

# ARCH•MASTER™

## OPERATIONS & SAFETY MANUAL



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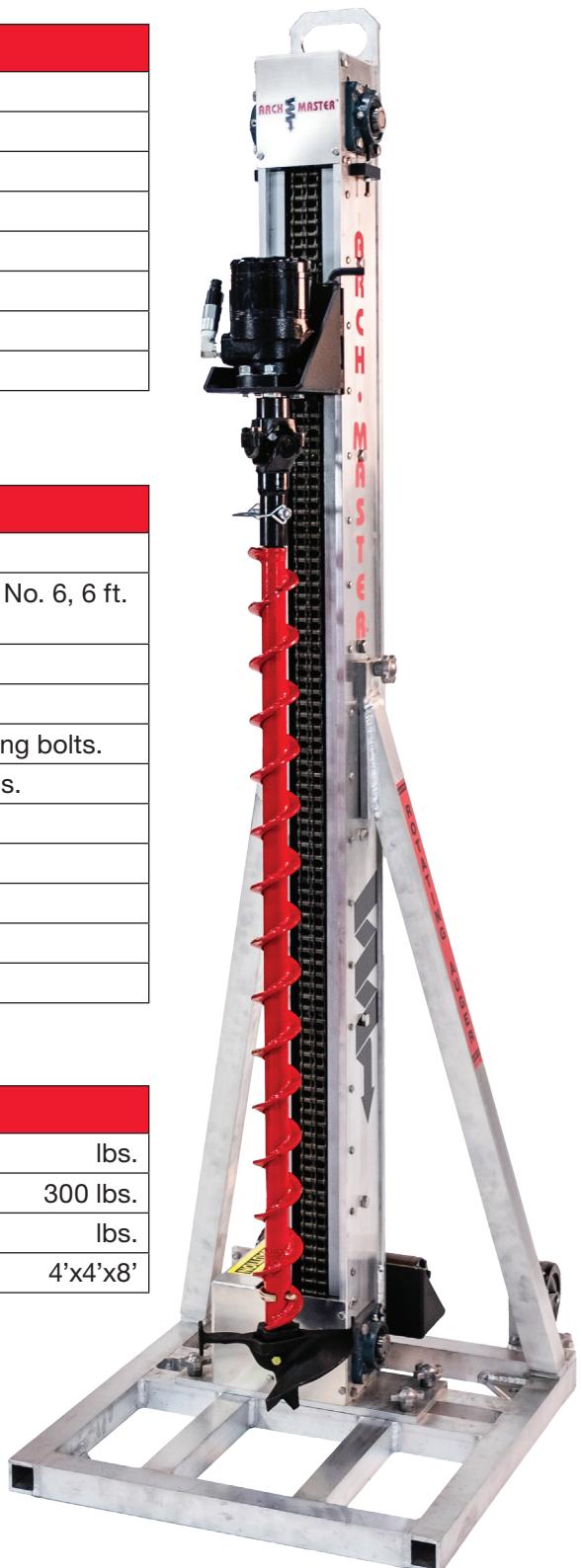
27815 State Route 7  
Marietta, Ohio 45750 USA  
(800) 322-6653 • (740) 374-6726  
FAX: (740) 374-5908

## SPECIFICATION & EQUIPMENT LIST

HYDRAULIC PUMP	
Type	Sealed-Dripless Motor
Approximate Weight	235 lbs.
Approximate Dimensions	21" x 36" x 18"
Power Output	5HP
Required Power Source	240/480 volt, 60 Hz
RPM	1,800
Pump Reservoir Capacity	10 gallons
Pump Output	6.1 gal/min

EQUIPMENT LIST	
1.	Self-contained hydraulic pump unit.
2.	Hydraulic control valves mounted on a portable panel with No. 6, 6 ft. hydraulic control hoses.
3.	Arch•Master™ mast structure with hydraulic chain drive.
4.	Two mast support braces with four wing bolts.
5.	Equipment base with two roller bearing wheels and four wing bolts.
6.	Hydraulic auger head motor assembly with two locking pins.
7.	pieces of 3" x 4' auger with locking pins.
8.	No. 2, 5' of hydraulic auger control hoses.
9.	Auger slide plate with locking bolt.
10.	auger cutting bit(s).
11.	Under-roof mounting bar with all thread bolts.

SHIPPING INFORMATION	
Equipment Weight	lbs.
Crating for Shipping, Weight (approx.)	300 lbs.
Total Shipping Crate Weight (approx.)	lbs.
Total Shipping Crate Size	4'x4'x8'



**ARCH•MASTER™ WEIGHTS**

QTY.	ITEM	EACH (LBS)	TOTAL (LBS)
1	Main Mast	225	225
1	Drill Head	50	50
2	Drill Head Mounting Pins	.5	1
1	Base Frame	34	34
2	Side Mast Supports	8	16
8	Hand Tighten Bolts	.25	2
1	Under Roof Mounting Bar	5	5
2	5' Hydraulic Hose	3	6
6	6' Hydraulic Hose	4	24
1	4' - 3" Auger	23	23
1	Auger Clip	.2	.2
1	Drill Head Auger Pin	1	1
1	6" Auger Bit	7	7
1	3" Auger Bit	4	4
1	3" Carbide Auger Bit	4	4
1	Slide Plate	17	17
1	50 HP 10 gal. Hydraulic Power Unit	234	234
1	Control Valve Bank	47	47
	<b>TOTAL WEIGHT</b>		<b>700.2</b>

## ARCH•MASTER™ ASSEMBLY

1. With the equipment base on the ground, stand the mast onto the base making sure it is facing the correct direction. The front of the mast, or the open side, should face away from the wheels on the base.
2. Install four wing bolts through the bottom of the mast into the base, but do not tighten.
3. Fit the two mast braces into place.
4. Install four wing bolts into mast and base and tighten.
5. With the mast and base assembled, place the hydraulic auger head motor on the mast and drive the set pins in place to secure the motor.
6. When cutting or drilling a hole for the Arch•Master™, make sure the hole is as close as possible to being over the bottom discharge opening; this is necessary for the best possible flow capabilities.
7. The minimum required opening for the Arch•Master™ is 4" diameter for 3" bit, 8" diameter for the 6" bit, and 12" diameter for the 10" bit.
8. When the Arch•Master™ is in place, drill two holes and install 2 cinch-anchors through the base to keep the Arch•Master™ from rotating during use.



## SET-UP OF HYDRAULIC LINES FOR ARCH•MASTER™

1. Connect one 6 ft. pair of hydraulic lines to the power unit and the valve manifold. NOTE: These lines cannot be hooked up wrong unless the quick coupler has been changed AFTER leaving the factory.
2. Connect one 24 in. pair of hydraulic lines to the valve with spring center (valve handle will NOT stay in forward or reverse position). Connect the other ends to the flow relief control block. DO NOT connect them to the discharge side of the flow controls valves. (Flow controls are used to adjust the up and down speed on the auger lift motor).
3. Connect one 5 ft. pair of hydraulic lines to the auger drive motor and to the quick couplers on top of the Arch•Master™ mast so as to make a loop in the hose.
4. Connect one 6 ft. pair of hydraulic lines to the flow controls valves and the hydraulic motor on the bottom of the Arch•Master™ unit.
5. Connect the last 6 ft. pair of hydraulic lines to the valve with a 3-position Detent (the control valve handle will stay in forward or reverse position) and to the bottom of the solid hydraulic lines that are mounted on the back near the bottom of the Arch•Master™ mast.
6. Turn pump on - check unit for leaks.

