



**CONNECTORS, MINIATURE, ELECTRICAL,
CIRCULAR, PUSH-PULL COUPLING PLUGS AND
RECEPTACLES AND RACK AND PANEL PLUG,
REMOVABLE CRIMP CONTACTS**

BASED ON TYPE DBAS

ESCC Detail Specification No. 3401/008

Issue 7	March 2023
---------	------------



LEGAL DISCLAIMER AND COPYRIGHT

European Space Agency, Copyright © 2023. All rights reserved.

The European Space Agency disclaims any liability or responsibility, to any person or entity, with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the use and application of this ESCC publication.

This publication, without prior permission of the European Space Agency and provided it is not used for a commercial purpose, may be:

- copied in whole, in any medium, without alteration or modification.
- copied in part, in any medium, provided that the ESCC document identification, comprising the ESCC symbol, document number and document issue, is removed.

DOCUMENTATION CHANGE NOTICE

(Refer to <https://escies.org> for ESCC DCR content)

DCR No.	CHANGE DESCRIPTION
1364, 1546	Specification upissued to incorporate changes per DCR.

TABLE OF CONTENTS

1	GENERAL	6
1.1	SCOPE	6
1.2	RANGE OF COMPONENTS	6
1.3	MAXIMUM RATINGS	6
1.4	PARAMETER DERATING INFORMATION	6
1.5	PHYSICAL DIMENSIONS	6
2	APPLICABLE DOCUMENTS	6
3	TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS	7
4	REQUIREMENTS	19
4.1	GENERAL	19
4.2	DEVIATIONS FROM GENERIC SPECIFICATION	19
4.2.1	Deviations from Special In-process Controls	19
4.2.2	Deviations from Final Production Tests (Chart II)	19
4.2.3	Deviations from Burn-in and Electrical Measurements (Chart III)	19
4.2.4	Deviations from Qualification Tests (Chart IV)	19
4.2.5	Deviations from Lot Acceptance Tests (Chart V)	19
4.3	MECHANICAL REQUIREMENTS	20
4.3.1	Dimension Check	20
4.3.2	Weight	20
4.3.3	Contact Capability	20
4.3.4	Contact Retention (In Insert)	20
4.3.5	Mating and Unmating Forces	20
4.3.6	Insert Retention (In Shell)	20
4.3.7	Jackscrew Retention	20
4.3.8	Contact Insertion and Withdrawal Forces	20
4.3.9	Engagement and Separation Forces	20
4.3.10	Oversize Pin Exclusion	20
4.3.11	Probe Damage	20
4.3.12	Solderability	21
4.4	MATERIALS AND FINISHES	21
4.4.1	Shells, Coupling Ring	21
4.4.2	Inserts	21
4.4.3	Contact Retaining Clip	21
4.4.4	Contacts	21
4.4.5	Lanyard	21
4.4.6	Guiding and Locking Devices	21

4.4.7	Accessories	21
4.4.8	Magnetism Level	22
4.5	MARKING	22
4.5.1	General	22
4.5.2	Contact Identification	22
4.5.3	The ESCC Component Number	22
4.5.4	Traceability Information	25
4.6	ELECTRICAL MEASUREMENTS	25
4.6.1	Electrical Measurements at Room Temperature	25
4.6.2	Electrical Measurements at High and Low Temperatures (Table 3)	25
4.6.3	Circuits for Electrical Measurements (Figure 4)	25
4.7	BURN-IN AND ELECTRICAL MEASUREMENTS (TABLES 4 AND 5)	25
4.8	ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESCC GENERIC SPECIFICATION NO. 3401)	26
4.8.1	Measurements and Inspections on Completion of Environmental Tests	26
4.8.2	Measurements and Inspections at Intermediate Points during Endurance Tests	26
4.8.3	Measurements and Inspections on Completion of Endurance Tests	26
4.8.4	Conditions for Operating Life Tests (Part of Endurance Testing)	26
4.8.5	Electrical Circuit for Operating Life Tests (Figure 5)	26
4.8.6	Conditions for High Temperature Storage Test (Part of Endurance Testing)	26

1 GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics, test and inspection data for Connectors, Miniature, Electrical, Circular, Push-Pull Coupling Plugs and Receptacles and Rack and Panel Plug, Crimp Removable Contacts, based on Type DBAS.

It shall be read in conjunction with:

- ESCC Generic Specification No. [3401](#), Connectors, Electrical, Non-Filtered Circular and Rectangular
- ESCC Detail Specification No. [3401/009](#), Contacts, Electrical, Crimp for [3401/007](#) and [3401/008](#) Connectors
- ESCC Detail Specification No. [3401/012](#), Contacts, Electrical, Crimp for [3401/011](#) Connectors
- ESCC Detail Specification No. [3401/033](#), Connector Savers, Electrical, Circular, Miniature, Non-Removable Contacts, Based on Type DBAS
- ESCC Detail Specification No. [3401/064](#), Accessories for Circular Connectors [3401/008](#)

the requirements of which are supplemented herein.

1.2 RANGE OF COMPONENTS

The different sizes of connectors specified herein, which are also covered by this specification, together with their mechanical characteristics, are given in Table 1(a).

1.3 MAXIMUM RATINGS

The maximum ratings, which shall not be exceeded at any time during use or storage, applicable to the connectors specified herein, are as scheduled in Table 1(b).

1.4 PARAMETER DERATING INFORMATION

The applicable derating information for the connectors specified herein is shown in Figure 1.

1.5 PHYSICAL DIMENSIONS

The physical dimensions of the connectors specified herein are shown in Figure 2.

2 APPLICABLE DOCUMENTS

The following documents form part of this specification and shall be read in conjunction with it:

- (a) ESCC Generic Specification No. [3401](#), Connectors, Electrical, Non-Filtered, Circular and Rectangular.
- (b) ESCC Detail Specification No. [3401/009](#), Contacts, Electrical, Crimp for [3401/007](#) and [3401/008](#) Connectors.
- (c) ESCC Detail Specification No. [3401/012](#), Contacts, Electrical, Crimp for [3401/011](#) Connectors.
- (d) ESCC Detail Specification No. [3401/033](#), Connector Savers, Electrical, Circular, Miniature, Non-Removable Contacts, Based on Type DBAS.
- (e) ESCC Detail Specification No. [3401/064](#), Accessories for Circular Connectors [3401/008](#).
- (f) SAE-AS81703, Connectors, Electric, Circular, Miniature Rack and Panel or Push-Pull Coupling, Environment Resisting.

3 TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESCC Basic Specification No. 21300 shall apply.

TABLE 1(a) – RANGE OF COMPONENTS

Shell Style	Shell Size	Max Weight (g) (Note 1)	Max Mating Force (daN)		Unmating Force (daN) (Note 2)			
					Min		Max	
			Push-Pull	Rack and Panel	Push-Pull	Rack and Panel	Push-Pull	Rack and Panel
Receptacle	3	16	-	-	-	-	-	-
Receptacle	7	22	-	-	-	-	-	-
Receptacle	12	27	-	-	-	-	-	-
Receptacle	19	34	-	-	-	-	-	-
Receptacle	27	45	-	-	-	-	-	-
Receptacle	37	51	-	-	-	-	-	-
Receptacle	61	73	-	-	-	-	-	-
Plug	3	24	6.8	8	0.54	0.06	6.8	8
Plug	7	31	8.9	8.9	0.66	0.15	8.9	8.9
Plug	12	38	15.1	16.9	0.89	0.25	15.1	16.9
Plug	19	49	16.9	20.5	1.33	0.4	16.9	20.5
Plug	27	53	17.8	20.5	1.78	0.56	17.8	20.5
Plug	37	71 (Note 3)	19.6	22.2	2.67	0.77	19.6	22.2
Plug	61	99 (Note 4)	21.8	30.2	3.11	0.94	21.8	30.2

NOTES:

- Without contacts, rear nut or lanyard (see Para. 4.3.2).
- The specified Minimum Unmating Forces for Rack and Panel Plugs apply when all mounting components and panel locking devices are relaxed.
- The Max Weight of Plugs, Shell Type 79, Shell Size 37 is 78g.
- The Max Weight of Plugs, Shell Type 79, Shell Size 61 is 125g.

TABLE 1(b) MAXIMUM RATINGS

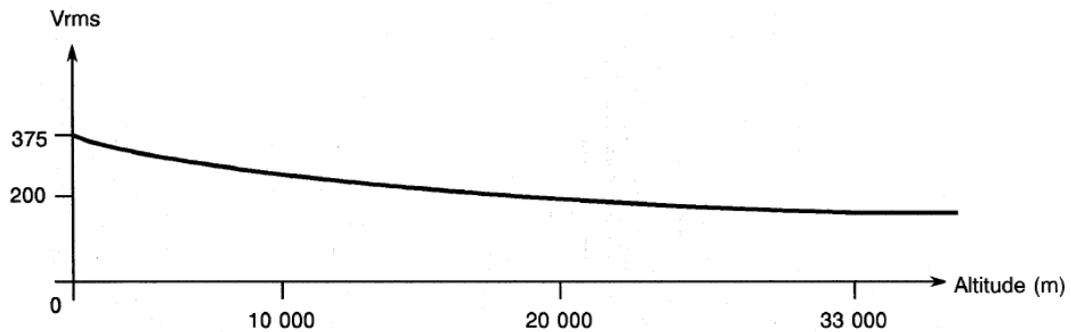
No.	Characteristics	Symbol	Maximum Ratings	Unit	Remarks
1	Working Voltage (Sea Level) Contacts Size 20, 16, 12, 08	U_R	375	Vrms	Note 1
	Working Voltage (Sea Level) Contacts Size 22	U_R	250	Vrms	Note 1
2	Operating Temperature Range	T_{op}	-65 to +200	°C	
3	Storage Temperature Range	T_{stg}	-65 to +200	°C	

NOTES:

1. See Figure 1.

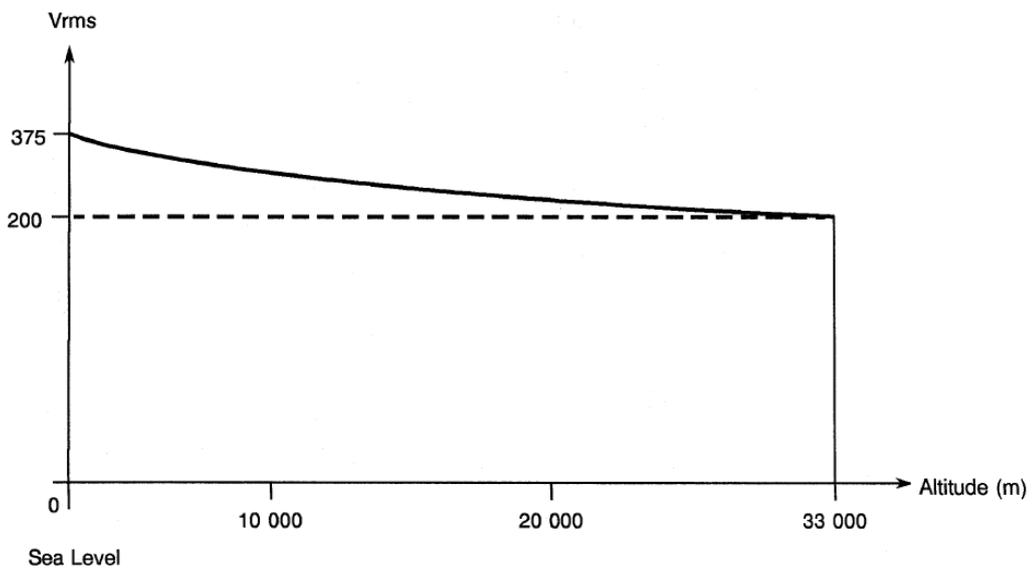
FIGURE 1 - PARAMETER DERATING INFORMATION

FIGURE 1(a) - CONTACT SIZE 08, 12, 16 AND 20



Working Voltage versus Altitude

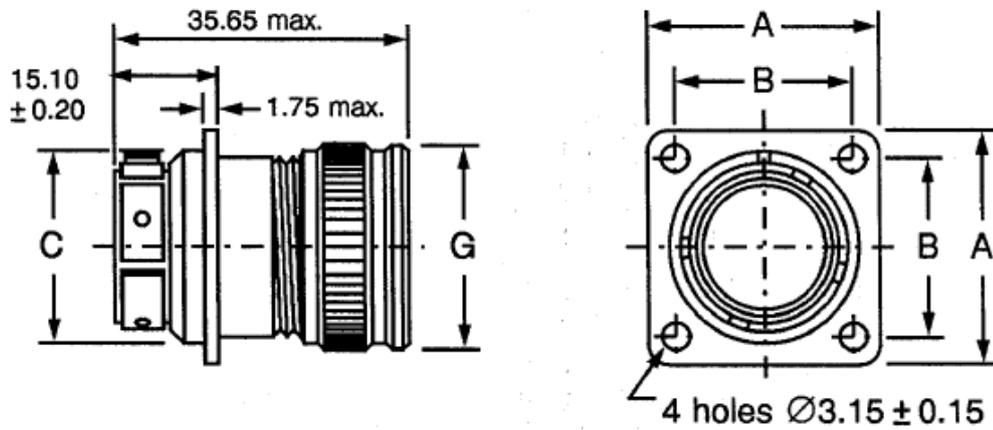
FIGURE 1(b) - CONTACT SIZE 22



Working Voltage versus Altitude

FIGURE 2 – PHYSICAL DIMENSIONS

SHELL TYPE 70 – SQUARE FLANGE RECEPTACLE

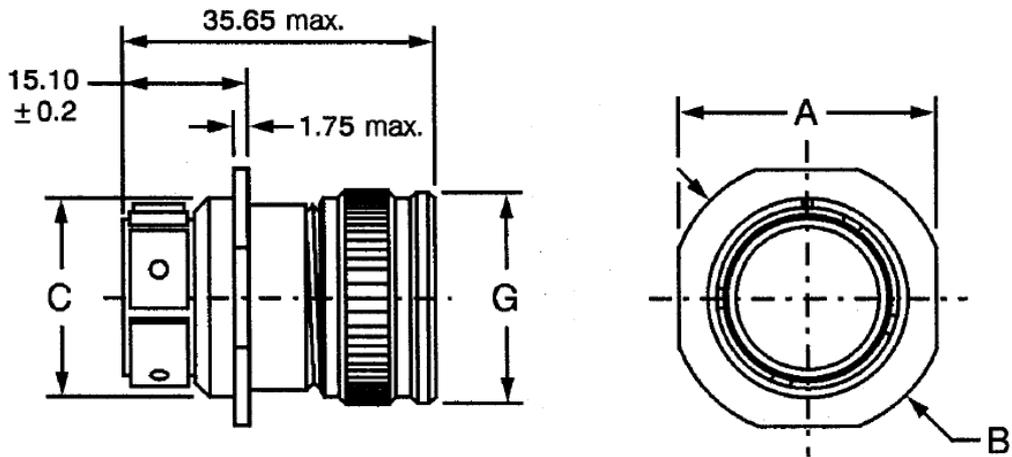


Shell Size	Dimensions (mm)			
	A Max	B ±0.1	C Max	G Max
3	22.6	15.9	14.5	17
7	25.8	18.26	17.35	21.8
12	28.2	20.62	20.8	25
19	30.6	23.02	24	28.25
27	33	24.58	28.65	30.95
37	36.9	30.12	31.95	34.15
61	45.7	36.48	39.9	42

NOTES:

- Figure shown including the default rear nut type [340106401B](#) to [340106407B](#) (Variant depending on shell size) in accordance with ESCC Detail Specification No. [3401/064](#) (see Para. 4.4.7.1).

