



LEGEND OF SYMBOLS



Inside Diameter (I.D.)



Outside Diameter (O.D.)



Minimum Bend Radius



Reinforcement Outside Diameter (R.O.D.)



Maximum Working Pressure



Ferrule / Socket



Weight



Burst Pressure: The minimum guaranteed burst pressure of the hose; Equivalent or superior to the minimum requirements of the reference specifications.

Insert



- MF** MF2000® Multifit type
- IP** MF2000® Interlock Plus type
- SP** MF2000® Spiralfit type
- XL** MF2000® Xtralock type
- IS** MF2000® Interlock Super type
- BL** MF2000® Blastlock type
- PL** MF2000® Push-Lock type



Working pressure: The maximum pressure at which correct functioning of the quick coupling is assured. The working pressure is assured in both connected and disconnected states.



Flow Rate: The quantity of fluid which passes through a cross section of the quick coupling in a specified unit of time.



Connection Effort: The effort required to lock the male insert into the female.



Oil Spillage: The quantity of fluid lost from the coupling during the connection/disconnection process.



Connection/Disconnection under pressure: Ability to connect and disconnect with the quick coupling under pressure.

GLOSSARY OF TERMS

Continuous service: Refers to the working temperature range

Max. operating temperature (Intermittent service): Peaks of temperature of short duration and total cumulative duration lower than 5% of the total service life.

Recommended fluids: Fluid types that the hose can convey with excellent / good chemical compatibility.

Hose service life: Cumulative duration of time in which the hose is under operative conditions.

HOSE SIZE CONVERSION CHART

HYDRAULICS

HOSE SIZE			
DN	dash	mm	inch
5	-03	4.7	$\frac{3}{16}$
6	-04	6.4	$\frac{1}{4}$
8	-05	7.9	$\frac{5}{16}$
10	-06	9.5	$\frac{3}{8}$
12	-08	12.7	$\frac{1}{2}$
16	-10	16.0	$\frac{5}{8}$
19	-12	19.0	$\frac{3}{4}$
25	-16	25.4	1
31	-20	31.8	$1\frac{1}{4}$
38	-24	38.1	$1\frac{1}{2}$
51	-32	50.8	2
60	-38	60.3	$2\frac{3}{8}$
63	-40	63.5	$2\frac{1}{2}$
76	-48	76.2	3
89	-56	88.9	$3\frac{1}{2}$
102	-64	101.6	4

FLUID COMPATIBILITY CHART

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in personal injury or property damage.

HOSE SELECTION BY MEDIUM AND HOSE TYPE

This hose compatibility chart is a reference of Manuli Hydraulics hose compatibility with various fluid media. It is intended as a guide to chemical compatibility with inner tube materials and assembly lubricants applied internally to the hose. The Fluid Compatibility Chart lists the relative resistance of hose tube and fitting materials to more common:

- **hydraulic oils**
- **other diversified oils families (for hydrokinetic and lubrication applications)**
- **chemicals**

in three relative separated charts.

The ratings shown do not cover all possible variations of all factors, such as temperature, concentration, degradation or fluid contamination, etc. Testing under actual conditions is the best way to assure chemical compatibility for critical applications.

PART 1: HYDROSTATIC OILS COMPATIBILITY CHART (ACTUAL HYDRAULIC SYSTEMS AND APPLICATIONS)

The specific recommendations regarding **hydraulic fluids** are based upon specific laboratory bench tests with fluids, performed according to ISO 1817 and internal methodology, integrated with field experiences and the advices of various polymers or fluid suppliers. **It must be stressed, however, that this information is offered only as a guide and is not a guarantee.** Final hose selection also depends upon pressure, fluid and ambient temperatures, concentration, duration of exposure and special requirements or variations, which may not be known by Manuli Hydraulics. Legal and other regulations must be followed with particular attention.

All the combined factors in working operations may impact on the service life of the hose assembly and must be carefully considered before releasing a hose for a specific application: the chemical compatibility with the service fluid is only one of the factors to be considered.

It is always recommended to test the specific fluid brand name with the requested hose, in order to verify chemical compatibility. Manuli Hydraulics constantly performs compatibility tests as service to market, progressively updating the compatibility chart.

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FLUID COMPATIBILITY CHART

PART 2: HYDROKINETIC APPLICATIONS AND LUBRICANT OILS COMPATIBILITY CHART (AUTOMATED TRANSMISSIONS AND VARIOUS LUBRICATION SYSTEMS)

This second part of the compatibility chart list a particular family of oils, not designed for standard hydraulics (hydrostatic applications), rather studied for many diversified applications such as lubrication for gear, compressors, turbines, diathermic oils for cooling or heat transmission, and ATF (Automatic Transmission Fluids) oils for the hydrokinetic (hydrodynamic) applications. These fluids are often very aggressive on traditional tube rubbers, more than hydraulic oils, due to the nature of the fluids and additives, aimed to give properties of long life duration and high temperature resistance; that's why their chemical compatibility with tube rubbers must be carefully checked before eventual use.

It is to be underlined that Manuli hoses are designed in principle for use with hydraulic oils only, and that diversified applications such as the ones with these categories of other oils, must be verified case by case with lab and/or field tests by users under their sole and exclusive responsibility and no liability whatsoever can be attributed to Manuli Hydraulics in that regard.

For more detailed information contact Manuli Hydraulics or visit www.manuli-hydraulics.com

PART 3: BEHAVIOUR TO CHEMICALS (GUIDELINES FROM LITERATURE) FOR NON-HYDRAULIC APPLICATIONS

WARNING: Manuli hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals.

The recommendations regarding **generic chemicals** are mainly based on literature data in conjunction with polymers used for the tube compound. The field results of the fluid conveyed in the hose should be carefully tested and field validated by users.

No test on finished hose assemblies in combination with the mentioned chemicals has been normally performed.

The possible good rating and on field performance of the hose with a chemical mentioned in the list does not mean in any case the release by Manuli Hydraulics of the product for that application or any guarantee. The possible validation for use is under the sole and exclusive responsibility of the end user and no liability whatsoever can be attributed to Manuli Hydraulics in that regard. In fact Manuli Hydraulics hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals.

The outer cover of the hose is intended to protect the reinforcement layer(s) from mechanical influences (abrasion, weathering etc.); cover compounds are not designed to exhibit the same chemical resistance as the tube compounds. Manuli Hydraulics should be consulted about the compatibility of the cover, should the application involve the extended exposure or immersion in a liquid: **anyway the hydraulic hoses of the Manuli Hydraulics product range are not designed in general for immersion in the service fluid.**

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FLUID COMPATIBILITY CHART

This type of special applications should be avoided or carefully studied with additional external protections for the hoses, selection of special hose types, e.g. with thermoplastic cover and validation on the specific application. The turbulence of the fluid, the high temperature and nature of the fluid as well as other elements may impact the properties or integrity of the hose cover material (the cover compound of the hose is designed to resist to oil drops and external agents, not immersion in the service fluid).

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LEGEND OF HOSE TYPES BY TUBE COMPOUNDS

Tube compound categories	Hose Types
NITRILE	std wire braid, textile braid & wire spiral hoses (Tractor, Harvester, Lyteflex, Firend, Goldenspir, Astro, Multitex, Pushfit, Cover, Spirtex/K, Rockmaster, Shieldmaster, Twinpower, GoldenISO, Goldenguard, Diamondspir, Xtraflow/4WS & 2WB, Pilot, Jackmaster)
CHLOROPRENE	Eternity/2, Nozone/2K, Goldenblast
CHLOROSULPHONATED POLYETHYLENE	Equator/1 (Blue & Black), Equator/2 (Blue & Black), Xtraflow/HT
CHLORINATED POLYETHYLENE	Mastertex
POLYESTER	Hydroplast, Hydrotwin

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FLUID COMPATIBILITY CHART

HOW TO USE THE CHART

- Hydraulic fluids are listed in alphabetic order with the manufacturer brand name and ISO identification symbol (DIN when available), chemicals are listed alphabetically;
- Find the hose type and read the compatibility rating (see rating scale);
- Define the proper hose selection for the application by choosing the best rating.

LEGEND OF RATINGS

E = Excellent - Small or negligible changes of compound properties: no problem for use. Service life can exceed the expectations.

G = Good - There are only minor changes of some compound properties. Service life is normally in line with state of the art (standard) expectations.

C = Conditional - Significant changes on some compound properties. Service life can be reduced; higher durability can be achieved with reduced severity of working conditions (temperature in particular) or with an upgraded hose selection. Whenever possible, a field validation under actual working conditions is recommended.

X = Not recommended - Unsuitable, severe effects on physical properties.

REMARKS

- O-Rings used with couplings must also be considered for chemical compatibility with the fluid to be conveyed. This includes fittings containing internal O-Rings; for example Metric Female 24° Cone seat fittings, etc. Standard O-Ring of Manuli Hydraulics fittings are made of Nitrile rubber (NBR), highly chemically compatible with all hydraulic fluids. If you use special fluids or very high temperatures, different O-Ring materials should be used, contact Manuli Hydraulics for specific information. See Technical Manual for dimensions of O-Rings.
- Compatibility of hose fittings with conveyed fluids is an essential factor in avoiding chemical reactions that may result in release of fluids and failure of the connection with the potential of causing severe personal injury or property damage. Standard Manuli Hydraulics fittings are made of carbon steel with Hexavalent chromium free plating.

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FLUID COMPATIBILITY CHART

OILS CLASSIFICATION - ACCORDING TO ISO 6743-4

ISO 6743-4 is an important norm regarding "Lubricants, industrial oils and related products (class L)". The norm defines a very wide family of oils, used in many different sectors and applications.

The oils must be carefully understood and properly managed to avoid problems and possible mistakes. The Part 4 of the norm in particular regards the Hydraulic Oils (Family H), for hydrostatic and hydrokinematic applications, the other parts of the norm regard other fluids, of different nature or aimed to different applications than hydraulics.

Manuli Hydraulics hoses are designed and qualified for use with Hydraulic Oils (Family H of the ISO 6743-4), and the behaviour of the particular oil formulation has to be verified case by case.

The applications with oils of the families different than H must be checked carefully but in principle Manuli Hydraulics hoses are not designed for use with them.

Here below the classification of oils by ISO 6743 spec.

Part 1: Family A (Total Loss systems)

Part 2: Family F (Spindle bearings, bearings and associated clutches)

Part 3A: Family D (Compressors)

Part 3B: Family D (Gas and refrigeration compressors)

Part 4: Family H (Hydraulic Systems)

Part 5: Family T (Turbines)

Part 6: Family C (Gears)

Part 7: Family M (Metalworking)

Part 8: Family R (Temporary protection against corrosion)

Part 9: Family X (Greases)

Part 10: Family Y (Miscellaneous)

Part 11: Family P (Pneumatic tools)

Part 12: Family Q (Heat Transfer Fluids)

Part 13: Family G (Slideways)

Part 14: Family U (Heat treatment)

Part 15: Family E (Internal combustion engines)

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FLUID COMPATIBILITY CHART

The Family H in particular, object of use with Manuli Hydraulics hoses is composed by the following families of oils, identified by ISO dedicated symbols, used also in the compatibility chart.

General application	Particular application	More specific applications	Composition and properties	Symbol ISO-L
HYDRAULIC SYSTEMS	HYDROSTATIC APPLICATIONS	(std hydraulic applications)	Non-inhibited refined mineral oils	HH
			Refined mineral oils with improved anti-rust and anti-oxidation properties	HL
			Oils of HL type with improved anti-wear properties	HM
			Oils of HL type with improved viscosity/temperature properties	HR
			Oils of HM type with improved viscosity/temperature properties	HV
			Synthetic fluids with no specific fire resistant properties	HS
		Applications where environmentally acceptable fluids are requested	Triglycerides	HETG
			Polyglycols	HEPG
			Synthetic esters	HEES
			Polyalpaoelefin and related hydrocarbon products	HEPR
		Hydraulic slide-way systems	Oils of HM tyoe with anti-stick/slip properties	HG
		Applications where fire resistant fluids are required	Oils in water emulsion	HFAE
			Chemical solution in water	HFAS
			Water in oil emulsion	HFB
			Water polymer soultions	HFC
			Synthetic fluids containing no water and consisting of phosphate esters	HFDR
			Synthetic fluids containing no water and of other composition	HFDU
		HYDROKINETIC APPLICATIONS	Automatic transmissions	(ATF oils)
	Couplers and converters		HN	

XXXX

Generally good compatibility with hoses, anyway the behaviour of the particular oil formation to be verified case by case

HA & HN

ATF oils, chemical compatibility with hoses to be carefully verified case by case upon request and application

HFAS & HFDR

No compatibility with Manuli Hydraulics hoses. Dedicated hoses are requested

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FLUID COMPATIBILITY CHART

PART 1: HYDROSTATIC APPLICATION OILS COMPATIBILITY CHART

(ACTUAL HYDRAULIC SYSTEMS AND APPLICATIONS)

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
ACT Ecosafe FR 46	HFDU	-	E	E	C	-	C	G	-
ACT FR WG 200 D	HFC	-	E	X	E	-	X	E	-
ADDINOL Ökosynth Super HEES 46	HEES	-	G	C	G	-	C	G	-
ADDINOL Ökosynth Super HEES 46 S	HEES	-	G	C	G	G	C	G	-
AGIP Arnica 46	HV	HVLP	E	G	G	G	E	G	-
AGIP Arnica Extra Plus	HEES	HVLP	G	G	G	G	C	G	E
AGIP Arnica Plus	HEES	HVLP	E	E	G	G	C	E	E
AGIP Arnica S46	HFDU	-	E	E	G	G	C	E	E
AGIP Oso 32	HM	HLP	E	E	G	-	E	E	G
AGIP Oso 46 S	HM	HLP	E	G	G	G	G	G	G
AGIP Oso D 46	HM	HLPD	G	G	C	E	G	G	-
AGROL Mendo 46 G4	HEES	-	-	C	-	-	C	-	-
AKZO Fyrquel	HFDR	-	X	X	X	X	-	X	-
AMBRA Hitech 46	HL	HLP	E	E	G	-	G	E	G
ANDEROL 8768 (PAO)	HEPR	-	G	G	C	G	C	G	-
API HS 46	HV	HVLP	E	G	G	-	E	-	-
ARAL Vitam EHF 46	HEES	-	E	E	G	-	G	G	G
ARAL Vitam GF 68	HL	HLP	E	E	E	-	E	E	E
AVIA Avilub HLP 46	HM	HLP	G	G	G	G	E	G	-
AVIA Avilub SF 568	HM	HLP	-	-	-	-	G	-	-
AVIA Biofluid BP 32	HEES	-	G	C	G	E	X	G	-

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AVIA Fluid RSL 32	HM	HLP	E	G	G	-	-	-	-
AVIA Fluid RSL 68	HM	HLP	G	G	G	G	E	G	-
AVIA HVI 46	HV	HVLP	G	G	G	-	E	G	-
AVIA Syntofluid F 46	HEES	-	E	G	E	-	G	G	E
AVIA Syntofluid N 32	HEES	-	G	G	E	G	G	E	G
AVIA Syntofluid N 46	HEES	-	E	E	G	-	G	E	G
AVIA Syntofluid PE B 30 (PAO)	HEPR	-	E	G	G	G	G	G	G
AVIA Syntofluid PE B 50 (PAO)	HEPR	-	E	E	G	G	G	G	-
BECHEM Hydrostar PM 46	HH	-	E	E	G	-	G	E	-
BINOL Hydrap 46	HETG	-	E	E	G	G	-	G	-
BP A 0629L/028	HS	-	G	C	G	G	E	G	G
BP Bartran HV	HV	HVLP	E	G	G	G	E	G	-
BP Biohyd SE-S 46	HEES	-	G	G	E	-	C	E	-
BP Energol HLP 46	HL	HLP	G	G	G	-	-	-	-
BREMER Rivolta SBH 23	HEES	-	E	G	E	G	G	G	E
CALTEX Rando DSZ 46	HV	HVLP	G	G	C	-	G	C	-
CALTEX Rando HD	HM	HLP	E	G	G	G	G	G	G
CALTEX Rando HD LVZ 46	HV	HVLP	G	G	C	G	G	C	-
CASTROL Aero HF 585 B (MIL 56006H)	HH	HL	E	C	G	-	C	E	C
CASTROL Anvol SWX 68 (POE based)	HFDU	-	E	C	E	-	C	G	-
CASTROL Biobar VG 68	HEES	-	E	C	E	E	X	G	-
CASTROL Biotech Alpin 22	HETG	-	E	E	E	-	C	E	-
CASTROL Brayco 717 (MIL 17111c)	HS	-	G	C	G	-	C	G	G
CASTROL Brayco Micronic 882	HH	HL	G	G	G	G	G	G	G

