

APPENDIX B

ENGINE FUEL-WETTED SYSTEM COMPONENTS

APPENDIX B TABLES

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TABLE B-1. T53-L-13B/703/7A/15/701A LYCOMING ENGINE

COMPONENT	VENDOR'S PART NUMBER (ENGINE CO. P/N)	VENDOR	BRIEF DESCRIPTION (UNIQUE FEATURES)	COMMENTS (SENSITIVITY TO FUEL CHANGES)
Starting Solenoid Valve	AVIF1155-1 AF56C-39A (1-300-191-02)	ITT Genl Conts (Aerospace Prods) Eckel Valve Corp	Internal Rubber Packing Conforms on MIL-P-5315 Two Position Electrically Opened, Spring-Loaded Closed Valve with an Internal 100 Mesh Filter	Contaminants and corrosion.
Starting Fuel Manifold Assembly	(1-170-430/420-01)	Kreisler Industrial Corp		Corrosion.
Starting Fuel Nozzle	6660042 24143 (1-300-405)	Parker Hannifan Delavan	Atomizing Nozzle, Incorporates a Starting Fuel Purge System to Help Eliminate Clogging of Start Fuel Nozzle Due to Coking	Contaminants, thermal stability and viscosity
Igniter Plug	10-390045-1 5611387 FHE 211-2 (1-300-348)	Bendix AC Champion		May require change if viscosity causes starting problems.
Combustor Drain Valve	(1-160-220-03)	Foremost Precision Reb Ind		Contamination, thermal stability.
Main Manifold Assembly	(1-160-160-09/10)	Lycoming	Two-Section, Dual-Channeled Assembly	Corrosion.
Main Fuel Injector	26518 6660001 (1-300-347)	Parker Hannifan Delavan	Atomizing Dual Orifice Nozzle	Particulates or Contamination Can Accumulate in Swirl Chamber and Change Flow Characteristics, Thermal Stability and Viscosity.

* T53 engine models 7A, 15, and 701A use a fuel filter and fuel heater included on the next page.

TABLE B-1. T53-L-13B/703/7A/15/701A LYCOMING ENGINE (CONT'D)

COMMENTS	VENDOR'S PART NUMBER (ENGINE CO. P/N)	VENDOR	BRIEF DESCRIPTION (UNIQUE FEATURES)	COMMENTS (SENSITIVITY TO FUEL CHANGES)
Fuel Control with Integral Pump	84200A7A/100770A	Chandler-Evans	Consists of a Power Turbine Governor and a Computer Assembly Plus High Pressure Pump (87352/7E820/85034) Which Is a Rotary Gear (-701A uses a vane for better protection against contamination).	Low Lubricity and Contaminants Will Affect the Gear Pump, Buna-N O-rings and Seals in Pump and Control Will Be Affected By Increased Level of Aromatics or Peroxides. Contaminants Could Also Create Problems in Close Tolerance Parts in the Control.
Flow Divider (Linear Directional Valve)	(1-180-190-03)	Arkwin Industries, Inc. Lycoming Pro sser Industries, Inc.	Controls Flow to the Engine Nozzles According to a Pre-Determined Schedule of Primary vs Secondary Air	Particulates Could Cause Stickage, Also Could be Affected by Low Lubricity and by a Decrease in Thermal Stability.
Fuel Filter	045468	Bendix Filter Corp	Incorporates an Impending Bypass 10m Nominal	Could Be Affected by Viscosity Changes. An Increase in Particulates (Less than 10 Micron Size) May Require A Change in Element Filtration Moisture Absorbancy.
Fuel Heater	5A470-001 VAS267586	Tavitrol United A/C Products		Thermal Stability and Corrosion

TABLE B-2. T63-A-700/720 DETROIT DIESEL ALLISON ENGINE

COMPONENT	VENDOR'S PART NUMBER	VENDOR	BRIEF DESCRIPTION (UNIQUE FEATURES)	COMMENTS (SENSITIVITY TO FUEL CHANGES)
Fuel Pump and Filter	6854292 (5A/700) 23003114 (720) 386500-5 (TRW)	Sundstrand TRW (alternate vendor)	Gear dual element on -700, single element on -720.	Low lubricity and contamination. Moisture absorbancy.
Gas Producer Fuel Control	6871111 (5A/700) 6895672 (720)	Bendix	Pneumatic communication with power turbine governor (Model DP-D3)	Lubricity and contamination (non-rotating metering valve), Aromatics and peroxides.
Fuel Nozzle	6852020 (5A/700) 5233333 (720)	DED Diesel Equipment Division GM	Dual orifice atomizing with built in metering valve	Contamination (fluted metering valve), thermal stability.
Igniter	FHE-161-9 5611071	Champion AC		Will require change if viscosity increases and causes starting problems.
Combustor * Drain Valve (Plug and Check)	6854255(CV) MS9015-03 (Plug)			Contaminants and Corrosion
Check Valve	252402-1	Bendix		Contaminants and corrosion.

