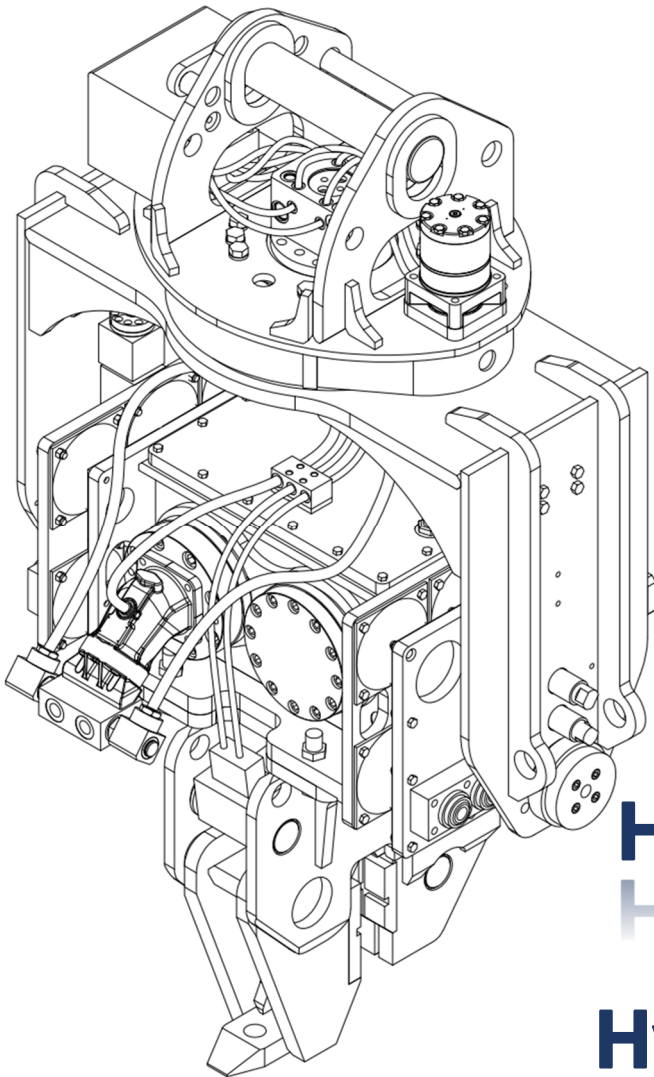


# OPERATION & MAINTENANCE MANUAL



**HYUNDAI HAMMER  
SH Auto Tilting Series.**

**Hyundai People!**  
HYUNDAI PEOPLE!

**Hyundai Service!**  
HYUNDAI SERVICE!

**Hyundai Products!**  
HYUNDAI PRODUCTS!

## FOREWORD



### **WARNING!**

It is very important for you to read and understand this manual before operating and to keep the instructions provided herewith. Never fail to follow the instruction related to safety.

**! This manual contains instructions and information on safe and correct use of Hyundai Hammers.**

- Please read and understand this manual before operation, inspections, and maintenance of Hyundai Hammer.
- Keep this manual with your equipment all the time for your quick and easy reference, and read it regularly.
- Do not operate Hyundai Hammer until you have been trained in the use of all operating controls and understand Hyundai Hammer operation.
- Get a replacement manual from HYUNDAI CORE MOTION CO. LTD's dealer if you lost it.
- If you transfer Hyundai Hammer to the other, do transfer this manual as well.
- The figures in this manual is for better understanding and may not correspond exactly to Hyundai Hammer. For exact shape, refer to the parts list or ask HYUNDAI CORE MOTION CO. LTD.
- For the purpose of constant product improvement, some parts of this manual may be changed. If you found the parts unclear or not corresponding to Hyundai Hammer, call and consult HYUNDAI CORE MOTION CO. LTD's dealer or service center
- Important information on safety is described in the safety information chapter of this book. Be familiarized with the instructions on the safe operation and observe the instructions before and during operation.
- Injury, death or damage caused by unauthorized product modifications and operation under incorrect application and/or use application will not be responsible by HYUNDAI CORE MOTION CO. LTD. Consult HYUNDAI CORE MOTION CO. LTD for such modifications and applications.
- Use HYUNDAI CORE MOTION CO. LTD's genuine parts. HYUNDAI CORE MOTION CO. LTD takes no responsibility for damages caused by use of non- HYUNDAI CORE MOTION CO. LTD's spare parts.
- For warranty, we refer you to the warranty conditions provided separately.

**Our mission is to help you achieve your business success and peace of mind by providing you with HYUNDAI CORE MOTION CO. LTD's products and service.**

**Thank you for using our HYUNDAI CORE MOTION CO. LTD's Technology products.**

**HYUNDAI CORE MOTION CO. LTD.**

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## **INTRODUCTION**

This is recently developed vibration construction equipment that meets the requirements of high-quality customers.

This device has been patented by HYUNDAI CORE MOTION CO. LTD and its breakthrough design has made it possible to perform better and more reliably.

Through the use of high-quality materials throughout, the maintenance cost of the equipment has been reduced significantly, and it has achieved lower cost per hour compared to other vibratory hammer (pile driver).

This equipment is ideal for hammering or pulling out sheet piles, H beams, steel plates, pipes, etc. Simple design, reasonable price and excellent durability ensure user's work stability.

## 1. Safety Information

This manual describes the correct use of the product and basic safety instructions. Important instructions in this manual are marked with the below symbol. When you see the below symbol in this manual or stickers on the product, you must be alert to the possibility of personal injury or death. Be sure to observe the instructions in the safety message.

The safety messages in this manual do not describe all the possibilities that could cause personal injury, death or damage to the product. These safety messages are intended to provide basic instructions for safe operation and service.

Although this manual does not cover all the possible situations, it is the operator's responsibility to observe the safety instructions and regulations.

***Remember! Safety is always first.***

### Safety Alert Symbol

The Safety Alert Symbol represents **ATTENTION**.

If you see the mark in this manual or on the products, never fail to read and observe the instructions for safe operation.



### Signal Words

The words "**DANGER**", "**WARNING**", "**CAUTION**" and "**IMPORTANT**" appeared with the above **Safety Alert Symbol** indicate degree of risk of hazards or unsafe practices. All four degrees of risk indicate that safety is involved. Observe precautions indicated whenever you see the **Safety Alert Symbol**, no matter which signal word appears next to the "Exclamation Point" symbol.

DANGER!	Indicates imminent hazard of a situation that, if not avoided, is very likely to cause death or extremely serious injury. It may also be used to alert against product that may exploded or detonate if handled or treated carelessly.
WARNING!	Indicates potential of a hazardous situation that, if not avoided, could result in serious injury or death. It may also be used to alert against a highly unsafe practice.
CAUTION!	Indicates potential of a hazardous situation that, if not avoided, could result in minor or moderate injury. It may also be used to alert against a general unsafe practice.
IMPORTANT!	Indicates potential of damages that, if not avoided, could cause the damages to the products or shorten the product life.

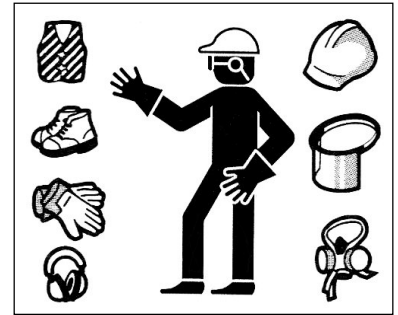
## 1.1 Basic Safety Information

### ■ Know yourself

Operators and service personnel must wear appropriate safety equipment, including ear protection, respirator, hardhat, safety shoes, eye protection, heavy gloves etc, as required.

**Note:** The wearing of loose clothing or any accessories such as neckties, scarves, untied shoe laces, rings, wrist watches or long hair could cause personal injury or death.

Always use the proper tools for inspection or maintenance work, which must only be carried out after ensuring that the equipment has been stopped completely, and it is placed suitably in a safe place.

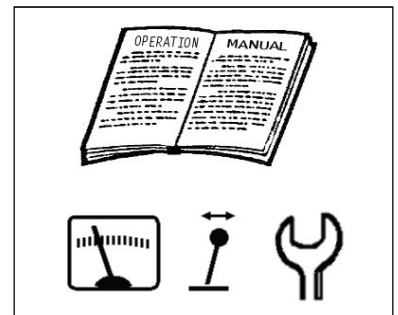


### ■ Know your equipment

Before installation or operation of Hyundai Hammer, the operator and maintenance personnel must read and understand the safety messages, operation manual and service instructions.

Only the operator who has been trained and qualified to operate the carrier and hammer should do so.

Be skilled and knowledgeable in all operational and technical aspects of the carrier and hammer.

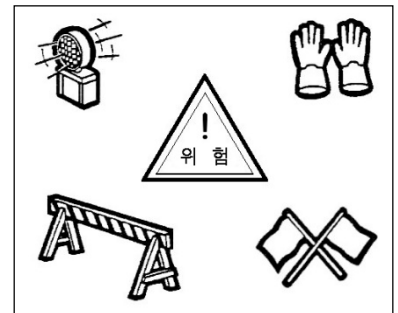


### ■ Know the work site

Before operating Hyundai Hammer, check the area of work site for any unusual conditions that could be dangerous, and prepare the appropriate warnings for safe working.

Be careful, particularly when working in the vicinity of electric power lines, gas pipes or other buried services.

Pay particular attention to other workers, bystanders and other machinery that may pass by near to the work site. Immediately stop operation of Hyundai Hammer if personnel enter the danger area.

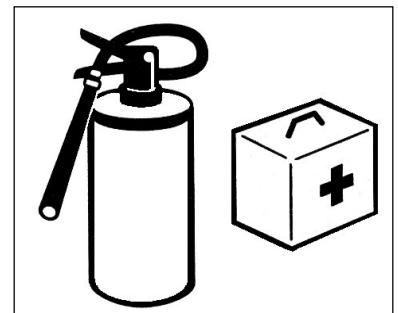


### ■ Know the Rules

Everybody who operates or maintains the equipment should know the meaning of the rules and laws in terms of handling the equipment.

Use Hyundai Hammer in accordance with all regulations regarding construction practice and public safety.

For emergency use, keep the fire extinguisher and the first-aid case in the operator's cab.



## 1.2 Preparation for safe operation



### **Warning!**

The following items must be prepared and checked in advance for safe use of this product. Please be sure to observe and observe the following points.

