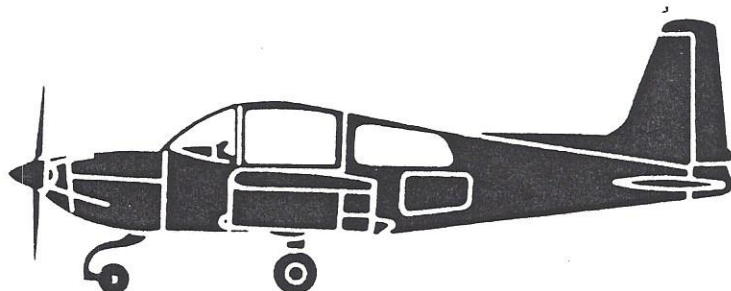
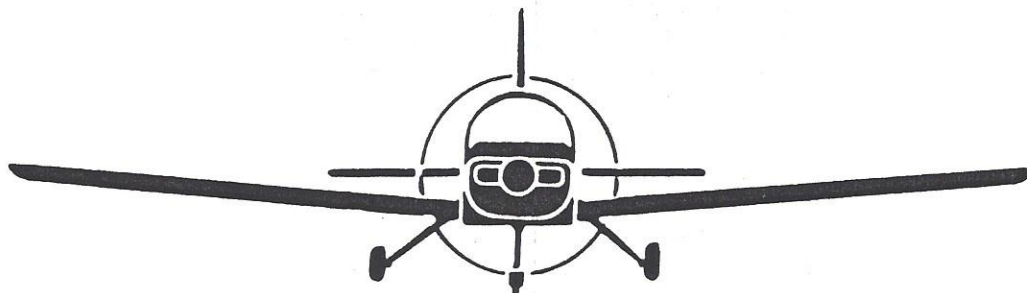


SINGLE ENGINE AIRCRAFT SERVICE KIT NO. 140A

SUBJECT: FUEL (ATA NO. 28) INTEGRAL FUEL TANK REPAIRS



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December 14, 1983



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GULFSTREAM AEROSPACE SINGLE ENGINE AIRCRAFT SERVICE KIT NO. 140A
 CANCELS SK 140 AND SK 140 AMENDMENT 1.

SUBJECT: Fuel (ATA No. 28) Integral Fuel Tank Repairs

PURPOSE/DISCUSSION: The purpose of this kit is to provide sealants and instructions for repair of Integral Fuel Tank Leaks. The kit consists of three parts.
 Part 1: Provides for the repair of minor fuel leaks. The aircraft may be fueled 2 hours after the repair.*
 Part 2: Provides for the repair of major fuel leaks. The aircraft may be fueled 30 hours after the repair.
 Part 3: Provides for the sealing of access covers. The aircraft may be fueled 2 hours after the repair.*

DESCRIPTION: This kit covers the repair of integral fuel tank leaks and access covers. Type A is a two-part, room temperature curing sealant which is used for quick repair of internal fuel tank leaks. Type B is a two-part, room temperature curing sealant which is used for sealing internal fuel tank leaks. Type C is a two-part, room temperature curing sealant which is used for sealing fuel tank access covers. All 3 types of sealants contain two parts which, when properly mixed in the specified ratios, cure into a firm rubber.

PARTS REQUIRED:

PART NUMBER	NOMENCLATURE	QTY		
		<u>Part 1</u>	<u>Part 2</u>	<u>Part 3</u>
Type A	Sealant-Quick Repair	1		
Type B	Sealant		1	
Type C	Sealant-Access Cover	1	2	1

NOTE: These are two part sealant kits consisting of 3½ Fl. oz. of Base Compound (packaged in a ½ pint can) and a separate container of accelerator.

*If at all possible, all sealants should be allowed to cure for 24 hours or more before refueling.

SPECIAL TOOLS/
EQUIPMENT REQUIRED:

1. Water Manometer (A Water Manometer is a 'U-Tube' Device that measures pressure in inches of water).
2. Pressure Regulator with positive shut off valve.

