

**DATE:** 14 June 1999  
**REVISION:** A (12/14/99)  
**AIRCRAFT:** HUSKY A-1/A-1A/A-1B  
**SUBJECT:** Fluidyne C-2200 Retractable Ski Installation and Operation;  
A-1/A-1A Forward CG Expansion.

*P.O. Box 1240  
672 South Washington  
Afton, WY 83110 USA  
Tel: 307-886-3151  
Fax: 307-886-9674  
e-mail: [aviat@aviataircraft.com](mailto:aviat@aviataircraft.com)*

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**Engineering aspects addressing Type Design changes are FAA Approved.**

1. EFFECTIVITY

Effective for: Husky A-1 Serial Nos. 1001 thru 1329 with trim system modified in accordance with this service bulletin;  
Husky A-1 Serial Nos. 1330 and later;  
Husky A-1A all;  
Husky A-1B all.

2. PURPOSE

Fluidyne C-2200 retractable skis have been approved for the Aviat Husky aircraft when installed and operated in accordance with the instructions presented in this service bulletin.

3. BACKGROUND

The C-2200 Fluidyne skis have been tested and approved for usage on the following Husky models and configurations:

A-1B Center of gravity travel with the Fluidyne skis installed remains within the envelope shown in the approved Airplane Flight Manual for the model A-1B Husky. No further modification or approval is required beyond the instructions contained in this bulletin for the installation and operation of the skis. Usage of the Fluidyne skis is approved when operating within the weight and balance limits presented in the approved Airplane Flight Manual.

A-1A Center of gravity travel with the Fluidyne skis installed exceed the forward envelope shown in the current Approved Flight Manual for the model A-1A Husky. The A-1A has been approved without modification by flight test for an expansion of the forward center of gravity envelope as presented in Appendix C of this bulletin. The revised envelope is to be inserted into the Approved Flight Manual for use until such time as the manual is revised. Usage of the Fluidyne skis is approved when the aircraft is operated within the weight and balance limits of the revised envelope presented in Appendix C.

## 3. Background (cont.)

A-1 Center of gravity travel with the Fluidyne skis installed exceed the forward envelope shown in the current Approved Flight Manual for the model A-1 Husky. To increase nose up trim capability required for forward center of gravity conditions the elevator trim system design was changed with A-1 serial number 1330 and continued through the A-1A and A-1B models. Flight test with this trim system in place justify the expansion of the forward center of gravity limits (see A-1A and A-1B) presented in Appendix D for the A-1. A-1 aircraft serial numbers 1329 and below do not have the trim authority to permit operation of the aircraft with skis installed and the resulting forward center of gravity travel. To permit ski installation and usage the trim system of Husky A-1 aircraft serial numbers 1329 and earlier must be modified in accordance with the instructions contained in Appendix B of this bulletin. Husky A-1 aircraft serial numbers 1329 and earlier when modified in accordance with Appendix B and A-1 aircraft serial numbers 1330 and later have been approved through flight test for a forward center of gravity envelope expansion presented in Appendix D which is to be inserted into the approved Airplane Flight Manual until such time as a revised flight manual is released. Installation of the Fluidyne C-2200 retractable skis on those aircraft is approved and usage permitted when the aircraft is operated within the weight and balance limits of the envelope presented in Appendix D.

4. COMPLIANCE

**MANDATORY for Fluidyne C-2200 ski installation and operation only.**

**5. ACCOMPLISHMENT INSTRUCTIONS****A. Ski installation.****Husky A-1B**

- 1) Install Fluidyne skis per Appendix A of this bulletin.
- 2) Insert Airplane Flight Manual Supplement for Fluidyne C-2200 Skis into the approved Airplane Flight Manual.
- 3) Insert approved Instructions for Continued Airworthiness Supplement for Fluidyne C-2200 Skis into the Instructions for Continued Airworthiness for the Husky A-1B.
- 4) Inspection to verify compliance and logbook entry to note changes.

