

# SAFETY, OPERATION AND MAINTENANCE MANUAL

JULY 2013 – 1° edition

## HD 13

### HYDRAULIC HAMMER DRILL



#### IMPORTANT

READ MANUAL BEFORE USE

KEEP THIS MANUAL FOR  
FUTURE CONSULTATIONS



HYDRAULIC TOOLS

**DOA** s.r.l.

**Via Cortiva 5 – 22060 NOVEDRATE (Como) ITALY**

**TEL ++39 031 792040 - FAX ++39 031 791917**

[www.doa.it](http://www.doa.it)

E-mail: [info@doa.it](mailto:info@doa.it)

# CONTENTS OF THE MANUAL

	<b>Page</b>
• <b>INTRODUCTION</b>	3
• <b>SAFETY SYMBOLS</b>	4
• <b>DESCRIPTION OF THE PRODUCT</b>	
DESCRIPTION	5
TYPICAL APPLICATION	5
ACCESSORIES ON REQUEST	5
TYPICAL POWER SOURCES	5
<b>TECHNICAL CHARACTERISTICS</b>	
GENERAL VIEW - MAIN COMPONENTS AND THEIR FUNCTIONS	6
WEIGHT AND DIMENSION	7
PERFORMANCES - SPEED	7
HYDRAULIC CHARACTERISTICS	7
• <b>GENERAL SAFETY NORMS</b>	8
• <b>USE OF THE PRODUCT</b>	
WHAT NOT TO DO	10
NEVER USE THE TOOL IF	11
BEFORE WORKING	12
USE OF THE TOOL	13
CUTTING OPERATIONS	14
END OF OPERATIONS	15
• <b>MAINTENANCE AND CARE</b>	13
CLEANING	13
PERIODICAL CONTROL	14
MAINTENANCE OF THE FLEXIBLE HOSES	14
DISPOSAL AND SCRAPPING	15
REPAIR	15
GENERAL INFORMATION ON THE REPAIR	16
DISASSEMBLY	17
• <b>PROBLEM / CAUSE / SOLUTION / CHART</b>	18
• <b>WARRANTY</b>	21
• <b>EXPLODED VIEW AND PART LIST</b>	ATTACHED IN SEPARATE SHEET

## INTRODUCTION

DEAR CUSTOMER,  
CONGRATULATIONS FOR HAVING PURCHASED A DOA PRODUCT. THE TOOL YOU BOUGHT WAS MANUFACTURED WITH HIGH QUALITY MATERIALS TO ASSURE YOUR MAXIMUM SATISFACTION AND A LONG LASTING SERVICE WITHOUT PROBLEMS. FOR YOUR SAFETY AND OBTAINING THE BEST RESULT, WE RECOMMEND TO READ THIS MANUAL AND RESPECT THE SIMPLE INSTRUCTIONS CONTAINED, THIS WILL PROTECT YOU FROM ACCIDENTS AND AVOID DAMAGES TO THE EQUIPMENT.  
KEEP IT ALWAYS AVAILABLE TOGETHER WITH ITS ENCLOSURES, SO THAT IT CAN BE CONSULTED WHEN NECESSARY.

## IMPORTANT

SOME ENCLOSURES CONTAINING INFORMATION ABOUT ACCESSORY PARTS OR SAFETY MANUALS OF THE MANUFACTURER OF SUB PARTS OR SUBCOMPONENTS OF DOA TOOLS, COULD HAVE BEEN SUPPLIED TOGETHER WITH THIS MANUAL.  
THESE ENCLOSURES ARE AN INTEGRAL PART OF THE MANUAL AND THEY MUST BE KEPT TOGETHER WITH THE MANUAL ITSELF..



BE CAREFUL WHEN YOU CONNECT THE TOOL TO AN HYDRAULIC CIRCUIT WHERE ARE UNKNOWN HYDRAULIC MAXIMUM VALUES OF PRESSURE AND FLOW. FOR AVOIDING ACCIDENTS AND DAMAGES TO THE EQUIPMENT, BE SURE THAT THE MAXIMUM VALUES OF PRESSURE AND FLOW OF THE POWERING CIRCUIT ARE COMPATIBLE WITH THOSE ONE OF THE TOOL ITSELF.

THE TEXT AND THE ILLUSTRATIONS IN THIS MANUAL ARE AN EXCLUSIVE PROPERTY OF DOA S.R.L. THE PERSON WHO USES THE TEXT OR REPRODUCES, EVEN PARTIALLY, ILLUSTRATIONS OR PARAGRAPHS FOR NON-AUTHORISED PURPOSES CAN BE LEGALLY LIABLE.

