

NASA Contractor Report 180834

Component Data Base for Space Station Resistojet Auxiliary Propulsion

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SPACE STATION RESISTOJET AUXILIARY
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NASA

National Aeronautics and
Space Administration



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ABSTRACT

The resistojet has been baselined for Space Station auxiliary propulsion because of its operational versatility, efficiency, and durability. This report was conceived as a guide to designers and planners of the Space Station auxiliary propulsion system. It is directed to the low thrust resistojet concept, though it should have application to other station concepts or systems such as the Environmental Control and Life Support System (ECLSS), Manufacturing and Technology Laboratory (MTL), and the Waste Fluid Management System (WFMS). The report will likely be quite useful in the same capacity for other non Space Station systems including satellites, freeflyers, explorers, and maneuvering vehicles.

This report is a catalog of the most useful information for the most significant feed system components and is organized for the greatest convenience of the user.

INTRODUCTION

In August 1986 the resistojet was baselined for Space Station auxiliary propulsion. Propellant strategies and system designs have not been resolved. However, multipropellant capability has been baselined for the resistojets. This is predicated on the use of station waste fluids as propellants, simultaneously eliminating certain waste fluid management problems and resupply requirements^{1,2}. The field of options is open to a wide variety of gaseous and liquid propellants and propellant handling strategies. Propellant selection has been tentatively narrowed to: inert gases, carbon dioxide, nitrogen, hydrogen, oxygen, water, and hydrazine. Some of these propellants have unique characteristics and applications that make them attractive candidates for Space Station auxiliary propulsion. Others are waste products from other systems onboard or on orbit with the Space Station. Table I shows the annual waste gas production for a Bosch ECLSS, Table II shows the same for a Sabatier ECLSS 3. It is not expected that the exclusive use of waste products will be sufficient to meet the total impulse requirements of orbit maintenance. Therefore some propellant resupply for the exclusive use in the resistojets may be necessary if the main and auxiliary propulsion systems are to use different propellants.

Source strategies will be a major influencing factor in the selection of that propellant. The base propellant for auxiliary propulsion may be scavenged from other systems on the station. Hydrogen and/or oxygen may be derived from main propulsion storage, electrolysis of water or from Orbital Transfer Vehicle (OTV) tank farm boiloff. Nitrogen could be drawn from the ECLSS or be shared from an onboard pressurization system. CO₂ will be recovered from the ECLSS as a waste product of the breathing air recycling process. Methane may be recovered with the CO₂ depending on whether the Sabatier or the Bosch process is used. Water may be scavenged from the ECLSS as well though not necessarily as a waste product. Inert gases, such as argon, helium, xenon, and krypton would be recovered from the MTL as waste products, along with Freon and potentially any of the other above listed propellants excluding hydrazine. Recovering and using propellants that might otherwise be waste

products with handling problems would provide the advantage of operational cost savings.

Hydrazine has the advantage of low volume storage and broad experience base. Nitrogen's largest advantage is its handling safety. Since nitrogen is the major component in breathing air, a nitrogen system could be at least partially routed through a crew compartment, allowing easy access for maintenance or repair, without immediate concern for contamination due to leakage. Because the prior mentioned waste fluids, and potentially others not mentioned or yet identified, will likely be recovered from the ECLSS, MTL, and WFMS sections, a system will have to be developed for multipropellant operation. Matching components to multipropellant systems could be a challenge to the designer, particularly in the area of seat/seal material compatibility.

In order to reduce development cost and time it is desirable to reutilize existing component technology wherever possible. There is a significant number of components with space flight heritage. Enough of these components may have application to Space Station in their current design configuration or with minor modification to warrant a study resulting in compilation of all such available information.

The major components that apply to the Space Station auxiliary propulsion feed system include: connectors, tanks and accumulators, service valves, filters, pumps and compressors, pressure switches, check valves, pressure and temperature transducers, relief valves, pressure regulators, line and isolation valves, heaters, and gas generators. Fig. 1 compares the simplified propellant feed systems and their components. These are the components that will be cataloged in this report.

This report is intended to serve as a starting point for auxiliary propulsion design, trade studies, cost estimating, and planning. It is designed to contain as much data as possible for the purposes mentioned without being superfluous. The information contained herein was derived from many sources including: manufacturer's specifications and drawings, technical papers, and other data bases. Naturally, there are voids in the data provided. This was unavoidable as some data was not readily available during the preparation of this report. A disproportionately larger amount of effort would have been necessary to fill in all of the voids. It is up to the user to determine if, based on the data provided, further investigation is warranted to uncover additional data as required.

The information contained herein is organized into three sections for the sake of user indexing. The first is a list of the manufacturers covered in the catalog with last known address, phone, and contact for each. The second section is a fast index by component type including: feature specification, part number, manufacturer, and a cross reference to the next section. In this section, the difference between psia and psig is not always addressed because some data in certain categories was simply noted as psi. In such instances the gage and absolute notations are ignored and all pressures are noted as psi. The relative positions of these components in the index is correct to within one atm. The third and final section, the Component Data

Catalog section (pp. 55-381), is included as a microfiche supplement in an envelope stapled to the inside back cover of this report. Components within each type category are organized in 1) alphabetical order by the manufacturer, 2) in alphanumerical order by part number. In this section all available pertinent data for each component category is organized into data formats. Blank copies of these formats are given in the Component Data Sample Format section. The catalog section of this report is designed to be periodically updated. Contributors should use the blank formats to organize information to be changed, included or deleted. This information should be forwarded to Dan Briehl, Mail Stop 500-221, National Aeronautics and Space Administration, Lewis Research Center, 21000 Brookpark Road, Cleveland, Ohio 44135

In order to limit the field of coverage in the common component categories, general parameters have been defined for both gas and liquid feed systems, as follows: maximum system pressure - 6000 psi, maximum tank volume - 50,000 cubic inches, and minimum valve cycle life - 100. However, when regarding those components for which data is scarce, these parameters may be ignored. This allows the user a look at components that may at least be closely related to the components required. Further, some components that may have special applications will be included even though they do not conform to all of the parameters as defined. An example of this is the pyrotechnic valve with no cycle life. This valve could prove necessary in an emergency venting system. Component cost should be a significant factor in component selection, but because cost data has proved to be largely unavailable and cost restrictions are not yet defined; the catalog will not be limited by cost data.

There are other aspects to Space Station auxiliary propulsion system design to be considered when selecting components. The projected on-orbit life of the station is at least ten years. Components capable of a ten year service life would be logical candidates. The majority of the components qualified in space have not demonstrated a ten year service life with the throughputs projected for Space Station. To account for this, maintainability and redundancy become necessary considerations. The Space Station will be manned. Crew safety and therefore component safety and reliability are important considerations. The overall effort to develop, fabricate, and launch the Space Station will be costly. Component qualifications, cost, and weight are the balance of the important considerations. Unfortunately, at the time of writing, certain forms of component data were not readily available. Cost and reliability data will, in most instances, have to be acquired by the user of this document.

It will be desirable to reuse existing technology whenever possible to reduce development time and cost requirements in the development of the auxiliary propulsion system for Space Station. There are many qualified or qualifiable components available for consideration. This catalog should provide the propulsion system designer with a useful reference source to aid in design decisions.

ABBREVIATIONS AND ACRONYMS

abs - absolute

APS - auxiliary propulsion system

APU - auxiliary power unit

ARPCS - atmospheric revitalization & pressure control system

ASME - American Society of Mechanical Engineers

atm - atmosphere

BC - bolt circle

bhp - brake horsepower

C_D - discharge coefficient

CRCS - corrosion resistant steel (includes stainless steel)

DI - deionized

ECLSS - environmental control & life support systems

ECS - environmental control system

EPR - ethylene propylene rubber

est - estimated

EQ SP - equally spaced

FEOD - flow equivalent orifice diameter

FS - full scale

G - gaseous

GPM - gallons per minute

HYD - hydraulic

i.d. - inner diameter

IOC - initial operational capability

L - liquid

lbf - pounds force
lbm - pounds mass
LH - left hand
LOA - length overall
LOX - liquid oxygen
LPM - liters per minute
max. - maximum
min. - minimum
MMH - monomethylhydrazine
MPS - main propulsion system
MTL - Manufacturing & Technology Laboratory
N.C. - normally closed
N.O. - normally open
nom. - nominal
NTO - nitrogen tetroxide
o.d. - outer diameter
OP - operational
PL - places
psi - pounds per square inch
psia - pounds per square inch, absolute
psid - pounds per square inch, differential
psig - pounds per square inch, gauge
RCS - reaction control system
RH - right hand
SCCH - standard cubic centimeters per hour
SCCM - standard cubic centimeters per minute
SCCS - standard cubic centimeters per second

SCFM - standard cubic feet per minute

Sh - sheet

SPDT - single pole double throw

SRB - solid rocket booster

std - standard

TBO - time before overhaul

TFE - tetrafluoroethylene (generic for Teflon)

UDMH - unsymmetrical dimethylhydrazine

WFMS - waste fluid management system

w/ - with

w/o - without

LIST OF MANUFACTURERS

Abex Corporation
Aerospace Division
3151 West 5th Street
Oxnard, CA 93030
Contact: M. W. Leisten - Product Sales Manager-Rotating
(805) 985-0217
D. L. Simpson - Product Sales Manager
Product: pump, valve

Aerodyne Controls Corporation
30 Haynes Court
Ronkonkoma, NY 11779
Contact: Richard B. Graeb - Director of Sales and Marketing
(516) 737-1900
Product: relief valve, check valve

Aeroquip Corporation
Aerospace Division
Jackson Plant
300 South East Avenue
Jackson, Michigan 49203-1972
Contact: Mark C. Schmidt - Sales Engineering Service Coordinator
(517) 787-8121
Product: fitting

Aircraft Porous Media
Pall Corporation
6301 49th Street North
Pinellas Park, FL 33565
(813) 522-3111
Product: filter
Ref. 4

Bendix Fluid Power Division
Allied Bendix Aerospace
211 Seward Avenue
P.O. Box 457
Utica, NY 13503
Contact: Louis A. Steppello - Senior Marketing Representative
(315) 793-1353
Richard Padgett - Director of Marketing
Product: compressor

Brunswick Defense Division
Brunswick Corporation
4300 Industrial Avenue
Lincoln, Nebraska 68504
Contact: Thomas R. Flynn - Director of Marketing
(402) 464-8211
Product: tank

Cajon Company
9760 Shepard Road
Macedonia, Ohio 44056
Product: fitting
Representative: Abbott Valve & Fitting Co.
6090 Cochran Road
Cleveland, Ohio 44139
(216) 248-6515
Contact: John Fant - Sales Representative

Carleton Technologies, Inc.
P.O. Box 28
East Aurora, NY 14052
Contact: James Walleshauser - Manager, Space Programs
(716) 652-8100
Product: pressure regulator, relief valve

CEC Instruments Division
Transamerica Delaval Inc.
325 Halstead Street
P.O. Bin 7087
Pasadena, CA 91190-7087
(818) 351-4410
Contact: Robert A. Bachus - Senior Applications Engineer
(818) 351-4241
James A. Vail - Account Manager (Dayton, Ohio)
(513) 252-1987
Product: pressure transducer

Circle Seal Controls
Brunswick Corporation
P.O. Box 3666
Anaheim, CA 92803
(714) 774-6110
Product: check valve

Consolidated Controls Corporation
Condec Corporation
15 Durant Avenue
Bethel, CT 06801

Contact: Peter D. VanVessem - Chief Project Engineer
(203) 743-6721

James L. Costanza - Manager, Technical Marketing (El Segundo, CA)
M. T. Petrozzi - Marketing Manager, Space Components (El Segundo, CA)
(213) 772-5301

Product: pressure regulator, pressure switch, pressure transducer, service valve, line/thruster valve

Deutsch Metal Components
14800 South Figueroa Street
P.O. Box 61188
Los Angeles, CA 90061

Contact: Clement Law - Media Specialist
(213) 321-3040

Product: fitting

Facet Enterprises, Inc.
Filter Products Division
8439 Triad Drive
Greensboro, NC 27409-9621
(919) 852-6800
Product: filter

Fairchild Control Systems Company
1800 Rosecrans Avenue
Manhattan Beach, CA 90266-3797
(213) 643-9222
Product: pressure regulator
Ref. 4

Fansteel, Inc.
5235 West 104th Street
Los Angeles, CA 90045
(213) 670-1030
Product: tank
ref. 5

Futurecraft Corporation
15430 Proctor Avenue
City of Industry, CA 91747
Contact: James J. Castor - Engineering/Sales Manager
(818) 330-1611
Product: check valve, relief valve, line/thruster valve, pressure regulator

Garrett Corp.
AiResearch Mfg. Co. Division
2525 West 190th Street
Torrance, CA 90509
(213) 323-9500
Product: tank
ref.5

HTL Industries, Inc.
Allegheny International Company
101 East Wheeler Avenue
Arcadia, CA 91006
(213) 574-7880
Product: service valve
ref. 4

Hughes Aircraft Company
Space & Communications Group
Box 92919
Los Angeles, CA 90009
(213) 648-2345
Product: service valve
ref. 4

ITT Neo-Dyn
21411 Prairie Street
P.O. Box 3789
Chatsworth, CA 91311
(818) 998-8611
Contact: Jeffrey D. Anderson - Regional Sales Manager-Airborne
(313) 329-9082
Product: pressure switch

Lexair Inc.
299 Goldrush
Lexington, KY 40503
Contact: C. W. Allen - President
(606) 278-5001
Product: compressor

Marotta Scientific Controls, Inc.
Boonton Avenue
Boonton, NJ 07005
(201) 334-7800
Product: pressure regulator
ref. 4

The Marquardt Company
16555 Saticoy Street
Van Nuys, CA 91409
Contact: Tom E. Hudson - Manager, Rocket Applications
(818) 989-6400
Product: gas generator (water vaporizer)

Martin Marietta Corporation
Denver Division
P. O. Box 179
Denver, CO 80201
(303) 794-5211
Product: tank
ref. 5

Metal Bellows Division
Parker Berteau Aerospace Group
1075 Providence Hwy
Sharon, MA 02067
Contact: John Barrett - Marketing Manager
(617) 668-3050
Product: compressor, accumulator

Moog Inc.
Space Products Division
East Aurora, NY 14052-0018
Contact: Jay Hennig - Sales & Marketing Engineer
(716) 687-4499
Douglas H. Morash - Engineering Manager
(716) 652-2000
Product: line/thruster valve, service valve, pump

Norman Equipment Company
Norman Filter Division
9850 South Industrial Drive
Bridgeview, Il 60454
Contact: O. Garapolo - Vice President-Filter Division
(312) 430-4000
Representative: Stanley M. Proctor Company
Box 446, Twinsburg, Ohio 44087
(216) 425-7814
Product: filter

Paine Corporation
2401 South Bayview Street
Seattle, WA 98144
(206) 329-8600
Product: pressure transducer

Pall Pneumatic Products Corporation
Pall Corporation
2200 Northern Boulevard
East Hills, NY 11548
Contact: Edward J. Murphy - Marketing Manager
(516) 484-5400
Product: filter

Parker Hannifin Corporation
Air and Space Products Division (Parker Aerospace)
18321 Jamboree Blvd.
P. O. Box C-19510
Irvine, CA 92713
Contact: William Hostetler - Marketing Manager
(714) 833-3000
Product: valve

Pressure Systems, Inc.
2017 Camfield Avenue
Los Angeles, CA 90040
(213) 685-4520
Product: tank
ref. 5

Purolator Technologies
H R Textron
2323 Teller Road
Newbury Park, CA 91320
(805) 499-2661
Product: filter

Pyronetics Devices, Inc.
OEA, Inc.
P. O. Box 10488
Denver, CO 80210
(303) 693-1411
Product: service valve
ref. 4

Resistoflex Company
UMC Industries, Inc.
Roseland, NJ 07068
(201) 226-7700
Anaheim, CA 92803
(714) 772-4700
Product: fitting

Rocket Research Corporation
York Center
Redmond, WA 98052
Contact: J. J. Galbreath
(206) 885-5000
Product: gas generator (thruster)
ref. 5

Rockwell International
Space Division
12214 Lakewood Blvd.
Downey, CA 90241
(213) 594-3838
Product: tank
ref. 5

Snap-Tite
Quick Disconnect Division
Union City, PA 16438
(814) 438-3821
Product: fitting

Statham Division
Solartron Transducers
2230 Statham Boulevard
Oxnard, CA 93033
(805) 487-8511
Product: pressure transducer

Sterer Engineering & Manufacturing Company
Box 39787
4690 Colorado Blvd
Los Angeles, CA 90039
Contact: J. Pauly
(213) 245-7161
Product: pressure regulator
ref.4

Structural Composites Industries (SCI)
Harsco Corporation
325 Enterprise Place
Pomona, CA 91768
Contact: Vicki Lynn - Marketing Engineer
(714) 594-7777
Product: tank

Systron Donner
Edcliff Division
1711 South Mountain Avenue
Monrovia, CA 91016-0727
Contact: Gordon L. Glau - Applications Engineering Manager
(818) 358-4571
Product: pressure transducer, pressure switch

Tavco, Inc.
20500 Prairie Street
Chatsworth, CA 91311
(818) 882-5411
Product: pressure regulator
ref. 4

TRW
One Space Park
Redondo Beach, CA 90278
(213) 535-4321
Product: service valve, pressure regulator, gas generator (thruster)
ref. 4

Vacco Industries
10350 Vacco Street
South El Monte, CA 91723
(213) 443-7121
Product: filter
ref. 4

Valcor Engineering Corporation
2 Lawrence Road
Springfield, NJ 07081
Contact: Bernard W. Quail - Vice President Sales Engineering
(201) 467-8400
Product: valve

Weed Instrument Company, Inc.
707 Jeffrey Way
P. O. Box 300
Round Rock, TX 78680-0300
Contact: Bill Byrd - Division Manager-Nuclear, Aerospace
(512) 255-7043
Product: temperature transducer

Western Filter Corporation
P.O. Box 3685
8968 Fullbright Avenue
Chatsworth, CA 91313-6158
Contact: Phillip Flor - Fluid Power Sales Manager
(818) 886-8450
Product: filter

Whittaker Controls Division
12838 Saticoy Street
North Hollywood, CA 91605
(818) 765-8160
Product: pressure regulator
ref. 4

Wiggins Connectors Division
Transamerica Delaval, Inc.
5000 Triggs Street
Los Angeles, CA 90022
(213) 269-9181
Product: fitting

Wintec
Brunswick Technetics
2313 South Susan Street
Santa Ana, CA 92704
Contact: Harry Buehrle - Marketing Manager
(714) 966-0831
Product: filter, service valve

Wright Components, Inc.
An EG&E Company
Route 96
P. O. Box 160
Phelps, NY 14532
Contact: C. J. Weeks - Sales Manager
(315) 548-9501
Product: valve

FAST COMPONENT INDEX
Fitting/Connector

| <u>Pressure</u> (psi) | <u>Part Number</u> (series) | <u>Manufacturer</u> | <u>Page</u> |
|--------------------------|--------------------------------|---------------------|-------------|
| 1000 | 3900 | Aeroquip | 55 |
| 1000 | 28 | Snap-tite | 63 |
| 1200 est | 3600 | Wiggins | 65 |
| 1200 est | 6300 | Wiggins | 67 |
| 3000-4000 | D9855, D10255, DNR9855 | Deutsch | 58 |
| 3000-4000 | D9856, D10256, DNR9856 | Deutsch | 59 |
| 3000-4000 | D10036, DNR10036 | Deutsch | 60 |
| 3000-4000 | D10045, DNR10045 | Deutsch | 61 |
| 5200 est | 20 | Wiggins | 64 |
| 5400 est | 6000 | Wiggins | 66 |
| 10,000 | R44XXX, R45XXX | Resistoflex | 62 |
| 14,400 | VCO | Cajon | 56 |
| 16,400 | VCR | Cajon | 57 |

FAST COMPONENT INDEX
Tank/Accumulator

| <u>Volume</u> (in ³) | <u>Pressure</u> (psig) | <u>Part Number</u> | <u>Manufacturer</u> | <u>Page</u> |
|-------------------------------------|---------------------------|-----------------------|---------------------|-------------|
| 1631 | 3600 | Model 156 | SCI | 82 |
| 3008 | 4500 | BLD999030 | Brunswick Defense | 70 |
| 3008 | 4000 | BLD999040 | Brunswick Defense | 71 |
| 8181 | 4500 | BLD999020 | Brunswick Defense | 69 |
| 8181 | 3300 | BLD999050 | Brunswick Defense | 72 |
| 8181 | 3300 | BLD999060 | Brunswick Defense | 73 |
| 10,200 | 1500 | (Grumman) LSC-270-821 | Garrett AiResearch | 76 |
| 11,000 | 3000 | Model 200 | SCI | 83 |
| 13,442 | 300 | 80140-1 | Pressure Systems | 80 |
| 13,478 | 700 | 942-D-03 | Fansteel | 74 |
| 14,750 | 400 | 80801B36220-049 | Martin Marietta | 77 |
| 17,300 | 600 | 240-48202 | Rockwell Internt'l | 81 |
| 30,033 | 4875 | BLD999010 | Brunswick Defense | 68 |
| 34,560 | 320 | 851240 | Garrett AiResearch | 75 |
| 35,300 | 890 | 80111-1 | Pressure Systems | 79 |
| 53,910 | 3000 | 88-4000500 | Martin Marietta | 78 |

FAST COMPONENT INDEX
Service Valve

| <u>Pressure</u> (psi) | <u>Part Number</u> | <u>Manufacturer</u> | <u>Page</u> |
|--------------------------|--------------------|-----------------------|-------------|
| 295 | 1-4-00-51-45 | Carleton Technologies | 86 |
| 315 | 12319 | Wright Components | 107 |
| 345 | 72855 | Consolidated Controls | 89 |
| 350 | 12183 | Wright Components | 106 |
| 365 | 1821-1 | Pyronetics | 103 |
| 415 | 325-7167 | Hughes Aircraft | 94 |
| 500 | 900490 | Futurecraft | 91 |
| 500 | 900491-1 | Futurecraft | 92 |
| 510 | 50-527 | Moog | 95 |
| 510 | 50-528 | Moog | 96 |
| 510 | 50-529 | Moog | 97 |
| 510 | 50-530 | Moog | 98 |
| 535 | 1176-16, 1832-1 | Pyronetics | 100 |
| 555 | 1831 | Pyronetics | 104 |
| 600 | 409708 | TRW | 105 |
| 1000 | 200791 | Futurecraft | 90 |
| 1250 | 1-4-00-51-27 | Carleton Technologies | 84 |
| 1250 | 1-4-00-51-43 | Carleton Technologies | 85 |
| 3015 | 71665 | Consolidated Controls | 87 |
| 3015 | 1811-4 | Pyronetics | 101 |
| 3615 | 72580 | Consolidated Controls | 88 |
| 4015 | 255620-3, 255921-3 | HTL Industries | 93 |

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Service Valve (continued)

| <u>Pressure</u> (psi) | <u>Part Number</u> | <u>Manufacturer</u> | <u>Page</u> |
|--------------------------|--------------------|---------------------|-------------|
| 4015 | 1146, 1176 | Pyronetics | 99 |
| 5015 | 1819 | Pyronetics | 102 |

FAST COMPONENT INDEX
Filter

| <u>Pressure</u> (psi) | <u>Rating</u> (μm abs) | <u>Part Number</u> | <u>Manufacturer</u> | <u>Page</u> |
|--------------------------|---------------------------------------|--------------------|-----------------------|-------------|
| 50 | 5 | 11267-504 | Wintec, Brunswick | 136 |
| 80 | 20(nom) | 1736760-05 | Facet | 113 |
| 100 | 3 to 250 (nom) | 1740001 | Facet | 114 |
| 150 | - | PCS 13501 G24 | Pall Corporation | 117 |
| 150 | - | 8228-501 | Wintec, Brunswick | 135 |
| 180 | 5 | AC-6875-4 | Aircraft Porous Media | 109 |
| 186 | 74 | 15204-516 | Wintec, Brunswick | 141 |
| 196 | 15 | 15241-526 | Wintec, Brunswick | 144 |
| 250 | 18 | 15241-508 | Wintec, Brunswick | 143 |
| 300 | - | PCS 33501 G24 | Pall Corporation | 118 |
| 300 | 35 | F1D10093 | Vacco Industries | 122 |
| 300 | 10 | F1D10151-01 | Vacco Industries | 126 |
| 300 | 10 | 15267-603 | Wintec, Brunswick | 149 |
| 315 | 10 | F1D10064-01 | Vacco Industries | 121 |
| 315 | 60 | 12204-508 | Wintec, Brunswick | 137 |
| 330 | 25 | 14228-621-3 | Wintec, Brunswick | 139 |
| 350 | 10 | 15241-694-1, -2 | Wintec, Brunswick | 147 |
| 396 | 10 | F1D10182-01, -02 | Vacco Industries | 129 |
| 400 | 15 | E-81916-4-15 | Vacco Industries | 120 |
| 400 | 10 | 15267-602 | Wintec, Brunswick | 148 |
| 415 | 25 | 15312-501-1 | Wintec, Brunswick | 151 |
| 415 | 25 | 15312-501-3 | Wintec, Brunswick | 152 |

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Filter (continued)

| <u>Pressure</u> (psi) | <u>Rating</u> (μm abs) | <u>Part Number</u> | <u>Manufacturer</u> | <u>Page</u> |
|--------------------------|---------------------------------------|--------------------|-----------------------|-------------|
| 555 | 35 | 15228-572 | Wintec, Brunswick | 142 |
| 600 | 25 | F1D10106-01 | Vacco Industries | 123 |
| 600 | 15 | 15241-685 | Wintec, Brunswick | 146 |
| 615 | 15 | 15241-647 | Wintec, Brunswick | 145 |
| 880 | 25 | F1D10106-02 | Vacco Industries | 124 |
| 1000 | 40 | F1D10132-01 | Vacco Industries | 125 |
| 1000 | 12 | SL-81500 | Vacco Industries | 131 |
| 1765 | 15 | AC-6875-855 | Aircraft Porous Media | 111 |
| 2000 | 10 | 14267-602 | Wintec, Brunswick | 140 |
| 3000 | 2x-200 | 4200T series | Norman Equipment | 115 |
| 3000 | 2x-200 | 4300 series | Norman Equipment | 116 |
| 3500 | 0.3 | AC-A370-6 | Aircraft Porous Media | 108 |
| 3820 | 12 | SL-81019 | Vacco Industries | 130 |
| 4000 | 12 | F1D10178-01 | Vacco Industries | 127 |
| 4000 | 10 | F1D10180-01 | Vacco Industries | 128 |
| 4000 | 15 | S2-8846 | Vacco Industries | 132 |
| 4015 | 5 | AC-6875-853 | Aircraft Porous Media | 110 |
| 4500 | 10 to 85 | series 16510 | Western Filter | 134 |
| 5215 | 25 | 14228-502 | Wintec, Brunswick | 138 |
| 6000 | - | F7008, F7009 | Circle Seal Controls | 112 |
| 6000 | 2x-200 | 4200T series | Norman Equipment | 115 |
| 6000 | 10 to 75 | series 6030 | Western Filter | 133 |

