

TOMCO Quick Coupler Training

Basics of Hydraulic Couplers

ISO A

ISO B

ST and MC

Minimum Spill

Couple Under Pressure

Hydraulic Couplers

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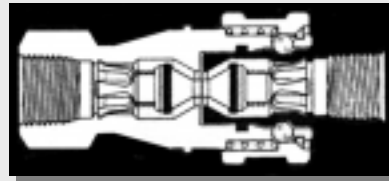
Early development and modern types

- Single Valved Type couplings had been around since 1917
 - Their first use was as pressure wash couplings on engine cleaning systems
 - They soon were adopted as Air Couplings on Pneumatic Systems
- Straight Through types were utilized during the 1920's
- Hydraulic Couplings were a later development – first adopted on water / chemical systems, during the late 1930's, aircraft ground support systems during World War II and Machine Tool / Mobil Hydraulic systems during the late 1940's and 50's.



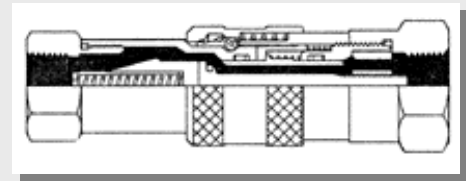
Late 40's / 50's

First Hydraulic couplings
Re-worked air couplings
Like Hansen 8000 series
Working pressure=800psi



1960 / 1985

+ISO A and B types
+Couple under pressure types
Working pressure=2500PSI



Year 2000

+Minimum Spill Types allows users
to Couple under slight pressure.
Designed for 3-4000psi
A version has 10,000 capabilities

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Purpose, Types and Valving

- What is the purpose of a hydraulic coupler?
 - The purpose of all hydraulic couplers is to connect water or other liquid lines in a system and turn off the flow immediately upon disconnect
- Are there different types?
 - Different types have been introduced during the age of hydraulic power depending on the particular industry and job application for which they are intended
 - The way they are valved and connect together determine their **Type and Application**
- How many parts are there to a hydraulic coupling?
 - With any hydraulic coupler, there are always two halves; Both with a poppet valve.

The “Plug” – male half



The “Coupler” – female half



- Do all Hydraulic Couplings contain shutoff valves?
 - If automatic shutoff, upon disconnect is needed, each half must always contain a valve
 - If NO shutoff is needed, the halves are non-valved

Terms:

Poppet Valve: Mounted in the I.D. of the plug or coupler body and spring loaded, the valve moves into and out of its port. Normally the valve is closed-in the port.

ISO; International Standards Organization: Sets dimensional and performance standards

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Basic Types of Hydraulic Couplers

- Poppet valved
 - Sleeve Style: disconnect / connect

Disadvantage:

Impossible to Couple with this design if pressure is in the line.

Tomco A5600 and THK [ISO types, A and B] are examples

- Couple under pressure
 - Wind-on feature to connect and disconnect

Large Coupling; Cannot be used where space is a problem.

Tomco A5100 is an example of this type of coupling

- Minimum Spill
 - Flat Valving Minimizes hydraulic fluid spillage

No technical disadvantages but FF types tend to be more expensive. **Tomco** FF and FE series are examples of this type of coupling

- Straight Through
 - Full Flow – no shut-off valving in this type of coupling

Cannot be used where fluid spillage is a factor.

Tomco ST and MC series are examples of this type of coupling

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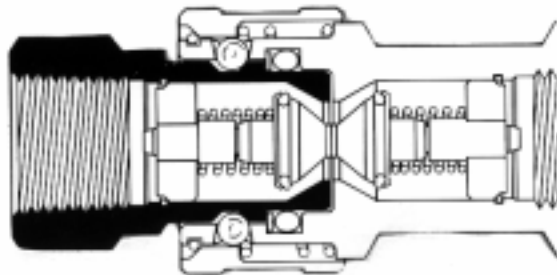
Basic Types – ISO A Type

- Developed during the late 1950's as the first all steel coupling for hydraulics
- Poppet Valved: Adopted by the Mobil Equipment Industry

**First sold by the
Aeroquip Corporation: 1959**

+1/2": Size will work at 4000psi

+Available only in Steel



Industry Interchanges: Tomco A5600 = Aeroquip 5600 = Parker 6600 = Faster ANV

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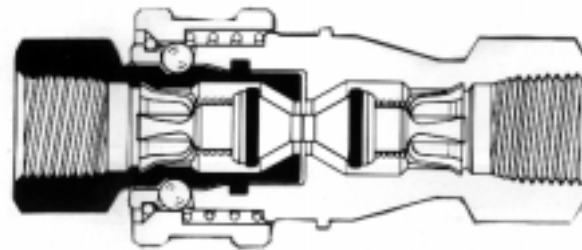
Basic Types – ISO B Type