- Hyundai Hammer should only be mounted on a carrier with sufficient load capacity.
- In case of using a quick coupler (hitch), determine the total weight including the quick coupler.
- Carriers below this weight class will not provide the required degree of stability and could even fall over during hammer use, causing personnel injury or machine damage. Carriers above this weight class may apply excessively high mechanical loads to Hyundai Hammer.
- Make sure Hyundai Hammer is compatible and match in capacity with carrier hydraulic systems.
- The product may fall down when it is loaded, carried and removed from equipment. Fix the product firmly so the weight is loaded on support point all the time and place the product with its bottom kept horizontality.
- Mounting Hyundai Hammer requires the presence of an assistant, who must be instructed by the carrier driver. The carrier driver and assistant should agree beforehand on clear hand signals.
- To avoid equipment damage, follow the carrier maintenance schedule before operating Hyundai Hammer.
- Check Hyundai Hammer for wear, getting loose, breakage or crack. Do not operate in case any damages or failure is found.
- When installing, repairing, moving and storing, always lock the tilting function with the stopper cylinders down. Otherwise, the ball stopper may be released and the hammer may fall to the ground, resulting in serious injury or death.

For details, refer to **"3.1.Carrier requirements"**.

## ■ Safety instructions on Hyundai Hammer installation

When insert the mounting pin to install Hyundai Hammer on the carrier, the pin holes in the carrier's arm must be flushed with those in the mounting adapter of Hyundai Hammer. For this job, a carrier operator and an assistant should be careful and agree on the hand signals beforehand. Your finger or hand must not be used to check whether the holes are flush. Once the mounting pins are inserted, lock the pins so that they are not taken off.

If quick coupler is used, be sure clamping is completed. When you connect the hose, tighten the connectors with prescribed torques.

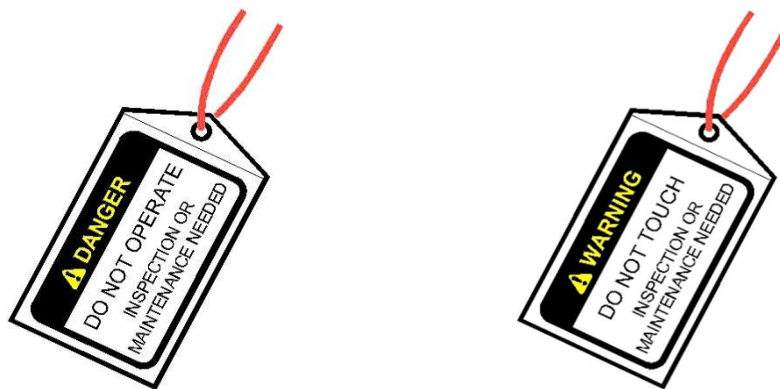
And make sure of complete connection when you open the stop valve. It may cause personal injury if the incorrectly connected hose is pressurized. When connecting the hose, be careful not to have the O-ring damaged or missed, and keep all the connectors clean.

## ■ Check Hyundai Hammer and carrier

Please check every necessary parts of Hyundai Hammer and the carrier before starting operation. Referring to check points in the manuals of Hyundai Hammer and carrier, check any damages, breakage, crack, wear, deformation, connections, oil leak and the safety related points.

For Hyundai Hammer, check carefully crack in the welded parts of hammer body, bolt and nut, pin, oil leak on the cylinder and hose. Do not operate in case any damages or failure is found until it is fixed. In case such trouble is found, put the warning tag in the driver cab. It is good to let the same person remove the tag after trouble shooting.

- It is good to let the same person remove the tag after trouble shooting.





### 1.3 Safety information on safe operating

**WARNING!**

The following instructions are on safety in operation with hammer. Read, understand and observe the instructions. More information is provided in page 24, “**4. Instructions for using Hyundai Hammer**”.

- Never operate in unalloyed applications

Operation in applications not allowed by the manufacturer must not be carried out.

Refer to page 20, “**4.2 Correct working methods**” for such applications.

- Never use for transportation purpose

Lifting and transporting loads such as concrete columns, steel beams or pipes on Hyundai Hammer may result in accident. There is a risk of crushing or cutting during the transportation.

- Never use for hammering or ramming

Hammering or ramming with Hyundai Hammer may cause serious damage to Hyundai Hammer.

- Prepare an escape for the carrier

Never fail to prepare an escape for the carrier for emergency. The direction needs to be opposite to the object of crushing and it should be straight way.

- Stop operation on finding uncertainties

Never fail to stop the operation if an uncertain noise or vibration is detected during the operation and check the condition of the carrier and Hyundai Hammer.

- Pay attention during operation

Do not read, do not listen to music, do not talk over the cell phone during the operation. Do not operate Hyundai Hammer as well as the carrier carelessly.



#### **WARNING!**

**When installing, repairing, moving and storing, always lock the tilting function with the stopper cylinders down. Otherwise, the ball stopper may be released and the hammer may fall to the ground, resulting in serious injury or death.**

### **1.4 Safety information on maintenance**



#### **Danger!**

Never try maintenance, inspection, cleaning, repair or checking the product while engine of the equipment is running.

The maintenance of Hyundai Hammer must be carried out by skilled servicemen so please contact HYUNDAI CORE MOTION CO. LTD. or their dealers in case the maintenance is required.

Always follow the instructions described in this manual when performing maintenance work on Hyundai Hammer.

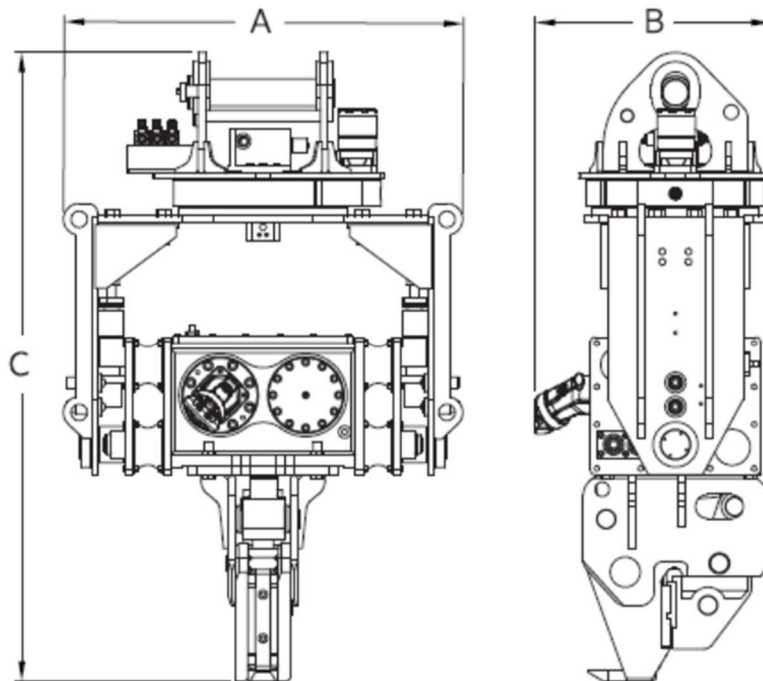
- Pay careful attention to all relevant safety regulations. Most accidents occur when the instructions are not observed.
- Maintenance work should be performed with the carrier completely stopped, the stop valves shut off.
- The carrier must be on firm and flat ground with all the control levers switched off.
- Only the proper tools should be used for maintenance. Use of improper tools may cause personal injury, or damage to Hyundai Hammer.
- Use only the lifting points provided and sufficiently strong lifting equipment when lifting Hyundai Hammer.
- The hydraulic oil may be very hot and may cause severe scald. Before disconnecting hydraulic lines, bleed all hydraulic pressure in the lines. And, always relieve tank pressure of the carrier.
- Do not start maintenance on Hyundai Hammer until it has cooled because Hyundai Hammer is heated up during operation.
- Some components, for example, blade, valve, motor or hydraulic connection parts become very hot.
- Oil spouted out from the crack or small hole on hydraulic system can penetrate the skin and cause serious injury. Therefore, be sure that all the connections are tight and pipes and hoses are in good condition. Use a sheet of cardboard or wood to search for suspected oil leaks.
- Oily, greasy ground may be very slippery. Collect any oil and grease, and dispose it correctly for safety and environment.
- Unauthorized alteration on Hyundai Hammer may cause Hyundai Hammer serious troubles or reduce hammer life and performance. These cases cannot be guaranteed by HYUNDAI CORE MOTION CO. LTD.
- Always use only genuine parts from HYUNDAI CORE MOTION CO. LTD. Infringement by using non-genuine parts may cause damage to the products and injury and automatically voids warranty.

## **2. Product information**

### **2.1 Main parts name and description**

- ◆ **Extension Boom:** Extension boom connects the Vibro Hammer to a carrier and increases the height of working object.
- ◆ **Rotary Joint:** Rotary joint can make sheet pile rotate horizontally and suppress vibration.
- ◆ **Gear Box:** Gear box has 2 units of driving gear, eccentric weights, rotation axis, roller bearing and roller bearing cover and it triggers vibration using centrifugal force which is made when eccentric weights are rotated by hydraulic motor in the side. Upper cover and bearing cover in the side block outside and inside of the gear box and inner lubricant lubricates it. An inlet for injecting lubricant is in the front side, lubricant level checking hole is in the lower part of the side and drainage is on the bottom side so checking, injecting and draining lubricant is possible. There are multiple holes on the bottom of the gear box so it can be assembled using clamping device and bolts.
- ◆ **Clamp Body:** Clamping device is assembled on the bottom of the gear box using bolts as necessary and operating jaw which is moved forwards and backwards by fixing jaw and hydraulic cylinder so working object can be clamped between each jaw. As clamping device includes pilot check valve in hydraulic circuit, it can prevent breaking away of gripped working object by external force. Each of the jaw has blades assembled for replacement as they will be worn out after used for a long time.
- ◆ **Hydraulic Motor:** This drives eccentric gears in the gear box.

