

REPLACING PAGE ADDENDUM

Filing Instructions:

1. REMOVE FROM THE SECTION THE PAGES NUMBERED THE SAME AS THOSE ATTACHED TO THIS PINK SHEET.
2. INSERT THE ATTACHED PAGES INTO THE SECTION IN THEIR PLACE.
3. PLACE THIS PINK SHEET AHEAD OF PAGE 1 OF THE SECTION.

**MANHOLE COVERS
REMOVING AND REPLACING**

1. GENERAL

1.001 This addendum supplements 620-150-010, Issue 2. The attached page must be inserted in the section in accordance with the filing instructions above.

1.002 This addendum is issued to add information about replacing manhole cover locking bolts.

4. REPLACING MANHOLE COVERS

The following changes apply to Part 4 of the section:

- (a) 4.07—Changed 4.07 to 4.09. Added new 4.07
- (b) 4.08—Added

Attached:

**Page 9 dated March 1972, revised
Page 10 dated March 1972, reissued**

MANHOLE COVERS

REMOVING AND REPLACING

CONTENTS	PAGE
1. GENERAL	1
2. SAFETY PRECAUTIONS	1
3. REMOVING MANHOLE COVERS . . .	2
4. REPLACING MANHOLE COVERS . . .	7

1. GENERAL

1.01 This section describes the procedures to be followed when removing and replacing manhole covers. The wide variety of old types of covers still in service precludes illustrating every type of cover, and consequently this section deals only with those more commonly encountered. However, observation of the safety principles included in the section should promote safe removal and replacement regardless of the type of cover involved.

1.02 This section is revised to include information on the Defiance Manufacturing, Inc. PTS-49 Manhole Cover Lifter and to modify recommendations concerning the operation of removing manhole covers. Since this is a general revision, arrows ordinarily used to indicate changes have been omitted.

2. SAFETY PRECAUTIONS

2.01 Before removing a manhole cover, place warning and guarding devices in accordance with the procedures covered in Section 620-135-010. Upon completion of the work in a manhole, be sure the cover is properly replaced before removing the warning and guarding devices.

2.02 Manhole covers are heavy and should be handled with care to avoid personal injury. When handling a cover, keep the feet solidly placed and positioned so they will be clear of the cover in the event it should drop. When lifting, bend the knees slightly and keep the back straight so

the work will be done with the arm and leg muscles and not the back muscles.

2.03 Two-man handling of manhole covers should be avoided wherever possible. Two-man operations are awkward and present more of a possibility of muscle strain or of the second man being struck if a hook should slip. Two-man operation is generally desirable only when removing or replacing rectangular covers. One man equipped with a B Manhole Cover Hook can safely remove and replace most round or hinged rectangular covers. Use of the PTS-49 Manhole Cover Lifter simplifies cover removal by one man and permits one man to remove even the heaviest standard round cover.

2.04 If snow, ice, or other surface conditions make footing around the manhole opening insecure, clear the working area with a shovel or broom. If this is impractical, scatter ashes, sand, or other suitable material around the opening to ensure firm footing.

2.05 Do not use an open flame or salt to thaw ice around or over a cover. An open flame is hazardous because of the possibility of an explosion in the event a combustible mixture is present in the manhole. Salt solution seeping into the manhole may contribute to cable corrosion. To remove ice from a cover use a hardened cold chisel.

2.06 To loosen a cover which can not be readily lifted, first make certain that it is not secured by a locking device. Then place a block of wood on the cover near the rim and strike it with a heavy hammer. Do this at several points around the circumference until the cover can be pried loose using the manhole hook.

2.07 When moving covers always use a B Manhole Cover Hook or a Manhole Cover Lifter. Never place the hands under a cover for the purpose of moving it.

2.08 Ordinarily the cover should be left near the opening if it will not be a hazard to workmen, pedestrians, or vehicles. Otherwise skid the cover to a safe location within the protected work area.

3. REMOVING MANHOLE COVERS

3.01 After properly guarding the work area, the manhole cover may be safely removed by working as described in the following paragraphs. Use one of the hook holes in the cover on the side away from moving traffic, if practicable. Otherwise, endeavor to move the cover in line with the direction in which traffic is moving. The object in removing the cover in this manner is that in the event of hook slippage, any tendency to fall will be away from traffic rather than toward it. It also affords better observation of oncoming traffic while in the act of removing the cover.

