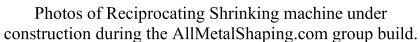
Reciprocating Shrinker Fabrication Drawings









CAL Cobras Danville, CA

Email: chuckcobra@aol.com Website: www.chuckcobra.com

Drawing	Drawing
Number	Description
	0 01 1
	Cover Sheet
RS01	DRAWING INDEX & NOTES
RS02	F01 & F02
RS03	F03, F04, F05, F06, F07, F08, F09 & F10
RS04	UTH01, UTH02 & UTH03
RS05	LTH01, LTH02, D01 & D02
RS06	Assembly
RS07	Photos
	_
Date: 11/20/201	8

Part	Part
Number	Description
F01	Frame - Vertical Tube
F02	Frame - Top Cross Tube
F03	Frame - Quil Support Tube
F04	Frame - Quil Support Tube - End Caps
F05	Frame - Lower Tool Arm - Mounting Tube
F06	Frame - Lower Tool Arm - Tube Mounting Plate
F07	Frame - Lower Tool Arm - Side Tube Mounting Plate
F08	Frame - Lower Tool Arm - Bottom Plate
F09	Frame - Lower Tool Arm - Reinforcement Plate
F10	Frame - Lower Tool Arm - Side Tube
F11	Frame - Lower Tool Holder - Mount
UTH01	Upper Tool Holder - Tool Retainer
UTH02	Upper Tool Holder - Quill
UTH03	Upper Tool Holder - Gibs
LTH01	Lower Tool Holder - Assembly
LTH02	Lower Tool Holder - Tool Retaining Plate
D01	Drive - Shaft
D02	Drive - Connecting Rod Assembly
Date: 11/20/2018	

Quantity	Description
1	Square hole tool sleeve without threads - 3/4" square ID (Reud supply #SHS-P75
2	Pillow block with lock collar - 5/8" diameter shaft
1	5/8" diameter steel shaft with 5/16" keyway
2	Shaft collar - 5/8" diameter
1	Shaft collar - 2" OPD x 1" ID
1	Rod end - male style with 1/2" shaft and 1/2" threads
1	Motor - 1/2 HP minimum - 1750 rpm - 120 volt single phase
1	Pulley - 4" OD x ID to match motor shaft with key and setscrew
1	Pulley - 4" OD x 5/8" shaft with 5/16" keyway and setscrew
1	5/16" key stock
As required	6" x 6" x 1/4" wall square steel tubing
As required	4" x 4" x 1/4" wall square steel tubing
As required	2" x 2" x 1/8" wall square steel tubing
As required	1/2" thick steel plate
As required	1/4" thick steel plate
As required	1/4" thick UHMW polyethylene (Ultra High Molecular Weight)

Acknowlegements:

The machine detailed in these drawings is based on the Recirpicating Shrinker developed and built by individuals in the AllMetalShaping.com group in February 2010.

The group's objective was to build an electric motor powered, benchtop mounted machine caple of shrinking light gauge steel and aluminum AND that could be fabricated with minimal machining work AND minimal cost by the average hobbyist.

The primary goal of these drawings is to document the reciprocating shrinking machine as built by the AllMetalShapering group. The group's website includes references to at least two variations as well as several 'on the fly' modifications to the machine. However, to my knowledge, the group never developed a comprehensive set of drawings for the machines built. These drawings have been developed to include complete details for the final version constructed to allow other enthusiats to fabricate a similar machine.

During the group build, it appears that some individuals made modifications to suite there specific needs. Examples include mounting type (i.e. legs or bench mount), motor location, throat depth, etc. These drawings do not cover those individual changes.

In general, these drawings provide details based on information obtained from the AllMetalShaping site. However, in a few instances these drawings deviate from the group build (where details were unclear or where an alterntative method could be utilized, etc.)

Additional information and project photos can be found on the AllMetalShaping.com web site.

Although I have not yet constructed this machine, I anticipate doing so in the near future. It is also my intent to add any modifications made in the machine that I build to these drawings.

