

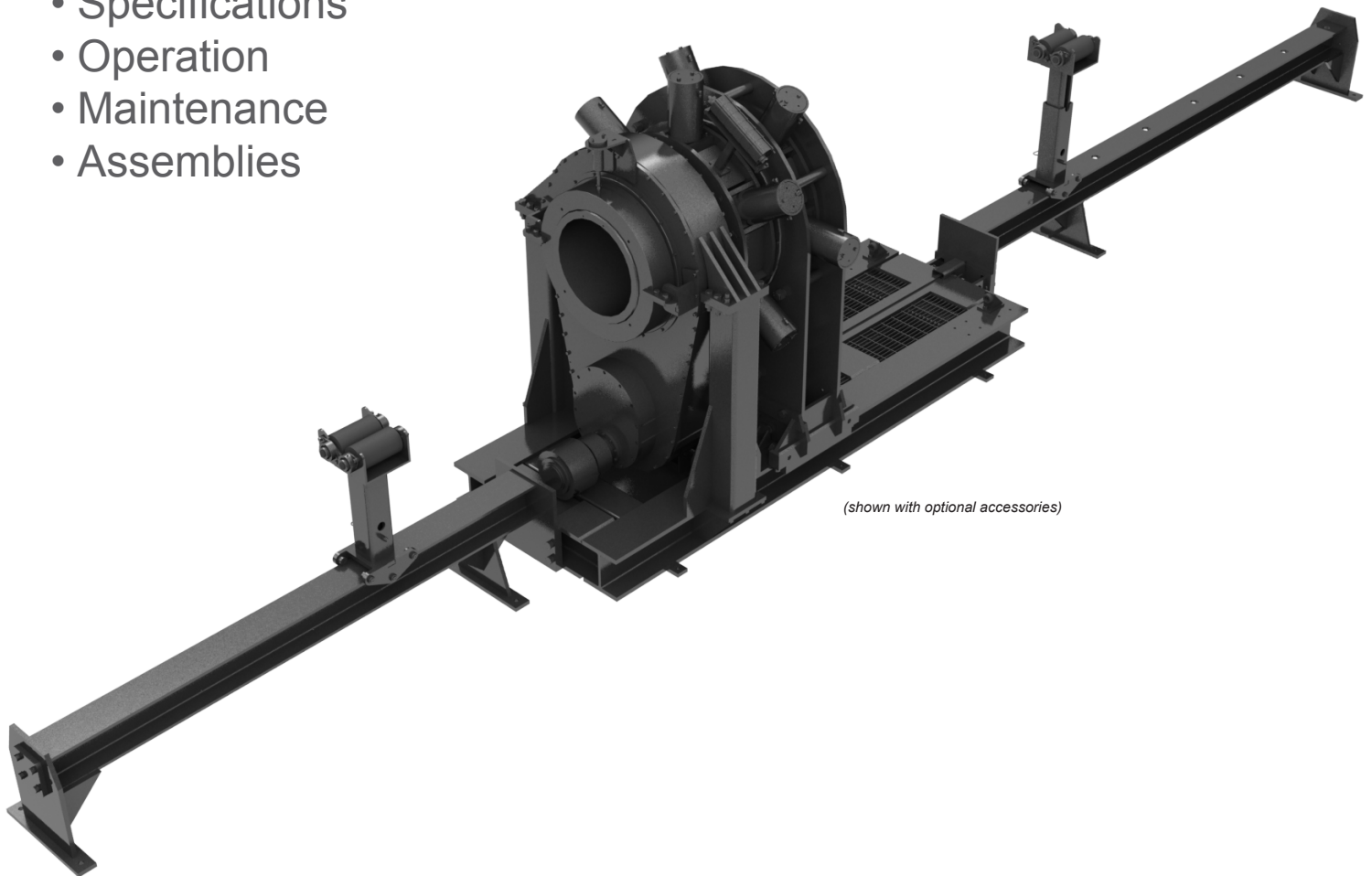
# CLINCHER<sup>®</sup>

TECHNICAL MANUAL

## RP7022

22" (55.8cm) 105K ft-lbs  
Continuously Rotating Bucking Unit

- Specifications
- Operation
- Maintenance
- Assemblies



*(shown with optional accessories)*

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**MCCOY**  
MOVING GLOBAL ENERGY FORWARD

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*Observance of all descriptions, information and instructions set out in this manual is the full responsibility of the user. This manual is intended for guidance and informational purposes and must be used in association with adequate training and on-the-job supervision to provide safe and effective equipment use.*

*It is the responsibility of the user to conform to all regulations and requirements issued by an authority or agency which may affect the operation, safety or equipment integrity, that may overrule the content of this documentation.*

*The user will acknowledge and obey any general legal or other mandatory regulation in force relating to accident prevention, safety, and equipment integrity.*

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## **SECTION I**

### **GENERAL DESCRIPTION:**

Your **CLINCHER®** Bucking Unit is a rugged, self-contained, continuously rotating unit designed to accurately make-up or break-out the threaded connections on tubular components such as oil and gas well drilling tools, casing, tubing, and similar equipment. The unit will accurately make-up and break-out thread connections without damage to the thread.

### **Recommended Safety Guidelines**

The safety guidelines that follow are recommended by McCoy Drilling & Completions, and are in no way intended to supersede the specific health and safety regulations and guidelines of our client's workplace. Workplace rules and regulations are the responsibility of the client.

#### **A. Work Apparel**

To ensure employee safety, it is recommended that the following PPE (Personal Protective Equipment) be worn when using and working around hydraulic equipment:

##### **1. Eye Protection (safety glasses)**

To avoid risk of eye damage due to:

- fracture/failure of die inserts under load
- fracture/failure of tool under load
- failure of hydraulic hose or component under pressure

##### **2. Ear Protection (ear plugs)**

To prevent hearing damage due to:

- electric motor and hydraulic systems noise
- sudden and loud noises that may occur during the work process

##### **3. Head Protection (hard hat)**

To reduce danger due to:

- overhead cranes and hooks
- fracture/failure of die inserts under load
- fracture/failure of tool under load

##### **4. Hand Protection (leather gloves)**

To avoid danger due to:

- metal slivers on the tool or dies produced during the work process
- chemicals used during the work process
- failure of hydraulic hose or components under pressure

##### **5. Foot Protection (steel-toed boots)**

To prevent injury due to:

- falling or rolling work pieces

## **SECTION II**

### **INSTALLATION:**

1. Inspect unit carefully for shipping damage or missing parts.
2. Position unit on a fairly flat and level floor leaving sufficient clearance on both ends to allow the insertion and removal of the longest tools expected to be serviced.
3. Anchor the unit in place.
4. Clean hydraulic hoses and quick disconnects.
5. Attach all hoses that connect the control console to the Bucking Unit.
6. Fill hydraulic reservoir with recommended hydraulic fluid filtered using 3 micron filter system. Filler cap/breather is accessible on left side of unit. Level indicator may be viewed through a window in front.
7. Verify suction valve is open if present.

8. Fill pump case with filtered hydraulic oil before connecting power.
9. **CAUTION:** Check that main power supply matches name plate rating on motor in control console. Use of an incompatible power source will result in equipment damage and will void warranty.
10. Connect power supply.
11. Check motor rotation by jogging start/stop switch quickly. Reference the rotation plaque attached to the power unit. If rotation is incorrect, switch any two-phase wires at motor starter.

### **START UP:**

1. Ensure both pressure relief valves are fully rotated counter-clockwise to reduce pressure to minimum.
2. Start motor and check for oil leaks in console. Hold back Backup Clamp Cylinder control lever in Open/Retract position and adjust Clamp Pressure Control until system pressure reads 1,000 psi. Cycle all valves fully several times to completely purge all air from the system.
3. Check Bucking Unit and Hydraulic Power Unit for leaks.
4. Check reservoir for proper fluid levels. Add filtered hydraulic fluid if level is below sight glass when all cylinders are extended. Fill until fluid level reaches midpoint in sight glass. If fluid level is below sight glass level, unit will not operate.

## **SECTION III**

### **OPERATION**

The E-Stop is located on the control console, and must be pulled out for the unit to operate. Locate the start button on the motor starter. Push to start main drive motor.

1. Start the motor.
2. Move Tong Make Up / Break Out lever in either direction until the power tong completes a rotation.
3. Hold Tailstock Clamp / Unclamp lever in the Unclamp position and adjust Clamp Pressure Control until system pressure reads 1,000 psi. Cycle all levers fully several times to completely purge all air from the system.
4. Position work-piece near center of Headstock, shift the Tailstock Clamp / Unclamp lever to the Clamp position. Tailstock Clamp / Unclamp control lever must be left in the 'Clamp' position while work-piece is in machine.
5. Position Tailstock as close as possible to tong, allowing required space for thread travel. **CAUTION:** If adequate space is not left to accommodate thread travel, the backup will contact the tong, potentially damaging the equipment or tubular connection. Such damage is not covered by the warranty.
6. Shift Headstock Clamp / Unclamp lever into Clamp position.
7. Using Tong Make Up / Break Out control lever, apply make-up or break-out torque, then rotate headstock.

### **MAKE-UP**

When making up connections, set relief valve to proper setting before rotating headstock.

### **BREAK-OUT**

Set relief valve to proper setting before rotating headstock.

## **SECTION IV**

### **MAINTENANCE**

#### **DAILY:**

1. With all clamp cylinders fully extended, check hydraulic reservoir oil level on sight glass on front of console. Fill with filtered hydraulic fluid if needed until level reaches midpoint on sight glass.
2. Inspect die inserts. Clear any debris from around clamp cylinders.

#### **WEEKLY:**

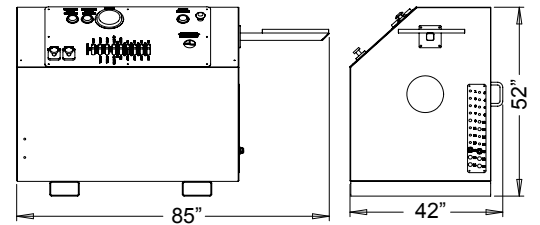
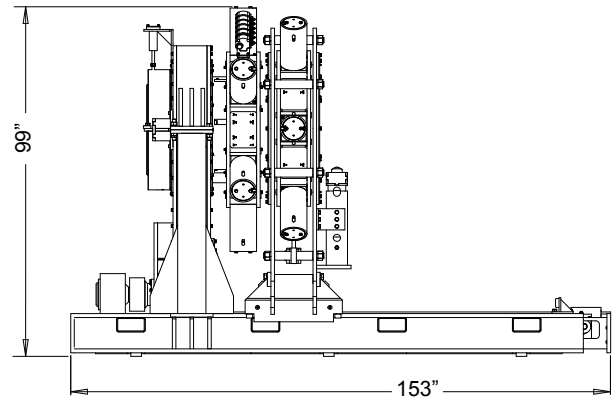
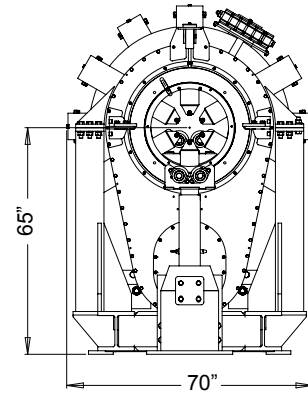
1. Remove dies and inspect jaw retainer bolt torque. Torque should be set to 180 ft-lbs.

#### **MONTHLY:**

1. Grease fittings.

#### **ANNUALLY (or following any system repair):**

1. Drain and clean hydraulic reservoir. Analyze contamination / quality status of hydraulic oil (with the use of an analysis kit or by other third party means). Filter / replace oil as required.
2. Remove and clean suction strainer.
3. Refill reservoir with new filtered hydraulic oil.



## **SECTION V**

### **HYDRAULIC POWER UNIT**

The hydraulic power unit incorporates a number of pressure control and relief valves. These valves are correctly adjusted and set prior to shipment from our factory.

**CAUTION:** Adjusting internal relief valves or pump compensator settings will void warranty.

## **SECTION VI**

### **SPECIFICATIONS**

#### **Console / Power Unit:**

Electric Motor:	50 Horsepower, 440 Volt, 3 phase, 60 Hertz
Hydraulic Oil:	AW-68
Hyd. Oil Capacity:	90 gal.
Overall Length:	42"
Overall Width:	85"
Overall Height:	52"
Weight (approx.):	3,000 lbs.

#### **Bucking Unit:**

Max. Torque:	105,000 ft-lbs
Handle Length:	36"
Overall Length:	153"
Overall Width:	70"
Overall Height:	99"
Weight (approx.):	18,000 lbs.

### **CHUCKING CAPACITIES**

7" to 21 1/2" Diameter

### **TORQUE CAPACITY**

Make-up 105,000 foot pounds / Break-out 105,000 foot pounds

# LUBRICATION SPECIFICATIONS

Use an EP synthetic grease that meets or exceeds the following specifications:  
(Used in tong case)

Use an EP synthetic grease that meets or exceeds the following specifications:  
(Used as bearing grease)

Type	High Temp MP
NLGI Consistency Grade	1
Color	Medium Green
Lithium Complex Soap, wt%	Non Soap
Serv. Temperature	0 Deg. F – 450 Deg. F
Base Oil Viscosity: @ 100° F	1300 SUS
@ 200° F	89 SUS
Viscosity Index	77
Penetration, dmm	325-340
Worked	
<i>ASTM D 217</i>	
Dropping Point, °F	500 ±
<i>ASTM D 566</i>	
Rust Protection, 5% SSW	N/A
Water Washout	N/A
%wt loss @ 175°F	
Timken, OK Load, lbs	50
Bomb Oxidation	N/A
100 hrs @ 210°F, psi drop	
Applications	High & Low Speed Bearings, Wheel Bearings, Pumps, Gears, Lubrication

Type	N/A
NLGI Consistency Grade	2
Color	Blue
Lithium Complex Soap, wt%	14
Serv. Temperature	N/A
Base Oil Viscosity: @ 40°C, cSt	150
@ 100°C, cSt	14.5
<i>ASTM D 445</i>	
Viscosity Index	N/A
Penetration, dmm	280
Worked, 60X	
<i>ASTM D 217</i>	
Dropping Point, °F	450+
<i>ASTM D 2265</i>	
Rust Protection, 5% SSW	Pass
<i>ASTM D 5969</i>	
Water Washout	6.8
%wt loss @ 175°F	
<i>ASTM D 1264</i>	
Timken, OK Load, lbs	45
<i>ASTM D 2509</i>	
Bomb Oxidation	5 max
100 hrs @ 210°F, psi drop	
<i>ASTM D 942</i>	
Applications	Industrial application where a high temperature/multipurpose extreme pressure grease is needed, Trailers

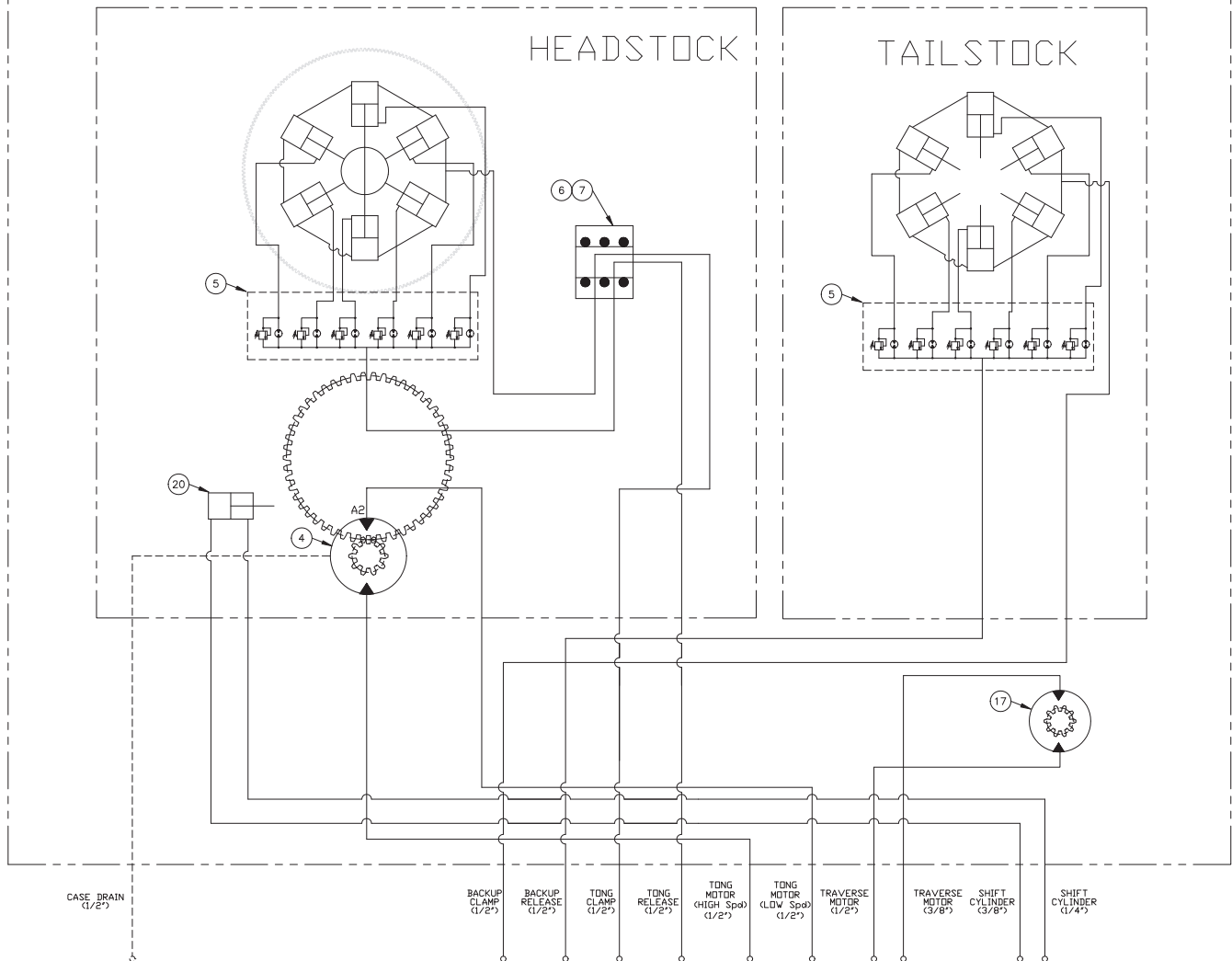
***Use a premium quality hydraulic fluid that meets or exceeds the following specifications:***

