

1. Introduction.

1.1 Scope. This standard describes procedures for the mechanical testing of inch series blind rivets to determine properties required in the product standard.

1.2 The following tests are described:

Shear strength, Para. 2.1
Tensile strength, Para. 2.2
Mandrel break load, Para. 2.3
Blind head formation, Para. 2.4
Mandrel retention, Para. 2.5

1.3 Definitions of terms relating to blind rivets are given in IFI-110, *Glossary of Terms Relating to Blind Rivets*.

2. Test Methods.

Alternative testing methods may be used for routine testing, but in case of dispute the test fixtures and procedures defined below shall be used to determine rivet acceptance.

2.1 Shear Test. The test shall be comprised of loading a single lap joint assembled with one rivet so that the direction of applied load induces transverse shear against the rivet body. The test specimen shall be mounted in a tensile testing machine capable of applying load at a controllable rate. The grips shall be self-aligning and care shall be taken when mounting the specimen to assure that the load will be transmitted in a straight line through the test rivet.

The specimen shall be tensile loaded at a speed of testing as determined with a free running cross head not less than 0.3 nor greater than 0.5 in. per minute. Loading shall be continued until failure of the rivet occurs. The maximum load in pounds applied to the specimen coincident with or prior to rivet failure shall be recorded as the ultimate shear strength of the rivet. At the discretion of the testing activity, tests need not be continued to destruction providing the test specimen supports the minimum shear load specified in the product standard without evidence of rivet failure.

The test specimen shall be comprised of two plates, of equal nominal thickness, axially aligned and assembled into a single lap joint with the test rivet, as shown in Fig. 1. When testing rivets, the total thickness of the joint shall not be less than 1.0 times the nominal rivet diameter when testing dome head rivets, or 1.5 times the nominal rivet diameter when testing countersunk head rivets, nor be greater than the specified maximum grip length of the test rivet. Washers may be used under the head of the rivet to position the shear plates in the rivet grip range to assure only the rivet body is in shear. The test rivet shall be set with a setting tool standard for that type of rivet and in accordance with the setting procedures recommended by the rivet manufacturer.

2.2 Tensile Test. The test shall be comprised of separating two plates of a joint assembled with one blind rivet. The joint with the test rivet shall be installed in a test fixture, as shown in Fig. 2, or other comparable arrangement if an alternate test fixture is used, and the fixture placed between the compression heads of a testing machine. Care shall be exercised to locate the fixture at the center of the piston when hydraulic testing machines are used. Load shall be applied to the joint at a speed of testing, as determined with a free running cross head, not less than 0.3 nor greater than 0.5 in. per minute. Loading shall be continued to failure with failure occurring when the rivet body fractures or is pulled through one of the plates. The maximum load in pounds applied to the joint coincident with or prior to rivet failure shall be recorded as the ultimate strength of the rivet.

The test specimen shall be comprised of two plates, of equal nominal thickness, aligned and assembled into a joint with a test rivet. When testing rivets, except those covered in IFI-119, *Structural Flush Break Pull Mandrel Self-Plugging Blind Rivets*, and IFI-134, the total thickness of the joint shall not be less than 1.0 times the nominal rivet

IFI STANDARD ®	MECHANICAL TESTING OF BLIND RIVETS	IFI-135 Page 1 of 5
Published and issued by the Industrial Fasteners Institute of Independence, OH		Revised: Aug. 15, 2013

All standards and specifications are advisory only. Their use by anyone is entirely voluntary. Reliance thereon for any purpose by anyone is at the sole risk of that person or the user of the product, and the IFI is not responsible for any loss, claim, or damage arising therefrom. In formulating and approving standards and specifications, the IFI has not investigated and will not investigate patents which may apply to the subject matter. Prospective users of the standards and specifications are responsible for advising themselves of and protecting themselves against any patent infringement liability which may arise out of such use. © INDUSTRIAL FASTENERS INSTITUTE 2013

