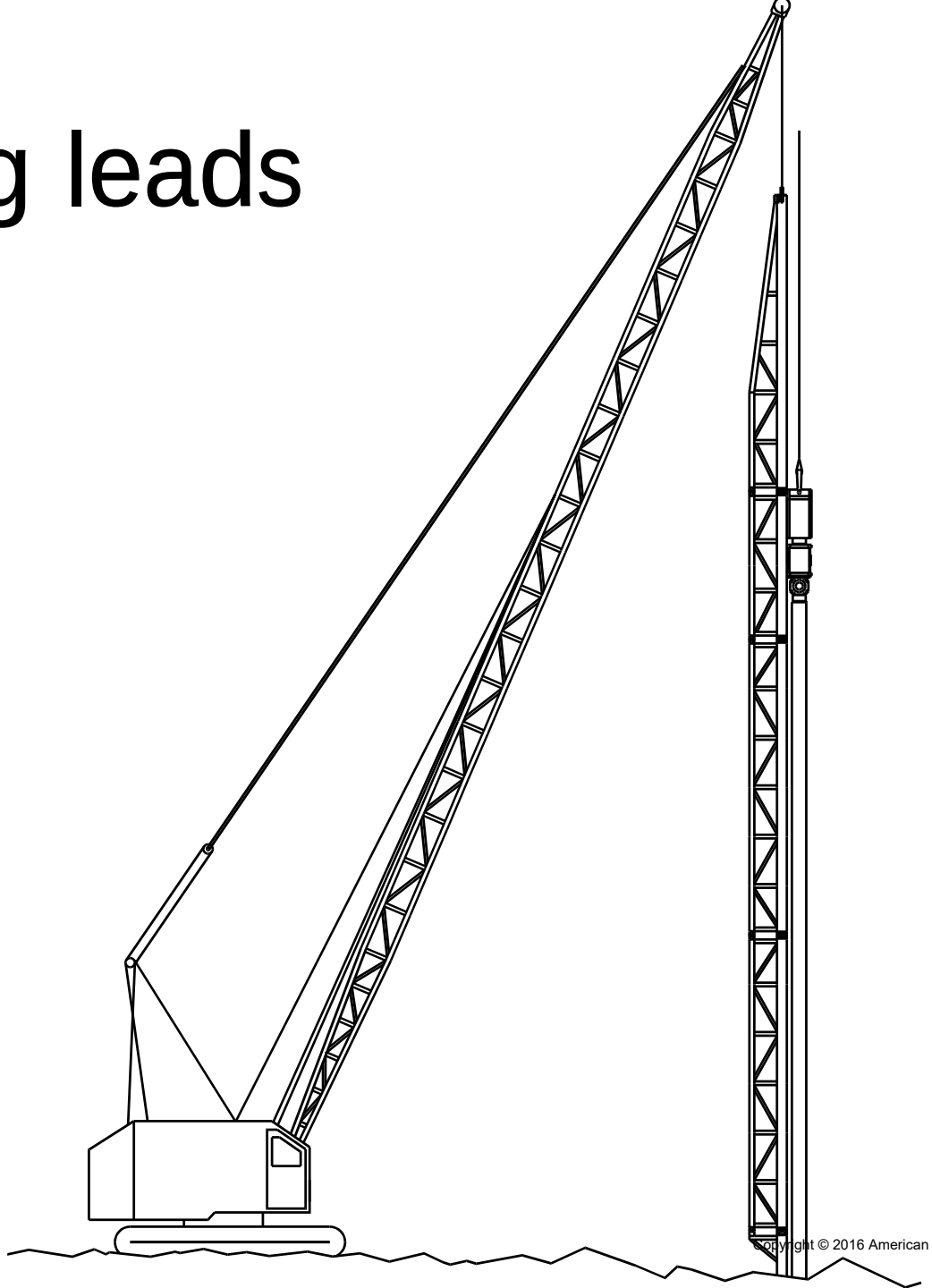
APE Pile Driving Course: Understanding Pile Driving Leads

Pile Driving Leads

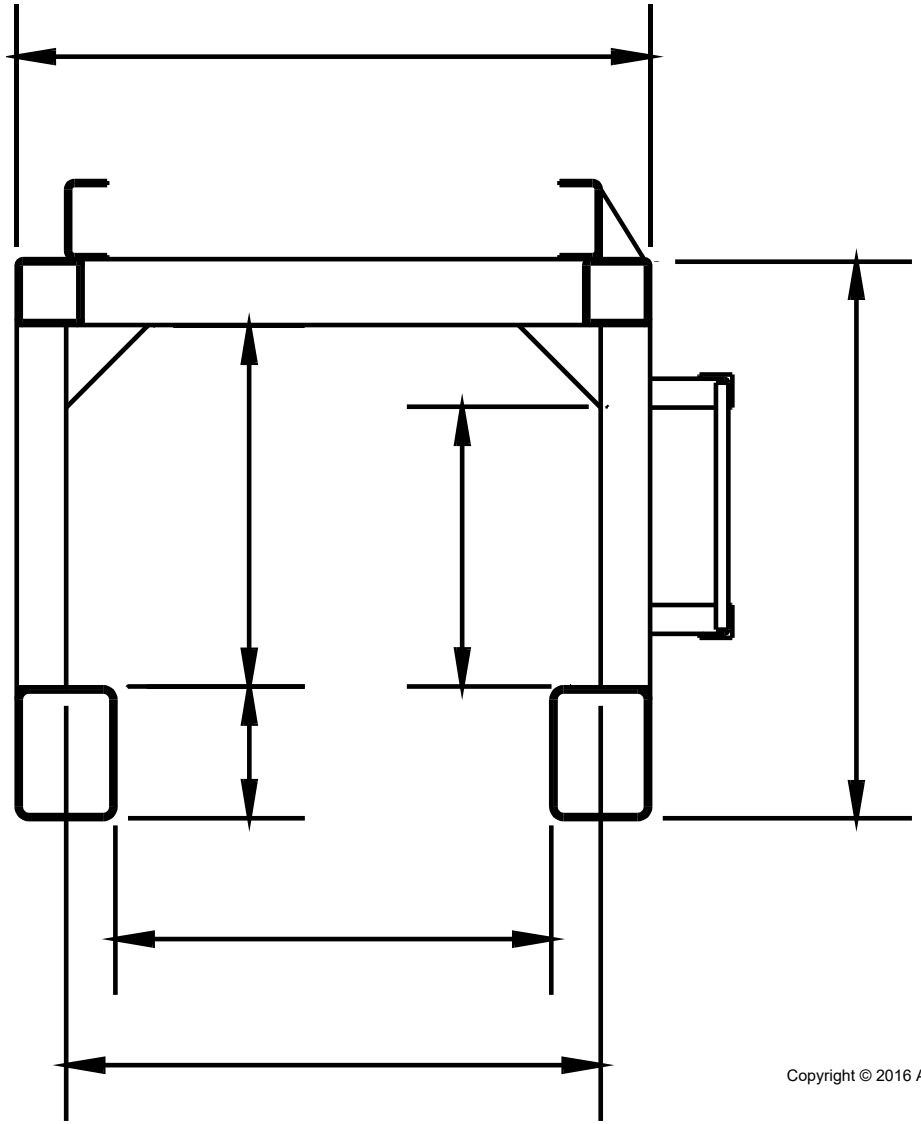
- Box lead dimensions
- Box lead swinging
- Box lead – clip on type
- Box lead, fixed, extended
- Box lead, semi-fixed travel
- Flying hammer with boot
- Fork Lift
- Excavator mounted
- European FEC leads
- Berminghammer type leads

Swinging leads

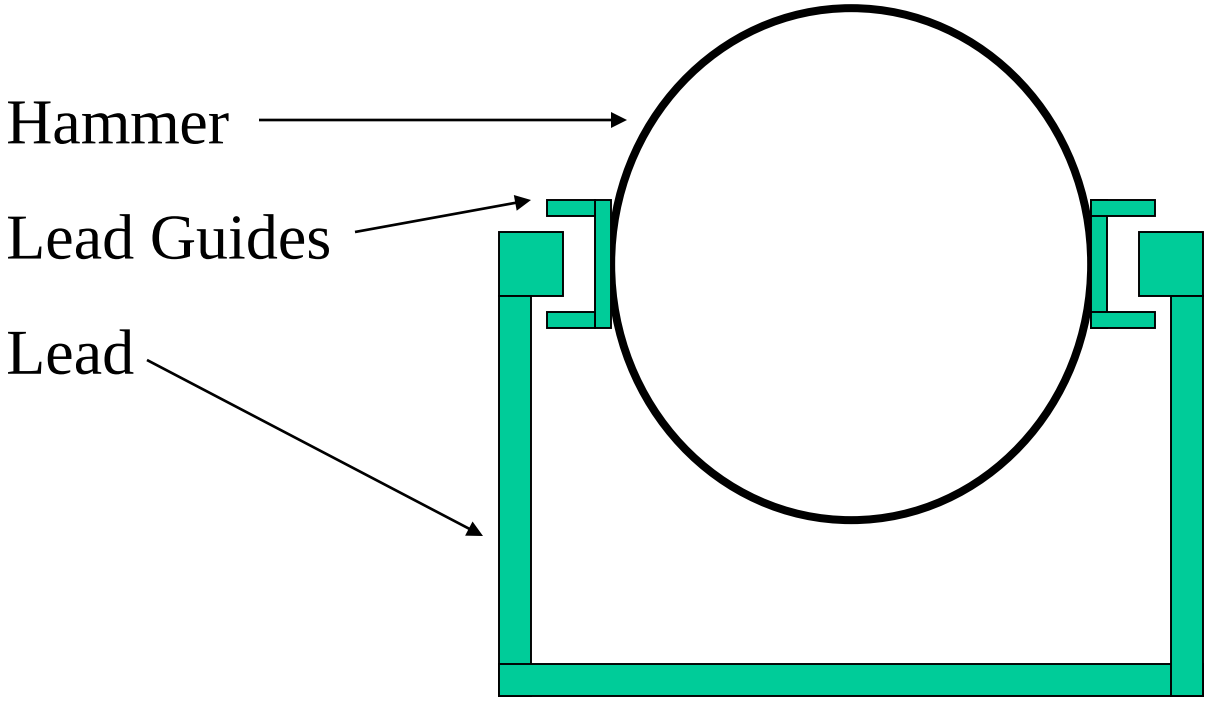


Swinging Box Lead 8 by 32”

Understanding Box Leads Dimensions



Typical Box Lead with Hammer



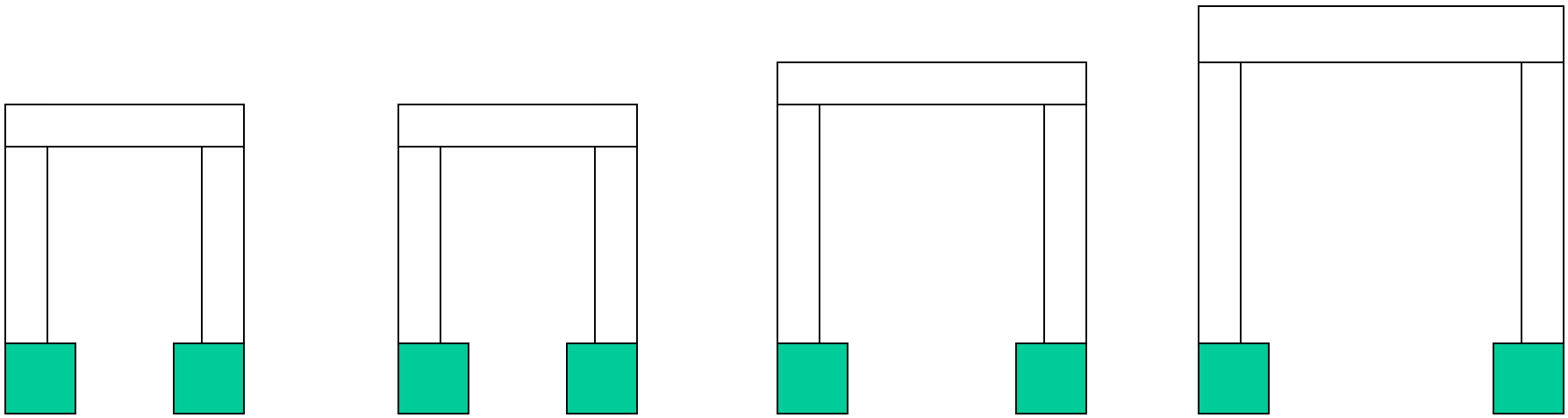
Diesel Hammer

Leads, Box

8 by 32”

Trip guide tubes

Standard Box Lead Sizes



8 by 21”

Small hammers such as D8, D16 or D19 max.

8 by 26”

Most common size leads in the industry. Hammers up to about 70,000 ft-lbs or D-30.

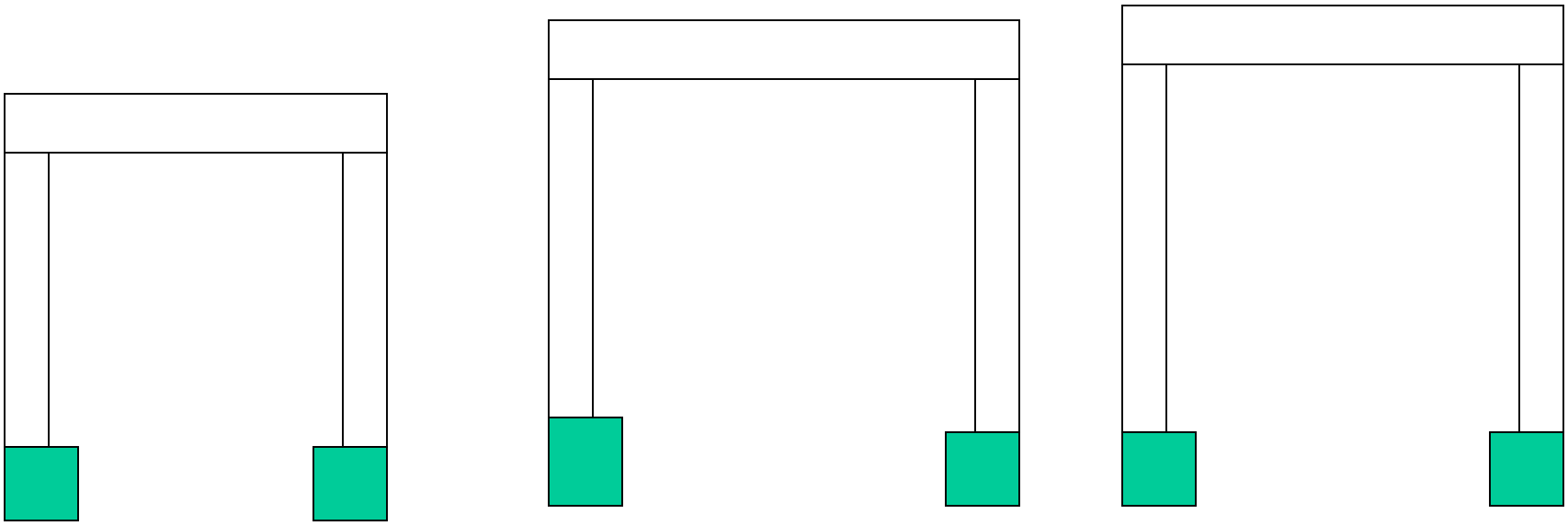
8 by 32”

Becoming most popular lead size. D36, D46, D62 size hammers.