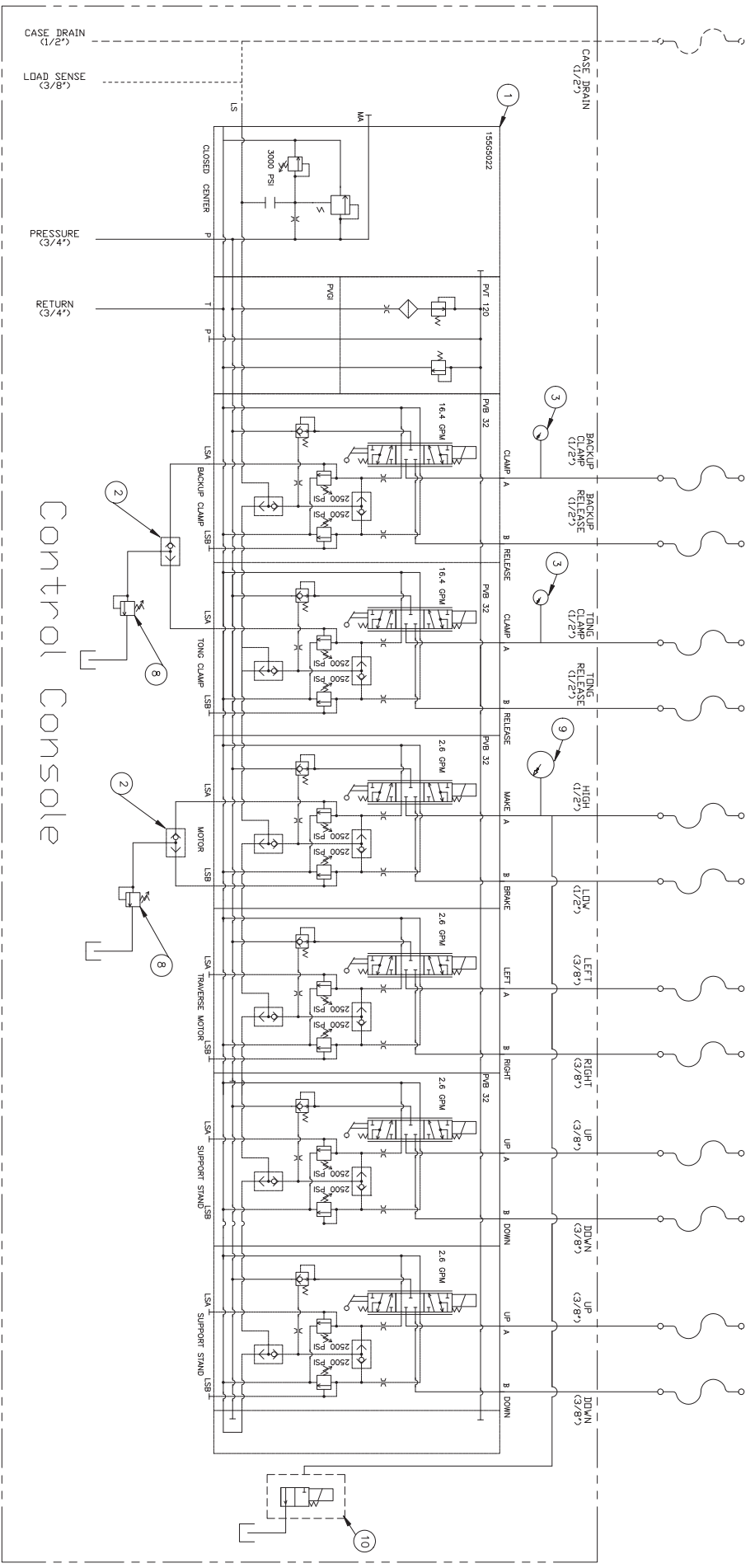
Humble Hydraulic H	68
ISO Viscosity Grade	68
Base Oil Viscosity: cSt @ 40°C	65.0
<i>ASTM D 445</i>	
cSt @ 100°C	8.5
Viscosity Index – <i>ASTM D 2270</i>	95
Pour Point – <i>ASTM D 97</i>	-9
Flash Point – <i>ASTM D 92</i> C(°F)	222 (432)
Demulsibility – <i>ASTM D 1401</i>	41/39/0 (20)
Vickers 104C (IP281)	Pass
Vickers M-2950-S	Quality Level
Vickers I-286-S	Quality Level
TOST – <i>ASTM D 943</i>	2000+

# Bucking Unit Hydraulic Schematic

ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	3	PVG 32 VALVE CONTROLS	157BXXXX
2	2	SHUTTLE VALVE	LSV1-6T-N
4	1	HYDRAULIC MOTOR, SINGLE	235-6500
5	2	FLOW DIVIDER	330-6500
6	1	HYDRAULIC SWIVEL	228-6500-165
7	3	ROTARY SEALS (3 PCS = 1 SET)	238-6500
8	2	RELIEF VALVE	R1E02-2512-A1
9	1	6" PRESSURE GAUGE, 0-3000	132-6500
10	1	DUMP VALVE SOLENOID VALVE NOR. CLOSED	148-6500
12	1	AIR PRESSURE GAUGE	149-6500
14	1	AIR VALVE	146-6500
16	1	AIR MUFFLER	147-6500
17	1	TRAVERSE MOTOR	143-6500
20	1	AIR CYLINDER	234-6500
21	8	CLAMP CYLINDER	400-3000-1

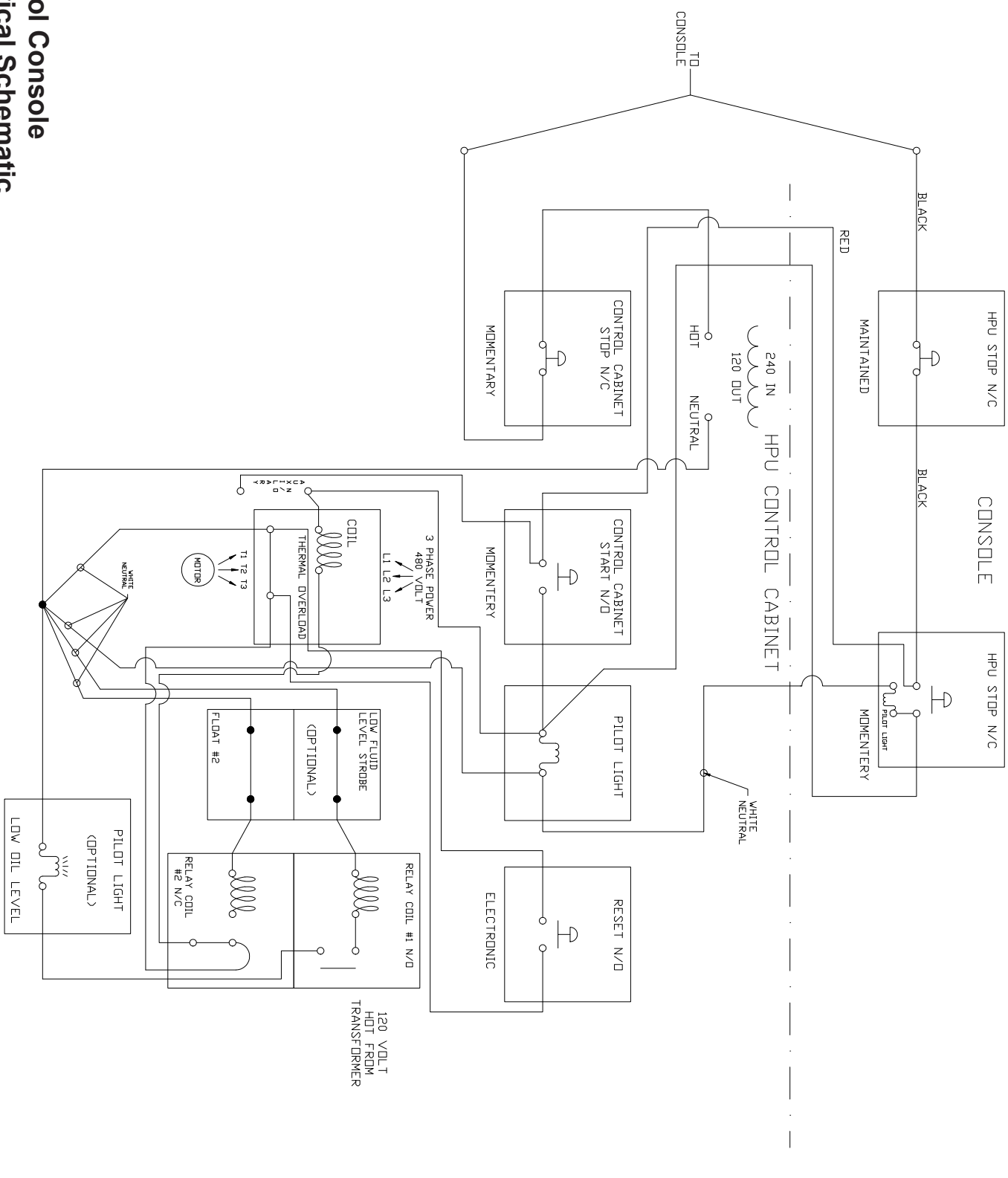
**CLINCHER® RP7000** Bucking Unit w/ Single speed motor





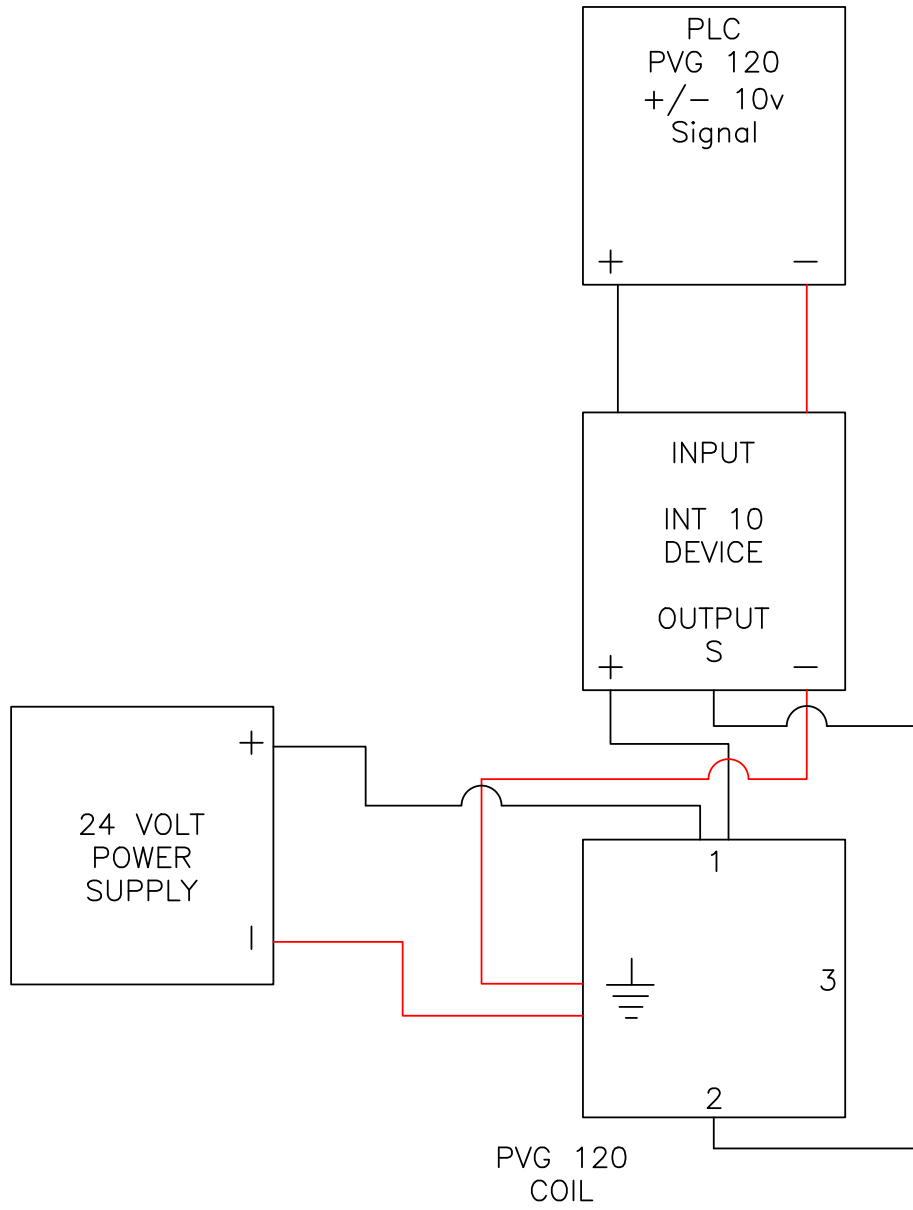
# Control Console Hydraulic Schematic



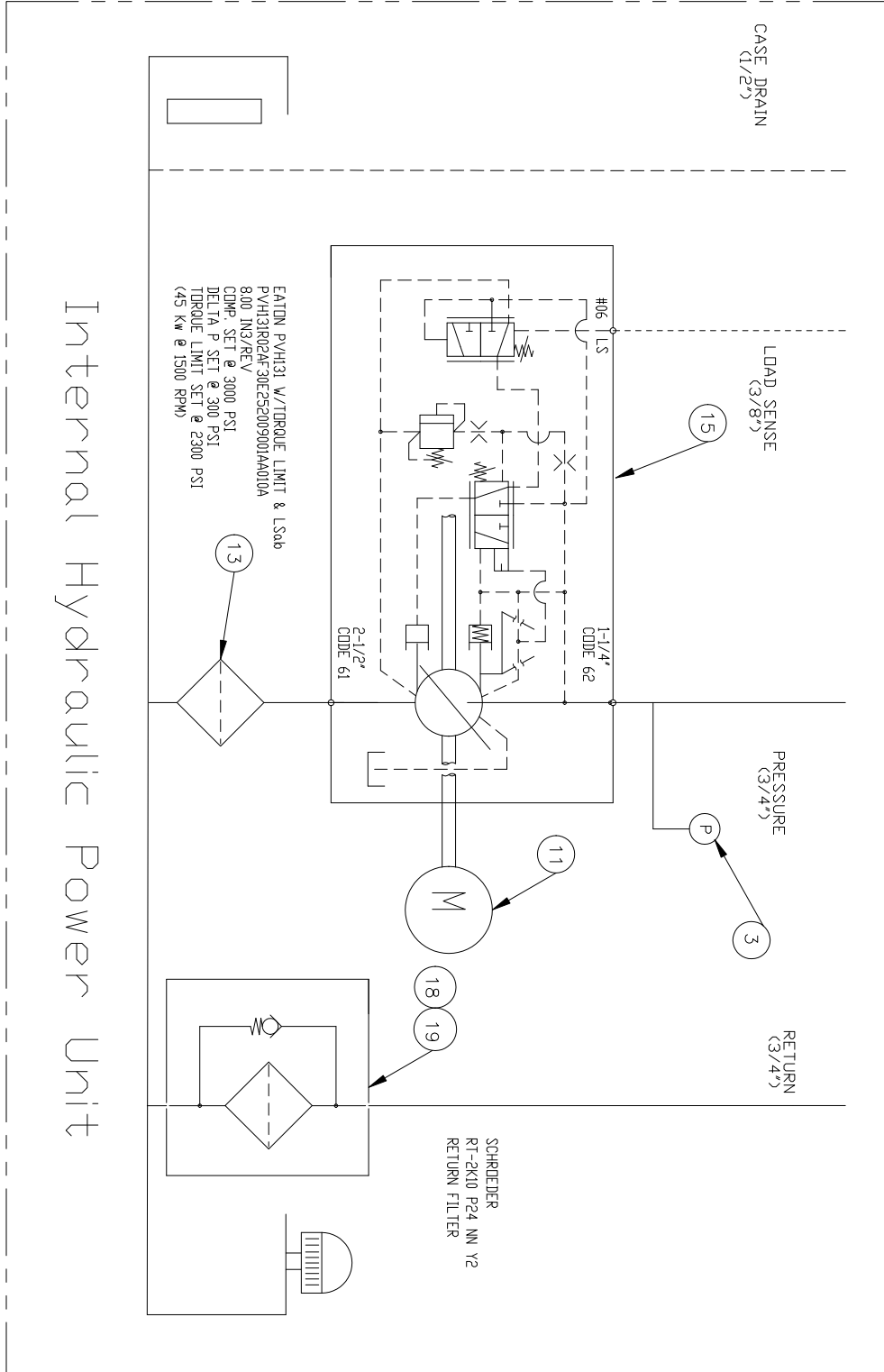


**Control Console  
Electrical Schematic**

# Electric Proportional Schematic

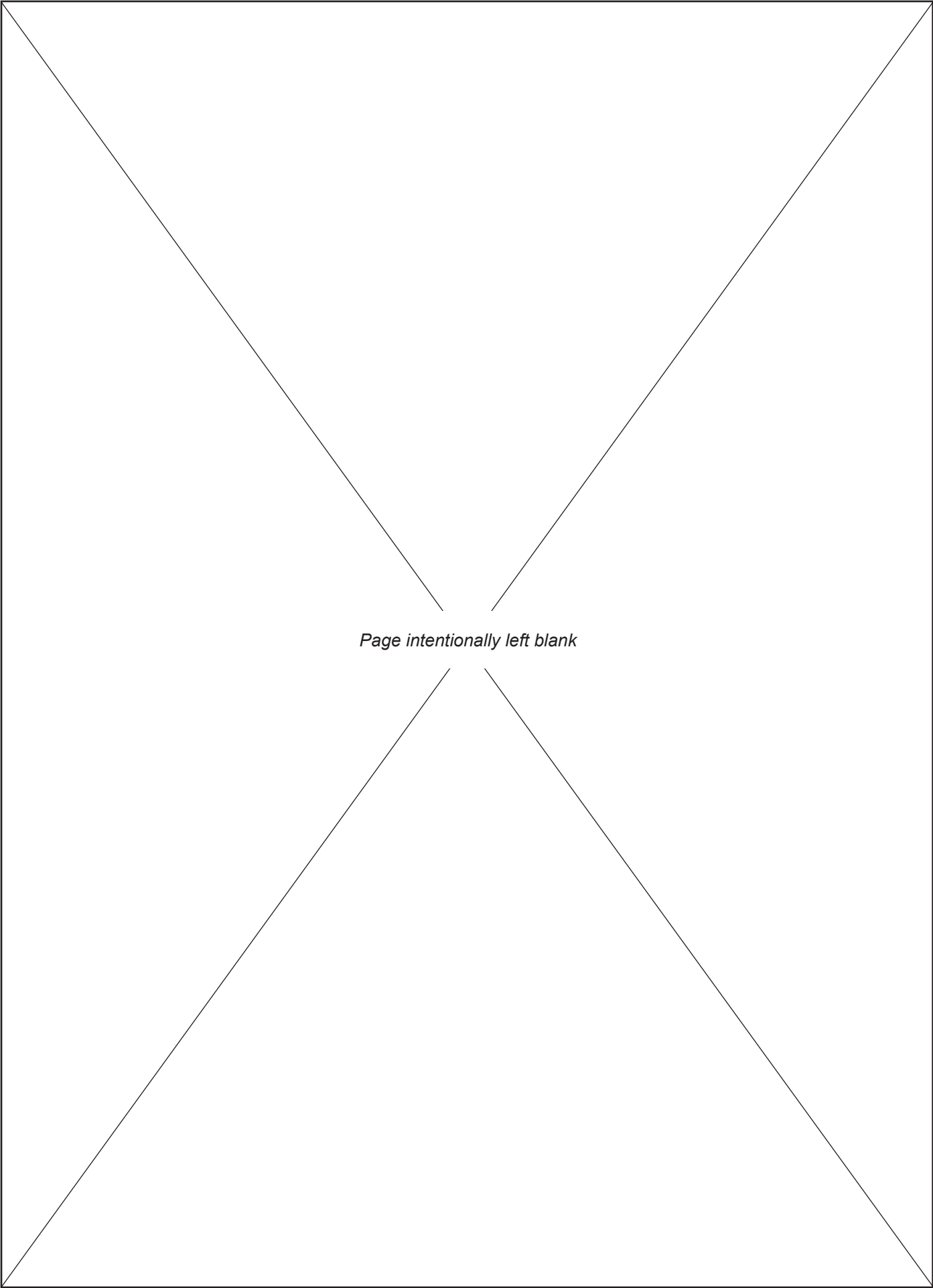


ITEM NO.	QTY.	DESCRIPTION	PART NUMBER	LOCATION
3	2	2-1/2" PRESSURE GAUGE, 0-3000	133-6500	CONSOLE/POWER UNIT
11	1	ELECTRIC MOTOR	121-6500	CONSOLE/POWER UNIT
13	1	SUCTION STRAINER	144-6500	CONSOLE/POWER UNIT
15	1	HYDRAULIC PUMP	145-6500	CONSOLE/POWER UNIT
18	1	FILTER HEAD	138-6500	CONSOLE/POWER UNIT
19	1	FILTER ELEMENT	139-6500	CONSOLE/POWER UNIT



