

A.B. CHANCE
POWER CAPSTAN CABLE PULLER
(EMERSON ELECTRIC COMPANY)

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1. GENERAL

1.01 This section describes the physical and functional characteristics of the Chance Series 2000 Cable Puller System.

1.02 The Chance Series 2000 Cable Puller System is designed to smoothly pull communications cable through conduit in indoor applications, from manhole to manhole, and/or from manhole to riser pole and/or buildings.

2. DESCRIPTION

2.01 The Cable Puller System is a powered capstan pulling system available in either of three (3) power sources:

- Electric, 120 volt or 240 Volt
- Hydraulic
- Gasoline

Operated by foot control, the capstan comes equipped with a capstan mounting bracket, adjustable stand, 2 conduit flanges, 5 sizes of conduit reaction fittings, 2-45° curved, aluminum cable troughs, and 1 straight aluminum cable trough. (Fig.-1)

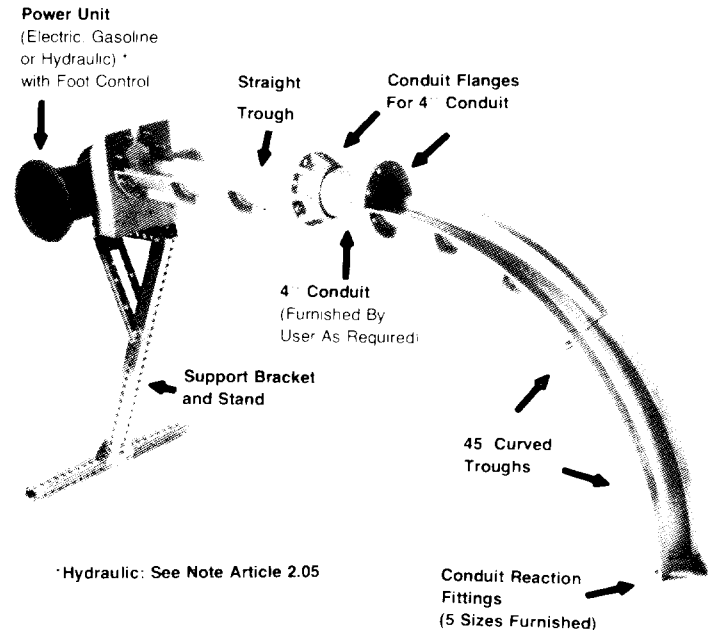


Fig.-1

2.02 Cable is pulled through conduit by means of a pull rope or line attached to the pulling eye, cable grip, or core hitch attached to the cable. Pulling tension is developed by coiling the pull rope around the capstan head a sufficient number of turns until pulling tension is developed. The cable pulling system has a maximum working load of 3000 pounds when equipped with the standard capstan drum (shown).

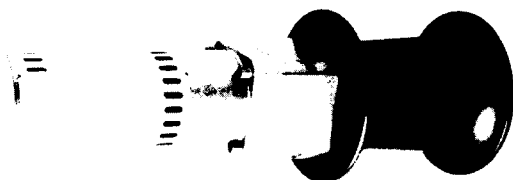
COMPONENTS

A. Optional Power Drives

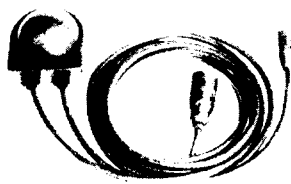
2.03 Electric Power Units include:

- Abrasion resistant capstan.

- Aluminum gearcase assembly with bolt mount for attachment to puller bracket.
- 25 feet per minute rope speed.
- 120 volt AC/DC (universal) electric motor, rated 20 amps continuous (Fig.-2) 240 volt rated 10 amps.
- Watertight, "deadman" foot control switch. (Fig.-2)



