



HARWIN

Test Report Summary

HT00102

Mechanical Endurance of
Datamate(M80 Series) Connectors

1. Introduction

1.1. Description and Purpose

The Harwin Datamate (M80 Series) connector is manufactured to the requirements of BS9525-F0033 and has been designed to withstand 500 successive engagements and separations without impairing its mechanical or electrical performance. The following tests were carried out to establish whether the connector's performance would be impaired following multiple engagements and separations up to 5,000 and 10,000 times.

1.2. Conclusion

The following data has been collated from Harwin test reports T27/94, T2/90 and 413. The connectors tested met the BS9525-F0033 specification for insertion, withdrawal and contact resistance initially and after multiple engagements and separations up to 500 operations.

Up to 1,000 operations, polishing marks are visible along the mating path. After 5,000 operations, the plating had been removed exposing the base metal but excessive wear could not be detected. However, even after 5,000 operations, contact resistance still remained within specification.

The tests indicate that the Datamate connector exceeds the requirements of the BS specification, and can be used with confidence up to a maximum of 5,000 successive engagements and separations, as long as the environmental atmosphere is non-aggressive.

2. Test Method, Requirements and Results

2.1. Specification Parameters

Insertion/withdrawal force requirement of BS9525-F0033 (force requirements for section 2.5 stated on the relevant graphs in that section):

	For 14-way connectors (section 2.3)	For 16-way connectors (section 2.4)
Insertion force	40.0N maximum	45.0N maximum
	7.0N minimum	8.0N minimum
Withdrawal force	26.0N maximum	26.0N maximum
	2.8N minimum	2.8N minimum

Contact resistance requirement of BS9525-F0033 for sections 2.3 and 2.4:

Initial contact resistance	20mΩ maximum
Contact resistance after conditioning	25mΩ maximum

2.2. List of Test Samples

- B5743-214-M-T-0 (M80-8691422 equivalent) – Datamate L-Tek BS male assembly, 14 contact, through-board termination
- B5740-214-F-C-2 (M80-8881405 equivalent) – Datamate L-Tek BS female assembly, 14 contact, crimp termination
- M80-8691622 – Datamate L-Tek male assembly, 16 contact, through-board termination
- M80-8881605 – Datamate L-Tek female assembly, 16 contact, crimp termination
- M80-5010642 – Datamate J-Tek male assembly, 6 contact, through-board termination
- M80-4100642 – Datamate J-Tek female assembly, 6 contact, through-board termination
- M80-5011442 – Datamate J-Tek male assembly, 14 contact, through-board termination
- M80-4101442 – Datamate J-Tek female assembly, 14 contact, through-board termination
- M80-5012042 – Datamate J-Tek male assembly, 20 contact, through-board termination
- M80-4102042 – Datamate J-Tek female assembly, 20 contact, through-board termination

2.3. Test Method and Results (Test Report T27/94)

Methodology: Insertion/withdrawal forces and contact resistance tests were performed. Checks were performed initially and after multiple engagements of 100, 500, 1,000, 2,000, 3,000, 4,000 and 5,000 cycles.

Samples:

- B5743-214-M-T-0 (M80-8691422 equivalent) – Datamate L-Tek BS male assembly, 14 contact, through-board termination
- B5740-214-F-C-2 (M80-8881405 equivalent) – Datamate L-Tek BS female assembly, 14 contact, crimp termination

Results: Insertion/withdrawal forces

No. of Cycles	Insertion Force (40N max, 7N min)	Withdrawal Force (26N max, 2.8N min)
Initial	28.3N	14.1N
100	15.0N	11.3N
500	13.9N	9.1N
1,000	13.0N	10.3N
2,000	13.8N	11.3N
3,000	10.2N	9.5N
4,000	8.9N	8.8N
5,000	9.5N	9.4N

Results: Contact resistance

No. of Cycles	Maximum (25mΩ)	Minimum	Average
Initial (20mΩ Max)	6.4mΩ	5.1mΩ	5.8mΩ
100	5.9mΩ	5.1mΩ	5.6mΩ
500	6.6mΩ	4.9mΩ	5.9mΩ
1,000	6.4mΩ	4.5mΩ	5.3mΩ
2,000	6.4mΩ	4.8mΩ	5.7mΩ
3,000	6.4mΩ	4.7mΩ	5.7mΩ
4,000	6.6mΩ	5.4mΩ	6.0mΩ
5,000	6.7mΩ	5.1mΩ	5.8mΩ

2.4. Test Method and Results (Test Report T2/90)

Methodology: Insertion/withdrawal forces and contact resistance tests were performed. Checks were performed initially and after multiple engagements of 500, 1,000, 2,500, 5,000, 7,500 and 10,000 cycles.

Samples:

- M80-8691622 – Datamate L-Tek male assembly, 16 contact, through-board termination
- M80-8881605 – Datamate L-Tek female assembly, 16 contact, crimp termination

Results: Insertion/withdrawal forces

No. Of Cycles	Insertion Force (45N max, 8N min)	Withdrawal Force (29N max, 3.2N min)
Initial	32.8N	22.9N
500	33.2N	22.3N
1,000	30.1N	21.3N
2,500	19.3N	18.0N
5,000	13.3N	12.3N
7,500	6.9N	6.0N
10,000	5.4N	3.7N

Results: Contact resistance

No. Of Cycles	Maximum (25mΩ)	Minimum	Average
Initial (20mΩ Max)	5.7mΩ	2.6mΩ	3.7mΩ
500	8.3mΩ	3.8mΩ	6.2mΩ
1,000	8.4mΩ	6.7mΩ	7.8mΩ
2,500	11.1mΩ	9.1mΩ	10.5mΩ
5,000	13.0mΩ	7.1mΩ	10.0mΩ
7,500	16.8mΩ	9.2mΩ	12.7mΩ
10,000	19.4mΩ	7.1mΩ	12.2mΩ

2.5. Test Method and Results (Test Report 413)

Methodology: Insertion force tests were performed with results being recorded throughout multiple engagements up to 500 cycles.

Samples:

- M80-5010642 – Datamate J-Tek male assembly, 6 contact, through-board termination
- M80-4100642 – Datamate J-Tek female assembly, 6 contact, through-board termination
- M80-5011442 – Datamate J-Tek male assembly, 14 contact, through-board termination
- M80-4101442 – Datamate J-Tek female assembly, 14 contact, through-board termination
- M80-5012042 – Datamate J-Tek male assembly, 20 contact, through-board termination
- M80-4102042 – Datamate J-Tek female assembly, 20 contact, through-board termination

Results:

