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Air Percussive Drill

JH40 Jackhamer™

Maintenance Information

Save These Instructions

Ingersoll Rand

Product Safety Information

WARNING

- **Failure to observe the following warnings, and to avoid these potentially hazardous situations, could result in death or serious injury.**
- **Read and understand this and all other supplied manuals before installing, operating, repairing, maintaining, changing accessories on, or working near this product.**
- **Always wear eye protection when operating or performing maintenance on this tool. The grade of protection required should be assessed for each use and may include impact-resistant glasses with side shields, goggles, or a full face shield over those glasses.**
- **Always turn off the air supply, bleed the air pressure and disconnect the air supply hose when not in use, before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool or any accessory.**

Note: *When reading the instructions, refer to exploded diagrams in parts Information Manuals when applicable (see under Related Documentation for form numbers).*

Lubrication

Each time a Series JH40 Jackhamer is disassembled for maintenance, repair or replacement of parts, inject approximately 3 cc of the appropriate Ingersoll-Rand Rock Drill Oil into the air inlet of the tool before attaching the air hose.

Disassembly

General Instructions

1. Do not disassemble the tool any farther than necessary to replace or repair damaged parts.
2. Do not remove any part that is a press fit in or on a subassembly unless the removal of that part is necessary for repairs or replacement.
3. Do not disassemble the tool unless you have a complete set of new gaskets and O-rings for replacement.
4. Never attempt major maintenance of the tool on the job. Always send it to a repair shop.
5. Clean the exterior of the tool before disassembly.
6. Provide a clean work area for disassembling the tool.
7. Handle all parts carefully. Hardened parts can chip or break when dropped onto a hard surface.
8. Place small parts in a clean box to prevent loss.
9. Do not allow dirt or chips from a soft drift or hammer to enter the tool.
10. If necessary, use a rubber mallet to loosen the fronthead and backhead.

Disassembly of the Tool

CAUTION

When clamping the Jackhamer, do not exert extreme pressure on the tool. Parts can be cracked or damaged if the vise is tightened too much.

1. Secure the drill firmly in a vise.
2. Remove the assembly rod nuts (2) and assembly rods (1) and carefully pull the handle assembly and blower tube assembly away from the drill.
3. Place the handle assembly on a clean work bench.
4. Unscrew the tube retainer (3), and pull the blower tube (5) out of the handle (8).
5. If necessary, remove the O-Ring (4) from the tube retainer (3).
6. Examine the tube rubber (6), and if worn or damaged, discard the rubber.
7. Remove the plug (18) and locating pin (17) from the handle. A small hole is provided in the underside of the handle to assist in removing the pin (17).
8. Use the lever (15) to pull the throttle valve (14) from the handle (8).

NOTICE

The Throttle Lever is press fitted in the Throttle Valve. Do not remove the Lever from the Valve unless replacement of the Lever or Valve Is necessary.

9. If necessary, remove the O-Rings (16) from the throttle valve (14).
10. Unscrew the air connection cap (24) and remove the air hose connection (22).
11. If necessary, remove the O-Ring (23) from the air connection (22).

NOTICE

The Handle Bolt is designed with an identical Nut on each end, however, the Nut (10) that seats the Lockwasher (12) Is removable, while the nut on the opposite end (No Lockwasher) is permanently assembled to the Handle Bolt. Do not attempt to remove the permanently assembled Nut.

12. Unscrew the handle bolt nut (10). Remove the nut and lockwasher (12).
13. Slide the handle grip washer (11) and handle grip (13) from the handle bolt (9).
14. Remove the handle bolt with remaining handle grip washer (11) and handle grip (13)] from the handle (8).
15. Pull the fronthead (58) with chuck and steel holder parts off the piston stem bearing (51).
16. Place the fronthead assembly on a clean work bench.
17. Drive the chuck (54) and chuck driver (55) with chuck nut (56) out of the fronthead assembly.
18. Clamp the chuck driver (55) in a vise.

NOTICE

The Chuck Nut has left-hand Threads.

