



2006 Perimeter Rd. Greenville, SC 29605
 Toll Free: 800-435-9340 - Phone: 864-277-5870
 Fax: 864-235-9661 - www.mightymole.com
 email: mmole@mightymole.com

Safety and Operations Manual CBM 48 Cradle Machine

Table of Contents	Section
Forward	1.0
Hazard Alert Decals	2.0
Operation of Machine	3.0
Repair and Maintenance	4.0
Warranty and Return Good Policy	5.0

California Proposition 65

⚠ WARNING ⚠

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

GENERAL RETURNS OF MERCHANDISE

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

Forward

This manual contains important safety information and operational instructions for your McLaughlin system. Read and understand this manual before operating this equipment. Failure to do so may result in serious personal injury or equipment damage.

Keep the manual with the equipment at all times for future reference. If you sell the equipment, be sure to give this manual to the new owner. A replacement copy of this manual is available through your local McLaughlin dealer or by contacting McLaughlin Group, Inc. directly at:

McLaughlin Group, Inc.
2006 Perimeter Road
Greenville, SC 29605
800-435-9340 Toll Free
864-277-5870 World Wide
864-235-9661 Fax
mmole@mightymole.com Email
www.mightymole.com

The illustrations, instructions and specifications in this manual are subject to change. McLaughlin Group, Inc. reserves the right to make product changes at any time. Contact your McLaughlin Group, Inc. dealer for the latest information on McLaughlin equipment.



WARNING! FAILURE TO FOLLOW ANY OR ALL OF THE SAFETY INSTRUCTIONS IN THIS MANUAL COULD RESULT IN DEATH OR SERIOUS INJURY. DO NOT USE THIS MACHINE IN A MANNER THAT IS INCONSISTENT WITH ITS INTENDED DESIGN!

LIMITED WARRANTY

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

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

THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AND NO REPRESENTATIONS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, (INCLUDING BUT NOT LIMITED TO A WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), ARE MADE BY THE MANUFACTURER IN CONNECTION WITH THE MANUFACTURE OR SALE OF ITS PRODUCTS. NO EMPLOYEE, DISTRIBUTOR, OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY ON BEHALF OF MANUFACTURER THE REMEDIES OF BUYER SET FORTH HEREIN ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER REMEDIES. THE LIABILITY OF MANUFACTURER WHETHER IN CONTRACT, TORT, UNDER ANY WARRANTY, OR OTHERWISE SHALL NOT EXTEND BEYOND ITS OBLIGATION TO REPAIR OR REPLACE, AT ITS OPTION ANY PRODUCT OR PART FOUND BY MANUFACTURER TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP. MANUFACTURER SHALL NOT BE LIABLE FOR COST OF INSTALLATION AND/OR REMOVAL OR BE RESPONSIBLE FOR DIRECT, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE.

Check fluid levels as follows:

Engine - Check oil level daily. Fill with seasonal grade oil as recommended in manufacturers manual. Change oil per manufacturer's recommendation.

Transmission - Fill to check point with EP 90 gear oil. Change after the first 50 hours of use, then every 1000 hours or annually.

Final Drive - Fill to check point with EP 90 gear oil. Change after the first 50 hours of use, then every 1000 hours or annually.

Winch Drive - Check oil level monthly. Fill with oil recommended in manufacturer's manual which is based on ambient temperature during operation. Change initial lubricant after the first 10 hours of operation, then every 250 hours of operation or annually.

Hydraulic Reservoir - Fill oil to high level mark on sight gauge (retract hydraulic cylinders). Change oil after first 1000 hours of use, then annually. Recommended hydraulic oil is ISO grade 46.

Hydraulic Filter - Replace with every hydraulic oil change and every 750 hours or three months.

Fuel - Refer to engine manual supplied for diesel fuel grade recommendations.

Auger Couplings - Clean and coat with light oil after use.

Cutting Heads - Examine teeth and replace as necessary before use. Check all conical bits on rock heads for rotary freedom. Check condition and freedom of wing cutters.

Auger - Examine after use for fractures and weld repair as needed.

Hazard Alert Decals

BE AWARE OF SAFETY INFORMATION

This is the safety-alert sign. This symbol is placed in the manual and on your machine to alert you to potential bodily injury or death.



SIGNAL WORDS

The safety-alert icon is used with the following signal word: **DANGER, WARNING, AND CAUTION**. When you see these words in the manual or on decals on your machine, care fully read and follow all instructions. Watch for these words and learn their meanings.

DANGER Imminent hazard which, if not avoided, will result in death or serious injury.



WARNING Potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION Potentially hazardous situation which, if not avoided, may result in minor personal injury or property damage.



READ YOUR OPERATOR'S MANUAL

Read and understand the operator's manual for your machine. Do not operate your machine unless you have read and understand the warnings and instructions contained in it. Contact your McLaughlin dealer if your manual becomes damaged or lost.

Keep hands, feet and clothing away from moving parts.

Keep all shields and guards in place. Do not modify or remove guards.

Turn off the machine before servicing.



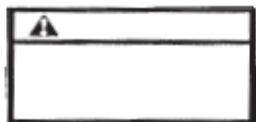
Specific Hazard Alert Symbols

READ MANUAL

Carefully read and understand all safety decals and proper operating techniques.

The safety decals in this manual contain important information. Understanding these decals will help you operate your equipment properly. Replace missing or damaged decals.

Allow only authorized personnel to operate equipment. Closely supervise inexperienced operators.



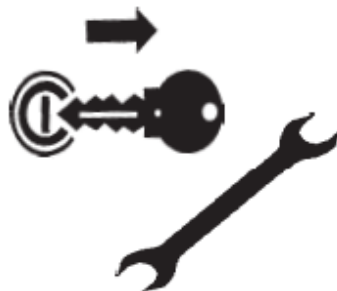
SERVICE AND MAINTENANCE

Make sure the machine is always in good working condition. Safety devices must always be installed and be functioning properly.

Check machine daily before operating.

Do not modify this machine. Use only McLaughlin repair parts

Follow service and maintenance intervals.



PERSONAL PROTECTIVE EQUIPMENT

Proper protective equipment is required for safe operation of this equipment.

Protective Equipment:

1. Hard hat
2. Safety Glasses/Shield
3. Safety Vest
4. Ear Protection
5. Electric Gloves
6. Electric Boots

Wear close fitting clothes.

Avoid jewelry such as bracelets, necklaces and watches. Restrain long hair.



Repair and Maintenance:

Carriage/Frame

Check bolts that mount chuck to the drive shaft flange of the machine initially then check each week when in continuous use. Each bolt should have a lock washer. Tighten as needed.

Check carriage mounting bolts to frame initially then check each week when in continuous use. Tighten as needed.

Check all hydraulic fittings initially then check each week when in continuous use. Tighten as needed; be careful not to twist hoses from original positions.

After each boring operation is completed, clean carriage and frame to remove dirt and mud. Use water if available. Be careful not to use high pressure water on electrical or hydraulic connections.

Engine

Review the engine manual supplied before starting and operating the engine. Follow manufacturer's recommendations for operation and maintenance to maintain your engine warranty.

Winch

Review the winch manual supplied before starting and operating the engine. Follow manufacturer's recommendations for operation and maintenance to maintain your winch warranty.

Check winch cable before and after each bore for frays or flattening. Replace the winch cable if visible defects are present. The cable supplied with the winch is 3/4" 6X37 domestic wire rope. Replace the cable with equivalent to ensure safe operation.

Once the connection is made with the snatch block and dead man sling, the operator can then retract the winch cable uniformly to remove slack and prepare for boring. Pipelayer 2 will need to reattach to the casing end to help position the casing on the bore target.

Ensure that the casing is inline and on grade. Grade should be checked while machine is not boring. The operator should use the range poles (above bore target) for sighting the straight line bore. Pipelayer 1 should travel beside the boring machine during operation and Pipelayer 2 should support casing end until the casing is into the ground enough to support itself. While boring, winch speed should be adjusted to accommodate the cutting rate with soil conditions.

Once the bore is completed, turn off the machine and remove the auger pin. Turn the machine on and extend the casing lockdown cylinders so the bore casing can be free. Disconnect the snatch block from the dead man sling and retract the cable until the snatch block is safely retained in front of the winch. The operator should then turn the machine off and exit the pit. Use Pipelayer 1 to move the cradle boring machine away from the casing and out of the pit while leaving the bore casing in the ground.

Before the bore casing can be removed, the drilling head will need to be removed. When removing the drilling head the cradle machine must be shut off and the operator **WITH THE IGNITION KEY IN HAND** should observe the removal of the cutting head. Once the drilling head is removed, the carrier casing should be welded to the bore casing on the end where the drilling head has been removed. Use dozers and excavators to pull the bore casing and carrier casing through the bore. The bore casing can then be cut from the carrier casing once the carrier casing has protruded through the bore target. Reattach the drilling head and remove the bore casing from the pit. The cradle boring machine and bore casing are now ready for transport to the next bore.

LOCATE UNDERGROUND UTILITY LINES

Before starting work, make sure all underground utilities have been properly located.

Inadvertent contact with buried utilities may cause death or serious injury. Contact with electric lines can cause electrocution. Contact with gas lines can cause explosion or fire.



MOVING PARTS

Keep hands, feet and clothing away from moving parts.

Keep all shields and guards in place. Do not modify or remove guards.

Turn off the machine before servicing.



HIGH PRESSURE AIR AND FLUIDS

This machine may use water, air, and hydraulic fluid at high pressure.

Water from wand and air from lance can cause serious injury. Wear protective clothing.

Relieve pressure before servicing.



FLAMMABLE LIQUID

Fumes and/or fuel can explode or catch fire.

Shut off engine before refueling.

Keep engine and trailer free of fuel. Wipe up any spilled fuel immediately.



Operation of the Machine:

The cradle boring machine is a specialized piece of equipment and must always be operated with caution by an experienced operator. Never allow inexperienced personnel operated this machine. All operators must read and fully understand this manual before starting or using the machine. Refer to the parts manual for your machine regarding specific instructions on machine maintenance.

This machine is equipped with an Emergency Stop Button located at the operator's station. This button must be pulled up (out) before the engine will start. The engine can be quickly shut down during use by simply hitting the red mushroom cap. The EMERGENCY STOP BUTTON should also be down (in), even when the key has been removed from the START switch, to provide an additional safety precaution whenever personnel are working on the machine or near the auger string.



WARNING - Always check that the dial control for the winch is operating properly and the valve is centering to neutral when the dial is in the 12 o'clock position.

The operator station on the CBM-48 is on the top of the carriage. A seat with lap belt is provided to secure the operator while boring. The auger rotation speed is controlled by the engine throttle regulator and the gear selected. The direction of the rotation (Forward-Reverse) is controlled by the transmission. Gears 1-5 will rotate the auger clockwise (Forward) as viewed from the rear of the machine. Reverse gear will rotate the auger counterclockwise (Reverse) as viewed from the rear of the machine. Note the torque available at the drive chuck is a function of the gear selected. The highest torque is in 1st and Reversed gears. A hydraulic clutch with operator presence control is provided to engage and disengage the final drive from the engine. A neutral gear is provided to allow the engine to run without turning the drive chuck.



DANGER – Rotating auger and cutting head will cause death or serious injury. Stay away. Do not wear loose clothing.

Doing the Bore:

The casing should be installed on the cradle boring machine before lowering into the pit for the bore. Rest the front of the lead section in the saddle/shoe and rotate the chuck until the hole is aligned with the hole in the auger shank pin hole, **ADVANCE** the machine to couple the hex joint, **SHUT DOWN** the engine and install an auger pin while reaching through the cutout on the right side of the machine. Make sure the casing is pushed up against the thrust plate and proceed to adjust casing lockdown chains. The casing lockdown linkage should be fully extended before latching chains. Ensure that only one personnel worker is performing the chain adjustment, latching, and controls activation. Once all chains are adjusted and latched, the operator can then use the controls to activate the casing lockdown cylinders.

