



fresmak

ARNOLD

MORDAZAS DE ALTA PRESION

MANUAL DE INSTRUCCIONES
MORDAZA ARNOLD-HIDRÁULICA

C

SERVICE MANUAL
ARNOLD-HYDRAULIC VICE

E

MANUEL DE SERVICE
ETAU ARNOLD-HYDRAULIQUE

F

BEDIENUNGSANLEITUNG
ARNOLD SCHRAUBSTOCK
MECHANISCH/HYDRAULISCH

D



SERVICE MANUAL

- ♦ This **ARNOLD** precision machine vice is guaranteed for quality, and workmanship. It has been prepared for its correct operation through our established final assembly and test procedures. Care should be taken that it is used correctly to ensure the operators and other persons safety in the workplace.
- ♦ Each person involved in the unpacking, handling, operation and maintenance of this vice is required to have to read this service manual. This is to ensure safety at work compliance, and the correct understanding of the vice operation.
- ♦ The operator has to be minimum 18-years of age, it must be ensured that the operator is capable or has to be trained on the correct vice operation by someone more senior. The operator must be able to prove his capabilities for its handling and operation and have read and understood this service manual and keep it available for reference.

Personal protection.-

- ♦ Security shoes (steel toecap type).
- ♦ Protecting gloves.
- ♦ Machine guards, safety glasses.

Workplace .-

- ♦ The vice must be clamped firmly to the machine table to avoid movements during a machining operation.
- ♦ Ensure the vice jaw movements are not impeded in any way, keep the work area tidy.

Moving the vice.-

- ♦ Care should be taken when moving the vice. The operator must keep clear of the crane or other lifting equipment used.

Unpacking the vice .-

- ♦ When unpacking the vice it should be with the use of a crane with a magnet or other safe system. Care should be taken that the load is correctly distributed before fully lifting.
- ♦ The vice is wrapped in oiled paper for its protection during delivery. Ensure that when the oiled paper is removed from its base it is immediately placed on a "cleaned" machine table and clamped safely in position.

Cleaning and general maintenance.-

- ♦ To ensure the vice long operational life and the most favourable working conditions, it is essential that it is cleaned very regularly, after each machining cycle of swarf or machining sludge that can affect its correct operation.
The regular "cleaning" can be by pressure coolant gun or air gun. Together the use of a small brush to clear the jaw movement ways can generally be effective. Cleaning by industrial rag or paper can also usefully be done after a number of machining cycles. It must be understood that the efficient vice operation needs clear space for clamping and unclamping. **Attention:** never use chemical products which can damage the vice.

Operating features

The hydraulic Spindle unit is actioned by means of a crank which is fitted in the hexagonal housing arranged in part (123). When the crank is turned, threaded spindle (001) runs through the spindle shoe (040) pushing the movable jaw (033) until jaws (036) meet the workpiece to be clamped. When the threaded spindle (001) encounters a determined resistance it stops acting, but by keeping on with the cranking procedure it makes the coupling disc (019) detach from the coupling body (121) and thus the torque rod (123) - which is firmly attached by part (124) - to spindle sleeve (122) advances and consequently introduces the small piston (012) in the oil chamber A in order to create an overpressure.

The pressure produced by the oil pushes the large piston (008) which at the meantime pushes pushrod (002). The pushrod through pressure plate (034) and movable jaw (033) transmits the power developed by the hydraulic differential mechanism to the clamping jaw. This maximum pressure moment is produced once spindle sleeve (122) has run over the threaded cylinder (013) and stopped against cylinder (003). The moment this point is reached, it is useless trying to increase the hydraulic pressure by hammering on the crank or by trying any other procedure.

Hydraulic Power Setting

If along the time the pressure decreases due to oil leakage, oil chamber A should be set by following the steps stated below:

- 1 Disassemble the hydraulic spindle unit from the vise or from any other fixture it may happen to be attached on.
- 2 Remove allen set-screw (004).
- 3 Drive forward threaded spindle (001) by giving it one third of a turn in cylinder (003) until the threaded hole in the cylinder matches with the next slot on the main spindle.
- 4 Replace allen set-screw (004) and thus the setting procedure shall have been accomplished.

