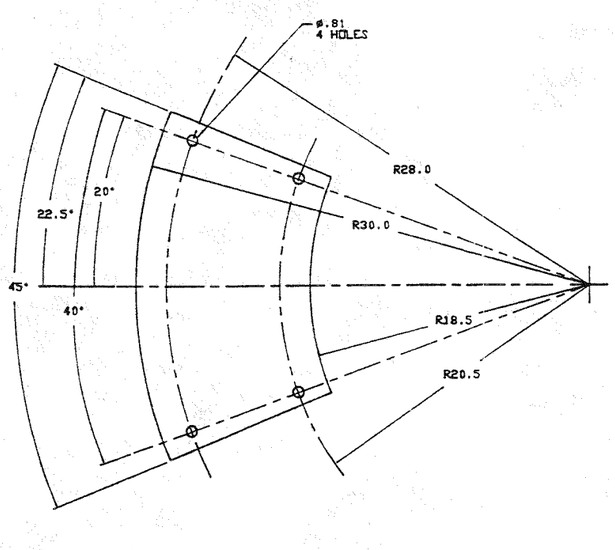
ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
COUNTERWEIGHT FABRICATION AND ASSEMBLY
EQUIP. NO. 162-T-001, 002, 003

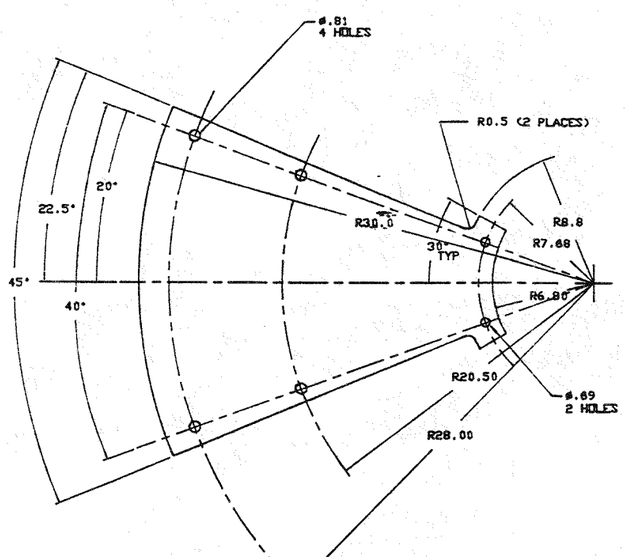
SCALE 1/4"=1"	WT. N/A		
REV	SHEET 2 OF 3		
DWG SIZE D	DWG NO. 2014-063		

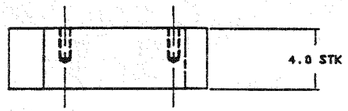
2014-063 SH 2 OF 3

REVISION HISTORY		
REV	DESCRIPTION	DATE

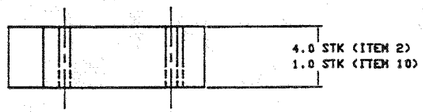




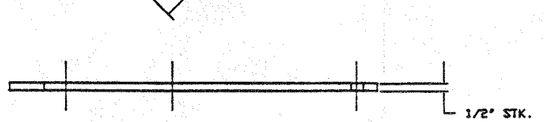




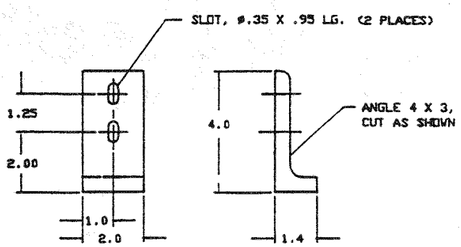
DETAIL ITEM ①



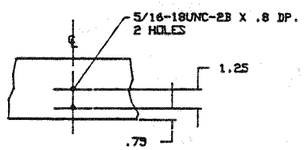
DETAIL ITEM ② (AS NOTED)
DETAIL ITEM ⑩ (AS NOTED)



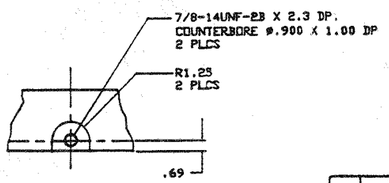
DETAIL ITEM ③



DETAIL ITEM⑦
SCALE = 1/2



VIEW A-A



VIEW B-B

			CHECK	D L SVANBACK	0-00-00
ITEM	QTY	NEXT ASSY	DRAWN	WEST	3-18-03

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1/2°
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

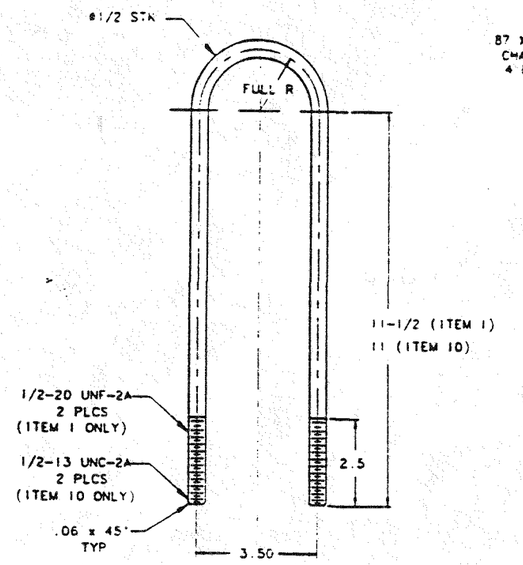
AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

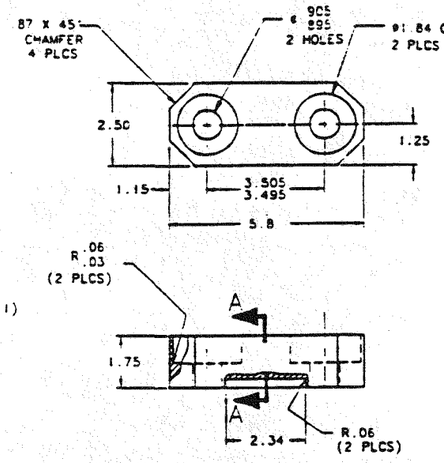
ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
COUNTERWEIGHT FABRICATION AND ASSEMBLY
EQUIP. NO. 162-T-001, 002, 003

		SCALE 1/4"=1'	WT. N/A
		REV	SHEET 3 OF 3
-		DWG SIZE D	DWG NO. 2014-063

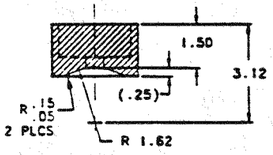
2014-063 SH 3 OF 3

REVISION HISTORY			
REV	DESCRIPTION	CHECK	REL
M	SEE INCORP ADCN J, K, L AND DCN		

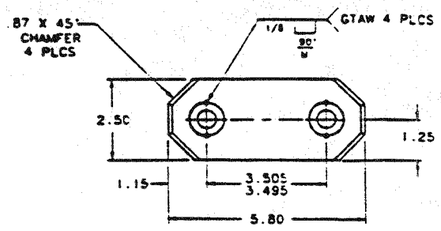


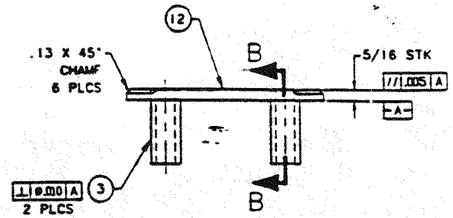


DETAIL ITEM (2)

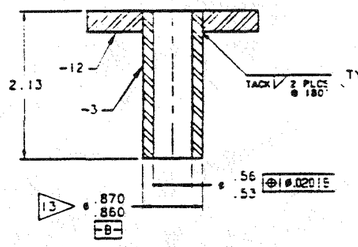


SECTION A-A



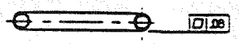


ASSEMBLY (A3)



SECTION B-B (M)

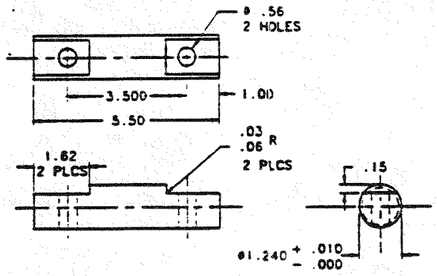
SCALE: FULL



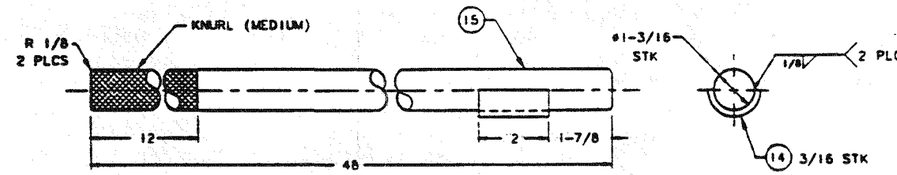
19 7 16 DETAIL ITEM (1) (M)

19 20 14 16 DETAIL ITEM (10) (M)

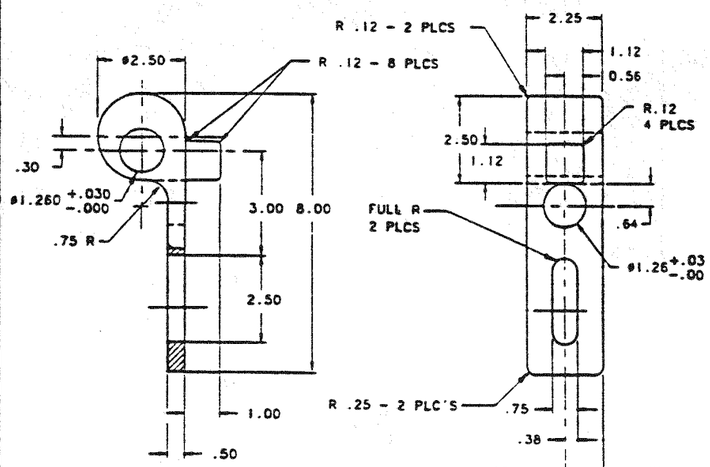
(SAME AS ITEM #1 EXCEPT AS NOTED)



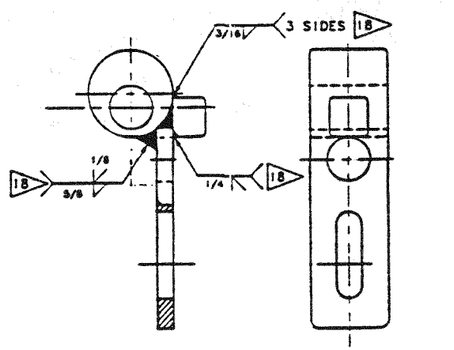
DETAIL ITEM (5)



WELDMENT (A4)

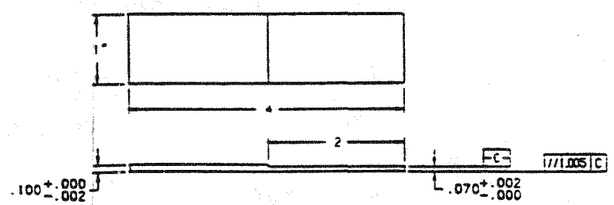


17 DETAIL ITEM (4)



17 OPTIONAL DESIGN: (M)

(DETAIL ITEM 4)



DETAIL ITEM (13)

SCALE: FULL

	REL	H.J. SWANNACK	9/30/88
	APPD		
	APPD		
	APPD	R.A. JOHNSON	9/30/88
	APPD	H.L. BROWN BY DLS	9/30/88
	APPD	H.J. WUNSCH	9/30/88
	APPD	S. GUIHA	9/30/88
	ENGRD	L. SWANNACK	9/30/88
	QA	J.R. OLIVADOTI	9/30/88
	CHECK	G.E. HILL	9/30/88
ITEM ! QTY ! NEXT ASSY	DRAWN	P.L. SULLIVAN	9/16/88

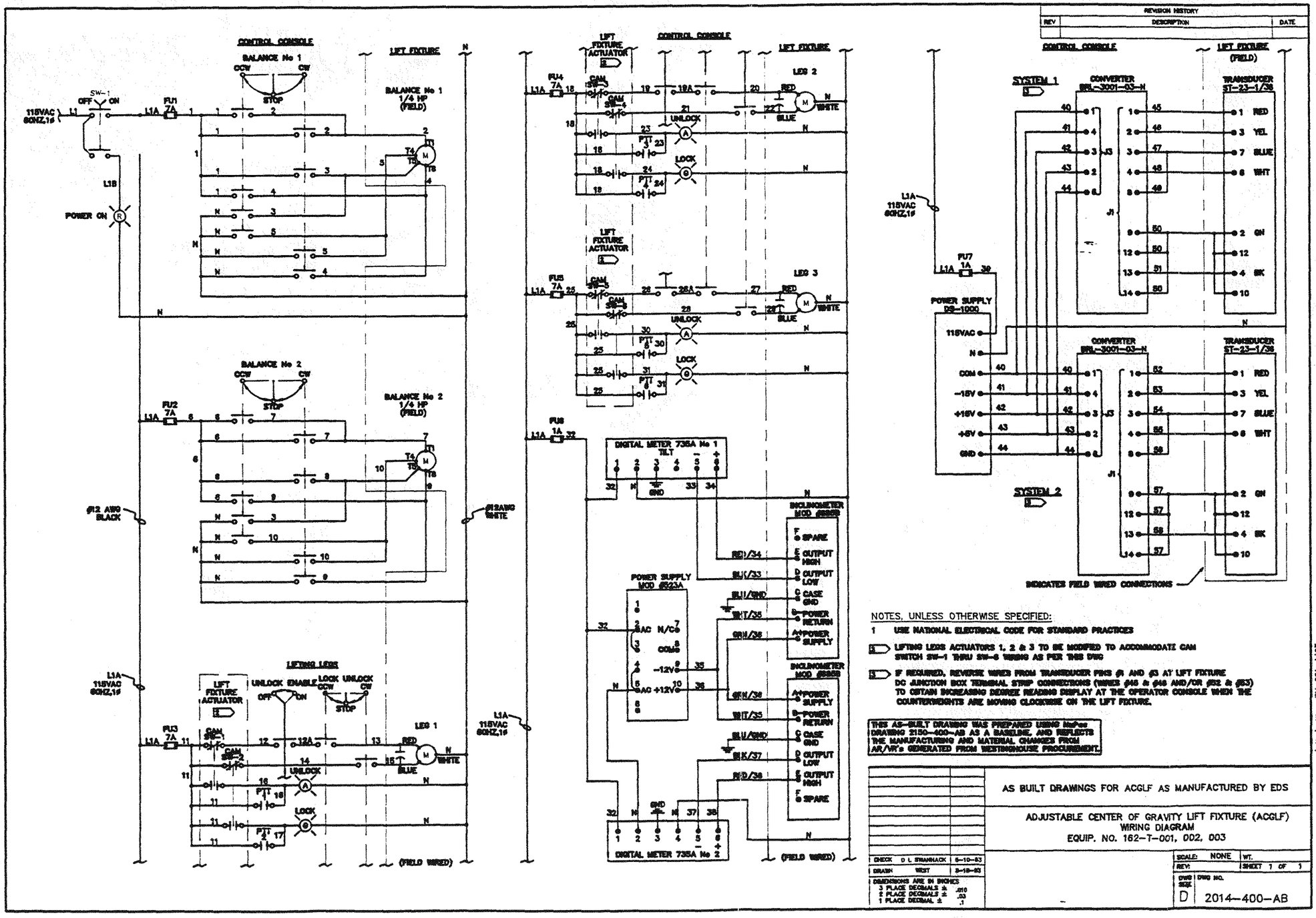
UNLESS OTHERWISE SPECIFIED — DIMENSIONS ARE IN INCHES
TOLERANCES: FRACTIONS ± 1/8, ANGLES ± 0°30', 3 PLACE DECIMALS ± .010, 2 PLACE DECIMALS ± .03, 1 PLACE DECIMAL ± .1

PACIFIC NUCLEAR SYSTEMS

TIEDOWN ASSEMBLY
FABRICATION DETAILS
TRUPACT - II

SCALE	1/2
WT	N/A
REV	M
SHEET	3 OF 3
DWG SIZE	D
DWG NO	2077-022

2077-022 M 3 OF 3



REVISION HISTORY

REV	DESCRIPTION	DATE

NOTES, UNLESS OTHERWISE SPECIFIED:

1 USE NATIONAL ELECTRICAL CODE FOR STANDARD PRACTICES

S LIFTING LEGS ACTUATORS 1, 2 & 3 TO BE MODIFIED TO ACCOMMODATE CAM SWITCH SW-1 THRU SW-6 WIRING AS PER THIS DWG

S IF REQUIRED, REVERSE WIRES FROM TRANSDUCER PINS #1 AND #3 AT LIFT FIXTURE DC JUNCTION BOX TERMINAL STRIP CONNECTIONS (WIRES #46 & #48 AND/OR #52 & #53) TO OBTAIN INCREASING DEGREE READING DISPLAY AT THE OPERATOR CONSOLE WHEN THE COUNTERWEIGHTS ARE MOVING CLOCKWISE ON THE LIFT FIXTURE.

THIS AS-BUILT DRAWING WAS PREPARED USING Mefree DRAWING 2150-400-AB AS A BASELINE, AND REFLECTS THE MANUFACTURING AND MATERIAL CHANGES FROM AR/VR's GENERATED FROM WESTINGHOUSE PROCUREMENT.

AS BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
WIRING DIAGRAM
EQUIP. NO. 162-T-001, 002, 003

CHECK	D L STANNACK	6-10-93
DRAWN	WEST	6-10-93

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

SCALE: NONE WT.
REV: SHEET 1 OF 1
DWG SIZE: D
DWG NO. 2014-400-AB

2014-400-AB SH 1 OF 1

ITEM	PART NUMBER	DESCRIPTION	QTY	MANUFACTURER	MATERIAL SPEC
1	C148	CONSOLE	1	HOFFMAN	
2	C14F2	INSIDE PANEL, HALF	1	HOFFMAN	
3	C14W	WELDING DESK	1	HOFFMAN	
4	CF20	CASTER KIT	1	HOFFMAN	
5	2378	POWER INLET, 20A/125VAC	1	HUBBELL	
6	14A-1803	CABLE POWER 3 COND. #12	50FT	ANIXTER	
7	IE313	CONNECTOR TWIST LOCK (P)	1	HUBBELL	
8	9286-0	GENERAL PURPOSE NON-LOCKING (A)	1	HUBBELL	
9	MS3102A-28-21S	CONNECTOR (AO)	1	AMPHENOL	
10	MS3102A-24-22S	CONNECTOR (DO)	1	AMPHENOL	
11	94861T20	STEBOLT 5/16	2	BOMASTER CARR	
12	MS3106B-28-21P(AO)	CONNECTOR (AO)	1	AMPHENOL	
13	MS3106A-28-21S	CONNECTOR (AC)	1	AMPHENOL	
14	MS3106B-24-22P(DO)	CONNECTOR (DO)	1	AMPHENOL	
15	MS3106A-24-22S	CONNECTOR (DO)	1	AMPHENOL	
16	MS3057-16A	CABLE CLAMP	4	AMPHENOL	
17	8307	CABLE #18-37 COND. (AO)	92FT	BELDEN	
18	WIRE71-BBJ	CABLE #18-27 COND. (DO) SHLD	56FT	BATAVIAN WIRE	
19	57121-6	CABLE GRIP (AO)	2	AERO-MOTIVE	
20	57121-10	CABLE GRIP (DO)	2	AERO-MOTIVE	
21	PR10-2804S3	SELECTOR SWITCH	2	ELECTRO SWITCH	
22	PB10-2203S3	SELECTOR SWITCH	1	ELECTRO SWITCH	
23	SPECIAL ORDER	NOSE PLATE (NO. 2)	1	ELECTRO SWITCH	
24	SPECIAL ORDER	NAME PLATE (LEDS)	1	ELECTRO SWITCH	
25	SPECIAL ORDER	NOSE PLATE (NO. 1)	1	ELECTRO SWITCH	
26	736A	DIGITAL PANEL METER	2	ROBINSON-HALPERN	
27	523A	POWER SUPPLY	1	ROBINSON-HALPERN	
28	16-001	CARD MATING CONNECTOR	1	ROBINSON-HALPERN	
29	BRL-3001-03-N-1/36	CONVERTER/READ-OUT	2	ASTRO SYSTEM, INC.	
30	PS1000	POWER SUPPLY	1	ASTRO SYSTEM, INC.	
31	AB 800T6PRR2B6	SWITCH, POWER ON	1	ALLEN-BRADLEY	
32	PWZL3088E2-99	AREA (A) LOCK (O) 1	1	MICRO SWITCH	
33	PWZL3088B-99	AREA (B) LOCK (O) 2	1	MICRO SWITCH	
34	PWZL3088B-99	AREA (B) LOCK (O) 3	1	MICRO SWITCH	
35	PWZL3048B-99	AREA (B) UNLOCK (O) 1	1	MICRO SWITCH	
36	PWZL3048F2-99	AREA (B) UNLOCK (O) 2	1	MICRO SWITCH	
37	PWZL3048B-99	AREA (B) UNLOCK (O) 8	1	MICRO SWITCH	
38	AB 800T-D01	CONTACT BLOCK, N.O.	1	ALLEN-BRADLEY	
39	NOSE PLATE (3/4 X 3)	BALANCE ROTATION	2	SYSTEMS INTERFACE INC.	9
40	NAME PLATE (3/4 X 3)	OPENING LEDS	1	SYSTEMS INTERFACE INC.	
41	NAME PLATE (3/4 X 6)	TILT SENSOR	2	SYSTEMS INTERFACE INC.	
42	NOSE PLATE (3/4 X 3)	BALANCE POSITION	2	SYSTEMS INTERFACE INC.	
43	1492-OA3	TERMINAL BLOCK	66	ALLEN-BRADLEY	
44	1492-N18	TB END COVER	2	ALLEN-BRADLEY	
45	1492-N2	RETAINING CLIP	4	ALLEN-BRADLEY	
46	1492-CE8	FUSE CLIP 10 AMP/600V	7	ALLEN-BRADLEY	
47	1492-N17	FUSE END COVER	1	ALLEN-BRADLEY	
48	1492-N28	MOUNTING RAIL	2	ALLEN-BRADLEY	
49	FRM-7	FUSE 7 AMP	6	BUSSMAN	
50	FRM-1	FUSE 1 AMP	2	BUSSMAN	
51	C1 X 2 LG6	WIRE DUCT 1" X 2"	8	PANDUIT	7
52	C1 LG6	DUCT COVER	5	PANDUIT	7
53	8307	CABLE #20-7 COND (INST) (SHLD)	50FT	BELDEN	7
54	1855-2	WIRE #18 SINGLE	200FT	ALPHA	7
55		SCREW-MACH 8-32 X 1/2	25	COMM	CAD. PLT.
56		NUT-HEX 8-32	25	COMM	CAD. PLT.
57		WASHER #8 EXT. TOOTH	85	COMM	CAD. PLT.
58		SCREW-MACH 4-40 X 1	4	COMM	CAD. PLT.
59		WASHER #4 EXT. TOOTH	4	COMM	CAD. PLT.
60	PF-126-150	PERMA-SLEEVE WIRE MARKERS	AR	BRADY	7
61		SCREW-MACH. 10-32 X 1/2	4	COMM	CAD. PLT.
62		NUT-HEX 10-32	4	COMM	CAD. PLT.
63		WASHER #10 EXT. TOOTH	4	COMM	CAD. PLT.
64	BB2330	WIRE TERMINAL LUGS-INSULATED	100	T & B	7
65	ABM3-0	TY-MOUNTS	50	PANDUIT	7
66	PLT 1.5M	TY-TAPE	100	PANDUIT	7
67	P18-6R	WIRE TERMINAL DUCE	50	PANDUIT	7
68		SCREW-MACH. 6-32 X 1/2	8	COMM	CAD. PLT.
69		NUT-HEX 6-32	8	COMM	CAD. PLT.
70		WASHER #8 EXT. TOOTH	8	COMM	CAD. PLT.
71	PR10-4J03S1	SELECTOR SWITCH	1	ELECTRO SWITCH	
72	SPECIAL ORDER	NAME PLATE (UNLOCK ENABLE)	1	ELECTRO SWITCH	
73	SPECIAL ORDER	NOSE PLATE (EDS)	1	EDS SUPPLIED	
74	NAME PLATE (2 X 3)	WARNING BALANCE UNLOADED FIXTURE BEFORE LIFTING	1	SYSTEMS INTERFACE INC.	10
75	NOSE PLATE (3/4 X 6)	UNLOADED BALANCE 180°	1	SYSTEMS INTERFACE INC.	9
76	NAME PLATE (3/4 X 3)	UNLOAD BALANCE 360°	1	SYSTEMS INTERFACE INC.	9
77	SPECIAL ORDER	WT38 ADHESIVE-BACKED FOIL W/BLACK LETTERS	1	EDS SUPPLIED	
78	SPECIAL ORDER	WT48 ADHESIVE-BACKED FOIL W/BLACK LETTERS	1	EDS SUPPLIED	
79	800T-D329	OFF OR NAMEPLATE	1	ALLEN-BRADLEY	
80	#24	ELECTRICAL SHIELD TAPE	AR	3-M COMPANY	15

NOTES, UNLESS OTHERWISE SPECIFIED:

1 UNINSULATED WIRE SHALL BE STRANDED #18 AWG, 600V INSULATION.
RED AO WIRING
BLUE DO WIRING
WHITE AO NEUTRAL
GREEN GROUND

2 WIRES NOT TERMINATED BY SOLDER CONNECTOR SHALL BE TERMINATED WITH SOLDERLESS CONNECTORS

3 ALL WIRES SHALL BE FITTED ON BOTH ENDS WITH PLASTIC SLEEVE TYPE WIRE MARKERS

4 NUMBERS SHOWN THUS [ ] INDICATES WIRE DESTINATION SEE SPECIFIED ITEM SUCH AS 4 & 5.

5 USE ITEM 80 (SHIELDED BRAID) ON BLUE #18 WIRE BUNDLE FROM PLUG TO TERMINAL STRIP

6 REMOVE BURRS AND SHARP EDGES .030 MAX

7 ITEMS 51 THRU 54, 60 AND 64 THRU 67 NOT SHOWN USE AS NEEDED FOR CONSOLE INTERNAL WIRING

8 ALL WIRE RUNS SHALL BE CONTINUOUS, NO SPLICES ALLOWED

9 PHENOLIC NAME PLATES, ITEMS 39, 40, 41, 42, 75 & 76, SHALL BE 3/4 INCH WIDE WHITE MATERIAL WITH 1/4 INCH BLACK LETTERS (LENGTH AS REQ'D)

10 CONNECT THESE THREE WIRES TO A GROUND LUG ATTACHED TO ONE OF THE SCREWS ATTACHING THE AC RECEPTACLE ON THE CONSOLE

11 ALL SHIELDS SHALL BE TREATED AS AN ACTIVE CONDUCTOR GROUND AT ONE POINT ONLY AS SHOWN ON DWGS

12 USE RED PHENOLIC MATERIAL WITH 1/4 INCH HIGH WHITE LETTERS FOR NOSEPLATE

13 ENCLOSURE WITHOUT MANUFACTURERS FINISH COAT SHALL BE PAINTED WITH SHERWIN WILLIAMS POLANE, SEMI-GLOSS INDUSTRIAL ENAMEL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS COLOR SHALL BE BEIGE

WIRE MARKER KIT
(EACH PART LIST ITEM 60)

QTY	WIRE #	SIZE	QTY	WIRE #	SIZE	QTY	WIRE #	SIZE
20	11	Y3	20	26	Y3	15	51	Y3
20	N	Y3	25	88	Y3	15	82	Y3
10	1	Y3	15	27	Y3	15	53	Y3
15	8	Y3	15	85	Y3	15	54	Y3
15	3	Y3	15	29	Y3	15	85	Y3
15	4	Y3	15	30	Y3	15	86	Y3
15	8	Y3	15	31	Y3	20	87	Y3
10	6	Y3	15	32	Y3	15	88	Y3
15	7	Y3	15	33	Y3	3	18A	Y3
15	8	Y3	15	84	Y3	6	19A	Y3
15	9	Y3	15	35	Y3	3	20A	Y3
15	10	Y3	15	36	Y3			
20	11	Y3	15	37	Y3			
15	12	Y3	15	88	Y3			
15	13	Y3	5	89	Y3			
15	14	Y3	10	40	Y3			
15	15	Y3	10	41	Y3			
15	16	Y3	10	42	Y3			
15	17	Y3	10	43	Y3			
20	18	Y3	10	44	Y3			
15	19	Y3	10	45	Y3			
15	20	Y3	15	46	Y3			
15	21	Y3	15	47	Y3			
15	22	Y3	15	48	Y3			
15	23	Y3	15	49	Y3			
15	24	Y3	20	50	Y3			

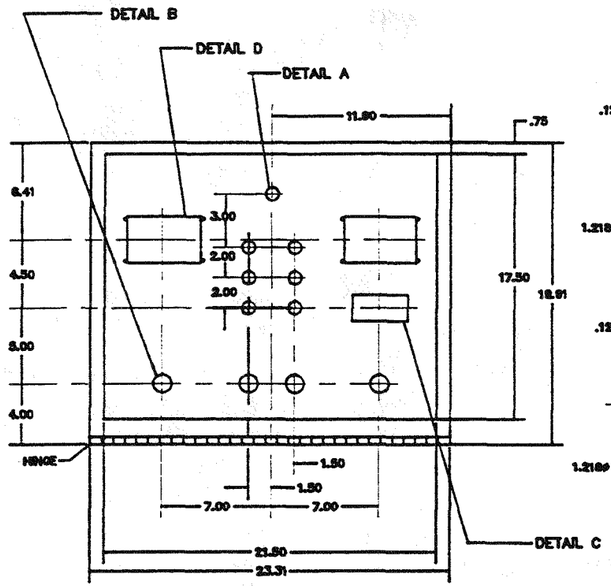
REVISION HISTORY		
REV	DESCRIPTION	DATE

THIS AS-BUILT DRAWING WAS PREPARED USING ReFlex DRAWING 2150-410-AB AS A BASELINE, AND REFLECTS THE MANUFACTURING AND MATERIAL CHANGES FROM AR/RCs GENERATED FROM WESTINGHOUSE PROCUREMENT.

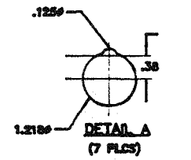
	AS BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS
	ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF) CONTROL CONSOLE PARTS LIST & NOTES EQUIP. NO. 152-T-001, 002, 003
CHECK D.L.SWANBACK 3-10-93	SCALE NONE WT.
DRAWN TEST 3-10-93	REV SHEET 1 OF 5
DIMENSIONS ARE IN INCHES: 3 PLACE DECIMALS ± .005; 2 PLACE DECIMALS ± .10; 1 PLACE DECIMAL ± 1	SIZE D DWG NO. 2014-410-AB

2014-410-AB REV 1 OF 5

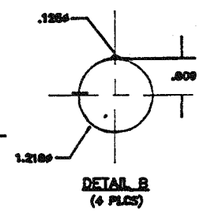
REVISION HISTORY		
REV	DESCRIPTION	DATE



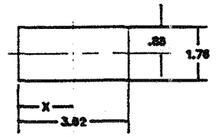
DETAIL ITEM (1)
READOUT PANEL COVER
SCALE = 1/4



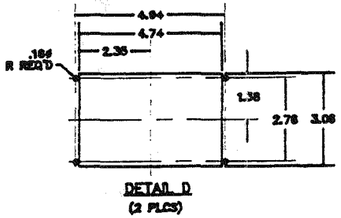
DETAIL A
(7 PLCS)



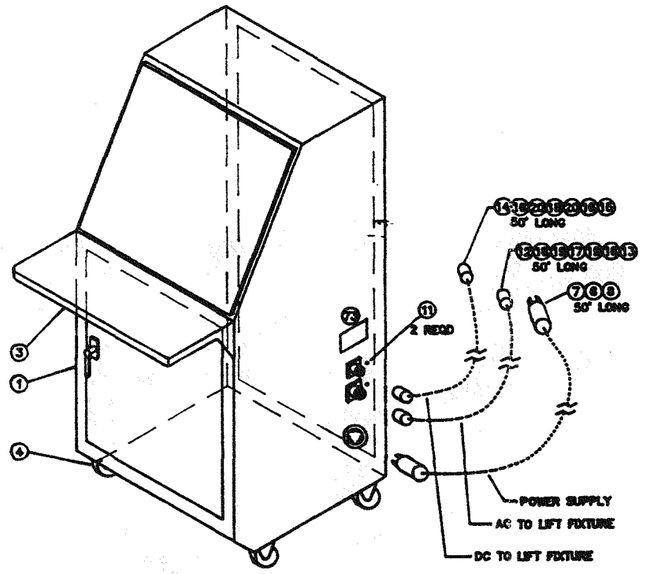
DETAIL B
(4 PLCS)



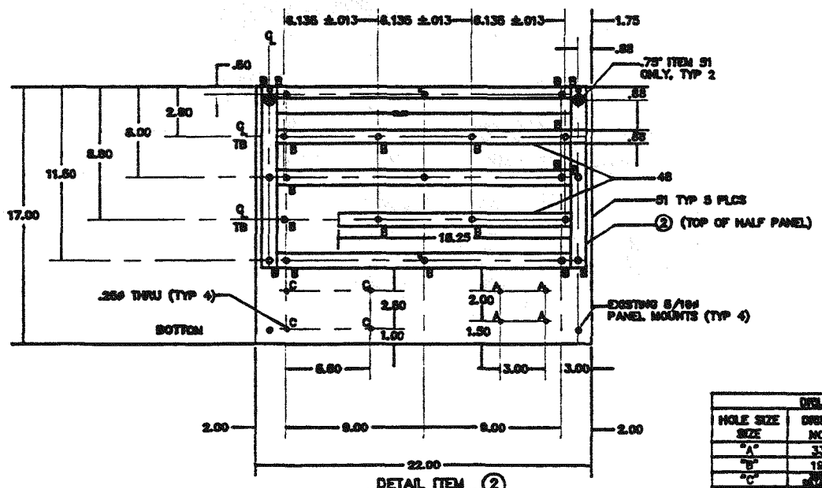
DETAIL C



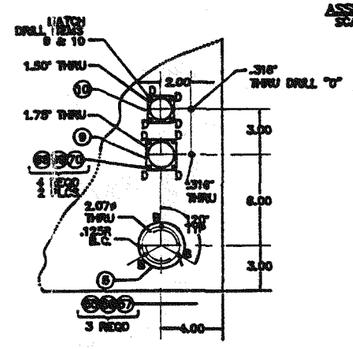
DETAIL D
(2 PLCS)



ASSEMBLY
SCALE 1/8 = 1 (A1)



DETAIL ITEM (2)
BACKPANEL LAYOUT
SCALE = 1/4



VIEW "A-A"

DRILL SCHEDULE			
HOLE SIZE SIZE	DRILL NO.	SCREW	ITEM NO.
"A"	33	#4-40	(58 & 69)
"B"	19	#8-32	(55,56 & 67)
"C"	#10	#10-32	(61,62, & 63)
"D"	28	#8-32	(68,69, & 70)

AS BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
CONTROL CONSOLE CUTOUT DETAILS
EQUIP. NO. 162-T-001, 002, 003

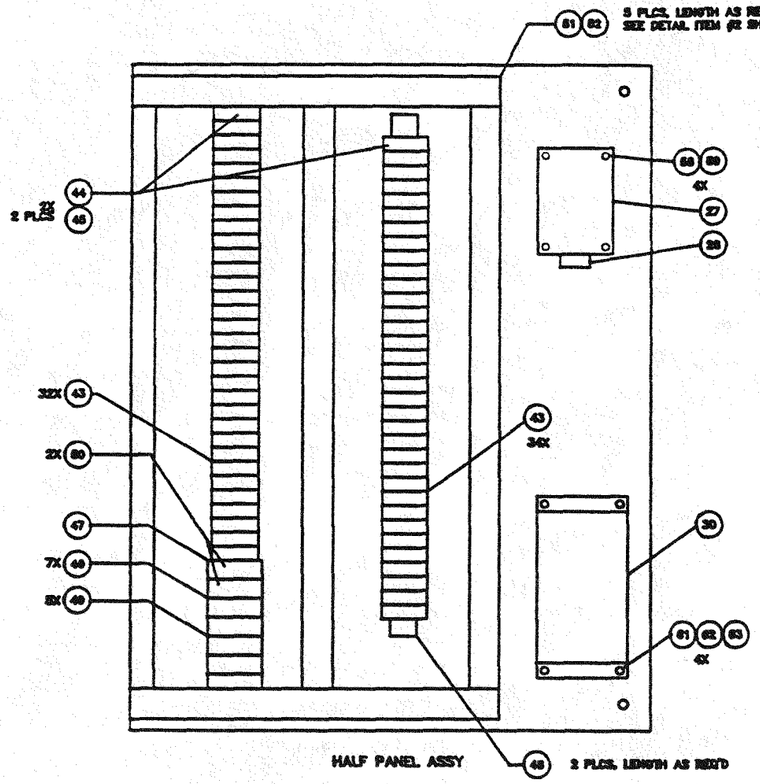
CHECK	D L SWANRACK	5-10-03
DRAIN	WEST	5-10-03

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

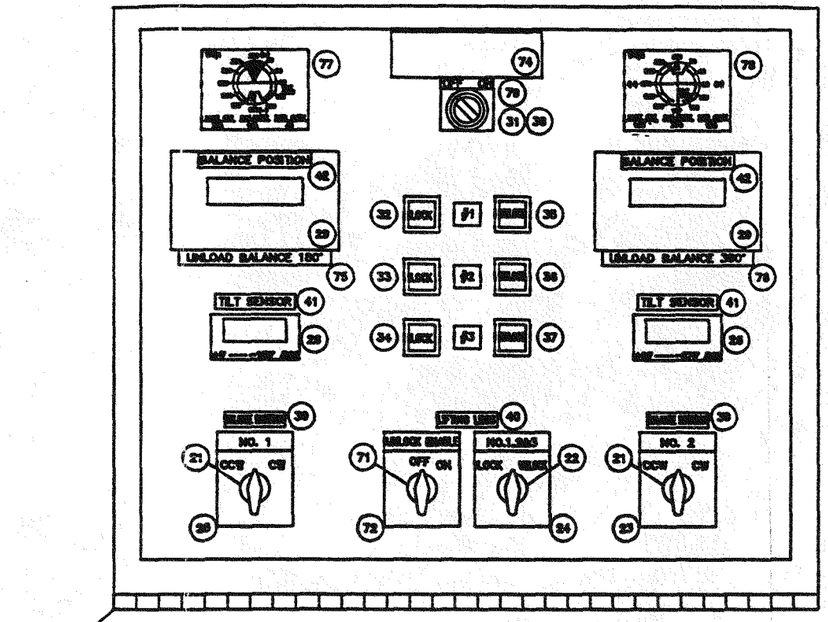
SCALE: NONE WT.
REV: SHEET 2 OF 5
DWG SIZE: D
DWG NO. 2014-410-AB

2014-410-AB SH 2 OF 5

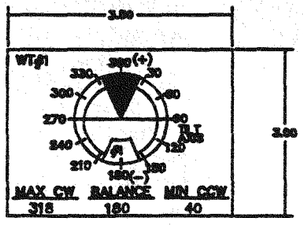
REVISION HISTORY		
REV	DESCRIPTION	DATE



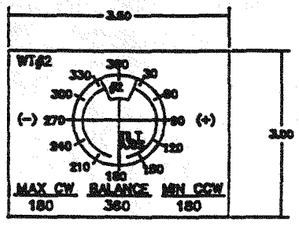
HALF PANEL ASSY



READOUT PANEL ASSY



(77) NAME PLATE DETAIL



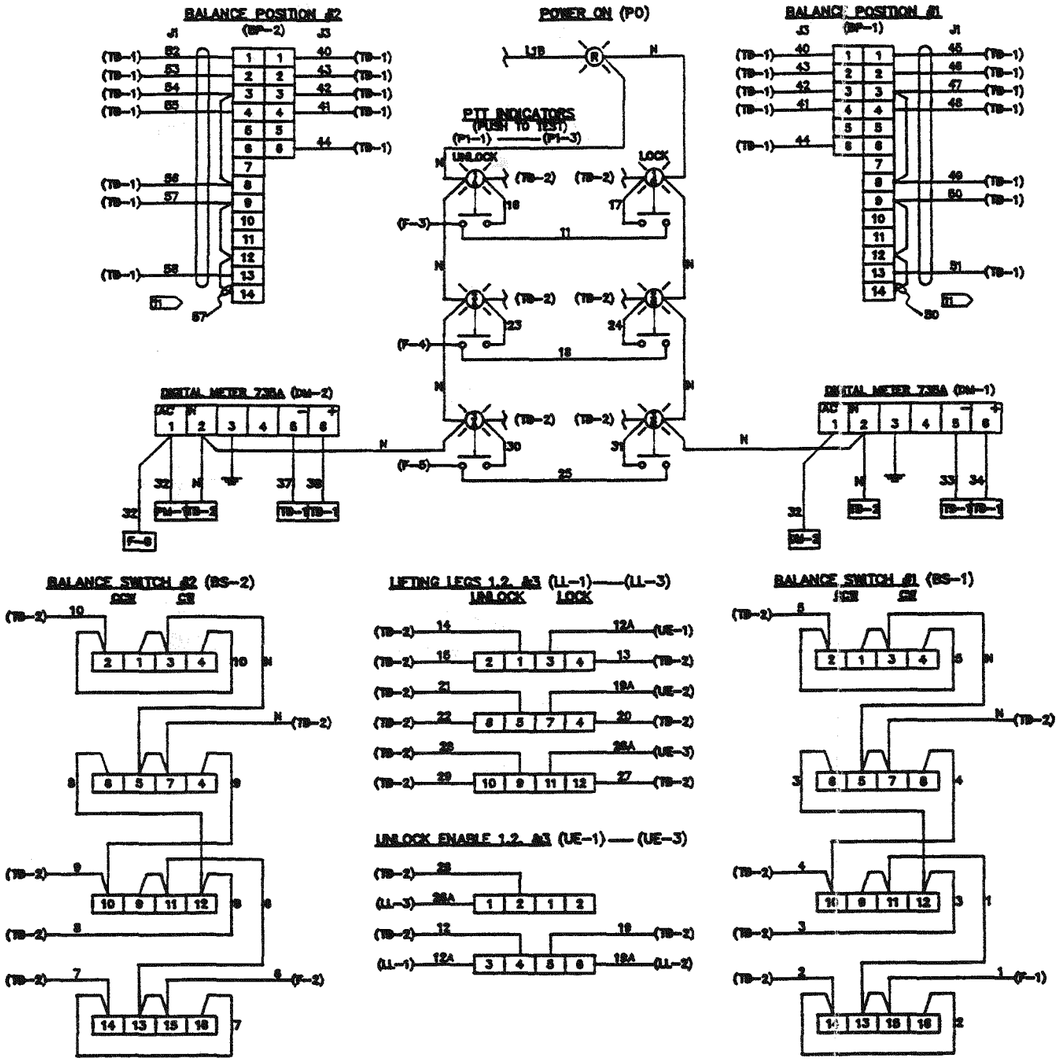
(78) NAME PLATE DETAIL

	AS BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS
	ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF) CONTROL CONSOLE PANEL ASSEMBLIES EQUIP. NO. 162-T-001, 002, 003

