



2-Slot 239/439 Repeater Housing Installation and Maintenance Practice

Document Number: 61152010L4-5C
Part Number: 1152010L4: CLEI: DDMOAAE__
Part Number: 1152010L3: CLEI: DDMOBAE__
November 2006

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Revision History

Revision	Date	Description
A	1998	Initial release
B	June 1998	Changes to figures, tables, and document style
C	November 2006	Updated Table 3 , and updated document style.

Conventions

The following typographical conventions are used in this document:

[This font](#) indicates a cross-reference link.

This font indicates screen menus, fields, and parameters.

THIS FONT indicates keyboard keys (ENTER, ESC, ALT). Keys that are to be pressed simultaneously are shown with a plus sign (ALT+X indicates that the ALT key and X key should be pressed at the same time).

This font indicates references to other documentation and is also used for emphasis.

This font indicates on-screen messages and prompts.

This font indicates text to be typed exactly as shown.

This font indicates silk-screen labels or other system label items.

This font is used for strong emphasis.

NOTE

Notes inform the user of additional, but essential, information or features.

CAUTION

Cautions inform the user of potential damage, malfunction, or disruption to equipment, software, or environment.

WARNING

Warnings inform the user of potential bodily pain, injury, or death.

Training

ADTRAN offers training courses on our products. These courses include overviews on product features and functions while covering applications of ADTRAN product lines. ADTRAN provides a variety of training options, including customized training and courses taught at our facilities or at customer sites.

For inquiries concerning training, contact ADTRAN:

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2-Slot 239/439 Repeater Housing

GENERAL

This practice is an installation and maintenance guide for the ADTRAN® 2-Slot 239/439 Repeater Housing (P/N 1152010L3 and P/N 1152010L4). [Figure 1](#) illustrates the 2-Slot 239/439 Repeater Housing.



Figure 1. 2-Slot 239/439 Repeater Housing

Description

The Repeater Housing is a sealed, pressurized apparatus case designed to provide a secure environmental enclosure for 239/439 repeaters. The Repeater Housing is designed to accommodate a broad range of digital technologies. The Repeater Housing provides simple wiring schemes for easy installation, along with air and gel stubs for various applications. The Repeater Housing is also equipped with gas tube surge arrestor boards as a standard feature. All wiring and pinout information is labeled on the Repeater Housing.

The Repeater Housings that are explained in this document are listed in [Table 1](#).

Table 1. Part Numbers

Unit	Part Number	CLEI
2-Slot 239/439 Environmental Housing Air-core Stub	1152010L4	DDMOAAE_ _
2-Slot 239/439 Environmental Housing Gel-core Stub	1152010L3	DDMOBAE_ _

Features

The basic features of the Repeater Housings are as follows:

- Supports two 239/439 HDSL Range Extenders (HREs), FT1s, 2-wire HDSL H2Rs, and DDS and ISDN repeaters
- Pole, manhole, or wallmount for various deployment scenarios
- Mounting kit supplied (mounting bracket included)
- Quick reference wiring labels support multiple circuit technologies
- Tamper resistant stainless steel locking clamp allows use of a customer-supplied lock for additional security
- 6 AWG ground cable supplied as a standard feature
- Replaceable gas tube surge arrestor boards for each slot (non-service-interrupting)
- Single 40-foot cable stubs for pole, vault, or wallmount applications (standard)
- All Repeater Housings are tested for pressure and electrical functionality

INSTALLATION

After unpacking the Repeater Housing, inspect it for damage. If damage has occurred, file a claim with the carrier then contact ADTRAN Customer Service. Refer to “[Appendix A, Warranty](#)” for further information. If possible, keep the original shipping container for returning the Repeater Housing for repair or for verification of shipping damage.

The Repeater Housing consists of the following major components:

- Mounting bracket
- Mounting clip
- Mounting clip clamp
- Base
- Circuit pack support
- Clamp
- O-ring
- Surge arrestors
- Order-wire terminals
- Ground cable
- Cover

A stainless steel locking clamp secures the bottom of the cover to the base of the Repeater Housing using an O-ring to form an air-tight seal. A tamper-resistant screw with captured cup washer is provided to attach to the clamp for additional security. [Figure 3](#) shows the parts of the Repeater Housing.

