

REMOVING UNDERGROUND CABLE HIGH PRODUCTION METHOD

CONTENTS	PAGE
1. GENERAL	1
2. PRECAUTIONS	1
3. PRESURVEY	2
4. DESCRIPTION	3
5. REMOVING CABLE—HOGG-DAVIS CABLE REMOVAL UNIT	6
6. REMOVING CABLE—AT-8490 CABLE TAKE-UP DRIVE	14

1.04 The cable removal units can be set up for the removal of cable in city streets or rural areas without any basic change in operation of the units.

1.05 The craft person responsible for the operation of the cable removal unit must be thoroughly familiar with the unit before attempting to remove cable. For operation and maintenance of the cable removal units, refer to Section 649-210-132, Hogg-Davis Cable Removal Unit, and Section 649-210-133, AT-8490 Cable Take-Up Drive.

1.06 The MCV mobile cable salvaging vehicle, Section 649-210-135, is a unit that in one continuous operation pulls and cuts cable into 4-foot lengths and deposits these lengths into a dump truck or other bulk handling vehicle. Where this unit is available and economically feasible, its use is preferred when removing cable to be junked.

1. GENERAL

1.01 This section covers the high production method of removing underground cable using a Hogg-Davis Cable Removal Unit or an AT-8490 Cable Take-Up Drive.

1.02 This section is revised to:

- Delete the requirement for shipping junked cable to Nassau Smelting and Refining Company
- Add reference to the MCV cable salvaging vehicle.

Revision arrows are used to emphasize the more significant changes.

1.03 The cable removal units provide a means of pulling and storing cable on a reel in a single operation. Cable to be held for reuse or to be junked can be removed in the same manner. Exercise care to avoid damaging cable that is to be reused.

2. PRECAUTIONS



Safety headgear and regular eye protection should be worn during all cable removal operations.

2.01 All personnel engaged in underground cable removal operations should be thoroughly familiar with the 620 Division of the Bell System Practices. The sections covering the following should be given special emphasis:

- (a) Guarding and Protecting Work Areas (Sections 620-135-010 and 620-135-100)
- (b) Testing and Ventilating Manholes (Section 620-140-501)
- (c) Removing and Replacing Manhole Covers (Section 620-150-010)

NOTICE

This document is either
AT&T - Proprietary, or WESTERN
ELECTRIC - Proprietary

Pursuant to Judge Greene's Order of August 5, 1983, beginning on January 1, 1984, AT&T will cease to use "Bell" and the Bell symbol, with the exceptions as set forth in that Order. Pursuant thereto, any reference to "BELL" and/or the BELL symbol in this document is hereby deleted and "replaced".

(d) Signals for Use by Outside Plant Forces
(Section 620-020-020).

2.02 *Before starting any lead sheath cable removal operation, refer to Section 620-100-010. All requirements in the section for protection against occupational exposure to lead dust must be strictly observed.*

2.03 All personnel involved in removing underground cable should also be familiar with the operation of the equipment and construction apparatus that is to be used.

2.04 *Practice good housekeeping.* Arrange material in the vicinity of the manhole so it will not fall into the manhole or unnecessarily interfere with pedestrian or vehicular traffic.

2.05 If work is done with a truck not equipped with an overhead exhaust and the truck is stationed near a manhole, direct the exhaust gases of the truck away from the manhole opening.

2.06 Locate gasoline or propane-driven generators, blowers, pumps, etc, so that the exhaust fumes will not blow into the manhole.

2.07 Locate the blower so its intake will not draw exhaust gases from the truck or other equipment and discharge them into the manhole.

2.08 Inspect manhole ladders each time before using and replace promptly when found in a deteriorated condition. When the bottom of the ladder is in water or otherwise invisible, remove the ladder for inspection.

2.09 Exercise caution when entering or leaving a manhole, particularly when located on a traveled thoroughfare. Always use a ladder when entering or leaving a manhole. Keep hands free of material or tools when ascending or descending a ladder. *Never use a cable, coil case, or apparatus case as a step.*

2.10 When working in a manhole, exercise care to prevent damage to cables while setting up the removal apparatus or while using tools of any kind.

2.11 *Do not place hands on a moving winch line.*

2.12 *Employees shall not remain in manholes during cable removal operations.* Should it be necessary to check for proper alignment of equipment prior to starting the removal operation, the employee can enter the manhole if:

(a) The employee remains clear of the equipment and outside the angle formed by the pulling line.

(b) The wire (and winch line when used in conjunction with the removal unit) has only enough tension to provide normal alignment of the equipment.

2.13 Empty reels delivered to the job or full reels that are not to be removed immediately should be securely blocked or secured to a pole or other substantial support to prevent rolling or movement by unauthorized persons. Do not leave them on a grade or in a traffic lane if this can be avoided. When it is necessary to leave a reel on a grade, cant it against the curb and block it so that it cannot roll.

2.14 Mark cable reels left on streets or highways overnight in accordance with local regulations. Otherwise, barricade and light with flasher lights not later than one-half hour before sunset.

