
Gates
CRIMPER TRAINING
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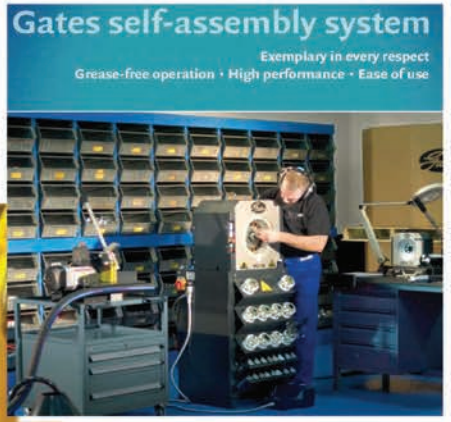
Flotec

INTRODUCTION AND SAFETY POINTS

EVERYONE HAS A RESPONSIBILITY FOR SAFETY

- **Hose & Coupling manufacturer :**
  - Has to provide quality products.
  - Reliable, tested & Guaranteed.
- **Machine manufacturer :**
  - Designs a Safe & Reliable hydraulic circuit.
- **Assembly Supplier:**
  - Ensures correct assembly.
- **End User :**
  - Uses & maintains equipment in accordance with recommendations and standards.



BS EN ISO 4413-2010

- **This standard deals specifically with hydraulics and serves to protect machinery operators, co-workers and the general public. With regards to hose assemblies it covers :-**
- **Replacement**
- **Performance requirements**
- **Marking**
- **Storage and service life**
- **Safe fitting onto the machine**
- **Reduction of hazards**
- **Operating temperatures**
- **Oil compatibility**

SOME IMPORTANT SAFETY RULES

- **EN ISO 4413**
- **Replacement of hose assemblies**
- **Flexible hose assemblies shall not be constructed from hoses or couplings which have been previously used as a part of a hose assembly.**

SAFE HYDRAULICS EUROPE

THINK SAFETY!

CAUTION:

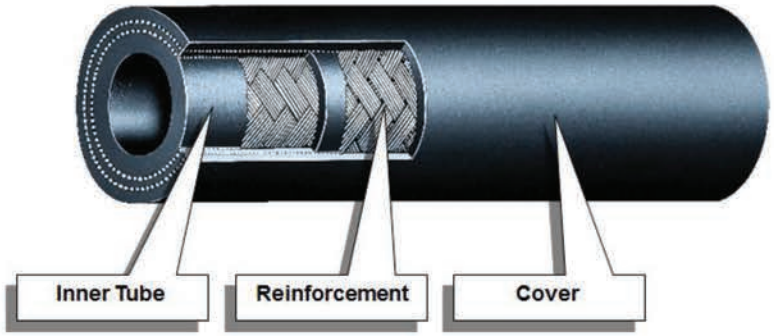
Never mix couplings and hose from different manufacturers without a full test programme. Never recrimp or recouple used hose.

HOSES

WHY USE A HOSE?

- Movement capacity
- Resistance to vibration
- No welding or brazing required
- No specialised bending required
- Easy to route around obstacles
- Sound absorption
- Dampens pressure surges
- Easy to obtain in the aftermarket

HOSE COMPONENTS



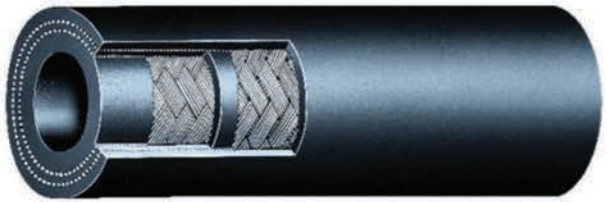
Inner Tube : This seals in the fluid but will NOT resist pressure without the reinforcement.

Reinforcement : Provides the necessary strength to resist internal pressure.

Cover : Protects the inner tube and reinforcement from outside influences.