A warning label (see [Figure 2](#)) is attached to the outside of the air-core stub Repeater Housing (P/N 1152010L4); a similar warning (omitting “Shut Off System Pressure”) is on the gel-core stub Repeater Housing (P/N 1152010L3).



Figure 2. Warning Label

WARNING

If the Repeater Housing is opened without releasing pressure first, the sudden release of the cover under pressure could cause injury.

Always release pressure before loosening clamp and removing cover.

To release pressure, hand-tightening the system pressure shut off valve clockwise to verify it is closed for the air-core Repeater Housing (P/N 1152010L4); and on both housings, depressing the fill valve.

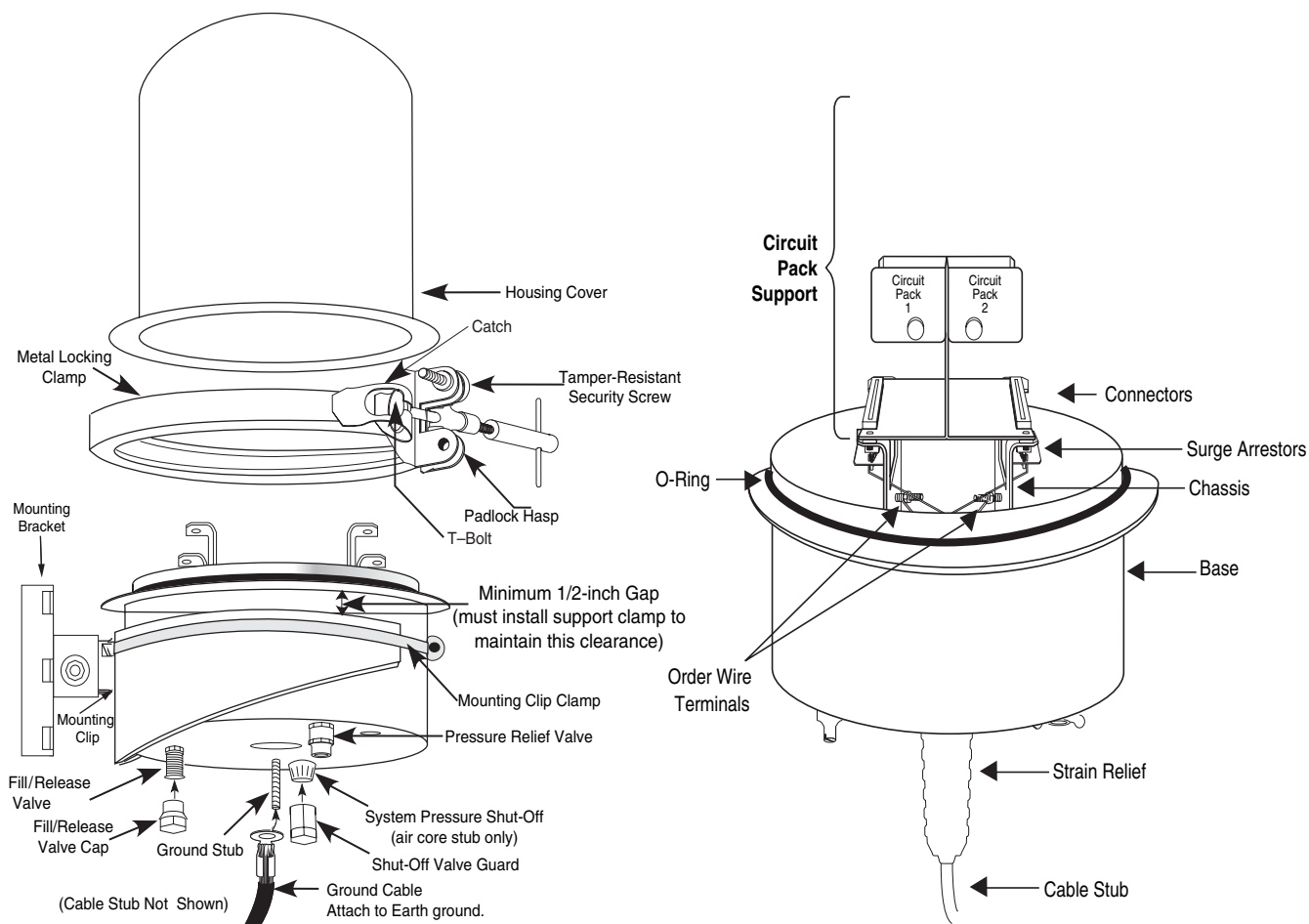


Figure 3. Repeater Housing Assembly

Instructions for Installing the Repeater Housing

To install the Repeater Housing, perform the following procedures:

1. “Install Mounting Bracket” on page 5