# SAFETY SYMBOLS

**This manual contains safety warnings represented by symbols indicating three different levels of danger:**

---



This symbol indicates an operation or situation extremely dangerous which can cause serious accidents or death if proper precautions are not respected



This symbol indicates a dangerous operation or situation that can cause serious accidents or death



This symbol warns about generic danger that can cause accidents and damages to the equipment or the properties.



This symbol indicates important information

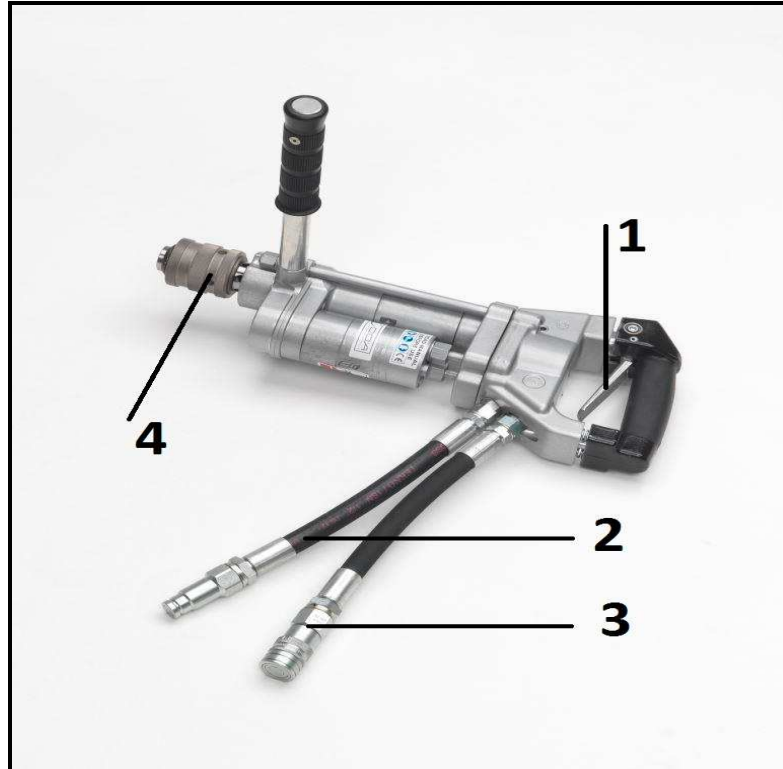


**WHEN THE EFFECTS OF A CERTAIN ACTION ARE NOT EXACTLY KNOWN, REMIND THAT EVEN THE SIMPLEST OPERATION MAY HIDE DANGERS.**

**IN CASE OF DOUBTS DO NOT RISK – DO NOT MAKE EXPERIMENTS!**  
**ASK YOUR DOA DEALER OR YOUR FOREMAN.**

---

## GENERAL VIEW – MAIN COMPONENTS AND THEIR FUNCTIONS



1. **TRIGGER** – is the ON/OFF control of the tool, it has a device that prevents accidental tool starting , it can be pressed with minimal effort to guarantee operator comfort also in long cutting operations
2. **RETURN HOSE** – T it is the tube where oil get out/exit the tool and go back to tank
3. **OIL PRESSURE HOSE** – P it is the tube where oil enter in pressure in the tool
4. **SDS MAX QUICK CHUCK STANDARD**

## HD 13 TECHNICAL CHARACTERISTICS

### WEIGHT & DIMENSIONS

WIEGHT	Kg. 13
LENGHT	cm. 40
WIDTH	cm. 24
BIT ATTACCHMENT	SDS MAX STANDARD
MAX BIT DIAMETER	50 mm.

### HYDRAULIC REQUIREMENTS

FLOW	16-30 L/min	4-8 gpm
IDEAL FLOW	20 L/min	5 gpm
PRESSURE	100-150 Bar	1500/2000 PSI
MAX BACK PRESSURE	18 Bar	250 PSI
BIT TYPE	SDSMAX	

#### NOTE !

The HD13 hammer drill can be used for underwater works, the underwater model as specific bit attachment that is a simplified version of the SDSS MAX type , the normal SDS MAX quick type chuck is not adequate for marine use as it has internal small parts that are not easy to be cleaned after use in salty water

### PERFORMANCES

BLOW PER MINUTE	2100
ROTATION SPEED	260 rpm

### HOSE REQUIREMENTS

For 20 meters flexible hoses connections use double hydraulic hoses type:  
**1/2" diameter, SAE 100 R1/A.**

DOA suggest flush face couplers as per EHTMA standards .

