

XPCM

Operation and Maintenance Manual



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Introduction

The XPCM is designed to meet the pipe cleaning needs of today's oil and gas industry. The unit can clean the inside diameter and outside diameter of pipe preparing it for other operations such as inspection and coating. Its features are designed for high production pipe cleaning. It is well adapted for most cleaning situations and configurable for nearly all pipe plants. It includes user friendly controls and safety features that make it easy to operate. The XPCM is designed to meet any need.



Safety

• Knight Oil Tools has provided operating procedures and other information on labels to ensure the safety of both the operator, and equipment. This entire operating manual is filled with 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).
- Electronic sensors to prevent improper use.
- Equipment safety labels.

Machine Specifications

Standard Features

- High speed wire brushes for OD cleaning
- Lance for ID cleaning
- Hydraulically driven rollers
- Hydraulic load/unload paddles
- Hydraulic brush frame height adjustment to accommodate various OD's
- Variable speed control on pipe rotation, OD & ID cart linear speed

Optional Features

- Water blasting ID &/or OD •
- Hose reel lance •
- Hard lance
- OD descaler
- Pipe preloader
- Enclosures w/ drain pan
- ID &/or OD water cleaning
- Range 3

Specifications

•	Pipe capacity	
	o XPCM-10	
	min. OD	2- 3/8"
	 max. OD 	10"
	o XPCM-20	
	 min. OD 	2- 3/8"
	 max. OD 	20"
•	Width	85"
•	Height	13'
•	Weight	17,000-30,000 lbs

Pipe Plant Requirements

- Electrical
- Rack height
- 36"-44" (others by request) • Pneumatic 100psi @ 150 CFM - Dry method 100psi @ 10 CFM - H20 method

480V, 3 Phase, 60 Hz (Others by request)

Machine Setup

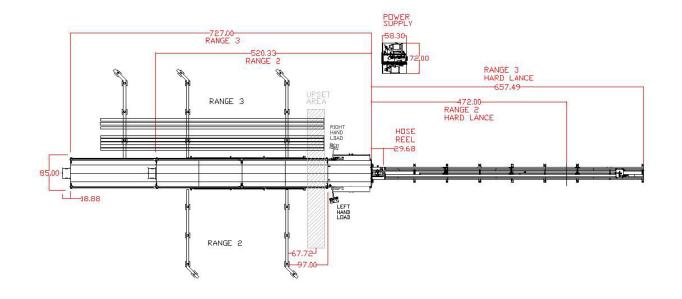
For proper operation, the machine must be installed straight and coplanar horizontally level. It is highly recommended that a Knight Manufacturing technician be present during installation.

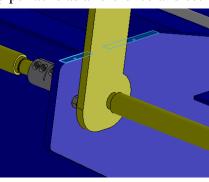
- 1. Layout and mark centerline of XPCM main frame and lance according to facility layout. Markings should be perpendicular to pipe racks within 3 degrees.
- 2. Position XPCM main frame in place.
- 3. Align the main frame in the X & Y direction. Alignment tolerance for the X & Y direction is $\pm 1/8$ " as measured from the axial center line at the component joints and perpendicular to the pipe racks.
- 4. Anchor the legs to the foundation and torque bolts between 150-200 ft-lbs.
- 5. Level the machine in the Z direction. To do this, use the pipe racks as a reference and set

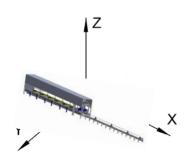
machine so that the top of the pipe racks is at the same elevation as the bridge plate on the XPCM frame.

6. Verify that the machine is in tolerance along the X and y axis, within the elevation tolerance between the bridge plate and pipe racks and that the bridge plates are also level.

- 7. Repeat steps 2 thru 6 with the lance frame. Verify the top of the lance frame is level.
- 8. Tighten the main frame and lance frame connector bolts without disturbing the alignment.
- 9. Proceed with electrical and hydraulic installation.

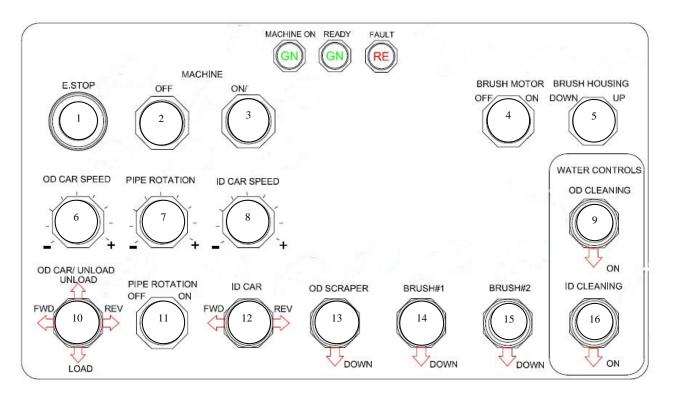






Controls

Standard Controls Layout



(Actual control panel vary slightly.)