2. “Splice Wires” on page 7
3. “Release Pressure in the Repeater Housing” on page 10
4. “Clean off Debris” on page 11
5. “Remove Clamp” on page 11
6. “Lift Cover” on page 12
7. “Install Repeaters” on page 12
8. “Place Cover on Base” on page 12
9. “Place Clamp over Cover and Base” on page 12
10. “Repressurize the Repeater Housing” on page 13

Install Mounting Bracket

NOTE

Clearances between the Repeater Housing and adjacent structures must be observed for access during maintenance. Pay particular attention to clearances for removing the cover. See [Figure 4](#).

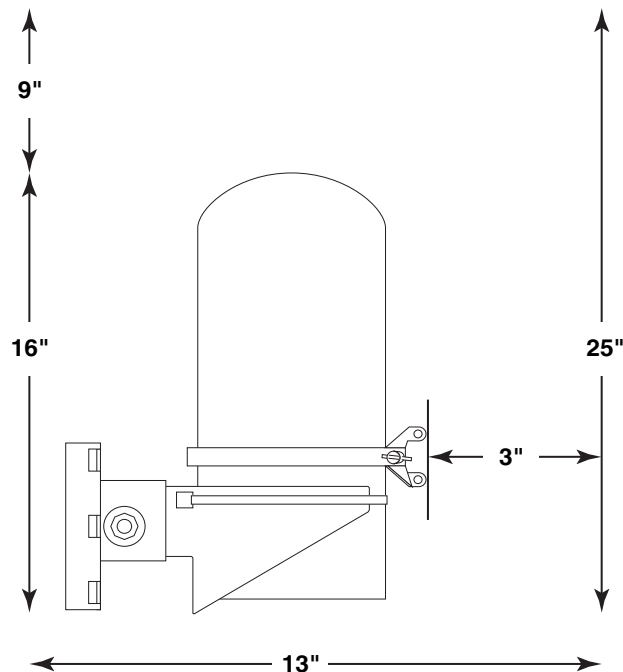


Figure 4. Mounting Clearances

To install the mounting bracket, perform the following steps:

1. Verify that the proposed cable route does not exceed the 40-foot cable length.

The mounting bracket contains holes for mounting the unit to a pole, in a vault, or in a manhole. See [Figure 5](#).

