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OPERATOR'S MANUAL

**CONTAINS:
COMPONENTS AND
REPAIR SECTIONS**

**MODEL M3800
MOLEING MACHINE
PART NO. M180000**

Manual Part No.: E250010



Machine Serial # _____

Purchased &
Serviced Thru: _____

Purchase Date: _____

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Revision Date: 08.28.07

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MACHINE SAFETY AND OPERATION

M3800

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 words: DANGER, WARNING and CAUTION. When you see these words in the manual or on decals on your machine, carefully 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: This machine is designed to produce holes up to 2" by screw comaction in the advance direction, and up to 3 1/2" by screw compaction in the retract direction. It requires both an experienced operator and helper. **NEVER WORK ALONE. READ AND UNDERSTAND OPERATION MANUAL PROVIDED.**



Specific Hazard Alert Decals

UNDERGROUND UTILITIES: Before starting work contact the local "one call" service in advance to mark all underground utilities. Make sure all underground utilities have been properly located, paying attention to any questionable areas in the immediate digging or boring area. Expose any utilities by non-destructive means before working.

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.

Know where and what type of utilities are in the area and how deep they are located.



MACHINE SAFETY AND OPERATION

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ENTANGLEMENT HAZARD: The normal use of this machine requires rotating parts, in the form of the drill string, cutting head and reamer, to be exposed in front of the machine.

The machine is to be shut down whenever work is required on the drill string, or any rotating parts. This machine is **NEVER** to be operated with personnel near the drill string, except for the initial start of the MOLEING HEAD.

Never stand on or straddle the drill string, and avoid gloves and loose clothing on the job.



Inadvertent contact with drill rod, cutting head and/or reamer will cause death or serious injury.

Always use a rod guide when positioning drill rods during operation.

When removing cutting head, operator must shut down machine - then attend the removal of cutting head on exit side.

MACHINE UPSET: In order to “screw” the MOLEING HEAD into the ground, the machine must resist the torque applied to the rods by the engine. Under normal use the machine is stable, but if the head catches on an obstruction in the ground and the rotation stops suddenly, the machine can upset to the left. All MIGHTY MOLES are equipped with a safety device in the form of an **OPERATOR PRESENCE CONTROL** that will stop the action of the machine when released. The Operator Presence Control (OPC) is located on the left hand grip of the M3800.



The drill rods are designed with a limited measure of flexibility to allow insertion into the ground with the machine at a different elevation than the tunnel. If an excessive amount of rod is exposed behind the pit, and if the operator tries to aid the machine by pushing it, the rods may “whip.” McLaughlin Group Inc. expressly limits the number of exposed rods behind the entrance pit to 2, during either insertion of the rods or removal of the rods.

Machine upset will cause death or serious injury

Inadvertent contact with underground obstacles may cause the machine to roll over. Operate only from designated operator position, see diagram on page 1.3.1.

DO NOT disable Operator Presence Control.

Keep others away from machine when in operation.

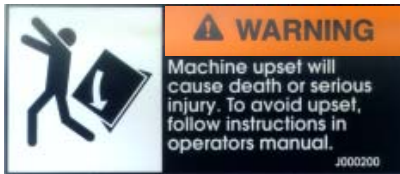
AVOID DEATH OR SERIOUS INJURY

Refer to warning decals on the machine for safety instructions and to the Accident Prevention page of this manual for safety instructions and safe operating procedures.

MACHINE SAFETY AND OPERATION

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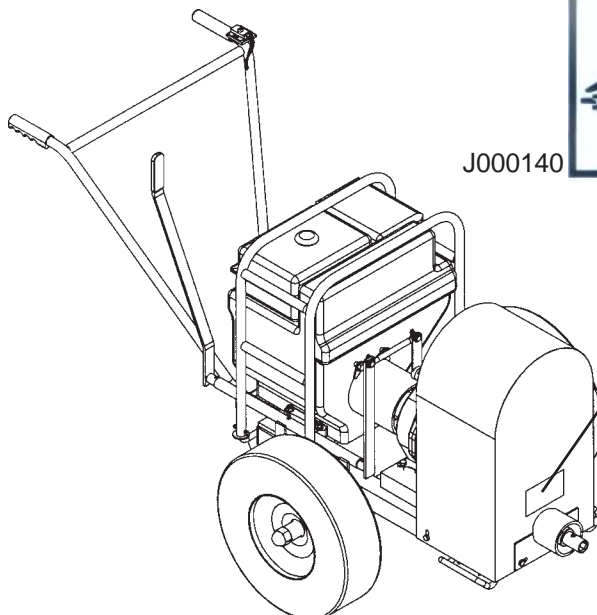
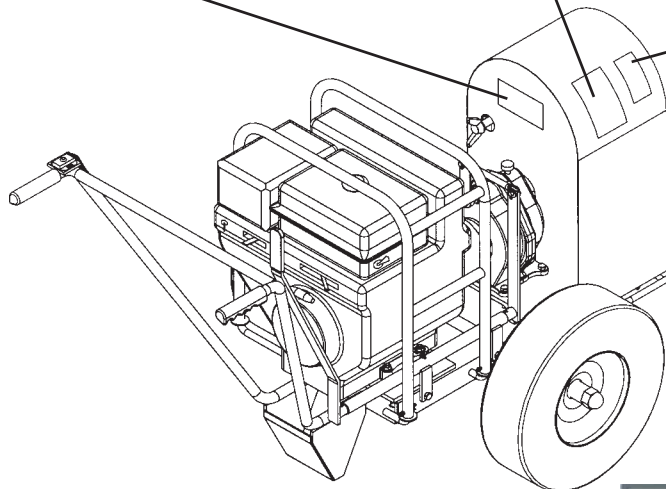
Warning Decal Placement



J000060



J000210



J000140



MACHINE SAFETY AND OPERATION

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LOCATION OF CONTROLS

OPERATOR PRESENCE CONTROL SWITCH (HOLD TO RUN)

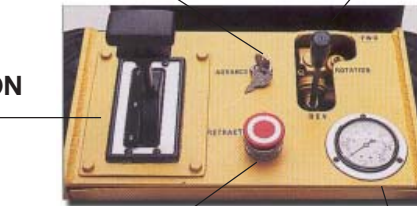
DESIGNATED OPERATOR POSITION



ENGINE START

ROD ROTATION FWD - REV

TRANSMISSION LEVER FWD - REV



EMERGENCY SHUT-OFF

PRESSURE GAUGE

JOBSITE

Before the entrance trench is constructed, contact the local "one call" service and all other underground plant owners to determine the location of existing services in the path of the proposed bore. DO NOT start excavating or boring until the area has been marked and cleared.

Working excavations more than 4 feet deep, must be constructed in accordance with Federal and local regulations. This is the responsibility of the contractor. McLaughlin recommends that the contractor be familiar with the requirements of (OSHA) regulations.

The working area at the site must be closed to all personnel not directly associated with the job. McLaughlin

Heavy duty rod M1575-1" (2.5 cm dia.) requires an entrance pit that is at least 10 times the depth of the entry point.

OPERATION

The engine ignition circuit is controlled by the Operator Presence Control (OPC) on the left side of the handle. Holding the OPC DOWN will allow the engine to run. Releasing the OPC will cause the engine to STOP.

The drill rod rotation speed is controlled by the throttle setting of the engine. The direction of the rotation is selected by the gear shift (FORWARD - NEUTRAL - REVERSE).

The ADVANCE of the drill rod and machine is caused by the "screw" action of the MOLE or REAMER selected for use. When MOLEING, the machine will ADVANCE when the transmission is in FORWARD, and RETRACT when the transmission is in REVERSE. When REAMING, the opposite action occurs and the machine will RETRACT when the transmission is in FORWARD and ADVANCE when the transmission is in REVERSE.

MACHINE SAFETY AND OPERATION

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When operating this machine, always be aware of any slight tipping of the machine, or engine “lugging”. Whenever these conditions occur, be ready to release the Operator Presence Control immediately.

Select the moleing head to be used, and couple it to the lead section of rod. Couple additional rods as necessary to the lead section so that at least one full rod is on the ground behind the entrance trench. **NO MORE THAN 2 EXPOSED RODS, BEHIND THE ENTRANCE TRENCH, ARE TO BE COUPLED TO THE MOLEING MACHINE AT ANY TIME.**

ROD CONNECTION

McLaughlin drill rods use a snap button connector for assembly. This provides a secure, flush connection that will pass through the compacted hole without interference. **DO NOT SUBSTITUTE PINS OR BOLTS FOR McLAUGHLIN SPRING-LOADED BUTTONS.**

STARTING THE MOLE

A Helper and an Operator are required to safely operate McLaughlin Moleing Units. The Helper is required to hold the rods in starting position with the ROD GUIDE TOOL. (See Fig.2)

McLaughlin Mfg. Co. prohibits the use of hands or any other tool other than the ROD GUIDE TOOL (provided) for starting the rods or aligning the MOLEING HEAD.

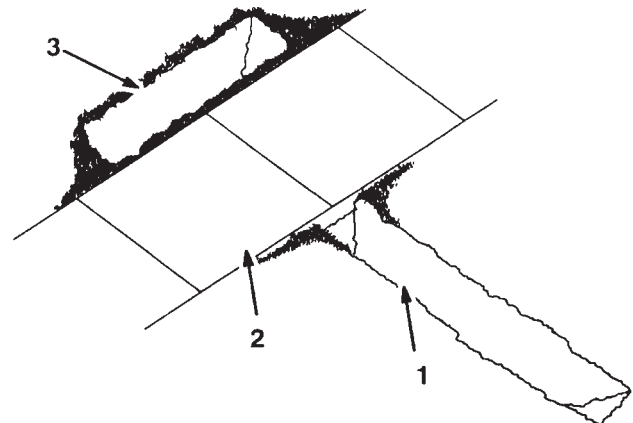
The position for the Helper is on top of the bank, on the right side of the trench with the tool just behind the moleing head. **AT NO TIME, SHALL PERSONNEL, BE IN THE ENTRANCE TRENCH WHEN THE MACHINE IS IN OPERATION.**

The Operator is ALWAYS in attendance at the machine and the Helper is responsible for the direction of the bore, and attaching the tools and the service to be installed. As soon as the MOLEING HEAD has entered the face, the machine is to be shut down, and the rod guide removed.

At this point, the grade of the rods should be checked with a LEVELING TOOL to assure that the bore has been started within specifications. If the LEVELING TOOL indicates that the first rod is not within grade tolerance, the rod should be withdrawn and restarted.

Clear the area and start the machine. Use FORWARD rotation and the drill stem will advance itself into the face by the “screw” action of the MOLEING HEAD. When using the Mighty Mole for IN-LINE BORES water services 48” to 60” (1.2m to 1.5m) below the surface, allow the machine to advance until approximately 6” (15.2 cm) of the rod protrudes from the face.

Fig. 1



- 1. Entrance trench
- 2. Sidewalk
- 3. Exit trench

Stop advancing, shut down the machine, uncouple the rod at the chuck using the UNCOUPLER, and move the machine back to install another rod section. Continue to install rods until the exit trench area has been reached.

When using the Mighty Mole for SURFACE BORES below the surface, allow the machine to advance until it has reached the rear of the entrance trench. Stop advance, shut down the machine, uncouple the rod at the chuck using the UNCOUPLER and move the machine back to install another rod section. Continue to install rods until the exit trench area has been reached.

MACHINE SAFETY AND OPERATION

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Stop advancing, shut down the machine, uncouple the rod at the chuck using the UNCOUPLER, and move the machine back to install another rod section. Continue to install rods until the exit trench area has been reached.

Fig. 2

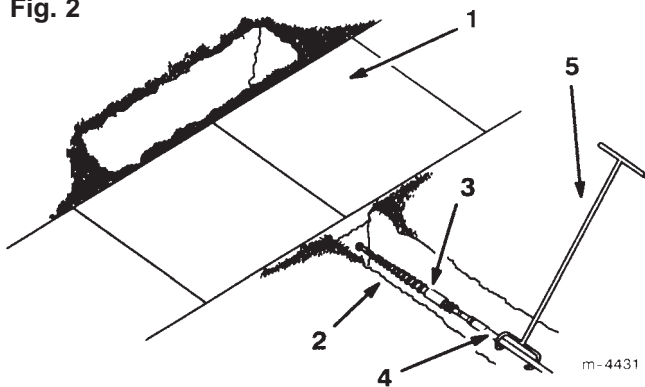


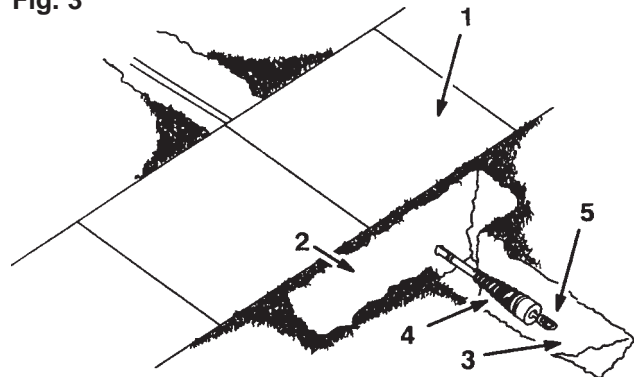
Figure 4

- | | |
|-------------------------|-------------------|
| 1. Sidewalk or driveway | 4. Rod |
| 2. Entrance trench | 5. Rod guide tool |
| 3. Boring bit | |

When using the Mighty Mole for SURFACE BORES below the surface, allow the machine to advance until it has reached the rear of the entrance trench. (See Fig.2)

Stop advance, shut down the machine, uncouple the rod at the chuck using the UNCOUPLER and move the machine back to install another rod section. Continue to install rods until the exit trench area has been reached.

Fig. 3



- | | |
|-------------------------------|-----------|
| 1. Sidewalk or driveway | 4. Reamer |
| 2. Exit trench | 5. Swivel |
| 3. Shovel dug area around bit | |

REAMING OPERATION

Shut down the machine then, with both the Operator and Helper, open the exit trench, locate and uncouple the MOLEING HEAD. Couple a REAMER to the end of the exposed rod and attach the service to be installed to the swivel on the REAMER.

The Helper must not guide or touch the service being installed. The Helper must stay 10' from the service being installed. Failure of the swivel or unforeseen ground friction may make the service rotate and become an entanglement hazard. The Helper should notify the operator by radio if this happens.

Station the Helper at the exit trench to watch the service if necessary, and to secure the area while the work is being done. He should be in radio contact with the operator. Clear the entrance trench area and start the machine. (See Fig.3)

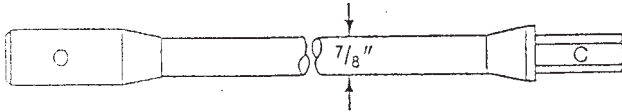
Use FORWARD rotation and the drill stem will RETRACT itself back into the entrance trench by the "screw" action of the REAMER. Allow the machine to RETRACT until the joint of the rod is beyond the end of the entrance trench. Stop ADVANCE, shut down the machine, uncouple and remove the rod, and manually move the machine to the edge of the trench and couple it to the drill string.

Clear the area, start the machine and continue to remove ONE ROD AT A TIME until the service has reached the entrance.

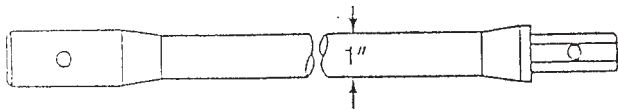
NOTES
M3800

DESCRIPTION AND USE OF TOOLS

M3800



Standard Drill Rod 7/8" diameter (22.2mm), x 5', 10', and 20' lengths (1.5, 3, and 6 m). Supplied with either the standard 13/16" (20.64 mm) hex shank and socket with snap button connector, or the 1" (25.4 mm) hex Bulldog Connector.



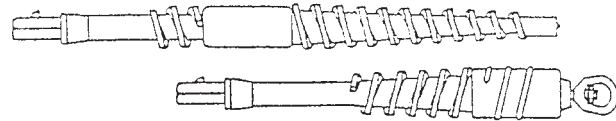
Heavy Duty Drill Rod 1" diameter (25.4mm), x 5', 10', and 20' lengths (1.5, 3, and 6m). Supplied with either the standard 13/16" (20.64 mm) hex shank and socket with snap button connector, or the 1" (25.4 mm) Bulldog Connector.



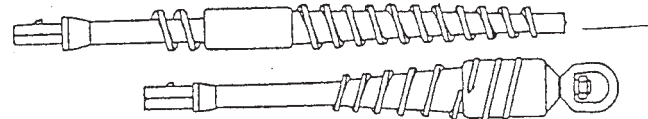
1 1/4" Mole. This is the smallest tool in the McLaughlin line. It is used primarily for the installation of small residential gas services (5/8" plastic). It is recommended for 25' to 30' (6.35 M - 7.62 M) (residential street crossings, with no reaming involved.) **THE SWIVEL SHANK CANNOT BE USED WITH THIS TOOL. NOT AVAILABLE WITH BULLDOG SHANK.**



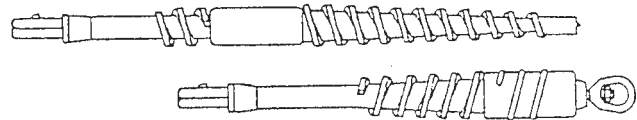
1 3/8" Mole. The Sand Mole is to be used only in sandy soil conditions where any degree of compaction is impossible. Usually no reaming pass is possible because the hole will collapse after the Sand Mole has passed through. The Swivel Shank can be used with this tool to retrieve small diameter electrical cable or similar services. **NOT AVAILABLE WITH BULLDOG SHANK.**



1 7/16" Mole. This tool is used in conjunction with the 2" Reamer. It is also used when the ground is very hard in the late fall and early winter. The reasoning behind this method is that there is very little displacement of the soil at any one time and the bore has a greater chance of success. **NOT AVAILABLE WITH BULLDOG SHANK.**



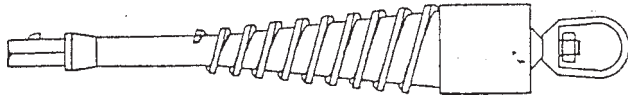
1 3/4" Mole. This tool is used in conjunction with the 2 1/2" Reamer, and is the most widely used tool. Most utility work will fall somewhere within this range. Installation of the service can be accomplished by reaming and pulling the service through simultaneously, or if the hole is large enough on the initial pass, the Swivel Shank can be used to pull the service through as the rods are withdrawn. Supplied with either the standard 13/16" (20.6 mm) hex shank, or the 1" (25.4mm) hex Bulldog Connector.



2" Mole. This Moleing Head is to be paired with the 2 7/8" Reamer for maximum effectiveness. It can also be used in conjunction with the Swivel Shank when enlarging the hole is not necessary. Supplied with either the standard 13/16" (20.6mm) hex shank, or the 1" (25.4mm) hex Bulldog Connector.

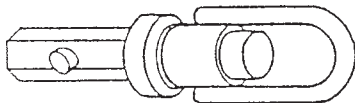
DESCRIPTION AND USE OF TOOLS

M3800

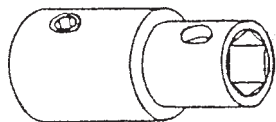


Rod Guide. PT# M157100 - Used at the start of the bore to locate and level the Mole and first rod at the entry face. At all times the help [unclear] the trench and holding the ROD GUIDE [unclear] standing on the right hand side of the trench. **ROD GUIDE IS REMOVED AFTER 1/2 OF THE LENGTH OF THE FIRST ROD HAS BEEN INSTALLED. ALWAYS USE GUIDE TOOL WHEN POSITIONING ROTATING DRILL RODS.**

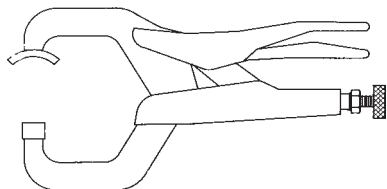
3 1/4", 3 1/2" and 4 1/2 Reamers. Whenever these tools are used, the soil condition must be ideal. By using these tools, 2" water and gas lines can be installed together with their connecting couplings. However, in some cases where the service is very heavy and awkward to handle underground, i.e. copper with large hex coupling, or plastic pipe that tends to snake in the hole, a cable or chain can be pulled through by the Reamer, and then attached to a backhoe to pull through the service. Supplied with either the standard 13/16" hex shank, or the 1" hex Bulldog Connector.