**Husky A-1A**

- 1) Insert revised weight and balance envelope of Appendix C of this bulletin into the approved A-1A Airplane Flight Manual. This envelope is valid for the A-1A when operating with or without the Fluidyne Skis installed.
- 2) Install Fluidyne skis per Appendix A of this bulletin.
- 3) Insert Airplane Flight Manual Supplement for Fluidyne C-2200 Skis into the approved Airplane Flight Manual.
- 4) Insert approved Instructions for Continued Airworthiness Supplement for Fluidyne C-2200 Skis into the Instructions for Continued Airworthiness for the Husky A-1A.
- 5) Inspection to verify compliance and logbook entry to note changes.

**Husky A-1 Serial Numbers 1330 and above.**

- 1) Insert revised weight and balance envelope of Appendix D of this bulletin into the approved A-1 Airplane Flight Manual. This envelope is valid for the A-1 when operating with or without the Fluidyne Skis installed.
- 2) Install Fluidyne skis per Appendix A of this bulletin.
- 3) Insert Airplane Flight Manual Supplement for Fluidyne C-2200 Skis into the approved Airplane Flight Manual.
- 4) Insert approved Instructions for Continued Airworthiness Supplement for Fluidyne C-2200 Skis into the Instructions for Continued Airworthiness for the Husky A-1.
- 5) Inspection to verify compliance and logbook entry to note changes.

**5. ACCOMPLISHMENT INSTRUCTIONS (cont.)****A. Ski installation and documentation (cont.)****Husky A-1 Serial Numbers 1329 and earlier**

- 1) Perform the trim cable change per the instructions presented in Appendix B of this bulletin.
- 2) When the trim cable change is completed insert revised weight and balance envelope of Appendix D of this bulletin into the approved A-1 Airplane Flight Manual. This envelope is valid for the A-1 when operating with or without the Fluidyne Skis installed only after completion of the trim cable change in step 1 above.
- 3) Install Fluidyne skis per Appendix A of this bulletin.
- 4) Insert Airplane Flight Manual Supplement for Fluidyne C-2200 Skis into the approved Airplane Flight Manual.
- 5) Insert approved Instructions for Continued Airworthiness Supplement for Fluidyne C-2200 Skis into the Instructions for Continued Airworthiness for the Husky A-1.
- 6) Inspection to verify compliance and logbook entry to note changes.

**B. Weight and balance**

Weight and balance changes are noted in the FAA approved Airplane Flight Manual supplement provided for the Fluidyne C-2200 ski installation. Center of gravity envelope changes for the A-1A and A-1 are presented in Appendices C and D of this bulletin.

**C. Flight Manual and Operating Information**

An FAA approved Airplane Flight Manual supplement is provided for the Fluidyne C-2200 skis and is to be attached to the Airplane Flight Manual.

**D. Life-Limited Components.**

The Husky A-1/A-1A/A-1B with the Fluidyne Skis installed has no life-limited components.

6. REVISION HISTORY

Revision	Date	Description
A	12/14/99	Added Section 6 Revision History Corrected ski designation. C-2200 was C-2000. Corrected hose number callouts, Appendix A.

APPENDIX A      Fluidyne C-2200 Ski Installation1. Installation Procedure

Refer to Figures A1 through A6 for additional information.

- A. Support aircraft with main gear clear of ground.
- B. Remove main landing gear in preparation for installation of new landing gear (Aviat part numbers 37017-509 LH and 37017-510 RH. Pump installation is easiest with the lower fuselage cover panels, gear and bungees removed.)
- C. Install pump per figure A1. Drill 3/8 holes in floor at locations noted and install AN834-4D tees in holes. Secure with AN960-716 washers and AN924-4D nuts under floor. Cut holes in fuselage panels as noted in figures A2 and A3 for the MS35489-19 grommets for routing the fluid cables outside the aircraft.
- D. Install main landing gear (37017-509 and 37017-510) and bungees. Install tire assembly and brake calipers positioned as shown in figures A2 and A3.