## 2.2 Technical specification



Model	Unit	SH25 Tilting	SH30 Tilting	SH40 Tilting
Excavator	TON	20~30	30~40	40~55
Weight	KG	1,620	1,910	2,250
Setting pressure	BAR	250	250	280
Oil Flow	LPM	170-200	180-220	240-260
Centrifugal Force	KN	400	520	550
Frequency	BPM	2,800~3,600	2,600~3,600	2,200~2,800
Rotation	Degrees	360	360	360
Tilt angle	Degrees	90	90	90
Jaw open	mm	65	65	65
Dimension [A x B x C]	mm	1,326x711x2,089	1,326x805x2,089	1,435x900x2,180

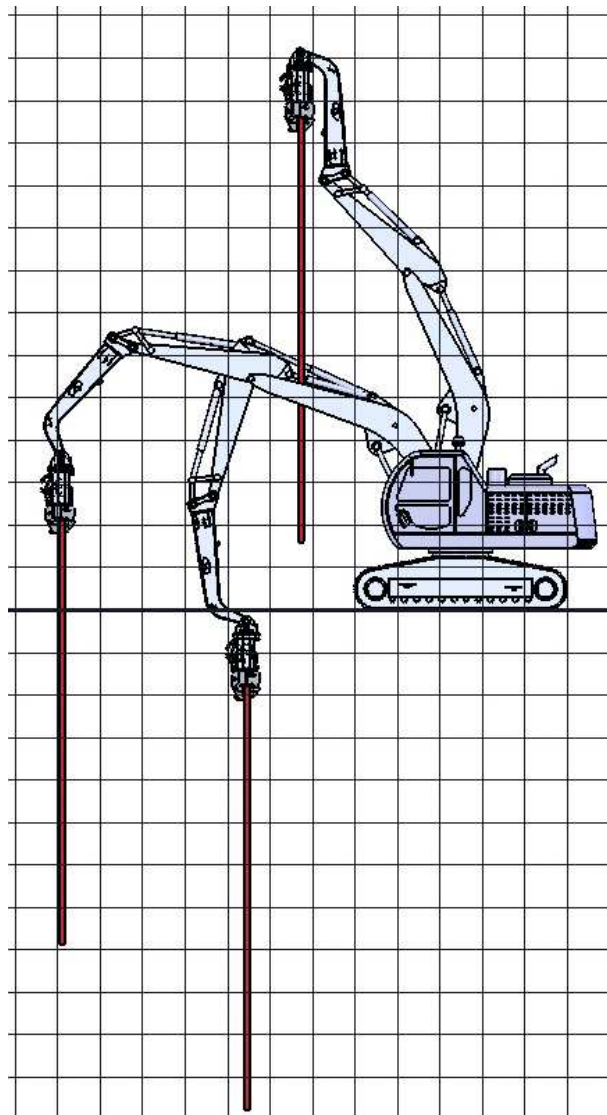
## 2.3 Characteristics

### ■ General description

The product is installed on excavator to be used for driving insert and pulling out sheet pile, H beam, steel plate and pipe in the ground. The product has been applied for patent by HYUNDAI CORE MOTION CO. LTD. and manufactured using special wear-resistant steel. Hydraulic pressure provides magnificent vibration power to the product for easier driving insert and pulling out. The product is designed for high productivity with strong vibration.

### ■ Working area

The product drives and pulls out working material with very long length. This working character requires wide working area. Also, securing wide safety zone and safety bar must be completed.



### 3. Installation



#### IMPORTANT!

Improper installation can cause serious damage to Hyundai Hammer and to the carrier.

Do not install Hyundai Hammer if you are unsure. Contact your HYUNDAI CORE MOTION CO. LTD's dealer for more information.

#### 3.1 Carrier requirements

Hyundai Hammer can be installed on any carrier that meets necessary mechanical and hydraulic installation requirements.

Check following points when installing Hyundai Hammer:

##### ■ Carrier weight

Hyundai Hammer should only be mounted on a carrier with sufficient load capacity, especially installed with long boom or long arm. In case of using a quick coupler, determine the total weight including the quick coupler. For more information about suitable carrier weight, please contact HYUNDAI CORE MOTION CO. LTD. and their dealers.

##### ■ Mounting dimension

To fit Hyundai Hammer on the carrier, proper mounting adapter must be used. This mounting adapter varies according to carrier model and should be ordered separately with follows:

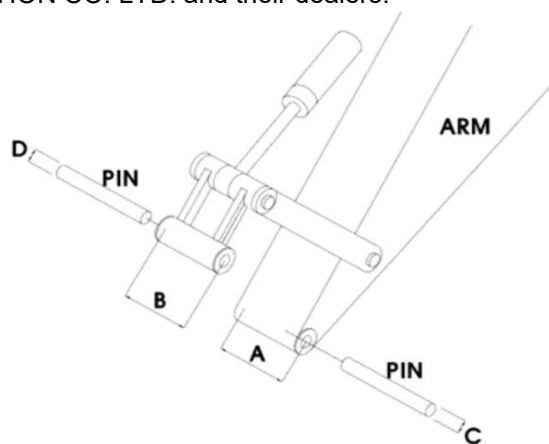
HYUNDAI CORE MOTION CO. LTD.'s standard mounting adapters are designed to fit most carrier, and parts for fitting, such as spacers and pins can also be provided according to mounting dimensions of arm width, link width, arm pin diameter and link pin diameter of your excavators. For more information about mounting dimension, please contact HYUNDAI CORE MOTION CO. LTD. and their dealers.

**A : Excavator arm width**

**B : Excavator link width**

**C : Excavator arm pin diameter**

**D : Excavator link pin diameter**



#### ■ Hydraulic line

Check the nominal bore size of Hyundai Hammer piping lines on the carrier. Both supply and return lines must have sufficiently large inner diameters. Small line size causes backpressure increase, overheating of oil or irregular blows.

**■ Do not use Hyundai Hammer with a carrier, which does not meet necessary mechanical and hydraulic installation requirements. Otherwise, it may cause serious damage to Hyundai Hammer and the carrier.**

#### ■ Hydraulic line:

Check the nominal bore size of Hyundai Hammer piping lines on the carrier. Both supply and return lines must have sufficiently large inner diameters. Small line size causes backpressure increase, overheating of oil or irregular blows.

#### ■ Hydraulic pressure:

The hydraulic pressure and oil flow of the carrier's hammer piping should be adequate for operating the hammer. The maximum hydraulic pressure of the carrier must be higher than the recommended relief pressure setting for Hyundai Hammer. If not, the impact rate of Hyundai Hammer becomes slow or Hyundai Hammer does not start blowing.

#### ■ Oil flow:

Oil flow, which controls impact rate of hammer, is the most important factor in the hydraulic parameters to operate hammer with a good performance, and should not only be too low but also be too high. Insufficient oil flow cause low impact rates, and on the contrary excessive oil flow causes an increase in the operating pressure and overheating of the oil. If the output of the pump is more than the maximum acceptable flow of Hyundai Hammer, a flow control valve is needed.

#### ■ Oil cooler:

Too low or too high oil temperature reduces the working performance of a hammer. The temperature of the hydraulic oil shall never exceed 90°C (194°F), maximum allowed limit, which may cause damage to Hyundai Hammer as well as the carrier. If the carrier's oil cooler is too small, either the original cooler should be replaced with a larger one or an auxiliary cooler must be installed.

For sufficient cooling of oil, return oil from Hyundai Hammer must run through oil cooler to oil tank.

### **★NOTICE**

**Fire prevention oil or vegetable oil should not be used without prior consent of HYUNDAI CORE MOTION CO. LTD.**

√ Allowable temperature range: -20°C/+80°C (depending on the oil in use)

√ Allowable viscosity: 25cSt – 150cSt

√ Ideal viscosity: 40cSt – 60cSt



### 3.2 Mounting Hyundai Hammer on the carrier



#### Warning!

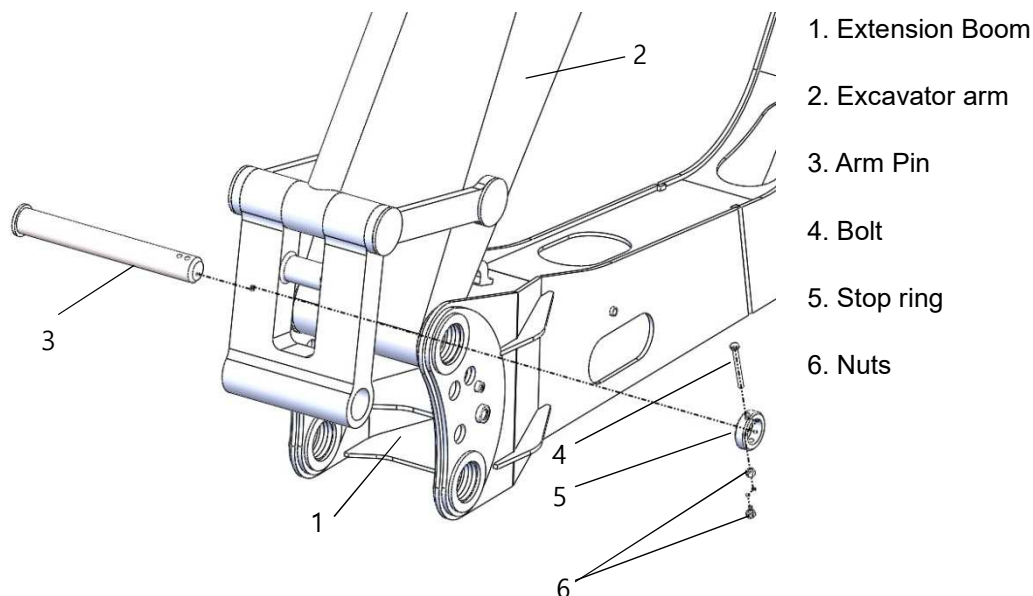
While mounting Hyundai Hammer or removing the bucket, make sure that there are no persons in the vicinity of the carrier.

When moving the carrier, do not touch any part of the carrier or hydraulic hammer.

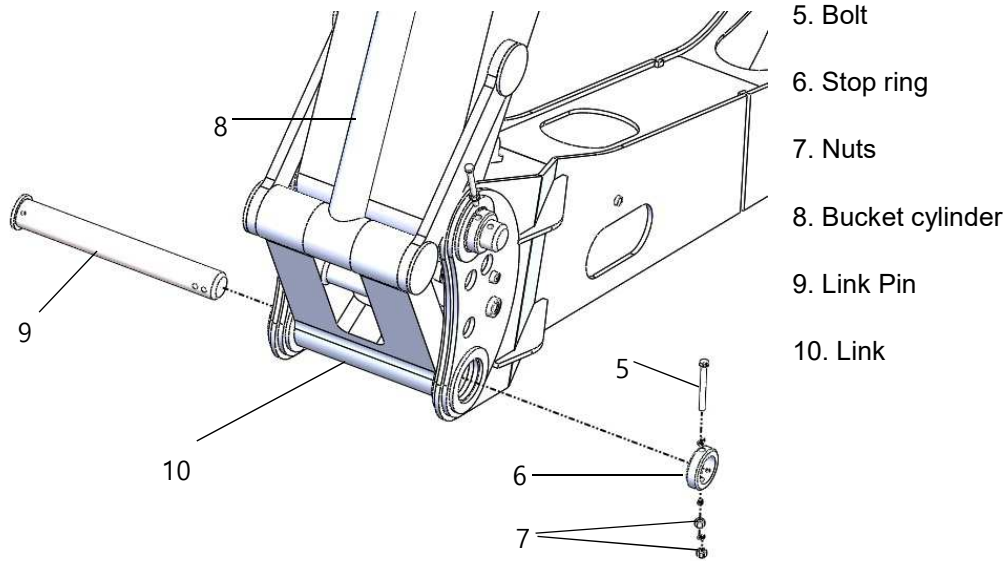
Keep hands away from linkage area and pin-bores.

When aligning pin-bores, never put a finger into the bore, align only by sight or with using drift pin. Agree with the assistant on clear hand signals.

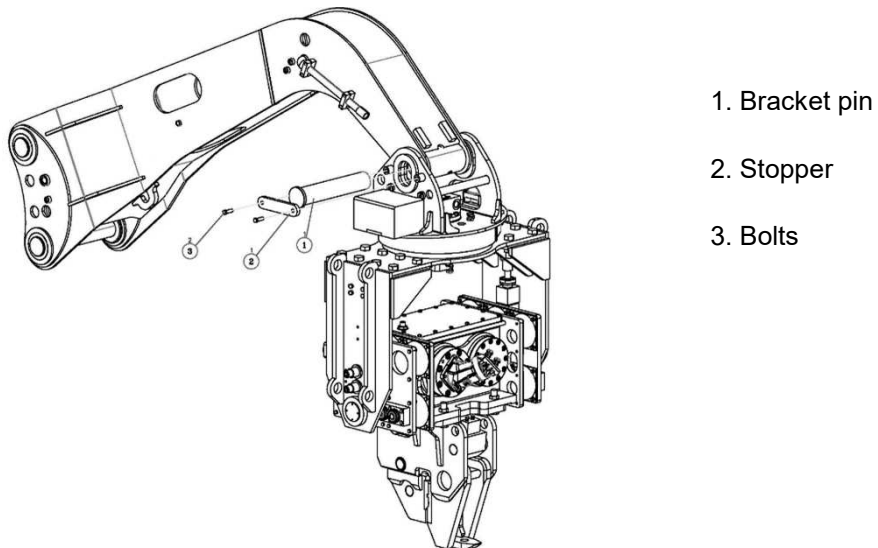
During hammer mounting, the carrier should only be operated from the operator's cab.



- ◆ Following the direction of an assistant, carefully move the excavator arm (2) into the adapter, until the bore in the arm is flush with those in the adapter.
- ◆ Insert the arm pin (3).
- ◆ Fit the stop ring (5) to the arm pin (3) and lock by using the bolt and nuts (4&6).
- ◆ Lift up the extension boom (1) to a proper height.
- ◆ Extend the bucket cylinder (8) until the bore in the link (10) is flush with those in the adapter.
- ◆ Fit the stop ring (6) to the bucket pin (9) and lock by using the bolt and nut (5&7).
- ◆ Check there are any mechanical difficulties, slacks or incompatibility in manipulating.

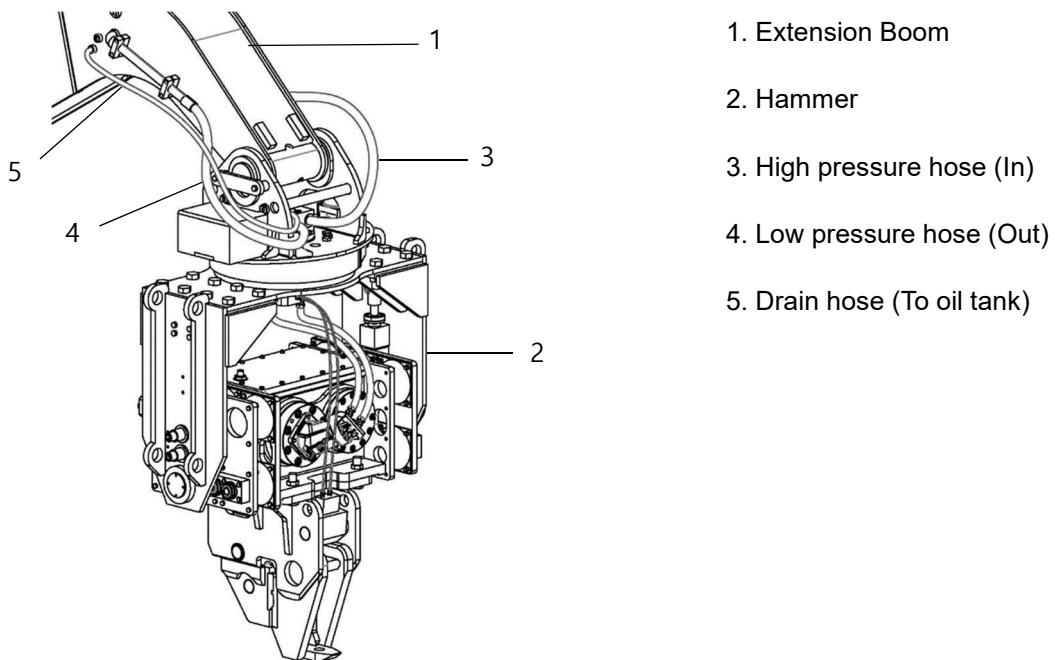


#### ■ Connecting Hyundai Hammer to extension boom



- ◆ Move bucket cylinder of the carrier slowly until the holes of extension boom is aligned with the holes of the hammer mount. And insert bracket pin to the holes.
- ◆ Fit the stopper (2) and the bolts (3).
- ◆ Make sure hydraulic motor is shown upward as the above picture

### 3.3 Connecting the hydraulic lines of Hyundai Hammer

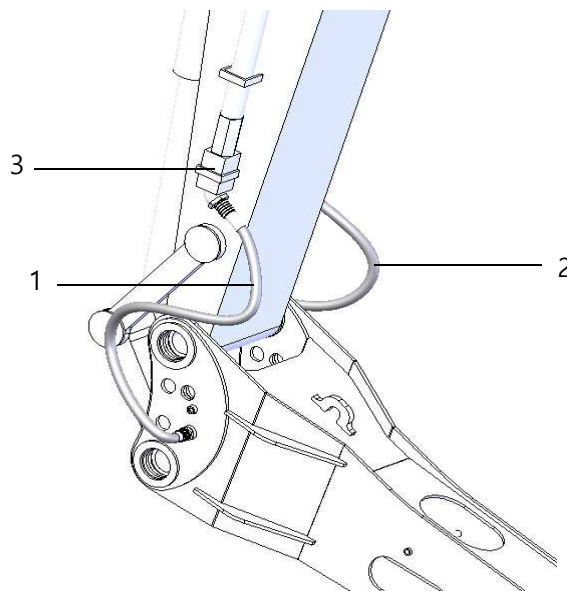


Before connecting the hydraulic lines to the carrier, check following points:

- To avoid hammer damage, the hydraulic oil of the carrier must be kept clean. Check the contamination of the oil, then, if necessary, change the oil or flush the oil through a external filtration system, and replace the carrier oil filter according to the maintenance schedule of the carrier.
- Check the pressure setting of the relief valve on Hyundai Hammer hydraulic line, this pressure-relief setting should be at least 30 ~ 40 bar higher than the measured maximum operating pressure of Hyundai Hammer.
- The sealing faces and connecting threads of the hoses or fittings must be undamaged and free of sand or similar foreign particles.

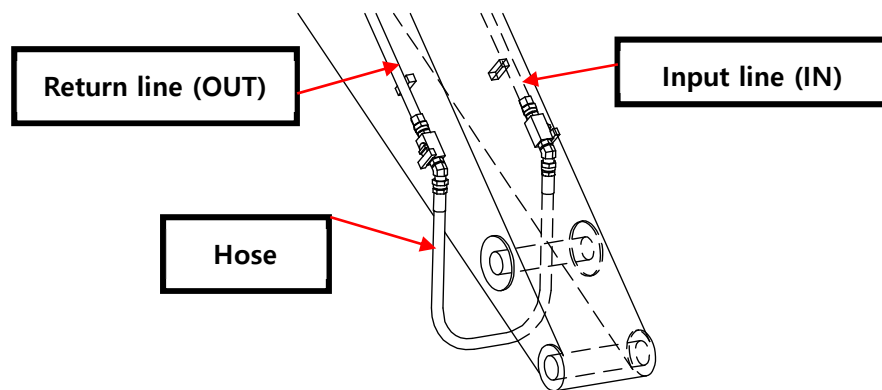
If the hydraulic lines are in good preparation for operating Hyundai Hammer, connect Hyundai Hammer as follows:

- ◆ If the connection hoses are not installed on Hyundai Hammer, remove the cover plate on the service window and connect the “IN” & “OUT” hoses (1, 2) to Hyundai Hammer.
- ◆ Confirm both of the stop valves (3) are closed.
- ◆ Remove the end caps from the stop valves (3) and remove the hose plugs from the hoses. Put them in the toolbox for safekeeping.
- ◆ Connect the “IN” & “OUT” hoses (1,2) to the stop valves on both sides of the carrier arm.
- ◆ Open the stop valves (3).



- 1. High pressure hose (In)
- 2. Low pressure hose (Out)
- 3. Stop valves

When attachment pipes were newly installed for a carrier or the pipes are not cleaned, the pipes must be flushed out through U-hose for more than 5 minutes before connecting the pipes with input line and return line of Hyundai Hammer. After flushing pipes, change the hydraulic oil filter of the carrier. Remind most damage of motor piston of Hyundai Hammer and the seals may be caused by foreign objects or debris inside of the hydraulic oil, so it is important to keep it clean for long life time of Hyundai Hammer.



All three hoses must be connected from HYUNDAI Ripper to the carrier. "IN" & "OUT" hoses must bear at least 350 bar of continuous pressure and additional pressure peaks.

We recommend using the 350bar hose for the pressure hose and recommend using over 120 bar hose for return hose. **(We supply 350bar for "IN" & "OUT" hoses, and 120bar for DRAIN" hose.)**

### 3.4 Inspection after installation

After Hyundai Hammer has been installed on the carrier and set ready to operate, installation inspection must be carried out. Check inspection items and specifications as follows:

- ◆ Shape of mounting and fitting (Pins and stop-rings)
- ◆ Hoses' connection and fitting between Hyundai Hammer and carrier
- ◆ Connection of each parts of Hyundai Hammer
- ◆ Abrasion, crack, defect of each parts of Hyundai Hammer

And start operating Hyundai Hammer slowly and check the following:

- ◆ Whether there are irregular operating motions
- ◆ Oil leak of connection of hoses and each parts of Hyundai Hammer

**WARNING!**

Wear safety shoes to protect feet.



Personal injury can result from dropping pins during dismounting.

### 3.5 Dismounting Hyundai Hammer from the carrier

Put Hyundai Hammer on a clean, flat, level surface, and engage the parking brake on the carrier machine.