CHECK	D L STAMBAUGH	5-10-03	
DRAWN	WEST	5-10-03	
DIMENSIONS ARE IN INCHES 3 PLACE DECIMALS ± .010 2 PLACE DECIMALS ± .03 1 PLACE DECIMAL ± .1			SCALE NONE WT. REV SHEET 3 OF 6 DWG SIZE D DWG NO. 2014-410-AB

2014-410-AB sh 3 of 6

REVISION HISTORY		
REV	DESCRIPTION	DATE



AS BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
CONTROL CONSOLE INTERNAL WIRING
EQUIP. NO. 162-T-001, 002, 003

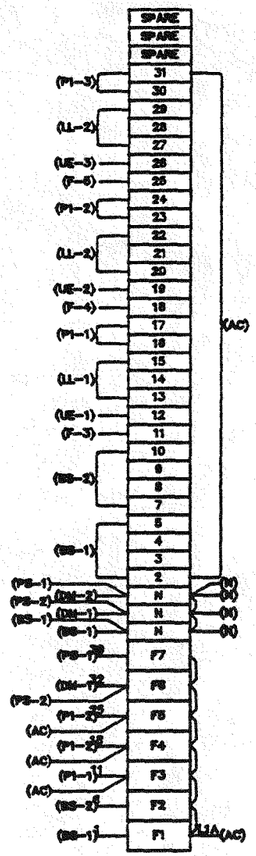
CHECK	D L SEAMSARK	5-10-93	
DRAWN	WDT	3-09-93	
DIMENSIONS ARE IN INCHES 3 PLACE DECIMALS ± .000 2 PLACE DECIMALS ± .03 1 PLACE DECIMAL ± .3			

SCALE NONE WT.
REV SHEET 4 OF 5
DWG SIZE D DWG NO. 2014-410-AB

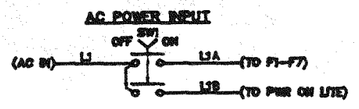
2014-410-AB SH 4 OF 5

REVISION HISTORY		
REV	DESCRIPTION	DATE

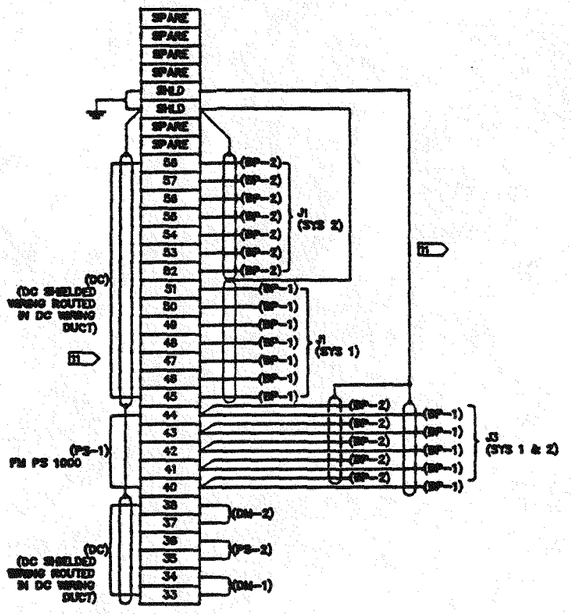
TERMINAL BLOCK #2 AC



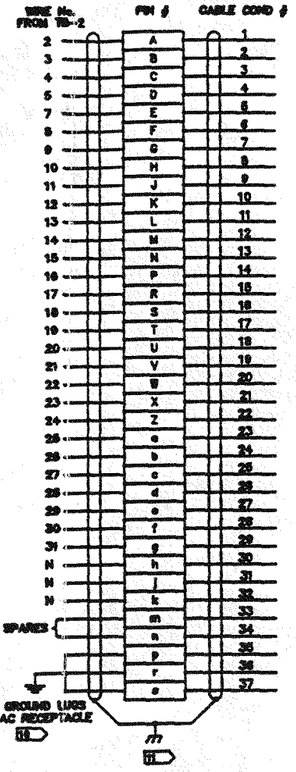
AC POWER INPUT



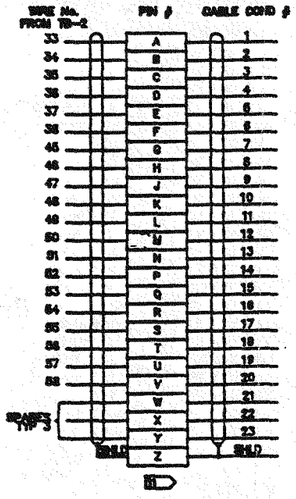
TERMINAL BLOCK #1 DC



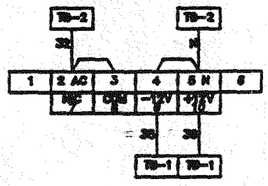
AC MS RECEPTACLE(AC)



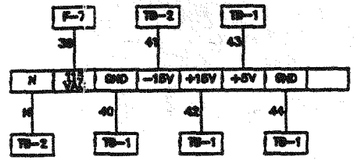
DC MS RECEPTACLE(DC)



POWER SUPPLY 523A(PS–2)



POWER SUPPLY PS–1000(PS–1)



AS BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
CONTROL CONSOLE INTERNAL WIRING
EQUIP. NO. 162–T–001, 002, 003

CHECK	D L GRANBACK	5–10–93	
DRAWN	WEST	5–10–93	
DIMENSIONS ARE IN INCHES 3 PLACE DECIMALS ± .000 2 PLACE DECIMALS ± .02 1 PLACE DECIMAL ± .1			

SCALE: NONE	WT.	
REV:	SHEET 5 OF 5	
SIZE: D	DWG NO. 2014–410–AB	

2014–410–AB SH 5 OF 5

QUANTITY PER ASSY A1	QUANTITY PER ASSY A2	ITEM	PART NUMBER	DESCRIPTION	MANUFACTURER	MATERIAL SPEC
X		A1		AC JUNCTION BOX		11
	X	A2		DC JUNCTION BOX		11
	2	1	6868-K054	INCLINOMETER	ROBINSON-HALPERN	12
	2	2	11-001-(10)	CONNECTOR AND CABLE	ROBINSON-HALPERN	12
	2	3	ST-23-1/36-2K	TRANSDUCER	ASTROSYSTEM, INC	12
	2 FT	4	8307	CABLE #20-7 COND. (SHLD)	BELDEN	11
3 FT		5	4A-1808	CABLE #18-8 COND. (AC)	AMDTER	
3 FT		6	A4-1804	CABLE #18-4 COND. (AC)	AMDTER	
1	1	7	A-1212CHNF	ENCLOSURE	HOFFMAN	
1	1	8	A12P12	PANEL	HOFFMAN	
40	30	9	1492-CA3	TERMINAL BLOCK	ALLEN BRADLEY	
2	2	10	1492-N16	TB END CLP	ALLEN BRADLEY	
4	4	11	1492-N2	RETAINING CLP	ALLEN BRADLEY	
2	2	12	1492-N22	MOUNTING RAIL	ALLEN BRADLEY	
4	4	13		SCREW-MACH 8-32 X 1/2	COMML	CAD. PLT
4	4	14		NUT-HEX 8-32	COMML	CAD. PLT
4	4	15		WASHER #8 EXT. TOOTH	COMML	CAD. PLT
1		16	MS102A-22-21P	CONNECTOR (AC)	AMPHENOL	
	1	17	MS102A-24-28P	CONNECTOR (DC)	AMPHENOL	
1	1	18	8489T25	EYEBOLT 5/16	MCMASTER CARR	
1		19	14RB-6	LUG	T & B	
2	4	20	CGB-194	CORD GRIP	CROUSE HINDS	
3		21	CGB-298	CORD GRIP	CROUSE HINDS	
2	4	22	STG-50	GASKET 1/2" CONDUIT	APPLET	
3		23	STG-75	GASKET 3/4" CONDUIT	APPLET	
2	4	24	A41	LOCK NUT 1/2" NPT	T & B	
3		25	A42	LOCK NUT 3/4" NPT	T & B	
2	4	26	2201	1/2" STRAIN RELIEF 45°	T & B	
3		27	2211	3/4" STRAIN RELIEF 45°	T & B	
		28		NOT USED		
		29		NOT USED		
		30		NOT USED		
		31		NOT USED		
25	25	32	TY6234-MX	CABLE TIE, SELF LOCKING	T & B	
4	4	33	3M #3	BOLT-HEX 1/4-20 X 1/2	COMML (100)	CAD. PLT
4	4	34		NUT-HEX 1/4-20	COMML	CAD. PLT
4	4	35		WASHER-LOCK SPRING	COMML	CAD. PLT
4	4	36		SCREW-MACH 8-32 X 1/2	COMML	CAD. PLT
4	4	37		NUT-HEX 8-32	COMML	CAD. PLT
4	4	38		WASHER #8 EXT. TOOTH	COMML	CAD. PLT
		39		NOT USED		
AR	AR	40	#24 (1" WIDE X 18 FEET)	ELECTRICAL SHIELD TAPE	3M COMPANY	

NOTES, UNLESS OTHERWISE SPECIFIED:

1. UNSHIELDED WIRE USED FOR CONTROL CONSOLE AND J-BOX SHALL BE STRANDED #16 AWG WITH 600 VOLT MINIMUM INSULATION, USE RED CABLE FOR AC LINE CONNECTIONS, WHITE CABLE FOR AC NEUTRAL CONNECTIONS, GREEN CABLE FOR AC GROUND CONNECTIONS AND BLUE CABLE FOR DC CONNECTIONS.
2. WIRES NOT TERMINATED BY SOLDER CONNECTION SHALL BE TERMINATED WITH RING TYPE SOLDERLESS CONNECTORS
3. ALL WIRES SHALL BE FITTED ON BOTH ENDS WITH PLASTIC SLEEVE TYPE WIRE MARKERS
4. NUMBER SHOWN THUS ( ) INDICATES WIRE DESTINATION SEE SPECIFIC ITEM SHT 2
5. ELECTRICAL SYMBOLS PER NATIONAL ELECTRICAL CODE
6. USE ALL REF DIMENSION ON ASSY A1 FOR ASSY A2 UNLESS OTHERWISE NOTED
7. ALL SHIELDS SHOULD BE TREATED AS AN ACTIVE CONDUCTOR AND GROUND AT ONE POINT ONLY
8. CONNECT THESE THREE WIRES TO A GROUND LUG ATTACHED TO A J-BOX SCREW USED FOR COMPONENT MOUNT PANEL
9. ALL WIRE RUNS SHALL BE CONTINUOUS, NO SPLICES ALLOWED
10. WIRING OF ACTUATORS 1, 2 & 3 (ITEM #27, DWG 2014-080) CAN SWITCHES SW-1 THRU SW-6 TO BE AS SHOWN ON SHEET 3
11. USE ITEM #4, 7 COND FOR INTERCONNECTING WIRING
12. COMPONENTS PHYSICALLY INSTALLED ON DWG 2014-080

REVISION HISTORY		
REV	DESCRIPTION	DATE

THIS AS-BUILT DRAWING WAS PREPARED USING NuPac DRAWING 2150-420-AB AS A BASELINE, AND REFLECTS THE MANUFACTURING AND MATERIAL CHANGES FROM AR/VR's GENERATED FROM WESTINGHOUSE PROCUREMENT.

CHECK D L SWAMRACK	5-10-03
DRAWN WEST	5-10-03
DIMENSIONS ARE IN INCHES 3 PLACE DECIMALS ± .010 2 PLACE DECIMALS ± .03 1 PLACE DECIMAL ± .3	

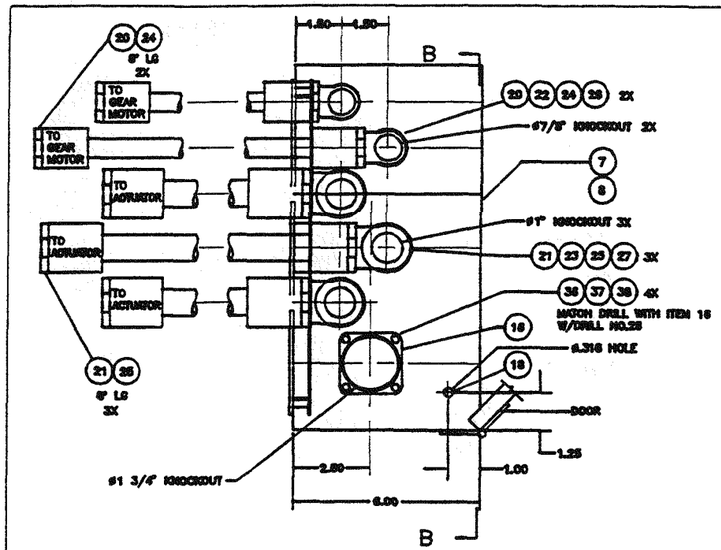
AS BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
AC & DC JUNCTION BOXES AND ACTUATORS
EQUIP. NO. 162-T-001, 002, 003

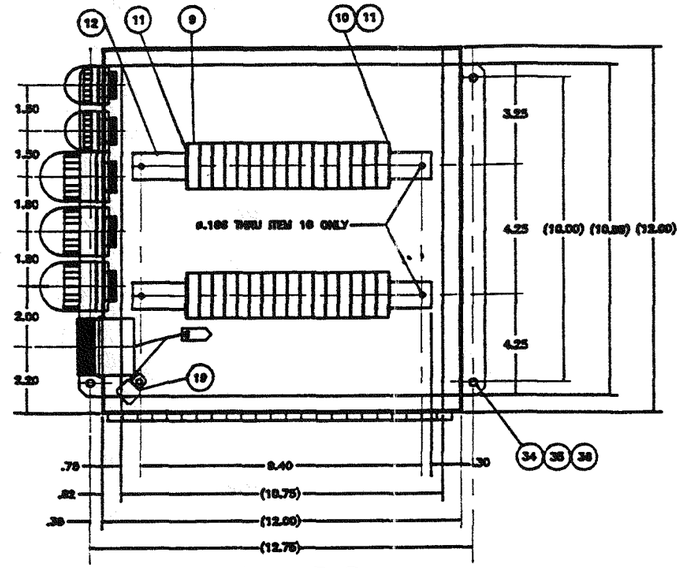
SCALE NONE | WT.
REV | SHEET 1 OF 3
DWG SIZE D | DWG NO. 2014-420-AB

2014-420-AB 1 3

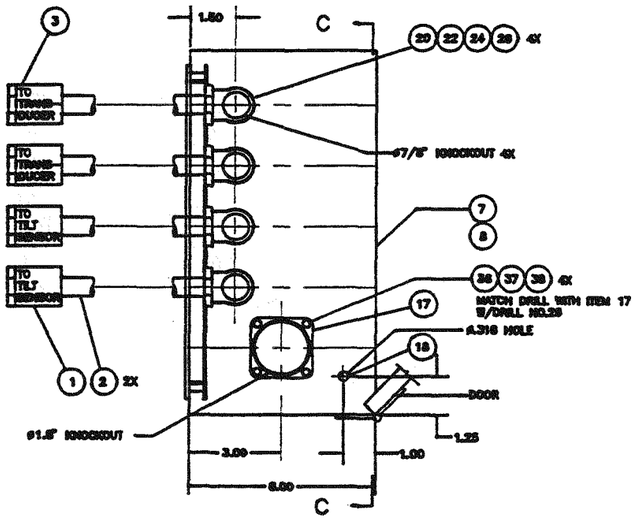
REVISION HISTORY		
REV	DESCRIPTION	DATE



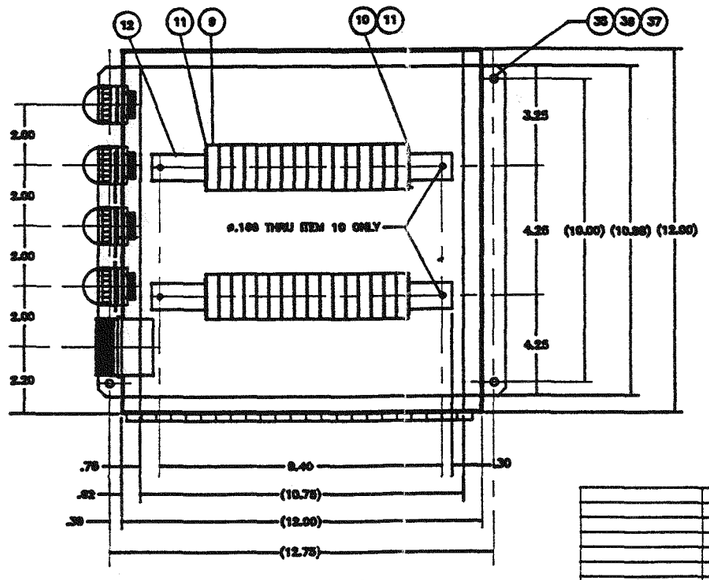
ASSEMBLY (A1)
AC JUNCTION BOX



SECTION B–B



ASSEMBLY (A2)
DC JUNCTION BOX



SECTION C–C

CHECK	D L SWANBACK	5-10-03
DRAWN	WEST	5-09-03

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

AS BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
AC & DC JUNCTION BOXES
EQUIP. NO. 162–T–001, 002, 003

-

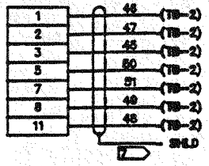
SCALE	NONE	WT.	
REV		SHEET	2 OF 3
SIZE	DWG NO.		
D	2014–420–AB		

2014–420–AB SH 2 OF 3

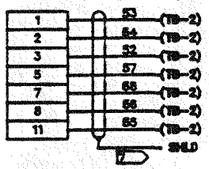
REVISION HISTORY		
REV	DESCRIPTION	DATE

DC JUNCTION BOX

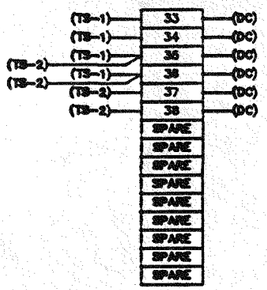
TRANSDUCER #1 (T-1)



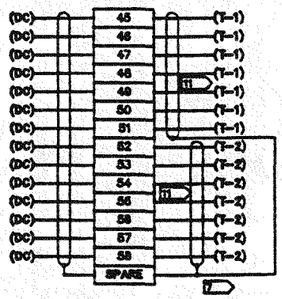
TRANSDUCER #2 (T-2)



TERMINAL BLOCK #1 (TB-1)

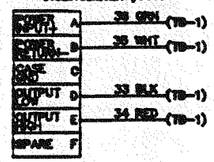


TERMINAL BLOCK #1 (TB-1)



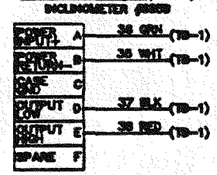
TILT SENSOR #1 (TS-1)

INCLINOMETER #6669

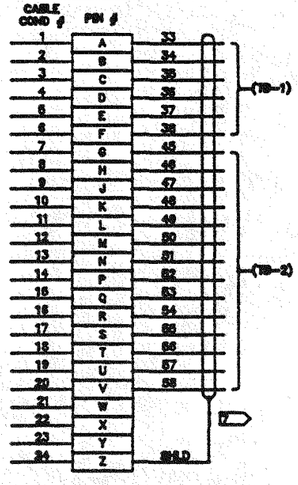


TILT SENSOR #2 (TS-2)

INCLINOMETER #6669



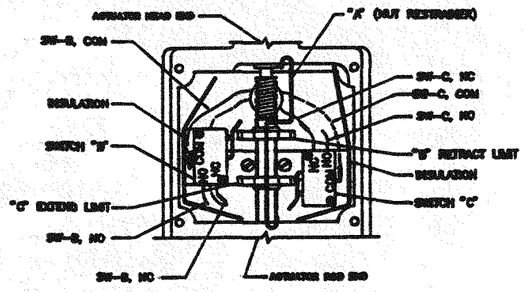
DC RECEPTACLE(DC)



NOTES, UNLESS OTHERWISE SPECIFIED:

THE DC JUNCTION BOX FIELD AND CABLE WIRING TERMINATION ORIENTATIONS ARE TENTATIVE. FINAL INSTALLATION WILL BE LEFT TO FIELD CRAFTSMAN IN ACCORDANCE WITH N.E.C. CODE.

AC SUPER-PAC ACTUATOR, 6415 SERIES LIMIT SWITCH ASSEMBLY

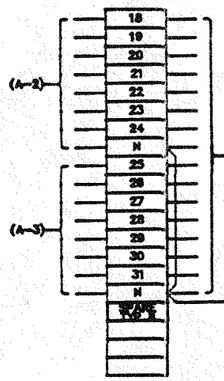


ACTUATOR LIMIT SWITCH TERMINAL DESIGNATIONS

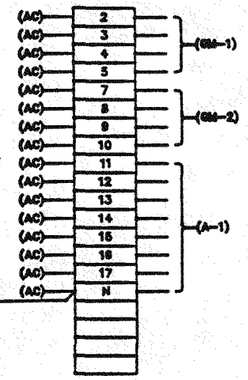
ACT.#	SW-B, NC	SW-B, NO	SW-B, COM	SW-C, NC	SW-C, NO	SW-C, COM
A-1	12	16	11	14	17	11
A-2	19	23	18	21	24	19
A-3	28	30	25	28	31	25
	GREEN	WHT/BLK	RED/BLK	BLACK	ORANGE	RED/BLK

AC JUNCTION BOX

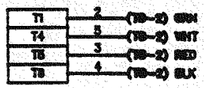
TERMINAL BLOCK #2 TB-1



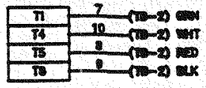
TERMINAL BLOCK #2 TB-2



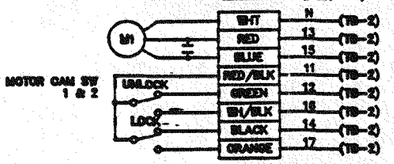
GEAR MOTOR #1 (GM-1)



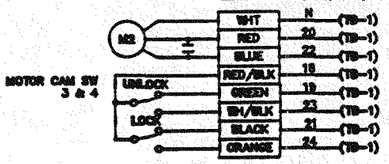
GEAR MOTOR #2 (GM-2)



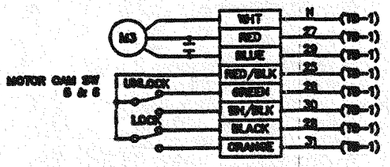
ACTUATOR #1 (A-1)



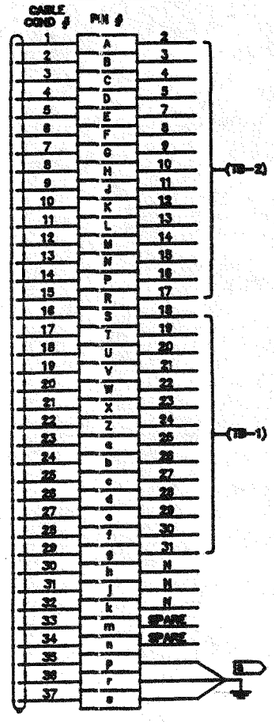
ACTUATOR #2 (A-2)



ACTUATOR #3 (A-3)



AC RECEPTACLE(AC)



NOTES, UNLESS OTHERWISE SPECIFIED:

THE AC JUNCTION BOX FIELD AND CABLE WIRING TERMINATION ORIENTATIONS ARE TENTATIVE. FINAL INSTALLATION WILL BE LEFT TO FIELD CRAFTSMAN IN ACCORDANCE WITH N.E.C. CODE.

AS BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
JUNCTION BOX AND ACTUATOR INTERNAL WIRING
EQUIP. NO. 162-T-001, 002, 003

CHECK	D L SWANSBACK	6-10-03	
DRAWN	WEST	3-10-03	

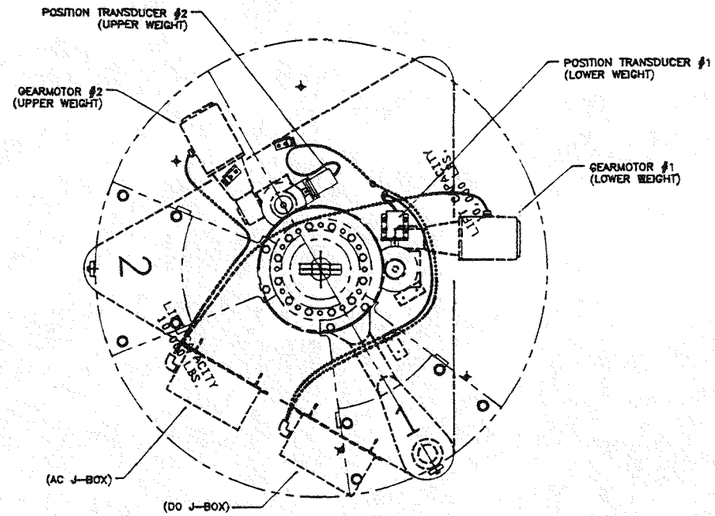
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

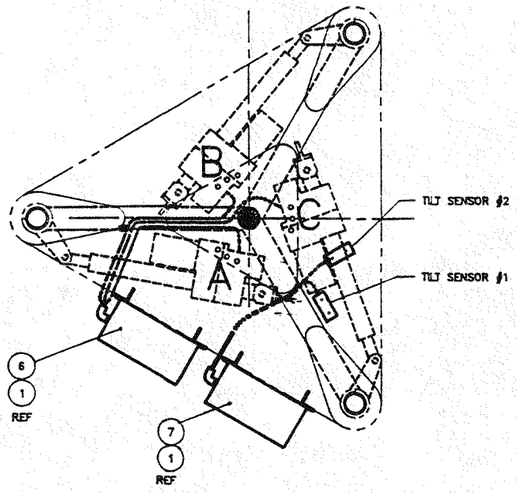
SCALE: NONE WT.
REV. SHEET 3 OF 3
SIZE D DWG NO. 2014-420-AB

2014-420-AB 3 3

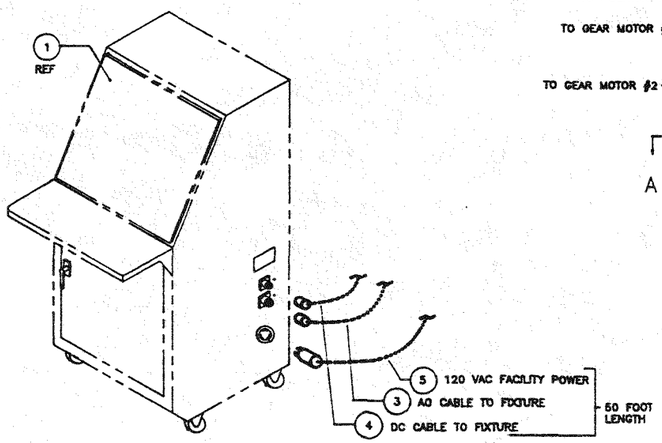
NOTES, UNLESS OTHERWISE SPECIFIED:

1. USE NATIONAL ELECTRICAL CODE FOR STANDARD PRACTICES.
2. ALL CABLE RUNS SHOWN ARE TO BE ROUTED APPROXIMATELY AS SHOWN USING COMMERCIAL TIE WRAPS TO BIND CABLES IN GROUPS.
3. CABLE RUNS SHALL NOT CROSS ANY SHARP EDGES OR MAKE ANY SHARP BENDS.
4. ALL CABLE POSITIONS SHOWN ARE TENTATIVE LOCATIONS. FINAL LOCATIONS WILL BE IN FIELD.

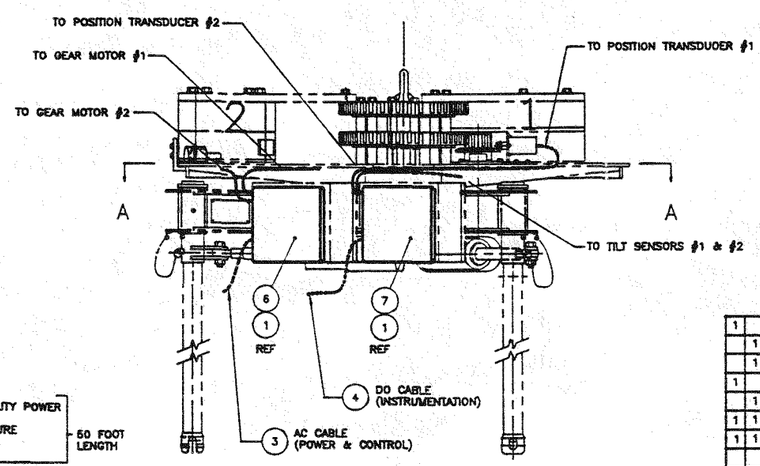




SECTION A-A



LIFT FIXTURE CONTROL CONSOLE ASSEMBLY (2)



LIFT FIXTURE ELECTRICAL ASSEMBLY (A1)

COUNTERWEIGHTS ROTATED FOR CLARITY

REVISION HISTORY		
REV	DESCRIPTION	DATE

THIS AS-BUILT DRAWING WAS PREPARED USING McPac DRAWING 2150-430-A0 AS A BASELINE, AND REFLECTS THE MANUFACTURING AND MATERIAL CHANGES FROM AR/VR's GENERATED FROM WESTINGHOUSE PROCUREMENT.

		ITEM	PART NO.	DESCRIPTION
		ASSEMBLY & QUANTITY		LIST OF MATERIAL
	1	7	2014-420	DO JUNCTION BOX ASS'Y
	1	6	2014-420	AO JUNCTION BOX ASS'Y
	1	5	2014-410	FACILITY POWER CABLE (120 VAC)
1		4	2014-410	DO CABLE ASSEMBLY (INSTRUMENTATION)
	1	3	2014-410	AO CABLE ASSEMBLY (POWER & CONTROL)
1	1	2	2014-410	CONTROL CONSOLE ASS'Y (AC & DC)
1	1	1	2014-400	WIRING DIAGRAM (AC & DC)
X		A2	2014-420	LIFT FIXTURE ELECTRICAL ASS'Y (DC)
	X	A1	2014-420	LIFT FIXTURE ELECTRICAL ASS'Y (AC)

2014-430 SH 1 OF 1

ITEM	QTY	NEXT ASSY	CHECK	D L SWINBACK	5-10-93
			DRAW	WEST	5-10-93

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1/2°
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

AS BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
ELECTRICAL INSTALLATION
EQUIP. NO. 162-T-001, 002, 003

SCALE: 1/8	WT. N/A
REV	SHEET 1 OF 1

DWG SIZE: D

DWG NO. 2014-430

REVISION HISTORY			
REV	DESCRIPTION	CHECK	REL
M	SEE INCORP ADCN J, K, L AND DCN		

NOTES: UNLESS OTHERWISE SPECIFIED

1. INTERPRET DRAWING PER ANSI Y-14.5.
2. FABRICATE IN ACCORDANCE WITH NUPAC SPECIFICATION FS-01.
3. MATERIAL SIZES LISTED IN THE MATERIAL COLUMN ARE FOR REFERENCE ONLY. MANUFACTURER SHALL CONFIRM ACTUAL REQUIREMENTS PRIOR TO FABRICATION.
4. EQUIVALENT COMPONENTS AND/OR SOURCES OF SUPPLY MAY BE SUBSTITUTED UPON APPROVAL OF NUPAC ENGINEERING.
5. IDENTIFY ALL COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC., DURING FABRICATION WITH A LOW CHLORIDE CONTENT MARKER. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER AND DRAWING REVISION NUMBER. IDENTIFY ALL COMPLETED FABRICATED COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC., USING .25 INCH CHARACTER DIES OR VIBRO ETCHING ON NON-MACHINED SURFACES AS APPROPRIATE TO COMPONENT SIZE AND CONFIGURATION. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER, DRAWING REVISION NUMBER AND A PROJECT UNIQUE SERIAL NUMBER, (SUPPLIED BY NUPAC)
6. (M) PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DYES, WELD FLUX, SPATTER, SCALE, GRIME AND ALL OTHER FOREIGN MATERIALS. FINISHED ASSEMBLY AND ALL INTERIOR SURFACES SHALL BE CLEANED AND VISUALLY OR WIPE TEST INSPECTED IN ACCORDANCE WITH ASTM-A380
7. PLATE WITH ELECTROLESS NICKEL PER MIL-C-26074 B OR C (.5 TO 1.0 MIL.)
8. (M) REFER TO NUPAC PROCEDURE OM-0136-NP, OM-0137-NP, OM-0142-NP OR OM-0147-NP, AS APPROPRIATE, FOR ADJUSTING THE TIEDOWN ASSEMBLY TO THE CORRECT PRELOAD GAP AS INDICATED BETWEEN ITEM NO'S. 2 AND 12 ON ASSEMBLY A3.
9. SEE NUPAC PROCEDURE O&M-0136-NP, O&M-0137-NP & O&M-0142-NP FOR LUBRICATION INSTRUCTIONS PRIOR TO EACH USE OF TIEDOWN ASSEMBLY.
10. REMOVED.
11. DO NOT PLATE THREADS.
12. PLATE WITH CADMIUM OR ZINC DI-CHROMATE.
13. (M) ITEM NUMBERS (3) & (12) SHALL BE MACHINED TO A LNI FIT PER USAS B4.1 FOR A PRESS FIT ASSEMBLY
14. 17-4 PH STAINLESS STEEL SHALL BE IN THE HEAT TREATED CONDITION H-1150, PRIOR TO FABRICATION
15. ALL WELDING PROCEDURES AND PERSONEL SHALL BE QUALIFIED IN ACCORDANCE WITH AWS D1.1 OR ASME CODE, SECTION IX. WELD PROCEDURES AND WELDER'S QUALIFICATIONS SHALL BE AVAILABLE FOR AUDIT OR REVIEW.
16. FOR THE U-BOLT ONLY, DO NOT MARK OR ETCH THE SHANK SURFACES. MARK THE ENDS OF THE U-BOLTS ONLY, ONE END SHALL INDICATE A REVISION CHARACTER, AND THE OTHER END SHALL INDICATE THE UNIQUE SERIAL NUMBER FOR THAT REVISION. USE 1/16 INCH CHARACTERS OR VIBRO ETCHING.
17. OPTIONAL: ITEM 4 MAY BE FABRICATED FROM A CASTING (AMS 5342), FORGED BILLET (AMS 5643), PLATE (AMS 5604), OR FABRICATED INTO A WELDMENT USING BAR AND PLATE (AMS 5604) AND POST WELD HEAT TREATED TO AN H1150 CONDITION.
18. WELDS SHALL BE LIQUID PENETRANT INSPECTED ON FINAL PASS IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000 AND SECTION V, ARTICLE 6.
19. TIEDOWN DEVICES SHALL BE LOAD TESTED IN ACCORDANCE WITH NUPAC SPECIFICATION NUMBER LOT-74.
20. ITEM NO. 10 SHALL BE LIQUID PENETRANT INSPECTED IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NF, ARTICLE NF 5000.