**NOTE: Aircraft must be equipped with 8.00x6 or 8.50x6 tires. Other tire sizes are not approved and will not permit correct ski operation.**

- E. Install ski assemblies as illustrated in Figures A2 and A3. Hose clamps for the ski assembly hoses attach through the gear leg fairing to the fairing attach brackets.

**WARNING: DO NOT DRILL LANDING GEAR LEG OR ATTACH CLAMPS DIRECTLY TO GEAR LEG**

- F. Install rigging cables as shown in Figures A2 through A6.
- G. Fill pump reservoir with hydraulic fluid. To remove air from the system set the selector to "WHEELS" and pump the handle until it no longer moves. Top off the reservoir with fluid to the bottom of the filler neck. The system is self bleeding.
- H. Rigging instructions:
  - 1) With the aircraft on the ground and the ski in the 'UP' position, set the length of the AFT limits cable to provide a minimum ski heel clearance of 1-1/4 inches. This adjustment is to be made without extending the preloaded shock ring unit included in the aft cable assembly.
  - 2) The rigger attachment can be accomplished most readily with the ski in the 'DOWN' position.
  - 3) Set the forward limit cable to the minimum length which will accommodate ground actuation of the ski.
  - 4) Keep tire inflation pressure as recommended in the Airplane Flight Manual.
- I. Check skis for proper operation following installation and rigging. See Airplane Flight Manual supplement for operation procedures.

**APPENDIX A**      Fluidyne C-2200 Ski Installation

2. Maintenance Notes

- A. Keep tires inflated to pressure listed in the approved Airplane Flight Manual.
- B. Pivoted joints of the ski mechanism incorporate self-lubricating bearings and should not require additional lubrication.
- C. Check cables and attachments for wear and damage prior to each flight.

**APPENDIX A**      Fluidyne C-2200 Ski Installation

3. Parts Required for Fluidyne C-2200 Ski Installation

Ski Installation			
Part No.	Qty	Description	Notes
37017-509	1	Landing Gear Assy, LH	
37017-510	1	Landing Gear Assy, RH	
37569-01	1	SKI ASSY, LH	Fluidyne 10R3810-1
37569-02	1	SKI ASSY, RH	Fluidyne 10R3810-2
37569-03	2	Cable Check Fitting	
37569-05	2	Fitting Assy, Aft	
37569-09	2	Fitting Assy, Aft	Fluidyne 11D1679
37569-13	2	Arm, Cable Check	
37569-14	2	Tube, Cable Check	
37569-15	2	Limits Cable, Fwd	Fluidyne 11B1354-1
37569-16	2	Rigging Cable, Fwd	Fluidyne 11B1407
37569-18	2	Cable Assy	Fluidyne 11D1375
AN6-36A	2	Bolt	
AN365-624A	2	Nut	
AN960-616	6	Washer	
AN4-6	2	Bolt	
AN6-40A	2	Bolt	Lower engine mount bolts
AN310-4	2	Castle Nut	
AN380-2-2	2	Cotter Pin	
AN742-DG14	4	Clamp	
AN526C-10R12	4	Screw	
AN970-3	4	Washer	
AN960-10	4	Washer	
AN8-32A	2	Bolt	
AN960-816	6	Washer	
AN365-820A	2	Nut	
MS28741-0460	4	Hose Assembly	Aeroquip AQ350-4-0460 or equivalent.

Pump Installation			
Part No.	Qty	Description	Notes
F3161-1	1	Hydraulic Power Pack	
AN3-7A	4	Bolt, Undrilled	
MS20365-1032	4	Nut, Self Locking	
AN970-10	4	Washer	
AN834-4D	2	Bulkhead Tee	
AN924-4D	2	"B" Nut	
AN960-716	2	Washer, Large Area	
37569-11	1	Tube, Hydraulic (SKI)	
37569-12	1	Tube, Hydraulic (WHEEL)	
AN818-4D	4	"B" Nut	
AN819-4D	4	Sleeve, B-Nut	
AN824-4D	2	Tee	
AQ350-0140	2	Hose Assy	Aeroquip
AQ350-0180	2	Hose Assy	Aeroquip
MS35489-19	4	Grommet	
MIL-H-5606		Hydraulic Fluid	Qty as required