C417-0314
Basic Electric Power Unit

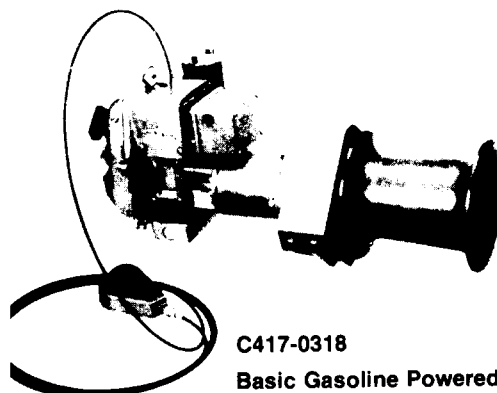


C417-0337
Electric Foot Control

Fig.-2

2.04 Gasoline Power Unit includes:

- 2 cycle, 7 HP gasoline engine.
- Abrasion resistant capstan.
- Aluminum gearcase assembly with bolt mount for attachment to puller bracket.
- 28 feet per minute rope speed.
- Foot operated throttle control with 15' of sealed, remote actuated cable. (Fig.-3)



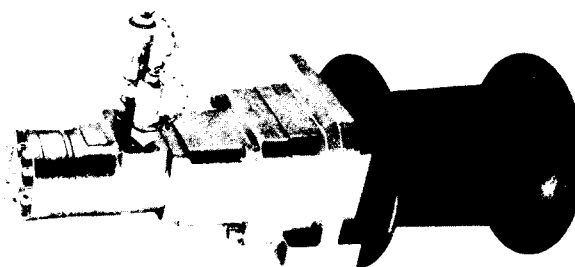
C417-0318
Basic Gasoline Powered Unit

C417-0339
Gasoline Foot Assembly

Fig.-3

2.05 Hydraulic Power Unit includes:

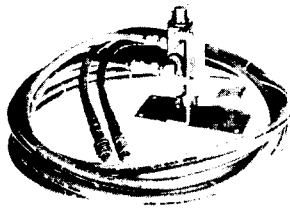
- Hydraulic motor with maximum pressure of 2000 P.S.I. max. flow of 15 gal. per minute.
- Abrasion resistant capstan.
- Output housing with bolt mount for attachment to puller bracket. (Fig.-4)



C417-0321
Bolt Mounted Unit

Fig.-4

- Note - Hydraulic Foot Assembly is optional, additional accessory to be ordered separately. Consists of valve, 15' 3/8" supply and return hose with quick connect couplings. (Fig.-5)



C417-0338
Hydraulic Foot Assembly

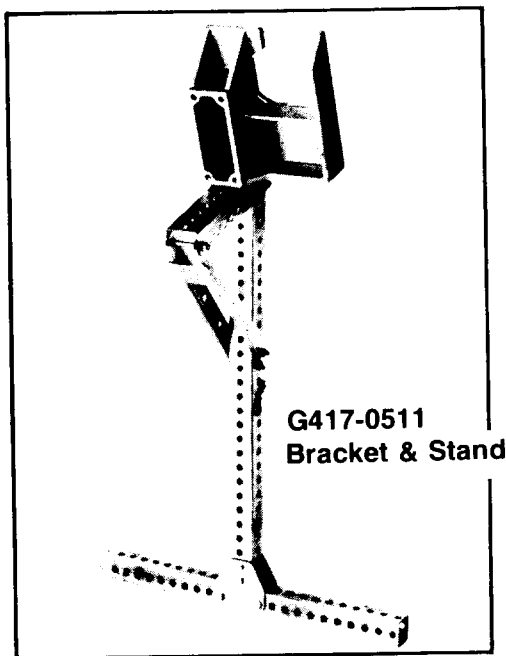
Fig.-5

2.06 Other optional power units available upon special order include:

- 240 volt AC

B. Pulling Accessories

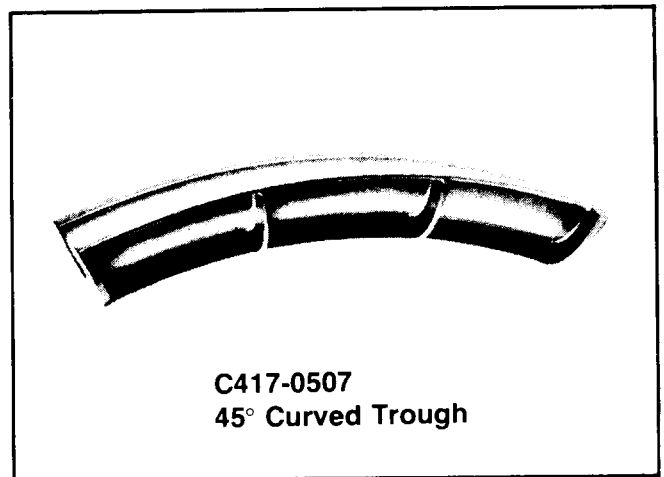
2.07 Bracket and Stand - Cast aluminum bracket and tubular steel stand. Telescoping leg adjusts from 3½' to 5' for proper alignment with conduit. (Fig.-6)



