CLINCHER®

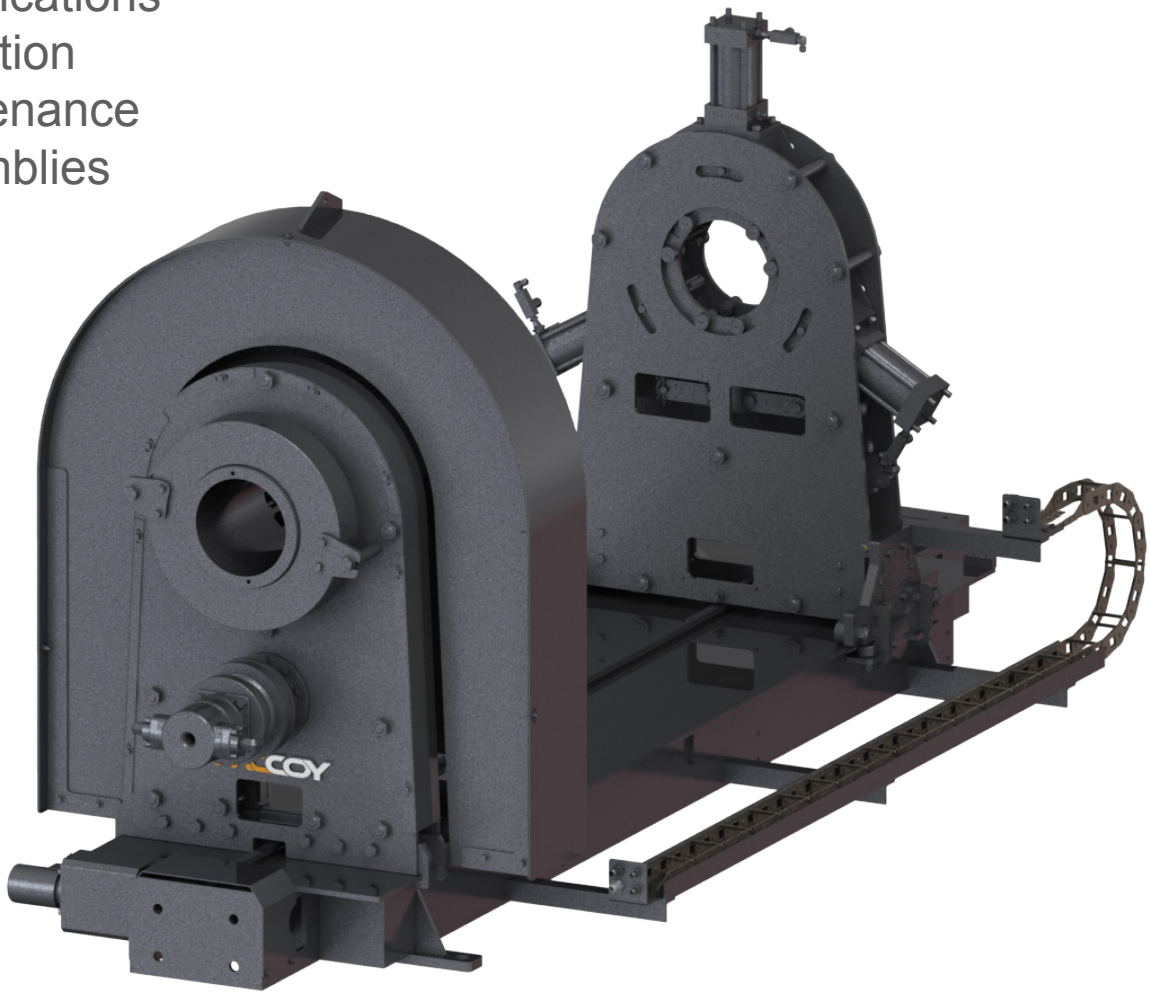
TECHNICAL MANUAL

RP2109

9” (22.8cm) 10K ft-lbs

Continuously Rotating Bucking Unit

- Specifications
- Operation
- Maintenance
- Assemblies



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MCCOY
MOVING GLOBAL ENERGY FORWARD

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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:

CAUTION: Before lifting the unit with a forklift, the tailstock must be moved to its maximum extended position along the bed of the unit to assure the equipment remains balanced during the lifting process.

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 counterclockwise 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:

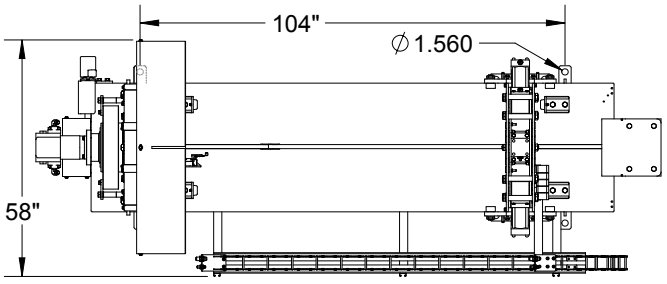
1. Remove dies and inspect jaw retainer bolt torque. Torque should be set to 180 ft-lbs.

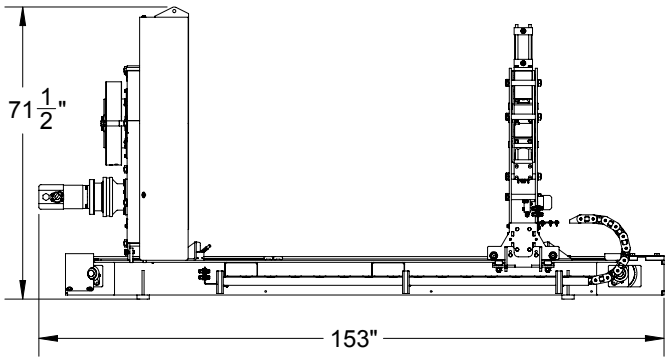
MONTHLY:

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.

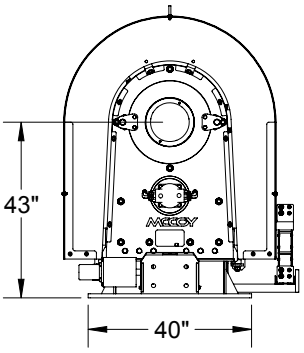




SECTION V

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, 480 Volt, 3 phase, 60 Hertz
Hydraulic Oil:	AW-68
Hyd. Oil Capacity:	90 gal.
Overall Length:	40”
Overall Width:	81”
Overall Height:	51”
Weight (approx.):	2,200 lbs.

Bucking Unit (10’ skid without accessories):

Max. Torque:	10,000 ft-lbs
Handle Length:	13”
Overall Length:	153”
Overall Width:	58”
Overall Height:	71 1/2”
Weight (approx.):	4,000 lbs.

CHUCKING CAPACITIES
1.660” to 9” Diameter

TORQUE CAPACITY
Make-up 10,000 ft-lbs / Break-out 10,000 ft-lbs

LUBRICATION SPECIFICATIONS

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

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: @ 100º F @ 200º F	1300 SUS 89 SUS
Viscosity Index	77
Penetration, dmm Worked *ASTM D 217*	325-340
Dropping Point, ºF *ASTM D 566*	500 ±
Rust Protection, 5% SSW	N/A
Water Washout %wt loss @ 175ºF	N/A
Timken, OK Load, lbs	50
Bomb Oxidation 100 hrs @ 210ºF, psi drop	N/A
Applications	High & Low Speed Bearings, Wheel Bearings, Pumps, Gears, Lubrication

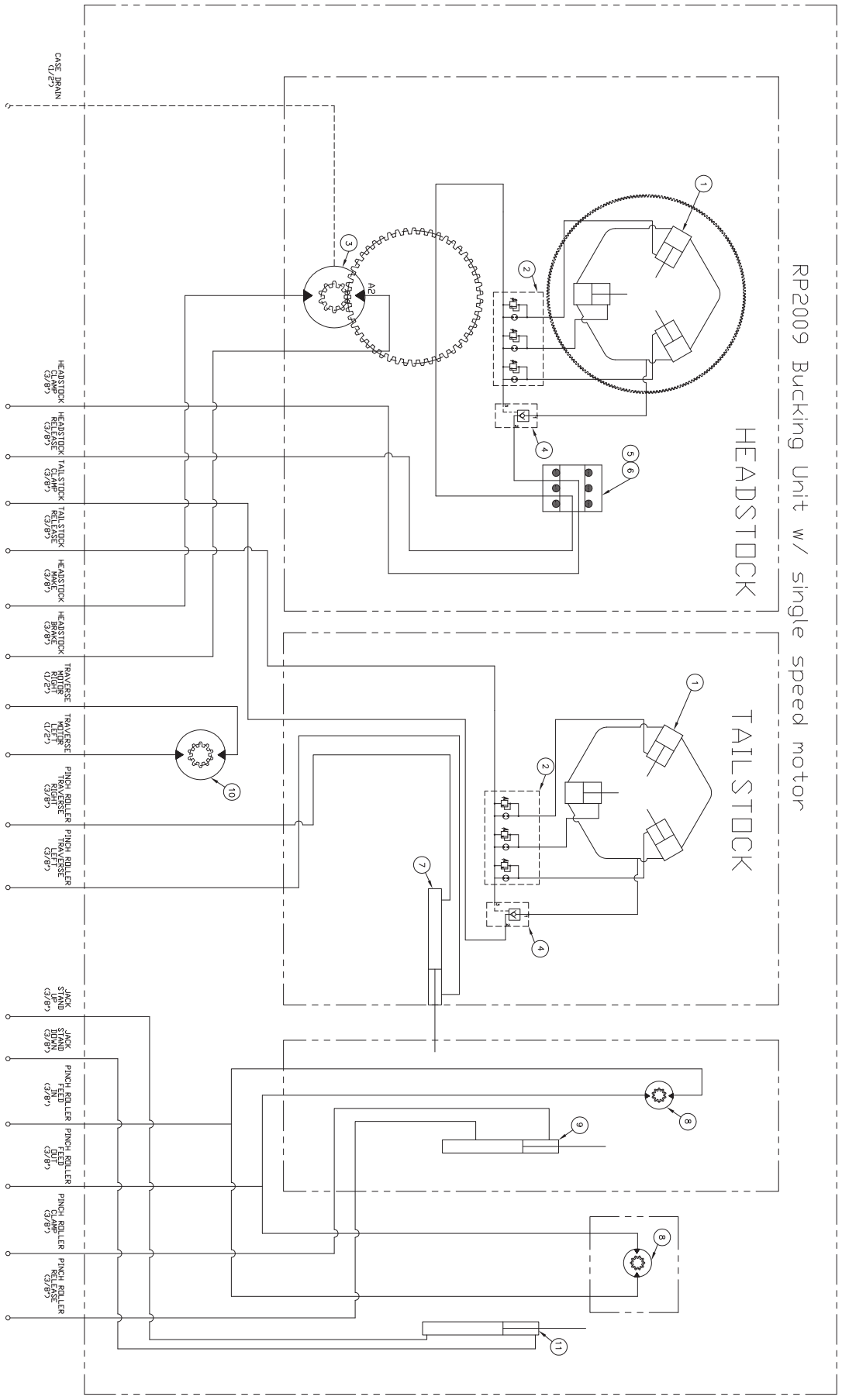
Use an EP synthetic grease that meets or exceeds the following specifications: (Used as bearing grease)

Type	N/A
NLGI Consistency Grade	2
Color	Blue
Lithium Complex Soap, wt%	14
Serv. Temperature	N/A
Base Oil Viscosity: @ 40ºC, cSt *ASTM D 445* @ 100ºC, cSt	150 14.5
Viscosity Index	N/A
Penetration, dmm Worked, 60X *ASTM D 217*	280
Dropping Point, ºF *ASTM D 2265*	450+
Rust Protection, 5% SSW *ASTM D 5969*	Pass
Water Washout %wt loss @ 175ºF *ASTM D 1264*	6.8
Timken, OK Load, lbs *ASTM D 2509*	45
Bomb Oxidation 100 hrs @ 210ºF, psi drop *ASTM D 942*	5 max
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:

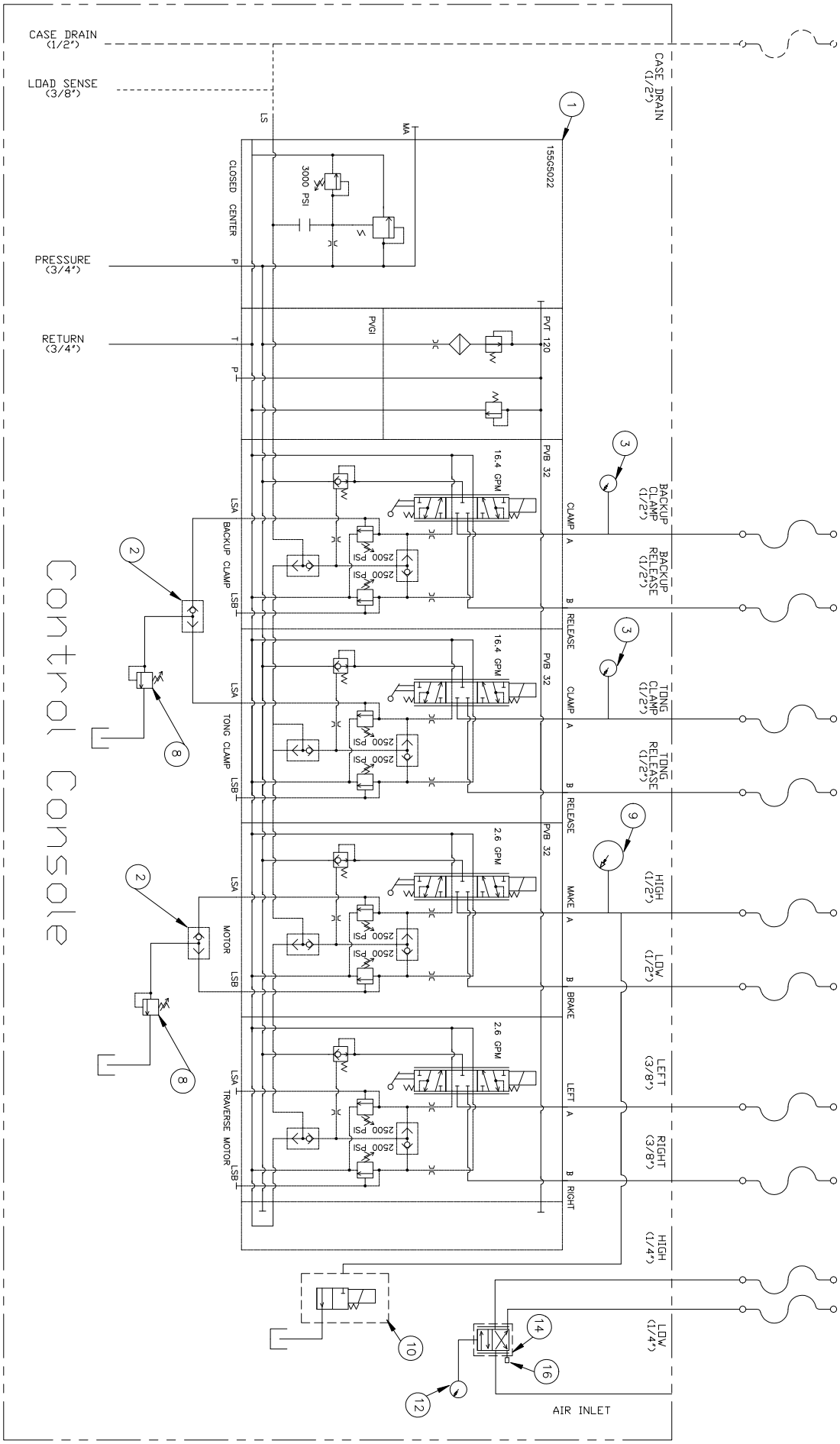
Humble Hydraulic H		68
ISO Viscosity Grade		68
Base Oil Viscosity: *ASTM D 445*	cSt @ 40ºC cSt @ 100ºC	65.0 8.5
Viscosity Index – *ASTM D 2270*		95
Pour Point – *ASTM D 97*		-9
Flash Point – *ASTM D 92*	C(ºF)	222 (432)
Demulsibility – *ASTM D 1401*		41/39/0 (20)
Vickers 104C (IP281)		Pass
Vickers M-2950-S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

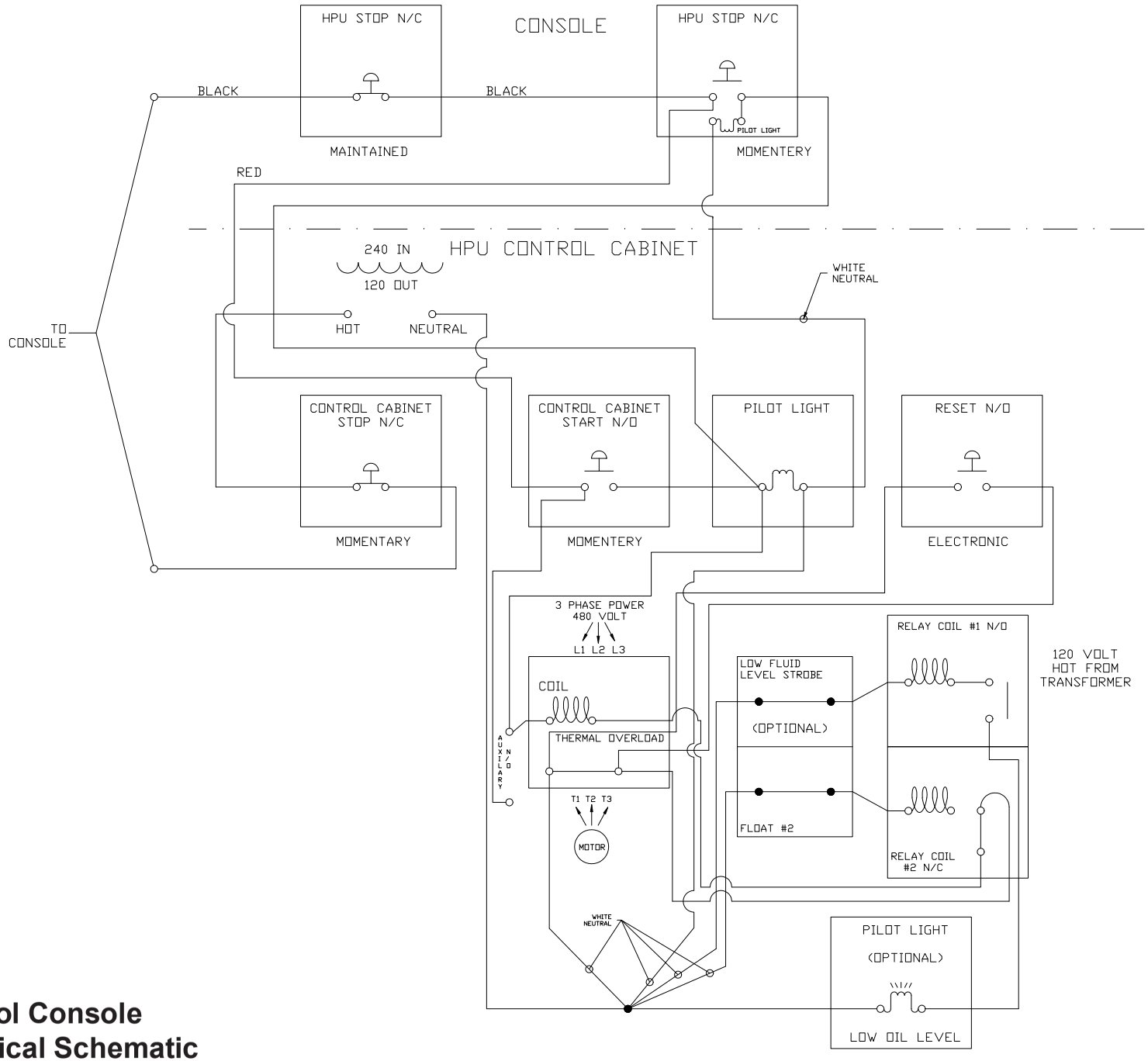
Bucking Unit
Hydraulic Schematic



ITEM NO.	QTY.	DESCRIPTION
1	6	CLAMP CYLINDER ASSEMBLY
2	2	FLOW DIVIDER
3	1	HYDRAULIC MOTOR, SINGLE SPEED
4	2	PILOT OPERATED CHECK VALVE
5	3	ROTARY SEALS (3 PCS = 1 SET)
6	1	HYDRAULIC SWIVEL
7	1	HYDRAULIC CYLINDER
8	2	HYDRAULIC MOTOR
9	1	AIR CYLINDER
10	1	TRAVEL MOTOR
11	1	HYDRAULIC CYLINDER

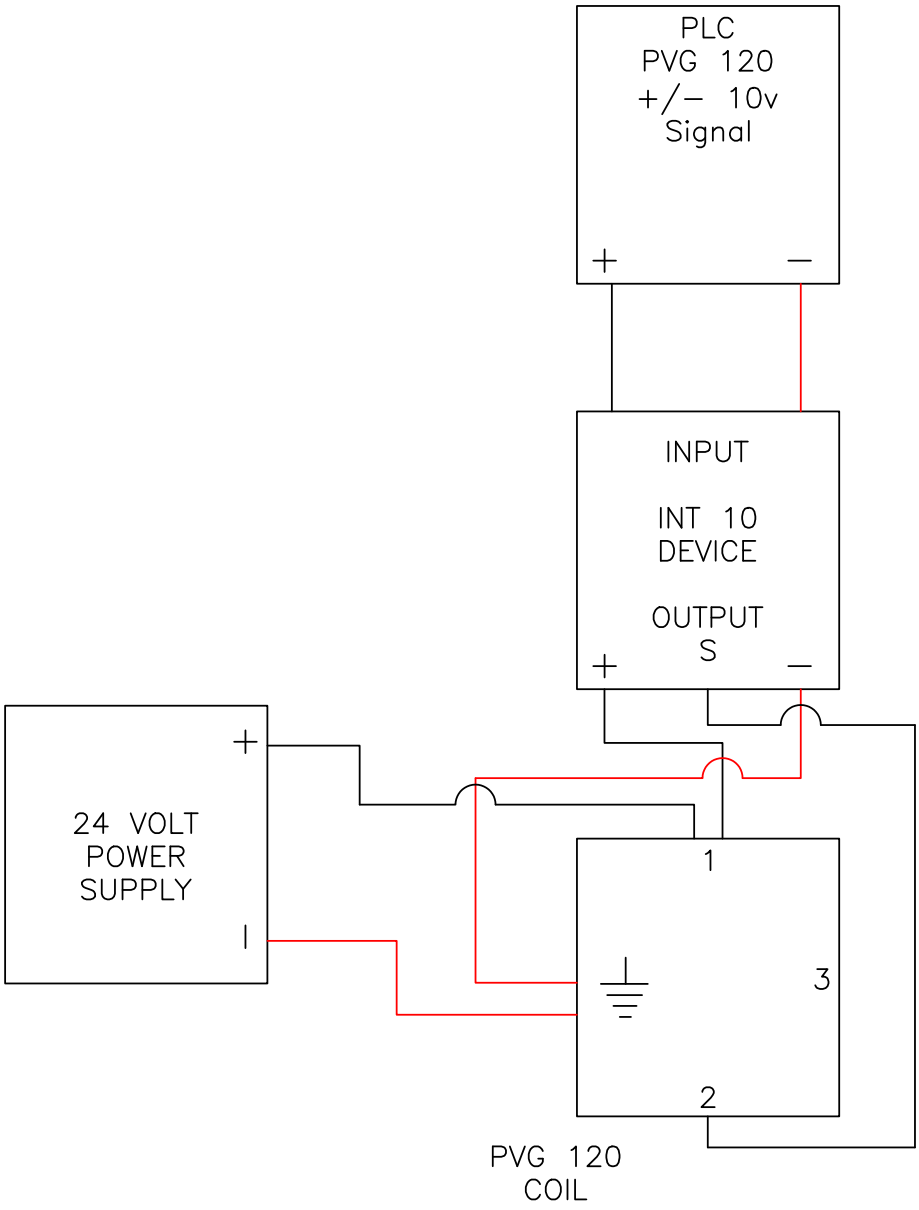
Control Console
Hydraulic Schematic



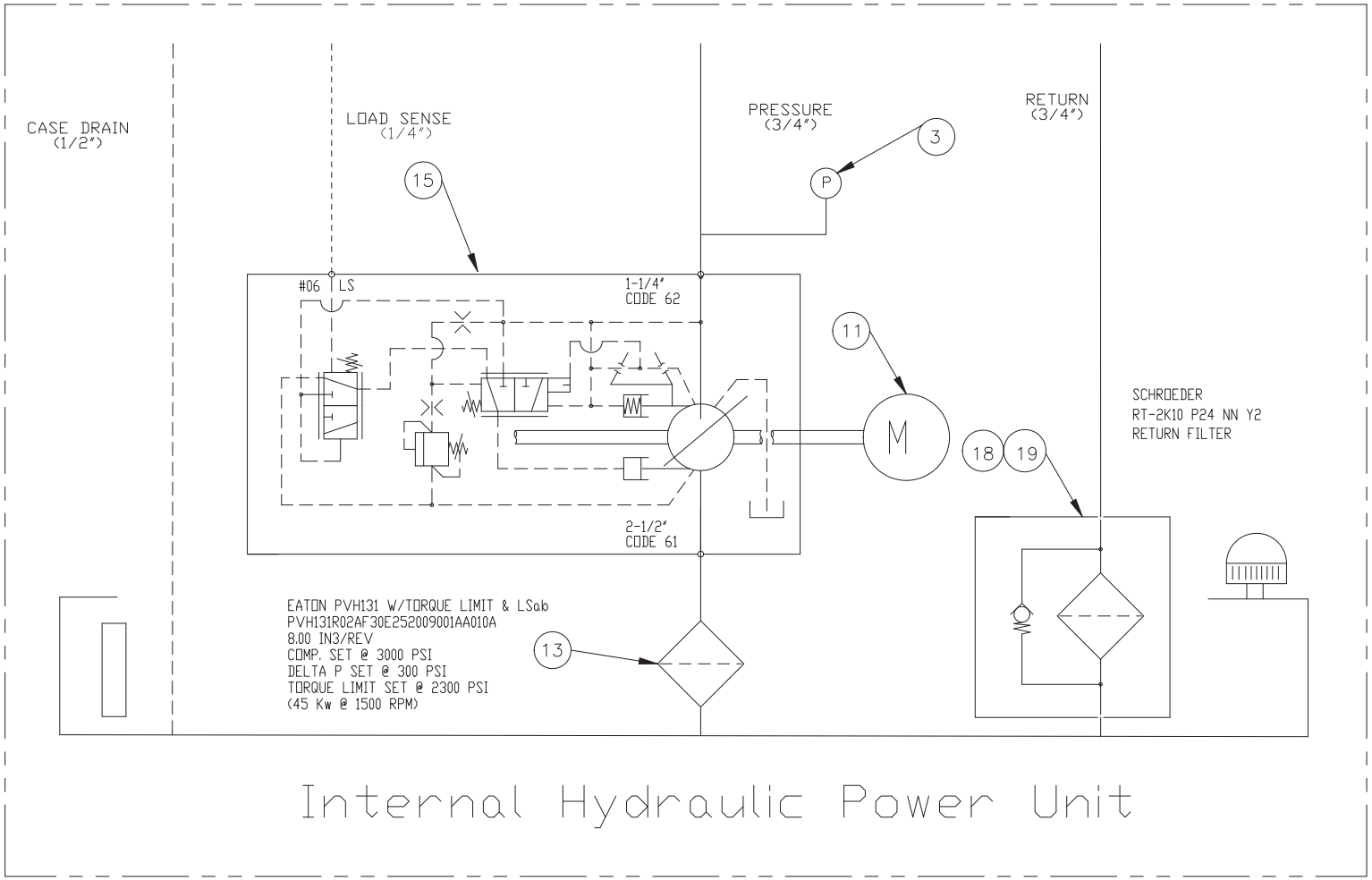


Control Console
Electrical Schematic

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	PU5060-S1	CONSOLE/POWER UNIT
13	1	SUCTION STRAINER	SS-2-100-3	CONSOLE/POWER UNIT
15	1	HYDRAULIC PUMP	7003638	CONSOLE/POWER UNIT
18	1	FILTER HEAD	P563268	CONSOLE/POWER UNIT
19	1	FILTER ELEMENT	P562207	CONSOLE/POWER UNIT



