

Safety & Technical Alert

Avoiding the Dangers of Mismatching Swivel Joint Components



FMC's Longsweep® swivel joint product line has been used in oilfield flowlines since the 1960s. FMC has continued to develop the Longsweep product line, culminating with the introduction of the TripleStep (TSi) swivel joint in the mid-1990s. The TSi swivel joint employs a stepped ball race design, providing significantly improved erosion life and higher swivel load capacity over traditional non-stepped race designs. This bulletin addresses potentially serious occurrences that could result from mismatching swivel joint components of different designs and/or manufacturers.



 **WARNING**

Using SPM 3" HD-LR swivel joint components in FMC 3" TripleStep swivel joint assemblies can cause damage to raceways, potentially leading to swivel separation when under pressure. Failure to avoid this condition may result in death, serious personal injury and severe property damage.

Avoiding the Dangers of Mismatching S

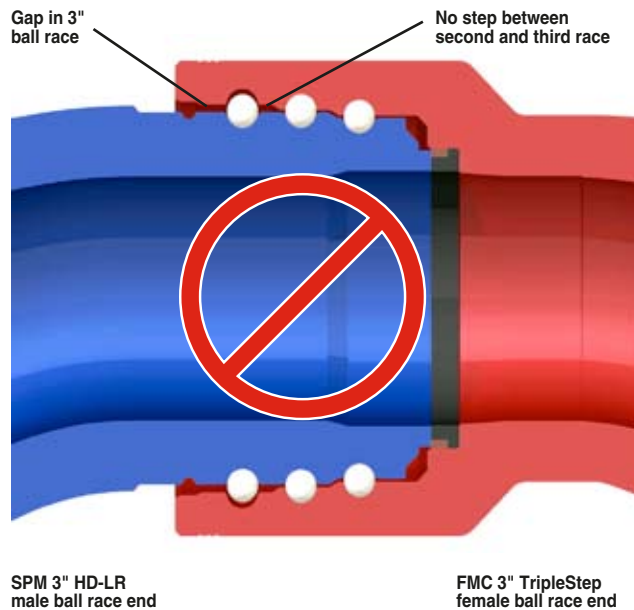


Figure 1: Dangerous Mismatch to be Avoided

During the development of the TSi product offering, FMC evaluated all known potential mismatch occurrences with its existing and competitive products. The final TSi design minimizes the possibility of mismatch occurrences. Consequently, attempts to assemble TSi components with older style Longsweep swivels or competing product components are physically impossible.

Like the FMC 3\" TSi swivel joint, the recently introduced SPM 3\" HD-LR swivel joint employs a stepped ball race feature. FMC's 3\" TSi swivel joints employ a one-ball step in raceway diameter between each of the three raceways. SPM's HD-LR swivel has a step between only two of the raceways. In addition to the stepped race similarities, the axial spacing between the raceways of the two models is very similar. Because of these similarities, it is physically possible to erroneously assemble a male race end of a SPM 3\" HD-LR component into the female race end of an FMC 3\" TSi component (Figure 1).

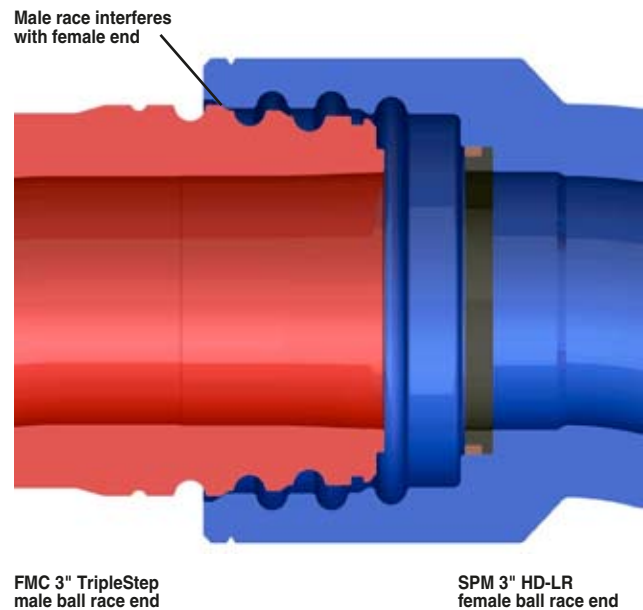


Figure 2: Mismatch Avoided

The erroneous assembly of these components may falsely give the impression of a proper assembly, since the swivel assembly may feel tight and hold pressure. This condition is made possible because the two raceways closest to the packing of both designs require the same number of balls. However, the third male race of the HD-LR swivel does not fully engage with the female race of the TSi swivel. The third race does not help carry the axial load caused by internal pressure with the other two raceways (Figure 1). While the resulting assembly may give the false sense of a correct assembly and would likely contain pressure, the assembly would not be structurally sound. This condition would result in a swivel connection that is unsafe and could potentially lead to catastrophic failure of the connection.

Please note that it is also not possible to assemble a male ball race end of an FMC 3\" TSi swivel component into a female ball race end of an SPM 3\" HD-LR swivel component (Figure 2).

