CPN 51990497

RM6087
Revision 1

REPAIR AND MAINTENANCE MANUAL

For

Paving Breaker

Models:

PB35A, PB35AS, PB50A & PB50AS

(With/Without Flex Handles)

INGERSOLL-RAND®

Designed and Built by Ingersoll–Rand Company
Roanoke, Va. 24019–5198 U.S.A.

Certified ISO–9001 (ANSI/ASQC Q91)
Certification No. QSR–80

Refer All Communications To The Nearest Address Listed On The Back Cover.

Warranty

Ingersoll–Rand, through its distributor, warrants that each item of equipment manufactured by it and delivered hereunder to the initial user to be free of defects in material and workmanship for a period of three (3) months from initial operation or six (6) months from the date of shipment to the initial user, whichever first occurs.

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C. All Compressor Air Ends, GENSET Generators and Paving Breakers – The earlier of twenty–four (24) months from shipment to, or the accumulation of 4,000 hours of service by, the initial user. For Air Ends, the warranty against defects will include replacement of the complete Air End, provided the original Air End is returned assembled and unopened.
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1. INTRODUCTION.

This maintenance and repair manual contains information for maintenance, service and troubleshooting for the Paving Breaker Models PB35A, PB35AS, PB50A & PB50AS, hereafter referred to as paving breaker.

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
PL6087	Parts List for Paving Breaker Models PB35A, PB35AS, PB50A & PB50AS.
IM6087	Instruction Manual for Paving Breaker Models PB35A, PB35AS, PB50A & PB50AS.

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.

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Safety First	1

1. INTRODUCTION.

This section contains important safety information for Paving Breaker Models PB35A, PB35AS, PB50A & PB50AS, hereafter referred to as paving breaker.

2. SAFETY FIRST.

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

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 paving breaker.

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1. INTRODUCTION.

This section provides information on maintenance and performance testing of the Paving Breaker Models PB35A, PB35AS, PB50A & PB50AS, hereafter referred to as paving breaker.

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 paving breaker on the job; always send the paving breaker to a repair shop.

b. Clean the exterior of the paving breaker before disassembly.

c. Provide a clean work area for disassembling the paving breaker.

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 paving breaker 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 paving breaker.

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. If equipped with a muffler, remove screws (43, 44), washers (41) and nuts (42); then remove muffler halves (45, 46).

b. Place the paving breaker in a vise with the fronthead up.

⚠CAUTION

CLAMP THE PAVING BREAKER HOUSING IN THE AREA OF THE HANDLES. CLAMP IT FIRMLY BUT CAREFULLY. THE HANDLE CAN BE SQUEEZED OUT–OF–ROUND OR CRACKED IF THE VISE IS OVERTIGHTENED.

c. Remove the nut (19), washer (35) and bolt (18).

d. Pull the fronthead assembly (20) up to remove it from the housing (11).

NOTICE

The fronthead assembly 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 assembly to be removed.

e. Remove the paving breaker from the vise and mount it with the handle up.

f. Remove the two roll pins (3, 5) which retain the throttle lever (2).

g. The throttle lever (2) can now be used to unscrew the housing plug (37) from the housing.

⚠CAUTION

THE OILER PLATE CAN BE REMOVED FROM THE HOUSING PLUG BY FILLING THE HOUSING PLUG CHAMBER FULL OF OIL AND INSTALLING THE OILER FILL PLUG. PRESSURE IN THE CHAMBER WILL BE GENERATED WHEN THE OILER FILL PLUG IS TIGHTENED CAUSING THE OILER PLATE TO BE PUSHED OUT OF THE HOUSING PLUG.

h. Remove the o–ring (7), oiler fill plug (40), and oiler plate (6) from the housing plug (37).

i. Remove the o–ring (39) from the oiler plate (6).