## SAFETY PRECAUTIONS

The operators and personnell in charge of the maintenance of this tool must read and understand the simple instructions and advices containde in this manual before the drill or beginning its maintenance.

## WHAT NOT TO DO

### NOTE

**The following list describes the most common incorrect uses of the tool. As it is impossible to foresee all the types of misuses possible, it is not sufficient to guarantee total security of the operators.**

- Do not use the tool near electric cables that are laying underground, hidden or walled in. **Serious enjuries** may be caused by cutting an energized electric cable with the drill.
- Do not use the tool when wearing loose-fitting clothes, necklaces or with long hair that could become caught in the tool, causing **serious enjuries**.
- Never point the tool in the direction of people.
- Do not use the drill with a leg over the handle or with one hand only. Kickback, caused by a blocking of rotation, could cause **serious enjuries**.
- Do not inspect, clean or change the bits while the oil is in pressure. Always put off the hydraulic source.
- Do not work with your face near the bit.
- Do not use the tool if it is an unstable or unbalanced position, on ladders or unstable supports.
- Do not use the tool connected to sources of hydraulic power which the hydraulic flow and pressure values are not known.
- Do not reach out trying to reach a far away points in particular if tool used on unstable or unbalanced position, on ladders or unstable supports.

## FURTHER SAFETY MEASURES

Always wear: helmet, goggles, ear defenders, protective gloves and safety footwear.

Send incautions spectators or unauthorized people away from the work place.

Keep the drill clean and dry. This ensures a firm grip.

Keep in good conditions and regularly check the wear state of bits and chisels.

Always connect the power pack hoses (or those of other power sources) to the hammer drill before starting the engine.

## BEFORE WORKING

### CONNECTION OF THE TOOL TO THE POWER PACK OR OTHER HYDRAULIC SOURCE

1. Lay down the flexible hydraulic hoses avoiding the contact of the couplers with the mud or dirt.
2. Lay the tool on a clean surface. Make sure that the tool is in perfect condition and that bits are well installed and that the spring return of the trigger is perfectly efficient
3. First connect the flexible hoses to the power pack whose engine must be OFF. Connect the female coupler of the hose to the male coupler of the power pack, then connect the other hose.

#### NOTE !

IF CORRECTLY INSTALLED, THE MALE COUPLER INSTALLED ON THE POWER PACK IS THE ONE CORRESPONDING TO THE PRESSURE LINE, WHERE THE OIL "GETS OUT" FROM THE POWER PACK, THE CORRECT SEQUENCE OF COUPLERS INSTALLATION DEPENDS ON THE POSITIONING OF THE FIRST MALE COUPLER THAT HAS TO BE INSTALLED ALWAYS ON THE P LINE OF PACK.

## USE OF THE HAMMER DRILL

### OPERATIONS

The **HD13** is a hydraulic hammer drill that can be powered by hydraulic power packs or by hydraulic circuits of earth-moving machines, mini excavators, trucks and vans etc...

Some versions are equipped with a lever that allows to reverse the rotation, this feature allows to easily retract the bit that may be blocked by a rebar into the material

The **HD13** hammer drill is a tool that is implicitly safe thanks to the absence of electricity, in particular its use is ideal when the operator works in high presence of water or mud or with feet in the water, so safe operations are guaranteed by the natural absence of sparks and risk of electric shocks, is ideal for all jobs in particular for the maintenance of utilities network (water, electric, telephone) and for underwater works.



Before using the tool, check the operational area, freeing it of objects that could cause obstruction and ensuring that there are not electric cables or pipes walled in or under the part to be drilled or demolished.

Prepare a sort of “working plan”, trying to foresee and avoid unexpected events, damage or, worse, accidents.

1 - Connect the tool to the hydraulic hoses of the power pack (or other hydraulic source). The pressure hose enters the hole in the tool at “IN” , is the port corresponding of the upper hole where on the short hose is installed a female quick coupler .

2 - The discharging/ return hose ( Tank) comes out of the tool from the tube at the hole marked “OUT”, is the port corresponding of the lower hole where on the short hose is installed a male quick coupler .

#### **NOTE !**

**IF THE HOSES OF THE POWER PACK ARE LEFT IN THE SUNLIGHT FOR A LONG TIME, THE EXPANSION OF THE OIL DUE TO THE HEAT COULD OBSTACLE THE PREVIOUS OPERATION. WHENEVER POSSIBLE, CONNECT THE ENDS OF THE HOSES TO ONE ANOTHER.**

3 - Choose the SDS MAX bits of the appropriate diameter

4 - Check the wear of the bits. If the bits in Widia or Tungsten are damaged or missing, even the best drill will give poor performance.

