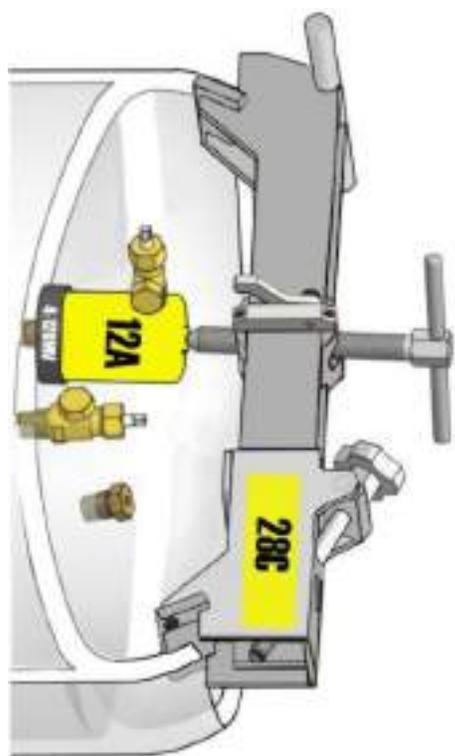


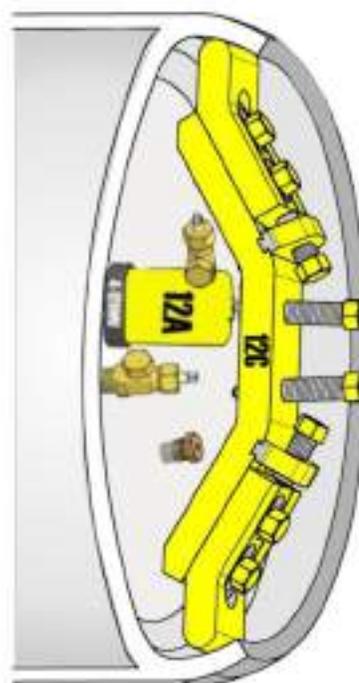
CHLORINE INSTITUTE EMERGENCY KIT “B” FOR CHLORINE TON CONTAINERS

Edition 12

January 2021



Kits manufactured after March 2014



Kits manufactured before April 2014



INSTRUCTION BOOKLET

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1. INTRODUCTION

Leaks in chlorine containers rarely occur. When they do occur, however, prompt corrective action is required by trained competent personnel with special equipment. The Chlorine Institute Emergency Kit “B” and this instruction booklet are made available by The Chlorine Institute in the belief that they will be helpful in handling such emergencies.

1.1 SCOPE

This instruction booklet provides information on the design and use of the Chlorine Institute Emergency Kit “B”.

1.1.1 Two Generations of Emergency Kit “B”

On January 1, 2014 the design of Emergency Kit “B” was modified for ease of use. This booklet includes instructions on how to apply both the current and previous versions of the tools and devices in Emergency Kit “B”.

1.2 CHLORINE INSTITUTE STEWARDSHIP PROGRAM

The Chlorine Institute exists to support the chlor-alkali industry in advancing safe, secure, environmentally compatible, and sustainable production, distribution, and use of its mission chemicals¹.

Chlorine Institute members are committed to adopting CI’s safety and stewardship initiatives, including pamphlets, checklists, and incident sharing, that will assist members in achieving measurable improvement. For more information on the Institute’s stewardship program, visit CI’s website at www.chlorineinstitute.org.

1.3 DISCLAIMER

The information in this booklet is drawn from sources believed to be reliable. The Institute and its members, jointly and severally, make no guarantee, and assume no liability, in connection with any of this information. Moreover, it should not be assumed that every acceptable procedure is included, or that special circumstances may not warrant modified or additional procedures. The user should be aware that changing technology or regulations may require changes in the recommendations contained herein. Appropriate steps should be taken to ensure that the information is current when used. These recommendations should not be confused with federal, state, provincial, municipal, or insurance requirements, or with national safety codes.

¹ CI’s mission chemicals: chlorine, sodium and potassium hydroxides, sodium hypochlorite, the distribution of vinyl chloride monomer (VCM), and the distribution and use of hydrogen chloride.

1.4 APPROVAL

The Institute's Emergency Preparedness Issue Team approved Edition 12 of this instruction booklet on January 12, 2021.

1.5 REVISIONS

Suggestions for revisions should be directed to the Secretary of the Institute in writing.

1.5.1 Significant Revisions in Current Edition

Significant revisions in Edition 12 of this instruction booklet include:

- Updated CI mission statement (Section 1.2);
- New section to emphasize instructions' applicability on the standard chlorine valves (Section 2.4);
- New section to further emphasize importance of Viton® gasket replacement (Section 2.5);
- Updated guidance on using aqua ammonia for leak detection (Section 2.6);
- Revised preferred instruction for leaks on valve inlet threads (Section 3.3);
- Revised preferred instruction for leaks on fusible plug threads (Section 3.7);
- Enhanced instruction cautions related to tightening of kit equipment (Sections 4 and 5);
- Enhanced guidance on handling chlorine remaining in containers (Section 6);
- Enhanced guidance on cleaning kit equipment after use (Section 7.1);
- New section providing caution if using kits for compressed gases other than chlorine (Section 8.2);
- New reference section (Section 9);
- Enhanced quality of various images throughout; and
- Minor editorial and formatting updates throughout.

1.6 REPRODUCTION

The contents of this instruction booklet are not to be copied for publication, in whole or in part, without prior permission from the Secretary of the Chlorine Institute in writing at secretary@CL2.com.

1.7 REVISION HISTORY AND COMPATIBILITY

Chlorine Institute has published an instruction booklet for the Emergency Kit “B” beginning in 1965. Since then, the kit and booklet have gone through a series of changes. The table below details the updates through the years and device compatibility with current equipment.

Instruction Booklet Edition	Date	Revision Summary	Compatible with Current Containers?
Ed. 12	Jan. 2021	No Kit design change, Booklet updated	Yes
Ed. 11, Rev. 1	July 2014	Added Device 400A in the “Optional Equipment” section, which replaced part 400.	Yes
Ed. 11	Dec. 2013	Kit Device 12 and 9 modified, Device 14 added	Yes
Ed. 10	Jan. 2009	No Kit design change, Booklet updated	Yes
Ed. 9	June 2003	No Kit design change, Booklet updated	Yes
Ed. 8	June 1996	No Kit design change, Booklet updated	Yes
Ed. 7	Oct. 1994	No Kit design change, Booklet updated	Yes
Ed. 6	1981	No Kit design change, Booklet updated	Yes
Ed. 5	July 1978	Included molded Viton gaskets 4-12BMV, 12BBV, 12MV & 9EV	Yes
Ed. 4	1976	No Kit design change, Booklet updated	Yes
Ed. 3	1974	No Kit design change, Booklet updated	Yes
Ed. 2	1970	No Kit design change, Booklet updated	Yes
Ed. 1	1965	Booklet created	Yes

2. **GENERAL DESCRIPTION**

The CI Emergency Kit “B” is designed for use with the standard DOT 106A500X chlorine ton container in chlorine service only. These containers have an outside diameter of approximately 30” and overall length from 80 ³/₄” to 82 ¹/₄”. The Kit is not designed for use on liquid-full ton containers. See Section 8 for additional restrictions when attempting to use Kit-B.

2.1 TRAINING AND SAFETY

Emergency Response and other personnel must be trained in the use of the devices and tools within the CI Emergency Kit “B”. Training must include the use of respiratory equipment and all other safety equipment. Knowledge of the properties of chlorine is a must.

Personnel safety is of primary importance. Emergency response should only be performed by authorized personnel who are trained in the procedures and are equipped with suitable respiratory and personal protective equipment.

See current CI Pamphlet 65 for guidance on appropriate personal protective equipment (9.1).

2.2 RESPIRATORY EQUIPMENT

The type of respiratory equipment required will be determined by the severity of the leak and the potential for exposure to chlorine. For further details, see the current edition of CI Pamphlet 65 (9.1).

2.3 CHLORINE CONTAINER INSPECTION

Daily inspection of full containers is recommended whether or not they are connected to unloading lines. Through these means, a leak usually can be detected in an early stage when it can be corrected or controlled by appropriate procedures. Inspection guidance can be found in CI Pamphlet 17 (9.1).

2.4 VALVE APPLICABILITY

The instructions included in this booklet are applicable to containers having standard chlorine ton container valves installed (CGA 820). If another type of valve is installed, consult your supplier or the kit manufacturer for additional instruction details.

2.5 GASKET REPLACEMENT

All Viton® gaskets for the emergency kit are stamped with the date of manufacture and should be removed and replaced every four years (see Section 7 for more details). For further guidelines concerning the Viton gaskets, consult the manufacturer or The Chlorine Institute.

2.6 LEAK DETECTION

As soon as there is any indication of the presence of chlorine in the air, **authorized, trained personnel equipped with suitable personal protective equipment should investigate promptly.** All other persons should be kept away from the affected area.

The location of a leak in a chlorine containing system can usually be detected by the reaction of ammonia vapor with the escaping chlorine. The reaction is a dense white cloud. The most convenient way to detect a chlorine leak is to use 5-30% aqua ammonia (10.3 – 61.7% ammonium hydroxide solution) in a squeeze bottle.

Direct the vapors at the suspected leak. To avoid corrosion, the ammonia solution (liquid) should not be directly sprayed onto the container or its connections. Efforts to detect the source of any leak should be carried out with an awareness of the potential hazards and use of necessary personal protective equipment. Note, a weaker solution such as household ammonia, which is typically 5%, may not be concentrated enough to detect minor leaks.

**CAUTION**

Once the leak is found and you can safely maneuver the container, rotate the container, if needed so that the leak is coming out from the top of the container. Liquid will be on the bottom of the container and gas will be on top. Because chlorine liquid vaporizes and expands into gas by 460 times its volume, it is more manageable to have gas leaking from the cylinder instead of liquid.

2.7 ASSISTANCE

Chlorine emergencies should be handled only by trained personnel at the use site. If assistance is required, promptly notify your supplier. If the supplier cannot be reached or respond immediately, then summon help by activating CHLOREP (The Chlorine Emergency Plan), an emergency response mutual aid network that can be accessed 24/7 for assistance. CHLOREP can be activated by calling CHEMTREC in the U.S. 1-800-424-9300 or CANUTEC in Canada 1-613-996-6666.

2.8 REPORTING REQUIREMENTS

There are federal, state and local government requirements for the reporting of chlorine releases that must be met.

2.9 EMERGENCY PLAN

It is recommended that users have an emergency plan that complies with federal, state and local requirements. For further detail on emergency response plans, refer to CI Pamphlet 155 (9.1).

3. IDENTIFYING AND STOPPING LEAKS

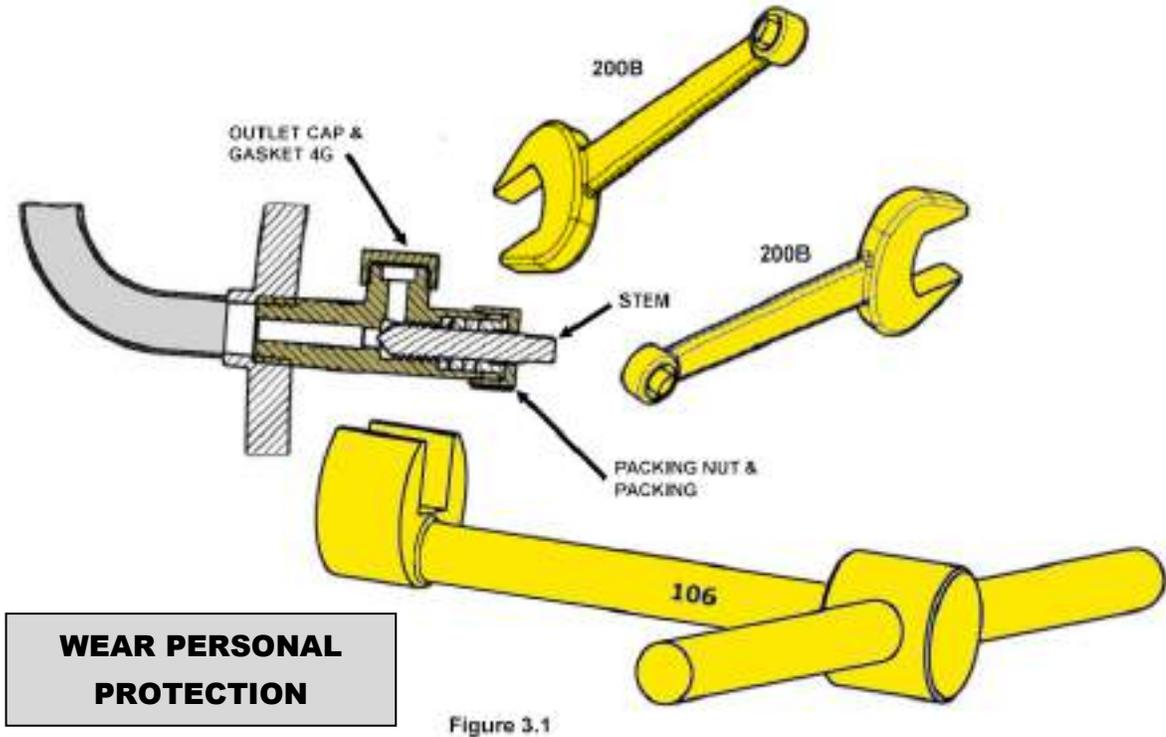


Figure 3.1

3.1 LEAK: VALVE STEM PACKING (FIGURE 3.1)

ACTION:

1. Ensure valve stem is closed with WRENCH 200B.
2. Tighten packing nut with WRENCH 200B.
3. Test for leaks.

3.2 LEAK: THROUGH VALVE SEAT (WILL NOT COMPLETELY CLOSE) (FIGURE 3.1)

ACTION:

1. If disconnecting from a process, reconnect and firmly open and close valve stem to dislodge foreign matter from seat, with WRENCH 200B, then disconnect and apply outlet cap* and GASKET 4G with WRENCH 200B. (*An outlet cap is included as part of HOOD 12A).

- or -

If unconnected container, apply outlet cap and GASKET 4G, then tighten with WRENCH 200B.

2. Test for leaks.

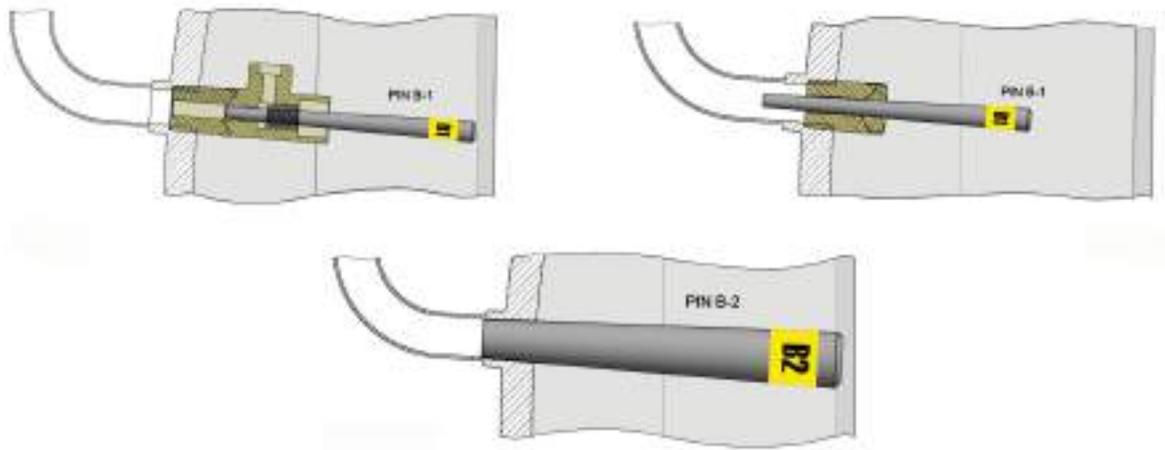
3.3 LEAK: VALVE INLET THREADS (FIGURE 3.1)

ACTION:

1. Apply DEVICE 12 (Hood and Bar Assembly) (See Section 4.1 for instructions).
2. Test for leaks.

NOTE

Kit "B" contains WRENCH 106 that can be used to tighten the valve back into the cylinder to address this type of leak. Extreme caution should be used when attempting this to avoid making the leak worse by dislodging the valve. Only trained and knowledgeable personnel should ever attempt this procedure. Otherwise, use DEVICE 12.



Figures 3.4, 3.5, and 3.6

3.4 LEAK: VALVE STEM ASSEMBLY BLOWN OUT (FIGURE 3.4)

ACTION:

1. Drive small DRIFT PIN B-1 into valve body.
2. Test for leaks.

NOTE

DEVICE 12 (Hood and Bar Assembly) will probably not fit over the DRIFT PIN B-1. Secure the container in an isolated area and call your chlorine supplier.