EFFECTIVITY:

<u>MODEL</u>	<u>SERIAL NUMBER</u>
AA5	0001 and Sub.
AA5A	0001 and Sub.
AA5B	0001 and Sub.

WEIGHT AND BALANCE:

Negligible

PRICE:

Prices are subject to change without notice:

List Price (E)

SK-140A Part 1
SK-140A Part 2
SK-140A Part 3

The following instructions, in step by step form, are written as a guide to perform this installation or modification. Compliance with safe maintenance practices as recommended in the Maintenance Manual and FAA Regulations is Mandatory.

SAFETY PRECAUTIONS

Sealants - Handling and Safety Instructions.

1. Sealants have been proven to be safe materials when reasonable care is observed but the following precautions must be observed.

WARNING

Some Sealants contain Flammable and Volatile Solvents.

2. Keep sealants away from heat, sparks and flame. Proper precautions used with flammable material must be taken when applying sealants. Comply with all local safety regulations.

3. Use and handle only in a well ventilated area. Air supplied respirators should be used during application. Avoid repeated or prolonged exposure. Remove affected personnel to fresh air immediately and obtain medical attention.
4. Avoid all contact with the body, especially contact with open breaks in the skin and ingestion. If skin contact is made, flush area with warm water. Obtain medical attention in case of extreme exposure or ingestion.
5. Polyethylene mitts and chemical type goggles must be used when handling or mixing materials.

The following precautions should be observed when performing the maintenance in this kit.

1. During fueling, draining, tank purging and tank repairing, ground the aircraft to a suitable ground rod.
2. Residual fuel draining from lines and openings constitutes a fire hazard. All lines should be capped and all excess fuel in openings should be removed before performing necessary maintenance.
3. Only non-spark non-magnetic tools should be used when performing work on fuel tanks or fuel systems.
4. Work only in well ventilated areas. Wearing of respirators is recommended.
5. Remove aircraft battery.

MODIFICATION INSTRUCTIONS

PART 1 - Minor repairs - For quick repairs (allowing aircraft to be fueled 2 hours after repair) If possible, a cure time of 24 hours is preferred.

- A. Prepare the aircraft for safe maintenance as follows:
 - a. Insure Master Switch OFF.
 - b. Aircraft grounded.
 - c. Observe all safety precautions.

B. Repair Instructions - Repairing minor leaks on Integral Tanks.

- B-1 Determine source of leak. If difficulty is experienced in locating leak source, it is recommended that the tank be pressurized, using procedure in Part II, Section D. Insure that tank is empty before pressurizing.
- B-2 Drain tank and/or tanks to be repaired.
- B-3 Gain access to tank by removing access covers. Retain hardware for reuse.
- B-4 With tank opened, purged and properly ventilated prepare leak area as follows:
 - a. Remove all loose, chipped or cracked sealant from area of leak source. Use of a chisel-like tool, made of hard fiber or plexiglass, is excellent to remove old sealant.
 - b. Remaining sealant may then be removed with aluminum wool, 3M ELEKTRO-Cut Cloth, or aluminum oxide paper. DO NOT USE STEEL WOOL OR SILICON GRIT ABRASIVES.
 - c. All cuts in old sealant should be made at 45 degrees angle to insure good adhesion between old and new sealant.
 - d. Thoroughly clean area using a vacuum or other suitable cleaning device.

NOTE

Checking and correcting for loose rivets and/or other mechanical fasteners is recommended prior to applying sealant. Check area of leak for defects in bond joints. Areas of cracked bond fillets or separated bond joints must be repaired. Contact the Gulfstream American Corporation Customer Service Department for further information.

- e. If inspection reveals no rework, proceed with cleaning of area to be sealed.
- f. Using a lint-free cheese cloth that has been dampened with MEK, Alcohol (99% Isopropyl), or acetone, clean area until cheese cloth shows no sign of dark smudge or stain.

NOTE

If fuel tank float is in area to be sealed, wax the float to prevent it from sticking to any sealant.

