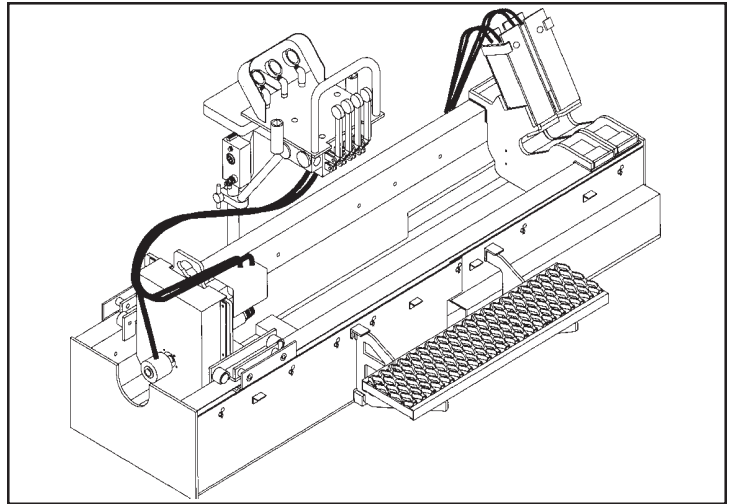




# McLaughlin BORING SYSTEMS

## COMPONENTS AND REPAIR MANUAL MODEL McL-10H VERSA-MOLE UTILITY DRILL PART NO. 8080000



Serial # \_\_\_\_\_

Purchased &  
Serviced Thru: \_\_\_\_\_

Purchase Date: \_\_\_\_\_

**Repair Manual Part No.: E250060**

## TABLE OF CONTENTS

Specifications & Maintenance.....	Section 1.0.0
Frame Assembly.....	Section 2.0.0
Carriage Assembly.....	Section 3.0.0
Console Assembly.....	Section 4.0.0
Breakout Assembly.....	Section 5.0.0
Hydraulics.....	Section 6.0.0
Water Parts.....	Section 7.0.0
Zap-Alert™ Operating Instructions/Strike Alert Components.....	Section 8.0.0
Repair Instructions.....	Section 9.0.0
Warranty Statement/Return Goods Policy.....	Section 10.0.0

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Revision Date: 09/19/08



# SPECIFICATIONS & MAINTENANCE

## McL-10H VERSA-MOLE

### McL-10H UTILITY DRILL

#### CAPABILITIES:

Dry Auger:	2" - 12"	(5.1 - 30.5 cm)
Wet Guided Pilot:	2 - 2-7/8"	(5.1 - 7.3 cm)
Back Reaming:	12"	(30.5 cm)

#### Chuck Options:

Threaded:	Tapered 1-5/8"	(4.1 cm)
Hex Size:	Customer to specify	
	13/16"	2.0 cm
	1-1/8"	2.8 cm
	1-3/8"	3.5 cm
	1-5/8"	4.1 cm

#### PERFORMANCE:

Maximum Pressure:	2500 psi	170 bar
Maximum Flow:	25 gpm	95 lpm
Spindle Speed:	0 - 125 rpm	0 - 125 rpm
Thrust @ 2500 psi:		
Forward:	17,670 lbs.	78,600 N
Pullback:	13,250 lbs.	58,950 N
Spindle Torque @ 2500 psi:	1030 ft.*lbs.	1400 Nm

#### DIMENSIONS:

	McL-10H-5 (5' version)		McL-10H-7 (7' version)	
Length:	60"	152.4 cm	84"	213.4 cm
Width:	45"	114.3 cm	45"	114.3 cm
Overall Height:	51"	129.5 cm	51"	129.5 cm
Drill Centerline:	12.25"	31.1 cm	12.25"	31.1 cm
Drill Height:	26"	66.0 cm	26"	66.0 cm

#### Drill Rod:

Length:	28"	71 cm	48"	122 cm
Weight:	15 lbs.	7 kg	19 lbs.	9 kg.

#### Weight:

Complete Machine:	1100 lbs.	500 kg.	1200 lbs.	545 kg.
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# GENERAL MAINTENANCE

## MCL-10H VERSA-MOLE

### CARRIAGE

Check all screws and nuts initially and then every week when in continuous use. Tighten all loose nuts and screws. Replace missing nuts or washer.

### HYDRAULICS

Check all hoses and fittings for leaks initially and then every week when in continuous use. When tightening fittings, be careful not to twist hoses from their original positions.

Relieve system pressure before disconnecting hoses.

Clean the quick-disconnects and install the dust caps.

### LUBRICATION

Lubricate the cam rollers with 1-2 pumps of grease each week.

Lubricate the chain drive every 2-3 days when in continuous use.

Use the grease fitting on the sprocket guard and use 4-5 pumps of all-purpose grease. Rotate the spindle while greasing the chain.

Lubricate the bearing carrier every 4-5 days when in continuous use. Use the grease fitting on the top of the bearing housing.

Use about 4-5 pumps of all-purpose bearing grease. (Photo 1)

Disassemble, inspect and re-pack spindle bearings every 1000 hrs or every 12 months.

### CHUCK

Check threaded chuck, each day in use. Check for scarred threads. NOTE: Always use an approved drill thread lubricant on the chuck and drill rods to prevent damage to the threads. Use *Jet-Lube - KOPR-KOTE with CZ-EX* or equivalent. (Photo 2).

Check hex chuck every day in use.

Lubricate hex on augers and chuck with penetrating oil.

NOTE: If the carriage is submerged under water:

Drain sprocket guard by removing bottom plug.

Re-lubricate bearing carrier, 4-5 pumps of grease.

Re-lubricate chain, 4-5 pumps of grease.

### FRAME

#### SHEET METAL GUARDS

Check sheet metal guards each day. Make sure that guards are properly secured at the top and the bottom. DO NOT OPERATE MACHINE WITHOUT GUARDS IN PLACE. Replace missing or damaged guards immediately. (Photo 3).

#### CONVEYOR GUARDS

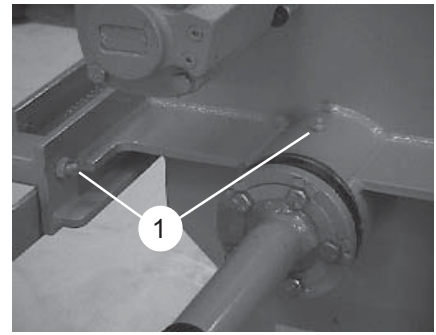
Check condition of belting material each day. Replace as necessary.

#### THRUST CHAIN

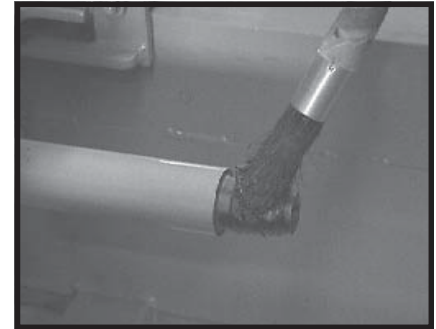
Check tension on thrust chain each week. Tighten as required using the bottom adjusting nut. The chain should be tight when tapped with a wrench. (Photo 4).

#### LUBRICATION

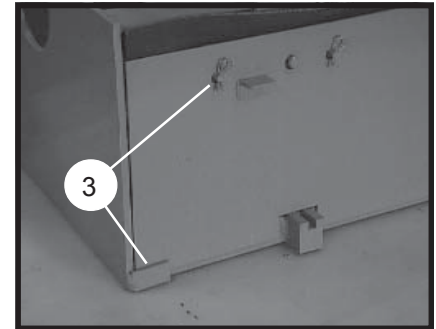
Grease the thrust chain once a week. Apply a light film of grease to the top and bottom of the chain. The thrust chain must be re-lubricated after each time it is cleaned with a pressure washer. (Photo 5).



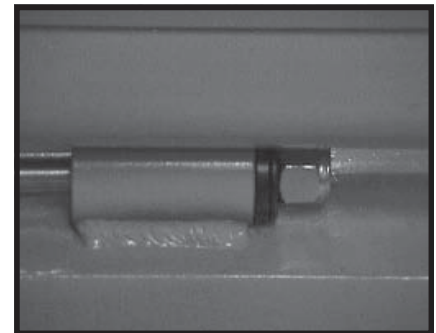
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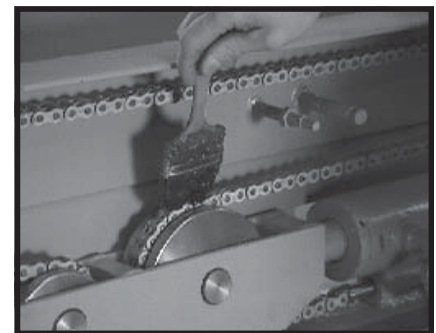
2



3



4



5

# GENERAL MAINTENANCE

## McL-10H VERSA-MOLE

Lubricate the pulley sheaves with penetrating oil. (Photo 6).

### HYDRAULICS

Check for hydraulic leaks and tighten fittings as needed.

### OPERATOR'S PLATFORM

Check that operator's platforms fits securely on machine.

### CONSOLE

#### HYDRAULICS

Check for hydraulic leaks and tighten fittings as needed.

Check gauges for damage and accurate readings.

Check relief pressure setting. Run carriage to the front or back of the frame and check the pressure on the thrust gauge.

#### SAFETY AND OPERATION MANUAL

Safety and Operation manual must be kept with the machine at all times. Call McLaughlin Group, Inc. for a free replacement.

#### GUARDS

Repair or replace guards which could restrict valve handle movement or view of gauges.

### BREAKOUT WRENCH

Test breakout wrench each time before going into service.

Test Procedure:

Assemble (2) rods and insert them into the breakout.

Screw the rod onto the chuck.

Move the carriage so the rods are properly positioned in the breakout.

Clamp the front rod in the front vise.

Tighten the rods with the spindle. Run the machine over relief 2500 psi (172 BAR).

Break the rod joint with the rear cylinder.

Break the spindle joint with the spindle.

### LUBRICATION

Grease cylinder pins with 1-2 pumps of grease. (Photo 8).

Grease jaw mounting blocks with cylinders extended.

### JAWS

Inspect jaws daily for wear and damage.

Jaws that slip must be replaced immediately.

**NEVER USE PIPE WRENCHES TO UNSCREW RODS.**

### BREAKOUT HOLD DOWNS

Hold downs must always be securely installed on the frame rails.

### CLEANING MACHINE

Clean machine after each use and before storing.

Clean all dirt off of machine.

Remove side panels and clean out dirt from around chains and pulleys. Re-grease chains after cleaning.

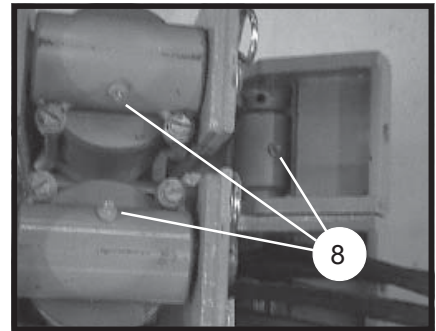
Clean and cap all hydraulic quick-disconnect fittings.

Drain any water from the spindle swivel.

6



8



### MAKING AND BREAKING ROD JOINTS

Always use an approved thread lubricant on rods.

#### MAKING JOINTS

Insert the new rod into the existing rod clamped in the breakout.

Rotate the rod 2-3 turns by hand to get threads started.

Slowly position the carriage so the new rod threads onto the chuck.

Rotate the spindle - but **DO NOT THRUST** - allow the carriage to "walk" forward as the rod and chuck screw together.

Run the machine over relief to tighten rods properly.

#### BREAKING JOINTS

Retract the carriage until the slider angle is even with the rear notch in the side rail.

Activate the front clamp. Run it over relief.

Actuate the breakout cylinder. The joint at the breakout should be loose.

Unscrew the rod about halfway out of the clamped rod.

Retract the Float Indicator to the rear position.

Again, actuate the breakout cylinder.

The joint at the chuck should be loose.

Unscrew the chuck from the rod.

Fully retract the carriage.

Disengage the breakout.

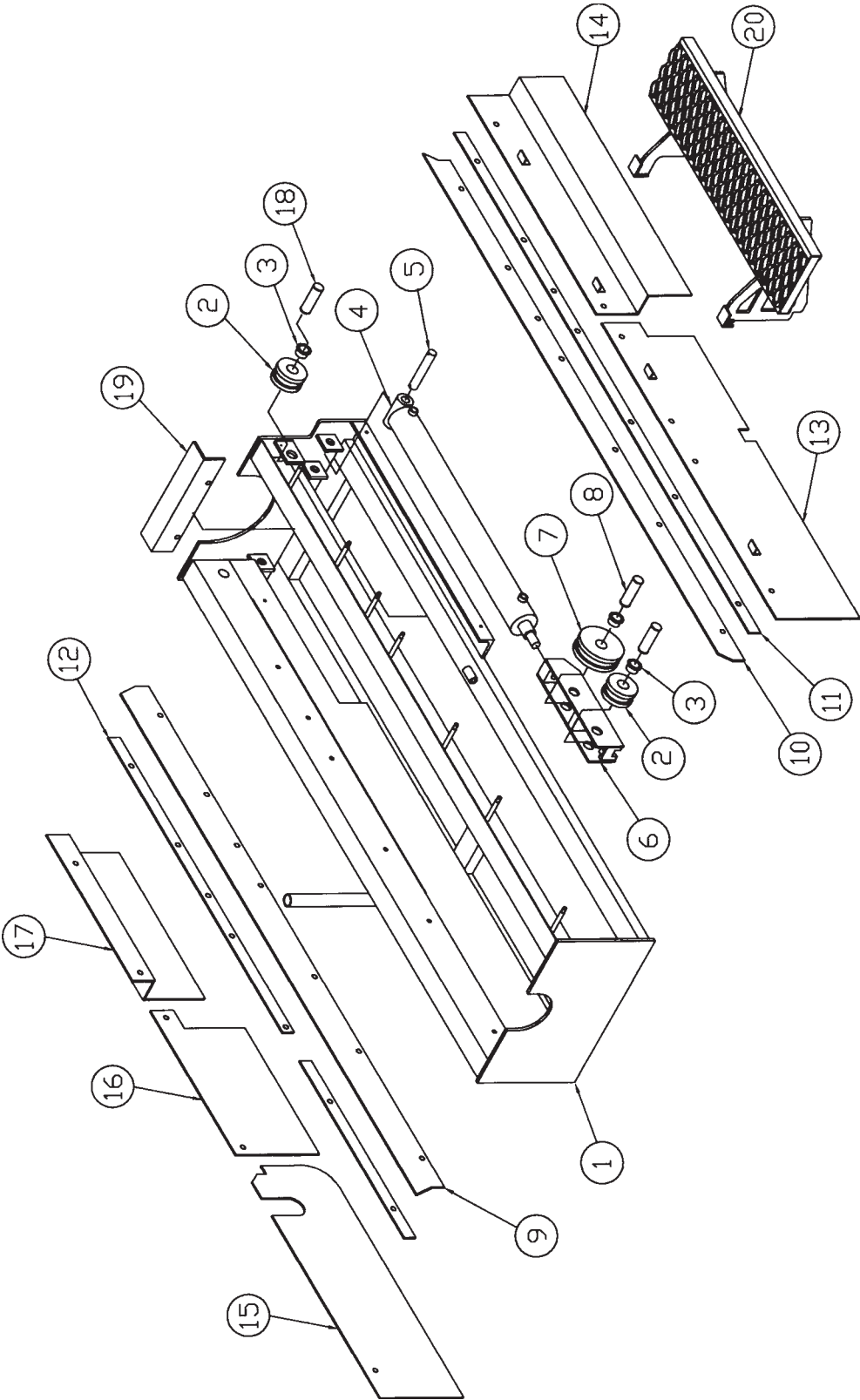
Remove the rod.

**IF FRONT JAW SLIPS, RE-ENGAGE TO FULL SYSTEM PRESSURE.**

**IF JAWS SLIP, REPLACE THEM IMMEDIATELY.**

# FRAME ASSEMBLY

## MCL-10H-5 VERSA-MOLE



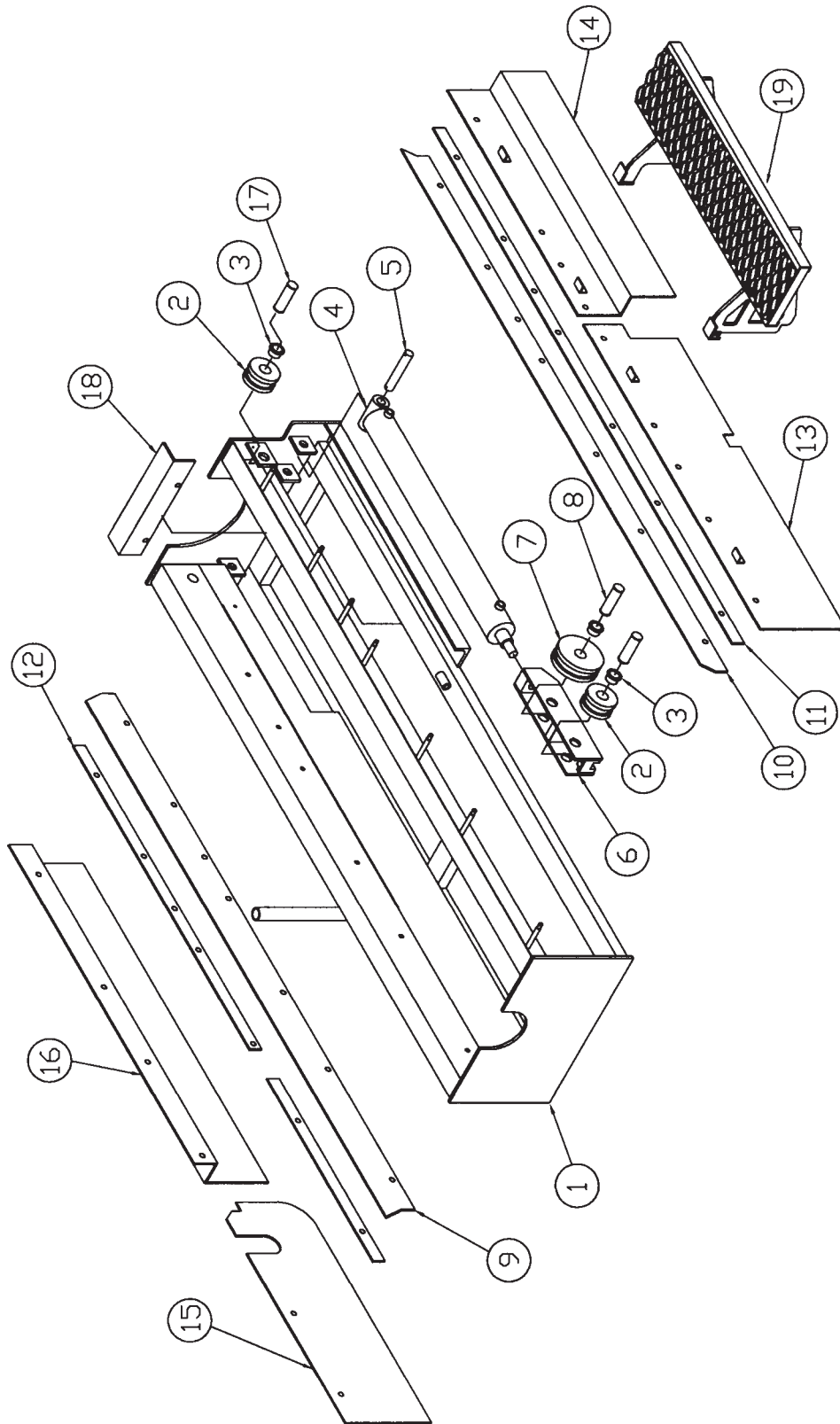
# FRAME ASSEMBLY

## MCL-10H-5 VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	8082050	Frame Weldment
2	6	8080008	Chain Sheave, Small
3	16	8080003	Plastic Bearing
4	2	8082009	Thrust Cylinder
5	2	8080023	Cylinder Pin
	4	U340040	R-Clip Pin, 1.250"
6	2	8080081	Slider Pulley Weldment
7	2	8080006	Chain Sheave, Large
8	4	8080034	Pulley Pin Short
	8	U500090	Spiral Clip Ring, 1.250" diameter
9	1	8082032	Conveyor Strip, Operator Side
	2	U002010	Screw, Rd. Hd. Slot, #10-24 X .500 Lg.
10	1	8082031	Conveyor Support Strip, Operator Side
	10	U100120	Nut, Hex, .500-13
	5	U200100	Washer, Flat .500
11	1	8082041	Conveyor Support Strip, Left Side
	10	U100120	Nut, Hex, .500-13
	5	U200100	Washer, Flat .500
12	8	8080198	Side Sheet Retaining Stud
13	1	8082029	Front Sheet, Operator Side
	2	U340020	R-Clip, .500
14	1	8082028	Rear Sheet, Left Side
	2	U340020	R-Clip, .500
15	1	8082041	Middle Sheet, Left Side
	2	U340020	R-Clip, .500
16	4	8080024	Pulley Pin, Long
	8	U500090	Spiral Clip Ring, 1.250
17	1	8082050	Front Sheet - Left Side
	2	U340020	R-Clip, .500
18	4	8080024	Pulley Pin, Long
	2	U500090	Spiral Clip Ring, 1.250
19	1	8080205	Hose Cover Plate
	2	U000400	Screw, HC .375-16 X .750 Lg.
	2	U210060	Washer, Lock .375
20	1	8080095	Operator's Platform