Hydraulic Oil Filling up

- 1 Disassemble the hydraulic spindle unit from the vise or from any other fixture it may happen to be attached on.
- 2 Remove allen set-screw (004).
- 3 Unscrew threaded spindle (001) being careful that preset tension spring (006) and belleville springs (007) do not fling off when the spindle is removed.
- 4 Remove allen set-screw (004) (on size 090 it is 014).
- 5 Clamp cylinder (003) and remove threaded cylinder (013).
- 6 Keep cylinder (003) in a vertical position and remove small piston (012) upwards.
- 7 Whenever filling up oil-chamber A, a disc must be made whose size may differ according to the type of vice involved (See Table).

Place cylinder (003) on a flat surface with its large opening on the said disc, and with the help of a small pin or still better by using air under pressure, push forward large piston (008) until it stops against the mentioned disc. If air pressure is used for this purpose, hold tightly the cylinder so it does not move due to the pressure applied.

DISC		
Type	Max. Ø	Height
0	27mm.	11mm.
1 and 2	35mm.	8mm.
3	45mm.	14mm.

- 8 Pour hydraulic oil into the chamber until its level reaches the upper edge of the opening. Oil chamber A should be completely free of **air bubbles**. To accomplish this, stir the oil gently with a clean prick, and refill again to reach the level stated above if it were necessary.

The hydraulic oil to be used should feature a viscosity of 6,5 E/50° C., type.

- E**
- 9 Now introduce gently small piston (012) into cylinder (003) by its chamfered end pushing it and creating a twisting movement at the meantime. Small piston (012) must be absolutely clean so as not to damage small seal (011).
 - 10 Hold light cylinder (003) and then screw in the threaded cylinder (013). The hole practiced through the threaded cylinder (013) has to match with the oil chamber slot, but if they did not, then unscrew threaded cylinder (013) and give it a **180°** turn for it features a double entry thread. If the threaded cylinder is screwed in through the proper thread entry, the openings shall certainly match with each other. Once the matching has been accomplished, replace allen set-screw (004) (on size 090 it is 014) and tighten it firmly.
 - 11 The belleville springs (007) are to be replaced as shown in the corresponding drawing.
 - 12 Screw in threaded spindle (001) with pushrod (002) and preset tension spring (006) into cylinder (003) until this group can not be driven ahead any more by hand. Followingly, threaded spindle (001) shall be advanced by screwing it into cylinder (003), until the second slot on the spindle matches with the hole tapered in the cylinder. Screw (004) is now to be replaced and tightened so as to keep everything assembled properly.
 - 13 After having filled up the hydraulic spindle with the proper oil, it should be actioned several times before it is reassembled for service routines.

The Hydraulic Spindle Unit Applied to Other Fixtures

If the hydraulic spindle unit were to be applied to any other fixture, the following important points are to be remembered:

The less the fixture strains elastically, the greater shall be the pressure obtainable from the spindle whose hydraulic travel comes only to about 1.8 mm. Such a short distance needs obviously a very rigid support to fulfill its purpose.

There is available a bush for the hydraulic spindle which can be acquired by the user if the spindle is applied to other fixtures.

If the fixture the Hydraulic spindle unit is to be applied on is provided with a connecting pin, the said pin should move freely in its guides or bushes.

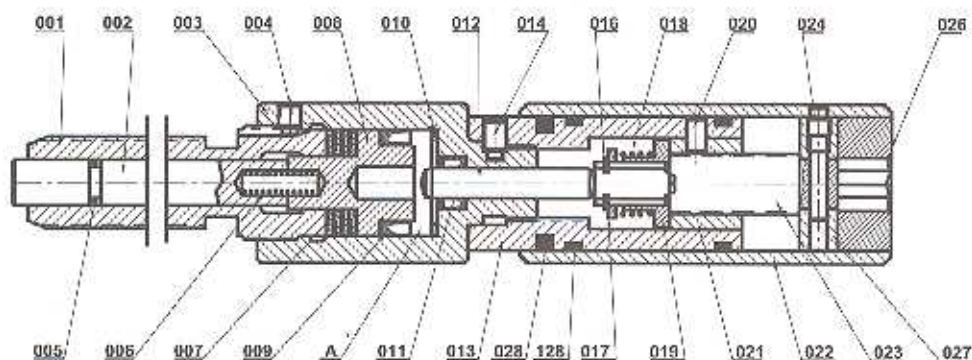
As not all fixtures are constructed so they feature rigid walls or supports, we suggest the use of a 0.2 to 6 Ton dynamometer to check the pressures it is able to stand.