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CASTROL Carelube HTG	HETG	-	E	C	E	-	C	E	G
CASTROL Carelube HY 46	HEES	-	G	G	G	-	C	G	G
CASTROL Hyspin HDH 7000	HM	-	E	G	G	-	E	E	-
CASTROL Hyspin ZZ32	HM	HLP	G	G	G	G	E	G	G
CASTROL Lift oil	HH	HL	G	G	G	G	G	G	G
CASTROL Product L 320	HFDU	-	E	G	G	-	X	G	
CASTROL Product L 571	HH	HL	E	G	G	G	X	G	-
CENEX Indol Premium AW 4646	HM	HLP	G	E	G	G	-	G	-
CEPSA Hidraulico HM 46	HM	HLP	E	E	G	-	E	G	E
CHEVRON ETL 10328	HV	HVLP	G	E	C	G	G	G	-
CHEVRON Extra Hyd oil VG 46	HM	-	G	G	G	G	C	-	-
CHEVRON Hydraulic AW 46	HM	HLP	E	G	G	-	E	G	-
CHEVRON Machine oil AW 220	HV	HLP	G	G	G	-	G	G	G
CHEVRON Machine oil AW ISO 46	HV	HLP	G	G	G	-	G	G	G
CHEVRON Rando HD 68	HM	HLP	G	G	G	G	G	G	-
CHEVRON Rycon MV	HM	-	E	G	G	-	G	G	-
COAST OIL A/W 68	HM	-	G	G	C	-	G	-	-
CONDAT D 46	HFDU	-	E	C	G	-	C	G	-
CONOCO Ecoterra	HM	HLP	G	G	-	G	-	-	-
DEA Econa E 46	HEES	-	G	C	E	G	C	E	E
DOT 3	HPG	-	-	-	X	-	X	X	G
DOT 4	HPG	-	-	-	X	-	X	X	G
ELAN Hydraulic 46	HV	HVLP	E	G	G	-	E	G	G
ESSO Hidraulikoel HE 46	HEES	-	E	E	E	-	G	E	E
ESSO Nuto H46	HM	HLP	G	G	G	-	E	G	E

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EXXON HUMBLE H 46	HM	HLP	E	G	G	-	E	G	-
EXXON RL 002775B	HM	-	G	G	C	G	C	-	-
EXXON Univis N46	HV	HVLP	E	G	G	G	E	G	-
FINKE Aviaticon HY HE	HEES	-	G	G	E	-	-	E	G
FOLTZERMSRINGOLI Hydra 46	HH	-	G	G	G	G	E	G	-
FRAGOL HE 46	HEES	-	E	C	G	-	C	G	E
FUCHS Eco Hyd 46S NWG	HEES	-	G	C	G	-	X	G	-
FUCHS OM 13	HH	HL	G	G	G	-	G	E	E
FUCHS OM 65	HH	HL	G	G	G	-	-	G	G
FUCHS Plantohyd S 46	HEES	-	E	C	E	-	C	E	E
FUCHS Plantohyd N 46	HETG	-	G	C	E	G	C	E	E
FUCHS Plantohyd SUPER S46	HEES	-	G	X	E	G	X	-	-
FUCHS Plantosyn 3268 Eco	HEES	-	G	C	E	-	G	E	G
FUCHS Plantosyn 46 HVI	HEES	-	E	C	G	-	C	G	G
FUCHS RENOLIN B 46 HVI	HV	HVLP	E	G	G	-	E	G	G
FUCHS Renolin B15 VG46	HM	HVLP'	G	G	G	-	-	-	-
FUCHS Renolin D15 VG 46	HM	HLPD	E	G	G	G	-	G	-
FUCHS Renolin MR 520	HV	HVLPD	G	G	G	-	G	E	E
GULF Armony AW 46	HM	HLP	E	E	G	-	E	G	E
HOUGHTON Cosmolubric HF 130 (POE based)	HFDU	-	G	G	G	-	C	G	-
HOUGHTON Hydravis BC 84005 (60°C)	HFA	-	E	G	E	-	C	E	E
HOUGHTON Isocore E 68 plus	HFC	-	E	G	E	-	C	G	-
HOUGHTON Safe 620	HFC	-	G	G	G	-	X	-	-
HOUGHTON Safe OX 40	HFC	-	E	G	E	-	C	E	E
HOUGHTON Vital fluid L46AL	HFDU	-	G	G	E	-	C	-	-

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HOUGHTON-Safe 273 CTF	HFC	-	E	C	E	-	X	E	E
IDEMITSU Daphne 46	HM	HLP	G	G	G	G	G	G	-
IGOL Matic ZNS 46	HV	-	E	G	G	-	E	-	-
IGOL Ticma Fluid	HV	-	E	G	G	-	E	G	-
IGOL Ticma Fluid BIO 46	HEES	-	G	G	G	-	C	G	-
INGERSOLL RAND SSR Ultracoolant (Polyglycole comp. coolant)	HEPG	-	G	G	G	-	G	G	-
INGERSOLL RAND Techtrol Gold(Polyglycole comp. coolant)	HEPG	-	G	C	G	-	G	G	-
IRVING hydraulic 46	HM	HLP	G	G	G	-	E	G	-
JIANGSU GAOKE L-HM32	HM	HLP	-	-	G	-	E	-	-
JOHN DEERE Bio Guard II	HETG	-	E	E	E	-	E	G	G
KLUBER Hysyn FG46	HS	-	G	G	C	-	G	C	-
KLUBER KluberBIO LR 9 68	HEES	-	E	C	G	G	X	G	-
KLUBERFOOD 4 NH1 46	HM	HLP	G	C	C	-	C	C	-
KOMATSU Genuine Bio 46 G4	HEES	-	E	G	G	-	G	G	E
KOMATSU KPO 10 Powertrain TO 10	HH	-	E	E	G	-	G	G	E
KUNLUN LHM 46	HM	HLP	E	G	G	G	E	G	G
LIEBHERR Hyd Basic 68	HM	HLPD	E	G	G	-	-	-	-
LIEBHERR Hydraulic HVI	HV	HVLDP	E	G	G	-	-	G	-
LIEBHERR Hydraulic Plus	HEPR	HVLDP	G	G	C	G	-	-	-
LIEBHERR Hydraulic Plus Arctic	HEPR	HVLDP	E	E	G	-	-	-	-
LUKOIL Geyser ST	HM	-	E	G	G	G	E	G	G
LUKOIL Geyser ZF	HM	HLP	G	G	G	G	E	G	G
MACDERMID Oceanic BTC 181	HS	-	E	G	G	G	-	G	G
MLC MetLube HFR 220	HFDU	-	G	G	G	G	E	C	-
MICRO QUIMICA Microcorte 530	HFB	-	C	X	C	-	X	C	-

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FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRITEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
MILLERS Millmax 22	HM	-	E	G	G	G	G	G	-
MILLERS Millfood 32	HS	-	G	G	G	-	E	G	E
MOBIL Aero HF 46 (MIL 5606H)	HH	HL	E	G	G	-	C	G	-
MOBIL DTE 10 Excel 46	HV	HVLP	G	E	G	G	C	G	-
MOBIL DTE 10 Excel 68	HV	HVLP	G	G	C	G	C	-	-
MOBIL DTE 13	HV	HVLP	E	G	G	-	E	G	-
MOBIL DTE 24	HV	HVLP	G	G	G	-	E	G	-
MOBIL DTE 25	HV	HVLP	E	G	G	-	E	G	E
MOBIL DTE 26	HV	HVLP	G	G	G	-	E	C	E
MOBIL DTE EXCEL 46	HM	HLP	E	E	G	G	E	G	G
MOBIL DTE EXCEL 68	HM	HLP	G	-	-	-	E	-	-
MOBIL DTE FM 32	HM	-	E	G	G	-	G	G	-
MOBIL EAL 224 H	HETG	-	G	G	E	G	X	E	G
MOBIL Hydrofluid HFDU	HFDU	-	E	E	E	E	G	E	E
MOBIL SHC 524	HM	-	E	G	C	G	E	-	-
MORRIS Triad 32	HM	-	-	G	G	G	G	-	-
MOTOREX Alpine Corex Polar S370	HV	HVLP	G	G	C	G	-	G	-
MOTOREX Corex HW	HV	HVLP	E	G	G	E	E	E	G
MOTUL Shock oil VI 400	HEES	-	G	C	G	-	X	G	-
NALCO Varidos FSK 40%	HFB	-	E	G	E	E	C	E	-
NESTE BIO Hydraulik LONGLIFE 46	HEES	-	G	C	G	-	C	G	-
NESTE BIO Hydraulik SE 46	HEES	-	G	C	G	G	C	G	-
NESTE Hydraulik 32 SUPER	HV	HVLP	E	G	G	G	E	-	-
NESTE Hydraulik 46 SUPER	HV	HVLP	E	G	G	G	E	-	-
NESTE Hydraulik 68 Super	HV	HVLP	G	E	G	G	E	G	E

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FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
NEW PROCESS AG NP Hyd oil PC HV1 46	HV	HVLP	-	C	C	G	G	-	-
NOALOIL Idro 32	HV	HLP	E	G	G	-	E	G	G
NYCO Hydraulic Oil FH 3 (MIL H 46170 C-1)	HH	HL	E	G	G	G	E	G	-
NYCO Hydraulic Oil FH 51 (MIL 5606H)	HH	HL	E	G	G	G	C	G	-
NYCO Hydraulic Oil FH 6 (MIL 6083H)	HH	HL	G	G	E	-	C	E	C
OEST Dopp-Synth 60	HLP	-	G	X	G	G	X	G	-
OEST Dopp-Synth 70	HLP	-	G	X	G	-	X	G	-
OMD 90	HH	HL	G	G	G	-	-	G	G
OMV Biohyd MS 46 (100°C)	HEES	-	G	G	G	G	-	G	G
OMV HLP AL 46	HL	HLP	E	G	C	-	E	C	-
OMV HLP M32	HV	HVLP	G	G	G	E	-	G	-
OMV Hyd HLP M15	HV	HVLP	E	C	G	G	-	G	-
PANOLIN EP Gear Synth 30 VDT	HEES	-	G	X	G	G	X	G	G
PANOLIN GRO Synth 46	HEES	-	G	C	G	G	C	-	E
PANOLIN HLP Synth 15	HEES	-	G	X	X	-	X	G	-
PANOLIN HLP Synth 46	HEES	-	E	C	G	G	X	G	G
PANOLIN HLP Synth E 46	HEES	-	E	C	G	G	X	G	E
PANOLIN HLP Uni 46	HV	HVLP	E	G	G	-	G	G	-
PANOLIN Orcon Hyd 46	HV	HVLP	G	G	C	G	G	G	-
PANOLIN Trafosynth 2	HEES	-	G	X	G	-	X	G	-
PENTOSIN CHF 11 S (Power Steering)	HV	-	E	G	G	G	E	G	-
PETRO CANADA Hydrex AW 46	HM	HLP	E	G	C	G	C	C	-
PETRO CANADA Hydrex MV 60	HV	HVLP	E	E	G	G	C	G	-
PETROFER Ultra Safe 620	HFC	-	G	C	E	-	X	E	-
PFINDER Aapresol	HH	-	G	G	G	-	E	G	E

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FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRITEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
Q8 Handel 68	HV	HVLP	G	G	G	-	E	G	E
Q8 Haydn	HM	HLP	E	G	G	G	E	G	-
Q8 Heller 46	HV	HVLP	E	G	G	-	E	G	-
Q8 Hogarth 46	HV	HVLP	G	G	C	G	C	G	-
Q8 Holbein	HEES	-	E	G	G	-	G	G	-
Q8 Hummel 46	HM	HLP	E	E	G	-	G	-	-
QUAKER Greensave N 40	HETG	-	G	G	G	-	C	G	G
QUAKER Quintolubric 888	HFDU	-	G	G	G	G	C	G	-
QUAKER Quintolubric 888-46	HFDU	-	G	C	G	G	C	-	-
QUAKER Quintolubric 888-68	HFDU	-	G	C	G	-	C	-	-
QUAKER Quintolubric N 822-300	HFDU	-	G	C	G	-	-	G	-
QUAKER Quintolubric N852	HFDU	-	G	X	G	G	X	E	-
RAUTIO ERGO MIX	HH	-	E	G	G	-	E	-	-
REPSOL Telex 32	HM	HLP	G	E	G	E	G	G	G
ROLOIL Estin S46	HFDU	-	G	C	G	G	X	G	-
SAFETY KLEEN Performance PLUS AW 32	HM	-	G	G	C	G	G	-	-
SHAEFFER 112 HTC	HM	HLP	G	G	G	-	E	-	-
SHAEFFER 112 NZ HTC 32	HM	HLPD	G	G	C	G	G	C	-
SHAEFFER 254 SUPREME ISO 32 TH 220	HM	HLP	G	C	C	G	G	C	-
SHAEFFER 275 S Dilux Supreme MEHF HYD	HV	HLPD	G	E	G	E	E	C	-
SHELL Aeroshell Fluid 41 (MIL 5606H)	HH	HL	E	G	G	-	C	G	-
SHELL Aeroshell Fluid 602 (MIL-PRF 87252C)	HEPR	-	E	E	G	-	E	G	G
SHELL Astron HL 46	HH	-	E	E	G	G	G	-	-
SHELL Donax TA (Torque conv. Allison C-3)	HM	-	-	-	G	G	G	-	-
SHELL Hydraulic oil PW 46	HV	HVLP	E	G	G	E	G	G	G

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FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
SHELL Irus Fluid DU-NA 46	HFDU	-	E	E	E	-	G	G	-
SHELL Irus Fluid DU-NA 68	HFDU	-	E	E	E	-	G	G	-
SHELL Morlina 220	HL	HLP	G	G	G	G	E	C	G
SHELL Morlina S2 BL10	HL	HLP	G	C	G	G	X	G	G
SHELL Morlina S2 BL5	HL	HLP	C	X	G	C	X	G	G
SHELL Naturelle HF-E15	HEES	-	E	C	G	-	X	G	G
SHELL Naturelle HF-E46	HEES	-	E	C	G	-	X	E	G
SHELL Targon AL plus	HH	-	E	C	E	-	C	G	-
SHELL Tellus Arctic 32	HH	HL	G	G	G	G	G	G	E
SHELL Tellus S1 M 46 (ex Tellus H 46)	HM	-	G	G	G	G	-	-	-
SHELL Tellus S2 M 100 (ex Tellus 100)	HM	-	E	G	G	G	G	G	G
SHELL Tellus S2 M 46 (ex Tellus 46)	HM	HLP	E	G	G	G	E	G	E
SHELL Tellus S2 M 68 (ex Tellus 68)	HM	HLP	E	G	G	G	E	G	-
SHELL Tellus S2 MA 46	HM	HVLP	E	G	G	E	G	G	-
SHELL Tellus S2 V 32 (ex Tellus T 32)	HV	HVLP	E	G	G	E	E	G	G
SHELL Tellus S2 V 46 (ex Tellus T 46)	HV	HVLP	E	G	G	E	E	G	G
SHELL Tellus S2 V 68 (ex Tellus T 68)	HV	HVLP	E	G	G	-	E	G	-
SHELL Tellus S3 V 32 (ex Tellus STX)	HV	HVLP	E	G	C	G	E	G	G
SHELL Tellus S3 V 46 (ex Tellus STX)	HV	HVLP	E	G	C	G	E	G	G
SHELL Tellus S46	HM	HLP	E	G	G	-	E	G	E
SHELL Tellus S4ME 46 (ex Tellus EE 46)	HM	HLP	E	C	-	-	-	-	-
SHELL Tellus TX 68	HV	-	G	C	G	E	G	G	-
SHENYANG TeLi Aeronautic Hydraulic Oil 10#	HV	-	G	-	G	G	C	-	-
SINOPEC L HM 32	HM	HLP	E	-	G	-	G	-	-
SMALLMAN Crownpress 46	HH	-	G	G	G	-	E	G	E

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FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRITEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
SOLUTIA Skydroll 500	HFDR	-	X	X	X	-	X	X	X
STATOIL Hydraway Extreme 46	HM	HLP	E	G	G	E	E	-	-
STATOIL Hydraway HVXA 15	HV	HVLP	G	-	G	G	-	G	-
STATOIL Hydrocor CC44	HFC	-	E	G	E	-	C	G	-
STUART Isocore E 68 Plus	HPG	-	E	G	G	G	C	E	-
SUNOCO Sunvis 746	HM	HLP	E	G	G	G	E	C	G
SUNOCO Sunvis 846	HV	HVLP	E	G	G	G	G	G	G
SUNOCO Sunvis 846 WR	HV	HLP	E	G	G	G	G	G	G
TAMOIL Green Hydro Safety 46	HETG	-	E	E	G	-	-	E	G
TEBOIL Hydraulic arctic	HH	-	G	G	E	G	G	E	E
TEBOIL Eco 46	HEES	-	E	E	G	G	C	G	G
TERRESOLVE Greenscare 46	HETG	-	G	G	G	G	G	G	-
TEXACO Biostar Hydraulic 32	HETG	-	E	C	E	G	C	E	-
TEXACO Hydra 46	HEES	-	E	C	G	-	C	G	G
TEXACO Rando HD 46	HM	HLP	E	G	C	-	G	C	G
TEXACO Rando HD LVZ 46	HV	HVLP	G	G	C	G	G	C	-
TEXACO Rando HD VZ 46	HV	HVLP	G	G	G	G	C	G	G
TEXACO Rando HD VZ 68	HV	HVLP	G	G	G	C	G	G	-
TEXACO Rando HD Z 46	HV	HVLP	E	G	G	G	G	G	-
TEXACO Synstar HT 68	HFDU	-	G	G	E	-	C	E	G
TOTAL Azolla HZS 46	HM	HLP	E	G	G	-	E	-	-
TOTAL Azolla ZS 46	HM	HLP	E	G	G	-	E	G	G
TOTAL Biohydran SE 46	HEES	-	G	C	G	-	X	E	G
TOTAL Equivis ZS 46	HV	HVLP	G	G	G	-	-	C	-
TOTAL Hydransafe HFDU 46	HFDU	-	E	-	G	-	-	-	-

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FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRITEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
TOTAL LHM (Brake fluid)	HS	-	G	X	C	G	X	G	-
UKABIOL HY 46 HTG	HETG	-	G	G	E	-	G	E	G
UNIL Hydro S46	HM	HLP	G	G	G	-	E	C	G
UNIL Opal HV 46	HV	HVLP	G	G	G	G	E	-	-
UNIL Opal HVB 46	HV	HLPD	G	G	G	-	E	-	-
UNIL Opal PO 6	HV	HVLP	E	G	G	G	G	G	G
UNIL Unihyd ISO WG 46	HV	HLPD	E	G	G	G	E	G	G
VALVOLINE Ultramax HVLP 68	HV	HVLP	G	E	G	G	E	-	-
VICKERS Ecosure HSE 68	HEES	-	G	C	G	G	X	C	-
WISURA WM 3021 2,8% in H2O	HFA	-	E	E	E	-	X	E	E
WURTH Triathlon HLP 46	HM	HLP	E	G	C	G	-	-	-
YORK 777	HEES	-	G	C	G	-	X	G	E
ZELLER+GMELIN Divinol HE 46	HEES	-	E	C	G	E	-	G	-

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FLUID COMPATIBILITY CHART

PART 2: HYDROKINETIC APPLICATIONS AND LUBRICANT OILS COMPATIBILITY CHART

(AUTOMATIC TRANSMISSION AND VARIOUS LUBRICATION SYSTEMS)

AUTOMATIC TRANSMISSION FLUID (ATF)	TYPE		WIRE SPIRAL	WIRE BRAID				TEXTILE BRAID	TPE TEXTILE BRAID
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN

AGIP ATF 2D Gear (ATF Dexron II, Mercon II spec)	HA	-	G	G	C	-	G	C	E
AVIA Fluid ATF 86	HA	-	G	G	C	G	E	G	G
BP Autran MBX (ATF Dexron IID) - 100°C	HA	-	E	G	G	G	E	G	-
CASTROL Transynd RD (ATF Allison C4)	HA	-	G	G	C	-	E	-	E
CHEVRON Drivetrain HD (ATF Caterpillar TO4)	HA	-	G	G	C	G	G	C	-
MAG 1 Fully synthetic ATF (ATF Mercon V, Dexron III)	HA	-	-	G	C	-	G	-	-
MILLERS Millermatic ATF UN (ATF Dexron II)	HA	-	-	C	C	-	G	-	-
MOBIL ATF 320	HA	-	G	G	C	G	E	C	G
SHELL ATF III D (ATF Dexron III)	HA	-	G	C	C	G	E	-	-
SHELL Donax ATF III (ATF Dexron III)	HA	-	G	G	C	-	E	G	-
SHELL Donax TX (ATF Dexron III)	HA	-	G	C	C	-	G	-	-
SHELL Spirax S6ATF ZM	HA	-	C	G	X	-	C	-	-
TAMOIL ATF II D (ATF Dexron IID) - 100°C	HA	-	G	G	G	-	E	-	-
TOTAL Fluid NA H3	HA	-	G	G	C	G	E	-	-

GEAR (MECHANICAL TRANSMISSION) FLUID	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
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EXXON MOBIL 424 (gear oil)	C	-	G	G	G	-	G	-	-
FUCHS Planto Hytrac (UTTO gear oil)	C	-	G	C	G	-	C	G	-
LIEBHERR Gear Basic 90 LS (Gearbox oil)	C	-	G	G	G	-	-	G	-

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FLUID COMPATIBILITY CHART

GEAR (MECHANICAL TRANSMISSION) FLUID	TYPE		WIRE SPIRAL	WIRE BRAID				TEXTILE BRAID	TPE TEXTILE BRAID
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN

MOBIL SHC PM 320 (Gear oil)	C	-	G	G	C	-	E	-	-
PENZOIL Long Life Gearplus 75w 90	C	-	E	G	G	E	G	G	-
SHELL Donax TD (UTTO gear OIL)	C	-	E	G	G	-	E	-	-
SHELL Omala 320 (Gear oil)	C	-	G	G	C	-	C	G	G
SHELL Omala HD 150 (Gear oil)	C	-	G	G	C	-	C	G	G
SHELL Spirax ASX (Gear oil SAE 80W140)	C	-	G	C	C	-	C	G	-
SHELL Tegula V32 (Gear oil)	C	-	E	G	G	-	E	G	E
TEXACO Textran TDH Premium (UTTO Gear oil)	C	-	E	G	G	G	E	G	-
VALTRA Transmission oil XT 60 (Gearbox)	C	-	G	G	C	-	E	C	-

COMPRESSOR OILS	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
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ANDEROL 497 (Di-ester based compressor oil)	D	-	G	C	G	-	C	G	-
ATLAS COPCO Paroil S BULK (ester based compr. oil)	D	-	G	G	C	-	C	C	-
ATLAS COPCO Roto Foodgrade fluid (Synt blend compr. Oil)	D	-	-	-	-	-	G	-	-
ATLAS COPCO Roto H (mineral based Compressor oil)	D	-	G	G	C	-	G	G	E
ATLAS COPCO Roto Inject Fluid Plus (mineral based compr. Oil)	D	-	G	G	C	-	G	G	E
ATLAS COPCO Roto Inject Fluid (mineral based compr. Oil)	D	-	E	G	G	-	G	G	E
ATLAS COPCO Roto Xtend Duty (PAO compr. Oil)	D	-	-	-	-	-	G	-	-
ATLAS COPCO Roto Z	D	-	-	-	-	-	G	-	-
CASTROL Icematic SW 100 (POE based compressor oil)	D	-	G	G	G	-	-	G	E
CHEVRON Machine oil ISO 32 (Compressor oil)	D	-	G	G	G	-	G	G	G
FUCHS Dea Triton SE 55 (POE based)	D	-	G	G	G	G	-	G	E

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FLUID COMPATIBILITY CHART

COMPRESSOR OILS	TYPE		WIRE SPIRAL	WIRE BRAID				TEXTILE BRAID	TPE TEXTILE BRAID
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN

INGERSOLL RAND SSR Ultra plus coolant (POE based compr. oil)	D	-	G	G	G	-	E	G	G
KLUBER Summit Hysyn FG 46 (Synt hydrocarbon comp. Oil)	D	-	G	G	C	G	G	C	-
LUBRIZOL Emkarate RL 100S	D	-	G	G	-	-	-	C	G
MOBIL Arctic EAL 22 (POE based A/C comp. Oil)	D	-	E	E	G	-	G	G	G
MOBIL Glycol 30 (PAG based comp.oil)	D	-	E	E	E	E	E	E	G
MOBIL Rarus SHC 1026 (Compressor oil)	D	-	E	G	G	-	E	G	-
PAG SP 10 (compressor oil)	D	-	G	G	G	-	-	C	E
SHELL Corena D (compressor oil)	D	-	G	G	C	-	E	C	G
SULLAIR AWF	D	-	-	-	-	-	G	-	-
TOTAL Dacnis SH 46 (PAO based comp. Oil)	D	-	-	G	G	G	E	G	-
TOTAL Dacnis VS 46 (mineral based comp. Oil)	D	-	G	G	G	G	E	C	-
VALVOLINE Valcomp Synth 68 Comp. Oil	D	-	-	-	-	-	G	-	-

ENGINE OILS	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
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AGIP SINT 2000 (engine oil 10W40)	E	-	G	G	G	-	G	E	G
AGIP Tec sint SL5W40 (engine oil 5W40)	E	-	E	G	C	-	G	-	-
BP Vanellus C 5 (engine oil 15W40)	E	-	E	G	G	G	G	-	-
CHEVRON Delo 400LE (Engine oil 15W40)	E	-	G	G	C	G	G	G	-
CHEVRON RPM 30 (Engine oil)	E	-	G	G	G	G	E	G	-
FUCHS Plantohydramot SL 5W40 (STOU engine oil)	E	-	G	G	C	G	G	G	-
FUCHS Titan GTI Pro C 2 (Engine oil 5W30)	E	-	G	G	G	-	C	G	-
IGOL Marine 15W-40 (engine oil)	E	-	G	G	G	-	-	-	-

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FLUID COMPATIBILITY CHART

TURBINE OILS	TYPE		WIRE SPIRAL	WIRE BRAID				TEXTILE BRAID	TPE TEXTILE BRAID
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN

JCB Engine oil EP (Engine oil 15W40)	E	-	E	G	G	-	G	G	G
MOBIL Delvac 1310 (engine oil 10W20)	E	-	E	G	G	-	G	E	G
Q8 T720 (engine oil 15w40)	E	-	E	G	G	-	E	G	-
SHELL Helix Ultra (Engine oil 5W40)	E	-	G	G	G	-	E	G	-
SHELL Rimula R3 (Engine oil 10W)	E	-	E	G	G	-	E	G	E
SHELL Rimula X30 (Engine oil 10W)	E	-	E	G	G	G	E	G	E
SHELL Rotella TMG (Engine oil 15W40)	E	-	G	G	G	G	E	G	-
SHELL V oil 1404	E	-	G	G	G	-	G	G	G
MOBIL Jet oil II	T	-	E	C	G	E	C	E	-
NYCO Turbonicoil TN 13 B	T	-	G	X	X	G	X	E	-

HEAT TRANSFER FLUIDS	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
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CHEVRON Havoline XLC (Fluid cooler)	Q	-	E	G	G	-	X	G	-
MOBIL Therm 605	Q	-	G	G	G	-	E	G	-
NESTE Fluid cooler BIO	Q	-	E	G	G	G	-	G	-
NESTE Super fluid cooler XLC	Q	-	E	G	G	-	-	G	-
PETROCANADA Calflo (Heat transfer fluid)	Q	-	G	G	G	E	G	G	-
PETRONAS Paraflo HT (OAT) at 100°C	Q	-	E	G	G	-	X	G	-
Water Glycol emulsion (50%) at 100°C	Q	-	E	G	G	-	X	G	E

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FLUID COMPATIBILITY CHART

METAL WORKING FLUIDS	TYPE		WIRE SPIRAL	WIRE BRAID				TEXTILE BRAID	TPE TEXTILE BRAID
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
BUDEMEIM Phosphatherm 948	M	-	E	E	E	-	X	E	-

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

PART 3: BEHAVIOUR TO CHEMICALS FOR NON-HYDRAULIC APPLICATIONS (GUIDELINES FROM LITERATURE)

FLUID	NITRILE	CHLOROPRENE	CHLOROSULPHONATED POLYETHYLENE	CHLORINATED POLYETHYLENE	POLYESTER
Acetaldeide	X	C	X	C	G
Acetic Acid, 10%	X	C	G	G	G
Acetic Acid glacial	X	X	C	G	C
Acetone	C	C	X	G	G
Air (60°C)	G	G	E	E	E
Air (100°C)	C	G	E	E	G
Air (150°C)	X	X	G	G	X
Ammonia, gaseous	C	G	-	-	X
Ammonia, liquid cold	E	E	G	-	X
Ammonia, liquid 70°C	X	C	C	-	X
Ammonium Hydroxide, 10%	G	G	E	E	-
Ammonium Hydroxide, conc	C	C	C	C	-
Ammonium nitrate (aqueous solutions)	G	G	G	G	G
Ammonium phosphate, mon-di-tri basic (aq. Sol)	E	E	E	E	C
Ammonium sulphate (aqueous solution)	E	E	E	E	C
Aniline	X	C	X	X	X
Aqua regia	C	C	X	C	-
ASTM oil n°1, 100°C	E	E	G	G	E
ASTM oil n°2, 100°C	E	G	C	C	E
ASTM oil n°3, 100°C	E	C	C	C	E
Benzene	X	X	X	C	C
Boric acid 10% 100°C	G	G	G	X	G
Brake fluid (SAE J 1703d)	X	-	X	G	-
Brine	E	C	C	G	G
Butanol	E	G	G	G	E

WARNING: No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed. The possible good rating and on field performance of the hose with a chemical mentioned in the list, does not mean in any case the release by Manuli Hydraulics of the product for that application or any guarantee. The possible validation for use is under the sole and exclusive responsibility of the end user and no liability whatsoever can be attributed to Manuli Hydraulics in that regard. In fact Manuli Hydraulics hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals. No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed.

FLUID COMPATIBILITY CHART

FLUID	NITRILE	CHLOROPRENE	CHLOROSULPHONATED POLYETHYLENE	CHLORINATED POLYETHYLENE	POLYESTER
Calcium bicarbonate	E	E	E	E	-
Calcium hydroxide (Aqueous suspensions)	E	E	G	G	-
Carbonic anhydride	G	E	G	G	E
Chlorine	X	X	X	X	X
Chloroform	C	C	X	X	X
Citric Acid, 33%	G	G	G	-	E
Crude oil	E	X	X	X	G
Detergent water solution	G	G	C	G	G
Dibenzyl ether	X	X	X	X	-
Diethyl phtalate (DEPH)	C	X	X	X	E
Epichlorhydrine	X	X	C	X	X
Ethyl acetate	C	X	C	C	G
Ethyl alcohol	E	E	E	E	E
Ethyl ether	G	C	-	-	-
Ethylene	E	G	-	-	G
Ethylene glycole	E	E	G	G	E
Ethylene glycole (100°C)	E	G	G	G	G
Formaldehyde	C	G	C	G	G
Formic acid 23°C (saturated solution)	G	G	G	X	G
Formic acid 75°C (saturated solution)	C	G	C	X	C
Glycerine	E	E	E	E	E
Heptane	G	C	X	C	E
Hydraulic oils (see detailed table)	*	*	*	*	*
Hydrochloric acid, 10%	G	G	G	X	G
Hydrochloric acid, 37%	C	C	C	X	X
Hydrochloric acid, 37% 70°C	X	X	X	X	X
Hydrocyanic acid 20%	C	C	-	-	-
Hydrogen sulphide	C	G	C	X	E

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FLUID COMPATIBILITY CHART

FLUID	NITRILE	CHLOROPRENE	CHLOROSULPHONATED POLYETHYLENE	CHLORINATED POLYETHYLENE	POLYESTER
Isobutyl alcohol	G	G	G	G	E
Isopropyl alcohol	G	E	E	E	E
Iso-octane	G	C	X	C	E
Kerosene (aromatics 40%max, 70°C)	G	C	X	C	-
Lead free petrol	G	C	X	C	E
Magnesium hydroxide (aqueous solutions)	G	E	E	E	-
Mercury	E	E	E	E	E
Methanol	G	E	E	E	G
Methyl methacrylate	X	X	X	X	-
Methylethylketone (MEK)	X	C	X	C	E
Nitric acid, concentrated 65%	X	X	X	X	X
Nitric acid, diluted 10% 50°C	C	X	X	C	X
Nitric acid fuming	X	X	X	X	X
Nitrogen	E	E	E	E	E
Oleic acid	G	C	C	C	E
Oleum	X	X	X	X	X
Oxalic acid 25% 80°C	G	E	G	X	-
Oxygen (80°C)	C	G	C	G	E
Paraffin	E	E	C	E	E
Pentane	G	C	X	C	E
Petrol	E	C	X	C	E
Petroleum, 70°C	E	G	X	C	E
Phenol	X	X	X	X	C
Phosphoric acid 20%	G	E	E	X	-
Phosphoric acid 60% 50°C	C	G	C	X	-
Phosphoric acid 85%	C	G	C	X	-
Phosphorous tri-chloride	X	X	X	X	-
Picric acid 10% 100°C	C	C	G	G	-

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FLUID COMPATIBILITY CHART

FLUID	NITRILE	CHLOROPRENE	CHLOROSULPHONATED POLYETHYLENE	CHLORINATED POLYETHYLENE	POLYESTER
Potassium chloride (aqueous solution)	E	E	E	E	-
Potassium hydroxide 70°C (medium high conc.)	G	G	-	-	E
Potassium sulphate (aqueous solution)	E	E	E	E	-
Sea water	E	G	C	G	E
Soaps	E	G	G	G	E
Soda caustic	C	G	G	C	G
Sodium bicarbonate	E	E	E	E	G
Sodium chloride (aqueous solution)	E	E	G	G	E
Sodium hydroxide	C	G	G	C	E
Sodium hydroxide 70°C (medium high conc.)	C	G	G	C	F
Sodium hypochlorite (aqueous solutions)	C	G	C	X	E
Sodium silicate (aqueous solutions)	E	E	E	E	-
Sodium sulphate (aqueous solution)	E	E	E	E	-
Sodium sulphide	E	E	E	E	-
Stearic acid	E	E	C	E	E
Sulphur	X	X	G	G	-
Sulphur dioxide	X	X	X	X	-
Sulphuric acid (hot concentrated 96°C)	X	X	X	X	X
Sulphuric acid (diluted 20%)	X	X	C	C	E
Sulphuric anhydride	X	C	C	C	-
Sulphurous acid	X	X	C	C	X
Tannic acid	G	G	G	X	E
Tannin	E	E	E	E	E
Tartaric acid 20%	E	G	G	X	-
Tetraethyl lead	G	C	X	-	-
Toluene	X	X	X	X	E
Turpentine	G	X	X	X	-
Urea	E	E	G	G	-

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FLUID COMPATIBILITY CHART

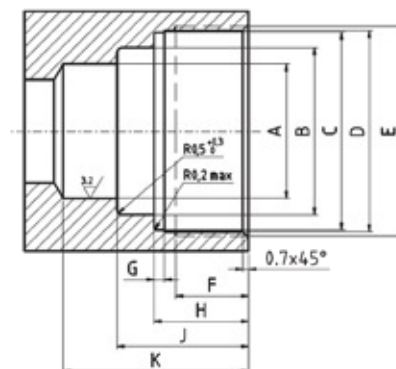
FLUID	NITRILE	CHLOROPRENE	CHLOROSULPHONATED POLYETHYLENE	CHLORINATED POLYETHYLENE	POLYESTER
Vinyl acetate	C	C	C	G	-
Vinyl chloride	X	X	X	X	-
Water	E	G	X	G	E
Xylene	C	X	X	X	G
Zinc chloride (aqueous solutions)	E	E	G	X	E
Zinc sulphate (aqueous solutions)	E	E	G	X	-

WARNING: No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed. The possible good rating and on field performance of the hose with a chemical mentioned in the list, does not mean in any case the release by Manuli Hydraulics of the product for that application or any guarantee. The possible validation for use is under the sole and exclusive responsibility of the end user and no liability whatsoever can be attributed to Manuli Hydraulics in that regard. In fact Manuli Hydraulics hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals. No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed.