# FRAME ASSEMBLY

## McL-10H-7 VERSA-MOLE





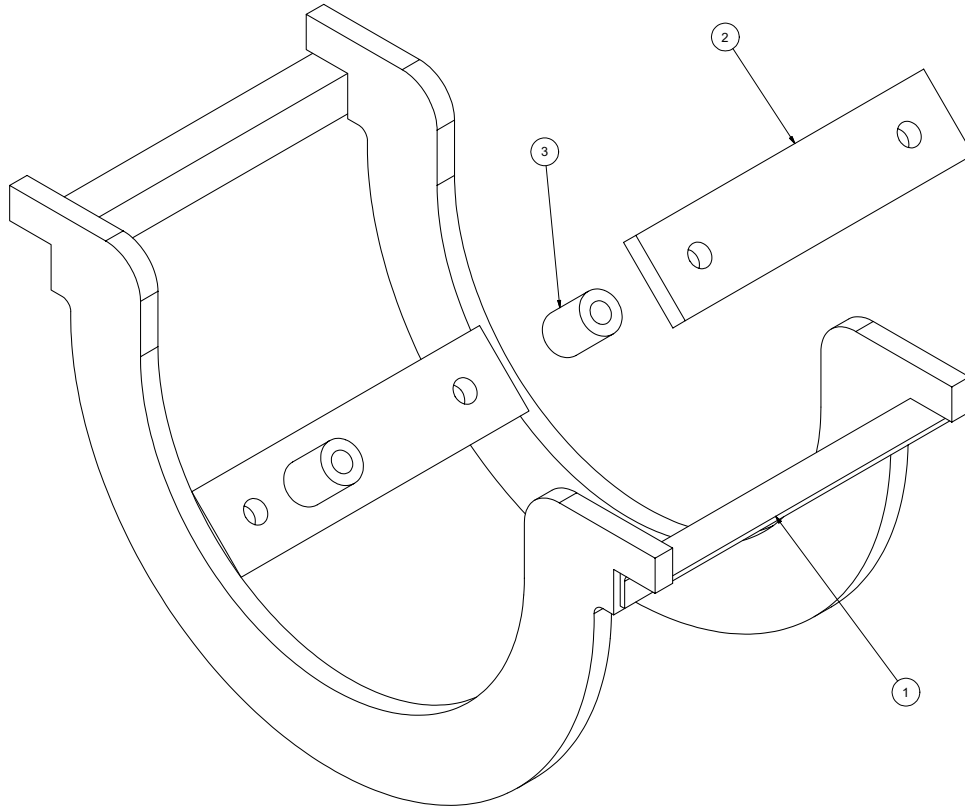
# FRAME ASSEMBLY

## McL-10H-7 VERSA-NOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	8080050	Frame Weldment
2	6	8080008	Chain Sheave, Small
3	16	8080003	Plastic Bearing
4	2	8080017	Thrust Cylinder
5	2	8080023	Cylinder Pin
	4	U340040	R-Clip Pin, 1.250
6	2	8080081	Slider Pulley Weldment
7	2	8080006	Chain Sheave, Large
8	4	8080034	Pulley Pin, Short
	8	U500090	Spiral Clip Ring, 1.250 diameter
9	1	8080211	Conveyor Strip, Left Side
	2	U002010	Screw, Rd. Hd. Slot, #10-24 X .500 Lg.
	2	U200000	Washer, Flat, #10
10	1	8080212	Conveyor Strip, Operator Side
	2	U002010	Screw, Rd. Hd. Slot, #10-24 X .500 Lg.
	2	U200000	Washer, Flat #10
11	1	8080200	Conveyor Support Strip, Operator Side
	14	U160016	Nut, Hex Jam, .500-13
	5	U200100	Washer, Flat .500
12	1	8080195	Conveyor Support Strip, Left Side
	14	U160016	Nut, Hex, Jam, .500-13
	5	U200100	Washer, Flat, .500
13	1	8080275	Rear Sheet, Operator Side
	3	U340020	R-Clip, .500
14	1	8080274	Front Sheet, Operator Side
	4	U340020	R-Clip, .500
15	1	8080273	Rear Sheet, Left Side
	3	U340020	R-Clip, .500
16	1	8080271	Front Sheet, Left Side
	4	U340020	R-Clip, .500
17	4	8080024	Pulley Pin, Long
18	1	8080205	Hose Cover Plate
	2	U000400	Screw, HC .375-18X.750 Lg.
	2	U210060	Washer, Lock, .375
19	1	8080095	Operator's Platform

# SADDLE & SPACERS

## McL-10H VERSA-MOLE



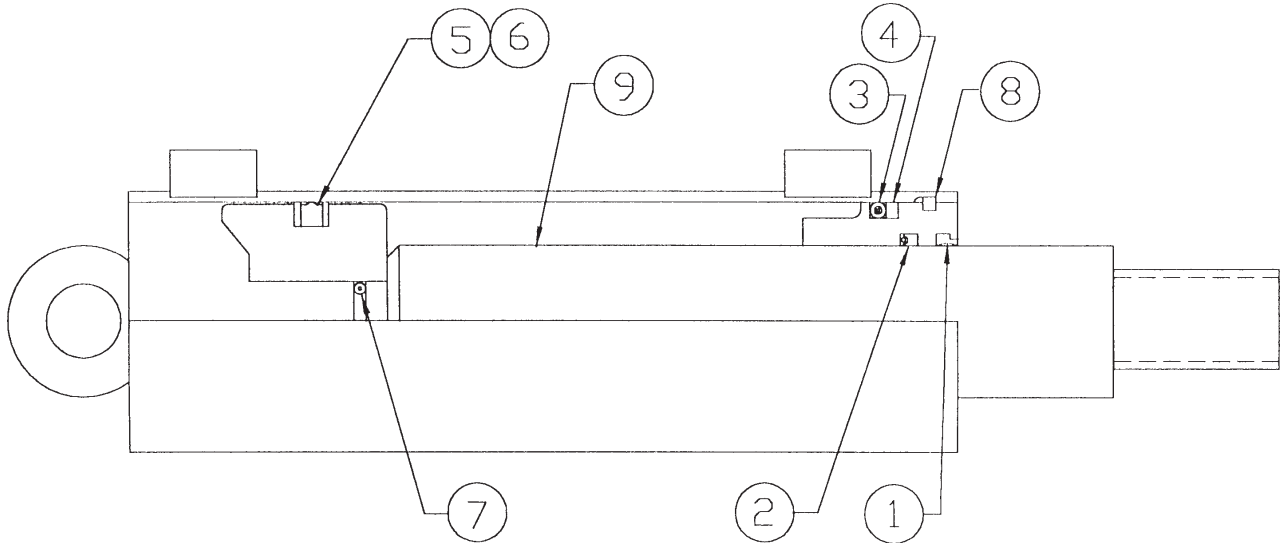
# SADDLE & SPACERS

## McL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	8080090	Saddle Weldment
2	2	8080094	Saddle Shoe
Optional Equipment			
3	4		Saddle Spacers
		8080290	10" Auger - .50 Long Spacer
		8082091	8" Auger - 1.50" Long Spacer
		8080292	6" Auger - 2.50" Long Spacer
		8080293	4" Auger - 2.50" Long Spacer

# THRUST CYLINDER - SEAL KIT

## McL-10H VERSA-MOLE



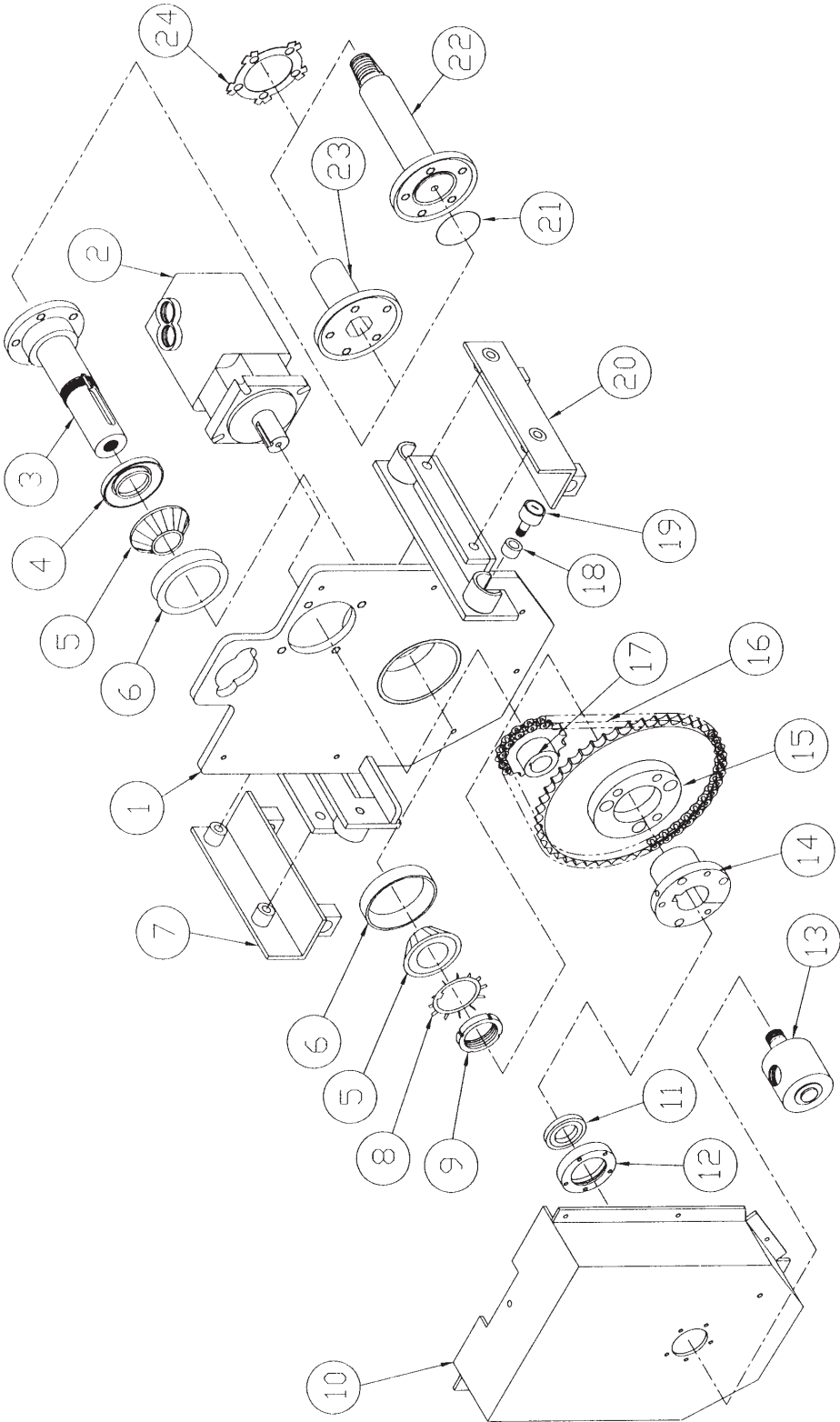
# THRUST CYLINDER - SEAL KIT

## McL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	8080022	Seal Kit, Includes Items #1 - #7 Item #1 - Wiper Item #2 - Seal Item #3 - O-Ring Item #4 - Back-Up Washer Item #5 - Back-Up Washer Item #6 - Seal Item #7 - O-Ring
8	1	8080243	Retaining Ring
McL-10H-5	1	8082043	Cylinder Rod
McL-10H-7	1	8080242	Cylinder Rod

# CARRIAGE ASSEMBLY

## MCL-10H VERSA-MOLE



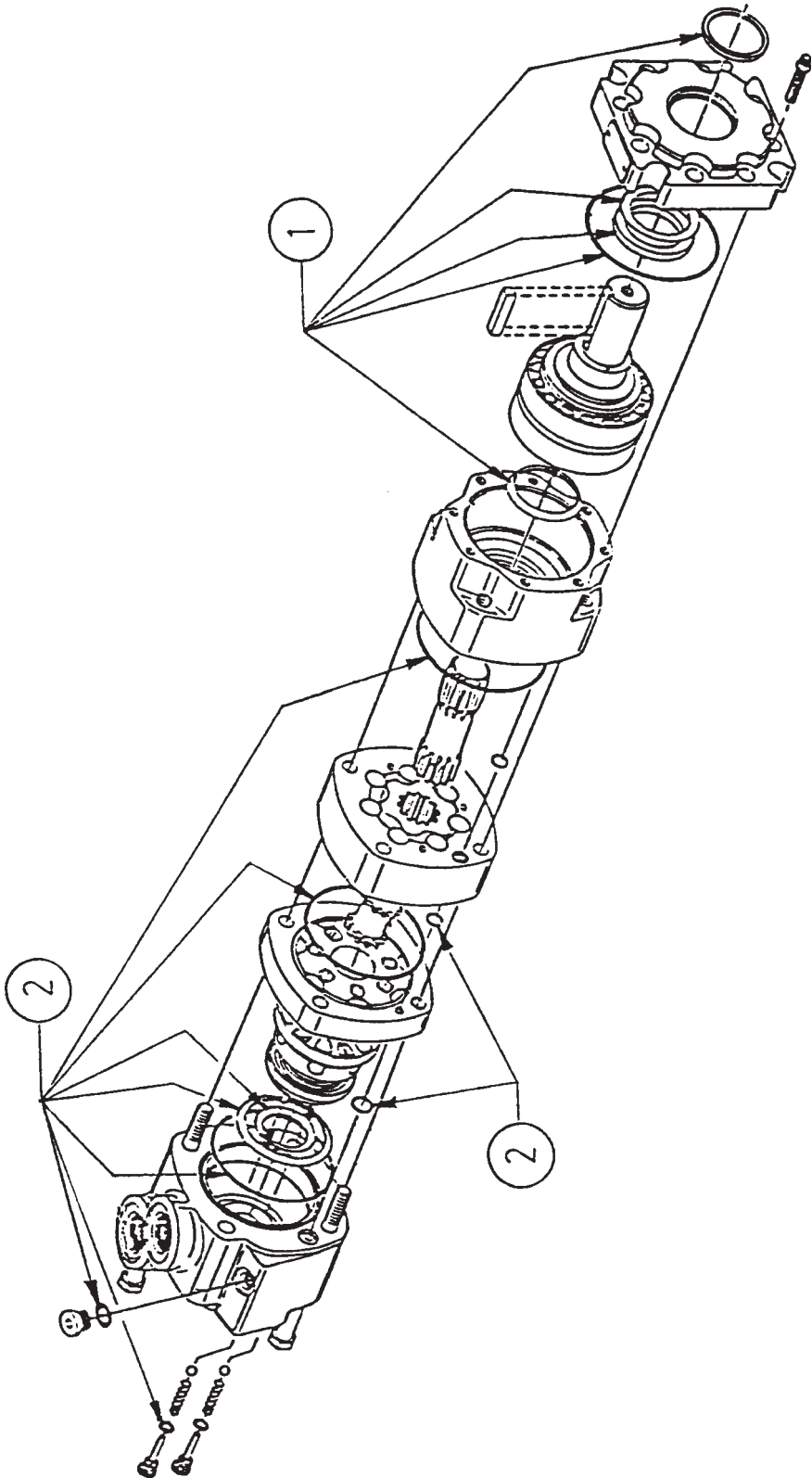
# CARRIAGE ASSEMBLY

## McL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION	ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	8080070	Carriage Frame	13	1	8080232	Water Swivel .750 NPT (Wet Version)
	1	T500020	Grease Fitting, .125 MNPT		1	T405065	Plug #12 MP (Dry Version)
2	1	T200080	Hydraulic Motor				
	4	U070020	Screw, C-Bore .500-13 X 1.500 Lg.	14	1	8080225	Taper Lock Bushing
	4	U210100	Washer, Lock .500		3	U000500	Screw, HC .375-18 X 2.000 Lg.
3	1	8080071	Spindle Shaft		3	U210060	Washer, Lock .375
	5	U000817	Screw, HC .500-13 X 1.000 Lg. GR 8		1	U240030	Screw, Set .375-18 X .500 Lg.
	1	8080220	Key, Sq. .500 (Special)	15	1	8080224	Sprocket, 45 Tooth
4	1	8080227	Front Lip Seal	16	1	8080222	Drive Chain, #60
5	1	8080229	Thrust Bearing, Front		1	P600210	Connecting Link, #60
6	1	8080228	Thrust Bearing Cup, Front	17	1	8080223	Sprocket, 16 Tooth
					2	U024010	Screw, Set .250-20 X .500 Lg.
7	1	8080035	Slider Angle Weldment, Left Side				
	2	U000900	Screw, .500-13 X 2.500 Lg.	18	4	HD20082	Spacer
	2	U100120	Nut, Hex .500-13	19	4	W000020	Camroller Bearing, 1.250 Dia.
	2	U210100	Washer, Lock .500		4	U100140	Nut, Hex, .500-20
	2	U200100	Washer, Flat .500		2	T500080	Grease Fitting, .1875 Str.
8	1	8080230	Tanged Bearing Washer		2	T500090	Grease Fitting, .1875, 65 deg.
9	1	8080231	Bearing Lock Nut	20	1	8080040	Slider Angle Weldment - Operator Side
10	1	8080046	Chain Guard				
	7	U000180	Screw, HC .312-18 X .750 Lg.		2	U000900	Screw, .500-13 X 2.500 Lg.
	7	U210040	Washer, Lock .312		2	U100120	Nut, Hex .500-13
	1		Silicone Sealer		2	U210100	Washer, Lock .500
	1	T405060	Plug, #8 MP		2	U200100	Washer, Flat .500
	1	T500020	Grease Fitting, .125 MNPT	21	1	W200210	O-Ring, #01-229
11	1	8080218	Rear Shaft Seal	22	1	8080087	Chuck, Taper Thd.
12	1	8080112	Seal Carrier	23	1	8080190	Chuck, .812 Hex
	5	U000020	Screw, HC .250-20 X .500 Lg.		1	8080191	Chuck, 1.125 Hex
					1	8080192	Chuck, 1.375 Hex
	5	U210020	Washer, Lock .250	24	1	8080193	Chuck, 1.625 Hex
					1	8080119	Chuck Bolt Lockdown