	Function
1	Emergency Stop
2	Machine Off Switch
3	Machine On Switch
4	Brush Motor On/Off Switch
5	Brush Frame Height Adjustment
6	OD Car Speed
7	Pipe Rotation
8	ID Car Speed
9	Water OD On
10	OD Car FWD/REV & Unload/Load
11	Pipe Rotation on/off
12	ID car FWD/REV
13	OD Scraper
14	Brush #1 Down
15	Brush #2 Down
16	Water ID on

Operation

Reference control panel layout for button numbering

Start up

- 1. Ensure that it is safe to operate machinery and all personnel are clear.
- 2. Perform daily maintenance.
- 3. Press start button (#2).
- 4. Warm up machine for 15 minutes.
 - a. Turn OD brushes on (#4).
 - b. Turn pipe rotation on (#11).
 - c. Move OD & ID cart back and for 3 cycles to ensure operating correctly.

Setup

- 1. Adjust pipe rotation stations to appropriate spacing
 - a. Pipe should sit on top 1/3 of wheel
 - b. Ensure that all wheels are set to the same distance
 - c. Recommended roller spacing:

Pipe/Casing OD	Roller Spacing (Center to Center)
2-3/8" to 10"	6.5"
10" to 15"	10.0"
15" to 20"	13.5"
20"	17.0"

- 2. Load joint of pipe by pressing the and holding the unload joystick (#10) up
- 3. Load joint of pipe and hold load joystick (#10) down.
- 4. Move OD cart over pipe
 - a. Set OD brush height
 - Turn pipe rotation (#11) ON
 - Engage brush #1 and #2 by moving the joysticks down (#14 & #15)
 - Adjust rear brush switch (#5) to proper height
 - When engaged the brush should be angled slightly down 2-3 degrees.
 - Ensure all sensors and nozzle spray bars are clear
- 5. Move ID Cart (#12) so that the lance tip is near the pipe
 - a. Adjust elevation so that the lance penetrates the pipe without hitting threads or shoulder and return to home position

Operation

- 1. Move Unload joystick (#10) up and hold, then manually roll pipe in place
- 2. Move load joystick (#10) down to load pipe
- 3. Move ID car Joystick to FWD (#12)
 - a. Move ID clean Joystick (#16) down as the lance enters pipe
- 4. Control desired linear speed (#8), stop lance at Box connection to ensure effective cleaning
- 5. Move OD cart Joystick to the FWD (#10)
 - a. Move Water OD Joystick (#9) down as it moves over pipe
 - b. Stop OD water blast at pin connection to ensure effective cleaning
- 6. Move Brush #1 Joystick down (#14) as it move over pipe
- 7. Move Brush #2 Joystick down (#15) as it move over pipe
- 8. If for any reason OD cart is stopped over pipe disengage brushes from cleaning pipe
- 9. Return OD & ID cart by move joystick to the right (#10 & #12)
 - a. Cart will stop automatically on the return trip
- 10. Move Unload joystick up to unload pipe and manually roll next pipe in place (#10)

Troubleshooting

- OD Cart will not move
 - o Load/Unload bridge arms not in upright position
 - Ensure rails are free of debris
 - Check full engagement of rack and pinion gear
- ID cart will not move
 - o Load/Unload bridge arms not in upright position
 - o Check full engagement of chain and sprockets
- Pipe paddles will not operate
 - OD or ID cart not in home position
 - Pipe bridges not fully down
- Pipe not loading and falling off wheels
 - o Wheels not adjusted out enough
- Pipe not unloading
 - Paddle wear tab needs to be replaced
 - Tool joint on paddle
- OD cart gear slipping
 - Ensure rack is clear of debris
 - o Ensure compression springs on motor bracket are tight
- Load/unload bridges not moving
 - OD or ID cart not in home position

Preventative Maintenance

Lock Out Tag Out machine before performing any maintenance.

Daily

- 1. Inspect wheel station rollers and couplings for excessive wear. Replace wheels as required.
- 2. Inspect paddle wear tabs for excessive wear.
- 3. Inspect hydraulic hoses for signs of leaks. Repair as required.
- 4. Inspect all sensors. Clean with a soft cloth to remove dust and debris.
- 5. Inspect OD wire brushes for excessive wear.
- 6. Check hydraulic reservoir return filter pressure gauge daily while pipe rotation motors are engaged.
- 7. Clean debris from roller tracks, roller chain and gear rack.

