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INTEGRATED G-SUIT / IMMERSION SUIT

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ABSTRACT

Canadian Forces (CF) aircrew flying CF18 and CF5 aircraft are required to wear anti-G suits to provide protection against the effects of high G forces experienced during air combat manoeuvres (ACM). They are also required to wear immersion suits with the G suits on domestic coastal operations to provide protection against hypothermia in the event of an emergency involving ejection and water landing. The standard CF anti-G suit was worn over the immersion suit, which being bulky, created discomfort and contributed to reduced G protection since this combination does not permit proper G suit fit on the wearer. National Defence Headquarters (NDHQ) tasked the Medical Life Support Division (MLSD) of this Institute (DCIEM) to develop a Canadian anti-G suit incorporating fixtures which would allow the anti-G suit to be worn under the immersion suit. MLSD identified suitable hardware to effect this interface and modified a standard anti-G suit and a CF constant wear immersion suit. In conjunction with MLSD support, a Canadian Aerospace Company manufactured two prototype anti-G suits which were successfully integrated with the immersion suit. Subsequent to favourable comments from initial flight trials, NDHQ directed MLSD to procure 20 modified anti-G suits for user trial by designated CF18 and CF5 aircraft squadrons. As a consequence of user trial acceptance, NDHQ has ordered sufficient quantities of the modified anti-G suit and associated immersion suit interface hardware to meet a foreseeable operational requirement.



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INTRODUCTION

For the past ten years MLSD has maintained a technology watch on anti-G suit developments. When it became necessary in 1980 for the CF to replace the, then current CSU-3/P anti-G suit, which had gone out of production, the United States Navy (USN) CSU-15/P garment was recommended as the next generation CF anti-G suit (1) (2). This suit embraced a fabric inflation hose whereas the CSU-3/P garment was equipped with a round rubber inflation hose.

When CF operational requirements for fighter aircraft dictated anti-G/immersion protection, the CSU-3/P anti-G suit could be worn under the immersion suit, with the G suit inflation hose exiting through an angular sealing sleeve, permanently affixed on the immersion suit.

The CSU-15/P anti-G suit specification (3) changed the inflation hose configuration and the round rubber hose was phased out. The fabric hose could not be passed through the immersion suit in the previous manner to maintain water tight integrity. The CSU-15/P garment had to be worn over the bulky immersion suit, creating discomfort for the wearer, preventing a proper G suit fit which degraded anti-G protection performance.

MLSD conducted a search for hardware previously used by the USN to permit a "pass through" capability between inner and outer protective garmentry (4). The hardware was no longer available through naval aviation supply listings. A Canadian Aerospace Company, however, was able to provide Military Specification (MS) drawings from their files. These were studied and in some instances, modified to provide increased performance and ease of maintenance. Prototype hardware was manufactured and installed on mock up patches of a G suit and an immersion suit.

NDHQ Directorate of Aerospace Support Engineering (DAS Eng) tasked MLSD to set up a development program with this Aerospace Company to modify a CSU-15/P anti-G suit to incorporate the MLSD proposed hardware to enable interface between the anti-G garment and immersion suit (5). Two modified CSU-15/P anti-G suits were ordered (6) and ultimately received in February 1984.

In July 1984, NDHQ Directorate of Air Requirements (DAR) recommended that applicable aircrew wear anti-G suits over the immersion suits for a six month trial period to determine user acceptance (7). A MLSD CSU-15/P (modified) garment interfaced with a CF constant wear immersion suit was submitted to CFB Cold Lake for comparison during a user trial tasked by Fighter Group Headquarters (FGHQ) North Bay. Findings of the six month trial period by 409 Squadron indicated pilot preference for the MLSD proposed interface configuration (8). Findings of the trial by 434 Squadron indicated wearer discomfort, immersion suit bulk and the resultant poor fit of anti-G suits contributing to decreased G suit effectiveness. The unit however, supported wearing the anti-G suit over the immersion suit as an interim solution (9) (10).

In April 1985, FGHQ recommended purchase of 150 of the MLSD CSU-15/P (modified) anti-G suits with associated interface hardware (11). Air Command Headquarters (Aircom) Winnipeg concurred with this recommendation (12) (13) (14). In December 1985, DAR requested MLSD to purchase 20 of these modified anti-G suits and associated hardware for a user trial to confirm that the garment was suitable and reliable (15), advising Aircom that the remainder of the required anti-G suits were proposed for procurement using 1987/88 funds. Just over a year later, the 20 suits were received, a user trial directive was issued (16) and the G suits shipped to CF18 and CF5 Squadrons specified in the user trial and tasking directives (17) (18).

The user trial indicated good acceptance of the CSU-15/P (modified) anti-G suit/immersion suit interface. In October 1988, DAR advised Aircom and FGHQ that action had been taken to procure sufficient quantities of the CSU-15/P (modified) anti-G suits to allow this garment to become the common Canadian Forces anti-G suit.

OBJECTIVES

The objectives of the MLSD research and development were:

To pursue an alternative to the angular sealing sleeve method to allow a G suit hose to penetrate the immersion suit.

To research hardware which could enable interface of a G suit and an immersion suit.

To incorporate any necessary modifications to the standard anti-G suit and immersion suit which would provide a satisfactory interface.

To conduct tests to confirm the interface concept.

METHODS

Anti-G cut-away garment CSU-15/P and CSU-15/P (modified) Mil-A-81905D (AS) Type II.

