

**CHLORINE INSTITUTE**

**EMERGENCY KIT 'C'**

**FOR CHLORINE**

**TANK CARS & TANK TRUCKS**

**Edition 7**

**October 1983**



**INSTRUCTION BOOKLET**

# I. GENERAL

## 1.1 INTRODUCTION

The Chlorine Institute Emergency Kit "C" is designed for use with the standard DOT 105A500W chlorine tank car and the DOT MC331 chlorine cargo tank in chlorine service only. These tanks vary in capacity from 16 to 90 tons of chlorine. The kit is not designed to be used on liquid full tank cars or cargo tanks. [See Section 8 for kit limitations].

## 1.2 KIT CONTENTS

The Chlorine Institute Emergency Kit "C" contains devices to stop leaks through the angle valves and the safety relief device, as well as hoods to stop leaks between the valves and the manway cover. This kit does not contain respiratory equipment which must always be worn when investigating and correcting chlorine leaks. The kit, packed in a steel box measuring 10" x 10" x 27", weighs approximately 175 pounds.

## 1.3 KIT MAINTENANCE

For kit maintenance, see Section 7.

## 1.4 EMERGENCY TRAINING

Training in the use of the kit and respiratory equipment is essential. Teaching aids consisting of slides with accompanying script and motion pictures are available from the Institute.

## 1.5 TANK INSPECTION

Daily inspection of loaded chlorine tank cars or cargo tanks is recommended, whether or not they are connected to unloading lines. Through this means a leak usually can be detected in an early stage when it can be stopped readily by applying appropriate remedies.

## 1.6 LEAK DETECTION

As soon as there is any indication of the presence of chlorine in the air, authorized, trained personnel equipped with suitable respiratory 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 use ammonia for this purpose is to direct the vapor from a plastic squeeze bottle containing aqua ammonia at the suspected leak. Do not squirt liquid aqua ammonia on pipe & fittings. Any efforts to detect the source of a leak should be carried out with full consideration of potential hazards.

## 1.7 ASSISTANCE

Promptly notify your chlorine supplier. If the supplier cannot be reached, then summon help by activating CHLOREP, the CHLORINE Emergency Plan, by utilizing the proper telephone number in the US or Canada. Chlorine leaks always get worse if they are not corrected promptly.

## 1.8 REPRODUCTION

The contents of this instruction booklet are not to be copied for publication, in whole or in part, without prior Institute permission.

## 1.9 APPROVAL

At a meeting held on June 15, 1983 the Institute's CHLOREP Steering Group approved changes as needed to the sixth edition of this kit instruction booklet to accommodate new parts 10D and 10E added to this kit effective with November 1, 1983 shipments.

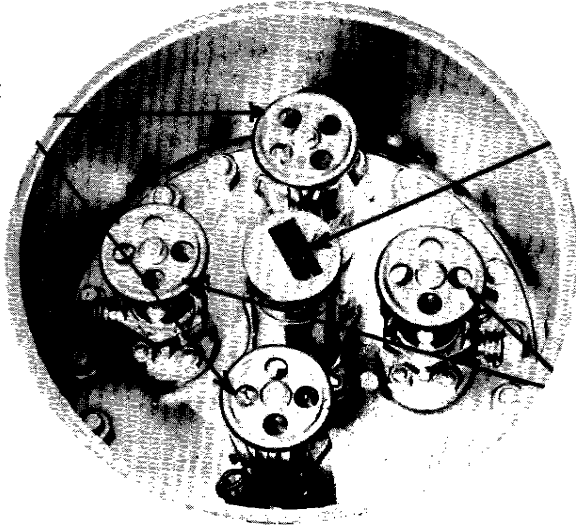
## 1.10 REVISIONS

Suggestions for revision of the kit or the Kit Instruction Booklet should be directed to the Secretary of the Institute.