With a standard hydraulic spindle unit it will not be possible to stack light metal sheets or similar parts if they are strained, since the spindle travel features only 1.8 mm. If either the hydraulic spindle or the vice will be used mainly for this purpose, we suggest the hydraulic **ARNOLD** spindle with presetting power control.

Remarks

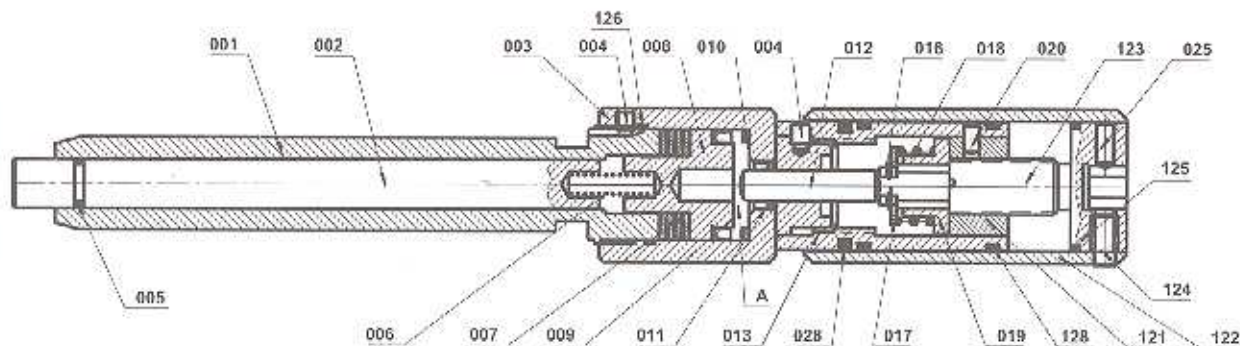
If by any chance it were necessary to disassemble the spindle sleeve (122) (on size 090 it is 022), before removing it, it shall be necessary to **INTRODUCE** locking pin screw (124) (on size 090 it is 024) inside the threaded housing featured by part (123) (on size 090 it is 023). After the previous procedure, the sleeve can be removed and then unscrewed the mentioned locking pin screw (124).

Whenever requiring spares for the said spindle, both the names and the reference numbers given to them in this instruction handbook are to be stated.



