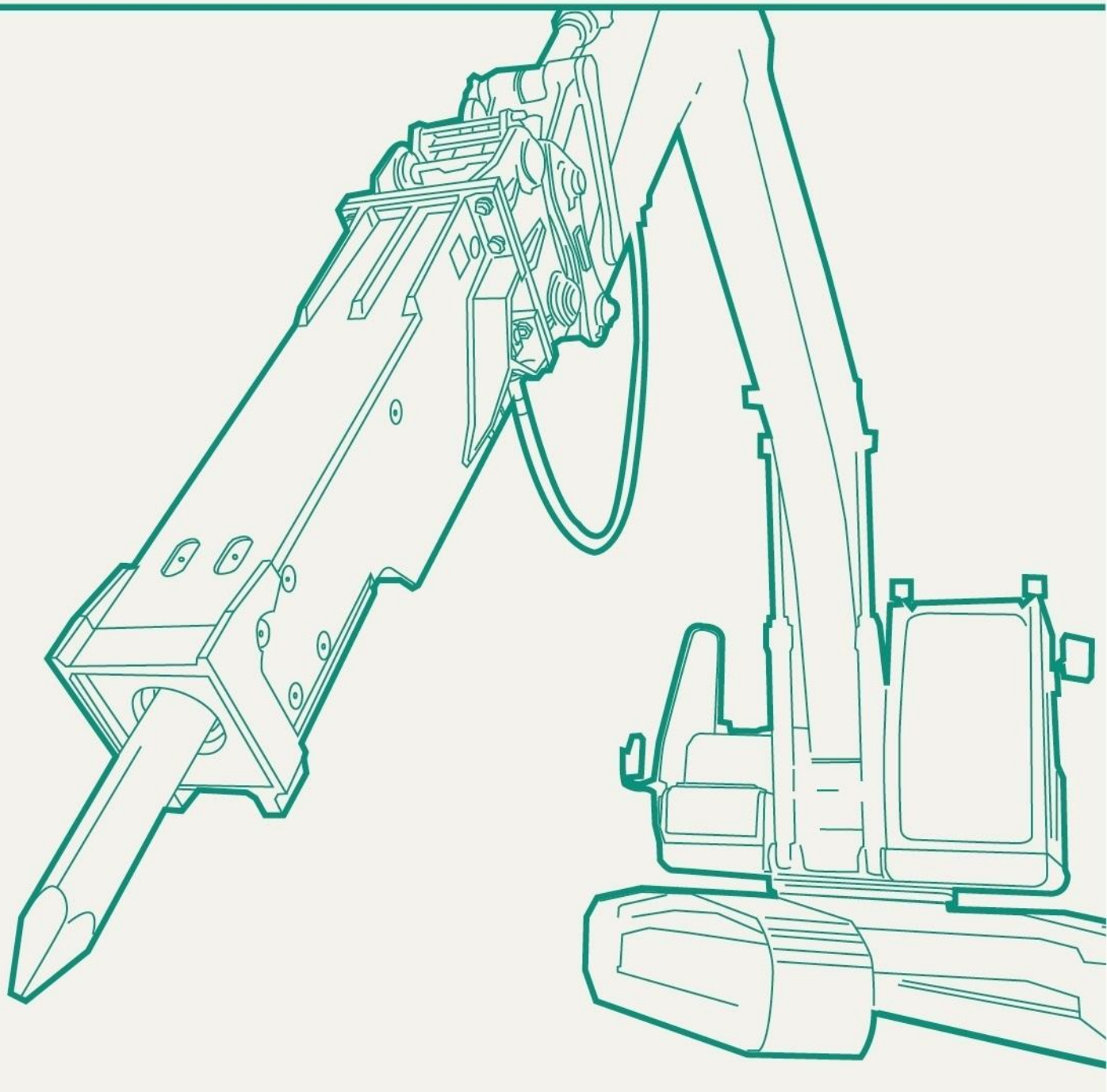
HYUNDAI EVERDIGM ATTACHMENT



HYDRAULIC BREAKER

OPERATION MANUAL TF-E

HYUNDAI EVERDIGM

Document No.: AA099-0332
Revision Date: 2024-06-26

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 EVERDIGM hydraulic hammers.

- Please read and understand this manual before operation, inspections and maintenance of the hydraulic hammer.

  Keep this manual with your equipment all the time for your quick and easy reference, and read it regularly.

- Do not operate the hydraulic hammer until you have been trained in the use of all operating controls and understand the hydraulic hammer operation.
- Get a replacement manual from HYUNDAI EVERDIGM dealer if you lost it.
- If you transfer the hydraulic hammer to the other, do transfer this manual as well.
- The figures in this manual are for better understanding and may not correspond exactly to the hydraulic hammer. For exact shape, refer to the parts list or ask HYUNDAI EVERDIGM.
- 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 the hydraulic hammer, call and consult HYUNDAI EVERDIGM 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 unallowed application will not be responsible by HYUNDAI EVERDIGM. Consult HYUNDAI EVERDIGM for such modifications and applications.
- Use HYUNDAI EVERDIGM genuine parts. HYUNDAI EVERDIGM takes no responsibility for damages caused by use of non-HYUNDAI EVERDIGM spare parts.
- For warranty, we refer you to the warranty conditions provided separately.

We always exert all our efforts for your satisfaction, and promise you quick and constant service.

We thank you for using HYUNDAI EVERDIGM hydraulic hammer and wish you a good luck in every your job,

Jul. 2010

HYUNDAI EVERDIGM Corp.

TABLE OF CONTENTS

* Specifications and features presented in this document are subject to change without notice.

1. Safety Information

This manual describes the correct use of the product and basic safety instructions. Important instructions in this manual are marked with this symbol ⚠. When you see this 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 instruction 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 up to you.

Safety Alert Symbol

The Safety Alert Symbol represents that **ATTENTION** is involved.

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 caused to the product or shorten the product life.

1.1 Basic Safety Information

WARNING!

The following instructions are those that should **ALWAYS** be observed in operation of construction equipment.

Know yourself

Operators and service personnel must wear appropriate safety equipment, including hearing 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.

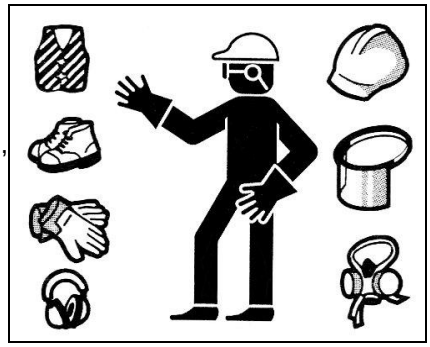


Figure 1

Know your equipment

Before installation or operation of the 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.

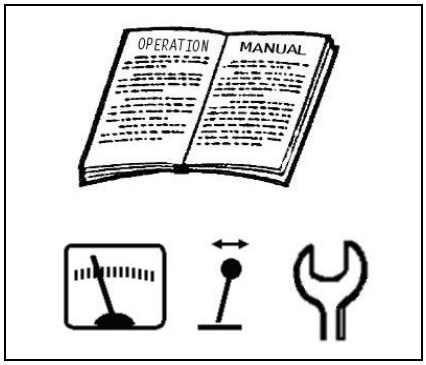


Figure 2

Know the work site

Before operating the 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 the hammer if personnel enter the danger area.

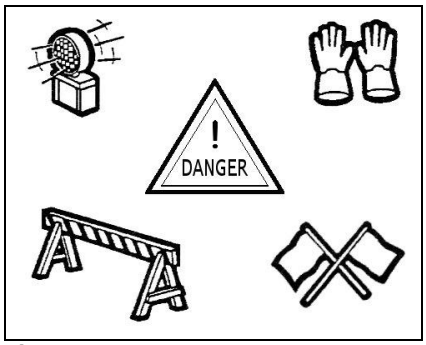


Figure 3

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 the 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.

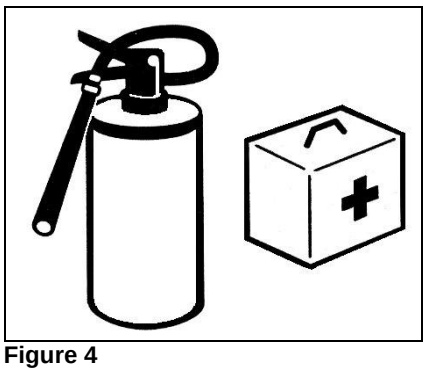


Figure 4

1.2. Preparation for safe operation

Some prior checks and scheduled maintenance must be performed on installing a new hydraulic hammer.

- The hydraulic 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 the hammer.
- Make sure the hammer is compatible and match in capacity with carrier hydraulic systems.
- To protect the operator from injury due to flying rock splinters, the operator's cab should be equipped with a protective shield or splinter guard. For information on the cab protector, consult carrier manufacturer or HYUNDAI EVERDIGM dealer.
- Mounting the hydraulic 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 the hammer.
- Check the hammer for wear, getting loose, breakage or crack. Do not operate in case any damages or failure is found.

Recommended carrier weight (in tonne) for hammer models:

Hammer Model	Carrier class (Standard)	Hammer Model	Carrier class (Standard)
TF-01E	0.7 ~ 1.2	TF-24E	18 ~ 24
TF-02E	1.0 ~ 2.5	TF-31E	26 ~ 32
TF-03E	1.5 ~ 3.0	TF-40E	32 ~ 40
TF-04E	2.5 ~ 4.5	TF-50E	40 ~ 60
TF-05E	4.0 ~ 6.0	TF-55E	40 ~ 60
TF-06E	6.0 ~ 8.0	TF-65E	50 ~ 80
TF-10E	8.0 ~ 12	TF-70E	65 ~ 85
TF-13E	12 ~ 16	TF-85E	80 ~ 100
		TF-100E	90 ~ 120

1.3. Safety information on safe operating

- Always operate the hammer from the operator's seat in the carrier cab, and also close the splinter guard on the driver's cab during hammer operations.
- The hydraulic hammer must not be used for disallowed applications. Refer to Section "**6.2. Correct working methods**" of this manual for instructions on how to handle the hydraulic hammer, and applications for which the hydraulic hammer is unsuitable and must not be used.
- Stop the operation if an abnormal noise or vibration is detected during the operation. Check the carrier and hammer.
- Never use the hammer in or underwater unless compressed air is supplied to the hammer. Refer to Section "**6.2. Correct working methods** for details".

1.4. Safety information on maintenance

Always follow the instructions described in this manual when performing maintenance work on the 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.
- Use only the lifting points provided and sufficiently strong lifting equipment when lifting the hammer.
- Do not start maintenance on the hammer until it has cooled because the hammer is heated up during operation. Some components, for example, chisel (tool), valve, piston or hydraulic connection parts become very hot.
- 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.
- 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.
- To avoid an explosion and equipment damage, use only pure nitrogen gas (99.8% or over) in the gas chamber of the back-head and accumulator.
- Only the proper tools should be used for maintenance. Use of improper tools may cause personal injury, or damage to the hammer.
- Oily, greasy ground may be very slippery. Collect any oil and grease, and dispose it correctly for safety and environment.
- Keep personnel away from the hammer while servicing the chisel, gas chambers or hydraulic system.
- Unauthorized alteration on the hammer may cause the hammer serious troubles or reduce hammer life and performance. These cases cannot be guaranteed by HYUNDAI EVERDIGM.

2. Warranty

The warranty period for HYUNDAI EVERDIGM hydraulic hammers is provided as below.

- **Base warranty**

  HYUNDAI EVERDIGM's products to be well-made, durable and of good material are warranted for twelve (12) months from the date of delivery of such new products to the actual and original buyer, but no more than eighteen (18) months from the date of shipment from HYUNDAI EVERDIGM's factory for the failure by the reason of defective material or poor workmanship, except wear and sealing items such as stipulated in the 'Limited Warranty'.

- **Limited warranty**

1. Sealing parts

   Sealing parts such as seals, O-rings and diaphragms installed in new products are warranted for six (6) months from the date of delivery to actual and original buyer, but no more than twelve (12) months from shipping date from HYUNDAI EVERDIGM's factory.

2. Wear parts

   Wear items listed herein below are warranted for three (3) months from the date of delivery to actual and original buyer, but no more than eighteen (18) months from shipping date from HYUNDAI EVERDIGM's factory.
   chisel, tooth, bush, pin, ring, plug, fitting, fastener, rubber, hose, wearing plate, damper, polyurethane form, shim

3. Through bolts

   Through bolts are warranted for six (6) months from the date of delivery to actual and original buyer, but no more than eighteen (18) months from shipping date from HYUNDAI EVERDIGM's factory.

4. Spare parts

   Spare parts other than those indicated as wearing parts or consumable parts will be warranted for three (3) months after the date of delivery to the actual or original buyer, but within eighteen (18) months from the shipping date from HYUNDAI EVERDIGM's factory. HYUNDAI EVERDIGM adopt whichever period comes first out of two conditions.

5. Multi-shift work

   HYUNDAI EVERDIGM guarantee the defect and failure caused by HYUNDAI EVERDIGM's fault under the normal condition of work which means that customer should comply with maintenance schedule, precautions and 8 hours (day shift) working a day. In case that the breaker is operated with multi-shift (day and night shift) working, the warranty period will be cut by half.

■ Exclusion of warranty

HYUNDAI EVERDIGM does not take responsibility for the results of use not recommended in this manual and specifically for:

1. Problems caused by incorrect operation or using to non-recommended application
2. Problems caused by improper handling or storage
3. Problems caused by improper maintenance
4. Problems caused by using non-genuine parts

These exclusions apply to damage to the hammer, the carrier, and associated equipment and personnel injury.

For further information, refer to the "Warranty & service guide line" provided by HYUNDAI EVERDIGM.

HYUNDAI EVERDIGM reserve the right to modify the design or change the specifications without prior notice for the improvement of performance or quality.

