

WP 08-PT.07
Revision 6

RH-TRU 72-B Cask Removable Lid Canister Handling and Operation Manual

Cognizant Department: Packaging Integration

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1.0 SCOPE

This document outlines the recommended procedures for the safe handling, effective operations, and proper maintenance of the RH-TRU (Remote-Handled Transuranic) 72-B Cask Removable Lid Canister (RLC).

2.0 GENERAL DESCRIPTION

The RH-TRU 72-B Cask RLC is designed for use with the RH-TRU 72-B Shipping Package, or as a stand-alone U.S. Department of Transportation (DOT) 7A Type A packaging. When used with the RH-TRU 72-B Shipping Package to transport RH-TRU waste to the Waste Isolation Pilot Plant (WIPP) for permanent disposal, the RLC is intended for one-time use. It is designed to be loaded horizontally or vertically. It is to be transported in a horizontal position only. Various lid installation/closure devices may be used with the RLC, ranging from a manual "T-bar" to remotely operated closure devices. The RLC is designed for both the direct loading of various contents and overpacking drums, and as described below. The RLC is designed for a maximum gross shipping weight of 4,240 lbs.

The RLC consists of a cylindrical main body. It has a flat top and bottom, and a twist lock lid. The lid is sealed using a flat gasket in a face seal configuration, or an optional hollow O-ring in a bore seal configuration in addition to the flat gasket in a face seal configuration. Internal gas pressure is relieved by one to four filter vents. The filter vents are installed in pipe thread tapped ports in the pintle base of the lid assembly.

NOTE

If the use of dunnage, blocking or bracing has been determined to be applicable to the payload, the shipper shall assume the responsibility of ensuring that large bulky, sharp, or heavy objects are blocked or braced appropriately on a case-by-case basis. This includes the blocking or bracing of objects inside drums. Dunnage or dunnage drums shall be required when the RLC payload consists of one or two drums only. Drums used for dunnage may be loaded without the use of a drum lifting bag.

Approved Material Forms are identified below:

- Material Form No. 1: Solids - any particle size.
- Material Form No. 2: Solids - large particle size only (e.g., sand, concrete, debris, soil).
- Material Form No. 3: Solids - objects with no significant dispersible or removable contamination (see 49 CFR §173.443 in "Contamination Control," Subsection 3.1).

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- Material Form No. 4: Solids as described in Form 3 above, including large bulky, dense objects with sharp and obtrusive members of components, but having Forms 1 and/or 2 as dispersible contaminants associated with the material (e.g., steel plates, motors, valves, steel pipes, concrete blocks).
- Material Form No. 5: Drums and other packagings in any arrangement within gross weight limitations, or other large bulky objects(s) with dunnage, as applicable to ensure that contents will not shift in a manner that would damage the RLC.
- Material Form No. 6: Combinations of one (1) or two (2) drums, and any of the materials in Forms 1, 2, 3, or 4 above, blocking or bracing as applicable, to ensure that contents will not shift in a manner that would damage the RLC. Contents shall be fastened/positioned within the package or dunnage shall be used to prevent damage within the package.

3.0 REFERENCE DOCUMENTS

The following documents apply to the performance of various handling, and maintenance activities. These documents shall be referred to during the applicable operations of this procedure.

3.1 U.S. DOT 7A Compliance Documents

- Title 49 Code of Federal Regulations (CFR) §173.443, "Contamination Control"
- 49 CFR §173.474, "Quality Control for Construction of Packaging"
- 49 CFR §178.350, Specification 7A; "General Packaging, Type A"
- DTS-RPT-080, Rev. 0, *Evaluation Report for the Removable Lid Canister Type A Packaging*, Duratek Federal Services, Inc., Richland, Washington
- FSWO-RPT-089, Rev. 0, *Evaluation Report for the Removable Lid Canister, Type A Packaging*, Energy Solutions Federal Services, Western Operations, Richland, Washington

3.2 Washington TRU Solutions LLC/Waste Isolation Pilot Plant (WTS/WIPP) Construction Drawings and Specifications

- Drawing No. 164-L-126 Series: RH MLU Canister Rack Assembly
- Drawing No. 164-L-127: RLC Lid Manual Tool Assembly
- Drawing No. 164-L-128: RLC Lid Manual Tool Assembly

