

P E R F O R M A N C E · E F F I C I E N T · R E L I A B L E

# Impact Rammer

## INSTRUCTION MANUAL

**Models HCD / HCR — 80 · 90 · 100 · 110 · 125**

Please read this instruction manual carefully before use.

The contents and data of this manual are subject to change without further notice.

S E I K O M A N U F A C T U R I N G · Q U A L I T Y I N H E R I T A N C E

## 1. Purpose and Features

The vibratory impact rammer is manufactured in accordance with standard **JC/T 5014.1-92**. It features compact size, light weight, high compaction capacity, high productivity, good edge-compaction performance, flexible and simple operation, and safe, reliable performance. Compared with the frog rammer, explosive rammer and plate compactor currently in common use, it offers considerably more advantages.

The machine is suitable not only for compacting sand, gravel, three-element mix (lime-soil) and various sandy soils, but also for compacting asphalt macadam, lean concrete and clay. It is especially suitable for construction on narrow sites such as indoor floors, courtyards and trenches, and is able to accomplish compaction tasks that large and medium-sized compaction machinery cannot complete.

## 2. Main Technical Parameters

*HCR series = gasoline-engine driven; HCD series = electric-motor driven.*

| Item                     | HCR series (gasoline)                       | HCD series (electric)                       |
|--------------------------|---------------------------------------------|---------------------------------------------|
| Model                    | HCR80 / HCR90 / HCR100 /<br>HCR110 / HCR125 | HCD80 / HCD90 / HCD100 /<br>HCD110 / HCD125 |
| Impact frequency         | 250 – 750 times/min                         | 420 – 650 times/min                         |
| Bouncing height          | 40 – 70 mm                                  | 40 – 70 mm                                  |
| Impact energy            | 56 – 90 N·m                                 | 56 – 65 N·m                                 |
| Rated power              | 2.2 – 3 kW                                  | 2.2 – 3 kW                                  |
| Travel speed             | 10 – 13 m/min                               | 8 – 10 m/min                                |
| Machine weight           | 70 – 110 kg                                 | 80 – 100 kg                                 |
| Max. power / rated speed | 5.5 – 6.5 Ps / 3600 rpm                     | 5.5 – 6.5 Ps / 3600 rpm                     |
| Power type & cooling     | 4-stroke, air-cooled gasoline engine        | Electric motor                              |
| Fuel consumption         | 310 g/kW·h                                  | —                                           |
| Voltage                  | —                                           | 380 V / 220 V                               |
| Current                  | —                                           | 5 / 2 A (as printed)                        |

Note: The current value is reproduced exactly as printed in the original manual; verify it against the motor nameplate before connecting the machine to a power supply.

### 3. Main Structure of the Machine

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The vibratory impact rammer mainly consists of the handle, motor (electric motor or gasoline engine), coupling, crankcase, transmission gear, connecting rod, push rod assembly, springs, inner and outer cylinders, ramming plate, dust cover, travel wheels and other principal parts.

- |                       |                       |
|-----------------------|-----------------------|
| 1. Handle             | 10. Push rod assembly |
| 2. Motor / Engine     | 11. Oil filler hole   |
| 3. Coupling           | 12. Outer cylinder    |
| 4. Gear shaft         | 13. Inner cylinder    |
| 5. Crankcase          | 14. Spring            |
| 6. Crankcase cover    | 15. Pressure plate    |
| 7. Crank gear         | 16. Ramming plate     |
| 8. Connecting rod     | 17. Travel wheels     |
| 9. Coupling pin shaft | 18. Dust cover        |

## 4. Working Principle

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During operation, the power of the motor is transmitted through the coupling to the gear shaft, which drives the crank gear to rotate; the crank gear drives the push rod through the connecting rod so that the push rod makes a reciprocating up-and-down movement. Because the springs absorb and release this energy, the rammer jumps rapidly, producing an impact on the area being compacted and thereby achieving the compaction effect.

In addition, because the machine body and the ramming plate are inclined at a certain angle, the rammer automatically travels forward while delivering its rapid impacts.

## 5. Operation and Safety Precautions

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### (1) Requirements before operation

1. The operator shall read this manual carefully and understand the operating essentials.
2. Check whether any part of the machine has come loose and whether the fastening bolts are tightened.
3. Check whether the machine has sufficient lubricating oil; top it up if the level is insufficient.
4. Check that the motor earth (ground) wire is properly grounded, and check that the insulation surface of the power cable is intact.
5. First turn the motor switch to the “OFF” position, then connect the power supply.
6. Start the motor and check that the direction of rotation is correct (clockwise when viewed from the fan blade side); if not, interchange two phase wires.

Note: Items 4 to 6 concern the electric-motor version (HCD series). For the gasoline version (HCR series), check the engine oil level, fuel, air cleaner and stop switch instead, and start the engine as described in the engine manufacturer's instructions.

### (2) Requirements during operation

1. Place the rammer on the flat surface to be compacted.
2. Start the machine with the motor switch and begin working.
3. Do not grip the handle too tightly while working. Grip it only firmly enough to prevent the machine from tipping over and to control the forward speed and direction, so as to reduce vibration transmitted to the operator's body.
4. During normal operation, do not press down hard on the handle, as this reduces the bouncing height of the rammer.
5. Turning the handle steers the rammer in the required direction; the machine can also be turned on the spot.
6. When working on loose fill or travelling uphill, press the handle down slightly to increase the forward speed of the rammer.