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Filter (continued)

| <u>Pressure</u> (psi) | <u>Rating</u> (μm abs) | <u>Part Number</u> | <u>Manufacturer</u> | <u>Page</u> |
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NO DATA

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PART NUMBER (SERIES) _____

DESCRIPTION _____

CONFIGURATIONS _____

QUALIFICATION STATUS _____
PROPELLANT/FLUID _____

PRESSURE, OPERATING _____

PROOF _____
BURST _____

MASS _____

TUBE SIZE(S), O.D. _____

DIMENSIONS _____

MATERIAL, BODY _____
SEAL _____

TUBE-FITTING ATTACHMENT _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE _____

TANK/ACCUMULATOR

MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

VOLUME _____
PRESSURE, OPERATING _____
PROOF _____
BURST _____

MASS _____
DIMENSIONS _____

MATERIAL _____

PORT(S), SIZE & TYPE _____
MOUNTING _____
EXPULSION METHOD _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE _____

SERVICE VALVE

MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OPERATING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL TFE _____

CONNECTIONS, GROUND SIDE _____
SPACECRAFT SIDE _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE _____

FILTER

MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____

QUALIFICATION STATUS _____
PROPELLANT/FLUID _____
RATING, ABSOLUTE _____

PRESSURE, OPERATING _____
PROOF _____
BURST _____
DIFFERENTIAL _____

RATED FLOW _____

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
ELEMENT _____

PORTS, INLET _____
OUTLET _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE _____

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MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

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MAX OUTLET _____
RATIO _____

RATED FLOW _____
LEAKAGE, INTERNAL _____
MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEALS _____
INTEGRAL CHECK VALVE _____

PORTS, SIZE & TYPE _____

MOTOR, VOLTS _____
WATTS _____
POWER OUTPUT _____
ELECTRICAL CONNECTION _____
RPM _____

DUTY CYCLE _____
COOLING METHOD _____

MOUNTING _____
OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE _____

PRESSURE SWITCH

MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OFF _____
RESET _____
MAX OPERATING _____
PROOF _____
BURST _____

DUTY CYCLE _____
MASS _____
DIMENSIONS _____

MATERIAL _____
PORT, SIZE & TYPE _____
VOLTAGE _____
WATTS _____
ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE _____

CHECK VALVE

MANUFACTURER _____
PART NUMBER _____

DESCRIPTION _____
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OPERATING _____
 CRACKING _____
 PROOF _____
 BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
 EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY _____
 SEAT/SEAL _____
 SPRING _____

PORTS, SIZE & TYPE _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
 SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
 CYCLE _____

 SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE _____

PRESSURE TRANSDUCER/GAGE

MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, MAX _____
MIN _____
PROOF _____
BURST _____

MASS _____
DIMENSIONS _____

MATERIAL _____
PORT, SIZE & TYPE _____
VOLTAGE, INPUT _____
WATTS _____
SIGNAL _____
ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE _____

RELIEF VALVE

MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, RELIEF _____
RESET _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY _____

SEAT/SEAL _____

SPRING _____

PORTS, SIZE & TYPE _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE _____

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MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____
QUALIFICATION STATUS _____

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PRESSURE, RANGE, INLET _____
REGULATED _____
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW _____
LEAKAGE, INTERNAL-MAX INLET PRESS _____
EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____
SPRING _____

PORTS, SIZE & TYPE, INLET _____
OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE _____

HEATER/HEAT EXCHANGER

MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OPERATING _____
PROOF _____
BURST _____

RATED FLOW _____
MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
HEATING ELEMENT _____

PORTS, SIZE & TYPE _____
VOLTAGE _____

WATTS, IN _____
OUT _____

ELECTRICAL CONNECTION _____

DUTY CYCLE _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE _____

LINE/THRUSTER VALVE

MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OPERATING _____
PROOF _____
BURST _____
DROP _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING _____
PULL IN/DROP OUT _____

WATTS _____
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE _____

GAS GENERATOR

MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OPERATING _____
CHAMBER _____
PROOF _____
BURST _____

RATED FLOW _____
TOTAL THROUGHPUT _____
TOTAL IMPULSE _____
MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
CATALYST/CORE _____

PORTS, SIZE & TYPE _____
VOLTAGE _____
WATTS _____
ELECTRICAL CONNECTION _____
DUTY CYCLE _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE _____

TEMPERATURE TRANSDUCER

MANUFACTURER _____
PART NUMBER _____
DESCRIPTION _____
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

INDICATED TEMPERATURE, MAX _____
MIN _____

PRESSURE, OPERATING _____
PROOF _____
BURST _____

MASS _____
DIMENSIONS _____

MATERIAL _____
PORT, SIZE & TYPE _____
VOLTAGE, INPUT _____
WATTS _____
SIGNAL _____
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE _____

FITTING/CONNECTOR

MANUFACTURER Aeroquip Corporation
PART NUMBER (SERIES) 3900 series (dash number = tube o.d. in
1/16 in. increments)
DESCRIPTION Positive valve, quick disconnect

CONFIGURATIONS _____

QUALIFICATION STATUS _____
PROPELLANT/FLUID Liquid

PRESSURE, OPERATING 1000 psi

PROOF 1500 psi

BURST 2500 psi

MASS 0.15 lbm for 3900-4

TUBE SIZE(S), O.D. 1/4, 3/8, 1/2, 5/8, 3/4, 1 in.

DIMENSIONS For 3900-4, coupled length 2.95 in.

MATERIAL, BODY Al alloy, CRES
SEAL _____

TUBE-FITTING ATTACHMENT _____

OPERATING TEMPERATURE RANGE -65 to 160 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Ball and race lock

DATA SOURCE Aeroquip catalog - 1985

FITTING/CONNECTOR

MANUFACTURER Cajon Company
PART NUMBER (SERIES) VCO series

DESCRIPTION Threaded locking nut connection, O-ring face seal

CONFIGURATIONS Union, T, elbow, reducer, accessory adapters,
bullshead union

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OPERATING 2400 to 14,400 psig (for CRES) (16,500 to
99,200 kPa)

PROOF _____

BURST _____

MASS _____

TUBE SIZE(S), O.D. 1/8 to 1 in. std sizes

DIMENSIONS _____

MATERIAL, BODY 316 CRES (steel and brass also available);
SEAL Viton, Buna-N, TFE

TUBE-FITTING ATTACHMENT Weld; thread - male, female; taper,
O-ring sealed

OPERATING TEMPERATURE RANGE To 450 °F for Viton and TFE (232 °C),
to 250 °F for Buna-N (121 °C)

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Some fittings compatible with Swagelok, Nupro, or Whitey
components

DATA SOURCE Cajon product data sheet - 1986

FITTING/CONNECTOR

MANUFACTURER Cajon Company
PART NUMBER (SERIES) VCR series

DESCRIPTION Threaded locking nut connection, gasket sealed

CONFIGURATIONS Union, reducer union, T, cross, elbow, accessory adapters

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OPERATING 2300 to 16,400 psig (15,800 to 112,000 kPa)

PROOF _____

BURST _____

MASS _____

TUBE SIZE(S), O.D. 1/8 to 1 in. std sizes

DIMENSIONS _____

MATERIAL, BODY 316 CRES

SEAL Silver-plated CRES and Ni, Ni, Cu, TFE, Al

TUBE-FITTING ATTACHMENT Weld; thread - male, female

OPERATING TEMPERATURE RANGE To 1000 °F for CRES, Ni, Cu (537 °C);
to 450 °F for TFE (232 °C); to 650 °F for Al (343 °C)

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Filtered gasket available, blind gaskets available; some fittings adapt to Swagelok, Nupro, or Whitey components

DATA SOURCE Cajon product data sheet - 1986

FITTING/CONNECTOR

MANUFACTURER Deutsch Metal Components
PART NUMBER (SERIES) D9855, D10255, DNR 9855 series "Permaswage"

DESCRIPTION Swage-on tee

CONFIGURATIONS _____

QUALIFICATION STATUS _____
PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psi (for D), 4000 psi (for DNR)

PROOF _____
BURST _____

MASS 0.031 lbm CRES, 0.011 lbn Al, 0.018 lbm Ti for 1/4 in.

TUBE SIZE(S), O.D. 3/16 to 1 1/2 in. std sizes

DIMENSIONS 2.10 by 1.25 by 0.39 in. for 1/4 in.

MATERIAL, BODY CRES, Al, Ti
SEAL _____

TUBE-FITTING ATTACHMENT Swage-on

OPERATING TEMPERATURE RANGE To 275 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Special tooling required

DATA SOURCE Deutsch catalog - 1985

FITTING/CONNECTOR

MANUFACTURER Deutsch Metal Components
PART NUMBER (SERIES) D9856, D10256, DNR 9856 series "Permaswage"

DESCRIPTION Swage-on 90° elbow fitting

CONFIGURATIONS _____

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psi (for D), 4000 psi (for DNR)

PROOF _____

BURST _____

MASS 0.025 lbm CRES, 0.009 lbm Al, 0.014 lbm Ti for 1/4 in.

TUBE SIZE(S), O.D. 3/16 to 1 1/2 in. std sizes

DIMENSIONS 1.25 by 1.25 by 0.39 in. for 1/4 in.

MATERIAL, BODY CRES, Ti, Al

SEAL Silicone

TUBE-FITTING ATTACHMENT Swage-on

OPERATING TEMPERATURE RANGE To 275 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Special tooling required

DATA SOURCE Deutsch catalog - 1985

FITTING/CONNECTOR

MANUFACTURER Deutsch Metal Components

PART NUMBER (SERIES) D10036, DNR 10036 series "Permaswage"

DESCRIPTION Swage-on union

CONFIGURATIONS _____

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psi (for D) 4000 psi (for DNR)

PF OF _____

BURST _____

MASS 0.013 lbm CRES, 0.005 lbm Al, 0.007 lbm Ti for 1/4 in.

TUBE SIZE(S), O.D. 3/16 to 1 1/2 in.

DIMENSIONS 1.540 by 0.338 in. diam for 1/4 in.

MATERIAL, BODY Ti, CRES, or Al

SEAL Silicone

TUBE-FITTING ATTACHMENT Swage-on

OPERATING TEMPERATURE RANGE To 275 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Special tooling required

DATA SOURCE Deutsch catalog - 1985

FITTING/CONNECTOR

MANUFACTURER Deutsch Metal Components
PART NUMBER (SERIES) D10045, DNR 10045 series "Permaswage"

DESCRIPTION Swage-on reducer union

CONFIGURATIONS _____

QUALIFICATION STATUS _____
PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psi (for D), 4000 psi (for DNR)

PROOF _____
BURST _____

MASS _____

TUBE SIZE(S), O.D. 3/16 to 1 1/2 in. various tube size combinations

DIMENSIONS 1.640 by 0.338 in. diam for 1/4 to 3/16 in.

MATERIAL, BODY CRES, Ti, Al
SEAL Silicone

TUBE-FITTING ATTACHMENT Swage

OPERATING TEMPERATURE RANGE To 275 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Special tooling required

DATA SOURCE Deutsch catalog - 1985

FITTING/CONNECTOR

MANUFACTURER Resistoflex Company
PART NUMBER (SERIES) R44XXX, R45XXX series "Dynatube"

DESCRIPTION Screw-together coupling

CONFIGURATIONS T, union, elbow, cross, reducer, etc.

QUALIFICATION STATUS Gemini, Apollo, space shuttle
PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 to 10,000 psi

PROOF _____
BURST _____

MASS _____

TUBE SIZE(S), O.D. 3/16 to 1 1/2 in.

DIMENSIONS _____

MATERIAL, BODY Ti, CRES, Inconel
SEAL Same (metal to metal)

TUBE-FITTING ATTACHMENT Internal swage, weld, braze; external
swage for TFE hose

OPERATING TEMPERATURE RANGE To 600 °F (1200 °F for Inconel)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Resistoflex Catalog DY-48 - 1985

FITTING/CONNECTOR

MANUFACTURER Snap-tite
PART NUMBER (SERIES) Series 28

DESCRIPTION Quick-disconnect coupling

CONFIGURATIONS _____

QUALIFICATION STATUS _____
PROPELLANT/FLUID _____

PRESSURE, OPERATING 1000 psi (600 psi for 1 1/4 and 1 1/2 in.)

PROOF
BURST 2500 psi (1500 psi for 1 1/4 and 1 1/2 in.)

MASS _____

TUBE SIZE(S), O.D. 1/4, 3/8, 1/2, 5/8, 3/4, 1, 1 1/4, 1 1/2 in.

DIMENSIONS _____

MATERIAL, BODY 316 CRES, Al alloy
SEAL Nitrile, Viton, EPR

TUBE-FITTING ATTACHMENT MS 33614, 15, 49, 56, 57, SAE, pipe

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Snap-Tite product data sheet - 1986

FITTING/CONNECTOR

MANUFACTURER Wiggins Division of Transamerica Delaval
PART NUMBER (SERIES) Series 20 "Min-O-Matic"

DESCRIPTION Quick disconnect

CONFIGURATIONS _____

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OPERATING _____

PROOF _____

BURST 13,000 psi

MASS 0.064 lbm

TUBE SIZE(S), O.D. 1/4 in. (1/8 and 3/8 in. available)

DIMENSIONS _____

MATERIAL, BODY Al alloy

SEAL Viton A (other options)

TUBE-FITTING ATTACHMENT Lock ring, spring load

OPERATING TEMPERATURE RANGE -20 to 400 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Self-sealing, MS 33656,7 ends

DATA SOURCE Wiggins catalog - 1985

FITTING/CONNECTOR

MANUFACTURER Wiggins Division of Transamerica Delaval
PART NUMBER (SERIES) 3600 series [3608 -4D, -6D, -8D, -10D (Al);
3618 -4 to -10 (CRES)]

DESCRIPTION Full connector (hard tube to hard tube) flexible

CONFIGURATIONS _____

QUALIFICATION STATUS _____
PROPELLANT/FLUID _____

PRESSURE, OPERATING _____

PROOF _____

BURST To 3000 psig

MASS 0.03 to 0.056 lbm (Al); 0.106 to 0.163 lbm (CRES)

TUBE SIZE(S), O.D. 1/4, 3/8, 1/2, 5/8 in.

DIMENSIONS 1.731 by 0.781 in. diam to 1.952 by 1.157 in. diam

MATERIAL, BODY Al or CRES

SEAL O-ring (customer provided) ARP568-10, -110, -112,
-114

TUBE-FITTING ATTACHMENT Threaded sleeves

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Requires tube end treatment

DATA SOURCE Wiggins catalog - 1985

FITTING/CONNECTOR

MANUFACTURER Wiggins Division of Transamerica Delaval

PART NUMBER (SERIES) 6000 series

DESCRIPTION Quick disconnect

CONFIGURATIONS _____

QUALIFICATION STATUS _____

PROPELLANT/FLUID Hydraulic

PRESSURE, OPERATING _____

PROOF _____

BURST 13,500 psi (1/4 in.), 4000 psi (2 in.)

MASS _____

TUBE SIZE(S), O.D. 1/4 to 2 in. std sizes

DIMENSIONS _____

MATERIAL, BODY CRES, A1

SEAL _____

TUBE-FITTING ATTACHMENT Dog latch

OPERATING TEMPERATURE RANGE -65 to 275 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK 20G 12 times

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Self-sealing or break-away available, MS 33656,7 ends

DATA SOURCE Wiggins catalog - 1985

FITTING/CONNECTOR

MANUFACTURER Wiggins Division of Transamerica Delaval
PART NUMBER (SERIES) 6300 series [63051-4A to -104A (Al) and
63151-4 to 104 (CRES)]
DESCRIPTION Full connector (less ferrule) flexible

CONFIGURATIONS _____

QUALIFICATION STATUS _____
PROPELLANT/FLUID _____

PRESSURE, OPERATING _____

PROOF _____
BURST To 3000 psi

MASS 0.041 lbm for -10A, 0.118 lbm for -10 (5/8)

TUBE SIZE(S), O.D. 1/4- to 6-1/2-in. std sizes

DIMENSIONS 1.225 by 1.282 diam for -10A/-10

MATERIAL, BODY Al or CRES
SEAL O-ring and ARP568-110 to -439

TUBE-FITTING ATTACHMENT Threaded sleeves

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Tube ends require swaged-on ferrule (part numbers 63052
and 63152)

DATA SOURCE Wiggins catalog - 1985

TANK/ACCUMULATOR

MANUFACTURER Brunswick Defense Division
PART NUMBER BLD 99901
DESCRIPTION Filament-wound over liner
QUALIFICATION STATUS Space shuttle OMS

PROPELLANT/FLUID He

VOLUME 30,033 in.³
PRESSURE, OPERATING 4875 psig
 PROOF 6473 psig
 BURST 7313 psig
MASS 277.5 lbm
DIMENSIONS 38.28 in. i.d.

MATERIAL 6Al-4V Ti liner; Kevlar 49 and LRF-092 resin

PORT(S), SIZE & TYPE _____
MOUNTING _____
EXPULSION METHOD _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
 SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
 CYCLE 1000
 SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Brunswick Defense product data sheet - 1985

TANK/ACCUMULATOR

MANUFACTURER Brunswick Defense Division

PART NUMBER BLD 999020

DESCRIPTION Filament-wound shell over liner

QUALIFICATION STATUS Space shuttle MPS

PROPELLANT/FLUID He

VOLUME 8181 in.³

PRESSURE, OPERATING 4500 psig

PROOF 6150 psig

BURST 6750 psig

MASS 76.0 lbm

DIMENSIONS 24.92 in. i.d. by 0.558 in. wall

MATERIAL 6Al-4V Ti liner; Kevlar 49 and LRF-092 resin

PORT(S), SIZE & TYPE

MOUNTING

EXPULSION METHOD

OPERATING TEMPERATURE RANGE

VIBRATION, RANDOM

SINL

ACCELERATION

SHOCK

LIFE, SERVICE

CYCLE 1000

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Brunswick Defense product data sheet - 1985

TANK/ACCUMULATOR

MANUFACTURER Brunswick Defense Division
PART NUMBER BLD 999030
DESCRIPTION Filament-wound shell over liner
QUALIFICATION STATUS Space shuttle MPS auxiliary

PROPELLANT/FLUID He

VOLUME 3008 in.³
PRESSURE, OPERATING 4500 psig
PROOF 5800 psig
BURST 6750 psig

MASS 28.1 lbm
DIMENSIONS 17.91 in. i.d. by 0.404 in. wall

MATERIAL 6A1-4V Ti liner; Kevlar 49 and LRF-092 resin

PORT(S), SIZE & TYPE
MOUNTING
EXPULSION METHOD

OPERATING TEMPERATURE RANGE

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
CYCLE 1000
SHELF

RELIABILITY
LEAD TIME
COST
REMARKS

DATA SOURCE Brunswick Defense product data sheet - 1985

TANK/ACCUMULATOR

MANUFACTURER Brunswick Defense Division
PART NUMBER BLD 999040
DESCRIPTION Filament-wound shell over liner
QUALIFICATION STATUS Space shuttle RCS

PROPELLANT/FLUID He

VOLUME 3008 in.³
PRESSURE, OPERATING 4000 psig
PROOF 5270 psig
BURST 6000 psig
MASS 26.3 lbm
DIMENSIONS 17.91 in. i.d. by 0.351 in. wall

MATERIAL 6Al-4V Ti liner; Kevlar 49 and LRF-092 resin

PORT(S), SIZE & TYPE _____
MOUNTING _____
EXPULSION METHOD _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE 1000
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Brunswick Defense product data sheet - 1985

TANK/ACCUMULATOR

MANUFACTURER Brunswick Defense Division

PART NUMBER BLD 999050

DESCRIPTION Filament-wound shell over liner

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID N₂

VOLUME 8181 in.³

PRESSURE, OPERATING 3300 psig

PROOF 4135 psig

BURST 4950 psig

MASS 56.4 lbm

DIMENSIONS 25 in. i.d. by 0.41 in. wall

MATERIAL 6A1-4V Ti liner; Kevlar 49 and LRF-092 resin

PORT(S), SIZE & TYPE _____

MOUNTING _____

EXPULSION METHOD _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE 1000

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Brunswick Defense product data sheet - 1985

TANK/ACCUMULATOR

MANUFACTURER Brunswick Defense Division

PART NUMBER BLD 999060

DESCRIPTION Filament-wound shell over liner

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂

VOLUME 8181 in.³

PRESSURE, OPERATING 3300 psig

PROOF 4225 psig

BURST 4950 psig

MASS 66.6 lbm

DIMENSIONS 25 in. i.d. by 0.388 wall

MATERIAL Inconel 718 liner; Kevlar 49 and LRF-092 resin

PORT(S), SIZE & TYPE _____

MOUNTING _____

EXPULSION METHOD _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE 1000

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Brunswick Defense product data sheet - 1985

TANK/ACCUMULATOR

MANUFACTURER Fansteel, Inc.
PART NUMBER 942-D-03
DESCRIPTION Spherical
QUALIFICATION STATUS _____

PROPELLANT/FLUID Liquid

VOLUME 13,478 in.³ (0.2209 m³)
PRESSURE, OPERATING 700 psig (482 N/cm²)
PROOF 1,100 psig (758.4 N/cm²)
BURST 1,465 psig (1010 N/cm²)

MASS 71.0 lbm (32.2 kg)
DIMENSIONS _____

MATERIAL 17-7PH CRES

PORT(S), SIZE & TYPE _____
MOUNTING _____
EXPULSION METHOD _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE NASA CR-142666 and NASA CR-142531 (ref. 5)

TANK/ACCUMULATOR

MANUFACTURER Garrett Corp, AiResearch
PART NUMBER 851240
DESCRIPTION Spherical
QUALIFICATION STATUS _____

PROPELLANT/FLUID Gas

VOLUME 34,560 in.³ (0.56643 m³)
PRESSURE, OPERATING 320 psig (220 N/cm²)
PROOF _____
BURST _____

MASS 160 lbm (72 kg)
DIMENSIONS 43.3 in. o.d. (109 cm)

MATERIAL 5A1-2.5Sn Ti

PORT(S), SIZE & TYPE _____
MOUNTING _____
EXPULSION METHOD _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME 10 to 12 months in 1974
COST _____
REMARKS _____

DATA SOURCE NASA CR-142666 and NASA CR-142531 (ref. 5)

TANK/ACCUMULATOR

MANUFACTURER Garrett Corp, AiResearch
PART NUMBER Grumman P/N LSC-270-821
DESCRIPTION Spherical, pressurant
QUALIFICATION STATUS Apollo LM descent stage

PROPELLANT/FLUID Liquid, supercritical He

VOLUME 10,200 in.³ (0.167 m³)
PRESSURE, OPERATING 1,500 psi (1068 N/cm²)
PROOF 2274 psi (1567 N/cm²)
BURST 3,420 psi design (2358 N/cm²)

MASS 102 lbm (46 kg)
DIMENSIONS 26.9 in. i.d. by 0.147 in. wall (683 by 0.373 cm)

MATERIAL 5Al-2.5Sn Ti (ELI)

PORT(S), SIZE & TYPE _____
MOUNTING _____
EXPULSION METHOD Vapor

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Two integral, independent pressure transducers

DATA SOURCE NASA CR-142666 and NASA CR-142531 (ref. 5)

TANK/ACCUMULATOR

MANUFACTURER Martin Marietta Corporation
PART NUMBER 80801E36220-049
DESCRIPTION Cylinder with hemispherical ends
QUALIFICATION STATUS Titan III C

PROPELLANT/FLUID Liquid N₂H₄

VOLUME 14,750 in.³ (0.24175 m³)
PRESSURE, OPERATING 400 psig (275 N/cm²)
PROOF 600 psig (413 N/cm²)
BURST 760 psig (524 N/cm²)
MASS 52 lbm (23 kg)
DIMENSIONS 33.24 in. by 28.24 in. diam (844.2 by 717.2 cm)

MATERIAL 6Al-4V Ti

PORT(S), SIZE & TYPE _____
MOUNTING Four tapped holes in bosses
EXPULSION METHOD Ethylene propylene diaphragm

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE 300
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST \$50,000 U.S. in 1974
REMARKS _____

DATA SOURCE NASA CR-142666 and NASA CR-142531 (ref. 5)

TANK/ACCUMULATOR

MANUFACTURER Martin Marietta Corporation
PART NUMBER 88-4000500
DESCRIPTION Cylinder with hemispherical ends
QUALIFICATION STATUS Saturn V

PROPELLANT/FLUID GHe

VOLUME 53,910 in.³ (0.8835 m³)
PRESSURE, OPERATING 3000 psi (2068 N/cm²)
PROOF 5000 psi (3,447 N/cm²)
BURST 6660 psi (4591 N/cm²)
MASS 1144 lbm (518.9 kg)
DIMENSIONS 211.88 in. by 20.90 in. o.d. by 0.90 in. wall (5381.7
by 53.09 by 2.29 cm)
MATERIAL Al 2014-T6

PORT(S), SIZE & TYPE _____
MOUNTING Bosses
EXPULSION METHOD _____

OPERATING TEMPERATURE RANGE -180 to 160 °F (118 to 71 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME No spares
COST _____
REMARKS _____

DATA SOURCE NASA CR-142666 and NASA CR-142531 (ref. 5)

TANK/ACCUMULATOR

MANUFACTURER Pressure Systems, Inc.
PART NUMBER 80111-1
DESCRIPTION Spherical
QUALIFICATION STATUS Beaver Submarine (Rockwell)

PROPELLANT/FLUID Gas

VOLUME 35,300 in.³ (0.57856 m³)
PRESSURE, OPERATING 890 psig (613 N/cm²)
PROOF 1335 psig (920 N/cm²)
BURST 1780 psig (1227 N/cm²)
MASS 255 lbm (115 kg)
DIMENSIONS 40.74 in. o.d. by 0.282 in. wall (103.4 by 0.716 cm)

MATERIAL 6Al-4V Ti

PORT(S), SIZE & TYPE One, polar
MOUNTING _____
EXPULSION METHOD _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE NASA CR-142666 and NASA CR-142531 (ref. 5)

TANK/ACCUMULATOR

MANUFACTURER Pressure Systems, Inc.