* Two ports for different applications OH-58 (Engine sits horizontally), OH-6 (Engine is at a 45° Angle)

TABLE B-3. T55-L-11ASA/11D/712 LYCOMING ENGINE

COMPONENT	VENDOR'S PART NUMBER (ENGINE CO. PART NUMBER)	VENDOR	BRIEF DESCRIPTION (UNIQUE FEATURES)	COMMENTS (SENSITIVITY TO FUEL CHANGES)
Start Fuel Nozzle	6660039 (2-300-216-02)	Parker Hannifan Delavan		Contamination, thermal stability, viscosity
In-Line Filter	21350 (2-300-311-01)	Mectron	712 Engine has an impending bypass	Particulates, viscosity and moisture absorbancy
Flow Divider	(2-161-390-01)	Arkwin Ind. Inc.		Contaminants, lubricity and thermal stability
Start Fuel Solenoid	AV1F11 55-1 (1-800-191-06)	ITT Genl Controls Aerospace Products		Contaminants and Corrosion
Main Manifold Assembly	2-160-950-14/15	Lycoming		Corrosion
Boost Pump	025028-107 (2-160-790-04)	Chandler Evans	Centrifugal	Contamination
Main or Static Fuel Filter	048757-01 (2-300-277-01)	Facet Enterprises, Inc. Filter Products Div.		Particulates, viscosity and moisture absorbancy. Thermal stability could cause fuel breakdown and deposition all along the line.
Oil Cooler Assembly	2-160-750-02	Lycoming		
Fuel Control	739222-6 (2-161-620-11) (2-161-620-39*)	Hamilton Standard	Contains Buna-N O-rings and seals	Particulates, increase in aromatics and peroxides.
High Pressure Pump		Sundstrand	Gear pump	Low lubricity fuel will affect gear wear

TABLE B-3. T55-L-11ASA/11D/712 LYCOMING ENGINE (CONT'D)

COMPONENT	VENDOR'S: PART NUMBER (ENGINE CO. PART NUMBER)	VENDOR	BRIEF DESCRIPTION (UNIQUE FEATURES)	COMMENTS (SENSITIVITY TO FUEL CHANGES)
Igniters	2-300-217-02			May require change if viscosity increases and causes starting problems.
Main Fuel Injectors	2-300-677-03 (712) 2-300-216 (11D)	Delavan	Dual orifice atomizing on the 11D and airblast on the 712.	Contamination, thermal stability and viscosity.

* Preferred for T55-L-11D (without inlet guide vane controller)

TABLE B-4. T700-GE-700 GENERAL ELECTRIC ENGINE

COMPONENT	VENDOR'S (ENGINE CO.) PART NUMBER	VENDOR	BRIEF DESCRIPTION OF (UNIQUE FEATURES)	COMMENTS (SENSITIVITY TO FUEL CHANGES)
Boost Pump (centrifugal, mixed flow)	RR 53150E1 (P/N 3033T33G02)	Lear-Siegler	Anodized Al housing, fluorosilicone O-ring (static), carbon in stainless steel case (dynamic)	Extremely sensitive to contaminants (no filter ahead of it). Fuel vapor pressure (cavitation)
Fuel Filter (10u nominal, 30u absolute) (impending bypass pop-up)	AD-9985-55 (P/N 5035T76P07)	Aircraft Porous Media, Inc.	Viton and fluorosilicone O-rings. Adhesive: Epoxy-ISO Chem. 130819546 (APNS-PM-0010).	Affected by viscosity changes. Increase in fine contaminants may require change in element filtration.
Hydromechanical Unit (HMU)	763700-3 (P/N 6038T62P04)	Hamilton-Standard	Many critical parts - spool valves, cam followers, flapper valves, bearings, gears, & seals. Sliding seals - graphite filled teflon	Corrosion, contaminants, lubricity, aromatics. Viscosity could affect scheduling.
Fuel-Oil Cooler	(P/N 4046T25601)	United Aircraft Products		Thermal stability, coking, (no problem to this date)
Sequence Valve*	0212021 (P/N 3033T32G01)	Arkwin Industries	O-rings: nichols 6072 compound teflon impregnated fluorosilicone	Contaminants, lubricity, thermal stability
Primer Nozzles (atomizing) Fuel Injectors (airblast)	Primer (P/N 4046T78P05) Injector (P/N 6035T64602)	Parker-Hannifan Parker-Hannifan	Primer nozzle has insulating tube to help prevent coking	Contamination, thermal stability, viscosity Contamination, thermal stability, viscosity
High Pressure Fuel Pump** (vane type)	PF4-038-6B	Vickers	Adhesive wafer ((3M, AF-31) on end plate	Lubricity and contamination (due to rubbing of vanes on cam ring and rotor on end plates)