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- Drawing No. 164-L-129 Series: RLC Lid Manual Retractor Tool Assembly
- Drawing No. 165-F-007 Series: RH-TRU 72-B Cask Removable Lid Canister Assembly
- Drawing No. 165-F-025 Series: RH 72-B RLC Sealed Spring Plunger
- E-I-446, Specification for Fabrication of the RH-TRU 72-B Cask Removable Lid Canister
- E-I-474, Specification for the RH-TRU Drum Handling Bags and Drum Handling Slings
- Specification OM-016, Operation and Maintenance Manual, Lid Latching Tool for Removable Lid Canister, Packaging Technology, Inc.

3.3 WIPP Shipment Compliance Documents

- NRC-Docket 71-9212, *RH-TRU 72-B Certificate of Compliance* (current revision)
- NRC-Docket 71-9212, *Safety Analysis Report for the RH-TRU 72-B Waste Shipping Package* (current revision)
- DOE/WIPP 90-045, *Remote-Handled Transuranic Waste Content Codes (RH-TRUCON)*

4.0 SAFETY PRECAUTIONS

4.1 General Safety Precautions

Only approved payloads, as defined in Section 2.0, are to be transported in the RLC when used as a DOT 7A container. During use and handling of the packaging, safety precautions in accordance with this manual, and as dictated by individual site procedures must be observed. Precautions include, but are not limited to, the following:

- No structural modifications shall be made to the container.
- If hardware replacement is required, replacement hardware shall meet the requirements of the assembly/manufacturing drawing.
- When lifting and handling the RLC, the recommendations in this document shall be followed the extent individual site procedures allow. The user shall assume the responsibility for safely performing all hoisting and rigging operations.

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- All personnel shall be kept clear of the work area while the RLC is being lifted or moved.
- No packaging shall be used to store, contain, or transport cargo other than the cargo for which the packaging was designed.
- Only qualified personnel shall be permitted to handle, rig, transport, or otherwise use the packaging. The user shall be responsible for determining qualifications of personnel.
- RLCs should be stored indoors whenever possible. If outdoor storage is unavoidable, the RLCs should be stored in the shipping crates and the crates fully covered with a secured tarp to prevent corrosion and the ingress of water.

4.2 Warnings

Detailed safety warnings are used to promote personnel safety, and are denoted by the prefix **WARNING**. Such warning statements and procedures shall be followed. A **WARNING** means **FAILURE TO HEED SUCH PROCEDURES COULD RESULT IN SERIOUS PERSONNEL INJURY OR DEATH**.

4.3 Cautions

Cautions before a step are denoted by the prefix **CAUTION**. Cautions alert personnel that a failure to comply with the caution **COULD RESULT IN DAMAGE TO CONTENTS OR PACKAGING**.

5.0 PRELOADING TOOLS, SUPPLIES, AND SPARE PARTS

The following items may be either manual tools or service powered devices. The user shall be responsible for ensuring that all tools, supplies, and spare parts meet the capability and stated certification requirements, as applicable.

5.1 Recommended Tools

- Six or 12-point thin wall sockets (for filter vents and pipe plug)
- 5/16-in. hex drive (for pintle cap screws)
- 5/8-in. open-end wrench for sealed spring plunger installation/removal
- Ratchet drive wrench
- Calibrated torque wrench(es) of appropriate range
- RLC Lid Manual Tool Assembly

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- Grapple, lid latching tool, or appropriately rated slings (for lifting and maneuvering the RLC)

5.2 Recommended Spare Parts (Available from Seller)

- Cap screws
- O-ring, as applicable
- Gasket
- Pipe plugs
- Filter vents, as authorized in accordance with Subsection 5.4
- Sealed spring plungers

5.3 Recommended Supplies (Commercially Available)

NOTE

Filter vents and Pipe Plug - For sealing the threads of the filter vents and pipe plugs, a thread sealant tape or compound is recommended. However, a liquid anaerobic thread sealant is acceptable.

- Spray silicone, silicone grease, or other WTS approved lubricant for lubrication of gasket
- Petroleum jelly, or other WTS approved rust inhibitor/assembly aid for lubrication of lid flange and body flange only
- Thread locking compound Loctite[®] 243 (for sealed spring plungers) or approved equivalent
- Gasket joint splicing compound, Loctite[®] 598 or approved equivalent
- Spray adhesive (3M[®] 77, or WTS Engineering approved equal)
- Touch-up paint (aerosol enamel, gloss white)

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5.4 Recommended Approved Filter Vents (Supplied by User or Shipper)

The RLC requires a minimum of one 3/4-in. National Pipe Straight Mechanical (NPSM), gasketed filter vent; up to four filter vents may be used per RLC to achieve the minimum hydrogen diffusivity of 1.48E-5 (mols/s/mol fraction at 25° C) as specified in the Safety Analysis Report for the RH-TRU 72-B Shipping Package and as authorized by the RH-TRAMPAC.^{1,2}

6.0 HANDLING PREREQUISITES

6.1 Pre-Use Inspection

NOTE

New RLCs may be shipped from the manufacturer assembled in a shipping crate. Removing the RLC from the shipping crate shall be performed according to site-specific procedures. RLC shipping crates may be constructed to be reusable. The reuse and exchange of crates can be arranged as an option in the individual procurement contract. Detailed inspection guidance is provided in Subsection 9.1. Pre-use inspection of the RLC may take place at any time and in any sequence prior to using the RLC, providing all applicable inspection criteria of this manual are met. If lid is removed prior to use, the bottom surfaces of the lid shall be inspected to ensure there is no scratching or gouging of the metal. Such conditions will cause difficulty in the closing of the RLC.

- 6.1.1 Inspect all RLC components for damage (significant deformation, punctures, corrosion, etc.), that could render the RLC unusable.
-

NOTE

If defective or damaged parts or components are identified, the RLC shall not be used until components are replaced with materials meeting the original specification requirements to maintain DOT 7A certification.

- 6.1.2 Verify that the serial number of the lid assembly matches the serial number of the body assembly and both are legible.

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NOTE

The RLC may be assembled with four threaded plugs or four filter vents or any combination thereof in the filter ports, depending on individual contract agreements between the manufacturer and the individual generator site receiving the RLC. The generator site shall be responsible for tracking the filter vents and ensuring proper installation by the manufacturer.

NOTE

If horizontal loading of drums in the RLC is intended, the optional body rails must be installed by the manufacturer. Specialized tools, equipment, and operating procedures shall be developed by the individual generator sites for the horizontal loading and handling of the RLC.

- 6.1.3 Ensure that all assembly components are present: body assembly (1 each), lid assembly (1 each), gasket (1 each), O-ring, optional for particular applications (1 each), sealed spring plungers (2 each), socket head cap screws (4 each), and pipe plugs or filter vents (4 each).

7.0 RLC HANDLING AND STORAGE

NOTE

To maintain the integrity of the RLC, indoor storage of empty RLCs is recommended. In the event that outdoor storage is unavoidable, the RLCs should be stored in the shipping crates and the crates fully covered with a secured tarp to prevent corrosion and the ingress of water. The user shall perform a pre-use inspection of the RLC to ensure packaging integrity has been maintained during outdoor storage.

NOTE

The RLC can be moved and stored horizontally while it is in the shipping crate. Once unpackaged, the RLC can be stored vertically, and must be moved vertically with a grapple or snares attached to the pintle only. The user shall be responsible for ensuring that the equipment and methods used for rigging and lifting are approved for the intended lifting operation, and that methods for storage are suitable.

7.1 Handling of Empty RLCs

- 7.1.1 With the RLC crate positioned horizontally in a suitable location for unpackaging, remove the top and ends of the crate. The sides may be removed if deemed necessary.

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- 7.1.2 Ensure that the RLC lid is in the locked position. The lid is in the locked position when the black line marked "L" on the body lines up with the black line on the lid.
- 7.1.3 Using an overhead hoist/crane and the appropriate rigging attached to the pintle, lift the RLC out of the crate.

7.2 Handling and Storage of Loaded RLCs

Loaded RLCs shall be lifted by the pintle only, and shall be stored only in the vertical position. RLCs may be stored in casks, overpacks, or storage racks in accordance with site-specific procedures.

7.3 Vertical Lid Removal

WARNING

To avoid personnel injury, the RLC body must be kept from rotating as the lid is being rotated.

CAUTION

To prevent damage to the RLC, the RLC body must be kept from rotating as the lid is being rotated. The use of an RLC loading silo or lid latching tool, each of which are equipped with an inflatable rubber bladder, will prevent rotation of the RLC body. To prevent damage to the closure interfaces, the lid **MUST** be removed by keeping the RLC lid level. The lid must be placed on a clean, smooth surface sturdy enough to support it, while protecting the finish of the contact surfaces.

NOTE

For manual operation, in the absence of a RLC lid manual tool, a tie wire, rope, or cable may be used to secure the spring plungers in the retracted position while removing the lid.

- 7.3.1 Retract the spring plungers to allow the lid to rotate.
- 7.3.2 Rotate the lid counter-clockwise approximately 22.5 degrees until the alignment mark on the lid lines up with the mark on the body labeled "U" indicating the lid is in the unlocked position and can be removed.

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- 7.3.3 Attach a grapple, lid latching tool, or suitable rigging, capable of lifting 500 lb, to the lid pintle cap.

WARNING

Pinch points are present between lid and body. Fingers should be kept clear.

- 7.3.4 Lift the lid upward/off and clear of the RLC body shell flange.
- 7.3.5 Stage the lid in a manner that will protect the interfacing surfaces.

7.4 Horizontal Lid Removal

CAUTION

The RLC lid weighs approximately 320 lb. Specialized tools and equipment are required for this operation. Lid handling and installation equipment must be capable of supporting the lid by the pintle cap in the horizontal position, and be able to rotate the RLC lid. To prevent damage to the RLC, measures must be taken to keep the RLC body from rotating as the lid is being rotated.

NOTE

Specialized tools, equipment, and operating procedures shall be developed by the individual generator sites for the horizontal loading and handling of the RLC.

- 7.4.1 Retract the spring plungers to allow the lid to rotate.
- 7.4.2 Rotate the lid counter-clockwise approximately 22.5 degrees until the alignment mark on the lid lines up with the mark on the body labeled "U" indicating the lid is in the unlocked position and can be removed.

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WARNING

Pinch points are present between lid and body. Fingers should be kept clear.

- 7.4.3 Pull the lid out of the RLC, in a manner that will not damage the sealing surface of the lid or body flange.
- 7.4.4 Stage the lid in a manner that will protect the interfacing surfaces.

7.5 Installation of Filter Vents, Plugs, and Spring Plungers

NOTE

- The quantity of filter vents installed, from one to four, are governed by the minimum specifications for total hydrogen diffusivity (See Subsection 5.4).
- The unused filter ports shall be sealed with 3/4-in. NTP socket recessed pipe plugs.
- The RLC was designed and tested using the Ultra Tech 9400 filter vent. The torque value specified in this section is applicable to that filter vent only. If other filter vents are approved for use with the RLC per Section 5.4, they shall be installed per the filter vent manufacturer's recommendations.
- The user may request the filter vents to be installed by the manufacturer as a procurement option. Filter vents and installation specifications shall be supplied by the user. Documentation of filter vent installation and tracking of filter vents shall be the responsibility of the user. If filter vents are installed by the manufacturer, the following steps for filter vent installation are not applicable.

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- 7.5.1 Apply a generous amount of pipe thread sealant compound or sealant tape to the threads of the filter vent(s) to be installed.
- 7.5.2 Install filter vent(s) into the threaded port(s) of the pintle base of the RLC lid, hand-tighten until the filter vent is securely sealed.
- 7.5.3 Torque each filter vent to 20 ± 5 lb-in., unless otherwise specified by the manufacturer.
- 7.5.4 Any remaining ports not containing filter vents must be plugged using a 3/4-in. NTP pipe plug.

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- 7.5.5 Apply a generous amount of pipe thread sealant compound or sealant tape to the threads of each plug before installing.
 - 7.5.6 Install each pipe plug into the pintle base ports, and torque to 300 ± 50 lb-in. (25 ± 4lb-ft).
 - 7.5.7 Remove all excess pipe plug sealant from the exterior of the container.
-

NOTE

Steps 7.5.8 through 7.5.10, for the installation of the spring plungers are not applicable, if the spring plungers were installed by the manufacturer as long as the factory installation has not been altered.

- 7.5.8 If the spring plungers are not already installed in the lid, coat the threads of each spring plunger with thread locking compound (Loctite® 243).
- 7.5.9 From the inner side of the lid flange, install each spring plunger in the threaded hole of the lid flange.
- 7.5.10 Rotate each spring plunger (clockwise) until the end of the spring plunger protrudes outward through the RLC lid flange 0.233 in. Refer to Drawing No. 165-F-007, Note 11.

8.0 PAYLOAD HANDLING/LOADING

The following steps shall be followed in loading the RLC.

8.1 Drums

- 8.1.1 Ensure that the Pre-Use Inspection (Subsection 6.1) has been performed prior to transferring the RLC into the drum loading area. General inspection and maintenance guidance is provided in Section 9.0.
-

NOTE

Drum lifting bags are recommended for the vertical loading of drums in the RLC. The loading of drums into lifting bags shall be performed in accordance with site-specific procedures. Drums used for dunnage may be loaded without the use of a drum lifting bag.

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CAUTION

All drums containing waste shall be closed in accordance with the intended function of the drum closure mechanism. The RLC clearance diameter is 24 5/8-in. The maximum clearance dimension of the drum and locking mechanism must fit within this dimension. Lever-lock rings or bolt-on seal rings with inboard closure lugs must be used on 55-gallon drums to fit within this dimension. A 55-gallon drum equipped with the standard bolted closure ring cannot be used with the RLC due to interface/clearance issues.

- 8.1.2 The body rail pipes are a manufacturing option intended to aid in the horizontal loading of drums. If the RLC is to be loaded horizontally, ensure that both body rail pipes (located along the RLC inner sidewall) are oriented downward when the RLC is positioned horizontally when placing drums into the RLC horizontally. Specialized tools, equipment, and operating procedures shall be developed by the individual generator sites if the horizontal loading of the RLC is intended.

NOTE

For reducing excess radiation exposure to the RH-TRU 72-B Cask operators As low as reasonably achievable (ALARA), high dose rate drums may be loaded in the bottom of the cask. ALARA issues take precedence over weight distribution.

- 8.1.3 To prevent the RLC from being top-heavy, load the drums in the RLC such that the weight is distributed as evenly as possible so that the center of gravity is close to the center of the RLC.
- 8.1.4 Install dunnage, blocking or bracing as applicable to Section 2.0.
- 8.1.5 Reinstall the RLC lid as instructed in Subsections 8.3 or 8.4.

8.2 Direct Loading

- 8.2.1 Ensure Pre-Use Inspection (Subsection 6.1) has been performed prior to transferring the RLC into the material loading area. General inspection and maintenance guidance is provided in Section 9.0.
- 8.2.2 Protect the sealing surfaces of the RLC from damage while loading materials.

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NOTE

Only materials specified in Section 2.0 may be direct loaded into the RLC.

- 8.2.3 Load materials as directed by site-specific procedures.
- 8.2.4 Block and brace sharp or heavy loose objects to prevent movement during shipment.
- 8.2.5 Install dunnage, blocking or bracing as applicable to Section 2.0.

8.3 Vertical Lid Installation

- 8.3.1 Remove any tie wire, rope, or cable from the spring plungers, as applicable.

WARNING

Pinch points are present between lid and body. Fingers should be kept clear.

NOTE

As an assembly aid, the gasket may be coated with spray silicone, silicone grease, or other WTS approved lubricant if not already coated with silicone grease by the manufacturer. A light coating of petroleum jelly may be applied to the body flange and lid flange if not already coated by the manufacturer providing the petroleum jelly is not applied within one inch of the gasket. Petroleum jelly is not to come in contact with the gasket. To prevent damage to the closure interfaces, the lid **MUST** be kept as level as possible during installation. To prevent damage to the RLC, measures must be taken to keep the RLC body from rotating as the lid is being rotated. The use of an RLC loading silo or lid latching tool, each of which are equipped with an inflatable rubber bladder, will prevent rotation of the RLC body.

- 8.3.2 Attach a grapple, slings, lid latching tool, or suitable rigging capable of lifting 500 lb, to pintle cap of the lid.
- 8.3.3 Lift the lid above the container.
- 8.3.4 Position the lid so that the lid alignment mark is positioned over the mark on the body flange labeled "U."

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NOTE

Allow sufficient time for the air to escape the RLC as the lid is lowered into the body.

- 8.3.5 Lower the lid slowly onto the body flange until fully seated on the gasket, keeping the marks on the lid and body aligned.
 - 8.3.6 Rotate the lid clockwise approximately 22.5 degrees until the mark on the RLC lid aligns with the mark on the RLC body labeled "L," and the spring plungers lock into the detents of the body flange.
-

NOTE

A tamper indicator seal is not required if the RLC will be transported in the RH-TRU 72-B Cask. The seal is required only if the RLC is transported per the requirements of Subsection 8.6. (Type A waste quantities shipped in a DOT 7A Type A RLC.)

- 8.3.7 If required, apply a tamper indicator seal, or other device, between the lid and body flanges.

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8.4 Horizontal Lid Installation

CAUTION

The RLC lid weighs approximately 320 lb. Specialized tools and equipment are required for this operation. Lid handling and installation equipment must be capable of holding the lid by the pintle cap in the horizontal position, and be able to rotate the RLC lid. To prevent damage to the RLC, measures must be taken to keep the RLC body from rotating as the lid is being rotated.

NOTE

Specialized tools, equipment, and operating procedures shall be developed by the individual generator sites for the horizontal loading and handling of the RLC.

NOTE

Prior to installation of the RLC lid, the gasket surface should be lubricated with spray silicone, silicone grease (preferable to spray), or other WTS approved lubricant if not already coated with silicone grease by the manufacturer. A light coating of petroleum jelly may be applied to the body flange and lid flange if not already coated by the manufacturer providing the petroleum jelly is not applied within one inch of the gasket. Petroleum jelly is not to come in contact with the gasket.

8.4.1 Remove any tie wire, rope, or cable from the spring plungers.

WARNING

Pinch points are present between lid and body. Fingers should be kept clear.

8.4.2 Attach the appropriate lid installation/removal and handling device, capable of lifting 500 lb, to pintle cap of the lid.

8.4.3 Position the lid so that the lid alignment mark is positioned in line with the mark on the body flange labeled "U."

8.4.4 Push the lid slowly into the body flange keeping the marks on the lid and body aligned.

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- 8.4.5 Rotate the lid clockwise approximately 22.5 degrees until the mark on the RLC lid aligns with the mark on the RLC body labeled "L," and the spring plungers lock into the detents of the body flange.

NOTE

A tamper indicator seal is not required if the RLC will be transported in the RH-TRU 72-B Cask. The seal is required only if the RLC is transported per the requirements of Subsection 8.6. (Type A waste quantities shipped in a DOT 7A Type A RLC.)

- 8.4.6 If required apply a tamper indicator seal, or other device, between the lid and body flanges.

8.5 Loading into the RH-TRU 72-B Cask

The RLC is loaded vertically into the RH-TRU 72-B Cask using an overhead crane. DOE/WIPP or approved site-specific procedures govern the loading of the RH-TRU 72-B Cask.

8.6 Securing Container to a Conveyance Vehicle

NOTE

The RLC, if used as a stand-alone DOT 7A Type A packaging, must be transported on a conveyance vehicle in the horizontal position only. This will require the use of adequately rated rigging, overhead crane/hoist, forklift, pallets, tiedowns, and blocking and bracing to prevent movement. The user shall be responsible for ensuring the methods, equipment, and safety measures are suitable for performing this operation.

- 8.6.1 With the RLC in the vertical position, attach rigging to the pintle.
- 8.6.2 Using the overhead crane/hoist and rigging equipment, position the RLC horizontally on the pallet.
- 8.6.3 Install adequate bracing on either side of the RLC to prevent lateral movement.
- 8.6.4 Secure the RLC to the pallet with webbing or other suitable rigging.
- 8.6.5 Load the pallet and the RLC onto the conveyance vehicle.
- 8.6.6 Secure the pallet and the RLC to the conveyance vehicle with webbing or other suitable rigging.
- 8.6.7 Verify that all rigging and equipment are secure before shipment.

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9.0 Maintenance, Inspection, and Repair

Guidance for general maintenance and inspection is provided in the following section. The user shall be responsible for determining when and if the RLC requires maintenance.

9.1 Maintenance and Inspection

NOTE

The sequence of inspection steps may be altered as necessary. During the inspection of the container, if defective parts or components are identified, the RLC shall not be used until components are replaced with materials meeting the original specification requirements to maintain DOT 7A certification. The manufacturer shall be contacted for replacements.

NOTE

The RLC design includes an optional O-ring seal. Maintenance and inspection steps in this section pertaining to the O-ring are applicable only if the optional O-ring is being utilized.

- 9.1.1 Inspect the pintle cap for damage or signs of fatigue and replace if such signs are found. If replaced, or pintle cap screws are found to be loose, torque pintle cap screws to 500 ± 50 lb-in. (41.5 ± 4 lb-ft).
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NOTE

Replacement spring plungers are to be installed as described in Steps 7.5.8 through 7.5.10.

- 9.1.2 Inspect the retractable spring plungers for damage, replace as needed.
- 9.1.3 Inspect the gasket for defects (uneven or deformed sealing surfaces due to cuts, gouges, or missing material); replace with a new gasket when needed. (See Subsection 9.2.1.). The gasket material should be free of cracks and pliable, and should meet the nominal dimensional requirements. Verify that the gasket shelf-life has not expired or is within the allowable shelf life range as described in Section 9.4.
- 9.1.4 Inspect the O-ring, if equipped for defects (uneven or deformed sealing surfaces due to cuts, gouges, or missing material) replace with a new O-ring when needed.
- 9.1.5 Inspect the body shell flange and O-ring sealing surfaces (if an O-ring is used) for cleanliness; clean if needed using a low intensity cleaning solvent such as denatured alcohol, or a general purpose adhesive remover containing a near equal mixture of Naphtha or Xylene. (See Subsection 9.2.1.4.).

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- 9.1.6 Inspect RLC interior and exterior surfaces for signs of damage or distortion.
- 9.1.7 If damage is found that could affect the containment integrity of the packaging, tag or label the unit as unusable and segregate from conforming units. Refer to Section 10.0 for disposition.
- 9.1.8 Inspect RLC interior and exterior surfaces for signs of corrosion.

NOTE

Touch-up paint (aerosol enamel, gloss white) may be applied to areas with minor surface corrosion that have been determined as NOT having an effect on the integrity of the packaging.

- 9.1.9 If signs of corrosion that could impair the containment are found, tag or label the unit as unusable and segregate from conforming units. Refer to Section 10.0 for disposition.
- | 9.1.10 Inspect all carbon filter vents and pipe plugs for damage. Replace as needed, in accordance with Subsection 7.5.
- 9.1.11 Verify the container identification serial number is in place and in legible condition.
- 9.1.12 Verify the cleanliness of the entire canister prior to loading it into the RH-TRU 72-B Cask to prevent the transfer of debris or moisture to the RH-TRU 72-B Cask internal surfaces.

9.2 Lid Flange Sealing Gasket and O-Ring

9.2.1 Lid Gasket Replacement

- 9.2.1.1 Remove the lid according to Subsection 7.3.
- 9.2.1.2 While protecting the interfacing surfaces of the lid flange, including the bottom, place the lid on a properly supported surface or other supports that allow access to the gasket area of the lid assembly.
- 9.2.1.3 Remove the existing gasket by stripping the gasket from the lid flange.
- 9.2.1.4 Clean the lid flange gasket seating area thoroughly by removing any residual gasket components or adhesive. Use a flexible spatula, putty knife, or similar tool, taking care to not damage the lid flange gasket seating area.

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- 9.2.1.5 Apply a light coat of low intensity cleaning solvent such as denatured alcohol or a general purpose adhesive remover containing a near equal mixture of Naphtha and Xylene. Adhesive remover of this type is commonly available at automotive parts stores. Use of acetone or other strong solvents is to be avoided as it will remove the paint/coating.
- 9.2.1.6 Verify that the gasket shelf-life has not expired or is within the allowable shelf life range as described in Section 9.4. Place the new gasket on the lid flange gasket sealing area with the self-adhesive/protective tape next to the lid flange surface.
- 9.2.1.7 Remove the self-adhesive/protective tape from under the gasket while seating the gasket against the lid flange. Do not stretch the gasket during installation.
- 9.2.1.8 Verify the gasket final installation to assure the gasket and lid sealing surfaces are clean, free of dirt, foreign particles, or other contaminants.