PART NUMBER 80140-1

DESCRIPTION Spherical

QUALIFICATION STATUS Qualified and flown in 1969 (JPL)

PROPELLANT/FLUID Liquid - MMH, NTO

VOLUME 13,442 in.³ (0.22031 m³)

PRESSURE, OPERATING 300 psig (206 N/cm²)

PROOF 600 psig (413 N/cm²)

BURST 750 psig (517 N/cm²)

MASS 22.5 lbm (1.02 kg)

DIMENSIONS 29.5 in. i.d. by 0.031 in. wall (749 by 0.078 cm)

MATERIAL Al-4V Ti

PORT(S), SIZE & TYPE Two, polar

MOUNTING Four equatorial lugs

EXPULSION METHOD Teflon bladder FED-TFE

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME 34 weeks in 1974

COST _____

REMARKS _____

DATA SOURCE NASA CR-142666 and NASA CR-142531 (ref. 5)

TANK/ACCUMULATOR

MANUFACTURER Rockwell International
PART NUMBER 240-48202
DESCRIPTION Spherical
QUALIFICATION STATUS X-15

PROPELLANT/FLUID Liquid H₂O₂

VOLUME 17,300 in.³ (0.283 m³)
PRESSURE, OPERATING 600 psi (413 N/cm²)
PROOF 900 psi (620 N/cm²)
BURST 975 psi (672 N/cm²)

MASS 64 lbm (29 kg)
DIMENSIONS _____

MATERIAL 350 CRES

PORT(S), SIZE & TYPE _____
MOUNTING _____
EXPULSION METHOD _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE NASA CR-142666 and NASA CR-142531 (ref. 5)

TANK/ACCUMULATOR

MANUFACTURER Structural Composite Industries
PART NUMBER Model 156
DESCRIPTION Filament-wound gas cylinder
QUALIFICATION STATUS MMU (Martin Marietta)

PROPELLANT/FLUID GN₂

VOLUME 1631 in.³ (0.0267 m³)
PRESSURE, OPERATING 3600 psig
PROOF
BURST

MASS 27.5 lbm (12.5 kg)
DIMENSIONS 10 in. diam by 31 in. (25.4 by 78.7 cm)

MATERIAL 6061-T6 liner; Kevlar 49 and epoxy wrap

PORT(S), SIZE & TYPE
MOUNTING
EXPULSION METHOD

OPERATING TEMPERATURE RANGE

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
CYCLE
SHELF

RELIABILITY
LEAD TIME
COST

REMARKS SCI manufactures filament-wound pressure vessels from 55
to 363,000 in.³ in spheres, near-spheres, and cylinders

DATA SOURCE SCI product data sheets - 1985; ASME proceedings
(ref. 6)

TANK/ACCUMULATOR

MANUFACTURER Structural Composite Industries
PART NUMBER Model 200
DESCRIPTION Filament-wound composite
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

VOLUME 11,000 in.³ (0.18 m³)
PRESSURE, OPERATING 3000 psig
PROOF 5000 psig
BURST _____

MASS 300 lbm (136 kg)
DIMENSIONS 50 in. by 21.4 in. o.d. (127 by 54.4 cm)

MATERIAL _____

PORT(S), SIZE & TYPE _____
MOUNTING _____
EXPULSION METHOD _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE SAMPE symposium (ref. 7)

SERVICE VALVE

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 1-4-00-51-27

DESCRIPTION Manual toggle valve

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂

PRESSURE, OPERATING 1250 psig

PROOF 1875 psig

BURST 2500 psig

RATED FLOW 50 lbm/hr at 300 psi, 10 psid

LEAKAGE, INTERNAL 5.0 SCCM

EXTERNAL 5.0 SCCM

MASS 0.49 lbm

DIMENSIONS _____

MATERIAL, BODY _____

SEAT/SEAL _____

CONNECTIONS, GROUND SIDE _____

SPACECRAFT SIDE _____

INTEGRAL FILTER _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton product data sheet - 1987

SERVICE VALVE

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 1-4-00-51-43
DESCRIPTION Manual toggle valve
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂

PRESSURE, OPERATING 0 to 1250 psig
PROOF 1875 psig
BURST 2500 psig

RATED FLOW 150 lbm/hr at 300 psi

LEAKAGE, INTERNAL 2.0 SCCM
EXTERNAL 0.2 SCCM

MASS 0.69 lbm

DIMENSIONS

MATERIAL, BODY
SEAT/SEAL

CONNECTIONS, GROUND SIDE
SPACECRAFT SIDE

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
CYCLE
SHELF

RELIABILITY
LEAD TIME
COST
REMARKS

DATA SOURCE Carleton product data sheet - 1987

SERVICE VALVE

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 1-4-00-51-45

DESCRIPTION Manual toggle valve

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂, N₂

PRESSURE, OPERATING 0 to 295 psig

PROOF 443 psig

BURST 590 psig

RATED FLOW 7.0 lbm/hr at 100 psi, 1.0 psid max.

LEAKAGE, INTERNAL 2.0 SCCM

EXTERNAL 0.2 SCCM

MASS 0.530 lbm

DIMENSIONS _____

MATERIAL, BODY _____

SEAT/SEAL _____

CONNECTIONS, GROUND SIDE _____

SPACECRAFT SIDE _____

INTEGRAL FILTER _____

MOUNTING _____

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton product data sheet - 1987

SERVICE VALVE

MANUFACTURER Consolidated Controls Corporation
PART NUMBER 71665
DESCRIPTION Manual fill and drain
QUALIFICATION STATUS USAF program
PROPELLANT/FLUID GN₂
PRESSURE, OPERATING 3015 psia (2078 N/cm²)
PROOF 4515 psia (3113 N/cm²)
BURST 6015 psia (4147 N/cm²)
RATED FLOW _____
LEAKAGE, INTERNAL 5 SCCH GN₂ at 3615 psia (2492 N/cm²)
EXTERNAL 0.0002 SCCS GN₂ at 3615 psia (2492 N/cm²)
MASS 1.0 lbm (0.45 kg)
DIMENSIONS 4.71 in. LOA
MATERIAL, BODY CRES
SEAT/SEAL CRES
CONNECTIONS, GROUND SIDE _____
SPACECRAFT SIDE Brazed tube
INTEGRAL FILTER 200 μm abs
MOUNTING _____
OPERATING TEMPERATURE RANGE -30 to 140 °F (-34 to 60 °C)
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE 100
SHELF _____
RELIABILITY _____
LEAD TIME 180 days in 1974
COST 5 to 10 units - \$2000 in 1974
REMARKS May be scaled up or down as required. Compatible with
pneumatics and storable propellants.
DATA SOURCE IIIRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

SERVICE VALVE

MANUFACTURER Consolidated Controls Corporation

PART NUMBER 72580

DESCRIPTION Manual fill and vent

QUALIFICATION STATUS USAF P-95

PROPELLANT/FLUID N₂, N₂O₄, UDMH, H₂O

PRESSURE, OPERATING 3615 psia (2492 N/cm²)

PROCF 5415 psia (3733 N/cm²)

BURST 9015 psia (6215 N/cm²)

RATED FLOW Equivalent to 0.5 in. (1.27 cm) orifice

LEAKAGE, INTERNAL 5 SCCH GN₂ at max. pressure

EXTERNAL 0.0002 SCCS GN₂

MASS 1.0 lbm (0.45 kg)

DIMENSIONS

MATERIAL, BODY CRES

SEAT/SEAL CRES

CONNECTIONS, GROUND SIDE MS tube fitting 0.56-18 UNF

SPACECRAFT SIDE Brazed tube

INTEGRAL FILTER 200 μm abs

MOUNTING

OPERATING TEMPERATURE RANGE -30 to 140 °F (-34 to 60 °C)

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

CYCLE 100

SHELF

RELIABILITY

LEAD TIME 180 days in 1974

COST 5 to 10 units - \$2000 in 1974

REMARKS

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

SERVICE VALVE

MANUFACTURER Consolidated Controls Corporation
 PART NUMBER 72855
 DESCRIPTION Manual fill and vent
 QUALIFICATION STATUS USAF P-50

PROPELLANT/FLUID GN₂, N₂H₄

PRESSURE, OPERATING 345 psia (237 N/cm²)
 PROOF 515 psia (355 N/cm²)
 BURST _____

RATED FLOW Equivalent to 0.5 in. (1.27 cm) orifice (See remarks.)

LEAKAGE, INTERNAL 5 SCCH GN₂

EXTERNAL 0.72 SCCH GN₂

MASS 1.20 lbm (0.544 kg) flight half only

DIMENSIONS _____

MATERIAL, BODY CRES
 SEAT/SEAL CRES

CONNECTIONS, GROUND SIDE _____
 SPACECRAFT SIDE _____

INTEGRAL FILTER 200 μm abs
 MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
 SINE _____

ACCELERATION _____
 SHOCK _____

LIFE, SERVICE _____
 CYCLE _____
 SHELF _____

RELIABILITY _____
 LEAD TIME _____
 COST _____

| REMARKS | | | Ground |
|----------|------------------------|---------------------------|--------------|
| Dash No. | Spacecraft brazed-tube | Flow | fitting-tube |
| -1 | 0.375 in. (0.952 cm) | 2.0 lbm/s GN ₂ | 0.50-20 UNF |
| -3 | 0.750 in. (1.904 cm) | 1.0 CFM H ₂ O | 0.875-14 UNF |

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

SERVICE VALVE

MANUFACTURER Futurecraft Corporation
PART NUMBER 200791
DESCRIPTION Solenoid, two-way, NC, fill and vent
QUALIFICATION STATUS Space shuttle OMS (Aerojet)

PROPELLANT/FLUID GN₂

PRESSURE, OPERATING 0 to 1000 psig, 0 to 3000 psig reverse flow
PROOF 6000 psig
BURST 12,000 psig

RATED FLOW FEOD = 0.01 min (C_D = 0.65)

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS 0.38 lbm

DIMENSIONS 3.58 by 2.47 by 1.06 in.

MATERIAL, BODY 6061-T6 Al alloy
SEAT/SEAL Buna-N 90 shore, ethylene propylene

CONNECTIONS, GROUND SIDE 0.750-16 UNJ-3B socket
SPACECRAFT SIDE Stub in pad mount

INTEGRAL FILTER Inlet, sintered CRES, 6 μm nom., 18 μm abs
MOUNTING Pad; four 0.192/0.205-in.-diam holes at 0.750 by 1.20 in.

OPERATING TEMPERATURE RANGE 0 to 160 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS 23 to 32 Vdc, 63.4-W solenoid

DATA SOURCE Futurecraft drawing 200791 - 1985

SERVICE VALVE

MANUFACTURER Futurecraft Corporation
PART NUMBER 900490-2
DESCRIPTION Fill and drain
QUALIFICATION STATUS ASAT (Hamilton Standard)

PROPELLANT/FLUID GHe, other compatible fluid

PRESSURE, OPERATING 0 to 500 psia
PROOF 1000 psia
BURST 2000 psia

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS 0.14 lbm

DIMENSIONS 2.09 in. by 0.874 in. diam

MATERIAL, BODY 17-4PH CRES
SEAT/SEAL Metal to metal seat; ethylene propylene and
Kel-F seals
CONNECTIONS, GROUND SIDE _____
SPACECRAFT SIDE _____
INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Futurecraft drawing 900490 - 1985

SERVICE VALVE

MANUFACTURER Futurecraft Corporation
PART NUMBER 900491-1, -2
DESCRIPTION _____
QUALIFICATION STATUS ASAT (Hamilton Standard)
PROPELLANT/FLUID N₂H₄, GN₂, GHe, other compatible fluid
PRESSURE, OPERATING 0 to 500 (for -1), 8000 psia (for -2)
PROOF 1000 (for -1), 16,000 psia (for -2)
BURST 2000 (for -1), 32,000 psia (for -2)
RATED FLOW _____
LEAKAGE, INTERNAL _____
EXTERNAL _____
MASS _____
DIMENSIONS 1.94/2.25 in. less tube by 1.50 in. by 1.25 in.
MATERIAL, BODY 17-4PH CRES
SEAT/SEAL Metal to metal seat; ethylene propylene and
Kel-F seal
CONNECTIONS, GROUND SIDE _____
SPACECRAFT SIDE 0.25-in.-diam tube
INTEGRAL FILTER _____
MOUNTING 0.221-in.-diam holes, two each, 1.000 in. apart
OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Futurecraft drawing 900491 - 1985

SERVICE VALVE

MANUFACTURER HTL Industries, Inc.
PART NUMBER 255620-3, 255921-3, (255610-2 ground fitting)
DESCRIPTION Fill and drain
QUALIFICATION STATUS Viking orbiter - 1975, Mariner - 1973
PROPELLANT/FITTING GN₂, MMH, N₂O₄
PRESSURE, OPERATING 0 to 4015 psia (0 to 2768 N/cm²)
PROOF 6015 psia (4147 N/cm²)
BURST 16015 psia (11,042 N/cm²)
RATED FLOW Liquid - 0.28 lbm/s H₂O at 75 psid (0.12 kg/s at 51 N/cm²); gas - 17 SCFM GN₂ at 25 psid (8000 SCCS at 17 N/cm²)
LEAKAGE, INTERNAL 0.003 SCCH He
EXTERNAL 0.005 SCCS He
MASS 0.30 lbm (0.13 kg)
DIMENSIONS
MATERIAL, BODY
SEAT/SEAL
CONNECTIONS, GROUND SIDE
SPACECRAFT SIDE
INTEGRAL FILTER
MOUNTING
OPERATING TEMPERATURE RANGE 25 to 125 °F (-3.8 to 51.6 °C)
VIBRATION, RANDOM
SINE
ACCELERATION
SHOCK
LIFE, SERVICE
CYCLE 100
SHELF
RELIABILITY
LEAD TIME
COST
REMARKS

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

SERVICE VALVE

MANUFACTURER Hughes Aircraft Company
PART NUMBER 325-7167
DESCRIPTION Inline ball fill and vent valve
QUALIFICATION STATUS Intelsat IV A, Westar, Anik

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 415 psia (286 N/cm²)
PROOF 6015 psia (4147 N/cm²)
BURST 8015 psia (5526 N/cm²)

RATED FLOW 0.0553 lbm/s at 30 psid (0.0250 kg/sec at 20 N/cm²)

LEAKAGE, INTERNAL 0.50 SCCH

EXTERNAL _____

MASS 0.27 lbm (0.12 kg) flight half only

DIMENSIONS _____

MATERIAL, BODY 6Al-4V Ti
SEAT/SEAL _____

CONNECTIONS, GROUND SIDE AND818-4J (1/4 in.)
SPACECRAFT SIDE _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -20 to 170 °F (-28 to 76.6 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE
CYCLE 1200
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST \$1400 in 1974
REMARKS _____

DATA SOURCE IITRI lists (ref. 8)

SERVICE VALVE

MANUFACTURER Moog Inc.
PART NUMBER Model 50-527
DESCRIPTION Fill and drain
QUALIFICATION STATUS Unknown

PROPELLANT/FLUID _____

PRESSURE, OPERATING 510 psig
PROOF 950 psig
BURST 1509 psig

RATED FLOW 0.25 lbm/min He at 4 psid

LEAKAGE, INTERNAL _____

EXTERNAL Zero liquid at 510 psig, 10⁻⁵ SCCS GHe

MASS 0.50 lbm max.

DIMENSIONS 3.48 in. by 2.79 in. diam

MATERIAL, BODY _____
SEAT/SEAL _____

CONNECTIONS, GROUND SIDE MS 33656-3
SPACECRAFT SIDE 1/4-in. tube

INTEGRAL FILTER _____

MOUNTING Three 0.196-in.-diam holes on 2.321-in.-diam BC

OPERATING TEMPERATURE RANGE -30 to 250 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE 10 yr
CYCLE 100
SHELF 4 yr

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Moog drawing A77479 - 1985

SERVICE VALVE

MANUFACTURER Moog Inc.
PART NUMBER Model 50-528
DESCRIPTION Fill and drain
QUALIFICATION STATUS Unknown

PROPELLANT/FLUID

PRESSURE, OPERATING 510 psig
PROOF 950 psig
BURST 1509 psig

RATED FLOW 0.25 lbm/min at 4 psid

LEAKAGE, INTERNAL

EXTERNAL 10^{-5} SCCS GHe at 510 psig zero liquid

MASS 0.50 lbm

DIMENSIONS 3.58 in. by 2.79 in. diam

MATERIAL, BODY
SEAT/SEAL

CONNECTIONS, GROUND SIDE MS 33656-4
SPACECRAFT SIDE 1/4-in. tube

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE -30 to 250 °F

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE 10 yr
CYCLE 100
SHELF 4 yr

RELIABILITY
LEAD TIME
COST
REMARKS

DATA SOURCE Moog drawing A77481 - 1985

SERVICE VALVE

MANUFACTURER Moog Inc.
PART NUMBER Model 50-529
DESCRIPTION Fill, drain, and vent
QUALIFICATION STATUS Unknown

PROPELLANT/FLUID MMH

PRESSURE, OPERATING 510 psig
PROOF 950 psig
BURST 1509 psig

RATED FLOW 0.30 lbm/min at 15 psid

LEAKAGE, INTERNAL

EXTERNAL Zero liquid at 510 psig, 10⁻⁵ SCCS GHe

MASS 0.50 lbm max.

DIMENSIONS 3.98 in. by 2.790 in. diam

MATERIAL, BODY
SEAT/SEAL

CONNECTIONS, GROUND SIDE MS 33656-6
SPACECRAFT SIDE 0.375 in. o.d. tube

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE -30 to 250 °F

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE 10 yr
CYCLE 100
SHELF 4 yr

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Moog drawing A77483 - 1985

SERVICE VALVE

MANUFACTURER Moog Inc.
PART NUMBER Model 50-530
DESCRIPTION Fill, drain, and vent w/cover
QUALIFICATION STATUS Unknown

PROPELLANT/FLUID N₂O₄

PRESSURE, OPERATING 510 psig
PROOF 950 psig
BURST 1509 psig

RATED FLOW 30 lbm/min at 15 psid

LEAKAGE, INTERNAL _____
EXTERNAL Zero liquid at 510 psig, 10⁻⁵ SCCS GHe

MASS 0.50 lbm max.

DIMENSIONS 3.90 in. by 2.790 in. diam

MATERIAL, BODY _____
SEAT/SEAL _____

CONNECTIONS, GROUND SIDE MS 33656-8
SPACECRAFT SIDE 0.375 in. o.d. tube
INTEGRAL FILTER _____
MOUNTING Three 0.196-in.-diam holes EQ SP at 2.114 in.

OPERATING TEMPERATURE RANGE -30 to 250 °F

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE 10 yr
CYCLE 100
SHELF 4 yr
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Moog drawing A77485 - 1985

SERVICE VALVE

MANUFACTURER Pyronetics Devices, Inc.

PART NUMBER 1146, 1176

DESCRIPTION Inline manifold mounted, manual operation

QUALIFICATION STATUS ATS, Surveyor, SAM-D, Apollo, etc.

PROPELLANT/FLUID _____

PRESSURE, OPERATING 4015 psia (2768 N/cm²) for Al alloy

PROOF 6015 psia (4147 N/cm²) for Al alloy

BURST 8015 psia (5526 N/cm²) for Al alloy

RATED FLOW _____

LEAKAGE, INTERNAL 0.03 SCCH He at 3015 psia (2078 N/cm²)

EXTERNAL _____

MASS 0.019 lbm (0.0086 kg) for Al alloy, 0.057 lbm (0.025 kg) for

CRES

DIMENSIONS _____

MATERIAL, BODY 6061T6 Al alloy or 303 CRES

SEAT/SEAL _____

CONNECTIONS, GROUND SIDE _____

SPACECRAFT SIDE _____

INTEGRAL FILTER _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE IITRI lists (ref. 8)

SERVICE VALVE

MANUFACTURER Pyronetics Devices, Inc.

PART NUMBER 1176-16; 1832-1

DESCRIPTION Manual, single-seat axial flow, fill and vent

QUALIFICATION STATUS Transit Improvement (TIP-II)

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 535 psia (368 N/cm²)

PROOF 1100 psia (758.4 N/cm²)

BURST 2100 psia (1447 N/cm²)

RATED FLOW _____

LEAKAGE, INTERNAL 3x10⁻³ SCCH He at OP pressure

EXTERNAL 1x10⁻⁶ SCCS He at OP pressure

MASS 0.1 lbm (0.04 kg) flight half only

DIMENSIONS _____

MATERIAL, BODY CRES

SEAT/SEAL Steel on steel

CONNECTIONS, GROUND SIDE 5/16-24 (for 1176), 3/8-24 (for 1832)

SPACECRAFT SIDE 1/2-20 (for 1176), 9/16-18 (for 1832)

INTEGRAL FILTER No

MOUNTING _____

OPERATING TEMPERATURE RANGE 41 to 122 °F (5 to 50 °C)

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE 50

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

SERVICE VALVE

MANUFACTURER Pyronetics Devices, Inc.

PART NUMBER 1811-4

DESCRIPTION Inline fitting mounted, manually operated

QUALIFICATION STATUS N. Rocket

PROPELLANT/FLUID GN₂, He

PRESSURE, OPERATING 0 to 3015 psia (0 to 2078 N/cm²)

PROOF 6015 psia (4147 N/cm²)

BURST 12015 psia (8284 N/cm²)

RATED FLOW _____

LEAKAGE, INTERNAL 3.9x10⁻⁶ SCCH He at max. OP pressure

EXTERNAL _____

MASS 0.07 lbm (0.03 kg)

DIMENSIONS _____

MATERIAL, BODY 6061-T6 Al alloy

SEAT/SEAL _____

CONNECTIONS, GROUND SIDE _____

SPACECRAFT SIDE _____

INTEGRAL FILTER _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE IITRI lists (ref. 8)

SERVICE VALVE

MANUFACTURER Pyronetics Devices, Inc.
PART NUMBER 1819
DESCRIPTION Inline bulkhead or manifold mount
QUALIFICATION STATUS COMSAT, Viking 1975, P-72, B-1, Scout, etc.

PROPELLANT/FLUID _____

PRESSURE, OPERATING 0 to 5015 psia (0 to 3457 N/cm²)
PROOF 7515 psia (5181 N/cm²)
BURST 15,015 psia (10,352 N/cm²)

RATED FLOW _____

LEAKAGE, INTERNAL 0.03 SCCH He at max. OP pressure
EXTERNAL _____

MASS 0.057 lbm (0.025 kg)

DIMENSIONS _____

MATERIAL, BODY 303 CRES, AMS-5639 CRES
SEAT/SEAL Viton "A"

CONNECTIONS, GROUND SIDE _____
SPACECRAFT SIDE _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -10 to 150 °F (-23 to 65.5 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE 100
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

SERVICE VALVE

MANUFACTURER Pyronetics Devices, Inc.
PART NUMBER 1821-1
DESCRIPTION Inline fitting mount, manually operated
QUALIFICATION STATUS N. Rocket

PROPELLANT/FLUID GN₂, He

PRESSURE, OPERATING 365 psia (251 N/cm²)
PROOF 715 psia (492 N/cm²)
BURST 1415 psia (975.6 N/cm²)

RATED FLOW _____

LEAKAGE, INTERNAL 6.5x10⁻⁸ SCCS He at 365 psia
EXTERNAL _____

MASS 0.07 lbm (0.03 kg)

DIMENSIONS _____

MATERIAL, BODY 304L CRES
SEAT/SEAL _____

CONNECTIONS, GROUND SIDE _____
SPACECRAFT SIDE _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8)

SERVICE VALVE

MANUFACTURER Pyronetics Devices, Inc.

PART NUMBER 1831

DESCRIPTION Inline, flange mounted, manual fill and vent

QUALIFICATION STATUS Viking 1975, MJS, GPR, CTS, HEAO, HCMM

PROPELLANT/FLUID GN₂, He

PRESSURE, OPERATING 555 psia (382 N/cm²)

PROOF 1115 psia (768.7 N/cm²)

BURST 2195 psia (1513 N/cm²)

RATED FLOW 0.15 lbm/s H₂O at 20 psid (0.068 kg/s at 13 N/cm²)

LEAKAGE, INTERNAL 1.7x10⁻³ SCCH He at OP pressure

EXTERNAL 1.3x10⁻⁷ SCCS He at 27 N/cm² (40 psia)

MASS 0.17 lbm (0.07 kg)

DIMENSIONS _____

MATERIAL, BODY 304L CRES

SEAT/SEAL _____

CONNECTIONS, GROUND SIDE _____

SPACECRAFT SIDE _____

INTEGRAL FILTER _____

MOUNTING _____

OPERATING TEMPERATURE RANGE 41 to 123 °F (5 to 50.5 °C)

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE 550

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

SERVICE VALVE

MANUFACTURER TRW

PART NUMBER 409708

DESCRIPTION Manually operated inline flow

QUALIFICATION STATUS Atmosphere Explorer 1973

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 600 psia (413 N/cm²)

PROOF 900 psia (620 N/cm²)

BURST 2400 psia (1654 N/cm²)

RATED FLOW _____

LEAKAGE, INTERNAL 1x10⁻⁵ SCCH He at OP pressure

EXTERNAL 1x10⁻⁷ SCCS He at OP pressure

MASS 0.22 lbm (0.10 kg)

DIMENSIONS _____

MATERIAL, BODY CRES with Al₂O₃ ceramic ball

SEAT/SEAL Ceramic on steel

CONNECTIONS, GROUND SIDE TRW P/N G404306

SPACECRAFT SIDE 1/4-in. braze joint (Aeroquip)

INTEGRAL FILTER _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE 100

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE ITTRI lists (ref. 8)

SERVICE VALVE

MANUFACTURER Wright Components, Inc.
PART NUMBER 12183
DESCRIPTION Manual fill and drain, two-way
QUALIFICATION STATUS MSD, classified

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 0 to 350 psia (0 to 241 N/cm²)
PROOF 615 psia (424 N/cm²)
BURST 1215 psia (837 N/cm²)

RATED FLOW 52 SCCS He (0.156 in. diam; C_D = 0.65)

LEAKAGE, INTERNAL 1.5x10⁻⁶ SCCS He at 79.2 N/cm²

EXTERNAL 1.5x10⁻⁶ SCCS at 79.2 N/cm²

MASS 0.35 lbm (0.15 kg)

DIMENSIONS

MATERIAL, BODY 304 CRES
SEAT/SEAL 304 CRES

CONNECTIONS, GROUND SIDE Four-bolt flange
SPACECRAFT SIDE Special flange

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE -20 to 160 °F (-28 to 71 °C)

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
CYCLE 250
SHELF

RELIABILITY
LEAD TIME Special order; 18 to 24 weeks in 1974 (ARO)

COST
REMARKS

DATA SOURCE Wright catalog - 1984, IITRI lists (ref. 8), and
Aerospace Corporation report (ref. 9)

SERVICE VALVE

MANUFACTURER Wright Components, Inc.