### HYDRAULIC PARTS LIST

1 each	Hydraulic Unit
1 each	Valve Manifold
3 sets	6' Hydraulic Lines
1 set	5' Hydraulic Lines
1 set	24" Hydraulic Lines



## OPERATION OF THE ARCH•MASTER™

The operation of the Arch•Master™ should always follow all standard safety rules and precautions for the maximum safety of the operating personnel. For maximum safety and efficiency, the Arch•Master™ should have two operators.

1. The Arch•Master™ must be secured to the silo roof. With the auger drive motor in the up position, attach an auger to the drive motor. NOTE: For ease of adding or removing augers, a quick pin is used to attach the auger to the auger motor.
2. Lower the auger into the hole and slide the auger plate into the precut groove in the top of the auger, and rest the auger on the plate.
3. Remove the quick pin from the auger and raise the auger drive motor to the top of the mast.
4. Insert an auger onto the piece resting on the auger plate, be sure to line up the drill pattern and the locking pin holes, and insert a locking pin.
5. Lower the auger head motor, CAREFULLY, into the auger, turning the auger motor shaft to line up the bolt holes on the motor and auger. Insert the bolt and tighten nut. Raise the auger assembly and remove the auger plate.
6. Repeat this process till the auger reaches the top of the non-flowing material, go slowly downward in order for the bit to cut into the built up material. If you proceed too quickly, the auger will deviate and not cut a straight hole and may "bind". Add additional auger sections as needed.
7. While cutting into the material, continue to work the auger up and down while it is spinning in order to develop a good flow channel and to keep the material from falling back into the hole and binding the auger.
8. Lower the whole assembly and repeat this process to the bottom of the storage bin. Calculate the storage bins straight wall height and have the correct amount of 4 ft. augers available so as to prevent damage to the bottom of the bin and to the Arch•Master™ unit.

## MAINTENANCE & LUBRICATION FOR THE ARCH•MASTER™

The Arch•Master™ routine maintenance and lubrication schedule is essential for the long life and maximum performance of the equipment and operator safety.

1. There are 5 greased fittings on the Arch•Master™; 4 are located on the top and bottom mast bearings; 1 is located on the universal joint on the auger motor.
2. The mast, chain, and motor assemblies on the Arch•Master™ should to be kept clean and free of dust and dirt at all times.
3. The chain should be blown off with air periodically to keep it clean and free of dust and dirt.
4. The chain tension should be checked every 500 hours of service and tightened if needed.
5. The hydraulic lines to the rotating auger motor should be checked for wear every 500 hours for service.
6. The hydraulic pump oil filter should be changed every 500 hours of service. The hydraulic fluid in the reservoir should be changed every 2000 hours of service. Replacement filters are SPE-15-10 (LHA) or equivalent 10 micron filter. Hydraulic fluid is Shell Tullus 32 or equivalent.
7. All hydraulic fittings and couplers should be kept clean, covered, or capped when not in use.

## TECHNICAL INFORMATION FOR THE ARCH•MASTER™ DRILL

### 1 Overall Equipment Dimensions and Weight

The Arch•Master™ drill is constructed of both aluminum and steel to provide the greatest strength and durability along with light weight to provide portability. The base of the unit measures 28" x 28" (72cm x 72 cm) and can easily operate over openings as large as 30" (76cm) in diameter. The overall height of the unit is 7'7" (2.4M), with the mast having nominal width of 12". (30.5cm)

### 2 Drilling Auger

The Arch•Master™ utilizes a special duty 3" (8cm) diameter steel auger. The unit is capable of drilling to depths of up to 150 feet (46M) through hardened material. The 3" auger can be fitted with larger diameter flighted cutting tips of 6" (15cm), 8" (20cm) or 10" (25cm) in diameter.

### 3 Roof Openings

The minimum circular roof opening required for the Arch•Master™ is 4" (10cm). The minimum square opening is 3" x 3" (8cm x 8cm).

### 4 Hydraulic Power Unit

The hydraulic power unit utilizes a submersible gear-type hydraulic pumping unit with a working pressure of 1,500 (77,575mmHg) - (104 bar) to 2,500 psi (129,290mmHg) - (173 bar). The pump is powered by a 5 hp electric motor of properly rated size.

### 5 Manpower and Set-up

The overall aluminum construction of the unit allows for fast, easy set-up. No hand tools are required, as all assembly is with threaded knobs. The base is also on wheels to allow quick repositioning. The unit can be set up by one man in fifteen minutes, however, operation is a two-man job to raise and lower the drill strongly and install/remove auger sections.

## ARCH•MASTER™ WARRANTY

### **Limited One-Year Warranty**

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For a period of one year from the original date of purchase, Mole•Master Services Corporation will service or repair, free of charge, any defect in the construction or workmanship of the Mole•Master Arch•Master™, provided the machine is well maintained, operated, and lubricated according to the instructions in this Operating Manual or as provided during on-site training.

This warranty excludes all hydraulic hoses, the cutting whips, and any other “wear part”, as well as all related shipping expenses.

Mole•Master Services Corporation reserves the right to inspect any defective part and request maintenance records for any warranty claim. All repairs to the unit are to be performed by Mole•Master or, in the case of parts purchased by Mole•Master, the original part manufacturer. In either event, Mole•Master is to be notified of the repair.

Warranty service is available by contacting Mole•Master Services Corporation at 1.800.322.6653 (USA only) or via email at [contact@molemaster.com](mailto:contact@molemaster.com) for a return authorization or consultation.

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REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	AA2000-00 WAS AA1000-00/SP2000-00 WAS SP1000-00	09-10-18	EPP
B	RVSD CONTROL VALVE PART NUMBER	01-08-20	EPP

NOTE:  
1. OPTIONAL HYDRAULIC HOSE ASSEMBLIES ARE AVAILABLE  
25'-0" LGTH ORDER HH0300-1, 50'-0" LGTH ORDER HH0600-1.