Function

The pneumatic type anti-G cut-away garments CSU-15/P and CSU-15/P (modified) are designed to provide protection for the aircrew against the effects of high G forces experienced in high performance aircraft which include visual dimming, blackout, unconsciousness and fatigue. The CSU-15/P is worn over the standard aircrew coverall; the modified version is worn under the CF Constant Wear Immersion Suit. These anti-G garments are available in seven sizes (refer to Table 1).

The bladders of the CSU-15/P cut-away garments are inflated automatically by means of a metering anti-G valve during manoeuvres involving positive centrifugal forces for a total of two or more times normal gravitational acceleration (G). The inflation pressure increases linearly with acceleration level up to a maximum of 11 psig.

The resulting pressurization of the abdominal and leg regions ensures an adequate blood supply to vital parts of the body (i.e. the head) by counteracting the pooling of blood in the legs due to the inertial forces, thus preserving circulation and ensuring visual and mental clearness. The bladders deflate within five seconds when the level of acceleration decreases to less than two G. The garments should remain deflated during straight and level flight, as well as manoeuvres below two G.

Description - CSU-15/P Garment

The CSU-15/P garment (Figs 1 & 2) covers the areas below the waist and above the ankles, excluding the buttocks, groin and knees. It consists of a fire resistant aramid cloth outer shell, a bladder system and an inner aramid liner. The outer shell has waist and leg entrance slide fasteners, six adjustment lacing areas with lacing covers, two leg pockets with slide fastener closures, a channel under the leg pockets to accommodate CF18 lower leg restraint garters, a knife pocket, pencil pocket and clip board pocket.

The lacing adjustments are located in the waist, thigh and calf areas. A backing of elasticized aramid cloth covers the lacing adjustments which are designed to accommodate different waist, thigh and calf circumferences in each of the garment sizes. The lacing covers incorporate slide fastener closures to prevent lacing hang-ups with aircraft cockpit hardware.

The bladder system is constructed of polyurethane coated nylon cloth and covers the abdomen, thighs and calves. The bladder includes an integrated hose attached at one end to the left side sub-bladder and at the other end to a male quick disconnect conforming to Mil-C-83390 for connecting directly to the aircraft anti-G system.

Description - CF Constant Wear Immersion Suit

This suit is designed to protect the wearer against the effects of the elements after an emergency exit from an aircraft in cold climates, both on land and in the water. When the wearer is immersed, the suit will keep him dry and provide protection against exposure.

The suit is a one piece garment made from two layers of ventile fabric which are permeable to water vapour given off by the body, but are impermeable when immersed in water as the ventile fabric becomes waterproof, keeping the wearer warm and dry. It is a full cut design, shaped at the knees, seat and arms, with a waterproof

zipper around the back of the neck from right to left chest, therefore providing maximum comfort whilst seated in an aircraft. Temperature on the inside of the suit is maintained by the evaporation of perspiration, making the suit marginally tolerable for long periods. The suit has a rubber neck seal, wrist seals and rubber socks that are fitted to keep the suit water tight.

Two writing pad window pockets, two plain pockets and three pencil pockets are supplied with each suit, to be attached during suit fitting. Window pockets are usually placed on each thigh and the pencil pockets placed on either the upper left arm or lower legs according to the wearer's needs. To ensure protection against exposure, CF thermal underwear is worn.

Prior to the DAS Eng tasking, as an "in-house" project, MLSD identified potential hardware items which would enable interface of an anti-G suit and immersion suit. MS drawings were acquired and studied. These covered design features of five items of hardware. Of the five, four items could be utilized as per the drawings. The fifth item, anti-G air inlet port required re-design. The original part was one piece. The MLSD designed item consisted of two pieces (spacer) and (air inlet port). The spacer was designed to be secured on the inside of the bladder and sealed in position with Tuftane film. The air inlet port (on the outside of the bladder) was secured to the spacer with screws. DCIEM workshops manufactured two anti-G air inlet ports to the MLSD drawings, which could be interfaced with samples of hardware covered by four of the MS drawings.

The following hardware from the MS drawings was utilized:

Nozzle assembly	Part Number - ID 54-669
Adapter assembly	Part Number - ID 54-667
Immersion suit air inlet port	Part Number - ID 54-668
Cover plate assembly (immersion suit)	Part Number - ID 54-670

The re-designed MLSD hardware comprised of:

Anti-G air inlet port	Part Number - ID 54-665
Anti-G garment spacer (inside bladder)	Part Number - ID 54-666

The length and position of the inflation hose on the CSU-15/P anti-G suit (Fig 1) was examined with a view to good interface between the wearer, the ejection seat and G valve outlet in the aircraft cockpit. A mock up of a MLSD proposed inflation hose was assembled; meetings were held with the Canadian Aerospace Company manufacturing the CSU-15/P anti-G suit to determine techniques to incorporate the hose and associated fittings into this garment. The final configuration of the modified anti-G suit embraced a short fabric hose protruding approximately five inches with its shape enlarged sufficiently to allow fitting of the re-designed anti-G air

inlet port (Figures 3 and 5). The adapter assembly, the nozzle assembly and hose, were attached to this item maintaining the same total length as the original CSU-15/P anti-G suit hose to provide bladder inflation capability (Fig 6).

In February 1984, two modified CSU-15/P anti-G suits were completed by the Aerospace Company. One garment was retained by MLSD for test purposes. The other garment, interfaced with a CF Constant Wear Immersion Suit was forwarded to CFB Cold Lake for inclusion in flight trials by a designated CF18 Squadron (7).