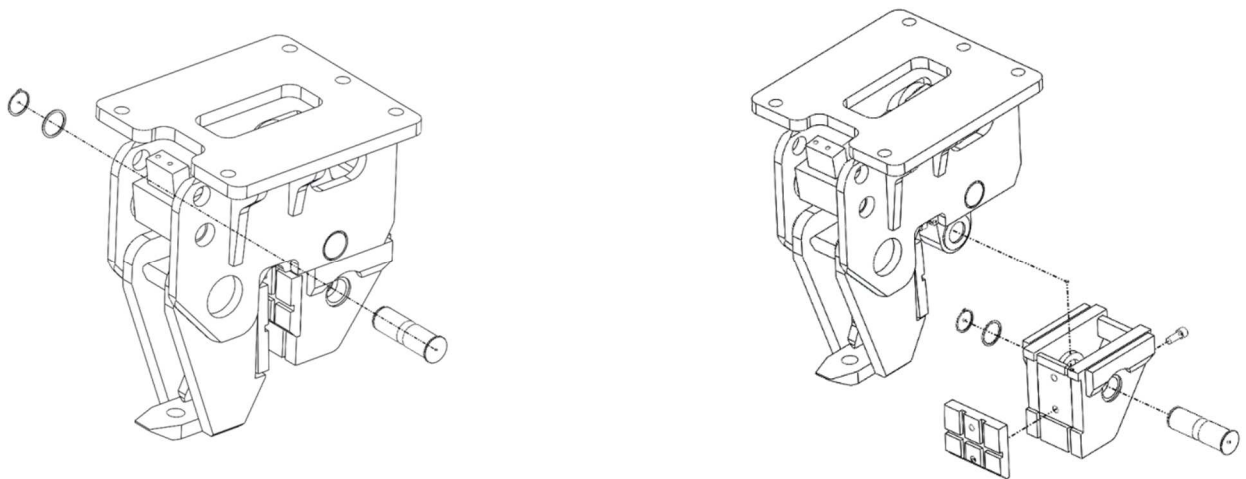
- ◆ Close the stop valves completely.
- ◆ Disconnect the hydraulic hoses (I, O) from the stop valves.
- ◆ Ensure no leakage occurs from hoses and stop valves.
- ◆ To prevent contamination, apply the end caps to the stop valves and hose plugs to the hoses.
- ◆ Remove the stop rings from the arm and link pins.
- ◆ Lift the arm away from Hyundai Hammer, so that Hyundai Hammer can be carried away, or another attachment mounted on the carrier.

### 3.6 Fitting / removing the blade

	<p><b>WARNING!</b></p> <p>The blade shall only be installed in the way described. Failure to do so could allow the blade to be drawn out from Hyundai Hammer with force possibly causing safety accidents.</p> <p>When installing the blade, the carrier must be switched off before fitting or removing the blade. Always wear safety glasses and gloves because metal chips or debris may fly off when driving the blade or the blade pins.</p> <p>Never put fingers in the blade pin-bores of Hyundai Hammer.</p> <p>Do not stand in front of blade; possible blank blow caused by the pressure trapped inside Hyundai Hammer can cause personnel injury.</p> <p>In case of large size hammer, the blades are very heavy and difficult to lift by hands. Always use a hoist with a sling when lifting the blade. Be careful of falling down.</p> <p>After operating Hyundai Hammer, the blade, especially the tip, may remain very hot for some time and can cause severe burn.</p>
	<p><b>IMPORTANT!</b></p> <p>Use only genuine HYUNDAI CORE MOTION CO. LTD blades. Use of other brands of blade may occur serious trouble to Hyundai Hammer and cause warranty rejected.</p> <p>It is important that the blade be used correctly for longer blade life. Pay particular attention to Section “4.2. <b>Correct working methods</b>”, and refer to a extra document “A guide for prefer use of tool” to determine the warranty guide for blade failure.</p>

#### ■ Blades Replacement

1. The equipment should be stored in a place with hard, even and flat surface in order for the support spots to hold the weight.
2. Place the equipment on horizontal surface to be fastened.
3. Remove the washer & snap ring from the pin.
4. Remove the pin from the jaw.
5. Disassemble the jaw from the link
6. Loosen the bolt and replace the blade.




7. Check whether all removed parts are worn out. Replace excessively worn parts with new ones or overlaying weld repair.

★ **NOTICE**

If a blade is worn out, it should be replaced with new one.

### 3.7 Rubber Cushion

	<p><b>WARNING!</b> Replacement rubber cushion must be carried by a qualified and skilled technician with full knowledge of rubber cushion including assembling and disassembling rubber cushion</p>
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■ Replacement of the rubber cushion

- ◆ Stop the engine of carrier and position Hyundai Hammer in a horizontal or vertical position.
- ◆ Dismantle the rubber cushion by unscrewing bolts and separate the rubber cushion from Hyundai Hammer.
- ◆ Check the condition of the rubber cushion and replace it with the new one if it cannot be used any longer.
- ◆ Assemble the rubber cushion in reverse order. the bolt must be tightened with proper torques.  
If you find some defect in the bolt condition, replace it with new one.
- ◆ Replace the rubber cushion one by one as the above process.



## 4. Instructions for using Hyundai Hammer



### **WARNING!**

The following information must be checked for efficient and safe work, preventing breakdown before starting operation.

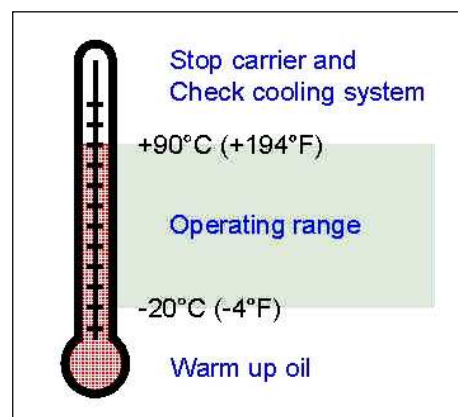
### 4.1 Correct using methods

#### ■ Operating temperature

The operating temperature of Hyundai Hammer is  $-20^{\circ}\text{C}$   $\sim$   $+90^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$   $\sim$   $+194^{\circ}\text{F}$ ).

If the ambient temperature is lower than  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ), Hyundai Hammer have to be warmed up before starting operation in the way described at the carrier's manual. During operation, they will remain warm.

If the oil temperature exceeds  $+90^{\circ}\text{C}$  ( $+194^{\circ}\text{F}$ ), please stop the carrier and wait until the oil has cooled to operating temperature range. For continuous operation with high duty, maximum oil temperature is recommended not to exceed  $+80^{\circ}\text{C}$  ( $+175^{\circ}\text{F}$ ). An auxiliary oil cooler must be fitted if needed.



- ✓ Allowable temperature range:  $-20^{\circ}\text{C}/+90^{\circ}\text{C}$  (depending on oil used)
- ✓ Allowable viscosity: 25 cSt  $\sim$  150cSt
- ✓ Ideal viscosity: 40 cSt  $\sim$  60 cSt

The hydraulic oil base on mineral oil should be selected. Oil is selected according to precise viscosity corresponding to ideal viscosity in the general operation mode. If oil viscosity less than the allowable value, the motor life can be shortened.

Hydraulic oil for the excavator should change according to the user's instructions.



### **IMPORTANT!**

If the oil temperature exceeds  $+90^{\circ}\text{C}$  ( $+194^{\circ}\text{F}$ ), please stop the carrier and wait until the oil has cooled to operating temperature range. Extreme oil temperature may cause serious damage on the seals in the carrier and hammer.

## 4.2 Correct working methods



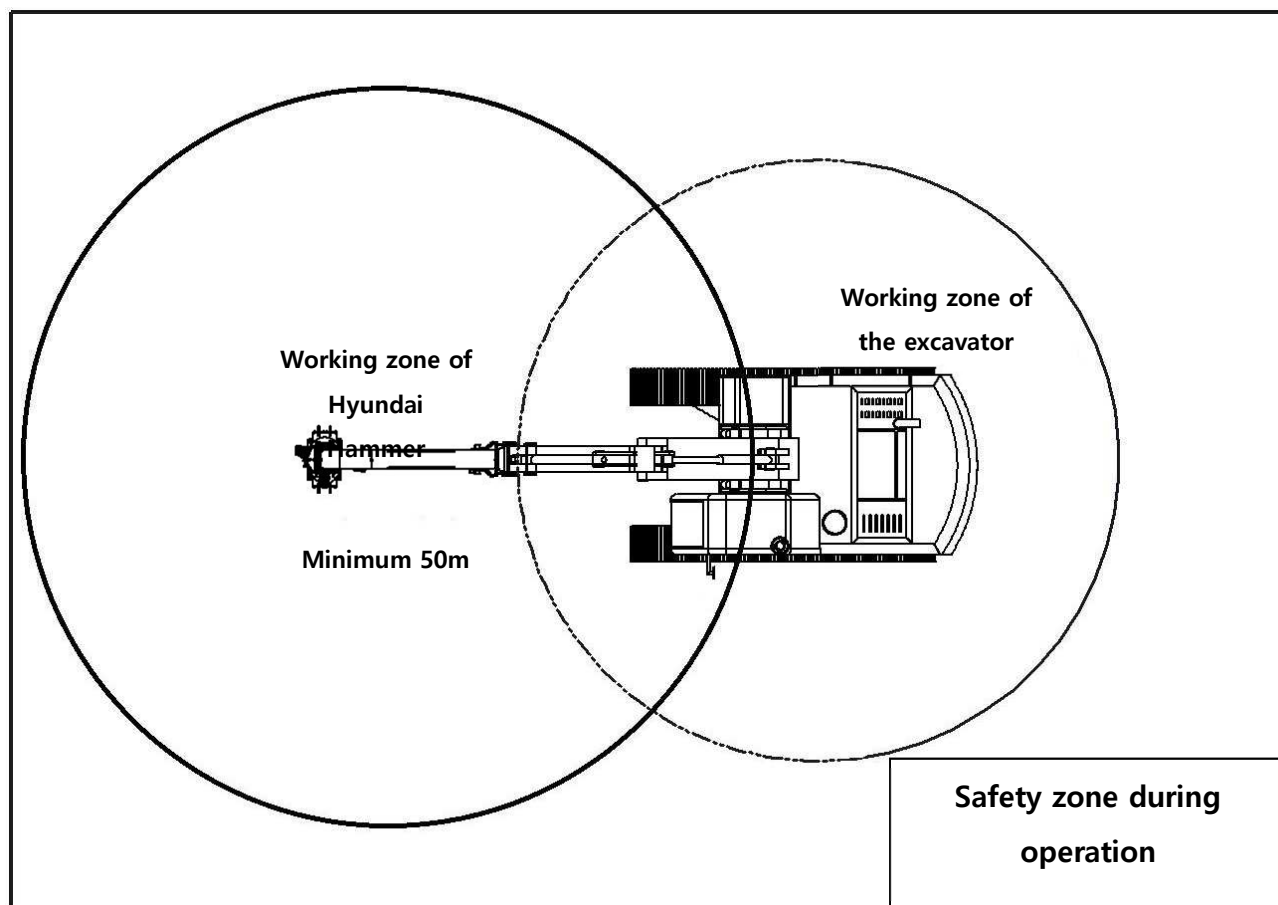
### **WARNING!**

Stop operating immediately if anyone moves into the danger area, i.e. within a radius of at least 50 meters around Hyundai Hammer. Must be observant of other workers, bystanders and other equipment in the danger area.





### **DANGER!**

Improper operation of Hyundai Hammer could result in serious injury or death. Never operate Hyundai Hammer unless you are properly trained.