Date: 11/21/2018

Notes

1. Scale of drawings. Example: A scale indicated on the drawings as 1':2'=1 drawing unit (inches) = 2 physical part units (inches). I.e the part is drawn at 1/2 scale and the part will print at 1/2 actual size when drawings are printed at full size of $22' \times 34'$.

Date: 8/29/2018



Detail or Section Reference.

x = Detail or Section Identification

Dwg = Drawing on which reference appears

General Notes:

The following general notes and comments for the machine documented in these drawings may be helpful to other builders:

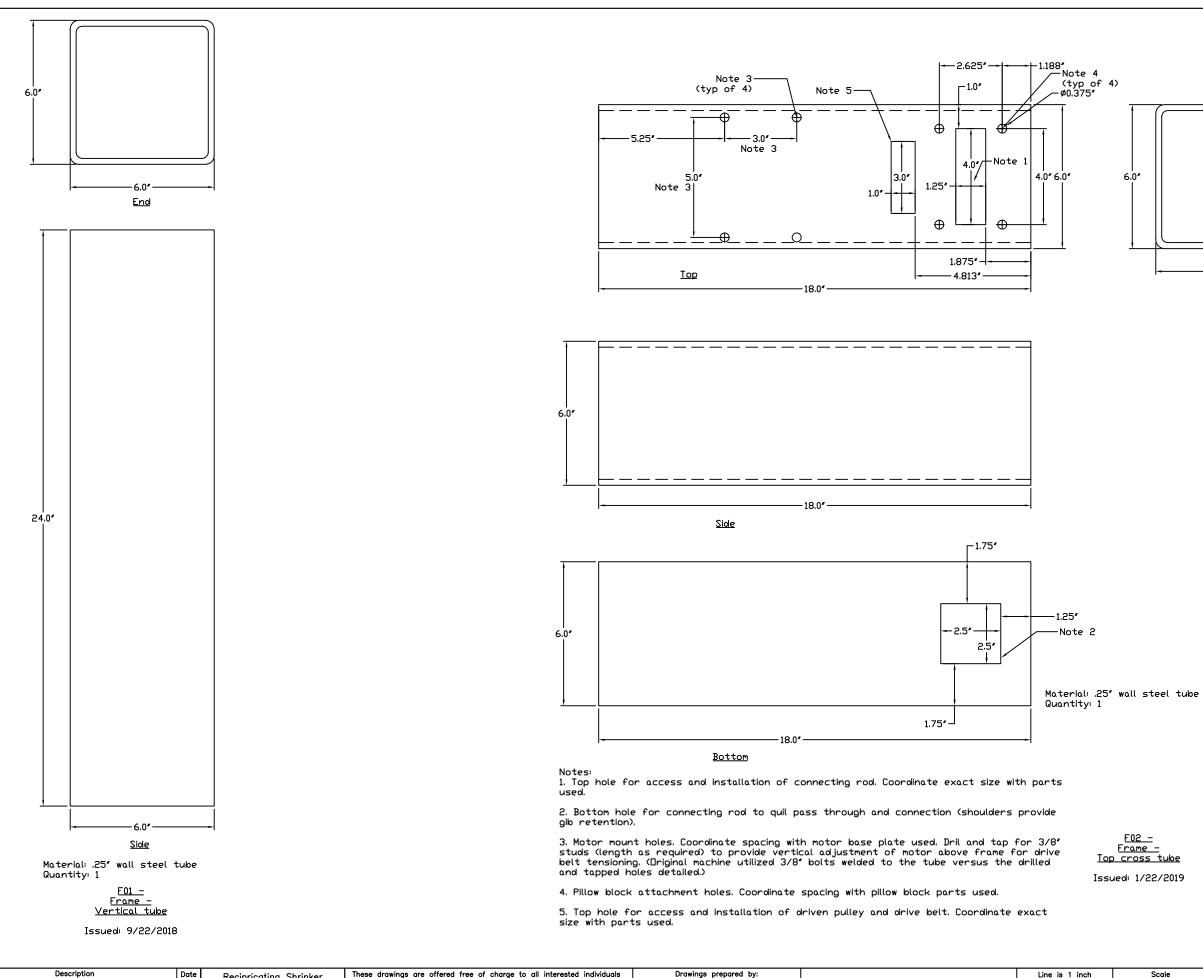
- 1. The stated original goal of the AllMetalShaper built machines was to build a dedicated shrinking machine to be built with minimal machining work. For individuals with access to more equipment, there are undoubtedly several modifications that could be made to the machine.
- 2. The shrinking dies can be purchased from the following: Stan Fulton Fulton Metal Works Ashland, Illinois (217) 476-8223 sfulton@casscomm.com

Tool steel or non-metalic dies are available depending on the material (steel or aluminum) that is being worked.

