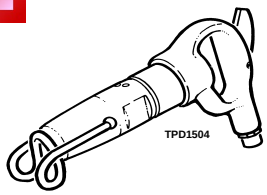
03533031

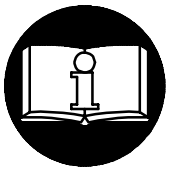
Form P6659
Edition 6
October, 1996




# OPERATION AND MAINTENANCE MANUAL
# for
# MODELS PH2, PH3 AND PH5 PICKHAMMERS

**NOTICE**

**Models PH2, PH3 and PH5 Pickhammers are designed for breaking concrete and other demolition work in construction applications.**
**Ingersoll–Rand is not responsible for customer modification of tools for applications on which Ingersoll–Rand was not consulted.**



**⚠ WARNING**

**IMPORTANT SAFETY INFORMATION ENCLOSED.**
**READ THIS MANUAL BEFORE OPERATING TOOL.**
**IT IS THE RESPONSIBILITY OF THE EMPLOYER TO PLACE THE INFORMATION IN THIS MANUAL INTO THE HANDS OF THE OPERATOR.**
**FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.**

## PLACING TOOL IN SERVICE

- Always operate, inspect and maintain this tool in accordance with American National Standards Institute Safety Code for Portable Air Tools (ANSI B186.1).
- For safety, top performance, and maximum durability of parts, operate this tool at 90 psig (6.2 bar/620 kPa) maximum air pressure at the inlet with 1/2” (13 mm) inside diameter air supply hose.
- Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.
- Do not use damaged, frayed or deteriorated air hoses and fittings.
- Be sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905–1 for a typical piping arrangement.
- Always use clean, dry air at 90 psig (6.2 bar/620 kPa) maximum air pressure. Dust, corrosive fumes and/or excessive moisture can ruin the motor of an air tool.
- Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.
- Do not remove any labels. Replace any damaged label.

## USING THE TOOL

- Always wear eye protection when operating or performing maintenance on this tool.
- Always wear hearing protection when operating this tool.
- Keep hands, loose clothing and long hair away from impacting end of tool.
- Anticipate and be alert for sudden changes in motion during start up and operation of any power tool.
- Keep body stance balanced and firm. Do not overreach when operating this tool. High reaction torques can occur at or below the recommended air pressure.
- Tool accessory may continue to impact briefly after throttle is released.
- 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.
- Use accessories recommended by Ingersoll–Rand.
- Never operate a Percussion Tool unless an accessory is properly installed and the tool is held firmly against the work.
- Always use a retainer, when furnished, in addition to proper barriers to protect persons in surrounding or lower areas from possible ejected accessories.

**NOTICE**

**The use of other than genuine Ingersoll–Rand replacement parts may result in safety hazards, decreased tool performance and increased maintenance, and may invalidate all warranties.**

**Ingersoll–Rand is not responsible for customer modification of tools for applications on which Ingersoll–Rand was not consulted.**

**Repairs should be made only by authorized, trained personnel. Consult your nearest Ingersoll–Rand Authorized Servicenter.**

**It is the responsibility of the employer to place the information in this manual into the hands of the operator.**

**Refer All Communications to the Nearest Ingersoll–Rand Office or Distributor.**



**Printed in U.S.A.**

INGERSOLL-RAND®
PROFESSIONAL TOOLS

## *WARNING LABEL IDENTIFICATION*

**⚠ WARNING**

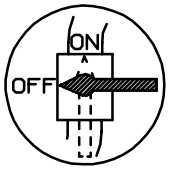
**FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.**

