ANCHOR TOOLING

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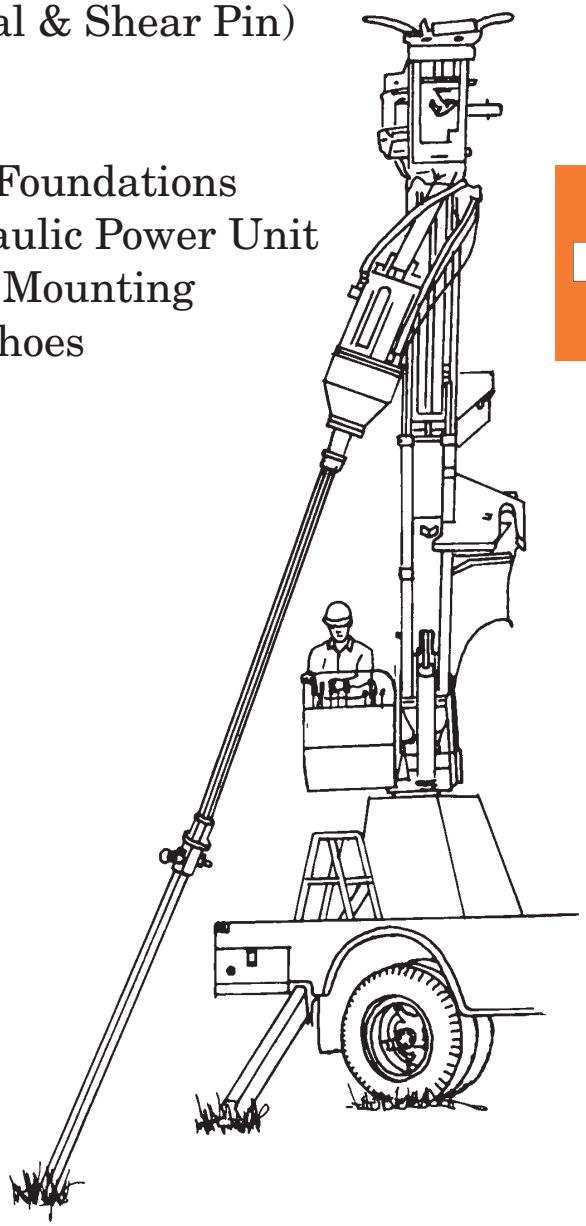
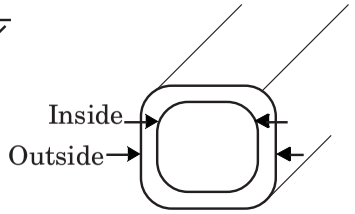
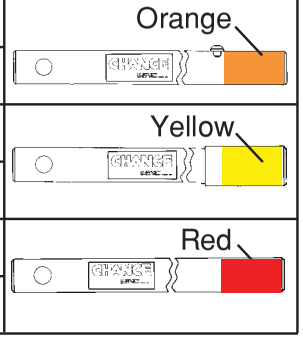


How to Match CHANCE® Anchors and Installing Wrenches

PISA® 6 Anchor (formerly PISA® 5 Anchor)	PISA® 7 Anchor	Standard-Strength PISA® Anchor	Mid-Strength PISA® Anchor	C102-52XX Series Tough One® Anchor - Small Hub	C102-52XX Series Tough One® Anchor - Small Hub	C102-50XX Series Tough One® Anchor - Large Hub	C102-50XX Series Tough One® Anchor - Large Hub	Installing Wrench Catalog Number	Length (ft.)	Maximum Installing Torque Rating (ft-lbs)	Outside Dim. (inches)	Inside Dim. (inches)
								*C102-1583	7'	10,000	2.16	1.46
								*C102-1595	3½'	10,000	2.16	1.46
								*C303-1064	7'	10,000	2.44	1.54
								*C303-1063	3½'	10,000	2.44	1.54
								**C303-0983	7'	15,000	2.44	1.54
								**C303-0982	3½'	15,000	2.44	1.54
6,000	7,000	4,000	6,000	8,000	10,000	8,000	15,000					



Inside and outside dimensions correspond to the color coded end of installing wrench.



Maximum Installation Torque Rating (ft-lbs)

*Fits Locking Dog Assembly CC303-0069HD

** Fits Locking Dog Assembly CC303-0981

NOTE: Because Hubbell has a policy of continuous product improvement, we reserve the right to change design and specifications without notice.

HUBBELL® POWER SYSTEMS, INC. CHANCE®

Bulletin 04-9114AT
A&J Rev 6/96

STANDARD and HYBRID PISA® Anchor Installing Tools
(For installing torques up to 10,000 ft.-lb.)

A complete tool system consists of: Kelly bar adapter, torque indicator, locking dog assembly and drive-end assembly. For instructions for selecting the proper Kelly bar adapter, see page 4A-5.

•Convertible to Extension Use
Extension assemblies can be added where soil conditions dictate that anchors be set more than one rod length deep or where digger to ground clearances are limited.

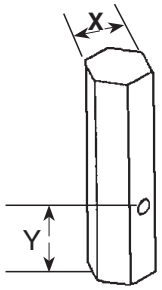
•Transmits Torque to Anchor Core
The wrench transmits the torque from the Kelly bar of the digger to the hub of the Power-Installed Screw Anchor so that the anchor rod need be only large enough in diameter to support the guy load.

STANDARD Kelly Bar Adapter with Bent Arm Pin (5¼" Bolt Circle)

Part No.	Kelly Bar Shape	Kelly Bar Dimension X	Y	Z	Wt. ea., lb.
630013	Hex	2"	5"	6⅛"	10
630011HD	Hex	2½"	4¼"	8⅛"	18
630012HD	Hex	2⅝"	4¼"	8⅛"	18
630014	Square	2¼"	5⅞"	7"	13¼
630015	Square	2½"	2¾"	7"	13¼
630016	Square	2¼"	2¼"	3½"	10
630017	Square	2½"	2½"	3½"	9

Each STANDARD Kelly bar adapter has six holes for ½" bolts on a 5¼" bolt circle and comes with six ½" Grade 5 bolts, nuts, lock washers and bent arm pin with coil lock.

Kelly Bar Adapter



Kelly Bar

P0010259P	Hex Bolt
055371P	Lockwasher
055635P	Hex Nut

STANDARD Locking Dog Assembly

Cat. No.	Description	Wt.ea.
C3030069HD	Complete STANDARD Locking Dog Assembly	20 lb.
C3030070	Locking Dog Replacement Kit includes parts needed to replace both locking dogs	4 lb.
P1300007P	Replacement Ring Only	0.10 lb.

STANDARD Locking Dog Assembly has six holes for ½" bolts on a 5¼" bolt circle, comes with six ½" Grade 5 bolts, nuts and lock washers.

STANDARD Locking Dog Assembly C3030069HD

7-ft. Drive-End Wrench

C1021583	STANDARD Drive-End Wrench installs 8,000 ft.-lb. (small hub) TOUGH ONE® anchors, 10,000 ft.-lb. (small hub) TOUGH ONE® anchors, 4,000 ft.-lb. Standard-Strength PISA anchors, 6,000 ft.-lb. Mid-Strength PISA anchors	57 lb.
*†C3031064	HYBRID Drive-End Wrench installs 8,000 ft.-lb. (large hub) TOUGH ONE® anchors, 6,000 ft.-lb. PISA 6 anchors, 7,000 ft.-lb. PISA 7anchors	64 lb.

3½-ft. Drive-End Wrench

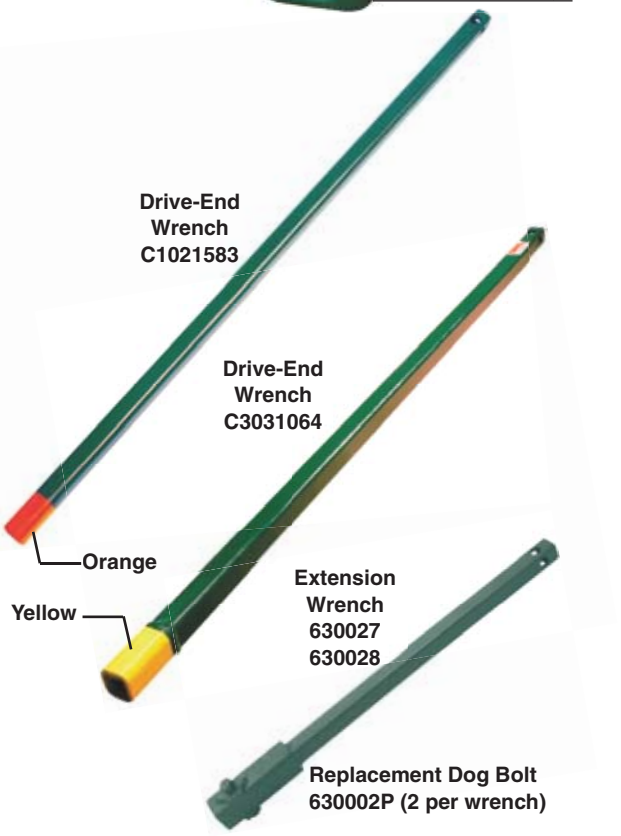
C1021595	STANDARD Drive-End Wrench installs 8,000 ft.-lb. (small hub) TOUGH ONE® anchors, 10,000 ft.-lb. (small hub) TOUGH ONE® anchors, 4,000 ft.-lb. Standard-Strength PISA anchors, 6,000 ft.-lb. Mid-Strength PISA anchors	29 lb.
*†C3031063	HYBRID Drive-End Wrench installs 8,000 ft.-lb. (large hub) TOUGH ONE® anchors, 6,000 ft.-lb. PISA 6 anchors, 7,000 ft.-lb. PISA 7anchors	28 lb.

Extension Wrench for above STANDARD and HYBRID Drive-End Wrenches

630027	3½-ft. Extension	42 lb.
630028	7-ft. Extension	70 lb.

†NOTE: These wrenches will fit 15,000 ft.-lb. TOUGH ONE® anchors dimensionally, but . . . MUST NOT be used for TORQUES IN EXCESS of 10,000 ft.-lb.!

***NOTE: The old-style HYBRID wrenches C3031063 and C3031064, having a collar welded around the drive end, fit only PISA 6 and PISA 7 anchors.**



B

SCREW ANCHOR DRIVE TOOL STRINGS

(For installing torques up to 10,000 ft.-lb.)

