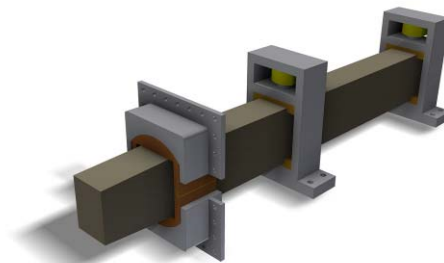


SPAN LOCKS RESEARCH CONCEPTS SUMMARY (OUTLINE OF DRAFT REPORT)

1. Tapered Lock Bar with Spherical Receiver

A. Concept Description: (ADD DETAILED DESCRIPTION)

- i. Based on existing tapered lock bars
- ii. Improvements:
- iii. Hydraulic jacks added to forward and rear guides allow for relaxed tolerance during installation compared with conventional lock bar
- iv. Spherical Receiving Socket allows for leaf tip rotation



B. Advantages:

C. Disadvantages:

D. Evaluation Summary:

- i. Effectiveness:
- ii. Maintenance:
- iii. Emergency Disengagement Procedures:
- iv. Constructability:
- v. Durability:
- vi. Cost:

2&3. Pincer & Jaw Lock Bars

A. Concept Description: (ADD DETAILED DESCRIPTION)

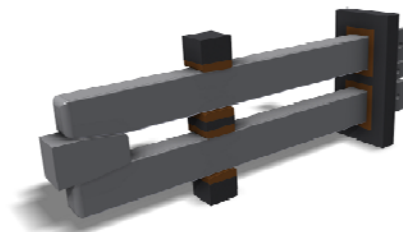
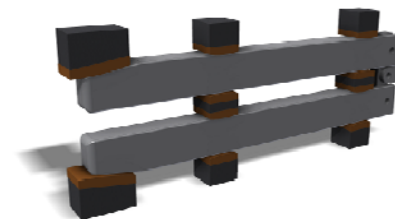
- i. Conceptually similar to historic pincer and jaw span locks
- ii. Increased spacing of forward guide shoes allows for relaxed tolerance during installation
- iii. Single sided wedges drive respective bars into contact with forward guide shoes and receiver
- iv. Allows for continuous operation with uneven wear

B. Advantages:

C. Disadvantages:

D. Evaluation Summary:

- vii. Effectiveness:
- viii. Maintenance:
- ix. Emergency Disengagement Procedures:

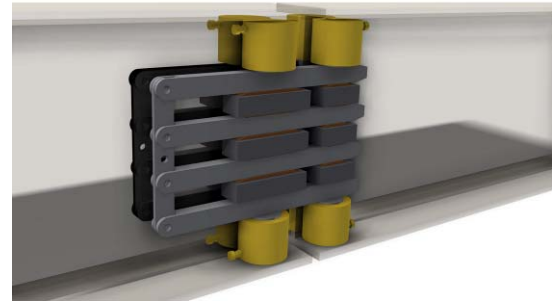


- x. Constructability:
- xi. Durability:
- xii. Cost:

4. Friction Lock

A. Concept Description: (ADD DETAILED DESCRIPTION)

- i. Based on transmission clutch
- ii. Engages both sides of bascule girder
- iii. Uses 8 total smaller lock bars
- iv. Floating spacers between lock bars allow for relaxed tolerance during installation
- v. Hydraulic jacks engage spacers and lock bars into place
- vi. Utilizes combined frictional force of all surfaces



A. Advantages:

B. Disadvantages:

C. Evaluation Summary:

- i. Effectiveness:
- ii. Maintenance:
- iii. Emergency Disengagement Procedures:
- iv. Constructability:
- v. Durability:
- vi. Cost:

5. Clamping Lock

A. Concept Description: (ADD DETAILED DESCRIPTION)

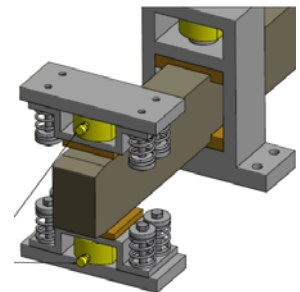
- vii. Based on conventional lock bars
- viii. Hydraulic jacks incorporated into guides and receivers allow for relaxed tolerance during installation
- ix. Springs allow for slight leaf tip deflections

B. Advantages:

C. Disadvantages:

D. Evaluation Summary:

- vii. Effectiveness:
- viii. Maintenance:

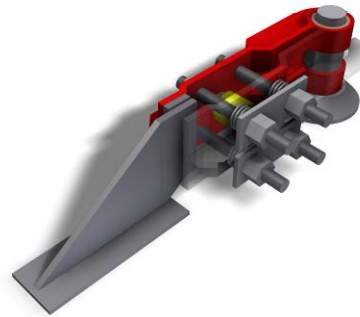
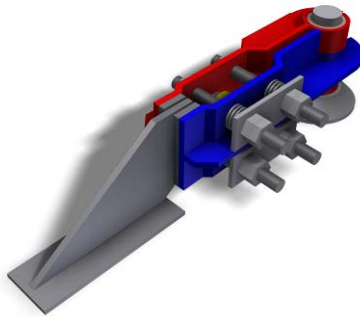


- ix. Emergency Disengagement Procedures:
- x. Constructability:
- xi. Durability:
- xii. Cost:

6. Fin Brake

A. Concept Description: (ADD DETAILED DESCRIPTION)

- x. Based on disc brake design
- xi. Barrier mounted above existing bascule girders
- xii. Frictional force of brake pads on fin receiver hold bridge in place
- xiii. Clamping force provided and relieved by springs or hydraulic jacks



B. Advantages:

C. Disadvantages:

D. Evaluation Summary:

- xiii. Effectiveness:
- xiv. Maintenance:
- xv. Emergency Disengagement Procedures:
- xvi. Constructability:
- xvii. Durability:
- xviii. Cost:

7. Spherical Pivot Lock

A. Concept Description: (ADD DETAILED DESCRIPTION)

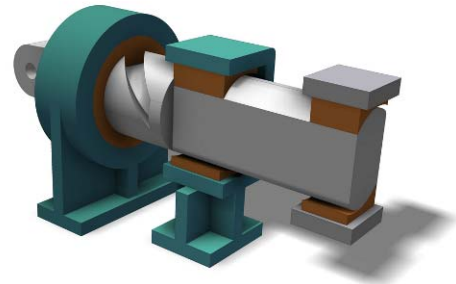
- i. Spherical pivoting receiving socket allows for tip rotation
- ii. Hydraulically actuated lock bar forces and locks leaves into vertical alignment



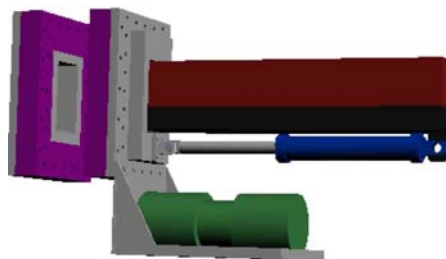
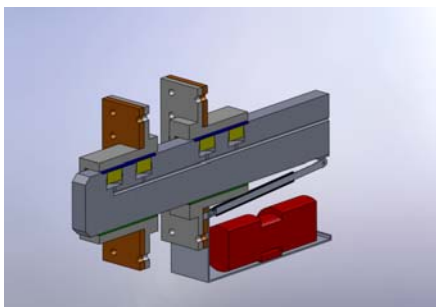
- B. Advantages:
- C. Disadvantages:
- D. Evaluation Summary:
 - i. Effectiveness:
 - ii. Maintenance:
 - iii. Emergency Disengagement Procedures:
 - iv. Constructability:
 - v. Durability:
 - vi. Cost:

8. Cam Lock

- A. Concept Description: (ADD DETAILED DESCRIPTION)
 - i. Actuated by rotation
 - ii. Sliding contact with cam receiver forces bridge into vertical alignment
- B. Advantages:
- C. Disadvantages:
- D. Evaluation Summary:
 - i. Effectiveness:
 - ii. Maintenance:
 - iii. Emergency Disengagement Procedures:
 - iv. Constructability:
 - v. Durability:
 - vi. Cost:



9. Internally Expanded Lock Bar



- A. Concept Description: (ADD DETAILED DESCRIPTION)
 - i. EHM design – permission to evaluate during study

- ii. Hydraulic jacks within lock bar expands steel plates to allow for relaxed tolerance during installation

B. Advantages:

C. Disadvantages:

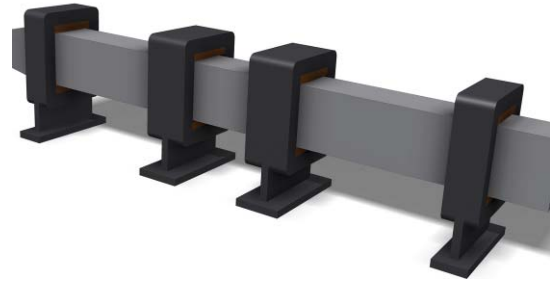
D. Evaluation Summary:

- vii. Effectiveness:
- viii. Maintenance:
- ix. Emergency Disengagement Procedures:
- x. Constructability:
- xi. Durability:
- xii. Cost:

10. Moment Lock Bar

A. Concept Description: (ADD DETAILED DESCRIPTION)

- i. Forward and Rear receiving guides transfer moment through lock bar
- ii. Stiffens bascule girder and significantly decreases leaf deflections



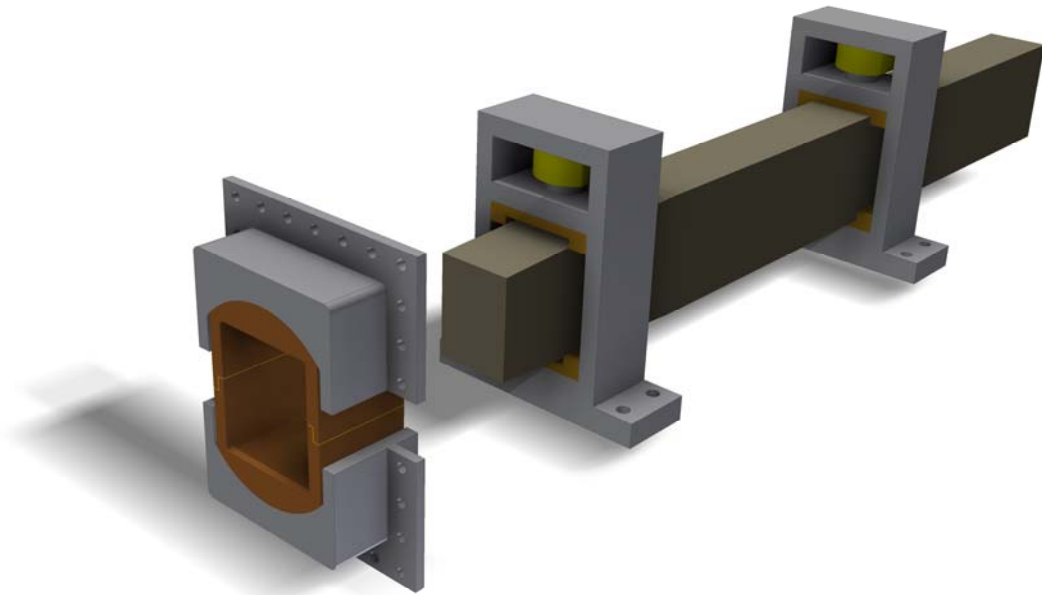
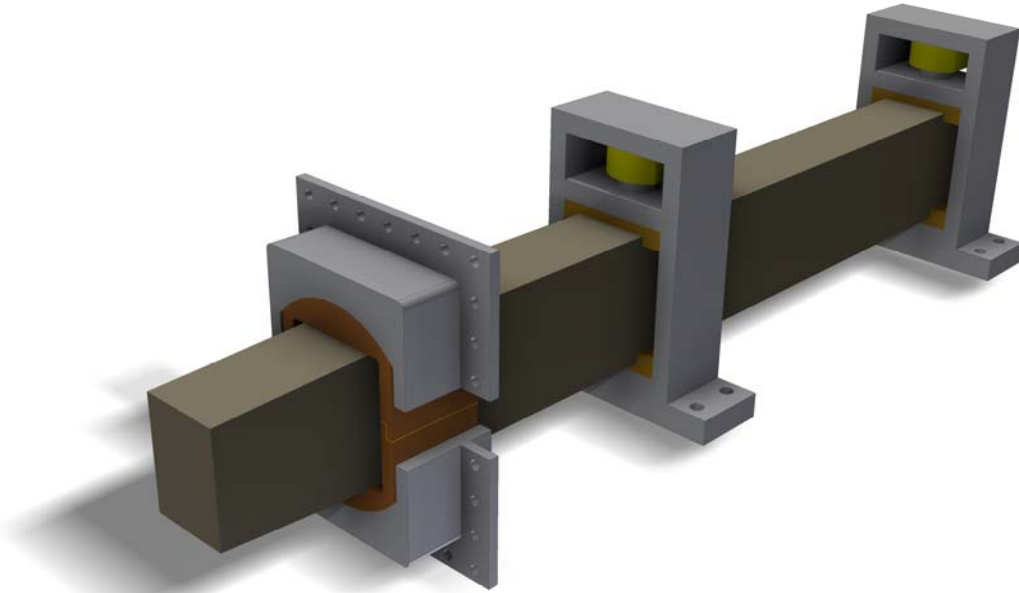
B. Advantages:

C. Disadvantages:

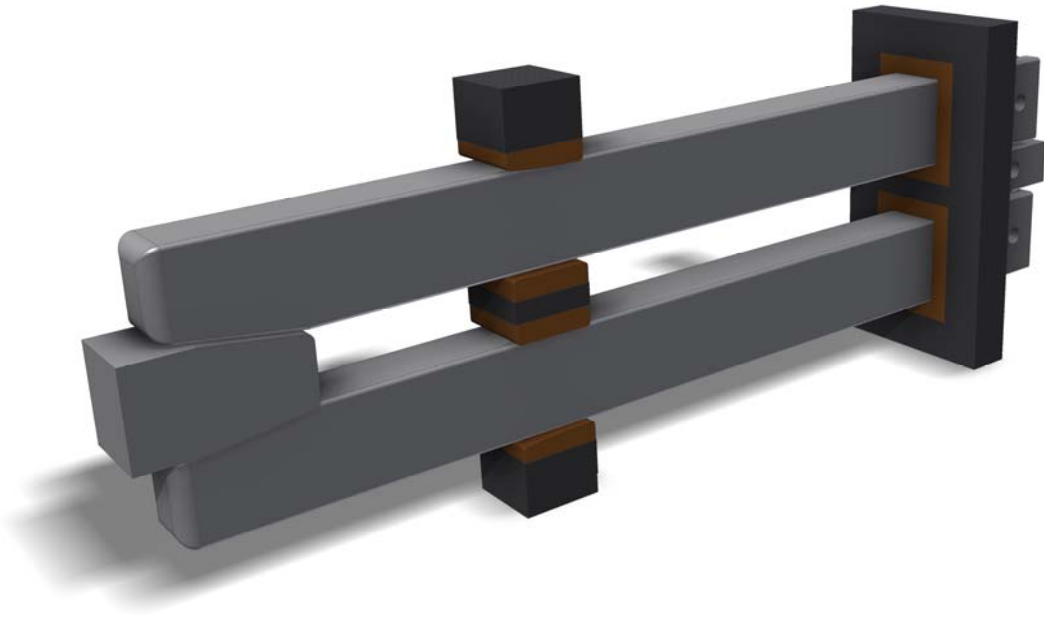
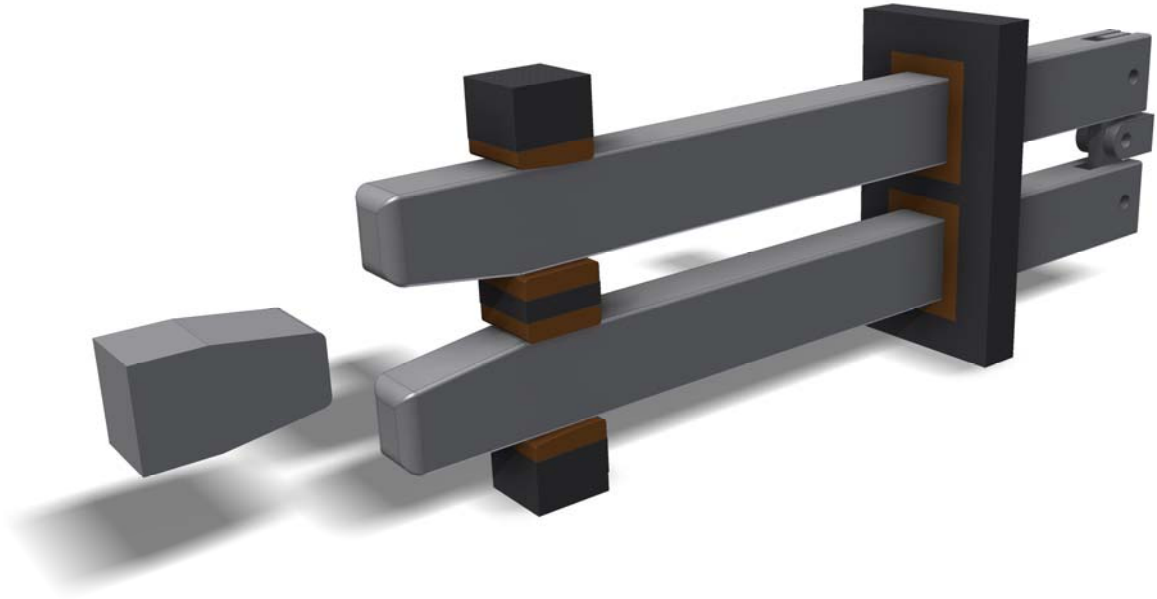
D. Evaluation Summary:

- i. Effectiveness:
- ii. Maintenance:
- iii. Emergency Disengagement Procedures:
- iv. Constructability:
- v. Durability:
- vi. Cost:

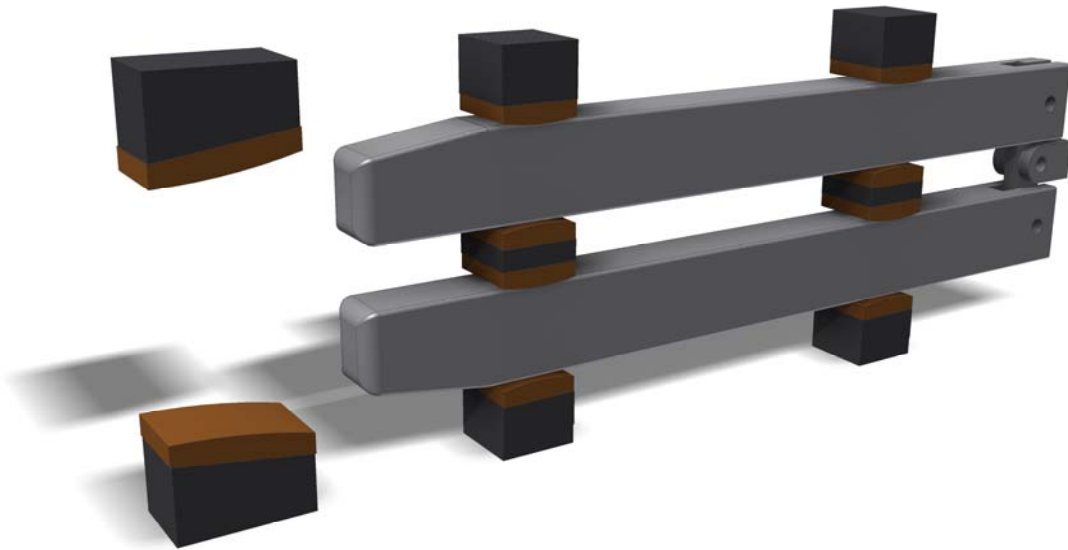
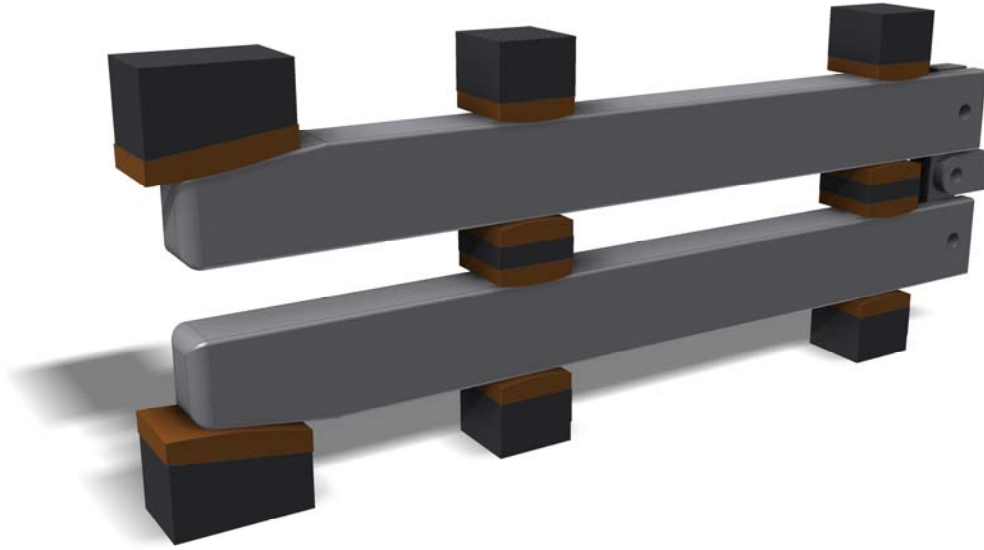
TAPERED LOCKBAR with SPHERICAL RECEIVER



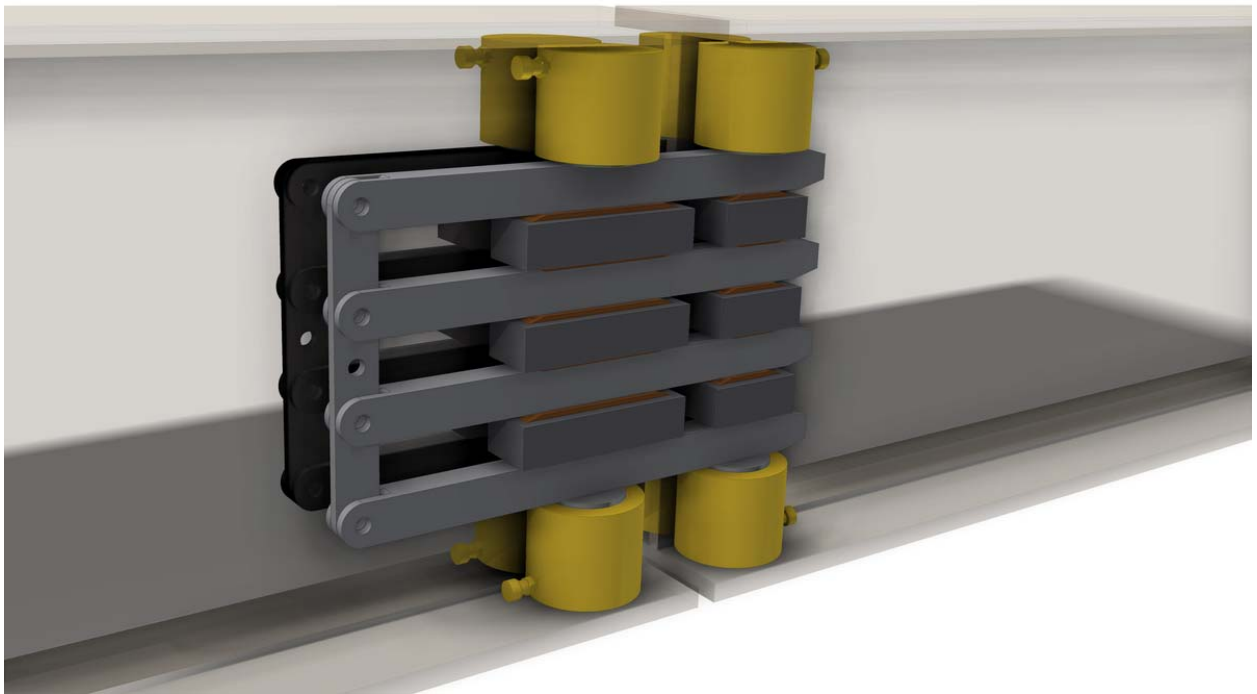
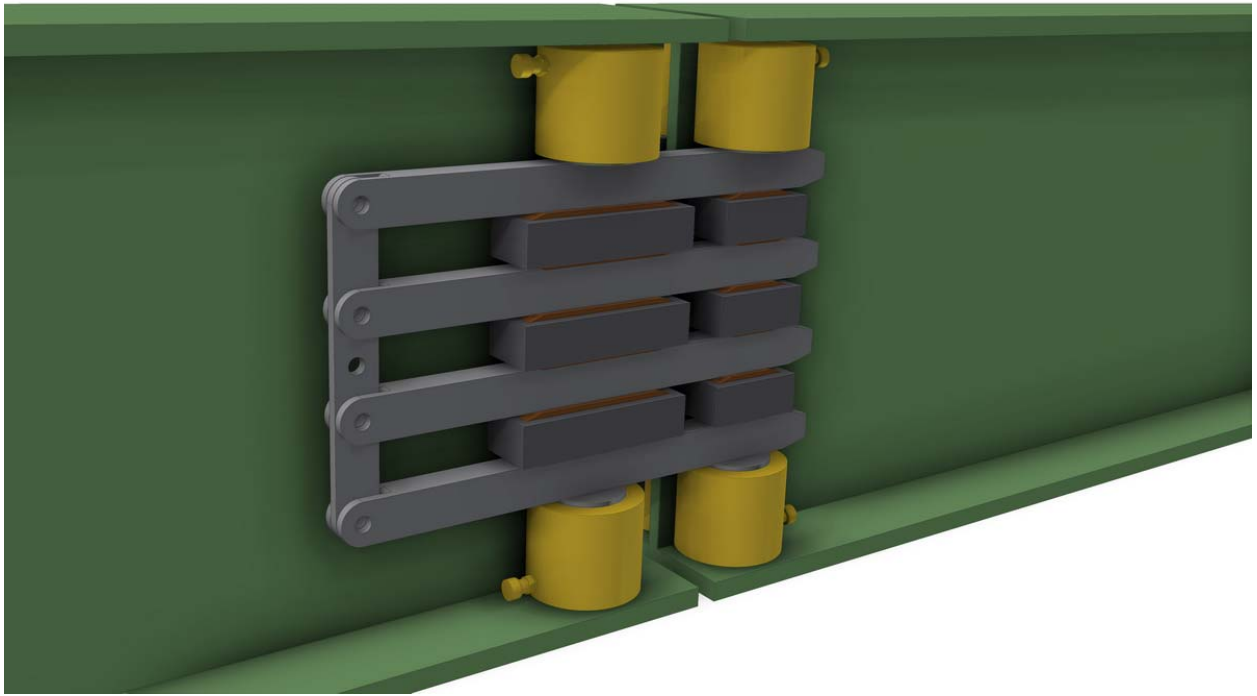
PINCER LOCK

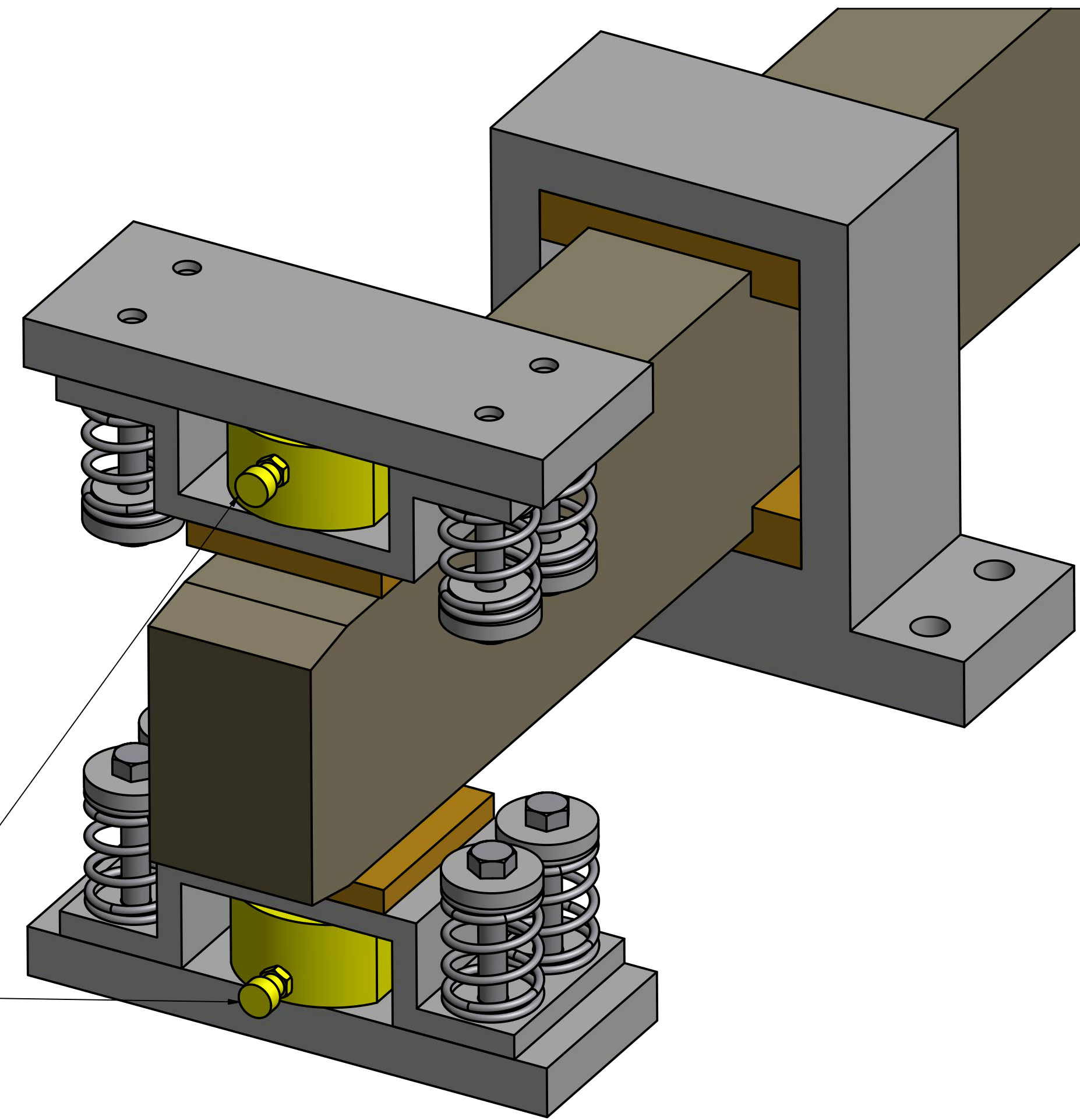
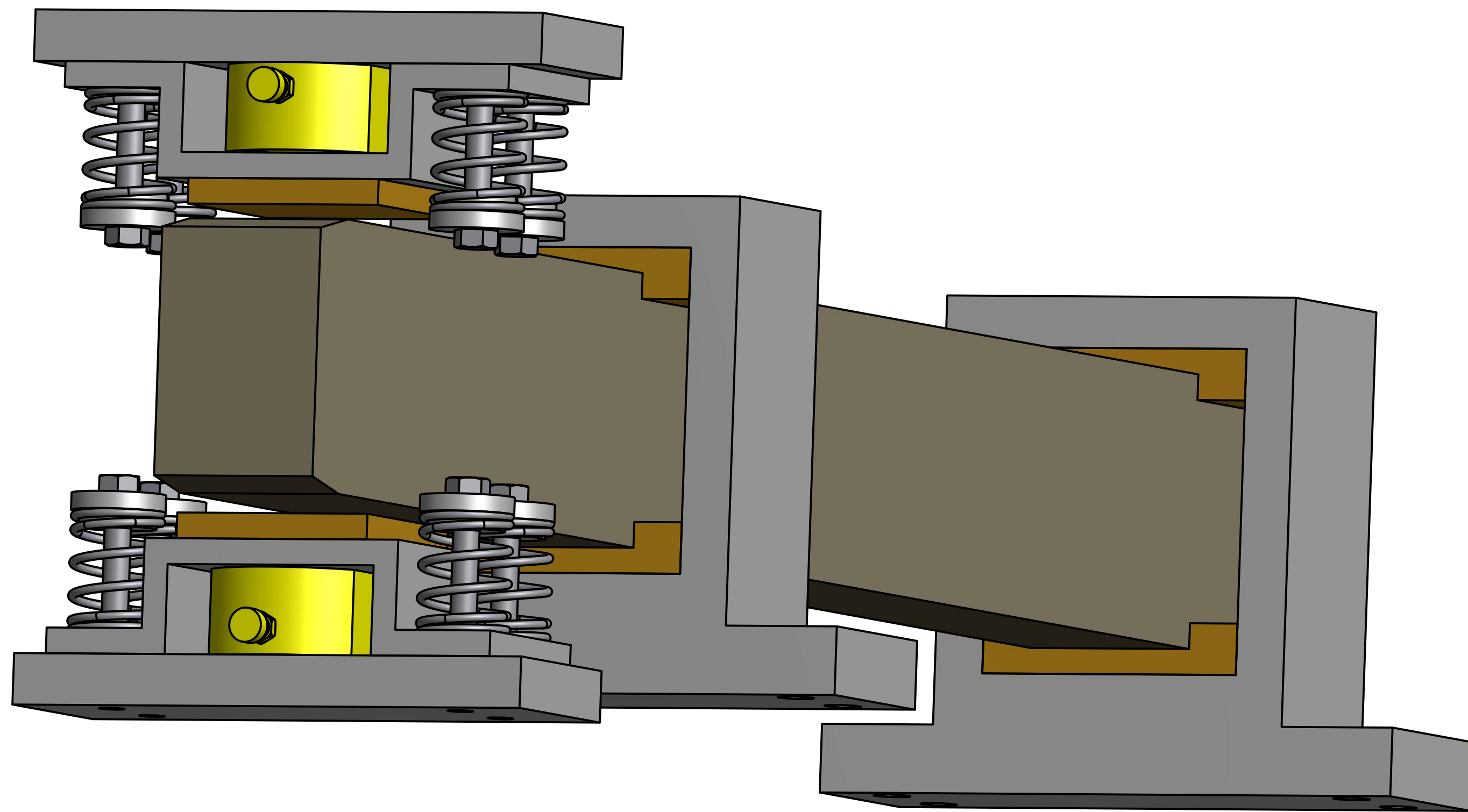


JAW LOCK



FRICTION LOCK





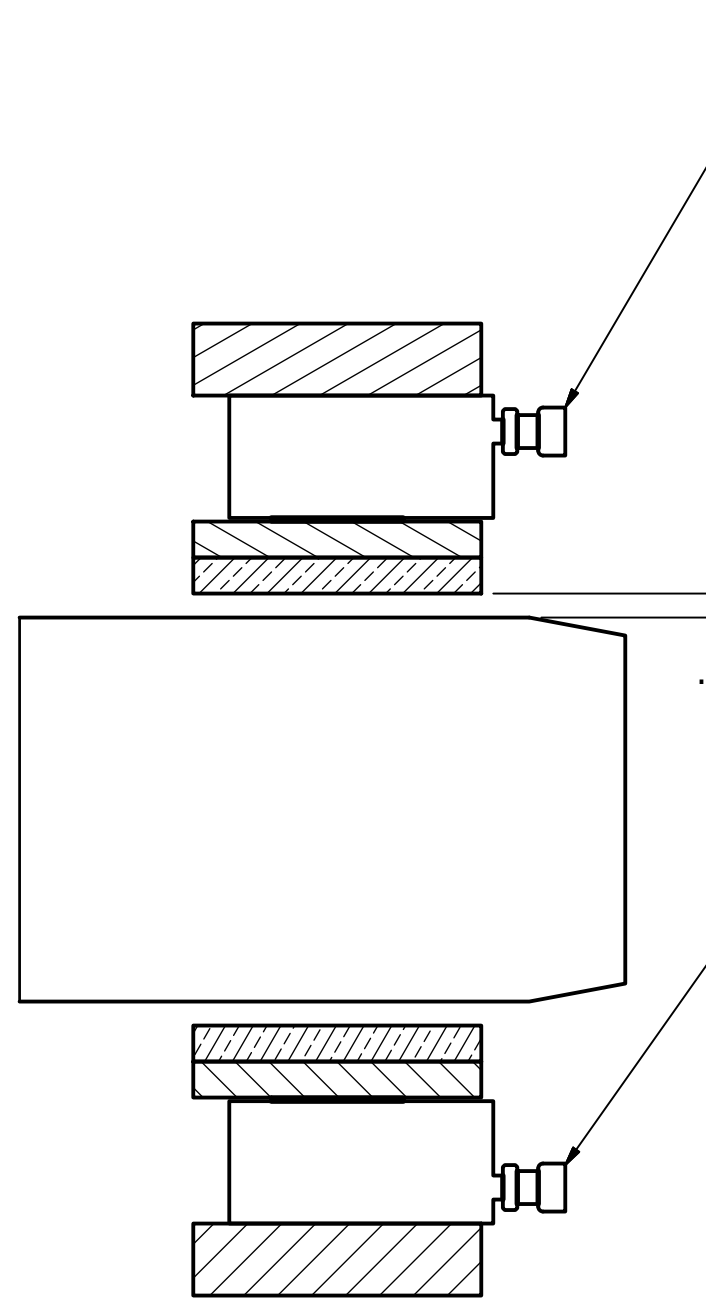
CONNECT JACKS TO HYDRAULIC SYSTEM WHICH CAN BE CONFIGURED TO EITHER CLAMP LOCK BAR IN POSITION OR FORCE LOCK BAR TOWARD CENTERLINE

ENERPAC RSM-500
LOW HEIGHT CYLINDER
50 TON CAPACITY
3/8" STROKE

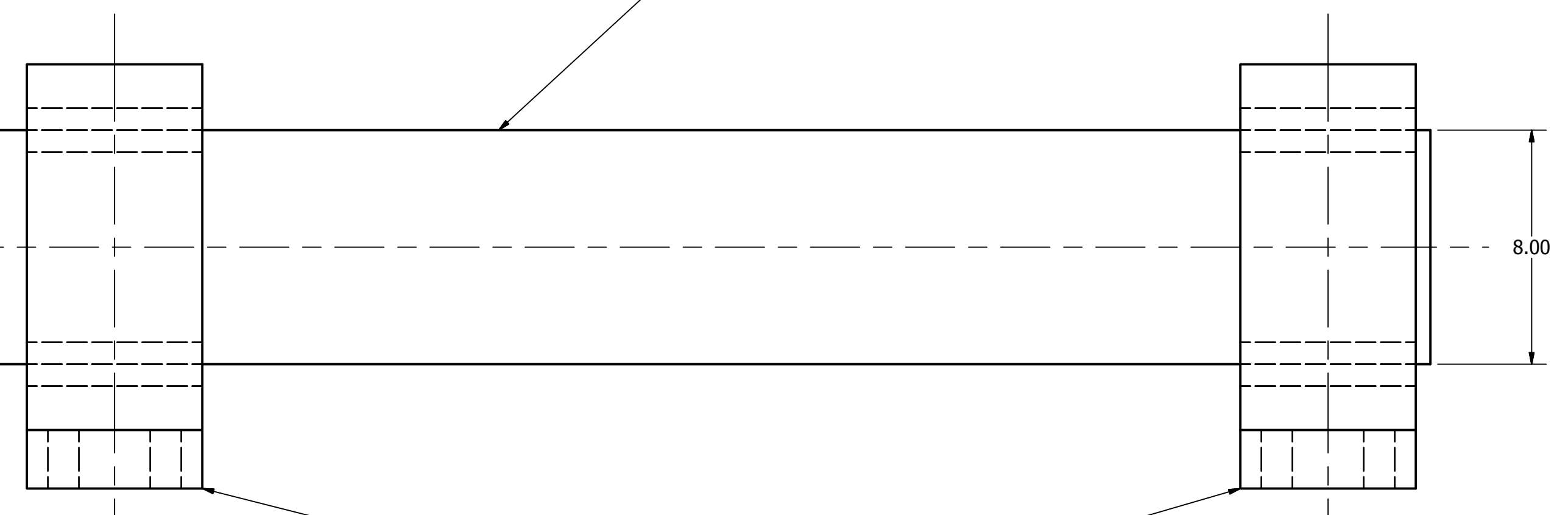
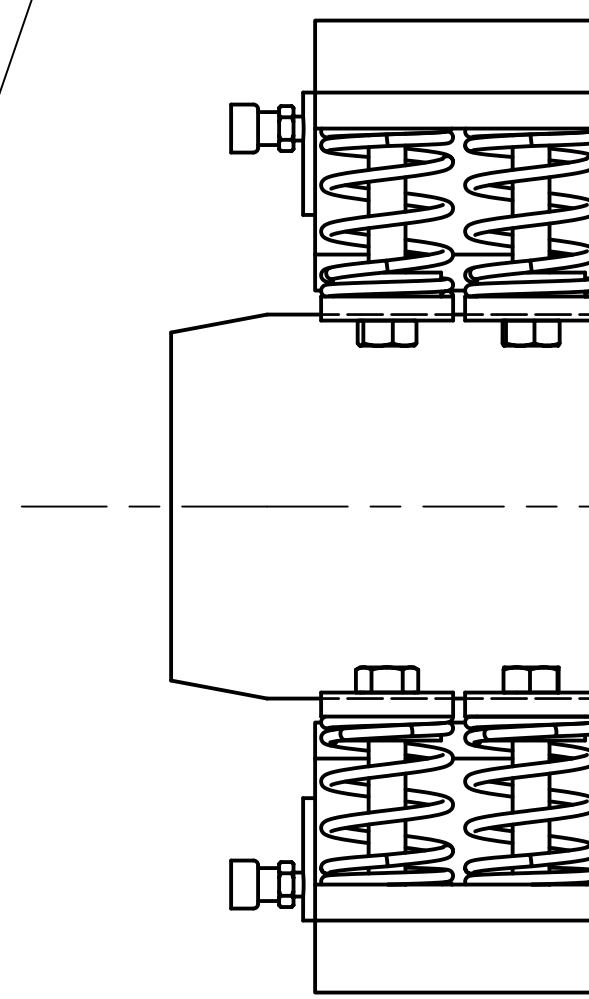
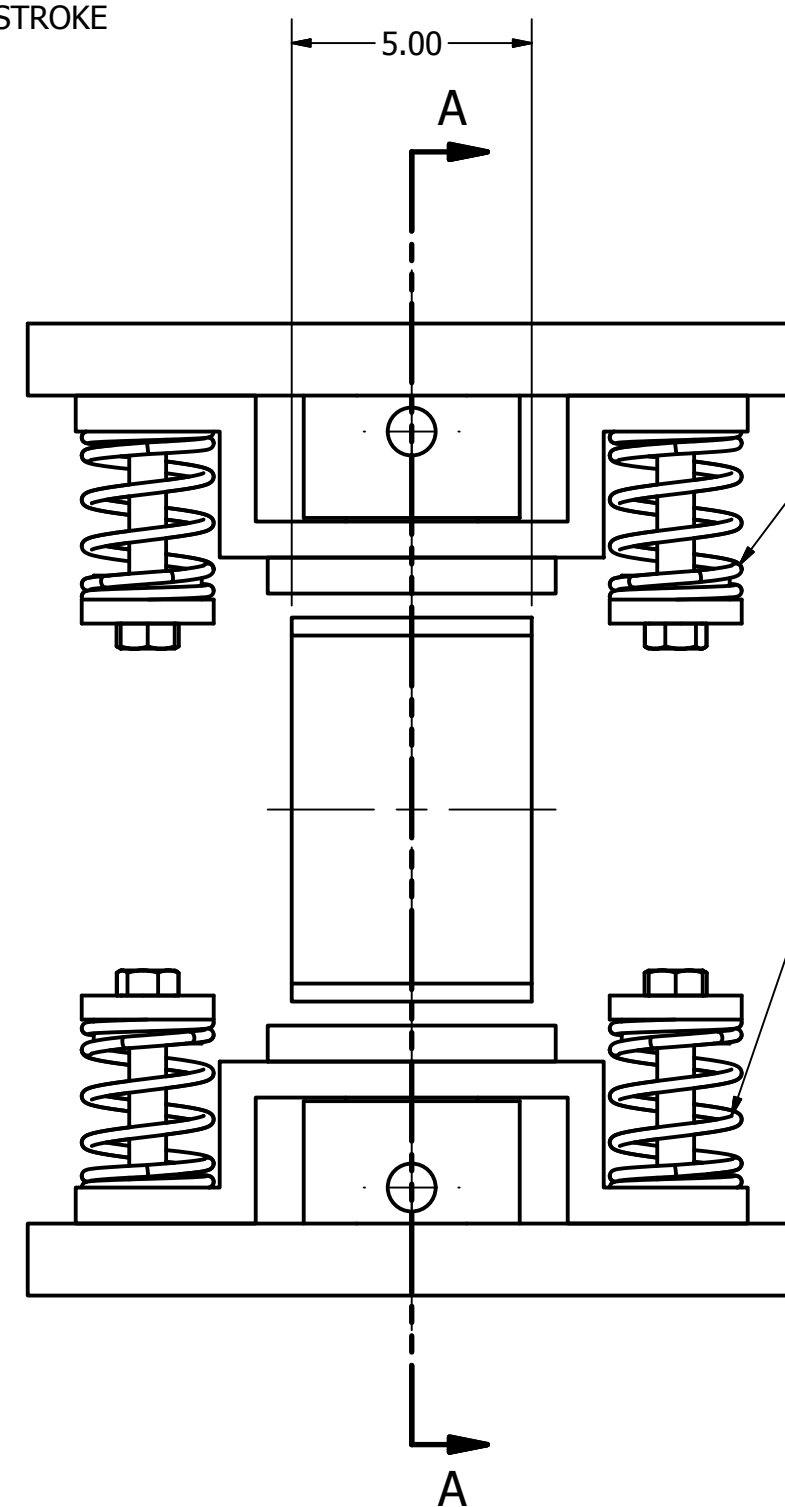
CYLINDER RETRACTION SPRINGS

STANDARD 5" x 8" LOCK BAR

STANDARD GUIDES USING RC6 FIT BETWEEN GUIDES AND LOCK BAR



SECTION A-A
SCALE 1 / 4



PREPARED BY
HARDESTY & HANOVER, LLP

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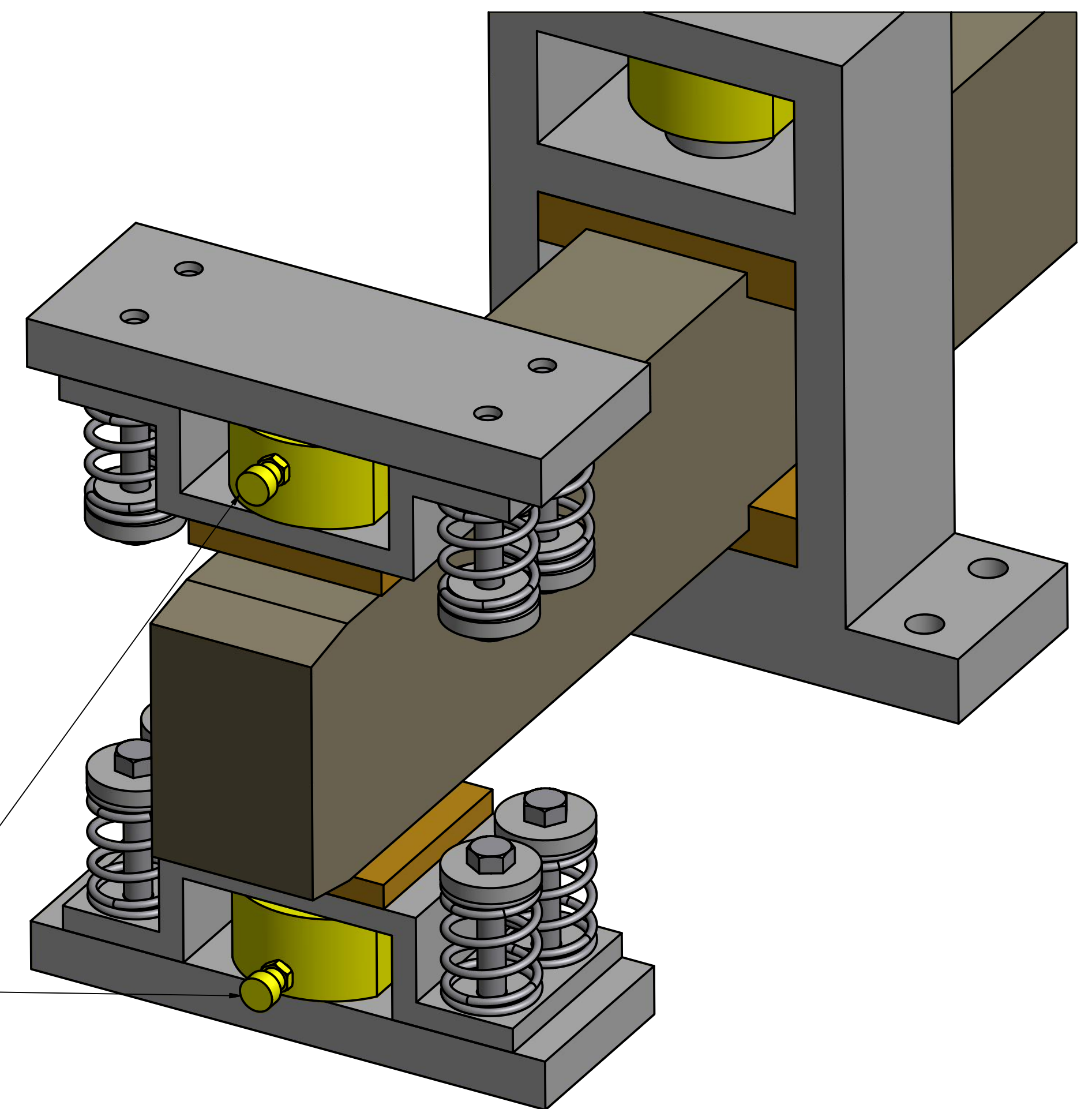
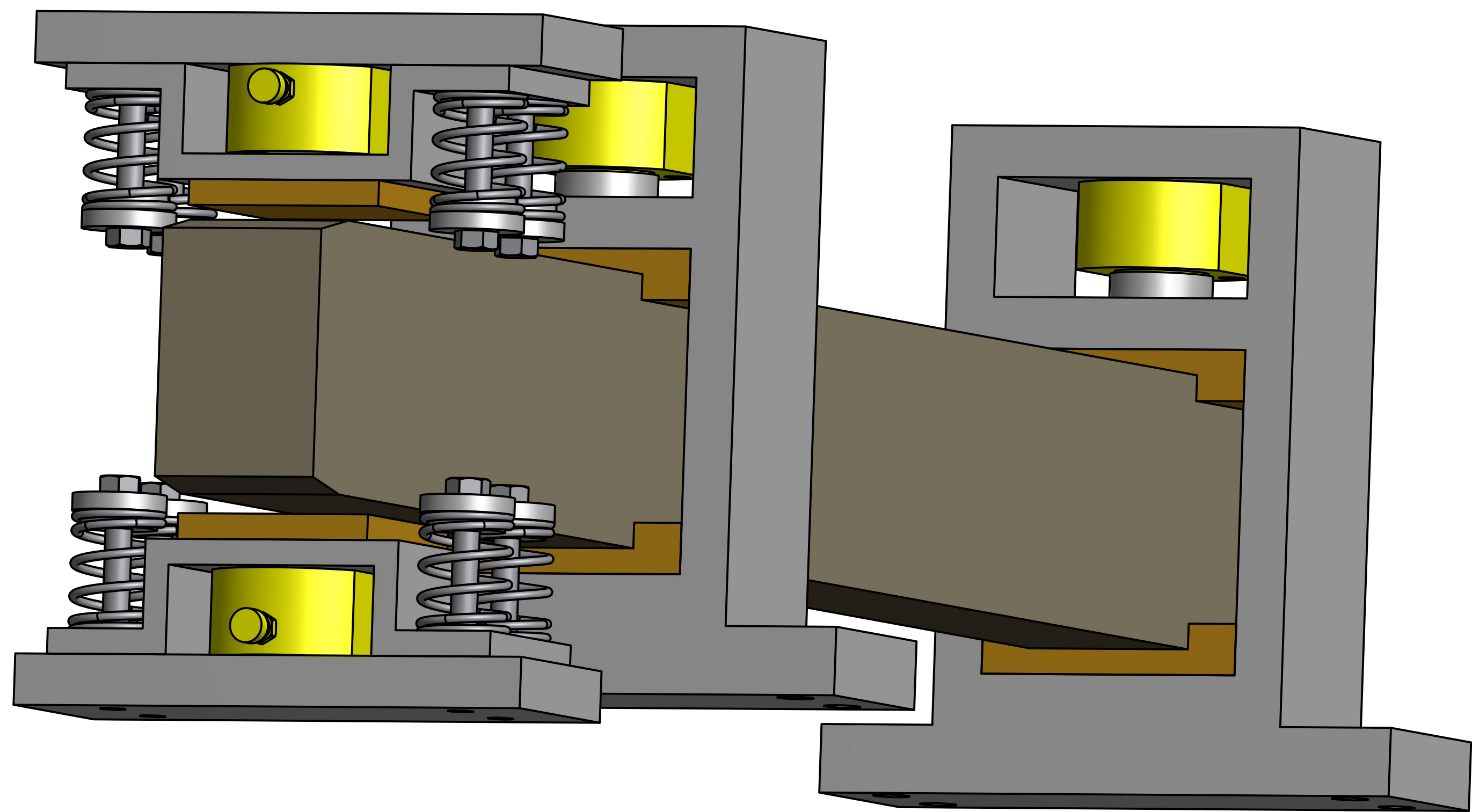


**CLAMPING SPAN LOCK
WITH STANDARD GUIDES**
FDOT

DRAWING NO.	SCALE	DATE	SHEET NO.
		10/28/11	OF 000

DATE STARTED: 10/28/2011
FILENAME: C:\Florida Span Lock Study\Inventor Files\Clamping Lockbar.idw

REV. NO.	DESCRIPTION	DATE



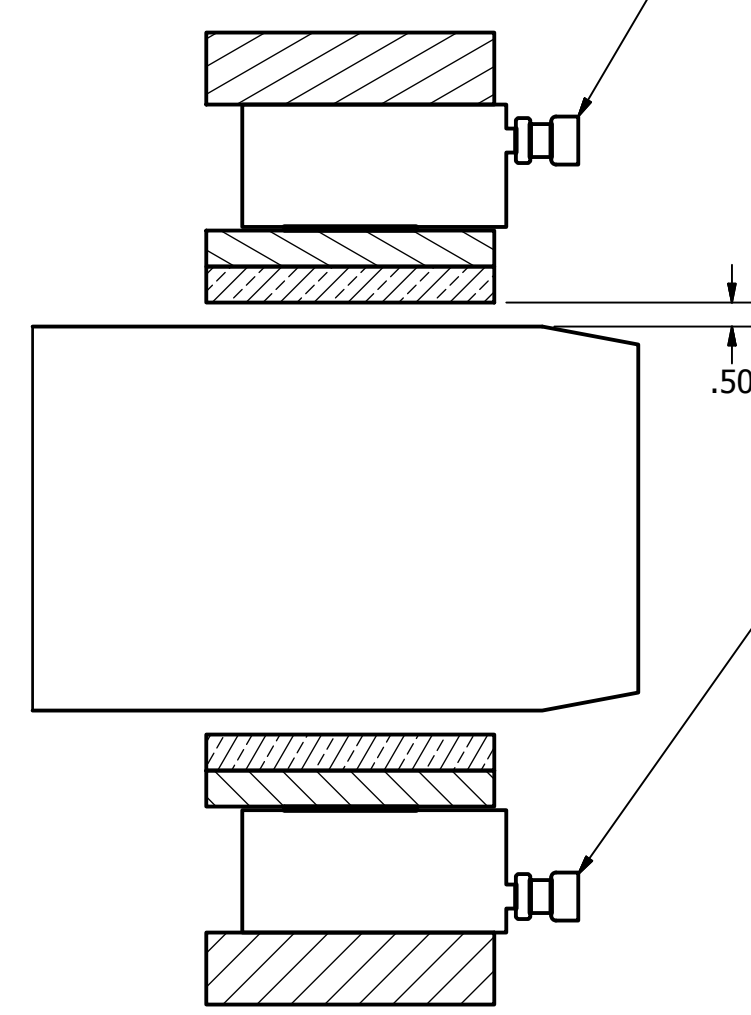
CONNECT JACKS TO HYDRAULIC SYSTEM WHICH CAN BE CONFIGURED TO EITHER CLAMP LOCK BAR IN POSITION OR FORCE LOCK BAR TOWARD CENTERLINE

ENERPAC RSM-500
LOW HEIGHT CYLINDER
50 TON CAPACITY
5/8" STROKE

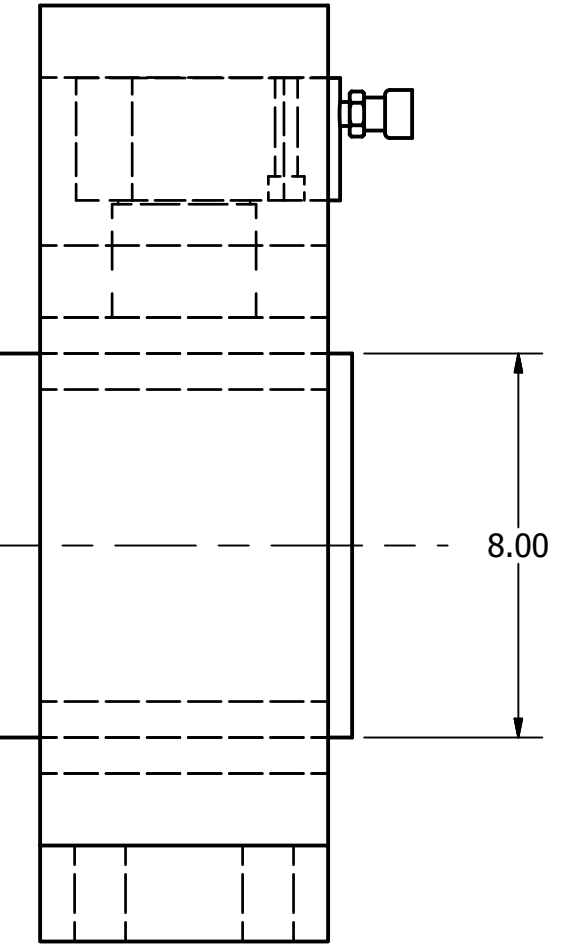
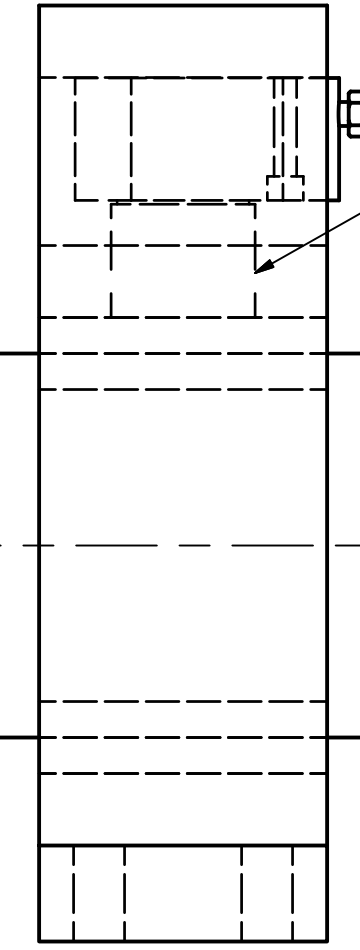
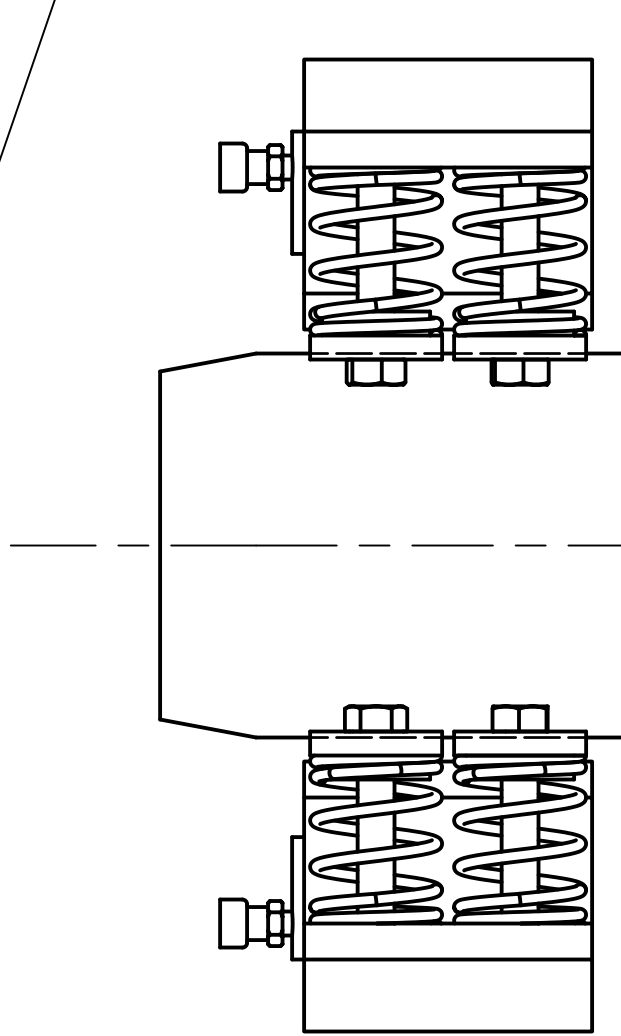
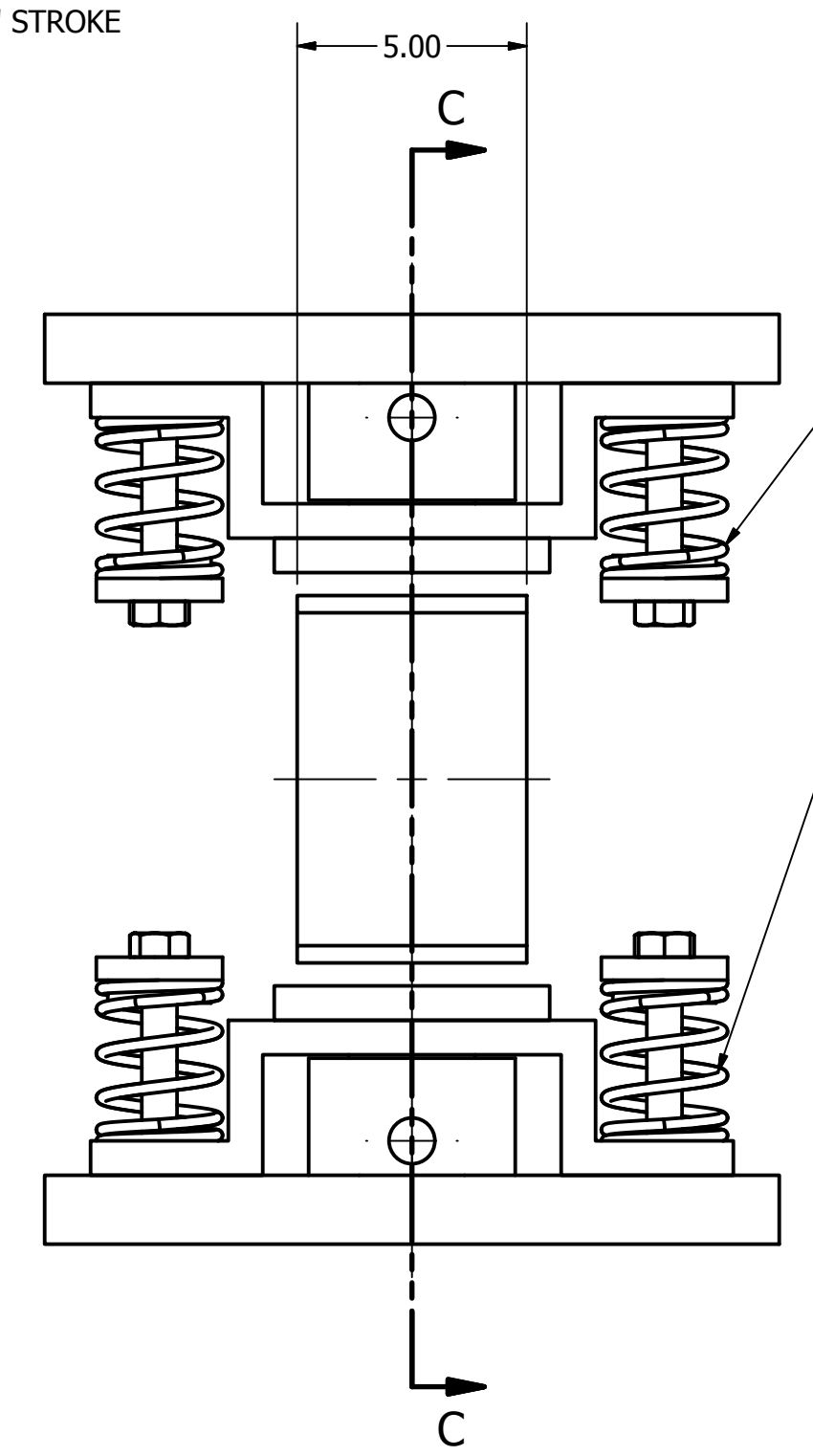
CYLINDER RETRACTION SPRINGS

JACK AND PLUNGER TO CLAMP GUIDE BUSHING TYP.

STANDARD 5" x 8" LOCK BAR



SECTION C-C
SCALE 1 / 4



DATE STARTED: 10/28/2011
FILENAME: C:\Florida-Span Lock Study\Inventor Files\Clamping Lockbar.idw

REV. NO.	DESCRIPTION	DATE

HH HARDESTY & HANOVER, LLP
ENGINEERING

PREPARED BY
HARDESTY & HANOVER, LLP

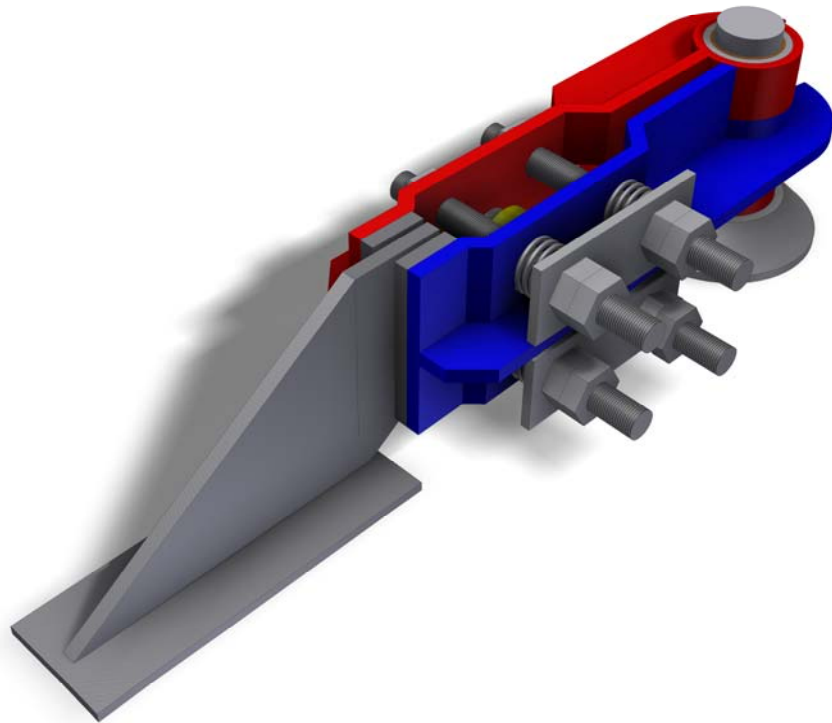
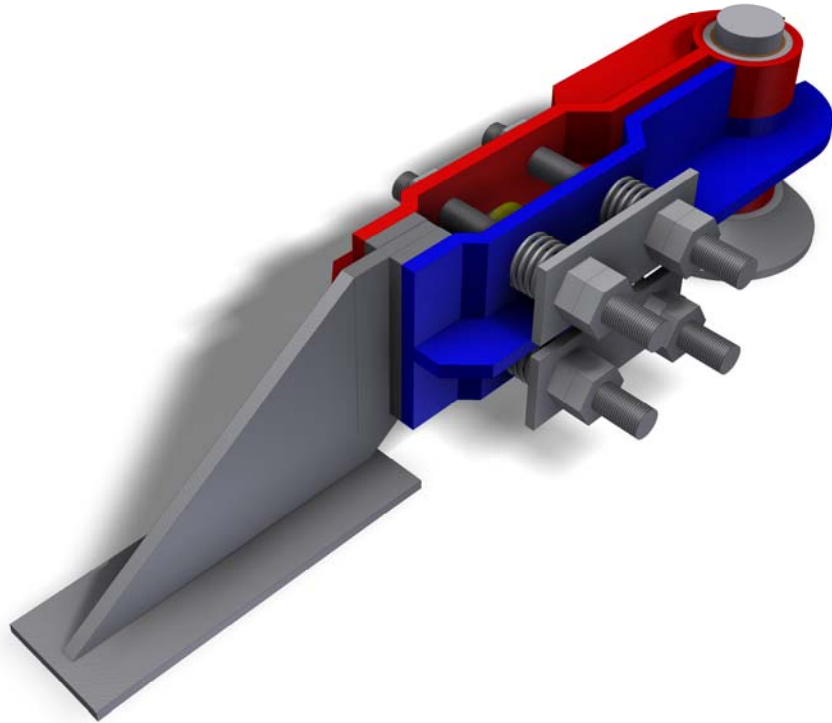
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DRAFTED
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ORIGINAL SIZE IN INCHES

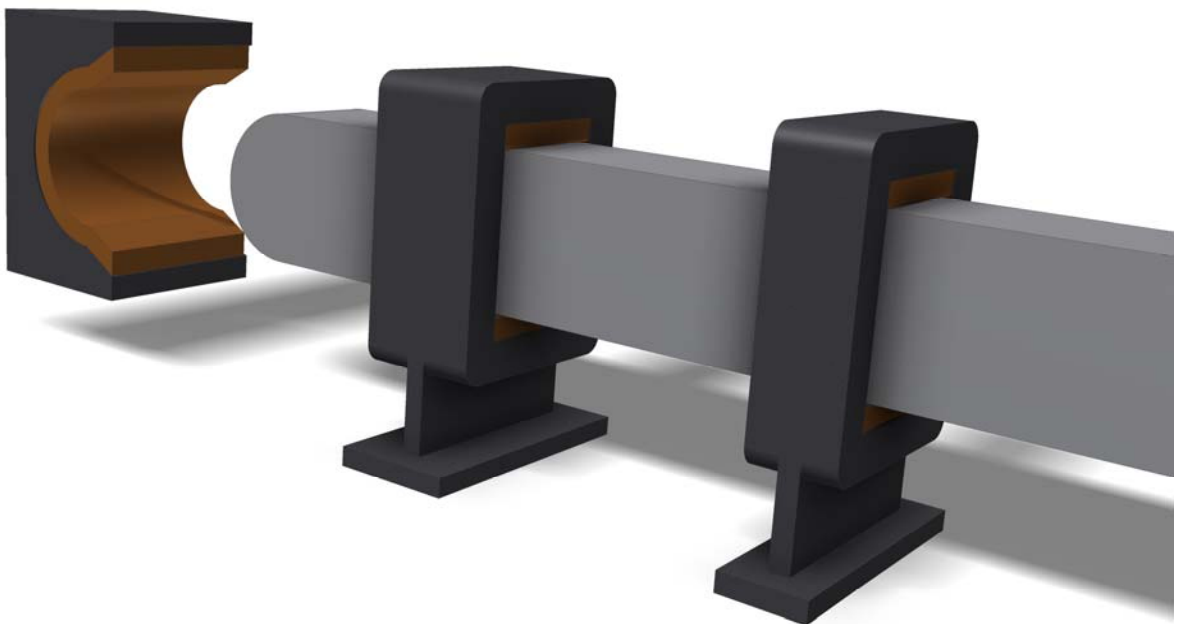
CLAMPING SPAN LOCK WITH JACKING GUIDES
FDOT

DRAWING NO.	SCALE	DATE	SHEET NO.
		10/31/11	OF 000

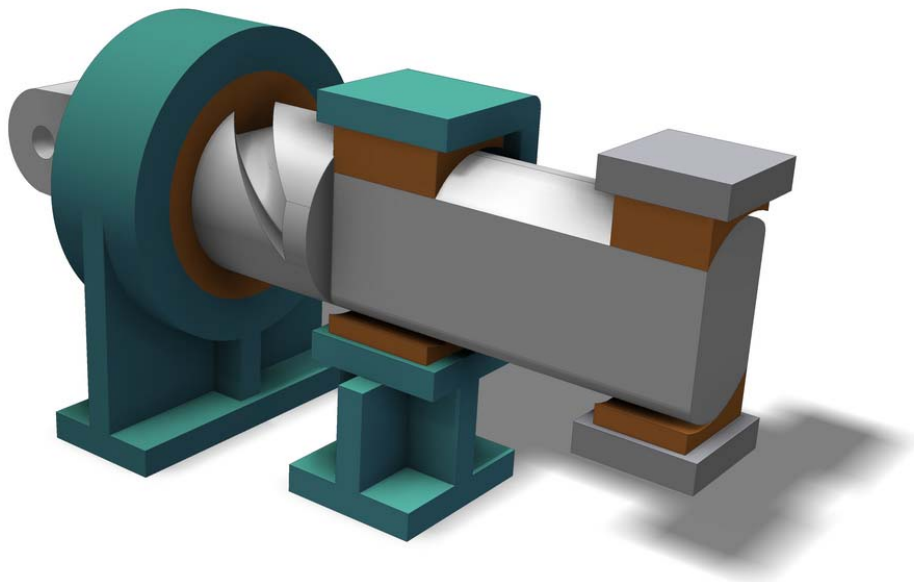
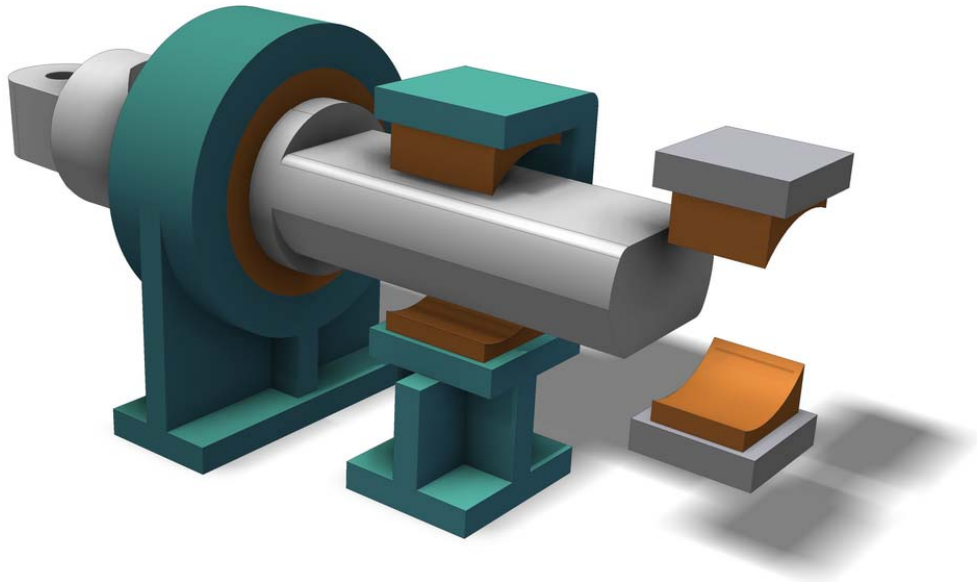
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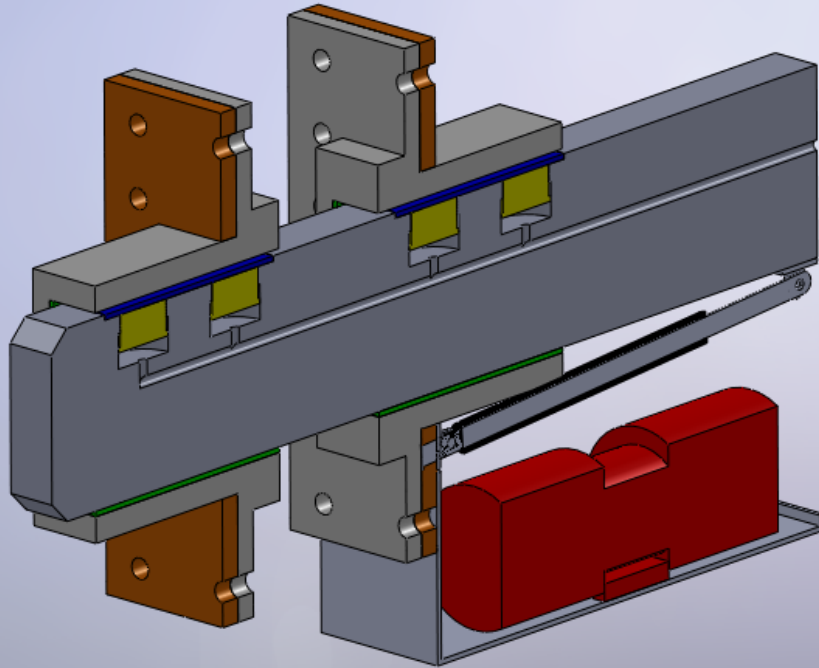
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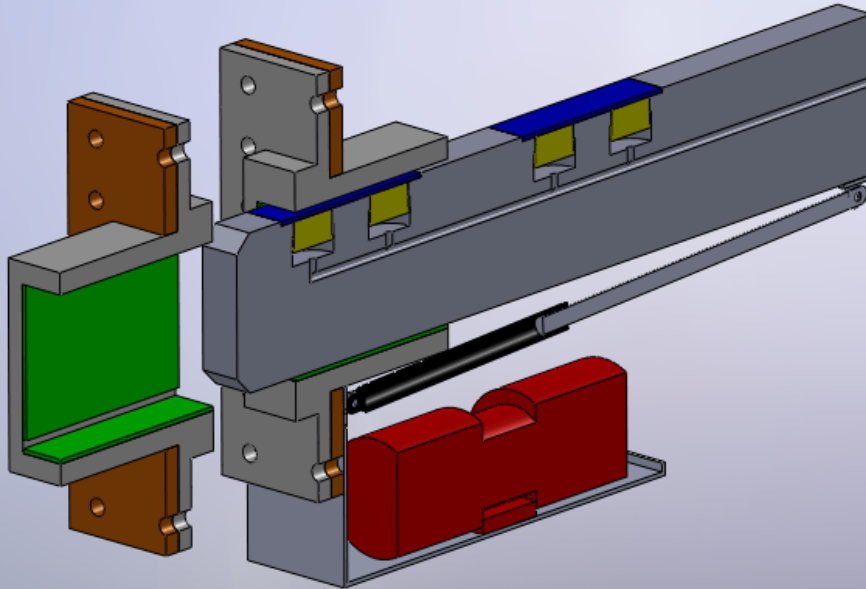
CAM LOCK



