Design Objectives

This product described in this document has not been fully tested to insure conformance to the requirements outlined below . Therefore , Tyco Electronics Brasil makes no representation or warranty , express or implied , that the product will comply with these requirements . Further, Tyco Electronics Brazil may change these requirements based on the results of additional testing and evaluation . Contact Tyco Engineering for further details .

1. SCOPE

This specification covers the requirements for product performance , test methods and quality assurance provisions of "Grounding Connector 6 positions" Tyco P/N 493971-1. This connector is suitable for counterpart Tyco P/N 284128-1.

2. APPLICABLE DOCUMENTS

The following documents form part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing , the product drawing shall take precedence . In the event of a conflict between the requirements of this specification and the referenced documents , this specification shall take precedence .

3. TYCO AND COMMERCIAL STANDARDS SPECIFICATIONS

3.1 TYCO Specifications

a) 109-1 - General Requirements for Test Methods.
b) 114-20102 - Application specification for IDC Harnesses manufactured with :

- Pistol Crimp
- MT Bench Press
- Fully Automatic Harness Machine

c) Product Specification 108-20182

d) For all electrical, mechanical and environmental requirements regarding counterpart (P/N 284128-1) see Quality Test Report number 501-20.025 of IDC connector .

3.2 Commercial Standards and Specifications

- FIAT Standard no. 9.91320/02.
- FIAT Standard no. 7.Z8260.
- Low Voltage Stranded Cables for Automobiles according to FIAT Table no. 91107/03.

4. REQUIREMENTS

Product shall be of the design , construction and physical dimensions specified in the applicable drawing.
The Busbar .070 contact for Grounding Connector is inserted into the 6 pos. Connector Housing cavity . Grounding at the first locking . After having assembled the 6 pos. Housing IDC , the secondary lock for the Busbar can be actuated .
The class identification was based on FIAT standard no. 9.91320/02 .

- Terminal Class : 1,5 – 1,8
- Water Resistance Class : S1
- Temperature Class : T1
- Kesternich Class : K1
- Vibration Class : V1

5. MATERIALS

a) Housing , Connector 6 pos. Grounding: - PA 6.6 glass fiber filled black color .

b) Busbar , .070 Contact for Grounding Connector : - Pre tinned brass .

5.1 Wire Range

Wire Range (mm^2)	Max. Ø – outside (mm)	Current (DC) Max.
0,35	1,4	3,5 A
0,50	1,7	6 A
0,75	1,9	9 A

Remarks: *Stranded cables according to Fiat table number 91107/03 (reduced insulation outside diameter), for .070 Multilock contact.*

5.2 Ratings

a) Total current in Grounding Connector is 54 A Max.
b) Temperature Rating : -30°C to 105°C including the temperature increases due to working current flow .
c) Maximum Operating Voltage : 24 V d.c. ; for application at higher voltage please contact Tyco .

6. QUALITY ASSURANCE PROVISION

6.1 Sample Preparation

Samples used for the tests shall be prepared by randomly selected components from the current production ; and the contact crimped in accordance with the application specification . No sample shall be reused , unless otherwise specified .

6.2 Test Condition

All the tests shall be performed under the following environmental conditions , unless otherwise specified .

- Room temperature : 23° ± 5° C.
- Relative Humidity : 45% ~ 75%.
- Atmospheric Pressure : 860 ~1060 mbar.

6.2.1 Test conditions and characteristics

a) For all electrical , mechanical and environmental requirements regarding counterpart (P/N 284128-1) see Quality Test Report number 501-20.025 of IDC connector .

b) When specified "mated connector"(*), the P/N 493971-1 shall be mated to P/N 284128-1 with six 0,75 mm² cables (see Figure 1).