THE TWO MAIN HOSE TYPES FROM GATES

Wire Braid Hose



Spiral Hose

HOSE “DASH SIZE” EXPLANATION

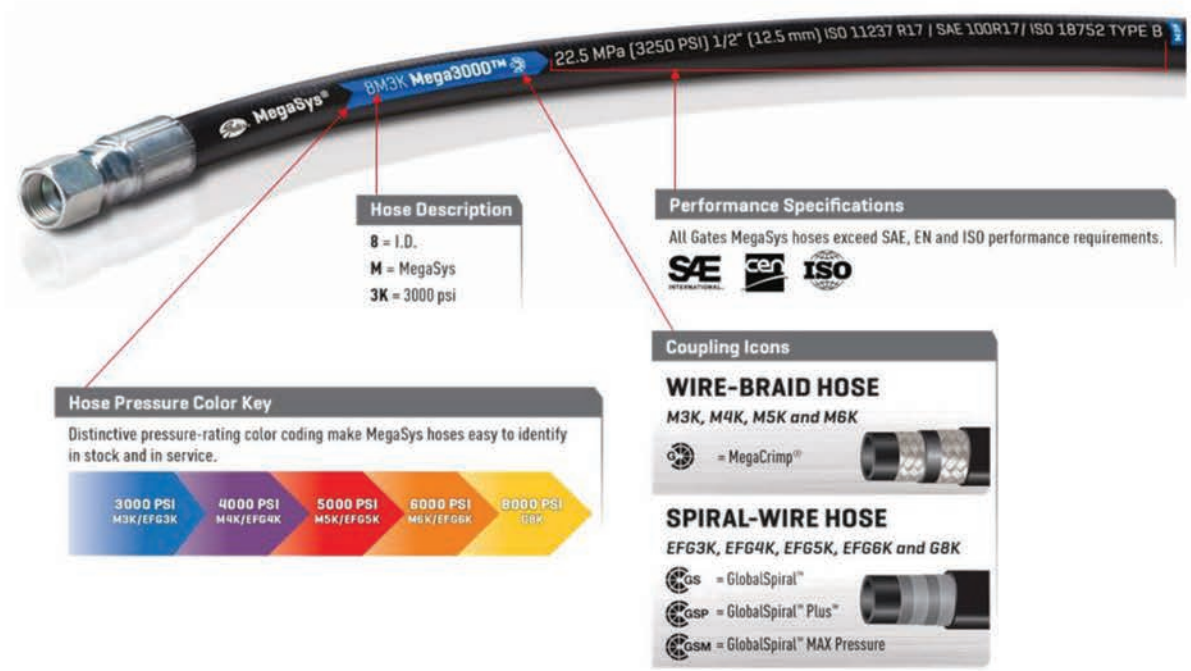
Inches	Diameter	DN	Dash Size
3/16"	4.8 mm	DN 5	-3
1/4"	6.4 mm	DN 6	-4
5/16"	7.9 mm	DN 8	-5
3/8"	9.5 mm	DN 10	-6
1/2"	12.7 mm	DN 12	-8
5/8"	15.9 mm	DN 16	-10
3/4"	19.0 mm	DN 19	-12
1"	25.4 mm	DN 25	-16
1”1/4	31.8 mm	DN 32	-20
1”1/2	38.1 mm	DN 38	-24
2"	50.8 mm	DN 51	-32

HOSE MARKINGS – THE “LAYLINE”

What should appear on a hose?

- Brand/Manufacturer
- Manufacturers part number
- Internal Size (Inches, mm or -size)
- Working Pressure (Bar/Mpa/Psi)
- International Standards (EN/ISO/ SAE/DIN)
- Date Code of Manufacture
- Flame Resistance (MSHA)

A typical Gates “Layline”



S.T.A.M.P.E.D.

- **S** : Size : If you take off a ½" hose then replace it with a ½" hose.
- **T** : Temperature : most hoses will work up to 100 degrees centigrade (higher/lower spec are available). The operating temperature of the system should be known prior to making replacement assemblies.
- **A** : Application : this will normally be known, agriculture, materials handling etc.
- **M** : Medium : this is the hydraulic fluid going through the hose.
- **P** : Pressure : The most important letter – the hose should be the same rating (or better) than the one being replaced. You should NEVER replace a hose with a lower specification product.
- **E** : Ends : these are the couplings on the ends of the hose.
- **D** : Delivery : this is the flow rate of the fluid through the hose.

XTF AND MTF COVERS

OPTIONAL

CM2T-MTF: the complete range of CM2T is also available with the Gates special MegaTuff™ cover which offers 300 times the abrasion resistance of the standard CM2T cover as per ISO 6945, superior ozone and weathering resistance.

IMPORTANT

Please consult Gates' Product Application Engineers for use of MegaTuff™ hose in reverse bending applications or for constant bending at minimum bend radius.

ABRASION-RESISTANT COVERS

MEGATUFF® AND XTRATUFF® COVERS

Nothing is harder on hydraulic hose covers than constant abrasion. Rubbed against metal or other hose, most standard hydraulic hoses – even ones with spring guards or nylon sleeving – can't take the punishment.

There's no industry standard for hose cover performance. Historically, Gates leads the pack in establishing engineering specs, and hose covers are no exception.