EASY FIT

DIRECT TO PORT CONCEPT

The male threadless termination can be connected directly to the port, by means of pre-installed cartridge, with a simple axial pushing action of the fitting into the port.



FEMALE PORT DESIGN

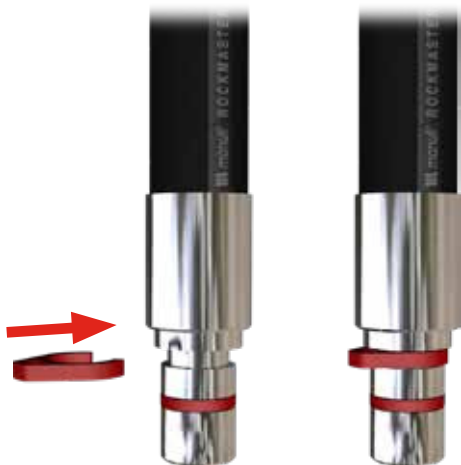
SIZE	DIMENSIONS (MM)					RECOMMENDED TORQUE
	A	B	C	D	E	
-04	10.03 + 0.08	12.75 + 0.1	16.55 + 0.07	17.0 + 0.1	M18 x 1	23 - 35 Nm
-06	13.03 + 0.08	16.9 + 0.2	20.55 + 0.07	21.0 + 0.1	M22 x 1	30 - 40 Nm
-08	16.03 + 0.08	19.9 + 0.2	23.55 + 0.07	24.0 + 0.1	M25 x 1	40 - 50 Nm
-12	23.03 + 0.08	27.9 + 0.2	31.05 + 0.07	31.5 + 0.1	M33 x 1.5	70 - 80 Nm

SIZE	DIMENSIONS (MM)					RECOMMENDED TORQUE
	F	G	H	J	K	
-04	8.5 + 1	1.1 - 0.1	10.35 + 0.1	14.15 + 0.2	19.56 + 0.15	23 - 35 Nm
-06	8.7 + 1	1.15 - 0.1	11.1 + 0.1	15.5 + 0.2	21.95 + 0.15	30 - 40 Nm
-08	8.7 + 1	1.25 - 0.1	11.3 + 0.1	15.7 + 0.2	22.15 + 0.15	40 - 50 Nm
-12	11.5 + 1	1.7 - 0.1	16.5 + 0.1	21.4 + 0.2	31.35 + 0.15	70 - 80 Nm

ASSEMBLING INSTRUCTIONS

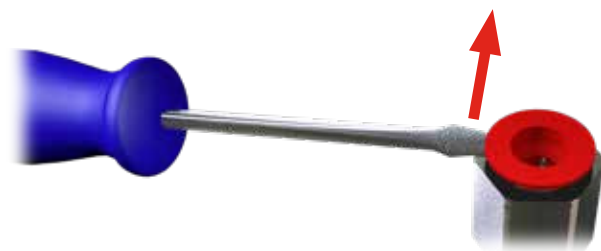
ASSEMBLING PROCEDURE

1



Fit the safety clip into the dedicated groove on the male fitting.

2



Use a flat-headed screwdriver, or similar tool, to remove the protective cap on the cartridge.

3



Connect the fitting by pushing it into the cartridge.

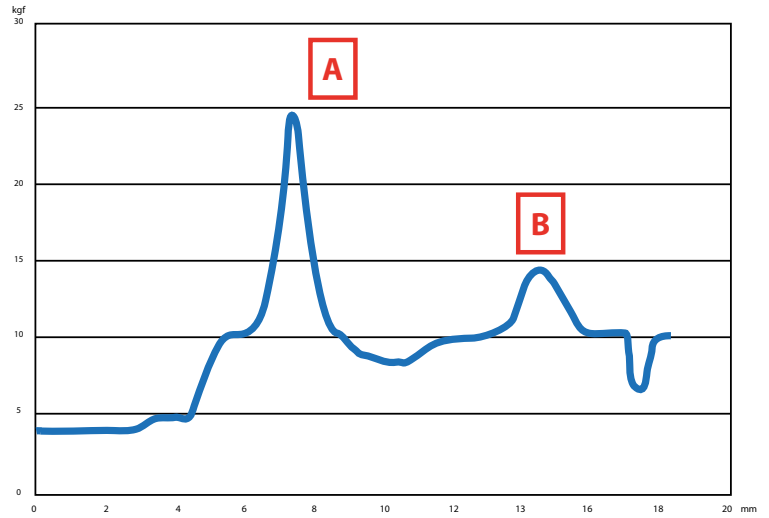
The fitting is correctly locked and connected when the safety clip touches the cartridge.

ASSEMBLING INSTRUCTIONS

When inserting the male fitting into the cartridge, the axial force required to ensure correct and secure assembly will vary throughout the insertion process (see graph opposite). In particular there will be a two points where the amount of force required will be noticeably higher.

The first peak (A), occurs when the internal collars of the cartridge are opening; For a -08 fitting this would typically be around 20 kgf.

The second peak (B), occurs when the plastic retaining ring is being inserted into the cartridge. This peak is significantly lower than the first.



DISASSEMBLING INSTRUCTIONS

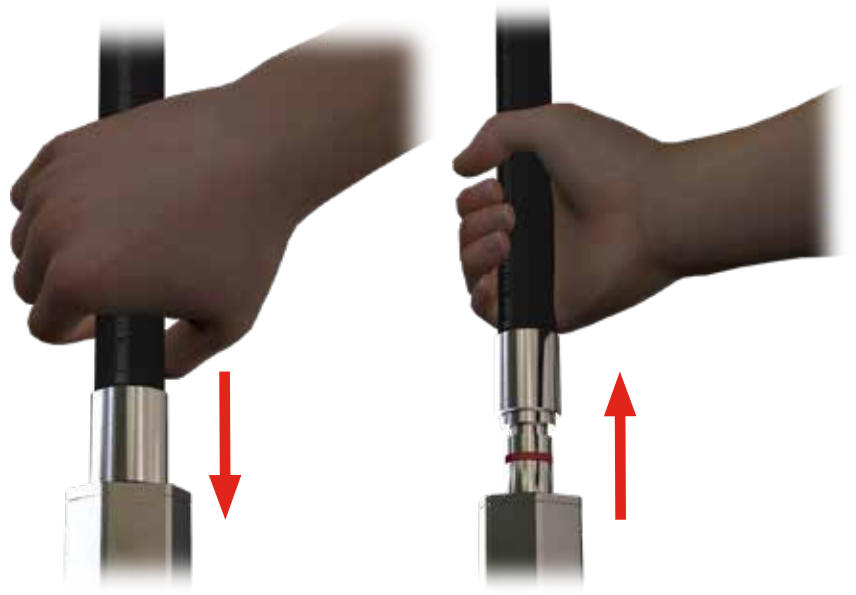
DISASSEMBLING PROCEDURE



Before disconnection, ensure the system is not under pressure



- 1 Use a flat-headed screwdriver, or similar tool, to remove the safety clip.



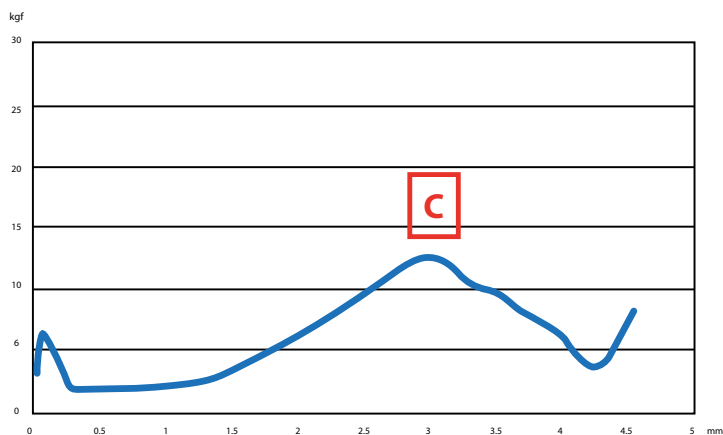
- 2 Push the fitting in until the collar touches the cartridge, then pull out to complete the disconnection process.

EASY FIT

DISASSEMBLING INSTRUCTIONS

The maximum axial force required to separate the components (after the initial "push") is approximately 10 kgf for a -08 fitting - see graph opposite.

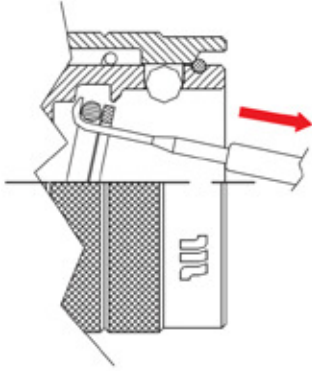
The peak (C) represents the force required to open the internal retaining ring to allow the withdrawal of the male fitting.



REPLACEMENT INSTRUCTIONS

O-RING AND BACK-UP RING SEAL REPLACEMENT ON FEMALE COUPLINGS

1

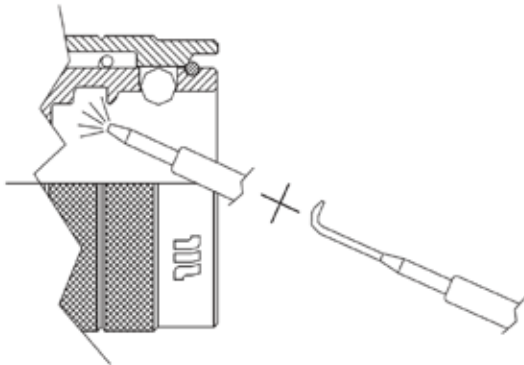


Remove the damaged O-ring and back-up ring



**Do not use sharpened tools.
Take care not to damage the components.**

2

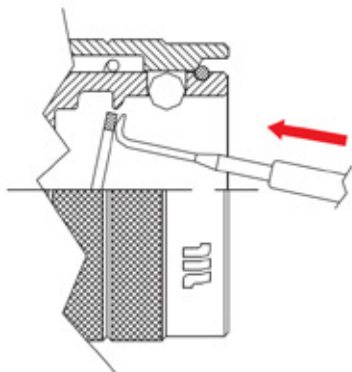


Clean the seal area



**Remove all residual parts of damaged
O-ring and back-up ring.**

3



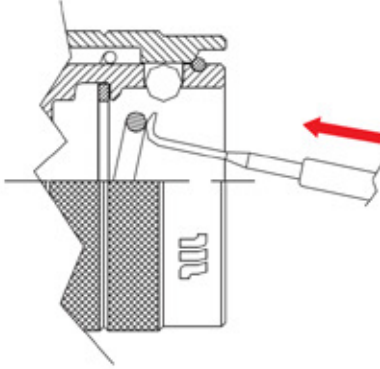
Insert the new back-up ring



**Take care not to deform or scratch the
back-up ring.
Ensure the back-up ring is correctly
located in it's seat.**

REPLACEMENT INSTRUCTIONS

4

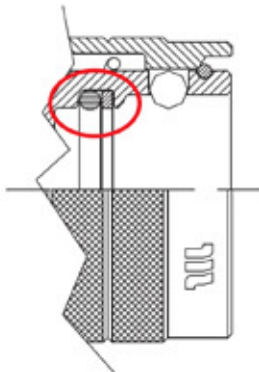


Insert the new O-ring



Lubricate the O-ring before inserting. Take care not to scratch the O-ring. Ensure the O-ring is correctly located in its seat.

5



The replacement process is now complete

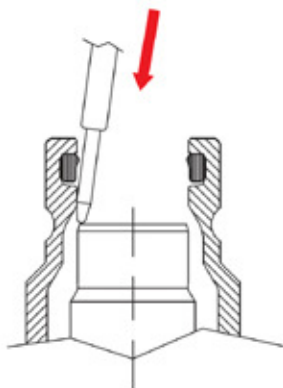


Lubricate the seal system.

REPLACEMENT INSTRUCTIONS

POLYURETHANE SEAL REPLACEMENT ON MALE FLAT-FACE

1

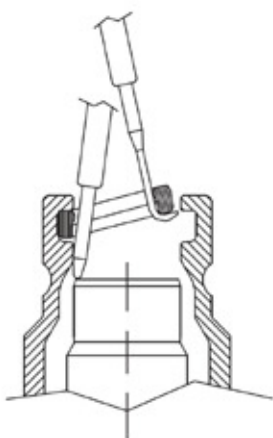


Use a suitable tool to pull back the valve and hold it in place



**Do not use sharpened tools.
Take care not to damage the components.**

2

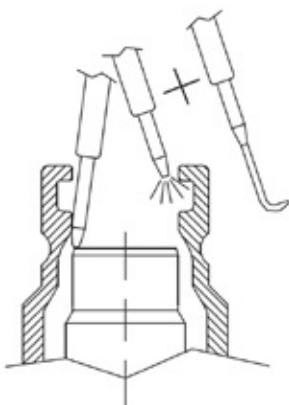


Remove the damaged seal



Take care not to damage the components.

3



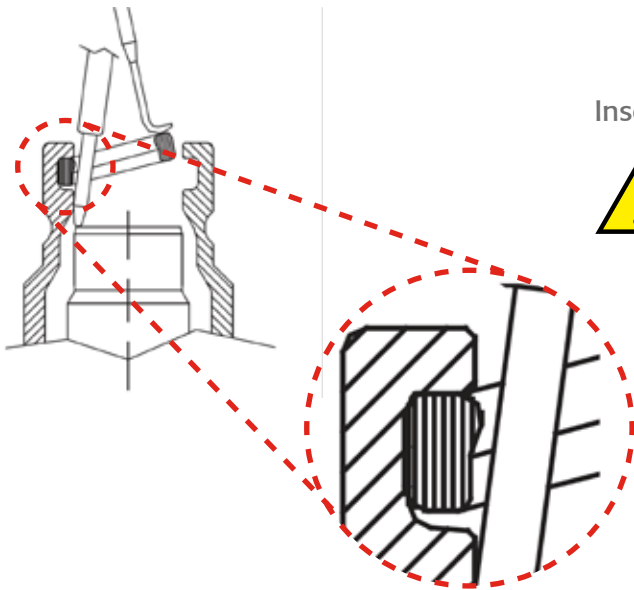
Clean the seal area



Remove all residual parts of polyurethane seal.

REPLACEMENT INSTRUCTIONS

4

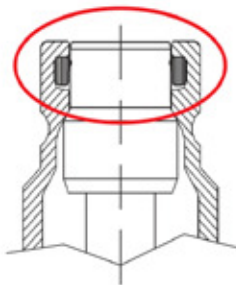


Insert the new seal, ensuring it is correctly orientated



Lubricate the seal before inserting. Take care not to scratch the seal. Ensure the seal is correctly located in it's seat.