CSU-15/P (Modified) Garment

The fabric and bladder materials and the general design of the CSU-15/P (modified) are the same as those of the CSU-15/P with the exception that the bladder incorporates an air inlet port which interfaces with an air inlet port on the immersion suit. This, in turn, interfaces with a nozzle assembly, a hose and the male disconnect Mil-C-83390 (Fig 7).

Annex A, prepared by MLSD details the installation of an air inlet port on the CF Constant Wear Immersion Suit and interface with the CSU-15/P (modified) garment. Interface between the CSU-15/P (modified) garment worn under the modified immersion suit is achieved by inserting the anti-G air inlet port through the immersion suit air inlet port, then connecting the nozzle assembly (with hose and quick disconnect) (Fig 2 - Annex A). The CSU-15/P (modified) garment could be worn over the standard aircrew coverall by connecting the anti-G air inlet port, the adapter assembly and nozzle assembly (with hose and quick disconnect) (Fig 3).

Attaching the cover plate assembly to the modified immersion suit (air inlet port installed) will provide water tight integrity and allow the immersion suit to be worn without the anti-G suit (Fig 3 Annex A).

Water Trials

The CSU-15/P (modified) anti-G suit integrated with a modified CF Constant Wear Immersion Suit was tested in the DCIEM static tank. No water leakage occurred around the integration hardware.

The modified CF Constant Wear Immersion Suit with the cover plate assembly attached to the immersion suit air inlet port was tested to confirm there were no leaks around this hardware.

Static Inflation Trials

A subject wearing the CSU-15/P (modified) anti-G suit over the standard flying coverall was strapped into a CF18 and CF5 ejection seat respectively. G suit inflations using the current aircraft anti-G valve did not reveal any air leaks.

Tests with subjects wearing a standard CSU-15/P anti-G suit over the standard CF Constant Wear Immersion Suit produced subject discomfort and confirmed it was not possible to obtain a proper G suit fit due to the bulkiness of the immersion suit.

Inflation tests with subjects wearing the CSU-15/P (modified) anti-G suit under a modified CF Constant Wear Immersion Suit indicated no discomfort problems and a more positive G suit inflation.

DISCUSSION

The original MS drawing for the anti-G garment air inlet port was a one piece design, secured to the bladder in such a manner that it could not be removed. If it was damaged, the bladder system became unserviceable. The MLSD drawing for a proposed air inlet port consisted of two separate parts - spacer and an air inlet port. These were designed so that, if the air inlet port was damaged, it could be replaced, thereby ensuring bladder serviceability. The fixed spacer consisted of a metal plate with a U shaped base perforated with holes. These prevented the bladder fabric from blocking the air inlet port, thereby increasing the inflation/deflation capability.

The nozzle assembly comprises of a dual locking system. A locking lever which allows it to be locked at four positions around the inside circumference of the adapter assembly and the immersion suit air inlet port. A system of grooves and flanges secure the nozzle assembly to the anti-G air inlet port and the adapter assembly in one locking action, or the nozzle assembly, the anti-G air inlet port and immersion suit air inlet port in the same manner. This enables good interface in the aircraft cockpit with the G valve outlet hose, whether it be console (CF18) or ejection seat mounted (CF5). The orientation for the anti-G garment hose CF18 is shown at (Fig 9), that for the CF5 is shown at (Fig 10).

CONCLUSIONS

The integrated G suit/immersion suit is a viable item of Life Support Equipment which will provide anti-G and immersion protection.

ACKNOWLEDGEMENTS

Appreciation is expressed to the Pilots and Safety Systems Technicians of 409, 425 and 434 Squadrons who participated in, and provided operational support, during the user trials of the integrated G suit/immersion suit.

REFERENCES

1. Letter 3614F-28 (MLSD) 4 November 1980
2. MLSD message 011630Z May 80
3. Military Specification, Anti-G Garment, Cut-away, Aramid, CSU-14/P and CSU-15/P, Mil-A 81905C (AS) 25 November 1980 (Superceded by Mil-A 81905 D (AS) 8 October 1986)
4. Letter 5103 Department of the Navy, Naval Air Development Centre, Warminster, PA - 29 June 1982
5. Letter 18475-100 (DAS Eng 4-3) 23 September 1982
6. Letter 3614H-12 (MLSD) 14 February 1983
7. DAR 3050 041140Z Jul 84
8. CFB Cold Lake BOpsO 082 251900Z Feb 85
9. FGHQ North Bay Ops 29 051340Z Mar 85
10. FGHQ North Bay A/DCOS Air 94 141345Z Feb 85
11. FGHQ North Bay DCOS Air 170 271315Z Mar 85
12. Aircom Winnipeg DCOS IPR 059 102030Z Apr 85
13. Aircom Winnipeg A/SSO REQR 125 032000Z Dec 85
14. Aircom Winnipeg A/SSO REQR 132 202115Z Dec 85
15. DAR 3103 101907Z Dec 85
16. DAR 3068 051605Z Dec 86
17. FGHQ North Bay SOEX 121900Z Dec 86
18. MLSD 031341Z Feb 87
19. Letter 18475-100 (DAR 3-2) 26 October 1988

FIGURE/TABLE CAPTIONS

Table 1 - Sizing Chart CSU-15/P and CSU-15/P (modified) anti-G garments

Figure 1 - CSU-15/P anti-G garment (front)

Figure 2 - CSU-15/P anti-G garment (back)