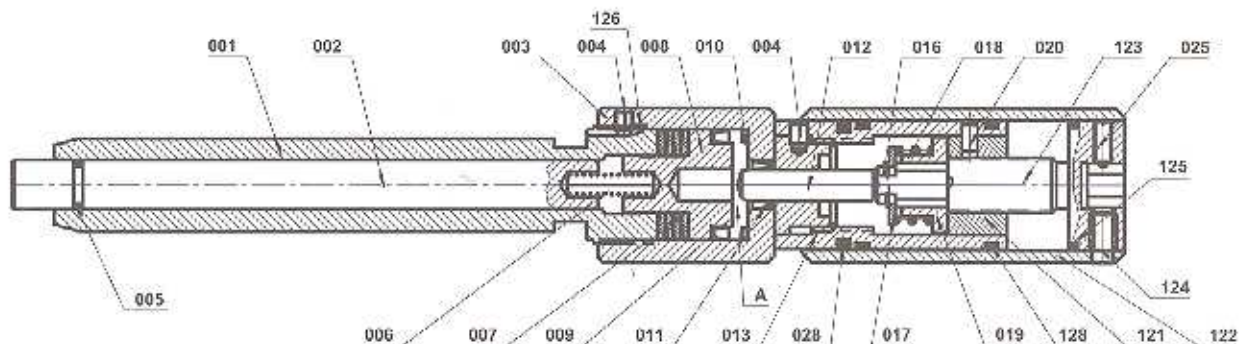
8 0 001 0 090

	HUSILLO HIDRAULICO ARNOLD 090	HYDRAULIC SPINDLE ARNOLD 090	BROCHE HIDRAULIQUE ARNOLD 090	HYDRAULIKSPINDEL ARNOLD 090
	DENOMINACION	DENOMINATION	DESIGNATION	BENENNUNG
9 0 001 0 090	HUSILLO PRINCIPAL	THREADED SPINDLE	BROCHE	GEWINDESPINDEL
9 0 002 0 090	BULON DE PRESION	PUSHROD	ARBRE DE SERRAGE	DRUCKBOLZEN
9 0 003 0 090	DEPOSITO	CYLINDER	CYLINDRE	ZYLINDER
9 0 004 0 090	TORNILLO PRISIONERO	ALLEN SET SCREW	VIS D'ARRET	GEWINDESTIFT
9 0 005 0 090	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 006 0 090	MUELLE PISTON	PRESET TENSION SPRING	RESSORT DE RAPPEL	DRUCKFEDER
9 0 007 0 090	MUELLE PLATILLO	BELLEVILLE SPRING	RONDELLE BELLEVILLE	TELLERFEDER
9 0 008 0 090	PISTON SECUNDARIO	LARGE PISTON	PISTON DE PRE SERRAGE	SEKUNDÄRKOLBEN
9 0 009 0 090	RETEN GRANDE	LARGE SEAL	BAGUE DE D'ETANCHEITE	NUTRING GROSS
9 0 010 0 090	ARANDELA DEPOSITO	DISC	RONDELLE RESERV. D'HUILE	SCHEIBE
9 0 011 0 090	RETEN PEQUEÑO	SMALL SEAL	BAGUE PETITE	NUTRING KLEIN
9 0 012 0 090	PISTON PRIMARIO	SMALL PISTON	PISTON HAUTE PRESSION	KOLBEN
9 0 013 0 090	CAMISA ROSCADA	THREADED CYLINDER	MANCHON FILETEE	GEWINDEBUCHSE
9 0 014 0 090	TORNILLO PRISIONERO	ALLEN SET SCREW	VIS D'ARRET	GEWINDESTIFT
9 0 016 0 090	ANILLO SEEGER	SAFETY RING	RONDELLE CIRCLIPS EXT.	SEEGERRING
9 0 017 0 090	ARANDELA DE EMBRAGUE	WASHER	DISQUE D'ARRET RESSORT	KUPPLUNGSRING
9 0 018 0 090	MUELLE DE EMBRAGUE	CLUTCH SPRING	RESSORT RAPPEL EMBRAYAGE	KUPPLUNGSFEDER
9 0 019 0 090	EMBRAGUE MACHO	COUPLING DISC	DISQUE D'ACCOUPEMENT	KUPPLUNGSSCHEIBE
9 0 020 0 090	PASADOR CILINDRICO	DOWEL PIN	GOUPILLE CYLINDRIQUE	ZYLINDERSTIFT
9 0 021 0 090	EMBRAGUE HEMBRA	COUPLING BODY	MANCHON D'ACCOUPEMENT	KUPPLUNGSSTÜCK
9 0 022 0 090	MANGO	SPINDLE SLEEVE	POIGNEE	GRIFFHÜLSE
9 0 023 0 090	HUSILLO DE EMBRAGUE	TORQUE ROD	BROCHE FILETEE	GEWINDEBOLZEN
9 0 024 0 090	TORNILLO PASADOR	LOCKING PIN SCREW	GOUPILLE FILETEE	GEWINDESTIFT
9 0 026 0 090	EXAGONO HEMBRA	CRANCK DISC	HEXAGON FEMELLE	SECHSKANT GEHÄUSE
9 0 027 0 090	DISCO DE ARRASTRE	RETAINING DISC	DISQUE D'ENTRAÎNEMENT	HALTESCHEIBE
9 0 028 0 090	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 128 0 090	TURCITE	TURCITE	TURCITE	TURCITE