JUDGE US BY OUR COVERS

MegaTuff®

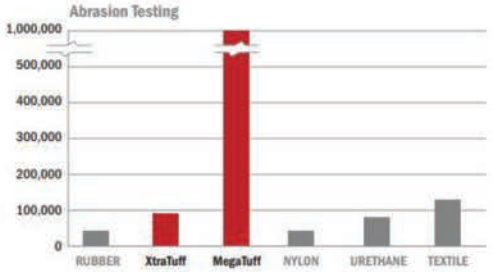
Gates MegaTuff hoses are exceptionally resistant to abrasion. The specially bonded cover stays put and won't peel as some competitive hose covers do.

- Maintain flexibility and minimum bend radius
- Resistant to oil, ozone and UV rays
- Tested to 1,000,000 ISO6945 metal-to-hose rubbing cycles without failure

XtraTuff®

Made of special hybrid compounds, Gates XtraTuff covers are versatile, flexible and easy to manage.

- Increase service life
- Lower maintenance
- Eliminate the need for costly hose protectors
- Lower installation friction



TYPES OF HOSE GUARD YOU MAY COME ACROSS

HG Sleeving – Nylon sleeve

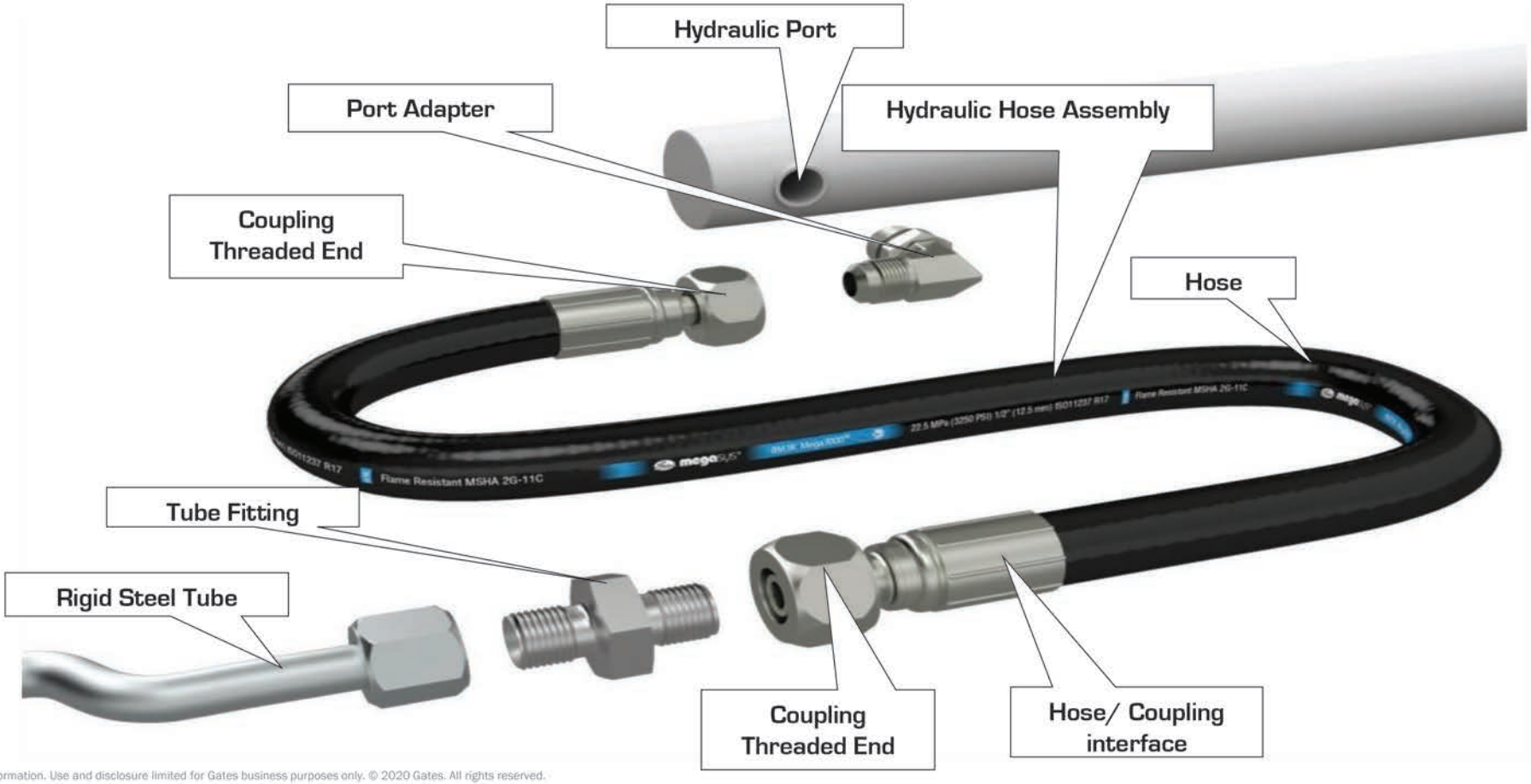
Polyurethane Sleeving

Round Steel Spring Guard

Flat Armour Guard (steel)