SHELL TYPE 71 – CABLE CONNECTING RECEPTACLE

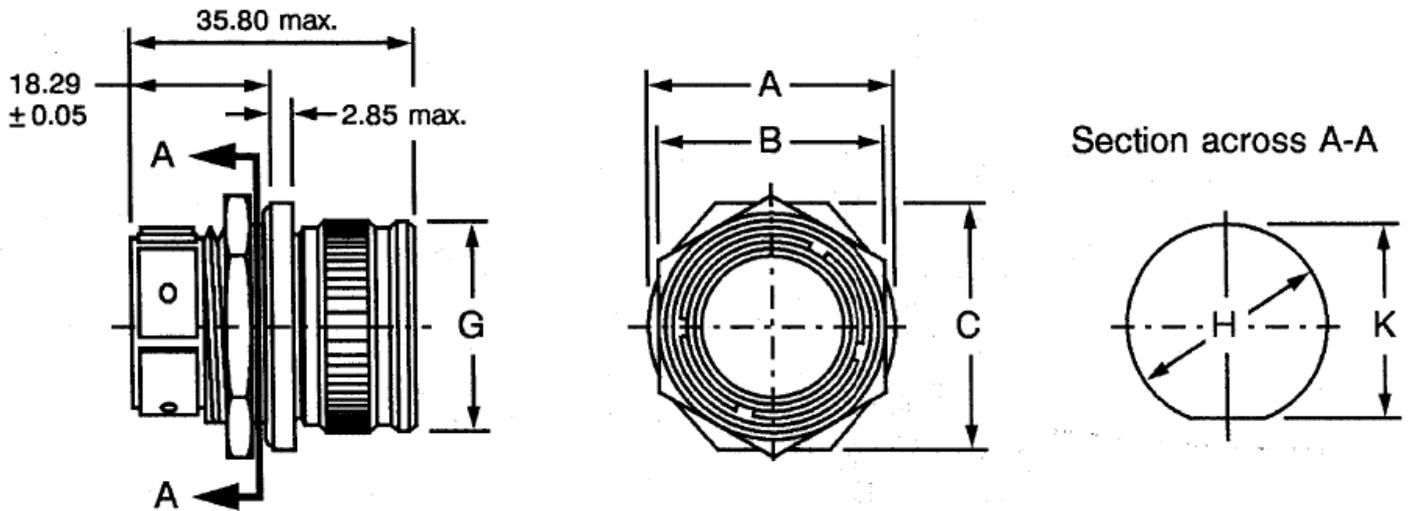


Shell Size	Dimensions (mm)			
	A Max	B Max	C Max	G Max
3	22.6	25.45	14.5	17
7	25.8	28.65	17.35	21.8
12	28.2	31.05	20.8	25
19	30.6	33.45	24	28.25
27	33	35.85	28.65	30.95
37	36.9	39.75	31.95	34.15
61	45.7	48.55	39.9	42

NOTES:

- Figure shown including the default rear nut type [340106401B](#) to [340106407B](#) (Variant depending on shell size) in accordance with ESCC Detail Specification No. [3401/064](#) (see Para. 4.4.7.1).

SHELL TYPE 74 – SINGLE HOLE MOUNTING RECEPTACLE

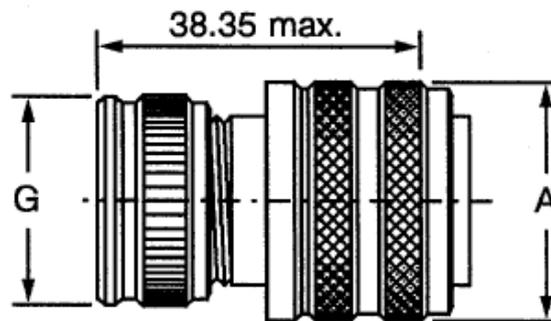


Shell Size	Dimensions (mm)					
	A Max	B Max	C Max	G Max	H Max	K Max
3	19.2	16.31	19.2	17	14.35	13.45
7	22.4	21.07	22.4	21.8	17.5	16.8
12	27.2	24.24	27.2	25	20.65	19.95
19	30.4	27.4	29.6	28.25	25.45	24.65
27	33.6	32.18	33.5	30.95	28.6	27.85
37	38.3	35.36	36.3	34.15	31.8	31
61	47.8	43.02	47.2	42	38.1	37.3

NOTES:

- Figure shown including the default rear nut type [340106401B](#) to [340106407B](#) (Variant depending on shell size) in accordance with ESCC Detail Specification No. [3401/064](#) (see Para. 4.4.7.1).

SHELL TYPE 76 – PLUG

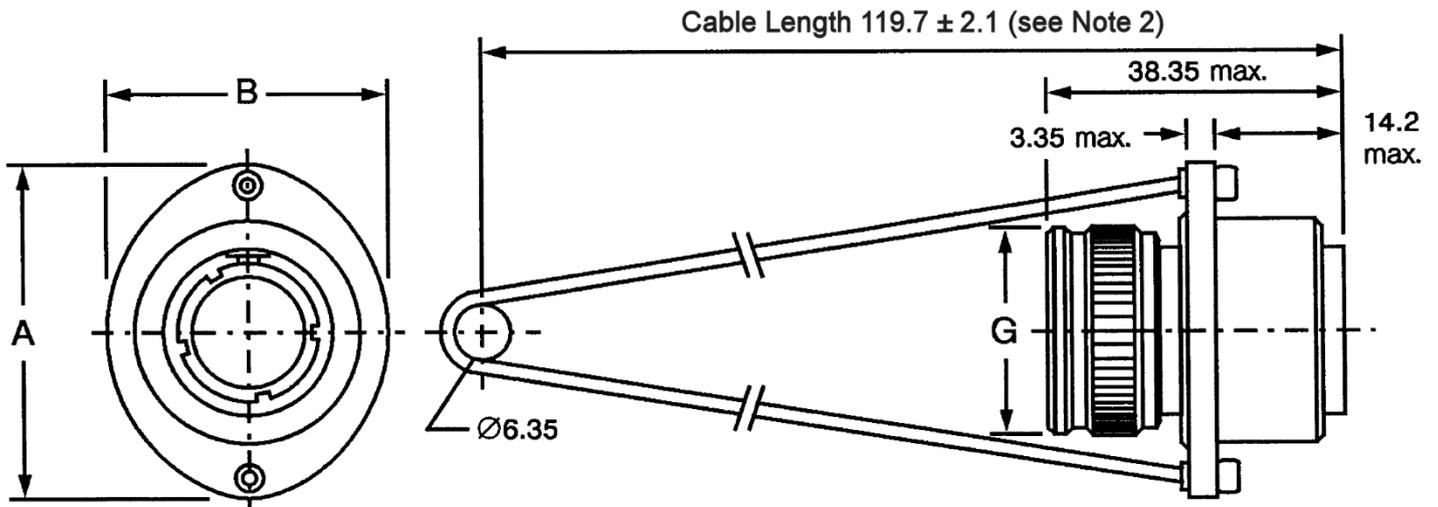


Shell Size	Dimensions (mm)	
	A Max	G Max
3	20.4	17
7	23.7	21.8
12	26.9	25
19	31.5	28.25
27	36.1	30.95
37	39.3	34.15
61	47.3	42

NOTES:

- Figure shown including the default rear nut type [340106401B](#) to [340106407B](#) (Variant depending on shell size) in accordance with ESCC Detail Specification No. [3401/064](#) (see Para. 4.4.7.1).