**⚠ WARNING**

**Always wear eye protection when operating or performing maintenance on this tool.**

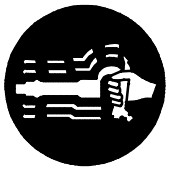
**⚠ WARNING**

**Always wear hearing protection when operating this tool.**




**⚠ WARNING**

**Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.**



**⚠ 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.**

**⚠ WARNING**

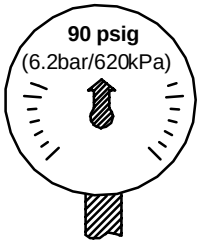
**Do not carry the tool by the hose.**

**⚠ WARNING**

**Do not use damaged, frayed or deteriorated air hoses and fittings.**

**⚠ WARNING**

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




**⚠ WARNING**

**Operate at 90 psig (6.2 bar/620 kPa) Maximum air pressure.**

## *PERCUSSIVE TOOL SPECIFIC WARNINGS*

- **When wearing gloves and operating models with inside trigger, always be sure that the gloves will not prevent the trigger from being released.**
- **Wear safety shoes, hard hat, safety goggles, gloves, dustmask and any other appropriate protective clothing while operating the tool.**
- **Do not indulge in horseplay. Distraction can cause accidents.**
- **Keep hands and fingers away from the throttle lever until it is time to operate the tool.**
- **Never rest the tool or chisel on your foot.**
- **Never point the tool at anyone.**
- **Compressed air is dangerous. Never point an air hose at yourself or co–workers.**
- **Never blow clothes free of dust with compressed air.**
- **Be sure all hose connections are tight. A loose hose not only leaks but can come completely off the tool and while whipping under pressure, can injure the operator and others in the area. Attach safety cables to all hoses to prevent injury in case a hose is accidentally broken.**
- **Never disconnect a pressurized air hose. Always turn off the air supply and bleed the tool before disconnecting a hose.**
- **The operator must keep limbs and body clear of the chisel. If a chisel breaks, the tool with the broken chisel projecting from the tool will suddenly surge forward.**
- **Do not ride the tool with one leg over the handle. Injury can result if the chisel breaks while riding the tool.**
- **Know what is underneath the material being worked. Be alert for hidden water, gas, sewer, telephone or electric lines.**
- **Use only proper cleaning solvents to clean parts. Use only cleaning solvents which meet current safety and health standards. Use cleaning solvents in a well ventilated area.**
- **Do not flush the tool or clean any parts with diesel fuel. Diesel fuel residue will ignite in the tool when the tool is operated, causing damage to internal parts. When using models with outside triggers or throttle levers, take care when setting the tool down to prevent accidental operation.**
- **Do not operate the tool with broken or damaged parts.**
- **Never start the tool when it is lying on the ground.**
- **This tool is not designed for working in explosive atmospheres.**
- **This tool is not insulated against electric shock.**

## *PLACING TOOL IN SERVICE*

### LUBRICATION

Use a high quality Rock Drill Oil with a flash point between 370 and 450 degrees Fahrenheit (188 and 232 degrees Celsius).

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

Periodically, the entire tool should be disassembled, the parts should be washed in a clean, nontoxic, nonflammable, commercial solvent, dried completely and well oiled before reassembly.

The method used to provide adequate lubrication is dependent upon actual operating conditions and customer preference.

a. If operation is intermittent, and the air supply hose does not exceed 6 meters (20 ft.) in length, a compressor–mounted lubricator can be used.

b. If operation is continuous, that is 8 hours a day, an Ingersoll–Rand No. 8LUB16C Air Line Lubricator is recommended for proper lubrication. Install it in the main air line within 3.5 meters (11.5 ft.) of the Pickhammer.

Regardless of the method of lubrication, the lubricating oil reservoir must be serviced with recommended oil as frequently as necessary to prevent any possibility of the Pickhammer running dry.

The oil level in the air line lubricator should be checked at the beginning of each eight hour shift and once during the shift.

Every effort must be made to avoid oil contamination from dirt or other impurities. Oil should be kept in covered containers and stored, if possible, in an area that is relatively dust free.

Before filling the air line lubricator, the area around the filler plug should be wiped clean.

The oil used in the lubricator must be a well refined petroleum lubricating oil. It must be suitably compounded to provide the specified consistency and film strength, and be further compounded to provide the specified steam emulsion number. The latter is required to provide a satisfactory lubricant for such Pickhammers where water or wet air is encountered. The oil must also be substantially non–corrosive to steel and bronze, and contain little or no sulpher.

## *PLACING TOOL IN SERVICE*

| Characteristics | Method | Below 20°F (6.7°C) Light | 20 to 90°F (6.7 to 32.2°F) Medium | Above 90°F (32.2°C) Heavy |
|---|---|---|---|---|
| Viscosity: | | | | |
| SUS at 100° F (37.8°C) | ASTM–D2161 | 175 Min. | 450 Min. | 750 Min. |
| SUS at 210°F (98.9°C) | ASTM–D2161 | 46 | 65 | 85 |
| cSt at 40°C | ASTM–D445 | 37 Min. | 105 Min. | 160 Min. |
| cStat 100°C | ASTM–D445 | 6 | 11 | 16 |
| Flash Point, °F (°C) Min. | ASTM–D92 | 370 (188) | 400 (204) | 450 (232) |
| Pour Point, °F (°C) Max. | ASTM–D97 | –10 (–23) | –10 (–23) | 0 (–18) |
| 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.(Min.) | ASTM–D2670 | 2000 | 2000 | 2000 |
| Timken, E.P. Test lbs.(Min.) | ASTM–D2782 | 30 | 30 | 30 |