NOTICE

It is not necessary to replace the filter in the oiler plate unless it is damaged or dirty.

j. Remove the valve chest (8) by screwing a piece of 1/2–13 UNC–2B threaded rod into the top of the valve chest. Pull out the three washers (4) and valve chest (8).

k. If it is necessary to remove any of the air connection parts, unscrew the air connection cap (29) and the air connection (27), throttle pin (34), valve (32) and spring (31) will drop out.

l. Loosen vise so breaker can be rotated so the valve (9), valve cover (10) and piston (17) fall out.

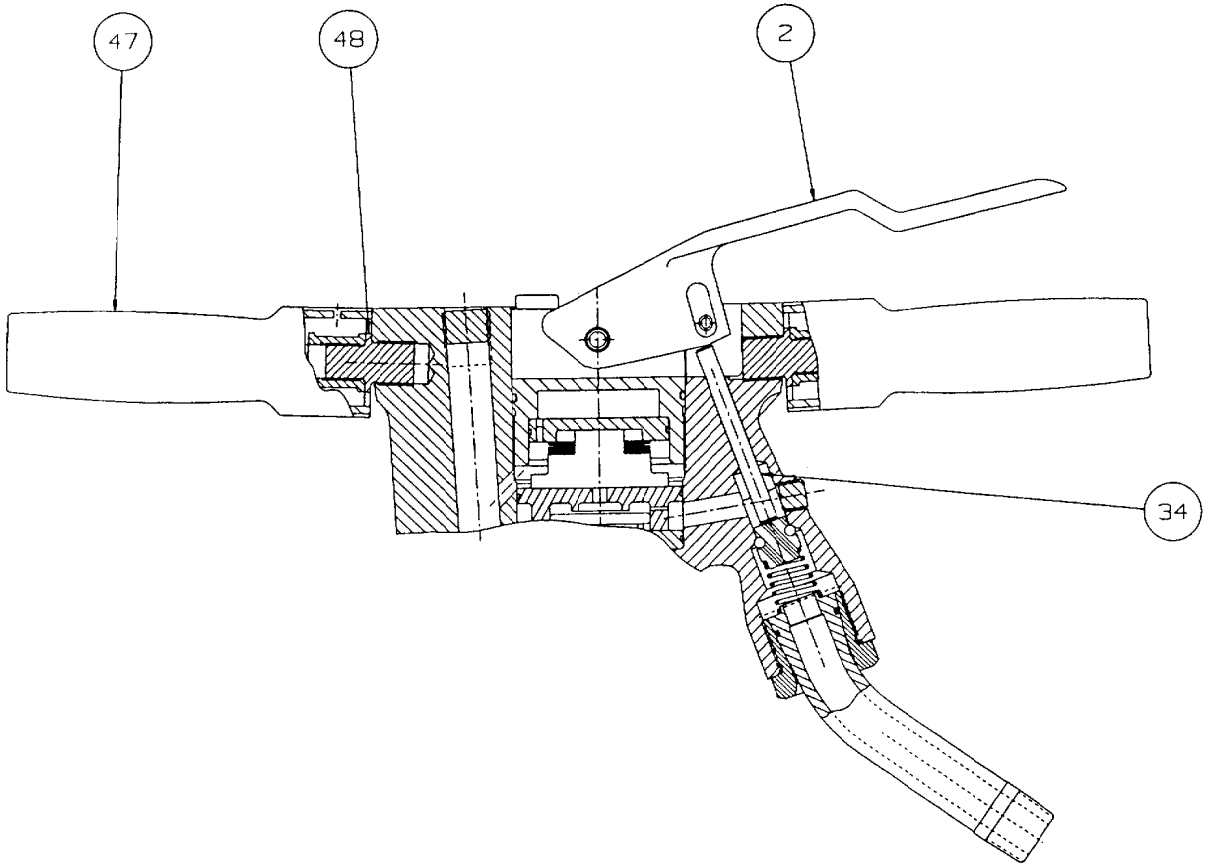
⚠CAUTION

WHEN LOOSENING THE VISE, MAKE SURE THE PAVING BREAKER IS SUPPORTED TO PREVENT IT FROM FALLING.

