



U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Fabrication of Aircraft Parts by
Maintenance Personnel

Date: 2/29/08

AC No: 43-18

Initiated by: AFS-300

Change: 1

- PURPOSE.** This advisory circular (AC) has been revised to update AC 43-18, Fabrication of Aircraft Parts by Maintenance Personnel, dated March 24, 2006.
- PRINCIPLE CHANGES.** This change updates guidance, including all references related to Title 14 of the Code of Federal Regulations (14 CFR).

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ORIGINAL SIGNED BY

John M. Allen for

James J. Ballough

Director, Flight Standards Service



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1. PURPOSE.

a. This advisory circular (AC) ensures that parts fabricated during maintenance and alteration have an equivalent level of safety as those parts produced under the original design holder's production certificate. This AC provides one means of complying with the requirements of Title 14 of the Code of Federal Regulations (14 CFR) part 21 and part 43 for the design and fabrication of parts by persons performing maintenance and alterations using methods, techniques, and practices acceptable to the Administrator. As required by regulation, such parts fabrication and their implementation must be accomplished "in such a manner...that the condition of the aircraft, airframe, aircraft engine, propeller, or appliance worked on will be at least equal to its original or properly altered condition."

b. This AC is not mandatory and does not constitute a regulation. It is issued for guidance and to outline one method of compliance with the rules. In lieu of following, without deviation, the method prescribed herein a person may elect to follow an alternative method, provided the Federal Aviation Administration (FAA) finds the alternative method to be an acceptable means of complying with the applicable requirements of 14 CFR.

2. **RELATED CFR PARTS.** Refer to the following 14 CFR regulations, generally applicable to satisfying or making a finding of compliance.

- a. Part 1, Definitions and Abbreviations.
 - b. Part 21, Certification Procedures for Products and Parts.
 - c. Part 23, Airworthiness Standards: Normal, Utility, Acrobatic, and Commuter Category Airplanes.
 - d. Part 25, Airworthiness Standards: Transport Category Airplanes.
 - e. Part 27, Airworthiness Standards: Normal Category Rotorcraft.
 - f. Part 29, Airworthiness Standards: Transport Category Rotorcraft.
 - g. Part 31, Airworthiness Standards: Manned Free Balloons.
 - h. Part 33, Airworthiness Standards: Aircraft Engines.
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- i. Part 35, Airworthiness Standards: Propellers.
- j. Part 39, Airworthiness Directives.
- k. Part 43, Maintenance, Preventive Maintenance, Rebuilding, and Alteration.
- l. Part 45, Identification and Registration Marking.
- m. Part 65, Certification: Airmen Other than Flight Crewmembers.
- n. Part 91, General Operating and Flight Rules.
- o. Part 145, Repair Stations.
- p. Part 183, Representatives of the Administrator.

3. DEFINITIONS. The following definitions apply for this AC:

a. Acceptable Data. Data is acceptable to the Administrator when used within the context of maintenance, a minor repair, or an alteration if the data substantiates that the product has been returned to its original or properly altered condition. Acceptable data may establish that the fabricated part complies with applicable airworthiness standards (i.e., regulations). When acceptable data is used to substantiate that the article meets the regulatory requirements and will be returned to its original or properly altered condition, it can be considered acceptable to the Administrator.

b. Airworthy. The term “airworthy” is defined in 14 CFR § 3.5(a), a clear understanding of its meaning is essential in making an airworthiness determination. Furthermore, the definition of airworthy applies to type-certificated products (aircraft, aircraft engine, or propeller), and parts thereof. Title 49 U.S.C. § 44704(c) and 14 CFR § 21.183(a), (b), and (c) state that the two conditions that must be met for issuance of an airworthiness certificate are:

(1) The product must conform to its type certificate (TC). A product conforms to its TC when its configuration and the components installed are as described in the drawings, specifications, and other data that are part of the TC, which includes any Supplemental Type Certificates (STC), Airworthiness Directives (AD), and field approved alterations incorporated into the product; and

(2) The aircraft (product) must be in a condition for safe operation.