ITEM	QTY	PART NO.	DESCRIPTION
8	1	UR1000-00	UNDER ROOF LOCK BAR ASSEMBLY
7	1	SP2000-00	SLIDE PLATE ASSEMBLY
6	1	PU4000-00	POWER UNIT ASSEMBLY
5	1	AA1001-01	DRIVE PIN U-CLIP, 1-1/8" HEX
4	1	CV4100-00	CONTROL VALVE ASSEMBLY
3	1	AM1001-00	ARCH MASTER SUB-ASSEMBLY
2	1	AA2000-00	ARCH MASTER AUGER
1	1	AA1060-00	6" FISHTAIL BIT ASSEMBLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.		APPROVALS	DATE
TOLERANCES ARE: DECIMALS .01 ± XXX ± .005 FRACTIONAL ± 1/16		DRAWN EPP	3-18-13
DO NOT SCALE DRAWING		CHECKED -	-
TREATMENT - ENGR			
FINISH -			
MATERIAL SEE BOM			
SCALE 7/40		CALC WT	ACT WT
		SHEET	1 OF 1

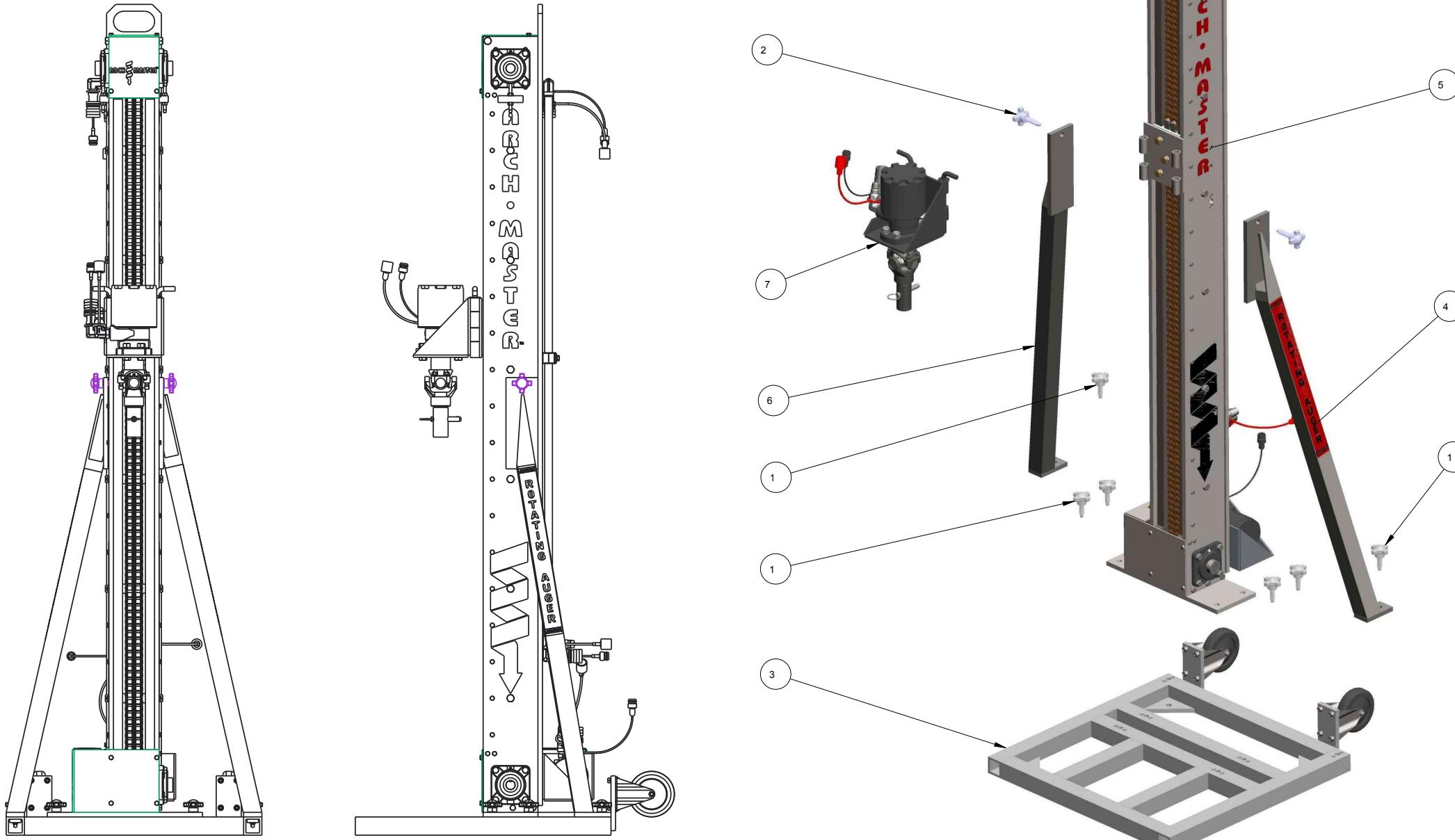
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SERVICES CORPORATION

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MARIETTA, OHIO  
45750 USA  
740-374-6726

ARCH MASTER  
ASSEMBLY

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REVISION HISTORY			
REV	DESCRIPTION	DATE	BY



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE:	
DECIMALS	ANGLES
XX±.01	XX±.005
XXX±.005	FRACTIONAL ± 1/16
DO NOT SCALE DRAWING	
TREATMENT	ENGR
FINISH	-
MATERIAL	SEE BOM

APPROVALS		DATE
DRAWN	EPP	03-18-13
CHECKED		
TREATMENT		ENGR
FINISH	-	
MATERIAL	SEE BOM	

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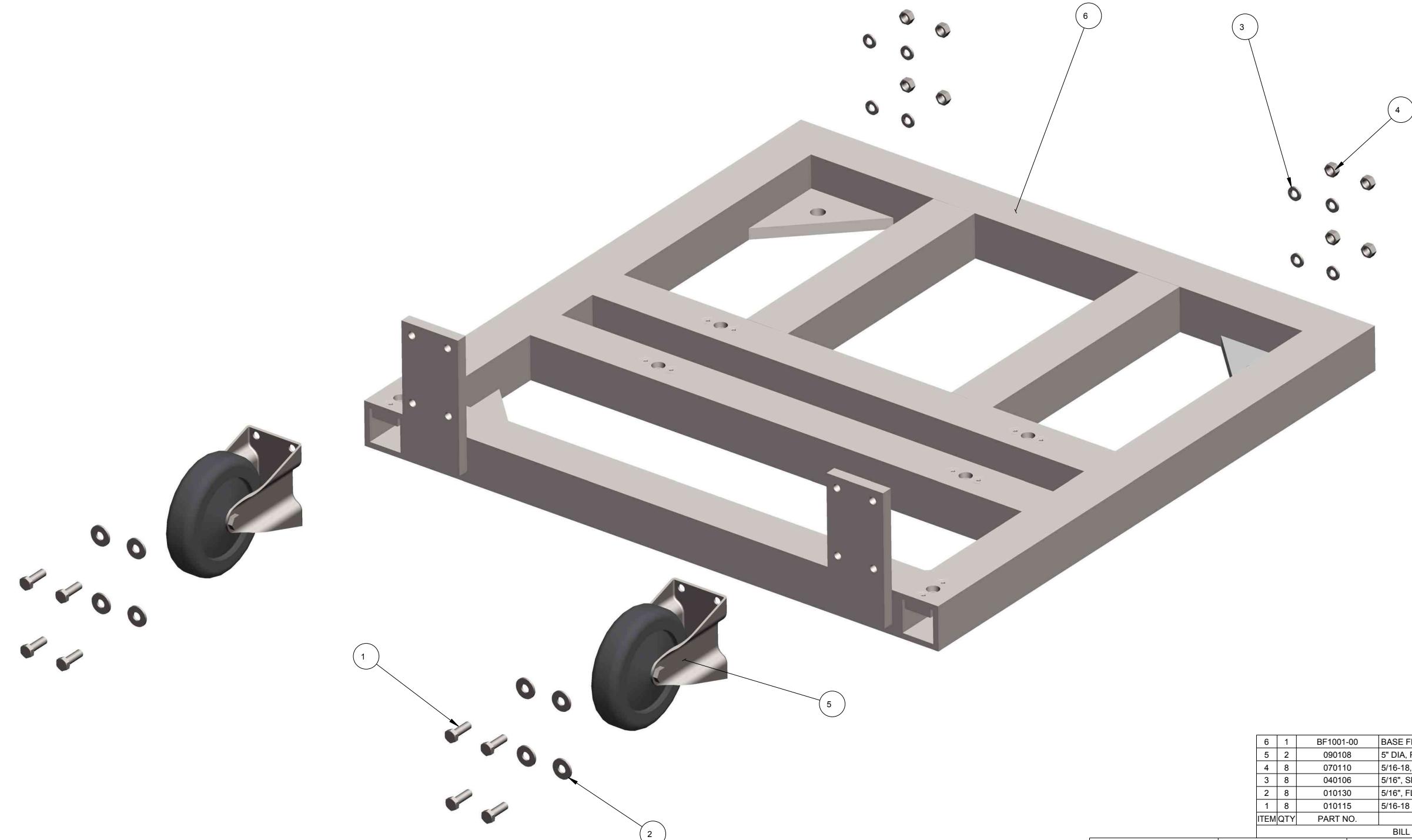
ARCH MASTER  
SUB-ASSEMBLY