8 by 37”

Used when contractor needs to drive larger pile sizes.

Non-Standard Box Lead Sizes



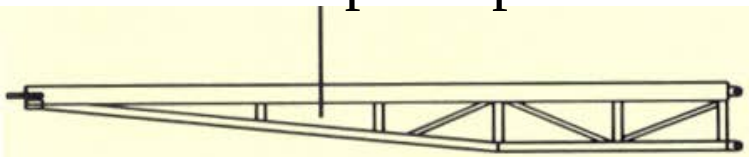
43”

56”

72 or 78”

Typical Lead Lengths

20 foot taper top



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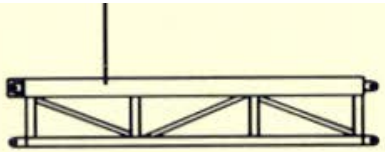

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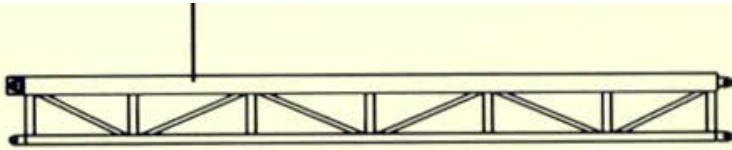
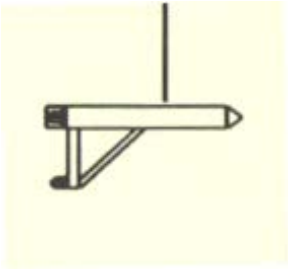
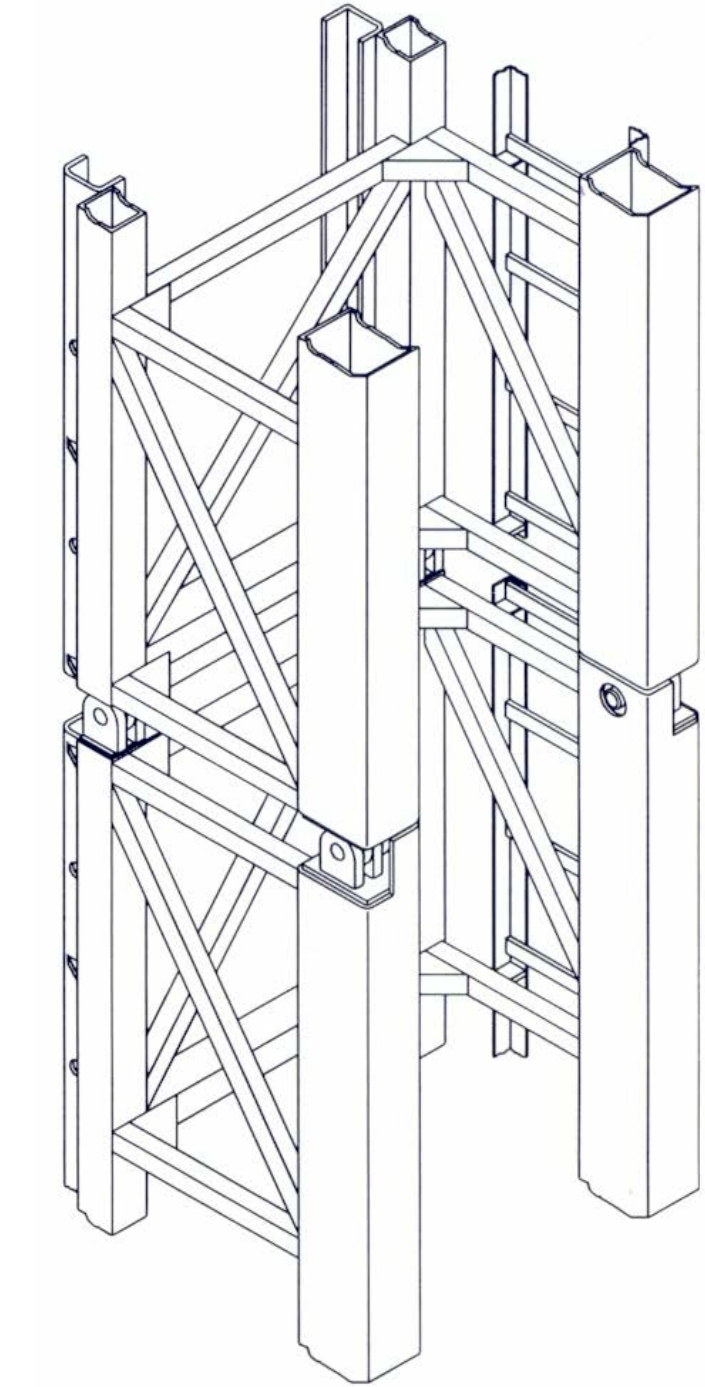
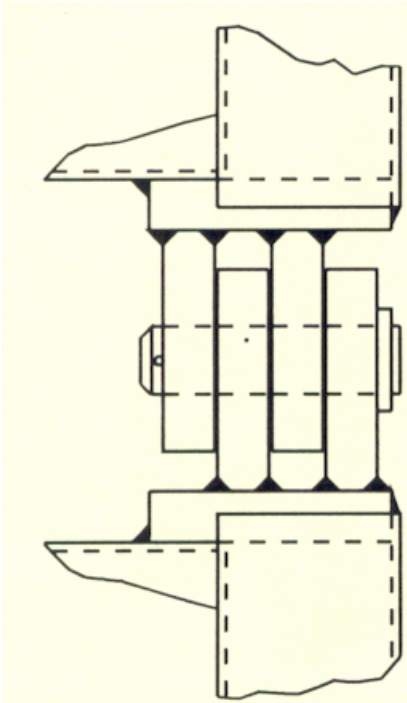


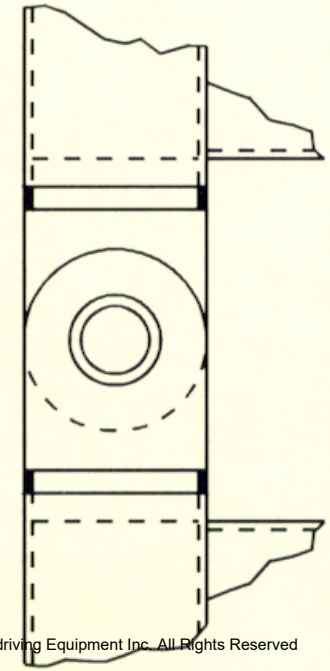
Bottom Stabber Section



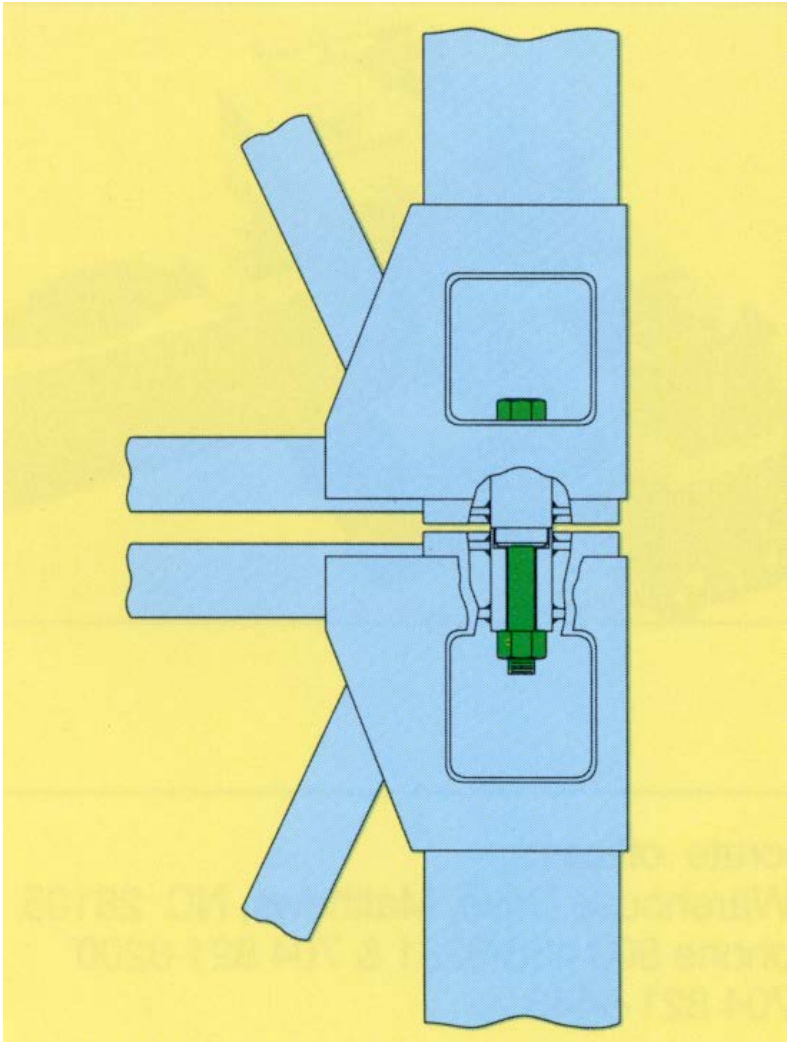
Connecting Box Leads







Example of Bolt Type Connection



This is a standard LB Foster or ICE bolt together type lead connection.

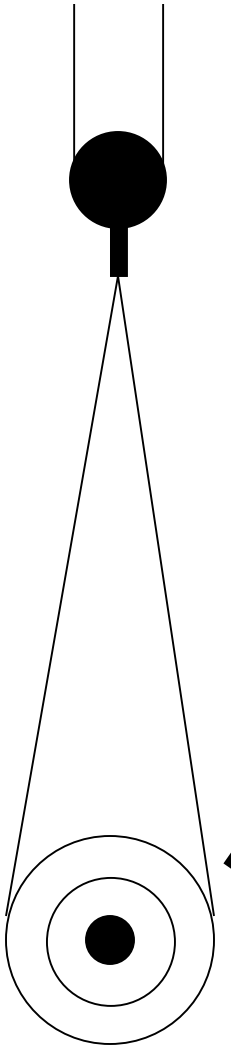
Diesel Hammer with lead guides for 8 by 26 inch leads

Swinging Box Leads 8 by 32”

Rigging to top of swinging leads

Note: Shackles pins must be wired off!

Two part sheave block with swivel. Long cable is treaded through the trip sheave and back to the hook. This keeps the block away from the diesel hammer piston.



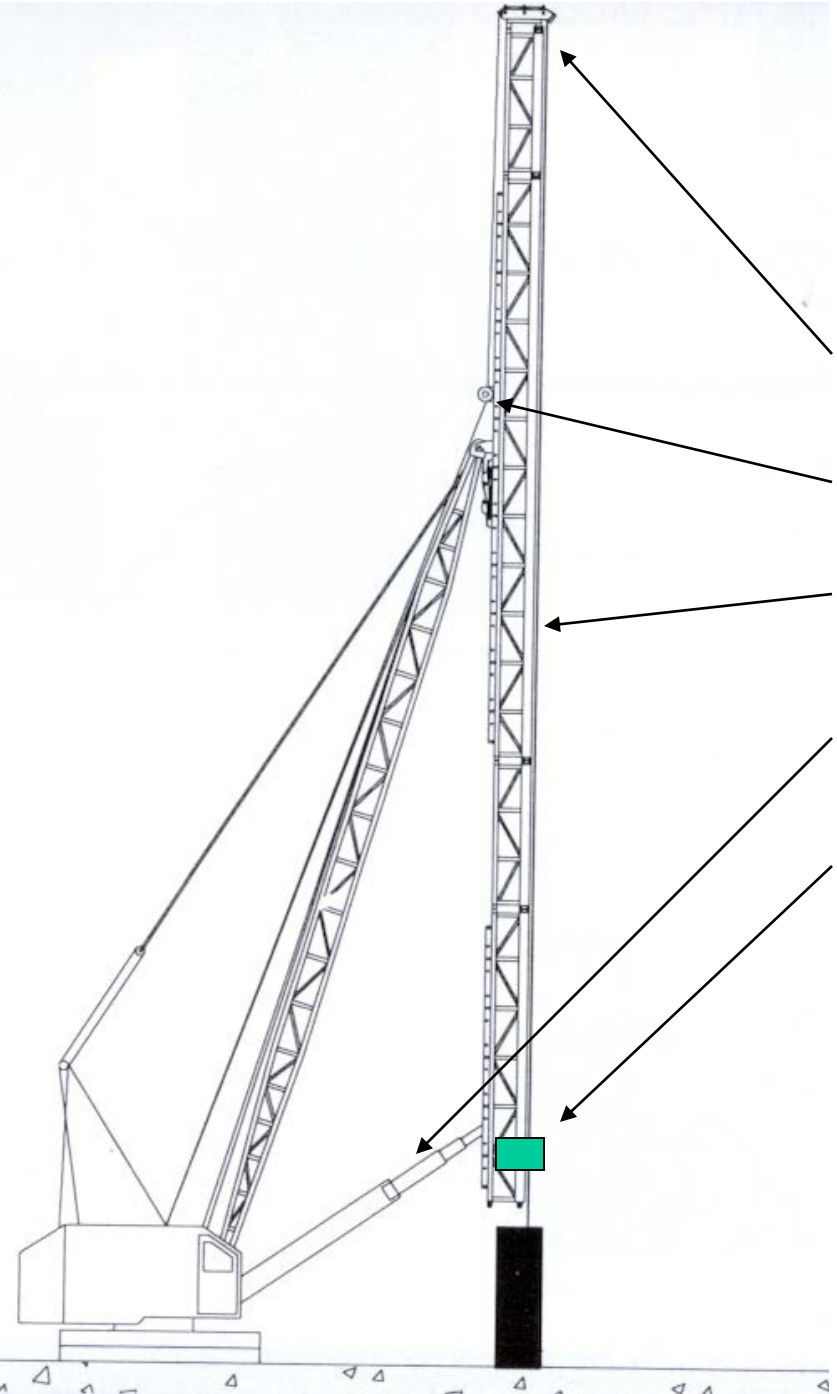
Sheave on trip

Note how a long cable is used to rig tripping device.

Fixed, Extended leads and Swinging Box Leads with Taper Top
8 by 32”

Swinging Leads With Roller At Top

Fixed, Extended Leads



Headblock

Rooster Sheaves

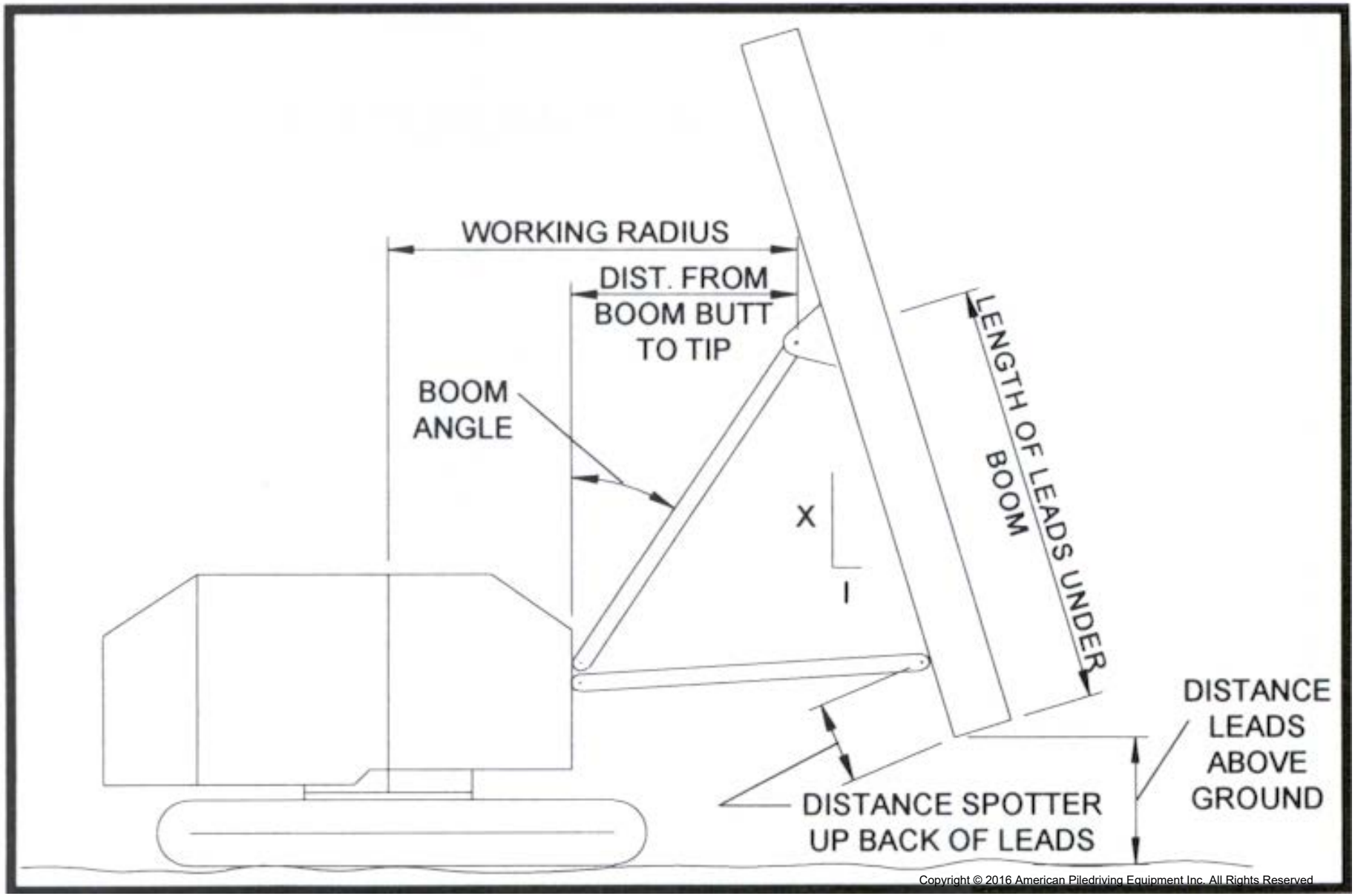
Leads

Spotter

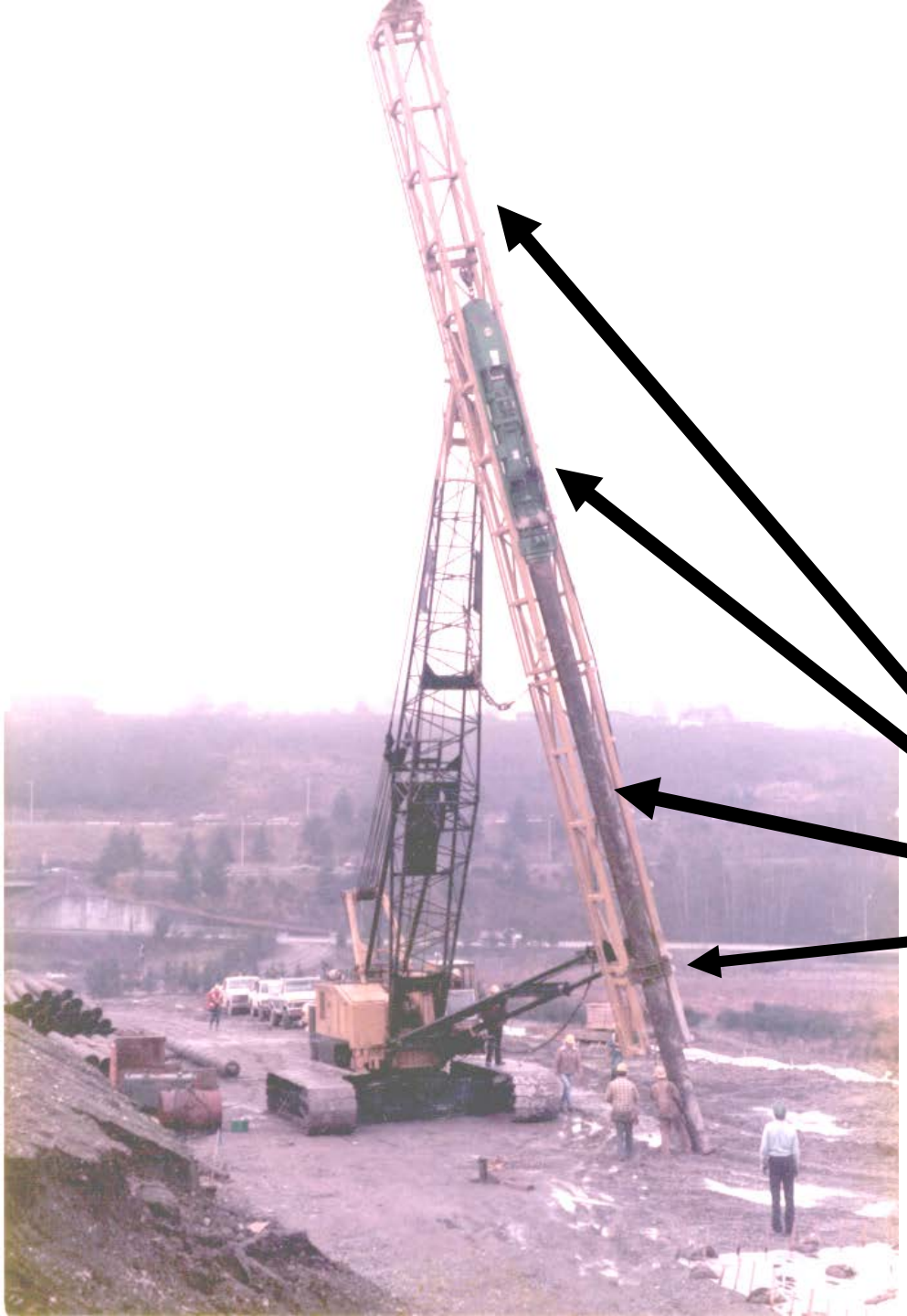
Gate

Requires more components than simple swinging lead set up.

LAYOUT CONSIDERATIONS



Fixed, Extended Lead



Lead, extended above crane boom

Diesel hammer

24 inch pipe piles

Pile Gate (Combination Rabbit)

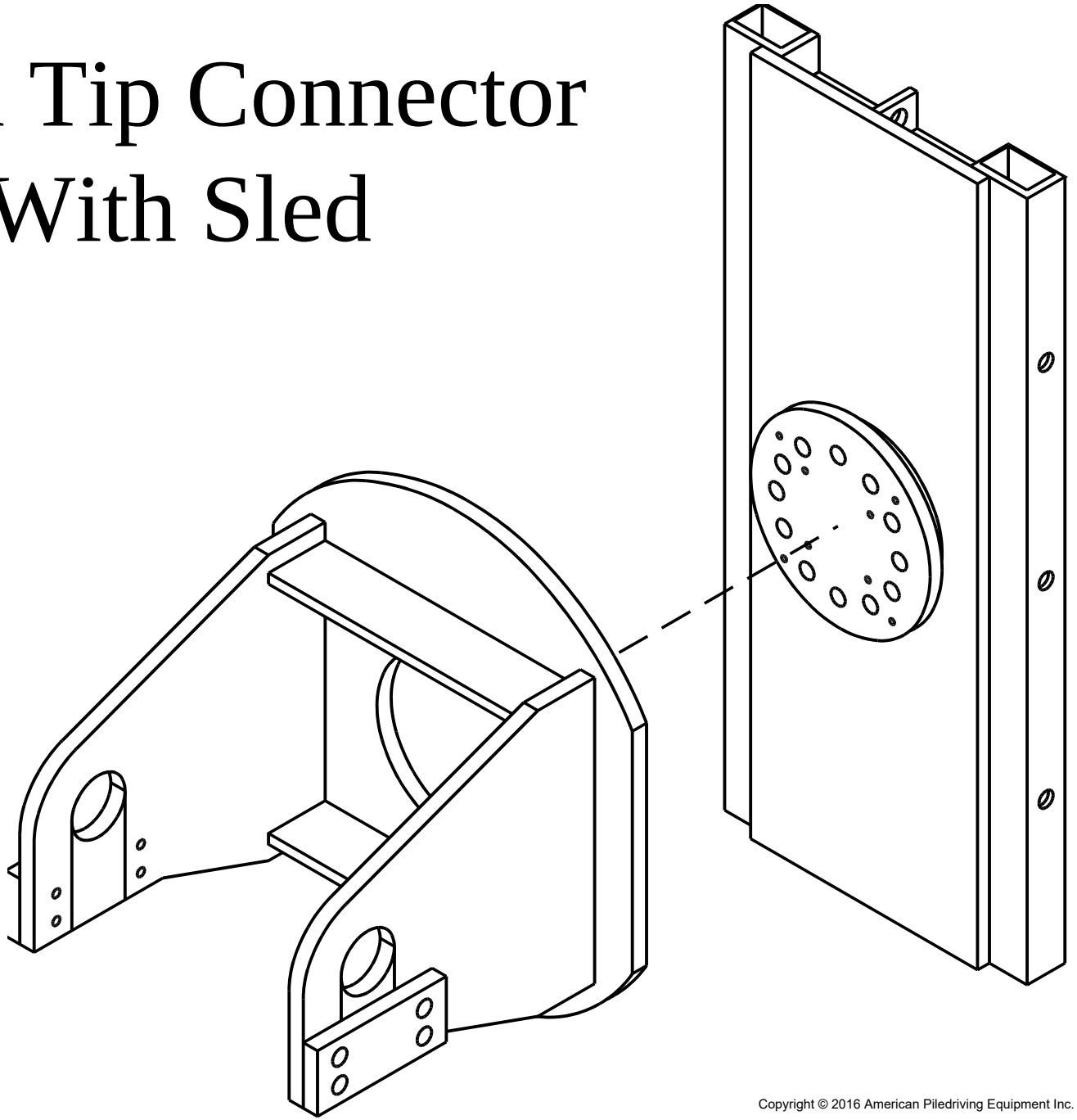
Note: Spotter pushing lead into a batter position called

“left side batter”

Fixed, Extended Leads

Note: Boom tip connector can be moved.