Weekly

- 1. The following items should be greased once a week* with 2-3 pumps of synthetic heavy duty grease (NLGI #2, GC/LB) or equivalent:
 - a. Brush motor shaft bearing
 - b. Brush frame back plate linear bearings
 - c. Paddle Bearings

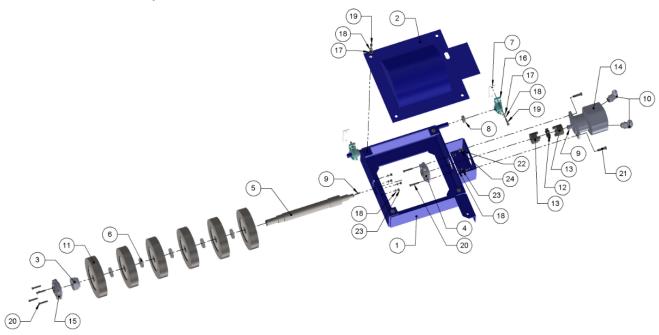
*In highly corrosive environments, it is recommended that bearings are greased daily Annual Maintenance

- 1. Sample hydraulic oil and send to approved laboratory for remaining life
- 2. Hydraulic reservoir should be drained and cleaned with a suitable solvent every 2 years. When the tank is drained, remove the suction strainer and clean with solvent.
- 3. Change hydraulic return filter
- 4. Machine should be level and realigned if necessary.
- 5. All electrical boxes should be inspected for frays in the wire and loose connections.

	KNIC oil to	HT ools		XPCM Preventative Maintenance											
Company: Location: Machine N Week of:	0.:						-63 -99 -99								
Instruction Inspect eac For more d	h item at th	rmation co	ach shift - ir nsult operat station	nitial next to ors manual	block after	task is com	plete	1					Grease Poin	. , ,	T AG
Day1	Rollers	Hyd. Motors	Coupling	bearings	load/unioad paddle weartab	Hyd. And H20 hoses for signs of wear	Sensors	OD brushes	Return filter pressure gauge	Clean debris from roller tracks	Brush motor shaft bearing	Brush frame back plate linear bearings	Paddle bearing	Pipe roller bearings	Drive gear & chain for excessive wear
2	4	\langle	\triangleleft	4	\square		4	4	4	4	4	4	4	4	4
3	>	\sim	\sim	\succ	\vdash	\succ	\vdash	\sim	\succ	\square	\sim		\sim	\sim	\square
5	\angle	\square	\square	\square	\square	\square	\square	\square	\square	\square	\square	\angle	\square	\square	\square
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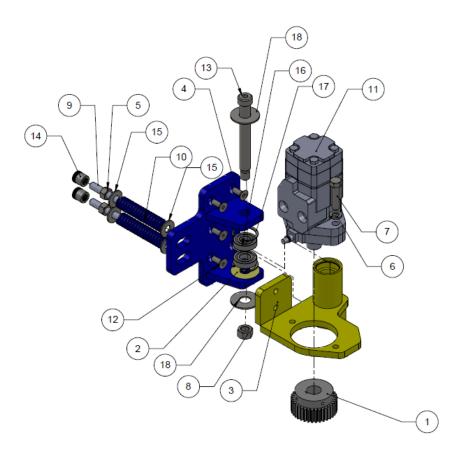
Comments:

Parts List OD Brush Assembly



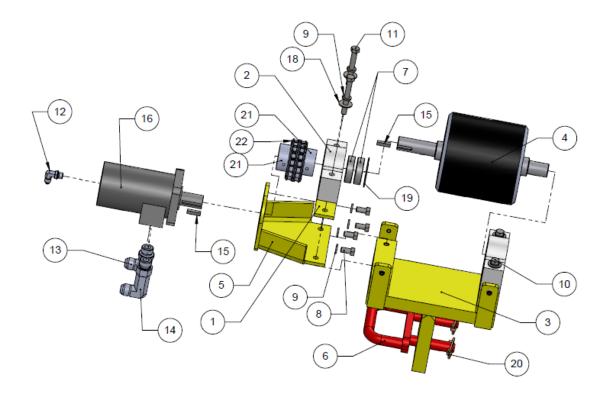
Item #	Part	Description	Quantity
1	14172	BRUSH HOUSING FRAME	1
2	13651	BRUSH HOUSING COVER	1
3	14680	BRUSH SHAFT NUT	1
4	14589	BRUSH SHAFT BEARING, CUT	1
5	13909	BRUSH SHAFT	1
6	13915	BRUSH SPACER	5
7	115-300-014-018	BRUSH HOUSING SPACER	2
8	16772	SPLIT COLLAR	2
9	16298	KEY	2
10	15595	JIC UNION	2
11	14683	WIRE BRUSH	6
12	15027	COUPLING SPIDER	1
13	15012	COUPLING HALF	2
14	16383	BRUSH MOTOR	1
15	14588	BRUSH SHAFT BEARING	1
16	14613	BEARING, PILLOW BLOCK	2
17	17656	WASHER, FLAT	8
18	14145	WASHER, LOCK	14
19	14132	BOLT, HEX	8
20	14321	BOLT, HEX	6
21	14311	BOLT, HEX	2
22	14140	WASHER, LOCK	2
23	16487	NUT, HEX	6
24	14124	NUT, HEX	2