## ■ Pile driving

	<p><b>ATTENTION!</b></p> <p>Operator must keep his eyes on the product while operating vibration and focus to clamping part of working object and the clamp.</p> <p>After pile drive to the targeted depth, unclamp and disassemble the safety steel wire.</p>
	<p><b>WARNING!</b></p> <p>Always make the equipment and work object in vertical and horizontal position so as not to bend clamping region during inserting operation.</p> <p>Wrong position not in vertical and horizontal can break anti-vibration rubber and object material.</p> <p>Check if there is possible danger of collision against other object when pull out and lift working object.</p>

### ◆ Clamping working object

1. Place a tip of bottom clamp of Hyundai Hammer on the ground to make 90 degree tilting posture.
2. Open clamp completely and have working object entered into between jaws entirely and clamp the central part of the top side of working object.
3. Connect Hyundai Hammer to working object using assistant wire after clamping working object.

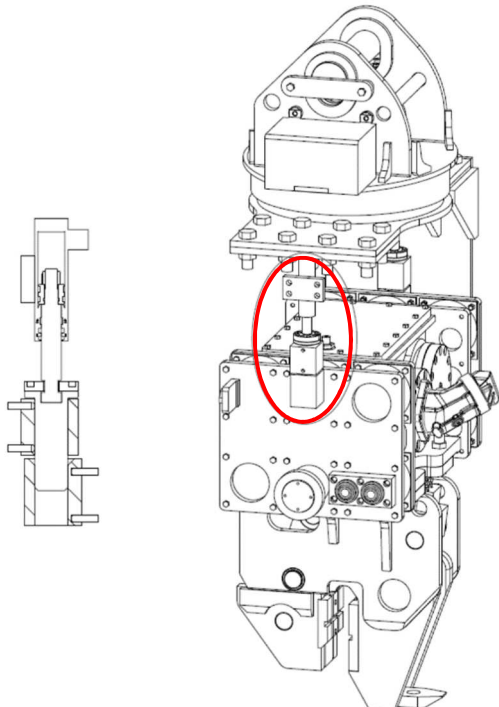
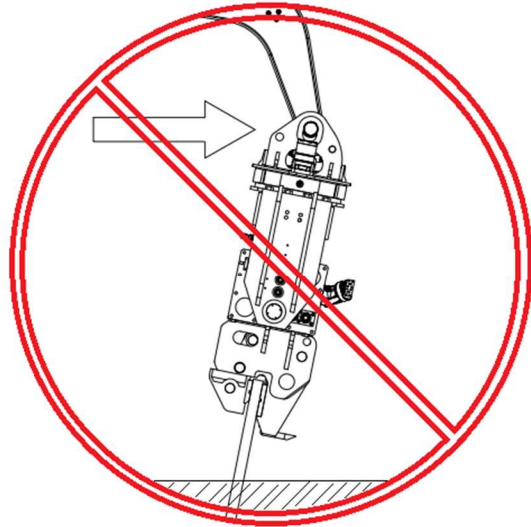
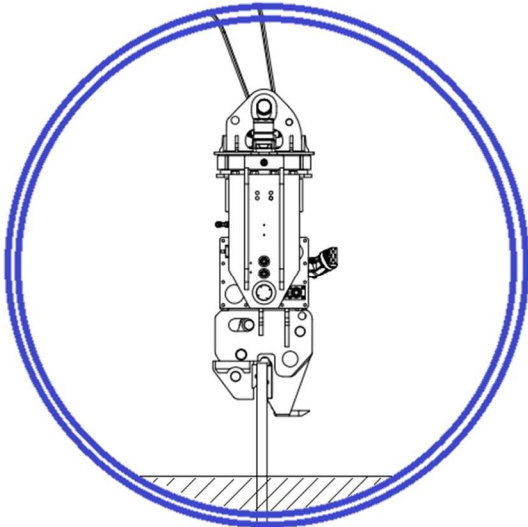
### ◆ Moving pile into the work position

1. Clamping and handling working object without complete entering of working object into the clamp is very dangerous as working object will be torn or deformed.
2. There should be no people nearby when clamp and lift working object and check if there is any possibility of collision against other object.
3. Operator has to keep his eyes on working object and the product while lifting working object.

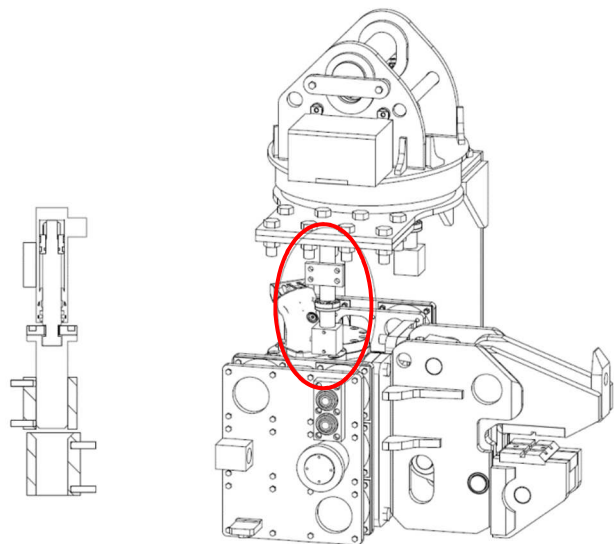
### ◆ Pile drive

1. Down the stopper cylinders before driving the object to prevent the object from bending.
2. Low down the bottom tip of working object until it contacts the ground surface and operate vibration to start pile driving.

3. When working object goes down about 2.5m from the ground level, stop driving to check if working object is in vertical position with the ground and if there is any problem and then continue working in same way.



Cylinder stoppers down position before driving object



Cylinder stoppers up position for 90 degree tilting

**★ NOTICE**

1. Operator must keep his eyes on the product while operating vibration and focus to clamping part of working object and the clamp. After pile drive to the targeted depth, unclamp and disassemble the safety steel wire.
2. Make sure to operate stopper cylinders up and down after checking if Hyundai Hammer is upright position(180 degree) all the time. Otherwise the cylinder parts can be damaged and the damaged parts are out of warranty.

**■ Pulling out****◆ Clamping working object**

1. Connect Hyundai Hammer to working object using assistant wire before clamping working object.
2. Open clamp completely and have working object entered into between jaws entirely and clamp the central part of the top side of working object.
3. Upon completion of clamping, operate vibration and lift the arm and boom slowly when the vibration reaches to sufficient frequency.
4. After working object has come up to proper position, stop vibration and connect assistant wire and then continue working to pull out working object completely.

**★NOTICE**

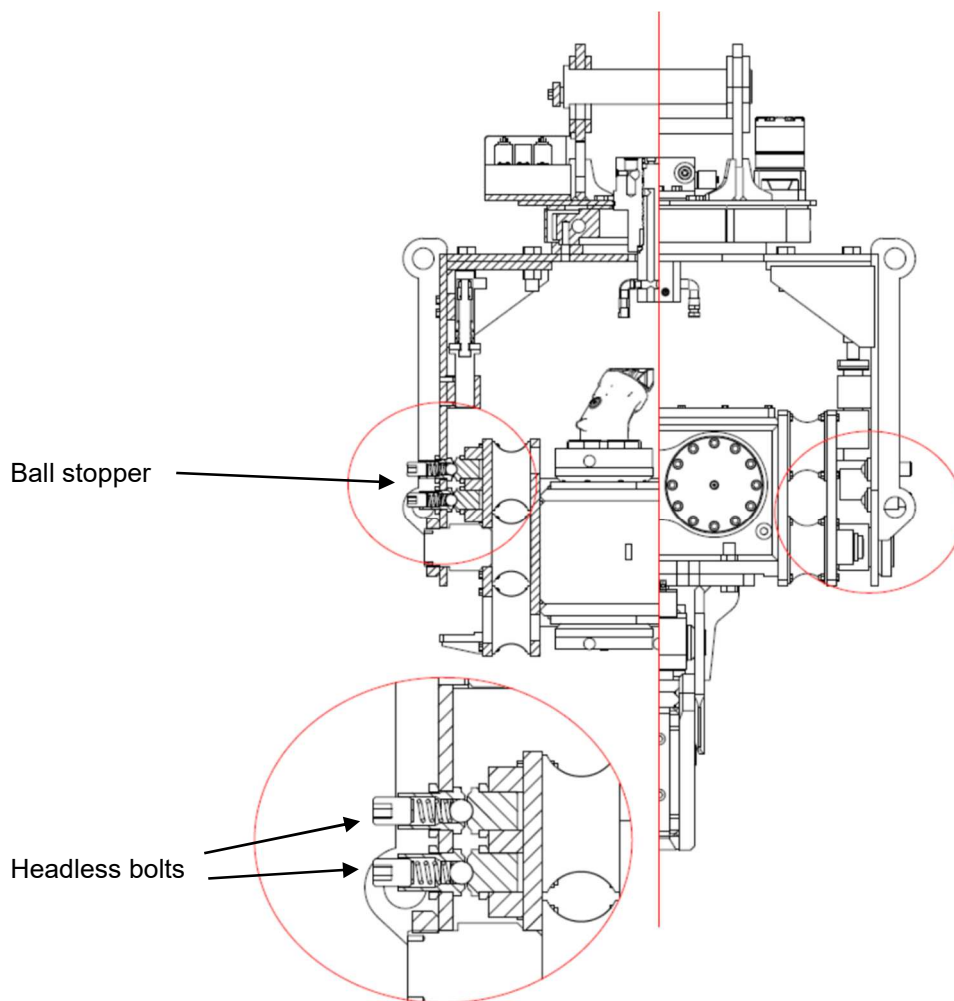
1. Always make the equipment and work object in vertical and horizontal position so as not to bend clamping region during pulling operation.
2. Wrong position not in vertical and horizontal can break anti-vibration rubber and object material.
3. Make sure to operate stopper cylinders up and down after checking if Hyundai Hammer is upright position(180 degree) all the time. Otherwise the cylinder parts can be damaged and the damaged parts are out of warranty.

## ■ Unload working object

1. Once the bottom tip of the pile comes out of the ground level, move working object to the place in which working object will be put down, and have the bottom tip of working object contact with the ground surface.
2. Up the stopper cylinders before lay down the object on the ground.
3. Lay slowly working object on the ground after topple it to safe direction.