Thermoplastic Armour Guard

TODAY'S TECHNOLOGY



THE HOSE & COUPLING INTERFACE

Basic function:

- Leak-free sealing
- Mechanical retention

Qualities:

- Pressure capability
- Maximised bore of the coupling
- Space saving according to application
- Compatibility
  (metal-to-metal, metal-to-rubber)
- Easy installation
- Withstands environmental influences
- Corrosion resistance

The leak-proof hose / coupling interface is determined by:

- Profile of the insert
- Characteristics of the hose tube
- Correct crimping
- Ferrule type

THE HOSE & MEGACRIMP COUPLING INTERFACE

COUPLINGS

THE TWO MAIN COUPLING TYPES FROM GATES

TWO PIECE COUPLINGS FOR SPIRAL HOSE

ONE PIECE COUPLINGS FOR WIRE BRAID HOSE

A CODE OF A 1-PIECE COUPLING WE WILL USE

MegaCrimp®

Coupling type G	Female end	O-ring seal

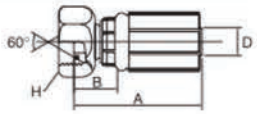
6 G 6 F BSP OR X

Hose size 6	End size 6	Thread type BSP	Swivel nut

MegaCrimp®

BSP FBSPORX

Female BSP 'O' ring swivel. 60° cone.



A CODE OF A 2-PIECE COUPLING WE WILL USE

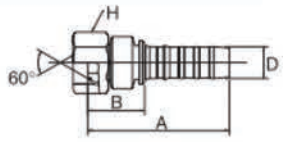
GlobalSpiral™

Coupling type GS	Female end	O-ring seal
6 GS 6 F BSP OR X		
Hose size 6	End size 6	Thread type BSP	Swivel nut

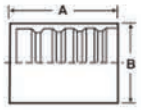
GlobalSpiral™

BSP FBSPORX

Female BSP 'O' ring swivel. 60° cone.

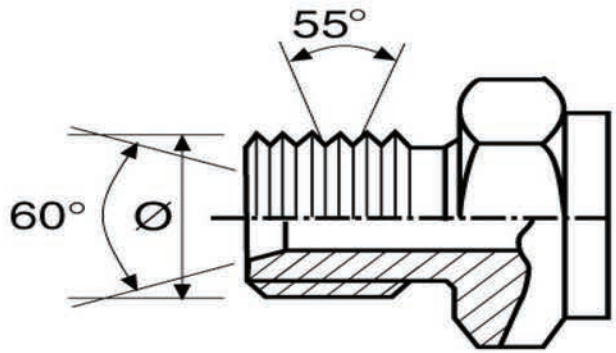


+ **FERRULE**

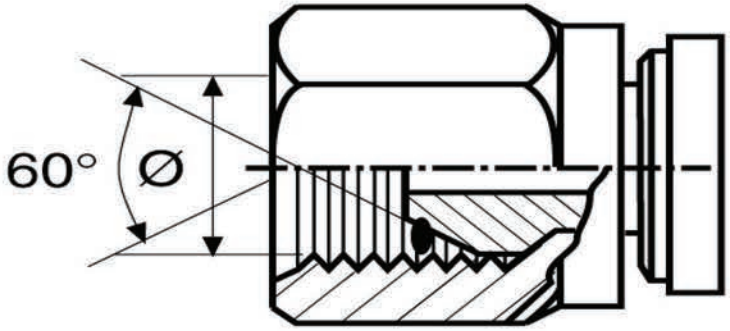


AN EXAMPLE OF A COMMON UK TERMINATION

- British standard
- BSPP - British Standard Pipe Parallel



MALE



FEMALE

HOSE ASSEMBLY MACHINES

GATES HOSE ASSEMBLY MACHINE/TOOL TYPES

Cutting

Measuring

Crimping

Insertion depth gauge

Marking

Cleaning

GATES HOSE ASSEMBLY MACHINE/TOOL TYPES

Powerful, Lightweight, portable hand-operated crimper, ideal for field service operations.

Comes with separate box, designed to contain complete set of dies.

Crimps no-skive GlobalSpiral couplings up to 1" and no-skive MegaCrimp couplings for wire-braid hose up to 1.1/4".