Boom Tip Connector With Sled



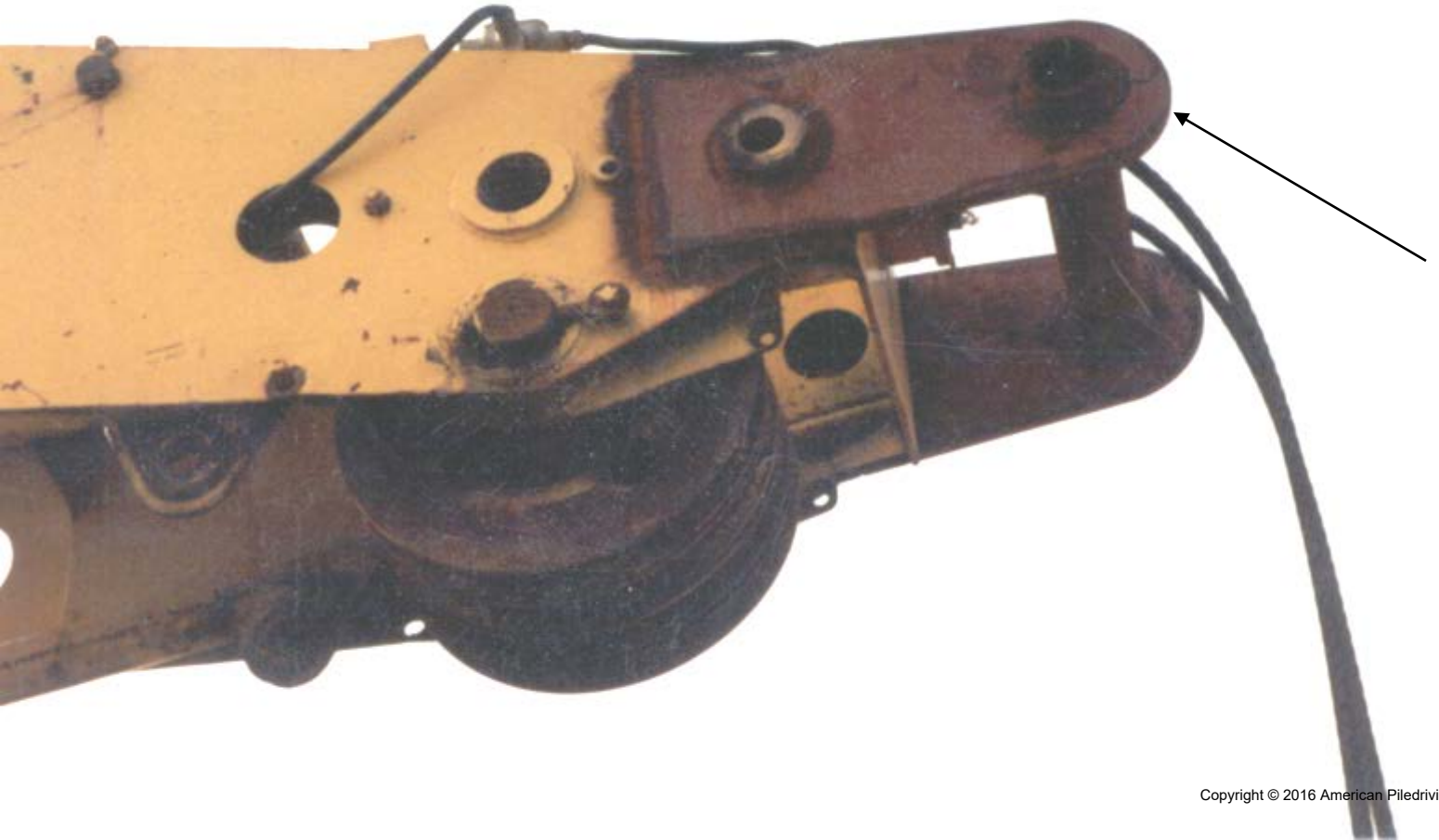
Massive boom tip connector

Boom point Connectors

Example of fixed boom point

Two cranes help assist piling crane in picking fixed lead system

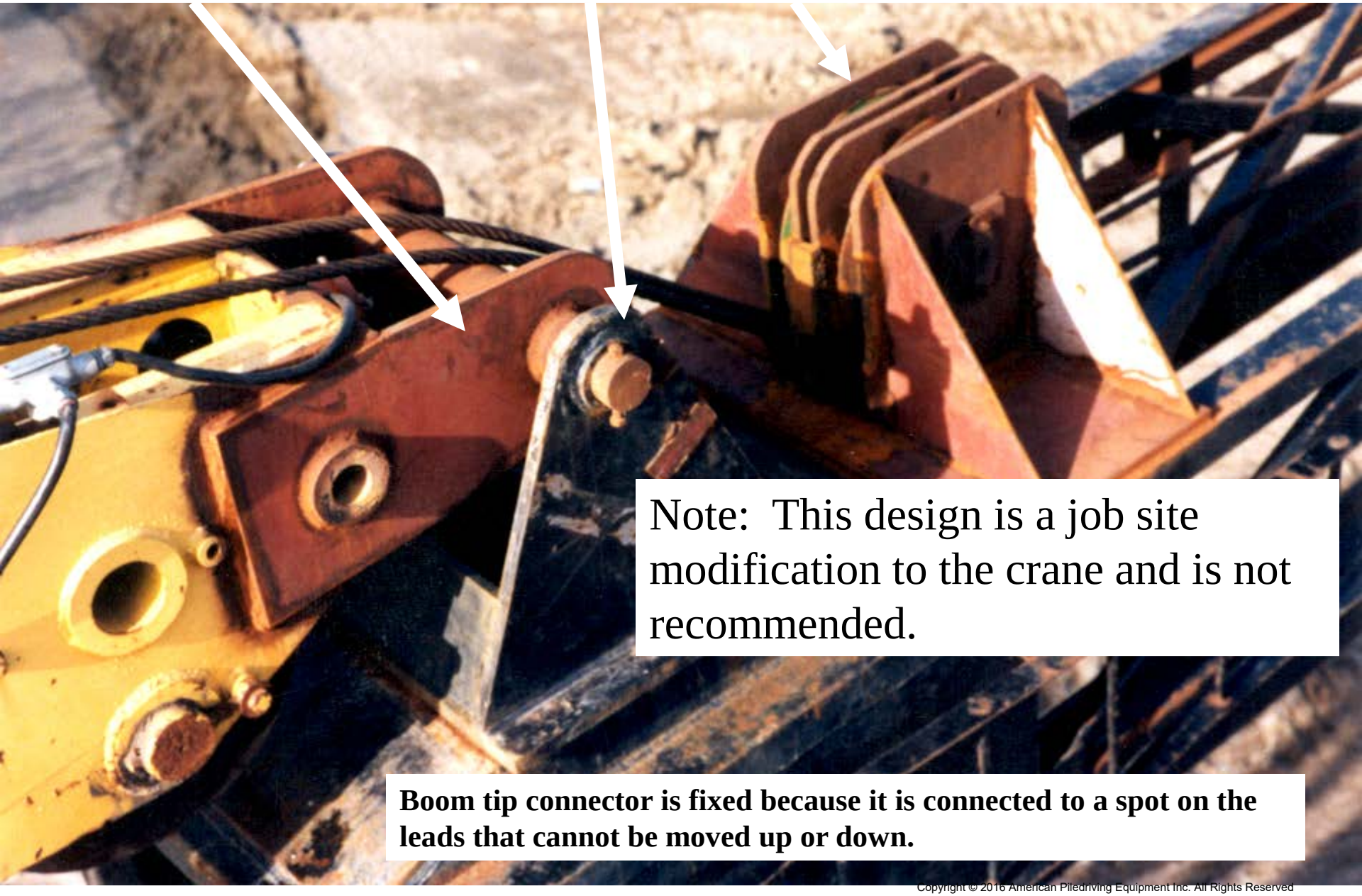
Connection to crane boom



Ears welded to crane boom.

Not a good practice.

Crane tip, Boom point, & Rooster



Note: This design is a job site modification to the crane and is not recommended.

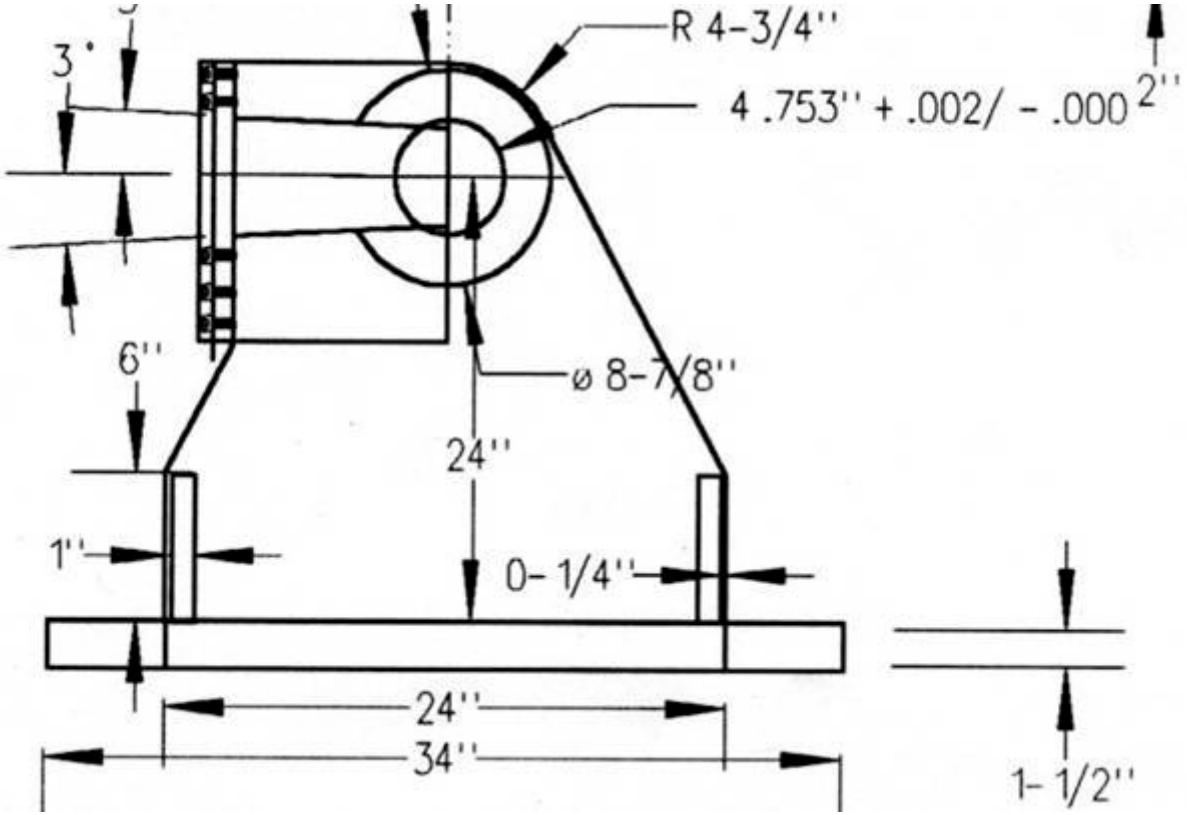
Boom tip connector is fixed because it is connected to a spot on the leads that cannot be moved up or down.

One type of Boom tip connector with bolt on mounting plate.

Fixed boom point connector

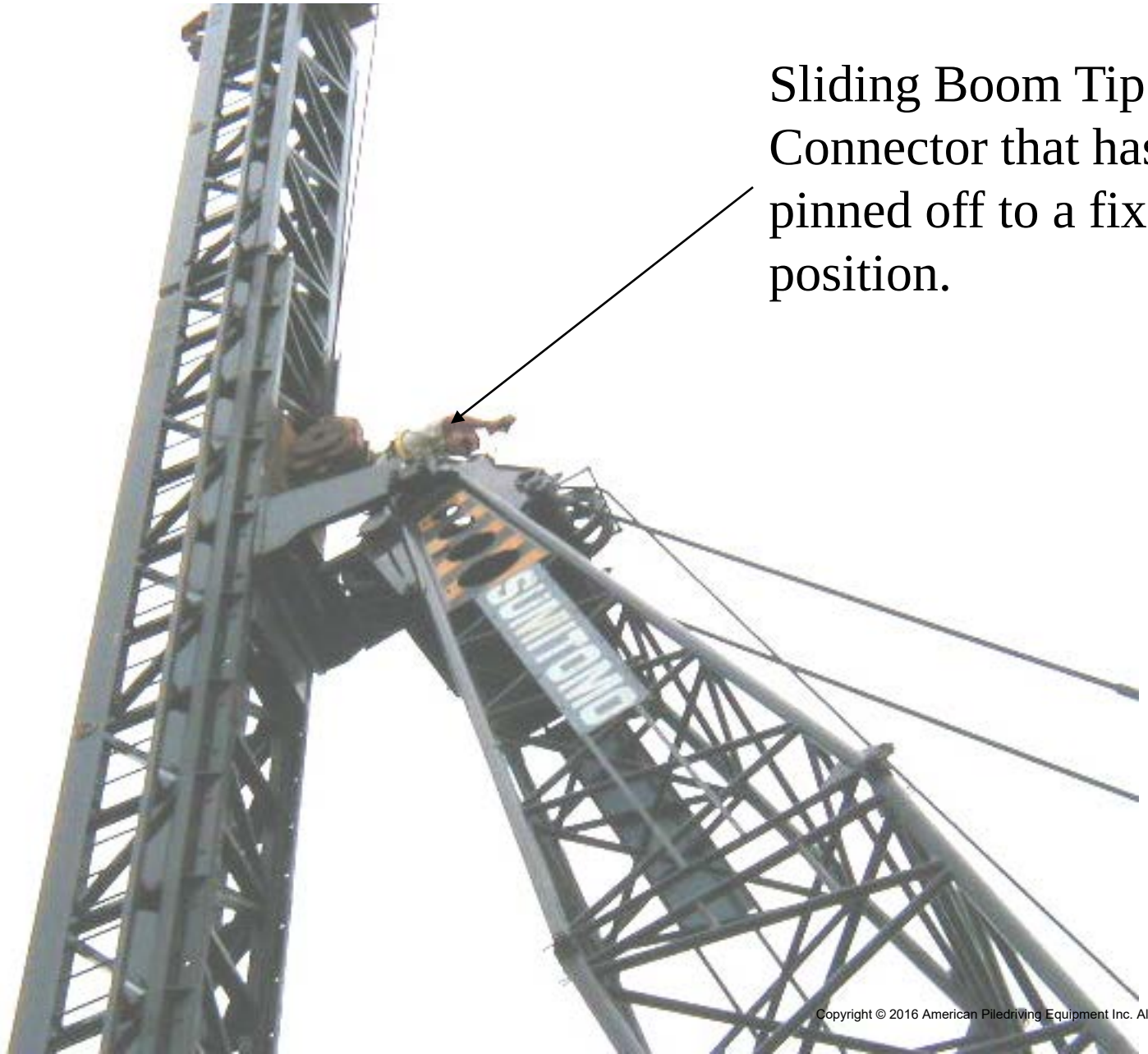
Sliding boom point with easy install pin.