- Developed during the late 1950's
- Poppet Valved: Used in Industrial Hydraulics usually in plant on hydraulic systems

**First sold by the
Hansen Coupling Co. 1963**

+1/2": Size will work at 4000psi

+Available in Steel, Brass, Stainless Steel



Industry Interchanges: Tomco THK = Hansen HK = Parker 60 Series = Aeroquip FD 45

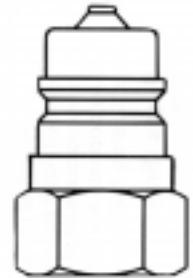
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Basic Types – Is it ISO Type A or ISO Type B?

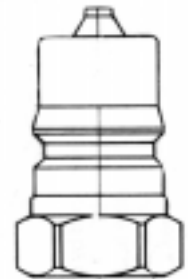
USES: ISO A – Mobile Hydraulics, ISO B – Industrial

- Common to both “ISO” types of couplings:
 - Both types are double shutoff
 - Both have a spring loaded poppet valve in both the socket and plug part of the coupling
 - Both valves instantly close when the coupling halves are disconnected and are pushed open when the halves are connected
 - Both developed during the late 40’s / early 50’s when hydraulic pressures were always in the range of 1200psi or lower
 - Designed as an upgrade to the unsatisfactory, heavy-duty air couplings traditionally used for hydraulic, water and chemical circuits during the 30’s and 40’s
 - Both can be utilized as single valved or non-valved couplings
 - Both have “poppet” style valves
 - Neither one can be coupled under pressure
 - Both tend to spill and drip when connected or disconnected
 - Neither one will interchange with the other



ISO A

Shorter Plug Nose



ISO B

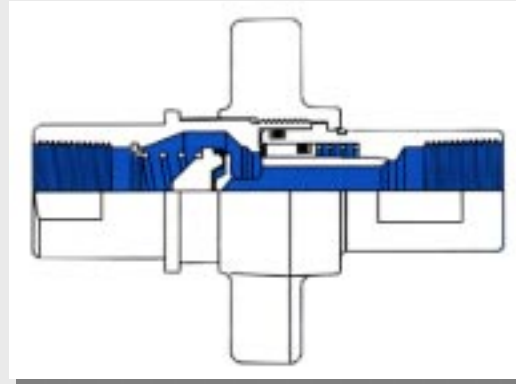
Longer Plug Nose

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Basic Types – Couple Under Pressure

- Developed during the late 1960's as the first effort to be able to connect and disconnect when trapped pressure was present
 - Flat Face type valving.
 - Permits dry break
 - First sold by Aeroquip during the 60's to hydraulically operated trailer builders.
 - Now used on all Mobile Hydraulics, Oil Rigs and on Test Stand Applications where frequent connect and disconnect is necessary with pressure trapped in the lines.
 - +1/2" pipe thread version [3/4" body size], works at 3000psi – 1 1/4" size at 2750psi



+ Available only with brass body and steel sleeve

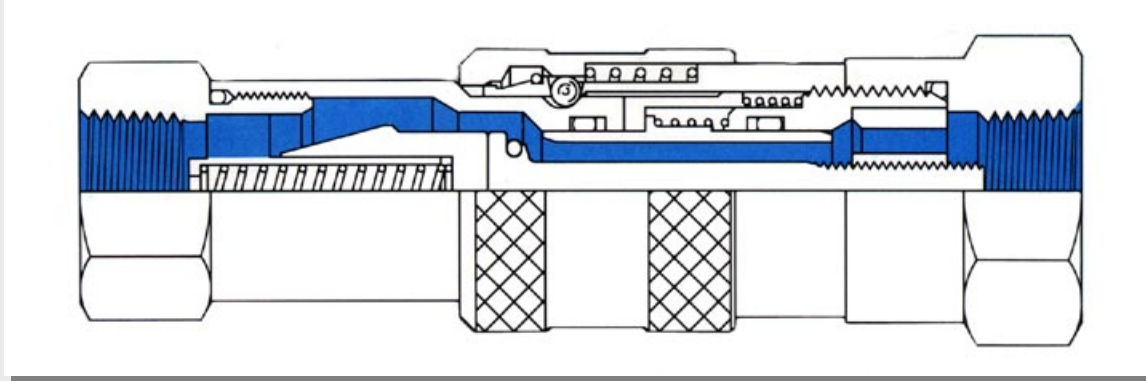
Industry Interchanges: Tomco A5100 = Aeroquip 5100 = Faster FB = Parker 6100