3.5 LEAK: VALVE BROKEN OFF (FIGURE 3.5)

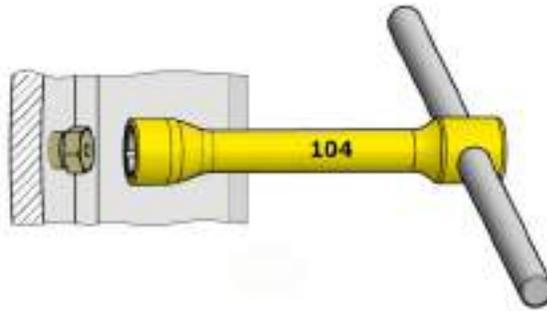
ACTION:

1. Drive small DRIFT PIN B-1 into valve shank and apply DEVICE 12 (Hood and Bar Assembly) (See Section 4.1 for instructions).
2. Test for leaks.

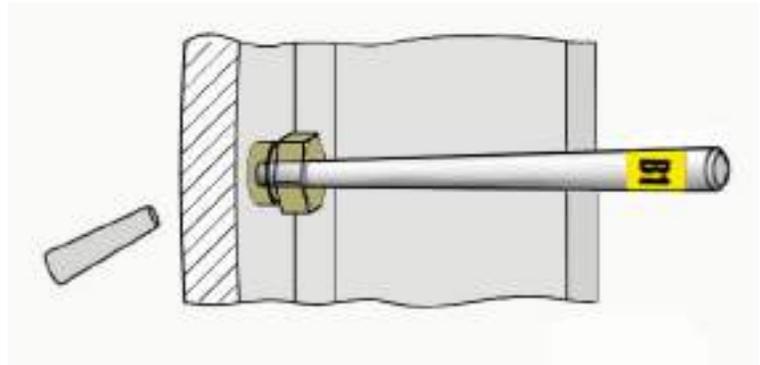
3.6 LEAK: VALVE BLOWN OUT (DUE TO STRIPPED THREADS) (FIGURE 3.6)

ACTION:

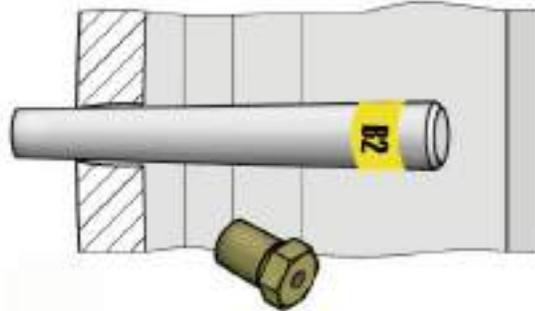
1. Drive medium DRIFT PIN B-2 into valve opening and apply DEVICE 12 (Hood and Bar Assembly) (See Section 4.1 for instructions).
2. Test for leaks.



WEAR PERSONAL PROTECTION



PIN B2 or B3

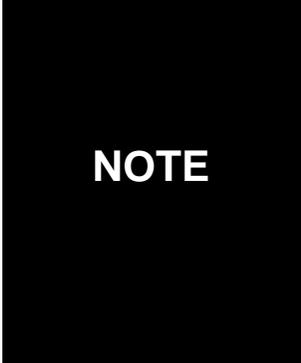


Figures 3.7, 3.8, and 3.9

3.7 LEAK: FUSIBLE PLUG THREADS (FIGURE 3.7)

ACTION:

1. Apply DEVICE 14 (Hood and Bar Assembly for Fusible Plugs) (See Section 4.2 for instructions).
2. Test for leaks.

**NOTE**

Kit "B" contains WRENCH 104 that can be used to tighten the fusible plug back into the valve to address this type of leak. Extreme caution should be used when attempting this to avoid making the leak worse by dislodging the fusible plug. Only trained and knowledgeable personnel should ever attempt this procedure. Otherwise, use DEVICE 14.

3.8 LEAK: FUSIBLE PLUG BLOWN OUT (FIGURE 3.8)

If threads of fusible plug are so corroded that plug should pull out:

ACTION:

1. Drive suitable drift pin into fusible plug opening with HAMMER B-6:

Use DRIFT PIN B-2 for fusible plugs with $\frac{3}{4}$ NPT threads (smaller threads).

- or -

Use DRIFT PIN B-3 for fusible plugs with 1-inch NPT threads (larger threads).

2. Test for leaks.

3.9 LEAK: FUSIBLE METAL OF PLUG (FIGURE 3.9)

ACTION:

1. Apply DEVICE 14 (Hood and Bar Assembly for Fusible Plugs) (See Section 4.2 for instructions).
2. Drive small DRIFT PIN B-1 thru fusible plug.
3. Test for leaks.

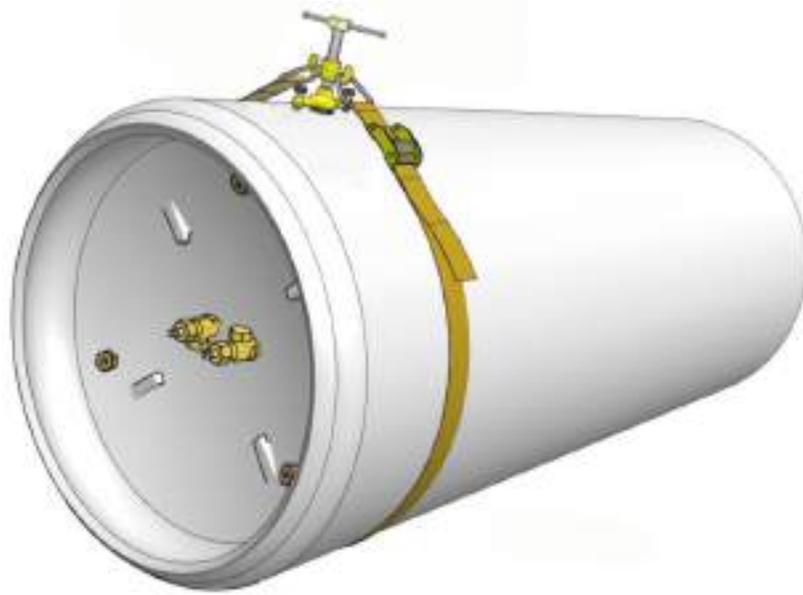


Figure 3.10

3.10 LEAK: SIDE WALL OF CONTAINER (FIGURE 3.10)

ACTION: Apply DEVICE 9 (Patch Assembly) (See Section 4.3 for instructions).