SHELL TYPE 78 – PLUG WITH LANYARD

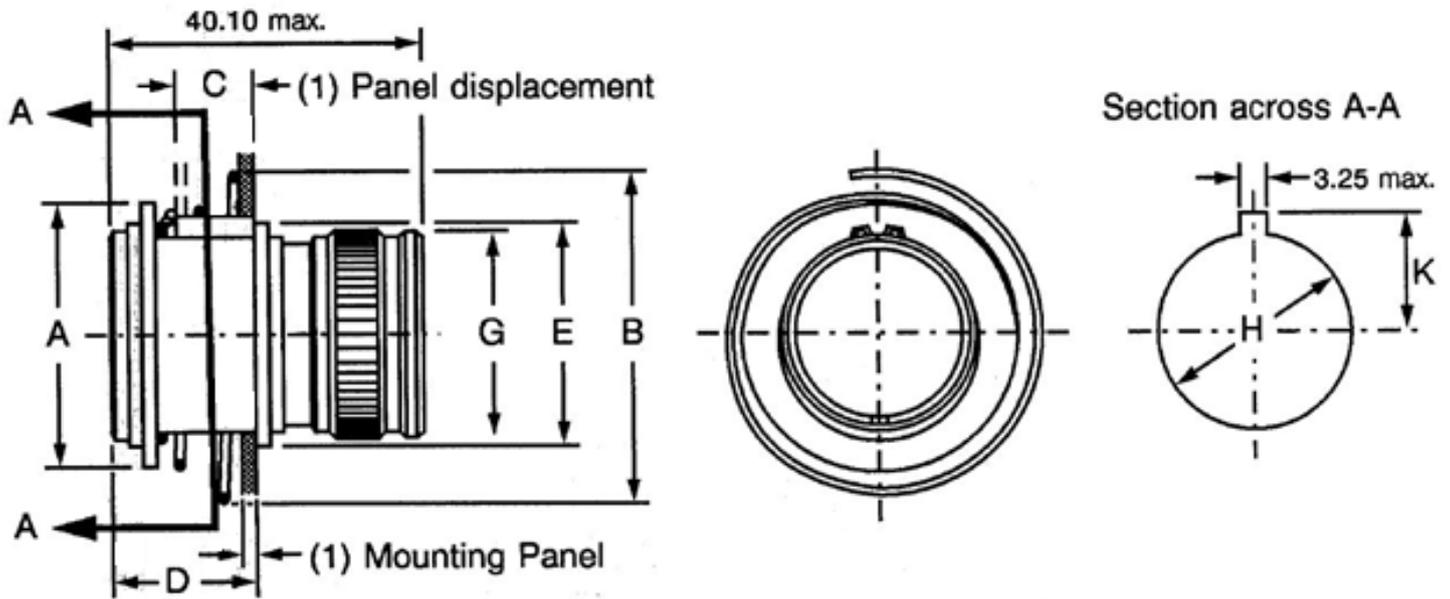


Shell Size	Dimensions (mm)		
	A Max	B Max	G Max
3	31.85	23.3	17
7	35.65	26.8	21.8
12	38.7	29.6	25
19	42.5	33.55	28.25
27	46.2	37.2	30.95
37	48.45	40.7	34.15
61	56.6	47.85	42

NOTES:

1. Figure shown including the default rear nut type [340106401B](#) to [340106407B](#) (Variant depending on shell size) in accordance with ESCC Detail Specification No. [3401/064](#) (see Para. 4.4.7.1).
2. For alternate lanyard cable lengths, see Para. 4.5.3.2(h).

SHELL TYPE 79 – RACK AND PANEL PLUG



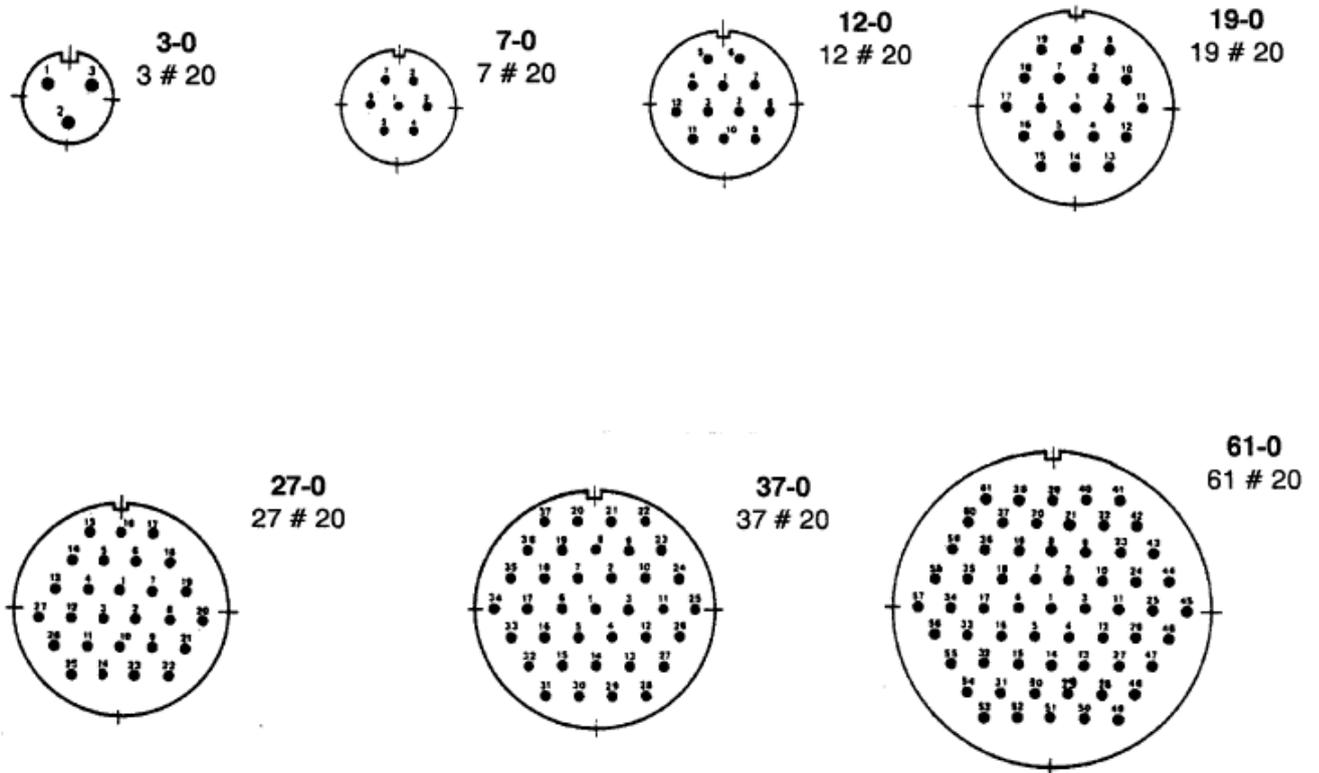
Shell Size	Dimensions (mm)									
	A Max	B Max	C (1) Max	Compression Force		D Max	E Max	G Max	H Max	K Max
				for C Max	for C Nul					
3	22.45	31	14.95 – e	1.6daN	0.3daN	21.05	19.3	17	15.55	11.05
7	29.6	34.3	14.55 – e	3.3daN	0.6daN	20.85	24.4	21.8	19.05	12.6
12	31.9	39.75	13.95 – e	5.0daN	1.2daN	20.85	27.25	25	22.20	14.2
19	35.15	43.4	13.95 – e	8.7daN	1.9daN	20.85	32	28.25	25.4	16.05
27	38.7	47.15	13.25 – e	11.8daN	2.7daN	20.6	35.75	30.95	29.15	17.8
37	45.95	53.5	12.65 – e	15.6daN	3.7daN	20.6	40.6	34.15	33.5	20
61	54.4	72	11.6 – e	26.2daN	6.1daN	20.3	50.4	42	41.5	23.95

NOTES:

1. The displacement of dimension C depends on the panel thickness (e) used.
2. Figure shown including the default rear nut type [340106401B](#) to [340106407B](#) (Variant depending on shell size) in accordance with ESCC Detail Specification No. [3401/064](#) (see Para. 4.4.7.1).

FIGURE 2(a) - STANDARD CONTACT ARRANGEMENTS - FRONT VIEW MALE INSERT

(See Para. 4.5 for definition of numbers)