Test	Test Items	Requirements	Procedures
1º	Confirmation of product and visual examination	- Product shall be conforming to the requirements of applicable product drawing and application specification, without any visible damage, cracking or defect when the product is new and even after environmental, mechanical and electric tests.	-Visually, dimensional and functionally inspected per applicable quality inspection plan. -Visual inspection.
2º	Temperature increase	- Mounted connection - Fix the kit on surface similar to the specified in the vehicle (see figure 2). The device shall be connected to 20mm² ground cable. - Temperature increases ≤ 45ºC.	- Apply 9 A of current per each cable, and measure the temperature according to shown in figure 2.
3º	Voltage Drop	≤ 4 mV/A (see figure 1)	- Between a point on the wire at 10 mm from the IDC connector edge and a point on the tab very closed to the connector edge (see figure 3).
4º	Grounding tab mating force	≤ 70 N (all terminals loaded in the housing).	- Apply a force in axial direction. - Operation speed of 25 mm/min.
5º	Grounding tab unmating force	≤ 100 N (all terminals loaded in the housing).	- Apply a force in axial direction. - Operation speed of 25 mm/min.
6º	Cable tensile strength	- Mounted connection - Wires bundle fixed by a tail to the connector shell - Fix the connector terminal on surface as shown in figure 4. - Force = 100 N / four (4) directions	- Apply a pull-out force for 1 minute per each direction as shown in figure 4. - Operation speed of 25 mm/min.
7º	Bending resistance on Mounted connector	- Perpendicular Force = 40 N min. - Mounted connection - Fix the connector terminal on surface as shown in figure 5.	- Apply a force for 1 minute per indicated direction as shown in figure 5. - Operation speed of 25 mm/min.
8º	Accelerated aging test.	- No deformation or cracking of the plastic parts. - Discoloration is admitted. - Voltage drop ≤ 6 mV/A (see figure 1). - Time interval in passing from one environment to another must not exceed 3 minutes and temperature gradient between 1,5 ~ 3ºC (uphill and downhill)	a) 5 cycles with shock composed of: - 2 hours at 105ºC ± 2ºC; - 2 hours at –25ºC ± 2ºC. b) 5 cycles without shock composed of : - 2 hours at 105ºC ± 2ºC; - 2 hours at 40ºC ± 2ºC and 90% ~ 95% of relative humidity; - 2 hours at –25ºC ± 2ºC. c) 200 hours at 105ºC
9º	Salt spray corrosion test	- Mounted connection - Voltage drop ≤ 8 mV/A (see figure 1).	- 150 hours according to Fiat specification Nº 50180, method A1.
10º	Kesternich corrosion.	- Mounted connection - Voltage drop ≤ 4 mV/A (see figure 1).	- 4 cycles (8 hours in industrial atmosphere + 16 hours in free air). - Atmosphere according to Fiat specification Nº 50180, method D1.

6.2.2 Product Qualification Test Sequence

Test	Test Items	Test Group						
		A	B	C	D	E	F	G
		Test Sequence						
1º	Confirmation of Product	1,4	1,3	1,6	1,6	1,5	1,3	1,3
2º	Temperature increasing		2					
3º	Voltage Drop			2,4	2,4	2,4		
4º	Grounding Tab. Mating Force	2						
5º	Grounding Tab. Unmating Force	3		5	5			
6º	Cable Tensile Strength						2	
7º	Bending Resistance							2
8º	Accelerated Aging Test			3				
9º	Salt Spray Corrosion Test				3			
10º	Kesternich Corrosion					3		