Figure 3 - CSU-15/P (modified) anti-G garment (front)

Figure 4 - CSU-15/P (modified) anti-G garment (back)

Figure 5 - Nomenclature CSU-15/P (modified) anti-G garment

Figure 6 - (Left) Bladder anti-G air inlet port, (centre) Adapter assembly, (right) Nozzle assembly and hose

Figure 7 - (Left) Bladder anti-G air inlet port (centre) Air inlet port for immersion suit interface, (right) Nozzle assembly and hose

Figure 8 - (Left) Adapter assembly, (right) Air inlet port for immersion suit

Figure 9 - Integrated G suit/immersion suit (CF18)

Figure 10 - Integrated G suit/immersion suit (CF5)

Table 1. Sizing Chart

Size	Height (in.)	Weight (lbs.)
Small Regular	64.0 - 68.5	129 - 156
Small Long	68.5 - 73.1	129 - 156
Medium Regular	64.7 - 70.3	157 - 184
Medium Long	70.3 - 74.5	157 - 184
Large Regular	66.8 - 71.7	185 - 212
Large Long	71.7 - 76.7	185 - 212
Large Extra Long	75.5 - 79.0	191 - 230

Figure 1. CSU-15/P Anti-G Garment (Front)

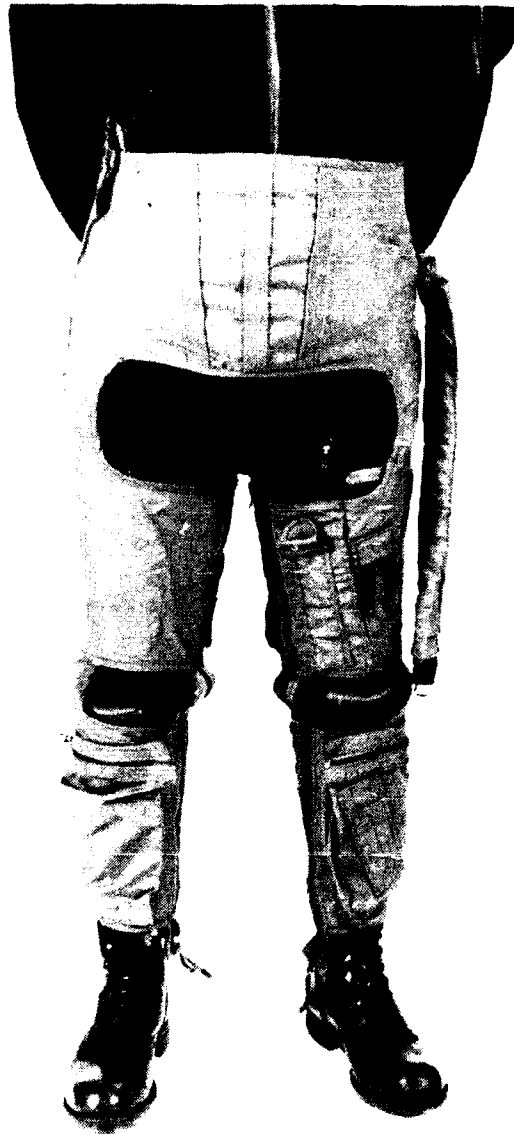


Figure 2. CSU-15/P Anti-G Garment (Back)



Figure 3. CSU-15/P (Modified) Anti-G Garment (Front)