Internal Hydraulic Power Unit

**Power Unit Hydraulic Schematic**

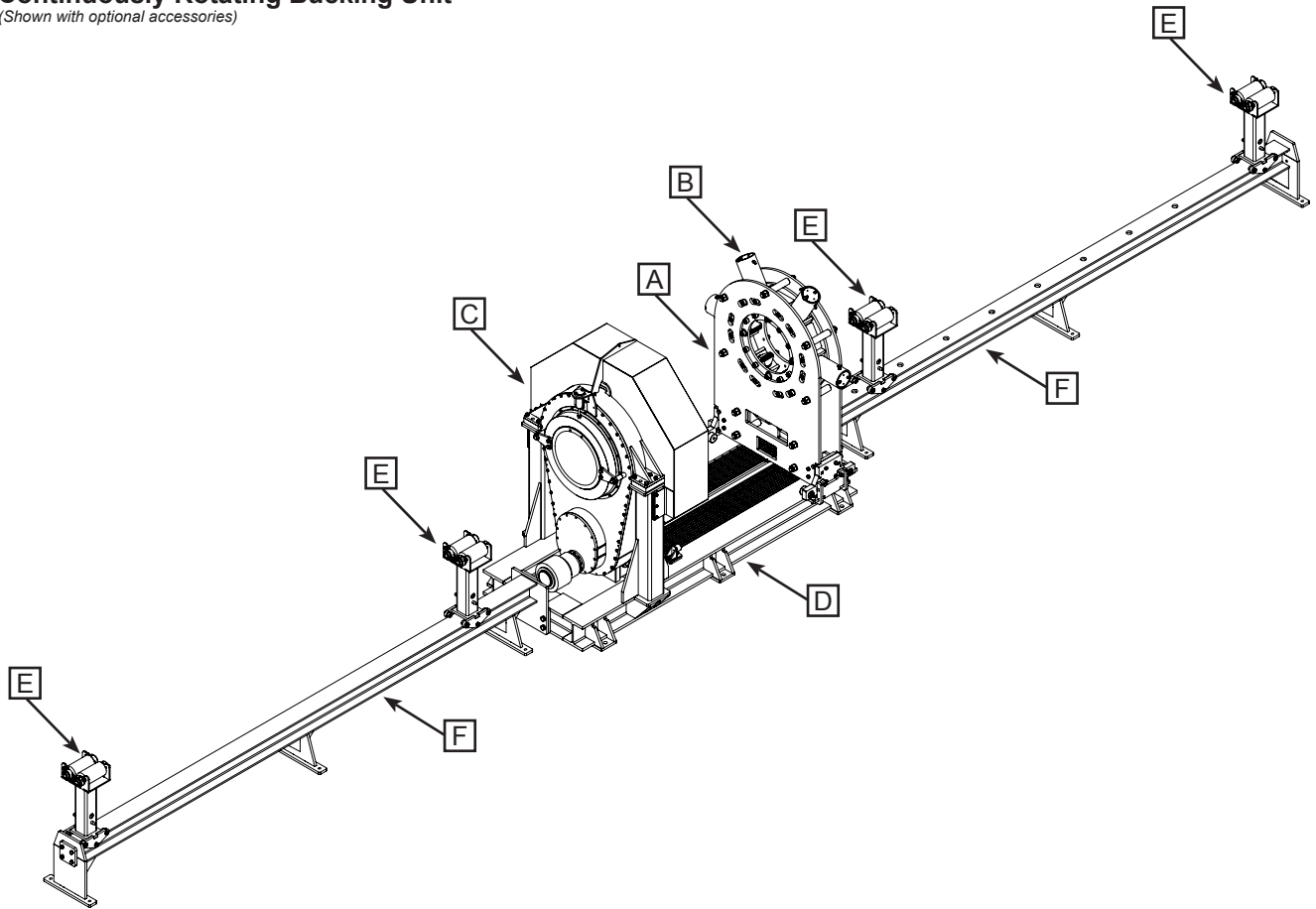


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# CLINCHER® RP7022

## Continuously Rotating Bucking Unit

(Shown with optional accessories)

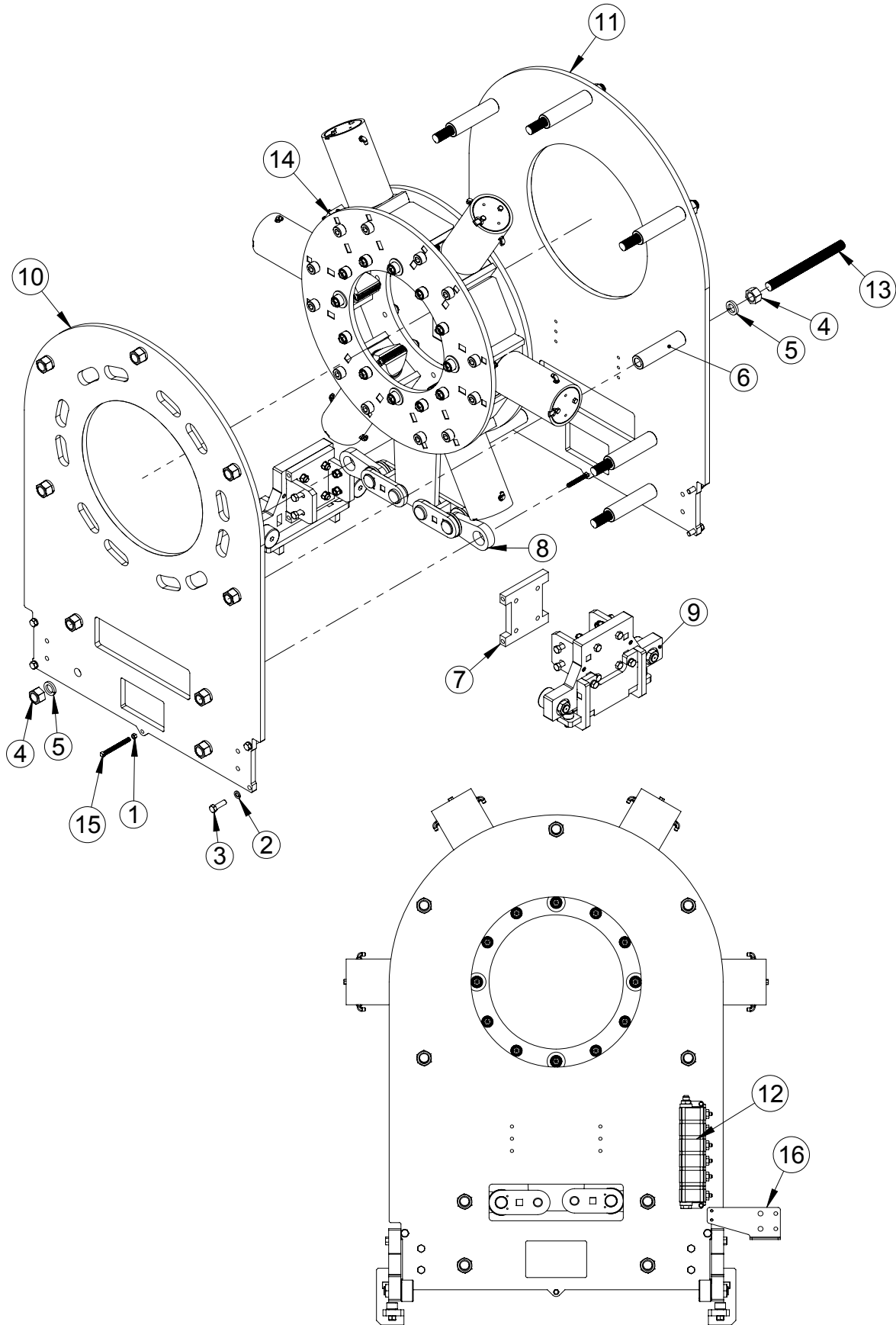


<b>A</b>	Tail Stock Assembly - - - - -	12
	Roller Assembly - - - - -	14
	Flow Divider Assembly - - - - -	16
	Tail Stock Vise Assembly - - - - -	17
	Bolt-on Support Assembly - - - - -	18
<b>B</b>	Clamp Cylinder Assembly - - - - -	20
<b>C</b>	Head Stock / Vise Assembly - - - - -	23
	Tong Assembly - - - - -	24
	Swivel Support Assembly - - - - -	26
	Swivel Keeper Assembly - - - - -	27
	Pinion Sprocket Assembly - - - - -	28
	Drive Gear Assembly - - - - -	30
	Vise/Hub Assembly - - - - -	32
	Rotating Head Guard Assembly - - - - -	33
<b>D</b>	12' Skid Assembly - - - - -	34
	Bed Extension Assembly - - - - -	36
	Push Pull Assembly - - - - -	37
<b>E</b>	Support Stand Assembly - - - - -	38
<b>F</b>	Extension Beam Assembly (various styles) - - - - -	39 - 41
	Control Console / Power Unit Assembly - - - - -	42

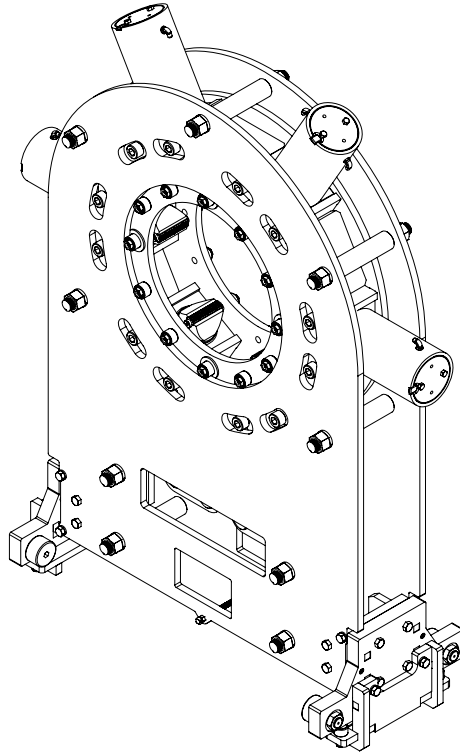
Notice: All drawings contained in this manual are the property of McCoy and are considered confidential. This information may not be used, disclosed, copied, or reproduced in any form, without the express written consent of McCoy.

For third party component documentation used within this unit, please contact McCoy.

**300-7000-22-01**  
**Tail Stock Assembly**

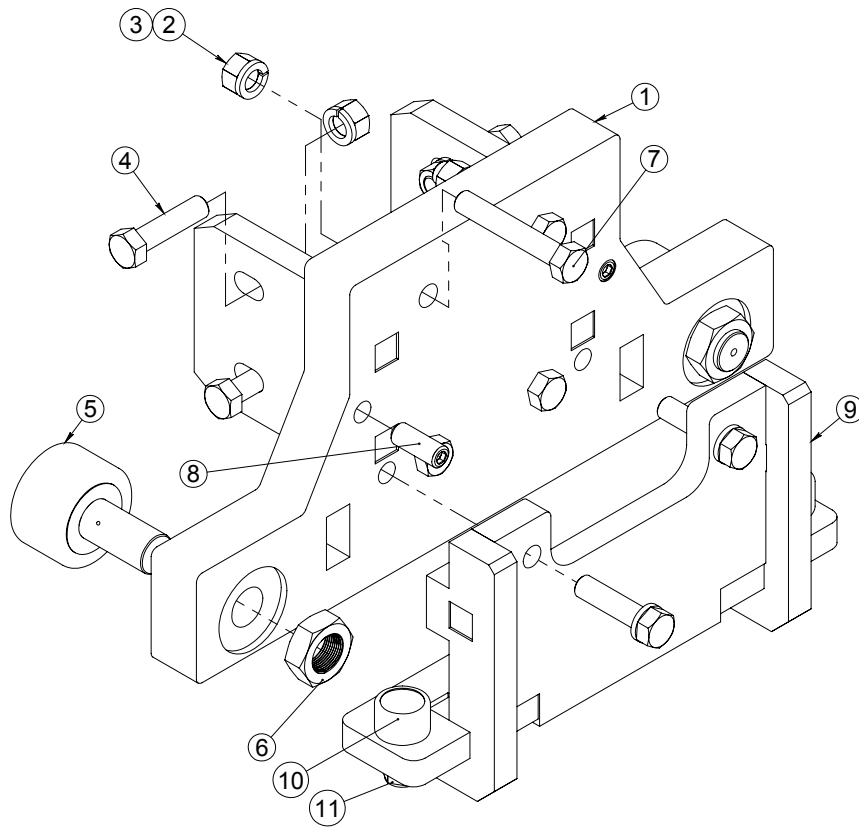


**300-7000-22-01**  
**Tail Stock Assembly**



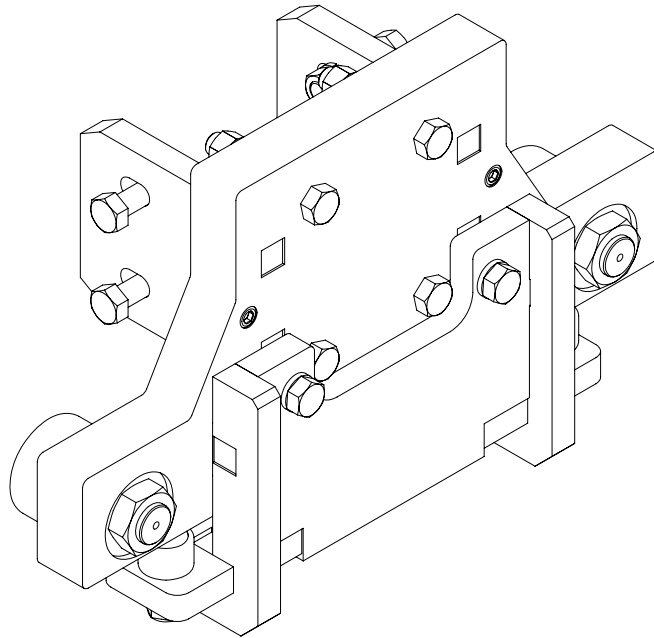
Item #	Qty.	Part Number	Part Name
1	4	1101	NUT, HEX, 1/2-13
2	8	1171	3/4" LOCKWASHER
3	8	1183	3/4"-10 x 2 1/2 HHCS
4	18	1187	1 1/2-6 HEX NUT
5	18	1223	1 1/2" LOCKWASHER
6	9	300-7022-S3	TAILSTOCK SPACER
7	2	301-7012	SPACER PLATE, TAILSTOCK
8	2	309-7000-1	LOAD CELL BRACKET ASSEMBLY
9	2	310-7012	ROLLER ASSEMBLY
10	1	310B-7000-22	INNER TAILSTOCK HOUSING PLATE
11	1	310C-7000-22	OUTER TAILSTOCK HOUSING PLATE
12	1	330-3500	DELTA POWER 6 PORT FLOW DIVIDER
13	9	333-7000	1-1/2"-6 ALL THREAD ROD
14	1	351-7000-4	TAILSTOCK VISE ASSEMBLY
15	2	507A-3000	CHAIN ATTACHMENT
16	1	518-6000-01	BULKHEAD PLATE