5



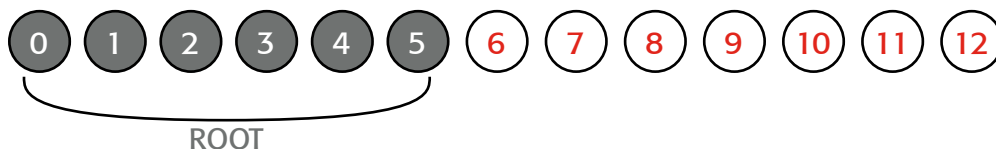
Release the valve to complete the replacement process



Lubricate the seal system.

PART NUMBERING SYSTEM

HOSES



DIGIT "0"



"H" letter always means "Hoses"

DIGITS "1-2-3-4-5"



Family

"Five digit number" that defines a specific hose family - see "Hose Family Table".

Digit "1"	Hose Type
0	Hydraulic rubber hose
2	Thermoplastic hose
3	Traded hose
7	Oil & marine hose
8	Industrial hose
9	PTFE hose

Digits "1-2"	Hose Type
10	Hydraulic rubber hose
16	Textile braided - Traded

DIGIT "6"



Progressive letter (A, B, ...) is used to identify an updated structure

In case a number is used, it must be read together with digits "7" and "8" to identify the hose's diameter in mm

DIGITS "7-8"



Diameter in millimetres

In case digit "6" is a number, the hose diameter in millimetres should be read including it.

DIGIT "9"



Value	Package	Marking Technology
0	Box	Ink transfer
B	Reel	Ink transfer
P	Plastic reel	Ink transfer
R	Roll	Ink transfer
W	Wooden reel	Ink transfer
E	Defined in digit "10"	Embossed / embedded
I	Defined in digit "10"	Inkjet
M	Defined in digit "10"	Mylar

PART NUMBERING SYSTEM

HOSES (CONTINUED)

DIGIT "10"



Value	Package	Special
L	Box (\leq DN51); Wooden reel ($>$ DN51)	Branding with License Number
O	Box	-
B	Reel	-
P	Plastic reel	-
R	Roll	-
W	Wooden reel	-
A	Box	100 ft (spiralled) / 50 ft (GoldenBlast)
Q	Box	40 m (GoldenBlast)
S, V, Z, Y	Box	Special length
C	-	Branding without "Made in..." declaration

DIGIT "11"



Value	Special
S, V, Z, Y	Special length
C	Branding without "Made in..." declaration
9	Manuli standard branding
0-8	Private brand

DIGIT "12"



Value	Special
9	Manuli standard branding
0-8	Private brand

Notes for digits "9-10-11-12"

If the above convention is NOT followed then the branding is considered "Private". Exceptions related to "Manuli Brand" hoses are: x900; xx90; x556; x833; x962; xx97; xx95

PART NUMBERING SYSTEM

HOSE FAMILIES

First 6 Digits	Prod. Tech.	Prod. Tech. Description	Family	Family Description
H01006	1	Wire Braided	6	TRACTOR/1SN
H01007	1	Wire Braided	7	ROCKMASTER/1SN
H01013	1	Wire Braided	13	TRACTOR/1SC
H01015	1	Wire Braided	15	PILOT
H01025	1	Wire Braided	25	TRACTOR/2SC
H01027	1	Wire Braided	27	TRACTOR/2SN
H01030	1	Wire Braided	30	ROCKMASTER/2SC
H01031	1	"Wire Braided; Wire Spiralled"	31	SHIELDMASTER/4000
H01032	1	"Wire Braided; Wire Spiralled"	32	SHIELDMASTER/5000
H01033	1	Wire Braided	33	CPH/2SC
H01034	1	Wire Braided	34	JACKMASTER
H01035	1	Wire Braided	35	ROCKMASTER/2ST
H01038	1	Wire Braided	38	ROCKMASTER/2SN
H01039	1	Wire Braided	39	NOZONE/2K
H01056	1	Wire Braided	56	HARVESTER/17
H01058	1	Wire Braided	58	EQUATOR/1 BLACK
H01059	1	Wire Braided	59	EQUATOR/1 BLUE
H01060	1	Wire Braided	60	EQUATOR/2 BLACK
H01061	1	Wire Braided	61	EQUATOR/2 BLUE
H01084	1	Wire Braided	84	LYTE-FLEX
H01101	1	Wire Braided	101	ROCKMASTER/2 PLUS
H01102	1	Wire Braided	102	ETERNITY/2
H01104	1	"Wire Braided; Wire Spiralled"	104	SHIELDMASTER/5000 MINE
H01105	1	Wire Braided	105	SHIELDMASTER/2SC MINE
H01106	1	Wire Braided	106	SHIELDMASTER/2000
H01108	1	Wire Braided	108	ROCKMASTER/1SC
H01110	1	Wire Braided	110	REFRISTAR
H01112	1	Wire Braided	112	TWINPOWER/PLUS
H01113	1	Wire Braided	113	FLUICONNECTO 2SN
H01119	1	Wire Braided	119	TWINPOWER 4000
H01120	1	Wire Braided	120	TWINPOWER 5000
H01122	1	Wire Braided	122	SHIELDMASTER/2 PLUS MINE
H01124	1	Wire Braided	124	FIREND
H01125	1	Wire Braided	125	GOLDENISO/21 ANTIWEAR
H01126	1	Wire Braided	126	GOLDENISO/28 ANTIWEAR
H01127	1	Wire Braided	127	TREX

PART NUMBERING SYSTEM

HOSE FAMILIES (CONTINUED)

First 6 Digits	Prod. Tech.	Prod. Tech. Description	Family	Family Description
H01128	1	Wire Braided	128	XTRAFLOW/ HT
H01129	1	Wire Braided	129	XTRAFLOW/2WB
H01133	1	Wire Braided	133	ULTRASTAR
H01134	1	Wire Braided	134	GOLDENISO/35 LONGLIFE
H01135	1	Wire Braided	135	LUBEMASTER
H01A32	1	"Wire Braided; Wire Spiralled "	A32	SHIELDMASTER/6000
H01A78	1	Wire Braided	A78	SUPERJET/PLUS
H01A79	1	Wire Braided	A79	SUPERJET/PLUS BLUE
H01A94	1	Wire Braided	A94	PROJET
H01A95	1	Wire Braided	A95	PROJET BLUE
H02001	2	Smooth Hoses	1	SUPERJET
H02002	2	Smooth Hoses	2	SUPERJET BLUE
H02003	2	Smooth Hoses	3	K-JET
H02004	2	Smooth Hoses	4	TRACTOR/1SN
H02008	2	Smooth Hoses	8	K-JET BLUE
H02011	2	Smooth Hoses	11	GOLDENISO/14
H05002	5	Wire Braided (R5 hose type)	2	COVER
H09002	9	Textile	2	REFRIMASTER
H09045	9	Textile	45	ASTRO/2
H09046	9	Textile	46	ASTRO/3
H09066	9	Textile	66	PUSHFIT
H09067	9	Textile	67	MULTITEX
H09069	9	Textile	69	MASTERTEX
H09071	9	Textile	71	REFRIMASTER PLUS
H09073	9	Textile	73	MULTITEX
H10008	10	Wire Spiralled	8	ROCKMASTER/4SP
H10018	10	Wire Spiralled	18	DIAMONDSPIR
H10031	10	Wire Spiralled	31	ROCKMASTER/12
H10035	10	Wire Spiralled	35	ROCKMASTER/13
H10044	10	Wire Spiralled	44	ROCKMASTER/4SH
H10049	10	Wire Spiralled	49	ROCKMASTER/15
H10066	10	Wire Spiralled	66	GOLDENBLAST/PLUS
H10067	10	Wire Spiralled	67	GOLDENBLAST/SIX
H10072	10	Wire Spiralled	72	GOLDENBLAST
H10086	10	Wire Spiralled	86	SHIELDMASTER/6000 MINE
H10089	10	Wire Spiralled	89	GOLDENISO/45 LONGLIFE

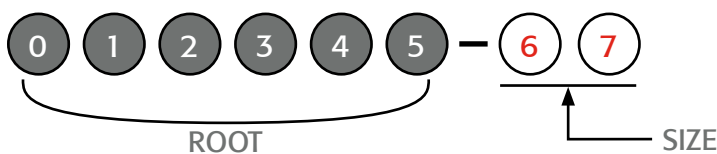
PART NUMBERING SYSTEM

HOSE FAMILIES (CONTINUED)

First 6 Digits	Prod. Tech.	Prod. Tech. Description	Family	Family Description
H10091	10	Wire Spiralled	91	XTRAFLOW/4WS
H10093	10	Wire Spiralled	93	GOLDENISO/21 XTRAFLEX
H10095	10	Wire Spiralled	95	GOLDENISO/28 XTRAFLEX
H10096	10	Wire Spiralled	96	GOLDENISO/35 XTRAFLEX
H10097	10	Wire Spiralled	97	GOLDENISO/42 XTRAFLEX
H10098	10	Wire Spiralled	98	GOLDENISO/38 LONGLIFE
H10102	10	Wire Spiralled	102	DIAMONDSPIR/21
H10103	10	Wire Spiralled	103	DIAMONDSPIR/35
H10104	10	Wire Spiralled	104	DIAMONDSPIR/14
H10108	10	Wire Spiralled	108	GOLDENISO/50 DIAMOND
H10109	10	Wire Spiralled	109	GOLDENISO/56 DIAMOND
H30005	30	Textile, helix wire	5	SPIRTEX/K
H30010	30	Thermoplastic	10	HYDROPLAST
H30011	30	Thermoplastic	11	HYDROTWIN

PART NUMBERING SYSTEM

FERRULES



DIGIT "0"



Value

Ferrule Type

M	Ferrule MF2000
C	Ferrule or clamp A/C
K	Reusable ferrule

DIGIT "1"



Value

Description

0	Always
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DIGITS "2-3"



Refer to Ferrule Series table.

DIGIT "4"



Value

Issue of Ferrule

0	First issue of ferrule series
1	Second issue of ferrule series
2	Third issue of ferrule series
3	Fourth issue of ferrule series

DIGIT "5"



Value

Special

0	Standard
1	Customised version
2	Customised version
...	...

DIGITS "6-7"



Hose bore size

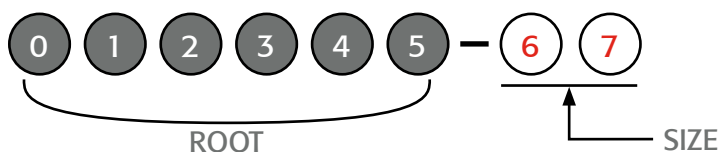
PART NUMBERING SYSTEM

FERRULE SERIES

Digits	Description
01	Skive Ferrule for W.B Hoses
03	No-Skive Ferrule for Textile Braided Hoses / Star-Crimp Ferrule AC for RefriStar
04	Reusable Star-Fit Ferrule AC for RefriStar
07	Refrimaster Ferrule AC
08	No-Skive Ferrule for Compact Hoses
09	Skive Ferrule for W.B and W.S Hoses
10	Refrimaster Clamp
13	Double Skive Ferrule for H.D. Spiral Hoses (Interlock 4-6 ply)
14	Double Skive Ferrule for H.D. Spiral Hoses (Interlock 4 ply)
15	Double Skive Ferrule for H.D. Spiral Hoses (Interlock Plus 4 ply)
16	Double Skive Ferrule for H.D. Spiral Hoses (Interlock Plus 6 ply)
17	Double Skive Ferrule for Extra Duty Spiral Hoses (Blastlock-Xtralock 4 ply)
18	Double Skive Ferrule for Extra Duty Spiral Hoses (Blastlock-Xtralock 6 ply)
24	No-Skive Ferrule for Minifit
26	Double Skive Ferrule for Extra Duty Spiral Hoses (Interlock Super)
28	Double Skive Ferrule for Extra Duty Spiral Hoses (Interlock Super)
31	No-Skive Ferrule for 1 W.B. Hoses
33	No-Skive Ferrule for W.B. Hoses
34	No-Skive Ferrule for W.B. Hoses
54	No-Skive Ferrule for 4 W.S. - 2 W.B. Hoses (Spiralfit)
55	No-Skive Ferrule for 4 W.S. - 6 W.S. Hoses (Spiralfit)
90	Frigostar Clamp

PART NUMBERING SYSTEM

SPECIAL FERRULES



DIGIT "0"



Value

J

Description

Always means "Accessories"

DIGIT "1"



Value

B

Ferrule Type

Always means "Special Ferrule"

DIGITS "2-3"



Value

01

Hose Type

Ferrule for PTFE hose

DIGIT "4"



The progressive number in this position specifies the customisation / release

DIGIT "5"



Value

2

Carbon steel

3

Stainless steel

Material

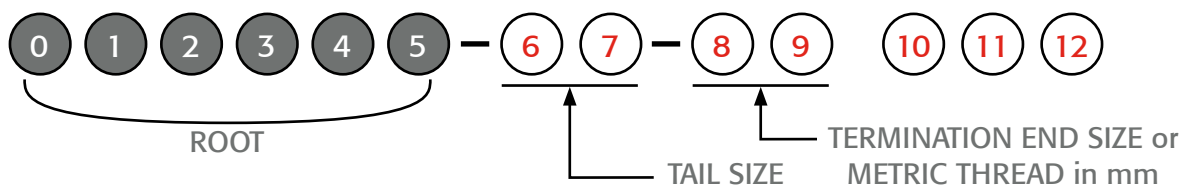
DIGITS "6-7"



Hose bore size

PART NUMBERING SYSTEM

TWO-PIECE HYDRAULIC FITTINGS



Value	Description
M	MF2000 Connector (Multifit, Interlock, Xtralock, ...)
O	Accessories (banjo, flange clamps, bolt, ...)
L	Push-Lock Connector



Value	Description
1	Male or Double connector type Multifit
2	Female or Flange type Multifit
3	Male or Double connector type Interlock and Interlock Plus
4	Female or Flange type Interlock and Interlock Plus
5	Male or Double connector type Xtralock
6	Female or Flange type Xtralock
7	Male or Double connector type Spiralfit
8	Female or Flange type Spiralfit / Accessories (flange clamps and bolt)
A	Male or Double connector type Interlock Super
B	Female or Flange type Interlock Super
S	Female type Minifit
T	Male type Minifit



The numbers in these positions specify the termination end or the second tail.
See "Termination Ends Type" table for coding details.

PART NUMBERING SYSTEM

TWO-PIECE HYDRAULIC FITTINGS (CONTINUED)

DIGIT "4"



Value

Bending Angle

0	Special Bending Angle
1	Straight
2	22,5° Swept
3	30° Swept
4	Double connector
5	45° Swept
6	60° Swept
7	67,5° Swept
8	Compact type
9	90° Swept

DIGIT "5"



Value

Description

0	No Nut / Male / Double skive Flange type Interlock/InterlockPlus/Xtralock
1	Crimped-back Nut / No-skive or External-skive Flange type Multifit/Spiralfit
2	Thrust-wire Nut
3	Slip-on Nut
4	Double Thrust-wire Nut
7	One-piece flange clamp (only for O8... Codes)
8	ISO/SAE code 61 split flange clamp (only for O8... Codes)
9	ISO/SAE code 62 split flange clamp (only for O8... Codes)

DIGITS "6-7"



Tail size

DIGITS "8-9"



Termination end size

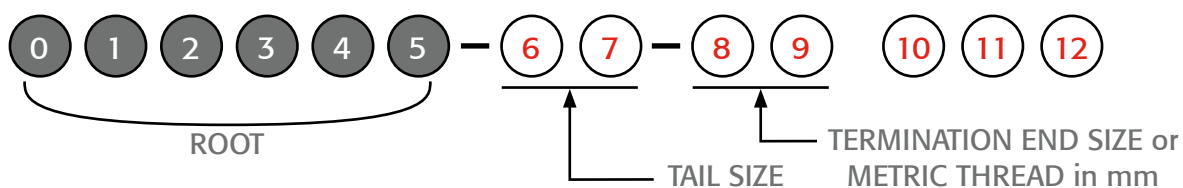
DIGITS "10-11-12"



These digits specify various customisations related to dimensions, threads, drops, ...

PART NUMBERING SYSTEM

ONE-PIECE HYDRAULIC FITTINGS



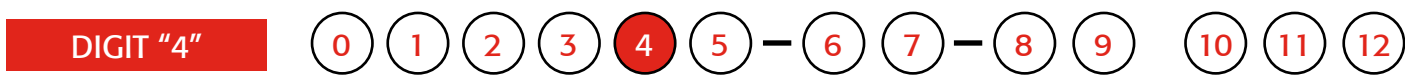
Value	Description
OPB	One-Piece (MF3000) Braided
OPNS	One-Piece (MF3000) No Skive
OPS	One-Piece (MF3000) Spiral
OPK	One-Piece (MF3000) No Skive Kompact
OPF	One-Piece (MF3000) No Skive Flat



Value	Description
1	Male
2	Female or Flange type



The numbers in these positions specify the termination end or the second tail.
See "Termination Ends Type" table for coding details.



Value	Bending Angle
0	Special Bending Angle
1	Straight
2	22,5° Swept
3	30° Swept
4	45° Swept
6	60° Swept
7	67,5° Swept
8	Compact type
9	90° Swept

PART NUMBERING SYSTEM

ONE-PIECE HYDRAULIC FITTINGS (CONTINUED)

DIGIT "5"



Value

Description

Value	Description
0	Flange type Interlock/Xtralock/Multispiral or Male
1	Crimped-back Nut or Flange type Multifit
2	Thrust-wire Nut
3	Slip-on Nut

DIGITS "6-7"



Tail size

DIGITS "8-9"



Termination end size

DIGITS "10-11-12"



These digits specify various customisations related to dimensions, threads, drops, ...

PART NUMBERING SYSTEM

TERMINATION END TYPES

Digit	Fittings	Q.Safe	Description (Male End)	Description (Female End)
00	00	-	Double connector (same tail in two-ends connectors) / No end (plug)	No end (plug)
01	-	01	BSP Male DIN 3852-11 - ISO 1179-2 Heavy Duty "form E"	Fixed Female GAS JIS B 2351 "type O"
02	-	02	BSP Male Tapered Thread Long	BSP Female Tapered
03	03		BSP Male Parallel Thread O'R Flat Face (ISO 1179-3)	BSP Banjo
04	-	04	BSP Male Bulkhead	BSP Fixed Female DIN 3852-2 "form X" / ISO 1179-1
05	05	05	BSP Male 60° cone seat BS5200 / ISO 8434-6	BSP Female 60° cone BS5200 / ISO 8434-6
06	06	-	BSP Male Flat Face	BSP Female Flat seat
07	07	-	BSPT Male	JIS B 8363 (BSP - Nissan) Swivel Female
08	08	08	Metric Bolt DIN 7643	BSP O-Ring Female 60° cone BS5200 / ISO 8434-6
09	09	-	BSP Male O'Ring Boss Adjustable ISO 1179-3	Metric Banjo DIN 7642
10	10	-	Metric male 60° cone superlight DIN 3863	Metric female 60° cone superlight DIN 3863
11	11	11	Metric male 24° cone seat light type DIN 3861 / ISO 8434-1	-
12	12	12	Metric male 24° cone seat heavy type DIN 3861 / ISO 8434-1	Metric Female 24° cone O'Ring heavy type DIN 3865 / ISO 8434-1 Long Drop
13	13	-	-	Metric Female Multiseal cone DIN 3868
14		14	Metric Male DIN 3852-11 "form E" b/ ISO 9974-2	"Metric Fixed Female DIN 3852-1 "form X" and "form Y"
15	15	-	-	Metric Female 24° cone O'Ring light type DIN 3865 / ISO 8434-1
16	16	-	-	Metric Female 24° cone O'Ring heavy type DIN 3865 / ISO 8434-1
17	17	-	French Millimetric metric male 24° cone seat	French Millimetric metric female
18	18	-	French GAZ metric male 24° cone seat	French GAZ metric female
19	-	19	Metric Male (Adjustable + Non-Adjustable Heavy) ISO 6149-2	Metric Fixed Female ISO 6149-1
20	20	-	-	DIN Metric Standpipe L.T. DIN 2353
21	21	-	-	DIN Metric Standpipe H.T. DIN 2353
23	-	23	JIC Bulkhead male 37° cone ISO 8434-2 / SAE J514	-
24	24	24	ORFS male ISO 8434-3 / SAE J1453	ORFS female ISO 8434-3 / SAE J1453

PART NUMBERING SYSTEM

TERMINATION END TYPES (CONTINUED)

Digit	Fittings	Q.Safe	Description (Male End)	Description (Female End)
25	25	25	JIC male (37° cone) ISO 8434-2 / SAE J514	JIC female (37° cone seat) ISO 8434-2 / SAE J514
26	26	-	-	SAE female (45° cone seat) SAE J512
27	27	27	ORFS Bulkhead male ISO 8434-3 / SAE J1453	JIC female double hexagon 37° cone seat
28	28	28	NPTF Male 60° cone seat SAE J476a	NPSM Swivel Female 60° cone SAE J514
30	30	30	Male O'Ring Boss type SAE J1926-3	Female Port SAE J1926-1
32	-	32	Male O'Ring Boss (Adjustable + Non-Adjustable Heavy) SAE J1926-2	-
33	33	-	Flange head (not including Clamps) Code 61 without O'Ring (adapters)	Flange ISO/SAE 61 (ISO 6162-1 / SAE J518 code 61)
34	34	34	API Male	NPTF Fixed Female SAE J476a
35	35	-	NPT Male	NPT Fixed Female
36	36	-	Flange head (not including Clamps) Code 62 without O'Ring (adapters)	Flange ISO/SAE 62 (ISO 6162-2 / SAE J518 code 62)
37	37	37	Metric male 60° cone superlight DIN 3863 Bulkhead	Flange ISO/SAE 62 Plus / Flange (A/C)
38	38	-	JIS B8363 Toyota male	JIS B 8363 (Toyota) Swivel Female
39	39	-	JIS male O-Ring boss - JIS B 8363 type CO	SUPERCAT flange
40	40	-	Komatsu Metric male 60° cone seat	JIS B 8363 (Komatsu) Swivel Female
41	41	-	NPTF Swivel Male SAE J476a	Komatsu Flange
43	43	-	SAE O'Ring Boss Swivel Male	-
44	44	-	Male BSPP Flat Face Bonded Washer	ORFS Female Long Drop Elbow ISO 12151-1 / SAE
46	46	-	Super Staple Male	Super Staple Fixed Female
47	47	-	Super Staple Male (only for Interlock Plus and Spiralfit)	JIC (37° cone) Female Long Drop Elbow ISO 12151-5 / SAE J516
48	48	-	Staple Male SAE J1467	Staple Fixed Female SAE J1467
49	49	-	-	Wash Cleaning
52	52	-	SAE 45° cone Metric Thread	SAE 45° cone Metric Thread
55	55	-	BSP Parallel Thread 60° cone BS5200 (only for Interlock/Xtralock tail)	BSP Parallel Thread 60° cone BS5200 (only for Interlock/Xtralock tail)
56	56	-	Union Fitting (Male SUB)	Union Fitting (Female SUB)
57	-	-	BSP Male Tapered Thread - JIS B 8363	BSP Swivel Female (only for Interlock/Xtralock tail)
58	58	-	GOST Male	BSP Parallel Thread O'Ring 60° cone BS5200 (only for Interlock/Xtralock tail)

PART NUMBERING SYSTEM

TERMINATION END TYPES (CONTINUED)

Digit	Fittings	Q.Safe	Description (Male End)	Description (Female End)
59	59	-	Flushfit Male Low Pressure	Flushfit Fixed Female Low Pressure
60	-	-	Metric thread 74° cone	Metric thread 74° cone
61	61	-	Flushfit Male High Pressure	Flushfit Fixed Female High Pressure
62	62	-	Male Metric Thread 24° cone heavy type DIN 3861 (only for Interlock/Xtralock tail)	Flushfit Swivel Female Low Pressure
63	63	-	Type M Female 58° cone	-
64	-	-	BSP Male front seal Flushfit Swivel Female High Pressure	-
66	66	-	-	Metric Female 24° cone O'Ring heavy type DIN 3865 / ISO 8434-2 (only for Blastlock / Xtralock); Grayloc Hub (only for Drilling)
67	67	-	Standard SSKV	Standard SSKV
68	68	-	Super SSKV	Super SSKV
74	74	-	ORFS type (only for Interlock/Xtralock tail)	ORFS type (only for Interlock/Xtralock tail)
75	75	-	JIC Thread 37° cone (only for Interlock/Xtralock tail)	JIC Thread 37° cone (only for Interlock/Xtralock tail)
76	76	-	Expansion valve short pilot (A/C)	ISO 6164 FLANGE type 40MPa / Expansion valve (A/C)
77	-	77	DIN Bulkhead Male 24° cone Light type ISO 8434-1	-
78	78	-	"NPTF Male 60° cone seat SAE J476a (only for Interlock	Blastlock/Xtralock)"
79	79	-	Fixed Male O'Ring seat (A/C)	HUB API 16A (type 16BX) / Female O'Ring (A/C)
80	80	-	Male Swivel O'Ring (A/C)	FLANGE API 6A (type 6B/6BX) / O'Ring short pilot (A/C)
81	81	-	Male Grooved	French GAZ Standpipe
82	-	82	French GAZ Bulkhead metric male 24° cone seat	Staple Lock Swivel Female
83	83	-	4-Bolts Flange head Code 61 without O'Ring (adapters)	Flange ISO/SAE 61 (ISO 6162-1 / SAE J518 code 61) / 4-Bolts Flange head Code 61 (adapters)
84	84	-	-	Xtraflange 61 (ISO6162-1 / SAE J518 code 61 port compatible)
85	85	-	-	XtraFlange 62 (ISO 6162-2 / SAE J518 code 62 port compatible)
86	86	-	4-Bolts Flange head Code 62 without O'Ring (adapters)	Flange ISO/SAE 62 (ISO 6162-2 / SAE J518 code 62) - only for Xtralock / 4-Bolts Flange head Code 62 (Adapters)

PART NUMBERING SYSTEM

TERMINATION END TYPES (CONTINUED)

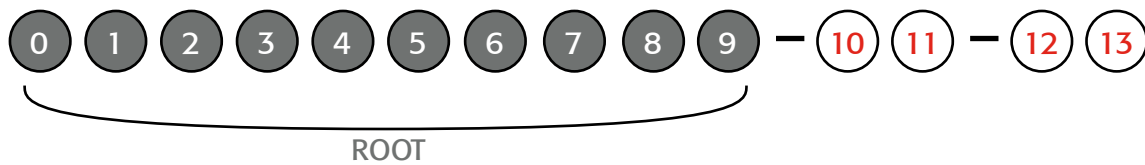
Digit	Fittings	Q.Safe	Description (Male End)	Description (Female End)
87	87	87	DIN Bulkhead Male 24° cone Heavy type ISO 8434-1	ASME B16.5 FLANGE / SDB compressor (A/C)
88	-	-	Male Metric Tapered Thread	Male Metric Tapered Thread
89	89	-	SUPERCAT flange (only for Interlock/Xtralock tail)	SUPERCAT flange (only for Interlock/Xtralock tail)
91	91	-	-	Gear Pump Flange
92	92	-	-	NSD (Non Stop Driller) Clamp Connection
95	95	-	Brazing Pipe (Fittings)	Brazing socket (Fittings) / Beveled To Weld (only Drilling)
97	97	-	Metric Male with 90° Male Cone ISO 4038	Metric Female DIN 74225

Digits	Easy-Fit / Fast-Fit
1H	Oyster High Pressure
2H	Easy-Fit High Pressure (Cejn)
1L	Easy-Fit Low Pressure (Oyster)
3H	Fast-Fit

Digits	Accessories for connectors (08...)
33	Clamps for flange ISO/SAE 61
36	Clamps for flange ISO/SAE 62
85	Xtraflange Clamps
02	BSP Bolt
08	BSP Bolt Double Hole
08	Metric Bolt DIN 7643
2H	Cartridge for Easy-Fit High Pressure
00	Drilling Safety Clamp
00	Drilling Lift Eye
20	Anti-Kink
21	Metal Sleeve
41	2 Holes Flange Clamp
42	Armour - Joint
81	Clamps for Male Grooved

PART NUMBERING SYSTEM

HYDRAULIC QUICK COUPLINGS



DIGIT "0"	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Value	Description													
Q	Quick Coupling													

DIGIT "1"	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Value	Description													
0	Hydraulic													

DIGITS "2-3"	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Quick Coupling Series - refer to "Quick Coupling Series" table														

DIGIT "4"	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Value	Material													
1	Steel													
2	AISI 316													
3	AISI 303													
4	Brass													
5	Aluminium													

DIGIT "5"	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Value	Seal Material													
0	None													
1	NBR (Nitrile)													
2	HNBR													
3	FKM (Viton, FPM)													
4	CR (Neoprene)													
5	EPDM													
6	FFPM (Kalrez)													
7	NBR - Low Temperature													
8	VMQ (Silicone Rubber)													
9	AU (Polyurethane)													
A	PTFE													

PART NUMBERING SYSTEM

HYDRAULIC QUICK COUPLINGS (CONTINUED)

DIGITS "6-7"



The numbers in these positions specify the termination end.
See "Termination Ends Type" table for coding details.

DIGIT "8"



Value

Description

0	Male
1	Female

DIGIT "9"



A letter in this position indicates a customised version.

DIGITS "10-11"



The numbers in this position indicate the Quick Coupling size.

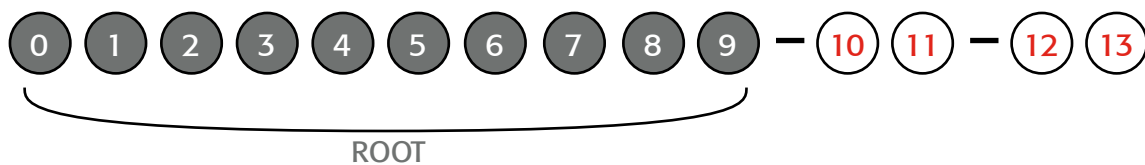
DIGITS "12-13"



The numbers in this position indicate the thread size.

PART NUMBERING SYSTEM

HYDRAULIC QUICK COUPLING TAILS



DIGIT "0"	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Value	Description													
Q	Quick Coupling													

DIGIT "1"	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Value	Description													
3	Q. Tail													

DIGITS "2-3"	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Quick Coupling Series - refer to "Quick Coupling Series" table														

DIGIT "4"	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Value	Material													
1	Steel													
2	AISI 316													
3	AISI 303													
4	Brass													
5	Aluminium													

DIGIT "5"	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Value	Seal Material													
0	None													
1	NBR (Nitrile)													
2	HNBR													
3	FKM (Viton, FPM)													
4	CR (Neoprene)													
5	EPDM													
6	FFPM (Kalrez)													
7	PTFE													
8	VMQ (Silicone Rubber)													
9	AU (Polyurethane)													

PART NUMBERING SYSTEM

HYDRAULIC QUICK COUPLING TAILS (CONTINUED)

DIGITS "6-7"



Value

Insert Type

MF

Multifit type

DIGIT "8"



Value

Insert Angle

1

Straight

DIGIT "9"



A letter in this position indicates a customised version.

DIGITS "10-11"



The numbers in this position indicate the Quick Coupling size.

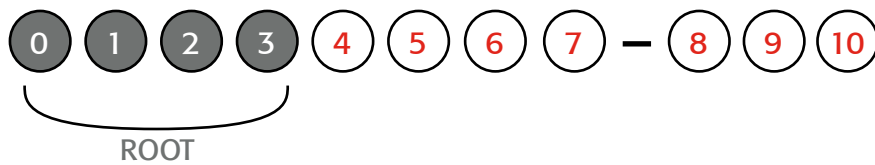
DIGITS "12-13"



The numbers in this position indicate the Insert size.

PART NUMBERING SYSTEM

HYDRAULIC QUICK COUPLING PLUGS, SEALS & CARTRIDGES



Value **Description**

Q	Quick Coupling
---	----------------



Value **Description**

1	Plugs and Seals
---	-----------------



Quick Coupling Series - refer to "Quick Coupling Series" table



Value **Material**

0	None
1	Steel
2	AISI 316
3	AISI 303
4	Brass
5	Aluminium
A	PE (polyethylene)
B	PVC
C	PA (polyamide)
D	POM (acetalic resin)

PART NUMBERING SYSTEM

HYDRAULIC QUICK COUPLING PLUGS, SEALS & CARTRIDGES (CONTINUED)

DIGIT "5"



Value	Seal Material
0	None
1	NBR (Nitrile)
2	HNBR
3	FKM (Viton, FPM)
4	CR (Neoprene)
5	EPDM
6	FFPM (Kalrez)
7	PTFE
8	VMQ (Silicone Rubber)
9	AU (Polyurethane)

DIGIT "6"



Value	Function
0	Simple cap / plug
1	EcoCap (with oil recycle)
2	Automatic cap
3	Seal
4	Parking
5	Cartridge

DIGIT "7"



Value	Colour
N	Not specified or natural
R	Red
B	Blue
Y	Yellow
G	Green
K	Black
W	Brown
H	White
O	Orange
E	Grey

DIGITS "8-9"



Quick coupling size - corresponds to nominal internal hose diameter recommended for use with the coupling (see ISO 4397)

DIGIT "10"



Free digit for Version or other.