## ★Ball Stoppers

**Auto hold function - Hyundai Hammer can hold 90 degree posture by using ball stoppers.**

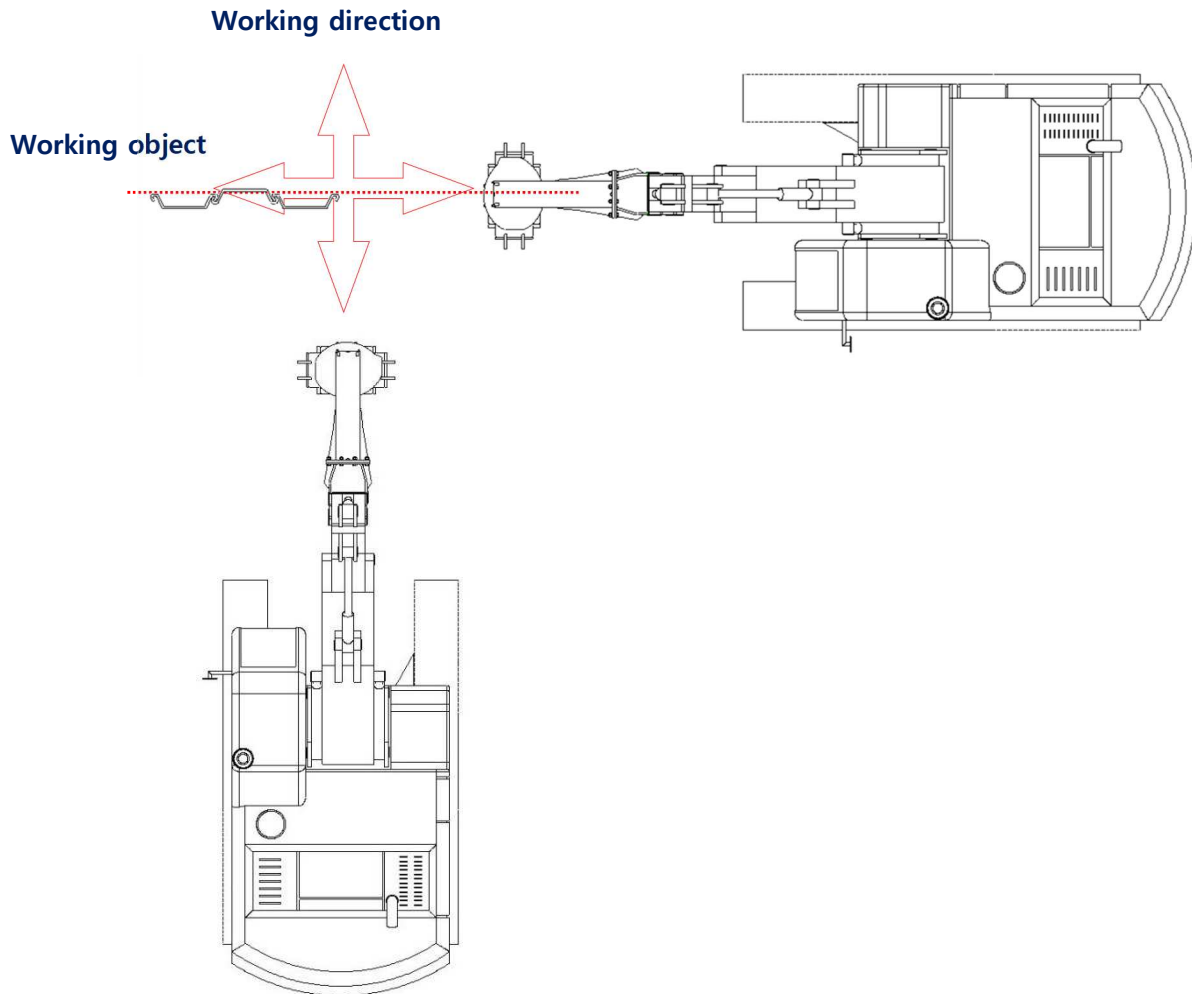


## How to adjust of tension of ball stoppers

1. Turn headless bolt clockwise to increase tension.
2. Turn headless bolt anti clockwise to decrease tension.

## ★TIP


For operating, an operator can conduct easily vertical piling job in a right-angle position of pile hammer and working object. If a machine is aligned with line of working objects, operating job will be easier.



### **WARNING!**

**When installing, repairing, moving, and storing, always lock the tilting function with the stopper cylinders down. Otherwise, the ball stopper may be released and the hammer may fall to the ground, resulting in serious injury or death.**

## 5. Markings and labels

	<p><b>IMPORTANT!</b></p> <p>The product has stickers in which descriptions and instructions for safety warning are printed.</p> <p>In case stickers have been damaged or erased, ask to manufacturer or dealer for new ones. Stickers are attached on the body of the product.</p>
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- ◆ Read whole parts of this manual.
- ◆ Understanding all information is mandatory.



- ◆ Noise level: 80~100dB. Wear ear protection.
- ◆ Keep at least 50m away from the product while it is working. Watch out scattering debris and pieces.








## ■ Model nameplate and serial number

Name plate of the product locates in the main body.

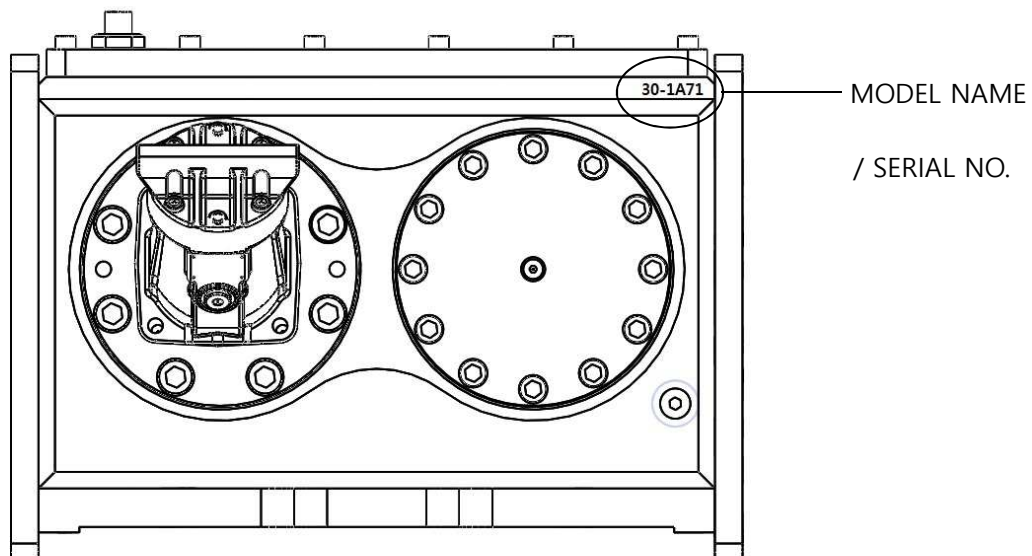
The name plate includes following data (refer to picture below);

- ①.MODEL NAME
- ②.SERIAL NO.
- ③.MANUFACTURING YEAR
- ④.WORKING WEIGHT
- ⑤.OIL FLOW
- ⑥.SETTING PRESSURE

  DO NOT DEFACE OR REMOVE THIS PLATE	
MODEL NAME	
SERIAL NUMBER	
MANUFACTURING YEAR	WORKING WEIGHT kg
OIL FLOW lpm	SETTING PRESSURE bar
 <b>HYUNDAI</b> CORE MOTION	
3rd. Floor, 55, Bundang-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea	

In case name plate is damaged, the data can be found in designated location for product information.

Model name of HYUNDAI CORE MOTION CO. LTD Hammer is engraved in the left of the upper part of the gear box and serial number is in the right of the upper part of the gear box.



★ Note

Consumable items (blade, pin, hose etc.) are excluded from warranty.

However, in case there is problem with any of the items within one month after installation, the item will be evaluated for warranty application.

Limited Warranty		
Consumables	Blade, Pin, Rubber Cushion, Hoses, Bolts	Not covered by warranty
Semi-Consumables	Motor, bearings	Three months warranty (In case of manufacturing fault)
Selective Warranty	* Consumables - One Month * Semi-Consumables - Three Months	

## 6. Storage of Hyundai Hammer

### ◆ Before long term storage:

- ◆ Clean and lubricate Hyundai Hammer carefully.
- ◆ Remove rust and poorly coated part.
- ◆ Protect unprotected iron/steel surface which can be the source of rust
- ◆ Store in warm and dry place if possible.

### ◆ Recommended storage condition

- Temperature: -40°C/+80°C (Note! Operating temperature is different from these values.)
- Humidity: 60% or under

### ★NOTICE

Observation of conditions and instructions described above is recommended for re-use of the product.

## 7. Maintenance

Problem		Possible Causes	Solution
Does not vibration	No pressure in connecting hose	Electric wire snaps	Check all wiring and connect
		Malfunction of excavator's hydraulic systems.	Check the pumps, control valve and pipe's relief valves of excavator.
	No pressure at solenoid even the voltage applied.	Solenoid(electromagnet ) malfunction	Replace the solenoid or electromagnet.
		Solenoid valve malfunction.	Disassemble the solenoid and clean it, assemble again. Otherwise replace it.
		Hose leak or break	Tighten or replace.
	No vibration even the pressure exists in hose.	Control valve malfunction	Contact a service technician
		Components malfunction	Check the motor and bearings Contact a service technician
		Wrong hose connecting	Check hose connecting and correct it.
	Electric control box malfunction	Relay operation trouble	replace
Low vibration (weak compacting power)		Insufficient oil flow or lower operation pressure.	Check the machine's hydraulic system and adjust when necessary. (if the trouble continues, contact a service technician)
		Oil shortage	Oil supplement.
		Higher oil temperature.	Stop the machine and restart after a descent of oil temperature. (if the trouble continues, check the cooling system of machine.)
		Malfunction of drive components such as motor, bearings, etc.	Contact a service technician
		Insufficient pressure.	Recharge the supply pressure to the recommended pressure level.
		Vibration motor malfunction	Check the motor including drain line connection and replace.

Problem	Possible Causes	Solution
Strange sound or irregular vibration during operation.	Insufficient grease lubricant or driving components trouble.	Grease lubricant and reoperation. (if the trouble continues, contact a service technician)
	Cushion rubber trouble or fixing bolt loose	Tighten bolts and replace damaged cushion rubber.
	Trouble in gear box	Contact a service technician
Cushion rubber damage	Cushion rubber worn out.	Replace.
Leak in the connecting region of hoses	O-ring damage	replace
	Hose sealing region damage	Check and retighten. If leak continue, replace hose.
Leak in motor or motor control valve.	Seal component damage.	Disassemble relevant components and check them. (if the trouble continue, contact a service technician)
Gear box overheat.	Oil leak through the air breather.	Stop the machine and restart after a descent of oil temperature in gear box..
Clamp jaw malfunction.	Wrong lubricant on sliding region.	Grease lubricant.
	Debris jam.	Remove the debris.