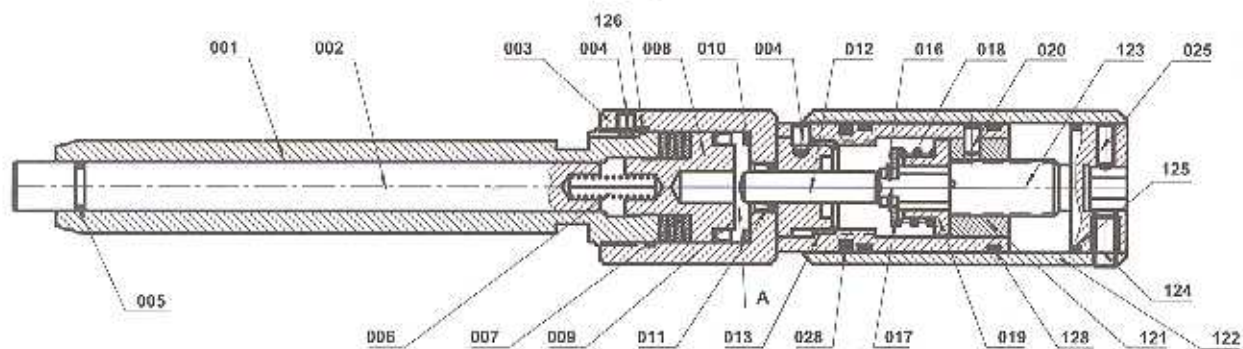
8 0 001 0 125

	HUSILLO HIDRAULICO ARNOLD 125	HYDRAULIC SPINDLE ARNOLD 125	BROCHE HIDRAULIQUE ARNOLD 125	HYDRAULIKSPINDEL ARNOLD 125
	DENOMINACION	DENOMINATION	DESIGNATION	BENENNUNG
9 0 001 0 125	HUSILLO PRINCIPAL	THREADED SPINDLE	BROCHE	GEWINDESPINDEL
9 0 002 0 125	BULON DE PRESION	PUSHROD	ARBRE DE SERRAGE	DRUCKBOLZEN
9 0 003 0 125	DEPOSITO	CYLINDER	CYLINDRE	ZYLINDER
9 0 004 0 125	TORNILLO PRISIONERO	ALLEN SET SCREW	VIS D'ARRET	GEWINDESTIFT
9 0 005 0 125	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 006 0 125	MUELLE PISTON	PRESET TENSION SPRING	RESSORT DE RAPPEL	DRUCKFEDER
9 0 007 0 125	MUELLE PLATILLO	BELLEVILLE SPRING	RONDELLE BELLEVILLE	TELLERFEDER
9 0 008 0 125	PISTON SECUNDARIO	LARGE PISTON	PISTON DE PRE SERRAGE	SEKUNDÄRKOLBEN
9 0 009 0 125	RETEN GRANDE	LARGE SEAL	BAGUE DE D'ETANCHEITE	NUTRING GROSS
9 0 010 0 125	ARANDELA DEPOSITO	DISC	RONDELLE RESERV. D'HUILE	SCHEIBE
9 0 011 0 125	RETEN PEQUEÑO	SMALL SEAL	BAGUE PETITE	NUTRING KLEIN
9 0 012 0 125	PISTON PRIMARIO	SMALL PISTON	PISTON HAUTE PRESION	KOLBEN
9 0 013 0 125	CAMISA ROSCADA	THREADED CYLINDER	MANCHON FILETEE	GEWINDEBUCHSE
9 0 016 0 125	ANILLO SEEGER	SAFETY RING	RONDELLE CIRCLIPS EXT.	SEEGERRING
9 0 017 0 125	ARANDELA DE EMBRAGUE	WASHER	DISQUE D'ARRET RESSORT	KUPPLUNGSRING
9 0 018 0 125	MUELLE DE EMBRAGUE	CLUTCH SPRING	RESSORT RAPPEL EMBRAYAGE	KUPPLUNGSFEDER
9 0 019 0 125	EMBRAGUE MACHO	COUPLING DISC	DISQUE D'ACCOUPLMENT	KUPPLUNGSSCHEIBE
9 0 020 0 125	PASADOR CILINDRICO	DOWEL PIN	GOUPILLE CYLINDRIQUE	ZYLINDERSTIFT
9 0 121 0 125	EMBRAGUE HEMBRA	COUPLING BODY	MANCHON D'ACCOUPLMENT	KUPPLUNGSSTÜCK
9 0 122 0 125	MANGO	SPINDLE SLEEVE	POIGNEE	GRIFFHÜLSE
9 0 123 0 125	HUSILLO DE EMBRAGUE	TORQUE ROD	BROCHE FILETEE	GEWINDEBOLZEN
9 0 124 0 125	TORNILLO PASADOR	LOCKING PIN SCREW	GOUPILLE FILETEE	GEWINDESTIFT
9 0 025 0 125	PRISIONERO DE PRESION	SPRING RING	POUSSOIR RESSORT	GEWINDESTIFT
9 0 028 0 125	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 125 0 125	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 126 0 125	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 128 0 125	TURCITE	TURCITE	TURCITE	TURCITE



8 0 001 0 160

	HUSILLO HIDRAULICO ARNOLD 160	HYDRAULIC SPINDLE ARNOLD 160	BROCHE HIDRAULIQUE ARNOLD 160	HYDRAULIKSPINDEL ARNOLD 160
	DENOMINACION	DENOMINATION	DESIGNATION	BENENNUNG
9 0 001 0 160	HUSILLO PRINCIPAL	THREADED SPINDLE	BROCHE	GEWINDESPINDEL
9 0 002 0 160	BULON DE PRESION	PUSHROD	ARBRE DE SERRAGE	DRUCKBOLZEN
9 0 003 0 125	DEPOSITO	CYLINDER	CYLINDRE	ZYLINDER
9 0 004 0 125	TORNILLO PRISIONERO	ALLEN SET SCREW	VIS D'ARRET	GEWINDESTIFT
9 0 005 0 125	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 006 0 125	MUELLE PISTON	PRESET TENSION SPRING	RESSORT DE RAPPEL	DRUCKFEDER
9 0 007 0 125	MUELLE PLATILLO	BELLEVILLE SPRING	RONDELLE BELLEVILLE	TELLERFEDER
9 0 008 0 125	PISTON SECUNDARIO	LARGE PISTON	PISTON DE PRE SERRAGE	SEKUNDÄRKOLBEN
9 0 009 0 125	RETEN GRANDE	LARGE SEAL	BAGUE DE D'ETANCHEITE	NUTRING GROSS
9 0 010 0 125	ARANDELA DEPOSITO	DISC	RONDELLE RESERV. D'HUILE	SCHEIBE
9 0 011 0 125	RETEN PEQUEÑO	SMALL SEAL	BAGUE PETITE	NUTRING KLEIN
9 0 012 0 125	PISTON PRIMARIO	SMALL PISTON	PISTON HAUTE PRESSION	KOLBEN
9 0 013 0 125	CAMISA ROSCADA	THREADED CYLINDER	MANCHON FILETEE	GEWINDEBUCHSE
9 0 016 0 125	ANILLO SEEGER	SAFETY RING	RONDELLE CIRCLIPS EXT.	SEEGERRING
9 0 017 0 125	ARANDELA DE EMBRAGUE	WASHER	DISQUE D'ARRET RESSORT	KUPPLUNGSRING
9 0 018 0 125	MUELLE DE EMBRAGUE	CLUTCH SPRING	RESSORT RAPPEL EMBRAYAGE	KUPPLUNGSFEDER
9 0 019 0 125	EMBRAGUE MACHO	COUPLING DISC	DISQUE D'ACCOUPEMENT	KUPPLUNGSSCHEIBE
9 0 020 0 125	PASADOR CILINDRICO	DOWEL PIN	GOUPILLE CYLINDRIQUE	ZYLINDERSTIFT
9 0 121 0 125	EMBRAGUE HEMBRA	COUPLING BODY	MANCHON D'ACCOUPEMENT	KUPPLUNGSSTÜCK
9 0 122 0 160	MANGO	SPINDLE SLEEVE	POIGNEE	GRIFFHÜLSE
9 0 123 0 125	HUSILLO DE EMBRAGUE	TORQUE ROD	BROCHE FILETEE	GEWINDEBOLZEN
9 0 124 0 125	TORNILLO PASADOR	LOCKING PIN SCREW	GOUPILLE FILETEE	GEWINDESTIFT
9 0 025 0 125	PRISIONERO DE PRESION	SPRING RING	POUSSOIR RESSORT	GEWINDESTIFT
9 0 028 0 125	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 125 0 125	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 126 0 125	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 126 0 125	TURCITE	TURCITE	TURCITE	TURCITE



8 0 001 0 200

	HUSILLO HIDRAULICO ARNOLD 200	HYDRAULIC SPINDLE ARNOLD 200	BROCHE HIDRAULIQUE ARNOLD 200	HYDRAULIKSPINDEL ARNOLD 200
	DENOMINACION	DENOMINATION	DESIGNATION	BENENNUNG
9 0 001 0 200	HUSILLO PRINCIPAL	THREADED SPINDLE	BROCHE	GEWINDESPINDEL
9 0 002 0 200	BULON DE PRESION	PUSHROD	ARBRE DE SERRAGE	DRUCKBOLZEN
9 0 003 0 200	DEPOSITO	CYLINDER	CYLINDRE	ZYLINDER
9 0 004 0 125	TORNILLO PRISIONERO	ALLEN SET SCREW	VIS D'ARRET	GEWINDESTIFT
9 0 005 0 200	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 006 0 125	MUELLE PISTON	PRESET TENSION SPRING	RESSORT DE RAPPEL	DRUCKFEDER
9 0 007 0 200	MUELLE PLATILLO	BELLEVILLE SPRING	RONDELLE BELLEVILLE	TELLERFEDER
9 0 008 0 200	PISTON SECUNDARIO	LARGE PISTON	PISTON DE PRE SERRAGE	SEKUNDÄRKOLBEN
9 0 009 0 200	RETEN GRANDE	LARGE SEAL	BAGUE DE D'ETANCHEITE	NUTRING GROSS
9 0 010 0 200	ARANDELA DEPOSITO	DISC	RONDELLE RESERV. D'HUILE	SCHEIBE
9 0 011 0 200	RETEN PEQUEÑO	SMALL SEAL	BAGUE PETITE	NUTRING KLEIN
9 0 012 0 200	PISTON PRIMARIO	SMALL PISTON	PISTON HAUTE PRESSION	KOLBEN
9 0 013 0 200	CAMISA ROSCADA	THREADED CYLINDER	MANCHON FILETEE	GEWINDEBUCHSE
9 0 016 0 125	ANILLO SEEGER	SAFETY RING	RONDELLE CIRCLIPS EXT.	SEEGERRING
9 0 017 0 125	ARANDELA DE EMBRAGUE	WASHER	DISQUE D'ARRET RESSORT	KUPPLUNGSRING
9 0 018 0 125	MUELLE DE EMBRAGUE	CLUTCH SPRING	RESSORT RAPPEL EMBRAYAGE	KUPPLUNGSFEDER
9 0 019 0 125	EMBRAGUE MACHO	COUPLING DISC	DISQUE D'ACCOUPLMENT	KUPPLUNGSSCHEIBE
9 0 020 0 125	PASADOR CILINDRICO	DOWEL PIN	GOUPILLE CYLINDRIQUE	ZYLINDERSTIFT
9 0 121 0 125	EMBRAGUE HEMBRA	COUPLING BODY	MANCHON D'ACCOUPLMENT	KUPPLUNGSSTÜCK
9 0 122 0 200	MANGO	SPINDLE SLEEVE	POIGNEE	GRIFFHÜLSE
9 0 123 0 200	HUSILLO DE EMBRAGUE	TORQUE ROD	BROCHE FILETEE	GEWINDEBOLZEN
9 0 124 0 125	TORNILLO PASADOR	LOCKING PIN SCREW	GOUPILLE FILETEE	GEWINDESTIFT
9 0 025 0 125	PRISIONERO DE PRESION	SPRING RING	POUSSOIR RESSORT	GEWINDESTIFT
9 0 028 0 125	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 125 0 125	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 126 0 125	JUNTA TORICA	O-RING	JOINT THORIQUE	O-RING
9 0 128 0 125	TURCITE	TURCITE	TURCITE	TURCITE