3. PRESURVEY

3.01 The route of the cable to be removed should be presurveyed, giving special attention to the following:

(a) Location of manholes in regard to traffic conditions

(b) Preferred direction of pull

(c) Special permits that may be required

(d) "No Stopping" or "No Parking" areas (Note the hours that removal equipment can be located on the street)

(e) Safeguarding work area including any special precautions required because of traffic or pedestrians

- (f) Manhole facilities and conditions including:
- (1) Fluid in manholes, eg, water, gasoline, oil.
 - (2) Pumping requirements:
 - (a) **Water:** Additional pumps required because of the heavy flow of water into the manhole. Additional drain hoses in areas where proper drain facilities are not available. Salt to prevent icing on sidewalks, streets, or highways during cold weather.
 - (b) **Gasoline or oil** (Section 620-145-010): Do not pump until all safety precautions have been taken to protect the craft person and public.
 - (3) Accessibility of cable to be removed with reference to duct position, protection of other cables in manhole, etc.
 - (4) Estimate, if possible, as to light, average, or hard pull as a guide to pulling equipment that may be necessary.
- (g) Need for ropeline or pulling wire to be left in duct coincident with cable removal
- (h) Setup for cable removal unit and truck
- (i) Equipment needed in manhole (quadrant block, pulling frame, cable sheave shackle, etc).
- 3.02** Before the cable to be removed is cut:
- (a) Verify with the assignment office that all working pairs have been transferred.
 - (b) Verify that the cable has been cut away from the main cable if the cable to be removed is multiplied with a working cable.
 - (c) **Positively identify the cable at all manhole locations.** One method is to use an appropriate test set to place a signal on a pair in the cable. The cable can then be identified at each manhole location with an exploring coil (Section 634-305-505).
- 4. DESCRIPTION**
- Hogg-Davis Cable Removal Unit**
- 4.01** The Hogg-Davis cable removal unit (Fig. 1) is a power winding unit mounted on a single spindle cable reel trailer. The trailer incorporates hydraulically operated lifting assemblies with spindle bar supports and mechanical locking devices, storage compartments, wheel chock racks, two quick-release rear ground props, and trailer tongue with hydraulically operated swivel caster assembly and heavy duty towing eye. The unit is 15 feet 4 inches long and 8 feet wide.

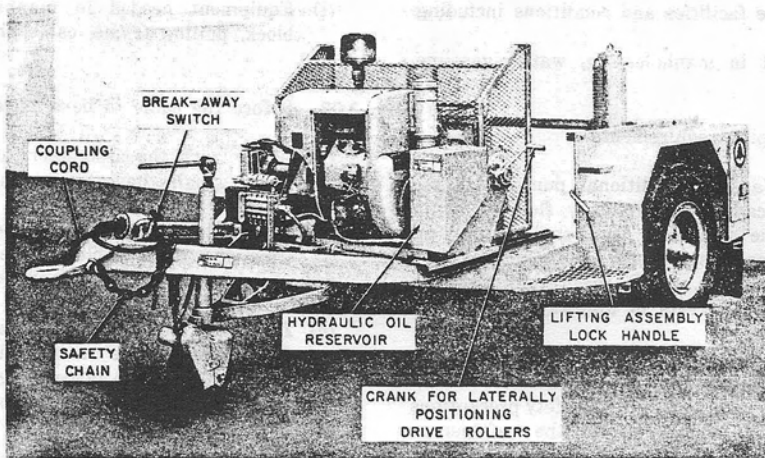


Fig. 1—Hogg-Davis Cable Removal Unit

4.02 There are two models of the Hogg-Davis unit that are most commonly used in the Bell System. One model will accommodate cable reels with diameters of 84 inches or less, which includes the 420Y cable reel and smaller reels. The other model will accommodate cable reels with diameters of 96 inches or less, which includes the 487 cable reel and smaller reels. A third model is available that will accommodate cable reels with diameters of 108 inches or less and reel widths of 56 inches or less. The units are capable of handling reels of cable weighing 13,500 pounds. The units will develop a maximum of 10,000 pounds pull at the drum.

AT-8490 Cable Take-Up Drive

4.03 The AT-8490 cable take-up drive can be mounted on a Truco or McCabe Powers hydraulic loading cable reel trailer. It is operated from the truck hydraulic system at the pole puller outlet. For vehicles not fitted with a pole puller, the truck hydraulic derrick system can be used if a valve is added.

4.04 The AT-8490 cable take-up drive (Fig. 2) consists of a reel drive sprocket, a drive chain, a chain guard, helical gear reducer, a hydraulic motor, a flexible coupling, and a frame. The complete unit has a total weight of approximately 260 pounds.

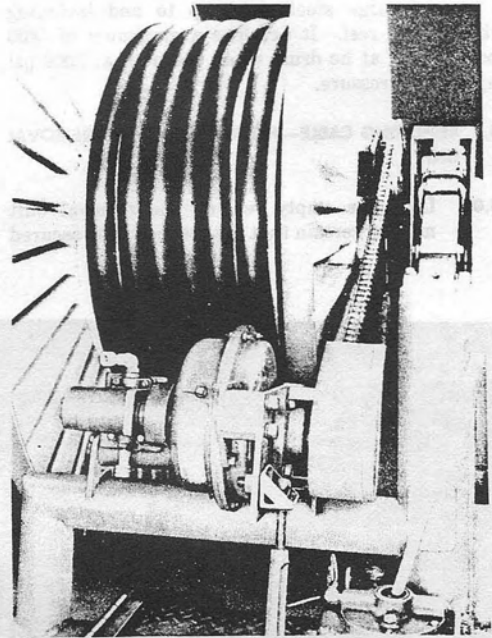


Fig. 2—AT-8490 Cable Take-Up Drive

4.05 The AT-8490 take-up drive can be used with all large steel reels, up to and including the No. 420 reel. It develops a maximum of 5000 pounds pull at the drum when operated at 2000 psi hydraulic pressure.