# SEAL KIT, HYDRAULIC MOTOR

## McL-10H VERSA-MOLE





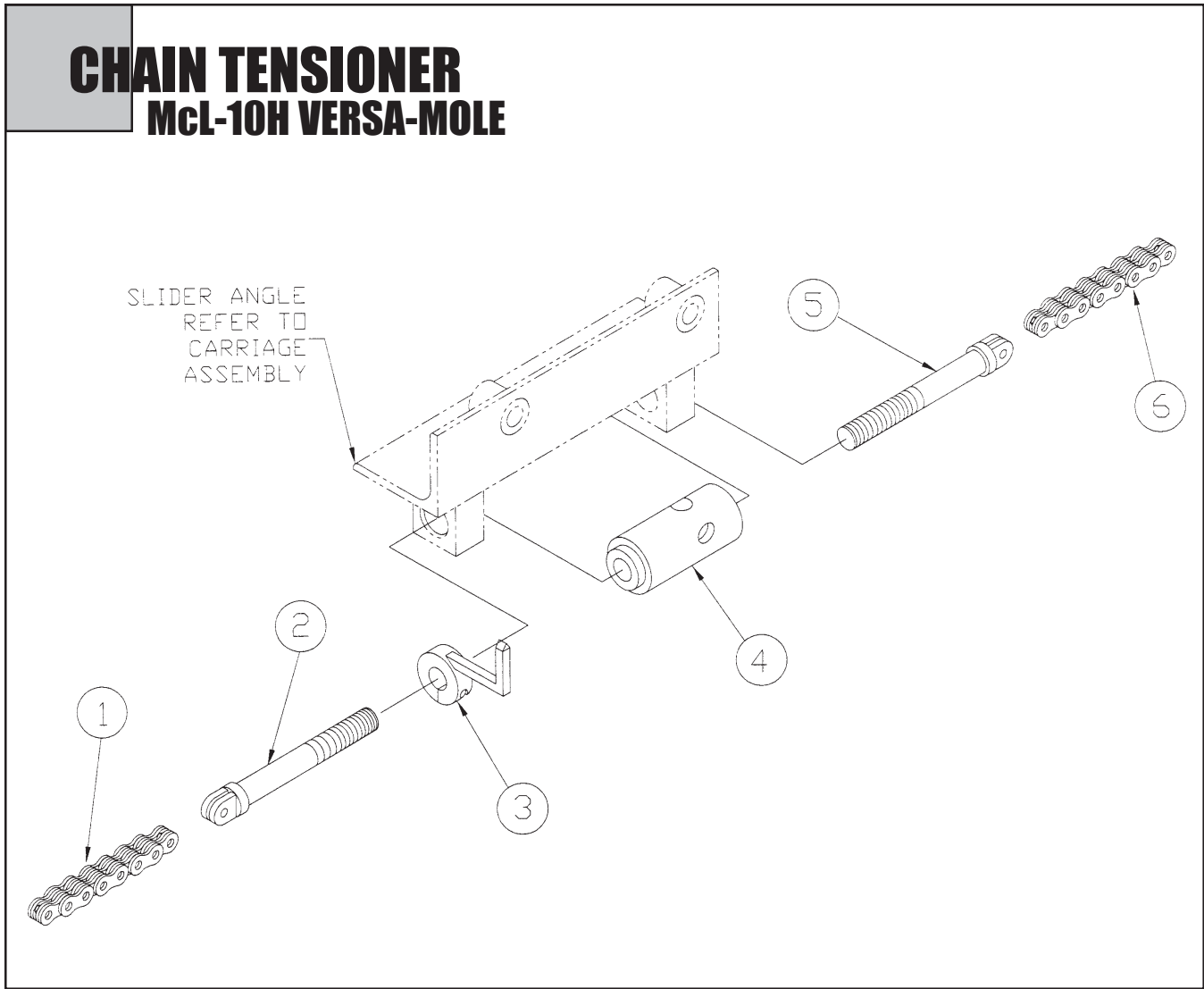
# SEAL KIT, HYDRAULIC MOTOR

## McL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	T200081	Seal Kit, Shaft
2	1	T200082	Seal Kit, Rear Motor

# CHAIN TENSIONER

## McL-10H VERSA-MOLE



# CHAIN TENSIONER

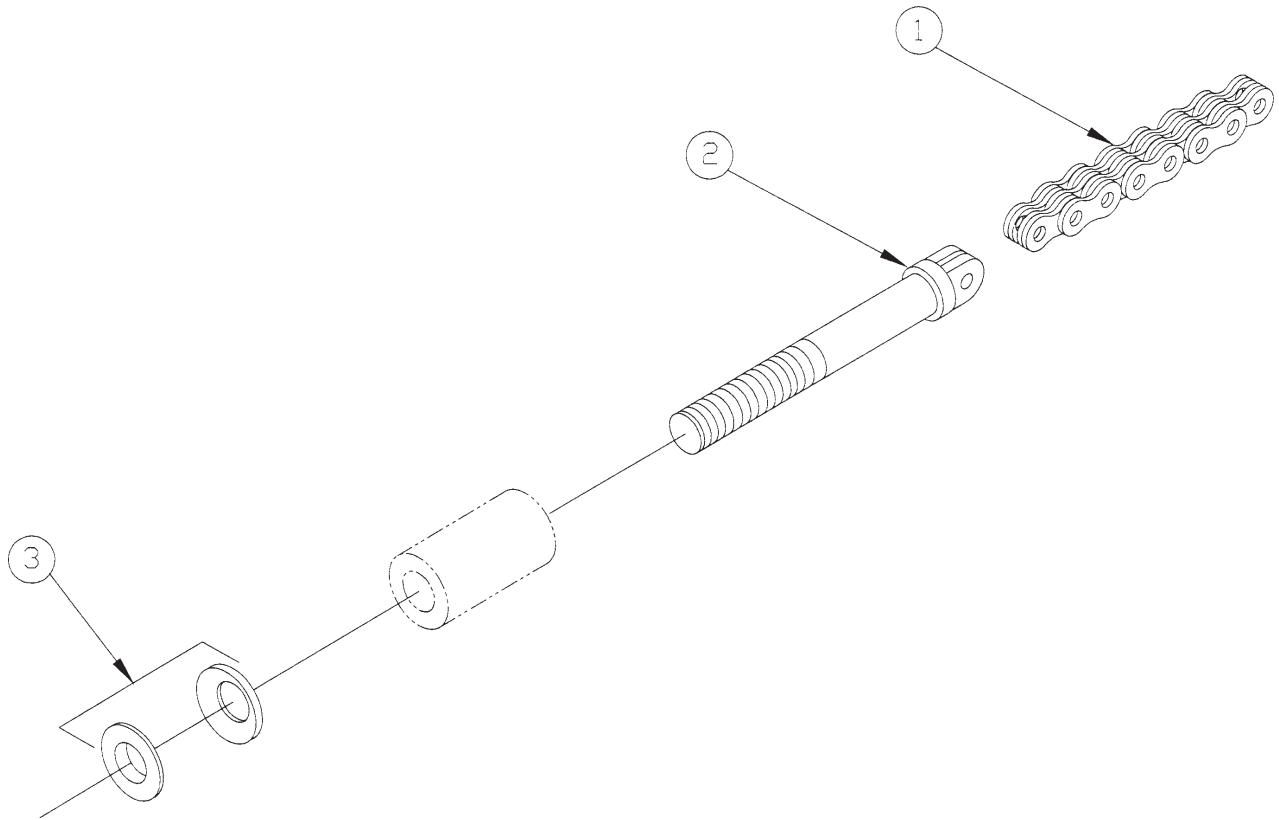
## McL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
McL-10H-7			
1	2	8080018	Thrust Chain, Long, Rear
	4	8080217	Connecting Link, BL-534
2	2	8080043	Threaded Chain Clevis, R.H. Thd.
3	1	8080066	Float Indicator, Operator Side Only
	1	U810025	Shaft Collar, .625, Left Side
4	2	8080042	Turnbuckle
5	2	8080044	Threaded Chain Clevis, L.H. Thd.
6	2	8080019	Thrust Chain, Short, Front
	4	8080217	Connecting Link, BL-534
McL-10H-5			
1	2	8082018	Thrust Chain, Long, Rear
	4	8082017	Connecting Link, BL-534
6	2	8082019	Thrust Chain, Short, Front
	4	8082017	Connecting Link, BL-534



# CHAIN ANCHOR ASSEMBLY

## McL-10H VERSA-MOLE



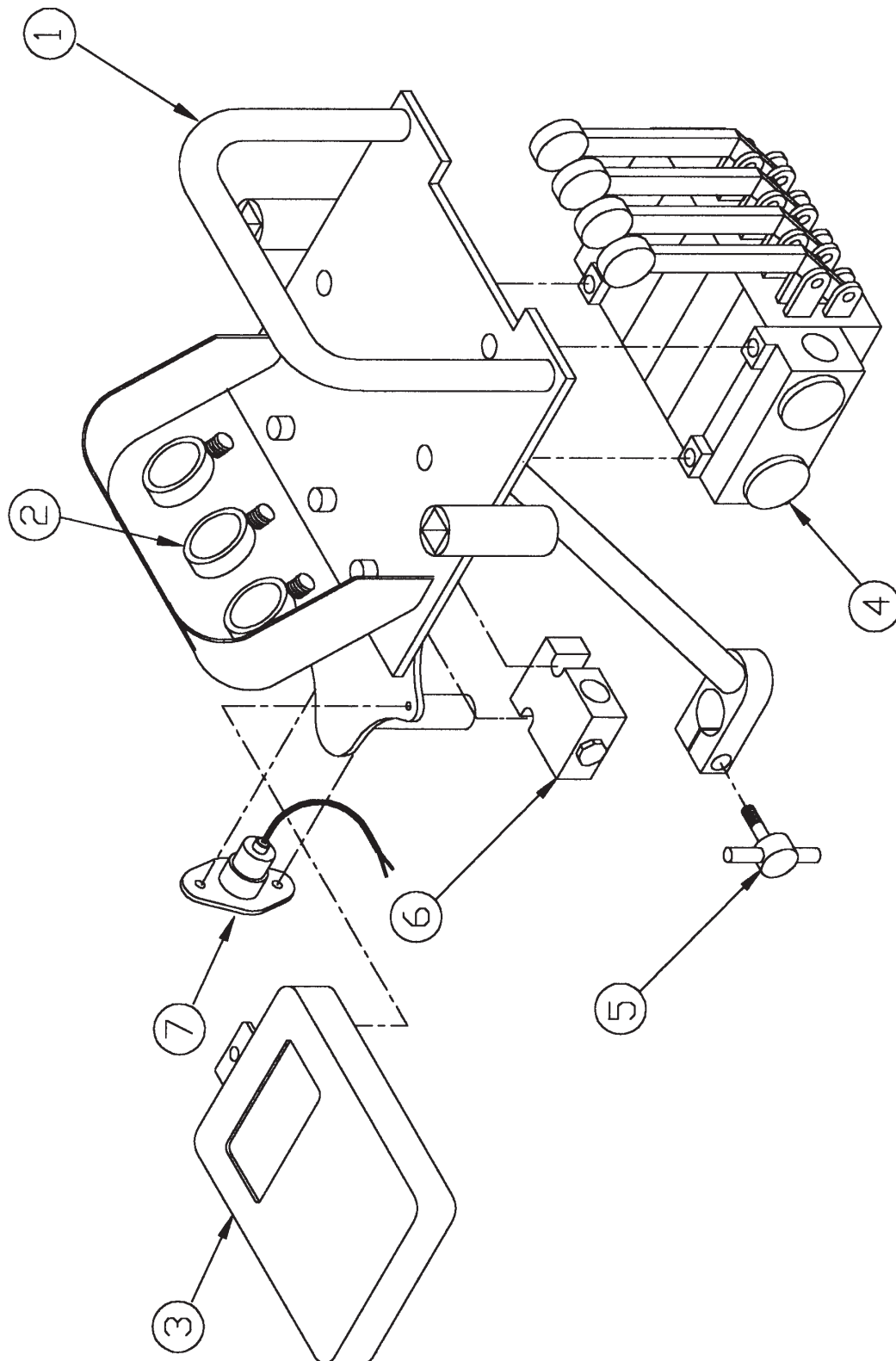
# CHAIN ANCHOR ASSEMBLY

## McL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
McL-10H-7			
1	2	8080018	Thrust Chain, Long, Rear
	4	8080217	Connecting Link, BL-534
2	2	8080043	Threaded Chain Clevis, R.H. Thd.
	4	U100180	Nut, Hex, .625-11 R.H. Thd.
3	2	8080072	Spherical Washer Set, Convex & Concave
McL-10H-5			
1	2	8082018	Thrust Chain, Long, Rear
	4	8080217	Connecting Link, BL-534
2	2	8080043	Threaded Chain Clevis, R.H. Thd.
	4	U100180	Nut, Hex, .625-11 R.H. Thd.
3	2	8080072	Spherical Washer Set, Convex & Concave

# CONSOLE ASSEMBLY

## McL-10H VERSA-MOLE



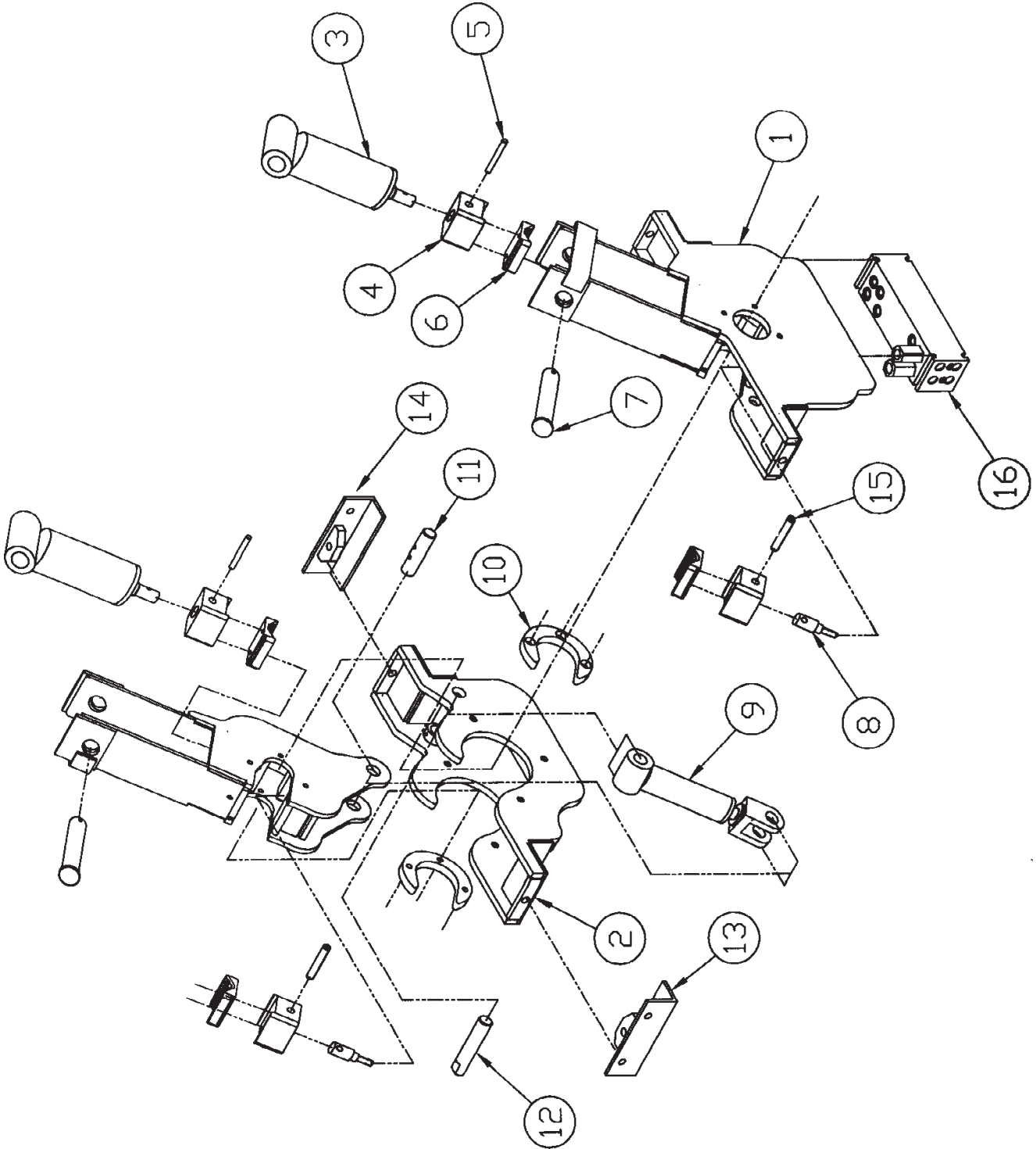
# CONSOLE ASSEMBLY

## MCL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	8080101	Console Weldment
2	3	T720020	Pressure Gauge (0-3000 psi)
3	1	E250210	Operation & Safety Manual Box
	1	E250205	Operation & Safety Manual
4	1	8080182	Hydraulic Control Valve
	3	U000300	Screw, HC .312-18 X 3.000 Lg.
	3	U200040	Washer, Flat .312
	3	U120105	Nut, Hex .312-18
5	1	8080076	Console Threaded Handle
6	1	8080157	Shuttle Valve (Thrust)
	2	U000100	Screw, HC .250-20 X 1.500 Lg.
	2	U210020	Washer, Lock .250
7	1	8080260	Strike Alert Receptical
	2	U000040	Screw, HC .250-20 X .750 Lg.
	2	U120100	Nut, Hex Lock .250-20

