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P/N 122-590013-7

Volume 1 of 1

STARSHIP

NOTE: PRINTING

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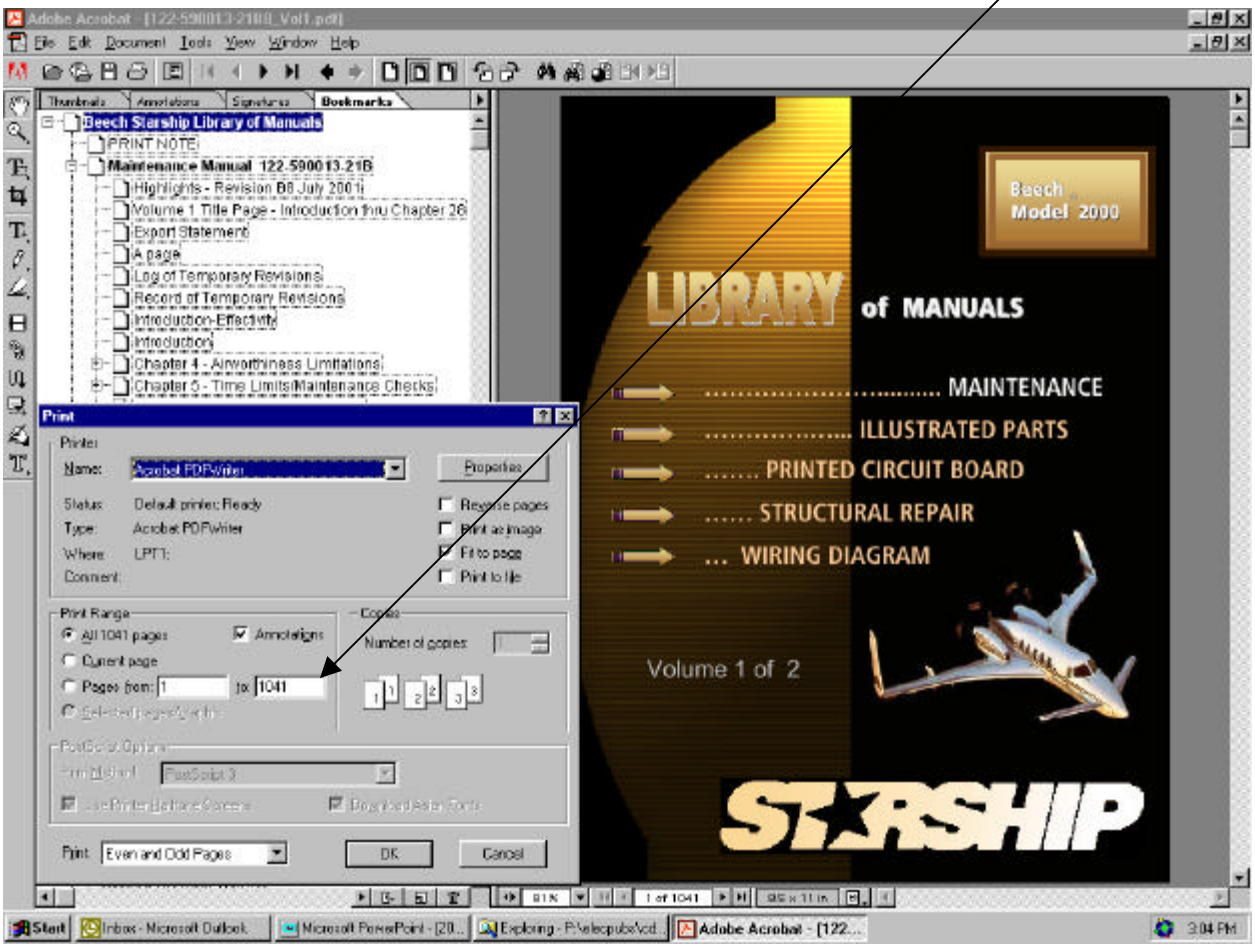

Beechcraft®

STARSHIP 1

MODEL 2000
NC-4 AND AFTER

STRUCTURAL REPAIR MANUAL

THIS MANUAL INCLUDES THE MAINTENANCE INFORMATION
REQUIRED TO BE AVAILABLE BY FAR PART 23.

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LIST OF EFFECTIVE REVISIONS

Always destroy superseded pages when you insert revised pages

Title Page . . . . . February 25, 1994
"A" Page A1

PART NUMBER	DATE	CHAPTERS AFFECTED
122-590013-7	November 10, 1989	Original Issue
122-590013-7A1	February 25, 1994	Introduction, 51, 54, 55, 91

NOTE: A list of effective pages will be found in the front of each chapter.

A1

Basic publications are assigned a part number which appears on the title page with the date of the issue. Subsequent revisions are identified by the addition of a revision code after the part number. A1 after a part number denotes the first revision to the basic publication, A2 the second, etc. Occasionally, it is necessary to completely reissue and reprint a publication for the purpose of obsoleting a previous issue and all outstanding revisions thereto. As these replacement reissues are made, the code will also change to the next successive letter of the alphabet at each issue. For example, B for the first reissue, C for the second reissue, etc.

When ordering a handbook, give the basic number, and the reissue code when applicable, if a complete up-to-date publication is desired. Should only revision pages be required, give the basic number and revision code for the particular set of revision pages you desire.

INTRODUCTION

LIST OF PAGE EFFECTIVITY

CHAPTER-SECTION-SUBJECT	*PAGE*	*DATE*
Introduction-Effectivity	1	Feb 25/94
Introduction	1	Feb 25/94
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INTRODUCTION (Effectivity: All)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

WARNING

Use only genuine BEECHCRAFT or BEECHCRAFT approved parts obtained from BEECHCRAFT approved sources, in connection with the maintenance and repair of Beech airplanes.

Genuine BEECHCRAFT parts are produced and inspected under rigorous procedures to insure airworthiness and suitability for use in Beech airplane applications. Parts purchased from sources other than BEECHCRAFT, even though outwardly identical in appearance, may not have had the required tests and inspections performed, may be different in fabrication techniques and materials, and may be dangerous when installed in an airplane.

Salvaged airplane parts, reworked parts obtained from non-BEECHCRAFT approved sources, or parts, components or structural assemblies, the service history of which is unknown or cannot be authenticated, may have been subjected to unacceptable stresses or temperatures or have other hidden damage, not discernible through routine visual or usual nondestructive testing techniques. This may render the part, component or structural assembly, even though originally manufactured by BEECHCRAFT, unsuitable and unsafe for airplane use.

BEECHCRAFT expressly disclaims any responsibility for malfunctions, failures, damage or injury caused by use of non-BEECHCRAFT approved parts.

NOTE

Service Publication reissues or revisions are not automatically provided to the holder of this manual. For information on how to obtain reissues or revisions applicable to this manual, refer to the latest revision of BEECHCRAFT Service Bulletin No. 2001.

The BEECHCRAFT Starship 1 Structural Repair Manual is prepared in accordance with the GAMA (General Aviation Manufacturers Association) Specification No. 2 format. It also meets the intent of the requirements of the ATA Specification 100 (Air Transport Association of America) with respect to the arrangement and content of the System/Chapters within the designated chapter-numbering system. The Structural Repair Manual is supplemented by the following publications:

NOTE

It shall be the responsibility of the owner/operator to ensure that the latest revision of publications referenced in this handbook are utilized during operation, servicing, and maintenance of the airplane.

- The BEECHCRAFT Starship 1 Illustrated Parts Catalog, P/N 122-590013-11
- The BEECHCRAFT Starship 1 Wiring Diagram Manual, P/N 122-590013-13
- The BEECHCRAFT Starship 1 Component Maintenance Manual, P/N 122-590013-9

- The BEECHCRAFT Starship 1 Maintenance Manual, P/N 122-590013-21
- The BEECHCRAFT Starship 1 Printed Circuit Board Manual, P/N 122-590013-49

NOTE

Beech Aircraft Corporation expressly reserves the right to supersede, cancel and/or declare obsolete any part, part numbers, kits or publication that may be referenced in this manual without prior notice.

CORRESPONDENCE (Effectivity: All)

If a question should arise concerning the care of your airplane, it is important to include the airplane serial number in any correspondence. The serial number appears on the model designation placard (see Chapter 11 of the BEECHCRAFT Starship 1 Maintenance Manual for placard location).

ASSIGNMENT OF SUBJECT MATERIAL (Effectivity: All)

The content of this publication is organized at four levels. The four levels are:

GROUP - Identified by different colored divider tabs. These are the primary divisions of the manual that enable broad separation of content. Typical of this division is the separation between Introduction and Structure.

SYSTEM/CHAPTER - The various groups are broken down into major systems such as DOORS, FUSELAGE, NACELLES, etc. The systems are arranged more or less alphabetically rather than by precedence or importance. They are assigned a number, which becomes the first element of the standardized numbering system. Thus, the element "**52**" of the number **52**-40-01 refers to the chapter "DOORS". Everything concerning Doors will be covered in this chapter.

SUB-SYSTEM/SECTION - The major systems/chapters of an airplane are broken down into sub-systems. These sub-systems are identified by the second element of the standard numbering system. The element "**10**" of the number 52-**10**-00 concerns itself with the passenger/crew portion of the Doors Chapter.

UNIT/SUBJECT - The individual units within a sub-system/section may be identified by the third element of the standard numbering system. The element "**01**" of the number 52-10-**01** is a subject designator. This element is assigned at the option of the manufacturer and may or may not be used.

APPLICATION (Effectivity: All)

Any publication conforming to the GAMA or ATA format will use the same basic numbering system. Thus, whether the manual be a BEECHCRAFT Starship 1 Maintenance Manual, or a BEECHCRAFT Starship 1 Parts Catalog, the person wishing information concerning the airstair door would refer to the System/Chapter Tab "52-DOORS". The table of contents in the front of this chapter will provide a list of sub-systems covered in this chapter. For example, the Doors chapter with a full index would contain:

52-00 General

52-10 Passenger-Crew

52-20 Emergency Exit

52-30 Cargo

52-40 Service

52-50 Fixed Interior

52-60 Entrance Stairs

52-70 Door Warning

52-71 Cargo-Airstair Door Warning

52-80 Landing Gear

52-90 Specific Repairs

Carrying this example further, the Airstair Door Damper could be assigned the number 52-10-30. The table of contents in the front of each chapter will list the items and numbers assigned.

All publications will use the standard numbering system even though all chapters and chapter sub-systems may not be applicable to your manual.

The material is arranged within the chapter in ascending numerical sequence. The Chapter-Section-Subject number and page number are found at the lower outside corner of each page.

LIST OF EFFECTIVE REVISIONS (Effectivity: All)

The List of Effective Revisions following the title page of the manual lists the revisions currently effective for the manual.

CHAPTER 51 - STRUCTURES

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51 - STRUCTURES

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Beechcraft
STARSHIP 1
STRUCTURAL REPAIR MANUAL

CHAPTER 51 - STRUCTURES

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GENERAL (Effectivity: All)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

REPAIR CLASSIFICATION (Effectivity: All)

NOTE

Inspection of the damaged area must be accomplished by visual inspection, tap test (refer to 51-30-00), and/or ultrasonic, impedance, or X-ray inspection to determine the extent of the damaged area to be repaired.

NOTE

All persons performing structural repairs must be trained and certified as a Composite Repair Technician by Beech Aircraft Corporation or their designee.

COSMETIC REPAIR (Effectivity: All)

Cosmetic repairs are done in the field with Beech Aircraft Corporation supplied kits by certified repair personnel. Cosmetically repaired damage must be limited to small structural surface damage in the form of an indentation with no internal delamination or disbond identified by inspection. The damage area must be determined to be a diameter of .50 inch or less for all areas except the wing fuel tank skins. Cosmetic repair for the wing fuel tank skins is limited to indentation damage of .250 diameter or less. Punctures of the facesheet may not be cosmetically repaired and require at least a standard repair.

STANDARD REPAIR (Effectivity: All)

Standard repairs are done in the field with Beech Aircraft Corporation supplied kits by certified repair personnel. Damage must be limited to: (1) facesheet delamination or disbond (2) puncture damage to laminate only or (3) puncture damage to the honeycomb core with damage to only one facesheet. The maximum sizes allowed for standard repairs, without prior Beech Aircraft Corporation Customer Support Department approval or supervision, is stated in Chart 1 for the various parts of the aircraft. Standard repairs may not extend into areas outlined in SUPERVISED REPAIRS or into a closeout area.

SUPERVISED REPAIRS (Effectivity: All)

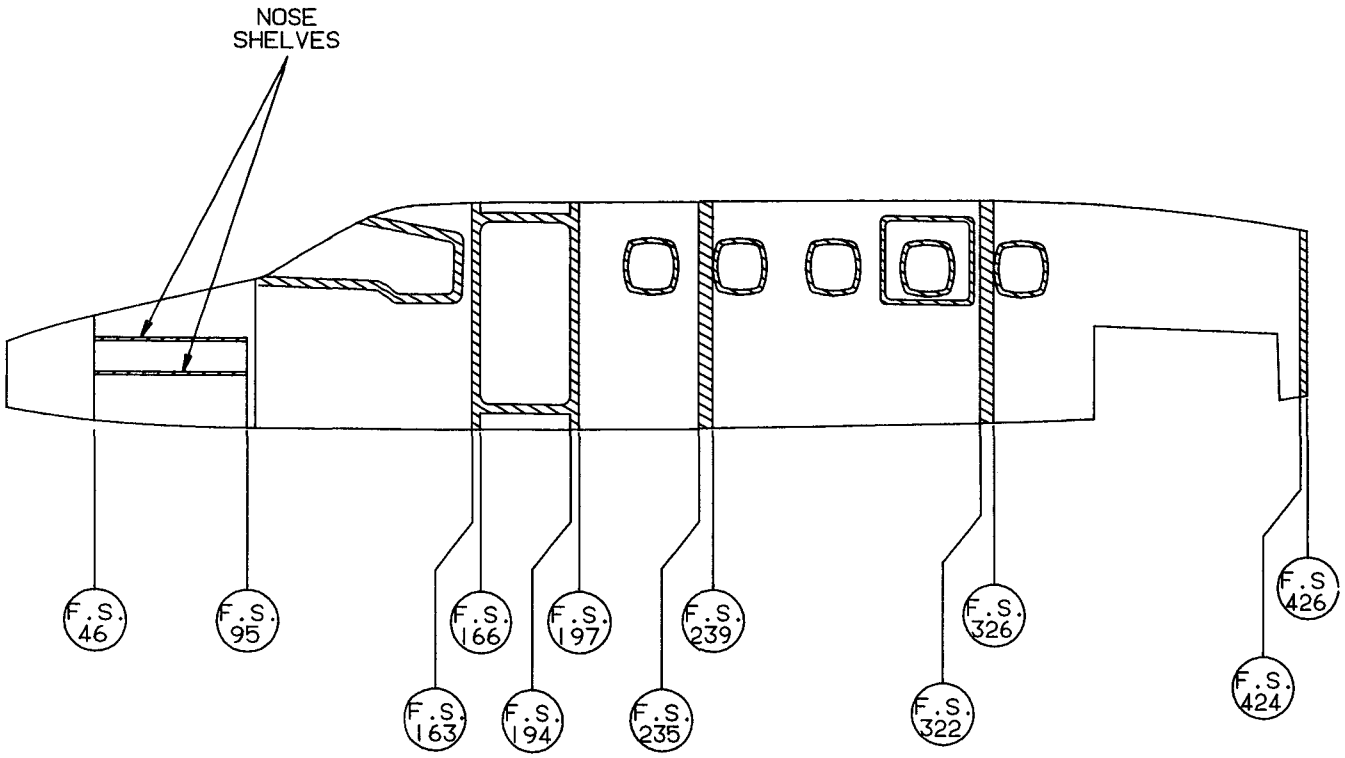
Supervised repairs are classified as those repairs done in the field by Beech Aircraft Corporation certified Composite Repair Technicians, with the approval or supervision of Beech Aircraft Corporation Customer Support Department. A supervised repair is to be performed if the damage is in a closeout area, if the damage is larger than that approved for a standard repair (refer to Chart 1), or if the damage is in any of the following areas:

- Fuselage (Figure 1)
  - Nose Assembly Upper and Lower Shelves.
  - All Pressure Bulkheads.
  - Aft Baggage Shelf (F.S. 357 to F.S. 415).
  - A 2.0-inch-wide band around the windshield opening on the inner and outer facesheets.
  - A 1.5-inch-wide band around all cabin window openings and escape hatch opening on the inner and outer facesheets.
  - A 3.0-inch-wide band around the cabin entry door on the inner and outer facesheet.
  - Two 4.0-inch-wide circumferential rings on the fuselage cabin shell: the first ring from F.S. 235 to F.S. 239 and the second ring from F.S. 322 to F.S. 326.
  - B.L. 0 Splice (F.S. 95 to F.S. 420).
  - A 2.0-inch-wide ring on the fuselage shell from F.S. 424 to F.S. 426.
  - Aft fuselage (F.S. 426 to F.S. 507) upper B.L. 0 skin cap.

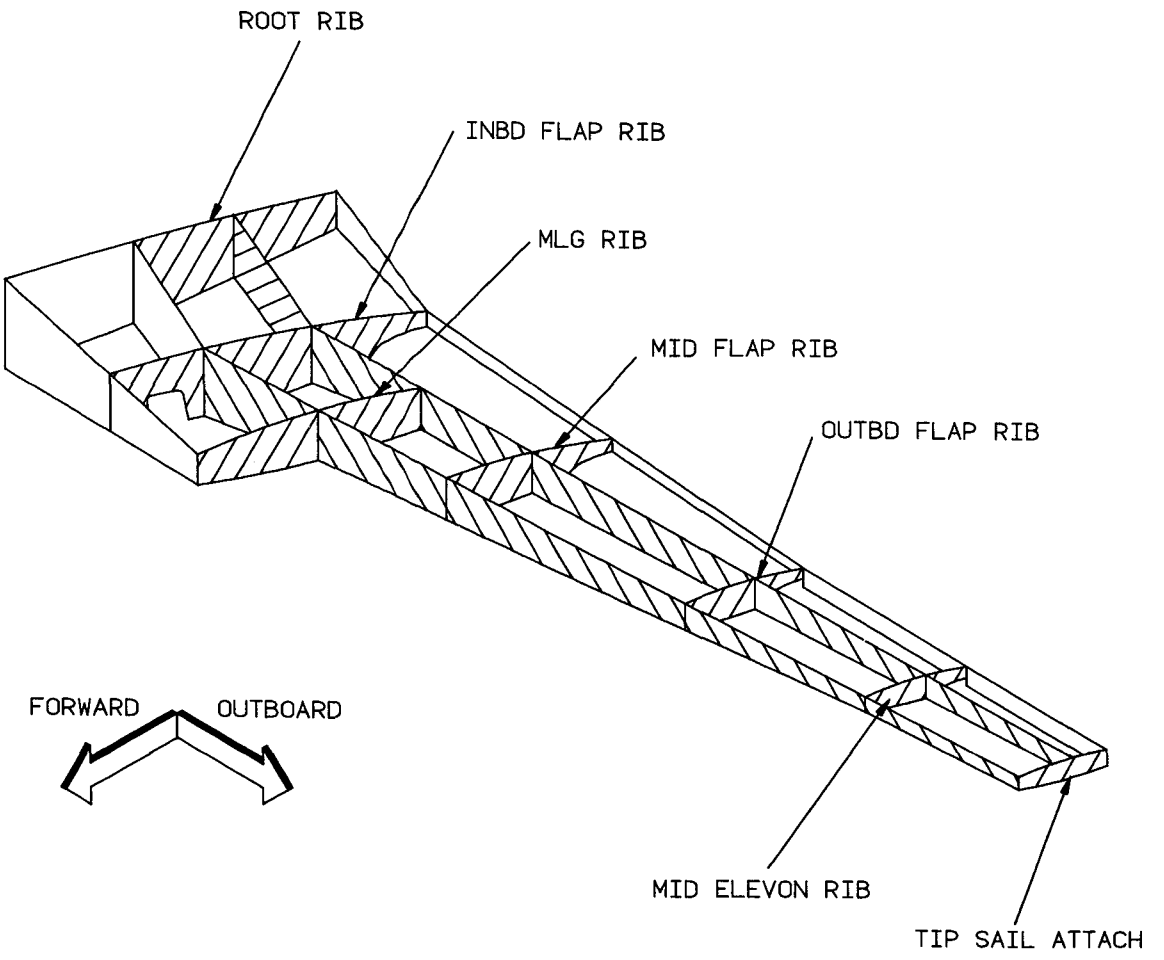
- Aft Wing (Figure 2)
  - Tipsail attachment area.
  - Spars that are only accessible from access panels in the lower wing skin.
  - Ribs that are only accessible from access panels in the lower wing skin.
  - Wing skins that are only accessible from access panels in the lower wing skin.
  - Leading edge attachment area.
- Forward Wing
  - All interior structure.
  - Fwd. spar caps.
  - Leading edge attachment area.
- Tipsail
  - All interior structure.
  - Leading edge attachment area.
- Fuel Tanks
  - Root rib.
  - Rear spar.
  - Leading edge attachment area.
  - All puncture damage to upper and lower skin.

CHART 1
MAXIMUM DAMAGE SIZE FOR STANDARD COMPOSITE REPAIR
(Effectivity: All)

Structural Area	Maximum Damage Size for Standard Repair
Aft Wing Upper Skin	1.0″ Dia.
Aft Wing Lower Skin	2.0″ Dia.
Aft Wing Spars	2.0″ Dia.
Aft Wing Ribs	2.0″ Dia.
Fuselage Pressure Cabin Skin	3.0″ Dia.
Tip Sail Inboard Skin	1.0″ Dia.
Tip Sail Outboard Skin	2.0″ Dia.
Tipsail Leading Edge	1.0″ Dia.
Fwd Wing Upper Skin	2.0″ Dia.
Fwd Wing Lower Skin	2.0″ Dia.
Control Surface Skins	2.0″ Dia. (requires rebalance)
Nacelle Skins	2.0″ Dia.
Cowling Skins	3.0″ Dia.
Landing Gear Doors	5.0″ Dia.
Fairings	No limit
Fuel Tank Skins	2.0″ Dia. (delams only, no punctures)
Ventral Fin Leading Edge	1.0″ Dia.



Cabin Shell Supervised Repair Areas (Effectivity: All)
Figure 1



Wing Supervised Repair Areas (Effectivity: All)
Figure 2

DAMAGE CLASSIFICATION (Effectivity: All)

Damage classification, as outlined in this structural repair manual, may range from superficial surface damage to permanent distortion of the structure of the airplane. The damage is referred to in three categories: cosmetic damage, repairable damage and replacement damage.

The following terms and conditions are used as a guide to aid in the determination of the damage to the airplane structure such as the skin, access doors, floor panels, etc. Terms and definitions, outlined in the subsequent glossary, are listed in alphabetical order.

The determining factor on damage is made from the terms and definitions listed in this manual. These terms are used in several chapters of this manual.

COSMETIC DAMAGE (Effectivity: All)

Superficial damage of this type, with no restrictions on flight operations, can be permitted to exist "as is" or be cosmetically repaired.

REPAIRABLE DAMAGE (Effectivity: All)

This type of damage will reduce the structural strength of the airplane. This is damage to the skin, bond or core that cannot be allowed to exist without placing performance restrictions on the airplane. The repair must meet or exceed the original structural strength. All permanent repairs must meet aerodynamic smoothness requirements as outlined in Chapter 51-20-00 under the heading EXTERIOR CONTOUR TOLERANCES in this manual. All repairs must meet the environmental durability requirements of the airplane.

REPLACEMENT DAMAGE (Effectivity: All)

Damage of this type is beyond repair limits and requires replacement of the damaged parts.

DAMAGE TYPES (Effectivity: All)

The following definitions reflect the common types and causes of damage to an airplane.

FATIGUE DAMAGE (Effectivity: All)

Fatigue damage occurs after an accumulation of flight hours on the airframe. Fatigue damage occurs near fasteners (rivets, screws, etc.) and components that are subjected to vibration or flexing. Inspections locate these descrepancies and repair procedures must be implemented.

IMPACT DAMAGE (Effectivity: All)

Impact damage occurs when the airplane strikes or is struck by some object. This type of damage may happen to an airplane at any time. In flight, the leading edges of the forward wing, aft wing and tipsails are the most likely to sustain impact damage. On the ground, the entire surface of the airplane is liable to sustain impact damage. All detected impact damage must be inspected for structure damage and flight control surface operation.

STRESS DAMAGE (Effectivity: All)

Stress damage occurs when the airplane is subjected to abnormal stress (rough flight, takeoff, landing, high winds while moored or an overloaded condition).

LIGHTNING STRIKE (Effectivity: All) (Figure 3)

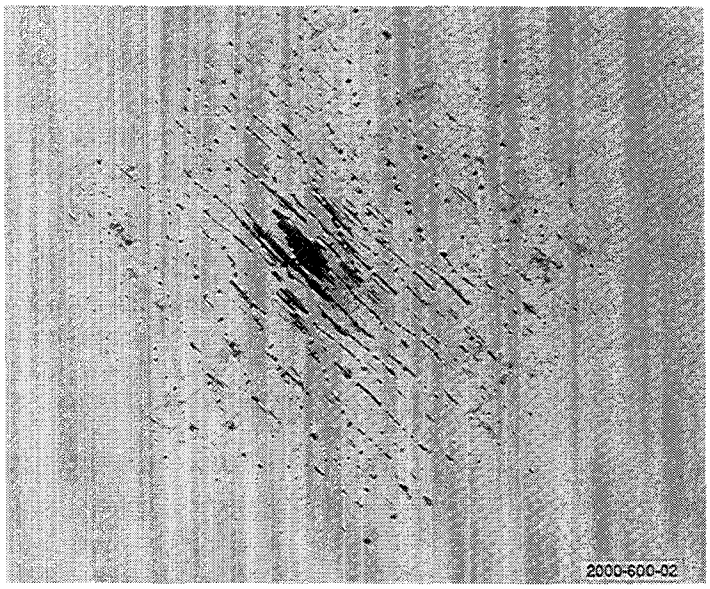
Lightning strike damage may vary in intensity, location, and type on the airplane. Figure 3 shows typical surface damage inflicted by lightning. Lightning damage always requires supervised repair.

THERMAL DAMAGE (Effectivity: All)

Thermal or burn damage occurs when composite materials are exposed to elevated temperatures. Thermal damage is apparent by discoloration or oxidation of the normal surface appearance (paint color and texture).

GLOSSARY OF AIRPLANE/COMPOSITE TERMS/ABBREVIATIONS (Effectivity: All)

A-Stage	An early stage in the reaction of thermosetting resins in which the material is still soluble in certain liquids and may be liquid or capable of becoming liquid upon heating. (Sometimes referred to as resol.)
Abrasion	A multitude of scratches where the outer material has been removed or damaged.
Accelerator	A substance that hastens a reaction, or the solidification in the case of thermosetting plastics.
Adhere	To cause two surfaces to be held together by adhesion.
Adherend	An object bonded or to be bonded to another by an adhesive.



Lightning Strike Damage (Effectivity: All)
Figure 3

Adhesive A glue-like substance that will produce a strong bond between two parts.

Advanced Composite Material A fabric or tape type material woven from high tensile strength fibers and saturated with an appropriate resin.

Aerodynamics The science that deals with the motion of air and the forces acting on solids in motion relative to the air.

Airfoil A surface or body, as a wing, propeller blade, rudder, or the like, especially designed to obtain a reaction, as lift or thrust, from the air through which it moves.

Airframe The assembled structural and aerodynamic components that support the different systems and subsystems integral to the vehicle.

Airworthy Suitability of the airplane or components to perform established functions within prescribed margins of safety.

Aluminum A ductile metallic element used to form many hard, light, corrosion-resistant alloys.

Aly Aluminum Alloy.

Alc Clad Aluminum.

Auxiliary (Aux) Subsidiary, Supplementary.

B-Stage An intermediate stage in the reaction of a thermosetting resin in which the material softens when heated and swells when in contact with certain liquids but does not entirely fuse or dissolve. Materials are usually precured to this stage to facilitate handling and processing prior to final cure. (Sometimes referred to as resistol.)

Balanced Laminate A composite laminate assembly (lay-up) which is symmetrical about its midply and in which all plies at angles other than 0 degrees or 90 degrees occur only in -+ pairs.

Bent Sharp deviation from the original line or plane, usually caused by a lateral force.

Binder A bonding resin used to hold strands together in a mat or preform during manufacture of a molded object.

Bleed To extract or drain off resin from a part or tool in a controlled manner.

Bleeder A nonstructural layer of material used in the manufacture of composite parts to allow the escape of excess gas and resin during the cure.

Blend To form or smooth metal or fiberglass so there is no sharp change or line from one area to another.

Blister A local elevation on the surface of a laminate.

Bond The adhesion of one surface to another, with or without the use of an adhesive.

Bond (Electrical) Specifically, a system of connections between parts or other structure forming a continuous electrical unit and preventing jumping or arcing of static electricity.

Bond Strength The amount of force required that will break the bond within the adhesive itself or along the line between the adhesive and the part.

Bond Void Absence of adhesive between bonded parts, or porosity to such a degree that it appears as such. A condition where adhesive is present but adhered locally as detected by impedance or tap testing. Edge voids are those which can be seen from the edge of a bondline. Island voids are buried within a bondline.

Bowed Curved or gradual deviation from the original line or plane, usually caused by lateral force.

Breaking Removal of a minimum of material from external edges, by a slight chamfer or radius, to prevent cutting.

Breather A loosely woven material, such as glass fabric, which serves as a continuous vacuum path over a part but does not come in contact with the resin. It is not a ply of the final part.

Bridging A condition causing a void where one or more plies of tape or fabric span a corner without seating into it.

Buildup An area within a laminate made thicker by the addition of plies or layers or material.

Bulkhead (Bhd) A partition or frame serving to divide, support, or give shape to the structure.

Burrs A sharp projection or rough edge remaining after drilling a hole, machining or rework.

C-Stage The fully cured state of a thermoset resin. In this state, the material will not soften if it comes in contact with solvents and will not fuse or permanently degrade at temperatures up to the cure temperature.

Carbon Fibers Fibers made from a precursor by oxidation and carbonization, but not having a graphitic structure.

Cast To form material into a certain shape by pouring it into a mold and letting it harden without applying external pressure.

Catalyst A substance which markedly speeds up the cure of a compound when added in minor quantity as compared to the amounts of primary reactants.

Caul Plates A smooth plate, of the appropriate size and shape, used in immediate contact with the lay-up during the curing process to transmit normal pressure and provide a smooth surface on the finished part.

Centerline (CL) A line equidistant or at the average distance from the sides or outer boundaries.

Chafed Frictional wear damage, usually caused by two parts rubbing together with limited motion.

Chord The longitudinal straight line connecting the leading and trailing edges of an airfoil section.

Chromate Tape See "Vacuum Bag Sealing Tape".

Closeout The area at the edge of a part, or an opening in the part, in which the part-thickness dimension decreases from the full core thickness.

Co-Bonding The process of adhesive bonding three or more parts or assemblies during the same bond cycle.

Co-Curing The process of curing a composite laminate and simultaneously bonding it to some other prepared surface during the same cure cycle.

Cohesion The mutual chemical attraction that holds a substance together.

Cold Pressing A bonding operation in which an assembly is subjected to pressure without the application of heat.

Collapsed Inward deformation of the original contour of a part, usually due to high pressure differential.

Compatibility Ability of two or more substances to mix together without separation or reaction.

Compaction	A process of removing as much of the air as possible in a laminate prior to its final cure.
Composite Material	A material formed by the combination of two or more other materials which differ greatly and retain their separate identities in the final product.
Composition	Mixture of ingredients before molding.
Contact Pressure Resins	Liquid resins which thicken (resinify) when bonding laminates, and require only enough pressure to assure intimate contact.
Concentricity	Perfect roundness about a common center.
Control Surface	Any movable airfoil used to guide or control an airplane in the air, including the rudder, elevators, elevons, forward wings and trim tabs.
Core Crush	A collapse, distortion or compression of the core of a honeycomb sandwich assembly.
Core Depression	A localized indentation or gouge in the core of a honeycomb sandwich assembly.
Core Separation	A partial or complete breaking of the bonding of core to the facesheet in a honeycomb sandwich assembly.
Core Splicing	The joining of segments of honeycomb core material by bonding.
Cowling	A covering placed over or around an airplane component or section for directing and regulating the flow of cooling air, for streamlining or for protecting the part or section covered, specifically, an engine cowling.
Crack	A Visible partial separation of material which may progress to a complete break.
Crazing	Apparent fine cracks at or under the surface of an organic matrix. (The crazed areas are composed of polymeric material of lower density than the surrounding matrix.)
Cross Laminated	Laminated so that some of the plies are transverse with respect to the grain or strongest direction in tension.
Crossply	Any ply in which the fibers run transverse to the grain or strongest direction.
Crushed	Destruction of a part or structure by a squeezing force which changes the original shape.
Cure	To change the properties of a thermosetting resin irreversibly by chemical reaction.
Curing Agent	That part of a two-part adhesive which combines with the resin (binder) to produce a cured adhesive film.
Curing Stage	The acceleration of a liquid to a stable solid through controlled application of heat.
Curing Temperature	Temperature to which a resin or an assembly is subjected in order to cure the resin.
Cut	One or more plies of fabric severed along a line.
Datum Line	A base line or reference line of which calculations from measurements are taken.
Debulk	Bagging normally associated with the partial removal of resin by heating a prepreg or wet laminate.
Deflection	The turning away from the original shape or direction by an undesired force.

Delamination A separation between plies of a laminated assembly.

Dent A surface indentation with a rounded bottom, usually caused by impact with a foreign object. The material is displaced. Dents in the skin that are stable and not accompanied with disbond, delamination, or broken fibers are classified as negligible damage.

Dihedral The upward or downward inclination of an airplane's wing from root to tip with respect to the horizontal. If the inclination is upward, the dihedral is positive; if downward, the dihedral is negative.

Dimensional Stability Ability of a material part to retain the precise shape in which it was molded, fabricated, or cast.

Disbond A separation between bonded parts.

Discoloration An abnormal coloration, usually caused by heat.

Distortion Extensive deformation of the original shape of a part, usually due to structural stresses, excessive localized heating, or any combination of these conditions.

Drag A resistant force exerted in a direction opposite to the direction of motion and parallel to the relative gas or airstream.

Drying Temperature The temperature to which an adhesive primer is subjected to become set.

Drying Time The period of time during which an adhesive primer is allowed to dry with or without the application of heat and/or pressure.

Ductility The ability of material to undergo plastic elongation under stress.

Edge Distance (ED) The measurement associated with the distance from the center line of a fastener to the edge of the material.

Elongation A stretching or lengthening of original dimensions, usually applied to holes or elements allowing visual measurement.

Envelope Bagging Vacuum bagging in which the master and tool are contained within two diaphragms and totally compressed.

Epoxy Resin A flexible, usually thermosetting resin capable of forming tight cross-linked polymer structures characterized by toughness, strong adhesion, and high corrosion and chemical resistance. The very thick fluid substance applied to woven graphite fabric as the "matrix" in the production of "prepreg" Graphite/Epoxy material.

Erosion A carrying away of material by the flow of fluids or gases, accelerated by heat or grit. This type of surface breakdown should not be confused with paint flaking.

Excessive Greater than the usual or specified amount. More than normal.

Exotherm A chemical change in which heat is liberated.

Fabric A material constructed of interlaced yarns, fibers, or filaments.

Fairing An auxiliary member or structure whose primary function is to reduce head resistance or drag of the part to which it is fitted.

Fairlead A form of rubbing block used to protect or guide a cable when it passes through a hole cut in a web, rib, etc.

Faying Surface That surface of a part or assembly that comes in contact with the surface of another part or assembly.

Fiber A single fine strand of thread of natural or synthetic material.

Fiber Direction	The orientation or alignment of the longitudinal axis of the fiber with respect to a given axis.
Fiber Volume	The amount of fiber present in a composite material as percentage of total volume.
Filament	See Fiber
Filament Winding	An automated process in which a continuous filament or tape (treated with a resin) is wound in a pattern on a mandrel.
Fill	The yarns or tows in a fabric that run perpendicular to the warp.
Filler	A material added to a basic material to alter its properties.
Finish (F)	Protective coating applied to material.
Firewall	A fireproof or fire-resistant bulkhead between the engine and the airplane.
Flash	Resin extruded from the edges of a joint or from parts during the cure cycle.
Flaws	Irregularities such as scratches, nicks, grooves, cracks, and granular disturbance of the structure of the composite.
FOD	Foreign object damage.
Foreign Object	A piece of material not normally found in or around a part or location.
Forward (Fwd)	Any point in front of the designated position.
Friction	A rubbing together of two parts, resisting motion, usually causing excessive wear.
Fuselage	The main structure or central section of an airplane.
Gap	An opening, break, space, or separation.
Gouge	Scooping out of material or breakdown of a surface, usually caused by excessive rubbing of adjacent parts. Displacement or loss of material results.
Hardner	A substance or mixture of substances added to an adhesive or plastic composition to promote or control the curing reaction by taking part in it.
Heat Tack	A process by which adhesives are applied to layups with a small electric iron or heat gun.
High Temperature Cure Adhesives	Adhesives which require temperatures above 72 degrees F to set or cure.
Homogeneous	A term which describes a material of uniform composition throughout.
Honeycomb	A light-weight, cellular material, resembling natural honeycomb, used as a core in sandwich assembly construction.
Honeycomb Sandwich Assembly	A structural composition consisting of relatively dense, high-strength facings (skin) bonded to a light-weight, cellular honeycomb core.
Impregnate	The application of resin onto fibers or fabric. The application of resin to composite material.
Indications	Cracks, inclusions, fractures, etc. which are not visible and located only by additional testing.
Inhibitor	A substance which slows a chemical reaction.
Internal	Inside the surface or structure.
Intercostal	Intermediate structure located between ribs.
Jig	An accurately constructed frame work, used as an aid in assembling and aligning structural components and assemblies.
Joggle (JOG)	An offset area designed into parts to permit smooth overlapping or splicing.
Joint, Bonded	That part of a structure at which two adherends are held together with a layer of adhesive.

Kevlar (DuPont Trademark)	An Aramid organic fiber similar to fiber glass but having a higher strength to weight ratio. An advanced composite material.
Kink	A short, tight twist or curl caused by doubling or winding of something upon itself.
Lamin	Any single ply.
Lamina	Plies of a laminate.
Laminate	A product made by curing together two or more plies (layers) of material. To unite sheets of material.
Laminate Orientation	The configuration of a composite laminate with regard to the angles of ply direction. The exact sequence of the individual plies.
Lamination	The process of preparing a laminate.
Lay-up	The uncured stack of "prepreg" plies ready for vacuum bagging. The process of stacking or nesting uncured plies into a desired shape, ie. common form of lamination.
Leading Edge (L.E.)	The foremost edge of an airfoil.
Longitudinal	The length or lengthwise dimension, usually the longest area.
Loose, Broken or Dry Fibers	Where one or more tows have been pulled away, have had the resin removed or were never covered with resin during cure.
Marks	A visible impression, scratch, score, gouge, etc.
Maximum (Max)	The greatest possible quantity, degree, or number.
Minimum (Min)	The least possible quantity, degree, or number.
Mismatched	Improper association of two or more parts.
Mispositioned	Improper installation of a part resulting in damage to the installed part or associated parts.
Mold Line (ML)	An arbitrary reference line.
Monocoque	A type of airplane construction in which the skin of the fuselage bears the primary stresses in the fuselage. This type of fuselage may be provided with bulkheads. If provided with longerons, it becomes semi-monocoque.
Nacelle (Nac)	A separate, streamlined enclosure on an airplane for housing an engine.
Nesting	The lamination sequence in which the warp surface of one ply is laid against the warp surface of the succeeding ply.
Nesting Tool	A fixture which will support a laminate during the lay-up and cure cycle but is not permanently attached to the tool.
Nick	A sharp surface indentation caused by impact of a foreign object. Material is displaced, but seldom separated.
Oleo Strut	A telescoping unit which when compressed, forces oil through an orifice and thereby absorbs energy.
Out-of-Round	An imperfect or unbalanced circular or spherical form.
Peel Ply	A final ply of nylon, polyester or non-pourous teflon placed over the lay-up. After curing, this ply is removed from the laminate, leaving a mat non-shiny surface.
Pin Holes	Small cavities through the thickness of a cured skin.
Peripheral	The outer surface or edge of a body.
Pits	Small, irregular shaped hollows in the surface.
Ply	A single layer of tape or fabric.

Ply Orientation The tow filament direction of unidirectional tape or the warp direction of biaxial fabric with respect to the reference axis of a part. Orientation angles are usually 0, +45, 90, or -45 degrees.

Porosity A void, air bubbles, or gas bubbles trapped within a cured resin.

Post Cure The exposure of certain resins to higher than the initial curing temperatures after the initial cure cycle. Post cure is necessary to attain the complete cure and desired mechanical properties of higher service temperature resins.

Pot Life The length of time at room temperature before a catalyzed resin has hardened to an unworkable state.

Prepreg Kevlar, Graphite, epoxy or fiberglass material preimpregnated with resin and ready for laminating.

Primer A coating applied to a surface before the application of adhesive or paint finish to improve the performance of the bond.

Propagation To grow or spread out, usually referring to cracks or delamination.

Puncture A hole made by a sharp object.

Radius The distance from the center of a circle to the outside edge. Often used to discuss a curve in the material.

Reinforced Plastic Thermosetting resin reinforced with materials such as fiber glass, boron, carbon fiber, etc. to produce a structural material far superior to the base resin.

Resin Any of various solid or semi-solid amorphous natural or synthetic organic substances with indefinite and usually high molecular weights and no sharp melting point. They are usually transparent or or translucent, yellowish to brown in color, and soluble in organic solvents. The epoxy matrix in which the fibers of graphite material are imbedded.

Resin Batch Resins mixed in one mixer in one operation.

Resin-Starved Those areas on the cured surface where the fibers are not covered with a smooth resin finish.

Room Temperature Cure Adhesive or Resin Adhesives which set at 68 degrees to 86 degrees F, inclusive.

Rubbed To move with pressure or friction against another part.

Rudder A movable control surface, attached to the ventral fin, by which an air vehicle is guided in the horizontal plane.

Sandwich Construction A structural panel consisting in its simplest form of two relatively thin, parallel sheets of structural material bonded to and separated by a comparatively thick, lightweight core. The resulting assembly has a high stiffness-to-weight ratio.

Scarf Joint A joint made by cutting away similar angular segments of two adherents and bonding the adherents with the cut areas fitted together.

Scrim A fabric woven into an open mesh construction and used to maintain resin or adhesive in place during processing.

Scratch A surface condition where the resin has a fine cut but with no fiber penetration.

Secured Correctly installed or fastened so as not to loosen.

Separation A space or gap caused by two parts moving away from each other.

Set To convert an adhesive into a fixed or hardened state by chemical or physical action (cure).

Setting Temperature The temperature to which an adhesive is subjected to cause set.

Shelf Life The length of time a material, substance, product or reagent can be stored under specified environmental conditions and continue to meet all applicable specification requirements and/or remain suitable for its intended function.

Skin The outside sheet covering of an airplane structure.

Slot An air gap between a wing and the length of a slot or certain other auxiliary airfoils, the gap providing space for airflow or room for the auxiliary airfoil to be depressed in such a manner so as to make for smooth air passage on the upper surface.

Snug A close fit between two parts.

Solvent A substance (usually a liquid) used for dissolving and/or cleaning materials.

Span The maximum dimension of an airfoil from tip to tip. The maximum width of an airplane from wing tip to wing tip.

Spar Any principle structural member in an airfoil, especially in a wing, running from tip to tip or from root to tip.

Stabilizer Any airfoil or any combination of airfoils considered as a single unit, the primary function of which is to give an airplane stability; specifically, the tipsail or the forward wing.

Stacking The lamination sequence in which the warp surface of one ply is laid against the fill surface of the preceding ply.

Storage Life The period of time during which a packaged adhesive can be stored under specified conditions and remain suitable for use (shelf life).

Stress Force running through an object or material, caused by an external load, usually from tension, compression, torsion, or a shearing force.

Stretched Elongation of a part as a result of exposure to operating conditions (tension-type stress).

Tack That property of an adhesive or prepreg that enables it to stick immediately after it and the adherends are brought into contact under pressure.

Tape A material in which the graphite filaments are laid in a single direction within a resin matrix. (Unidirectional material).

Tensile Strength The ability of a material to resist forces which tend to stretch or lengthen it.

Thermoset Resin A material which undergoes a chemical reaction by the action of heat, catalysts, ultraviolet light, etc., leading to a relatively infusible state. A resin material that will irreversibly harden as the result of certain chemical reactions.

Torn Separation by pulling apart.

Torque Any resistance to a turning or twisting action about an axis.

Torque Tube A tubular member designed to resist torsional loads and moments.

Tow A loose, untwisted bundle of filaments.

Trailing Edge (TE) The rearmost edge of an airfoil.

Transverse Extended or lying crosswise, usually cracks or scratches across material.

Twisted A change in the original shape of a part by a turning motion, sometimes called distortion.

Typical (TYP) Exhibiting the traits or characteristics peculiar to a kind, group, or category.

Uneven Wear A general condition of localized, unevenly distributed wear. This condition includes hollows, shiny spots, uneven polish, and other visual indications of rotating parts; includes abrasion of parts subject to fluid, air, or gas flow.

Vacuum Bag An airtight flexible sheet placed over a lay-up and sealed along its edges. The bag is fitted with vacuum ports. During the cure cycle, vacuum is applied, the bag is evacuated, and the lay-up is compacted by pressure.

Vacuum Bag Sealing Tape A thick, rubber based adhesive tape that is sticky all around and is used to form an airtight seal along the edges of vacuum bags.

Void An empty space, opening, cavity or gap.

Warp The yarns or tows of a fabric that run along the length of a fabric.

Warp Direction The direction of the warp yarns or tows in a fabric or tape.

Wet Lay-up A composite fabrication process in which non-impregnated material is laid up. A liberal amount of liquid epoxy resin is applied to each ply. The excess resin is removed by squeegee, vacuum bagging, and/or debulking processes.

Wing An airfoil on either side of an airplane's fuselage or flight compartment, paired off by one on the other side. The two airfoils provide the principal lift for the airplane.

Wing Root The very base of an airplane's wing, where it joins and is faired into the fuselage.

Wing Spar A principal spanwise tension and compression member of the wing structure of an airplane.

Wire Mesh A fine, screen-like metal used in outer skin laminates for lightning strike protection.

Work Life The period of time during which a compound, after being mixed with a catalyst, solvent, or other compounding ingredient, remains suitable for its intended use. (Pot life.)

Worn Material or part consumed as a result of exposure to operation or usage.

Yarn Strands of fibers or filaments in a form suitable for weaving or otherwise intertwining to form a fabric.