OD Motor Mount

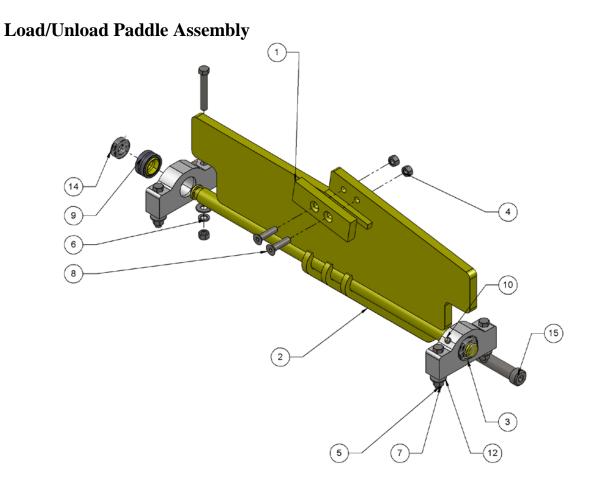


Item #	Part	Description	Quantity
1	36288	SPUR GEAR	1
2	115-300-823-XXX	MOTOR BRACKET SHIM	1
3	115-700-220-00	MOTOR MOUNT	1
4	115-700-221-00	MOTOR MOUNT BRACKER	1
5	13999	NUT, NYLOCK	1
6	14140	WASHER, LOCK	2
7	14312	BOLT, HEX	2
8	16532	NUT, NYLOCK	1
9	17354	STUD	2
10	24448	SPRING, COMPRESSION	2
11	28544	HYDRAULIC MOTOR	1
12	36357	BOLT, FLAT HEAD CAP SCREW	6
13	41307	BOLT, SHOULDER	1
14	41305	CAP SCREW NUT	2
15	17649	WASHER, FLAT	4
16	41410	BEARING, BALL DOUBLE SEALED	2
17	41411	RETAINING RING, INTERNAL	2
18	17653	WASHER, FLAT	2

Drive Roller Assembly

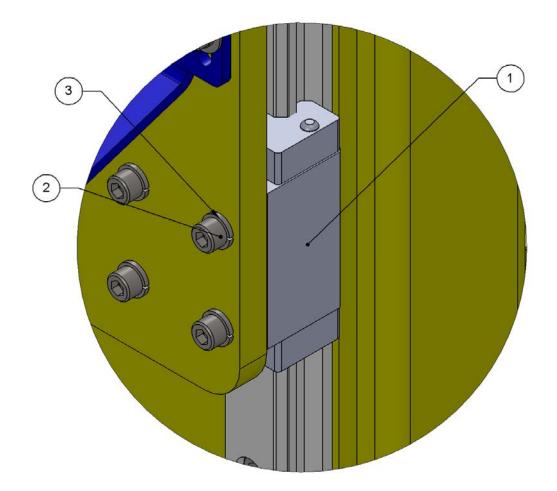


Item #	Part #	Description	Quantity
1	115-110-006-018	SPACER PLATE	1
2	115-110-010-018	BEARING HOUSEING, WHEEL	2
3	115-700-010-00	FRAME, ROLLER, DRIVE	1
4	115-700-007-00	RUN ROLLER	1
5	115-700-086-00	MOTOR MOUNT, HI TORQUE	1
6	115-700-006-00	POLLER PIN	1
7	41421	BEARING, BALL, DOUBLE SEALED	4
8	14144	BOLT, HEX HEAD	4
9	14145	WASHER, LOCK	8
10	14330	BOLT, HEX HEAD	2
11	14348	BOLT, HEX HEAD	2
12	15612	UNION, JIC-SAE ORING	1
13	15739	UNION, JIC-SAE ORING	1
14	15790	UNION, JIC-SAE ORING	1
15	16299	KEYSTOCK	2
16	16391	HYDRAULIC MOTOR	1
17	17158	SET SCREW	4
18	17656	WASHER, FLAT	4
19	21483	RETAINING RING, INTERNAL	2
20	29406	LINCH PIN	2
21	40606	SHAFT COUPLING	2
22	40607	COUPLING CHAIN	1