SIZE	DWG NO.	REV.
D	PL-AM-2	-

SCALE 3/20 CAL. WT ACT. WT SHEET 1 OF 1

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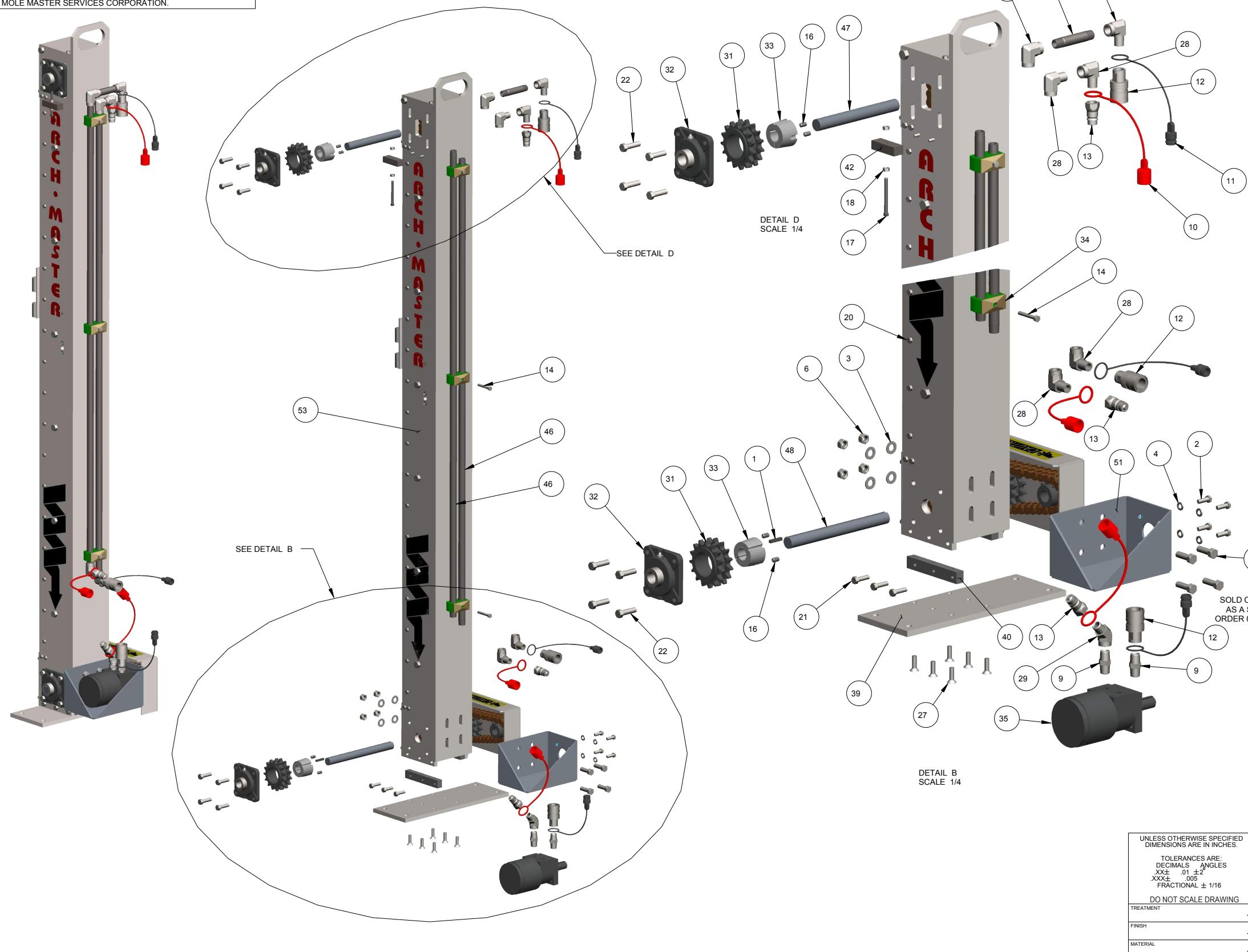
REVISION HISTORY			
REV	DESCRIPTION	DATE	BY



ITEM	QTY	PART NO.	DESCRIPTION
6	1	BF1001-00	BASE FRAME WELDMENT
5	2	090108	5" DIA, RIGID CASTER
4	8	070110	5/16-18, HEX NUT, GRA. A, ZP
3	8	040106	5/16", SPLIT LOCK WASHER, ZP
2	8	010130	5/16", FLAT WASHER, SAE, ZP
1	8	010115	5/16-18 X 1", HHCS, GR. 5, ZP