**310-7012**  
**Roller Assembly**



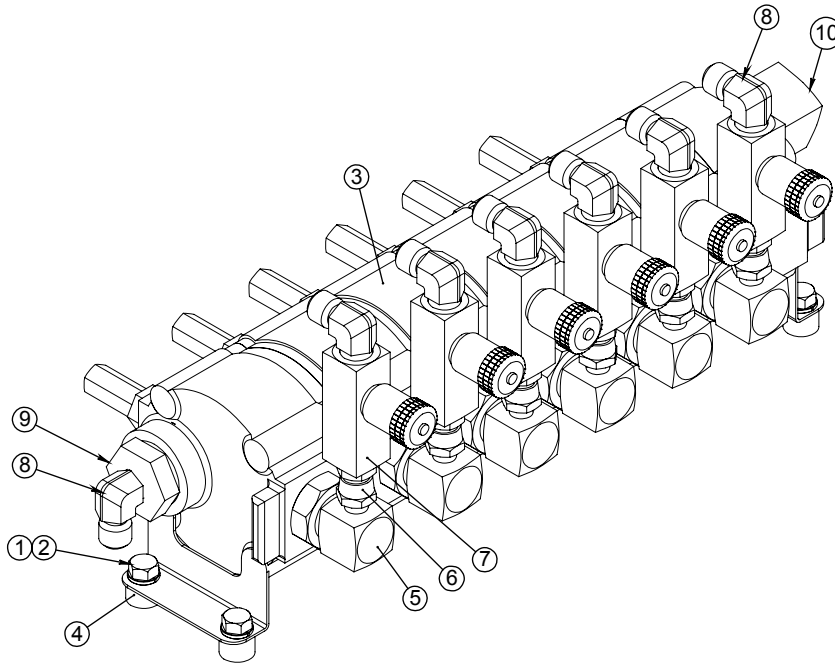


**310-7012**  
**Roller Assembly**



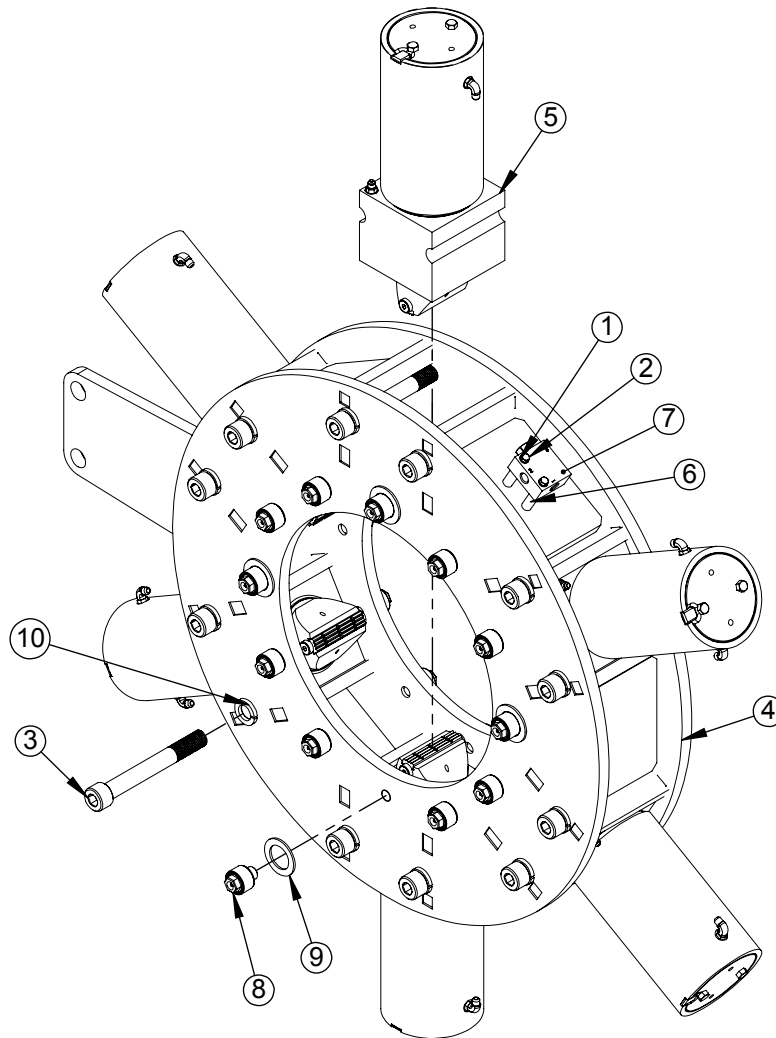
Item #	Qty.	Part Number	Part Name
1	1	370-7012	ROLLER WELDMENT
2	8	1176-A	3/4"-10 HEX NUT
3	10	1171	3/4" LOCKWASHER
4	6	1176	3/4"-10 X 3" HHCS
5	2	310I-7000	3 1/2" CAM FOLLOWER W/ 1 3/8" SHANK
6	2	1220	JAM NUT 1 3/8"-12
7	4	1202	3/4"-10 X 4 1/2" HHCS
8	2	284A	SET SCREW (3/4"-10)
9	1	320-7012	CLIP WELDMENT
10	2	310E-7000	1-3/4" CAM FOLLOWER
11	2	1167	3/4-10 NYLOCK HEX NUT

# 330-3500 Flow Divider Assembly



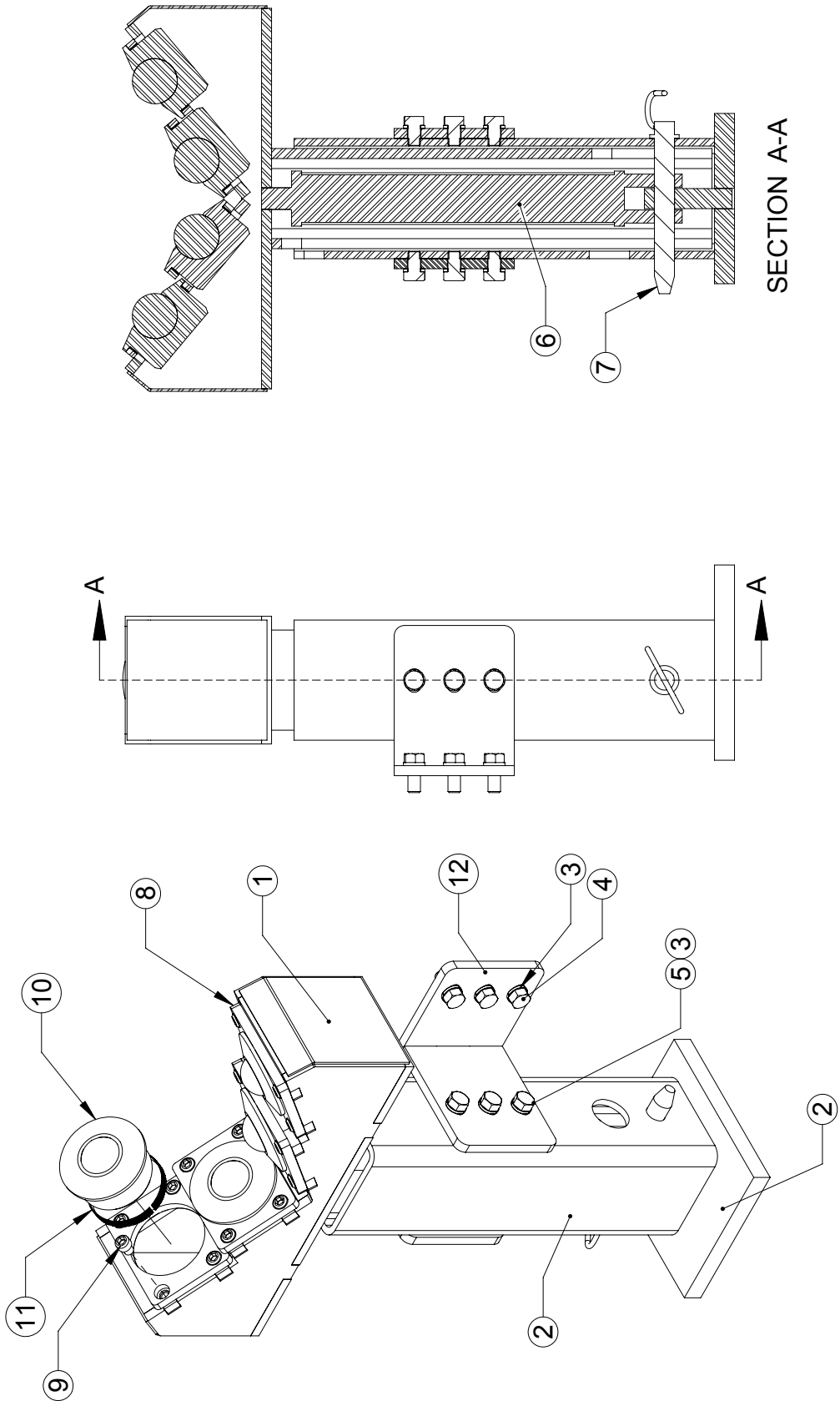
ITEM	QTY	P/N	DESCRIPTION
1	4	1027	LOCKWASHER 3/8" GR8
2	4	1046	HHCS 3/8"-16 X 3/4" GR8
3	1	RP14S3500-1001-S1	DELTA FLOW DIVIDER
4	4	BUC4085-S7	BUC4000 B/U VALVE LEG
5	6	6801-06-12	3/8" MJIC X 3/4" MORING X 90 DEGREE
6	6	6-6F6X-S	3/8 MNPT X 3/8 FJIC SWIVEL ADAPTER
7	6	1800	PARKER FLOW CONTROL F600S 3/8" MNPT
8	7	1577-A	3/8 MNPT X MJIC FORGED 90
9	1	6405-16-6-0	1"M-ORING BOSS X 3/8 FNPT
10	1	RP6801-NWO-08-16	1" MORB X 1/2" MJIC 90 DEG

**351-7000-4**  
**Tail Stock Vise Assembly**

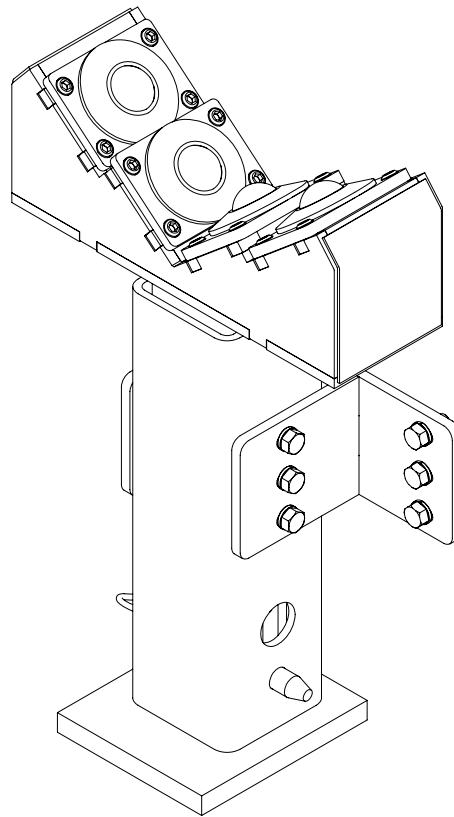


ITEM	QTY	P/N	DESCRIPTION
1	2	1027	LOCKWASHER 3/8" GR8
2	2	1050	HHCS 3/8"-16 X 2" GR8
3	12	1805-B	SHCS 1 1/4"-7 X 10" ALLOY GRADE
4	1	351-7022-01	TAILSTOCK VISE WELDMENT F/ RP7022
5	6	400-7000-2	CLAMP CYLINDER ASSEMBLY F/ 22"
6	2	73180	VALVE LEG, 2" LONG
7	1	BUC5524	PILOT OPER CHK VALVE Assy cartridge & steel body 5k wp
8	24	BUCS11825-02	CAM FOLLOWER ASSEMBLY
9	8	BUCS11836	SPACER THRUST BRONZE
10	12	1216	LOCKWASHER 1 1/4" ** GRADE 5 ONLY **

**1120-7000-01**  
**Bolt-on Support Assembly**

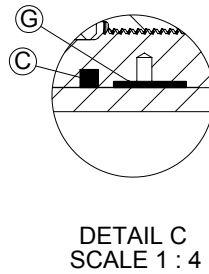
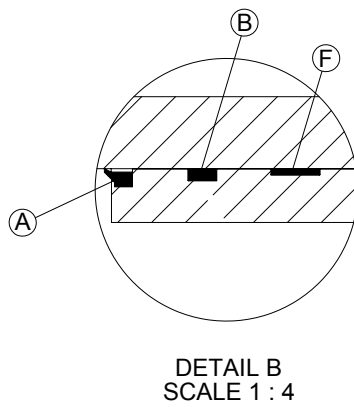
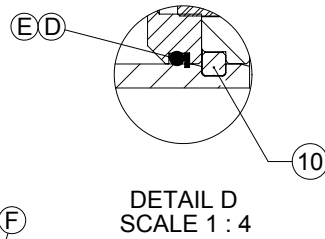
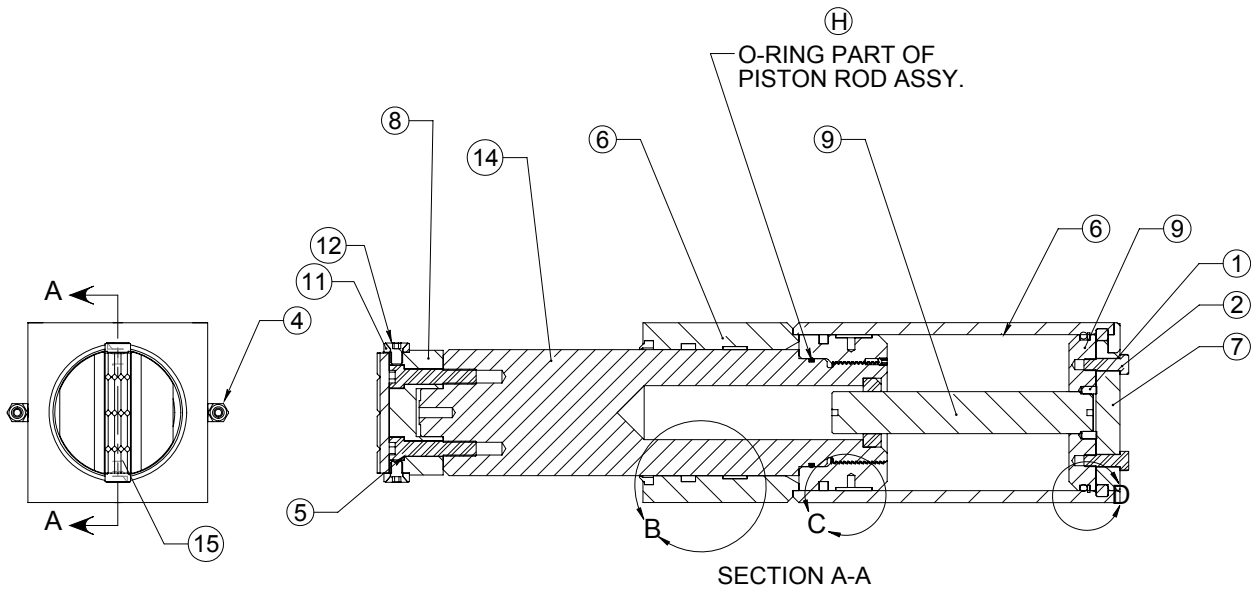


**1120-7000-01**  
**Bolt-on Support Assembly**

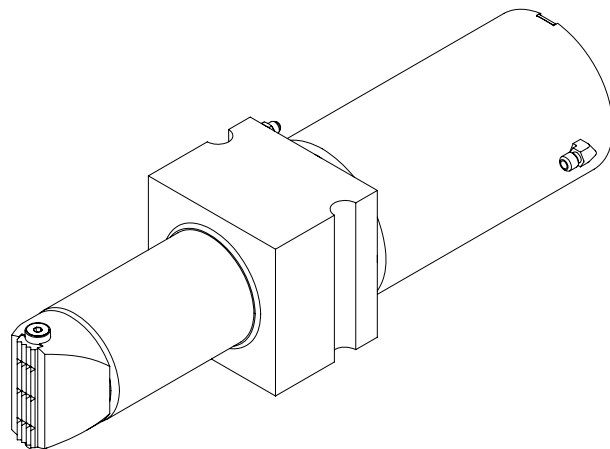


Item #	Qty.	Part Number	Part Name
1	1	1109-3000-02	WELDMENT TOP SECTION
2	1	1122-7000-01	WELDMENT SUPPORT LOWER
3	12	1151	5/8 LW
4	6	1157	5/8"-11 X 1 1/2" HHCS
5	6	196	HHCS 5/8"-11 X 1"
6	1	901D-7000-01	TIE ROD CYLINDER
7	1	902B-3000-1	1" X 7 3/4" HITCH PIN
8	4	903-3000-5	ROLLER MOUNTING PLATE
9	16	246A	1/2-13 x .625 SHCS
10	4	CB2008	HEAVY DUTY BALL TRANSFER UNIT
11	4	CB2011	FIXING CLIP FOR BALL TRANSFER UNIT
12	2	1115-3000	BRACKET MOUNTING

**400-7000-2**  
**Clamp Cylinder Assembly**



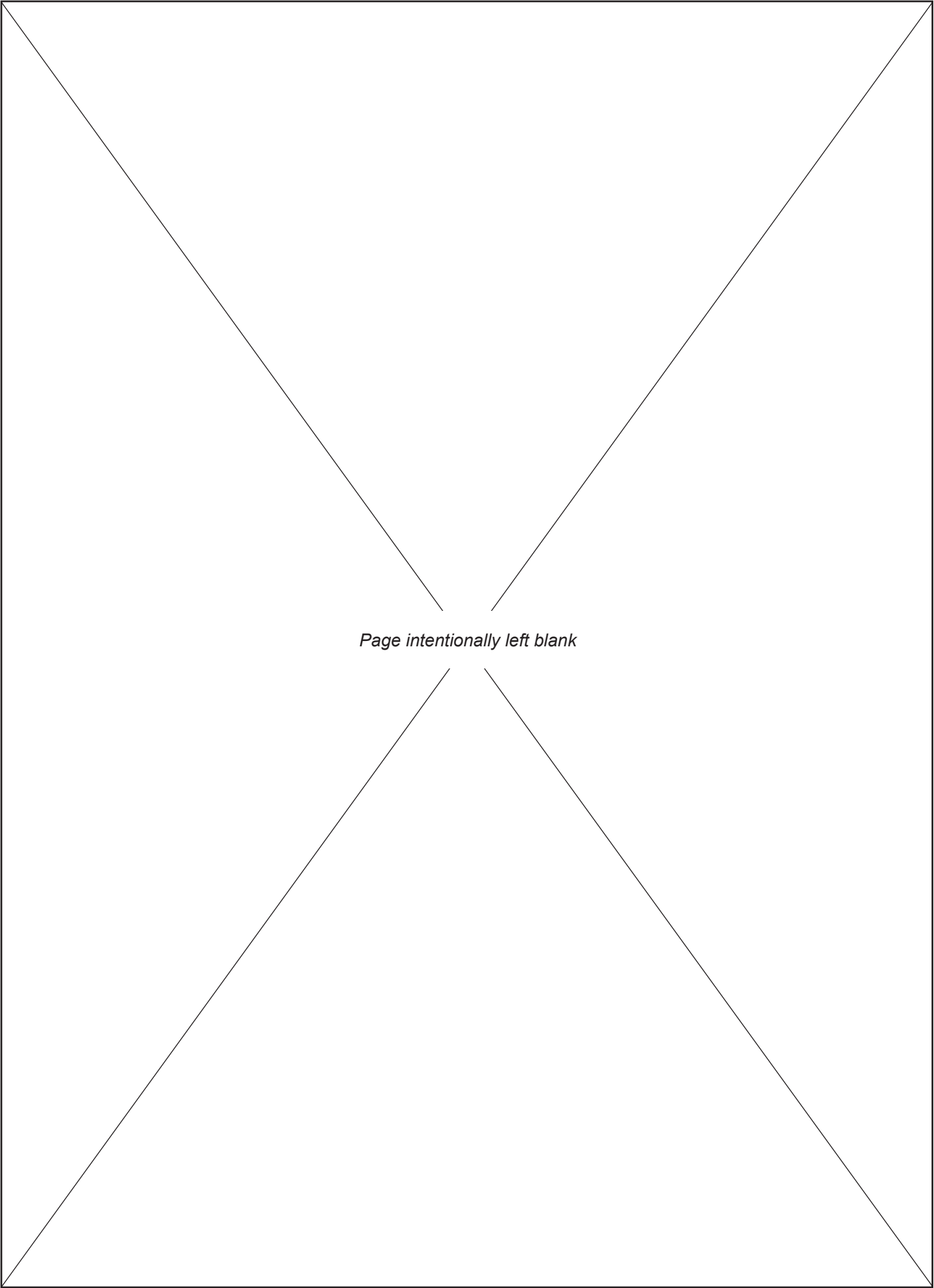
**400-7000-2**  
**Clamp Cylinder Assembly**