PART NUMBERING SYSTEM

HYDRAULIC QUICK COUPLING SERIES

QC Series	Plug & Seals Series	Description	
01	A0	Male according to ISO 7241-1 standards, series A	Free flow
02		Male according to ISO 7241-1 standards, series A	Poppet valve
03		Male according to ISO 7241-1 standards, series A	Ball valve
04		Male according to ISO 7241-1 standards, series A	Poppet valve, special guidevalve
05		Male according to ISO 7241-1 standards, series A	Ball valve, special guidevalve
06		Male according to ISO 7241-1 standards, series A	Connectable under pressure
07	A1	Female according to ISO 7241-1 standards, series A	Free flow
08		Female according to ISO 7241-1 standards, series A	One-way release, poppet valve
09		Female according to ISO 7241-1 standards, series A	One-way release, ball valve
10		Female according to ISO 7241-1 standards, series A	One-way release, connectable under pressure
11		Female according to ISO 7241-1 standards, series A	One-way release, connectable with male under pressure
12		Female according to ISO 7241-1 standards, series A	One-way release, connectable with both parts under pressure
13		Female according to ISO 7241-1 standards, series A	Two-ways release, poppet valve
14		Female according to ISO 7241-1 standards, series A	Two-ways release, ball valve
15		Female according to ISO 7241-1 standards, series A	Two-ways release, connectable under pressure
16		Female according to ISO 7241-1 standards, series A	Two-ways release, connectable with male under pressure
17		Female according to ISO 7241-1 standards, series A	Two-ways release, connectable with both parts under pressure
18		Female according to ISO 7241-1 standards, series A	Rigid, two-ways release, connectable with male under pressure
19		Female according to ISO 7241-1 standards, series A	Rigid, two-ways release, connectable with both parts under pressure

PART NUMBERING SYSTEM

HYDRAULIC QUICK COUPLING SERIES (CONTINUED)

QC Series	Plug & Seals Series	Description	
20	A2	Male according to ISO 7241-1 standards, series B	Free flow
21		Male according to ISO 7241-1 standards, series B	Poppet valve
22		Male according to ISO 7241-1 standards, series B	Ball valve
23	A3	Female according to ISO 7241-1 standards, series B	Free flow
24		Female according to ISO 7241-1 standards, series B	One-way release, poppet valve
25		Female according to ISO 7241-1 standards, series B	One-way release, ball valve
26		Female according to ISO 7241-1 standards, series B	Safety sleeve, poppet valve
27		Female according to ISO 7241-1 standards, series B	Safety sleeve, ball valve
28	A4	Male standard series	Free flow
29		Male standard series	Poppet valve
30		Male standard series	Ball valve
31	A5	Female standard series	Free flow
32		Female standard series	One-way release, poppet valve
33		Female standard series	One-way release, ball valve
34		Female standard series	Safety sleeve, poppet valve
35		Female standard series	Safety sleeve, ball valve
36		Female standard series	Two-ways release, poppet valve
37	A6	Compact Male	Free flow
38	A7	Compact Female	Free flow
39	A8	Flat face male according to ISO 16028	
40		Flat face male according to ISO 16028	Connectable under pressure
41	A9	Flat face female according to ISO 16028	With safety sleeve
42		Flat face female according to ISO 16028	Without safety sleeve
43	A8	Flat face male according to ISO 16028	Working Pressure 35MPa
44	A9	Flat face female according to ISO 16028	Working Pressure 35MPa
45	AC	Male for diagnostic purpose according to ISO 15171	
46	AD	Female for diagnostic purpose according to ISO 15171	

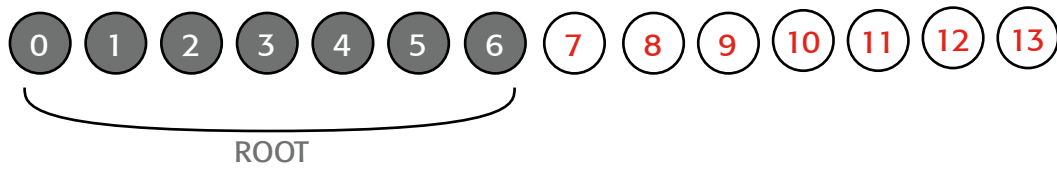
PART NUMBERING SYSTEM

HYDRAULIC QUICK COUPLING SERIES (CONTINUED)

QC Series	Plug & Seals Series	Description	
47	AE	Male for hydraulic braking circuit according to ISO 5676	
48	AF	Female for hydraulic braking circuit according to ISO 5676	
49	AG	Screw type male for hydraulic braking circuit	
50	AH	Screw type female for hydraulic braking circuit	
51	AI	Screw type male for german market	
52	AJ	Screw type female for german market	
53	AK	Screw type male for very high pressure	
54	AL	Screw type female for very high pressure	
55	AM	Screw type male for hydraulic cylinder	
56	AN	Screw type female for hydraulic cylinder	
57	AP	Screw type male for truck	
58	AQ	Screw type female for truck	
59	AR	Compact Flat face male Screw type	
60	AS	Compact Flat face female Screw type	
61	AI	Screw type male for german market	Heavy duty
62	AJ	Screw type female for german market	Heavy duty
63	AT	Screw type male for U.S. market	(Not available in other markets - No catalogue)
64	AU	Screw type female for U.S. market	(Not available in other markets - No catalogue)
65	A1	Female according to ISO 7241-1 standard, series A	Rigid, two ways release
66	AV	Flat face male Screw type	
67	AW	Flat face female Screw type	

PART NUMBERING SYSTEM

HOSE PROTECTIONS



DIGIT "0"



Value

Description

J	Always means "Accessories"
---	----------------------------

DIGIT "1"



Value

Description

P	Always means "Protection"
---	---------------------------

DIGIT "2"



Value

Protection Type

1	Spring
2	Sleeve
3	Clinch
4	Flexible armour

DIGIT "3"



Value

Material

1	Polyethylene
2	Polyamide
3	Polyester
4	Silicone
5	Stainless steel
6	Steel

DIGIT "4"



Value

Colour

B	Black
Y	Yellow
A	Orange
G	Grey
M	Metal
T	Other

PART NUMBERING SYSTEM

HOSE PROTECTIONS (CONTINUED)



DIGITS "5-6"

Value	Product Family
01	Protection spring
02	Mining protection spring
03	HT Protection spring
04	Light protection spring
05	Fire sleeve
06	Textile sleeve
07	Round metal sleeve
08	Heat protection spring
09	BOP hose flexible armour
10	Clinch



DIGITS "7-8-9"

The numbers in these positions indicate the internal diameter in mm.



DIGITS "10-11-12-13"

Letters and numbers in these positions describe branding, packaging or special length information.

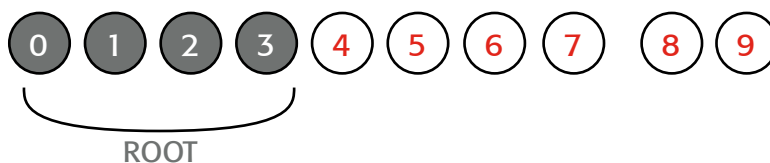
Value	Branding Information
E	Embossed / Embedded
I	Inkjet
T	Textile

Value	Packaging Information
0	Embossed / Embedded

Value	Branding
99	Standard

PART NUMBERING SYSTEM

RING AND SEAL



DIGIT "0"



Value

Description

J

Always means "Accessories"

DIGIT "1"



Value

Description

0

Always means "Rings"

DIGITS "2-3"



Value

Description

Value

Description

01

O'ring for SAE 3000 and 6000 PSI flange

16

kit bonded seal rings

02

O'ring imperial size

17

kit copper sealing rings

03

O'ring metric size

18

kit O'ring metric size

04

O'ring for Staple Lock

19

O'ring for ORFS

05

O'ring for MSAE

20

O'ring for H.P washer fitting

06

O'ring and metallic anti-extrusion ring for metric series

21

O'ring for refri fitting

07

O'ring for BSPP

22

Cylindrical seal for refri connector

08

Metallic anti-extrusion ring for male BSPP

23

O'ring for Super Staple Lock

09

O'ring for ETCAO

24

Metal sealing ring for banjos

10

Flat seal built in

25

Metal sealing ring for pressure gauge connectors

11

Copper sealing ring

26

Soft sealing ring for banjos

12

Bonded seal ring

27

Elastomeric (captive) seal - NBR

13

Flange counter-ring for "Caterpillar" insert

28

Elastomeric (captive) seal - Viton

14

Seal type for SAE 3000 and 6000 PSI flange

29

Interlock Plus O-Ring

15

Support plastic ring (open ring)

30

One-piece Polyurethane seal for Staple Low Pressure (Yellow)

31

One-Piece Polyurethane seal for Staple High Pressure (Red)

PART NUMBERING SYSTEM

RING AND SEAL

DIGITS "4-5"



The numbers in these positions indicate the external diameter in mm.

DIGITS "6-7"



The numbers in these positions indicate the internal diameter in mm.

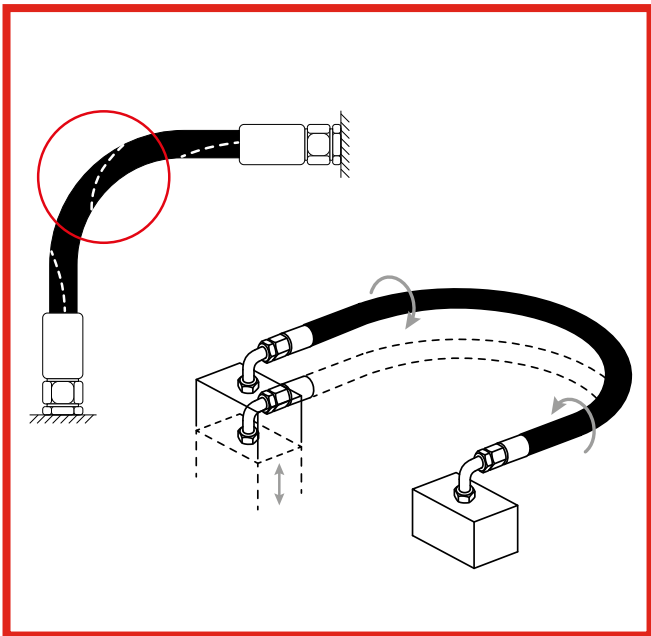
DIGITS "8-9"



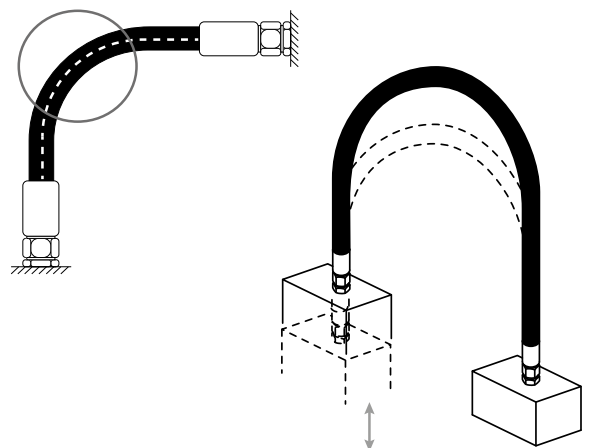
The numbers in these positions indicate the axial thickness in mm.

HOSE INSTALLATION GUIDE

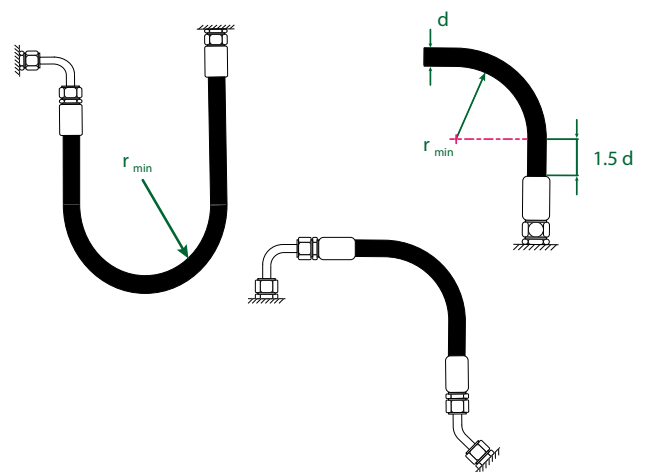
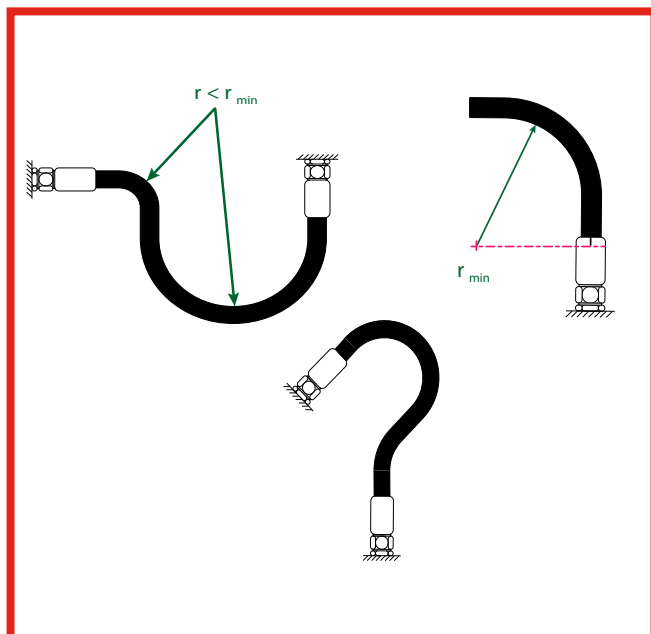
INCORRECT USE



CORRECT USE



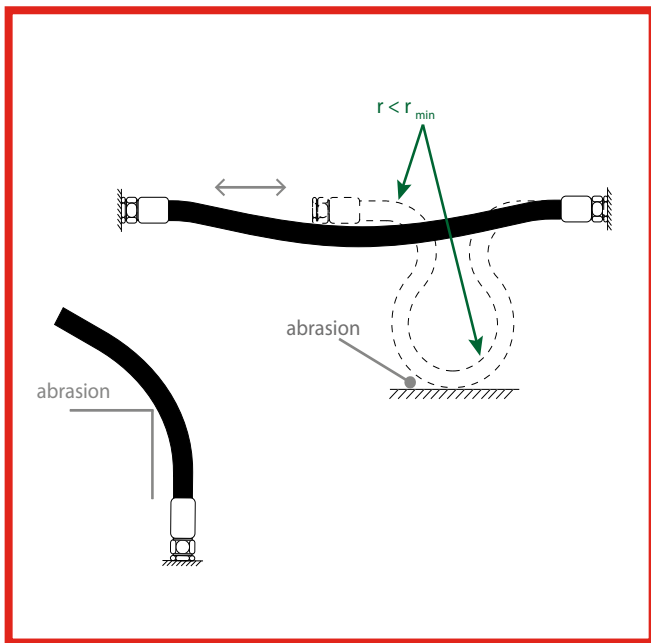
- Avoid twisting the hose assembly when installing.
- Avoid situations where moving parts will cause twisting effects on the hose assemblies after installation.



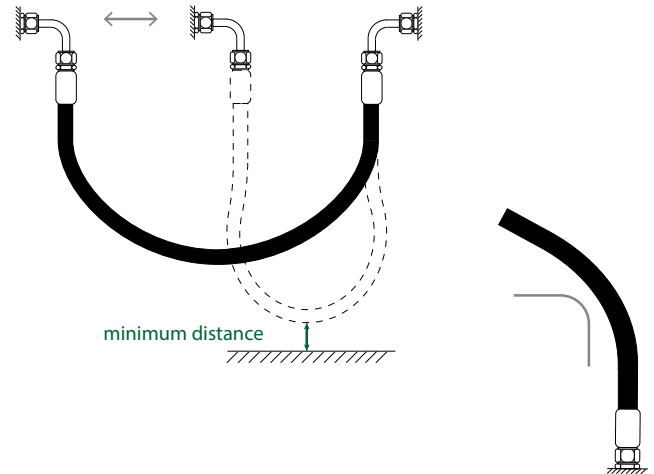
- Select the correct fittings to avoid tight bend radii.
- Ensure a minimum distance of 1.5 x "d" after the ferrule before hose bending.

HOSE INSTALLATION GUIDE

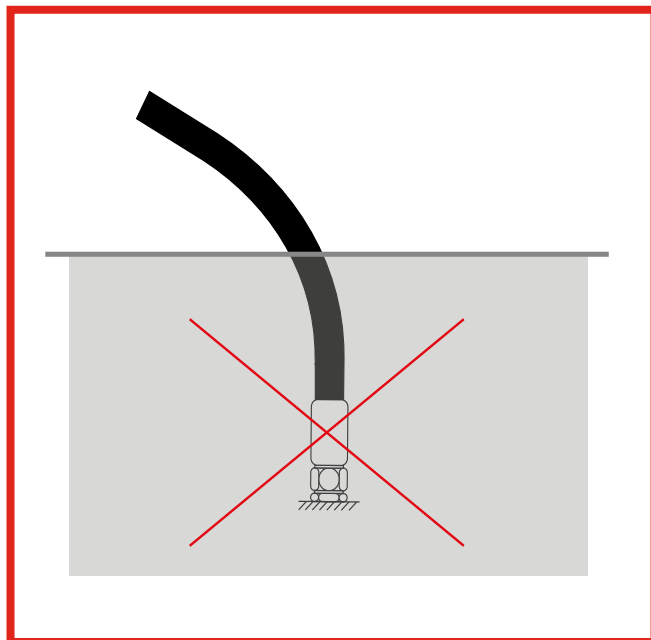
INCORRECT USE



CORRECT USE



- Avoid interference with objects that can cause abrasion or damage to the hose.
- In flexing applications ensure that the hose is not subjected to tensile stresses or to impacts / abrasion from the surrounding environment.



The Manuli hydraulic hose product range is not designed for immersion in the service fluid. This type of special application should be avoided or carefully studied with reference to the hose specifications.

For detailed information concerning recommended practices for hydraulic hose assemblies, please refer to **SAE J1273**. This document should be used as a guide when selecting, routing, fabricating, installing, replacing, maintaining and storing hose for hydraulic systems.

HOSE INSTALLATION GUIDE

PRODUCT SELECTION AND INSTALLATION

The information in this document concerning hoses, fittings and other items manufactured and provided by Manuli Rubber Industries and its subsidiaries, is provided for the express purpose of aiding in the correct selection of products for particular applications. However it is the responsibility of the customer to ensure that they consider the specific details of the application during the selection process.

Important factors to consider include:

- Hose size
- Hose length
- Fluid compatibility
- Ambient and operating temperatures
- System operating pressures
- Static head pressures
- Installation design
- Minimum bend radii
- Possible abrasion of the hose
- Movement and flexing of the hose during operation

Improper selection and / or installation of hydraulic hose assemblies can result in reduced assembly life, equipment failure, property damage, bodily injury or death.

HOSE INTEGRATION

Manuli hoses and fittings are designed to be part of an integrated hose assembly system. As such they should only be used together or in conjunction with other types of fittings recommended by Manuli Rubber Industries and its subsidiaries. Failure to observe these requirements may result in a reduced lifespan of the hose assemblies or other failures which can cause equipment failure, property damage, bodily injury or death.

Manuli provides guidelines for the proper assembly, installation, maintenance and use of its products and further information on recommended practices is available in [SAE J1273](#).

Should you have any questions regarding proper assembly, installation or application usage of any Manuli product, please contact our Technical Centre in Italy.

WARNING!

Improper selection or use of any of the products found in this document may result in property damage, bodily injury or death. Consider all aspects of your application carefully to ensure that the products selected are the most appropriate for the task.

Manuli Rubber Industries reserves the right to modify the data provided in this catalogue without notice.

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SALES TERMS AND CONDITIONS

STANDARD TERMS AND CONDITIONS OF SALES[®] MANULI HYDRAULICS GROUP ("MHG") ALL GOODS AND SERVICES PROVIDED BY MHG ARE FURNISHED ONLY ON THE TERMS AND CONDITIONS STATED BELOW:

1. PURPOSE. These standard terms and conditions of sales apply to the relationship involving the supply of products by any company owned or controlled by Manuli Rubber Industries S.p.A. operating in the Manuli Hydraulics Group (referred to below as MHG) to professional operators (referred to below as Buyer or Buyers).

2. SUPPLY ORDERING PROCESS. The Buyer may issue purchase orders to MHG in the following ways:

2.A) By fax

2.B) By e-mail

2.C) On-line, only in the case of Buyers previously authorized to do so by means of a suitable activation procedure. This activation is essential if orders are to be placed on-line. The Buyer activation is by allocation of an identity code (user-id) and password to enable it to be recognized each time an order is placed, and takes place by filling in and returning the schedule set out in the home page of MHG's web site as described in the Request for Information section. The Buyer has the right to refuse the request for activation or cancel an existing activation.

3. CONTRACT FORMATION. All orders for MHG goods are subject to written acceptance by MHG by e-mail, fax or post. For on-line orders to MHG as described in point 2.C above, the authorized Buyer is first identified through his user-id and password, then selects the products, quantities and delivery address as guided by the system and issued the supply order. The order sent to MHG on-line is accepted only if specifically confirmed by this latter by email, fax or post.

Any and all terms in Buyer's purchase orders, acknowledgments, confirmations, or other business forms ("Buyer's Forms") which vary, conflict with or add to, or are in any way inconsistent with, the terms provided below are REJECTED by MHG and shall not be part of any agreement between the Buyer and MHG unless specifically agreed to in a writing document signed by MHG. MHG's acceptance of a purchase order or the commencement of performance by MHG shall neither change nor add to this Agreement;

THE TERMS PROVIDED BELOW SHALL PREVAIL OVER ANY VARYING, ADDITIONAL OR CONFLICTING TERMS IN THE BUYER'S FORMS.

For all on-line orders, these Standard Terms and Conditions of Sale, as available to the Buyer on the web site www.manuli-hydraulics.com, are applicable.

4. INFORMATION MADE AVAILABLE TO THE BUYER. Before the issue of the purchase order, MHG will provide the Buyer with all the commercial information on the products that it may require. After the order has been placed, MHG will inform the Buyer of the stages of the order through MHG service structure or, for those Buyers in possession of User_ID and Password, through MHG's web site.

5. PRICES. MHG reserves the right to alter the prices, discounts and payment conditions in force when the contract is confirmed and the Buyer expressly acknowledges and agrees upon such right. However, any modifications will become effective after notification of these has been issued, and they will apply only to the part of the supply that has not been completed. In such a case the Buyer may cancel the contract for the part not completed within 2 (two) weeks of the issue of notification of the increase and MHG shall have no liability, directly or indirectly, whatsoever.

6. TAXES. Prices do not include country, federal, state or local taxes, now or hereafter enacted, applicable to the goods sold, which tax or taxes will be added by MHG to the sales prices where MHG has the legal obligation to collect them, and will be paid by the Buyer or reimbursed by the Buyer to MHG if paid by MHG, unless the Buyer provides MHG with a proper tax exemption certificate.

7. SHIPPING, TITLE AND DELIVERY. Shipments shall be EXW as such term is defined in the Incoterms 2010, unless differently agreed upon in writing. Shipping dates are approximate and are based to a great extent on prompt receipt by MHG of all necessary information from the Buyer. MHG shall not be liable for any loss or expense incurred by the Buyer in the event that MHG fails to meet the specified delivery schedule(s) due to production or other delays due to unforeseen circumstances. Buyer must collect the products within 5 working days from the declaration by MHG of readiness for shipment EXW. For shipment FCA or FOB, Buyer must notify MHG with all necessary information for the shipment FCA or FOB within 10 working days from the declaration by MHG of readiness for shipment. In case of not respect of the above mentioned period, MHG will have the right to terminate the order or to store the products at MHG's warehouse at risk and expense of the Buyer at a rate of €0,5 per day per pallet. Unless differently agreed upon in writing, shipments shall be only for Lot or multiple of Lot for each product code. The term "Lot" is the minimum order quantity for each product code as indicated in the current price list/catalogue and must be a multiple of the minimum quantity per product code.

8. WITHDRAWAL RIGHT. In case of communication by MHG of his impossibility to respect the shipping date indicated in the confirmation of order, and unless a new shipping date will be agreed upon in writing, the Buyer can, waiving any other rights, withdraw the order by means of written notice to be sent to MHG within 7 days from the communication of MHG.

9. RETURNS. MHG will accept returns only upon prior agreement and at conditions to be defined between the parties.

10. TOLERANCES. Due to MHG's requirements, tolerances of +/-10% of the confirmed quantities, as and if applicable, are always allowed and accepted.

11. PAYMENT. Payment shall be made within the agreed upon period from the date of invoice, in the agreed upon currency at the address shown on the invoice. If payment in full is not received by MHG by the due date, the Buyer shall be in breach hereof. In the event of late payment, the Buyer will incur an interest charge calculated at the reference rate of the local national central bank plus 2 percentage points per year on the unpaid balance to cover the administration costs of collection. Moreover, MHG reserves the right to suspend all further deliveries, to recover all unpaid materials and to require an immediate payment of all

SALES TERMS AND CONDITIONS

other claims. Such charges may be in addition to other remedies exercisable by MHG. The amount of credit may be changed or credit withdrawn by MHG at any time. On any order on which credit is not extended by MHG, shipment or delivery shall be made, at MHG's election, Cash on order (in whole or part), letters of credit with all costs of collection paid by the Buyer or other terms as agreed between the parties.

12. SUSPENSION OF THE CONTRACT. Should the Buyer fail to comply in whole or in part even with only one of the supply conditions or if there are any changes of any kind in the Buyer's company name, form or trading capacity, as well as in the event of proven difficulty in meeting the payments to MHG or third parties, MHG will have the right to suspend any further deliveries and convert any premiums that have matured, bank transfers or other deeds of payment unless a suitable guarantee is issued.

13. FORCE MAJEURE. MHG shall not be responsible for any delay or failure to perform due to causes beyond its reasonable control. These causes shall include, without limitation, fire, flood, earthquake, accident, acts of the public enemy, war, acts of terrorism, riot, epidemic, quarantine restrictions, labor dispute, labor shortages, interruption of transportation, inability to secure raw materials or machinery, extraordinary increases in such raw materials prices, rationing or embargoes, acts of God, acts of Government or any agency thereof, acts of any state or local government or any agency thereof, and judicial action. Similar causes shall excuse the Buyer for failure to take goods ordered by the Buyer, provided reasonable notice is given to MHG of such contingency. However, the Buyer shall not be excused from the terms hereof for (i) any goods shipped prior to receipt of such notice; or (ii) goods already in transit when the contingency occurs.

14. LIMITATION OF LIABILITIES. THE BUYER AND MHG AGREE THAT (I) THE SOLE AND EXCLUSIVE REMEDIES FOR BREACH OF ANY WARRANTY CONCERNING THE GOODS SHALL BE REPAIR OR REPLACEMENT OF THOSE GOODS OR THEIR COMPONENT PARTS OR REFUND OF THE PURCHASE PRICE; AND (II) MHG SHALL HAVE THE EXCLUSIVE RIGHT TO SELECT ANY SUCH REMEDY IN ITS SOLE DISCRETION. MHG SHALL NOT BE LIABLE FOR CONTINGENT, INCIDENTAL OR CONSEQUENTIAL DAMAGES TO PERSONS OR PROPERTY AND MHG'S SOLE LIABILITIES AND BUYER'S EXCLUSIVE REMEDIES HEREUNDER ARE AS PROVIDED IN THESE STANDARD TERMS AND CONDITIONS OF SALES. MHG SHALL NOT BE LIABLE FOR ANY EXCESS REPROCUREMENT COSTS, SPECIFIC PERFORMANCE OR DELAY IN DELIVERY.

Notwithstanding any implication to the contrary, MHG shall have no liability whatsoever unless and until the Buyer shall have paid the full purchase price of all goods delivered.

15. WARRANTY AND CLAIMS. MHG warrants that the Products will be free of defects in material and workmanship for a period equal to twelve (12) months from the date of shipping from MHG to the Buyer or, with the sole exception of assembly machines, within two thousand (2000) hours of use, whichever comes first. In case of claims presented in the correct way and regarded as founded, MHG agrees to replace or repair the defective product when these are returned to its premises.

a. This warranty does not cover any faults caused by normal deterioration, accelerated deterioration caused by special

physical, chemical or electrochemical conditions, insufficient maintenance or incorrect repair, failure to follow the storage, user and operating instructions, use of unsuitable materials, the effects of a chemical or electrolyte process, assembly operations not carried out using only MHG's original parts or MHG's original certified parts, using MHG's assembly machines and in strict accordance with MHG's latest assembly instructions to be found always updated at www.manuli-hydraulics.com, or any other faults arising as a result of circumstances over which the supplier has no control. This warranty does not cover faults caused by modifications made by the customer or a third party, or assembly or installation operations carried out by these latter without observance of the operating and installation conditions and/or the technical specifications of the products.

b. IN NO EVENT SHALL MHG BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. NO PRODUCT IS WARRANTED AS BEING FIT FOR A PARTICULAR PURPOSE. The warranties described above apply only if (i) the Product has not been misused, tampered or abused in any manner nor have repairs been attempted thereon; (ii) written notice of failure within the warranty period is forwarded – exclusively by means of the form available on the website www.manuli-hydraulics.com to be filled in each section - to MHG and MHG's direction for properly identifying Products returned under warranty are followed; and (iii) with the return, a notice authorizing MHG to examine and disassemble returned Products to the extent MHG deems it necessary to ascertain the cause of failure. The warranties stated herein are exclusive.

THERE ARE NO OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED, BEYOND THOSE SET FORTH HEREIN, and MHG does not assume any other obligation or liability in connection with the sale or use of the Products.

c. The receipt by the Buyer or its customer(s) of any of the Products shall constitute the Buyer' unqualified acceptance of same and waiver by the Buyer of all claims hereunder (**OTHER THAN CLAIMS NOT DISCOVERABLE UPON RECEIPT AND INSPECTION**) unless the Buyer gives written notice of the same to MHG within eight (8) days after its receipt or, in the event of concealed defects, the claim should be sent to MHG in writing within eight (8) days of their discovery, and in any case within a period of twelve (12) months from shipping from MHG to the Buyer, or, with the sole exception of assembly machines, within two thousand (2000) hours of use, whichever comes first. In any case, whenever possible, the Buyer shall send MHG a sample of the defective product to follow up the claim procedure.

d. No claim of any kind, where as to Products delivered or for delay in delivery or failure to deliver, and whether or not based on negligence, shall be greater in amount than the purchase price of the Products with respect to which such claim is made. **IN NO EVENT SHALL MHG BE LIABLE FOR INDIRECT, INCIDENTAL SPECIAL, OR CONSEQUENTIAL DAMAGES, WHETHER OR NOT CAUSED BY OR RESULTING FROM THE NEGLIGENCE THEREOF.** It is expressly understood that any technical advice furnished by MHG with respect to the use of the Products, shall not be deemed to be a representation that the Products may be so used successfully or that such use will offer any specific result, and MHG does not assume any obligation or liability for any advice given or results obtained.

e. The Buyer shall indemnify and hold MHG harmless against

SALES TERMS AND CONDITIONS

any and all loss damage, cost, or expense of any kind incurred by reason of any negligence, breach or other fault of the Buyer imposed by law upon MHG for damages assessed because of property damage or bodily injuries or death sustained or resulting from the sale, use, or handling of the Products except to the extent caused by the negligence of or breach of this Agreement by MHG, and the MHG has notified the Buyer in writing of any third party's claims or demands within sixty (60) days after MHG received notice thereof.

16. RESERVE. For the orders sent to MHG on-line, these will be accepted only after the correct completion of the activation procedure described in point 2.C above, which takes place using a user-id and password. The Buyer is aware that the revelation of the user-id and password to unauthorized parties would enable these to make orders in his name. Consequently, the Buyer will guard his identity code and password with maximum diligence and reserve, as he will be held responsible for any abusive use of these. MHG will take no responsibility for abusive use of the user-id and password, and the order will remain fully valid and effective after confirmation of it has been issued.

a. The Buyer agrees to exonerate MHG from any action, request or claim, including claims for compensation for damages, deriving directly or indirectly from the use or abuse of the user-id and password by any party.

b. The Buyer agrees to inform MHG of the loss or theft of the password, whereupon MHG will deactivate the password in question and issue a new one.

17 ENTIRE AGREEMENT. THESE TERMS AND CONDITIONS, INCLUDING THE LIMITED WARRANTY AND DISCLAIMER AND LIMITATIONS OF LIABILITY, ARE A COMPLETE AND FULL EXPRESSION OF THE AGREEMENT BETWEEN THE PARTIES. The terms hereof may not be varied, supplemented, qualified, modified, waived or interpreted by any prior or subsequent course of performance or conduct between the parties (including the shipment of goods hereunder) or by any usage of the trade or by conflicting or additional terms upon the face or reverse of any form to which this is attached or a part of, nor may it be modified by any agent, employee, or representatives of MHG unless such modification or representation is made in writing and signed by a duly authorized officer of MHG. Stenographic or clerical errors are subject to correction.

18. SEVERABILITY. If any term of this Agreement is held to be illegal or unenforceable, such term shall be severed from this Agreement and the remaining terms shall remain in force.

18. ASSIGNS. This Agreement shall be binding on and inure to the benefit of the successors and assigns of the entire business and goodwill of either MHG or Buyer, or of that part of the business of either used in the performance of such contract, but shall not be otherwise assignable by Buyer.

20. PROPRIETARY RIGHTS. Trademarks, service marks and other product identifications are MHG's property at all times and shall only be used in connection with the products. The Buyer shall not remove or deface any such marks.

21. CORRESPONDENCE. All correspondence regarding this contract will be sent to the MHG's Customer Service structures geographically competent:

Manuli Rubber Industries S.p.A

fax: +39 02 62713383;

telephone: +39 02 62713450;

email address: service.southeu@manulirubber.com.

Manuli Hydraulics Polska S.A.

fax: +48 32 2220 147;

telephone: +48 32 2220 222;

email address: service.northeu@manulirubber.com.

Manuli Hydraulics (Suzhou) Co. Ltd.

fax +86 512 6283 7399;

telephone and help desk: +86 512 6283 7099;

email address: service@manuli-hydraulics.com

22. INTERPRETATION. The validity, performance and construction of these terms and conditions and any sale made hereunder shall be governed by the laws of the Italy. All the terms hereof shall be interpreted in the manner which enhances its enforceability.



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10th Floor Bridgewater House,
58-60 Whitworth Street
Manchester, M1 6LT
Phone: +44(0)161 871 1130
Fax: +44 (0)161 247 7862