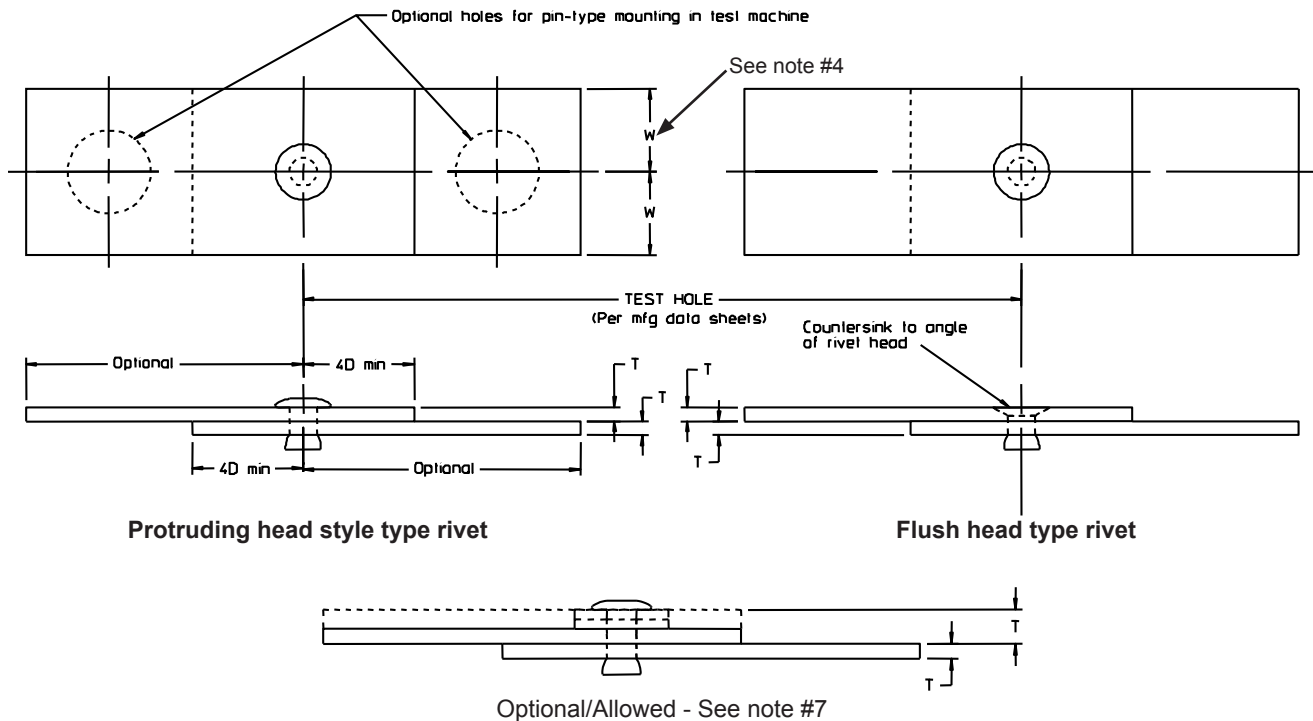


Fig. 1 Test Fixture for Shear Testing Blind Rivets

NOTES:

1. Design of plates may be modified to add holes for shearing two or more sizes of rivets using the same plates. Such holes shall be located on the longitudinal centerline of the plate, and the centerline distances between adjacent holes shall be at least 4 times the diameter of the larger hole. Ends of the plate may be drilled for pin-type mounting in the testing machine.
2. Plates shall be alloy steel, quench and tempered to a hardness of Rockwell C42 minimum.
3. Plates must be of sufficient thickness to prevent hole elongation, deflect or break during testing.
4. W for plates for testing IFI-119 and IFI 134 rivets equal 1.0 in min. When testing all other rivets, W equals 0.5 minimum.
5. The holes size in the plates shall be within the hole size range indicated by the manufacturer's data sheets.
6. When tensile testing IFI 134 rivets, washers may be used on the end opposite the head to avoid the plates from shearing the expanded blind side rivet body during testing.
7. For longer grip fasteners, varying thickness of test plates, washers or other material may be used to allow the shear plates to test shear performance within the grip range of the fastener. All/any material must be within the manufacturer's hole tolerance.

Rivet Series No.	Nom Rivet Size in. D	Test Hole Dia, in.	
		Max	Min
3	0.0938	0.100	0.098
4	0.1250	0.132	0.130
5	0.1562	0.164	0.162
6	0.1875*	0.196	0.194
8	0.2500*	0.260	0.258