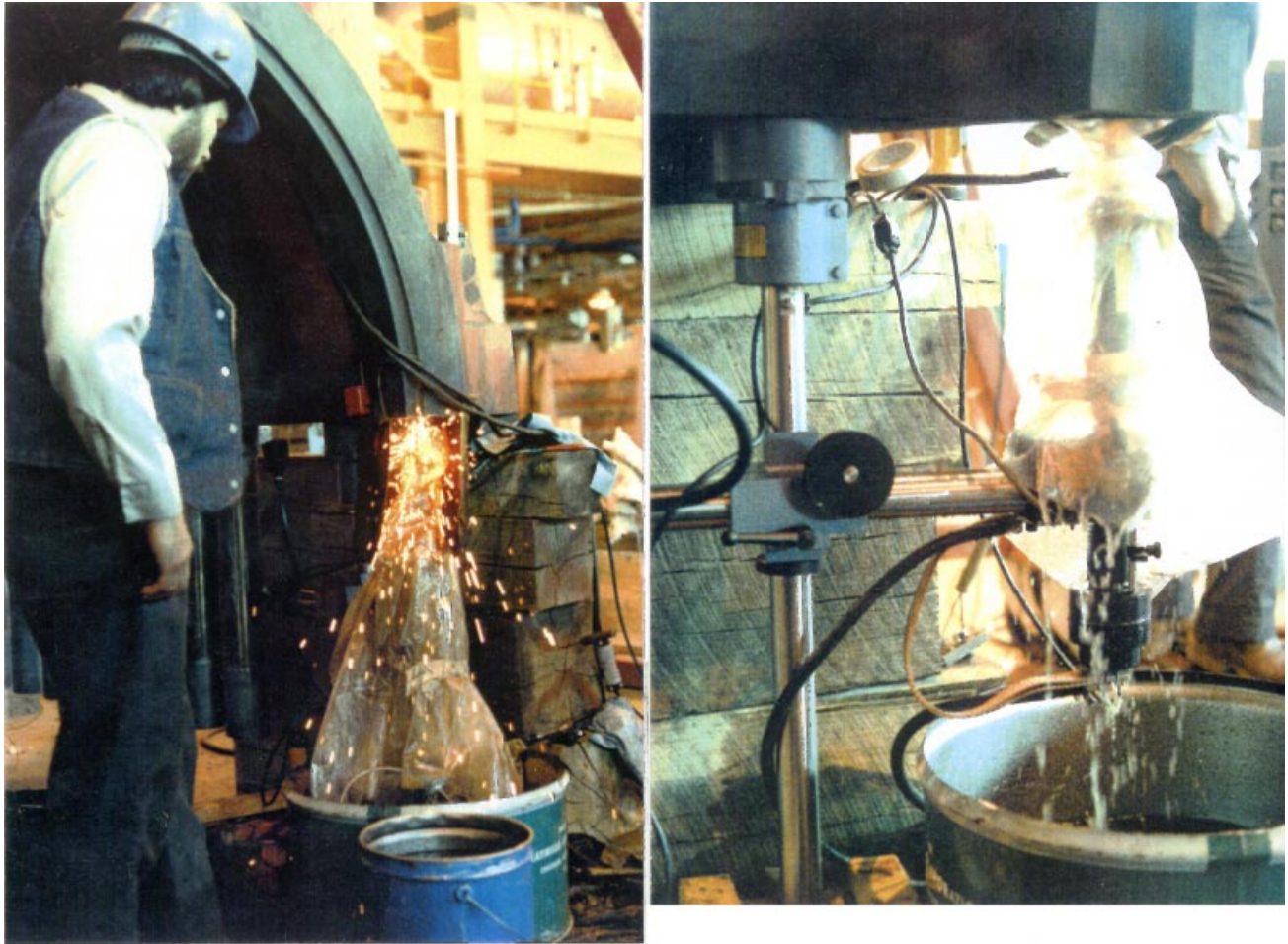


Every situation is different.
You may need to be creative.

The Bolt Eater will operate just as well upside down; the magnet base will hold the head in line for the cut. Here the operator has taped the splash bag to the workpiece.