## 2. IDENTIFYING AND STOPPING LEAKS

<b>CHLORINE LEAKS</b>		
<b>OCCURRING THROUGH...</b>	<b>ARE CORRECTED BY...</b>	<b>REFER TO SEC.</b>
A. ANGLE VALVE PACKING GLAND	CLOSING VALVE <u>or</u>  TIGHTENING PACKING GLAND NUTS with Wrench 110, <u>or</u>  APPLYING DEVICE 6 [HOOD].	3
B. ANGLE VALVE SEAT [WILL NOT CLOSE TIGHT]	INSERTING VALVE OUTLET PLUGS using Wrench 214, <u>or</u>  APPLYING DEVICE 6 [HOOD].	3
C. ANGLE VALVE GASKET	TIGHTENING STUD NUTS with Wrench 112, <u>or</u>  APPLYING DEVICE 6 [HOOD].	3
D. SAFETY RELIEF VALVE	APPLYING DEVICE 24 [HOOD].	4
E. SAFETY RELIEF VALVE GASKET	TIGHTENING STUD NUTS with Wrench 112, <u>or</u>  APPLYING DEVICE 24 [HOOD].	4
F. MANWAY COVER GASKET	See Section 5.	

GAS ANGLE VALVES



SAFETY RELIEF VALVE

LIQUID ANGLE VALVES

FIG. 2.1 VALVE ARRANGEMENT

TYPICAL CHLORINE LEAKS OCCUR THROUGH.....

- A- ANGLE VALVE PACKING GLAND
- B- ANGLE VALVE SEAT
- C- ANGLE VALVE GASKET
- D- SAFETY RELIEF VALVE
- E- SAFETY RELIEF VALVE GASKET
- F- MANWAY COVER GASKET