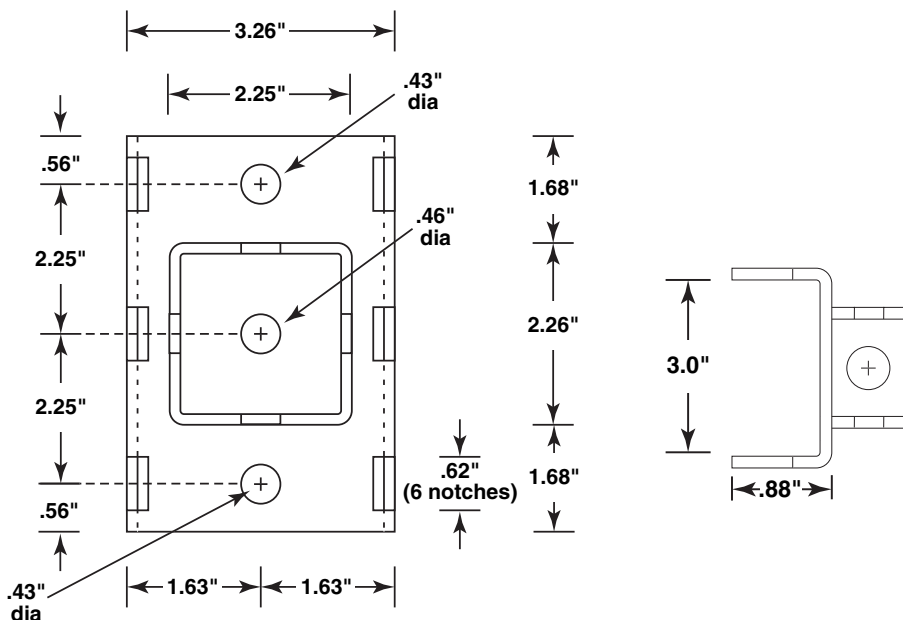


Figure 5. Guide for Mounting Bracket Holes

2. Select the location for mounting the unit, and attach the mounting bracket to the location using fasteners appropriate to local methods and procedures.

NOTE

The mounting bracket is normally mounted vertically, but can be attached in a horizontal position.

3. Before attaching the Repeater Housing to the mounting bracket, be sure the mounting clip is secured around the housing base. A minimum 1/2-inch gap is required between the mounting clip and the base flange. See [Figure 3](#) on page 4.

NOTE

Do not mount the Repeater Housing with the mounting clip around the housing cover.

4. Place the housing base into the mounting clip. The mounting clip must not contact the metal locking clamp when installed. The mounting clip should be placed with the flat side up and the slant side facing downward.

- Secure the mounting clip by inserting the mounting clip clamp through the slots in the mounting clip and tighten, using a flathead screwdriver, to a maximum of 12 inch-pounds (see [Table 2](#)). **Do not overtighten.**

Table 2. Quick Reference for Proper Tightening

Part	Torque
Metal Locking Clamp Security Bolt	10 Inch-pounds
Mounting Bracket Bolt	30 to 40 inch-pounds maximum
Ground Stud	18 to 22 inch-pounds maximum
Mounting Clip Clamp	12 inch-pounds maximum
Shutt-off Valve Gaurd (P/N 1152010L4 only)	10 inch-pounds maximum

- Attach the mounting clip to the mounting bracket using the supplied bolt, flat washer, lock washer, and nut (30 to 40 inch-pounds maximum).

NOTE

The Repeater Housing is normally mounted vertically, with the cable stub down.

Splice Wires

To splice the wires, perform the following steps:

- Connect the wiring from the cable stub base to the appropriate matching slot configuration. See [Figure 6](#) for the Repeater Housing wiring diagram.

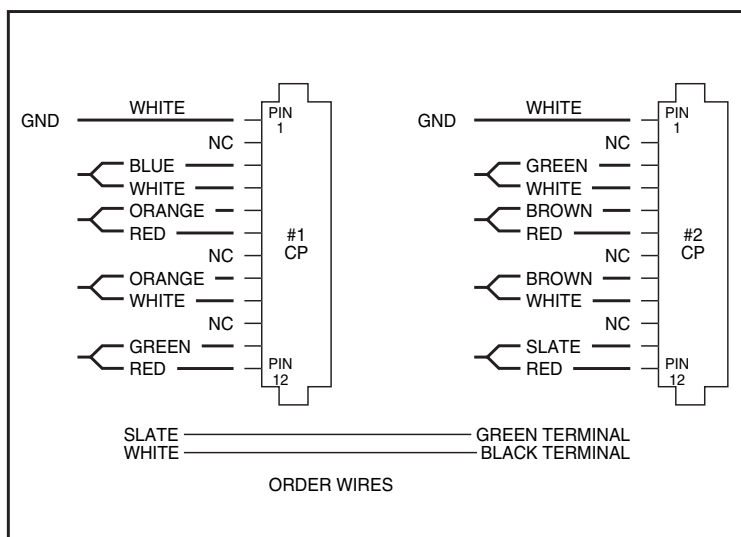


Figure 6. Repeater Housing Wiring Diagram Label

See [Figure 7](#) and [Table 4](#) on page 14 for circuit technology configuration.