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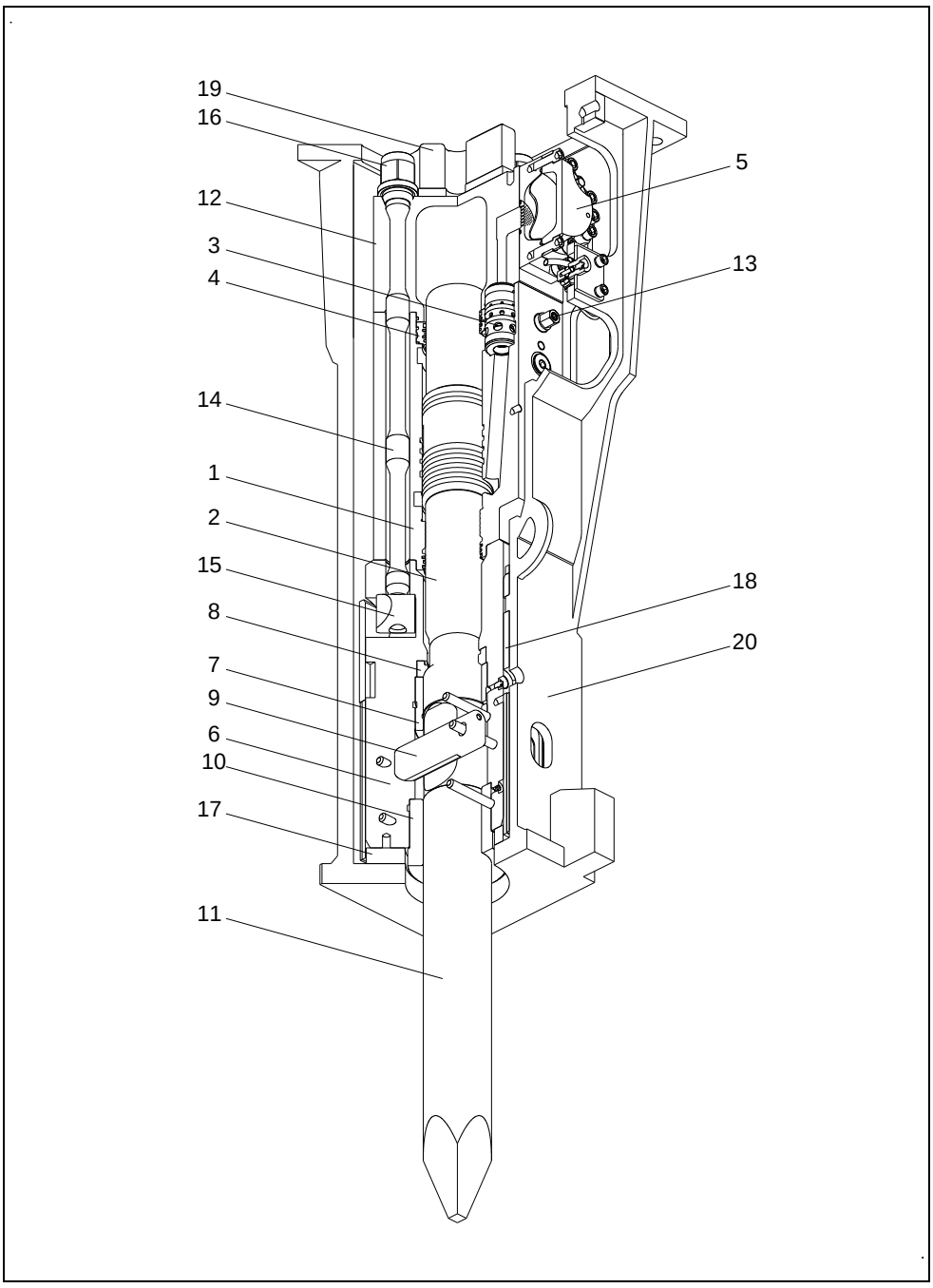
3. Product information

3.1. Configuration of the HYUNDAI EVERDIGM hydraulic hammer

The HYUNDAI EVERDIGM hydraulic hammer has the following main components or assemblies



1. *Cylinder*
2. Piston
3. Valve
4. Cylinder bush
5. Accumulator
6. Front-head
7. Chisel bush
8 Thrust ring
9. Chisel pins
10. Front bush
11. Chisel
12. Back-head
13. Minimess coupling
14. Through bolts
15. Front-head nuts
16. Back-head nuts
17. Lower damper
18. Wear plates
19. Support damper
20. Upper damper
21. Bracket

The graphic shows only a general view of the main components, the actual details may vary on different models of hydraulic hammer.

The hammer is hydraulically operated equipment, and can be used on any carrier that meets the necessary hydraulic and mechanical installation requirements (Refer to Section "**4. Technical specifications**").

3.2. Information for ordering and service

The equipment serial number is marked with the type and serial number on the nameplate (refer to Section "**3.3.** Markings and labels". It is important to make correct reference to the serial number of the hammer when making repairs or ordering spare parts. Identification by serial number is the only proper means of maintaining and identifying parts for specific hammers.

Model Code and Serial Number

(○: Number, □: Alphabet)

Model code: **TF-○○E - □□**

Example: TF-13E - BA

TF: Model prefix

13E: Model number
13: 13 tonne carrier class

B: Bracket version
N: side plate
B: silenced

A: Mounting type
A: adapter mounted type
D: direct mounted type
L: backhoe loader mount type

Serial Number : **○○ - □○○○**

Example : 13 - H001

13 : Model number

H : Factory code

001 : Serial number

Available bracket version

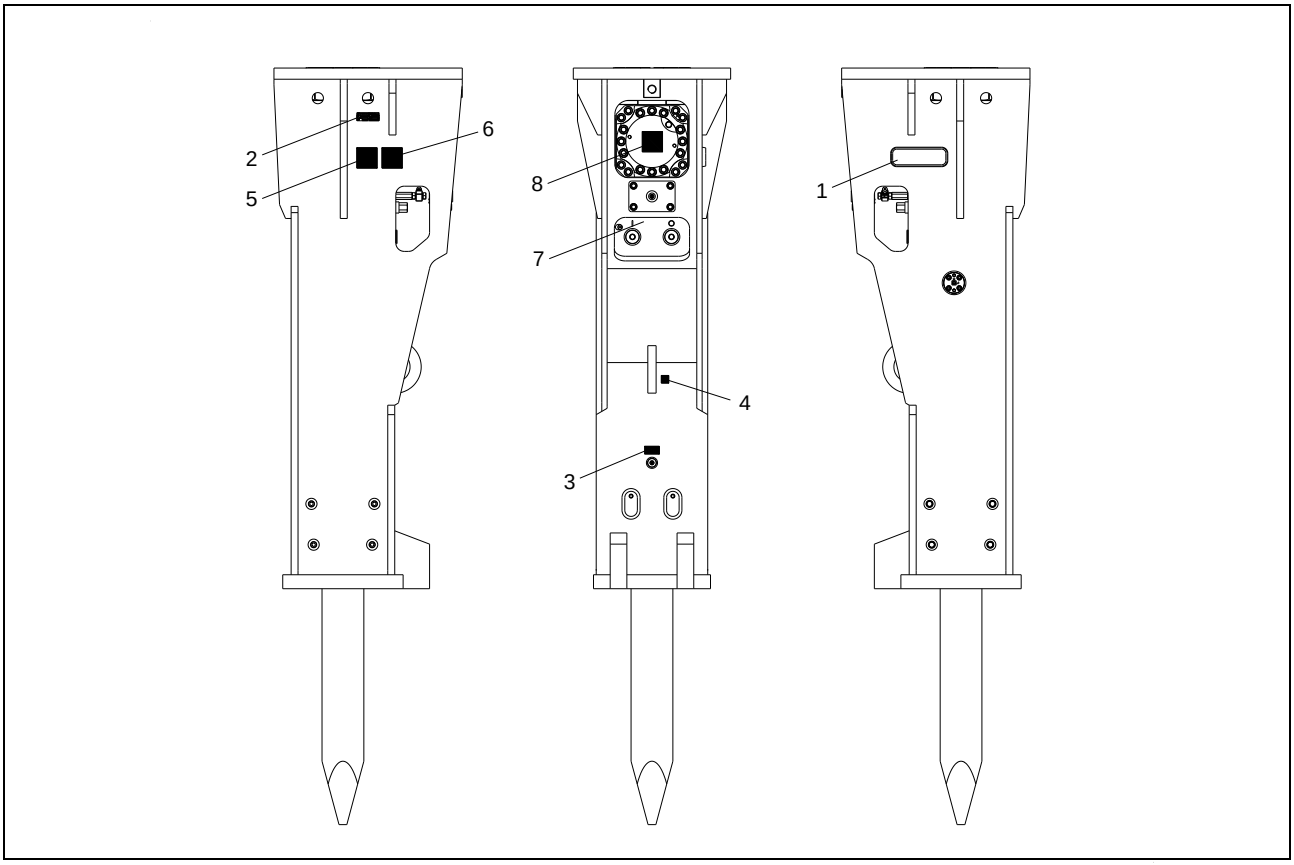
Hammer model code:	01	02	03	04	05	06	10	13	24	31	40	50	55	65	70	85	100
BA: *Adapter mounted silenced bracket*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Available features (standard & option)

Hammer model code:	01	02	03	04	05	06	10	13	24	31	40	50	55	65	70	85	100
2-speed control	–	–	–	–	–	–	–	–	**ALL**	**ALL**	**ALL**	**ALL**	**ALL**	**ALL**	**ALL**	**ALL**	**ALL**
Anti-blank blow	–	–	–	–	–	–	–	–	**ALL**	**ALL**	**ALL**	**ALL**	**ALL**	**ALL**	**ALL**	**ALL**	**ALL**
Auto-greasing kit	–	–	–	–	–	–	*all*	*all*	*all*	*all*	*all*	*all*	*all*	*all*	*all*	*all*	*all*
Under-water operating kit	–	–	–	–	–	–	–	–	*all*	*all*	*all*	*all*	*all*	all	*all*	*all*	*all*

Note Depending on bracket type;
BOLD: standard features for the designated bracket version
Italic: optional features for the designated bracket version
–: not available

3.3. Markings and labels



This figure shows only a general view. Details may vary on different hammer models.

1. HYUNDAI EVERDIGM Logo

EVERDIGM

2. Name plate (with CE label)

HYUNDAI EVERDIGM

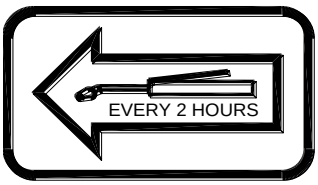
49, Buyeong-gil, Jincheon-eup,
Jincheon-gun, Chungcheongbuk-do, Korea.
WWW.HYUNDAIEVERDIGM.COM

CE Made In Korea.

MODEL NAME		FLOW RATE	lpm
SERIAL NO.		Rotation	lpm
MANUFACTURING YEAR		OPERATING PRESSURE	bar
WORKING WEIGHT	kg	Rotation	bar

3. Greasing Port

Indicates grease point. Apply grease at the interval prescribed.



4. Lifting Point

Indicates the hooking points used when lifting the hammer

Pay special attention to the marks and labels related to safety such as follows.

5. General safety

DANGER

- The operator must be adequately protected within the cab using the necessary window guarding.
- Do not operate breaker when bystanders are in working area.

IMPORTANT

- Lubricate the tool every 2 hours or as needed.
- Never operate the breaker in or under water unless compressed air is supplied to the breaker.
- Follow all maintenance schedules.

Read the manuals prior to initial use and follow the safety instructions.

6. Stay clear

Indicates the distance that must be kept from the breaker, to be safe from the flying rock splinter

7. Safety on gas charging in Back-head

DANGER

- Never disassemble the hammer before discharging gas from the back-head.
- Use pure nitrogen gas only.

IMPORTANT

- Gas charging pressure:
  8~10 bar (***116~145*** *psi*) at 20℃ (*68°F*)
  9.1~11.4 bar (*132~165* *psi*) at 60℃ (*140°F*)
- Refer to operation manual for charging instructions.

8. Safety on gas charging in Accumulator

DANGER

- Never disassemble the accumulator before discharging gas from the accumulator.
- Use pure nitrogen gas only.
- The maintenance of the accumulator is recommended to be performed by authorized service personnel only.

IMPORTANT

- Gas charging pressure:
  60 ±2 bar (***870*** ±30 *psi*) at 20℃ (*68°F*)
  68 ±2 bar (*990* ±30 *psi*) at 60℃ (*140°F*)
- Refer to operation manual for charging instructions.

4. Technical specifications

■ TF-01E / 02E / 03E / 04E

Model		TF-01E	TF-02E	TF-03E	TF-04E
Bracket version [1]		*BA*	*BA*	*BA*	*BA*
Working weight [2]	kg	106	106	178	232
Weight w/o mounting adapter	kg	83	83	123	175
Overall length [3]	mm	1,136	1,136	1,216	1,289
Required oil flow rate	l/min	15 ~ 25	20 ~ 35	25 ~ 35	30 ~ 50
Operating pressure	bar	90 ~ 110	90 ~ 110	90 ~ 110	110 ~ 140
Input power (max.)	kW	4.6	5.8	5.9	10.7
Impact rate					
Low speed mode	bpm	n/a	n/a	n/a	n/a
High speed mode	bpm	700 ~ 1,200	700 ~ 1,200	600 ~ 1,100	600 ~ 1,100
Impact Energy (CLASS)					
Low speed mode	ft.lbf	n/a	n/a	n/a	n/a
High speed mode	ft.lbf	230	250	390	510
Tool shank diameter	mm	45	45	50	55
Applicable carrier weight					
Optimal range	tonne	0.7 ~ 1.2	1.0 ~ 2.5	1.5 ~ 3.0	2.5 ~ 4.5
Available range	tonne	*0.7 ~ 2.5*	*1.0 ~ 4.0*	*1.5 ~ 4.5*	*2.5 ~ 6.0*
Gas charging pressure					
Back-head	bar	10 ~ 12	10 ~ 12	10 ~ 12	10 ~ 12
Accumulator	bar	n/a	n/a	n/a	n/a
Hydraulic piping					
Line size; min. internal diameter	mm (in)	9.5 (3/8)	12 (1/2)	12 (1/2)	12 (1/2)
Acceptable back pressure [4]	bar	15	15	15	15
Hose connection ports for Oil supply(IN) & return(OUT)		BSP 3/8" O-Ring boss female	BSP 1/2"O-Ring boss female		
Pressure relief (min.)	bar	30 bar higher than measured maximum operating pressure			
Acceptable Hydraulic oil					
Operating temperature	°C	-20 ~ +80	-20 ~ +80	-20 ~ +80	-20 ~ +80
Viscosity	cSt	1,000 ~ 12	1,000 ~ 12	1,000 ~ 12	1,000 ~ 12

Note: 1) For the specifications of other versions of bracket, contact your HYUNDAI EVERDIGM dealer or service.