* This valve is being redesigned (to be called pressurizing and overspeed unit (POU))
 ** Installed in HMU

TABLE B-5. T74-CP-700 PRATT & WHITNEY AIRCRAFT CANADA ENGINE

COMPONENT*	ENGINE MFR. NO. (Vendor Part No.)	VENDOR	BRIEF DESCRIPTION (Unique Features)	COMMENTS (Sensitivity to Fuel Changes)
Main Fuel Control Unit	2524245-3 2524546-1	Bendix	Same Basic Control as in T63 (Model No. DP-F2. Incorporates starting Fuel Function	Lubricity and contamination (non-rotating metering value) Aromatics and peroxides.
Fuel Pump	(4V146R100)	Vickers	Vane type pump	Lubricity and contamination (due to rubbing of vanes on cam ring and rotor on end plates).
Oil to Fuel Heater	8426B	Southwind Div. of Stewartwarner Corporation		Reduced thermal stability could cause fuel breakdown and deposition
Fuel Nozzles	3013635	**	Pressure Atomizing Simplex	Contamination, thermal stability, viscosity
Igniters	3014054	**		May require change if viscosity increases and causes starting problems.
Automatic Dump Valve	DV 1003-40	Lucas Rotox, Ltd.		Contaminants
Compressor Drain Valve	3007009	**		Contaminants
Transfer Tube	3010146	**		Stainless steel, seals could be affected by aromatics or peroxides.
Fuel Manifold (Adapter Assy.)	3011098 3011099	**		Stainless steel, seals could be affected by aromatics or peroxides.
Flow Divider				Contaminants, lubricity and thermal stability.

* Commercial designation is P76A-20/21.

** Vendor information is not available.

TABLE B-6. T74-CP-702 PRATT & WHITNEY AIRCRAFT CANADA ENGINE

COMPONENT	ENGINE MFR. NO. (Vendor Part No.)	VENDOR	BRIEF DESCRIPTION (Unique Features)	COMMENTS (Sensitivity to Fuel Changes)
Main Fuel Control Unit	2524389-1 2524547-1	Bendix	Same Basic Control as in T63 (Model No. DP-F2)	Lubricity and contamination (non-rotating metering value) Aromatics and peroxides.
Fuel Pump	0 24800-104-01	Sundstrand	Gear type pump	Lubricity and contamination
Starting Fuel Control	11011563	Lucas Rotax, Ltd.	Incorporates Flow Division Function	Lubricity, contamination, Aromatics and Peroxides.
Oil to Fuel Heater	VA 525193-6	United Aircraft Product		Reduced thermal stability could cause fuel breakdown and deposition.
Fuel Nozzle	3010036	**	Pressure Atomizing	Contamination, thermal stability, viscosity
Igniter	3014054	**		May require change if viscosity increases and causes starting problems.
Transfer Tube	3011155	**		Stainless steel, seals could be affected by aromatics or peroxides.
Primary Adapter	3014704	**		Stainless steel, seals could be affected by aromatics or peroxides.
Secondary Adapter	3014705	**		Stainless steel, seals could be affected by aromatics or peroxides.
Adapter Drain Valve	3011071	**		Contaminants.

* Commercial designation is PT6A-27/28.
 ** Vendor information is not available.

TABLE B-7. T73-P-1 PRATT & WHITNEY AIRCRAFT, USA ENGINE

COMPONENT	ENGINE MFG. NO. (Vendor Part No.)	VENDOR	BRIEF DESCRIPTION (Unique Features)	COMMENTS (Sensitivity to Fuel Changes)
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ITEMIZED LISTING OF THE T73-P-1 ENGINE FUEL-WETTED COMPONENTS WAS
NOT AVAILABLE FROM PRATT & WHITNEY AIRCRAFT.