5. REMOVING CABLE—HOGG-DAVIS CABLE REMOVAL UNIT

5.01 Load the empty reel on the removal unit making certain that the reel has been secured

in position on the spindle bar and that the reel flanges are centered on and in contact with the drive rollers.

Pulling End Preparations

5.02 Set up the construction equipment in the manhole, utilizing a quadrant block (Fig. 3), cable sheave (Fig. 4), or pulling frame (Fig. 5).

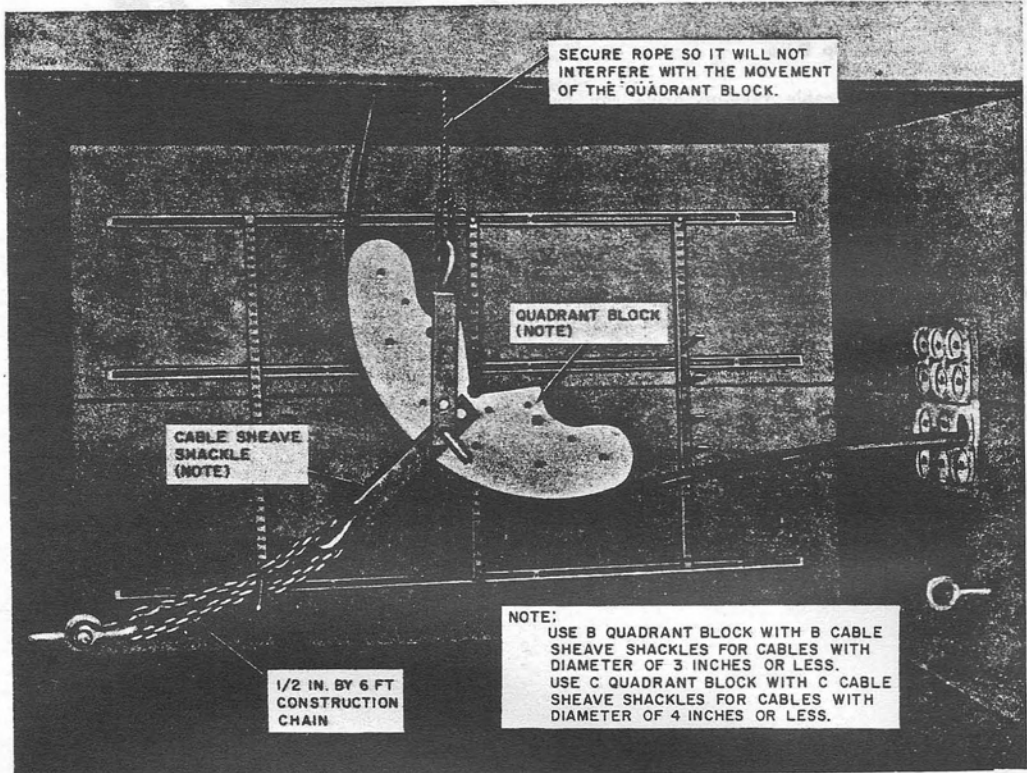


Fig. 3—Pulling Arrangement Using Quadrant Block and Cable Sheave Shackles

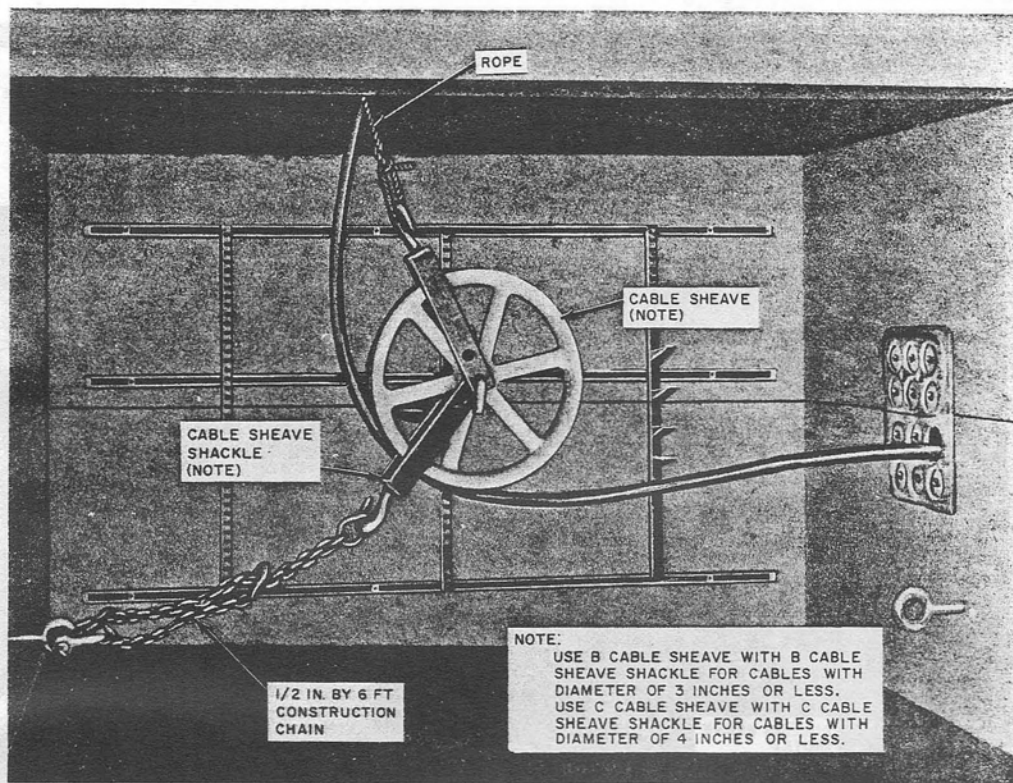


Fig. 4—Pulling Arrangement Using Cable Sheave and Cable Sheave Shackles

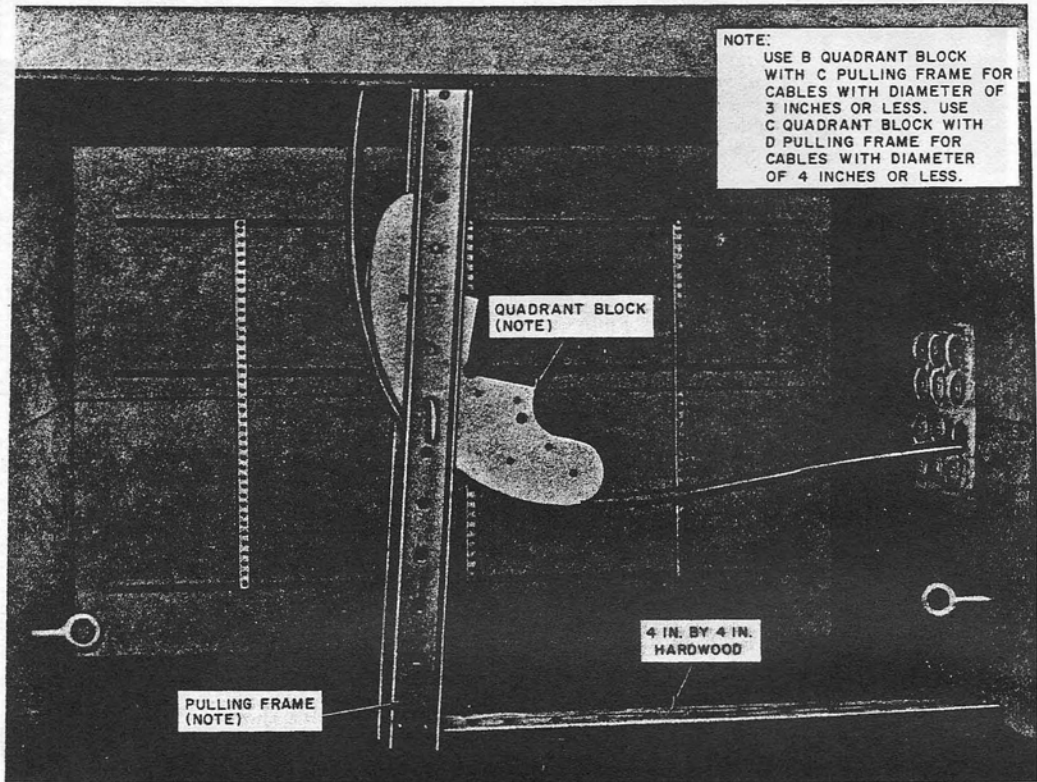
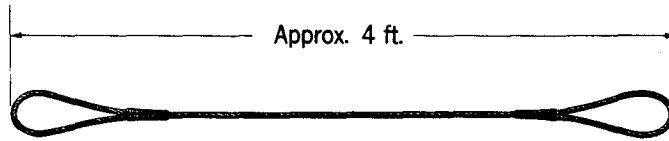


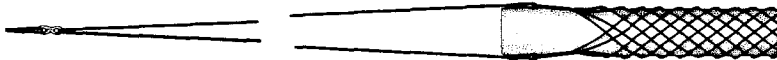
Fig. 5—Pulling Arrangement Using Pulling Frame and Quadrant Block

5.03 Unrack the cable to be removed and with a wire rope sling, a cable removing grip, or a core hitch (Fig. 6), secure the cable to a wire rope line. The wire rope line must be long enough

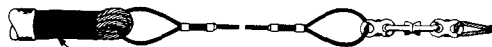
to reach from the cable end to the reel on the cable removal unit and to permit taking at least one full turn around the drum of the cable reel.



A—WIRE ROPE SLING



B—CABLE REMOVING GRIP



MAKE TIGHT SERVING OF HOUSELINE AROUND WIRES.
COVER ENTIRE HITCH WITH SEVERAL WRAPPINGS OF
TAPE AND COAT WITH CABLE LUBRICANT.

C—CORE HITCH

Fig. 6—Wire Rope Sling, Cable Removal Grip, and Core Hitch

5.04 Position the removal unit about 5 feet from the edge of the manhole from which the pull is to be made (Fig. 7). The unit should be in line with the direction of the cable section being

removed and should be centered on the manhole opening. Bring the rear ground props in firm contact with the ground and place wheel chocks.