19. The chuck nut (56) can be removed from the chuck driver (55) by using a tool made from an old moil point. Cut off the oil piston stem and weld a hex. nut to the stem.
20. Insert the fabricated tool in the chuck nut (56) and turn clockwise to remove.
21. Tighten the steel holder bolt nuts (63) and remove the steel holder bolt nut retaining rings (64).
22. Unscrew and remove the steel holder bolt nuts (63), and slide the steel holder springs (62) off the steel holder bolts (61).
23. Slide the steel holder bolts (61) and steel holder (60) out of the fronthead (58).
24. If worn, drive the steel holder bolt bushings (59) out of the fronthead lugs.
25. Remove the muffler cap (34) and slide the muffler (33) from the cylinder (35).
26. Insert a brass bar in the front end of the cylinder until it makes contact with the end of the piston stem, and force the piston to drive the valve chest assembly and rotation parts (rifle bar, ratchet, pawls, etc.) out the rear end of the cylinder.

CAUTION

The rotation Pawls, Plungers, and Springs will fall out of the Rifle Bar Head when the Head is clear of the Cylinder.

27. Remove the four pawls (41), plungers (42), and springs (43).
28. Remove the rifle bar (40) from the ratchet (38).
29. Remove the locating pin (39) and seal (37) from the ratchet (38).
30. Remove the piston (49) from the front end of the cylinder (35).
31. To remove the rifle nut (50) from the piston: Hold the piston in a vise, insert an old rifle bar in the rifle nut and turn clockwise to unscrew. (The rifle nut has left-hand threads).

NOTICE

The old rifle bar may require several good blows with a copper hammer to loosen the rifle nut. Block-up under the head of the old rifle bar before striking it to prevent it from breaking.

32. Press the piston stem bearing (51) out of the cylinder.
33. If worn and replacement is necessary, press the piston stem bearing sleeve (52) out of the piston stem bearing (51). The sleeve is press fitted in the bearing, and should not be removed unless replacement is necessary

Inspection and Repair

1. Clean disassembled parts in a suitable solvent.

⚠ WARNING

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.

2. Replace the rifle bar or rifle nut if the flutes are worn approximately 1/16 in. (1.6mm). If a 1/8 in. (3.2mm) shim can slide between the sides of the flutes of the rifle bar and rifle nut, either one, or both, is excessively worn.
3. The rotation pawls can be reversed when the edges on one side become rounded. When the edges on both sides have rounded to approximately 1/16 in. (1.6mm) radius, the pawls should be replaced.
4. Replace weak pawl plunger springs.
5. Replace the rotation ratchet when the teeth are rounded to 1/1 6 in. (1.6mm) radius.
6. When a 0.003 in. (0.076mm) feeler gauge can be inserted between the valve and valve guide, or between the valve and valve chest, one or both parts are worn and should be discarded. To determine which part is excessively worn, various combinations of new valve parts should be assembled. The worn parts can be determined by means of a feeler gauge.
7. To check for a sticky valve, clean the valve parts and assemble the valve chest complete without oil. Shaking the chest should cause a clicking sound as the valve moves back and forth. If the clicking cannot be heard the sticky valve must be replaced. Be sure to disassemble and oil the valve parts before reassembling for operation.
8. Examine the piston and rifle bar for heat checks resulting from improper lubrication. If heat checked, replace these parts in order to prevent damage to other parts.
9. Check the cylinder and piston for wear by inserting a 0.007 in. (0.178mm) feeler gauge between them. To determine whether the piston or cylinder is worn, insert a new piston in the cylinder, and check the clearance with a feeler gauge.
10. Check the piston periodically, to be sure that the striking face is in proper condition at all times. If cupped, it can be refaced by grinding. Regrind the striking face flat and square without burning, remove as little metal as possible and not more than 1/16 in. (1.6mm). This is the limit which will insure a hard striking face. If the striking end of the piston is cupped, check the shanks of the steels that were used to be sure the striking ends are flat and square.
11. Replace the piston stem bearing sleeve when a 0.007 in. (0.178mm) feeler gauge can be inserted between the piston stem and the sleeve.
12. Replace the chuck nut when the flutes in the nut are worn approximately 1/16 in. (1.6mm).
13. Replace the chuck when the ends of the chuck bore are worn to the extent that the drill steel shank cocks in the drill assembly. When the chuck is worn, the drill steel can no longer be held in line with the piston, and the loss of support for the shank allows the piston to strike the shank on an angle, damaging the piston, shank, and tube.