9.2.2 Lid O-Ring Replacement

- 9.2.2.1 Remove the lid according to Subsection 7.3.
- 9.2.2.2 While protecting the interfacing surfaces of the lid flange, including the bottom, place the lid on a properly supported surface or other supports that allow access to the gasket area of the lid assembly.
- 9.2.2.3 Remove the existing O-ring from the groove in the lid.
- 9.2.2.4 Clean the O-ring groove thoroughly using a low intensity cleaning solvent such as denatured alcohol, or a general purpose adhesive remover containing a near equal mixture of Naphtha and Xylene. (See Subsection 9.2.1.4.)
- 9.2.2.5 Lubricate the replacement O-ring and O-ring groove of the lid with spray silicone.
- 9.2.2.6 Seat the replacement O-ring into the O-ring groove.

9.3 Lid Gasket Fabrication

This section provides field instructions to fabricate a replacement gasket when a manufactured continuous gasket is not available. Refer to Drawing No. 165-F-007 for indicated items/note.

- 9.3.1 Obtain the required gasket material as shown on Item 16.
- 9.3.2 Obtain an approved gasket joint splicing adhesive material (recommend Loctite[®] 598 or equivalent).

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- 9.3.3 Place the gasket material into a flat circular shape. Do not allow the gasket to become twisted.
- 9.3.4 Cut off the gasket end excess length with a matching chamfer cut. The only overlap is to be at the chamfered ends. This provides smooth, flat sealing surfaces for the body shell flange and lid flange.
- 9.3.5 Review the adhesive manufacturer's application and safety instructions.
- 9.3.6 Apply the adhesive on the gasket chamfered ends.
- 9.3.7 Complete the gasket joint splice.
- 9.3.8 Allow the adhesive to cure as recommended by the manufacturer's instructions.
- 9.3.9 Complete the installation of the gasket on the RLC lid.

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9.4 Gasket Shelf Life, Storage and Adhesive

NOTE

The information in this section has been approved by the manufacturer of the RLC gaskets, and is intended to clarify the allowable shelf life of RLC gaskets based on the gasket material only, exclusive of the adhesive. Justification for use of gaskets beyond the shelf life provided by the gasket manufacturer is based on the following:

The gasket shelf life is indicated on the certificate of conformance (C of C) provided by the gasket manufacturer. According to the gasket C of C, the shelf life for the RLC lid gasket is limited to two years due to the shelf life of the pressure sensitive adhesive (PSA). The RLC gasket material itself has a shelf life of up to five years, providing the gaskets have been stored in accordance with the conditions described in this section.

The PSA on the RLC gasket is used as an operational aid for holding the gasket in place during installation. The PSA serves no other purpose, and is not considered to be part of the containment boundary or the Type A packaging design.

To maximize the shelf life of RLC gaskets, the gaskets should be stored in a dry location where they are protected against light, radiation, humidity and vapors. The ideal storage temperature is 70°F +/- 10° although storage temperatures between 60°F and 90°F are acceptable.

RLC gaskets, whether installed or not installed may be used beyond the shelf life of the PSA, providing less than five years has elapsed from date of manufacture, and they meet the inspection criteria in subsection 9.1.3.

If the RLC gasket meets the shelf life criteria of this section and the inspection criteria in subsection 9.1.3, but the PSA adhesion is inadequate, spray adhesive, 3M[®] 77, (or WTS Engineering approved equal) may be used to adhere the gasket to the RLC lid.

10.0 USER QUALITY ACCEPTANCE CRITERIA

If the requirements/criteria of Subsection 9.1 are not met, the user shall perform the corrective action(s) below following the user's Quality Assurance procedures.

10.1 Nonconformance Report

A document that identifies and records 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 using approved instructions.

10.2 Uncorrectable Conditions

Conditions found during visual inspection of the RLC in Subsection 9.1 that are **NOT** correctable shall be documented on a Nonconformance Report (NCR) and dispositioned following user's NCR procedures before the next use of the packaging.