APPENDIX C

AUXILIARY POWER UNIT FUEL-WETTED SYSTEM COMPONENTS

TABLE C-1. T-62T-2A1 SOLAR AUXILIARY POWER UNIT

COMPONENT	VENDOR'S PART NUMBER	VENDOR	BRIEF DESCRIPTION (UNIQUE FEATURES)	COMMENTS (SENSITIVITY TO FUEL CHANGES)
Fuel Control	100829-100	Solar		
Fuel Pump (Gear Type)	102-203-1	DeLaval		Corrosion, contaminants, lubricity, aromatics and peroxides
Fuel Filter	2250-4005 75 75486	Carborundum Corp Purolator Products		low lubricity and contaminants
Start Fuel Solenoid Valve	37695-100	Solar		Contaminants, viscosity and moisture absorbancy.
Main Fuel Solenoid Valve	37696-100	Solar		Contaminants and corrosion
Start Fuel Nozzle	28022-4	Delavan Mfg Co		Contaminants and corrosion
Main Fuel Injectors	19050	Delavan Jay Craft Engr		Contamination, thermal stability and viscosity

APPENDIX C TABLES

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C-2	GTCP36-55H Garrett AiResearch Auxiliary Power Unit	C-5

TABLE C-2. GTC36-55H GARRETT AIRESEARCH AUXILIARY POWER UNIT

COMPONENT	Engine MFR. P/N (VENDOR'S PART NUMBER)	VENDOR	BRIEF DESCRIPTION (Unique Features)	COMMENTS (Sensitivity to Fuel Changes)
Gear Pump Fuel Control	3882660-1	Garrett AIREsearch design made by Aero Hydraulics Division	Control contains; integral gear pump and 3 micron filter (electronic torque motor made by Servotronics)	Will be sensitive to increase in level of contaminants and low lubricity fuel. Uses only fluorosilicone seals and O-rings so relatively insensitive to increase in aromatics or peroxides.
Fuel shutoff solenoid	692545-6	Valcor		Contaminants and corrosion
Piloted air blast atomizer	3830061-2	Delevan	Start fuel is supplied through primary (simple pressure atom- izing), run fuel through a secondary air blast orifice.	Contamination, thermal stability, viscosity.
High energy igniter plug	369964-5	Champion		
Fuel Manifold			Stainless steel tube running to the single atomizer.	

APPENDIX D

PERSONNEL CONTACTED FROM AIRFRAME, ENGINE,
AUXILIARY POWER UNIT, AND COMPONENT MANUFACTURERS

Aeroquip Corporation, Aeroquip Aerospace Division; 300 South East Avenue; Jackson, Michigan, 49203; Mr. Rick Walsh, Sales Energy Service Coordinator; (517) 787-8121.

Airborne Manufacturing Company; 711 Taylor Street, Elyria, Ohio, 44035; Mr. K.R. Kelly, V.P. Sales; (216) 323-4676.

Air-Maze International, Inc.; 25002 Miles Road; Cleveland, Ohio, 44128; Mr. George Slater; (216) 292-6800.

Allen Aircraft Products, Inc; P.O. Box 271-T; Ravenna, Ohio, 44266; Mr. E.P. Vigluicci, Design Engineer; (216) 296-9621.

Arkwin Industries, Inc.; 686 Main; Westbury, New York, 11590; Mr. Bob Newman; (516) 333-2640.

Auto-Valve, Inc.; 1707 Guenther Road; Dayton, Ohio, 45427; Mr. Ralph Drew; (513) 759-0870.

Beech Aircraft Corporation; 9700 East Central; Wichita Kansas, 67201; Mr. Irwin Johnson, Department 86, Executive Project Administrator; (316) 681-7184.

Brunswick Corporationk Technetics Division; Box 3668; 1111 North Brookhurst; Anaheim, California, 92803.

J.C. Carter Company, Division of ITT; 673 West 17th Street; Costa Mesa, California, 92626; Mr. Dick Cornwell; (714) 548-3421.

Chandler-Evans, Control Systems Division; West Hartford, Conneticut; L.A. Difford, Section Supervisor, Pumps Engineering.

Christen Industries; 1048 Santa Anna Road; Hollister, California; (408) 637-7405.

Circle Seal Controls; 1111 North Brookhurst Street; Anaheim, California, 92801; Mr. Don Ogilive; (714) 774-6110.

Consolidated Controls Corporation; 15 Durant Avenue; Bethel, Conneticut, 06801; Mr. Walter Uhl, Seniro Project Engineer, Pressure Switches; (203) 743-6271.