## **STARTING ON /OFF**

To start the tool, simply pull the trigger. To stop it, release the trigger. The number of revolutions of the bit can be changed according to the pressure exercised on the trigger. This characteristic facilitates the initial approach when drilling hard materials.

## **DRILLING**

Place the bit where the hole is to be made and pull the trigger. Do not force the tool. Light pressure gives best results. Keep the drill in place and prevent it from slipping out of the hole.

If the holes become blocked by splinters or particles, instead of forcing the tool, let it idle then pull the bit out of the hole, removing the rubble. By repeating this operation several times, the hole will be completely cleaned and bits will rotate freely.

## **END OF OPERATIONS**

1. LAY DOWN TOOL, TRY LIMITING CONTACTS WITH THE MUD AND DIRT
2. PUT THE FLOW LEVER OF THE POWER PACK IN **OFF** POSITION, THIS WILL TAKE AWAY FLOW TO TOOL
3. PUT THE PACK ENGINE OFF

4. DISCONNECT THE TOOL FROM THE OIL FLEXIBLE HOSE RELEASING **FIRST THE PRESSURE HOSE** ( IS THE UPPER HOSE NEAR THE HANDLE) CORRESPONDING TO THE HOLE WITH **P – IN** THIS OPERATION WILL PREVENT ACCIDENTAL PRESSURE TRAPPING INSIDE THE TOOL.
5. DISCONNECT THE FLEXIBLE OIL HOSE FROM THE POWER PACK
6. ROLL UP THE OIL FLEXIBLE HOSE IN CIRCLES OF ABOUT 60 CM OF DIAMETER, CONNECTING THE QUICK COUPLERS AT THE EXTREMITIES IN THE “HEAD/TAIL” WAY. THIS OPERATION WILL PROTECT THE OIL COUPLERS AGAINST IMPACTS OR SCRAPING AND WILL ALSO HELP IN KEEPING THE HOSE WELL ROLLED UP.
7. DETACH THE BIT FROM THE TOOL IF NEEDED, CONTROL THE STATE AND EFFICIENCY OF THE BIT AND DISCARD THOSE DAMAGED TO AVOID THAT CAN BE REUSE
8. STORE THE EQUIPMENT IN A SAFE PLACE REPAIRED FROM BUMPS AND ATMOSPHERIC AGENTS
9. IF THE EQUIPMENT SHOULD BE TRANSPORTED ON VEHICLES OR TRUCKS, TAKE CARE THAT IT IS LOADED AND BLOCKED IN A PROPER WAY FOR AVOIDING TILTING AND DAMAGES.

## **AFTER USE IN UNDERWATER WORKS**

### **AFTER THE USE IN UNDERWATER WORKS AND ABOVE ALL IN SALTY WATER**

- - AFTER USE THE TOOL MUST BE IMMEDIATELY ACCURATELY WASHED WITH FRESH WATER, INSISTING IN THE RECESSED CAVITIES AND HIDDEN POINTS WHERE SALT MAY NEST
- - THEN WITH AN AIR GUN ACCURATELY REMOUVE ALL TRACES OF WATER ( THE FRESH WATER )
- - THEN SPRAY TOOL WITH **WD40** OR **CRC** OR OTHER DEWATERING MOISTURE RUST NEUTRALISING PRODUCT
- - SPRAYING WELL **WD40** OR **CRC** INSISTING IN THE RECESSED CAVITIES AND HIDDEN POINTS
- - THEN BETTER WRAP TOOL IN A PLASTIC WRAP TO AVOID ANY CONTACT WITH METAL AND SALTY AIR
- - IF POSSIBLE PLACE TOOL ON WOOD AND PLASTIC SURFACE ( NEVER ON METAL SURFACE) IN A DRY PLACE THIS WILL PREVENT GALVANIC OXIDATION

## **MAINTENANCE AND CARE OF THE PRODUCT**

### **CLEANING OF THE TOOL**

THE TOOL CLEANING IS ESSENTIAL FOR THE GOOD FUNCTIONING OF THE EQUIPMENT. A CLEAN PRODUCT WILL IMMEDIATELY ALLOW TO FIND OIL LEAKS OR CAUSES OF MALFUNCTIONING. A CLEAN TOOL IS ALSO MORE COMFORTABLE FOR THE OPERATOR AND GUARANTEES A FIRM GRIP.

CLEANING WITH CLOTHS OR PAPER THE TOOL CAN BE CLEANED WITH A DAMP RAG, USING A BRUSH WITH GASOHOL OR AN AIR GUN FOR ELIMINATING ALL TRACES OF DIRT AND OIL

CLEAN IN PARTICULAR THE RECESSED POINTS AND CAVITIES AND THE CONNECTION SURFACE OF THE QUICK COUPLERS.

WITH THE TOOL PERFECTLY DRY, SPRAY A PROTECTIVE-DEWATERING PRODUCT (**CRC-or WD40**) ON THE TOOL AND ON THE QUICK COUPLERS.  
DRY UP COMPLETELY THE TOOL HANDLE TO GUARANTEE A FIRM GRIP

## **PERIODICAL CONTROLS**

### **EVERY TIME THE EQUIPMENT IS USED :**

1. CONTROL THAT THE TRIGGER RETURN SPRING IS EFFICIENT , AND THAT THE SCREWS, THE VALVES, AND ALL COMPONENTS ARE WELL INSTALLED AND EFFICIENT, IN CASE SOMETHING IS DAMAGED IMMEDIATELY DISCARD THE PART OR INFORM YOUR FOREMAN SO THE PARTS WILL NOT BE REUSED
  2. CLEAN THE TOOL AND ITS HOSES AND THE REST OF THE EQUIPMENT
- 3 - PERFORM A GENERAL INSPECTION OF ALL THE EQUIPMENT

### **MAINTENANCE OF THE OIL FLEXIBLE HOSE**

#### **INSPECTION OF THE HOSE**

- Lay the flexible hoses on the floor and control if there are oil leaks and the hose surfaces are integral without peeled sections showing metallic braid with broken steel wires.
- the presence of little sections of wire braid can be tolerated only if the wires are not broken and still braided.
- Control the pressed bushing at the extremity of the hydraulic hoses and discard immediately hoses showing bending, squeezing, or deformations.
- Check that the quick couplers are well dry, without oil leaks and that the knurled bushing on the female quick coupler is intact and can slide freely during the connections. The male coupler should be intact, without dents and deformations. If you try to force the connection of a damaged male coupler, this will damage irremediably also the female.
- If the oil flexible hose and quick couplers show oil leaks, even if the couplers are well screwed into the hose fittings, they should be immediately substituted with new parts.
- Replace hoses that show squeezing, unnatural bending, deformations, swellings, etc...

### **CARE AND MAINTENANCE OF THE OIL FLEXIBLE HOSES**

The flexible hose can be cleaned with a hydro cleaner or pressure washer after having laid it on a clean surface. Clean with the water jet in particular near the area of the clips where the dirt is going to deposit.

Move the hoses and wash completely in particular the quick couplers.

Blow the hoses with an air gun in particular in the area of the quick couplers.

Roll up the flexible hoses in a roll having a diameter of about 60-70 cm and connect the quick couplers at the ends in the "head/tail" way. This operation will protect them against impacts or scraping.

Place the hose in a safe and dry place, protected from bumps and weather



IF A FLEXIBLE HOSE FULL OF OIL REMAINS UNDER THE SUN, THE OIL EXPANSION DUE TO THE HEAT CAN CAUSE A PRESSURE INCREASE AND PREVENT THE CONNECTION OF THE QUICK COUPLERS. TO DECREASE PRESSURE, LOOSEN THE QUICK COUPLERS, DRIPPING SOME OIL DROPS DE-PRESSURIZING THE HOSE.

**NOTE !**

THE FLEXIBLE HOSE ALWAYS REMAINS FULL OF OIL THAT, DEPENDING ON THE HOSE LENGTH, CAN HAVE A RELEVANT VOLUME. IF YOU CHANGE THE HYDRAULIC OIL IN THE POWER PACK, IT IS RECOMMENDED TO REPLACE ALSO THE OIL IN THE HOSES.  
THIS WILL ASSURE A FULL REPLACEMENT AND AVOID THE CONTAMINATION OF THE NEW OIL.

## DISPOSAL AND SCRAPPING

**IMPORTANT**

THE HYDRAULIC OIL –  
HYDRAULIC OIL FILTERS –  
ENGINE OIL –  
ENGINE OIL FILTERS –

BATTERIES OF THE POWER PACKS  
ACID OF THE BATTERIES  
FLEXIBLE HOSES FULL OF OIL  
ALL FUELS

## ARE DANGEROUS WASTES

THAT MUST BE DISPOSED ACCORDING TO THE LOCAL REGULATION OF YOUR COUNTRY OR MUNICIPALITY



DON'T THROW AWAY THE LIQUIDS AND MATERIALS OF THE ABOVE-MENTIONED LIST. THE INFRINGEMENT OF THE RULES REGARDING THE DISPOSAL OF DANGEROUS WASTES IMPLIES LEGAL RESPONSIBILITIES.