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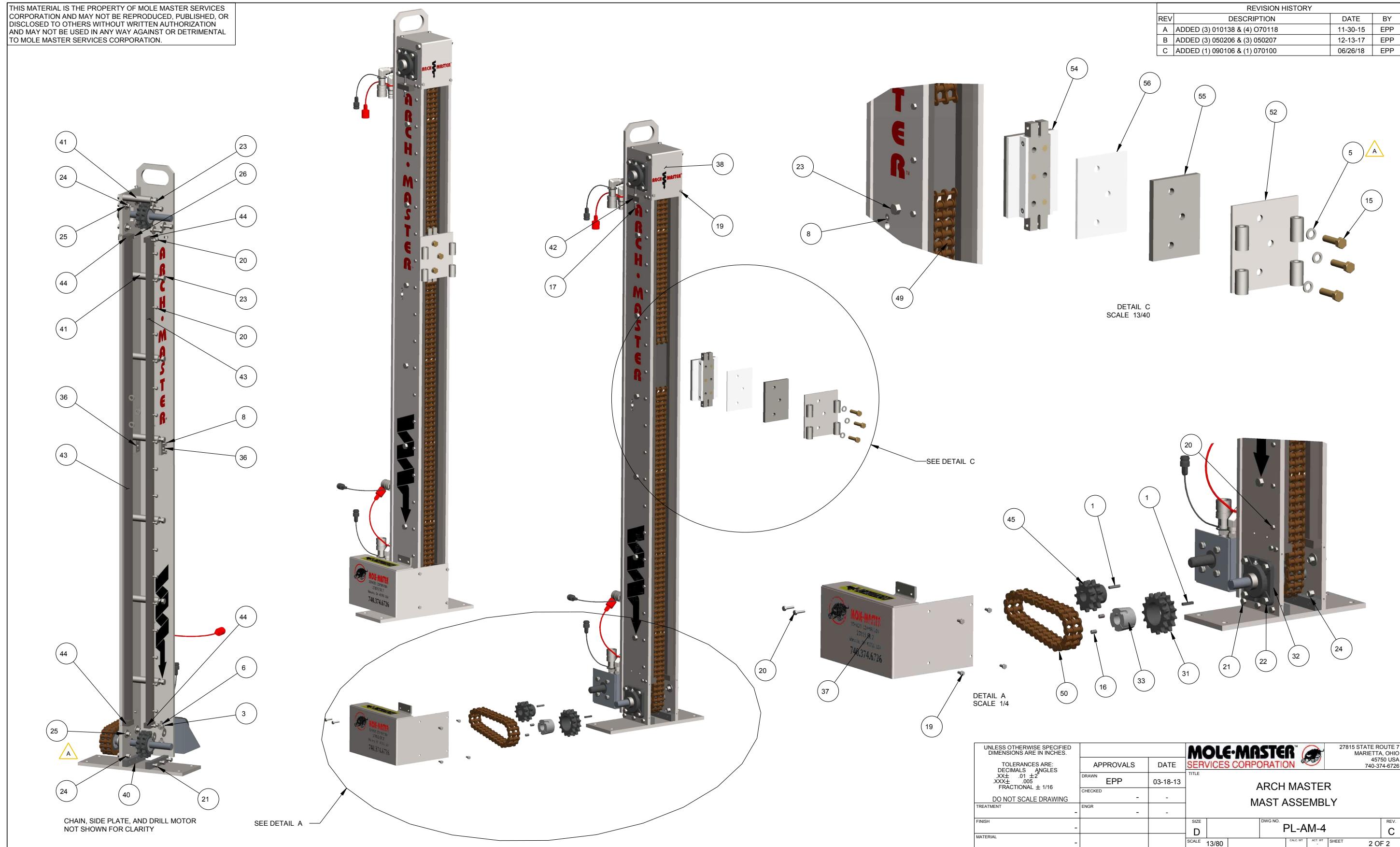
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REV	DESCRIPTION	DATE	BY
A	ADDED (3) 010138 & (4) 070118	11/30/15	EPP
B	ADDED (3) 050206 & (3) 050207	12/13/17	EPP
C	ADDED (1) 090106 & (1) 070100	06/26/18	EPP



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.		APPROVALS		DATE				
DEGREES	ANGLES	DRAWN	EPP	03-18-13				
XX±.01 <sup>+.005</sup>		CHECKED	-	-				
XXX±.005		DO NOT SCALE DRAWING						
FRACTIONAL ± 1/16		TREATMENT	ENGR	-				
		FINISH	-					
		MATERIAL	-					
ITEM QTY		PART NO.	DESCRIPTION					
BILL OF MATERIALS								
MOLE-MASTER™ SERVICES CORPORATION								
27815 STATE ROUTE 7 MARIETTA, OHIO 45750 USA 740-374-6726								
TITLE: ARCH MASTER MAST ASSEMBLY								
SIZE		DWG NO.	PL-AM-4					
REV.			C					
SCALE		13/80	CALC WT	ACT WT	1 OF 2			

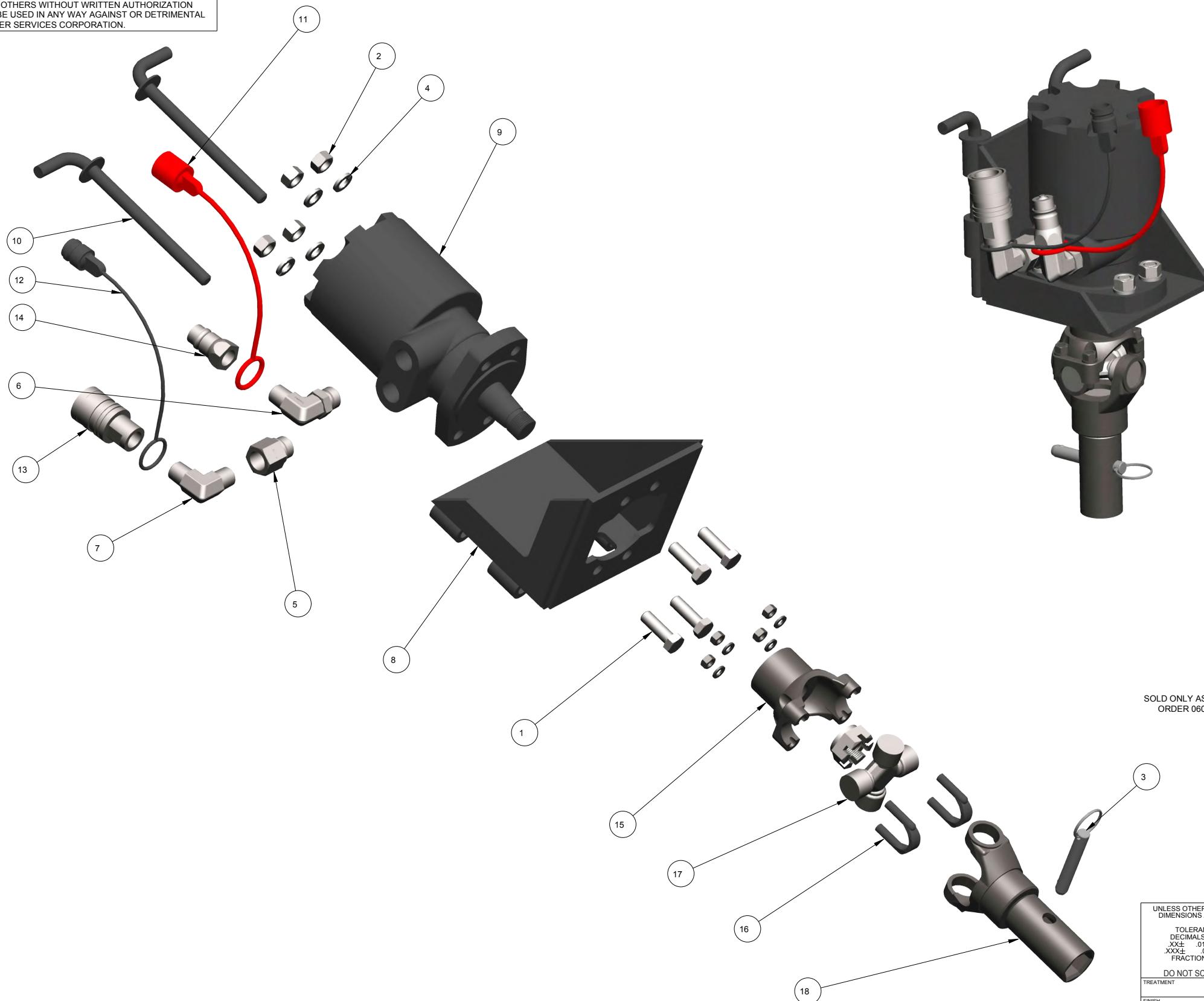
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REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	ADDED (3) 010138 & (4) 070118	11-30-15	EPP
B	ADDED (3) 050206 & (3) 050207	12-13-17	EPP
C	ADDED (1) 090106 & (1) 070100	06/26/18	EPP