Power Unit
Hydraulic Schematic

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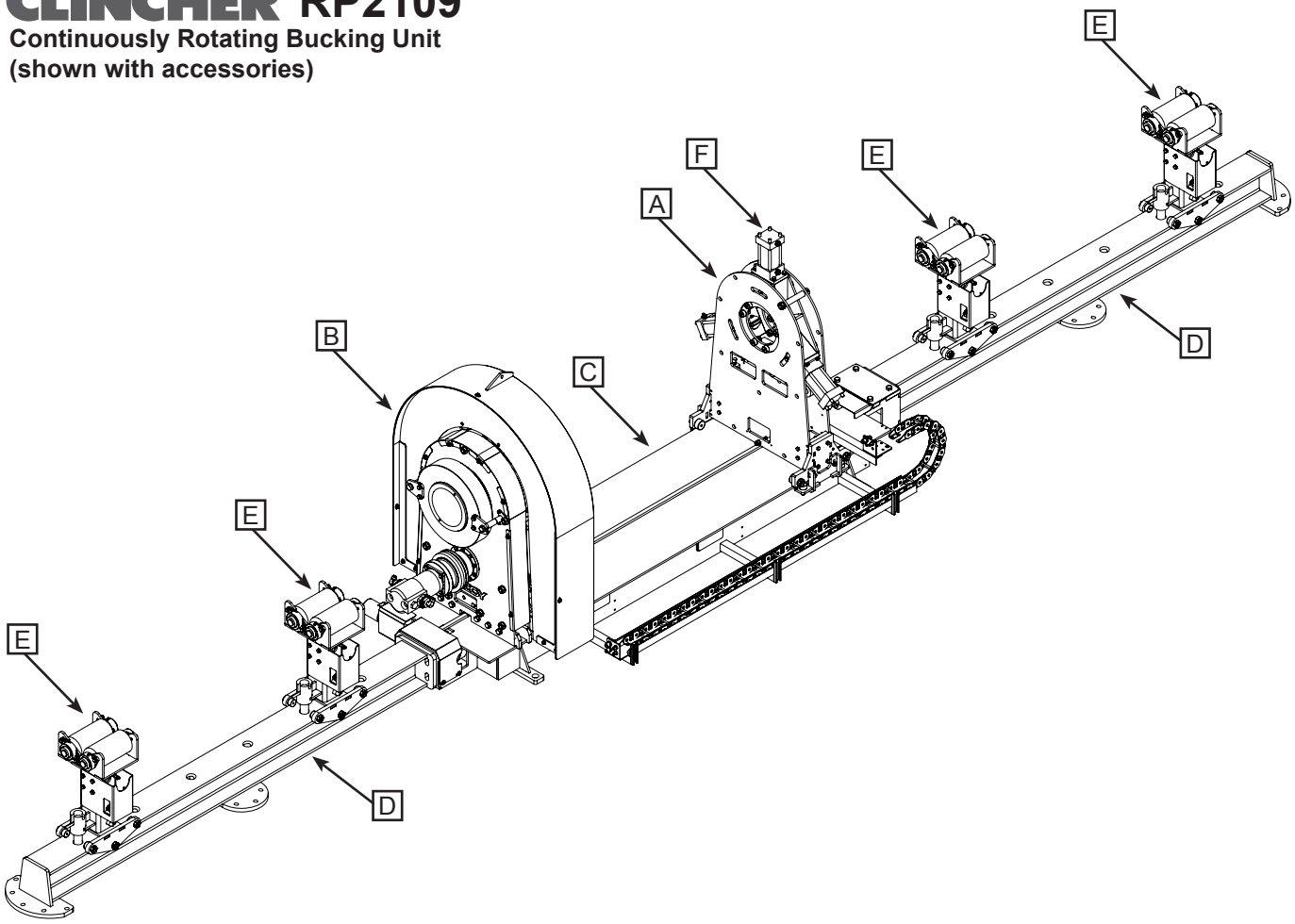
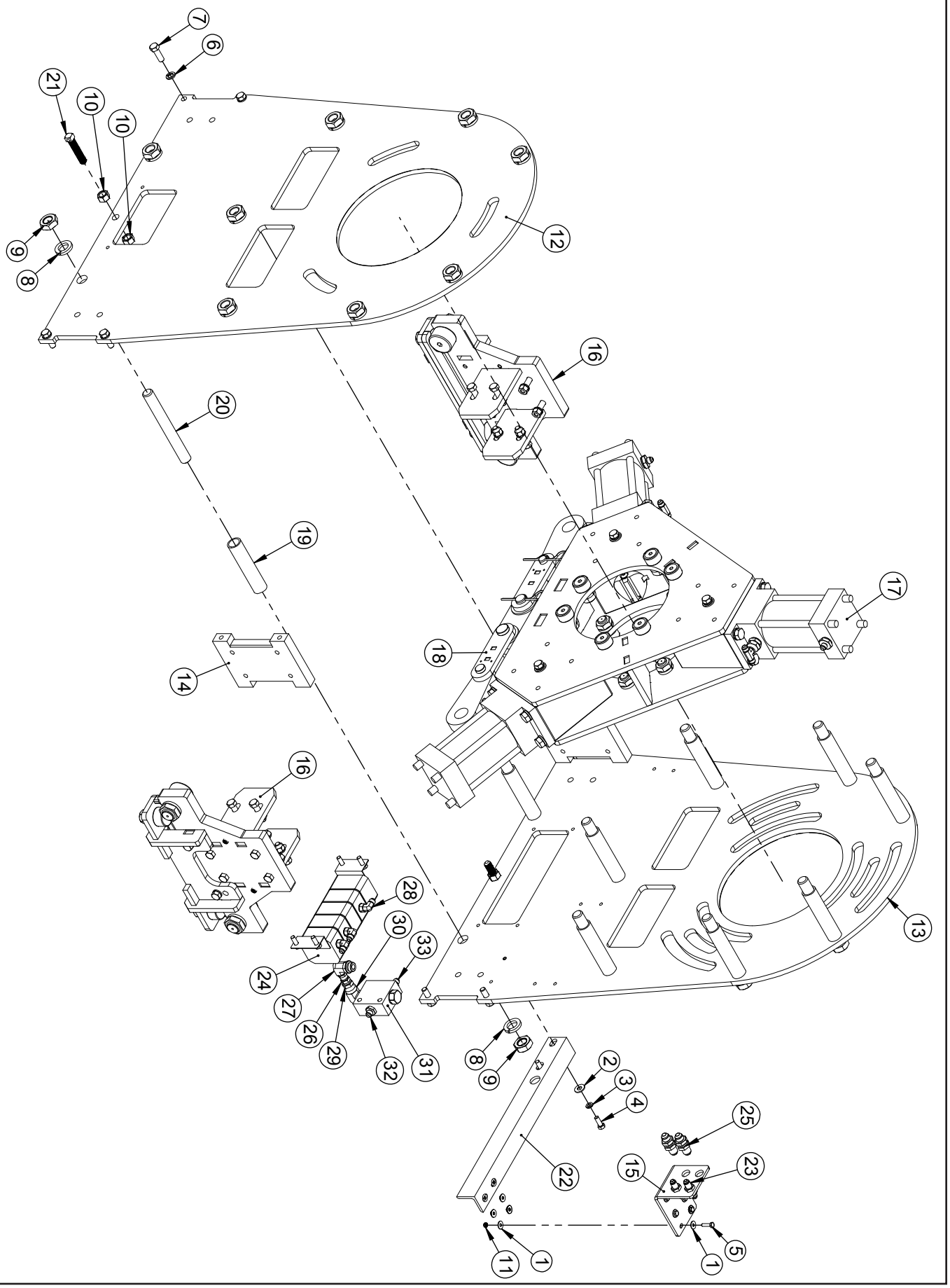
CLINCHER® RP2109

Continuously Rotating Bucking Unit
(shown with accessories)

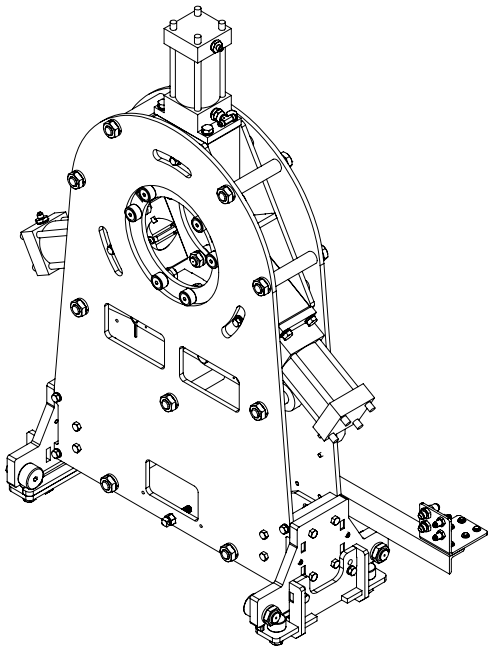


For third party component documentation used within this unit, please contact McCoy.