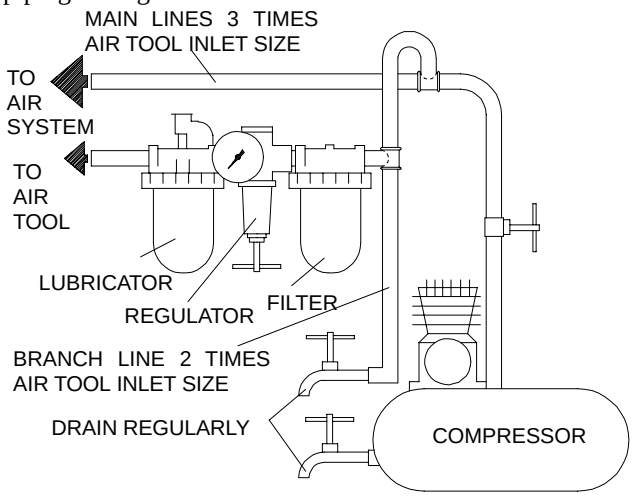
The composition of the “film strength” additive is not specified. The additive must be suitable for use with both steel and bronze, and be substantially non–corrosive to both metals. Except for consistency, all tests must be conducted in accordance with the standard method (latest edition) of the American Society for Testing Metals.

## INSTALLATION

### Air Supply and Connections

Always use clean, dry air at 90 psig maximum air pressure. Dust, corrosive fumes and/or excessive moisture can ruin the motor of an air tool. An air line filter can greatly increase the life of an air tool. The filter removes dust and moisture.

Make sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905–1 for a typical piping arrangement.




**(Dwg. TPD905–1)**

## OPERATION

Almost immediately after starting the Pickhammer, check for the presence of oil at the exhaust ports and on the steel shank. This is the only assurance that oil is travelling all the way through the Pickhammer. Break in a new Pickhammer slowly, usually half throttle, for at least the better part of an hour.

Heating is not unusual in a new Pickhammer and it should be checked carefully during the first few hours of operation. In most cases, heating will be localized around the front end of the cylinder. Test this area frequently with the hand. As long as the hand can be held on the part comfortably, it is safe to continue drilling. When the heat is great enough to cause discomfort, stop the Pickhammer and let it cool. Since lack of oil can cause excessive heating, check again to see that the steel shank is oily.

Hold the Pickhammer against the work to get maximum efficiency from the tool. Failure to do this can result in an excessive heat buildup at the front end of the cylinder which can damage the steel holder. Never back the steel out of the hole at full throttle.

Always blow out the air supply line before attaching it to the Pickhammer. Purging the line will prevent moisture, pipe scale and other foreign matter from being carried into the Pickhammer with the air.

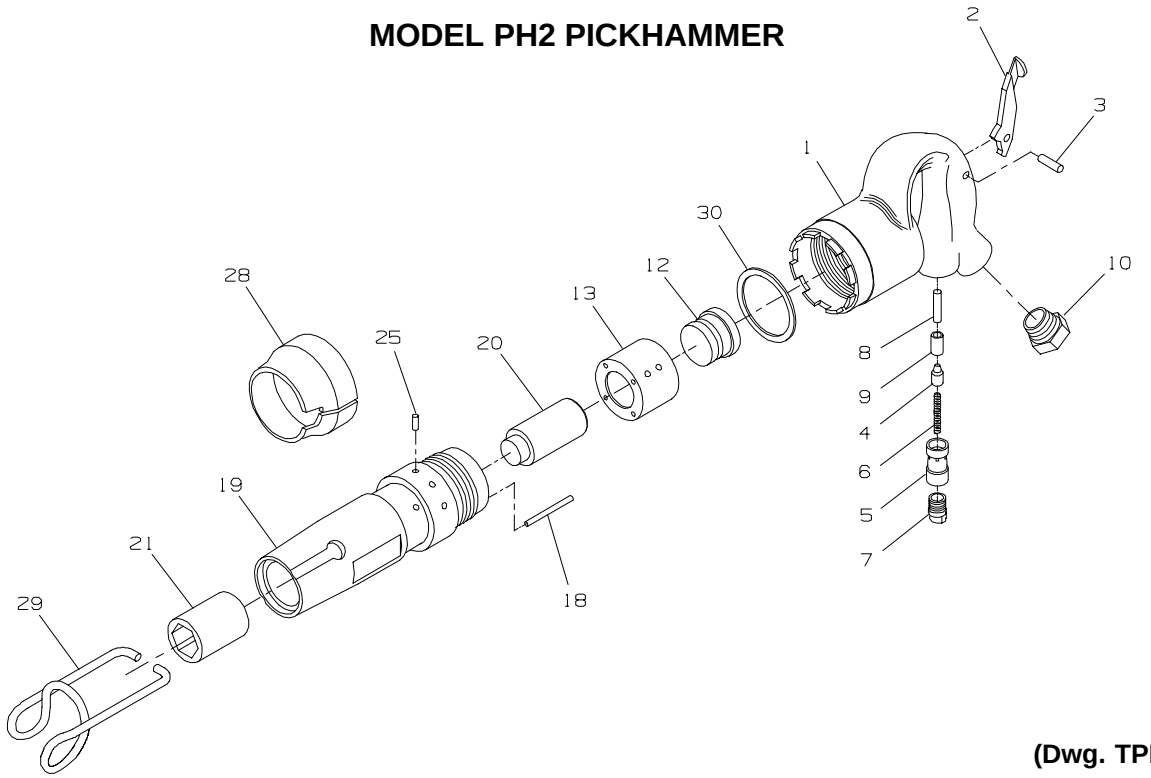
# *PLACING TOOL IN SERVICE*

***Models PH2, PH3 and PH5 Pickhammers are designed for breaking concrete and other demolition work in construction applications.***