ITEM	QTY	PART NO	DESCRIPTION	MATERIAL
		ASSEMBLY & QUANTITY		
A4	1		CAM HANDLE OPERATING BAR WELDMENT	
A3	1		COMPRESSION PLATE ASSEMBLY	
A2	1		TIEDOWN ASSEMBLY (17-4/COURSE THRDS)	
A1	1		TIEDOWN ASSEMBLY (FINE THRDS)	
15	1		RD BAR, 1-3/16 DIA X 48.0	17-4 PH
14	1		PLATE, 3/16 THK X 2.0 X 2.3	17-4 PH
13	1		PLATE, 3/16 THK X 1.0 X 4.0	17-4 PH
12	1		PLATE, 5/16 THK X 2.5 X 5.8	17-4 PH
11	2		HEX NUT, 1/2-13UNC-2B NYLOCK	SAE GR.8
10	1		RD BAR, 1/2 DIA X 27.6	17-4 PH
9	2		WASHER	AN960 C816 S.STL
8	2		HEX NUT 1/2-20 UNF-2B	SAE GR. 8
7	2	K1750-J-131	LOADWASHER (PRESET)	KEY BELLEVILLES
6	2		HI NUT 1/2-20 UNF-2B	SAE GR. 8
5	1		RD BAR, 1-1/4 DIA. X 5.5.	17-4 PH
4	1		LOCKING CAM HANDLE, 3.5 X 2.3 X 8.0	17-4 PH
3	1		RD BAR, 1" DIA. X 2.2	17-4 PH
2	1		BAR, 1-3/4 THK. X 2.5 X 6.0	17-4 PH
1	1		RD BAR, 1/2" DIA. X 28.6	ETD 150 CR

ITEM	QTY	NEXT ASSY
A4	1	2077-035
A2	1	2077-035
A3	1	2077-035
3	1	2077-030
3	1	2077-020
4	1	2077-030
4	1	2077-020
A2	2	2077-030
A1	2	2077-020

REL	N.L. SHANNACK 9/30/88
APPD	
APPD	
APPD	A. JOHNSON 9/30/88
APPD	L. BROWN BY DLS 9/30/88
APPD	J. WUNSCH 9/30/88
APPD	S. QUINN 9/30/88
ENGR	L. SHANNACK 9/30/88
QA	JOE R. SULLIVAN 9/30/88
CHECK	E. HILL 9/30/88
DRAWN	P. SULLIVAN 9/19/88

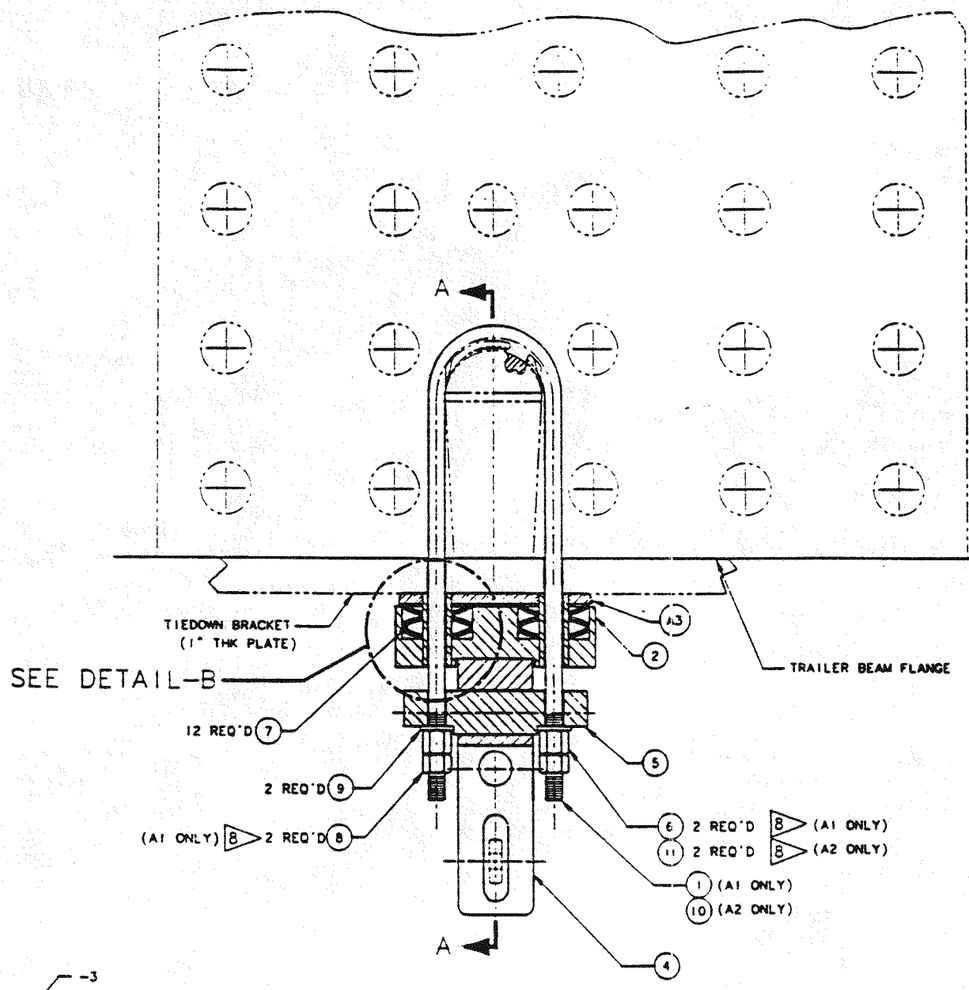
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES
TOLERANCES: 3 PLACE DECIMALS ±N/A
FRACTIONS ±: N/A; 2 PLACE DECIMALS ±N/A
ANGLES ±: N/A; 1 PLACE DECIMAL ±N/A

PACIFIC NUCLEAR SYSTEMS

TIEDOWN ASSEMBLY
FABRICATION DETAILS
TRUPACT - II

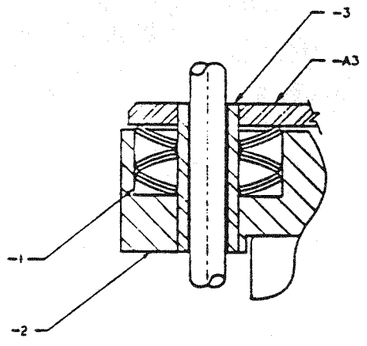
SCALE	N/A
WT	N/A
REV	M
SHEET	1 OF 1
DWG SIZE	D
DWG NO	2077-022

REVISION HISTORY			
REV	DESCRIPTION	CHECK	REL
M	SEE INCORP ADCN J, K, L AND DCN		



ASSEMBLY (A1) (AS NOTED)
B
SCALE: 1/2

ASSEMBLY (A2) (AS NOTED)
SCALE: 1/2



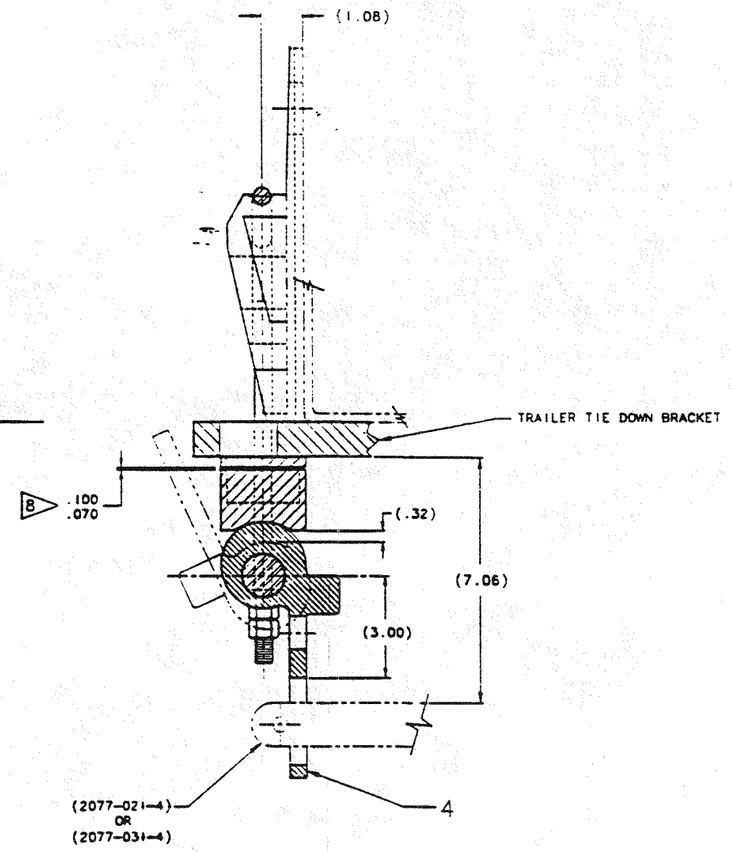
LOAD WASHER ORIENTATION

(2) UP

(2) DOWN

(2) UP

DETAIL-B
SCALE: FULL



SECTION A-A
SCALE: 1/2

	RE N. J. SWANNACK	8/30/89
	APPD	
	APPD	
	APPD B. A. JOHNSON	8/30/89
	APPD WIL BROWN BY DLS	8/30/89
	APPD H. J. WUNSCH	8/30/89
	APPD G. QUINN	8/30/89
	ENGR D. L. SWANNACK	8/30/89
	QA J. R. OLIVADOTI	8/30/89
	CHECKG E. MILL	8/30/89
ITEM QTY NEXT ASSY	DRAWN PL SULLIVAN	8/18/89

UNLESS OTHERWISE SPECIFIED
TOLERANCES
FRACTIONS ± 1/8
ANGLES ± 0°30'

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

PACIFIC NUCLEAR SYSTEMS

TIEDOWN ASSEMBLY
FABRICATION DETAILS
TRUPACT - II

SCALE NOTED | WT N/A
REV M | SHEET 2 OF 3
DWG SIZE D | DWG NO 2077-022

M 2077-022 SH 2 OF 3

REVISION HISTORY		
REV	DESCRIPTION	DATE

NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER ANSI Y14.5.
2. NOT USED
3. ALL WELDING PROCEDURES AND PERSONNEL SHALL BE QUALIFIED IN ACCORDANCE WITH AWS D1.1 OR ASME CODE, SECTION IX. (ALL STAINLESS STEEL MATERIAL WELDING SHALL BE PERFORMED PER ASME CODE, SECTION IX.) WELD PROCEDURES AND WELDER QUALIFICATIONS SHALL BE AVAILABLE FOR AUDIT OR REVIEW.
4. ALL WELDS SHALL BE VISUALLY EXAMINED IN ACCORDANCE WITH AWS D1.1, SECTION 8.15.1. VISUAL WELD INSPECTORS SHALL BE QUALIFIED PER AWS D1.1.
5. SURFACE PREPARATION PER SSPC-SP-6.
6. EQUIVALENT COMPONENTS AND/OR SOURCES OF SUPPLY MAY BE SUBSTITUTED UPON APPROVAL OF CUSTOMER ENGINEERING.
7. PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DYES, WELD FLUX, SPLATTER, SCALE, GRIME AND ALL OTHER FOREIGN MATERIALS. FINISHED ASSEMBLY AND ALL INTERIOR AREAS SHALL BE CLEANED AND VISUALLY INSPECTED TO VERIFY THAT ALL SURFACES ARE FREE OF PARTICLES OR LIQUIDS.
8. MATERIAL SIZES LISTED IN THE MATERIAL COLUMN ARE FOR REFERENCE ONLY. MANUFACTURER SHALL CONFIRM ACTUAL REQUIREMENTS PRIOR TO FABRICATION.
9. IDENTIFY ALL COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC., DURING FABRICATION WITH A LOW CHLORIDE CONTENT FELT TIP MARKER. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER AND DRAWING REVISION NUMBER. IDENTIFY ALL COMPLETED FABRICATED COMPONENTS, SUB-ASSEMBLIES, WELDMENTS, ETC., USING .25 INCH CHARACTER DIES OR VIBRO ETCHING AS APPROPRIATE TO COMPONENT SIZE AND CONFIGURATION. IDENTIFICATION SHALL CONSIST OF: DRAWING NUMBER, APPLICABLE DASH NUMBER, DRAWING REVISION NUMBER AND A PROJECT UNIQUE SERIAL NUMBER, (SUPPLIED BY CUSTOMER).
10. PAINT 3" WIDE STRIPE AROUND WELDMENT A1 AS SHOWN, COLOR-SAFETY RED, USING HIGH QUALITY INDUSTRIAL ENAMEL. APPLY PER MANUFACTURER'S INSTRUCTIONS.
11. FINISH PAINT NOT REQUIRED.
12. FINISH PAINT ALL CARBON STEEL SURFACES AFTER LOAD TEST WITH HIGH QUALITY INDUSTRIAL ENAMEL, COLOR - WHITE. APPLY IN ACCORDANCE WITH MANUFACTURE'S INSTRUCTIONS.
13. ITEMS 9, 11, 16, 20, 21, 26, 27, 30, WELDMENT A3, WELDMENT A4, WELDMENT A5 AND WELDMENT A7 SHALL BE ZINC OR CADMIUM PLATED.

A7	A8	A5	A4	A3	A2	A1	ITEM	PART NO.	DESCRIPTION
								ASSEMBLY & QUANTITY	LIST OF MATERIAL
							30		PLATE, 1/2" THK X 3.0 X 2-1/2 — ASTM A36
						1	29		PLATE, 1/4" THK X 3.0 X 3-1/2 — ASTM A36
						1	28	2SC225	CLAMP, SPLIT, 2-1/4 BORE X 3-1/2 O.D. X 5/8 WIDTH — BOSTON
							27		ROUND TUBE, 7/8 O.D. X 3/8 I.D X 2.8 LG — AISI 1026
							26	89-500-14-03	SPUR GEAR, .75 DIA.BORE X 3/16 KEYWAY — DEFONTAINE
							25		NOT USED
						1	24		ROUND BAR, .5"DIA. X 4.2 LG. — AISI 1018
		1					23		ROUND TUBE, 2.5"O.D. X 2.0"I.D. X 10.4 LG. — AISI 1026
							22	OR 01-0345-00 / 01-0345-51	SLEW BEARING RING — DEFONTAINE
							21		ROUND TUBE, 1 1/4"O.D. X 5/8"I.D. X 2.3 LG. — AISI 1026
							20	YSB16B16-60	BEVEL GEAR — BROWNING
		1					19		PLATE, 1/4"THK X 2.4" X 3.0" — ASTM A36
		1					18		PLATE, 1/2"THK X 1.0" X 2.8" — ASTM A36
		1					17		PLATE, 1/2"THK X 1.0" X 4.5" — ASTM A36
							16	YSB16B96-60	BEVEL GEAR, 16 DP. — BROWNING
							15		NOT USED
				1			14		ROUND TUBE, 2.25"O.D. X 1.50"I.D. X 2.3" LG. — AISI 1026
			1				13		ROUND TUBE, 2.25"O.D. X 1.50"I.D. X 5.5" LG. — AISI 1026
			1	1			12		PLATE, 3/8"THK X 4.8" X 5.8" — ASTM A36
							11		PLATE, 1/4"THK X 3.5" X 7.4" — ASTM A36
							10		NOT USED
							9		PLATE, 3/4"THK X 2.9" X 4.8" — ASTM A36
	1					1	8		ROUND BAR, .5 O.D. X 2.8 L.G. — 17-4 S.STL. H-1150
							7		SHAFT, .750 DIA. X 9.5" LG. TURNED, GROUND, & POLISHED — ASTM A311 GR. B
							6		SHAFT, .750 DIA. X 5.5" LG. TURNED, GROUND, & POLISHED — ASTM A311 GR. B
							5		PLATE, 3/8"THK X 4.0"O.D. X 3.0"I.D. — ASTM A36
						1	4		ROUND TUBE, 3.0"O.D. X 2.5"I.D. X 12.5 LG. — AISI 1026
						2	3		PLATE, 3/8"THK X 2.8" X 6.2" — ASTM A36
	1					1	2		ROUND BAR, 3.0 "O.D. X 4.0"LG. — 17-4 S.STL H-1150
						1	1		ROUND TUBE, 2.5"O.D. X 2.0"I.D. X 83.5 LG. — AISI 1026
							A7		ENCODER SUPPORT BRACKET
							A6		LIFT LEG WELDMENT (SHORT)
							A5		STOP ANGLE WELDMENT
							A4		TALL BEARING SUPPORT
							A3		SHORT BEARING SUPPORT
							A2		LIFT LEG TURNING SLEEVE WELDMENT
							A1		LIFT LEG WELDMENT (LONG)

ITEM	QTY	NEXT ASSY
30	1	2014-060
27	4	2014-060
26	2	2014-060
22	2	2014-060
21	24	2014-060
20	2	2014-060
16	2	2014-060
11	1	2014-060
9	2	2014-060
7	1	2014-060
6	1	2014-060
5	3	2014-060
A7	1	2014-060
A6	3	2014-060
A5	2	2014-060
A4	1	2014-060
A3	1	2014-060
A2	3	2014-060
A1	3	2014-060

ITEM	QTY	NEXT ASSY

THIS AS-BUILT DRAWING WAS PREPARED USING NuPac DRAWING 2150-064-AB AS A BASELINE, AND REFLECTS THE MANUFACTURING AND MATERIAL CHANGES FROM AR/WR's GENERATED FROM WESTINGHOUSE PROCUREMENT.

CHECK	D L SVARMACK 9-20-93
DRAWN	BEST 8-18-93

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± 1/8
ANGLES ± 1/2°

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMAL ± .1

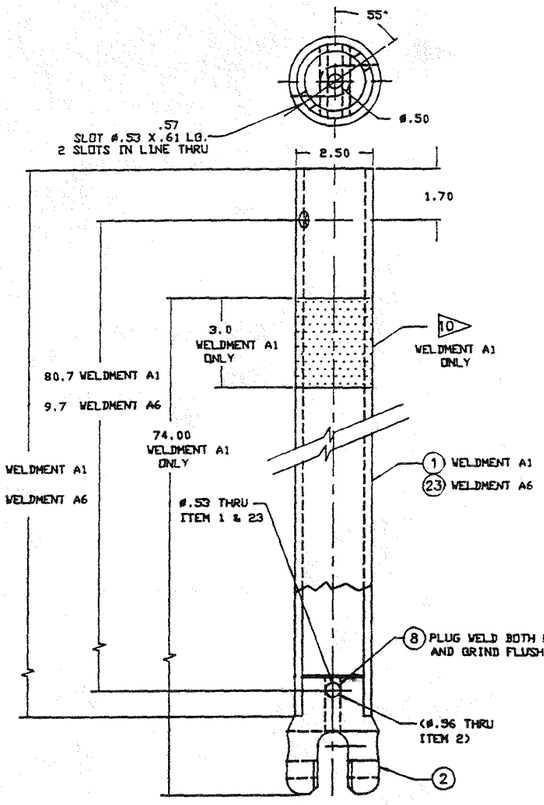
AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
LEG WELDMENT AND MISC. DETAILS
EQUIP. NO. 162-T-001, 002, 003

SCALE: NONE	WT. N/A
REV	SHEET 1 OF 3
SIZE D	DWG NO. 2014-064

2014-064 SH 1 REV

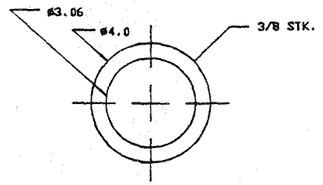
REVISION HISTORY		
REV	DESCRIPTION	DATE



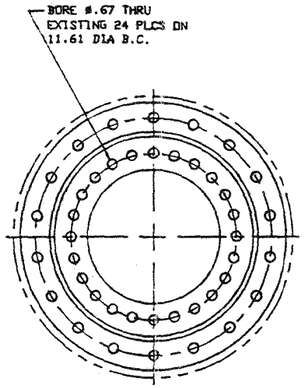
WELDMENT (A1) (AS NOTED)

WELDMENT (A6) (AS NOTED)

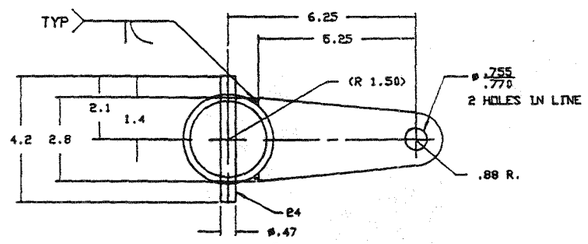
DETAIL ITEM (8)
SCALE: FULL

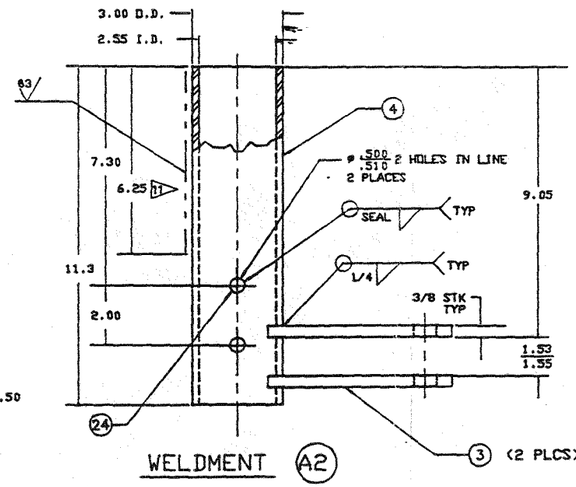


DETAIL ITEM (5)



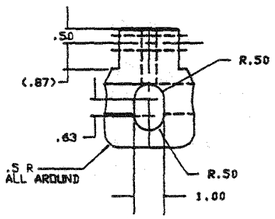
DETAIL ITEM (22)
SCALE: 1/4



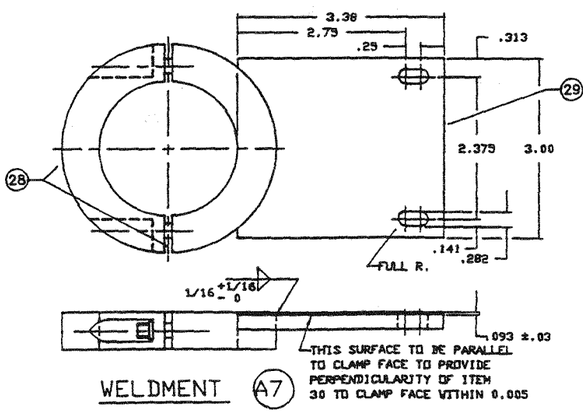


WELDMENT (A2)

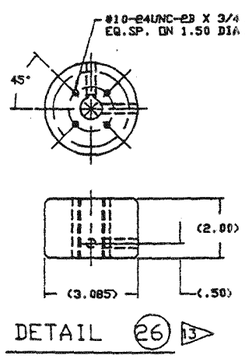
DETAIL ITEM (2)



VIEW C-C



WELDMENT (A7)



DETAIL (26) (13)

ITEM	QTY	NEXT ASSY	GRAIN	NEXT
			CHECK	P L SWARINGEN 9-18-98

UNLESS OTHERWISE SPECIFIED
TOLERANCES
FRACTIONS ± 1/8
ANGLES ± 1/2°
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .05
1 PLACE DECIMAL ± .1

AS-BUILT DRAWINGS FOR ACGLF AS MANUFACTURED BY EDS

ADJUSTABLE CENTER OF GRAVITY LIFT FIXTURE (ACGLF)
LEG WELDMENT AND MISC. DETAILS
EQUIP. NO. 162-T-001, 002, 003

SCALE: 1/2	WT. N/A
REV	SHEET 2 OF 3
SIZE D	DWG NO. 2014-064

2014-064 SH 2 OF 3

ATTACHMENT F

TRUPACT-II Certificate of Compliance (NRC Docket No. 71-9218)

NRC FORM 618
(8-89)
10 CFR 71

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIALS PACKAGES

U.S. NUCLEAR REGULATORY COMMISSION

1.a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. PACKAGE IDENTIFICATION NUMBER	d. PAGE NUMBER	e. TOTAL NUMBER PAGES
9218	4	USA/9218/B(U)F	1	4

2. PREAMBLE

a. This certificate is issued to certify that the packaging and contents described in Item 5 below, meets the applicable safety standards set forth in Title 10 Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."

b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

a. ISSUED TO (Name and Address)

Department of Energy
Transportation & Packaging
Safety Div., EH-33.3
Washington, DC 20585

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION:

Nuclear Packaging Inc. application
dated March 3, 1989, as supplemented.

c. DOCKET NUMBER 71-9218

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

(1) Model No.: TRUPACT-II

(2) Description

A stainless steel and polyurethane foam insulated shipping container designed to provide double containment for shipment of contact-handled transuranic waste. The packaging consists of an unvented, 1/4-inch thick stainless steel inner containment vessel (ICV), positioned within an outer containment assembly (OCA) consisting of an unvented 1/4-inch thick stainless steel outer containment vessel (OCV), a 10-inch thick layer of polyurethane foam and a 1/4 to 3/8-inch thick outer stainless steel shell. The package is a right circular cylinder with outside dimensions of approximately 94 inches diameter and 122 inches height. The package weighs not more than 19,250 pounds when loaded with the maximum allowable contents of 7,265 pounds.

The OCA has a domed lid which is secured to the OCA body with a locking ring. The OCV containment seal is provided by a butyl rubber O-ring (bore seal). The OCV is equipped with a seal test port and a vent port.

The ICV is a right circular cylinder with domed ends. The outside dimensions of the ICV are approximately 73 inches diameter and 98 inches height. The ICV lid is secured to the ICV body with a locking ring. The ICV containment seal is provided by a butyl rubber O-ring (bore seal). The ICV is equipped with a seal test port and vent port. Aluminum spacers are placed in the top and bottom domed ends of the ICV during shipping. The cavity available for the contents is a cylinder of approximately 73 inches diameter and 75 inches height.

6. Physical form, chemical properties, chemical compatibility, configuration of waste containers and contents, isotopic inventory, fissile content, decay heat, weight and center of gravity, radiation dose rate must be determined and limited in accordance with Appendix 1.3.7 of the application, "TRUPACT-II Authorized Methods for Payload Control", (TRAMPAC).

7. Each drum, bin or SWB must be assigned to a shipping category in accordance with Table 5, "TRUPACT-II Content Codes", (TRUCON), DOE/WIPP 89-004, Rev. 6, or must be tested for gas generation and meet the acceptance criteria in accordance with Attachment 2.0, to Appendix 1.3.7 of the application.

8. Each drum, bin or SWB must be labeled to indicate its shipping category. All drums, bins or SWB's within a package must be of the same shipping category.

9. Each drum, bin, SWB, or TDOP must be equipped with filtered vents prior to shipment in accordance with Appendix 1.3.7 of the application. Drums which were not equipped with filtered vents during storage must be aspirated before shipment. The minimum aspiration time must be determined from Tables 7.1 through 9.3 in "TRUPACT-II Content Codes", (TRUCON), DOE/WIPP 89-004, Rev. 6.

10. In addition to the requirements of Subpart G of 10 CFR Part 71:

    (a) Each package must be prepared for shipment and operated in accordance with the procedures described in Chapter 7.0, "Operating Procedures", of the application.

    (b) Each package must be tested and maintained in accordance with the procedures described in Chapter 8.0, "Acceptance Tests and Maintenance Program", of the application.

11. The contents of each package must be in accordance with Appendix 7.4.3., "Payload Control Procedures", of the application.

12. Prior to each shipment, the lid and vent port seals on the inner and outer containment vessels must be leak tested to 1×10^{-7} std cm^3/sec in accordance with Chapter 7.0, "Operating Procedures", of the application.

13. All free standing water must be removed from the inner containment vessel cavity and the outer containment vessel cavity before shipment.

14. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR §71.12.

15. Expiration date: August 31, 1994.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APPROVAL RECORD
Model No. TRUPACT-II Package
Certificate of Compliance No. 9218
Revision No. 4

By application dated September 24, 1992, Nuclear Packaging, Inc., on behalf of the Department of Energy (DOE), requested an amendment to Certificate of Compliance No. 9218, for the Model No. TRUPACT-II package. The request included the following changes: (1) a new secondary container which could be used as an overpack for 55-gallon drums or standard waste boxes (SWBs), and (2) revision of several content codes to include additional waste materials.

In order to address the potential issue of waste retrieval from WIPP, a ten drum overpack (TDOP) was developed which could be used to overpack the retrieved waste containers, either 55-gallon drums or SWBs. This would allow the shipment of waste containers which may have been damaged during storage. One SWB or ten 55-gallon drums can fit inside the TDOP. The applicant evaluated the decay heat limits for each shipping category, to assure that the hydrogen concentration within the innermost confinement layer would not exceed 5% during a 60 day shipment period. The evaluation demonstrated that all shipping categories could be shipped inside the TDOP with no reduction in the decay heat per 55-gallon drum or per SWB. This is because there are fewer 55-gallon drums and SWBs per package when shipped in a TDOP. Each TDOP must be equipped with a minimum of 9 filtered vents, as described in Appendix 1.3.7 of the application.

The applicant provided descriptions for the revised content codes. The new content codes are for waste for the WIPP experimental program. The revised content codes include combinations of wastes from other content codes. The waste restrictions, chemical compatibility, and acceptable package configurations were determined using methodology used for other content codes. Decay heat limits were based on the most restrictive content code.

The Certificate of Compliance has been revised to specify the packaging configurations authorized for the TRUPACT-II, and to include the TDOP as an overpack for drums and SWBs. The certificate has been revised to reference the updated TRUCON document, which includes the revised content codes. The certificate holder has been changed to the Transportation & Packaging Safety Division of the DOE, based on a previous agreement between NRC and DOE.

These changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Ross Chappell
for Charles E. MacDonald, Chief
Transportation Branch
Division of Safeguards and
Transportation, NMSS

Date NOV 19 1992

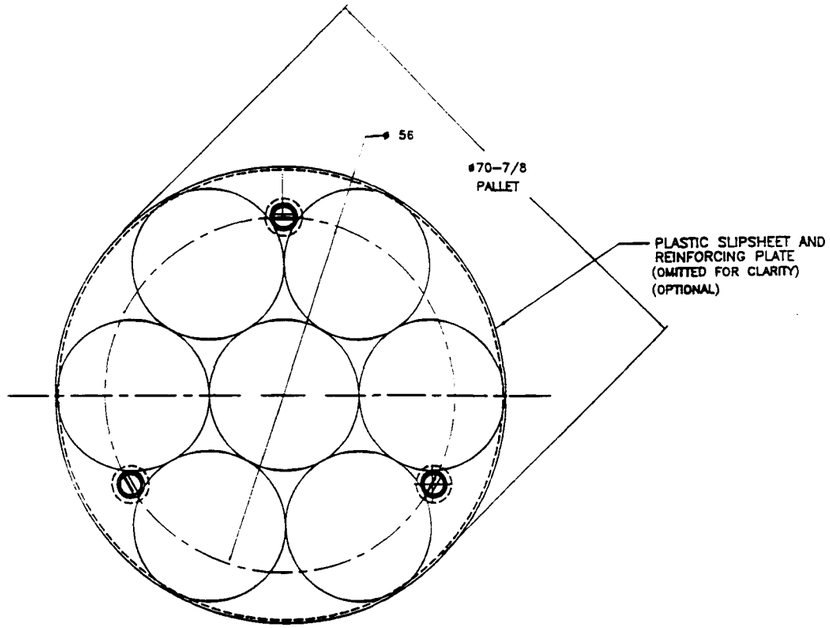
ATTACHMENT G

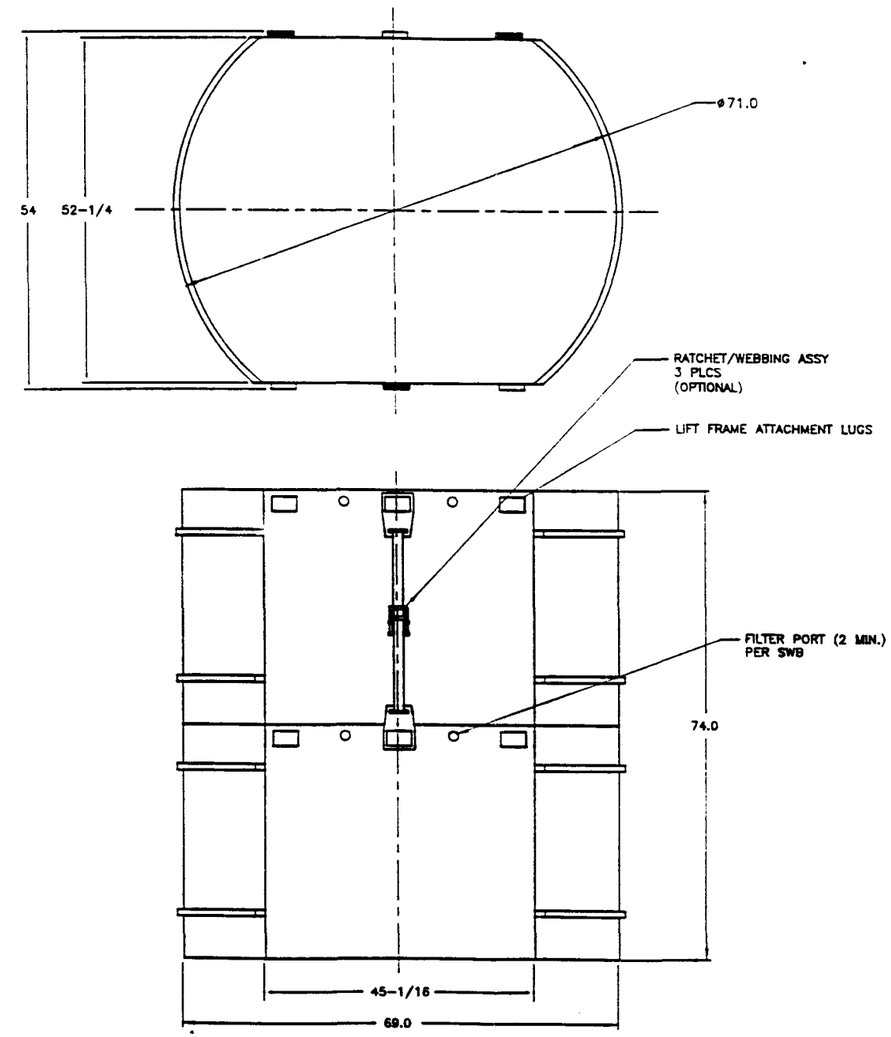
TRUPACT-II Safety Analysis Report for Packaging (SARP General Arrangement Drawings

NOTE: The drawings listed in this section are the design drawings that were approved by the Nuclear Regulatory Commission (NRC). With the exception of Drawing No. 2077-1120, no changes shall be made to these drawings without acquiring NRC approval.

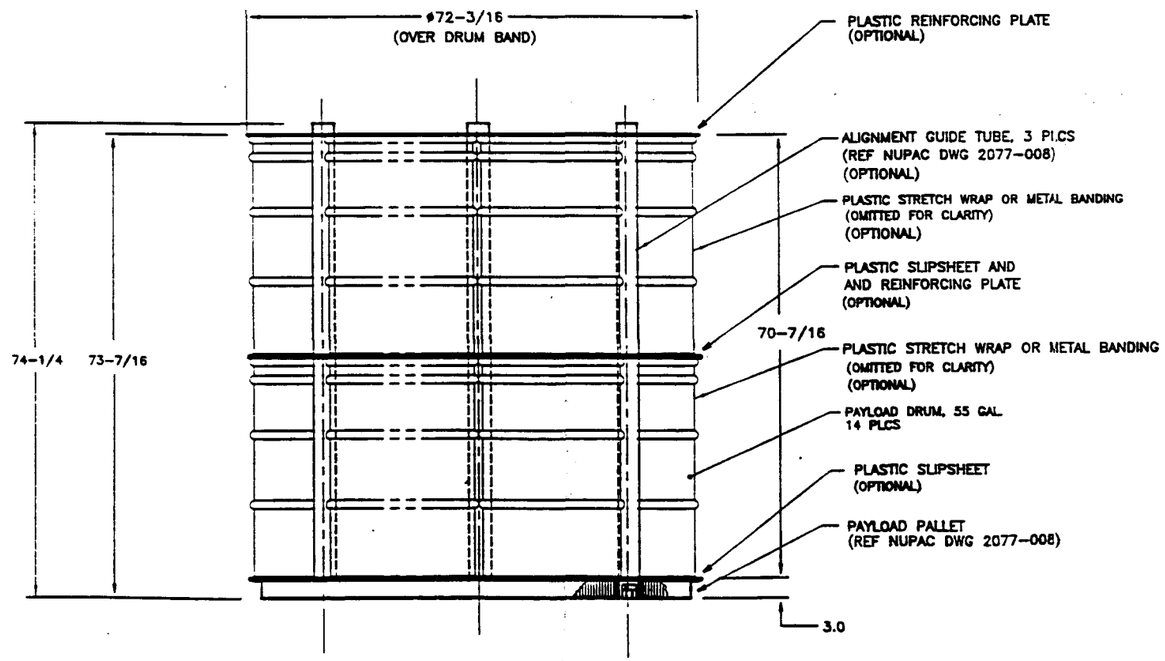
- Drawing No. 2077-007-SNP, Rev. C, 1 sheet, "TRUPACT-II Payload Assembly Design"
- Drawing No. 2077-008-SNP, Rev. C, 2 sheets, "TRUPACT-II Pallet and Alignment Guide Tube Design"
- Drawing No. 2077-500-SNP, Rev. K, 11 sheets, "TRUPACT-II Packaging"
- Drawing No. 2077-1120, Rev. E, 2 sheets, "TRUPACT-II Quality Level and Spare Parts List"

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
C	SEE DCN		





2-SWB PAYLOAD ASSEMBLY



14-DRUM PAYLOAD ASSEMBLY ⚠6

			REL	N.J.SWANNACK 2-24-99
			APPD	S.A.PORTER 2-24-99
			APPD	W.HENKEL 2-24-99
			APPD	D.L.SWANNACK 2-24-99
			APPD	D.SCHMOKER 2-24-99
			APPD	H.WUNSCH 2-23-99
			APPD	M.R.RICHARDS 2-23-99
			APPD	L.E.ULBRICHT 2-23-99
			QA	G.E.HILL 2-24-99
			CHECK	H.LEVITT 2-23-99
ITEM	QTY	NEXT ASSY	DRAWN	[illegible] 2-23-99

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

PAYLOAD ASSEMBLY
DESIGN DRAWING
TRUPACT-II

SCALE: 3/16 | WT. N/A
REV: C | SHEET 1 OF 1
DWG SIZE: D | DWG NO. 2077-007SNP

NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER ANSI Y-14.5.

2. ALL WELDING PROCEDURES AND PERSONNEL SHALL BE QUALIFIED IN ACCORDANCE WITH ASME CODE, SECTION IX. WELD PROCEDURES AND WELDER QUALIFICATIONS SHALL BE AVAILABLE FOR AUDIT OR REVIEW.

3. ALL WELDS SHALL BE VISUALLY EXAMINED IN ACCORDANCE WITH AWS D1.1, SECTION 8.15.1. VISUAL WELD INSPECTORS SHALL BE QUALIFIED PER AWS D1.1.

4. PALLET LIFTING FEATURES SHALL BE LOAD TESTED TO 150% OF THEIR MAXIMUM WORKING LOAD.

5. PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DYES, WELDING FLUX, SPATTER, SCALE GRIME AND ALL OTHER FOREIGN MATERIALS. FINISHED ASSEMBLY AND ALL INTERIOR SURFACES SHALL BE CLEANED AND VISUALLY OR WIPE TEST INSPECTED IN ACCORDANCE WITH ASTM-A380.

6. WELDS SHALL BE LIQUID PENETRANT INSPECTED ON FINAL PASS IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000 AND SECTION V, ARTICLE 6.

7. BOND IN PLACE USING 1617 A-B FURANE ADHESIVE.

8. SKINS MAY HAVE ONE SPLICE IF REQUIRED FOR FABRICATION. IF BOTH UPPER AND LOWER SKINS REQUIRE SPLICING, UPPER AND LOWER SPLICE LINES SHALL RUN PARALLEL.

9. SEAL ALL FASTENERS, HOLES AND GAPS WITH RTV SILICONE SEALANT.

10. WELDS SHALL BE LIQUID PENETRANT INSPECTED AFTER LOAD TEST PER G/N 6.

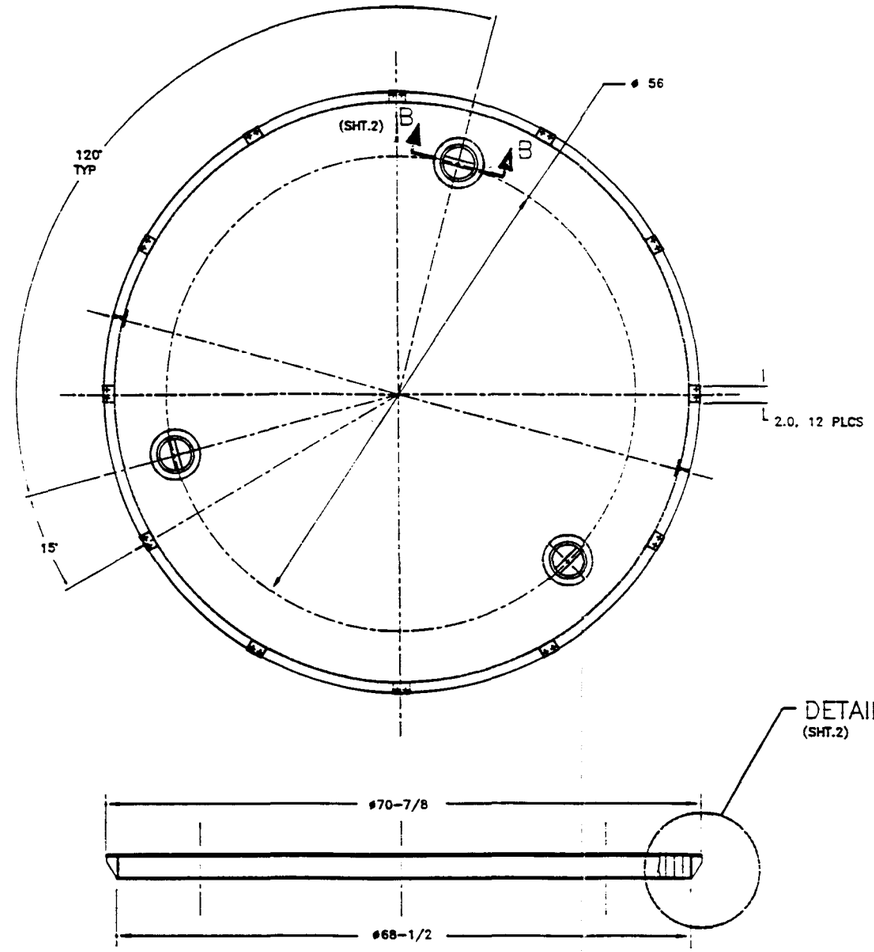
11. LIFT POCKETS SHALL BE POTTED IN PLACE USING ISOCAST SYSTEMS UNCAST TWO A/B PER MANUFACTURER'S INSTRUCTIONS.

12. HEXCEL ALUMINUM HONEYCOMB, CRIII 5052 OR 5056, CELL SIZE: 1/8 TO 3/8; FOIL THICKNESS: .0015 TO .005; DENSITY: 6.0 TO 6.9; PERFORATION OPTIONAL.

13. BOND IN PLACE USING NEWPORT ADHESIVE NO. NB101TR OR PER MIL-A 25463A.

C.

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
C	SEE DCN		



PAYLOAD PALLET

		REL	N.J.SWANNACK 2-24-89
		APPD	W.HENKEL 2-24-89
		APPD	S.A.PORTER 2-24-89
		APPD	D.L.SWANNACK 2-24-89
		APPD	D.SCHMOKER 2-24-89
		APPD	H.WUNSCH 2-23-89
		APPD	M.R.RICHARDS 2-23-89
		APPD	L.E.ULBRICHT 2-23-89
		QA	G.E.HILL 2-24-89
		CHECK	H.LEVITT 2-23-89
ITEM	QTY NEXT ASSY	DRAWN	[illegible] 2-23-89

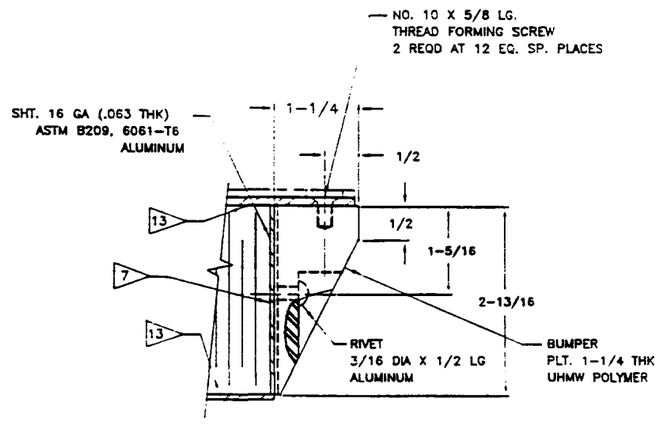
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

PALLET AND ALIGNMENT GUIDE TUBE
DESIGN DRAWING
TRUPACT - II

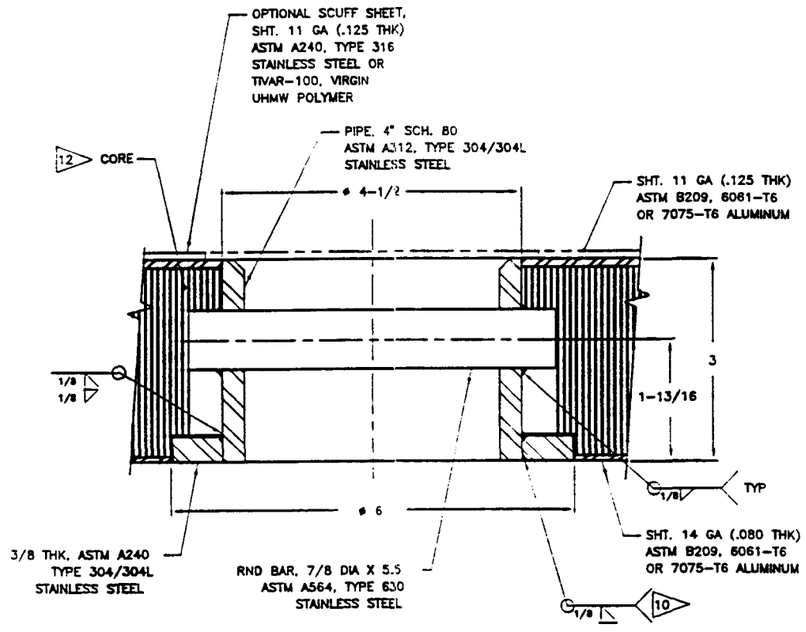
SCALE: 1/8 WT. N/A
REV: C SHEET 1 OF 2
DWG SIZE D
DWG NO. 2077-008SNP

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
C	SEE DCN		



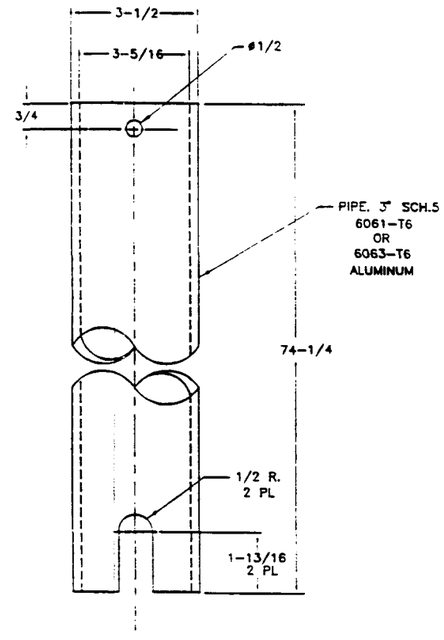
6 DETAIL A (SHT.1)

SCALE: FULL
12 PLCS



SECTION B-B (SHT.1) 11

SCALE: FULL
TYP-3 PLC'S



ALIGNMENT GUIDE TUBE

SCALE: 1/2

		REL N.J.SWANNACK	2-24-89
		APPD S.A.PORTER	2-24-89
		APPD W.HENKEL	2-24-89
		APPD D.L.SWANNACK	2-24-89
		APPD D.SCHMOKER	2-24-89
		APPD H.WUNSCH	2-23-89
		APPD M.R.RICHARDS	2-23-89
		APPD L.E.ULBRICHT	2-23-89
		QA G.E.HILL	2-24-89
		CHECK H.LEVITT	2-23-89
ITEM	QTY	NEXT ASSY	DRAWN [illegible]

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

PALLET AND ALIGNMENT GUIDE TUBE
DESIGN DRAWING
TRUPACT II

SCALE: NOTED | WT. N/A
REV: C | SHEET 2 OF 2
DWG SIZE: D | DWG NO. 2077-008SNP

NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER ANSI Y-14.5.

