CPN 51998342

RM6119

REPAIR AND MAINTENANCE MANUAL

For

"PROMAXX™" Spike Driver

Models: MX60–SD & MX90–SD

INGERSOLL-RAND®

CONSTRUCTION & MINING

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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A. MAIN BREAKER HOUSING & FRONTHEAD CASTING	3 YEARS
B. ALL OTHER COMPONENTS:	1 YEAR

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Alphabetical Index

1. INTRODUCTION.

This maintenance and repair manual contains information for maintenance, service and troubleshooting for the "PROMAXX™" Spike Driver Models MX60–SD & MX90–SD.

2. REFERENCE MATERIAL.

The reference material required to operate and/or maintain the paving breakers are listed in Table 1.

Table 1. Reference Material

Manual No.	Title of Manual
PL6119	Parts List for "PROMAXX™" Spike Driver Models MX60–SD & MX90–SD.
IM6119	Instruction Manual for "PROMAXX™" Spike Driver Models MX60–SD & MX90–SD.

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

1. INTRODUCTION.

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

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 maintenance work on the spike driver.

3. SAFETY ALERT SYMBOL AND SIGNAL WORDS.

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

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:

⚠DANGER

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

⚠WARNING

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

⚠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.

By understanding what **DANGER, WARNING, CAUTION,** and **NOTICE** mean; and using good judgment and common sense; all personnel can avoid injuring themselves and/or damaging the spike driver.

Alphabetical Index

1. INTRODUCTION.

This section provides information on maintenance and performance testing of the "PROMAXX™" Spike Driver Models MX60–SD & MX90–SD.

2. MAINTENANCE.

To ensure maximum life and top performance of the equipment, it is necessary that the maintenance be made before serious damage occurs. It is important to be cautious when performing any service work. A general knowledge of the system and/or components is important before the removal or disassembly of any components. The following is a list of basic precautions that must always be observed:

a. Never attempt major maintenance of the spike driver on the job; always send the spike driver to a repair shop.

b. Clean the exterior of the spike driver before disassembly.

c. Provide a clean work area for disassembling the spike driver.

d. Handle parts carefully. Hardened parts might chip or break if dropped on a hard surface.

e. Place small parts in a clean box to prevent loss.

f. Keep your hands and the spike driver clean and free of dirt, while assembling.

g. Wipe a film of clean oil over the working parts as they are assembled.

h. Do not allow dirt or chips from soft drifts and hammers to enter the spike driver.

i. With the exception of pressed–in parts, all the parts should fit together easily. If excessive force is required, the part is probably cocked and should be removed and realigned.

j. If necessary, use a rubber mallet to loosen the fronthead and backhead.

3. DISASSEMBLY. (Figure 1)

a. Set the breaker vertically on the floor.

b. If equipped with a muffler (50), remove bolt (51) and washer (52). Slide the muffler off of the housing (1).

c. Remove the backhead capscrews (29) and the backhead washers (38) from the housing (1). Lift the backhead (3) off the housing.

d. If damaged, remove the oil fill plug (17) from the backhead (3), and the oil fill plug o–ring (30).

e. Remove the throttle lever (14) from the housing plug (6).

Parts Legend for spike driver
(Refer to Page 3 for Illustration)

1. Housing
2. Fronthead
3. Backhead
4. Piston
5. Piston Seat
6. Housing Plug
7. Valve Chest Assembly
8. Throttle Body
9. Throttle Valve
10. Air Connection Cap
11. Swivel Nipple
12. Damper
13. Hammer Block
14. Throttle Lever
15. Exhaust Deflector
16. Filter
17. Oil Fill Plug
18. Rubber Plug
19. Handle Sleeve (Standard)
19. Flex Handle (Flex Option)
20. Flex Handle Connector
21. Spring
23. Fronthead Washer
27. Retaining Ring
28. Fronthead Capscrew
29. Backhead Capscrew
30. Oil Fill Plug O–ring
31. Backhead O–ring
32. Throttle Body O–ring
33. Seal
34. Strainer
35. Swivel Nipple O–ring
36. Connection Cap O–ring
37. Valve Cover O–ring
38. Backhead Washer
39. Fronthead Nut
50. Muffler
51. Muffler Bolt
52. Muffler Washer

f. Remove the backhead o–ring (31) from the housing plug (6).