NOTE: If one or more of these conditions are not satisfied, the product would not be considered airworthy.

c. Approved Data. Data that has been approved by the FAA and that is used to perform maintenance and alterations on products under 14 CFR part 43. Approved data must be used when performing major repairs and alterations. The FAA approves the data in conjunction with the issuance of a TC, STC, Technical Standard Order Authorization (TSOA), or Parts

Manufacturer Approval (PMA). Other forms of approved data include ADs, letters of engineering design approval issued by an FAA Aircraft Certification Office (ACO), maintenance instructions approved by an FAA Designated Engineering Representative (DER), and FAA-approved Structural Repair Manuals (SRM).

NOTE: While technical and other forms of data are approved under the field approval process as declared on Form 337, such approved data may not be sufficiently detailed to allow for fabrication of parts that are intended for use in multiple applications.

d. Certificate Holder. Any person certificated by the FAA and authorized to perform maintenance, preventive maintenance, rebuilding, and alterations as provided in 14 CFR § 43.3. Within the context of this AC, if a certificate holder intends to fabricate a part for maintaining a product he/she may do so only under the provisions (privileges) of his/her certificate.

e. Certificate Management ACO. The ACO responsible for issuing and overseeing the original design or technical approval under TC, STC, TSOA, or PMA of the product or article on which the fabricated part will be installed. The certificate management ACO is also responsible for managing continued airworthiness of a product for as long as it is in service.

f. Critical. A term of significance applied to a part or to a function performed by a part. A critical part performs a function of such significance (critical function) to the aircraft on which it is installed that, if it failed, the airworthiness of the aircraft would be degraded to an extent that would preclude continued safe flight or landing.

g. Consumed. A fabricated part is considered consumed in a repair when it is installed into the next higher assembly component part, or within a product by the fabricator, while undergoing maintenance or an alteration.

h. Design. Consists of all drawings and specifications, which may be summarized on a master drawing list. These are necessary to show the configuration of the part(s) and all information on dimensions, tolerances, materials, processes, and procedures necessary to define all characteristics of the part(s), as well as, the Airworthiness Limitations Section of the instructions for continued airworthiness (ICA).

i. Fabrication. An act in which a part/subpart is made (fabricated) and consumed by the fabricator on the product, or part thereof, in the course of performing maintenance or alterations in accordance with (IAW) approved or acceptable data, depending on the Category (CAT) classification of the part being fabricated and the applicable regulations. In addition, a maintenance record entry must be made with a description of work performed, date of completion, name of person who performed the work, and a satisfactory signature and FAA certificate number.

j. Flight Standards District Office (FSDO). The FAA FSDO that has the responsibility for certificate management over the certificate holder that is undertaking the fabrication of the part or part thereof.

(5) AC 43.13-1B, Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair.

(6) AC 43.13-2A, Acceptable Methods, Techniques, and Practices - Aircraft Alterations.

(7) AC 43-210, Standardized Procedures for Requesting Field Approval of Data, Major Alterations, and Repairs.

(8) AC 91-60, The Continued Airworthiness of Older Airplanes.

(9) AC 120-77, Maintenance and Alteration Data.

5. BACKGROUND.

a. Maintenance personnel have raised questions and concerns regarding their authority to fabricate aircraft parts during the course of performing maintenance and alterations on a product or part thereof. Typically, such questions center around whether a person needs an approval under 14 CFR part 21 to produce parts for installation on type-certificated products or whether it is permissible to use the maintenance rules outlined in 14 CFR part 43 to fabricate parts for consumption during maintenance or alteration. Previous questions were evaluated against regulatory criteria and answered on a case-by-case basis.