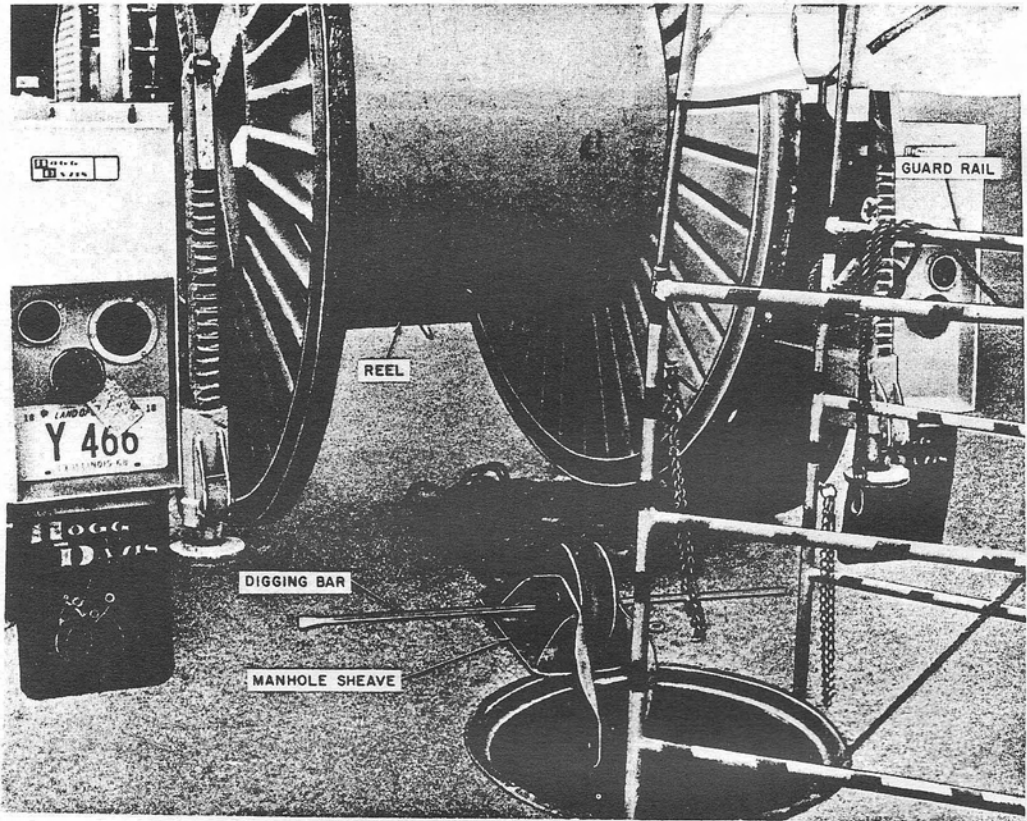


Fig. 7—Cable Removal Unit in Position for Starting Pull

5.05 Set a quadrant block or C manhole sheave on the edge of the manhole frame (Fig. 7) and route the cable and wire rope line through the blocks or sheaves. Take at least a full turn of the rope around the reel drum (over the top of the drum) before securing it through the cable port on the reel to the crossarm as shown in Fig. 8.



Only standard toroidal reels with X-, Y-, or T-crossarms or structural reels should be used when removing underground cables. (See Section

626-030-005.) A heavy load applied to the drum of a reel having a single piece crossarm can result in crushing the reel drum.

