

HUB CITY
IRON WORKS

PCM-5000 R2/R3

Operation and Maintenance Manual



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Customer: _____
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Introduction

PCM 5000 Pipe Cleaning Machine

The Hub City Iron Works PCM 5000 provides OD and ID cleaning for oilfield tubing, drill pipe and casing. It comes equipped with a steel brush for cleaning the OD of the pipe and a rattling motor for ID scale removal. The robust design has repeatedly proven itself to be a reliable and effective product that meets the demands of today's harsh work environments.



Safety

Hub City has provided operating procedures and safety information to ensure the wellbeing of both the operator and the equipment.

This operating manual contains important safety information - please read it thoroughly.

Safety Features Include:

- Mechanically active components are painted a high visibility yellow.
- Low oil level indicator protects machinery in the case of a hydraulic line rupture and limits environmental impact.
- Low voltage operator interface (24vdc)
- Equipment safety labels.



Machine Specifications

Standard Features

- Single wire brush for outside diameter cleaning
- Lance for inside diameter cleaning
- Dual hydraulic power supply
 - One hydraulic pump for conveyor motors & auxiliary equipment
 - One for wire brush
- Range 2 pipe capability
- Left or right hand pipe loading configuration
- Adjustable drive speed
- Dust collection system

Optional Features

- Outside diameter Descaler
- Rattler motor centering device
- Grip enhancer
- Range 3 capability
 - Accommodates pipe lengths up to 48'
 - 24' added to overall length of machine

Specifications

Category	Min Tube OD	Max Tube OD	Max Tool Joint OD
Drill Pipe/ Tubing	2.-3/8"	5"	7-1/4"
Casing	4-1/2"	7-5/8"	8-1/2"
NOTE: Conveying performance can be diminished by larger pipe sizes and water blasting			

- Overall length 84'
- Width 30"
- Height 7'
- Drive station spacing 6' (4' option available)
- Weight 7,000 lbs. (Max Gross Weight)

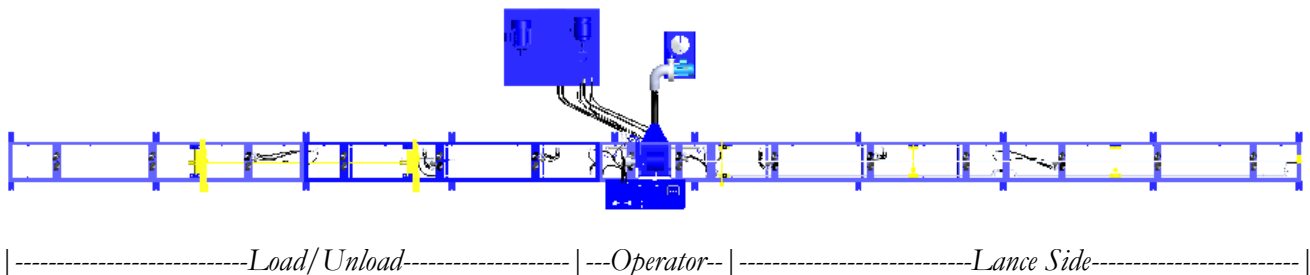
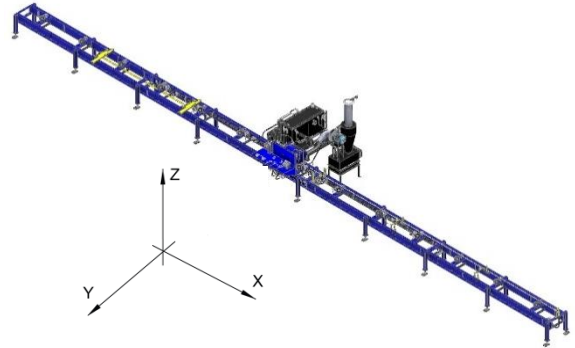
Pipe Plant Requirements

- Electrical 220/480V, 3 Phase, 60 Hz
- Compressed air 100 PSI @ 150 CFM
- Rack height 36"- 48"

Machine Setup

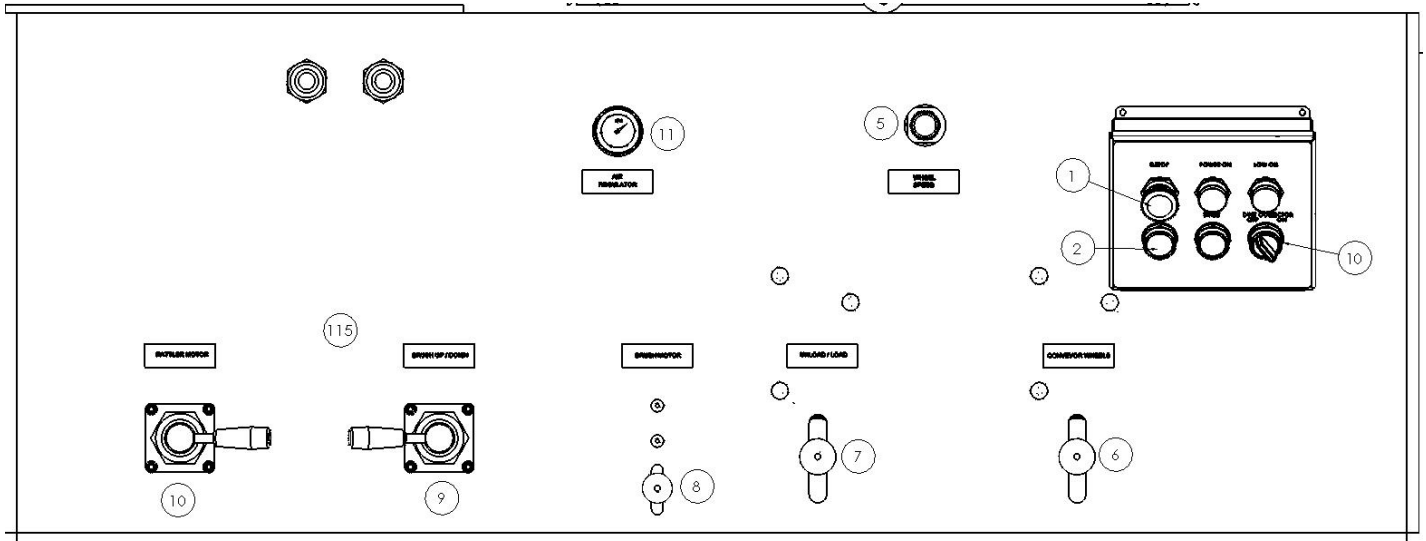
For proper operation, the machine must be installed straight and coplanar horizontally level.