GATES HOSE ASSEMBLY MACHINE/TOOL TYPES

Ref: 7480-19184: 3 phase
7480-19183: 1 phase
7480-19182: 12V

MCX 25

Compact crimper for low-volume production. Ideal as starter machine or for small workshops. Crimps no-skive GlobalSpiral™ couplings up to 1" and no-skive MegaCrimp® couplings for wire-braid hose up to 1.1/4". Equipped with a die set storage rack allowing for logically organised die storage within easy reach of the operator, thus speeding up die selection and assembly. Also available for mobile service with DC power pack.

GATES HOSE ASSEMBLY MACHINE/TOOL TYPES

MCX 30

Compact, operator-friendly machine to crimp the complete Gates range up to 1.1/4". Optional foot pedal to enable hands-free operation. Equipped with a die set storage rack allowing for logically organised die storage within easy reach of the operator, thus speeding up die selection and assembly. Also available for mobile service with DC power pack.

Ref: 7480-19187: 3 phase
7480-19186: 1 phase
7480-19185: 12V

Ref: 7480-19194: QDC MCX 25 7480-19195: QDC MCX 50
7480-19200: QDC MCX 30

Quick die change

The universal quick die change allows fast and easy change of dies without risk of damage to the die sets. The transparent shield of the quick die change allows you to quickly and safely position die sets into the master dies of the crimper head. A single press of the closing button is enough to lock the dies safely in place and rapidly produce a perfect hose assembly. When buying an electrical crimper, the QDC that goes together with the respective machine will be included in the package.

CLEANLINESS IS CRITICAL

AVOIDING CONTAMINATION BEFORE ASSEMBLY

Being aware of potential contamination sources and taking steps to avoid them in the first place will assist in reducing system contamination.

- Bulk hose reels should be stored in a clean, dry environment.
- Hoses & couplings should remain capped until fitment.
- Finished hose assemblies should not be placed anywhere uncapped.
- Welding, Grinding, Painting should not be undertaken in the close proximity of uncapped hoses or open hydraulic ports etc.

REMOVING CONTAMINATION AFTER ASSEMBLY

Contamination should be removed from hoses prior to assembly however a post assembly cleaning process is also recommended:

- Blowing workshop compressed air – be aware that debris from the cut end can merely be moved down the length of the hose. The longer the hose the more likely that this is.
- Flushing with liquid – rarely undertaken prior to fitting the couplings (normally associated with large volume production).
- Blowing a cleaning projectile – such as a sponge pellet with clean dry, filtered air not only removes cutting debris but also any hose mandrel lubricant or other manufacturing residues. It is however vital that the pellet is recovered prior to hose use.

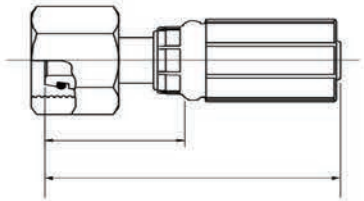
AS A MINIMUM, WE EXPECT ENGNEERS TO BLOW THE HOSE WITH AN AIR GUN!