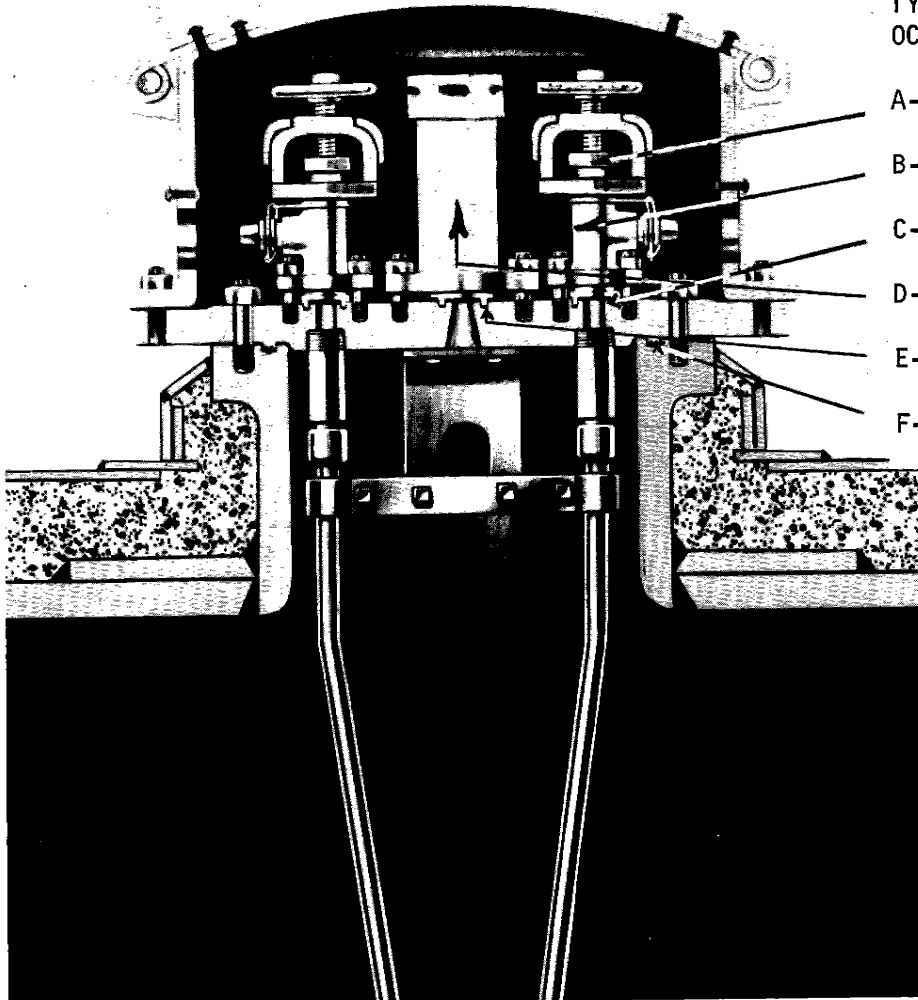


FIG. 2.2 TANK MANWAY

### 3. HOOD FOR ANGLE VALVES - DEVICE 6

STEPS	EQUIPMENT REQUIRED
1. REMOVE OUTLET CAP from VENT VALVE ON HOOD (6A) and OPEN VALVE.	WRENCH 200
2. ASSEMBLE BLOCK (10B) and SCREW (10C) IN ONE OF THE OBLONG SLOTS IN YOKE (10A) IS LOOSE OR UNEVEN.	YOKE ASSEMBLY 10A, BLOCK 10B & SCREW 10C
3a. DISCONNECT PIPING IF LEAKING VALVE IS CONNECTED, <u>or</u>	USUAL TOOLS
3b. UNSCREW VALVE OUTLET PLUG.	WRENCH 214
4. PLACE PLUG AGAINST PACKING GLAND. IF PLUG CHAIN IS IN THE WAY, CUT IT OFF.	BOLT CUTTER C-3
5. CLEAN MANWAY COVER. USE SCRAPER IF PAINT IS LOOSE OR UNEVEN.	PAINT SCRAPER C-2
6. PLACE GASKET (6BMV) ON HOOD (6A). [See Note 1.]  PLACE HOOD WITH GASKET OVER THE LEAKING VALVE.	HOOD 6A & GASKET 6BMV
7. PLACE YOKE HOOKS INTO PORT OPENINGS OF PROTECTIVE HOUSING.	
8. CENTER SCREW (10C) OVER HOOD and TIGHTEN SCREW forcing hood and gasket against manway cover.	WRENCH 108
9. CLOSE VENT VALVE ON HOOD.	WRENCH 200
10. TEST FOR LEAKS. TIGHTEN SCREW further IF NECESSARY.	WRENCH 108

Note 1: When ambient temperatures are low, it is desirable to perform this operation in advance, preferably in a heated area.

**DEVICE 6 includes:**

ANGLE VALVE HOOD ASSEMBLY	(6A)	YOKE ASSEMBLY	(10A)
GASKET	(6BMV)	BLOCK	(10B)
		SCREW	(10C)