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REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	050106 WAS 020110	12-19-16	EPP
B	ADDED 050206 & 050207	12/13/17	EPP



SOLD ONLY AS A SET  
ORDER 060115

ITEM	QTY	PART NO.	DESCRIPTION
BILL OF MATERIALS			
18	1	YW1000-00	YOKE WELDMENT
17	1	090113	U-JOINT
16	1	090110	U-BOLT KIT
15	1	090112	TAPERED BORE END YOKE
14	1	060114	QUICK COUPLER, MALE
13	1	060113	QUICK COUPLER, FEMALE
12	1	050207	PLASTIC SOCKET DUST CAP
11	1	050206	PLASTIC PLUG DUST CAP
10	2	MP1001-00	MOTOR ATTACHMENT PIN
9	1	090116	HYDRAULIC AUGER ROTATION MOTOR
8	1	MM1001-00	AUGER MOTOR MOUNT
7	1	050105	8MP-8MP90, MALE PIPE-MALE PIPE 90° D ELBOW HYD ADAPTER
6	1	050109	10MB-8MP90, MALE O RING BOSS-MALE PIPE 90° D ELBOW HYD ADAPTER
5	1	050106	10MB-8FP, MALE O RING BOSS-FEMALE PIPE STRAIGHT HYD ADAPTER
4	4	010138	1/2", SPLIT LOCK WASHER, ZP
3	1	010158	1/2" X 2-1/2", DETENT RING PIN
2	4	010140	1/2-13, HEX NUT, GR. A, ZP
1	4	010120	1/2-13 X 1-1/2", HHCS, GR. 5, ZP

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.		APPROVALS	DATE
DEGREES	DEGREES	DRAWN	EPP
DECIMALS .01 ± <sup>2</sup> <sub>005</sub>	ANGLES	CHECKED	03-19-13
XXX <sub>±</sub> <sup>2</sup> <sub>005</sub>	FRACTIONAL ± 1/16	DO NOT SCALE DRAWING	-
TREATMENT			TREATMENT
FINISH			FINISH
MATERIAL			MATERIAL
SEE BOM			SEE BOM
SCALE 1/2			SCALE 1/2
CALC WT			CALC WT
ACT WT			ACT WT
SHEET			SHEET
1 OF 1			1 OF 1

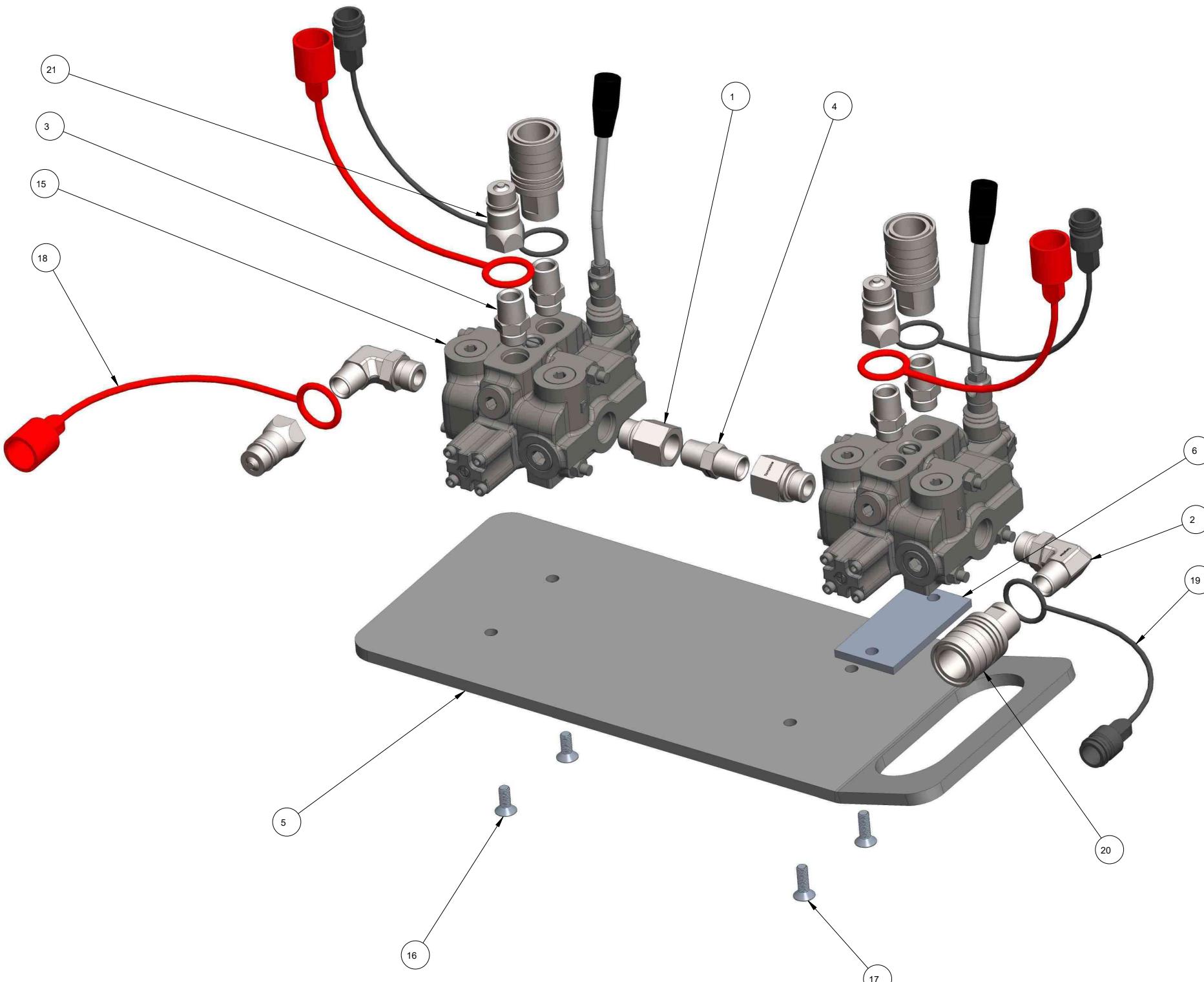
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ARCH MASTER  
ROTATION MOTOR ASSEMBLY

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REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	ADDED (3) 050206 & (3) 050207	12-13-17	EPP
B	RVSD VALVE FROM PARKER TO YOULI	01-08-20	EPP



NOTE:  
 1. APPLY TEFLON TAPE TO ALL PIPE THREAD CONNECTIONS.  
 2. HYDRAULIC HOSE ASSEMBLIES ARE NOT SHOWN FOR CLARITY.  
 3. QUICK COUPLINGS THAT CONNECT TO HYDRAULIC HOSES ARE NOT SHOWN FOR CLARITY.