AIRPLANE DIMENSIONS, AREAS, STATIONS AND ZONES (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

CAUTION

Before towing, or moving the airplane by hand, ensure that the lower nose skin panels are installed and secured and the cabin door is closed and latched. Refer to Chapter 9-10-00 of the Starship 1 Maintenance Manual for towing instructions.

AIRPLANE STATIONS (EFFECTIVITY: ALL) (FIGURES 3, 4, 5, 6 AND 7)

To facilitate the location of various assemblies, components, areas and structural members of the airplane, reference points are measured in inches along three axes as shown in Figure 3. When a specific component, assembly or structure is located in this manual by reference points, it can be easily found by measuring from known points on the airplane. The stations diagrams shown in Figures 4 through 8 illustrate the position of these points on the airplane. The following reference points are used in this manual:

CENTERLINE - An imaginary vertical plane dividing the airplane into two halves longitudinally.

FUSELAGE STATION (F.S.) - A length measurement along and perpendicular to the centerline of the airplane. Fuselage Station 0.00 is located at the nose radome.

WATERLINE (W.L.) - A vertical measurement from a horizontal plane located below the fuselage bottom. Waterline 0.00 is located 61.25 inches below the fuselage bottom.

BUTTOCK LINE (B.L.) - A width measurement left or right of and parallel to the centerline. Right or Left is added to indicate the direction from the centerline (L.B.L. or R.B.L.). Buttock Line 0.00 is the centerline of the airplane.

AIRPLANE ZONES (EFFECTIVITY: ALL) (FIGURES 8, 9, 10 AND 11)

In order to simplify the location of airplane components, aid in repair planning and provide a simple way of identifying access doors and panels, the airplane has been divided into easily identifiable zones for reference location.

These zones follow a logical arrangement with boundaries generally defined by major structural components of the airplane, i.e. bulkheads, wing spars, ribs, major partitions, cabin floor, control surface boundaries, etc.

Zone identification is provided by a three-digit number that adheres to a standardized major zone description. The numbering sequence within these major zones will, in most instances, conform to the following order: front to back, left to right (within the fuselage), bottom to top and inboard to outboard (pertaining to the wing).

CHART 1

AIRPLANE ZONES (EFFECTIVITY: ALL)

ZONES	DESCRIPTION
100	Lower Half of Fuselage (radome, side nose avionics compartments, compartments under the lower nose shelf, area below cockpit floor, cabin floor and cabin seat decks to the aft pressure bulkhead).
200	Upper Half of Fuselage (Compartments above the lower nose shelf, area above cockpit floor, cabin floor and cabin seat decks to the aft pressure bulkhead including the aft baggage compartments.
300	Tail Section
400	Engine Compartments, Spinners and Props
500	Left Forward and Aft Wings
600	Right Forward and Aft Wings
700	Landing Gear, Wheel Wells and Doors
800	Doors

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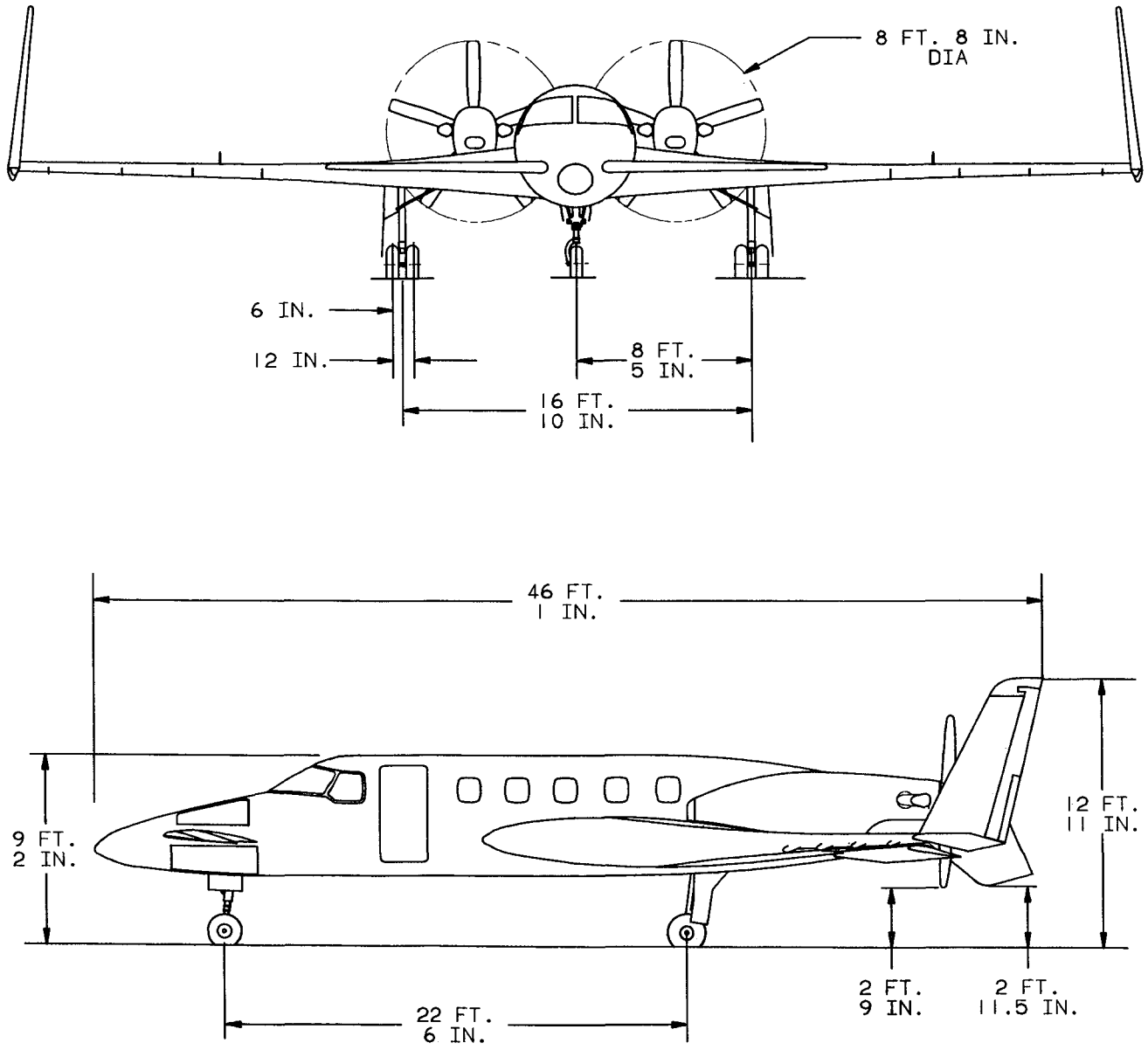
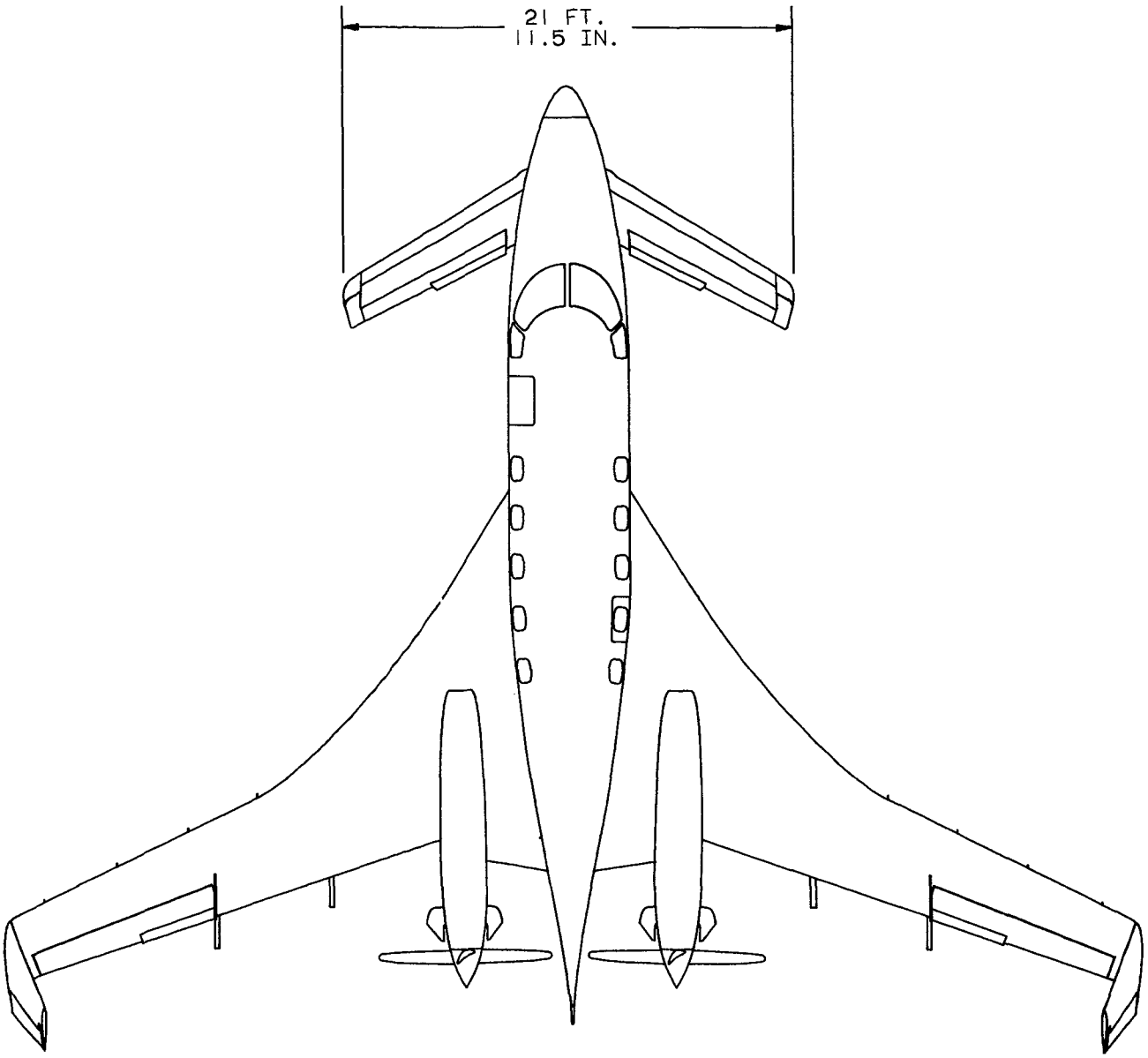


Airplane Dimensions (Effectivity: All)
(Sheet 1 of 3)
Figure 1

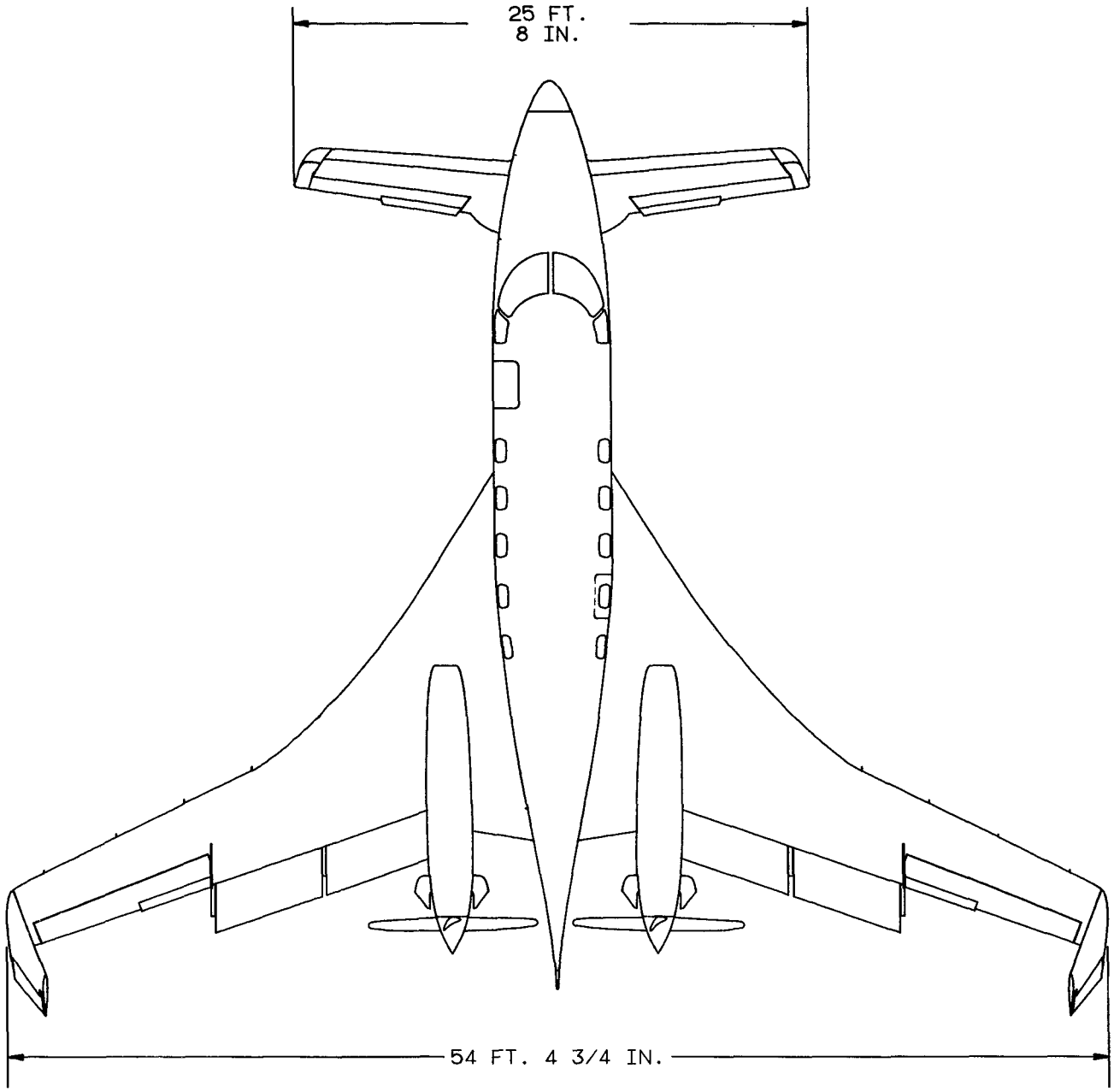


AIRPLANE SHOWN IN CRUISE MODE.

NOTE FORWARD WING POSITION AND RETRACTED FLAPS.

2000-607-02

Airplane Dimensions (Effectivity: All)
(Sheet 2 of 3)
Figure 1



AIRPLANE SHOWN IN LANDING AND/OR TAKEOFF MODE.

NOTE FORWARD WING POSITION AND EXTENDED FLAPS.

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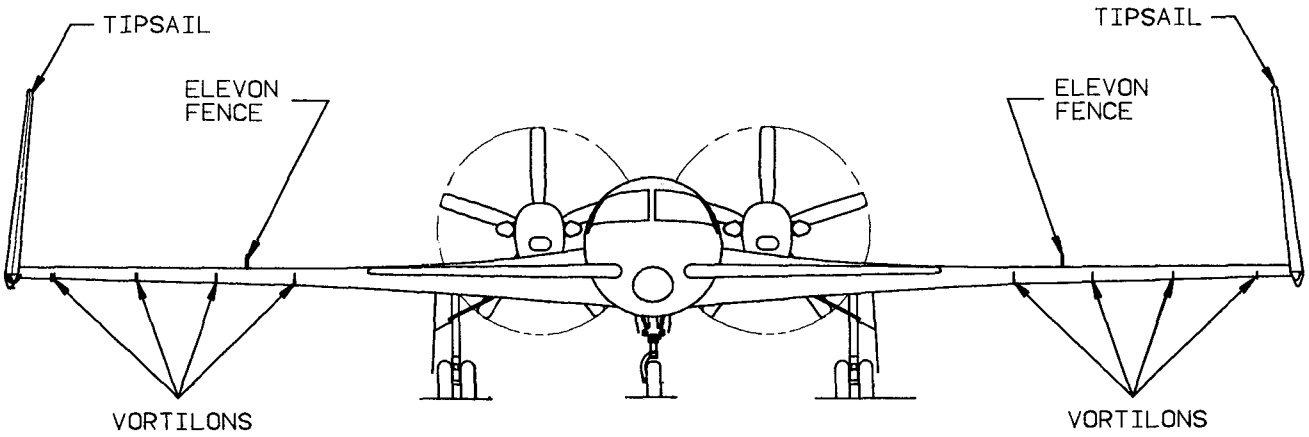
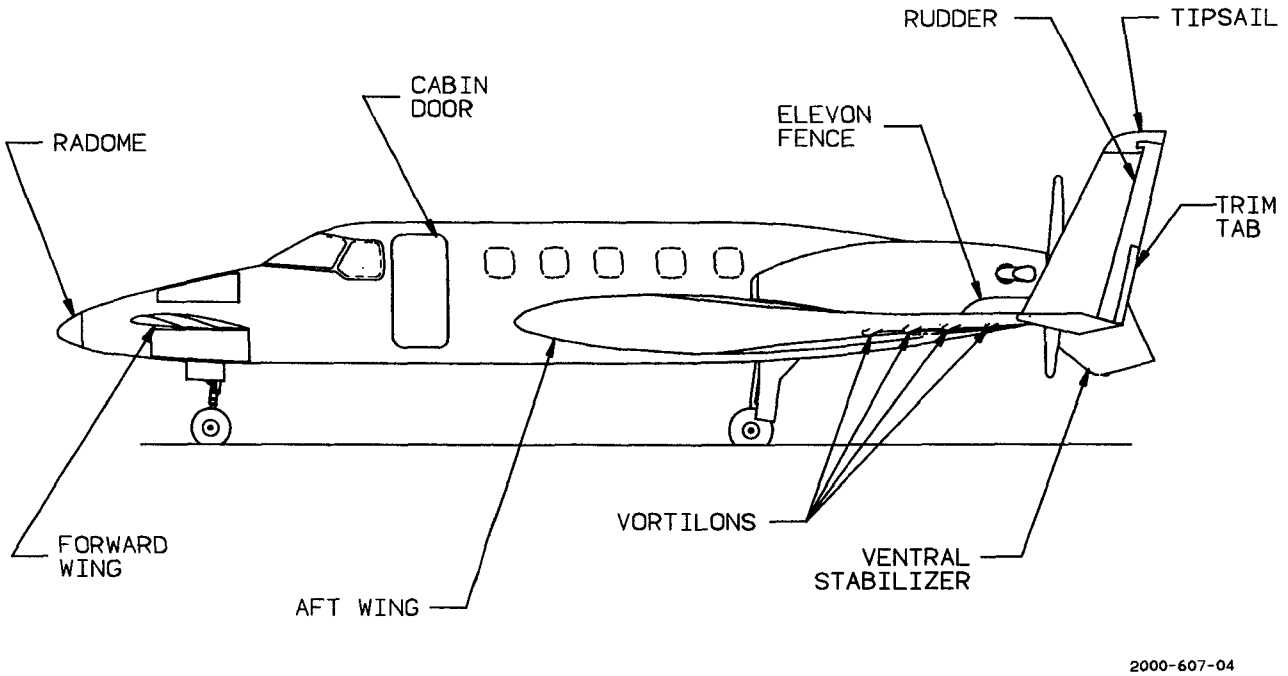
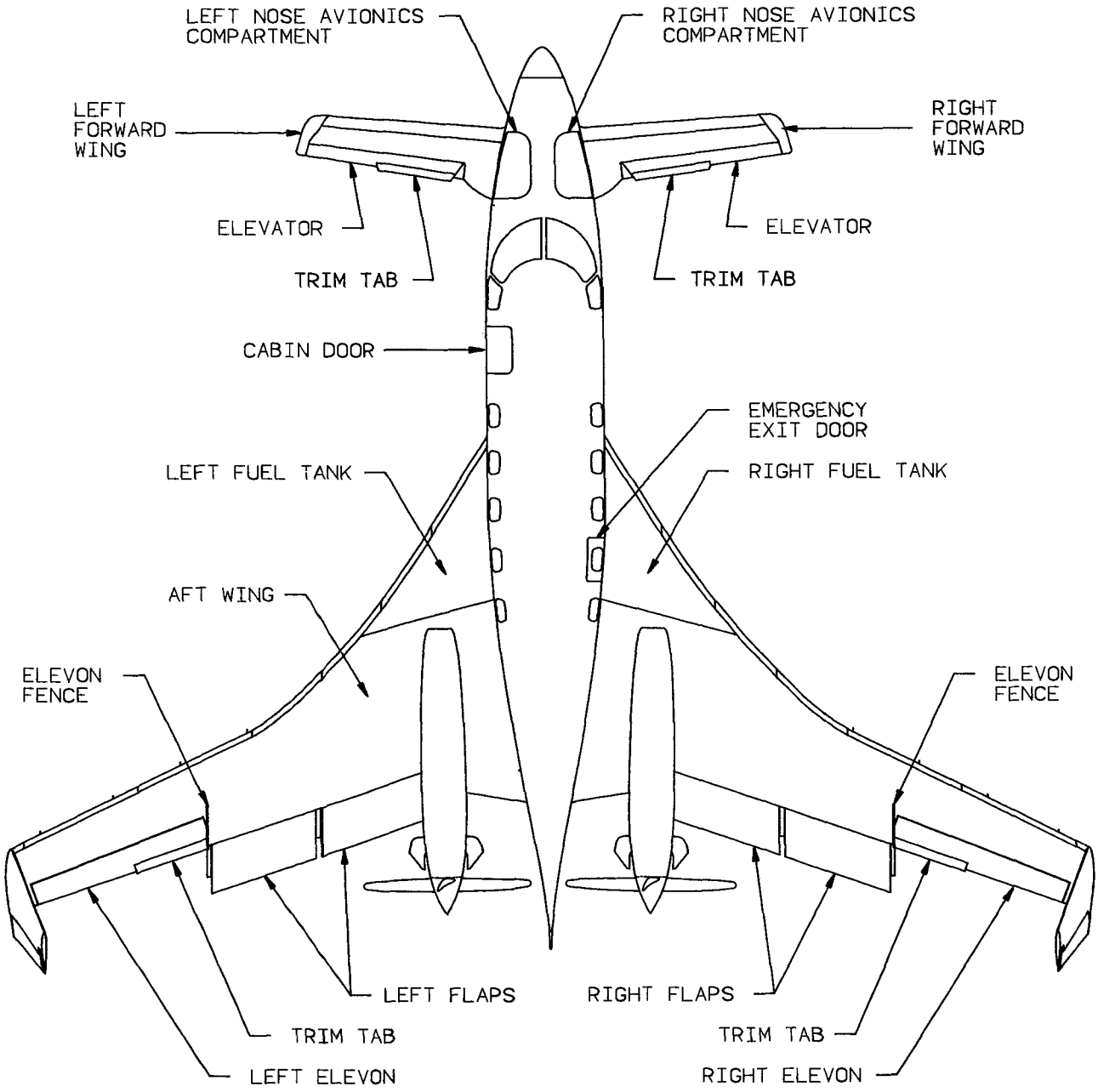
Airplane Dimensions (Effectivity: All)
(Sheet 3 of 3)
Figure 1

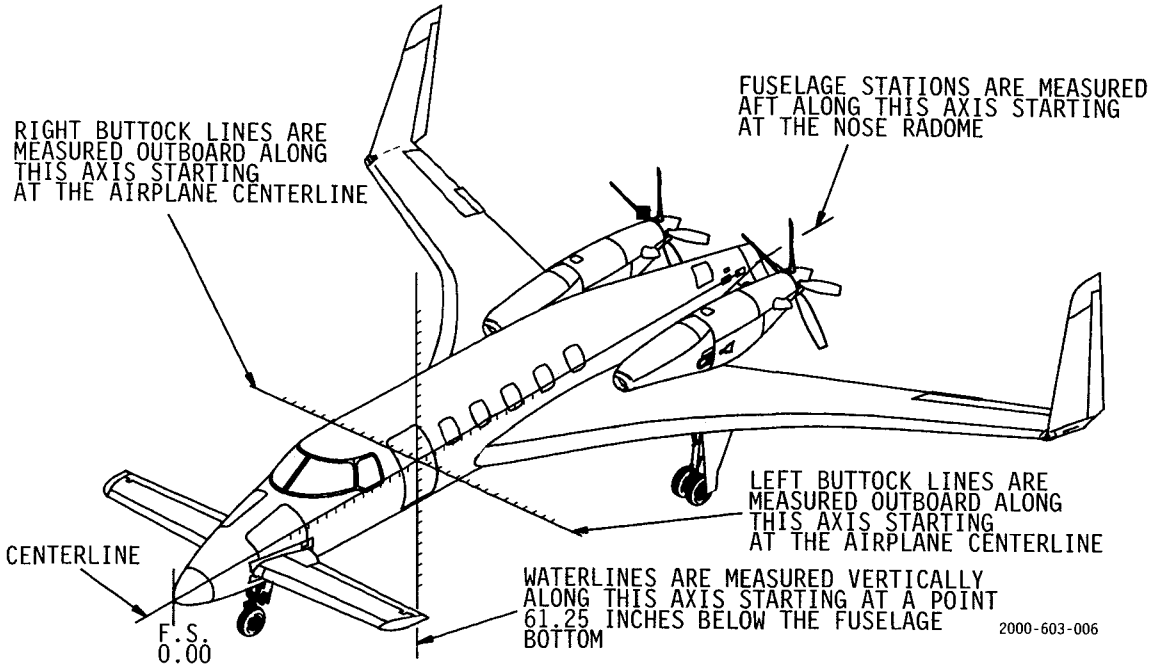




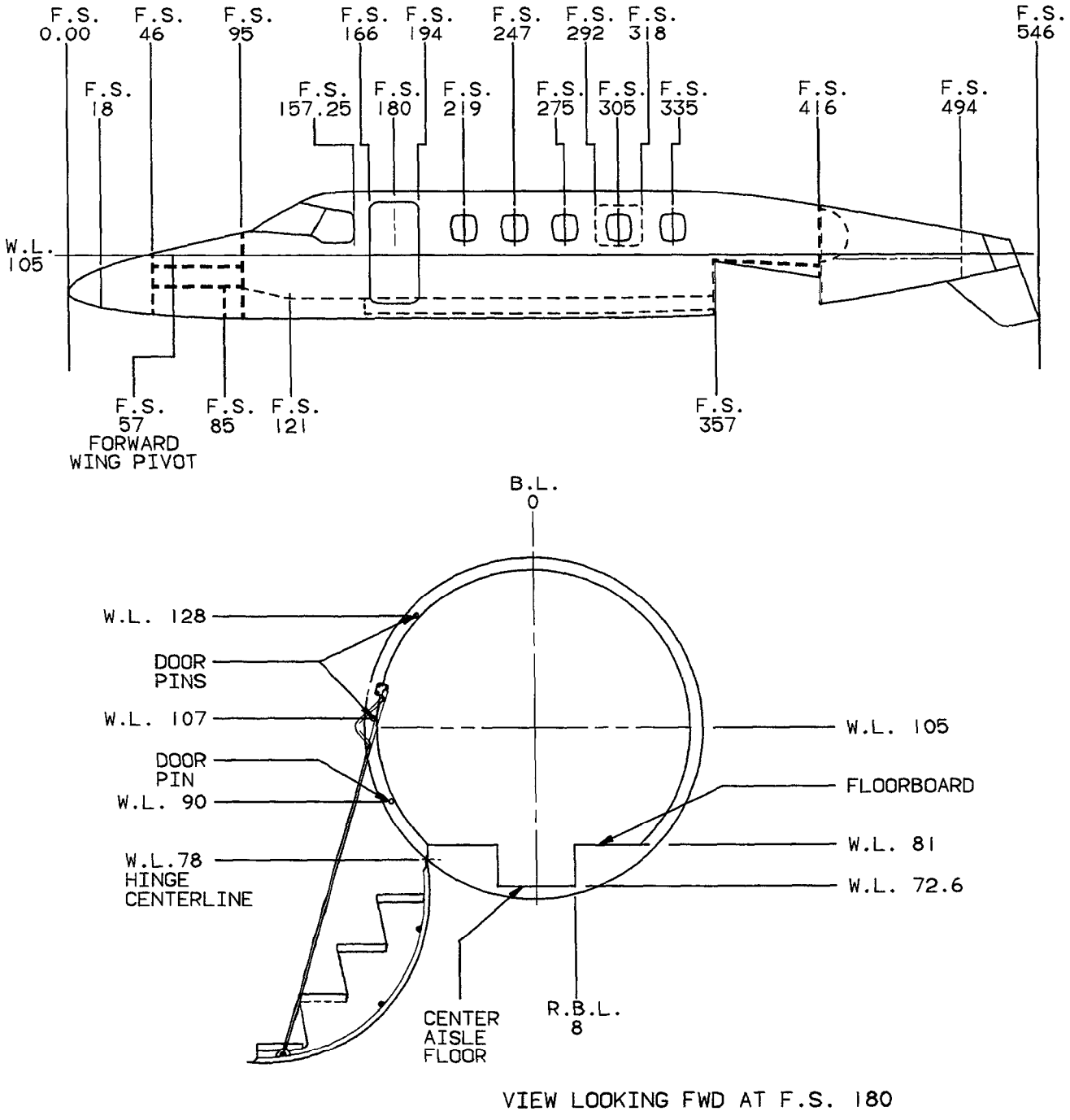
Airplane Areas (Effectivity: All)
(Sheet 1 of 2)
Figure 2



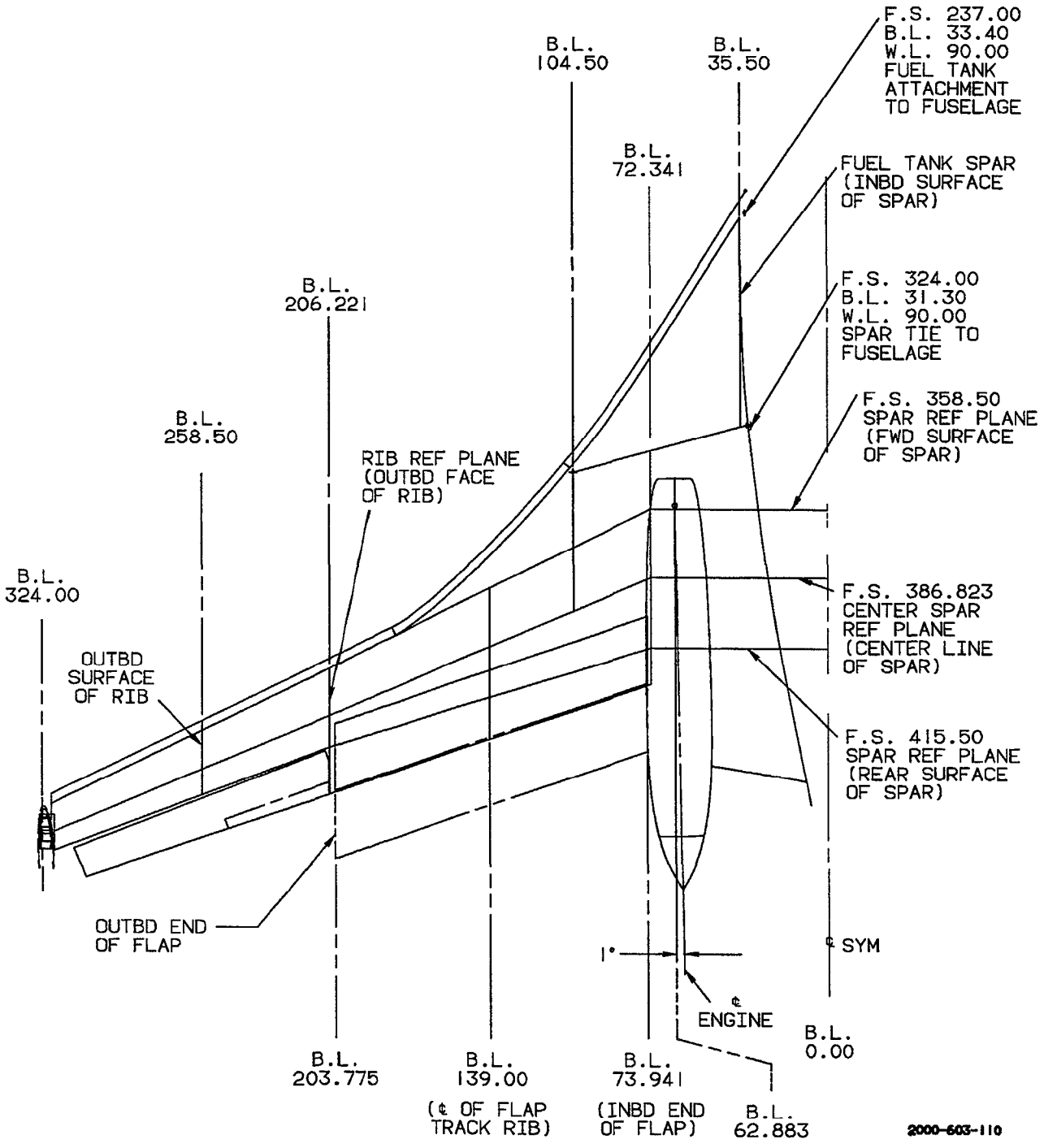
Airplane Areas (Effectivity: All)
(Sheet 2 of 2)
Figure 2



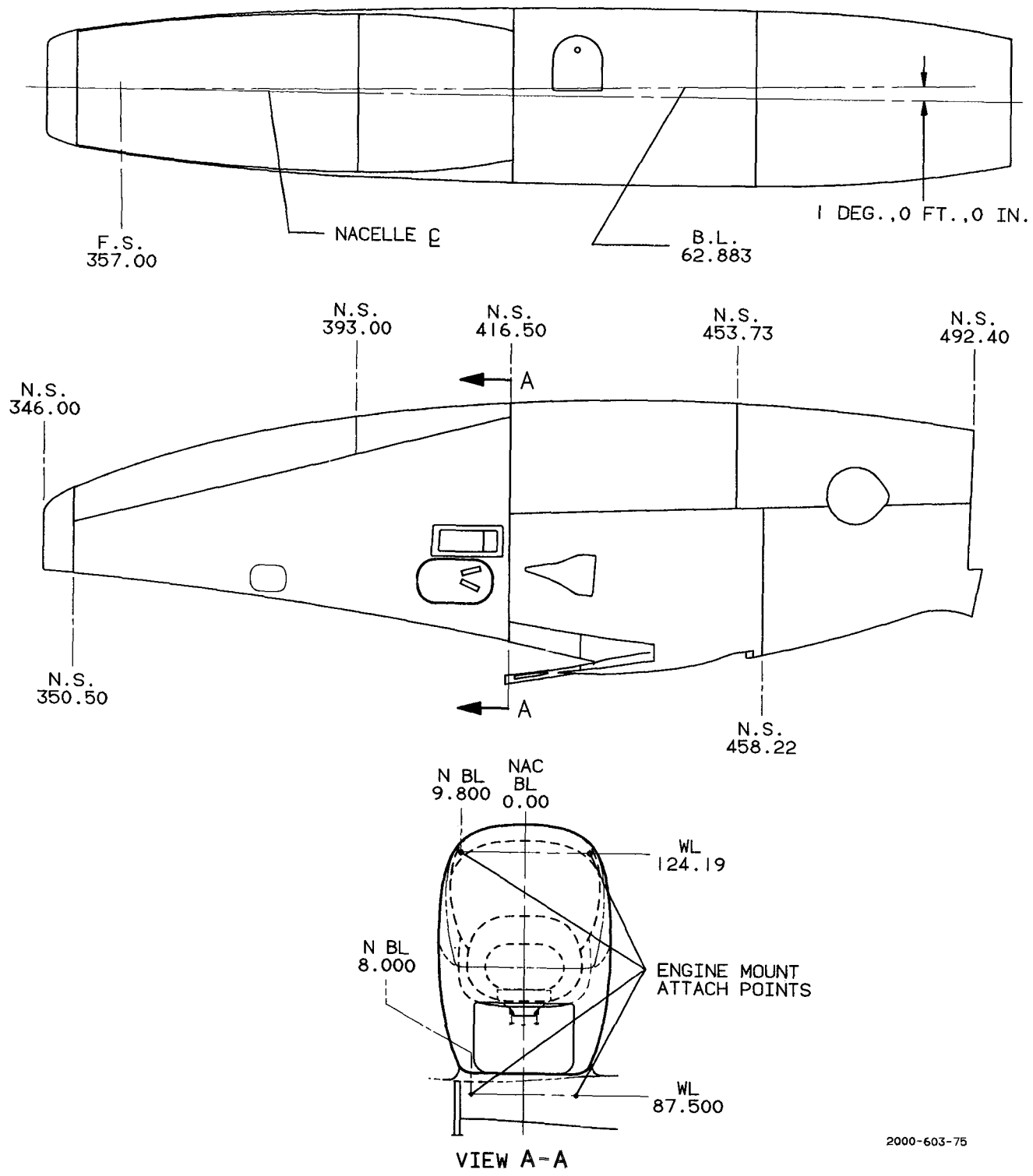
Airplane Reference Stations (Effectivity: All)
Figure 3



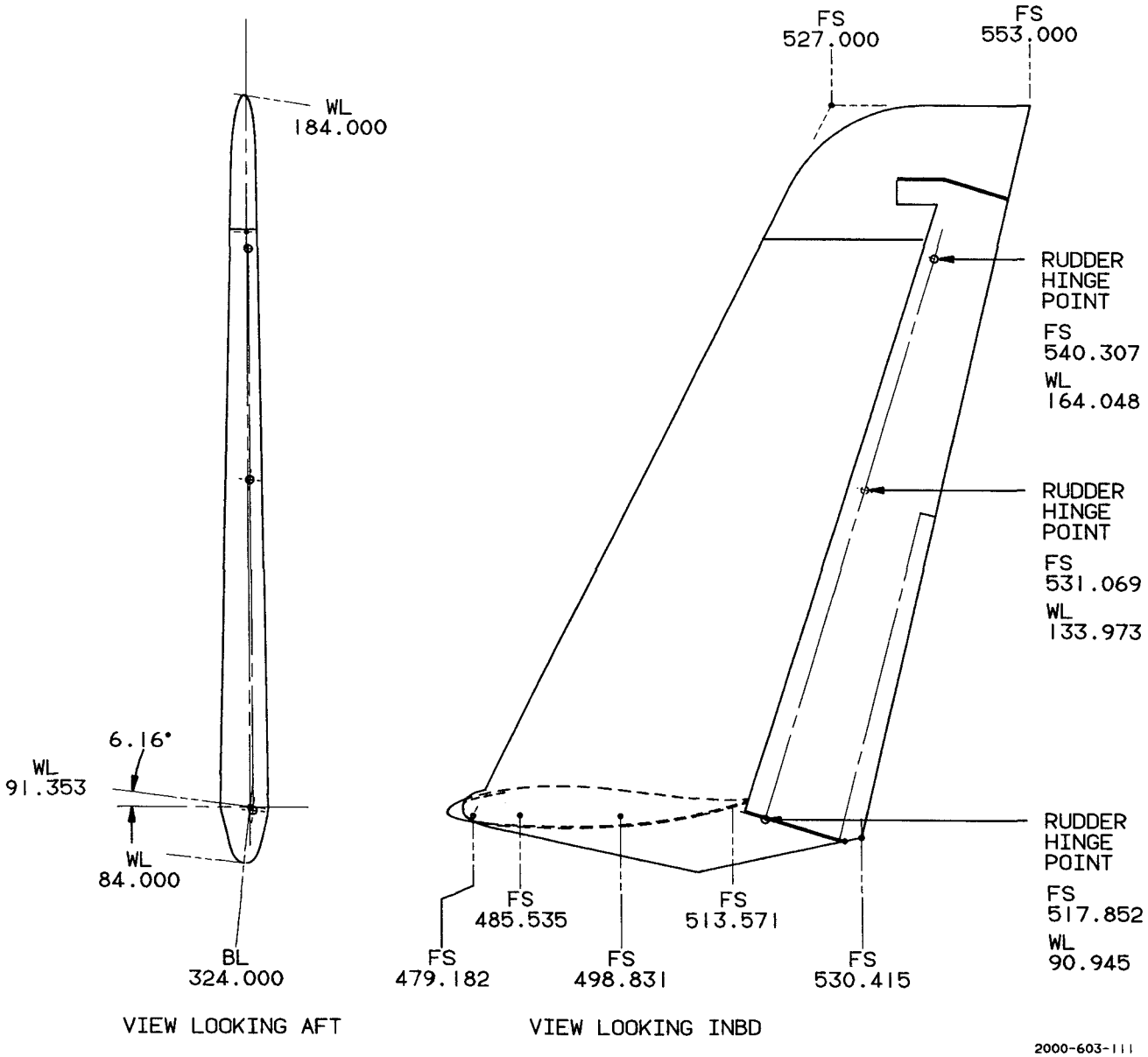
Fuselage Stations Diagram (Effectivity: All)
Figure 4



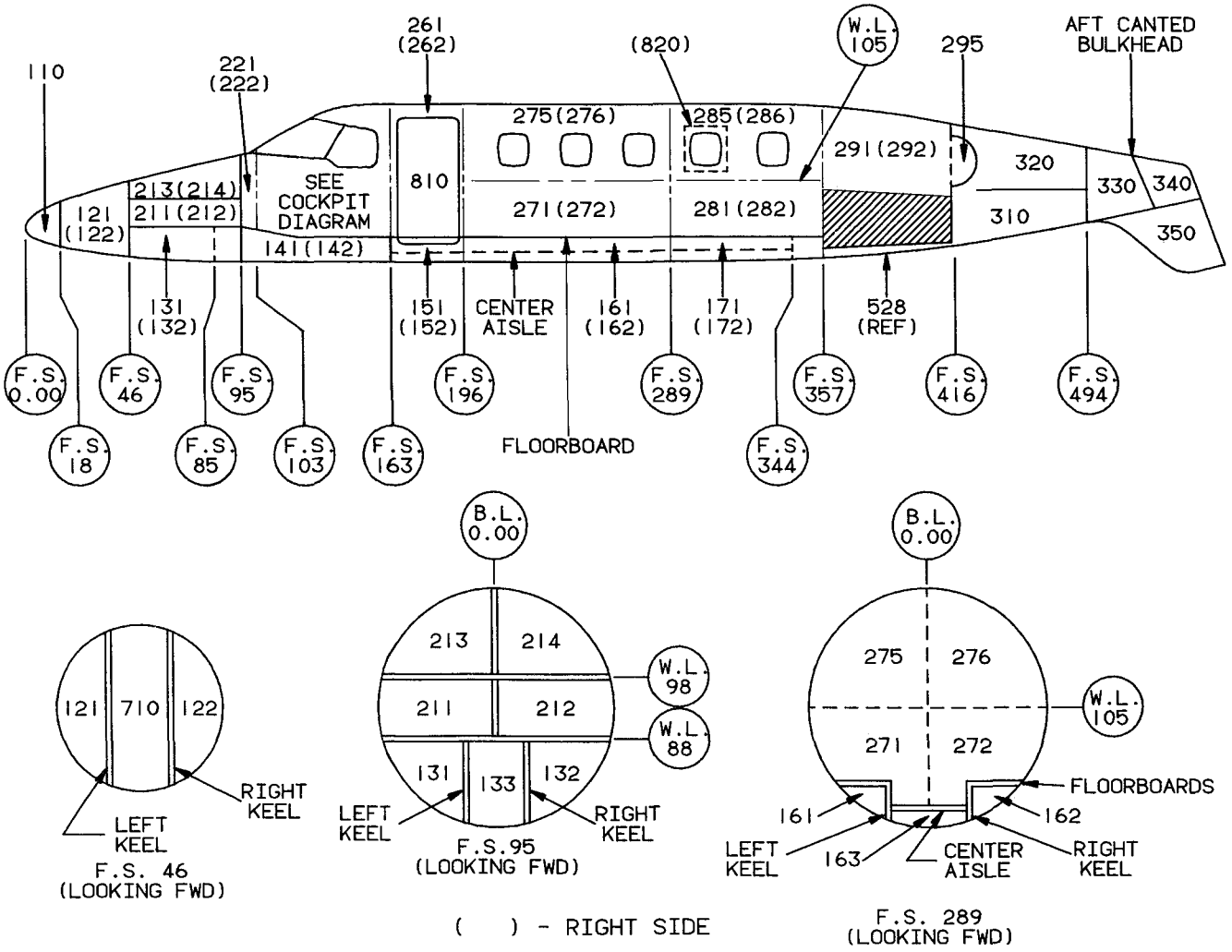
Aft Wing Stations Diagram (Effectivity: All)
Figure 5



Nacelle Stations Diagram (Effectivity: All)
Figure 6



Tipsail Stations Diagram (Effectivity: All)
Figure 7



ZONE
100 - F.S. 0.00 TO F.S. 357 (BELOW THE FLOORBOARDS AND CENTER AISLE)
110 F.S. 0.00 TO F.S. 18
120 F.S. 18 TO F.S. 46
130 F.S. 46 TO F.S. 95
140 F.S. 95 TO F.S. 163
150 F.S. 163 TO F.S. 196
160 F.S. 196 TO F.S. 289
170 F.S. 289 TO F.S. 357

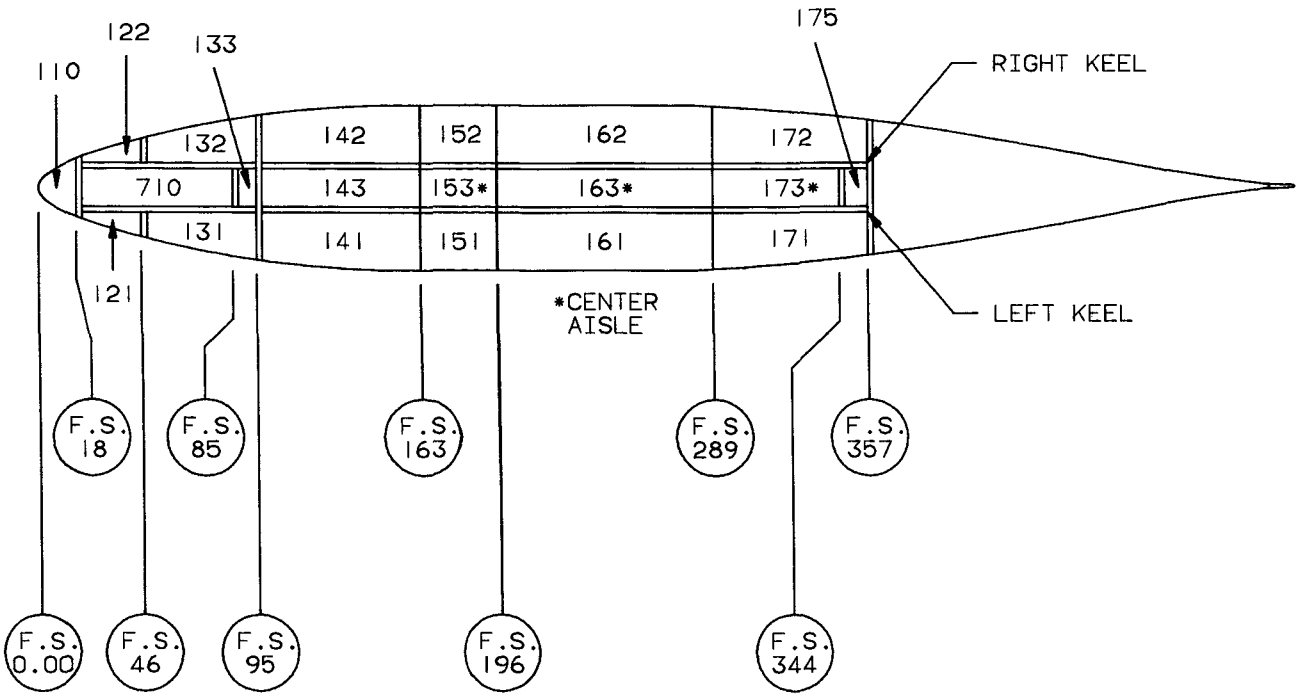
ZONE
200 - F.S. 46 TO F.S. 416 INCLUDING THE ENVIRONMENTAL DOME (ABOVE THE FLOORBOARDS)
210 F.S. 46 TO F.S. 95
220 F.S. 95 TO F.S. 103
230 SEE COCKPIT DIAGRAM
240 SEE COCKPIT DIAGRAM
250 SEE COCKPIT DIAGRAM
260 F.S. 163 TO F.S. 196
270 F.S. 196 TO F.S. 289
280 F.S. 289 TO F.S. 357
290 F.S. 357 TO F.S. 416