- WEAR RESPIRATORY EQUIPMENT -

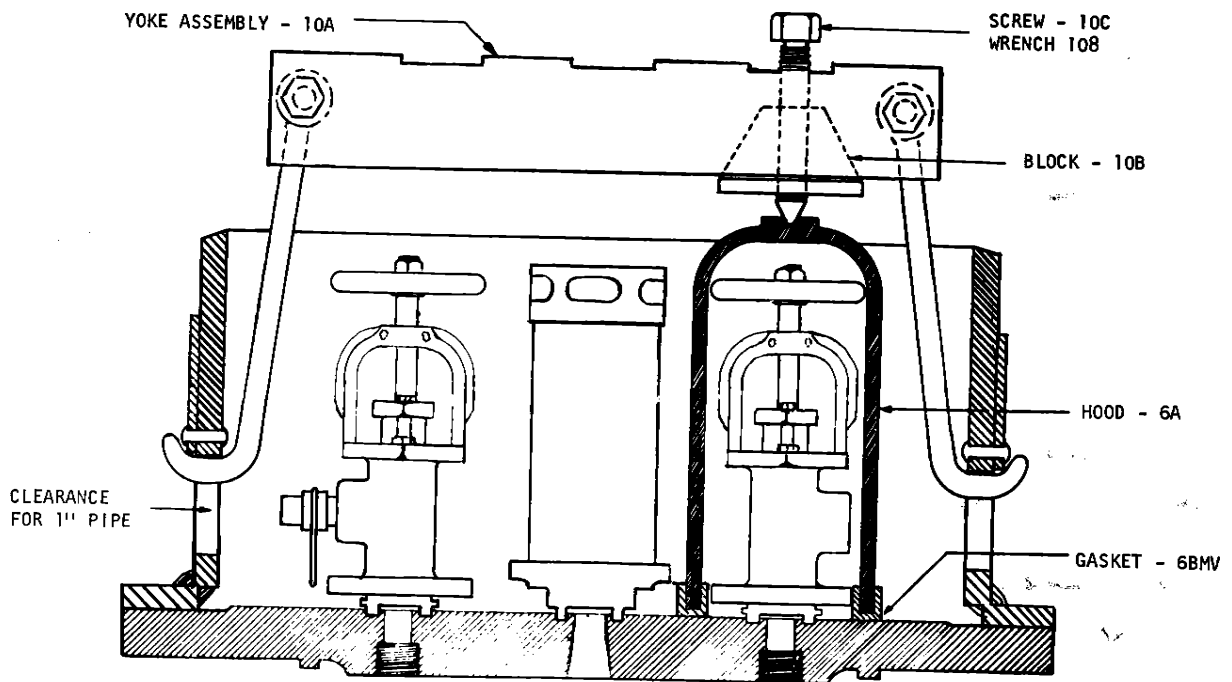


FIG. 3.1. DEVICE 6-OVER ANGLE VALVE

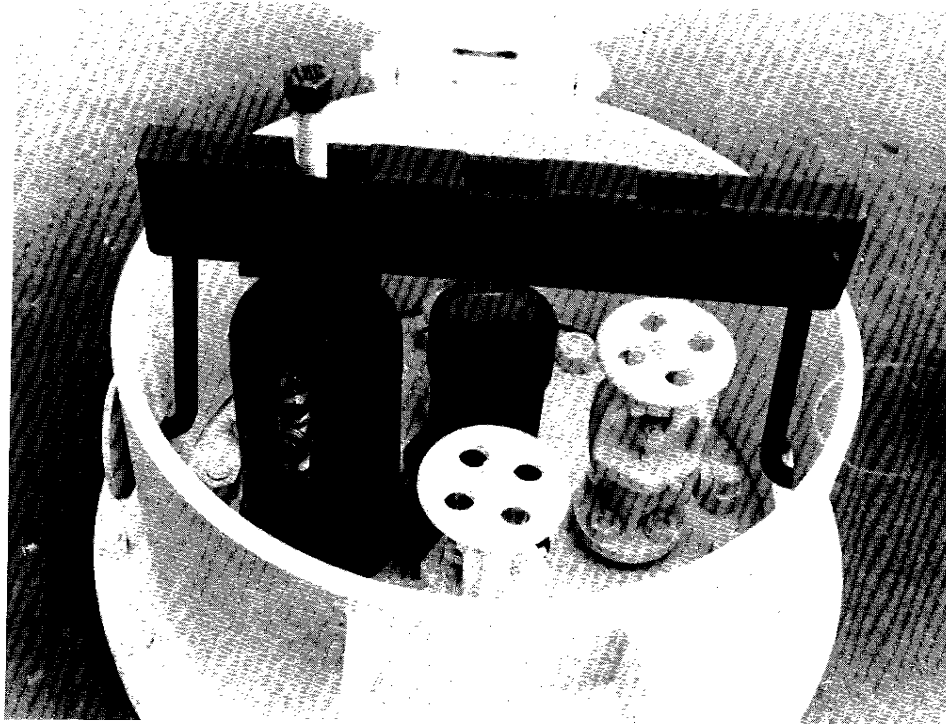


FIG. 3.2 DEVICE 6 OVER ANGLE VALVE

## 4. HOOD FOR SAFETY VALVE - DEVICE 24

STEPS	EQUIPMENT REQUIRED
1. REMOVE OUTLET CAP from VENT VALVE ON HOOD (24A) and OPEN VALVE.	WRENCH 200
2. CLEAN MANWAY COVER. USE PAINT SCRAPER IF PAINT IS LOOSE OR UNEVEN.	PAINT SCRAPER, C-2
3. PLACE GASKET (24BMV) ON HOOD (24A). [See Note 1.]  PLACE HOOD AND GASKET OVER SAFETY RELIEF DEVICE.	GASKET 24BMV & HOOD 24A
4. PLACE ADAPTER PLATE (10D) WITH SCREWS (10E) ENGAGED ON TOP OF HOOD (24A). The center hole in the plate will be over the center of hood (24A).	ADAPTER PLATE 10D and FOUR 10E SCREWS (See Note, Section 7)
5. REMOVE SCREW (10C) FROM BLOCK (10B).	BLOCK 10B & SCREW 10C
6. SLIDE BLOCK (10B) INTO SLOT OF ADAPTER PLATE (10D) OVER INDENTATION ON TOP OF HOOD (24A).	
7. CENTER YOKE ASSEMBLY (10A) OVER BLOCK (10B) & ADAPTER PLATE (10D).	YOKE ASSEMBLY 10A
8. PLACE YOKE HOOKS INTO PORT OPENINGS OF PROTECTIVE HOUSING [See Note 2.]	
9. INSERT SCREW (10C) INTO BLOCK (10B) AND TIGHTEN WITH WRENCH. BE CERTAIN SCREW (10C) SEATS IN INDENTATION ON TOP OF HOOD (24A).	WRENCH 108
10. THEN TIGHTEN 4 SCREWS (10E) ALTERNATELY IN THE ADAPTER PLATE (10D) forcing the hood and gasket against manway cover. DO <u>NOT</u> TIGHTEN SCREW 10C AFTER TIGHTENING 10E SCREWS as this only loosens the 10E screws.	WRENCH 214
11. CLOSE VENT VALVE ON HOOD.	
12. TEST FOR LEAKS. TIGHTEN SCREWS (10E) IN THE ADAPTER PLATE (10D) further IF NECESSARY.	