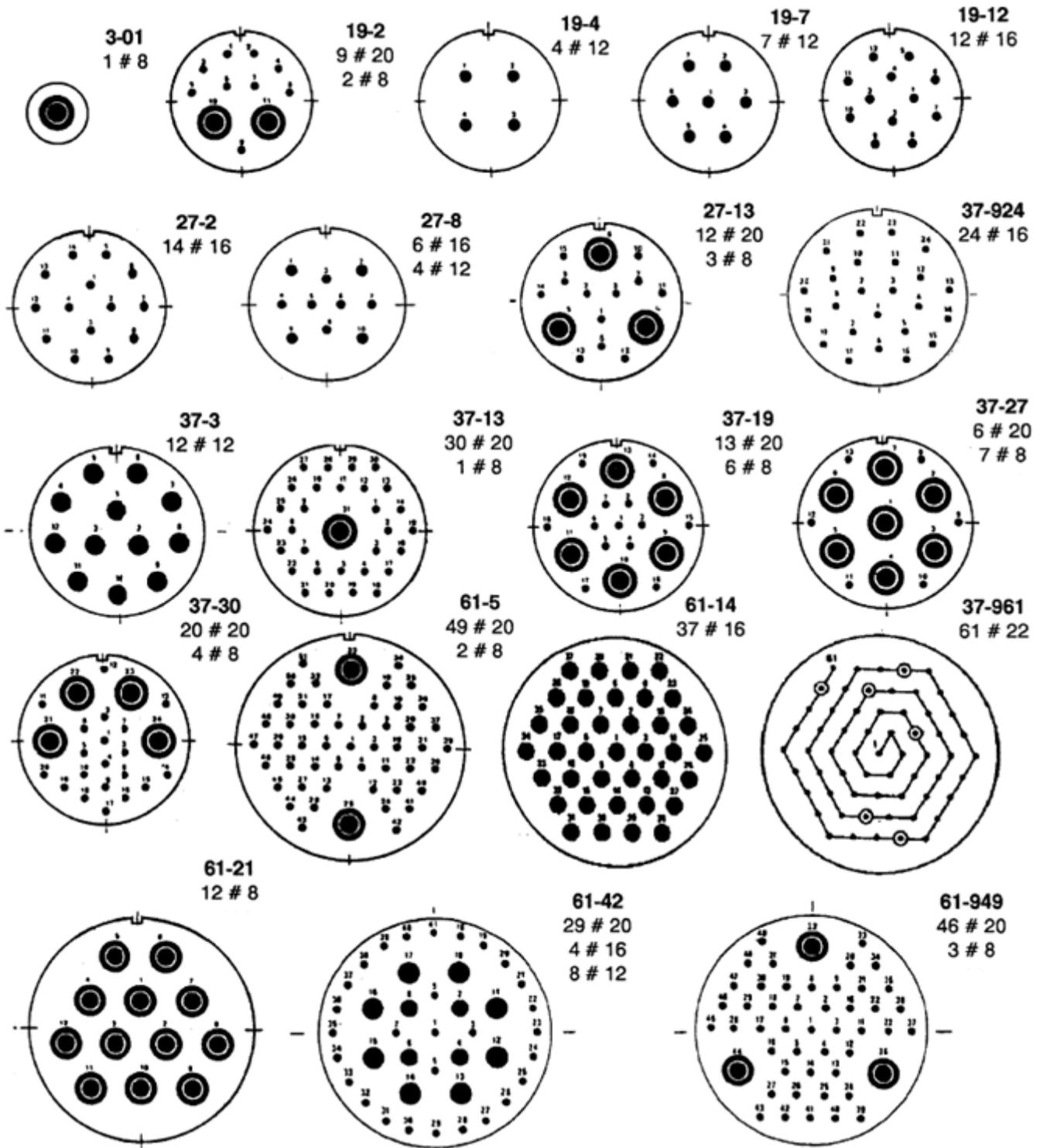


NOTES:

1. Contact locations are in conformity with SAE-AS81703 specification sheets and shall not be checked during procurement.

FIGURE 2(b) - SPECIAL CONTACT ARRANGEMENTS - FRONT VIEW MALE INSERT

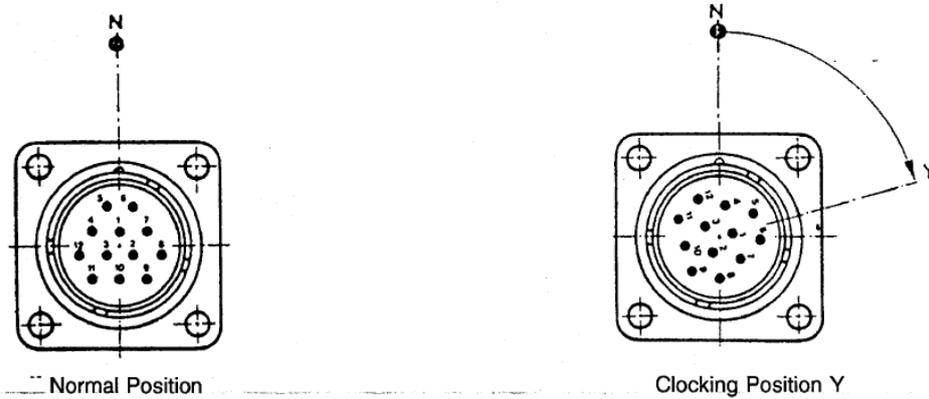
(See Para. 4.5 for definition of numbers)



NOTES:

1. Contact locations are in conformity with SAE-AS81703 specification sheets and shall not be checked during procurement.

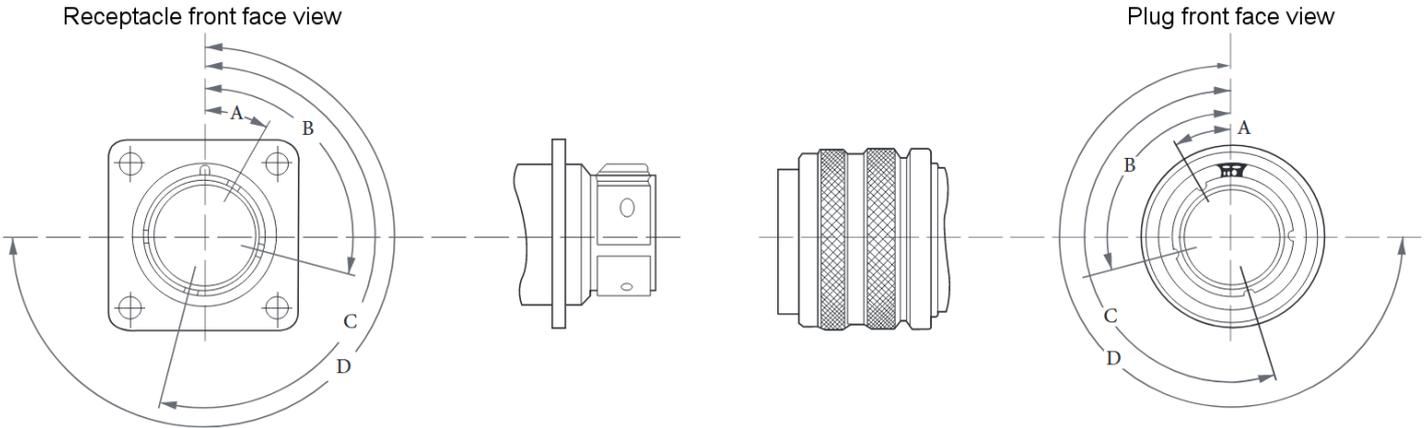
FIGURE 2(c) - INSERT CLOCKING POSITIONS



The normal position is achieved when the vertical axis of the insert (Figures 2(a) and 2(b)) is the same as the axis of the key in the shell (position N). Mating of two connectors with the same contact arrangement, standing side by side, can be made fool-proof by rotating one of the inserts within its shell. Rotation shall be clockwise for male inserts and anti-clockwise for female inserts. Determined rotations give clocking positions W, X, Y, B and C as specified below.

Contact Arrangement	Clocking Positions (°)				
	W	X	Y	B	C
3 – 0			75		
3 – 01					
7 – 0				150	
12 – 0	15	50	75	150	225
19 – 0			75	150	225
19 – 2	25	50	75	150	225
19 – 4			22.30	135	247.30
19 – 7			75	150	225
19 – 12	25	50	75	150	225
27 – 0	25	50	75	150	225
27 – 2	25	50		150	
27 – 8	25	50	75	150	225
27 – 13	25	50	75	150	225
37 – 0	25		75	150	225
37 – 924	105	13			
37 – 3	20	70			
37 – 13			75	150	225
37 – 19			75	150	225
37 – 27			75	150	225
37 – 30	25	50	75	150	225
37 – 961					
61 – 0	25		75	150	225
61 – 5	25	50	75	150	225
61 – 14					
61 – 21	25	50	75	150	225
61 – 42		67.30			
61 – 949	25	50	75	150	225