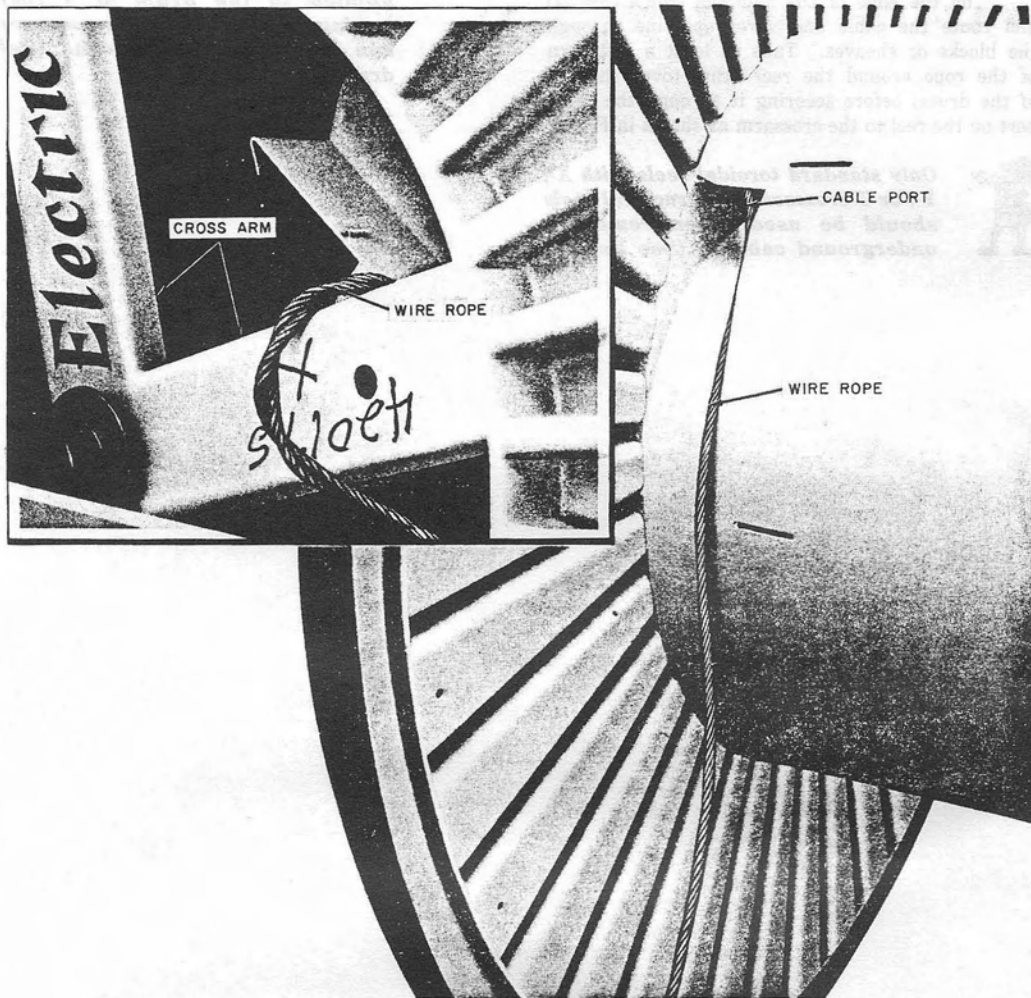


Fig. 8—Wire Rope Secured to Cable Reel

Distant End Preparation

5.06 Make certain that the cable has been unracked and that the end is free and will not become entangled with other cables in the manhole. If a pulling line or fish line is to be left in the duct coincident with the cable removal, secure the line to the cable end, making sure that it will pay out freely.

Removal Operation

5.07 Start the engine of the cable removal unit, set the throttle at about 1/3 speed, place

the transmission shift lever in low position, place the power winding unit (reel direction control) in forward position and take up all slack in the wire rope line to the reel. Check for proper alignment of equipment. Start the pull.

Note: If difficulty is experienced in starting the pull, the truck winch line can be temporarily secured to the wire rope line with a strand puller as shown in Fig. 9. Operate the truck winch and power winding unit together to start the pull. Remove the strand puller and continue the pull with the cable removal unit.

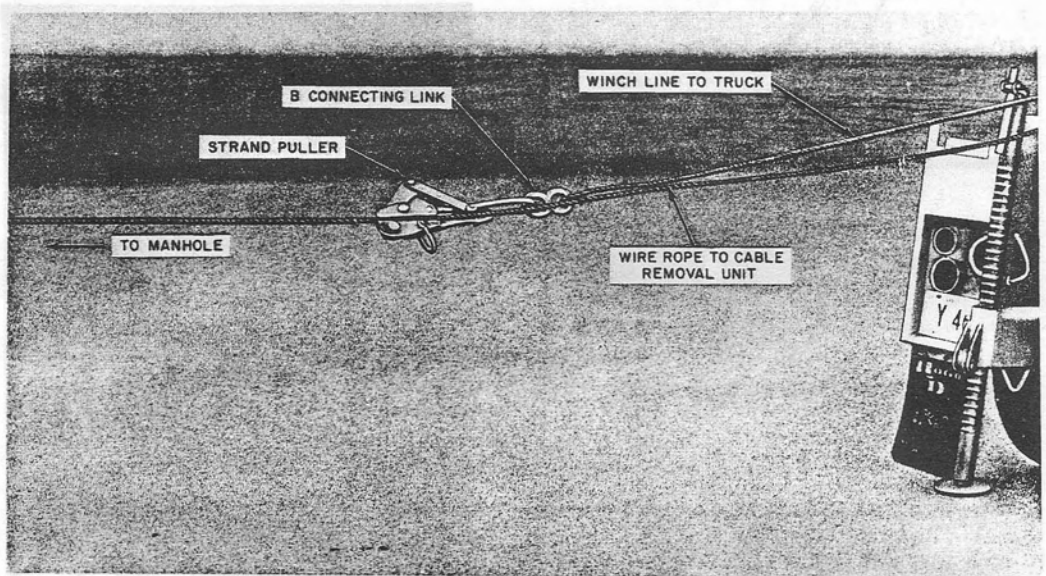


Fig. 9—Winch Line Attached to Wire Rope

5.08 After the pull has been started, the removal unit may be moved forward 40 to 50 feet with the truck (Fig. 10) to allow the cable to level-wind freely. Move the truck very slowly with the unit still pulling. After the desired distance

has been reached, stop the pull, reset the ground props and wheel chocks, and then restart the pull with the power winding unit. Select the transmission setting and engine speed that will give a steady pull.

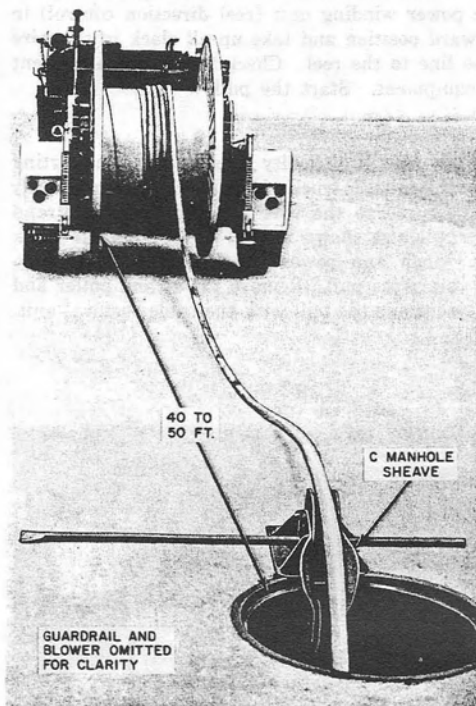


Fig. 10—Repositioning the Removal Unit

5.09 If the wire rope line can be scrapped it can be left on the reel and the cable removal operation continued until all cable is wound on the reel. Otherwise when about 2 or 3 full turns of cable have been wound on the reel, stop the pull, remove the wire rope, secure the cable end in the cable port on the reel, and then restart the cable removal operation. Do not attempt to level the cable while the removal unit is operating. If leveling is necessary, stop the pull, obtain slack, level, and restart the pull.