- 3. The electric powered machine with the non-metalic dies is relatively quiet in operation and provide excellent shrinking results on .060' thickness aluminum.
- 4. A 3/4 hp 1750 rpm motor has been used by several of the original builders and appears to be adequate for the intended use.
- 5. Machine stiffness. Paraphrasing comments from the original machine designer (Kerry Pinkerton) the stiffness of a recipricating shrinking machine is a very important part of it's design. The machine's frame material outside dimensions and wall thickness as shown provide a very ridgid frame for holding the shrinking dies. The group's website includes discussions of alternative frame material size. However, the bottom line is that the frame dimensions given in these drawings provide a stiff, workable machine. (Although different frame material sizes could be used, substitution should be done with an understanding of how the alternative material will effect the stiffness and therefore the machines performance.)
- 6. This machine is designed to accept standard 3/4" (19mm) shank tooling.
- 7. Details for fabricating thumbnail dies is on the AllMetalShapers.com site.

Date: 9/3/2018

ev.	Description	Date	Recipricating Shrinker
			Drawing registration No.: 02
			Name: chuckcobra.com
			Date: February 2019



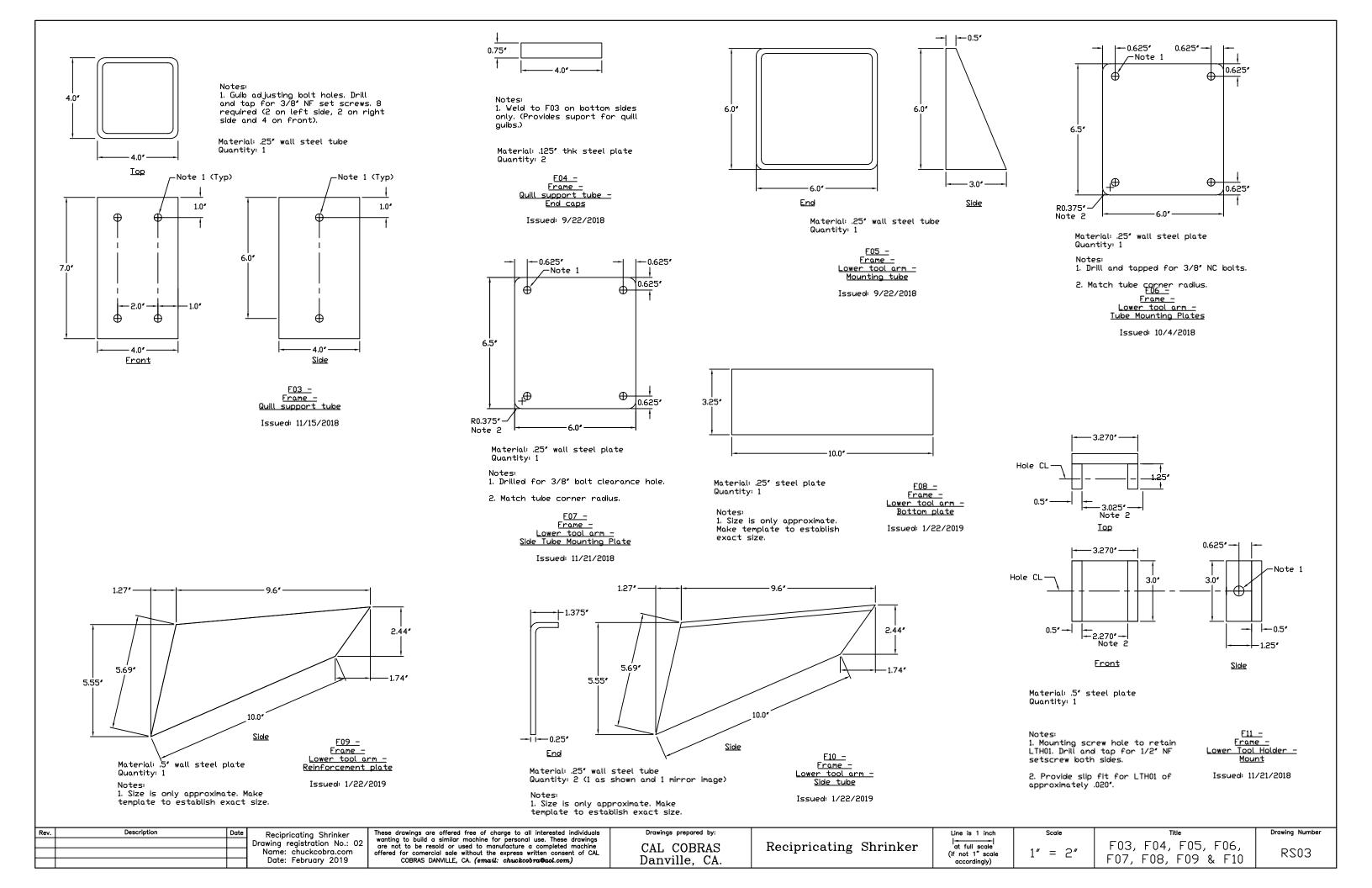
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Г		Drawing registration No. 02	wanting to build a similar machine for personal use. These drawings are not to be resold or used to manufacture a completed machine	CAI CODDAG	Recipricating Shrinker	at full scale			
Г		Name: chuckcobra.com	offered for comercial sale without the express written consent of CAL	CAL COBRAS	Recipricating Shrinker	(if not 1" scale	1" = 2"	F01 & F02	RS02
Г		Date: February 2019	COBRAS DANVILLE, CA. (email: chuckcobra@aol.com)	Danville, CA.		accordingly)	_		