Item #	Qty.	Part Number	Part Name
1	2	1023-N	5/16" X 5/8" DOWEL PIN
2	2	1112	1/2"-13 x 1 1/2" HHCS
3	1	1570	3/8" MNPT X 3/8" MJIC STRAIGHT
4	2	1577-A	90 3/8" MNPT X 3/8" MJIC
5	2	260	5/8-11 x 2 SHCS
6	1	400-7000	CYLINDER BLOCK HOUSING WELDMENT F/ 22"
7	1	401-3000-1	END PLATE WELDMENDT
8	1	402-3000	STANDARD JAW HOLDER
9	1	404-7000	SEAL PLATE WELDMENT
10	1	405-3000	SPLIT RING
11	2	408-3000	3/8" WASHER
12	2	91253B	SHCS Flat 1/2"-13 x 7/8"
13	1	400C-3000	SEALS KIT
14	1	403-7000-2	PISTON/ROD ASSEMBLY
15	1	DTI1602	DOVETAIL STRIP DIE (1 1/4" x 1/2" x 5")

**400C-3000 SEALS KIT**

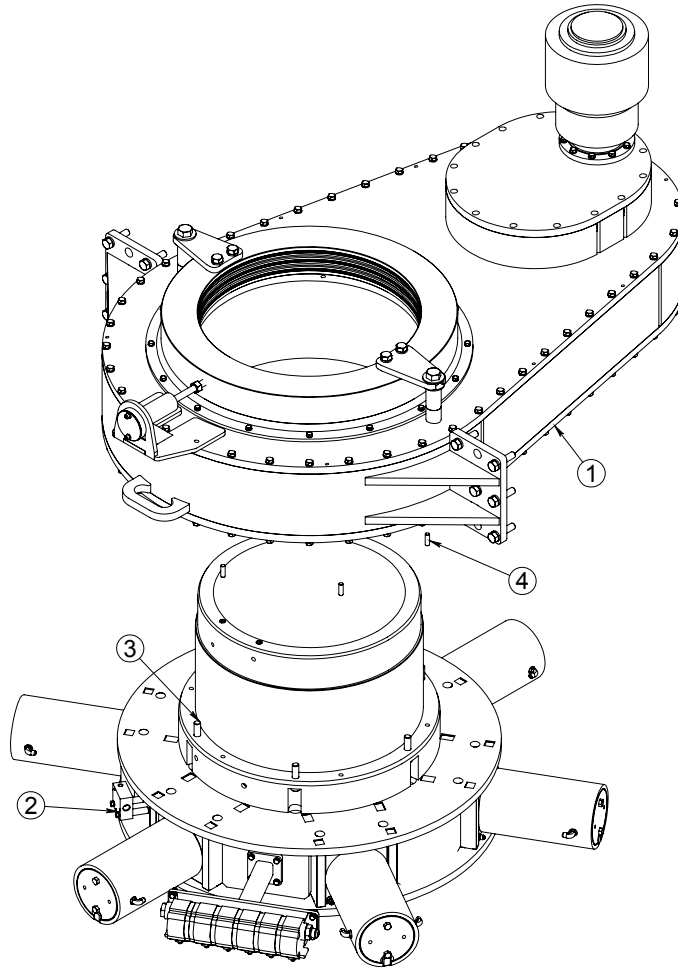
Item	Qty.	Part Number	Part Name
A	1	D5250	ROD WIPER
B	1	25005250-562	POLYPACK
C	1	PS1800-104	PISTON SEAL
D	1	2-437	6" ID O-RING
E	1	8-437	BACK UP RING
F	1	W55001000	5 1/2" OD WEARBAND
G	1	W65001500	6 1/2" OD WEARBAND
H	1	2-345	4" ID O-RING



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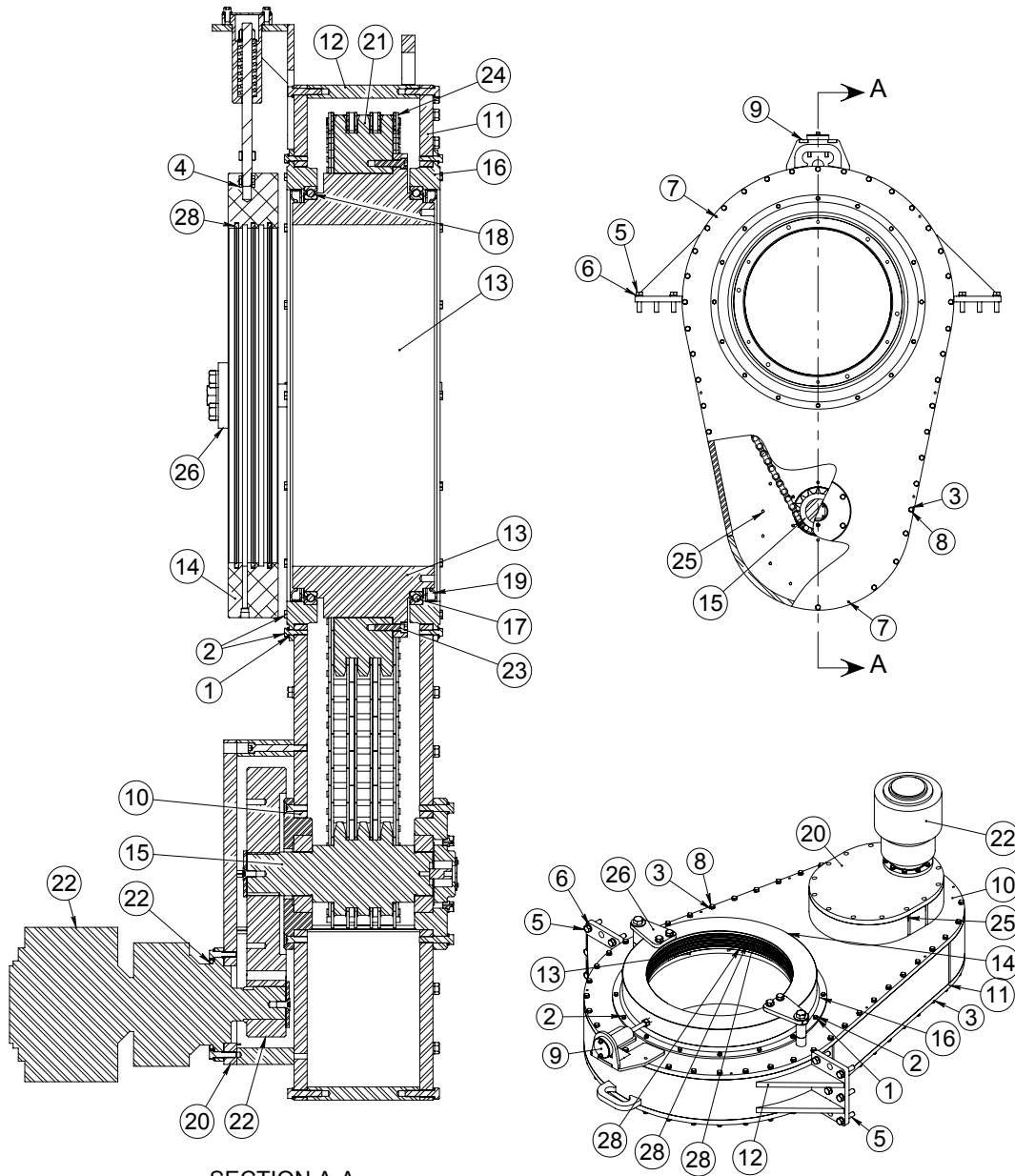


**200-7000-22A**  
**Head Stock / Vise Assembly**



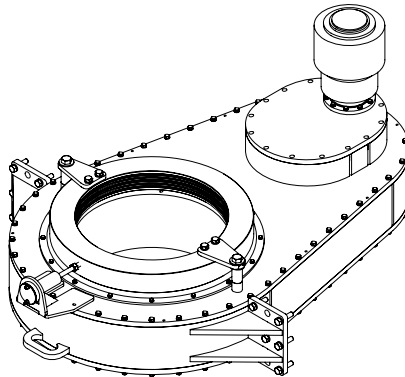
Item #	Qty.	Part Number	Part Name
1	1	200-7000-22	22" TONG ASSEMBLY
2	1	260-7000-22	WISE/HUB ASSEMBLY
3	6	1325	3/4-10 x 2 3/4 SHCS
4	6	83669	1/2" X 1 1/2" DOWEL P

**200-7000-22**  
**Tong Assembly**



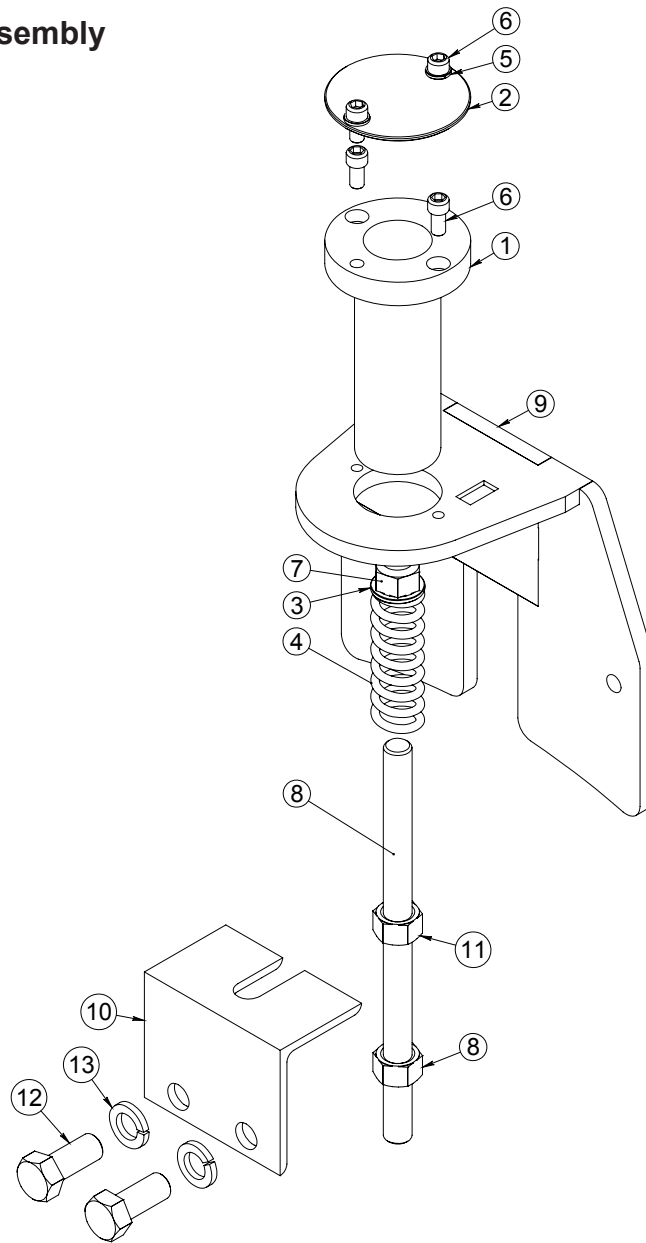
SECTION A-A  
 SCALE 1 : 14

**200-7000-22**  
**Tong Assembly**



Item #	Qty.	Part Number	Part Name
1	32	1027	WASHER, LOCK 3/8"
2	32	1049	3/8"-16 X 1 1/2" HHCS
3	80	1103	1/2" LOCKWASHER
4	1	1176-A	3/4" GR. 8 NUT
5	12	1176	3/4"-10 X 3" HHCS
6	12	1171	3/4" LOCKWASHER
7	16	1309	DOWELL PIN 3/8" x 1-1/4"
8	80	173	1/2"-13 x 2 1/4" HHCS
9	1	2000-7000-22	SWIVEL SUPPORT ASSEMBLY
10	1	200B-7000	TOP TONG PLATE
11	1	200C-7000	BOTTOM TONG PLATE
12	1	200D-7000-22	TONG CASE WELDMENT
13	1	202-7000-22	22" FINAL DRIVE
14	1	204-7000-22	HYDRAULIC SWIVEL
15	1	207-7000-2	PINION SPROCKET ASSEMBLY
16	2	210-7000	HEADSTOCK BEARING CAP
17	1	210A-7000	30" FOUR CONTACT THIN SECTION BEARING
18	1	210B-7000	30" RADIAL CONTACT THIN SECTION BEARING
19	2	210C-7000	GARLOCK OIL SEAL (21238-4352)
20	1	211B-7000	MOTOR MOUNT WELDMENT
21	1	212-7000	BULL GEAR SPROCKET
22	1	235-7000-1	DRIVE GEAR ASSEMBLY
23	6	249	1/2"-13 X 2" SHCS
24	1	247-7000	COTTERED CHAIN W/ CONNECTING LINK, 20 FEET
25	13	253	SHCS 1/2"-13 x 4"
26	2	2700-7000	SWIVEL KEEPER ASSY.
27	6	83669	1/2" X 1 1/2" DOWEL PIN
28	3	CB2221	SWIVEL SEAL

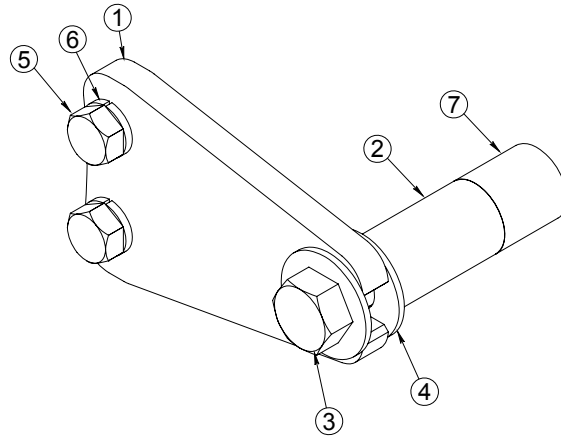
**2000-7000-22**  
**Swivel Support Assembly**



Item #	Qty.	Part Number	Part Name
1	1	CB2322	SPRING TUBE
2	1	CB2323	SPRING COVER
3	1	CB2324	SPRING WASHER
4	1	CB2326	COMPRESSION SPRING
5	2	1027	WASHER, LOCK 3/8"
6	4	1040-A	3/8-16 x 3/4 SHCS
7	1	1167	3/4-10 NYLOCK HEX NUT
8	1	CB2325-03	THREADED LIFTING ROD WELDMENT
9	1	2001-7000-22	SWIVEL SUPPORT WELDMENT
* 10	1	2002-7000-22	SWIVEL SUPPORT BRACKET
11	1	1176-A	3/4" GR. 8 NUT
* 12	2	1173	3/4"-10 x 1 3/4" HHCS
* 13	2	1171	3/4" LOCKWASHER

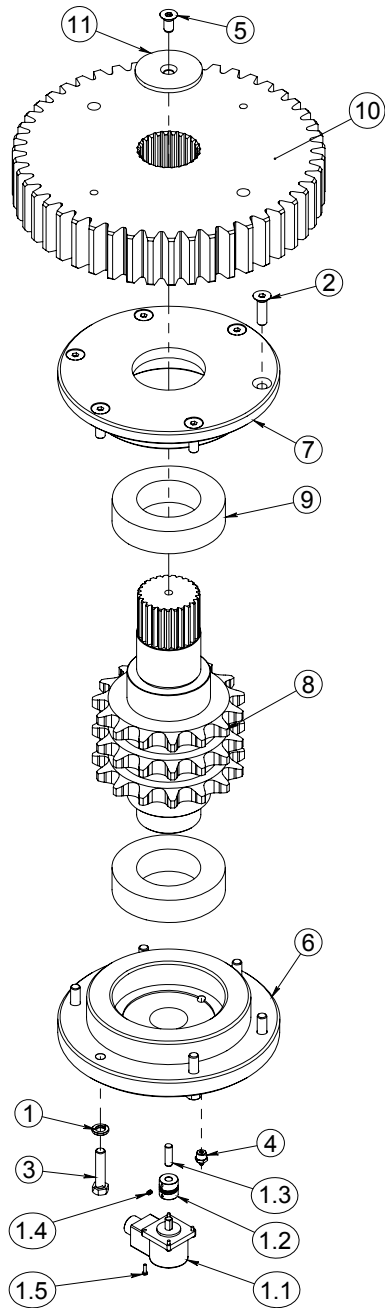
\* OPTIONAL

**2700-7000**  
**Swivel Keeper Assembly**

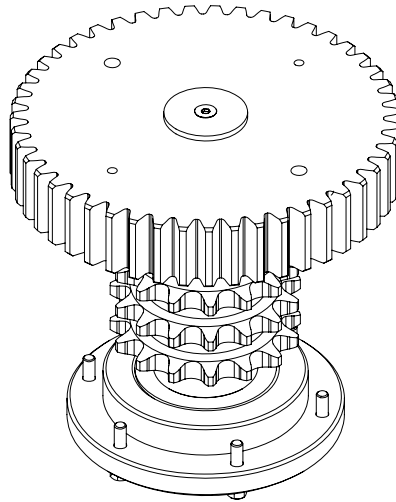


Item #	Qty.	Part Number	Part Name
1	1	2701-7000	BOLT-ON SWIVEL KEEPER
2	1	2702-7000	SWIVEL SPACER TUBE
3	1	74073	1"-8 X 6" HHCS
4	2	1249	1" FLAT WASHER
5	2	1173	3/4"-10 x 1 3/4" HHCS
6	2	1171	3/4" LOCKWASHER
7	1	2753A-7000	ANCHOR FOR SWIVEL KEEPER ASSY.