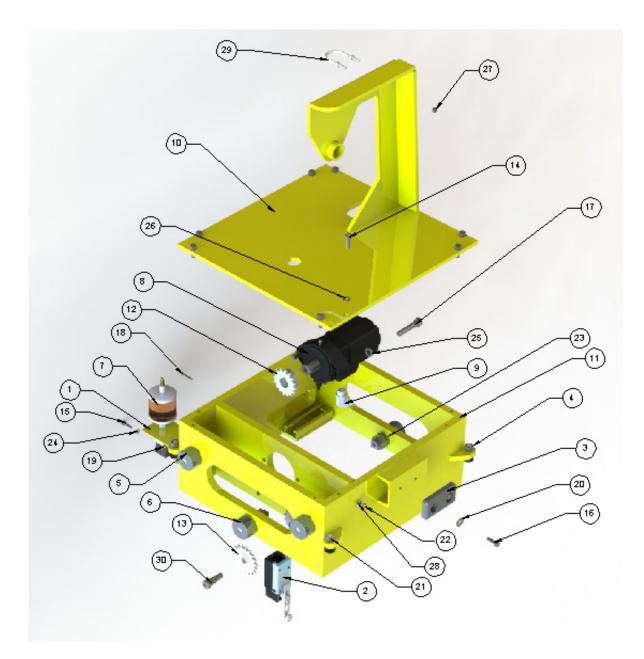
Item #	Part #	Description	Quantity
1	13592	PADDLE WEAR PAD	1
2	115-700-205-00	PADDLE	1
3	13609	BEARING BLOCK	2
4	13999	NUT, LOCK	2
5	14124	NUT, HEX	4
6	14140	WASHER, LOCK	4
7	14361	BOLT, HEX HEAD	4
8	14495	BOLT, FLAT HEAD, SCS	2
9	14645	BEARING, SPHERICAL	2
10	16086	GREASE ZERK	2
11	16321	NUT, LOCK	1
12	17649	WASHER, FLAT	4
13	17653	WASHER, FLAT	1
14	38072	COLLAR, CLAMP	2
15	38824	BOLT, SHOULDER	1

Back Plate Linear Bearing



Item #	Part	Description	Quantity
1	16091	LINEAR BEARING	4
2	24889	BOLT	16
3	17668	WASHER, LOCK	16

Lance Drive Cart



Item #	Part	Description	Quantity
1	115-400-108-018	OILER BRACKET	1
2	17397	LIMIT SWITCH W/ROLLER	1
3	16793	BUMBER	1
4	40933	1" ECCENTRIC CAM FOLLOWER	4
5	40934	2" ECCENTRIC CAM FOLLOWER	4
6	27201	2" CONCENTRIC CAM FOLLOWER	2
7	28129	OILER WITH BRUSH	1
8	28544	HYDRAULIC MOTOR	1
9	15735	HYDRAULIC 90° ELBOW	2
10	115-700-314-00	LANCE HANGER ASSEMBLY	1
11	115-700-228-00	CAR FRAME	1
12	36130	DRIVE SPROCKET	1
13	36129	IDLE SPROCKET	2
14	14132	HEX BOLT	8
15	14139	HEX BOLT	4
16	14341	HEX BOLT	2
17	14359	HEX BOLT	2
18	14491	SOCKET HEAD CAP SCREW	2
19	17650	FLAT WASHER	4
20	17657	FLAT WASHER	2
21	17668	LOCK WASHER	4
22	17670	LOCK WASHER	2
23	17677	LOCK WASHER	6
24	14138	LOCK WASHER	2
25	14140	LOCK WASHER	2
26	14145	LOCK WASHER	8
27	16541	NYLOCK HEX NUT	2
28	16539	NYLOCK HEX NUT	2
29	41434	U BOLT	1
30	29408	SHOULDER BOLT	1