Simple drawing of Boom Point



Example of contactor fabricated sliding boom tip connector

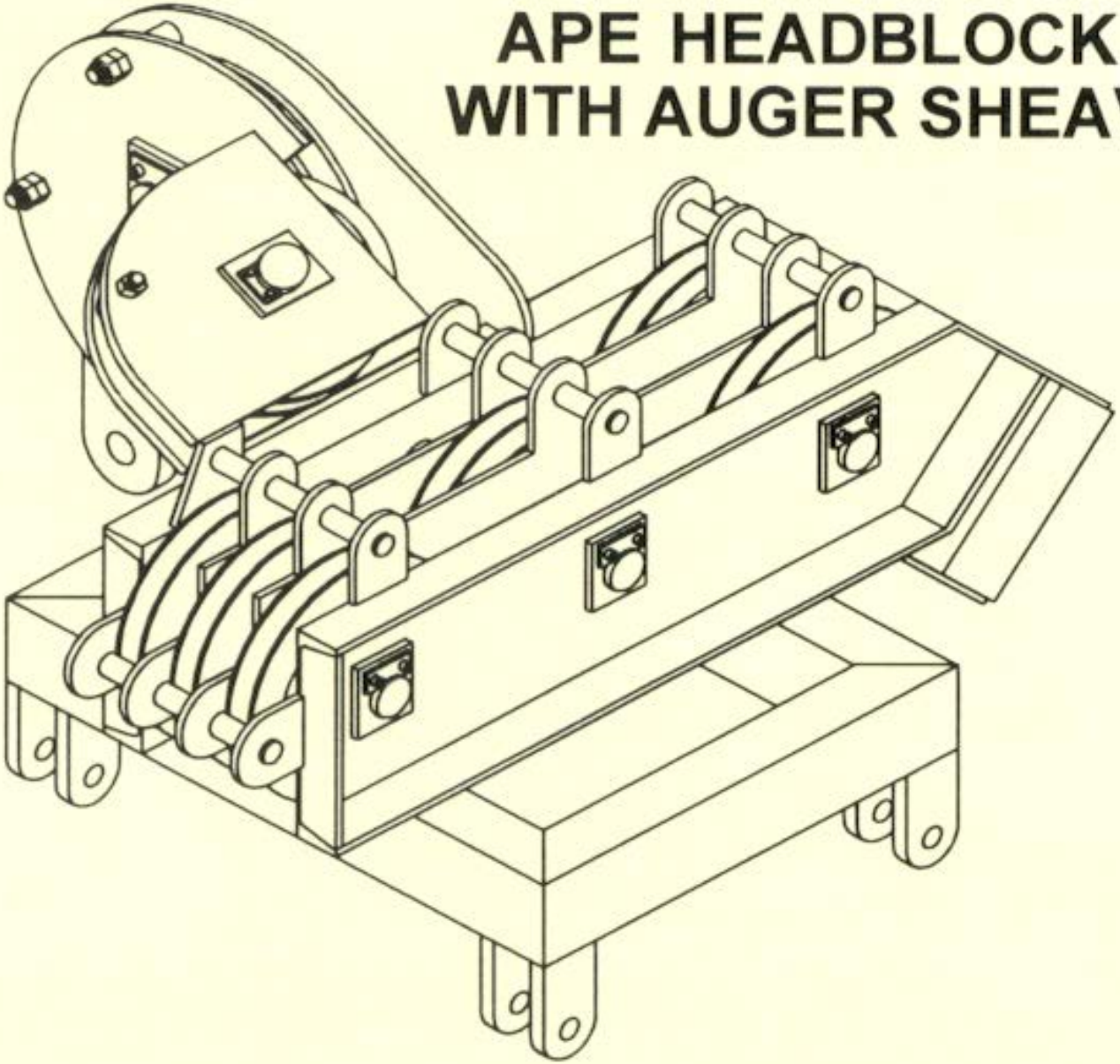
Sliding boom tip that is fixed.



Sliding Boom Tip Connector that has been pinned off to a fixed position.

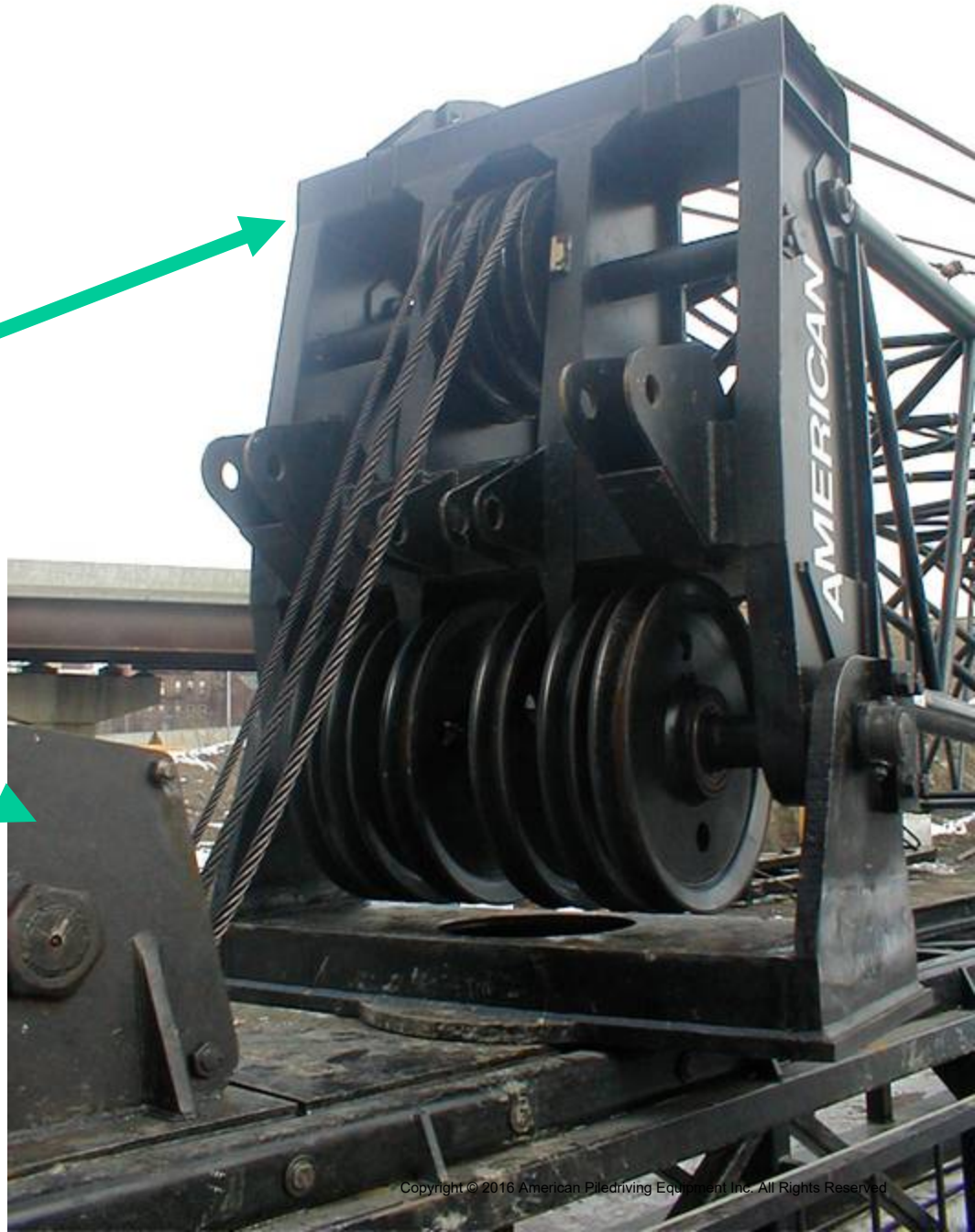
Headblock

APE HEADBLOCK WITH AUGER SHEAVE



Example Head Block With Side Sheaves For Auger

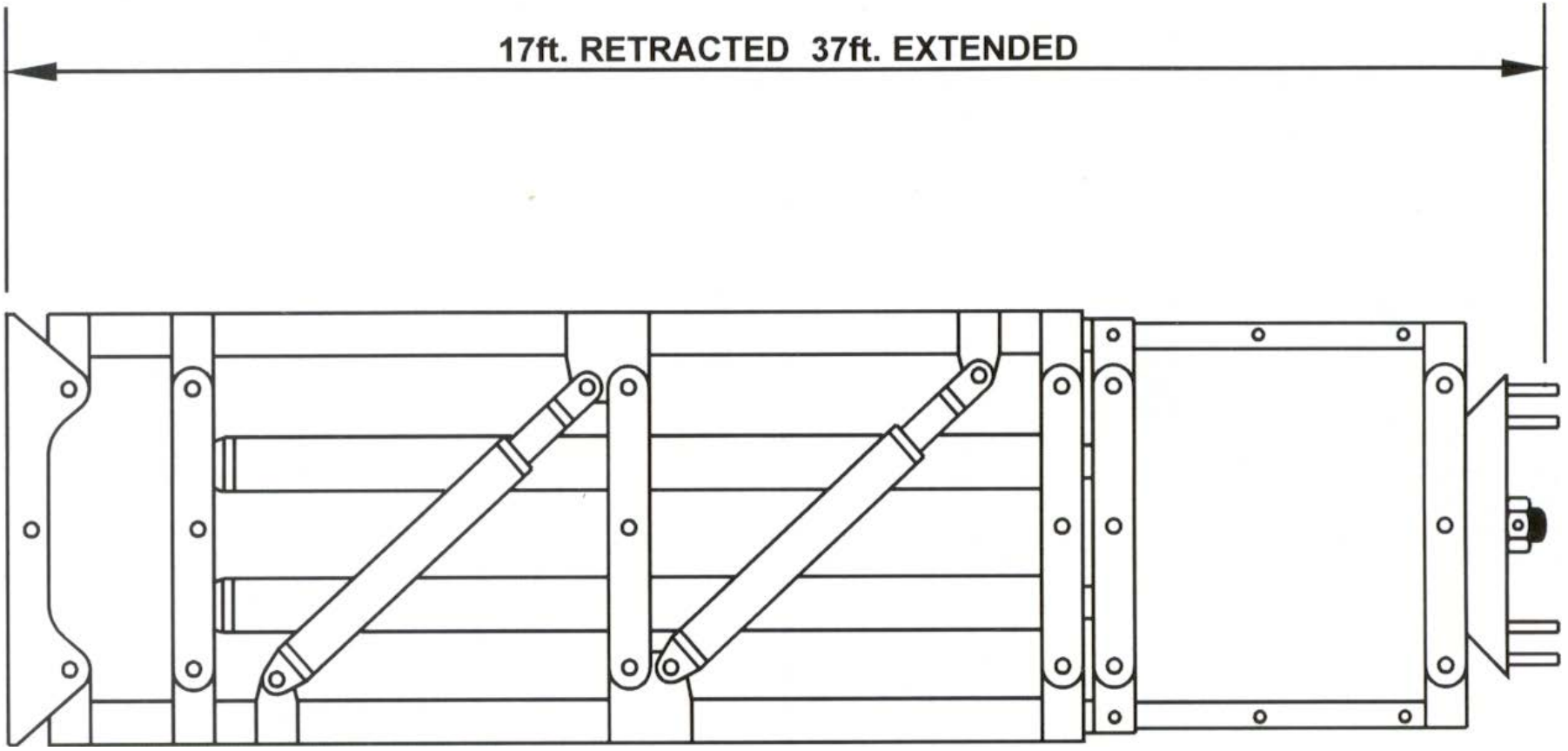
Boom Tip & Roosters



Top View of Headblock

Spotters

Typical Spotter



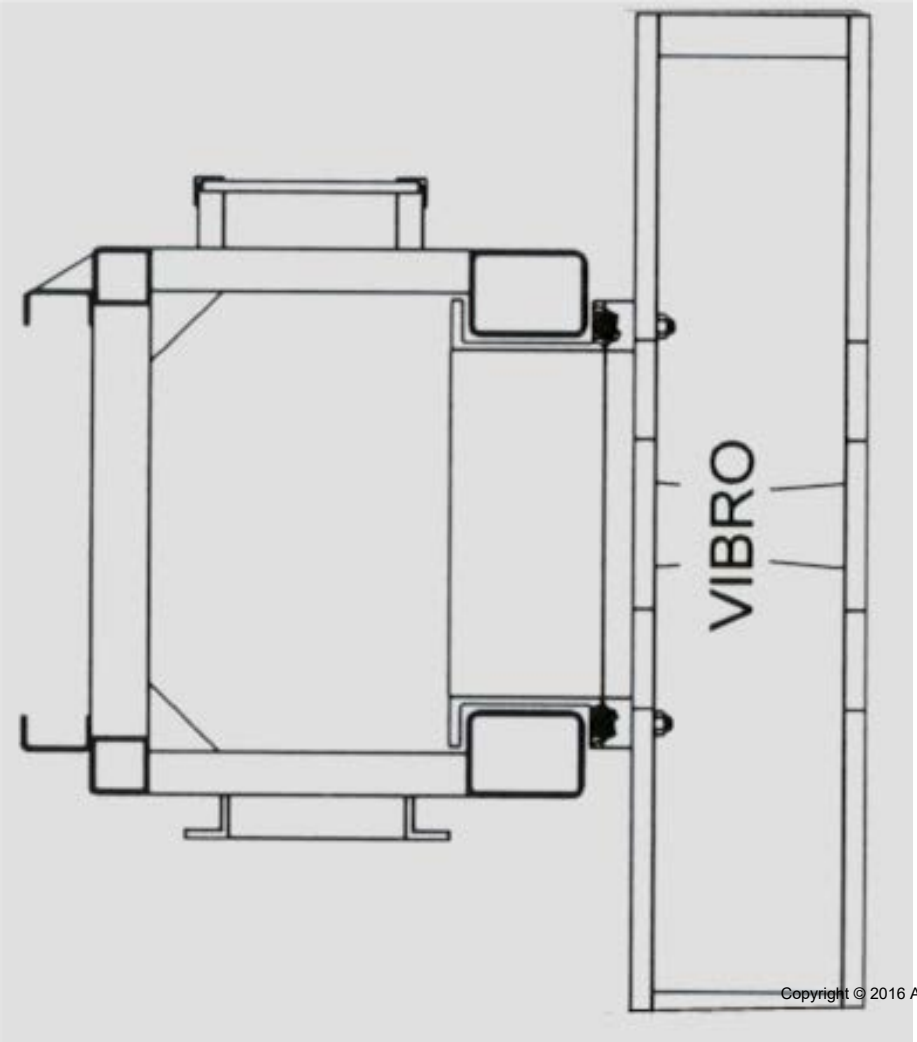
Spotter to Lead Connections

Fixed Leads with Vibro in Front

Note: Swinging leads can be fit to front of fixed leads to allow for larger hammer to fit smaller leads.