g. Using a pair of adjustable pliers, pull the housing plug (6) out of the housing bore.

h. Remove the housing plug o–rings (33) from the housing plug.

i. If damaged or dirty, remove the filter (16) from the housing plug (6).

j. Using the adjustable pliers, remove the valve chest assembly (7) from the housing bore.

k. Remove the seals (33) from the valve chest.

l. Remove the valve cover o–ring (37) from the housing bore.

m. To remove the throttle valve (9), use adjustable pliers and pull the throttle valve from the housing.

n. Remove the throttle body o–rings (32) from the throttle valve body (8).

o. Remove the throttle valve spring (21) from the housing.

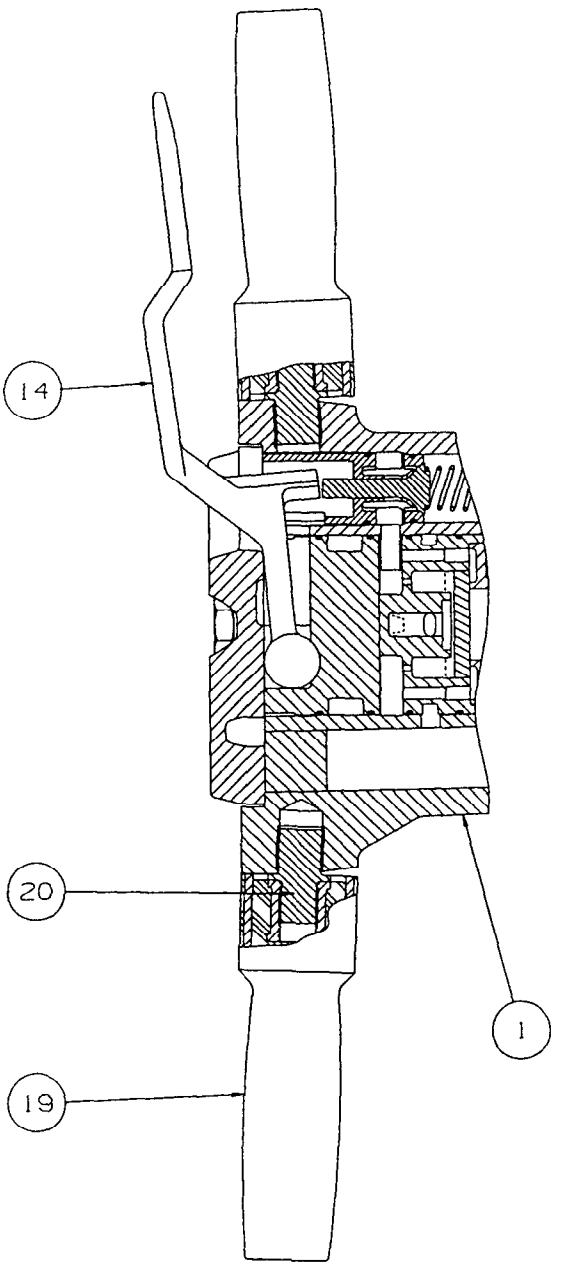
p. If the handle sleeves (19) need replacing, remove them from the housing.

q. Although there should never be a need to, the rubber plug (18) may be removed by inserting a screw driver between the plug and the hole bore and prying the plug out.

r. If it becomes necessary to remove any of the air connection parts, unscrew the air connection cap (10) from the housing (1). Slide the swivel nipple (11) back through the cap. If damaged, remove o–rings (35 & 36).

s. If required, remove the strainer from the air inlet.

t. If required, use a screwdriver to pry the exhaust deflector (15) out of the housing (1).