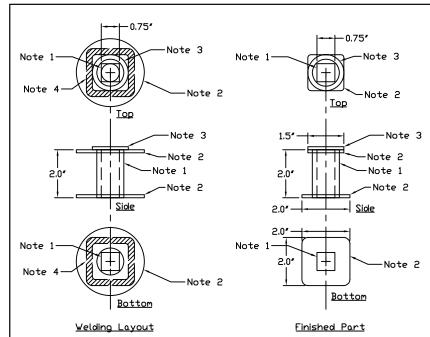
6.0"

F02 -Frame -Top cross tube

Issued: 1/22/2019

End





Notes:

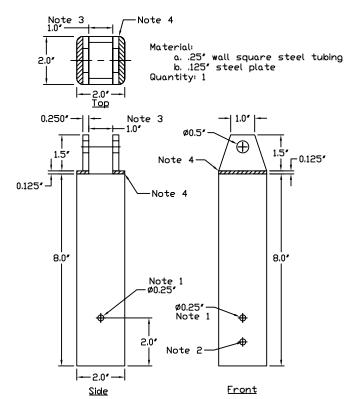
1. .75 (19 mm) square holed machine sleeve non threaded (Reid Part # Supply Inc. part SHS-P75). Cut to length shown.

- 2. 1' ID x ___' OD heavy washer (UTH01 to UTH02 mounting):
 a. Washer ID bored to fit sleeve OD.
 b. Top washer OD ground to fit ID of UTH02 (Quill).
 c. Bottom washer OD ground to fit OD of UTH02 (Quill).

 - d. Top and bottom washers welded to sleeve.
 - e. (Alternatitively instead of 1" heavy washers, use .125" thick steel plate with OD and ID finished same as washer.)
- 3. 1/2' ID \times ___" DD heavy washer. Weld to top face of top 1' washer. (Provides tool shank stop and center hole allows maintenance access to remove stuck tool shank if necessary.>
- 4. UTH02 (Quill) whown for reference only in this view.)