2. THREADS PER ASA B1.1 1960 EDITION.

3 IDENTIFICATION: PACKAGE SHALL BE IDENTIFIED ON THE OUTER CONTAINMENT ASSEMBLY LID AND BODY WITH STAINLESS STEEL NAMEPLATES SEAL WELDED ALL AROUND IN ACCORDANCE WITH THE REQUIREMENTS OF 10CFR 71.85 (c).'TYPE B' SHALL BE STENCILED NEAR THE NAMEPLATE IN 1/2 INCH MINIMUM HIGH CHARACTERS USING STANDARD INDUSTRIAL ENAMEL PAINT OR MARKING INK, COLOR: BLACK.

4 POLYURETHANE FOAM SHALL HAVE A NOMINAL DENSITY OF 8-1/4 LBS/CU FT. INSTALLATION TECHNIQUES, ACCEPTANCE TESTS AND ACCEPTABLE DEVIATIONS IN PROPERTIES ARE SUMMARIZED IN SECTION 8.1.4.1 OF THE TRUPACT-II SAFETY ANALYSIS REPORT.

5. PRIOR TO ASSEMBLY, ALL COMPONENTS SHALL BE CLEANED OF CUTTING OILS, MARKING DYES, WELD FLUX, SPATTER, SCALE, GRIME AND ALL OTHER FOREIN MATERIALS. FINISHED ASSEMBLY AND ALL INTERIOR SURFACES SHALL BE CLEANED, AND VISUALLY OR WIPE TEST INSPECTED IN ACCORDANCE WITH ASTM-A380.

6. ALL WELDING PROCEDURES AND PERSONNEL (EXCEPT AS NOTED) SHALL BE QUALIFIED IN ACCORDANCE WITH ASME CODE, SECTION IX. WELD PROCEDURES AND WELDER QUALIFICATIONS SHALL BE AVAILABLE FOR AUDIT OR REVIEW.

7. ALL WELDS (EXCEPT AS NOTED) SHALL BE VISUALLY EXAMINED IN ACCORDANCE WITH AWS D1.1, SECTION 8.15.1. VISUAL WELD INSPECTORS SHALL BE QUALIFIED PER AWS D1.1.

8. ALL WELDS (EXCEPT AS NOTED) ON THE ICV AND OCV (CONTAINMENT BOUNDRY) SHALL BE LIQUID PENETRANT INSPECTED ON FINAL PASS IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000 AND SECTION V, ARTICLE 6. ALL WELDS (EXCEPT AS NOTED) ON THE OCA OUTER SHELL SHALL BE LIQUID PENETRANT INSPECTED ON FINAL PASS IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NF, ARTICLE NF-5000.

9 INDICATED WELDS SHALL BE LIQUID PENETRANT INSPECTED ON ROOT AND FINAL PASSES IF A MULTIPASS WELD AND ON THE COMPLETED WELD IF A SINGLE PASS WELD IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000 AND SECTION V, ARTICLE 6.

10 INDICATED WELDS SHALL BE RADIOGRAPH INSPECTED IN ACCORDANCE WITH ASME CODE SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000 AND SECTION V, ARTICLE 2 FOR THE ICV AND OCV (CONTAINMENT BOUNDARY) WELDS AND RADIOGRAPH INSPECTED IN ACCORDANCE WITH SUBSECTION NF, ARTICLE NF-5000 FOR THE OCA OUTER SHELL WELDS.

11 MATERIAL: ASTM-A240, TYPE 304 STAINLESS STEEL (ROLLED AND WELDED PLATE).
OPT: ASTM-A182, GRD F304 (FORGED BILLET)
OPT: ASTM-A351, GRD CF8A (CENTRIFUGAL CASTING)
MATERIAL SHALL BE ULTRASONIC OR RADIOGRAPHIC TEST INSPECTED IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-2500 AND SECTION V, ARTICLE 5 OR ARTICLE 2 RESPECTIVELY. ROLLED AND WELDED PLATES SHALL BE FULL PENETRATION WELDED AND RADIOGRAPHIC TEST INSPECTED IN ACCORDANCE WITH ASME CODE SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000 AND SECTION V, ARTICLE 2.

12. MAXIMUM NORMAL OPERATING PRESSURE IS 50 PSIG. INNER AND OUTER VESSEL CONTAINMENT BOUNDARIES SHALL BE SUBJECTED TO AN INTERNAL TEST PRESSURE EQUAL TO A MINIMUM OF 150% OF THE MAXIMUM NORMAL OPERATING PRESSURE PER 10CFR 71.85(b).

13. INNER AND OUTER VESSEL CONTAINMENT BOUNDARIES SHALL BE LEAK TESTED TO DEMONSTRATE A LEAKAGE RATE NOT TO EXCEED 1 X 10 STANDARD CUBIC CENTIMETERS PER SECOND PER ANSI N14.5-1987.

14. OCA AND ICV LID LIFTING FEATURES SHALL BE LOAD TESTED TO 150% OF THEIR MAXIMUM WORKING LOAD. MAXIMUM WORKING LOAD FOR EACH OCA LID LIFT POINT IS 2,500 POUNDS AND FOR EACH ICV LID LIFT POINT IS 1,667 POUNDS.

15 PRIOR TO ASSEMBLY, COAT EACH O-RING WITH APPROXIMATELY 1 TABLESPOON OF DOW CORNING HIGH VACUUM GREASE. SEAL FLANGES MAY ALSO AS AN OPTION BE COATED WITH A THIN COAT OF DOW CORNING HIGH VACUUM GREASE.

16 PRIOR TO ASSEMBLY, THREADS SHALL BE COATED WITH A HIGH QUALITY NICKEL BEARING LUBRICANT.

17 COAT THREADS WITH A HIGH QUALITY THREAD LOCKING COMPOUND PRIOR TO INSTALLATION.

18 BUTYL MATERIAL PER RR0405-70, RAINIER RUBBER CO., SEATTLE, WA.

19 MATERIAL IS ASTM-A240, TYPE 304 STAINLESS STEEL. TOLERANCES FOR AS-ROLLED SHELL MATERIAL ARE IN ACCORDANCE WITH THE TOLERANCES GIVEN IN ASTM-A480, TABLE A1.17. THICKNESS OF AS-ROLLED PLATE MATERIAL FOR HEADS MAY BE 1/32 INCH GREATER THAN ALLOWED BY ASTM-A240/A480 TO ALLOW FOR THINNING DURING THE FORMING PROCESS. THE MINIMUM THICKNESS FOR ALL 1/4 INCH NOMINAL MATERIAL IS 0.240 INCH; THE MINIMUM THICKNESS FOR 3/16 INCH NOMINAL MATERIAL IS 0.178 INCH; THE MINIMUM THICKNESS FOR 3/8 INCH NOMINAL MATERIAL IS 0.365 INCH.

20 TAMPER INDICATING SEALS SHALL BE INSTALLED AT ONE (1) OCA LOCK BOLT LOCATION AND THE OCA VENT PORT ACCESS PLUG AS SHOWN.

21 FASTENERS SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING :
a. TORQUE OUTER CONTAINMENT ASSEMBLY LOCKING RING LOCK BOLTS (1/2-13UNC-2A) TO 28-32 FT-LBS (LUBRICATED 18).
b. TORQUE INNER CONTAINMENT VESSEL LOCKING RING LOCK BOLTS (1/2-13UNC-2A) TO 28-32 FT-LBS (LUBRICATED 18).

22 OCA SEAL TEST AND VENT PORT ACCESS PLUGS SHALL BE INSTALLED USING A TORQUE OF 35-45 FT-LBS (LUBRICATED 18)

23. ALL CONTAINMENT SHELL JOINTS SHALL BE MADE IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-4230. OCA OUTER SHELL JOINTS SHALL BE MADE IN ACCORDANCE WITH ASME CODE SECTION III, DIVISION 1, SUBSECTION NF, ARTICLE NF-4230.

24. ALL CYLINDRICAL AND CONICAL CONTAINMENT SHELL FABRICATIONS SHALL COMPLY WITH THE TOLERANCE REQUIREMENTS OF ASME CODE, SECTION III, DIVISION 1, SUBSECTION NE, ARTICLE NE-4220, AND FLAG NOTE 19.

25. ALL EXPOSED EXTERNAL OCA STEEL SURFACES, EXCEPT FOR AN 8 INCH SQUARE AREA ON EACH SIDE OF THE PACKAGE (LABEL LOCATION), AND OUTER THERMAL SHIELD WHICH ATTACHES TO THE LOCKING Z-FLANGE, SHALL BE SAND BLASTED WITH A FINE SILICA SAND IN ACCORDANCE WITH SSPC-SP-6.

26. THE FOLLOWING LONGITUDINAL WELDS ARE NOT SHOWN, BUT WILL BE UTILIZED AND SHALL BE FULL PENETRATION 'V' GROOVE PER G/N 6, 47 AND INSPECTED PER NOTES 7, 8, & 10:
a. OCA EXTERNAL SHELLS
b. OCV SHELLS
c. ICV SHELLS

27. ANY ADDITIONAL WELDS REQUIRED TO JOIN SHELL MATERIALS SHALL BE FULL PENETRATION WELDS PER G/N 6, 47 AND INSPECTED PER NOTES 7,8 & 10.

28 ALL Z-FLANGES ARE MADE FROM 14 GA. (.075 THK) ASTM A240 TYPE 304 STAINLESS STEEL AND MAY OPTIONALLY BE FABRICATED AS WELDED ASSEMBLIES USING CYLINDERS AND DISKS, OR SPUN FROM ONE PIECE. UPPER Z-FLANGE MAY, AS AN OPTION, BE FABRICATED AS TWO (2) SPUN PARTS JOINED WITH ONE (1) CIRCUMFERENTIAL FULL-PENETRATION BUTT WELD. WELDS (IF ANY) SHALL BE PER G/N 6 AND INSPECTED PER NOTES 7 & 8. FOR SPUN OPTION, CORNERS ARE SPUN WITH 1 INCH RADIUS UNLESS OTHERWISE SHOWN.

29 INDICATED RECEPTACLES ARE PROVIDED FOR LIFTING AND HANDLING THE OCA LID ONLY. EACH LOCATION SHALL BE LABELED WITH THE FOLLOWING WARNING: 'LID LIFT ONLY', VIA STENCILING WITH 2 INCH LETTERING USING A STANDARD INDUSTRIAL ENAMEL PAINT, COLOR: BLACK.

30 INDICATED RECEPTACLES ARE PROVIDED FOR LIFTING AND HANDLING THE ICV LID OR EMPTY INNER CONTAINMENT ASSEMBLY ONLY. EACH LOCATION SHALL BE LABELED WITH THE FOLLOWING WARNING: 'LID OR EMPTY CONTAINER LIFT ONLY', VIA STENCILING WITH 2 INCH LETTERING USING A STANDARD INDUSTRIAL ENAMEL PAINT, COLOR: BLACK.

31. FORK LIFT POCKETS ARE PROVIDED FOR LIFTING AND HANDLING THE COMPLETE ASSEMBLY AND ARE NOT TO BE USED FOR TIEDOWN.

32 BOND FOAM TO ACCESS PLUG UTILIZING A HIGH QUALITY EPOXY ADHESIVE.

33 BOND FIBERGLASS TUBE TO MATING STAINLESS PARTS USING HIGH QUALITY RTV SILICONE ADHESIVE.

34 LYTHERM CERAMIC FIBER PAPER, 1/4 INCH THK. LYDALL NO. 1535-LK. ADHERED TO OCA FOAM CAVITY WALL WITH RTV SILICONE ADHESIVE, DOW CORNING NO. 732 OR NO. 737.

35 ANGULAR ORIENTATION OF ICV LID RELATIVE TO ICV BODY AND ASSEMBLED ICV WITHIN OCA IS NOT SPECIFICALLY CONTROLLED. POSITIONS SHOWN ARE FOR REFERENCE PURPOSES AND ARE REPRESENTATIVE ONLY.

36 MICROLITE INSULATION AND INNER THERMAL SHIELD ARE LOCALLY CUT OUT TO PROVIDE ACCESS TO SEAL TEST PORT PLUG.

37 OPTIONAL FABRICATION:
ATTACHMENT OF ANGLE: MAY BE RIVETED IN 20 PLACES EQUALLY SPACED WITH 300 SERIES STAINLESS STEEL #1/8 COMMERCIAL POP RIVETS ON #82 B.C. OR RESISTANCE SPOT WELDED 20 PLACES EQUALLY SPACED WITH #3/16 SPOTWELDS ON # 82 B.C.

38 COAT PLUG AND COVER SEAL O-RINGS WITH A THIN COAT OF DOW CORNING HIGH VACUUM GREASE. PLUGS AND COVERS SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING:
a. TORQUE SEAL TEST PORT PLUGS TO 6-8 FT-LBS.
b. TORQUE VENT PORT PLUGS TO 8-10 FT-LBS.
c. TORQUE VENT PORT COVERS TO 13-16 FT-LBS.
d. TORQUE VENT PORT PLUG TO 10-13 FT.-LBS.

39 MATING SEAL FLANGE LUG HAS CORRESPONDING 1/8 X 20° TAPER ON LEADING EDGE.

40 STENCIL AS SHOWN USING 1/2 INCH HIGH CHARACTERS WITH A STANDARD INDUSTRIAL ENAMEL PAINT OR MARKING INK; COLOR: BLACK.

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
K	SEE DCN		

41 WEAR PAD INCLUDES SILICONE-BASED PRESSURE SENSITIVE ADHESIVE BACKING FOR ATTACHMENT TO INSIDE SURFACE OF OCV LOWER DISHED HEAD.

42 AXIAL DIMENSIONS SHALL BE CONTROLLED SUCH THAT WHEN ASSEMBLED WITH LOCKING RING IN LOCKED POSITION, MAXIMUM AXIAL FREE PLAY BETWEEN UPPER AND LOWER SEAL FLANGES SHALL BE NO GREATER THAN 0.153 INCHES.

43 MATERIAL: BUTYL PER RAINER RUBBER RR0403-50,
OR BUNA-N PER MIL-R 3065 GR.50,
OR FLUOROCARBON PER ASTM D2000 MHK 607,Z1
(50 TO 55 SHORE A)
OR FLUOROSILICONE PER MIL-R 25988.

44 MATERIAL: NEOPRENE PER ASTM D2000 BC 715,
OR ETHYLENE PROPYLENE PER ASTM D2000 BA 712.

45. ASME HEADS SHALL BE CONSTRUCTED TO SECTION VIII OF THE ASME CODE. ALL CONSTRUCTION WELDING OF THE HEADS SHALL BE 100% RADIOGRAPHIC EXAMINED USING THE EXAMINATION TECHNIQUE AND ACCEPTANCE CRITERIA OF SECTION III OF THE CODE (NB 5000). DOCUMENTATION OF RADIOGRAPHIC EXAMINATION SHALL BE IN ACCORDANCE WITH SECTION VIII (UW-51(a)(1)) OF THE CODE.

46 APPROXIMATE LOCATION OF ADHESIVE BACKED LABELS.

47. WELDS FOR THE ICV AND OCV SHELLS SHALL CONFORM TO ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-4400. MAXIMUM WELD REINFORCEMENT FOR THE ICV AND OCV SHELLS SHALL BE 3/32 INCH IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-4426, SUBARTICLE NB-4426.1. WELDS FOR THE OCA (EXTERNAL) SHELL SHALL CONFORM TO ASME CODE, SECTION III, DIVISION 1, SUBSECTION NF, ARTICLE NF-4400, AND SHALL BE SMOOTH, THAT IS, HAVE A MAXIMUM REINFORCEMENT OF 1/32 INCH AND HAVE A TAPERED TRANSITION TO THE BASE MATERIAL SURFACE.

48: REPAIR OF BASE MATERIAL

FOR THE ICV AND OCV COMPONENTS AND OCA INTERNAL SURFACES ONLY, REPAIR OF BASE MATERIAL SHALL BE IN COMPLIANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-2538 AND NB-2539, OR NB-4131. MAXIMUM WELD REINFORCEMENT SHALL BE +3/32 INCH IN COMPLIANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-4426, SUBARTICLE NB-4426.1.

FOR THE OCA EXTERNAL SURFACES, REPAIR OF BASE MATERIAL SHALL BE IN COMPLIANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NF-4131 OR NF-2510 AND ASTM A-240. ALTERNATIVELY, REPAIRS MAY BE PERFORMED IN COMPLIANCE WITH NB-2538 AND NB-2539, OR NB-4131. MAXIMUM WELD REINFORCEMENT SHALL BE +1/32 INCH.

REMOVAL OF EXCESS WELD REINFORCEMENT FROM BASE MATERIAL REPAIR WELDS, TEMPORARY ATTACHMENT WELDS, ETC., SHALL BE UNIFORMLY BLENDED, THAT IS, SHALL HAVE A MAXIMUM WELD REINFORCEMENT AS STATED ABOVE AND HAVE TAPERED TRANSITION TO THE BASE MATERIAL SURFACE.

DOCUMENTATION OF BASE MATERIAL REPAIRS SHALL BE IN COMPLIANCE WITH ARTICLE NB-4132.

49 OUTER THERMAL SHIELD HAS A 3/4 INCH X 10-1/2 INCH RELIEF TO PROVIDE CLEARANCE FOR VENT PORT TOOLING IN THE LOCKED OR UNLOCKED POSITION.

50. WHERE SECTIONS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINNEERS BOILER AND PRESSURE VESSEL CODE (ASME CODE) ARE REFERENCED, THE CODE EDITION AND ADDENDA WHICH ARE APPLICABLE ARE 1986 EDITION, 1987 ADDENDA. FOR OTHER REFERENCED CODES AND STANDARDS, THE CURRENT REVISION AT THE TIME OF FABRICATION OF THE TEST UNITS SHALL APPLY (1987). REVISIONS AND/OR ADDENDA FOR ALL CODES AND STANDARDS LATER THAN THESE DATES MAY BE USED.

51 MIRROR IMAGE OF SAWCUT AND PINS RELATIVE TO TABS IS AN OPTION.

52 OPTION: 2.2 INCHES.

53 LOCATE THE SIDE DOUBLER PLATE SO THAT THE TIEDOWN LUG LANDS BETWEEN THE CENTERLINES OF THE ADJACENT 1-1/2 INCH DIAMETER HOLES. IF ANY PORTION OF THE LUG OR LUG WELD OVERLAPS A HOLE, THE HOLE SHALL BE PLUG WELDED PRIOR TO WELDING THE LUG TO THE DOUBLER. POSITIONING OF TIEDOWN LUG AND 1/4 INCH THICK INTERNAL GUSSET PLATE MUST BE MAINTAINED PER SECTION T-T, SHEET 11.

	REL	R.J.SWANBACK	2-24-89
	APPD	W.MENKEL	2-24-89
	APPD	S.A.PORTER	2-24-89
	APPD	D.L.SWANBACK	2-24-89
	APPD	D.SCHMOKER	2-24-89
	APPD	H.WONSCH	2-23-89
	APPD	M.K.RICHARDS	2-23-89
	APPD	L.E.OLBRICHT	2-23-89
	QA	G.E.HILL	2-24-89
	CHECK	M.LEVITT	2-23-89
ITEM | QTY | NEXT ASSY	DRAWN	BRYAN	2-23-89

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

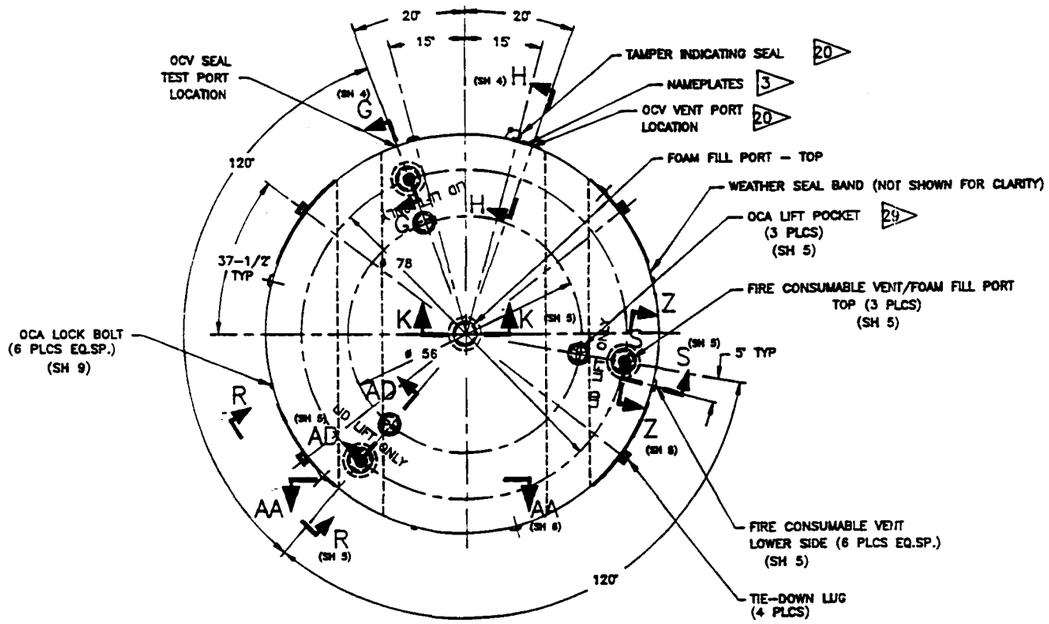
TRUPACT-II

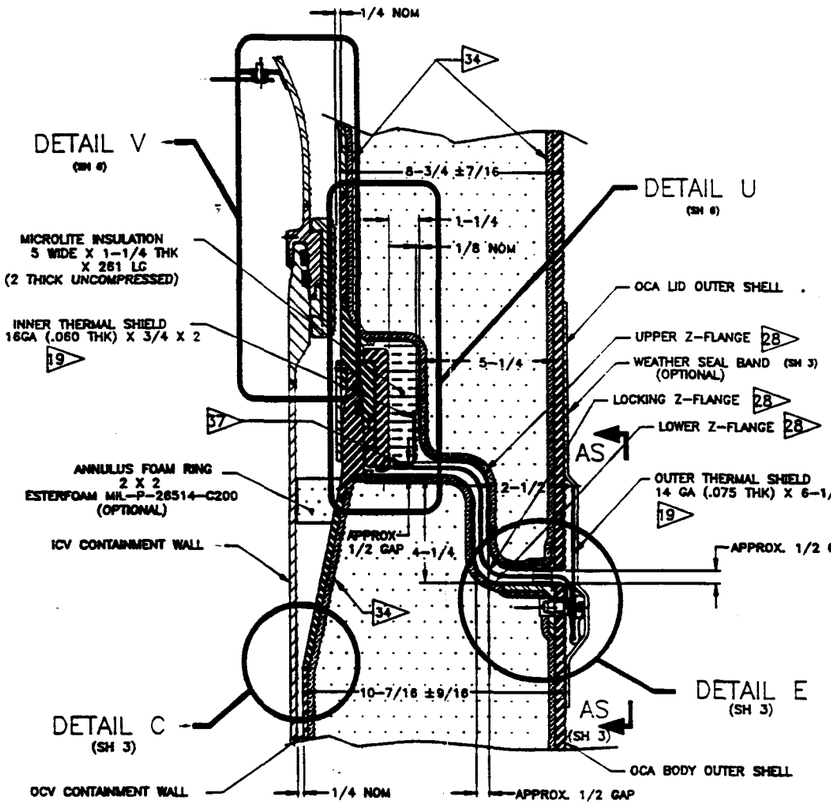
PACKAGING

SCALE: NONE | WT. N/A
REV: K | SHEET 1 OF 11

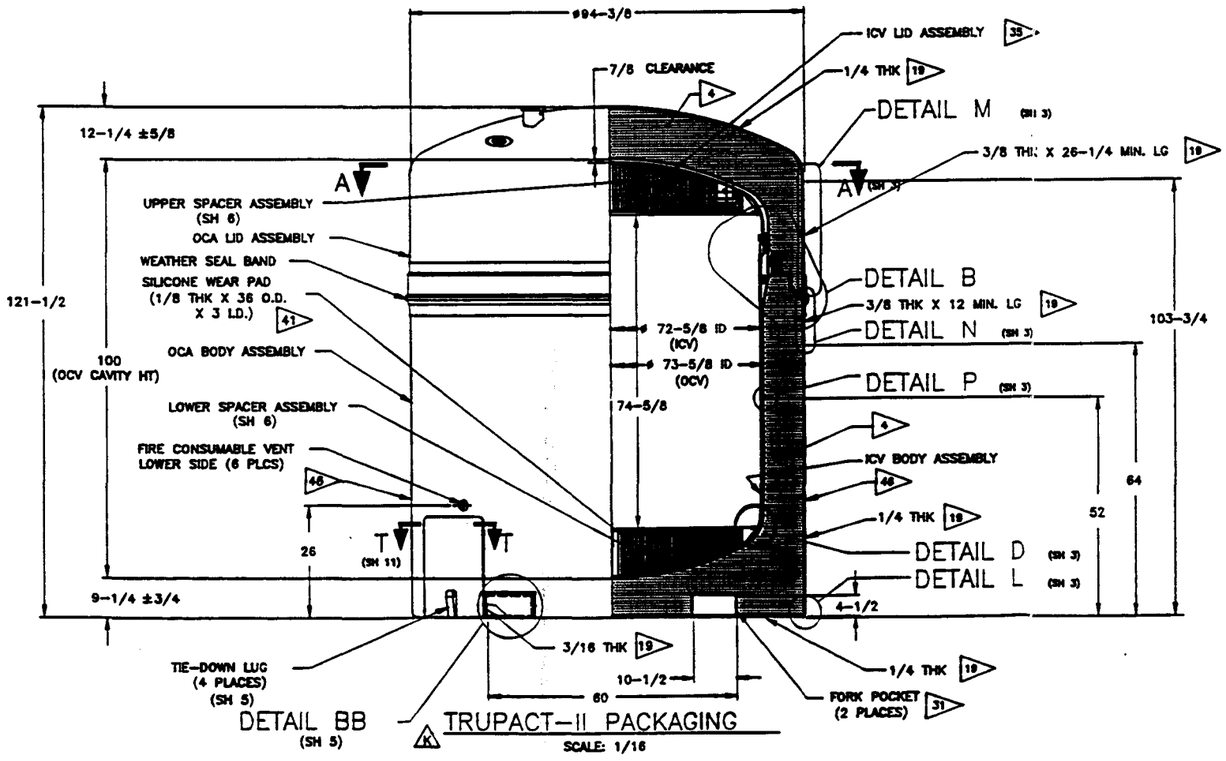
DWG SIZE: D | DWG NO. 2077-500SNP

K 2077-500SNP 1 11





DETAIL B (K)
SCALE: 3/8
(LOCK BOLT NOT SHOWN IN TRUE POSITION)



TRUPACT-II PACKAGING (K)
SCALE: 1/16

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
K	SEE DCN		

			REL	R.J.SWANSON 2-24-88
			APPD	W.HENKEL 2-24-88
			APPD	S.A.PORTER 2-24-88
			APPD	D.C.SWANSON 2-24-88
			APPD	D.SCHMOKER 2-24-88
			APPD	R.WONSCH 2-25-88
			APPD	M.RICHARDS 2-25-88
			APPD	L.E.ULBRICHT 2-25-88
			QA	G.E.HILL 2-24-88
			CHECK	H.LEVITT 2-25-88
ITEM	QTY	NEXT ASSY	DRAWN	[illegible] 2-[illegible]-88

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

TRUPACT-II

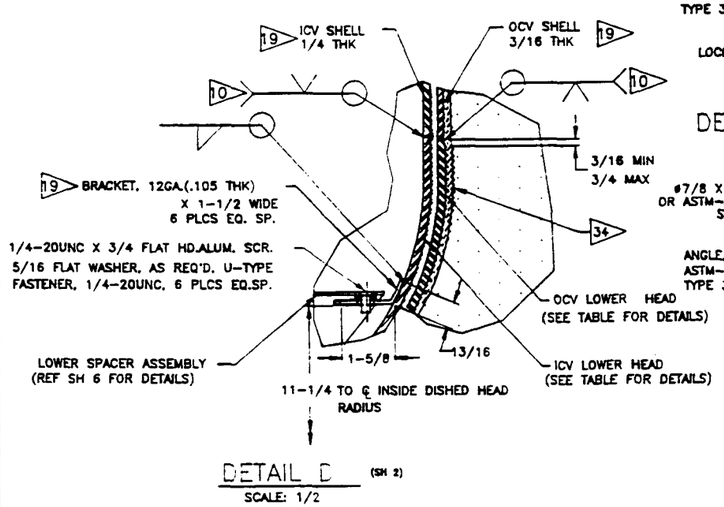
PACKAGING

SCALE: NOTED WT: N/A
REV: K SHEET 2 OF 11

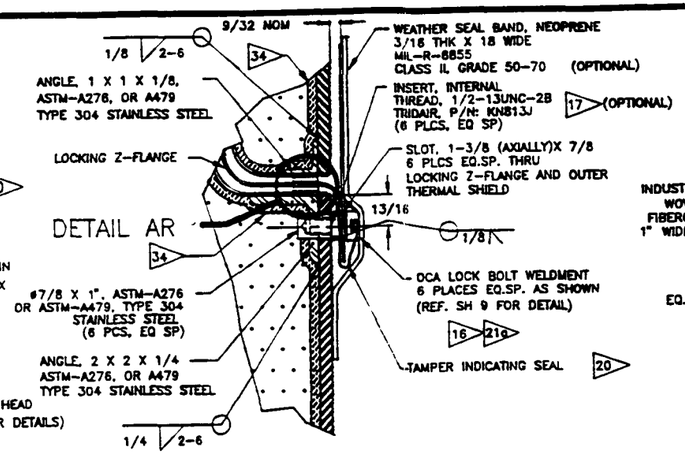
DWG SIZE D
DWG NO. 2077-500SNP

K 2077-500SNP 2 11

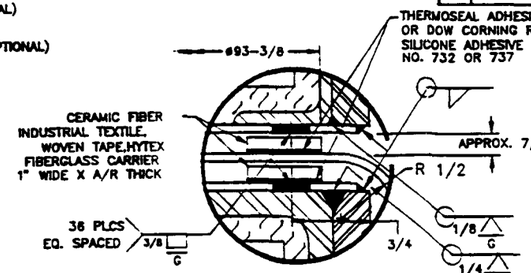
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
K	SEE DCN		



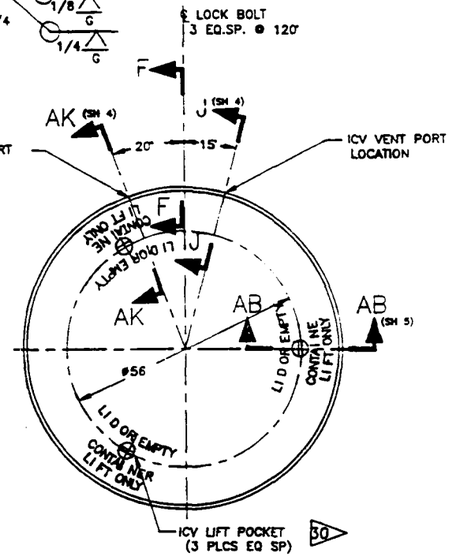
DETAIL D (SH 2)
SCALE: 1/2



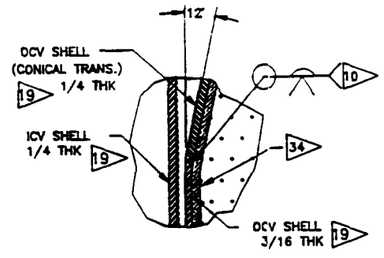
DETAIL E (SH 2)
SCALE: 1/2
(LOCK BOLT NOT SHOWN IN TRUE POSITION)



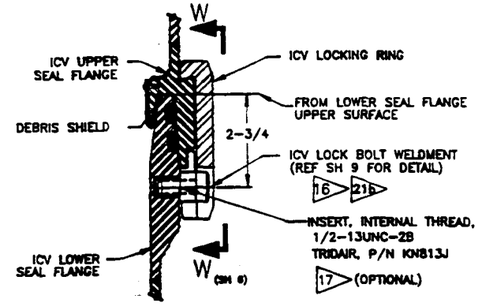
DETAIL AR
SCALE: 1-1/2



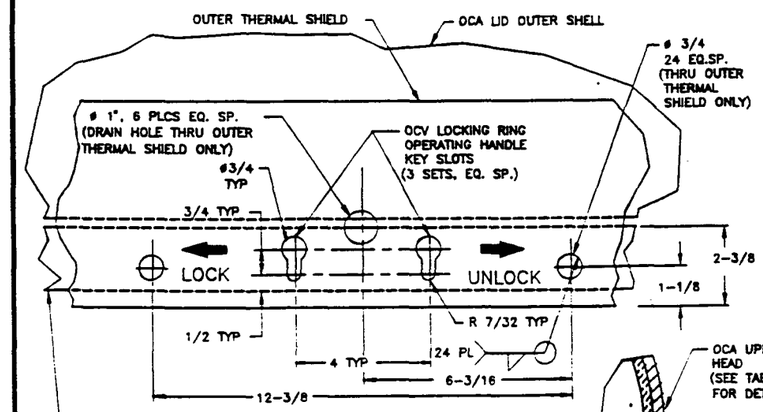
VIEW A-A ICV LID 35 (SH 2)
SCALE: 1/16
(OCA NOT SHOWN FOR CLARITY)



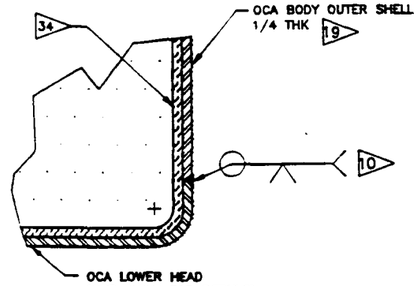
DETAIL C (SH 2)
SCALE: 1/2



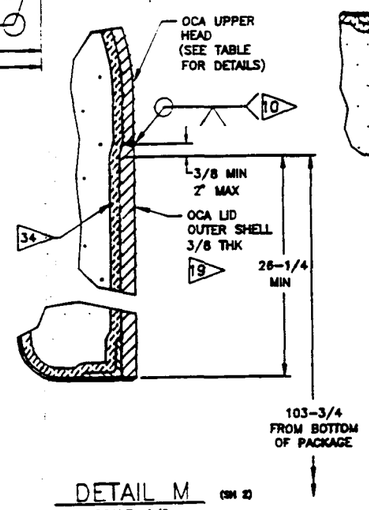
SECTION F-F
(ICV LOCK BOLT 3 EQUALLY SPACED)
SCALE: 1/2



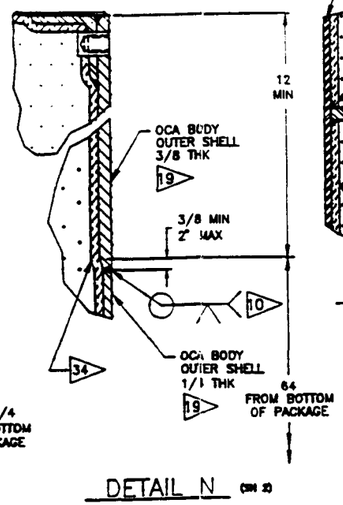
VIEW AS-AS (SH 2)
(WEATHER SEAL OMITTED FOR CLARITY)
SCALE: 1/2 40



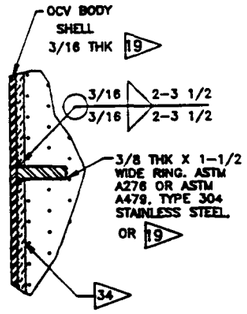
DETAIL L (SH 2)
SCALE: 1/2



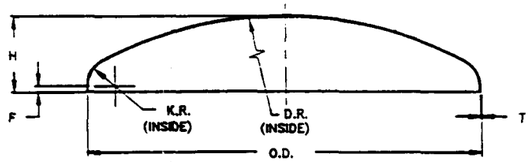
DETAIL M (SH 2)
SCALE: 1/2
(LOCKING Z-FLANGE AND WEATHER SEAL NOT SHOWN FOR CLARITY.)



DETAIL N (SH 2)
SCALE: 1/2
(LOCKBOLT, LOCKING Z-FLANGE, AND WEATHER SEAL NOT SHOWN FOR CLARITY.)



DETAIL P (SH 2)
SCALE: 1/2



LOCATION	T	O.D.	D.R.	H	K.R.	F	MATERIAL SPECIFICATIONS
ICV UPPER	1/4	74-3/8	74-3/8	15-5/8 MIN	8-1/2	3/8 MIN	ASTM-A240,TYPE 304 ST.STL.
ICV LOWER	1/4	73-1/8	73-1/8	15-3/8 MIN	8-1/2	3/8 MIN	ASTM-A240,TYPE 304 ST.STL.
OCV UPPER	1/4	77-5/16	77-5/16	15-7/8 MIN	8-1/2	3/8 MIN	ASTM-A240,TYPE 304 ST.STL.
OCV LOWER	1/4	74-1/8	74-1/8	15-1/8 MIN	8-1/2	3/4 MIN	ASTM-A240,TYPE 304 ST.STL.
OCA UPPER	1/4	94-3/8	94-3/8	16-7/8 MIN	6-3/8	3/8 MIN	ASTM-A240,TYPE 304 ST.STL.
OCA LOWER	1/4	94-3/8	FLAT	1-3/8 MIN	3/4	3/8 MIN	ASTM-A240,TYPE 304 ST.STL.