Optional Flex Handles

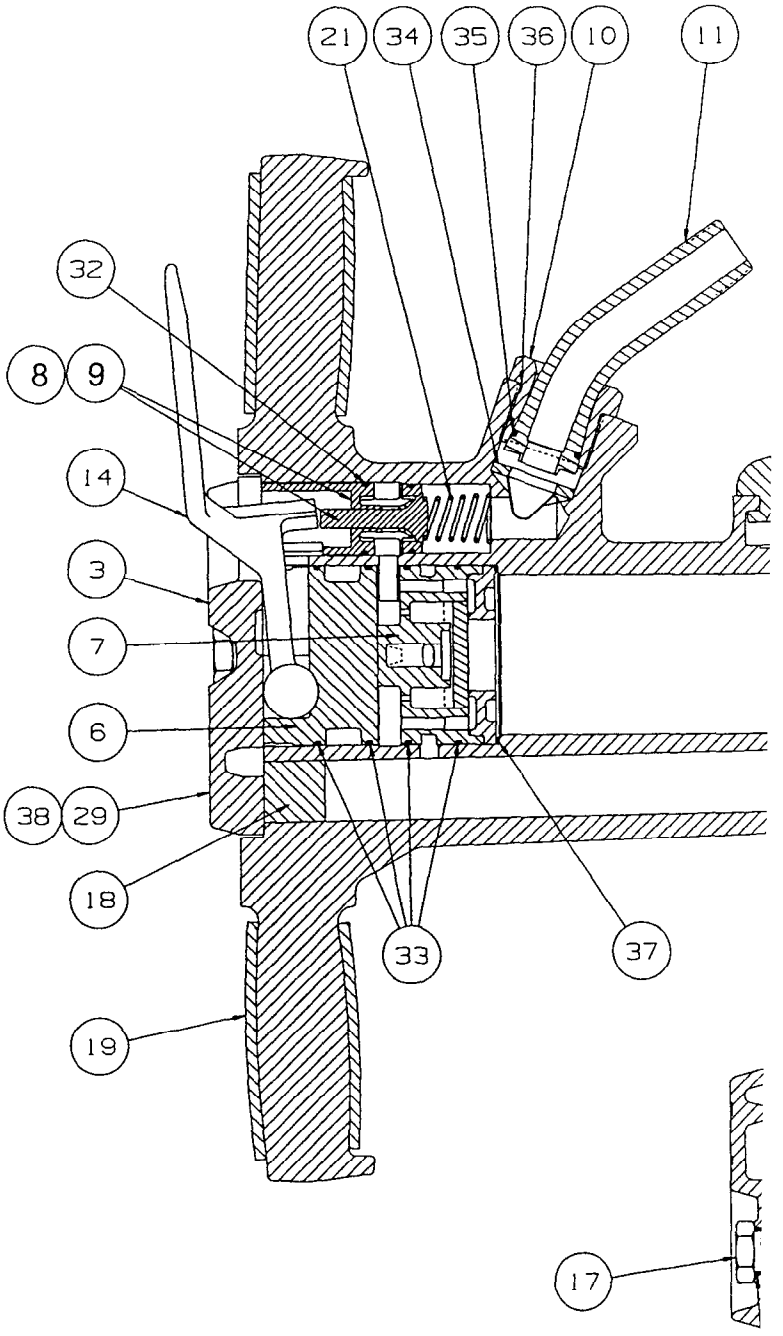
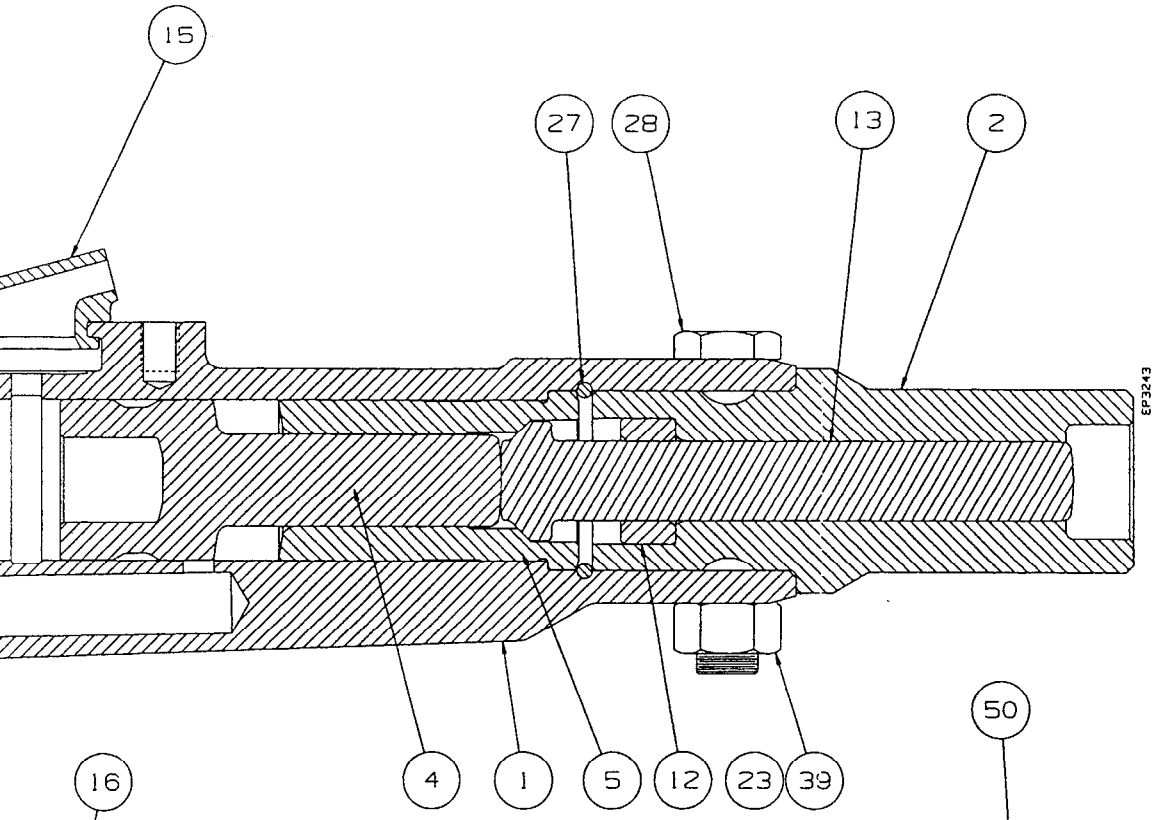