APE Model 400 in leads extracting Concrete Piles

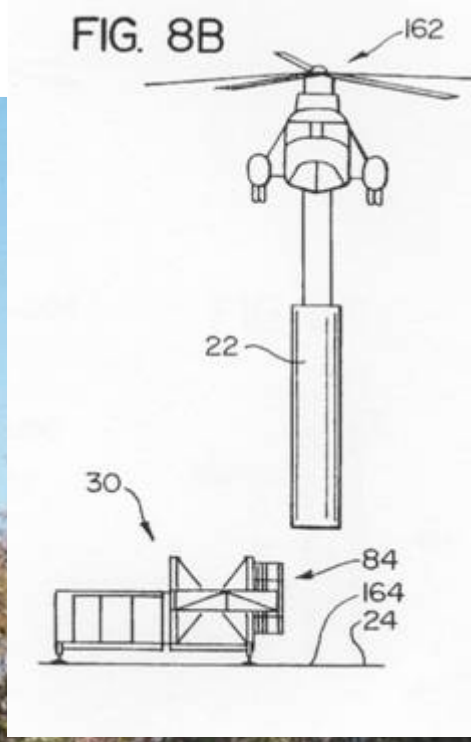
Top View of Vibro in Leads



Vibros in Leads

Forklift Mounted Leads

Power Unit Leaders



Power Unit Support Leaders

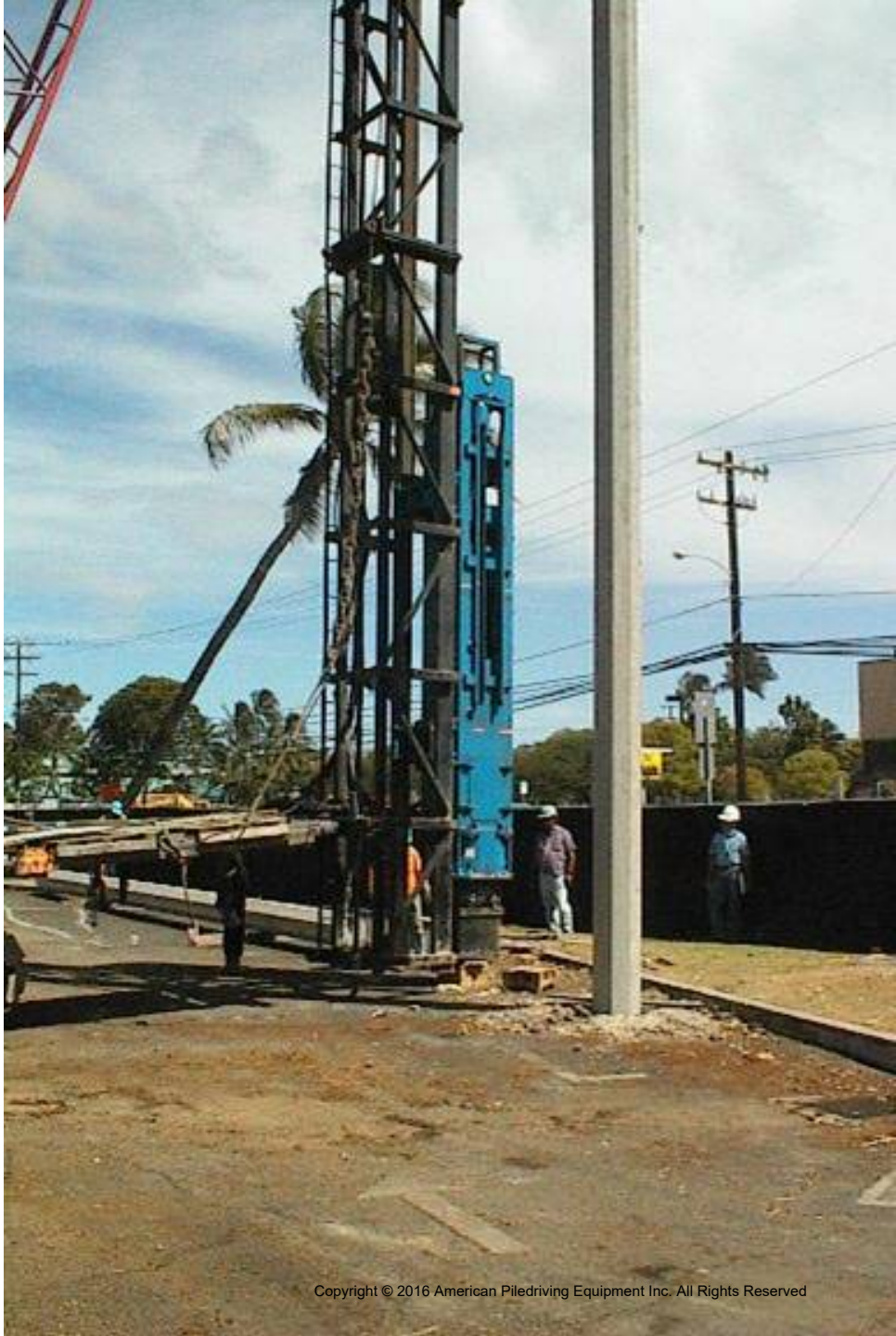
Power Unit Supported Leads

Vibros In Leads

Vibros
In Leads

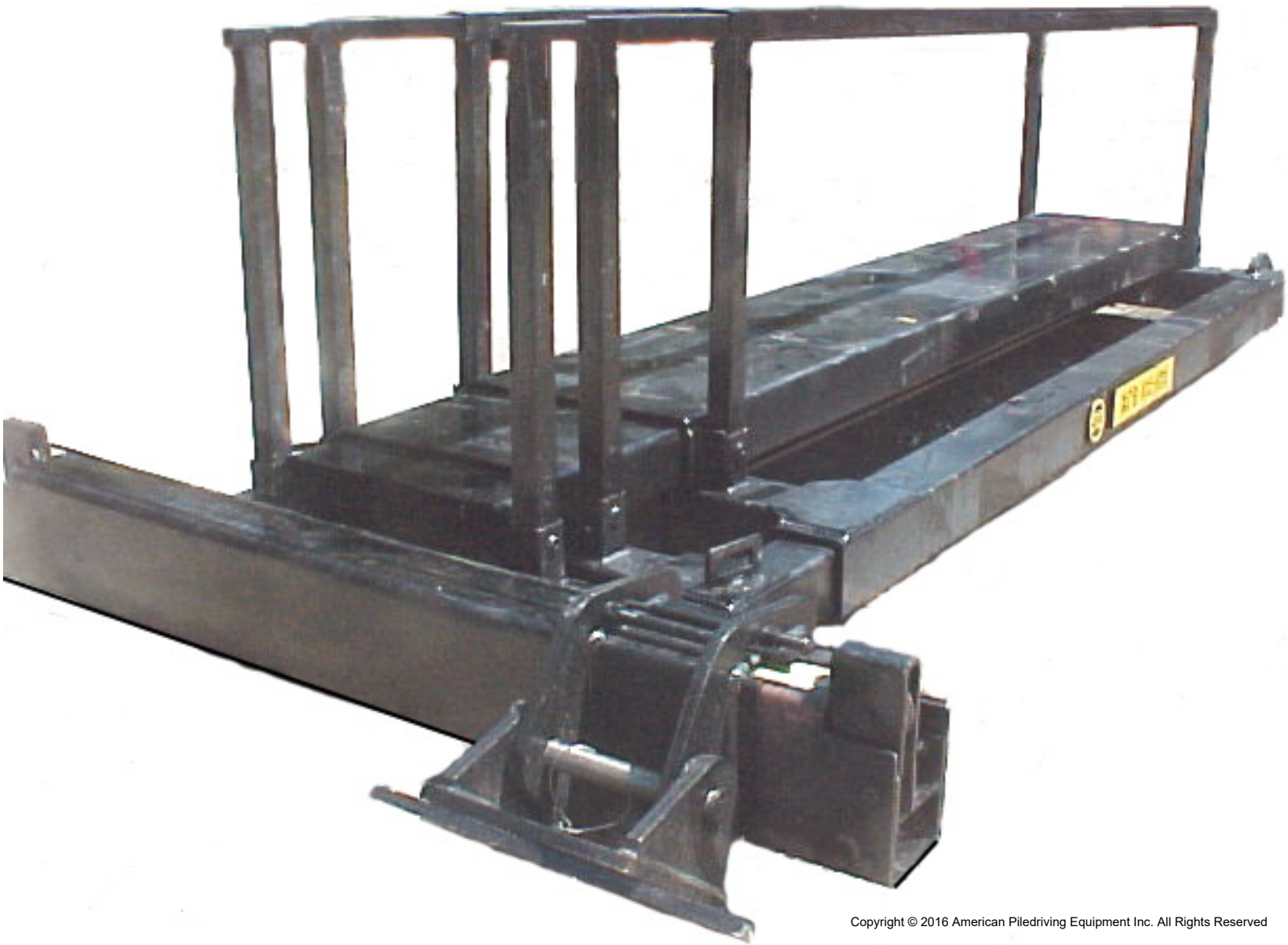
Hydraulic Impact Hammer in Front of Leads

