# USE - SAFETY AND MAINTENANCE MANUAL

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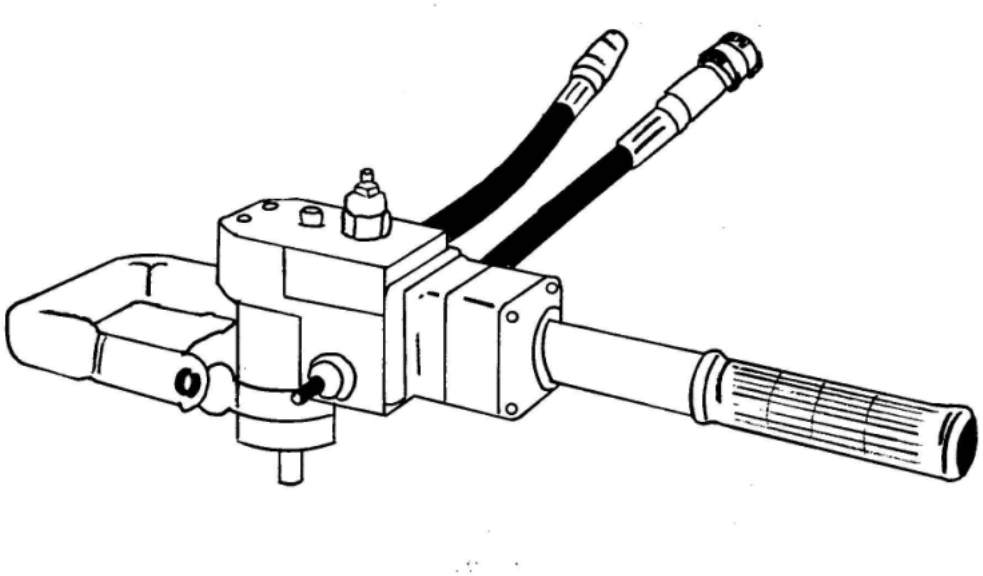

# AH 15

## HYDRAULIC ACTUATOR – DRIVE HEAD

**IMPORTANT**

READ MANUAL BEFORE USE

KEEP THIS MANUAL FOR FUTURE CONSULTATIONS


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# CONTENTS OF THE MANUAL

# INTRODUCTION

Dear customer,
congratulations for having purchased a **DOA** product. The machine 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.**



**DATA, ILLUSTRATIONS AND CHARACTERISTICS OF THIS MANUAL ARE ONLY INFORMATIVE AND NOT BENDING. DOA RESERVES THE RIGHT TO MAKE MODIFICATIONS AT ANY TIME AND WITHOUT PREVIOUS NOTICE.**

# 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.

## IMPORTANT

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.

## DESCRIPTION OF THE PRODUCT

**AH 15** is a tool designed to make the rotation, clock wise and counter clock wise, of devises that are normally rotated by hand.
The tool can develop an high rotation force that can be controlled by hand, in certain application is needed to install on the tool an appropriate system to contrast the reaction force and maintain the tool firm and steady for avoiding accidents. **AH 15** is equipped with two valves that allow the easy and quick regulation of the maximum torque and speed, the twist type control handle can dose the speed and reverse the sense of rotation as needed.
The tool immediately stops rotation when operator releases the handle this guarantees the total safety.

## TYPICAL APPLICATIONS

**AH 15** is used to rotate pipe drilling machines, open and close shutters of irrigation canals, lifting and lowering rail road devises, for activating spindles and mixers, to turn military devises etc..

## SPECIAL ACCESSORIES TO BE MADE ON REQUEST

On the **AH 15** shaft is possible to install different accessories like sockets, square drive sockets, adaptors etc that allow to connect the tool with the various organs to rotate.
Some of these accessories have to be made on purpose, for more information on accessories contact **DOA**.

## STANDARD ACCESSORIES AVAILABLE ON REQUEST

Metal box for the transport and care of all parts and accessories.

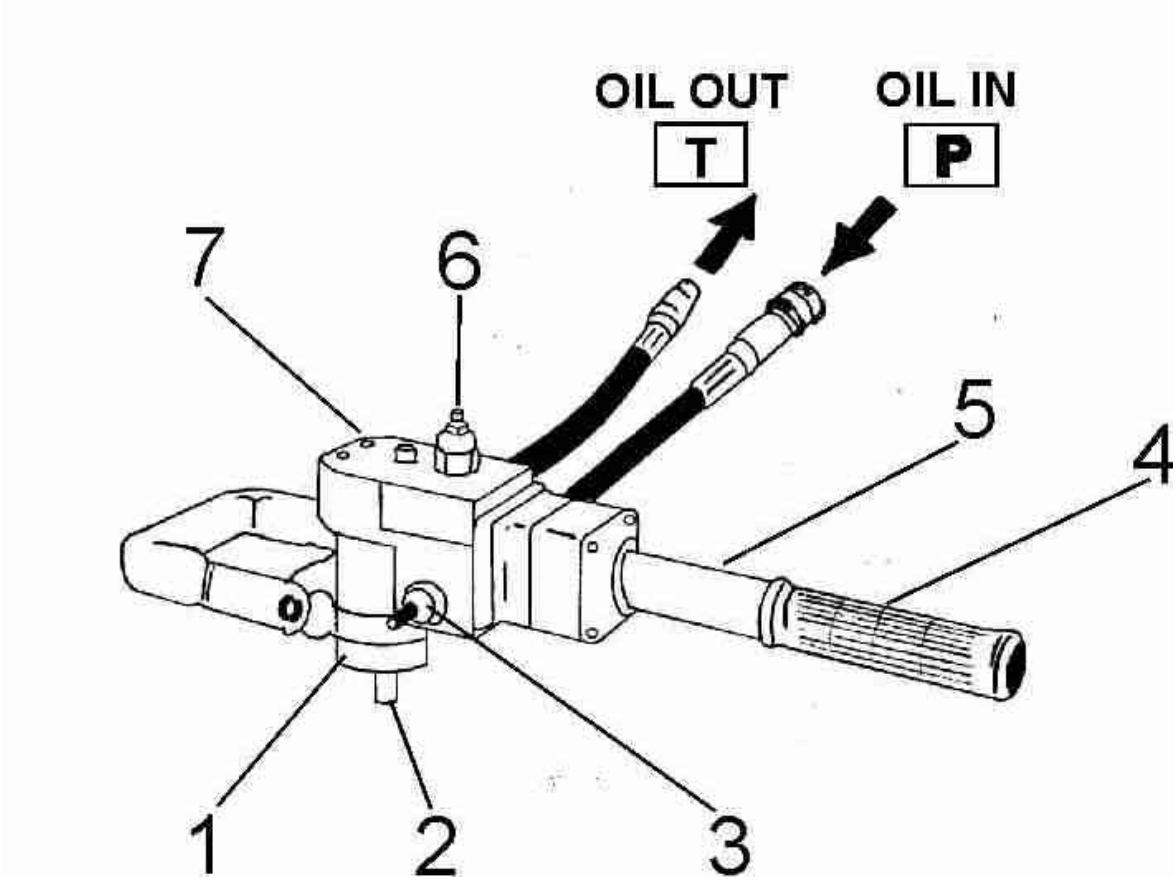
Detachable assist handle that allow the ideal tool control with two hands.

## TYPICAL POWERING MACHINES

Hydraulic power packs – mini excavators – trucks – all the vehicles equipped with a sufficient hydraulic circuit.

# AH 15 TECHNICAL CHARACTERISTICS

## GENERAL VIEW – MAIN COMPONENTS AND THEIR FUNCTIONS




1. **HYDRAULIC "GEROTOR" MOTOR:** The motor supplies a high torque with low speed, on the front face has two threaded holes that allow the installation of anti reaction systems.
2. **MOTOR SHAFT:** On the shaft is possible to install different adaptors or sockets to adapt the tool with the various devise to turn.
3. **VALVE FOR REGULATION OF SPEED / REVS:** It can adjust the maximum speed or revolution per minute as needed.
4. **TWIST TYPE CONTROL HANDLE:** It has 3 positions and works like the accelerator of the motor bikes:

**twisting it clock wise** **the tool turns clock wise – like screwing**
**twisting it counter clock wise** **the tool turns counter clock wise – like unscrewing**

The handle is type " dead man" that means that when the operator releases the handle the tool immediately stops rotation.

5. **CONTROL BAR:** It holds the twist handle and has an arm sufficiently long to allow an easy control.
6. **VALVE FOR REGULATION OF TORQUE:** It can adjust the maximum torque as needed.
7. **VALVE BLOCK:** In the block are contained the elements for the control, distribution and regulation of the tool.