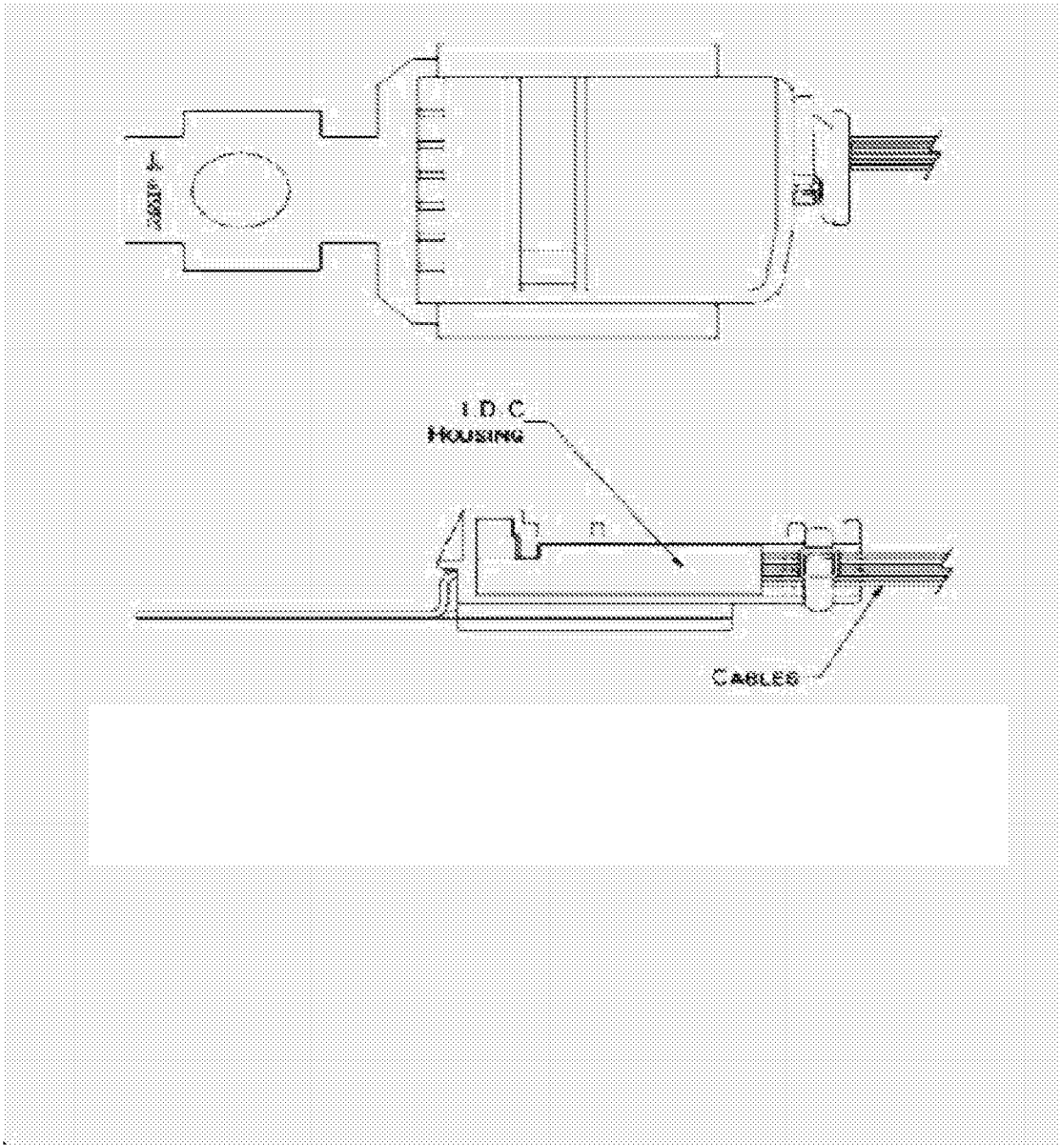

Figure 1

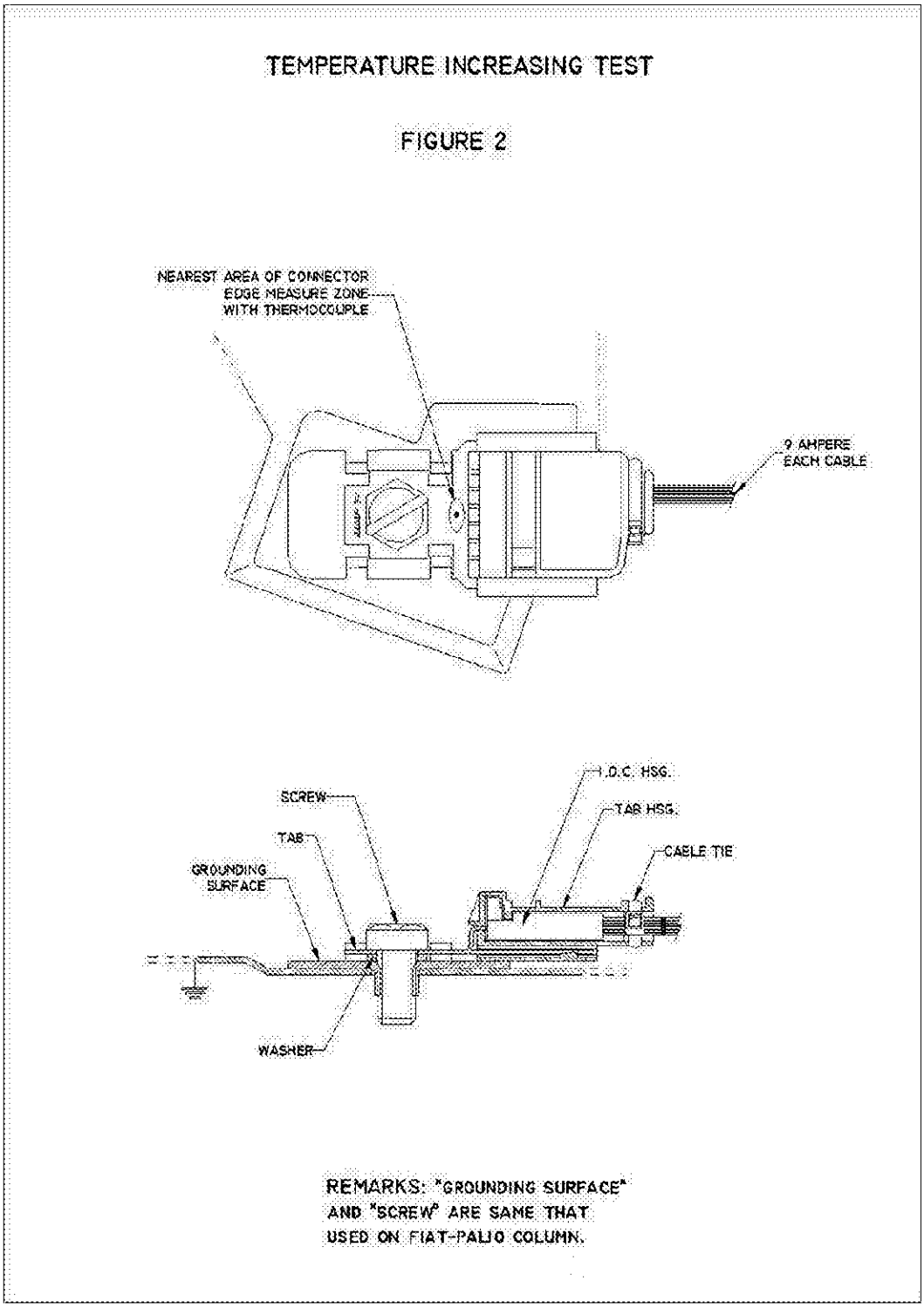

Figure 2
Temperature Increasing test

VOLTAGE DROP TEST

FIGURE 3

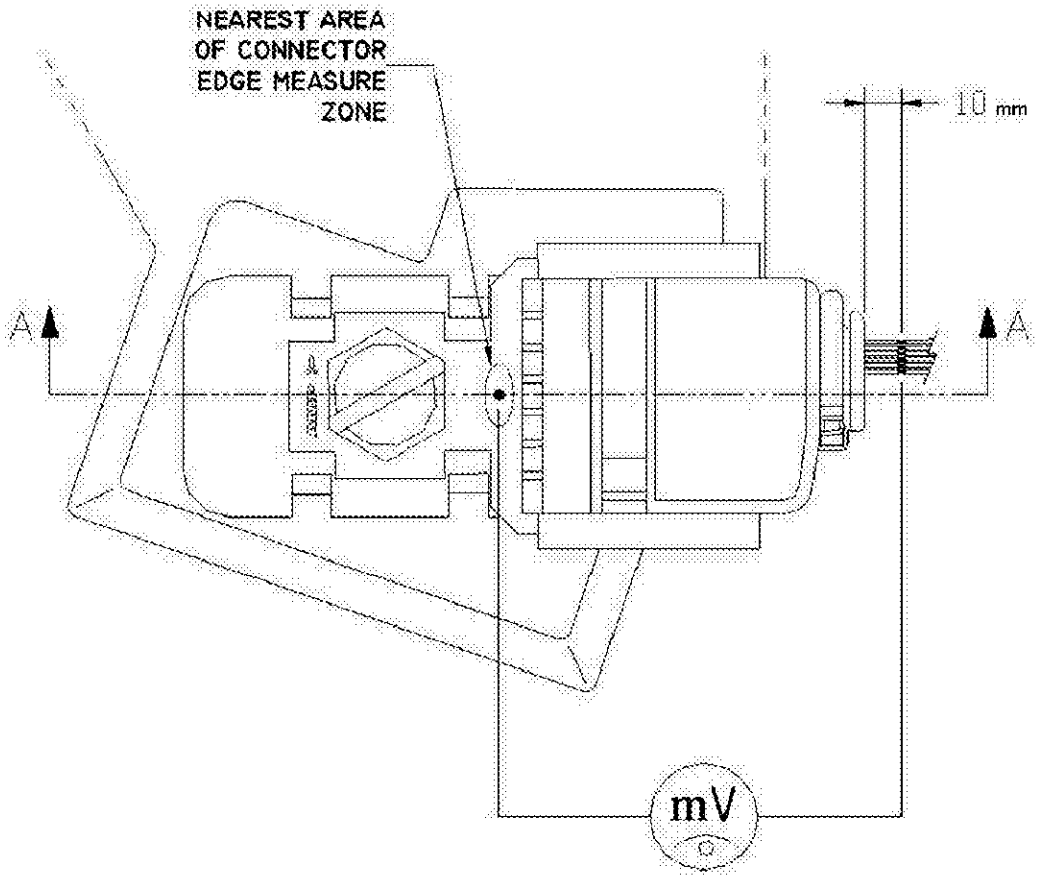

Figure 3
Voltage Drop Test