PART NUMBER 12319

DESCRIPTION Fill and drain, manual

QUALIFICATION STATUS Shuttle-launched dispenser (See Remarks.)

PROPELLANT/FLUID He, N₂, 1PA, Freon, N₂H₄, N₂O₄, H₂O

PRESSURE, OPERATING 315 psia

PROOF _____

BURST _____

RATED FLOW 100 ppm H₂O (seat diam, 0.625 in.)

LEAKAGE, INTERNAL 1x10⁻⁶ SCCS He

EXTERNAL 1x10⁻⁶ SCCS He

MASS 1.5 lbm

DIMENSIONS _____

MATERIAL, BODY _____

SEAT/SEAL TFE

CONNECTIONS, GROUND SIDE _____

SPACECRAFT SIDE _____

INTEGRAL FILTER _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE 100 minimum

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Not known to have flown

DATA SOURCE Wright catalog - 1984

FILTER

MANUFACTURER Aircraft Porous Media
PART NUMBER AC-A370-6
DESCRIPTION Fiberglass-mat element gas filter

QUALIFICATION STATUS ELMS
PROPELLANT/FLUID
RATING, ABSOLUTE 0.3 μm

PRESSURE, OPERATING 3500 psia (2415 N/cm²)
PROOF
BURST
DIFFERENTIAL

RATED FLOW 0.001 lbm/s N₂ at 2 psid (0.0005 kg/s)

THROUGHPUT
LEAKAGE, EXTERNAL

MASS
DIMENSIONS

MATERIAL, BODY
ELEMENT

PORTS, INLET

OUTLET

MOUNTING

OPERATING TEMPERATURE RANGE -80 to 150 °F

VIBRATION, RANDOM 22.3g rms
SINE

ACCELERATION 15g

SHOCK 30g

LIFE, SERVICE
CYCLE
SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Aircraft Porous Media
PART NUMBER AC-6875-4
DESCRIPTION Sintered wire-mesh element gas filter

QUALIFICATION STATUS ELMS
PROPELLANT/FLUID _____
RATING, ABSOLUTE 5 μ m

PRESSURE, OPERATING 180 psia (124 N/cm²)
PROOF _____
BURST _____
DIFFERENTIAL _____

RATED FLOW 0.0003 lbm/s He (0.00014 kg/s)

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
ELEMENT _____

PORTS, INLET _____
OUTLET _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Aircraft Porous Media
PART NUMBER AC-6875-853
DESCRIPTION Fiberglass element, inline, 0.5-in. (1.27-cm) gas filter
QUALIFICATION STATUS Apollo LEM
PROPELLANT/FLUID He
RATING, ABSOLUTE 5 μm
PRESSURE, OPERATING 4015 psia (2768 N/cm²)
PROOF 5335 psia (3678 N/cm²)
BURST 8015 psia (5526 N/cm²)
DIFFERENTIAL
RATED FLOW 380 SCFM (1.7x10⁵ SCCS)
THROUGHPUT
LEAKAGE, EXTERNAL
MASS 0.38 lbm (0.17 kg)
DIMENSIONS
MATERIAL, BODY
ELEMENT Fiberglass
PORTS, INLET Inline braze
OUTLET Inline braze
MOUNTING
OPERATING TEMPERATURE RANGE
VIBRATION, RANDOM
SINE
ACCELERATION
SHOCK
LIFE, SERVICE
CYCLE
SHELF
RELIABILITY
LEAD TIME
COST 5 to 9 units - \$600 in 1974
REMARKS

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Aircraft Porous Media
PART NUMBER AC-6875-855
DESCRIPTION Inline-braze gas filter

QUALIFICATION STATUS Apollo LEM
PROPELLANT/FLUID GHe
RATING, ABSOLUTE 15 μ m

PRESSURE, OPERATING 1765 psia (1216 N/cm²)
PROOF 2345 psia (1616 N/cm²)
BURST 3515 psia (2423 N/cm²)
DIFFERENTIAL

RATED FLOW 380 SCFM (1.7x10⁵ SCCS)

THROUGHPUT
LEAKAGE, EXTERNAL

MASS 0.43 lbm (0.19 kg)
DIMENSIONS

MATERIAL, BODY
ELEMENT Fiberglass mat

PORTS, INLET Inline braze
OUTLET Inline braze

MOUNTING

OPERATING TEMPERATURE RANGE

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
CYCLE
SHELF

RELIABILITY
LEAD TIME

COST 5 to 9 units - \$1450 in 1974
REMARKS

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

FILTER

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER F7008, F7009
DESCRIPTION _____

QUALIFICATION STATUS Apollo (Martin Marietta)
PROPELLANT/FLUID _____
RATING, ABSOLUTE _____

PRESSURE, OPERATING 6000 psi
PROOF _____
BURST _____
DIFFERENTIAL _____

RATED FLOW _____

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 304 CRES, TFE
ELEMENT _____

PORTS, INLET MS 33656-6

OUTLET Same as inlet
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Circle Seals Controls list (ref. 10)

FILTER

MANUFACTURER Facet Enterprises, Inc.
PART NUMBER 1736760-05
DESCRIPTION Replaceable element, bypass

QUALIFICATION STATUS Lear Fan 2100 Aircraft
PROPELLANT/FLUID Liquid (jet fuel)
RATING, ABSOLUTE 20 μ m nom.

PRESSURE, OPERATING 80 psi
PROOF _____
BURST _____
DIFFERENTIAL 0.6 psid clean, 1.5 psid switch, 2.25 psid
bypass
RATED FLOW 3 GPM

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 1.5 lbm
DIMENSIONS 8.38 by 3.50 in.

MATERIAL, BODY _____
ELEMENT Cellulose fiber and phenolic resin; CRES or
Inconel may be available

PORTS, INLET MS 33649-10
OUTLET Same as inlet

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 160 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Integral 1.5 psid switch

DATA SOURCE Facet product data catalog - 1986

FILTER

MANUFACTURER Facet Enterprises, Inc.
PART NUMBER 1740001
DESCRIPTION Replaceable element, integral differential pressure indicator
QUALIFICATION STATUS Variation used on Nomad aircraft
PROPELLANT/FLUID Liquid (jet fuel, gasoline)
RATING, ABSOLUTE 3 to 250 μ m nom.

PRESSURE, OPERATING 100 psi
PROOF _____
BURST _____
DIFFERENTIAL Indicator - 1 to 15 psid, bypass - 1.5 to 20 psid
RATED FLOW To 10 GPM

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 1.5 lbm
DIMENSIONS 7.75 by 4.00 in.

MATERIAL, BODY _____
ELEMENT _____

PORTS, INLET MS 33656E10 fitting in MS 33649-12 port

OUTLET Same as inlet
MOUNTING Three-bolt holes

OPERATING TEMPERATURE RANGE -65 to 300 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Facet product data catalog - 1986

FILTER

MANUFACTURER Norman Equipment Company
PART NUMBER 4200T series
DESCRIPTION Bidirectional, straight inline

QUALIFICATION STATUS _____
PROPELLANT/FLUID Any fluid compatible w/304 CRES
RATING, ABSOLUTE 2x to 200 μ m

PRESSURE, OPERATING 0 to 6000 psi; 0 to 3000 psi
PROOF 9000 psig
BURST 24,000 psig
DIFFERENTIAL _____

RATED FLOW _____

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS 1-in. hex by 1.6-in.² element (for 0 to 6000 psi);
1.375-in. hex by 3.3-in.² element, 1.75-in. hex by 6.6-in.²
element (for 0 to 3000 psi)
MATERIAL, BODY 304 CRES
ELEMENT 304 CRES

PORTS, INLET 0.25 to 0.5-in. pipe, 37° SAE, MS 33656, or AND-10050
OUTLET Same as inlet

MOUNTING _____

OPERATING TEMPERATURE RANGE -320 to 800 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Cleanable, pleated, woven element

DATA SOURCE Norman Equipment product data sheet - 1986

FILTER

MANUFACTURER Norman Equipment Company
PART NUMBER 4300 series
DESCRIPTION Straight inline

QUALIFICATION STATUS _____
PROPELLANT/FLUID Liquid (MIL-H-5606) and gas (air)
RATING, ABSOLUTE 2x to 200 μ m

PRESSURE, OPERATING 0 to 3000 psi
PROOF 4500 psig
BURST 12,000 psig
DIFFERENTIAL _____

RATED FLOW 1.2 to 29 GPM liquid/15 to 1750 SCFM gas

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 303 CRES or 2024T351
ELEMENT 304 CRES

PORTS, INLET Pipe, 37° SAE, MS 33656, or AND10050

OUTLET Same as inlet
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Cleanable, woven element

DATA SOURCE Norman Equipment product data sheet - 1986

FILTER

MANUFACTURER Pall Pneumatic Products Corporation
PART NUMBER PCS 13501 G24
DESCRIPTION Single cartridge, particulate or coalescing

QUALIFICATION STATUS _____
PROPELLANT/FLUID Pneumatic
RATING, ABSOLUTE _____

PRESSURE, OPERATING 150 psig
PROOF _____
BURST _____
DIFFERENTIAL 0.3 psid clean

RATED FLOW 350 SCFM

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 20 lbm
DIMENSIONS 24 by 7.6 by 6 in.

MATERIAL, BODY 304 CRES
ELEMENT _____

PORTS, INLET 1.5-in. NPT
OUTLET 1.5-in. NPT, 0.25-in. NPT drain

MOUNTING _____

OPERATING TEMPERATURE RANGE To 200 or 425 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Two-piece housing, removable element; PCS 350AF or HT
cartridge P/N

DATA SOURCE Pall product data sheet - 1986

FILTER

MANUFACTURER Pall Pneumatic Products Corporation
PART NUMBER PCS 33501 G24
DESCRIPTION Single cartridge, particulate or coalescing

QUALIFICATION STATUS _____
PROPELLANT/FLUID Pneumatic
RATING, ABSOLUTE _____

PRESSURE, OPERATING 300 psig
PROOF _____
BURST _____
DIFFERENTIAL 0.3 psid clean

RATED FLOW 810 SCFM

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 30 lbm
DIMENSIONS 24 by 7.8 by 6 in.

MATERIAL, BODY 304 CRES
ELEMENT _____

PORTS, INLET 1.5-in. NPT
OUTLET 1.5-in. NPT, 0.25-in. NPT drain

MOUNTING _____

OPERATING TEMPERATURE RANGE To 200 or 425 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Two-piece housing, removable element

DATA SOURCE Pall product data sheet - 1986

FILTER

MANUFACTURER Purolator Technologies
PART NUMBER _____
DESCRIPTION Pressure, return, case drain elements

QUALIFICATION STATUS Space shuttle (Rockwell)
PROPELLANT/FLUID Hydraulic (MIL-H-83282)
RATING, ABSOLUTE 5 μ m for pressure, 15 μ m for case drain/return

PRESSURE, OPERATING _____
PROOF _____
BURST _____
DIFFERENTIAL _____

RATED FLOW 65 GPM for pressure and return, 5 GPM for case drain

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 22 lbm
DIMENSIONS 12.25 by 6.5 by 10.5 in.

MATERIAL, BODY _____
ELEMENT _____

PORTS, INLET _____
OUTLET _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS Check valves and shutoff valves integral

DATA SOURCE Purolator product data sheet - 1985

FILTER

MANUFACTURER Vacco Industries
 PART NUMBER E-81916-4-15
 DESCRIPTION Cartridge element, liquid-propellant filter

QUALIFICATION STATUS Titan III
 PROPELLANT/FLUID N₂H₄
 RATING, ABSOLUTE 15 μm

PRESSURE, OPERATING 400 psia (275 N/cm²)
 PROOF 668 psia (460 N/cm²)
 BURST 888 psia (612 N/cm²)
 DIFFERENTIAL _____

RATED FLOW 0.222 lbm/s N₂H₄ at 4 psid and 75 °F (0.100 kg/s at
 2 N/cm² and 23 °C)
 THROUGHPUT _____
 LEAKAGE, EXTERNAL _____

MASS 0.75 lbm (0.34 kg)
 DIMENSIONS _____

MATERIAL, BODY 303 CRES
 ELEMENT 303 CRES, etched disc

PORTS, INLET Special cartridge
 OUTLET Same as inlet

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
 SINE _____

ACCELERATION _____
 SHOCK _____

LIFE, SERVICE _____
 CYCLE _____
 SHELF _____

RELIABILITY _____
 LEAD TIME 8 to 10 weeks in 1974
 COST _____
 REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
 (ref. 9)

FILTER

MANUFACTURER Vacco Industries
PART NUMBER F1D10064-01
DESCRIPTION 0.25-in. inline liquid filter assembly, etched-disc
element
QUALIFICATION STATUS COMSAT, Intelsat IV, SDS
PROPPELLANT/FLUID N₂H₄
RATING, ABSOLUTE 10 μm

PRESSURE, OPERATING 315 psia (217 N/cm²)
PROOF 465 psia (320 N/cm²)
BURST 1215 psia (837.7 N/cm²)
DIFFERENTIAL _____

RATED FLOW 0.015 lbm/s N₂H₄ (0.007 kg/s)

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 0.3 lbm (0.1 kg)
DIMENSIONS _____

MATERIAL, BODY Ti
ELEMENT _____

PORTS, INLET 0.25-in. o.d. by 0.020-in. wall tube
OUTLET Same as inlet
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME 8 to 10 weeks in 1974
COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

FILTER

MANUFACTURER Vacco Industries
PART NUMBER F1D10093
DESCRIPTION Etched-disc element, liquid filter

QUALIFICATION STATUS Mariner, Viking
PROPELLANT/FLUID N₂H₄
RATING, ABSOLUTE 35 μ m

PRESSURE, OPERATING 300 psia (206 N/cm²)
PROOF
BURST 1200 psia (828 N/cm²)
DIFFERENTIAL

RATED FLOW 0.44 lbm/s at 3 psid and 70 °F (0.19 kg/s at 2 N/cm²
and 21 °C)
THROUGHPUT
LEAKAGE, EXTERNAL

MASS 1.6 lbm (0.75 kg)
DIMENSIONS 6.3 in. length (16 cm)

MATERIAL, BODY 304 CRES
ELEMENT 304 CRES

PORTS, INLET 0.5-in. tube
OUTLET Same as inlet

MOUNTING

OPERATING TEMPERATURE RANGE

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
CYCLE
SHELF

RELIABILITY
LEAD TIME

COST
REMARKS

DATA SOURCE Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Vacco Industries

PART NUMBER F1D10106-01

DESCRIPTION Inline liquid-propellant filter assembly

QUALIFICATION STATUS ERTS

PROPELLANT/FLUID N₂H₄

RATING, ABSOLUTE 25 μm

PRESSURE, OPERATING 600 psia (413 N/cm²)

PROOF 990 psia (682 N/cm²)

BURST 1320 psia (910 N/cm²)

DIFFERENTIAL _____

RATED FLOW _____

THROUGHPUT _____

LEAKAGE, EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 304 CRES

ELEMENT _____

PORTS, INLET _____

OUTLET _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME 8 to 10 weeks in 1974

COST _____

REMARKS _____

DATA SOURCE IITRI lists (ref. 8)

FILTER

MANUFACTURER Vacco Industries
PART NUMBER FID10106-02
DESCRIPTION Inline liquid-propellant filter assembly

QUALIFICATION STATUS ERB
PROPELLANT/FLUID N₂H₄
RATING, ABSOLUTE 25 μm

PRESSURE, OPERATING 880 psia (606 N/cm²)
PROOF 1320 psia (910 N/cm²)
BURST 2640 psia (1870 N/cm²)
DIFFERENTIAL _____

RATED FLOW _____

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 304 CRES
ELEMENT _____

PORTS, INLET _____

OUTLET _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME 8 to 10 weeks in 1974

COST _____

REMARKS _____

DATA SOURCE IITRI lists (ref. 8)

FILTER

MANUFACTURER Vacco Industries
PART NUMBER FID10132-01
DESCRIPTION 0.25-in. inline filter assembly, etched-disc element

QUALIFICATION STATUS Apollo
PROPELLANT/FLUID GN₂
RATING, ABSOLUTE 40 μm

PRESSURE, OPERATING 1000 psia (689.4 N/cm²)
PROOF 2040 psia (1406 N/cm²)
BURST 4080 psia (2813 N/cm²)
DIFFERENTIAL _____

RATED FLOW 423 SCFM GN₂ at 15 psid and 75 °F (1.99x10⁵ SCCS at
10 N/cm² and 23 °C)
THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 0.3 lbm (0.1 kg)
DIMENSIONS _____

MATERIAL, BODY 304L CRES
ELEMENT 304L CRES

PORTS, INLET 0.25-in. o.d. by 0.035-in. wall tube
OUTLET Same as inlet

MOUNTING _____

OPERATING TEMPERATURE RANGE -275 to 170 °F (-170 to 76.6 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME 8 to 10 weeks in 1974

COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

FILTER

MANUFACTURER Vacco Industries
PART NUMBER F1D10151-01
DESCRIPTION 0.25-in. inline liquid-propellant filter assembly

QUALIFICATION STATUS CTS
PROPELLANT/FLUID Anhydrous N₂H₄
RATING, ABSOLUTE 10 μm

PRESSURE, OPERATING 300 psia (206 N/cm²)
PROOF 450 psia (310 N/cm²)
BURST 1200 psia (827.3 N/cm²)
DIFFERENTIAL _____

RATED FLOW 0.05 lbm/s for N₂H₄ at 10 psid and 75 °F (0.02 kg/s at
6.8 N/cm² and 23 °C)

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 0.50 lbm (0.22 kg)
DIMENSIONS _____

MATERIAL, BODY 304L CRES
ELEMENT 304L CRES, etched disc

PORTS, INLET 0.25-in. by 0.020-in. wall tube
OUTLET Same as inlet

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME 8 to 10 weeks in 1974

COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

FILTER

MANUFACTURER Vacco Industries
PART NUMBER F1D10178-01
DESCRIPTION 0.375-in. inline gas filter assembly

QUALIFICATION STATUS Qualified
PROPELLANT/FLUID He
RATING, ABSOLUTE 12 μ m

PRESSURE, OPERATING 4000 psia (2757 N/cm²)
PROOF 6000 psia (4136 N/cm²)
BURST 14900 psia (10273 N/cm²)
DIFFERENTIAL _____

RATED FLOW 16 SCFM He at 5 psid and 75 °F (7500 SCCS at 3 N/cm²
and 23 °C)

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 1.0 lbm (0.45 kg)
DIMENSIONS _____

MATERIAL, BODY 304L CRES
ELEMENT 304L CRES

PORTS, INLET 0.375-in. o.d. by 0.050-in. wall tube

OUTLET Same as inlet
MOUNTING _____

OPERATING TEMPERATURE RANGE 30 to 90 °F (-1 to 32 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME 8 to 10 weeks in 1974
COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8)

FILTER

MANUFACTURER Vacco Industries
PART NUMBER FID10180-01
DESCRIPTION 0.25 in. inline gas filter assembly

QUALIFICATION STATUS OSO-1
PROPELLANT/FLUID GN₂
RATING, ABSOLUTE 10 μm

PRESSURE, OPERATING 4000 psia (2757 N/cm²)
PROOF 6000 psia (4136 N/cm²)
BURST 14,000 psia (9652 N/cm²)
DIFFERENTIAL _____

RATED FLOW 7.0 SCFM GN₂ at 1 psid and 75 °F (3300 SCCS at
0.6 N/cm² and 23 °C)
THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 0.30 lbm (0.13 kg)
DIMENSIONS _____

MATERIAL, BODY Ti
ELEMENT 304L CRES, etched disc

PORTS, INLET 0.25-in. tube (0.63 cm) by 0.018-in. wall

OUTLET _____
MOUNTING Bracket; two holes, 0.217 in. diam (0.55 cm)

OPERATING TEMPERATURE RANGE -40 to 140 °F (-40 to 60 °C)

VIBRATION, RANDOM 18.6g rms
SINE 12g

ACCELERATION 18g
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME 8 to 10 weeks in 1974

COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

FILTER

MANUFACTURER Vacco Industries
PART NUMBER F1D10182-01 and -02
DESCRIPTION 0.1875-in. inline liquid filter assembly

QUALIFICATION STATUS CTS
PROPELLANT/FLUID N₂H₄
RATING, ABSOLUTE 10 μm

PRESSURE, OPERATING 396 psia (273 N/cm²)
PROOF 594 psia (409 N/cm²)
BURST 1584 psia (1092 N/cm²)
DIFFERENTIAL _____

RATED FLOW 0.025 lbm/s N₂H₄ at 5 psid and 75 °F (0.011 kg/s at
3 N/cm² and 23 °C)

THROUGHPUT _____
LEAKAGE, EXTERNAL 1x10⁻⁶ SCCS He at 315 psia (217 N/cm²)

MASS 0.23 lbm (0.10 kg)
DIMENSIONS _____

MATERIAL, BODY Ti
ELEMENT 316L CRES (F.H.)

PORTS, INLET _____

OUTLET _____

MOUNTING _____

OPERATING TEMPERATURE RANGE 40 to 160 °F (4.4 to 71 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME 8 to 10 weeks in 1974

COST _____
REMARKS -01 dynamic unit, -02 production unit

DATA SOURCE IITRI lists (ref. 8)

FILTER

MANUFACTURER Vacco Industries
PART NUMBER SL-81019
DESCRIPTION Inline gas filter assembly
QUALIFICATION STATUS Viking lunar orbiter
PROPELLANT/FLUID GN₂
RATING, ABSOLUTE 12 μm
PRESSURE, OPERATING 3820 psia (2633 N/cm²)
PROOF 5730 psia (3950 N/cm²)
BURST 7640 psia (5267 N/cm²)
DIFFERENTIAL _____
RATED FLOW 10 SCFM GN₂ at 15 psid and 75 °F (4700 SCCS at 10 N/cm²
and 23 °C)
THROUGHPUT _____
LEAKAGE, EXTERNAL _____
MASS 0.033 lbm (0.014 kg)
DIMENSIONS _____
MATERIAL, BODY 304L CRES
ELEMENT 304L CRES
PORTS, INLET 0.25-in. o.d. by 0.035-in. wall tube
OUTLET Same as inlet
MOUNTING _____
OPERATING TEMPERATURE RANGE -65 to 160 °F (-53 to 71 °C)
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME 8 to 10 weeks in 1974
COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

FILTER

MANUFACTURER Vacco Industries
PART NUMBER SL-81500
DESCRIPTION Inline gas filter assembly

QUALIFICATION STATUS Apollo
PROPELLANT/FLUID GHe
RATING, ABSOLUTE 12 μ m

PRESSURE, OPERATING 1000 psia (689.4 N/cm²)
PROOF 3500 psia (2413 N/cm²)
BURST 7000 psia (4826 N/cm²)
DIFFERENTIAL _____

RATED FLOW 40 SCFM He at 10 psid and 75 °F (1.9x10⁴ SCCS at
6.8 N/cm² and 23 °C)

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 0.22 lbm (0.1 kg)
DIMENSIONS _____

MATERIAL BODY 304L CRES
ELEMENT 304L CRES, etched disc

PORTS, INLET 0.25-in. o.d. by 0.035-in. wall tube

OUTLET Same as inlet

MOUNTING _____

OPERATING TEMPERATURE RANGE -275 to 160 °F (-170 to 71 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME 8 to 10 weeks in 1974

COST _____

REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

FILTER

MANUFACTURER Vacco Industries
PART NUMBER S2-8846
DESCRIPTION Inline gas filter assembly

QUALIFICATION STATUS LEM
PROPELLANT/FLUID GHe
RATING, ABSOLUTE 15 μ m

PRESSURE, OPERATING 4000 psia (2757 N/cm²)
PROOF 5320 psia (3668 N/cm²)
BURST 8000 psia (5515 N/cm²)
DIFFERENTIAL _____

RATED FLOW 130 SCFM He at 2.8 psid and 65 °F (6.3x10⁴ SCCS at
1.9 N/cm² and 18 °C)

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 0.43 lbm (0.19 kg)
DIMENSIONS _____

MATERIAL, BODY 304L CRES
ELEMENT 304 CRES, etched disc

PORTS, INLET 0.375-in. o.d. by 0.040-in. wall tube

OUTLET Same as inlet
MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 160 °F (-53 to 71 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME 8 to 10 weeks in 1974

COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

FILTER

MANUFACTURER Western Filter Corporation
PART NUMBER Series 6030
DESCRIPTION Inline, gas or liquid

QUALIFICATION STATUS _____
PROPELLANT/FLUID Compatible w/300 series CRES
RATING, ABSOLUTE 10 to 75 μ m

PRESSURE, OPERATING 6000 psi
PROOF 9000 psi
BURST _____
DIFFERENTIAL 75 or 300 psid

RATED FLOW To 8 GPM liquid, to 200 SCFM gas

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 304 CRES
ELEMENT _____

PORTS, INLET Optional for 0.25 to 0.5-in. line

OUTLET Same as inlet

MOUNTING _____

OPERATING TEMPERATURE RANGE Cryogenic to 800 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Western Filter product data sheet - 1982

FILTER

MANUFACTURER Western Filter Corporation
PART NUMBER XX-1-16510-XX (series 16510)
DESCRIPTION Inline filter, twilled Dutch double-weave element

QUALIFICATION STATUS _____
PROPELLANT/FLUID LHe, GHe, LN₂, GN₂, LOX, 90-percent H₂O₂
RATING, ABSOLUTE 10 to 85 μ m

PRESSURE, OPERATING 4500 psi
PROOF _____
BURST _____
DIFFERENTIAL _____

RATED FLOW 4 GPM

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS 3.5 in. by 1.25 or 1.375 in. diam (excluding ports)

MATERIAL, BODY 300 series CRES, TFE seal
ELEMENT 304 CRES

PORTS, INLET MS 33565-4, -6, -8, or -12

OUTLET Same as inlet
MOUNTING _____

OPERATING TEMPERATURE RANGE -425 to 500 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS Filtration rating increases w/tube and port size

DATA SOURCE Western Filter product data sheet - 1982

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 8228-501
DESCRIPTION _____

QUALIFICATION STATUS Apollo
PROPELLANT/FLUID _____
RATING, ABSOLUTE _____

PRESSURE, OPERATING 150 psia (104 N/cm²)
PROOF _____
BURST _____
DIFFERENTIAL _____

RATED FLOW _____

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
ELEMENT _____

PORTS, INLET _____
OUTLET _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 11267-504
DESCRIPTION Sintered metal-fiber element gas filter

QUALIFICATION STATUS Viking
PROPELLANT/FLUID _____
RATING, ABSOLUTE 5 μm

PRESSURE, OPERATING 50 psia (35 N/cm²)
PROOF _____
BURST _____
DIFFERENTIAL _____

RATED FLOW _____

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
ELEMENT _____

PORTS, INLET _____
OUTLET _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 12204-508
DESCRIPTION Woven-wire element gas filter

QUALIFICATION STATUS Apollo
PROPELLANT/FLUID He
RATING, ABSOLUTE 60 μ m

PRESSURE, OPERATING 315 psia (217 N/cm²)
PROOF 465 psia (320 N/cm²)
BURST 1215 psia (837 N/cm²)
DIFFERENTIAL _____

RATED FLOW 8 SCFM He at 155 psid

THROUGHPUT _____
LEAKAGE, EXTERNAL 0.0001 SCCS He

MASS 0.8 lbm (0.3 kg)
DIMENSIONS _____

MATERIAL, BODY 300 series CRES
ELEMENT 300 series CRES

PORTS, INLET MS 24385-4
OUTLET AND10050-4

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE ITTRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 14228-502
DESCRIPTION Woven-wire element gas filter

QUALIFICATION STATUS USAF classified program
PROPELLANT/FLUID GN₂
RATING, ABSOLUTE 25 μm (10 μm nom.)