5.10 If a pulling wire or fish line has been left in the vacated duct, secure it to the cable rack at each manhole.

6. REMOVING CABLE—AT-8490 CABLE TAKE-UP DRIVE

Note: The AT-8490 cable take-up drive should be used only where a relatively easy

pull is anticipated. **Maximum** pull at the drum on a 420 cable reel is approximately 5000 pounds.

6.01 Position an empty reel at the rear of the trailer. Place the spindle through the center holes in the reel crossarms. Place the sprocket (Fig. 11) on the spindle bar so the reel crossarm will engage the sprocket. Lock the sprocket to the reel crossarm with two connecting pins. Place the chain on the sprocket to engage the sprocket teeth in the chain links as shown in Fig. 12. Load the reel on the trailer.

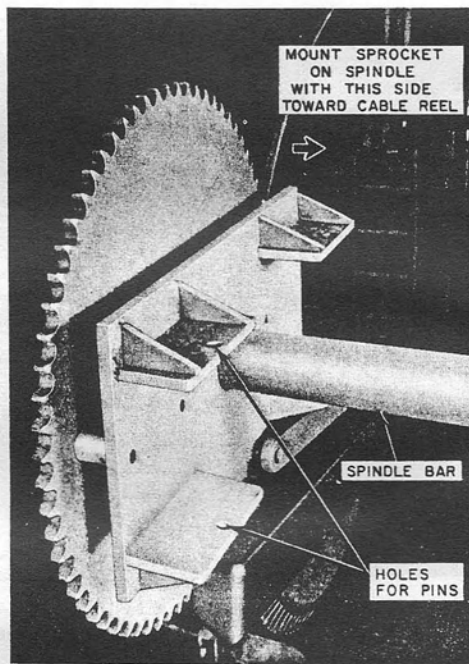


Fig. 11—Reel Drive (Sprocket)

201 Remove the air from the system (Fig. 12) and fill the drive unit toward the chain end to allow the chain to be placed on the drive sprocket. Before the drive sprocket is placed in its original position and replace the air in the drive unit. The sprocket on the drive unit is a...

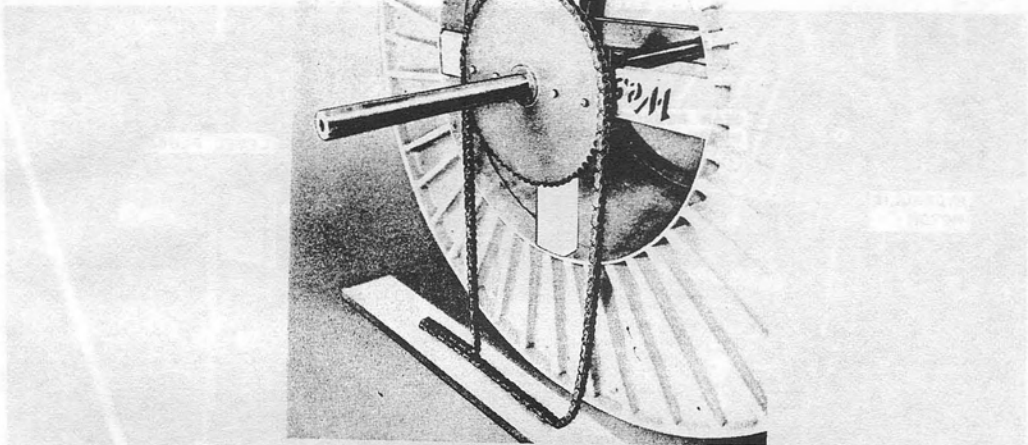


Fig. 12—Chain in Place on Sprocket

6.02 Remove the pin from the torque arm (Fig. 13) and tilt the drive unit toward the cable reel to allow the chain to be placed on the drive sprocket under the chain guard. Return the drive unit to its original position and replace the pin. Be sure the sprocket on the drive unit is aligned with the

large sprocket on the cable reel. The sprockets are aligned by sliding the reel on the spindle bar. After the sprockets have been aligned, lock the reel in place with two cable reel spacers provided with the drive mounting.