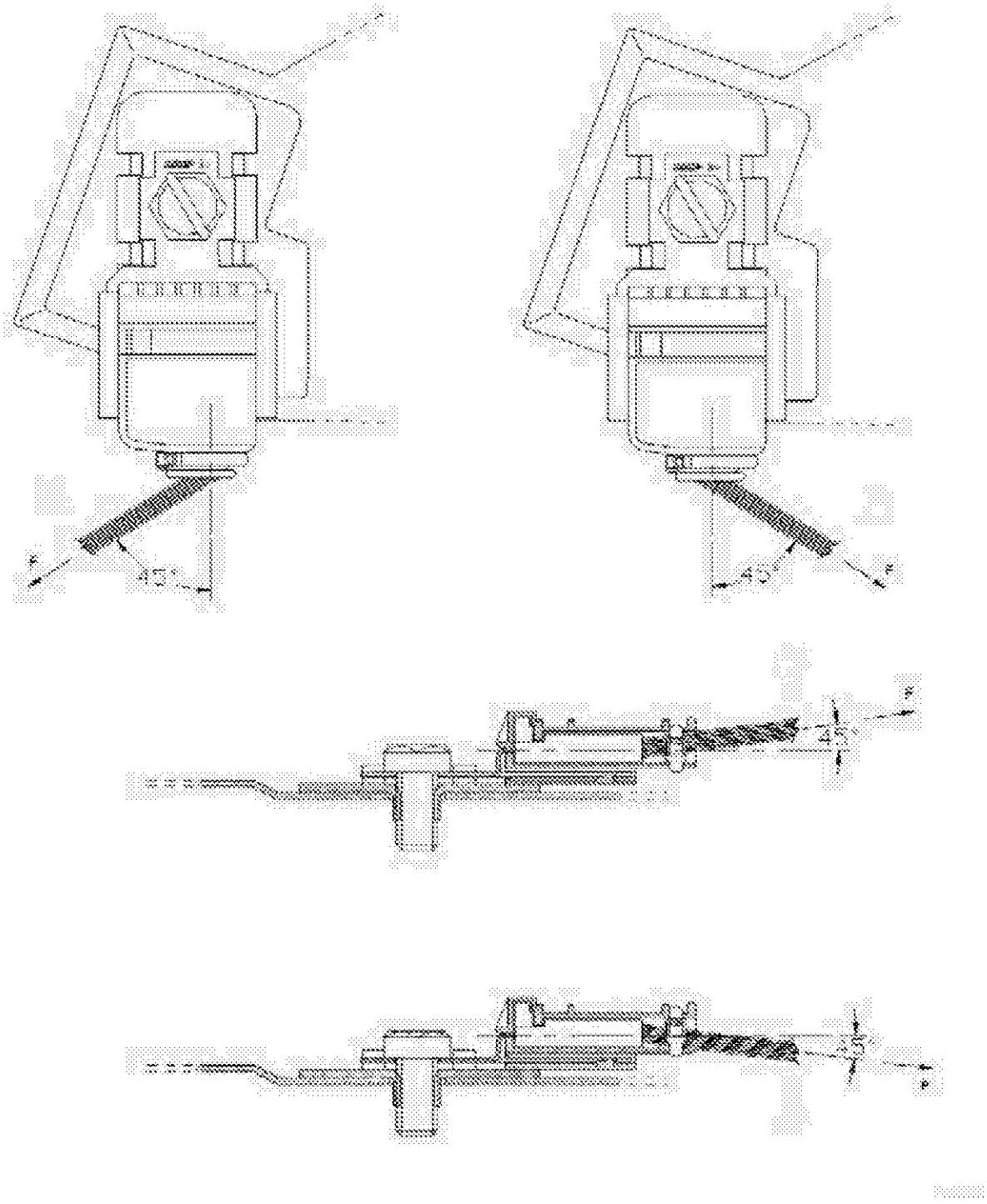

Figure 4
Cable Tensile Strength test

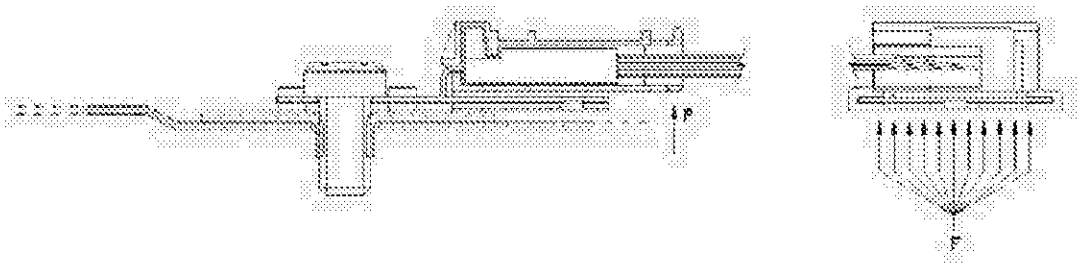

Figure 5
Bending Resistance Test

Revision Record		
Revision	**Date**	**Description**
O	20-Jun-2001	Released