In other examples you will see where the operator has created support bases for attaching the magnet.



Turbine Bolt

Big River Electric, Henderson Generating Station
Livermore, KY

Bolt size: 3-1/2"-8

Depth 4"

Cutting Time: 3 hr.

Removal Time .5 hr

Total Time: 3.5 hr

from bottom half of high-pressure
side of steam turbine

BOLTS

Model 1025 Bolt Eater How-To Manual **Real-Life Examples**

Here the operator has created a support base for attaching the magnet by bolting on a plate.



Flange Bolts

Laroche Industries
Riverdale, IL

Steel Flanges on an
aluminum ammonia
storage tank

Bolt sizes: 24 ea. 3/4"-10 x 3/4"
8 ea. 5/8"-11 x 3/4"

Depth 3/4"

Removal Time .5 hr avg.

Total Time: 16.5 hr including setup and clean-up

Model 1025 Bolt Eater How-To Manual

Real-Life Examples

Core Sample

Union Electric Steel
Valparaiso, IN

Core size: 5/8"
Depth 3-1/2"
Induction Hardened Steel
Cutting Time: 45 minutes



Note shaped iron block for adapting flat-bottomed magnet to cylinder.

Similar example
from Sept. 2008:

(not shown)

Electrode:

Graphite 1.5" OD

Length: 7.25"

Depth of cut: 5.25"

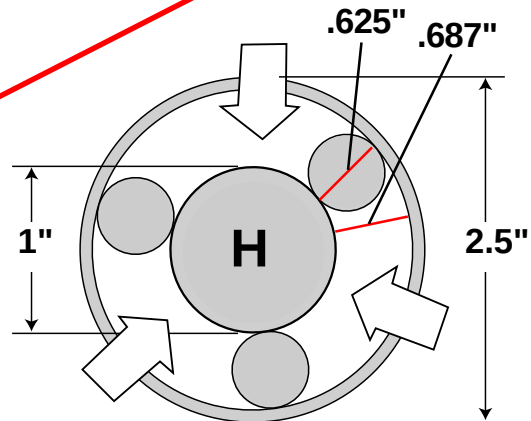
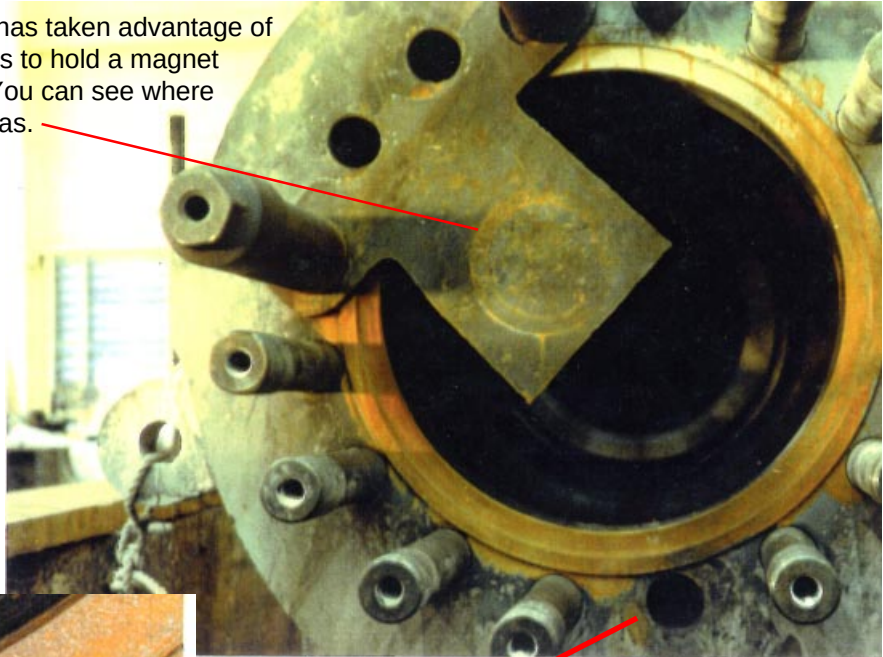
Time: 32 min 23 sec.