# BREAKOUT ASSEMBLY

## MCL-10H VERSA-MOLE



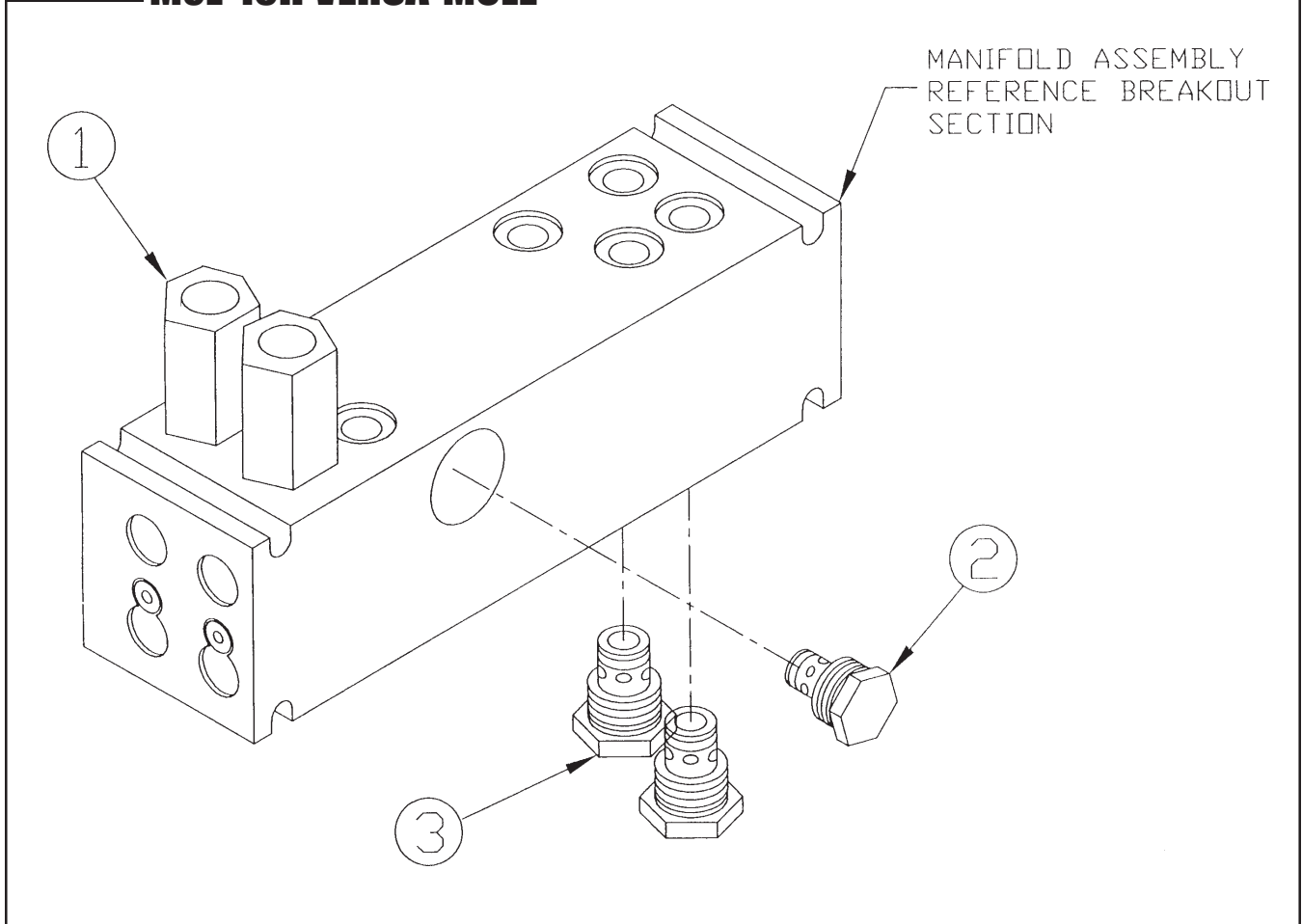
# BREAKOUT ASSEMBLY

## MCL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	8080147	Breakout Frame, Front
2	1	8080148	Breakout Frame, Rear
	3	U030130	Screw, SFH, .500-13 X 1.000 Lg.
3	2	8080153	Breakout Clamp Cylinder
4	4	8080188	Jaw Mounting Block
5	2	U300025	Dowel Pin, .375 X 3.000 Lg.
6	4	8080189	Jaw
	8	U030040	Screw, Flat Hex Hd. .312-18 X .750
7	2	8080127	Cylinder Pin
	2	U340045	R-Clip Pin, 1.250
8	2	8080165	Lower Jaw Retainer
	2	U120120	Nut, Lock Hex .500-13
	2	U200100	Washer, Flat .500
9	1	8080176	Breakout Rotation Cylinder
10	2	8080133	Breakout Rotation Guide
	6	U030100	Screw, SFH .375-16 X 1.000 Lg.
11	1	8080139	Rotation Cyl. Pin, Lower
	1	U021015	Screw, Set, .313-18 X .250, Knurl
12	1	8080138	Rotation Cyl. Pin, Upper
	1	U340040	R-Clip Pin, 1.000
13	1	8080168	Breakout Hold Down, Operator Side
	1	U001195	Screw, HC .625-11 X 1.750 Lg.
	1	U100180	Nut, Hex .625-11
	2	U000880	Screw, HC .500-13 X 2.000 Lg.
	2	U100120	Nut, Hex .500-13
14	1	8080167	Breakout Hold Down, Left Side
	1	U001195	Screw, HC .625-11 X 1.750 Lg.
	1	U100180	Nut, Hex .625-11
	2	U000880	Screw, HC .500-13 X 2.000 Lg.
	2	U100120	Nut, Hex .500-13
15	2	U370050	Spring Pin, .500 Dia. X 3.000
16	1	8080169	Breakout Manifold Assembly
	3	U000152	Screw, HC, .250-20 X 3.250 Lg.
	3	U210020	Washer, Lock, .250

# BREAKOUT WRENCH MANIFOLD ASSEMBLY

## McL-10H VERSA-MOLE



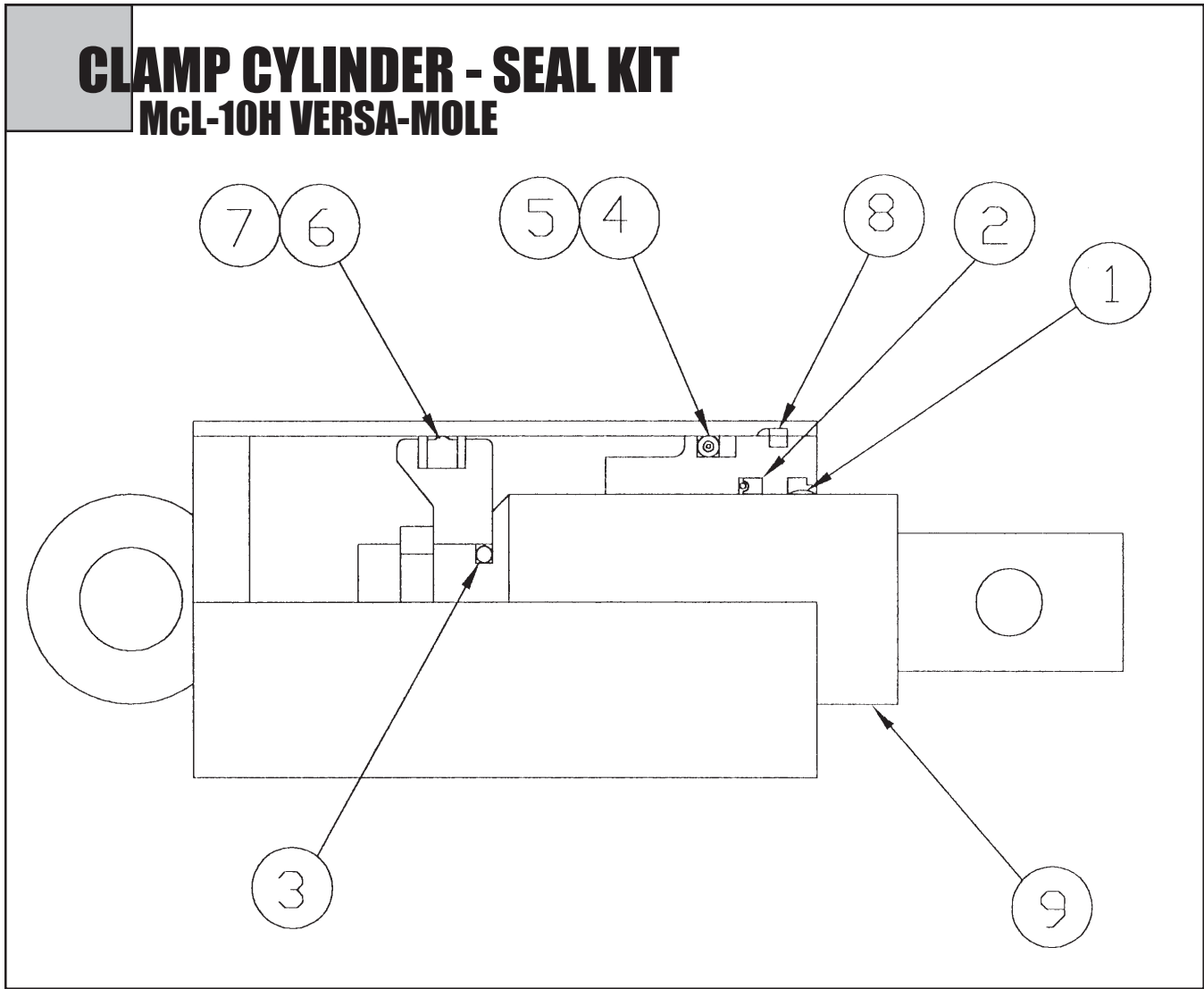
# BREAKOUT WRENCH MANIFOLD ASSEMBLY

## McL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	2	8080156	Shuttle Valve
2	1	8080156	Check Valve
3	2	8080154	Pilot Op. Check Valve

# CLAMP CYLINDER - SEAL KIT

## McL-10H VERSA-MOLE



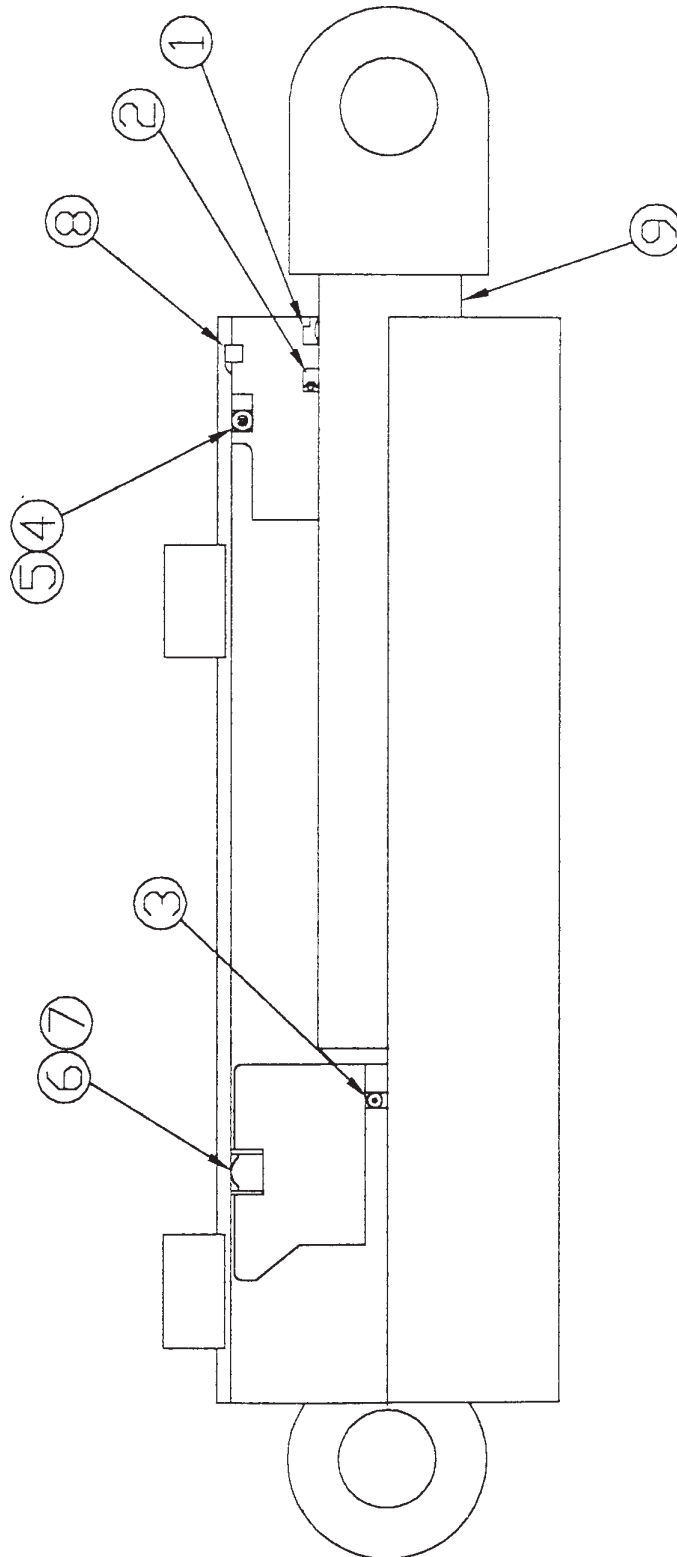
# CLAMP CYLINDER - SEAL KIT

## McL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	8080244	Seal Kit, Includes Items #1 - #7 Item #1 - Wiper Item #2 - Seal Item #3 - O-Ring Item #4 - O-Ring Item #5 - Back-Up Washer Item #6 - Seal Item #7 - Back-Up Washer
8	1	8080247	Retaining Rod
9	1	8080248	Cylinder Rod

# ROTATION CYLINDER - SEAL KIT

## MCL-10H VERSA-MOLE





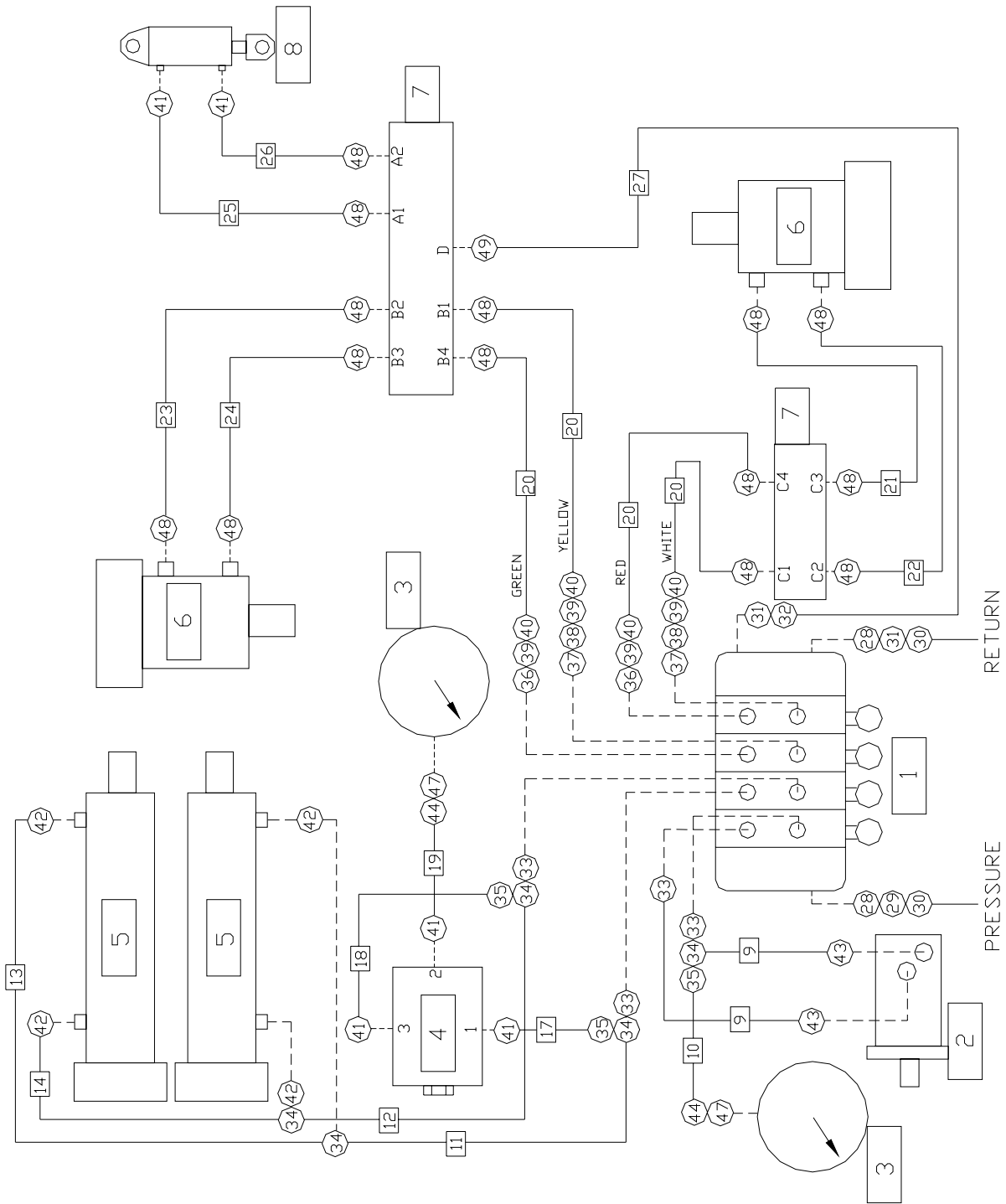
# ROTATION CYLINDER - SEAL KIT

## McL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	8080245	Seal Kit, Includes Items #1 - #7 Item #1 - Wiper Item #2 - Seal Item #3 - O-Ring Item #4 - O-Ring Item #5 - Back-Up Washer Item #6 - Seal Item #7 - Back-Up Washer
8	1	8080249	Retaining Rod
9	1	8080250	Cylinder Rod