Also the storing and charging/discharging management of the materials of the above-mentioned list have to be run according to the specific regulation.

For information about the handling and disposal of the dangerous wastes contact the ENVIRONMENT department of your municipality.

**NOTE !**

Except for the liquids and materials of the previous list, the other components of the products manufactured by **DOA** are fabricated with recyclable materials that can be stored, disposed and scrapped without particular cautions.

**MATERIALS AND COMPONENTS USED BY DOA DO NOT CONTAIN ASBESTOS OR OTHER TOXIC ELEMENTS THAT REQUIRE SPECIAL CAUTION FOR THEIR USE.**

## REPAIR

### DISASSEMBLY – INSPECTION OF THE PARTS – REASSEMBLY



DOA HYDRAULIC TOOLS ARE PROFESSIONAL PRODUCTS THAT SHOULD BE REPAIRED ONLY BY QUALIFIED PERSONNEL.

THE TOOL REPAIR MAY REQUIRE TECHNICAL LITERATURE AND INSTRUMENTS FOR THE CONTROL OF THE HYDRAULIC VALUES AND AN ADEQUATE HYDRAULIC SOURCE NECESSARY FOR CARRYING OUT THE TOOL FUNCTIONING TESTS.

IT IS THEREFORE ADVISABLE NOT TO START THE COMPLETE DISASSEMBLY OF THE PRODUCT IF YOU ARE NOT A TECHNICIAN AND IF PROFESSIONAL TOOLS AND EQUIPMENT ARE NOT AVAILABLE

### REPAIR OF PRODUCTS UNDER WARRANTY

**IMPORTANT**

IF THE PRODUCTS ARE STILL UNDER WARRANTY, THE REPAIRS MUST BE CARRIED OUT ONLY BY DOA AUTHORIZED SERVICE AGENTS OTHERWISE THE WARRANTY WILL BE AUTOMATICALLY NULLIFIED.

## GENERAL INFORMATION

Although we recommend that the repairs have to be carried out only by authorized DOA service agents, some minor repairs can be carried out also by other engineers, in this case follow these instructions:

### BEFORE DISASSEMBLY

- Clean accurately the product and remove any trace of dirt and solidified concrete.
- Keep available a clean working surface, paper, rags, tools, an air gun, a rubber hammer, a brass punch, a vice with soft protection for the jaws, a clean container for collecting the tool oil.
- Keep available an exploded view of the tool and part list.
- Consider that when the tool is completely disassembled, it's recommended to replace all exposed seals.

**NOTE !**

OFTEN THE CAUSE OF FAILURE IS NOT DUE TO PROBLEMS OF THE HYDRAULIC TOOLS, BUT TO PROBLEMS OF THE HYDRAULIC CIRCUITS WHICH COULD NOT HAVE PRESSURE AND FLOW CORRECT VALUES. IF YOU SUPPOSE THIS, DO NOT DISASSEMBLE THE TOOL, DO NOT MAKE EXPERIMENTS AND CONTACT THE NEAREST AUTHORIZED DOA CENTRE.

## GENERAL PRE-INSPECTION

- CONTROL THAT THE TOOL IS INTEGRAL AND COMPLETE, AND THAT ALL BOLTS AND NUTS ARE IN THEIR PLACE AND WELL TIGHTENED.
- CHECK THAT POSSIBLE SAFETY DEVICES AND THE RETURN SPRING ARE EFFICIENT, WITHOUT DEFORMATIONS AND IN THEIR ORIGINAL STATE. IF THEY HAVE BEEN MODIFIED OR REPAIRED ADAPTING THEM, DISCARD THEM AND ORDER NEW PARTS.
- IF SAFETY OR WARNING STICKERS ARE DAMAGED, ILLEGIBLE OR MISSING, ORDER NEW PARTS CHECKING THE PART NUMBER ON THE TOOL PART LIST.
- CONTROL THE ACCESSORIES:, HYDRAULIC FLEXIBLE HOSES AND QUICK COUPLERS ARE OF THE RIGHT TYPE AND INTEGRAL, ORIENTED IN THE RIGHT WAY AND THEY ARE NOT THE CAUSE OF THE PROBLEMS.
- CONTROL THE QUICK COUPLERS ON THE TOOL AND ON THE FLEXIBLE HOSES, MAKE SURE THEY ARE CORRECTLY INSTALLED, THAT THEY CAN BE CONNECTED IN THE RIGHT WAY TO ASSURE THE RIGHT OIL DIRECTION.
- CONTROL THE FLEXIBLE HOSES, DISCARDING THOSE DAMAGED, WORN, SQUEEZED, ETC., CONTROL ALSO THAT THERE ARE NOT EXPOSED BRAIDS.

## DISASSEMBLY

- REMOVE THE PIG-TAIL HOSES OR THE QUICK COUPLERS FROM THE TOOLS, MEMORIZING THE ORIGINAL POSITION OF THE PARTS. REMIND THAT THE FEMALE QUICK COUPLERS SHOULD BE INSTALLED ON THE TOOL IN THE HOLE WITH **P** PUNCHED (OIL ENTERS THE TOOL), COLLECT THE DRIPPING OIL IN A CLEAN CONTAINER. CHECK IF THE OIL IS DIRTY, OR WITH IMPURITIES, THIS WILL HELP IN FINDING SOME CAUSES OF PROBLEMS.
- IF A VICE IS USED FOR HOLDING THE TOOL, ALWAYS COVER THE JAWS OF THE VICE WITH SOFT PROTECTIONS, AND BLOCK THE TOOL IN ITS MORE SOLID POINT, FOR NOT DEFORMING THE PARTS.
- IF IT IS POSSIBLE TO MEMORIZE THE ORIGINAL POSITION OF THE SCREWS AND THEIR TENSION.
- IF IT IS POSSIBLE TO DISASSEMBLE ONLY THE PART INVOLVED IN THE PROBLEM, MEMORIZING THEIR ORIGINAL POSITION AND THE ORIENTATION OF THE SEALS.

### **IMPORTANT**

THE HYDRAULIC COMPONENTS OF DOA PRODUCTS ARE MANUFACTURED WITH FINE WORKMANSHIP AND STRICT TOLERANCES. BE CAREFUL NOT TO DEFORM AND DROP THEM. IT IS COMPULSORY TO KEEP EVERYTHING CLEAN. WHEN IT IS POSSIBLE INSTALL PARTS WITH MORE THAN ONE INSTALLABLE POSITION, IN THE ORIGINAL POSITION.

## HYDRAULIC COMPONENTS INSPECTION



THE HYDRAULIC MOTOR SHOULD NEVER BE DISASSEMBLED. IF THE MOTOR SHOWS OIL LEAKS OR OTHER DAMAGES IT MUST BE SHIPPED TO DOA FOR REPAIR

### SEALS - O-RINGS

- CONTROL THE CONDITION AND AREA OF WEAR, TRYING TO FIND THE CAUSE (DIRTY OIL, EXCESS OF TURNS, OTHER). IT IS ALWAYS BETTER TO REPLACE ALL SEALS THAT HAVE BEEN DISASSEMBLED, IN PARTICULAR THE "DYNAMIC SEALS", WHICH SEAL MOVING OR ROTATING PARTS. THESE SEALS ARE MORE SUBJECT TO WEAR.

**NOTE !**

IF WORKING PROBLEMS REOCCUR OVER AND OVER, THE CAUSE OR CAUSES OF MALFUNCTIONING ARE PROBABLY IN THE HYDRAULIC CIRCUIT. FOR SOLVING THESE PROBLEMS, CONTACT THE NEAREST DOA SERVICE AGENT. THE TROUBLE SHOOTING CHART PROBLEM-CAUSE-SOLUTION AT THE END OF THIS MANUAL GIVES SOME GENERAL INFORMATION ABOUT FUNCTIONING PROBLEMS LINKED WITH HYDRAULIC CIRCUITS.

**IMPORTANT**

**IF THE PRODUCT SHOULD BE SHIPPED:**  
DRIP THE TOOL COMPLETELY AND MAKE SURE THAT THE TOOL IS PERFECTLY SEALED AND THAT THERE ARE NOT OIL OR WATER LEAKS DURING THE TRANSPORT.  
USE AN ADEQUATE CONTAINER OR PACKAGING, SUFFICIENTLY STRONG AND PROPORTIONAL TO THE TOOL WEIGHT, IN ORDER TO PROTECT THE TOOL AND MAINTAIN ITS INTEGRITY.

**PROBLEM / CAUSE / SOLUTION**  
**TRUBLE SHOOTING CHART**

THE FOLLOWING TABLE IS A GUIDE FOR FINDING AND SOLVING THE MOST COMMON WORKING PROBLEMS. THE CAUSES OF MALFUNCTION OFTEN DEPEND ON INADEQUATE VALUES OF THE HYDRAULIC CIRCUIT. THE CONTROL OF THE :PRESSURE – FLOW - BACK PRESSURE VALUES SHOULD BE CARRIED OUT WITH PROPER INSTRUMENTS AND OIL TEMPERATURE OF 50° C.

**PROBLEM:**

**IT IS NOT POSSIBLE TO CONNECT THE HOSES TO TOOL**

<b>CAUSE</b>	<b>SOLUTION</b>
Quick couplers damaged or blocked or inadequate	Control and change as necessary
Tool or hoses pressurised by residual pressure	Verify and release some oil drops after having unscrewed the quick couplers

**PROBLEM:**

**THE TOOL SHAFT DOES NOT TURN**

<b>CAUSE</b>	<b>SOLUTION</b>
Power pack flow lever left in <b>OFF</b>	Put flow lever in <b>ON</b> delivering flow to tool
Problems of flow circulation	Control hoses, quick couplers and their installation sequence,
The trigger or the <b>ON OFF</b> valve are broken or blocked	Control and repair
Broken hydraulic motor or broken drive shaft	Control / repair or contact the nearest DOA service agent

**PROBLEM**

**THE BIT TURNS BUT THERE ARE POOR PERFORMANCES –  
TOOL HAS NO POWER**

<b>CAUSE</b>	<b>SOLUTION</b>
The flow control valves integrated in the tool are dirty, damaged or blocked	Control, clean or change
The power pack does not give sufficient pressure The power pack has low setting of the relief valve	Control the power pack pressure delivery Increase setting of relief valve of power pack
Tool broken	Control and contact the nearest DOA service agent



**PROBLEM:****THE TOOL SPEED IS TOO HIGH OR TOO LOW**

<b>CAUSE</b>	<b>SOLUTION</b>
The tool trigger and its ON OFF valve are broken	Control, clean, repair or change
The power pack gives low flow, insufficient flow to tool – High back pressure	Control the flow delivery of power pack in case contact the nearest DOA service agent
Broken tool or broken power pack or bad oil circulation	Control or repair and contact the nearest DOA service agent
Back pressure too high	Control and reduce hose length

**PROBLEM:****TOOL WORKS WELL BUT THERE ARE POOR PERFORMANCES**

<b>CAUSE</b>	<b>SOLUTION</b>
Drilling bits are inadequate to material or to tool speed – Bad state of bit cutting plaquettes or plaquette dull	Control and contact the nearest DOA service agent
The material has plastic inside or bit has encountered a steel rebar	Control if material is adequate to tool work or change position of hole
High back pressure, hoses too long	Control and repair , in case unblock the devise with a hand type system then continue with tool

**PROBLEM:**

**THE TOOL BIT KEEPS TURNING ALSO WHEN TRIGGER IS RELEASED**

<b>CAUSE</b>	<b>SOLUTION</b>
Broken return spring of trigger	STOP WORK IMMEDIATELY Control , repair and contact the nearest DOA service agent
The ON OFF valve of trigger is dirty	Control and clean, change and control hydraulic power pack oil filter

**WARRANTY**

All parts produced by DOA s.r.l. are guaranteed for a period of twelve months from the date of delivery to the final customer, against defect of: material, workmanship-assembly.

Cost of labour and transports are not covered by warranty and should be paid by the customer. Parts and complete components not produced by DOA such as engines, compressors, alternators, etc., are covered by the warranty of the manufacturer.

Batteries of power packs and “worn out “ accessories, such as chisel bits, drill bits, cut off discs, flexible hoses, quick couplers, or other accessories that have not an identification number, are covered by a **LIMITED WARRANTY OF THREE MONTHS** from the date of starting.

DOA reserves the right to substitute only those parts recognized to be defective after an inspection of DOA engineers under warranty at its own expenses and in its own plant.

If the repairs during the warranty period are performed by the customers, DOA will reject any charge for labour expenses.



**THE WARRANTY WILL BE AUTOMATICALLY VOIDED IF:**

- Repairs are performed using non original, adapted or modified parts.
- The maximum hydraulic values of pressure, back pressure and flow are exceeded, or the filtration and other operative conditions of the hydraulic circuits are inadequate to power DOA tools.
- If the tool has been modified or used in excessive heavy applications or different from its natural applications.
- If the attached WARRANTY CARD is not properly filled and mailed to DOA.

In any case the warranty excludes any redraft or reimbursement for damages of any kind and there are not other explicit or implicit warranties besides the above mentioned one.

**FOR ANY CONTROVERSY, THE COMPETENT COURT IS IN COMO-ITALY**