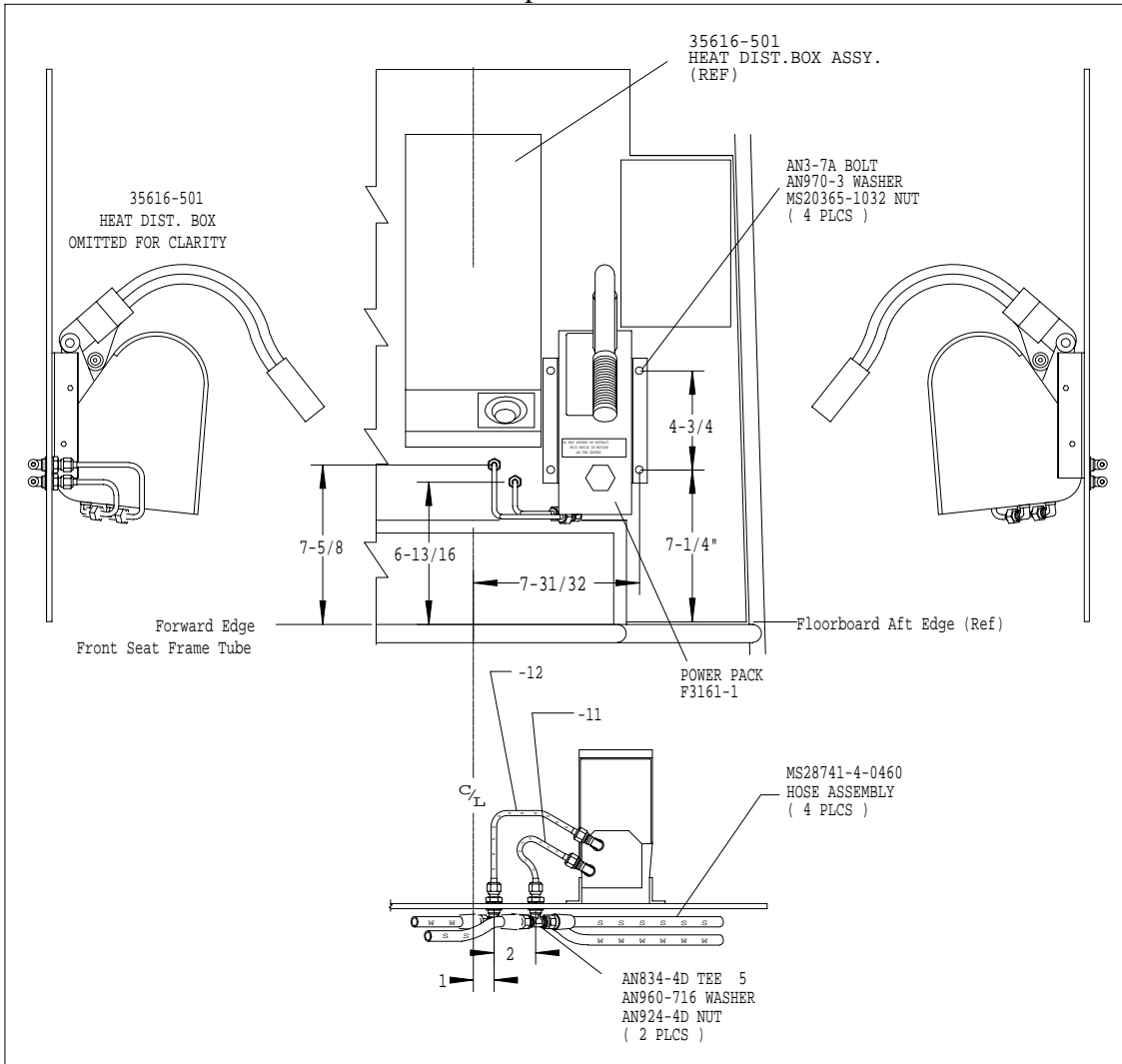




APPENDIX A

Fluidyne C-2200 Ski Installation

Figure A1  
Pump Installation



APPENDIX A