ROUND COVERS

One-Man Method—Using B Manhole Cover Hook

3.02 To remove round manhole covers that have hook holes in the rim, proceed as follows:

- (1) Insert the manhole hook into one of the hook holes with the shank in a position tangential to the cover (Fig. 1) until the hook end has cleared the rib on the underside of the cover. The hook can then be turned and raised to engage the rib (Fig. 2).

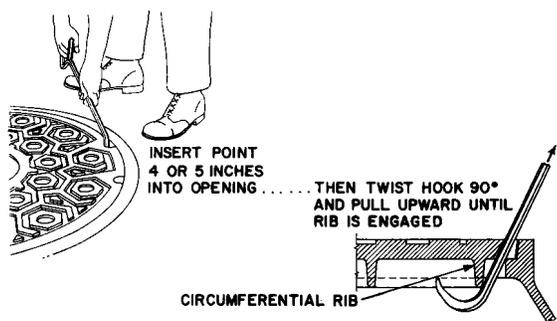


Fig. 1—Inserting Manhole Hook into Hook Hole

Note: If the hook holes are too small to permit inserting the manhole hook far enough to engage the circumferential rib, it will be



Fig. 2—Preparing to Unseat Cover

necessary to use two hooks. Use the point of one hook to pry the cover loose. Raise the cover enough to allow the second hook to be inserted far enough to engage the circumferential rib. Remove the hook used as a pry and place it out of the way. Be sure that the hook is engaged with the circumferential rib of the cover before starting the pull.

- (2) The cover should then be unseated approximately 4 inches (Fig. 3) by pulling with the manhole hook making sure that all of the pulling is done with the leg and arm muscles and not with the back muscles.

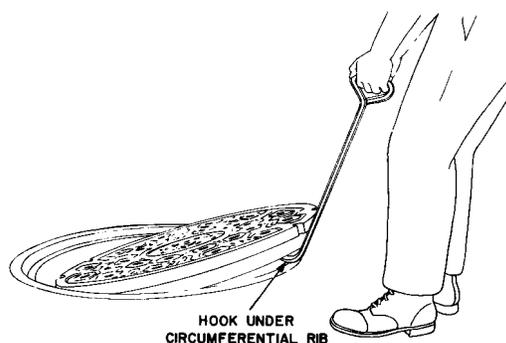


Fig. 3—Unseating the Cover

- (3) After the cover has been unseated and before removing operations are continued, make sure that the area in the direction which the

cover is to be pulled is clear of tools, warning devices, material and debris. Place feet solidly in position to lift and pull with leg and arm muscles. Always make sure that footing is secure and that feet are clear of the cover.

- (4) Slide the cover clear of the frame (Fig. 4) being cautious that all lifting and pulling is done with the arm and leg muscles. At no time should any lifting or sliding of a manhole cover be attempted solely with the use of back muscles.

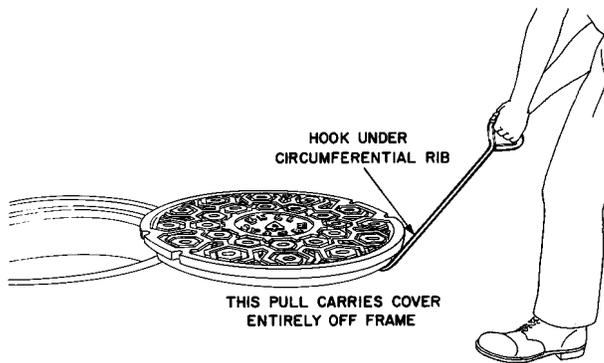


Fig. 4—Sliding Cover Clear of Frame

- (5) Pull the cover to a location where it will not interfere with work operations or be a hazard to vehicular or pedestrian traffic. The hook is then disengaged and placed out of the way.

Note: If the cover must be moved a considerable distance over irregular terrain or if difficulty is experienced in removing the cover, the individual removing the cover should request help in the operation. (See two-man method described in 3.09.)

- 3.03** Other round type covers may have lifting holes in the surface of the cover instead of in the rim. When removing covers of this type, insert the hook in the hole and lift to unseat the cover approximately 4 inches observing the precautions outlined in 3.02(2). Remove the hook from the lifting hole, place it under the circumferential rib and remove cover as outlined in 3.02(3), (4), and (5).

- 3.04** The type-R cover has one hook slot in the surface of the cover approximately 4 inches in from the rim. This cover can be removed by one workman by inserting a manhole hook in the slot, lifting, and sliding the cover from the frame.