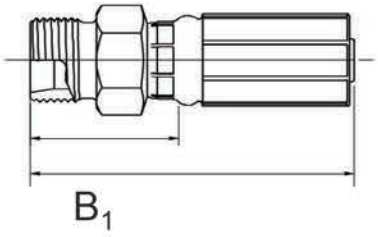
HOSE ASSEMBLY PRACTICALITIES

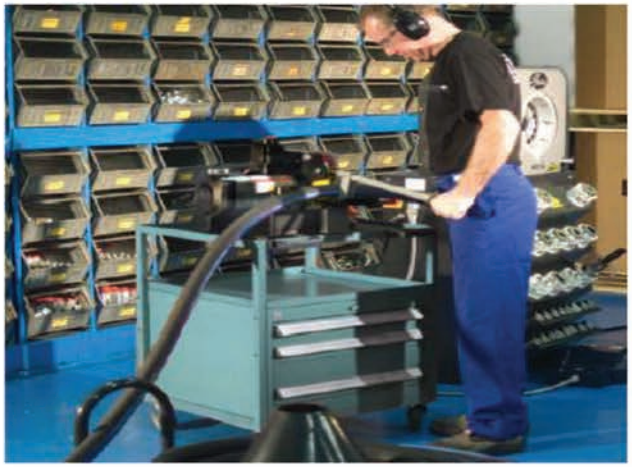
CREATING A CORRECT ASSEMBLY - SAFELY

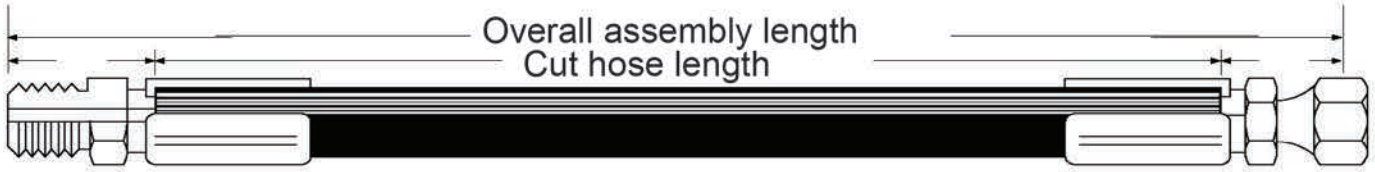
- Measuring
- Cutting
- Marking
- Insertion
- Orientation
- The crimp data sheet
- Crimping
- Measuring the crimp diameter

DETERMINING THE CUT HOSE LENGTH

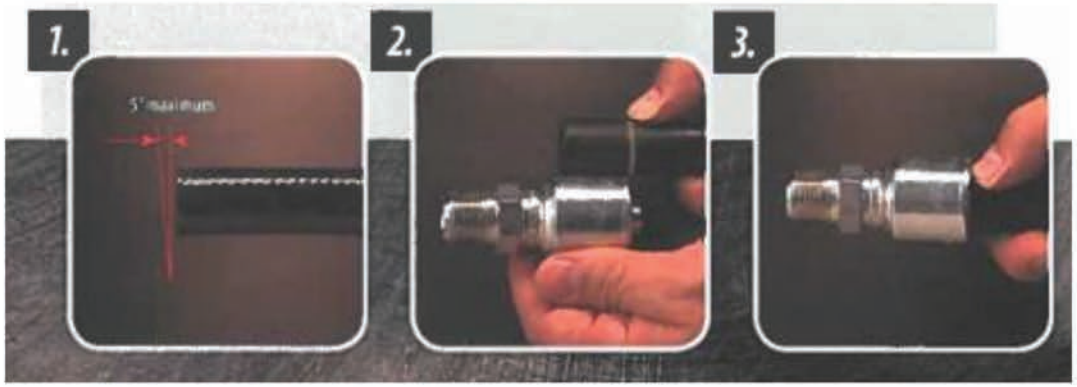








CUTTING, MARKING & INSERTION (1 PIECE)



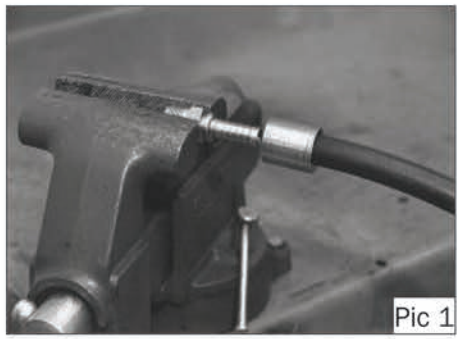
- Check the hose end is cut straight and square – maximum cut angle is 5 degrees
- Place hose next to the coupling and use your thumb to gauge the depth – mark the hose
- Push the coupling onto the hose until it reaches your thumb or the mark – twist to ensure full insertion

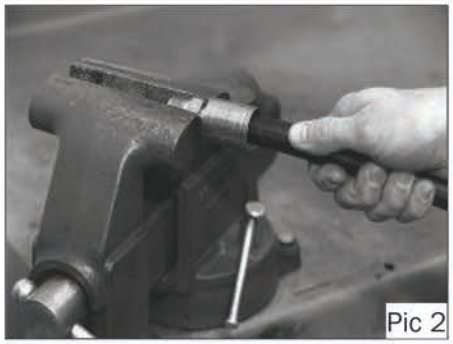
MegaCrimp®

- Alternatively use the Gates MegaCrimp coupling insertion tool.

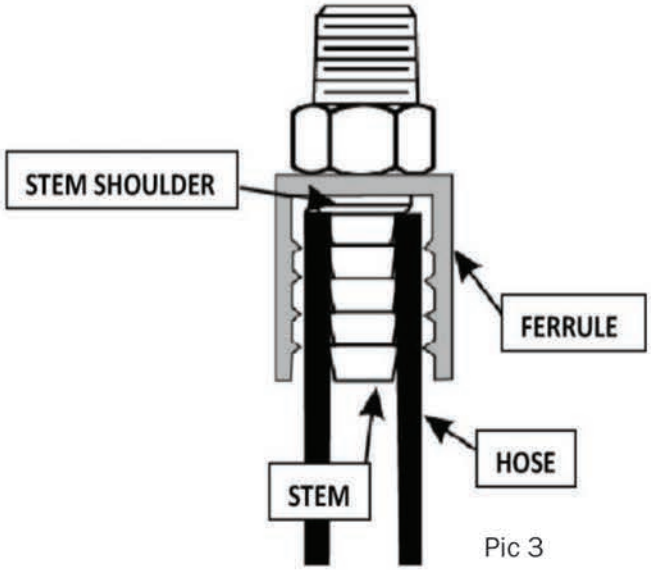
CUTTING, MARKING & INSERTION (2 PIECE)