300-2000
Tailstock Assembly

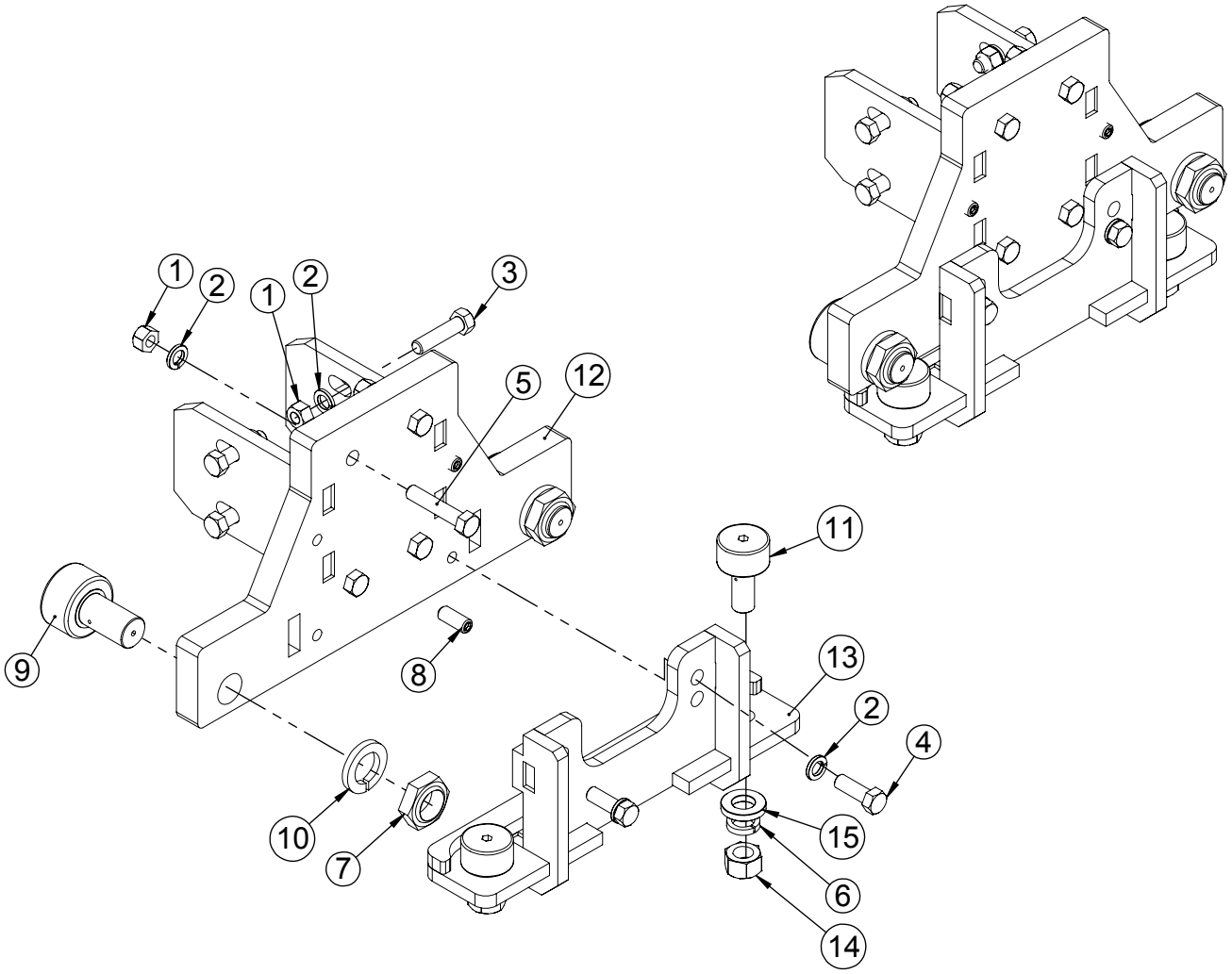


300-2000
Tailstock Assembly



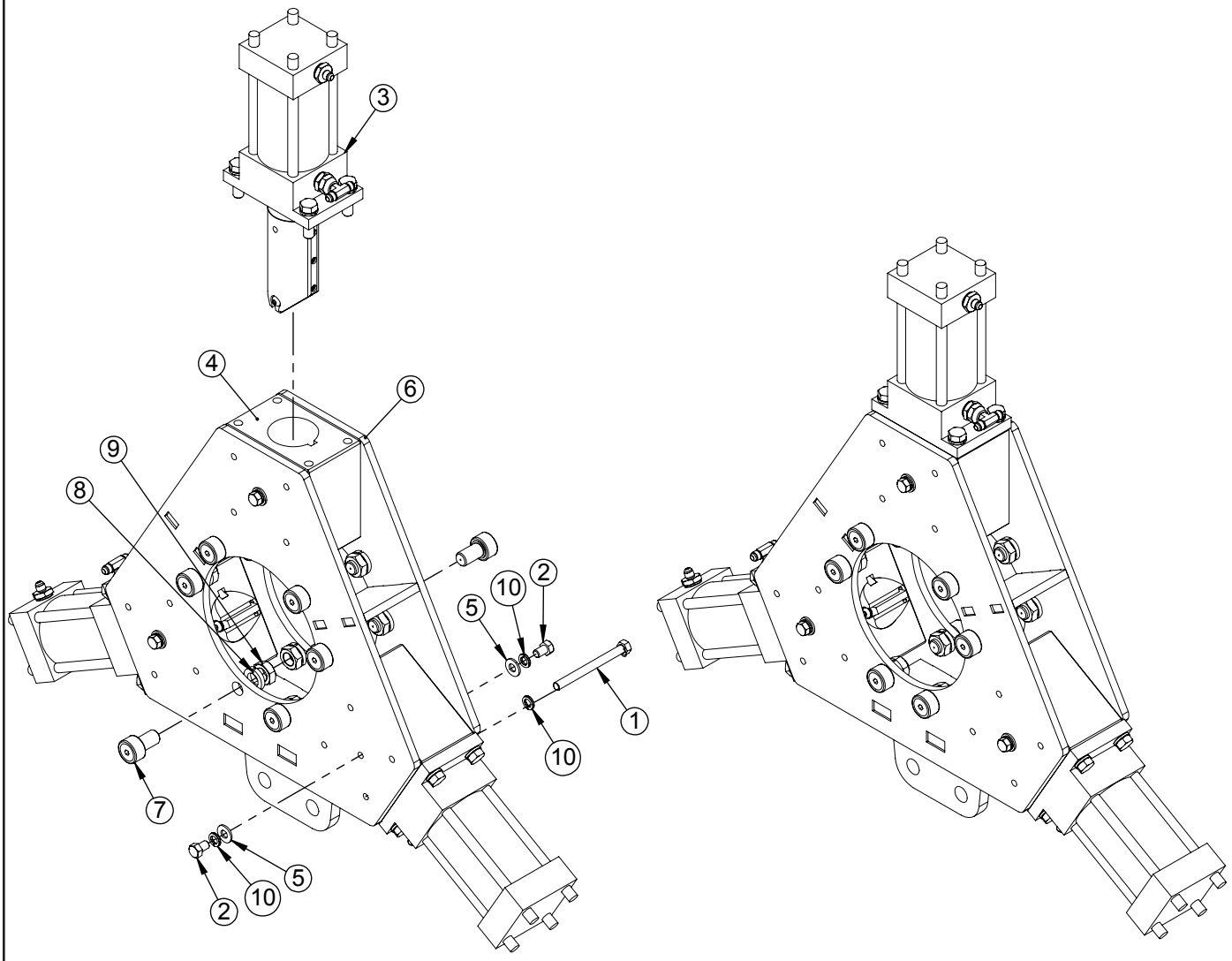
ITEM	QTY	P/N	DESCRIPITION
1	14	1008-B2	FLATWASHER 1/4" GR8
2	2	1025	FLATWASHER 3/8" GR8
3	14	1027	LOCKWASHER 3/8" GR8
4	14	1047	HHCS 3/8"-16 X 1" GR8
5	7	105	HHCS 1/4"-20 X 1" GR8
6	8	1103	LOCKWASHER 1/2" GR8
7	8	1112	HHCS 1/2"-13 X 1 1/2" GR8
8	18	1218	LOCKWASHER 1" GR8
9	18	1295	JAM NUT 1"-8 GR8
10	4	194	HEX NUT 5/8"-11 GR8
11	7	212	NYLOCK NUT 1/4"-20 GR8
12	1	300-2000-S1	OUTER
13	1	300-2000-S2	INNER
14	2	300-2000-S3	TAILSTOCK GUIDE PLATE
15	1	518-3000-06	TAILSTOCK BULKHEAD PLATE
16	2	320-2000	TAILSTOCK ROLLER ASSEMBLY
17	1	340-2000	TAILSTOCK VISE ASSEMBLY
18	2	342-2000	3/4" LOAD CELL BRACKET ASSEMBLY
19	9	348-2000	BACKUP HOUSING SPACER
20	9	349-2000	1"-8
21	2	350-2000	91410A806
22	1	354-2000	BULKHEAD EXTENDER
23	2	6WTX-WLN-S	3/8 MJIC X 3/8 MJIC BULKHEAD CONNECTOR WITH LOCK NUT
24	1	250-977A	MODIFIED FLOW DIVIDER
25	2	8WTX-WLN-S	1/2" MJIC X 1/2" MJIC BULKHEAD FITTING
26	1	6-6F6X-S	3/8 MNPT X 3/8 FJIC SWIVEL ADAPTER
27	1	6801-NWO-6-10	5/8" MORB X 3/8" MJIC 90
28	3	1687	3/8 M O-RING x 3/8 MJIC 90 DEGREE
29	1	1491	REDUCER BUSHING 1/2" X 3/8"
30	1	1451	ADAPTER, 1/2 IN STREET EL
31	1	BUC5524-01	PILOT OPERATOR CHECK VALVE (3000 PSI ONLY)
32	1	6-8FTX	1/2" MNPT X 3/8 MJIC
33	1	1559	3/8 MJIC X 1/4 MNPT STRAIGHT

320-2000
Tailstock Roller Assembly



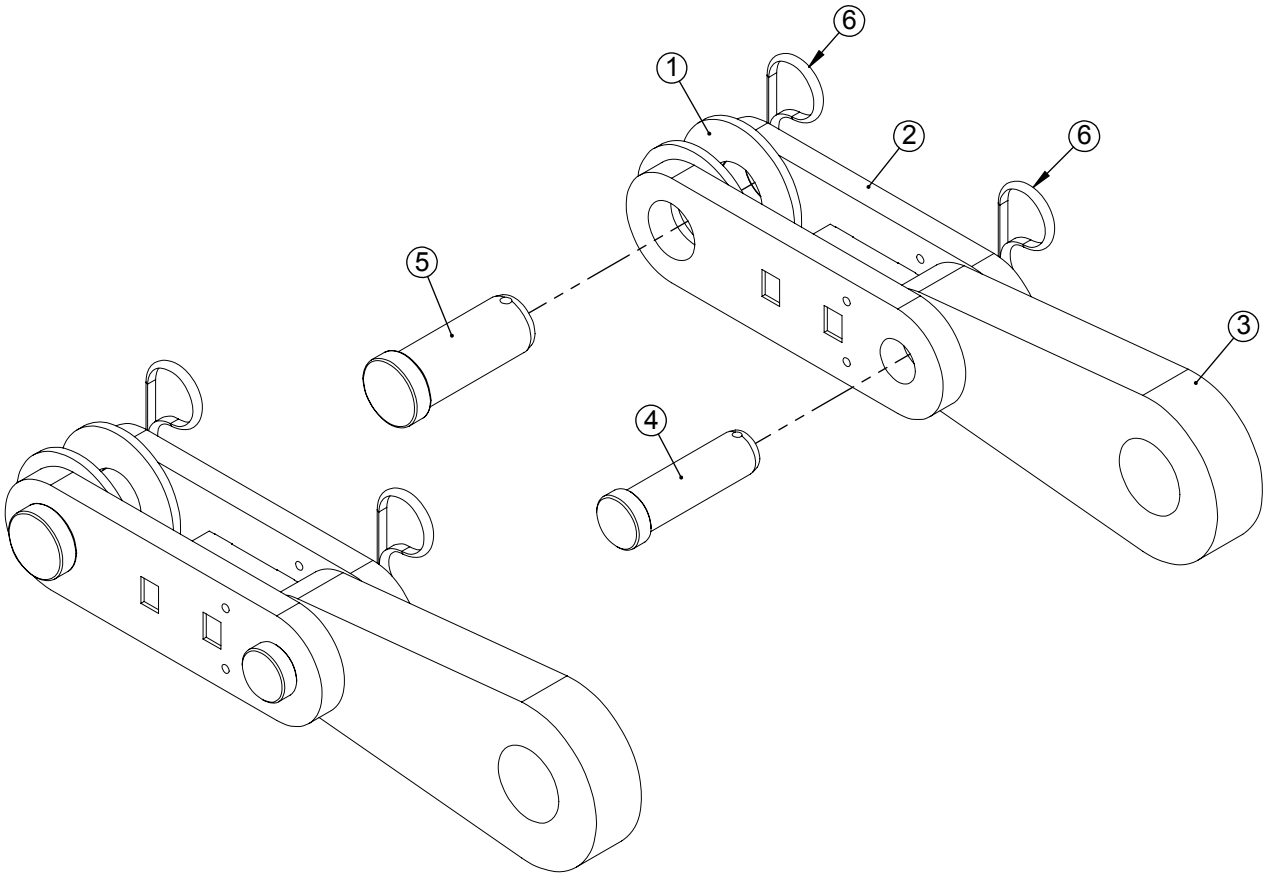
ITEM	QTY	P/N	DESCRIPITION
1	8	1101	NUT HEX 1/2-13 GR8
2	10	1103	LOCKWASHER 1/2" GR8
3	4	1112-A	HHCS 1/2"-13 X 2" GR8
4	2	1112	HHCS 1/2"-13 X 1 1/2" GR8
5	4	1113-A	HHCS 1/2"-13 X 2 1/2" GR8
6	2	1170-A	HI COLLAR LOCKWASHER 3/4" ALLOY GRADE
7	2	1207A	NYLOCK NUT LOW PRO 1 1/8"-12 JAM NUT
8	2	1238	SCREW SET 1/2-13 X 1 1/4 IN
9	2	1976	CAM FOLLOWER McGill CFH2-1/4SB
10	2	278	LOCKWASHER 1 1/8" *** GRADE 5 ONLY ***
11	2	310E-7000-01	1-3/4" CAM FOLLOWER
12	1	321-2000	ROLLER WELDMENT
13	1	322-2000	CLIP WELDMENT
14	2	272	HEX NUT 3/4"-16 GR8
15	2	280	FLATWASHER 3/4in x 1.5in OD .216 thk GRD 8

340-2000
Tailstock Vise Assembly



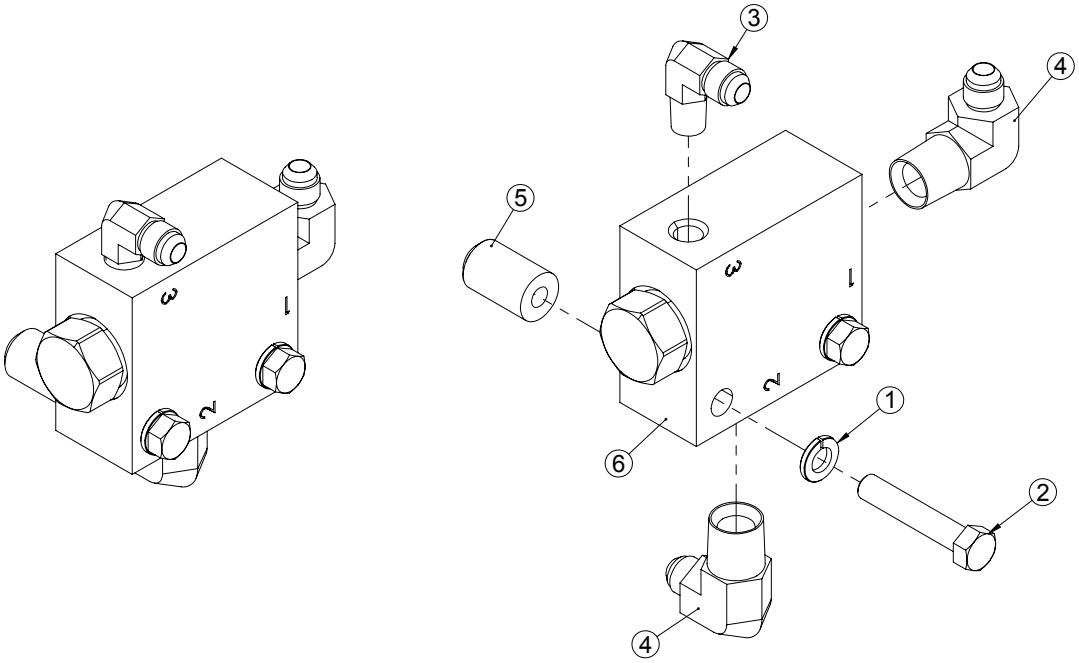
ITEM	QTY	P/N	DESCRIPTION
1	12	X2-101	HHCS 1/2-13 X 5 1/2"
2	6	1109	HHCS 1/2"-13 X 3/4" GR8
3	3	309-2000	HYDRAULIC CLAMP CYLINDER ASSEMBLY
4	3	310-2000-S3	CYLINDER BLOCK
5	6	340-2000-S3	BRASS SPACER
6	1	351-2000	TAILSTOCK VISE WELDMENT
7	12	1960	CAM FOLLOWER 1.50 IN HEAVY STUD
8	12	1224	LOCKWASHER 7/8" GR8 HEAVY SPLIT
9	12	1178	JAM NUT 7/8"-14
10	18	1103	LOCKWASHER 1/2" GR8