B-5 Type A Sealant - Storage, mixing and cure instructions:

- a. Storage life of Type A sealant is at least 6 months when stored temperatures below 80 degrees F, in the original unopened containers.
- b. Mix sealant according to instructions on the container, if weight measuring devices are not available for use, entire contents of kit can be mixed as each kit contains base compound and accelerator in proper proportions.
 1. Thoroughly stir the accelerator in its container until an even consistency is obtained.
 2. Slowly stir the accelerator into the base compound and thoroughly mix approximately 50 strokes. Be sure to scrape sides and bottom of container to include all base compound in the mixture and to assure uniform blending.
- c. An application life of $\frac{1}{4}$ hour (15 minutes) is given at 75°F, and 50% relative humidity (R.H.). Application life will vary, depending on temperature. For every 10°F rise above standard (75°F, and 50% R.H.) life is reduced by half, and for every 10°F below standard life is doubled. High humidity at the time of mixing shortens application life.
- d. Cure times depend on the ambient temperatures and relative humidity.
 1. For use in this kit a minimum of twenty-four (24) hours cure will be used, at standard temperature and relative humidity.
- e. Time to Pressurize - 2 hours.

B-6 Apply sealant to area to be sealed. Special care must be taken to joints that have a direct fuel path out of the tank area. Sealant must be pressed between these surfaces thoroughly and then fillet sealed on the fuel side. Fillet sealing is applying sealant to the edge of all joints, joggles, bend reliefs, voids, all rivets and/or fasteners through the boundary of the tank and any other place that a fuel leak has occurred.

B-7 Allow 2 hour minimum cure time on sealant in tank before fueling. If possible, a cure time of 24 hours is preferred.

B-8 If time permits or if desired fuel tank may be pressure tested using procedure in Part II, Section D. Sealant requires 2 hours cure before pressure checking.

C. Sealing Access Covers

- C-1 Remove all existing old sealant from access covers and mating surfaces of the tank.
- C-2 Clean access covers and mating surfaces with cheese cloth dampened with MEK, Alcohol (99% isopropyl) or acetone. Clean cover and surfaces until a clean cheese cloth shows no sign of dark smudge or stain.
- C-3 Insure that all covers and mating surfaces are cleaned before proceeding. Pot life of sealant is only 30 minutes.
- C-4 Mix Type C sealant as follows: One kit is enough for four (4) access covers (one wing).
 - a. Storage life is at least 6 months when stored at temperatures below 80°F, in the original unopened containers.
 - b. Mix sealant according to instructions on the container. If weight measuring devices are not available for use, contents of kit can be mixed as each kit contains base compound and accelerator in proper proportions.
 - 1. Thoroughly stir the accelerator in its container until an even consistency is obtained.
 - 2. Slowly stir the accelerator into the base compound and thoroughly mix approximately 7 to 10 minutes. Be sure to scrape sides and bottom of container to include all base compound in the mixture and to assure uniform blending.
 - c. An application life of ½ hour (30 minutes) is given at 75°F, and 50% relative humidity (R.H.). Application life will vary, depending on temperature. For every 15°F, rise above standard (75°F, and 50% R.H.) life is reduced by half and for every 15°F, below standard life is doubled. High humidity at the time of mixing shortens application life.
 - d. Cure times depend on the ambient temperatures and relative humidity.
 - 1. For use in this kit a minimum of 48 hours will be used, at standard temperatures and relative humidity.
 - e. Time to Pressurize - 45 minutes.
 - f. Time to Fuel - 2 hours.

C-5 Apply Type C sealant to wing mating surface in layer of 1/32" to 1/16" thick. Install cover immediately using hardware retained in Step B-3. Tighten screws in a staggered sequence to insure a more even pull down of cover. Remove excess sealant that has squeezed out, after sealant has cured.

C-6 Repeat Step C-5 for all covers.

D. Return aircraft to flight status.

E. Record compliance in the log book.

PART II - Major Repairs - For repair of Major Leaks.

A. Prepare the aircraft for safe maintenance as follows:

- a. Insure Master Switch OFF.
- b. Aircraft grounded.
- c. Observe all safety precautions.