ZONE 300 - F.S. 416 TO AFT END OF AIRPLANE
310 F.S. 416 TO F.S. 494 (BELOW SHELF)
320 F.S. 416 TO F.S. 494 (ABOVE SHELF)
330 F.S. 494 TO AFT CANTED BULKHEAD
340 TAIL CONE
350 VENTRAL STABILIZER

ZONE 800 - DOORS
810 CABIN ENTRANCE DOOR (LEFT SIDE)
820 EMERGENCY HATCH (RIGHT SIDE)

2000-369-02

Fuselage Zone Diagrams (Effectivity: All)
(Sheet 1 of 2)
Figure 8



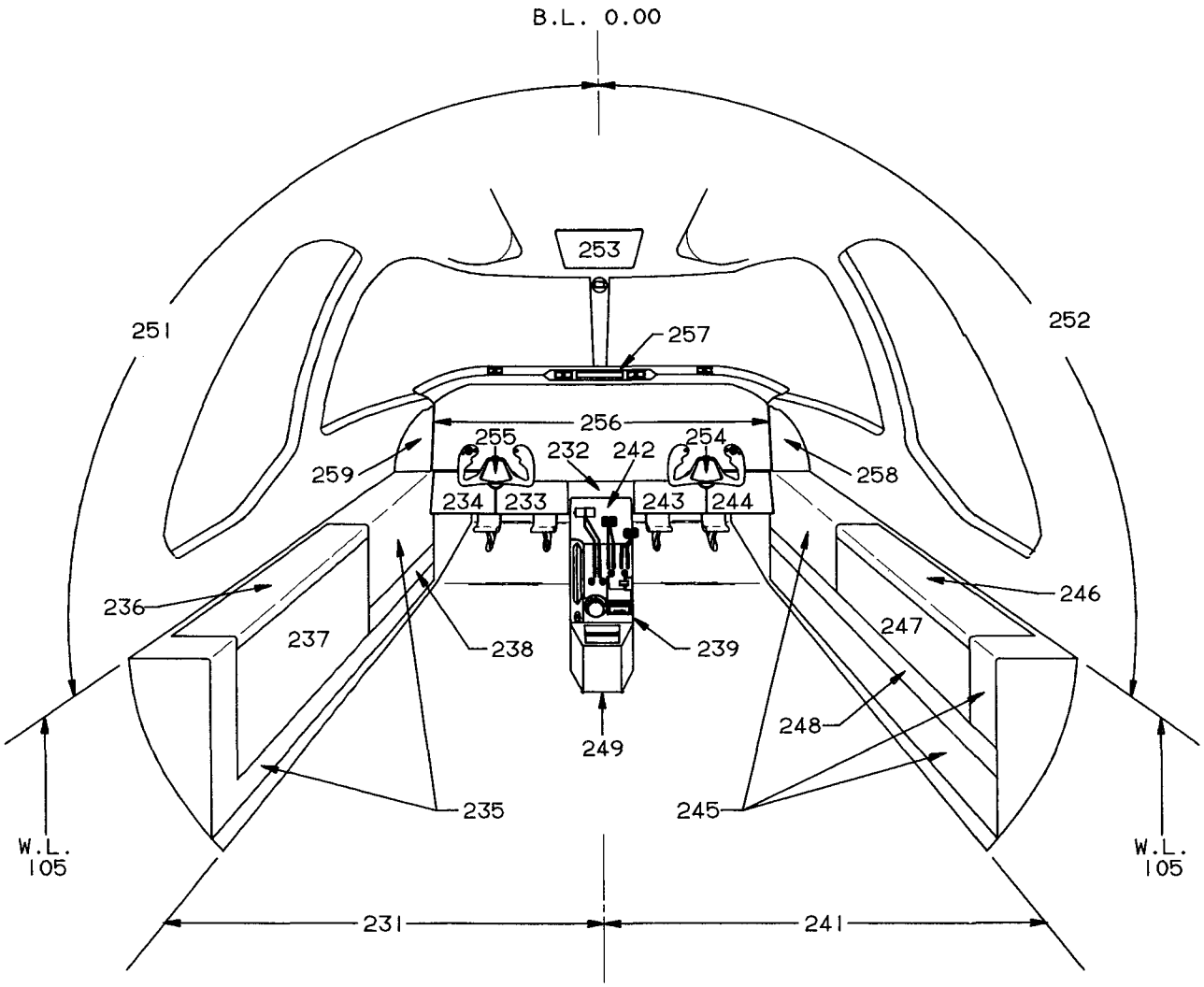
TOP VIEW
(BELOW FLOORBOARDS AND CENTER AISLE)

ZONE 100 - F.S. 0.00 TO F.S. 357
(BELOW FLOORBOARDS AND CENTER AISLE)
110 - F.S. 0.00 TO F.S. 18
120 - F.S. 18 TO F.S. 46
130 - F.S. 46 TO F.S. 95
140 - F.S. 95 TO F.S. 163
150 - F.S. 163 TO F.S. 196
160 - F.S. 196 TO F.S. 289
170 - F.S. 289 TO F.S. 357

ZONE 700 - LANDING GEAR, WHEEL WELLS AND DOORS
710 - NOSE LANDING GEAR, WHEEL WELL AND DOORS
720 - LEFT MAIN LANDING GEAR, WHEEL WELL AND DOORS
(SEE WING DIAGRAM)
730 - RIGHT MAIN LANDING GEAR, WHEEL WELL AND DOORS
(SEE WING DIAGRAM)

2000-369-03

Fuselage Zone Diagrams (Effectivity: All)
(Sheet 2 of 2)
Figure 8



ZONE 230-COCKPIT
F.S. 103 TO F.S. 163
(BELOW W.L. 105)

231 LEFT COCKPIT
232 CENTER SUBPANEL
233 LEFT INBOARD SUBPANEL
234 LEFT OUTBOARD SUBPANEL
235 LEFT CONSOLE
236 LEFT CIRCUIT BREAKER PANEL
237 LEFT CONSOLE CIRCUIT BREAKER PANEL ACCESS
238 LEFT CONSOLE WIRE TRAY ACCESS
239 PEDESTAL

ZONE 240-COCKPIT
F.S. 103 TO F.S. 163
(BELOW W.L. 105)

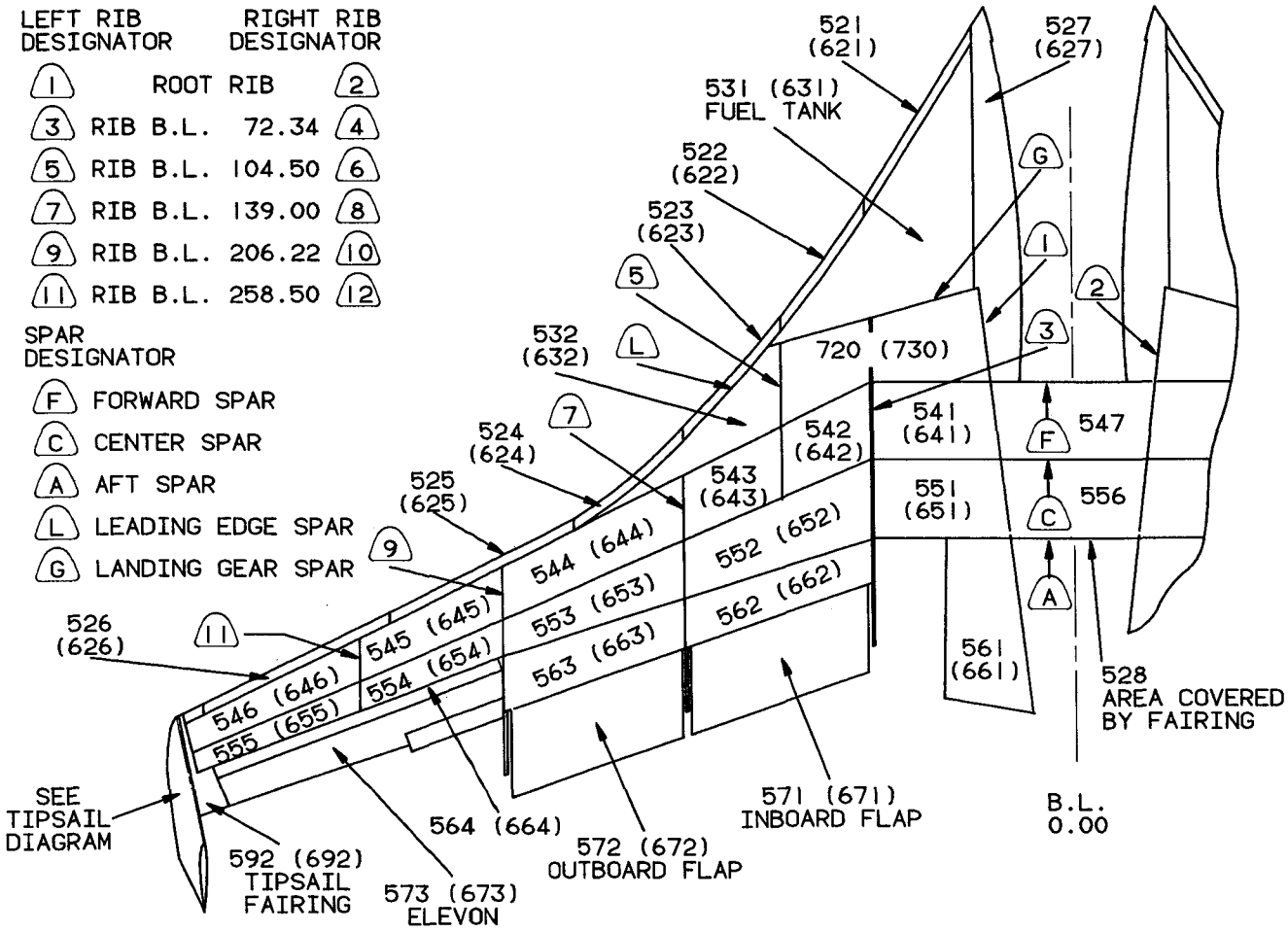
241 RIGHT COCKPIT
242 PEDESTAL SUBPANEL
243 RIGHT INBOARD SUBPANEL
244 RIGHT OUTBOARD SUBPANEL
245 RIGHT CONSOLE
246 RIGHT CIRCUIT BREAKER PANEL
247 RIGHT CONSOLE CIRCUIT BREAKER PANEL ACCESS
248 RIGHT CONSOLE WIRE TRAY ACCESS
249 PEDESTAL EXTENSION

ZONE 250-COCKPIT
F.S. 103 TO F.S. 163
(ABOVE W.L. 105)

251 LEFT SIDEWALL
252 RIGHT SIDEWALL
253 OVERHEAD PANEL
254 COPILOT'S CONTROL WHEEL
255 PILOT'S CONTROL WHEEL
256 INSTRUMENT PANEL
257 GLARESHIELD
258 RIGHT SIDEWALL INSTRUMENT PANEL
259 LEFT SIDEWALL INSTRUMENT PANEL

2000-369-01

Cockpit Zone Diagram (Effectivity: All)
Figure 9



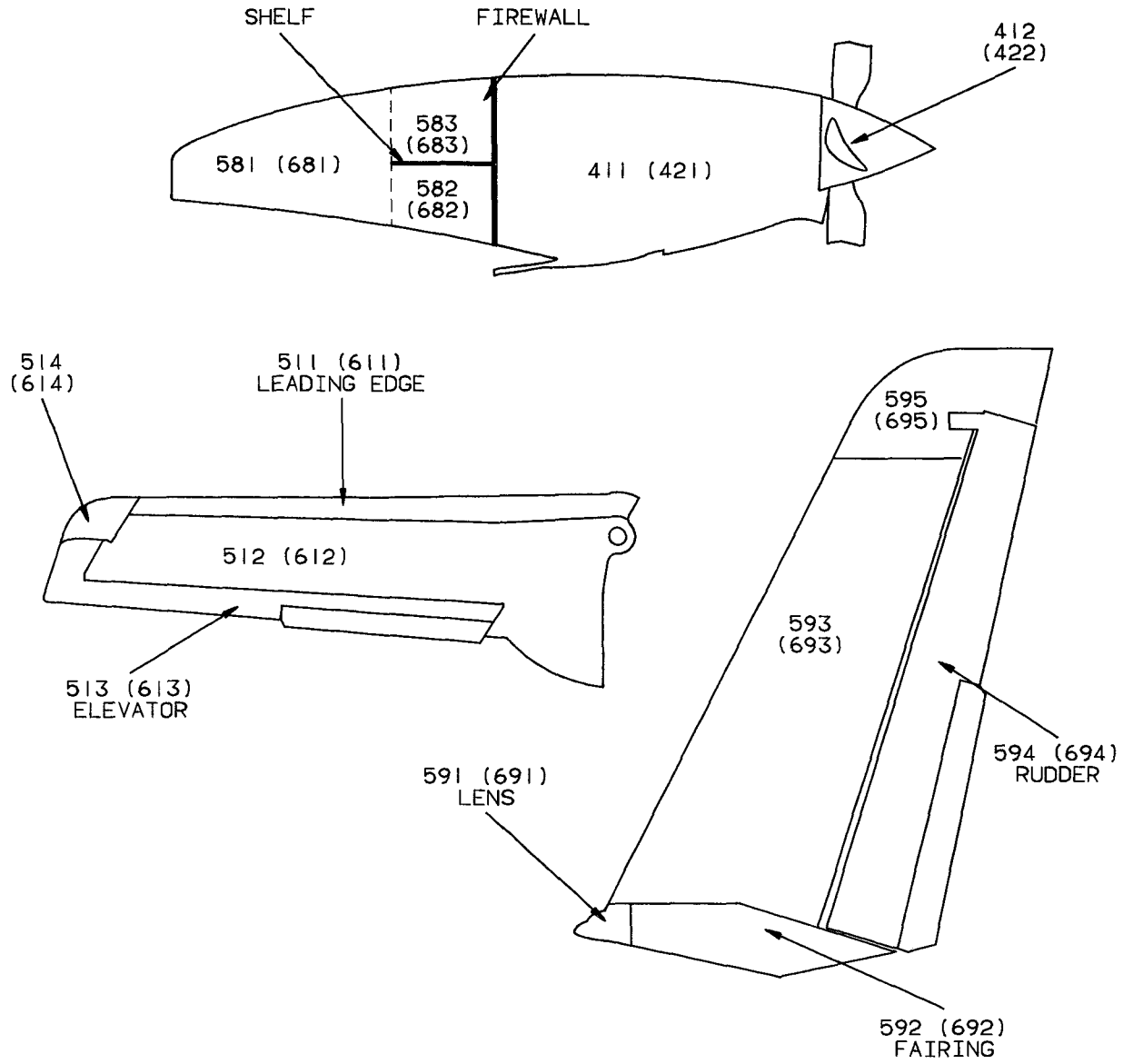
ZONE 500- LEFT FORWARD WING, AFT WING, TIPSAIL AND NACELLE (FORWARD OF THE FIREWALL)
- 510 SEE FORWARD WING DIAGRAM
- 520 AFT WING (LEADING EDGE)
- 527 AFT WING (WING TO FUSELAGE)
- 528 AREA COVERED BY FAIRING
- 530 AFT WING (LEADING EDGE TO FORWARD SPAR)
- 540 AFT WING (FORWARD SPAR TO CENTER SPAR)
- 550 AFT WING (CENTER SPAR TO AFT SPAR)
- 560 AFT WING (AFT OF AFT SPAR)
- 570 AFT WING (ELEVON AND FLAPS)
- 580 SEE NACELLE DIAGRAM
- 590 SEE TIPSAIL DIAGRAM

ZONE 600- RIGHT FORWARD WING, AFT WING, TIPSAIL AND NACELLE (FORWARD OF THE FIREWALL)
- 610 SEE FORWARD WING DIAGRAM
- 620 AFT WING (LEADING EDGE)
- 627 AFT WING (WING TO FUSELAGE)
- 630 AFT WING (LEADING EDGE TO FORWARD SPAR)
- 640 AFT WING (FORWARD SPAR TO CENTER SPAR)
- 650 AFT WING (CENTER SPAR TO AFT SPAR)
- 660 AFT WING (AFT OF AFT SPAR)
- 670 AFT WING (ELEVON AND FLAPS)
- 680 SEE NACELLE DIAGRAM
- 690 SEE TIPSAIL DIAGRAM

ZONE 700 LANDING GEAR, WHEEL WELLS AND DOORS
- 710 NOSE LANDING GEAR, WHEEL WELLS AND DOORS (SEE FUSELAGE DIAGRAM)
- 720 LEFT MAIN LANDING GEAR, WHEEL WELL AND DOORS
- 730 RIGHT MAIN LANDING GEAR, WHEEL WELL AND DOORS

2000-369-04

Wing Zone Diagrams (Effectivity: All)
(Sheet 1 of 2)
Figure 10



ZONE 400 - ENGINE COMPARTMENT, SPINNER AND PROP
(AFT OF FIREWALL)
410 - LEFT ENGINE COMPARTMENT, SPINNER AND PROP
420 - RIGHT ENGINE COMPARTMENT, SPINNER AND PROP

ZONE 510 - LEFT FORWARD WING
610 - RIGHT FORWARD WING

ZONE 580 - LEFT NACELLE (FORWARD OF THE FIREWALL)
680 - RIGHT NACELLE (FORWARD OF THE FIREWALL)

ZONE 590 - LEFT TIPSAIL
690 - RIGHT TIPSAIL

2000-369-05

Wing Zone Diagrams (Effectivity: All)
(Sheet 2 of 2)
Figure 10

EXTERIOR CONTOUR TOLERANCES (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

ALLOWABLE CONTOUR CHANGE (EFFECTIVITY: ALL) (FIGURE 1)

Three smoothness zones specify tolerances on external aerodynamic surfaces. These zones are defined in this chapter under the heading EXTERIOR CONTOUR ZONES and illustrated in Figure 1. Smoothness requirements are outlined and where check stations or points are on a dividing line between two zones, the requirements of the more critical zone shall apply. The tolerances specified are the maximum allowable to attain streamlined flow characteristics for optimum performance.

DETAIL CONTOUR (EFFECTIVITY: ALL)

Surface contours must be smoothed and faired so that deviations from the checking spline will not exceed the stated allowables over the specified wave length (see Chart 1). Contour tolerances for Zone 1 leading edge surfaces are specified over shorter checking lengths to establish both single and multiple wave criteria. The two-inch wave length allowables are tabulated to facilitate checking leading edge contour waviness. Allowable waviness is for multiple waves unless noted otherwise.

EXTERIOR CONTOUR ZONES (EFFECTIVITY: ALL) (FIGURE 1)

ZONE 1 (EFFECTIVITY: ALL)

a. Fuselage nose aft to Fuselage Station 100.

b. Forward Wing - All surfaces except the pivot panel and sector.

c. Elevator - All surfaces forward of hinge line.

d. Aft Wing - All surfaces outboard of BL 140.

e. Elevon - All surfaces forward of the hinge line.

f. Vertical Stabilizer - All surfaces.

g. Vertical Stabilizer Rudder - All surfaces forward of hinge line.

h. Ventral - All surfaces.

i. Nacelle - Inlet lip aft to Nacelle Station 380.

j. Flaps - Lower surface forward of 25% chord line.

CHART 1

ALLOWABLE CONTOUR CHANGES AFTER REPAIRS (EFFECTIVITY: ALL)

Zone	Checking Spline Parallel to Airstream
1	.010 inch in 2 inches
2	.015 inch in 2 inches
3	.025 inch in 2 inches

BT00411

ZONE 2 (EFFECTIVITY: ALL)

a. Forward Wing - pivot panel and sector.

b. Elevator - All surfaces from hinge line aft to trailing edge.

c. Aft Wing - All surfaces inboard of BL 140.

d. Flaps - All upper surfaces. Lower surfaces aft of 25% chord line.

e. Elevon - All surfaces from the hinge line aft to the trailing edge.

f. Vertical Stabilizer Rudder - All surfaces from the hinge line aft to the trailing edge.

ZONE 3 (EFFECTIVITY: ALL)

a. Fuselage - All surfaces aft of Fuselage Station 100 including lower surface contiguous with lower wing surface.

b. Nacelle - All surfaces aft of Nacelle Station 380.

GAPS AND EXTERIOR JOINTS (EFFECTIVITY: ALL)

Allowable tolerances for surface gaps at permanent joints, service joints and operating joints are outlined in the following charts. Alignment of surface gaps with respect to the airstream are illustrated in Figure 2. Due to the streamline flow requirements for the areas in Zone 1, any mismatch normal to the airstream will present the surface gap as a forward-facing step only. Refer to Figure 2, illustration c. Forward Step (Sharp Edge) or d. Forward Step (Radius Edge) as appropriate. Forward and aft steps are allowed in Zones 2 and 3 within the tolerances indicated in the following charts.

Allowable tolerances are outlined in the following charts for sharp edge configurations. Allowables for contour gaps and radius-edge steps shown in Figure 2, illustration B and D are as noted.

FIXED JOINTS (EFFECTIVITY: ALL)

Tolerances for fixed surface joints where there is no provision for mechanical disassembly are outlined in CHART 2.

SERVICE JOINTS (EFFECTIVITY: ALL)

Tolerances for inspection plates, access plates and panels with mechanically removable fasteners are outlined in CHART 3.

CHART 2

FIXED SURFACE JOINT TOLERANCES (EFFECTIVITY: ALL)

Zone	Mismatch Normal to Airstream	Mismatch Parallel to Airstream
1	.010 inch (see Note 1)	.020 inch
2	.020 inch	.040 inch
3	.025 inch	.050 inch

Notes:

1. Forward Facing step only.
2. For contoured (radius edge) steps in Zone 1, increase tolerance (normal) from .010 to .015 inch and tolerance (parallel) from .020 to .030 inch.
3. For contoured (radius edge) steps in Zones 2 and 3, increase all tolerances by .010 inch.
4. Permanent joint gaps will be filled and finished as outlined under the heading SURFACE SMOOTHNESS.

BT00412

CHART 3
SERVICE JOINT TOLERANCES (Effectivity: All)

ZONE	ALLOWABLE GAP	MISMATCH NORMAL TO AIRSTREAM	MISMATCH PARALLEL TO AIRSTREAM
1	.030 inch	+.010 inch fwd edge -.000 (see Note 2) +.005 inch aft edge -.000	.020 inch (see Note 2)
2	.030 inch	.020 inch	.040 inch
3	.060 inch	.025 inch	.050 inch

NOTES:

1. Separate allowables for the forward/aft plate edge mismatch are specified in Zone 1 to ensure proper alignment of plates for streamlined airflow. If the plates cannot be made flush with adjacent surfaces, plate leading edges will be made to protrude into the airstream as a forward-facing step within the stated tolerances.

2. For contoured (radius edge) steps in Zone 1, increase the mismatch tolerance (normal) from +.010 to .015 inch and mismatch tolerance (parallel) from .020 to .030 inch. Aft edge tolerances remain unchanged.

3. For contoured gaps, increase all allowables by 50%.

OPERATING JOINTS (Effectivity: All)

Tolerances for the hinged cabin door are as follows:

a. Allowed gap - .060 inch

b. An additional .030 inch is permissible over 50% of the length of the gap.

NOTE

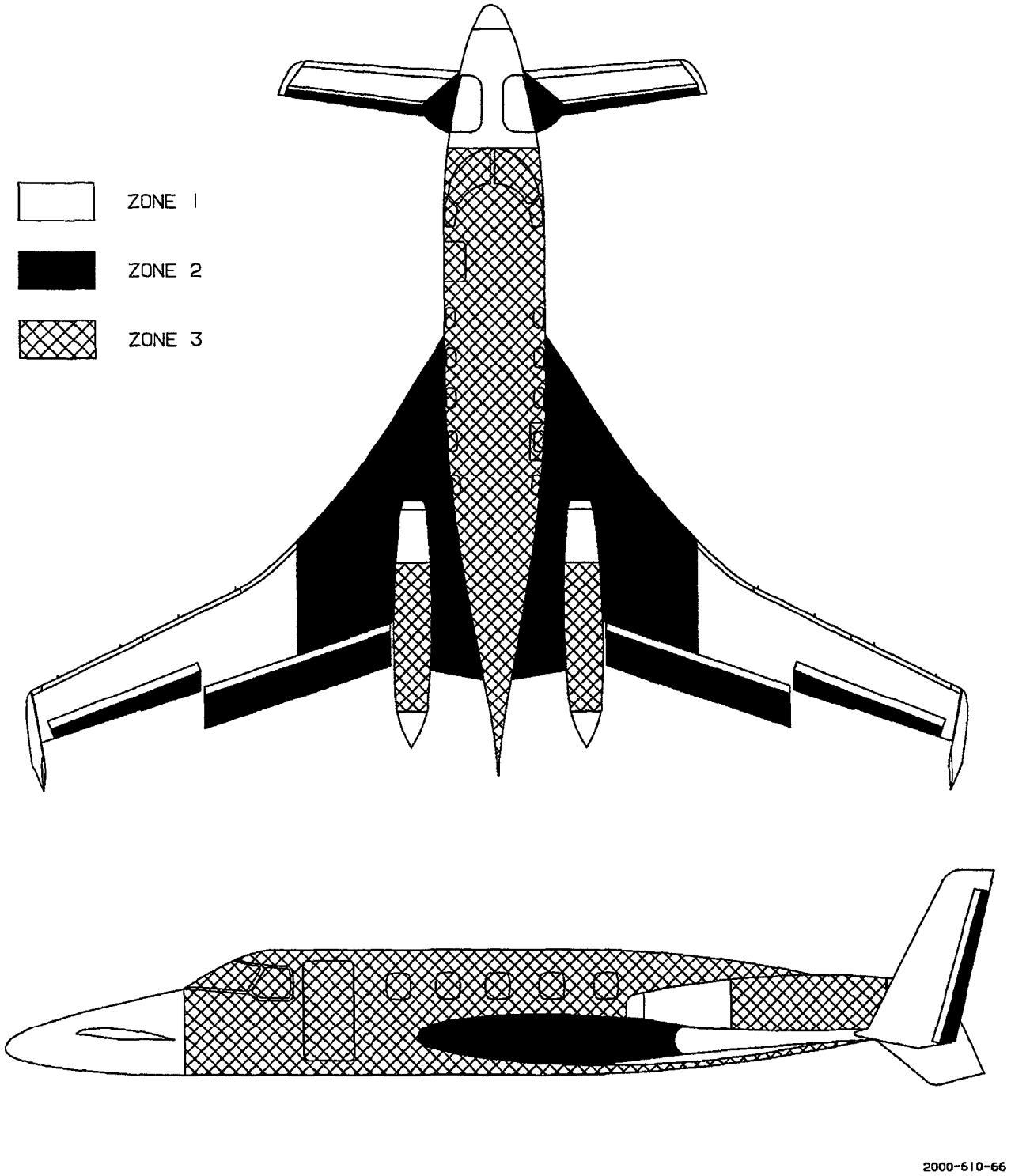
Check the cabin door, emergency exit door, fuel tank filler doors, nacelle cowling access doors and cabin windows to be certain they are flush with adjacent surfaces. Ensure that seals on doors and access panels are sufficient to minimize aerodynamic leakage.

SURFACE SMOOTHNESS (Effectivity: All)

The surface surface finish can be determined through the use of a surface smoothness comparator. The surface finish must meet the finish specifications detailed in Chart 4.

CHART 4
SURFACE SMOOTHNESS
(Effectivity: All)

ZONE	FINISH
1	Surface finish 80 or better
2 and 3	Surface finish 125 or better



Smoothness Zones (Effectivity: All)
Figure 1

FASTENERS (EFFECTIVITY: ALL)

Screw fasteners must be flush with adjacent surfaces within the following tolerances:

CHART 5

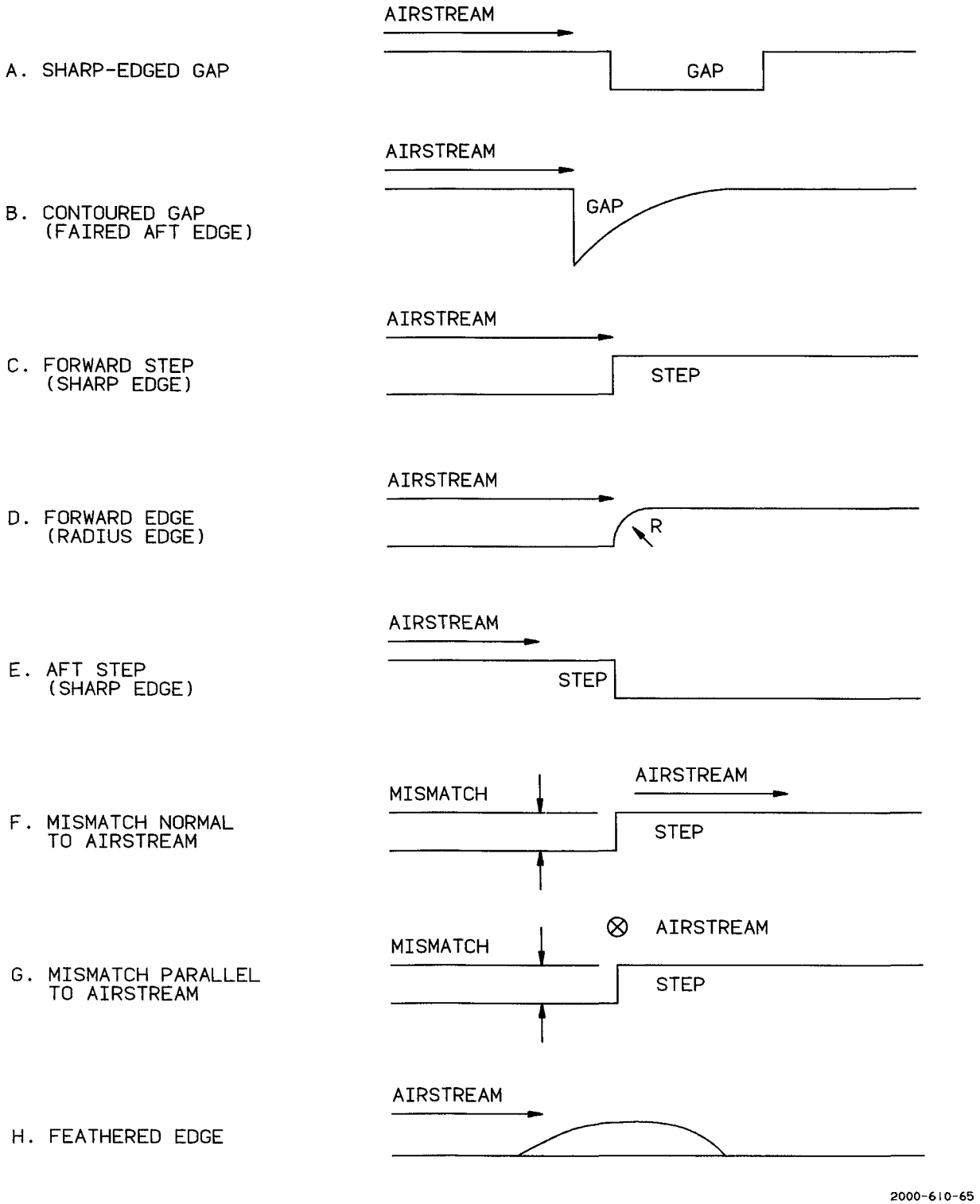
SCREW FASTENER TOLERANCE (EFFECTIVITY: ALL)

Zone	Screw Height Tolerance
1	+ .005 inch (above surface)

CHART 5

SCREW FASTENER TOLERANCE (EFFECTIVITY: ALL) (Continued)

Zone	Screw Height Tolerance
2	- .005 inch (below surface) ± .010 inch
3	± .010 inch
BT00415	



Gap and Step Definitions (Effectivity: All)
Figure 2

TAP TESTING (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

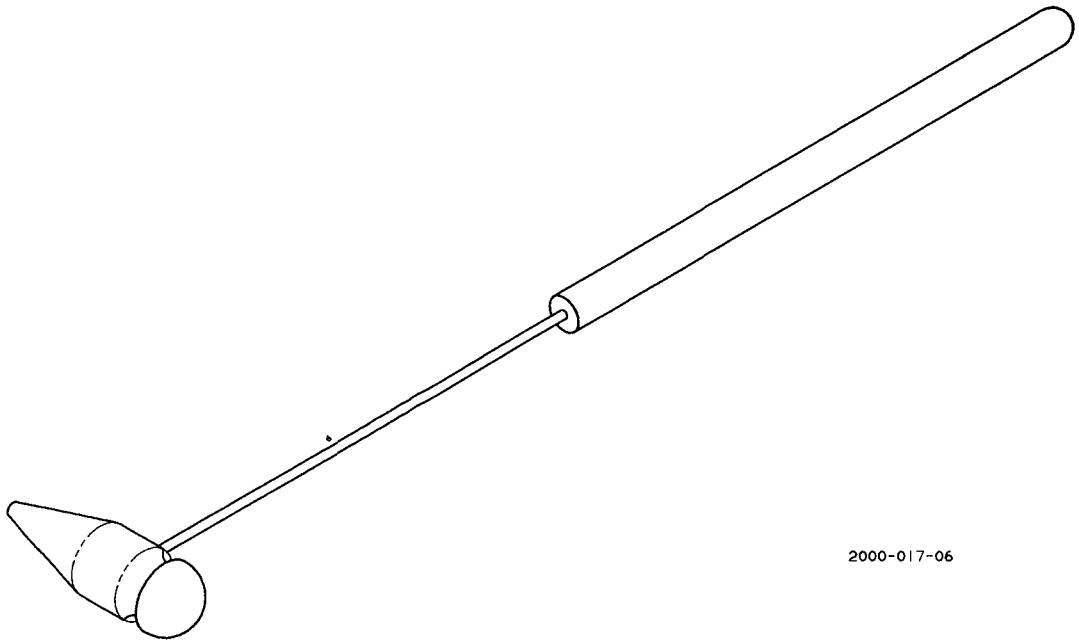
Tap testing may be used to evaluate the condition of laminated and bonded structures. Surfaces to be inspected must be dry and have any oil or grease removed. This inspection must be conducted in a relatively quiet area. The method consists of lightly tapping the surface of the part with a tap hammer (See Figure 1). The acoustic response is compared with a known good area. The tapping rate is accomplished to produce a continuous sound so that any difference in sound tone can be detected. A "flat" or "dead" response indicates an area of internal delamination or disbond requiring repair. The acoustic response of a good part can vary dramatically with changes in geometry. The entire area of interest must be tapped. The method is limited to finding relatively shallow defects. Where multiple bondlines exist over the core, the core bond cannot be evaluated. In a honeycomb structure, the far-side bondline cannot be evaluated. Thus, two side access is required for a complete inspection of honeycomb structures.

SPECIAL TOOLS

Each tool listed in Chart 1 is provided as an example of the equipment designed to perform a specific function. Generic or locally manufactured tools that are the equivalent with respect to accuracy, function and craftsmanship may be used in lieu of those listed.

CHART 1
SPECIAL TOOLS AND EQUIPMENT (EFFECTIVITY: ALL)

TOOL NAME	PART NO.	MANUFACTURER	USE
Tap Hammer	TS 1469	Beech Aircraft Corp Wichita, Kansas	Structural Inspection
BT00857			



Tap Hammer (Effectivity: All)
Figure 1

COMPOSITE MATERIALS IDENTIFICATION (Effectivity: All) (Figure 1)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

PLAIN WEAVE FABRIC (PW) (Effectivity: All)

Plain Weave fabric is made of carbon fiber yarns woven into the warp and the fill. The fabric has certain strength factors in relation to its ply axis. The ply axis of the fabric can be determined by the presence of Kevlar tracer yarns woven into the fabric. These tracer yarns are fine yellow lines appearing on the fabric either 2 inches or 6 inches apart. The 0° ply axis is parallel to the tracers 2 inches apart. The 90° ply axis is parallel to the tracers 6 inches apart.

8 HARNESS SATIN FABRIC (HS) (Effectivity: All)

The 8 Harness Satin fabric is made of carbon yarn and fiberglass yarn. The carbon yarns are woven in both the warp and the fill and the fiberglass yarns only in the fill. The fiberglass yarns are white and can be seen along the cut edge of the fabric.

The fabric has certain strength factors in relation to its ply axis. The ply axis of the fabric can be determined by the presence of Kevlar tracer yarns woven into the fabric. These tracer yarns are fine yellow lines appearing on the fabric either 2 inches or 6 inches apart. The 0° ply axis is parallel to the tracers 2 inches apart. The 90° ply axis is parallel to the tracers 6 inches apart.

The 8 Harness Satin also has a top and bottom side. The top side can be determined by visual examination in relation to the 0° axis. Each individual weave of the fabric is longer in one direction, giving the fabric an appearance or flow longitudinally. The longitudinal appearance going in the 0° ply axis direction indicates the top (warp) side.

UNIDIRECTIONAL FABRIC (TG) (Effectivity: All)

The unidirectional fabric is made of carbon and fiberglass yarns woven into a fabric. The carbon yarns are woven in only the warp and the fiberglass yarns only in the fill. The fiberglass yarns are white and can be seen along the cut edge of the fabric.

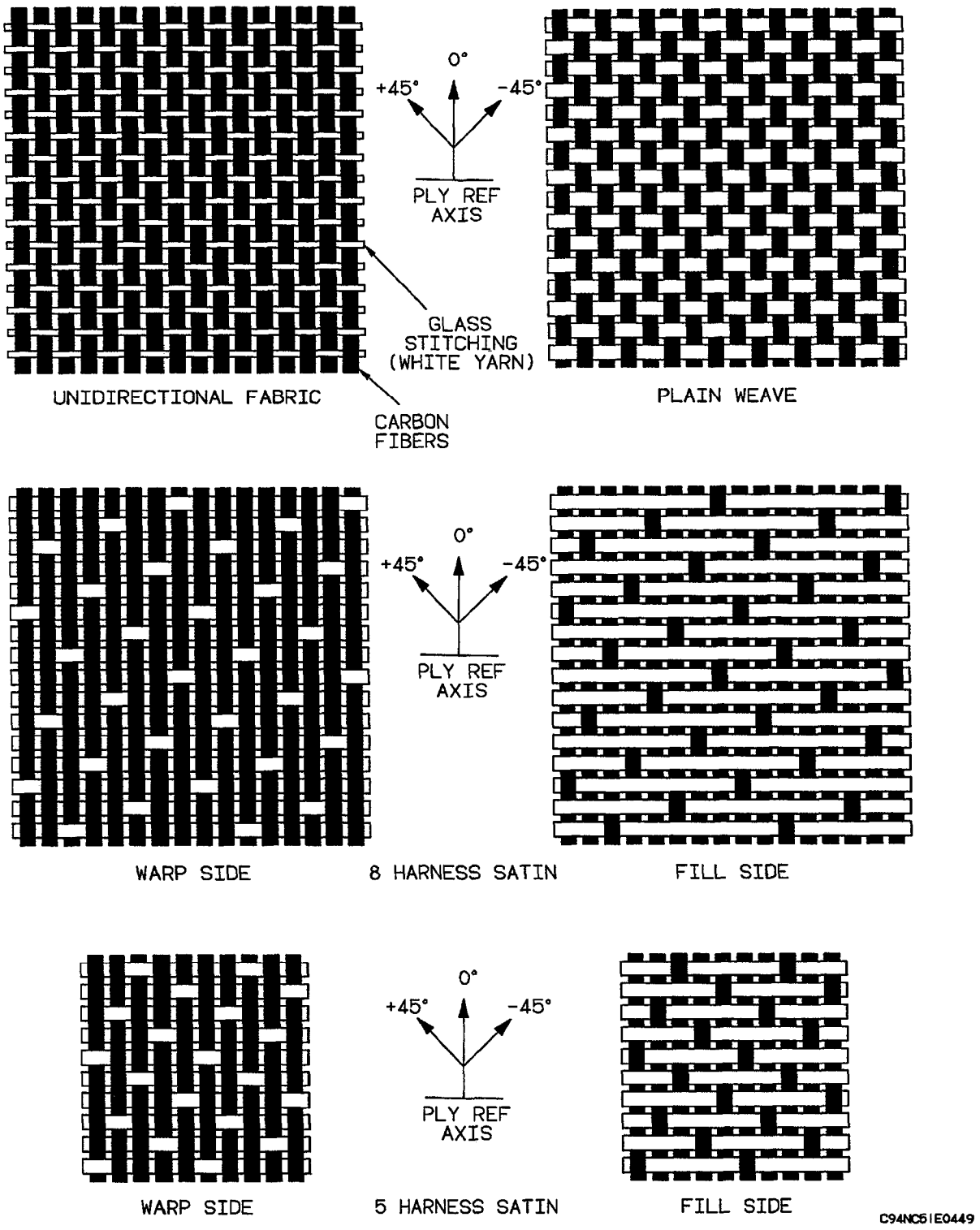
The fabric has certain strength factors in relation to its ply axis. The ply axis of the fabric can be determined by the direction of the warp. The 0° ply axis is parallel to the warp or carbon fiber yarns.

5 HARNESS SATIN FABRIC (WN) (Effectivity: All)

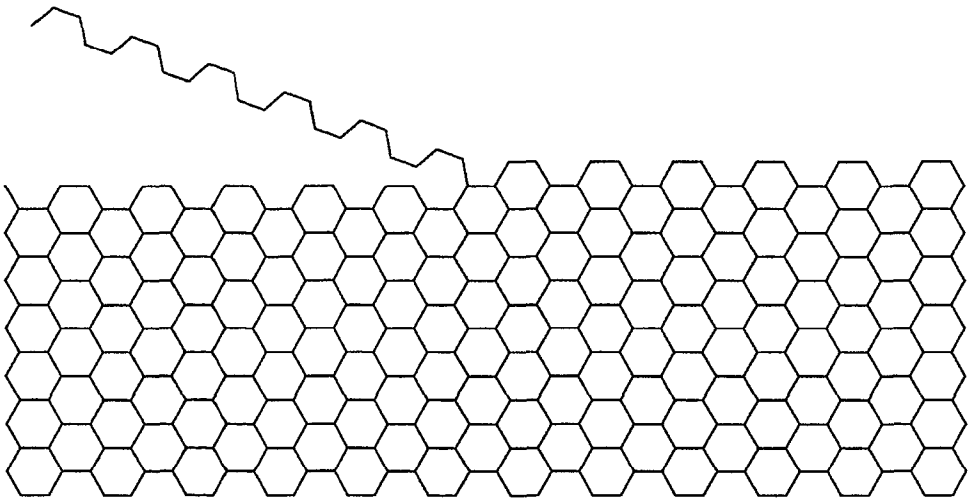
The 5 Harness Satin fabric is made of ceramic fibers woven into a fabric. The ceramic fibers are transparent and have the appearance of glass fibers. 5 Harness Satin material is used in the high temperature interior areas of the engine cowlings and is the last repair patch ply. This ply is nonstructural with the ply orientation optional.

HONEYCOMB CORE (Effectivity: All) (Figure 2)

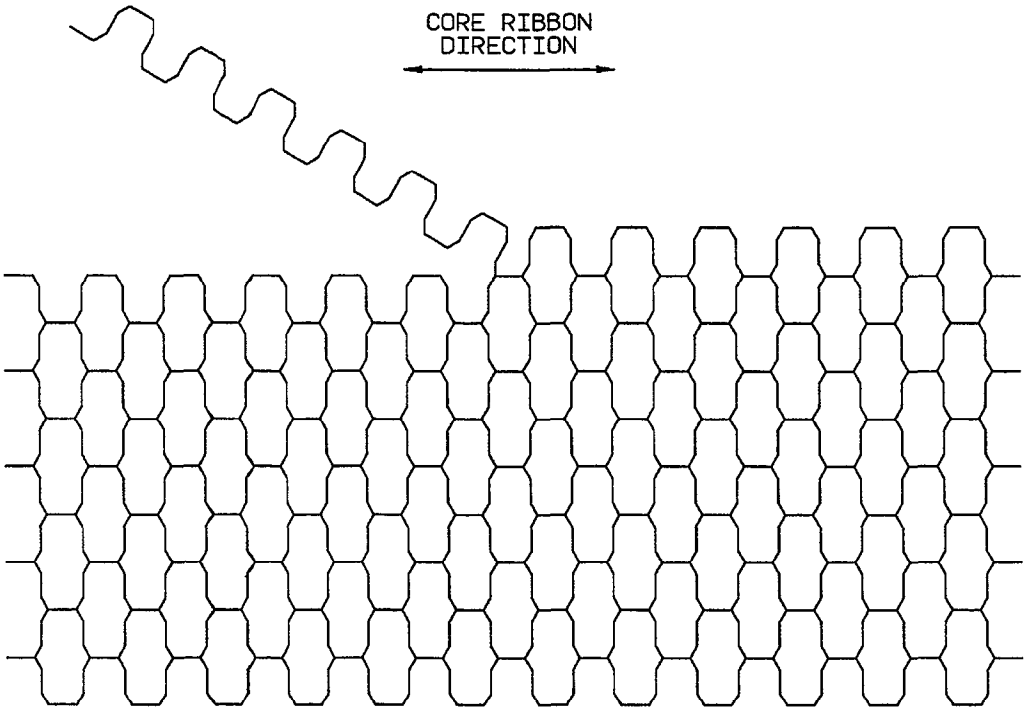
The core is made from aramid fiber/phenolic resin constructed into a honeycomb matrix material. The matrix is formed to a specific shape and size. Two matrix shapes are used, hexagonal (H) and overexpanded (OX). The honeycomb has certain strength factors in relation to its material ribbon direction. The ribbon direction may be determined as shown in Figure 2.



Repair Fabric Identification (Effectivity: All)
Figure 1



HEXAGONAL (H) CORE



OVEREXPANDED (OX) CORE

2000-610-70 C

Honeycomb Core Material (Effectivity: All)
Figure 2

TYPICAL COMPOSITE REPAIR PROCEDURES (Effectivity: All)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

NOTE

All persons performing composite structural repairs must be trained and certified as a Composite Repair Technician by Beech Aircraft Corporation or their designee.

The materials used in the repair of the laminate surface preserve the strength, weight, aerodynamic characteristics, and the electrical properties of the original structure. This is accomplished by replacing damaged material with material of identical chemical composition. These materials are furnished in the form of kits by Beech Aircraft Corporation to match the size and the area of the damage.

The procedure for a standard repair is a wet lay-up cured within a vacuum bag at an elevated temperature. By sealing the repair area with a vacuum bag, air bubbles trapped in the resin mix will be drawn out and excess resin will be removed (debulked). Cure by controlled elevated temperatures makes the repair stronger and greatly reduces cure time.

The Starship is divided into areas for specific repair procedures based upon the manufactured structural formation of the area. Limitations in the size of damage for standard repairs are detailed in Chapter 51-00-00 for all areas. The repair ply lay-up for each area is illustrated in the appropriate chapters of this manual. The illustrations specify core thickness and type, ply reference axis, repair ply orientation, number of repair plies, and type of patch material. The following nomenclature is used to describe the repair patch lay-ups:

PW - Class II, Style 195/P3, Plain Weave

TG - Class II, Style 280/Uni-Fabric

HS - Class II, Style 360/8HS3, 8 Harness Satin

WN - Type 4, Style A or B, 5 Harness Satin

P# - Ply number, P1 is always the first ply applied to the area of repair

T - Core thickness in inches and core type

EXAMPLE: (P1) PW 45°/(P2) TG 0°/(P3) PW 45°

3 Ply lay-up with ply one (P1) being plain weave layed down at 45°, ply two (P2) being uni-fabric layed down at 0° and ply three (P3) being plain weave layed down at 45°.

For all standard repairs to the exterior surface of the Starship 1, the electrical path distribution must be restored. One layer of foil mesh must be applied over the repair with a one inch (1.0″) overlap onto the existing structure. This will distribute the current over the repair patch.

For cosmetic repair to the exterior surface of the Starship 1, the electrical path distribution must be restored if the repair to be made is 6 inches or less from a previous or another repair being made at the same time. Foil mesh must be applied over the combined repair area prior to cure. A minimum of one inch (1.0″) overlap onto the existing structure must be beaccomplished. This will distribute the current over the repair patch. beaccomplished. This will distribute the current over the repair patch.

WARNING

All control surfaces must be rebalanced after any repair or repainting. Refer to Chapter 55 or 57 of the BEECHCRAFT Starship 1 Maintenance Manual for the appropriate procedure.

FACILITIES EQUIPMENT (Effectivity: All)

All certified repair facilities shall have the following equipment available to perform standard field repairs as follows:

- Primary Equipment
  - Gauges (Certified accurate) - For vacuum check and other fabrication uses having a minimum of ± 1 in. mercury (Hg) accuracy and one-half (0.5) in. Hg per division.
  - Vacuum Pumps - Capable of maintaining 19-26 in. Hg vacuum.
  - Heat Lamps - Capable of attaining temperatures up to 180° F.
  - Heat monitoring device (Certified accurate) with a remote heat sensing probe.
  - Drill motors - Electric or air driven.
  - Weighing Scales (Certified accurate) - To weigh adhesives and their proportions.
- Secondary Materials
  - Methyl Ethyl Ketone, (2, Chart 1, 91-00-00).
  - Isopropyl Alcohol, (1, Chart 1, 91-00-00).
  - Cheesecloth Bleached, Commercial Grade.
  - Rymplecloth, (5, Chart 1, 91-00-00).
  - Cotton Gloves, commercially available
  - Rubber Latex Gloves, commercially available
  - 120, 180, & 240 Grit Sandpaper, (4, Chart 1, 91-00-00).
  - Scotchbrite Pads, (7, Chart 1, 91-00-00).
  - Mixing Cups (wax free), commercially available.
  - Tongue Depressors, commercially available.
  - Dust Masks, (6, Chart 1, 91-00-00).
  - Spatula, commercially available (wood or plastic)

BONDING/SEALING (Effectivity: All)

The Starship 1 is made of composite material for lighter weight while maintaining strength. The honeycomb structure is constructed of two facesheets and a honeycomb core.

The following instructions aid in the adhesive bonding/sealing of the BEECHCRAFT Starship 1.

CAUTION

For proper bonding of composite surfaces, do not use any type of silicone adhesives on the BEECHCRAFT Starship 1.

BONDING (Effectivity: All)

a. Two part adhesives must be used prior to the product expiration date.

b. Surfaces must be clean, dry, free from dust, lint, grease, chips, oil, condensation or other moisture and all other contaminating substances prior to the application of adhesives.

c. Isopropyl Alcohol (TT-I-735) or Naphtha Type II (1 or 3, Chart 1, 91-00-00) are cleaners approved for use on plastic transparencies.

d. Adhesives may be applied to either unprimed or primed metal surfaces or unprimed composite surfaces. The primer on metal surfaces must be applied at least 48 hours prior to the adhesive application.

e. Adhesives must not be applied when the temperature of either the adhesive or the structure for adhesive application is below 60° F or above 100° F.

f. Airplane pressurization must not be attempted until the adhesives have fully cured.

g. Adhesives should not be applied over ink, pencil or wax (grease) pencil marks.

h. Adhesives applied over primed metal areas from which the primer was removed during cleaning must have the adhesive applied directly to the cleaned area. Touch up the exposed area with primer after the adhesive has been applied and is cured to a tack free condition.

i. Structure must not be handled or moved until the adhesive is fully cured.

SEALING (Effectivity: All)

The fuselage is sealed to prevent air loss during airplane pressurization. The fuel cells are sealed to prevent fuel leakage. Other areas are sealed to protect the airplane from damaging elements.

The following instructions aid in resealing of the airplane.

a. Two part sealers must be used prior to the product expiration date.

b. Sealers which have been premixed and flash frozen must be maintained at -40° F or lower. These sealers must not be used more than six weeks after the date of mixing.

c. Frozen sealers must be thawed to room temperature before being used. Frozen sealer may be thawed by any means which does not cause contamination or overheating of the sealer and does not shorten the application time of the sealer. Thawing temperature and time must be adjusted to give the sealer a temperature between 60 to 80° F at the time the sealer is applied.

NOTE

Frozen sealers which have been thawed may not be refrozen.

d. Surfaces must be clean, dry, free from dust, lint, grease, chips, oil, condensation or other moisture and all other contaminating substances prior to the sealer application.

e. Isopropyl Alcohol (TT-I-735) or Naphtha Type II (1 or 3, Chart 1, 91-00-00) are cleaners approved for use on plastic transparencies.

f. Sealers may be applied to unprimed or primed surfaces but new primer must be applied 48 hours prior to sealer application.

g. Sealers may not be applied when the temperature of either the sealer or the surface for sealer application is below 60° F.

h. Sealers applied by brush coat method must be applied on the pressurized side of the seal.

i. All holes must be drilled and deburred before application of sealer between structure.

j. After application, all sealer must be smoothed and pressed into the seam or joint.

k. Reaming of holes and installation of fasteners through a sealed area shall be performed during the working life of the sealer.

l. Extruded sealer must be evident around the complete periphery of any fasteners. Sealer must be wiped from the end of a fastener after installation through the material.

m. Airplane pressurization should not be attempted until the sealer is cured.

n. Sealer must not be applied over ink, pencil or wax (grease) pencil marks.

o. On areas from which the primer was removed during cleaning, seal directly over the cleaned area and then touch up the exposed area with primer after the sealer has cured to a tack free condition.

p. Sealed structure must not be handled or moved until the sealer is not tacky when touched.

ADHESIVE PREPARATION (EFFECTIVITY: ALL)

NOTE

Instructions contained within Beech Aircraft Corporation supplied kits regarding the mixing of adhesives supercede the following instructions.

WARNING

All 2 part adhesives must be mixed with the base or catalyst with which it was shipped. A base or catalyst left from a previous order must not be used.

Two part adhesives may be mixed as follows:

a. Using a clean spatula, weigh out the proper amount of required base in a clean, wax free paper cup.

b. Stir the catalyst with a clean spatula and discard the spatula. Using a clean spatula, weigh the correct amount of catalyst in the cup with the base.

NOTE

Do not allow the catalyst to touch the side of the mixing cup or spill during the weighing or mixing of the sealer/adhesive.

c. Mix the base and catalyst together until the mixture is uniform in color with no streaks or lumps.

BAGGING THE REPAIR (EFFECTIVITY: ALL) (FIGURE 1)

The adhesives, used for wet lay-up repair, require pressure and elevated temperature during the cure cycle to develop full strength. The following information describes the operations required to enclose the repair in a vacuum bag so that atmospheric pressure is applied to the repair when a vacuum is drawn inside the bag.

When all repair details are in place and ready to be cured, they are enclosed in a bag of plastic film or thin rubber. Air is removed from the bag by a vacuum source so that atmospheric pressure exerts a pressure on the repair as it is cured.

To provide a path for the air that is initially inside the bag to be drawn off by the vacuum source, layers of fiberglass cloth or similar materials known as "breather plies" are placed inside the bag. It is also sometimes necessary to bleed off excess resin. To do this, layers of fiberglass cloth or similar materials known as "bleeder plies" are placed over the wet lay-up. Porous separator plies are used between the repair and the bleeder and between the bleeder and the breather to control the flow of air and resin. A pressure plate (caul plate) of thin metal or cured fiberglass may be used to exert pressure over the patch area to help smooth the surface of the material being cured.

Figure 1 illustrates a typical bagging arrangement for a localized repair utilizing a heating lamp to supply controlled elevated heat. The procedure for the bagging arrangement shown in Figure 1 is outlined as follows:

a. With the patch material in place, locate the end of a length of thermocouple wire near the edge of the repair lay-up. Tape the wire in place with heat-resistant tape. The tape must not be in contact with the repair patch or the adhesive.

b. Place a layer of porous separator cloth over the patch, extending beyond the repair and the adhesive. Smooth to avoid wrinkles.

c. Place bleeder plies as shown, extending two or three inches beyond the patch.

d. Place a layer of perforated separator ply, one inch smaller than the bleeder plies, over the bleeder plies. This layer is intended to stop resin flow from bleeder plies into breather plies while still providing an air flow path when vacuum is applied.

e. If a pressure plate (caul plate) is used, place it over the previous separator ply (referred to in the previous step).

WARNING

If the thickness of the patch varies near its edge because of ply drop-off as shown, a stiff pressure plate will prevent equal application of pressure to the outermost plies.

f. Place breather plies as shown, extending beyond the bleeder plies and providing a location for the vacuum probe.

g. Place a bead of bag sealant around the edge of the breather plies. Seal around the thermocouple wires (if used for elevated temperature cure).

h. Cover with vacuum bag material. Smooth to prevent wrinkles.

i. Press the bag firmly onto the bag sealant to obtain an airtight seal.

j. Install a vacuum probe through an opening cut in the bag. The probe must sit on the breather plies but must not be in contact with the patch or adhesive. Seal around the probe with sealing tape.

k. Connect the vacuum source and smooth the bag by hand pressure as the air is removed. Check for leaks and reseal as necessary.

CURING THE REPAIR (EFFECTIVITY: ALL)

WARNING

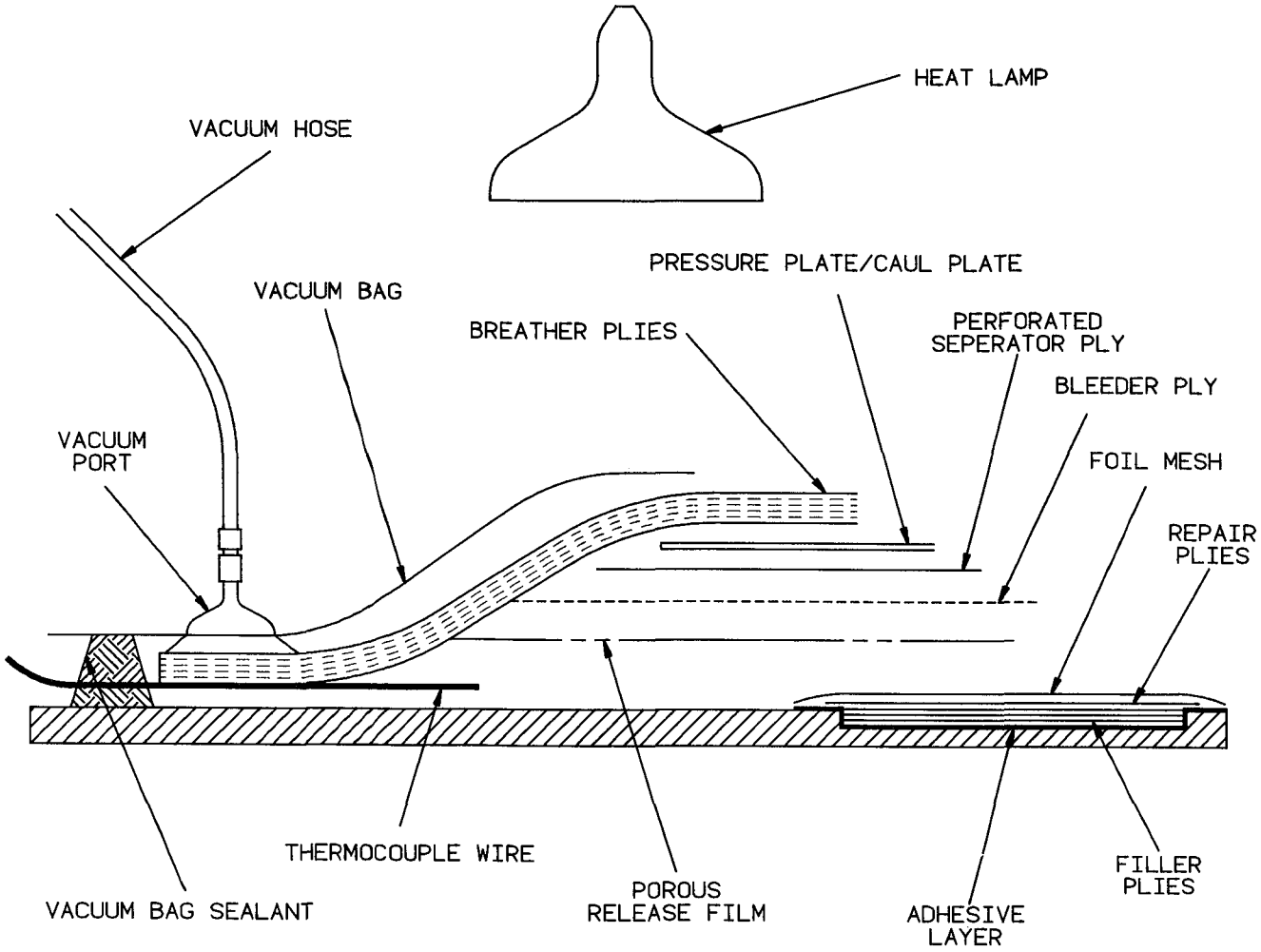
Structural failure may occur if the repair is subjected to movement or stress before the cured adhesive has obtained full strength.

WARNING

When heat lamps are used, care must be taken to insure that the repair lay-up does not exceed 190 F.

The curing process of composite repair is accomplished by enclosing the repair in a vacuum bag and using a controlled elevated temperature. The elevated controlled temperature may be achieved with the use of heat lamps. The use of heat lamps require a temperature sensing device to monitor temperature. The temperature must be monitored and controlled to keep a constant temperature at the repair patch of 170° to 190° F for 90 minutes to produce a full cure.

After the curing process is complete, the vacuum bag and repair area must be cooled to room temperature before relieving vacuum pressure.



Typical Repair Bagging Layup (Effectivity: All)
Figure 1

WATER BREAK TEST (EFFECTIVITY: ALL)

A water break test is used to determine if a surface is clean of all impurities. A clean surface will retain an even coat of water over its entire surface. If the surface is contaminated with impurities such as oil, dirt, fingerprints and etc., the water will "break" on contact with the impurities and will not adhere to the surface. The water break test may be performed as follows:

NOTE

If the honeycomb core is exposed, do not allow the water to run from the prepared surface into the exposed core area.

a. Direct a stream or mist of distilled or deionized water on the surface of the area to be checked. Use enough water to completely cover the entire area without flooding the area.

b. After at least ten seconds, but no longer than two minutes, check for a solid water pattern on the cleaned area.

c. There must be no break in the water. The entire area must have uniform wetness.

d. Wipe the surface clean with a clean white cloth.

If the prepared clean area did not have a uniform wetness (the water showed a break), that area is contaminated and needs to be cleaned again.

WARNING

Adhesives will not adhere to wet surfaces. After performing water break tests, the surface must be completely dried.

COMPOSITE REPAIR PROCEDURES (EFFECTIVITY: ALL)

The repair procedures vary depending upon the classification of damage entailed. Refer to Chapter 51-00-00 for damaged type classification and repair limitations. All composite repairs must be made with Beech Aircraft Corporation supplied kits or materials.

STANDARD REPAIR (EFFECTIVITY: ALL)

NOTE

Foil mesh, for lightning strike protection, must be used on external surfaces but does not need to be used on repair of internal surfaces.

a. Perform a tap test (refer to 51-30-00) to determine the complete area of damage.

NOTE

The area of damage must not exceed the limits of standard repair for that particular area as stated in 51-00-00, STANDARD REPAIR.

WARNING

The removal of composite material by sanding, routing, etc produces small airborne composite particles that are harmful to personal health and equipment. A vacuum system must be used in conjunction with these processes to prevent airborne particles. Dust masks must be worn by all personnel in the area.

b. Remove the damaged area with a router, as shown in Figure 3, sanding disc, or a suitable substitute.

CAUTION

Do not remove or cut into the opposite facesheet

NOTE

For ease of repair, remove the damaged material in a circle.

c. Determine the size of area around the perimeter of the damage area to be prepared as follows:

1. Allow 1 inch for the first repair ply.
2. Allow .75 inch for each successive repair ply.
3. Allow 1 inch for the foil mesh.

4. Allow 1/2 inch extra area.

d. Abrade the determined area with maximum of 180 grit aluminum oxide sandpaper to remove the paint. Abrade the composite laminate facesheet until the glossy glaze is removed by using 180 grit aluminum oxide sandpaper.

NOTE

Do not sand the facesheet deep enough to cut the composite fibers.

e. Clean the surface using a clean white cloth dampened with isopropyl alcohol or methyl ethyl ketone (1 or 2, Chart 1, 91-00-00) and follow immediately with a dry clean white cloth. Do not allow the solvent to evaporate on the surface.

NOTE

The surface to receive the repair application must be clean for proper adhesive adhesion. Any type of contamination on the surface will not allow the adhesive to adhere to the surface.

f. Perform a water break test for surface cleanliness.

g. Repeat the cleaning process and the water break test if contamination is indicated.

WARNING

Adhesives will not adhere to wet surfaces. After performing water break tests, the surface must be completely dried.

NOTE

The Beech Aircraft Corporation supplied repair kits are supplied with the repair plies in proper order and ply orientation. Care must be taken to keep the plies in their correct order and orientation.

WARNING

Personal protective equipment must be worn while doing wet lay-up procedures. The equipment must include but not be limited to the use of goggles, gloves, aprons and dust masks.

h. Cut the honeycomb core repair material to make a tight fit into the routed void. Do not install.

NOTE

Beech Aircraft Corporation supplied repair kits provide filler plies cut in concentric circles and repair plies cut in oval shapes.

i. Cut the filler ply materials the same size as the routed hole.

j. Prepare the repair plies from the repair kit by cutting each ply to the appropriate size. Cut the first ply to be laid down 1 inch larger than the damage area. Cut each successive ply 3/4 inch larger than the previous ply. The foil mesh must be cut 1 inch larger than the top or last fabric ply.

k. Mix the adhesive in accordance with ADHESIVE PREPARATION in this chapter.

NOTE

Wet lay-ups of more than six fabric plies must be accomplished in multiples of six. Each lay-up of six plies must be vacuum bagged and cured 90 minutes at 170° to 190° F with 19-26 inches Hg vacuum.

l. Apply a layer of adhesive to the bottom and sides of the routed hole.

m. Install the core repair material into the routed hole with the ribbon direction in proper direction.

n. Apply a layer of adhesive to the top of the core material.

o. Install the first filler ply.

p. Squeegee to remove all air, excess resin and wrinkles.

q. Repeat the process of applying adhesive, installing fabric, and using a squeegee to remove all air, excess resin and wrinkles for each filler ply and repair ply. Make sure that each repair ply orientation is correct.

r. Clean the foil mesh with isopropyl alcohol or methyl ethyl ketone (1 or 2, Chart 1, 91-00-00) followed by wiping with a clean dry cloth. Do not allow the solvent to evaporate on the surface.

s. Apply a layer of adhesive over the complete repair patch and extending 1 inch greater than the patch perimeter.

t. Apply foil mesh over the patch material. Make sure the perimeter of the foil is 1 inch larger than the patch material.

u. Squeegee to remove all air, excess resin and wrinkles.

v. Apply bag sealant approximately 4 inches around the periphery of the repair area.

w. Bag the repair as outlined in BAGGING THE REPAIR in this chapter.

x. Cure the lay-up as outlined in CURING THE REPAIR in this chapter.

COSMETIC REPAIR (EFFECTIVITY: ALL)

Cosmetic repair is used for small indentations of the facesheet laminate. The size of cosmetic repair is limited to .50 inch diameter on all structures except the wing fuel tank skins. The maximum size for the fuel tank skins is .250 inch diameter. Cosmetic repairs that are less than 6 inches apart, including previous repairs and all fuel tank skin repairs, require foil mesh applied over the entire repair area and a 1 inch overlap area for lightning strike protection.

COSMETIC REPAIR (WITHOUT FOIL MESH) (EFFECTIVITY: ALL)

a. Perform a tap test (refer to 51-30-00) to determine the complete area of damage.

WARNING

The removal of composite material by sanding, routing, etc produces small airborne composite particles that are harmful to personal health and equipment. A vacuum system must be used in conjunction with these processes to prevent airborne particles. Dust masks must be worn by all personnel in the area.

b. Remove the paint from the indention and .50 inch surrounding the area with 180 grit sandpaper. Sand the composite laminate facesheet until the glossy glaze of the composite material is removed.

NOTE

Do not sand the facesheet deep enough to cut the composite fibers.

c. Clean the surface using a clean white cloth dampened with isopropyl alcohol or methy ethyl ketone (1 or 2, Chart 1, 91-00-00) and follow immediately with a dry clean white cloth. Do not allow the solvent to evaporate on the surface.

NOTE

The surface to receive the repair application must be clean for proper adhesive adhesion. Any type of contamination on the surface will not allow the adhesive to adhere to the surface.

d. Mix the filler adhesive in accordance with ADHESIVE PREPARATION in this chapter.

e. Using a clean spatula, fill and smooth the indentation with the mixed filler adhesive or fairing compound.

f. Cure the adhesive in either of the following ways:

1. Room temperature (77° F.) for 5 days.

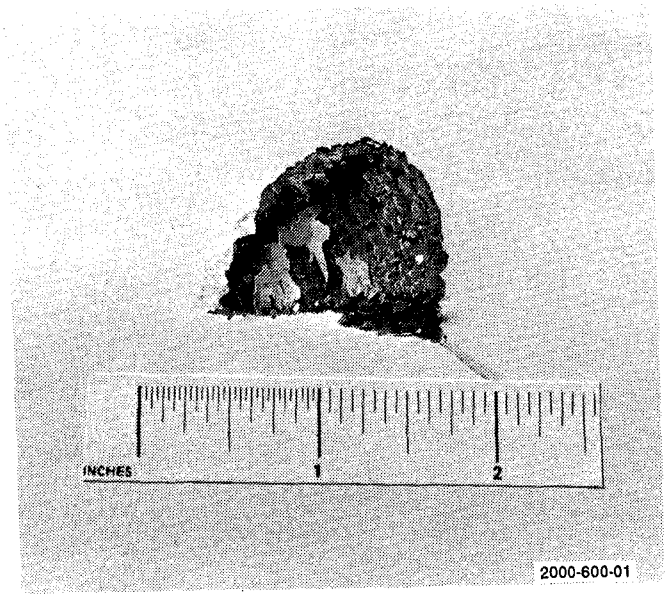
WARNING

If heat lamps are used, care must be taken to insure that the repair surface does not exceed 190° F.

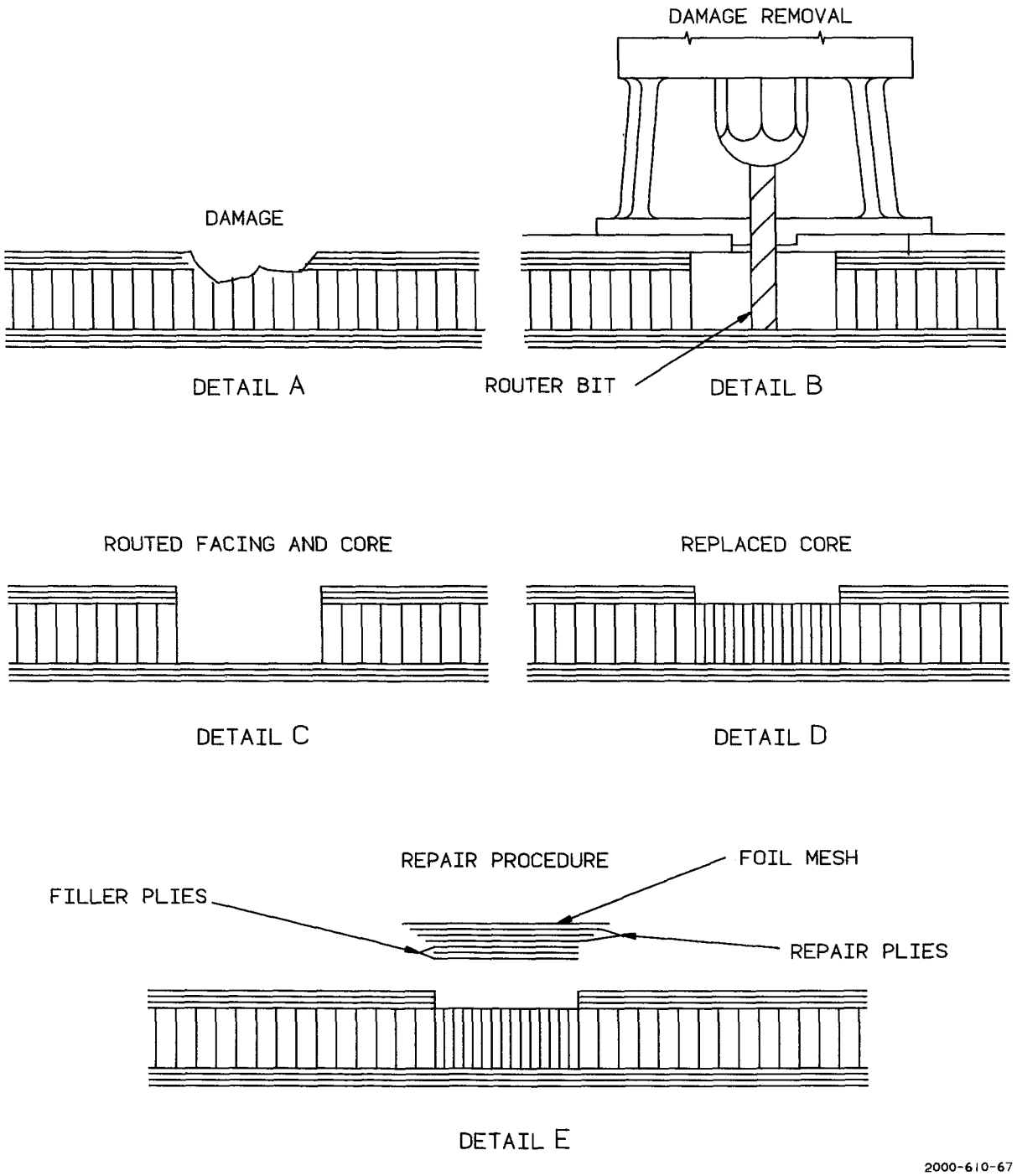
2. Controlled elevated temperature using heat lamps. A constant temperature of 100° to 130° F for 1 hour to be followed by an elevated temperature of 180° F for 1 hour. The elevated temperature curing process must be monitored with a temperature sensing device to monitor temperatures.

COSMETIC REPAIR (WITH FOIL MESH) (EFFECTIVITY: ALL)

a. Perform a tap test (refer to 51-30-00) to determine the complete area of damage.



Facesheet and Core Damage (Effectivity: All)
Figure 2



Damage Repair Procedure (Effectivity: All)
Figure 3

WARNING

The removal of composite material by sanding, routing, etc produces small airborne composite particles that are harmful to personal health and equipment. A vacuum system must be used in conjunction with these processes to prevent airborne particles. Dust masks must be worn by all personnel in the area.

b. Determine the size of the repair area to be prepared by marking approximately 2 inches surrounding the repair area or the combined repair areas.

c. Remove the paint from the indention(s) and the determined area with 180 grit aluminum oxide sandpaper. Abrade the composite laminate facesheet until the glossy glaze of the composite material is removed.

NOTE

Do not sand the facesheet deep enough to cut the composite fibers.

d. Clean the surface using a clean white cloth dampened with isopropyl alcohol or methyl ethyl ketone (1 or 2, Chart 1, 91-00-00) and follow immediately with a dry clean white cloth. Do not allow the solvent to evaporate on the surface.

NOTE

The surface to receive the repair application must be clean for proper adhesive adhesion. Any type of contamination on the surface will not allow the adhesive to adhere to the surface.

e. Mix the filler adhesive in accordance with ADHESIVE PREPARATION in this chapter.

f. Using a clean spatula, fill the indentation with the mixed filler adhesive.

g. Cure the filler adhesive in either of the following ways:

1. Room temperature (77° F) for 5 days.

WARNING

If heat lamps are used, care must be taken to insure that the repair surface does not exceed 190° F.

2. Controlled elevated temperature using heat lamps. A constant temperature of 100° to 130° F for 1 hour to be followed by an elevated temperature of 180° F for 1 hour. The elevated temperature curing process must be monitored with a temperature sensing device to monitor temperatures.

h. Lightly scuff sand the entire area.

i. Clean the surface using a clean white cloth dampened with isopropyl alcohol or methyl ethyl ketone (1 or 2, Chart 1, 91-00-00) and follow immediately with a dry clean white cloth. Do not allow the solvent to evaporate on the surface.

NOTE

The surface to receive the repair application must be clean for proper adhesive adhesion. Any type of contamination on the surface will not allow the adhesive to adhere to the surface.

j. Apply bag sealant approximately 4 inches around the periphery of the prepared area.

k. Cut a patch of aluminum foil mesh to cover the repair area plus a 1 inch overlap.

l. Clean the foil mesh with isopropyl alcohol or methyl ethyl ketone (1 or 2, Chart 1, 91-00-00) followed by wiping with a clean dry cloth.

m. Mix the adhesive in accordance with ADHESIVE PREPARATION in this chapter.

n. Apply a thin coat of adhesive to the area.

o. Apply foil mesh to the area.

p. Squeegee to remove all air, excess resin and wrinkles.

q. Bag the repair as outlined in BAGGING THE REPAIR in this chapter.

r. Cure the lay-up as outlined in CURING THE REPAIR in this chapter.

CHAPTER 52 - DOORS

LIST OF PAGE EFFECTIVITY

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52-80-00	1	Nov 10/89

CHAPTER 52 - DOORS

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Landing Gear Doors (Effectivity: All)	1

CABIN ENTRY DOOR (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

NOTE

Personnel accomplishing composite structural repair of the Starship 1 must be trained and certified as a Composite Repair Technician by Beech Aircraft Corporation or their designee.

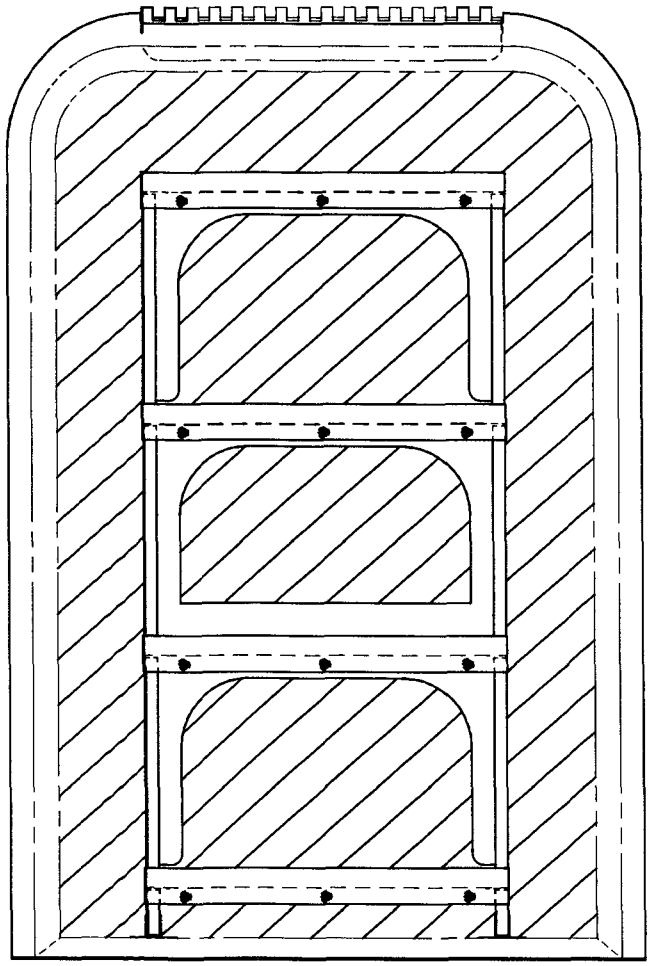
The information in this chapter gives details regarding the materials needed to make standard structural repairs for specific areas. The repair processes and materials are defined in Chapter 51.

WARNING

The size of the standard repair for any area is limited. Damage repair larger than the limits or repair in areas not specifically detailed in this chapter must be done with the supervision of Beech Aircraft Corporation Customer Support Department. Refer to 51-00-00 STANDARD REPAIR for repair limitations.

REPAIR LAYUP: (P1) PW 45°/(P2) PW 90°/(P3) PW 0°/(P4) PW 90°/
(P5) PW 45°
T = 1.0 THK OX-3/16-3.0

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES ON THE OUTER SURFACE OF THE DOOR AND ON THE INNER SURFACE WHERE THE REPAIR WILL NOT INTERFERE WITH THE MECHANISM.



CORE RIBBON DIRECTION

PLY REF AXIS
+45°
0°
-45°

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -29.

VIEW LOOKING INBOARD WITH DOOR OPEN
SOME DETAILS NOT SHOWN FOR CLARITY

2000-104-30

Cabin Entry Door (Effectivity: All)
Figure 1

SERVICE DOORS (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

NOTE

Personnel accomplishing structural repair of the Starship 1 must be trained and certified as a Composite Repair Technician by Beech Aircraft Corporation or their designee.

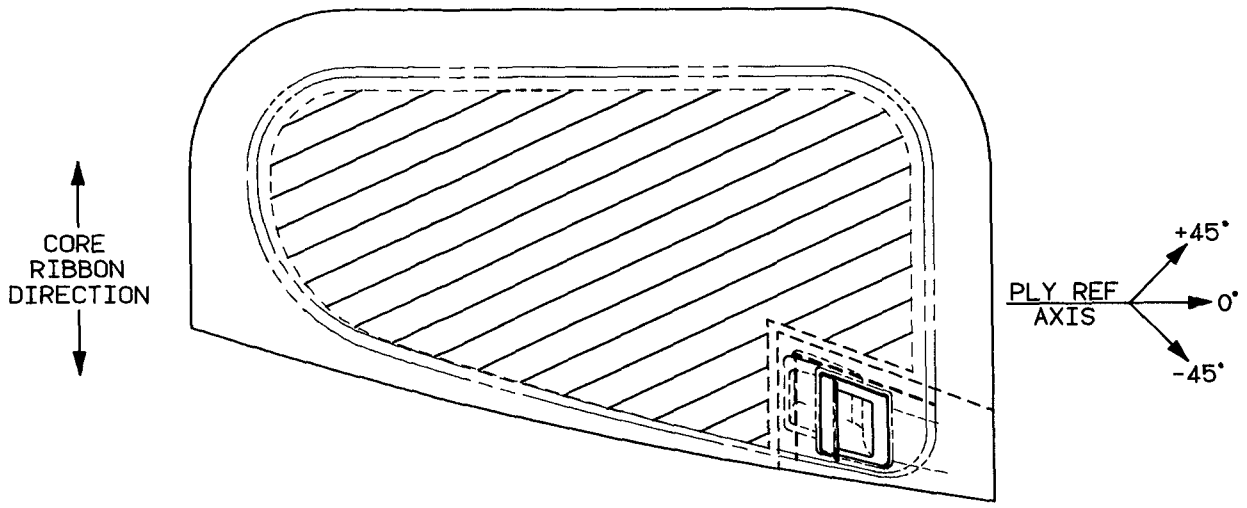
The information in this chapter gives details regarding the materials needed to make standard structural repairs for specific areas. The repair processes and materials are defined in Chapter 51.

WARNING

The size of the standard repair for any area is limited. Damage repair larger than the limits or repair in areas not specifically detailed in this chapter must be done with the supervision of Beech Aircraft Corporation Customer Support Department. Refer to 51-00-00 STANDARD REPAIR for repair limitations.

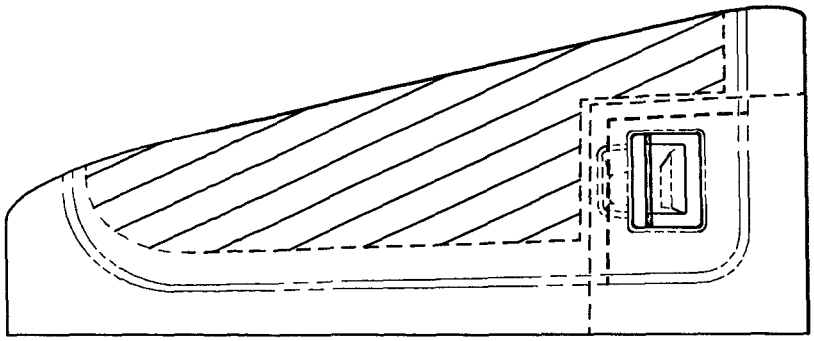
REPAIR LAYUP: (P1) PW 45°/(P2) PW 0°/(P3) PW 45°/(P4) PW 0°/
(P5) PW 45°
T = .50 THK H-1/8-3.0

AREA CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES ON THE INNER AND OUTER SIDES OF THE DOOR.



VIEW LOOKING DOWN

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -51.



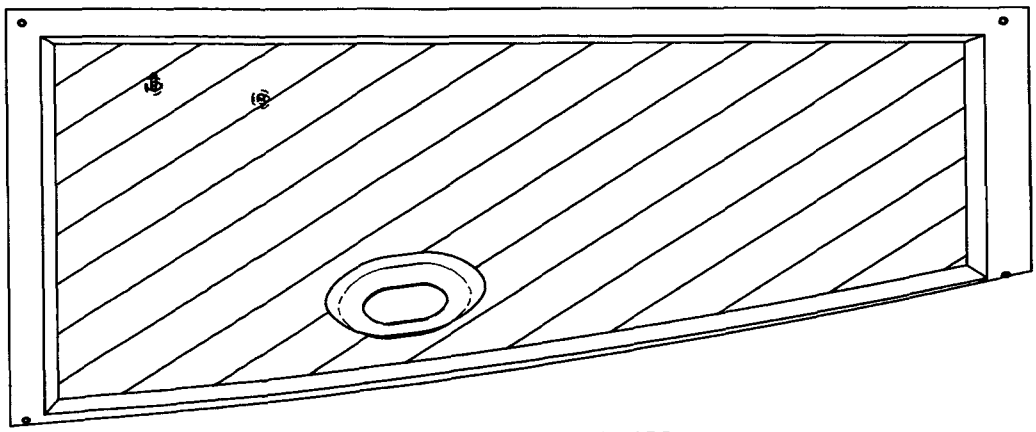
VIEW LOOKING INBOARD

2000-113-03

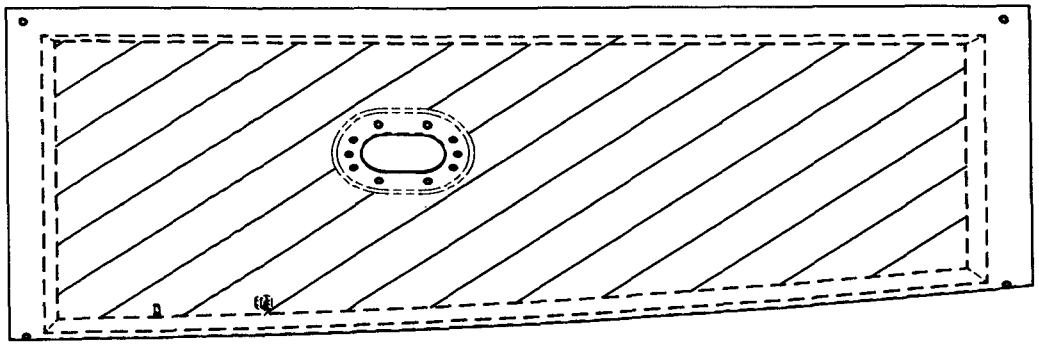
Nose Section Avionics Doors (Effectivity: All)
Figure 1

REPAIR LAYUP: (P1) PW 45°/(P2) PW 0°/(P3) PW 45°/(P4) PW 0°/
(P5) PW 45°/(P6) PW 0°/(P7) PW 45°
T = .50 THK H-1/8-3.0

AREA CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES ON THE INNER AND OUTER SURFACES OF THE DOOR.

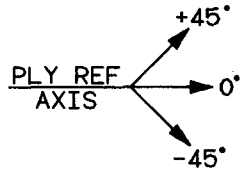


VIEW LOOKING INBOARD



CORE RIBBON DIRECTION

VIEW LOOKING UP



STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -53.

2000-091 17

Nose Section Cheek Skin Doors (Effectivity: All)
Figure 2

LANDING GEAR DOORS (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

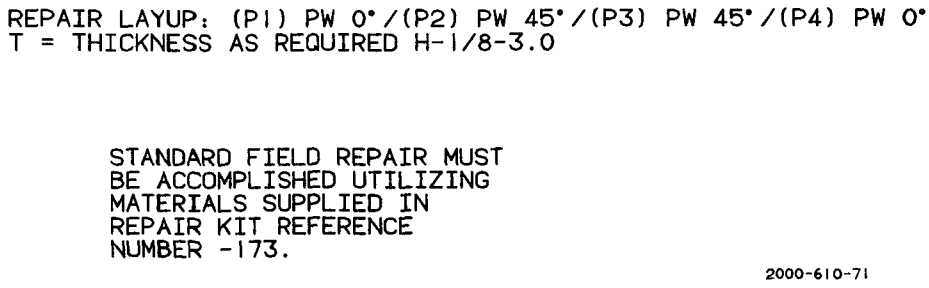
NOTE

Personnel accomplishing structural repair of the Starship 1 must be trained and certified as a Composite Repair Technician by Beech Aircraft Corporation or their designee.

The information in this chapter gives details regarding the materials needed to make standard structural repairs for specific areas. The repair processes and materials are defined in Chapter 51.

WARNING

The size of the standard repair for any area is limited. Damage repair larger than the limits or repair in areas not specifically detailed in this chapter must be done with the supervision of Beech Aircraft Corporation Customer Support Department. Refer to 51-00-00 STANDARD REPAIR for repair limitations.



All Landing Gear Doors (Effectivity: All)
Figure 1

CHAPTER 53 - FUSELAGE

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CHAPTER 53 - FUSELAGE

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53-30-00	
Fuselage (EFFECTIVITY: ALL)	1

BULKHEADS (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

NOTE

Personnel accomplishing structural repair of the Starship 1 must be trained and certified as a Composite Repair Technician by Beech Aircraft Corporation or their designee.

The information in this chapter gives details regarding the materials needed to make standard structural repairs for specific areas. The repair processes and materials are defined in Chapter 51.

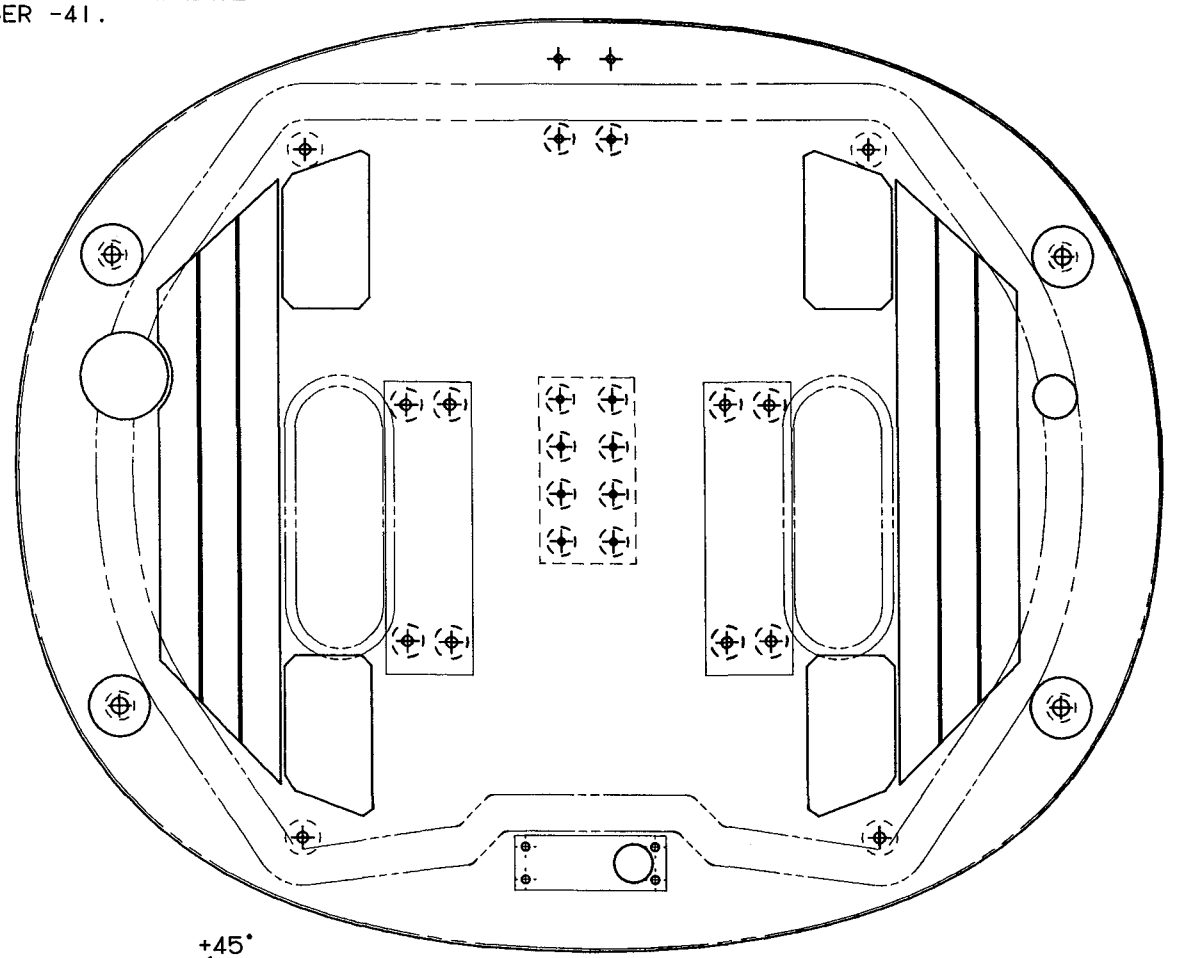
WARNING

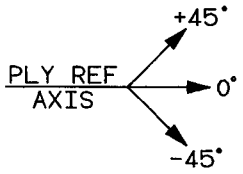
The size of the standard repair for any area is limited. Damage repair larger than the limits or repair in areas not specifically detailed in this chapter must be done with the supervision of Beech Aircraft Corporation Customer Support Department. Refer to 51-00-00 STANDARD REPAIR for repair limitations.