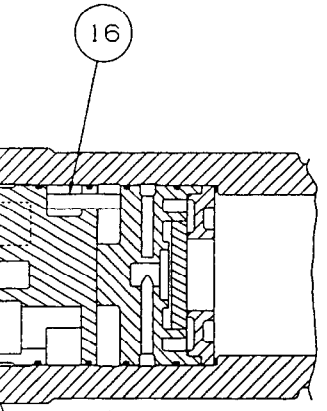
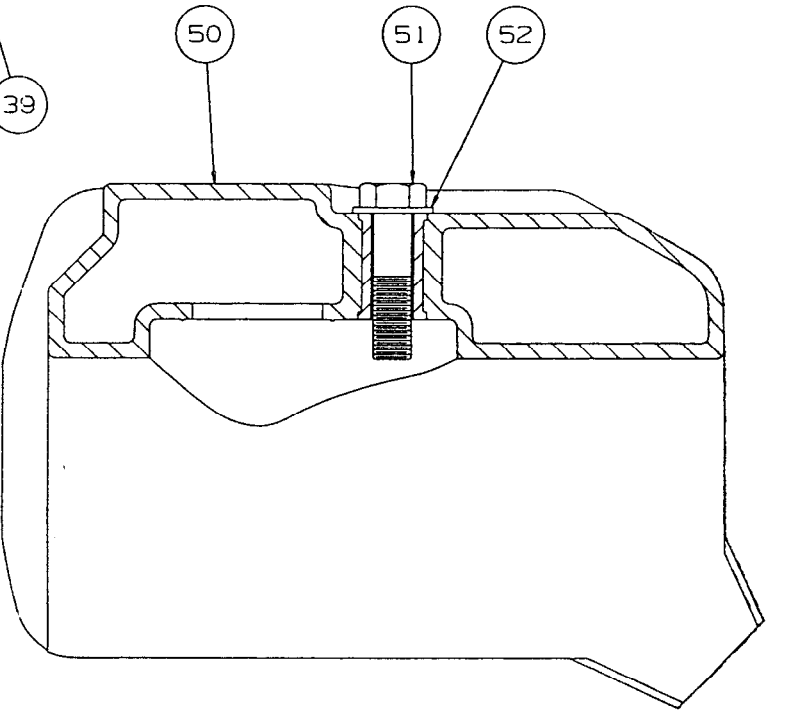


Figure 1. Paving Breaker Mo





View of Oil Fill Plug & Filter



View of Optional Customer Installed Muffler

s MX60 & MX90 – Sectional Illustration

u. Carefully lay the housing horizontally on the floor. From the fronthead end, tilt the housing so that the piston will come out of the backhead end of the housing. Remove the piston (4) from the housing.

NOTICE

A lifting device is recommended for lifting the spike driver and putting it into a vise.

v. Position and secure the spike driver in a vise horizontally.

⚠CAUTION

CLAMP THE SPIKE DRIVER HOUSING IN THE AREA OF THE EXHAUST. CLAMP IT FIRMLY, BUT CAREFULLY. THE HOUSING CAN BE CRACKED IF THE VISE IS OVER TIGHTENED.

w. Remove the fronthead bolt (28), fronthead washer (23) and fronthead nut (39) which retain the fronthead to the housing.

NOTICE

The fronthead is a tight fit in the housing bore. It may be necessary to drive a wedge into the housing slot to open the housing bore enough to allow the fronthead to be easily removed.

x. Remove the fronthead (2) from the housing (1).

⚠DANGER

THE HAMMER BLOCK MAY COME OUT OF THE HOUSING WHEN THE FRONTHEAD IS REMOVED. BE CAREFUL NOT TO LET THE BLOCK FALL.

y. If the hammer block (13) did not come out with the fronthead (2), remove it from the housing.

z. If the damper (12) is damaged, it may be removed from the fronthead and replaced.

aa.
If damaged, the piston seat (5) may be removed by:

1. Using a hacksaw, place the saw into the slot in the fronthead end of the housing (1). Cut the retaining ring (27). Rotate the retainer with a screwdriver and saw the retainer again. Remove the retainer. Refer to Figure 2.

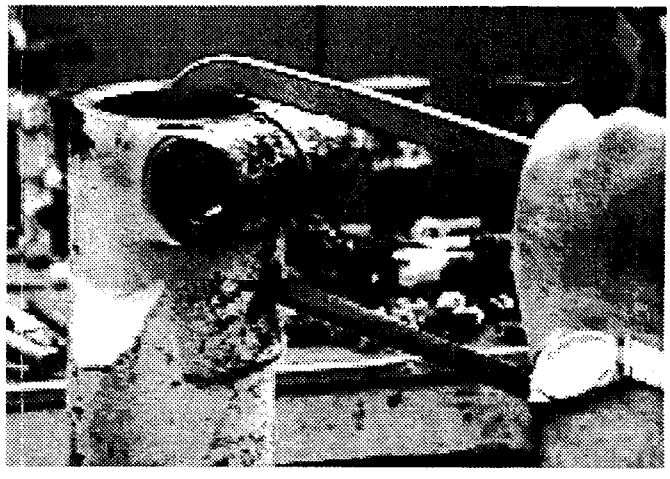


Figure 2.

2. The piston seat (5) is pressed into the housing (1), so the seat will have to be

pressed out. Remove the seat through the fronthead end of the housing.

ab. If equipped with flex handles (19) that require removal, unscrew the flex handles from the housing (1). If damaged, remove the flex handle connectors (20).

4. INSPECTION AND REPAIR. (Figure 1)

⚠ DANGER

WHEN USING ANY SOLVENT TO CLEAN PARTS, MAKE SURE THAT IT MEETS CURRENT SAFETY AND HEALTH STANDARDS, AND THAT IT IS USED IN AN AREA THAT IS ADEQUATELY VENTILATED.

a. Clean all parts in a suitable solvent.

b. All parts in the housing (1), including the valve chest assembly (7) and housing plug (6) must be examined, and all dust or dirt particles removed.

c. Check the valve chest assembly (7) for cracks or chipping. If damaged, replace it.

d. Replace the piston (4) when a .007 in. (.178mm) feeler gauge can be inserted between the piston and the housing bore.

e. Check the throttle valve parts for wear. Make sure the throttle valve is moves freely.