ITEM	QTY	PART NO.	DESCRIPTION
BILL OF MATERIALS			
21	11	060114	QUICK COUPLER, MALE
20	11	060113	QUICK COUPLER, FEMALE
19	3	050207	PLASTIC SOCKET DUST CAP
18	3	050206	PLASTIC PLUG DUST CAP
17	2	040107	M8 X 1.25 X 25mm FHSCS, ZP
16	2	010160	M8 X 1.25 X 20mm FHMS, ZP
15	2	060119	HYD CONTROL VLV, YOULI 1 SPOOL
14	1	HH0072-1	HOSE ASSY, #8M3K,(2) 8GE-8MP, 72" LGTH
13	1	HH0072-1	HOSE ASSY, #8M3K,(2) 8GE-8MP, 72" LGTH
12	1	HH0120-1	HOSE ASSY, #8M3K,(2) 8GE-8MP, 120" LGTH
11	1	HH0120-1	HOSE ASSY, #8M3K,(2) 8GE-8MP, 120" LGTH
10	1	HH0120-1	HOSE ASSY, #8M3K,(2) 8GE-8MP, 120" LGTH
9	1	HH0120-1	HOSE ASSY, #8M3K,(2) 8GE-8MP, 120" LGTH
8	1	HH0120-1	HOSE ASSY, #8M3K,(2) 8GE-8MP, 120" LGTH
7	1	HH0120-1	HOSE ASSY, #8M3K,(2) 8GE-8MP, 120" LGTH
6	1	CV3300-02	CONTROL VALVE SPACER PLATE
5	1		CONTROL VALVE MOUNTING PLATE
4	1	050102	8MP-8MP, MALE PIPE-MALE PIPE HEX NIPPLE
3	4	020109	8MB-8MP, MALE O RING BOSS-MALE PIPE THREAD HYD ADAPTER
2	2	050109	10MB-8MP90, MALE O RING BOSS-MALE PIPE 90 D ELBOW HYD ADAPT
1	2	050106	10MB-8FP, MALE O RING BOSS-FEMALE PIPE STRAIGHT HYD ADAPTER

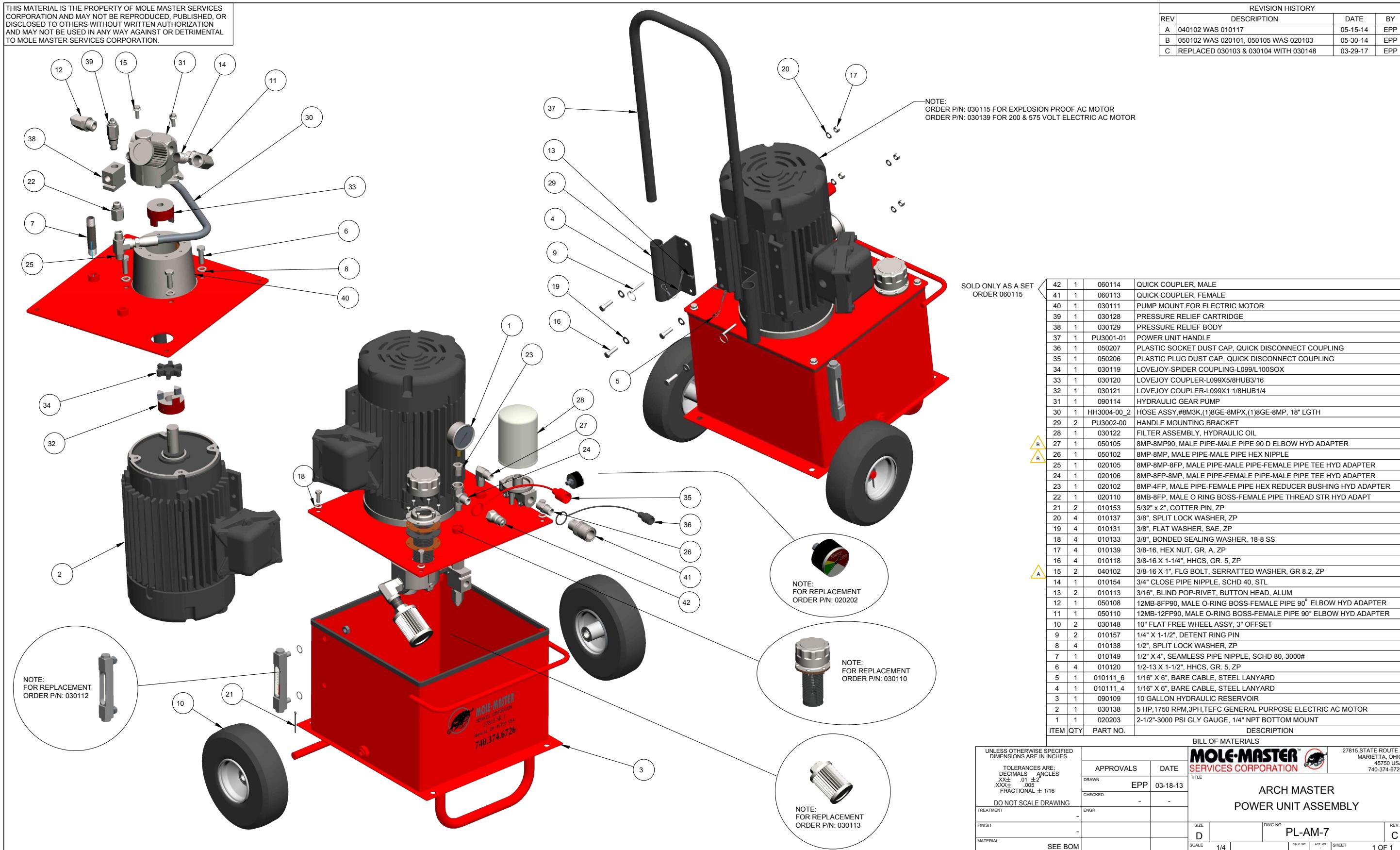
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TOLERANCES ARE: DECIMALS . <sup>01</sup> <sub>.005</sub> ANGLES XX <sub>±</sub> <sup>2</sup> XXX <sub>±</sub> <sup>2</sup> FRACTIONAL $\pm 1/16$		DRAWN	EPP	03-18-13	
DO NOT SCALE DRAWING		CHECKED	-	-	
TREATMENT		ENGR			
FINISH	-				
MATERIAL	SEE BOM				
SIZE	D			DWG NO.	PL-AM-6
SCALE	5/8			CALC WT	
				ACT WT	
				1 OF 1	