2) Including standard tool, standard mounting adapter and spacers but excluding hydraulic hoses, fittings and mounting pins.

3) Measured from the tool tip of the standard tool to the top of the breaker including standard mounting adapter.

4) The maximum allowed oil pressure at the breaker's connection point to the return line (measured statically without the breaker).

■ TF-05E / 06E / 10E / 13E

Model		TF-05E	TF-06E	TF-10E	TF-13E
Bracket version [1]		*BA*	*BA*	*BA*	*BA*
Working weight [2]	kg	344	449	504	835
Weight w/o mounting adapter	kg	255	336	378	625
Overall length [3]	mm	1,630	1,838	1,983	2,214
Required oil flow rate	l/min	35 ~ 65	45 ~ 90	60 ~ 110	80 ~ 140
Operating pressure	bar	140 ~ 170	140 ~ 170	150 ~ 170	160 ~ 180
Input power (max.)	kW	20.4	26.5	33	42
Impact rate					
Low speed mode	bpm	n/a	n/a	n/a	n/a
High speed mode	bpm	500 ~ 1,000	500 ~ 900	400 ~ 850	450 ~ 750
Impact Energy (CLASS)					
Low speed mode	ft.lbf	n/a	n/a	n/a	n/a
High speed mode	ft.lbf	730	1,100	1,900	2,500
Tool shank diameter	mm	68	75	93	98
Applicable carrier weight					
Optimal range	tonne	4.0 ~ 6.0	6.0 ~ 8.0	8.0 ~ 12	12 ~ 16
Available range	tonne	*3.5 ~ 8.0*	*5.0 ~ 11*	*7.0 ~ 15*	*12 ~ 20*
Gas charging pressure					
Back-head	bar	14 ~ 16	14 ~ 16	14 ~ 16	14 ~ 16
Accumulator	bar	n/a	n/a	n/a	n/a
Pressure adjust valve setting (No. of turns open from full-close)		n/a	n/a	n/a	n/a
Hydraulic piping					
Line size; min. internal diameter	mm (in)	12 (1/2)	19 (3/4)	19 (3/4)	19 (3/4)
Acceptable back pressure [4]	bar	15	15	15	15
Hose connection ports for Oil supply(IN) & return(OUT)		BSP 1/2" O-Ring boss female	BSP 3/4" O-Ring boss female		
Pressure relief (min.)	bar	30 bar higher than measured maximum operating pressure	40 bar higher than measured maximum operating pressure		
Acceptable Hydraulic oil					
Operating temperature	°C	-20 ~ +80	-20 ~ +85	-20 ~ +85	-20 ~ +85
Viscosity	cSt	1,000 ~ 12	1,000 ~ 10	1,000 ~ 10	1,000 ~ 10

Note: 1) For the specifications of other versions of bracket, contact your HYUNDAI EVERDIGM dealer or service.

2) Including standard tool, standard mounting adapter and spacers but excluding hydraulic hoses, fittings and mounting pins.

3) Measured from the tool tip of the standard tool to the top of the breaker including standard mounting adapter.

4) The maximum allowed oil pressure at the breaker's connection point to the return line (measured statically without the breaker).

■ TF-24E / 31E / 40E / 50E

Model		TF-24E	TF-31E	TF-40E	TF-50E
Bracket version [1]		*BA*	*BA*	*BA*	*BA*
Working weight [2]	kg	1,690	2,307	2,986	3,776
Weight w/o mounting adapter	kg	1,442	1,903	2,516	3,296
Overall length [3]	mm	2,781	3,076	3,380	3,707
Required oil flow rate	l/min	130 ~ 180	170 ~ 240	200 ~ 280	230 ~ 330
Operating pressure	bar	150 ~ 180	150 ~ 185	160 ~ 185	165 ~ 185
Input power (max.)	kW	54	74	86	102
Impact rate					
Low speed mode	bpm	350 ~ 500	310 ~ 450	300 ~ 410	250 ~ 370
High speed mode	bpm	450 ~ 600	400 ~ 560	380 ~ 540	300 ~ 420
Impact Energy (CLASS)					
Low speed mode	ft.lbf	3,800	6,400	9,300	12,000
High speed mode	ft.lbf	2,880	4,680	7,330	9,120
Tool shank diameter	mm	135	150	165	175
Applicable carrier weight					
Optimal range	tonne	18 ~ 24	26 ~ 32	32 ~ 40	40 ~ 60
Available range	tonne	*18 ~ 30*	*26 ~ 35*	*32 ~ 45*	*40 ~ 70*
Gas charging pressure					
Back-head	bar	14 ~ 16	14 ~ 16	14 ~ 16	14 ~ 16
Accumulator	bar	60	60	60	60
Pressure adjust valve setting (No. of turns open from full-close)		2.5 ~ 3.0	1.5 ~ 2.0	2.0 ~ 2.5	2.0 ~ 2.5
Hydraulic piping					
Line size; min. internal diameter	mm (in)	25 (1)	32 (1-1/4)	32 (1-1/4)	32 (1-1/4)
Acceptable back pressure [4]	bar	10	10	10	10
Hose connection ports for Oil supply(IN) & return(OUT)		BSP 1" O-Ring boss female	BSP 1-1/4" O-Ring boss female		BSP 1-1/2" O-Ring boss female
Pressure relief (min.)	bar	40 bar higher than measured maximum operating pressure			
Acceptable Hydraulic oil					
Operating temperature	°C	-20 ~ +85	-20 ~ +85	-20 ~ +85	-20 ~ +85
Viscosity	cSt	1,000 ~ 10	1,000 ~ 10	1,000 ~ 10	1,000 ~ 10

Note: 1) For the specifications of other versions of bracket, contact your HYUNDAI EVERDIGM dealer or service.

2) Including standard tool, standard mounting adapter and spacers but excluding hydraulic hoses, fittings and mounting pins.

3) Measured from the tool tip of the standard tool to the top of the breaker including standard mounting adapter.

4) The maximum allowed oil pressure at the breaker's connection point to the return line (measured statically without the breaker).

■ TF-55E / 65E / 70E / 85E / 100E

Model		TF-55E	TF-65E	TF-70E	TF-85E	TF-100E
Bracket version [1]		*BA*	*BA*	*BA*	*BA*	*BA*
Working weight [2]	kg	4,215	5,945	6,750	8,457	10,500
Weight w/o mounting adapter	kg	3,735	5,045	5,850	7,244	9,287
Overall length [3]	mm	3,737	4,065	4,236	4,591	4,738
Required oil flow rate	l/min	250 ~ 350	300 ~ 400	320 ~ 420	380 ~ 480	410 ~ 530
Operating pressure	bar	165 ~ 185	165 ~ 185	165 ~ 185	165 ~ 185	165 ~ 185
Input power (max.)	kW	108	125	130	156	163
Impact rate						
Low speed mode	bpm	230 ~ 325	250 ~ 340	240 ~ 350	250 ~ 320	268 ~ 347
High speed mode	bpm	320 ~ 450	340 ~ 460	330 ~ 440	335 ~ 425	362 ~ 470
Impact Energy (CLASS)						
Low speed mode	ft.lbf	12,400	14,000	15,000	18,000	20,000
High speed mode	ft.lbf	9,440	10,700	11,300	12,900	16,500
Tool shank diameter	mm	180	195	205	225	245
Applicable carrier weight						
Optimal range	tonne	40 ~ 60	50 ~ 80	65 ~ 85	80 ~ 100	90 ~ 120
Available range	tonne	*40 ~ 70*	*45 ~ 90*	*60 ~ 110*	*70 ~ 120*	*85 ~ 140*
Gas charging pressure						
Back-head	bar	16 ~ 18	16 ~ 18	16 ~ 18	16 ~ 18	14 ~ 15
Accumulator	bar	60	60	60	60	60
Pressure adjust valve setting (No. of turns open from full-close)		2.0 ~ 2.5	2.5 ~ 3.0	2.0 ~ 2.5	3.0 ~ 3.5	3.0 ~ 3.5
Hydraulic piping						
Line size; min. internal diameter	mm (in)	32 (1-1/4)	32 (1-1/4)	32 (1-1/4)	32 (1-1/4)	32 (1-1/4)
Acceptable back pressure [4]	bar	10	10	10	10	10
Hose connection ports for Oil supply(IN) & return(OUT)		BSP 1-1/2” O-Ring boss female				
Pressure relief (min.)	bar	40 bar higher than measured maximum operating pressure				
Acceptable Hydraulic oil						
Operating temperature	°C	-20 ~ +85	-20 ~ +85	-20 ~ +85	-20 ~ +85	-20 ~ +85
Viscosity	cSt	1,000 ~ 10	1,000 ~ 10	1,000 ~ 10	1,000 ~ 10	1,000 ~ 10

Note: 1) For the specifications of other versions of bracket, contact your HYUNDAI EVERDIGM dealer or service.

2) Including standard tool, standard mounting adapter and spacers but excluding hydraulic hoses, fittings and mounting pins.

3) Measured from the tool tip of the standard tool to the top of the breaker including standard mounting adapter.

4) The maximum allowed oil pressure at the breaker's connection point to the return line (measured statically without the breaker).

5. Installation

IMPORTANT!

Improper installation can cause serious damage to the hammer and to the carrier. Do not install the hammer if you are unsure. Contact your HYUNDAI EVERDIGM dealer for more information.

5.1. Carrier requirements

The HYUNDAI EVERDIGM hammer can be installed on any carrier that meets necessary mechanical and hydraulic installation requirements. Refer to Section “4. Technical specifications” to determine the carrier specification required.

Check following points when installing the hammer:

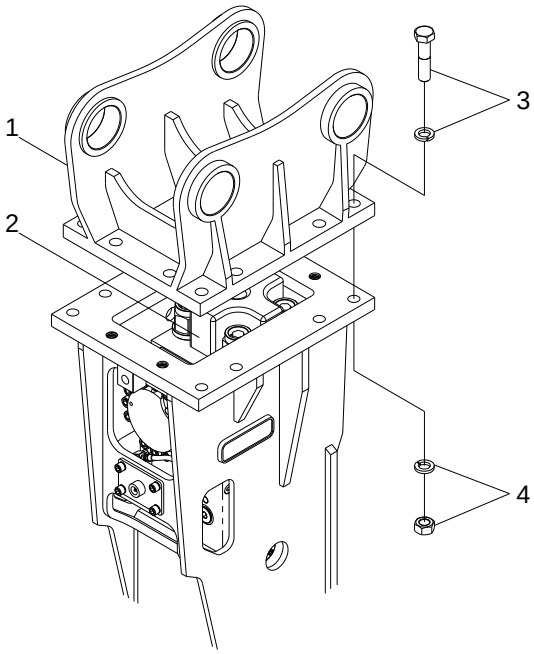
- **Carrier weight:**
  The hydraulic hammer should only be mounted on a carrier with sufficient load capacity. In case of using a quick coupler (hitch), determine the total weight including the quick coupler.
- **Mounting dimension:**
  To fit the hammer on the carrier, proper mounting adapter must be used. This mounting adapter varies according to carrier model and should be ordered separately with follows:
  - ✓ Excavator model and year built
  - ✓ Arm(stick) type

  HYUNDAI EVERDIGM’s standard mounting adapters are designed to fit most carrier, and parts for fitting, such as spacers and pins can also be provided.
- **Hydraulic line:**
  Check the nominal bore size of the 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 the hammer. If not, the impact rate of the hammer becomes slow or the 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 the 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 the 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 the hammer must run through oil cooler to oil tank.

5.2. Attaching the mounting adapter

1. Stand the hammer on the flat and stable base or lay the hydraulic hammer on squared beams or a pallet with the service window of the hammer box facing upwards.
2. Fix the adapter (1) to the hammer box with two screws.
   For silenced hammer, insert the upper damper (2) in the hammer box before fixing the adapter.
3. Then fit all screws (3) and tighten to the specified torque. The sizes of screws for different hammer types are as follows;

- TF-01E ~ 02E : 12 mm
- TF-03E ~ 10E : 20 mm
- TF-13E ~ 24E : 30 mm
- TF-31E ~ 100E : 36 mm



1. Adapter
2. Upper damper
3. Screw and washer
4. Nuts and washer
(Number of nuts -single or double- may vary on different hammer models)

5.3. Mounting the hydraulic hammer on the carrier

DANGER!

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

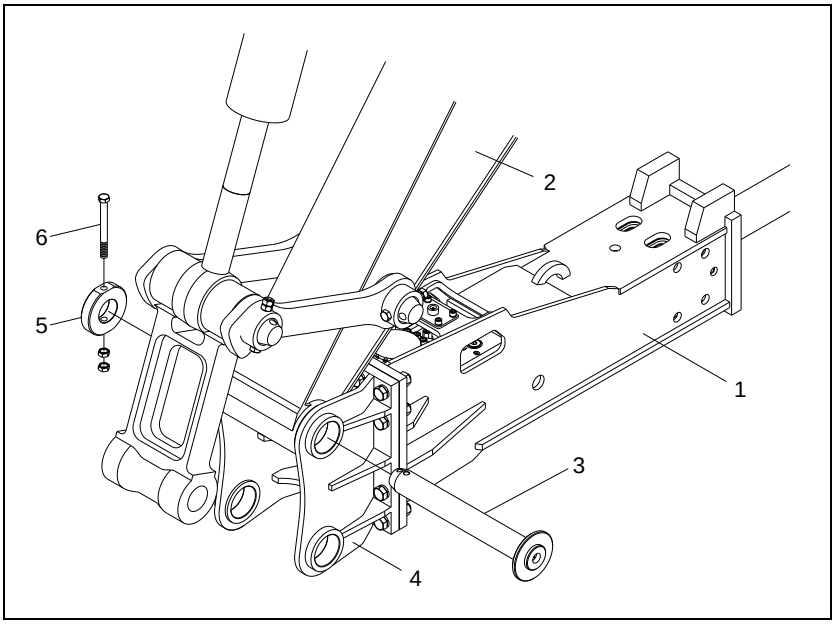
When moving the carrier, do not touch any part of the carrier or hydraulic hammer. Keep hands away from linkage area and pin-bores.