Jacksonville Electric Authority

3 ea. 2-1/2"-8 x 5" Studs
removed from Throttle
Valve Flange

3 cuts each with .625"
electrode – collapse
segments to existing
hole (H)

Operator has taken advantage of
good studs to hold a magnet
support. You can see where
magnet was.



1 ea. 1-3/8"-8 x
8" Jack Bolt
from Upper
High-Pressure
Case



Model 1025 Bolt Eater How-To Manual
Real-Life Examples
Jacksonville Electric Authority

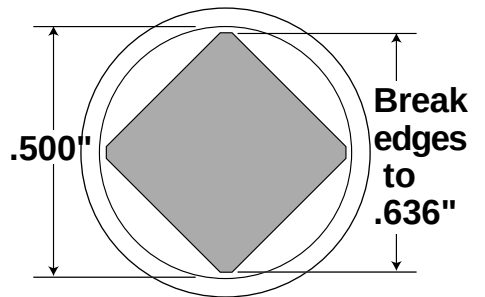
BOLTS



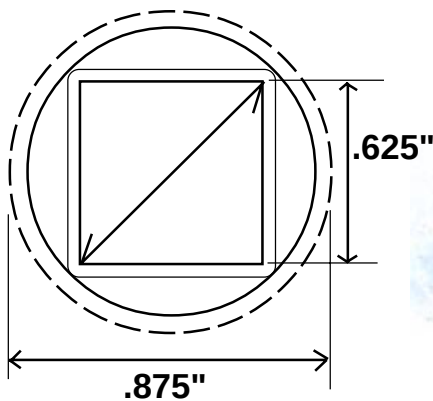
**3/4"-10 x 2" Bolts re-
moved from Lower High
Pressure Turbine Case**

**1 cut with .5" square
electrode – break edges
to .636"**

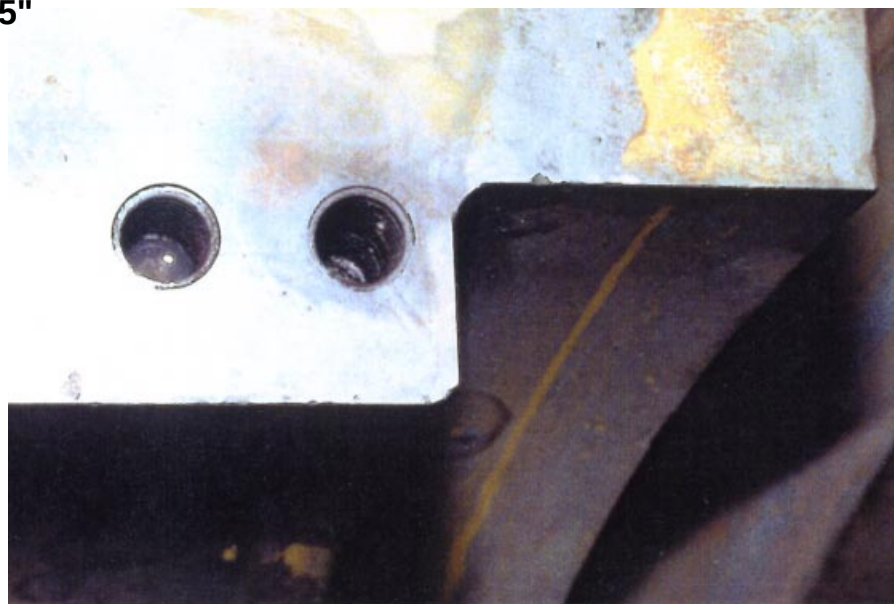
**Cut through – collapse
sections**

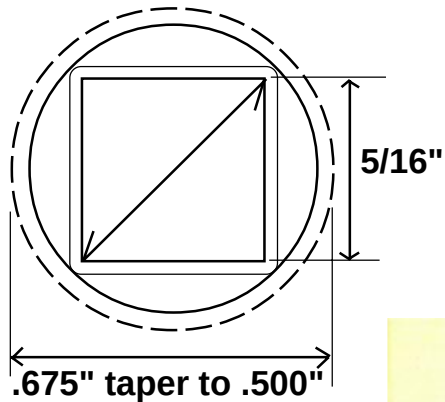


Jacksonville Electric Authority



- 1"-8 x 2-1/2" stud removed from Turbine Diaphragm
- 1 cut with 5/8" square electrode
- Cut through – collapse four sections

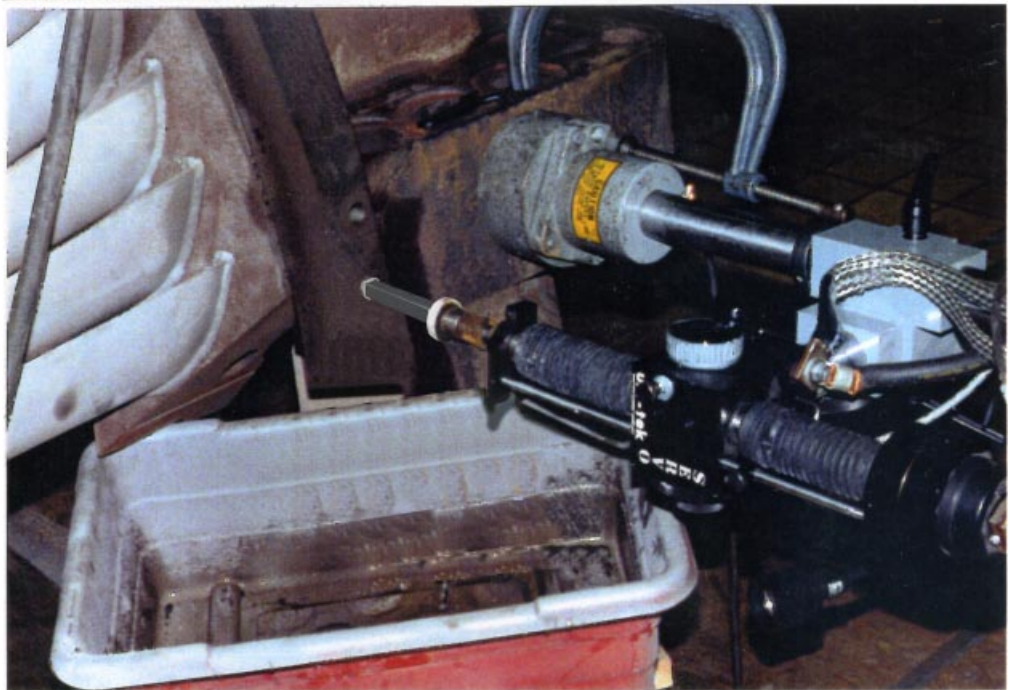




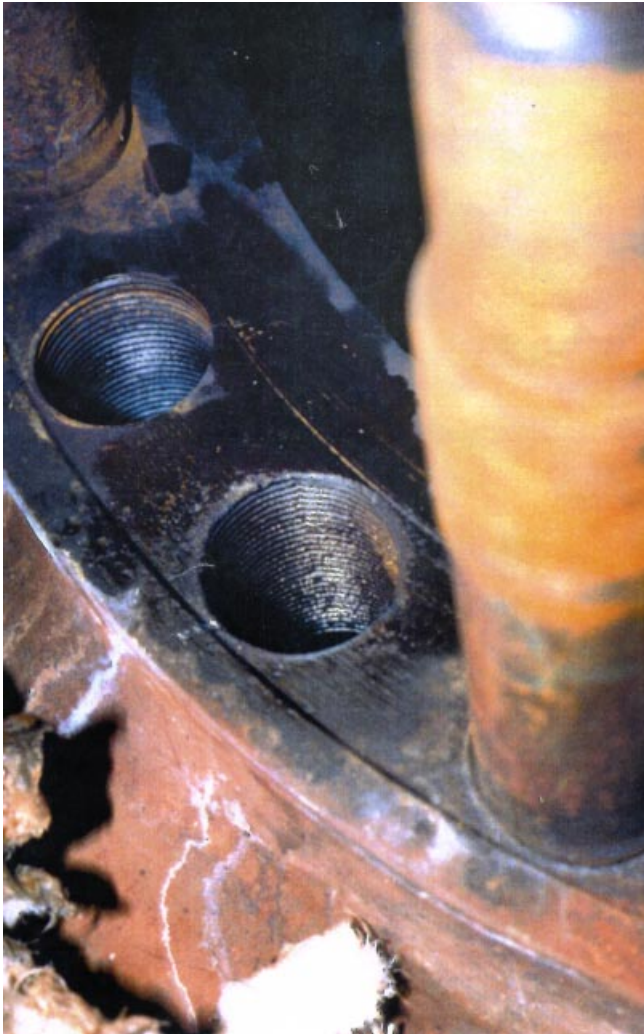
2 ea - $1/2''$ tapered dowels $3-1/2''$ long removed from #1 Low Pressure Inner Cover

1 cut with $5/16''$ square electrode

Cut through – collapse sections



Jacksonville Electric Authority



More examples



OFFSHORE, NORTH SEA, FULMAR
FLOATING STORAGE UNIT

JULY-AUGUST 1993

Problem 1: 10 foot (3 metre) diameter swivel bearing on end of mooring arm; requires removal of an accurate segment of the bearing retaining ring by slicing it in two places. Ring thickness of 6.3" (170mm) and only 10" (250mm) headroom at the cut locations. Method must use a cold process and there must be no collateral damage.

Problem 2: Drilltap holes in the bearing surface which is exposed by removal of the ring segment; problem is that surface material is inconel and only 8" (200mm) headroom is available for these holes

Solutions: Cut series of adjacent square holes to slice ring; uses unique square hole cutting technique; Use spark erosion to cut pilot holes through inconel prior to tapping.

Schedule: Completed on target within 2 week offshore time window;



Cutting head in place at port side work platform overhanging sea



View of finished cut after removal of ring segment

Working Headroom (For Slicing Ring) 250mm

Working Headroom (Hole Drilling) 200mm

Inconel Bearing Surface



Power Unit located remotely from work site on walkway of mooring arm



Offshore, October 1992:

Task: Removal of seized clevis pins from travelling block onboard rig Santa Fe 140; pins eroded in-situ while the block was suspended half way up the drill derrick;

Technique: Slice pins across diameter and expel using hydraulic jack (jacking had failed prior to slicing)

Result: Rapid response time allowed rig to become operational again with minimum of delay;

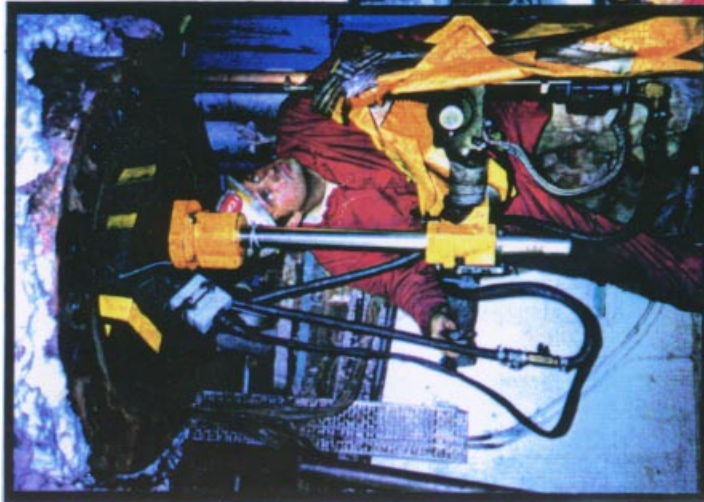


STUD REMOVAL: POWER STATION, AUGUST 1993

Quantity 48 x 2.5" seized studs from steam turbine.

Location: Underside face of turbine interceptor valves.

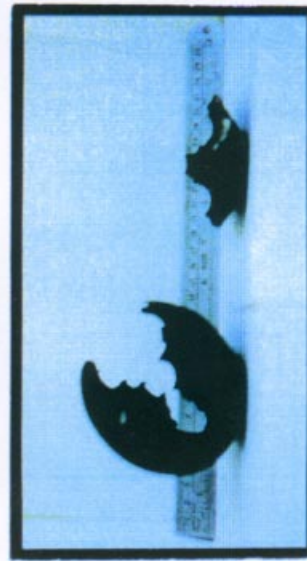
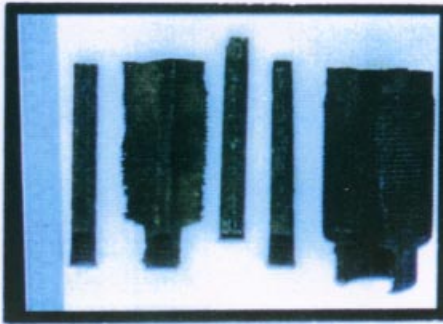
Technique: Cut clover-leaf hole pattern. Weakened studs fully collapse or rotate out. Twelve day cutting turnaround time.



Top Left: Setting up the graphite electrode for cutting

Above: Cutting in progress

Left: Pneumatic chisel rotating out weakened stud



Customer:
Scottish Power
CMO
Bonnybridge

Task:
Removal of
quantity 16 x
3.25 inch
diameter x 5
inch long studs
from steam
interceptor
valve for
Cockenzie
Power Station

Top: Last hole being eroded; working orientation is horizontal

Middle Right: Core pin from above hole being removed

Middle Left: Removed segments and core pins for one stud

Bottom: End view showing segment shapes after removal

Performance: Achieved removal of two studs per 8 hour shift. No thread damage.



Machine used:

Electrode:

Depth of Disintegration:

Time:

Bolt Eater

Square .450 Graphite

2"

4 minutes

STUDS

Model 1025 Bolt Eater How-To Manual

Real-Life Examples

- 2" Stud
3" Depth
- 20 KVA
 - 1 ³/₄" Triangle Carbon Electrode
 - 30 minutes



- 1 ¹/₄ " Tap
2 ¹/₂" Depth
- 20 KVA
 - Round Carbon .625" Electrode
 - 12 ¹/₂ minutes



- 2" Stud
3" Depth
- 20 KVA
 - 1.75" x ¹/₂" Carbon Slitting Electrode
 - 33 minutes

- 1" Stud
2 ¹/₂" Depth
- 20 KVA
 - ⁷/₈" Tri Pan Carbon Electrode
 - 30 minutes



Extraction

3" Stud 6" Depth

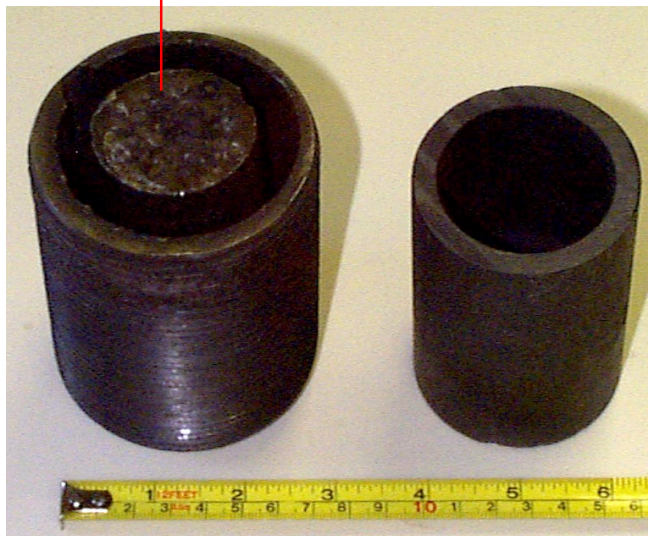
- Time: approximately 3 hours
disintegrating several holes across the
diameter. After the bolt collapsed, a nut
was welded to the end for final removal.



