

Pull Tests on Crimped Wire Assemblies



▶ Performing crimped wire pull tests on terminals without using the correct fixtures and methods could lead to inaccurate results.

The DFS II force gauge coupled with GF-10 or ML1785 gripping attachments on an LTCM 100 or MT 150 test stand is the ideal solution for crimped wire testing.

Companies within the automotive, appliance, and connector industries commonly perform these tests to verify integrity of their crimping process in production, as part of a quality system, and as a function to develop new products in R&D.

This guide will help you through the process of selecting the force tester and adaptor(s) needed to perform a pull-test on a lug crimped to a stranded shielded electric wire 18 AWG.

What is Required

LTCM Test Stand with DFS II Force Gauge

Using a motorized test stand as the LTCM will assure having a constant speed during the test.

The optional remote foot switch allows the user to control the movement of the crosshead up/down.



- Travel Distance: 80 mm (15 in) to 750 mm (29 in)
- Crosshead Speed: 5 to 500 mm/min (0.2 to 20 in/min)
- Capacities: 500 and 2,500 N

MT Test Stand with DFS II Force Gauge

The non-motorized MT test stand is the solution if constant speed is not a requirement. This force tester is a great value for a simple solution.

The MT test stand comes in either 150 lbf (660N) or 500 lbf (2,500N) capacity and is available with optional digital travel indicator.

- MT Lever: 75 mm (3 in) per revolution
- MT Hand Wheel: 12 mm (0.5 in) per revolution
- Standard Work Height: 750 mm (29.5 in)
- Extended Height : 1,000 mm (39.4 in)
- Ultra Height: 1,500 mm (59 in) 150 mm (6 in)
- Longer strokes available.



DFS II Force Gauge

The DFS II force gauge is ideal for crimped wire testing. The large, high-resolution, full colour LCD display makes readings easy and intuitive. With the capture peak readings, high/low limits, set points, pass/fail results, load averaging, load comparisons and % and sharp break detection, this force gauge includes all the features you need for high-precision crimped wire testing.

The DFS II force gauge also features Bluetooth, USB, RS-232 and analog communication.

- Accuracy: $\pm 0.1\%$ of full scale
- Maximum Overload: 150% of rated capacity
- Resolution: 1:10,000
- Capacities: 0.5 to 500 lbf / 2.5 to 2,500 N



ML1785 Wire Grip with Eye Crimp

This grip is ideal for testing wire terminals, connectors and other end fittings. A rotating turret has 9 grooves to accept wire sizes from 28 gauge to 10 gauge. A ring stud behind the turret is supplied for ring-type terminals.

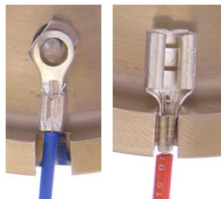


Wire gauge sizes from 0.06 up to 0.21 in. The ML1785 grip is rated for a maximum capacity of 2.500N (550 lbs) and has a 5/16"-18 female thread.

TP-10 Terminal Testing Fixture

The TP-10 terminal testing fixture is specifically designed to test the ultimate strength of wire connectors and terminals.

The upper fixture consists of a self-aligning wheel with 9 equally spaced slots to accept standard terminal shank sizes. Ring terminals are secured with a pin.



The bottom fixture has an eccentrically mounted, self-tightening knurled roller which accepts wire diameters up to 3 mm (0.13 in).



Items included with the TP-10

This fixture can be used for sample sizes from 0.8 to 6 mm (0.03 to 0.25 in) and is rated for a maximum capacity of 110 lbf (500N). The thread is 1/4"-20 male upper and 3/8"-16 female bottom with force gauge and tester coupling hardware included.

The Crimp Pull Test

Double Crimped Assemblies using the ML1785 Grip

The ML1785 grip is the perfect solution to test double crimped assemblies. The ML1785 grips are sold individually and will adapt to both test stands using the thread adaptors listed below.

- 17057 Coupling, 1/4-20 F X #10-32 F
- NC000296 Adaptor, 1/4-28 BY 5/16-18
- 17056 Coupling, 1/4-20 F X 5/16-18 F
- 21046-1 Adaptor, 1/4-28 BY 3/8-16
- 21046-2 Adaptor, 10-32 BY 3/8-16

Note! Make sure to determine to correct adaptors needed depending on tester and capacity chosen. This information is also available in the Chatillon Force Measurement Instruments catalogue.

The design of the ML1785 grip allows testing of a diversity of crimped wire assemblies from 0.06 to 0.21 inches in diameter.

Single and Double Crimped Assemblies using the GF-10 Fixture

The GF-10 fixture comes complete with the thread adaptors for both LTCM and MT test stands and a spring loaded serrated eccentric cam for clamping wire, cable or other non-terminated materials.

The upper turret is similar in many respects to the ML1785 grip. When testing single crimped wire using the lower fixture, special attention needs to be taken as the insulation may pull off during the test, not the lug. Solutions to remedy this problem are as follows:

- Tie a knot to the wire to prevent slippage.
- Crimp a lug to the opposite side of the cable.
- Strip the wire insulation off of the bottom and clamp the stranded wire into the fixture. In some situations the strands may break depending on loads and wire/cable diameters.
- Use a wire winding fixture as a TG-11 to facilitate the setup of the test, and eliminate wire preparation. This fixture requires 5/8" male eye adaptor type SPK-TLC-002 (1/4"-28 Male) or SPK-TLC-003 (1/2"-20 Male) depending on the tester capacity (additional couplings may be required).



SPK-TLC-002



TG-11

For additional information go to our website, www.ametektest.com, where you can find product information and video demonstration on how to perform pull tests on crimped wire assemblies.