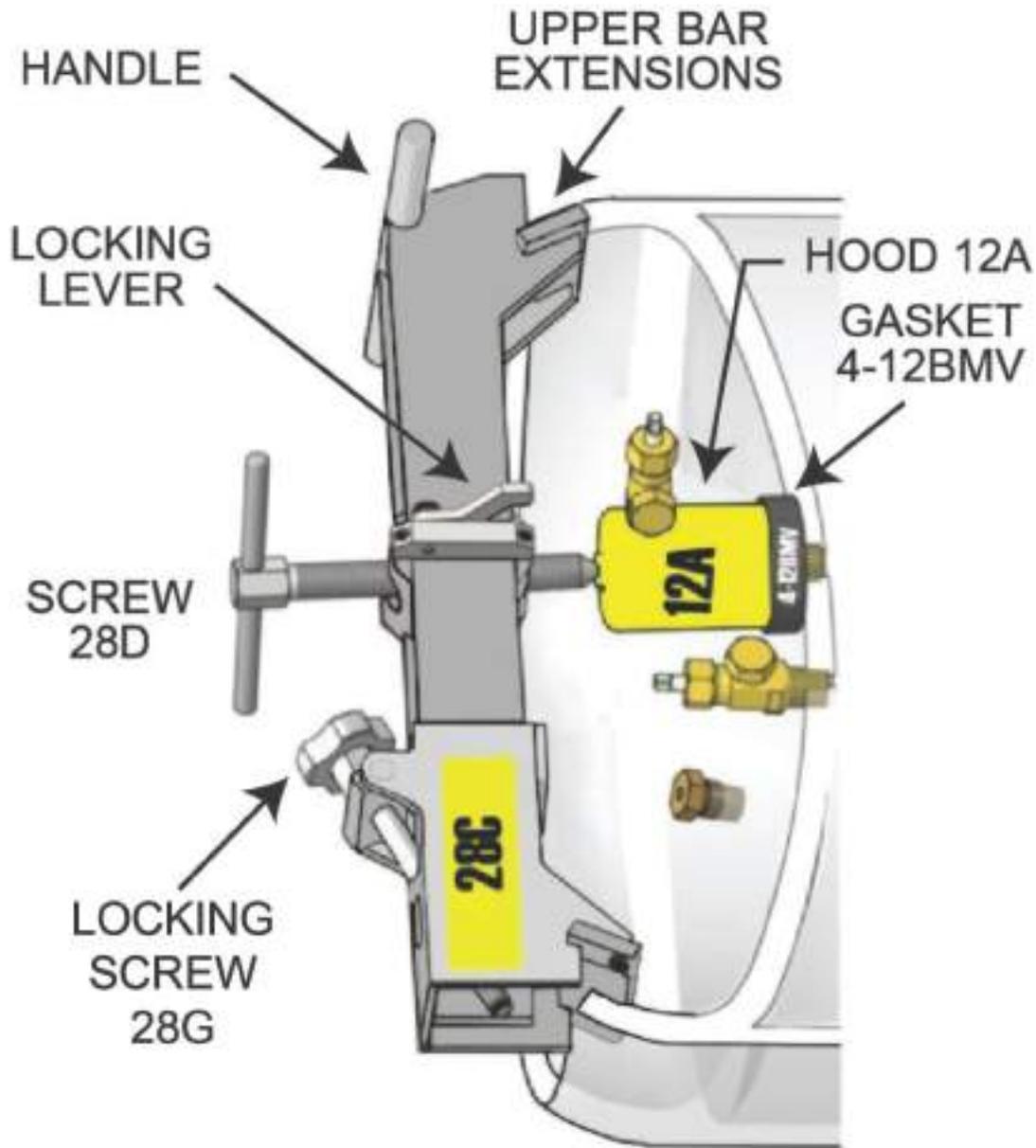
NOTE

At all times, before and after application of emergency devices, position container so that the source of the leak is in the gas phase (See Section 4 or 5).

4. EMERGENCY KIT “B” MANUFACTURED AFTER MARCH 2014

4.1 HOOD VALVES – DEVICE 12

STEPS – See Figure 4.1	Equipment
<p>NOTE: Remove valve protective hood if in place. Position container so that the leaking valve is in the uppermost position.</p> <ol style="list-style-type: none"> 1. Remove outlet cap from VENT VALVE (12V) on HOOD (12A) and open VALVE (12V). 2. Loosen LOCKING SCREW (28G) on BAR ASSEMBLY (28C) to allow unit to compress and expand fully. Retract SCREW (28D) until point extends slightly beyond bar assembly. 3. Clean head container around leaking valve; use SCRAPER (B-5) if paint is loose or uneven. 4. Place adjustable end of BAR ASSEMBLY (28C) on bottom, inside of chime lip with bar extensions outside chime. Compress assembly downward from atop with handles. Insert upper bar assembly inside upper chime. Reduce resistance to allow unit to expand into the upper chime lip with upper bar extensions resting on outside of chime. Tighten LOCKING SCREW (28G) until hand tight. <p>NOTE: WRENCH 200B can be used on hex head of LOCKING SCREW (28G) for additional force.</p> <ol style="list-style-type: none"> 5. Place molded GASKET (4-12BMV) on HOOD (12A). Place HOOD (12A) with molded GASKET (4-12BMV) over leaking valve. <p>NOTE: For certain containers having a ridge between the two valves, use molded GASKET (12MV) which has a depression to fit over the ridge, or molded GASKET (12BBV).</p> <ol style="list-style-type: none"> 6. Loosen locking lever on center SCREW (28D) unit and slide over HOOD (12A). Hand tighten forcing HOOD (12A) and GASKET* against head of container. *GASKET 4-12BMV, 12BBV or 12MV <p>NOTE: WRENCH 200B can be used on hex head of SCREW (28D) for additional force.</p> <p>CAUTION: Tighten only enough to stop the leak. Overtightening may damage gasket. Wait a short amount of time (allowing container to come back ambient temperature/pressure) to ensure the leak has stopped and the cap screws do not need additional tightening.</p>	<p>WRENCH 200B</p> <p>BAR ASSEMBLY 28C</p> <p>SCRAPER B-5</p> <p>BAR ASSEMBLY 28C, HOOD 12A</p> <p>WRENCH 200B</p> <p>GASKET 4-12BMV</p> <p>HOOD 12A</p> <p>WRENCH 200B</p>
<p>DEVICE 12 INCLUDES: HOOD ASSEMBLY - 12A GASKETS – 4-2BMV, 12BBV, or 12MV ADJUSTABLE BAR ASSEMBLY – 28C</p>	<p>WEAR PERSONAL PROTECTION</p>



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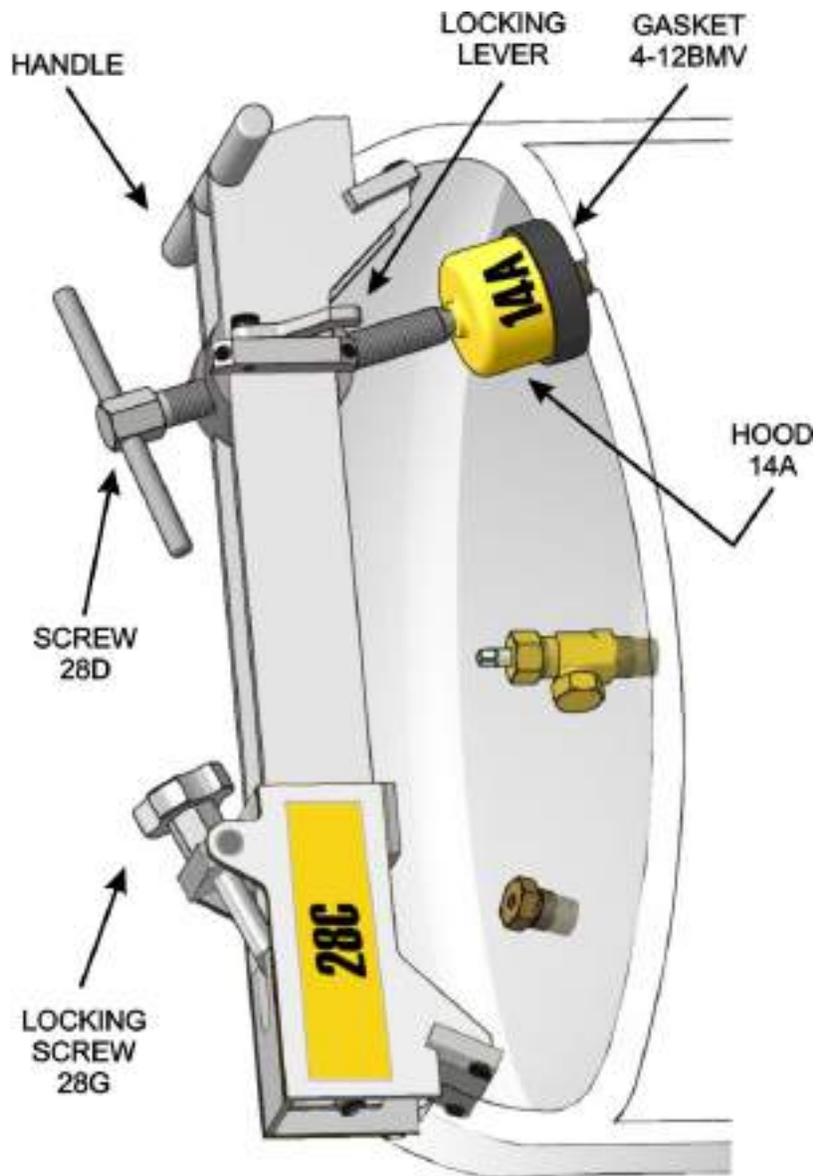


DEVICE 12
INSTALLATION
VIDEO

Figure 4.1

4.2 HOOD FOR FUSIBLE PLUGS – DEVICE 14

STEPS – See Figure 4.2	Equipment
<p>NOTE: Remove valve protective hood if in place. Position container so that the leaking Plug is in the uppermost position.</p> <ol style="list-style-type: none"> Loosen LOCKING SCREW (28G) to allow unit to compress and expand fully. Retract SCREW (28D) until point extends slightly beyond bar assembly. Clean head container around leaking fusible plug; use SCRAPER (B-5) if paint is loose or uneven. Place adjustable end of BAR ASSEMBLY (28C) on bottom, inside of chime lip with bar extensions outside chime. Compress assembly downward from atop with handles. Insert upper bar assembly inside upper chime. Reduce resistance to allow unit to expand into the upper chime lip with upper bar extensions resting on outside of chime. Tighten LOCKING SCREW (28G) until hand tight. <p>NOTE: WRENCH 200B can be used on hex head of LOCKING SCREW (28G) for additional force.</p> <ol style="list-style-type: none"> Place molded GASKET (4-12BMV) on HOOD (14A). Place HOOD (14A) with molded GASKET (4-12BMV) over leaking plug. Loosen locking lever on SCREW (28D) unit and slide over HOOD (14A). Hand tighten SCREW (28D) forcing HOOD (14A) and GASKET (4-12BMV) against head of container. <p>NOTE: WRENCH 200B can be used on hex head of SCREW (28D) for additional force.</p> <p>CAUTION: Tighten only enough to stop the leak. Overtightening may damage gasket. Wait a short amount of time (allowing container to come back ambient temperature/pressure) to ensure the leak has stopped and the cap screws do not need additional tightening.</p> <ol style="list-style-type: none"> Test for leaks. 	<p>BAR ASSEMBLY 28C</p> <p>SCRAPER B-5</p> <p>BAR ASSEMBLY 28C</p> <p>WRENCH 200B</p> <p>GASKET 4-12BMV HOOD 14A</p> <p>WRENCH 200B</p>
<p>DEVICE 14 INCLUDES: HOOD ASSEMBLY – 14A GASKETS – 4-2BMV OR 12BBV ADJUSTABLE BAR ASSEMBLY – 28C</p>	<p>WEAR PERSONAL PROTECTION</p>



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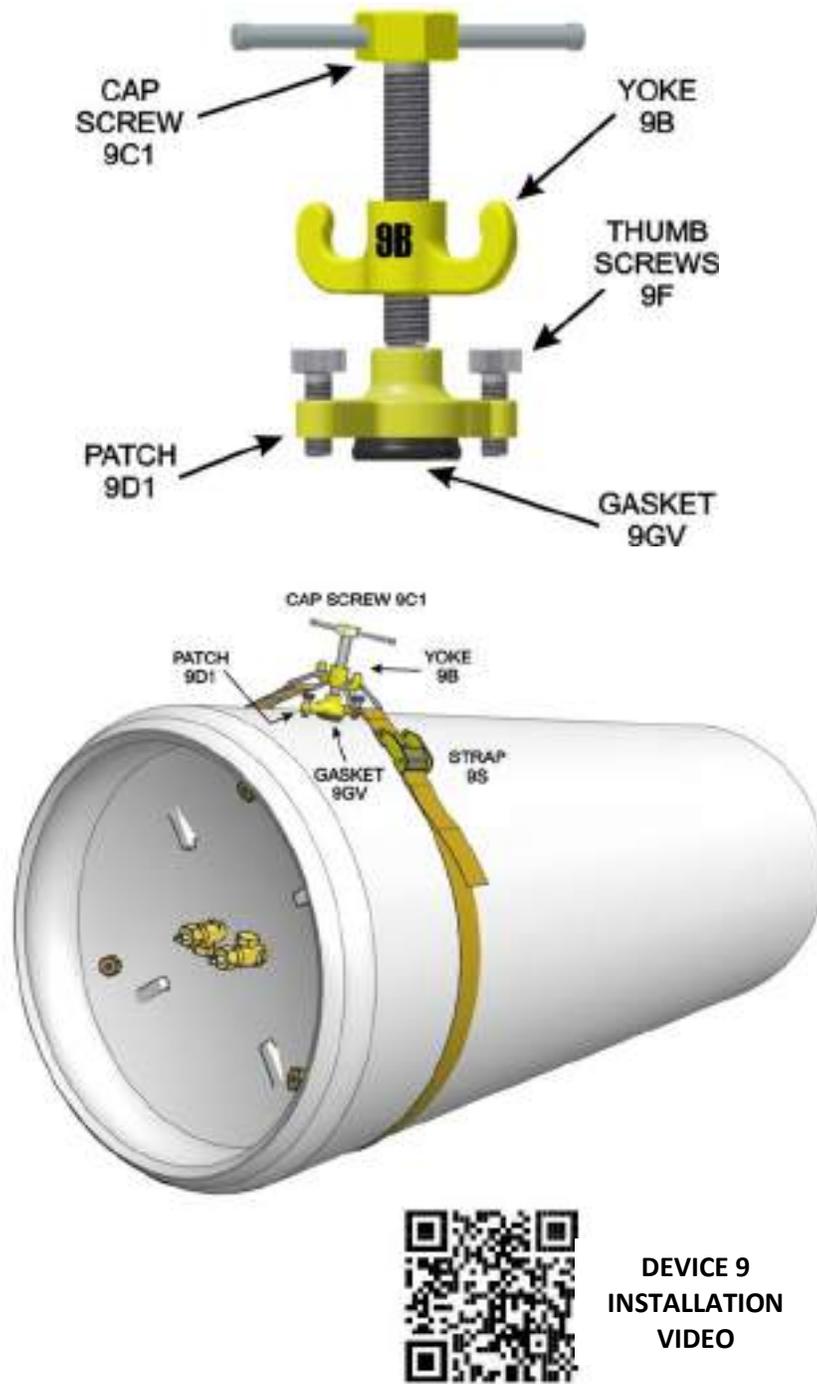


**DEVICE 14
INSTALLATION
VIDEO**

Figure 4.2

4.3 PATCH FOR SIDE LEAKS – DEVICE 9

STEPS – See Figure 4.3	Equipment
<p>1. Roll container so that leak is in uppermost position. Chock container to prevent rolling. Be sure container wall around leak is sturdy before proceeding with application of device.</p> <p>NOTE: If container is not on storage rack or rails, place it on rails or 2x4 planks, or dig a trench under it sufficient to allow free passage of strap under the container.</p> <p>2. Adjust CAP SCREW (9C1) in YOKE (9B) until point of screw extends only slightly below YOKE (9B).</p> <p>3. Slip one end of STRAP (9S) under container and pull it through until it reaches the approximate area of leak.</p> <p>4. Place BUTTON GASKET (9GV) inside of PATCH (9D1). Center CAP SCREW (9C1) in YOKE (9B) and then into PATCH (9D1) depression.</p> <p>5. Hook free ends of STRAP (9S) to ears on each side of YOKE (9B).</p> <p>6. Use SCRAPER (B-5) if paint is loose or uneven. Slide PATCH (9D1) with GASKET (9GV) and STRAP (9S) over leak.</p> <p>7. Hand-tighten CAP SCREW (9C1) until leak stops. Tighten thumb screws 9F until touching cylinder – do not overtighten.</p> <p>CAUTION: Tighten only enough to stop the leak. Overtightening may damage gasket. Wait a short amount of time (allowing container to come back ambient temperature/pressure) to ensure the leak has stopped and the cap screws do not need additional tightening.</p> <p>CAUTION: If there is any evidence of weakening of the container wall, immediately discontinue tightening CAP SCREW (9C1) and pursue other options.</p> <p>8. Test for leaks. Tighten CAP SCREW (9C1) further, if necessary.</p> <p>NOTE: Thumb screws 9F can be tightened independently to apply pressure on the opposite sides of gasket to stop leak.</p>	<p>YOKE 9B CAP SCREW 9C1</p> <p>STRAP 9S</p> <p>YOKE 9B CAP SCREW 9C1 PATCH 9D1 STRAP 9S</p> <p>SCRAPER B-5 PATCH 9D1 GASKET 9GV</p>
<p>DEVICE 9 INCLUDES: STRAP – 9S YOKE – 9B CAP SCREW – 9C1 PATCH – 9D1 GASKET – 9GV</p>	<p>WEAR PERSONAL PROTECTION</p>