## HOW TO ORDER A PICKHAMMER

| Model | Impacts/min. | Piston Stroke | |
|---|---|---|---|
| | | in | mm |
| PH2 | 2850 | 2 | 50 |
| PH3 | 3850 | 1–1/2 | 37 |
| PH5 | 2550 | 2–3/8 | 60 |

## MODEL PH2 PICKHAMMER

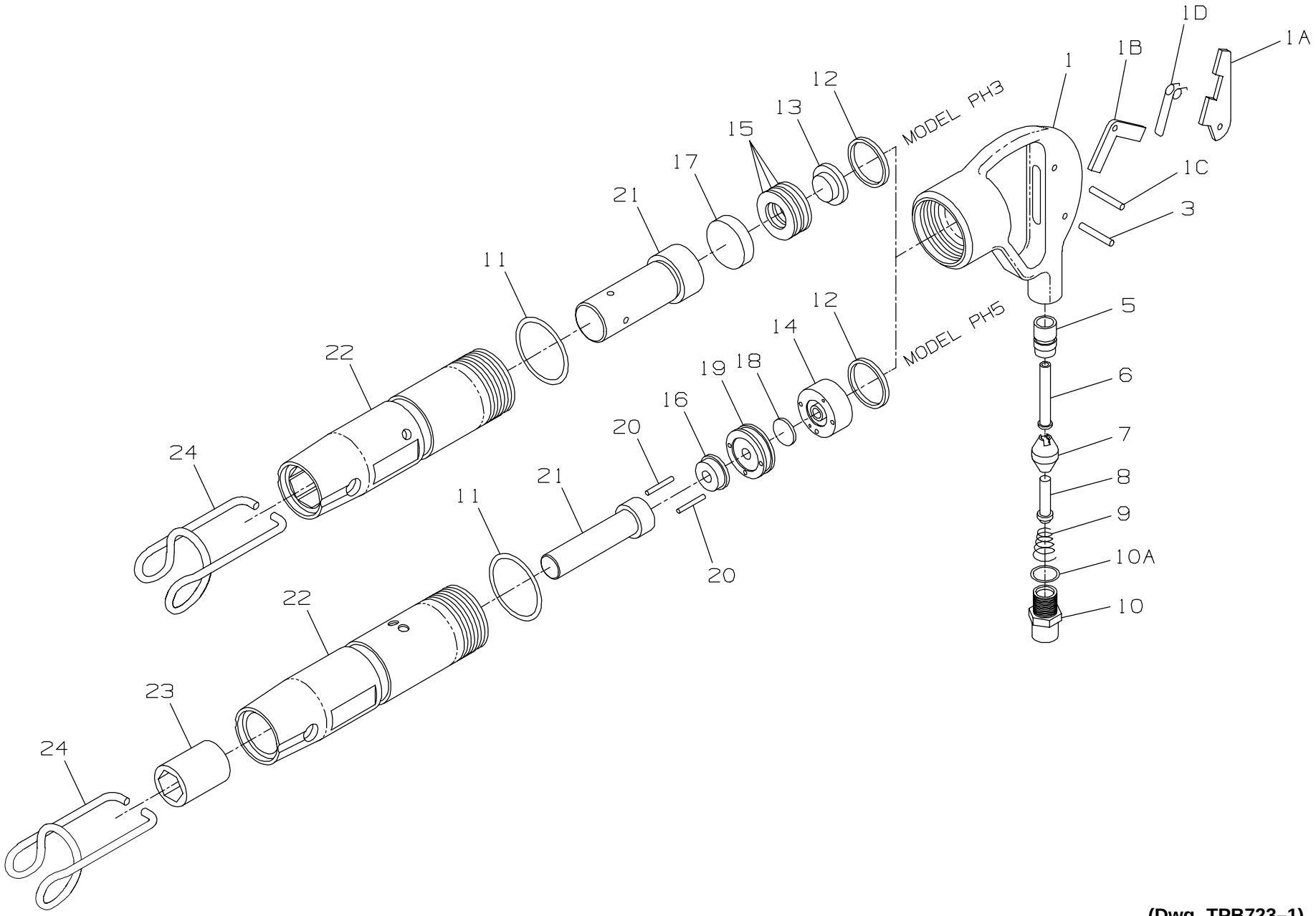



**(Dwg. TPB996)**

**PART NUMBER FOR ORDERING** → **PART NUMBER FOR ORDERING** →

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | Grip Handle | PH2–50901 | • | 18 | Valve Pin | PH2–50918 |
| | 2 | Throttle Lever | PH2–50902 | | 19 | Cylinder | PH2–50919 |
| • | 3 | Throttle Lever Pin | PH2–50903 | | 20 | Piston | PH2–50920 |
| • | 4 | Throttle Valve Face | PH2–50904 | | 21 | Nozzle | PH2–50921 |
| | 5 | Throttle Valve Seat | PH2–50905 | | 25 | Handle Lock Pin | PH2–50925 |
| • | 6 | Throttle Valve Spring | PH2–50906 | | 28 | Deflector | PH2–50928 |
| | 7 | Valve Stopper | PH2–50907 | | 29 | Retainer | PH2–50929 |
| • | 8 | Throttle Valve Stem | PH2–50908 | • | 30 | Spacer Ring | |
| | 9 | Throttle Valve Stem Bush | PH2–50909 | | | 1 mm | PH2–50930 |
| | 10 | Inlet Bushing | PH2–50910 | | | 1.5 mm | PH2–50931 |
| • | 12 | Valve | PH2–50912 | | * | Warning Label | EU–99 |
| | 13 | Valve Box | PH2–50913 | | * | Nameplate | PH2–301 |

## MODELS PH3 AND PH5 PICKHAMMERS




(Dwg. TPB723–1)

| | | PART NUMBER FOR ORDERING | |
|---|---|---|---|
| | | PH3 | PH5 |
| | Grip Handle Assembly | PH3–50111 | PH5–50202 |
| 1 | Grip Handle | PH3–50110 | PH5–50201 |
| 1A | Safety Throttle Lever | PH3–50130 | PH5–50130 |
| 1B | Safety Lever | PH3–50131 | PH5–50131 |
| 1C | Safety Lever Pin | PH3–50132 | PH5–50132 |
| 1D | Safety Lever Spring | PH3–50133 | PH5–50133 |