Assembly of the Tool

1. Press the piston stem bearing sleeve (52) into the piston stem bearing (51).
2. Align the assembly rod half-holes in the piston stem bearing flanges with the half holes in each side of the cylinder body and press the piston stem bearing (51) into the cylinder (35). This is a tight fit; make sure the bearing is started squarely and that the cylinder is supported.
3. Screw the rifle nut (50) into the piston and slide the piston into the cylinder.

NOTICE

The rifle nut has left-hand threads; turn counterclockwise when installing in piston. Use an old rifle bar as a wrench to tighten rifle nut.

Assembly of the Valve Chest

1. Install the valve (46) over the valve guide stem (47).
2. Install the valve chest (45) on the valve guide (47).

NOTICE

Make sure the valve is free, check by shaking the valve chest. The valve should click open and shut when free of oil. After the clicking noise is noted, oil the valve.

3. Insert the rotation ratchet dowel pin (39) in the groove provided in the O.D. of the valve chest (45). Install the complete valve chest assembly in the cylinder (35) aligning the rotation ratchet dowel pin (39) with its groove in the cylinder.

Assembly of Rotation Parts

4. Place one rotation pawl plunger spring (43) and one rotation pawl plunger (42) in each of the four holes in the rifle bar (40).
5. Slip one rotation pawl (41) into each of the pawl housings in the rifle bar (40).
6. Compress the four rotation pawls (41) and slip the rotation ratchet (38) over the pawls.
7. Align the dowel pin groove in the rotation ratchet (38) with the dowel pin (39) already in place in the cylinder (35) and slide the rotation assembly into the cylinder.
8. Install the muffler cap (34) on the handle end of the cylinder (35).
9. Slide the muffler (33) over the cylinder so that it seats against the muffler cap at the back end and on the piston stem bearing at the front end.
10. Screw the chuck nut (56) into the chuck driver (55).

NOTICE

The chuck nut is fitted with left-hand threads. Turn counterclockwise to screw chuck nut into driver. An old piston can be used to tighten the chuck nut.

11. Slide the chuck (54) and chuck driver assembly into the fronthead (58).
12. Align the assembly rod holes in the fronthead flange with the half-holes in the cylinder and piston stem bearing and slide the fronthead (58) into position.

Assembly of Handle

13. Install the new O-Rings (16) in its groove in the throttle valve.
14. If removed, press the throttle valve lever (15) in the throttle valve (14).
15. Install the throttle valve assembly in the handle (8).
16. Insert the throttle valve locating pin (17) in its hole in the rear of the handle to secure the throttle valve in the handle.
17. Install the plug (18).
18. Install one set of handle grip parts on the handle bolt (9). Slide the washer (11) and grip (13) into the handle bolt (9) in order listed.
19. Insert the handle bolt (9) through the handle (8).
20. Install the remaining grip (13) and washer (11) over the projecting end of the handle bolt (9).
21. Install the lockwasher (12) and secure the handle with the nut (10).
22. Install a new O-Ring (23) in its groove on the hose connection (22).
23. Position the hose connection in the handle inlet port and secure by screwing the hose connection cap into the handle.
24. Position the handle assembly over the cylinder (35), align the assembly rod holes in the handle with the half-holes on each side of the cylinder body, and slide the handle (8) into the cylinder (35).
25. Slide the assembly rods (1) through the holes in the handle (8), half-holes in cylinder (35) and piston stem bearing (51), and through the holes in the fronthead flange (58).
26. Secure the jackhamer assembly by attaching assembly rod nuts (2).