<u>UTH01 -</u> Upper Tool Holder -Tool Retainer

Issued: 11/21/2018

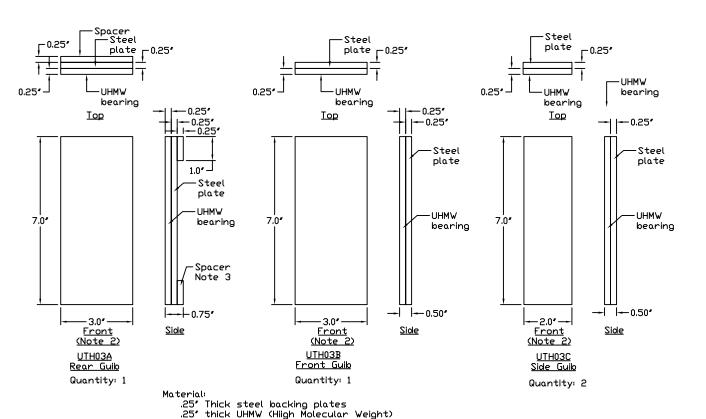


Notes

- 1. .25' hole to provide for plug welding to UTH01. Coordinate exact location with length of UTH01 part. Provide plug welding holes on all 4 sides of quill.
- 2. Drill and tap for 1/8' allen head tool retention set
- 3. Coordinate mounting tab 1" spacing to accomodate D02 rod end used.
- 4. .125" Thk plate (shown hatched for clarity) to be trimed at outer corners to match tube corner radius.) Typ of 2.

<u>Upper Tool Holder -</u> Quill

Issued: 11/21/2018



bearing material.

Notes 1. Trim UHMW to match size of steel plates and glue to plate.

- 2. Trim of widths if required to alow parts to fit against ID of FO3. (i.e. A larger corner ratius of F03 will require the width of these gibs to be trimmed slightly.)
- 3. Tack weld .25" thick spacers to 1/4" plate on top and bottome of Rear Guilb only. (Final adjustment of quil is adjusted with set screws on F03.)

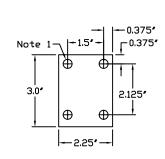
<u> UTH03 -</u> <u>Upper Tool Holder -</u>

Issued: 9/22/2018

ev.	Description	Date	Recipricating Shrinker
			Drawing registration No.: 02
			Name: chuckcobra.com
			Date: February 2019

RS04

Drawing Number

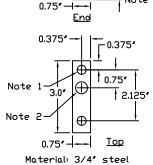


Material: 1/4" steel plate Quantity: 1

Notes:

1. Holes threaded for 3/8" NF adjustment jacking bolts. Typ of 4.

LTH01A-Lower Tool Holder -<u>Base</u>



0.725"

Note 3

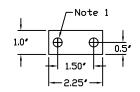
Quantity: 2

1. Clearance holes for 3/8" NF adjustment jacking bolts. Typ

2. Holes threaded for 1/2" NF cover retention bolts. Typ of

3. Machine to approximately .725" H x .750" W to provide clamp fit of die stem when LYH020 is bolted in place.

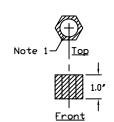
> LTH01B-Lower Tool Holder -<u>Side</u>



Material: 1/4" steel Quantity: 1

1. Clearance holes threaded for 3/8" NF adjustment jacking bolts. Typ of 2.

LTH01C-Lower Tool Holder -<u>Тор</u>



Material: 3/4" threaded rod coupling nut Quantity: 1

1. Threaded 3/4" NC.

LTH01D-Lower Tool Holder -<u>Adjustment Hex</u>

Lower Tool Holder -Die Height Adjuster

Material: 3/4" NC

Quantity: 1

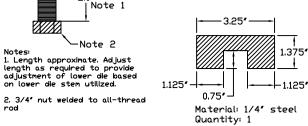
Notes:

I---I-0.75"