342-2000
3/4” Load Cell Bracket Assembly



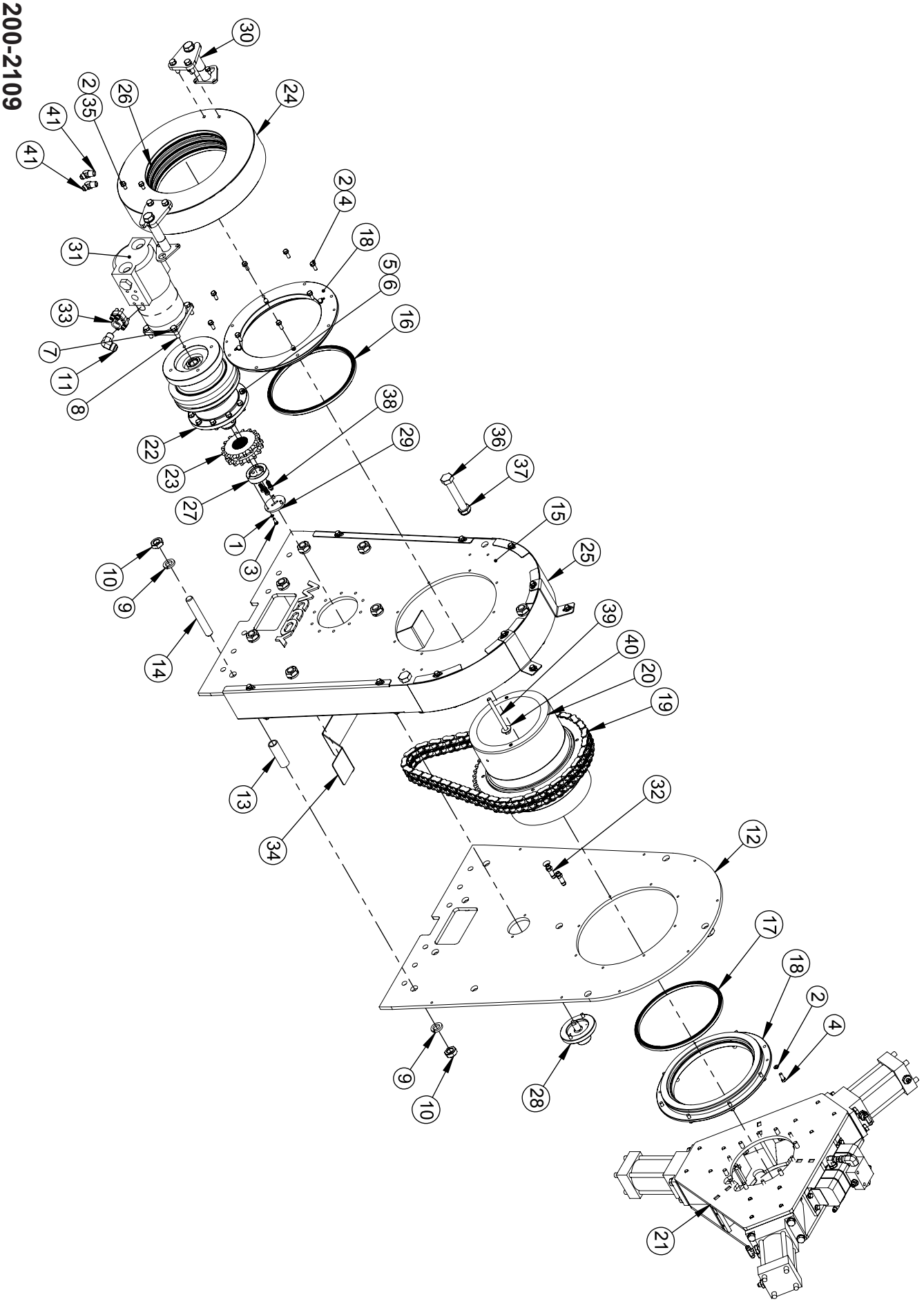
ITEM	QTY	P/N	DESCRIPTION
1	2	1249	FLATWASHER 1" GRADE 8
2	1	343-2000	LOAD CELL BRACKET WELDMENT
3	1	344-2000	LOAD CELL BRACKET LINKAGE
4	1	345-2000	LOAD CELL DEAD PIN
5	1	346-2000	LOAD CELL LOCK PIN
6	2	6012	HAIRPIN COTTER PIN

352-2000
P.O. Check Valve Assembly

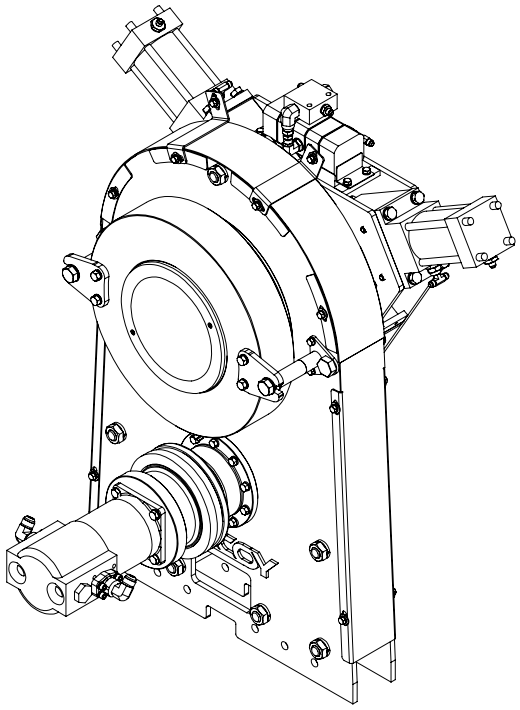


Item #	Qty.	Part Number	Part Name
1	2	1027	WASHER, LOCK 3/8"
2	2	1050	HHCS 3/8"-16 X 2"
3	1	6 CTX	1/4" MNPT X 3/8" MJIC MALE ELBOW
4	2	6-8CTX	1/2" MNPT X 3/8" MJIC 90 DEG.
5	2	73179	VALVE LEG
6	1	BUC5524	PILOT OPERATOR CHECK VALVE

200-2109
Headstock Assembly



200-2109
Headstock Assembly



ITEM	QTY	P/N	DESCRIPITION
1	3	101	LOCKWASHER 1/4" GR8
2	20	1027	LOCKWASHER 3/8" GR8
3	3	104	HHCS 1/4"-20 X 3/4" GR8
4	16	1047	HHCS 3/8"-16 X 1" GR8
5	10	1081	LOCKWASHER 7/16" GR8
6	10	1083	HHCS 7/16"-14 X 1 1/4" GR8
7	5	1103	LOCKWASHER 1/2" GR8
8	4	M1225	HHCS M12X1.75 X 25 GR8
9	16	1218	LOCKWASHER 1" GR8
10	16	1295	JAM NUT 1"-8 GR8
11	2	12 CTX	3/4" MNPT X 3/4" MJIC
12	1	200-2000-S2	INNER
13	8	200-2000-S3	HEADSTOCK HOUSING SPACER
14	8	200-2000-S4	1"-8
15	1	202-2000	OUTER
16	1	204-2000	FINAL
17	1	205-2000	FINAL
18	2	206A-2000	BEARING CAP ASSEMBLY
19	1	207-2000	DRIVE CHAIN
20	1	208-2000	HYDRAULIC HUB ASSEMBLY
21	1	210-2000	HEADSTOCK VISE ASSEMBLY
22	1	215-2000-04	6.20 : 1 RATIO
23	1	216-2000	DRIVE SPROCKET WITH METRIC SPLINE
24	1	217-2000	RP2000 HYDRAULIC SWIVEL
25	1	220-2000	HEADSTOCK HOUSING COVER ASSEMBLY
26	3	222-2000	SWIVEL SEAL
27	1	228-2000	DRIVE SPROCKET RETAINER PLATE
28	1	230-2000	ENCODER ASSEMBLY
29	1	232-2000	ENCODER COUPLING PLATE
30	2	2700-2009	SWIVEL KEEPER ASSY.
31	1	10111	RINEER MOTOR 23 cu in
32	2	6-FF5OX-S	SAE-6 MALE X 3/8 MJIC LONG STRAIGHT
33	2	W43-12-12U	3/4" FLANGE
34	1	209-2000	DRIP PAN
35	4	1046	HHCS 3/8"-16 X 3/4" GR8
36	2	BJ1088	HHCS 1"-8 x 5" GRADE 8
37	2	1295-A	1"-8 LOW-PROFILE NYLOC NUT
38	3	M1025	HHCS M10X1.5 X 25 GR8
39	1	X2-26	HHCS 1/2"-13 X 6" GR8
40	1	1102	FLATWASHER 1/2" GR8
41	2	1457-A	1/2" MNPT X 1/2" MJIC 45 DEG.

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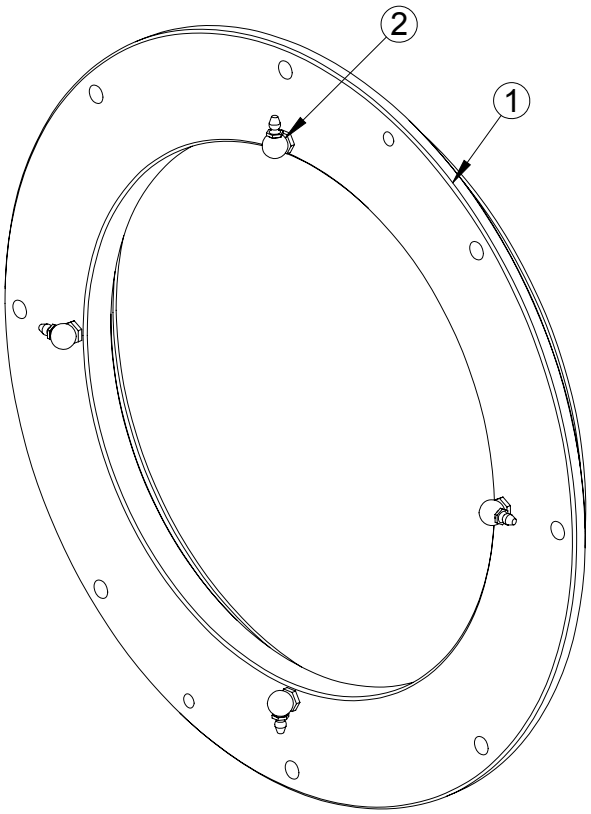
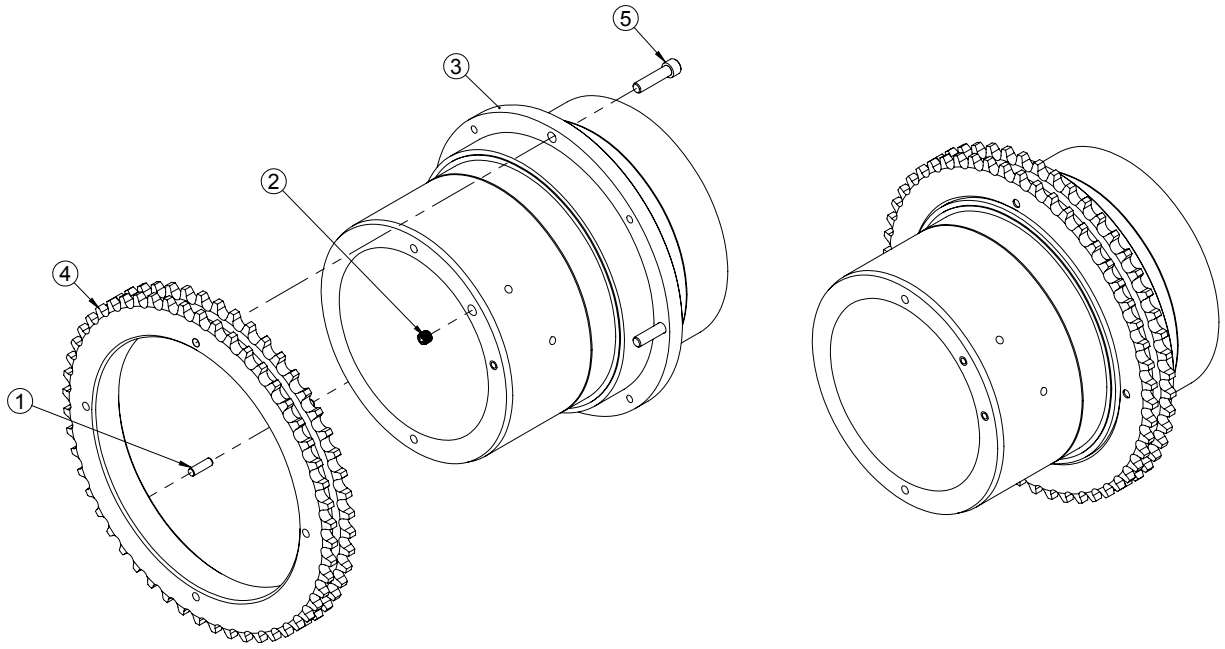
206A-2000
Bearing Cap Assembly