REPAIR LAYUP: (P1) PW 45°/(P2) PW 0°/(P3) PW 45°
T = .50 THK H-1/8-3.0

ENTIRE SURFACE OF BULKHEAD MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES ON THE FORWARD AND AFT SIDES OF THE BULKHEAD.

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -41.





VIEW LOOKING FORWARD

CORE RIBBON DIRECTION OPTIONAL

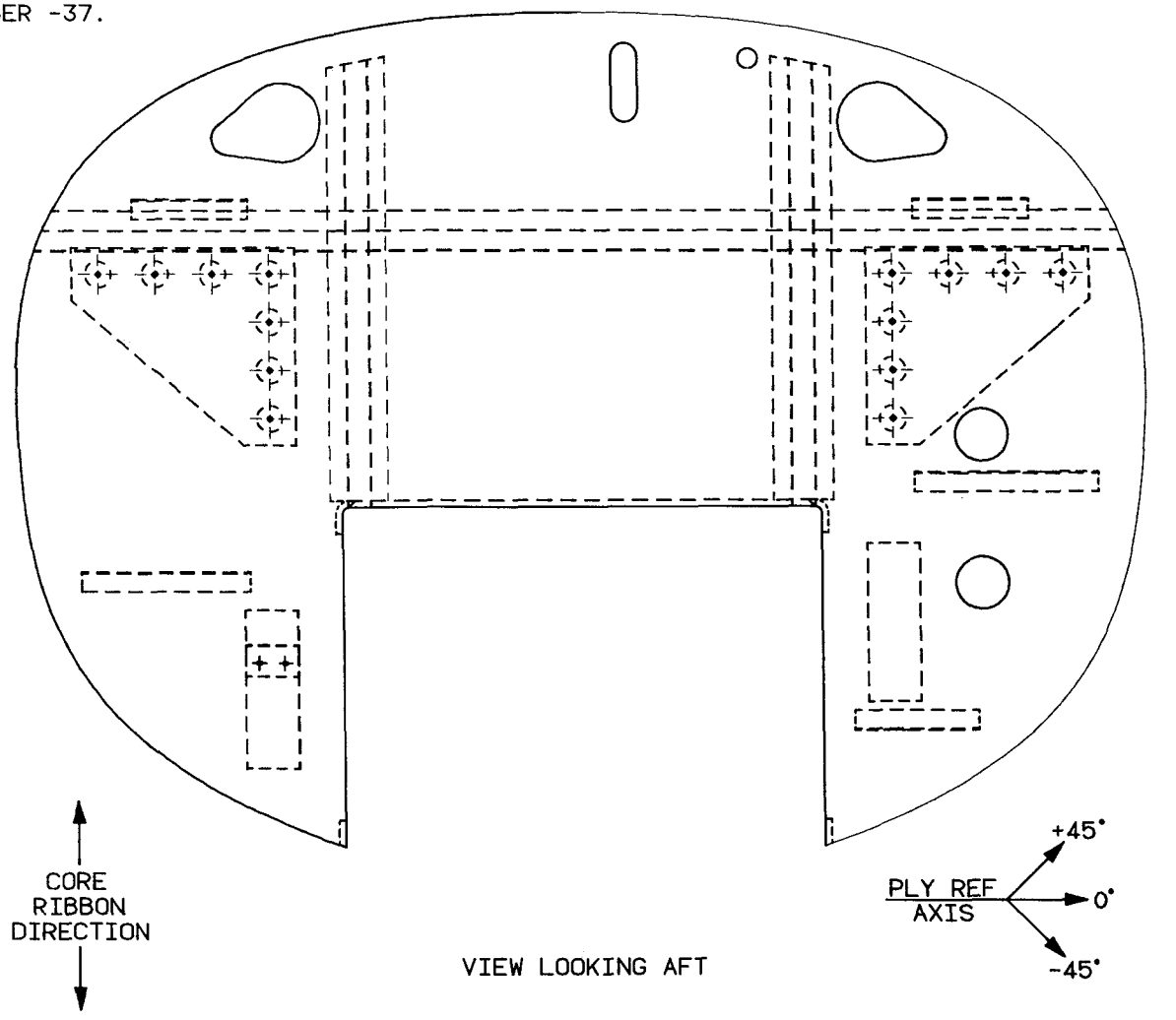
2000-091-12

F.S. 18 Bulkhead (Effectivity: All)
Figure 1

REPAIR LAYUP: (P1) PW 0°/(P2) PW 45°/(P3) PW 0°/(P4) PW 45°/
(P5) PW 0°
T = .50 THK H-1/8-3.0

THE ENTIRE SURFACE OF THE BULKHEAD MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES ON THE FORWARD AND AFT SIDES OF THE BULKHEAD.

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -37.

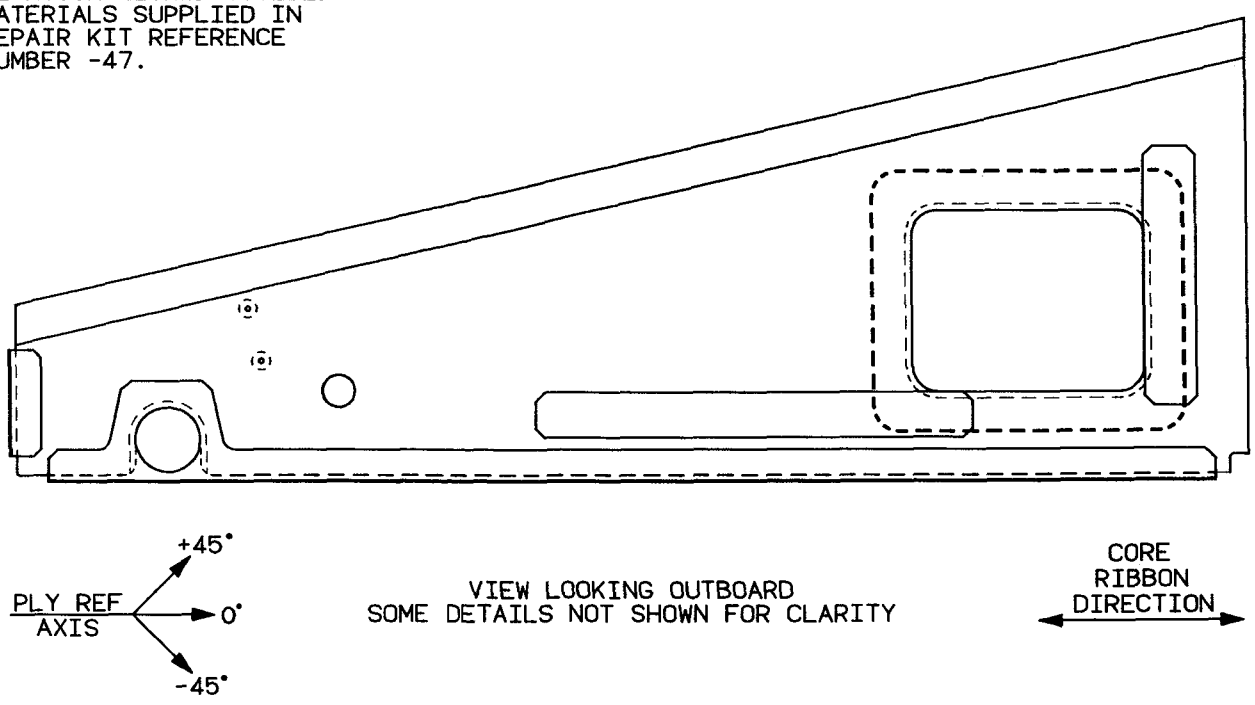


F.S. 46 Bulkhead (Effectivity: All)
Figure 2

REPAIR LAYUP: (P1) PW 0°/(P2) PW 45°/(P3-P4) PW 0°/(P5) PW 45°/
(P6) PW 0°
T=.50 THK H-1/8-3.0

ENTIRE SURFACE OF KEEL MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES ON BOTH SURFACES OF KEEL.

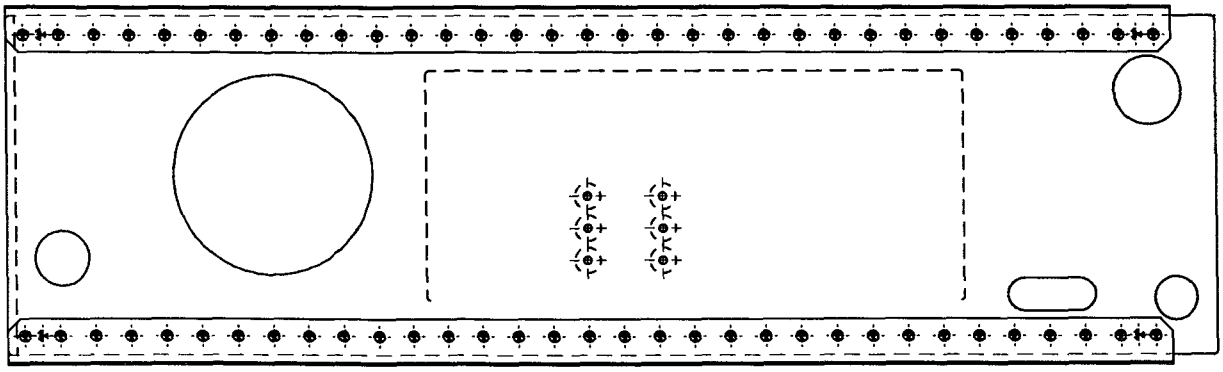
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -47.



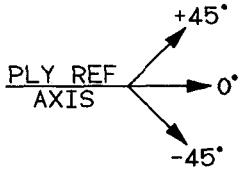
Nose Section B.L. 0 Keel (Effectivity: All)
Figure 3

REPAIR LAYUP: (P1) PW 45°/(P2) PW 0°/(P3) PW 45°/(P4) PW 0°/
(P5) PW 45°/(P6) PW 0°/(P7) PW 45°
T = .50 THK H-1/8-3.0

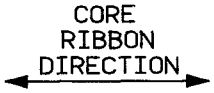
ENTIRE SURFACE OF KEEL MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES ON BOTH SIDES OF THE KEEL.



VIEW LOOKING OUTBOARD
SOME DETAILS NOT SHOWN FOR CLARITY



STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -49.



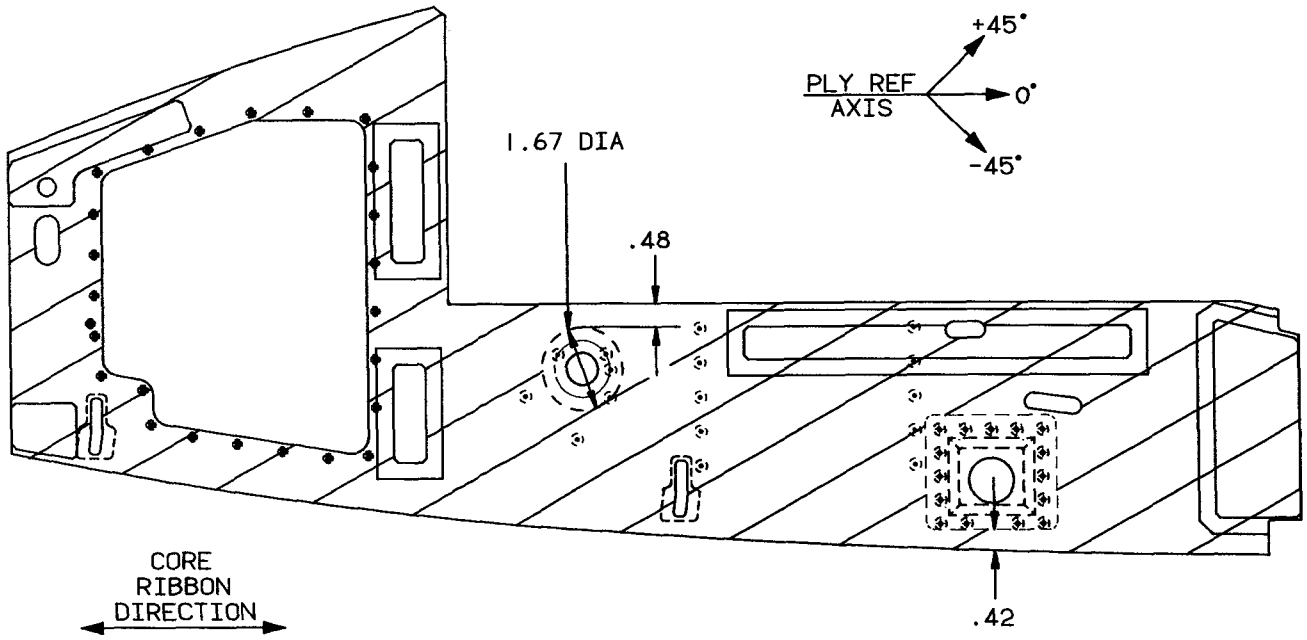
2000-091-15

Nose Section B.L. 0 Mid Keel (Effectivity: All)
Figure 4

REPAIR LAYUP: (P1) PW 0°/(P2) PW 45°/(P3-P4) PW 0°/(P5) PW 45°/
(P6) PW 0°
T = .75 THK H-1/8-3.0

AREAS CROSS HATCHED MAY BE REPAIRED PER
STANDARD REPAIR MANUAL PROCEDURES.

STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -43.



VIEW LOOKING OUTBOARD
SOME DETAILS NOT SHOWN FOR CLARITY

2000-091-13

Nose Section B.L. 8.5 Keels (Effectivity: All)
Figure 5

AUXILIARY STRUCTURE (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

NOTE

Personnel accomplishing structural repair of the Starship 1 must be trained and certified as a Composite Repair Technician by Beech Aircraft Corporation or their designee.

The information in this chapter gives details regarding the materials needed to make standard structural repairs for specific areas. The repair processes and materials are defined in Chapter 51.

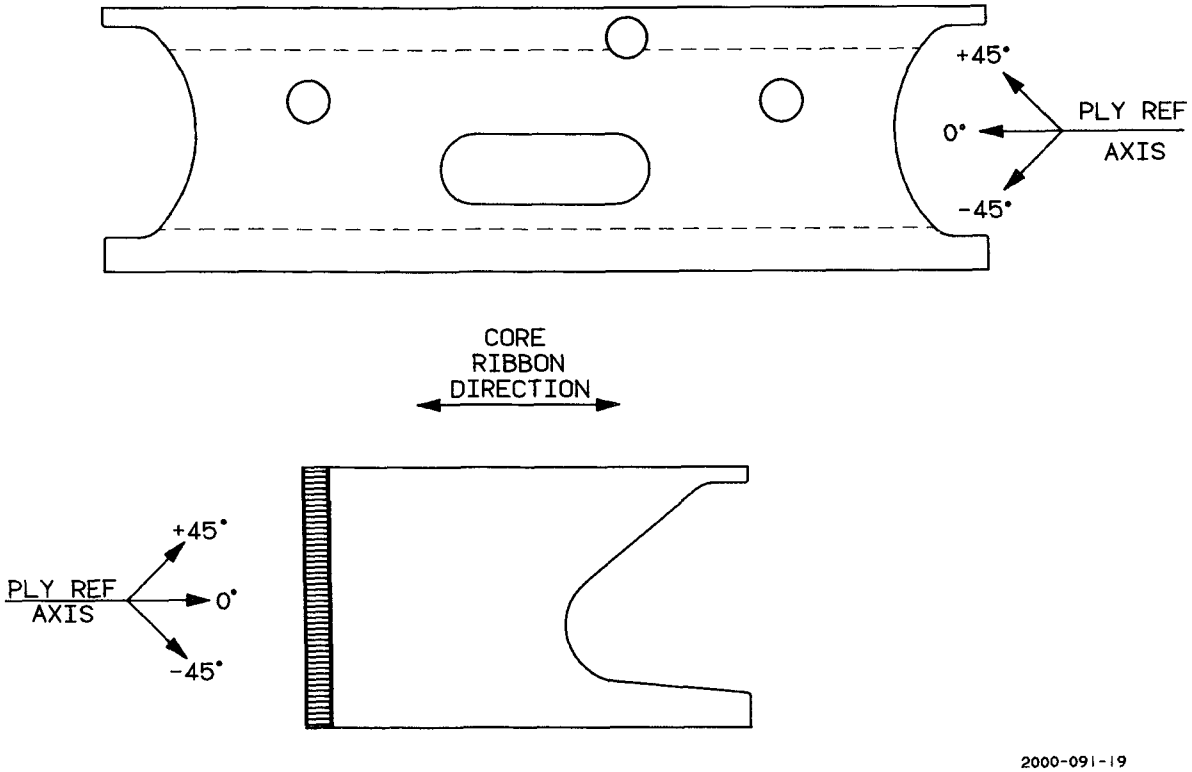
WARNING

The size of the standard repair for any area is limited. damage repair larger than the limits or repair in areas not specifically detailed in this chapter must be done with the supervision of Beech Aircraft Corporation Customer Support Department. Refer to 51-00-00 STANDARD REPAIR for repair limitations.

REPAIR LAYUP: (P1) PW 0°/(P2) PW 45°/(P3-P4) PW 0°/(P5) PW 45°
(P6) PW 0°
T = .50 THK H-1/8-3.0

ENTIRE SURFACE OF BEAMS MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES ON THE FORWARD AND AFT SIDES OF THE BEAMS.

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -57.



Nose Section Inter-Shelf Connect Beams (Effectivity: All)
Figure 1

FUSELAGE (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

NOTE

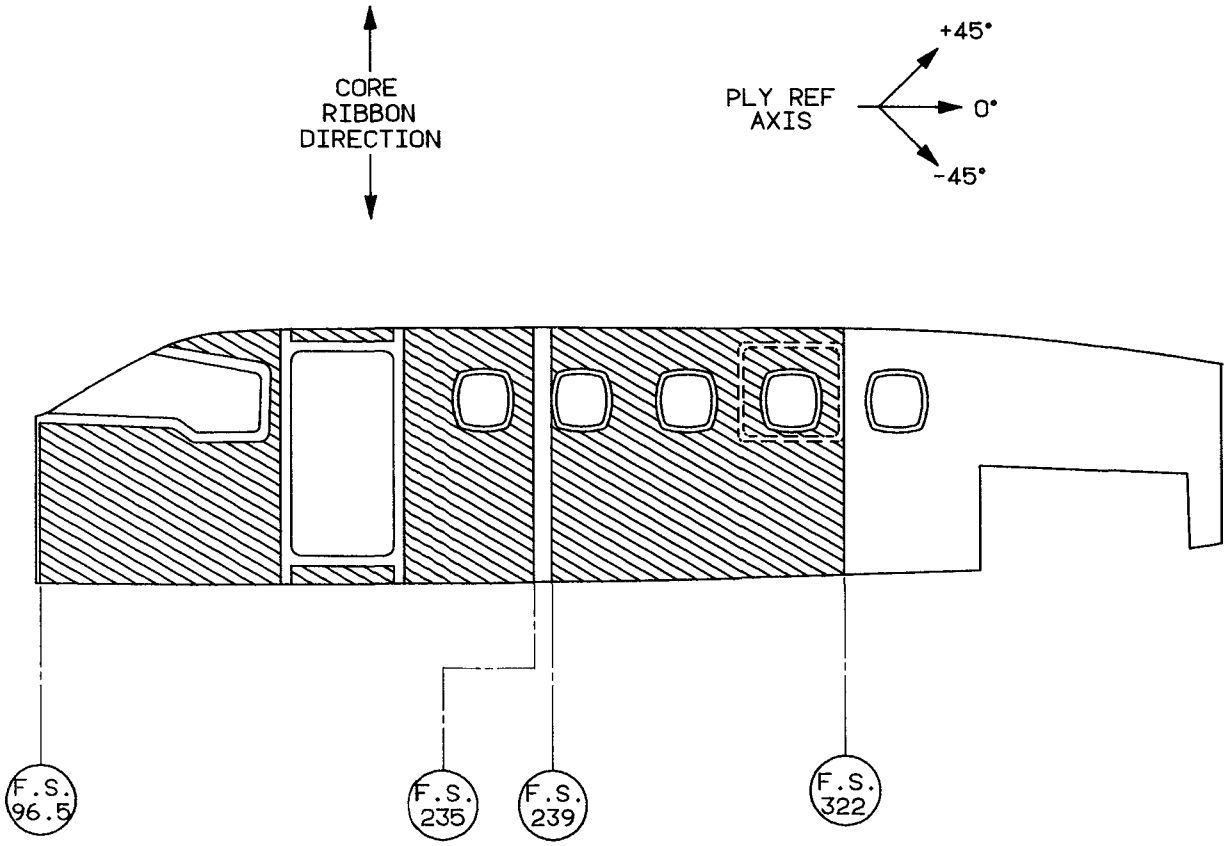
Personnel accomplishing structural repair of the Starship 1 must be trained and certified as a Composite Repair Technician by Beech Aircraft Corporation or their designee.

The information in this chapter gives details regarding the materials needed to make standard structural repairs for specific areas. The repair processes and materials are defined in Chapter 51.

WARNING

The size of the standard repair for any area is limited. damage repair larger than the limits or repair in areas not specifically detailed in this chapter must be done with the supervision of Beech Aircraft Corporation Customer Support Department. Refer to 51-00-00 STANDARD REPAIR for repair limitations.

REPAIR LAYUP: (P1) PW 90°/(P2-P3) PW 0°/(P4) PW 90°
T=.75 THK OX-3/16-3.0



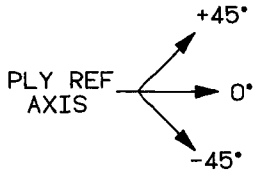
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -3.

AREAS CROSS HATCHED MAY BE REPAIRED THROUGH STANDARD FIELD REPAIR PROCEDURES. THIS DOES NOT INCLUDE THE B.L. 0 SPLICE AREA.

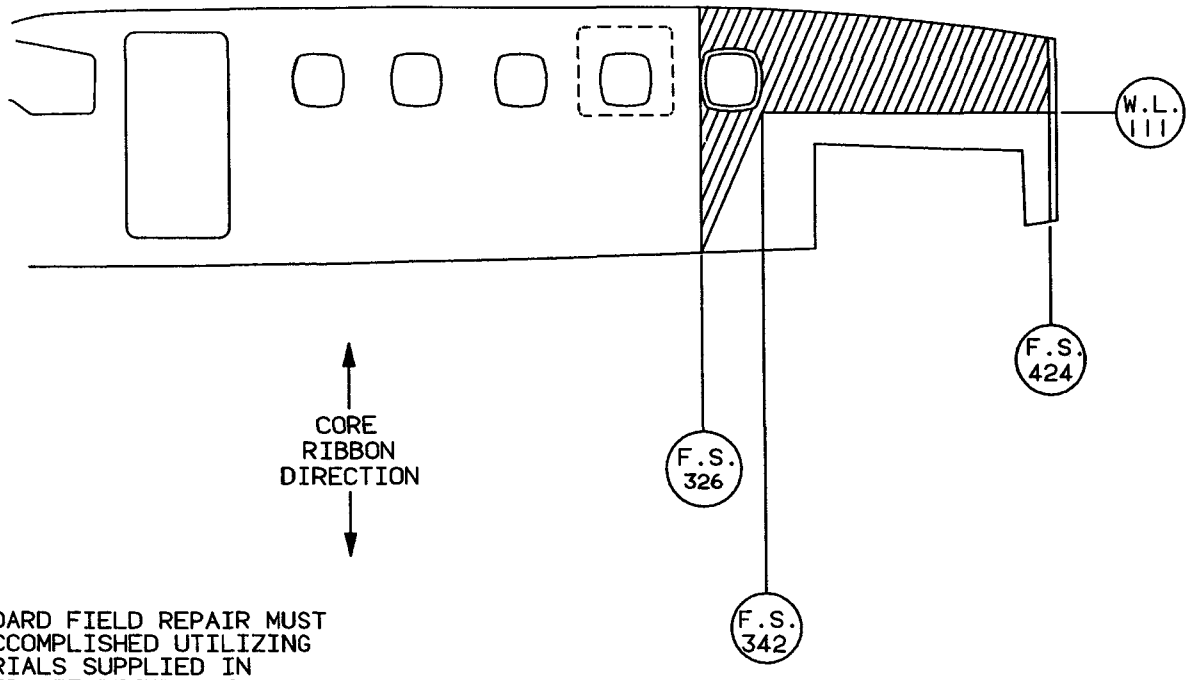
2000-090-06

Fuselage Shell (Effectivity: All)
(Sheet 1 of 3)
Figure 1

REPAIR LAYUP: (P1) TG 90°/(P2) TG 0°/(P3) PW 90°/(P4) TG 0°/
(P5) TG 90°
T=.75 THK OX-3/16-3.0



AREAS CROSS HATCHED MAY BE REPAIRED THROUGH STANDARD FIELD REPAIR PROCEDURES. THIS DOES NOT INCLUDE THE B.L. 0 SPLICE AREA.

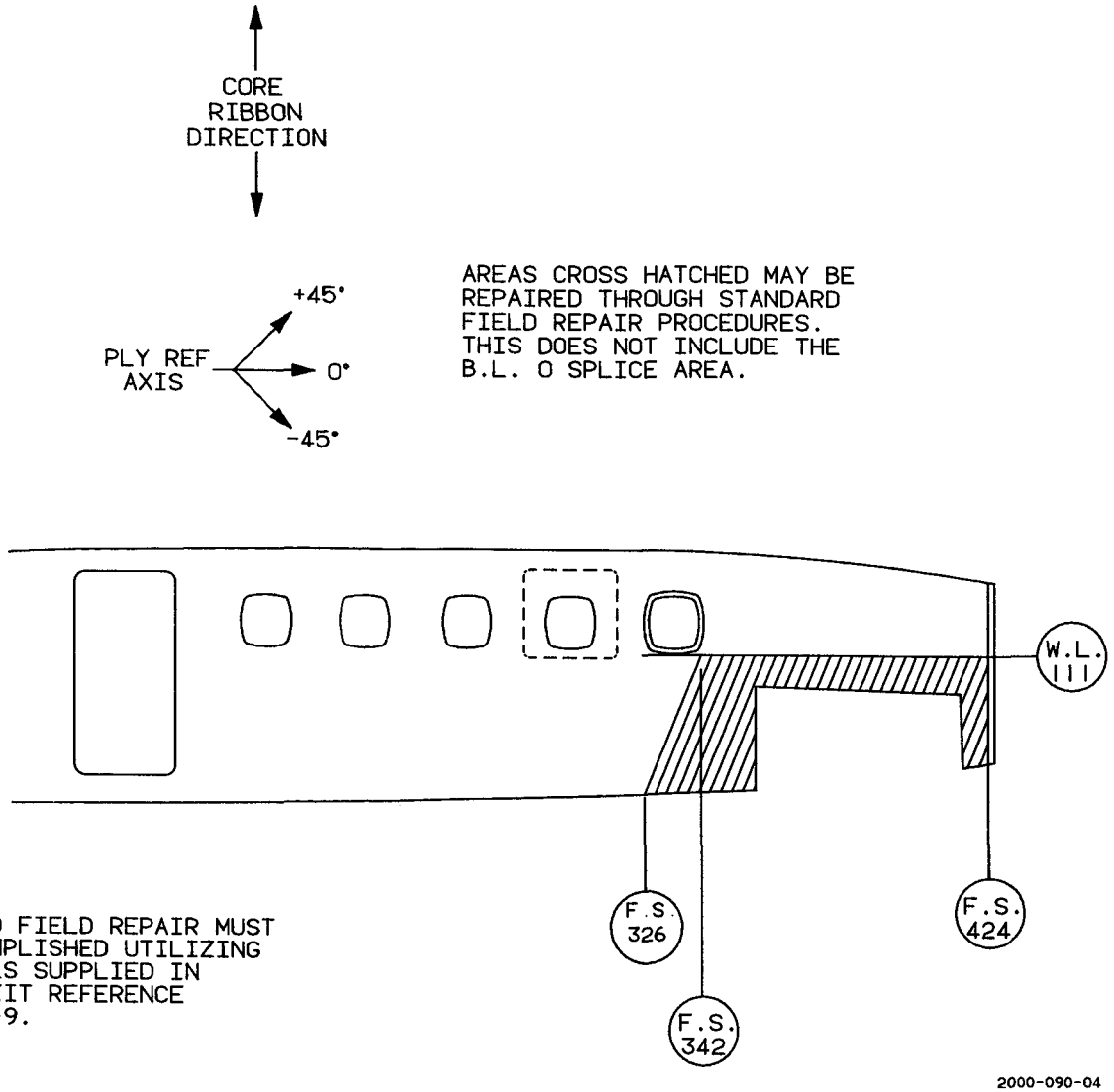


STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -7.

2000-090-05

Fuselage Shell (Effectivity: All)
(Sheet 2 of 3)
Figure 1

REPAIR LAYUP: (P1-P2) PW 45°/(P3) TG 90°/(P4) TG 0°/(P5) TG 90°/
(P6) PW 0°/(P7-P8) PW 45°/(P9) TG 90°/(P10) TG 0°/
(P11) TG 90°/(P12) PW 0°/(P13-P17) PW 45°/(P18) PW 0°/
(P19) PW 90°/(P20) TG 0°/(P21) TG 90°/(P22-P23) PW 45°/
(P24) PW 0°/(P25) PW 90°/(P26-P27) PW 45°
T = .56 THK OX-3/16-3.0

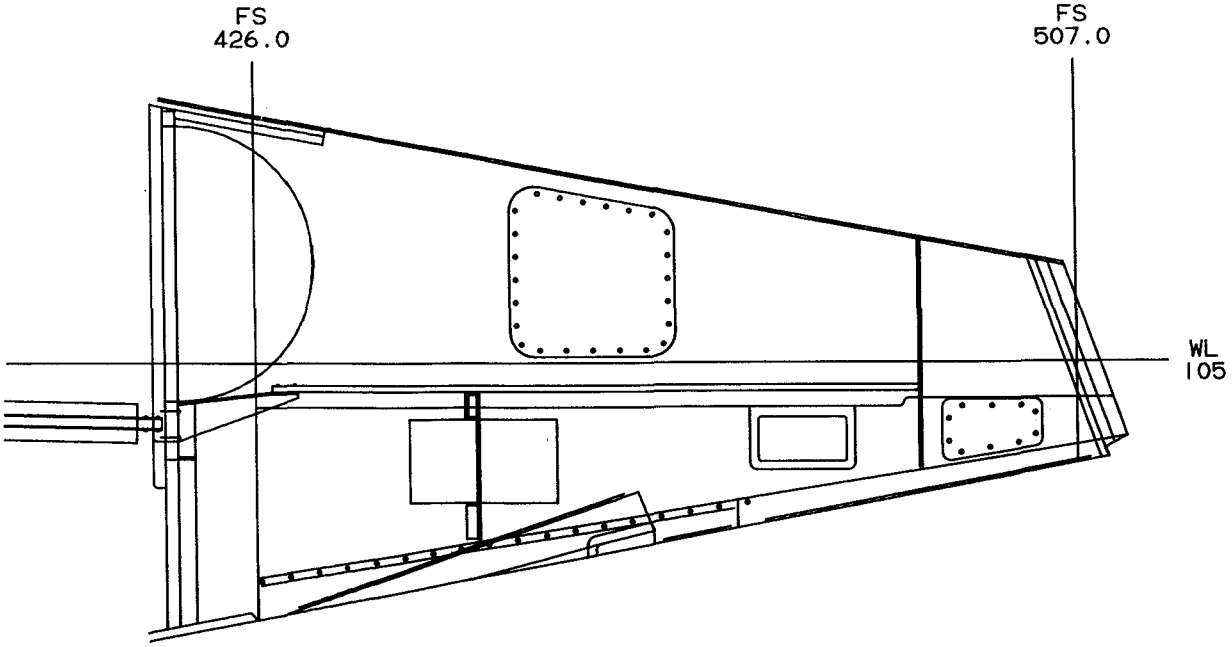


Fuselage Shell (Effectivity: All)
(Sheet 3 of 3)
Figure 1

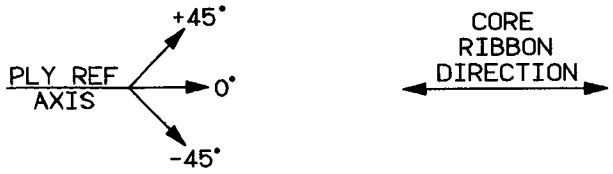
REPAIR LAYUP: (P1) PW 45°/(P2) PW 0°/(P3) PW 45°/(P4) PW 0°/
(P5) PW 45°
T = .25 THK H-1/8-3.0

ALL AREAS OF THE AFT FUSELAGE AND THE AFT FUSELAGE ACCESS DOORS MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES ON THE INTERIOR AND EXTERIOR SURFACES.

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -63.



VIEW LOOKING INBOARD
SOME DETAILS NOT SHOWN FOR CLARITY

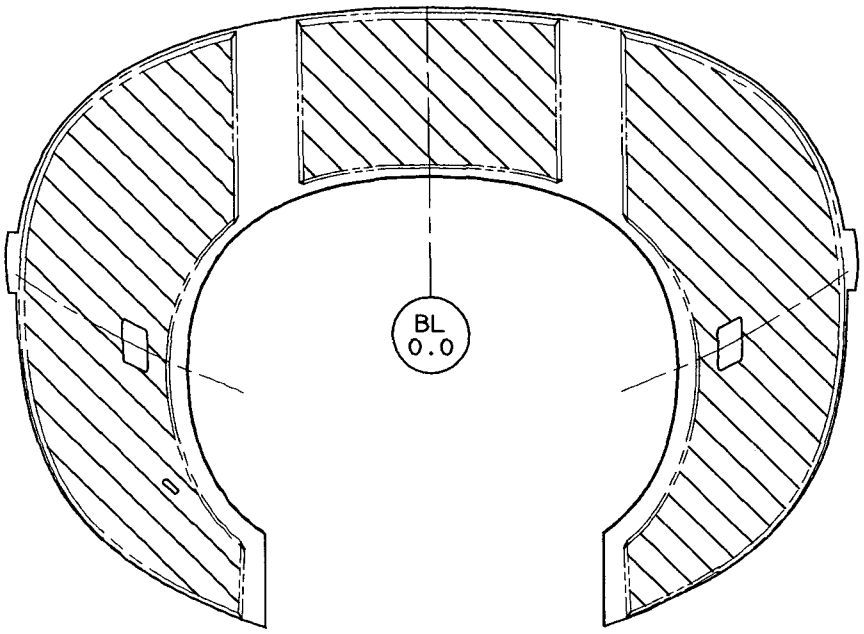


2000-103-02

Aft Fuselage (Effectivity: All)
Figure 2

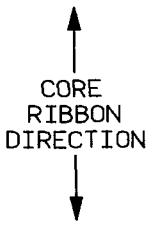
REPAIR LAYUP: (P1) PW 0°/(P2) PW 45°/(P3) PW 0°/(P4) PW 45°/
(P5) PW 0°
T = .25 THK H-1/8-3.0

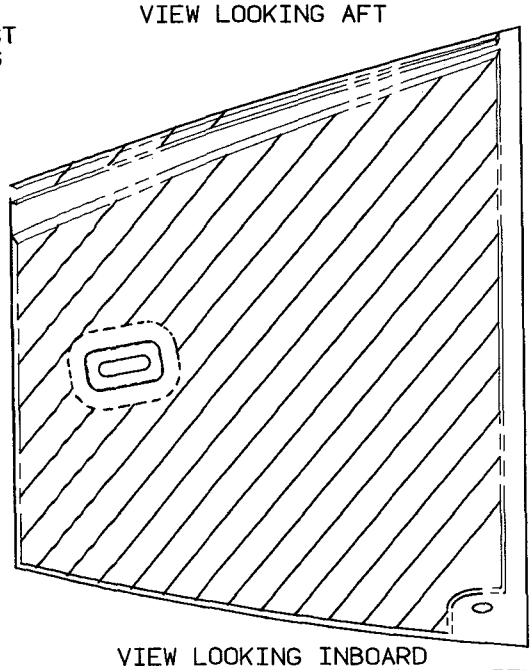
AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURE ON THE INNER AND OUTER SURFACES OF THE FORWARD SKIN.

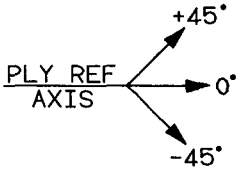


VIEW LOOKING AFT

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -59.







2000-091-20

VIEW LOOKING INBOARD
SOME DETAILS NOT SHOWN FOR CLARITY

Nose Section Forward Skin (Effectivity: All)
Figure 3

54 - NACELLES

LIST OF PAGE EFFECTIVITY

CHAPTER-SECTION-SUBJECT	*PAGE*	*DATE*
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CHAPTER 54 - NACELLES

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Nacelle Skins (Effectivity: All)	1

NACELLE SKINS (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

NOTE

Personnel accomplishing structural repair of the Starship 1 must be trained and certified as a Composite Repair Technician by Beech Aircraft Corporation or their designee.

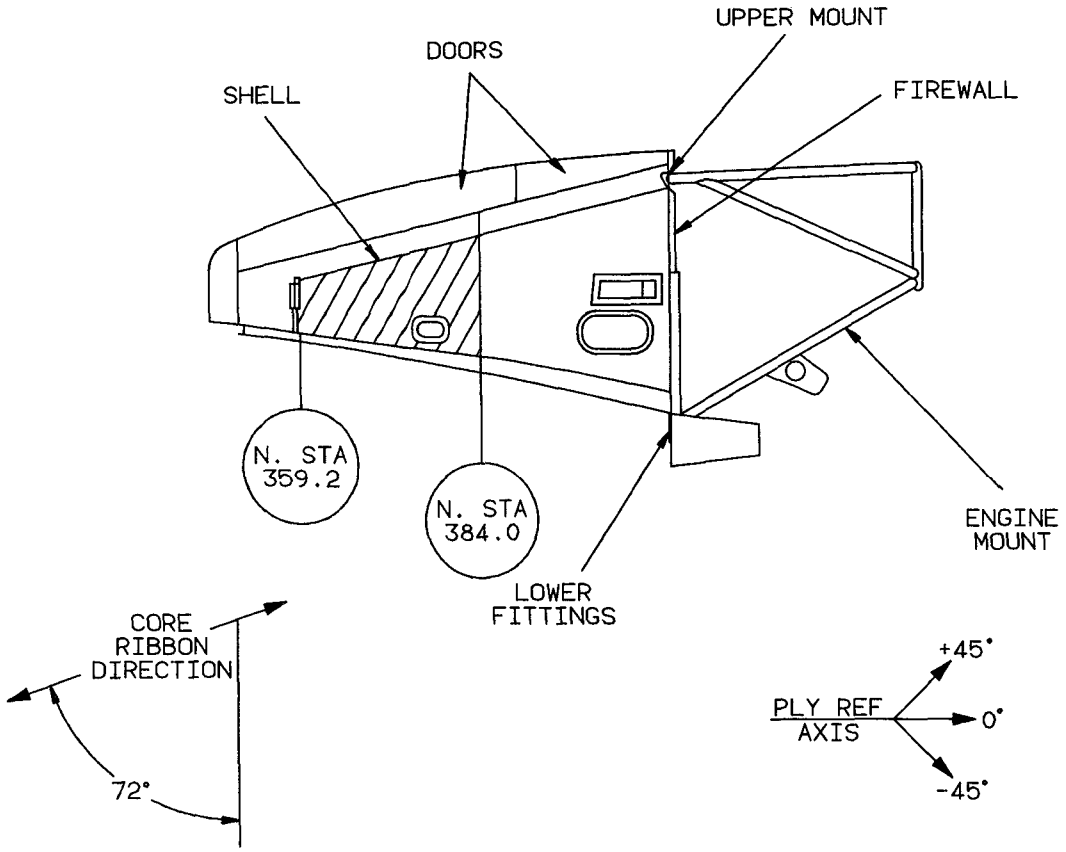
The information in this chapter gives details regarding the materials needed to make standard structural repairs for specific areas. The repair processes and materials are defined in Chapter 51.

WARNING

The size of the standard repair for any area is limited. Damage repair larger than the limits or repair in areas not specifically detailed in this chapter must be done with the supervision of Beech Aircraft Corporation Customer Support Department. Refer to 51-00-00 STANDARD REPAIR for repair limitations.

REPAIR LAYUP: (P1) HS 90°/(P2) HS 135°/(P3) HS 119°/(P4) HS 90°/
(P5) HS 119°/(P6) HS 135°/(P7) HS 90°
T = .375 THK H-1/8-3.0

STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -165.



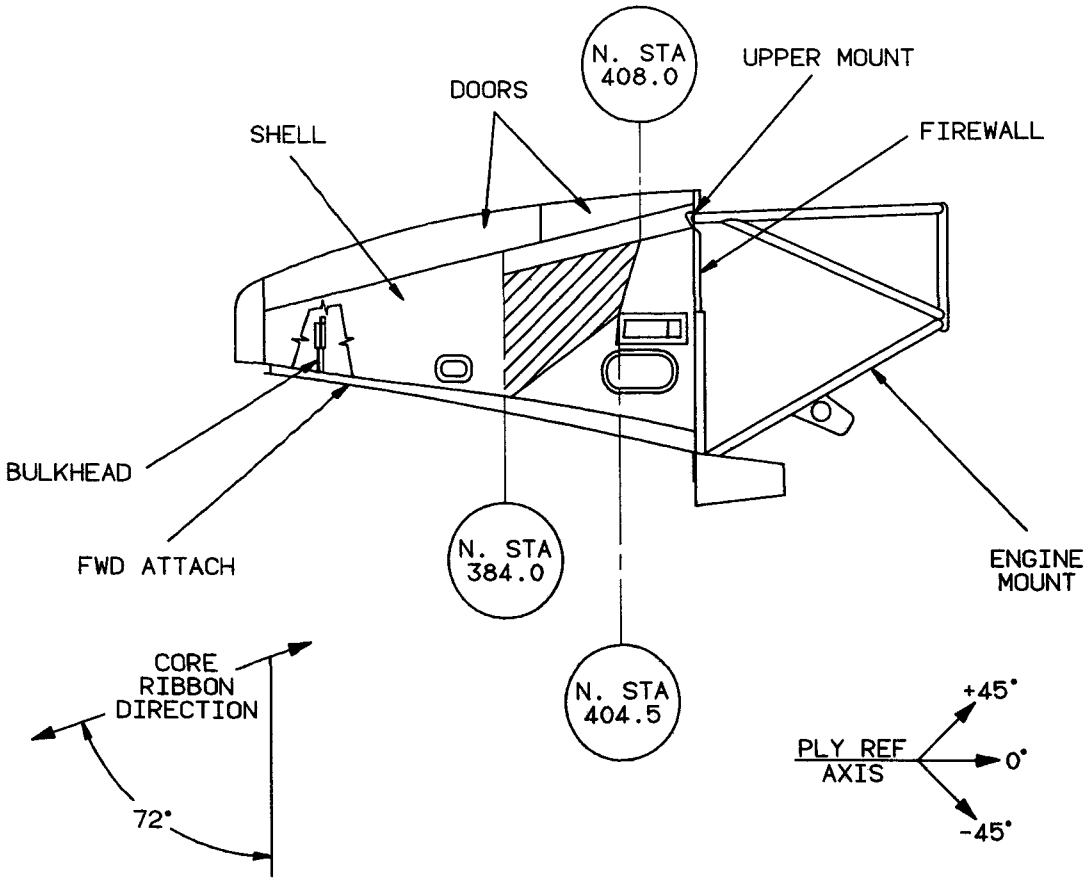
AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-038-15

Nacelle Forward Lower Skin (Effectivity: All)
Figure 1

REPAIR LAYUP: (P1) HS 90°/(P2) HS 135°/(P3) HS 119°/(P4) HS 119°/
(P5) HS 135°/(P6) HS 90°
T = .75 THK H-1/8-3.0

STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -167.