5. REASSEMBLY. (Figure 1)

a. If the piston seat (5) was removed, a new seat will have to be pressed into the housing (1) from the fronthead end of the housing.

b. After pressing the piston seat into the housing, install the piston seat retainer (27).

c. Set the housing in a vertical position so that the fronthead end of the housing is resting on the floor.

d. Install the piston (4), stem end first, into the backhead end of the housing bore. The piston may require some initially line up before dropping all the way into position.

e. The valve cover o–ring (37) is installed next.

f. Install new valve chest o–rings (33) into the grooves on the valve chest assembly (7) O. D.

g. Install the valve chest assembly (7), stem end pointing up, into the housing.

h. Install new valve chest o–rings (33) on the O. D. of the housing plug (6).

i. If the filter (16) was removed from the housing plug, insert a new filter. The filter should protrude from the bottom of the housing plug 3/16 – 1/4 in. (4.8 – 6.4mm).

j. Install the housing plug (6) into the housing, making sure to line-up the slot in the plug with the slot in the side of the housing bore.

k. Install a new backhead o–ring (31) onto the top of the housing plug (6).

l. If the rubber plug (18) was removed, put a thin film of oil on a new plug and insert into the cavity until flush with the top of the hole.

m. Install the throttle valve spring (21) into the throttle valve hole in the housing (1).

n. Install new throttle body o–rings (32) on the throttle valve (9),

o. Install the throttle valve into the throttle valve body.

p. Insert the throttle valve (9) and throttle body (8) into the housing (1). Make sure that the slot in the top of the throttle body lines up with the slot in the housing (1) and the housing plug (6).

q. Place the throttle lever (14) into the grooves of the housing plug (6) and throttle valve (9).

r. Install the backhead (3) onto the top of the housing and attach with backhead bolts

(29) and backhead washers (38). Torque the bolts to 140 ft-lbs (190 Nm).

s. If the oil fill plug (17) was removed from the backhead (3), install a new oil fill plug o–ring (31) and screw the plug back into the backhead.

⚠CAUTION

CLAMP THE HOUSING FIRMLY BUT CAREFULLY. THE HOUSING CAN BE CRACKED IF THE VISE IS OVER TIGHTENED.

t. Secure the housing (1) in a vise with soft jaws. Position the housing with the handles pointing up.

u. Install a new connection cap o–ring (36) into the groove on the air connection cap (10).

v. Install a new swivel nipple o–ring (36) in the groove on the swivel nipple (11). Install the swivel nipple (11) through the air connection cap (10). Screw the assembled air connection cap into the housing (1).

w. If the damper (12) was damaged, install a new one in the fronthead (2).

x. Insert the hammer block (13), stem end first) into the fronthead (2).

y. Install the fronthead (2) into the housing (1).

z. Install the fronthead bolt (28), fronthead washer (23) and fronthead nut (39). Lubricate the bolt threads and torque the bolt to:

MX60–SD – 240 ft-lb (325 Nm)
MX90–SD – 375 ft-lb (508 Nm)

aa. Install either the exhaust deflector (15) with a screw driver or install the muffler (50) and retain with the muffler bolt (51) and muffler bolt washer (52).

ab. Install new handle sleeves (19) or the flex handles (19) if so furnished.

6. PERFORMANCE TESTING.

A reconditioned spike driver should be tested before it is sent back to the job. Before connecting the air hose, check to see that the lubricator used with the spike driver is filled with the proper lubricating oil. Refer to IM6119 "Instruction Manual for "PROMAXX™" Spike Driver Models MX60–SD & MX90–SD", Section 5, for the correct lubricating oil specifications.

Pour a small amount (2 to 3 oz. [.06 to .09 L]) of rock drill oil into the spike driver inlet, for initial lubrication. With the spike driver against the work surface, the spike driver should start with less than 20 psi (1.4 bar) air pressure and with the piston reciprocating smoothly. Let the spike driver run in slowly at reduced pressure long enough to see that it is in good working order. If the spike driver stalls, turn off the air immediately. Stalling indicates binding caused by tight fits. After a short period of operation, a definite rhythm should develop and an even exhaust note will be heard. The spike driver may become warm, but should not overheat. If erratic operation continues or stalling persists, disassemble the spike driver and check for binding of parts.

After an initial period of low pressure operation, check the performance of a reconditioned spike driver with that of a new one by comparing both under similar conditions and with normal air pressure. Once testing is completed, place plastic caps or plugs in all parts to keep out dirt until the spike driver is put back into service.

Alphabetical Index

1. INTRODUCTION.

This section contains detailed information for troubleshooting the "PROMAXX™" Spike Driver Models MX60–SD & MX90–SD.

2. TROUBLESHOOTING.

Troubleshooting will be accomplished by using the appropriate illustration provided in this instruction manual and the step by step trouble and remedy. Using both of these together will solve most common problems.

Table 1. Troubleshooting

TROUBLE	PROBABLE CAUSE	REMEDY
Spike driver will not start.	1. Plugged exhaust port or air passages caused by dirt or hose particles.	1. Dismantle spike driver, clean out all ports and air passages. Keep the air hose in good condition; never use a soft deteriorated hose.
	2. Stuck valve due to gummy oil or incorrect assembly.	2. Remove valve chest assembly from the spike driver. Clean the assembly. Never use dirty oil or oil that does not conform to the recommended specifications.
	3. Frozen piston due to improper lubrication.	3. Dismantle spike driver to remove piston. Repair piston by placing in a high speed lathe and dressing with fine emery cloth. Never run spike driver without the proper lubricating oil in the lubricating oil reservoir.

(Continued)

Table 1. Troubleshooting (Con't.)

TROUBLE	PROBABLE CAUSE	REMEDY
Spike driver loses power rapidly.	1. Restriction in air supply line.	1. Never allow the air supply to kink or make sharp bends.
	2. Air supply line too long.	2. As a general rule keep the air supply line under 50 ft. (15m).
	3. Diameter of air supply line too small.	3. A 3/4 in. (19.1 mm) diameter air supply is recommended for the spike driver.
Freezing at exhaust ports.	1. Excessive moisture in the air supply line.	1. Install moisture traps in the air supply line or add anti–freeze lubricant directly through the air inlet. Use "KIL-FROST" anti–freeze lubricant or equivalent.
Spike driver lacks power.	1. Low air supply pressure.	1. The air supply pressure at the tool should be 90 to 100 psi (6.2 to 6.9 bar).
	2. Running on fronthead cushion.	2. Always maintain a constant pressure when operating the spike driver.
	3. Plugged air passages.	3. Dismantle the spike driver and clean out all ports and passages.
	4. Lack of lubricating oil.	4. Maintain the proper oil level in the lubricating oil reservoir.
	5. Sticking valve.	5. Remove valve chest parts from the spike driver. Clean parts. Never use dirty oil or oil that does not conform to the recommended specifications.
Overheating of the piston seat on a new machine.	1. Spike driver not properly broken in.	1. Stop operating the spike driver and perform initial servicing. Never run a new spike driver at full throttle until a proper break–in period has been completed.

(Continued)

Table 1. Troubleshooting (cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
Overheating of spike driver after break–in period.	1. Running on fronthead cushion.	1. Keep hammer block fed–up to work. Always maintain constant pressure when operating the spike driver.
	2. Lack of lubrication or improper lubricating oil.	2. Before operating the spike driver make sure the lubricating oil reservoir is full of proper lubricant.
Erratic or sluggish operation.	1. Lubricating oil too heavy, slowing down valve action.	1. Use only the recommended lubricating oil.
	2. Gummed oil or dirt in operating parts.	2. Dismantle spike driver and clean out dirt and gummy residue. Service the spike driver with clean oil. Protect the tool from dirt when idle.
Fogging.	1. Excessive moisture in the air supply line.	1. Blow out air lines. If moisture traps are installed in the air supply line, drain the moisture.
	2. Over lubrication.	2. Clean lubricating oil reservoir and adjust for proper rate of feed.

MAINTENANCE RECORDS AND NOTES

Date	Run Time (Hours)	Work Performed	Qty	Work By

Date	Run Time (Hours)	Work Performed	Qty	Work By

Date	Run Time (Hours)	Work Performed	Qty	Work By

NOTES

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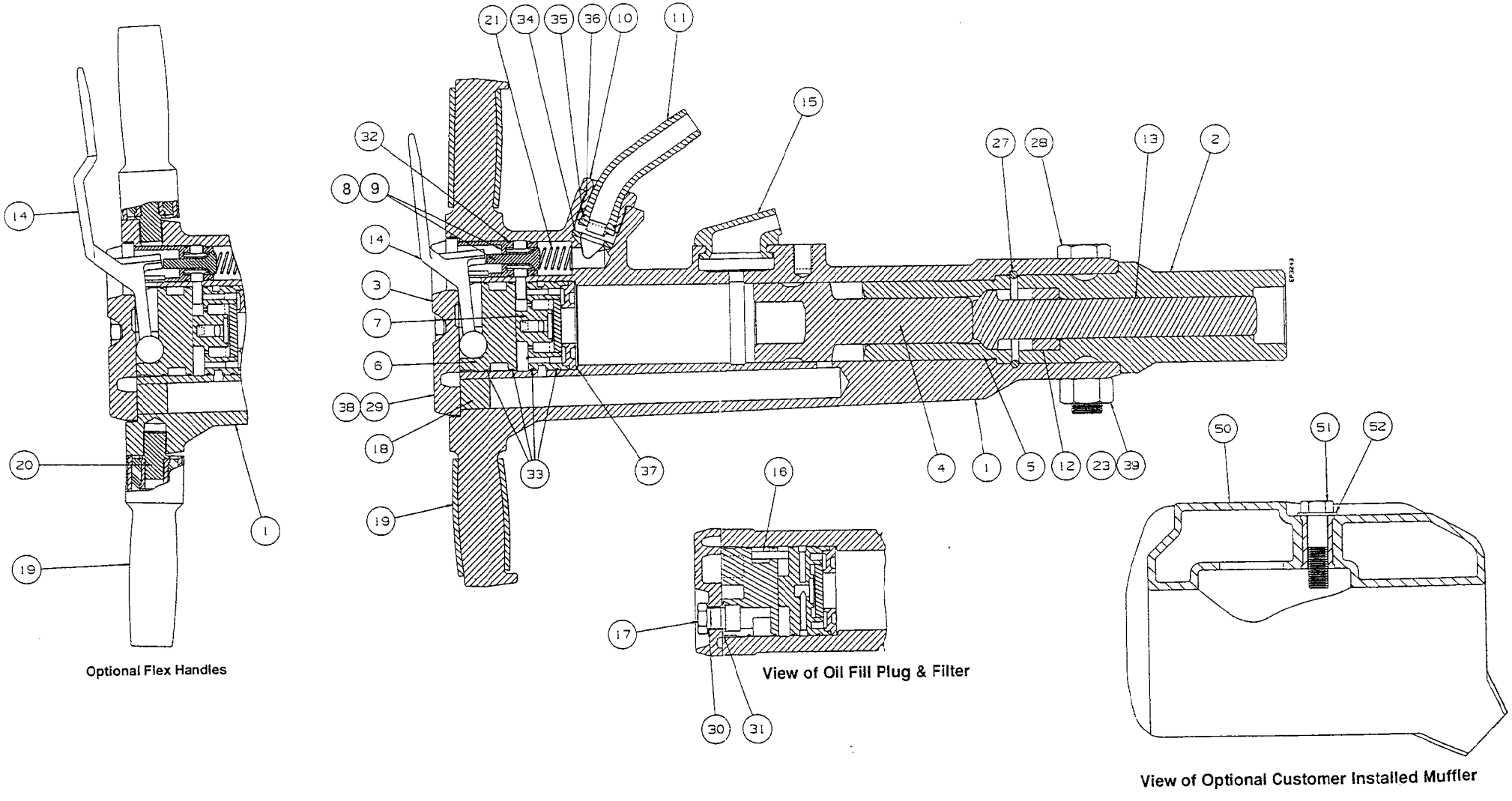

Figure 1. Paving Breaker Models MX60 & MX90 – Sectional Illustration