Selecting the correct Kelly Bar Adapter is key to building a successful Drive String.
Follow these two easy steps:

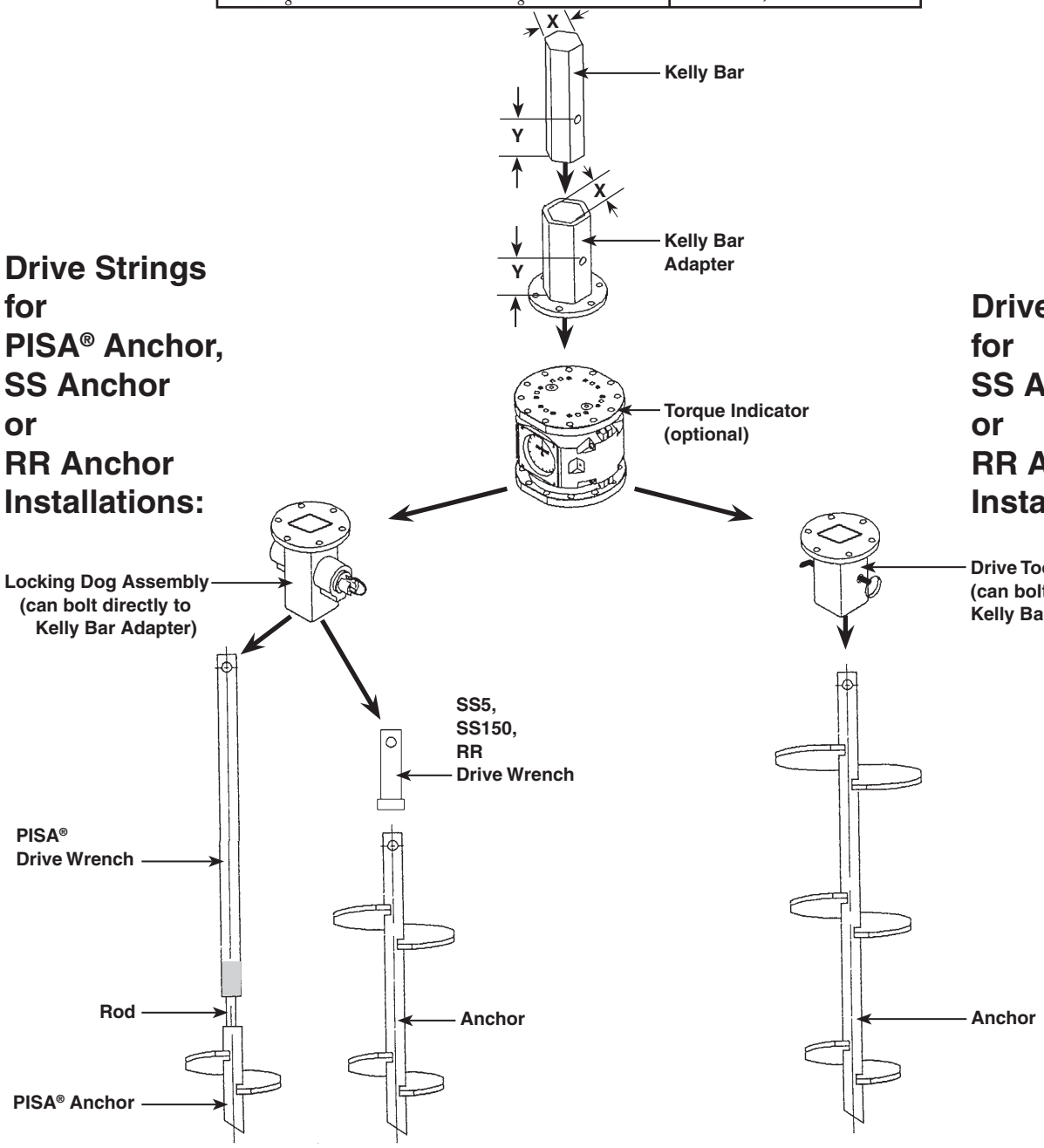
1) Remove the auger from the digger and carefully measure the X and Y dimensions of the Kelly bar.
2) Match the shape of the Kelly bar and the X and Y dimensions with the Kelly bar adapter chart provided on page 4A-4 or 4A-6. The Y dimension on the Kelly bar adapter must be equal to or greater than the "Y" dimension on the Kelly bar itself.

A Note about Bolt Circles

Chance anchor installing tools are provided with appropriate bolt circles for the expected service. The torque limitations for the three standard bolt circles are give below. **Never exceed the rated torque of any Chance installing tool.**

Bolt Circle	Use for Torque up to
(6) $^1/_2$" Grade 5 bolts on $5^1/_4$" Bolt Circle	10,000 ft.-lb.
(6) $^5/_8$" Grade 2 bolts on $7^5/_8$" Bolt Circle	15,000 ft.-lb.
(12) $^5/_8$" Grade 2 bolts on $7^5/_8$" Bolt Circle	20,000 ft.-lb.

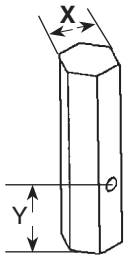
Drive Strings for PISA® Anchor, SS Anchor or RR Anchor Installations:



Drive String for SS Anchor or RR Anchor Installations:

TOUGH ONE® Anchor Installing Tools
(For installing torques up to 15,000 ft.-lb.)

A complete tool system consists of: Kelly bar adapter, torque indicator, locking dog assembly and drive-end assembly. For instructions for selecting the proper Kelly bar adapter, see page 4A-5.



Kelly Bar

TOUGH ONE Kelly Bar Adapter with Bent Arm Pin (7⅝" Bolt Circle)

Part No.	Kelly Bar Shape	Kelly Bar Dimensions X	Y	Z	Weight, lb.	⅝" Gr. 2 Bolts Included	Bent Arm Pin Included
C3030936	Hex	2½"	3⅞"	8¼"	23	12	C3031223
C3030937	Hex	2⅝"	3⅞"	8¼"	23	12	C3031223
C3030940	Hex	3"	4½"	8"	27	12	C3031222
C3030955	Square	2½"	4¾"	7"	22	12	C3031227
C3030958	Square	3"	3½"&4 15/16"	7"	23	12	C3031227

Kelly Bar Adapter

Each TOUGH ONE® Kelly bar adapters has twelve holes for ⅝" bolts on a 7⅝" bolt circle, comes with twelve ⅝" Grade 2 bolts, nuts & lockwashers and bent arm pin with coil lock.

Hex Bolt	056653P
Lockwasher	055827P
Hex Nut	450314P

B

*Mechanical Torque Indicator

Catalog No.	Description	Wt., lb.
C3031340	Torque Indicator adaptable to 5¼" B.C. or 7⅝" B.C.	65

*See page 4A-9 for additional information on Chance Torque Indicators.


*Torque Indicator

TOUGH ONE Locking Dog Assembly

Catalog No.	Description	Wt., lb.
C3030981	Complete TOUGH ONE Locking Dog Assembly	28
C3031026	Locking Dog Replacement Kit Includes all parts less casting, bolts, nuts, washers	5

Locking Dog Assembly

TOUGH ONE locking dog assembly has twelve holes for ⅝" bolts on a 7⅝" bolt circle and comes with twelve ⅝" Grade 2 bolts, nuts and lockwashers.

Hex Bolt	056653P
Lockwasher	055827P
Hex Nut	055803P

TOUGH ONE Drive-End Wrenches

Catalog No.	Length	Description	Wt., lb.
C3030982	3½ ft.	Installs 15,000 ft.-lb. (large hub) TOUGH ONE®	36
C3030983	7 ft.	Anchors, 8,000 ft.-lb. (large hub) TOUGH ONE® and all 1½" Core Anchors	73

TOUGH ONE® drive ends are painted with a red band on the bottom.

Drive Wrench

Extension Assemblies for TOUGH ONE Drive-End Wrench

Catalog No.	Length	Description	Wt., lb.
C3030987	3½ ft.	Extension attaches to drive-end wrench when additional depth is required.	53
C3030988	7 ft.		89

For SS and RR Anchor Tool options when using the TOUGH ONE® Drive String System, see page B-33.

ANCHOR INSTALLING TOOL
BENT ARM PIN WITH COIL LOCK

Use with STANDARD and TOUGH ONE® Kelly bar adapters, SS, RR and bumper post installing tools

Each Chance plated-steel Bent Arm pin is designed to attach a Kelly bar adapter to a Kelly bar. Also used to secure SS, RR and bumper post anchors to anchor drive tools.

Bent Arm Pins with Coil Locks are included with new tools as required. Order Pins and Coil Locks for existing tools as shown below.

ORDERING INFORMATION

Kelly Bar Adapter	Bent Arm Pin and Coil Lock Assembly
*630010	C3031227
*630011	C3031223
630011HD	C3031223
*630012	C3031223
630012HD	C3031223
630013	C3031223
630013A	C3031223
630014	C3031222
630015	C3031222
630016	C3031227
630017	C3031227
C3030936	C3031223
C3030937	C3031223
C3030940	C3031222
C3030955	C3031227
C3030958	C3031227

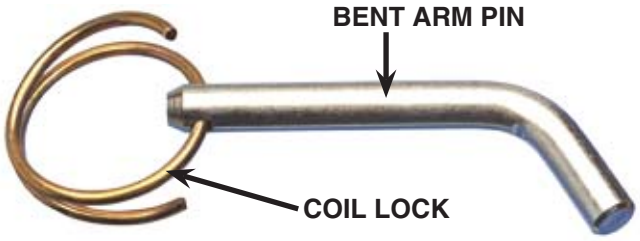
*Old-style Kelly Bar Adapters, no longer available.

SS/RR Tools	Bent Arm Pin and Coil Lock Assembly
639001	C3031226
C3030195	C3031225
C3030201	C3031224
C3030202	C3031224
C3030020	C3031226

Bumper Post Tools	Bent Arm Pin and Coil Lock Assembly
C3030737	C3031227
C3030739	C3031227

⚠ WARNING

Chance Bent Arm Pins with Coil Locks are the only tested and approved means for through-pin attachment of drive tools. Do not attempt to use any other means of attachment.



To order Coil Lock only, order Part No. P3031215P.

Bent Arm Pin and Coil Lock Assembly	Size
C3031226	3" x 5/8"
C3031225	3 1/2" x 3/4"
C3031224	4 1/2" x 1"
C3031227	5" x 3/4"
C3031223	4 1/2" x 1/2"
C3031222	5" x 5/8"

⚠ WARNING

Always use the approved combination of Coil Locks and Bent Arm Pins. Never attempt to use any other combinations, such as hair pins, cotter keys, etc., with Bent Arm Pins.

ADAPTERS

C3030115

T3030166

639001

C3030020

E3030255

BOLT CIRCLE ADAPTERS
(For torques up to 10,000 ft.-lb.)

These adapters are used to connect two tools having incompatable bolt circles. The C3030115 is for use between two tools having tapped 5¼" bolt circles.

The T3030166 is for use between a tool having a 5¼" bolt circle and one having a 7⅝" bolt circle.

Both are limited to 10,000 ft.-lb.

Cat. No.	Description	Wt., lb.
C3030115	Bolt circle adapter with two ½" x 5¼" bolt circles	11
T3030166	Bolt circle adapter with one ½" x 5¼" bolt circle and one ⅝" x 7⅝" bolt circle	18

FOR INSTALLING SS OR RR ANCHORS

These Drive tools require the appropriate Kelly bar adapter, sold separately. Each comes with bolts, nuts and lockwashers.

Cat. No.	Description	Bolt Circle	Approx. Wt., lb.
639001	SS5/SS150/RR Drive Tool	(6) ½" holes on 5 ¼" B.C.	7
C3030195*	SS175 Drive Tool	(12) ⅝" holes on 7 ⅝" B.C.	18
C3030201*	SS200 Drive Tool	(12) ⅝" holes on 7 ⅝" B.C.	30
C3030202*	SS225 Drive Tool	(12) ⅝" holes on 7 ⅝" B.C.	30

*Requires use of T3030166 adapter, and limited to 10,000 ft.-lb., when used with STANDARD Kelly bar adapter (with a 5 ¼" bolt circle).

Cat. No.	Description	Unit fits:	Approx. Wt., lb.
C3030020	SS5/SS150/RR Drive Tool	STANDARD Locking Dog Assembly	8
C3031035		TOUGH ONE® Locking Dog Assembly	11
T3031403	SS175 Drive Tool	TOUGH ONE® Locking Dog Assembly	26
C3031077	SS200 Drive Tool		23

These tools slide into locking dog adapter and are retained by spring loaded dogs.

FOR INSTALLING NO-WRENCH ANCHOR & MANUAL FOUNDATION TOOL

Especially designed for use with the Chance portable anchor installer. This tool bolts directly to the installer's output flange or Kelly bar adapter having six ½" dia. holes on a 5¼" bolt circle. Adjustable pivoting plates accept rods from ¾" to 1¼" diameter.

For manually-installed foundations, eyenut must be temporarily installed for installation. Has four holes on 5¼" bolt circle for attachment. Includes four ½" x 1½" bolts, nuts and lockwashers.

Cat. No.	Weight, lb.
E3030255	9

B

CHANCE TORQUE INDICATORS

Using the Chance Torque Indicator, you can install screw anchors to a pre-determined torque value which gives a positive indication of anchor holding capacity in any type soil. These tools also help your crew avoid excessive torsional loading which could cause damage to the anchor and/or other anchor tools during installation.

The Indicators are mounted between the Kelly bar adapter and drive wrench or locking dog assembly.

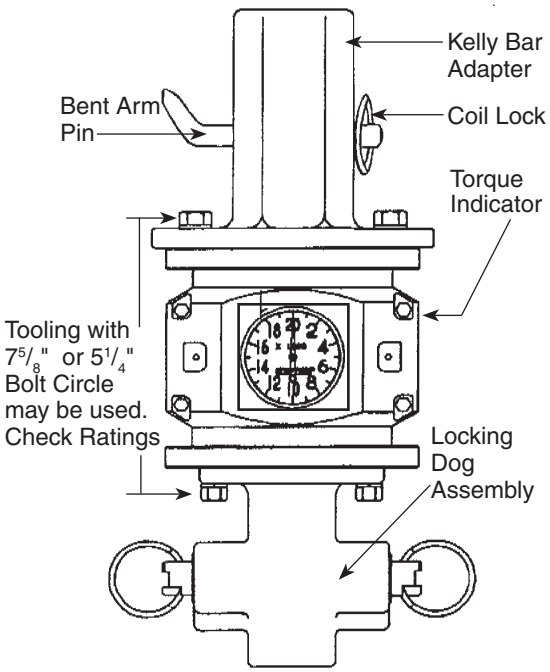
MECHANICAL TORQUE INDICATOR
Catalog No. C3031340
(For Installing torques up to 20,000 ft.-lb.)

Offers: Easy-to-read dial gives the operator a direct readout of installation torque at all times.

No Shear pins to replace.

Top and bottom each has six holes tapped ½" - 13 on a 5¼" bolt circle and twelve holes tapped ⅝" - 11 on a 7⅝" bolt circle.

NOTE: Mechanical Torque Indicator is not recommended in heavy, rocky soil applications.



SHEAR PIN TORQUE LIMITER
Catalog No. C3030044
For Installing torques up to 10,000 ft.-lb.

Offers: Protection for anchors and installing tools by disconnecting the power when the installing torque reaches a preselected level.

Useable in very rocky soil.

Durable — does not require special storage or handling.

Top and bottom each has six holes tapped ½" - 13 on a 5¼" bolt circle.

Catalog Number	Description	Wt., lb.
C3030044	Shear Pin Torque Indicator	54
*C3030045	One Carton of Shear Pins (Approx. 1700 pins)	50
*T3031420	One Box of Shear Pins (Approx. 510 pins)	15

*Each Shear Pin provides 500 ft.-lb. of torque.

SOIL TEST PROBE

•Determine soil conditions without taking core samples

The Chance Soil Test Probe is a mechanical instrument which enables the operator to determine the condition of the sub-soil without core samples. A ratchet-handle torque wrench which slides up and down on the shaft is used to install or retract the probe. Torque wrench readings, in inch-pounds, provide a way to measure the consistency of the sub-soil. The torque values obtained are translated into soil classifications using the copyrighted Chance Soil Classification Table (see below) located on the inside flap of the carrying case.

Torque readings are taken at the depth to which an anchor is to be installed, and at least 2 feet above this depth because the average earth consistency 2 to 3 feet above the anchor determines the anchor holding capacity. The probe shaft is marked at 1-foot intervals permitting soil evaluation at every foot of depth.

The length of the Soil Test Probe (including helix) is 5 feet. Each shaft coupled to the probe provides an additional 5 feet. A durable carrying case protects the equipment when not in use.

B

ORDERING INFORMATION

Soil Test Probe 1800 in.-lb. Capacity

Cat. No.	Description	Length	Weight
C3090032	Probe w/3 5-ft. extensions	20'	21½ lb.

Accessories

Catalog No.	Description	Weight
C3090033	5-ft. extension only	3 lb.

SOIL CLASSIFICATION DATA

Class	Common Soil-Type Description	Geological Soil Classification	Probe Values ft.-lb. (NM)	Typical Blow Count "N" per ASTM-D1586
N.A.	Sound hard rock, unweathered (bedrock)	Granite, Basalt, Massive Limestone	N.A.	N.A.
1	Very dense and/or cemented sands; coarse gravel and cobbles	Caliche, (Nitrate-bearing gravel/rock),	over 60 (85 - 181)	60-100+
2	Dense fine sands; very hard silts and clays (may be preloaded)	Basal till; boulder clay; caliche; weathered laminated rock	over 50 (68 - 85)	45-60
3	Dense sands and gravel; hard silts and clays	Glacial till; weathered shales, schist, gneiss and siltstone	42 - 50 56 - 68	35-50
4	Medium dense sand and gravel; very stiff to hard silts and clays	Glacial till; hardpan; marls	33 - 42 (45 - 56)	24-40
5	Medium dense coarse sands and sandy gravels; stiff to very stiff silts and clays	Saprolites, residual soils	25 - 33 (34 - 45)	14-25
6	Loose to medium dense fine to coarse sands to stiff clays and silts	Dense hydraulic fill; compacted fill; residual soils	17 - 25 (23 - 34)	7-14
**7	Loose fine sands; Alluvium; loess; medium - stiff and varied clays; fill	Flood plain soils; lake clays; adobe; gumbo, fill	8 - 17 (11 - 23)	4-8
**8	Peat, organic silts; inundated silts, fly ash very loose sands, very soft to soft clays	Miscellaneous fill, swamp marsh	under 8 (0 - 11)	0-5

Class 1 soils are difficult to probe consistently and the ASTM blow count may be of questionable value.
**It is advisable to install anchors deep enough, by the use of extensions, to penetrate a Class 5 or 6, underlying the Class 7 or 8 Soils.

EXPANDING & TAMPING BAR

The Chance fiberglass handle Expanding and Tamping Bar simplifies the job of expanding anchors. The curved Expander and Tamper Head distributes the weight of the bar evenly around the anchor rod to reduce handle vibration. The hook of the Expanding and Tamping Bar wraps around the anchor rod to keep the expanding head from slipping off the anchor top plate. This tool is also effectively used for tamping in soil above the installed anchor. The base casting is attached directly to the fiberglass handle.

Cat. No.	Description	Length	Weight
C3020003	Expanding & Tamping Bar	10'	22 lb.
C3020004	Expanding & Tamping Bar	12'	24 lb.
*E3020001P	Fiberglass Handle	10'	7 lb.
*E3020006P	Fiberglass Handle	12'	8 lb.
P3020002P	Expander and Tamper Head	N/A	14 lb.

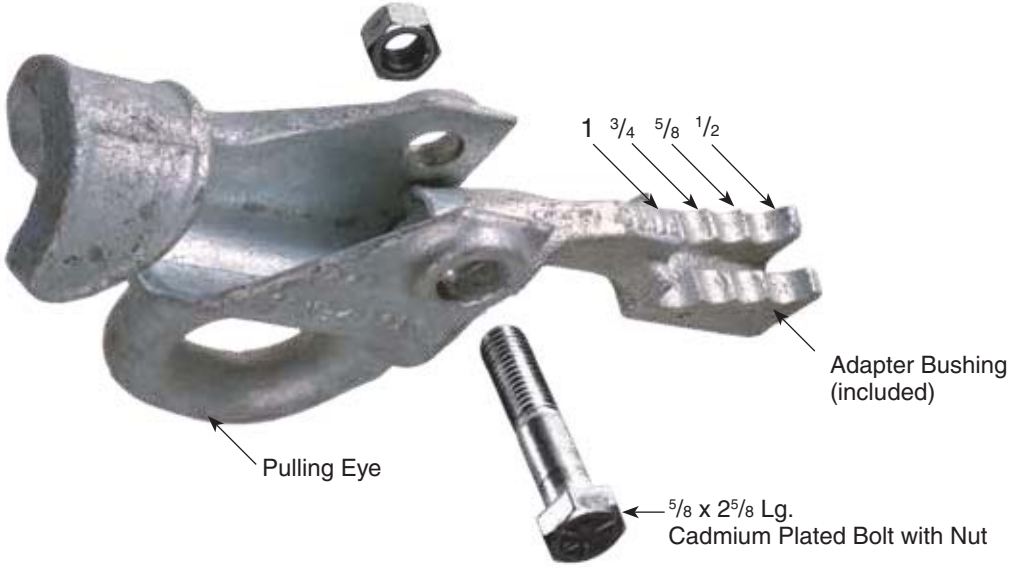
*Includes plug mix to reset handle.

B

STANDARD PULLING EYE

This inexpensive cost-cutter provides a large offset eye to accommodate three-ton chain hoist hooks, and leaves the anchor eye free with plenty of clearances for attaching formed wire grips. By removing the Adapter Bushing, the E96 Pulling Eye fits 1¼" rods. The E96 Pulling Eye is inexpensive and easy to use. One person can assemble and hook up in minutes. For working loads to approximately 6,000 pounds (ultimate strength — 18,000 pounds).

Catalog No.	Weight
E96	5 lb.



Portable Anchor Installers for small foundations

2,500 ft.-lb. torque capacity hydraulic power drive

Economical manual operation and portability for remote sites, common anchor installations

For most shaft-driven guy anchors and smaller screw foundations, these compact drivers get into areas where large equipment cannot go or is impractical. Operator does not need to resist the torque generated by anchor installation. Countertorque transmits through a torque bar from the drive head to the earth or other restraint. This frees the operator for the task of guiding the anchor path.

Built-in bypass valve limits output to 2,500-ft.-lb. maximum, two-way foot pedal gives operator direct control over drive and reverse directions, hoses (two 12-ft. and two 25-ft.) come with quick couplers for all connections from power supply to foot control to drive head. Pivoting drive-head yoke connects with bent-arm pin to square-tubular torque bar which telescopes from 8 feet to 10 feet as needed.

Catalog No. C3031032

Medium-Duty Installer requires 1550 psi at 8 gpm flow rate to deliver 2,500 ft.-lb. maximum torque.

Catalog No. C3031244

Heavy-Duty Installer requires 1,900 psi at 8 gpm flow rate to deliver 2,500 ft.-lb. maximum torque.

2,500 ft-lb Portable Anchor Installers

†Medium Duty — Catalog No. C3031032

Grease filled gear case. Single Catalog Number above includes all items below. Each item also may be ordered by separate number.	
* Hydraulic Control Valve	C3031031
Two 25-ft. Hydraulic Hoses	C4176121 (each)
* Hydraulic Drive Head	C3031180
Yoke Assembly	E3030680
* Two 12-ft. Hydraulic Hoses	E3030876 (pair)
Square Torque Bar Assembly	E3031041

Output shaft is $1^1/_2$" square socket. Requires C3031230 and flanged drive tool (order separately) to install anchors other than $1^1/_2$" square $1^1/_4$" round shaft.

* Note: Hydraulic components are not interchangeable between C3031032 and C3031244.

Heavy Duty — Catalog No. C3031244

Sealed oil-filled gear case. Single Catalog Number above includes all items below. Each item also may be ordered by separate number.	
* Hydraulic Control Valve	C3031247
Two 25-ft. Hydraulic Hoses	C4176121 (each)
* Hydraulic Drive Head	C3031233
Yoke Assembly	E3030680
* Two 12-ft. Hydraulic Hoses	E3031253 (pair)
Square Torque Bar Assembly	E3031041

Output Shaft is 2" Hex. - Requires Kelly Bar Adapter P630013 and flanged drive tool (order separately) to install all anchors.

* Note: Hydraulic components are not interchangeable between C3031032 and C3031244.

Anchor Drive Tools

See page 8 for details on tools to drive specific anchor types.

†Adapter Tool Catalog No. C3031230

†Note that all $5^1/_4$" bolt-circle tools may be connected directly to Heavy Duty Portable Anchor Installer Cat. No. C3031244. †Adapter Tool Cat. No. C3031230 is required to connect $5^1/_4$" bolt-circle tools to Medium Duty Portable Anchor Installer Cat. No. C3031032. If needed, order Adapter C3031230 as a separate item.

Optional Hydraulic Power Unit Catalog No. C3031201

For easy wheeling to worksite, hydraulic drive head and foot control secure by rubber strap included to angle braces atop the cart frame and hoses ride on handles.

Cart-mounted on ⅝"-diameter axle with two 4.80 x 8 inflatable (30psi) tires; 27¼" wide x 34½" high x 36" long; shipping weight with oil: 275 lb.

Hydraulic Pump with fan cooling system:

- **Typical output pressure 2500psi**
- **Pump displacement 8 gpm @ 3400rpm**
- **Reservoir capacity 5 gallons US**
- **(shipping cap and vented fill cap provided)**

Gasoline Engine System:

- **16hp Briggs & Stratton**
- **Industrial/Commercial Model 326437, Type 2527**
- **12-Volt pushbutton start, 3600rpm (maximum)**

Operating instructions are included with anchor installer and hydraulic power unit.

Anchor/Foundation Drive Heads

• Vehicle Mounted • Hydraulic Powered
• 6,000 & 11,500 ft.-lb. Torque Ratings

Specially suited for vertical installations of screw-type anchors, foundations, and bumper posts.

The drive head comes in two torque-rating ranges. The design also delivers other features for rugged field conditions.

- Precision planetary gears and bearings in oil-filled, sealed gearcase
- Heavy-duty output housing and bearings
- Heavy-duty bail flange mounted to gearcase housing provides balanced load-sharing torque restraint
- Dual-pin mounting provides drive-head positioning for controlled installations
- Drive-head also readily accepts earth augers for hole digging

Hose assemblies are not furnished with drive heads. For hydraulic flow more than 20 gpm, $^{3}/_{4}$"-diameter hose is recommended. For flow rates of 20 gpm and below, $^{1}/_{2}$" hose may be used. Swivel joint and swivel joint adapter are furnished. Thread size is 1"-11$^{1}/_{2}$" NPSM (National Pipe Straight Mechanical).

B

Skid-Steer Utility Plate, Bail and Jib Components

To order, refer to information below and on next page. Specify one each: Drive Head, Utility Plate, Bail & Jib Assembly, and Kelly Bar Adapter.

6,000 ft.-lb. maximum torque

For *Bobcat* Skid-Steers ONLY:

Catalog No.	Description
C3031014	6,000 ft.-lb. Utility Plate, Bail & Jib Assembly

For Skid-Steers *other than Bobcat*:

(for field welding to utility plates on skid-steers)

C3031016	3,500 ft.-lb. Bail & Jib Assembly less Utility Plate

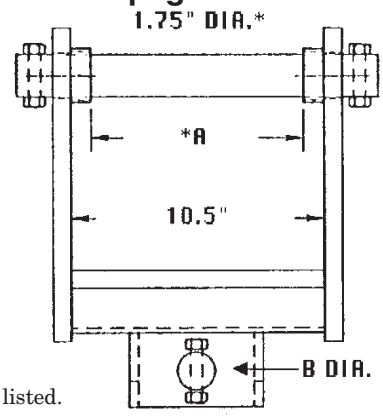
Catalog Numbers at left do not include drive head, hoses or kelly bar adapter as shown at right.

Backhoe Mounting Components

To order, specify components in Typical Tool-String Assemblies on next page.
6,000 and 11,500 ft.-lb. maximum torque

†Backhoe Mounting Brackets

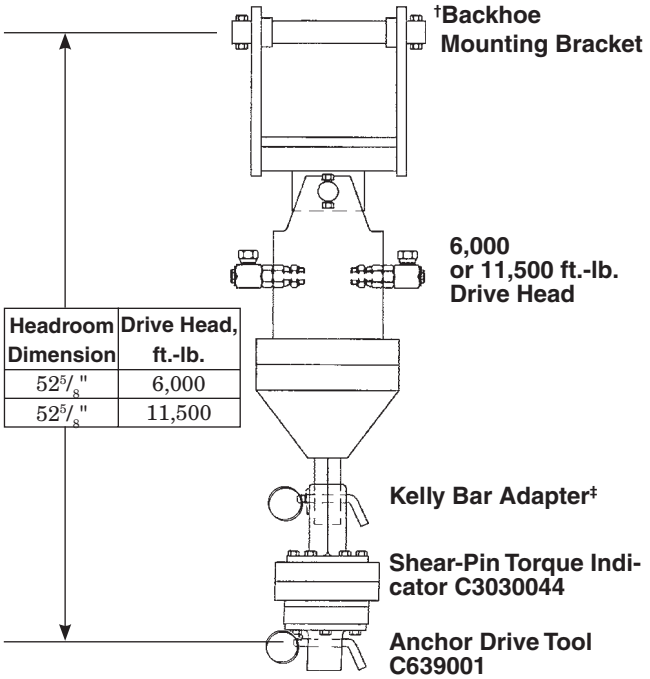
Dimensions, inches		Backhoe	Catalog	Bracket
*A	B	Brand Name	Number	Description
10.1	1.5	Case	C3030969	6K & 11.5K ft.-lb. Eskridge
10.1	1.0	Case	C3030970	3.5K ft.-lb. Eskridge
7.00	1.5	JCB	C3030971	6K & 11.5K ft.-lb. Eskridge
7.00	1.0	JCB	C3030972	3.5K ft.-lb. Eskridge
8.18	1.5	John Deere	C3030973	6K & 11.5K ft.-lb. Eskridge
8.18	1.0	John Deere	C3030974	3.5K ft.-lb. Eskridge



*Bracket accepts boom up to 10.2" wide (1.75" dia. pin).
For booms 7" & 8.18" wide, 2 spacer bushings supplied. Other bushings available for backhoes not listed.

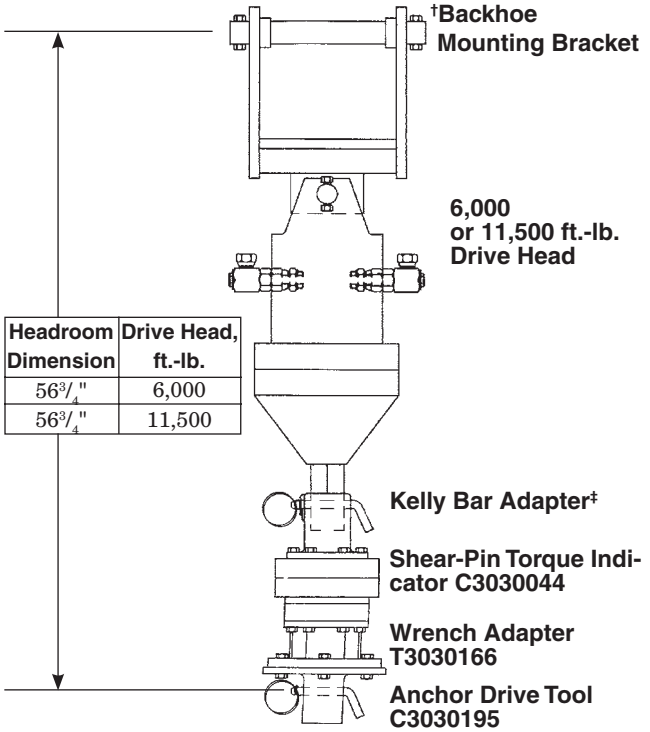
Typical BackhoeTool-Strings

For SS5 and SS150 (1½" Square Shaft) Series Anchors



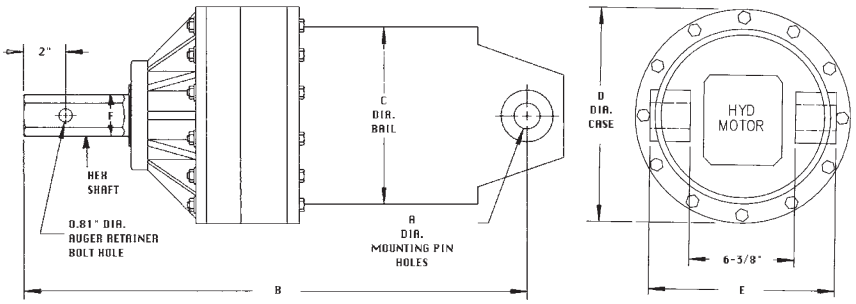
Headroom Dimension	Drive Head, ft.-lb.
52⅝"	6,000
52⅝"	11,500

For SS175 (1¾" Square Shaft) Series Anchors



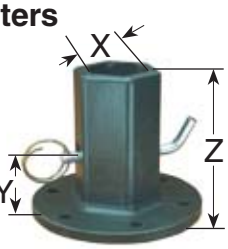
Headroom Dimension	Drive Head, ft.-lb.
56¾"	6,000
56¾"	11,500

Anchor/Foundation Drive Heads



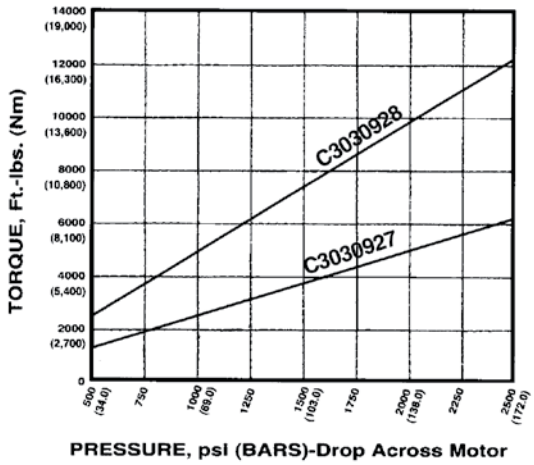
‡Kelly Bar Adapters

Each of these Kelly Bar Adapters has a 5¼" bolt circle and comes with (6) ½" bolts, nuts and lock-washers and a Bent-Arm Pin with Coil Lock (see page 4A-7).

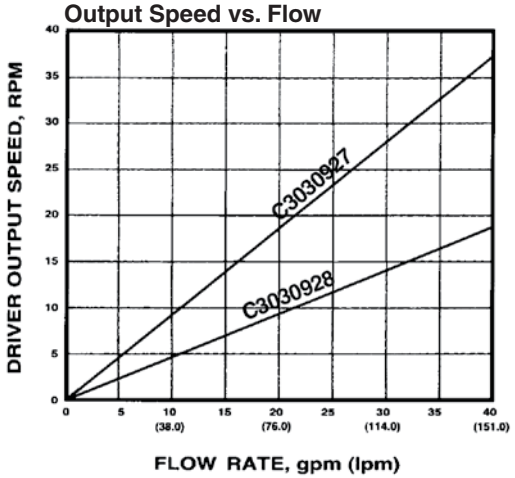


Part No.	X	Y	Z
630013	2" Hex	5"	6⅛"
630011HD	2½" Hex	4¼"	8⅛"

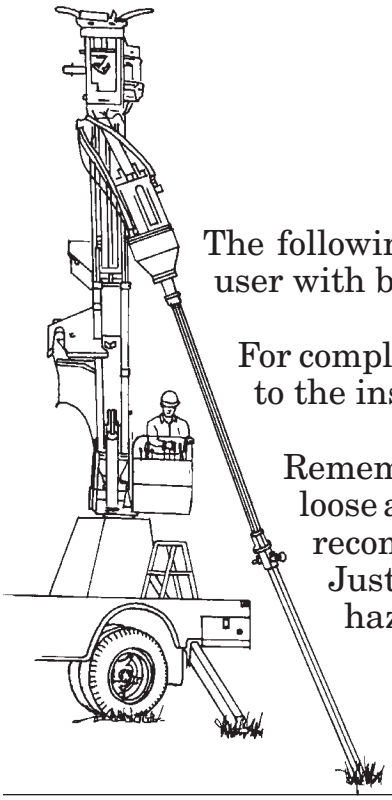
Output Torque vs. Pressure



Output Speed vs. Flow



Catalog Number	Running Torque ft.-lb.	Running Torque Nm	Flow gpm	Speed rpm	Wt. lb.	Wt. kg	Dimensions (in., cm) A		B		C		D		E		F	
C3030927	6,000 @ 2,400 psi	8,100 @ 165 BARS	40	39	246	112	1.5	3.81	29.5	74.9	10.7	27.2	13	33.0	11.4	28.9	2.5	6.4
C3030928	11,500 @ 2,400 psi	15,600 @ 165 BARS	40	20	246	112	1.5	3.81	29.5	74.9	10.7	27.2	13	33.0	11.4	28.9	2.5	6.4



APPLICATION AND INSTALLATION GUIDES

The following installation procedures have been written to familiarize the user with basic knowledge on how the chosen anchor is to be used.

For complete installation instructions and safety information, always refer to the instruction sheets provided with the drive tooling.

Remember, before starting any anchor job, inspect the tooling for wear or loose and missing parts. If replacement is necessary, only use CHANCE® recommended parts.

Just as equally important, inspect and survey the worksite for safety hazards.

B

Table of Contents

This section of the Anchor Encyclopedia is to provide basic data on how and when a certain anchor is to be used. Always refer to the actual supplied instructions for preferred installation techniques.

APPLICATION/INSTALLATION
TOUGH ONE® ANCHORS

	15,000 FT-LB. LARGE HUB ASSEMBLIES	8,000 FT-LB. LARGE HUB ASSEMBLIES
ANCHOR APPLICATIONS	For distribution and transmission guy loads, 3½ and 7 foot anchor rods are used.	For distribution and transmission guy loads, 3½ and 7 foot anchor rods are used.
INSTALL IN THESE CLASS SOILS	Classes 1, 2, 3, 4 and 5 (300-1600 inch-pounds with the soil test probe)	Classes 2, 3, 4 and 5 (300-750 inch-pounds with the soil test probe)
INSTALLING EQUIPMENT REQUIRED	Power digger and wrench assembly (see page B-28)	Power digger and wrench assembly (see pages B-26 or B-28)
LIMITATIONS ON USE	Do not use beyond two extensions (14 feet). Maximum installation torque is 15,000 foot-pound.	Do not use beyond two extensions (14 feet). Maximum installation torque is 8,000 foot-pound.

	10,000 FT-LB. SMALL HUB ASSEMBLIES	8,000 FT-LB. SMALL HUB ASSEMBLIES
ANCHOR APPLICATIONS	For distribution and transmission guy loads, 3½ and 7 foot anchor rods are used.	For distribution and transmission guy loads, 3½ and 7 foot anchor rods are used.
INSTALL IN THESE CLASS SOILS	Classes 2, 3, 4 and 5 (300-750 inch-pounds with the soil test probe)	Classes 2, 3, 4 and 5 (300-750 inch-pounds with the soil test probe)
INSTALLING EQUIPMENT REQUIRED	Power digger and wrench assembly (see page B-26)	Power digger and wrench assembly (see page B-26)
LIMITATIONS ON USE	Do not use beyond two extensions (14 feet). Maximum installation torque is 10,000 foot-pound.	Do not use beyond two extensions (14 feet). Maximum installation torque is 8,000 foot-pound.

APPLICATION/INSTALLATION
PISA® ANCHORS

	STANDARD STRENGTH ANCHORS	MID-STRENGTH ANCHORS
ANCHOR APPLICATIONS	For distribution guy loads, 3½ and 7 foot anchor rods are used.	For distribution and sub-transmission guy loads, 3½ and 7 foot anchor rods are used.
INSTALL IN THESE CLASS SOILS	Classes 5 and 6 (200-400 inch-pounds with the soil test probe)	Classes 4, 5 and 6 (200-500 inch-pounds with the soil test probe)
INSTALLING EQUIPMENT REQUIRED	Power digger and wrench assembly (see page B-26)	Power digger and wrench assembly (see page B-26)
LIMITATIONS ON USE	Do not use in hard soils beyond two extensions (14-feet). Maximum installation torque is 4,000 foot-pound.	Do not use in very hard soils or beyond two extensions (14-feet). Maximum installation torque is 6,000 foot-pound.

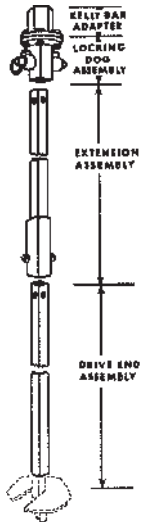
	PISA®-6 ANCHORS (FORMERLY PISA®-5 ANCHORS)	PISA®-7 ANCHORS
ANCHOR APPLICATIONS	For distribution and sub-transmission guy loads, 3½ and 7 foot anchor rods are used.	For distribution and transmission guy loads, 3½ and 7 foot anchor rods are used.
INSTALL IN THESE CLASS SOILS	Classes 4, 5 and 6 (200-500 inch-pounds with the soil test probe)	Classes 2, 3, 4 and 5 (300-750 inch-pounds with the soil test probe)
INSTALLING EQUIPMENT REQUIRED	Power digger and wrench assembly (see page B-26)	Power digger and wrench assembly (see page B-26)
LIMITATIONS ON USE	Do not use in very hard soils or beyond two extensions (14-feet). Maximum installation torque is 6,000 foot-pound.	Do not use in hard, rocky soils or beyond two extensions (14-feet). Maximum installation torque is 7,000 foot-pound.

HOW TO USE POWER-INSTALLED SCREW ANCHORS

GENERAL INSTALLATION CONSIDERATIONS

Four words summarize proper anchor installation technique: "proper alignment" and "down pressure." The PISA® anchor wrench transmits torque from the digger's Kelly bar to the anchor hub. (The anchor rod only has to be of sufficient diameter to support the guy load.) Always maintain adequate down pressure and keep the Kelly bar and the wrench aligned with the anchor. The right amount of down pressure keeps the anchor continuously advancing. Too much down pressure may bend or even break an anchor helix at torque loads far below the rating. Too little down pressure may result in "churning" the soil, damaging the wrench and possibly damaging the digger truck. Either extreme may result in wasted time, reduced holding capacity and damaged equipment.

FOR SITUATIONS WHERE OVERHEAD LINES ARE NOT AN OBSTRUCTION

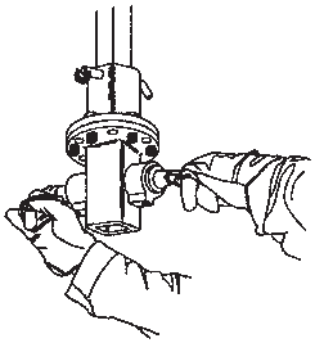


STEP-BY-STEP ANCHOR INSTALLATION PROCEDURE

ANCHOR WRENCH

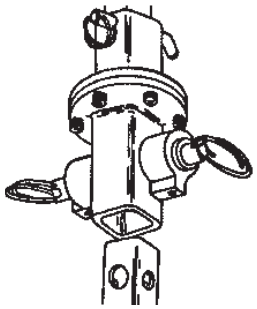
Kelly bar adapter is attached to digger's Kelly bar by a single bolt. Locking dog assembly holds the drive end assembly. If anchor depth of one 7' rod length is desired, drive end assembly is all that's required. If anchor is to be installed deeper than one anchor rod length, the 3½' extension assembly is attached between drive end assembly and locking dog assembly to obtain added depth. PISA® anchors should not be installed beyond 14' since wrench retrieval is difficult beyond this depth.

STEP ONE — OPEN LOCKING DOGS



Before installing drive end assembly in locking dog assembly, open dogs by pulling outward and twisting to outside position. NOTE: Locking dog assembly has three ring positions. Middle position holds wrench drive end assembly. Inside ring position allows locking dogs to hold anchor rod. Outside position releases drive end assembly from locking dog assembly.

STEP TWO — INSERT DRIVE END ASSEMBLY



With locking dog rings in outside position, insert drive end asembly into locking dog assembly. Rotate rings to middle position. Drive end assembly will be captured in locking dog assembly. Now rotate locking dogs to inside position to accept and capture anchor rod.

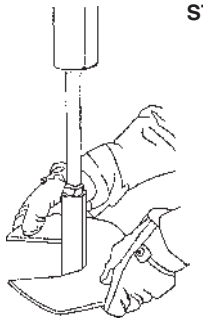
STEP THREE— INSERT ANCHOR ROD IN DRIVE END ASSEMBLY

Because locking dogs are now at inside position, assembly will hold anchor rod. Screw rod into the threads located in the hub of the anchor helix. Insert rod into drive end assembly with an upward thrust.

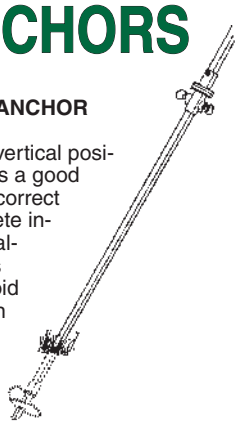
STEP FOUR—LOCKING ANCHOR IN PLACE

With strong upward motion, lock anchor into wrench. Locking dogs, properly closed to inside position, will hold anchor rod in wrench.

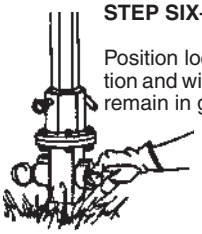
STEP FIVE—INSTALL ANCHOR



Begin anchor in near vertical position. When anchor has a good start, retract boom to correct anchor angle. Complete installation. During installation, truck outriggers should lift slightly. Avoid excessive uplift. When locking dogs reach ground level, stop installation.



STEP SIX—RETRIEVE WRENCH

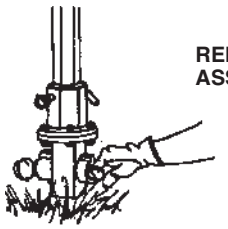


Position locking dog rings in middle position and withdraw wrench. Anchor rod will remain in ground.

STEP SEVEN— ATTACH ANCHOR EYE NUT

Complete installation by installing eye nut.

FOR AN INSTALLATION DEEPER THAN ONE ANCHOR ROD LENGTH, PERFORM FOLLOWING STEPS

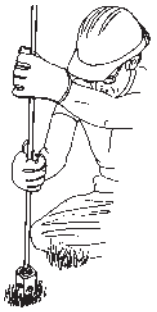


REMOVE LOCKING DOG ASSEMBLY AT GROUND LEVEL

Position locking dog rings in outside position and withdraw locking dog assembly.

ADD ANCHOR ROD EXTENSION

Add anchor extension rod to rod remaining in ground.

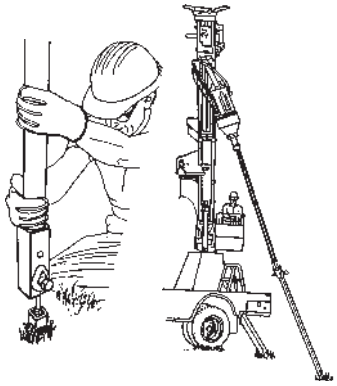


ATTACH WRENCH ASSEMBLY

With wrench extension bolted to drive end assembly in the ground and locked in position at the locking dogs, installation can proceed.

COMPLETE THE INSTALLATION

When locking dogs reach ground level, position locking dogs in middle position and retrieve the drive end assembly and extension assembly.



Attach anchor eye nut and the installation is complete

NOTE: Always refer to the actual supplied tooling instructions before any installation as conditions may require a modification in practiced methods.

APPLICATION/INSTALLATION
TYPE SS SQUARE SHAFT AND TYPE RR ROUND ROD ANCHORS

	TYPE SS 5 ANCHORS	TYPE RR ANCHORS
ANCHOR APPLICATIONS	For transmission guy loads, 3½, 5, 7 and 10 foot extensions are used.	For distribution and transmission guy loads. 3½, 5, 7 and 10 foot extensions are used.
INSTALL IN THESE CLASS SOILS	Classes 2, 3, 4, 5 and 6 (200-750 inch-pound with soil test probe)	Classes 5, 6 and 7 (100-400 inch-pounds with soil test probe)
INSTALLING EQUIPMENT REQUIRED	Power digger and wrench assembly (see page B-30)	Power digger and wrench assembly (see page B-30)
LIMITATIONS ON USE	Not normally recommended for depths beyond 100 feet. Maximum installation torque is 5500 foot-pound.	Not recommended for use beyond 35 feet. Maximum installation torque is 2300 foot-pound.

B

INSTALLATION GUIDE

Once all safety concerns have been addressed, attach the Kelly bar adapter and installing tool assembly to the Kelly bar on the installing truck.

Insert the upper end of the anchors' lead section into the installing tool. Position the anchor at the desired guy location and at a near vertical position; screw the first helix into the ground.

When the first helix is buried, begin to make the angular adjustment for the desired guying angle.

Remember, final angular adjustments should be made before the second helix penetrates the ground.

When the installing tool becomes 12"-18" from the ground, disconnect it from the section in the ground and reconnect it to the next extension.

Align the extension with the section in the ground and bolt them together. (Make certain that the bolt and nut are securely tightened.)

Continue to drive the anchor and add extensions until the desired torque is reached and maintained for a minimum of three feet or three times the diameter of the largest helix.

A minimal installation depth of three times the diameter of the largest helix (below the freeze/thaw line) is required. This depth should equal or exceed five times the diameter of the largest helix from the top surface of the soil vertically.

If this cannot be achieved (while still maintaining an adequate safety margin below the anchor's minimum ultimate torsional strength of 5,500 ft.-lb., the anchor should be removed and replaced with an anchor having smaller or fewer helices. The replacement anchor should be installed at least 5 feet from the first installation site.

Although SS anchors can be installed over 100 feet deep, one should always consider the economics of using a shallower anchor with more or larger helices or extensions with helices.

If the desired protrusion from the ground cannot be achieved without exceeding the rated torque, the last extension may be replaced with a shorter extension by excavation along the rod to the coupling bolt, but never by unscrewing the anchor.

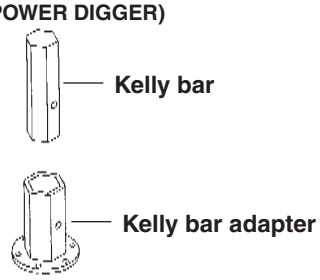
When the anchor reaches the desired setting the guy adapter is attached using the same attachment method as the extensions.

APPLICATION/INSTALLATION
NO-WRENCH ANCHORS

ANCHOR APPLICATIONS	For distribution guy loads. Extensions available.
INSTALL IN THESE CLASS SOILS	Classes 5, 6 and 7 (100-300 inch-pound with the soil test probe)
INSTALLING EQUIPMENT REQUIRED	Install by hand using a turning bar or a power digger. Using a digger, adapter and installing tool is required. (see page B-30)
LIMITATIONS ON USE	Can only be installed in relatively soft soils. Maximum installing torque 2300 foot pounds.

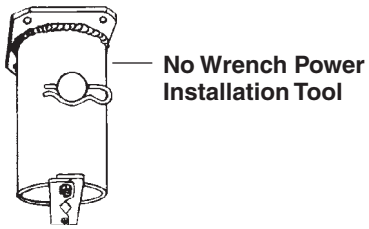
B

STEP #1 (POWER DIGGER)



Attach the appropriate Kelly bar adapter to the digger's Kelly bar (output shaft).

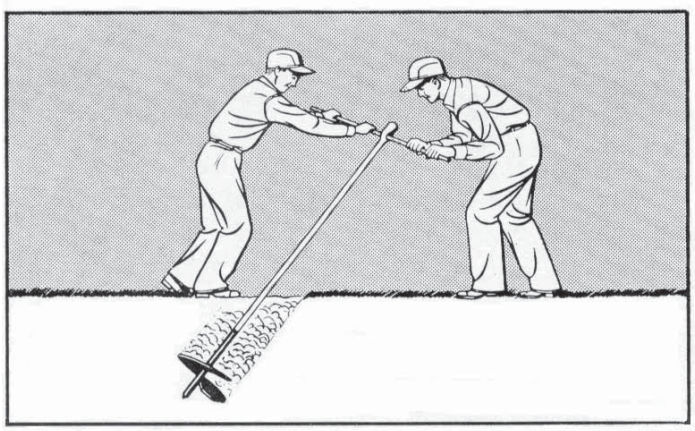
STEP #2 (POWER DIGGER)



Bolt the no-wrench power installation tool to the Kelly bar adapter.

INSTALLATION GUIDE:

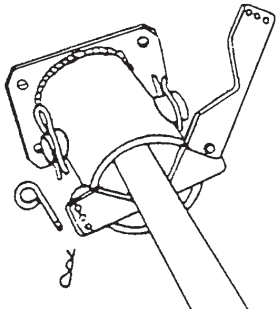
STEP #1 (BY HAND)



Insert turning bar into the opening of the forged eye on the rod and screw anchor into ground.

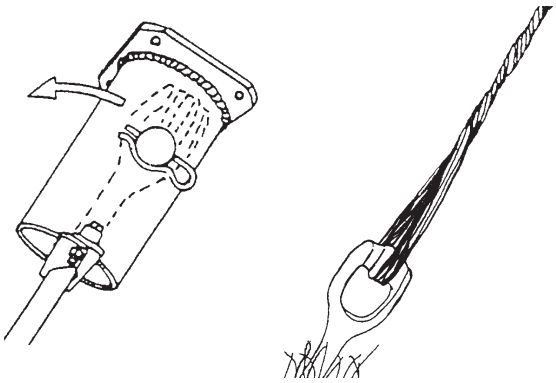
NOTE: For harder soils, a small, shallow pilot hole dug with a shovel may be required to get anchor started.

STEP #3 (POWER DIGGER)



Remove the appropriate pins in the No-Wrench anchor installation tool. Insert anchor rod eye into the tool and re-pin to the appropriate settings.

STEP #4 (POWER DIGGER)



Start driving the anchor at a near vertical position. Once the anchor's helix is below ground, retract the boom to the correct guy angle.

NOTE: When installation is complete, make certain that the eye of the anchor is in the correct position for guying before removing the installation tool from the anchor.

APPLICATION/INSTALLATION
CORROSION RESISTANT DISK ANCHORS

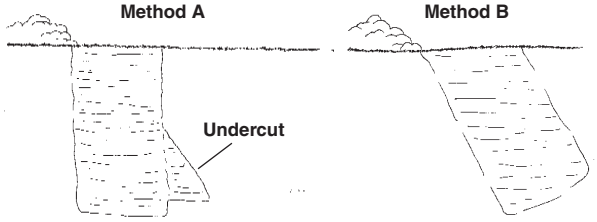
ANCHOR APPLICATIONS	For alkali, acid and soils with electrolyte combinations.
INSTALL IN THESE CLASS SOILS	Classes 3, 4, 5, 6 and 7 (100-600 inch-pound with the soil test probe)
INSTALLING EQUIPMENT REQUIRED	Power digger, rod trenching tool, shovel and tamping bar.
LIMITATIONS ON USE	Necessity of undercutting hole limits anchor depth. Rod trench should not be large or hold capacity will be reduced. Both anchor hole and rod trench must be backfilled and tamped.

INSTALLATION GUIDE:

STEP #1

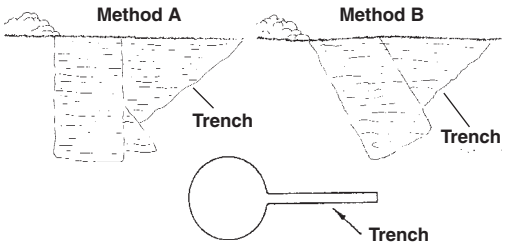
Drill a vertical hole or angled hole.

STEP #2



Undercut the hole so that the anchor plate can be installed at a right angle to the guy.

STEP #3

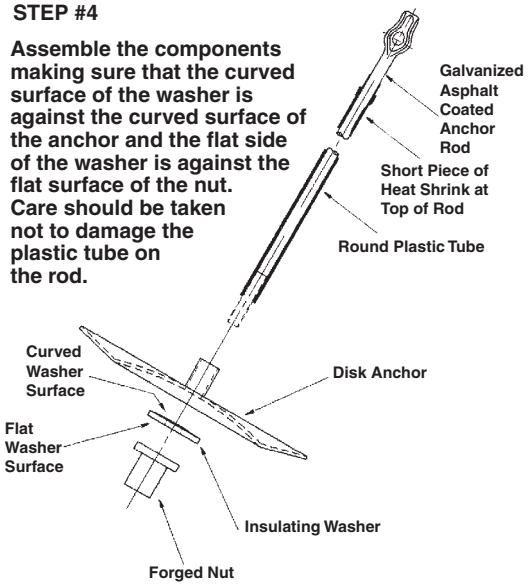


Cut a rod trench with a trenching tool or a small auger.

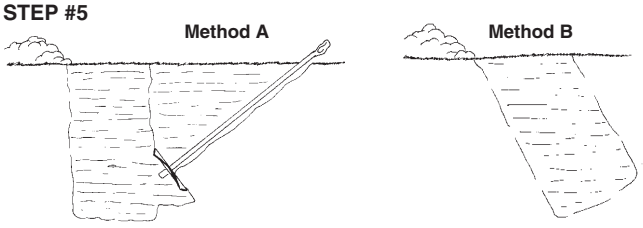
NOTE: Trench should be narrow to avoid disturbing soil.

STEP #4

Assemble the components making sure that the curved surface of the washer is against the curved surface of the anchor and the flat side of the washer is against the flat surface of the nut. Care should be taken not to damage the plastic tube on the rod.

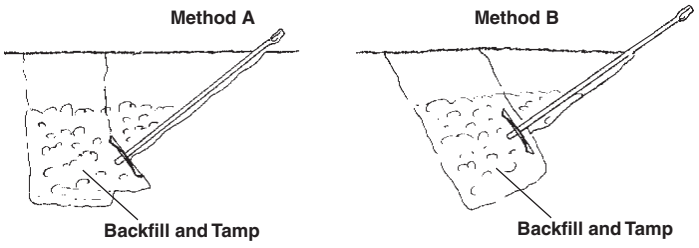


STEP #5



Install anchor in hole so rod is aligned within ± 10 degrees of the guy so that strength of the installation is not reduced.

STEP #6



Thoroughly backfill and tamp the anchor hole and rod trench.

B

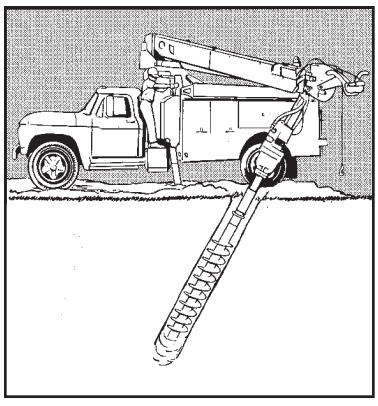
APPLICATION/INSTALLATION
EXPANDING 8-WAY ANCHORS

ANCHOR APPLICATIONS	For distribution guying. Use to depths of 12 feet.
INSTALL IN THESE CLASS SOILS	Classes 3, 4, 5, 6 and 7 (100-600 inch-pound with the soil test probe)
INSTALLING EQUIPMENT REQUIRED	Hand or power auger. Expanding and tamping bar or mechanical tamper and shovel. (See page B-33)
LIMITATIONS ON USE	Depends on backfill effectiveness. Difficult to tamp in wet or plastic soil after rain. Seeping ground water can cut holding capacity 50 percent.

B

INSTALLATION GUIDE:

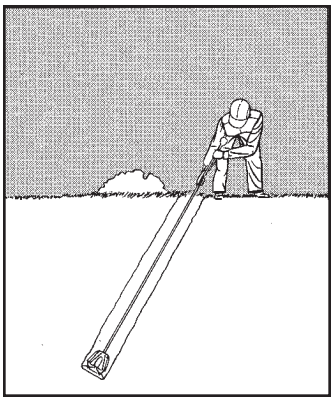
STEP #1



The hole should be drilled at a 45° to 60° angle in line with the guy.

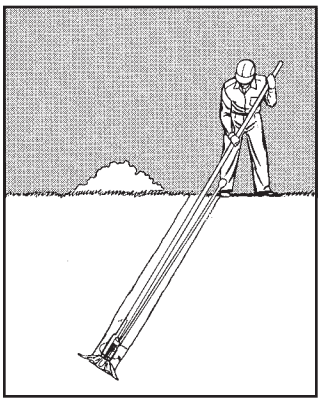
NOTE: Hole size should be slightly larger than the unexpanded anchor. See chart on page B-20.

STEP #2



Attach rod to anchor and lower the assembly into the hole.

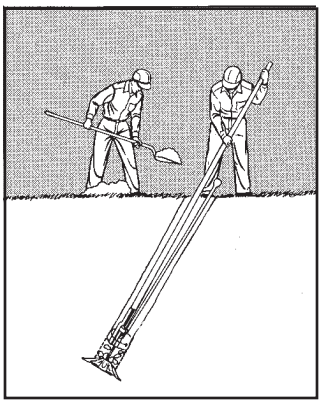
STEP #3



Expand the anchor with the expanding bar by striking the top plate.

NOTE: The expanding bar should be rotated around the anchor during the busting process.

STEP #4



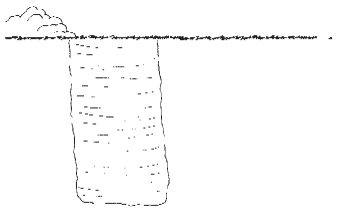
Backfill and tamp hole.

APPLICATION/INSTALLATION
CROSS PLATE ANCHORS

ANCHOR APPLICATIONS	For medium and heavy transmission guying. Installed in machine bored holes. Load-based on using a 400 square inch anchor to a 24" hole.
INSTALL IN THESE CLASS SOILS	Classes 3, 4, 5, 6 and 7 (100-600 inch-pound with the soil test probe)
INSTALLING EQUIPMENT REQUIRED	Power digger, rod trenching tool, shovel and tamping bar.
LIMITATIONS ON USE	Necessity of undercutting hole limits anchor depth. Rod trench should not be large or holding capacity will be reduced. Both anchor hole and rod trench must be backfilled and tamped.

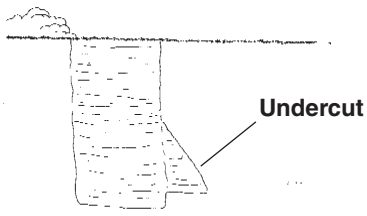
INSTALLATION GUIDE:

STEP #1



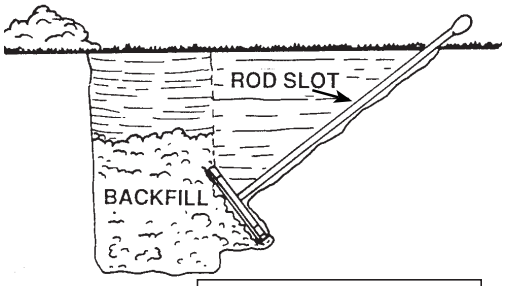
Drill a vertical or angled hole.

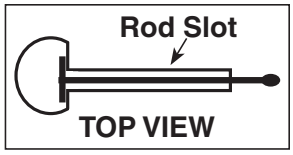
STEP #2



Undercut the hole so that the anchor plate can be installed at a right angle to the guy.

STEP #3

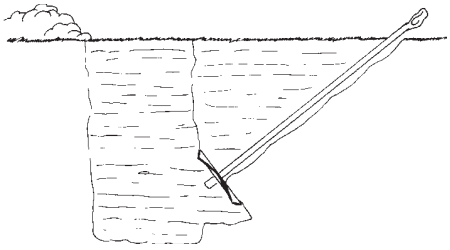




Cut a rod trench with a trenching tool or a small auger.

NOTE: Trench should be narrow to avoid disturbing soil.

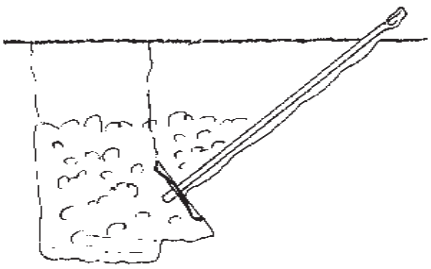
STEP #4



Assemble rod to anchor and install the anchor inside the hole so that the rod is aligned within ±5° of the guy.

NOTE: Improper alignment may reduce holding capacity.

STEP #5



Thoroughly backfill and tamp the anchor hole and rod trench.

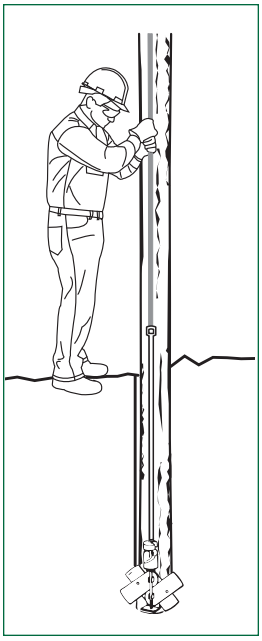
B

APPLICATION/INSTALLATION
EXPANDING POLE KEY ANCHOR

ANCHOR APPLICATIONS	For reinforcing poles at the ground line where load is unbalanced in soft soils or in areas subjected to constant high winds.
INSTALL IN THESE CLASS SOILS	Classes 3, 4, 5 and 6 (200-600 inch-pound with soil test probe)
INSTALLING EQUIPMENT REQUIRED	Extra anchor rod, expanding bar and shovel. (See page B-36)
LIMITATIONS ON USE	Will not take the place of guying on a heavily-loaded structure.

B

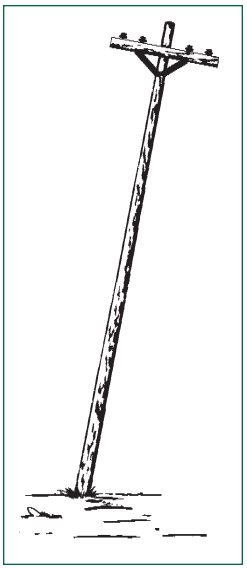
STEP #2

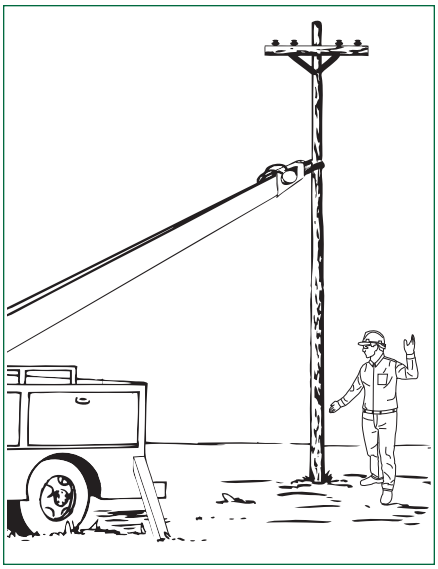


Attach anchor to rod. Lower anchor assembly into pole hole (beside the butt of pole) and bust anchor open with the Expanding/Tamping bar.

INSTALLATION GUIDE:

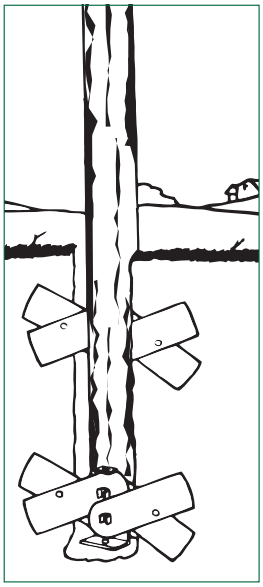
STEP #1





Straighten the pole.

STEP #3



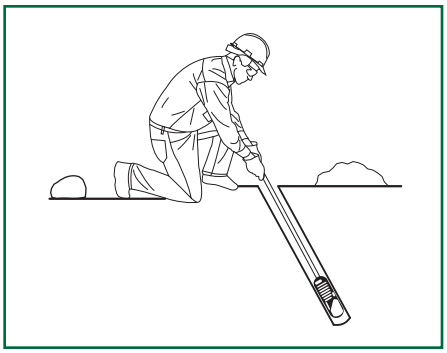
Remove rod from anchor and hole. Backfill and tamp hole.

NOTE: If desired, a second pole key anchor may be used at the top (ground level) of the hole on the opposite side of the pole.

APPLICATION/INSTALLATION
EXPANDING ROCK ANCHORS

ANCHOR APPLICATIONS	For medium-duty guying where poles are in or near rocky areas.
INSTALL IN THESE CLASS SOILS	Class 0.
INSTALLING EQUIPMENT REQUIRED	Hand or power drill and turning bar.
LIMITATIONS ON USE	In extremely soft rock, it may be necessary to use grouting to avoid rock crumbling which would affect holding capacity. Drilling can be a tedious job in some rock types.

STEP #2

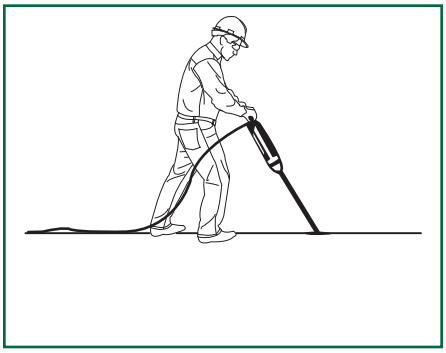


Push the anchor assembly down inside the hole.

B

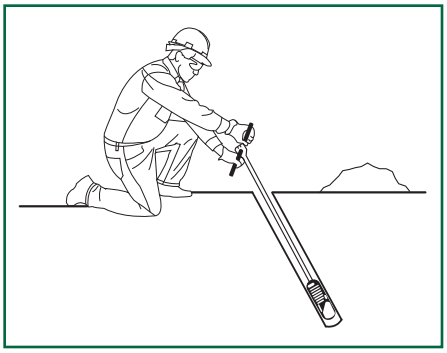
INSTALLATION GUIDE:

STEP #1



Drill the hole.
NOTE: Hole size is determined by the size of anchor used. Refer to the chart on Catalog Page B-23.

STEP #3

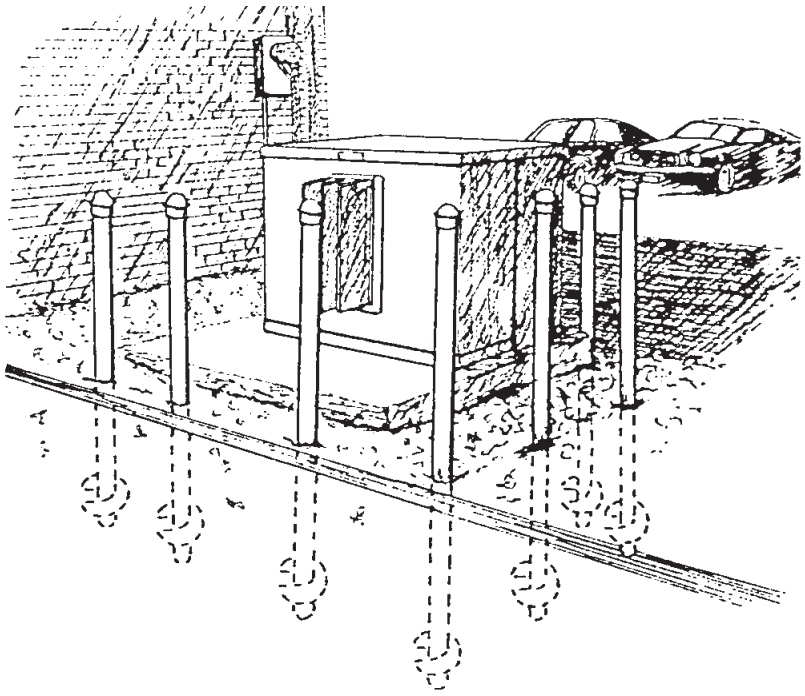


Turn the rod until the anchor is expanded tight against the sides of the hole.

Backfill and tamp hole.

APPLICATION/INSTALLATION
BUMPER POST ANCHORS

ANCHOR APPLICATIONS	Serves as instant ground protection for transformers, switchgear, guys and streetlights.
INSTALL IN THESE CLASS SOILS	Commonly installed through black top.
INSTALLING EQUIPMENT REQUIRED	Power digger and wrench assembly. (See page B-22 for required installing tools)
LIMITATIONS ON USE	Maximum installing torque 8,000 foot pounds.



Step #1: Assemble the drive tool to the correct Kelly bar adapter, using the six 1⁄2 inch diameter grade 5 bolts supplied with the tool.

Step #2: Attach the drive tool assembly to the power diggers Kelly bar, using the supplied Kelly bar adapter's bent arm pin.

Step #3: Stand the bumper post upright and slide it into the dive tool assembly.

Step #4: Raise the Kelly bar until the bumper post swings free of the ground and maneuver the assembly to the marked installation location.

Step #5: Lower the Kelly bar until the point of the bumper post sticks into the ground's surface.

Step #6: Plumb the bumper post to ensure a straight installation.

Step #7: Apply down pressure on the bumper post and rotate it in a clockwise direction.

Step #8: When the helix has penetrated approximately 1-foot, replumb the post.

Step #9: After the desired depth is reached, disconnect the bumper post from the drive tool assembly and cap.