Fluidyne C-2200 Ski Installation

Figure A2  
Ski Installation - Right Hand Side

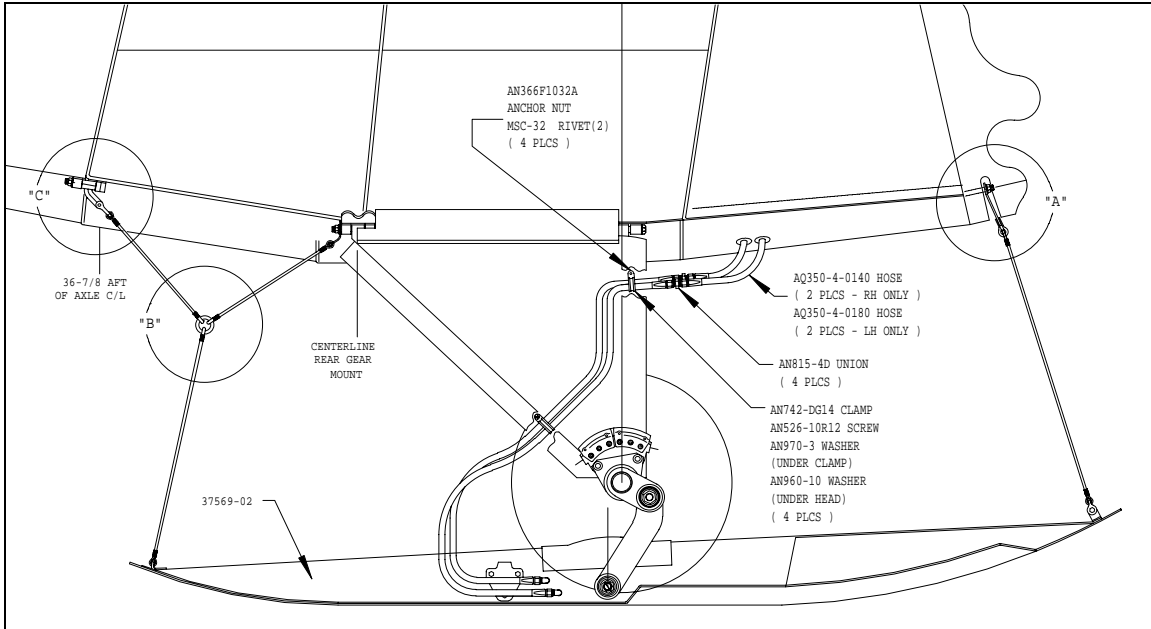
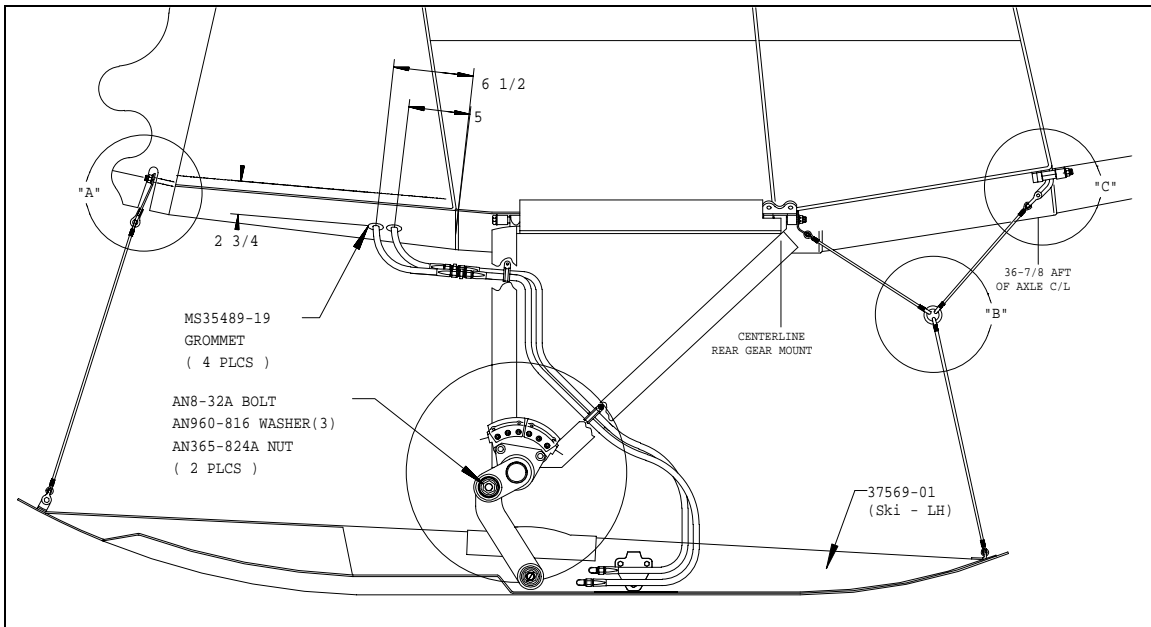