m. If it is necessary to remove any of the latch parts, drive out the roll pins (25, 26), then remove the lever (22), plunger (24) and spring (23) from the fronthead (20).

n. If the fronthead bushing (21) should require removal from the fronthead (20), make a tool from an old moil point:

1. Cut off the tip of the moil, making sure it is square.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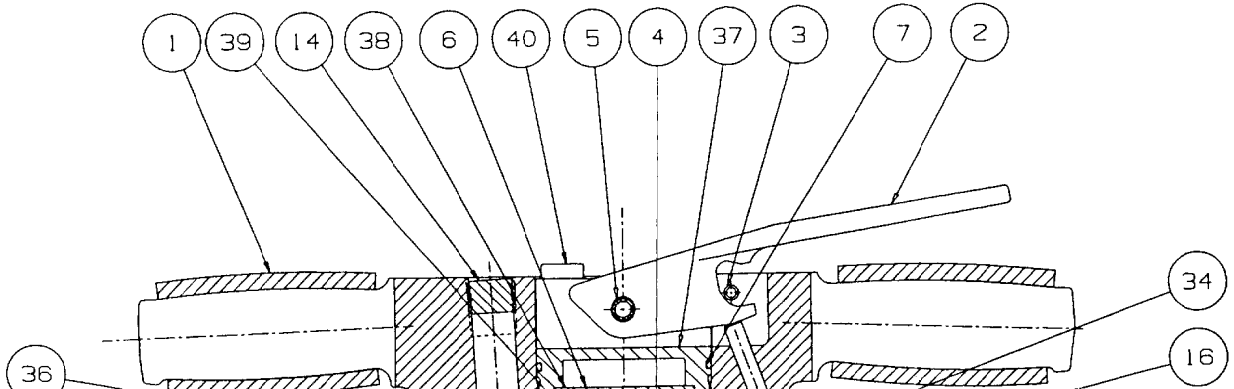
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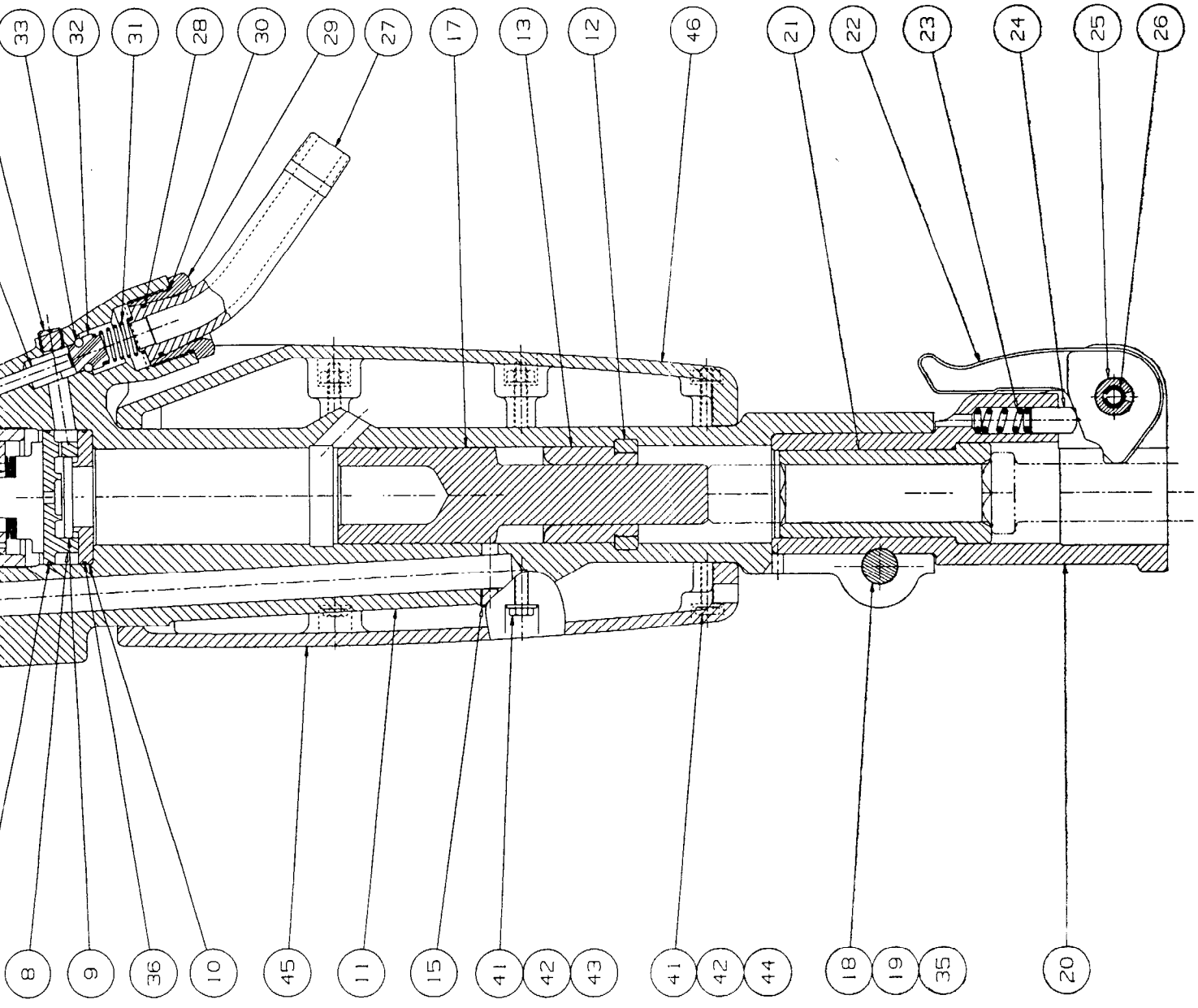