G417-0511
Bracket & Stand

Fig.-6

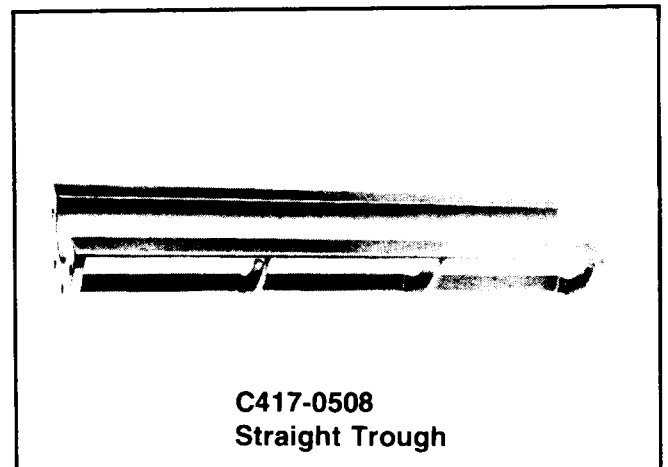
2.08 Two 45° cable troughs - cast aluminum, curved troughs accept cable diameter up to 4". Two 45° troughs can be bolted together to form a 90° sweep. (Fig.-7)



C417-0507
45° Curved Trough

Fig.-7

2.09 Straight cast aluminum cable trough accepts cable up to 4" in diameter. Up to four straight troughs may be bolted together in tandem to gain additional cable lengths. (Fig.-8)



C417-0508
Straight Trough

Fig.-8

2.10 Conduit Flanges - Conduit flanges bolt to the straight or curved troughs. They allow up to 20' of 4" conduit to be inserted as a spacer to gain additional cable length. Flanges have set screws for seating and tightening in conduit. (Fig.-9) (Conduit is secured locally.)



**C417-0509
Conduit Flanges**

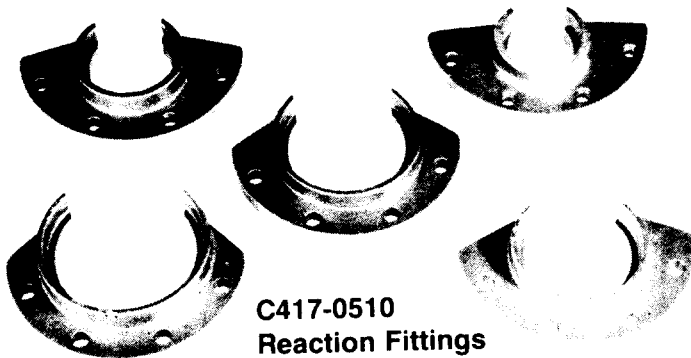
Fig.-9

2.11 Reaction Fittings - A set of five reaction fittings for conduit sizes

of:

- 2"
- 2½"
- 3"
- 3½"
- 4"

Fittings bolt to the trough, and fit over the end of the conduit to provide a positive seating and pulling position (Fig.-10)