INTERNALLY EXPANDING



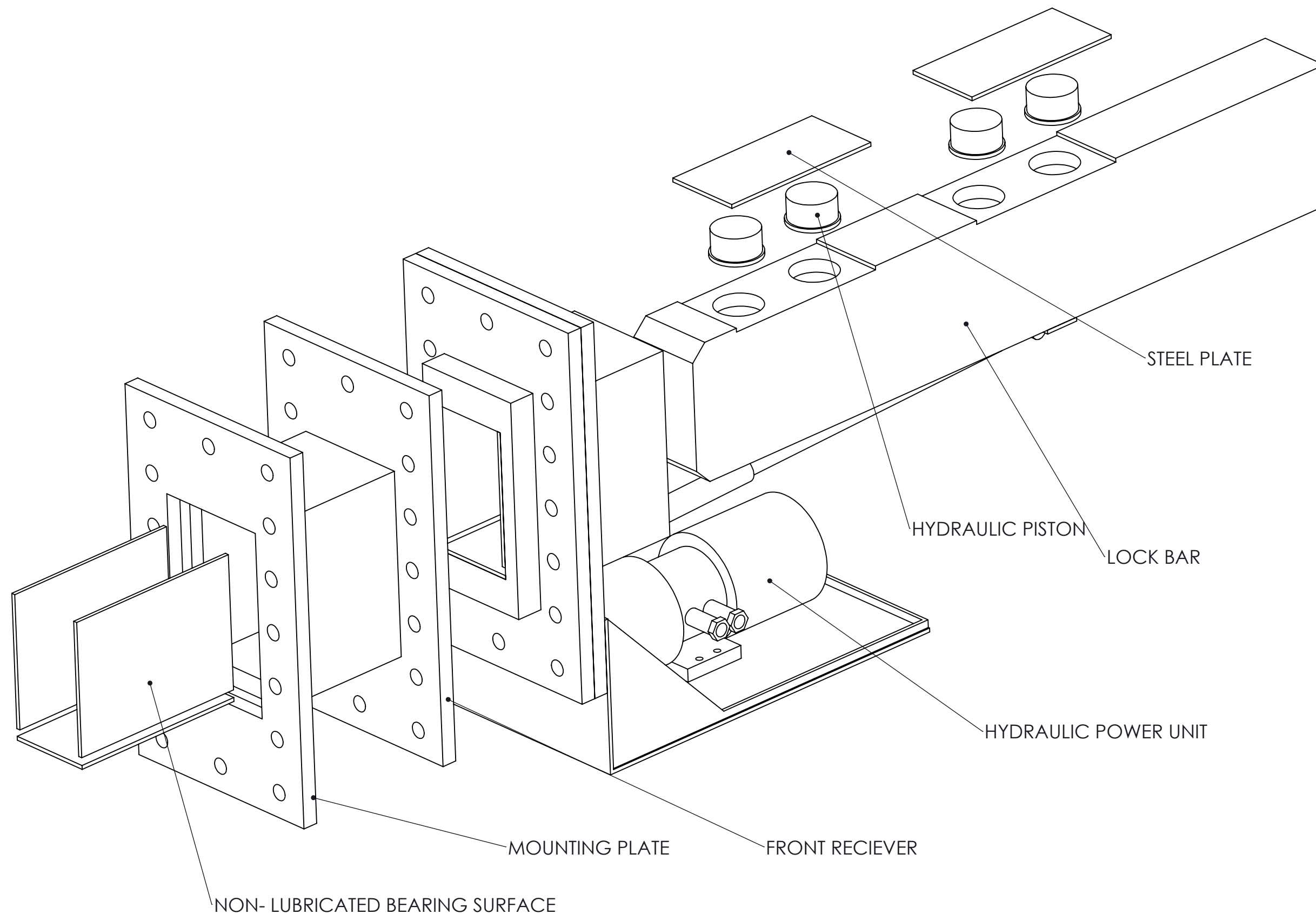
INTERNALLY EXPANDING



INTERNALLY EXPANDING



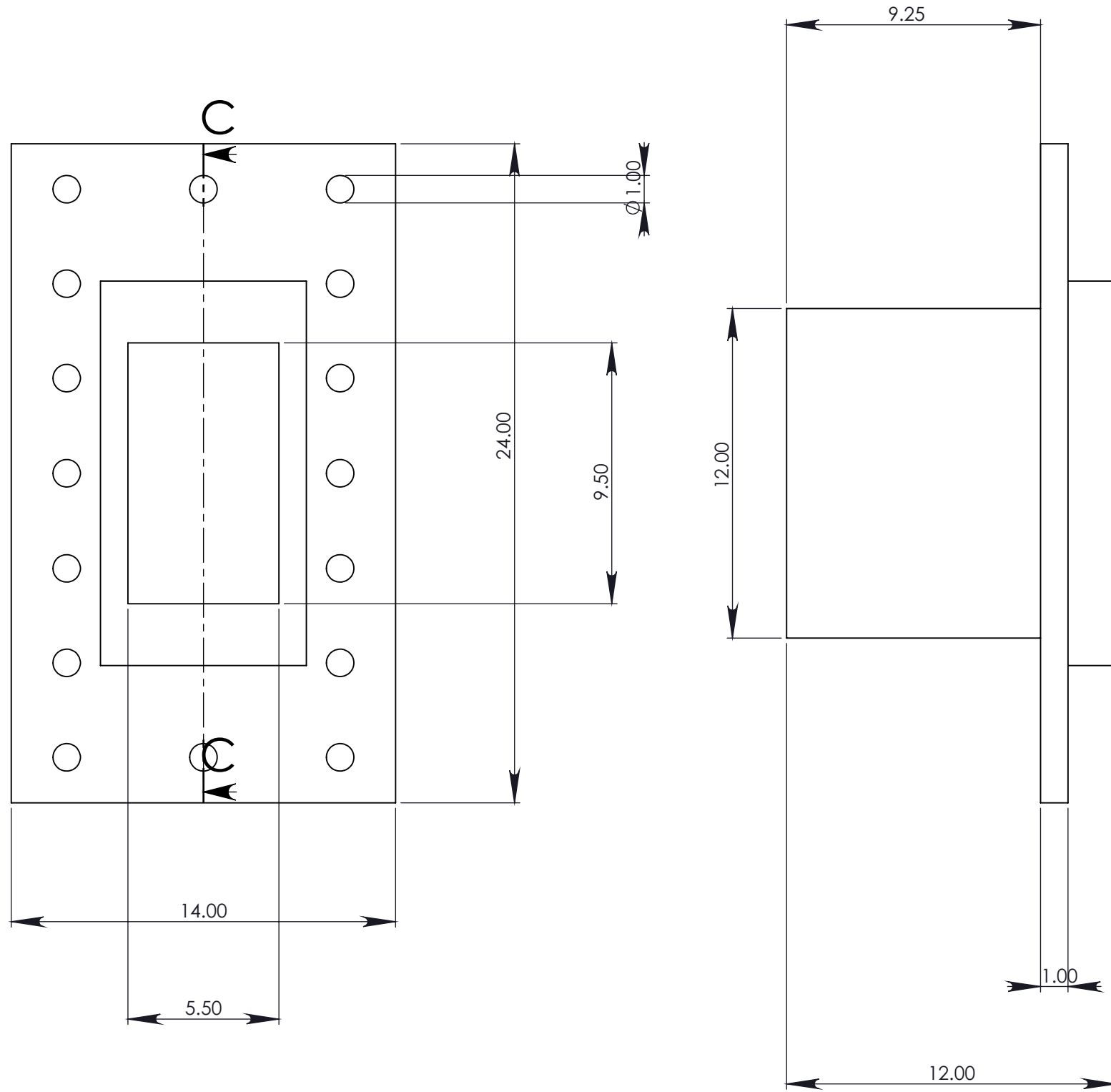
2501 JOHN P. LYONS LANE
 PEMBROKE PARK
 FL, 33009
 PH:954-981-0023
 FAX:954-981-4022
 WWW.EHMCOMPANY.COM



REV	DATE	DESCRIPTION	BY	CHD

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	CHECKED BY: MH	
TITLE: EXPLODED ASSEMBLY	DRAWN BY: GD	
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INTERNALLY EXPANDING



SECTION C-C
SCALE 1 : 5

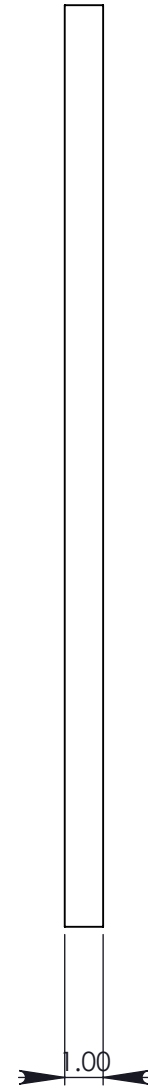
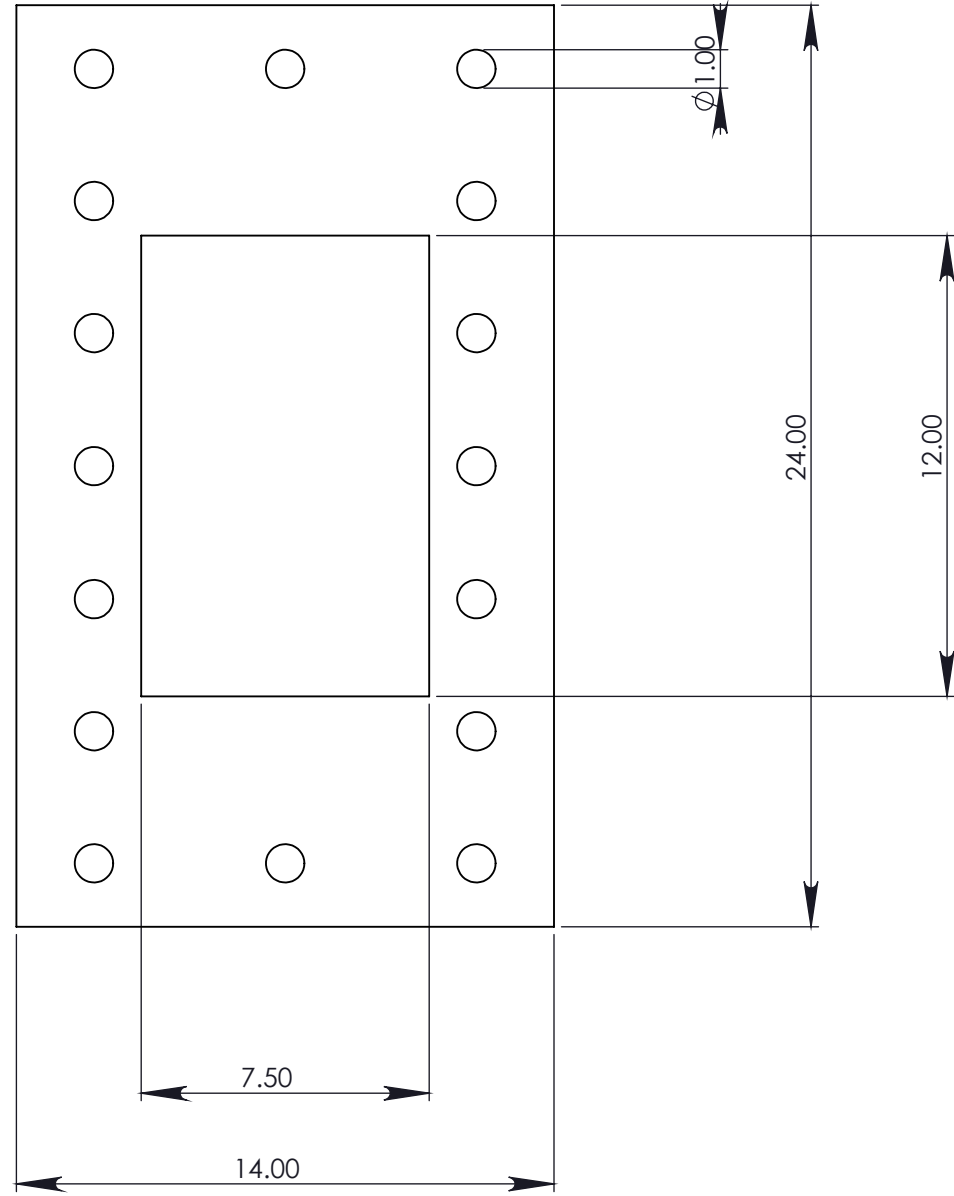


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FL, 33009
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INTERNALLY EXPANDING



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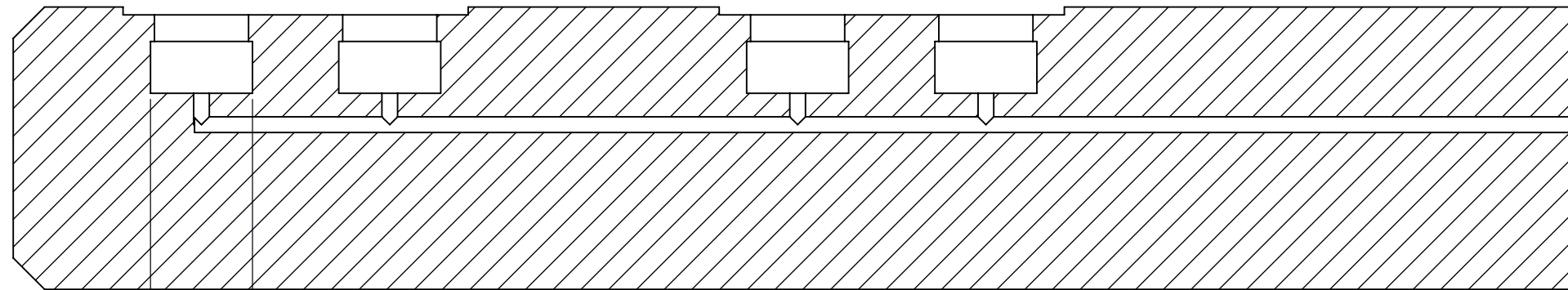
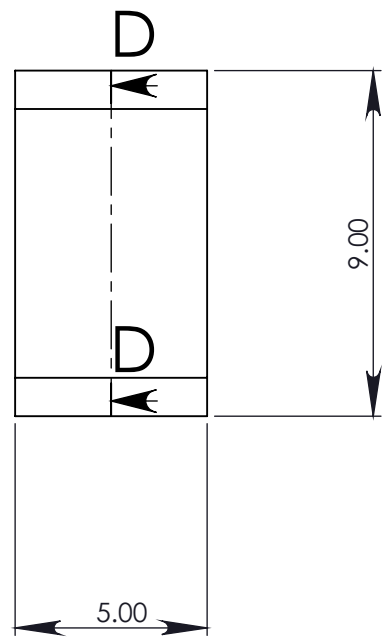
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	DATE: 10/17/2011

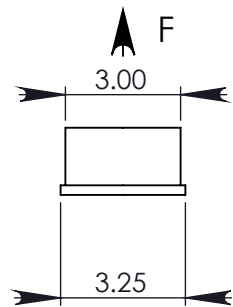
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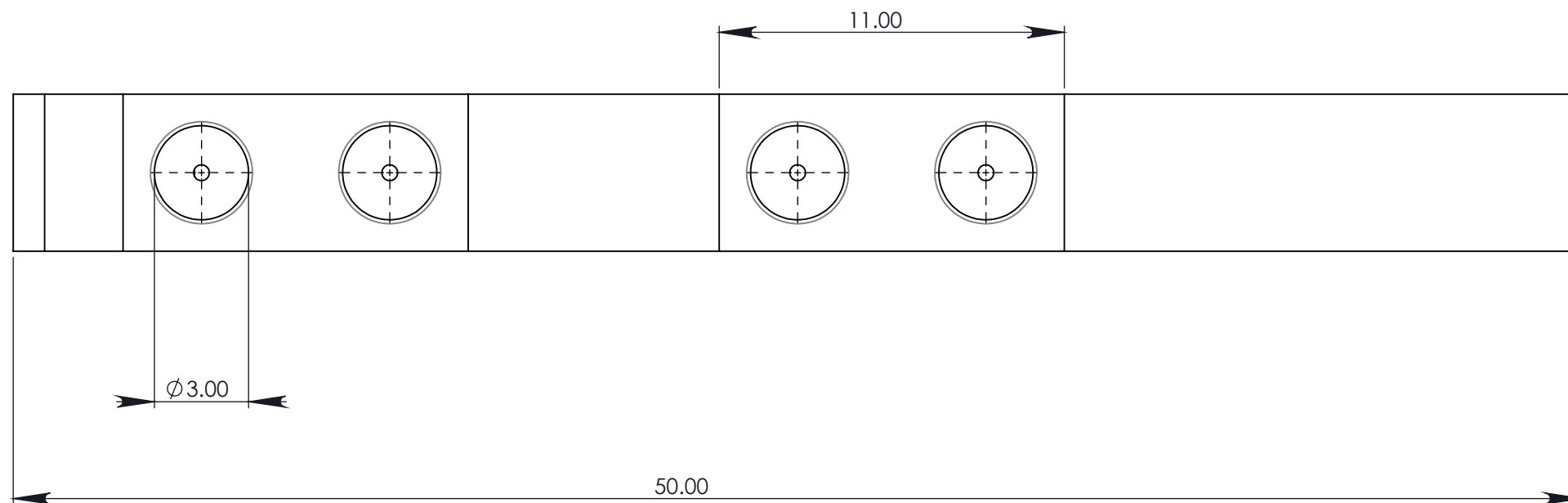
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SECTION D-D
 SCALE 1 : 5



VIEW F
 SCALE 1 : 5



REV	DATE	DESCRIPTION	BY	CHD

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	DRAWN BY: GD
	SCALE: DATE:10/17/2011
TITLE: LOCK BAR	DRAWING NO: CONCEPT 4
PI: 465-10.2.2(A)	

MOMENT LOCK