Swivel Joint Components

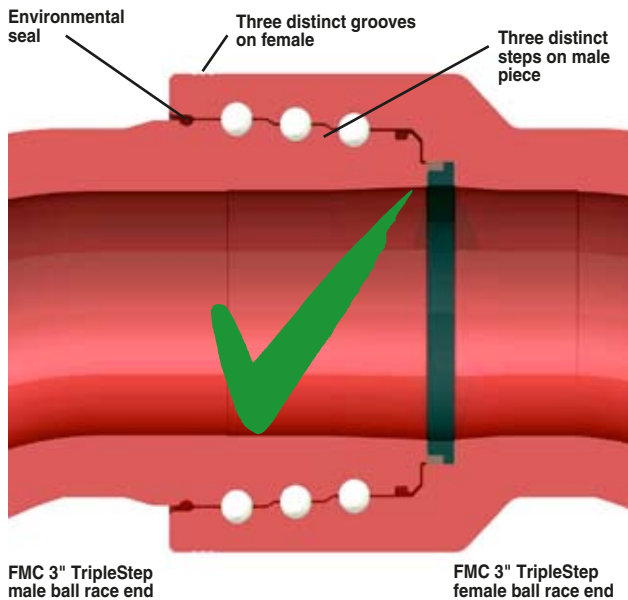


Figure 3: Matching Assembly

TSi swivel joint female ball race ends are easily identified by three machined grooves on the OD close to the environmental seal end (Figures 3 and 4).

For help with specific questions regarding identification of swivel joint components, contact FMC Technologies or your nearest representative. When product identification is removed or is not discernible due to wear, damage or lack of information, the affected components must be immediately and permanently removed from service.

! WARNING

Use of non-FMC manufactured parts in Chiksan® and Weco® products may result in death, personal injury or property damage. The use of non-FMC parts voids all design, type, case, test and quality approvals by third-party certifying authorities and may void product warranty.

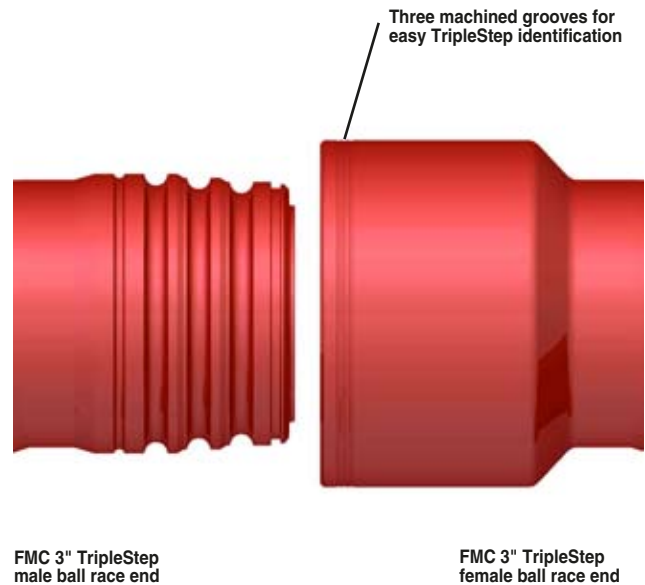


Figure 4: Identification of TripleStep Swivel Joint

! WARNING

Never assemble swivel joint components together that are not positively identified as to the manufacturer, service and pressure rating. Failure to do so can result in a swivel connection that may fail under pressure, which can lead to death, serious personal injury and severe property damage.

! WARNING

Do not suspend loads with a TripleStep Swivel Joint. Externally applied binding or tensile loads are additive to the loads already induced by internal pressure. Externally applied loads can result in an overstress condition leading to catastrophic failure. If externally applied loads are to be applied, consult factory for limitations.

WARNING

Failure to follow these safety warnings could result in death, serious personal injury, and/or severe property damage.

- Never mix or assemble components, parts or end connections with different pressure ratings. Mismatched conditions, including but not limited to that of a 2" Figure 1502 male sub end connected to a 2" Figure 602 female sub, may fail under pressure resulting in death, serious personal injury or severe property damage.
- Never use or substitute non FMC components or parts in FMC products or assemblies.
- Never modify or repair FMC products in a manner not specifically directed in instructions published by FMC Technologies.
- Never strike, tighten, loosen or attempt repairs on pressurized components or connections.
- Never exceed the rated working pressure of the product.
- Complete and proper make-up of components and connections is required to attain rated working pressure. Always apply essential care, attention, handling and inspection to threaded components before, during and after make-up.
- Never use severely worn, eroded or corroded products. Contact FMC Technologies for more information on how to identify the limits of erosion and corrosion.
- Never strike wing union nuts having severely flattened and extruded ears. This condition can result in flying debris leading to serious personal injury and must immediately be addressed by either grinding off extruded material or removing the nut from service.
- Always follow safe practices when using products in overhead applications. Products not properly secured could fall.
 - Never exceed the load rating of lifting devices on products or lifting equipment.
- Use of FMC products in suspension applications can result in over-stress conditions leading to catastrophic failure. If externally applied loads are anticipated, consult factory.
- Always follow safe practices when manually lifting and carrying products.
- Always select only appropriate product and materials for the intended service:
 - Never expose standard service products to sour gas fluids (Refer to NACE MR-01-75). Do not interchange sour gas with standard service components.
 - Always use appropriate safety precautions when working with ferrous products in below freezing temperatures. Freezing temperatures lower the impact strength of ferrous materials.
- Always follow manufacturer's instructions and Material Safety Data Sheet directions when using solvents.
- Always make certain that personnel and facilities are protected from residual hazardous fluids before disassembly of any product.
- Whenever leakage is detected from FMC Technologies products, remove them from service immediately to prevent death, serious personal injury, and/or property damage.

FMC has warned against the use of non-FMC manufactured parts in Chiksan and Weco products in previous technical alerts and product literature. Please read and follow all product instructions, warnings and cautions when using, maintaining or repairing Chiksan and Weco products. Technical alerts and product literature can be accessed at www.fmctechnologies.com/fluidcontrol.

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