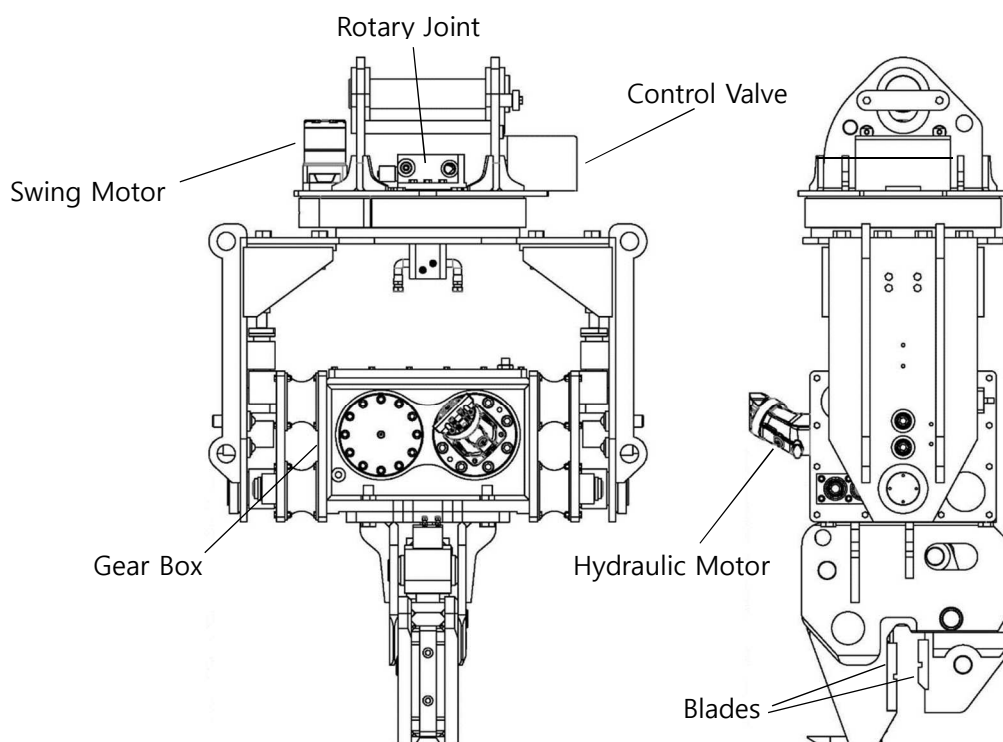
## 7.1 Maintenance, Inspection and Repair

### ■ Daily inspection

Prior to work, daily visual inspection should be performed as follows;

- ◆ Oil leak
  - Hydraulic Motor
  - Control Valve
  - Gear Box
  - Oil Plug
  - Rotary Joint
  - Clamp
- ◆ Hose condition (worn out, twisted, scratched)
- ◆ Screw and bolt tightness
- ◆ Potential deformation and crack
- ◆ General condition of the product
- ◆ Condition of plugs in lubricating area of the product and equipment
- ◆ Condition of vibration proof rubber
- ◆ Checking leakage
- ◆ Blades wear status

Following picture shows the locations of parts to be checked.



Complete checking can be carried out in a few minutes. Take proper measures if any problem out of above mentioned items is found, even if it is only one problem. Taking proper measures is saving money and time.

<b>VISUAL INSPECTION</b>	
<b>PROBLEM</b>	<b>SOLUTION</b>
LEAKS	
Hydraulic motor/Center joint/Swing motor	Find location and remove.
Oil plugs	Fill lubricant and contact service technician.
Hydraulic hoses	Replace as immediate as possible.
Gear box	Contact service technician.
Blade wear	Repair and replace with genuine part.
Abnormal functional motion	Check and fix wiring.
Loss or loosening tightness of screw and bolt	
Missing	Replace with genuine part
loosening	Re- tightening
Twisted and cracked	Contact service technician
General condition of the product	Keep hammer cleaned and in good condition.
Anchoring of hammer to excavator	Remove play. Contact service technician
Missing stickers	Attach new sticker.

! Damaged lubrication cap should be replaced as soon as possible. Disregarding the problems indicated in above list can invalidate warranty.

## 7.2 Care and maintenance schedule

Hours indicated below are inspection cycle. The hours are maximum operating hours in common operating conditions for common applications. About omitted item in the chart below, if any, contact service technician.

Check connection of all bolts of each part of Hyundai Hammer	8hours			
Check the connection of Hyundai Hammer to the excavator.	8hours			
Check the hydraulic circuit for leaks (hoses, motor, control block)	8hours			
Check oil leakage in plug	8hours			
Check leakage in gear box	8hours			
Check the gear box for distortion and breakage.	8hours			
Check the top bracket for distortion and breakage.	8hours			
Check the safety instruction stickers.	8hours			
Check the blades and assembly pins.	8hours			
Replace the hydraulic oil in the eccentric gear housing.	50hours (Initial Change)		500hours	
Check corrosion in installation product.			500hours	

1) If the lubrication plug is damaged, replace it as quickly as possible.

2) Comply with oil level specified in the manual. Excessive oil in the eccentric gear housing may cause severe damage to Hyundai Hammer's function.



### 7.3 Lubrication of gearbox

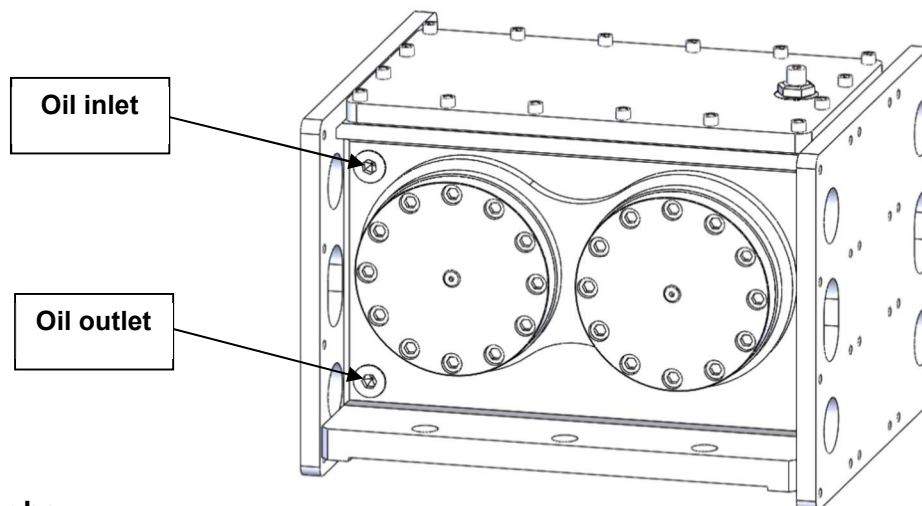
Use SAE-120 gear oil for the housing. HYUNDAI CORE MOTION CO. LTD recommends SAE80 - 100 or more qualified oil. Replace oil after 100 hours of initial operation and thereafter, every 500 hours or once a half year.

Oil quantity

SH25 : 3L

SH30 : 4L

SH40 : 5.5L



#### ■ Oil change for gear box

- ◆ Move the position of Hammer so that the oil port can be released.
- ◆ Eliminate residual pressure in gear box completely by loosening the plug little by little. Collect used oil in separate container to dispose.
- ◆ Fill oil up to the level instructed in the manual for applied model of Hammer. Clog again using plug and fix it firmly. Damaged plug should be replaced with new one. Make sure that the seal of the plug should be perfect at all times. In case metal powder has been found in used oil, contact qualified service technician and let him make decision on replacing bearing or cleaning the gear box
- ◆ When the oil indicator HYUNDAI CORE MOTION CO. LTD assembled is damaged, plug with replacing steel one of right hole specification.

#### ! NOTICE

After half process of disassembling plug, check whether internal pressure exist or not. After checking above, start disassembling.

## 7.4 Pressure relief of gearbox

The pressure relief valve locates in the upper part of the gear box inlet. The valve depressurizes when adjust overpressure which can be produced in the gear box and in maintenance time. The overpressure is made only when the sealing of the hydraulic motor shaft is damaged.

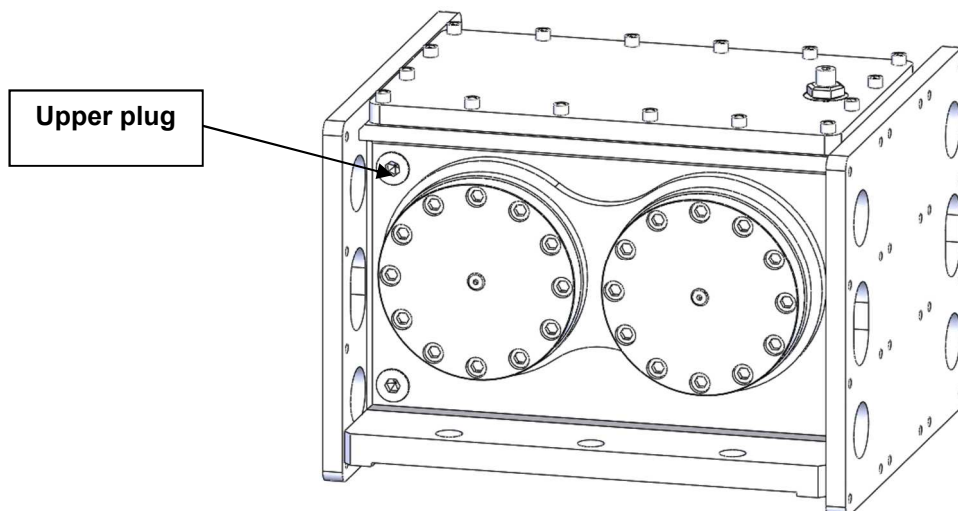
### Cause of damage on motor sealing:

- ◆ Overpressure in drain line off the product.
- ◆ Complete shut off of return stop valve or start operating at the same time when the valve is shut partially.
- ◆ Disruptors that can exist in hose, quick coupling for hydraulic connection, return circuit line and clogged return filter of the product.

### ! CAUTION

Recommended maximum pressure of the flow in drain hose is 6 bars.

In case operation force weakens suddenly, stop operating and open depressurizing relief valve cap to connect hose for depressurizing (supplied item) and check if the inside is filled with oil fully. If so, discharge oil through depressurizing hose to eliminate internal pressure. And, at this time, lock shut off valve of the product and contact qualified customer service. Operating Hammer in this condition causes overheat in the eccentric gear housing and damages to functions seriously.



## 8. Torque

◆ MAX. Tightening torque for bolts steel quality 8.8

Bolt diameter x Thread pitch (mm)	Torque Nm	Lbs.ft
M4 x 0.7	3	2.2
M5 x 0.8	5.5	4
M6 x 1	10	7.5
M7 x 1	16	11.9
M8 x 1.25	22	16.3
M8 x 1	23	17
M10 x 1.5	45	33.3
M10 x 1	50	37
M12 X 1.5	53	39.2
M12 x 1.25	78	57.7
M12 x 1.75	94	69.6
M14 x 1.5	119	88
M16 x 1.5	120	89
M18 x 1.5	265	196
M20 x 1.5	360	266.4
M22 x 1.5	480	355.2
M24 x 2	610	451.4

These above bolts, torques are for dry bolts. If the threads are lubricated before assembly, reduce the torque setting by 10%.