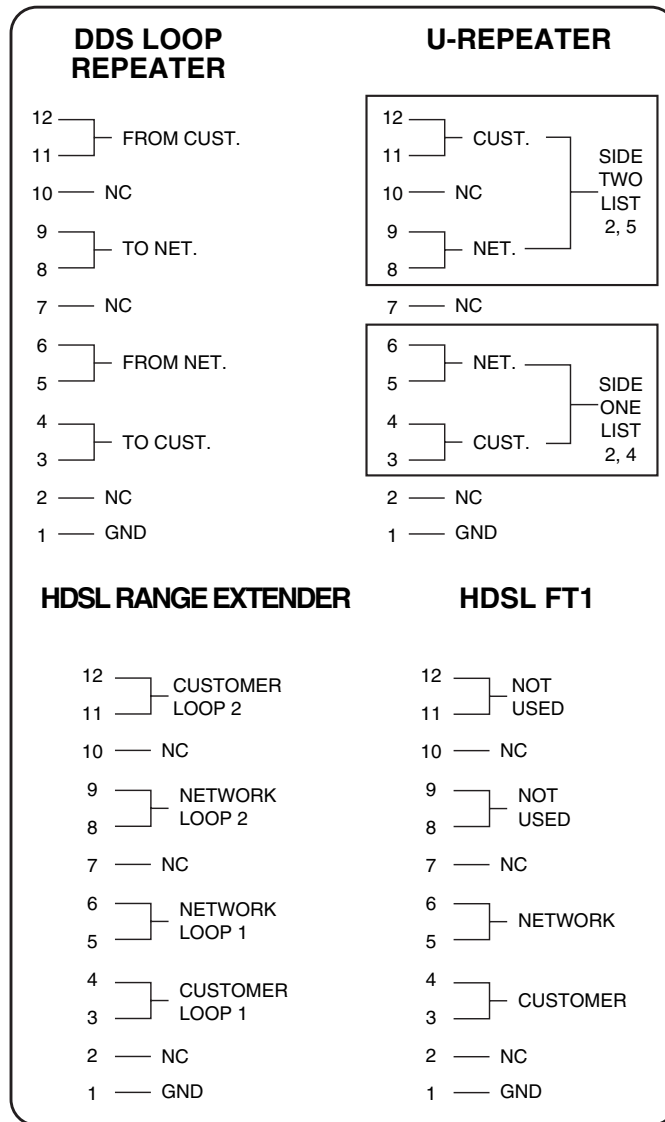


Figure 7. Circuit Technology Connections Label

NOTE

If installing an air-pressurized model and using remote pressurization, an air-tight splice enclosure must be provided.

2. Connect ground cable to an appropriate ground.

NOTE

The surge arrestors work only when ground cable is connected.

Table 3. Circuit Technology Configuration Chart

Circuit Pack (CP) Pin Number ⁽¹⁾	Cable Wire Color for Repeater Housing		HRE (Single or Dual Size) ⁽³⁾	HRE (Quad Size)	HDSL FT1 (Single or Dual Size) ⁽³⁾	DDS (Single or Dual Size) ⁽³⁾	Dual ISDN (Dual Size)
CP1: 3, 4	Blue	White	Customer, Loop 1	Customer, Loop 1	Customer	To Customer	Side 1 Customer
5, 6	Orange	Red	Network, Loop 1	Network, Loop 1	Network	From Network	Side 1 Network
8, 9	Orange	White	Network, Loop 2	Network, Loop 2	NC ⁽¹⁾	To Network	Side 2 Network
11, 12	Green	REd	Customer, Loop 2	Customer, Loop 2	NC ⁽¹⁾	From Customer	Side 2 Customer
CP2: 3, 4	Green	White	Customer, Loop 1	NC	Customer	To Customer	Side 1 Customer
5, 6	Brown	Red	Network, Loop 1	NC	Network	From Network	Side 1 Network
8, 9	Brown	White	Network, Loop 2	NC	NC	To Network	Side 2 Network
11, 12	Slate	Red	Customer, Loop 2	NC	NC	From Customer	Side 2 Customer
Order Wires	Slate	White					
Spare Pairs	Blue	Red					
	Blue	Black					
	Orange	Black					