1. Remove the lance if it is installed on the machine.
2. Position frame components and loosely bolt them together.
3. Level the machine in the Z direction. To do this, establish a base line from a stationary object (such as installed pipe racks) and adjust the frame elevation of the load / unload side of the machine. The other frame components elevation is adjusted via the jack screws mounted to the feet. The elevation tolerance from the reference is $\pm 1/8''$.
4. Align the frame components in the X direction. Alignment tolerance is $Y \pm 1/8''$ as measured from the machines axial center line through the length of the entire machine at the component joints and perpendicular to the pipe racks.
5. Anchor bolt the feet to the foundation. The minimum foundation thickness is 4" concrete. The anchor bolts may be left loose and tightened after full testing.
6. Verify that the machine is straight (along the X axis), within the elevation tolerance (the Z axis) and reasonably flat to the X-Y plane.
7. Tighten the frame connector bolts without disturbing the alignment. Torque the bolts to 120 ft.-lb..
8. Tighten the machine feet to the torque value recommended by the anchor bolt manufacturer.
9. Proceed with electrical and hydraulic installation.
10. Install duct collection system according to the manufacturer's procedures manual.



Controls

Standard Layout



(Typical machine layout, custom units may vary.)

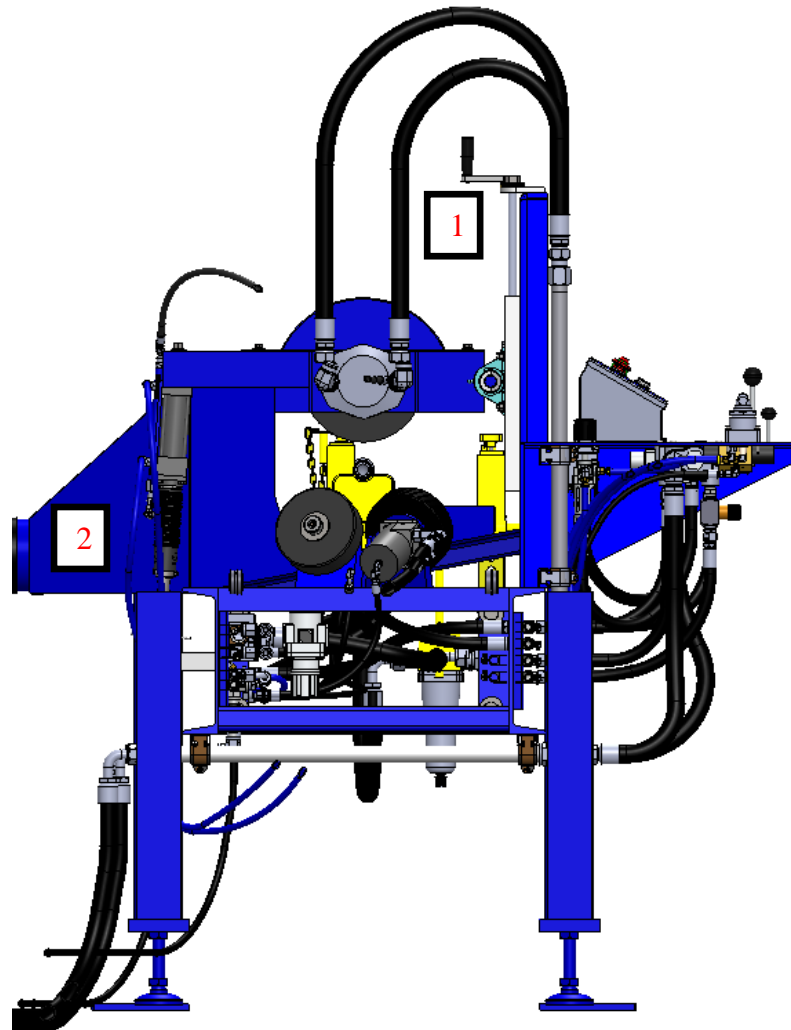
	<u>Function</u>
1	Emergency Stop
2	Machine Stop
3	Machine Start
4	Dust Collector Switch
5	Conveyor Wheel Speed Control
6	Conveyor Wheel Direction
7	Load/Unload Paddles
8	Brush Motor Off/On
9	Brush Engage/Disengage
10	Ratter Motor Off/ON
11	Brush Frame Pressure Regulator

Process Setup

Prior to operating this machine, ensure that the front and rear brush housing adjustments are positioned to effectively process the pipe. Failure to do so could result in damage to the machinery or decrease in efficiency.

Brush Housing Adjustment

1. When loading the first pipe, or changing pipe sizes, the brush housing will need to be adjusted accordingly.
2. Move the joint under the brush housing frame, engage the brush and adjust the adjustment handle (1) and rear pin (2) so that the brush housing frame is level when contacting the pipe.
 - a. Prior to operating this machine, ensure that the front and rear brush housing adjustments are positioned to effectively process the pipe. Failure to do so could result in damage to the machinery or decrease in efficiency.



Startup

1. Before starting, ensure that all daily maintenance is completed.
2. Install appropriate rattler motor and cleaning head.
3. Turn the **Machine Control** ON (**Control #3**).
4. Turn the **Dust Collector** ON (**Control #4**).
5. Ensure that the **Rattler Motor Control** (**Control #10**) is in the OFF position.
6. Ensure that the **Brush Housing Controls** (**Control #9**) are in the disengaged position.
7. Load the first joint of pipe onto the machine (**Control #7**).
8. Locate collar stop pins so that only one joint is picked up with the paddles.
9. Adjust brush frame so that it is level when brush is engaging pipe.
10. Turn the **Brush Motors Button** ON (**Control #8**).

Note: Reference page 7 for control panel layout.



Process

1. With the pipe on the rack, ACTUATE the **Pipe Index Load** (**Control #7**). This will load the pipe onto the machine.



2. Turn **Brush Motor** on (**Control #8**).
3. Using the **Motor Directional Control** (**Control #6**), CONVEY the pipe toward the Table Section.
4. Adjust the drive motor speed as required with the **Pipe Speed Control** (**Control #5**).
5. If equipped, LOWER the **OD Scraper**, after the pipe is under the Scraper Head.
6. *After* the pipe is under the Brush Housing Assembly, the **Brush Housing** can be placed in the engaged position (**Control #9**).
7. Turn the **Rattler Motor** ON (**Control #10**) *after* the rattler motor is inside the pipe.
8. If the pipe has traveled beyond the Brush Housing Assembly, ensure that the **Brush Housing** is in the UP position (**Control #9**), prior to conveying the pipe back toward it.
9. If the pipe has traveled beyond the OD Scraper, ensure that the **OD Scraper** head is in the UP position, prior to conveying the pipe back toward it.
10. Using the **Motor Directional Control**, (**Control #6**), CONVEY the pipe toward the Load Section.



11. If required, LOWER the **OD Scraper**, *after* the pipe is under the Scraper Head.
12. *After* the pipe is under the Brush Housing Assembly, the **Brush Housing** can be placed in the engaged position (**Control #9**).

13. Turn the **Rattler Motor** OFF (**Control #10**), *prior* to the ID Scraper exiting the pipe.
14. After the pipe has been processed, convey the pipe back to the load side of the machine.
15. Be sure to properly collar the pipe prior to offloading.
16. After the pipe has been properly collared, ACTUATE the **Pipe Index Load** (**Control #7**). This will offload the processed pipe, and load the next pipe onto the machine.
17. Repeat as required.

Preventative Maintenance Procedure



PCM 5000 Daily Preventative Maintenance

Company: _____
 Location: _____
 Machine No.: _____
 Week of: _____

Instructions:
 Inspect each item at the start of each shift - initial next to block after task is complete
 For more detailed information consult operators manual.

Day	Inspect control console (1) Loose wires and proper function (2) switches and joysticks for loose and/or broken wires	Inspect j-boxes (1) loose wires	Inspect load/unload paddles (1) cracks, bent parts, and excessive wear (2) broken bearings or loose grease fittings (3) hydraulic cylinder and hoses for leaks (4) Grease paddle bearings w/ synthetic HD grease (NLGI #2, GC/LB or equivalent)	Inspect Dust Collector (1) Loose wires (2) Debris level. Empty as needed	Inspect Drive System (1) Drive/Idler wheels for wear. Min. dia. is 6" (2) Hydraulic hose for wear/leaks (3) Grease idler bearings w/ synthetic HD grease (NLGI #2, GC/LB or equivalent)	Inspect Cleaning System (1) Inspect brush wheels for excessive wear. Replace if >50% missing (2) Check brush housing adjustment mechanism. Make sure airline lubricator containers are full. Recommended dial setting is b/t 2 & 4. (Refill w/ SAE Gr. 20, viscosity 46 or equivalent) (3) Grease brush housing pivot bearings & brush shaft bearings with synthetic HD grease (NLGI #2, GC/LB or equivalent)	Inspect power supply (1) all fittings and hoses for leaks (2) electrical panel for loose wires (3) low oil switch functions properly (4) Check oil levels in hydraulic reservoir (5) Check return filter pressure gauge while conveyor/brush motors are operating
1							
2							
3							
4							
5							
6							
7							

Comments:



PCM 5000 Yearly Preventative Maintenance

Company: _____
 Location: _____
 Machine No.: _____
 Week of: _____

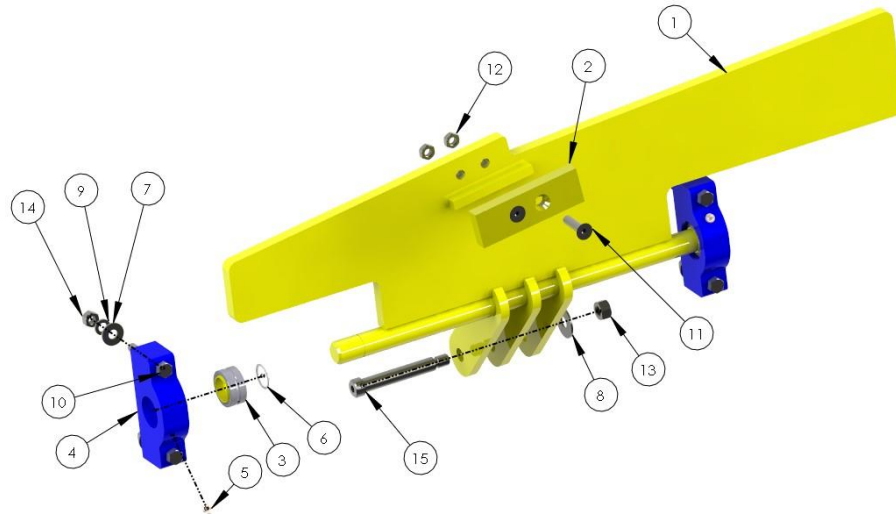
Year	Power Supply (1) Drain hydraulic reservoir & clean w/ suitable solvent. (2) Remove suction strainer & clean w/ solvent (3) Change hydraulic filters	Machine Alignment (1) Verify machine is aligned properly. Correct if necessary							

Comments:

Parts List

Paddle Loader

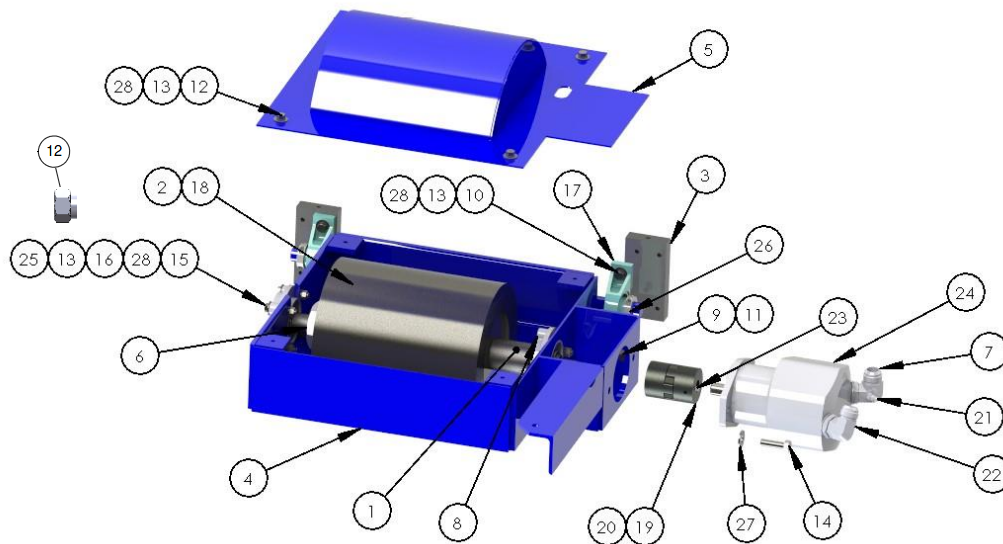
Revision: B



Item #	Part #	Description	Quantity
1	13606	PADDLE FAB ASSEM	1
2	13592	PADDLE WEAR PAD	1
3	14645	SPHERICAL BEARING	2
4	13609	BEARING BLOCK	2
5	16086	GREASE ZERK, 1/8 NPT	2
6	17053	EXTERNAL RETAINING RING, 1 1/4"	2
7	17649	WASHER, FLAT, .50"	4
8	17651	WASHER, FLAT, .625"	1
9	14140	WASHER, LOCK, .50"	4
10	14361	BOLT, HHCS, .50" X 3.50" NC GR5	4
11	14495	BOLT, FHSCS, .50" X 2"	2
12	16524	NUT, JAM LOCK, .50"	2
13	16532	NUT, LOCK, .625" NC NYLOCK	1
14	14124	NUT, HEX, .5" NC	4
15	38707	BOLT, SHOULDER, .75 X 4.25 X .625-11	1