b. It is important to emphasize that design and production rules differ from maintenance and alteration rules. Therefore, it is crucial that the FAA organization responsible for each of these different activities is appropriately involved when acquiring approvals. For example, FSDO inspectors have the necessary knowledge on requirements for maintaining a product, whereas Manufacturing Inspection District Office (MIDO) inspectors possess the expertise and familiarity with the requirements for manufacturing parts and their use of specific materials and processes. Compliance with both the maintenance and manufacturing requirements is the only way a certificate holder can ensure that a fabricated part is airworthy. This AC provides guidance for establishing a system that ensures the same level of safety for parts fabricated under 14 CFR part 43, for maintenance or repair purposes, as those produced under the production rules under 14 CFR part 21.

c. Any person who engages in the design, production, operation, maintenance, or alteration of a civil aviation product is responsible for ensuring that the part/product conforms to its approved design and is in condition for safe operation. Therefore, an appropriately rated certificate holder that fabricates a part in the course of performing maintenance or alterations must possess:

(1) Approved design data or data acceptable to the Administrator that is determined by the CAT classification for the part being fabricated; and

(2) A fabrication quality control system (FQCS) to ensure each fabricated part conforms to its design data and is in a condition for safe operation.

6. FABRICATION UNDER 14 CFR PARTS 21 AND 43.

(1) For the purposes of this AC, the FAA recommends use of the CPL (a copy of the CPL can be found in Appendix 2 of this AC), in combination with other factors, to determine a part's criticality level. The CPL classifies parts into one of three categories depending on their effect on safety. The CPL should be used as a guide in determining a parts criticality. It's important to understand that not all component parts have been addressed on this list, and therefore, specific questions concerning parts not addressed can be evaluated by contacting the certificate holding ACO.

(2) When used in the context of this AC, this CPL is a means to determine the criticality category of the part and the level of AIR involvement needed in the design data approval process for certificate holders fabricating parts.

NOTE: No part, or fabricated part thereof, that is the subject of an AD can be installed on an aircraft without complying with the AD or obtaining an alternative method of compliance (AMOC) approval from the responsible ACO.

b. Part Categories.

(1) **CAT 1 Part.** A fabricated part, the failure of which could prevent continued safe flight and landing; resulting consequences could reduce safety margins, degrade performance, or cause loss of capability to conduct certain flight operations.

(a) **Design Issues.** A CAT 1 part is a part intended to be consumed within a major repair or major alteration. The certificating ACO, through the geographic ACO, must approve the design data. The list of data to be submitted to the ACO can be found in paragraph 6d(1)(a). The ACO will make the determination of necessary data for development and submittal based on each circumstance. In the case of a CAT 1 part, a DER may only "recommend approval" of the design data.

(b) **Fabrication Issues.** The certificate holder is responsible for ensuring all aspects of the FQCS are addressed and satisfied. The guidelines provided in paragraph 6d(2) should be used to develop the FQCS for compliance.

(2) **CAT 2 Part.** A fabricated part, the failure of which would not prevent continued safe flight and landing, but would reduce the capability of the aircraft or the ability of the flightcrew to cope with adverse operating conditions or subsequent failures.

(a) **Design Issues.** A CAT 2 part is a part intended to be consumed within a major repair or major alteration. Design data is required to be approved by the geographic ACO or appropriately authorized DER. The list of required data to be submitted to the ACO or the DER for approval can be found in paragraph 6d(1)(a).

(b) **Fabrication Issues.** The certificate holder is responsible for ensuring all aspects of the FQCS are addressed and satisfied. The guidelines provided in paragraph 6d(2) should be used to develop the FQCS for compliance.

APPENDIX 2. CATEGORY PARTS LIST

Note: The information contained in this Appendix should be used as a guideline in determining a parts criticality. It is not all inclusive and specific questions concerning parts not addressed can be evaluated by contacting the certificate holding ACO.

The CPL has not been reviewed for update since July 1, 2004 and is not scheduled for any future update. Current FAA Safety Management System initiatives could render the CPL obsolete at which time it will be eliminated. The CPL posted on the Internet is for information only and if used for other purposes than what is stated above it is solely at the user's risk.