FIGURE 2(d) – KEY ORIENTATION



Key Orientation Code	Key Orientation Angle (°)															
	Shell size: 3				Shell size: 7				Shell size: 12				Shell size: 19			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
- (Standard)	23	97	187	-	23	97	187	277	30	105	195	270	30	105	195	270
DA	-	-	-	-	23	105	195	300	30	90	225	315	40	105	195	270
DB	-	-	-	-	23	115	210	285	30	120	210	285	30	115	195	270
DC	-	-	-	-	30	120	195	285	30	135	180	300	30	115	210	270
DD	-	-	-	-	30	97	210	270	45	105	210	315	30	115	195	280
DE	-	-	-	-	-	-	-	-	45	90	180	285	-	-	-	-
DF	-	-	-	-	-	-	-	-	45	120	270	300	-	-	-	-
DG	-	-	-	-	-	-	-	-	45	135	195	225	-	-	-	-

Key Orientation Code	Key Orientation Angle (°)											
	Shell size: 27				Shell size: 37				Shell size: 61			
	A	B	C	D	A	B	C	D	A	B	C	D
- (Standard)	30	105	195	270	30	105	195	270	30	105	195	270
DA	40	105	195	270	40	105	195	270	40	105	195	270
DB	30	115	195	270	30	115	195	270	30	115	195	270
DC	30	115	210	270	30	115	210	270	30	115	210	270
DD	30	115	195	280	30	115	195	280	30	115	195	280
DE	-	-	-	-	30	90	170	270	30	90	170	270
DF	-	-	-	-	30	115	170	255	30	115	170	255
DG	-	-	-	-	30	115	180	300	30	115	180	300

4 REQUIREMENTS

4.1 GENERAL

The complete requirements for procurement of the connectors specified herein shall be as stated in this specification and ESCC Generic Specification No. 3401. Deviations from the Generic Specification, applicable to this specification only, are listed in Para. 4.2.

Deviations from the applicable Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESCC requirements and do not affect the components' reliability, are listed in the appendices attached to this specification.

4.2 DEVIATIONS FROM GENERIC SPECIFICATION

4.2.1 Deviations from Special In-process Controls

None.

4.2.2 Deviations from Final Production Tests (Chart II)

(a) Para. 9.5, Magnetism Level: Not applicable.

(b) For plugs with lanyard (Shell Type 78): Before External Visual Inspection, the lanyard shall be submitted to a distortion resistance test.

A pull force of 93daN minimum shall be applied to the lanyard by means of a mandrel of 6.35mm diameter for 5 seconds. The force shall then be released, and the terminals shall be checked for distortion. Distortion shall not exceed 0.025mm in the direction of the application of the force.

4.2.3 Deviations from Burn-in and Electrical Measurements (Chart III)

Not applicable.

4.2.4 Deviations from Qualification Tests (Chart IV)

(a) Para. 9.9, Seal Test: Not applicable.

(b) Para. 9.11, Vibration: 20g, 10 - 2000Hz.

(c) Para. 9.12, Shock: 100g, 11ms, half-sine wave.

(d) Para. 9.18, Endurance: The number of cycles for plug with grounding fingers shall be 250 only.

(e) Para. 9.24, Jackscrew Retention: Not applicable.

(f) For plugs with lanyard (Shell Type 78): At the end of Subgroup III, the lanyard shall be submitted to a tensile strength test. Prior to application of the load, the lanyard shall be marked at the point where it enters the swaging end of the terminal.

A force of 155daN minimum shall be applied to the lanyard by means of a mandrel of 6.35mm diameter for 5 seconds. Breaking of the cable before reaching the specified load, any slippage of the cable in the fitting, or any sign of failure in the terminal shall constitute failure.

4.2.5 Deviations from Lot Acceptance Tests (Chart V)

For (a) to (e), see Para. 4.2.4 above.

(f) The tensile strength test of the lanyard shall be performed as defined in Para. 4.2.4(f) on samples from the Environmental Subgroup.

4.3 MECHANICAL REQUIREMENTS

4.3.1 Dimension Check

The dimensions of the connectors specified herein shall be verified in accordance with the requirements set out in Para. 9.6 of ESCC Generic Specification No. 3401 and shall conform to those shown in Figure 2 of this specification.

4.3.2 Weight

The maximum weight of the connectors specified herein, without contacts, rear nut or lanyard, is specified in Table 1(a).

The maximum weight of the default rear nut (see Para. 4.4.7.1) is specified in ESCC Detail Specification No. 3401/064 for type 340106401B to 340106407B (Variant depending on shell size).

The maximum weight of the lanyard for shell type 78 is specified in Para. 4.5.3.2(h).

4.3.3 Contact Capability

As specified in ESCC Detail Specification No. 3401/009 for contact size 08, 12, 16 and 20, and in ESCC Detail Specification No. 3401/012 for contact size 22.

4.3.4 Contact Retention (In Insert)

As specified in ESCC Detail Specification No. 3401/009 for contact size 08, 12, 16 and 20, and in ESCC Detail Specification No. 3401/012 for contact size 22.

4.3.5 Mating and Unmating Forces

The forces applied for mating and unmating of the connectors shall conform to the values specified in Table 1(a). For plugs with lanyard, the unmating force shall be measured 3 times under the following conditions:

- (a) Pull in the axial direction.
- (b) Pull $10 \pm 3^\circ$ left or right of the axial plane.
- (c) Pull $10 \pm 3^\circ$ above or below the axial plane.

4.3.6 Insert Retention (In Shell)

Connector inserts shall withstand a pressure of 5.27 kg/cm² without being dislodged from the shell.

4.3.7 Jackscrew Retention

Not applicable.

4.3.8 Contact Insertion and Withdrawal Forces

As specified in ESCC Detail Specification No. 3401/009 for contact size 08, 12, 16 and 20, and in ESCC Detail Specification No. 3401/012 for contact size 22.

4.3.9 Engagement and Separation Forces

As specified in ESCC Detail Specification No. 3401/009 for contact size 08, 12, 16 and 20, and in ESCC Detail Specification No. 3401/012 for contact size 22.

4.3.10 Oversize Pin Exclusion

As specified in ESCC Detail Specification No. 3401/009 for contact size 08, 12, 16 and 20, and in ESCC Detail Specification No. 3401/012 for contact size 22.

4.3.11 Probe Damage

As specified in ESCC Detail Specification No. 3401/009 for contact size 08, 12, 16 and 20, and in ESCC Detail Specification No. 3401/012 for contact size 22.

4.3.12 Solderability

As specified in ESCC Detail Specification No. [3401/009](#) for contact size 08, 12, 16 and 20, and in ESCC Detail Specification No. [3401/012](#) for contact size 22.

4.4 MATERIALS AND FINISHES

The materials and finishes shall be as specified herein. Where a definite material is not specified, a material which will enable the connectors specified herein to meet the performance requirements of this specification shall be used. Acceptance or approval of any constituent material does not guarantee acceptance of the finished product.

4.4.1 Shells, Coupling Ring

Aluminium, nickel-plated.

Where residual magnetism is of importance, a black anodise treatment can be ordered (see Modification code 031 in Para. 4.5.3.2(h)).

4.4.2 Inserts

Bonded sandwich: Silicone/Phenolic/Silicone.

4.4.3 Contact Retaining Clip

The retaining clip shall be made of beryllium copper.

4.4.4 Contacts

As specified in ESCC Detail Specification No. [3401/009](#) for contact size 08, 12, 16 and 20, and in ESCC Detail Specification No. [3401/012](#) for contact size 22.

NOTE: Contacts for these connectors shall always be ordered and delivered separately from the connectors (see Modification code 090 in Para. 4.5.3.2(h)).

4.4.5 Lanyard

- Cable: stainless steel
- Cable ends (balls): stainless steel
- Cable protective tube: PTFE

4.4.6 Guiding and Locking Devices

Not applicable.

4.4.7 Accessories

4.4.7.1 Rear Nut

The default rear nut shall be as specified for type [340106401B](#) to [340106407B](#) (Variant depending on shell size) in ESCC Detail Specification No. [3401/064](#).

NOTE: This rear nut shall always be included as part of the connector except when specifically excluded by use of the appropriate modification code (i.e. 1A, E5624 or L5624; see Para. 4.5.3.2(h)).

Where residual magnetism is of importance, a black anodise treatment can be ordered (see Modification code 031 in Para. 4.5.3.2(h)).

4.4.7.2 *Other Accessories*

As specified in ESCC Detail Specification No. [3401/064](#).