# 207-7000-1 Pinion Sprocket Assembly



**207-7000-1  
Pinion Sprocket Assembly**

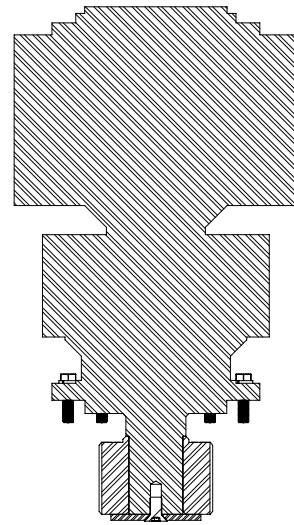
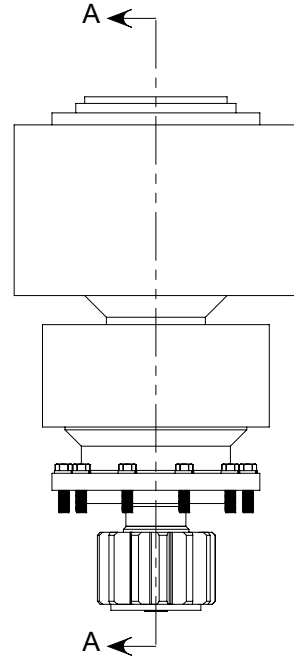
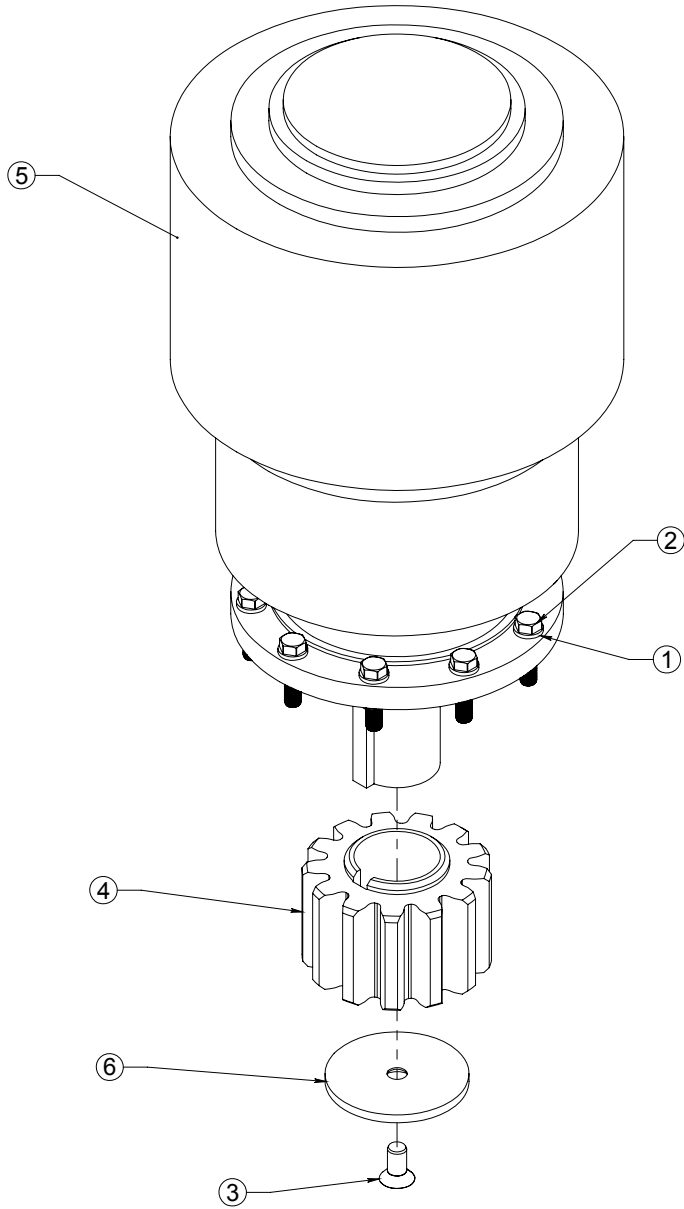


Item #	Qty.	Part Number	Part Name
1	6	1103	1/2" LOCKWASHER
2	6	1132-B	SCHCS 1/2"-13 X 1 3/4"
3	6	173	1/2"-13 x 2 1/4" HHCS
4	2	1771	1/4" NPT GREASE ZERT
5	1	1772	SHCS Flat 1/2"-13 x 1"
6	1	206A-7000	HEADSTOCK BEARING CAP
7	1	208-7000	HEADSTOCK TOP BEARING CAP
8	1	209-7000	PINION SPROCKET
9	2	209-7000-1	PINION SPROCKET BEARING
10	1	209B-7000	HIGH PINION GEAR
11	1	507D-7000	DRIVE GEAR RETAINER

**ENCODER ASSEMBLY**

1.1	1	ENCODER_H20D	ENCODER
1.2	1	ES100	ENCODER COUPLING
1.3	1	1309	DOWELL PIN 3/8" x 1-1/4"
1.4	2	2101	#10-24 SET SCREW
1.5	4	1276-B	#6-32 X 3/8" MACHINE SCREW

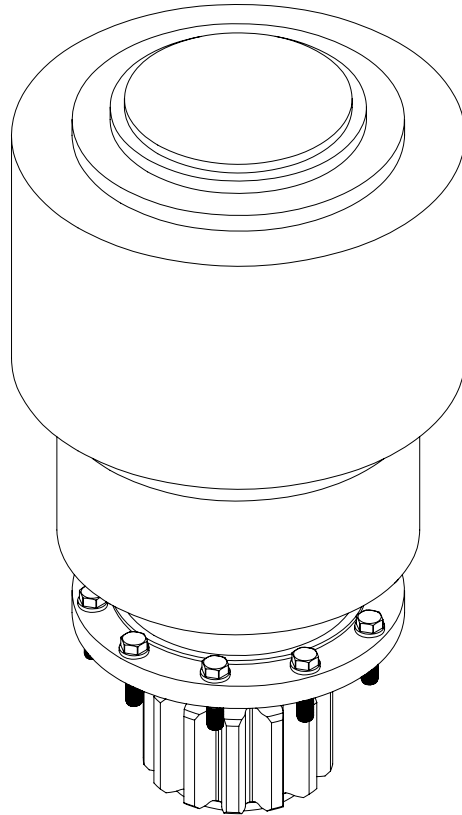
**235-7000-1**  
**Drive Gear Assembly**



SECTION A-A  
SCALE 1 : 8

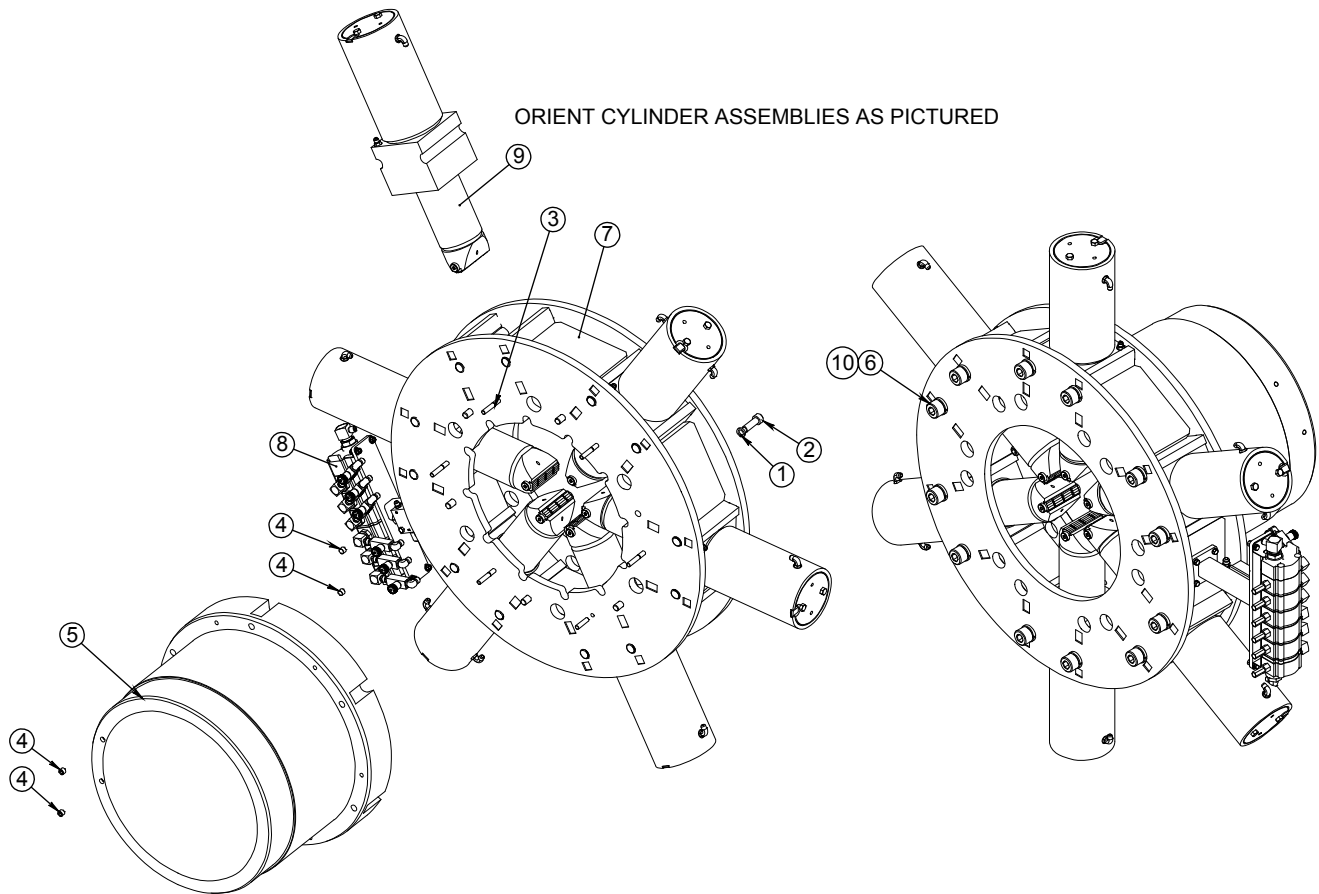


**235-7000-1**  
**Drive Gear Assembly**



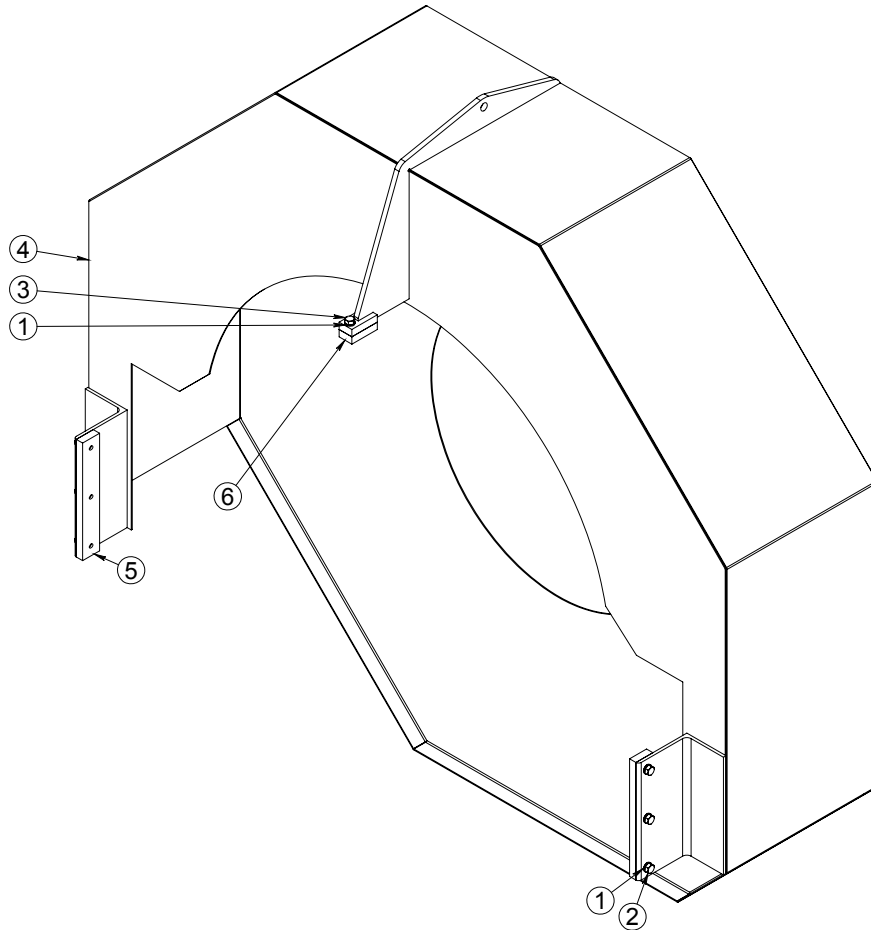
Item #	Qty.	Part Number	Part Name
1	10	1081	7/16" LOCKWASHER
2	10	1085-A	HHCS 7/16"-20
3	1	1132-C	SHCS Flat 1/2"-20 x 1"
4	1	209C-7000	MOTOR DRIVE GEAR
5	1	235-7000	HYDRAULIC MOTOR
6	1	507D-7000	DRIVE GEAR RETAINER

**260-7000-22**  
**Vise/Hub Assembly**



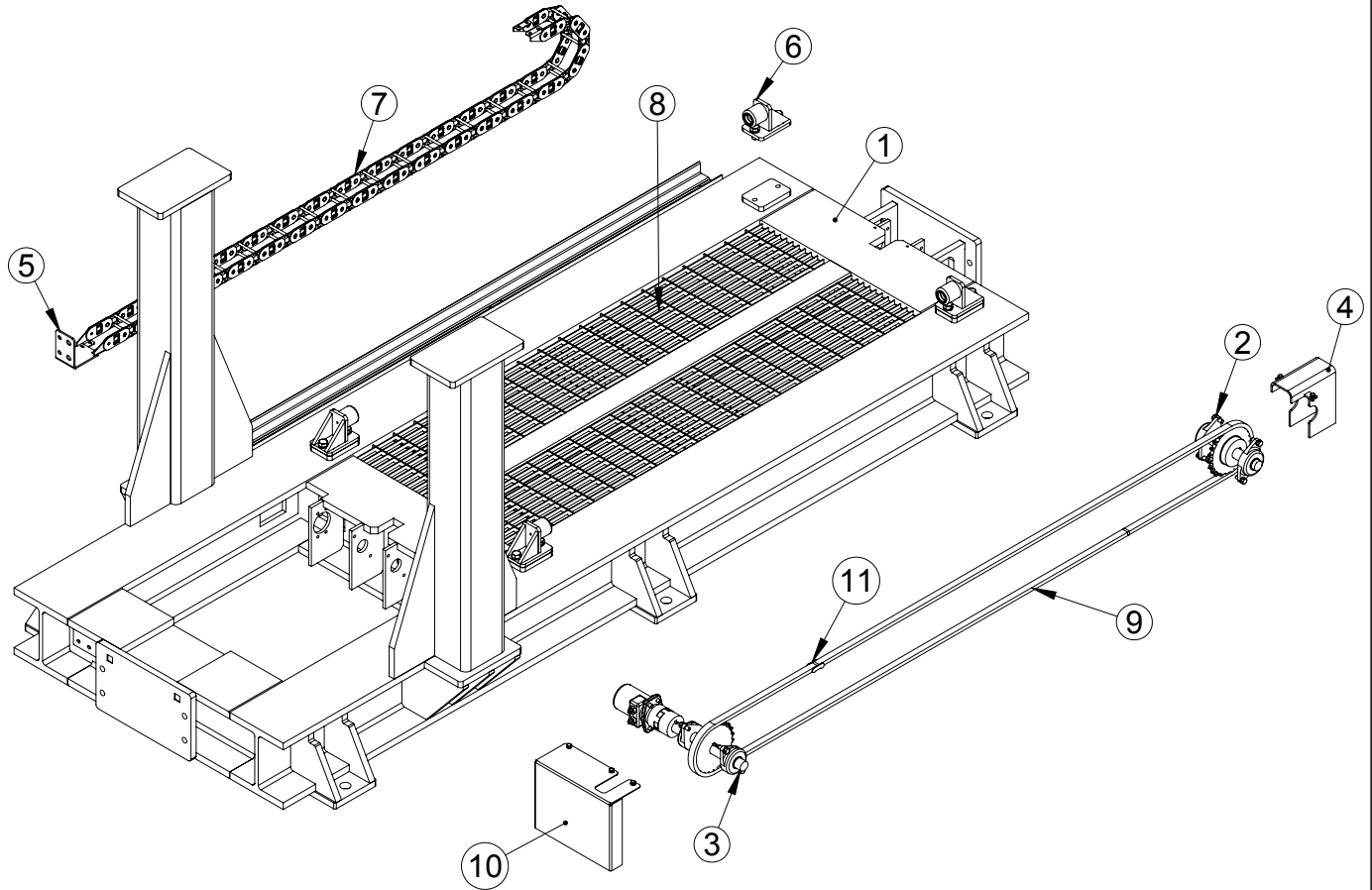
ITEM	QTY.	P/N	DESCRIPTION
1	6	1170-A	HI COLLAR LOCKWASHER 3/4" ALLOY GRADE
2	6	1277	SHCS 3/4"-10 X 2 1/4" GR8
3	12	1333	DOWEL PIN 1/2" X 2"
4	4	1609	3/8" NPT PLUG
5	1	203-7000-22	22" HEADSTOCK INNER MANIFOLD
6	12	1805-B	SHCS 1 1/4"-7 X 10" ALLOY GRADE
7	1	240-7000-22	HEADSTOCK VISE WELDMENT
8	1	253-7000-1	FLOW DIVIDER MOUNT ASSEMBLY
9	6	400-7000-2	CLAMP CYLINDER ASSEMBLY
10	12	1216	LOCKWASHER 1 1/4" ** GRADE 5 ONLY **