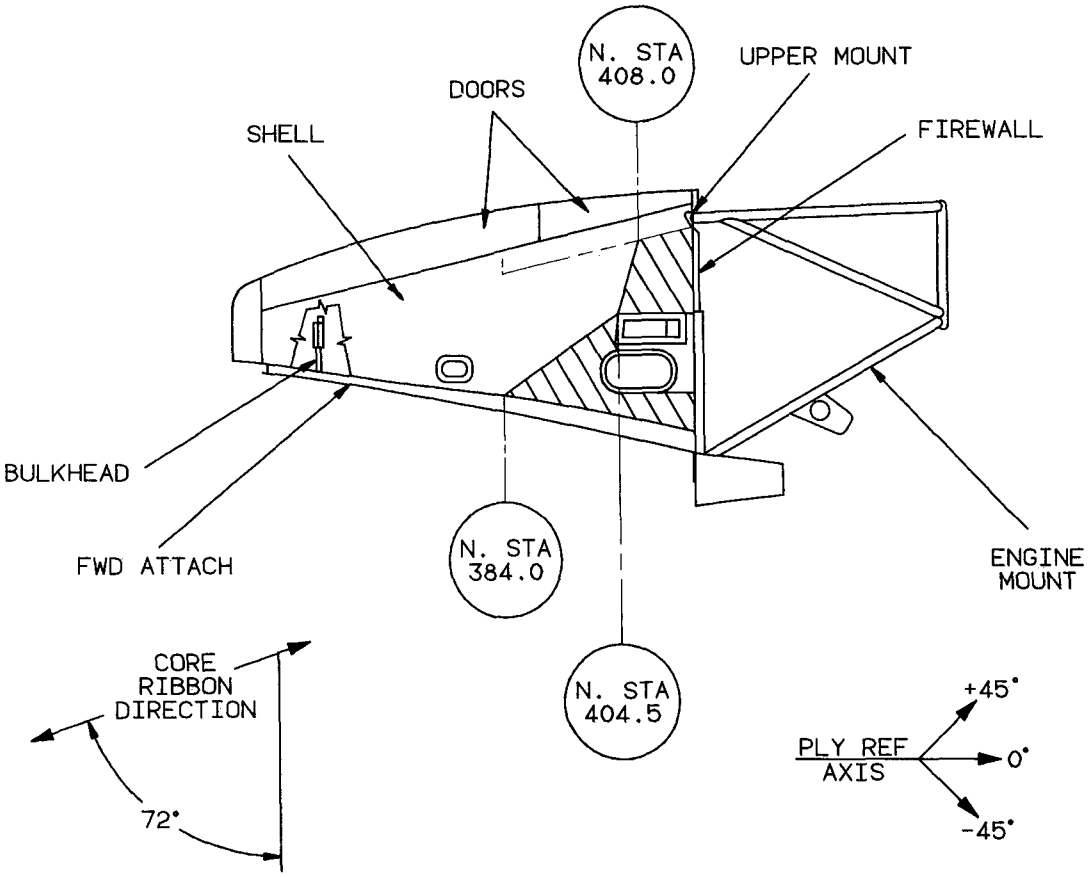
AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-038-16

Nacelle Center Lower Skin (Effectivity: All)
Figure 2

REPAIR LAYUP: (P1) HS 90°/(P2) HS 119°/(P3) HS 135°/(P4) HS 119°
(P5) HS 90°

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -169.



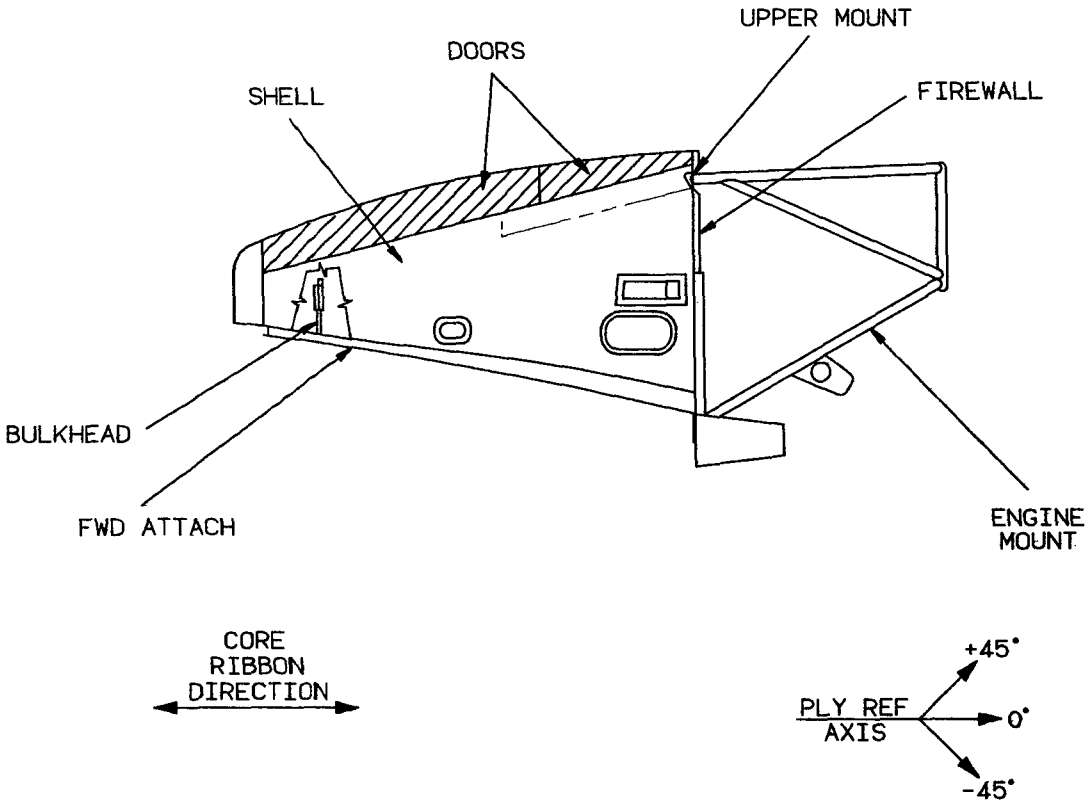
AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-038-17

Nacelle Aft Skin (Effectivity: All)
Figure 3

REPAIR LAYUP: (P1) HS 90°/(P2) HS 130°/(P3) HS 90°
T = .25 THK H-1/8-3.0

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -171.



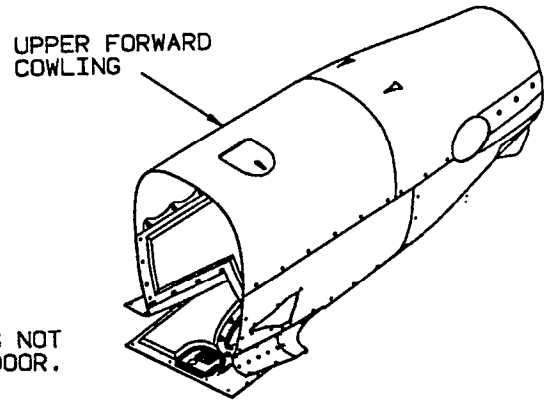
AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-038-18

Nacelle Access Doors (Effectivity: All)
Figure 4

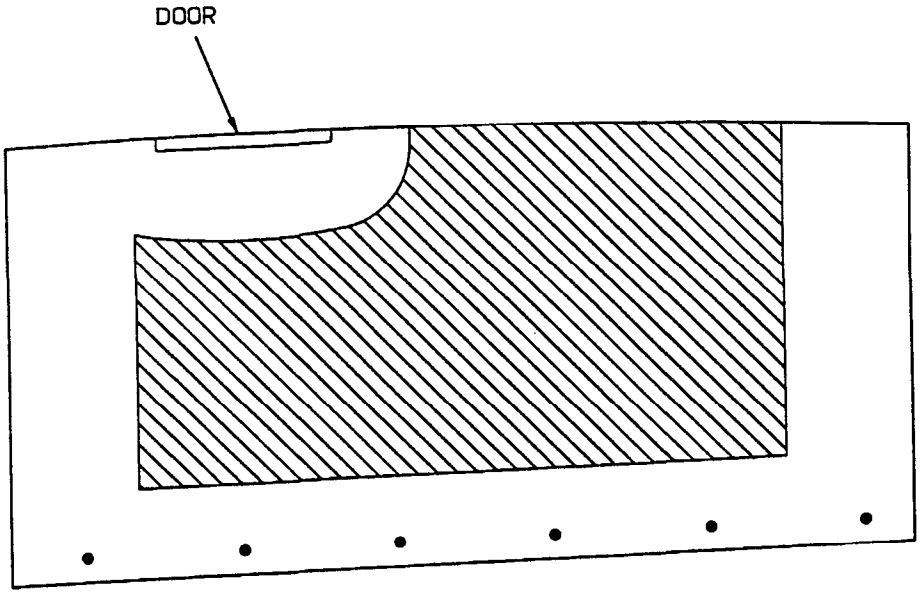
REPAIR LAYUPS: (-227) (P1) WG 45°/(P2-P3) WG 0°
(-231) (P1-P2) WG 45°/(P3) WN
T=.25 THK OX-3/16-3.0

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER: -227 (EXTERIOR)
-231 (INTERIOR)



NOTE

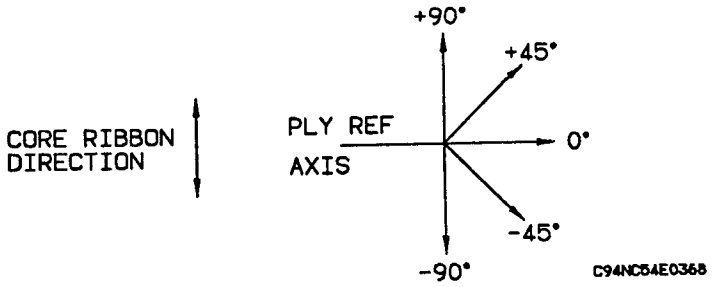
STANDARD FIELD REPAIR IS NOT TO BE WITHIN 3" OF THE DOOR.



AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

NOTE

USE ADHESIVE (8, CHART 1, 91-00-00) FOR -227 AND -231 REPAIR KITS.



Upper Forward Cowling (Effectivity: All)
Figure 5

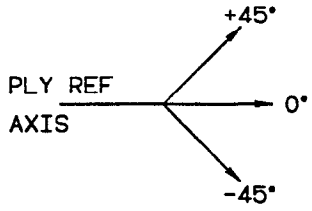
REPAIR LAYUPS:

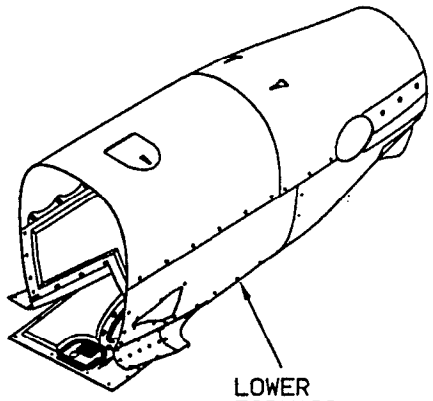
(-211) (P1) WG 45°/(P2-P3) WG 0°

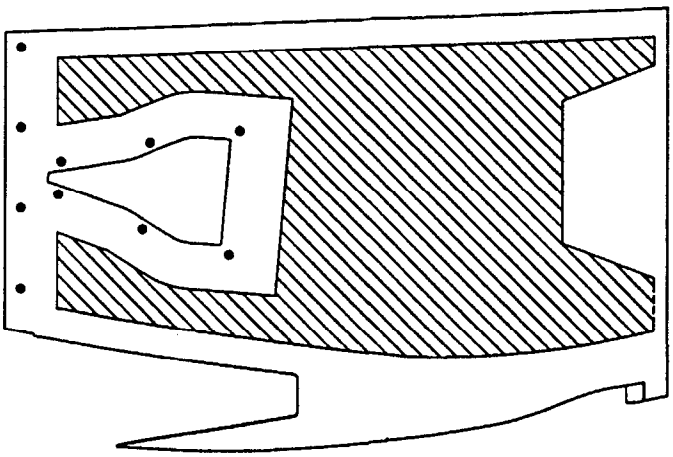
(-217) (P1) WG 45°/P2-P3) WG 0°/(P4) WN

T=.25 THK H-1/8-3.0

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER: -211 (EXTERIOR)
-217 (INTERIOR)

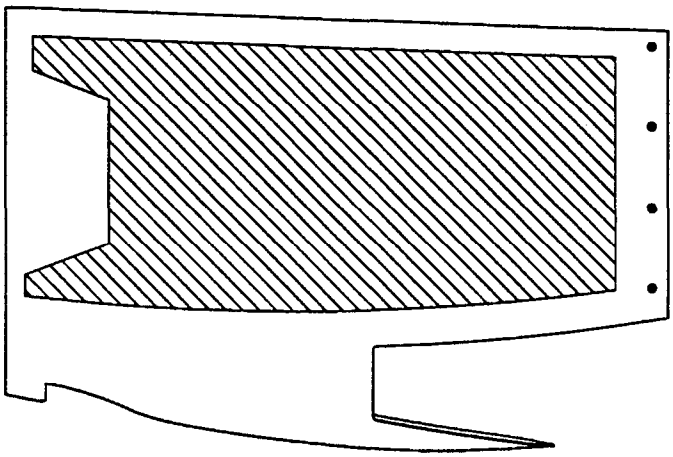






CORE RIBBON DIRECTION

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.



NOTE

USE ADHESIVE (8, CHART 1, 91-00-00) FOR -211 AND -217 REPAIR KITS.

C94NC54E0411

Lower Forward Cowling (Effectivity: All)
Figure 6

REPAIR LAYUPS:

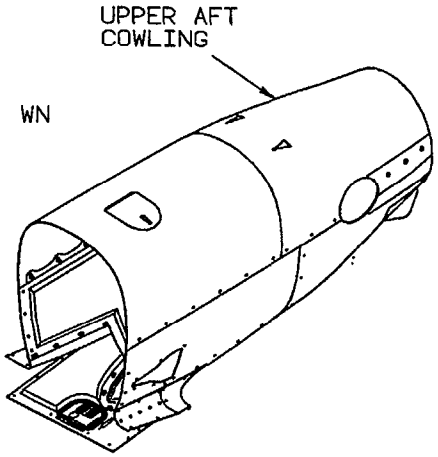
(-211) (P1) WG 45°/(P2-P3) WG 0°

(-217) (P1) WG 0°/(P2-P3) WG 45°/(P4) WG 0°/(P5) WN

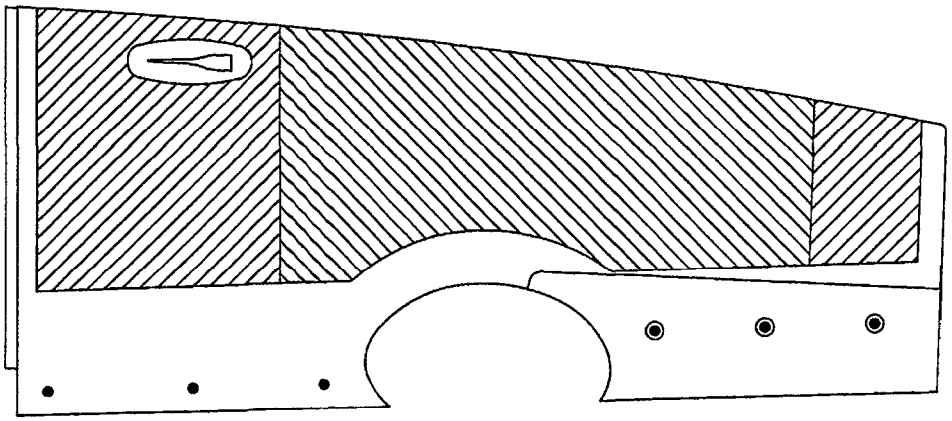
(-211) (P1) WG 45°/(P2-P3) WG 0°

(-217) (P1-P2) WG 45°/(P3) WN

T=.25 THK H-1/8-3.0



STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER: -211 (EXTERIOR)
-217 (INTERIOR)

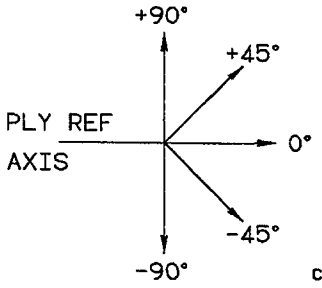


AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

NOTE

USE ADHESIVE (8, CHART 1, 91-00-00) FOR -211 AND -217 REPAIR KITS.

CORE RIBBON DIRECTION



C94NC54E0425

Upper Aft Cowling (Effectivity: All)
Figure 7

REPAIR LAYUPS:

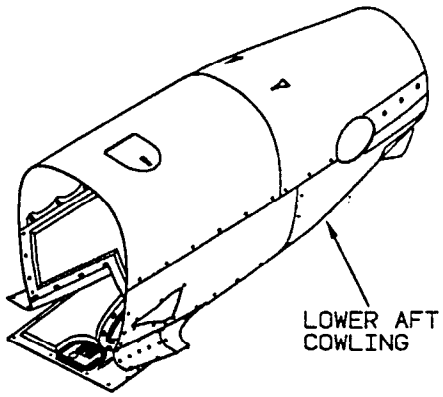
(-211) (P1) WG 45°/(P2-P3) WG 0°

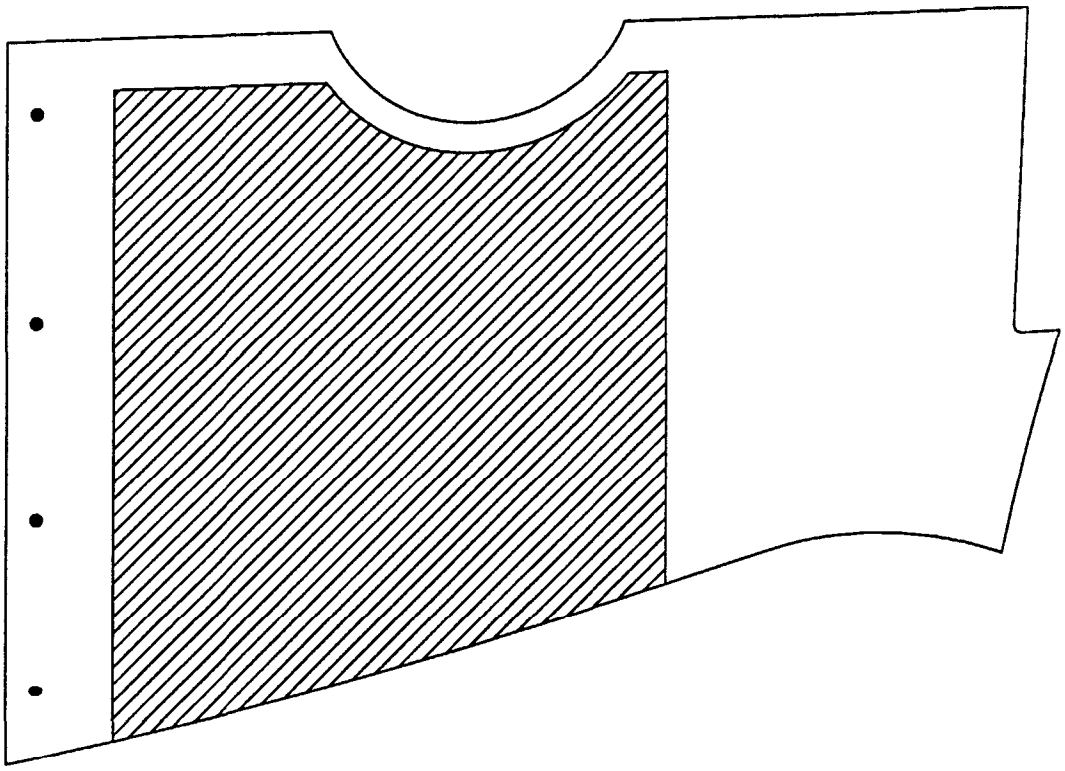
(-217) (P1) WG 45°/(P2-P3) WG 0°/(P4) WN

T=.25 THK H-1/8-3.0

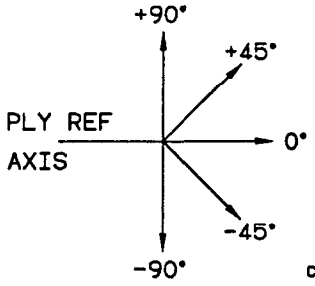
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER: -211 (EXTERIOR)
-217 (INTERIOR)

CORE RIBBON DIRECTION





AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.



C94NC54E0426

NOTE

USE ADHESIVE (8, CHART 1, 91-00-00) FOR -211 AND -217 REPAIR KITS.

Lower Aft Cowling (Effectivity: All)
Figure 8

55 - STABILIZERS

LIST OF PAGE EFFECTIVITY

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55-10-00	1	Feb 25/94
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55-30-00	1	Feb 25/94
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	3	Nov 10/89
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	7	Nov 10/89
	8	Nov 10/89
	9	Feb 25/94
55-60-00	1	Nov 10/89
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	3	Feb 25/94

Beechcraft
STARSHIP 1
STRUCTURAL REPAIR MANUAL

CHAPTER 55 - STABILIZERS

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Stabilizers (Effectivity: All) 1

55-10-00

Forward Wing (Effectivity: All) 1

55-30-00

Tipsails (Effectivity: All) 1

55-60-00

Ventral Stabilizer (Effectivity: All) 1

STABILIZERS (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

NOTE

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The information in this chapter gives details regarding the materials needed to make standard structural repairs for specific areas. The repair processes and materials are defined in Chapter 51.

WARNING

The size of the standard repair for any area is limited. Damage repair larger than the limits or repair in areas not specifically detailed in this chapter must be done with the supervision of Beech Aircraft Corporation Customer Support Department. Refer to 51-00-00 STANDARD REPAIR for repair limitations.

WARNING

All control surfaces must be rebalanced after repair. Refer to Starship 1 Maintenance Manual, Chapter 55 for rebalancing procedures.

CAUTION

Trim Tabs may not be repaired if damaged. If damaged, they must be replaced.

REPAIR LAYUP: (P1) PW 45°/(P2) PW 0°/(P3) PW 0°/(P4) PW 45°
T = FILL DAMAGED CORE AREA WITH PASTE ADHESIVE.

STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -163.

2000-610-72

Elevon, Elevator, Rudder and Flap Repair (Effectivity: All)
Figure 1

FORWARD WING (Effectivity: All)

WARNING

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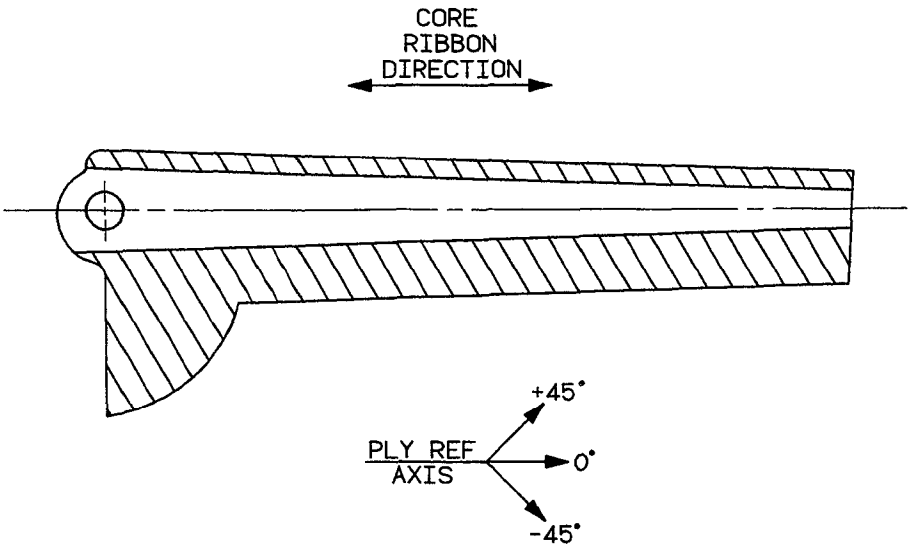
REPAIR LAYUP: (P1) HS 45°/(P2) HS 0°/(P3) HS 45°/(P4) HS -45°/(P5) HS 0°/(P6) HS 45°
T = .33 THK H-1/8-3.0

STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -141.



AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-031-08

Forward Wing Structure (Effectivity: All)
Figure 1

TIPSAILS (Effectivity: All)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

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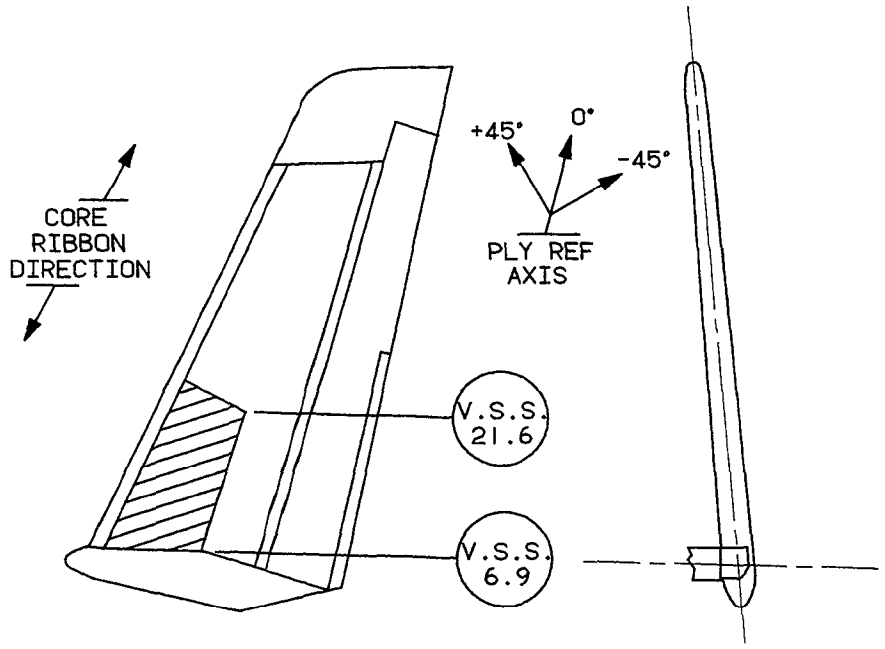
REPAIR LAYUP: (P1) HS 0°/(P2) HS 45°/(P3) HS 90°/(P4) HS -45°/
(P5) HS 0°
T=.375 THK H-1/8-6.0



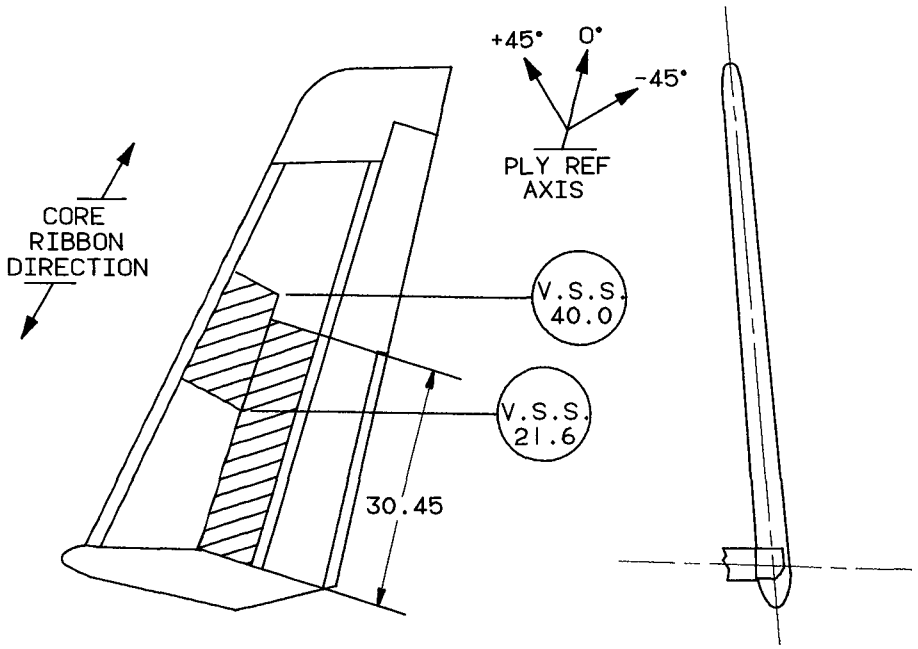
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -145.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES

2000-134-04

Tipsail Inboard Skin (Effectivity: All)
(Sheet 1 of 4)
Figure 1

REPAIR LAYUP: (P1) HS 45°/(P2) HS 0°/(P3) HS 90°/(P4) HS -45°
T=.375 THK H-1/8-6.0



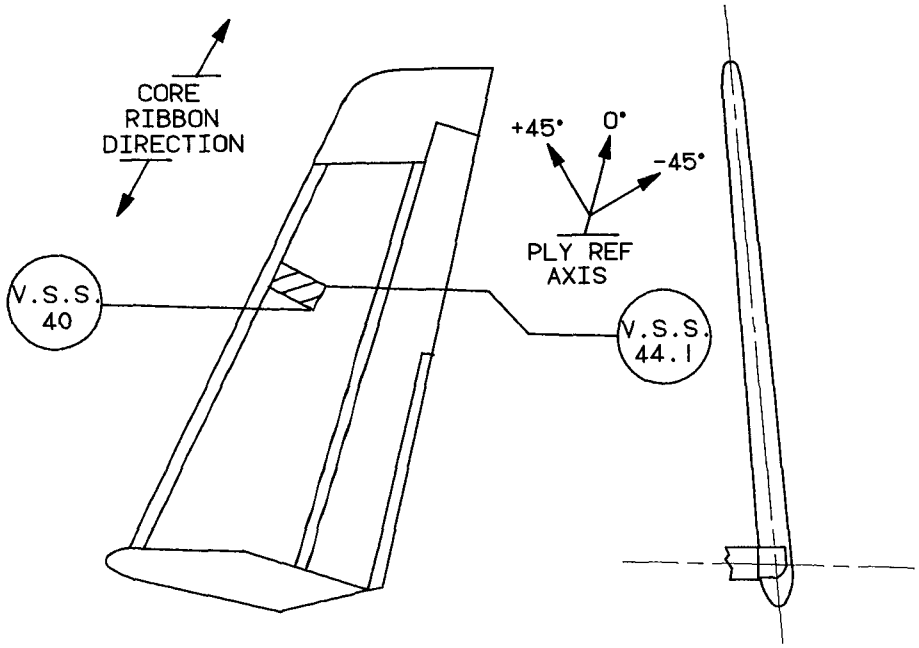
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -149.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES

2000-134-05

Tipsail Inboard Skin (Effectivity: All)
(Sheet 2 of 4)
Figure 1

REPAIR LAYUP: (P1) HS 45°/(P2) HS 0°/(P3) HS 90°/(P4) HS -45°
T=.375 THK H-1/8-3.0



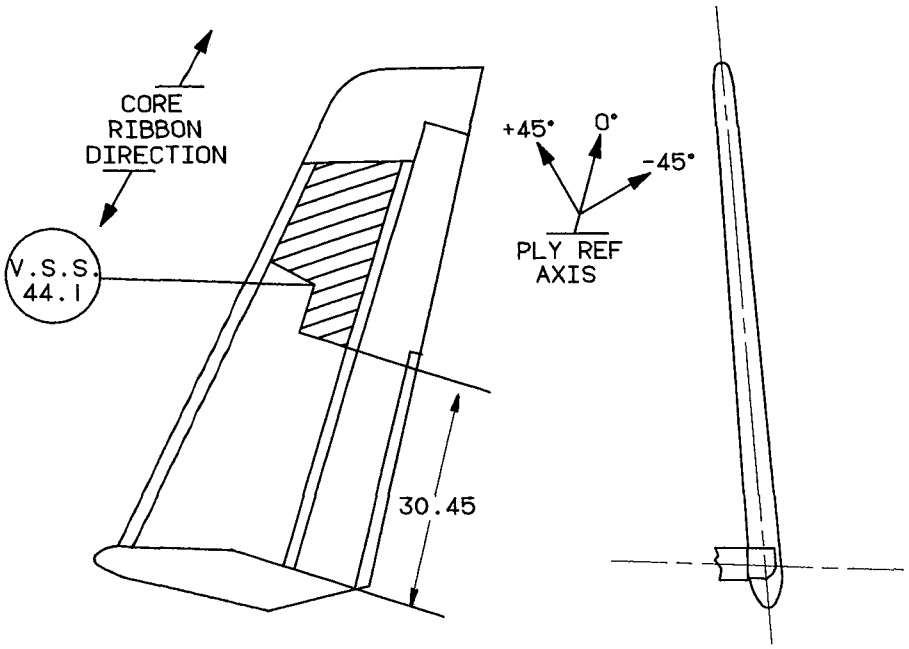
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -151.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES

2000-134-06

Tipsail Inboard Skin (Effectivity: All)
(Sheet 3 of 4)
Figure 1

REPAIR LAYUP: (P1) HS 45°/(P2) HS 0°/(P3) HS -45°
T=.375 THK H-1/8-3.0



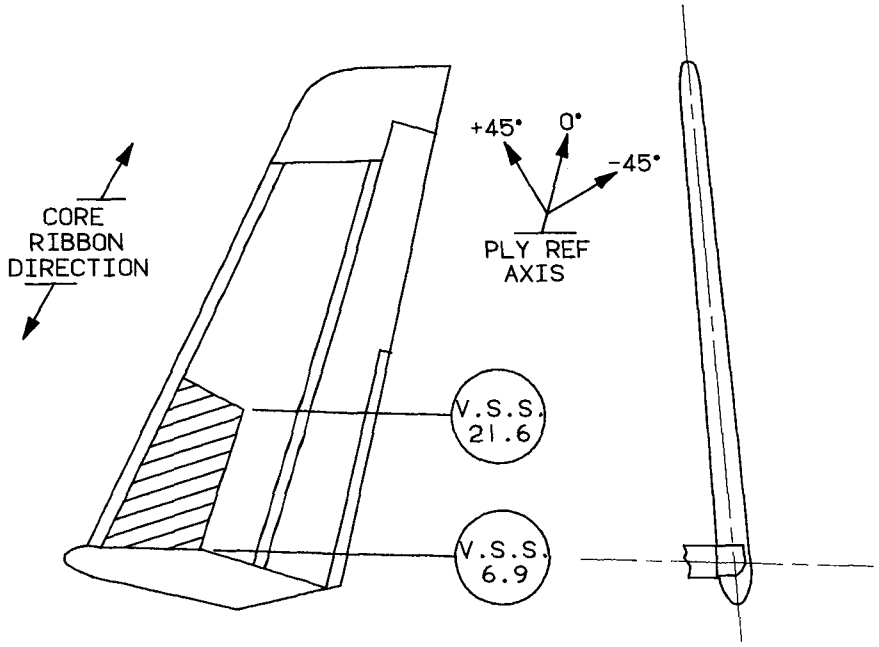
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -155.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES

2000-134-07

Tipsail Inboard Skin (Effectivity: All)
(Sheet 4 of 4)
Figure 1

REPAIR LAYUP: (P1) HS 0°/(P2) HS 45°/(P3) HS 90°/(P4) HS -45°
/(P5) HS 0°
T = .375 THK H-1/8-6.0



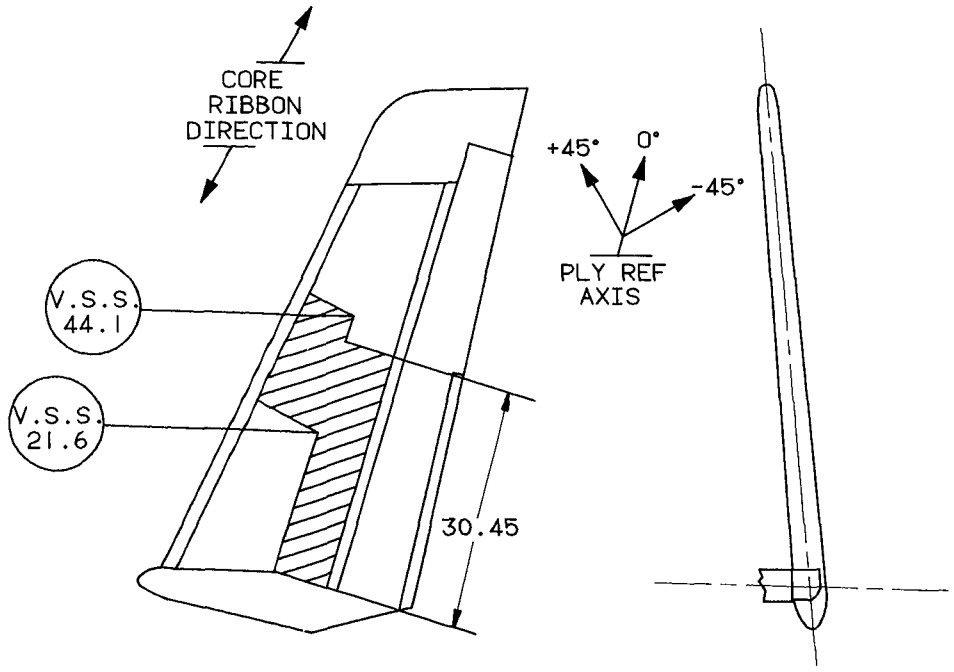
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -157.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES

2000-134-08

Tipsail Outboard Skin (Effectivity: All)
(Sheet 1 of 3)
Figure 2

REPAIR LAYUP: (P1) HS 45°/(P2) HS 0°/(P3) HS 90°/(P4) HS -45°
T=.375 THK H-1/8-3.0



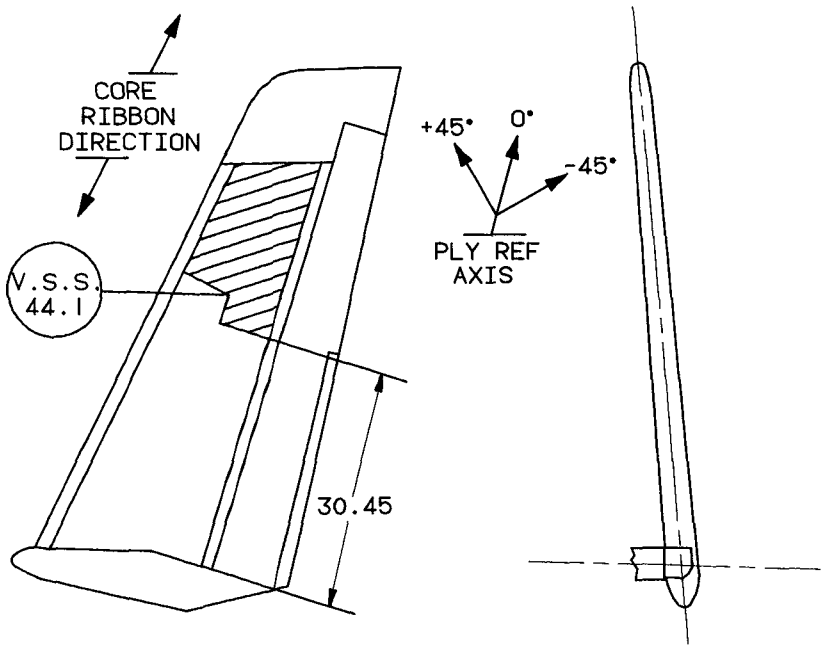
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -159.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES

2000-134-09

Tipsail Outboard Skin (Effectivity: All)
(Sheet 2 of 3)
Figure 2

REPAIR LAYUP: (P1) HS 45°/(P2) HS 0°/(P3) HS -45°
T=.375 THK H-1/8-3.0



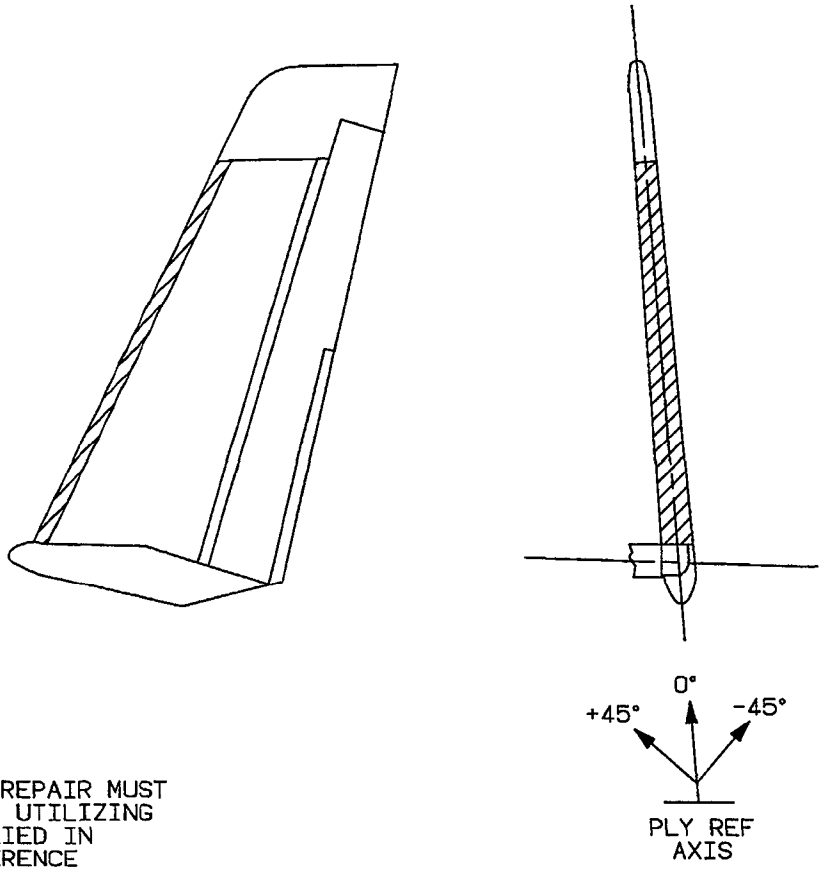
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -161.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES

2000-134-10

Tipsail Outboard Skin (Effectivity: All)
(Sheet 3 of 3)
Figure 2

REPAIR LAYUP: (P1-P2) WG 45°/(P3) WG 90°/(P4-P5) WG 45°
(P6) WG 90°/(P7-P8) WG 45°



STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -207.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES

C94NC55E0413

Tipsail Leading Edge (Effectivity: All)
Figure 3

VENTRAL STABILIZER (EFFECTIVITY: ALL)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

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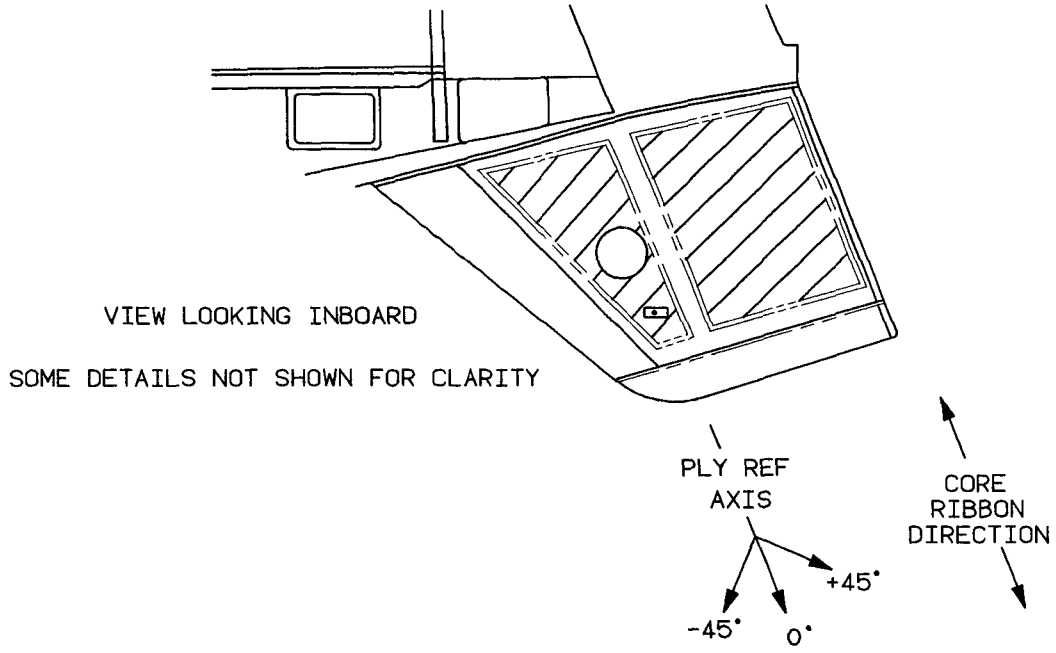
REPAIR LAYUP: (P1) PW 45°/(P2) PW 0°/(P3) PW 45°
T = .187 THK H-1/8-3.0



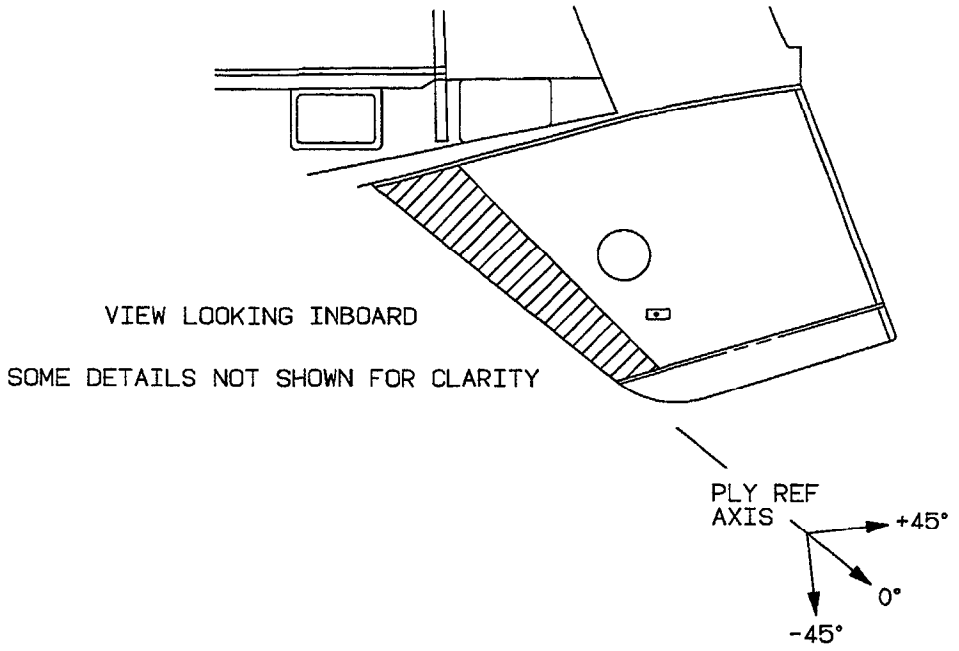
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -65.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURE ON LEFT AND RIGHT SIDES OF THE STABILIZER

2000-134-03

Ventral Stabilizer (Effectivity: All)
Figure 1

REPAIR LAYUP: (P1) WG 45°/(P2) WG-45°/(P3) WG 45°
(P4) WG-45°/(P5) WG 45°



STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -209.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURE ON LEFT AND RIGHT SIDES OF THE STABILIZER

C94NC55E0412

Ventral Stabilizer Leading Edge (Effectivity: All)
Figure 2

CHAPTER 57 - WINGS

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CHAPTER 57 - WINGS

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57-30-00	
Wing Skins (Effectivity: All)	1

WING MAIN FRAME (EFFECTIVITY: ALL)