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.

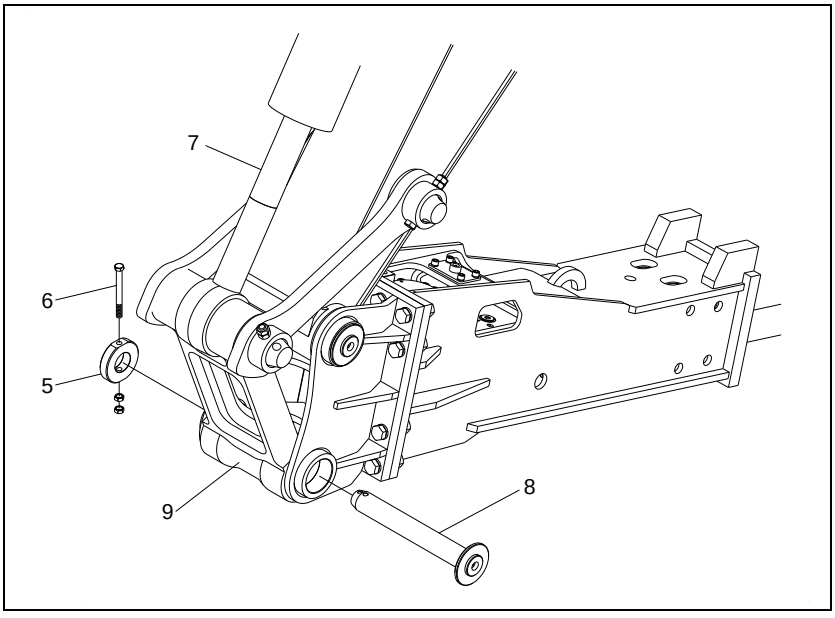
During hammer mounting, the carrier should only be operated from the operator's cab.

1. Following the direction of an assistant, carefully move the excavator arm (2) into the adapter (4), until the bore in the arm is flush with those in the adapter.
2. Insert the arm pin (3).
3. Fit the stop ring (5) to the arm pin (3) and lock by using the bolt and nuts (6).



1. Hydraulic hammer
2. Excavator arm
3. Arm pin
4. Mounting adapter
5. Stop ring
6. Bolt and nuts

4. Lift up the hammer (1) to a proper height.
5. Extend the bucket cylinder (7) until the bore in the link (9) is flush with those in the adapter (4).
6. Insert the link pin (8).
7. Fit the stop ring (5) to the bucket pin (8) and lock by using the bolt and nut (6).
8. Check there are any mechanical difficulties, slacks or incompatibility in manipulating.



5. Stop ring
6. Bolt and nuts
7. Bucket cylinder
8. Link pin
9. Link

IMPORTANT!

After mounting the hammer, extend and retract the carrier's cylinder to its full extent in each direction to ensure that carrier's cylinder can move without any difficulty or damage.

If problems are encountered, consult your local HYUNDAI EVERDIGM dealer.

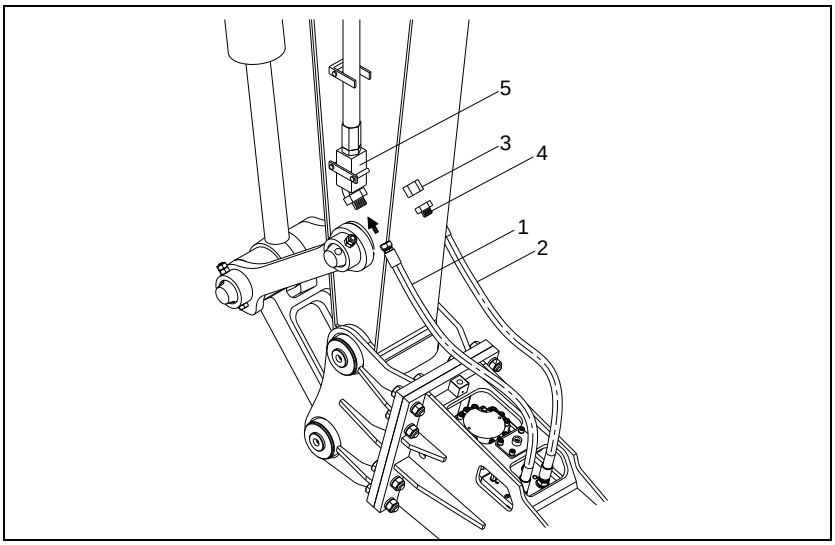
5.4. Connecting the hydraulic lines of the hammer

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.
- In case of using a newly installed hammer piping, remove the contamination in the hydraulic line through bypass flushing (without connecting the hammer).
- Check the pressure setting of the relief valve on the hammer hydraulic line, this pressure-relief setting should be at least 30 ~ 40 bar higher than the measured maximum operating pressure of the hydraulic hammer.
- The sealing faces and connecting threads of the hoses or fittings must be undamaged and free of sand or similar foreign particles.

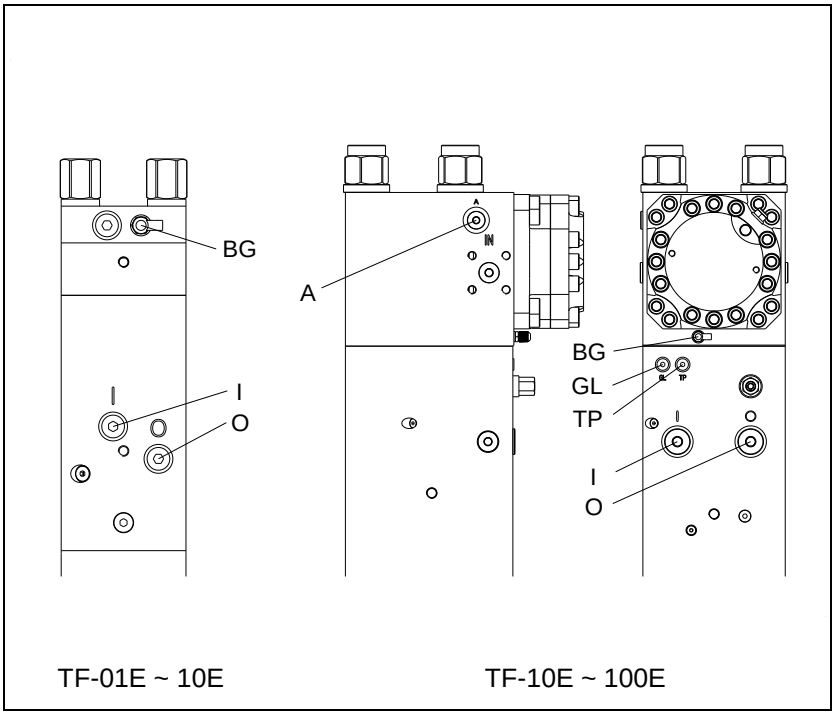
If the hydraulic lines are in good preparation for operating the hammer, connect the hammer as follows:

1. If the connection hoses are not installed on the hammer, remove the cover plate on the service window and connect the "IN" & "OUT" hoses (1, 2) to the hammer.
2. Confirm both of the stop valves (5) are closed.
3. Remove the end caps (3) from the stop valves (5) and remove the hose plugs (4) from the hoses. Put them in the toolbox for safekeeping.
4. Connect the "IN" & "OUT" hoses (1,2) to the stop valves on both sides of the carrier arm.
5. Open the stop valves (5).



1. High pressure hose (In)
2. Low pressure hose (Out)
3. End caps
4. Hose plugs
5. Stop valves

5.5. Connection ports of the hammer



I : Inline port (high pressure) marked with 'I'

O : Outline port (low pressure) marked with 'O'

BG : Back-head gas charging port

A : Compressed air supply port for underwater operation

GL : Greasing port for chisel lubricating, connected to external grease nipple on bracket

TP : Test port to measure the operating pressure

The graphic shows only a general view of the connection ports on the hammer power-cell, and the brackets are not shown for explanation. The details of port location and port size may vary on different hammer models. Refer to followings:

Connection ports	**TF-01E ~ 10E**	**TF-13E**	**TF-24E ~ 100E**
I / O	Varies according to hammer model, refer to Section "**4. Technical** specifications".		
BG	Minimess coupling (plastic cap) Use the gas charging kit provided with the hammer.		
A	Not available.		BSP 3/4" O-ring boss port Steel plug (12mm Hex. socket)
GL	Not available.	BSP 1/4" O-ring boss port Steel plug (6mm Hex. socket)	BSP 3/8" O-ring boss port Steel plug (8mm Hex. socket)
TP	Not available.		BSP 3/8" O-ring boss port Steel plug (8mm Hex. socket)

5.6. Dismounting the hydraulic hammer from the carrier

WARNING!

Wear safety shoes to protect feet.

Personal injury can result from dropping pins during dismounting.

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

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

5.7. Fitting / removing the chisel

WARNING!

The chisel shall only be installed in the way described. Failure to do so could allow the chisel to be drawn out from the hammer with force possibly causing safety accidents.

When installing the chisel, the carrier must be switched off before fitting or removing the chisel. Always wear safety glasses and gloves because metal chips or debris may fly off when driving the chisel or the chisel pins.

Never put fingers in the chisel pin-bores of the hammer.

Do not stand in front of chisel; possible blank blow caused by the pressure trapped inside the hammer can cause personnel injury.

In case of large size hammer, the chisels are very heavy and difficult to lift by hands. Always use a hoist with a sling when lifting the chisel. Be careful of falling down.

After operating the hammer, the chisel, especially the tip, may remain very hot for some time and can cause severe burn.

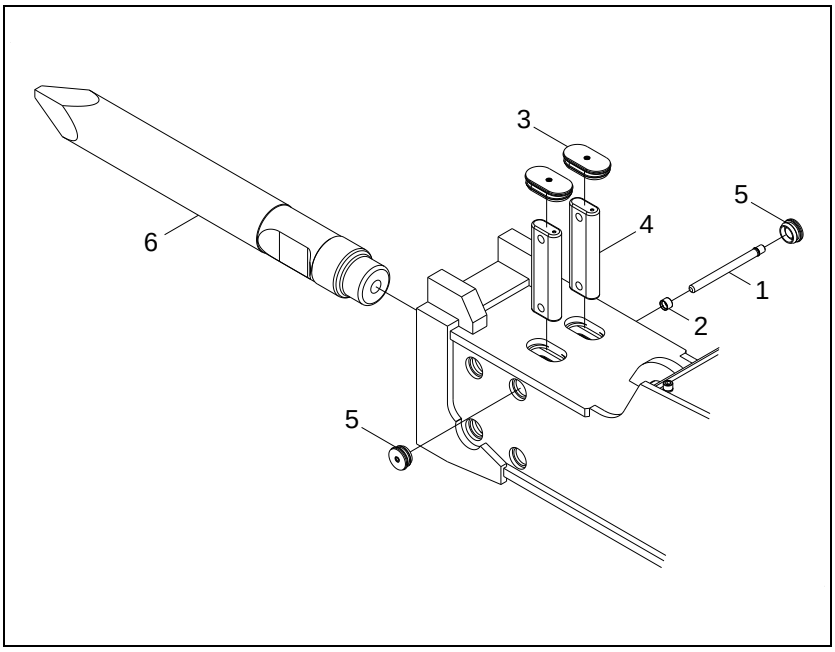
IMPORTANT!

Use only genuine HYUNDAI EVERDIGM chisels. Use of other brands of chisel may occur serious trouble to the hammer and cause warranty rejected.

It is important that the chisel be used correctly for longer chisel life. Pay particular attention to Section “**6.2. Correct working methods**”, and refer to a extra document “A guide for profer use of tool” to determine the warranty guide for chisel failure.

In general the chisel is not fitted when the hammer is delivered. Before fitting the chisel, move the hydraulic hammer into a horizontal position using the carrier and place it on a suitable support (e.g. squared beams).

■ Silenced version bracket (BA version)



1. Stop pins
2. PU-sleeves
3. Plugs
4. Chisel pins
5. Plugs
6. Chisel

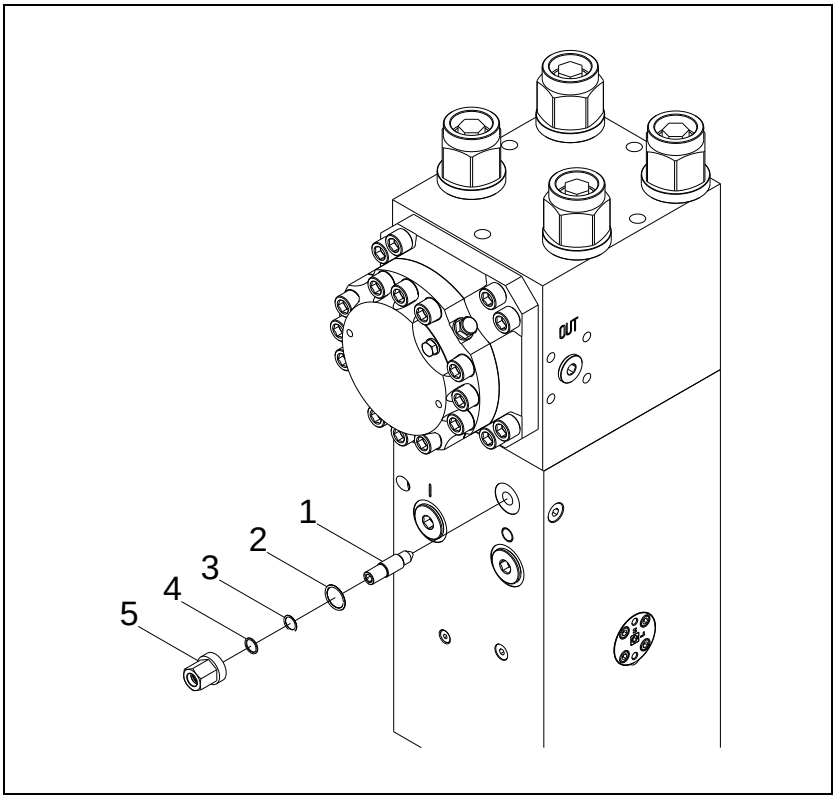
This figure shows only a case of the BA version. Detail configurations may vary on different bracket version and hammer models.