Note 1: When ambient temperatures are low, it is desirable to perform this operation in advance, preferably in a heated area.

Note 2: It is more convenient to unload the tank if hooks are placed in gas valve port openings.

**DEVICE 24 includes:**

SAFETY VALVE HOOD ASSEMBLY	(24A)	BLOCK	(10B)
GASKET	(24BMV)	SCREW	(10C)
YOKE ASSEMBLY	(10A)	ADAPTER PLATE	(10D)
		SCREWS	(10E)

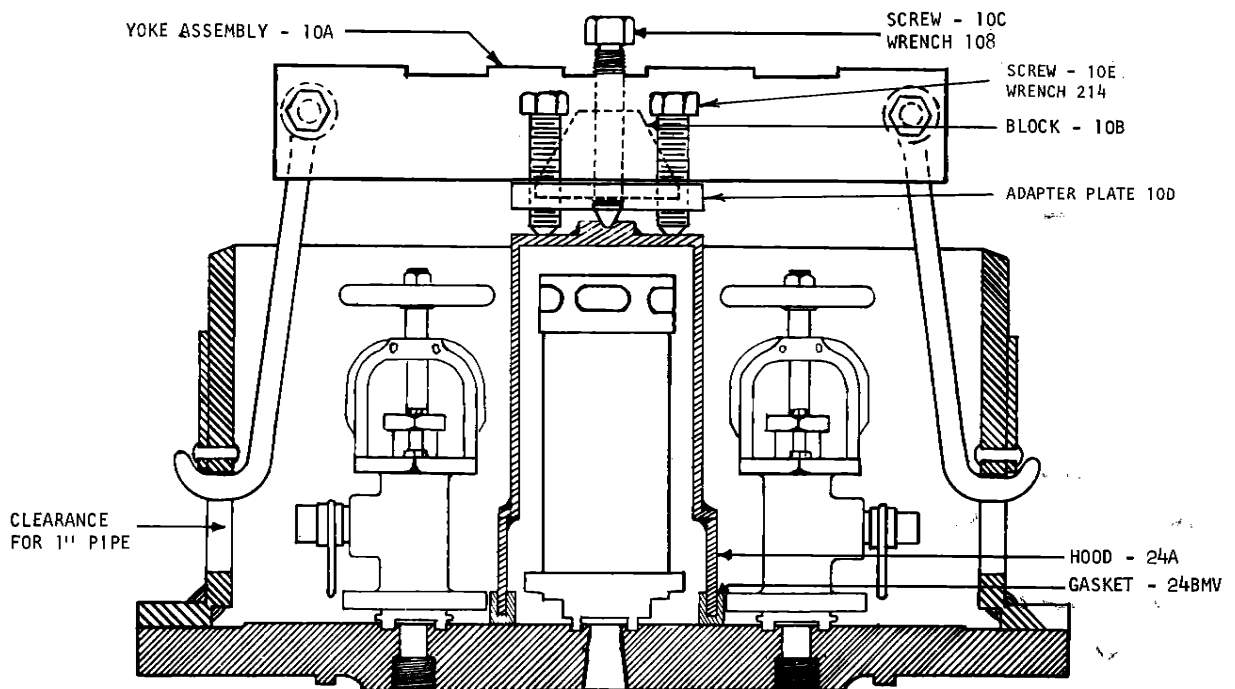


FIG. 4.1 DEVICE 24-OVER SAFETY RELIEF VALVE

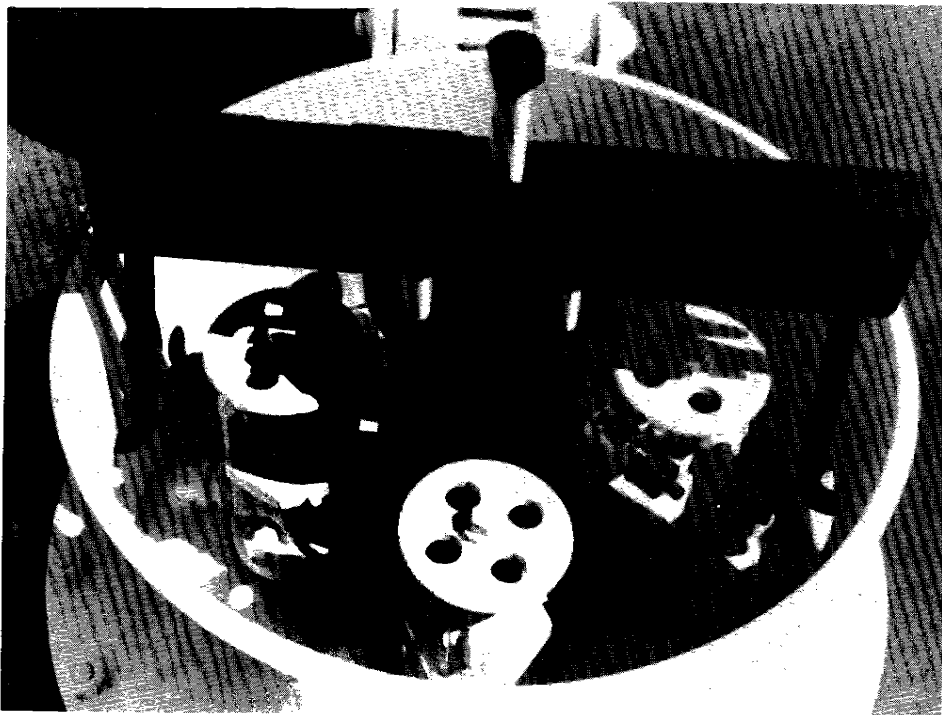


FIG. 4.2 DEVICE 24 OVER SAFETY RELIEF VALVE