- 3.05** The inner covers of manhole frames so equipped are removed by unlocking and removing the padlock from the locking bar screw, if one is used, removing the saddle plate and loosening the locking bar screw. The screw can be turned with the point of the manhole cover hook or any other suitable tool. When the locking bar is free, disengage it from the locking bar catches and remove it. The inner cover can then be lifted out using a manhole hook to engage either one of the handles, or one of the hook holes provided in the ribs of the cover.

One Man Method—Using PTS-49 Manhole Cover Lifter

- 3.06** The PTS-49 Manhole Cover Lifter shown in Fig. 5 is a cadmium plated steel tool consisting of a modified B Manhole Cover Hook hinged to a tubular frame having a neoprene covered foot and handle. The open end of the hook can be locked in a safe, covered position for storage.

- 3.07** Use the Manhole Cover Lifter as follows:

- (1) Release the hook by turning the knurled sleeve. Insert the hook tip into one of the hook holes in the cover as shown in Fig. 6, making certain to insert the hook deep enough to clear the rib on the underside of the cover.
- (2) Turn the hook 90 degrees, set the foot of the tool on the ground about 12 inches from the cover, take a working position as shown in Fig. 7, and unseat the cover by pulling on the handle.
- (3) Reposition the foot of the tool and make additional pulls of the handle until the cover is clear of the frame and will not interfere with work operation or be a hazard to vehicular or pedestrian traffic.

- 3.08** With an A or SA Manhole Frame and Cover having an inner pan, a different procedure is necessary in order to avoid having the rib on the underside of the cover become fouled with the

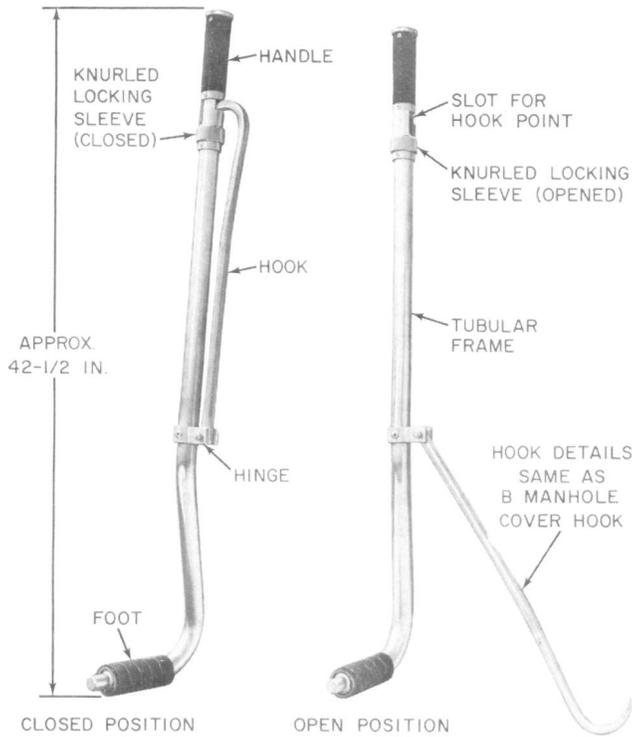


Fig. 5—Manhole Cover Lifter, Defiance Mfg. Inc. PTS-49

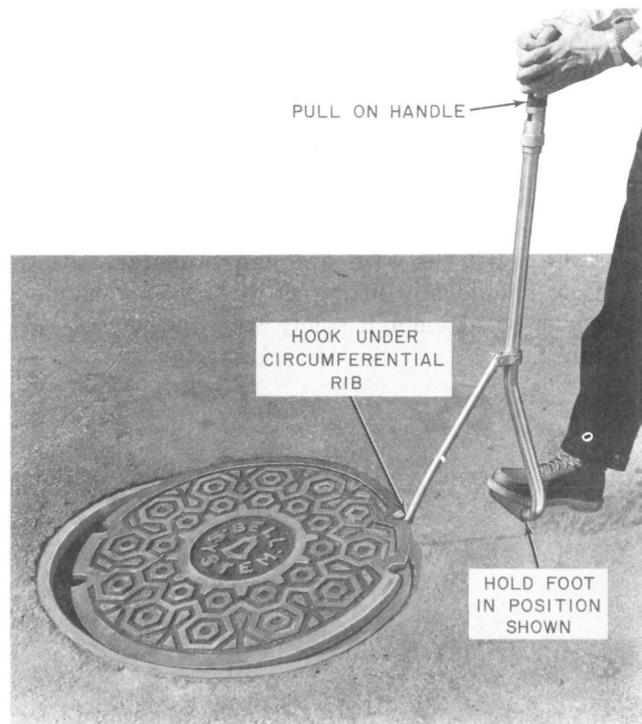


Fig. 7—Unseating Cover with Cover Lifter



Fig. 6—Inserting Cover Lifter Hook into Hook Hole

locking bar screw and saddle as the cover is being pulled across the frame. Proceed as follows:

- (1) Insert the hook and set the foot of the tool as described in 3.07(1) and (2) and unseat the cover sufficiently to permit sliding a B Manhole Cover Hook under the cover and against the frame as shown in Fig. 8. Remove the manhole cover lifter and lock its hook in the closed position. Then slide the foot of the lifter under the cover, adjacent to the B Manhole Cover Hook as shown in Fig. 9, and raise the cover by pushing down on the handle sufficiently to reposition the hook so it lays across the locking bar and against the manhole frame. (Note position of hook in Fig. 11).
- (2) Remove the manhole cover lifter, reposition it on the cover opposite the hook as shown in Fig. 10, and pull the cover clear of the hook and locking bar.
- (3) Reposition the foot of the tool and make additional pulls of the handle until the cover is clear of the frame (see Fig. 11) and will not



Fig. 8—Inserting B Manhole Cover Hook for Positioning on Locking Bar



Fig. 9—Positioning Manhole Hook on Locking Bar and Manhole Frame



Fig. 10—Pulling Cover Clear of Hook and Locking Bar

interfere with work operations or be a hazard to vehicular or pedestrian traffic.

Two-Man Method

3.09 To remove round manhole covers that have hook holes in the rim, proceed as follows:

- (1) Insert the manhole hooks with the shank in a position tangential to the cover until the hook end has passed below the outer circumferential reinforcing rib of the cover. The hook can then be turned and raised to engage the rib.
- (2) If the hook holes are too small to permit entering the manhole hooks far enough to engage the circumferential rib, use the point of one hook to pry the cover at the hook hole and raise it while the second hook is entered far enough to engage the rib. Then hold the cover with this hook while the first hook is being engaged. Be sure that the hooks are engaged with the rib before starting the pull. See Fig. 12.



Fig. 11—Pulling Cover Clear of Frame

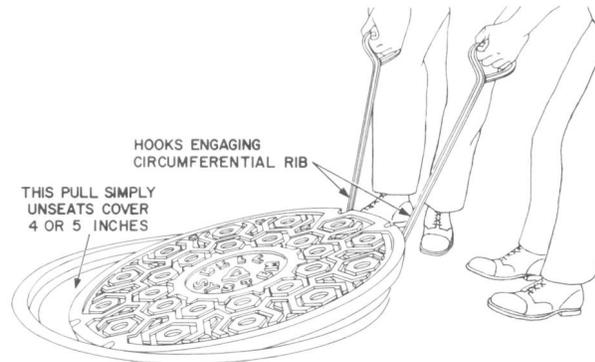


Fig. 13—Unseating the Cover—Two-Man Method

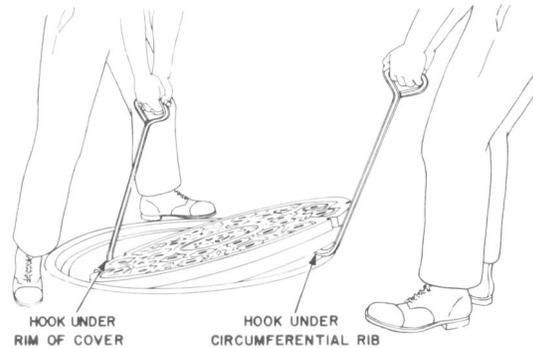


Fig. 14—Preparing to Slide Cover Clear of Frame—Two-Man Method



Fig. 12—Preparing to Unseat Cover—Two-Man Method

- (3) The cover should then be unseated approximately 4 inches by the two men pulling with their manhole hooks as shown in Fig. 13.
- (4) While one workman holds the cover in the position shown in Fig. 13, the other workman releases his manhole hook, moves around to the opposite side and, while facing the first man, engages his hook under the rim of the cover as shown in Fig. 14.