WARNING

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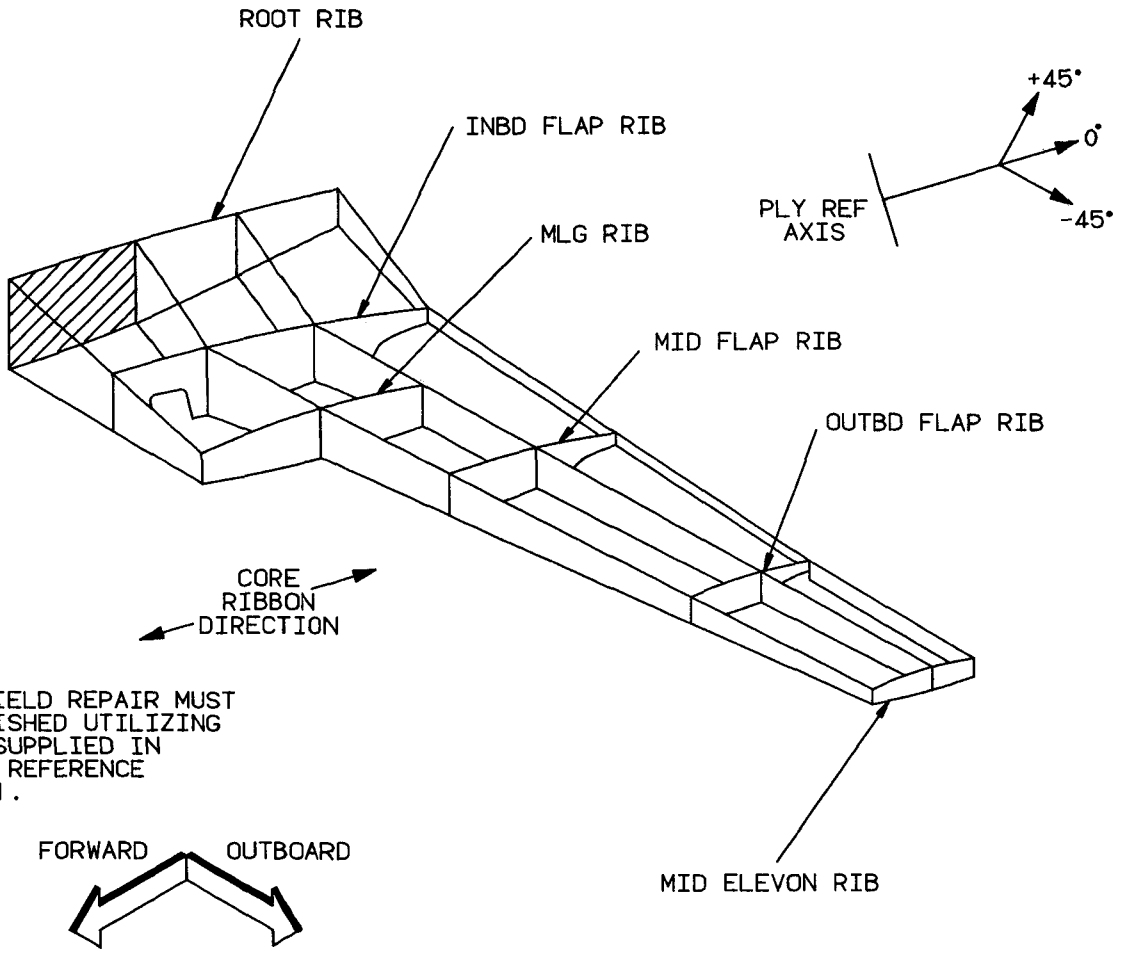
(P6-P7) HS 45°
T = .75 THK H-1/8-3.0

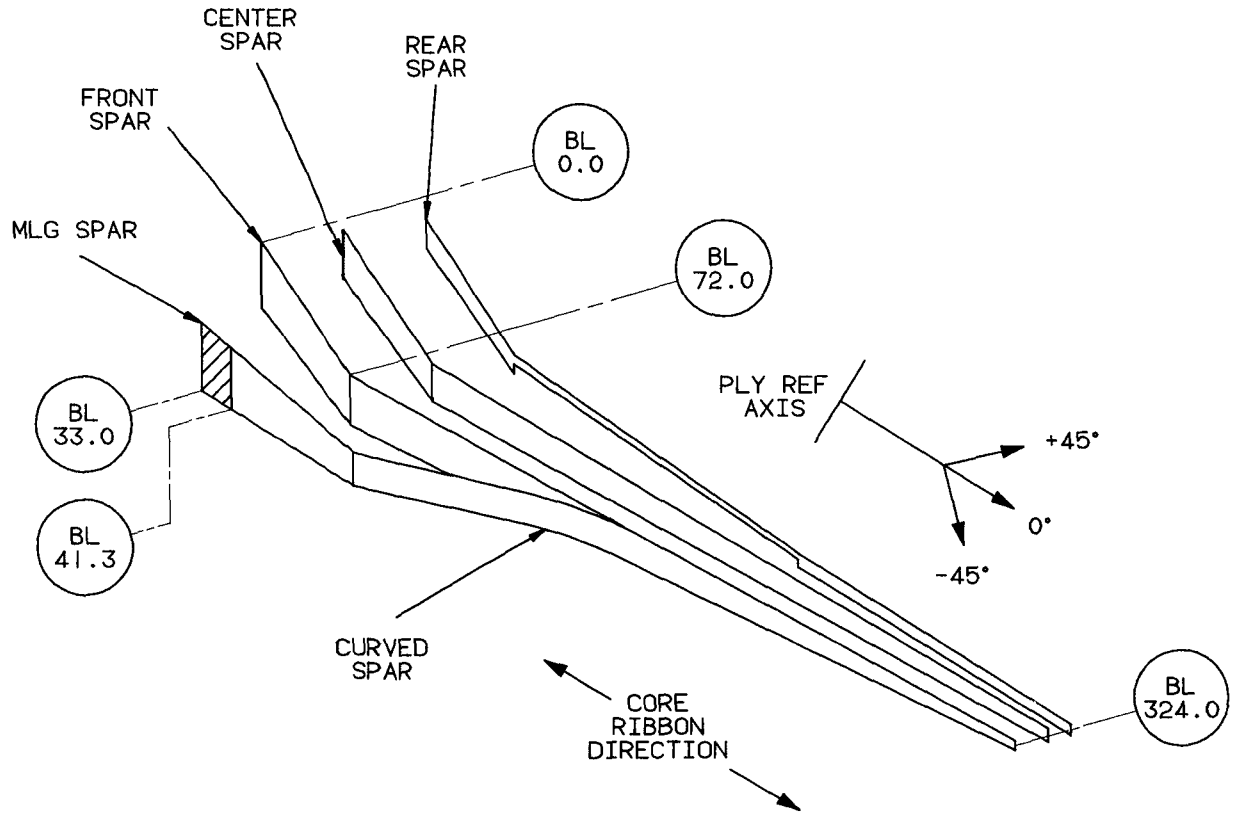


AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-21

Wing Root Rib (Effectivity: All)
Figure 1

REPAIR LAYUP: (P1-P2) PW 45°/(P3) PW 0°/(P4-P5) PW 45°/(P6) PW 0°/
(P7-P8) PW 45°
T = .47 THK H-1/8-3.0



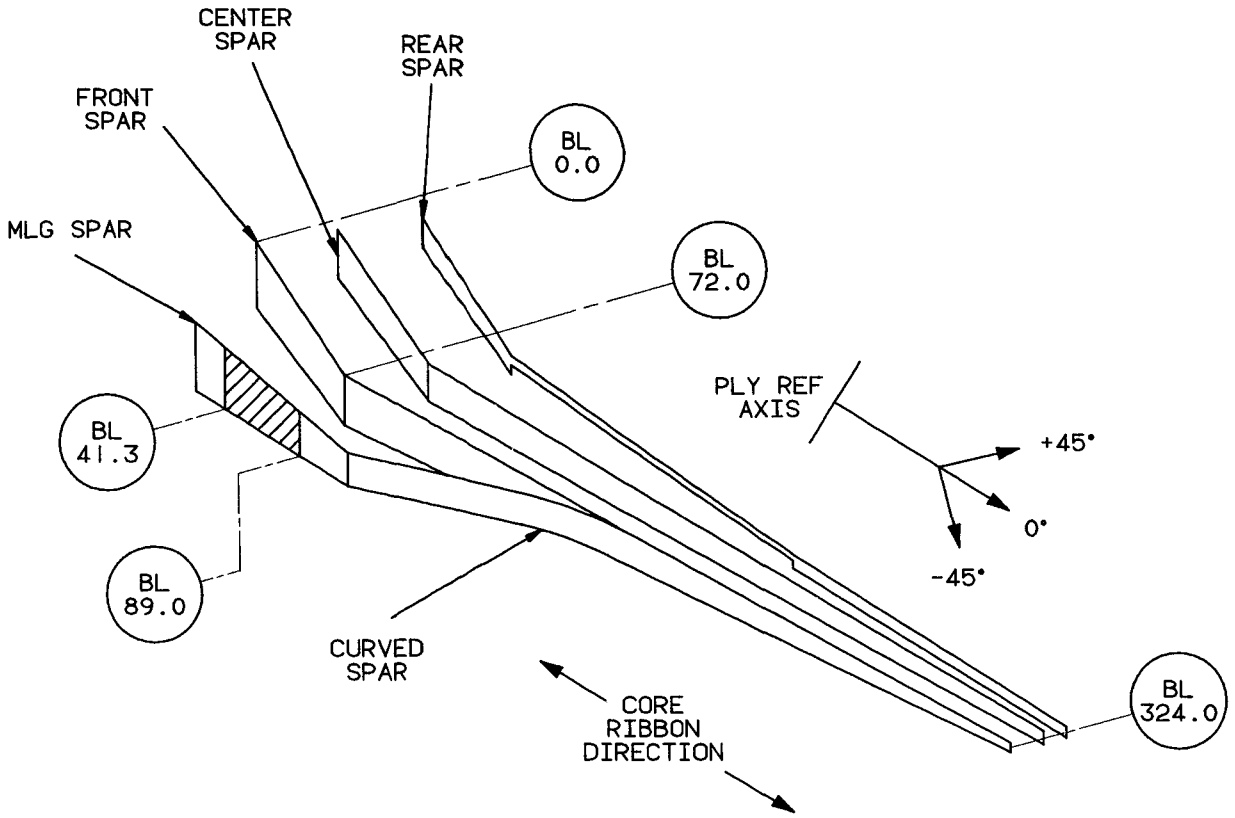
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -113.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-22

Main Landing Gear Spar (Effectivity: All)
(Sheet 1 of 3)
Figure 2

REPAIR LAYUP: (P1-P2) PW 45°/(P3) PW 0°/(P4) PW 45°/(P5) PW 0°/
(P6-P7) PW 45°
T = .50 THK H-1/8-3.0



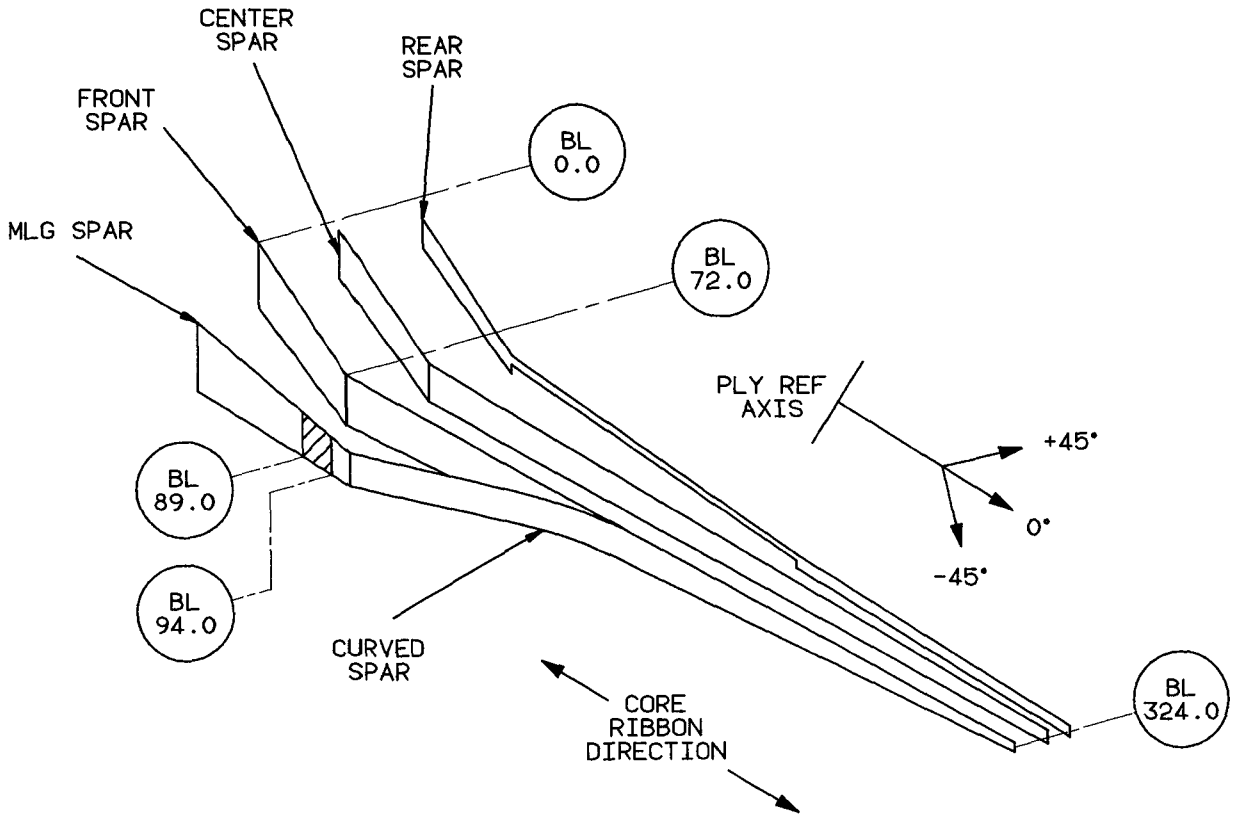
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -117.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-23

Main Landing Gear Spar (Effectivity: All)
(Sheet 2 of 3)
Figure 2

REPAIR LAYUP: (P1-P2) PW 45°/(P3-P4) PW 0°/(P5-P9) PW 45°/(P10-P11) PW 0°/(P12-P13) PW 45°
T = .50 THK H-1/8-3.0



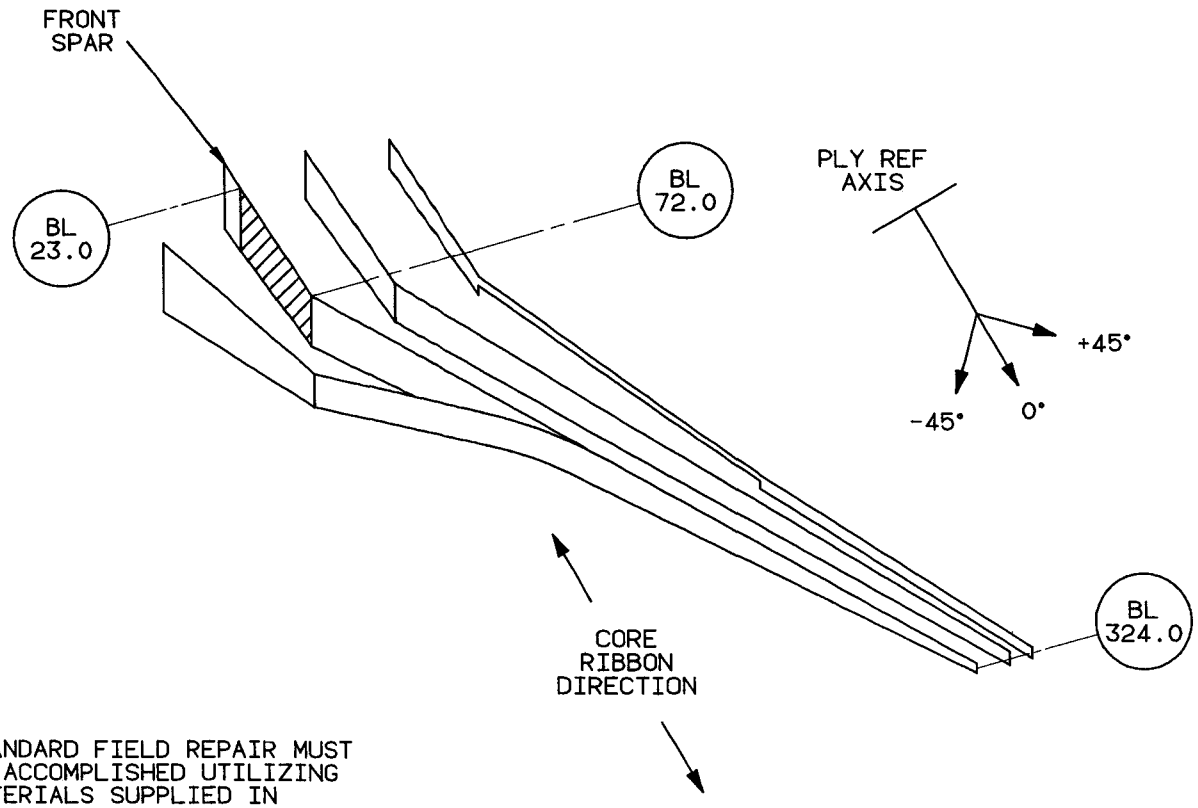
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -119.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-24

Main Landing Gear Spar (Effectivity: All)
(Sheet 3 of 3)
Figure 2

REPAIR LAYUP: (P1-P2) PW 0°/(P3-P5) PW 45°/(P6-P7) PW 0°
T = .46 THK H-1/8-3.0



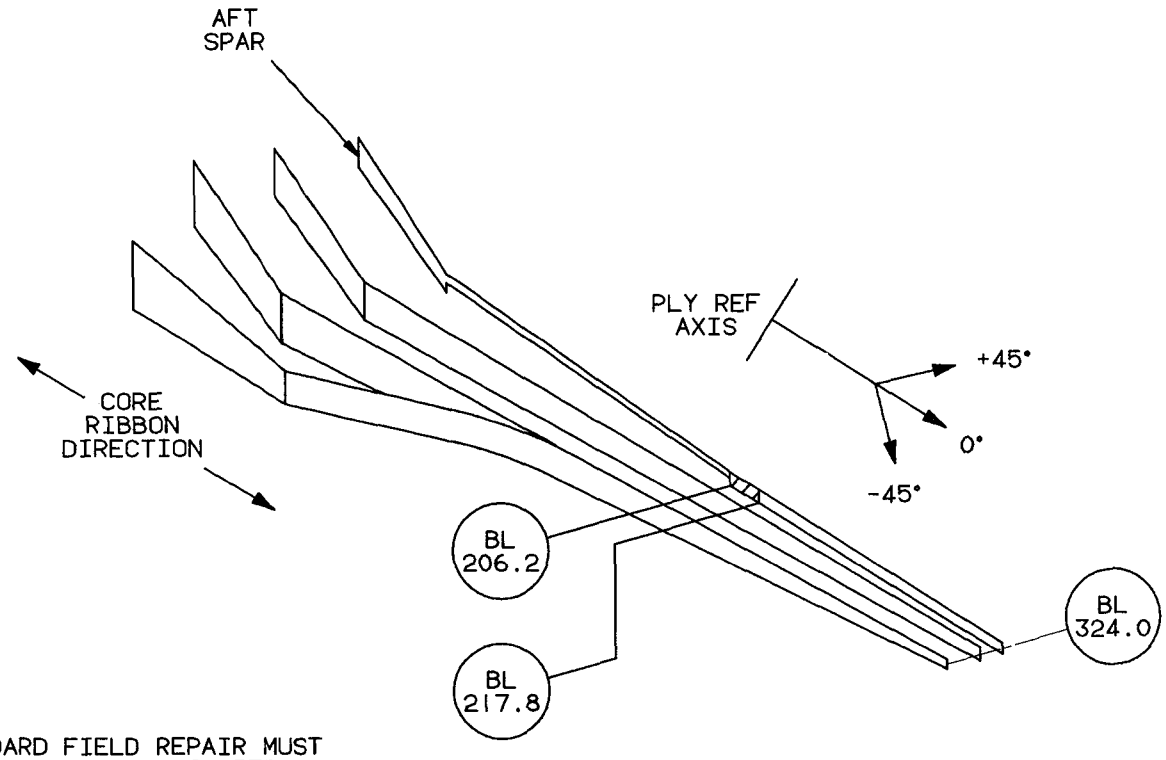
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -121.

FORWARD SIDE ONLY:
AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-25

Wing Forward Spar (Effectivity: All)
Figure 3

REPAIR LAYUP: (P1-P2) HS 45°/(P3) HS 0°/(P4-P6) HS 45°
T = .43 THK H-1/8-3.0



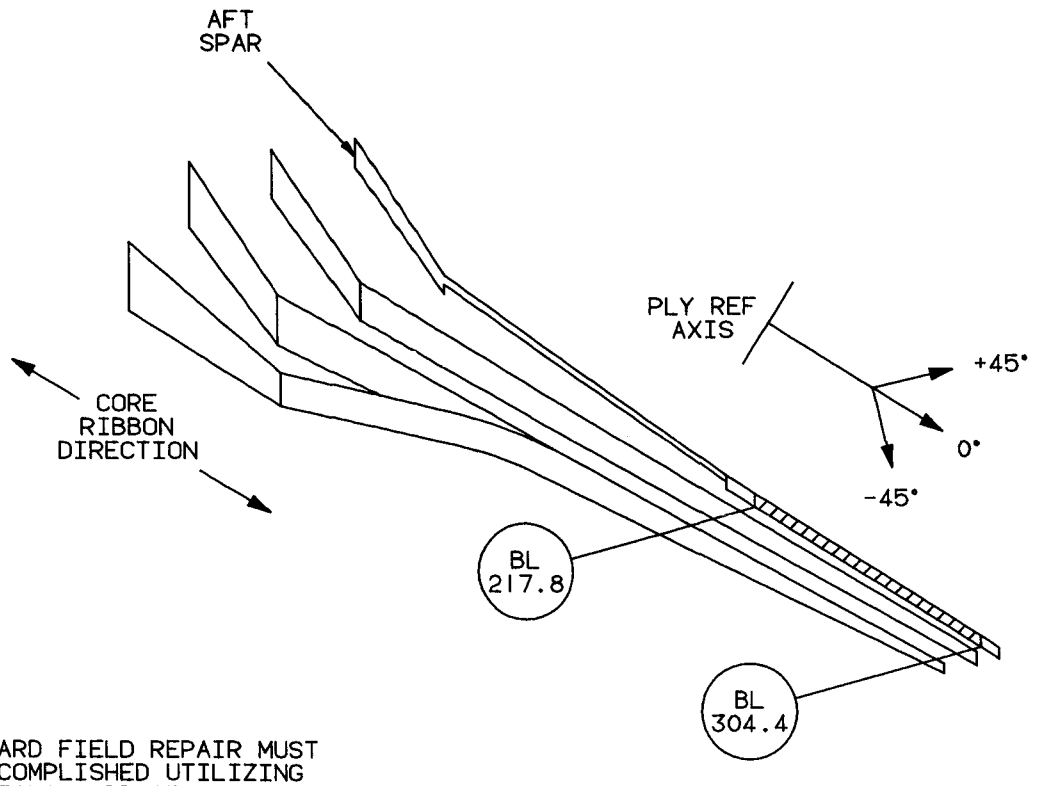
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -125.

AFT SIDE ONLY:
AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-26

Wing Aft Outboard Spar (BL 206.2 to BL 217.8) (Effectivity: All)
(Sheet 1 of 2)
Figure 4

REPAIR LAYUP: (P1) HS 45°/(P2) PW 45°/(P3) PW 0°/(P4) PW 45°/(P5) HS 45°
T = .46 THK H-1/8-3.0



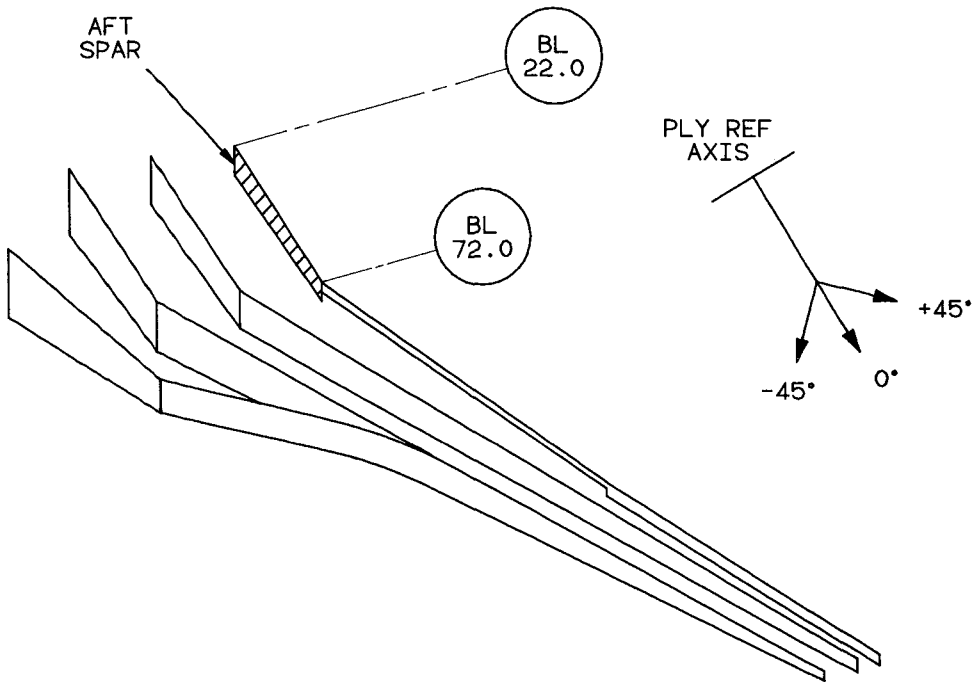
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -129.

AFT SIDE ONLY:
AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-27

Wing Aft Outboard Spar (BL 217.8 to BL 304.4) (Effectivity: All)
(Sheet 2 of 2)
Figure 4

REPAIR LAYUP: (P1) HS 45°/(P2) HS 0°/(P3) HS 45°/(P4) HS 0°/(P5) HS 45°
T = .47 THK H-1/8-3.0



STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -137.

AFT SIDE ONLY:
AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-31

Wing Aft Inboard Spar (Root Rib to BL 72.0) (Effectivity: All)
Figure 5

WING SKINS (EFFECTIVITY: ALL)

WARNING

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The information in this chapter gives details regarding the materials needed to make standard structural repairs for specific areas. The repair processes and materials are defined in Chapter 51.

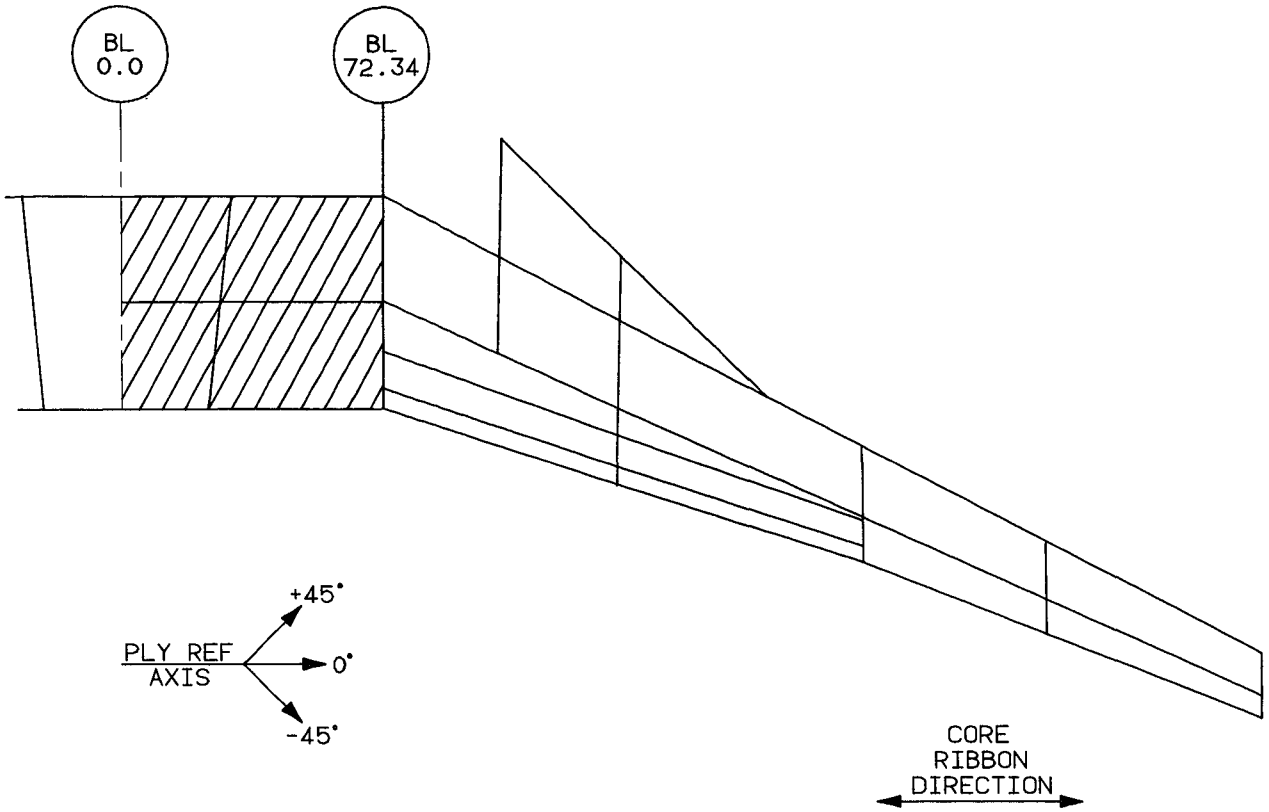
WARNING

The size of the standard repair for any area is limited. Damage repair larger than the limits or repair in areas not specifically detailed in this chapter must be done with the supervision of Beech Aircraft Corporation Customer Support Department. Refer to 51-00-00 STANDARD REPAIR for repair limitations.

WARNING

Aluminum foil mesh must be applied for lightning protection over all cosmetic repairs on Wing Fuel Tank Skins. Refer to Chapter 51-70-00, COSMETIC REPAIR (WITH FOIL MESH).

REPAIR LAYUP: (P1) HS 45°/(P2-P3) TG 0°/(P4) HS 45°/(P5-P6) TG 0°/
(P7) HS 45°
T = .75 THK H-1/8-3.0



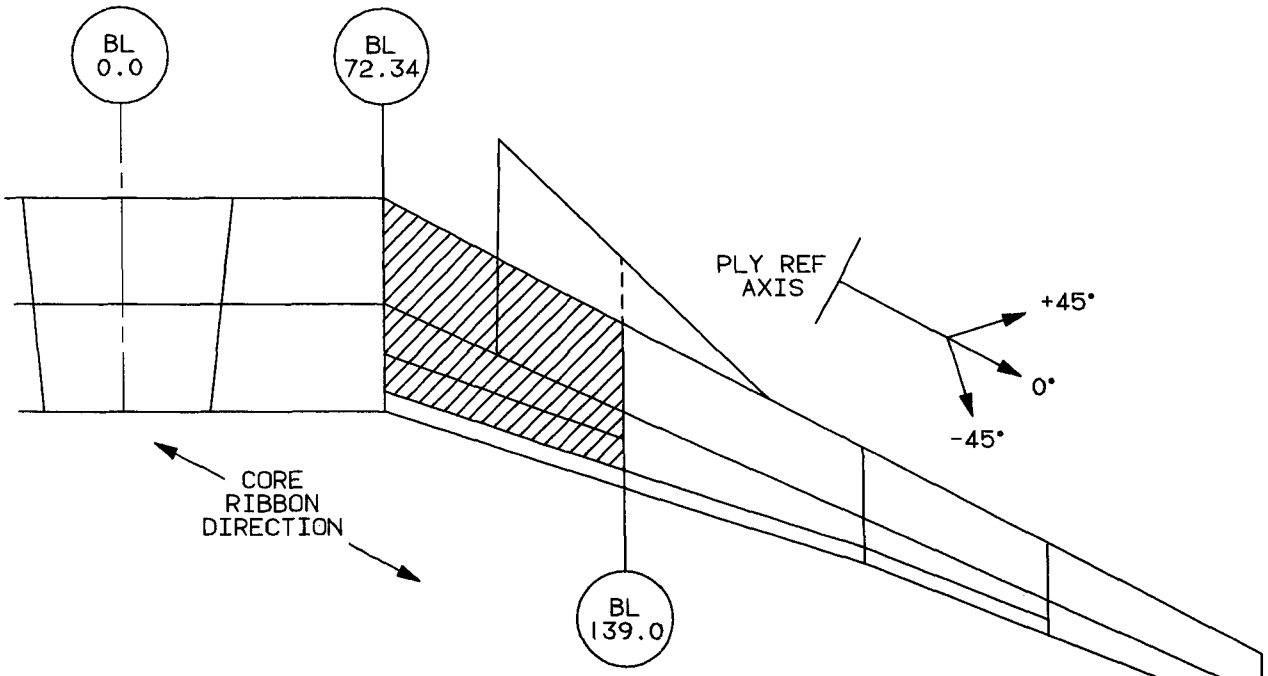
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -67.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-04

Lower Wing Skin (Effectivity: All)
(Sheet 1 of 7)
Figure 1

REPAIR LAYUP: (P1) HS 45°/(P2-P3) TG 0°/(P4) HS 0°/(P5-P6) TG 0°/
(P7) HS 45°
T = .75 THK H-1/8-3.0



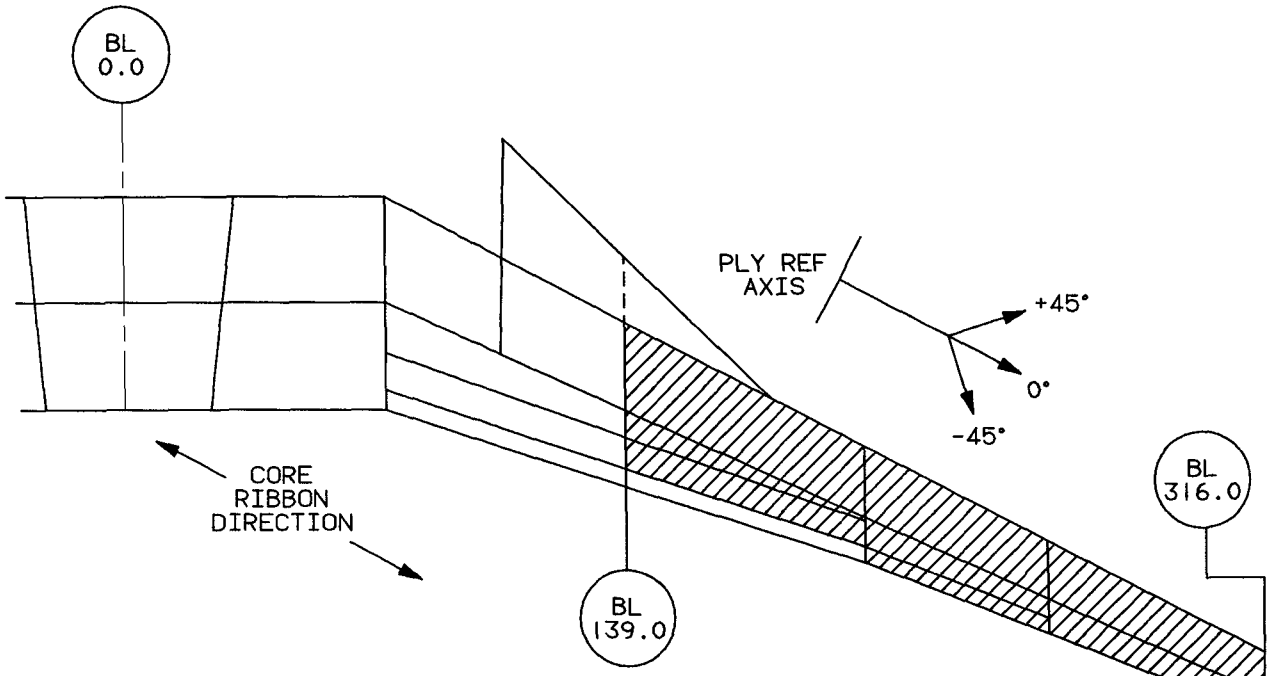
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -71.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-05

Lower Wing Skin (Effectivity: All)
(Sheet 2 of 7)
Figure 1

REPAIR LAYUP: (P1) HS 45°/(P2-P3) TG 0°/(P4) HS 0°/(P5-P6) TG 0°/
(P7) HS 45°
T = .50 THK H-1/8-3.0



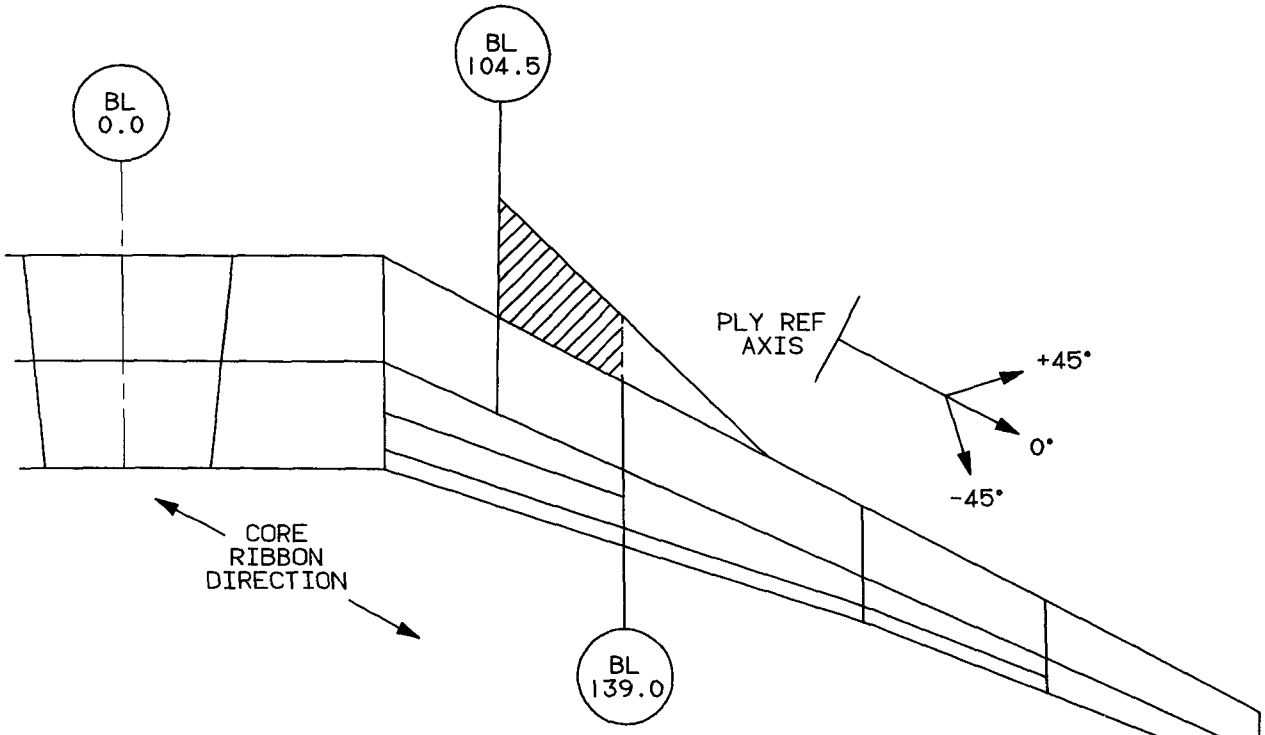
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -73.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-06

Lower Wing Skin (Effectivity: All)
(Sheet 3 of 7)
Figure 1

REPAIR LAYUP: (P1-P2) HS 45°/(P3) HS 0°/(P4-P5) HS 45°
T = .75 THK H-1/8-3.0



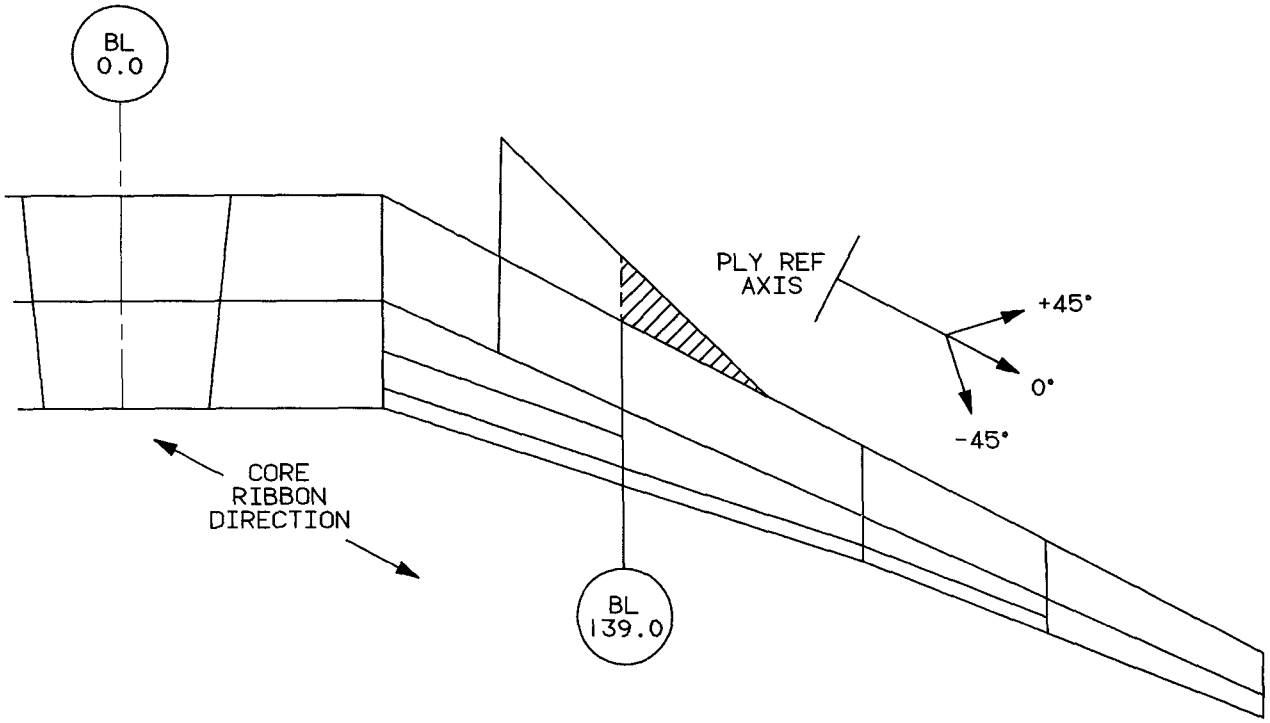
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -75.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-07

Lower Wing Skin (Effectivity: All)
(Sheet 4 of 7)
Figure 1

REPAIR LAYUP: (P1-P2) HS 45°/(P3) HS 0°/(P4-P5) HS 45°
T = .50 THK H-1/8-3.0



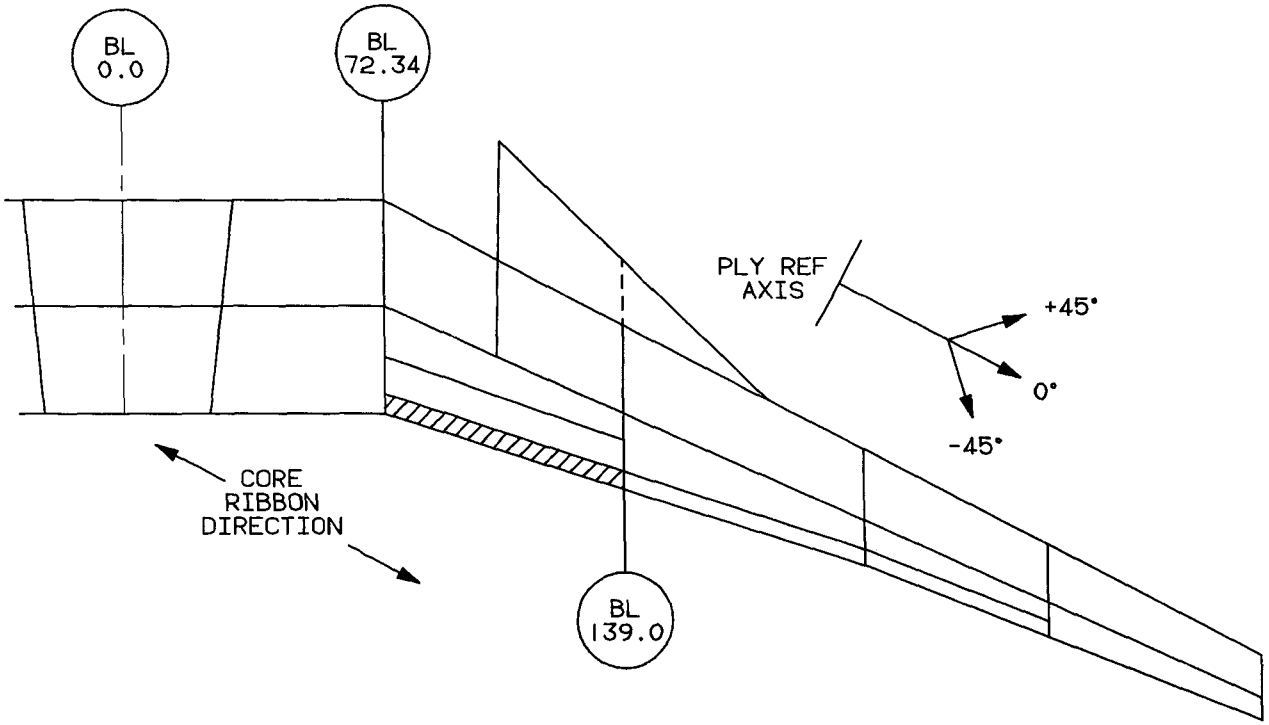
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -77.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-08