NOTE: No accessories from ESCC Detail Specification No. [3401/064](#) other than the default rear nut (see Para. 4.4.7.1) can be ordered or shall be delivered together with the connector. Other accessories shall be ordered separately.

4.4.8 Magnetism Level

Not applicable.

4.5 MARKING

4.5.1 General

The marking of all components delivered to this specification shall be in accordance with the requirements of ESCC Basic Specification No. [21700](#) and the following paragraphs. When the component is too small to accommodate all of the marking as specified, as much as space permits shall be marked and the marking information, in full, shall accompany the component in its primary package.

The information to be marked and the order of precedence, shall be as follows:

- (a) Contact Identification.
- (b) The ESCC qualified components symbol (for ESCC qualified components only).
- (c) The ESCC Component Number.
- (d) Traceability Information.

4.5.2 Contact Identification

Contact identification shall be marked in accordance with Figures 2(a) and 2(b).

4.5.3 The ESCC Component Number

The ESCC Component Number shall be constituted as follows:

Example: 340100801BDBAS76G19-2PN1DA090-031

- Detail Specification Reference: 3008008
- Component Type Variant (see Note 1): 01
- Testing level: B
- Characteristic code: Connector Series: DBAS
- Characteristic code: Shell Type: 76 (as required)
- Characteristic code: Grounding: G (if required)
- Characteristic code: Shell Size: 19 (as required)
- Characteristic code: Contact Arrangement: -2 (as required)
- Characteristic code: Contact Type: P (as required)
- Characteristic code: Insert Clocking Position: N (as required)
- Characteristic code: Key Orientation: DA (if and as required)
- Characteristic code: Modifications: 090-031 (as required) (see Note 2)

NOTES:

1. Marking of the Component Type Variant is mandatory. No further reference to Component Type Variant is made in this specification.
2. Modification code 090 (i.e. Delivered Without Contacts) shall not be included in the marking marked on the connector itself, but shall only be used for ordering purposes and within documentation (see Para. 4.5.3.2(h)).

4.5.3.1 Characteristics Codes

Characteristics to be codified as part of the ESCC Component Number shall be as follows:

- (a) Connector Series
This connector series shall be designated by the code letters: DBAS.
- (b) Shell Type
The shell types shall be designated by the following codes:

Shell Type	Code
Square flange receptacle	70
Cable connecting receptacle	71
Single hole mounting receptacle	74
Plug	76
Plug with lanyard	78
Rack and panel plug	79

- (c) Grounding
Grounding shall be indicated by the code letter G. When grounding is not required, the code letter G shall be omitted.
Grounding is not applicable to receptacles, nor to components with black anodise treatment modification (see Modification code 031 in Para. (h)).

- (d) Shell Sizes and Contact Arrangements
Shell sizes and contact arrangements are closely related to each other and shall be indicated by the following codes:

Code (Shell size-Contact Arrangement)	Number of Contacts
3-0	Numbers of contacts and contact sizes are as shown in Figures 2(a) and 2(b)
3-01	
7-0	
12-0	
19-0	
19-2	
19-4	
19-7	
19-12	
27-0	
27-2	
27-8	
27-13	
37-0	
37-3	
37-13	
37-19	
37-27	
37-30	
37-924	
37-961	
61-0	
61-5	
61-14	
61-21	
61-42	
61-949	

(e) Contact Type

The contact types shall be indicated by the following code letters:

Contact Type	Code Letter
Male	P
Female	S

(f) Insert Clocking Position

Insert clocking positions are as shown in Figure 2(c) and shall be designated by the code letters: N, W, X, Y, B and C.

(g) Key Orientation

Key Orientation angles are as shown in Figure 2(d) and shall be designated by the letter codes: DA, DB, DC, DD, DE, DF and DG. For the specified standard key orientation, no code applies; no code shall appear.

(h) Modifications

Modifications, when required, shall be indicated by the following codes which shall be marked in the following order of precedence, each separated by a dash:

Modification Code	Modification Description	Remarks
090	Delivered Without Contacts	Note 1
031	Black Anodise Treatment	
1A	Delivered Without Rear Nut	Note 2
A614	Cable Length: 134.3 ±2.1mm	Lanyard Weight: 4g max.
B614	Cable Length: 164.3 ±2.1mm	Lanyard Weight: 5g max.
B864	Cable Length: 188 ±2.1mm	Lanyard Weight: 5g max.
C614	Cable Length: 194.3 ±2.1mm	Lanyard Weight: 6g max.
D614	Cable Length: 204.7 ±2.1mm	Lanyard Weight: 6g max.
E614	Cable Length: 217 ±2.1mm	Lanyard Weight: 6g max.
F614	Cable Length: 230 ±2.1mm	Lanyard Weight: 6g max.
G614	Cable Length: 144.4 ±2.1mm	Lanyard Weight: 4g max.
H614	Cable Length: 94.4 ±2.1mm	Lanyard Weight: 3g max.
K614	Cable Length: 124.8 ±2.1mm	Lanyard Weight: 4g max.
L614	Cable Length: 244.4 ±2.1mm	Lanyard Weight: 7g max.
M614	Cable Length: 494.4 ±2.1mm	Lanyard Weight: 13g max.
N614	Cable Length: 98.7 ±2.1mm	Lanyard Weight: 4g max.
P614	Cable Length: 294.4 ±2.1mm	Lanyard Weight: 8g max.
Q614	Cable Length: 190.4 ±2.1mm	Lanyard Weight: 6g max.
R614	Cable Length: 109 ±2.1mm	Lanyard Weight: 4g max.
S614	Cable Length: 153.6 ±2.1mm	Lanyard Weight: 5g max.
T614	Cable Length: 75.4 ±2.1mm	Lanyard Weight: 3g max.
U614	Cable Length: 118.82 ±2.1mm	Lanyard Weight: 4g max.
V614	Cable Length: 87.1 ±2.1mm	Lanyard Weight: 3g max.
W614	Cable Length: 384.9 ±2.1mm	Lanyard Weight: 10g max.
X614	Cable Length: 171 ±2.1mm	Lanyard Weight: 5g max.
Y614	Cable Length: 238 ±2.1mm	Lanyard Weight: 7g max.
E5624	Cable Length: 217 ±2.1mm (same as Code E614) plus Delivered Without Rear Nut (see Note 2)	Lanyard Weight: 6g max.
L5624	Cable Length: 244.4 ±2.1mm (same as Code L614) plus Delivered Without Rear Nut (see Note 2)	Lanyard Weight: 7g max.

Alternate Lanyard Cable Lengths for Shell Type 78; see Figure 2
Lanyard Weight for Standard Length: 4g max.

NOTES:

1. Contacts for these connectors shall always be ordered and delivered separately from the connectors. Accordingly, this modification code (090) shall always apply. However, this modification code shall not be included in the marking marked on the connector itself, but shall only be used for ordering purposes and within documentation.
2. When this modification code (i.e. 1A, E5624 or L5624) is not included in the ESCC Component Number, the connectors shall be delivered including a default rear nut type [340106401B](#) to [340106407B](#) (Variant depending on shell size) in accordance with ESCC Detail Specification No. [3401/064](#).

4.5.4 Traceability Information

Each component shall be marked in respect of traceability information in accordance with the requirements of ESCC Basic Specification No. [21700](#).

4.6 ELECTRICAL MEASUREMENTS

4.6.1 Electrical Measurements at Room Temperature

The parameters to be measured in respect of electrical characteristics are scheduled in Table 2. Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3^{\circ}C$.

4.6.2 Electrical Measurements at High and Low Temperatures (Table 3)

Not applicable.

4.6.3 Circuits for Electrical Measurements (Figure 4)

Not applicable.

4.7 BURN-IN AND ELECTRICAL MEASUREMENTS (TABLES 4 AND 5)

Not applicable.