ASME FLANGED AND DISHED HEADS 19
SCALE: NONE

		RELEASED	R.C.SWANSON 2-24-88
		APPD	W.HENKEL 2-24-88
		APPD	S.A.PORTER 2-24-88
		APPD	D.C.SWANSON 2-24-88
		APPD	D.SCHMOKER 2-24-88
		APPD	R.WUNSCH 2-25-88
		APPD	M.R.RICHARDS 2-25-88
		APPD	L.E.DUBRICH 2-25-88
		QA	G.E.HILL 2-24-88
		CHECK	R.LEVITT 2-25-88
ITEM	QTY	NEXT ASSY	DRAWN [illegible] 2-23-88

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: FRACTIONS ± N/A; ANGLES ± N/A; 3 PLACE DECIMALS ± N/A; 2 PLACE DECIMALS ± N/A; 1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

TRUPACT-II

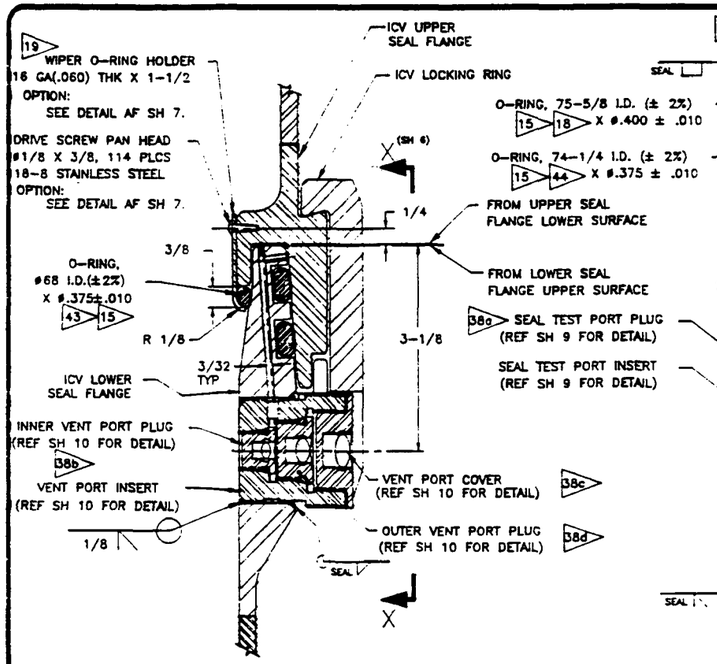
PACKAGING

SCALE: NOTED | WT. N/A
REV: K | SHEET 3 OF 11

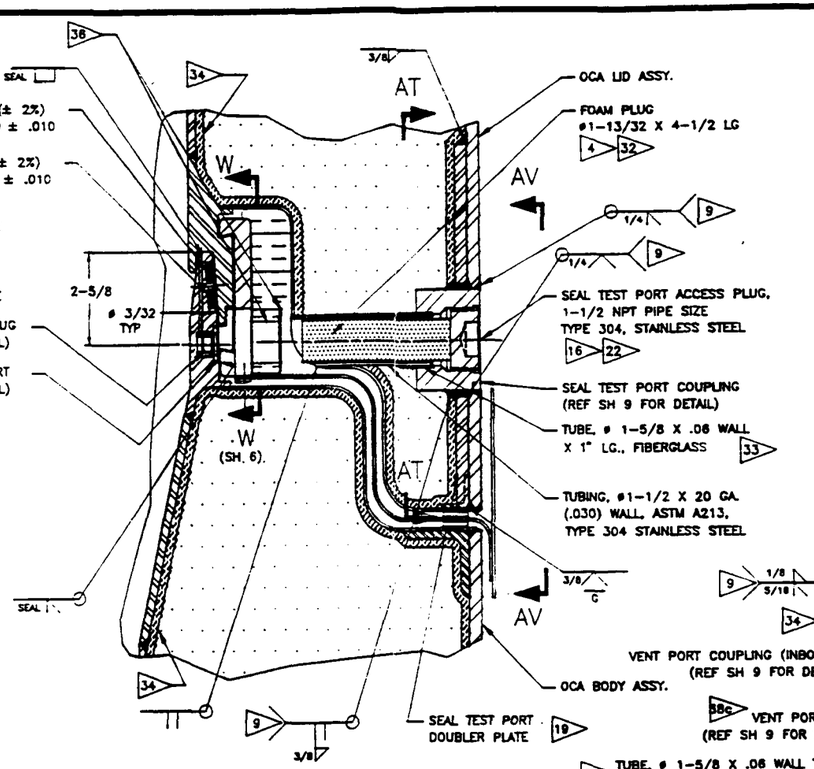
DWG SIZE D | DWG NO. 2077-500SNP

K 2077-500SNP 3 11

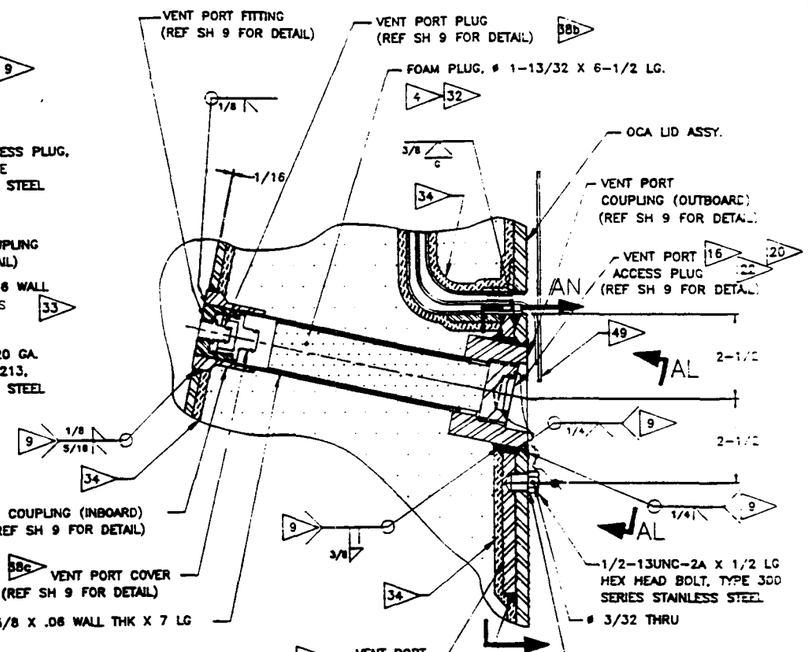
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
K	SEE DCN		



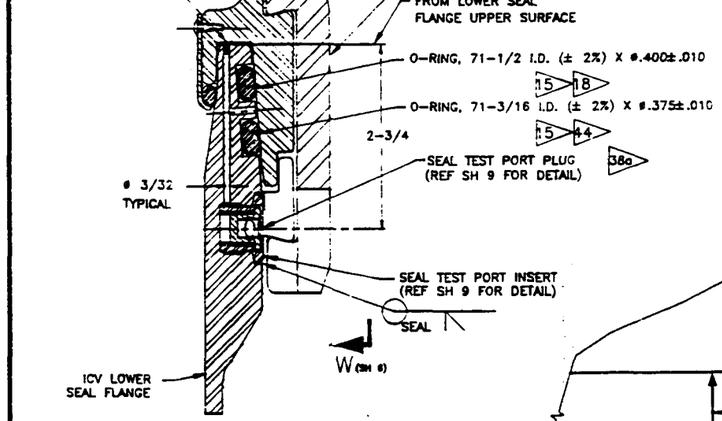
SECTION J-J (SH 3)
(ICV VENT PORT)
SCALE: FULL



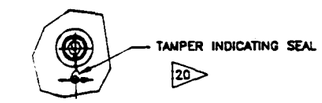
SECTION G-G (SH 2)
(OCV SEAL TEST PORT)
SCALE: 1/2
(WEATHER SEAL OMITTED FOR CLARITY)



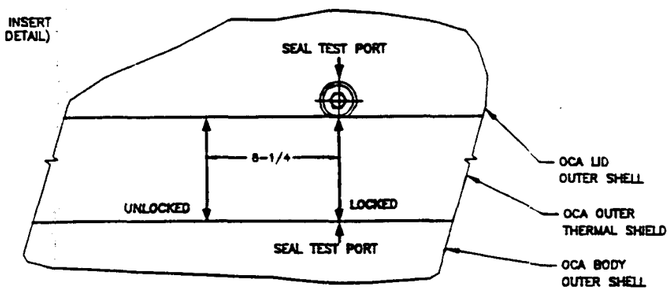
SECTION H-H (SH 2)
(OCV VENT PORT)
SCALE: 1/2
(WEATHER SEAL OMITTED FOR CLARITY)



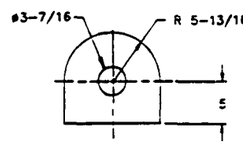
SECTION AK-AK (SH 3)
(ICV SEAL TEST PORT)
SCALE: FULL



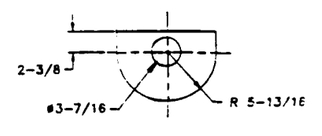
VIEW AL-AL
SCALE: 1/4



VIEW AV-AV
(OCA STENCILING)
SCALE: 1/4
(WEATHER SEAL OMITTED FOR CLARITY)
40



VIEW AT-AT
3/8 THK
(SEAL TEST PORT DOUBLER PLATE)
(SEAL TEST PORT FITTINGS OMITTED FOR CLARITY)
SCALE: 1/8



VIEW AN-AN
3/8 THK
(VENT PORT DOUBLER PLATE)
(VENT PORT FITTINGS OMITTED FOR CLARITY)
SCALE: 1/8

	REL	R.J.SWANWICK	2-24-89
	APPD	W.HENKEL	2-24-89
	APPD	S.A.PORTER	2-24-89
	APPD	D.L.SWANWICK	2-24-89
	APPD	D.SCHMOKER	2-24-89
	APPD	R.WUNSCH	2-25-89
	APPD	M.K.RICHARDS	2-25-89
	APPD	L.E.ULBRICHT	2-25-89
	QA	G.E.HILL	2-24-89
	CHECK	H.LEVITT	2-25-89
	DRAWN	BRIAR	2-25-89

ITEM	QTY	NEXT ASSY

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ±. N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
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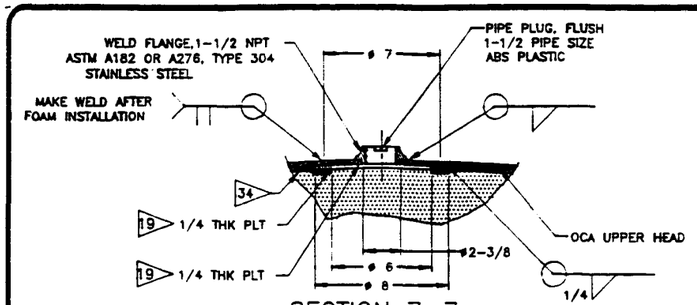
TRUPACT-II

PACKAGING

SCALE: NOTED WT: N/A
REV: K SHEET 4 OF 11

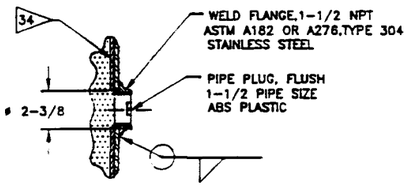
DWG SIZE D
DWG NO. 2077-500SNP

K 2077-500SNP 4 11

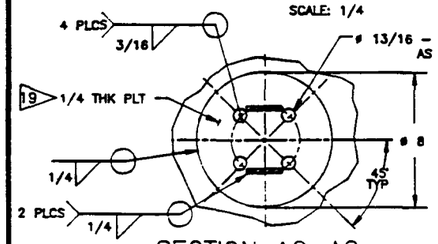


SECTION Z–Z (SH 2)
TYP 3 PLCS
SCALE: 1/4

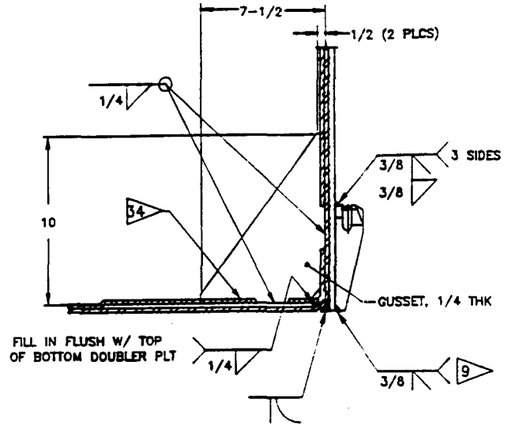
SECTION K–K (SH 2)
IDENTICAL TO SECTION Z–Z WITHOUT FLANGE, PIPE PLUG, AND ø 2-3/8 HOLE.



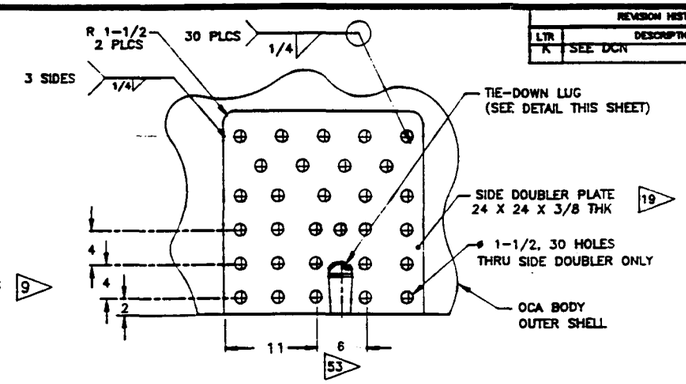
SECTION S–S (SH 2)
TYP 6 PLCS
SCALE: 1/4



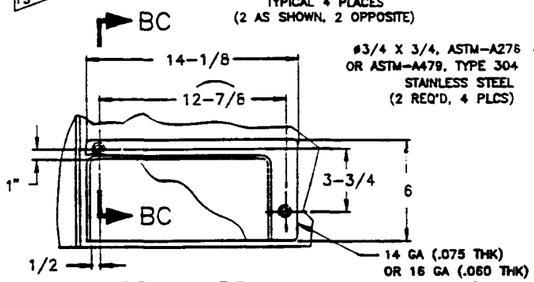
SECTION AG–AG
SCALE: 1/4
(FOAM AND LYTHERM NOT SHOWN FOR CLARITY)



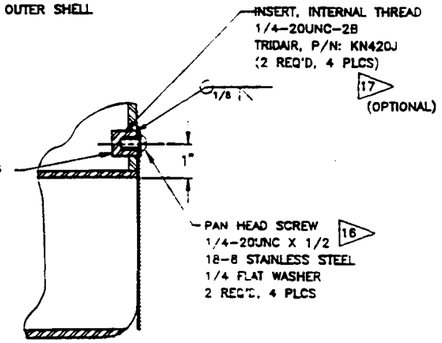
SECTION AJ–AJ (SH 11)
SCALE: 1/4
(4 PLCS)



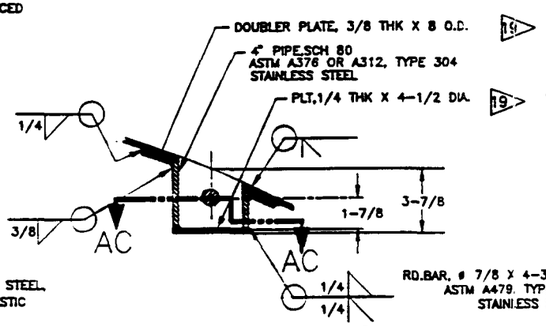
VIEW R–R (SH 2)
SCALE: 1/8
TYPICAL 4 PLACES
(2 AS SHOWN, 2 OPPOSITE)



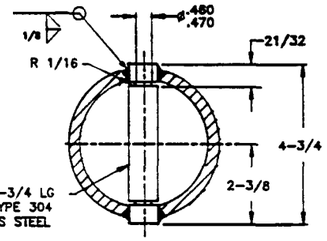
DETAIL BB (SH 2)
SCALE: 1/4
(TYPICAL 4 PLCS, 2 AS SHOWN, 2 OPOSITE)



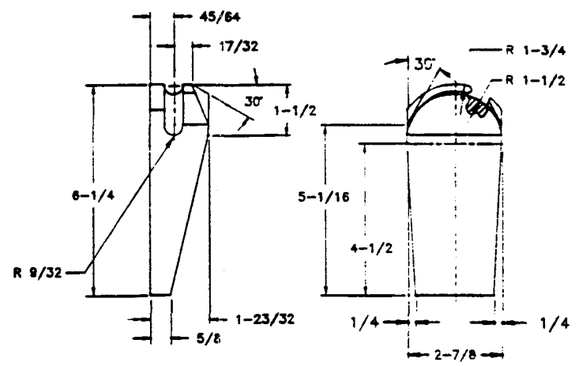
SECTION BC–BC
SCALE: 1/2
(FOAM AND LYTHERM REMOVED FOR CLARITY)



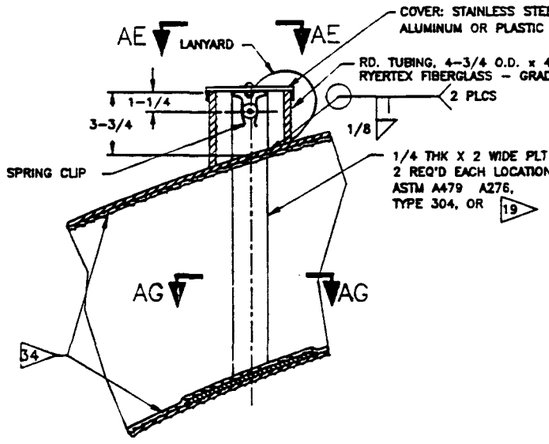
SECTION AB–AB (SH 3)
TYP 3 PLCS
SCALE: 1/4



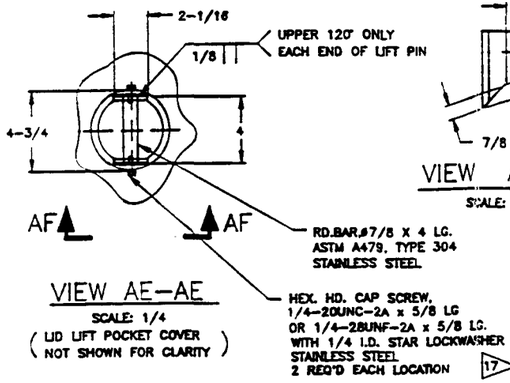
SECTION AC–AC
SCALE: 1/2



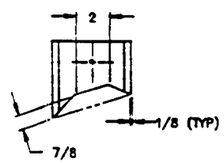
TIE–DOWN LUG 19 OR ASTM A479
SCALE: 1/2



SECTION AD–AD (SH 2)
TYP 3 PLCS
SCALE: 1/4



VIEW AE–AE
SCALE: 1/4
(LID LIFT POCKET COVER
NOT SHOWN FOR CLARITY)



VIEW AF–AF
SCALE: 1/4

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
K	SEE DCN		

	REL	R.E.SWANSON	2-24-89
	APPD	W.HENKEL	2-24-89
	APPD	S.K.PORTER	2-24-89
	APPD	D.E.SWANSON	2-24-89
	APPD	D.SCHMOKER	2-24-89
	APPD	H.WUNSCH	2-23-89
	APPD	M.K.RICHARDS	2-23-89
	APPD	L.E.ULBRICHT	2-23-89
	QA	G.E.HILL	2-24-89
	CHECK	H.LEVITT	2-23-89
ITEM | QTY | NEXT ASSY	DRAWN	[illegible]	2-22-89

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: 3 PLACE DECIMALS ± N/A
FRACTIONS ± N/A 2 PLACE DECIMALS ± N/A
ANGLES ± N/A 1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

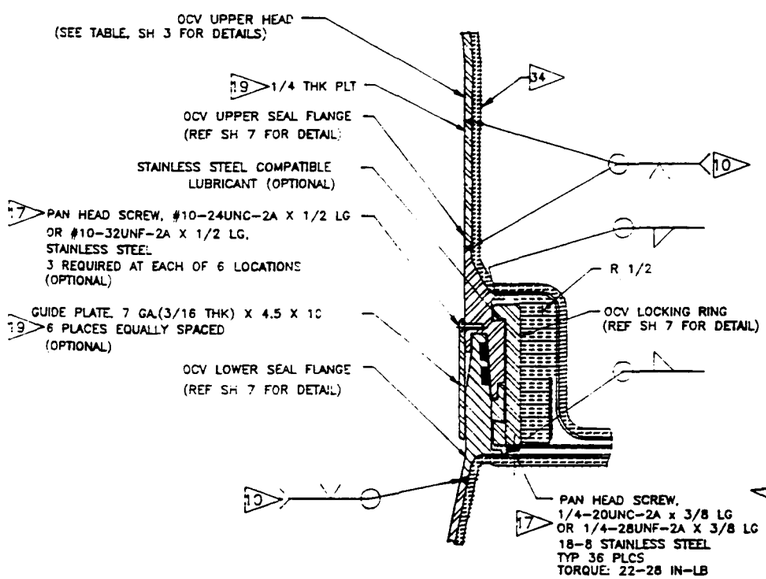
TRUPACT–II

PACKAGING

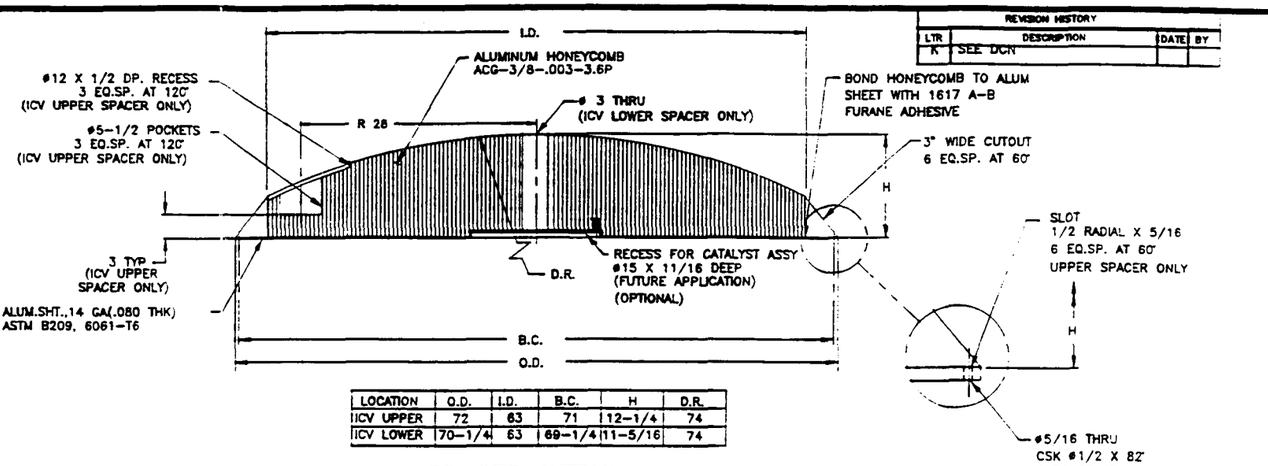
SCALE: NOTED | WT. N/A
REV K | SHEET 5 OF 11
DWG SIZE D | DWG NO. 2077–500SNP

K 2077-500SNP 5 11

REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
K	SEE DCN		

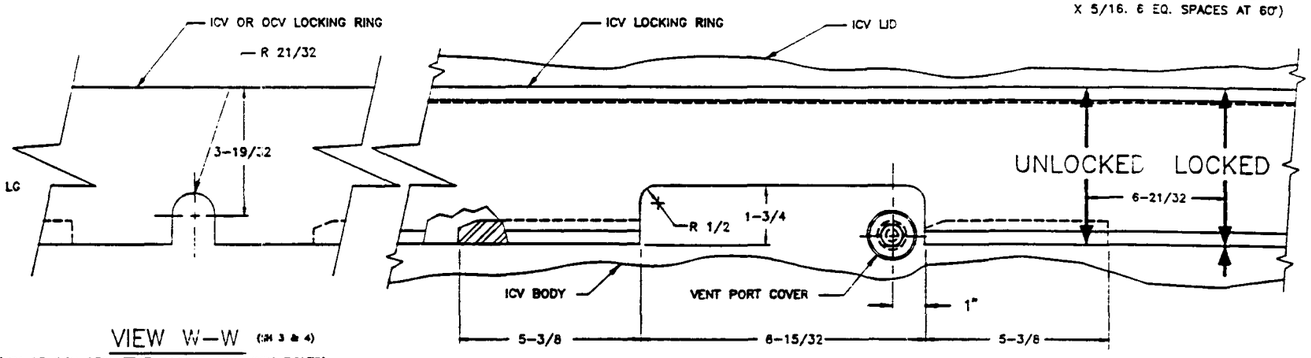


DETAIL U (SH 2)
SCALE: 1/2

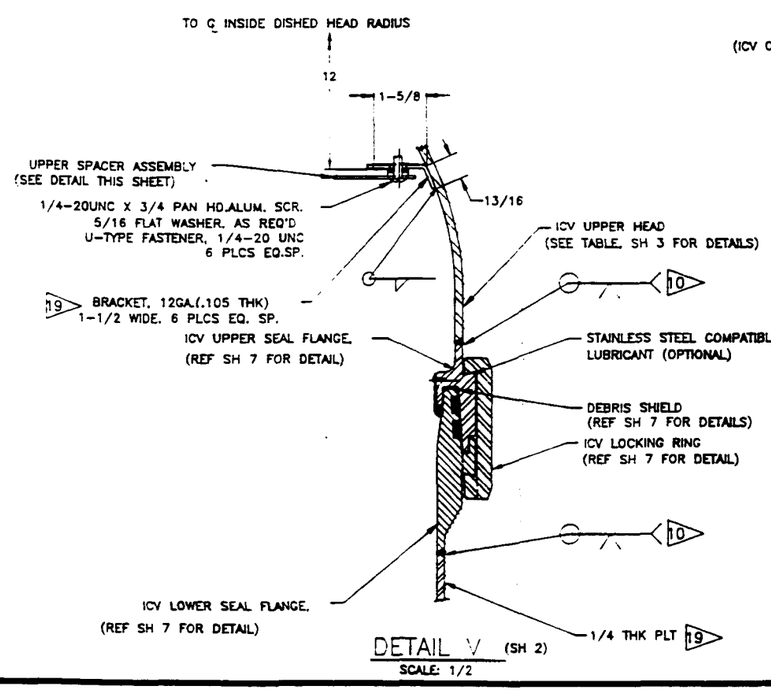


LOCATION	O.D.	I.D.	B.C.	H	D.R.
ICV UPPER	72	63	71	12-1/4	74
ICV LOWER	70-1/4	63	69-1/4	11-5/16	74

SPACER DETAIL (SH 2)
SCALE: NONE

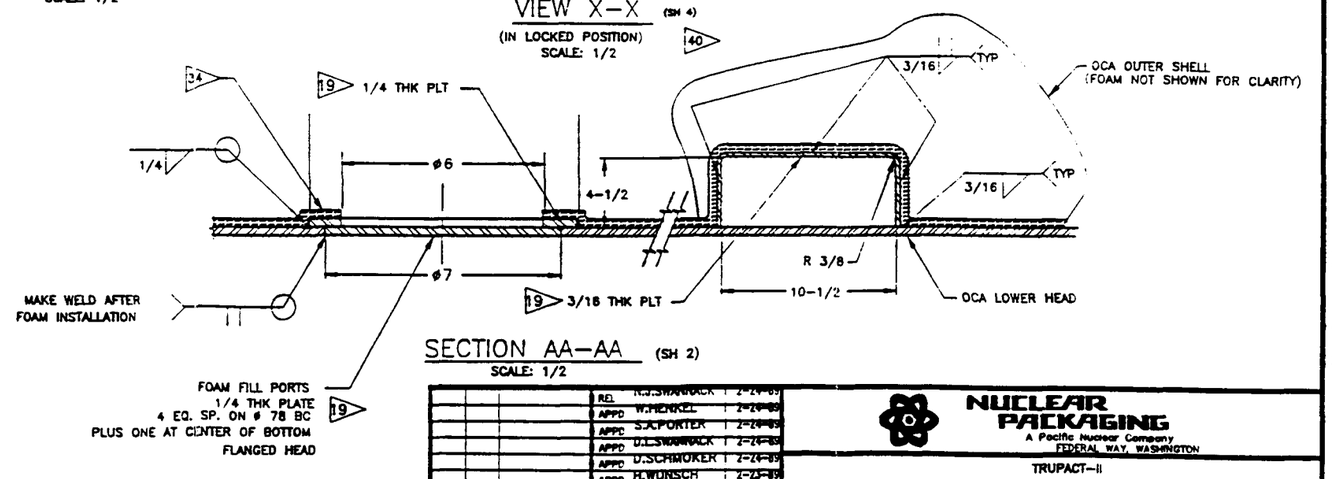


VIEW W-W (SH 3 & 4)
(ICV OR OCV SEAL TEST PORT & ICV LOCK BOLTS)
SCALE: 1/2



DETAIL V (SH 2)
SCALE: 1/2

VIEW X-X (SH 4)
(IN LOCKED POSITION)
SCALE: 1/2



SECTION AA-AA (SH 2)
SCALE: 1/2

	REL	R.J.SWANSON	2-24-89
	APPD	W.HENKEL	2-24-89
	APPD	S.A.PORTER	2-24-89
	APPD	D.L.SWANSON	2-24-89
	APPD	D.SCHWOKER	2-24-89
	APPD	H.WUNSCH	2-25-89
	APPD	M.R.RICHARDS	2-25-89
	APPD	L.E.ULBRICHT	2-25-89
	QA	G.E.HILL	2-24-89
	CHECK	H.LEVITT	2-25-89
ITEM | QTY | NEXT ASSY	DRAWN	[illegible]	2-25-89

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

TRUPACT-II

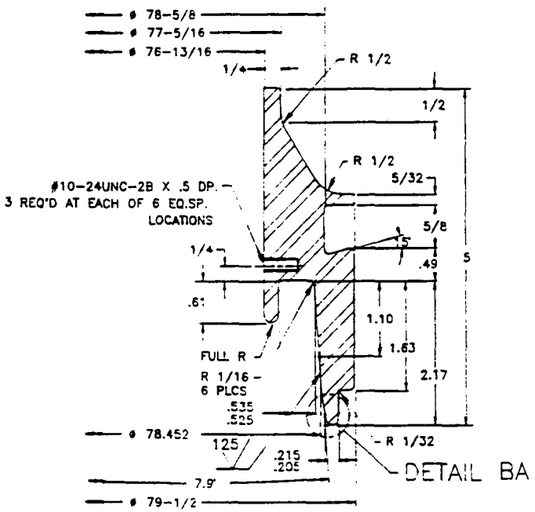
PACKAGING

SCALE: NOTED | WT. N/A
REV K | SHEET 6 OF 11

DWG SIZE D | DWG NO. 2077-500SNP

K 2077-500SNP 6 11

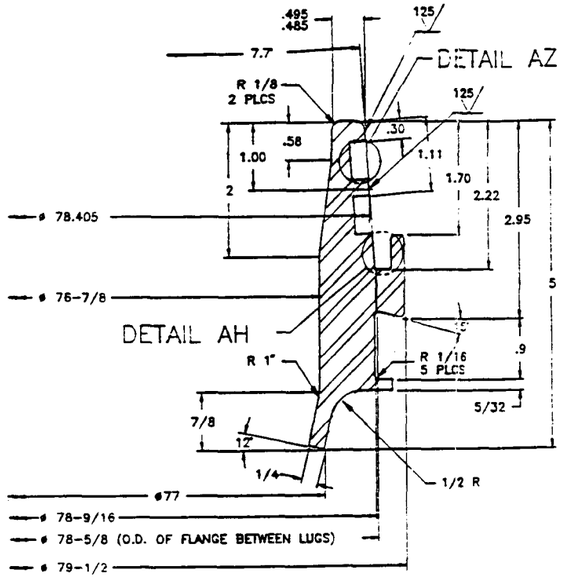
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
K	SEE DCR		



OCV UPPER SEAL FLANGE

SCALE: FULL

42 11

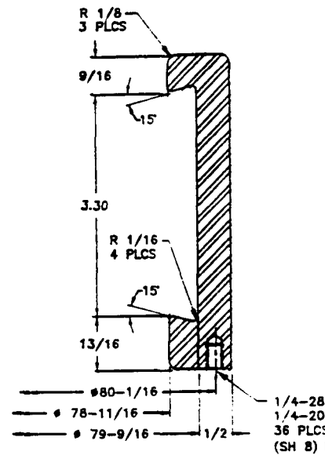


OCV LOWER SEAL FLANGE

(SEE SH 8 FOR PLAN VIEW)

SCALE: FULL

42 11

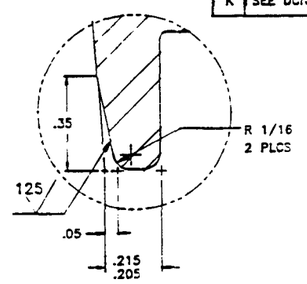


OCV LOCKING RING

(SEE SH 8 FOR PLAN VIEW)

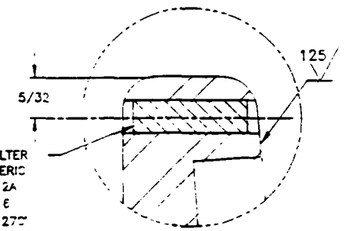
SCALE: FULL

42 11



DETAIL BA

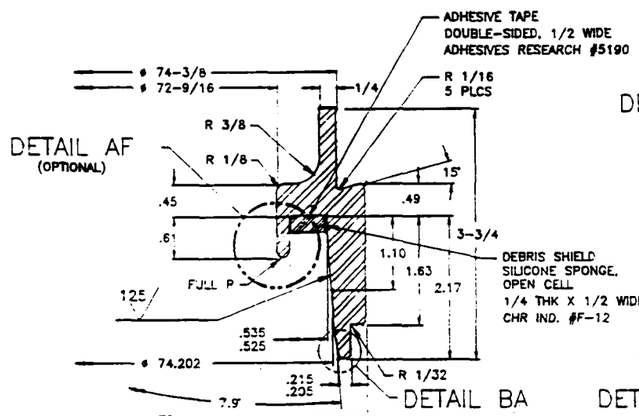
SCALE: 4/1



POLYETHYLENE FILTER
GENERAL POLYMERIC
P/N:714.200-12A
ø1/8 X 7/16
LOCATE 90°, 180° & 270°
FROM SEAL TEST PORT.
PRESS FIT AND STAKE BOTH ENDS

DETAIL AU

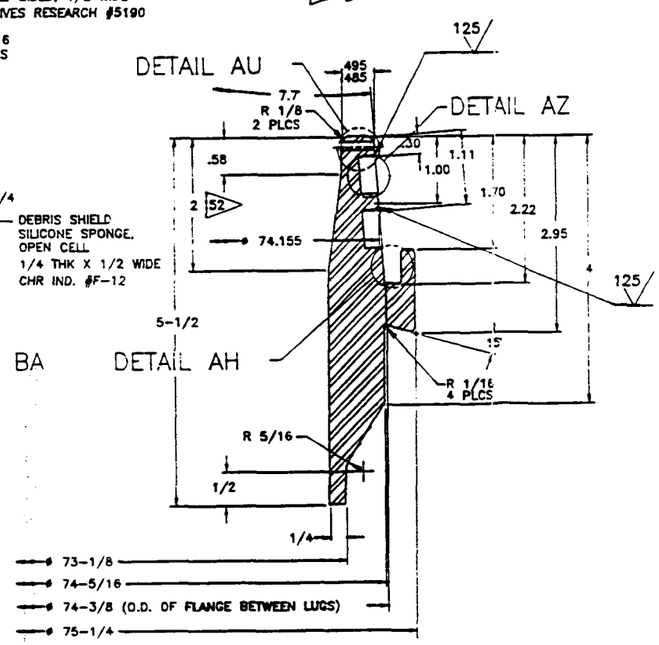
SCALE: 4/1



ICV UPPER SEAL FLANGE

SCALE: FULL

42 11

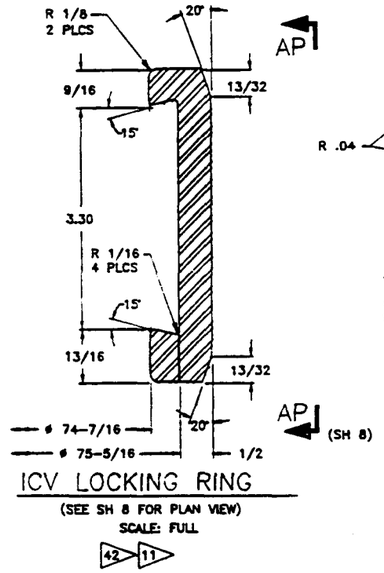


ICV LOWER SEAL FLANGE

(SEE SH 8 FOR PLAN VIEW)

SCALE: FULL

42 11

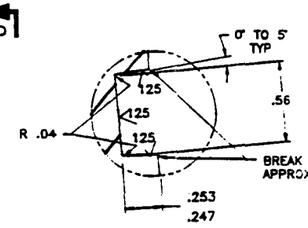


ICV LOCKING RING

(SEE SH 8 FOR PLAN VIEW)

SCALE: FULL

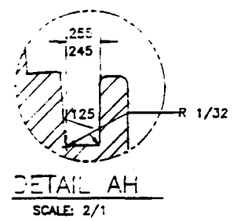
42 11



DETAIL AZ

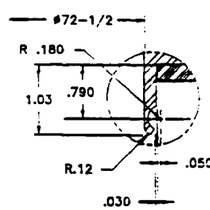
SCALE: 2/1

(TYP. 2 PLCS, EACH LOWER SEAL FLANGE)



DETAIL AH

SCALE: 2/1



DETAIL AF

SCALE: FULL

(ICV UPPER SEAL FLANGE OPTION)

	RE.	R.C.SWANBACK	2-24-89
	APPC	W.HENKEL	2-24-89
	APPC	S.A.PORTER	2-24-89
	APPC	D.C.SWANBACK	2-24-89
	APPC	D.SCHMOKER	2-24-89
	APPC	H.WURSCH	2-23-89
	APPC	M.R.RICHARDS	2-23-89
	APPC	L.E.ULBRICHT	2-23-89
	QA	G.E.HILL	2-24-89
	CHECK	H.LEVITT	2-23-89
ITEM | QTY | NEXT ASSY	DRAWN		2-23-89

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

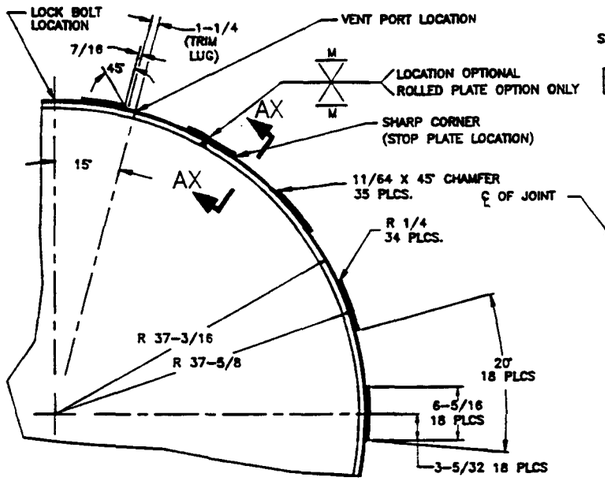
TRUPACT-II

PACKAGING

SCALE: NOTED | WT. N/A
REV: K | SHEET 7 OF 11

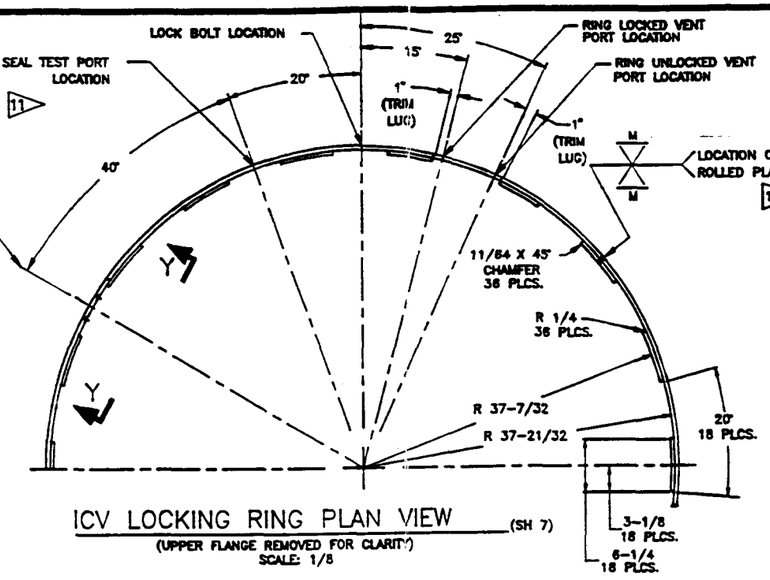
DWG # | DWG NO.
SIZE D | 2077-500SNP

K 2077-500SNP 7 11



ICV LOWER SEAL FLANGE PLAN VIEW (SH 7)

SCALE: 1/8

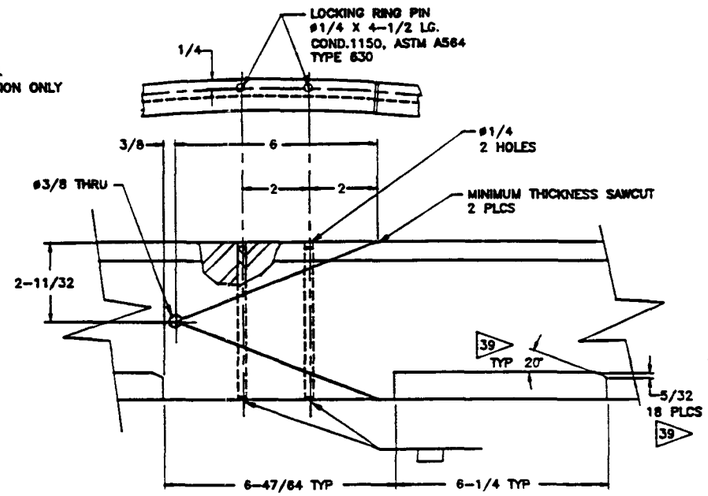


ICV LOCKING RING PLAN VIEW (SH 7)

(UPPER FLANGE REMOVED FOR CLARITY)

SCALE: 1/8

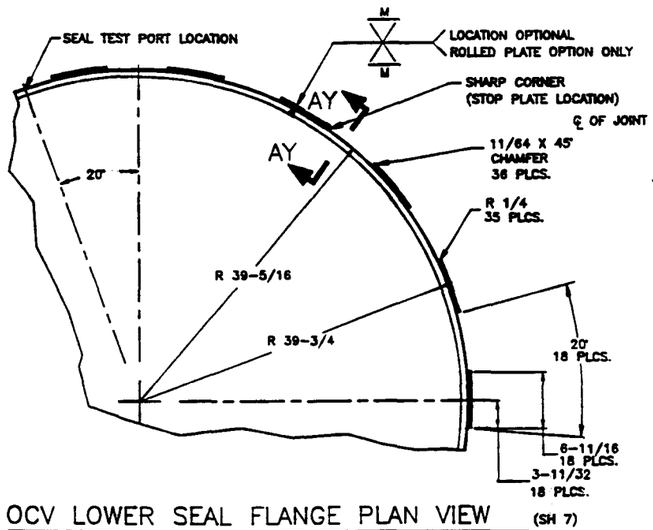
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
K	SEE DCN		



VIEW Y-Y (51)