Figure 1. Typical Paving Breaker -- Sectional Illustrated

2. Leave about 8 in. (203mm) of steel below the moil collar.

3. Insert the fabricated tool (short end first) in the sleeve end of the fronthead (20), and with a hydraulic press, drive out the fronthead bushing (21).

4. INSPECTION AND REPAIR. (Figure 1, Page 3)

⚠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 (11), including the valve chest (8) and valve cover (10) must be examined, and all dust or dirt particles removed.

c. Check the valve (9) for cracks or chipping. If damaged, replace it.

d. Replace the piston (17) when a .007 in. (.178mm) feeler gauge can be inserted between the piston and the housing bore.

e. Check the throttle valve (32) and o–ring (33) for wear,and make certain that the throttle pin (34) is free to slide in the handle.

5. REASSEMBLY. (Figure 1, Page 3)

a. If it was removed, reassemble the steel retaining lever:

1. Insert the spring (23) then the plunger (24) into the fronthead (20).

2. Fit the lever (22) to the fronthead, then secure the lever with the pins (25, 26).

⚠CAUTION

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

b. Secure the housing (11) in a vise with soft jaws. Position the housing with the handle up.

c. Check the housing bore to make sure it is clean. If necessary, use a clean soft rag to wipe out any dirt or chips.

d. Drop the piston (17) into the housing (11) [shank end towards the fronthead end].

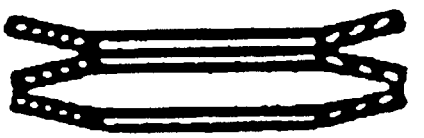
e. Install a new o–ring (36) on the valve cover (10).

f. Install a new o–ring (36) on the valve chest (8).

g. Install the valve cover (10) and valve (9) into the housing bore.

h. Use a piece of 1/2–13 UNC–2B threaded rod to screw into the top of the valve chest (8). Hold the end of the rod and install the valve chest into the housing bore, being careful that it doesn't get cocked.

i. Install the three washers (4) as shown in Figure 2.