⚠ CAUTION

The Assembly Rods must be tight and under equal tension. Loose or unequal Assembly Rod tension will cause misalignment of internal parts which will promote breakdown of the Drill. Apply 110-130 Lb-ft (149-176 Nm) of torque to each Assembly Rod Nut.

27. Slide the blower tube (5) through the hole in the tube rubber (6) until rubber is seated under tube collar.
28. Push the blower tube/rubber assembly through the tube hole in the handle (8) and through the center hole in the rifle bar and piston until the rubber seats in the counterbore in the handle.
29. Install a new O-Ring (4) on the tube retainer (3) and screw the retainer (3) into the handle to secure the tube. Assembly of Beavertail type Steel Holder
30. Press the steel holder bolt bushings (59) into the lugs of the fronthead (58).
31. Place the steel holder bolts (61) on the steel holder trunnions.
32. Position the steel holder and bolt assembly so that the bolts protrude through the fronthead lugs.
33. Place the steel holder bolt springs (62) over the steel holder bolts (61) and secure by attaching the steel holder bolt nuts (63).
34. Compress the springs (62) by tightening the nuts (63) until the retaining rings (64) can be inserted in the grooves in the steel holder bolts (61).
35. Back-off the steel holder bolt nuts (63) until they rest against the retaining rings (64).

Performance Testing

A reconditioned jackhamer should be tested before it is sent back to the job. Before connecting the air hose, check to see that the air line lubricator is filled with the proper lubricant. Refer to the instruction manual for jackhamers for specifications.

Pour a small amount of rock drill oil directly into the air inlet for initial lubrication. The jackhamer should start with little air pressure, with the piston reciprocating smoothly.

Let the jackhamer run-in slowly at reduced pressure long enough to see that it is in good working order. If the jackhamer stalls, turn off the air immediately. This indicates binding due to tight fits or perhaps unevenly tightened assembly rods. Check rod tension first, then start the jackhamer again. After a short period of operation, a definite rhythm should develop and an even exhaust note will be heard. The jackhamer may become warm but should not overheat. If erratic operation or stalling persists, disassemble the jackhamer and check for binding parts.

After the initial period of low pressure operation, check the performance of a reconditioned Jackhamer with that of a new Jackhamer by comparing its speed under similar conditions and with normal air pressure. Once testing is completed, install plastic plugs or caps in all ports to keep out dirt until the machine is back in service.

Troubleshooting Guide

Trouble	Probable Cause	Solution
Jackhamer will not start	Plugged exhaust port or air passages caused by dirt or hose particles.	Dismantle Jackhamer, clean out all ports and air passages. Keep the air hose in good condition; never use a soft deteriorated hose.
	Stuck valve due to gummy oil or incorrect assembly.	Remove Backhead completely. Dismantle Valve and clean parts. Never use dirty oil or oil that does not conform to the recommended specifications.
	Frozen piston due to improper lubrication.	Dismantle Jackhamer to remove piston. Repair piston by placing in a high speed lathe and dressing with fine emery cloth. Never run Jackhamer without the proper lubricating oil in the air line lubricator.
	Side Rods tightened unevenly, causing binding.	Check Jackhamer for correct assembly and retighten Side Rods evenly. Torque Side Rod Nuts between 110 - 130 ft-lb (149 - 176 Nm) torque.
Jackhamer loses power rapidly	Restriction in air supply line.	Never allow the air supply to kink or make sharp bends.
	Air supply line too long.	As a general rule, keep the air supply line under 50 ft. (15 m).
	Diameter of air supply line too small.	A 3/4 in. (19 mm) diameter air supply is recommended for the Jackhamer.
Freezing at exhaust ports	Excessive moisture in the air supply line	Install moisture traps in the air supply line or add antifreeze lubricant directly through the air inlet. Use "KILFROST"* anti-freeze lubricant or equivalent.