Structural Assemblies	CFR part	Structural Elements	CFR part	Hydraulic Pneumatic Components	CFR part	Propulsion System Components	CFR part	Systems and Equipment	CFR part
Fuselage (23-1), (25-1)	23, 25	Fuselage Structural Elements Pressure Bulkheads (23-1), (25-1) Keel Beam (25-1) Longerons/Stringers (25-2) Floor Beam (25-2) Plates/Skins (25-2) Fuselage to Wing Attach Fittings (25-1) Stabilizer to Fuselage Attach Fittings (25-1) Gear to Fuselage attach Fittings (25-1) Door Hinge (on Fuselage) (25-1) Fuselage Panels (23-1), (25-1)	23, 25	Hydraulic Main Pump (23-1), (25-2), (27-1), (29-1) Main Accumulator (25-2) Main Reservoir (25-2) Auxiliary Pump (25-2)	23, 25, 27, 29	Software Thrust (EEC) (23-1), (25-1)	23, 25	Electrical Power System Alternator/Generator Drive System (25-2) AC Generator-Alternator (25-2) AC Inverter (25-2) Phase Adapter (25-2) AC Regulator (25-2) Fire Protection Smoke Detection (25-2), (27-2), (29-2) Fire Detection (25-2), (27-2), (29-2) Overheat Detection (25-2), (27-2), (29-2) Extinguishing System (25-2), (27-2), (29-2) Fire Bottle-Fixed (25-2), (27-2), (29-2)	25, 27, 29
Flight Control Surfaces Ailerons (23-1), (25-1) Rudder (23-1), (25-1) TE Flaps (23-1), (25-2) LE Devices (25-2) Elevator (23-1), (25-1) Spoilers (25-2)	23, 25	Flight Control Structural Elements Aileron Tabs (25-2) Jackscrew (23-1), (25-1) Belleranks (23-1), (25-1) Flight Control Cables (23-1), (25-1)	23, 25	Flight Control Servo Actuators (25-2), (27-1), (29-1) Flap Actuator (25-2) Rudder Actuator (25-2) Stabilizer Actuator (25-2)	25, 27, 29	Thrust Reversers (23-1), (25-2) Auxiliary Power Units (23-1) FADEC (23-1)	23, 25	Fuel System Boost Pumps (23-1), (25-2), Transfer Valves (23-1), (25-2) Fuel S O V (23-1), (25-1) Digital Fuel Flow System (25-2) Fuel Dump (25-2) Fuel Hose (Single engine applications ONLY) (23-2) (27-2), (29-2) Fuel Quantity Indicator (25-2), (27-2), (29-2) Fuel Flow Indicating (27-2), (29-2) Fuel Pressure Indicating (27-2), (29-2) Fuel Pump (25-2), (27-1), (29-1) Oil Cooler (Single engine applications ONLY) (23-2) (27-2), (29-2) Crew Oxygen System	23, 25, 27, 29