For the entire bracket version, fit the chisel as follows:

1. Remove the plugs (3), (5) by using the screw bolt and remove the stop pins (1) by using a hand-hammer and the special tool provided. Drive the stop pins out from the chamfered small diameter side to the large diameter side.
2. If the PU-sleeve (2), which was inserted in the hole, is damaged, replace it with a genuine replacement.
3. Remove the chisel pins (4).
4. Check the inside of the front-head for wear or foreign bodies. In case of replacing the chisel after use, do check and maintenance work according to Section "**7.6. Chisel, wear bushings and chisel pins**".
5. While lifting up the chisel, clean away any dirt adhering to the chisel shank in the inserted portion, then sufficiently lubricate the chisel shank and the bushes in the hammer. For details of chisel lubricating and applicable grease refer to Section "**7.4. Grease**".
6. Insert the chisel (6) to the chisel bore of the front-head.
7. Align the recesses of the chisel shank to the chisel pin holes on the front-head by turning the chisel.
8. Then insert the chisel pins (4).
9. Drive the stop pin (1) into the front-head, small diameter side first, making sure that the stop pin is inserted completely and insert the plugs (3), (5).
10. Moving the carrier and stand the hammer vertically on the chisel. Check that the chisel can move up and down smoothly by applying contact pressure and releasing it.

5.8. Adjusting the pressure-adjusting valve

For TF-24E and bigger model



1. Pressure-adjusting valve
2. O-ring
3. O-ring
4. Backup ring
5. Adjuster nut

The graphic shows only a general view of the pressure-adjusting valve. The position of the pressure-adjusting valve may vary on different hammer models.

The TF-24E ~ TF-100E hydraulic hammer have a pressure-adjusting valve to allow adjustment of the operating pressure which have an effect on the blow power. The pressure-adjusting valve controls the hammer's drain pressure during the piston raising operation. By controlling the working pressure, the blow power can be increased or decreased.

- To increase the blow power, turn the pressure-adjusting valve clockwise.
- To decrease the blow power, turn the pressure-adjusting valve anticlockwise.

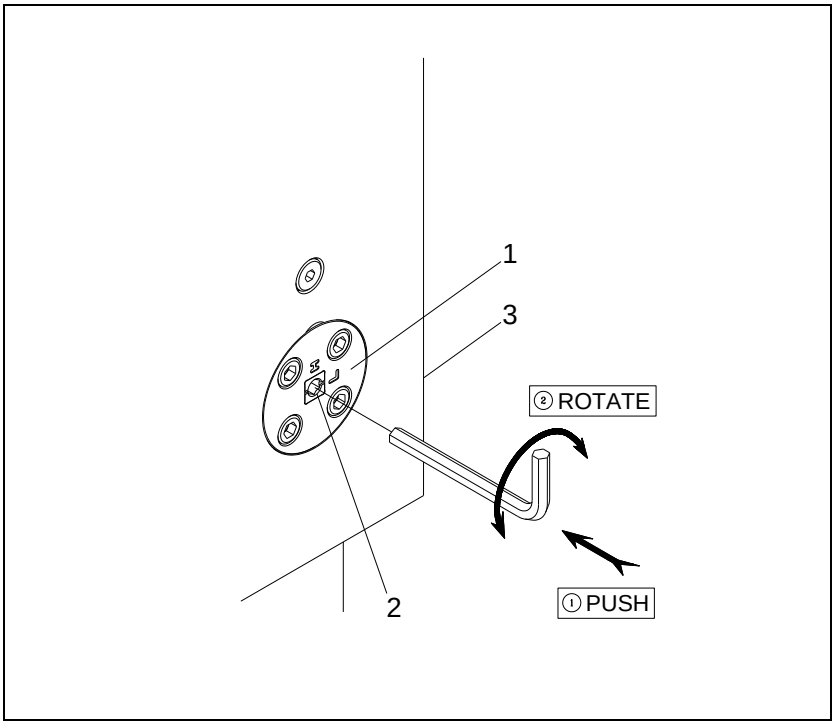
The pressure adjusting-valve is set in the factory before delivery; if you need to reset it, follow instructions below:

1. Loosen the adjuster nut (5) to enable the adjust valve to be turn.
2. Turn the pressure-adjusting valve (1) clockwise or anticlockwise as required.
3. Tighten the adjuster nut (5) to the prescribed torque (140 ~ 180 N·m)
4. The standard factory settings are as follows:
   No. of turns open from the full-close:

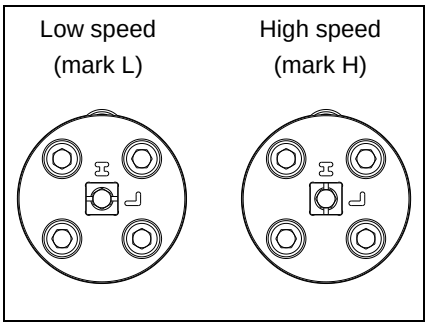
■ TF-24E	2.5 ~ 3.0	■ TF-55E	2.0 ~ 2.5
■ TF-31E	1.5 ~ 2.0	■ TF-65E	2.5 ~ 3.0
■ TF-40E	2.0 ~ 2.5	■ TF-70E	2.0 ~ 2.5
■ TF-50E	2.0 ~ 2.5	■ TF-85E	3.0 ~ 3.5
		■ TF-100E	3.0 ~ 3.5

5.9. Adjusting impact rate – 2-speed selection

For TF-24E and bigger model



1. Speed selection switch
2. Locking button
3. Cylinder



The TF-24E ~ TF-100E hydraulic hammers have a 2-speed selection valve on the cylinder body to change the impact rate and the impact energy according to working condition.

■ Low speed: working with normal impact rate and maximum percussive power

Breaking large rocks embedded under ground, or breaking heavy-reinforced concrete structures requires strong percussive power rather than high impact rate. When impact energy per blow of hammer is not sufficient to make breakage on material, however fast impact rate may be, the hammer does not give expected breaking productivity because the chisel cannot penetrate into the material.

For this kind of work, maximum percussive power, even though low impact rate, is needed.

The speed selection switch is set to the low speed mode (mark L) in the factory when delivered, as shown in the previous figure.

■ High speed: working with increased impact rate and reduced percussive power

When breaking small or soft rocks, or when tearing up thin concrete surfaces reduced percussive power is sufficient, and the impact rate switching system allows the hammer to be operated at a higher impact rate, by reducing the stroke. The impact energy is thus adapted to the lighter application.

To change impact rate to high speed:

Push and rotate using an 8mm hexagon L wrench so that the lock button (2) faces the high speed mode (Mark H).

5.10. Inspection after installation

After the 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:

- The **oil flow supplied to the hammer;**
  should be measured from the 'IN' line with a flowmeter while operating the hammer. As alternative, oil flow can be measured, without hammer operating, using a flowmeter that has a throttle valve, which set to the operating pressure of the hammer.
- The **operating pressure of the hammer;**
  should be measured as close to the hammer 'IN' port as possible.
  Note: The oil flow and the operating pressure should be measured in minimum and maximum values because those fluctuate slightly while operating the hammer.
- The **relief pressure of the hammer piping;**
  should be measured with the stop valve shut off. And, it must be set to 30~40 bar higher than the measured maximum operating pressure of the hammer.
- The **prefill gas pressures in the back-head gas chamber and the accumulator;**
  must be measured statically, the hammer not operating, at the ambient temperature before operating. Refer to Section "**7.5. Gas**" for details about measuring the gas pressures.
- The **impact rate;**
  can be measured if a blow frequency counter is available. It is highly recommended to measure the impact rate.
- Refer to Section "**4. Technical** specifications" for given limits of the specification.

6. Operating the hydraulic hammer

This chapter describes how to choose the correct chisel for the job and how to operate the hammer correctly. To increase the hammer's breaking performance and working life, pay attention to this chapter.

The hammer is powerful machinery and lots of damage can be done if you do not know how to use the hammer safely. Read this chapter before operating the hammer.

6.1. Selecting the right chisel

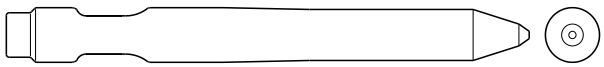
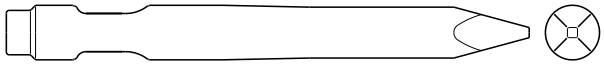
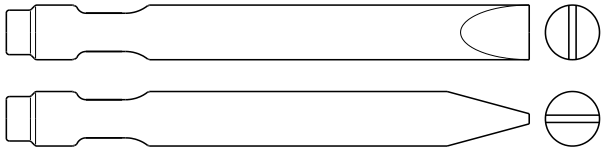
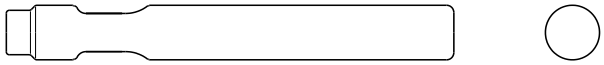
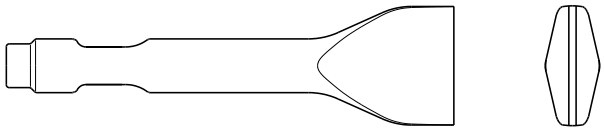
The correct type of chisel must be selected to get the best possible working results and longest lifetime for chisel.

The recommended selections of standard chisels for various kind of job are depicted as follows:

Basically, there are two types of breaking principle with a hydraulic hammer.

- Penetrative (or cutting) breaking:
  A conical, pyramid or wedge type tool is forced into the material. This method is most effective in soft, layered or plastic material. The sharper edge the chisel has, the better the hammer penetrate the material. However, breaking hard material will cause the sharp edges to wear very quickly.
- Impact breaking:
  Transferring strong mechanical stress wave into material breaks material. Best possible energy transfer between chisel and material is achieved with a blunt chisel. This impact breaking is more effective in hard, brittle and very abrasive materials. Generally, small size hammer is not suitable for impact breaking.

Standard chisels:

Type of Chisel	Application
Moil point (Conical) 	Universal use; Breaking concrete, bedrock and pavement
Moil wedge (Pyramid) 	Universal use; Breaking concrete, bedrock and pavement
Flat wedge - cross-cut - inline-cut 	Mining, Foundation, Trenching and benching, Concrete demolition, Finishing slopes
Flat end (Blunt) 	Breaking oversize boulders, Concrete demolition
Wide flat wedge (Asphalt cutter) 	Mining, foundation, trenching, demolition, finishing slopes, Breaking asphalt pavement

Note:

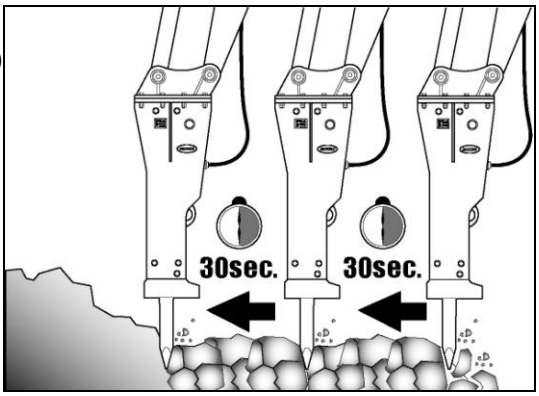
- Chisels are subject to wear and tear in the course of normal operations. (Replacement of these parts due to wear is not covered by the warranty.)
- Only genuine HYUNDAI EVERDIGM chisels should be used, if other makes of chisels are used the warranty may become void.
- Special designs available on request.

6.2. Correct working methods

■ Advance:

Move the impact point from the edge to the interior. Never try to break off a too large block, if the object has not broken within 30 seconds. The object should be broken up piece by piece in small blocks. Large distance steps will not improve working results.

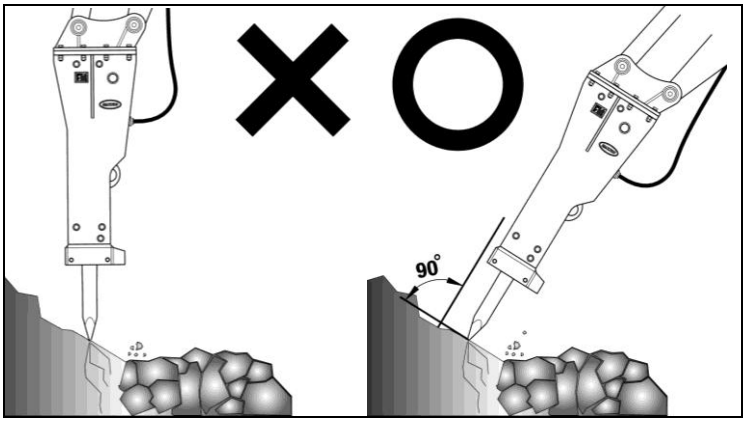
Operating the hammer longer than 30 seconds may cause damage to the hammer.



■ Angle of attack:

The hammer should always be positioned at right angles to the surface of the material. If the hammer is operated at slant angle,

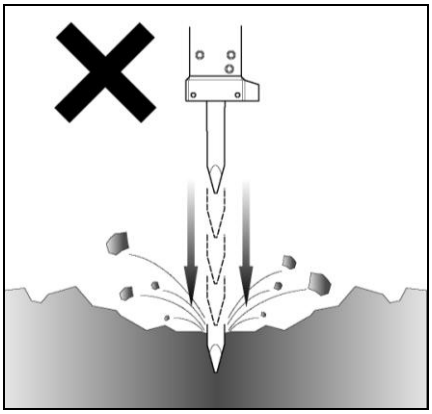
The chisel slide off the material surface and it cause blank blows that damage the hammer. And the chisel will wear more quickly, or broken more frequently.



■ Never use as a sledgehammer:

Before starting up, place the chisel point on the ground.