PRESSURE, OPERATING 5215 psia (3595 N/cm²)
PROOF 7515 psia (5181 N/cm²)
BURST 10,015 psia (6905 N/cm²)
DIFFERENTIAL 10.00 psid (6.9 N/cm²)

RATED FLOW 20 SCFM GN₂ at 450 psid and 70 °F (9440 SCCS GN₂ at 310 N/cm² and 21 °C)

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 0.4 lbm (0.1 kg)
DIMENSIONS _____

MATERIAL, BODY 300 series CRES
ELEMENT 300 series CRES

PORTS, INLET MS 33656E4

OUTLET Same as inlet

MOUNTING _____

OPERATING TEMPERATURE RANGE -100 to 160 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Wintec product data sheet - 1985, IITRI lists (ref. 8), and Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick

PART NUMBER 14228-621-3

DESCRIPTION _____

QUALIFICATION STATUS Classified program

PROPELLANT/FLUID H₂O, alcohol

RATING, ABSOLUTE 25 μm

PRESSURE, OPERATING 330 psia (228 N/cm²)

PROOF _____

BURST _____

DIFFERENTIAL 0.90 psid (0.6 N/cm²)

RATED FLOW 1.3 lbm/s (0.6 kg/s)

THROUGHPUT _____

LEAKAGE, EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY _____

ELEMENT _____

PORTS, INLET _____

OUTLET AN818-12J

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 125 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Wintec product data sheet - 1985 and Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 14267-602
DESCRIPTION Wire-mesh element gas filter

QUALIFICATION STATUS ERTS, NIMBUS
PROPELLANT/FLUID _____
RATING, ABSOLUTE 10 μ m

PRESSURE, OPERATING 2000 psia (1380 N/cm²)
PROOF _____
BURST _____
DIFFERENTIAL _____

RATED FLOW 12 SCFM at 50 psia and 70 °F (5.6x10³ SCCS at 35 N/cm²
and 21 °C)
THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
ELEMENT 304 CRES wire mesh

PORTS, INLET _____
OUTLET _____

MOUNTING _____

OPERATING TEMPERATURE RANGE -60 to 160 °F (-51 to 71 °C)

VIBRATION, RANDOM 20g rms
SINE 20g

ACCELERATION 30g
SHOCK _____

LIFE, SERVICE 5 yr
CYCLE _____
SHELF 3 yr

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 15204-516
DESCRIPTION Woven-wire element gas filter

QUALIFICATION STATUS Apollo (qualified)
PROPELLANT/FLUID GHe, NTO, Freon, other
RATING ABSOLUTE 74 μ m (33 μ m nom.)

PRESSURE, OPERATING 186 psi
PROOF 215 psi
BURST _____
DIFFERENTIAL _____

RATED FLOW 403 SCFM He at 186 psi and 60 °F (270 lbm/hr)
 1.9×10^5 SCCS He at 128 N/cm² and 15 °C)

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 1.5 lbm (0.68 kg)
DIMENSIONS _____

MATERIAL, BODY 300 series CRES
ELEMENT 300 series CRES

PORTS, INLET _____
OUTLET 1-in. tube

MOUNTING _____

OPERATING TEMPERATURE RANGE 65 to 275 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Wintec product data sheet - 1985 and IITRI lists
(ref. 8)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 15228-572
DESCRIPTION Woven-wire element liquid-propellant filter

QUALIFICATION STATUS Viking (qualified, not flown)
PROPELLANT/FLUID N₂H₄
RATING, ABSOLUTE 35 μm

PRESSURE, OPERATING 555 psia (382 N/cm²)
PROOF 825 psia (568 N/cm²)
BURST 1095 psia (754 N/cm²)
DIFFERENTIAL 1.50 psid

RATED FLOW 2.30 lbm/s H₂O at 315 psid and 70 °F (1.04 kg/s H₂O at
217 N/cm² and 21 °C)
THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 0.45 lbm (0.2 kg)
DIMENSIONS _____

MATERIAL, BODY 300 series CRES
ELEMENT 300 series CRES

PORTS, INLET Flange; three 0.25-in. 28 UNJF-3A studs
OUTLET Flange; four 0.187-in.-diam holes
MOUNTING _____

OPERATING TEMPERATURE RANGE -20 to 125 °F

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Wintec product data sheet - 1985, IITRI lists
(ref. 8), and Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 15241-508
DESCRIPTION _____

QUALIFICATION STATUS Apollo, AE
PROPELLANT/FLUID UDMH, GN₂, GHe, deionized H₂O
RATING, ABSOLUTE 18 μm (5 μm nom.)

PRESSURE, OPERATING 250 psia (173 N/cm²)
PROOF _____
BURST _____
DIFFERENTIAL 0.50 psid

RATED FLOW _____

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
ELEMENT _____

PORTS, INLET _____
OUTLET _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Wintec product data sheet - 1985, and Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 15241-526
DESCRIPTION Woven-wire element liquid-propellant filter

QUALIFICATION STATUS Apollo
PROPELLANT/FLUID N₂H₄
RATING, ABSOLUTE 15 μm

PRESSURE, OPERATING 196 psia (135 N/cm²)
PROOF 390 psia (268 N/cm²)
BURST 515 psia (355 N/cm²)
DIFFERENTIAL _____

RATED FLOW 0.240 lbm/s (0.108 kg/s)

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS 0.287 lbm (0.130 kg)
DIMENSIONS _____

MATERIAL, BODY MC-999-0058
ELEMENT 300 series CRES

PORTS, INLET 0.631-in. o.d. tube
OUTLET 0.379-in. o.d. tube
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE ITTRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 15241-647
DESCRIPTION Woven-wire element liquid-propellant filter

QUALIFICATION STATUS USAF P777, AE, DSCSII, DSP
PROPELLANT/FLUID N₂H₄
RATING, ABSOLUTE 15 μm

PRESSURE, OPERATING 615 psia (424 N/cm²)
PROOF 1017 psia (701 N/cm²)
BURST 1347 psia (928 N/cm²)
DIFFERENTIAL _____

RATED FLOW 0.05 lbm/s N₂H₄ at 1.0 psid and 70 °F (0.02 kg/s at
0.69 N/cm² and 21 °C)

THROUGHPUT _____
LEAKAGE, EXTERNAL 1x10⁷ SCCS He

MASS 0.4 lbm (0.2 kg)
DIMENSIONS _____

MATERIAL, BODY 300 series CRES
ELEMENT 300 series CRES

PORTS, INLET 0.25-in. o.d. tube

OUTLET Same as inlet

MOUNTING _____

OPERATING TEMPERATURE RANGE -60 to 300 °F (-51 to 149 °C)

VIBRATION, RANDOM 20g rms
SINE 10g

ACCELERATION 24g

SHOCK 1000g

LIFE, SERVICE 7 yr

CYCLE 3 yr

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE ITTRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick
 PART NUMBER 15241-685 (TRW P/N EQ1-464)
 DESCRIPTION Metal-mesh element liquid-propellant filter

QUALIFICATION STATUS Atmosphere Explorer (qualified)
 PROPELLANT/FLUID N₂H₄
 RATING, ABSOLUTE 15 μm

PRESSURE, OPERATING 600 psia (413 N/cm²)
 PROOF 900 psia (620 N/cm²)
 BURST 2400 psia (1544 N/cm²)
 DIFFERENTIAL _____

RATED FLOW 0.02 lbm/s N₂H₄ at 1.0 psid and 70 °F (0.0009 kg/s at
 0.68 N/cm² and 21 °C)

THROUGHPUT _____
 LEAKAGE, EXTERNAL 1x10⁷ SCCS He at 750 psia (517 N/cm²)

MASS 0.4 lbm (0.2 kg)
 DIMENSIONS 5-in. length including tube connection

MATERIAL, BODY All CRES welded inline
 ELEMENT Twilled Dutch double-weave wire cloth

PORTS, INLET 0.25-in. o.d. tube (brazed into system by Aeroquip
 process)
 OUTLET Same as inlet

MOUNTING _____

OPERATING TEMPERATURE RANGE 41 to 122 °F (5 to 50 °C)

VIBRATION, RANDOM _____
 SINE _____

ACCELERATION _____
 SHOCK _____

LIFE, SERVICE _____
 CYCLE _____
 SHELF _____

RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS _____

DATA SOURCE ITTRI lists (ref. 8)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 15241-694-1 and -2
DESCRIPTION Wire-mesh element liquid filter

QUALIFICATION STATUS FLTSATCOM
PROPELLANT/FLUID N₂H₄
RATING, ABSOLUTE 10 μm

PRESSURE, OPERATING 350 psi
PROOF
BURST
DIFFERENTIAL 0.50 psid

RATED FLOW 60 lbm/hr

THROUGHPUT
LEAKAGE, EXTERNAL

MASS
DIMENSIONS

MATERIAL, BODY
ELEMENT

PORTS, INLET

OUTLET

MOUNTING

OPERATING TEMPERATURE RANGE 40 to 120 °F (for -1) and 150 °F (for -2)

VIBRATION, RANDOM 20.8g rms
SINE

ACCELERATION 15g

SHOCK 2500g

LIFE, SERVICE 5 yr

CYCLE

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Wintec product data sheet - 1985 and Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 15267-602
DESCRIPTION _____

QUALIFICATION STATUS Classified program
PROPELLANT/FLUID Aerozine 50, GN₂, GHe, alcohol, Freon
RATING, ABSOLUTE 10 μm

PRESSURE, OPERATING 400 psia (276 N/cm²)
PROOF _____
BURST _____
DIFFERENTIAL 2.00 psid

RATED FLOW 2520 lbm/hr

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
ELEMENT _____

PORTS, INLET _____
OUTLET 0.50-in. tube

MOUNTING _____

OPERATING TEMPERATURE RANGE 40 to 140 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Wintec product data sheet - 1985 and Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick

PART NUMBER 15267-60

DESCRIPTION _____

QUALIFICATION STATUS Skylab

PROPELLANT/FLUID Air, GN₂, GO₂

RATING, ABSOLUTE 10 μm

PRESSURE, OPERATING 300 psia (208 N/cm²)

PROOF _____

BURST _____

DIFFERENTIAL 25 psid

RATED FLOW 50 SCFM

THROUGHPUT _____

LEAKAGE, EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY _____

ELEMENT _____

PORTS, INLET _____

OUTLET MS 33656-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 275 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Wintec product data sheet - 1985 and Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 15267-604
DESCRIPTION _____

QUALIFICATION STATUS Skylab
PROPELLANT/FLUID _____
RATING, ABSOLUTE 10 μm

PRESSURE, OPERATING 6000 psia (4160 N/cm²)
PROOF _____
BURST _____
DIFFERENTIAL _____

RATED FLOW _____

THROUGHPUT _____
LEAKAGE, EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
ELEMENT _____

PORTS, INLET _____

OUTLET _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

FILTER

MANUFACTURER Wirtec, Brunswick
PART NUMBER 15312-501-1
DESCRIPTION Woven-wire element liquid-propellant filter

QUALIFICATION STATUS USAF P95 satellite
PROPELLANT/FLUID N₂H₄
RATING, ABSOLUTE 25 μm

PRESSURE, OPERATING 415 psia (286 N/cm²)
PROOF 915 psia (630 N/cm²)
BURST 1215 psia (837 N/cm²)
DIFFERENTIAL _____

RATED FLOW 0.075 lbm/s N₂H₄ at 2 psid and 70 °F (0.034 kg/s at
1 N/cm² and 21 °C)

THROUGHPUT _____
LEAKAGE, EXTERNAL No GN₂ bubbles at 415 psia (286 N/cm²) in Freon
TF for 2 min

MASS 0.75 lbm (0.34 kg)
DIMENSIONS _____

MATERIAL, BODY 300 series CRES
ELEMENT 300 series CRES

PORTS, INLET AN-818-GJ "B" nut and MS 20819-GJ sleeve

OUTLET Same as inlet
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8)

FILTER

MANUFACTURER Wintec, Brunswick
PART NUMBER 15312-501-3
DESCRIPTION Woven-wire element liquid-propellant filter

QUALIFICATION STATUS USAF P95 satellite
PROPELLANT/FLUID N₂H₄
RATING, ABSOLUTE 25 μm

PRESSURE, OPERATING 415 psia (286 N/cm²)
PROOF 915 psia (630 N/cm²)
BURST 1715 psia (1182 N/cm²)
DIFFERENTIAL _____

RATED FLOW 0.075 lbm/s at 2 psid and 70 °F (0.034 kg/s at
1 N/cm² and 21 °C)

THROUGHPUT _____
LEAKAGE, EXTERNAL No GN₂ bubbles at operating pressure submerged
in Freon TF for 2 min
MASS 0.46 lbm (0.20 kg)
DIMENSIONS _____

MATERIAL, BODY 300 series CRES
ELEMENT 300 series CRES

PORTS, INLET 0.375-in.-o.d. tube

OUTLET Same as inlet

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

C-2

COMPRESSOR/PUMP

MANUFACTURER Abex Corporation
PART NUMBER AM3C
DESCRIPTION Hydraulic pump

QUALIFICATION STATUS Space shuttle (rudder/speed brake)

PROPELLANT/FLUID _____

PRESSURE, MAX INLET _____
MAX OUTLET _____
RATIO _____

RATED FLOW _____
LEAKAGE, INTERNAL _____
MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEALS _____
INTEGRAL CHECK VALVE _____

PORTS, SIZE & TYPE _____

MOTOR, VOLTS _____
WATTS _____
POWER OUTPUT _____
ELECTRICAL CONNECTION _____
RPM _____

DUTY CYCLE _____
COOLING METHOD _____
MOUNTING _____
OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Abex product data sheet - 1984

COMPRESSOR/PUMP

MANUFACTURER Abex Corporation
 PART NUMBER AP05VC
 DESCRIPTION Multiple axial piston, single-stage, variable-volume pump
 QUALIFICATION STATUS Aircraft - Boeing 707, 727, 737; McDAC DC8; SNIAS A300, A310; etc.
 PROPELLANT/FLUID Hydraulic phosphate ester, MIL-H-5606, MIL-L-7808, MIL-H-83282
 PRESSURE, MAX INLET 30 psi
 MAX OUTLET 3000 psig
 RATIO 100:1
 RATED FLOW 4.4 GPM (16.7 L/min)
 LEAKAGE, INTERNAL _____
 MASS 1.9 lbm (0.86 kg)
 DIMENSIONS 3.094 by 3.094 by 2.90 in. (7.86 by 7.86 by 7.46 cm)
 MATERIAL, BODY _____
 SEALS _____
 INTEGRAL CHECK VALVE _____
 PORTS, SIZE & TYPE AND10050-6 (pressure and suction), -4 (case drain and seal drain)
 MOTOR, VOLTS _____
 WATTS _____
 POWER OUTPUT _____
 ELECTRICAL CONNECTION _____
 RPM 12,000
 DUTY CYCLE _____
 COOLING METHOD _____
 MOUNTING AND10260 type X
 OPERATING TEMPERATURE RANGE -65 to 275 °F (-54 to 135 °C)
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE 2000-hr normal operation
 CYCLE _____
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS Allowed particle contamination up to 40 µm. Motor is separate from compressor.

 DATA SOURCE Abex product data sheet - 1984

COMPRESSOR/PUMP

MANUFACTURER Abex Corporation
 PART NUMBER AP27V
 DESCRIPTION Multiple axial piston, single-stage pump
 QUALIFICATION STATUS Shuttle orbiter and SRB
 PROPELLANT/FLUID Phosphate esters, MIL-H-5606, MIL-L-7808, MIL-H-83282
 PRESSURE, MAX INLET 50 psi
 MAX OUTLET 3000 psi
 RATIO 60:1
 RATED FLOW 90 GPM (341 L/min)
 LEAKAGE, INTERNAL _____
 MASS 29.75 lbm (13.49 kg)
 DIMENSIONS 9.8 in. approximate length (25 cm)
 MATERIAL, BODY _____
 SEALS _____
 INTEGRAL CHECK VALVE _____
 PORTS, SIZE & TYPE MS 33649-20 (suction), -16 (outlet), -8 (case drain)
 MOTOR, VOLTS _____
 WATTS _____
 POWER OUTPUT _____
 ELECTRICAL CONNECTION _____
 RPM 5000
 DUTY CYCLE _____
 COOLING METHOD _____
 MOUNTING _____
 OPERATING TEMPERATURE RANGE -65 to 275 °F (-54 to 135 °C)
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE _____
 CYCLE _____
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS Motor is a separate item

 DATA SOURCE Abex product data sheet - 1984

COMPRESSOR/PUMP

MANUFACTURER Bendix Fluid Power Division
PART NUMBER 33E08-1
DESCRIPTION Motor-driven, double-ended, nonlubricated piston

QUALIFICATION STATUS _____

PROPELLANT/FLUID Air

PRESSURE, MAX INLET 1 atm
MAX OUTLET 20 psig
RATIO 2.36:1

RATED FLOW 3 CFM
LEAKAGE, INTERNAL _____
MASS 13 lbm
DIMENSIONS _____

MATERIAL, BODY _____
SEALS TFE (piston)
INTEGRAL CHECK VALVE _____

PORTS, SIZE & TYPE _____

MOTOR, VOLTS 25 to 31 Vdc
WATTS 527
POWER OUTPUT _____
ELECTRICAL CONNECTION _____
RPM _____

DUTY CYCLE Continuous
COOLING METHOD _____
MOUNTING _____
OPERATING TEMPERATURE RANGE -25 to 125 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE 1000 hr
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Designed for operation at 10,000-ft altitude max.,
integral relief 15 to 25 psi

DATA SOURCE Bendix product data sheet - 1985

COMPRESSOR/PUMP

MANUFACTURER Lexair Inc.
 PART NUMBER P57228
 DESCRIPTION Two-stage, convection cooled w/intercooler
 QUALIFICATION STATUS U.S. Navy submarine
 PROPELLANT/FLUID CO₂
 PRESSURE, MAX INLET 10 psig
 MAX OUTLET 550 psi
 RATIO 22:1
 RATED FLOW 1.2 to 3.5 SCFM (8 to 24 lbm/hr)
 LEAKAGE, INTERNAL
 MASS 44 lbm (30.8 lbm possible)
 DIMENSIONS 12.84 by 12.35 by 18.1 in.
 MATERIAL, BODY
 SEALS
 INTEGRAL CHECK VALVE
 PORTS, SIZE & TYPE
 MOTOR, VOLTS
 WATTS Optional
 POWER OUTPUT 0.8 to 1.6 bhp
 ELECTRICAL CONNECTION
 RPM
 DUTY CYCLE
 COOLING METHOD
 MOUNTING Four 0.531-in. diam holes at 6.28 by 7.16 in.
 OPERATING TEMPERATURE RANGE to 340 °F
 VIBRATION, RANDOM
 SINE
 ACCELERATION
 SHOCK
 LIFE, SERVICE
 CYCLE
 SHELF
 RELIABILITY
 LEAD TIME
 COST \$6680 w/o motor or ≈ \$9000 w/motor per unit in 1985
 REMARKS Mineral oil pressure lubricated; may require modifications
 for microgravity operation; convection cooled

DATA SOURCE Lexair product data sheet - 1985

COMPRESSOR/PUMP

MANUFACTURER Metal Bellows Division
PART NUMBER DX27312
DESCRIPTION Three-stage bellows gas compressor
QUALIFICATION STATUS Not qualified; MORL research
PROPELLANT/FLUID _____
PRESSURE, MAX INLET 30 psia
MAX OUTLET 300 psia
RATIO 10:1
RATED FLOW 0.5 SCFM min.
LEAKAGE, INTERNAL _____
MASS 25 lbm
DIMENSIONS _____
MATERIAL, BODY _____
SEALS _____
INTEGRAL CHECK VALVE _____
PORTS. SIZE & TYPE _____
MOTOR, VOLTS 200 V (three phase)
WATTS 700 max.
POWER OUTPUT 0.38 hp
ELECTRICAL CONNECTION _____
RPM 3700
DUTY CYCLE _____
COOLING METHOD _____
MOUNTING _____
OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST Four units \$39,175 in 1972 (including \$22,500 engineering)
REMARKS Motors are no longer available; design modification
necessary

DATA SOURCE Metal Bellows drawing DX27312 - 1973

COMPRESSOR/PUMP

MANUFACTURER Metal Bellows Division
PART NUMBER D41609
DESCRIPTION Single-stage, bellows gas pump

QUALIFICATION STATUS

PROPELLANT/FLUID neon

PRESSURE, MAX INLET
MAX OUTLET
RATIO 2.6:1 (estimated based on 24 psid)

RATED FLOW
LEAKAGE, INTERNAL 3.0×10^{-6} SCCS air at 1 atm
MASS 7 lbm
DIMENSIONS

MATERIAL, BODY
SEALS
INTEGRAL CHECK VALVE

PORTS, SIZE & TYPE SS-400-1-2 (inlet); SS-400-2-2 (outlet)

MOTOR, VOLTS 28 ± 7 Vdc
WATTS 12 max. average
POWER OUTPUT
ELECTRICAL CONNECTION
RPM 0 to 3000

DUTY CYCLE 3 hr continuous/24 hr; 1000 cycles
COOLING METHOD

MOUNTING
OPERATING TEMPERATURE RANGE -20 to 70 °C (-4 to 158 °F)

VIBRATION, RANDOM Per table 1 and fig. 1 (NAS5-28178 S.O.W.)
SINE

ACCELERATION $\pm 15g$
SHOCK

LIFE, SERVICE 2 to 4 yr
CYCLE
SHELF

RELIABILITY
LEAD TIME
COST
REMARKS

DATA SOURCE Metal Bellows drawing D41609 - 1985

COMPRESSOR/PUMP

MANUFACTURER Moog Inc.
PART NUMBER Model 50-503
DESCRIPTION Circulator pump

QUALIFICATION STATUS Peacekeeper - inertial measurement unit

PROPELLANT/FLUID FC-77

PRESSURE, MAX INLET
MAX OUTLET (Rise) 19 psid
RATIO 2.3:1 (from 1 atm)
RATED FLOW 1.0 GPM at 19 psid
LEAKAGE, INTERNAL
MASS
DIMENSIONS 2.726 by 2.001 by 2.59 in.

MATERIAL, BODY Al alloy
SEALS Viton
INTEGRAL CHECK VALVE

PORTS, SIZE & TYPE

MOTOR, VOLTS 40
WATTS 110
POWER OUTPUT
ELECTRICAL CONNECTION
RPM 24,000

DUTY CYCLE
COOLING METHOD
MOUNTING
OPERATING TEMPERATURE RANGE

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE 10 yr
CYCLE 4000
SHELF

RELIABILITY 40 failures per million operating hours

LEAD TIME
COST

REMARKS Alternative motor possible

DATA SOURCE Moog Model 50-503 Circulator Pump Rev A
(Product description report) - 1985

PRESSURE SWITCH

MANUFACTURER Consolidated Controls Corporation
PART NUMBER 21SN04-22
DESCRIPTION

QUALIFICATION STATUS Satellite (Walter Kidde)

PROPELLANT/FLUID

PRESSURE, OFF 18±2 psig
RESET 12 psig min.
MAX OPERATING
PROOF 50 psig
BURST 75 psig

DUTY CYCLE
MASS
DIMENSIONS

MATERIAL
PORT, SIZE & TYPE 0.736-in.-diam special plug
VOLTAGE 28±5 to 5.5 Vdc
WATTS 66
ELECTRICAL CONNECTION

MOUNTING Four-bolt flange; 0.177-in.-diam holes on a 1.375 in. square

OPERATING TEMPERATURE RANGE 40 to 120 °F

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
CYCLE
SHELF

RELIABILITY
LEAD TIME
COST
REMARKS

DATA SOURCE Consolidated Controls drawing R21SN04-22 - 1985

PRESSURE SWITCH

MANUFACTURER Consolidated Controls Corporation
PART NUMBER 21SN04-93
DESCRIPTION _____

QUALIFICATION STATUS Satellite (Walter Kidde)
PROPELLANT/FLUID _____

PRESSURE, OFF 3.2±0.15 psig
RESET 2.85 psig min.
MAX OPERATING _____
PROOF 50 psig
BURST 75 psig

DUTY CYCLE _____
MASS _____
DIMENSIONS 4.06 in. max. by 1.75 in. diam less leads and port

MATERIAL _____
PORT, SIZE & TYPE 0.483-in.-diam special plug
VOLTAGE 28±5 to 5.5 Vdc
WATTS 17
ELECTRICAL CONNECTION 2 lead wires

MOUNTING _____

OPERATING TEMPERATURE RANGE 40 to 120 °F

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Consolidated Controls drawing R21SN04-93 - 1985

PRESSURE SWITCH

MANUFACTURER Consolidated Controls Corporation
PART NUMBER 21SN22-1
DESCRIPTION _____

QUALIFICATION STATUS Saturn (McDonnell Douglas)

PROPELLANT/FLUID LOX

PRESSURE, OFF 41.0 psia
RESET 38.0 psia min.
MAX OPERATING _____
PROOF 74 psia
BURST 125 psia

DUTY CYCLE _____
MASS _____
DIMENSIONS 4.90 in. max. by 3.625 in. diam

MATERIAL _____
PORT, SIZE & TYPE MC172-4, MC172-2 test port
VOLTAGE 30 Vdc
WATTS 15
ELECTRICAL CONNECTION Mates w/Bendix PTOGE-8-4S

MOUNTING _____

OPERATING TEMPERATURE RANGE -200 to 175 °F

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Consolidated Controls drawing R21SN22-1 - 1985

PRESSURE SWITCH

MANUFACTURER Consolidated Controls Corporation
PART NUMBER 21SN41 series
DESCRIPTION High temperature, low pressure

QUALIFICATION STATUS Airbus

PROPELLANT/FLUID _____

PRESSURE, OFF 0.75 to 40 psig
RESET _____
MAX OPERATING 80 psig
PROOF 120 psig
BURST _____

DUTY CYCLE _____

MASS _____

DIMENSIONS 1.97 in. less connections and port by 1.76 in. diam

MATERIAL CRES

PORT, SIZE & TYPE MS 33514E6

VOLTAGE _____

WATTS _____

ELECTRICAL CONNECTION Mates w/MS 24266R12T3S

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 400 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Consolidated Controls product data sheet - 1985

PRESSURE SWITCH

MANUFACTURER Consolidated Controls Corporation

PART NUMBER 212C50-54H

DESCRIPTION

QUALIFICATION STATUS Peacekeeper (United Technologies Chemical Systems Division)

PROPELLANT/FLUID Freon 12

PRESSURE, OFF 9.25 psia

RESET 0.5 psia min.