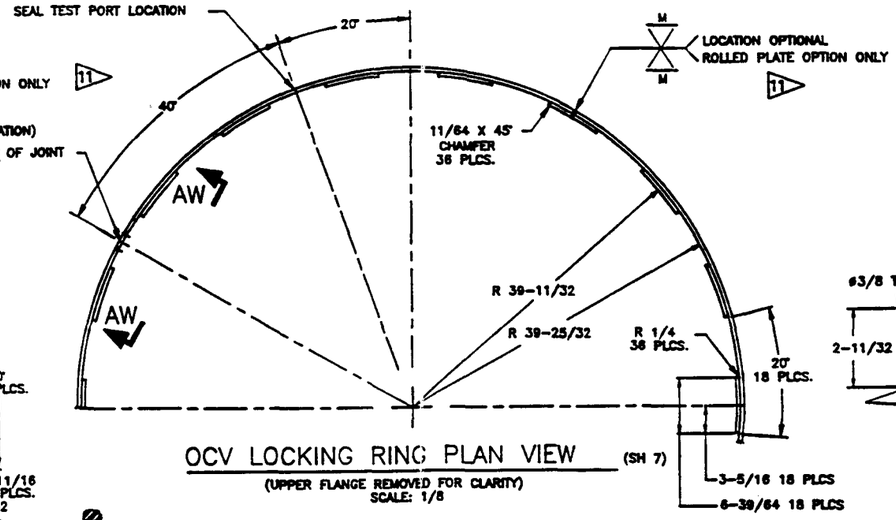
(ICV LOCKING RING)

SCALE: 1/2



OCV LOWER SEAL FLANGE PLAN VIEW (SH 7)

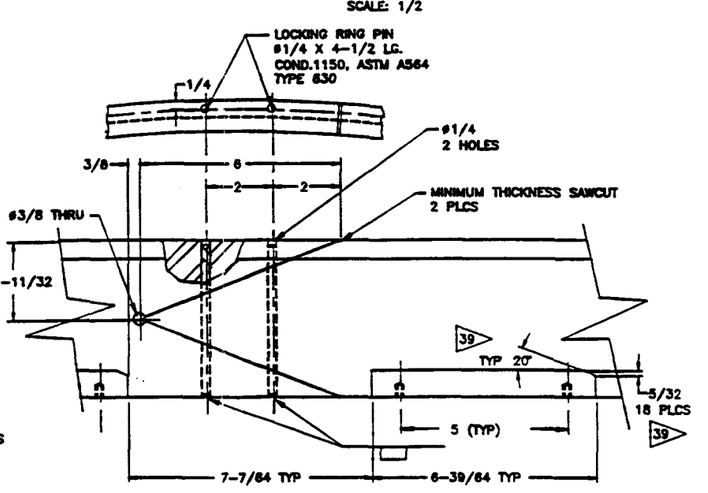
SCALE: 1/8



OCV LOCKING RING PLAN VIEW (SH 7)

(UPPER FLANGE REMOVED FOR CLARITY)

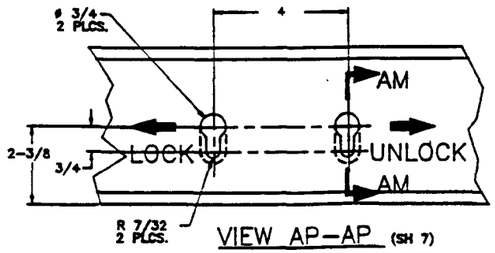
SCALE: 1/8



VIEW AW-AW (51)

(OCV LOCKING RING)

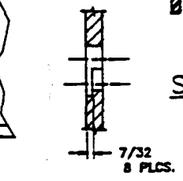
SCALE: 1/2



VIEW AP-AP (SH 7)

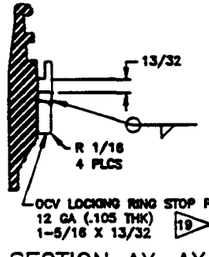
(ICV LOCKING RING OPERATING HANDLE KEYSLOTS) (4 PLCS)

SCALE: 1/2 (40)



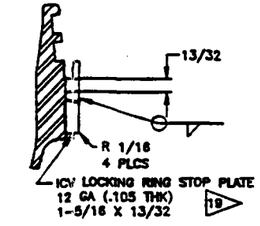
SECTION AM-AM

SCALE: 1/2



SECTION AX-AX

SCALE: 1/2



SECTION AY-AY

SCALE: 1/2

			REL	R.J.SWANSON	2-24-98
			APPD	W.HENKEL	2-24-98
			APPD	S.PORTER	2-24-98
			APPD	D.C.SWANSON	2-24-98
			APPD	D.SCHMOKER	2-24-98
			APPD	R.WUNSCH	2-25-98
			APPD	M.RICHARDS	2-25-98
			APPD	L.E.UDDBORG	2-25-98
			QA	G.E.HILL	2-25-98
			CHECK	R.LEVITT	2-25-98
			DRAWN	R.SWANSON	2-24-98
ITEM	QTY	NEXT ASSY			

UNLESS OTHERWISE SPECIFIED: TOLERANCES: FRACTIONS ± N/A; ANGLES ± N/A; DIMENSIONS ARE IN INCHES: 3 PLACE DECIMALS ± N/A; 2 PLACE DECIMALS ± N/A; 1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING

A Pacific Nuclear Company

FEDERAL WAY, WASHINGTON

TRUPACT-II

PACKAGING

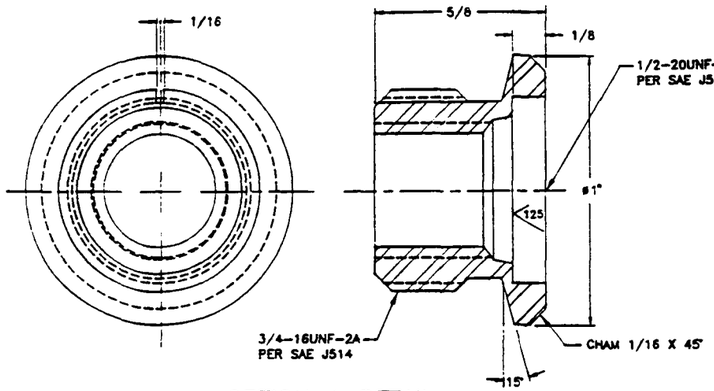
SCALE: NOTED | WT. N/A

REV: K | SHEET 6 OF 11

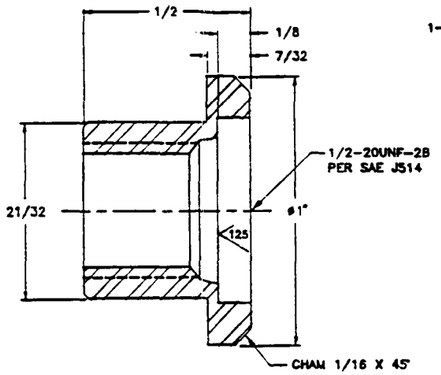
SIZE D | DWG NO. 2077-500SNP

K 2077-500SNP 6 11

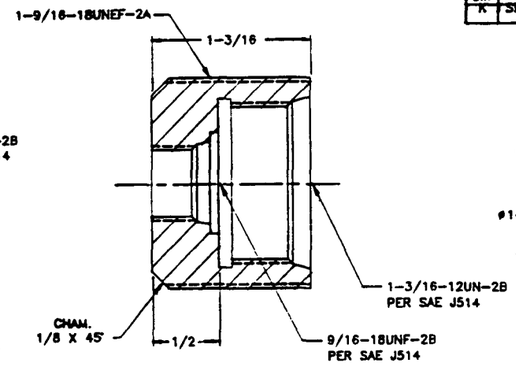
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
K	SEE DCN		



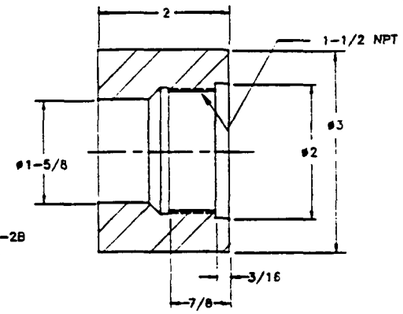
OPTION 1 DETAIL
OCV & ICV SEAL TEST PORT INSERT
ASTM A479, TYPE 304 STAINLESS STEEL
(IN SECTION)



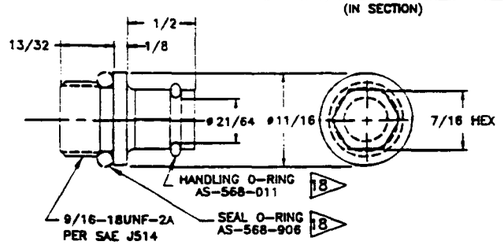
OPTION 2 DETAIL
OCV & ICV SEAL TEST PORT INSERT
ASTM A479, TYPE 304 STAINLESS STEEL
(IN SECTION)



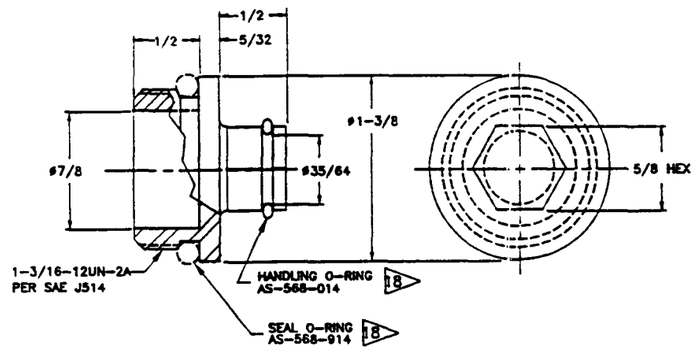
DETAIL
OCV VENT PORT FITTING
ASTM A479, TYPE 304 STAINLESS STEEL
(IN SECTION)



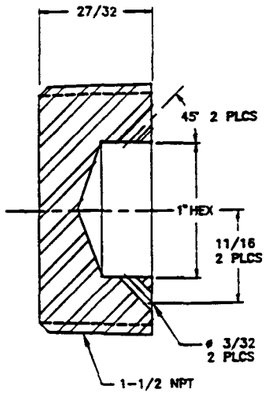
DETAIL
OCV SEAL TEST PORT COUPLING
ASTM A276 OR ASTM A479, TYPE 304 STAINLESS STEEL
(IN SECTION)



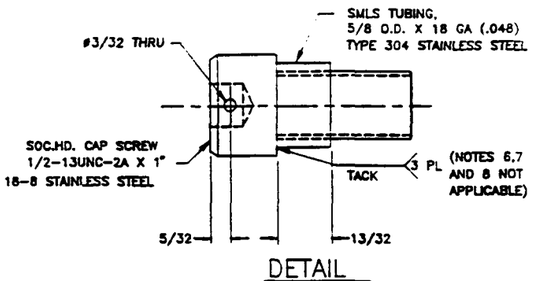
DETAIL
OCV VENT PORT PLUG
ASTM B16, ALLOY 360 BRASS, 1/2 HARD TEMPER



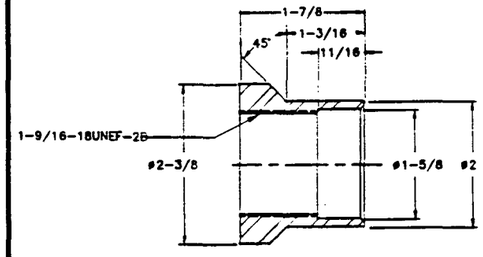
DETAIL
OCV VENT PORT COVER
ASTM B16, ALLOY 360 BRASS, 1/2 HARD TEMPER
(IN SECTION)



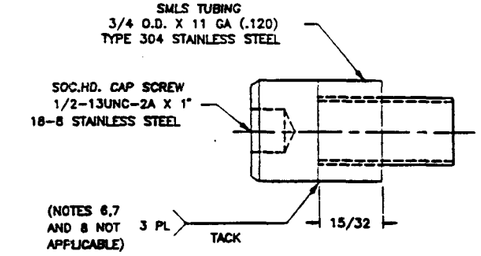
DETAIL
VENT PORT ACCESS PLUG
TYPE 304 STAINLESS STEEL (MODIFIED STD. PLUG)
(IN SECTION)



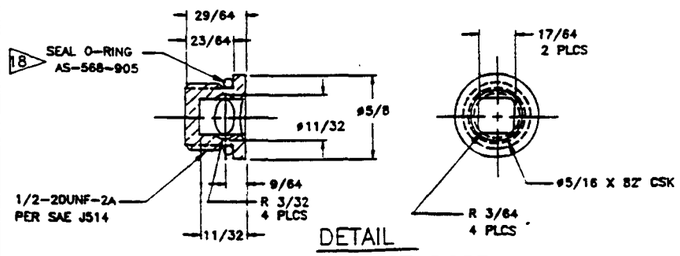
DETAIL
OCA LOCK BOLT WELDMENT
SCALE: 2/1



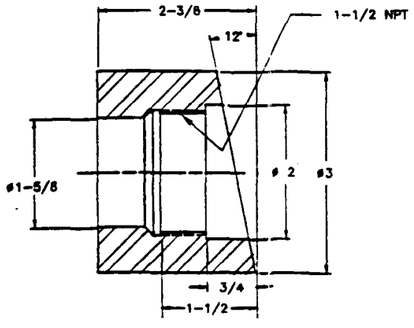
DETAIL
OCV VENT PORT COUPLING (INBOARD)
ASTM A479, TYPE 304 STAINLESS STEEL
(IN SECTION)



DETAIL
ICV LOCK BOLT WELDMENT
SCALE: 2/1



DETAIL
OCV & ICV SEAL TEST PORT PLUG
ASTM B16, ALLOY 360 BRASS, 1/2 HARD TEMPER



DETAIL
OCV VENT PORT COUPLING (OUTBOARD)
ASTM A276 OR ASTM A479, TYPE 304 STAINLESS STEEL
(IN SECTION)

	REL	R.J.SWANSON	2-24-93
	APPD	W.HENKE	2-24-93
	APPD	S.K.PORTER	2-24-93
	APPD	L.L.SWANSON	2-24-93
	APPD	D.SCHMOKER	2-24-93
	APPD	R.WUNSCH	2-23-93
	APPD	M.RICHARDS	2-23-93
	APPD	L.E.UEBRICH	2-23-93
	QA	G.E.HILL	2-24-93
	CHECK	H.LEVITT	2-23-93
ITEM | QTY | NEXT ASSY	DRAWN	M. RODRIGUES	2-23-93

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

TRUPACT-II

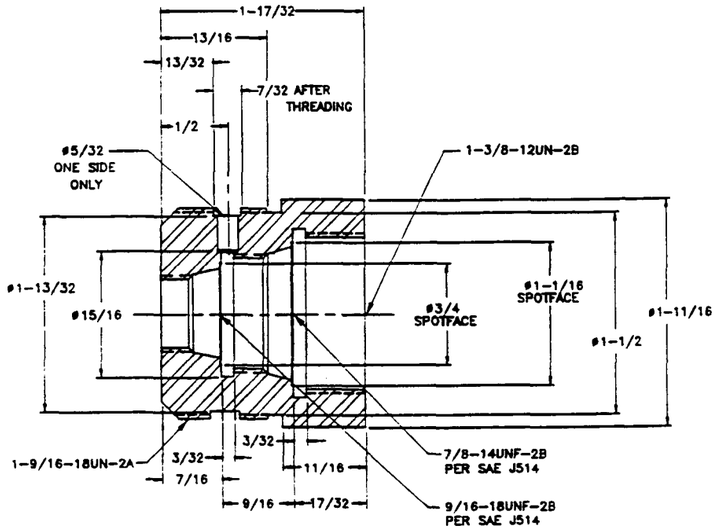
PACKAGING

SCALE: NOTED | WT. N/A
REV: K | SHEET 3 OF 11

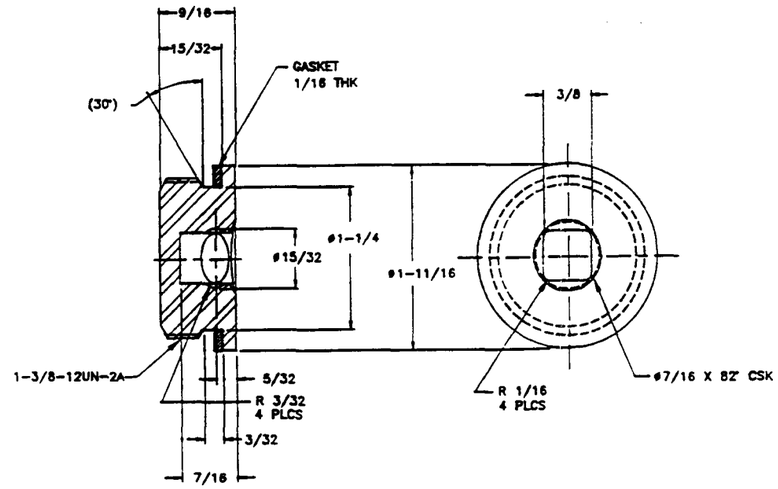
DWG SIZE D | DWG NO. 2077-500SNP

K 2077-500SNP 9 11

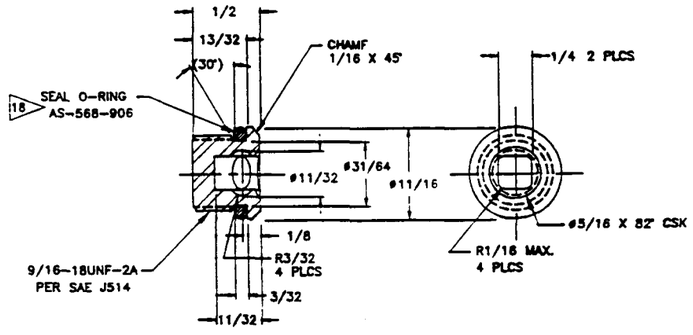
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
K	SEE DCN		



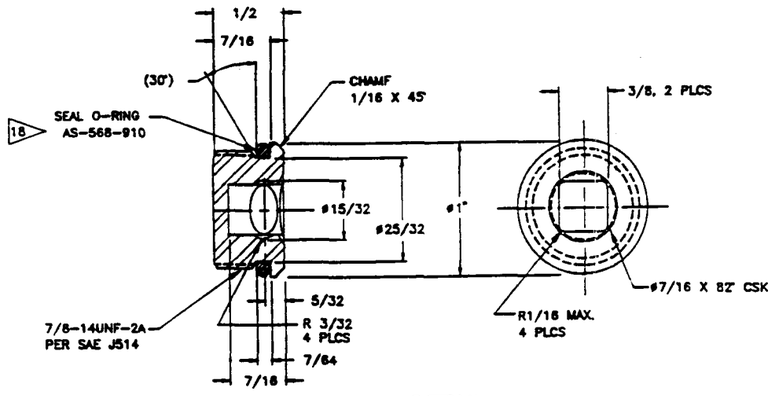
DETAIL
ICV VENT PORT INSERT
ASTM A479, TYPE 304 STAINLESS STEEL
(IN SECTION)



DETAIL
ICV VENT PORT COVER
ASTM B10, ALLOY 360 BRASS, 1/2 HARD TEMPER
(IN SECTION)



DETAIL
ICV INNER VENT PORT PLUG
ASTM B10, ALLOY 360 BRASS, 1/2 HARD TEMPER
(IN SECTION)



DETAIL
ICV OUTER VENT PORT PLUG
ASTM B10, ALLOY 360 BRASS, 1/2 HARD TEMPER
(IN SECTION)

	RD.	R.D.SWANWICK	5-17-88
	APPD	W.HENKEL	5-17-88
	APPD	H.WORSCH	5-17-88
	APPD	D.L.SWANWICK	5-17-88
	APPD	G.J.QUINN	5-17-88
	APPD	S.A.PORTER	5-17-88
	APPD	L.E.ULBRICHT	5-17-88
	APPD	M.R.RICHARDS	5-17-88
	QA	JOE FRITH	5-17-88
	CHECK	H.LEVITT	5-17-88
ITEM | QTY | NEXT ASSY	DRAWN	PC BUDDIN	5-11-88

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

TRUPACT-II

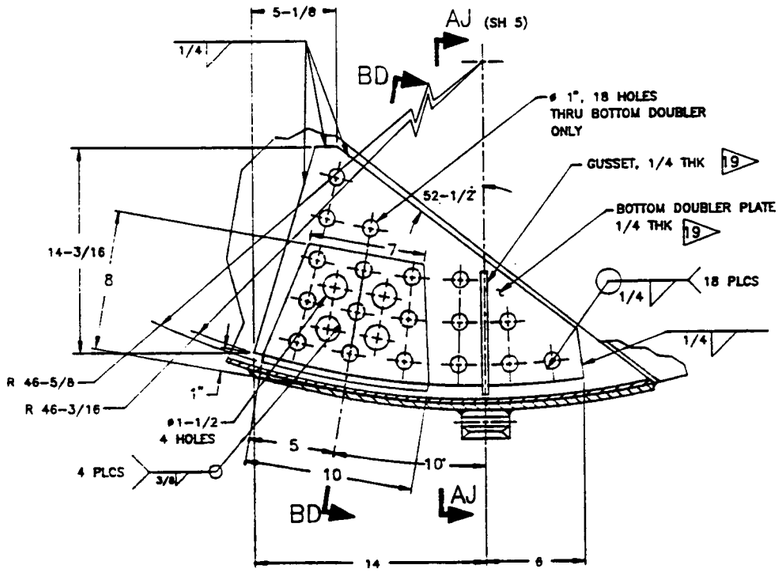
PACKAGING

SCALE: 2/1 | WT. N/A
REV: K | SHEET 10 OF 11

DWG SIZE D | DWG NO. 2077-500SNP

K 2077-500SNP 10 11

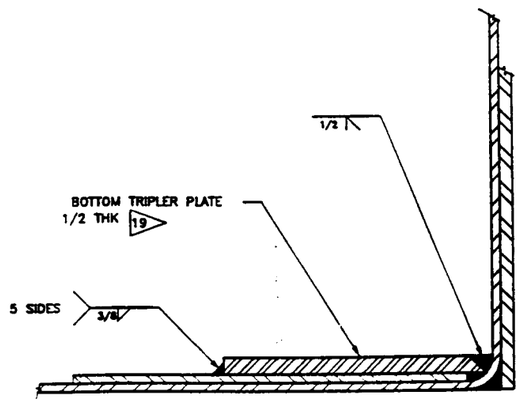
REVISION HISTORY			
LTR	DESCRIPTION	DATE	BY
K	SEE DCN		



SECTION T-T, OPTION 1 (SH 2)

SCALE: 1/4

(TYPICAL 4 PLACES, 2 AS SHOWN, 2 OPPOSITE)
FOAM AND LYTHERM REMOVED FOR CLARITY

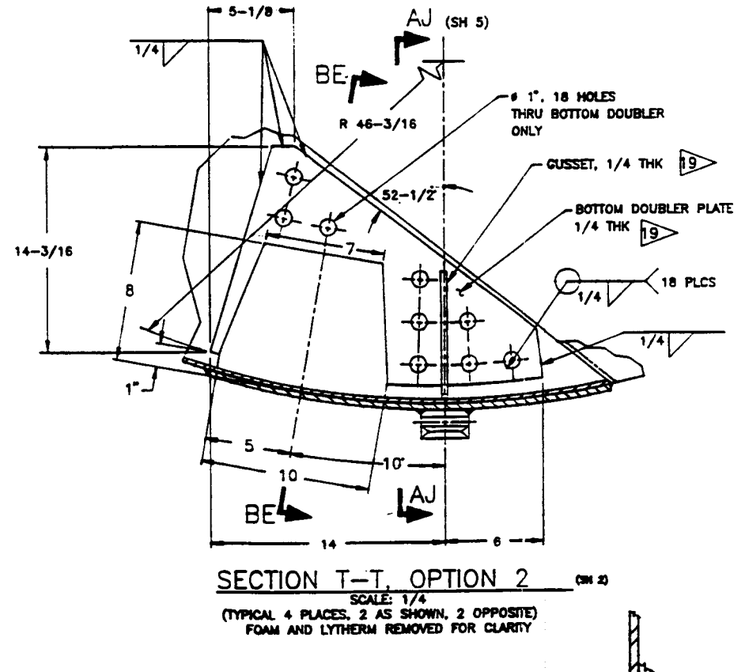


SECTION BD-BD

SCALE: 1/4

TYPICAL 4 PLCS

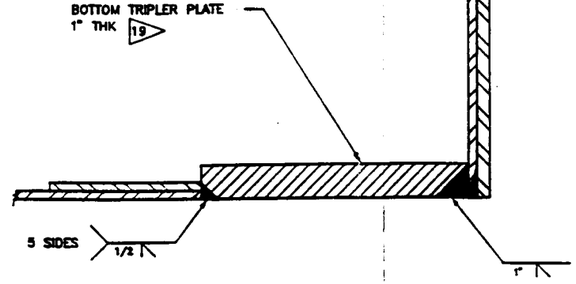
(FOAM AND LYTHERM REMOVED FOR CLARITY)



SECTION T-T, OPTION 2 (SH 2)

SCALE: 1/4

(TYPICAL 4 PLACES, 2 AS SHOWN, 2 OPPOSITE)
FOAM AND LYTHERM REMOVED FOR CLARITY



SECTION BE-BE

SCALE: 1/4

TYPICAL 4 PLCS

(FOAM AND LYTHERM REMOVED FOR CLARITY)

ITEM	QTY	NEXT ASSY

	REL	
	APPD W.HENKEL	8-2-88
	APPD S.K.PORTER	8-2-88
	APPD D.L.SWANBACK	8-2-88
	APPD G.J.QUINN	8-2-88
	APPD H.WUNSCH	8-2-88
	APPD L.E.ULBRICHT	8-2-88
	APPD M.D.RICHARDS	8-2-88
	QA D.E.RODGERS	8-2-88
	CHECK H.LEVITT	8-2-88
	DRAWN [illegible]	8-2-88

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A

DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

NUCLEAR PACKAGING
A Pacific Nuclear Company
FEDERAL WAY, WASHINGTON

TRUPACT-II

PACKAGING

SCALE: NOTED | WT. N/A
REV: K | SHEET 11 OF 11

DWG SIZE D | DWG NO. 2077-500SNP

K 2077-500SNP 11 11

NOTES: UNLESS OTHERWISE SPECIFIED

1. DETERMINATION OF QUALITY CATEGORY CLASSIFICATION IS BASED ON THE FOLLOWING.

   CATEGORY A- STRUCTURES, COMPONENTS, OR SYSTEMS WHOSE FAILURE COULD RESULT DIRECTLY IN A CONDITION ADVERSELY AFFECTING PUBLIC HEALTH AND SAFETY. EXAMPLE - LOSS OF PRIMARY CONTAINMENT OR SHIELDING.

   CATEGORY B- STRUCTURES, COMPONENTS, OR SYSTEMS WHOSE FAILURE COULD RESULT DIRECTLY IN A CONDITION ADVERSELY AFFECTING PUBLIC HEALTH AND SAFETY. AN UNSAFE CONDITION COULD RESULT ONLY IF THE PRIMARY EVENT OCCURS IN CONJUNCTION WITH A SECONDARY EVENT OR OTHER FAILURE.

   CATEGORY C- ITEMS HAVING A MINOR IMPACT ON SAFETY. FAILURE WOULD NOT SIGNIFICANTLY REDUCE EFFECTIVENESS OF THE PRODUCT.

2. OPTIONAL MATERIALS, COMPONENTS OR FABRICATION METHODS: REFER TO THE SAR FOR OPTIONAL INFORMATION.

3. THIS COLUMN PROVIDES A REFERENCE TO THE TRUPACT-II SAR DRAWING (2077-500SNP) AND INDICATES THE LOCATION ON THAT DRAWING WHERE THE ITEM IS DESCRIBED.

4. PART NUMBERS LISTED IN THIS COLUMN ARE NUPAC PART NUMBERS AS USED ON THE APPLICABLE FABRICATION DRAWING.

(CONTINUED ON SHEET 2)

			ITEM	PART NO. (NOTE 4)	DESCRIPTION	SAR DWG REF. (NOTE 3)	REMARKS
				ASSEMBLY & QUANTITY			
				QUANTITY			
				SPARE PARTS			
				QUALITY LEVEL (NOTE 1)			
-		1	5		OCA LOCKING RING ASSEMBLY(2077-161-A1)		
A				2077-162-3	-OCV LOCKING RING	SHT 7	
B				2077-162-2	-OCV LOCKING RING PIN	SHT 8 (AB-AB)	
C				2077-161-2	-OUTER THERMAL SHIELD	SHT 2 (B)	
B				2077-161-1	-LOCKING Z-FLANGE	SHT 2 (B)	
C				2077-161-3	-INNER THERMAL SHIELD	SHT 2 (B)	
C				2077-160-10	-INSULATION, MICROLITE	SHT 2 (B)	
B				2077-160-13	-SCREW, PAN HEAD 1/4-28UNF X 3/8 LG	SHT 8 (U)	
-		1	4		ICV BODY ASSEMBLY (2077-183-A1)		
A				2077-185-1	-HEAD	SHT 3	
A				2077-184-3	-SHELL		
A				2077-184-4	-SEAL FLANGE	SHT 7	
A				2077-156-6	-VENT PORT INSERT	SHT 4 (J-J)	
C				2077-183-3	-LOCKING RING STOP PLATE	SHT 8 (AY-AY)	
C				2077-183-4	-FILTER, ø.128 X .45 LG	SHT 7 (AU)	
B				2077-156-5	-SEAL TEST PORT INSERT	SHT 4 (AK-AK)	
B				2077-183-2	-PALLET TABS	SHT 3 (D)	
A				2077-184-5	-FILLER PLATE		
-		1	3		ICV LID ASSEMBLY (2077-186-A1)		
A				2077-188-1	-HEAD	SHT 3	
A				2077-187-3	-SEAL FLANGE	SHT 7	
B				2077-187-5	-DOUBLER PLATE	SHT 5 (AB-AB)	
A				2077-187-6	-POCKET	SHT 5 (AB-AB)	
A				2077-187-4	-POCKET BASE PLATE	SHT 5 (AB-AB)	
B				2077-186-2	-PALLET TABS	SHT 8 (V)	
A				2077-186-3	-FILLER PLATE		
A				2077-187-7	-LIFTING POCKET BAR	SHT 5 (AE-AE)	
-		1	2		OCA BODY ASSEMBLY (2077-170-A1)		
A				2077-176-1	-INNER HEAD	SHT 3	
A				2077-174-3	-INNER SHELL		
A				2077-174-6	-SEAL FLANGE	SHT 7	
B				2077-171-5	-CERAMIC FIBER INSULATION	SHT 1 NOTE 34	
B				2077-171-10	-FOAM	SHT 1 NOTE 4	
B				2077-175-1	-OUTER HEAD	SHT 3	
B				2077-173-3	-OUTER SHELL, 1/4 PLATE		
B				2077-172-1	-Z-FLANGE	SHT 2 (B)	
B				2077-173-15	-WELD FLANGE	SHT 5 (S-S)	
B	•			2077-170-6	-PIPE PLUG	SHT 5 (S-S)	
B				2077-173-7	-TIEDOWN LUG	SHT 5 (AJ-AJ)	
B				2077-173-11/12	-SIDE DOUBLER PLATE	SHT 8 (R-R)	
B				2077-173-14	-BOTTOM DOUBLER PLATE	SHT 11 (T-T)	
B				2077-173-16	-GUSSET	SHT 11 (T-T)	
C				2077-171-7	-VENT TUBE	SHT 4 (H-H)	
B				2077-174-5	-STIFFENING RING	SHT 3 (P)	
B				2077-170-2	-INNER LOCK BOLT BLOCK	SHT 3 (E)	
B				2077-173-4	-STIFFENING ANGLE	SHT 3 (E)	
B				2077-173-13	-VENT PORT COUPLING (OUTBOARD)	SHT 4 (H-H)	
A				2077-171-6	-VENT PORT COUPLING (INBOARD)	SHT 4 (H-H)	
A				2077-156-19	-VENT PORT FITTING	SHT 4 (H-H)	
C				2077-170-3	-LOCKING RING STOP PLATE	SHT 8 (AX-AX)	
B				2077-173-10	-VENT PORT DOUBLER PLATE	SHT 4 (H-H)	
B				2077-171-9	-FORKLIFT POCKET COVER MTG. BLOCK	SHT 5 (BC-BC)	
A				2077-174-4	-INNER SHELL, CONE SECTION	SHT 2 (B)	
B				2077-173-8	-OUTER SHELL, 3/8 PLATE	SHT 3 (N)	
B				2077-173-2	-TRIPLER PLATE	SHT 11(BD-BD)	
B				2077-156-5	-SEAL TEST PORT INSERT	SHT 4 (G-G)	
B				2077-173-5	-FORKLIFT POCKET PLATE	SHT 8 (AA-AA)	
B				2077-173-6	-FOAM FILL PORT BACKING PLATE	SHT 8 (AA-AA)	
A				2077-174-7	-FILLER PLATE (INNER HEAD)		
B				2077-170-5	-FOAM FILL PORT PLATE	SHT 8 (AA-AA)	
-		1	1		OCA LID ASSEMBLY: (2077-163-A1)		
A				2077-168-1	-INNER HEAD	SHT 3	
A				2077-165-3	-INNER SHELL		
A				2077-165-7	-SEAL FLANGE	SHT 7	
B				2077-164-7	-CERAMIC FIBER INSULATION	SHT 1 NOTE 34	
B				2077-164-6	-FOAM	SHT 1 NOTE 4	
B				2077-169-1	-OUTER HEAD	SHT 3	
B				2077-167-4	SEAL TEST PORT DOUBLER PLATE	SHT 4 (G-G)	
B				2077-167-2	-OUTER SHELL		
B				2077-165-1	-Z-FLANGE	SHT 2 (B)	
B				2077-164-9	-LIFTING POCKET BAR	SHT 5 (AE-AE)	
B				2077-166-5	-LIFTING STRAPS	SHT 5 (AD-AD)	
C				2077-163-2	-LIFTING POCKET TUBE	SHT 5 (AD-AD)	
B				2077-166-4	-LIFTING POCKET STRAP BASE PLATE	SHT 5 (AG-AG)	
B				2077-163-12	-WELD FLANGE	SHT 5 (Z-Z)	
B	•			2077-163-13	-PIPE PLUG	SHT 5 (Z-Z)	
B				2077-167-6	-SEAL TEST PORT COUPLING	SHT 8	
B				2077-163-14	-FOAM FILL PORT PLATE	SHT 5 (Z-Z)	
B				2077-163-15	-FOAM FILL PORT PLATE (CENTER)	SHT 5 (K-K)	
C				2077-164-5	-SEAL TUBE SLEEVE	SHT 4 (G-G)	
B				2077-167-3	-FOAM FILL PORT BACKING RING	SHT 5 (K-K) (Z-Z)	
A				2077-166-8	-FILLER PLATE (INNER HEAD)		
B				2077-167-5	-STIFFENING ANGLE	SHT 3 (E)	
C				2077-164-4	-SEAL TUBE	SHT 4 (G-G)	

LIST OF MATERIAL

REVISION HISTORY

REV	DESCRIPTION	CHECK	REL
E	SEE DCR		

REL	C.A. McMANUS	8-17-90	
APPD			
APPD			
APPD	H. WUNSCH	8-17-90	
APPD	D. DUNCAN	8-17-90	
APPD	S.A. PORTER	8-17-90	
APPD	M.RICHARDS	8-17-90	
ENGR	MARY L. CROOK	8-17-90	
QA	K.RIBBA	8-17-90	
CHECK	M.LEVITT	8-17-90	
DRAWN	Y.LIBBY	8-16-90	

ITEM | QTY | NEXT ASSY

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

PACIFIC NUCLEAR SYSTEMS
Nuclear Packaging Inc

QUALITY LEVEL & SPARE PARTS LIST
•
TRUPACT II

SCALE: N/A | WT. N/A
REV: E | SHEET 1 OF 2
DWG SIZE: D | DWG NO. 2077-1120

E | 2077-1120 | SH 1 OF 2

REVISION HISTORY			
REV	DESCRIPTION	CHECK	APP.
E	SEE DCN		

C		1	79	2077-096-A1	ICV SPACER REMOVAL TOOL		
C		1	78	2077-095-A2	ICV LEAK DETECTION TOOL		
C	•	1		2077-095-1	O-RING, PORT SEAL CONNECTION		
C		1	77	2077-095-A1	OCV LEAK DETECTION TOOL		
C	•	1		2077-095-1	O-RING, PORT SEAL CONNECTION		
C		1	76	2077-094-A2	ICV SEAL CHECK PORT PLUG INSTALL/REMOVAL TOOL		
C		1	75	2077-094-A1	OCV SEAL CHECK PORT PLUG INSTALL/REMOVAL TOOL		
C		1	74	2077-093-A2	OCV SEAL LEAK CHECK TOOL		
C	•	1		2077-093-2	O-RING, PORT SEAL CONNECTION		
C		1	73	2077-093-A1	ICV SEAL LEAK CHECK TOOL		
C	•	1		2077-093-2	O-RING, PORT SEAL CONNECTION		
C		1	72	2077-092-A1	OCV & ICV OUTER VENT PLUG REMOVAL/INSTALLATION TOOL		
C		1	71	2077-091-A2	OCV VENT PLUG REMOVAL/PRESSURE RELIEF TOOL		
C	•	2		2077-091-6	O-RING, TOOL STEM SEAL		
C	•	2		2077-091-7	O-RING, PORT SEAL CONNECTION		
C		1	70	2077-091-A1	ICV VENT PLUG REMOVAL/PRESSURE RELIEF TOOL		
C	•	2		2077-091-6	O-RING, TOOL STEM SEAL		
C	•	2		2077-091-7	O-RING, PORT SEAL CONNECTION		
C		20	69		POP RIVET, #1/8 COM'L	SHT 1 NOTE 37	
C	•	2	68	2077-2000	NAMEPLATE		
C	•	A/R	67		THREAD LOCKING COMPOUND	SHT 1 NOTE 17	
C	•	A/R	66		NICKEL BEARING LUBRICANT, SS COMP.	SHT 1 NOTE 16 SHT 8 (U)	
C	•	A/R	65		HIGH VACUUM GREASE	SHT 1 NOTE 15	
C	•	1	64	2077-156-22	WEATHER SEAL (OPTIONAL)	SHT 3 (E)	
C	•	18	63	2077-160-14	SCREW, PAN HEAD #10-32UNF X 1/2 LG	SHT 8 (U)	
C	•	6	62	2077-163-11	PLATE, OCA UPPER ASSEMBLY GUIDE	SHT 8 (U)	
–	•	1	61		OCA SEAL TEST PORT ACCESS COVER ASSY (2077-156-A3)		
B				2077-156-12	-OCA SEAL TEST PORT ACCESS COVER	SHT 4	
B				2077-156-14	-FOAM PLUG	SHT 4 (G-G)	
C				2077-156-16	-ADHESIVE, EPOXY	SHT 1 NOTE 32	
C	•	6	60	2077-163-4	WASHER, 1/4 NOM STAR LOCK	SHT 8 (AE-AE)	
C	•	6	59	2077-163-3	SCREW, HEX HEAD, 1/4-20UNC X 5/8 LG	SHT 8 (AE-AE)	NOTE 2
C	•	A/R	58		ENAMEL PAINT	SHT 1 NOTES 3.29,38 & 40	
C	•	3	57	2077-183-4	FILTER, ø.128 X .45 LG	SHT 7 (AU)	
B	•	8	56	2077-160-29	INSERT, FORK LIFT POCKET COVERS	SHT 8 (BD-BC)	
B	•	6	55	2077-160-28 2077-160-6	INSERT, OCV & ICV LOCK BOLT	SHT 3 (F-F)	
C		1	54	2077-173-9	SCREW, HEX HEAD, 1/2-13UNC X 1/2 LG	SHT 4 (H-H)	
C		1	53		TAMPER SEAL LOCKWIRE	SHT 3 (E)	
C	•	A/R	52	2077-160-23/2077-164-6 2077-171-4	RTV SILICONE ADHESIVE	SHT 3 (AR)	
C	•	1	51	2077-160-19	O-RING, OCV VENT PORT COVER HANDLING	SHT 9	
C	•	A/R	50	2077-160-27	HYTEX WOVEN TAPE	SHT 3 (AR)	
C	•	3	49	2077-156-A6	ICV CLOSURE TOOL	NONE	
C	•	4	48	2077-156-A7	OCV CLOSURE TOOL	NONE	
			47		REMOVED		
–	•	3	46		COVER, LID LIFT POCKET ASSY (2077-163-A2)		
C				2077-163-6	-END CAP	SHT 8 (AB-AD)	
C				2077-163-5	-TOOL HOLDER (SPRING CLIP)	SHT 8 (AB-AD)	
C				2077-163-7	-CABLE ASSEMBLY	SHT 8 (AB-AD)	
C				2077-163-8	-SCREW, PAN HEAD #10-32UNF X 1/2 LG	SHT 8 (AB-AD)	
C				2077-163-9	-HEX NUT, #10-32UNF	SHT 8 (AB-AD)	
C				2077-163-10	-CLIP	SHT 8 (AB-AD)	
			ITEM	PART NO. (NOTE 4)	DESCRIPTION	SAR DWG REF (NOTE 3)	REMARKS

LIST OF MATERIAL

C	•	8	45	2077-180-31	WASHER, 1/4 NOM FLAT	SHT 8 (BD-BC)	
C	•	8	44	2077-180-30	SCREW, PAN HEAD 1/4-20UNC X 1/2 LG	SHT 8 (BD-BC)	
C	•	2	43	2077-171-12	COVER, FORK LIFT POCKET, LF.	SHT 8 (BB)	
C	•	2	42	2077-171-11	COVER, FORK LIFT POCKET, RT.	SHT 8 (BB)	
C	•	12	41	2077-180-23	U-TYPE FASTENER	SHT 3.6 (V.D)	
C	•	A/R	40	2077-180-6	WASHER, 5/16 NOM FLAT	SHT 3.6 (V.D)	
C	•	6	39	2077-180-10	SCREW, FLAT HEAD, 1/4-20UNC X 3/4 LG	SHT 3 (D)	
C	•	8	38	2077-180-20	SCREW, ROUND HEAD 1/4-20UNC X 3/4 LG	SHT 6 (V)	
C	•	1	37	2077-156-23	WEAR PAD, ICV	SHT 2	
C	•	3	36	2077-156-20	GUIDE TUBE	2077-0072NP	
C	•	14	35	2077-180-11	DRIVE SCREW, PAN HEAD #1/8 X 3/8 LG	SHT 4	NOTE 2
C		1	34	2077-156-8	WIPER O-RING HOLDER	SHT 4	NOTE 2
C	•	A/R	33	2077-180-26	ADHESIVE TAPE, DOUBLE SIDED	SHT 7	
C	•	A/R	32	2077-180-25	DEBRIS SEAL, ICV	SHT 7	
C	•	1	31	2077-180-16	GASKET, ICV VENT PORT COVER, 1/16"THK	SHT 10	
C	•	1	30	2077-156-21	DEBRIS SHIELD, ANNULUS (OPTIONAL)	SHT 2 (B)	
C	•	1	29	2077-160-18	O-RING, OCV VENT PORT PLUG HANDLING	SHT 9	
C	•	1	28	2077-160-16	O-RING SEAL, OCV VENT PORT COVER	SHT 9	
A	•	1	27	2077-160-17	O-RING SEAL, OCV VENT PORT PLUG	SHT 9	
B	•	2	26	2077-160-28 2077-160-24	O-RING SEAL, ICV/OCV SEAL TEST PORT PLUG	SHT 9	
A	•	1	25	2077-180-21	O-RING SEAL, ICV OUTER VENT PORT PLUG	SHT 10	
B	•	1	24	2077-180-22	O-RING SEAL, ICV INNER VENT PORT PLUG	SHT 10	
–	•	1	23		OCA VENT PORT ACCESS COVER ASSY (2077-156-A4)		
B				2077-156-13	-OCA VENT PORT ACCESS COVER	SHT 9	
B				2077-156-15	-FOAM PLUG	SHT 4 (H-H)	
C				2077-156-16	-ADHESIVE, EPOXY	SHT 1 NOTE 32	
C	•	1	22	2077-156-18	OCV VENT PORT PLUG, COVER	SHT 9	
A	•	1	21	2077-156-17	OCV VENT PORT, PLUG	SHT 9	
C	•	2	20	2077-156-7	ICV/OCV SEAL TEST PORT, PLUG	SHT 9	
C	•	1	19	2077-156-11	ICV VENT PORT, COVER	SHT 10	
A	•	1	18	2077-156-9	ICV OUTER VENT PORT, PLUG	SHT 10	
B	•	1	17	2077-156-10	ICV INNER VENT PORT, PLUG	SHT 10	
B	•	1	16	2077-080	PALLET	2077-0080NP	
C	•	1	15	2077-160-24	O-RING SEAL, OCV LOWER MAIN	SHT 4 (G-G)	NOTE 2
A	•	1	14	2077-180-15	O-RING SEAL, OCV UPPER MAIN	SHT 4 (G-G)	
C	•	1	13	2077-180-27	O-RING SEAL, ICV WIPER SEAL	SHT 4 (J-J)	NOTE 2
A	•	1	12	2077-180-9	O-RING SEAL, ICV UPPER MAIN	SHT 4 (AB-AK)	
C	•	1	11	2077-180-19	O-RING SEAL, ICV LOWER MAIN	SHT 4 (AB-AK)	NOTE 2
–	•	3	10		ICV LOCK BOLT (2077-156-A1)		
B				2077-156-1	-SCREW, SOC HD 1/2-13UNC X 1"LG	SHT 9	
B				2077-156-2	-SLEEVE	SHT 9	
–	•	6	9		OCV LOCK BOLT (2077-156-A2)		
B				2077-156-3	-SCREW, SOC HD 1/2-13UNC X 1"LG	SHT 9	
B				2077-156-4	-SLEEVE	SHT 9	
–		1	8		ICV LOCKING RING ASSEMBLY:		
A				2077-182-3	-ICV LOCKING RING	SHT 8 (AB-AB)	
B	•			2077-182-2	-ICV LOCKING RING PIN	SHT 8 (AB-AB)	
B		1	7	2077-053-A1	ICV UPPER SPACER	SHT 6	
B	•	1	6	2077-053-A2	ICV LOWER SPACER	SHT 6	
			ITEM	PART NO. (NOTE 4)			
			ASSEMBLY & QUANTITY				
			└ QUANTITY				
			└ SPARE PARTS				
			└ QUALITY LEVEL (NOTE 1)		DESCRIPTION	SAR DWG REF (NOTE 3)	REMARKS

LIST OF MATERIAL

	REL	C.A. McMANUS	8-17-90
	APPD		
	APPD		
	APPD	H. WUNSCH	8-17-90
	APPD	D. DUNCAN	8-17-90
	APPD	S.A. PORTER	8-17-90
	APPD	M.RICHARDS	8-17-90
	ENGR	GARY L. CLARK	8-17-90
	QA	K.HANNA	8-17-90
	CHECK	H.LEVITT	8-17-90
ITEM | QTY | NEXT ASSY	DRAWN	T.LEON	8-16-90

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONS ± N/A
ANGLES ± N/A
DIMENSIONS ARE IN INCHES
3 PLACE DECIMALS ± N/A
2 PLACE DECIMALS ± N/A
1 PLACE DECIMAL ± N/A

PACIFIC NUCLEAR SYSTEMS
Division of Pennsylvania, Inc.

QUALITY LEVEL & SPARE PARTS LIST
•
TRUPACT II

SCALE: N/A | WT. N/A
REV: # . E | SHEET 2 OF 2
DWG SIZE: D | DWG NO. 2077-1120

E | 2077-1120 | SH 2 OF 2

8 7 6 5 4 3 2 1

ATTACHMENT F

TRUPACT-II Certificate of Compliance (NRC Docket No. 71-9218)

NRC FORM 618
(3-96)
10 CFR 71

U.S. NUCLEAR REGULATORY COMMISSION

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIALS PACKAGES

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. PACKAGE IDENTIFICATION NUMBER	d. PAGE NUMBER	e. TOTAL NUMBER PAGES
9218	8	USA/9218/B(U)F	1	4

2. PREAMBLE

a. This certificate is issued to certify that the packaging and contents described in Item 5 below, meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."

b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

a. ISSUED TO *(Name and Address)*

Department of Energy
Washington, DC 20585

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION:

Nuclear Packaging Inc. application dated March 3, 1989, as supplemented.

c. DOCKET NUMBER 71-9218

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

(1) Model No.: TRUPACT-II

(2) Description

A stainless steel and polyurethane foam insulated shipping container designed to provide double containment for shipment of contact-handled transuranic waste. The packaging consists of an unvented, 1/4-inch thick stainless steel inner containment vessel (ICV), positioned within an outer containment assembly (OCA) consisting of an unvented 1/4-inch thick stainless steel outer containment vessel (OCV), a 10-inch thick layer of polyurethane foam and a 1/4 to 3/8-inch thick outer stainless steel shell. The package is a right circular cylinder with outside dimensions of approximately 94 inches diameter and 122 inches height. The package weighs not more than 19,250 pounds when loaded with the maximum allowable contents of 7,265 pounds.

The OCA has a domed lid which is secured to the OCA body with a locking ring. The OCV containment seal is provided by a butyl rubber O-ring (bore seal). The OCV is equipped with a seal test port and a vent port.

The ICV is a right circular cylinder with domed ends. The outside dimensions of the ICV are approximately 73 inches diameter and 98 inches height. The ICV lid is secured to the ICV body with a locking ring. The ICV containment seal is provided by a butyl rubber O-ring (bore seal). The ICV is equipped with a seal test port and vent port. Aluminum spacers are placed in the top and bottom domed ends of the ICV during shipping. The cavity available for the contents is a cylinder of approximately 73 inches diameter and 75 inches height.

(3) Drawings

The packaging is constructed in accordance with Nuclear Packaging Inc. Drawing No. 2077-500 SNP, Sheets 1 through 11, Rev. K.

5.(a)(3) Drawings (Continued)

The contents are positioned within the packaging in accordance with Nuclear Packaging Inc. Drawing Nos. 2077-007 SNP, Rev. C, and 2077-008 SNP, Sheets 1 and 2, Rev. C.

The pipe overpack is constructed and assembled in accordance with U.S. Department of Energy, Carlsbad Area Office, Drawing No. 163-001, Sheets 1 through 3, Rev. 0.

(b) Contents

(1) Type and form of material

Dewatered, solid or solidified transuranic and tritium-contaminated wastes. Wastes must be packaged in 55-gallon drums, standard waste boxes (SWB), bins, or pipe overpacks. Wastes must be restricted to prohibit explosives, corrosives, nonradioactive phrophorics and pressurized containers. Within a drum, SWB, bin, or pipe overpack, radioactive pyrophorics must not exceed 1 percent by weight and free liquids must not exceed 1 percent by volume. Flammable organics are limited to 500 ppm in the headspace of any drum, SWB, bin, or pipe overpack.

(2) Maximum quantity of material per package

Contents not to exceed 7,265 pounds including shoring and secondary containers, with no more than 1,000 pounds per 55-gallon drum and 4,000 pounds per SWB.

Maximum number of containers per package and authorized packaging configurations are as follows:

(i) 14 55-gallon drums,
(ii) 14 pipe overpacks,
(iii) 2 SWBs,
(iv) 2 SWBs, each SWB containing one bin,
(v) 2 SWBs, each SWB containing 4 55-gallon drums,
(vi) 1 ten-drum overpack (TDOP), containing 10 55-gallon drums,
(vii) 1 TDOP, containing 1 SWB,
(viii) 1 TDOP, containing 1 bin within an SWB, or
(ix) 1 TDOP, containing 4 55-gallon drums within an SWB.

Fissile material not to exceed 325 grams Pu-239 equivalent with no more than 200 grams Pu-239 equivalent per 55-gallon drum or 325 grams Pu-239 equivalent per SWB. For fissile material packaged within the pipe overpack specified in Item 5(a)(3), above, a maximum of 200 grams Pu-239 equivalent per pipe overpack, and a maximum of 2,800 grams Pu-239 equivalent per package. Pu-239 equivalent must be determined in accordance with Appendix 1.3.7 of the application.

Decay heat not to exceed the values given in Tables 6.1 through 6.3 "TRUPACT-II Content Codes (TRUCON)," DOE/WIPP 89-004, Rev. 10.

5.(c) Transport Index for Criticality Control

Minimum transport index to be shown on label for nuclear criticality control: 0.4

6. Physical form, chemical properties, chemical compatibility, configuration of waste containers and contents, isotopic inventory, fissile content, decay heat, weight and center of gravity, radiation dose rate must be determined and limited in accordance with Appendix 1.3.7 of the application, "TRUPACT-II Authorized Methods for Payload Control" (TRAMPAC).

7. Each drum, SWB, bin, or pipe overpack must be assigned to a shipping category. The shipping category for SWBs, bins, and pipe overpacks must be in accordance with Table 5, "TRUPACT-II Content Codes (TRUCON)," DOE/WIPP 89-004, Rev. 10. The shipping category for drums (including drums overpacked within an SWB) must be in accordance with Table 5, "TRUPACT-II Content Codes (TRUCON)," DOE/WIPP 89-004, Rev. 10, or the drums (including drums overpacked within an SWB) must be tested for gas generation and meet the acceptance criteria in accordance with Attachment 2.0, to Appendix 1.3.7 of the application.

8. Each drum, SWB, bin, or pipe overpack must be labeled to indicate its shipping category. All drums, SWB's, bins, or pipe overpacks within a package must be of the same shipping category.

9. Each drum, SWB, bin, pipe overpack, or TDOP must be equipped with filtered vents prior to shipment in accordance with Appendix 1.3.7 of the application. Drums which were not equipped with filtered vents during storage must be aspirated before shipment. The minimum aspiration time must be determined from Tables 7.1 through 9.3 in "TRUPACT-II Content Codes (TRUCON)," DOE/WIPP 89-004, Rev. 10.

10. In addition to the requirements of Subpart G of 10 CFR Part 71:

    (a) Each package must be prepared for shipment and operated in accordance with the procedures described in Chapter 7.0, "Operating Procedures," of the application.

    (b) Each package must be tested and maintained in accordance with the procedures described in Chapter 8.0, "Acceptance Tests and Maintenance Program," of the application.

11. The contents of each package must be in accordance with Appendix 7.4.3., "Payload Control Procedures," of the application.

12. Prior to each shipment, the lid and vent port seals on the inner and outer containment vessels must be leak tested to 1×10^{-7} std cm^3/sec in accordance with Chapter 7.0, "Operating Procedures," of the application.

13. All free standing water must be removed from the inner containment vessel cavity and the outer containment vessel cavity before shipment.

14. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR §71.12.

15. Expiration date: June 30, 1999.

REFERENCES

Safety Analysis Report for the TRUPACT-II Shipping Package dated March 3, 1989.

Supplements dated: May 26, June 27, June 30, August 3, and August 8, 1989; April 18, July 10, July 25, August 24, and December 20, 1990; April 11, April 29, and June 17 1991; September 24, 1992; April 22, and October 22, 1994; March 22, June 28, and December 13, 1996; and February 7, 1997.

"TRUPACT-II Content Codes (TRUCON)," DOE/WIPP 89-004, Rev. 10, dated December 1996.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Cass R. Chappell

Cass R. Chappell, Chief
Package Certification Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Date: February 20, 1997

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

APPROVAL RECORD
Model No. TRUPACT-II Package
Certificate of Compliance No. 9218
Revision No. 8

By application dated March 22, 1996, as supplemented June 28 and December 13, 1996, and February 7, 1997, Westinghouse Electric Corporation, on behalf of the Department of Energy, requested an amendment to Certificate of Compliance No. 9218, for the Model No. TRUPACT-II package. The applicant requested several changes.

1. Addition of a new waste container, called a pipe overpack, that consists of an inner vessel, or pipe component, centered within a 55-gallon drum by fiberboard and plywood. The pipe overpack was developed to increase the allowable fissile quantity per package.

2. Addition of new content codes, including content codes for wastes packaged in pipe overpacks and content codes for wastes stored at "small quantity sites," and revision of some existing content codes.

3. Modification of some of the waste packaging configurations.

Pipe Overpack

The applicant requested approval of a new waste container, called the pipe overpack. The pipe overpack was developed to increase the allowable fissile contents of the TRUPACT-II package, by providing confinement of the fissile materials under normal and hypothetical accident conditions.

The pipe overpack consists of an inner vessel, or pipe component, positioned by fiberboard and plywood dunnage within a 55-gallon drum with a rigid liner and lid. The TRUPACT-II package will accommodate 14 pipe overpacks. The pipe component is a cylindrical pipe of 1/4-inch nominal thickness with a welded bottom cap and a bolted stainless steel lid sealed with an elastomeric O-ring seal. The pipe component and the drum are equipped with filter vents. The pipe component is approximately 2 feet long, is either 6-inch or 12-inch diameter pipe, and is constructed of stainless steel. The total gross weight of the pipe overpack is 328 pounds for the 6-inch diameter pipe, and 547 pounds for the 12-inch diameter pipe. These weights are well below the maximum allowable weight for a 55-gallon drum within the TRUPACT-II package.

To demonstrate the ability of the pipe component to confine the fissile material, the applicant performed a series of 30-foot drop tests on the pipe overpack. Three top end impact and one side impact drop tests were performed. The top end drops were performed without the TRUPACT-II package, that is, the bare pipe overpacks were tested. In each test, two drums were strapped end-to-end as if positioned for transport within a TRUPACT-II. Top impact drop

tests were performed for the following three configurations: (1) two pipe overpacks containing 6-inch diameter pipe components, (2) two pipe overpacks containing 12-inch diameter pipe components; and (3) two pipe overpacks, one containing a 12-inch diameter pipe component and one containing a 6-inch diameter pipe component.

One side impact test was performed. For the side drop test, a TRUPACT-II inner containment vessel (without the outer containment vessel or the crushable foam) was loaded with 14 pipe overpacks in the typical shipping configuration. The pipe overpacks were arranged with a top layer of seven 6-inch diameter pipe overpacks and a bottom layer of seven 12-inch diameter pipe overpacks. These tests were conservative, since the TRUPACT-II package would provide significant protection to the pipe overpacks under actual accident conditions.

After the drop tests, each pipe component was inspected and leak tested. The 20 pipe components used in the drop tests sustained no visible damage. Some of the lid bolts in two of the 6-inch diameter test specimens used in the top end drops had become loosened. However, there was no release of material from any of the pipe components, and the leak tests performed on the pipe component seals showed no leakage. The tests demonstrated that the fissile material within a pipe component would remain confined within the pipe component under normal conditions of transport and hypothetical accident conditions.

The applicant performed criticality analyses to demonstrate the criticality safety of the fissile material in the pipe overpacks. For the analyses, no credit was taken for the spacing or the materials of the 55-gallon drums, or the packing material within the drums. The TRUPACT-II package was assumed to be loaded with 14 pipe components. Each pipe component was assumed to contain 200 grams Pu-239, with a maximum of 2,800 grams Pu-239 per TRUPACT-II package. Full density water was assumed within the pipe components and between the pipe components. The results of the analysis showed that, even with these conservative assumptions, the maximum k-eff did not exceed 0.9. The analyses were performed for a single TRUPACT-II package. Previous analyses have shown that a single flooded package is the most reactive, including arrays of damaged and undamaged TRUPACT-II packages.

NRC staff performed confirmatory calculations for the pipe components within a TRUPACT-II package. The analyses considered the maximum fissile loading, and also neglected the spacing and materials of the drums and packing material within the drums. The analyses assumed 14 close-packed pipe components, with optimum moderation within and between the pipe components. The staff performed calculations for the 6-inch and 12-inch diameter pipes. The staff's results were consistent with those reported by the applicant.

New Content Codes

The applicant requested approval of several new content codes, including content codes for "small quantity sites." There are approximately 20 to 30 sites across the country where small amounts of transuranic waste are stored.

Since content codes include identification of the generating sites, these waste materials do not fall within the content codes previously authorized for transport in the TRUPACT-II package. DOE plans to transport these wastes from the various sites for consolidation at larger DOE facilities prior to disposal. The applicant developed a set of content codes, identified by the prefix "SO" for these wastes. The wastes consist of noncombustible inorganic materials that may be packaged in metal cans, or within plastic bag confinements. The content codes are assigned a shipping category consistent with similar wastes generated at other sites. The various restrictions for the shipping categories (e.g., decay heat limits, fissile content limits, and limits on free liquids, pyrophorics, etc.) are the same for the wastes generated at the small quantity sites. The contents will be certified consistent with other approved content codes.

The applicant requested approval of a new content code consisting of tritium bonded onto titanium sponges. The tritium on the sponges forms stable compounds of TiT_2, TiHT, and TiDT. The bonding reaction occurs at temperatures above 300°C, and the tritium will not be released at temperatures below 400°C. The maximum temperatures within the inner containment vessel of the TRUPACT-II package under hypothetical accident conditions is less than 100°C. The equilibrium partial pressure of tritium above a titanium sponge is 1×10^{-6} torr, which is below the flammable limits for hydrogen. The applicant stated that under normal conditions of transport (e.g., shock, vibration, and exposure to air and humidity) and hypothetical accident conditions, the tritium will not be released, and that the hydrogen concentration within any confinement region of the package would not exceed five percent. These sponges are not designed to act as hydrogen getters or recombiners during transport, that is, they do not scavenge or adsorb hydrogen produced during transport. The transport of waste materials that require the use of hydrogen getters or recombiners to reduce hydrogen concentrations during transport is not authorized for the TRUPACT-II package.

The applicant also submitted revisions for several existing content codes.

Miscellaneous Packaging Configuration Changes

The applicant requested a revision of the specification for filter vents used in the various waste containers to ensure adequate diffusion of hydrogen gas. The specification previously allowed only carbon composite filters, whereas the new specification allows alternative filter materials, provided that the material is nonflammable, and that the filter allows a minimum diffusion rate.

The applicant also requested the addition of filtered bags that have been heat sealed as a new form of confinement for waste materials packaged within waste containers. Previously, heat sealing was not permitted for unfiltered bags, since it may inhibit the diffusion of hydrogen gas, and cause higher hydrogen concentrations within the bags. Bags may now be heat sealed provided they include at least one filter vent for hydrogen diffusion. New content codes and shipping categories that include heat sealed filtered bags were added to the tables of authorized waste configurations.

Revised Certificate

The Certificate of Compliance has been revised to specify the pipe overpack as an authorized waste container, with increased fissile material quantity limits for the package. Drawings of the pipe overpack are referenced in the Certificate of Compliance. The Certificate has also been revised to reference revision number 10 of the TRUCON document that lists approved content codes and shipping categories. These changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Cass R. Chappell

Cass R. Chappell, Chief
Package Certification Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Date 02/20/97

LIST OF USERS FOR CERTIFICATE - 9219

FOR MODEL - TRUPACT-II

DEPARTMENT OF ENERGY, EM-76
ATTN: MR. MICHAEL E. WANGLER
19901 GERMANTOWN ROAD
GERMANTOWN MD 20874

NUCLEAR FUEL SERVICES, INC
ATTN: MR. ANDREW M. MAXIN
P. O. BOX 337, MS 123
ERWIN TN 37650

SCIENTIFIC ECOLOGY GROUP, INC.
ATTN: MR. J. F. MCCARTER
1560 BEAR CREEK ROAD,
P. O. BOX 2530
OAK RIDGE TN 37831

ATTACHMENT G

TRUPACT-II Safety Analysis Report for Packaging (SARP General Arrangement Drawings

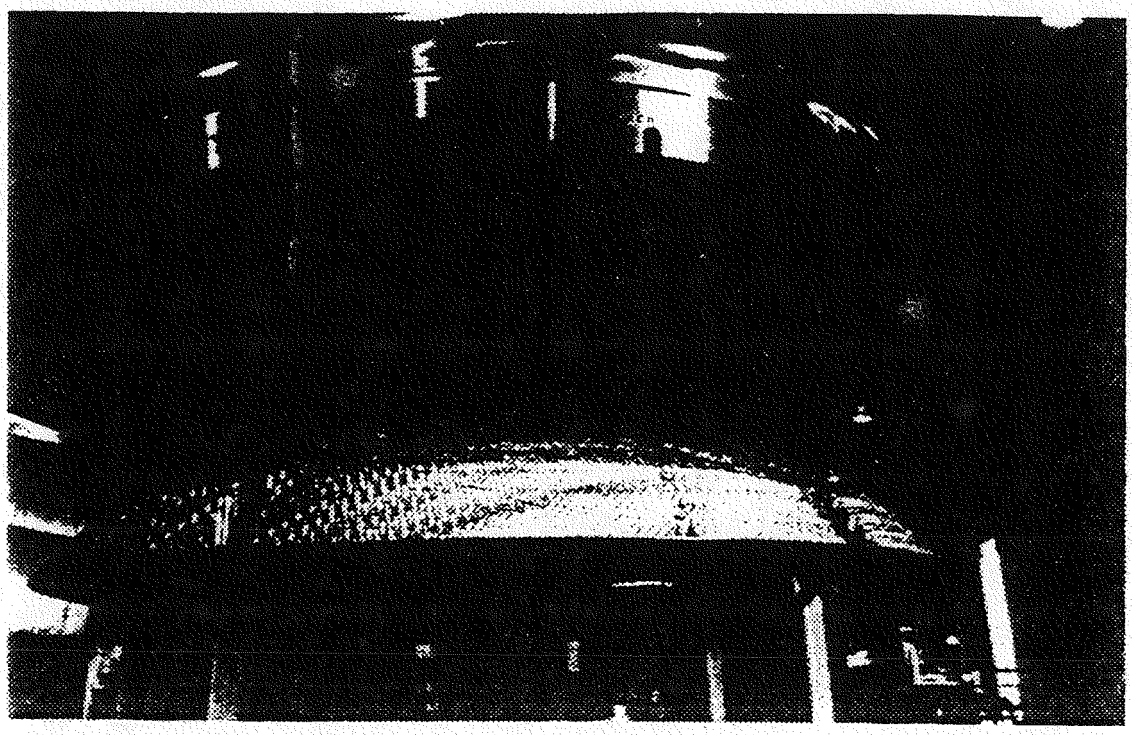
NOTE: The drawings listed in this section are the design drawings that were approved by the Nuclear Regulatory Commission (NRC). With the exception of Drawing No. 2077-1120, no changes shall be made to these drawings without acquiring NRC approval.

- Drawing No. 2077-007-SNP, Rev. C, 1 sheet, "TRUPACT-II Payload Assembly Design"
- Drawing No. 2077-008-SNP, Rev. C, 2 sheets, "TRUPACT-II Pallet and Alignment Guide Tube Design"
- Drawing No. 2077-500-SNP, Rev. K, 11 sheets, "TRUPACT-II Packaging"
- Drawing No. 2077-1120, Rev. E, 2 sheets, "TRUPACT-II Quality Level and Spare Parts List"

ATTACHMENT E

Miscellaneous System Interface and Tool Drawings

- Drawing No. 2077-300, Rev. B, 8 sheets, "TRUPACT-II Interface Control Drawings"
- TRUPACT-II Leak Test and Vent Port Tool Drawings:
  - Drawing No. 2077-091, Rev. E, 3 sheets, "TRUPACT-II ICV and OCV Vent Plug Removal/Pressure Relief Tools"
  - Drawing No. 2077-092, Rev. C, 1 sheet, "TRUPACT-II OCV and ICV Outer Vent Plug Removal and Installation Tool"
  - Drawing No. 2077-093, Rev. C, 1 sheet, "TRUPACT-II ICV/OCV Seal Leak Check Tools"
  - Drawing No. 2077-094, Rev. D, 1 sheet, "TRUPACT-II ICV and OCV Seal Check Port Plug Installation/Removal Tools"
  - Drawing No. 2077-095, Rev. F, 1 sheet, "TRUPACT-II ICV/OCV Leak Detection Tool"
  - Drawing No. SK-1104, Rev. None, 1 sheet, "Spacer Removal Sling"
- ACGLF drawings:
  - Drawing No. 2014-060, Rev. 0, 3 sheets, "(ACG) Lift Fixture Top Assembly"
  - Drawing No. 2014-061, Rev. 0, 3 sheets, "(ACG) Lift Fixture Frame Weldment"
  - Drawing No. 2014-062, Rev. 0, 3 sheets, "(ACG) Lift Fixture Upper Structure Turntable Weldment"
  - Drawing No. 2014-063, Rev. 0, 3 sheets, "(ACG) Lift Fixture Counterweight Fabrication and Assembly"
  - Drawing No. 2014-064, Rev. 0, 3 sheets, "(ACG) Lift Fixture Leg Weldment and Miscellaneous Details"
  - Drawing Nos. 2014-400-AB, Rev. 0, 1 sheet, 2014-410-AB, Rev. 0, 5 sheets, and 2014-420-AB, Rev. 0, 3 sheets, ACGLF Control Console
  - Drawing No. 2077-022, Rev. M, 3 sheets, "TRUPACT-II Tiedown Assembly"



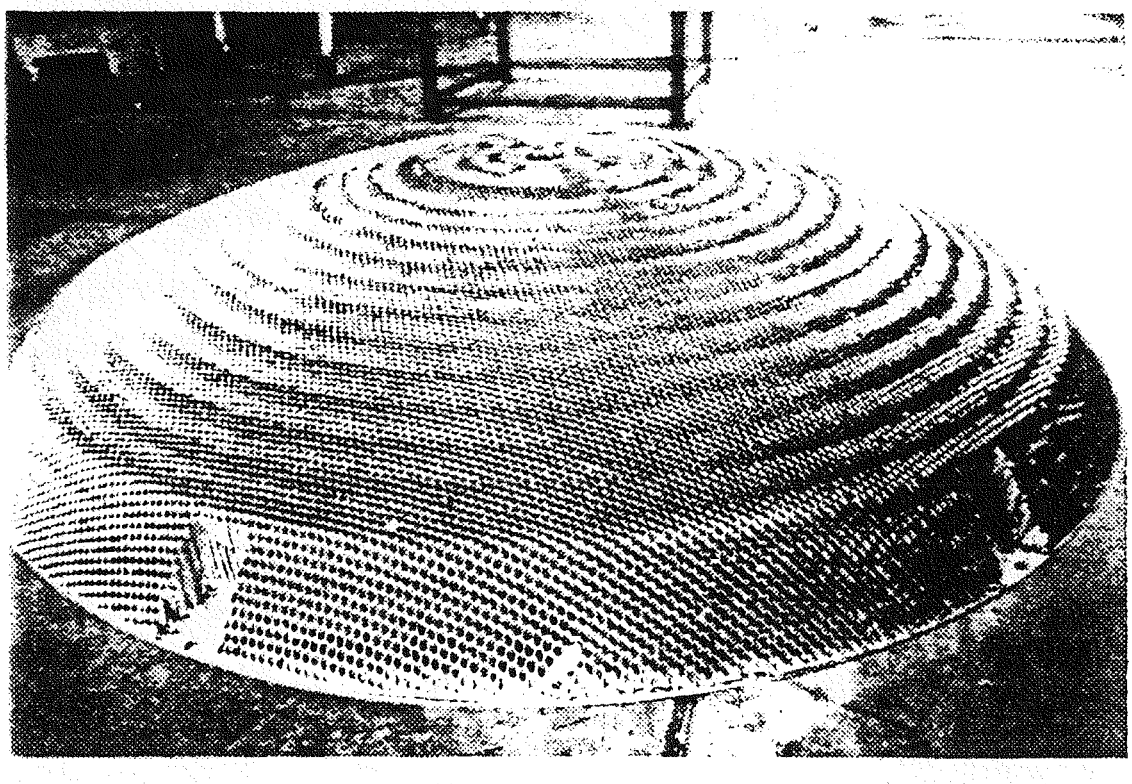
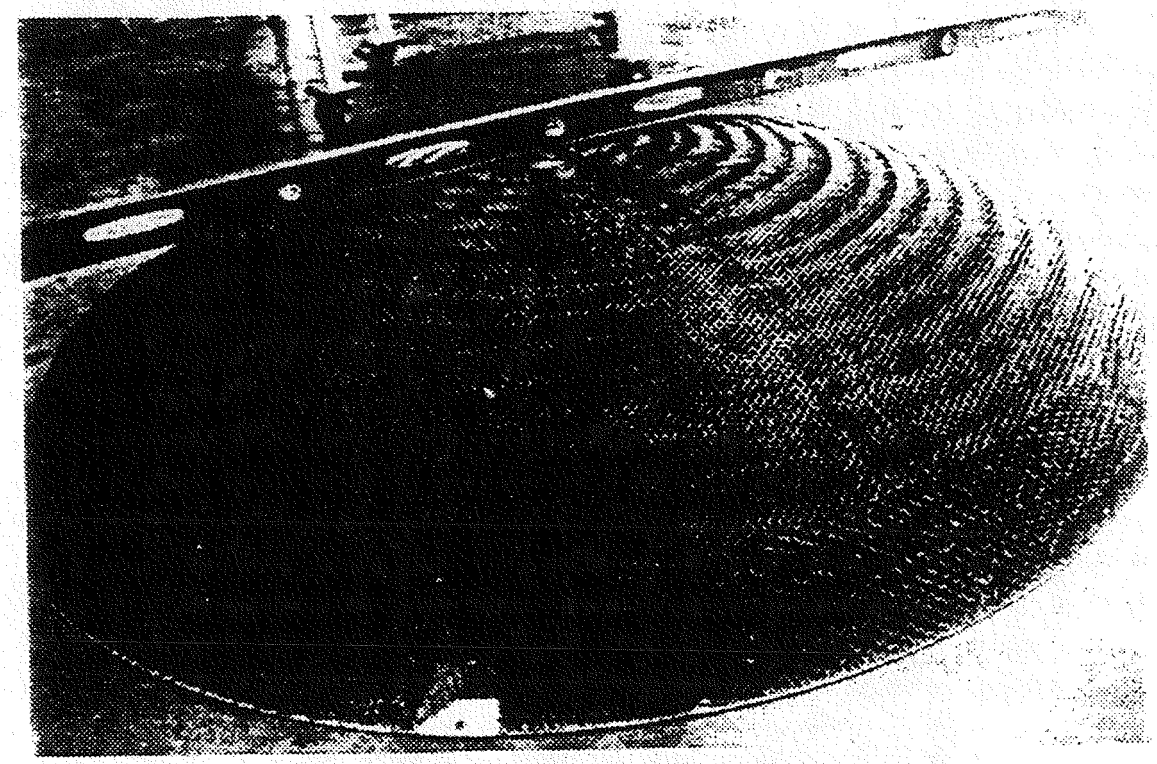


Figure 1



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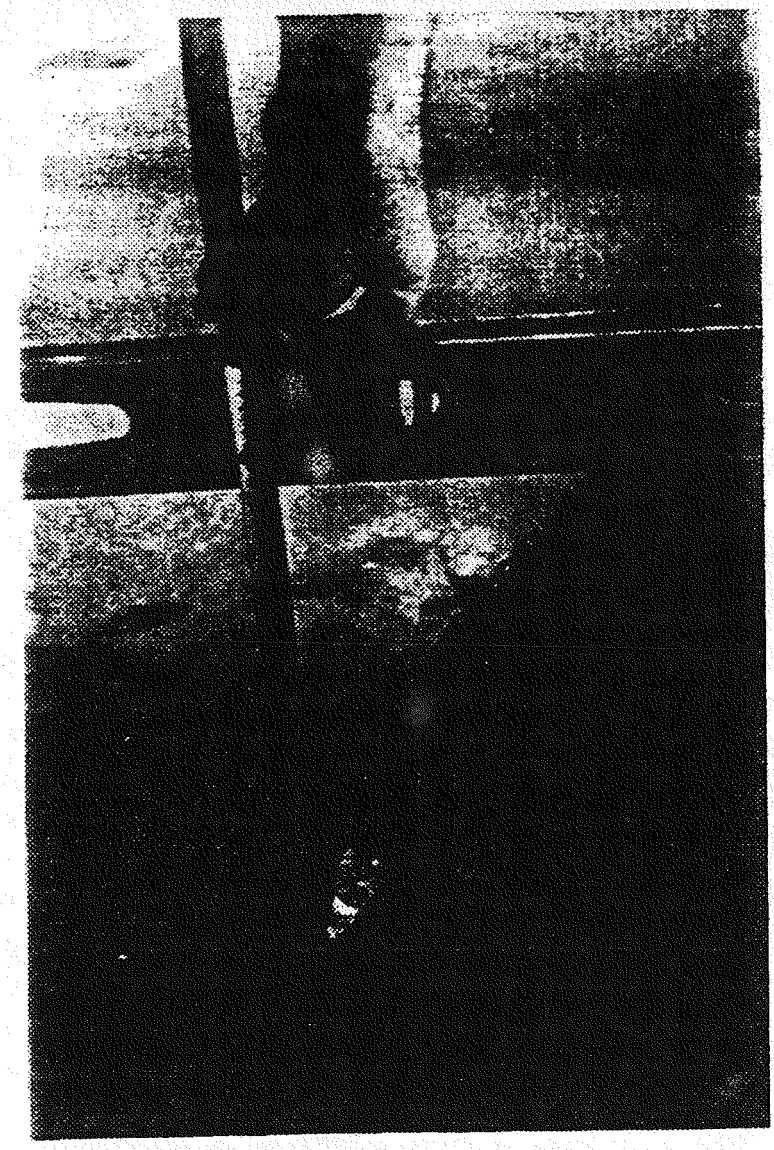
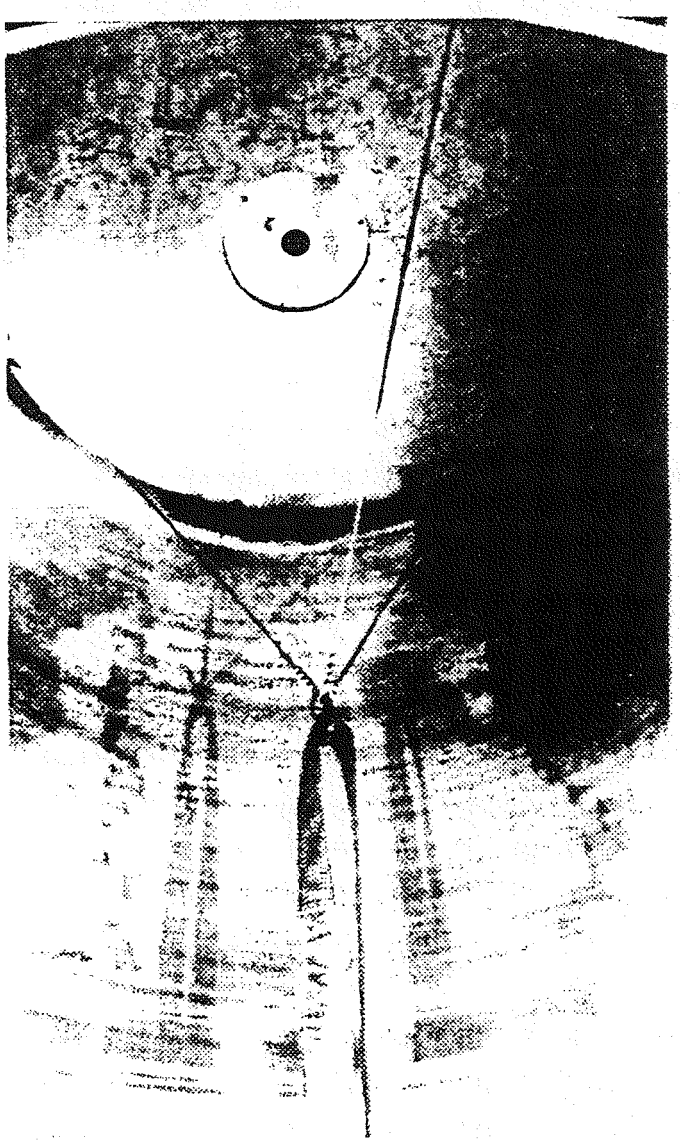
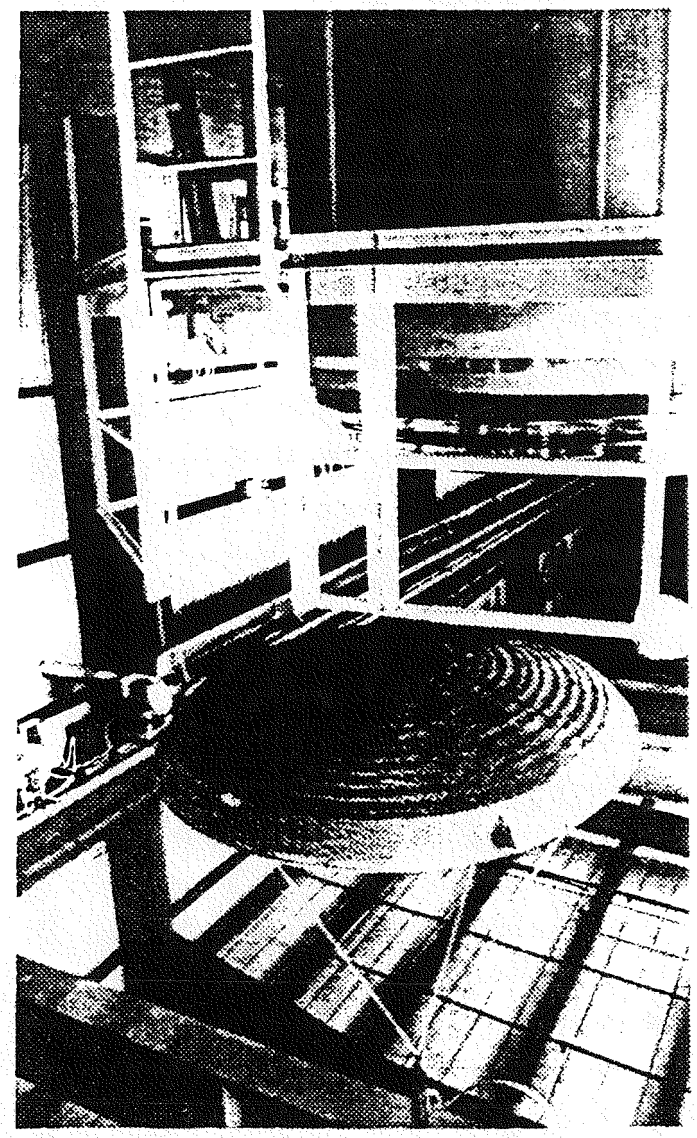
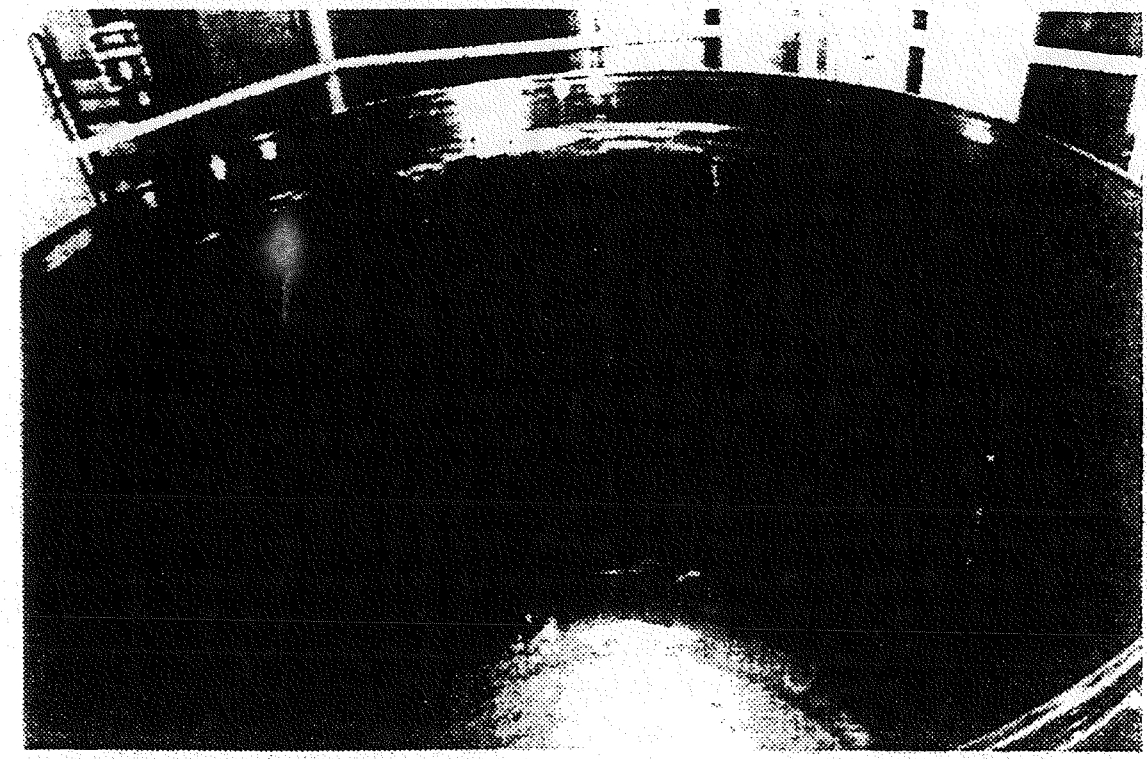


Figure 3







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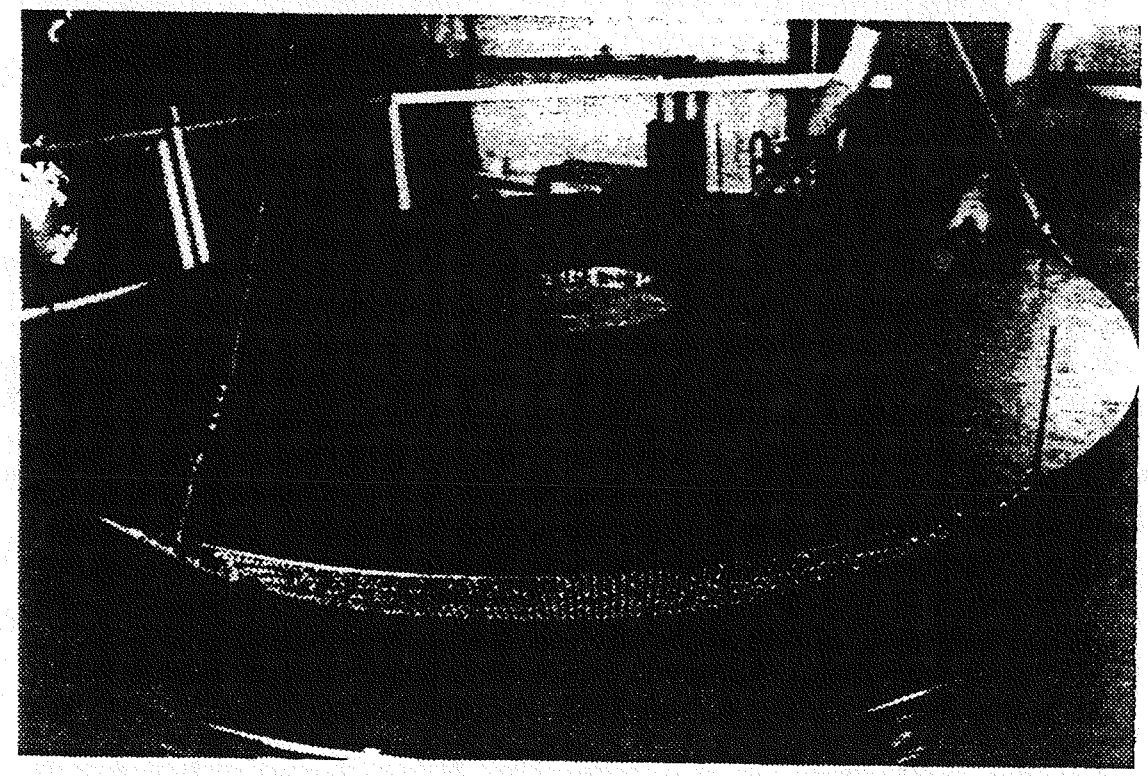


Figure H

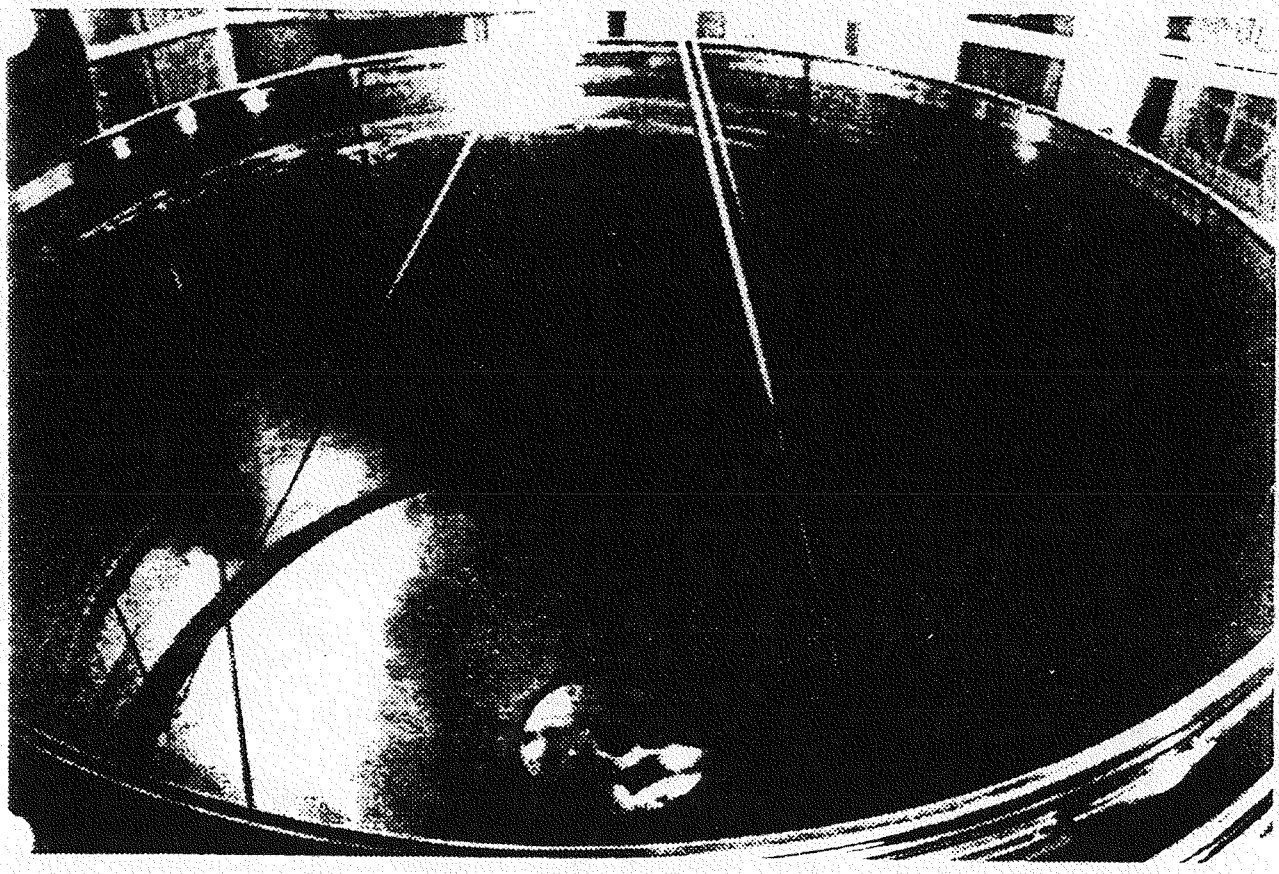
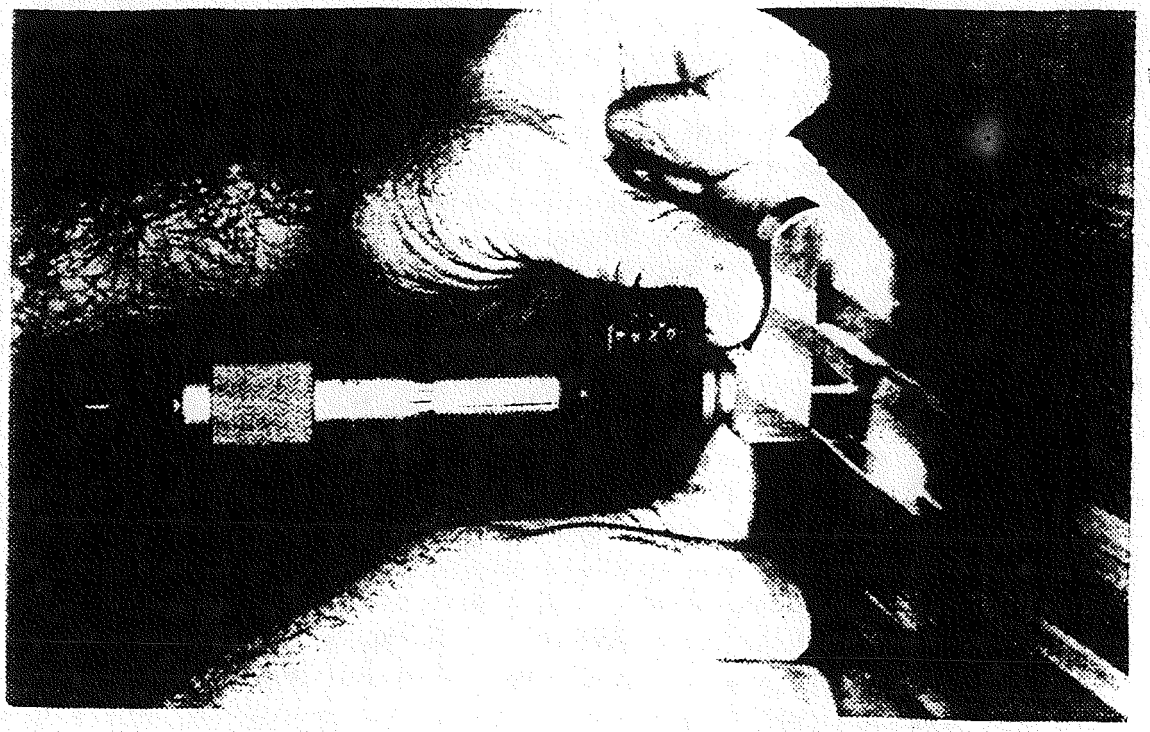


Figure I



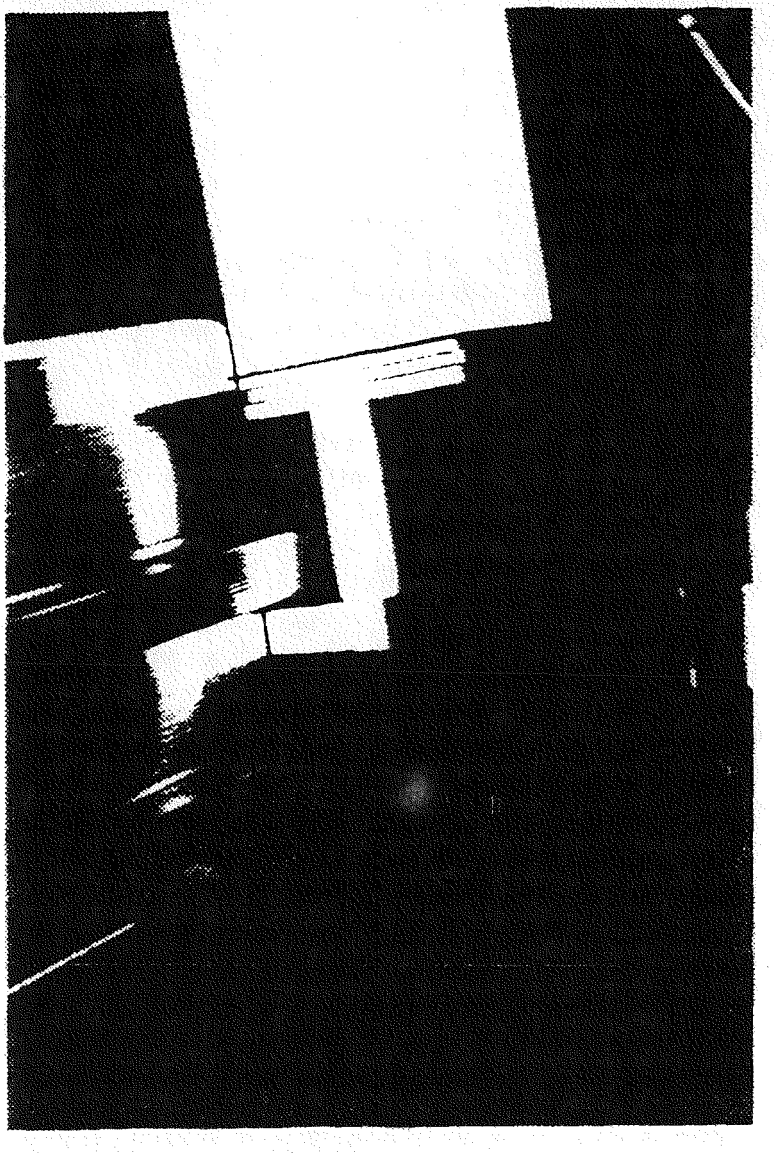


Figure B

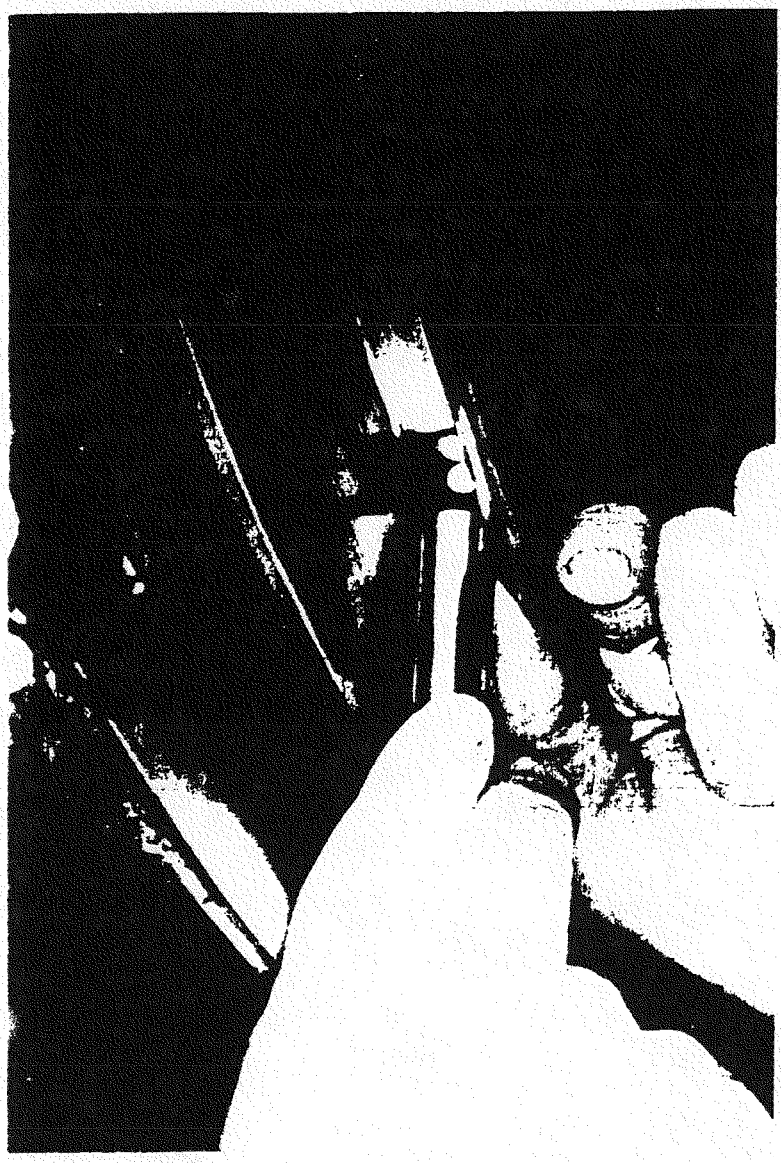


Figure A

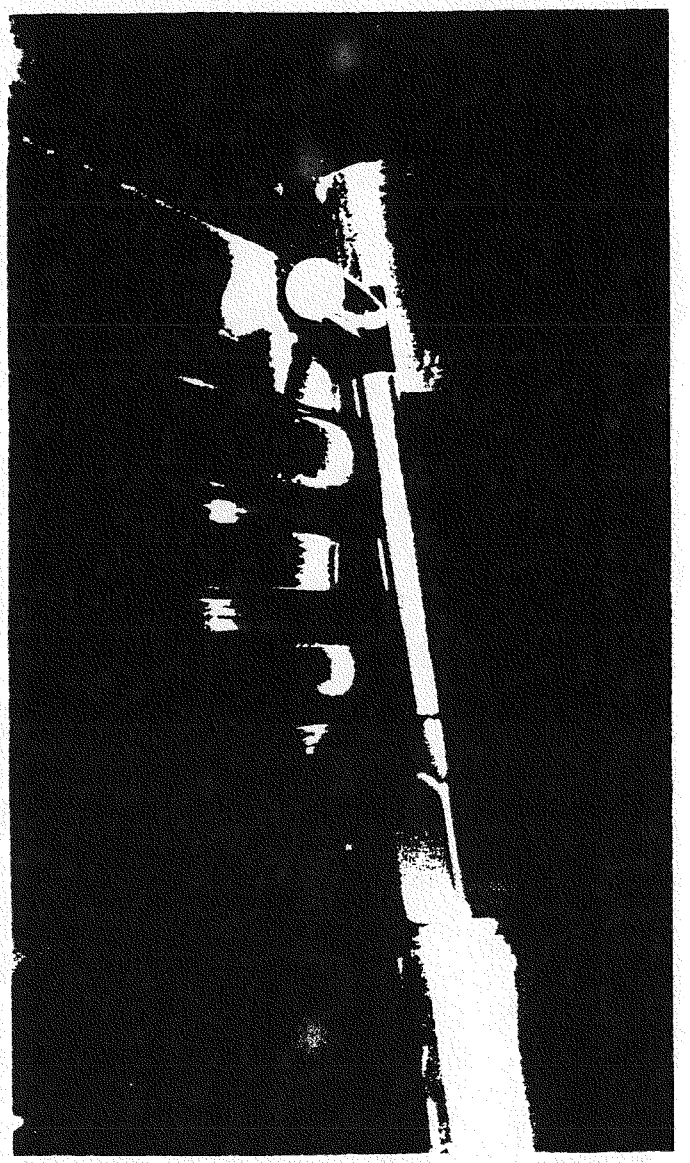


Figure B

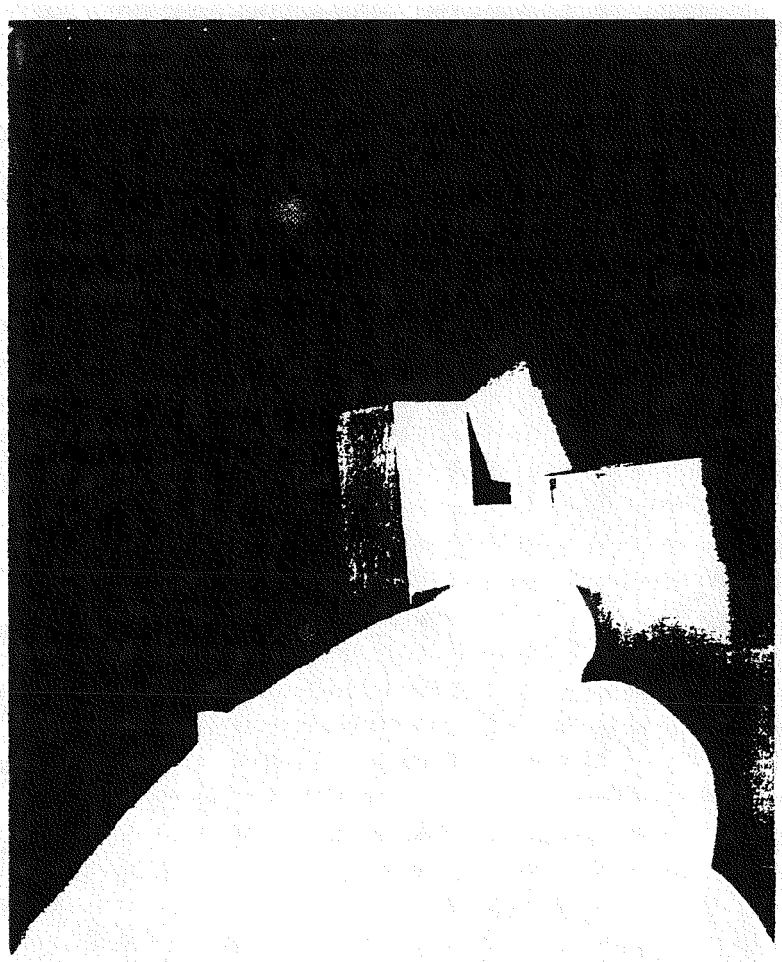


Figure A

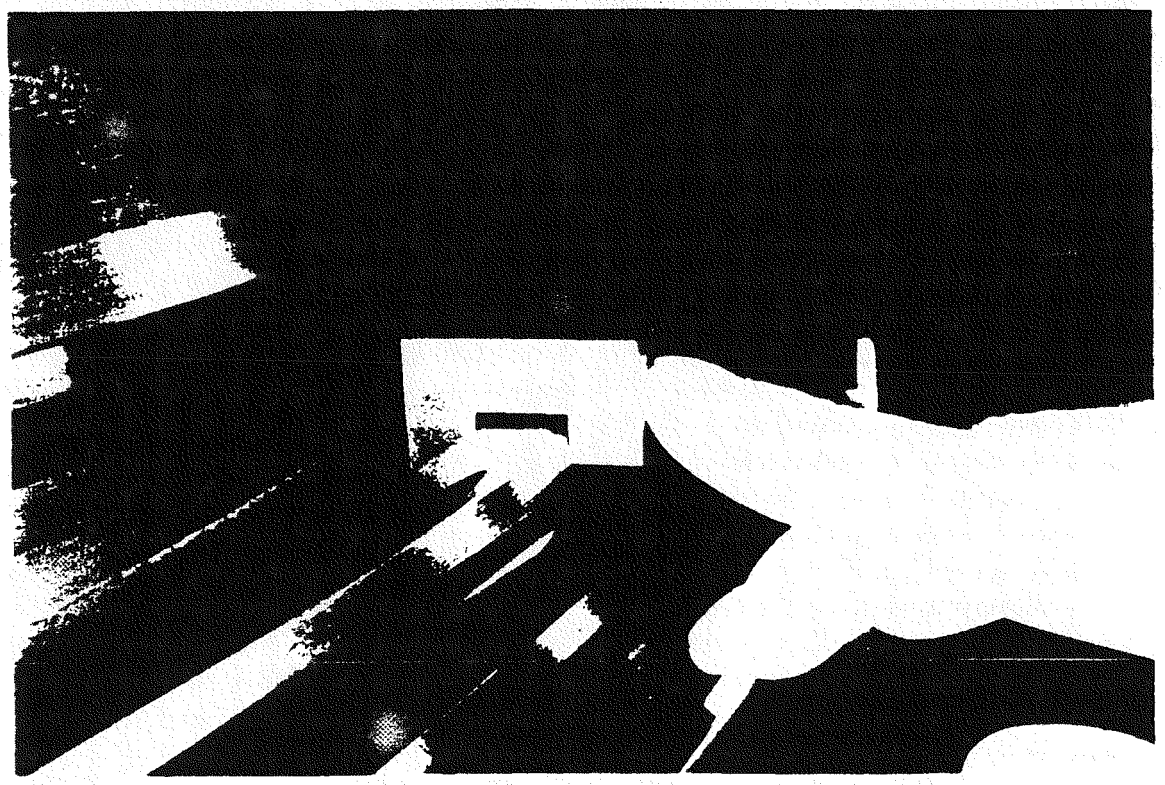


Figure B

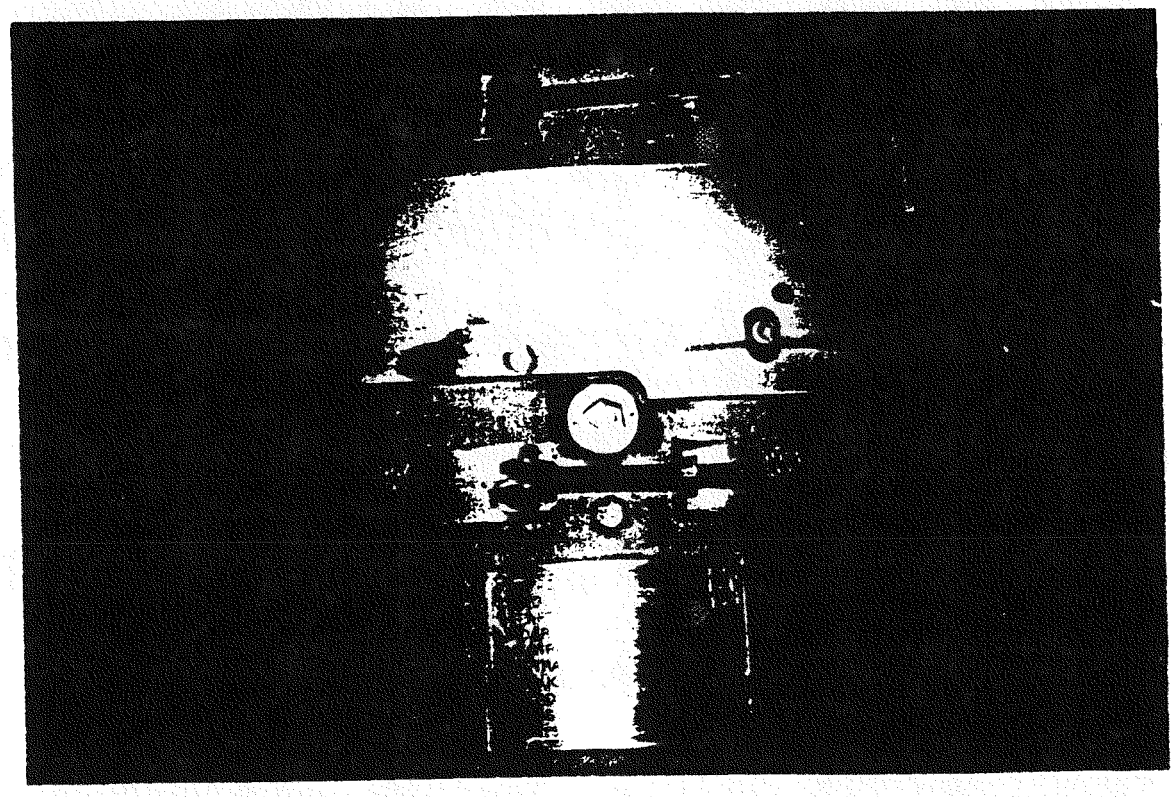


Figure 3

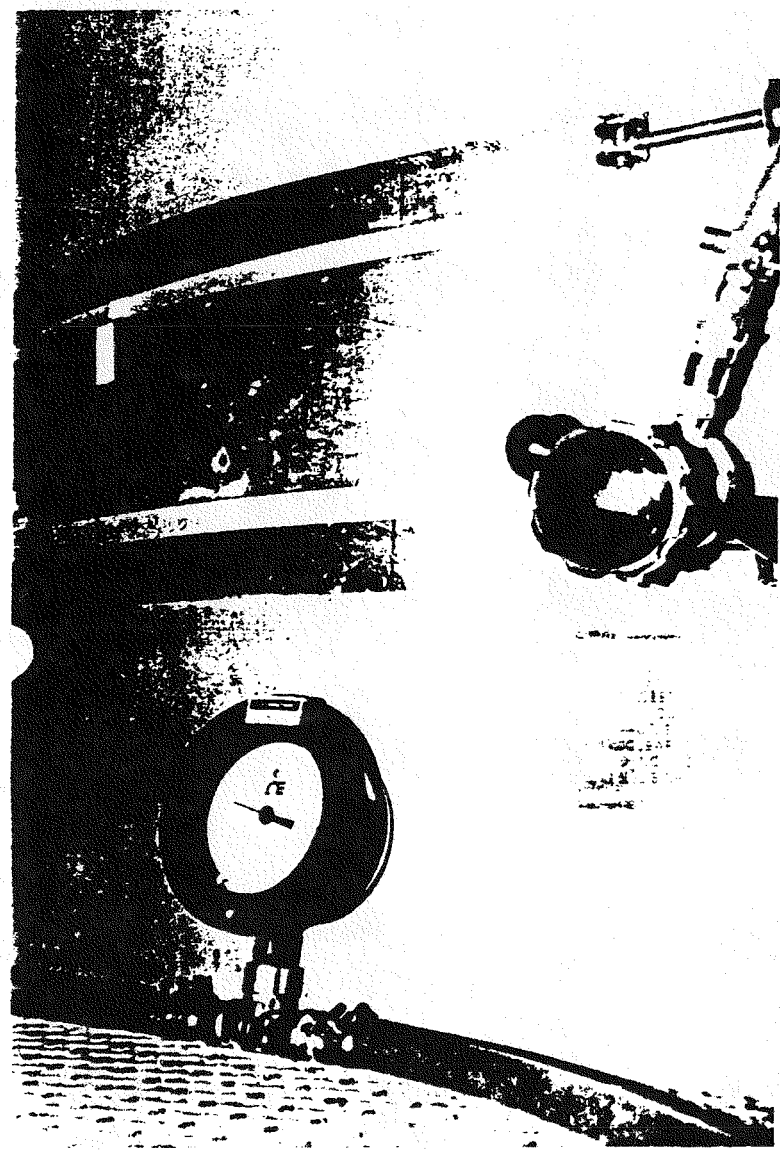


Figure 1

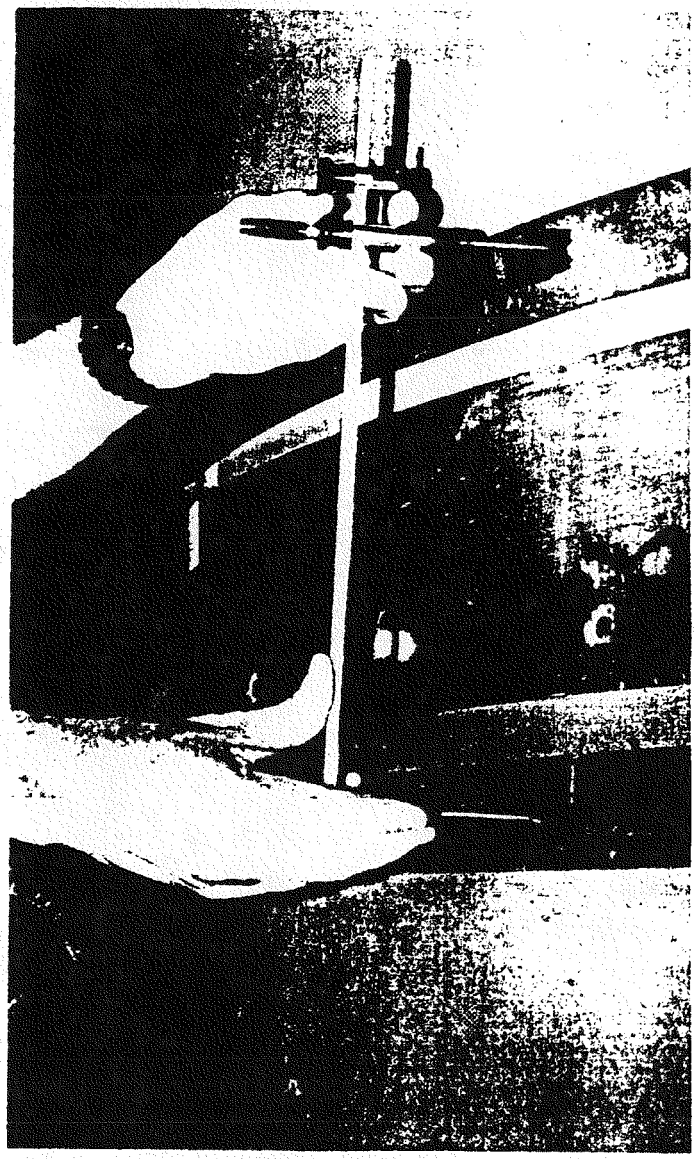
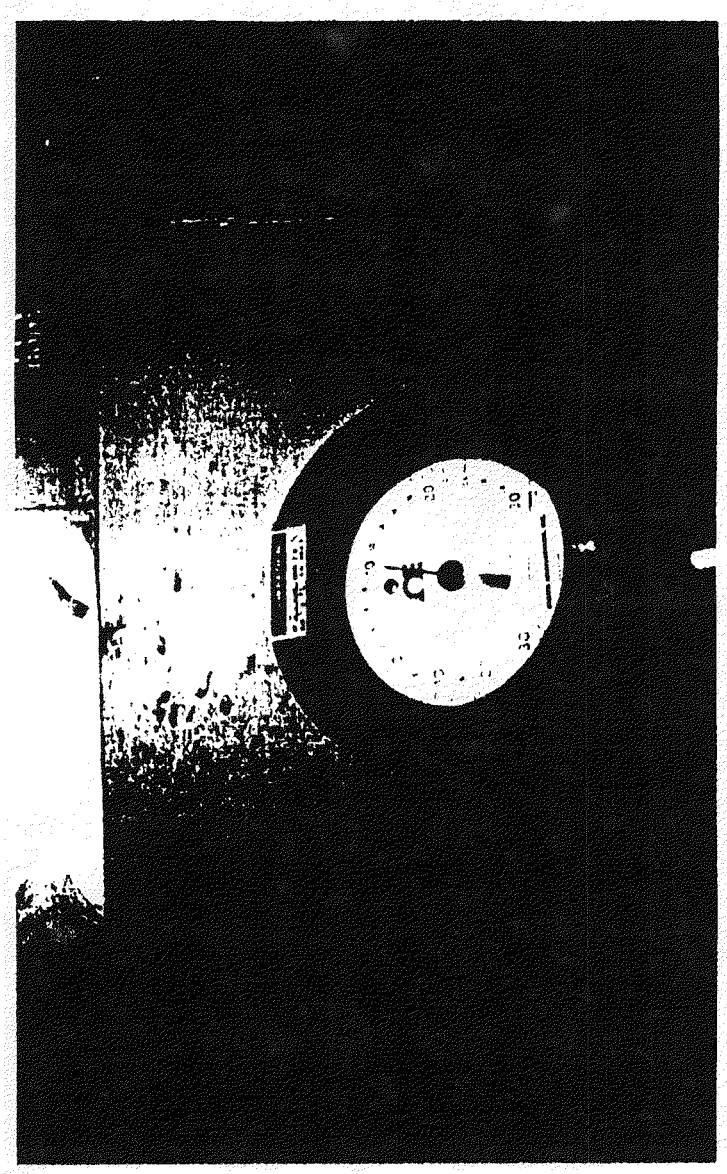
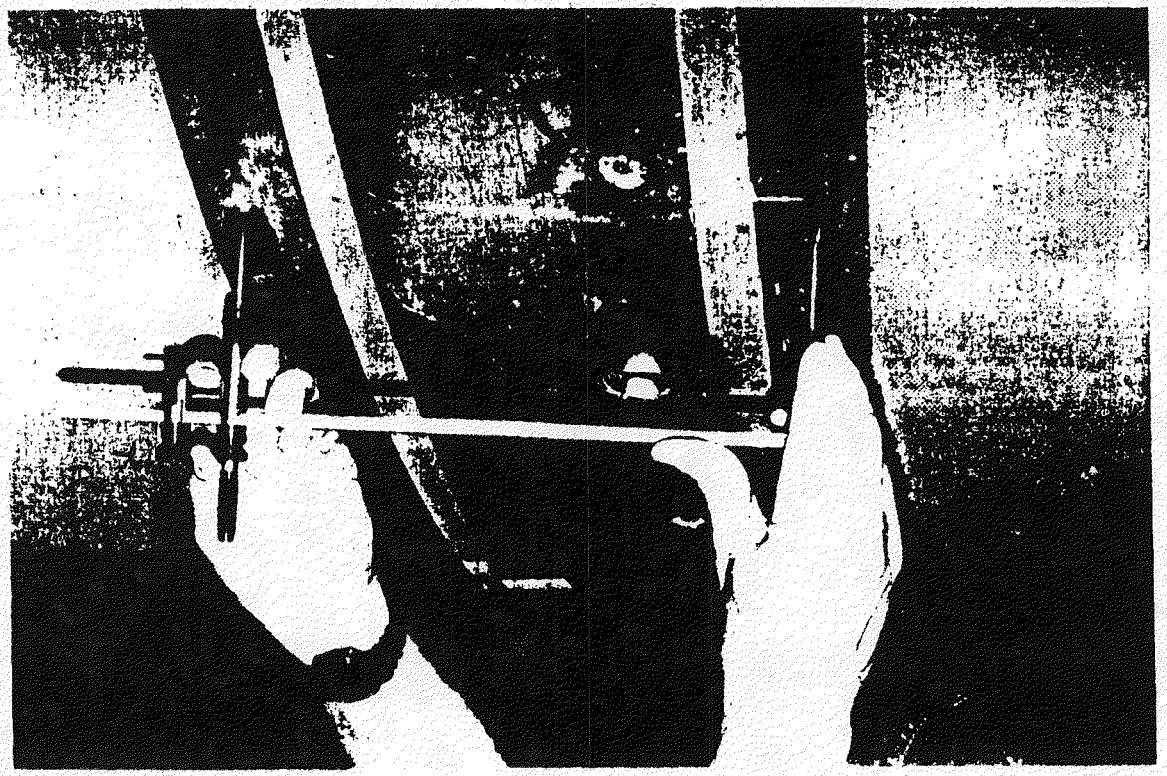


Figure 2





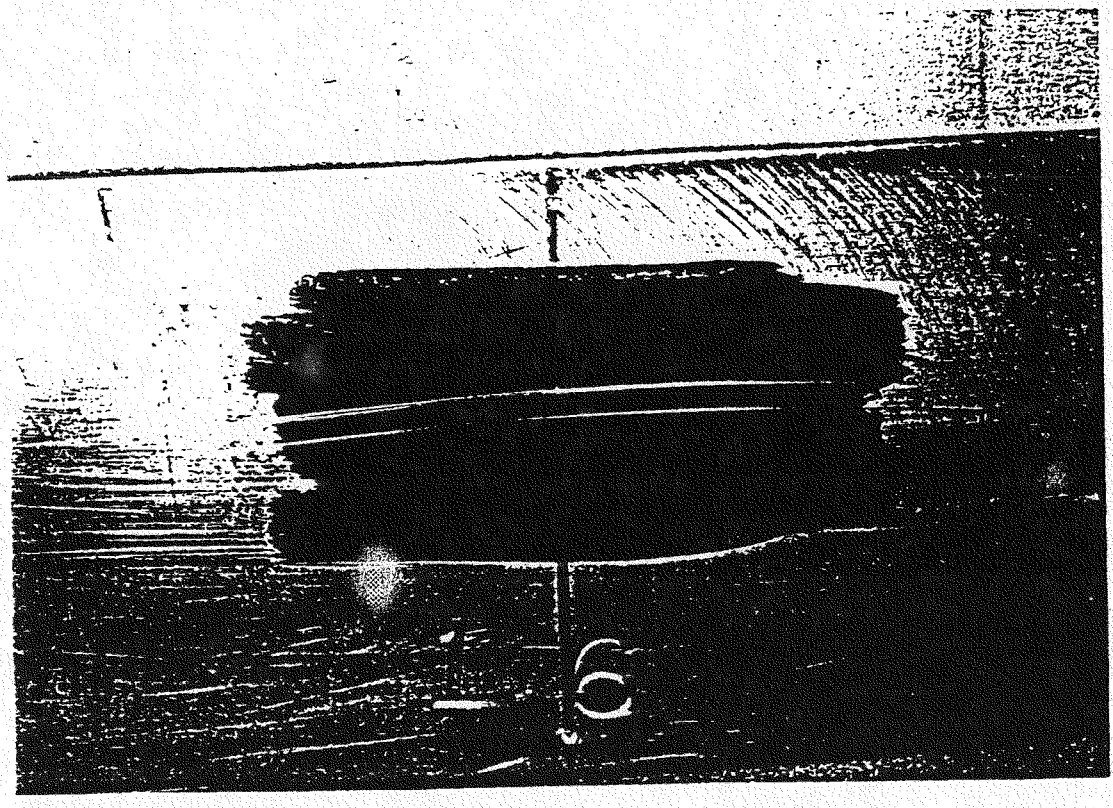


Figure G