

COPPERHEAD XD SCHEDULED LUBRICATION & MAINTENANCE								
SERVICE ITEM	PERFORM AT EACH	SERVICE INTERVAL IN MACHINE HOURS					FAR DIFFERENCE	FEBRUARY
		500 HRS	1000 HRS	1500 HRS	2000 HRS	2500 HRS		
Perform at every indicated month or equivalent hour interval, whichever comes first.								
Check engine oil level	✓						MONTH	EO
Change engine oil		✓					MONTH	EO
Check air filter		✓					MONTH	
Change air filter			✓				MONTH	
Replace air filter				✓			MONTH	
Clean sediment cup					✓		MONTH	
Clean/wash/inspect pump plug					✓		MONTH	
Replace spark plug						✓	MONTH	
Check-adjust life spread							MONTH	
Check/adjust valve clearance							MONTH	
Clean fuel tank and nozzle							MONTH	
Check fuel line							MONTH	
Check fuel level	✓						MONTH	
Inspect electrical wiring								
Clean oil cooler case exterior				✓			C-3.1	
Check oil cooler hoses					✓		C-3.1	

DEFINITIONS:

10-
HYDRO-
HYDRAULIC-OR
HYPO-
MULTI-PURPOSE TYPE GREASE WITH MOLYBDENUM DISULFIDE

ENGINE CRANKCASE OIL

104

C.1.2

CopperHead® XD™ 2.0 Laser Screed® OWNER'S MANUAL

CopperHead XD 2.0®

OWNER'S MANUAL

MACHINE SERIAL NUMBER: _____

- Somero Enterprises, provides the following services through the Service Center in Houghton, MI at (906) 482-7252.
- Technical assistance with the operation and maintenance of Somero Products.
- Trouble Shooting assistance.
- Sales of Parts and Accessories for your Somero products.
- Product literature with technical specifications on our current products.
- 24 Hour Emergency Service Pager.

CORPORATE OFFICE

82 FITZGERALD DRIVE
JAFFREY, NH. 03452
PHONE (603) 532-1600
FAX (603) 532-5930

SALES AND SERVICE

P.O. BOX 309
46980N STATE HIGHWAY M26
HOUGHTON MI. 49931
PHONE (906) 482-7252
FAX (906) 483-2774

PRODUCT REGISTRATION



46980 State Highway M26
PO Box 309
Houghton, MI 49931
906-482-7252 Fax: 906-483-2774

Please fax completed form to Attn: Customer Support when machine is put into service.

EQUIPMENT INFORMATION

Model No.: _____ 1) _____

Laser Receivers
(GCR) Serial No.'s

Serial No.: _____ 2) _____

Hours on Machine: _____ Control Box Serial No. _____

END USER INFORMATION

(to be completed when sold)

Company: _____ Contact: _____

Address: _____ Tel: () _____ Fax: () _____

Address: _____

City: _____ State: _____ Zip: _____ Country: _____

Date Sold: _____

Internal Use Only

Install Base Update: ☐

Goldmine Update: ☐

CopperHead XD 2.0

Owner's Manual

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 PARTS CATALOG	
10.00	MAJOR COMPONENTS SAFETY AND INFORMATION DECALS
20.00	AXLE, FRAME, COMPONENTS
30.00	COVERS
40.00	HEAD ASSEMBLY
50.00	HYDRAULICS/ELECTRICAL MANIFOLD HYDRAULIC HOSE GUIDE ELECTRICAL LAYOUT

CopperHead XD 2.0®

Owner's Manual

GLOSSARY OF ABBREVIATIONS AND TERMS

Adj. - Adjustable

Deg. - Degree

Dia. - Diameter

Hyd. - Hydraulic

NC - National Coarse Thread

Elev.- Elevation

ORB - "O" Ring Boss

JIC - As used in this manual, refers to a 37 Degree Flare fitting conforming to the standards established by the Joint Industrial Council

PSI - Pounds Per Square Inch (1 PSI = .069 bar) (1 bar = 14.5 PSI)

NM - Newton-Meters

FT. LBS. - Foot Pounds

Thrd Lck - Thread Locking Compound

Serv Thrd Lck - Serviceable Thread Locking Compound

NOTE: (Serviceable thread locking compound is to be used on all threaded holes unless otherwise noted)

Non-Serv Thrd Lck - Non-Servicable Thread Locking Compound

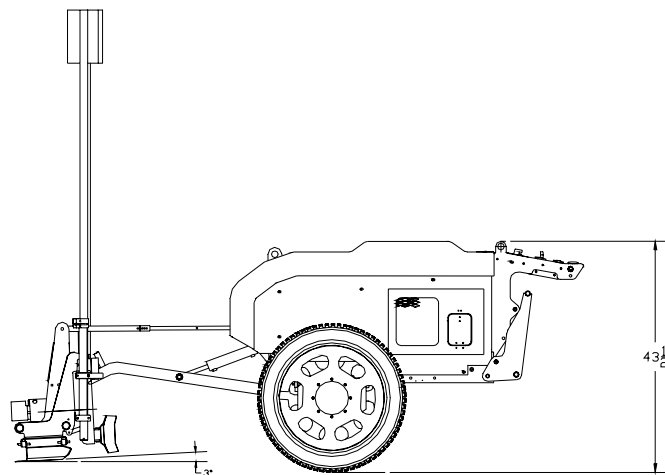
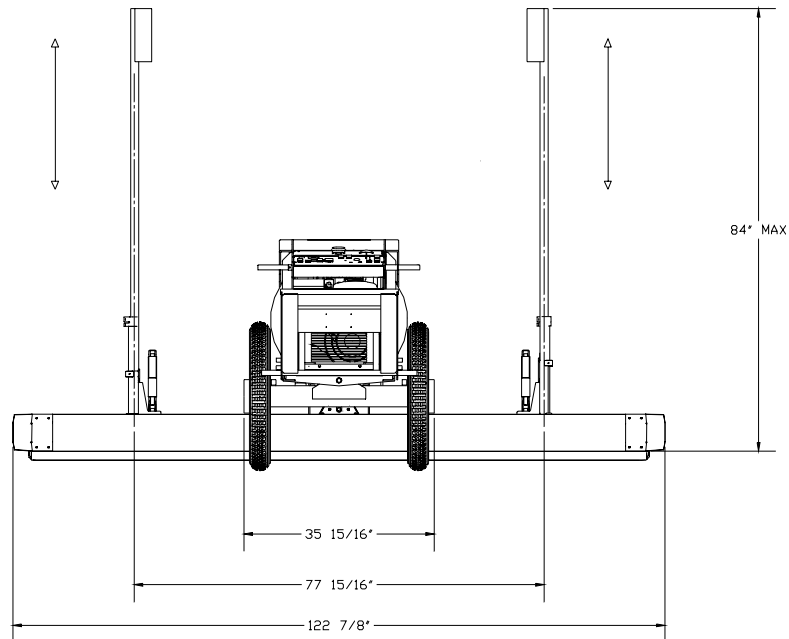
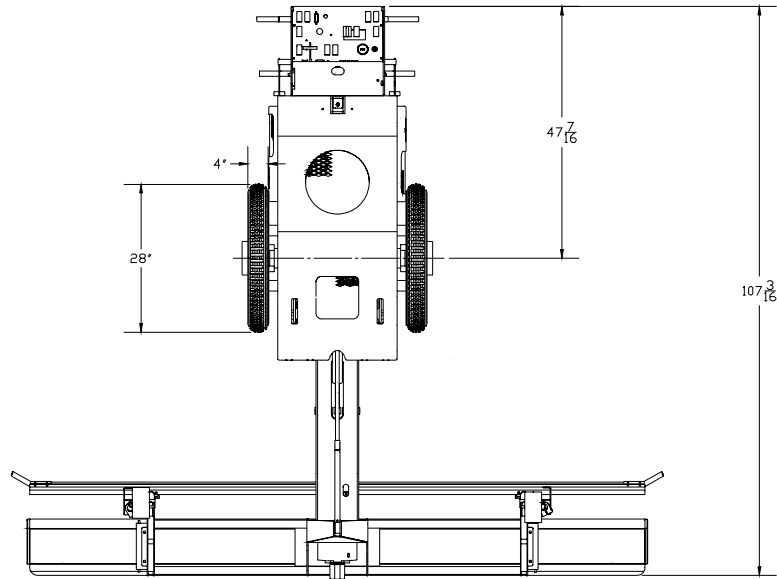
Bolt description:

Gr8 Hx Hd Cs 5/16-18 X 3/4 Zc

Grade Hex Head Cap screw Bolt size Threads per inch Length Zinc coated

CopperHead XD 2.0 SPECIFICATIONS

GENERAL DIMENSIONS



CopperHead XD 2.0 SPECIFICATIONS

GENERAL

Model	Copperhead XD
Classification	Mobile (Walk Behind) Construction Equipment
Type	Laser Controlled Concrete Leveling and Screeding Machine
Manufacturer	Somero Enterprises

POWER UNIT - ENGINE

Engine Model	Robin America EH41
Type	4-Stroke with 1 cylinder, air cooled
Horse Power	13.5 hp @ 3600 rpm
Fuel	Gasoline, 87 Octane minimum
Starting	Electric Start with secondary pull cord
Battery/Electrical	12V DC with 200 watt alternator (16.6 amps)
Controls	Manual throttle and choke with electric shutoff

POWER TRAIN - DRIVE SYSTEM

Propulsion	Hydraulic drive motors with 5.25 : 1 gear ratio for each wheel
Propel Control	Hand controls - mechanical, proportional hydraulic valves
Wheels - Standard	21" motorcycle custom aluminum weldment
Tires - Standard	80/100 x 21" motorcycle tires with aggressive treads
Wheels - Option	Custom 12 x 7 ATV rim
Tires - Option	28x10-12 ATV tires with aggressive treads

HYDRAULIC SYSTEM

Pump	Variable displacement piston pump with load sensing
Rated Flow Rate	10gpm @ 3600rpm
System Pressure	2650 psi
Filtration	10 micron tank top return-line filter
Hyd Fluid	ISO 32, 2.94 gallons
Valve Types	Cartridge valves with pressure compensated flow controls
Oil cooler	Return line



CopperHead XD 2.0 SPECIFICATIONS

FUNCTIONS

Vibrator	Hydraulic motor, 3000-5500 RPM
Propel	Hydraulic Motors, 5.25 : 1 gear ratio, 3.0 cubic inch per revolution
Elev. Control, Plow	Electric linear actuators with 4" stroke, laser controlled
Head Lift	2.0" Hydraulic cylinder, manual switch and machine auto level, 6" stroke

FLUID CAPACITIES

Engine Oil	1.27 quarts
Fuel Tank	1.85 gallons
Hydraulic Oil	2.94 gallons

GENERAL DIMENSIONS

Overall Width	123" (10' head), 36" at wheels (standard tires), and 48" at wheels (ATV tires)
Overall Length	108"
Overall Height	43-1/2" without masts
Ground Clearance	11" under frame
Weight	775 lbs. with 10' head assembly



TO THE OPERATOR

THIS OPERATING AND SERVICE MANUAL outlines the detailed operating, service and safety procedures for your COPPERHEAD XD 2.0. Read this manual carefully. Failure to do so could result in personal injury or equipment damage.

THIS MANUAL IS CONSIDERED PART OF YOUR COPPERHEAD XD 2.0 and should remain with the machine when it is sold.

THE LEFT AND RIGHT-HAND SIDE of your COPPERHEAD XD 2.0 is determined by the operator being in the operating position behind the handles.

MEASUREMENTS ARE GIVEN IN BOTH U.S. AND METRIC EQUIVALENTS. Use the correct replacement parts and specified grade, or higher grade fasteners.

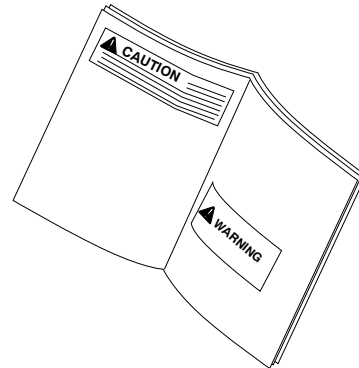


SAFETY

READ THIS MANUAL AND FOLLOW SAFETY INSTRUCTIONS BEFORE OPERATING THE MACHINE

Learn to operate the machine and its controls properly. Never let anyone operate without instruction.

Read the safety messages in this manual and on your machine safety signs. Keep safety signs clean and in good condition. Replace damaged safety signs.



RECOGNIZE SAFETY INFORMATION AND SIGNAL WORDS

A safety symbol is used with the signal words DANGER, WARNING and CAUTION.

DANGER denotes the most serious hazard.

WARNING is intermediate between DANGER and CAUTION.

CAUTION denotes the least serious hazard.

 **DANGER**

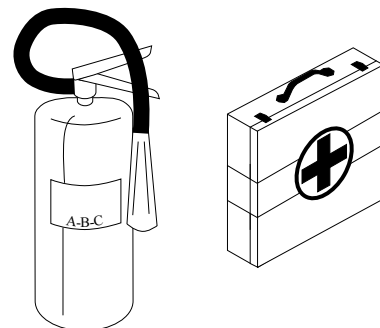
 **WARNING**

 **CAUTION**

PREPARE FOR EMERGENCIES

Keep a first aid kit and fire extinguisher handy.

Keep emergency phone numbers for doctors, ambulance, hospital and fire with you at all times.



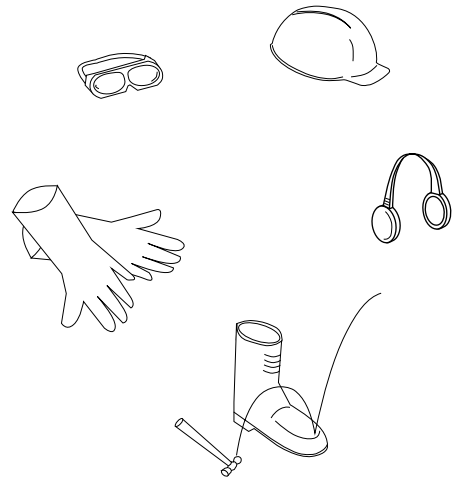
SAFETY

WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing. Operator and rakers must wear suitable hearing protective devices such as earmuffs or earplugs.

Give full attention to operating your **COPPERHEAD XD LASER SCREED** safely.



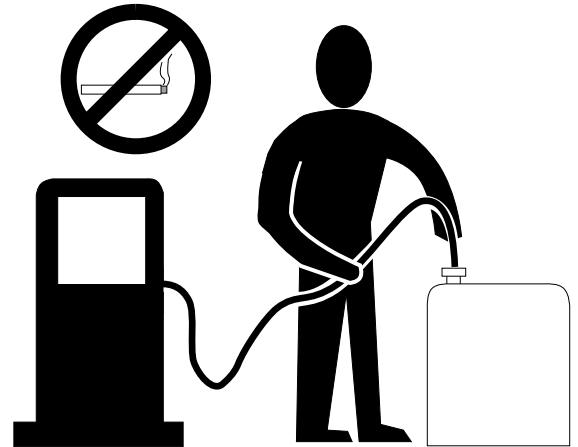
HANDLE FUEL SAFELY

Fuel is highly flammable. Do not refuel your **COPPERHEAD XD SCREED** while smoking or near open flame or sparks.

Stop engine and let cool for a minimum of two (2) minutes before refueling.

Refuel outdoors.

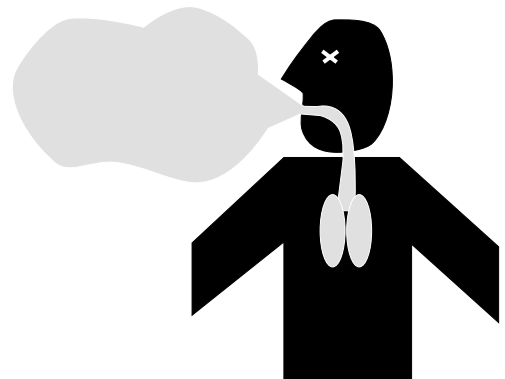
Prevent fires by keeping your machine clean of spilled fuel. Use a funnel to refuel.



WORK IN VENTILATED AREA

Engine exhaust fumes can cause sickness or death. If it is necessary to operate your machine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension

If you do not have an exhaust pipe extension, open the doors and get outside air into the area.



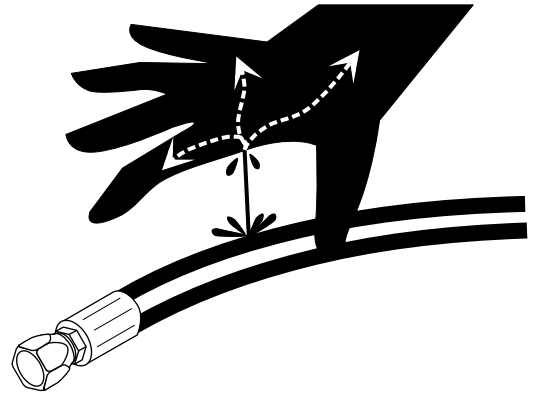
SAFETY

AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin and cause serious injury.

Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

IF AN ACCIDENT OCCURS, SEE A DOCTOR IMMEDIATELY. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

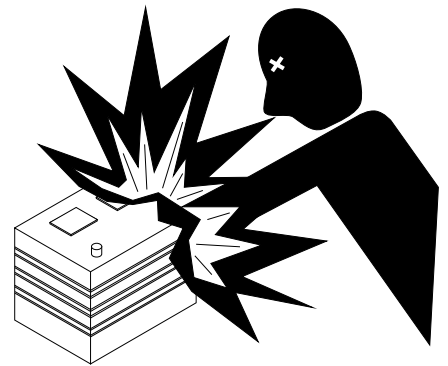


BATTERY CHARGING

Always remove grounded (-) battery clamp first and replace it last.

Quick charging should only be done in an emergency. Slow charging is preferred.

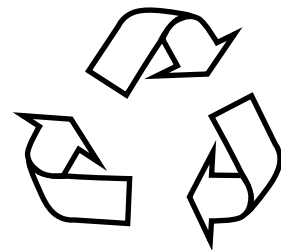
Plug charger into an electrical outlet with the power off. **DO NOT** connect terminals with power on.



DISPOSE OF WASTE PROPERLY

Use leakproof containers when draining fluids such as oil, fuel, coolant, filters and batteries. Do not use food or beverage containers that may mislead someone into drinking from them.

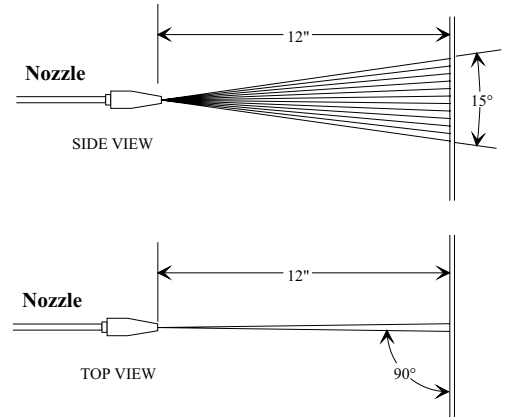
DO NOT pour waste onto the ground, down a drain, or into any water source.



SAFETY

Vinyl Graphic Washing Instructions

The vinyl graphics applied to your machine are made of high quality "OEM approved" materials that have been proven to last under harsh conditions, but will not hold up to direct and deliberate high pressure power washing. It is recommended that surfaces with vinyl graphics applied be pre rinsed to remove large loose dirt and then washed using a soft brush. For surfaces that must be washed using a high pressure power washer, care must be taken to only spray the graphics with a 15 degree fan nozzle at an angle of 90 degrees from the surface being washed. The nozzle should never get closer than 12 inches from the graphic and the power washer output pressure should not exceed 2500 psi.



NEVER LOOK DIRECTLY INTO THE LASER BEAM

Set Laser Transmitter at a height of seven (7) feet above the benchmark height. (See B.4.7)

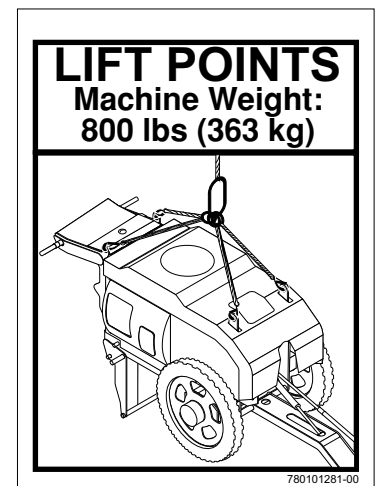


DO NOT OPERATE THE MACHINE UNDER THE INFLUENCE OF DRUGS OR ALCOHOL!



Do not place the CopperHead XD 2.0 on a deck until a structural engineer has been consulted!

Before placing this machine on an elevated deck, consult a structural engineer to verify that the deck meets the structural requirements to support the CopperHead XD. The CopperHead XD 2.0 weighs approximately 800 lbs. See page B.2.1 for machine weight and ground pressure specifications.

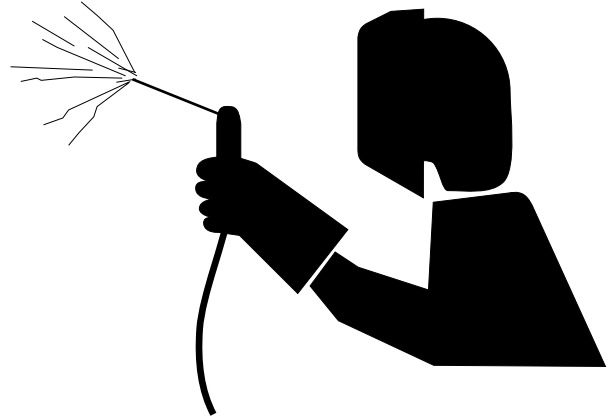


SAFETY

PRECAUTIONS WHEN WELDING

If it becomes necessary to weld on an assembled Copperhead Screed:

- 1) Disconnect the battery cables from the battery.
- 2) If welding near the battery, remove the battery to a safe location.
- 3) Always connect the welder's ground clamp as close as possible to the area being welded. Never connect ground clamp to the lower frame while welding on the upper frame. Major components may be destroyed.

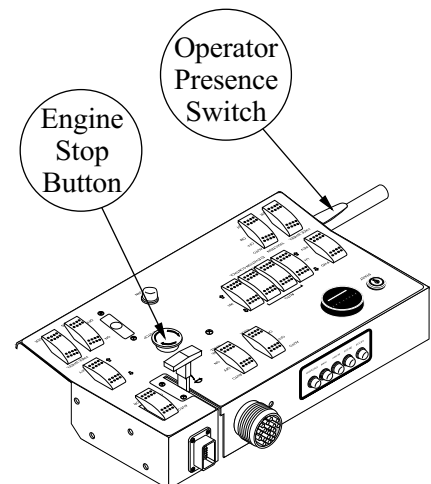


**TO AVOID AN ELECTRICAL SHORT
ALWAYS TURN OFF THE MASTER
SWITCH WHEN THE MACHINE IS
UNATTENDED.**



DO NOT BYPASS SAFETY DEVICES

If any safety device such as the Engine Stop Button or Operator Presence Switch become damaged or inoperative, repair or replace them before operating the machine.



COPPERHEAD XD DECAL LOCATIONS

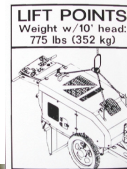
780101120-01 1 pcs.



780101193-01 2 pcs.



780101227-00 1 pcs.



780101141-00 3 pcs.
Moving parts can crush and cut.
Keep hands clear.
Follow lockout procedure before servicing.



780101155-00 1 pcs.
Moving parts can crush and cut.
Do not operate with guard removed.
Follow lockout procedure before servicing.



780101230-00 2 pcs.



780101167-00 2 pcs.



780101154-00 3 pcs.
Pinch Points.
Moving part can crush or cut.
Keep clear.



780101128-00 2 pcs.
Pinch Point.
Keep hands clear during operation.

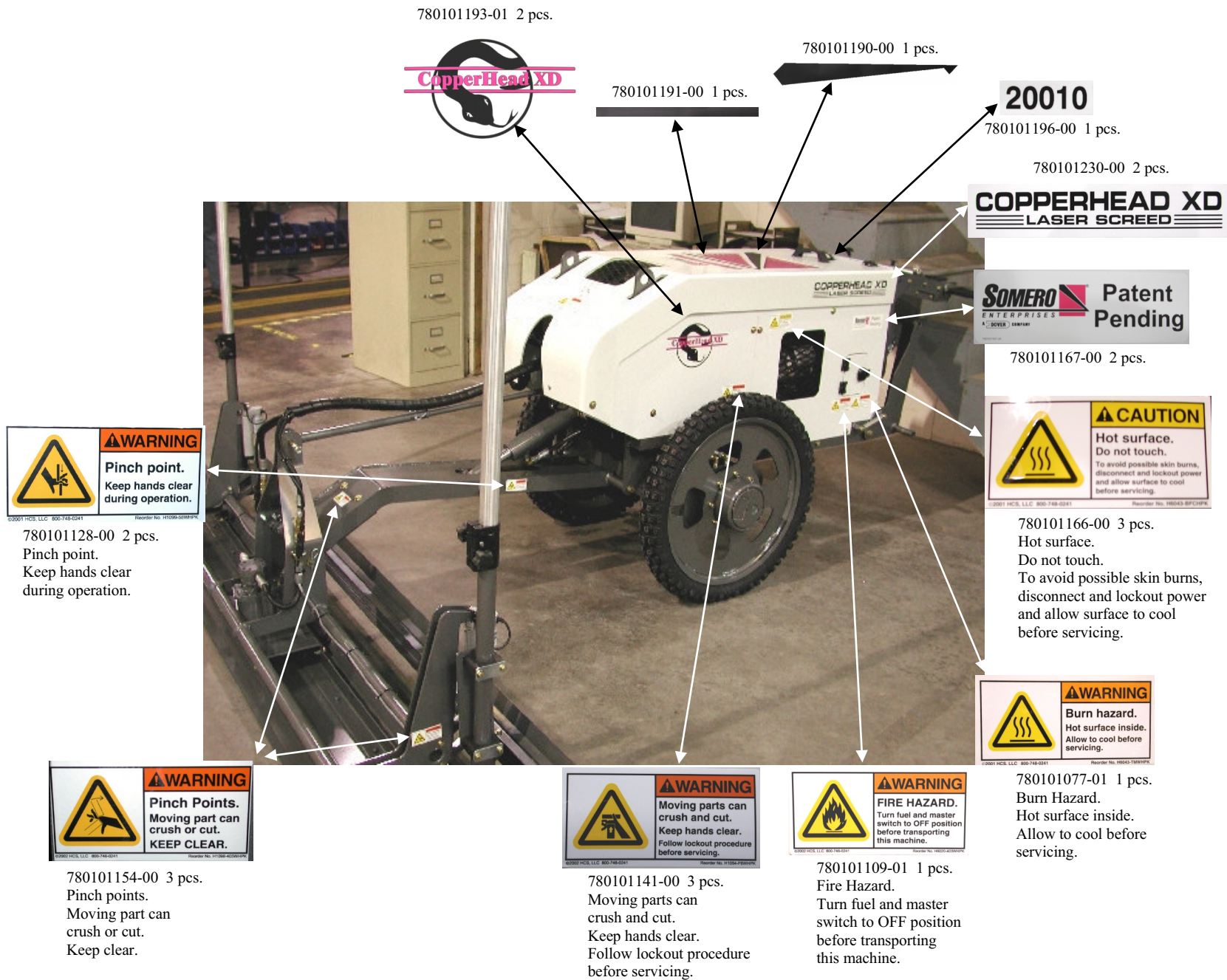


780101141-00 3 pcs.
Moving parts can crush and cut.
Keep hands clear.
Follow lockout procedure before servicing.



780101154-00 3 pcs.
Pinch Points.
Moving part can crush or cut.
Keep clear.

COPPERHEAD XD DECAL LOCATIONS



780101134-00 1 pcs.



780101126-00 1 pcs.
Read and understand operator's manual before using this machine.
Failure to follow operating instructions could result in injury or damage to equipment.

780101166-00 3 pcs.
Hot surface.
Do not touch.
To avoid possible skin burns, disconnect and lockout power and allow surface to cool before servicing.



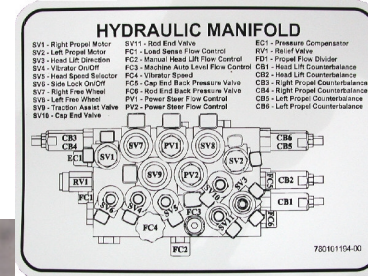
780101125-00 1 pcs.
Flammable gases may be present.
Avoid causing sparks.

780101124-00 1 pcs.

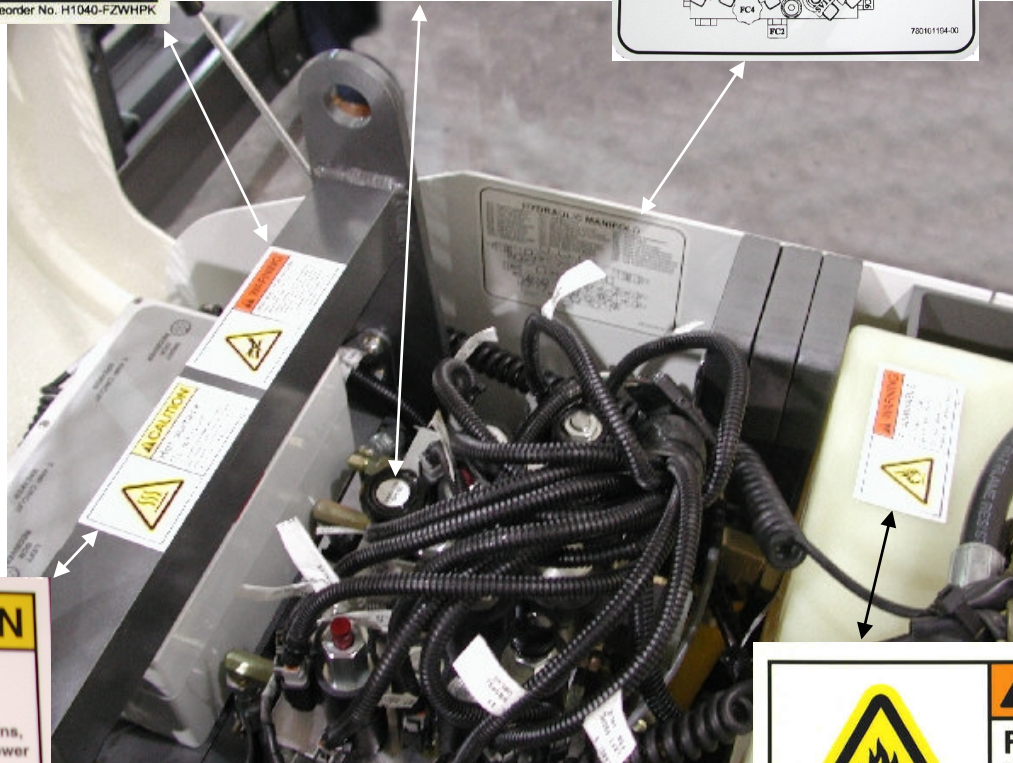




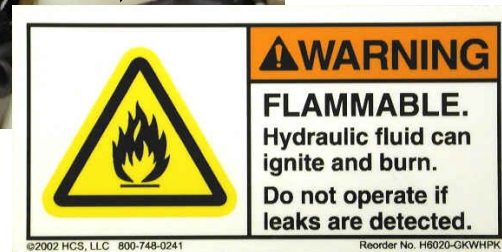
780101164-00 1 pcs.

VIBRATOR
SPEED

780101078-01 1 pcs.
 Skin injection hazard.
 Protect hands and body from high pressure fluids.
 Relieve pressure before disconnecting hydraulic or other lines and tighten all connections before applying pressure.
 In case of accidental skin injection seek immediate "Surgical Treatment"
 Failure to follow this warning can result in amputation or serious injury.



780101166-00 3 pcs.
 Hot surface.
 Do not touch.
 To avoid possible skin burns, disconnect and lockout power and allow surface to cool before servicing.

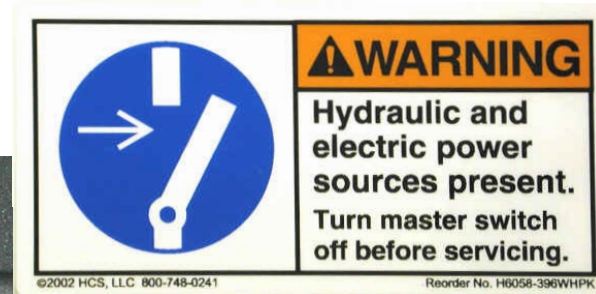


780101131-00 1 pcs.
 Flammable.
 Hydraulic fluid can ignite and burn.
 Do not operate if leaks are detected.

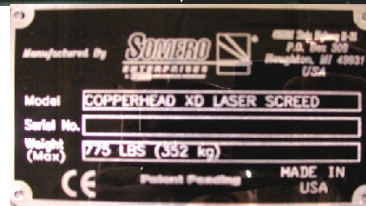


780101060-01 1 pc.

Rivet, Alum,
3/32 Od X 3/8 Lg
20731 4 pcs.



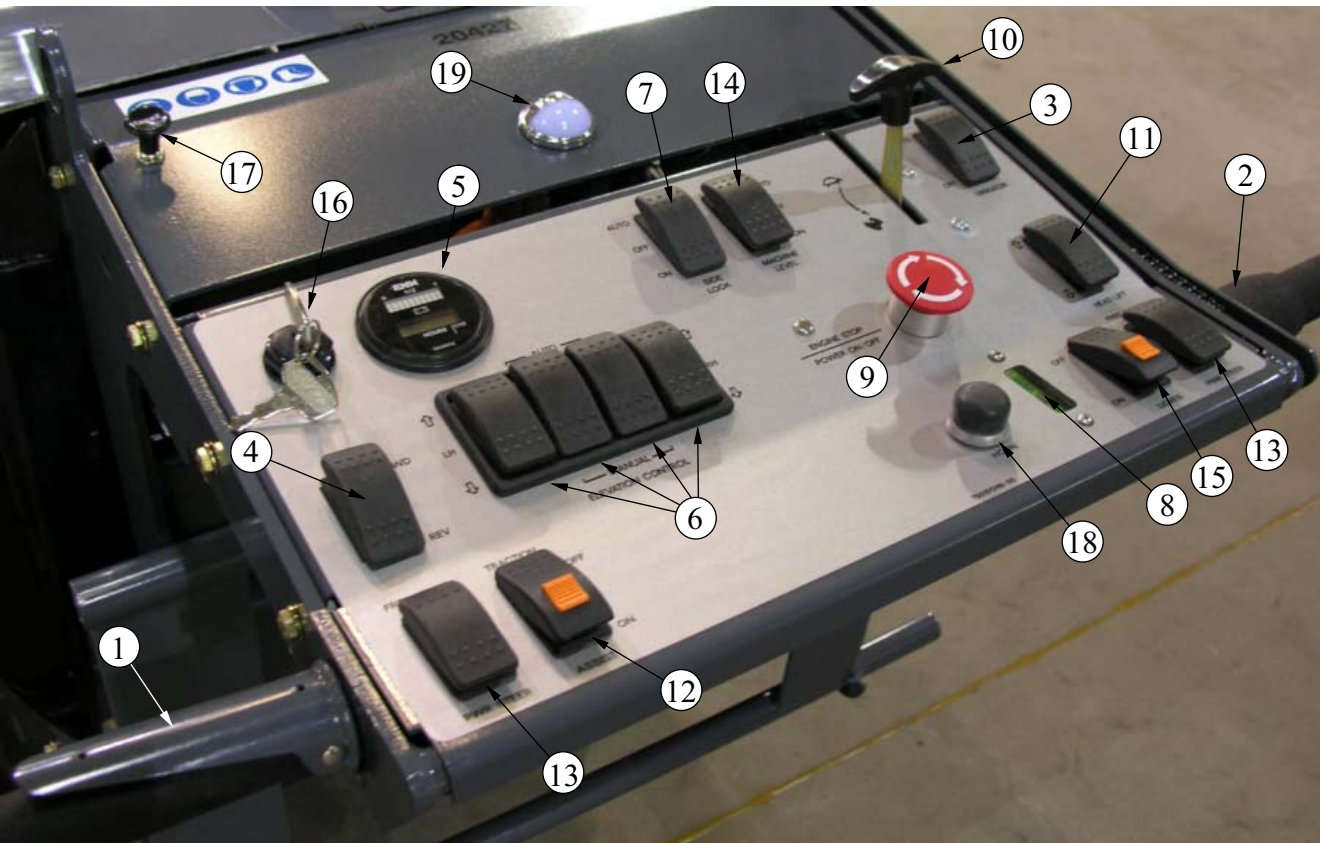
780101148-00 1 pc.
Hydraulic and electric power sources present.
Turn master switch off before servicing.



780401016-00 1 pc.

COPPERHEAD XD DECAL LOCATIONS

COPPERHEAD XD 2.0 OPERATOR CONTROLS



CONTROLS

Refer to Figure B.1.1. Callout numbers on the figures correspond to the item numbers below. See the engine manual for the controls on the engine.

- 1) **OPERATOR PRESENCE SWITCH-** The left side handlebar has a "Operator presence switch" for safety which must be held down for the machine to operate. When you let go of this switch the drive train and the vibrator come to a complete stop. However, even when this switch is released, the engine and the manual head lift function will continue to operate.
- 2) **DRIVE SPEED CONTROL-** The right handlebar has a twist grip which controls the speed of the Copperhead's drive train: in other words, how fast the wheels turn. Twisting the grip toward the rear of the machine will increase the speed of the wheels while twisting the grip toward the front of the machine will decrease the speed of the wheels. There are two very important facts relating to this control that you should take note of. One, this control does not change the speed of the engine, it just regulates the amount of hydraulic drive delivered to the wheels. And two, the twist grip is not spring loaded, which means that once you set it to a certain position, it will stay there and not return to the OFF or NEUTRAL position. Therefore, it's very important that you remember to manually return this control to the OFF position, which disengages the drive, before depressing the Operator Presence Switch on the other handlebar. Otherwise, when you depress the Operator Presence Switch on the left handlebar to start moving in forward or reverse, the machine will jump quickly to the drive speed set by this control.
- 3) **VIBRATOR MASTER SWITCH-** The Vibrator Master switch sets the vibrator to AUTO or turns it off completely. When this switch is in the AUTO position, the vibrator will not operate if the machine is set to drive forward or is unattended. However, when the machine is set in reverse and the Operator Presence Switch is depressed to begin a screeding pass, the vibrator will start automatically.
- 4) **PROPEL SWITCH-** The Propel switch controls the direction of the Copperhead XD's movement when the drive is engaged. It has two positions, FORWARD and REVERSE.
- 5) **HOOR METER/BATTERY INDICATOR-** The Hour Meter will count whenever the power is ON and indicates how many total hours the machine has been running. This information is primarily used to determine when maintenance functions should be performed on the Copperhead XD. The Battery Indicator shows the charge status of the battery.
- 6) **ELEVATION CONTROL SWITCHES-** Just below the Hour Meter/Battery Indicator is a row of four switches. These switches, working together, control the elevation, or height, of the left and right sides of the plow in relation to the vibrator plate. The center switch toggles the elevation control of the plow between Auto and Manual operation. Under all normal screeding conditions, this switch should be set to the AUTO position. Since the elevation of the plow is critical to screeding a high quality floor, let's review in detail how this switch affects the operation of the machine. When the Elevation Auto/Manual Switch is set to the AUTO position, the Operations Box, using reference information from the laser receivers, continuously sends instructions to the linear actuators on the screed head to keep the plow at the correct height.



If one of the laser receivers loses the reference signal, the Operations Box will leave the screed head at the last known correct height until the signal from the laser transmitter is reacquired. Likewise, if both laser receivers lose the reference signal, then the Operations Box will keep the plow at the last known correct height. At that point, the operator will be effectively operating the machine manually, although the machine remains switched into the AUTO mode.

Also in the AUTO mode, when either side of the plow is locked because the reference signal has been lost, the Left and Right Elevation Switches can be used to move the plow up or down if necessary to continue accurate screeding. This allows the operator to control screeding height on one or both sides of the plow without any reference to the signal from the laser transmitter. When one of these switches is activated, the plow on that side of the screed head will continue moving until the switch is released or the actuator reaches its limit. The plow will then stay in that position until the reference signal is reacquired or the Elevation Switch for that side is activated again. Again, in this mode, as soon as the laser reference signal is reacquired by either one of the receivers, the Operations Box will automatically begin adjusting the plow height on that side of the screed head up and down to meet the reference grade. When the other receiver reacquires the reference signal, the plow will again be under full automatic control. When the Elevation Auto/Manual switch is set to the MANUAL position, the height of the plow is not referenced to the laser transmitter at all. Instead the height of the plow is affected only by the Left and Right Elevation switches. The operation of these Left and Right Elevation switches in this mode, however, continue to work as outlined before. They cause the plow on that side of the screed head to move up or down until the switch is released or the actuator hits its limit.

7) **SIDE LOCK SWITCH-** The Side Lock Switch controls a key feature of the Copperhead XD, it's ability to drive over uneven ground while keeping the screed head level and constantly referenced to the laser transmitter. In order to accomplish this, the machine was designed with an upper frame and a lower frame, which are connected by a pivot joint. That allows the lower frame to move up or down on either side while the upper frame stays level. And because the screed head is attached only to the upper frame, the screed head is isolated from the effect of bumps and obstacles on the sub-floor. When the Side Lock Switch is set to the ON position, the upper and lower frames are locked together and do not move independently. This is useful when transporting the machine on site because, otherwise, the upper frame would tip from side to side, forcing the operator to provide balance. When this switch is in the OFF position, the upper frame can move from side to side independently of the lower frame. This may occasionally be useful during placement operations, but the preferred approach while screeding is to leave this setting in AUTO. When the Side Lock Switch is in the AUTO position, the upper and lower frames are locked at all times, except when the Copperhead XD is performing an actual screeding pass. In other words, when the Propel Switch is set to REVERSE and the Operator Presence Switch is depressed, the Side Lock will be released and the two frames will move from side to side independently. With any other combination of control settings, the frames will be locked together, which reduces strain on the operator and allows easier maneuvering between passes on fresh concrete. Therefore, in most circumstances, the operator should leave this switch set in the AUTO position.

8) **LEVEL-** This bubble level indicates whether the machine is oriented correctly for screeding operations. This is important, because if the machine is not properly leveled, then the attack angle of the screed head will be wrong and poor screeding results will occur. During the course of a job, the level should be checked at the beginning of each pass to insure that the machine and the screed head are correctly aligned. Also, see machine level feature.



9) **ENGINE STOP SWITCH-** Twisting the Engine Stop switch clockwise allows the engine to be started. Pushing this control down shuts off the engine and can be used during operations as an emergency "kill switch".

10) **ENGINE THROTTLE CONTROL-** Pushing the Engine Throttle Control forward decreases the speed of the engine and pulling it back increases the speed of the engine. During screeding operations, the throttle would normally be pulled all the way back so that the engine was operating at full speed.

11) **HEAD LIFT SWITCH-** The Head Lift Switch lifts the screed head up and down to level the machine. This switch should also be used to lift the screed head up to its full height prior to maneuvering the machine around the job site.

12) **TRACTION ASSIST SWITCH-** The Traction Assist Switch is set in the OFF position during most normal operations. In the OFF position, the Copperhead XD's wheels turn independently, with hydraulic power flowing to the wheel motor which is encountering the least resistance. In the ON position, the hydraulic system is designed to balance power between the two wheel motors. This allows traction to be improved when wheel slippage is encountered. NOTE: The Copperhead XD is more difficult to maneuver when the traction assist is ON.

13) **FREE WHEEL/POWER STEER-** Free Wheel and Power Steer are maneuvering aids for the operator. There are two Free Wheel/Power Steer switches. One controls the left wheel and the other controls the right wheel. If the rocker switch is pushed forward it enables the Free Wheel function for that side of the machine. If the rocker switch is pushed back, it enables the Power Steer function for that side of the machine. These are momentary switches that must be pushed and held for as long as the function requires activation.

Free Wheel is used to reduce the operator's effort while maneuvering the machine in non-screed mode. When Free Wheel is enabled on one side of the machine, it allows that wheel to spin freely in either direction. This makes it extremely easy to turn the machine.

The Free Wheel function is also used as a means of moving the machine around if hydraulic power is unavailable. With the ignition key turned to the ON position, and the E-Stop switch twisted to the up position (On), the operator can hold down both the left and right Free Wheel switches and easily push the machine around.

Power Steer is a function that is typically used while screeding around obstacles or screeding with a heavy load on one side of the plow. The Power Steer feature allows the machine to perform a powered turn to either direction. For instance, if the left Power Steer switch is activated, the left wheel will slow down and the right wheel will "power" the turn. This feature is commonly used when there is a heavy load on one side of the plow. The offset load will tend to cause the machine to start turning off of its course of travel. Power Steer assists the operator to realign the machine back to its original direction.

The Power Steer function is factory set at a certain power level. If the operator finds that the Power Steer is either too strong or too weak, it can be adjusted using the two potentiometers located on the front right frame rail. Turning the dials clockwise will make Power Steer react more strongly. The top potentiometer controls the right hand switch and the bottom potentiometer controls the left hand switch.



14) **MACHINE LEVEL-** The Machine Level feature is designed to keep the machine level and the receiver masts vertical while screeding. It is very important to have a level machine while screeding flatwork. The original setup of the machine is done while the machine is level and the GCR masts are vertical. If the machine comes out of level while screeding, the masts will tilt forward or back which lowers the laser receivers. If the receivers are lowered, the laser will strike the receiver towards the top of the window and the laser control system thinks that the floor dipped low. It will correct for this by raising the actuators enough to get the laser beam to strike the center of the receiver window. The end result will be a screeded floor that is screeded to a higher elevation than intended.

The Machine Level function can be switched to On, Off, or Auto. When Machine Level is On, the machine will continuously adjust to stay level in forward and reverse. When Machine Level is in Auto, the machine will continuously adjust to stay level only in reverse. And, of course, when Machine Level is Off, the machine will not auto-level in any mode. When Machine Level is activated it keeps the machine level while screeding through uneven subgrade. Another benefit of the Machine Level feature is when the operator pushes down on the handlebars to move the machine to the next pass, the head will automatically lift up which makes it easier for the operator to move the machine to the next pass without bumping stub-ups or dipping the head into the concrete. The machine is leveled with the lift cylinder and Machine Level feature will only work when the operator presence switch is activated.

15) **LIGHTS-** Your Copperhead XD is outfitted with work lights on the front of the machine. The lights enable the operator to see the plow and the concrete in front of it while screeding in low light conditions.

16) **IGNITION-** The Copperhead XD has an engine with electric start. With the E-Stop button up, turn the ignition key clockwise to start the machine.

17) **CHOKE-** If the engine is cold, pull the choke cable up, which CLOSES the choke. If the engine is warm, cable is left down.

18) **HORN**

19) **DASH LIGHT**



FRAME

The frame of the Copperhead XD 2.0 incorporates the engine, head lift, hydraulics, and the drive train, which includes the wheels of the machine. Also, separate, but usually mounted on the machine, are six (6) counterweights.

The engine is a Robin with a maximum output of 13.5 horsepower. The engine powers the Copperhead XD 2.0's hydraulic system and also keeps the battery charged. The battery, in turn, powers the laser receivers and linear actuators, as well as the indicator light, switches, and other electrical components.

Before you begin using the Copperhead XD 2.0, it's important that you read and understand the Engine Owner's Manual. It contains complete operating instructions, detailed service schedules, and important safety information.

The Head Lift is a hydraulic cylinder that moves the screed head up and down in relation to the chassis. This allows the screed head to sit level on the placement regardless of the depth of the concrete. And, since the wheels of the Copperhead XD 2.0 rest on the sub-floor, and the sub-floor height usually varies quite a bit across the entire placement, regular adjustments to the Head Lift are needed during screeding operations.

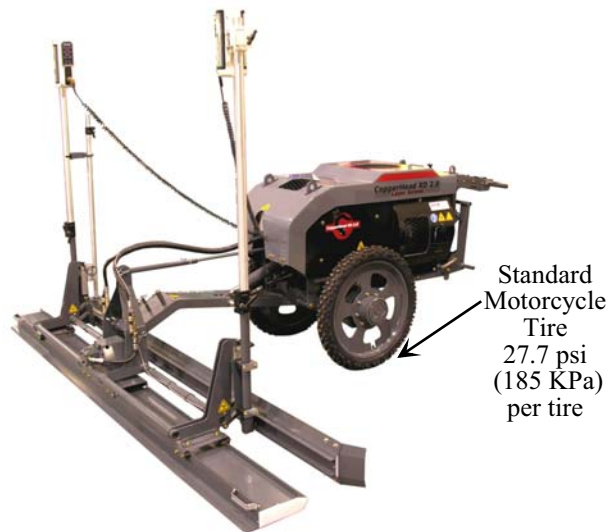
The hydraulic system has nine (9) primary components. See section D. for Hydraulic Operation.

The drive train simply consists of two hydraulic motors, one for each wheel, and the wheels themselves.

COPPERHEAD XD 2.0 GROUND PRESSURE

Machine weight = 800 lbs. (363kg)

Ground pressure per tire*



ATV Tire
3.9 psi
(27 KPa)
per tire

Standard
Motorcycle
Tire
27.7 psi
(185 KPa)
per tire

* Ground pressure determined during maneuvering while head elevated off ground.

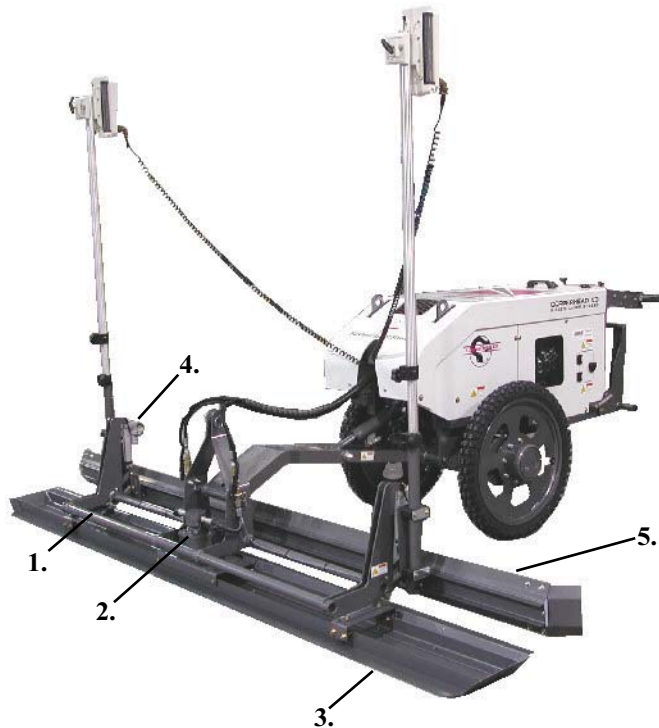
NOTE: Consult structural engineer before using Copperhead XD 2.0 on any job site.



SCREED HEAD

The screed head is composed of five (5) components and also holds the masts for the two laser receivers.

1. Screed Head Support - As its name implies, this supports the screed head.
2. Vibrator Gear Box - This gear box houses the components that provide vibration to the vibrator plate.
3. Vibrator plate - This plate provides floatation for the front of the machine and seals the freshly screeded concrete.
4. Linear Actuators - These precision electric devices control the elevation of the plow.
5. Plow - The plow actually cuts the concrete to grade and is controlled by the linear actuators.



TIE ROD SETTING

5 Degree Attack Angle

7 Degree Attack Angle

9 Degree Attack Angle

3 Degree Attack Angle

1 Degree Attack Angle



ITEMS TO BRING TO A JOB SITE

- | | |
|-----------------------------|------------------------------------|
| 1.) Laser Transmitter | 9.) Copperhead Grade rod |
| 2.) Tripod/Column clamp | 10.) Batteries for Laser |
| 3.) Gas | 11.) Rubber Boots |
| 4.) Tachometer | 12.) Safety Glasses |
| 5.) Scrub Brush for washing | 13.) Copperhead XD Counter Weights |
| 6.) General tool set | 14.) Ear Plugs |
| 7.) Spare tire | 15.) Spare Parts Kit |
| 8.) Hard hats | |

PRESTART MACHINE CHECK and SAFETY CHECK

Before starting the machine, perform the following checks:

- 1.) Check the engine oil level.
- 2.) Check fuel level.
- 3.) Check the air filter.
- 4.) Check the hydraulic oil level.
- 5.) Check the battery condition.
- 6.) Check the condition of the hydraulic cooler fins.
If the fins become oily, dirt will stick to them and eventually block air flow.
- 7.) Check for any obstructions at the engine cooling air intake and discharge.
- 8.) Check hydraulic pump and associated hoses and fittings for leaks.
- 9.) Check hydraulic oil filter and associated hoses and fittings for leaks.
- 10.) Check tire condition and check tire pressure.
- 11.) Check fuses and circuit breakers.
- 12.) Ensure all guards and safety decals are in place.
- 13.) Set Tie Rod to a 3 degree attack angle.
- 14.) Level machine with Head lift or Auto machine level.
- 15.) Verify Laser/Electronics working properly.
- 16.) Check vibrator speed.



STARTING THE MACHINE

Refer to the engine manual for engine starting and stopping instructions.

Warm up procedure to be used when the ambient temperature is below 32°F. (See page B.3.4)

CAUTION:



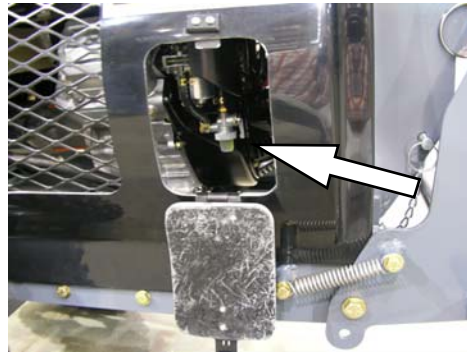
Hydraulic oil should be 80°F for ideal performance but should reach a minimum of 50°F before using machine to screed concrete. Run a hydraulic function to warm hydraulic oil, recommended function is propel. Do not engage pump if hydraulic oil is below -13°F.

- 1.) Be sure that Propel Twist is off.



- 2.) Open side door to locate fuel valve.
Be sure the fuel valve lever is ON.

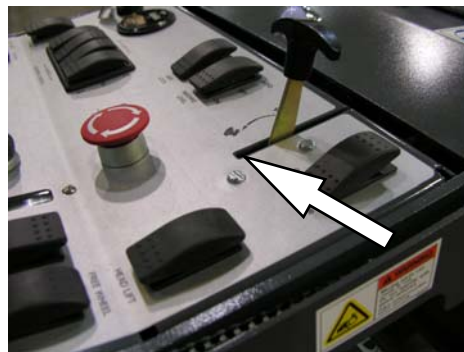
NOTE: Fuel should be OFF while transporting.



- 3.) If the engine is cold, pull the choke lever to the CLOSED position. To restart a warm engine, leave the choke lever down in the OPEN position.



- 4.) Move the throttle lever away from the SLOW position, about 1/3 of the way toward the FAST position.



5.) Turn the engine stop switch clockwise.



6.) Turn key clockwise to start, then release.



7.) Move the throttle lever to the FAST position and the Copperhead XD is ready for operation.



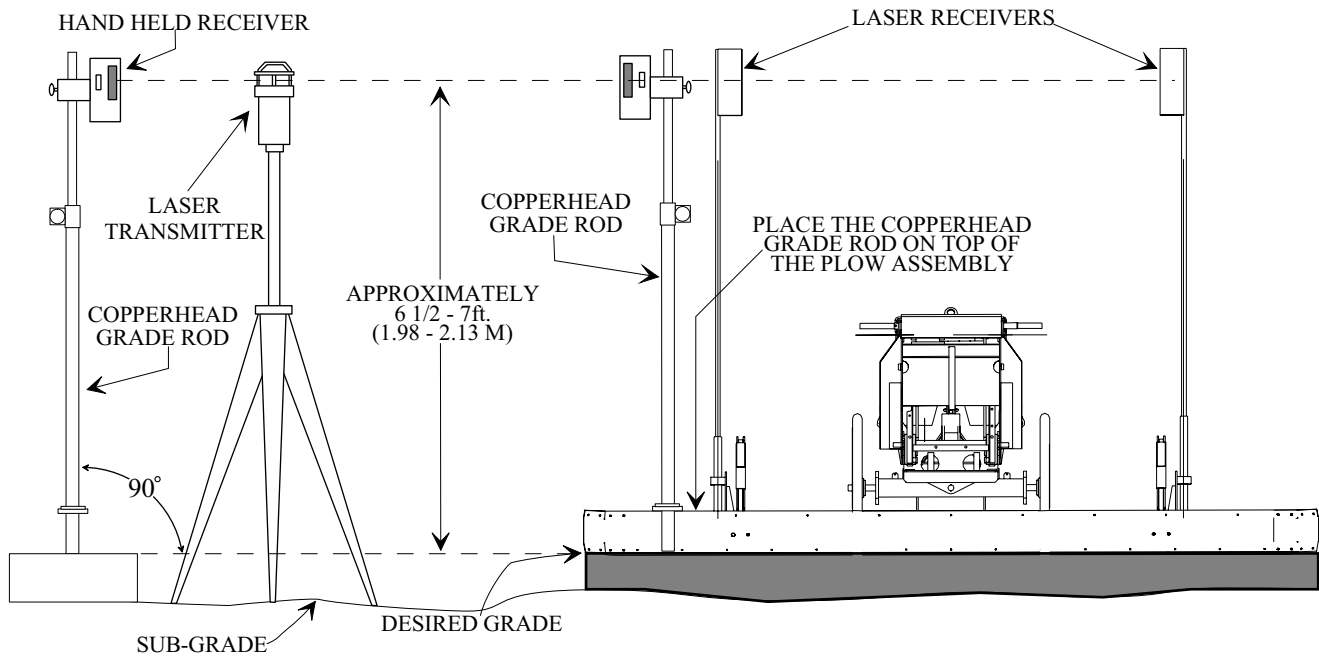
COLD WEATHER START PROCEDURE

- 1) Start the engine at a low RPM and leave running until engine is warmed (See Engine manual).
- 2) Turn vibrator switch OFF.
- 3) Once engine is warm, propel around the job site to warm the hydraulic oil -- BEFORE running the vibrator. Do this for 10 minutes or so. If it is colder, run the machine longer.
- 4) Drop the engine RPM's to approximately 1/2 throttle.
- 5) Run the vibrator in short bursts for 3-10 seconds.
- 6) Let the vibrator run for 5 minutes.

ROBIN ENGINE HIGH ALTITUDE KIT

It is recommended that a Robin Engine High Altitude Kit is installed if the Robin engine is used 3500 ft. above sea level on a consistent basis.
Robin Engine High Altitude Kit part #267-62551-07 for 13.5HP EH410 Robin Engine.
Kits can be purchased at your local Robin Dealer.
Visit www.somero.com for the Robin Dealer locator on our website.





SET UP PROCEDURE

- 1.) Start up Laser Transmitter at 6.5-7 feet above grade. Be sure the Laser Transmitter is set up in a location that will not have anything in the way to cause interference.
- 2.) Establish and set grade on the Copperhead XD Grade Rod.
- 3.) Position Machine in concrete, making sure both laser receivers are clear to the transmitter and switch elevation control to manual.
- 4.) Using level indicator, level the machine with Head Lift.
- 5.) Near the laser receiver mast, place the Copperhead Grade Rod ring on top of plow and hold vertical.
- 6.) Using raise/lower elevation control, adjust height of plow until Copperhead Grade Rod indicates proper grade.
- 7.) Repeat Step #6 for opposite side and then recheck original side.
- 8.) Once the plow is on-grade, manually lower the laser receiver (from top down) until the LED's indicate the on-grade signal, repeat the process for the opposite side.
- 9.) Switch elevation control to automatic.
- 10.) Screed approximately 6 feet then verify grade and make adjustments if required.

SHUT DOWN PROCEDURE

- 1.) Position plow 1" from top.
- 2.) Turn Off using key start and press e-stop button down.
- 3.) Shut off Fuel.
- 4.) Use pressure washer to get concrete off machine.



LOADING AND UNLOADING PROCEDURES

The best way to transport the Copperhead XD is on a dedicated trailer. Of course, before you use any trailer for this purpose, you should check to see whether the one you're considering is up to the task. At the very least, it must have sturdy ramps and a load rating that is more than adequate for the Copperhead XD's weight and size.

To load the Copperhead XD, start by setting the parking brake on your vehicle and chock the wheels of the trailer. Then lower the drive-on ramp and check to make sure that it is securely attached.

Next, using the engine power of the Copperhead XD, drive the machine up onto the trailer.

Then, secure the Copperhead XD by threading nylon straps through the machine and cinching the straps up tight.

Somero recommends that you transport the Copperhead XD with the screed head attached. However, in some cases, that may not be feasible, in which case you must remove the screed head from the machine before loading. If this is necessary, start by setting the kickstand on the machine so that it doesn't fall over backwards when you remove the screed head. Then disconnect the quick release hydraulic fittings and do the same for the two quick release electrical fittings. Finally, pull out the retaining clips on the two large cotter pins which hold the screed head to the turnbuckle and the lift arm. The screed head is now free and can be set aside.

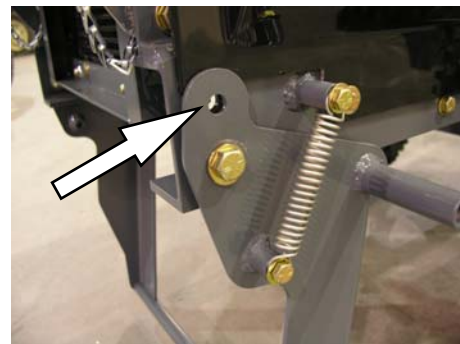
Once the screed head has been detached from the machine it should be tied down to the trailer with nylon straps as well. Be careful not to tighten the straps more than necessary - too much downward pressure can damage the vibrator float or the plow.

Secure the Copperhead XD
to a trailer with the
tie down straps available
from our Customer Support
Department 906-482-7252.
Part #740801254-xx



**Tie Down Locations on
Front of machine**

*NOTE: Be sure not to damage the Limit Switch Assembly
when using the tie downs on front of machine*



**Tie Down Locations on
Back of machine**



Be sure to turn the Master Switch off while transporting the Copperhead XD.



Unloading the Copperhead XD is simply the reverse of the loading procedure.

First, remove the straps holding the Copperhead XD to the trailer's bed. Of course, if the screed head has been detached, then it should be removed from the trailer first and set aside.

If the screed head needs to be reattached, start by positioning the screed head at the front of the machine. Then bring the attachment couplings for the lift arm and the turnbuckle together, insert the cotter pins, and replace the retaining clips. Finally, reattach the electrical and hydraulic connectors.

Now, before you move the machine to the placement area, check the route you plan to take and make sure that it is free of obstacles that could damage the machine. The screed head in particular is a precision device and in some cases may have to be removed in order to get it safely onto the job site. And, remember, with the screed head removed, the Copperhead XD will be back heavy. Therefore, as you move the machine around, you will have to hold up on the control handles in order to prevent the Copperhead XD from falling over backwards. A front transport wheel assembly is available which makes maneuvering without the head attached much easier. Call our Customer Support Department at 906-482-7252.

With the route planned and an assistant standing by, you can now move the machine. Here's the procedure for getting under way.

1. Increase the engine speed by pulling the Throttle Lever toward the rear of the machine.
2. Push down on the handle bars to lift the head up off the ground.
3. Set the Propel switch to drive forward.
4. Push down on the Operator Presence Switch.
5. Rotate the Drive Speed Control toward the operator.

When you're maneuvering the Copperhead XD around the work site, set the screed head as high as possible by activating the Head Lift switch and be on the lookout for obstructions. Keep in mind that the screed head is substantially wider than the machine itself and is only supported at two points by the Head Lift. So, if you run into something with the screed head, even at low speed, it's very likely that damage to the machine will result.

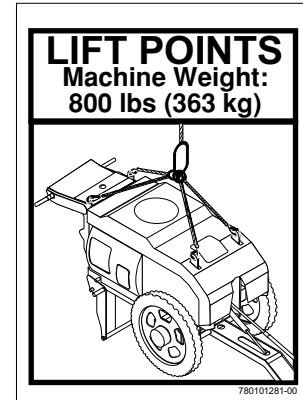


LIFTING & MOVING THE MACHINE

LIFT POINTS

The Copperhead XD can be moved by the lift points provided.

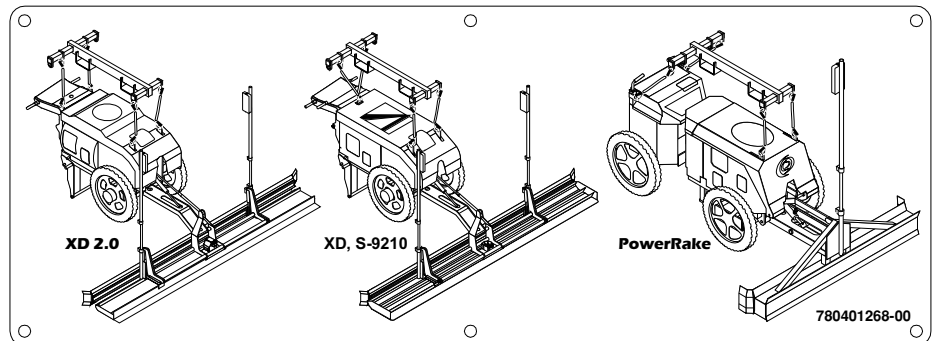
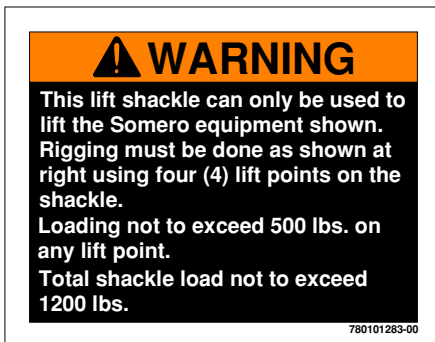
- 1.) Shut down machine.
- 2.) Turn off all power.
- 3.) Somero recommends that you use the optional lifting device that is available for purchase or an equivalent device rated for 1000lbs. and above.
 - triple chain loop with hooks
 - three lifting straps with hooks
 - triple cable loop with hooks
- 4.) Hook lifting eyes located on frame and handle bar (pictured below).
- 5.) Slowly lift machine and check before lifting overhead.



NOTE: Consult structural engineer before using Copperhead XD on any job site.

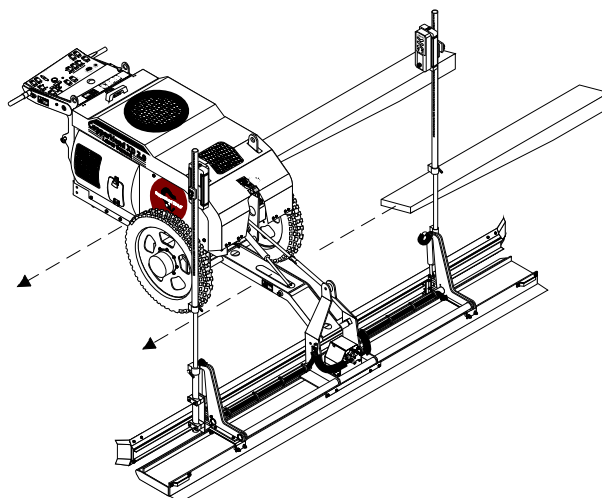
LIFT SHACKLE

Lift Shackle available by calling our Customer Support Department 906-482-7252. Part #740801422-xx
Lift shackle plate and decal explain proper procedure when using the lift shackle.



FORK LIFT

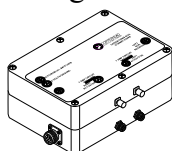
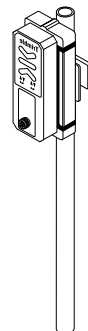
The Copperhead XD can also be moved with a forklift. First, be sure that the kickstand is in the up position. Approach the Copperhead XD from the side at a low speed with forks low. Be extra careful not to bump the Copperhead XD with the forks. Lift and drive at a low speed.



LASER SYSTEM

The GCR receivers will work with most of the standard laser transmitters currently in use by the construction industry. However, the transmitter you select will need to meet certain minimum guidelines in order for the Copperhead XD to perform at its best. The key things to look for are the rate at which the laser transmitter rotates and the accuracy of the beam itself. (The rotation speed must be a minimum of 600rpm and the beam itself should be accurate to plus-or-minus 1/16 of an inch at 100 feet from the transmitter.)

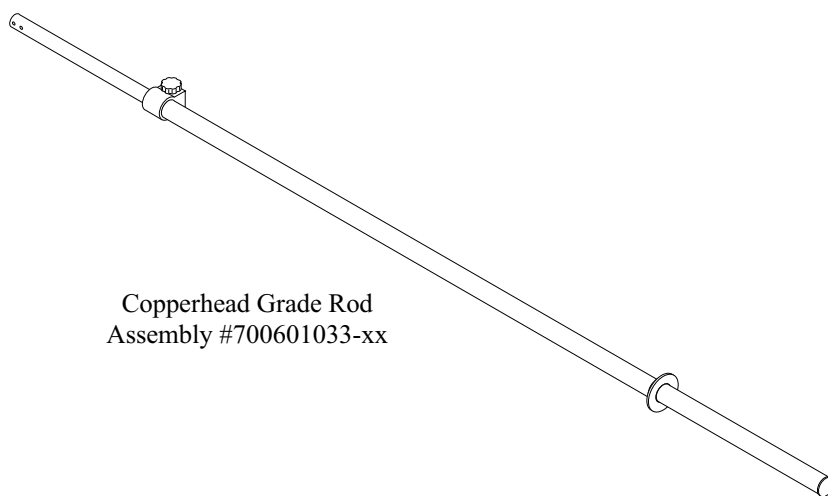
The laser receivers have a light that indicates when the unit has power as well as visual grade indicators. The receivers are also equipped with an array of optical sensors protected by transparent windows. The optical sensors are divided into individual segments arranged along the vertical axis of the receivers. Whenever the laser reference signal hits one of the optical sensors on a segment that is above or below the correct "strike-point", the grade indicator on the receiver will display an up-arrow or a down-arrow showing whether the screed head is high or low relative to the reference signal. At the same time, the receiver also sends a signal to the Operations Box indicating whether the plow needs to move up or down to remain on grade.



The Operations Box then activates the linear actuator on the appropriate side of the plow until the reference beam is again hitting the correct "strike-point" on the receiver.

Obviously, setting up these receivers correctly is crucial to the performance of the Copperhead XD. In order to set up the laser receivers on the Copperhead XD to the correct height, a hand-held receiver is used in conjunction with the Copperhead Grade Rod to take benchmarks. A benchmark records the vertical distance between the desired placement elevation and the laser signal emitted by the transmitter.

The hand-held receiver uses audio tones and a liquid crystal display arrow to tell the operator when it's directly in the path of the invisible laser beam. It operates in three modes, fine, medium and coarse. For use with the Copperhead XD it should always be in fine mode. We'll discuss the details of how to take a benchmark later in this manual. (See B.4.9)



Copperhead Grade Rod
Assembly #700601033-xx



PLANNING & PREPARATION

Planning and preparation is the key to every successful job and, generally speaking, it all begins the day before you're scheduled to start.

First of all, you should familiarize yourself with the job site itself.

- Is the job site open or cluttered with stubs etc.
- Will you be working under a roof or outside?
- What's the weather forecast?
- What's the mix design?
- Will there be an accelerator in the concrete?
- How many yards per hour will be poured?
- Which head (10' or 8') should be used?
- Which tire package should be used (Hi-Float or Standard).

NOTE: Consult structural engineer before using Copperhead XD on any job site.

Also, you need to make sure that you and the Copperhead XD are ready to go to work and to continue working without unnecessary interruptions.

- Charge all rechargeable batteries, especially your laser transmitter's battery and bring spare batteries for any equipment that uses them, like the hand-held receiver. Remember, without a backup plan, one dead battery in a piece of equipment can put you out of work in the middle of a job.
- Fuel the machine and make sure you have sufficient extra gas to complete the job.
- Make sure you've packed everything you need:
 1. Your laser transmitter and a tripod or a column clamp.
 2. The Copperhead Grade Rod.
 3. Counterweights for the machine.
 4. A tachometer.
 5. A set of general tools.
 6. A spare tire.
 7. A scrub brush for cleaning the Copperhead XD.
 8. Your hard hat, safety glasses, rain gear, and rubber boots.
 9. This Owner's manual and spare parts.
 10. A fire extinguisher.
 11. Ear plugs.
 12. Spare parts kit.
 13. Lift harness if applicable to jobsite.
 14. Form oil.



COPPERHEAD XD 2.0 SETUP

The day of the job, plan on reaching the job site at least one hour before the scheduled arrival of the concrete. After the machine is unloaded do a thorough walk-around inspection. If you find a serious problem with the machine speak immediately to your supervisor so that the concrete delivery can be pushed back (if necessary) until repairs have been completed.

Next, check the fluid levels, including the engine oil and the hydraulic oil. Also confirm that the fuel tank is topped off and grease vibrator gear box bearings (See C.3.3). Inspect the air filter and check the condition of the battery. Check for any obstructions at the engine cooling air intake and discharge. Check the hydraulic pump and oil filter and look for chaffed, leaking or broken hoses and fittings. Check for any signs of wear that require your attention before going to work. Check the tires and inspect them to make sure they're in good condition. Make sure all machine guards, covers and safety decals are in place. Set the Tie Rod to a 3 degree attack angle.

Attach the masts to the screed head. Slide the bottom of each mast into the support on the screed head and tighten the retaining clamp. Raise the mast so that the mounting point for the laser receivers is at about the height of the laser transmitter. Now you can mount the laser receivers to the masts. To do this, slide the receivers onto the masts and tighten the threaded knob. Typically, the receivers face inward and back towards the operator at a 45 degree angle.

There are just a few items left to check, but they require the engine to be running first. Before we review these items, let's briefly review the engine starting process. To begin with, at the Control Panel, you should reset the Engine On/Off switch. Then, open the access panel on the frame cover and carry out the following sequence:

1. Move the fuel valve lever under the hood to the ON position.
2. If the engine is cold, pull the choke cable up, which CLOSES the choke.
If the engine is warm, cable is left down.
3. Move the throttle lever away from the SLOW position, about 1/3 of the way toward the FAST position.
4. Turn the ignition key counter clockwise until the engine starts, the release.

Complete details on starting and stopping the engine, as well as operating, safety, and service instructions, are contained in the engine Owners Manual. You should familiarize yourself with this manual before using the Copperhead XD and refer to it as needed during operations or maintenance.

Once the engine is started, make sure to let it warm up. At the same time you can warm the hydraulic oil in the system by either driving the machine around or activating the vibrator while the machine is standing still. NOTE: In cold weather the machine must be driven for at least 5 minutes before turning on the vibrator. Even after driving for 5 minutes, the vibrator should only be turned on for 1 second intervals. Do this 10 times to drive the cold oil out of the vibrator hoses. This will prevent the vibrator shaft seal from failing. Also, once the hydraulic oil is circulating in the system, it may take awhile to reach the optimal temperature of 80 degrees Fahrenheit.



When you're satisfied that the engine and the hydraulic oil are sufficiently warmed up, level the machine with the Head Lift switch, verify that the laser electronics are working, and finally, check the speed of the vibrator.

Last, but not least, take a moment to protect your Copperhead XD from drying concrete. Spray the screed head, the stabilizers and wheels - anything that will come into contact with wet concrete - with a form oil or other concrete release agent.

At this point, if everything has checked out OK, you can move on to setting up the laser transmitter.



LASER TRANSMITTER SETUP

There are many types of laser transmitters in use by the construction industry. The type that you will want for your Copperhead XD depends on the type of work that you do. If you do all flatwork, then a non-angling transmitter from Trimble will work fine. If you plan on doing slope work, then you should be using a transmitter that is capable of single or dual slope, whichever your job demands. Those can be precisely tilted so that the plane of reference light remains parallel to a grade of up to 10% uphill or downhill and along one or two axis. Other transmitters will vary between maximum settings of 5%, 10%, or even 20% slopes. When doing steeper jobs, determining the maximum slope the transmitter can achieve will become more important.

Also, every transmitter has some method for leveling the base unit. Check the instruction manual for your specific transmitter to determine the applicable procedures.

Finally, some laser transmitters have multiple louvered windows which can be closed to prevent the laser beam from shining on areas of potential reflection. This is helpful when setting up the transmitter because you can open only those windows that are necessary to allow light to pass over the placement area. If your transmitter does not have this capability then you should take precautions to make sure that part of the beam does not shine away from the placement area where it could strike a pane of glass or other shiny surface. Reflected beams that bounce back toward the placement area can cause interference and confuse the Copperhead XD's control system.

If you've chosen a spot for your transmitter that is next to a suitable column, you can mount the transmitter with a column clamp. If not, you'll have to use a tripod. When using a tripod, it's important to make sure that the legs don't slip during screeding operations. The best way to insure that the legs will remain stable is to position the feet of the tripod in existing saw cuts or other indentations. Once the feet are placed, press them down firmly with your foot. Also check to make sure that all the nuts and bolts on your tripod are tight and that the safety chains are attached. Finally, remember that the safety chains should hang loosely between the legs so that they won't transfer vibrations from leg to leg.

As was mentioned earlier, the Copperhead XD determines the height of the screed head by constantly checking the reference signal from a laser transmitter. In operation, the transmitter is mounted near the front of the placement and at a height of about seven (7) feet above the benchmark height. Keeping the transmitter at least this high above the floor makes it less likely that the laser will be blocked by people or other moving obstructions.

There are two guiding principles for choosing a spot for the transmitter. First, you want the transmitter in a spot where the air is cleaner and it won't be disturbed during the job. Second, you want to reduce shadow areas as much as possible. Shadow areas are those places where the laser beam is blocked by columns or other immovable obstructions. When the machine passes through one of these shadow areas, one or both of the Copperhead XD's laser receivers will lose a line-of-site connection to the transmitter and screeding accuracy will be compromised.



If one of the Copperhead XD's two laser receivers loses the transmitter signal, that receiver will stop sending reference information to the Operations Box. When that happens, the Operations Box immediately locks the linear actuators on that side of the screed head so that the plow holds the last known reference position. At that point, the receiver on the other side of the screed head will still be sending reference information to the Operations Box and the plow will continue to hold grade by reference to the laser transmitter.

However, if both of the Copperhead XD's laser receivers are blocked from seeing the transmitter, then all reference will be lost, the feedback loop will be broken, and the machine will lock both linear actuators at the last known reference point. Your only choice at this point, other than moving the laser transmitter, is to operate the machine in full manual mode until it picks up the laser signal again. Of course, during manual operation there will be loss of accuracy and speed.

By now it should be obvious that carefully choosing a location for the laser transmitter can make the difference between an easy day or long and difficult placement.

A word of caution is called for regarding the use of laser transmitters on a construction site. Remember that, even though these devices use a lower-power laser, they can still cause eye damage. So never look directly at the laser beam.

Finally, we strongly urge you to consult the Owners Manual provided with your specific laser transmitter for complete instructions on set up and operation as well as more specifics on safety.



COPPERHEAD XD

GCR SETUP/CALIBRATION INSTRUCTIONS

1.0 BUTTON IDENTIFICATION

<u>BUTTON</u>	<u>FUNCTION</u>
CORRECTION INCREASE (YELLOW, ↑)	Increases correction speed when the engage button is pressed
CORRECTION DECREASE (YELLOW, ↓)	Decreases correction speed when the engage button is pressed
ENGAGE (RED)	Engages the selected correction mode, when used alone, moves actuator at speed set in selected mode (yellow LED above the turtle or rabbit)
SELECT (GREEN)	Allows you to put the GCR in calibration mode, and select which calibration mode (Yellow LED above turtle or rabbit) you want to adjust.

2.0 VALVE TYPE SELECTION (Not all GCR's have this option, some are set to "PT" already)

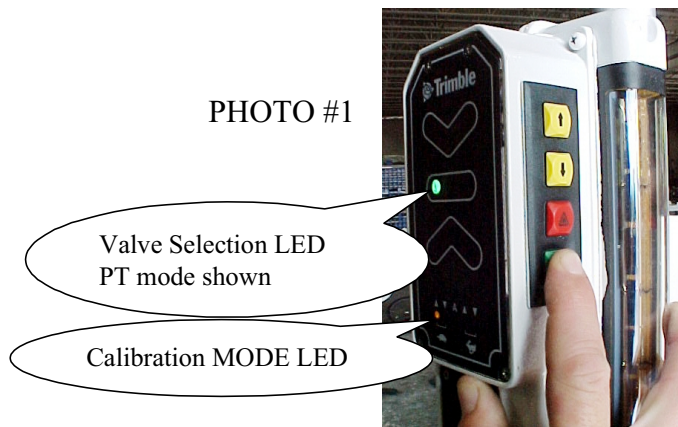
- 1) Turn the key off or press the E-Stop switch down. This ensures that the GCR's are reset.
- 2) Turn the key to the first stop and twist up the E-Stop button. This will turn on the electrical power to the machine.
- 3) Switch the laser system auto/manual switch to the "MANUAL" position.
- 4) Press and hold the two yellow buttons simultaneously until the four mode yellow LEDs light and a valve selection green LED lights.
- 5) We want **PT** valve selection, which is the first green LED on the left (See photo #1 on next page), so if that is not on, press either the yellow up or down buttons to cycle through and select the machine's valve type.
- 6) After selecting **PT** valve type, press the green select button to exit the valve selection mode and enter the valve calibration mode.
- 7) If you need to adjust the GCR Up/Down speeds then go to section 3.0.
- 8) To get out of calibration mode, turn power off or press the E-Stop button down.

3.0 GCR VALVE MODE AND SPEED ADJUSTMENTS

- 1) If the machine is running, turn it off. This ensures that the GCR's are reset.
- 2) Support the vibrator plate so that the plow will not touch the ground throughout its entire stroke.
- 3) Start the engine and run it at full throttle to provide full voltage to the actuators.
- 4) Switch the laser system auto/manual switch to the "**MANUAL**" position.
- 5) To adjust left side actuator speeds, adjust the right actuator so that it is positioned in the middle of its stroke, to minimize binding on the side being adjusted. To adjust the right side, center the left actuator.
- 6) Press and hold the green **SELECT** button (about 2 seconds) on the GCR receiver until the first valve selection green LED lights and the first calibration mode yellow LED lights, see photo #1 on next page. We are using **PT** valve selection, so the first green LED on the left should be on, if not see section 2.0 to set to correct valve type.
- 7) We want the **RABBIT** up and down speeds to be set at max speed (**5-6 SECONDS FULL STROKE**), and the **TURTLE** speeds (**7-8 SECONDS FULL STROKE**) to be set slightly slower, so to start, lower the side of the plow being adjusted fully down, with the manual switch on the console.



PHOTO #1



- 8) To begin turtle up speed adjustments, press and hold the red engage button and time the stroke from bottom to top, we want it to be 7-8 seconds. If it is not in that range you will have to adjust it.
 - A) First get the plow back down by pressing the green select button until the rabbit down LED lights, then press the red button to bring the plow down.
 - B) Now press the green button to light up the turtle up LED.
 - C) To slow down the turtle up speed, press and hold the red button and yellow **DOWN** buttons simultaneously.
 - D) To speed up the turtle up speed, press and hold the red button and yellow UP button simultaneously. As shown in photo #2.
 - E) Return the plow to the down position by following step (A)
 - F) Time the turtle up speed by following step (9) to see if it is in the 7-8 second range, if not repeat steps (A) thru (F).
 - G) If it is in the range then move on to turtle down speed, which you would adjust the same as the turtle up speed.
- 9) After the turtle speeds are set at 7-8 seconds, now check the rabbit speeds, they should be maxed out at 5-6 seconds. To check and adjust the rabbit speeds follow steps 8) thru 8G) above, but vary the steps slightly because you are adjusting the rabbit and not the turtle.

TURTLE SPEEDS:

FULL STROKE UP OR DOWN = ABOUT 7-8 SECONDS

RABBIT SPEEDS:

FULL STROKE UP OR DOWN = ABOUT 5-6 SECONDS



PHOTO #2

- 10) To get the GCR's out of calibration mode, turn off the machine.



SCREEDING OPERATIONS

TAKING A BENCHMARK

Perhaps the most critical task in all of screed preparation is taking a benchmark. A benchmark is a precise measurement of the distance between the finished floor elevation and the height of the laser beam. The benchmark is used to set the same distance between the screed head and the mast-mounted laser receivers. It's also used to double check that the laser beam is running exactly parallel to the on-grade reference points all around the placement.

Before you begin, remember to work carefully throughout this procedure. Making an error at this point could cause the entire floor to be placed above or below grade - and that's an expensive mistake to correct after the fact.

To start with, attach the hand-held receiver to the Copperhead Grade Rod. Press the on/off button once to turn the receiver on.

The receiver has three (3) sensitivity settings, make sure that the receiver is in the fine mode. Use the button to select between them. Set the audio level. There are three settings. Choose an audio level that can be heard easily over the general noise of the job site.

Next ask your supervisor or foreman to point you to the grade reference point on the job site that is closest to your transmitter. This grade reference should be used to take your benchmark. Once you find the grade reference, extend the grade stick so that the receiver is high enough to reach the rotating beam of the laser transmitter when the grade stick is sitting on the grade reference. Hold the grade stick over the grade reference point and high enough so that the receiver is above the transmitter's reference beam.

Then, holding the grade stick vertically, slowly lower the receiver until you hear the tone that indicates that it has found the laser beam. During this initial adjustment to the grade reference point, when setting the screed head, and throughout the process of checking the height of the finished concrete, it is absolutely imperative that you always start high and lower the receiver into the transmitter's reference beam. That's because the receiver has what is called a dead band.

In fine mode, this dead band is approximately 1/16th of an inch. Therefore, if you do not consistently bring the receiver into the laser beam from one direction, you may inadvertently introduce a 1/16th of an inch error in your finished grade level. It should also be noted that in coarse mode, the dead band is larger, so never use the hand-held receiver in coarse mode.

Now make sure the Copperhead Grade Rod is locked and mark the rod with a pencil. During the course of the day, it's a good idea to check this pencil mark periodically to assure yourself that the stick has not slipped in one direction or another.

Now that the Copperhead Grade Rod has been set against the grade reference point, you should walk the Copperhead Grade Rod around the placement area, checking that all forms and other grade references have been properly set.



The walk around inspection is extremely important. Not only are you verifying that all perimeter forms, plumbing, dock levelers, doorways, and previously poured concrete are at the desired elevation, but you are also verifying that the transmitter is sending out a laser beam that is perfectly level and that the receiver itself is operating properly.

The end goal of a complete walk-around is to confirm that the Copperhead Grade Rod is set correctly, that the laser beam is following the desired grade of the floor, and to find elevation errors at reference points so that they can be corrected before the pour begins. Also, while doing the walk around, you should make a note of the location of plumbing or other obstructions that you'll need to avoid while screeding.

Finally, once the benchmark is properly set, you should always use the same benchmark for every placement in the building. If you need to transfer the benchmark due to obstructions or excessive distance, take extreme care. Use a very accurate transit or optical level to help to eliminate any variance in elevation caused by the transfer.

TRANSFERING THE BENCHMARK

Now we need to transfer the benchmark height to the Copperhead XD. In doing so, we'll be setting the distance between the Copperhead XD's plow and its laser receivers to exactly match the distance between the original grade reference and the "strike point" on the Copperhead Grade Rod's laser receiver. This process must be done carefully and accurately because setting the wrong height on the Copperhead XD will result in the entire floor being screeded above or below the desired elevation.

To start the process, verify that the laser receivers have power and make sure the left and right Auto/Manual switches are set to Manual. Then position the machine in the placement area with the screed head sitting on the first pour of concrete and confirm that the laser receivers have a clear field of view to the transmitter. Using the level indicator on the Copperhead XD, level the machine with the Head Lift control.

Now set the edge of the Copperhead XD Grade Rod Ring on the top of the plow on one side of the screed head and to the side of the nearest linear actuator. Then manually raise or lower the linear actuators on that side of the plow until the hand-held receiver on the Copperhead Grade Rod signals that the screed head is on grade. Raise the laser receiver up above the beam and slowly lower it until the receiver shows the green "on grade" light. Be sure to always come from the top side of the beam. Repeat this process on the opposite side of the screed head. Finally, double check each side one more time.

After the setup is complete, set the Elevation Auto/Manual Switch to Auto and screed about six (6) feet of concrete as a test. Then check the actual grade of the concrete on both sides of the newly screeded section and make adjustments to the Copperhead XD's receivers as needed. If the Copperhead Grade Rod indicates that the concrete is too low on one side, the receiver on that side is lowered in order to raise the grade. If the Copperhead Grade Rod indicates the concrete is too high then the receiver on that side is raised. Let's go over how that works.



Lowering the receiver moves the receiver's "strike point" down closer to the plow which causes the Operations Box to raise the screed head back up so that the "strike point" again sits right on target with the reference signal from the laser transmitter. For example, lowering the receiver by 1/8 of an inch will raise the plow by 1/8 of an inch. Raising the receiver does the opposite. So, one more time. Moving a receiver down will raise the grade and moving a receiver up will lower the grade.

If you do make adjustments after this first pass, rescreed the same section, but at the new elevation. Then break out the Copperhead Grade Rod and check the finished height of the concrete again. You should repeat the process until a measurement with the Copperhead Grade Rod confirms that the machine is screeding right on grade.

SCREEDING OPERATIONS

Before you start actual screeding operations, make sure you have a screeding pattern in mind and share that plan with the entire crew. That way they can work with you to achieve the best results.

In terms of good planning, a good, daily average speed to set for yourself when working with the Copperhead XD is 3,000-4,000 square feet per hour. But don't expect to hit that target consistently throughout the job. A number of factors on the site could reduce your speed, including cold weather, low slump concrete, or a requirement for high-tolerance floors.

As the concrete is delivered to the placement area, it should be raked out in front of the screed head so that it tops off at between one-eighth to one-quarter of an inch above finish floor height. By having the crew provide this steady, slight oversupply, you'll have enough concrete to fill any unexpected low spots. This is important because if they consistently place the concrete too high, you'll expend a lot of time and energy dealing with excess concrete.

As soon as the first concrete comes in, the finishers can start troweling the edges of the placement. This will eliminate the need to rescreed the edges by hand if they are not accessible after the Copperhead XD has completed its pass. However, if the edges of the placement are accessible after the Copperhead XD has screeded, they should be re-screeded by hand to blend the edges into the perimeter form or existing floor edges.

After you make the first complete pass, and regularly thereafter, you should check the newly screeded concrete for proper elevation. Remember, whenever you're checking the grade, keep the Copperhead Grade Rod plumb and lower it into the laser beam.

When you're ready to screed the next section, drive straight up to the point you'll begin screeding with the screed head overlapping the previous pass by one or two feet. The exact amount of overlap will be determined by the slump of the concrete. The wetter the concrete, the more you'll need to overlap. Remember, the screed head will be coming down over screeded concrete, so it's especially critical that you bring it in for a smooth landing.



The Copperhead XD comes equipped with four (4) counterweights. When not needed, these counterweights are stored in front of the hydraulic tank, directly over the axle, where they will not affect the machine's balance. However, depending on the slump of the concrete you're screeding, one or more counterweights may need to be mounted at the front or rear of the machine. If the concrete is relatively wet, counterweights can be hung at the rear of the machine to reduce down-pressure on the screed head. This will help prevent the screed head from sinking into the concrete.

As you continue to screed, you'll no doubt encounter some shadow areas where one of the receivers is blocked from seeing the laser transmitter. In cases where a receiver is blocked from the laser transmitter, you'll have to switch over to manual mode to continue screeding. In the manual mode you'll have to pay very careful attention to make sure that the screed head does not drop too low. Watch the ridge on the overlapping section as an indication of your progress.

At the end of the placement, while you're working your way toward the exit, remember to think ahead. Stick to the route you decided on during planning and particularly, as you get close to the end, make sure that the rest of the placement crew always knows where to dump concrete before your next pass.



Copperhead XD GCR Laser System Setup List

- 1.) Begin by setting the transmitter up in the beginning of the placement in the best possible locations (eliminating as many column blocks as possible) approx. 6 feet above floor elevation.
- 2.) Attach the screed head to the lift arm.
- 3.) See pages B.3.2-B.3.3 for warm up procedure.
- 4.) Slide the 2 receiver poles into the screed head assembly.
- 5.) Attach the 2 receivers onto the receiver poles, receiver LED's should be pointed toward the control panel.
- 6.) Attach the receiver cord from the receiver to the control box on both sides.
- 7.) Verify that the laser system is turned on and working properly.
 - Turn the auto/manual switch to manual.
 - Raise and lower both sides using the manual switches to verify the system is working properly.
- 8.) Set the grade stick to the benchmark, do you walk around inspection of the placement verifying that the grade stick is matching up to all forms, previous screeded concrete, diamonds, and anything that will be on grade.
- 9.) Start placing the concrete in the best known location. Wherever the Copperhead XD will start screeding needs to be ongrade. Example: If the first pass of the Copperhead XD will be against an exterior wall edge this wall edge needs to be troweled/magged to the proper elevation) this procedure will make the setup of the Copperhead XD easier and more accurate.
- 10.) Drive the Copperhead XD into the first pass position.
- 11.) Level the machine.
- 12.) Make sure the laser control system is in the manual position.
- 13.) Instruct a coworker to hold the grade stick on the plow facing the laser transmitter. When doing the setup, the Copperhead Grade Rod should be held as closely as possible to the linear actuators.
- 14.) At the operator console raise or lower the plow using the manual switch for that side until the grade stick/handheld receiver indicate that the plow is at the proper elevation. Repeat this same process for the opposite side. Recheck both sides.
- 15.) Once the plow is on-grade, manually lower the laser receiver (from the top down) until the LED's indicate the on-grade signal, repeat the process for the opposite side.
- 16.) Turn the laser control system into the auto mode.
- 17.) Proceed to screed the first 6 feet of the pass.
- 18.) Check the actual screeded surface of the concrete on both sides of the pass.
- 19.) Make the necessary adjustments to either receivers, if the gradestick is showing that the grade is high on one side of the pass, raise the receiver to lower the grade. Do the same for the opposite side. If the grade stick is showing that the screeded pass needs to be raised up, lower the receiver to obtain the proper height.
- 20.) Rescreed the pass at the new elevation and recheck the elevation with the grade stick. If changes are needed once again, follow the same process as above.



CLEAN UP PROCEDURES

Even though the concrete is in and the floor is within tolerances, your day isn't done until you completely clean your Copperhead XD.

1. Before you move to the washing area, switch the laser control over to the manual mode and drive both actuators to the top of their travel.
2. Then engage the Side Lock Switch. Finally, lower the receiver masts, disconnect the laser receivers, remove them from the masts, and coil their connecting cords.
3. Now you can drive to where the machine will be washed.
4. Once you're in position, turn off the machine and shut off the fuel supply to the engine.
5. Keeping water away from the electronic equipment and the breather filter on the vibrator gear box (see 40.10), wash the entire Copperhead XD with a regular hose and water.

NOTE: Do not tip the machine all the way back to the frame to wash under the vibrator plate. The air filter can become filled with oil and cause machine performance problems. Remove the head assembly from the lift arm to clean the bottom of the vibrator plate.

6. Thoroughly clean the Copperhead XD daily using a pressure washing system capable of providing 3000psi. When you do this, be very careful because a tight high pressure stream of water is sometimes powerful enough to remove paint and safety decals.



COPPERHEAD XD TROUBLESHOOTING GUIDE

PROBLEM

CHECK

Linear actuators will not move

Manual/Auto Switch is where you want it
All cords for laser control are plugged in and tight
Transmitter is on & rotating
Key switch is turned and e-stop switch is up
Battery is charged
Linear actuator packard connectors are plugged in

Machine will not hold grade

Side-Side oscillation is locked
Too close to laser transmitter
Laser is reflecting off of glass and bouncing back
Laser receiver is slipping down
Re-set up the plow
Machine level
Subgrade bad
Pulling too much concrete with plow
Receivers picking up flashing light from elsewhere on jobsite

Machine is not sealing the concrete

Check vibrator speed
Attack angle of head (tie rod setting)
Remove counterweights from rear of machine

Hard to turn traveling in the forward direction

Turn Traction Assist off

Vibrator does not turn on while screeding

Vibrator switch on
Quick disconnect hoses are connected properly

Machine does not stop when operator releases handles

Operator presence switch on left handlebar working



TROUBLESHOOTING - SCREEDING OPERATIONS CONDITIONS THAT MAY AFFECT THE LASER CONTROL SYSTEM

- 1) The following may cause interference between the laser transmitter and the receivers:
 - a) Fog.
 - b) Dust.
 - c) Diesel Exhaust.
 - d) Unevenly heated air.
 - e) Using a column clamp on a building column. Wind or other disturbances may cause the building to rock. This movement will not be discernible by eye, but can easily be enough to cause erratic signals. Use of a tripod may eliminate the problem.
 - f) Heavy equipment such as a bulldozer or a vibratory roller operating nearby. This can cause ground to vibrate enough to affect the transmitter. If equipment cannot be shut off, try relocating the transmitter further from the source of vibration and mount the transmitter on a tripod rather than a building column.
 - g) Wind may cause the transmitter tripod to rock. Try hanging weights, such as several concrete blocks, from the center of the tripod, or place a wind break, such as a vehicle, upwind.
- 2) Fluorescent lights may cause a solid red high signal.
Possible solutions:
 - a) Shut off lights.
 - b) Install shields above the receivers.
- 3) Weak batteries in the transmitter will cause:
 - a) Weak erratic signals.
 - b) No signal if far enough away.
- 4) Reflective surfaces such as glass or galvanized sheet metal, located at the same height as the transmitter, can cause false beam reflections to strike the receivers and result in erratic high or low signals.

Solutions:
 - a) Place a nonreflective material at transmitter height on the reflective surfaces.
 - b) Tape up the side of the receiver that is picking up the reflected signal.
 - c) Place nonreflective shield between transmitter and source of reflection.
 - d) Tape the window of the transmitter on the reflection source side.
- 5) If isolated areas of rippled concrete finish are noticed, it may be due to interference of the laser beam by the support legs at the corners of the transmitter rotating beacon housing. Rotate the transmitter as necessary to eliminate the blockage by the support legs.



COPPERHEAD XD SONIC TRACER SYSTEM INSTRUCTIONS

The Sonic XD system uses sonic sensors in place of laser receivers to enable a CopperHead XD to be utilized for depth pours. The Sonic Tracer on one side reads the finished concrete from the previous pass while the Sonic Tracer on the opposite side of the head reads a wet pad or a screed rail that is placed in the concrete to establish the proper thickness on the unfinished side.

CAUTION: You must use the Sonic XD coil cords for the Sonic Tracers only. Interchanging the GCR and Sonic Tracer cords can result in damage to the Operations box and/or GCR's or Sonic Tracers.

- 1) Install the Sonic XD system onto the CopperHead XD (see section 40.50).
- 2) Adjust the Sonic Tracer tubes so they are 12 - 18" away from surface to read.
- 3) When the system is installed, start the CopperHead XD with the Auto/Manual control switches in Manual position.
- 4) The Sonic Tracers lights will come on when they are powered up.
- 5) With machine elevation control still in manual, press the reset button on both Sonic Tracers.
- 6) With the LH & RH manual switches and either a form or a tape measure for a reference, adjust the plow to the desired height for floor thickness.
- 7) Place rail in place or make wetpad at desired height on one side, and read the form or another wetpad on the other side.
- 8) Press Auto on the Sonic Tracers and they will flash a green blinking light.
- 9) Switch the CopperHead XD elevation control to Auto and the Sonic Tracers green light will become solid.
- 10) At this point, adjustments can be made on each Sonic Tracer by toggling the switch up or down on the CopperHead XD. Make adjustments as needed at this point and then press "Reset" on the Sonic Tracer.
- 11) Make a pass with the machine and check the thickness with a depth rod.
- 12) Make minor adjustments to Sonic Tracer, as instructed in step 10, to establish final grade.
- 13) When Sonic Tracers are tuned in to proper grade, press "Reset" to zero out the unit.
- 14) If using the screed rails, the pour may be set up for passes as long as desired by "leap frogging" the rails from front to back to establish a continuous rail.
- 15) By rotating the legs on the screed rails, they can be placed around obstacles or deck footing to reach the bottom of the subgrade or deck. Always be sure that the legs are sitting on the surface desired.



COPPERHEAD SONIC TRACER SYSTEM



SERVICE AND MAINTENANCE

OBSERVE SERVICE INTERVALS

Using the hour meter as a guide, perform all recommended services at hourly intervals indicated on the following pages. You should keep a service record.

Use the correct fuels and lubricants

SERVICE

☒ OIL CHANGE

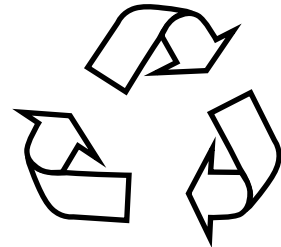
☒ FAN BELT

☒ HYD. FILTER

DISPOSE OF WASTE PROPERLY

Use leakproof containers when draining hazardous fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

DO NOT pour waste onto the ground, down a drain, or into any water source.

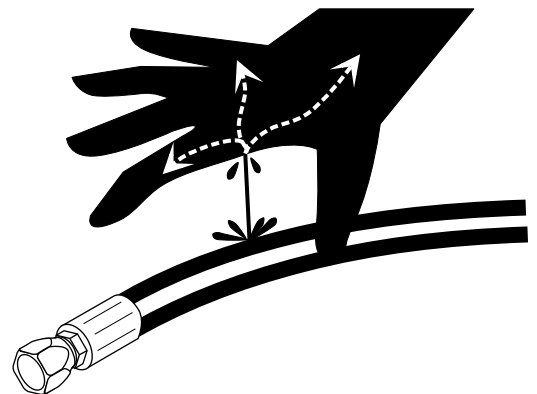


AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin and cause serious injury.

Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

IF AN ACCIDENT OCCURS, SEE A DOCTOR IMMEDIATELY. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

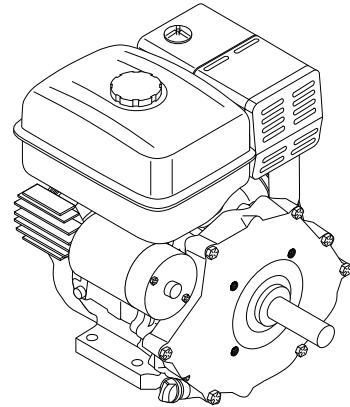


SERVICE AND MAINTENANCE

SHUT THE ENGINE OFF

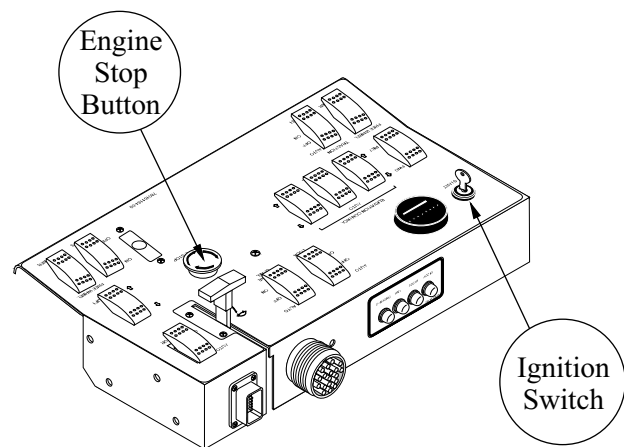
ALWAYS shut the Copperhead XD's engine OFF **BEFORE** attempting any repairs or working on any moving parts on or inside the machine, including any part of the hydraulic system.

NEVER work on any part of the hydraulic system or the engine when the machine is hot.



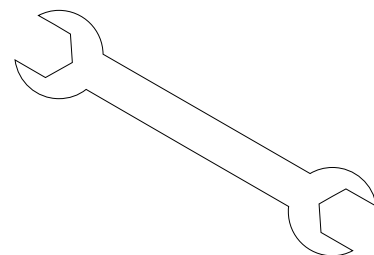
TURN THE ENGINE STOP SWITCH OFF

ALWAYS turn the Engine Stop Switch, and the Ignition Switch OFF when working on the electrical system.



USE PROPER TOOLS

ALWAYS service your Copperhead with the proper tools and be particularly careful when changing precision components.



COPPERHEAD XD 2.0 SCHEDULED LUBRICATION & MAINTENANCE

SERVICE ITEM Perform at every indicated month or operating hour interval, whichever comes first.	SERVICE INTERVAL IN MACHINE HOURS						PAGE REFERENCE	LUBRICANT
	EACH USE	EVERY month or 20 HRS.	EVERY 3 months or 50 HRS.	EVERY 6 months or 100 HRS.	EVERY year or 300 HRS.	EVERY 2000 HRS.		
Check engine oil level	✓						ENGINE MANUAL	EO
Change engine oil		✓		✓			ENGINE MANUAL	EO
Check air filter	✓						ENGINE MANUAL	
Clean air filter			✓				ENGINE MANUAL	
Replace air filter					✓		ENGINE MANUAL	
Clean sediment cup				✓			ENGINE MANUAL	
Clean-readjust spark plug				✓			ENGINE MANUAL	
Replace spark plug					✓		ENGINE MANUAL	
Check-adjust idle speed					✓		ENGINE MANUAL	
Check/readjust valve clearance					✓		ENGINE MANUAL	
Clean fuel tank and strainer					✓		ENGINE MANUAL	
Check fuel line	Every 2 years (Replace if necessary)						ENGINE MANUAL	
Check fuel level	✓						ENGINE MANUAL	
Inspect electrical wiring				✓				
Clean oil cooler core exterior			✓				C.3.1	
Check oil cooler hoses					✓		C.3.1	

DEFINITIONS:

EO - ENGINE CRANKCASE OIL
 HYDO - HYDRAULIC OIL
 MPGM - MULTIPURPOSE TYPE GREASE WITH MOLYBDENUM DISULFIDE
 OGL - OPEN GEAR LUBRICANT

COPPERHEAD XD 2.0 SCHEDULED LUBRICATION & MAINTENANCE

SERVICE ITEM Perform at every indicated month or operating hour interval, whichever comes first.	SERVICE INTERVAL IN MACHINE HOURS						PAGE REFERENCE	LUBRICANT
	EACH USE	EVERY month or 20 HRS.	EVERY 3 months or 50 HRS.	EVERY 6 months or 100 HRS.	EVERY year or 300 HRS.	EVERY 2000 HRS.		
Check hydraulic oil level	✓						C.3.1	HYDO
Change hyd. oil filter (return line)					✓		C.3.2	
Change hyd. oil in reservoir						✓	C.3.3	HYDO
Check hydraulic hoses					✓			
Check wheel lug nut tightness				✓				
Check Vibrator Gear Box Oil	✓						C.3.4	EO
Change Vibrator Gear Box Oil					✓		C.3.4	EO
Grease in drive motors		✓					C.1.4	MPGM

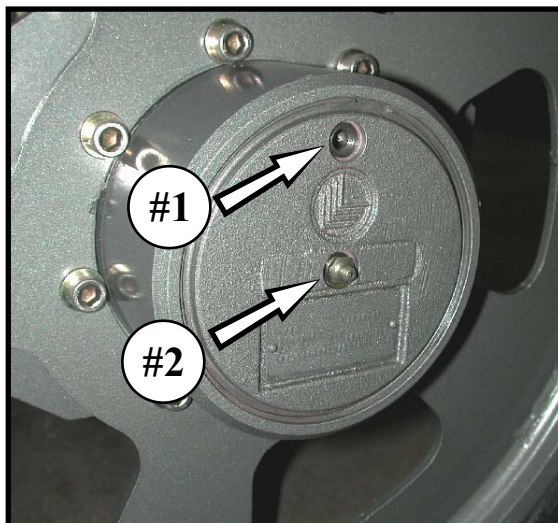
DEFINITIONS:

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 OGL - OPEN GEAR LUBRICANT

Instruction for filling CopperHead XD 2.0 drive motor with grease.

INSTALLATION INSTRUCTIONS:

- 1) Rotate drive hub so hole #1 is on top.
- 2) Remove plugs from hole #1 & #2 on the CopperHead XD 2.0 drive motors with a 3/16" allen wrench.
- 3) Install grease fitting in hole #2 in the middle of the drive motor.
- 4) Pump grease into grease fitting on the drive motor until it spills out of hole #1.
- 5) Reinstall top plug and drive machine around for approximately one minute.
- 6) Remove top plug and repeat step 4)
- NOTE: Approximately 1.5 tubes of grease will have been injected into each drive motor.
- 7) Install the plug back into the top fill hole (#1).
- 8) Always remove top plug in hole #1 before pumping grease. Check grease level once a month.



LUBRICANT SPECIFICATIONS

Lubricant abbreviations used are in accordance with SAE J754a. Oil classifications are in accordance with SAE J183.

ENGINE OILS: Use engine oils with an API classification of SF or SD. New machines are supplied with, and we recommend the use of, engine oil equivalent to SAE 10W30.

Refer to your engine manual for additional engine oil information and requirements.

HYDRAULIC OILS: (HYDO) Use hydraulic oils certified by supplier to have antiwear, antirust, antifoam and antioxidation additives for heavy duty use. New machines are equipped with, and we recommend the use of, hydraulic oil with a viscosity equivalent to ISO 32.

VISCOSITY	TEMPERATURE RANGE
ISO 32	Above 0 degrees F (-18 deg.C)
ISO 68	Above 22 degrees F (-5 deg. C)
ISO 100	Above 45 degrees F (7 deg.C)

LUBRICATING GREASE: (MPGM) Use grease which contains 3-5% molybdenum disulfide for all grease points.

CAPACITIES

APPROXIMATE FLUID CAPACITIES:

System	Capacity
Engine crankcase: Engine	1.3 qt. US quarts (1.2 L)
Hydraulic tank	3.0 US gallons (11.4 L)
Fuel tank	1.9 US gallons (7.0 L)



SERVICE INSTRUCTIONS

CLEANING THE OIL COOLER CORE EXTERIOR

If the air flow through the oil cooler becomes restricted the hydraulic oil may begin to operate at too high a temperature which will shorten the life of the hydraulic pump. Clean the oil cooler daily to prevent the buildup and hardening of concrete dust. If the oil cooler becomes blocked due to lack of cleaning it will eventually need to be replaced. Clean the radiator with compressed air or use a pressure washer before dusty material hardens to the radiator.

CHECKING OIL COOLER HOSES

Periodically check all hoses of the cooling system for leaks or deterioration. Replace any questionable-appearing hoses with new ones.

CHECKING HYDRAULIC OIL LEVEL

The hydraulic oil level is checked by looking at the transparent hydraulic tank. Compare the oil level to the "full" line located on the front of the hydraulic tank. Check the oil level with the machine parked on level ground, the oil at normal operating temperature. Add oil as required to maintain correct oil level.

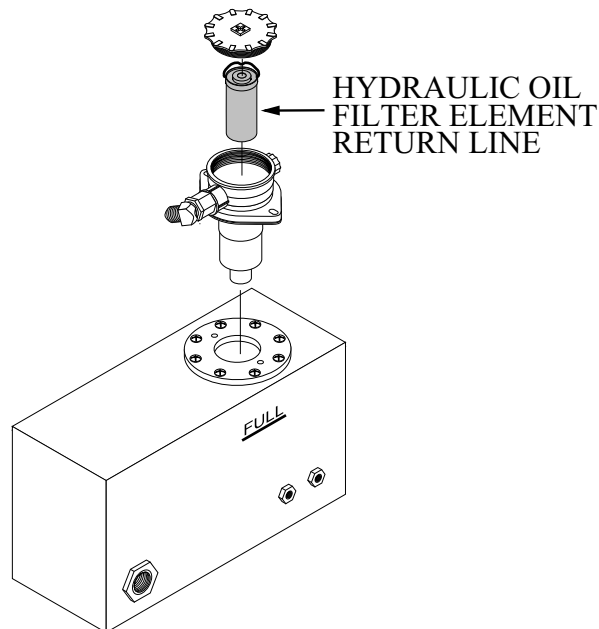
HYDRAULIC OIL FILTER ELEMENTS:

Change the hydraulic oil filter on the return line as follows:

With the machine turned off, remove the top of the filter housing and replace filter element. **Do not** allow any dirt and debris to enter the hydraulic tank.

Change the hydraulic oil filter on the pressure line as follows:

Unscrew the lower portion of the filter housing, and replace filter element. **Do not** allow any dirt and debris to enter the filter housing.



CHANGING HYDRAULIC OIL

Refer to figure on page C.3.1.

Periodically it will be necessary to change the hydraulic oil to prevent deterioration of the systems components. As oil ages with use the special chemical additives in the oil, which resist corrosion, break down and become less effective. Therefore it is important to periodically replace as much of the oil as possible with fresh oil. It is impractical to change all the oil in the system due to oil being trapped in the various components of the system.

To change hydraulic oil:

- 1) Pressure wash the machine. Pay special attention to cleaning the top of the hydraulic tank in the area of the hydraulic reservoir access covers. The top of the tank should be as clean as possible so that no dirt can fall into the tank when the oil filter assembly is removed.
- 2) Drain the oil from the hydraulic tank by opening the return port at the bottom of the tank. Drain the old oil into a large drain pan of capacity equal to or greater than the oil capacity of the reservoir (3 gallons /11.4 L).
- 3) Once all the oil has drained from the tank, it may be best to remove the oil filter assembly for an inspection and cleaning of the inside of the reservoir.
- 4) The hydraulic oil filter assembly is removed by removing the hex bolts in the base plate of the oil filter assembly.
- 5) The filter element is located under the cover of the oil filter assembly.
- 6) With the oil filter assembly removed, the interior of the hydraulic reservoir can be inspected and cleaned. After cleaning, replace the oil filter assembly with the sealing gasket in proper position.
- 7) Replace the fittings on the return port and refill the hydraulic tank to the correct level with new hydraulic oil.

CHECKING WHEEL LUG NUT TIGHTNESS

Periodically check the tightness of the wheel lug nuts.

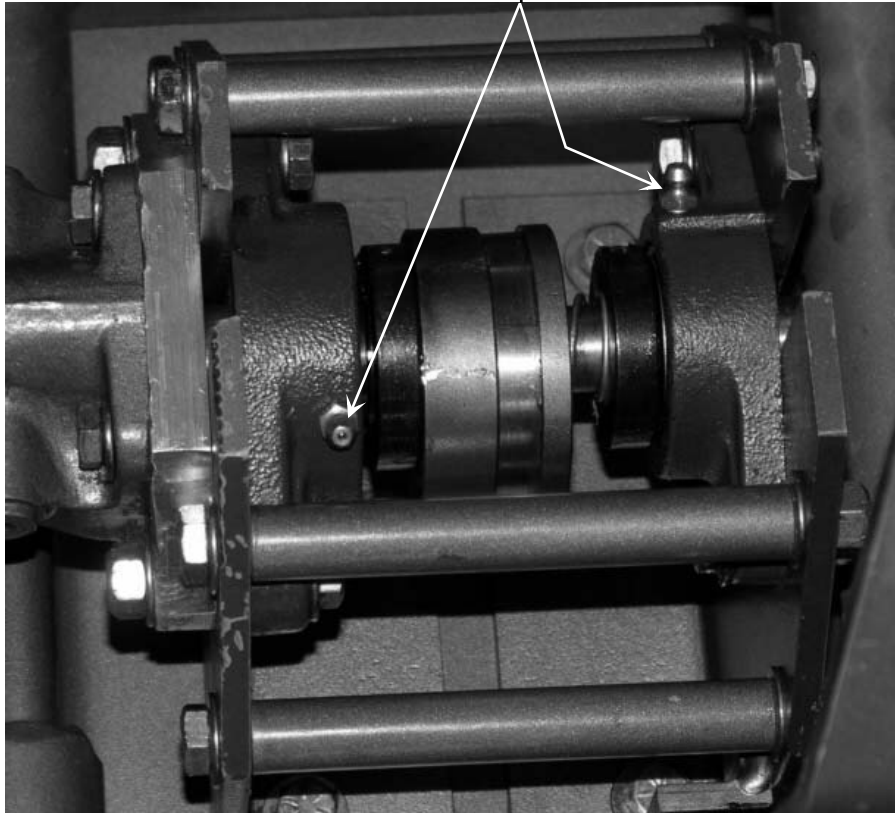


VIBRATOR GEAR BOX



CAUTION: DO NOT ATTEMPT TO LUBRICATE OR PERFORM ANY OTHER MAINTENANCE ON ANY FUNCTION WHILE IT IS IN OPERATION.

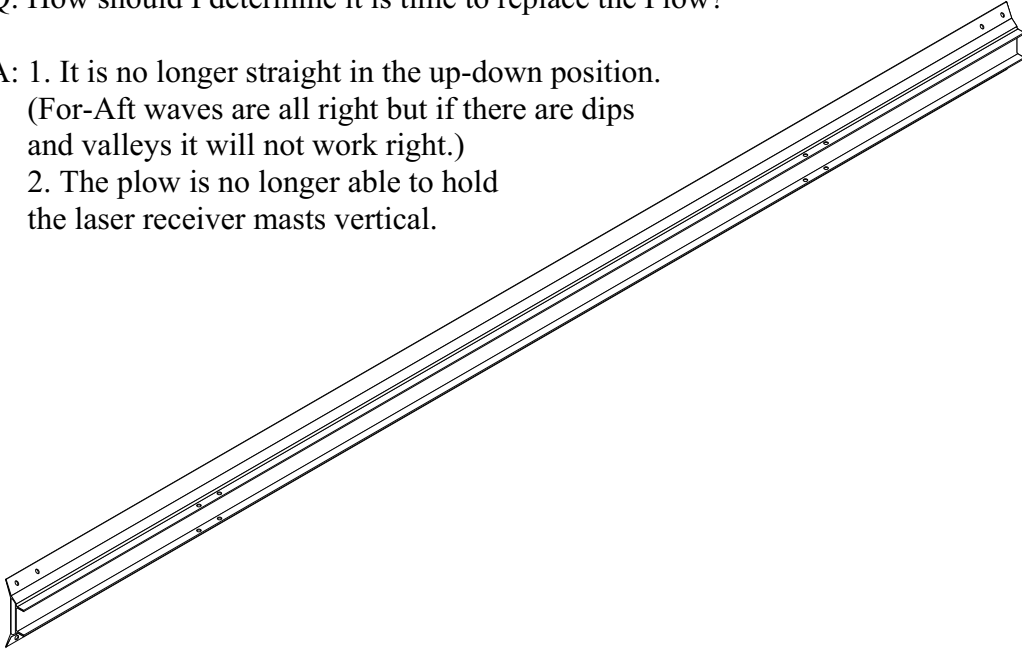
Grease bearings daily



PLOW AND VIBRATOR PLATE

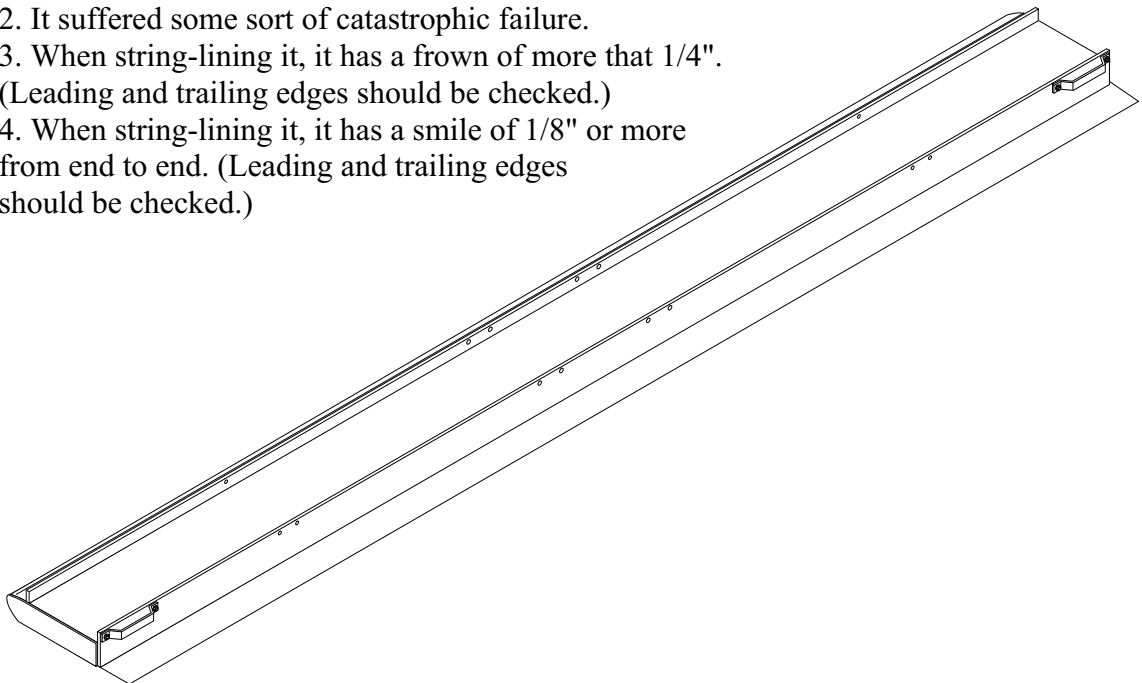
Q: How should I determine it is time to replace the Plow?

- A: 1. It is no longer straight in the up-down position.
(For-Aft waves are all right but if there are dips and valleys it will not work right.)
2. The plow is no longer able to hold the laser receiver masts vertical.



Q: How should I determine it is time to replace the Vibrator Plate?

- A: 1. The bottom plate is worn through.
2. It suffered some sort of catastrophic failure.
3. When string-lining it, it has a frown of more than 1/4".
(Leading and trailing edges should be checked.)
4. When string-lining it, it has a smile of 1/8" or more from end to end. (Leading and trailing edges should be checked.)



COPPERHEAD XD 2.0 OPERATING SPEEDS & PRESSURES

Engine at full 3600 RPM, the Hydraulic Oil at Operating Temperature 90-100 degree F

MANUAL HEAD LIFT	10 SECOND CYCLE (UP/DOWN) 2500 PSI MAX
AUTO HEAD LIFT (MACHINE LEVEL)	20 SECOND CYCLE (UP/DOWN) 2500 PSI MAX
VIBRATOR	FACTORY SETTING 4500 RPM's @ 950 PSI
PROPEL	FWD/REV LEVEL DRIVE 400-500 PSI
	SPEED 0 RPM to 75 RPM ON KICKSTAND WITH ONE WHEEL BLOCKED (WITH TRACTION ASSIST OFF)
LINEAR ACTUATORS	5-6 SEC'S FOR FULL STROKE (RABBIT MODE)
	7-8 SEC'S FOR FULL STROKE (TURTLE MODE)
COUNTER BALANCE SETTING	PROPEL 1 1/2 TURNS OUT
MAX SYSTEM PRESSURE	3000 PSI



RECOMMENDED TORQUE VALUES FOR BOLTS

Most bolts supplied on the Laser Screed are Grade 8.

Grade 8 bolts have 6 marks/lines on the heads

Grade 5 bolts have 3 marks/lines on the heads

THREAD SIZE	HEX SIZE (DISTANCE ACROSS FLATS (INCHES))	GRADE 8 DRY OR PLAIN	PLATED OR LUBRICATED *	GRADE 5 DRY OR PLAIN	PLATED OR LUBRICATED *
		FT LB (N-m)	FT LB (N-m)	FT LB (N-m)	FT LB (N-m)
1/4-20	7/16	12 (16)	9 (12)	8 (11)	6 (8)
5/16-18	1/2	25 (34)	20 (27)	17 (23)	13 (18)
3/8-16	9/16	45 (61)	35 (47)	30 (41)	23 (31)
1/2-13	3/4	110 (149)	80 (108)	75 (102)	55 (75)
5/8-11	15/16	220 (298)	170 (230)	150 (203)	110 (149)
3/4-10	1 1/8	380 (515)	280 (379)	260 (352)	200 (271)
1-8	1 1/2	900 (1220)	680 (921)	640 (867)	480 (650)

* The values for plated or lubricated bolts should also be used if the bolt is coated with a threadlocking compound such as loc-tite or if a hardened steel washer is used under the head of the bolt.

Refer to your engine operation manual for torque values that apply to the metric nuts and bolts furnished on the engine.



RECOMMENDED TORQUE VALUES FOR PLATED LOCKNUTS

Applicable when they are used with comparable hex head bolts with hardened flatwashers under the nut and bolt head and torque is applied to the nut only.

Most locknuts supplied on the Laser Screed are Grade 8.
Grade 8 nuts have 6 identifying marks on them.
Grade 5 nuts have 3 identifying marks on them.

THREAD SIZE	HEX SIZE (DISTANCE ACROSS FLATS (INCHES))	GRADE 8 FT LB (N-m)	GRADE 5 FT LB (N-m)
1/4-20	7/16	8 (11)	6 (8)
5/16-18	1/2	13 (18)	11 (15)
3/8-16	9/16	24 (33)	17 (23)
1/2-13	3/4	55 (75)	42 (57)
5/8-11	15/16	100 (136)	82 (111)
3/4-10	1 1/8	165 (224)	137 (186)
1-8	1 1/2	409 (554)	332 (450)



RECOMMENDED TOOLS & SPARE PARTS

RECOMMENDED TOOLS TO KEEP WITH EACH COPPERHEAD XD 2.0 MACHINE

- 1) Set of standard open/box end wrenches thru 1"
- 2) Standard socket set to 1"
- 3) Pressure washer
- 4) Pressure can to spray on form release oil
- 5) 8mm Hex drive socket with 6" extension
- 6) Allen wrench sets (in. & metric)

GENERAL PARTS & SUPPLIES

- | | |
|---|--------------------------------|
| 1) Black electrical tape | 6) Engine oil |
| 2) Nylon tie wraps | 7) Form release oil |
| 3) Carburetor Cleaner for cleaning parts | 8) Spare transmitter batteries |
| 4) Lubricant such as WD-40 | |
| 5) Two JIC caps and plugs for each hydraulic hose size. | |

SPECIFIC PARTS

We recommend that the parts listed on the following pages be kept on hand with each Copperhead XD 2.0 machine.



RECOMMENDED SPARE PARTS TO KEEP WITH EACH COPPERHEAD XD 2.0 MACHINE

PART NUMBER	DESCRIPTION	QUANTITY	REFERENCE PAGE IN PARTS BOOK
750701073-00	MP Filtri Return Filter - Replacement, MF0203A10HB	1	20.20
740801331-00	Cotter Pin, .125 Wire, Double Loop*	2	40.20, 40.30
720501657-01	Pin - Head to Turnbuckle *	1	40.20, 40.30
720501656-00	Pin - Head to Lift Arm *	1	40.20, 40.30
740801208-00	Isolators, Vibrator *	1	40.20, 40.30
20065-0006	3/8" ORB plug	1	Use where needed
740801219-00	O-Ring 3/32" Dia	1	Use where needed
711601034-00	Rocker Switch, VJD1 DPDT Carling, ON-OFF-ON *	1	20.30
711601035-00	Rocker Switch, VLD1 DPDT Carling (ON)-OFF-(ON) *	1	20.30
710601074-00	Spare GCR4 Noncoiled Cord 7 ft. *	1	50.30
750701055-00	5000 psi gauge assy, FSC 201111203-62	1	Use where needed
20509	Vibrator Motor Shaft Seal *	1	40.10
	Robin Fuel Filter, 13 HP	1	Robin Engine
740501011-C0	Element, Air Filter, Robin 13.5 HP	1	Robin Engine
780301038-00	Robin, Shop Manual	1	Robin Engine
710601080-00	Cord, Act to GCRbox *	1	50.30
750201031-00	Test Port Fitting for gauge assembly	2	Use where needed
20042-0606	Hyd Ftg 90 Degree Elbow, 6 M Jic to 6 M Orb	2	Use where needed
741101007-00	8mm Hex Bit, T-Handle*	1	20.10 - Lug Nuts
750701078-00	Gauge - Air Pressure 0-100psi, Digital *	1	Use where needed
20271-10	Fuse - Ops Box, 10 amp	1	20.30
740801335-00	Spare Key, Robin Engine	1	Use where needed

* Included in Spare Parts kit.



COPPERHEAD XD 2.0 HYDRAULIC OPERATION

See fig. (D.1.2) and hydraulic diagram for items referenced below.

PUMP

This is a load sensing pump that will provide the required flow to run the functions of the machine.

HYDRAULIC TANK

This is the reservoir from which the pumps draw their hydraulic oil supply. The oil is filtered as it returns to the tank.

WHEEL MOTORS

Two separate hydraulic motors. Each drive one of the machine's two wheels.

VIBRATOR MOTOR

This motor turns two eccentric weights inside the vibrator gear box which provides vibration to the vibrator shoe.

LIFT CYLINDER

The cylinder lifts and lowers the screed head.

SIDE LOCK CYLINDER

This cylinder allows the upper and lower frames of the machine to be locked together.

PROPEL COUNTERBALANCE BYPASS VALVE/FREE WHEEL

When the engine is turned off, hydraulic pressure through the counterbalance valve will make it difficult to move the machine around. In that case, this bypass valve can be opened, thereby releasing pressure in the drive system and allowing the wheels to turn more easily. There are (2) Propel Counterbalance Bypass valves, one for the left wheel and the other for the right. They are activated by the Free Wheel switches on the dash. If electrical power is disabled, the valves are activated via the manual overrides on top of the cartridges.

VIBRATOR SPEED ADJUSTMENT VALVE

This valve adjusts the speed of the vibrator to match the slump of the concrete being leveled.

Copperhead XD Vibrator Motor

1 turn in* \approx 3900 rpm

3/4 turn in* \approx 4500 rpm - *Factory Setting*

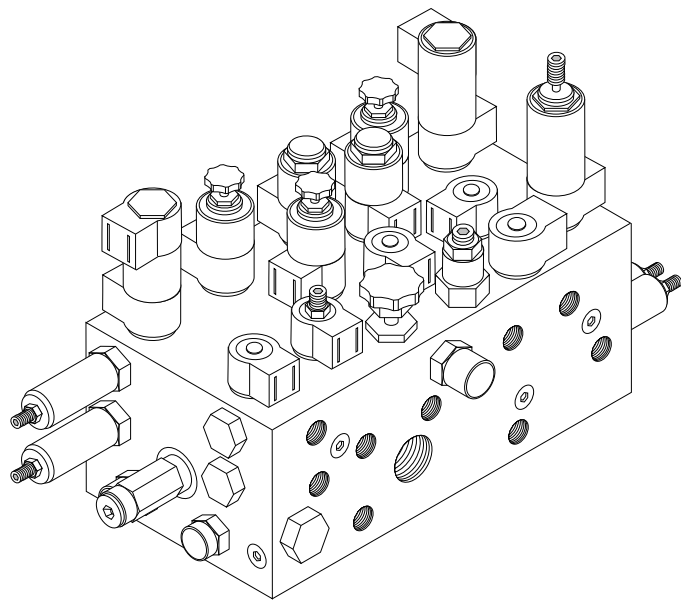
5/8 turn in* \approx 5100 rpm

1/2 turn in* \approx 5500 rpm

Recommended maximum speed of 5500 rpm, which is \approx 1/2 turn in*.

* *Turn in Clockwise from the top.*



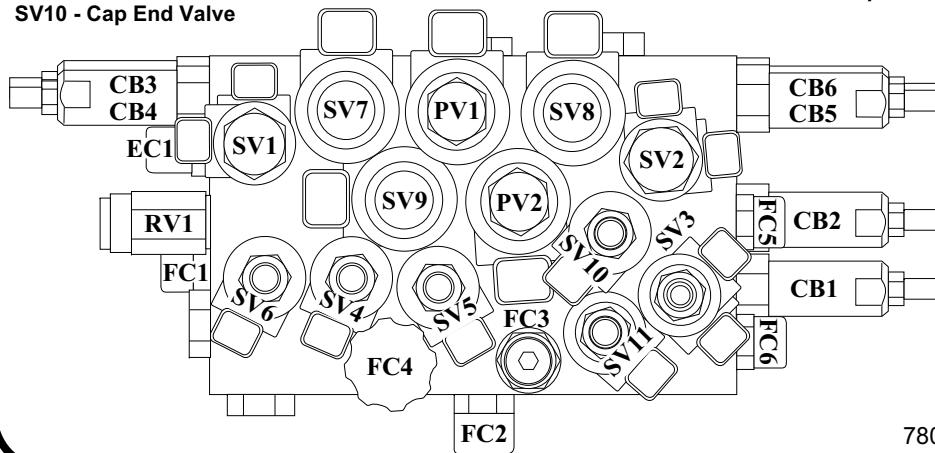


HYDRAULIC MANIFOLD

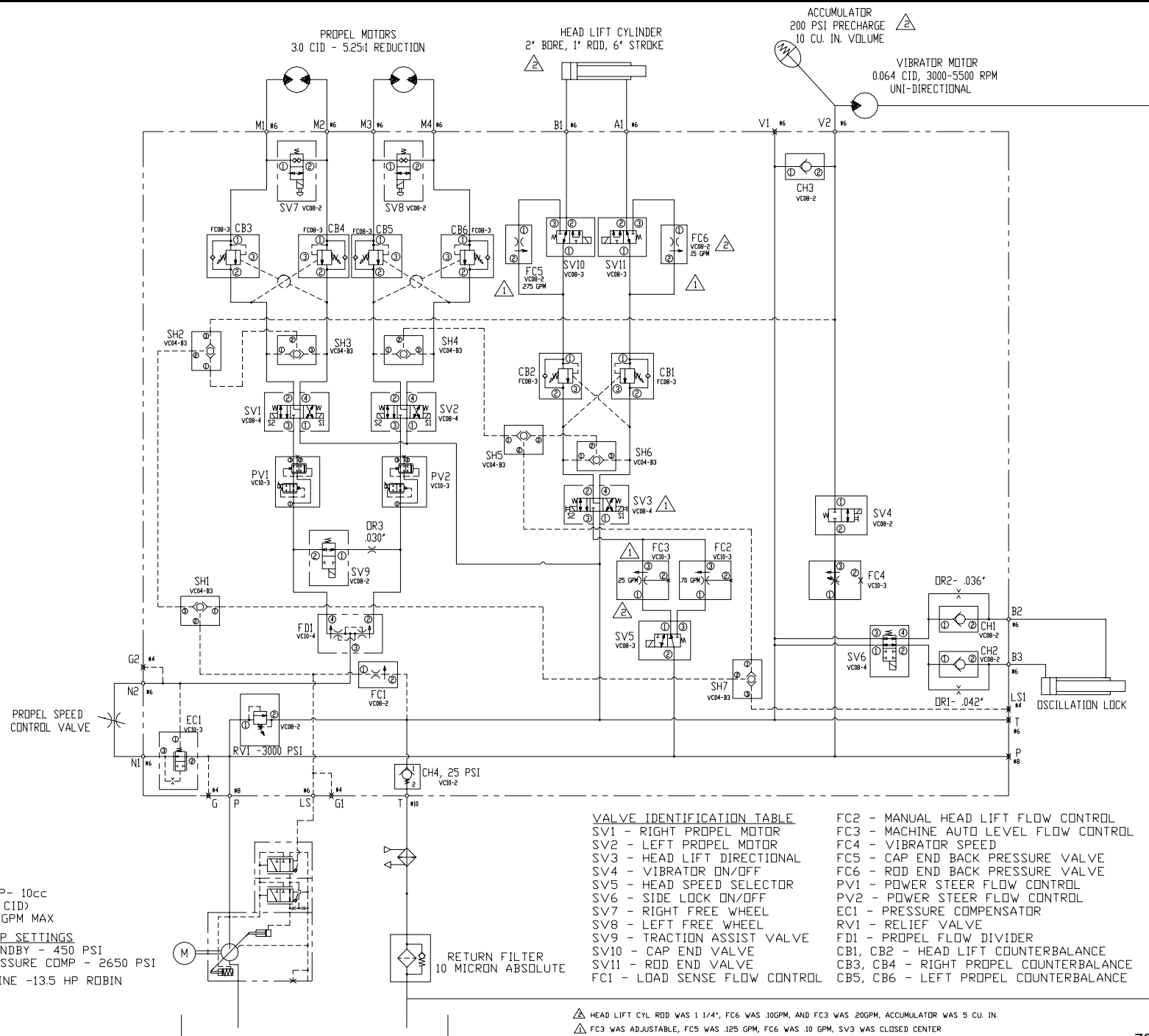
SV1 - Right Propel Motor
SV2 - Left Propel Motor
SV3 - Head Lift Direction
SV4 - Vibrator On/Off
SV5 - Head Speed Selector
SV6 - Side Lock On/Off
SV7 - Right Free Wheel
SV8 - Left Free Wheel
SV9 - Traction Assist Valve
SV10 - Cap End Valve

SV11 - Rod End Valve
FC1 - Load Sense Flow Control
FC2 - Manual Head Lift Flow Control
FC3 - Machine Auto Level Flow Control
FC4 - Vibrator Speed
FC5 - Cap End Back Pressure Valve
FC6 - Rod End Back Pressure Valve
PV1 - Power Steer Flow Control
PV2 - Power Steer Flow Control

EC1 - Pressure Compensator
RV1 - Relief Valve
FD1 - Propel Flow Divider
CB1 - Head Lift Counterbalance
CB2 - Head Lift Counterbalance
CB3 - Right Propel Counterbalance
CB4 - Right Propel Counterbalance
CB5 - Left Propel Counterbalance
CB6 - Left Propel Counterbalance



780101194-00



COPPERHEAD XD 2.0 HYDRAULIC SCHEMATIC

780901002-02

TROUBLESHOOTING HYDRAULIC SYSTEM PROBLEMS

The most common problems encountered with the hydraulic system are caused by dirt and debris that get into the system. IT IS VERY IMPORTANT TO KEEP THE HYDRAULIC SYSTEM CLEAN. Following these simple maintenance practices can help prevent unnecessary down-time:

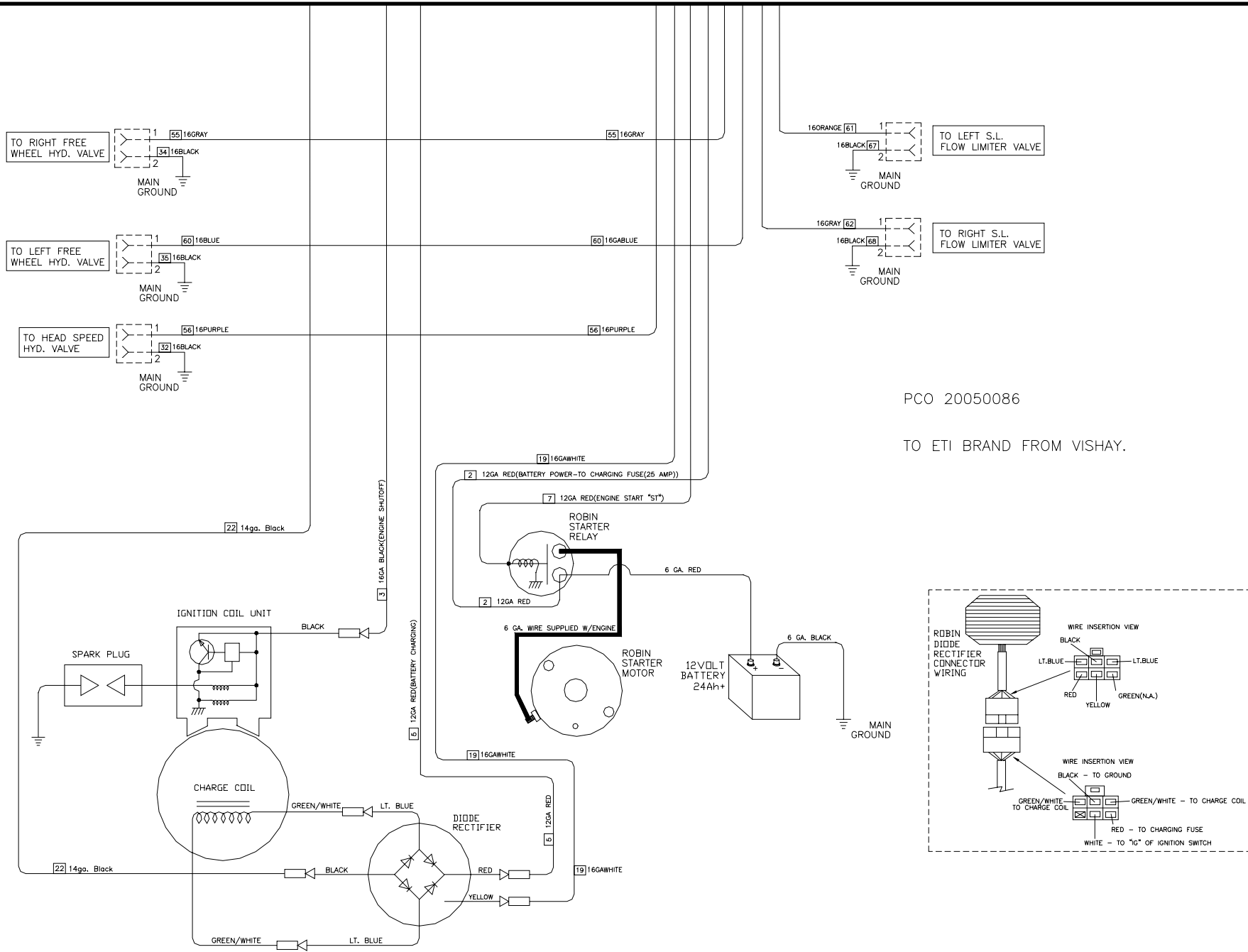
- 1) Replace the hydraulic system filter element as specified in the Service section of this manual with the proper replacement element.
- 2) If the hydraulic system has to be worked on, such as to change a failed hose or other component of the system, take special care to keep dirt out of the system by capping and plugging all broken connections, preferably with steel JIC caps and plugs. Before disconnecting a hose, clean the hose end area thoroughly (a toothbrush works well).
- 3) Clean new hose assemblies thoroughly before installing them; blowing compressed air through them works well. Once they are cleaned, plug the ends of new hose assemblies until they are actually installed.
- 4) Be sure that any oil added to the system is clean. Ideally, any oil added to the system should be pumped through a filter before it is poured into the hydraulic tank. Be sure any funnels or containers that come into contact with the fluid are thoroughly cleaned before use.

GENERAL INFORMATION

Typically, hydraulic system problems caused by dirt can be recognized as follows: A function fails to operate in one or both directions. In this case, the problem is most likely due to dirt affecting the load sensing circuit of the function, or else the actuator (cylinder or motor) is allowing the oil to leak by. If, after removing and plugging the lines at the actuator, full system pressure builds up when you shift that function's control valve, then the problem probably lies within the actuator. If, after removing and plugging the lines at the actuator, full system pressure still cannot be obtained, then dirt affecting the load sensing system is probably the cause. The most likely place for this to occur is at the load sense check ball located in each hydraulic manifold.

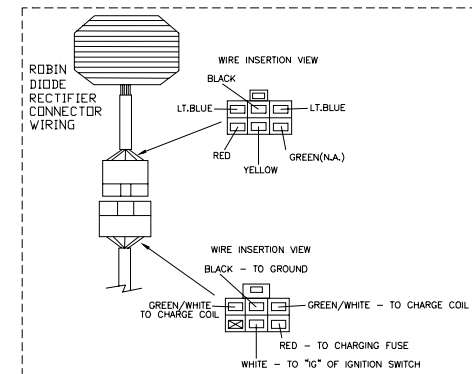






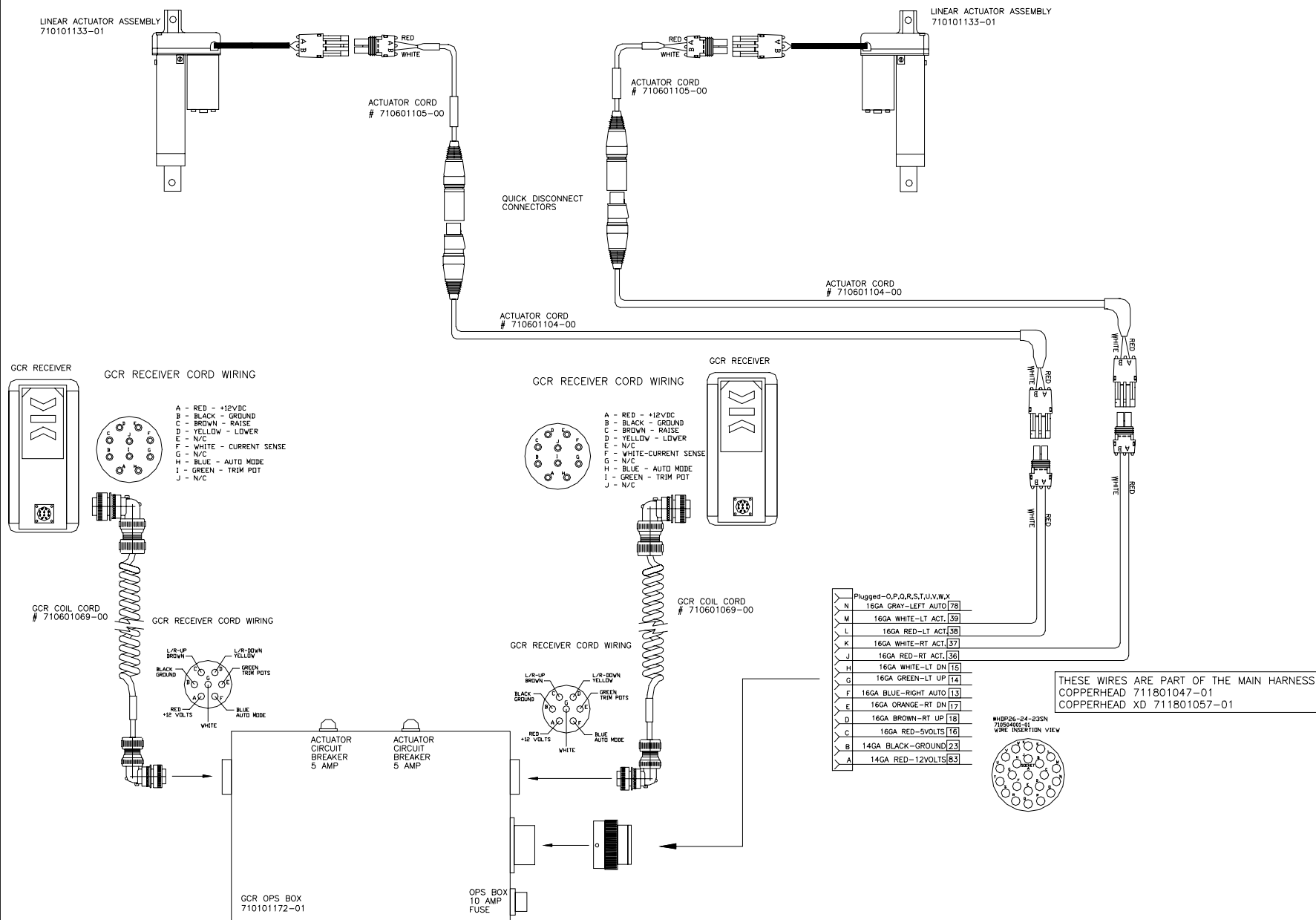
PCO 20050086

TO ETI BRAND FROM VISHAY.



COPEHEAD XD 2.0 WIRING DIAGRAM





COPPERHEAD XD 2.0 WIRING DIAGRAM

TROUBLESHOOTING ELECTRICAL SYSTEM PROBLEMS

SPECIFIC PROBLEMS AND SOLUTIONS

PROBLEM: Electrical component on machine is not working.

POSSIBLE CAUSE: Loose connection on machine (such as ground cable), broken wire, or broken connection.

ACTION: Use a volt meter to check the amount of voltage a component is getting, it should be getting 12 volts. If not, check that circuit for any of the possible causes listed. **Disconnect the battery** before attempting to correct the problem.

PROBLEM: Linear Actuators not working.

POSSIBLE CAUSE: Circuit breakers on OPS Box have "popped".

ACTION: Wait 1 minute for the circuit breaker to cool down before resetting. Push to reset circuit breakers on OPS Box. **NOTE:** If circuit breaker continues to "pop" then search for a short in the Linear Actuator wiring.

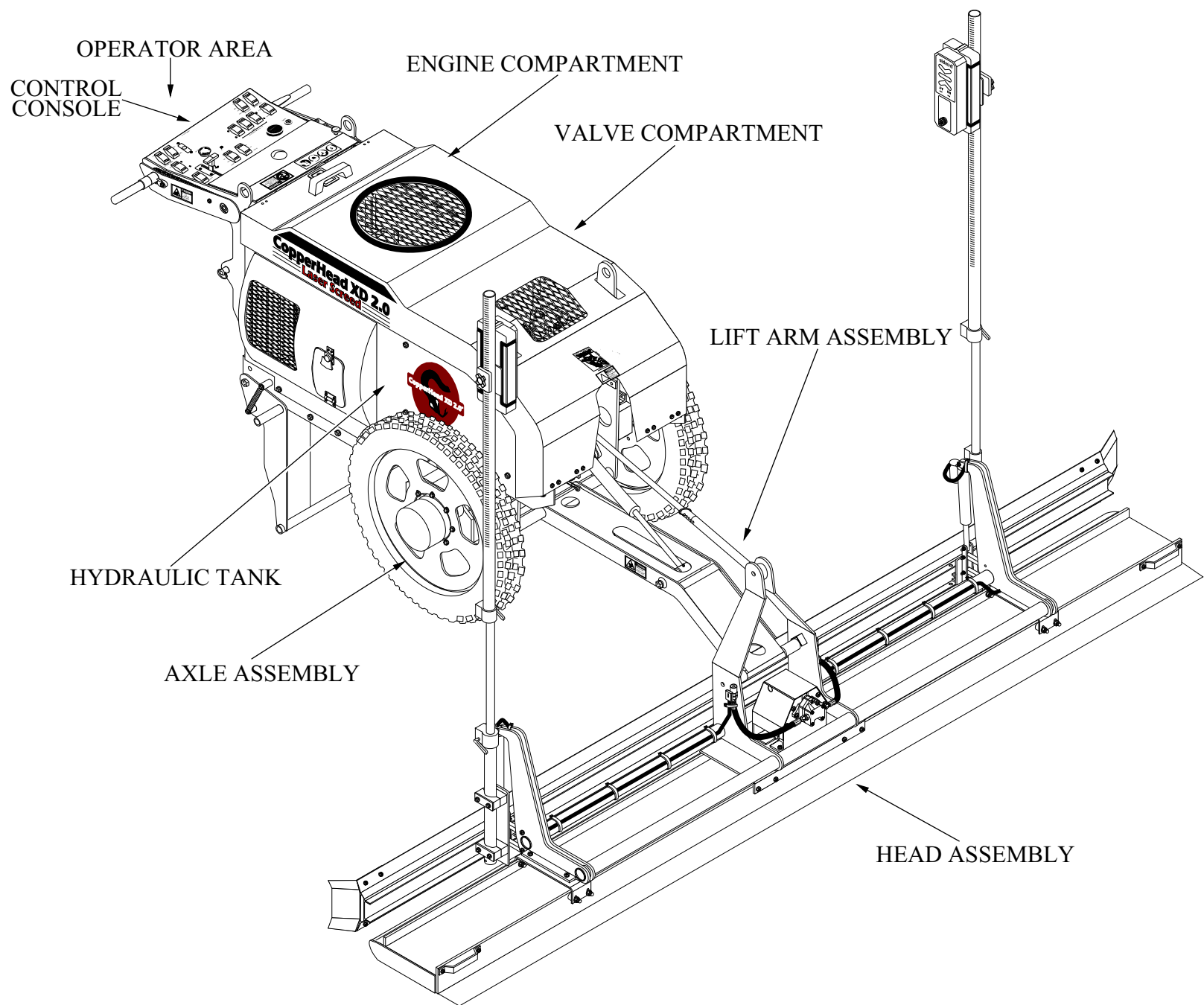


COPPERHEAD XD 2.0 MACHINE LAYOUT INDEX

PAGE	DESCRIPTION
10.10	COPPERHEAD XD 2.0 MAJOR COMPONENTS



COPPERHEAD XD 2.0 MAJOR COMPONENTS

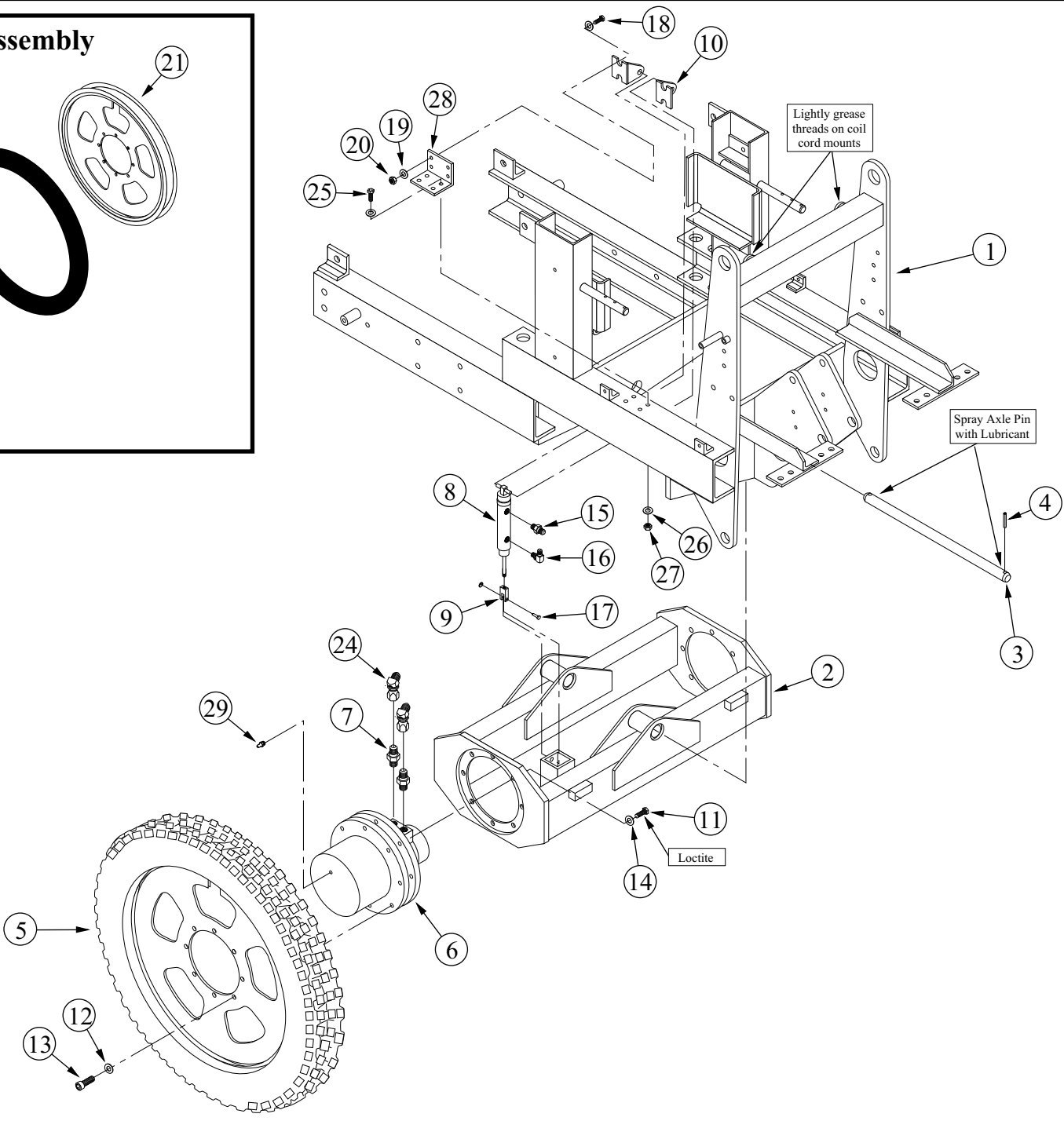
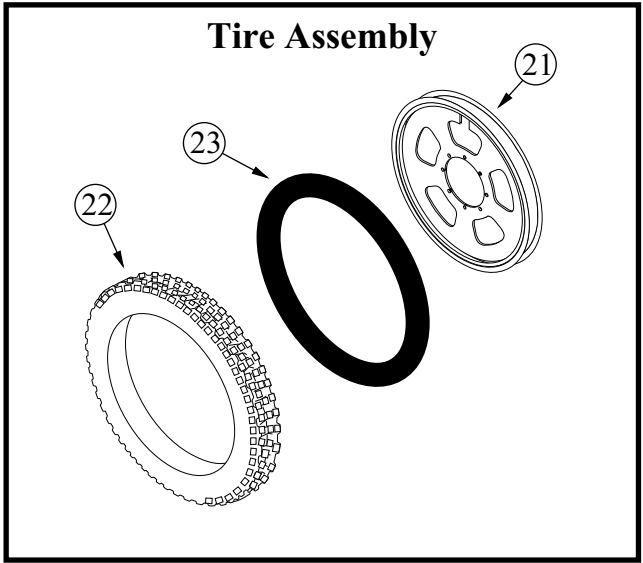


COPPERHEAD XD 2.0 FRAME INDEX

PAGE	DESCRIPTION
20.10	AXLE ASSEMBLY
20.20	ENGINE & HYDRAULIC TANK ASSEMBLY
20.30	HANDLE ASSEMBLY
20.35	CONSOLE ASSEMBLY
20.40	LIFT ARM ASSEMBLY



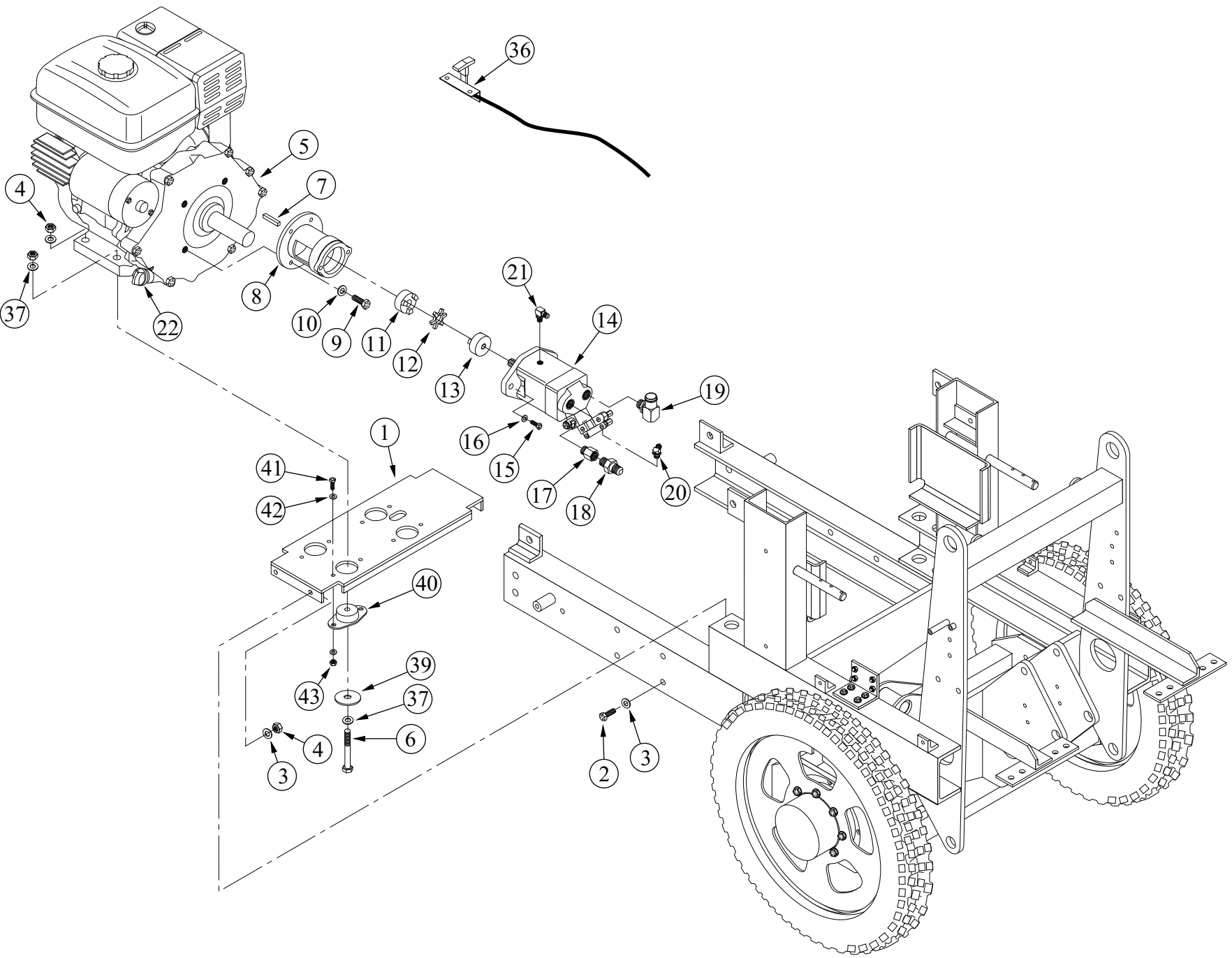
CopperHead XD 2.0 AXLE ASSEMBLY



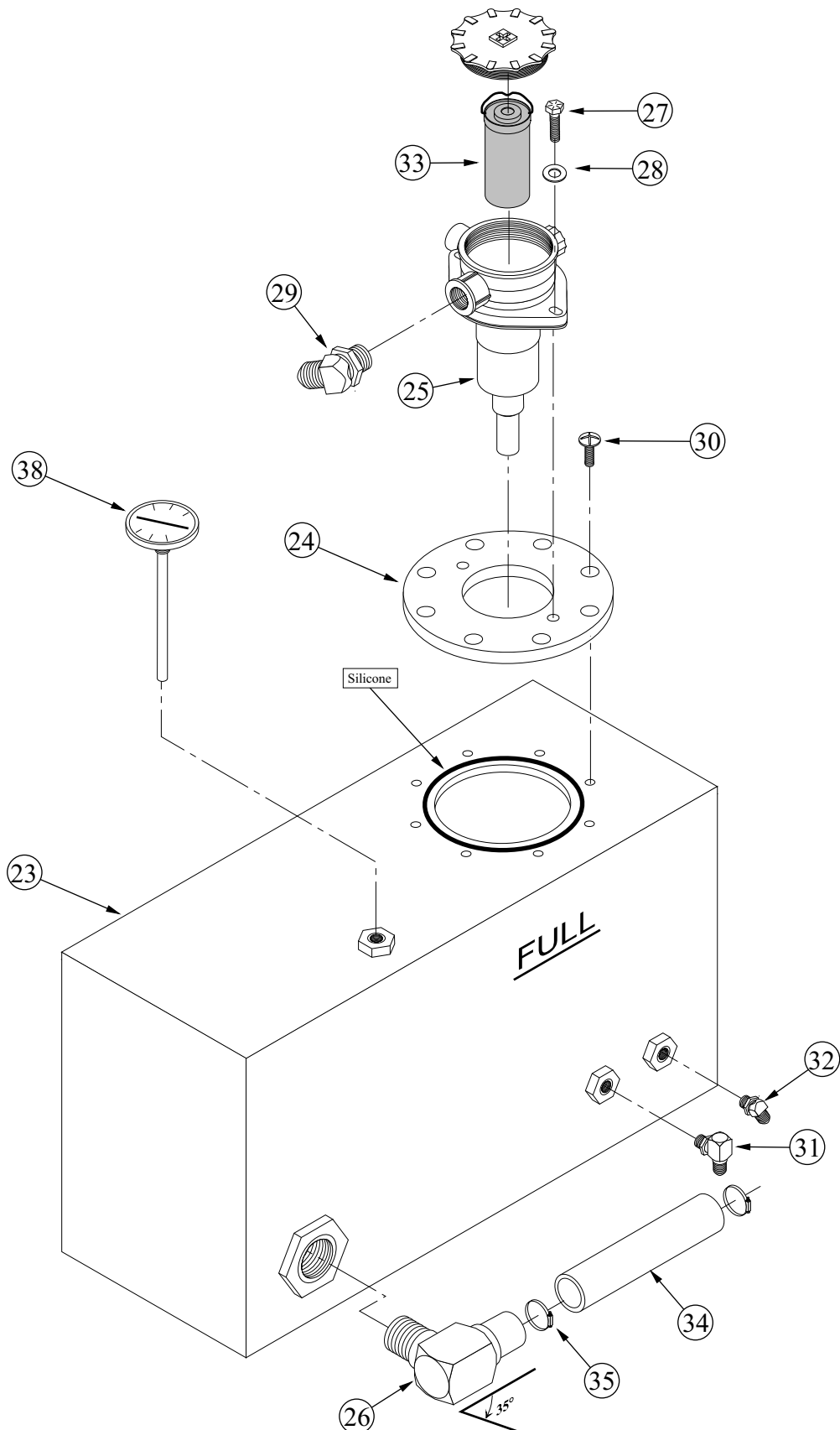
CopperHead XD 2.0 AXLE ASSEMBLY

ITEM	DESCRIPTION	PART No.	QTY
1	Frame Weldment	720601749-01	1
2	Axle Weldment	720601474-02	1
3	Pin, Axle Pivot	720501959-00	1
4	Spring Pin, 1/4" x 1 1/2" Stainless	740408004-00	2
5	Wheel/Tire Assembly Motorcycle, XD, 21"	700801016-01	2
6	Hyd Motor, Bonfiglioli Gearbox	750801034-00	2
7	Fitting, #6 BSPP-#6 JIC, Straight w/ O-Ring	750201042-00	4
8	Cylinder, Hyd. 1.125" x 3", Side Lock	750101026-00	1
9	Mount, Clevis, Cylinder	750401042-00	1
10	Mount, Pivot, Cylinder	750401041-00	1
11	M10X1.5X20MM DIN 933 HXHD Zinc	20438-020	14
12	3/8 Flat Washer Sae Hard Zinc	20402-038	14
13	Bolt, M10 - 1.5 x 20mm Long, Internal Socket Hd	740407011-00	16
14	3/8 Flat Washer Sae Hard Zinc	20402-038	16
15	Hyd Ftg St, 4 M Jic to 2 M Npt	20032-0402	1
16	Hyd Ftg 90 Deg Elbow, 4 M Jic to 2 M Npt	20044-0402	1
17	Clevis Package included w/clevis package	*	2
18	1/4-20 x 3/4 Hx Hd Gr8 Cs Zinc	20410-0075	4
19	1/4 Flat Washer Sae Hard Zinc	20402-025	8
20	1/4-20 Toplock Nut Gr. C. C&W	20401-025	4
21	Weldment, 21" Motorcycle Wheel	720601478-01	2
22	Tire, 80/100/21	700801011-00	2
23	Tube, 80/100/21	700801010-00	2
24	Hyd Ftg 90 Deg Swivel, 6 M Jic To 6 F Jic	20045-0606	4
25	5/16-18 X 1-1/4 Hx Hd Gr8 Cs Z	20411-0125	4
26	5/16 Flat Washer Sae Hard Zinc	20402-031	8
27	5/16-18 Toplock Nut Gr.C C&W	20401-031	4
28	Angle - side lock mount	720502917-00	1
29	Fitting, Grease M10x1	740801357-00	2

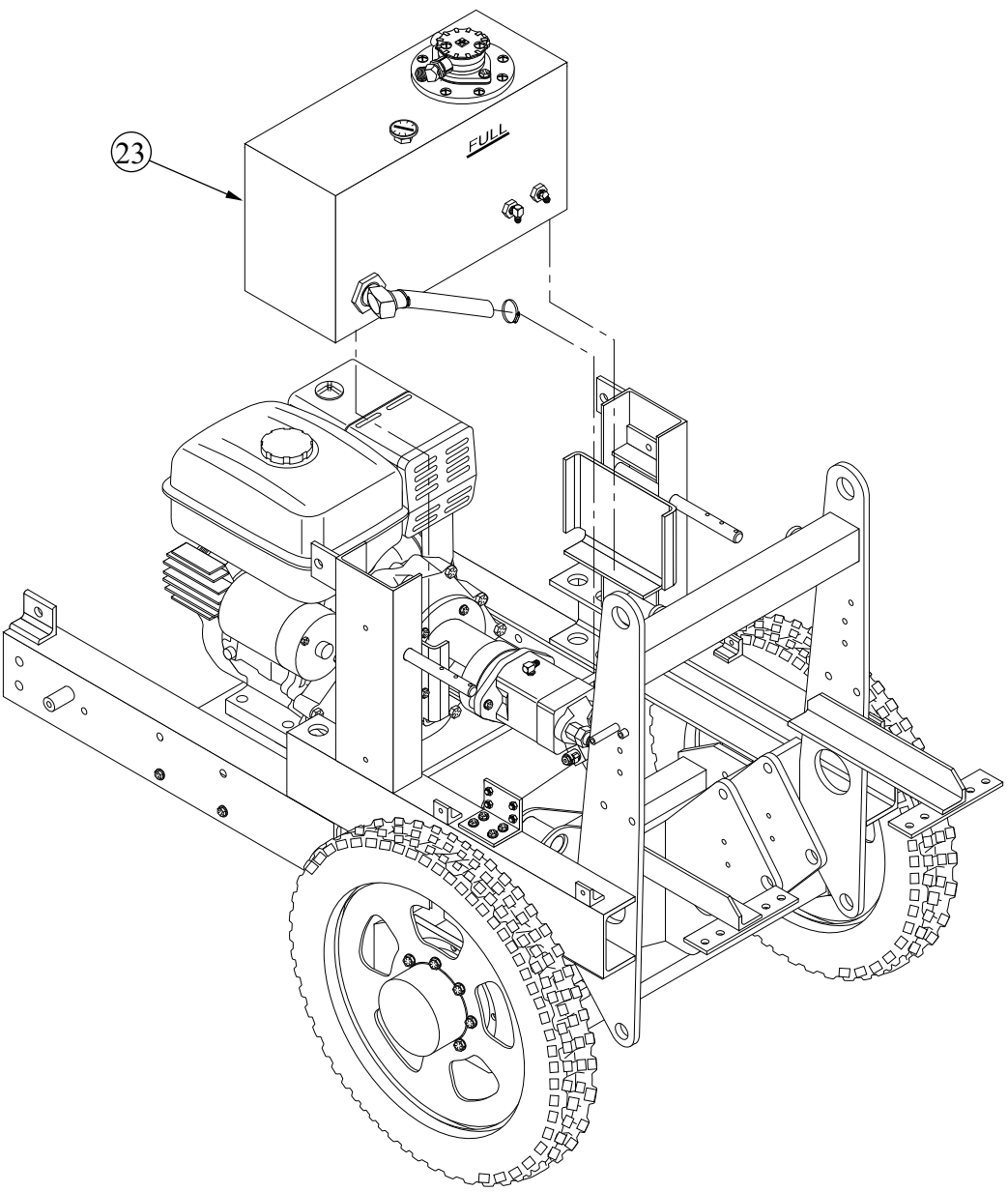
CopperHead XD 2.0 ENGINE & HYDRAULIC TANK ASSEMBLY



COPPERHEAD XD ENGINE & HYDRAULIC TANK ASSEMBLY



CopperHead XD 2.0 ENGINE & HYDRAULIC TANK ASSEMBLY



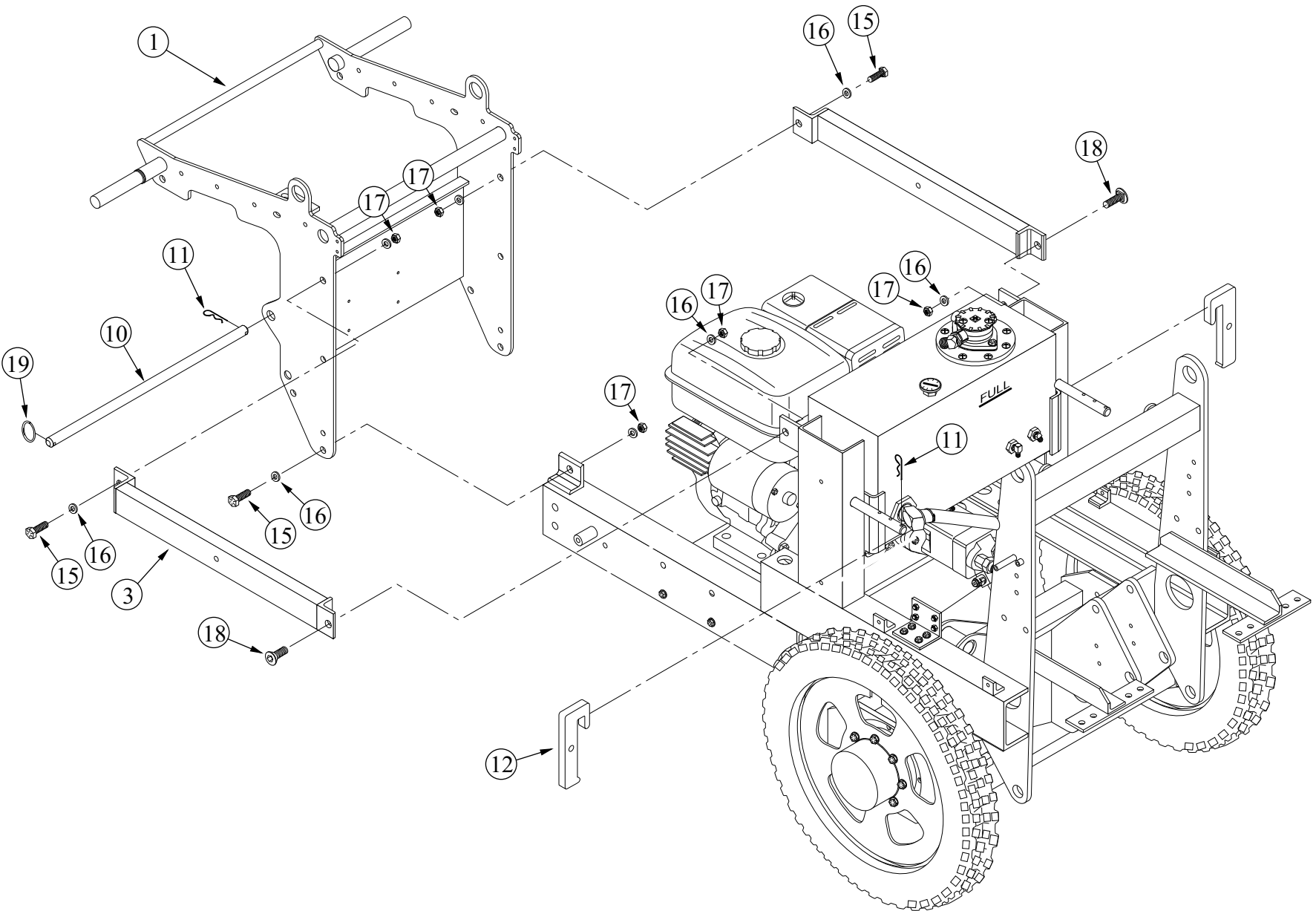
CopperHead XD 2.0 ENGINE & HYDRAULIC TANK ASSEMBLY

ITEM	DESCRIPTION	PART No.	QTY
1	Plate, Engine Mount	720503102-00	1
2	3/8-16 X 1" Hx Hd Gr8 Cs Zinc	20412-0100	4
3	3/8 Flat Washer Sae Hard Zinc	20402-038	8
4	3/8-16 Toplock Nut Gr.C C&W	20401-038	8
5	Engine, Robin 13 Hp, EH41	770401013-00	1
6	3/8-16 x 3 Hx Hd Gr8 Cs Zc	20412-0300	4
7	Keystock, 1/4" x 1-1/4" Copperhead	740801321-00	1
8	Pump Mount Casting	720502539-00	1
9	3/8-16 x 1-1/4 Hx Hd Gr8 Cs Zinc	20412-0125	4
10	3/8 Flat Washer Sae Hard Zinc	20402-038	4
11	Coupling, Engine Half, Guardian, Copperhead	740801286-00	1
12	Coupling, Spider, Guardian, Copperhead	740801280-00	1
13	Coupling, Pump Half, Guardian, Copperhead	740801308-00	1
14	Rexroth Implement Pump	750901005-00	1
15	3/8-16 X 1-1/4 Hx Hd Gr8 Cs Zc	20412-0125	2
16	3/8 Flat Washer Sae Hard Zinc	20402-038	2
17	Hyd Ftg Bushing, 12 M Orb to 8 F Orb	20061-1208	1
18	Hyd Ftg St, 8 M Jic to 8 M Orb	20030-0808	1
19	Hyd. Ftg 90 Degree 16 Beaded 10 12 Orb	750201034-00	1
20	Hyd Ftg 45 Deg Elbow, 4 M Jic to 4 M Orb	20040-0404	1
21	Hyd Ftg 90 Deg Elbow, 6 M Jic to M Orb	20042-0606	1
22	Motor Oil, 10-30, API SF of SG, SDS-DP	730201002-00	1.27 qt
23	Plastic Hydraulic Tank Assy	750701065-02	1
24	Plate - Return Filter Mount	720502189-00	1
25	Return Filter, MP Filtri MPT0213CAG8A10HBT	750701072-00	1
26	Fitting -16 Orb Male - 1" Tube, 90 Deg	750201043-00	1
27	3/8-16 X 3/4 Hx Hd Gr8 Cs Zinc	20412-0075	2
28	3/8 Flat Washer Sae Hard Zinc	20402-038	2
29	Hyd Ftg 45 Degree Elbow 8 M JIC to 8 M ORB	20040-0808	1

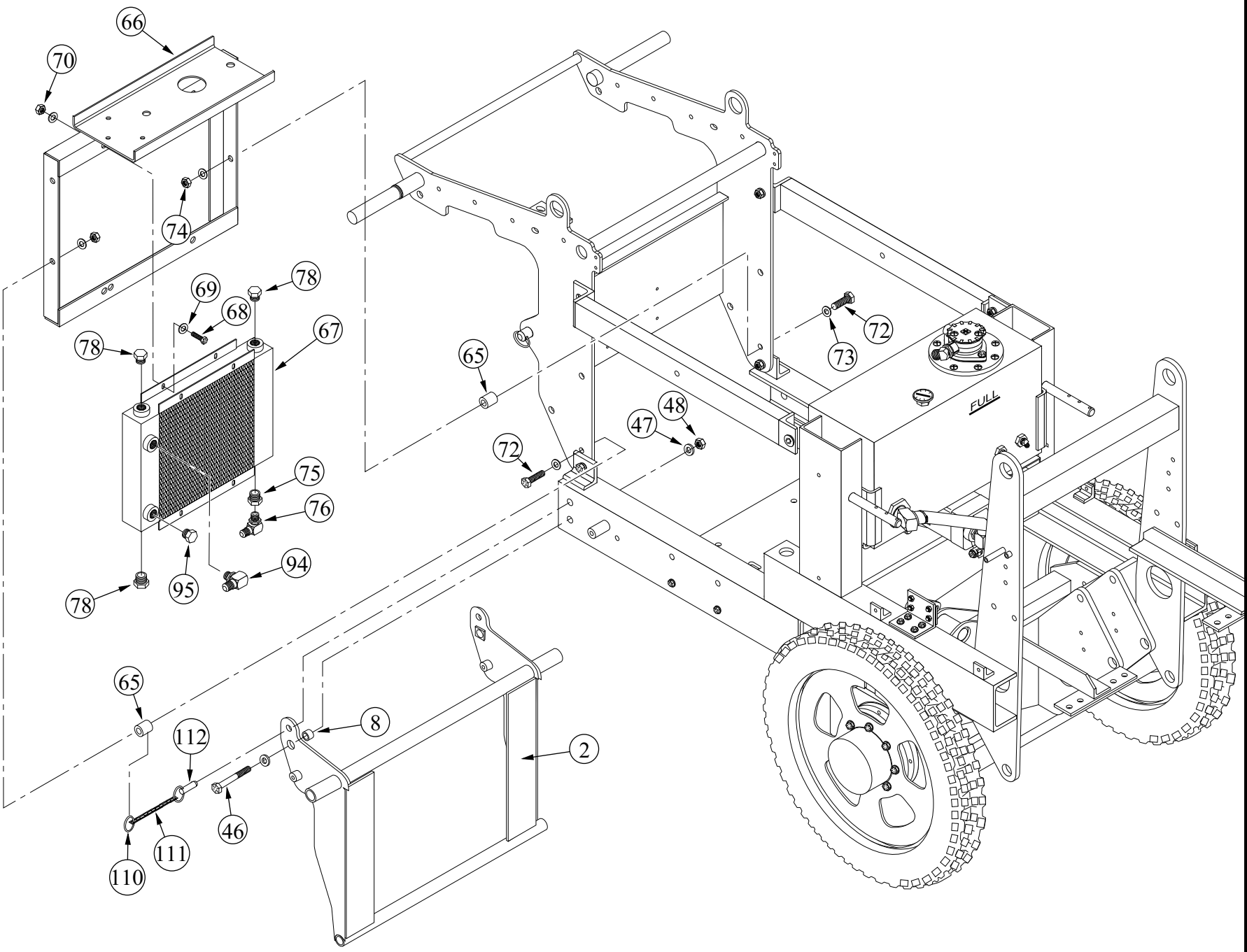
CopperHead XD ENGINE & HYDRAULIC TANK ASSEMBLY

ITEM	DESCRIPTION	PART No.	QTY
30	Screw, 1/4-20 x 3/4 Flat Head, Phillips, Znk	740406028-00	8
31	Hyd Ftg 90 Deg Elbow, 6 M Jic To 6 M Orb	20042-0606	1
32	Hyd Ftg 45 Deg Elbow, 6 M Jic To 6 M Orb	20040-0606	1
33	Filter Element, Mp Filtri, Mf0203a10hb	750701073-00	1
34	Hose, Intake, 1" ID 5.75" Long	750501032-00	1
35	Hose Clamp, 13/16 To 1 1/2	20737-016	2
36	Throttle Cable Assy.	740201006-00	1
37	3/8 Flat Washer, Uss Zinc	20404-038	8
38	Thermometer, 1.75" Face 6" Probe, 0-200F, 1/8NPT	740601010-00	1
39	Snubbing Washer	20875	4
40	Isolator, engine, Tech Products 51700-1	740801400-00	4
41	5/16-18 X 1 Hx Hd Gr8 Cs Zinc	20411-0100	8
42	5/16 Flat Washer Sae Hard Zinc	20402-031	16
43	5/16-18 Toplock Nut Gr.C C&W	20401-031	8

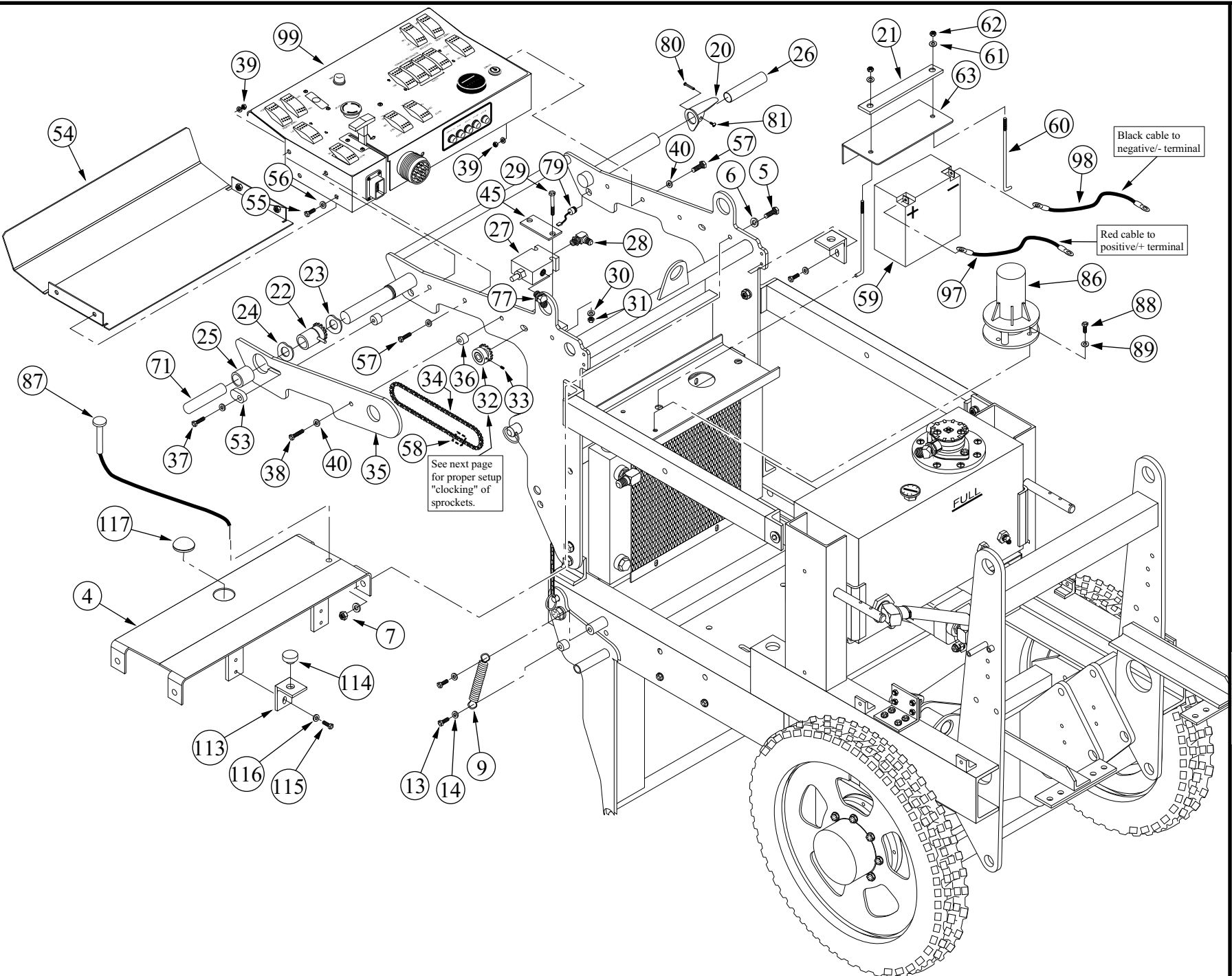
CopperHead XD 2.0 HANDLE ASSEMBLY



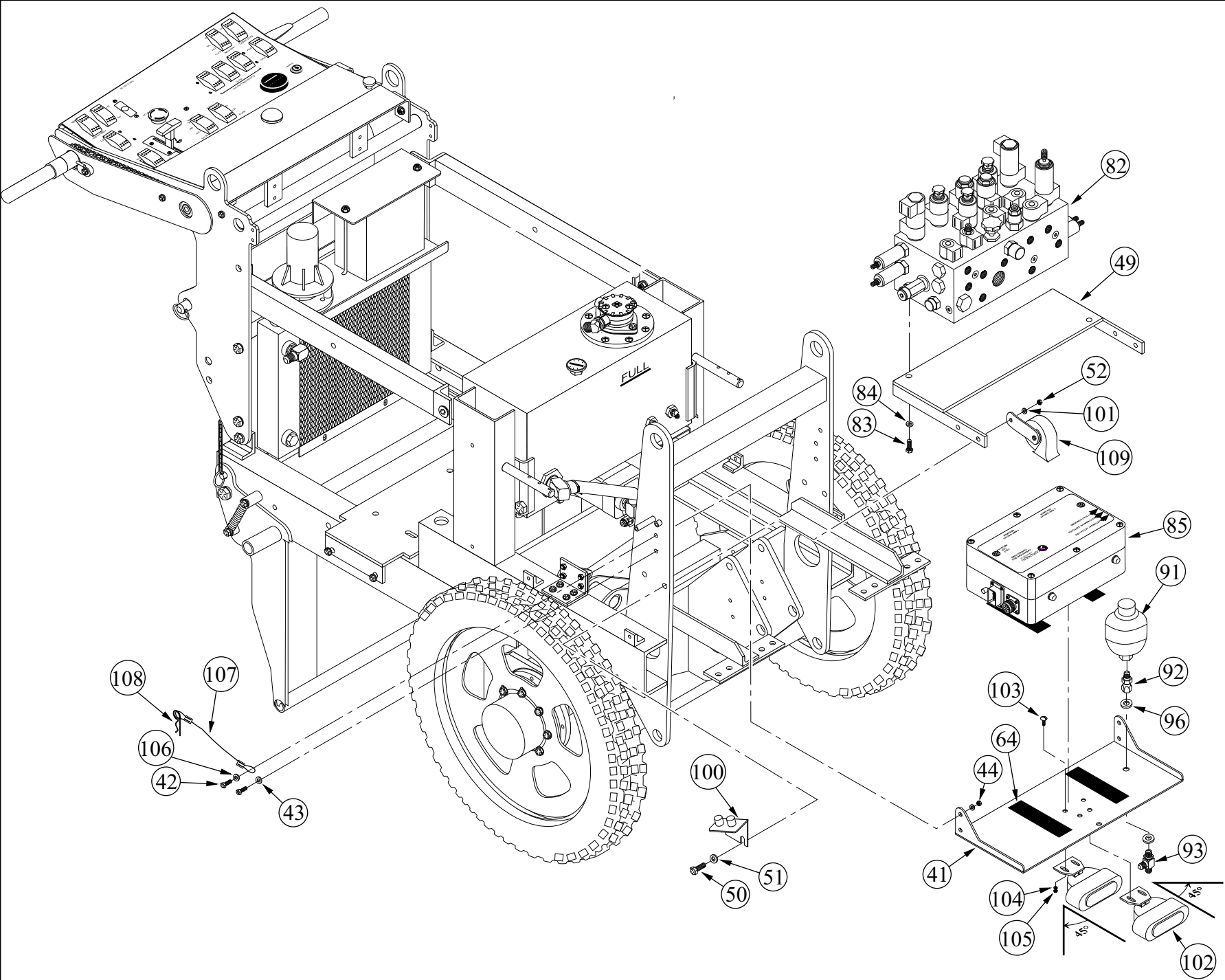
CopperHead XD 2.0 HANDLE ASSEMBLY



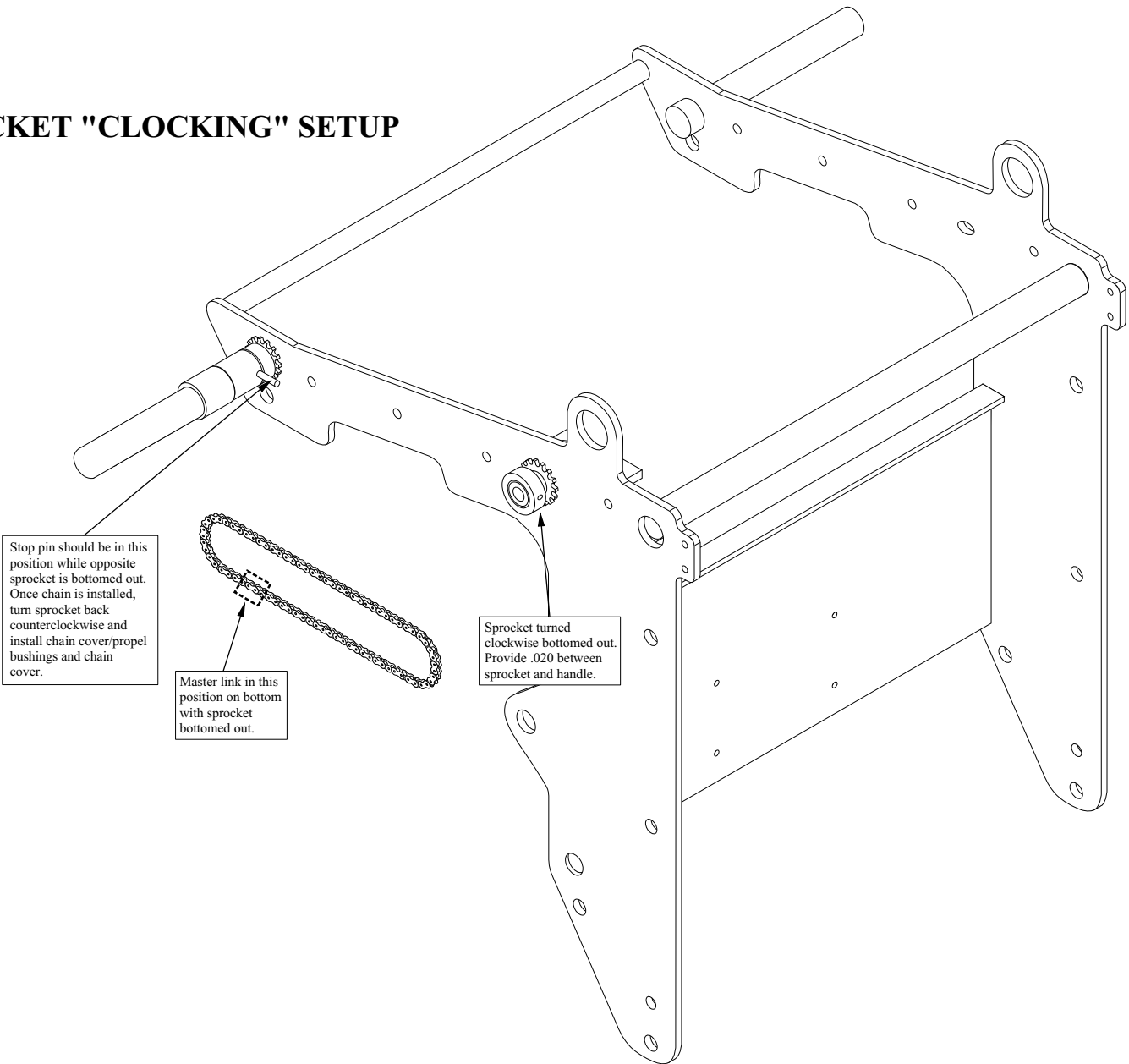
CopperHead XD 2.0 HANDLE ASSEMBLY



CopperHead XD 2.0 HANDLE ASSEMBLY



SPROCKET "CLOCKING" SETUP



CopperHead XD 2.0 HANDLE ASSEMBLY

ITEM	DESCRIPTION	PART No.	QTY
1	Weldment, Handlebar	720601760-00	1
2	Weldment, Kickstand	720601471-01	1
3	Weldment, Forward Tube	720601470-01	2
4	Weldment, Top Cover Stop, 13 Hp	720601745-01	1
5	1/4-20 x 3/4 Hx Hd Gr8 Cs Zinc	20410-0075	4
6	1/4 Flat Washer Sae Hard Zinc	20402-025	8
7	1/4-20 Toplock Nut Gr.C C&W	20401-025	4
8	Bushing, Kickstand, Weldment	720501362-00	2
9	Spring Extension, Kickstand	740408003-00	2
10	Pin, Counterweight Mount	720501958-00	1
11	Cotter Pin, .125 Wire, Double Loop	740801331-00	3
12	Counterweight	720501336-03	4
13	3/8-16 x 1 Hx Hd Gr8 Cs Zinc	20412-0100	4
14	3/8 Flat Washer Sae Hard Zinc	20402-038	4
15	1/2-13 x 1-1/4 Hx Hd Gr8 Cs Zinc	20413-0125	4
16	1/2 Flat Washer Sae Hard Zinc	20402-050	10
17	1/2-13 Toplock Nut Gr.C C&W	20401-050	6
18	1/2-13 x 1-1/2 Flat Socket Hd Cap Screw	740404019-00	2
19	Ring - Split, 2" ID	740801352-00	1
20	Weldment, Deadman Lever	720601465-02	1
21	Strap, Clamp,	10812	1
22	Weldment - Propel Sprocket	720601428-00	1
23	Spring, Wave Disc, Twist Grip	740408002-00	1
24	Lock Ring, External, Twist Grip	740801210-00	1
25	Handle Grip, Foam, 1 1/4" Dia.	740801212-00	.5
26	Handle Grip, Foam, 7/8" Dia x 6"	740801304-00	1
27	Valve, Flow Control, Propel Speed	751001064-00	1
28	Hyd Ftg 90 Deg Elbow, 6 M Jic to 6 M Orb	20042-0606	2
29	1/4-20 x 2 Hx Hd Gr8 Cs Zc	20410-0200	2

CopperHead XD 2.0 HANDLE ASSEMBLY

ITEM	DESCRIPTION	PART No.	QTY
30	1/4-20 Toplock Nut Gr.C C&W	20401-025	2
31	1/4 Flat Washer Sae Hard Zinc	20402-025	2
32	Sprocket - Propel, 25B9 2 set screws	740801351-00	1
33	8-32 Set Screw, 3/16" Lg, Stainless	740406027-00	1
34	Roller Chain, #25, 103 Links, 1/4" Pitch	740301023-00	1
35	Plate, Chain Cover	720502478-03	1
36	Bushing, Chain Cover, Propel	720501373-01	2
37	1/4-20 x 1-1/2 Hx Hd Gr8 Cs Zc	20410-0150	1
38	1/4-20 x 1-1/2 Hx Hd Gr8 Cs Zc	20410-0150	1
39	1/4-20 Toplock Nut Gr.C C&W	20401-025	4
40	1/4 Flat Washer Sae Hard Zinc	20402-025	8
41	Plate, Ops Box Mount, 13 Hp	720501942-01	1
42	1/4-20 x 1 Hx Hd Gr8 Cs Zinc	20410-0100	4
43	1/4 Flat Washer Sae Hard Zinc	20402-025	6
44	1/4-20 Topluck Nut Gr.C C&W	20401-025	4
45	Plate, Mount, Needle Valve	740801281-00	1
46	1/2-13 x 1-1/2 Hx Hd Gr8 Cs Zc	20413-0150	2
47	1/2 Flat Washer Sae Hard Zinc	20402-050	4
48	1/2-13 Toplock Nut Gr.C C&W	20401-050	2
49	Plate, Manifold Mount	720501949-01	1
50	5/16-18 x 1-1/4 Hx Hd Gr8 Cs Zinc	20411-0125	4
51	5/16 Flat Washer, Uss Zinc	20404-031	2
52	5/16-18 Toplock Nut Gr.C C&W	20401-031	4
53	Plate, Propel Sprocket Limiter	720502535-00	1
54	Plate, Bottom, Console	720501961-03	1
55	1/4-20 x 3/4 Hx Hd Gr8 Cs Zinc	20410-0075	4
56	1/4 Flat Washer Sae Hard Zinc	20402-025	4
57	1/4-20 x 3/4 Hx Hd Gr8 Cs Zinc	20410-0075	3
58	Master Link, #25, 1/4" Pitch	740301011-00	1

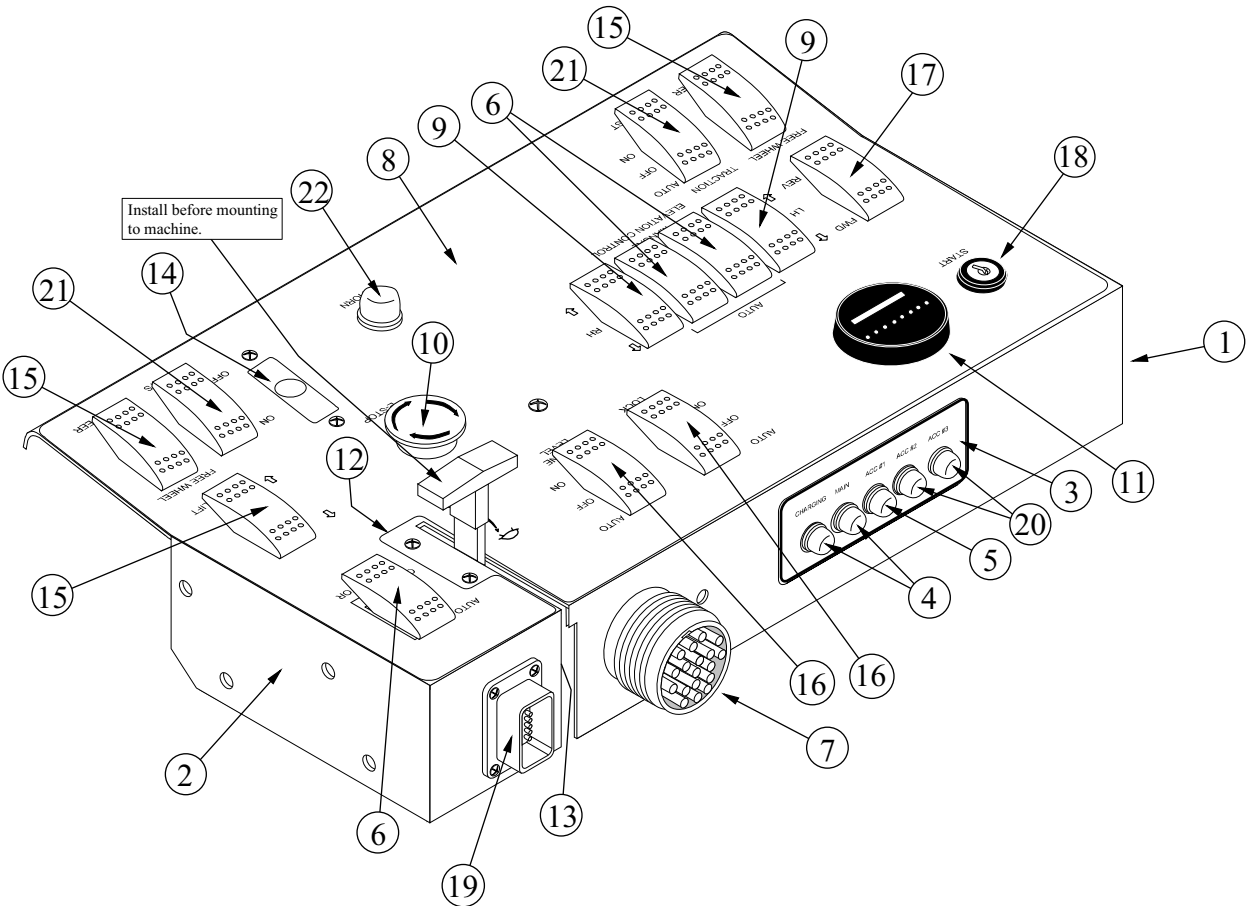
CopperHead XD 2.0 HANDLE ASSEMBLY

ITEM	DESCRIPTION	PART No.	QTY
59	Battery 12V, 25AH	710401133-00	1
60	Battery Hold Down Bolt, 8"	20729	2
61	5/16 Flat Washer, Uss Zinc	20404-031	2
62	5/16-18 Hex Nut, Gr 8	20400-031	2
63	Cover - Battery Sds-Ds	720201096-00	1
64	Velcro, Dual Lock, 1" Wide Super Adhesive 96055K43	740801218-00	.66yd
65	Bushing, Spacer, Cooler Mount	720501940-00	4
66	Weldment, Cooler Mount	720601575-03	1
67	Cooler, Hyd Return Flow	750701071-00	1
68	3/8-16 X 1 Hx Hd Gr8 Cs Zinc	20412-0100	4
69	3/8 Flat Washer Sae Hard Zinc	20402-038	8
70	3/8-16 Toplock Nut Gr.C C&W	20401-038	4
71	Handle Grip, Foam, 7/8 Dia. Sds-Ds	740801211-00	1
72	3/8-16 x 1-3/4 Hx Hd Gr8 Cs Zinc	20412-0175	4
73	3/8 Flat Washer Sae Hard Zinc	20402-038	8
74	3/8-16 Toplock Nut Gr.C C&W	20401-038	4
75	Hyd Ftg Bushing, 12 M Orb To 8 F Orb	20061-1208	1
76	Hyd Ftg 90 Deg Elbow, 8 M Jic To 8 M Orb	20042-0808	1
77	Hyd Ftg 45 Deg Elbow, 6 M Jic To 6 M Orb	20040-0606	1
78	Hyd Ftg Plug, 12 Orb	20065-0012	3
79	Switch Assembly Neutral Safety Switch	20847-assy	1
80	Barrel, 1/4" OD x 1.25" 10-24 thrds	740801306-00	1
81	10-24 Screw, Stainless Steel	740406004-00	1
82	Hyd. Manifold Assembly	751001074-02	1
83	3/8-16 x 3/4 Hx Hd Gr8 Cs Zinc	20412-0075	2
84	3/8 Flat Washer Sae Hard Zinc	20402-038	2
85	OPS Box Assembly, CH w/Deutsch Connector	710101172-00	1
86	PQ Level Sensor Assy, 13 Hp Ch Xd	710101143-00	1
87	Cable, Pull, Remote Choke	740201007-00	1

CopperHead XD 2.0 HANDLE ASSEMBLY

ITEM	DESCRIPTION	PART No.	QTY
88	1/4-20 X 1/2 Hx Hd Gr8 Cs Zinc	20410-0050	3
89	1/4 Flat Washer Sae Hard Zinc	20402-025	3
90	N/A		
91	Accumulator, 10 in 3, 200psi, Copperhead 13HP	750701088-00	1
92	Hyd. Ftg St, 6 Orb To 6 Jic Fe Swivel	20037-0606	1
93	Hyd Ftg Bulkhead Branch Tee, 6 M Jic 3 Plc's	20058-0606	1
94	Hyd Ftg 90 Deg Elbow, 8 M Jic To 8 M Npt	20044-0808	1
95	Hyd Ftg 1/2" NPT Plug	20066-0008	1
96	9/16 Flat Washer Sae Hard Zinc	20402-056	2
97	Red Battery Cable, XD 44" w/two 1/4" studs	710301044-00	1
98	Black Battery Cable, 44" w/two 1/4" studs	710301043-01	1
99	Console, Assy, 13HP	710101171-00	1
100	Power Steer Pot Assy CHXD w/Pots mounted to plate	710101158-01	1
101	5/16 Flat Washer Sae Hard Zinc	20402-031	6
102	35W Eagle Eye Light Kit w/Packard tower connectors	710101161-00	1
103	10-32 X 1/2, Screw	30897	4
104	3/16 Flat Washer Sae Hard Zinc	20402-019	4
105	Locknut 10-32 Zinc	20430	4
106	1/4" Uss Washer	20404-025	2
107	Lanyard Control Console	30011	2
108	Cotter Pin, .125 Wire, Double Loop	740801331-00	2
109	Horn	20746	1
110	Split Ring, 1.48" OD	740801263-00	2
111	Single Jack Chain	740301025-00	1 FT.
112	Pin, 1/2" OD, 0.8" Long	740404022-00	2
113	Bracket, top cover bumper	720503303-00	4
114	Bumper, rubber, top cover	740801403-00	4
115	1/4-20 X 3/4 Hx Hd Gr8 Cs Zinc	20410-0075	8
116	1/4 Flat Washer Sae Hard Zinc	20402-025	8
117	Dash Light Assembly	710101194-00	1

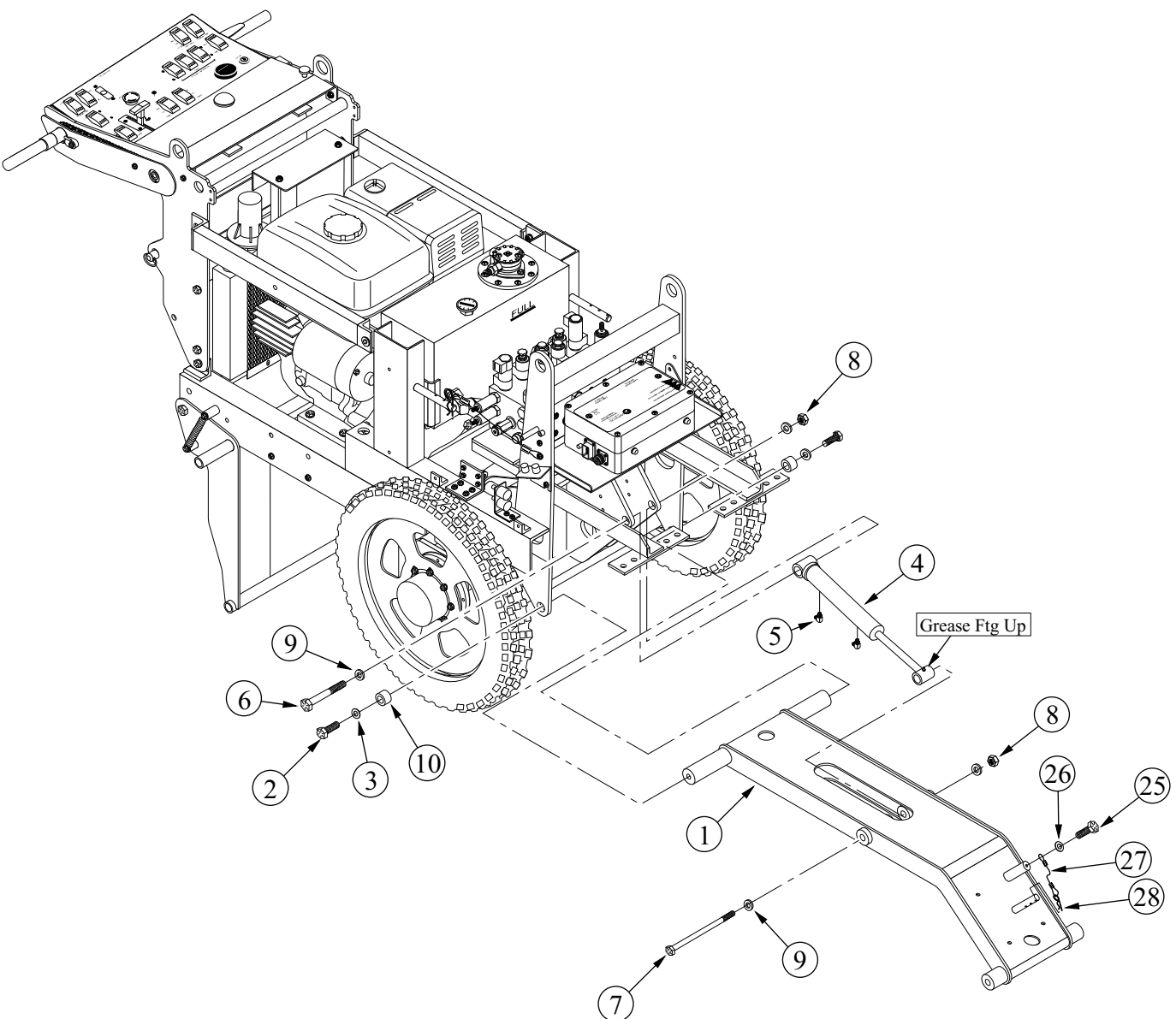
CopperHead XD 2.0 CONSOLE ASSEMBLY



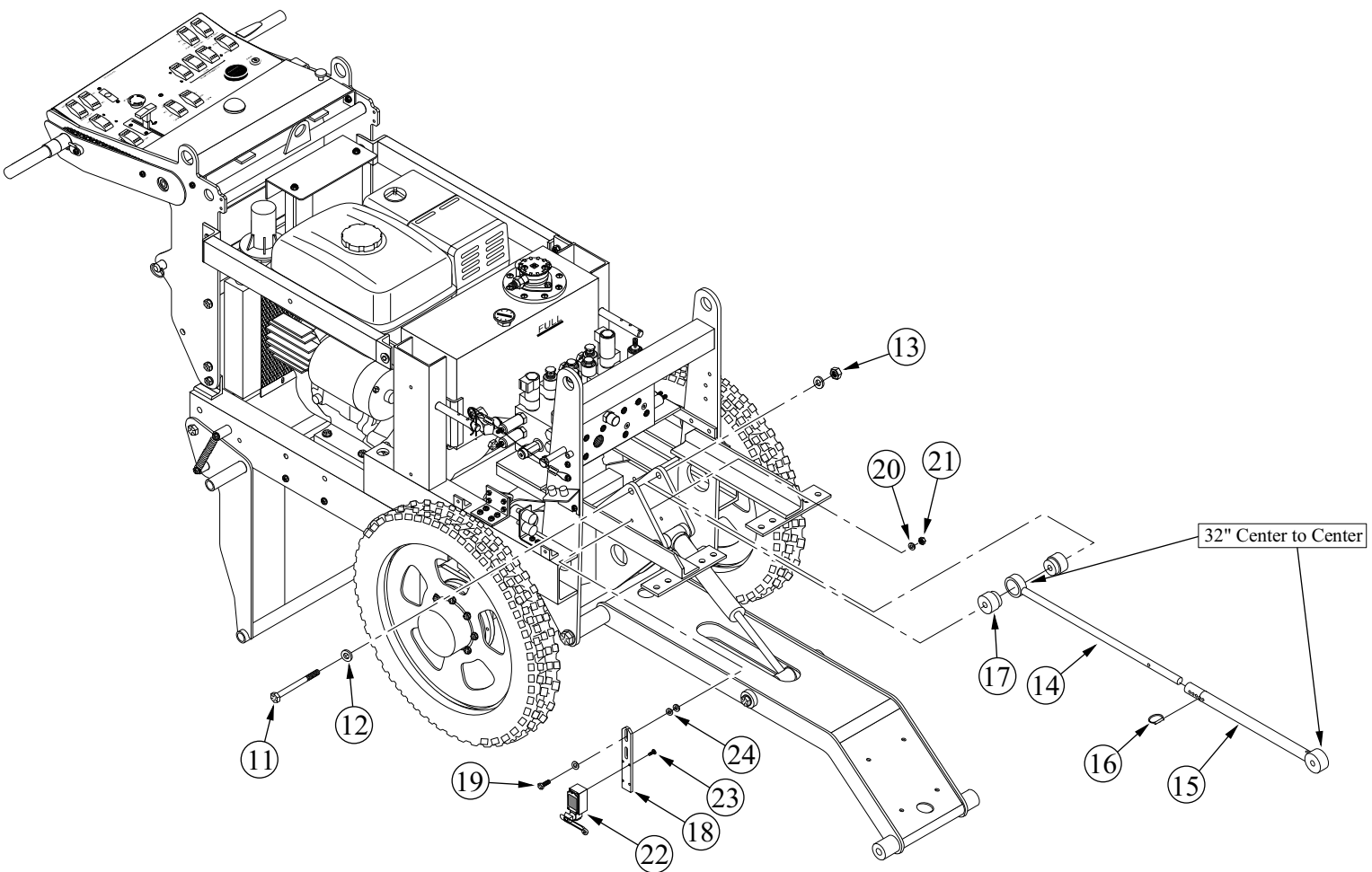
CopperHead XD 2.0 CONSOLE ASSEMBLY

ITEM	DESCRIPTION	PART No.	QTY
1	Console Assembly 13 HP	710101171-00	1
2	Console Top Plate, 13 HP	720503100-00	1
3	Decal, Circuit Breakers	780101247-00	1
4	Circuit Breaker, 25 AMP Push to Reset, W58 Series	710401117-00	2
5	Circuit Breaker, 15 AMP Push to Reset, W58 Series	710401110-00	1
6	Rocker Switch, V4D1 Carling Contura II, ON-ON	711601033-00	3
7	Conn, Receptacle Deutsch 21 Pin, HDP24-24-21PN	710503003-01	1
8	Decal, Console, 13 Hp	780101246-00	1
9	Rocker Switch, V8D1 Carling (ON)-OFF-(ON)	711601014-C0	2
10	Actuator, E-Stop Switch 40mm Head	711601028-00	1
11	ENM Hour Mtr/Batt Indicator, ENM PT271AB5	710401108-00	1
12	10-32 X 1/2, Screw	30897	2
13	Locknut 10-32 Zinc	20430	2
14	Level, Clear Plastic	740801264-00	1
15	Rocker Switch, VLD1 DPDT Carling (ON)-OFF-(ON)	711601035-00	3
16	Rocker Switch, VJD1 DPDT Carling, ON-OFF-ON	711601034-00	3
17	Rocker Switch, VDD1 DPDT Carling, ON-NONE-ON	711601037-00	1
18	Ignition Switch, Robin Engine, w/2 keys	710401136-00	1
19	Receptacle, DT04-12PA-L012, 12 PIN 16-14g Deutsch	710504027-00	1
20	Circuit Breaker, 7amp Push to Reset	710401098-00	2
21	Rocker Switch w/lock on-none-on	711601041-00	2
22	Switch, Push Button, Horn	20747	1

CopperHead XD 2.0 LIFT ARM ASSEMBLY



CopperHead XD 2.0 LIFT ARM ASSEMBLY



CopperHead XD 2.0 LIFT ARM ASSEMBLY

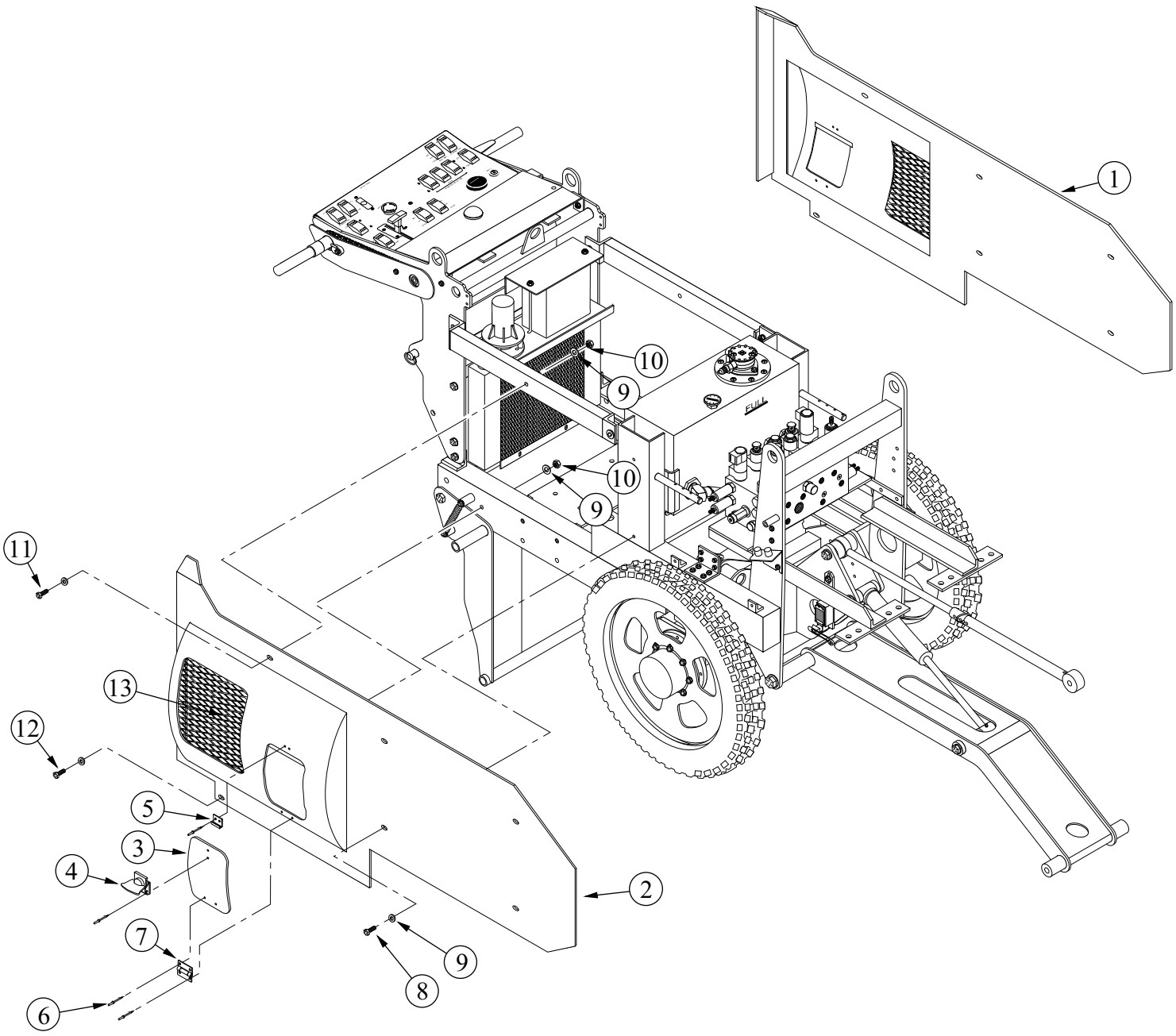
ITEM	DESCRIPTION	PART No.	QTY
1	Weldment, Lift Arm, 13Hp	720601458-03	1
2	1/2-13 x 2 Hx Hd Gr8 Cs Zinc	20413-0200	2
3	1/2 Flat Washer Sae Hard Zinc	20402-050	2
4	Hyd Cylinder, 2" x 6" stroke w/1" rod, CH 13HP	750101033-00	1
5	Hyd Ftg 90 Deg Elbow, 6 M Jic to 6 M Orb	20042-0606	2
6	3/4-10 x 4-1/2 Hx Hd Gr8 Cs Zinc	20415-0450	1
7	3/4-10 x 10 Hx Hd Gr8 Cs Zinc	20415-1000	1
8	3/4-10 Toplock Nut Gr.C C&W	20401-075	2
9	3/4 Flat Washer Sae Hard Zinc	20402-075	6
10	Bushing, Liftarm, Mount, 13Hp	720502443-00	2
11	1/2-13 x 4-1/2 Hx Hd Gr8 Cs Zc	20413-0450	1
12	1/2 Flat Washer Sae Hard Zinc	20402-050	2
13	1/2-13 Toplock Nut Gr.C C& W	20401-050	1
14	Weldment, Rod Head Lift, 13Hp	720601466-01	1
15	Tube Weldment, Upper Head Support, Copperhead	720601391-03	1
16	Pin, Wire Lock Copperhead	740801287-00	1
17	Bushing, Head Lift, 13Hp	720501992-00	2
18	Plate, Limit Switch Mount, 13Hp	720502524-01	1
19	1/4-20 x 1-1/4 Hx Hd Gr8 Cs Zc	20410-0125	2
20	1/4" Uss Washer	20404-025	4
21	1/4-20 Toplock Nut Gr.C C&W	20401-025	2
22	Limit Switch Assy, Honeywell, w/4way Packard	710101123-00	1
23	Pan Head Ms 10-32 x 1/2 Zinc	30897	4
24	1/4 Uss Washer	20404-025	8
25	5/16-18 x 3/4 Hx Hd Gr8 Cs Zc	20411-0075	1
26	5/16 Flat Washer, Uss Zinc	20404-031	1
27	Lanyard, 6" loop-loop, 3/64" Nylon coated	740801332-00	1
28	Cotter Pin, .125 Wire, Double Loop	740801331-00	1

COPPERHEAD XD 2.0 COVERS INDEX

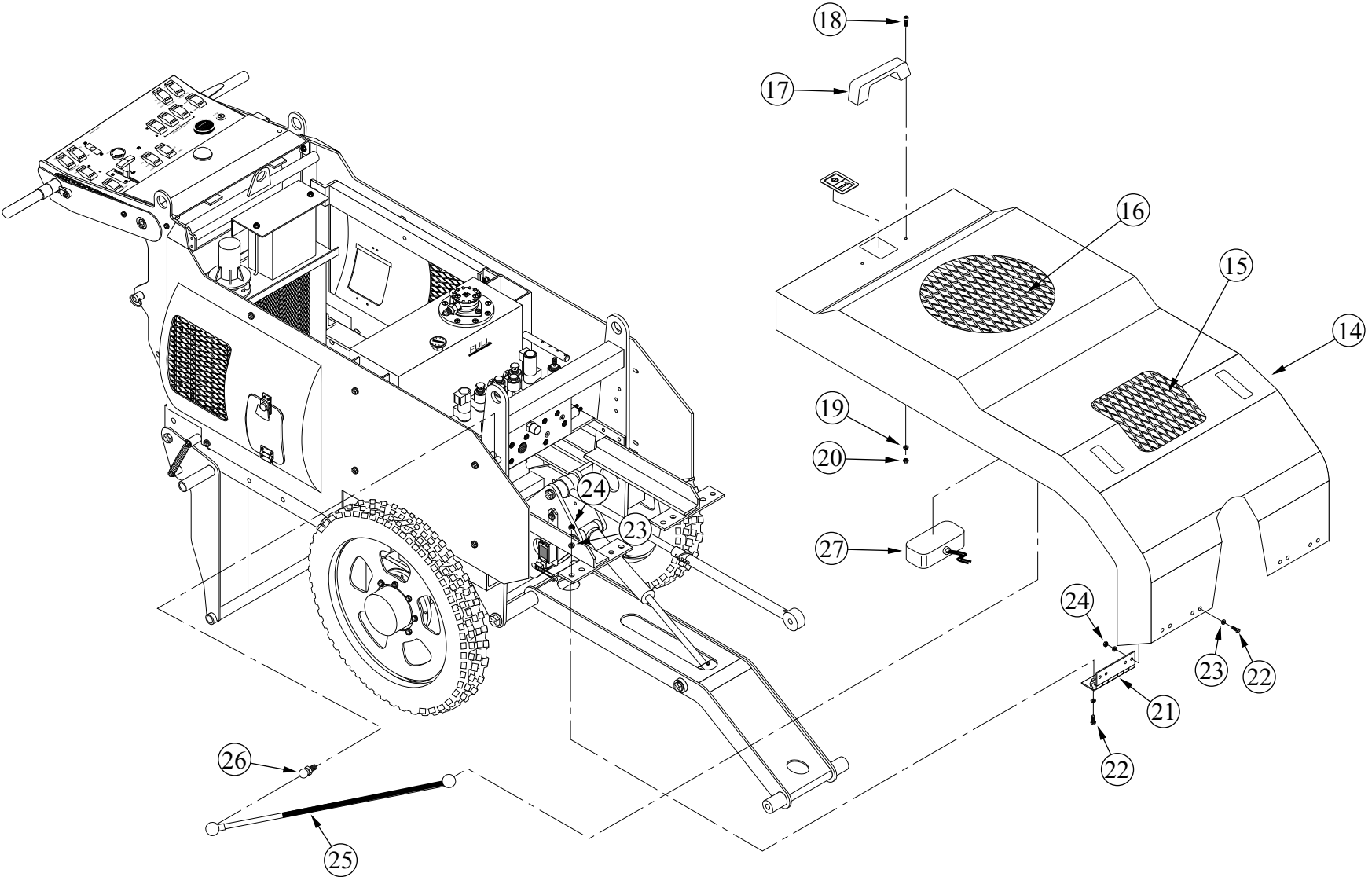
PAGE	DESCRIPTION
30.10	COVERS



CopperHead XD 2.0 COVERS



CopperHead XD 2.0 COVERS



CopperHead XD 2.0 COVERS

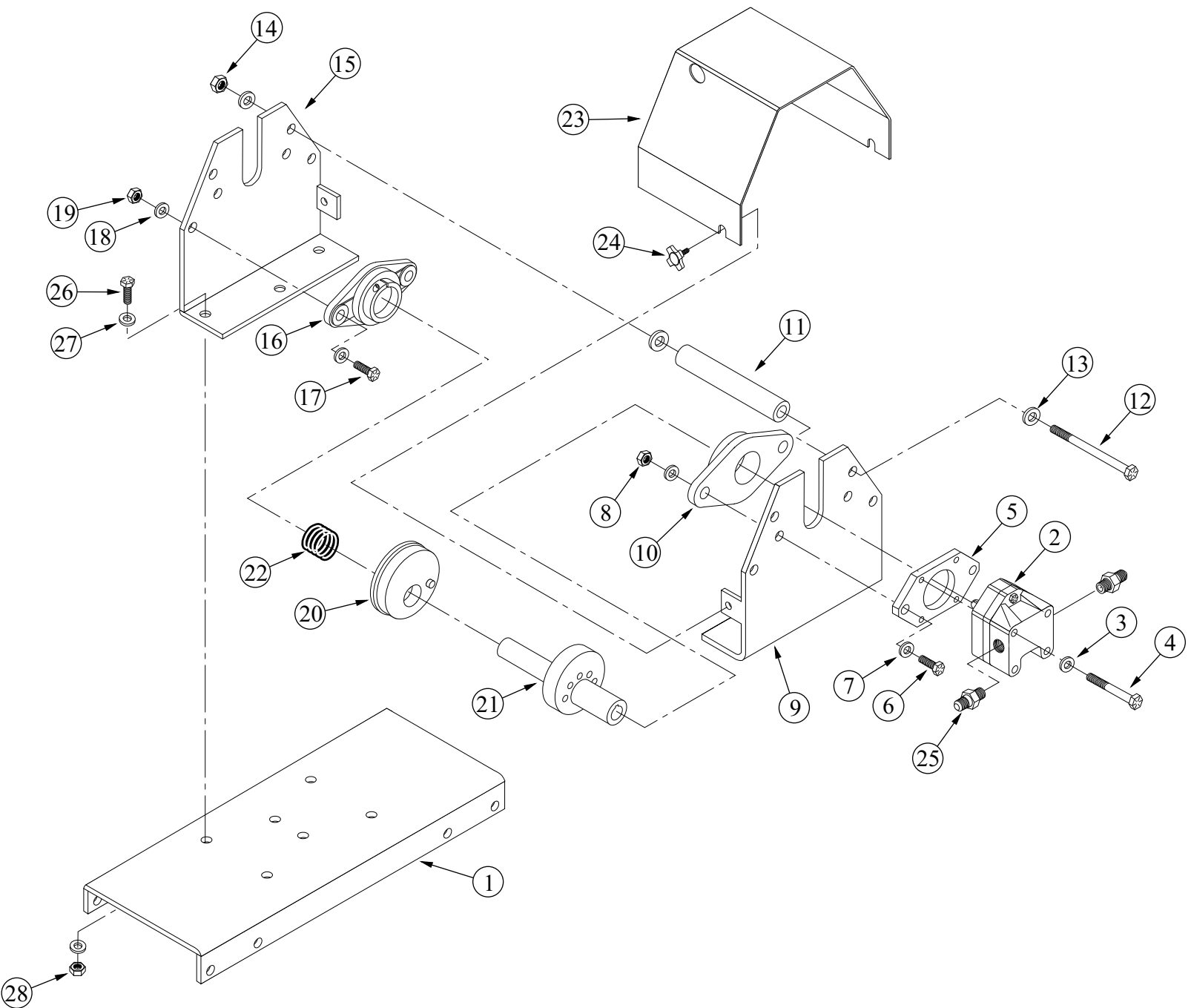
ITEM	DESCRIPTION	PART No.	QTY
1	Side cover assy, LH	720201151-02	1
2	Side cover assy, RH	720201154-02	1
3	Door, side cover	720503307-00	2
4	Latch, Hood	740701011-00	2
5	Keeper Plate, Latch, Hood	740701012-00	2
6	Rivet, SS, 3/16" x 1/8"-1/4" Grip	740801302-00	8
7	Hinge, Control Console	16162	2
8	5/16-18 x 3/4 Hx Hd Gr8 Cs Zinc	20411-0075	8
9	5/16 Flat Washer, Uss Zinc	20404-031	20
10	5/16-18 Toplock Nut Gr.C C&W	20401-031	4
11	5/16-18 X 1-3/4 Hx Hd Gr8 Cs Z	20411-0175	2
12	5/16-18 x 1 Hx Hd Gr8 Cs Zinc	20411-0100	2
13	Grill, Side Cover	720503289-00	2
14	Top cover assembly	720201149-01	1
15	Grill, Front	720501948-00	1
16	Grill, Top, Top Cover	720503288-00	1
17	Handle, Top Cover, Copperhead	740701013-00	1
18	Pan Head Ms 10-32 X 3/4 Zinc	20429	2
19	3/16 Flat Washer Sae Hard Zinc	20402-019	2
20	Locknut 10-32 Zinc	20430	2
21	Hinge, top cover assembly	720503302-00	2
22	5/16-18 X 1 Hx Hd Gr8 Cs Zinc	20411-0100	16
23	5/16 Flat Washer Sae Hard Zinc	20402-031	32
24	5/16-18 Toplock Nut Gr.C C&W	20401-031	16
25	Gas Spring, TopCover, 20lb.	740801282-00	2
26	Ball Stud,.39" Dia, Gas Spring	740801283-00	2
27	Hood Light Assembly	710101195-00	1

COPPERHEAD XD 2.0 FRONT END INDEX

PAGE	DESCRIPTION
40.10	VIBRATOR GEAR BOX
40.20	10' FRONT END ASSEMBLY
40.30	8' FRONT END ASSEMBLY
40.40	COPPERHEAD GRADE ROD
40.50	SONIC TRACER SYSTEM ASSEMBLY



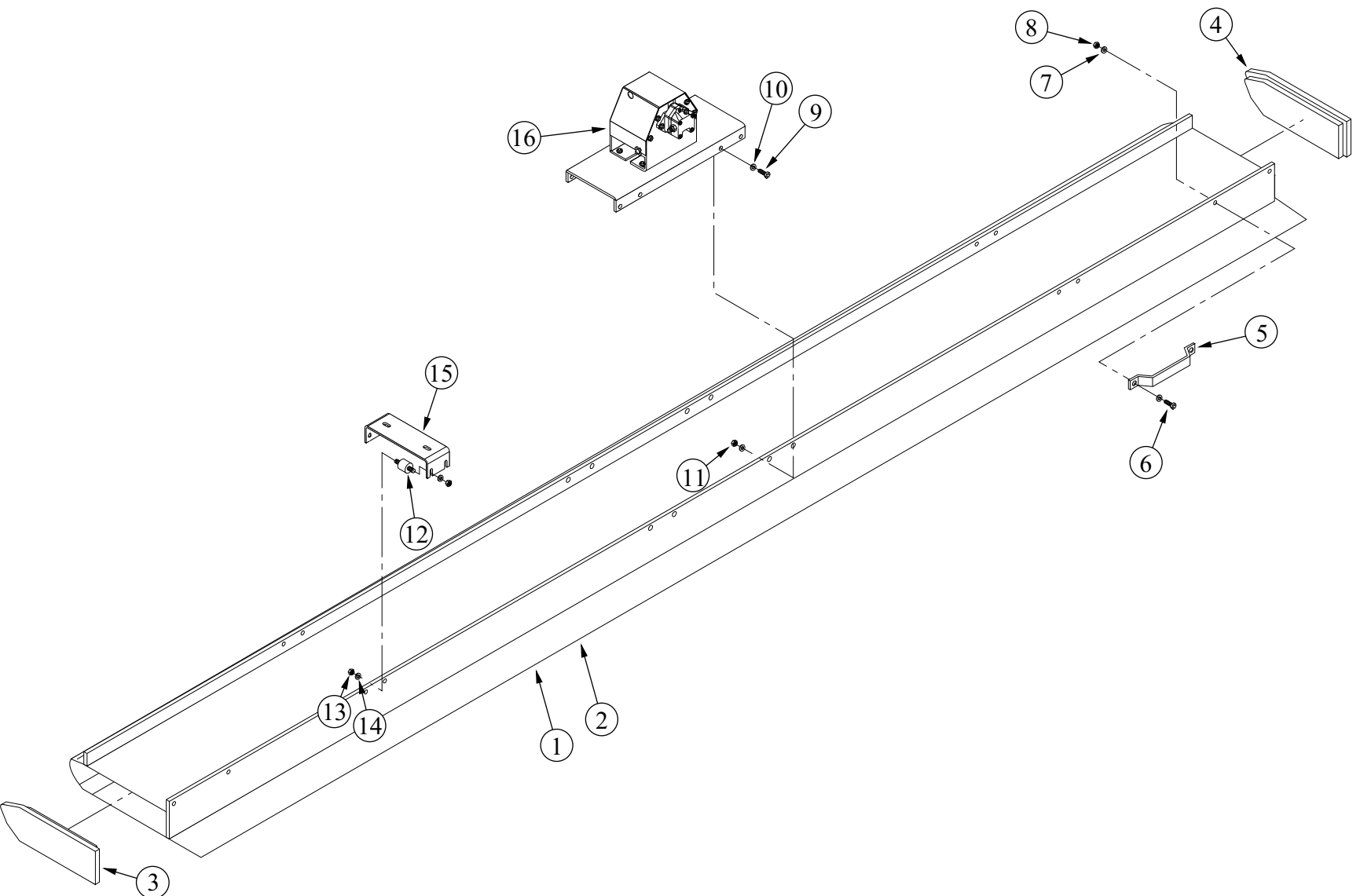
CopperHead XD 2.0 VIBRATOR GEAR BOX ASSEMBLY **Assembly #700301159-00**



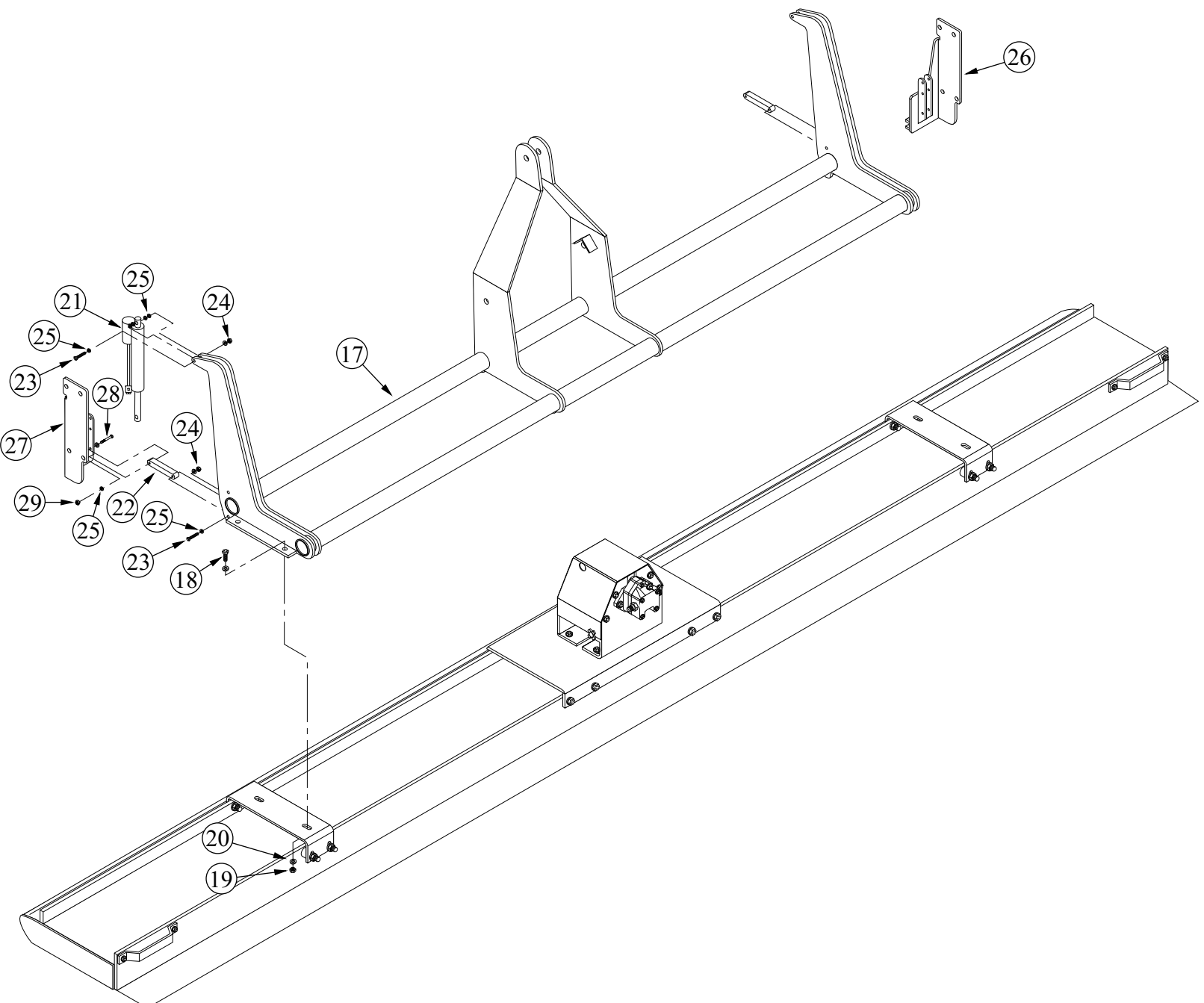
CopperHead XD 2.0 VIBRATOR GEAR BOX ASSEMBLY
Assembly #700301078-07

ITEM	DESCRIPTION	PART No.	QTY
1	Vibrator Mount Plate	720503300-00	1
2	Vibrator motor, .067 CIR, 7/16" key shaft	750801042-00	1
3	5/16 Flat Washer Sae Hard Zinc	20402-031	4
4	5/16 - 18 X 3 1/2 Hx Hd Gr. 8	20411-0350	4
5	Mount, vibrator motor, extruded vib	720502901-02	1
6	3/8-16 X 1-3/4 Hx Hd Gr8 Cs Zc	20412-0175	2
7	3/8 Flat Washer Sae Hard Zinc	20402-038	4
8	3/8-16 Toplock Nut Gr.C C&W	20401-038	2
9	Weldment, Vibrator Mount Mtr Side	720601778-00	1
10	Bearing, 1, Two Bolt Flange	20133	1
11	Tube, spacer, ext vibrator	720502900-01	4
12	3/8-16 X 5-1/2 Hx Hd Gr8 Cs Zc	20412-0550	4
13	3/8 Flat Washer Sae Hard Zinc	20402-038	12
14	3/8-16 Toplock Nut Gr.C C&W	20401-038	4
15	Weldment, vibrator drive mount	720601746-01	1
16	Bearing, sealmaster, SFT-12T	740101044-00	1
17	3/8-16 X 1-1/4 Hx Hd Gr8 Cs Zc	20412-0125	2
18	3/8 Flat Washer Sae Hard Zinc	20402-038	4
19	3/8-16 Toplock Nut Gr.C C&W	20401-038	2
20	Weldment, adjustable weight, vibrator	720601748-01	1
21	Weldment, fixed wt shaft, ext vib	720601774-01	1
22	Spring, vibrator, Century spring #2881	740408008-00	.5
23	Vibrator Head Cover	720201155-00	1
24	Knob, 5/16-18nc, 4 arm	740701029-00	2
25	Hyd Ftg St 6 M Jic to 6 M Orb	20030-0606	2
26	3/8-16 X 1-1/4 Hx Hd Gr8 Cs Zc	20412-0125	6
27	3/8 Flat Washer Sae Hard Zinc	20402-038	12
28	3/8-16 Toplock Nut Gr.C C&W	20401-038	6

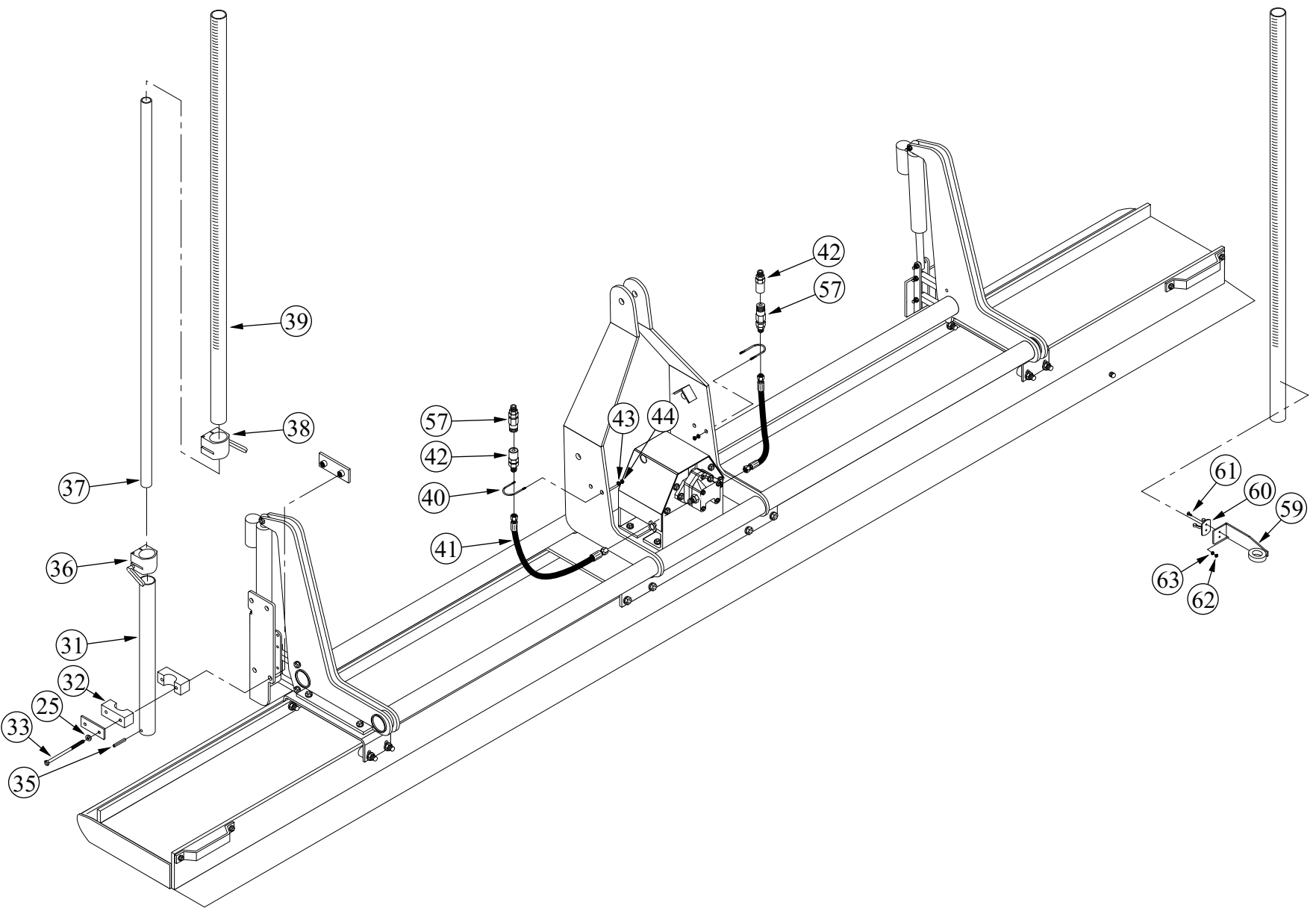
COPPERHEAD XD 2.0 10' FRONT END ASSEMBLY
Assembly #700601053-00



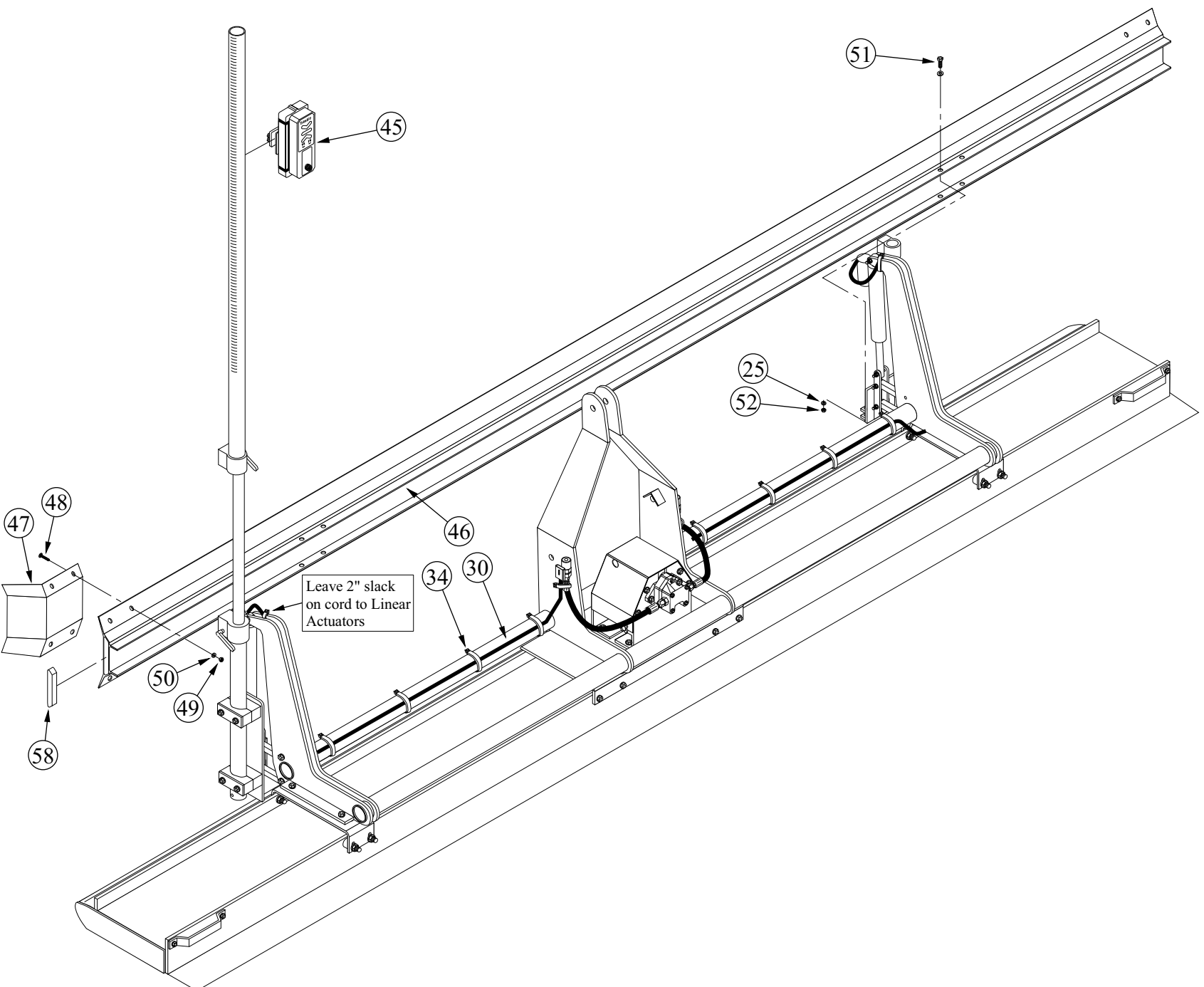
COPPERHEAD XD 2.0 10' FRONT END ASSEMBLY
Assembly #700601053-00



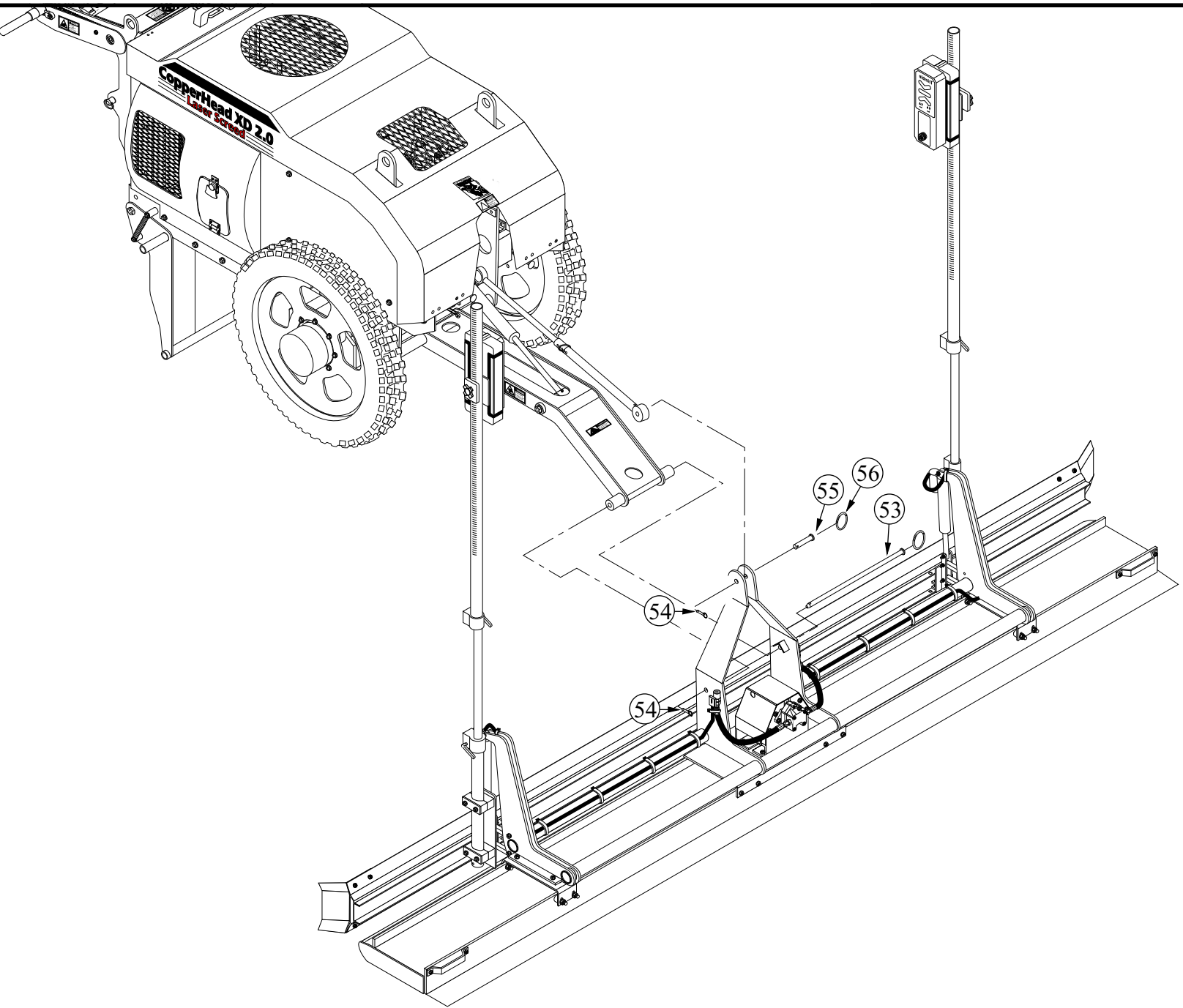
COPPERHEAD XD 2.0 10' FRONT END ASSEMBLY
Assembly #700601053-00



COPPERHEAD XD 2.0 10' FRONT END ASSEMBLY
Assembly #700601053-00



COPPERHEAD XD 2.0 10' FRONT END ASSEMBLY
Assembly #700601053-00



COPPERHEAD XD 2.0 10' FRONT END ASSEMBLY**Assembly #700601053-00**

ITEM	DESCRIPTION	PART No.	QTY
1	Vibrator assy, extruded vibrator	700601054-00	1
2	Vibrator plate, extruded	720503249-00	1
3	End Cap, RH, Extruded Vibrator	720503305-01	1
4	End Cap, LH, Extruded Vibrator	720503306-01	1
5	Handle, extruded vib	740701031-00	2
6	1/4-20 x 3/4 Hx Hd Gr8 Cs Zinc	20410-0075	4
7	1/4" Flat Washer, SAE Zinc	20402-025	8
8	1/4-20 Toplock Nut Gr C C&W	20401-025	4
9	3/8-16 X 1 Hx Hd Gr8 Cs Zinc	20412-0100	8
10	3/8-16 Toplock Nut Gr.C C&W	20401-038	8
11	3/8 Flat Washer Sae Hard Zinc	20402-038	16
12	Isolator, Vibrator	740801413-00	8
13	5/16-18 Hex Nut, Gr 8	20400-031	16
14	5/16 Flat Washer, Uss Zinc	20404-031	16
15	Plate, Isolator Mount	720502905-01	2
16	Vibrator Gear Box	700301159-00	1
17	Weldment - Head Support	720601430-01	1
18	3/8-16 X 1 Hx Hd Gr8 Cs Zinc	20412-0100	4
19	3/8-16 Toplock Nut Gr.C C&W	20401-038	4
20	3/8 Flat Washer Sae Hard Zinc	20402-038	8
21	Linear Actuator Assy Duff w drain hole	710101133-01	2
22	Connector Link, Plow	720501317-00	4
23	1/4-20 X 2 Hx Hd Gr8 Cs Zc	20410-0200	6
24	1/4-20 Toplock Nut Gr.C C&W	20401-025	6
25	1/4 Flat Washer Sae Hard Zinc	20402-025	56
26	Left Plow Mount Weldment	720601741-00	1
27	Right Plow Mount Weldment	720601742-00	1
28	1/4-20 X 1-3/4 Hx Hd Gr8 Cs Zc	20410-0175	6
29	1/4-20 Toplock Nut Gr.C C&W	20401-025	6

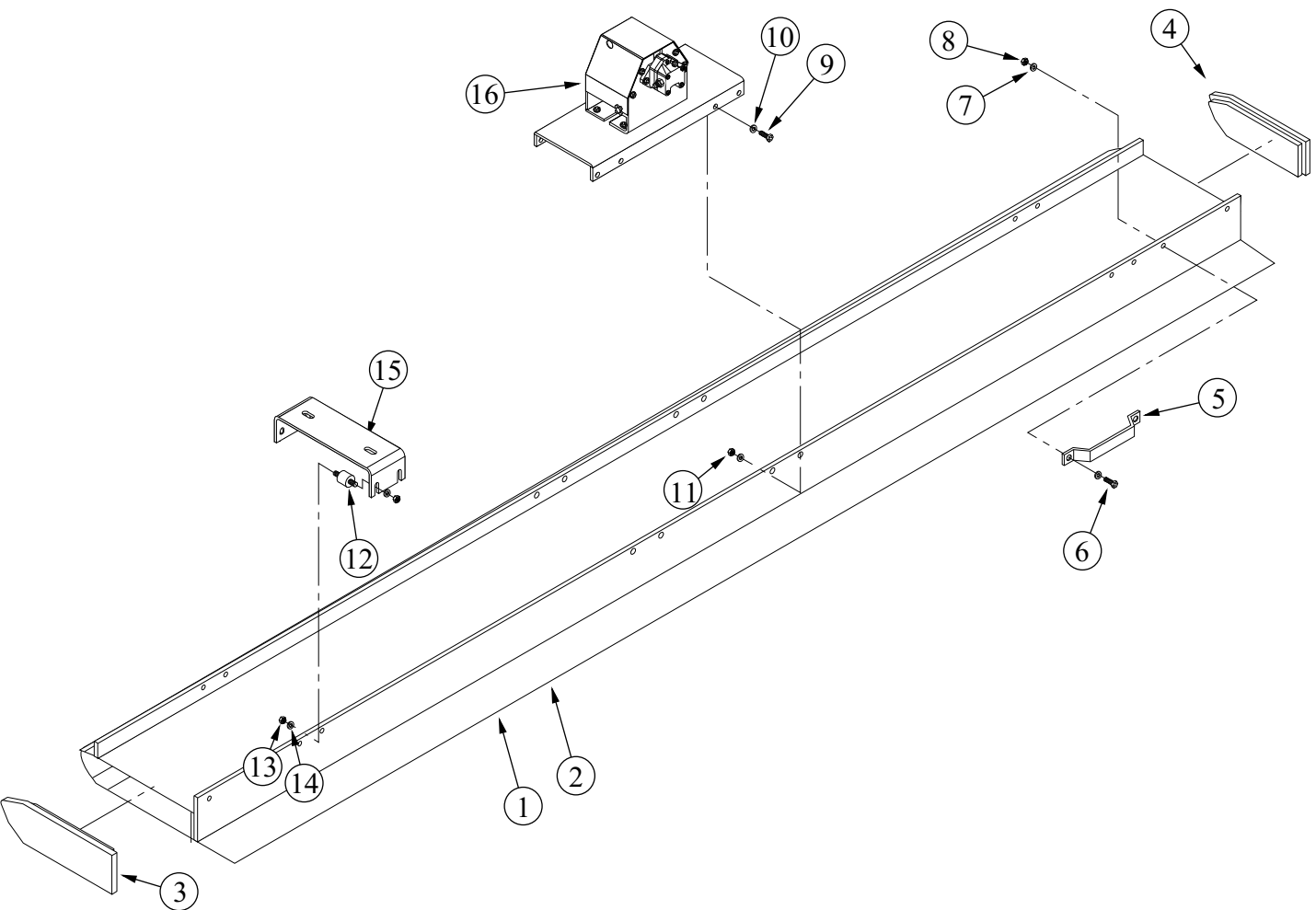
COPPERHEAD XD 2.0 10' FRONT END ASSEMBLY**Assembly #700601053-00**

ITEM	DESCRIPTION	PART No.	QTY
30	Actuator Cord, Actuator To Disconnect,Copperhead	710601105-00	2
31	Tube, Gcr Mast Base	720501376-00	2
32	Clamp, 1-1/2 Behringer	740402014-00	4
33	1/4-20 X 3 Hx Hd Gr8 Cs Zc	20410-0300	8
34	Cable Tie, 8 Black	20272-08	12
35	Spring Pin, 1/4 X 1 1/2 Stainless	740408004-00	2
36	Clamp Assy, 1.25, Seco Copperhead	740402027-00	2
37	Tube, Gcr Mast Mid	720501377-01	2
38	Clamp Assy, 1.25, Seco Copperhead	740402027-00	2
39	Tube, Gcr Mast Top	720501378-00	2
40	U-Bolt 5/16" x 18	740401012-00	2
41	Hyd. Hose 3/8 X 12	20006-012	2
42	Quick Coupler #4 F	750201020-00	2
43	5/16 Flat Washer Sae Hard Zinc	20402-031	4
44	5/16-18 Toplock Nut Gr.C C&W	20401-031	4
45	Laser Receiver, Gcr-4, Narrow band, metal conn	711301035-01	2
46	Plow Assy, 10' Extruded, CopperHead	700601038-00	1
47	Weldment, Plow Wing, Ext Plow, CopperHead	720601448-01	2
48	Bolt - Carriage, 1/4-20, 3/4" long, gr 5	740401018-00	8
49	1/4-20 Lock Nut Nylon Insert, Yel. Zinc	740405010-00	8
50	1/4 Uss Washer	20404-025	8
51	1/4-20 X 1 Hx Hd Gr8 Cs Zinc	20410-0100	8
52	1/4-20 Toplock Nut Gr.C C&W	20401-025	8
53	Pin - Head to Lift Arm	720501656-00	1
54	Cotter Pin, .125 Wire	740801331-00	2
55	Pin - Head to Turnbuckle	720501657-01	1
56	Ring - Split, 2" ID	740801352-00	2
57	Quick Coupler #4 M	750201021-00	2
58	Plug, Extruded Plow, CopperHead	720501782-00	2

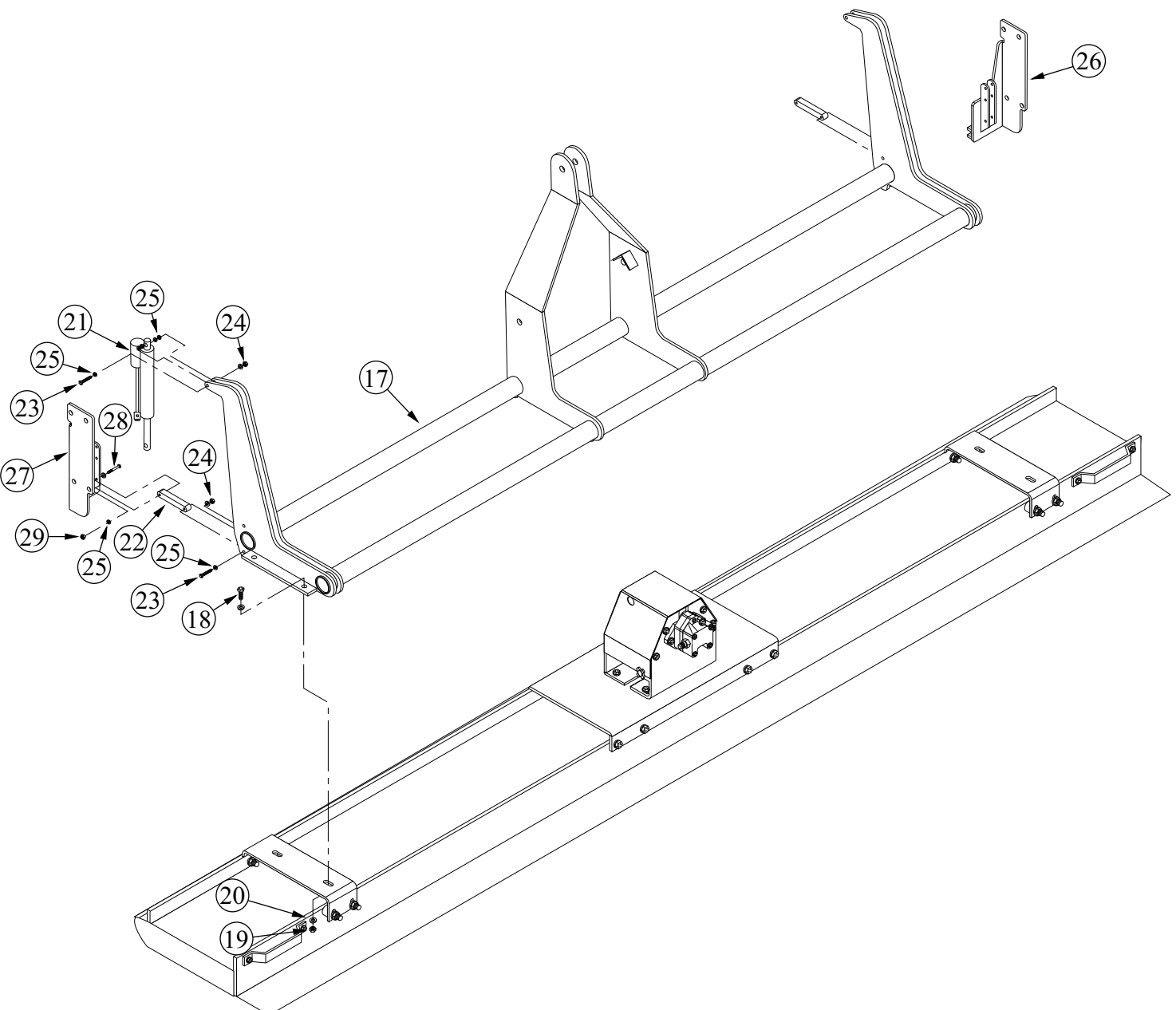
COPPERHEAD XD 2.0 10' FRONT END ASSEMBLY
Assembly #700601053-00

ITEM	DESCRIPTION	PART No.	QTY
59	Grade Rod Holder, Bracket, Weldment	720601761-01	1
60	Clip, Grade Rod, Beckson Clipmate CM-1-1/28	740404024-00	1
61	Screw, Pan Hd Phlps 6-32 x 3/8"	20427	2
62	6-32 Nylon Lock Nut	20445	2
63	3/16 Flat Washer Sae Hard Zinc	20402-019	2

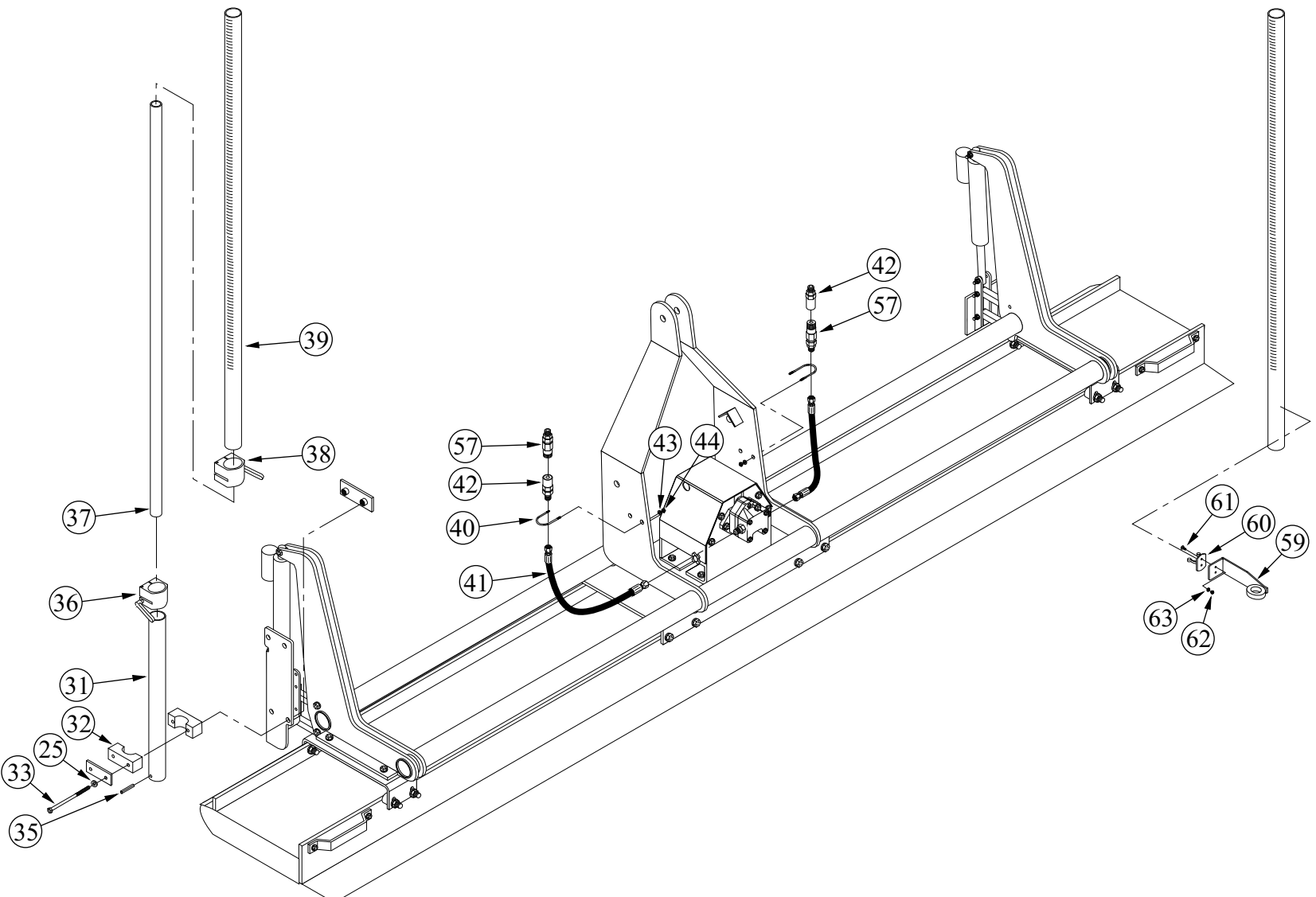
COPPERHEAD XD 2.0 8' FRONT END ASSEMBLY
Assembly #700601056-00



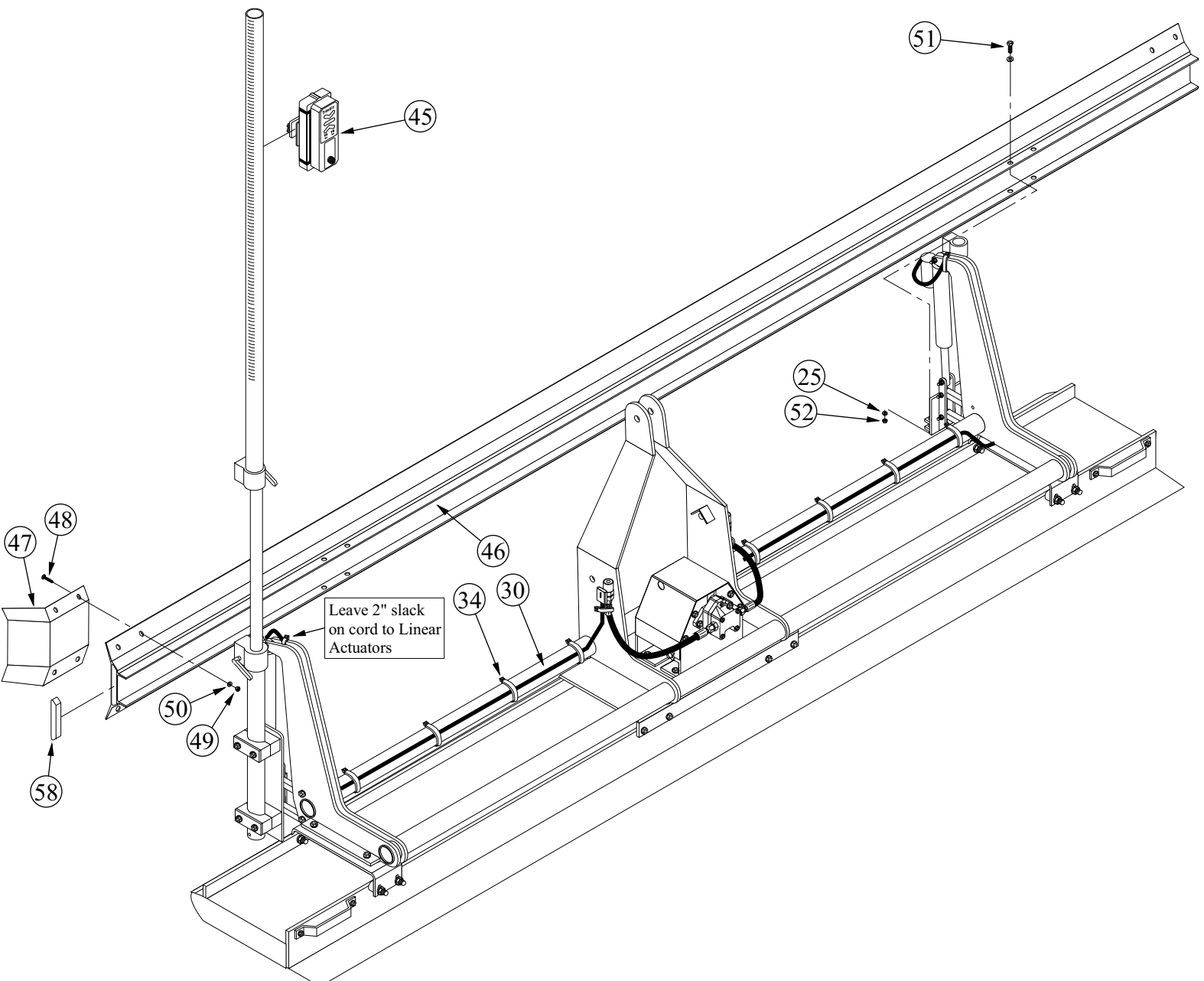
COPPERHEAD XD 2.0 8' FRONT END ASSEMBLY
Assembly #700601056-00



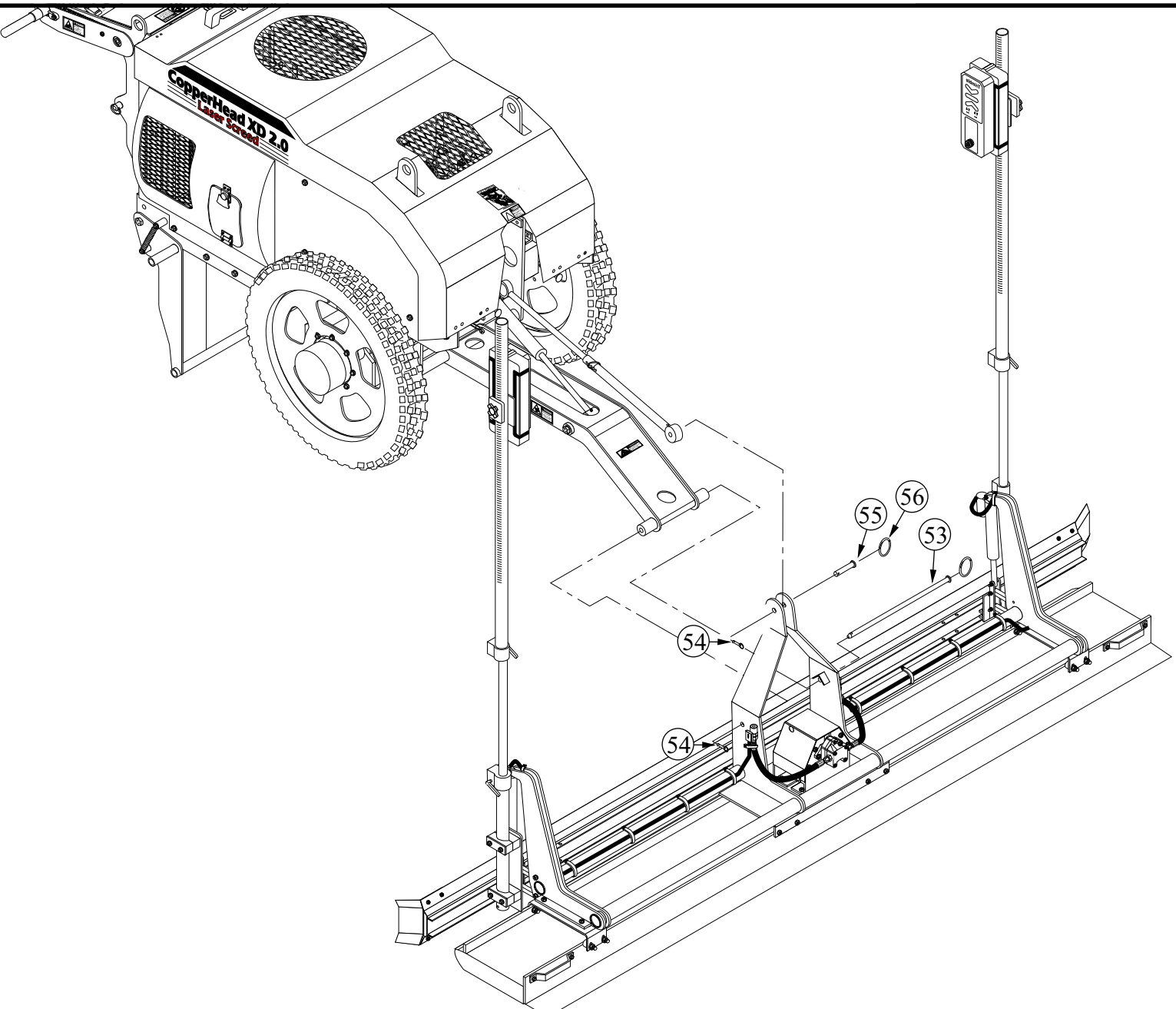
COPPERHEAD XD 2.0 8' FRONT END ASSEMBLY
Assembly #700601056-00



COPPERHEAD XD 2.0 8' FRONT END ASSEMBLY **Assembly #700601056-00**



COPPERHEAD XD 2.0 8' FRONT END ASSEMBLY
Assembly #700601056-00



COPPERHEAD XD 2.0 8' FRONT END ASSEMBLY**Assembly #700601056-00**

ITEM	DESCRIPTION	PART No.	QTY
1	Vibrator assy, extruded vibrator	700601057-00	1
2	Vibrator plate, extruded	720503530-00	1
3	End Cap, RH, Extruded Vibrator	720503305-01	1
4	End Cap, LH, Extruded Vibrator	720503306-01	1
5	Handle, extruded vib	740701031-00	2
6	1/4-20 x 3/4 Hx Hd Gr8 Cs Zinc	20410-0075	4
7	1/4" Flat Washer, SAE Zinc	20402-025	8
8	1/4-20 Toplock Nut Gr C C&W	20401-025	4
9	3/8-16 X 1 Hx Hd Gr8 Cs Zinc	20412-0100	8
10	3/8-16 Toplock Nut Gr.C C&W	20401-038	8
11	3/8 Flat Washer Sae Hard Zinc	20402-038	16
12	Isolator, Vibrator	740801413-00	8
13	5/16-18 Hex Nut, Gr 8	20400-031	16
14	5/16 Flat Washer, Uss Zinc	20404-031	16
15	Plate, Isolator Mount	720502905-01	2
16	Vibrator Gear Box	700301159-00	1
17	Weldment - Head Support	720601430-01	1
18	3/8-16 X 1 Hx Hd Gr8 Cs Zinc	20412-0100	4
19	3/8-16 Toplock Nut Gr.C C&W	20401-038	4
20	3/8 Flat Washer Sae Hard Zinc	20402-038	8
21	Linear Actuator Assy Duff w drain hole	710101133-01	2
22	Connector Link, Plow	720501317-00	4
23	1/4-20 X 2 Hx Hd Gr8 Cs Zc	20410-0200	6
24	1/4-20 Toplock Nut Gr.C C&W	20401-025	6
25	1/4 Flat Washer Sae Hard Zinc	20402-025	56
26	Left Plow Mount Weldment	720601741-00	1
27	Right Plow Mount Weldment	720601742-00	1
28	1/4-20 X 1-3/4 Hx Hd Gr8 Cs Zc	20410-0175	6
29	1/4-20 Toplock Nut Gr.C C&W	20401-025	6

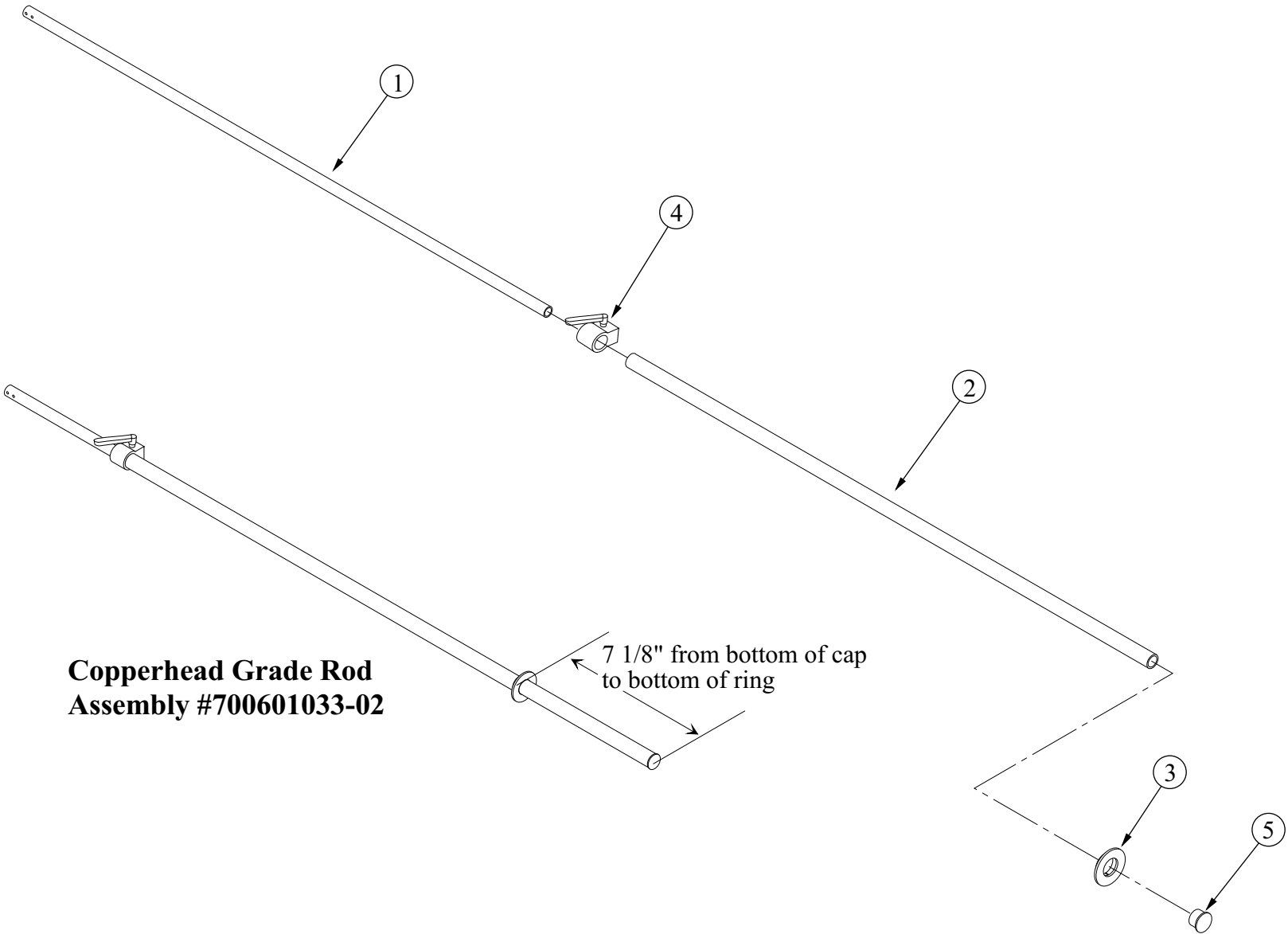
COPPERHEAD XD 2.0 8' FRONT END ASSEMBLY**Assembly #700601056-00**

ITEM	DESCRIPTION	PART No.	QTY
30	Actuator Cord, Actuator To Disconnect,Copperhead	710601105-00	2
31	Tube, Gcr Mast Base	720501376-00	2
32	Clamp, 1-1/2 Behringer	740402014-00	4
33	1/4-20 X 3 Hx Hd Gr8 Cs Zc	20410-0300	8
34	Cable Tie, 8 Black	20272-08	12
35	Spring Pin, 1/4 X 1 1/2 Stainless	740408004-00	2
36	Clamp Assy, 1.25, Seco Copperhead	740402027-00	2
37	Tube, Gcr Mast Mid	720501377-01	2
38	Clamp Assy, 1.25, Seco Copperhead	740402027-00	2
39	Tube, Gcr Mast Top	720501378-00	2
40	U-Bolt 5/16" x 18	740401012-00	2
41	Hyd. Hose 3/8 X 12	20006-012	2
42	Quick Coupler #4 F	750201020-00	2
43	5/16 Flat Washer Sae Hard Zinc	20402-031	4
44	5/16-18 Toplock Nut Gr.C C&W	20401-031	4
45	Laser Receiver, Gcr-4, Narrow band, metal conn	711301035-01	2
46	Plow Assy, 8', Extruded CopperHead	700601039-00	1
47	Weldment, Plow Wing, Ext Plow, CopperHead	720601448-01	2
48	Bolt - Carriage, 1/4-20, 3/4" long, gr 5	740401018-00	8
49	1/4-20 Lock Nut Nylon Insert, Yel. Zinc	740405010-00	8
50	1/4 Uss Washer	20404-025	8
51	1/4-20 X 1 Hx Hd Gr8 Cs Zinc	20410-0100	8
52	1/4-20 Toplock Nut Gr.C C&W	20401-025	8
53	Pin - Head to Lift Arm	720501656-00	1
54	Cotter Pin, .125 Wire	740801331-00	2
55	Pin - Head to Turnbuckle	720501657-01	1
56	Ring - Split, 2" ID	740801352-00	2
57	Quick Coupler #4 M	750201021-00	2
58	Plug, Extruded Plow, CopperHead	720501782-00	2

COPPERHEAD XD 2.0 8' FRONT END ASSEMBLY
Assembly #700601056-00

ITEM	DESCRIPTION	PART No.	QTY
59	Grade Rod Holder, Bracket, Weldment	720601761-01	1
60	Clip, Grade Rod, Beckson Clipmate CM-1-1/28	740404024-00	1
61	Screw, Pan Hd Phlps 6-32 x 3/8"	20427	2
62	6-32 Nylon Lock Nut	20445	2
63	3/16 Flat Washer Sae Hard Zinc	20402-019	2

COPPERHEAD GRADE ROD

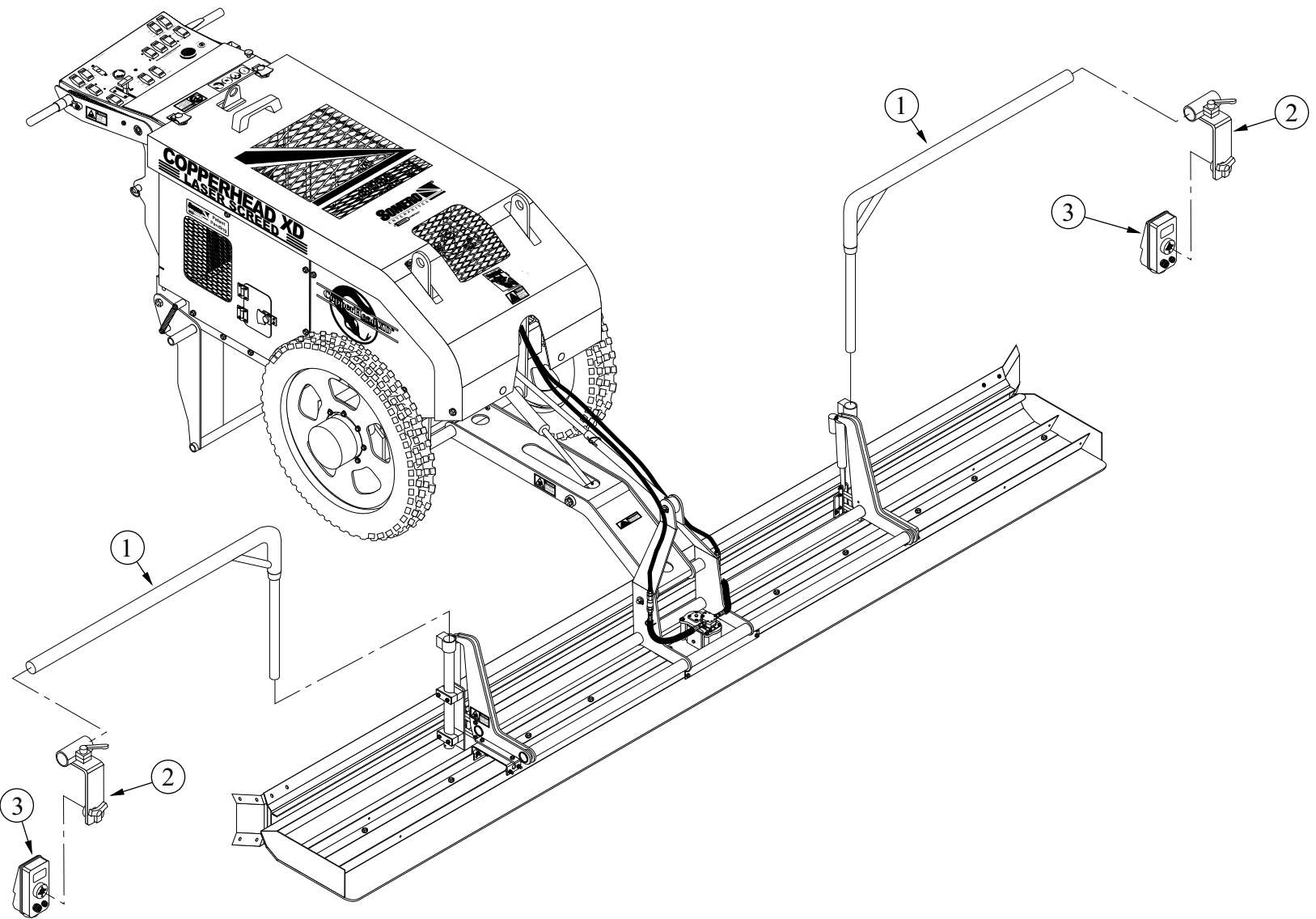


**Copperhead Grade Rod
Assembly #700601033-02**

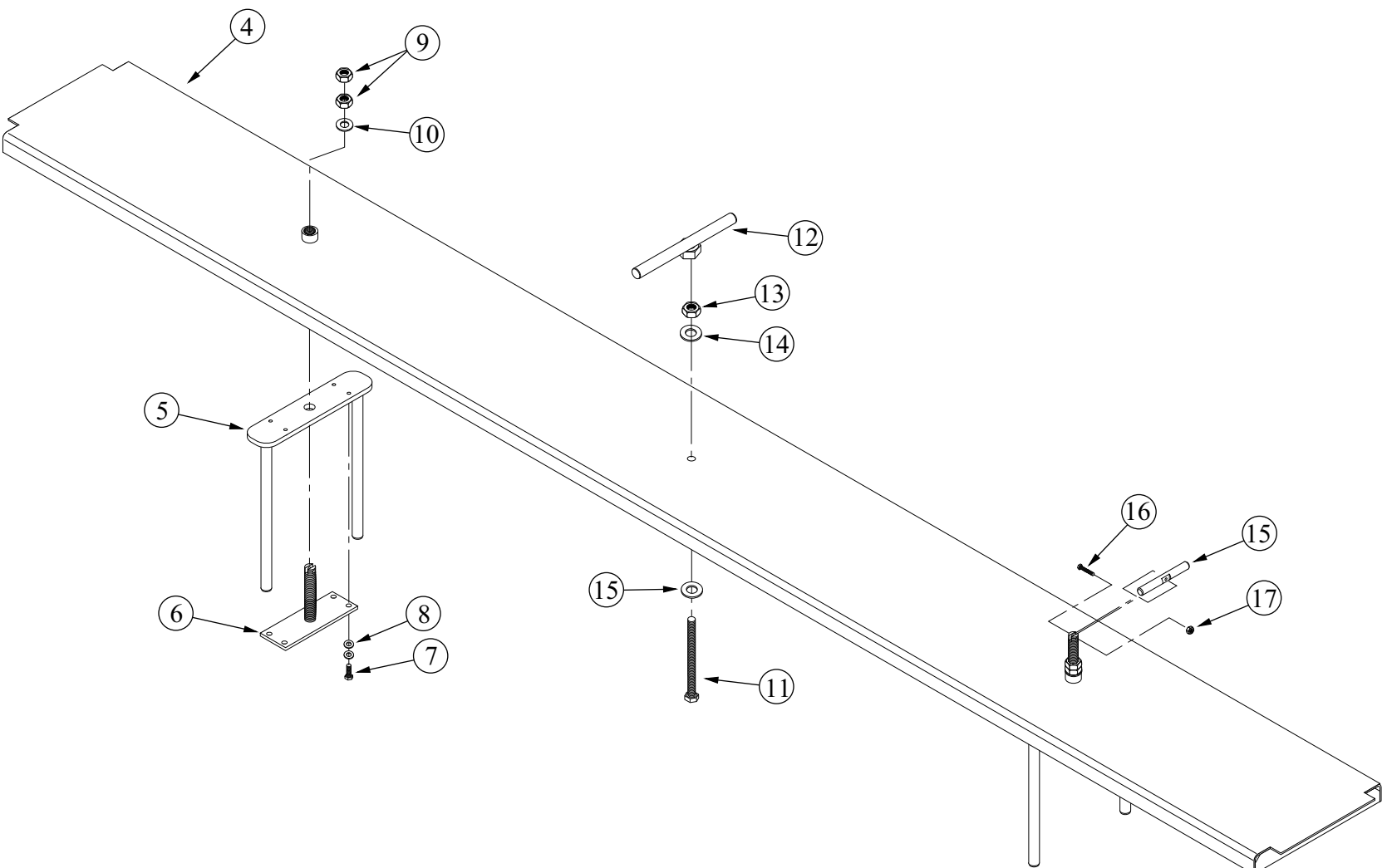
COPPERHEAD XD GRADE ROD

ITEM	DESCRIPTION	PART No.	QTY
1	Tube, Top, Receiver Support, Sds-Ds	720501333-00	1
2	Tube, Mid, Receiver Support, Sds-Ds	720501334-01	1
3	Weldment, Grade Rod Ring, Sds-Ds	720601335-01	1
4	Clamp, 3/4, Seco	740402026-00	1
5	Cap, Grade Rod, Sds-Ds	740801220-00	1

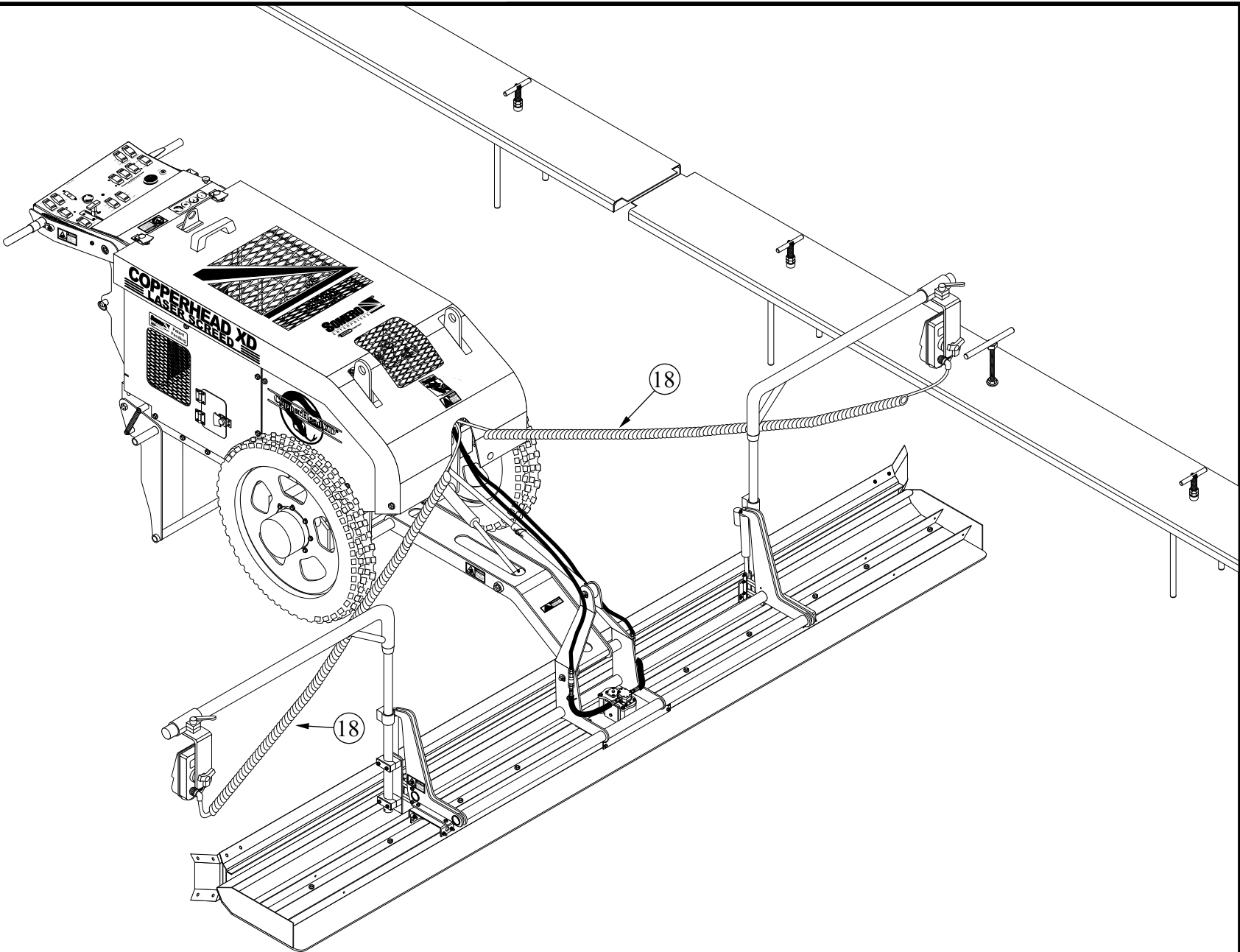
COPPERHEAD XD SONIC TRACER SYSTEM ASSEMBLY



COPPERHEAD XD SONIC TRACER SYSTEM ASSEMBLY



COPPERHEAD XD SONIC TRACER SYSTEM ASSEMBLY



COPPERHEAD XD SONIC TRACER ASSEMBLY

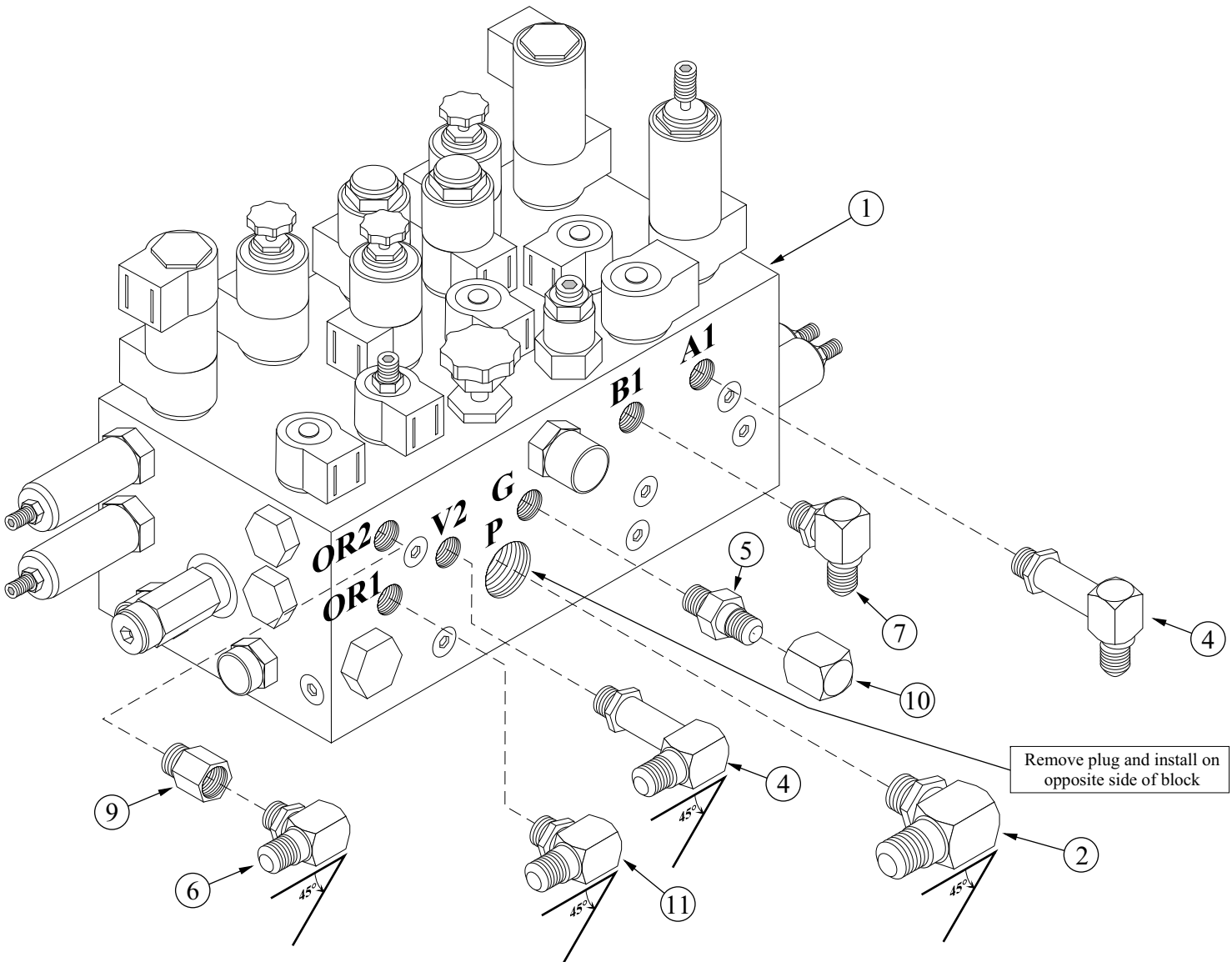
ITEM	DESCRIPTION	PART No.	QTY
1	Tube, Sonic Tracer Mount	720503196-00	2
2	Sonic Tracer Bracket	740801389-00	2
3	Sonic Tracer ST2-25CE	711301042-00	2
4	Top Plate, Sonic Tracer Rail Weldment	720601719-01	2
5	Leg Weldment, Sonic Tracer Rail Assy	720601720-01	4
6	Leg Handle Weldment	720601718-01	4
7	5/16-18 X 3/4 Hx Hd Gr8 Cs Zc	20411-0075	16
8	5/16 Flat Washer Sae Hard Zinc	20402-031	32
9	3/4-10 Hex Nut, Gr8 Zinc	20400-075	8
10	3/4 Flat Washer Sae Hard Zinc	20402-075	4
11	1/2-13 X 6 Hx Hd Gr8 Cs Zinc Fully Threaded	20413-0600	2
12	Carry Handle, Sonic Tracer Rail Assy	720601729-00	2
13	1/2-13 Hex Nut Gr8 Zinc	20400-050	2
14	1/2 Flat Washer Uss Zinc	20404-050	4
15	Handle, Sonic Tracer Rail Assy	720503178-01	4
16	Screw, Pan Head, S/S 10-32 X 1 Slotted	740406012-00	4
17	Locknut 10-32 Zinc	20430	4
18	Coil Cord	710601095-00	2

COPPERHEAD XD 2.0 HYDRAULICS/ELECTRICAL

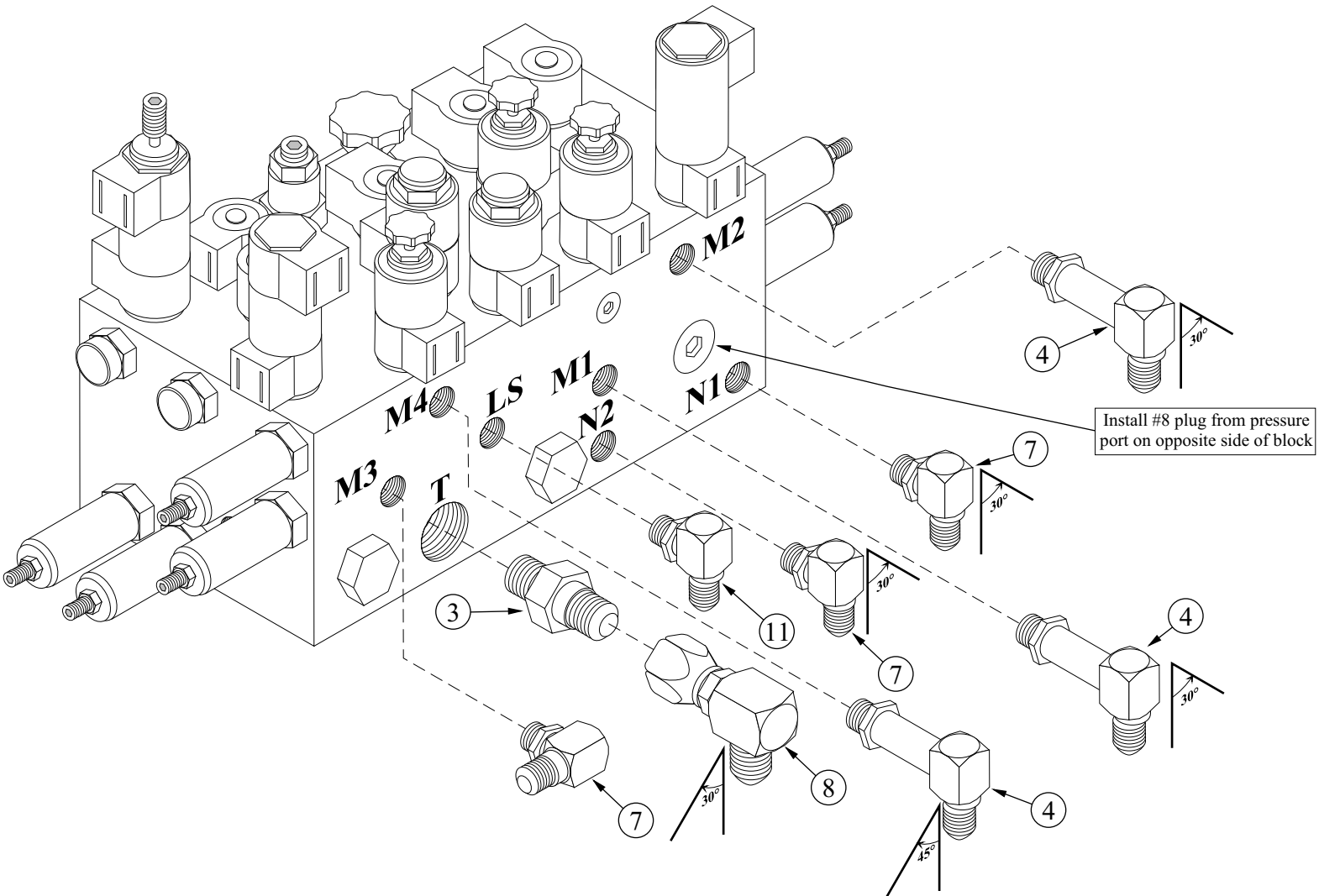
PAGE	DESCRIPTION
50.10	MANIFOLD
50.20	HYDRAULIC HOSES
50.30	ELECTRICAL LAYOUT



COPPERHEAD XD MANIFOLD



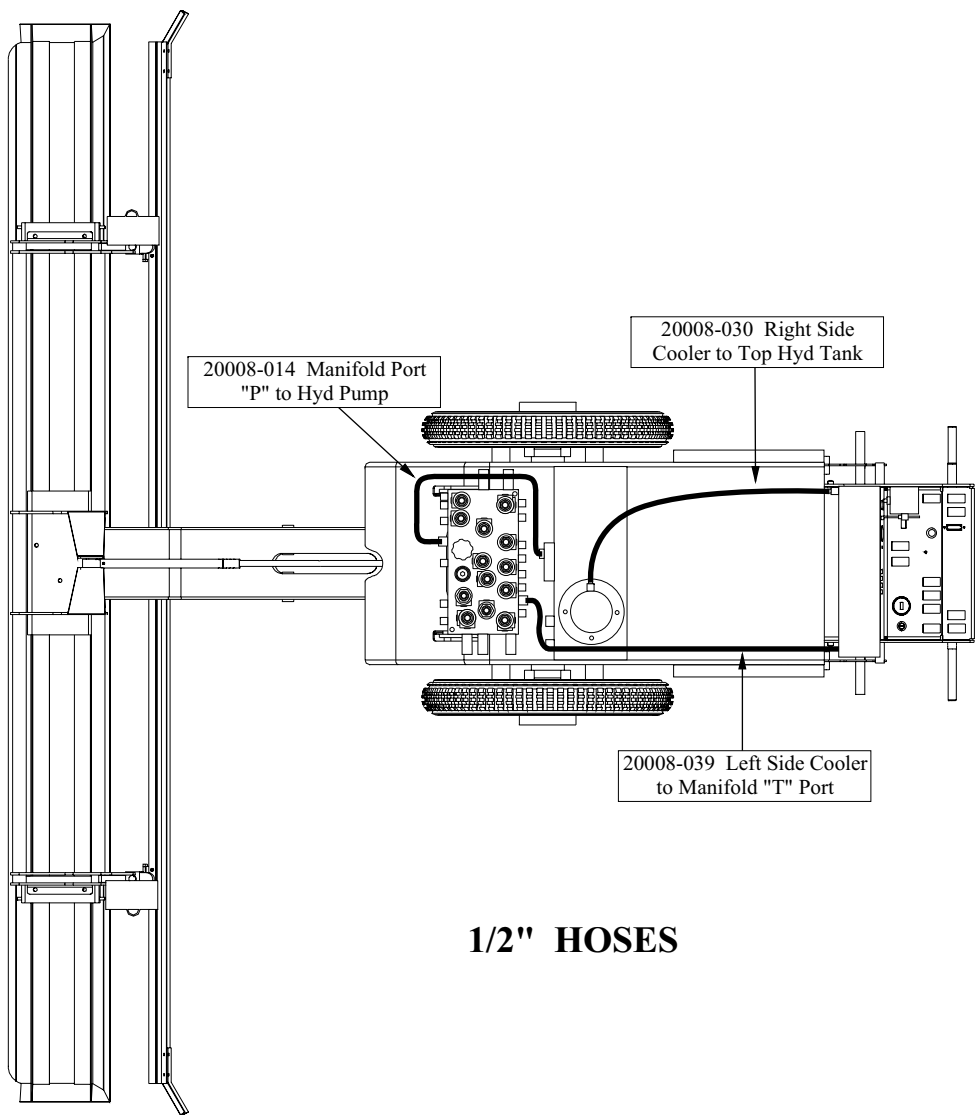
COPPERHEAD XD MANIFOLD



COPPERHEAD XD MANIFOLD

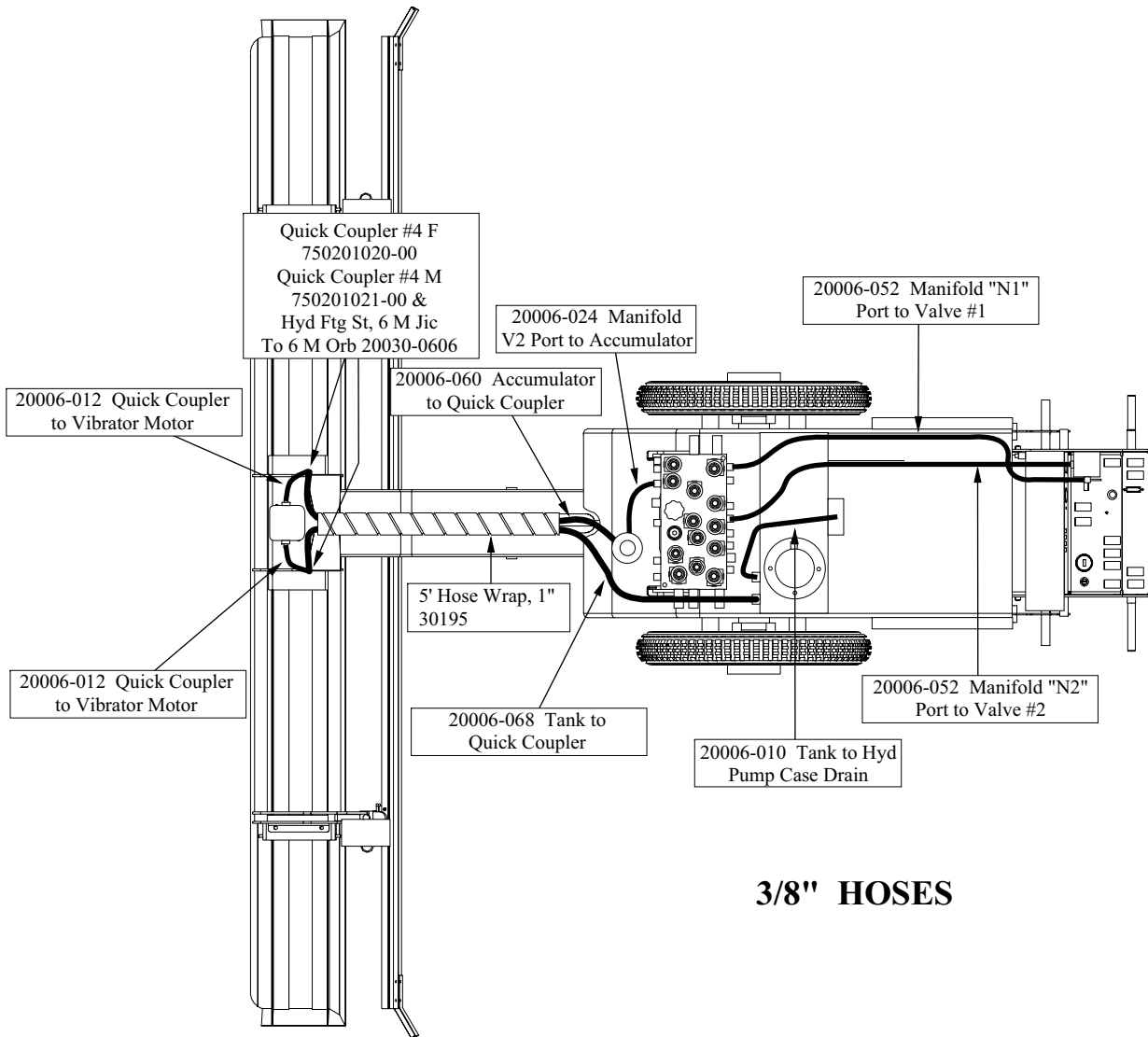
ITEM	DESCRIPTION	PART No.	QTY
1	Hyd Manifold Assembly	751001074-02	1
2	Hyd Ftg 90 Deg Elbow, 8 M Jic To 8 M Orb	20042-0808	1
3	Hyd Ftg St, 8 M Jic To 10 M Orb	20030-0810	1
4	Hyd Ftg 90 Degree Elbow Long 6 M Jic To 6 M Orb	20039-0606	5
5	Hyd Ftg St, 4 Male Jic To 4 Male Orb	20030-0404	1
6	Hyd Ftg 90 Deg 4 M Jic To 4 M Orb	20042-0404	1
7	Hyd Ftg 90 Deg Elbow, 6 M Jic To 6 M Orb	20042-0606	4
8	Hyd Ftg 90 Deg Swivel, 8 M Jic To 8 F Jic	20045-0808	1
9	Hyd Ftg Bushing, 6 M Orb To 4 F Orb	20061-0604	1
10	Hyd Ftg Cap Nut, 4 Jic	20071-0004	1
11	Hyd Ftg 90 Deg 4 M Jic To 6 M Orb	20042-0406	2

COPPERHEAD XD 2.0 HOSES

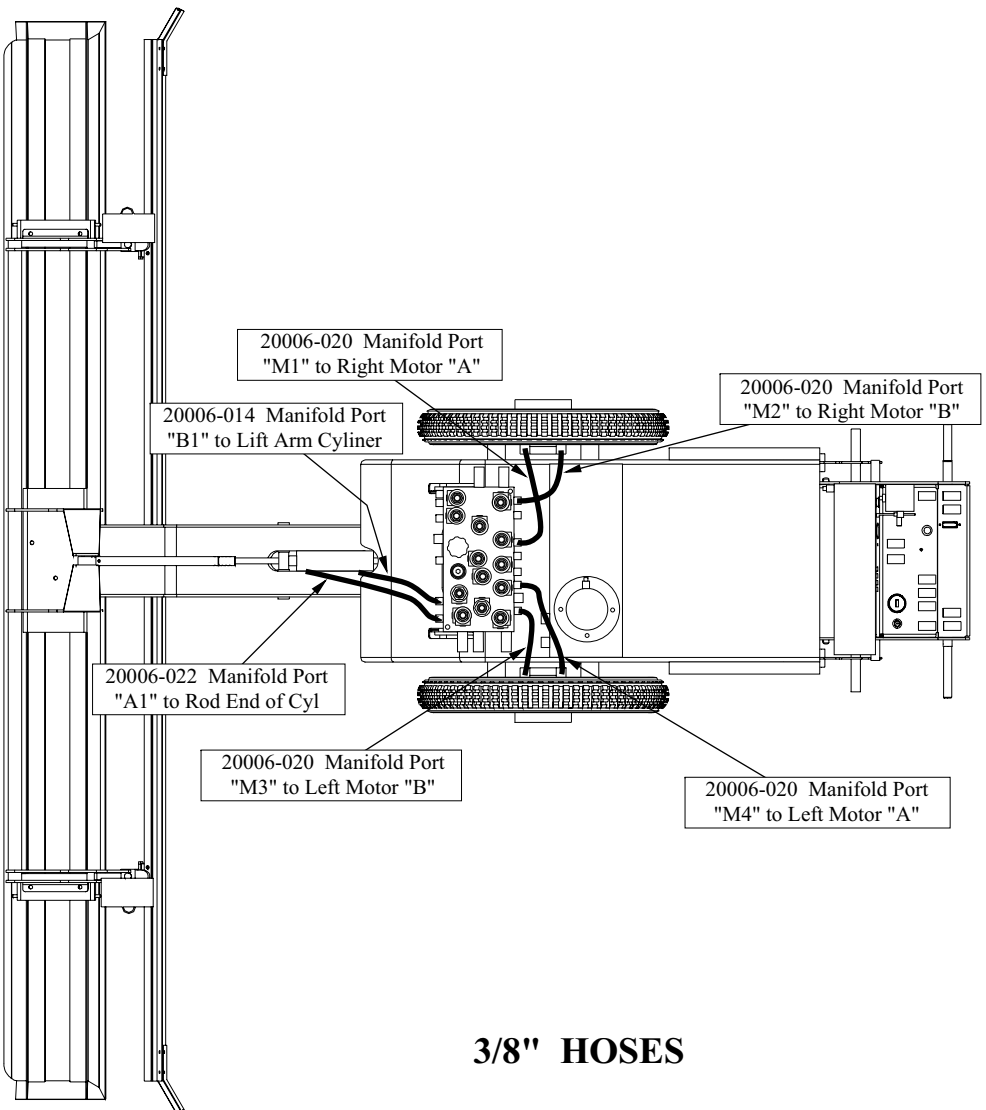


1/2" HOSES

COPPERHEAD XD 2.0 HOSES

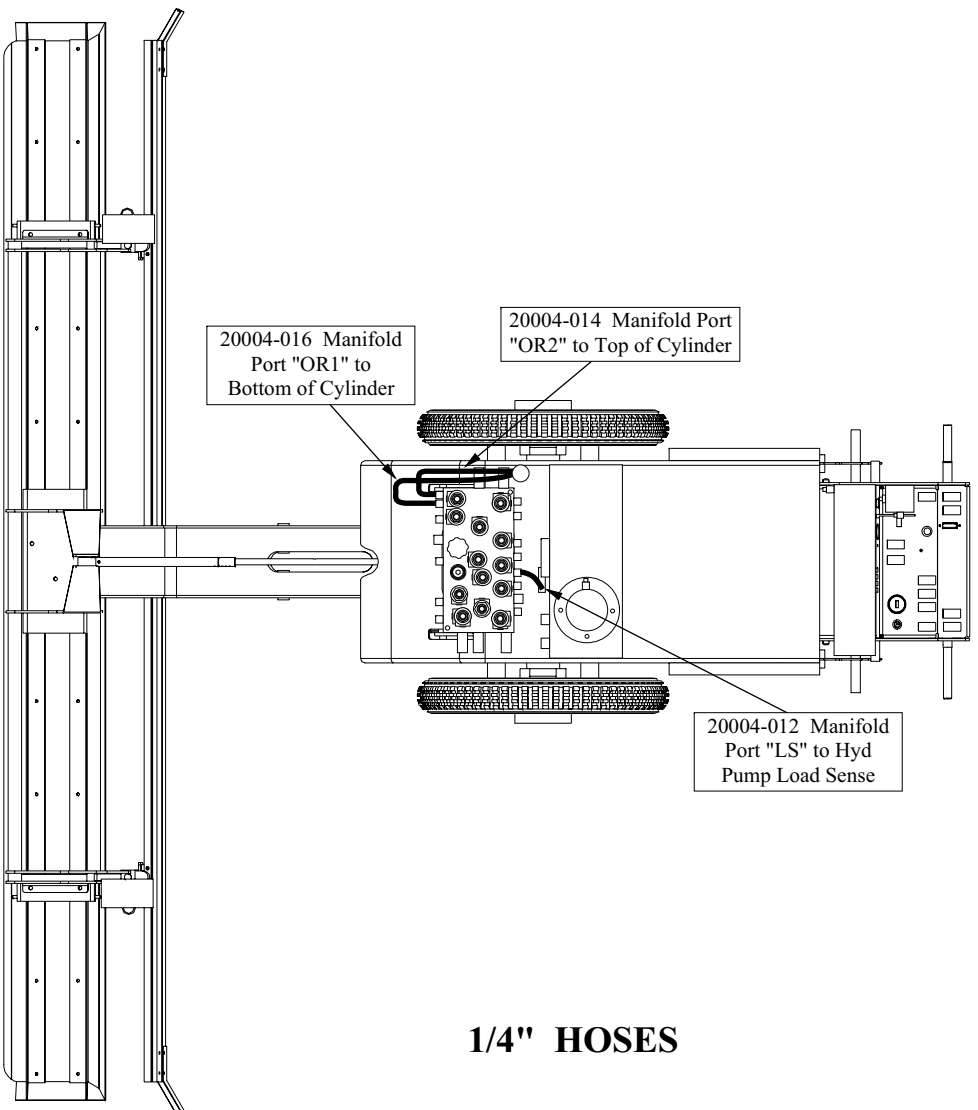


COPPERHEAD XD 2.0 HOSES



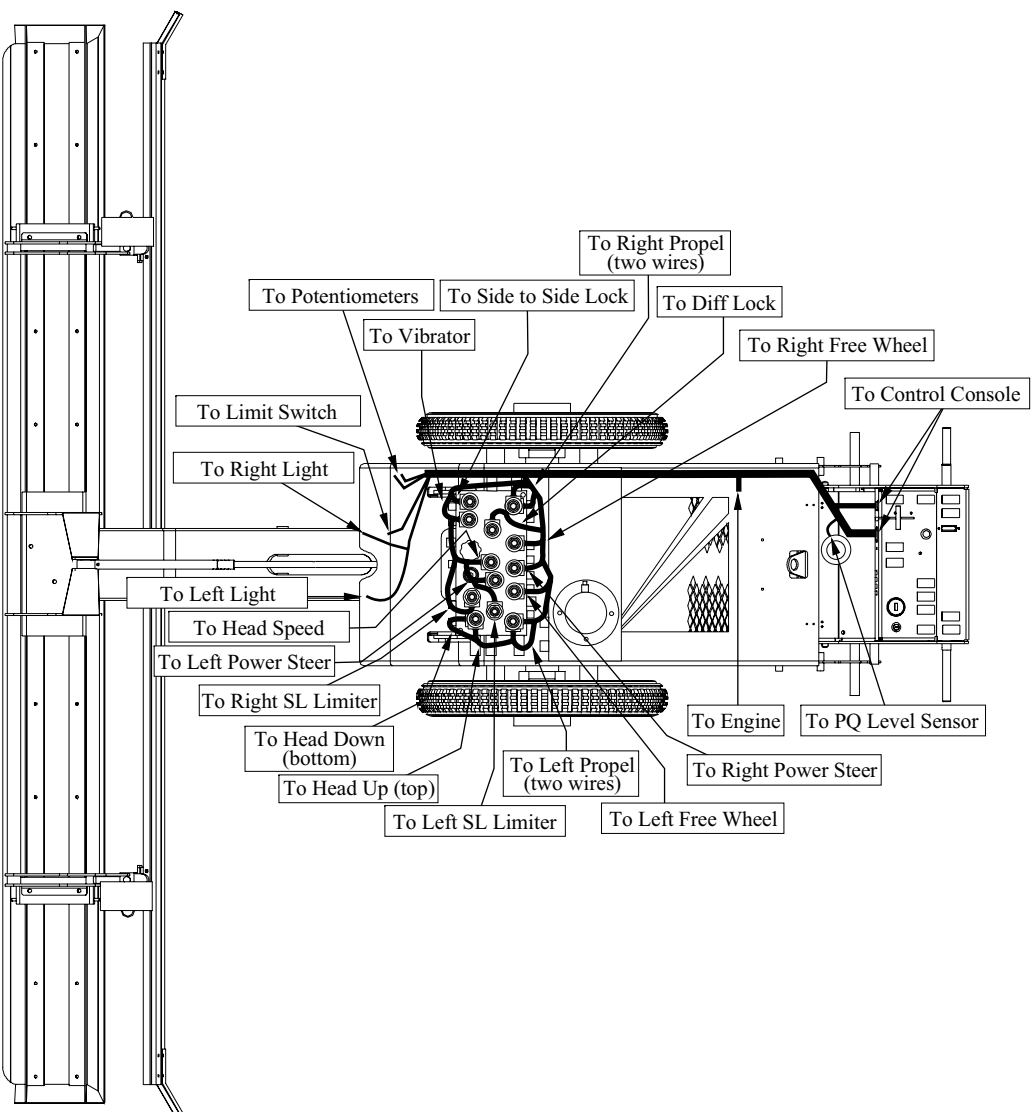
3/8" HOSES

COPPERHEAD XD 2.0 HOSES



1/4" HOSES

COPPERHEAD XD 2.0 ELECTRICAL LAYOUT



COPERHEAD XD 2.0 ELECTRICAL LAYOUT