- (5) The man in the original position now pulls while the other lifts his side of the cover level with the rim of the frame and also assists in pulling to the extent permitted by his position. See Fig. 15. The pull should be directly off the frame. Any attempt to swing the cover by other than a direct pull may cause the manhole hooks to slip. It is not necessary that this pull carry the cover completely clear of the frame, only that less than half its weight be left overhanging the opening at the completion of the pull.
- (6) While the man on the pulling side still has his manhole hook engaged, the other workman moves around and engages his hook under the reinforcing rib. The men then assume positions so that the cover can be skidded between them and, with feet spread, pull the cover clear of the frame (Fig. 16). Both men then pull the

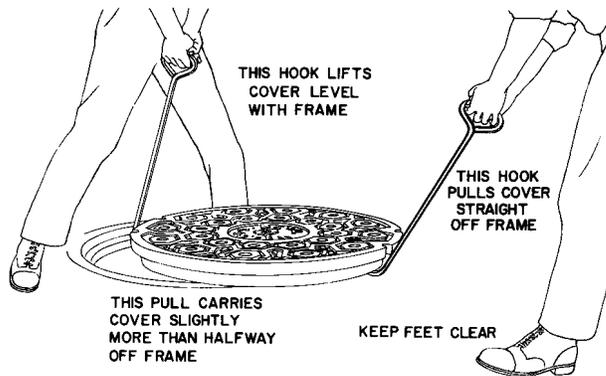


Fig. 15—Sliding Cover Partially Clear of Frame—Two-Man Method

cover to a location where it will not interfere with work operations or be a hazard to vehicular or pedestrian traffic. The hooks are then disengaged and placed out of the way.

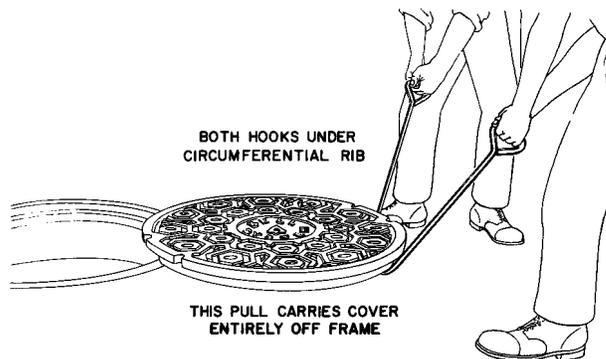


Fig. 16—Sliding Cover Clear of Frame—Two-Man Method

3.10 Other round covers may have lifting holes in the surface of the cover instead of notches in the rim. When removing covers of this type, insert the manhole hooks in the holes as shown in Fig. 17 and lift to unseat the cover about 4 inches. One hook is then engaged with the circumferential rib on the underside of the cover to hold the cover unseated. Thereafter, proceed as in 3.09(4) and succeeding paragraphs.

3.11 The inner covers of manhole frames so equipped are removed by unlocking and removing the padlock from the locking bar screw,

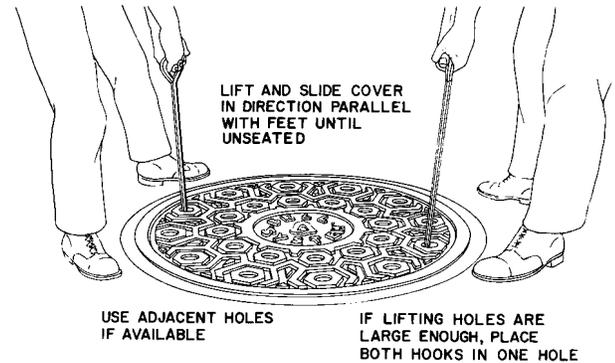


Fig. 17—Unseating Cover With Lifting Holes in Cover Surface

if one is used, removing the saddle plate and loosening the locking bar screw. The screw can be turned with the point of the Manhole Cover Hook or any suitable tool. When the locking bar is free, disengage it from the locking bar catches and remove it. The inner cover can then be lifted out, using two manhole hooks to engage either the handles or the hook holes provided in the ribs of the cover.

RECTANGULAR COVERS

3.12 When removing rectangular type covers, other than the hinged type, two workmen should insert their manhole hooks in the vent holes located along the narrow edge of the cover on the side toward which they wish to pull the cover. Both workmen then lift and pull slightly toward themselves to unseat the cover (Fig. 18). Having unseated the cover, they then pull from the narrow side and remove the cover from the frame. In removing a rectangular cover, care should be exercised to keep the edges of the cover parallel to the sides of the frame while sliding the cover along the frame seat in order to avoid dropping the cover into the manhole.