# HYDRAULICS

## McL-10H-5 VERSA-MOLE



# HYDRAULICS

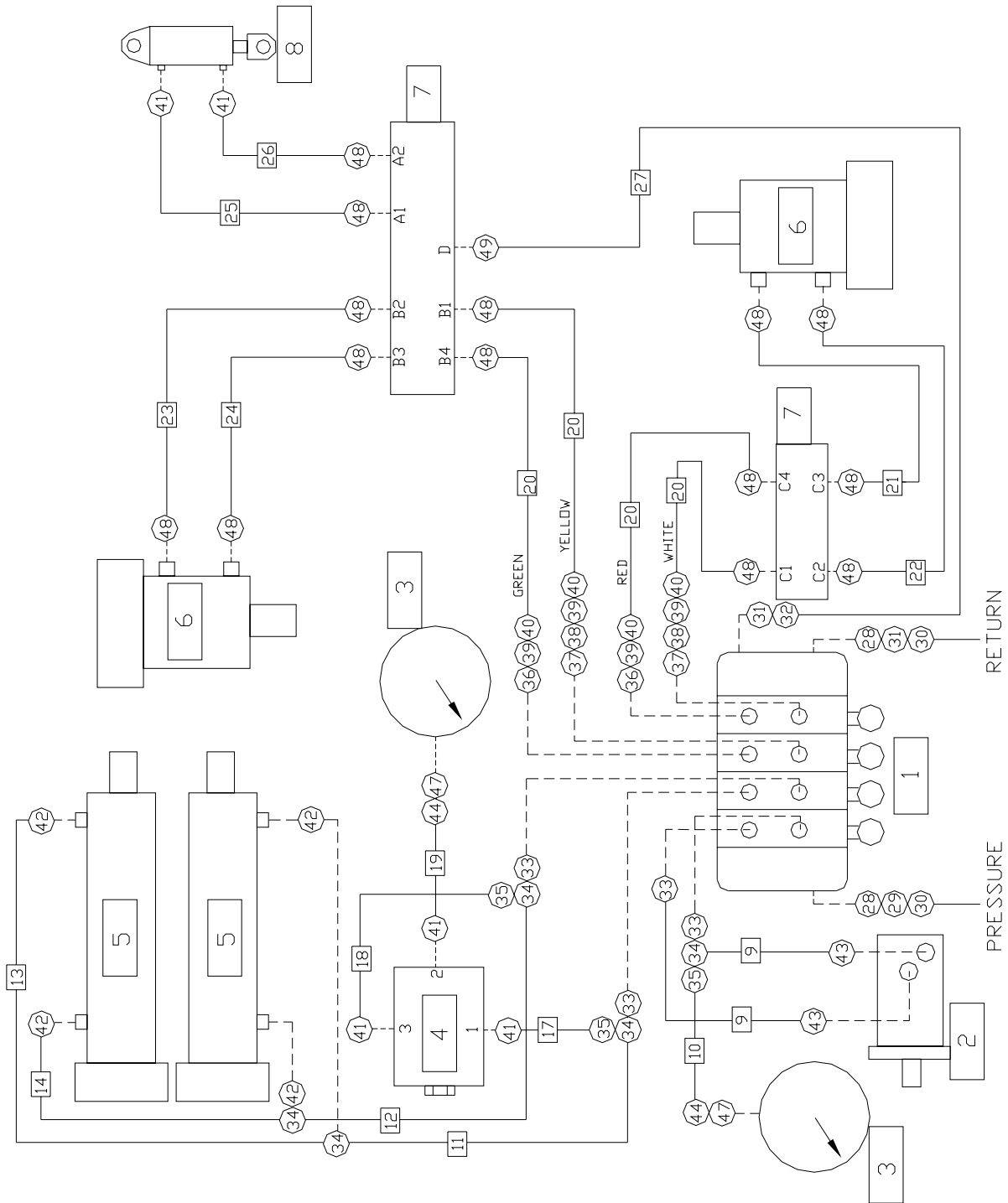
## McL-10H-5 VERSA-MOLE

ITEM	QTY	NUMBER	DESCRIPTION
1	1	8080182	Hydraulic Control Valve
2	1	T200080	Hydraulic Motor
3	2	T720020	Pressure Gauge (0-3000 psi)
4	1	8080157	Shuttle Valve
5	2	8082045	Thrust Cylinder
6	2	8080153	Breakout Clamp cylinder
7	1	8080169	Hydraulic Manifold Assembly
8	1	8080176	Breakout Rotation Cylinder
9	2	TH00133	Hose Assembly, Valve-Motor
10	1	TH00116	Hose Assembly, Valve-Gauge
11	1	TH00134	Hose Assembly, Valve-Cylinder Rod
12	1	TH00135	Hose Assembly, Valve-Cylinder Base
13	1	TH00119	Hose Assembly, Cylinder-Cylinder-Rod
14	1	TH00120	Hose Assembly, Cylinder-Cylinder-Base
15*	1	8082040	Hose Protector, 1.500 dia. Hose #11 & 12
16*	1	8082041	Hose Protector, 1.500 dia. Hose #20
17	1	TH00121	Hose Assembly, Cylinder Rod-Sh. Valve
18	1	TH00122	Hose Assembly, Cylinder Base-Sh. Valve
19	1	TH00123	Hose Assembly, Sh. Valve-Gauge
20	4	TH00136	Hose Assembly, Valve-Breakout Manifold
21	1	TH00125	Hose Assembly, B/O Manifold-F. Clamp Rod
22	1	TH00126	Hose Assembly, B/O Manifold-F. Clamp Base
23	1	TH00127	Hose Assembly, B/O Manifold-R. Clamp Base
24	1	TH00128	Hose Assembly, B/O Manifold-R. Clamp Rod
25	1	TH00129	Hose Assembly, B/O Manifold-Rotate Cyl. Base
26	1	TH00130	Hose Assembly, B/O Manifold-Rotate Cyl. Rod
27	1	TH00138	Hose Assembly, B/O Manifold Drain-Valve
28	2	T401350	Fitting, Elbow 90, 12MB-12MP
29	1	T412001	Fitting, Quick Disconnect, Female-12FP
30	2	T412002	Cap, Quick Disconnect, Male & Female .750
31	1	T400020	Fitting, Union, 04MP-04MJ
32	1	T401225	Fitting, Elbow, 04FJ-04MJ
33	2	T400160	Fitting, Union, 10MB-08MJ
34	4	T402155	Fitting, Tee, 08FJ-08MJ-08MJ
35	2	T403010	Fitting, Reducer, 08FJ-04MJ
36	2	T401300	Fitting, Elbow 90, 10MB-08MJ
37	2	T401310	Fitting, Elbow 90, Longneck, 10MB-08FP
38	2	T400040	Fitting, Union, 08MP-08MJ
39	2	T401125	Fitting, Union, 08FJ-06MP
40	4	T412009	Fitting, Quick Disconnect, Female-06FP
41	5	T401240	Fitting, Elbow 90, 06MB-04MJ
42	4	T401280	Fitting, Elbow 90, 08MB-08MJ
43	2	T400200	Fitting, Union, 12MB-08MJ
44	2	T401015	Fitting, Elbow 45, 04FP-04MP
45*	1	8082042	Hose Protector, 1.500 dia., Hose #9
46*	1	8082043	Hose Protector, .750 dia., Hose #27
47	2	T400020	Fitting, Union, 04MP-04MJ
48	16	T400570	Fitting, Union, 04MB-04MJ
49	1	T401230	Fitting, Elbow 90, 04MB-04MJ

\* NOT SHOWN

# HYDRAULICS

## McL-10H-7 VERSA-MOLE



# HYDRAULICS

## MCL-10H-7 VERSA-MOLE

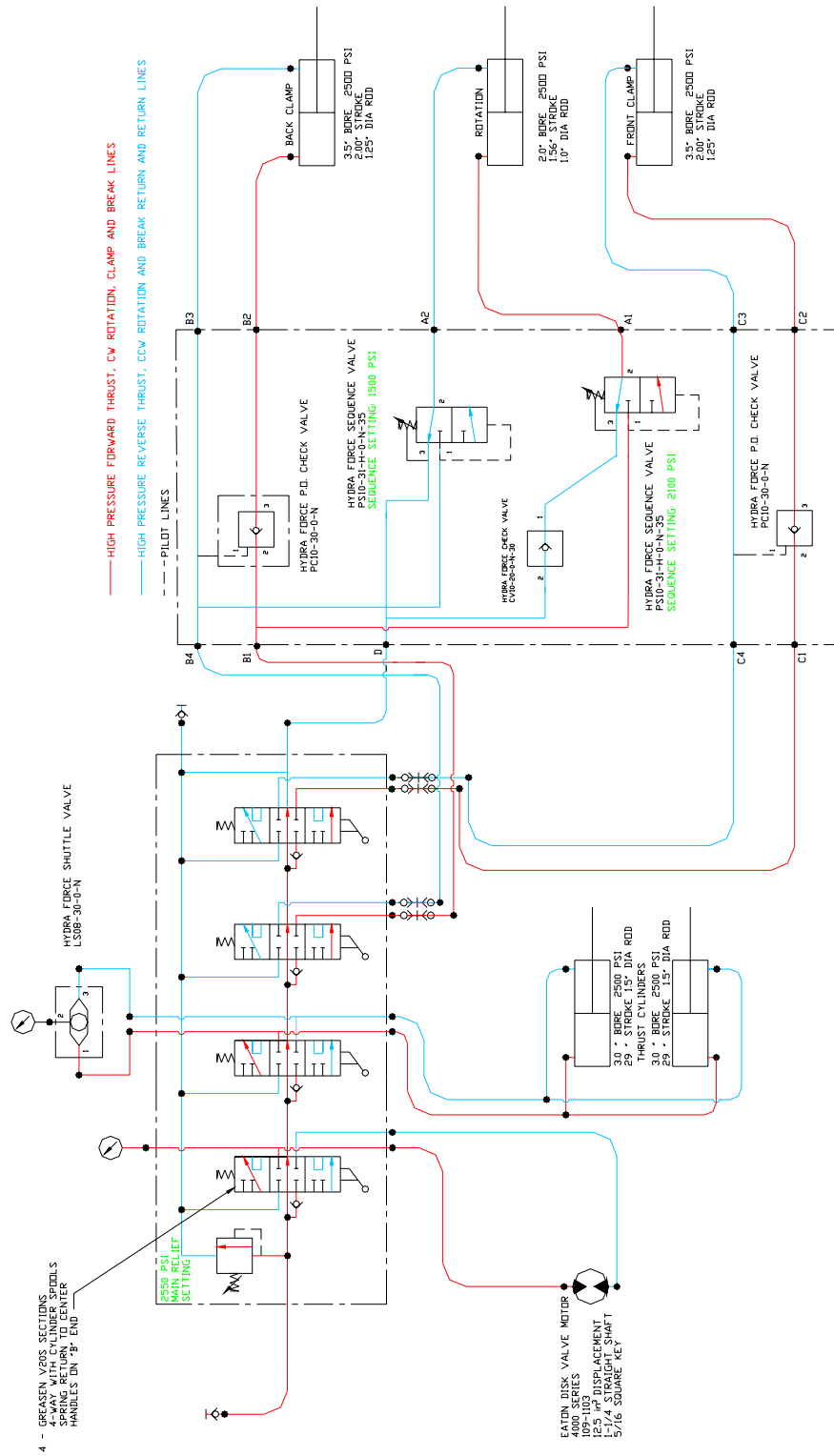
ITEM	QTY	NUMBER	DESCRIPTION
1	1	8080182	Hydraulic Control Valve
2	1	T200080	Hydraulic Motor
3	2	T720020	Pressure Gauge (0-3000 psi)
4	1	8080157	Shuttle Valve
5	2	8080017	Thrust Cylinder
6	2	8080153	Breakout Clamp cylinder
7	1	8080169	Hydraulic Manifold Assembly
8	1	8080176	Breakout Rotation Cylinder
9	2	TH00115	Hose Assembly, Valve-Motor
10	1	TH00116	Hose Assembly, Valve-Gauge
11	1	TH00117	Hose Assembly, Valve-Cylinder Rod
12	1	TH00118	Hose Assembly, Valve-Cylinder Base
13	1	TH00119	Hose Assembly, Cylinder-Cylinder-Rod
143	1	TH00120	Hose Assembly, Cylinder-Cylinder-Base
15*	1	8080236	Hose Protector, 1.500 dia. Hose #11 & 12
16*	1	8080237	Hose Protector, 1.500 dia. Hose #20
17	1	TH00121	Hose Assembly, Cylinder Rod-Sh. Valve
18	1	TH00122	Hose Assembly, Cylinder Base-Sh. Valve
19	1	TH00123	Hose Assembly, Sh. Valve-Gauge
20	4	TH00124	Hose Assembly, Valve-Breakout Manifold
21	1	TH00125	Hose Assembly, B/O Manifold-F. Clamp Rod
22	1	TH00126	Hose Assembly, B/O Manifold-F. Clamp Base
23	1	TH00127	Hose Assembly, B/O Manifold-R. Clamp Base
24	1	TH00128	Hose Assembly, B/O Manifold-R. Clamp Rod
25	1	TH00129	Hose Assembly, B/O Manifold-Rotate Cyl. Base
26	1	TH00130	Hose Assembly, B/O Manifold-Rotate Cyl. Rod
27	1	TH00131	Hose Assembly, B/O Manifold Drain-Valve
28	2	T401350	Fitting, Elbow 90, 12MB-12MP
29	1	T412001	Fitting, Quick Disconnect, Female-12FP
30	2	T412002	Cap, Quick Disconnect, Male & Female .750
31	1	T400020	Fitting, Union, 04MP-04MJ
32	1	T401225	Fitting, Elbow, 04FJ-04MJ
33	2	T400160	Fitting, Union, 10MB-08MJ
34	4	T402155	Fitting, Tee, 08FJ-08MJ-08MJ
35	2	T403010	Fitting, Reducer, 08FJ-04MJ
36	2	T401300	Fitting, Elbow 90, 10MB-08MJ
37	2	T401310	Fitting, Elbow 90, Longneck, 10MB-08FP
38	2	T400040	Fitting, Union, 08MP-08MJ
39	2	T401125	Fitting, Union, 08FJ-06MP
40	4	T412009	Fitting, Quick Disconnect, Female-06FP
41	5	T401240	Fitting, Elbow 90, 06MB-04MJ
42	4	T401280	Fitting, Elbow 90, 08MB-08MJ
43	2	T400200	Fitting, Union, 12MB-08MJ
44	2	T401015	Fitting, Elbow 45, 04FP-04MP
45*	1	8082042	Hose Protector, 1.500 dia., Hose #9
46*	1	8082043	Hose Protector, .750 dia., Hose #27
47	2	T400020	Fitting, Union, 04MP-04MJ
48	16	T400570	Fitting, Union, 04MB-04MJ
49	1	T401230	Fitting, Elbow 90, 04MB-04MJ

\* NOT SHOWN

# HYDRAULICS

## MCL-10H-5 and MCL-10H-7 VERSA-MOLE

### Hydraulic Schematic

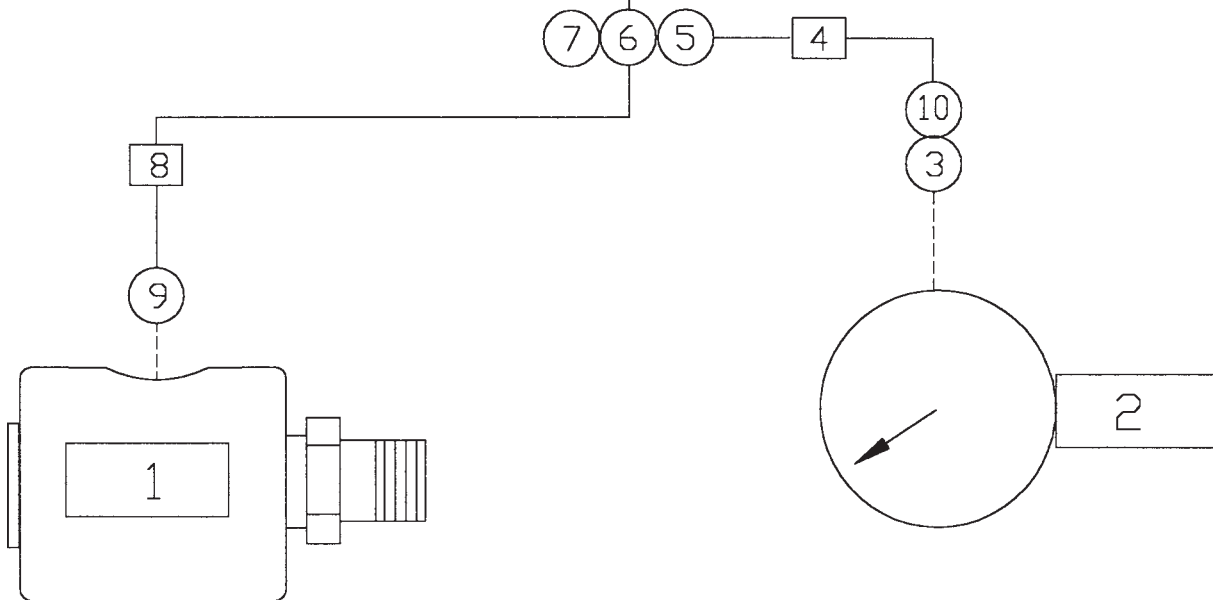


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# WATER PARTS

## McL-10H VERSA-MOLE

WATER  
INLET



# WATER PARTS

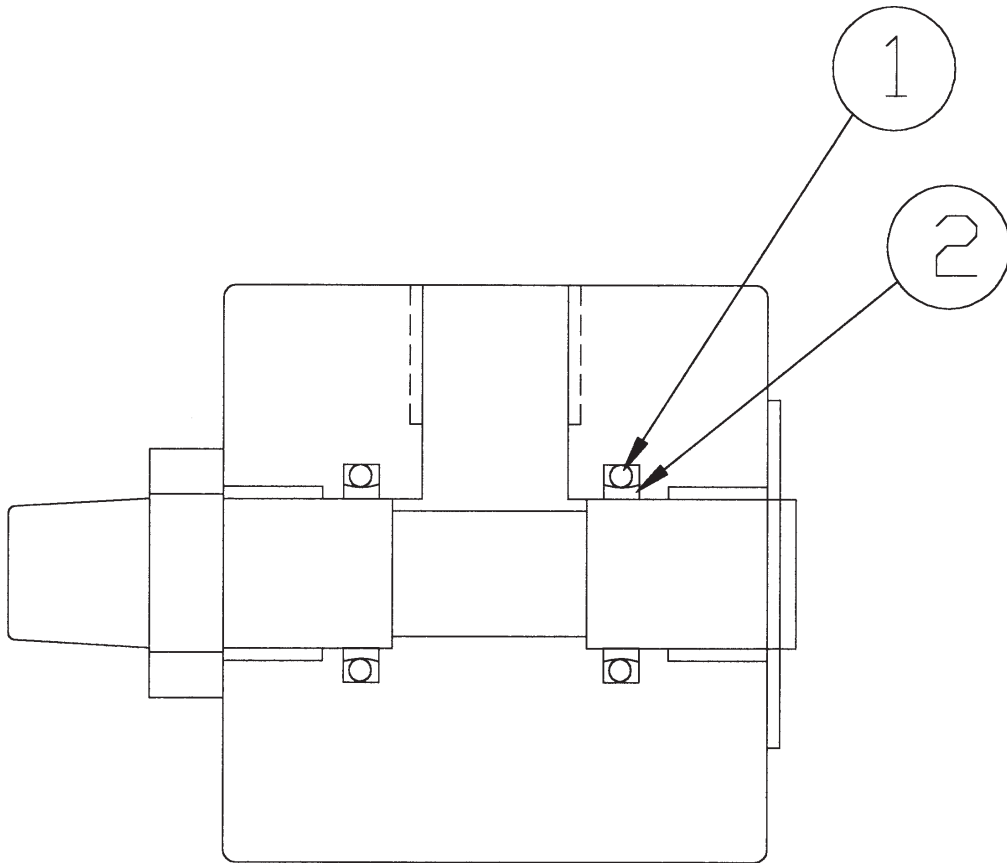
## McL-10H VERSA-MOLE

ITEM#	QTY	NUMBER	DESCRIPTION
1	1	8080232	Water Swivel, 750 NPT
2	1	T720020	Pressure Gauge (0-3000psi)
3	1	T401015	Fitting, Elbow45, 04FP-04MP
4	1	TH00139	Hose Assembly, Water, Console - Bulkhead
5	1	T400700	Fitting, Reducer, 08FJ-04MJ
6	1	T402150	Fitting, Tee, 08MJ-08MJ-08FJ
7	1	T400396	Fitting, Bulkhead, 08MP-08MJ
McL-10H-5			
8	1	TH00137	Hose Assembly, Water, Console - Water Swivel
McL-10H-7			
8	1	TH00132	Hose Assembly, Water, Console - Water Swivel
9	1	T400080	Fitting, Union, 12MP-08MJ
10	1	T400020	Fitting, Union, 04MP-04MJ



# WATER SWIVEL SEAL KIT

## McL-10H VERSA-MOLE



# WATER SWIVEL SEAL KIT

## McL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	8080226	Seal Kit, Includes Items #1 - #2 Item #1 - O-Rings Item #2 - Teflon Seals

*NOTE: Install O-Rings on top of Teflon Seals.*

# ZAP ALERT™ OPERATING INSTRUCTIONS

## McL-10H VERSA-MOLE

**WARNING:** It is important to read and understand these instructions before using the *ZAP-ALERT™*.

The *ZAP-ALERT™* is an electrical power line strike indicator to be used in conjunction with earth boring equipment. The *ZAP-ALERT™* signals contact and damage to buried power lines from 100 volts AC to 100,000 volts AC. Any voltage over 42 volts peak between the *ZAP-ALERT™* unit and the grounding stake will trigger the alarm.

**WARNING:** The *ZAP-ALERT™* will not be set off by coming near a power source. It only sounds an alert after electrical contact has been made. Safety equipment and safety apparel must be used at all times.

### Mounting:

The *ZAP-ALERT™* is mounted under the console. The power outlet for *ZAP-ALERT™* is adjacent to it. The female receptacle is used to bring power from the power cable to the *ZAP-ALERT™* siren.

## OPERATION

### Power Source:

The *ZAP-ALERT™* uses a standard 12-volt DC power source. Connect the black wire of the power cable to the positive (+) battery terminal and the white wire to the negative (-) battery terminal. Do not use any fuses in the lines powering the *ZAP-ALERT™*. The *ZAP-ALERT™* must always have power whenever in use. Do not connect the power source to a switch that may inadvertently be turned off while working.

Plug the power cord into the female receptacle on the console.

### Sensing Stake:

The sensing stake should be connected to the insulated bolt on the front of the *ZAP-ALERT™* box. Push the sensing stake into the ground at least 6' away from the equipment, **perpendicular to the bore path**. It is important for the earth stake to be inserted into soil which electrical current can pass through. If the earth stake is in extremely dry soil or asphalt, the *ZAP-ALERT™* may not function. If it must be inserted in extremely dry soil, moisten the soil around the sensing stake to improve soil conductivity. Be sure to fully insert the sensing stake into the ground.

### Insulated Blanket:

The insulated blanket should be positioned to protect the operator from inadvertent contact with the pit wall. Place the blanket in the desired position and install the stakes in the ground to hold the blanket in place. Drive the stakes flush with the ground.

### Testing:

Connect the power cord to the power source and to the female receptacle on the console. Lay the sensing stake on the ground. (Do not insert the stake into the ground at this time.) Connect one lead of the test set to the sensing stake. Connect the other lead to an exposed metal part on the machine. Press the test button on the hand held tester. Check that the *ZAP-ALERT™* siren is sounding. When you have confirmed the operation of the *ZAP-ALERT™*, press the reset button to stop the siren.

**WARNING:** Do not operate the machine unless the test system confirms that the *ZAP-ALERT™* system is operational.

### Resetting After A Strike:

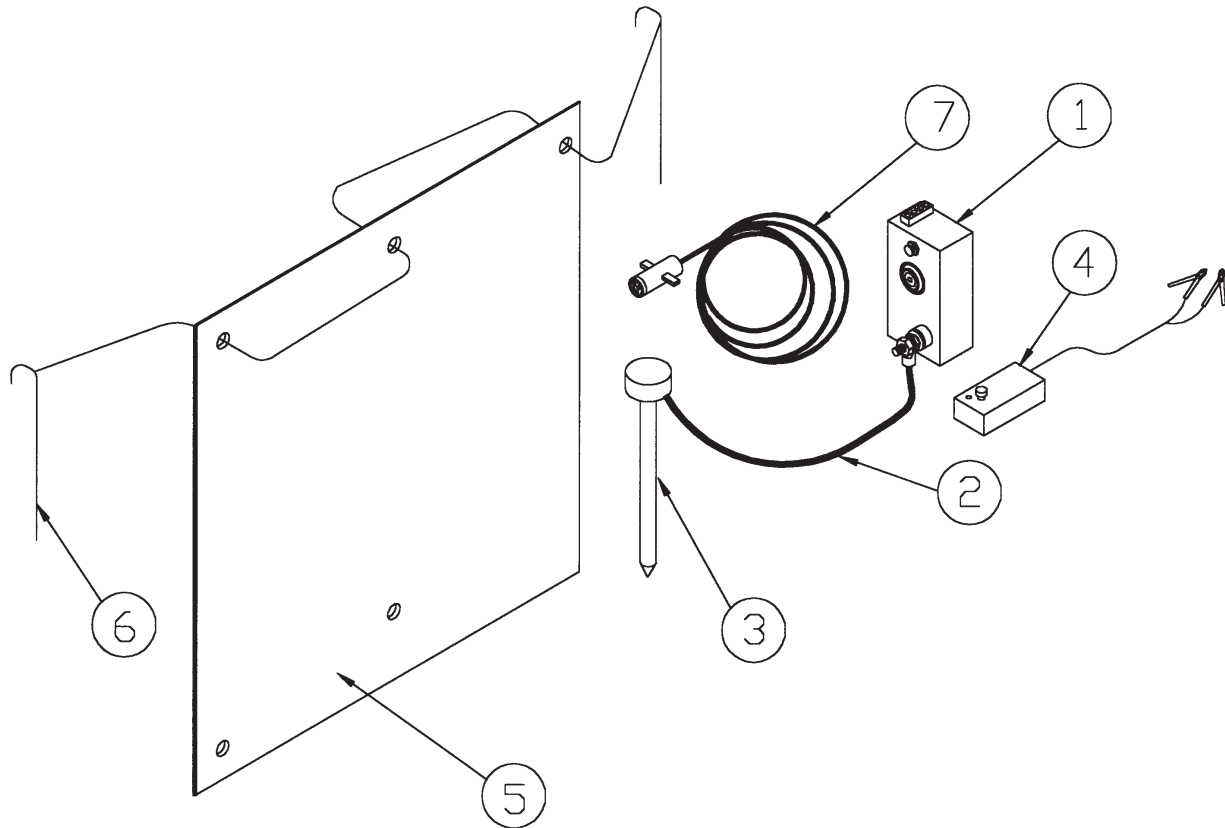
Once you have made a strike, the siren will continue to sound as long as current is passing into the machine and soil. If you attempt to reset the *ZAP-ALERT™*, the siren will not stop until the current has stopped.

**WARNING:** Do not stop the siren by resetting the *ZAP-ALERT™* until you have confirmed that the electric power has been locked out. If the power has not been properly shut off, an automatically resetting circuit breaker could reenergize the power line, or contact between the boring tool and power line may recur if they are close to each other.

ZAP-ALERT™ is a trademark of Melfred Borzall.

# ZAP ALERT™ COMPONENTS

## MCL-10H VERSA-MOLE



# ZAP ALERT™ COMPONENTS

## MCL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	8080251	Siren Box
	2	U100040	Nut, Hex .312-18
	2	U210040	Washer, Lock .312
	1	U100060	Nut, .375-16
	1	U210060	Washer, Lock .375
2	1	8080254	Sensing Stake Cable - 12' lg.
3	1	8080253	Sensing Stake
	1	U010080	Screw, HSH .375-16 x .750
4	1	8080252	Tester
	1	C900834	9V Battery
5	1	8080256	Insulated Blanket
6	2	8080257	Blanket Stakes & Rope - 6' lg.
7	1	8080261	Power Cord - 30' lg.
8*	2 pr.	X800010	Electric Safety Boots (By Certificate)

\* Not Shown



# **ELECTRIC SAFETY BOOT CARE & MAINTENANCE**

## **McL-10H VERSA-MOLE**

Rinse boots with water after each use.

Boots must stay soft and not dry out. Apply a rubber protector to the exterior of the boots to prevent them from drying out.

Inspect boots thoroughly before each bore. Check for cracks, holes or any other type of damage. Discard and replace any boots which show signs of damage.

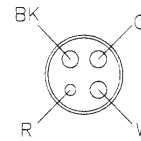
**DAMAGED SAFETY BOOTS PROVIDE NO PROTECTION AGAINST ELECTROCUTION.**

# STRIKE ALERT POWER CORD ASSEMBLY

## MCL-10H VERSA-MOLE

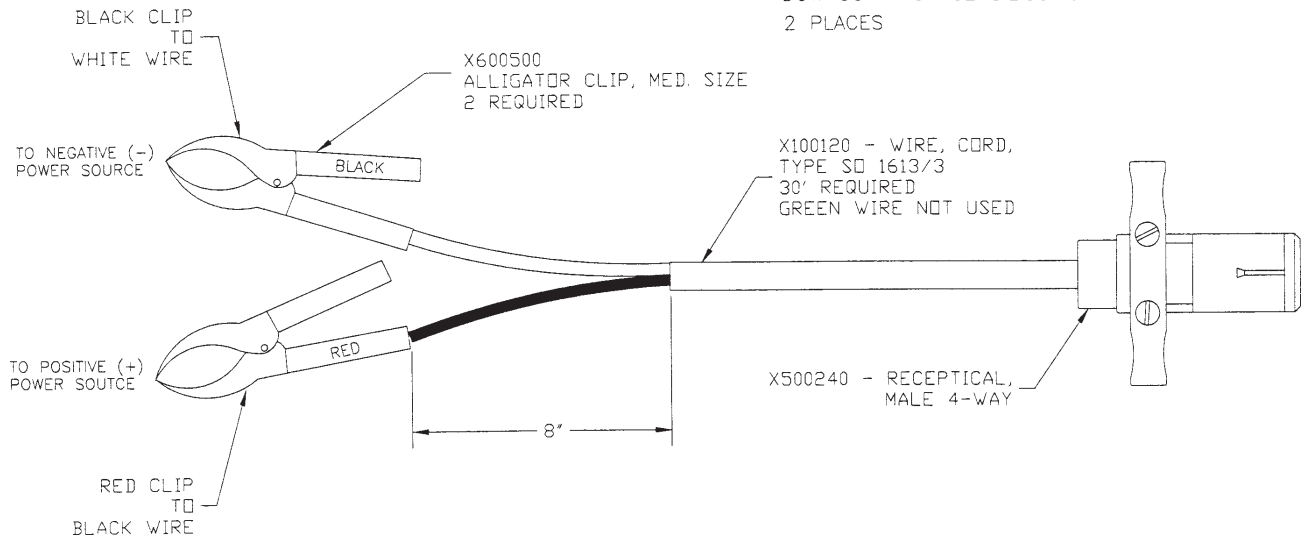
BLACK WIRE IS POSITIVE (+)  
WHITE WIRE IS NEGATIVE (-)

WHITE WIRE  
TERMINAL "G"  
BLACK WIRE  
TERMINAL "BK"



TERMINAL  
DETAIL  
FEMALE SLOTS

NOTE:  
SEAL BACK SIDE OF PLUG AND WIRES WITH  
DOW CORNING 732 SILICONE RTV  
2 PLACES



# STRIKE ALERT POWER CORD ASSEMBLY

## MCL-10H VERSA-MOLE

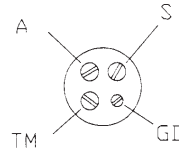
ITEM#	QTY.	NUMBER	DESCRIPTION
		8080261	Power Cord Assembly

# STRIKE ALERT FEMALE RECEPTICAL ASSEMBLY

## McL-10H VERSA-MOLE

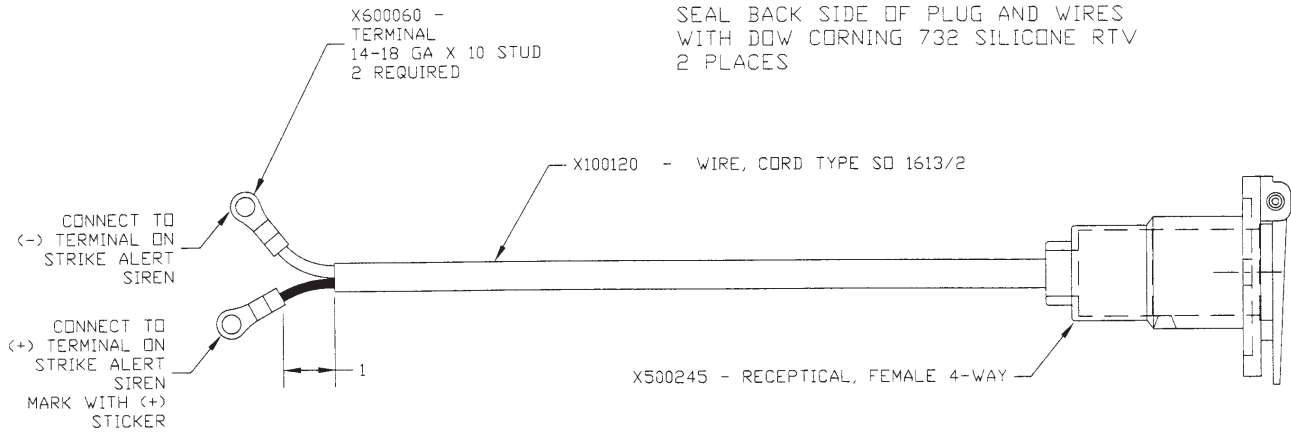
BLACK WIRE IS POSITIVE (+)  
WHITE WIRE IS NEGATIVE (-)

WHITE WIRE  
TERMINAL "A"  
BLACK WIRE  
TERMINAL "S"



TERMINAL  
DETAIL  
MALE STUDS

NOTE:  
SEAL BACK SIDE OF PLUG AND WIRES  
WITH DOW CORNING 732 SILICONE RTV  
2 PLACES



# STRIKE ALERT FEMALE RECEPTICAL ASSEMBLY

## McL-10H VERSA-MOLE

ITEM#	QTY.	NUMBER	DESCRIPTION
		8080260	Power Cord Assembly

# REPAIR INSTRUCTIONS

## McL-10H VERSA-MOLE



### WARNING:

Moving parts. Keep all guards in place. Shut down engine before service or maintenance. Being caught in machinery may cause serious injury.



### WARNING:

Crushing weight can cause serious injury. Place machine on solid surface to prevent rollover or falling.



### WARNING:

High Pressure. Leaking hydraulic fluid under pressure can penetrate and cause serious injury. Check for leaks with cardboard. Relieve pressure before working on any system.



### WARNING:

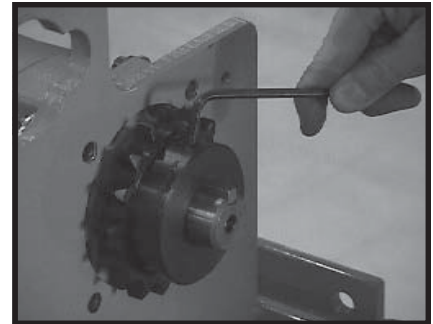
Do not modify this machine. Use only authorized McLaughlin repair parts. Failure to comply can result in serious injury. Service this equipment according with maintenance instructions in this manual.

## SECTION 1: CARRIAGE ASSEMBLY & DISASSEMBLY

### STEP 1: CHAIN GUARD REMOVAL

#### DISASSEMBLY

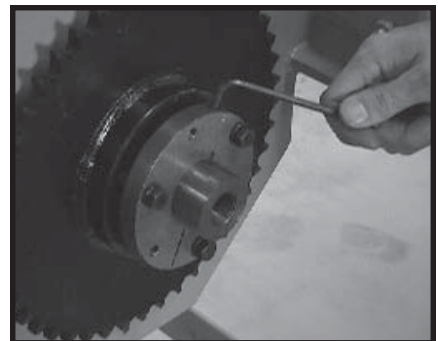
1. Remove the swivel at the back end of the spindle.
2. Remove the seven (7) screws from the back of the chain cover.
3. Pull the cover away from the carriage.
4. Remove the seal carrier from the inside of the chain cover. Inspect for damage. Replace if necessary.



5

### STEP 2: CHAIN & SPROCKET REMOVAL

5. Loosen the set screws in the small sprocket.
6. Remove the screws which hold the bushing to the large sprocket. Loosen the set screw directly above the keyway in the shaft.
7. Reinsert the screws into the tapped holes in the bushing. Tighten all the screws alternately to "walk" the bushing out of the sprocket.
8. Once the bushing is loose, walk both sprockets and the chain away from the back plate.
9. Find and remove the master link in the drive roller. Check the chain, sprockets and bushing for wear and replace if necessary.



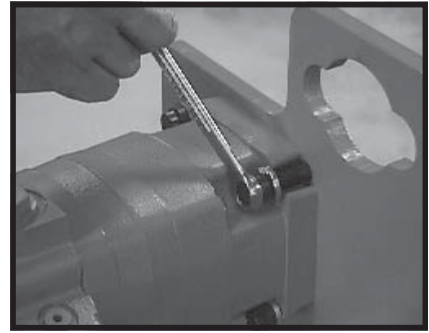
6



9

**STEP 3: HYDRAULIC MOTOR REMOVAL**

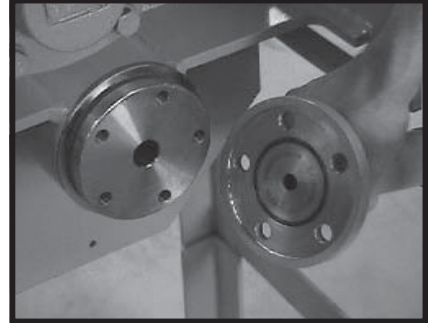
- 10. Remove the hydraulic hoses going to the motor. Cap the hoses to prevent hydraulic fluid loss and contamination. Mark hoses for proper installation later.
- 11. Remove the screws which hold the motor to the carriage plate. Remove the motor.



11

**STEP 4: CHUCK REMOVAL**

- 12. Bend up the tabs on the chuck lockout ring to allow the screws to turn freely.
- 13. Remove the screws which hold the chuck to the spindle.
- 14. Remove the chuck. Inspect the o-ring for damage and replace if necessary. Check the following: 1) Thread condition on threaded chuck only. (Replace if necessary). 2) Hex condition on auger chuck.



14

**STEP 5: SPINDLE REMOVAL**

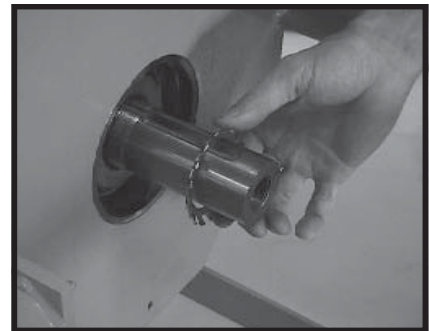
- 15. Remove the key from the back of the spindle shaft.
- 16. Bend up the tab(s) on the bearing nut lock.
- 17. Remove the bearing nut lock. Loosen the lock nut by inserting a small bar or screwdriver into one of the slots on the nut. Tap the bar, with a hammer, at an angle to break the nut loose. Remove the nut by hand once it is loose. Do not damage the threads of the spindle.
- 18. Remove the bearing nut washer.
- 19. Remove the rear bearing by pulling it out of the back end of the bearing carrier.
- 20. Remove the spindle by pushing the back and pulling on the front flange. Be careful not to damage the front shaft seal when removing the spindle from the bearing carrier. Inspect for damage or worn threads. Replace if necessary.
- 21. Remove the front seal. Replace if worn or damaged.
- 22. Remove the front bearing. Inspect both front and rear bearing for damage and replace if necessary.
- 23. Remove all grease from the bearing cones inside the bearing carrier. Inspect for damage. Replace if necessary.