Brush Housing Assembly

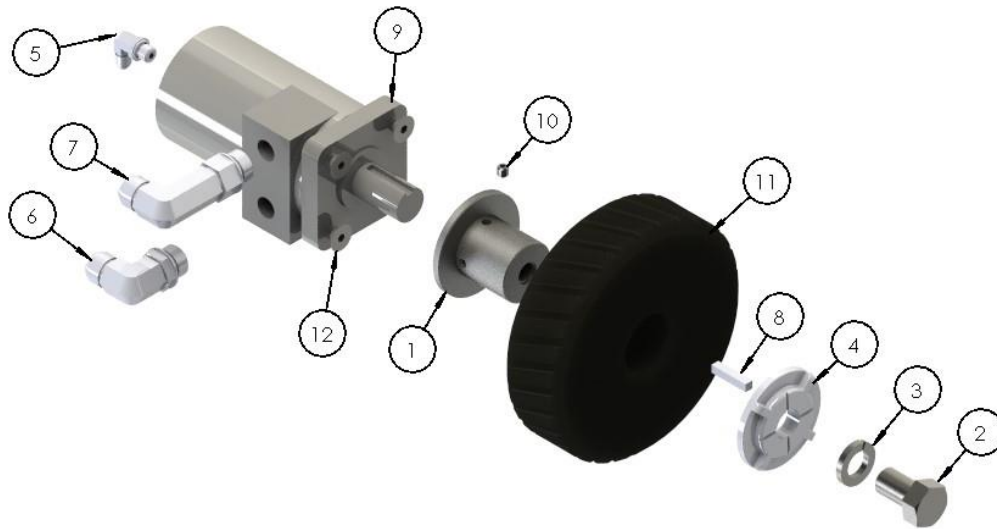
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Item #	Part #	Description	Quantity
1	13909	BRUSH SHAFT	1
2	13915	BRUSH SPACER	5
3	13570	BEARING MOUNT	2
4	16016	BRUSH HOUSING MACHINE WORK	1
5	13651	BRUSH HOUSING COVER	1
6	14680	BRUSH SHAFT NUT	1
7	15742	DRILL & TAP 15595	1
8	14589	CUT BRUSH SHAFT BEARING	1
9	14124	NUT, HEX, .5" NC	2
10	14132	BOLT, HHCS, .375" X 1" NC GR5	4
11	14140	WASHER, LOCK, .50"	2
12	14144	HHCS, .375" x .75" NC	4
13	14145	WASHER, LOCK, .375"	14
14	14311	BOLT, HHCS, .50" X 1.75" NC GR5	2
15	14321	BOLT, HHCS, .375" X 2" NC GR5	6
16	14588	BRUSH SHAFT BEARING	1
17	14613	BEARING SEALMASTER, NP-16C	2
18	14683	WIRE BRUSH	6
19	15012	7/8" ID SPIDER COUPLING HALF	2
20	15027	L099NP BUNA-N SPIDER	1
21	15580	# 2 MNPT X # 4 MJIC 45 EL, (2023-2-4)	1
22	15595	# 16 MSAE X # 16 MJIC 90° ELBOW	1
23	16298	1/4" x 1-1/4" KEY	2
24	16383	BRUSH MOTOR	1
25	16487	NUT, HEX, .375" NC	6
26	16772	SPLIT COLLAR 1" BORE	2
27	17649	WASHER, FLAT, .50"	2
28	17656	WASHER, FLAT, .375"	14

Drive Station

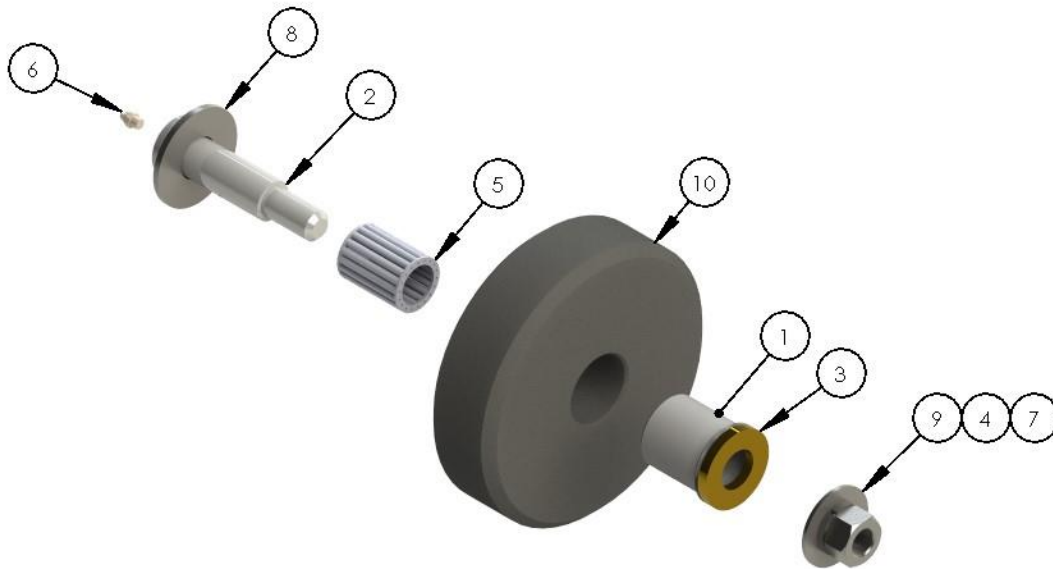
Revision: C



Item #	Part	Description	Quantity
1	13566	DRIVE HUB (020-00024)	1
2	14131	BOLT, HHCS, .75" X 1.25"	1
3	14133	WASHER, LOCK, .75"	1
4	14134	LOCK WASHER CASTING	1
5	15612	# 4 MSAE X # 4 MJIC 90° ELBOW, (2062-4-4)	1
6	15739	# 10 MSAE X #10 MJIC 90° ELBOW, (2062-10-10)	1
7	15790	# 10 MSAE X # 10 MJIC LONG 90° ELBOW	1
8	16298	1/4" x 1-1/4" KEY	1
9	16391	CHARLYNN HYD MOTOR P/N - 101-2435009 (HT)	1
10	17149	SET SCREW, .3125"-18 X .3125"	2
11	22510	WHEEL, 18001JT, GROOVED	1