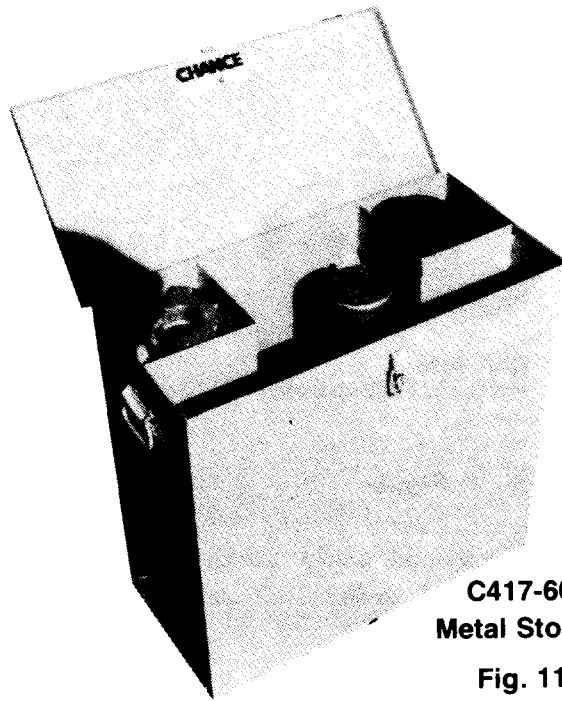


**C417-0510
Reaction Fittings**

Fig.-10

C. Optional Accessories

2.12 Metal Tool Box - Heavy duty steel storage box for storing cable puller components. All heavy duty construction with hinged top, lifting handles, hasp closure for padlocking. (Fig.-11)



**C417-6021
Metal Storage Box**

Fig. 11

2.13 4000 pound Capstan Drum - Optional capstan drum provides working loads up to 4000 pounds.

2.14 Manhole Bracket - Adjustable tubular steel bracket fits various manhole diameter openings. Seats positively into lip of manhole frame. Provides 360° rotational capability. Flange on cable troughs bolts to manhole bracket providing for adjustable positions. Allows sufficient room for ventilating hose. (Fig.-12)

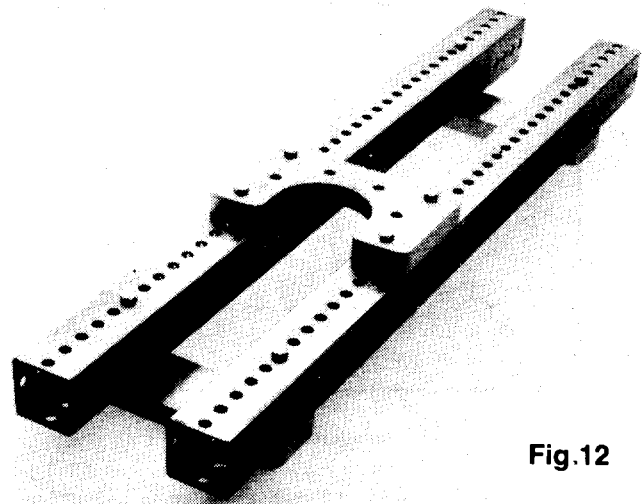
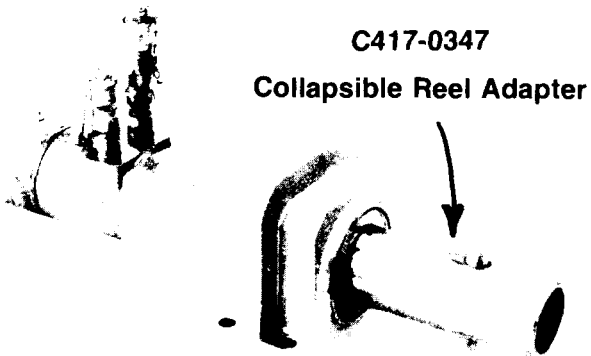


Fig.12

2.15 "Collapsible reel adapter - converts the Hydraulic, Electric and Gasoline power units to accept the standard collapsible reel commonly used on mechanical winch extended shafts. (Fig.-13)

**Fig.-13**

- 2.16 A capstan drum is available for use with the reel adapter (Fig.-14)



C417-0341
Fig. 14

D. Weights

TABLE A

Electric Powered Puller Assembly	155 lbs./69.8 Kg
Power Unit Only	57 lbs./25.7 Kg.
Gasoline Powered Puller Assembly	155 lbs./69.8 Kg
Power Unit Only	52 lbs./23.4 Kg.
Hydraulic Powered Puller Assembly	155 lbs./69.8 Kg
Power Unit Only	53 lbs./23.9 Kg.

3. ASSEMBLY

3.01 The various component accessories of the cable puller assembly form a kit, the parts of which can be used, or not used to suit the requirements of the cable pulling task required.

3.02 The aluminum mounting bracket bolts to the tubular steel stand with four (4) bolts. The attitude of the mounting bracket can be adjusted to suit the cable pulling task at hand.

3.03 The gearcase assembly integral with the power unit has a "J" type bolt

mount which interfaces with the aluminum mounting bracket. Four (4) mounting bolts are furnished.

3.04 The tubular steel mounting stand has a telescoping leg to adjust the height of the power unit to insure proper alignment with the conduit opening. Adjustment is 3½' to 5'.

3.05 The straight cast aluminum trough can be used when additional exposed cable lead or slack is required. The straight trough bolts to the aluminum mounting bracket on one end and, if required, can be bolted to either the mounting flange of the 45° cable trough or to the conduit flanges. The straight trough will accept cable diameters up to 4".

3.06 If required, additional cable lead or slack can be obtained by using the two (2) conduit flanges. These can be bolted into the pulling assembly between cable trough segments. The flanges will allow up to 20' of 4" steel or aluminum conduit to be installed into the pulling assembly. This provides a spacer between the power pulling unit and the conduit opening, and allows a comparable length of additional cable lead or slack to be pulled. Thus, the cable pull remains continuous, pulling on the cable eye. No pulling need be done in incremental steps using temporary cable clamps installed on the cable itself. The conduit ends seat firmly and positively into the ferrule in the conduit flanges and are secured by tightening the two (2) set screws on the flanges. It is recommended that conduit secured locally be in five foot lengths for ease in handling.

3.07 The conduit flanges used with conduit allow for 180° rotation of the 45° curved cable trough by loosening the two (2) set screws in one of the flanges, positioning the 45° curved cable trough as desired, then tightening the set screws.

3.08 The reaction fittings fit over the end of the conduit positioning and stabilizing the pulling assembly. The conduit end stub fits inside the cast aluminum reaction fitting. (Fig.-1)

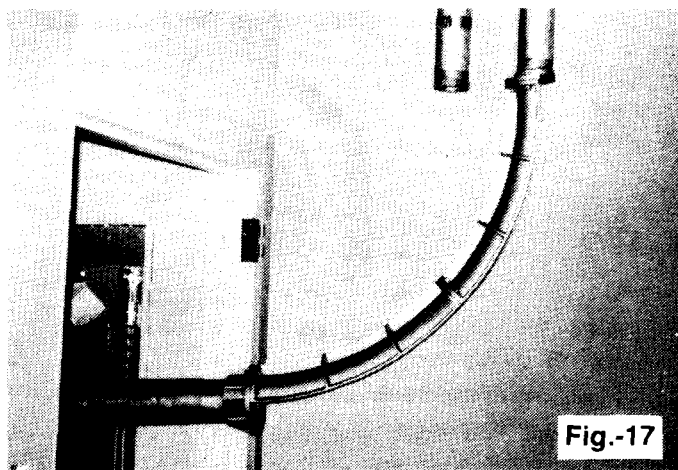
3.09 For manhole cable pulling the manhole bracket is used to support the cable trough over the manhole opening. The manhole bracket has two (2) adjustable aluminum positioning guides, allowing the bracket to seat firmly and positively into the inner lip of the manhole frame, and providing additional bearing surface. The adjustable guides allow use with a wide variety of manhole diameters.

3.10 An aluminum mounting shoe interfaces between the manhole bracket and the mounting flange of the cable trough. The mounting shoe is provided with bolt holes for attaching to the manhole bracket at various positions. This allows the cable trough to be best positioned over the manhole opening for the cable pulling operation.

4. OPERATION

4.01 Assemble the cable puller assembly to best adapt to cable pulling operation involved. For pulling cable up through conduit stubs set in the floor, assemble as per Fig.-1.

4.02 For conduit runs emerging from overhead, downward, assemble the capstan puller assembly, rotating the 45° cable troughs 180° from the position shown in Fig.-1. Seat the conduit reaction fitting over the end of the conduit. Secure the cable through to a suitable support (Fig.-17). Attachment holes for this purpose are located in the backbone rib section of the cable troughs.