7. This machine is a small compaction machine; backfill shall be compacted in layers. A layer height of **250 mm or less** is advisable, and each layer shall be compacted by **three passes** back and forth. Where especially high compaction is required, a few more passes may be applied until the requirements of the engineering specification are met.
8. To move the rammer over a short distance, first lift the handle slightly upward, fit the travel wheels into the hooks, then press the handle down to tilt the centre of gravity backwards and push the rammer.

### **(3) Operating precautions**

1. The earth wire of the motor power socket must be reliably grounded — never connect it to a live (phase) wire. Check the insulation of the power cable frequently to prevent damage to the cable and electric shock injury.
2. While the rammer is working, do not pull the cable too tight, so as to avoid breaking it.
3. Regularly check that the motor terminals are securely fastened, to prevent looseness that could cause leakage of current.
4. Protect the rammer from moisture. Working in the rain is strictly forbidden, in order to avoid electric shock accidents.
5. It is strictly forbidden to operate the rammer on concrete pavement or other hard surfaces.
6. If any abnormal noise is noticed during operation, stop the machine immediately and inspect it.

## 6. Maintenance and Lubrication

1. After each day's work, remove sand and adhering material from the ramming plate, keep the rammer clean, and check the bolts for looseness. When a new machine is used for the first time, all fasteners must be checked thoroughly half an hour after work begins, and any loosened parts must be retightened promptly.
2. Before starting a new machine, add **0.8 kg of No. 10 engine oil**. Add **0.4 kg** of oil for every 30 hours of operation; after the oil has been changed three times, change the oil once every **100 hours** of operation. The oil drain hole is located at the lower part of the rammer, on the steel bowl.
3. The motor must be especially protected from moisture.
4. The disassembly sequence of the machine is as follows: first remove the ramming plate from the bottom; then remove the coupling nut (clip) at the lower part of the push rod assembly and take out the lower pressure plate, spring and upper pressure plate; loosen the fastening nut of the dust cover ring and remove the inner cylinder and outer cylinder; remove the circlip of the pin shaft with circlip pliers, drive out the pin shaft and remove the push rod; unscrew the fixing bolts of the crankcase cover and lift the cover out of the case; remove the circlip fixing the crank gear to the cover with circlip pliers, then pull the crank gear out of the cover with two M8 bolts; unscrew the motor fixing bolts and remove the motor; remove the circlip fixing the gear shaft to the case with circlip pliers, then remove the gear shaft. **Assembly is carried out in the reverse order**; pay attention to the correct installation of the seals at all joints.

## 7. Special Warning — Electric Impact Rammer

1. The operator must wear insulating shoes and insulating gloves.
2. A residual-current device (earth-leakage circuit breaker) must be connected between the site power distribution system and the impact rammer according to the electrical wiring diagram. The operating (tripping) current of the device shall be **within 10 mA**.

**Wiring diagram:** Site power distribution system (380 V) → Residual-current device → Impact rammer

## 8. Wearing Parts List

| No. | Name & Specification                   | Qty | Main Assembly Location      | Standard |
|-----|----------------------------------------|-----|-----------------------------|----------|
| 1   | Single-row radial ball bearing<br>6204 | 1   | Connecting rod              | GB276-93 |
| 2   | Single-row radial ball bearing<br>6207 | 2   | Crankcase / crankcase cover | GB276-93 |

|    |                                     |   |                                            |               |
|----|-------------------------------------|---|--------------------------------------------|---------------|
| 3  | Needle bearing HK0322               | 1 | Gear & crankcase cover                     | GB290-93      |
| 4  | Single-row radial ball bearing 6206 | 1 | Crank-to-cover connection                  | GB276-93      |
| 5  | O-ring 69.6 × 2.65                  | 1 | Oil seal seat                              | JB/T7757.2-95 |
| 6  | O-ring 94.6 × 3.55                  | 1 | Case-to-outer-cylinder connection          | JB/T7757.2-95 |
| 7  | O-ring 74.6 × 3.55                  | 1 | Ramming-plate-to-inner-cylinder connection | JB/T7757.2-95 |
| 8  | Oil seal B42 × 62 × 8               | 1 | Inside oil seal seat                       | GB9877.1-98   |
| 9  | Gear shaft                          | 1 | Crankcase                                  | —             |
| 10 | Crank gear                          | 1 | Crankcase                                  | —             |
| 11 | Coupling pin shaft                  | 1 | Push rod / connecting rod                  | —             |
| 12 | Spring (set)                        | 1 | Inner cylinder                             | —             |
| 13 | Dust cover                          | 1 | Inner & outer cylinder                     | —             |
| 14 | Vibration-damping block             | 2 | Handle                                     | —             |
| 15 | Push rod assembly                   | 1 | Inner cylinder                             | —             |

## 9. Certificate of Approval

|                      |                                                                  |
|----------------------|------------------------------------------------------------------|
| Product Model        |                                                                  |
| Name                 |                                                                  |
| Factory Number       |                                                                  |
| Inspector            |                                                                  |
| Result of Inspection | This product has passed inspection and is approved for delivery. |
| Date                 | Year _____ Month _____ Day _____                                 |

## 10. Product Warranty

|                         |                        |
|-------------------------|------------------------|
| User / Company Name     |                        |
| Detailed Address        |                        |
| Telephone               | Postal Code: _____     |
| Equipment Model         |                        |
| Equipment No.           |                        |
| Purchase Date           | Warranty Period: _____ |
| Invoice No.             |                        |
| Seller Name             |                        |
| Seller Signature (Seal) | User Signature (Seal)  |

**Note:** As our products are continuously improved and updated from generation to generation, certain parts of the product may differ from those described in this manual. In that case, the actual product shall prevail; no further notice will be given.