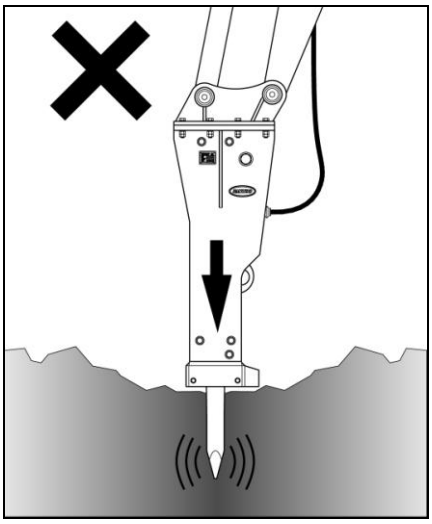
Never attempt to use the hammer as a sledgehammer to break material, as the result of such action will cause damage to the hammer and the carrier.



■ Never drive the chisel into the ground:

If the advance is too large and the chisel is not rocked to release the dust, the chisel will be driven into the material without breaking the material. This causes the chisel tip to glow red-hot and lose its hardness. As a result, the chisel wears out more quickly. Operating in this way is not permitted.

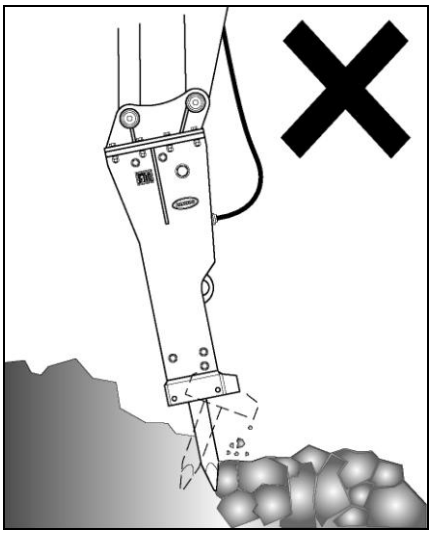
Dust dampens impact power, when the chisel is inserted into the ground, and reduces the efficiency of the hammer. Tilt the hammer slightly backward and forward, not more than 5°, while operating so that the dust can escape. Do not rock the hammer at angles greater than 5° or the chisel will be broken.



■ Never use as a lever:

Do not use the chisel as a lever; e.g. crowbar, as this will cause the chisel to break.
Under any circumstances, operating in this way is not permitted.

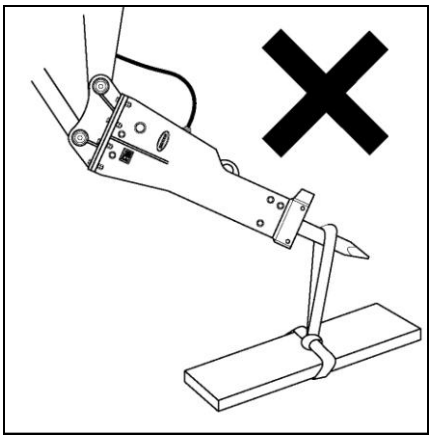
Most of bending failure of the chisel may be caused by lever action in stone that is inside hard or frozen ground. Be careful and stop operating if you feel sudden resistance under the chisel.



■ Never use for transport purposes:

The hydraulic hammer is not designed to lift or transport loads. Never use the chisel as a lifting point.

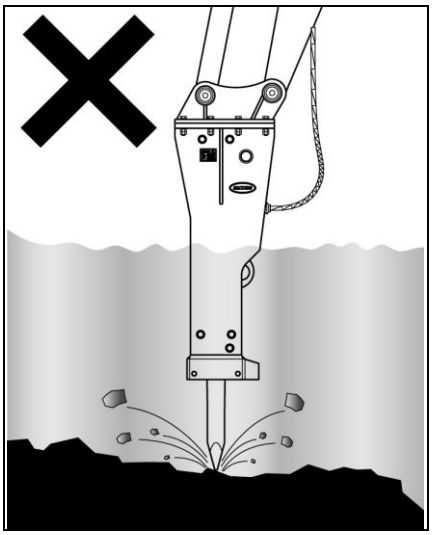
This is dangerous and could damage the hammer or the chisel.



■ Never use the hydraulic hammer under water:

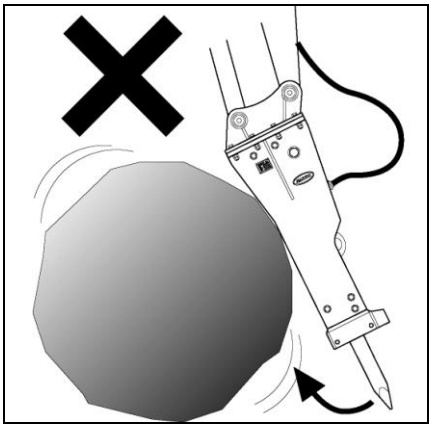
The hydraulic hammer, as a standard assembly, must never be used in or under water without prior conversion. If you use under water, water fills the impact chamber between the piston and the chisel, a strong hydraulic pressure wave is generated and will damage the seals in the hammer. And, in addition, corrosion, lack of lubrication or penetration of water could result in further damage to components of the hammer and the carrier.

To operate the hammer under water, compressed air must be supplied into the hammer, into the impact chamber of the front-head, prior to use. Refer to the manual of underwater kit, which is a separate document, provided with the underwater kit.



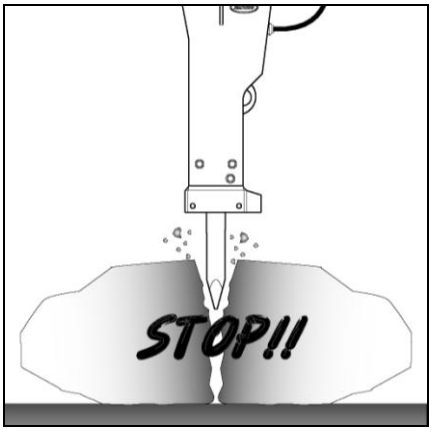
■ Never use the chisel or hydraulic hammer to move rocks or other objects:

The hydraulic hammer is not designed for this usage.
Do not use the hammer or chisel to roll, push the object or reposition the carrier.
This may cause damage to the hammer and the carrier.



■ Blank blows:

Blank blows, which are impact on the chisel without contact with the object, are very harmful for the hammer. Always press the chisel down onto the material before starting the hammer. And stop operation immediately as soon as the object has been broken. If operation is continued, blank blows could result in excessive wear to major components.



Consult HYUNDAI EVERDIGM dealer for the operating the hammer in special applications such as: operation under water, operation in very high or low temperature, operation in chemical factory, etc.

7. Maintenance

IMPORTANT!

Always follow the instructions described in this section when performing maintenance work on the hammer. Neglecting the maintenance schedule can cause damage to the hammer.

This section of the manual describes how to care and maintain your hammer. Check every item before and after operating the hydraulic hammer to always keep the hammer in good condition.

Neglecting the maintenance schedule and improper maintenance can cause damage to the hammer and the carrier.

7.1. General Information

Whenever maintenance work is carried out, always follow the basic rules:

- Absolute cleanliness and great care are basic and essential matters in the handling of any hydraulic components of the hammer. **(Dirt is the worst enemy of hydraulic systems.)**
- Hammer parts should be handled carefully and stored clean using lint free cloth or cleaning papers for hydraulic use.
- Do not use anything other than the correct cleaning fluid for cleaning hydraulic parts.
  (Never use water, steam, paint thinners or acid fluid)
- Sealing components, such as O-rings, packings and wipers in the hydraulic hammer should be oiled with clean hydraulic oil before assembling. Especially, for sealing parts used for tight fitting, apply lubricant paste onto the sliding portions of the seals.
- Always release the prefill gas in the back-head and accumulator before carrying out maintenance or repair work to the hydraulic hammer.
- Only the proper tools should be used for maintenance. Use of improper tools may cause personal injury, or damage to the hammer.
- Unauthorized alteration on the hammer may cause the hammer serious troubles or reduce hammer life and performance. HYUNDAI EVERDIGM cannot guarantee these cases.

Since the hydraulic hammer is a precision machine, never disassemble the power-cell and main moving parts. If it needs disassembly, contact your local HYUNDAI EVERDIGM dealer. If the customer disassembles the hammer, we don’t take responsibility for it.

Prior to maintenance work, perform the following sequence:

1. Put the hammer in a stable position on a level surface, for easy maintenance and repair.
2. Turn off the carrier.
3. Shut off the stop valves.
4. Disconnect the hoses if needed and seal them with plugs to prevent entry of impurities.

In special application such as: tunneling, scaling, operating in ironwork, underwater use, etc., service interval is considerably shorter than usual usage.

7.2. Care and maintenance schedule

To keep the hammer condition at its best, maintenance must be done regularly to the schedule below.

Every 2 hours	▪ Grease the chisel and chisel bush. ▪ Check hydraulic oil temperature, piping & connection and impact efficiency. ▪ Tighten loose connections.
Every 10 hours or daily	▪ Remove the retaining pin and the chisel and check their condition. Grind off any burrs that may be present. ▪ Check that the chisel has been receiving sufficient grease. Grease more frequently, if you needed.
Every 50 hours or weekly (Main inspection)	▪ Check gas pressure in the back-head. Refill the gas if necessary. ▪ Check for wear of the chisel, front bush, chisel bush and piston lower part. ▪ Check the hydraulic hoses, Replace if necessary ▪ Check through bolts, Replace and/or re-tighten if necessary.
Every 100 hours or monthly	It is recommended to have the main inspection done by your local HYUNDAI EVERDIGM dealer. ▪ Check all hydraulic hoses and pipe connections. ▪ Check interference between hoses with carrier.
Every 600 hours or 6 monthly	It is recommended that the annual maintenance be carried out by your local HYUNDAI EVERDIGM dealer, or after 600 operating hours. ▪ Check all hydraulic pipe, hose connections and conditions of oil filters ▪ Check through bolts for cracks on the threads and shanks. ▪ Change all seals including the accumulator diaphragm. ▪ Check the conditions of the power cell and bracket.

7.3. Hydraulic oil

Most of the hydraulic oil brands prescribed by the carrier manufacturer are suitable for the HYUNDAI EVERDIGM hydraulic hammer. However, operating the hydraulic hammer will heat up the oil much more than the usual earth moving work.

Therefore, the hydraulic oil should correspond to viscosity class HLP32 or higher; in general case viscosity class HLP46 is recommended. In summer and in hotter climates, oils of viscosity class HLP 68 or higher should be used.

- Optimum viscosity range: 20 ~ 60 cSt
- Maximum initial viscosity: 1,000 cSt
- Minimum viscosity: 12 cSt for TF-01E ~ 04E
  10 cSt for TF-05E ~ 50E
- Maximum oil temperature (with HLP46 oil):
  80°C (176°F) for TF-01E ~ 04E
  85°C (185°F) for TF-05E ~ 100E

In some working environments with a high ambient temperature, the oil temperature may affect hammer in its performance and durability. The hydraulic system of the carrier must have a proper cooling system according to these working environments.

The temperature of the hydraulic oil must never exceed the permissible maximum oil temperature. If higher temperatures are measured in the tank, the hydraulic system and/or the pressure-relief valve have to be checked. Troubles due to incorrect oil viscosity or improper oil temperature are as follows:

Too thick oil (too low oil temperature) may cause:

- Slow or irregular blows and difficult to start
- Damage to the hammer parts by cavitation
- Low impact power

Too thin oil (too high oil temperature) may cause:

- Decreasing of flow delivery from carrier's pump
- Low impact rate; low breaking efficiency
- Insufficient lubrication; accelerated wear of hammer parts and damage to the sealing parts

When using special oils (e.g. biological oils or fire-resistive oils), contact oil manufacturer or HYUNDAI EVERDIGM.

■ Hydraulic oil filter

Contamination of the hydraulic oil may result in parts damage, not only to the hammer, but also to the hydraulic components of carrier.

Impurities in the hydraulic oil can cause

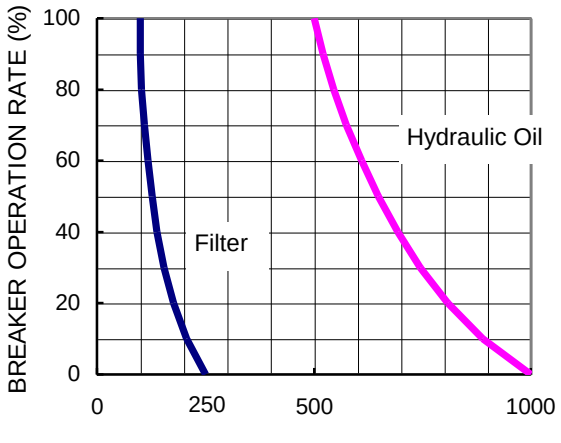
- Accelerated parts wear
- Stick or seizure of moving parts or Score on the sliding surface of moving parts
- Oil leak and decreasing of hammer efficiency
- Deterioration of oil quality

Air bubble and water are also impurities in hydraulic oil and may induce cavitation failure.

Check the oil filter in the return line of the carrier's hydraulic system, the grade of this filter should not exceed 50 micrometers and a magnetic separator should be fitted.

We recommend hydraulic oil and oil filter replacement, as shown in the following table, and this is based on 100% hammer operation.

Replacement intervals for hydraulic oil and oil filter:



← Full time hammer operation
Hydraulic oil replacement : 500 hours
Filter replacement : 100 hours

← Operation without hammer work
Hydraulic oil replacement : 1,000 hours
Filter replacement : 250 hours

■ Working in high or low ambient temperatures

IMPORTANT!

Feeding hot hydraulic oil to an extremely cold hammer will cause internal stresses in the hammer resulting in its failure.

If the hammer is used without pre-heating the oil:

- The sealing parts of the hammer may fracture.
- The diaphragm in the accumulator may tear.

High ambient temperature:

When operating the hammer in high ambient temperature: summer or tropical climates, above 30°C (86°F), the temperature of the hydraulic oil must be monitored to ensure it does not exceed the specified temperature limits.

If the oil temperature exceeds the maximum permissible operating temperature limits, use hydraulic oil of proper viscosity. In this case the hydraulic oil of viscosity class HLP68 should be used. If the oil temperature is still too high in spite of using the high viscosity oil, the auxiliary hydraulic cooler must be installed.

Low ambient temperature:

At temperatures below 0°C (32°F), the carrier must be warmed up prior to use in the way described by the carrier manufacturer. Ensure that the hydraulic oil of the carrier is at least at 0°C (32°F), before starting up the hydraulic hammer.