Extraction

2½" Stud 4" Depth

- 20 KVA
- 2¼" Round
Carbon Electrode
- 60 minutes



Extraction

2" Stud 2" Depth

- 20 KVA
- X-shaped Carbon Electrode
- 28 minutes

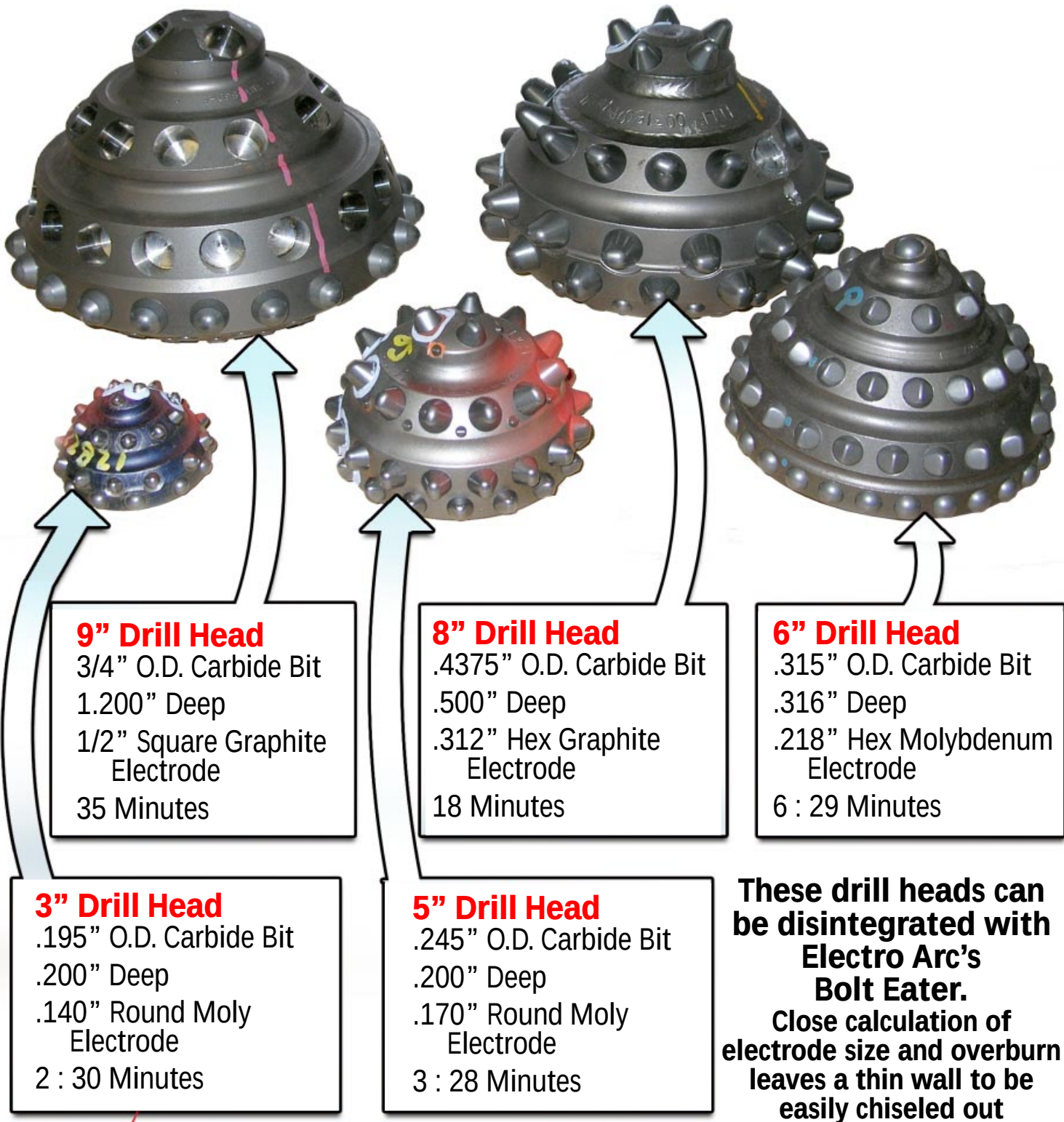


Extraction

1" Stud 2" Depth

- 20 KVA
- 7/8" Round Carbon Electrode
- 30 minutes

Disintegrate Carbide drill head buttons



**LOOK! A hole cut straight through
this 8" block of steel in 35 min.
with a .565" graphite electrode!**