CATEGORY PARTS LIST

Structural Assemblies	CFR part	Structural Elements	CFR part	Hydraulic Pneumatic Components	CFR part	Propulsion System Components	CFR part	Systems and Equipment	CFR part
								(27-2), (29-2) Indicating System Warning, Caution, and Advisory Lights (27-2), (29-2), Main Rotor Indicating System (27-2), (29-2) Engine Power (27-2), (29-2) Engine Temperature (27-2), (29-2)	
Empennage Horizontal Stabilizers (23-1), (25-1) Elevators (23-1), (25-1) Vertical Stabilizers (23-1), (25-1) Rudder (23-1), (25-1)	23, 25	Empennage Structural Elements Horizontal Stabilizer Spars/Ribs (25-2) Plates/Skins (25-2) Tab Structure (25-2) Attach Fitting (25-2) Empennage Structural Elements Elevator Spars/Ribs (25-2) Plates/Skins (25-2) Tab Structure (25-2) Attach Fitting Elevator Tab (25-2) Empennage Structural Elements Vertical Stabilizer Spars/Ribs (25-2) Plates/Skins (25-2) Attach Fitting (25-2) Ventral Structure (25-2) Empennage Structural Elements Horizontal Stabilizer Spars/Ribs (25-2) Plates/Skins (25-2) Tab Structure (25-2) Attach Fitting (25-2)	25	Control Valves (23-2), (25-2) Shut Off Valves (23-2), (25-2) Rudder Power Control Units (23-1), (25-2) Rudder Power Control Unit (Boeing 737) (25-1)	23, 25	Engine Cowling Systems Inlets(23-1), (25-2) Nacelles (23-1), (25-2) Fairings (23-1), (25-2)	23, 25	Brake System and Assembly Components Brakes(23-1), (25-1) Anti-Skid Valves (23-2), (25-2) Wheel Assemblies (23-1) (25-2) Tire Casing (25-2) Tire Tube (25-2) Anti Skid Section (25-2) Master Cylinder/Brake Valve (25-1)	23, 25
Wing Structure (23-1), (25-1)	23, 25	Wing Structure Structural Elements Panels (23-1), (25-2) Wing Webs (23-1), (25-2) Spars (23-1), (25-1) Ribs/Bulkheads (25-2) Longerons/Stringers (25-2) Center Wing Box (25-1) Auxiliary Structure (25-2) Wing Attach Fitting (25-1) NAC/Pylon Wing Fitting (23-1), (25-1)	23, 25			Airborne Software Controlled Equipment Software Level A (per RTCA/DO 178B), (23-1) (25-1), (33-1) Software Levels B, or C (per RTCA/DO 178B) (23-2) (25-2), (33-2)	23, 25, 33	NOTAR (High Speed Fan) (27-1), (29-1) Automatic Flight Control Systems/Stability Augmentation Systems Flight Control Computers (27-1), (29-2) Servo/Linear Actuators (27-1), (29-1) Electrical Power Systems AC Generator (27-2), (29-2) AC Inverters (27-2), (29-2)	27, 29