GREASE FITTINGS SHOULD FACE
AWAY FROM CENTER OF PART
AS SHOWN



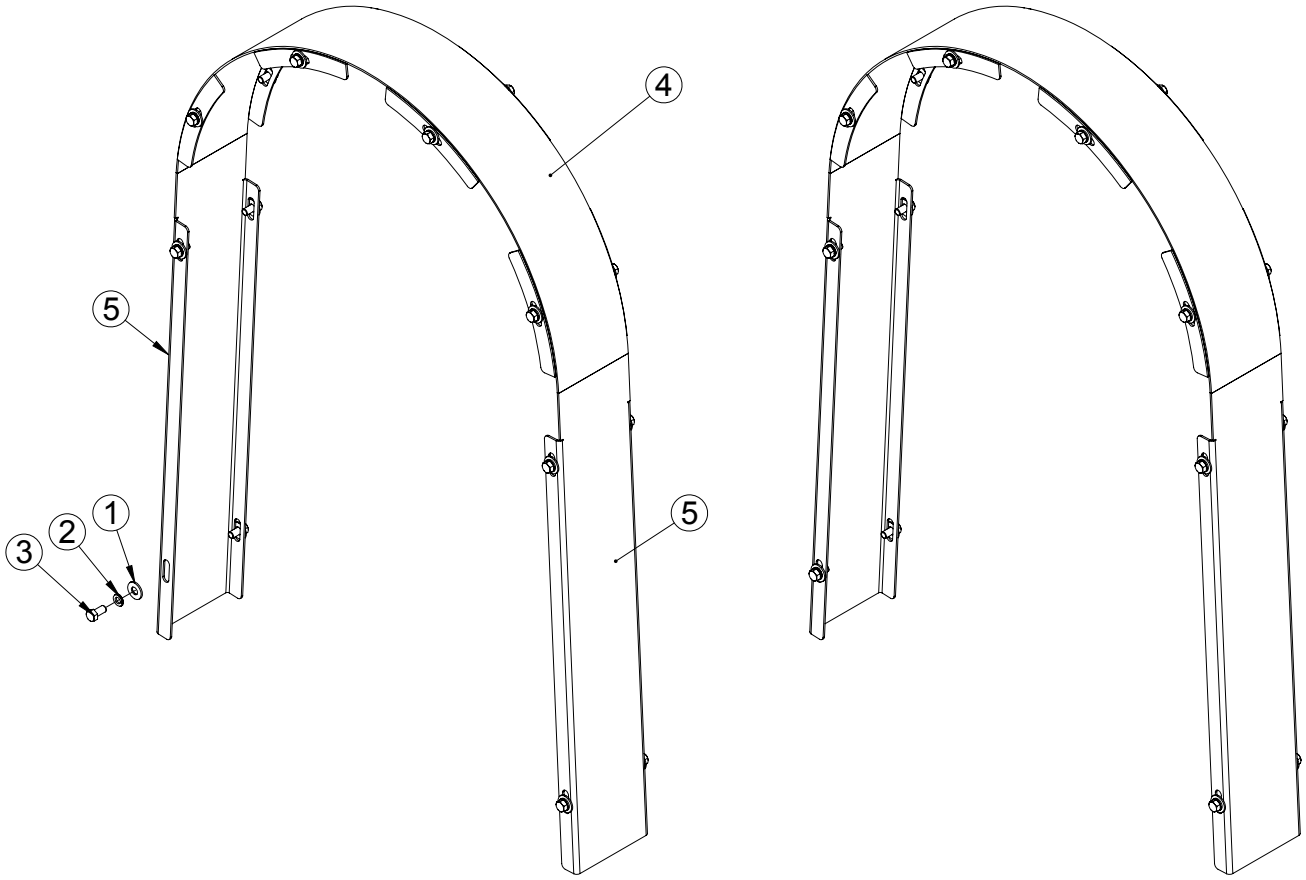
Item #	Qty.	Part Number	Part Name
1	1	206-2000	BEARING CAP
2	4	1002	1/8 NPT ZERT

208-2000
Hydraulic Hub Assembly



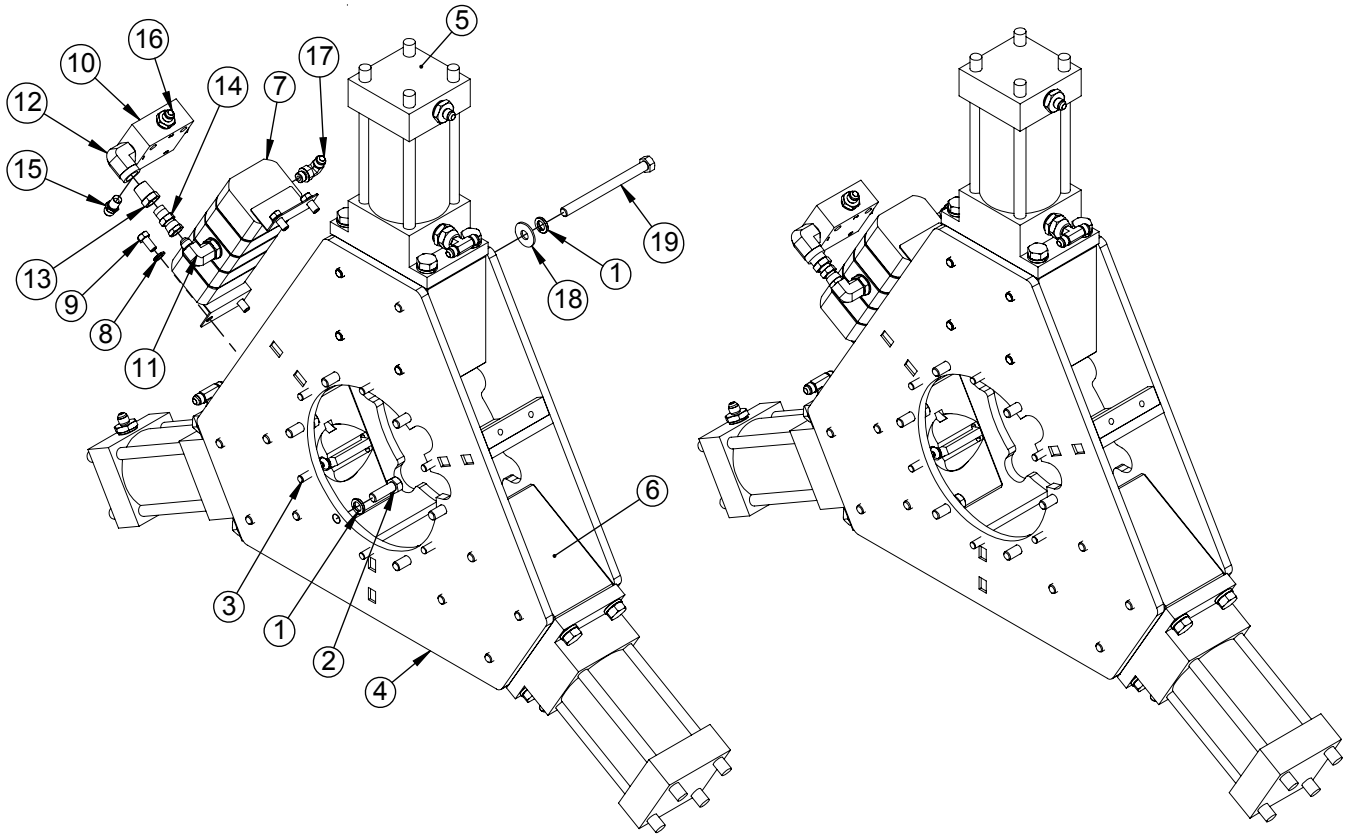
Item #	Qty.	Part Number	Part Name
1	4	1309	DOWELL PIN 3/8" x 1-1/4"
2	2	1765	1/4" NPT FLUSH PLUG
3	1	201-2000	HYDRAULIC HUB
4	1	203-2000	DRIVE SPROCKET
5	4	249	1/2"-13 X 2" SHCS

220-2000
Headstock Housing Cover Assembly



Item #	Qty.	Part Number	Part Name
1	16	1025	3/8 FLAT WASHER
2	16	1027	WASHER, LOCK 3/8"
3	16	1046	HHCS 3/8-16 X 3/4
4	1	218-2000	TOP HEADSTOCK COVER WELDMENT
5	2	219-2000	HEADSTOCK SIDE COVER

210-2000
Headstock Centering Head Assembly



ITEM	QTY	P/N	DESCRIPITION
1	22	1103	LOCKWASHER 1/2" GR8
2	6	1112	HHCS 1/2"-13 X 1 1/2" GR8
3	6	1309	PIN DOWEL 3/8 x 1 1/4
4	1	211-2000	HEADSTOCK CENTERING HEAD WELDMENT
5	3	309-2000	HYDRAULIC CLAMP CYLINDER ASSEMBLY
6	3	310-2000-S3	CYLINDER BLOCK
7	1	250-977A	MODIFIED FLOW DIVIDER
8	4	1027	LOCKWASHER 3/8" GR8
9	4	1046	HHCS 3/8"-16 X 3/4" GR8
10	1	BUC5524-01	PILOT OPERATOR CHECK VALVE (3000 PSI ONLY)
11	1	6801-NWO-6-10	5/8" MORB X 3/8" MJIC 90
12	1	1451	ADAPTER, 1/2 IN STREET EL
13	1	1491	REDUCER BUSHING 1/2" X 3/8"
14	1	6-6F6X-S	3/8 MNPT X 3/8 FJIC SWIVEL ADAPTER
15	1	1559	3/8 MJIC X 1/4 MNPT STRAIGHT
16	1	6-8FTX	1/2" MNPT X 3/8 MJIC
17	4	1687	3/8 M O-RING x 3/8 MJIC 90 DEGREE
18	16	1102	FLATWASHER 1/2" GR8
19	16	X2-26	HHCS 1/2"-13 X 6" GR8

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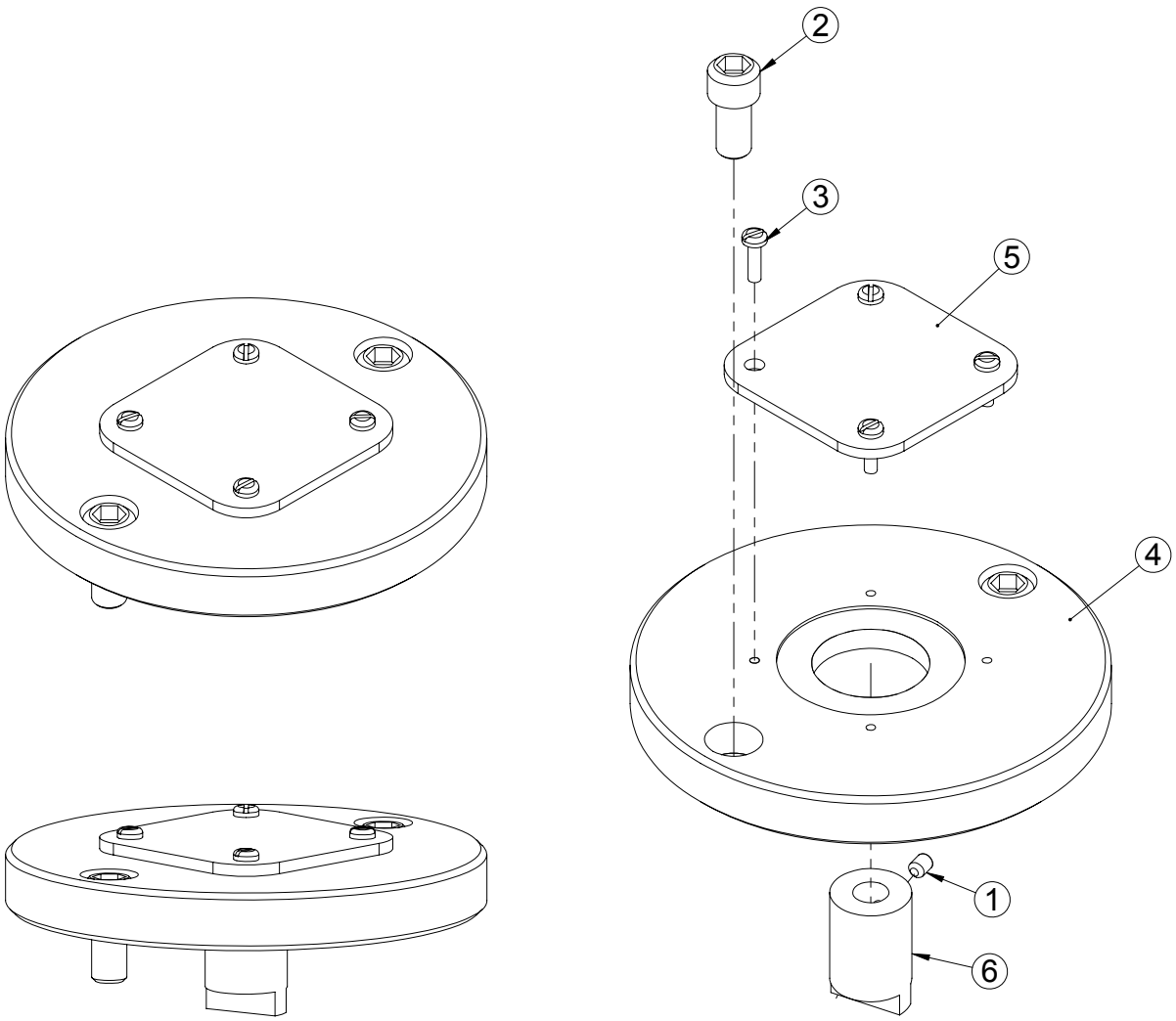
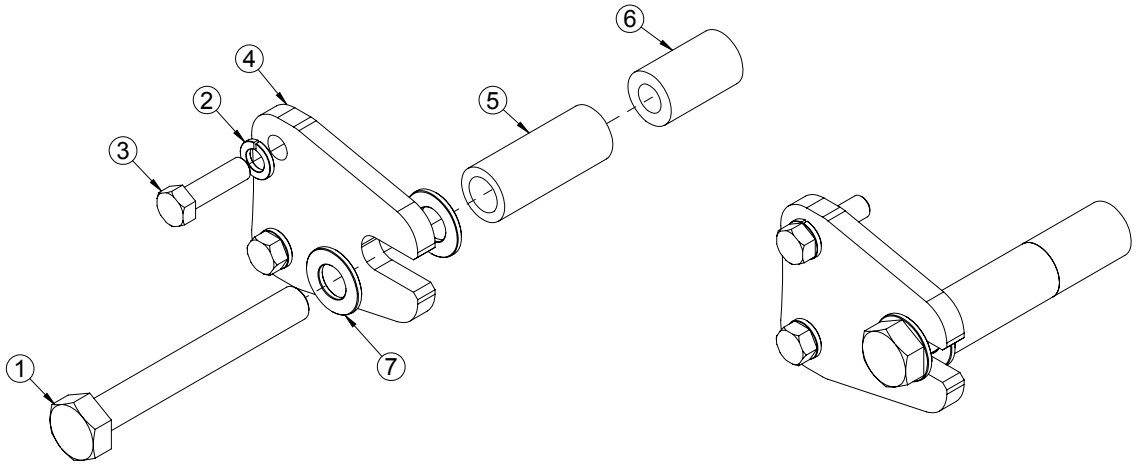
230-2000
Encoder Mount Assembly



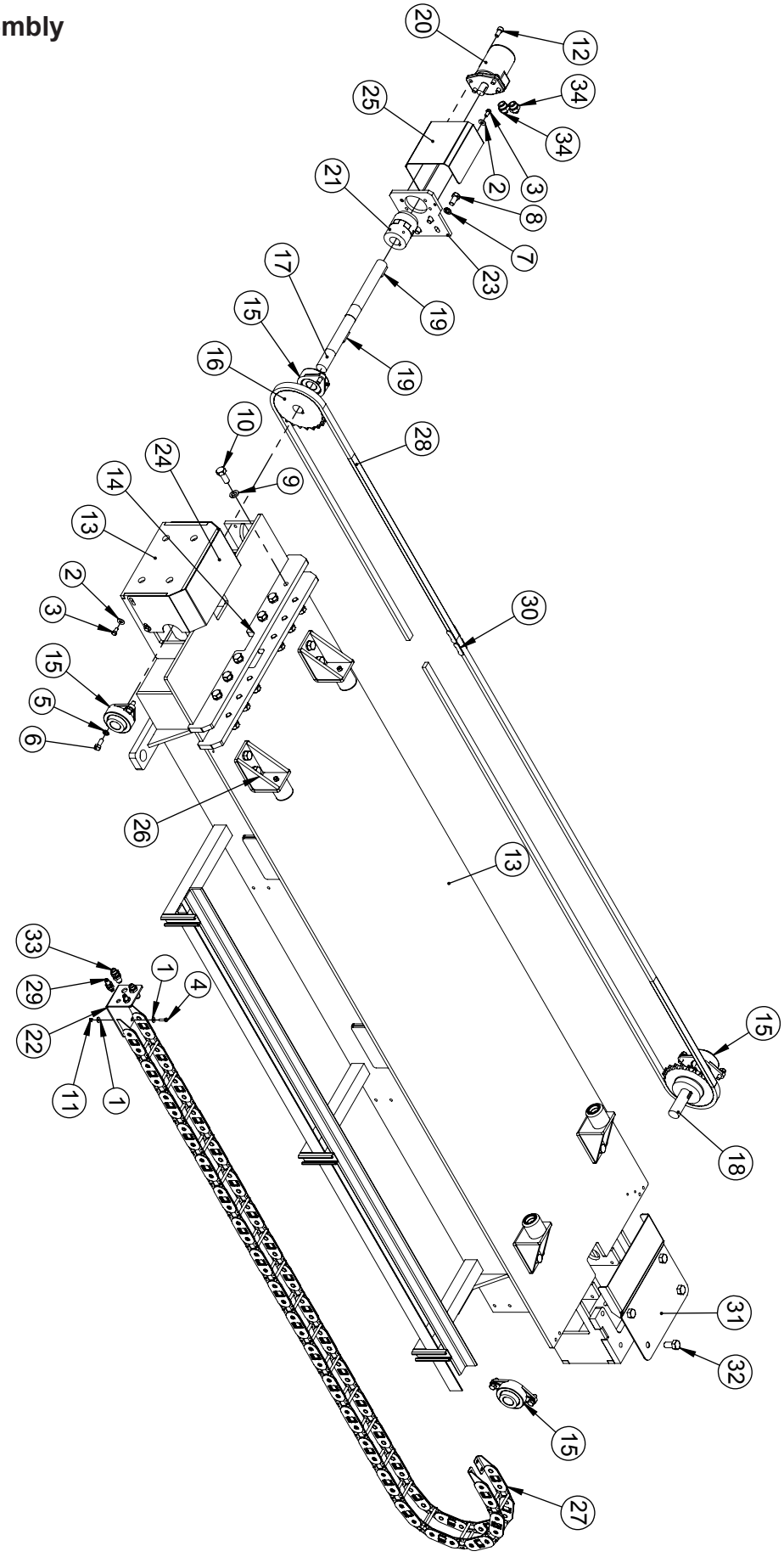
Item #	Qty.	Part Number	Part Name
1	1	1034	#10-32 X 1/4" SET SCREW
2	2	1040-A	3/8-16 x 3/4 SHCS
3	4	1276-B	#6-32 X 3/8" MACHINE SCREW
4	1	230-2000-S1	ENCODER MOUNTING PLATE
5	1	40034	COVER PLATE
6	1	55144-03	ENCODER COUPLING

2700-2009
Swivel Keeper Assembly

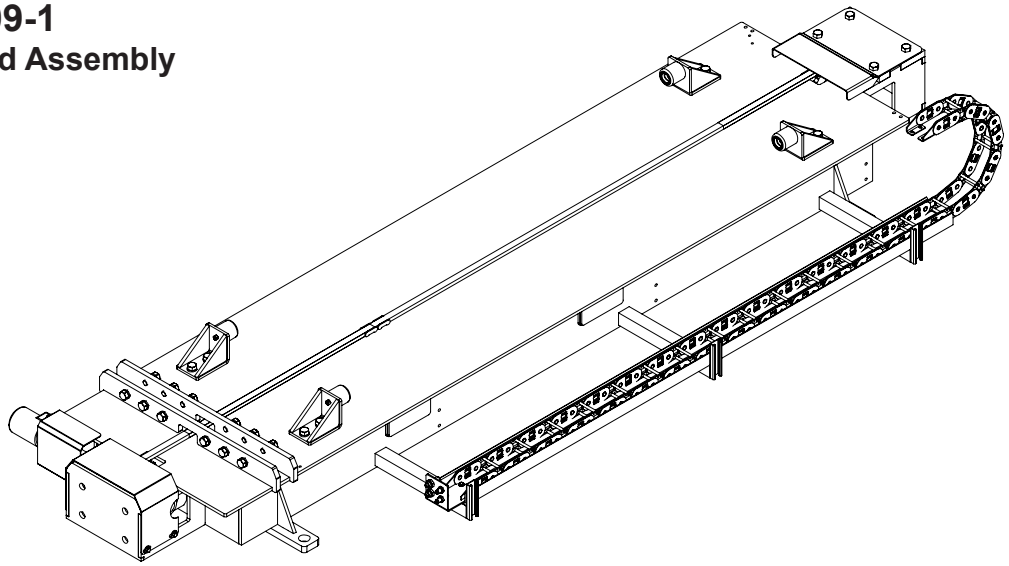


Item #	Qty.	Part Number	Part Name
1	1	1088	3/4-10 x 6" HHCS (1174)
2	2	1103	1/2" LOCKWASHER
3	2	171	1/2"-13 x 1 3/4" HHCS
4	1	2700-2009-S1	SWIVEL KEEPER PLATE
5	1	2700-2009-S3	SWIVEL SPACER TUBE
6	1	2700-2009-S2	SWIVEL KEEPER ANCHOR
7	2	280-A	3/4" FLATWASHER

500-2009-1
10 ft. Skid Assembly

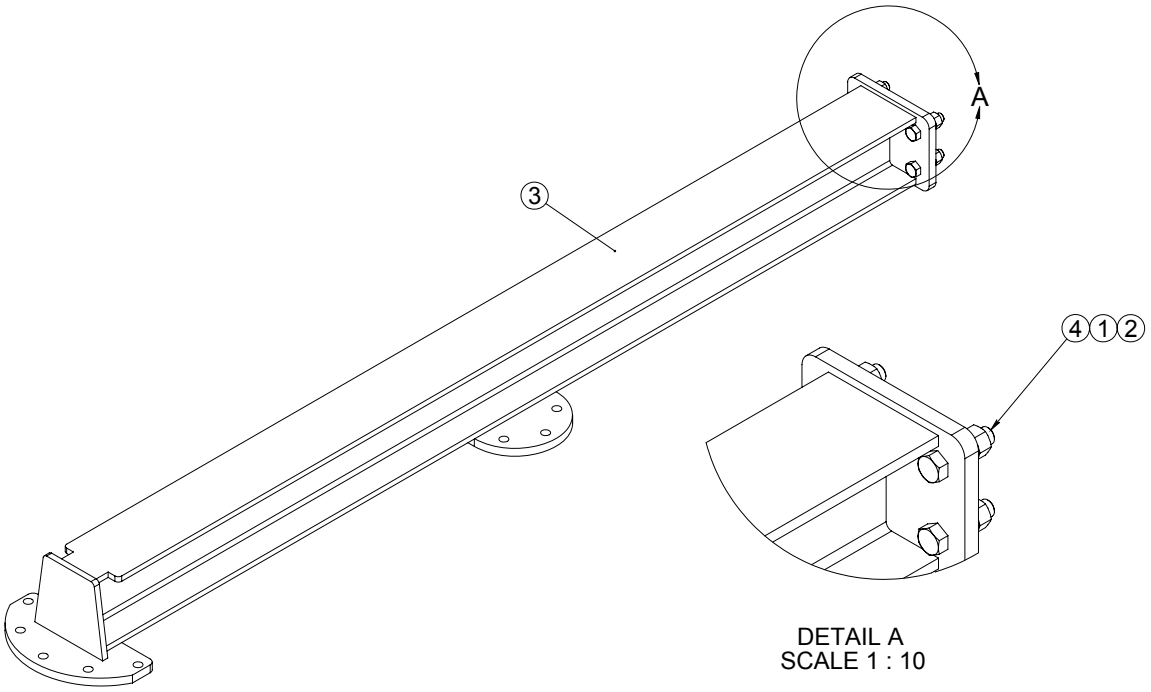


500-2009-1
10 ft. Skid Assembly



ITEM	QTY	P/N	DESCRIPITION
1	4	1008-B2	FLATWASHER 1/4" GR8
2	6	1025	FLATWASHER 3/8" GR8
3	6	1046	HHCS 3/8"-16 X 3/4" GR8
4	2	105	HHCS 1/4"-20 X 1" GR8
5	8	1103	LOCKWASHER 1/2" GR8
6	8	1111	HHCS 1/2"-13 X 1 1/4" GR8
7	4	1151	LOCKWASHER 5/8" GR8
8	4	1156	HHCS 5/8"-11 X 1 1/4" GR8
9	12	1171	LOCKWASHER 3/4" GR8
10	12	1173	HHCS 3/4"-10 X 1 3/4" GR8
11	2	212	NYLOCK NUT 1/4"-20 GR8
12	4	246	SHCS 1/2"-13 X 1" ALLOY GRADE
13	1	500-2009	RP2000 10' SKID WELDMENT
14	2	506-2009	TONG MOUNT PLATE
15	4	508-3000	1 1/2" BEARING
16	2	509-3000	TRAVEL SPROCKET
17	1	510A-3000	TRAVEL SPROCKET SHAFT
18	1	510B-3000	TRAVEL SPROCKET SHORT SHAFT
19	3	510C-3000	TRAVERSE SPROCKET KEY
20	1	511-3000	TRAVEL MOTOR
21	1	515-3000	1 1/2" X 1" FLEIXABLE SHAFT COUPLING
22	1	522-3000-05	PINCH ROLLER FIXED BULKHEAD
23	1	529-3000	MOTOR MOUNT PLATE
24	1	530-3500	SPROCKET COVER
25	1	531-3500	COUPLING COVER
26	4	540-3000-02	BUMPER ASSEMBLY
27	1	550C-3000-05	SKID METAL HOSE TRACK
28	3	556-7000	10' TRAVEL CHAIN
29	2	6WTX-WLN-S	3/8 MJIC X 3/8 MJIC BULKHEAD CONNECTOR WITH LOCK NUT
30	2	80CL	LINK, MASTER SAME AS 527A-6500
31	1	501-2009-1	COVER PLATE
32	4	1201	HHCS 3/4"-10 X 1 1/2" GR8
33	2	8WTX-WLN-S	1/2" MJIC X 1/2" MJIC BULKHEAD FITTING
34	2	6-12_f5ox-s	3/8" MJIC X 3/4" ORING

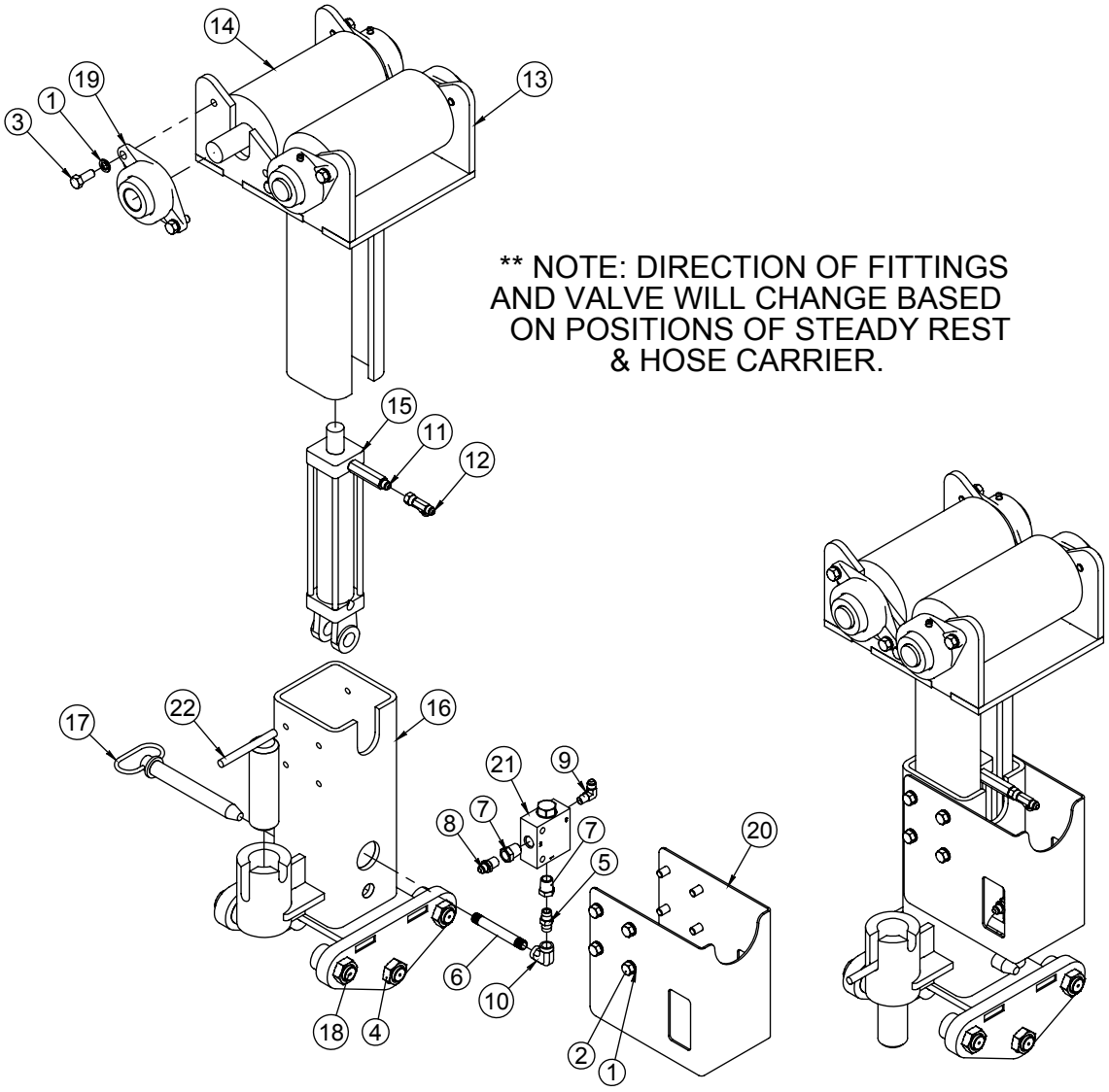
1750-3000-1
10ft Extension Beam Assembly



DETAIL A
SCALE 1 : 10

Item #	Qty.	Part Number	Part Name
1	4	1210	1"-8 NUT GR. 8
2	4	1218	1" LW
3	1	1750-3000	10' HEADSTOCK EXTENSION BEAM WELDMENT
4	4	74053	1"-8 X 3 3/4" HHCS

900-4000-1
Support Stand Assembly

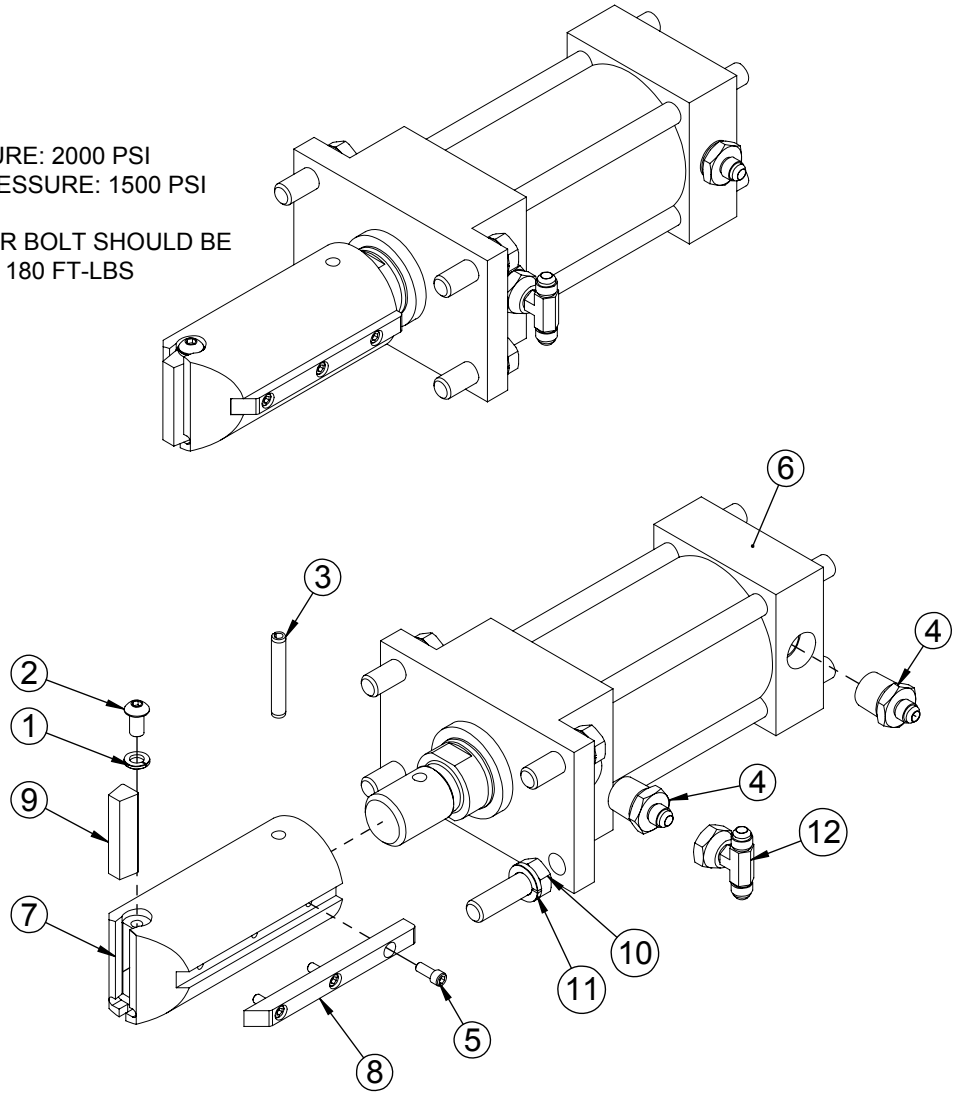


Item #	Qty.	Part Number	Part Name
1	16	1103	1/2" LOCKWASHER
2	8	1110	1/2"-13 x 1" HHCS
3	8	1111	1/2"-13 x 1 1/4" HHCS
4	6	1323	1-14 NYLOCK JAM NUT (1323)
5	1	1457	3/8" HEX NIPPLE
6	1	1488	3/8" X 4-1/2" PIPE NIPPLE
7	2	1491	REDUCER BUSHING 1/2" X 3/8"
8	1	1570	3/8" MNPT X 3/8" MJIC STRAIGHT
9	1	1576-A	1/4" MNPT x 3/8" MJIC ELBOW
10	1	1580	90 3/8" F X F NPT
11	1	2404-LL-06-06	3/8" MJIC X 3/8" MNPT ST. EXTRA LONG
12	1	6 R6X-S	3/8" FJIC X 3/8" MJIC RUN TEE
13	1	901-3000	TOP SUPPORT WELDMENT
14	2	901A-3000-1	RED ROLLER
15	1	901D-3000-2	2" BORE CYLINDER WITH 8" STROKE
16	1	902-4000	BOTTOM SUPPORT WELDMENT
17	1	902B-3000-1	1" X 7 3/4" HITCH PIN
18	6	902D-3000-1	1 3/4" CAM FOLLOWER W/ 1" STUD
19	4	508-3000	1 1/2" SUPPORT STAND BEARING
20	1	905-3000	SUPORT STAND VALVE COVER
21	1	BUC5524	PILOT OPERATOR CHECK VALVE
22	1	9112-7000-01	LOCKING PIN WELDMENT

309-2000
Hydraulic Clamp Cylinder Assembly

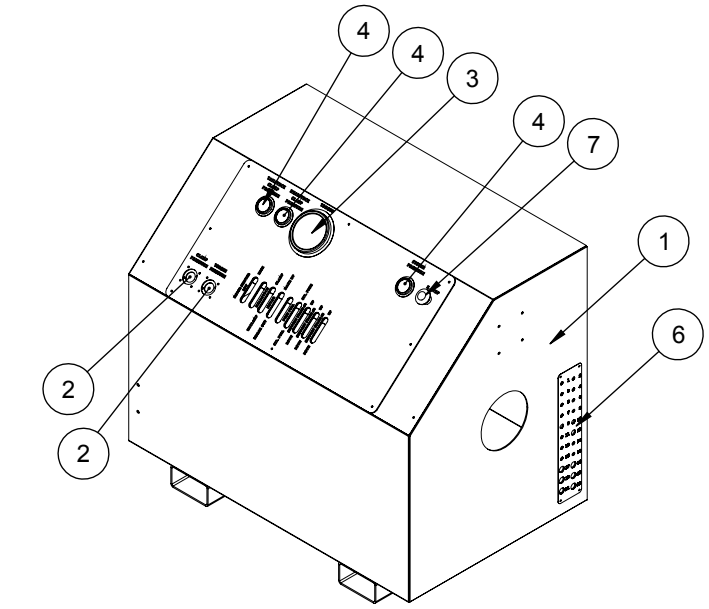
NOTE:
TEST PRESSURE: 2000 PSI
WORKING PRESSURE: 1500 PSI

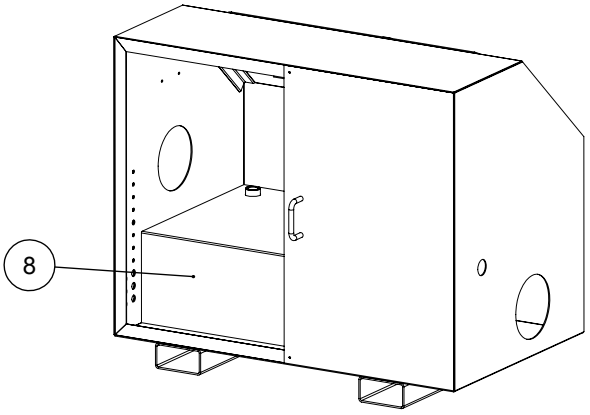
JAW RETAINER BOLT SHOULD BE TORQUED TO 180 FT-LBS



ITEM	QTY	P/N	DESCRIPITION
1	1	1027	LOCKWASHER 3/8" GR8
2	1	1061	BHCS 3/8"-16 X 3/4" ALLOY GRADE
3	1	1104-A	ROLLED PIN 3/8" X 2-1/2"
4	2	1494-A	STRAIGHT ADAPTER 3/4" MNPT X 3/8" MJIC
5	3	291	SHCS 1/4"-20 X 5/8"
6	1	311-2000	3.25" BORE X 4.25" STROKE
7	1	312-2000	8" LONG
8	1	313-2000	JAW HOLDER KEY
9	1	314-2000	DOVETAIL STRIP DIE 5/8"T X 5/8"W X 2 1/2"L
10	4	1160	HHCS 5/8"-11 X 2" GR8
11	4	1151	LOCKWASHER 5/8" GR8
12	1	6600	3/8" MJ-MJ-FJ SWIVEL TEE

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

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TROUBLE SHOOTING

HYDRAULIC SYSTEM

Hydraulic Pump Making Excessive Noise:

Problem	Solution
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:

Problem	Solution
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	Solution
A) Shortened bearing life	Check alignment, insure proper lubrication to non-sealed bearings.

Slow Tong Speed:

Problem	Solution
A) Restricted supply line	Verify proper hi/low speed setting. Clear supply line and check intake on reservoir.
B) Low fluid level	Add fluid to proper volume.
C) Air leak	Locate and repair leak.
D) Pump speed insufficient	Assure proper pump speed for application.
E) Damaged or worn equipment	Isolate pump and check pressure to determine whether motor or pump is defective. Repair or replace defective part.
F) Pump not primed	Check fluid viscosity and restrictions of intake line. Replace fluid if inadequate for operating temperature.
G) Low or no flow from supply line	Check to assure couplings are securely fastened.

Insufficient Torque:

Problem	Solution
A) Relief valve malfunctioning	Relief set too low, broken valve spring, contamination or defective seals.
B) Damaged or worn pump parts	Inspect, repair or replace.
C) Slow pump speed	Assure proper pump speed for application.
D) Improper system fluid	Check fluid viscosity and replace fluid if inadequate for operating temperature.
E) Directional control valve set improperly	Check relief and directional control valve. Neutral should return slightly to reservoir.
F) Damage to motor	Inspect, repair or replace.
G) Restriction of supply line, excessive back pressure	Check to assure couplings are securely fastened.
H) Defective gauge or load cell	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:

	Problem	Solution
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:

	Problem	Solution
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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