GlobalSpiral™


Pic 1


Pic 2

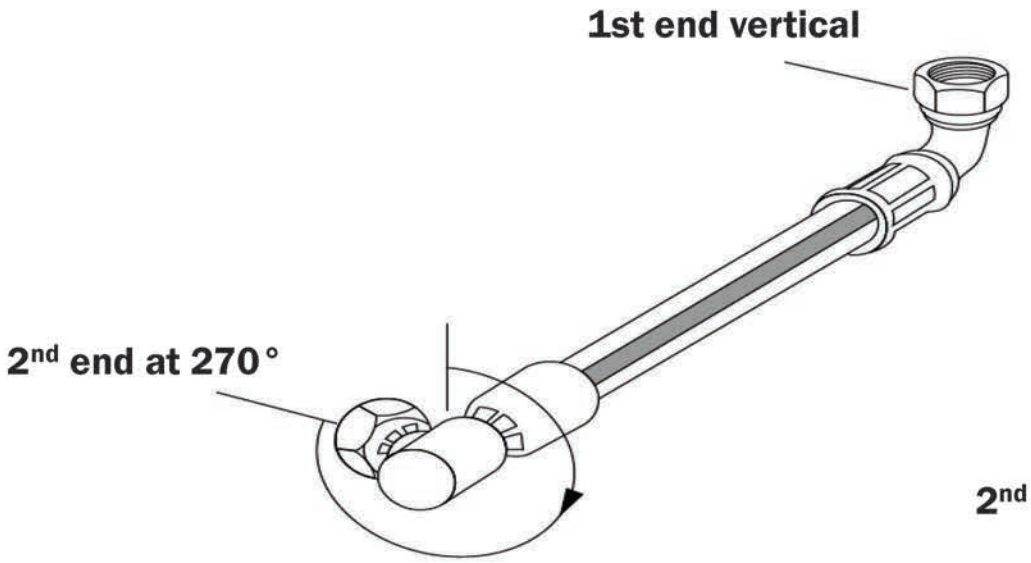
- Fit the ferrule over the hose end
- Lubricate the first one or two serrations of the stem with lightweight oil
- Clamp the stem in a vice on the hexagonal portion (pic 1)
- Push hose onto the stem until it is flush with the stem shoulder (pic 2)
- To check for full insertion pull the ferrule down – the top should be level with the stem shoulder
- Push the ferrule so it rests against the hex of the stem (pic 3)
- The hose and coupling are now ready for crimping

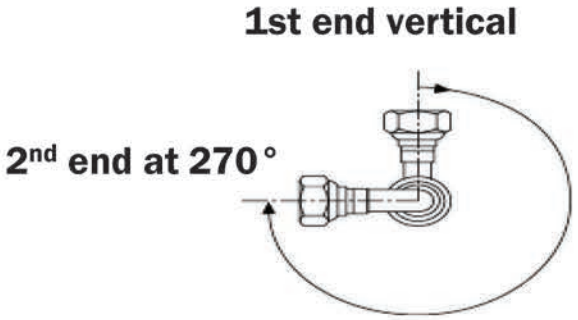


Pic 3

ORIENTATION OF A HOSE ASSEMBLY

FITTING ORIENTATION





THE GATES ECRIMP DATABASE eCrimp™ Flotec

ECRIMP

MegaCrimp®

Electronic Crimp Data

View and Print Crimp Data reports for Gates hoses. Select your desired search criteria by selecting attributes below. Click the "Add Results to List" button to view crimp data. Multiple values may be selected for each attribute. If no value is selected, all values for that attribute are returned.

Add additional crimp settings to your list by selecting additional attributes. In the Crimp Specifications table, individual items can be removed by clicking the "Remove" link on the right. The table can be printed and posted for easy reference on a crimper.

This crimp data supersedes all previous printed and electronic crimp data. All settings are APPROXIMATE. Always check the final crimp OD to ensure the crimp has been properly formed.