CATEGORY PARTS LIST

Structural Assemblies	CFR part	Structural Elements	CFR part	Hydraulic Pneumatic Components	CFR part	Propulsion System Components	CFR part	Systems and Equipment	CFR part
		Blended Winglet (25-2)						Battery (27-2), (29-2) Starter Generator (27-2), (29-2)	
Main Rotor	27, 29	Main Rotor Control	27, 29			Propellers	35	Drive Systems	27, 29
Hubs (27-1), (29-1) Trunnions (27-1), (29-1) Yokes (27-1), (29-1) Spindles (27-1), (29-1) Grips (27-1), (29-1) Pitch Horns (27-1), (29-1) Drag Braces (27-1), (29-1) Blades (27-1), (29-1) Blade Spars (27-1), (29-1) Damper Hubs (27-1), (29-1) Retention Pins/Straps/Bolts (27-1), (29-1) Tension-Torsion Straps (27-1), (29-1) Strap Packs (27-1), (29-1) Pillow Blocks (27-1), (29-1) Droop Restraint Bolts (27-1), (29-1) Elastomeric Dampers (27-1), (29-1) Bearings (27-1), (29-1) Bushings (27-1), (29-1)	Swashplates (27-1), (29-1) Swashplate Drives (27-1), (29-1) Anti-Drives (27-1), (29-1) Anti-Links (27-1), (29-1) Pitch Change Links (27-1), (29-1) Drive Links (27-1), (29-1) Drive-Levers (27-1), (29-1) Gimbal Stabilizer Bars (27-1), (29-1) Mixing Levers (27-1), (29-1) Collective Sleeves (27-1), (29-1) Cyclic & Collective Control Sticks (27-1), (29-1) Actuator Supports (27-1), (29-1) Control System Tubes/Bolts/Pins (27-1), (29-1)				(Hubs (35-1), Blades (35-1) Blade Retention Devices (35-1) Counter Weights (35-1) Pitch Control Systems Including PCU (35-1) Governors (35-1) Actuators (35-1) PCU Mechanisms (35-1) Propeller Electronic Controls (35-1), and Propeller Valve Modules (35-1)	Masts (27-1), (29-1) Gear Boxes (27-1), (29-1) Driveshafts (27-1), (29-1) Bearings (27-1), (29-1) Hanger Bearings (27-1), (29-1) Clutches (27-1), (29-1) Couplings (27-1), (29-1) Transmissions Cases (27-1), (29-1) Gears (27-1), (29-1) Clutches (27-1), (29-1) Oil Pumps (27-1), (29-1) Bearings (27-1), (29-1)			
Nose Section (23-1), (25-1) Radomes (23-2), (25-2)	23, 25	Fuel Tank Structure Fuel Cell (23-1), (25-1), (27-1), (29-1)	23, 25, 27, 29			Drive Belts (27-1), (29-1)	27, 29	Stall Warning (23-2), (25-2)	23, 25
Nacelles/Pylons (23-1), (25-1) Doors	23, 25	Nacelles/Pylons Structural Elements	23, 25, 27, 29			Gas Turbine Engines- Engine Rotors	33	Anti-Ice System	25, 27, 29
Passenger Crew Doors (25-1) Emergency Exit Door (25-2) Landing Gear Doors (25-2) Cargo Baggage Door (25-2)		Attachment Fittings (25-1), (27-1), (29-1) Bulkhead/Firewalls (Nac/Pylon) (25-2), Longerons/Stringers (Nac/Pylon) (25-2) Plates/Skins (Nac/Pylon) (25-2) Attach Fittings (Nac/Pylon) (25-1), (27-1), (29-1) Engine Struts (23-1), (25-1), (27-1), (29-1) Engine Mounts (23-1), (25-1), (27-1), (29-1) Pylon Lift/Link Assemblies (27-1), (29-1)				Fan Blades (33-1), Disks (33-1), Blisks (33-1), Impellers (33-1), Spools (Drum Rotors) (33-1), Thermal Shields for cooling of main rotors (33-1), Cooling Plates (33-1), Main Rotor Rotating Spacers and Seals (33-1), Main Line Engine Shafts (i.e., low and high pressure rotor shafts, propeller shafts for turboprop applications and power transmission shafts for input to propeller and transmission gearboxes) (33-1), Main Line		Pitot/Static Anti-Ice (25-2) Air Foil Anti Ice/Deice (25-2), (27-2), (29-2) Window/Windshield & Doors (25-2) Antenna/Radome Anti Ice (25-2) Intake Anti-Ice/Deice (27-2), (29-2)	

CATEGORY PARTS LIST

Structural Assemblies	CFR part	Structural Elements	CFR part	Hydraulic Pneumatic Components	CFR part	Propulsion System Components	CFR part	Systems and Equipment	CFR part
						Gas Turbine Engines (Con't) Engine Bearings (33-2), Rotating Compressor & Turbine Airfoils (33-2), Spinners (33-2), Main Engine Mounts (i.e., redundant designs)(33-1), High Pressure Vessels (i.e. Casting subject to compressor discharge pressure & combustor Pressure) (33-1), Containment Structures (33-1), Primary Structures (i.e. structures that provide support and rigidity of the main engine backbone and for attachment of engine to airframe) (33-1), Main Engine Mounts (i.e., redundant designs) (33-2), Electronic Engine Controls/Full Authority Digital Electronic Controls (33-2), Gas Path (Static & Variable Nozzle Guide Vanes) (33-2), Control System Actuators (33-2), Combustion Liners (33-2), Fuel Nozzles (33-2)	33		
Flight Control Mechanisms (23-1), (25-1)	23, 25	Lift/Compression Struts (23-1) Flying Wires (23-1) Floats (23-1), Skis (23-1) Tail Wheels (23-1)	23			Reciprocating Engines Crankshafts (33-1) Connecting Rods Assembly (33-1) Pistons (33-1) Wrist Pins (33-1) Cylinders (33-1) Cylinder Heads (33-1) Engine Mounts (33-1) Crankcase (33-2) Crankshaft Bearings (33-2) Valve Train (valves, valve springs, pushrods, camshafts, rocker shaft assembly) (33-2) Fuel Delivery Systems (carburetors, injectors, fuel pumps) (33-2), Valve Train/Accessory Drive Gears (33-2)	33	Airborne Software Systems Software Level A (per RTCA/DO 178B), (23-1) (25-1), (27-1), (29-1) Software Levels B, or C (per RTCA/DO 178B) (23-2) (25-2), (27-2), (29-2) Navigation System Wind Shear Detection System (25-2) Ground Proximity System (25-2) Air Collision Avoidance (TCAS) (25-2) Air Speed Indicator (27-2), (29-2) Altimeter (27-2), (29-2) Air Data Computer (27-2), (29-2) Attitude Gyro and Indication (27-2), (29-2) Directional Gyro and	23, 25, 27, 29