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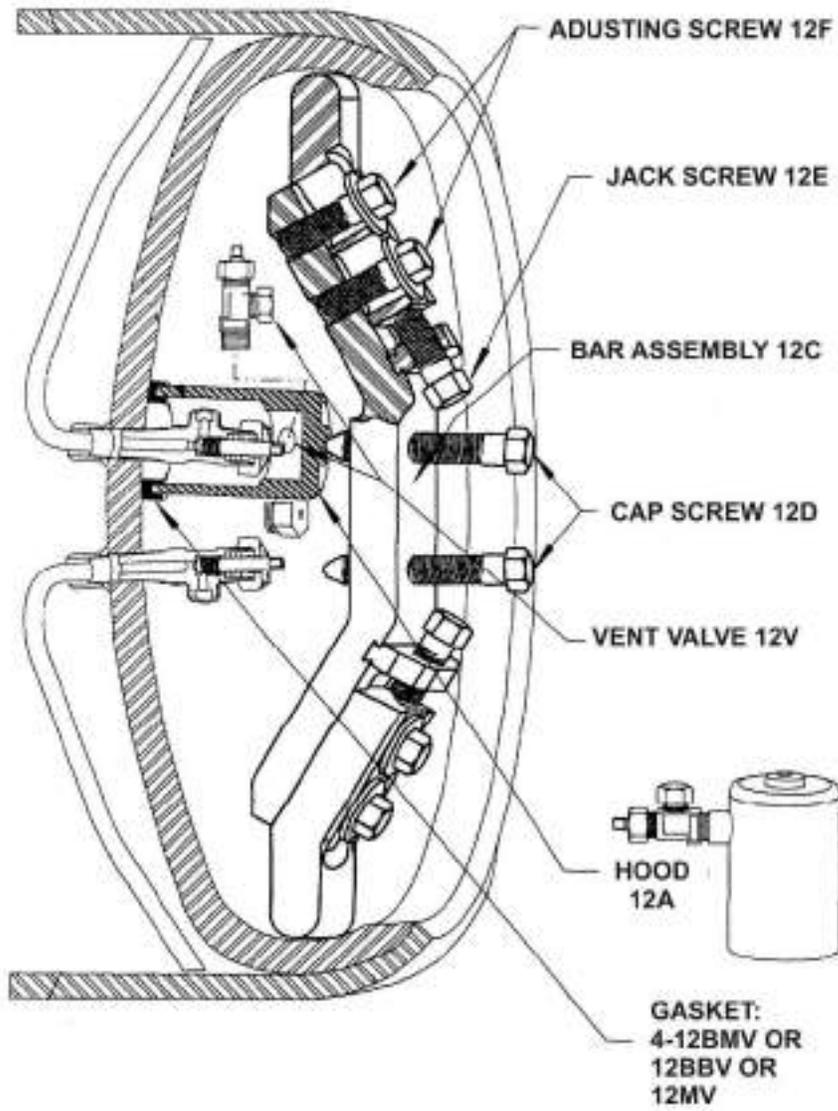
DEVICE 9
INSTALLATION
VIDEO

Figure 4.3

5. EMERGENCY KIT “B” MANUFACTURED BEFORE APRIL 2014

5.1 HOOD FOR VALVES – DEVICE 12

STEPS – See Figure 5.1	Equipment
<p>NOTE: Remove valve protective hood if in place. Position container so that the leaking valve is in the uppermost position.</p> <ol style="list-style-type: none"> Remove outlet cap from VENT VALVE (12V) on HOOD (12A) and open VALVE (12V). Loosen ADJUSTING SCREWS (12F) and retract JACK SCREWS (12E) sufficiently to allow insertion of ADJUSTABLE BAR ASSEMBLY (12C) behind chime of container. <p>NOTE: ADJUSTABLE ASSEMBLY (12C) must be in vertical position to facilitate making adjustments.</p> <ol style="list-style-type: none"> Clean head container around leaking valve; use SCRAPER (B-5) if paint is loose or uneven. Place molded GASKET (4-12BMV) on HOOD (12A). Place HOOD (12A) with molded GASKET (4-12BMV) over leaking valve. <p>NOTE: For certain containers having a ridge between the two valves, use molded GASKET (12BBV) or molded GASKET (12MV) which has a depression to fit over the ridge.</p> <ol style="list-style-type: none"> Adjust lower JACK SCREW (12E) to center one CAP SCREW (12D) over HOOD (12A) and adjust upper JACK SCREW (12E) so that ADJUSTABLE BAR ASSEMBLY (12C) fits tightly inside chime. Using WRENCH (101) tighten ADJUSTING SCREWS (12F). Using WRENCH (101) tighten CAP SCREW (12D) forcing HOOD (12A) and GASKET* against head container. *GASKET 4-12BMV or 12BBV or 12MV <p>CAUTION: Tighten only enough to stop the leak. Overtightening may damage gasket. Wait a short amount of time (allowing container to come back ambient temperature/pressure) to ensure the leak has stopped and the cap screws do not need additional tightening.</p> <ol style="list-style-type: none"> Close VENT VALVE (12V) on HOOD (12A) using WRENCH (200). 	<p>WRENCH 200</p> <p>BAR ASSEMBLY 12C WRENCH 101</p> <p>SCRAPER B-5</p> <p>HOOD 12A GASKET 4-12BMV</p> <p>WRENCH 101 BAR ASSEMBLY 12C</p> <p>WRENCH 101 CAP SCREW 12D HOOD 12A</p> <p>WRENCH 200</p>
<p>DEVICE 12 INCLUDES: HOOD ASSEMBLY – 12A GASKETS – 4-12BMV, 12BBV, OR 12MV ADJUSTABLE BAR ASSEMBLY – 12C</p>	<p>WEAR PERSONAL PROTECTION</p>



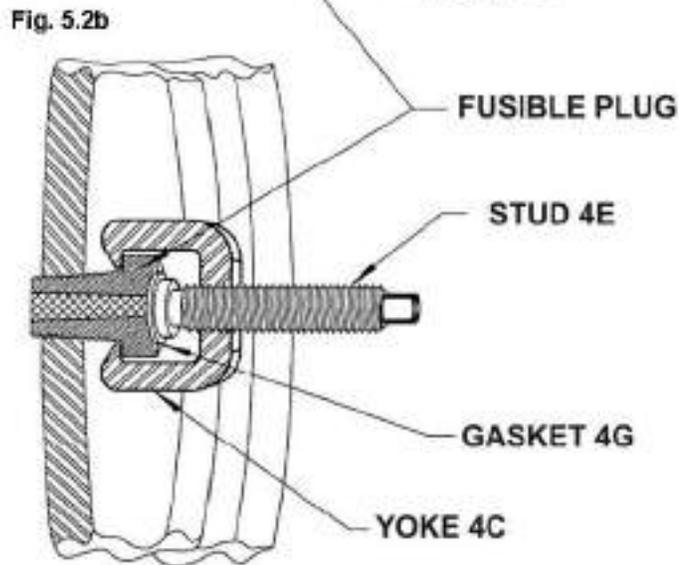
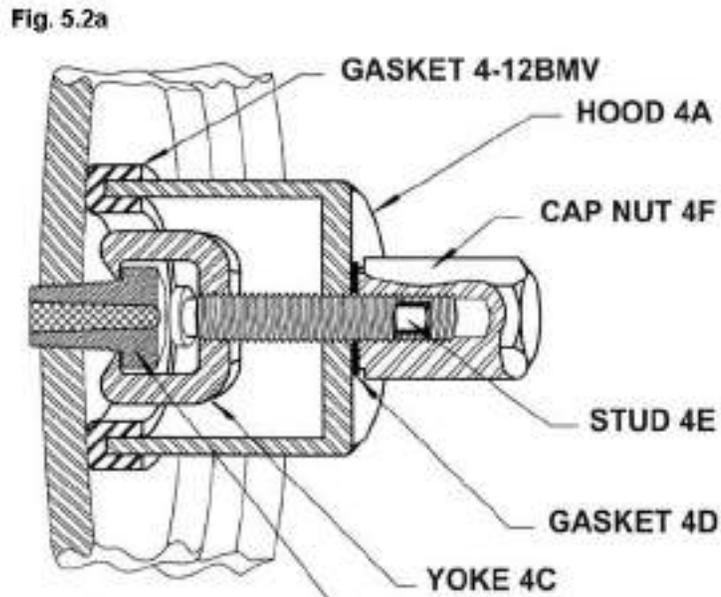
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Figure 5.1

5.2 HOOD FOR FUSIBLE PLUG – DEVICE 4

STEPS – See Figures 5.2a & 5.2b Equipment	Equipment
<p>NOTE: Roll ton container so that leaking fusible plug is in uppermost position.</p> <p><u>If leak is at threads of fusible plug (see Figure 5.2a:</u></p> <ol style="list-style-type: none"> 1. Clean head of container around leaking fusible plug; use SCRAPER (B-5) if paint is loose or uneven. 2. Place GASKET (4-12BMV) on HOOD (4A). Fit YOKE (4C) with STUD (4E) over head of plug. 3. Place HOOD (4A) with GASKET (4-12BMV) over YOKE (4C) and STUD (4E) so that STUD (4E) extends out of top of HOOD (4A). 4. Place GASKET (4D) over STUD (4E). 5. Screw CAP NUT (4F) on STUD (4E) and tighten gently, using WRENCH (101), forcing HOOD (4A) and GASKET (4-12BMV) against head of container firmly enough to stop the leak. 6. Test for leaks. <p>CAUTION: If threads of fusible plug are so corroded that plug should pull out: Drive suitable DRIFT PIN (B-2 or B-3) into fusible plug opening (See Fig 3.8 for instructions).</p> <p>NOTE: Most ton containers have ¾ NPT fusible plug openings and require use of DRIFT PIN (B-2); Ton containers with one inch NPT openings require use of DRIFT PIN (B-3).</p> <p><u>If leak is in fusible material (See Figure 5.2b):</u></p> <ol style="list-style-type: none"> 1. Fit YOKE (4C) with STUD (4E) over head of fusible plug. 2. Place GASKET (4G) against face of fusible plug. 3. Tighten STUD (4E) using WRENCH (200). 4. Test for leaks. <p>NOTE: The abovementioned leak can also be corrected by applying HOOD (4A) and DRIFT PIN (B-1) (See Fig 3.9 for instructions).</p>	<p>SCRAPER B-5</p> <p>HOOD 4A GASKET 4-12BMV</p> <p>YOKE 4C STUD 4E</p> <p>GASKET 4D</p> <p>WRENCH 101 CAP NUT 4F</p> <p>DRIFT PIN B-2 or B-3, HAMMER B-6</p> <p>YOKE 4C STUD 4E</p> <p>GASKET 4G</p> <p>WRENCH 200</p>
<p>DEVICE 4 INCLUDES: HOOD – 4A GASKET – 4-12BVM YOKE – 4C STUD – 4E GASKET – 4D</p>	<p>WEAR PERSONAL PROTECTION</p>

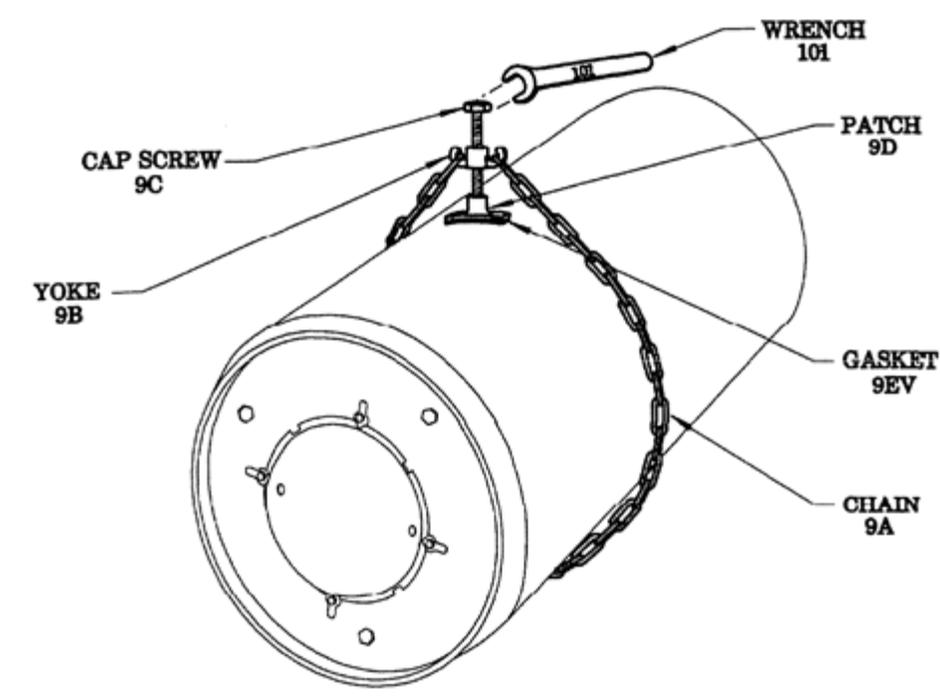


Figures 5.2a and 5.2b

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5.3 PATCH FOR SIDEWALL LEAKS – DEVICE 9

STEPS – See Figure 5.3	Equipment
<p>1. Roll container so that leak is in uppermost position. Chock container to prevent rolling.</p> <p>NOTE: If container is not on storage rack or rails, place it on rails or 2x4 planks, or dig a trench under it sufficient to allow free passage of chain under the container.</p> <p>2. Be sure container wall around leak is sturdy before proceeding with application of device.</p> <p>3. Adjust CAP SCREW (9C) in YOKE (9B) until point of screw extends only slightly below YOKE (9B).</p> <p>4. Slip one end of CHAIN (9A) under container and pull it through until it reaches the approximate area of leak.</p> <p>NOTE: Ensure CHAIN (9A) is straight and not twisted.</p> <p>5. Center CAP SCREW (9C) in YOKE (9B) in PATCH (9D) depression.</p> <p>6. Hook free ends of CHAIN (9A) to ears on each side of YOKE (9B), keeping CHAIN (9A) as short as possible.</p> <p>7. Use SCRAPER (B-5) if paint is loose or uneven. Place GASKET (9EV) and PATCH (9D) over leak.</p> <p>8. Tighten CAP SCREW (9C) using WRENCH (101).</p> <p>CAUTION: If there is any evidence of weakening of the container wall, immediately discontinue tightening CAP SCREW (9C) and pursue other options.</p> <p>9. Test for leaks.</p>	<p>YOKE 9B CAP SCREW 9C</p> <p>CHAIN 9A</p> <p>YOKE 9B,CAP SCREW 9C, PATCH 9D</p> <p>GASKET 9EV, PATCH 9D, SCRAPER B-5</p> <p>WRENCH 101</p>
<p>DEVICE 9 INCLUDES: CHAIN – 9A YOKE – 9B CAP SCREW – 9C PATCH – 9D GASKET – 9EV</p>	<p>WEAR PERSONAL PROTECTION</p>



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Figure 5.3

6. HANDLING OF CHLORINE REMAINING IN CONTAINER

The containment of leaks by the CI Emergency Kit "B" devices is only an interim measure.

The containment of leaks by the CI Emergency Kit B devices is only an interim measure. VALVE YOKE (B-9) and VALVE ADAPTER (B-10) are included in this kit for use in disposing of remaining chlorine in a capped container. This procedure should be attempted by experienced personnel only.

CONSULT WITH THE CHLORINE SUPPLIER IMMEDIATELY AND ARRANGE FOR ULTIMATE DISPOSAL.

If supplier is unknown, see Section 2.7 for instructions to contact CHLOREP for immediate assistance.

If the ton container requires transport to another facility for disposal, it is important to be familiar with applicable transportation regulations. If the container is safe for transport, it may be transported in the U.S. with Kit "B" devices applied (see 49 CFR §173.3(e)(2)), as well in Canada (see TP 14877, Section 11.4.1).

7. KIT MAINTENANCE

NOTE

All parts of the CI Emergency Kit "B" should be maintained in a ready-to-use condition.

7.1 AFTER USE

Inspect all parts for damage, wear, and corrosion. Wash all parts used with approximately 5% solution of caustic soda or soda ash to neutralize any residual chlorine. After washing, rinse parts with water until they are free of cleaning solution. Dry all parts once free of cleaning solution.

Lubricate moveable parts with a non-reactive lubricant. Refer to CI Pamphlet 164 (9.1) for information on lubricant materials that are compatible with chlorine.

Replace all gaskets used. Inspect side patch strap after use for wear and replace as necessary.

7.2 ROUTINE

The kit should be frequently inspected by the person responsible for the equipment and checked with the contents list to ensure that equipment is complete and ready for use. The box should be sealed after each inspection and such seals should be broken only by authorized persons or in case of accidents. Many owners coordinate routine inspection with training drills.

All Viton gaskets are stamped with the date of manufacture and should be removed from emergency use after a four-year shelf life. For further guidelines concerning the Viton gaskets, consult the manufacturer or The Chlorine Institute.

7.3 SPARE PARTS

Spare parts may be purchased by owners of this kit from the manufacturer. For information on ordering procedures consult the manufacturer or The Chlorine Institute.

8. KIT LIMITATIONS

8.1 CONTAINER DESIGN

Some ton containers in current use are of such design that application of Kit B devices might be difficult or impossible. Among these are containers with double-dished heads; with fusible plugs located too close to valve protective hood lugs (precluding proper placement of Device 14); with fusible plugs located radially from the center of the head too close to the chime (precluding proper placement of Device 14); with valve protection hood fastened by means of a single stud located between the two operating valves (precluding use of Device 12); and with oversized valve bushing (precluding proper seating of gasket 4-12BMV, 12BBV or 12MV and of Hood Assembly 12A).

8.2 OTHER COMPRESSED GASES

The CI Emergency Kit "B" is designed for use on chlorine cylinders. Contact the kit manufacturer before considering applying on other compressed gas cylinders.

**CAUTION**

Using Emergency Kit "B" for other ton containers transporting compressed gas can result in a worsening incident due to incompatibility of materials provided in the kit.