MOLE-MASTER™  
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ARCH MASTER  
CONTROL VALVE ASSEMBLY

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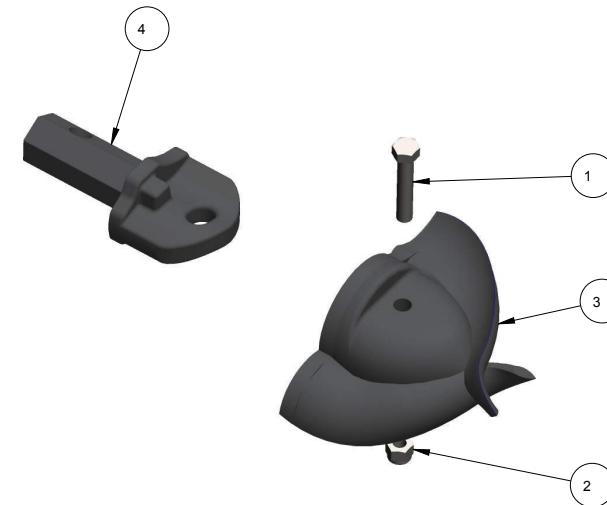
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REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	AA2000-00 WAS AA1000-00/SP2000-00 WAS SP1000-00	09-10-18	EPP



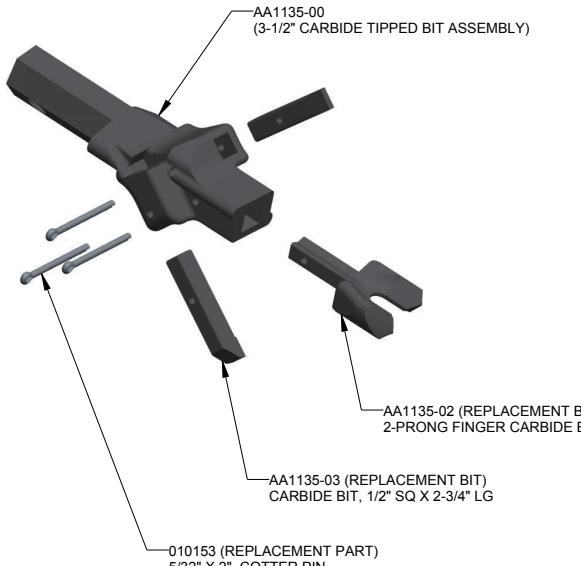
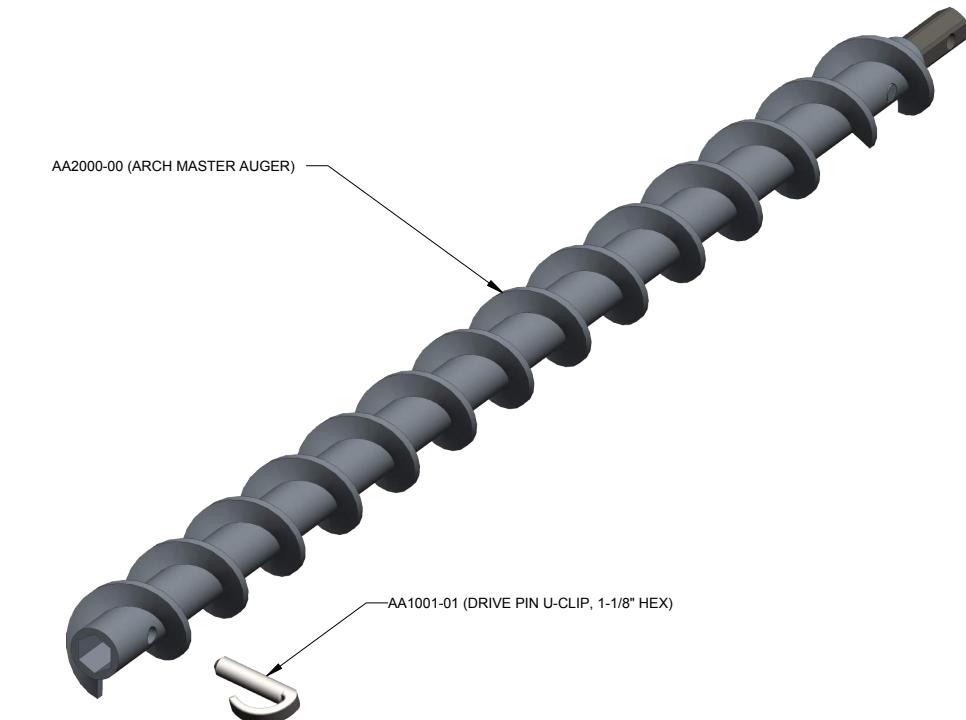
AA1035-00 (3-1/2" FISHTAIL BIT ASSEMBLY)

ITEM	QTY	PART NO.	DESCRIPTION
BILL OF MATERIALS			

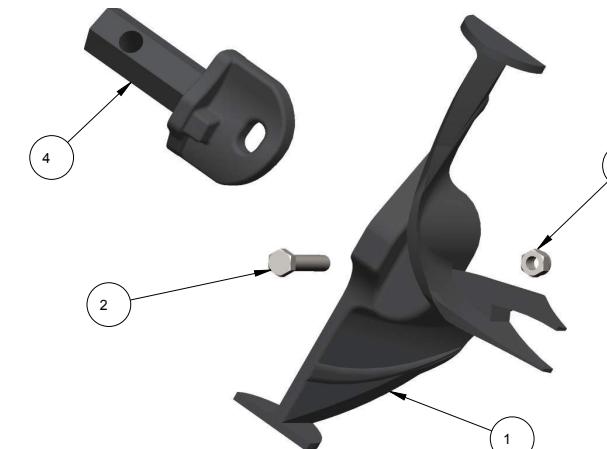


AA1060-00 (6" FISHTAIL BIT ASSEMBLY)

ITEM	QTY	PART NO.	DESCRIPTION
BILL OF MATERIALS			



AA1135-00 (3-1/2" CARBIDE TIPPED BIT ASSEMBLY)



AA1100-00 (10" FISHTAIL BIT ASSEMBLY)

ITEM	QTY	PART NO.	DESCRIPTION
BILL OF MATERIALS			

SP2000-00 (Slide Plate Assembly)

ITEM	QTY	PART NO.	DESCRIPTION
BILL OF MATERIALS			



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.		APPROVALS	DATE
TOLERANCES ARE: DECIMALS    ANGLES XX±.01 ±2° XXX±.005    FRACTIONAL ± 1/16			
TREATMENT	-	DRAWN EPP	3-18-13
FINISH	-	CHECKED -	-
MATERIAL	SEE BOM	ENGR	
SCALE	-	CALC WT	1 OF 1
ACT WT		ACT WT	
SHEET			