B. Repair Instructions - Repairing Major Leaks on Integral Tanks.

B-1 Determine source of leak. If difficulty is experienced in locating leak source, it is recommended that the tank be pressurized, using procedure in Part II, Section D. Insure that tank is empty before pressurizing.

B-2 Drain tank and/or tanks to be repaired.

B-3 Gain access to tank by removing access covers. Retain hardware for reuse.

B-4 With tank opened, purged and properly ventilated prepare leak area as follows:

- a. Remove all loose, chipped or cracked sealant from area of leak source. Use of a chisel-like tool, made of hard fiber or plexiglass, is excellent to remove old sealant.
- b. Remaining sealant may then be removed with aluminum wool, 3M ELEKTRO-Cut cloth, or aluminum oxide paper. DO NOT USE STEEL WOOL OR SILICON GRIT ABRASIVES.
- c. All cuts in old sealant should be made at 45 degrees angle to insure good adhesion between old and new sealant.

- d. Thoroughly clean area using a vacuum or other suitable cleaning device.

NOTE

Checking and correcting for loose rivets and/or other mechanical fasteners is recommended prior to applying sealant. Check area of leak for defects in bond joints. Areas of cracked bond fillets or separated bond joints must be repaired. Contact the Gulfstream American Corporation customer service department for further information.

- e. If inspection reveals no rework, proceed with cleaning of area to be sealed.
- f. Using a lint-free cheese cloth that has been dampened with MEK, Alcohol (99% Isopropyl), or acetone, clean area until cheese cloth shows no sign of dark smudge or stain.

NOTE

If fuel tank float is in area to be sealed, wax the float to prevent from sticking to any sealant.

B-5 Type B sealant (MIL-S-8802D(1)) - Storage, mixing and cure instructions.

- a. Storage life is at least 6 months when stored at temperatures below 80°F, in the unopened containers.
- b. Mix sealant according to instructions on the container. If weight measuring devices are not available for use, entire contents of kit can be mixed as each kit contains base compound and accelerator in proper proportions.
 - 1. Thoroughly stir the accelerator in its container until an even consistency is obtained.
 - 2. Slowly stir the accelerator into the base compound and thoroughly mix approximately 7 to 10 minutes. Be sure to scrape sides and bottom of container to include all base compound in the mixture and to assure uniform blending.

c. An application life of $\frac{1}{2}$ hour (30 minutes) is given at 75°F, and 50% relative humidity (R.H.). Application life will vary depending on temperature. For every 15°F, rise above standard (75°F, and 50% R.H.) life is reduced by half and for every 15°F below standard life is doubled. High humidity at the time of mixing shortens application life.

d. Cure times depend on the ambient temperatures and relative humidity.

1. For use in this kit a minimum of 48 hours will be used, at standard temperature and relative humidity.

C-5 Apply sealant to wing mating surface in layer of 1/32" to 1/16" thick. Install cover immediately using hardware retained in Step B-3. Tighten screws in a staggered sequence to insure a more even pull down of cover. Remove excess sealant that has squeezed out, after sealant has cured.

C-6 Repeat Step C-5 for all covers.

C-7 Allow 30 hours cure time before pressure testing and fueling.

D. Pressure Testing Fuel Tank.

D-1 Plug vent line at outboard end.

D-2 To the fuel line leading from the sump to the fuel selector, attach a water manometer capable of measuring 20 inches of water.

D-3 To the quick drain, connect a well regulated supply of air ($\frac{1}{2}$ PSI MAXIMUM OR 13.8 INCHES OF WATER). Nitrogen may be used where the tank might be exposed to temperature changes while testing.

D-4 Insure filler cap is installed and sealed.

CAUTION

Do not attempt to apply pressure to the tank without a good regulator and a positive shut off in the supply line. Do not pressurized the fuel tank to more than $\frac{1}{2}$ PSI or damage may occur.

- D-5 Apply pressure slowly until $\frac{1}{2}$ PSI or 13.8 inches of water is obtained.

NOTE

Temperature changes will affect pressure readings. Be sure tank and outside air temperatures are equal and stable.