1. CP# refers to the Circuit Pack Number inside the Repeater Housing

2. NC = Not Connected

3. Any Single Size (239 Form) Repeater installed inside this Repeater Housing must have a Stick-On Retainer placed on the side of the Repeater Case in order to provide adequate mechanical support to hold the repeater in the slot while in a horizontal or upsidedown position. The Stick-On Retainer is typically supplied with the repeater. If it is not supplied, contact ADTRAN Technical Support.

Release Pressure in the Repeater Housing

WARNING

This Repeater Housing is shipped pressurized to prevent moisture accumulation during shipment and storage.

To release pressure in the Repeater Housing, perform the following steps:

1. If releasing pressure for a gel-core (P/N 1152010L3) Repeater Housing, skip to step 4.
2. Remove the shut-off valve guard.
3. Turn the system pressure shut-off valve by hand clockwise until it is tight.

CAUTION

Do not overtighten the system pressure shut-off valve.

4. Remove the fill valve cap.
5. Fully depress the needle in fill valve for at least 30 seconds and be certain all pressure is released. See [Figure 8](#).

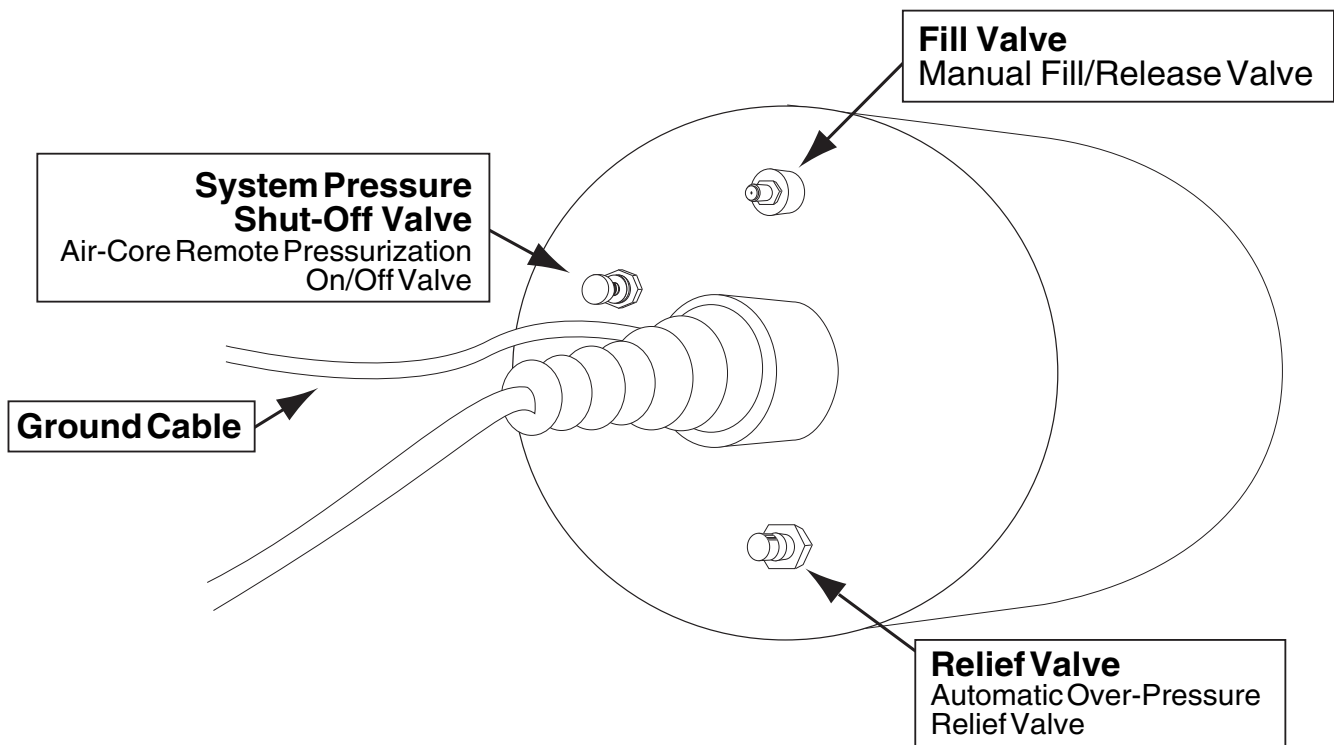


Figure 8. Release Pressure Before Removing Clamp

Clean off Debris

Brush off any debris or dirt from the Repeater Housing and clamp before removing the clamp.

Remove Clamp

To remove the clamp, perform the following steps:

1. Remove the tamper-resistant bolt using a 7/16-inch nut driver.
2. Turn the T-bar counter-clockwise, releasing the end of Tbolt from the catch.
3. Remove the locking clamp.
4. Hang the locking clamp over the bracket behind the base. See [Figure 9](#).



Figure 9. Hang Clamp Over Bracket

Lift Cover

Lift the cover from the housing base.

Install Repeaters

To install repeaters, perform the following steps:

1. Insert the repeater into the circuit pack support by pulling the spring-loaded plunger.
2. Insert the repeater (lining up the “goldfingers” on each repeater with the connector inside circuit pack support) into a prewired slot.
3. Verify that the spring-loaded plunger snapped into place.
4. A “Thru Card” (which can be purchased separately) can be inserted into a slot to make a connection without increasing range. Refer to ADTRAN practice Repeater Housing Thru Card, Section 61150035L1-2, for more information.