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Basic Types – Minimum Spill Quick Disconnects

- Developed during the late 1970's for the farm market as an improvement to their traditional "Pioneer", a ball valved coupling that leaked
 - Flat Face type valving minimizes leaks and drips upon connection
 - Flush valve face minimizes dirt included upon connection
 - NS (non spill) first developed during late 60's by Brunning Hydraulics – had quality problems
 - Later version, developed during early 1980, called FF (Flat Face) was a modification of the original NS design
 - 3/8" body size with alternate 1/2" port were only sizes available
 - First industry which standardized on this type of coupling were the hydraulic tool OEM's, who developed the HTMA standard (FF type)
 - Now used in all sizes with chemicals, the mobile industry and machine tools



Industry Interchanges: Tomco FF - FE = Faster 2FF-2FFJ = Parker FF-FE = Aeroquip FD49 = Safeway FF49

Hydraulic Couplers

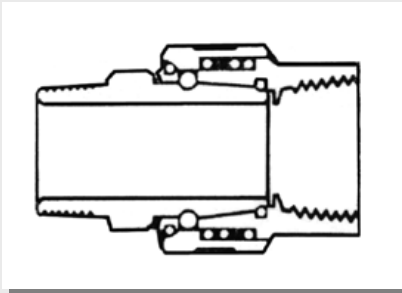
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Basic Types – Non-Valved Couplings

- Have been around forever. Preceded valved one-way couplers
- Early versions utilized in water hydraulics in 19th century
 - Most non-valved couplings are brass or stainless because of their applications with chemicals, water or in outdoor environments
 - Steel is available - Steel plugs used in pressure wash

ST Style

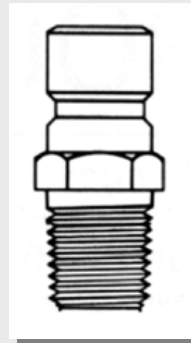
Most popular
[1/2" works at 2700psi]
sizes: 1/8 thru 1 1/2



Industry Interchanges:
Tomco ST, Hansen ST,
Parker ST

MC Style

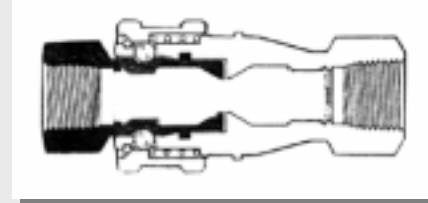
Usually used in water
cooling circuits in injection
molding industry



Industry Interchanges:
Tomco MC, Hansen FT,
Foster FS, Parker PC

THK Non-valved

Use as Straight Through
where high pressure
capability is needed



Industry Interchanges:
Tomco THK-NV, Other
ISOB Style, Non-valved

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Working Pressure, Valving, Size Range, Material Availability

Type of coupling	Valve		Working Pressure	Size Range	Material
	Socket	Plug			
ISO A	Yes	Yes	1/4"=5000psi Other sizes 4000psi	1/4"-3/8"-1/2" 3/4"-1"	Always Steel
ISO B	Yes	Yes	Steel: 1/8" thru 1/2"=4000psi 3/4" and 1"=2000psi	1/8"-1/4"-3/8"-1/2" 3/4" and 1"	Steel
			Brass: 1/8 thru 1"-1000psi		Brass
			Stainless: 1/8" and 1/4"=2000 psi 3/8" thru 3/4"=1500psi		Stainless 303 Type
Couple Under Pressure	Yes	Yes	3/4" and 1" IS 3000 psi 1 1/4" is 2750psi *1/2" thread available with 3/4" body size coupling and plug	1/2"-3/4"-1", -1 1/4"	Always Brass
Minimum Spill Types	Yes	Yes	Steel: 3/8"=10,000 psi Available with 3/8" or 1/2" pipe thread	3/8"	Steel
	Yes	Yes	Steel: 1/4"=4000psi 3/8" thru 1"=3000psi	1/4"-3/8"-1/2" 3/4"-1"	Steel
	Yes	Yes	Stainless 3/8" size; 2000psi		Stainless
Straight Through Types	No	No	ST Types: 1400psi up to 5500psi	1/8" 1/4"-3/8"-1/2"- 3/4"-1"-1 1/4"-1 1/2"	Brass, Steel, Stainless
	No	No	MC Types: 200psi	1/4"-3/8" - 1/2"	Brass only
	No	No	GH Types: 200psi	5/8" Garden Hose Size	Brass only