CATEGORY PARTS LIST

Structural Assemblies	CFR part	Structural Elements	CFR part	Hydraulic Pneumatic Components	CFR part	Propulsion System Components	CFR part	Systems and Equipment	CFR part
								Indication (27-2), (29-2) Pitot/Static System (27-2), (29-2) Localizer/VOR System (27-2), (29-2) Glide Slope System (27-2), (29-2)	
Tail Rotor and Controls Hubs (27-1), (29-1) Yokes (27-1), (29-1) Trunnions (27-1), (29-1) Blades (27-1), (29-1) Blade Spars (27-1), (29-1) Grips (27-1), (29-1) Pitch Change Links (27-1), (29-1) Pitch Change Bearings (27-1), (29-1) Output/Drive Shafts (27-1), (29-1) Gearsets (27-1), (29-1) Strap Packs (27-1), (29-1) Pedal Linkages (27-1), (29-1) Bellcranks (27-1), Flapping & Lead/Lag Bearings (27-1), (29-1)	27, 29	Balloons Baskets (31-1) Envelopes (31-1)	31			Balloon Burner Systems Burner Units (31-1)	31	Balloon Fuel Systems Fuel Manifolds (31-1)	31
Fuselage (27-1), (29-1) Tail Boom (27-1), (29-1) Tail Boom Struts (27-1), (29-1) Tail Boom Mount Fittings (27-1), (29-1) Vertical Stabilizers (27-1), (29-1) Horizontal Stabilizers (27-1), (29-1) Elevator (27-1), (29-1) Elevator Horn (27-1), (29-1) Skin Assemblies (27-1), (29-1) Bonded Panel Assemblies (27-1), (29-1) Spars (27-1), (29-1)	27, 29	Main Landing Gear Struts (23-1), (25-1), (27-1), (29-1) Crosstubes (23-1), (25-1), (27-1), (29-1) Drag Links (23-1), (25-2), (27-1), (29-1) Fuse Pins (25-2) Attach Section (25-1) Extension and Retract System (25-2) Landing Gear Door Retract Section (25-2) Landing Gear Position and Warning (27-2), (29-2) Nose Landing Gear (23-1), (25-1) Strut/Axle (25-1) Attach Section (25-1) Steering Links (23-1), (25-2), (27-1), (29-1)	23, 25, 27, 29	Main Landing Gear Components Landing Gear Actuator (23-1), (25-2), (27-1), (29-1) Selector Valve (25-2) Landing Gear Door Actuator (25-2) Nose Landing Gear Components Shimmy Damper (25-2) Steering Unit (25-2)	23, 25, 27, 29	Gas Turbine Engines-Static Structures Engine Mounts (i.e. non-redundant designs) (33-1) High Pressure Vessels (Casings Subject to Compressor Discharge Pressure & Combustor Pressure) (33-1) Containment Structures (33-1) Primary Structures (that provide support and rigidity of the main engine backbone and for attachment of engine to airframe) (33-1)	33	Window-Windshield System Flight Compartment Windows (23-1), (25-1) Passenger Compartment Windows (25-2) Door Windows (25-2) VHF Communication System (27-2), (29-2)	23, 25, 27, 29