Idler Station

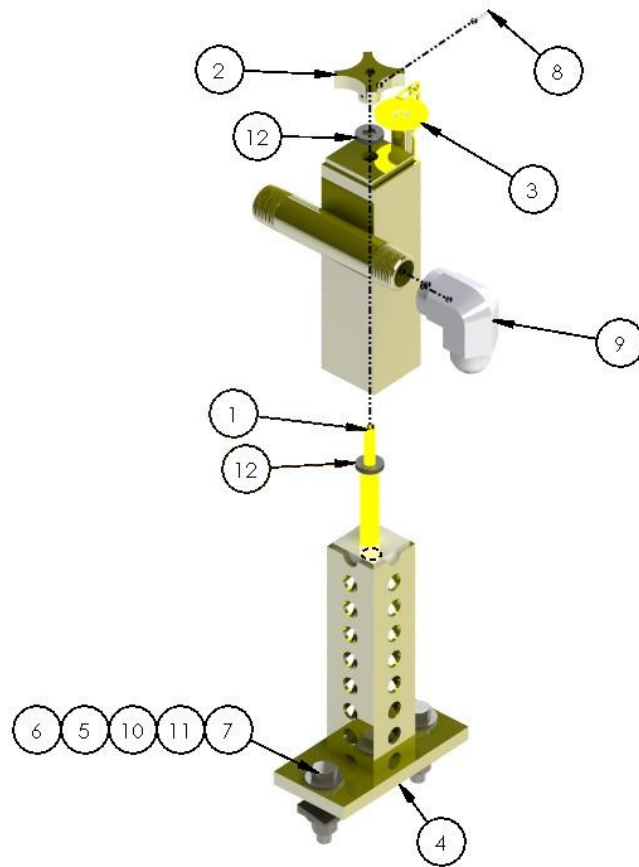
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Item #	Part	Description	Quantity
1	28991	NEEDLE BEARING RACER, W. FLANGE	1
2	14435	1" X 2.5" SHOULDER BOLT	1
3	13979	WASHER, FLAT, 1" X 2" X .125" BRASS	2
4	14133	WASHER, LOCK, .75"	1
5	14641	Needle Bearing (J32-1264)	1
6	16082	GREASE FITG, .25"-28 X .75"	1
7	16485	NUT, HEX, .75" NC	1
8	17652	WASHER, FLAT, 1"	1
9	17653	WASHER, FLAT, .75"	1

Rear lance Assembly

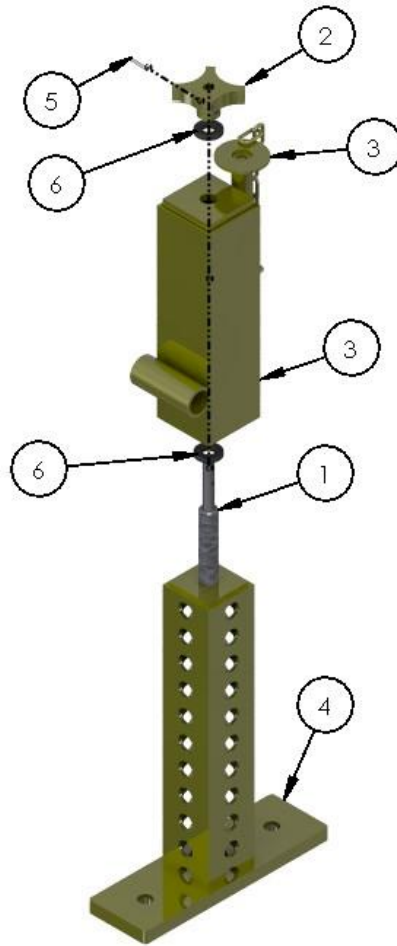
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Item #	Part #	Description	Quantity
1	13596	ADJUSTMENT SCREW	1
2	43669	KNOB, .375" STAR TRUTROL (MODIFIED)	1
3	13602	ELEVATION ADJUSTMENT COVER	1
4	13604	PERFORATED TUBE ASSEMBLY (REAR)	1
5	14124	NUT, HEX, .5" NC	2
6	14140	WASHER, LOCK, .50"	2
7	14359	BOLT, HHCS, .50" X 2.50" NC GR5	2
8	15288	ROLL PIN, 1/8 " X 3/4"	1
9	15653	# 16 FNPT X #16 MJIC 90° ELBOW, (2025-16-16)	1
10	17218	LEVELING SHIM (BEVEL WASHER) 9115A033	2

Front Lance Assembly

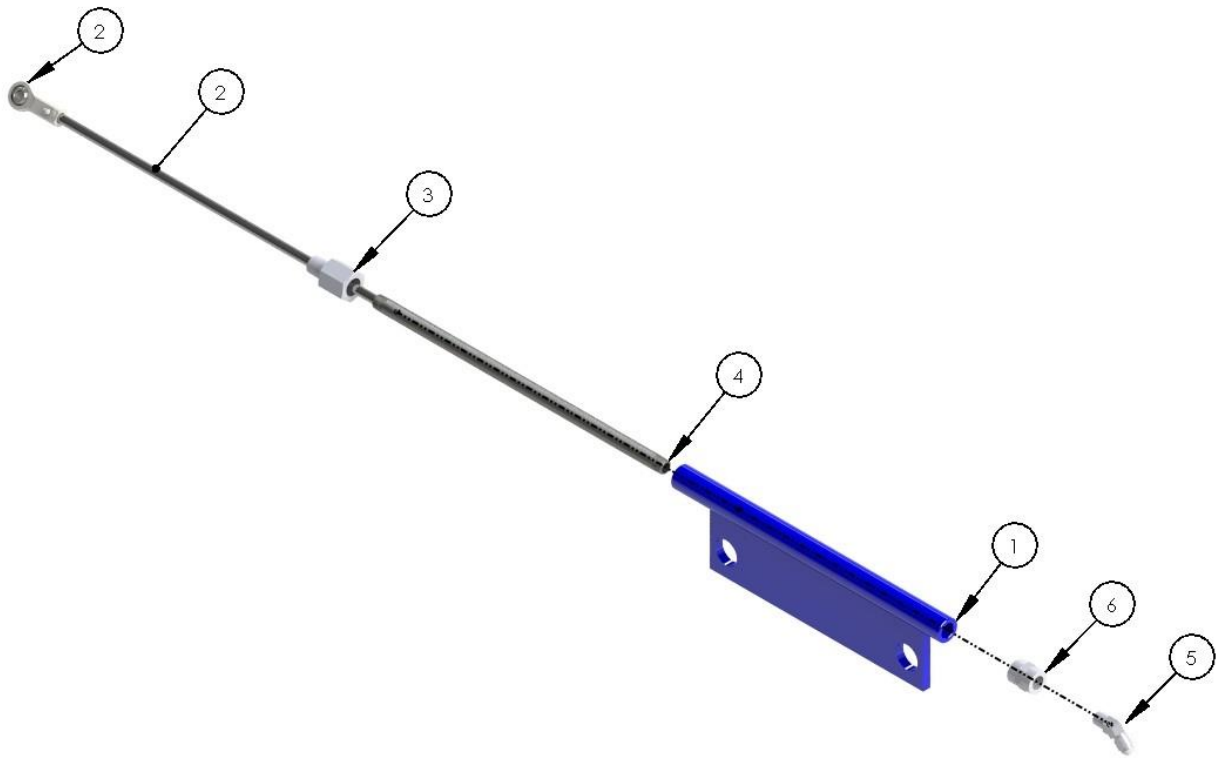
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Item #	Part #	Description	Quantity
1	13596	ADJUSTMENT SCREW	1
2	43669	KNOB, .375" STAR TRUTROL (MODIFIED)	1
3	13603	ELEVATION ADJUSTMENT COVER	1
4	21207	PERFORATED TUBE ASSEMBLY	1
5	15288	ROLL PIN, 1/8 " X 3/4"	1
6	22246	WASHER, FLAT, .375" FW-3	2