**3000-7000**  
**Rotating Head Guard Assembly**

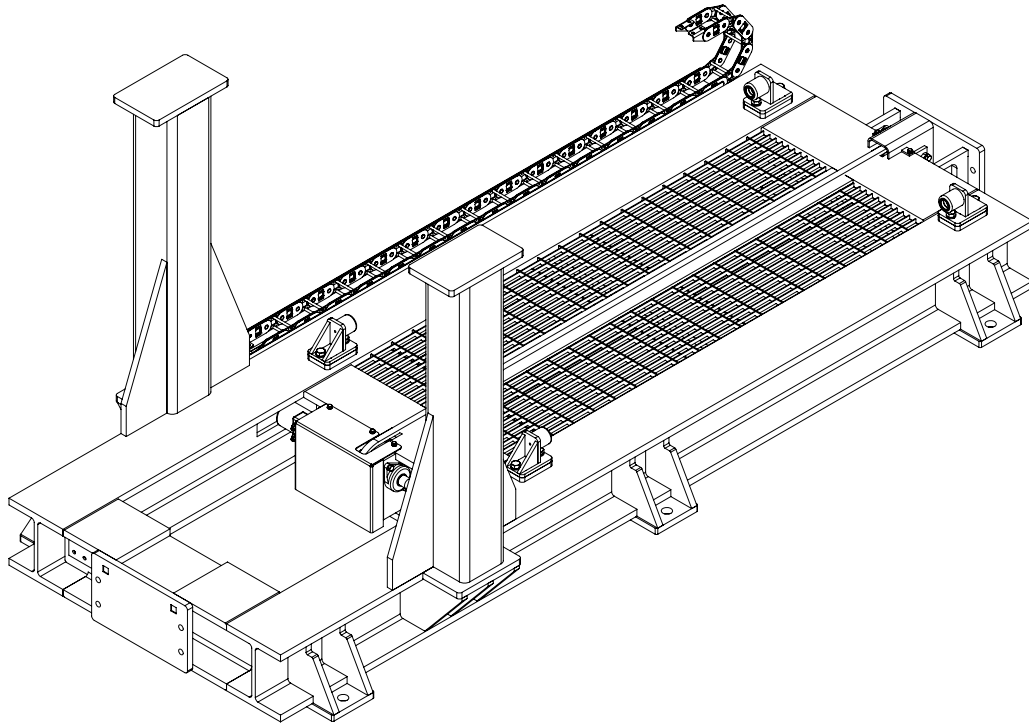


Item #	Qty.	Part Number	Part Name
1	7	1103	1/2" LOCKWASHER
2	6	1110	1/2"-13 x 1" HHCS
3	1	1112	1/2"-13 x 1 1/2" HHCS
4	1	3100-7000	ROTATING HEAD GUARD WELDMENT
5	2	3109-7000	MOUNT PLATE
6	1	3115-7000	MOUNT TAB

**500-7022-12**  
**12' Skid Assembly**

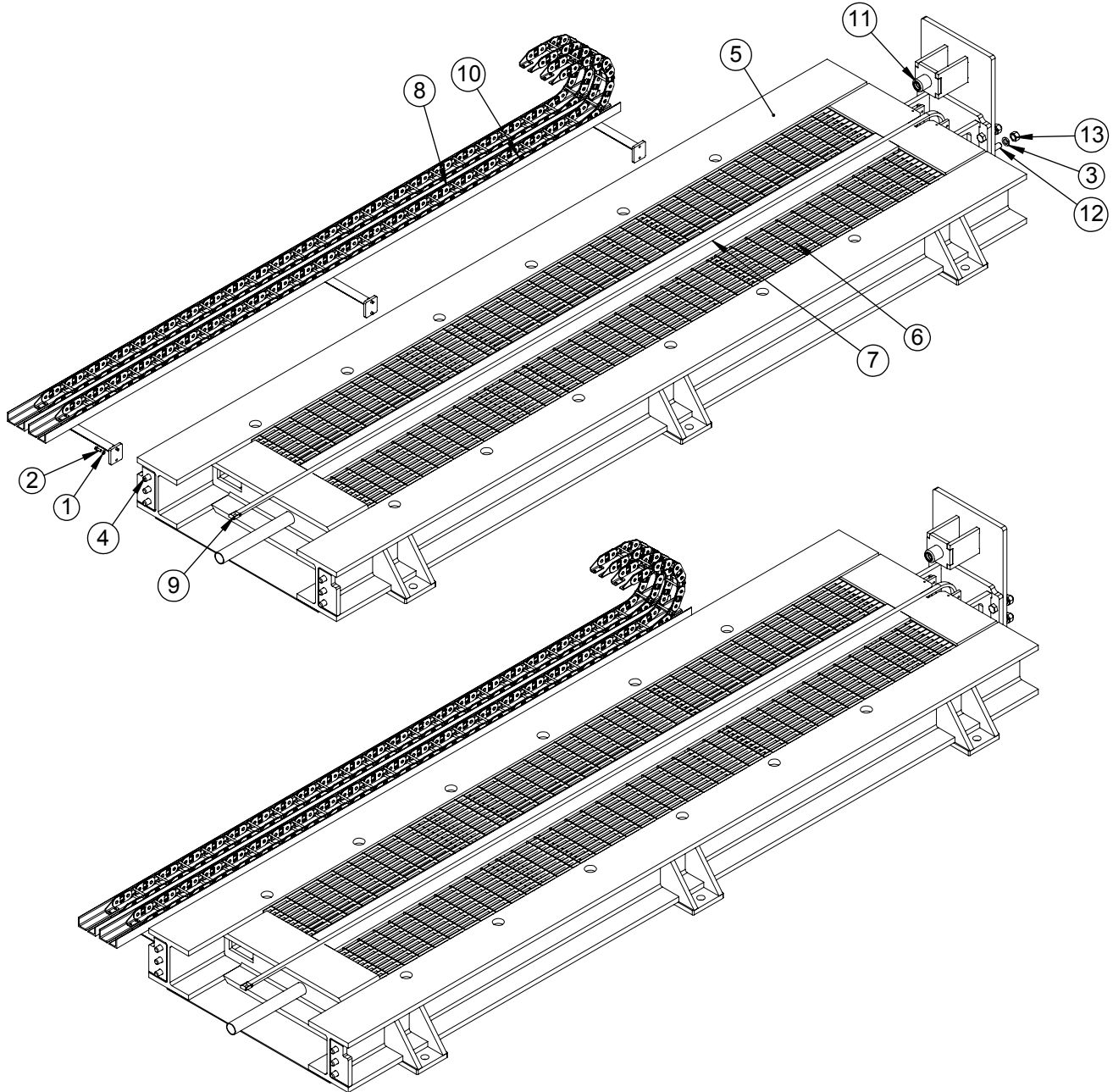


**500-7022-12**  
**12' Skid Assembly**



Item #	Qty.	Part Number	Part Name
1	1	500A-7022-12	12' SKID WELDMENT F/ 22" BORE BREAKOUT UNIT
2	1	508-3000-1	IDLER SPROCKET ASSEMBLY
3	1	509-3000-1	DRIVE SPROCKET ASSEMBLY
4	1	515-7000-1	SPROCKET COVER ASSEMBLY
5	1	522-6000	FIXED BULKHEAD PLATE
6	4	540-3000	BUMPER STOP ASSEMBLY
7	1	550C-3000-02	HOSE CARRIER
8	2	552A-7000-02	78-3/4" x 13-5/8" x 1" GRATING
9	2	556-7000	10' TRAVEL CHAIN
10	1	571-7000-01	DRIVE SPROCKET COVER ASSEMBLY
11	1	80CL	MASTERLINK 80C/L

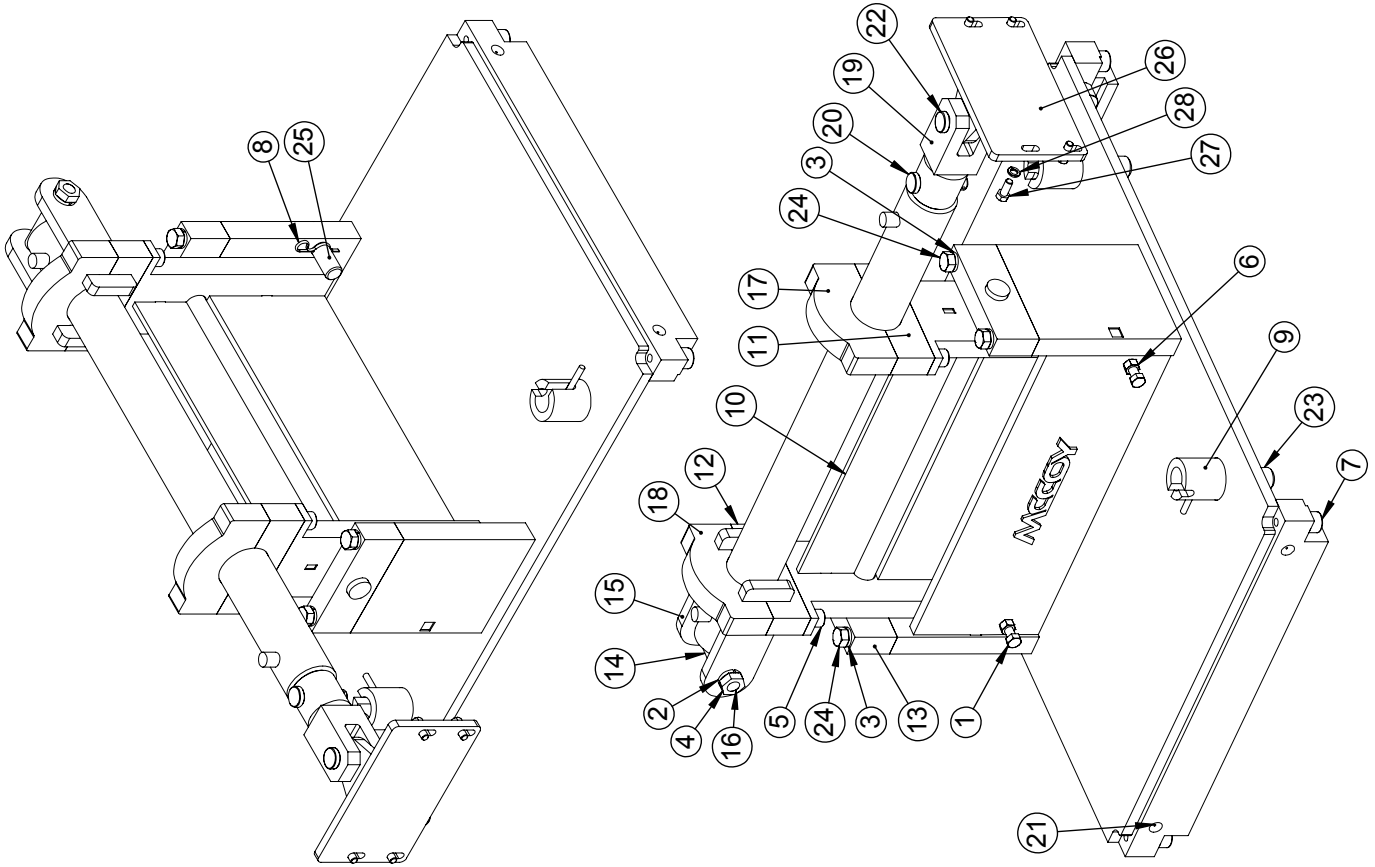
**500EX-7000-1**  
**Bed Extension Assembly**



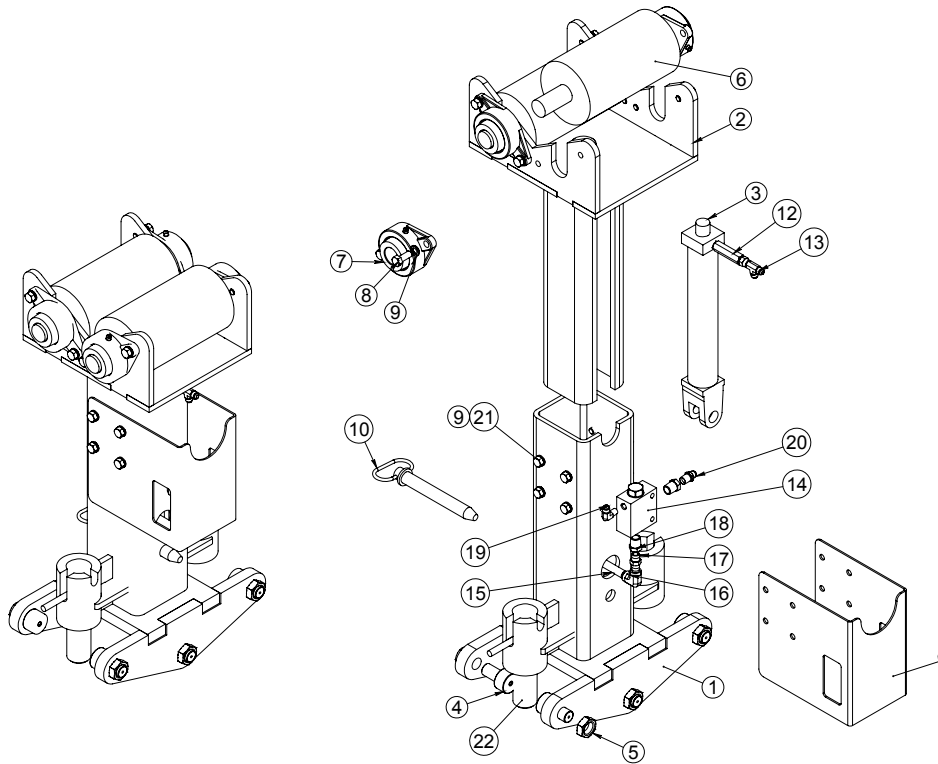
ITEM	QTY	P/N	DESCRIPTION
1	6	1027	LOCKWASHER 3/8" GR8
2	6	1047	HHCS 3/8"-16 X 1" GR8
3	10	1218	LOCKWASHER 1" GR8
4	6	1264	HHCS 1"-8 X 2 1/2" GR8
5	1	500EX-7000	BED EXTENSION WELDMENT
6	6	500EX-7000-S10	GRATING
7	1	500EX-7000-S12	TRAVEL CHAIN, EXTENSION 386" LONG 80-C
8	1	521-3000-3	HOSE RACK WELDMENT
9	2	527A-6500	TRAVEL CHAIN MASTER LINK SAME AS 80CL
10	2	550D-3000-06	20 FEET HEADSTOCK EXTENSION BEAM INNER HOSE TRACK
11	1	1001839	BUMPER STOP ASSEMBLY
12	4	1244	HHCS 1"-8 X 4 1/2"
13	4	1210	HEX NUT 1"-8 GR8

# 9000-7000-01 Push Pull Assembly

ITEM	QTY	P/N	DESCRIPTION
1	2	1176	HHCS 3/4"-10 X 3" GR8
2	2	1216	LOCKWASHER 1 1/4" ** GRADE 5 ONLY **
3	4	1218	LOCKWASHER 1" GR8
4	2	1268	JAM NUT 1 1/4"-7
5	4	1294	SHCS 1"-8 X 6 1/2" ALLOY GRADE
6	2	1176-A	3/4"-10 HEX NUT
7	4	310E-7000	1-3/4" CAM FOLLOWER McGill PCF 1-3/4"
8	1	6009	PIN, HAIRPIN COTTER 0.243" F/ 1 1/8" - 1 1/2" ROUND
9	1	9001-7000-01	LOWER SECTION WELDMENT
10	1	9002-7000	TOP SECTION WELDMENT F/ PUSH PULL MACHINE
11	1	9001A-4000	CYLINDER LOWER CLAMP PUZZLED
12	1	9001-4000	CYLINDER LOWER CLAMP (PUZZLED)
13	2	9041-7000	PUSH PULL PLATE#4
14	1	9071-7000	4" BORE HYDRAULIC CYLINDER 4" BORE X 48" STROKE
15	2	9004-4000	FISHEYE CYLINDER CLEVIS
16	1	9003-4000	1.25"-7 THREADED ROD
17	1	9002A-4000	CYLINDER UPPER CLAMP
18	1	9002-4000	CYLINDER UPPER CLAMP PUZZLED
19	1	609-7000-01	ROD CLEVIS WELDMENT
20	1	607A-6500	PUSH PULL COVER PIN
21	4	PM1000-6A	2 1/2" CAM FOLLOWER W/ 1 1/4" HEAVY STUD
22	1	611-7000-01	CLEVIS PIN, 1 3/8" X 4 1/2"
23	2	9112-7000-01	LOCKING PIN WELDMENT
24	4	74073	HHCS 1"-8 x 6" GR 8
25	1	9181-7000	TILT PIN
26	1	1001851	PAD EYE WELDMENT
27	4	1157	HHCS 5/8"-11 X 1 1/2" GR8
28	4	1151	LOCKWASHER 5/8" GR8