17

**STEP 6: CAM ROLLER REMOVAL**

- 24. Remove the grease fitting and nut on the inside of the carriage.
- 25. Unscrew the cam roller from the carriage side plate.



18

**ASSEMBLY**

**STEP 7: CAM ROLLER INSTALLATION**

- 26. Press the cam roller spacer onto the roller shaft.
- 27. Insert the cam roller into the cam roller cover and tighten.
- 28. Install the nut and the grease fitting on the inside of the carriage and tighten.



19



### STEP 8: HYDRAULIC MOTOR INSTALLATION

29. Place the motor in the mounting hole in the carriage back plate.
30. Line-up the slots in the motor with the tapped hole in the carriage plate. Install the four (4) screws. Position the motor so the ports are facing upward.
31. Install the two (2) hydraulic fittings from the previous motor, and connect the hydraulic hoses.

### STEP 9: SPINDLE ASSEMBLY

32. Repack both the front and rear bearings.
33. Install one (1) of the bearings in the front of the bearing carrier.
34. Install the front shaft seal.
35. Grease the spindle and front seal. Slide the spindle through the front seal and the front bearing inside the bearing carrier. Be careful not to damage the lip of the seal.
36. Slide the bearing over the spindle and push it into the bearing carrier.
37. Slide the locking washer onto the shaft and into the slot behind the bearing.
38. Install and tighten the bearing locknut. Tighten the lock nut until all “play” or movement is out of the shaft and so the spindle spins easily. Use a hammer and screwdriver to rotate the lock nut around until it lines up with one of the tabs on the tapered washer.
39. Bend down a tab until it is seated in 1 of the 4 grooves in the bearing lock nut.
40. Install the key in the keyway of the shaft.

### STEP 10: CHAIN & SPROCKET ASSEMBLY

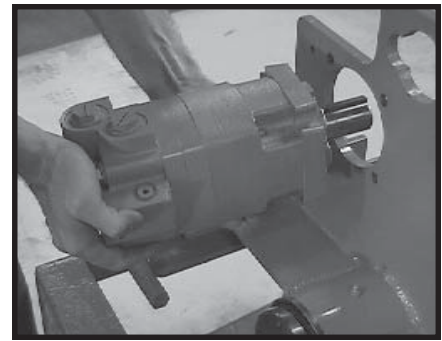
41. Apply *anti-sieze* to the spindle and motor shaft.
42. Push the large sprocket onto the spindle shaft. The shoulder of the sprocket should be facing away from the carriage back plate.
43. Push the taper bushing onto the shaft and into the large sprocket. Install but do not tighten the screws.
44. Place the small sprocket on the motor shaft.
45. Wrap the chain around the large sprocket and small sprocket and install the master link.
46. Slide the sprockets and chain back toward the carriage plate. Space the chain 1/4” from the back of the carriage plate.
47. Tighten the set screws in the sprocket and bushing screws. Be sure sprockets and chain are in-line.
48. Grease the chain with all purpose bearing grease.

### STEP 11: REAR SHAFT SEAL INSTALLATION

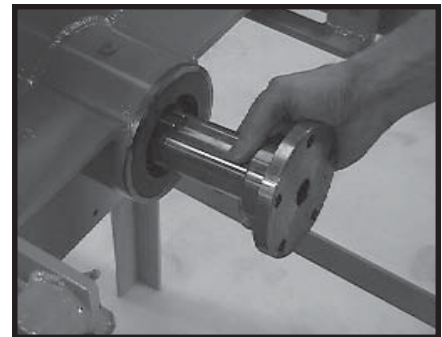
49. Install the seal with the open side of the seal facing upward. Press the seal into the seal carrier.
50. Screw the seal carrier to the inside of the chain guard. The lip of the seal must be facing out of the chain guard.

### STEP 12: CHAIN GUARD INSTALLATION

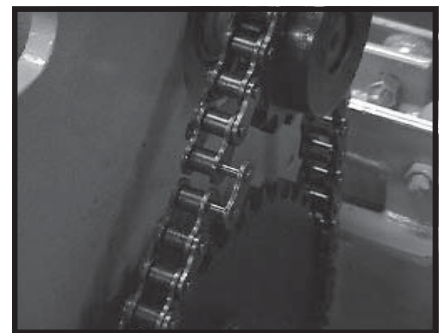
51. Clean off any remaining silicone from the edges of the chain guard and from the back side of the



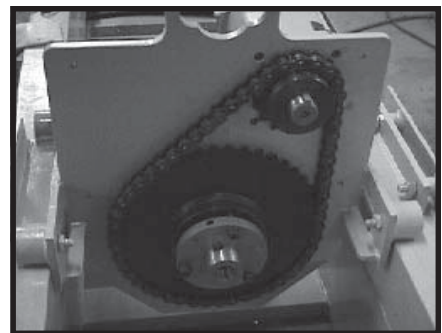
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carriage plate.

52. Apply two (2) thin beads of silicone sealant (Dow Corning-RTV # 732, or equivalent) to the inner edge and outer edge of the chain guard.
53. Press the chain guard to the back of the carriage plate and wiggle slightly to ensure proper seating of the sealant. Install the seven (7) screws which hold it to the carriage back plate.

#### **STEP 13: SWIVEL INSTALLATION**

53. Apply a light bead of removable pipe sealant to the male threads of the swivel and screw it into the end of the spindle.
54. Reconnect the water supply hose.

#### **STEP 14: CHUCK INSTALLATION**

55. Place an o-ring in the groove on the face of the chuck (threaded chuck only).
56. Slide the chuck lockout ring to the front of the flange.
57. Install the five (5) screws through the lockout ring and chuck flange.
58. Line-up the screws and tighten the chuck to the spindle.
59. Bend down one tab of the lockout ring onto the flat portion of each screw head.

## **SECTION 2: FRAME DISASSEMBLY & ASSEMBLY**

### **DISASSEMBLY**

#### **STEP 1: SIDE SHEET REMOVAL**

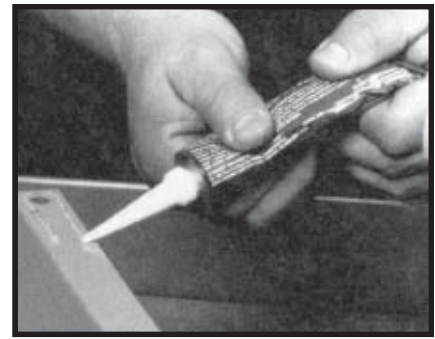
1. Remove all R-Clip pins which hold the side sheets in place.
2. Pull the side sheets out and up to remove them.

#### **STEP 2: CONVEYOR BELT REMOVAL**

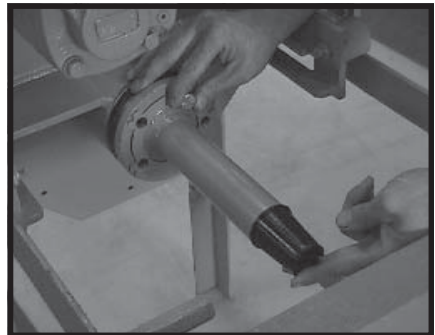
3. Remove all nuts holding the conveyor support sheets against the conveyor.
4. Remove the side sheet.
5. Remove the two (2) machine screws at each end of the conveyor belt.
6. Remove the conveyor belt.

#### **STEP 3: THRUST CHAIN REMOVAL**

7. Loosen the nut on the bottom of the chain tensioner.
8. Locate the chain turnbuckle.
9. Use a screwdriver to rotate the turnbuckle. Place the screwdriver in the most accessible hole and rotate the turnbuckle. Rotate clockwise or counter-clockwise to determine if the chain is getting tight or loose. Rotate the turnbuckle until the threaded chain connectors completely unscrew.



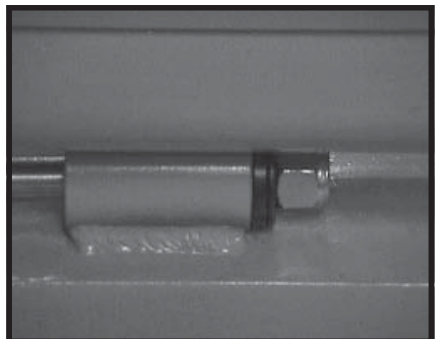
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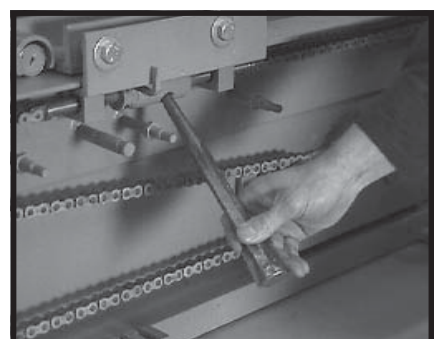
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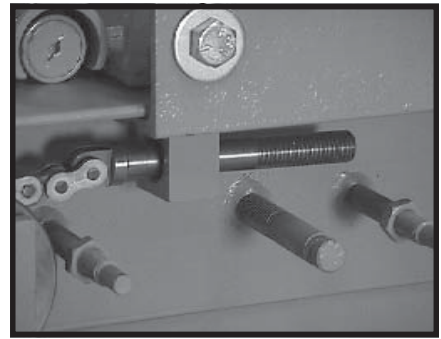


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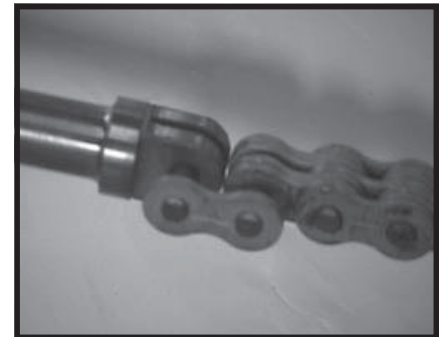
10. Slide the chain connectors out of the slider angles. The float indicator or collar must be removed from the chain connector before it will slide through the stop block.
11. Remove the nut on the bottom chain tensioner and slide the chain clevis out of the bottom tube.
12. Remove the connecting link between the thrust chain and the chain connectors. Be careful not to lose the individual chain links during disassembly. Discard the original cotter pins.
13. Remove the connecting links between the thrust chain and the frame rear plate. Be careful not to lose the individual chain links during disassembly. Discard the original cotter pins.
14. Thread the chains through the top pulleys at each end of the frame.
15. Lift the end of the hydraulic cylinder and thread the chains through the two (2) cylinder pulleys.
16. Remove the chains from the machine.



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**STEP 4: THRUST CYLINDER REMOVAL**

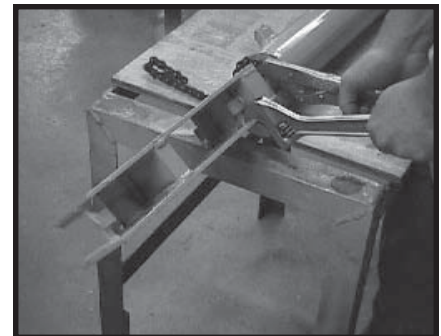
17. Disconnect and cap the hydraulic hoses and fittings on the thrust cylinder.
18. Remove the R-clip pin on the inside of the machine.
19. Remove the cylinder pin.
20. Remove the cylinder.



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**STEP 5: SLIDER PULLEY REMOVAL**

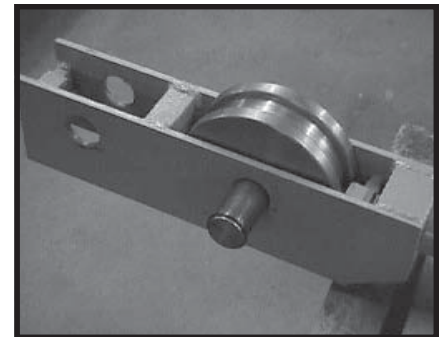
21. Place the thrust cylinder on a stable surface.
22. Use a chain clamp to grasp the cylinder rod. Be careful not to damage or scar the rod.
23. Unscrew the slider pulley off the end of the cylinder rod. Be sure exposed threads on the cylinder rod are clean to prevent the threads from getting jammed.



22

**STEP 6: PULLEY REMOVAL AND DISASSEMBLY**

24. Remove the spiral locking ring on one end of the pulley pin.
25. Remove the pin and the pulley. Check the plastic bushings for wear or damage. Replace if necessary.



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**STEP 7: BUSHING REMOVAL**

26. Break off the shoulder of the bushing and push it out of the pulley.

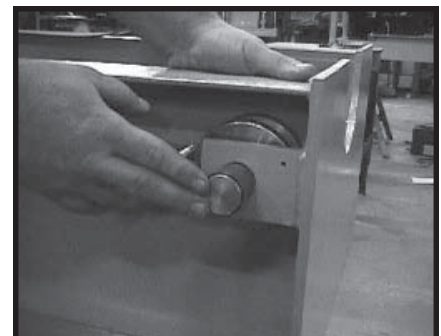
DISASSEMBLY

**STEP 8: BUSHING INSTALLATION**

27. Press the new bushing into the pulley. Be sure the shoulder of the bushing is tight against the pulley side. Check the fit with a pulley pin.

**STEP 9: PULLEY INSTALLATION**

28. Lubricate the inside of the pulley bushing with all purpose grease.
29. Slide the pulley into place and install the pulley pin. NOTE: The four (4) long pins are for the four (4) small diameter frame pulleys. The four (4) short pulley pins are for the two (2) small and two (2) larger slider pulleys.
30. Install the spiral locking rings. Be sure they are



29

properly seated in the pulley pin groove.

#### STEP 10: SLIDER PULLEY INSTALLATION

31. Screw the slider pulley onto the end of the cylinder rod. Using a chain clamp to hold the rod, tighten the slider pulley assembly.

#### STEP 11: HYDRAULIC CYLINDER INSTALLATION

32. Place the hydraulic cylinder in the frame. NOTE: The steel tabs on the slider pulley assembly must be facing down. Rotate the cylinder rod as required.
33. Install the cylinder pin and R-clip.

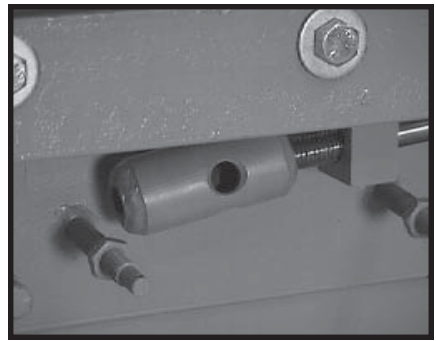
#### STEP 12: THRUST CHAIN INSTALLATION

34. Connect the chains to the rear plate of the frame by using connecting links. Connecting links consist of: (1) master link, (2) individual links, and (2) cotter pins.
35. Thread the chain through the slider pulleys and up over the upper frame pulleys.
36. Connect the chains to the threaded chain clevises by using connecting links.
37. Slide the front chain clevis through the stop block on the slider angle and install the turnbuckle. Only engage the chain connector for 2-3 revolutions.
38. On the rear chain, the chain connector must have the float indicator placed on it after being inserted into the stop block on the slider angle.
39. Put the bottom chain tensioner through the tube. Install the spherical washers and tighten the nut so it is fully threaded on the chain tensioner.
40. Pull the second chain connector to the turnbuckle and rotate the turnbuckle to engage the threads. Be careful not to thread the turnbuckle too far onto the opposite chain clevis.
41. Apply a few drops of *Loctite* #243 removable thread locker to the threaded clevises of the turnbuckle.
42. With both chain clevises threaded in the turnbuckle, begin tightening with a screwdriver. Rotate the turnbuckle until the chain is tight when hit with a wrench.
43. Push the float indicator or collar flush with the rear of the turnbuckle and tighten.
44. Remove any remaining slack in the chain by tightening the nut on the bottom chain tensioner.
45. Straighten out the chains after tightening.
46. Lubricate the chain with all-purpose grease.

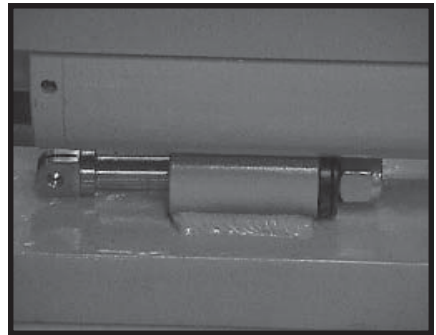
#### STEP 13: CONVEYOR BELT INSTALLATION

47. Set the backing nut on the side sheet studs. The dimension from the edge of the angle to the front edge of the nut should be 2".
48. Place a 1/2" flat washer on all studs except the (2) end studs near the pulleys.
48. Slide the conveyor up to the backing nuts on all studs. NOTE: The smooth, coated side should be facing in toward the center of the machine. Also, the conveyor should be slightly above the top of the frame angle.

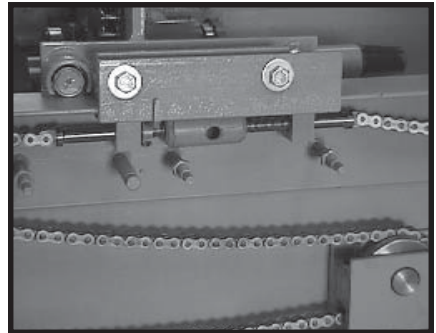
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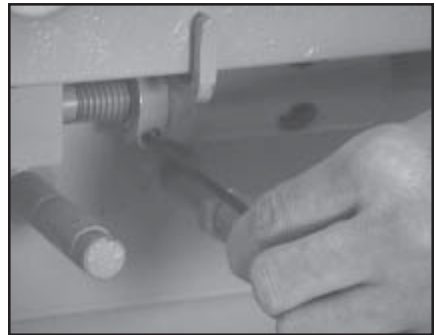
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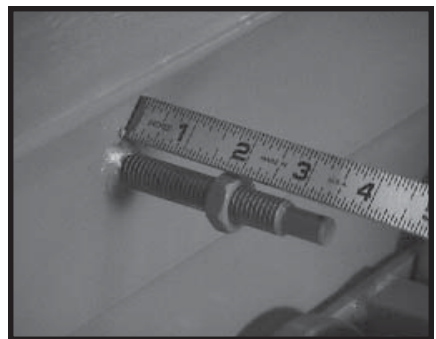
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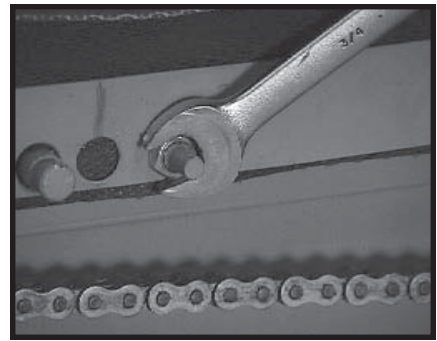
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50. Install the two (2) machine screws at each end of the conveyor belt.
51. Install the conveyor side sheets. The long leg of the sheet should be on the top side of the studs.
52. Install and tighten the nuts to hold the conveyor in place.