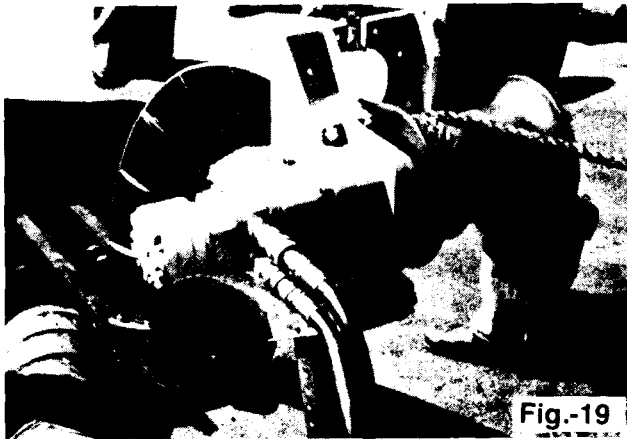


4.03 If cable slack or lead is not required, the cable puller assembly can be assembled and mounted as best fits the pulling condition. Thus, if no slack is required, the cable puller assembly can be mounted on a floor conduit stub as per Fig.-18.



4.04 The modular, component concept of the cable puller assembly allows for a wide variety of mounting configurations. By improvising and adapting most cable pulling situations can utilize the cable puller assembly. Extra components can be ordered separately as required.

4.05 For manhole cable pulling situations, mount the cable pulling assembly as required to the manhole bracket (Fig.-19).



4.06 3/8" Poly dacron or 5/8" manila rope should be used for cable pulling. These sizes will give 4800 minimum break load. Pulling friction generates heat and can cause softening of nylon and polypropylene ropes due to their low melting point. Wire cable should not be used as it can damage the cable troughs and the hardened anodized abrasion resistant capstan drum surface.

4.07 To pull cable, take only enough turns on the capstan drum with the pull rope to develop pulling friction and tension. Ideally, little or no effort will be required by the capstan operator to control pulling rope (Fig.-19), (Fig.-20).



Fig.-20

4.08 The Power unit is controlled by the capstan operator by means of the foot switch (Fig.-2), (Fig.-3), (Fig.-5).

4.09 The capstan drum head is a hard coated, anodized, heat treated aluminum surface which provides a very abrasion resistant surface. By releasing "finger-tip" tension on the pull rope, the capstan operator can allow the pull rope to "free wheel" on the capstan drum, relieving the pulling tension, and stopping the cable pull. Pulling tension can be reinstated instantly by merely again imposing "finger-tip" tension on the pull rope. (Fig.-20). This provides a second pull rope control in addition to the foot control.

4.10 The power units are single speed, single direction, will not reverse for safety. In those cable pulling situations where reversing is required, such as pulling cable in vertical risers or conduit in multi-story buildings, reversing can be accomplished by manipulating rope slippage on the capstan drum head. Reversing may be required on vertical pulls to allow for and accumulate cable slack at lower levels to facilitate cable splicing and connections. Reversing can be accomplished by the capstan operator manipulating the "finger-tip" tension on the pull rope. By releasing the operator tension the weight of the cable will allow a reverse slippage. This reverse slippage can be controlled by changing the operator tension on the pull rope, and by means of the power unit controlled through the foot control. Very precise alignment can be achieved by this technique.

CAUTION - POSSIBILITY FOR PERSONAL INJURY:
The equipment covered in this instruction should be installed, used, and serviced only by competent personnel familiar with and following good work practices and safety procedures.

This equipment is for use by such personnel and is not intended as a substitute for adequate training and experience in safe procedures for this type of equipment.

5. MAINTENANCE AND REPAIR

5.01 This equipment when used within its capabilities, and normal operating conditions should be relatively maintenance free. Do not perform any repair work on the cable puller motor or gear case.

5.02 Foot controls and cords may be field repaired.

5.03 The power unit gear case is sealed, with all gears and bearings pregreased at the factory. No oiling or greasing is required.

5.04 In the event repairs or maintenance work may be required other than mentioned in proceeding paragraphs, please contact: A.B. Chance Division, Emerson Electric Company, 1670 Fenpark Drive, Fenton, Missouri, 63026.