

INSTRUCTION MANUAL

For

“PROMAXX™” Spike Driver

Models: MX60-SD & MX90-SD

INGERSOLL-RAND®
CONSTRUCTION & MINING



Read this instruction manual before
operating this equipment.

Ingersoll-Rand Company, Rock Drill Division
7500 Shadwell Drive, Roanoke, Va. 24019-5198 U.S.A.



Rock Drill Division Certified ISO-9001
(ANSI/ASQC Q91) Certification No. QSR-80

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“PROMAXX™” Series Paving Breaker

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- | | |
|--|---------|
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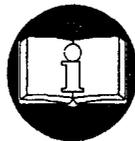
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Title	Section
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**Read this instruction manual before
operating this equipment.**

INTRODUCTION	1
Foreword	
Introduction	
Reference Material	
SAFETY	2
Introduction	
Safety Alert Symbol and Signal Words	
Safety First	
Safety Precautions	
DESCRIPTION	3
Description	
Introduction	
Optional Equipment	
Standard Equipment	
INSTALLATION AND OPERATION	4
Air Requirements	
Air Hose and Fittings	
Before Operation	
Controls	
Introduction	
Lubrication	
Lubricating Oil Specifications	
Methods of Lubrication	

(Continued)

Table of Contents (Con't.)

Title	Section
INSTALLATION AND OPERATION (CON'T.)	4
Operation	
Operational Tips	
SPECIFICATIONS	5
Lubricating Oil Chart	
Spike Driver Specifications	

Alphabetical Index

<u>Title</u>	<u>Page No.</u>
Abbreviation List	1
Foreword	1
Introduction	1
Reference Material	1

1. FOREWORD.

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All equipment, regardless of how well built, requires a certain amount of attention. The

purpose of this publication is to acquaint an operator with the function and operation of the components to obtain maximum performance and trouble free service from the spike driver.

Before using the spike driver, these instructions should be carefully read to obtain a thorough knowledge of the duties to be performed. Take pride in the spike driver, keep it clean; and in good mechanical condition.

2. INTRODUCTION.

This instruction manual contains information on safety, installation, operation, description, and specifications for the "PROMAXX™" Spike Driver Models MX60-SD & MX90-SD.

3. REFERENCE MATERIAL.

The reference materials required to operate and/or maintain the spike driver are listed in Table 1.

4. ABBREVIATION LIST.

Abbreviations listed in this manual that are not common are listed in Table 2 with the proper definition.

Table 1. Reference Material

Manual No.	Title of Manual
PL6119	Parts Lists For "PROMAXX™" Spike Driver Models MX60-SD & MX90-SD.
RM6119	Repair and Maintenance Manual For "PROMAXX™" Spike Driver Models MX60-SD & MX90-SD.

Table 2. Abbreviation List

Abbreviation, Symbol, or Term	Meaning
ft ³ /min	Cubic Feet Per Minute
in.	Inch
kg	Kilogram
lbs.	Pounds
lb-ft	Foot Pounds
M	Meter
mm	Millimeter
m/s ²	Meters Per Square Second
m ³ /min.	Cubic Meters Per Minute
NPT	National Pipe Tap
psi	Pounds Per Square Inch
rpm	Revolutions Per Minute
scfm	Standard Cubic Feet Per Minute
	Safety Alert Symbol

NOTICE

SAVE THESE INSTRUCTIONS. DO NOT DESTROY.

All information, illustrations, and specifications in this manual are based on the latest information available at the time of publication.

Product improvement is a continuing goal at Ingersoll-Rand®. Design and specifications are subject to change without notice or obligation.

The use of repair parts other than those included within the Ingersoll-Rand® approved parts list may create hazardous conditions over which Ingersoll-Rand® Company has no control. Therefore Ingersoll-Rand® Company cannot be held responsible for equipment in which non-approved repair parts are installed.

When the life of the tool has expired, it is recommended that the tool be disassembled, degreased and parts be separated by material so that they can be recycled.

Alphabetical Index

<u>Title</u>	<u>Page No.</u>
Introduction	1
Safety Alert Symbol and Signal Words	1
Safety First	1
Safety Precautions	2

1. INTRODUCTION.

This section contains important safety information for "PROMAXX™" Spike Driver Models MX60-SD & MX90-SD.

⚠ DANGER

DANGER IS USED TO INDICATE THE PRESENCE OF A HAZARD WHICH WILL CAUSE SEVERE PERSONAL INJURY OR DEATH IF THE WARNING IS IGNORED.

2. SAFETY FIRST.

SAFETY FIRST is the primary concern for the protection of both, personnel and the spike driver during any phase of operation. All personnel must thoroughly understand all safety precautions before operating or doing any work on the spike driver.

⚠ WARNING

WARNING IS USED TO INDICATE THE PRESENCE OF A HAZARD WHICH CAN CAUSE SEVERE INJURY OR DEATH IF THE WARNING IS IGNORED.

3. SAFETY ALERT SYMBOL AND SIGNAL WORDS.

⚠ – This is the Safety Alert Symbol. When you see this symbol in this instruction manual, be alert to the presence of a hazard.

⚠ CAUTION

CAUTION IS USED TO INDICATE THE PRESENCE OF A HAZARD WHICH WILL OR CAN CAUSE PERSONAL INJURY, OR PROPERTY DAMAGE IF THE WARNING IS IGNORED.

NOTICE

Notice is used to notify people of installation, operation, or maintenance information which is important but not hazard related.

All personnel must understand the **DANGER, WARNING, CAUTION,** and **NOTICE** used throughout the text of this instruction manual. The **DANGER, WARNING, CAUTION,** and **NOTICE** are defined as follows:

By understanding what **DANGER, WARNING, CAUTION,** and **NOTICE** mean; and using good judgment and common sense; all

personnel can avoid injuring themselves, others and/or damaging the spike driver.

4. SAFETY PRECAUTIONS.

The Safety Precautions listed are intended to make all personnel aware of the hazards

while working on or near a spike driver. All personnel must use common sense and a good working practice while operating and maintaining the spike driver. The safety precautions listed are of a general nature and cannot cover every possible situation:

	⚠ WARNING
	Do not start the spike driver while it is lying on the ground.

	⚠ WARNING
	Keep your hands off the throttle lever until it is time to start spike driver operation.

	⚠ CAUTION
	Always wear gloves when operating this tool.

	⚠ WARNING
	Keep body stance balanced and firm. Do not overreach when operating this tool.

	⚠ WARNING
	Always wear safety shoes when operating this tool.

	⚠ WARNING
	Do not ride the spike driver with one leg over the handle.

	⚠ CAUTION
	Always wear respirator when operating this tool.

	⚠ WARNING
	Operate at 90-100 psig (6.2-6.9 bar) Maximum air pressure.

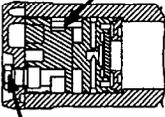
	⚠ WARNING
	Always wear approved hard hat when operating this tool.

	⚠ WARNING
	Always turn off the air supply and bleed and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool.

	⚠ WARNING
	Always wear eye protection when operating this tool.

	⚠ WARNING
	Do not use damaged, frayed or deteriorated air hose and fittings.

	⚠ WARNING
	Always wear hearing protection when operating this tool.

 <p>Filter</p> <p>Plug</p>	⚠ CAUTION
	Do not operate tool without a properly installed oil filter and oil fill plug.

	⚠ WARNING
	Never rest the spike driver on your foot.

	⚠ WARNING
	Do not operate the tool without a safety cable installed on the air supply hose.

	⚠ WARNING
	Always keep both hands on the handles while operating the spike driver.

	⚠ WARNING
	Air powered tools can vibrate in use. Vibration, repetitive motions or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advice before resuming use.



Alphabetical Index

<u>Title</u>	<u>Page No.</u>
Description	1
Introduction	1
Optional Equipment	1
Standard Equipment	1

1. INTRODUCTION.

This section provides a brief description of the standard and optional equipment for the "PROMAXX™" Spike Driver Models MX60-SD & MX90-SD.

2. DESCRIPTION.

The MX60SD is a medium-duty spike driver and the MX90SD is a heavy-duty spike driver that provide maximum performance at minimum cost. They are designed for general spike driver work where their size and weight range is necessary. With the two-piece design (breaker housing and fronthead) the spike driver is easier to maintain and repair.

The spike driver is designed for driving cut spikes in the construction of new track and the relaying of old track with new rails.

3. STANDARD EQUIPMENT.

Each spike driver is a complete unit ready to be put into service with proper lubrication. There are no extra parts or special fittings required.

a. MX60-SD Models:

- 1. **MX60-SD (51997922)**

2. MX60F-SD (51997930)

b. MX90-SD Models:

- 1. **MX90-SD (51997948)**

- 2. **MX90F-SD (51997955)**

4. OPTIONAL EQUIPMENT.

The spike drivers can also be furnished with the following options:

a. **Muffler** – Each spike driver is equipped with a tapped hole near the exhaust deflector. This hole is used to install the optional muffler which includes the bolt and washer. (**Note:** The exhaust deflector must be removed before the muffler can be installed.)

The muffler is a customer installed option and is available when specially ordered separately.

b. **Flex Handles** – These handles are used to reduce the amount of vibration that the operator encounters. The flex handle option may be ordered by specifying one of the model numbers with a "F" in the part number.



Alphabetical Index

<u>Title</u>	<u>Page No.</u>
Air Requirements	1
Air Hose and Fittings	1
Before Operation	2
Controls	2
Introduction	1
Lubrication	3
Methods Of Lubrication	3
Lubricating Oil Specifications	4
Operation	2
Operational Tips	3

1. INTRODUCTION.

This section provides installation and operation requirements for "PROMAXX™" Spike Driver Models MX60-SD & MX90-SD.

Low or inadequate air pressure at the spike driver is costly and wasteful, and an insufficient volume of air will not allow it to operate efficiently.

2. AIR REQUIREMENTS.

An air compressor of sufficient capacity is needed to provide the necessary volume of air at the most efficient operating pressure to ensure effective and economical operation of the spike driver. Refer to Section 5, Paragraph 3 for air requirements of the spike driver.

The figures represent air pressures at the spike driver inlet and not at the compressor. There is always a certain amount of pressure drop between the compressor and the spike driver; only the pressure and volume at the tool is effective in doing work. If the hose is relatively short and in good condition, the pressure drop between the compressor (or air receiver) and the spike driver should not exceed 15 percent of the initial pressure.

3. AIR HOSE AND FITTINGS.

Quality hose designed especially for rock drill service should be used. It should be constructed with an outer covering that resists abrasive wear, an oil-resistant inner tube and should be able to withstand the heat of the compressed air. It should have a working pressure safety factor of at least 4 to 1 in relation to burst.

The hose fittings should be kept as tight as possible and should be in good condition. Elimination of leakage involves making the air system tight and then keeping it tight. Air losses through bad connections and worn hose can often reach 10 to 20 percent of the total air compressed. Refer to Section 5 for the size air hose required.

4. BEFORE OPERATION.

- a. Determine the method of lubrication to be used. (Refer to Paragraph 9.)
- b. Fill the oil reservoir with rock drill oil conforming to the physical and chemical properties listed in Section 5, Table 1.
- c. Blow out the main air supply hose to get rid of moisture, rubber particles, and dirt.
- d. When using new air hose, blow lubricated air through the hose to completely coat the inside with oil. This may take 10 to 15 minutes.

▲WARNING

COMPRESSED AIR IS DANGEROUS. WHEN BLOWING OUT AN AIR HOSE, HOLD IT FIRMLY, AND POINT IT AWAY FROM PERSONNEL AND EQUIPMENT. NEVER BLOW YOUR CLOTHES FREE OF DUST WITH COMPRESSED AIR.

- e. An air strainer is installed in the main air supply line to keep dirt from entering the spike driver.
- f. Connect the leader hose to the air connection on the spike driver.

▲WARNING

BE SURE ALL HOSE CONNECTIONS ARE TIGHT. A LOOSE HOSE NOT ONLY CAUSES LEAKS, BUT CAN COME COMPLETELY OFF THE SPIKE DRIVER, WHIP AROUND, AND INJURE PERSONNEL IN THE AREA. ATTACH SAFETY CABLES TO ALL HOSES TO PREVENT INJURY IF A HOSE IS ACCIDENTALLY BROKEN.

5. CONTROLS.

The spike driver is controlled by a self-closing, lever-operated, throttle valve that is built into the handle.

When air pressure is directed to the spike driver, the throttle lever will be in the raised, or off, position. The spike driver will not start until the lever is depressed. The lever will return to the off position when it is released.

6. OPERATION.

▲ DANGER

ALWAYS KEEP BOTH HANDS ON THE HANDLE WHILE OPERATING THE SPIKE DRIVER.

1. Grip the spike driver handle with both hands. Depress the throttle lever with the palm of the hand, and apply firm steady pressure to the handles. The correct amount of pressure for maximum efficiency can be gained only by experience, but generally the correct pressure is usually recognizable by the rhythmic sound of the exhaust and maximum breaking action. Insufficient pressure will slow down the spike driver action. Do not "ride" the spike driver with one leg over the handle.

▲CAUTION

RIDING THE SPIKE DRIVER HANDLE CREATES EXCESSIVE PRESSURE ON ONE SIDE OF THE SPIKE DRIVER, THROWING IT OUT OF ALIGNMENT AND CAUSING UNNECESSARY WEAR ON INTERNAL PARTS.

2. Immediately after starting the spike driver, check for the presence of oil mist at the

exhaust port and on the spike being driven. This is the only assurance that oil is traveling all the way through the spike driver. When checking the spike driver for proper lubrication, always put the spike driver against the work.

3. Release the throttle lever to shut the spike driver off.

4. If exhaust freeze-up occurs, add anti-freeze lubricant directly through the air inlet connection. Use an anti-freeze lubricant recommended for air tools.

7. OPERATIONAL TIPS.

For maximum operating efficiency, observe the following suggestions:

a. Never strike the spike driver with a blunt object; the housing may be broken or damaged.

b. Never attempt major maintenance of the spike driver on the job; take it to a repair shop.

c. Never drag the spike driver along the ground; the air ports in the exhaust may fill with dirt.

d. Always blow out the air supply hose before connecting it to the spike driver to remove any dirt inside the hose.

e. Always be sure the spike driver is well lubricated. Adjust the air line lubricator so that the spike driver always shows an oil film. There should be a fine mist of oil coming out of the exhaust port during operation.

f. Always keep rock drill oil in a sealed container so it doesn't get contaminated with dust or dirt.

g. Do not operate the spike driver without it against the work.

h. Always keep plastic caps or plugs in all ports when the spike driver is not in service.

i. Do not lift or transport the breaker by the throttle lever. Damage can occur to the breaker.

8. LUBRICATION.

The spike driver is initially supplied with a small amount of lubricating oil in the spike driver lubrication reservoir, but should be checked and filled before use. Always check the oil level in the reservoir before each start up.

9. METHODS OF LUBRICATION.

Proper lubrication is the most important single factor responsible for the service life of the pneumatic spike driver. A spike driver can be severely damaged during the first few minutes of operation if it is not properly lubricated.

The lubrication method depends on the actual operating conditions and customer preference.

▲ CAUTION

THE BUILT-IN OIL RESERVOIR IN THE HOUSING PLUG MUST BE CHECKED EVERY TWO HOURS AND REFILLED AS NECESSARY.

a. The oil reservoir built into the housing plug will provide proper lubrication. It must be checked every two hours and refilled as necessary.

b. For intermittent operation with an air supply hose no longer than 50 ft. (15 m), a compressor-mounted lubricator may be used.

c. For continuous operation during an eight hour shift, an Ingersoll-Rand® air line lubricator, or other constant-feed air line lubricator, should be installed in the air-supply line about 11.5 ft. (3.5 m) from the spike driver. The lubricator listed in the parts list has a capacity of 1 U.S. pint (0.47 liters) and will be furnished when it is specially ordered. To adjust an air line lubricator initially:

1. Turn the lubricator needle valve clockwise until it is completely closed, and then turn the valve counter-clockwise about 3/4 of a turn off its seat.
 2. Almost immediately after starting the spike driver, check for the presence of oil at the exhaust ports and on the spike being driven. When checking the spike driver for proper lubrication, always put the spike driver against the work.
 3. Fine-tune the lubricator needle valve to provide a light film of oil on the spike driver tool and a fine oil mist coming from the exhaust ports. If there is blue smoke coming from the exhaust port or oil running down the spike, the spike driver is getting too much oil. Adjust the lubricator for proper rate of feed.
- d. Regardless of the method of lubrication, the lubricating oil reservoir must be filled with the correct grade of rock drill oil as frequently as is necessary to prevent any possibility of the spike driver running dry.
- e. The oil level in the air line lubricator should be checked at the beginning of each eight-hour shift and once during the shift.

- f. Every effort must be made to avoid oil contamination from dirt or other impurities. Oil should be kept in covered containers and stored in an area that is relatively dust free.
- g. Before filling the air line lubricator, the area around the filler plug should be wiped clean.

10. LUBRICATING OIL SPECIFICATIONS.

Ingersoll-Rand® offers a complete line of rock drill oil formulated in all types of rock drill equipment. These oils exceed the oil specifications listed in Section 5, Table 1.

▲CAUTION

NEVER ALLOW THE LUBRICATOR TO BECOME EMPTY AS THE PARTS WILL BE DAMAGED IF THE spike driver IS OPERATED WITHOUT LUBRICATION.

Use Section 5, Table 2 for the correct viscosity grade selection to meet your requirements and Section 5, Table 3 for selecting the correct rock drill oil part number.

Alphabetical Index

<u>Title</u>	<u>Page No.</u>
Lubricating Oil Chart	1
Spike Driver Specifications	2

1. LUBRICATING OIL CHART.

Table 1. Rock Drill Oil Specifications

Characteristic	Test Procedure	Below 20°F (-7°C)	20°F to 90°F (-7°C to 32°C)	Above 90°F (32°C)
Viscosity:				
SUS at 100°F (38°C)	ASTM-D2161	175 Min.	450 Min.	750 Min.
SUS at 210°F (99°C)	ASTM-D2161	46 Min.	65 Min.	85 Min.
cST at 104°F (40°C)	ASTM-D445	37 Min.	105 Min.	160 Min.
cST at 212°F (100°C)	ASTM-D445	6 Min.	11 Min.	16 Min.
Pour Point, °F (°C) Max.	ASTM-D97	-10°F (-23°C)	-10°F (-23°C)	0°F (-18°C)
Flash Point, °F (°C) Min.	ASTM-D92	370°F (188°C)	400°F (204°C)	450°F (232°C)
Viscosity Index, Min.	ASTM-D2270	90	90	90
Steam Emulsion No. Min.	ASTM-1935-65	1200	1200	1200
Consistency	Stringy	Stringy	Stringy
Falex Load Test lbs (kg) [Min]	ASTM-D2670	2000 lbs (907 kg)	2000 lbs (907 kg)	2000 lbs (907 kg)
Timken E.P. Test lbs (kg) [Min]	ASTM-D2782	30 lbs (14 kg)	30 lbs (14 kg)	30 lbs (14 kg)

Table 2. Selection Chart

Typical Operating Conditions	20°F to 90°F (-7°C to 32°C)	Above 90°F (32°C)
90-100 psi (6.2 to 6.9 bar)	Light	Medium

Table 3. Ingersoll–Rand Rock Drill Oil Part Numbers

Grade	1 Gallon (3.8 Liter)	5 Gallon (18.9 Liter)	55 Gallon (208 Liter)
Light	51378701	51378727	51378743
Medium	51378693	51378719	51378735

3. PAVING BREAKER SPECIFICATIONS.

a. Net Weight (less tool):

MX60–SD 69 lbs 31 kg
 MX90–SD 84 lbs 38 kg

b. Shipping Weight (less tool):

MX60–SD 72 lbs 33 kg
 MX90–SD 87 lbs 39 kg

c. Overall Length (less tool):

All Models 28 in. 635 mm

d. Bore of Cylinder:

MX60–SD 2.06 in. 52.3mm
 MX90–SD 2.62 in. 66.5mm

e. Working Stroke:

All Models 5.75 in. 146mm

f. Recommended Air Supply:

90 -100 psi (6.2 - 6.9 bar) @ spike driver inlet

g. Air Inlet Size:

All Models 3/4 NPT

h. Size Air Hose Recommended:

All Models 3/4 in. 19 mm

i. Air Consumption @ 80 psi (5.5 bar):

MX60–SD: 65-70 ft³/min
 1.84-1.98 m³/min
 MX90–SD 83-87 ft³/min
 2.35-2.46 m³/min

j. Blows Per Minute:

All Models 1200 – 1400



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