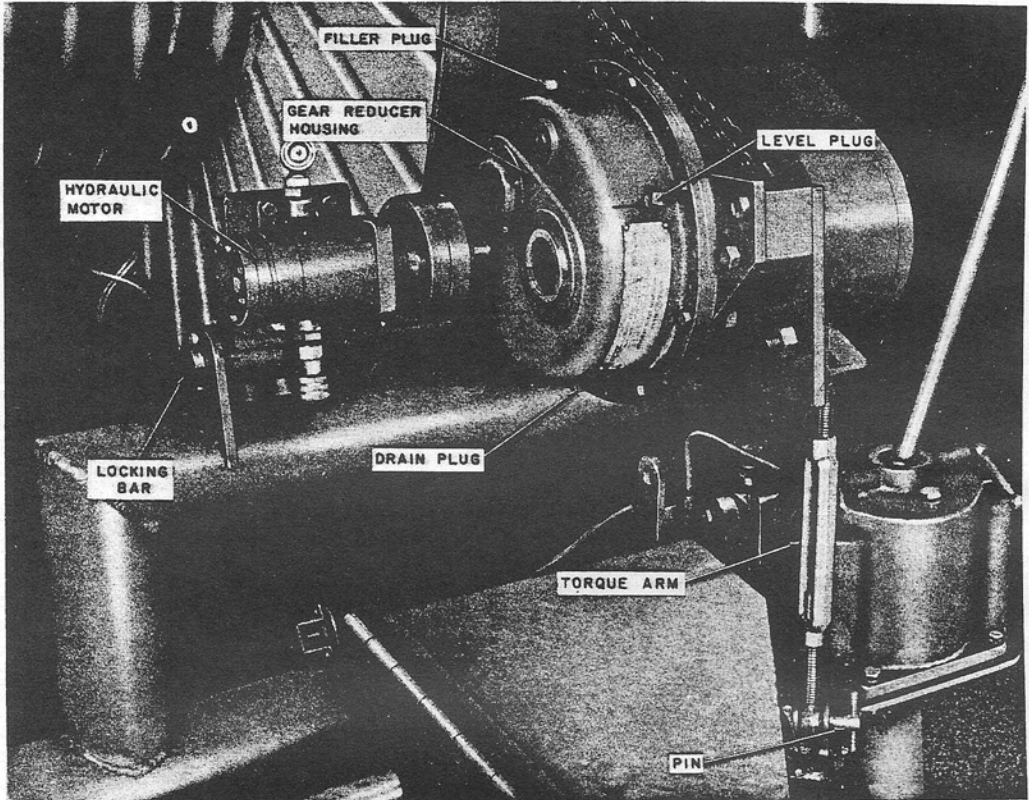


Fig. 13—Cable Take-Up Drive Unit

Pulling End Preparation

- 6.03 Set up the construction equipment as outlined in paragraph 5.02.
- 6.04 Position the truck about 5 feet from the edge of the manhole. The truck should be faced toward the direction of the cable section

being removed and should be centered on the manhole opening.

- 6.05 Unrack the cable to be removed and with a wire rope sling, a cable removing grip, or a core hitch (Fig. 6) secure the cable to the winch line. Set a quadrant block or C manhole sheave on the edge of the manhole frame (Fig. 14).

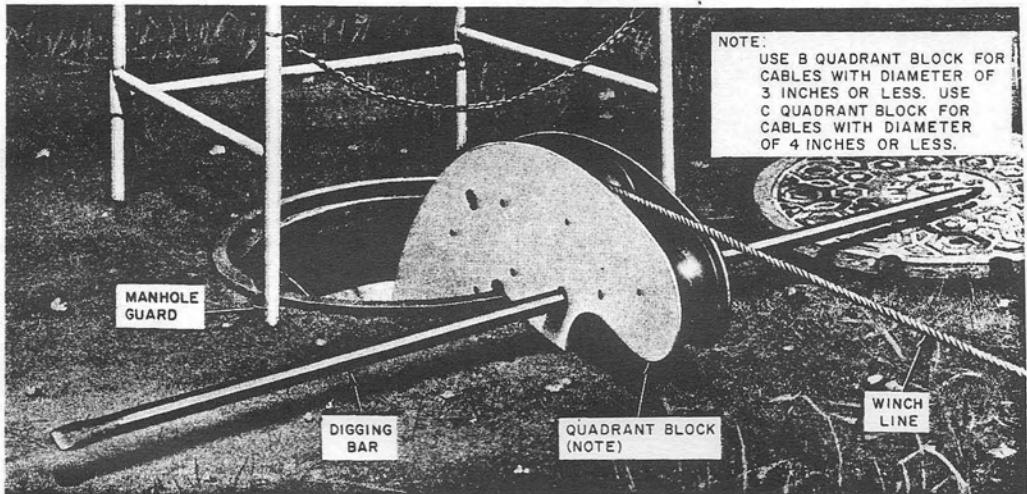


Fig. 14—Pulling Arrangement Using Quadrant Block

Distant End Preparation

- 6.06 Make certain the cable has been unracked and that the end is free and will not become entangled with other cables in the manhole. If a pulling line or fish line is to be left in the duct coincident with the cable removal, secure the line to the cable end, making sure it will pay out freely.

Removal Operation

- 6.07 Take up on the winch, pulling sufficient cable so at least one full turn can be placed around the drum of the reel. Stop the winch and remove the winch line from the cable.

- 6.08 Position the trailer about 5 feet from the edge of the manhole from which the pull is to be made. The trailer should be faced toward the direction of the cable section being removed and should be centered on the manhole opening.

- 6.09 Connect the flexible hoses to the truck hydraulic system outlets and to the couplings on the drive unit. Set the ground props, place wheel chocks, and set hand brakes on truck.

- 6.10 Route the cable (or wire rope if it can be junked) over the top of the drum taking at least one full turn around the drum before securing it through the cable port to the crossarm.

6.11 Start the truck engine, engage the hydraulic system, and start winding the cable on the reel. Continue the removal operation until all cable has been wound on the reel. ***Do not attempt to level the cable while winding it on a reel. If the cable requires leveling, stop***

the pull, obtain slack, and level the cable manually.

6.12 If a pulling wire or fish line has been left in the vacated duct, secure it to the cable rack at each manhole.