TABLE 2 – ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE

No.	Characteristics	Symbol	Spec. And Test Method	Test Conditions	Limits		Unit
					Min	Max	
1	Insulation Resistance	Ri	ESCC No. 3401 Para. 9.1.1.1	Para. 9.1.1.1	10000	-	MΩ
2	Voltage Proof Leakage Current	I_L	ESCC No. 3401 Para. 9.1.1.2	1500V	-	2	mA
3	Mated Shell Conductivity (Voltage Drop) (1)	Vd	ESCC No. 3401 Para. 9.1.1.4	Para. 9.1.1.4	-	5	mV

NOTES:

1. Applicable only to mated connectors with grounding option.

TABLES 3, 4 AND 5

Not applicable

- 4.8 ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESCC GENERIC SPECIFICATION NO. 3401)
- 4.8.1 Measurements and Inspections on Completion of Environmental Tests
The parameters to be measured and inspections to be performed on completion of environmental testing shall be those specified in Table 6. Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3^{\circ}\text{C}$.
- 4.8.2 Measurements and Inspections at Intermediate Points during Endurance Tests
Not applicable.
- 4.8.3 Measurements and Inspections on Completion of Endurance Tests
The parameters to be measured and inspections to be performed on completion of endurance tests shall be those specified in Table 6. Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3^{\circ}\text{C}$.
- 4.8.4 Conditions for Operating Life Tests (Part of Endurance Testing)
Not applicable.
- 4.8.5 Electrical Circuit for Operating Life Tests (Figure 5)
Not applicable.
- 4.8.6 Conditions for High Temperature Storage Test (Part of Endurance Testing)
The requirements for the high temperature storage test are specified in Section 9 of ESCC Generic Specification No. 3401. The conditions for high temperature storage testing shall be the maximum storage temperature specified in Table 1(b) of this specification.

TABLE 6 – MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL AND ENDURANCE TESTING

No.	ESCC Generic Spec. No. 3401		Measurements and Inspections		Symbol	Limits		Unit
	Environmental and Endurance Tests (1)	Test Method and Conditions	Identification	Conditions		Min	Max	
01	Seal Test	Para. 9.9	ESCC 3401 Para. 9.9	-	-	Not applicable		
02	Wiring	Para. 9.10	ESCC 3401/009 & /012	-	-	-	-	
03	Vibration	Para. 9.11 & Para. 4.2.4(b) of this spec.	Initial Measurements Coupling Screw(s) Unlocking Torque	-	-	Not applicable		
			Final Measurements Coupling Screw(s) Unlocking Torque Drift Visual Examination	Full Engagement -	Δ -	Not applicable -		
04	Shock	Para. 9.12 & Para. 4.2.4(c) of this spec.	Final Measurements Visual Examination	Full Engagement -	-	-	-	
05	Climatic Sequence	Para. 9.13	Dry Heat Insulation Resistance	Table 2 Item 1	Ri	1000	-	MΩ
			Low Air Pressure Voltage Proof Leakage Current	Figure 1	I _L	Table 2 Item 2		
			Damp Heat Insulation Resistance	Immediately after test Table 2 Item 1	Ri	100	-	MΩ
			Final Measurements External Visual Inspection	After 1 - 24 hrs Recovery ESCC 3401 Para. 9.7	-	ESCC 3401 Para. 9.7		
			Insulation Resistance Voltage Proof Leakage Current	Table 2 Item 1 Table 2 Item 2	Ri I _L	Table 2 Item 1 Table 2 Item 2		
06	Plating Thickness	Para. 9.14	Thickness	-	-	ESCC 3401/009 & /012		
07	Joint Strength	Para. 9.15	ESCC 3401 Para 9.15	-	-	ESCC 3401 Para. 9.15		
08	Rapid Change of Temperature	Para. 9.16	Final Measurements Visual Examination	-	-	-	-	
			Insulation Resistance	Table 2 Item 1	Ri	Table 2 Item 1		
			Voltage Proof Leakage Current	Table 2 Item 2	I _L	Table 2 Item 2		
09	Contact Retention (In Insert)	Para. 9.17 & Para. 4.3.4 of this spec.	Contact Displacement	-	-	ESCC 3401 Para. 9.17		

No.	ESCC Generic Spec. No. 3401		Measurements and Inspections		Symbol	Limits		Unit
	Environmental and Endurance Tests (1)	Test Method and Conditions	Identification	Conditions		Min	Max	
10	Endurance	Para. 9.18	Initial Measurements Mating/Unmating Forces Low Level Contact Resistance Mated Shell Conductivity Final Measurements Visual Examination Mating/Unmating Forces Low Level Contact Resistance Drift Mated Shell Conductivity Insulation Resistance Voltage Proof Leakage Current	- ESCC 3401/009 & /012 Table 2 Item 3 - - ESCC 3401/009 & /012 Table 2 Item 3 Table 2 Item 1 Table 2 Item 2	F Rcl Vd - F ΔRcl Vd Ri I _L	Para. 4.3.5 of this spec. Record Values Table 2 Item 3 - - Para. 4.3.5 of this spec. ESCC 3401/009 & /012 Table 2 Item 3 Table 2 Item 1 Table 2 Item 2		
11	Permanence of Marking	Para. 9.19	As applicable	-	-	-	-	
12	Mating/Unmating Forces	Para. 9.20	Force	-	F	Para. 4.3.5 of this spec.		
13	High Temperature Storage	Para. 9.21	Initial Measurements Low Level Contact Resistance Mated Shell Conductivity Final Measurements Visual Examination Mating/Unmating Forces Low Level Contact Resistance Drift Rated Current Contact Resistance Mated Shell Conductivity Insulation Resistance Voltage Proof Leakage Current Contact Retention (In Insert)	ESCC 3401/009 & /012 Table 2 Item 3 - - ESCC 3401/009 & /012 ESCC 3401/009 & /012 Table 2 Item 3 Table 2 Item 1 Table 2 Item 2 Para. 4.3.4 of this spec.	Rcl Vd - F ΔRcl Rcr Vd Ri I _L	Record Values Table 2 Item 3 - Para. 4.3.5 of this spec. ESCC 3401/009 & /012 ESCC 3401/009 & /012 Table 2 Item 3 Table 2 Item 1 Table 2 Item 2 ESCC 3401 Para. 9.17		
14	Corrosion	Para. 9.22	Visual Examination	-	-	-	-	
15	Insert Retention (In Shell)	Para. 9.23 & Para. 4.3.6 of this spec.	Visual Examination	-	-	Para. 4.3.6		
16	Jackscrew Retention	Para. 9.24 & Para. 4.3.7 of this spec.	Visual Examination	-	-	Not applicable		
17	High Temperature Measurements	Para. 9.25	Insulation Resistance	Table 2 Item 1	Ri	500	-	MΩ
18	Overload Test	Para. 9.26	Internal Temperature Rated Current Contact Resistance Mated Shell Conductivity Insulation Resistance Voltage Proof Leakage Current	- ESCC 3401/009 & /012 Table 2 Item 3 Table 2 Item 1 Table 2 Item 2	T Rcr Vd Ri I _L	- +100 ESCC 3401/009 & /012 Table 2 Item 3 Table 2 Item 1 Table 2 Item 2	°C	

No.	ESCC Generic Spec. No. 3401		Measurements and Inspections		Symbol	Limits		Unit
	Environmental and Endurance Tests (1)	Test Method and Conditions	Identification	Conditions		Min	Max	
19	Maintenance Ageing	Para. 9.27	Visual Examination Contact Retention (In Insert) Contact Insertion & Withdrawal Forces	- Para. 4.3.4 of this spec. Para. 4.3.8 of this spec.	- - -	- ESCC 3401 Para. 9.17 Para. 4.3.8	-	
20	Engage/Separation Forces	Para. 9.28 & Para. 4.3.9 of this spec.	Force	-	-	Para. 4.3.9		
21	Oversize Pin Exclusion	Para. 9.29 & Para. 4.3.10 of this spec.	-	-	-	ESCC 3401 Para. 9.29		
22	Probe Damage	Para. 9.30 & Para. 4.3.11 of this spec.	Contact Separation Force	Para. 4.3.11 of this spec.	-	Para. 4.3.11		
23	Solderability	Para. 9.31 & Para. 4.3.12 of this spec.	-	-	-	Para. 4.3.12		
24	Tensile Strength (Lanyard)	Para. 4.2.4(f) of this spec.	Visual Examination	Para. 4.2.4(f)	-	Para. 4.2.4(f)		

NOTES:

1. The tests in this Table refer to either Chart IV or V and shall be used as applicable.