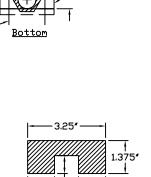
2.04

1. Length approximate. Adjust length as required to provide adjustment of lower die based on lower die stem utilized.

all-thread rod and nut



LTH01F-



-2.25

ر 0.5**'**

-Note 1

-Note 1

—LTH01B

LTH01D

⊢Note 2

Note 3

<u>Top</u>

Ф

<u>Front</u>

_ _LTH01A

Note 2

Note 6

Note

LTH01C

-0.75*****

LTH01F

-LTH01A

-LTH01B

1. This holder based on use of shrinking die with .750' square stem. Tool holder

shown as double cross hatch for

holder plate is bolted in place. 3. Loose slip fit (approximately .010")

2. LTH01B (Sides) to be machined to

approximately .725' H x .750' W to provide clamp fit of die stem when top

between LTH01A, LTH02, LTH03 to allow free movement of LTH02E (adjusting

4. Align all tapped and through holes

5. All parts to be welded together to form the Tool Holder Assembly.

<u>LTH01-</u> Lower Tool Holder -

Assembly

Issued: 11/21/2018

at bottom rear and sides.

general reference only.

- L TH01D

<u>Side</u>

Notes:

screw).

before welding.

- 3.25**′ ----**|

LTH01F-

LTH01B-

LTH01C-

LTH01F

LTH01B

2.25*

LTH01C

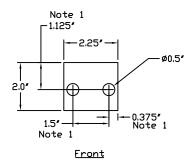
I THOID

LTH01A

Note 4

Note 6-

Lower Tool Holder -Push out stop plate

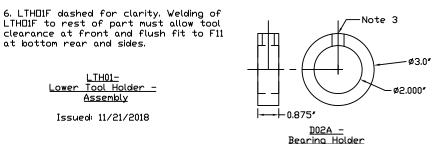


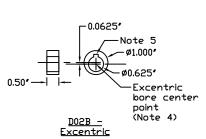
Notes: 1. Clearance hole for 1/2" Allen head cap screw. Coordinate exact hole spacing to match holes on LTH01.

Material: 1/4" Steel plate Quantity: 1

LTH02 -Lower Tool Holder -Tool Retaining Plate

Issued: 10/3/2018





−ø0.75* |-|-|- 0.75"

D02C -Connecting Rod

Note 1 0.625*

Notes:

1. Keyway: 3/16" W x entire shaft length. (Size given is typical, but match to keyway on pulley and eccentric used.)

Material: 5/8" Dia steel round Quantity: 1

> <u>Drive</u> -<u>Shaft</u>

Issued: 11/21/2018



1. Shielded bearing: 3" $\Box D~\times~2"~ID~\times~.5"~V$ (part number R162RS)

2. Male rod end (Heim joint): .5" bre ID \times 1.0" L \times 1/2" NF thread

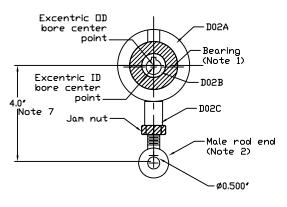
3. Drill and tap for 1/2" x NF set screw. (Bearing retention.)

4. Eccentric center hole offset .0625' from center of part outside diameter. (This provides a .125' stroke.) Press fit into bearing.

5. 3/16" keyway (Match to DO1 and drive pulley keyway size.)

6. Weld Connecting Rod to Bearing Holder.

7. DO2C (Connecting Rod) threaded 1/2" NF to match rod end. (Allows adjustment of center to center length of Connecting Rod Assembly.)



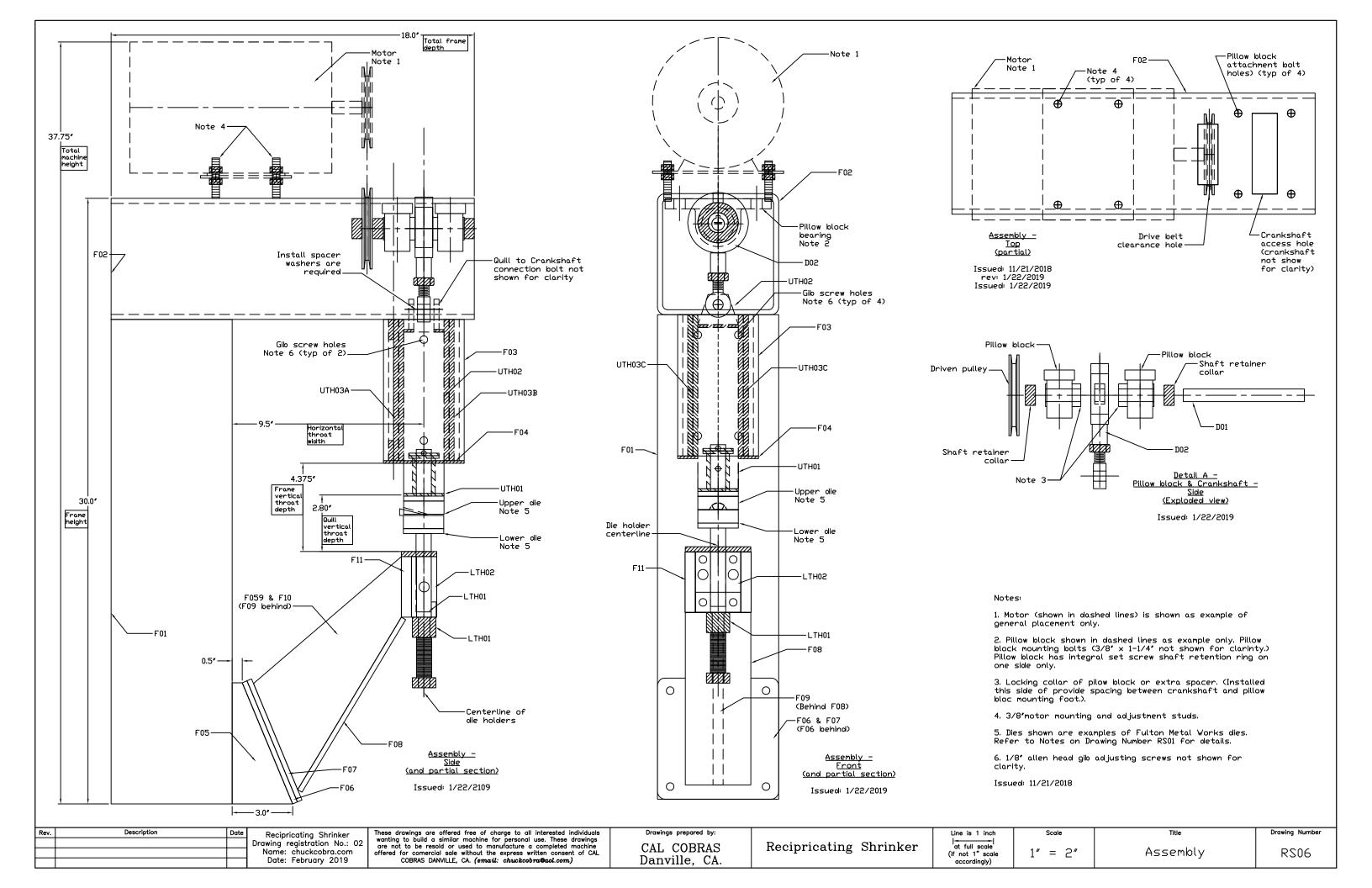
<u>Drive</u> -Connecting Rod Assembly

Issued: 11/15/2018

Drawing Number

RS05

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Upper tool holder



Pillow blocks, crankshaft and pulley assembly



Quill and crankshaft assembly



Lower tool arm and tool holder assembly



Lower tool arm



Nonmetalic thumbnail dies for aluminum shrinking (See Drawing number RS01 for details.)



1. Miscellaneous photos of shrinker under construction for reference

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F					wanting to build a similar machine for personal use. These drawings are not to be resold or used to manufacture a completed machine offered for comercial sale without the express written consent of CAL	CAL COBRAS	Recipricating Shrinker	at full scale (if not 1" scale	NTS	Photos	RS07
r				Date: February 2019	COBRAS DANVILLE, CA. (email: chuckcobra@aol.com)	Danville, CA.		accordingly)	1115	1110 003	1.007