Hammer in front of leads



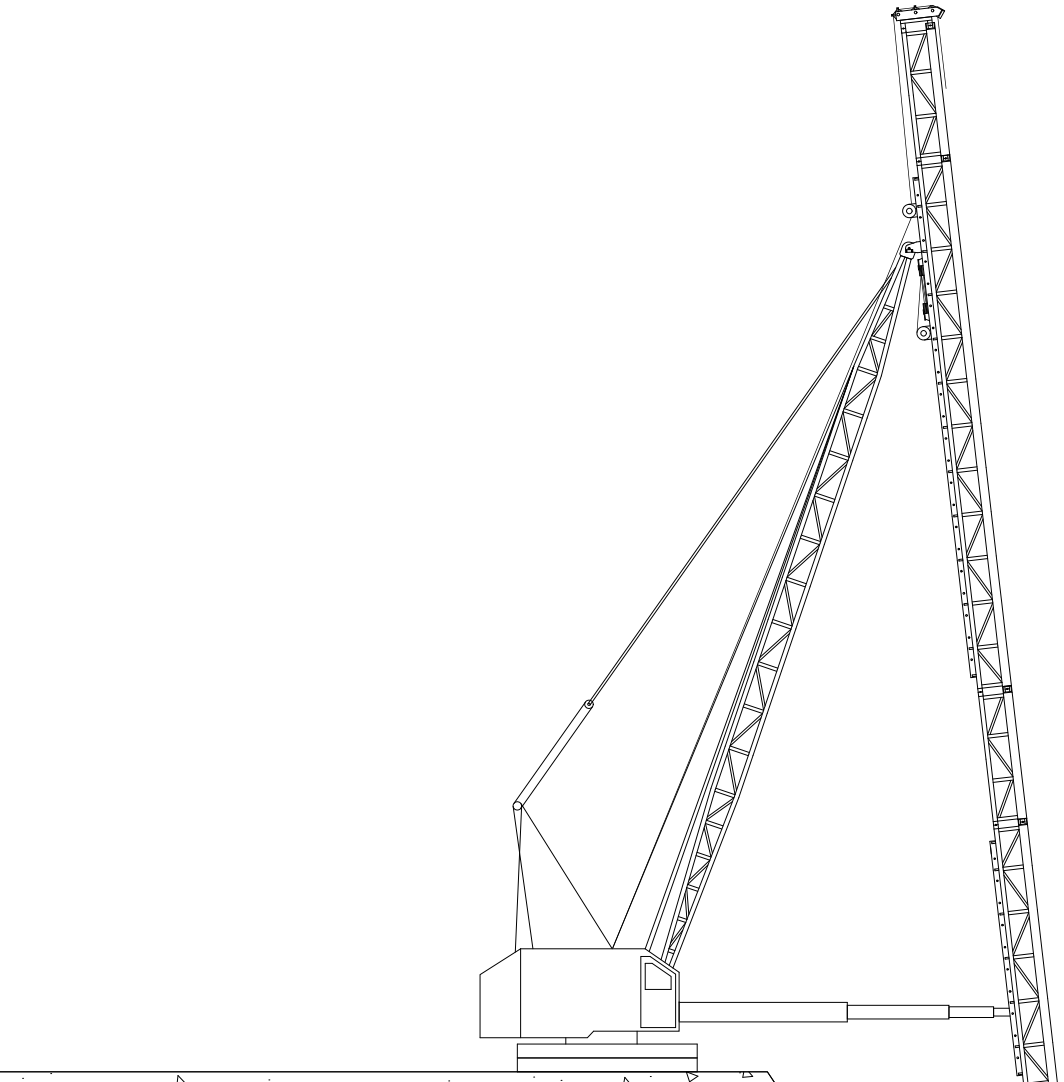
Lead Adapter

Spotters



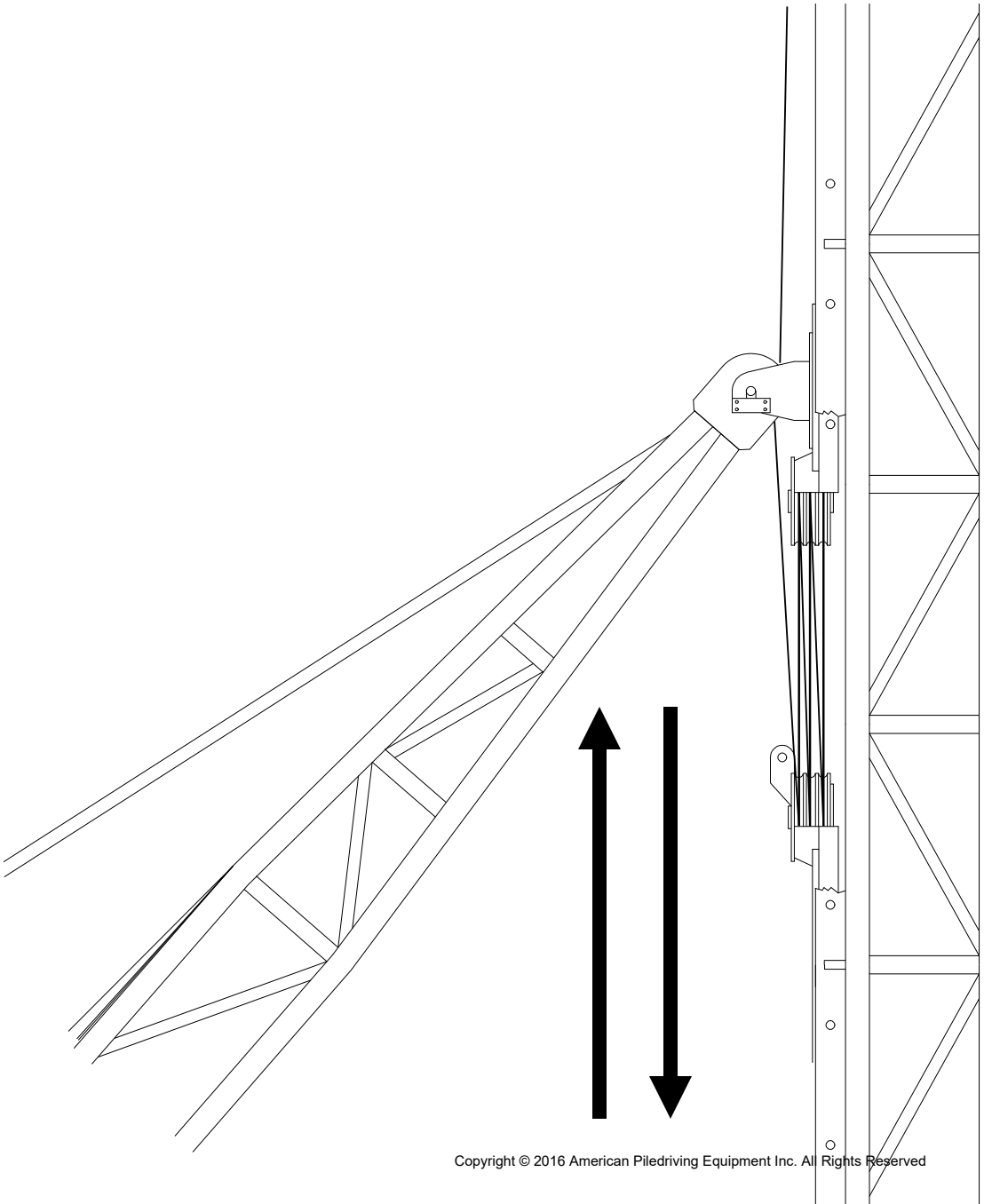
Spotters

Fixed, Extended Travel Leads

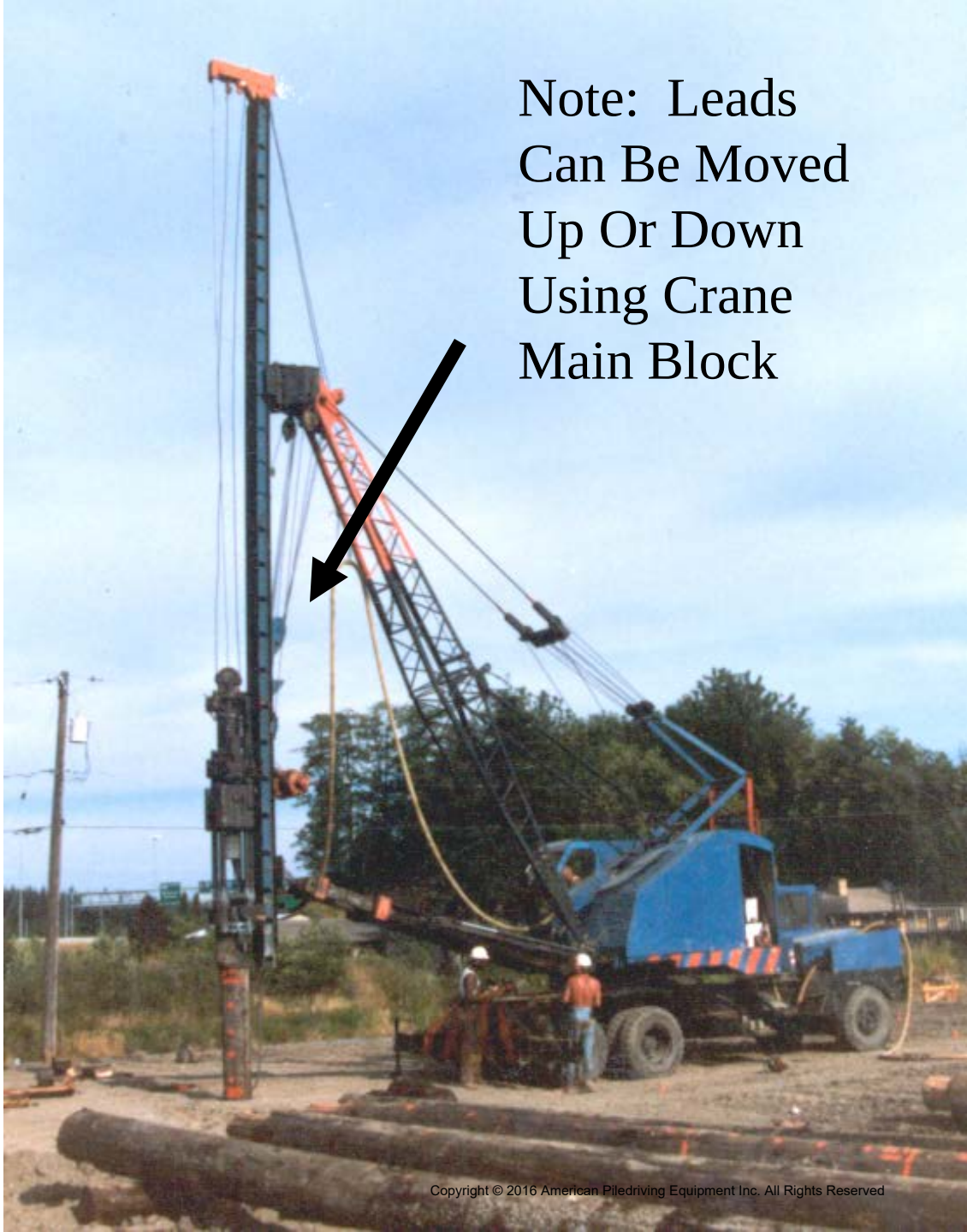


Fixed, Extended, Vertical Travel

Vertical Travel Leads



Pogo Stick in a Vertical Travel Leader Type System



Inside Pogo Stick Lead

Boom tip sides up and down on back of leader.

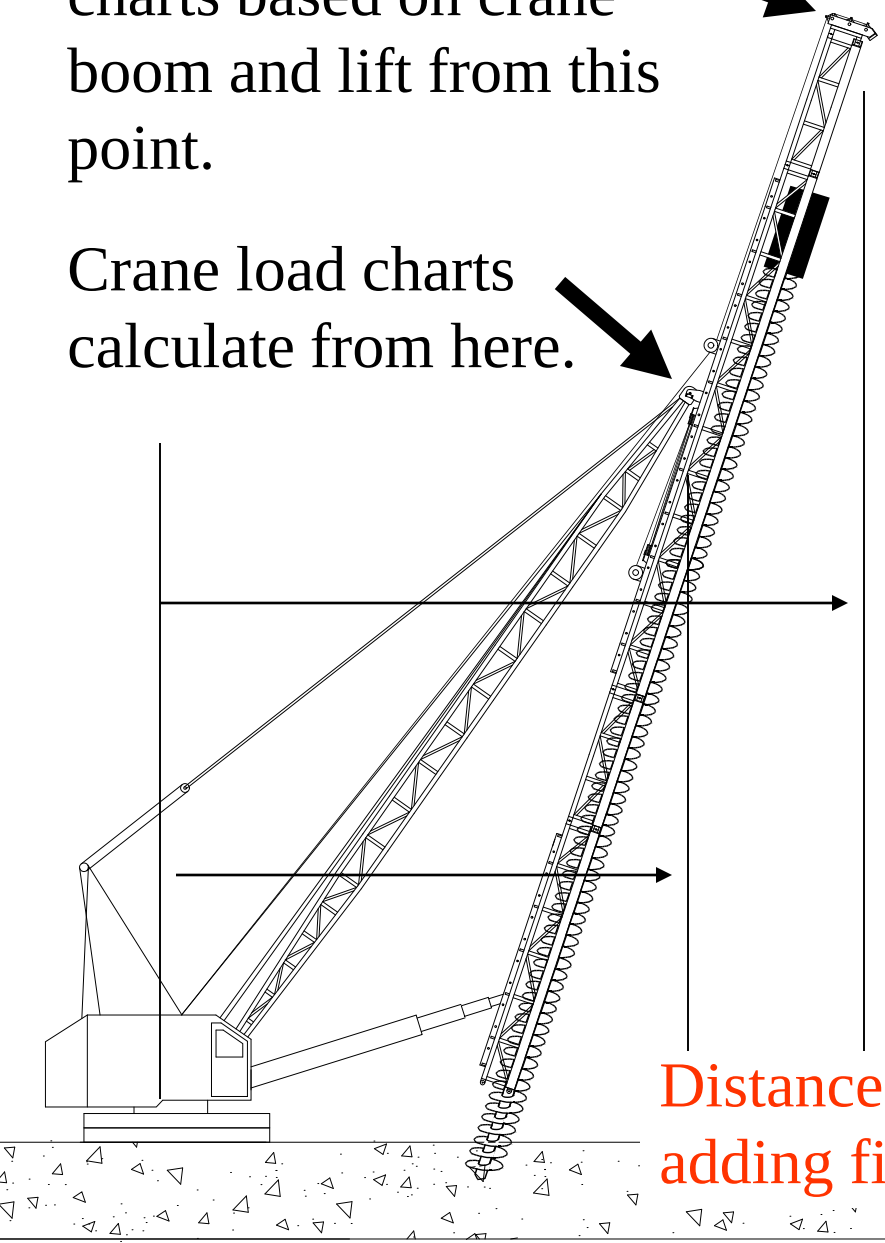
Stops are welded to top of leader to allow crane operator to boom up and pick leads.

Note: Hammer faces crane operator.

Dangers of extending Leads

Do not read crane charts based on crane boom and lift from this point.

Crane load charts calculate from here.



Crane lifting capacity is based on many factors including the length of the boom.

Extending the boom reduces lifting capacity.

When extending the leads above the boom, please have all lifting calculations reviewed by a qualified engineer and the crane manufacturer.

Distance from crane center changes when adding fixed leads and spotting back.

Boot Leads

Boot Leads (John Lucas)

Boot Leads

Boot Leads

IHC Hydraulic Impact

and

Woodrow Wilson Bridge

Boot Leads

Boot or pile guide is mounted to bottom of IHC hammer to be used as a leader system.

Boot Leads

APE Model 400 with 400,000 ft pounds and 80,000 lb ram.

Hydraulic and Underwater

Flying Leads On Batter

Flying Leads

Flying Leads On Oil Rig

Off Shore Leads

Flying Leads

Barge Mounted

D100 diesel hammer

New technology

Bottom drive leads for large pipes.

APE D80 Drives 84" Piles

This photo shows the new APE 37 inch box type leads with a new development pile driving system for super large diameter pipe piles.

This new system is called the "Bottomdrive". It has a much lighter hanging weight and a much lower center of gravity.

The system was first used in California by Lucas Marine. It is now commonly used on many large diameter pile projects.

Another added feature is the ability to drive the pile closer to the ground which is impossible with a conventional offshore type leader system.

If you need to drive large diameter pipe or caissons then this is the only way to go. It is fast, simple, and your crane operator will love it.

Contact Joe Wright at APE Houston for additional information.

This design was jointly manufactured by APE and Bomac Contractors of Houston, Texas.

Bottom Drive

APE D100 driving ten foot diameter caissons in California with FlatIron

Bottom Drive

Excavator Leads

Excavator Leads

Excavator Leads

Excavator Leads

Excavator Leads

Excavator Leads

Excavator Leads

APE Diesel Mounted In Leads

Excavator Leads

Excavator Leads

Model APE 8A driving pipe piles under a bridge in California

Excavator Leads

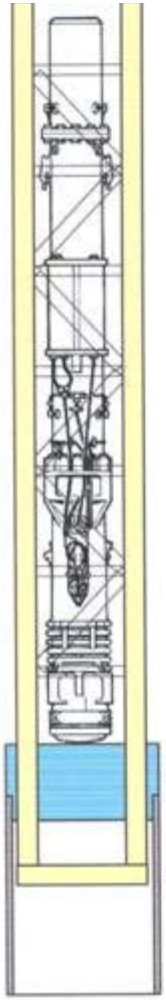
Excavator Mounted Leads

Excavator Leads

Excavator Leads

Rig Leads

Special Leads

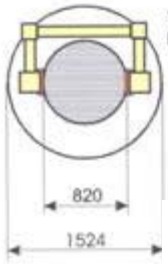


This special lead system allows to drive steel pipe piles close to each other.

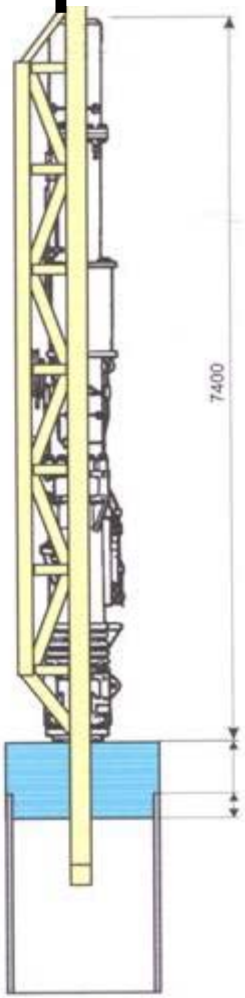
The leader is supported by the crane and allows the diesel hammer to slide up and down. The special machined drive cap / helmet is also guided by the leader which guarantees the correct line and the optimum transfer of the impact energy to the pile.

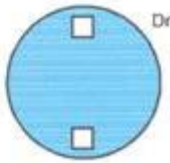
Drive cap / helmet machined to fit inside the casing pipe

Bottom cross bar



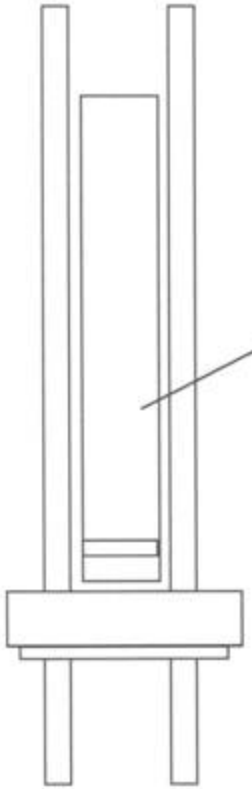
Top view of hammer, lead and drive cap





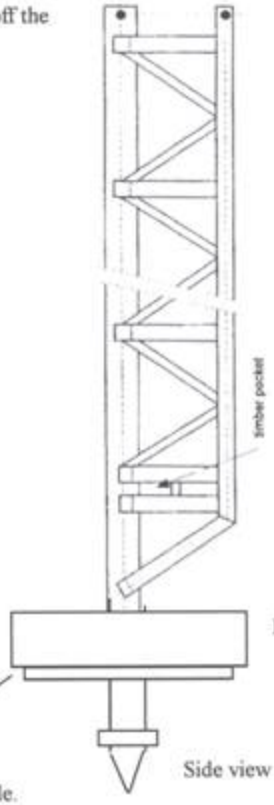
Drive cap

slides up and down in leads. Hammer cannot fall out the bottom of the leads because drive cap cannot fall off the two guide rails.



Hammer

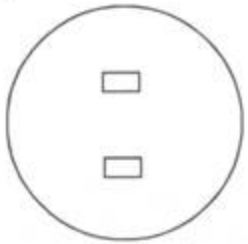
Front view



Drive cap

machined to fit inside of pipe pile.

Side view

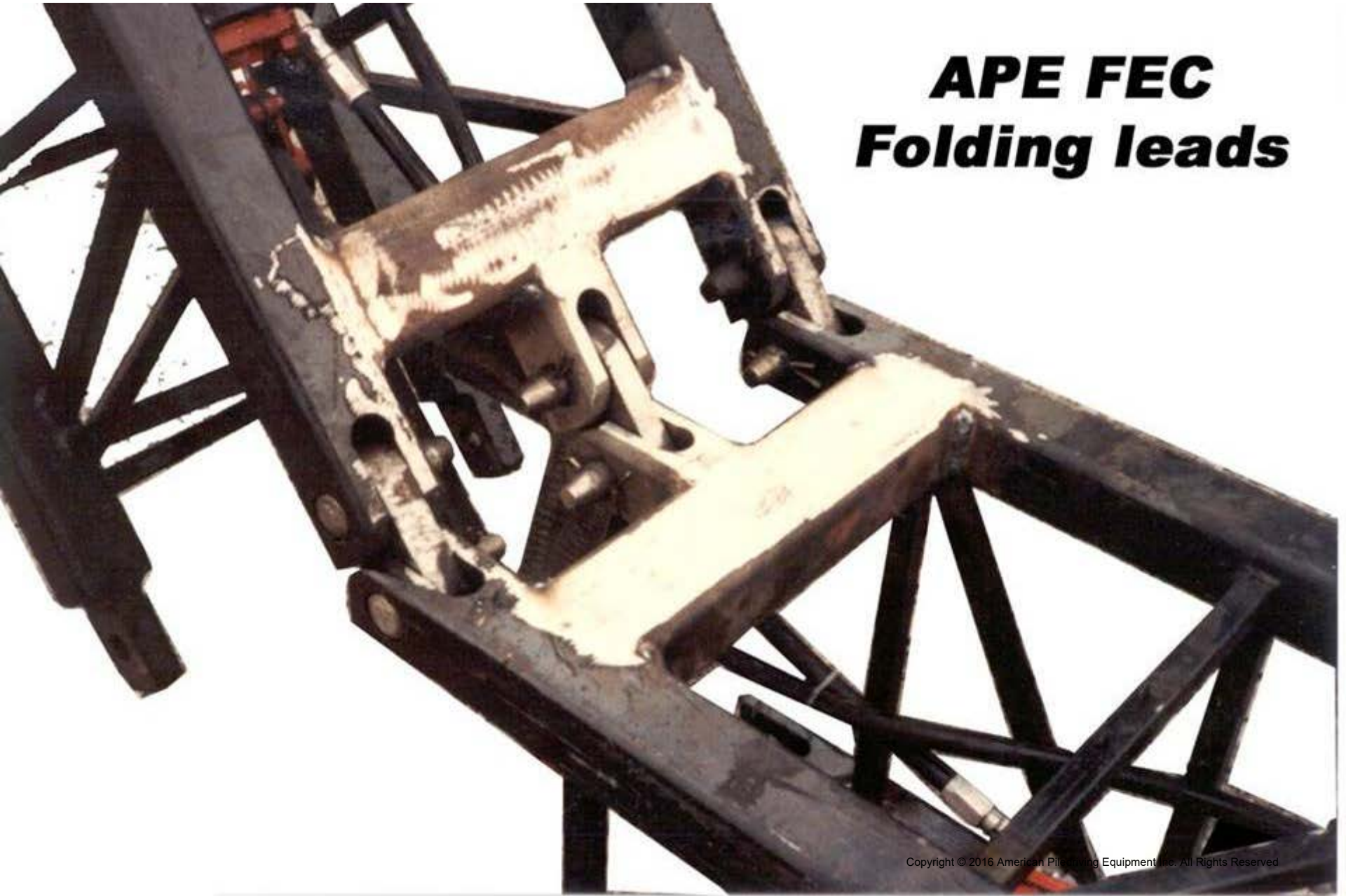


Top view of drive cap

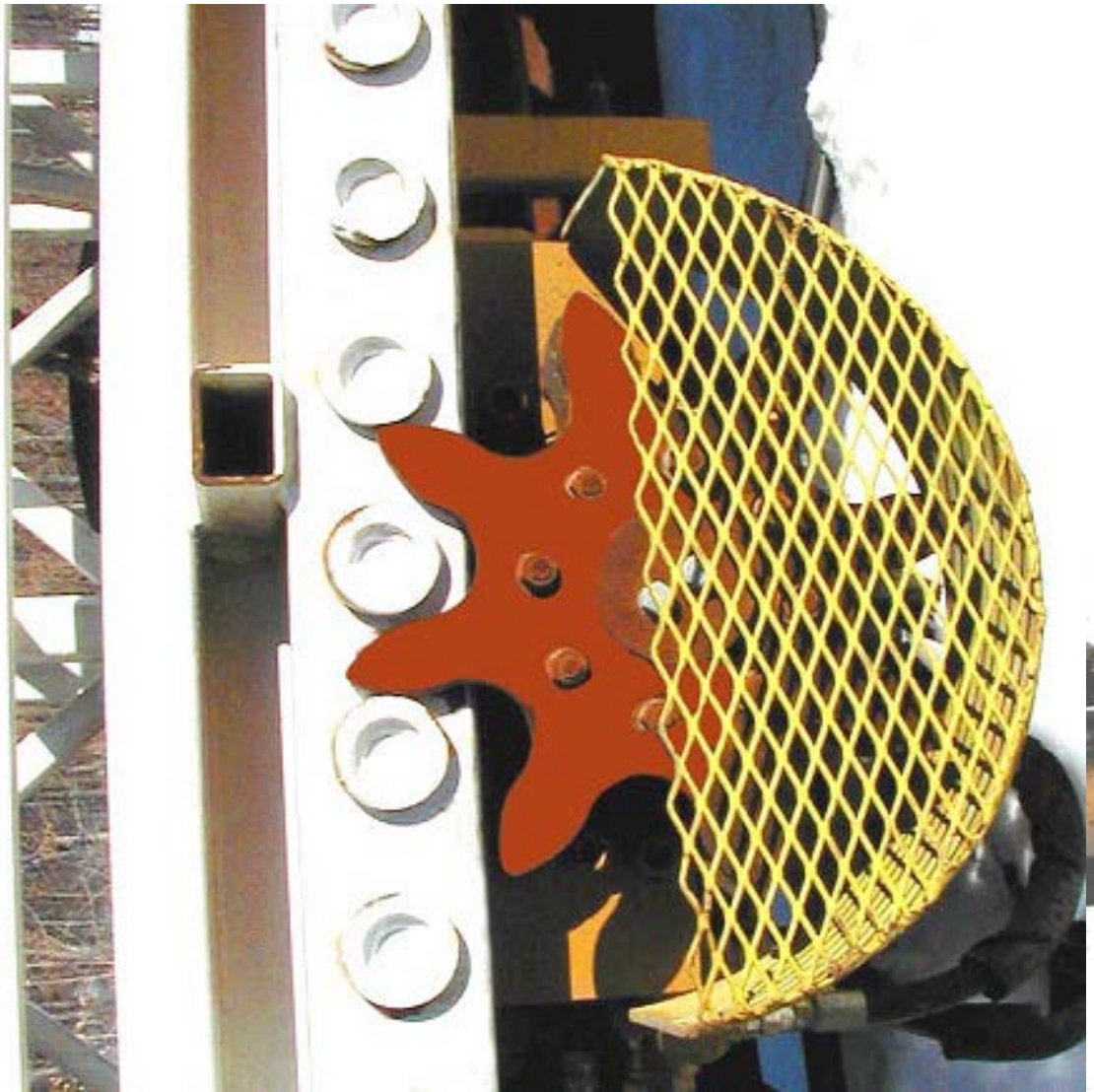
APE D100 and D62 fit in same leads or we can provide two sets of leads so the crew will not need to pull the D100 out and stick the D62 in.

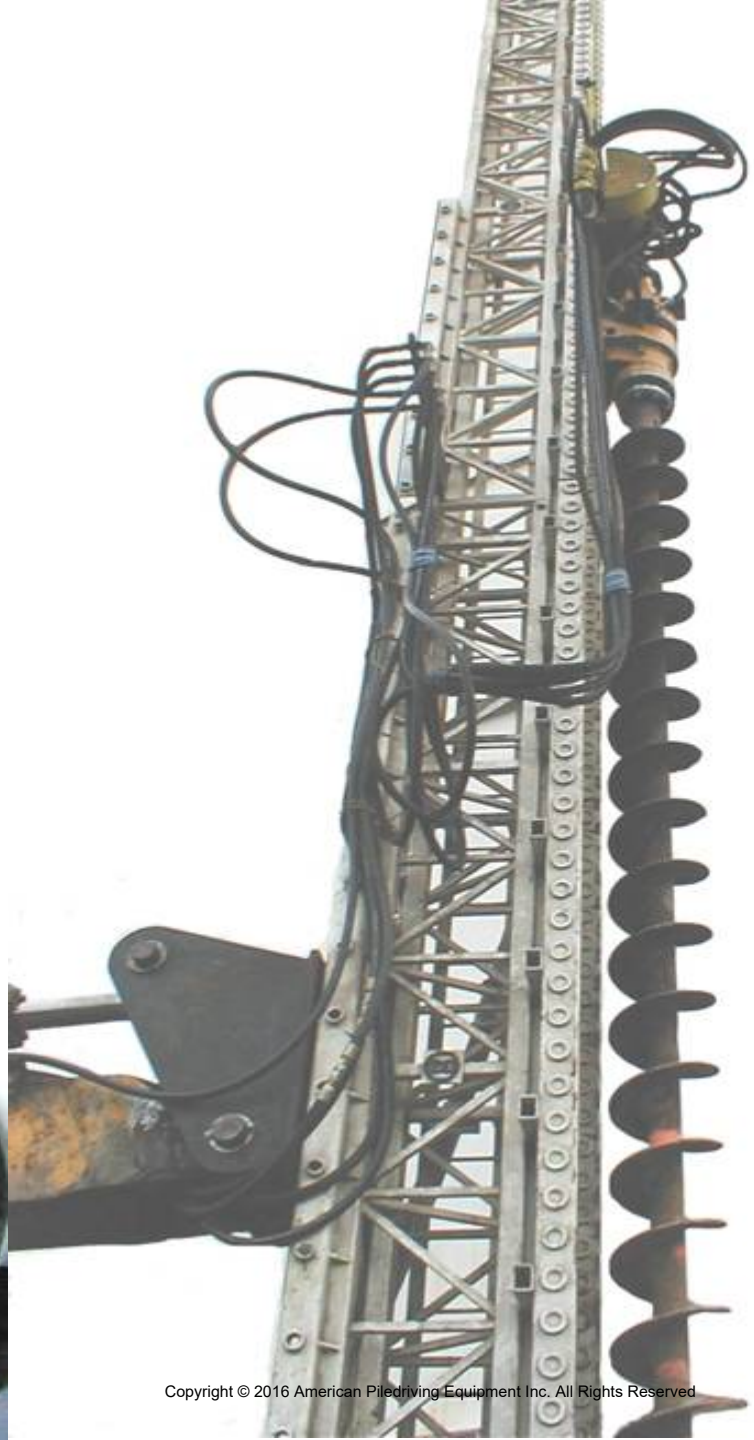
For driving pipe piles right next to each other.

Special Folding Leads



APE rack and pinion drive leader system





Excavator Leads

Excavator Leads

Excavator Leads

Vibros in Leads

This photo shows an MKT V-20 mounted in leads for the West Seattle Bridge Project in the early 1980's.

It was the first time a vibro was mounted in leads on the West Coast of the USA.

Vibros in Leads

APE Model 400 mounted in front of leads to drive pipe piles.

San Francisco, California

Kiewit Construction

Vibros on Forklift Leads

Leads for

Wick Drains

Vibros in Leads

Leads with Pull down