Trouble	Probable Cause	Solution
Jackhamer lacks power	Low air supply pressure.	The air supply pressure at the inlet should be 90 to 100 psi (6.2 to 6.9 bar).
	Running on fronthead cushion.	Keep shank fed-up to the work. Always maintain a constant pressure when operating the Jackhamer.
	Plugged air passages.	Dismantle the Jackhamer and clean out all ports and passages.
	Lack of lubricating oil.	Maintain the proper oil level in the air line lubricator. Steel shank must show a film of oil.
	Short Drill Steel shank due to wear or regrinding.	Replace Drill Steel if shank is worn excessively.
	Worn components.	Check and replace parts that show wear.
Jackhamer will not start	Plugged exhaust port or air passages caused by dirt or hose particles.	Dismantle Jackhamer, clean out all ports and air passages. Keep the air hose in good condition; never use a soft deteriorated hose.
	Excessive moisture in the air supply line.	Blow out air lines. If moisture traps are installed in the air supply line, drain the moisture.
	Over lubrication.	Adjust the air line lubricator for proper rate of feed.
Overheating of Jackhamer	Running on fronthead cushion.	Keep shank or hammer block fed-up to work. Always maintain constant pressure when operating the Jackhamer.
	Lack of lubrication or improper lubricating oil.	Before operating the Jackhamer make sure the air line lubricator is full of proper lubricant.
	Piston not hitting the shank because of short shank.	Remove the Drill Steel with the short shank from the Jackhamer and install a new Drill Steel.
	Pulling Drill Steel at full throttle.	When pulling Drill Steels, always use minimum throttle.
Erratic or sluggish operation	Lubricating oil too heavy.	Use only the recommended lubricating oil.
	Gummed oil or dirt in operating parts.	Dismantle Jackhamer and clean out dirt and gummy residue. Service the Jackhamer with clean oil. Protect the Jackhamer from dirt when idle.
Stuck Drill Steel	Driving Drill Steel after bit is dull or has lost its gauge.	Sharpen or replace with a new bit.
	Crowding bit in soft formation.	Use down pressure cautiously in soft formations; be certain the Drill Steel is rotating freely.
	Cuttings not being blown from hole.	Use blow air frequently.
	Misalignment of Drill Steel with hole causing binding.	Keep Jackhamer, Drill Steel and hole in alignment at all times
Slow drilling speed	Dull bit.	Replace the bit.
	Cuttings not being removed from hole.	Use blow air more frequently to keep the bit working on fresh rock.
	Plugged Drill Steel or Blow Tube.	Remove Tube and Drill Steel; clean out air passages.
	Jackhamer and Drill Steel not aligned in hole; Drill Steel or bit binding in hole.	Check alignment while drilling to prevent binding and to avoid a stuck Drill Steel.
	Insufficient down pressure.	Increase down pressure.
No Drill Steel rotation or rotation is weak	Steel binding in hole.	Apply correct amount of down pressure and keep Drill Steel and hole in alignment. Replace worn bits.
	Worn rotation parts.	Disassemble Jackhamer and replace worn parts.
Side Rod breakage	Uneven tension on Rods or loose Rods.	Keep Side Rods tight and at even tension. Tighten Rods alternately.
	Loss of fronthead cushion which allows Piston to strike Front Washer Bushing with hard impact.	Replace worn Cylinder, Piston or Front Washer Bushing.
Chipping or breakage of Piston	Bad Drill Steel shank which is too hard or rounded on end allowing minimum contact with Piston striking face.	Take bad shanks out of service. One bad shank can ruin many Pistons.
	Worn Chuck which permits Drill Steel to cock in Chuck so that Piston strikes shank a glancing blow.	Replace worn Chuck.
	Heat cracking due to faulty lubrication.	Keep Jackhamer well lubricated with proper type of oil.
	Failure in neck of Piston due to loss of fronthead cushion. Piston striking Front Washer Bushing.	Check Cylinder, Piston and Front Washer Bushing for maximum wear tolerances.

Related Documentation

For additional information refer to:

Air Percussive Drill Product Safety Information Manual Form 04584975.

Air Percussive Drill Product Information Manual Form 51985323.

Air Percussive Drill Parts List Manual Form 52086477.

Manuals can be downloaded from ingersollrandproducts.com

Notes:

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