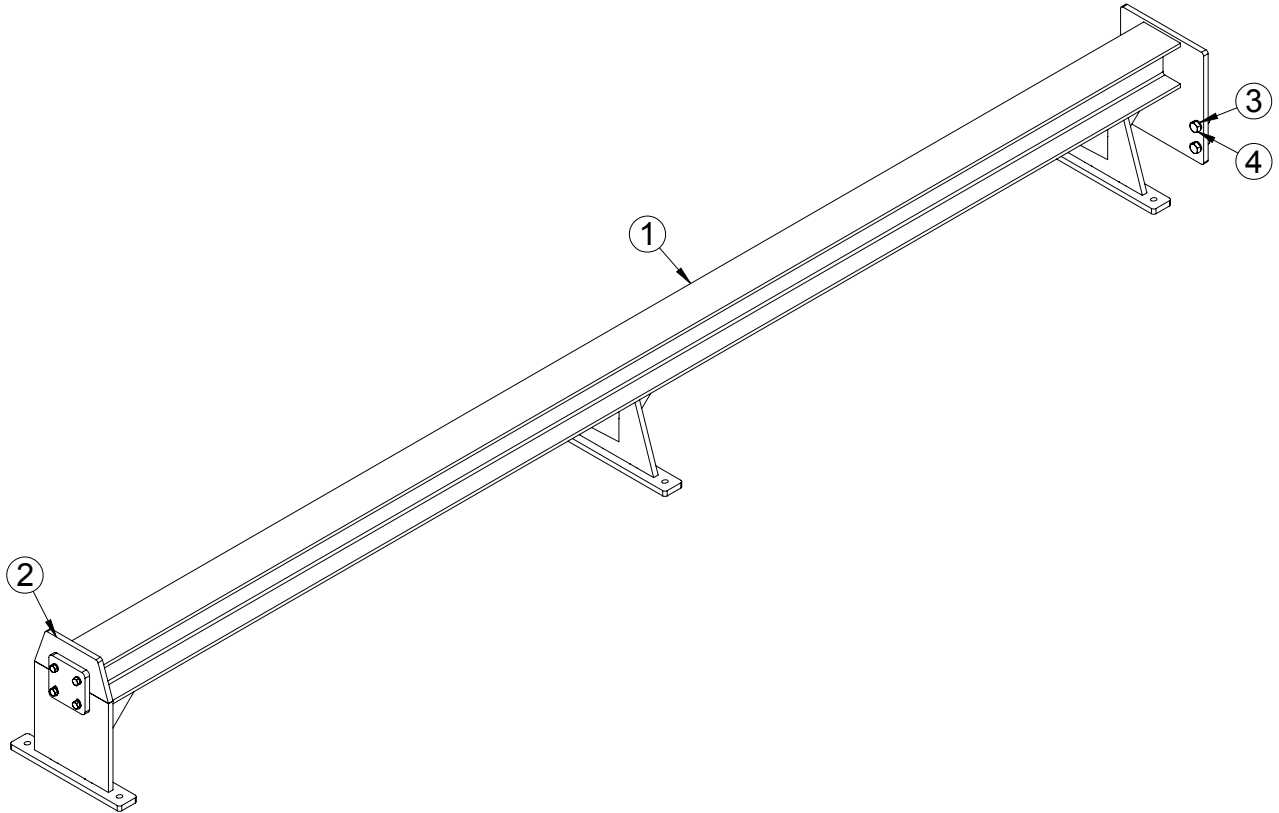
# 900-7000 Support Stand Assembly



Item #	Qty.	Part Number	Part Name
1	1	902-7000	BOTTOM SUPPORT WELDMENT
2	1	901-7000	TOP SUPPORT WELDMENT
3	1	901D-7000	2" BORE CHIEF CYLINDER 10" STROKE (216-677)
4	6	902D-3000-1	1 3/4" CAM FOLLOWER W/ 1" STUD
5	6	1323	1-14 NYLOCK JAM NUT (1323)
6	2	901A-3000-1	RED ROLLER
7	4	508-3000	1 1/2" SUPPORT STAND BEARING
8	8	1111	1/2"-13 x 1 1/4" HHCS
9	16	1103	1/2" LOCKWASHER
10	1	902B-3000-1	1" X 7 3/4" HITCH PIN
11	1	905-3000	SUPPORT STAND VALVE COVER
12	1	2404-LL-06-06	3/8" MJIC X 3/8" MNPT ST. EXTRA LONG
13	1	6 R6X-S	3/8" FJIC X 3/8" MJIC RUN TEE
14	1	BUC5524	PILOT OPERATOR CHECK VALVE
15	1	1488	3/8" X 4-1/2" PIPE NIPPLE
16	1	1580	90 3/8" F X F NPT
17	1	1457	3/8" HEX NIPPLE
18	2	1491	REDUCER BUSHING 1/2" X 3/8"
19	1	1576-A	1/4" MNPT x 3/8" MJIC ELBOW
20	1	1570	3/8" MNPT X 3/8" MJIC STRAIGHT
21	8	1110	1/2"-13 x 1" HHCS
22	1	9112-7000-01	LOCKING PIN WELDMENT

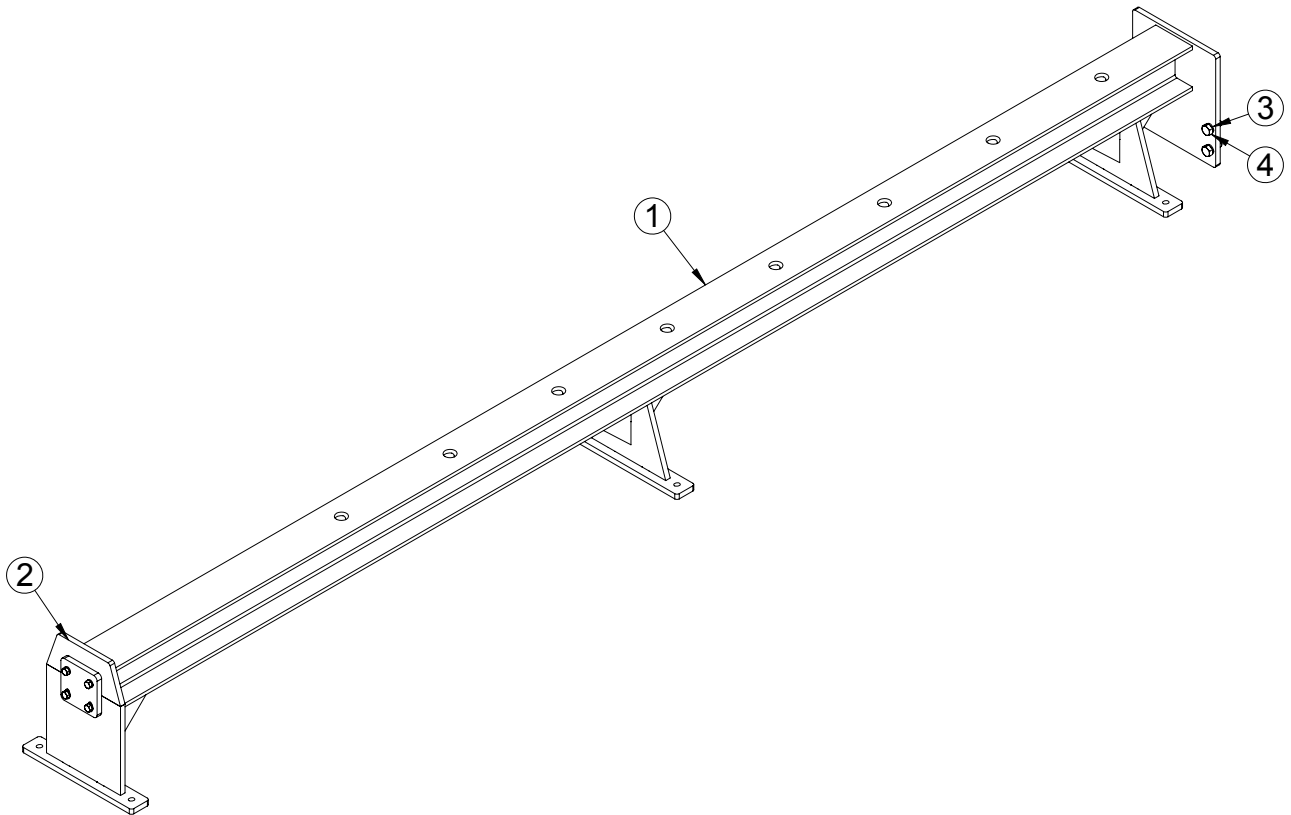


**1400-7022-2**  
**20' Head Stock Extension Beam Assembly**



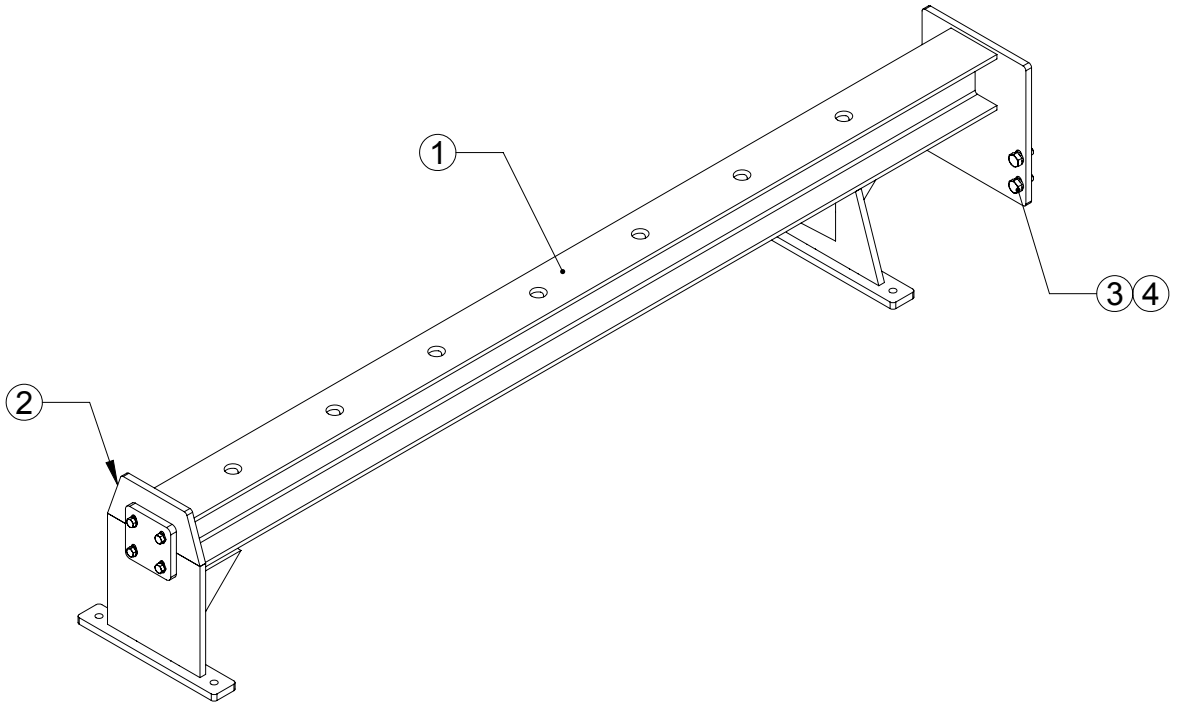
Item #	Qty.	Part Number	Part Name
1	1	1400-7022-01	20 FEET HEADSTOCK EXTENSION BEAM WELDMENT 22" UNIT
2	1	1303-7000	EXTENSION BEAM END PLATE ASSEMBLY
3	4	1218	1" LW
4	4	1264	1"-13 X 2.5" HHCS

**1400-7022-1**  
**20' Tail Stock Extension Beam Assembly**



Item #	Qty.	Part Number	Part Name
1	1	1400-7022	20 FEET EXTENSION BEAM WELDMENT FOR 22" UNIT
2	1	1303-7000	EXTENSION BEAM END PLATE ASSEMBLY
3	4	1218	1" LW
4	4	1264	1"-13 X 2.5" HHCS

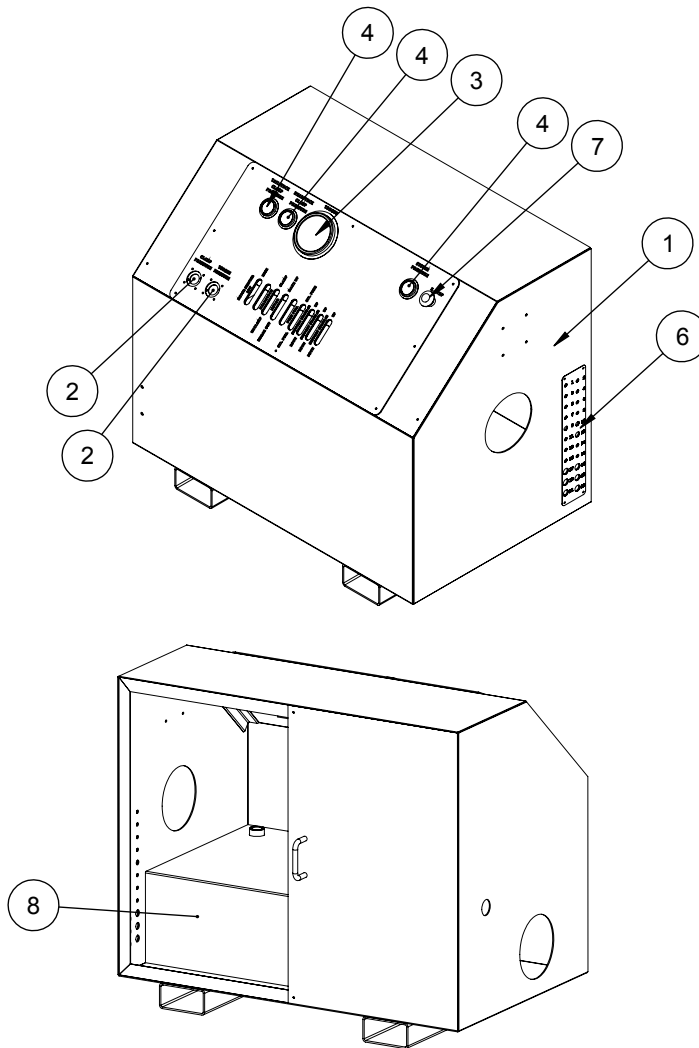
**1200-7001-1**  
**12' Extension Beam Assembly**



Item #	Qty.	Part Number	Part Name
1	1	1200-7001	WELDMENT EXTENSION BEAM 12 FOOT
2	1	1303-7000	EXTENSION BEAM END PLATE ASSEMBLY
3	4	1264	1"-13 X 2.5" HHCS
4	4	1218	1" LW

# RP5047

## Control Console / Power Unit Assembly



Item #	Qty.	Part Number	Part Name
1	1	100-6500	CONSOLE WELDMENT
2	2	130-6500	PRESSURE CONTROL VALVE
3	1	132-6500	0-1000 PSI GAUGE
4	3	133-6500	0-3000 PSI GAUGE
5	1	150-7000-16	TOP COVER PLATE
6	1	152-6500	BULKHEAD COVER
7	1		STOP BUTTON
8	1		ELECTRIC POWER UNIT

# TROUBLE SHOOTING

## HYDRAULIC SYSTEM

### Hydraulic Pump Making Excessive Noise:

<u>Problem</u>	<u>Solution</u>
A) Restricted or clogged intake line	Clean line, check for contamination.
B) Contaminated fluid	Flush system change fluid.
C) Restricted vent	Clean or replace air vent.
D) Air in fluid	Check for leaks and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
E) Damaged or worn parts	Repair or replace damaged parts, check fluid for contamination.
F) Excessive RPM (I/C engines only)	Check PTO, gears and recommended speed to assure proper pump is in-stalled for operation.
G) Increased friction	Make sure pump has been assembled using correct torque valves.
H) Damaged or worn relief valve	Replace relief valve.
I) Damaged or worn check valve	Replace check valve.
J) Restricted discharge	Check to make sure relief valve is set to proper pressure.
K) Valve system restricted	Inspect and repair or replace defective parts, check system for contamination.
L) High operating temp	Check for low hydraulic oil level, inspect and replace dirty oil filters, check for restrictions to return circuit

### Excessive Wear to Hydraulic Components:

<u>Problem</u>	<u>Solution</u>
A) Fluid contamination	Flush fluid system, replace with new fluid.
B) Components misaligned	Inspect and realign
C) High operating pressures	Gauge and set to proper pressure.
D) Exhausted fluid (depletion of additives)	Flush fluid system, replace with new fluid.
E) Air in fluid	Check for leaks, and be certain fluid suction in tank is well below hydraulic fluid in reservoir.

# TROUBLE SHOOTING

## HYDRAULIC TONG SECTION

### Problem

- A) Shortened bearing life

### Solution

Check alignment, insure proper lubrication to non-sealed bearings.

### Slow Tong Speed:

### Problem

- A) Restricted supply line
- B) Low fluid level
- C) Air leak
- D) Pump speed insufficient
- E) Damaged or worn equipment
- F) Pump not primed
- G) Low or no flow from supply line

### Solution

Verify proper hi/low speed setting. Clear supply line and check intake on reservoir.

Add fluid to proper volume.

Locate and repair leak.

Assure proper pump speed for application.

Isolate pump and check pressure to determine whether motor or pump is defective. Repair or replace defective part.

Check fluid viscosity and restrictions of intake line. Replace fluid if inadequate for operating temperature.

Check to assure couplings are securely fastened.

### Insufficient Torque:

### Problem

- A) Relief valve malfunctioning
- B) Damaged or worn pump parts
- C) Slow pump speed
- D) Improper system fluid
- E) Directional control valve set improperly
- F) Damage to motor
- G) Restriction of supply line, excessive back pressure
- H) Defective gauge or load cell

### Solution

Relief set too low, broken valve spring, contamination or defective seals.

Inspect, repair or replace.

Assure proper pump speed for application.

Check fluid viscosity and replace fluid if inadequate for operating temperature.

Check relief and directional control valve. Neutral should return slightly to reservoir.

Inspect, repair or replace.

Check to assure couplings are securely fastened.

Inspect, repair or replace. Assure unit has been calibrated to proper arm length. NOTE: When using **CLINCHER®** integral backup system, it is the length of backup arm, NOT the tong arm length.

# TROUBLE SHOOTING

## Failure to Grip Tubulars:

<u>Problem</u>	<u>Solution</u>
A) Jaws move out from neutral, but fail to penetrate	Inspect size of both the die holder and dies. Verify range at console and replace with dies compatible with tubular range.
B) Jaws fail to move out of neutral	Inspect and replace defective cylinders for debris or damage. Remove rust and debris from jaws, and jaw pockets. Repair, replace and lubricate as needed.
C) Tong will not release from tubular	Confirm system pressure is adequate to unlock valve. Inspect Directional Control Valves.
D) Motor runs but Tong does not rotate	Inspect and replace defective chain, sprocket or gear reducer.
E) Tong binds under light load	Inspect and replace defective parts. Damaged hub or bearings.
F) Tong rotates while control lever is in neutral	Replace control valve.
G) Hydraulic fluid leaking from motor	Repair or replace motor. Verify case drain is open to reservoir.
H) Clamping cylinders are not synchronized	Resync by fully retracting and extending through several cycles. Inspect damaged lines & fittings, check for other restrictions. Individually check each cylinder for fluid leakage. Replace flow divider.

## HYDRAULIC BACKUP SYSTEM

### Backup Fails to Hold Tubular:

<u>Problem</u>	<u>Solution</u>
A) Incorrect die for size tubular	Check pipe O.D. and match die size to pipe O.D.
B) Dies have material compacted in tooth area	Clean dies with wire brush and inspect for worn teeth. Replace with new dies if necessary.
C) Power unit pressure set incorrectly	Inspect relief valve on power unit to make sure enough system pressure is being delivered to backup.
D) Counter balance valve not holding pressure	Remove side plates on backup. Bench test and replace the counter balance valve defective.
E) Internal leakage in backup cylinder	Disconnect lines and bench test cylinder. Repair or replace as necessary.
F) Jaws will not retract	Counter balance valve is stuck. Replace counter balance valve.
G) External leakage of cylinder	Repair or replace cylinder.
H) Control valve set to neutral, but jaws extend	Inspect control valve for damage and/or incorrect spool. Repair or replace as necessary.

# TROUBLESHOOTING

## Problem

## Solution

I) Excessive hydraulic leaks

The presence of some hydraulic oil on hydraulic cylinder rods and swivels is expected and required to lubricate rod seals. Continuous dripping or stream indicates a failure. If failure is suspected, replace all cylinder seals.

J) Die insert slippage and breakage

Ensure clamping pressure is adequate. Ensure holder and dies are appropriate for pipe size. Ensure dies are aligned with pipe centerline. Ensure dies are not gripping on tooljoint hardbanding.





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