Current Revision: 159, 2020-10-09
Added Components: -10 thru -20 4-XH hose for MC & MCX Machine; -8 thru -20 4-XP hose for MC & MCX Macnines
Changed Components:
Notes:

Enter Search Criteria

G Coupling type

MCX30 Crimper

Search Hoses
Search Hydraulic Hoses Search Industrial Hoses

Crimper	Die Set	Hose Description	Hose Dash Size	Stem Type
MCX20	D33	M4KH	8	G
MCX25		M4KL		
MCX30		M5K		
MCX50		M5K-MTF		
S8003				

http://ecrimp.gates.eu/

THE GATES ECRIMP DATABASE eCrimp™ Flotec

Enter Search Criteria

Search Hoses

Search Hydraulic Hoses Search Industrial Hoses

Crimper	Die Set	Hose Description	Hose Dash Size	Stem Type
MCX20	D33	M4KH	8	G
MCX25		M4KL		
MCX30		M5K		
MCX50		M5K-MTF		
S8003				

Reset Add Results to List Print Results

Crimp and Machine Specifications for MCX30

Click on an underlined attribute name to sort by that column.

Show Metric Units Show English Units

Show 10 entries Search Description:

Hose				Stem	Ferrule	Specifications									
Dash Size	Description	Size (mm)	Working Pressure (MPa)	Type	Description	Skive Length (mm) (+/- 0.75)	Skive Diameter (mm)	Crimp Insertion Length (mm) (+/- 0.75)	Crimp Length (mm) (+/- 0.75)	Crimp Outside Diameter (mm)	Crimp Outside Diameter Tolerance (+/-)	Crimp Tail Length (mm) (+/- 2.5)	Die Set	Approximate Setting	
8	M5K	12.0	35.0	8G	One-Piece	NONE	NONE	FULL	FULL	26.40	0.25	NONE	D33	2.30	remove

Crimper gauge setting

Skiving length (n/a)

Finished crimp diameter

Die set used

THE GATES ECRIMP MOBILE PHONE APP

SAFE CRIMPER OPERATION

- Safety glasses
- Stay clear of equipment
- No loose clothing
- Equipment securely mounted
- Follow operation instructions

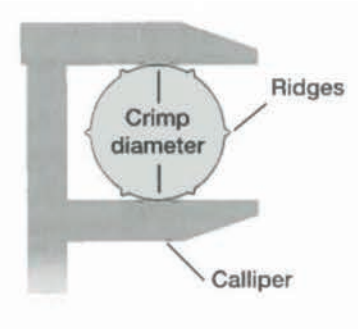
BASIC CRIMPING PROCEDURE

- Obtain all necessary information for hose, couplings, gauge and dies from the crimp data sheet
- Load the selected dies into the crimper and locate in crimp position
- Set the gauge setting mechanism to the correct value
- Insert the hose and locate ferrule within the dies - 5mm from front of dies – ensuring it is fully engaged along its whole length
- Always wear safety glasses and ensure hands and clothing are clear of moving parts
- Activate the crimping mechanism
- Remove the assembly from the dies
- Measure the crimp diameter and verify the hose insertion
- Cap hose/couplings as necessary

- NOTE : These are the basic steps and can vary depending on the crimper being used, for specific instructions please refer to the appropriate operator's manual.

MEASURING THE CRIMP DIAMETER

Measure between the ridges halfway down the ferrule. If the crimp diameter is not within the tolerance from the crimp data sheet the hose cannot be used.



For smaller crimp diameters the Gates MegaCrimp vernier should be used.

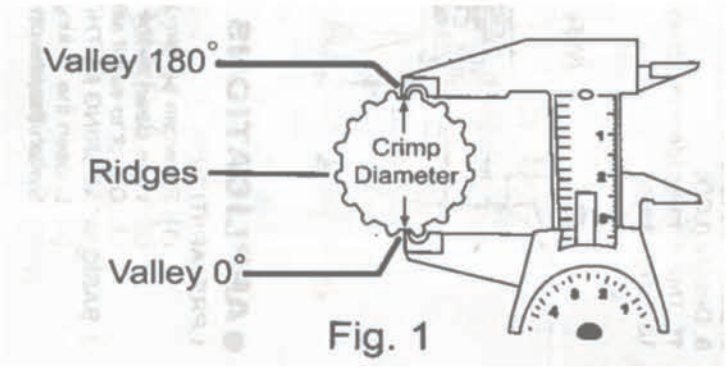


Fig. 1

THE IMPORTANCE OF CRIMPING CORRECTLY

INCORRECT CRIMPER SETTINGS

Overcrimp

Undercrimp

FERRULE NOT FULLY ENGAGING IN THE DIES

Mushroom flare crimp

Tail-flare crimp

SAFE HYDRAULICS EUROPE

ALL OF THE ABOVE COULD LEAD TO EARLY HOSE FAILURE OR COUPLING LEAKS OR COUPLING BLOW OFF

THANK YOU FOR YOUR ATTENTION!