Lower Wing Skin (Effectivity: All)
(Sheet 5 of 7)
Figure 1

REPAIR LAYUP: (P1-P2) HS 45°/(P3) HS 0°/(P4-P5) HS 45°
T = .75 THK 0X-3/16-3.0



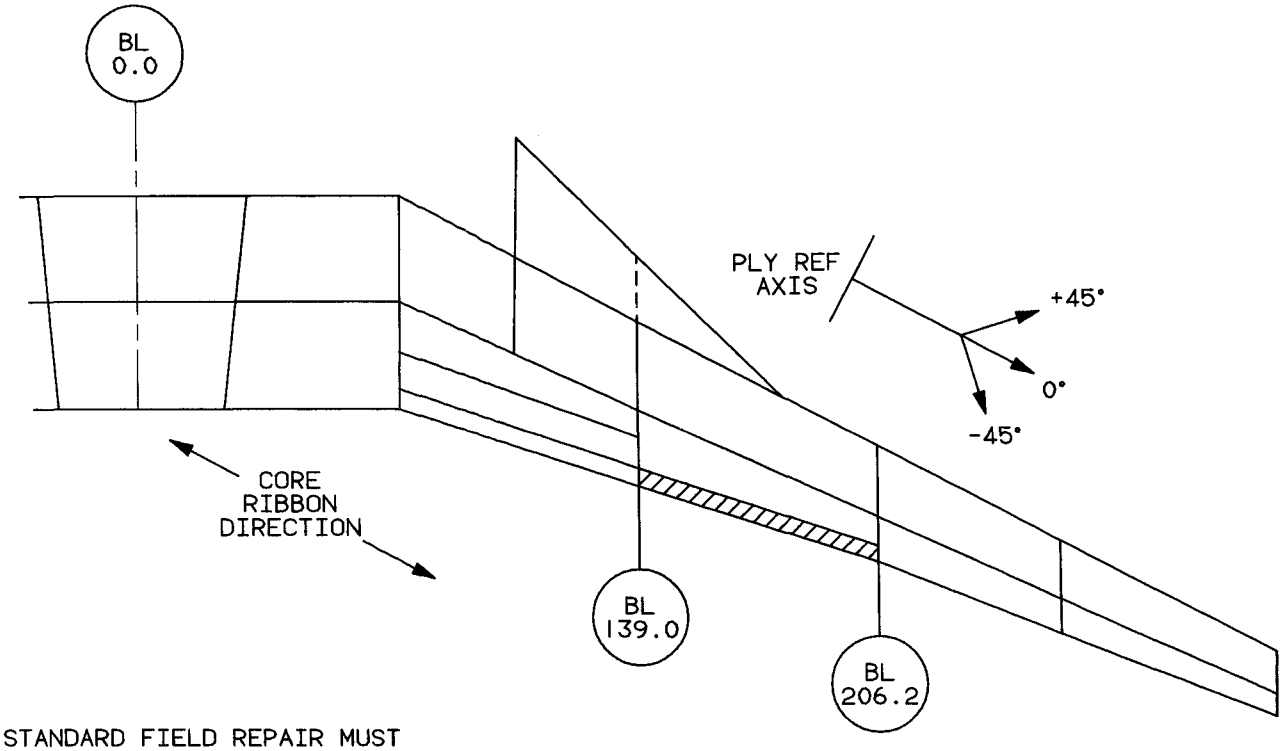
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -79.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-09

Lower Wing Skin (Effectivity: All)
(Sheet 6 of 7)
Figure 1

REPAIR LAYUP: (P1-P2) HS 45°/(P3) HS 0°/(P4-P5) HS 45°
T = .50 THK 0X-3/16-3.0



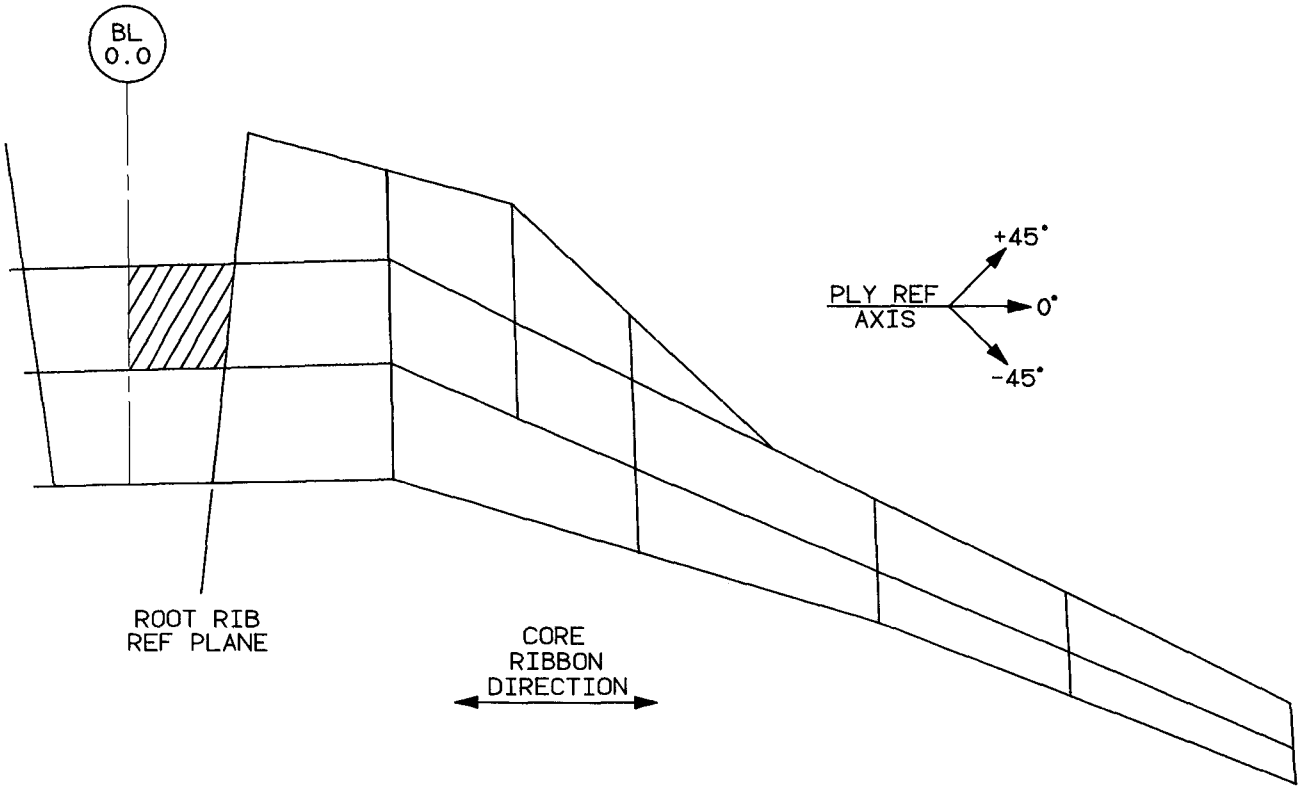
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -81.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-10

Lower Wing Skin (Effectivity: All)
(Sheet 7 of 7)
Figure 1

REPAIR LAYUP: (P1-P2) HS 45°/(P3) TG 0°/(P4) HS 90°/(P5) HS 0°/
(P6-P7) TG 0°/(P8) HS 45°
T = 1.0 THK H-1/8-6.0



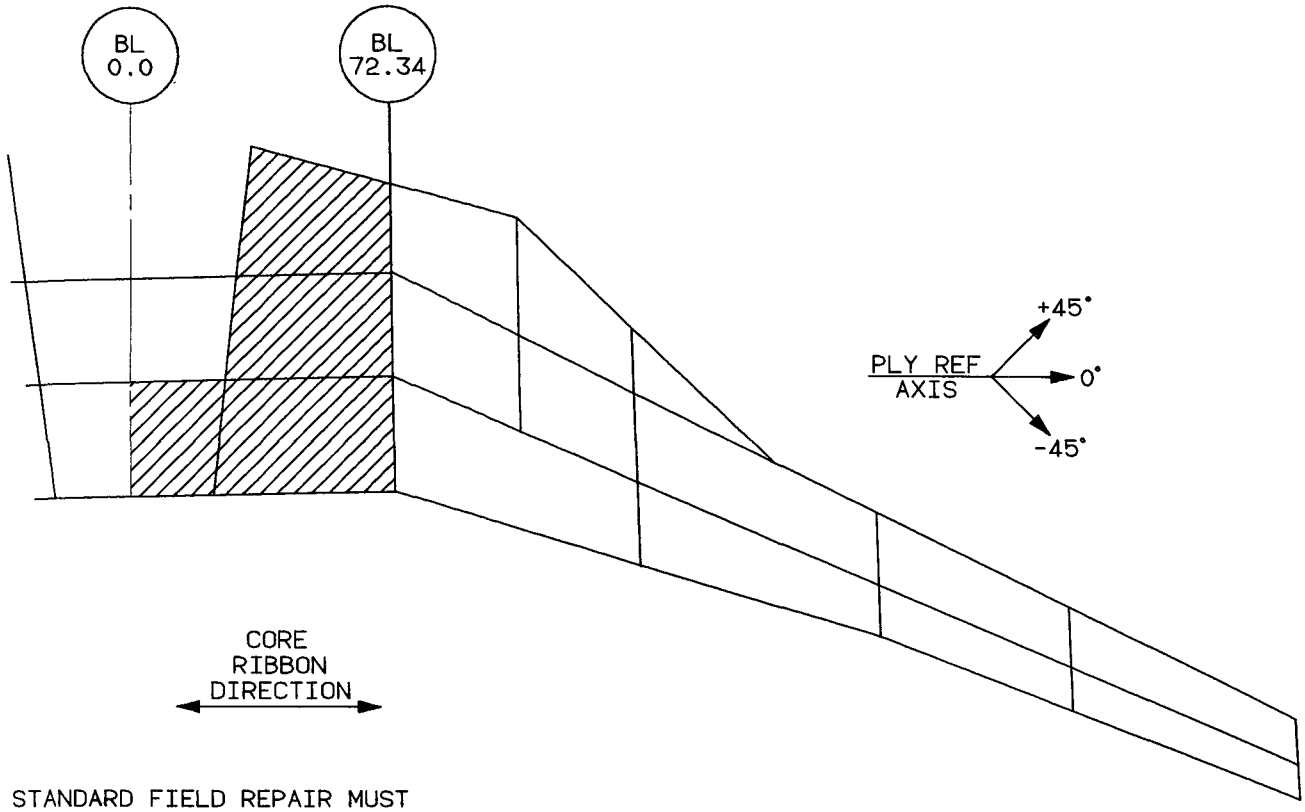
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -85.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-11

Upper Wing Skin (Effectivity: All)
(Sheet 1 of 10)
Figure 2

REPAIR LAYUP: (P1) HS 45°/(P2) TG 0°/(P3) HS 0°/(P4) TG 0°/
(P5) HS 0°/(P6) TG 0°/(P7) HS 45°
T = 1.0 THK H-1/8-3.0



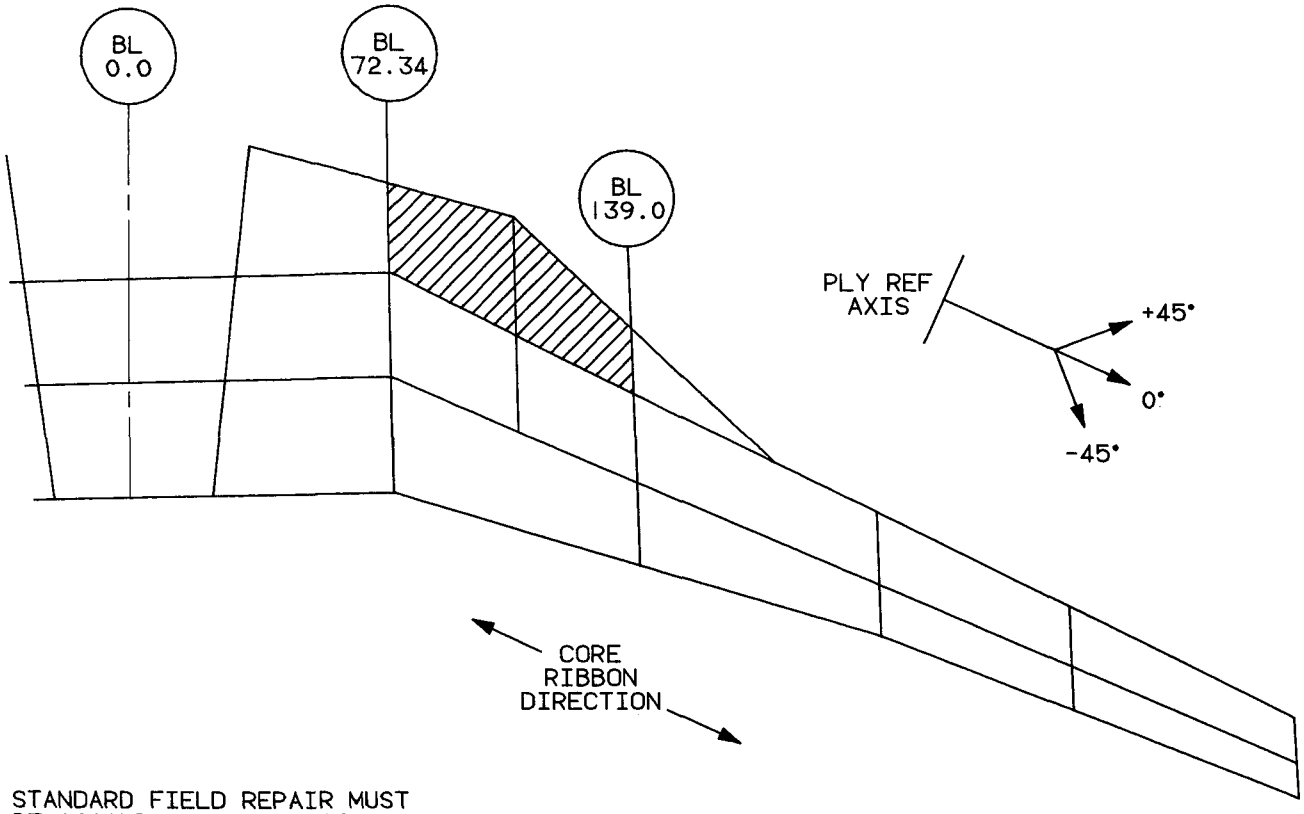
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -89.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-12

Upper Wing Skin (Effectivity: All)
(Sheet 2 of 10)
Figure 2

REPAIR LAYUP: (P1) HS 45°/(P2) TG 0°/(P3) HS 90°/(P4) HS 0°/
(P5) HS 90°/(P6) TG 0°/(P7) HS 45°
T = 1.0 THK H-1/8-3.0



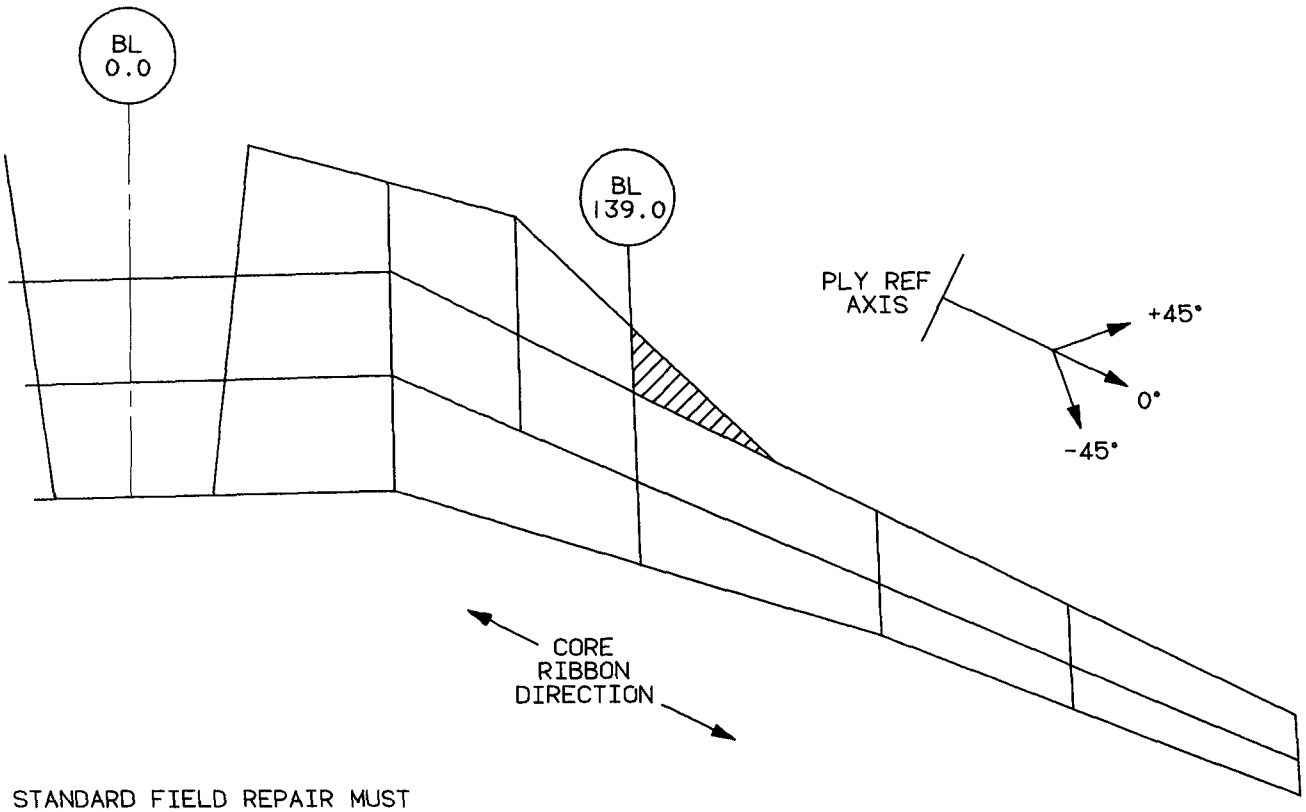
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -91.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-13

Upper Wing Skin (Effectivity: All)
(Sheet 3 of 10)
Figure 2

REPAIR LAYUP: (P1) HS 45°/(P2) TG 0°/(P3) HS 90°/(P4) HS 0°/
(P5) HS 90°/(P6) TG 0°/(P7) HS 45°
T = .75 THK H-1/8-6.0



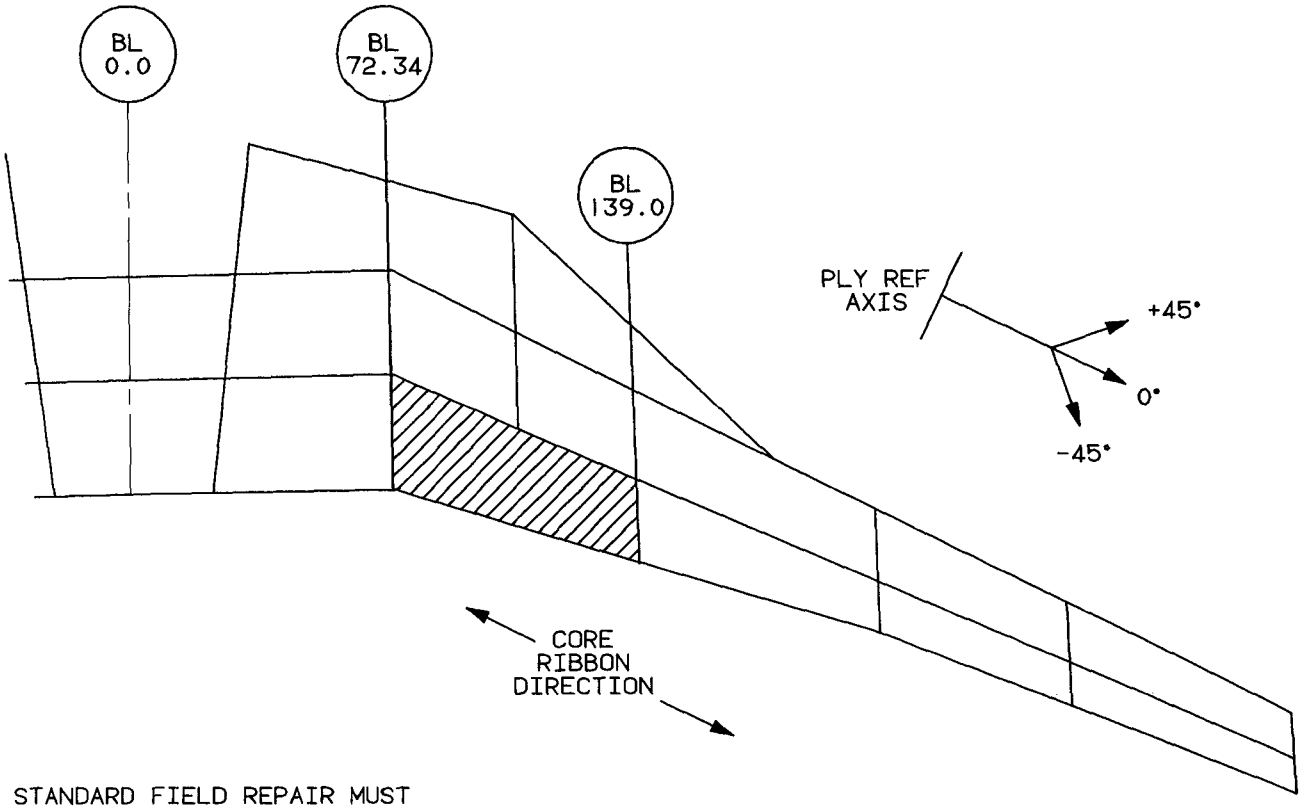
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -93.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-14

Upper Wing Skin (Effectivity: All)
(Sheet 4 of 10)
Figure 2

REPAIR LAYUP: (P1) HS 45°/(P2) TG 0°/(P3) HS 90°/(P4) HS 0°/
(P5) HS 90°/(P6) TG 0°/(P7) HS 45°
T = 1.0 THK H-1/8-3.0



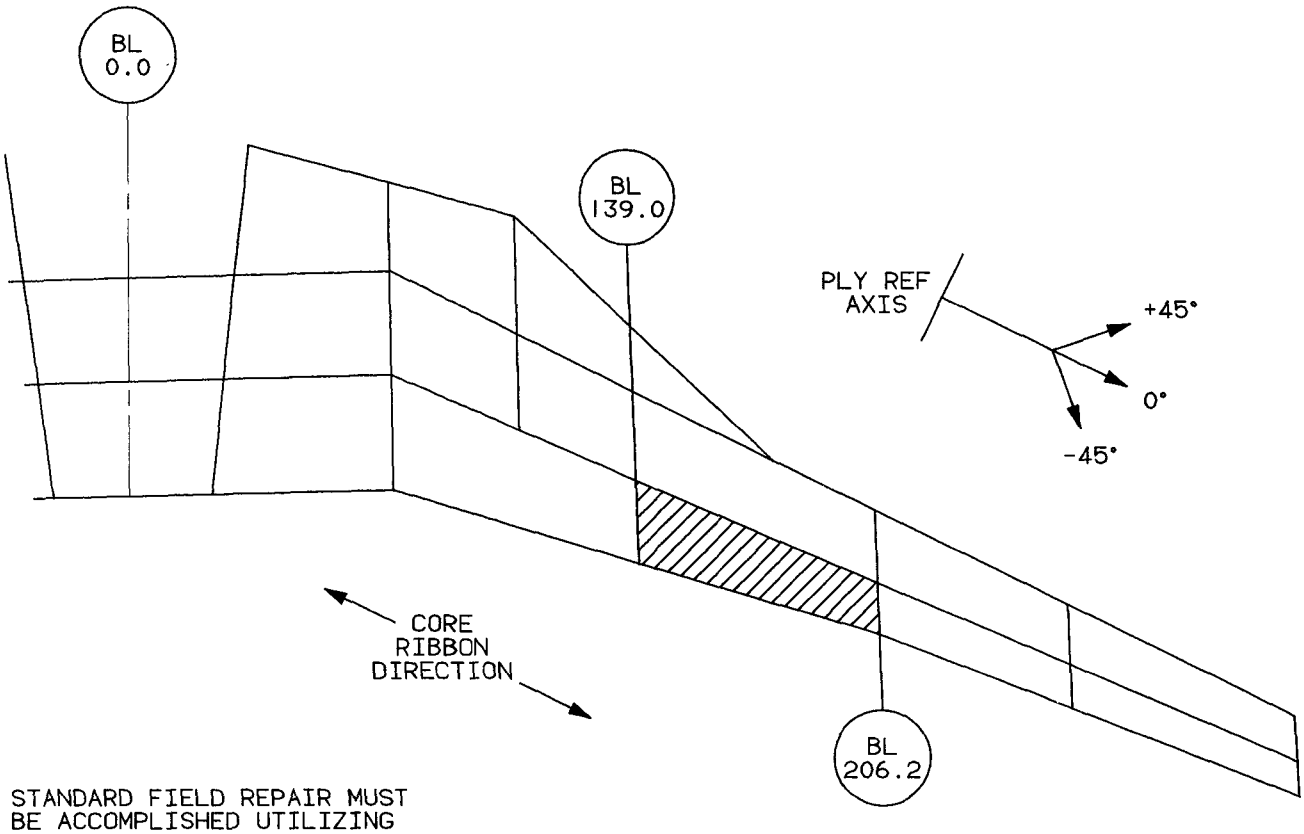
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -97.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-15

Upper Wing Skin (Effectivity: All)
(Sheet 5 of 10)
Figure 2

REPAIR LAYUP: (P1) HS 45°/(P2) TG 0°/(P3) HS 90°/(P4) HS 0°/
(P5) HS 90°/(P6) TG 0°/(P7) HS 45°
T = .75 THK H-1/8-6.0



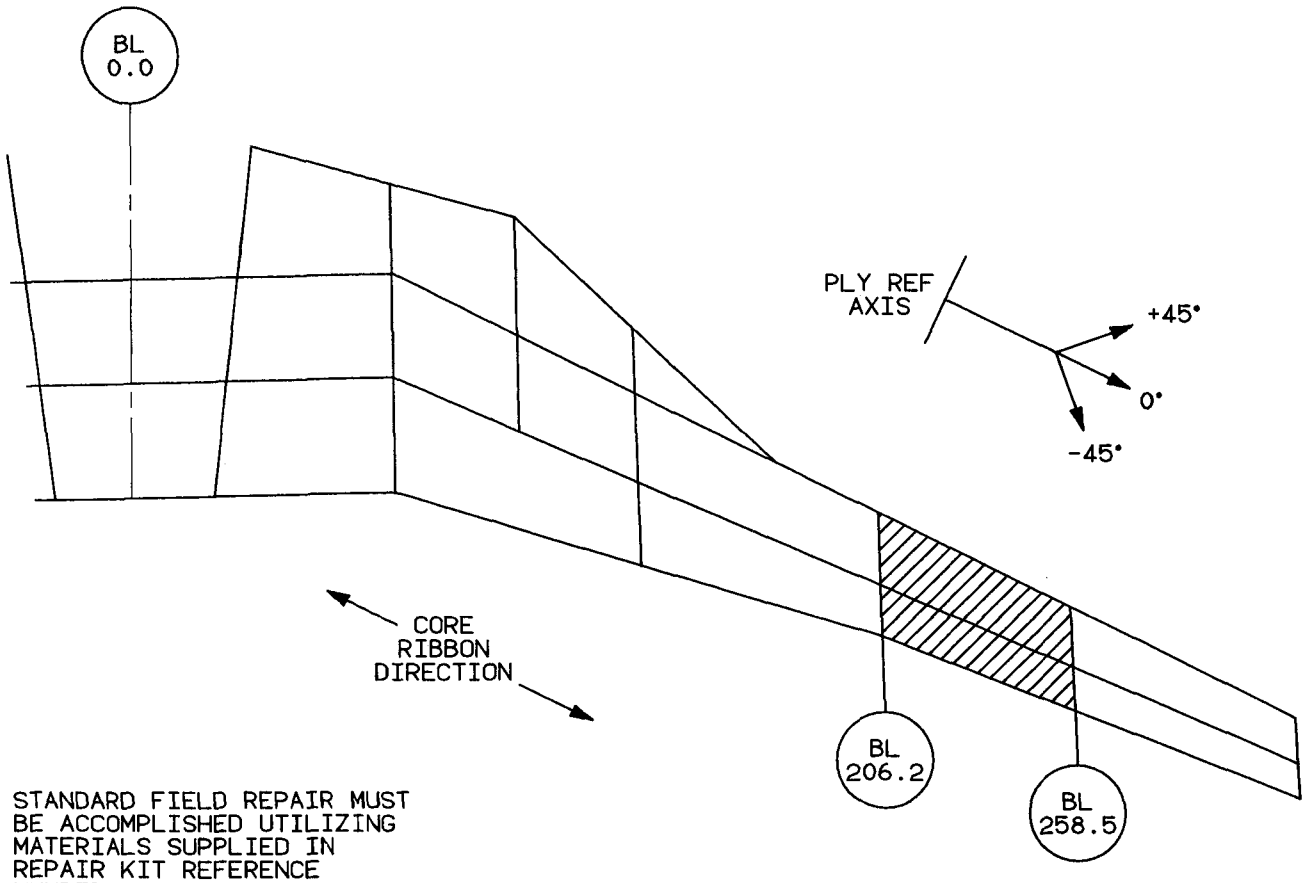
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -99.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-16

Upper Wing Skin (Effectivity: All)
(Sheet 6 of 10)
Figure 2

REPAIR LAYUP: (P1) HS 45°/(P2) TG 0°/(P3) HS 90°/(P4) HS 0°/
(P5) HS 90°/(P6) TG 0°/(P7) HS 45°
T = .50 THK H-1/8-6.0



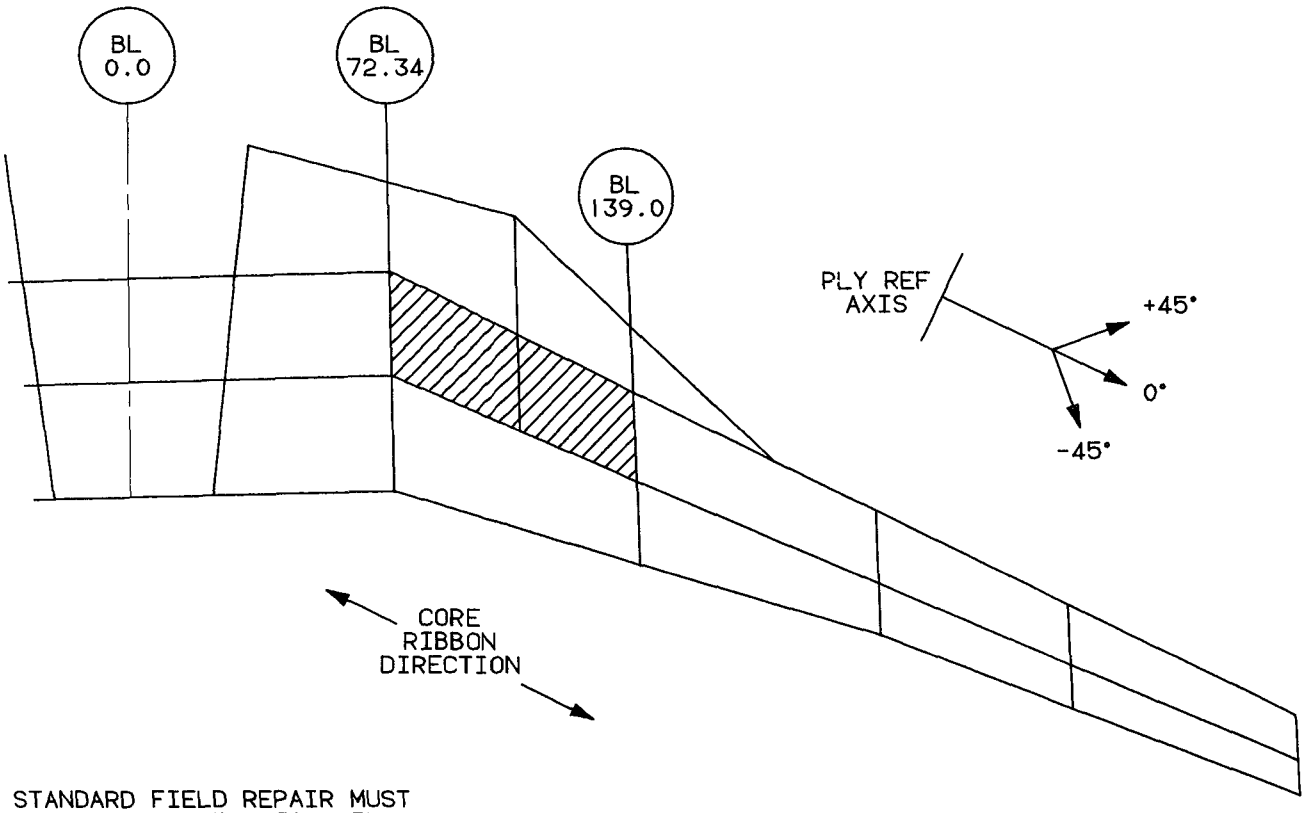
STANDARD FIELD REPAIR MUST BE ACCOMPLISHED UTILIZING MATERIALS SUPPLIED IN REPAIR KIT REFERENCE NUMBER -101.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-17

Upper Wing Skin (Effectivity: All)
(Sheet 7 of 10)
Figure 2

REPAIR LAYUP: (P1) HS 45°/(P2) TG 0°/(P3) HS 90°/(P4) HS 0°/
(P5-P6) TG 0°/(P7-P8) HS 0°/(P9) TG 0°/(P10) HS 45°
T = 1.0 THK H-1/8-6.0



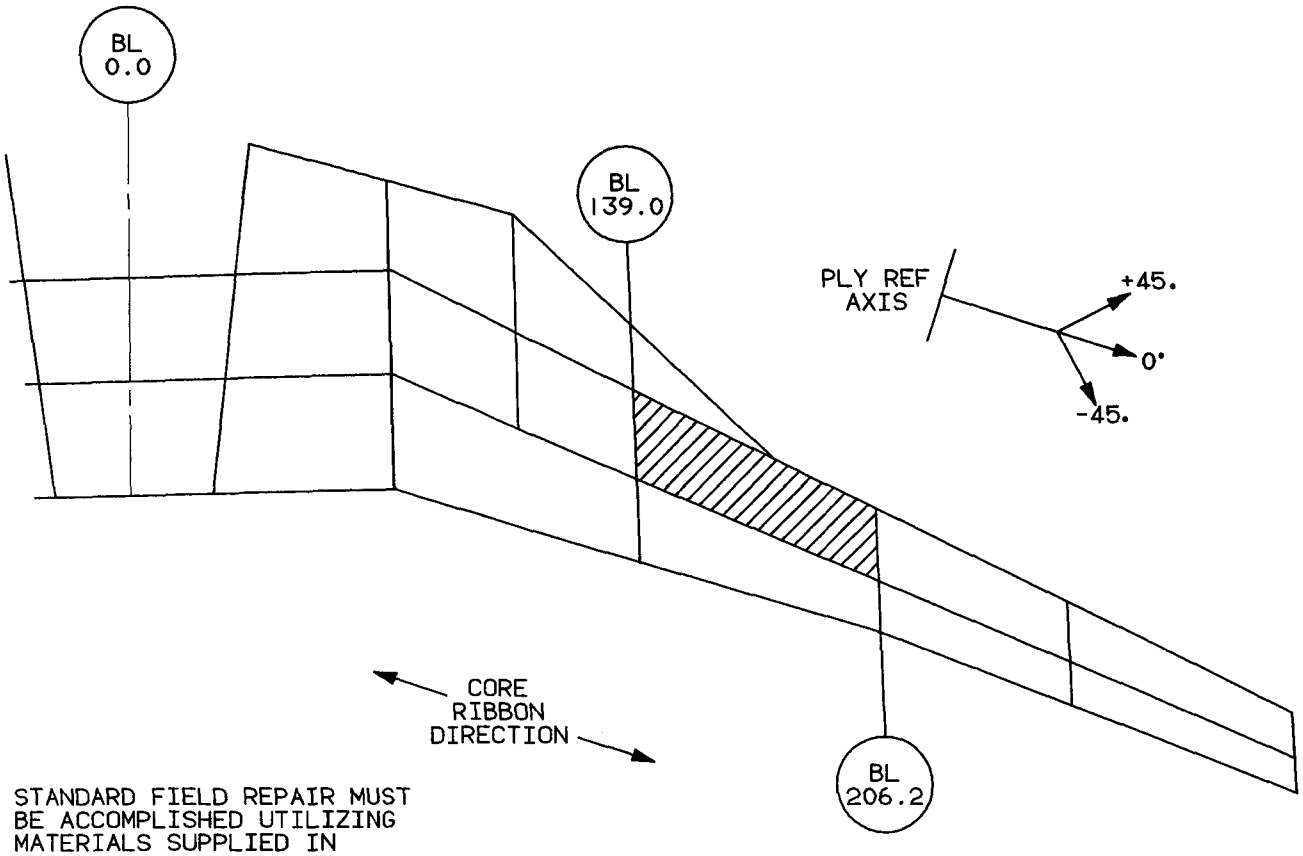
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -103.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-18

Upper Wing Skin (Effectivity: All)
(Sheet 8 of 10)
Figure 2

REPAIR LAYUP: (P1) HS 45°/(P2) TG 0°/(P3) HS 90°/(P4) HS 0°/
(P5-P6) TG 0°/(P7-P8) HS 0°/(P9) TG 0°/(P10) HS 45°
T = .75 THK H-1/8-6.0



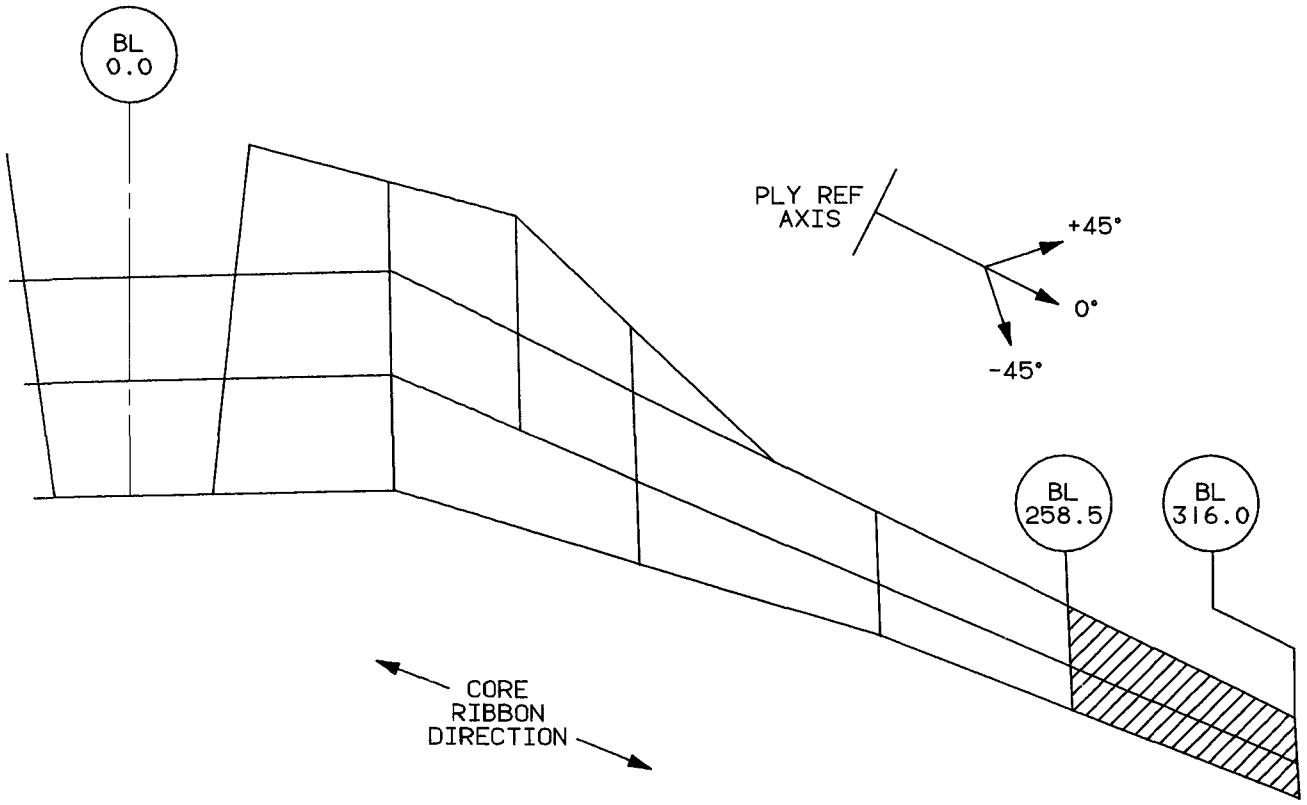
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -105.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-19

Upper Wing Skin (Effectivity: All)
(Sheet 9 of 10)
Figure 2

REPAIR LAYUP: (P1) HS 45°/(P2) TG 0°/(P3) HS 0°/(P4) TG 0°/
(P5) HS 0°/(P6) TG 0°/(P7) HS 45°
T = .50 THK H-1/8-6.0



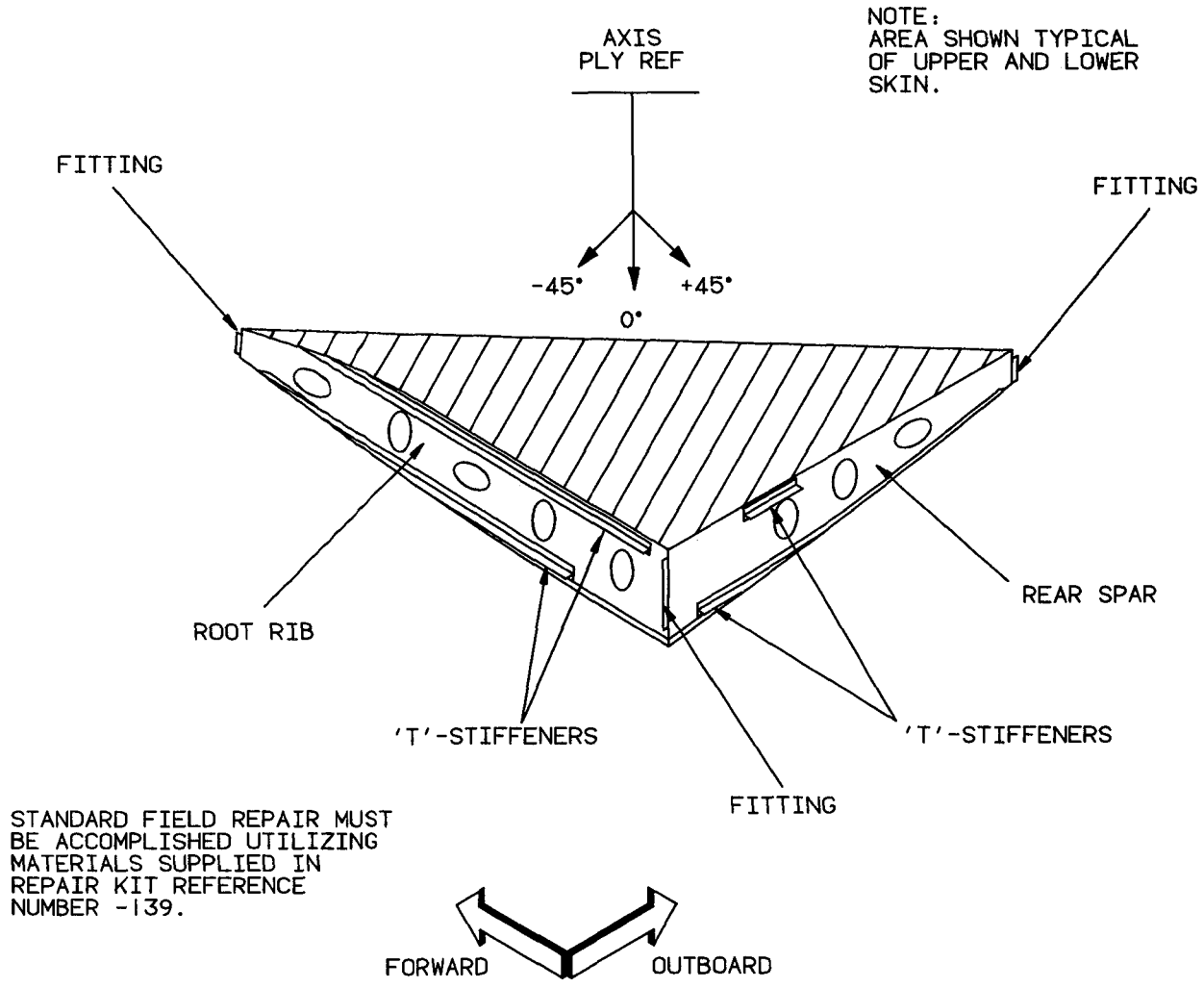
STANDARD FIELD REPAIR MUST
BE ACCOMPLISHED UTILIZING
MATERIALS SUPPLIED IN
REPAIR KIT REFERENCE
NUMBER -107.

AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-20

Upper Wing Skin (Effectivity: All)
(Sheet 10 of 10)
Figure 2

REPAIR LAYUP: (P1) HS 90°/(P2) HS 45°/(P3) HS -45°/(P4-P5) HS 0°/
(P6) HS -45°/(P7) HS 45°/(P8) HS 90°



AREAS CROSS HATCHED MAY BE REPAIRED PER STANDARD FIELD REPAIR PROCEDURES.

2000-030-02

Wing Fuel Tank Skins (Effectivity: All)
Figure 3

91 - CHARTS

LIST OF PAGE EFFECTIVITY

CHAPTER-SECTION-SUBJECT	*PAGE*	*DATE*
91-Effectivity	1	Feb 25/94
91-00-00	1	Feb 25/94
	2	Feb 25/94

CHARTS (Effectivity: All)

WARNING

Anytime the airplane is on the ground (whether on jacks or on the wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be during landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position. Refer to the Starship 1 Maintenance Manual Chapters 32-10-00 and 32-20-00 for the proper lock pin installation procedures.

CHART 1
CONSUMABLE MATERIALS (Effectivity: All)

NOTE

Only the basic number of each Military specification is included in the Consumable Materials Chart. No attempt has been made to update the basic number with the letter suffix that designates the current issues of the various specifications. It is the responsibility of the owner/ operator to determine the current revision of the applicable Military Specification prior to usage of that item. This determination may be made by contacting the vendor of a specific item.

Vendors listed as meeting Federal and Military Specifications are provided as reference only and are not specifically recommended by Beech Aircraft Corporation; consequently, any product conforming to the specification listed may be used. The products listed below have been tested and approved for aviation usage by Beech Aircraft Corporation, by the vendor, or by compliance with the applicable specifications. Other products that are locally procurable which conform to the requirements of the applicable Military Specification may be used even though not specifically included herein.

ITEM	MATERIAL	SPECIFICATION	PRODUCT	VENDOR
1.	Cleaner	TT-I-735 or MIL-I-10428A	Isopropyl Alcohol	
2.	Cleaner	TT-M-261	Methyl Ethyl Ketone	
3.	Cleaner	TT-N-95	Naphtha	
4.	Sandpaper		120, 180 grit	Minnesota Mining and Manufacturing Co. 900 Bush Ave. St. Paul, MN 55144
5.	Rymplecloth			Kendall Co. One Federal Street Boston, MA 02101
6.	Dust Mask			Minnesota Mining and Manufacturing Co. 900 Bush Ave. St. Paul, MN 55144
7.	Pad, Abrasive	MIL-A-9962A	Scotchbrite	Building and Cleaning Products Division Minnesota Mining and Manufacturing Co. 900 Bush Ave. St. Paul, MN 55144
8.	Adhesive		EA 934 N.A.	Hysol Aerospace Products 2850 Willow Pass Road Pittsburg, CA 94565 Advanced Composites Pty., Ltd. Australia Phone: 42-71-5398 Aero Consultants Ltd. AG Switzerland Phone: 1-941-1814

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