MAX OPERATING 220 psia

PROOF 300 psia

BURST 485 psia

DUTY CYCLE

MASS

DIMENSIONS 4.38 by 2.25 by 1.28 in.

MATERIAL

PORT, SIZE & TYPE

VOLTAGE 28 Vdc

WATTS 112

ELECTRICAL CONNECTION Mates w/ G&H Technology P/N BLG6F11-5SN

MOUNTING

OPERATING TEMPERATURE RANGE 23 to 121 °F

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

CYCLE 100 min

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS 1×10^{-7} SCCS He at 220 psia leakage

DATA SOURCE Consolidated Controls drawing R212C50-54H - 1985

PRESSURE SWITCH

MANUFACTURER Consolidated Controls Corporation
PART NUMBER 212C117-5
DESCRIPTION _____

QUALIFICATION STATUS Standard missile (Aerojet) (Morton Thiokol)

PROPELLANT/FLUID _____

PRESSURE, OFF 370 psig
RESET 160 psig
MAX OPERATING _____
PROOF 4000 psi
BURST 7500 psi

DUTY CYCLE _____

MASS _____

DIMENSIONS 2.821 in. by 1.00 in. diam

MATERIAL _____

PORT, SIZE & TYPE MS 33656E3

VOLTAGE _____

WATTS _____

ELECTRICAL CONNECTION MS 3113H-10A-6P

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE 200 min.

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Consolidated Controls drawing R212C117-5 - 1985

PRESSURE SWITCH

MANUFACTURER Consolidated Controls Corporation
PART NUMBER 218C50
DESCRIPTION Vacuum switch

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OFF 1- to 30-in. mercury (vacuum)
RESET _____
MAX OPERATING _____
PROOF 150 percent max. operating
BURST _____

DUTY CYCLE _____
MASS 0.23 lbm
DIMENSIONS 2.94 in. by 1.40 in. diam

MATERIAL _____
PORT, SIZE & TYPE AND10050-4
VOLTAGE _____
WATTS _____
ELECTRICAL CONNECTION Mates w/MS 3106-10SL-3S

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 250 °F

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE 50,000 min.
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS Meets MIL-E-5272

DATA SOURCE Consolidated Controls product data sheet - 1985

PRESSURE SWITCH

MANUFACTURER ITT Neo-Dyn
PART NUMBER 1103P, 1173P, and 1193P
DESCRIPTION Welded diaphragm type, pneumatic, hydraulic

QUALIFICATION STATUS

PROPELLANT/FLUID

PRESSURE, OFF 1 to 100 psig (psia for 1193P)
RESET
MAX OPERATING
PROOF 300 psig for 1103P and 1193P, 100 psig for 1173P
BURST

DUTY CYCLE
MASS 0.13 lbm
DIMENSIONS

MATERIAL CRES
PORT, SIZE & TYPE MS 33656E4
VOLTAGE 28 Vdc rated
WATTS 196 (28 for 1193P)
ELECTRICAL CONNECTION

MOUNTING

OPERATING TEMPERATURE RANGE -65 to 275 °F ambient

VIBRATION, RANDOM
SINE 0 to 2000 Hz; 0 to 15g
ACCELERATION
SHOCK 25 to 50g

LIFE, SERVICE
CYCLE 75,000 to 100,000
SHELF

RELIABILITY
LEAD TIME

COST
REMARKS Optional: 100 to 1500 switch-off setpoint range; 550 °F
max. ambient temperature, 600g vibration

DATA SOURCE ITT Neo-Dyn product data sheet - 1985

PRESSURE SWITCH

MANUFACTURER ITT Neo-Dyn
PART NUMBER 1105P and 1106P
DESCRIPTION Diaphragm type, pneumatic (hydraulic optional)

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OFF 1 to 600 psig
RESET _____
MAX OPERATING _____
PROOF 4500 psig
BURST _____

DUTY CYCLE _____
MASS 0.13 lbm
DIMENSIONS _____

MATERIAL Al (CRES optional for 1105P only)
PORT, SIZE & TYPE MS 33656E4
VOLTAGE 28 Vdc rated
WATTS 196
ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 275 °F ambient

VIBRATION, RANDOM _____
SINE 0 to 2000 Hz; 0 to 15g
ACCELERATION _____
SHOCK 25 to 50g

LIFE, SERVICE _____
CYCLE 75,000 to 100,000
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Optional: 600 to 1400 psig switch-off setpoint range, dry circuit, 350 °F max. ambient OP temperature; 600g vibration; CRES body (1105P); hydraulic medium optional; hermetically sealed electricals

DATA SOURCE ITT Neo-Dyn product data sheet - 1985

PRESSURE SWITCH

MANUFACTURER Systron Donner, Edcliff
PART NUMBER 2-54
DESCRIPTION Snap action SPDT, diaphragm

QUALIFICATION STATUS _____

PROPELLANT/FLUID Any material-compatible fluid

PRESSURE, OFF (ON) 1 to 300 psig
RESET _____
MAX OPERATING 300 psig
PROOF 600 psig
BURST _____

DUTY CYCLE _____
MASS 0.11 lbm (0.05 kg)
DIMENSIONS 2.50 in. by 0.87 in. hex (6.35 by 2.21 cm)

MATERIAL NiSpan-C, 17-7PH CRES
PORT, SIZE & TYPE MS 33656-4 or optional
VOLTAGE 28 Vdc (rated)
WATTS 196 W (rated)
ELECTRICAL CONNECTION Solder pins or optional

MOUNTING _____

OPERATING TEMPERATURE RANGE -58 to 302 °F (-50 to 150 °C)

VIBRATION, RANDOM _____
SINE 10g at 20 to 2000 Hz
ACCELERATION 100g
SHOCK 100g for 11 ms, 1000g for 0.6 ms

LIFE, SERVICE _____
CYCLE 25,000
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Systron Donner product data sheet - 1986

PRESSURE SWITCH

MANUFACTURER Systron Donner, Edcliff
PART NUMBER 4-902
DESCRIPTION Strain gage, N.O.

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OFF 0 to 5000 psia/psig
RESET _____
MAX OPERATING 0 to 5000 psia/psig
PROOF 2X max.
BURST 5X max.

DUTY CYCLE _____
MASS 0.75 lbm (0.34 kg)
DIMENSIONS 1.50-in. hex by 3.60 in. less port (3.81 by 9.14 cm)

MATERIAL 17-7PH CRES
PORT, SIZE & TYPE AN893-4S modified
VOLTAGE 32 Vdc; 28 Vdc nom.
WATTS _____
ELECTRICAL CONNECTION PT1H-8-4P

MOUNTING _____

OPERATING TEMPERATURE RANGE -58 to 248 °F (-50 to 120 °C)

VIBRATION, RANDOM _____
SINE 50g peak to 2000 Hz
ACCELERATION 100g
SHOCK 100g for 11 ms

LIFE, SERVICE _____
CYCLE 1x10⁹
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Systron Donner product data sheet - 1986

PRESSURE SWITCH

MANUFACTURER Systron Donner, Edcliff
PART NUMBER 610 and 612
DESCRIPTION Low-pressure differential switch; single and dual

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, OFF 0.2 to 20 in. H₂O
RESET _____
MAX OPERATING _____
PROOF 50 psig
BURST _____

DUTY CYCLE _____

MASS _____

DIMENSIONS 2-in. hex by 1.63 or 2.40 in. (5.08 by 4.14 or 6.10 cm)

MATERIAL _____

PORT, SIZE & TYPE 1/8-27 female pipe thread

VOLTAGE 115 Vac rated

WATTS 575 W rated

ELECTRICAL CONNECTION Solder pins

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Systron Donner product data sheet - 1986

CHECK VALVE

MANUFACTURER Aerodyne Controls Corporation
PART NUMBER 4022

DESCRIPTION Inline
QUALIFICATION STATUS DOD qualified

PROPELLANT/FLUID Pneumatic

PRESSURE, OPERATING 300 psig
CRACKING 1.0 psid min.
PROOF 750 psig
BURST 1500 psig
RATED FLOW 4.0 SCFM (FEOD - 0.11 in.)

LEAKAGE, INTERNAL Zero at 2.5 to 750 psid
EXTERNAL Zero at 300 psig

MASS 0.88 lbm
DIMENSIONS 1.54 by 0.68 in. hex
MATERIAL, BODY
SEAT/SEAL
SPRING

PORTS, SIZE & TYPE MS 33656G4 (inlet)

MOUNTING

OPERATING TEMPERATURE RANGE -65 to 185 °F

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
CYCLE 50,000 min
SHELF

RELIABILITY
LEAD TIME
COST
REMARKS

DATA SOURCE Aerodyne Controls product data sheet - 1985

CHECK VALVE

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 2662-0001-13, -15

DESCRIPTION _____

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂, N₂

PRESSURE, OPERATING 0 to 1250 psig

CRACKING _____

PROOF 1875 psig

BURST 2500 psig

RATED FLOW 75 lbm/hr at 100 psig, at 2 psid

LEAKAGE, INTERNAL 0.2 SCCM at 10 to 1250 psid

EXTERNAL 0.2 SCCM

MASS 0.184 lbm

DIMENSIONS _____

MATERIAL, BODY _____

SEAT/SEAL _____

SPRING _____

PORTS, SIZE & TYPE _____

MOUNTING _____

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton product data sheet - 1987

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER H249T1-4TT(L)

DESCRIPTION _____
QUALIFICATION STATUS Saturn V (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 6000 psi
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 316 CRES
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -40 to 250 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER H299T-16BB (M.M. P/N 47E8-10F)

DESCRIPTION _____
QUALIFICATION STATUS Viking (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 6000 psi
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE AND10050-16

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 250 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick

PART NUMBER HP220T-8TT to -16TT

DESCRIPTION _____

QUALIFICATION STATUS Viking fuel systems (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 6000 psi

CRACKING _____

PROOF _____

BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES

SEAT/SEAL Teflon

SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-8 to -16

MOUNTING _____

OPERATING TEMPERATURE RANGE -320 to 400 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS M.M. P/N's 47D9-4 to -7

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER HP280T-4TF4 (Aerojet P/N 1159059)

DESCRIPTION _____
QUALIFICATION STATUS Delta/E, Delta/F (Aerojet)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 4500 psi
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Teflon
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -320 to 400 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Contrcls, Brunswick
PART NUMBER K220T-6TT, -12TT (Gen. Dyn. P/N 27/02108/10)

DESCRIPTION _____
QUALIFICATION STATUS Atlas propulsion control box (General Dynamics)
PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psi
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____
DIMENSIONS _____
MATERIAL, BODY 303 CRES
SEAT/SEAL Teflon
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-6/12

MOUNTING _____

OPERATING TEMPERATURE RANGE -320 to 400 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER K5120T-16TT-38

DESCRIPTION Integral relief check valve
QUALIFICATION STATUS Saturn V (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 2500 psi
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Teflon
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-16

MOUNTING _____

OPERATING TEMPERATURE RANGE -320 to 400 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P1-602, P2-602 (Bell P/N 8247-472065, -472070)

DESCRIPTION _____
QUALIFICATION STATUS Gemini - Agena engine

PROPELLANT/FLUID _____

PRESSURE, OPERATING 1700 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 347 CRES (for P1), 2024-T351 (for P2)
SEAT/SEAL Teflon (for P1), Butyl (for P2)
SPRING 302 CRES

PORTS, SIZE & TYPE MS 24385-5, MS 24385-4, MS 24386-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -35 to 160 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P3-319 (Gen. Dyn. P/N GD/A27-08565-1)

DESCRIPTION _____
QUALIFICATION STATUS Atlas vernier solo system (General Dynamics)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 120 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 2024-T351
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE MS 24385-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -30 to 275 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P6-180 (Aerojet P/N 094516)

DESCRIPTION _____
QUALIFICATION STATUS Delta AJ10-118 engine (Aerojet General)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 750 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 2024-T351 Al alloy
SEAT/SEAL Butyl
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-8

MOUNTING _____

OPERATING TEMPERATURE RANGE -20 to 120 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P7-425 (Gen. Dyn. P/N GD/A27-01279-3)

DESCRIPTION Pilot operated
QUALIFICATION STATUS Atlas staging (General Dynamics)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 4000 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 2024-T351 Al alloy
SEAT/SEAL Buna-N, Teflon
SPRING _____

PORTS, SIZE & TYPE AND10050-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 180 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P8-690 (GE P/N 133B2578)

DESCRIPTION Pneumatic
QUALIFICATION STATUS OAO (General Electric)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 3250 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 2024-T351 Al alloy
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33514-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -30 to 150 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P14-735 (Gen. Dyn. P/N 27-02109)

DESCRIPTION _____
QUALIFICATION STATUS Atlas propulsion control box (General Dynamics)
PROPELLANT/FLUID _____

PRESSURE, OPERATING 1000 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Teflon
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-8, AND10050-8

MOUNTING _____

OPERATING TEMPERATURE RANGE -100 to 165 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P15-698, P16-698 (Aerojet P/N 1120434,5)

DESCRIPTION
QUALIFICATION STATUS Apollo AJ10-137 engine (Aerojet)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 15 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 2024-T351 Al alloy
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -40 to 250 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick

PART NUMBER P17-698 (Aerojet P/N 1120437)

DESCRIPTION _____

QUALIFICATION STATUS Apollo AJ10-137 engine (Aerojet)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 15 psig

CRACKING _____

PROOF _____

BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES

SEAT/SEAL Buna-N

SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-6

MOUNTING _____

OPERATING TEMPERATURE RANGE -40 to 250 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P24-698 (Aerojet P/N 1181725)

DESCRIPTION _____
QUALIFICATION STATUS Space shuttle OMS

PROPELLANT/FLUID _____

PRESSURE, OPERATING 500 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 304 CRES
SEAT/SEAL Butyl
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 280 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P25-180 (Gen. Dyn. P/N 55-02446)

DESCRIPTION _____
QUALIFICATION STA: US Centaur (General Dynamics)

PROPELLANT/FLUID H₂O₂

PRESSURE, OPERATING 350 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 316 CRES
SEAT/SEAL Viton
SPRING 302 CRES

PORTS, SIZE & TYPE AND10050-8

MOUNTING _____

OPERATING TEMPERATURE RANGE -20 to 350 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P29-180, P30-180 (Aerojet P/N 1158525)

DESCRIPTION _____
QUALIFICATION STATUS Apollo AJ10-118 engine (Aerojet)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 2024-T351 Al alloy
SEAT/SEAL Teflon
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -20 to 120 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P45-220 (Hughes P/N 287278, 254207)

DESCRIPTION _____
QUALIFICATION STATUS Surveyor satellite vernier engine
(Hughes Aircraft)
PROPELLANT/FLUID _____

PRESSURE, OPERATING 1150 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 6061-T6
SEAT/SEAL Teflon
SPRING 302 CRES

PORTS, SIZE & TYPE _____

MOUNTING _____

OPERATING TEMPERATURE RANGE 0 to 300 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P64-344 (Boeing P/N 10-20387)

DESCRIPTION _____
QUALIFICATION STATUS Boeing project

PROPELLANT/FLUID LH₂

PRESSURE, OPERATING 130 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Teflon
SPRING 17-7PH CRES

PORTS, SIZE & TYPE MS 33656-6

MOUNTING _____

OPERATING TEMPERATURE RANGE -424 to 160 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P75-356

DESCRIPTION _____
QUALIFICATION STATUS Apollo (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 75 psi
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY Al alloy
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 275 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 119T1-1PP-35 (GE P/N 47C142684)

DESCRIPTION _____
QUALIFICATION STATUS BIOSAT (General Electric)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 215 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 316 CRES
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE 1/8-in. NPT

MOUNTING _____

OPERATING TEMPERATURE RANGE -40 to 250 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 220T-24BB-3, 220T-32BB-3 (M.M. P/N 47E8-22F, 26F)

DESCRIPTION _____
QUALIFICATION STATUS Viking (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psi
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Teflon
SPRING 302 CRES

PORTS, SIZE & TYPE AND10050-24, -30

MOUNTING _____

OPERATING TEMPERATURE RANGE -320 to 400 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 220T-8TT (M.M. P/N 47E8C8)

DESCRIPTION _____
QUALIFICATION STATUS Viking (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psi
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Teflon
SPRING 302 CRES

PORTS, SIZE & TYPE MS 336565-8

MOUNTING _____

OPERATING TEMPERATURE RANGE -320 to 400 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 249A-4TT(L)-15 (GE P/N SVS2635)

DESCRIPTION _____
QUALIFICATION STATUS Nimbus attitude control system (General Electric)
PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 2024-T4 Al alloy
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE MS 336565-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -40 to 250 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick

PART NUMBER 259T-4TT

DESCRIPTION _____

QUALIFICATION STATUS Sidewinder

PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psig

CRACKING _____

PROOF _____

BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES

SEAT/SEAL Buna-N

SPRING 302 CRES

PORTS, SIZE & TYPE MS 336565-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -30 to 275 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 264T2-8TT-25, -16TT-5 (Bell P/N 7161-472070, -25)

DESCRIPTION _____
QUALIFICATION STATUS Lunar Landing Research Vehicle
(Bell Aerospace)
PROPELLANT/FLUID H₂O₂

PRESSURE, OPERATING 3000 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 347 CRES
SEAT/SEAL Fluorosilicone
SPRING 302 CRES

PORTS, SIZE & TYPE MS 336565-8, -16

MOUNTING _____

OPERATING TEMPERATURE RANGE -80 to 350 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 859T-8TT

DESCRIPTION _____
QUALIFICATION STATUS Apollo (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 600 psi
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE MS 336565-8

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 275 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 869A-8TT/GA, 869A-8TT2 (Gen. Dyn. P/N 7-02337)

DESCRIPTION _____
QUALIFICATION STATUS Atlas vernier fuel system (General Dynamics);
Apollo (Martin Marietta)
PROPELLANT/FLUID _____

PRESSURE, OPERATING 600 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 2024-T4 Al alloy
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-8, -8TT2

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 180 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 2249B-2MM (Army P/N 11242054)

DESCRIPTION _____
QUALIFICATION STATUS Nike

PROPELLANT/FLUID _____

PRESSURE, OPERATING 250 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY Brass
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE 1/8-in. NPT

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 260 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 2633A-4TT (GE P/N R3447)

DESCRIPTION _____
QUALIFICATION STATUS BIOSAT capsule reentry system (General Electric)
PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 2024-T4 Al alloy
SEAT/SEAL Neoprene
SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-4

MOUNTING _____

OPERATING TEMPERATURE RANGE -40 to 300 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 8524T-6BB (Ham. Stan. P/N SVSK85341-1)

DESCRIPTION _____
QUALIFICATION STATUS Space shuttle ECS (Hamilton Standard)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 600 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Silicone
SPRING 302 CRES

PORTS, SIZE & TYPE AND10050-6

MOUNTING _____

OPERATING TEMPERATURE RANGE -70 to 500 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 8538A-16BB-9 (M.M. P/N 47E368-1)

DESCRIPTION _____
QUALIFICATION STATUS Viking (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 600 psig
CRACKING _____
PROOF _____
BURST _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 2024-T4 Al alloy
SEAT/SEAL Butyl
SPRING 302 CRES

PORTS, SIZE & TYPE AND10050-16

MOUNTING _____

OPERATING TEMPERATURE RANGE -40 to 100 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 10)

CHECK VALVE

MANUFACTURER Futurecraft Corporation

PART NUMBER 60616-19A

DESCRIPTION Pneumatic, cartridge

QUALIFICATION STATUS Space shuttle OMS engine (Aerojet)

PROPELLANT/FLUID N₂ or MMH

PRESSURE, OPERATING 0 to 450 psig

CRACKING 6.0 psig max. (reseal, 1.0 psig min.)

PROOF 900 psig

BURST 1800 psig

RATED FLOW 0.02 to 0.05 lbm/s min. FEOD = 0.135 in. diam

LEAKAGE, INTERNAL

EXTERNAL

MASS

DIMENSIONS 0.845 in. by 0.499 in. diam

MATERIAL, BODY 304L CRES

SEAT/SEAL Butyl

SPRING 302/304 CRES

PORTS, SIZE & TYPE

MOUNTING

OPERATING TEMPERATURE RANGE

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

CYCLE

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Futurecraft drawing 60616 - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2653-0001-1, 2001-3, 1001-5
DESCRIPTION Partial pressure oxygen sensor
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂

PRESSURE, MAX 5 psia O₂ partial pressure
MIN 0 psia
PROOF _____
BURST _____

MASS 0.79 lbm
DIMENSIONS _____

MATERIAL _____
PORT, SIZE & TYPE _____
VOLTAGE, INPUT 18 to 32 Vdc
WATTS 1.82 at 28 Vdc
SIGNAL _____
ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Carleton product data sheet - 1987

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 2657-0001-1

DESCRIPTION _____

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID N₂

PRESSURE, MAX 3300 psig

MIN 0 psig

PROOF 4950 psig

BURST 6600 psig

MASS 0.46 lbm

DIMENSIONS _____

MATERIAL _____

PORT, SIZE & TYPE _____

VOLTAGE, INPUT 10 Vdc

WATTS 0.066 at 28 Vdc

SIGNAL 30 mV

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 200 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton product data sheet - 1987

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 2664-0001-11

DESCRIPTION Cabin pressure decay sensor

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID Air

PRESSURE, MAX 18 psia

MIN 8 psia

PROOF 24 psia

BURST 36 psia

MASS 3.64

DIMENSIONS _____

MATERIAL _____

PORT, SIZE & TYPE _____

VOLTAGE, INPUT 24 to 32 Vdc

WATTS 1.96 at 28 Vdc

SIGNAL _____

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton product data sheet - 1987

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 2730-0001-1

DESCRIPTION _____

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID N₂

PRESSURE, MAX 20 psig

MIN 0 psig

PROOF 30 psig

BURST 60 psig

MASS 0.89 lbm

DIMENSIONS _____

MATERIAL _____

PORT, SIZE & TYPE _____

VOLTAGE, INPUT 10 Vdc

WATTS 0.066 at 28 Vdc

SIGNAL 30 mV FS

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS External leakage, 0.2 SCCM

DATA SOURCE Carleton product data sheet - 1987

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 2731-0001-5

DESCRIPTION Cabin air pressure

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID Air

PRESSURE, MAX 20 psia

MIN 0 psia

PROOF 40 psia

BURST 80 psia

MASS 0.46 lbm

DIMENSIONS _____

MATERIAL _____

PORT, SIZE & TYPE _____

VOLTAGE, INPUT 24 to 32 Vdc

WATTS 1.5 at 28 Vdc

SIGNAL 0 to 5 Vdc

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS External leakage, 0.2 SCCM

DATA SOURCE Carleton product data sheet - 1987

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 2732-0001-1

DESCRIPTION _____

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂

PRESSURE, MAX 1500 psig

MIN _____

PROOF 2500 psig

BURST 4500 psig

MASS 0.46 lbm

DIMENSIONS _____

MATERIAL _____

PORT, SIZE & TYPE _____

VOLTAGE, INPUT 10 Vdc

WATTS 0.066 at 28 Vdc

SIGNAL 30 mV FS

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton product data sheet - 1987

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 2733-0001-1

DESCRIPTION _____

QUALIFICATION STATUS _____

PROPELLANT/FLUID O₂, N₂

PRESSURE, MAX 300 psig

MIN _____

PROOF 450 psig

BURST 900 psig

MASS 0.26 lbm

DIMENSIONS _____

MATERIAL _____

PORT, SIZE & TYPE _____

VOLTAGE, INPUT 10 Vdc

WATTS 0.066 at 28 Vdc

SIGNAL 30 mV FS

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton product data sheet - 1987

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 2767-0001-1

DESCRIPTION Pressure gauge

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂, air

PRESSURE, MAX 20 psid

MIN 0 psid

PROOF _____

BURST _____

MASS 1.0 lbm

DIMENSIONS _____

MATERIAL _____

PORT, SIZE & TYPE _____

VOLTAGE, INPUT _____

WATTS _____

SIGNAL _____

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 120 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Leakage, 5.0 SCCM max.

DATA SOURCE Carleton product data sheet - 1987

PRESSURE TRANSDUCER/GAGE

MANUFACTURER CEC Instruments, Transamerica Delaval
PART NUMBER CEC 1000 series
DESCRIPTION Sputtered thin film
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, MAX 15 to 10,000 psi
MIN 0 psi
PROOF 2X rated max.
BURST 3X rated max.

MASS 0.31 to 0.34 lbm (except - 06, 0.50 lbm)

DIMENSIONS 2.40-in. body by 1.01 in. diam (6.10 cm by 2.56 cm
diam) except -06

MATERIAL 17-4PH CRES

PORT, SIZE & TYPE MS-33656-4

VOLTAGE, INPUT _____

WATTS _____

SIGNAL 30 mV (except -06, 15 mV)

ELECTRICAL CONNECTION PT1H-10-6P (101) or option

MOUNTING _____

OPERATING TEMPERATURE RANGE -420 to 650 °F (depending on model)

VIBRATION, RANDOM Natural frequency = 80 kHz (for most models)

SINE 35g (10 to 2000 Hz)

ACCELERATION _____

SHOCK 100g for 11 ms (8 ms for -09)

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Options include lead wire or PCS0GE-10-6S(SR) electrical
connection, vent port

DATA SOURCE CEC product data sheet - 1986

PRESSURE TRANSDUCER/GAGE

MANUFACTURER CEC Instruments, Transamerica Delaval
PART NUMBER CEC 2200 A/G
DESCRIPTION Diffused semiconductor type
QUALIFICATION STATUS

PROPELLANT/FLUID

PRESSURE, MAX 15 to 6000 psi
MIN 0 psi
PROOF 2X rated max.
BURST 3X rated max.