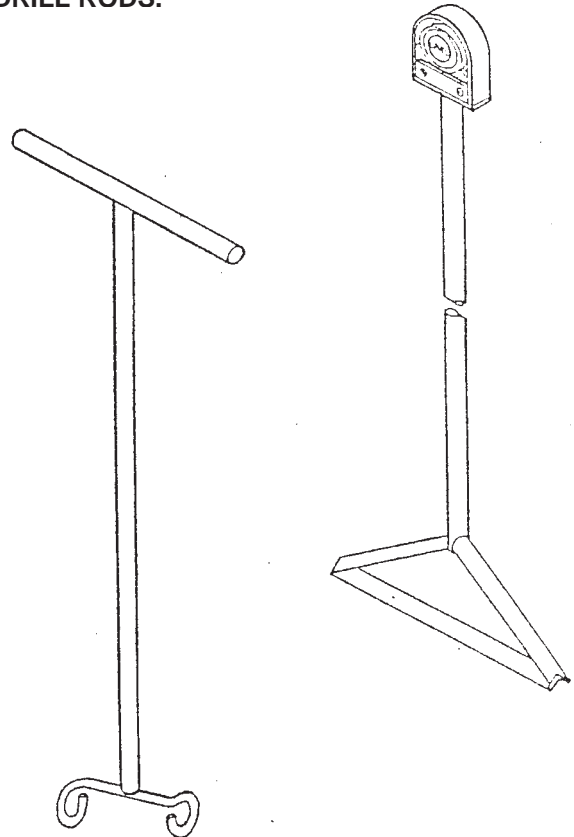
Swivel. This tool can be used with any Mole except the 1 1/4" (M-157200). Use this tool when no additional reaming is needed.



Adapter. For M-1800, and M-427 Gasoline and Hydraulic Machines. This component is a replacement part normally permanently coupled to the machine.



Uncoupler. Used for disengaging 13/16" (20.6mm) and 1" (25.4mm) snap button connectors on standard or heavy duty drill rods.



Devil Level. Used to determine the difference between the angle to the rod being installed and actual horizontal level. Always shut down the machine before using the level. Check as close to the face as practical. Keep base of tool clean to obtain accurate readings. Each one degree is a rise or fall of approximately 20 inches (50.8 cm) in 100 feet (25.4 M).

Moleing heads, reamers, adapters, and swivels are supplied with the proper hex size to match the rods being used. Always use a complete string of either standard or heavy duty rods, and select the tool with

Refer to McLaughlin's Drilling Tools catalog for the complete line of moleing tools and accessories.

MACHINE SPECIFICATIONS

M3800

3800 SPECIFICATIONS

Gasoline Powered Boring Unit

Boring Range:	ENGLISH	METRIC
Bore	1 1/4" - 2 1/2" Compacted holes	3.175cm -6.35cm
Reams	4 1/2"	11.4 cm
Engine:	16 hp (12 kW) Gas w/ Electric Start Max. engine rpm: 3600 Idle rpm: ~ 1800	
Transmission:	Forward, Neutral, and Reverse	
Clutch:	Hydraulic, 127 @ 3600 engine rpm Forward	
Final Drive:	13/16" Hex	
Torque:	480 ft/lbs. @ 2500 psi	651 Nm @ 172 bar
Fuel Tank:	1.8 gallon	9.6 L

Dimensions

Machine: 34" (86 cm) wide x 70" (178 cm) long x 45" (115 cm) high
Weight: 640 lbs (290 kg)

WARRANTY

RETURN GOODS POLICY

LIMITED WARRANTY

The Manufacturer warrants its products to be free from defects in material and workmanship for a period of twelve months from the date of shipment from the factory. The Manufacturer shall not be responsible for any damage resulting to or caused by its products by reason of installation, improper storage, unauthorized service, alteration of the products, neglect or abuse, or use of the product in a manner inconsistent with its design. 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.

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.