Custom Components, Inc.; 21111 Plummer Street; Chatsworth, California, 91311.

Derogene, Inc., 885 West 16th Street; Newport Beach, California, 92663; Mr. Pat Patrick; (213) 998-9811.

Firestone; Magnolia, Arkansas; Mr. Lou Reddick, Product Engineer; (501) 234-3381.

Globe Industries, Division of TRW; 2275 Stanley Avenue; Dayton, Ohio, 45404;
Mr. Jack Hohne; (513) 228-3171.

B.F. Goodrich Company; P.O. Box 182; Green Camp, Ohio, 43322; Mr. Oren
Linger, Technical Manager; (614) 383-31111.

Goodyear Aerospace Corporation; Rockmart, Goergia, 30153; Mr. G.A. Steffensen,
Manager Product Support Engineered Fabrics Division; (404) 684-7055.

Grumman Aerospace Corporation; P.O. Box 1137; Stuart, Florida, 33494, Mr.
Clifford Fenwick, Project Engineer; (305) 287-5300, ext: 213.

Gull Airborne; 55 Engineers Road; Smithtown, New York, 11781; Mr. S. Sporn,
Director of Engineering; (516) 231-3737.

Hydro-Aire, Division of Crane Company; 30000 Winona Avenue; Burbank, California,
91510; (213) 842-6121.

Hydra-Electric, Inc.; 3151 Kenwood Street; Burhanic, California, 91503; Mr.
Frank Davis; (213) 843-6211.

Hydraulic Research and Manufacturing Company, Division of Textron, Inc.; APCO
Filter Division; 10445 Glenoaks Boulevard; Pacoima, California, 91331;
Mr. Jerry Steel; (213) 896-2411.

ITT General Controls Aerospace Products; 1200 South Flower; Burbank, California,
91502; Mr. O.V. Roberts, Marketing Manager; (213) 842-6131.

Lear-Siegler; 241 S. Abbe Road; P10. Box 4014; Elyria, Ohio, 44036; Mr. Tony
Klimczak; (216) 323-3211.

Lord Industries

Michigan Dynamics Division, Ambac Industries, Inc.; 32410 Ford Road; Garden
City, Michigan, 48135; Mr. Jim Hopkins - Mr. Jim Chaplin; (313)
522-4000.

Parker-Hannifin; Irvine, California, Mr. Jim Deklotz; (714) 833-3000.

PNU-Devices, Inc.; 72 Santa Felicia Drive; Goleta, California, 93117;
Ms. Carla Zimmerman; (805) 968-0272.

Revere Corporation of America; 845 North Colony Road; Wallingford, Conneticut;
Mr. Gary Buteau; (203) 269-7701.

Ronson Hydraulic Units Corporation; 530 Sugar Creek Road; Charlotte, North
Carolina, 28225; Mr. Walter Karasiewicz; (704) 596-3311.

Shaw Aero Devices, Inc.; 1 Industrial Road; East Hampton, New York; Mr. Dave Jones - Mr. Harry DeRosa; (516) 537-1404.

Simmonds Precision; Pantan Road; Vergennes, 05491; Mr. Cecil Franklin; (802) 877-2911.

Stellar Hydraulic Company; 11310 Sherman Way; Sun Valley, California, 91352.

Stratoflex, Inc.; 220 Roberts Cutt-off Road; Fort Worth, Texas, 76114; Mr. Ken Parks, Standards Engineer; (817) 738-6543.

Symetrics, Inc.; 2524 Calcite Circle; Newbury Park, California, 91320; (805) 498-4586.

TRW Incorporated; 23555 Euclid Avenue; Cleveland, Ohio, 44117; (216) 383-2930.

Turbomach, Division of Solar Turbines International; 4400 Ruffin Road; San Diego, California, 92123; Mr. Vern Wolcott; (714) 238-6976.

Uniroyal Corporation; 312 North Hill Street; Mishawaka, Indiana, 46544; Mr. Charles McGregor, Quality Control Manager; (219) 256-8145.

Valcor Engineering Corporation; 4 Lawrence Road; Springfield, New Jersey, 07081; Mr. Larry Anderson; (201) 467-8400.

Whittaker Controls; 12838 Saticoy Street; North Hollywood, California, 91605; (213) 765-8160.

Wiggins Connector Division, Transamerica DeLaval, Inc.; Los Angeles, California; Mr. Cliff Cannon, Manager Sales and Engineering; (213) 269-9181.

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