Note:

The hydraulic hammer and the carrier will not operate to full capacity until the oil temperature has reached at least 60°C (140°F).

7.4. Grease

IMPORTANT!

If grease is not supplied sufficiently, then high heat is generated due to friction at the chisel of the hammer. The heat can cause premature wear and cracking of the parts related to the chisel.

Always observe the relevant safety regulations when handling oils and greases.

Lubricate and check the grease regularly (refer to Section “7.2. Care and maintenance schedule”). Every two hours of continuous operation lubricate the chisel with appropriate amount of moly-based grease. Inject grease between the chisel and the chisel bush, through the grease nipple provided.

- Every 2 hours
- 5 ~ 10 strokes for TF-01E ~ 13E
  12 ~ 15 strokes for TF-24E ~ 100E
  using a large size grease gun
- Adjust greasing interval and amount of grease to the hammer models and working conditions.

When lubricate the chisel, the hammer must be standing upright against the chisel with enough down pressure applied to force the chisel into the hammer. This will prevent excessive grease getting into the impact chamber which could cause the hammer to lose power due to cushioning, or to stop operating due to a hydraulic lock in the impact chamber.

Failure to lubricate the hammer regularly will reduce the life of the chisel, the chisel bush and front bush.

Recommended grease products by makers:

Maker	Grease Product Name
CALTEX	MULTIFAC EP2
CASTROL	SPHEEROL EP2
ESSO	RONEX MP2
GULF	CROWN EP2
MOBIL	MOBILUX EP2
SHELL	ALVANIA EP2
TOTAL	MULTIS EP2

For other than those recommended consult HYUNDAI EVERDIGM or our dealer prior to use.

7.5. Gas

DANGER!

Using other gases could result in an explosion. Use pure nitrogen; 99.8% purity, only.

The HYUNDAI EVERDIGM hammer is a gas assisted type hydraulic hammer. The gas prefilled in the back-head gives strong impact power and the gas prefilled in the accumulator decrease the pressure fluctuation in the hammer. For this type of hammer, operating performance of hammer is under the control of the gas pressure. Therefore, the charging pressures in these gas chambers are very important factor in the hammer and must always be maintained within the specified limits(refer to Section "**4. Technical** specifications").

This section describes how to fill the gas and check the gas pressure in the back-head and accumulator of your hammer. Use only pure nitrogen of 99.8% purity and ensure that no other gas, e.g. air or oxygen is used. Gas charging kits should be on hand all the time, to allow the following checking and maintenance work to be performed.

7.5.1. Checking and charging the gas in the back-head

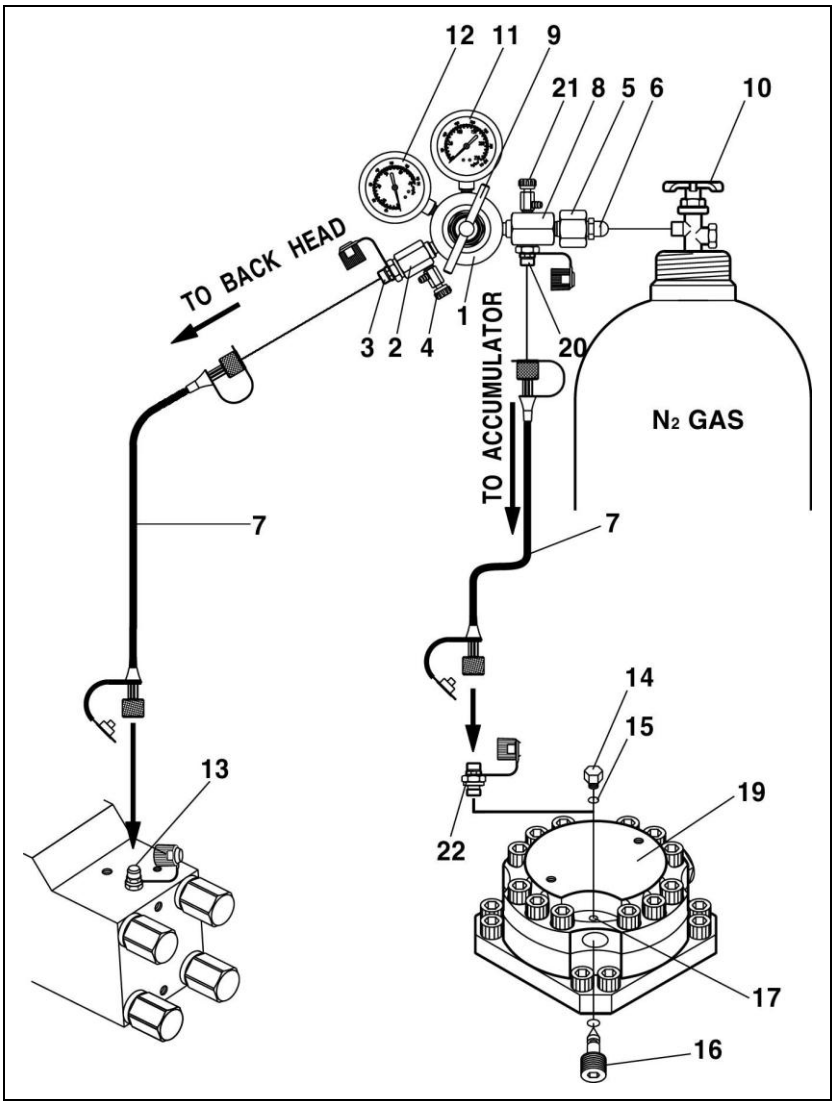
If the impact power of the hydraulic hammer starts to drop, the gas pressure in the back-head should be checked.

The back-head need not to be refilled until the gas pressure has decreased to below the specified value. In general, checking the back-head gas pressure recommended at least every 50 hours or weekly. And, Refill the gas if necessary.

Note:

When checking or charging the gas pressure, always lay the hydraulic hammer flat without any contact force applying to the chisel. The gas pressures should be checked with the hammer at the ambient temperature before operating or at the gas temperature of 60°C to 70°C (140 to 158°F) after operating.

Gas charging kit:



1. Regulator
2. Adapter
3. Mini-mess coupling I
4. Exhaust valve I
5. Cap nut
6. Coupling
7. Hose
8. Adapter
9. Handle
10. Gas valve
11. Accumulator gauge
12. Back-head gauge
13. Back-head mini-mess coupling
14. Accumulator charging plug
15. O-ring
16. Accumulator charging valve
17. Gas charging port
18. Back-head
19. Accumulator
20. Mini-mess coupling II
21. Exhaust valve II

1. Ensure the exhaust valve I (4) and gas valve (10) are closed, and then connect the cap nut (5) to the nitrogen bottle.
2. Be sure handle (9) is fully opened (loosened).
3. Connect each end of the hose (7) to the Mini-mess coupling I (3) and the Mini-mess coupling (13) on the back-head.
4. Open the gas valve (10). And, turn the handle (9) clockwise to charge.
5. Adjust the handle (9) until the back-head gauge (12) pointer indicates the specified gas pressure.
6. If the back-head is charged over the specified gas pressure, adjust the gas pressure by opening the exhaust valve I (4) slightly to reduce the gas pressure.
7. Close the gas valve (10), and carefully vent the hose (7) by opening the exhaust valve I (4) before removing it.

Back-head gas charging pressure:

Hammer model	**CHARGING at ambient temperature; 20°C (68°F)**	**CHECKING at operating temperature; 60~70°C (140~158°F)**
	bar *(psi)*	bar *(psi)*
TF-01E TF-02E TF-03E TF-04E	10 ~ 12 *(145 ~ 174)*	11.4 ~ 13.7 *(132 ~ 187)*
TF-05E TF-06E TF-10E TF-13E TF-24E TF-31E TF-40E TF-50E	14 ~ 16 *(203 ~ 232)*	15.9 ~ 18.2 *(231 ~ 264)*
TF-55E TF-65E TF-70E	16 ~ 18 *(232 ~ 261)*	18.2 ~ 20.5 *(264 ~ 297)*
TF-85E	17 ~ 19 *(247 ~ 276)*	19.4 ~ 21.7 *(281 ~ 315)*
TF-100E	14 ~ 15 *(203 ~ 218)*	15.9 ~ 17.0 *(231 ~ 247)*

Notes: In general, as a basic rule, if the gas temperature increases 30°C (86°F) higher, then the gas pressure increases of about 10% on the initial pressure.

7.5.2. Checking and charging the gas in the accumulator

1. Ensure the exhaust valve II (21) and the gas valve (10) are closed, and connect the cap nut (5) to the nitrogen bottle.
2. Be sure the handle (9) is fully opened (loosened).
3. Remove the accumulator charging plug (14) and the O-ring (15) from the accumulator (19). Put them in the toolbox for safekeeping.
4. Connect the Mini-mess coupling III (22) to the gas charging port (17).
5. Connect each end of the hose (7) to the Mini-mess couplings II (20) and III (22), respectively.
6. Open the accumulator charging valve (16), by turning it counter-clockwise a half turn.
7. Open the gas valve (10) to charge the accumulator, until the gauge pointer on the accumulator gauge (11) indicates the specified gas pressure.If the accumulator is charged over the specified gas pressure, open the exhaust valve II (21) slowly to reduce the gas pressure.
8. After the gas charging is completed, close the accumulator charging valve (16).
9. Close the gas valve (10), and carefully vent the hose (7) by opening the exhaust valve II (21).
10. Remove the Mini-mess coupling III (22) from the accumulator, and close the accumulator charging port (17) with the plug (14) and O-ring (15).

Accumulator gas charging pressure:

Hammer model	**CHARHING** **at ambient temperature;** **20°C (68°F)** bar *(psi)*	**CHECKING** **at operating temperature;** **60~70°C (140~158°F)** bar *(psi)*
TF-24E TF-31E TF-40E TF-50E TF-55E TF-65E TF-70E TF-85E TF-100E	60 ± 2 *(870 ±30)*	68 ± 2 *(990 ±30)*

7.6. Chisel, wear bushings and chisel pins

Operating the hammer, even though it is regular and correct, wear the chisel and its wear parts such as:

- Wear bushings; chisel bush, front bush
- Thrust ring
- Chisel pin, stop pins and PU-sleeves

These wear of chisel and wear parts is caused by:

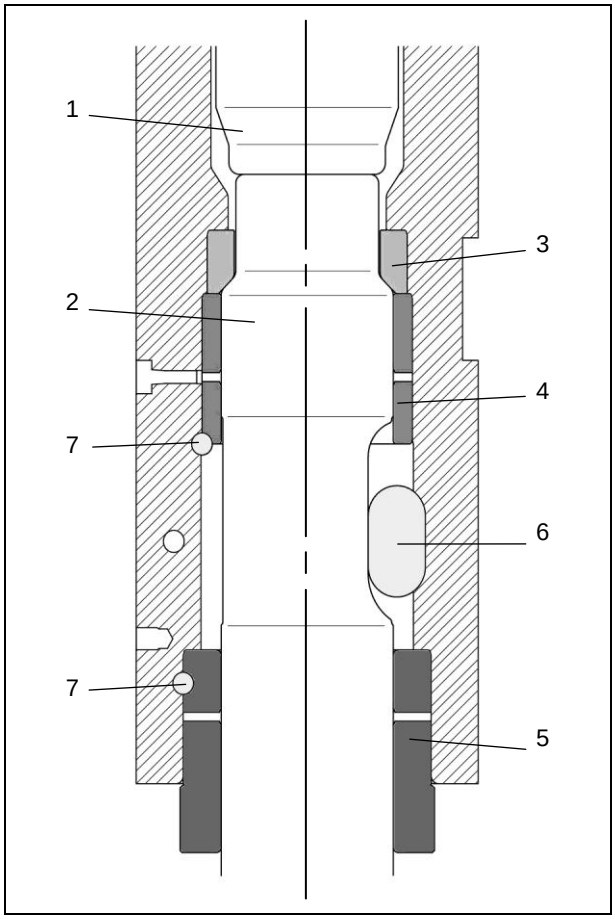
- Wear by metal-to-metal sliding
- Tear of contact point by micro-welding
- Particle engaged abrasive wear
- Collapse or peeling of surface by extremely high contact pressure
- Heat generated by friction accelerates wear

Check the chisel, chisel bush and front bush for wear every 50 hours of hydraulic hammer use or weekly. And, replace them if the amounts of wear exceed the permissible wear limits.

If these parts are used beyond their wear limits, the piston and chisel may be damaged severely. Especially, when the hydraulic hammer has too much clearance between the chisel and both wear bushes, the chisel can be broken by bending through wrong impacts.

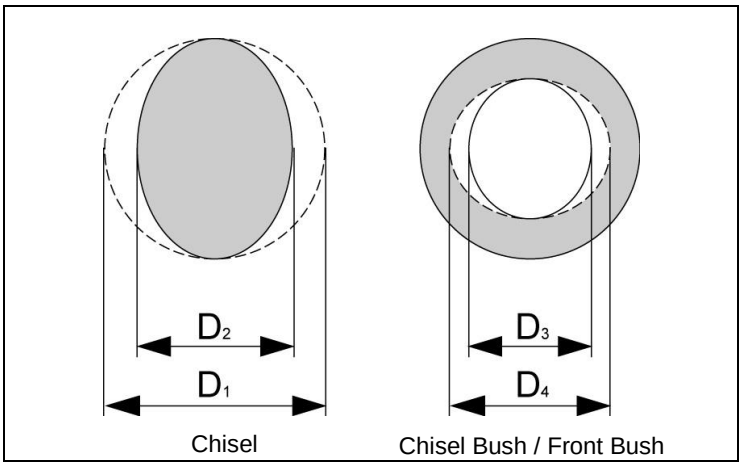
Replacement of the parts below due to wear is not covered by the warranty.

Chisel and wear parts in the front-head:



This is a general angled section view of front-head.

1. Piston
2. Chisel
3. Thrust ring
4. Chisel bush
5. Front bush
6. Chisel pin
7. Stop pin



D_1 : Original diameter of chisel

D_2 : Minimum diameter of chisel worn out

D_3 : Original diameter of bush

D_4 : Maximum diameter of bush worn out

Chisel:

Initial diameter (D1) for the chisel is shown in the following table. The chisel diameter should be measured in the direction of minimum diameter. Replace the chisel if the diameter is worn down to below the lower limit (D2) specified in the table.

Chisel bush and front bush:

The inner diameters of the chisel bush and front bush are the same when new. The initial diameter (D3) for chisel bush and front bush is shown below. Replace the both bushes, if the diameter (D4) is exceeded upper limit specified in the table.

TF-01E ~ 13E is equipped with the 1-piece type front bush, so checking of the front-head is required.

When replacing the chisel bush and the front bush, ensure the bushes and bore of the front head are cleaned without any dirts. And, apply Moly-based grease to their mating surfaces.

Dimension limits of Chisel, Chisel Bush and Front Bush: Unit: mm

Hammer model	Nominal diameter of Chisel and bushes (D1, D3)	Lower limit of Chisel diameter (D2)	Upper limit of Chisel Bush & Front Bush (D4)
TF-01E / 02E	45	43	47
TF-03E	50	47	52
TF-04E	55	52	58
TF-05E	68	65	71
TF-06E	75	72	78
TF-10E	93	90	96
TF-13E	98	95	101
TF-24E	135	132	140
TF-31E	150	147	155
TF-40E	165	162	171
TF-50E	175	172	181
TF-55E	180	177	186
TF-65E	195	191	201
TF-70E	205	201	211
TF-85E	225	221	231
TF-100E	245	241	251

Chisel pins:

Check the chisel pins for wear, every 50 hours of hydraulic hammer use or weekly as well as each time the chisel is replaced. Any burr and swelling on the chisel pins must be smoothed off carefully by grinding.

■ Circular type chisel pins (TF-01E ~ TF-10E)

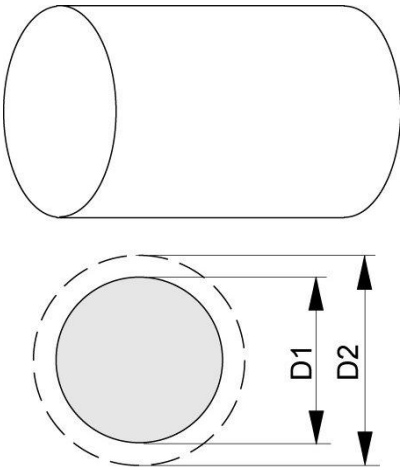
The initial diameters (D1) of the chisel pins are shown in the following table. Replace the chisel pin, if the diameter is less than the lower limit (D2) of the diameter.

■ Plate type chisel pins (TF-13E ~ TF-100E)

Check the width of the chisel pins including the worn out portion.

If the wear on the first side exceeds 1.5 mm, both chisel pins must be inverted together to use the other side.

Replace the chisel pins, if the final widths are less than lower limits (D2) of the width.



Circular type chisel pin
TF-01E ~ TF-10E

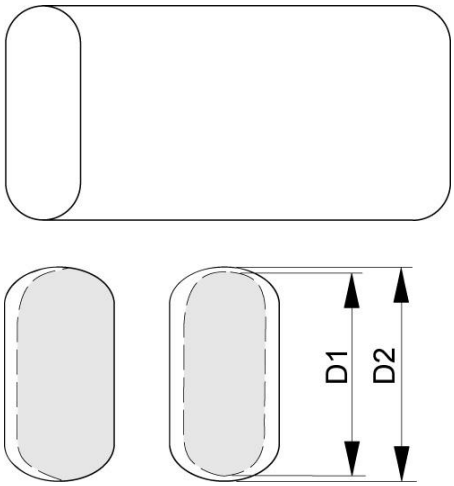


Plate type chisel pin
TF-13E ~ TF-100E

Dimension limits of Chisel Pins: Unit: mm

Hammer Model	Original Dimensions (D2)	Lower Limits (D1)	Pin shape
TF-01E / 02E / 03E	25	23	Circular
TF-04E	28	26	
TF-05E	35	33	
TF-06E / 10E	38	36	
TF-13E	60	56	Plate
TF-24E	80	76	
TF-31E	90	85	
TF-40E	110	105	
TF-50E / 55E	120	115	
TF-65E / 70E	130	125	
TF-85E	140	135	
TF-100E	145	140	

7.7. Bracket and Adapter

Check the bracket and the adapter installed at the top, whenever the chisel is replaced or at least 4 times a year, to see if there are any cracks. If any crack is found out, the breaker must not be used until it is repaired.

If the bottom of the bracket is worn away, replace the bottom plate as needed.

If it is necessary to repair by welding, contact your local HYUNDAI EVERDIGM dealer for advice.

7.8. Screw tightening

On percussive tools such as hydraulic hammers, the screw fasteners are subjected to particularly high loads and extreme vibration. During the first 50 operating hours the screw fasteners on the hammer must be checked daily, and thereafter once a week. Tighten any loose screws taking care not to exceeding the specified tightening torque below.

■ Screws to check and/or re-tighten regularly:

Applied part	Hex. size mm	Tightening Torque N·m (ft·lbs)	Applied hammer models
Accumulator body	17 (socket)	500 ~ 550 (370 ~ 410)	TF-24E ~ 100E
	22 (socket)	2200~ 2300 (1620 ~ 1700)	TF-55E / 65E / 85E
Accumulator cover	14 (socket)	250 ~ 300 (185 ~ 220)	TF-24E
	17 (socket)	500 ~ 550 (370 ~ 410)	TF-31E ~ 100E
Through bolts	30	400 ~ 450 (300 ~ 330)	TF-01E / 02E
	36	450 ~ 500 (330 ~ 370)	TF-03E
	36	600 ~ 650 (440 ~ 480)	TF-04E
	41	830 ~ 880 (610 ~ 650)	TF-05E
	46	1080 ~ 1180 (800 ~ 870)	TF-06E
	50	1370 ~ 1470 (1010 ~ 1085)	TF-10E
	55	1660 ~ 1760 (1220 ~ 1300)	TF-13E
	60	2160 ~ 2260 (1590 ~ 1670)	TF-24E
	71	3950 ~ 4110 (0000 ~ 0000)	TF-70E
	75	3720 ~ 3920 (2740 ~ 2890)	TF-31E
	80	3720 ~ 3870 (0000 ~ 0000)	TF-85E
	85	4700 ~ 4900 (3470 ~ 3610)	TF-40E / 100E
	90	6170 ~ 6370 (4550 ~ 4700)	TF-50E / 55E
	95	7040 ~ 7250 (0000 ~ 0000)	TF-65E

Applied part	Hex. size mm	Tightening Torque N·m (ft·lbs)	Applied breaker models
Mounting adapter	19	100 ~ 120 (75 ~ 90)	TF-01E / 02E
	30	550 ~ 600 (410 ~ 440)	TF-03E ~ 10E
	46	800 ~ 1000 (590 ~ 740)	TF-13E ~ 24E
	55	1000 ~ 1200 (740 ~ 890)	TF-31E ~ 100E

■ **Screws for common use (reference for assembling):**

Application	Hex. size mm	Type of head	Torque N·m (ft·lbs)	Applied hammer models
Grease nipple	14	H	50 ~ 60 (37 ~ 44)	All models
Air plug	12	S	200 ~ 250 (148 ~ 184)	TF-24E ~ 100E
Accumulator gas charging valve	6	S	40 ~ 50 (30 ~ 37)	TF-24E ~ 100E
Fixing cap for accumulator gas charging valve	24	H	140 ~ 160 (103 ~ 118)	TF-24E ~ 100E
Plug for accumulator gas charging port	19	H	40 ~ 60 (30 ~ 44)	TF-24E ~ 100E
Connecting adapters for hose, Swivel nuts of hose	22	H	150 ~ 200 (111 ~ 148)	TF-01E
	27	H	200 ~ 250 (148 ~ 184)	TF-02E ~ 05E
	36	H	300 ~ 350 (221 ~ 258)	TF-06E ~ 13E
	41	H	500 ~ 550 (369 ~ 406)	TF-24E
	50	H	600 ~ 650 (443 ~ 479)	TF-31E ~ 50E
	55	H	700 ~ 750 (520 ~ 550)	TF-65E ~ 100E
Plugs for blocking oil line of the cylinder	5, 6	S	20 ~ 30 (15 ~ 22)	
	8	S	80 ~ 100 (59 ~ 74)	
	10	S	120 ~ 140 (89 ~ 103)	
	12	S	40 ~ 60 (30 ~ 44)	Thread size BSP 1/4
	12	S	200 ~ 250 (148 ~ 184)	Thread size BSP 3/4
	14	S	250 ~ 300 (184 ~ 221)	

7.9. Replacing the through bolts

The through bolts connect and retaining the body sections of the hydraulic hammer.

- The through bolts for TF-01E ~ TF-13E models are directly assembled directly into the female threads in the front-head.
- The through bolts for TF-24E ~ TF-100E models use the separate nuts (the front-head nuts) at the front-head.

The through bolts can be checked visually, once the sealing plugs in the inspection holes in the top of the bracket have been removed.

If the through bolts get loose or damaged during operation, stop hammer work. And, repairs must be done immediately in the following manner:

1. Place the hammer on flat and firm ground. Separate the power-cell of the hammer from the bracket.
2. Discharge the nitrogen gas from the back-head completely.
3. Remove all the through bolts, and inspect for the presence of any cracks at the threads and the shank of the bolts.
4. Always apply thread paste, made of molybdenum disulphide (MoS2), to the threads of the through bolts before installing.
5. At first, tighten the entire bolts to the **half of the specified torque** in diagonal pattern.
6. Tighten the bolts to the specified torque in diagonal pattern.
7. Repeat 1~2 times in the same way.

7.10. Checking the bottom of the piston

CAUTION!

Be sure to turn off the power switch of the carrier and to shut off the stop valves before checking the bottom of the piston. Never insert hands into the front-head. Check only by sight.

Check the bottom of the piston, which impact the chisel directly, every week, at least every 50 hours or whenever the chisel is changed. Check the impact surfaces of the piston for wear, sinking or cracking.

If the hammer is continuously used once the bottom of the piston has any failure or crack, the hammer can be seriously damaged.

■ **Permissible dent depth:**

- TF-01E ~ TF-13E : less than 1mm
- TF-24E ~ TF-100E : less than 2mm

Any modification such as re-machining, welding or heat treatment is not allowed.

Use only genuine replacement parts, or it may invalidate the warranty.

7.11. Storage of the hammer

Short periods of non-use

Dismount the hammer from the carrier according to the instruction in Section "**5.6. Dismounting the hydraulic hammer from the carrier**". Storing the hydraulic hammer in horizontal position can be permitted for short period (maximum 2 weeks).

Long periods of non-use

If the hammer is to remain out of use for more than 2 weeks, the following maintenance work must be performed:

- The chisel must be removed.
- The gas in the back-head must be discharged completely.
- The percussion piston must be positioned at the upper end of its stroke.
- The lower end of the piston, chisel and bushes must be well protected with grease or anti-lust fluid.
- All the hydraulic connections must be sealed with clean plugs to prevent oil leak or dirties from getting in to the hammer.
- The hammer must be stored in a vertical position.
- The hammer must be stored in a dry location.

Washing the hydraulic hammer

When the hydraulic hammer is working, dirt, mud, rock powder etc. can attach itself to the hammer. Always wash the outside of the hydraulic hammer with a pressure washer before sending it to the workshop otherwise dirt can cause difficulties in the disassembly and reassembly of the hammer.

8. Troubleshooting

Trouble	Probable cause	Remedy
The hammer will not start.	Pressure and return lines inverted	Connect hammer hoses correctly
	Stop valve in pressure and/or return lines closed	Open stop valves
	Gas pressure in back head too high	Check gas pressure in back head, reset to correct value
	Hydraulic oil level in tank to low	Check and refill hydraulic oil tank
	Relief valve opens at to low a pressure	Re-adjustment relief pressure
	Failure in valve and piston	Contact your HYUNDAI EVERDIGM dealer
	Leakage from pressure to return in excavator hydraulic circuit	Check the installation, pump and other hydraulic components
	Operating pressure too low	Check carrier engine speed and/or operating pressure
The impact rate of hydraulic hammer is too low	Insufficient hydraulic oil delivery from carrier	Contact your HYUNDAI EVERDIGM dealer
	Flow resistance too high on oil filter or oil cooler	Check oil filter/cooler, clean or replace
	Hydraulic oil overheated	Check and replace filter, cooler
	Gas pressure in back head too low	Check and refill back head gas pressure
	Chisel out of range for piston	Push down chisel by carrier
	Inside diameter of return line too small	Increase inner diameter of the return line. (Refer to section 5.1.)
	Return pressure too high	Check and lower return pressure
	Relief valve opens at too low a pressure	Re-adjust the relief pressure
	Hydraulic oil level in tank to low	Check and refill hydraulic oil tank
	Poor pump performance	Contact authorized service man
	Diaphragm in accumulator defective	Replace diaphragm
	Pressure adjustment valve is screwed too much	Re-adjust pressure adjusting valve (Refer to section 5.8.)
	Delivery flow rate of hydraulic system is inadequate	Check pump characteristics with measuring device and compare with original specifications
The impact rate is irregular	Gas pressure of accumulator is too low	Check and refill with nitrogen gas
	Failure in hammer valve or distributor operation	Contact your HYUNDAI EVERDIGM dealer
Oil leaks between back head and cylinder	Seals defective	Check and replace seals

Oil leaks at accumulator	O-ring and or back-up ring defective	Check and replace o-ring and back-up ring
Oil leaks from chisel	Cylinder seals defective	Disassemble hydraulic hammer and replace the seals
Hydraulic oil temperature too high	Hydraulic oil level in tank too low Carrier pump delivery too high High outside temperature and no cooler fitted Pressure-relief valve defective	Refill hydraulic oil tank Correct carrier engine speed. Reset pump Fit oil cooler Fit new pressure-relief valve
Back head gas leaks	Loose through bolts Defect in back head gas valve Defective O-ring on back head Defective cylinder bush seals	Tighten through bolts (Refer to section 7.9.) Replace back head gas valve Replace O-ring Check and replace the piston bush seals

Notes

Notes

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HYUNDAI EVERDIGM ATTACHMENT

OPERATION MANUAL

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