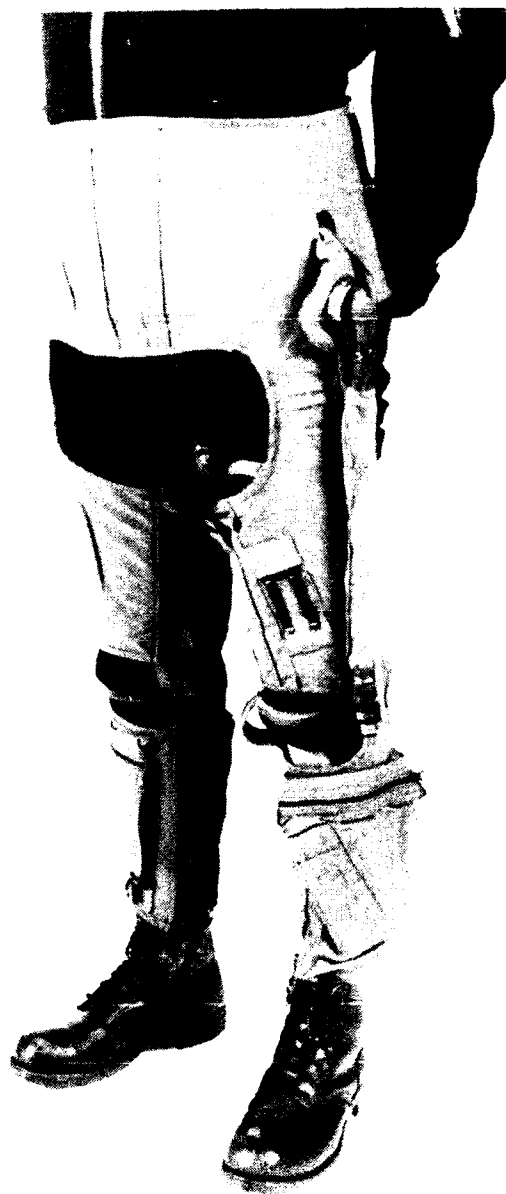
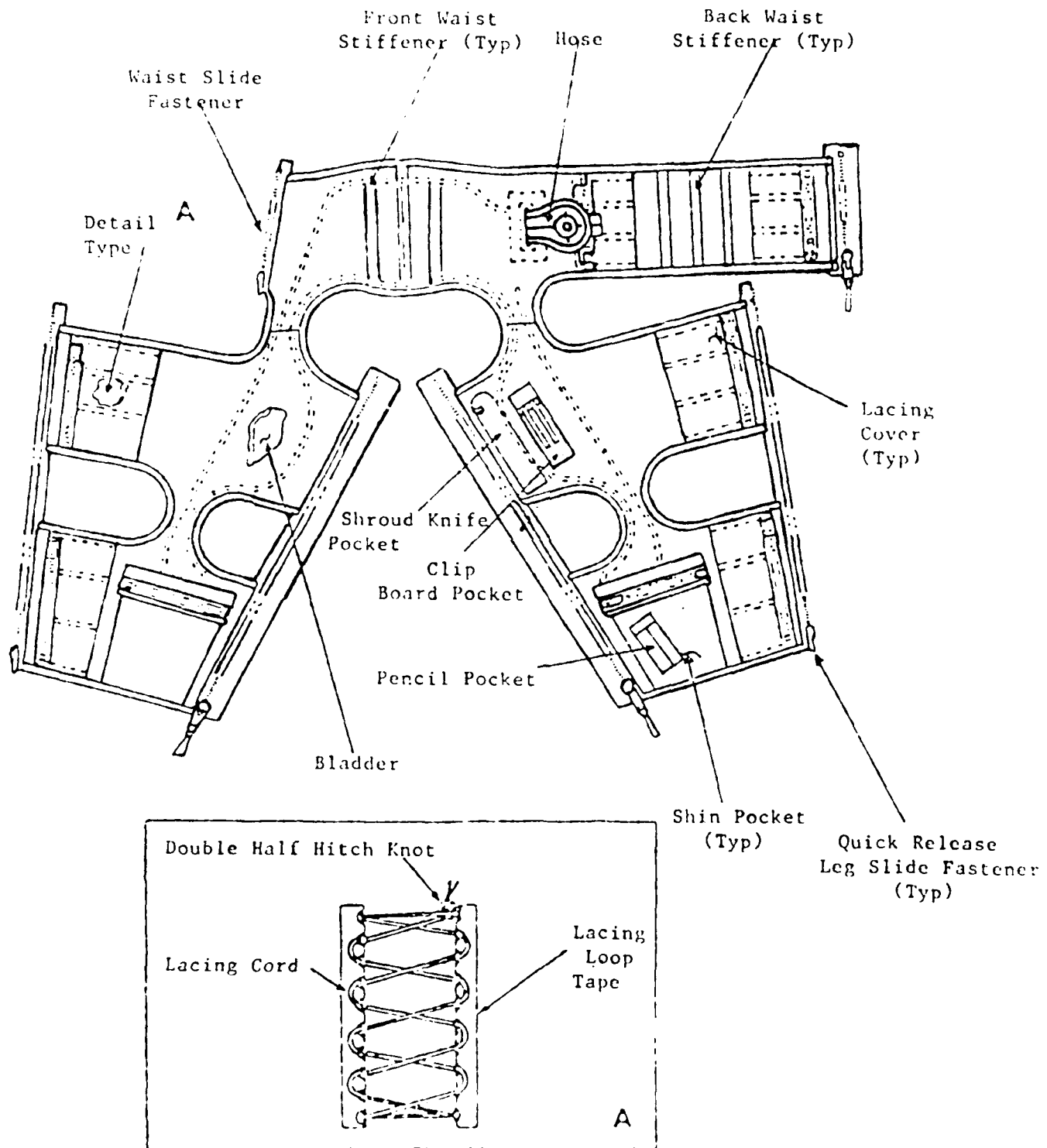


Figure 4. CSU-15/P (Modified) Anti-G Garment (Back)



Figure 5. Nomenclature CSU-15/P (Modified) Anti-G Garment



**Figure 6. (Left) Bladder Anti-G Air Inlet Port
(Centre) Adapter Assembly (Right) Nozzle Assembly and Hose**

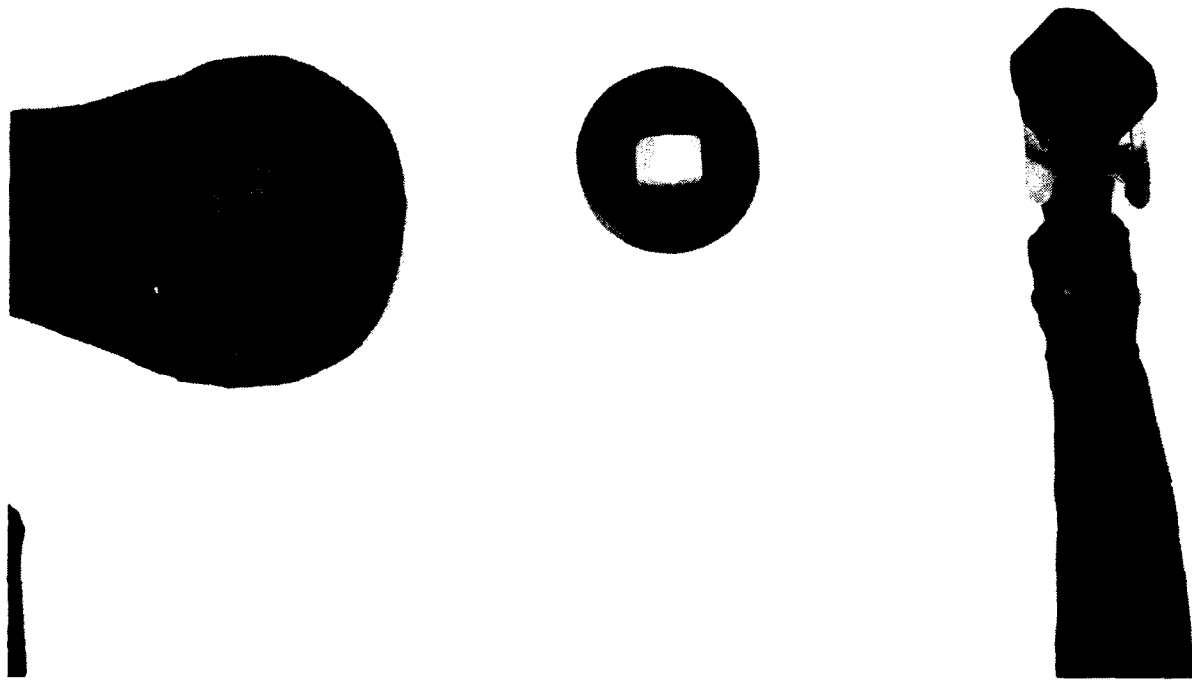


Figure 7. (Left) Bladder Anti-G Air Inlet Port (Centre) Air Inlet Port For Immersion Suit Interface (Right) Nozzle Assembly and Hose

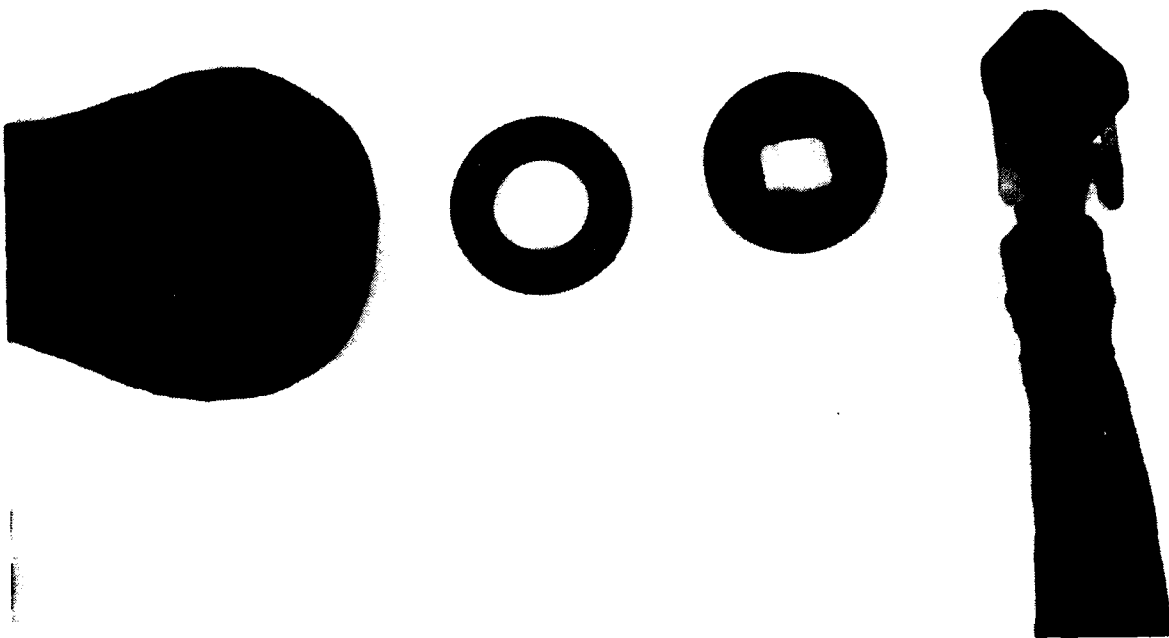


Figure 8. (Left) Adapter Assembly (Right) Air Inlet Port For Immersion Suit

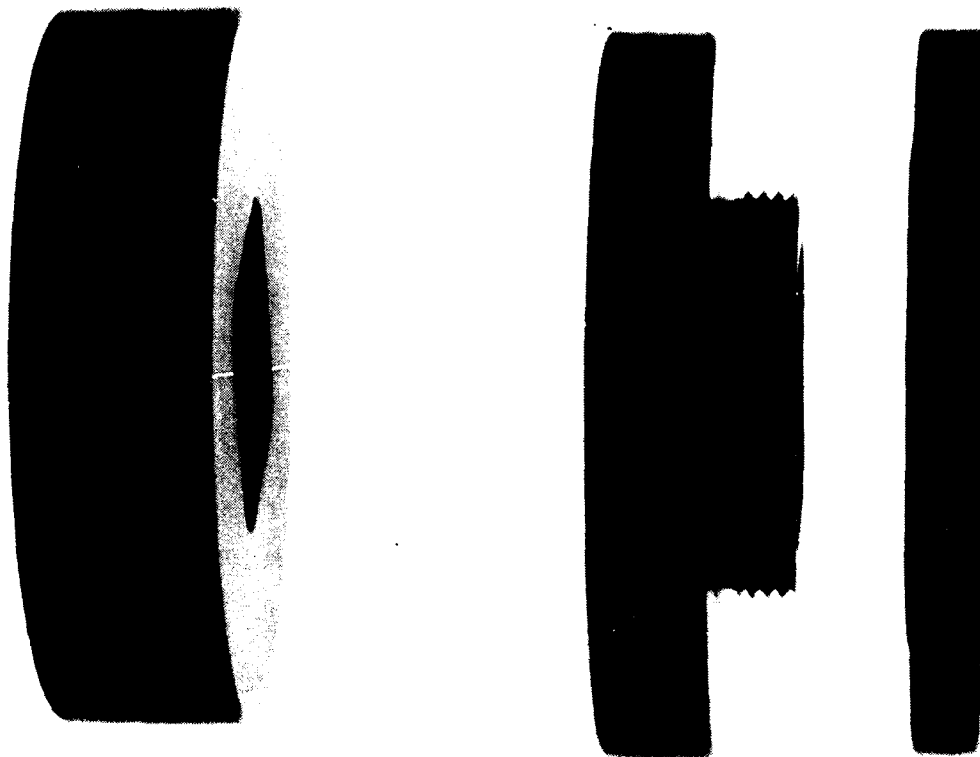


Figure 9. Integrated G Suit/Immersion Suit (CF18)



Figure 10. Integrated G Suit/Immersion Suit (CF5)



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CANADIAN FORCES

MODIFICATION INSTRUCTION

**INSTALLATION OF AN AIR INLET PORT ON THE
CF CONSTANT WEAR IMMERSION SUIT**

ISSUED ON AUTHORITY OF THE CHIEF OF THE DEFENCE STAFF

OPI: DCGEM 2

PURPOSE

1. The purpose of this modification is to achieve interface with the CSU-15/P (modified) Anti-G Coverall, thus allowing it to be worn under the Immersion Suit.

WHEN MODIFICATION SHALL BE EMBODIED

2. To be advised by NDHQ/DAR/DCGEM.

INSTALLATIONS AFFECTED

3. Nil.

EQUIPMENT AFFECTED

4. CF Constant Wear Immersion Suits NSN 8475-21-870-5559.

TRAINING AIDS AFFECTED

5. CF Constant Wear Immersion Suits used for training purposes.

BY WHOM WORK WILL BE PERFORMED

6. Operating units where flying operations require the wearing of CSU-15/P Anti-G Coveralls.

RESOURCES REQUIRED

7. The following resources are required:
 - a. Manpower - SS Tech 531 (0.5 man hours);

b. Downtime - Nil;

c. Material - the following items are required:

ITEM	NSN	PART NO.	DESCRIPTION	QTY PER EQPT	BASE ACC CODE
1	8475-21-905-7357	ID54-668	Immersion Suit Air Inlet Port	1	D
2	8475-21-905-7358	ID54-670	Cover Plate Assy	1	D
3	8040-21-731-5010		Adhesive, Mil-C5540 Type D	AR	C
4		L-28	CF Constant Wear Immersion Suit Material	16 sq in	C

d. Special tools required - Nil.

MATERIAL RENDERED SURPLUS

8. Nil

MODIFICATION OF SPARE ITEMS

9. As required by NDHQ/DCGEM

MODIFICATION EMBODIMENT PROCEDURES

10. The following is the sequence of operation:

- a. don and fit the CSU-15/P (modified) Anti-G Coverall with the hose removed;
- b. don the CF Constant Wear Immersion Suit;
- c. with wearer in the seated position, ascertain the location under the Immersion Suit of the Anti-G Coverall Air Inlet Port and mark with chalk;
- d. doff the CF Constant Wear Immersion Suit;
- e. punch/cut a one inch diameter hole at the marked position;
- f. apply adhesive to the insides of the two layer fabric, aligning holes and stick the two pieces together;
- g. cut a four inch diameter circular patch of L28 material and punch/cut a one

inch diameter hole at the centre;

- h. apply adhesive to both patch and outside of Immersion Suit fabric, then attach, ensuring the holes are aligned;
- j. use roller to ensure that patch is free of wrinkles, particularly in the area of the one inch diameter hole;
- k. from outside, insert top half of part number ID 54-668 Immersion Suit Air Inlet Port;
- m. thread bottom half of part number ID 54-668 from inside, finger tight, ensuring that the square opening flats of the Immersion Suit Air Inlet Port point approximately 45° downward to the rear;
- n. tighten both halves of the Air Inlet Port in this position, ensuring that the inside face of both halves are flush;
- p. don the CF Constant Wear Immersion Suit, which now incorporates this modification, over the CSU-15/P (modified) Anti-G Coverall; and
- q. from the inside insert the Anti-G Coverall Air Inlet Port through the Immersion Suit Air Inlet Port and attach the Anti-G Coverall Air Inlet Hose.

NOTE

In this configuration, when attaching the Air Inlet Hose, two "O" rings have to be compressed and the spring clip on the Hose connector must be lifted to allow it to be rotated to the locked position (see Fig 1 & 2).

Light lubrication of the "O" rings with an oxygen compatible lubricant may be required. Recommended lubricant is KRYTOX 240 AC.

The Cover Plate Assembly P/N ID 54-670 should be installed on the Immersion Suit Air Inlet Port when the Anti-G Coverall is removed, thereby preventing ingress of foreign material/water (see Fig 3).

WEIGHT, BALANCE AND STABILITY DATA

- 11. This modification will have no effect on weight, balance and stability.

RECORDING PROCEDURES

- 12. Forms and Records - CF 363

REPORTING PROCEDURES

- 13. To be advised by NDHQ/DCGEM

FUNCTIONAL CHARACTERISTICS OF EQUIPMENT ALTERED

14. This modification does not alter the functional characteristics of the CF Constant Wear Immersion Suit.

ANNOTATION TO APPLICABLE TECHNICAL ORDERS

15. C-22-259-000/MF-000

ADDITIONAL INFORMATION

16. When the Cover Plate Assembly is attached to the Air Inlet Port, water tight integrity is maintained, thereby allowing the CF Constant Wear Immersion Suit to be worn without the Anti-G Coverall

REFERENCES AND OTHER DATA

17. a) Required References - Nil
 b) Background Reference - NDHQ/DAR 3-2 User Trial
 Directive 3068 051605Z Dec 86

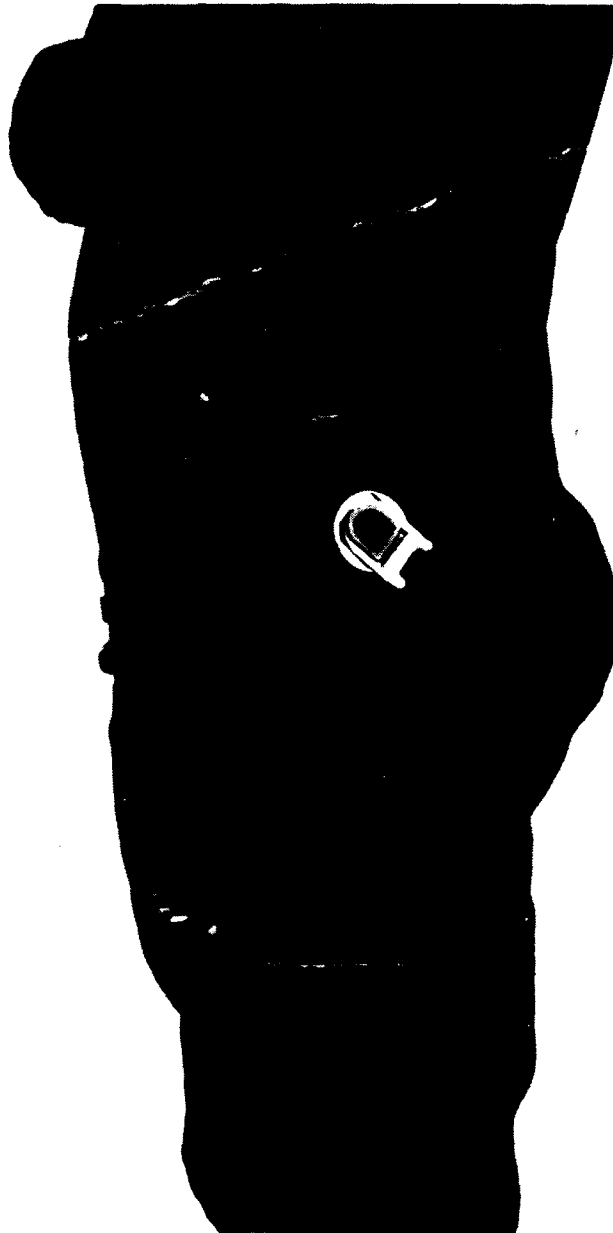
Figure 1. Anti-G Coverall Air Inlet Hose in the locked position



**Figure 2. Anti-G Coverall Interface With the
CF Constant Wear Immersion Suit**



**Figure 3. Cover Plate Assembly Installed on the
Immersion Suit Air Inlet Port**



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Canadian Forces (CF) aircrew flying CF18 and CF5 aircraft are required to wear anti-G suits to provide protection against the effects of high G forces experienced during air combat manoeuvres (ACM). They are also required to wear immersion suits with the G suits on domestic coastal operations to provide protection against hypothermia in the event of an emergency involving ejection and water landing. The standard CF anti-G suit was worn over the immersion suit, which being bulky, created discomfort and contributed to reduced G protection since this combination does not permit proper G suit fit on the wearer. National Defence Headquarters (NDHQ) tasked the Medical Life Support Division (MLSD) of this Institute (DCIEM) to develop a Canadian anti-G suit incorporating fixtures which would allow the anti-G suit to be worn under the immersion suit. MLSD identified suitable hardware to effect this interface and modified a standard anti-G suit and a CF constant wear immersion suit. In conjunction with MLSD support, a Canadian Aerospace Company manufactured two prototype anti-G suits which were successfully integrated with the immersion suit. Subsequent to favourable comments from initial flight trials, NDHQ directed MLSD to procure 20 modified anti-G suits for user trial by designated CF18 and CF5 aircraft squadrons. As a consequence of user trial acceptance, NDHQ has ordered sufficient quantities of the modified anti-G suit and associated immersion suit interface hardware to meet a foreseeable operational requirement.

14 KEYWORDS, DESCRIPTORS or IDENTIFIERS (technically meaningful terms or short phrases that characterize a document and could be helpful in cataloguing the document. They should be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location may also be included. If possible keywords should be selected from a published thesaurus, e.g. Thesaurus of Engineering and Scientific Terms (TEST) and that thesaurus-identified. If it is not possible to select indexing terms which are Unclassified, the classification of each should be indicated as with the title.)

G-Suit

Anti-G Coverall

Anti-G Cut-away Garment

G Protection / Immersion Protection

Anti-G Suit

Integrated G-Suit / Immersion Suit