- D-6 Allow time for pressure to stabilize.
- D-7 Apply soap solution to any suspected leak areas and watch for bubbles.
- D-8 If tank holds for 15 minutes, without pressure loss, tank is acceptable. If leakage does occur, make certain it has not been caused by a leaky fuel cap, fitting caps or vent line.
- D-9 Reseal and retest if any leaks are found.
- E. Return aircraft to flight status.
- F. Record compliance in the log book.

PART III - Sealing of access cover leaks (allows aircraft to be fueled 2 hours after repair).

- A. Prepare the aircraft for safe maintenance as follows:
- a. Insure Master Switch OFF.
 - b. Aircraft grounded.
 - c. Observe all safety precautions.
- B. Repair Instructions - Access Cover Leaks
- B-1 Determine source of leak. If difficulty is experienced in locating leak source, it is recommended that the tank be pressurized, using procedure in Part II, Section D. Insure that tank is empty before pressurizing.
 - B-2 Drain tank and/or tanks to be repaired.
 - B-3 Remove access cover or covers to be resealed. Retain hardware for reuse.
 - B-4 Remove all existing old sealant from access covers and mating surfaces of the tank.

- B-5 Clean access covers and mating surfaces with cheese cloth dampened with MEK, Alcohol (99% Isopropyl) or acetone. Clean cover and surfaces until a clean cheese cloth shows no sign of dark smudge or stain.
- B-6 Insure that all covers and mating surfaces are cleaned before proceeding. Pot life of sealant is only 30 minutes.
- B-7 Mix Type C sealant as follows: One kit is enough for four (4) access covers (one wing).
- a. Storage life is at least 6 months when stored at temperatures below 80°F, in the original unopened containers.
 - b. Mix sealant according to instructions on the container. If weight measuring devices are not available for use, entire contents of kit can be mixed as each kit contains base compound and accelerator in proper proportions.
 1. Thoroughly stir the accelerator in its container until an even consistency is obtained.
 2. Slowly stir the accelerator into the base compound and thoroughly mix approximately 7 to 10 minutes. Be sure to scrape sides and bottom of container to include all base compound in the mixture and to assure uniform blending.
 - c. An application of $\frac{1}{2}$ hour (30 minutes) is given at 75°F and 50% relative humidity (R.H.). Application life will vary, depending on temperature. For every 15°F rise above standard (75°F and 50% R.H.) life is reduced by half and for every 15°F below standard life is doubled. High humidity at the time of mixing shortens application life.
 - d. Cure times depend on the ambient temperatures and relative humidity.
 1. For use in this kit a minimum of 48 hours will be used, at standard temperature and relative humidity.
 - e. Time to Pressurize - 45 minutes.
 - f. Time to Fuel - 2 hours.

- B-8 Apply sealant to wing mating surface in layer of 1/32" to 1/16" thick. Install cover immediately using hardware retained in Step B-3. Tighten screws in a staggered sequence to insure a more even pull down of cover. Remove excess sealant that has squeezed out, after sealant has cured.
- B-9 Repeat Step B-8 for all covers.
- B-10 If time permits or if desired fuel tank maybe pressure tested using procedure in Part II, Section D. Sealant requires 45 minutes cure before pressure checking.
- C. Return aircraft to flight status.
- D. Record compliance in the log book.

PARTS REQUIRED:

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>KIT 1</u>	<u>QTY.</u> <u>KIT 2</u>	<u>KIT 3</u>
Type A (PR 1435B 1/2)	Sealant-Quick Repair	1		
Type B (PR 1422B 1/2)	Sealant		1	
Type C (PR 1403GA 1/2)	Sealant-Access Cover	1	2	1

NOTE

These are two part sealant kits consisting of 3 1/2 Fl. oz. of Base Compound (packaged in a 1/2 pint can) and a separate container of accelerator.

Service Kit prepared by Gulfstream Aerospace Corporation,
P.O. Box 2206, Travis Field, Savannah, Georgia 31402.

FAA (DER) Approval of this Service Kit has been granted.