Two (2) pipelayers will be required to complete the bore. Check that the pipelayer's lifting capacities are rated to hold cradle boring machine and casing weight. During the boring operation and transport in and out of the pit, Pipelayer 1 should ALWAYS be supporting the cradle boring machine.

Pipelayer 1 will be used to carry the cradle boring machine and attached casing, without operator on machine, to the pit entrance ramp. Pipelayer 2 will be used to carry the end of the casing to the end of the pit for resting the casing end on the bore bench under the bore target. Once both Pipelayers and the cradle boring machine are safely positioned in the pit, the operator can enter the machine for boring operations.

Once the operator is safely positioned on the machine, the operator will need to use the controls to work in conjunction with Pipelayer 2 to get the winch cabling and snatch block positioned for pulling. Pipelayer 2 will travel to the cradle boring machine and connect to the snatch block for pulling the winch cable out and connecting to the dead man pipe sling. The operator will need to free spool the winch while Pipelayer 2 is traveling to the dead man pipe sling.

Above the bore target should be a dead man pipe for winching connection while boring. See the diagram for detailed dimensions. A thirty (30') foot long heavy wall (1/2" Minimum) pipe (16-36" Diameter Minimum) should be used as the dead man anchor. A high load (125,000 lb capacity) sling should be used for the snatch block mount.



Warning - This machine is equipped with a hydraulic clutch operator presence control. Read and understand operating instructions before using. Failure to comply can result in serious injury or death.

The hydraulic clutch uses compressed hydraulic oil within a hydraulic cylinder to sandwich steel discs and fiber plates together to join the drive train. This action takes place in less than one second. Conversely, when the hydraulic system is depressurized, the plate and discs separate in the same time-frame. When used in a horizontal boring application, the clutch is pressurized to activate the rotation of the machine's drill string. The machine operator does this by actuating an electric solenoid-operated hydraulic valve that sends the pressurized oil to the clutch. **THE OPERATOR MUST BE SEATED AND HOLDING THE OPERATOR PRESENCE CONTROL CONTINUOUSLY DURING THE DRILLING OPERATION.** If it becomes necessary to disengage the drive, releasing the operator presence control handle will deactivate the clutch therefore stopping the driveline from rotating. The seat is also equipped with an operator presence switch.

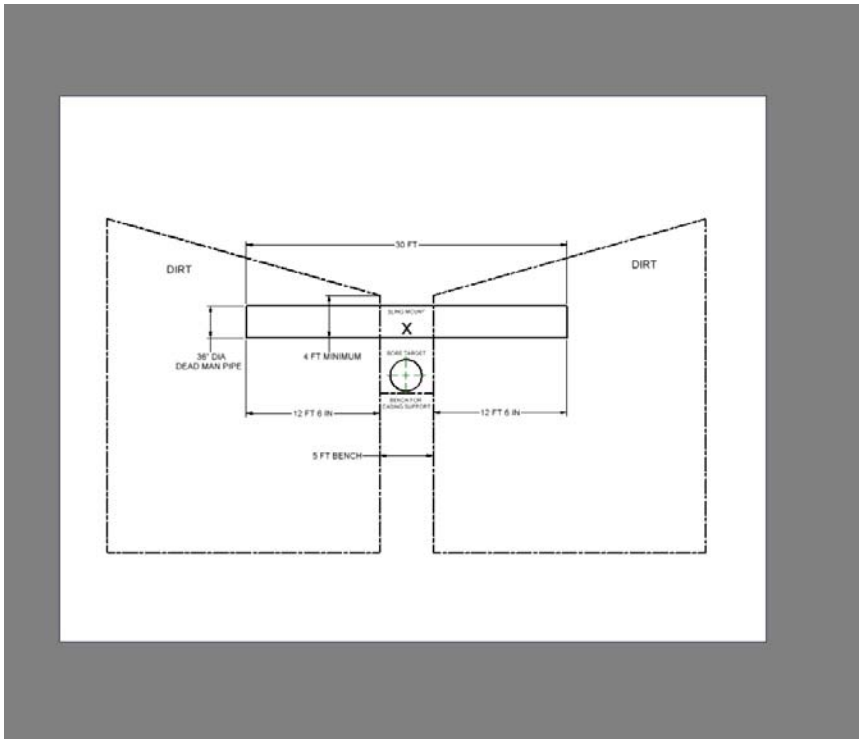


Danger - Operator control device - Do not alter, modify, or defeat. Failure to comply will result in serious injury or death.

TESTING THE HYDRAULIC CLUTCH

Before beginning the bore, check to make sure that the Hydraulic Clutch is functioning properly.

1. Start the engine and set the engine speed to low idle.
2. Place the transmission into one of the forward gears.
3. Position the clutch toggle switch, located on the joystick control handle, to the ON position.
4. Grasp the control handle. Make sure to engage the Operator Presence Control located on the front of the joystick control handle and observe the movement of the driveline in the clockwise direction.
5. Release the Operator Presence Control handle and observe that the driveline has stopped turning.



6. Place the transmission into reverse gear and repeat steps 1-5. The rotation of the driveline will now be counterclockwise.

ONCE THE SYSTEM HAS BEEN SATISFACTORILY TESTED, THE BORING OPERATION CAN BEGIN. IF THE HYDRAULIC CLUTCH DOES NOT FUNCTION PROPERLY, SHUT DOWN THE MACHINE AND HAVE SERVICE PERFORMED BY A QUALIFIED MECHANIC.

When operating this machine, always be aware of engine "lugging". Whenever these conditions occur, use caution while winching and rotating augers forward until the obstruction has passed.



Danger - Machine upset will cause death or serious injury. To avoid upset, follow instructions in operating manual.

The machine is suspended during operation and force is applied to the casing by the winch pulling the machine towards the bore target. The winch has two speeds for both retracting and extending the cable. During the boring operation, the winch should always be in the Low Speed setting while the driveline is turning. This ensures smooth winch pulling and maintains operator control. The winch direction is controlled by a rotating dial on the operator console. The dial pointer in the 12 o'clock position indicates the valve is in the neutral position and the winch is **NOT** retracting or extending the cable. The dial can be rotated clockwise and counterclockwise to change winch direction for retracting and extending the cable. The dial will only function when the winch control toggle switch is activated on the joystick control handle. The operator presence control handle must also be held and the operator seated with lap belt attached for the winch dial control to function properly.

The machine is equipped with a casing lockdown feature which, when activated, will hold pressure on the casing and automatically energize to tighten the casing if pressure loss is sensed. The chain length must be adjusted to provide minimal slack before the casing lockdown cylinders are engaged. The controls for the casing lockdown cylinders are located beside the winch and within close proximity to the lockdown device to ensure safe operation of the controls.

It is recommended that only one (1) person adjusts the casing lockdown chains and operate the casing lockdown controls.

Danger - Pinch point at casing clamp lockdown. Stay clear. The primary hydraulic system relief on all Mclaughlin machines is factory set to protect the components of the particular machine and maintain intended functionality. Operation at settings that exceed the factory value will damage the winch and related components. Do not adjust relief pressure settings.



Preparing to Bore:

Before the entrance pit is constructed, all utility companies are to be contacted to determine the location of existing services in the path of the proposed tunnel. The working area at the site must be closed to all personnel not directly associated with the job. All crew personnel should be instructed in job safety and what their specific responsibilities will be for the job.

Pit preparation for cradle boring is a key element in ensuring proper functionality and safety of machine while operating. All excavations on the job site must be constructed in accordance with Federal and local regulations. OSHA regulations concerning excavation change from over time. Make sure the pit excavation is in accordance with the latest OSHA regulations. Copies of the OSHA regulations are available free of charge by writing:

OFFICE INFORMATION & CONSUMER AFFAIRS
US DEPT OF LABOR
OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
200 CONSTITUTION AVENUE
WASHINGTON, DC 20210

The width and slope of the pit must be governed by the desired depth of the bore, soil conditions, and current OSHA trench excavation requirements on sloping and shoring.