3.13 Rectangular covers of the hinged type are usually easily opened by inserting the tip of the manhole hook in the hand-hold and raising and locking the cover in its opened position.

4. REPLACING MANHOLE COVERS

4.01 Remove all loose material from the frame seat and from the sides and seat of the cover so the cover will rest evenly in the frame.

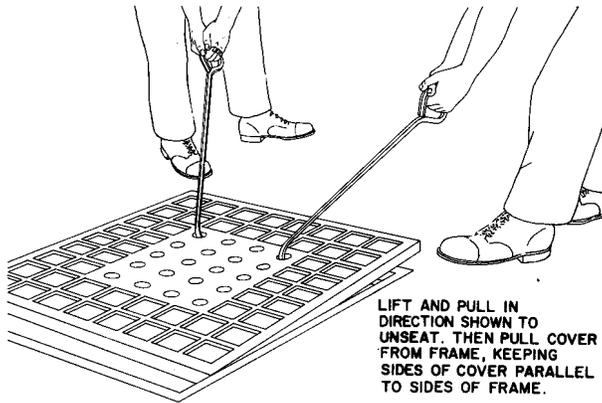


Fig. 18—Removing Rectangular Cover

The Manhole Cover Hook or other suitable tool can be used for this purpose.

ROUND COVERS

One Man Method—Using B Manhole Cover Hook

4.02 Proceed as follows:

- (1) Stand slightly over the cover while facing approximately at right angles to the line on which the cover is to be moved and with feet spread well apart.
- (2) Place the point of the manhole hook under the rim of the cover, lift slightly and swing the cover toward the manhole while the cover pivots on its opposite edge (Fig. 19).

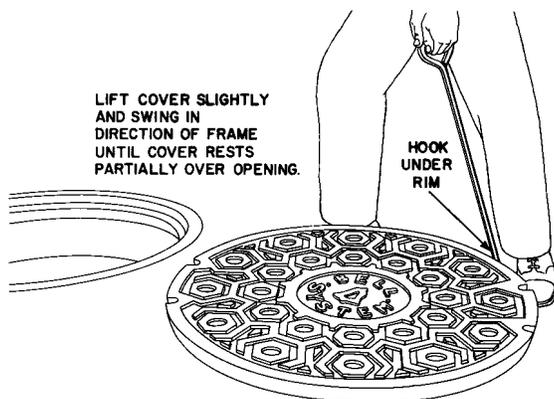


Fig. 19—Sliding Cover to Manhole Frame

- (3) Change to the opposite side and repeat until the cover rests partially over the opening of the manhole.
- (4) Place the hook under the rim of the cover at the point farthest from the opening and lift until the cover slides onto its seat (Fig. 20).

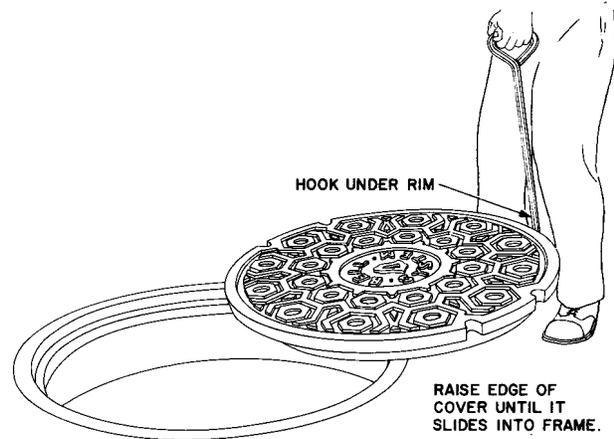


Fig. 20—Preparing to Slide Cover onto Seat

Note: When replacing the outer cover of an A or SA frame fitted with a locking bar and screw, do not allow the cover to strike the locking bar screw in sliding the cover into the opening. A heavy blow may bend or break the screw. The forward edge of the cover should be guided with a hook, if necessary, until it has cleared the screw.

4.03 If the cover has been left several feet or more from the manhole, it may be skidded to the opening by two workmen pulling with manhole hooks as shown in Fig. 21. One man engages the circumferential rib preferably at one of the hook holes nearest the manhole opening. The other man engages his hook with the rim on the opposite side, whereupon both men lift and pull the cover toward the opening.