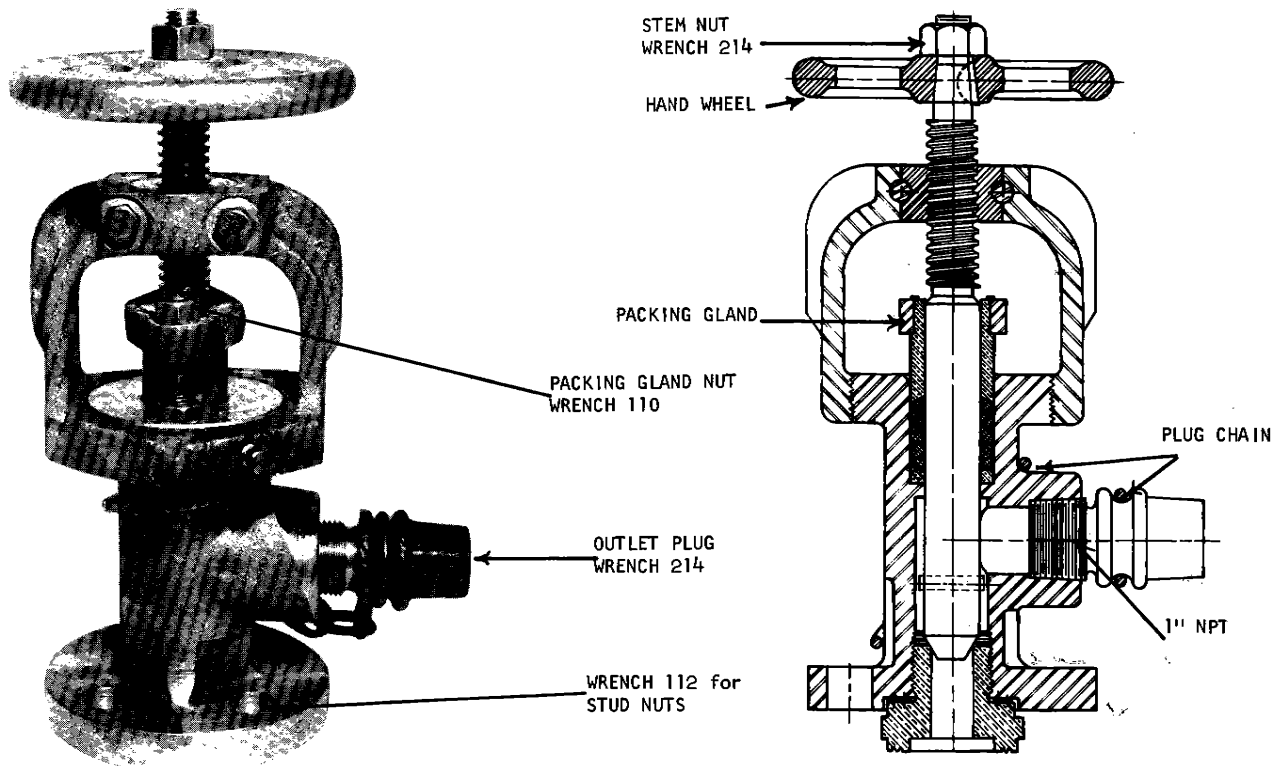


FIG. 5.1 STANDARD CHLORINE ANGLE VALVE

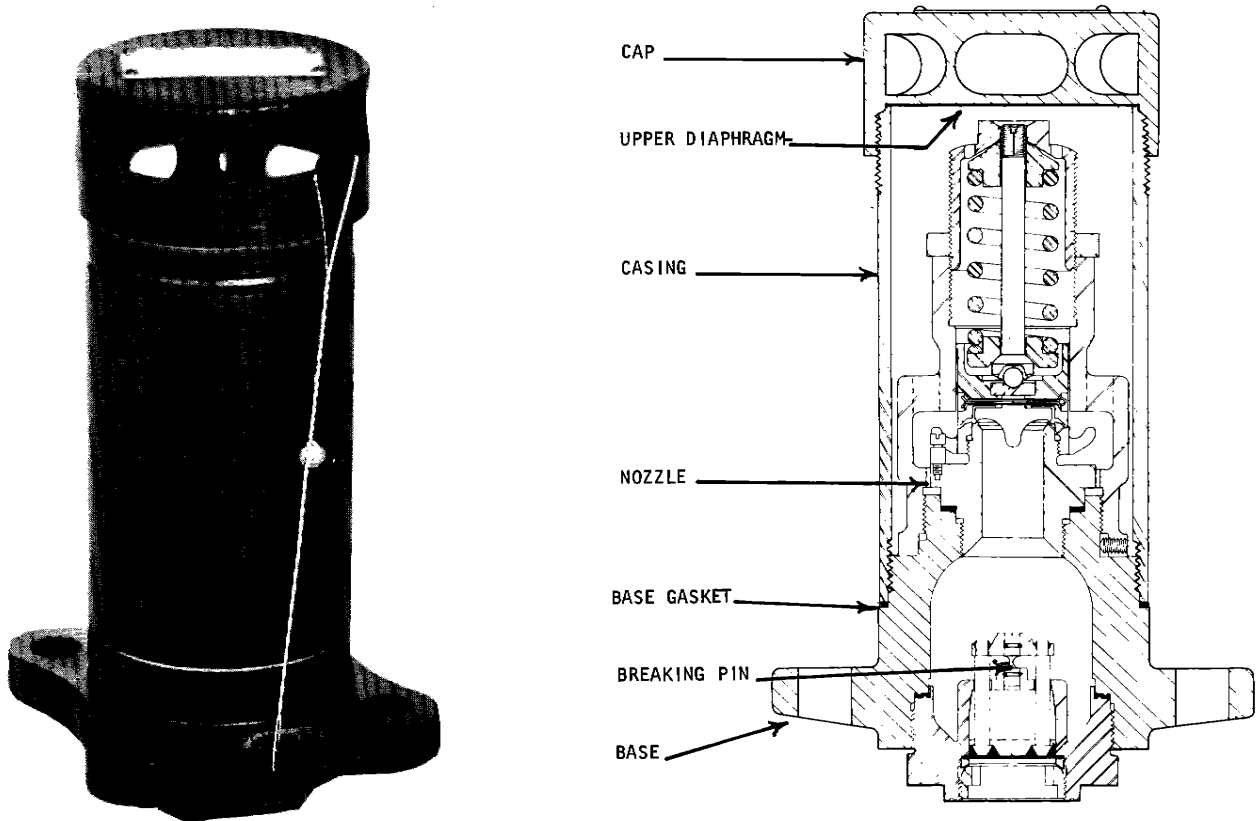


FIG. 5.2 STANDARD CHLORINE SAFETY RELIEF DEVICE

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**FIG. 5.3 CHLORINE INSTITUTE EMERGENCY KIT "C"**