NOTE

This Repeater Housing is not for use with T1 repeaters.

Place Cover on Base

To place cover on the base, perform the following steps:

1. Before replacing the cover, verify that the O-ring is fully inserted in place next to the base flange, and is free of debris and dirt.
2. Place the cover on base.

NOTE

If the O-ring has not been replaced in the last three months, ADTRAN recommends replacement of the O-ring when the Repeater Housing has been opened.

Place Clamp over Cover and Base

To place the clamp over the cover and base, perform the following steps:

1. Place the clamp over the cover and base, verifying that the cover seats evenly all around the base.
2. Put the T-bolt inside the catch, and tighten the T-bar clockwise (refer to caution label on the cover for installation clearances).
3. If tamper resistance is needed, secure the tamper-resistant bolt in place. The nominal torque is 10 inch-pounds.
4. A hole on the bottom of the clamp allows the option of installing a lock.

Repressurize the Repeater Housing

To repressurize the Repeater Housing, perform the following steps:

NOTE

Repeater Housings should be pressurized with nitrogen.

1. To locally pressurize a Repeater Housing, use a portable tank connected to the fill valve.
2. To remotely pressurize Repeater Housing (via cable), turn on the system pressure shut off valve by turning it counter-clockwise by hand.

NOTE

Only the air-core Repeater Housing can be pressurized remotely. See [Figure 3](#) on page 4.

3. Pressurize to the Repeater Housing to approximately 9 P.S.I.G.
4. Check for pressure leaks using a soapy water solution.
5. If a leak is found around the clamp area, repeat the following procedures:
 - [“Release Pressure in the Repeater Housing”](#) on page 10
 - [“Clean off Debris”](#) on page 11
 - [“Remove Clamp”](#) on page 11
 - [“Lift Cover”](#) on page 12
 - [“Place Cover on Base”](#) on page 12
 - [“Place Clamp over Cover and Base”](#) on page 12
 - [“Repressurize the Repeater Housing”](#) on page 13
6. Place the fill valve cap over the fill valve and tighten by hand clockwise.
7. Secure the shut-off valve guard in place if tamper resistance is needed. The nominal torque is 10 inch-pounds.

MAINTENANCE

The Repeater Housing contains surge arrestors, which can be replaced in the field if needed. Refer to [“Replacement of Surge Arrestors”](#) for instructions on replacing the surge arrestors.

NOTE

If the O-ring has not been replaced in the last three months, ADTRAN recommends replacement of the O-ring when the Repeater Housing has been opened.

The cover, clamp, O-ring, and surge arrestors can be replaced in the field if they become damaged. See [Table 4](#) for replacement part numbers.

Table 4. Replacement Parts

Part	Part Number
Cover, Metal Locking Clamp, and O-Ring Repair Kit for 1152010L4	1150049L1
Cover, Metal Locking Clamp, and O-Ring Repair Kit for 1152010L3	1150049L2
Metal Locking Clamp	3293007@
O-Ring	3273006@
Surge Arrestor (2 per housing)	2152010-9

Replacement of Housing Cover, Metal Locking Clamp, and O-Ring Assembly

To repair an installed housing metal locking clamp or cover, it is necessary to use **all** of these replacement items: housing cover, metal locking clamp, and O-ring.

When ordering this replacement assembly, specify whether the application is for a GEL or AIR assembly. Refer to ADTRAN installation and maintenance practice Section 61150049L1-5, Repeater Housing Cover, Metal Locking Clamp, and O-Ring Repair Kit, for more information.

Replacement of Surge Arrestors

If the repeaters in a Repeater Housing fail apparently due to lightning, ADTRAN recommends replacing all surge arrestors in that housing. [Figure 3](#) on page 4 shows the surge arrestors on the bottom of the circuit pack support.

To replace surge arrestors, perform the following steps:

1. Unseat and tag the appropriate powering modules (located in the central office) before replacing surge arrestors inside the housing. This removes power from the wires and pins. The tag should read: Do not insert. Field work in process.
2. Release pressure in housing by depressing needle in fill valve. For more information, refer to [“Release Pressure in the Repeater Housing”](#) on page 10.

3. Remove clamp and cover after cleaning off debris from housing and clamp. For more information, refer to [“Clean off Debris”](#) on page 11, [“Remove Clamp”](#) on page 11, and [“Lift Cover”](#) on page 12.
4. Grasp one surge arrestor board in hand and push downward toward the valves.
5. Plug in new surge arrestor in same position, matching notch in the surge arrestor board and flat side of surge arrestor towards circuit pack support.
6. Replace remaining surge arrestors in the same manner.
7. Reseat the tagged powering modules at the central office.
8. Perform circuit tests to verify proper circuit operation.
9. Replace O-ring if it has not been replaced within the last three months.
10. Place cover and clamp and repressurize housing. For more information, refer to the following procedures:
 - [“Place Cover on Base”](#) on page 12
 - [“Place Clamp over Cover and Base”](#) on page 12
 - [“Repressurize the Repeater Housing”](#) on page 13.

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Appendix A

Warranty

WARRANTY AND CUSTOMER SERVICE

ADTRAN will replace or repair this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found at www.adtran.com/warranty.

Refer to the following subsections for sales, support, Customer and Product Service (CAPS) requests, or further information.

ADTRAN Sales

Pricing/Availability:

800-827-0807

ADTRAN Technical Support

Pre-Sales Applications/Post-Sales Technical Assistance:

800-726-8663

Standard hours: Monday - Friday, 7 a.m. - 7 p.m. CST

Emergency hours: 7 days/week, 24 hours/day

ADTRAN Repair/CAPS

Return for Repair/Upgrade:

(256) 963-8722

Repair and Return Address

Contact CAPS prior to returning equipment to ADTRAN.

ADTRAN, Inc.

CAPS Department

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