**STEP 14: SIDE SHEET INSTALLATION**

53. Install the side sheets by setting it into the bottom slots and pushing down and in.
54. Reinstall the R-clip pins in the side sheet studs. Do not operate machine without guards properly in place.



51

**SECTION 3: CONSOLE DISASSEMBLY & ASSEMBLY  
HYDRAULIC ADJUSTMENTS**

The control valve contains the following:

- One (1) non-adjustable relief valve preset @ 2500 psi / 170 BAR.

The main system relief is non-adjustable.

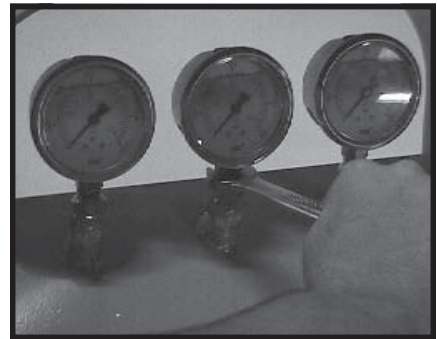
**DISASSEMBLY**

**STEP 1: CONTROL VALVE REMOVAL**

1. Mark the hoses with their corresponding fitting location on the valve.
2. Disconnect and cap both the hose and the fittings to prevent oil loss and contamination.
3. Remove the three (3) nuts which hold the valve in place. Remove the valve.

**STEP 2: PRESSURE GAUGE REMOVAL**

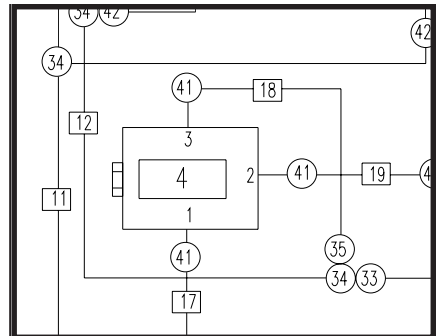
4. Unscrew the pressure gauge from the console fitting.



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**STEP 3: SHUTTLE VALVE REMOVAL**

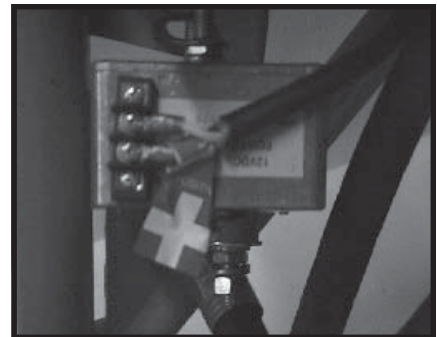
5. Remove the two (2) screws which mount the shuttle valve to the console. NOTE: Mark the orientation of the #1, #2 and #3 ports on the shuttle valve. These ports will be important in replumbing the valve.



5

**STEP 4: STRIKE ALERT REMOVAL**

6. Remove the two (2) screws which hold the female receptacle to the console.
7. Remove the two (2) nuts which hold the strike alert to the console.
8. Pull the strike alert down to expose the wire connections. NOTE: Mark the positive (+) and negative (-) wires before disconnecting them.
9. Remove the strike alert and the female receptacle.



8

**ASSEMBLY**

**STEP 5: STRIKE ALERT INSTALLATION**

10. Install the female receptacle on the console.
11. Wire the strike alert to the female receptacle.
12. Remove all paint and corrosion from around the front side mounting holes on the strike alert mount plate. NOTE: There must be a good contact between the strike alert and the frame. Paint, rust and corrosion, around the mounting bolts can



12

prevent the strike alert from working properly.

13. Tighten the two (2) nuts on the back of the strike alert.

#### **STEP 6: CONTROL VALVE INSTALLATION**

14. Place the valve under the console plate and insert and tighten the three (3) screws for the valve.
15. Connect the hoses to the proper fittings. Refer to the Hydraulic Schematic section of the manual. Be careful not to cross or twist hoses. Route hoses away from moving components and away from possible damage.

#### **STEP 7: SHUTTLE VALVE INSTALLATION**

16. Install the proper fittings into the valve.
17. Noting the previous orientation, screw the valve to the underside of the console.
18. Connect the hoses to the valve fittings. Refer to the Hydraulic Schematic and Console Assembly for proper fittings and valve orientation.

#### **STEP 8: PRESSURE GAUGE INSTALLATION**

19. Apply a small bead of pipe sealant (Loctite #592, or equivalent) around the end of the fitting.
20. Tighten the gauge into the console fitting. Position the gauge appropriately.

## **SECTION 4: BREAKOUT WRENCH ASSEMBLY & DISASSEMBLY**

### **DISASSEMBLY**

#### **STEP 1: BREAKOUT WRENCH REMOVAL**

1. Disconnect the supply hoses from the control valve.
2. Remove the breakout hold down angles.
3. Lift the breakout out of the carriage and place on a solid surface.
4. Mark, disconnect and cap the supply hoses from the breakout manifold.

#### **STEP 2: CLAMP CYLINDER DISASSEMBLY**

5. Remove the two (2) screws which hold the jaw to the mtg. block.
6. Disconnect and cap both the hoses and fittings of the clamp cylinder.
7. Remove the R-clip pin and remove the cylinder pin.
8. Pull the cylinder up and out of the breakout.
9. Remove the dowel pin which holds the jaw mtg. block to the cylinder rod.

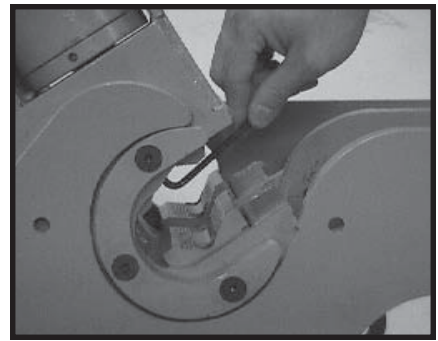
#### **STEP 3: MANIFOLD REMOVAL**

10. Mark, disconnect and cap all remaining hoses and fittings. Leave the five (5) top hoses connected.
11. Remove the three (3) screws which hold the manifold to the breakout front plate.

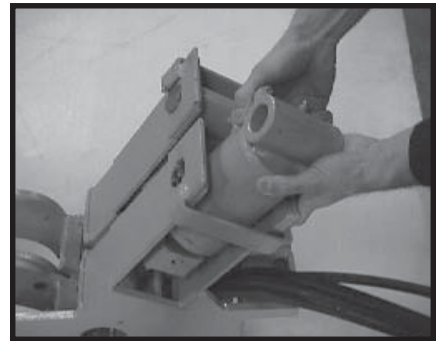
#### **STEP 4: LOWER JAW REMOVAL**

12. Remove the two (2) screws which hold the jaw to the block.
13. Remove the nut on the bottom of the lower jaw retainer.
14. Pull the jaw mtg. block and the jaw retainer up out of

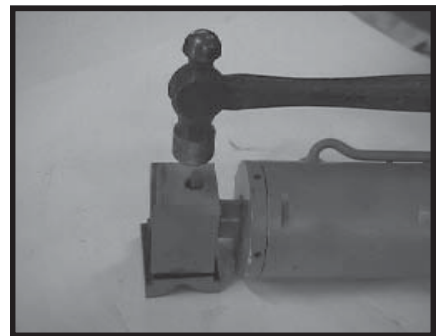
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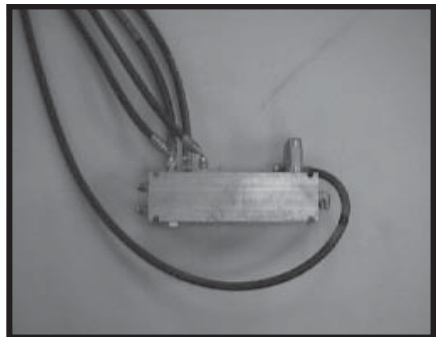
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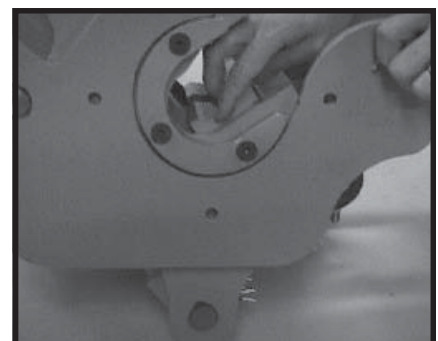
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the breakout.

15. Drive out the spring pin to separate the retaining pin from the mtg. block.

#### STEP 5: ROTATION CYLINDER REMOVAL

16. Remove the three (3) screws which connect the front breakout section to the back breakout section. Separate the two sections.
17. Stand the back section on its top.
18. Remove the R-clips and set screw. (The lower pin uses (2) R-clips. The upper pin uses a set screw).
19. Remove the cylinder pins and the cylinder. Note cylinder orientation.

#### STEP 6: INSPECTION

20. With both sections of the breakout separated, inspect the breakout frame of each section. Remove dirt and grease and look for cracks, or signs of bending or spreading in the frames.
21. Check the jaws for cracks or signs of wear.
22. Inspect the cylinders for signs of bent rods or damaged barrels.

#### ASSEMBLY

##### STEP 7: LOWER JAW INSTALLATION

23. Slide the lower jaw retainer into the jaw mtg. block.
24. Align the holes and hammer in the spring pin.
25. Drop the retainer block down into the bottom of the breakout.
26. Ensure the block is seated properly on the base plate and tighten the retaining nut.
27. Place the jaw on the block and install the two (2)screws. Ensure that the jaw is seated properly on the block. Also, the screws must be below the top edge of the jaw.

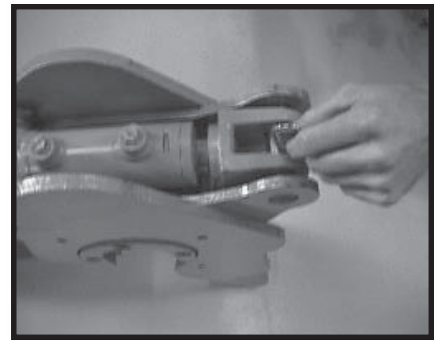
##### STEP 8: ROTATION CYLINDER INSTALLATION

28. Place the rotation cylinder in the breakout assembly with the rod end facing downward.
29. Rotate the upper breakout section until the holes in the cylinder match the corresponding holes in the breakout.
30. Install the cylinder pins and R-clip pins. (The lower pin uses (2) R-clip pins. The upper pin uses 1 set screw.) Align flat on shaft with set screw.
31. Line-up the two sections of the breakout and bolt them together.

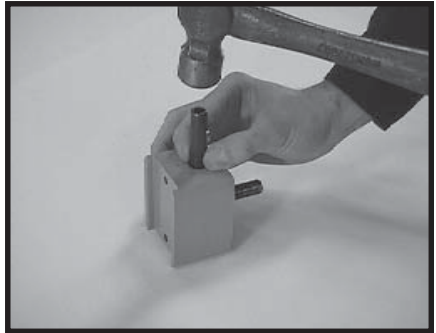
##### STEP 9: MANIFOLD INSTALLATION

32. Orientate the manifold behind the front plate in the position shown in the corresponding picture.
33. Install the three (3) screws which attach it to the front plate. Note hose routing.
34. Connect the hoses from the manifold to the rotation cylinder. Refer to the Hydraulic Schematic for proper routing of hoses.

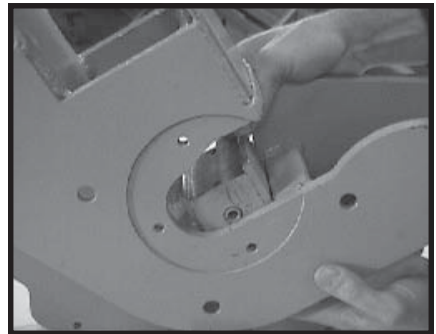
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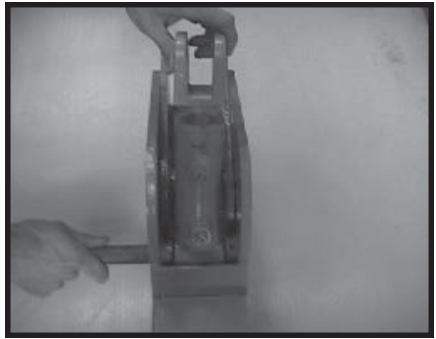
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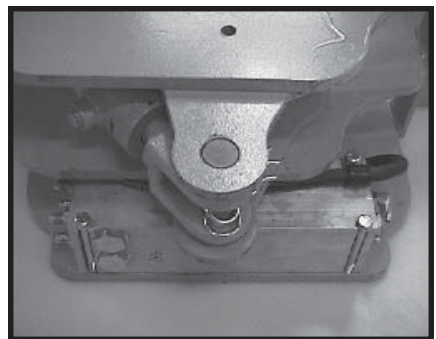
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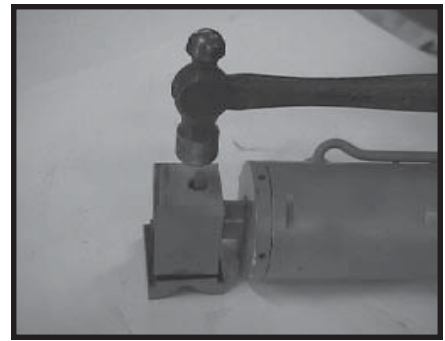


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### STEP 10: CLAMP CYLINDER ASSEMBLY

35. Place the jaw mtg. block on the rod of the cylinder.
36. Align the holes and insert the dowel pin.
37. Slide the assembly down into the breakout. Orientate the cylinder ports so they are closest to the center of the breakout.
38. Align the cylinder in the breakout and install the cylinder pin and R-clip pin.
39. Reconnect the hoses.
40. Place the jaw on the block and install the two (2) screws. Ensure that the jaw is seated properly on the block. Also, the screw must be below the top edge of the jaw.



36

### STEP 11: BREAKOUT WRENCH INSTALLATION

41. Connect the supply hoses to the manifold.
42. Set the breakout wrench into the frame of the machine.
43. Slide the breakout wrench forward as far as possible. Install the breakout hold down angles.
44. Connect the supply hoses to the control valve.



38

### HYDRAULIC ADJUSTMENTS

The breakout manifold consists of the following:

- (2) adjustable sequence valves
- (2) pilot-operated check valves
- (1) in-line check valve

The pressure setting for each sequence valve is as follows:

1 - Front Sequence Valve (closest to front plate):

Pressure Setting: 1000 psi (69 BAR).

Remove cap.

Tee into Rod End of Rear Cylinder. Actuate breakout spool and the pressure should read 1000 psi just before the breakout returns to the neutral position.

Adjust as required.

Replace cap.

2 - Rear Sequence Valve (furthest from front plate):

Pressure Setting: 2100 psi (145 BAR).

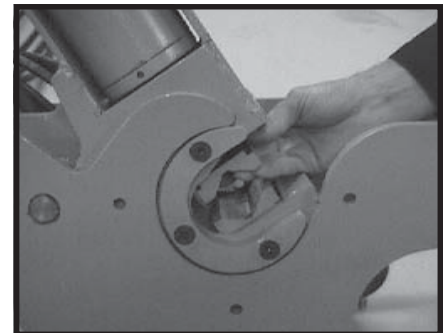
Remove Cap

Tee into Base End of Rear Cylinder. Actuate the breakout spool and the pressure should read 2100 psi just before the breakout rotates down.

3 - Front Clamp Cylinder (cylinder closest to front plate).

Set as system pressure: 2500 psi (172 BAR) - (non-adjustable)

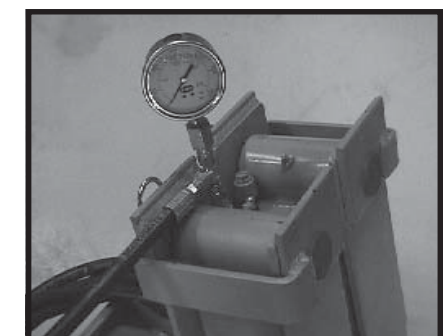
Tee into Base End of Front Cylinder. Accuate valve and read pressure when the cylinder fully extends.



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# **WARRANTY**

# **RETURN GOODS POLICY**

## LIMITED WARRANTY

The Manufacturer warrants its products to be free from defects in material and workmanship for a period of twelve months from the date of shipment from the factory. The Manufacturer shall not be responsible for any damage resulting to or caused by its products by reason of installation, improper storage, unauthorized service, alteration of the products, neglect or abuse, or use of the product in a manner inconsistent with its design. The warranty does not extend to any component parts not manufactured by Manufacturer; however, Manufacturer's warranty herein shall not limit any warranties made by manufacturers of component parts which extend to Buyer.

Claims for defects in material and workmanship shall be made in writing to Manufacturer within ten days of discovery of defect. Manufacturer may either send a service representative or have the product returned to its factory at Buyer's expense for inspection. Upon notification of defect, Manufacturer will issue a return goods authorization number to Buyer. The return goods authorization number must accompany the product returned. If judged by the Manufacturer to be defective in material or workmanship, the product will be replaced or repaired at the option of the Manufacturer, free from all charges except authorized transportation. Buyer shall be responsible for all maintenance services consisting of lubrication and cleaning of equipment, replacing expandable parts, making minor adjustments, and performing operating checks, all in accordance with procedures outlined in Manufacturer's maintenance literature.

THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AND NO REPRESENTATIONS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, (INCLUDING BUT NOT LIMITED TO A WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), ARE MADE BY THE MANUFACTURER IN CONNECTION WITH THE MANUFACTURE OR SALE OF ITS PRODUCTS. NO EMPLOYEE, DISTRIBUTOR, OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY ON BEHALF OF MANUFACTURER.

THE REMEDIES OF BUYER SET FORTH HEREIN ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER REMEDIES. THE LIABILITY OF MANUFACTURER WHETHER IN CONTRACT, TORT, UNDER ANY WARRANTY, OR

OTHERWISE SHALL NOT EXTEND BEYOND ITS OBLIGATION TO REPAIR OR REPLACE, AT ITS OPTION ANY PRODUCT OR PART FOUND BY MANUFACTURER TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP. MANUFACTURER SHALL NOT BE LIABLE FOR COST OF INSTALLATION AND/OR REMOVAL OR BE RESPONSIBLE FOR DIRECT, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE.

## GENERAL RETURNS OF MERCHANDISE

1. All returns must be pre-authorized
  - A. Please call our parts department for an RGA number
  - B. Please include RGA number on the outside of box
  - C. Include any required paper work or special instructions
  - D. Items returned without an RGA number will not be accepted
2. All returns are subject to a 20% restock charge.
3. Special items are non-returnable
  - A. Non-stock parts
  - B. Custom parts
  - C. If you are unsure about a parts status when ordering, ask your McLaughlin representative if the item fits on of the above conditions.
4. Items must be returned within thirty days of original order date.
5. Items not returned within 30 days from the date of RGA is issued will not be accepted.
6. The item(s) must be in new condition. Used item(s) are not returnable.