## 5. LEAKS AT MANWAY COVER GASKET

Leaks at the manway cover gasket should be reported immediately to the chlorine supplier. The kit contains wrench 113, and wrench extension 113A which, together with adapter 113B and sliding handle 113C, tighten cover stud nuts. However, it is not advisable for persons to handle this condition without special training.

## 6. DISPOSAL OF CHLORINE REMAINING IN TANK

The stopping of leaks with the emergency devices is only an interim measure; the container must be emptied as soon as possible. The preferred method is to use the remaining chlorine in the consumer's process. If this is not possible it may be passed into and absorbed by a solution of caustic soda or soda ash.

If it is impossible to consume or absorb the chlorine, the capped or plugged tank car or tank truck should be moved to a location where recurrence of the leak will do the least harm and assistance from the chlorine supplier or the nearest producer should be obtained.

## 7. KIT MAINTENANCE

7.1

### AFTER USE

When the emergency device is removed from the tank, all metal parts should be thoroughly cleaned with a dilute alkaline solution, rinsed thoroughly, dried, and lightly oiled to prevent corrosion. Return the device, all wrenches and other tools to the box, check the contents list, and reseal the box so that it will be ready for an emergency.

7.2

### ROUTINE

The kit should be frequently inspected by the person responsible for the equipment and checked with the contents list to insure 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.

7.3

### SPARE PARTS

Spare parts may be purchased by owners of this kit or the Solvay Emergency Kit "C", provided that the kit serial number accompanies the order. The serial number is steel-stamped on the inside, upper right hand corner of the cover of the steel box in 3/8" numbers and decaled on the front in 1" numbers. For information on ordering procedures, consult the Institute.

Note: In 1983, the Institute added parts numbered 10D and 10E to all new Chlorine Institute "C" kits effective with November 1, 1983 shipments. All known owners of Solvay and Institute "C" kits will be contacted so that existing kits will be updated with these parts to ensure additional reliability in the application of Device 24.

## 8. KIT LIMITATIONS

Kit specifications call for the pressure retaining parts of this kit to be tested to 300 psi by the manufacturer. Emergency kit "C" does not contain any device to handle leaks in the tank itself.

# CHLORINE INSTITUTE EMERGENCY KIT "C"

## PARTS LIST

<u>Part Number</u>	<u>Description</u>	<u>Quantity Per Kit</u>
6A	Hood Assembly with 6V vent valve	1
6BMV	Gasket, Molded Viton A®*	2
10A	Yoke Assembly	1
10B	Block	1
10C	Screw	1
10D	Adapter Plate with 4-10E screws	1
24A	Hood Assembly with 24V Vent Valve	1
24BMV	Gasket, Molded Viton A®*	2
108	Wrench, open end single head, 1-3/8" opening	1
110	Wrench, combination, 12-pt box end, 11/16" opening	1
112	Wrench, crowfoot special, 1-9/32" opening x 21"	1
113	Wrench, socket, 1-13/16" 12-pt opening, 1" sq. drive	1
113A	Wrench extension, 1" sq. drive x 18"	1
113B	Adapter for Sliding Handle, 1" round - 1" square drive	1
113C	Sliding Handle 1" dia. x 20"	1
200	Wrench, 3/8" sq. box x 1-1/4" open end x 7-1/4"	1
214	Wrench, open end, double head-15° angle 31/32" & 1-1/16"	1
C-1	Hammer, machinist, 24 oz.	1
C-2	Paint Scraper, 1-1/4" blade	1
C-3	Bolt Cutter	1
C-4	Rings, Angle Valve Packing, set of 5, 1-7/16 OD x 15/16 ID x 1/4 square	3
C-5	Rings, Vent Valve Packing	5
C-7	Metal Railroad Car Seals	15
C-9	Gasket Sack	1
151-C	Steel Box	1
152	Tool Roll	1
	Kit Instruction Booklets	2
	Chlorine Manual	1

\*Note: Viton® is a registered trademark of E. I. du Pont de Nemours, Inc.