

Shear Fatigue in Bolted Connections

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ASTM A490
Specification f

Yes. The Commentary to Section 3.4 states: "Bolts installed in joints meeting all the requirements for slip-critical connections survive unharmed when subject to cyclic sheap-censresses"

steel interchange

The [2010 Specification](#) provides general requirements for fully restrained connections in two different sections. Section B3.6b states: “A fully restrained (FR) moment connection transfers moment with a negligible rotation between the connected members. In the analysis of the structure, the connection may be assumed to allow no relative rotation. An FR connection shall have sufficient strength and stiffness to maintain the angle between the connected members at the strength limit states.” Section J1.3 states, “End connections of restrained beams, girders and trusses shall be designed for the combined effect of forces resulting from moment and shear induced by the rigidity of the connections. Response criteria for moment connections are provided in Section B3.6b.” Both of these criteria mention stiffness. In practice, stiffness is often not explicitly checked but rather judged by inspection.

The definition of a fully restrained connection (or Type 1 connection, as it was once called) has varied some with time, as has the guidance related to this topic. The Commentary to the 2010 [Specification](#) provides a definition based on stiffness: “If $K L/EI \geq 20$, it is acceptable to consider the connection to be fully restrained (in other words, able to maintain the angles between members).” K is the secant stiffness of the connection at service loads. Relative to strength, it states: “The strength of a connection can be determined on the basis of an ultimate limit-state model of the connection, or from a physical test. If the