4.04 On reaching the opening, the cover can be placed finally on the frame by one or both men handling the cover as described in 4.02.

4.05 Inner covers should be inspected to see that the rubber gasket, if present, is clean and properly held by the retaining lug (27- or 30-inch B Manhole Cover Gaskets are available as replacement

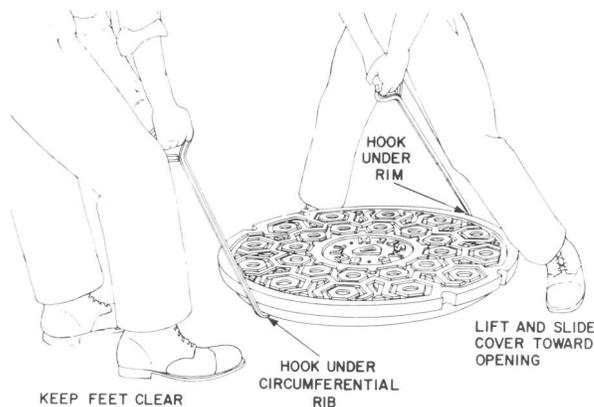


Fig. 21—Sliding Cover to Manhole Frame—Two-Man Method

items). Remove loose material from the inner cover lip and set the cover in place. Place the locking bar in the catches on either side of the frame and turn down the locking bar screw until the inner cover is firmly seated and the locking bar is secure in the catch at each end. Place the saddle plate over the screw and snap the padlock on the eye of the screw, if the cover is locked in this manner.

One Man Method—Using PTS-49 Manhole Cover Lifter

4.06 Engage the Manhole Cover Lifter hook under the rim of the cover and raise the foot of the lifter until the end of the handle rests on top of the cover as shown in Fig. 22. Then, holding the lifter foot, raise the cover slightly and swing the lifter handle toward the manhole frame while pivoting it on the cover edge directly under the lifter handle.

Locking Covers

4.07 The procedures for replacing a cover that utilizes locking bolts (C or D frame and cover) are the same as for replacing any other round cover except that when the locking cover is seated, the alignment marks on the cover and frame must register to permit replacing the locking bolts. In cases where the locking bolts were difficult to remove because of rust or corrosion, it is advisable to apply a small amount of grease to the bolt threads before replacing them to help prevent difficult removal in the future.



Fig. 22—Moving Cover to Manhole Frame

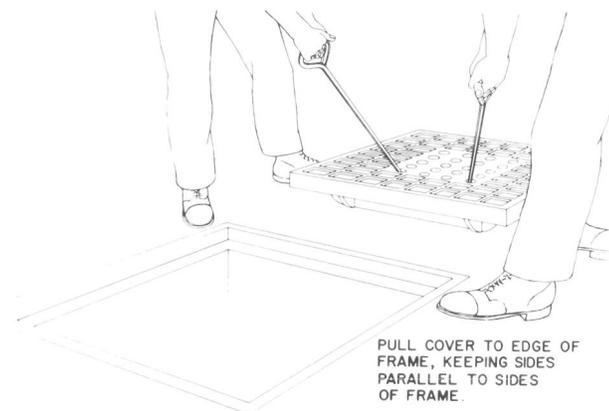


Fig. 23—Replacing Rectangular Cover

4.08 Always **replace both locking bolts**. Start the bolts carefully to avoid cross-threading and then, using the B Manhole Wrench, tighten only until snug. Do not over-tighten as this can make removal difficult. When using the B Manhole Cover Hook as a wrench handle, light hand pressure on the manhole cover hook is sufficient to adequately tighten the locking bolts.

SECTION 620-150-010

RECTANGULAR COVERS

4.09 To replace rectangular manhole covers, other than the hinged type, proceed as follows:

- (1) Place manhole hooks in the vent holes along the narrow edge of the cover on the side in the direction in which the cover is to be moved.
- (2) Pull the cover to the edge of the opening (Fig. 23) with the long sides of the cover approximately in line with the long sides of the frame.

- (3) The workmen then take positions, one on either side of the frame, and carefully work the forward end of the cover into the frame seat. Then the cover is slid along the frame seat while keeping the edges of the cover parallel to the sides of the frame.

- (4) Both men should pull evenly on the cover until it is properly seated.

Caution: Extreme care should be exercised in replacing rectangular covers to prevent the cover from twisting and falling into the manhole.