Auxiliary Cylinder Assist

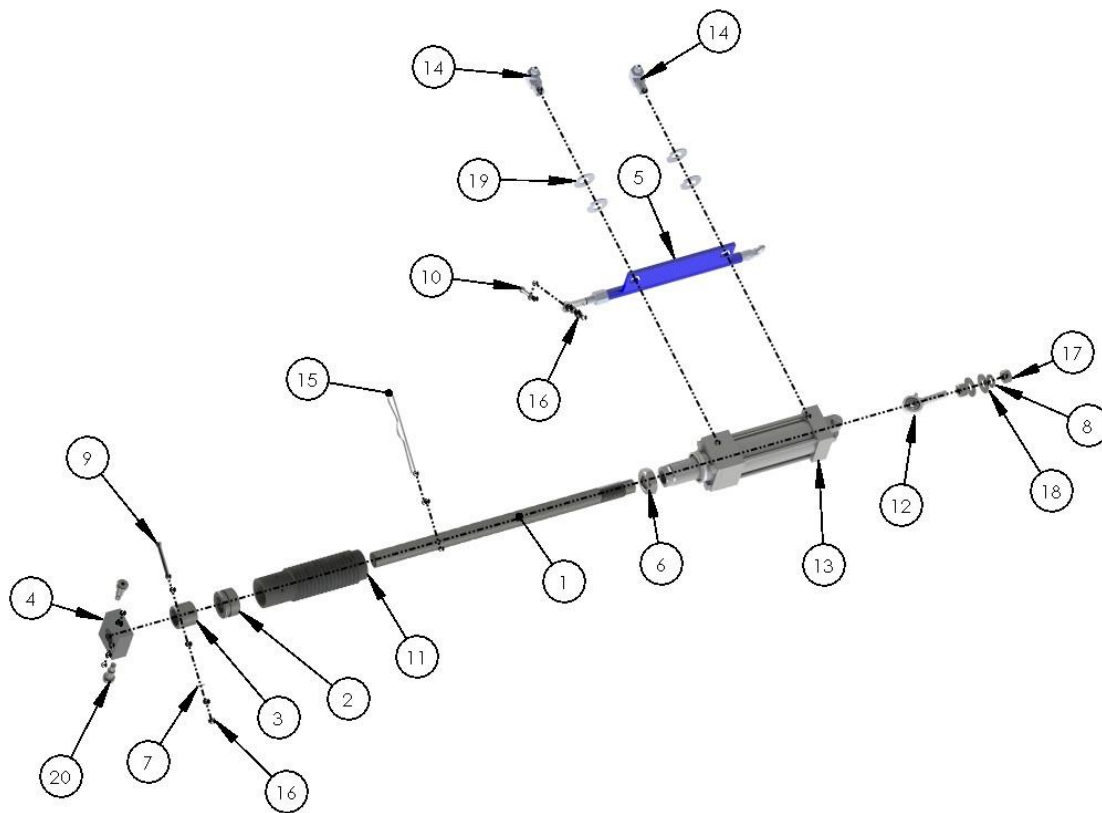
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Item #	Part #	Description	Quantity
1	20563	GUIDE, ADAPTER GUIDE	1
2	13959	AUXILLIARY CYLINDER ROD & ROD END	1
3	14037	FITG, HYD	1
4	15450	FITG, HYD	1
5	15580	FITG, HYD	1
6	15607	FITG, HYD	1

Secondary Cylinder Assist

Revision: D



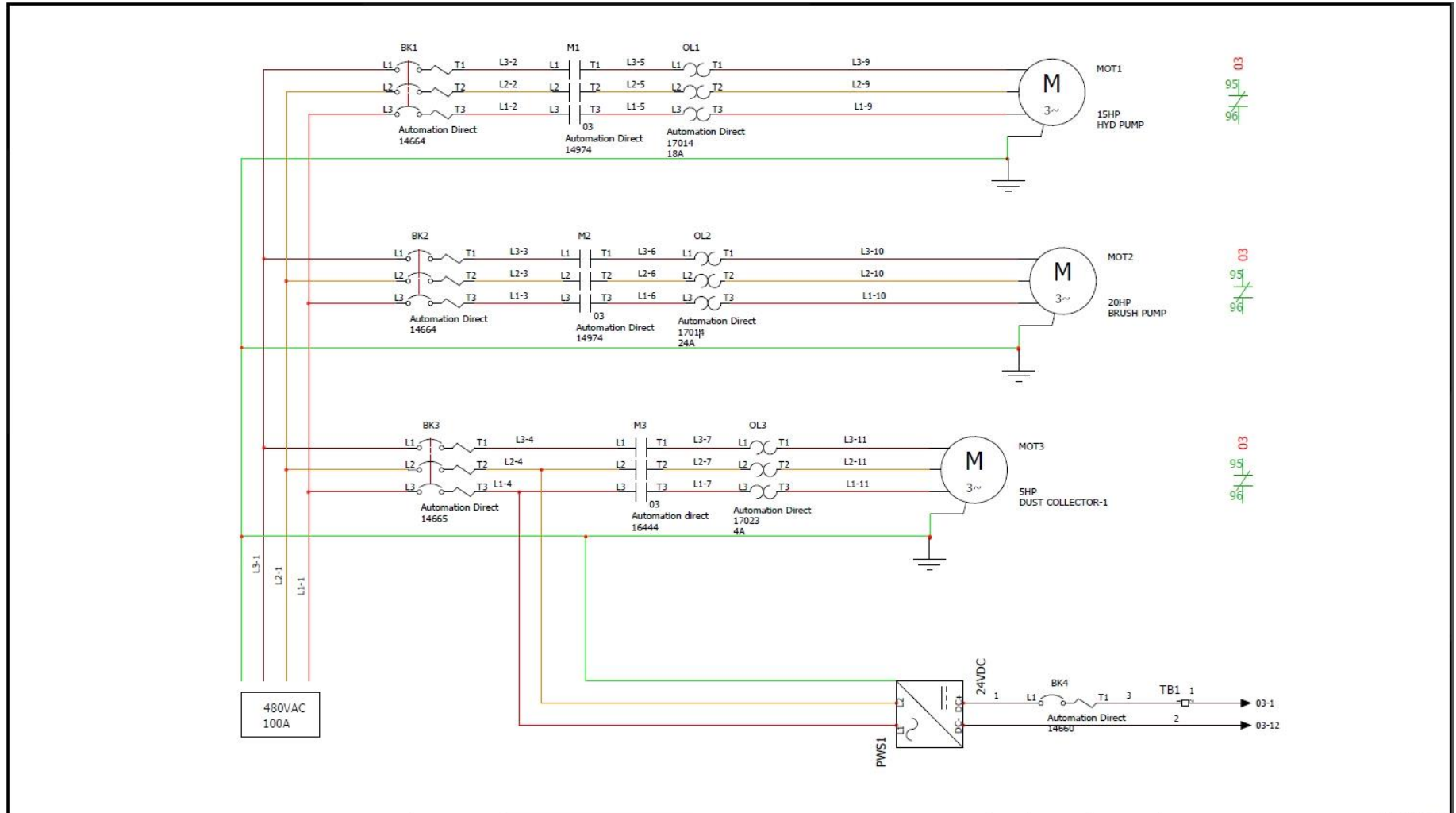
ITEM #	PART NUMBER	DESCRIPTION	QTY.
1	13567	ROD EXTENSION	1
2	13568	BOOT ANCHOR	1
3	13569	ROD SPACER	1
4	14166	ROD GUIDE	1
5	107-701-008-00	AUXILLIARY CYLINDER ASSIST	1
6	14135	NUT, JAM, 1" NF	1
7	14138	WASHER, LOCK, .25"	1
8	14140	WASHER, LOCK, .50"	1
9	14492	BOLT, SHCS, .25" X 2" GR5	1
10	14504	BOLT, SHCS, .25" X 1.75" NC GR5	1
11	14513	HONDA # 51611-459-880 RUBBER BOOT	1
12	14629	BEARING ROD END	1
13	15098	MODIFIED AIR CYL	1
14	15582	3/8" MP X 1/4" MJIC 90 DEG (2024-6-4)	2
15	16098	HAIR PIN COTTER .243 X 5-1/4 LG	1
16	16483	NUT, HEX, .25" NC	3
17	16511	NUT, HEX, .5" NF	2
18	17649	WASHER, FLAT, .50"	2
19	17681	WASHER, SPRING, 0.375	4
20	23129	BOLT, SHOULDER, .5"x.75"x.375"-16	2

Recommended Spare Parts

Level A Items (Stocked On Site)		
Part #	Description	Qty
13959	OD Brush	8
17719	Drive Wheels	10
13592	Paddle Wear Pad	4
17718	Idler Wheel	6
16734	Power Supply,	1
14974	Contactora, 24vdc coil ;25HP,42A	1
17014	Thermal Overload relay (18-26A)	1
Level B Items (1-3 Day Delivery)		
14037	Lenz Fitg	2
14683	Chrome Rod	2
14435	Idler Shoulder Bolt	6
17577	Hydraulic Valve, Auxillary Fn	1
17565	Air Valve	1
17587	Hydraulic Valve, Brush Motor	1
14641	Needle Bearing	3
13979	1" Brass Washer	6
16391 (16392)	High Torque Hydraulic Motor (High Speed Motor)	1
16444	Contactora, 24vdc coil ; 5hp,32A	1
13989	Select Switch, Two Position	1
38616	Timer Relay ,H3DS-AL-24/230ac	1
16030	Fuse, 1-1/2A MDL-	5
Level C Items (0-120 Day Delivery)		
42130	Hydraulic Pump (Brush)	1
22353	Hydraulic Pump (Auxiliary)	1

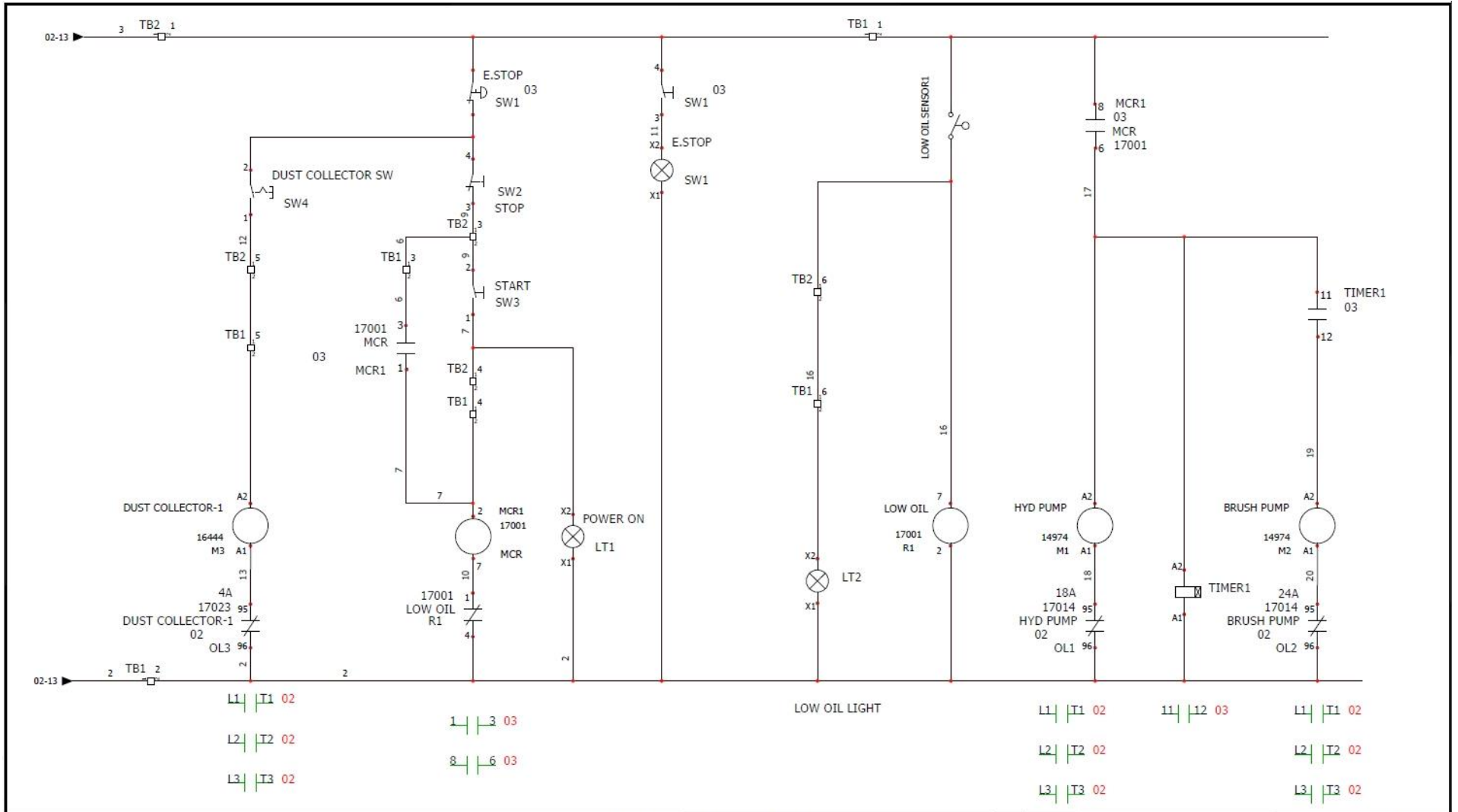
Electrical Schematics

Power Supply Panel Schematic



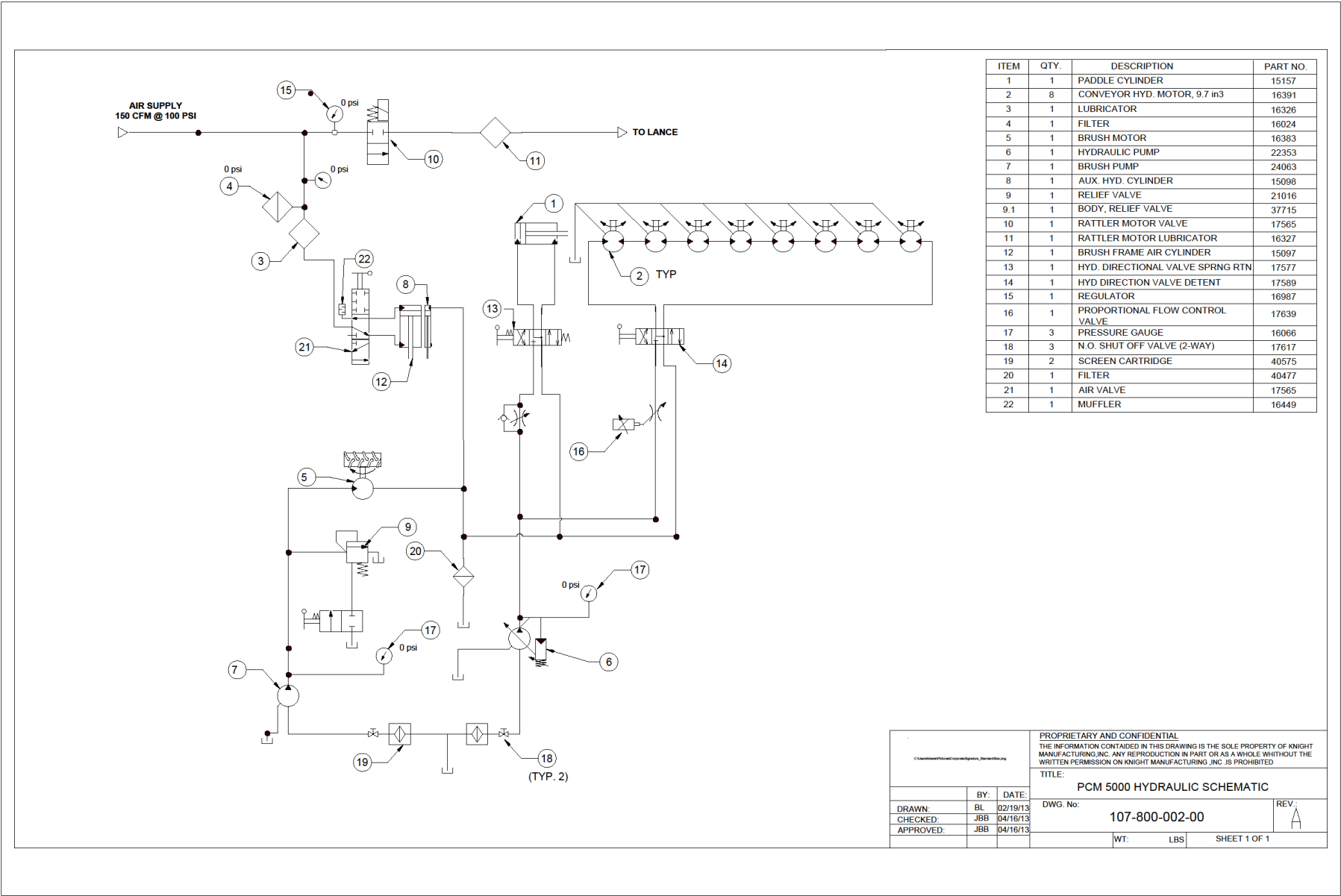
POWER SCHEMATIC				REVISION
				0
REV.	DATE	NAME	CHANGES	SCHEME
				02
CONTRACT N° :		LOCATION: L1	POWER SUPPLY PANEL	User data 2

Control Schematic



CONTROL SCHEMATIC				REVISION
				0
0	2/11/2014	jgonzalezjalme		
REV.	DATE	NAME	CHANGES	SCHEME
				03
CONTRACT N° :		LOCATION: L1	POWER SUPPLY PANEL	User data 2

Hydraulic & Pneumatic Schematics



ITEM	QTY.	DESCRIPTION	PART NO.
1	1	PADDLE CYLINDER	15157
2	8	CONVEYOR HYD. MOTOR, 9.7 in3	16391
3	1	LUBRICATOR	16326
4	1	FILTER	16024
5	1	BRUSH MOTOR	16383
6	1	HYDRAULIC PUMP	22353
7	1	BRUSH PUMP	24063
8	1	AUX HYD. CYLINDER	15098
9	1	RELIEF VALVE	21016
9.1	1	BODY, RELIEF VALVE	37715
10	1	RATTLER MOTOR VALVE	17565
11	1	RATTLER MOTOR LUBRICATOR	16327
12	1	BRUSH FRAME AIR CYLINDER	15097
13	1	HYD. DIRECTION VALVE SPRNG RTN	17577
14	1	HYD DIRECTION VALVE DETENT	17589
15	1	REGULATOR	16987
16	1	PROPORTIONAL FLOW CONTROL VALVE	17639
17	3	PRESSURE GAUGE	16066
18	3	N.O. SHUT OFF VALVE (2-WAY)	17617
19	2	SCREEN CARTRIDGE	40575
20	1	FILTER	40477
21	1	AIR VALVE	17565
22	1	MUFFLER	16449

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<small>BY: DATE:</small> DRAWN: BL 02/19/13 CHECKED: JBB 04/16/13 APPROVED: JBB 04/16/13		TITLE: PCM 5000 HYDRAULIC SCHEMATIC DWG. No: 107-800-002-00 REV: A	
		WT:	LBS SHEET 1 OF 1