# AH 15 TECHNICAL CHARACTERISITCS

## WEIGHT AND DIMENSIONS

| | |
|---|---|
| **WEIGHT** | **Kg. 6** |
| **HEIGHT** | **cm 18 without hoses** |
| **WIDTH** | **cm 7** |
| **LENGTH** | **cm 43** |
| **Ø OF THE SHAFT** | **mm 16** |

## PERFORMANCES

| | |
|---|---|
| **ROTATION** | **clock wise and counter clock wise** |
| **TORQUE min – max** | **0 – 8 KGM ( 84 Nm ) @ 140 bar oil pressure** |
| **SPEED min – max** | **0 – 600 giri/min @ 30 L/min oil flow** |
| **No of revolutions @ 10 L/min** | **0 - 200** |
| **No of revolutions @ 20 L/MIN** | **0 - 400** |
| **No of revolutions @ 30 L/min** | **0 - 600** |

## HYDRAULIC CHARACTERISTICS

| | |
|---|---|
| **FLOW** | **10-34 l/min** |
| **IDEAL FLOW** | **30 l/min** |
| **PRESSURE** | **max 150 bar** |
| **TOLERABLE BACK PRESSURE** | **max 90 bar** |
| **EHTMA GROUP** | **C – D** |

**IMPORTANTE**

**THE TOOL TORQUE IS PROPORTIONAL TO THE AVAILABLE HYDRAULIC PRESSURE , THE FIGURES IN THE ABOVE CHART ARE REFERRED TO PRESSURE OF 140 BAR**

# GENERAL SAFETY NORMS

## GENERAL SAFETY INSTRUCTIONS


**THE FOLLOWING INSTRUCTIONS ARE GENERAL SAFETY RULES AND HAVE TO BE RESPECTED IN EVERY WORKS WITH HAND TOOLS. WE RECOMMEND TO FOLLOW THEM CAREFULLY IN ORDER TO AVOID ACCIDENTS AND DAMAGES TO THE EQUIPMENT AND THINGS.**

- WEAR ALWAYS THE HARD-HELMET, SAFETY GOGGLES, GLOVES, SAFETY SHOES, EAR PROTECTIONS AND, WHEN IT IS PRESCRIBED, A DUST MUSK.

- WEAR TIGHT-FITTING CLOTHES AND AVOID OPERATING WITH SHORT TROUSERS OR T-SHIRTS, OR OTHER BARE PARTS OF THE BODY. PAY ATTENTION TO LONG LOOSE HAIR, GATHER THEM TO PREVENT THEY GET IN CONTACT AND TRAPPED IN MOVING PARTS.

- BEFORE OPERATING, PREPARE ALWAYS A WORKING PLAN THAT CONSIDERS AND FORESEES PROBLEMS, INTERRUPTIONS AND AVOIDS MOST OF ALL DANGEROUS SITUATIONS. THIS LITTLE OPERATION STRATEGY, GUARANTEES SAFETY AND IMPROVES PRODUCTIVITY

- WHEN WORKING IN TRENCHES PAY THE MAXIMUM ATTENTION WHEN YOU APPROACH THE TRENCH IN STEEP AND SLIPPERY POINTS FOR PREVENTING FALLS AND ACCIDENTS.

- WORK ONLY IN GOOD PHYSICAL AND MENTAL CONDITIONS. ALWAYS PAY THE MAXIMUM ATTENTION!

- WHEN YOU OPERATE IN DIFFICULT POSITIONS, DO NOT REACH OUT AND NEVER LEAN AGAINST THE TOOL. KEEP THE BALANCE ON YOUR LEGS.

- BE SURE THAT THE EQUIPMENT IS IN PERFECT WORKING CONDITIONS, WITHOUT OIL LEAKS.

- KEEP THE PROTECTION DEVICES ALWAYS IN GOOD CONDITIONS AND PRESERVE THE READABILITY OF THE SAFETY STICKERS.

- DO NOT WORK ON UNSTABLE OR ADAPTED SUPPORTS (SUCH AS OIL CANS, BOXES, WHEELBARROWS, ETC.). IF YOU NEED TO WORK IN ELEVATED POSITIONS, USE ONLY STABLE AND SAFE SUPPORTS APPROVED BY THE LOCAL SAFETY RULES.

- THE WORKING AREA MUST BE EXAMINED AND WELL-KNOWN. IF YOU WORK ALONG ROADS, MAKE WELL VISIBLE YOUR POSITION AND WARN THE TRAFFIC BY THE USE OF SIGNALS, FLASHING LIGHTS, OR OTHER PRESCRIBED ROAD SIGNS.

- WORK ONLY IF THE EQUIPMENT ENGINES ARE OUTSIDE OR IN A WELL VENTILATED POINT. THE INHALATION OF EXHAUST GAS CAN BE FATAL. THE WATER IS AN ELECTRICITY CONDUCTOR, THE CONTACT OF THE WATER WITH ELECTRIC LINES CAN CAUSE SERIOUS ACCIDENTS AND EVEN DEATH.

- PAY THE MAXIMUM ATTENTION WHEN YOU WORK NEAR ENERGIZED ELECTRIC LINES THAT CAN BE BURIED, WALLED OR HIDDEN. BE VERY CAREFUL ALSO TO GAS AND WATER PIPES, TELEPHONE LINES OR OTHER BURIED CABLES OR DUCTS.

- THE WORKING AREA MUST BE FREE FROM OBJECTS THAT MAY FALL, GET SPOILED, CATCH FIRE, MAKE TRIP UP OR MAKE THE OPERATION DIFFICULT OR DANGEROUS.

- WARN AND MOVE AWAY IMPRUDENT BYSTANDERS OR OTHER PEOPLE NOT AUTHORIZED OR INVOLVED WITH THE JOB.

- IF YOU WORK IN NARROW OR CLOSED ROOMS ALWAYS PLAN AN ESCAPE WAY OUT THAT MUST BE KEPT FREE.

- MAKE SURE THAT THE DEVISE THAT YOU ARE TURNING OR THE PIPE TO DRILL OR THE OPERATION POINT IS THE RIGHT ONE AND THAT THERE ARE THE PROPER AUTHORIZATIONS OF THE OWNERS BEFORE STARTING THE WORKS.

- BEFORE WORKING ALWAYS FORESEE THE EFFECT OF THE OPERATION YOU ARE DOING AND TAKE OPPORTUNE DEFENCES AND COUNTER MEASURES FOR PREVENTING POSSIBLE DAMAGES OR DANGEROUS SITUATIONS.

- BEFORE USING THE EQUIPMENT MAKE SURE AND PREVENT VEHICLES, MACHINES OR PEOPLE FROM PASSING ON THE EQUIPMENT HOSES OR HYDRAULIC CONNECTIONS

- ALWAYS CONNECT TOOLS TO THE OPERATING MACHINE OR POWER PACK BEFORE STARTING THE ENGINE.

- WHEN WORKING IN NOISY AMBIENT , BE SURE THAT YOUR VOICE MESSAGE OR WARNING OR OTHER SIGNAL GIVEN TO YOUR COLLEAGUES IT HAS REALLY BEEN UNDERSTOOD AND LISTEN . DO NOT TRUST TO ORAL MESSAGE GIVEN WHEN ENGINES OR OTHER NOISY EQUIPMENT ARE IN USE. **GOOD COMMUNICATION MEANS SAFETY**

- DO NOT INSPECT OR DISASSEMBLE THE TOOL WITH THE HYDRAULIC HOSES CONNECTED TO TOOL

- KEEP IN A SAFE DRY PLACE THIS MANUAL AND ITS ENCLOSURES, SO THEY CAN BE ALWAYS AVAILABLE FOR FUTURE CONSULTATIONS.

# WHAT NOT TO DO


**THE FOLLOWING RULES ARE GIVEN FOR DESCRIBING THE MORE COMMON ERRORS OR IMPROPER AND DANGEROUS USE OF THE TOOL.**
**SINCE IT IS IMPOSSIBLE TO FORESEE ANY ABUSE OR DANGEROUS SITUATIONS, THE RULES ARE NOT SUFFICIENT TO GUARANTEE THE TOTAL SAFETY.**
**IT'S RECOMMENDED TO USE ALWAYS THE MAXIMUM CAUTION IN EVERY CIRCUMSTANCES.**

## IN CASE OF DOUBT DO NOT RISK, BUT ASK YOUR FOREMAN.

## WHAT NOT TO DO

- DO NOT USE THE TOOL IF THERE COULD BE THE POSSIBILITY OF GETTING IN CONTACT WITH ENERGIZED ELECTRIC LINES OR PRESSURIZED PIPES.
- DO NOT START OR USE THE POWER PACK AND TOOL IN CLOSED ROOMS WITHOUT VENTILATION , BE CAREFUL IF THERE ARE STRANGE ODOURS, THEY MAY BE DANGEROUS GASES OR EXHALATIONS.
- DO NOT USE TOOL IF IT IS DAMAGED, IF THERE ARE OIL LEAKS OR SOME PARTS ARE MISSING OR WRONGLY INSTALLED.
- IF THE TOOL IS RE USED AFTER A LONG PERIOD, OR IF IT HAS BEEN USED BY OTHERS, DO NOT USE IT IF YOU HAVE NOT CONTROLLED THE TORQUE AND THE SPEED SETTING, THE TOOL COULD BE WRONGLY REGULATED CREATING DANGEROUS SITUATIONS.
- DO NOT START THE TOOL CONNECTED TO POWER PACKS OR OTHER MACHINES WHOSE MAXIMUM VALUES OF PRESSURE AND FLOW ARE NOT KNOWN. IF THE TOOL IS STARTED WITH FLOWS HIGHER THAN 34 l/min AND PRESSURE HIGHER THAN 150 bar, THIS CAN CAUSE THE BREAK OF THE EQUIPMENT AND EVEN ACCIDENTS.
- DO NOT ALLOW THE USE OF THE EQUIPMENT TO PEOPLE THAT ARE NOT TRAINED OR WHO HAVE NOT READ THIS MANUAL.
- DO NOT WORK IF YOU ARE NOT IN PERFECT PHYSICAL AND MENTAL CONDITIONS. DO NOT KEEP THE HEAD TOO CLOSE TO TOOL WHEN WORKING
- DO NOT WORK ALONE WHEN IT IS POSSIBLE, MAKE SURE THAT SOMEBODY KNOWS WHERE YOU ARE AND WHAT YOU ARE DOING.
- DO NOT CARRY OUT REPAIRS, INSPECTIONS OR CLEANING OF THE PUMP WITH THE HYDRAULIC HOSES CONNECTED OR EVEN WORSE WITH THE PUMP WORKING.
- DO NOT USE AND DISCARD IMMEDIATELY BADLY CONNECTED TO THE METAL ENDS. IMPROVISED FASTENINGS WITH WIRES OR CLAMPS SHOULD BE AVOIDED FOR PREVENTING ACCIDENTAL REMOVAL OF THE DISCHARGE HOSE WITH CONSEQUENT DANGEROUS SITUATIONS.

- DO NOT WORK, AND IF IT IS NECESSARY PAY THE MAXIMUM ATTENTION, WHEN YOU WORK ON STEEP AND SLIPPERY BANKS, WHICH COULD CAUSE VERY DANGEROUS FALLS INTO THE WATER.

- DO NOT PULL THE TOOL BY THE HOSES ALWAYS GRAB IT IN THE METAL PART .

- ONCE THE ROTATION OPERATION IS FINISH AND THE DEVISE HAS ARRIVED TO THE END OF ITS ACTION , DO NOT INSIST AGAINST THE END OF THE RACE. **FORCING THE DEVISE AGAINST THE BOTTOM CAN CAUSE DAMAGES TO THE EQUIPMENT**

# NEVER USE THE TOOL IF :

**THE SOCKETS OR OTHER SHAFT ADAPTORS ARE WRONGLY INSTALLED OR LOOSE OR ARE ADAPTED OR IMPROVISED OR NOT ADEQUATE TO THE OPERATION TO BE DONE.**

-

**THE SPRING RETURN OF THE HANDLE AND THE TWIST HANDLE ITSELF ARE NOT IN PERFECT EFFICIENCY AND OPERATIVE.**

-

**IF YOU ARE NOT EXACTLY AWARE AND SECURE ABOUT THE RESULT OF THE ACTION YOU ARE DOING WITH THE TOOL.**

**IF THE REACTION DEVISES THAT WERE INSTALLED HAVE BEEN REMOVED.**


**AH 15 IS A TOOL THAT CAN GENERATE A HIGH TORQUE THAT CAN BE CONTROLLED AND CONTRASTED MANUALLY.**
**FOR THE MAXIMUM SAFETY AND FOR AVOIDING ACCIDENTS IT IS BETTER TO INSTALL ON THE TOOL AN ANTI REACTION DEVISE THAT BLOCKS THE TOOL AND PREVENT ITS ROTATION.**
**THESE PARTS MUST BE MADE ON PURPOSE AS THEY HAVE TO BE ADEQUATE TO THE PART TO TURN.**

**DO NOT USE THE TOOL AND STOP IMMEDIATELY THE OPERATIONS IF THE SPRING RETURN OF THE HANDLE IS BROKEN OR IF IT IS NOT IN PERFECT EFFICIENCY.**

## CONTACT DOA FOR MORE INFORMATION IN THIS RESPECT.


**DO NOT USE THE TOOL WITH SOCKETS OR SQUARE DRIVES THAT ARE NOT PERFECTLY MADE FOR THE HUB TO TURN.**
**THE USE OF ADAPTED SOCKETS OR DRIVE SQUARES CAN CAUSE ACCIDENTS AND DAMAGE THE PARTS TO BE TURNED.**

# 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 its accessories are efficient and well installed.

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.


**IF CORRECTLY INSTALLED, THE MALE COUPLER OF 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 .**

4. Now connect the flexible hose to the tool, connecting first the return hose corresponding to the hole with a **T** or **OUT** symbol punched on the tool.

5. The hydraulic connection is now completed.

6. Start the power pack (or other hydraulic source ) leaving it at idle for a few minutes allowing engine and oil warm up.

7. Put the flow lever of the power pack to **ON** position making circulate the oil. Leave the equipment in this condition for a few minutes without using the tool and warming engine and the hydraulic oil. The tool is now ready to use. Check that there are not hydraulic oil leaks.


**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. IN THIS CASE THE HOSES SHOULD BE DEPRESSURIZED UNSCREWING THE QUICK COUPLERS DRIPPING SOME OIL DROPS.**


**IF THE AMBIENT TEMPERATURE IS VERY COLD, THE HEATING OPERATION SHOULD BE PROLONGED UNTIL THE HYDRAULIC OIL TANK WILL BE WARM TOUCHING IT. DO NOT WORK IMMEDIATELY IF THE OIL IS COLD. AT LOW TEMPERATURES THE OIL CAN BE VERY VISCOUS (HARD) AND CAN CAUSE HARMFUL INCREASES IN THE BACK PRESSURE AND DIFFICULT SUCTION OF THE PUMP ( CAVITATION PHENOMENON ).**

# USE OF THE TOOL


**AH 15 IS A TOOL THAT DEVELOPS A HIGH ROTATION FORCE THAT ALLOWS TO ELIMINATE THE FATIGUE TO MAKE THE OPERATIONS BY HAND. FOR ITS FUNCTION THE TOOL MUST HAVE HIGH TORQUE FORCE , THIS FORCE CAN BE ADJUSTED IN BOTH SPEED AND TORQUE THESE VALUES SHOULD BE ADEQUATE AND JUST A LITTLE HIGHER TO THE WORK TO BE DONE . IT IS IMPORTANT THAT THE OPERATOR EVALUATE THE TYPE OF OPERATION TO DO AND CONSEQUENTLY EVALUATE THE NECESSARY SPEED AND TORQUE AND WHEN THE OPERATION CAN COMMENCE OR STOP IT. NOT TO DO SO MAY RESULT IN DAMAGE TO THE EQUIPMENT AND CAUSE ACCIDENTS.**

THE MAJOR AND MORE COMMON RISKS DERIVING FROM IMPROPER USES ARE THE FOLLOWING:

## TOO HIGH FORCE / TORQUE APPLIED OR NECESSARY

**RISK:**

NECESSITY TO CONTROL AND CONTRAST THE REACTION MANUALLY OR BY THE USE OF ANTI REACTION DEVISES.

COUNTERBLOW / RECOIL ON THE OPERATORS ARM.

WHEN TO ROTATION OPERATION HAS ARRIVED TO THE END THE RISK IS THAT TO FORCE THE END OF THE RACE OF DEVISES CAN CAUSE DAMAGES.

## ROTATION SPEED TOO HIGH

**RISK:**

HIGH SPEED OR EXCESS OF REVOLUTIONS CAN CAUSE PREMATURE WEAR OF THE DRILLING BITS USED WITH THE PIPE DRILLING MACHINES.

HIGH SPEED COULD SLAM VIOLENTLY THE DEVISES AT THE END OF THE RACE.

# OPERATIONS

READ AND OBSERVE THE INSTRUCTIONS OF THE PREVIOUS PARAGRAPHS.

- **GENERAL SAFETY NORMS**
- **WHAT NOT TO DO**

**NOTE !**

**AH 15 IS SUPPLIED WITHOUT THE ADAPTOR SOCKET, WILL BE OBVIOUSLY NECESSARY TO INSTALL AN OPPORTUNE ADAPTOR SOCKET THAT CONNECT THE TOOL SHAFT WITH THE HUB OF THE ORGAN TO BE TURNED.**
**IN CASE OF DOUBT OR FOR MORE INFORMATION CONTACT DOA.**

1. AFTER HAVING STARTED THE POWER PACK AND CONNECTED THE OIL HOSES TO TOOL, WITHOUT ENGAGING THE TOOL MAKE SOME FREE ROTATION IN ORDER TO GET FAMILIAR WITH TURNING EFFECT CONSEQUENT TO THE HANDLE TWISTING OPERATIONS.

**TWISTING THE HANDLE COUNTER CLOCK WISE ( LIKE ACCELERATING A MOTOR BIKE ) THE TOOL WILL TURN THE DEVISE CLOCK WISE**

**LIKE SCREWING** ( just like the action of a electric drill )

**TWISTING THE HANDLE CLOCK WISE ( LIKE DECELERATING THE MOTOR BIKE ) THE TOOL WILL TURN THE DEVISE COUNTER CLOCK WISE**

**LIKE UNSCREWING**

2. AFTER GETTING FAMILIAR WITH THE SENSE OF ROTATION, POSITION THE TOOL ON THE HUB OF THE DEVISE TO BE ROTATED
3. AFTER HAVING SECURELY POSITIONED THE TOOL ON THE DEVISE ( IF NECESSARY USING AN OPPORTUNE COUNTER REACTION DEVISE ) SLOWLY TWIST THE HANDLE.

**TWIST HANDLE <u>CLOCK WISE</u> TO <u>SCREW THE ORGAN</u>**

**TWIST HANDLE <u>COUNTER CLOCK</u> WISE TO <u>UNSCREW THE ORGAN</u>**

NOTE !

**IF A PIPE DRILLING MACHINE IS USED THE SENSE OF ROTATION IS JUST ONE , IN THIS APPLICATION THE HANDLE SHOULD NORMALLY BE TURNED COUNTER CLOCK WISE.**

4 ROTATE THE DEVISE AS NEEDED OBTAINING THE ACTION EFFECT.


**ONCE THE ROTATION HAS BEEN COMPLETED DO NOT INSIST USELESSLY ON THE END , THIS TO AVOID STRESS TO THE TOOL AND TO THE DEVISE JUST TURNED.**

**THE HYDRAULIC MOTOR CAN GET HOT DURING PROLONGED OPERATIONS, AVOID CONTACTS OF THE MOTOR WITH BARE HANDS TO PREVENT BURNS.**

5 IF THE TOOL HAS NO SUFFICIENT TURNING FORCE WILL BE NECESSARY TO ADJUST FORCE, OR SPEED, FOLLOWING THE INSTRUCTIONS AS DESCRIBED IN THE FOLLOWING PARAGRAPH.

## REGULATION OF THE ROTATION FORCE – TORQUE

**A** THE VALVE THAT CONTROLS THE FORCE IS A HYDRAULIC RELIEF VALVE INTEGRATED IN THE VALVE BODY OF THE TOOL.

**B** UNSCREW THE NUT THAT BLOCKS THE VALVE REGULATION SCREW.

**C** TURN THE CENTRAL SCREW

**CLOCK WISE TO INCREASE FORCE/TORQUE**
**COUNTER CLOCK WISE TO DECREASE FORCE/TORQUE**

**D** AFTER HAVING DONE MORE ATTEMPT IN ORDER TO OBTAIN THE NECESSARY FORCE , BLOCK THE LOCKING NUT OF THE VALVE.


**THE MOMENT WHERE THE PIPE DRILLING BITS IS GETTING OUT OF THE MATERIAL OR WHEN THE DEVISE HAS ARRIVED TO THE END , THIS MOMENT CORRESPOND TO THE MAXIMUM REACTION - RECOIL OF THE TOOL, BE CAREFUL NOT TO GET KICKED AND TO AVOID DAMAGES AND ACCIDENTS.**

## REGULATION OF SPEED – N° OF REVOLUTIONS

**A** THE VALVE THAT CONTROLS THE SPEED IS A CARTRIDGE INTEGRATED IN THE VALVE BODY OF THE TOOL .

**B** UNSCREW THE NUT THAT BLOCKS THE VALVE REGULATION SCREW.

**C** TURN THE CENTRAL SCREW

**CLOCK WISE TO REDUCE SPEED**

**COUNTER CLOCK WISE TO INCREASE SPEED**

**D** AFTER HAVING DONE SOME TRAILS FOR OBTAINING THE RIGHT SPEED, BLOCK THE LOCKING NUT OF THE VALVE.

## END OF OPERATIONS

1. LAY THE TOOL LIMITING CONTACTS WITH THE MUD AND DIRT, IF IT IS POSSIBLE.

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** CORRESPONDING TO THE HOLE WITH **P – IN** PUNCHED ON THE TOOL. 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 ACCESSORY FROM THE TOOL IF NEEDED, CONTROL THEIR STATE AND EFFICIENCY AND DISCARD THOSE DAMAGED TO AVOID THAT CAN BE REUSED.

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.

# CLEANING OF THE TOOL

**THE CLEANING IS VERY IMPORTANT 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 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 TWIST HANDLE AND ITS RETURN SPRING, THE SCREWS, THA VALVES, AND ALL COMPONENTS ARE WELL INSTALLED AND EFFICIENT, IN CASE SOMETHING IS DAMAGED IMMEDIATELY DISCARD THE APRT 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 ACCESSORIES

**IMPORTANT**

**A CORRECT MAINTENANCE OF THE ACCESSORIES LIKE ADAPTORS, SOCKETS, SHAFT OR OTHER COUPLING DEVISES PRESERVE THE EFFICIENCY AND GUARANTEES THE SAFETY AND THE BEST PERFORMANCES ACCESSORIES NOT WELL PRESERVED OR IN BAD CONDITIONS MAY MAKE THE OPERATION DIFFICULT AND CAN ALSO CAUSE ACCIDENTS OR DANGEROUS SITUATIONS.**

**IN ORDER TO OBTAIN THE BEST PERFORMANCE IT'S IMPORTANT TO USE THE RIGHT ACCESSORY. REMIND THAT A WRONG OR INADEQUATE ACCESSORY CAN CAUSE ACCIDENTS AND MAKE THE OPERATIONS DIFFICULT.**

**ACCESSORIES MUST BE OFTEN INSPECTED WITH CARE ELIMINATING PROMPTLY THOSE WHICH ARE FAULTY OR NON MAINTAINABLE, ALSO FOR AVOIDING THAT OTHER PERSONS MAY INCAUTIOUSLY USE THEM AGAIN.**

## 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 SCRAPING

**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.**

## REPARATION 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.
- 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 PUMP 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 AT A TEMPERATURE OF **ABOUT 40° C.**

**PROBLEM:**

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

| ***CAUSE*** | ***SOLUTION*** |
|---|---|
| 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

| ***CAUSE*** | ***SOLUTION*** |
|---|---|
| Power pack flow lever left in OFF | Put flow lever in ON delivering flow to tool |
| Problems of flow circulation | Control hoses, quick couplers and their installation sequence, |
| The device too be turned is blocked or too hard to rotate | Control and repair , in case unblock the devise with a hand type system then continue with tool |

| | |
|---|---|
| Broken hydraulic motor | Control and contact the nearest DOA service agent |
| Broken control valve block or ON/OFF twist handle defective | Control and contact the nearest DOA service agent |
| The speed control valve is regulated too low to zero turns | Regulate conveniently the speed control valve |

**PROBLEM**

## THE TOOL SHAFT TURNS BUT THERE ARE POOR PERFORMANCES THERE IS NO FORCE

| ***CAUSE*** | ***SOLUTION*** |
|---|---|
| The torque control valve is regulated too low to zero force | Regulate conveniently the torque control valve increasing the force |
| The power pack does not give sufficient pressure<br>The power pack has low setting of the relief valve | Control the power pack pressure delivery<br><br>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

| ***CAUSE*** | ***SOLUTION*** |
|---|---|
| The speed control valve setting is too low | Regulate conveniently the speed control valve |

| | |
|---|---|
| The power pack gives low flow, insufficient flow to tool | Control the flow delivery of power pack in case contact the nearest DOA service agent |
| Broken control valve block or ON/OFF twist handle defective | Control and contact the nearest DOA service agent |
| Broken hydraulic motor or tool or defective power pack | Control and contact the nearest DOA service agent |

**PROBLEM:**

## THE TOOL WORKS ERRATIC OR AT INTERVALS

| ***CAUSE*** | ***SOLUTION*** |
|---|---|
| Tool broken or defective | Control and contact the nearest DOA service agent |
| Problems of flow circulation | Control hoses, quick couplers and their installation sequence, |
| The device too be turned is blocked or too hard to rotate or is rusty | Control and repair , in case unblock the devise with a hand type system then continue with tool |
| Broken control valve block or ON/OFF twist handle defective | Control and contact the nearest DOA service agent |
| Broken control valve block or ON/OFF twist handle defective | Control and contact the nearest DOA service agent |

# 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.**