Different gasket materials may be required for other compressed gases. When used with compressed gases other than chlorine, the Viton gasket included with this kit may result in rapid deterioration and continued release.

9. REFERENCES

9.1 INSTITUTE PUBLICATIONS

The following publications are specifically referenced in the CHLOREP Handbook. The latest editions of CI publications may be obtained at www.chlorineinstitute.org.

<u>Pamphlet #</u>	<u>Title</u>
1	<i>Chlorine Basics (Formerly The Chlorine Manual)</i> , ed. 8; Pamphlet 1; The Chlorine Institute: Arlington, VA, 2014 .
17	<i>Packaging Plant Safety and Operational Guidelines</i> , ed. 5; Pamphlet 17; The Chlorine Institute: Arlington, VA, 2017 .
65	<i>Personal Protective Equipment for Chlor-Alkali Chemicals</i> , ed. 6; Pamphlet 65; The Chlorine Institute: Arlington, VA, 2021 .
155	<i>Water and Wastewater Operators Chlorine Handbook</i> , ed. 3; Pamphlet 155; The Chlorine Institute: Arlington, VA, 2014 .
164	<i>Reactivity and Compatibility of Chlorine and Sodium Hydroxide with Various Materials</i> , ed. 3; Pamphlet 164; The Chlorine Institute: Arlington, VA, 2017 .

9.2 REGULATIONS

9.2.1 *Code of Federal Regulations*. Title 49. Chapter 1. Parts 190-192 & 195. Office of the Federal Register National Archives and Records Administration. U.S. Government Printing Office: Washington, DC, (revised annually).

9.2.2 *Canadian Transportation of Dangerous Goods Act and Regulations*; Transport Canada: Ottawa, Ontario, 2009. Website: <http://www.tc.gc.ca/tdg>.

APPENDICES

Appendix A: Parts List

Appendix B: Optional Equipment

Appendix C: Emergency Contacts

APPENDIX A: PARTS LIST

**Chlorine Institute Emergency Kit "B"
Kits Manufactured After March 2014**

Part Number	Description	Quantity Per Kit
4-12BMV	Gasket, Molded Viton	2
4G	Gasket, $1\frac{5}{16}$ " dia. x $\frac{1}{16}$ " thick	5
9S	Strap	1
9B	Yoke	1
9C1	Cap Screw	1
9D1	Patch	1
9GV	Gasket, Viton, $1\frac{7}{16}$ " diameter x $\frac{3}{4}$ " thick	2
12A	Hood Assembly (with Vent Valve 12V)	1
12BBV	Gasket, Viton, 5" OD x 2" ID x $\frac{1}{2}$ " thick	1
28C	Adjustable Bar Assembly	1
12MV	Gasket, Molded Viton, $5\frac{1}{4}$ " OD x $2\frac{1}{4}$ " ID x $\frac{3}{4}$ " thick	1
14A	Hood	1
101	Wrench, straight open end, $1\frac{1}{4}$ " x 12" long	1
104	Wrench, Socket, $1\frac{1}{4}$ " hex x 11" long	1
104B	Wrench Bar, 1" diameter x 20" long	1
106	Wrench, Crowfoot, special $1\frac{5}{32}$ " x 11" long	1
200B	Wrench, $\frac{3}{8}$ sq. box, $1\frac{1}{4}$ " open end x $7\frac{1}{4}$ " long	1
B-1	Drift Pin, $\frac{9}{32}$ " x $\frac{1}{2}$ " x 6" long	2
B-2	Drift Pin, $\frac{7}{8}$ " x $1\frac{1}{4}$ " x 8" long	2
B-3	Drift Pin, $1\frac{1}{16}$ " x $1\frac{7}{16}$ " x 8" long	2
B-4	Ring, vent valve packing, $\frac{7}{8}$ " OD x $\frac{15}{32}$ " ID x $\frac{1}{4}$ " thick	5
B-5	Paint Scraper, $1\frac{1}{4}$ " blade	1
B-6	Hammer, machinist, 48 oz.	1
B-7	Kit Box Seal	15
B-8	Gasket Sack	1
B-9	Valve Yoke	1
B-10	Valve Adapter	1
B-11	Gasket, $1\frac{5}{16}$ " OD x $\frac{9}{16}$ " ID x $\frac{1}{16}$ " thick	5
B-12	Plastic Gasket Box	1
151-B	Kit Tool Box	1
153	Tool Roll	1
	Instruction Booklet	2
	CI Pamphlet 1, <i>Chlorine Basics</i>	1

For kits manufactured after January 1, 2008, the individual 1" drive components of Socket Wrench Assembly 104 were replaced with a completely machined, 1-piece wrench.

Viton is a registered trademark of The Chemours Company.

Chlorine Institute Emergency Kit "B" Kits Manufactured Before April 2014

Part Number	Description	Quantity Per Kit
4A	Hood	1
4-12BMV	Gasket, Molded Viton	2
4C	Yoke	1
4D	Gasket, 1 ¼" OD x 1 1/16" ID x 1/16" thick	3
4E	Stud	1
4F	Cap Nut	1
4G	Gasket, 1 5/16" diameter x 1/16" thick	5
9A	Chain	1
9B	Yoke	1
9C	Cap Screw	1
9D	Patch	1
9EV	Gasket, Viton, 3" sq. x 1/8" thick	2
12A	Hood Assembly (with Vent Valve 12V)	1
12BBV	Gasket, Viton, 5" OD x 2" ID x 1/2" thick	1
12C	Adjustable Bar Assembly	1
12MV	Gasket, Molded Viton, 5 ¼" OD x 2 ¼" ID x 3/4" thick	1
101	Wrench, straight open end, 1 ¼" x 12" long.	1
104	Wrench, Socket, 1 ¼" hex x 11" long	1
104A	Wrench extension, 1" sq. drive x 9" long	1
104B	Wrench Bar, 1" diameter x 20" long	1
104C	Wrench Bar, Adapter, 1" round to 1" square	1
106	Wrench, Crowfoot, special 1 5/32" x 11" long	1
200	Wrench, 3/8" sq. box, 1 ¼" open end x 7 ¼" long	1
B-1	Drift Pin, 9/32" x 1/2" x 6" long	2
B-2	Drift Pin, 7/8" x 1 ¼" x 8" long	2
B-3	Drift Pin, 1 1/16" x 1 7/16" x 8" long	2
B-4	Ring, vent valve packing, 7/8" OD x 15/32" ID x 1/4" thick	5
B-5	Paint Scraper, 1 ¼" blade	1
B-6	Hammer, machinist, 48 oz.	1
B-7	Kit Box Seal	15
B-8	Gasket Sack	1
B-9	Valve Yoke	1
B-10	Valve Adapter	1
B-11	Gasket, 1 5/16" OD x 9/16" ID x 1/16" thick	5
B-12	Plastic Gasket Box	1
151-B	Kit Tool Box	1
153	Tool Roll	1
	Instruction Booklet	2
	CI Pamphlet 1, <i>Chlorine Basics</i>	1

For kits manufactured after January 1, 2008, the individual 1" drive components of socket wrench assembly 104 were replaced with a completely machined, 1-piece wrench.

Viton is a registered trademark of The Chemours Company.



CHLORINE INSTITUTE EMERGENCY KIT "B"
Kits Manufactured before March 2014

Figure A-2

APPENDIX B: OPTIONAL EQUIPMENT

If the optional equipment shown here is used, consult the kit manufacturer for instruction details.

Device Part #400A	Device Part #405
	
<p>Stripped Valve Stem Clamping Device: Designed to close cylinder and ton valves with stripped valve stem threads.</p>	<p>Valve Plugging Device: Designed to seal leaks in valves with stripped outlet threads or corroded outlet face.</p>

Device Part #BCLAMP

<p>Fusible Plug Containment Device: Designed to contain leaks in and around the container fusible plugs without attaching to the plug itself.</p>

APPENDIX C: EMERGENCY CONTACTS

Chlorine Supplier: _____

Address: _____

Phone: _____

CHEMTREC* **800-424-9300**CANUTEC** **613-996-6666**Nearest Chlorine
Producer or Packager: _____

Address: _____

Phone: _____

Police Department: _____

Fire Department: _____

First Aid: _____

* In the UNITED STATES, summon help through CHEMTREC, the Chemical Transportation Emergency Center at the American Chemistry Council in Arlington, VA.

(Toll Free)

800-424-9300

** In CANADA, summon help through CANUTEC, the Canadian Transport Emergency Centre in Ottawa.

CANADA, All provinces (Call Collect)

613-996-6666



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