| 2 | Throttle Lever | PH3–50101 | PH3–50101 |
| ♦ 3 | Throttle Lever Pin | PH3–50102 | PH3–50102 |
| 5 | Throttle Valve Stem Bushing | PH3–50104 | PH3–50104 |
| ♦ 6 | Throttle Valve Stem | PH3–50105 | PH3–50105 |
| ♦ 7 | Throttle Valve Face | PH3–50106 | PH3–50106 |
| ♦ 8 | Throttle Valve Pin | PH3–50107 | PH3–50107 |
| ♦ 9 | Throttle Valve Spring | PH3–50108 | PH3–50108 |
| 10 | Inlet Bushing Assembly | PH3–50127 | PH3–50127 |
| ♦ 10A | Inlet Bushing Seal | PH3–50128 | PH3–50128 |
| ♦ 11 | O–ring | PH3–50112 | PH5–50203 |
| ♦ 12 | Cylinder Spacer | | |
| | 1 mm thick | — | PH5–50204 |
| | 2 mm thick | — | PH5–50223 |
| | 3.6 mm thick | PH3–50126 | — |
| 13 | Washer Guide | PH3–50115 | — |
| 14 | Upper Valve Seat | — | PH5–50205 |

♦ Indicates Tune–up Kit part.

| | | | PART NUMBER FOR ORDERING ↓ | ↓ |
|---|---|---|---|---|
| | 15 | Spring Washer Assembly (set of 3 Washers) | PH3–50116 | — |
| | 16 | Piston Bumper | — | PH5–50209 |
| | 17 | Piston Shield | PH3–50117 | — |
| ♦ | 18 | Valve | — | PH5–50206 |
| | 19 | Lower Valve Seat | — | PH5–50207 |
| ♦ | 20 | Valve Pin (2) | — | PH5–50208 |
| | 21 | Piston | PH3–50118 | PH5–50210 |
| | 22 | Cylinder | PH3–50113 | PH5–50211 |
| | 23 | Nozzle | — | PH5–50212 |
| | * | Warning Label | EU–99 | EU–99 |
| | 24 | Retainer | PH3–50114 | PH3–50114 |
| | * | Nameplate | PH3–301 | PH5–301 |
| | * | Tune–up Kit (includes illustrated parts 3, 6, 7, 8, 9, 10A and 11) | PH3–TK1 | — |
| | | (includes illustrated parts 3, 6, 7, 8, 9, 10A, 11, 12, 18 and 20 [2]) | — | PH5–TK1 |

♦ Indicates Tune–up Kit part.

* Not illustrated.

**PART NUMBER FOR ORDERING**

| | PH3 and PH5 | PH2 |
|---|---|---|
| Moil Point Chisel | | |
| 8–21/32” (220 mm) long | – – – | PH2–4060 |
| 11–13/16” (300 mm) long | PH3–02200 | – – – |
| 19–11/16” (500 mm) long | PH3–02201 | – – – |
| Flat Blade Chisel | | |
| 11–13/16” (300 mm) long | PH3–02202 | – – – |
| 19–11/16” (500 mm) long | PH3–02203 | – – – |
| Bushing Bit Shank | PH3–02206 | – – – |
| Carbide Bushing Bit | | |
| 9 teeth | PH3–02208 | – – – |
| 16 teeth | PH3–02209 | – – – |
| Angle Chisel | PH3–02204 | – – – |
| Tooth Chisel | PH3–02228 | – – – |
| Gouge Chisel | PH3–02205 | – – – |
| Flat Chisel | | |
| 25 mm wide | – – – | PH2–4061 |
| Wide Scaling Chisel | | |
| 100 mm wide | – – – | PH2–4062 |

# MAINTENANCE SECTION

**⚠ WARNING**

**Always wear eye protection when operating or performing maintenance on this tool.**

**Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool or before performing any maintenance on this tool.**

## LUBRICATION

Use only a high quality Rock Drill Oil with a flash point between 370° and 450° F (188° and 232° C) and lubricate as instructed in the section **Placing the Tool in Service**.

## DISASSEMBLY

### General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. When grasping a tool or part in a vise, always use leather–covered or copper–covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
3. Do not remove any part which is a press fit in or on a subassembly unless the removal of that part is necessary for repairs or replacement.
4. Do not disassemble the tool unless you have a complete set of new gaskets and O–rings for replacement.
5. Never attempt extensive maintenance or major repairs in the field; always send the Pickhammer to the repair shop.
6. Clean the exterior of the Pickhammer before disassembly.
7. Provide a clean work area for disassembling the Pickhammer.
8. Handle all parts carefully. Hardened parts may chip or break if dropped on a hard surface.
9. Probe all porting to loosen and clean out all foreign matter. Place small parts in a clean box to prevent loss.

### Disassembly of the Pickhammer

**For PH3 and PH5**

1. Grasp the Handle (1) firmly in leather–covered or copper–covered vise jaws with the Cylinder (22) upward.

**CAUTION**

**Do not exert extreme pressure on the Handle. The Handle can be cracked if the vise is tightened excessively.**

2. Using a large adjustable wrench on the flats of the Cylinder, loosen the Cylinder.

**NOTICE**

**Do not loosen the Cylinder unless a new O–ring (11) is available. This O–ring is usually damaged during disassembly.**

3. Remove the Pickhammer from the vise and unscrew the Cylinder from the Handle.
4. **For Model PH3**, remove the Cylinder Spacer (12), Washer Guide (13), Spring Washer Assembly (15), Piston Shield (17) and Piston (21) from the Cylinder. **For Model PH5,** remove the Cylinder Spacer (12), Upper Valve Seat (14), Valve (18), Lower Valve Seat (19), Piston Bumper (16), two Valve Pins (20) and Piston (21) from the Cylinder.
5. Remove the O–ring from the Cylinder.
6. **For Model PH5,** press the Nozzle (23) from the Cylinder if the Nozzle requires replacement.
7. Using a wrench, remove the Inlet Bushing Assembly (10) from the Handle.
8. Remove the Throttle Valve Spring (9), Throttle Valve Pin (8), Throttle Valve Face (7) and the Throttle Valve Stem (6).
9. If the Throttle Valve Stem Bushing (5) requires replacement, press the Throttle Lever Pin (3) from the Handle and remove the Throttle Lever (2). Using an arbor press and a rod that fits into the throttle lever slot, press the Bushing out of the Handle through the Inlet Bushing opening.
10. If the Throttle Valve Stem Bushing (5) requires replacement, press the Throttle Lever Pin (3) from the Handle, and remove the Safety Throttle Lever (1A). Using an arbor press and a rod that fits into the throttle lever slot, press the Bushing out of the Handle through the Inlet Bushing opening.
11. If the Safety Lever (1B) requires replacement, press the Safety Lever Pin (1C) from the Handle, and remove the Safety Lever and the Safety Lever Spring.

**For PH2**

1. Grasp the Handle (1) firmly in the leather–covered or copper–covered vise jaws with Cylinder (19) upward.

**CAUTION**

**Do not exert extreme pressure on the Handle. The Handle can be cracked if the vise is tightened excessively.**

2. Remove the Retainer (29).
3. Remove the Deflector (28) from the Cylinder.
4. Remove the Handle Pin (25).
5. Using a large adjustable wrench on the flats of the Cylinder, loosen the Cylinder.

6. Remove the Pickhammer from the vise and unscrew the Cylinder from the Handle.
7. Remove the Spacer Rings (30), Valve (12), Valve Box (13), Valve Pin (18) and Piston (20) from the Cylinder.
8. Press the Nozzle (21) from the Cylinder if the Nozzle requires replacement.
9. Using a wrench, remove the Valve Stopper (7) from the Handle.
10. Remove the Throttle Valve Spring (6), Throttle Valve Face (4) and Throttle Valve Stem (8) from the Handle.
11. If the Inlet Bushing (10) requires replacement, remove the Inlet Bushing from the Handle by using a wrench.

## ASSEMBLY

### General Instructions

1. When grasping a tool or part in a vise, always use leather–covered or copper–covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
2. Always clean every part and wipe every part with a thin film of clean oil before installation.
3. Apply a film of O–ring lubricant to all O–rings before final assembly.
4. Except for press fits, parts should fit together easily. If force is required to assemble parts, the parts are out of alignment and must be correctly aligned to prevent binding and damage.

### Assembly of the Pickhammer

**For PH3 and PH5**

1. If the Throttle Valve Stem Bushing (5) was removed, press a new Bushing into the Handle (1).
2. Position the Throttle Lever (2) in the Handle and secure it by pressing the Throttle Lever Pin (3) into the Handle and through the Throttle Lever.
3. If the Safety Lever (1B) was removed, position the Safety Lever and the Safety Lever Spring (1D) in the Handle, with the “U”–shape of the Spring inside the angle made by the Safety Lever. Secure them by pressing the Safety Lever Pin (1C) into the Handle, and through the Safety Lever and Spring.

**NOTICE**

**Safety system is to be fitted only with adapted Safety Throttle Lever (1A).**

4. Position the Safety Throttle Lever in the Handle, adjusting the “L”–shape of the Safety Lever Spring against the edge of the Throttle Lever. Secure it by pressing the Throttle Lever Pin (3) into the Handle, and through the Safety Throttle Lever.
5. Insert the Throttle Valve Stem (6) into the Throttle Valve Stem Bushing.
6. Position the slotted end of the Throttle Valve Face (7) against the Throttle Valve Stem.
7. Install the smaller diameter end of the Throttle Valve Spring (9) on the short hub of the Throttle Valve Pin (8). Using the Spring to hold the Pin, install the long end of the Throttle Valve Pin into the Throttle Valve Face.
8. Install the Inlet Bushing Seal (10A) on the Inlet Bushing (10) and thread the Inlet Bushing Assembly into the Handle and tighten it to 9 ft–lb (12 Nm) torque.
9. **For Model PH5,** press the new Nozzle (23) into the front end of the Cylinder (22) if the Nozzle required replacement.
10. Install the O–ring (11) in the groove adjacent to the threads on the exterior of the Cylinder.
11. Insert the Piston (21) into the rear end of the Cylinder.
12. **For Model PH3,** proceed as follows:
    a. Install the Piston Shield (17) in the threaded end of the Cylinder with the shallow counterbored surface toward the Piston.
    b. Stack the three Spring Washers (15) together and position them, concave side first, against the Piston Shield.
    c. Insert the small diameter hub of the Washer Guide (13) into the central opening of the Spring Washers.
    d. Position the Cylinder Spacer (12) against the threaded end of the Cylinder and thread the Handle onto the Cylinder.

    **For Model PH5,** proceed as follows:
    a. Insert the two Valve Pins (20) into the holes in the threaded end of the Cylinder.
    b. If the Piston Bumper (16) was separated from the Lower Valve Seat (19) during disassembly, work the large diameter of the Piston Bumper into the counterbore of the Lower Valve Seat until the Bumper is seated squarely against the Valve Seat.
    c Slide the Lower Valve Seat, Piston Bumper first, onto the two Pins and against the Cylinder.
    d. Position the Valve (18) in the counterbore of the Upper Valve Seat (14) and slide the Upper Valve Seat, Valve first, onto the Pins against the Lower Valve Seat.
    e. One or two Cylinder Spacers (12) have been installed in these tools at the factory to locate the Handle in the correct position at the Cylinder. Install an identical number of Spacers of the same thickness (1 or 2 mm thick) in the rear of the Handle with the dished side of the Spacer facing the Valve.
    f. Thread the Handle onto the Cylinder.

13. Using a torque wrench, tighten the Cylinder between 34 and 40 ft–lb (46 and 54 Nm) torque.

**For PH2**

1. If the Throttle Lever (2) was removed, position the Throttle Lever into the Handle (1) and secure it by pressing the Throttle Lever Pin (3) into the Handle and through the Throttle lever.
2. Insert the Throttle Valve Stem (8) into the Throttle Valve Stem Bushing (9).
3. Position the cone end of the Throttle Valve Face (4) against the Throttle Valve Stem.
4. Install one end of the Throttle Valve Spring (6) into the Throttle Valve Face (4).
5. Install the Valve Stopper (7) on the other end of the Throttle Valve Spring, and thread it into the Handle and tighten it to 9 ft–lb (12 Nm) torque. Also, thread the Inlet Bushing (10) into the Handle if it was removed.
6. Press the new Nozzle (21) into the front end of the Cylinder (19) if the Nozzle required replacement.
7. Insert the Piston (20) into the rear end of the Cylinder.
8. Install the Valve Pin (18) into the smallest of the four holes located into the rear of the Cylinder.
9. Slide the Valve Box (13) into the rear of the Cylinder, its larger surface first, and position it on the Valve Pin.
10. Then, slide the Valve (12) into the Valve Box (13), its smallest diameter first.
11. One of two Spacer Rings (30) have been installed in these tools at the factory to locate the Handle in the correct position at the Cylinder. Install an identical number of Spacer Rings of the same thickness (1 or 1.5 mm thick) in the rear of the Handle with the dished side of the Spacers facing the Valve.
12. Using a torque wrench, tighten the Cylinder between 34 and 40 ft–lb (46 and 54 Nm) torque.
13. Position the Handle Pin (25) into the only hole of the Cylinder that faces exactly one slot of the Handle.
14. Slide the Deflector (28) on the Cylinder, and position it into the slots of the Handle.
15. Install the Retainer (29) into the two side holes of the nose of the Cylinder.

## TROUBLESHOOTING GUIDE

| Trouble | Probable Cause | Solution |
|---|---|---|
| Pickhammer will not start | Plugged exhaust port or air passages caused by dirt or hose particles | Dismantle the Pickhammer and clean out all ports and air passages. Keep the air hose in top notch condition; never use a soft, deteriorated hose. |
| | Stuck valve due to gummy oil or incorrect assembly | Remove and clean the valve chest parts. Never use dirty oil or oil that does not conform to the recommended specifications. Check for correct valve assembly procedures. |
| | Frozen piston due to improper lubrication | Repair the piston by placing in a high speed lathe and dressing with fine emery cloth. Never run the Pickhammer without the proper lubricating oil in the lubricator. |
| Pickhammer loses power rabidly | Restriction in the air hose | Never allow the air hose to kink or make sharp bends. |
| | Air hose too long | As a general rule, keep the air hose length under 49 feet (15 m). |
| | Air Hose diameter too small | Use a 12” (13 mm) inside diameter air supply hose. |
| | Clogged Inlet Bushing screen | Clean the screen in the Inlet Bushing Assembly |
| Pickhammer lacks power | Low air supply pressure | The air supply pressure at the tool should be between 483 and 827 kPa (70 and 120 psig). |
| | Running on Fronthead cushion | Keep shank fed–up to the work. Always maintain a constant pressure when operating the Pickhammer. |
| | Plugged air passages | Disassemble the Pickhammer and clean out all ports and passages. |
| | Lack of lubricating oil | Maintain the proper oil level in the lubricator. Steel shank must show a film of oil. |
| | Clogged Inlet Bushing Screen | Clean the screen in the Inlet Bushing Assembly. |
| Cylinder overheating on new Pickhammer | Tool not properly broken in | Stop operating the tool and perform initial servicing. Never run a new Pickhammer at full throttle until a proper break–in period has been completed. |
| Tool overheating after break–in period | Running on Fronthead cushion | Keep shank fed–up to the work. Always maintain a constant pressure when operating the Pickhammer. |
| | Piston not hitting shank because shank is short | Remove the shank from the Pickhammer |
| | Pulling steel at full throttle | Use minimum throttle when pulling steels away from work. |
| | Lack of lubricant or improper lubricating oil | Before operating the Pickhammer, make sure the lubricating oil reservoir is full of proper lubricant. |
| Erratic or sluggish operating | Lubricating oil too heavy, slowing down valve action | Use only the recommended lubricating oil. |
| | Gummed oil or dirt in operating parts | Disassemble the tool and clean out dirt and gummy residue. Service the Pickhammer with clean oil. Protect the tool from dirt when idle. |
| | Clogged Inlet Bushing screen | Clean the screen in the Inlt Bushing Assembly. |
| Freezing at exhaust ports | Excessive moisture in the air supply line (Usually occurs in low ambient temperatures) | Install moisture traps in the air supply line or add anti–freeze lubricant directly throught the air inlet. Use “KILFROST” anti–freeze lubricant or equivalent. |
| Fogging | Excessive moisture in the air supply line | Clean out the air lines. IF moisture traps are installed in the air supply line, drain the moisture. |
| | Over lubrication | Adjust the lubricator for the proper rate lubricant feed. |

**NOTICE**

**SAVE THESE INSTRUCTIONS. DO NOT DESTROY.**