Hose Schedule

ITEM NO.	PART NUMBER	FROM	то	ADDITIONAL NOTES	DESCRIPTION	QTY.
1	115-610-001-00	ROLLER MOTOR UPPER TUBING ASSY	6TH PIPE ROLLER MOTOR	MOTOR FARTHEST AWAY FROM HOME STATION	15562, HOSE 16234 30.50" LG., 15563	1
2	115-610-002-00	ROLLER MOTOR LOWER TUBING ASSY	6TH PIPE ROLLER MOTOR	MOTOR FARTHEST AWAY FROM HOME STATION	15562, HOSE 16234 30.50" LG., 15563	1
3	115-610-003-00	CASE DRAIN TUBING ASSY	6TH PIPE ROLLER MOTOR	MOTOR FARTHEST AWAY	15544, HOSE 16228 28.875" LG., 15544	1
4	115-610-004-00	ROLLER MOTOR UPPER TUBING ASSY	ROLLER MOTOR UPPER TUBING	FROM HOME STATION JUMPS THE TWO TUBING	15562, HOSE 16234 17.875" LG., 15562	2
5	115-610-005-00	ROLLER MOTOR UPPER TUBING ASSY	ASSY ROLLER MOTOR UPPER TUBING	ASSY TOGETHER JUMPS THE TWO TUBING	15562, HOSE 16234 17:875 EG., 15562	2
6	115-610-006-00	ROLLER MOTOR UPPER TUBING ASSY	ASSY ROLLER MOTOR UPPER TUBING	ASSY TOGETHER JUMPS THE TWO TUBING	15562, HOSE 16234 16.875" LG., 15562	2
7	115-610-007-00	VANE MOTOR BLK HD	ASSY VANE MOTOR	ASSY TOGETHER	15560, HOSE 16233 31.5" LG., 15555	1
8	115-610-008-00	VANE MOTOR BLK HD	VANE MOTOR		15555, HOSE 16233 25" LG., 15560	1
9	115-610-009-00	VANE MOTOR BLK HD	VANE MOTOR		15555, HOSE 16233 34.75" LG., 15560	1
10	115-610-010-00	VANE MOTOR BLK HD	VANE MOTOR		15555, HOSE 16223 40" LG., 15560	1
11	115-610-012-00	CASE DRAIN TUBING RUN	5TH PIPE ROLLER MOTOR		15544, HOSE 16228 57.875" LG., 15544	1
12	115-610-013-00	ROLLER MOTOR UPPER TUBING ASSY	5TH PIPE ROLLER MOTOR		15566, HOSE 16226 63.375" LG., 15562	1
13	115-610-014-00	ROLLER MOTOR UPPER TUBING ASSY	5TH PIPE ROLLER MOTOR		15563, HOSE 16234 64,125" LG., 15562	1
14	115-610-015-00	ROLLER MOTOR UPPER TUBING ASSY	4TH PIPE ROLLER MOTOR		15566, HOSE 16234 34.50" LG., 15562	1
15	115-610-016-00	ROLLER MOTOR UPPER TUBING ASSY	4TH PIPE ROLLER MOTOR		15563, HOSE 16234 35.875" LG., 15562	1
16	115-610-017-00	CASE DRAIN TUBING ASSY	4TH PIPE ROLLER MOTOR		15544, HOSE 16228 26.5" LG., 15544	1
17	115-610-018-00	ROLLER MOTOR UPPER TUBING ASSY	3RD PIPE ROLLER MOTOR		15566, HOSE 16226 20.5 LG., 15544	1
18	115-610-019-00	ROLLER MOTOR UPPER TUBING ASSY	3RD PIPE ROLLER MOTOR		15563, HOSE 16234 54" LG., 15562	1
19	115-610-020-00	CASE DRAIN TUBING RUN	3RD PIPE ROLLER MOTOR		15544, HOSE 16228 51" LG., 15544	1
20	115-610-021-00	ROLLER MOTOR UPPER TUBING ASSY	2ND PIPE ROLLER MOTOR			1
20	115-610-022-00	ROLLER MOTOR UPPER TUBING ASSY	2ND PIPE ROLLER MOTOR		15566, HOSE 16234 31.5" LG., 15562	1
21	115-610-022-00	CASE DRAIN TUBING ASSY	2ND PIPE ROLLER MOTOR		15563, HOSE 16234 33" LG., 15562	1
22				PIPE ROLLER MOTOR	15544, HOSE 16228 27.25" LG., 15544	-
	115-610-024-00	ROLLER MOTOR UPPER TUBING ASSY	1ST PIPE ROLLOER MOTOR	CLOSEST TO HOME SECTION	15566, HOSE 16234 56.625" LG., 15562	1
24	115-610-025-00	ROLLER MOTOR UPPER TUBING ASSY	1ST PIPE ROLLOER MOTOR	PIPE ROLLER MOTOR CLOSEST TO HOME SECTION	15563, HOSE 16234 54.75" LG., 15562	1
25	115-610-026-00	CASE DRAIN TUBING ASSY	1ST PIPE ROLLOER MOTOR	PIPE ROLLER MOTOR CLOSEST TO HOME SECTION	15544, HOSE 16228 48.625" LG., 15544	1
26	115-610-027-00	LOWER FRAME BLK HD PLTE	PADDLE CYLINDER A PORT		15562, HOSE 16234 21.5" LG., 15562	1
27	115-610-028-00	OD CART ECHAIN BULKHEAD	LEFT VANE MOTOR BLK HD		15555, HOSE 16233 198" LG., 15555	1
28	115-610-030-00	LOWER FRAME BLK HD PLTE	PADDLE CYLINDER B PORT		15562, HOSE 16234 31.00" LG., 15562	1
29	115-610-031-00	LOWER FRAME BLK HD PLTE	CASE DRAIN TUBING ASSY		15562, HOSE 16234 20.50" LG., 15562	1
30	115-610-032-00	LOWER FRAME BLK HD PLTE	ROLLER MOTOR LOWER TUBING ASSY		15562, HOSE 16234 18.625" LG 15562	1
31	115-610-033-00	LOWER FRAME BLK HD PLTE	ROLLER MOTOR UPPER TUBING ASSY		15562, HOSE 16234 16.375" LG., 15562	1
32	115-610-034-00	FLIPPER CYL TEE	LOAD SIDE FLIPPER CYL BLK HD		15539, HOSE 16229 45.50" LG., 15539	2
33	115-610-037-00	OD CART ECHAIN BULKHEAD	LEFT VANE MOTOR BLK HD		15555, HOSE 16233 207.5" LG., 15555	1
34	115-610-046-00	VALVE STACK	ID CART MOTOR		15550, HOSE, 16228 X 858.26" LG. 15538	1
35	115-610-047-00	VALVE ENCLOSER SIDE BLKHD	FLIPPER CYL TEE		15551, HOSE 16229 60.00" LG., 15551	1
36	115-610-048-00	VALVE ENCLOSER SIDE BLKHD	FLIPPER CYL TEE		15551, HOSE 16229 65.00" LG., 15551	1
37	115-610-049-00	VALVE ENCLOSER SIDE BLKHD	LOWER FRAME BULKHEAD PLT		15562, HOSE 16234 25.50" LG., 15562	1
38	115-610-050-00	VALVE ENCLOSER SIDE BLKHD	LOWER FRAME BULKHEAD PLT		15562, HOSE 16234 28.50" LG., 15562	1
39	115-610-051-00	VALVE ENCLOSER SIDE BLKHD	LOWER FRAME BULKHEAD PLT		15562, HOSE 16234 29.75" LG., 15562	1
40	115-610-052-00	VALVE ENCLOSER SIDE BLKHD	LOWER FRAME BULKHEAD PLT		15562, HOSE 16234 32.00" LG., 15562	1
41	115-610-053-00	VALVE ENCLOSER SIDE BLKHD	LOWER FRAME BULKHEAD PLT		15562, HOSE 16234 34.25" LG., 15562	1
42	115-610-054-00	VALVE ENCLOSER SIDE BLKHD	LOWER FRAME BULKHEAD PLT		15562, HOSE 16234 37.25" LG., 15562	1
43	115-610-055-00	VALVE ENCLOSER SIDE BLKHD	LOWER FRAME BULKHEAD PLT		15562, HOSE 16234 38.50" LG., 15562	1
44	115-610-056-00	OD CART ECHAIN BULKHEAD	RIGHT VANE MOTOR BLK HD		15555, HOSE 16233 207" LG., 15555	1
45	115-610-057-00	VALVE ENCLOSURE UPPER BLK HD	UPPER FRAME BLK HD PLTE	BRUSH MOTOR LINE 1	15560, HOSE 16233 19.25" LG., 15549	1
46	115-610-058-00	VALVE ENCLOSURE UPPER BLK HD	UPPER FRAME BLK HD PLTE	BRUSH MOTOR LINE 2	15560, HOSE 16233 18.875" LG., 15549	1
47	115-610-059-00	VALVE ENCLOSURE UPPER BLK HD	UPPER FRAME BLK HD PLTE	BRUSH MOTOR LINE 3	15560, HOSE 16233 18.50" LG., 15549	1
48	115-610-060-00	VALVE ENCLOSURE UPPER BLK HD	UPPER FRAME BLK HD PLTE	BRUSH MOTOR LINE 4	15560, HOSE 16233 18.187" LG., 15549	1