Install washers as illustrated.

Figure 2. Valve Chest Washer Orientation

⚠CAUTION

BEFORE INSTALLING THE HOUSING PLUG, MAKE SURE THE VALVE PARTS ARE PROPERLY ASSEMBLED IN THE HOUSING. IF THEY ARE MISALIGNED, THEY MAY BE PERMANENTLY DAMAGED AND THE PAVING BREAKER WILL NOT RUN.

j. Install a new o–ring (7) in its groove in the housing plug (37).

k. Install a new o–ring (39) on the oiler plate (6).

l. Install the oiler plate (6) into the housing plug (37).

m. Install the housing plug (37) in the housing. Using the throttle lever (2), tighten the plug until the plug fully collapses the three washers, then loosen 1/8 to 1/2 turn until the slot in the plug allows assembly of the throttle lever.

n. Position the throttle lever (2) in the housing plug (37) slot, and drive in the two roll pins (3, 5) thru the housing and throttle lever to secure.

o. If the filter was damaged, the oiler plate (6) must be replaced.

p. Install oiler fill plug (40) into the top of the housing plug (37).

q. Loosen the vise and position the paving breaker so the air connection parts can be easily installed.

r. Insert the throttle pin (34), throttle valve (32), and throttle spring (31) into the housing (11).

NOTICE

The throttle pin must move freely in its bore.

s. Install a new o–ring (30) into the groove on the air connection cap (29).

t. Install a new o–ring (28) in the groove on the air connection (27) and install the air connection through the air connection cap (29). Secure the air connection parts with the air connection cap.

u. If the fronthead bushing (21) was removed from the fronthead (20), an assembly tool should be made from and old moil point to assist in reassembling the bushing in the fronthead. Refer to Paragraph 3, Step n, for instructions on fabricating this tool.

NOTICE

Make sure the bushing is aligned in the fronthead so that chisel points, asphalt cutters, and other bladed tools will have the blade parallel to the paving breaker T–handle.

The fronthead assembly 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 assembly to be easily replaced.

v. Using the fabricated assembly tool, press the fronthead bushing (21) into the front end (steel end) of the fronthead (20) until bottomed.

w. Install the fronthead (20) into housing (11) with the steel retainer latch on the same side as the air connection. Line up the slot in the fronthead with hole in the housing. Insert bolt (18), washer (35) and nut (19). ***Lubricate the bolt threads and torque the bolt to 280 lb-ft (380Mm).***

x. If removed, install the muffler.

6. PERFORMANCE TESTING.

A reconditioned paving breaker 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 breaker is filled with the proper lubricating oil. Refer to IM6087 "Instruction Manual for Paving Breaker Models PB35A, PB35AS, PB50A & PB50AS", Section 5, for the correct lubricating oil specifications.

With the breaker against the work surface, the breaker should start with less than 20 psi (1.4 bar) air pressure and with the piston reciprocating smoothly. Let the breaker run in slowly at reduced pressure long enough to see that it is in good working order. If the breaker 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 breaker may become warm, but should not overheat. If erratic operation continues or stalling persists, disassemble the breaker and check for binding of parts.

After an initial period of low pressure operation, check the performance of a reconditioned breaker 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 breaker is put back into service.

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1. INTRODUCTION.

This section contains detailed information for troubleshooting the Paving Breaker Models PB35A, PB35AS, PB50A & PB50AS, hereafter referred to as paving breaker.

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
Paving breaker will not start.	1. Plugged exhaust port or air passages caused by dirt or hose particles.	1. Dismantle breaker, 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 parts from the breaker. Clean parts. Never use dirty oil or oil that does not conform to the recommended specifications.
	3. Frozen piston due to improper lubrication.	3. Dismantle breaker to remove piston. Repair piston by placing in a high speed lathe and dressing with fine emery cloth. Never run breaker without the proper lubricating oil in the lubricating oil reservoir.