Figure A3  
Ski Installation - Left Hand Side

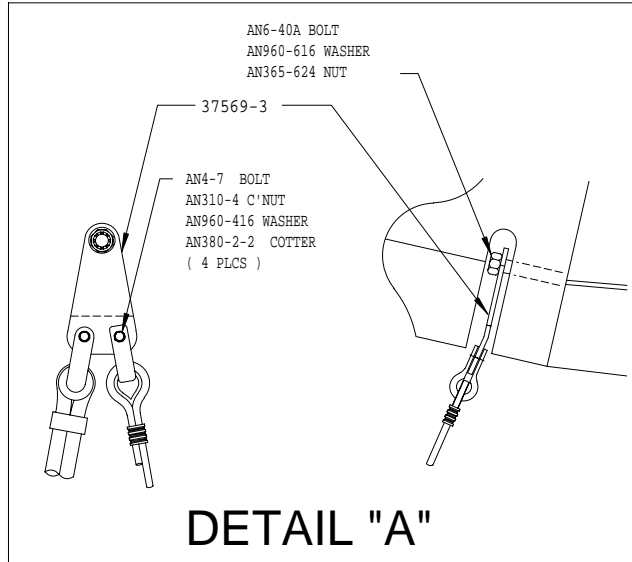


**APPENDIX A**

**Fluidyne C-2200 Ski Installation**

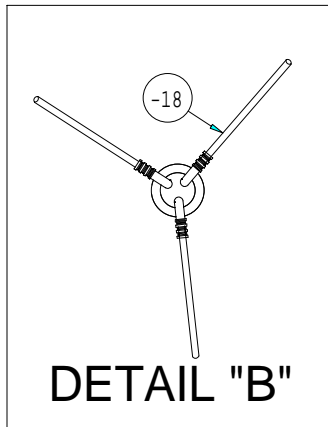
**Figure A4**

**Detail A**



**Figure A5**

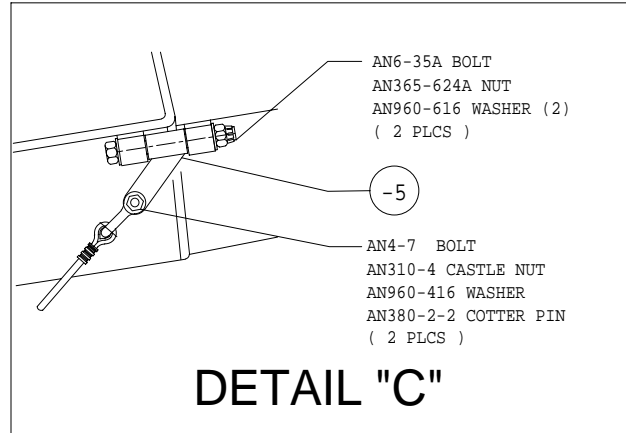
**Detail B**



**APPENDIX A**

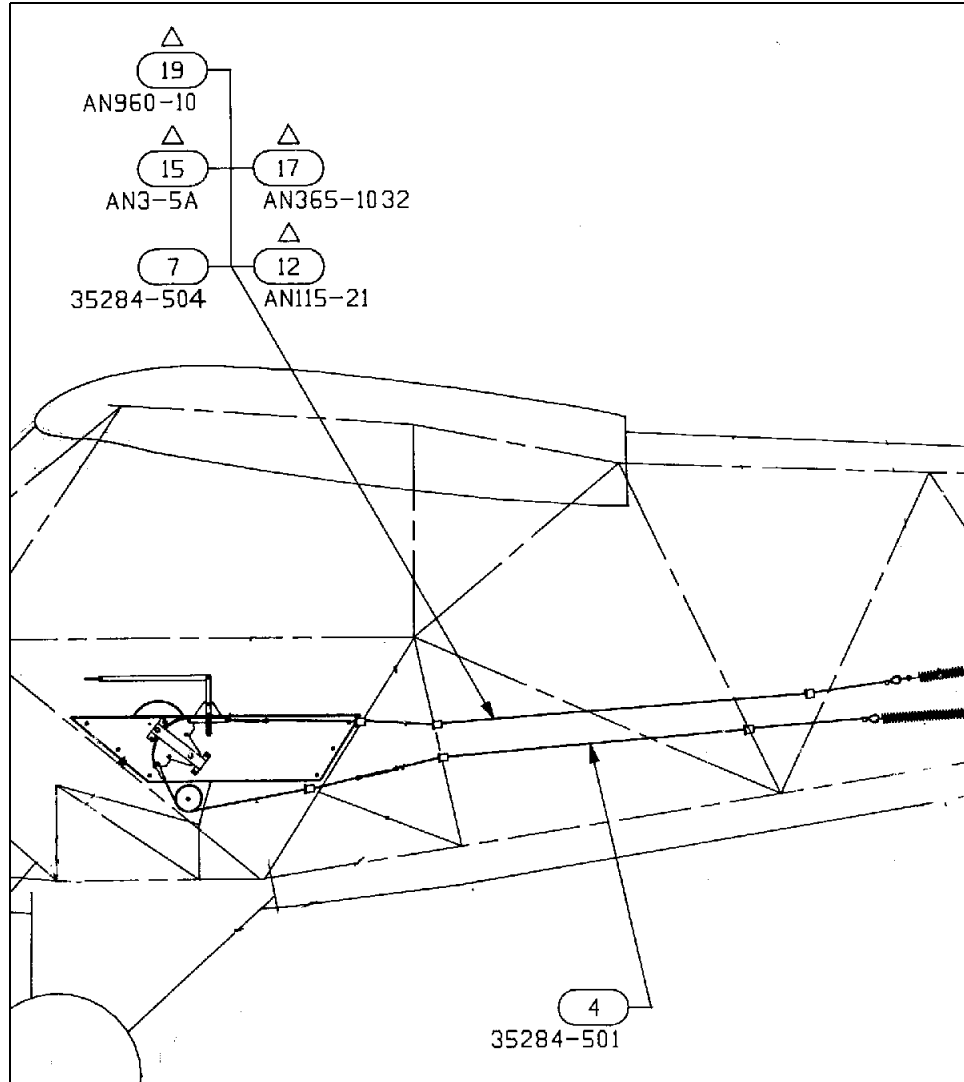
**Fluidyne C-2200 Ski Installation**

**Figure A6**  
**Detail C**



**APPENDIX B**      Trim Cable Change - Husky A-1 Serial Numbers 1329 and Earlier

1. Replace upper and lower trim cables with new 32584-501 and 32584-504 cable assemblies as shown in the figure below.



**APPENDIX B**      Trim Cable Change - Husky A-1 Serial Numbers 1329 and Earlier

2. Check elevator trim as follows:
  - A. Adjust the elevator trim control to the full nose down (elevator trailing edge down) position.
  - B. At full nose down trim position the top cable tension should be 55 to 65 pounds and the bottom cable should be 65 to 75 pounds.
  - C. Check the force necessary to move the elevator at an arm of 26 3/4 inches aft of the hinge center line. With the full nose down trim, force required to pull the elevators up to neutral is 12 3/4 pounds to 17 3/4 pounds. The force required to pull the elevators down from full nose up trim to neutral is 1 1/2 pounds to 6 1/2 pounds.
  - D. Should the forces fall outside the ranges above, check the control system for wear, binding, frayed cables, worn fairleads and control wheel and pulley misalignment.
  - E. Following rigging the elevators should move freely throughout the full range of travel.

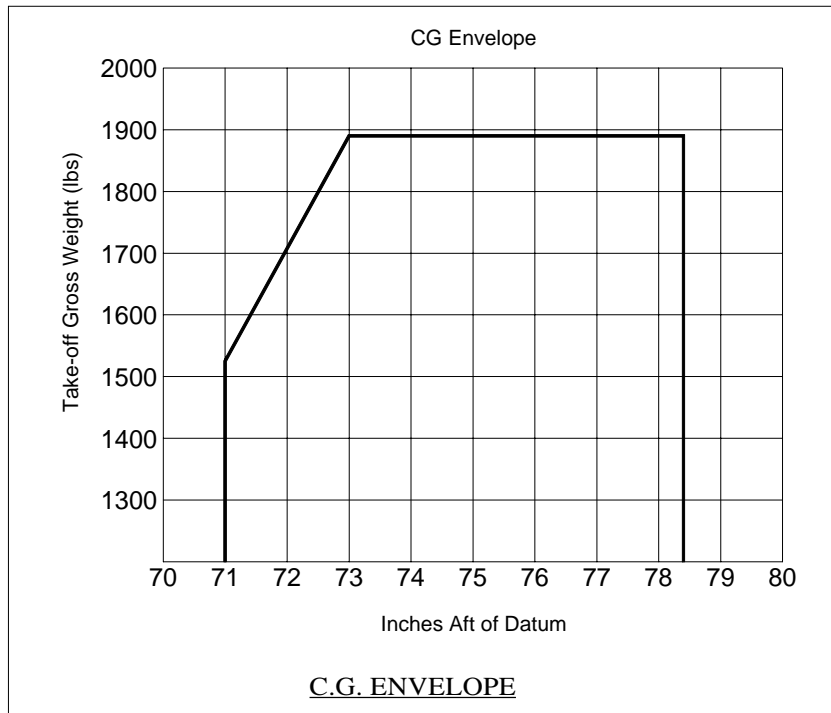
**APPENDIX C**      Husky A-1A Weight and Balance Envelope

The following changes are made to the Husky A-1A Airplane Flight Manual:

1. Change Section I - OPERATING LIMITATIONS, Subsection C - WEIGHTS to read:

<u>Weight and Center of Gravity Limits (Normal Category)</u>	
Most Forward Limit.....	FS 71 at 1525 LBS
Most forward Limit at maximum Gross Weight.....	FS 73 at 1890 LBS
Most rearward at Maximum Gross Weight or Less.....	FS 78.4 at 1890 LBS

2. The CG Envelope diagram in Section V - LOADING INFORMATION, Subsection A - WEIGHT & BALANCE, 5. - DETERMINING AIRPLANE WEIGHT & C.G. is replaced with the following diagram:





**APPENDIX D**      Husky A-1 Weight and Balance Envelope

The following changes are made to the Husky A-1 Airplane Flight Manual:

1. Change Section I - OPERATING LIMITATIONS, Subsection C - WEIGHTS to read:

Weight and Center of Gravity Limits (Normal Category)

1. Most Forward Limit  
FS 71 at 1525 LBS
2. Most forward Limit at Maximum Gross Weight  
FS 72.5 at 1800 LBS
3. Most rearward at Maximum Gross Weight or Less  
FS 78.4 at 1800 LBS

2. The CG Envelope diagram in Section V - LOADING INFORMATION, Subsection A - WEIGHT & BALANCE, 5. - DETERMINING AIRPLANE WEIGHT & C.G. is replaced with the following diagram:

