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Written By Engineers For Engineers

## BSPP 60° Cone Fittings: Looks Can Be Deceiving

Not all BSPP 60° cone fittings are created equal, nor are they always interchangeable.

Questions often arise regarding compatibility and interchangeability between different kinds of BSPP 60° cone fittings, which typically serve as hose adapters on 'low-cost' hydraulic systems from Asia and Europe. This is similar to how NPSM pipe swivels are typically used in the U.S. on equipment such as log splitters and other low-end hydraulic farm machinery.

The two main styles of BSPP cone fittings conform to either British Standard BS 5200 or Japanese Industrial Standard JIS B8363. Both are designed as hose adapters rather than tube connections, and both seal by metal-to-metal line contact between the conical surface of the internal seal and a corresponding surface on the mating component. Although cone angles and threads are identical, there are instances when these fittings will not function properly if interchanged.

**Identification:** There is no standard for identifying these fittings. Some manufacturers mark JIS adapters with 'JIS' on the hex or forging flats for visual identification.

BS 5200 adapters do not carry a specific identifying mark. Also, BS 5200 adapters may or may not have the tapered undercut at the end of the threads.



Two main styles of BSPP 60° fittings conform to either British or Japanese standards. While the designs are similar, they are not always interchangeable.

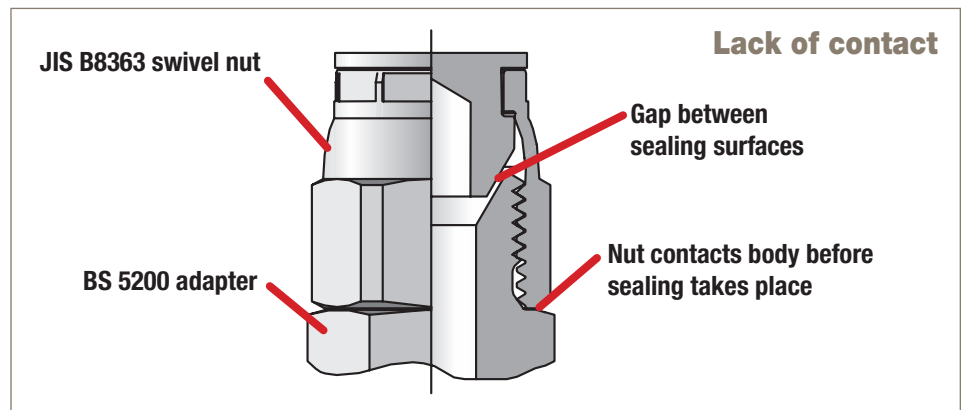
### Compatibility with hose fittings:

Both adapters connect to hose fittings if the connection meets the appropriate standard.

**Interchangeability:** BS 5200 adapters do not mate with JIS swivel connections. JIS adapters may mate with BS swivels, but these fittings should not be considered

interchangeable because they were not designed as such.

The International Standards Organization is developing a standard to replace BS 5200 and JIS, based mostly on the BS 5200 standard. In the meantime, while BS 5200 and JIS 8363 adapters are similar, in some instances they are not



Mating a BS 5200 body and JIS 8363 swivel nut results in a hydraulic assembly that will not seal.

interchangeable. The best advice is to avoid mixing them.

Here is a review of the similarities, differences, and interchangeability of these two styles:

**Similarities:**

- The seat angle is 60° for both styles.
- Both use British Standard Pipe, Parallel (BSPP) thread.
- Both have an undercut at the end of the threads near the hex.

**Differences:**

- Each conforms to a different standard, British Standard BS 5200 or Japanese Industrial Standard JIS B8363.
- Thread lengths are shorter on BS 5200 adapters. (*Dimension A, Table 1*)
- The 60° cone diameter differs for each type. (*Dimension B, Table 1*)
- The BS 5200 can also be used as a port fitting. A tapered undercut on some versions of the adapter helps locate a loose seal when used as a port fitting. The taper centers the port's bonded seal for proper sealing.
- BS 5200 adapters include Size 10 (5/8 in.) and JIS adapters do not.

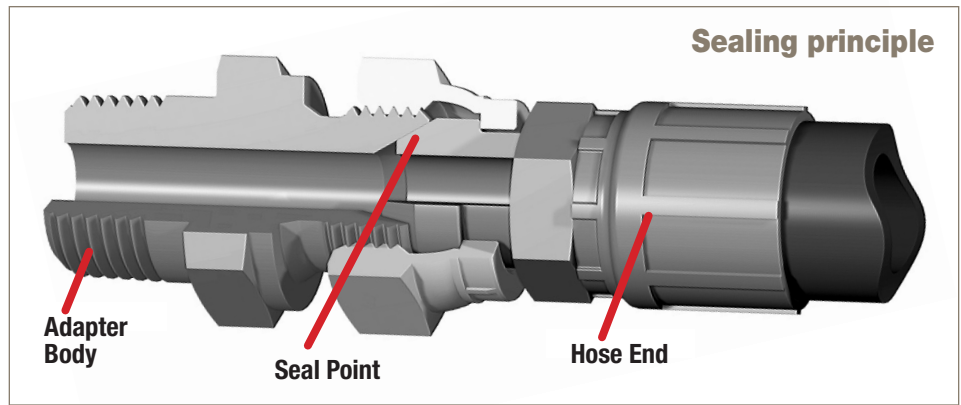
If you have questions or comments, please post them and I'll respond if warranted. If you want to talk to me directly, I can be reached at Parker Tube Fittings Division, **614.279.7070**.

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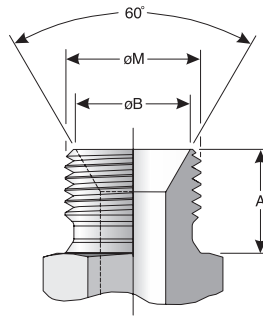
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**Sealing principle**



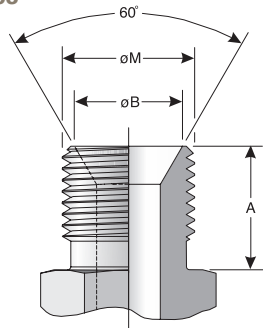
A BSPP 60° cone fitting seals by metal-to-metal line of contact

**BS 5200**



Dash Size	BSPP Thread	M, in. DIA.	A, in.	B, in. DIA.
2	1/8-28	0.38	0.315	0.295
4	1/4-19	0.51	0.433	0.409
6	3/8-19	0.65	0.472	0.551
8	1/2-14	0.82	0.551	0.689
10	5/8-14	0.90	0.630	0.760
12	3/4-14	1.04	0.630	0.902
16	1-11	1.30	0.748	1.130
20	1 1/4-11	1.64	0.787	1.449
24	1 1/2-11	1.87	0.866	1.681
32	2-11	2.34	0.984	2.150

**JIS B8363**



Dash Size	BSPP Thread	M, in. DIA.	A, in.	B, in. DIA.
2	1/8-28	0.38	0.418	0.276
4	1/4-19	0.51	0.570	0.394
6	3/8-19	0.65	0.609	0.531
8	1/2-14	0.82	0.726	0.650
12	3/4-14	1.04	0.805	0.866
16	1-11	1.30	0.883	1.102
20	1 1/4-11	1.64	0.945	1.417
24	1 1/2-11	1.87	0.962	1.654
32	2-11	2.34	1.102	2.126

Table 1: Comparing dimensions