(Continued)

Table 1. Troubleshooting (Con't.)

TROUBLE	PROBABLE CAUSE	REMEDY
Paving breaker 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 breaker.
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.
Paving breaker 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. Keep shank fed–up to the work. Always maintain a constant pressure when operating the breaker.
	3. Plugged air passages.	3. Dismantle the breaker and clean out all ports and passages.
	4. Lack of lubricating oil.	4. Maintain the proper oil level in the lubricating oil reservoir. Steel shank must show a film of oil.
	5. Sticking valve.	5. Remove valve chest parts from the breaker. 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. Breaker not properly broken in.	1. Stop operating the breaker and perform initial servicing. Never run a new breaker at full throttle until a proper break–in period has been completed.

(Continued)

Table 1. Troubleshooting (cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
Overheating of paving breaker after break–in period.	1. Running on fronthead cushion.	1. Keep shank fed–up to work. Always maintain constant pressure when operating the breaker .
	2. Piston not hitting the shank because of short shank.	2. Remove shank piece from breaker.
	3. Pulling steel at full throttle.	3. When pulling steels, always use minimum throttle.
	4. Lack of lubrication or improper lubricating oil.	4. Before operating the breaker 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 breaker and clean out dirt and gummy residue. Service the breaker 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.

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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Phillipsburg, NJ 08865
201/859–7000

Reciprocating pumps and standard centrifugal pumps
Ingersoll–Rand Co.
P.O. Box 656
Allentown, PA 18105
215/433–6411

Vertical turbine pumps
Ingersoll–Rand Co.
Vertical Turbine Pump Division
Hastings, NE 68901
402/463–1306

TOOLS, WINCHES

Ingersoll–Rand Co.
Power Tool Division
P.O. Box 1776
Liberty Corner, NJ 07938
201/647–6000

LIQUID/SOLID SEPARATORS

Ingersoll–Rand Co.
Impco Division
150 Burke St.
Nashua, NH 03061
603/882–2711

CANADA

Surface and underground equipment
Tools and industrial equipment

Ingersoll–Rand Canada Inc.
2360 Millrace Court
Mississauga, Ontario L5N1W2
(1)416/858–8480

Ingersoll–Rand Canada, Inc.
2250 Hymus Blvd
Dorval, Quebec H9P1J9
(1) 514/683–9157

MEXICO

All equipment
Ingersoll–Rand, S.A. de C.V.
Boulevard Centro
Industrial #11
Fracc. Industrial
Puente de Vigas
Tlalnepantla,
54090 Edo. de Mexico
Mexico
52 (5) 390–40–21
52 (5) 390–24–11

SOUTH AMERICA

USA, Miami, Florida
1 (305) 599–0500

Chile – Santiago
56 (2) 41–198

Colombia – Bogota
57 (1) 219–1406/1460

Venezuela – Caracas
58 (2) 239–9369

EUROPE

Austria – Vienna
43 (222) 83–05–250

Belgium – Brussels
32 (02) 216–99–95

France – Trappes
33 (3) 050–61–10

Germany – Ratingen
49 (2102) 48090

*Italy – Milano
39 (02) 950561

Netherlands – Zoeterwoude
31 (071) 452200

Norway – Oslo
47 (02) 39–15–26

Spain – Madrid
34 (9) 1–671–07–00

Sweden – Spanga
46 (08) 750–59–20

United Kingdom – London
44 (01) 584–5070

*Also for Bulgaria, Czechoslovakia, Hungary, Poland, Rumania, USSR, Yugoslavia.

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(02)341–5190

South Africa – Alrode
27 (011) 864–3930

ASIA–PACIFIC

Australia–Melbourne
61–(3) 794–1611

Hong Kong
852 (5) 270183

India–Bombay
91 (22) 4936765

Japan – Tokyo
81 (3) 403–0841/7

Korea – Seoul
82 (2) 776–2541

New Zealand – Auckland
64 (9) 885096

Philippines – Manila
63 (2) 89–85–06/08

Singapore
(65) 8611555

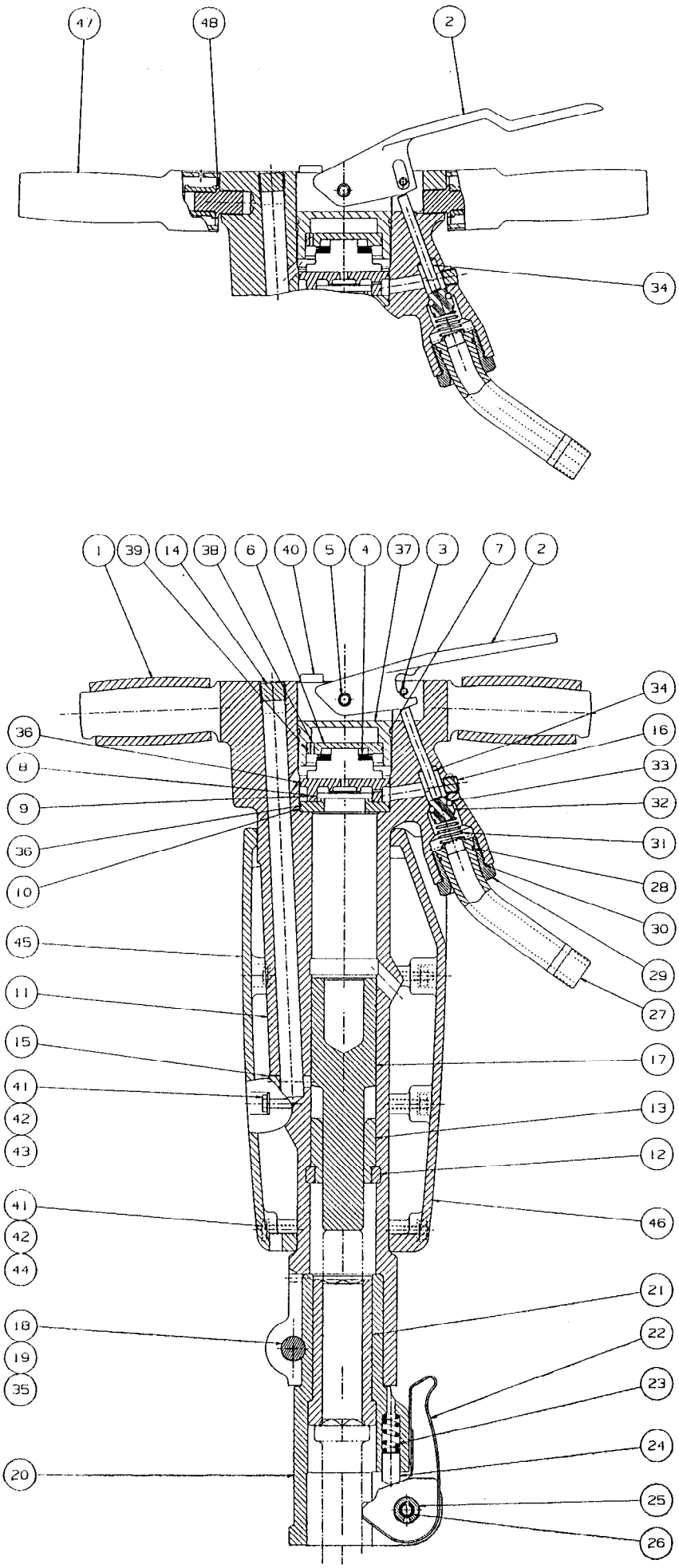

Figure 1. Typical Paving Breaker – Sectional Illustrated