49	115-610-061-00	VALVE ENCLOSURE UPPER BLK HD	UPPER FRAME BLK HD PLTE	AIR SUPPLY FOR BRUSH FRAME TILT CYLINDERS	15562, HOSE 16234 18.83" LG., 15566	1
50	115-610-062-00	VALVE ENCLOSURE UPPER BLK HD	UPPER FRAME BLK HD PLTE		15562, HOSE 16234 18.62" LG., 15566	1
51	115-610-063-00	VALVE ENCLOSURE UPPER BLK HD	UPPER FRAME BLK HD PLTE		15562, HOSE 16234 18.375" LG., 15566	1
52	115-610-064-00	VALVE ENCLOSURE UPPER BLK HD	UPPER FRAME BLK HD PLTE		15562, HOSE 16234 18.187" LG., 15566	1
53	115-610-065-00	VALVE ENCLOSURE UPPER BLK HD	UPPER FRAME BLK HD PLTE		15562, HOSE 16234 18.00" LG., 15566	1
54	115-610-066-00	VALVE ENCLOSURE UPPER BLK HD	UNLOAD SIDE DOOR MOTOR		15562, HOSE 16234 50.00" LG., 15562	1
55	115-610-067-00	VALVE ENCLOSURE UPPER BLK HD	UNLOAD SIDE DOOR MOTOR		15562, HOSE 16234 47.875" LG., 15562	1
56	115-610-068-00	VALVE ENCLOSURE UPPER BLK HD	LOAD SIDE DOOR MOTOR		15562, HOSE 16234 112.25" LG., 15562	1
57	115-610-069-00	OD CART ECHAIN BULKHEAD	RIGHT VANE MOTOR BLK HD		15555, HOSE 16233 216" LG., 15555	1
58	115-610-070-00	VALVE ENCLOSURE BLK HD	LOAD SIDE DOOR MOTOR		15562, HOSE 16234 114.375" LG., 15562	1
59	115-610-071-00	VALVE ENCLOSEURE LOWER BLK HD	VALVE ENCLOSURE UPPER BLK HD	VANE MOTOR	15560, HOSE 16233 42.125" LG., 15560	1
60	115-610-072-00	VALVE ENCLOSEURE LOWER BLK HD	VALVE ENCLOSURE UPPER BLK HD	VANE MOTOR	15560, HOSE 16233 42.75" LG., 15560	1
61	115-610-073-00	VALVE ENCLOSEURE LOWER BLK HD	VALVE ENCLOSURE UPPER BLK HD	VANE MOTOR	15560, HOSE 16233 42.25" LG., 15560	1
62	115-610-074-00	VALVE ENCLOSEURE LOWER BLK HD	VALVE ENCLOSURE UPPER BLK HD	VANE MOTOR	15560, HOSE 16233 43.25" LG., 15560	1
63	115-610-075-00	VALVE ENCLOSURE UPPER BLK HD	OD CART ECHAIN BULKHEAD	VANE MOTORS	15560, HOSE 16233 APROX. 670.00" LG., 15555	4
64	115-610-076-00	VALVE ENCLOSURE UPPER BLK HD	OD CART ECHAIN BULKHEAD		15568, HOSE 16234 APROX. 698.00" LG., 15562	5
65	115-610-086-00	VALVE ENCLOSER SIDE BLKHD	ID CART MOTOR		15550, HOSE, 16228 X 859.39" LG, 15538	1
66	115-610-110-00	VALVE ENCLOSURE UPPER BLK HD	VALVE ENCLOSURE UPPER BLK HD	AIR SUPPLY FOR BRUSH FRAME TILT CYLINDERS	15540, HOSE 16230 APROX. 698.00" LG., 15552	1
67	115-610-111-00	OD CART EHAIN BLK HD	AIR TEE		15552,HOSE 16230 80.00" LG,15540,15598,15648,(2)15677	1
68	115-610-112-00	AIR SPLIT TEE	AIR FILTER ASMBLY RIGHT		15610, HOSE 13973 106.00" LG., 15610	1
69	115-610-113-00	AIR SPLIT TEE	AIR FILTER ASMBLY LEFT		15610, HOSE 13973 110.00" LG., 15610	1
70	115-610-114-00	RIGHT AIR CONTROL BOX	RIGHT BRUSH TILT CYL PORT B		15610, HOSE 13973 30.00" LG., 15610	1
71	115-610-115-00	RIGHT AIR CONTROL BOX	RIGHT BRUSH TILT CYL PORT A		15610, HOSE 13973 31.00" LG., 15610	1
72	115-610-116-00	LEFT AIR CONTROL BOX	LEFT BRUSH TILT CYL PORT A		15610, HOSE 13973 24.75" LG., 15610	1
73	115-610-117-00	LEFT AIR CONTROL BOX	LEFT BRUSH TILT CYL PORT B		15610, HOSE 13973 28.50" LG., 15610	1
74	115-610-118-00	LEFT AIR FILTER ASMBLY	LEFT AIR CONTROL BOX		15610, HOSE 13973 11.50" LG., 15610	1
75	115-610-119-00	RIGHT AIR FILTER ASMBLY	RIGHT AIR CONTROL BOX		15610, HOSE 13973 6.50" LG., 15610	1
76	115-610-226-00	OD CART ECHAIN BULKHEAD	BRUSH LIFT CYL TUBING ASSY		15562, HOSE 16234 139" LG., 15568	1
77	115-610-227-00	OD CART ECHAIN BULKHEAD	OD CART DRIVE MOTOR TUBING ASSY		15562, HOSE 16234 126" LG., 15568	1
78	115-610-228-00	OD CART ECHAIN BULKHEAD	OD CART DRIVE MOTOR TUBING ASSY		15562, HOSE 16234 128.75" LG., 15568	1
79	115-610-229-00	BRUSH LIFT CYL TUBING ASSY	BRUSH LIFT CYL		15562, HOSE 16234 13.875" LG., 15562	1
80	115-610-230-00	OD CART DRIVE MOTOR TUBING ASSY	OD CART DRIVE MOTOR		15562, HOSE 16234 15.875" LG., 15568	1
81	115-610-231-00	OD CART DRIVE MOTOR TUBING ASSY	OD CART DRIVE MOTOR		15562, HOSE 16234 19.125" LG., 15568	1

Recommended Spare Parts

Part #	Description	Quantity
13592	PADDLE WEAR PAD	6
36596	ROLLER	2
40606	COUPLING, SHAFT, ROLLER CHAIN	4
40607	ROLLER CHAIN	2
16391	HYDRAULIC MOTOR	2
43856	MOTOR MOUNT, HI TORQUE	2
28544	HYDRAULIC MOTOR	1
24448	COMPRESSION SPRING	2
14645	BEARING, SPHERICAL	2
14613	BEARING, PILLOW BLOCK	2
36288	SPUR GEAR	1
14683	WIRE BRUSH	20
16383	BRUSH MOTOR	1
16091	LINEAR BEARING	4