MASS 0.38 lbm

DIMENSIONS 3.87 in. (less connect) by 1.01 in. diam (9.81 cm by 2.57 cm diam)

MATERIAL 17-4PH CRES

PORT, SIZE & TYPE 1/4-18 NPT male

VOLTAGE, INPUT

WATTS

SIGNAL 40 mV full range

ELECTRICAL CONNECTION PT1H-10-6P

MOUNTING

OPERATING TEMPERATURE RANGE -65 to 250 °F

VIBRATION, RANDOM

SINE 35g peak at 5 to 2000 Hz

ACCELERATION 100g

SHOCK 1000g half sine wave pulse for 1 ms

LIFE, SERVICE

CYCLE

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE CEC product data sheet - 1986

PRESSURE TRANSDUCER/GAGE

MANUFACTURER CEC Instruments, Transamerica Delaval
PART NUMBER CEC 3000 A/G/S
DESCRIPTION Sputtered thin-film type
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, MAX 15 to 6000 psi
MIN 0 psi
PROOF 2X rated max.
BURST 7000 psi

MASS 0.31 lbm

DIMENSIONS 3.66 in. (less connector) by 1.01 in. diam (9.30 by 2.56 cm)

MATERIAL 17-4PH and 15-7Mo CRES

PORT, SIZE & TYPE MS 33656-4

VOLTAGE, INPUT _____

WATTS _____

SIGNAL 30 mV typical full range

ELECTRICAL CONNECTION PT1H-10-6P (101)

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 300 °F

VIBRATION, RANDOM _____

SINE 35g peak at 5 to 2000 Hz

ACCELERATION _____

SHOCK 1000g half sine wave pulse for 1 ms

LIFE, SERVICE 13,000 hr steady state

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE CEC product data sheet - 1986

PRESSURE TRANSDUCER/GAGE

MANUFACTURER CEC Instruments, Transamerica Delaval
PART NUMBER CEC 3300 A/G/S
DESCRIPTION Sputtered thin-film type
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, MAX 15 to 6000 psi
MIN 0 psi
PROOF 2X rated max.
BURST 3X rated max.

MASS 0.47 lbm

DIMENSIONS 4.72 in (less connector) by 1.01 in. diam (12.00 cm by 2.56 cm diam)

MATERIAL 17-4PH (and 15-7Mo below 30 psi) CRES

PORT, SIZE & TYPE MS 33656-4

VOLTAGE, INPUT _____

WATTS _____

SIGNAL 5.0 Vdc full range; 2 mA

ELECTRICAL CONNECTION PT1H-10-6P (101) (Bendix)

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 250 °F

VIBRATION, RANDOM _____

SINE 35g peak at 5 to 2000 Hz

ACCELERATION 100g

SHOCK 100g half sine wave pulse of 11 ms

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE CEC product data sheet - 1986

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Consolidated Controls Corporation

PART NUMBER 41SG51-1, -2

DESCRIPTION Strain gage pressure transducer

QUALIFICATION STATUS Space shuttle (Rockwell)

PROPELLANT/FLUID H₂, O₂

PRESSURE, MAX 1200 for -1, 400 psia for -2

MIN 0 psia

PROOF 1800 for -1, 600 psia for -2

BURST 3600 for -1, 1200 psia for -2

MASS 0.44 lbm

DIMENSIONS 1.25 in. diam by 3.00 in. less port and connections

MATERIAL

PORT, SIZE & TYPE MS 24385-4E

VOLTAGE, INPUT 24±0.024 Vdc

WATTS

SIGNAL 0 to 48 mV

ELECTRICAL CONNECTION MSFC 40M39569 (Deutsch DBA51H-10-6PN)

MOUNTING

OPERATING TEMPERATURE RANGE -125 to 225 °F

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

CYCLE

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Consolidated controls drawing R41SG51 - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Consolidated Controls Corporation

PART NUMBER 41SG78-7

DESCRIPTION

QUALIFICATION STATUS Space shuttle RCS (Marquardt)

PROPELLANT/FLUID NTO, MMH, He

PRESSURE, MAX 200 psia

MIN 0 psia

PROOF 3000 psia

BURST 10,000 psia

MASS 0.4 lbm

DIMENSIONS 2.27 in. by 1.00 in. diam plus base

MATERIAL

PORT, SIZE & TYPE At mount

VOLTAGE, INPUT

WATTS

SIGNAL 300 mV/V sensitivity; 1000 Ω

ELECTRICAL CONNECTION MP572-0306-0003 lead wires

MOUNTING Four 0.205-in.-diam holes at 0.45 by 1.375-in. flange mount

OPERATING TEMPERATURE RANGE 30 to 300 °F

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

CYCLE

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Consolidated Controls drawing R41SG78-7 - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Consolidated Controls Corporation

PART NUMBER 41SG85-21 to -75

DESCRIPTION _____

QUALIFICATION STATUS SSME (Rocketdyne)

PROPELLANT/FLUID _____

PRESSURE, MAX 300 to 9500 psia

MIN 0 psia

PROOF 150 percent of max.

BURST 300 percent of max. (20,000 psi max.)

MASS _____

DIMENSIONS 3.500 by 1.62 by 2.25 in.

MATERIAL _____

PORT, SIZE & TYPE At mount

VOLTAGE, INPUT _____

WATTS _____

SIGNAL 1500 Ω , 3.0 mV/V sensitivity

ELECTRICAL CONNECTION RES1231-E100 5N (2 required)

MOUNTING Flange; 0.28-in.-diam holes EQ SP on 1.50-in.-diam BC

OPERATING TEMPERATURE RANGE -65 to 165 °F compensated

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Consolidated Controls drawing R415685 - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Consolidated Controls Corporation
PART NUMBER 41SG86-21,-22,-31,-32,-41,-42
DESCRIPTION _____
QUALIFICATION STATUS Space shuttle (Rocketdyne)

PROPELLANT/FLUID _____

PRESSURE, MAX 4000 psia
MIN 0 psia
PROOF 6000 psia
BURST 12,000 psia

MASS _____
DIMENSIONS 3.500 by 1.650 by 2.30 in.

MATERIAL _____
PORT, SIZE & TYPE At mount
VOLTAGE, INPUT _____
WATTS _____
SIGNAL 1500 Ω , 3.0 mV/V sensitivity
ELECTRICAL CONNECTION RES1231-E1005N (2 required)

MOUNTING Flange, four 0.281-in. holes EQ SP on 1.500-in. BC

OPERATING TEMPERATURE RANGE 10 to 270 °F compensated

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Consolidated Controls drawing R415686-21,-31,-41,-22,-32,-42

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Consolidated Controls Corporation
PART NUMBER 41SG144 series
DESCRIPTION Strain gage type
QUALIFICATION STATUS Peacekeeper

PROPELLANT/FLUID _____

PRESSURE, MAX 300 to 5000 psia
MIN 0 psia
PROOF 150 percent of max.
BURST 200 percent of max. (5000 psia min.)

MASS _____
DIMENSIONS 5.12 in. max. by 1.28 in. diam

MATERIAL _____
PORT, SIZE & TYPE MS 33656E4
VOLTAGE, INPUT 28±4 Vdc
WATTS _____
SIGNAL _____
ELECTRICAL CONNECTION MIL-C-38999 series IV

MOUNTING _____

OPERATING TEMPERATURE RANGE -30 to 200 °F compensated

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Consolidated Controls drawing R41SG144 - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Consolidated Controls Corporation
PART NUMBER 41SG149-2500A1
DESCRIPTION Strain gage type
QUALIFICATION STATUS Peacekeeper (Hercules)

PROPELLANT/FLUID _____

PRESSURE, MAX 2500 psia
MIN 0 psia
PROOF 3750 psia
BURST 5000 psia

MASS 0.63 lbm max.
DIMENSIONS 5.42 in. max. by 1.85 by 1.35 in.

MATERIAL _____
PORT, SIZE & TYPE Special 0.394-in.-diam plug at mount
VOLTAGE, INPUT 28±4 Vdc
WATTS _____
SIGNAL 0 to 5 Vdc; 50-kΩ load; 1000-Ω max. impedance
ELECTRICAL CONNECTION MIL-C-38999 series IV

MOUNTING Three-bolt flange; 0.204-in.-diam holes EQ SP on
1.000-in.-diam BC

OPERATING TEMPERATURE RANGE -30 to 200 °F compensated

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Consolidated Controls drawing R41SG149-1 - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Consolidated Controls Corporation

PART NUMBER 41SG155-1

DESCRIPTION Strain gage type

QUALIFICATION STATUS Peacekeeper (Hercules)

PROPELLANT/FLUID

PRESSURE, MAX 3500 psia

MIN 0 psia

PROOF 5250 psia

BURST 7000 psia

MASS 0.56 lbm

DIMENSIONS 4.92 in. max. by 1.28 in. diam

MATERIAL

PORT, SIZE & TYPE MS 33656E4

VOLTAGE, INPUT 28±4 Vdc

WATTS

SIGNAL 0 to 5 Vdc; 1000-Ω impedance

ELECTRICAL CONNECTION MIL-C-38999 series IV

MOUNTING

OPERATING TEMPERATURE RANGE -30 to 200 °F compensated

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

CYCLE

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Consolidated Controls drawing R41SG155-1 - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Consolidated Controls Corporation

PART NUMBER 41SG156-1700A1

DESCRIPTION Strain gage type

QUALIFICATION STATUS Peacekeeper (Hercules)

PROPELLANT/FLUID

PRESSURE, MAX 1700 psia

MIN 0 psia

PROOF 2550 psia

BURST 5000 psia

MASS 0.56 lbm

DIMENSIONS 4.94 in. max. by 1.28 in. diam

MATERIAL

PORT, SIZE & TYPE MS 33656E2

VOLTAGE, INPUT 28±4 Vdc

WATTS

SIGNAL 0 to 5 Vdc; 1000-Ω max. impedance

ELECTRICAL CONNECTION MIL-C-38999 series IV

MOUNTING

OPERATING TEMPERATURE RANGE -30 to 200 °F compensated

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

CYCLE

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Consolidated Controls drawing R41SG156 - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Consolidated Controls Corporation

PART NUMBER 41SG156-3500A1, -3500A2

DESCRIPTION Strain gage type

QUALIFICATION STATUS Peacekeeper (Hercules)

PROPELLANT/FLUID

PRESSURE, MAX 3500 psia

MIN 0 psia

PROOF 5250 psia

BURST 7000 psia

MASS 0.56 lbm

DIMENSIONS 4.94 in. max by 1.28 in. diam

MATERIAL

PORT, SIZE & TYPE MS 33656E2

VOLTAGE, INPUT 28±4 Vdc

WATTS

SIGNAL 0 to 5 Vdc; 1000-Ω max. impedance

ELECTRICAL CONNECTION MIL-C-38999 series IV

MOUNTING

OPERATING TEMPERATURE RANGE

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

CYCLE

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Consolidated Controls drawing R41SG156 - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Consolidated Controls Corporation

PART NUMBER (NAVORD) 3064422

DESCRIPTION _____

QUALIFICATION STATUS PBCS, Trident

PROPELLANT/FLUID _____

PRESSURE, MAX 150 psia

MIN 0 psia

PROOF _____

BURST _____

MASS 1.1 lbm

DIMENSIONS 4.25 in. (less port and connections) by 2.25 in. diam
(less mount)

MATERIAL _____

PORT, SIZE & TYPE MS 33656E4 (modified)

VOLTAGE, INPUT _____

WATTS _____

SIGNAL _____

ELECTRICAL CONNECTION Special

MOUNTING Standoff pad; two 0.266-in. holes at 0.750 in.

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Consolidated Controls drawing 3064422 - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Paine Corporation
PART NUMBER 210-75-XXX series
DESCRIPTION _____
QUALIFICATION STATUS _____

PROPELLANT/FLUID Any fluid compatible w/17-4PH CRES

PRESSURE, MAX 75 to 1500 psi
MIN 0 psi
PROOF Up to 150 percent of max.
BURST 300 percent of max.

MASS _____
DIMENSIONS 1.92 in. less electrical connections by 1.004-in. hex
(4.88 by 2.54 cm)

MATERIAL 17-4PH CRES
PORT, SIZE & TYPE MS 33649-4
VOLTAGE, INPUT 10 Vdc

WATTS _____
SIGNAL _____
ELECTRICAL CONNECTION Mates w/MS 3115-10-6S or solder terminal

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE 20g
ACCELERATION 20g
SHOCK 30g

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Paine product data sheet - 1986

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Statham Division
PART NUMBER PA732TC
DESCRIPTION Unbonded strain gage type
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, MAX 5 to 5000 psia
MIN 0 psia
PROOF 7500 psia
BURST _____

MASS 0.44 lbm (0.20 kg)
DIMENSIONS 2.61 in. (less port and connections) by 1.14 in. diam
(6.63 cm by 2.90 cm diam)

MATERIAL _____
PORT, SIZE & TYPE MS 33656-G4 (two for differential pressure
versions)

VOLTAGE, INPUT 7 V

WATTS _____

SIGNAL 3 mV/V sensitivity

ELECTRICAL CONNECTION Mates w/Bendix PC06-8-4S

MOUNTING _____

OPERATING TEMPERATURE RANGE 75 to 600 °F compensated (24 to
315 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS PL732TC and PM732TC differential pressure gage versions:
specifications above necessary for PA732TC only

DATA SOURCE Statham product data sheet - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Statham Division
PART NUMBER PA4088
DESCRIPTION Thin-film strain gage; high performance
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, MAX 15 to 5000 psia
MIN 0 psia
PROOF 7500 psia
BURST _____

MASS 0.53 lbm (0.24 kg)
DIMENSIONS 1.25 in. diam (3.18 cm diam)

MATERIAL _____
PORT, SIZE & TYPE MS 33656-E4
VOLTAGE, INPUT 28 Vdc
WATTS _____
SIGNAL 5 V
ELECTRICAL CONNECTION Mates w/Bendix PTO6-10-6S

MOUNTING _____

OPERATING TEMPERATURE RANGE 0 to 200 °F compensated (-17 to 93 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Statham product data sheet - 1985

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Systron Donner, Edcliff
PART NUMBER 2-201
DESCRIPTION Potentiometric, capsule sensor
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, MAX 5 to 350 psig/psia
MIN 0 psig/psia
PROOF 150 percent of max.
BURST _____

MASS 0.19 lbm (0.09 kg)
DIMENSIONS 1.00 in. diam by 2.27 in. plus connections (2.54 by 5.77 cm)

MATERIAL NiSpan-C, 17-7PH CRES
PORT, SIZE & TYPE MS 33656-4 or optional
VOLTAGE, INPUT _____

WATTS _____
SIGNAL 500 to 10,000 Ω
ELECTRICAL CONNECTION PT1H-8-4P

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE 20g to 65g at 55 to 2000 Hz
ACCELERATION 100g
SHOCK 100g for 11 ms

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Options available; welded construction

DATA SOURCE Systron Donner product data sheet - 1986

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Systron Donner, Edcliff
PART NUMBER 2-400
DESCRIPTION Potentiometric, helical Bourdon tube
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, MAX 300 to 5000 psia/psig
MIN 0 psia/psig
PROOF 150 percent of max.
BURST 200 percent of max.

MASS 0.25 lbm (0.11 kg)

DIMENSIONS 2.812 in. by 1.125 in. diam (7.14 by 2.86 cm)

MATERIAL NiSpan-C, 17-7PH CRES

PORT, SIZE & TYPE MS 33656E2 or optional

VOLTAGE, INPUT _____

WATTS _____

SIGNAL 500 to 10,000 Ω

ELECTRICAL CONNECTION MS 3116-8-45

MOUNTING Two-hole mounting base optional

OPERATING TEMPERATURE RANGE -58 to 302 °F (-50 to 150 °C)

VIBRATION, RANDOM _____

SINE 35g at 55 to 2000 Hz for ± 1 percent FS error

ACCELERATION 30g

SHOCK 50g for 11 ms half sine wave

LIFE, SERVICE 100,000 full cycles; 1,000,000 dither cycles

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Optional differential pressure models, segmented switches,
other

DATA SOURCE Systron Donner product data sheet - 1986

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Systron Donner, Edcliff
PART NUMBER 4-901
DESCRIPTION Solid state strain gage
QUALIFICATION STATUS _____

PROPELLANT/FLUID Compatible with 17-7PH CRES

PRESSURE, MAX 200 to 5000 psia/psig
MIN 0 psia/psig
PROOF 200 percent of max.
BURST 500 percent of max.

MASS 0.38 lbm (0.17 kg)
DIMENSIONS 1.12 in. hex by 3.0 in. plus fittings (2.84 by 7.62 cm)

MATERIAL 17-7PH CRES
PORT, SIZE & TYPE MS 33656-4 modified
VOLTAGE, INPUT 28±4 Vdc
WATTS _____
SIGNAL 0 to 5±0.05 Vdc at FS
ELECTRICAL CONNECTION PT1H-8-4P

MOUNTING _____

OPERATING TEMPERATURE RANGE -58 to 248 °F (-50 to 120 °C)

VIBRATION, RANDOM _____
SINE 50g to 2000 Hz
ACCELERATION 100g
SHOCK 100g for 11 ms

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Systron Donner product data sheet - 1986

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Systron Donner, Edcliff

PART NUMBER 4-910

DESCRIPTION Solid state strain gage

QUALIFICATION STATUS _____

PROPELLANT/FLUID Compatible with 17-7PH CRES

PRESSURE, MAX 16 to 2000 psia/psig

MIN 0 psia/psig

PROOF 500 percent of max.

BURST 1000 percent of max.

MASS 0.75 lbm (0.34 kg)

DIMENSIONS 4.85 in. by 1.38 in. diam (12.32 by 3.51 cm)

MATERIAL _____

PORT, SIZE & TYPE MS 33656E4

VOLTAGE, INPUT 28±4 Vdc

WATTS _____

SIGNAL 0 to 5±0.05 Vdc at FS

ELECTRICAL CONNECTION PT1H-8-4P

MOUNTING _____

OPERATING TEMPERATURE RANGE -58 to 248 °F (-50 to 120 °C)

VIBRATION, RANDOM _____

SINE 50g to 2000 Hz

ACCELERATION 100g

SHOCK 100g for 11 ms

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Systron Donner product data sheet - 1986

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Systron Donner, Edcliff
PART NUMBER 4-930
DESCRIPTION Differential pressure, strain-gaged diaphragm
QUALIFICATION STATUS _____

PROPELLANT/FLUID Compatible with 17-7PH CRES

PRESSURE, MAX 15 to 100 psid
MIN 0 psid
PROOF _____
BURST _____

MASS _____
DIMENSIONS 4.24 in. by 1.50 in. diam (10.80 by 3.81 cm)

MATERIAL 17-7PH CRES
PORT, SIZE & TYPE MS 33656-E4 modified and -E2
VOLTAGE, INPUT 28±4 Vdc
WATTS _____
SIGNAL 0 to 5±0.5 Vdc at FC
ELECTRICAL CONNECTION PT1H-8-4P

MOUNTING _____

OPERATING TEMPERATURE RANGE -58 to 248 °F (-50 to 120 °C)

VIBRATION, RANDOM _____
SINE 50g peak to 2000 Hz
ACCELERATION 100g
SHOCK 100g for 11 ms

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Systron Donner product data sheet - 1986

PRESSURE TRANSDUCER/GAGE

MANUFACTURER Systron Donner, Edcliff
PART NUMBER 4-931
DESCRIPTION Differential pressure, strain-gaged diaphragm
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

PRESSURE, MAX 15 to 100 psia
MIN 0 psia
PROOF 1.5X max.
BURST 3X max.

MASS 1.0 lbm (0.45 kg)
DIMENSIONS 5.31 in. by 2.00 in. diam (13.49 by 5.08 cm)

MATERIAL 17-7PH CRES
PORT, SIZE & TYPE MS 33657S3 and MS 33657S4
VOLTAGE, INPUT 28±4 Vdc
WATTS _____
SIGNAL 0 to 5±0.5 Vdc at FS
ELECTRICAL CONNECTION PT1H-10-6P

MOUNTING _____

OPERATING TEMPERATURE RANGE -58 to 248 °F (-50 to 120 °C)

VIBRATION, RANDOM _____
SINE 50g peak to 2000 Hz
ACCELERATION 100g
SHOCK 100g for 11 ms

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Systron Donner product data sheet - 1986

RELIEF VALVE

MANUFACTURER Aerodyne Controls Corporation
PART NUMBER 3895
DESCRIPTION Miniature, adjustable

QUALIFICATION STATUS DOD flight qualified

PROPELLANT/FLUID _____

PRESSURE, RELIEF 3 to 200 psig
RESET 90 percent of relief setting

RATED FLOW _____
LEAKAGE, INTERNAL _____

MASS 0.56 lbm
DIMENSIONS 0.72 in. by 0.44 in. hex

MATERIAL, BODY CRES
SEAT/SEAL _____
SPRING _____

PORTS, SIZE & TYPE 1/4-28 UNF-3A per MIL-S-7742

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 165 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____
COST _____

REMARKS Proof pressure, 350 psig; burst pressure, 450 psig

DATA SOURCE Aerodyne product data sheet - 1985

RELIEF VALVE

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2655-0001-5
DESCRIPTION Cabin relief, motor driven

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂, N₂

PRESSURE, RELIEF 16 psi

RESET 15.5 psi

RATED FLOW 0 to 150 lbm/hr at 16 psig

LEAKAGE, INTERNAL 15 SCCM at 15 psid

MASS 2.20 lbm

DIMENSIONS _____

MATERIAL, BODY _____

SEAT/SEAL _____

SPRING _____

PORTS, SIZE & TYPE _____

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 200 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS 18 to 32 Vdc motor - 6.7 W running, 32.2 W stalled
(w/position indicator)

DATA SOURCE Carleton product data sheet - 1987

RELIEF VALVE

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 3111-0001-15 (model number R217-050)
DESCRIPTION _____

QUALIFICATION STATUS Rocketdyne program

PROPELLANT/FLUID He

PRESSURE, RELIEF 320 to 330 psig
RESET 300 psia min.

RATED FLOW 0.19 lbm/s at 350 psig max.

LEAKAGE, INTERNAL 500 SCCM

MASS _____

DIMENSIONS 3.580 in. by 3.150 in. diam

MATERIAL, BODY 304L, 304 CRES

SEAT/SEAL _____

SPRING _____

PORTS, SIZE & TYPE 5/8-in. tube

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton drawing 3111-0001-15 - 1985

RELIEF VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER D500T series (Gen. Dyn. P/N 55-02957)
DESCRIPTION _____

QUALIFICATION STATUS Centaur (General Dynamics)

PROPELLANT/FLUID _____

PRESSURE, RELIEF 150 psig
RESET _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES

SEAT/SEAL Various

SPRING 302 CRES

PORTS, SIZE & TYPE Various

MOUNTING _____

OPERATING TEMPERATURE RANGE Various

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

RELIEF VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P13-533
DESCRIPTION _____

QUALIFICATION STATUS Apollo (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, RELIEF 15 psi
RESET _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 2024-T351

SEAT/SEAL Buna-N

SPRING 17-7PH CRES

PORTS, SIZE & TYPE MS 33656-16

MOUNTING _____

OPERATING TEMPERATURE RANGE 70 to 165 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

RELIEF VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P27-673 (M.M. P/N SK808D04206-001)
DESCRIPTION _____

QUALIFICATION STATUS Viking (Martin Marietta)

PROPELLANT/FLUID H₂

PRESSURE, RELIEF 150 psig
RESET _____

RATED FLOW _____
LEAKAGE, INTERNAL _____
MASS _____
DIMENSIONS _____

MATERIAL, BODY 2024-T351 Al alloy
SEAT/SEAL Teflon
SPRING 17-7PH CRES

PORTS, SIZE & TYPE _____

MOUNTING _____

OPERATING TEMPERATURE RANGE -100 to 150 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

RELIEF VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P68-344
DESCRIPTION _____

QUALIFICATION STATUS Apollo cryopump booster (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, RELIEF 250 psi
RESET _____

RATED FLOW _____
LEAKAGE, INTERNAL _____
MASS _____
DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Teflon
SPRING 302 CRES

PORTS, SIZE & TYPE AND10050-6

MOUNTING _____

OPERATING TEMPERATURE RANGE -300 to 155 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

RELIEF VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 520T1-8D-175 (Gen. Dyn. P/N 57-02913)
DESCRIPTION _____

QUALIFICATION STATUS Atlas (General Dynamics)

PROPELLANT/FLUID H₂O₂

PRESSURE, RELIEF 400 psig
RESET _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 316 CRES

SEAT/SEAL Teflon

SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-8 flare cone removed

MOUNTING _____

OPERATING TEMPERATURE RANGE -320 to 400 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

RELIEF VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 524T-2MP-7
DESCRIPTION _____

QUALIFICATION STATUS Apollo (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, RELIEF 200 psig
RESET _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES

SEAT/SEAL Silicone

SPRING 302 CRES

PORTS, SIZE & TYPE 1/4-in. NPT

MOUNTING _____

OPERATING TEMPERATURE RANGE -70 to 500 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

RELIEF VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 532T-1D-5 (VAR-1)
DESCRIPTION _____

QUALIFICATION STATUS Viking VTS telescope (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, RELIEF 150 psi
RESET _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES

SEAT/SEAL Viton

SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-5 w/flare cone removed

MOUNTING _____

OPERATING TEMPERATURE RANGE -20 to 400 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

RELIEF VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 559A-1M-X
DESCRIPTION _____

QUALIFICATION STATUS Mercury life support (AiResearch)

PROPELLANT/FLUID O₂

PRESSURE, RELIEF 400 psig
RESET _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 2024-T4 Al alloy

SEAT/SEAL Buna-N

SPRING 302 CRES

PORTS, SIZE & TYPE 1/8-in. NPT

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 275 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

RELIEF VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 559B-X (Army P/N 11241398)
DESCRIPTION _____

QUALIFICATION STATUS Nike-A

PROPELLANT/FLUID _____

PRESSURE, RELIEF 150 psig
RESET _____

RATED FLOW _____
LEAKAGE, INTERNAL _____
MASS _____
DIMENSIONS _____

MATERIAL, BODY Brass
SEAT/SEAL Buna-N
SPRING 302 CRES

PORTS, SIZE & TYPE *Various

MOUNTING _____

OPERATING TEMPERATURE RANGE -40 to 260 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

RELIEF VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 559T-6D-18.8 (GE P/N 47B113135P4)
DESCRIPTION _____

QUALIFICATION STATUS Bio-satellite, capsule relief (GE)

PROPELLANT/FLUID _____

PRESSURE, RELIEF 150 psig
RESET _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY _____

SEAT/SEAL Buna-N

SPRING 302 CRES

PORTS, SIZE & TYPE MS 33656-6 w/flare cone removed

MOUNTING _____

OPERATING TEMPERATURE RANGE -40 to 250 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

RELIEF VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 5159T-4TT-155, 5159T-2MP-200
DESCRIPTION _____

QUALIFICATION STATUS Apollo (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, RELIEF 2500 psi
RESET _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 303 CRES

SEAT/SEAL Buna-N

SPRING 17-7PH CRES

PORTS, SIZE & TYPE MS 33656-4 (for 4TT) 1/4-in. NPT (for 2MP)

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 275 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

RELIEF VALVE

MANUFACTURER Futurecraft Corporation
PART NUMBER 400214
DESCRIPTION Spring loaded, interval piston guide and stop

QUALIFICATION STATUS Minuteman reentry stage (Avco)

PROPELLANT/FLUID _____

PRESSURE, RELIEF 540±15 psia
RESET 475 psia min.

RATED FLOW _____

LEAKAGE, INTERNAL Zero at 450 psia

MASS 0.13 lbm

DIMENSIONS 2.30 in. by 0.81 in. hex

MATERIAL, BODY 2024-T4 Al alloy, 303 CRES poppet

SEAT/SEAL Fluorosilicone O-ring

SPRING CRES

PORTS, SIZE & TYPE MS 33656-4 modified

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Proof pressure, 1200 psia; burst pressure, 2400 psia

DATA SOURCE Futurecraft drawing 400214 - 1985

RELIEF VALVE

MANUFACTURER Futurecraft Corporation
PART NUMBER 400233
DESCRIPTION Spring and poppet w/inlet filter

QUALIFICATION STATUS Teal Ruby

PROPELLANT/FLUID GN₂

PRESSURE, RELIEF 75 to 85 psia (60 to 75 psig)
RESET 75 to 85 psia

RATED FLOW _____

LEAKAGE, INTERNAL _____

MASS _____

DIMENSIONS 4.15 by 2.50 by 1.19 in.

MATERIAL, BODY 304L CRES

SEAT/SEAL _____

SPRING 302 CRES

PORTS, SIZE & TYPE 0.250-in. tube (inlet and outlet); 0.028-in.
wall

MOUNTING Two 0.209-in.-diam holes, 0.940-in. apart

OPERATING TEMPERATURE RANGE -22 to 160 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Proof pressure, 105 psig; burst pressure, 280 psig; inlet
filter, 30 to 55 µm

DATA SOURCE Futurecraft drawing 400233 - 1985

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 1-4-00-58-11
DESCRIPTION w/integral relief
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂
PRESSURE, RANGE, INLET 900 to 600 psig
REGULATED 100 psi
OUTLET-LOCKUP 100 psi
PROOF, INLET 1875 psig
PROOF, OUTLET 190 psig
BURST, INLET 2500 psig
BURST, OUTLET 250 psig
DROP

RATED FLOW 0 to 50 lbm/hr
LEAKAGE, INTERNAL-MAX INLET PRESS 2.0 SCCM

EXTERNAL-MAX INLET PRESS 0.7 SCCM
MASS 2.5 lbm
DIMENSIONS

MATERIAL, BODY
SEAT/SEAL

SPRING
PORTS, SIZE & TYPE, INLET

OUTLET

INTEGRAL RELIEF 125 psi open, 105 psi reset

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE 35 to 120 °F
VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
SHELF

RELIABILITY
LEAD TIME

COST
REMARKS

DATA SOURCE Carleton product data sheet - 1987

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 1-4-00-58-13
DESCRIPTION w/integral relief
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂
PRESSURE, RANGE, INLET 1250 to 300 psig
REGULATED 100±10 psig
OUTLET-LOCKUP 125 psi
PROOF, INLET 1875 psig
PROOF, OUTLET 370 psig
BURST, INLET 2500 psig
BURST, OUTLET 490 psig
DROP

RATED FLOW 0 to 75 lbm/hr
LEAKAGE, INTERNAL-MAX INLET PRESS 2.0 SCCM at lockup

EXTERNAL-MAX INLET PRESS 0.6 SCCM

MASS 4.70 lbm
DIMENSIONS

MATERIAL, BODY
SEAT/SEAL

SPRING

PORTS, SIZE & TYPE, INLET

OUTLET

INTEGRAL RELIEF 245 psig, 215 reset

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Carleton product data sheet - 1987

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 1-4-00-58-15
DESCRIPTION _____
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂
PRESSURE, RANGE, INLET 900 to 300 psig
REGULATED 100±10 psig
OUTLET-LOCKUP 245 psi
PROOF, INLET 1875 psig
PROOF, OUTLET 370 psig
BURST, INLET 2500 psig
BURST, OUTLET 490 psig
DROP _____

RATED FLOW 0 to 50 lbm/hr
LEAKAGE, INTERNAL-~~MAX INLET PRESS~~ 10 SCCM at lockup

EXTERNAL-MAX INLET PRESS 1.0 SCCM
MASS 4.7 lbm
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____

OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE 35 to 120 °F
VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Carleton product data sheet - 1987

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 1-29-00
DESCRIPTION Diaphragm
QUALIFICATION STATUS _____

PROPELLANT/FLUID GH₂
PRESSURE, RANGE, INLET 5000 to 150 psi
REGULATED 0.5 to 1.2 psi
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW 0.07 SCFM
LEAKAGE, INTERNAL-MAX INLET PRESS _____

EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS 3.50 in. diam by 1.72 in. (8.89 by 4.37 cm)

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____

PORTS, SIZE & TYPE, INLET AND10050-4

OUTLET AND10050-4

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 160 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton drawing 1-29-00 - 1985

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 1-59-00-3
DESCRIPTION Diaphragm w/relief
QUALIFICATION STATUS _____

PROPELLANT/FLUID GO₂
PRESSURE, RANGE, INLET 1300 to 300 psig
REGULATED 10 psig
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW 0.4 lbm/hr min.
LEAKAGE, INTERNAL-MAX INLET PRESS _____

EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS 3.406 by 2.688 by 2.125 in.

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____

PORTS, SIZE & TYPE, INLET MS 2435-4

OUTLET Outlet and relief same as inlet

INTEGRAL RELIEF 39 psia crack; 30 psia reset, 0.2 lbm/hr at
40 psia

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -35 to 125 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Similar models: 1-59-00-1 and -2

DATA SOURCE Carleton drawing 1-59-00-3 - 1985

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 1-59-00-5
DESCRIPTION Diaphragm w/relief
QUALIFICATION STATUS Unknown

PROPELLANT/FLUID GN₂
PRESSURE, RANGE, INLET 1800 to 300 psig
REGULATED 37 to 43 psig
OUTLET-LOCKUP 48.0 psig max.
PROOF, INLET 2700 psig
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW 0.83 SCFM (393 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS 1.0 SCCM

EXTERNAL-MAX INLET PRESS 1.8 SCCH
MASS 0.45 lbm (0.2 kg)
DIMENSIONS 3.400 by 3.844 by 2.14 in.

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET MS 33514E-4 line and relief

OUTLET MS 33514E-4; MS 24385-4C relief

INTEGRAL RELIEF 56 psia crack, 48 psia reset

INTEGRAL FILTER _____
MOUNTING Two 8-32 holes at 1.562 in. (3.967 cm)

OPERATING TEMPERATURE RANGE 10 to 125 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton drawing 1-59-00-5 - 1985

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 2144-0001-31

DESCRIPTION Cabin pressure regulator

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂, N₂

PRESSURE, RANGE, INLET 295 to 90 psig

REGULATED 14.7 to 0.2 psia

OUTLET-LOCKUP 15.0 psia

PROOF, INLET 443 psig

PROOF, OUTLET 45 psig

BURST, INLET 590 psig

BURST, OUTLET 80 psig

DROP

RATED FLOW 0 to 75 lbm/hr

LEAKAGE, INTERNAL ~~MAX INLET PRESS~~ 7.0 SCCM at lockup

EXTERNAL-MAX INLET PRESS 1.0 SCCM

MASS 6.221 lbm

DIMENSIONS

MATERIAL, BODY

SEAT/SEAL

SPRING

PORTS, SIZE & TYPE, INLET

OUTLET

INTEGRAL RELIEF

INTEGRAL FILTER

MOUNTING

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Carleton product data sheet - 1987

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2144-0001-33
DESCRIPTION Cabin pressure regulator
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂, N₂
PRESSURE, RANGE, INLET 295 to 0 psig
REGULATED 8±0.2 psia
OUTLET-LOCKUP 8.3 psia
PROOF, INLET 443 psig
PROOF, OUTLET 45 psig
BURST, INLET 590 psig
BURST, OUTLET 60 psig
DROP

RATED FLOW 0 to 75 lbm/hr
LEAKAGE, INTERNAL ~~MAX INLET PRESS~~ 7.0 SCCM at lockup

EXTERNAL-MAX INLET PRESS 0.2 SCCM

MASS
DIMENSIONS

MATERIAL, BODY
SEAT/SEAL

SPRING

PORTS, SIZE & TYPE, INLET

OUTLET

INTEGRAL RELIEF

INTEGRAL FILTER

MOUNTING

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Carleton product data sheet - 1987

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2362-0001-11
DESCRIPTION Water tank pressure regulator w/relief
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID N₂
PRESSURE, RANGE, INLET 295 to 0 psig
REGULATED 16.25±0.75 psig
OUTLET-LOCKUP 17 psig
PROOF, INLET 443 psig
PROOF, OUTLET 27 psig
BURST, INLET 590 psig
BURST, OUTLET 36 psig
DROP

RATED FLOW 1 to 1.0 lbm/hr
LEAKAGE, INTERNAL-MAX INLET PRESS 2 SCCM at 215 psig

EXTERNAL-MAX INLET PRESS 0.6 SCCM

MASS 3.528 lbm
DIMENSIONS

MATERIAL, BODY
SEAT/SEAL

SPRING

PORTS, SIZE & TYPE, INLET

OUTLET

INTEGRAL RELIEF 20 psig at 0.5 lbm/hr, 17 psig reseal

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Carleton product data sheet - 1987

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2566
DESCRIPTION Single-stage pneumatic
QUALIFICATION STATUS OSO

PROPELLANT/FLUID N₂, He
PRESSURE, RANGE, INLET 4015 psia (2770 N/cm²) max.
REGULATED 220 psia (152 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW _____
LEAKAGE, INTERNAL-MAX INLET PRESS _____

EXTERNAL-MAX INLET PRESS _____
MASS 1.2 lbm (0.55 kg)
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____

OUTLET 0.25-in. tube (0.635 cm)

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE 5 to 140 °F (-29 to 60 °C)
VIBRATION, RANDOM 18.6g rms
SINE 12g

ACCELERATION 18g
SHOCK _____

LIFE, SERVICE 1 yr (100,000 cycles)
SHELF 2 yr

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2566-0002-1
DESCRIPTION Single stage
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID GN₂, CH₄
PRESSURE, RANGE, INLET 4000 to 300 psig
REGULATED 220 psig
OUTLET-LOCKUP 260 psig
PROOF, INLET 6000 psig
PROOF, OUTLET 6000 psig
BURST, INLET 8000 psig
BURST, OUTLET 8000 psig
DROP

RATED FLOW 1 to 7 SCFM
LEAKAGE, INTERNAL-MAX INLET PRESS 10 SCCH N₂

EXTERNAL-MAX INLET PRESS 1x10⁻⁶ SCCS He
MASS 1.75 lbm
DIMENSIONS 5.37 by 3.45 by 2.50 in.

MATERIAL, BODY
SEAT/SEAL

SPRING
PORTS, SIZE & TYPE, INLET Tube
OUTLET Tube

INTEGRAL RELIEF

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE -40 to 160 °F
VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
SHELF

RELIABILITY
LEAD TIME

COST
REMARKS

DATA SOURCE Carleton drawing 2566-0002 - 1985

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2726-0001-7
DESCRIPTION Two-stage w/integral relief
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID N₂
PRESSURE, RANGE, INLET 3300 to 200 psig
REGULATED 400±50 psig 1st stage, 200±15 psig 2nd stage
OUTLET-LOCKUP 240 psig
PROOF, INLET 4950 psig
PROOF, OUTLET 443 psig
BURST, INLET 6600 psig
BURST, OUTLET 590 psig
DROP

RATED FLOW 0 to 75 lbm/hr
LEAKAGE, INTERNAL-MAX INLET PRESS 2.5 SCCM at lockup

EXTERNAL-MAX INLET PRESS 1.0 SCCM
MASS 2.98 lbm
DIMENSIONS

MATERIAL, BODY
SEAT/SEAL

SPRING
PORTS, SIZE & TYPE, INLET
OUTLET

INTEGRAL RELIEF 295 psig open, 245 psig reseal

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE -65 to 200 °F
VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
SHELF

RELIABILITY
LEAD TIME

COST
REMARKS

DATA SOURCE Carleton product data sheet - 1987

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2729-0001-9
DESCRIPTION Two-stage w/integral relief
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂
PRESSURE, RANGE, INLET 3300 to 300 psig
REGULATED 400±50 psig 1st stage, 300±15 psig 2nd stage
OUTLET-LOCKUP 340 psig
PROOF, INLET 4950 psig
PROOF, OUTLET 1875 psig
BURST, INLET 6600 psig
BURST, OUTLET 2500 psig
DROP _____

RATED FLOW 0 to 150 lbm/hr
LEAKAGE, INTERNAL-MAX INLET PRESS 2.5 SCCM at lockup
EXTERNAL-MAX INLET PRESS 1.05 SCCM

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____

PORTS, SIZE & TYPE, INLET _____
OUTLET _____

INTEGRAL RELIEF 1250 psig open, 1075 psig reseal

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 200 °F
VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Carleton product data sheet - 1987

PRESSURE REGULATOR

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 1826001-19

DESCRIPTION _____

QUALIFICATION STATUS Unknown

PROPELLANT/FLUID 90 percent Ar, 10 percent CH₄

PRESSURE, RANGE, INLET 2500 to 500 psig

REGULATED 16 psia

OUTLET-LOCKUP _____

PROOF, INLET 3750 psig

PROOF, OUTLET 50 psig

BURST, INLET 6250 psig

BURST, OUTLET 100 psig

DROP _____

RATED FLOW 0.018 to 0.0004 SCFM (8.33 to 0.167 SCCS)

LEAKAGE, INTERNAL-MAX INLET PRESS _____

EXTERNAL-MAX INLET PRESS _____

MASS 0.9 lbm (0.4 kg)

DIMENSIONS 3.59 by 2.41 by 2.63 in.

MATERIAL, BODY _____

SEAT/SEAL _____

SPRING _____

PORTS, SIZE & TYPE, INLET MS 24385-4

OUTLET MS 24385-4

INTEGRAL RELIEF _____

INTEGRAL FILTER 10 μ m abs inlet, 14 μ m abs outlet

MOUNTING _____

OPERATING TEMPERATURE RANGE -25 to 174 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton drawing 1826001-19 - 1985

PRESSURE REGULATOR

MANUFACTURER Consolidated Controls, Inc.
 PART NUMBER 6890
 DESCRIPTION Single stage
 QUALIFICATION STATUS Minuteman III

PROPELLANT/FLUID He, N₂
 PRESSURE, RANGE, INLET 3655 to 415 psia (2520 to 286 N/cm²)
 REGULATED 247 psia (170 N/cm²)
 OUTLET-LOCKUP 262 psia (180 N/cm²)
 PROOF, INLET 6015 psia (4147 N/cm²)
 PROOF, OUTLET 390 psia (268 N/cm²)
 BURST, INLET 9015 psia (6215 N/cm²)
 BURST, OUTLET 615 psia (424 N/cm²)
 DROP

RATED FLOW 26 SCFM (12,200 SCCS)
 LEAKAGE, INTERNAL-MAX INLET PRESS 10 SCCH He

EXTERNAL-MAX INLET PRESS _____
 MASS 1.5 lbm (0.7 kg)
 DIMENSIONS 5.16 in. length by 1.84 in. diam (13.1 by 4.7 cm)

MATERIAL, BODY 304L CRES
 SEAT/SEAL 440A

SPRING _____
 PORTS, SIZE & TYPE, INLET MS 24385-4E

OUTLET Same as inlet

INTEGRAL RELIEF _____

INTEGRAL FILTER 10 μm abs
 MOUNTING _____

OPERATING TEMPERATURE RANGE -19 to 90 °F (-28 to 32 °C)

VIBRATION, RANDOM 22g rms
 SINE 20g

ACCELERATION 14g
 SHOCK 100g

LIFE, SERVICE 10,000 cycles
 SHELF 10 yr

RELIABILITY _____
 LEAD TIME 180 days in 1974
 COST 5 to 10 units - \$12,000 in 1974
 REMARKS Pressure drop 165 psid (114 N/cm²) 2.7x10⁻⁴ SCCS He

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Fairchild Control Systems Company
 PART NUMBER 63-036
 DESCRIPTION Pilot-loaded, series redundant seals
 QUALIFICATION STATUS Apollo Command Module RCS, LM RCS

PROPELLANT/FLUID He
 PRESSURE, RANGE, INLET 4515 to 280 psia (3113 to 193 N/cm²)
 REGULATED 291 psia (201 N/cm²)
 OUTLET-LOCKUP 203/313 psia (139/215 N/cm²)
 PROOF, INLET 6780 psia (4674 N/cm²)
 PROOF, OUTLET 405 psia (279 N/cm²)
 BURST, INLET 9015 psia (6215 N/cm²)
 BURST, OUTLET 515 psia (355 N/cm²)
 DROP

RATED FLOW 3 SCFM (1416 SCCS)
 LEAKAGE, INTERNAL-MAX INLET PRESS 17 SCCH

EXTERNAL-MAX INLET PRESS 5x10⁻⁵ SCCS
 MASS 2.9 lbm (1.3 kg)
 DIMENSIONS

MATERIAL, BODY 17-4PH, 300 series CRES
 SEAT/SEAL Kynar

SPRING
 PORTS, SIZE & TYPE, INLET 0.25-in. tube
 OUTLET Same as inlet

INTEGRAL RELIEF

INTEGRAL FILTER
 MOUNTING

OPERATING TEMPERATURE RANGE -85 to 160 °F (-65 to 71 °C)
 VIBRATION, RANDOM
 SINE

ACCELERATION
 SHOCK

LIFE, SERVICE 7000 cycles
 SHELF

RELIABILITY
 LEAD TIME

COST \$6000 to \$9000 in 1974
 REMARKS Not in production. Available by special order.

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Fairchild Control Systems Company
PART NUMBER 65-168
DESCRIPTION Pilot-loaded, series redundant seals
QUALIFICATION STATUS Saturn IV-B

PROPELLANT/FLUID N₂, He
PRESSURE, RANGE, INLET 3215 to 365 psia (2216 to 251 N/cm²)
REGULATED 200 psia (138 N/cm²)
OUTLET-LOCKUP 218 psia (150 N/cm²)
PROOF, INLET 4815 psia (3319 N/cm²)
PROOF, OUTLET 390 psia (268 N/cm²)
BURST, INLET 8015 psia (5526 N/cm²)
BURST, OUTLET 640 psia (441 N/cm²)
DROP

RATED FLOW 15 SCFM (7080 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS 149 SCCH

EXTERNAL-MAX INLET PRESS 2x10⁻⁴ SCCS
MASS 3.0 lbm (1.3 kg)
DIMENSIONS

MATERIAL, BODY 17-4PH
SEAT/SEAL Kynar

SPRING
PORTS, SIZE & TYPE, INLET MC 124-C4
OUTLET Same as inlet

INTEGRAL RELIEF

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE -10 to 124 °F (-23 to 51 °C)
VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE 5000 cycles
SHELF

RELIABILITY

LEAD TIME

COST \$6000 to \$9000 in 1974

REMARKS Not in production. Available by special order.

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Fairchild Control Systems Company
 PART NUMBER 332000
 DESCRIPTION Pilot-loaded, single stage
 QUALIFICATION STATUS Minuteman III (Bell Aerospace)
 PROPELLANT/FLUID N₂, He
 PRESSURE, RANGE, INLET 3515 to 415 psia (2423 to 286 N/cm²)
 REGULATED 240 psia (165 N/cm²)
 OUTLET-LOCKUP 262 psia (180 N/cm²)
 PROOF, INLET 5240 psia (3612 N/cm²)
 PROOF, OUTLET 315 psia (217 N/cm²)
 BURST, INLET 6985 psia (4816 N/cm²)
 BURST, OUTLET 615 psia (424 N/cm²)
 DROP 160 psid (110 N/cm²)
 RATED FLOW 25 SCFM (11,800 SCCS)
 LEAKAGE, INTERNAL-MAX INLET PRESS 0.017 SCCS He
 EXTERNAL-MAX INLET PRESS 0.0041 SCCS
 MASS 1.2 lbm (0.54 kg)
 DIMENSIONS 4.85 in. length by 3.46 in. width (12.3 by 8.8 cm)
 MATERIAL, BODY 17-4PH, 300 series CRES
 SEAT/SEAL Kynar
 SPRING
 PORTS, SIZE & TYPE, INLET MS 24385-4
 OUTLET MS 24385-1
 INTEGRAL RELIEF No
 INTEGRAL FILTER 25 μm abs
 MOUNTING Bracket
 OPERATING TEMPERATURE RANGE 20 to 150 °F (-7 to 65 °C)
 VIBRATION, RANDOM
 SINE 20g
 ACCELERATION 21g X Y Z
 SHOCK
 LIFE, SERVICE 3 yr; 5000 cycles
 SHELF 3 yr
 RELIABILITY
 LEAD TIME
 COST \$4000 to \$6000 in 1974
 REMARKS
 DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Fairchild Control Systems Company
PART NUMBER 385000
DESCRIPTION Pilot-loaded, series redundant seals
QUALIFICATION STATUS Apollo LM ascent engine tank pressure

PROPELLANT/FLUID He
PRESSURE, RANGE, INLET 3515 to 415 psia (2423 to 286 N/cm²)
REGULATED 182 psia (126 N/cm²)
OUTLET-LOCKUP 188 psia
PROOF, INLET 5335 psia (3678 N/cm²)
PROOF, OUTLET 340 psia (24 N/cm²)
BURST, INLET 8015 psia (5626 N/cm²)
BURST, OUTLET 515 psia (365 N/cm²)
DROP 218 psid (130 N/cm²)
RATED FLOW 140 SCFM (66,080 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS 101 SCCH

EXTERNAL-MAX INLET PRESS 3.3x10⁻⁴ SCCS
MASS 2.85 lbm (1.3 kg)
DIMENSIONS 7.62 by 5.10 in. (19.4 by 13 cm)

MATERIAL, BODY 17-4PH, 300 series CRES
SEAT/SEAL Kynar

SPRING
PORTS, SIZE & TYPE, INLET 3/8-in. tube
OUTLET 1/2-in. tube

INTEGRAL RELIEF

INTEGRAL FILTER 25 μm abs
MOUNTING

OPERATING TEMPERATURE RANGE -85 to 160 °F (-65 to 72 °C)
VIBRATION, RANDOM
SINE 5g
ACCELERATION 13.5g X Y Z
SHOCK 50g

LIFE, SERVICE 1 yr; 5000 cycles
SHELF 5 yr

RELIABILITY
LEAD TIME
COST

REMARKS Not in production. Available by special order.

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Fairchild Control Systems Company
PART NUMBER 601000
DESCRIPTION Pneumatic, single direct acting
QUALIFICATION STATUS OAO

PROPELLANT/FLUID GN₂
PRESSURE, RANGE, INLET 3261 to 64.7 psia (2248 to 44.6 N/cm²)
REGULATED 5 psig (3 N/cm²)
OUTLET-LOCKUP 21.2 psia (14.6 N/cm²)
PROOF, INLET 4890 psia (3371 N/cm²)
PROOF, OUTLET 25.7 psia (17.7 N/cm²)
BURST, INLET 8140 psia (5612 N/cm²)
BURST, OUTLET 32.7 psia (22.5 N/cm²)
DROP

RATED FLOW 0.1 SCFM (47 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS 10 SCCH

EXTERNAL-MAX INLET PRESS 5x10⁻⁴ SCCS
MASS 0.9 lbm (0.4 kg)
DIMENSIONS

MATERIAL, BODY 17-4PH, 300 series CRES
SEAT/SEAL

SPRING
PORTS, SIZE & TYPE, INLET MS 33514-4

OUTLET Same as inlet

INTEGRAL RELIEF

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE -30 to 150 °F (-34 to 65.5 °C)
VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE 10,000 cycles
SHELF

RELIABILITY
LEAD TIME

COST \$4000 to \$6000 in 1974
REMARKS Not in production. Available by special order.

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

PRESSURE REGULATOR

MANUFACTURER Fairchild Control Systems Company
PART NUMBER 617000
DESCRIPTION Pneumatic, single stage, pilot loaded
QUALIFICATION STATUS OAO

PROPELLANT/FLUID N₂
PRESSURE, RANGE, INLET 3915 to 165 psia (2699 to 114 N/cm²)
REGULATED 38 psia (26 N/cm²)
OUTLET-LOCKUP 44 psia (30 N/cm²)
PROOF, INLET
PROOF, OUTLET
BURST, INLET 8125 psia (5606 N/cm²)
BURST, OUTLET 175 psia (121 N/cm²)
DROP 115 psid at max. flow

RATED FLOW 1 to 5 SCFM (472 to 2360 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS 10 SCCH

EXTERNAL-MAX INLET PRESS 5x10⁻⁴ SCCS
MASS 1.2 lbm (0.54 kg)
DIMENSIONS 3.46 by 3.76 in. (8.8 by 9.6 cm)

MATERIAL, BODY 17-4PH, 300 series CRES
SEAT/SEAL Kynar, polyimide

SPRING
PORTS, SIZE & TYPE, INLET MS 33514-4

OUTLET Same as inlet

INTEGRAL RELIEF Yes

INTEGRAL FILTER 25 μm abs
MOUNTING Bracket

OPERATING TEMPERATURE RANGE -30 to 150 °F (-34 to 65.5 °C)
VIBRATION, RANDOM 12.7g rms
SINE 15g

ACCELERATION 11.5g
SHOCK 30g

LIFE, SERVICE 5000 cycles; 1 yr
SHELF 2 yr

RELIABILITY
LEAD TIME

COST

REMARKS Not in production. Available by special order.

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Fairchild Control Systems Company
 PART NUMBER 679000
 DESCRIPTION Pilot-loaded, series redundant seals, pneumatic
 QUALIFICATION STATUS Saturn IV B

PROPELLANT/FLUID N₂, He
 PRESSURE, RANGE, INLET 3215 to 615 psia (2216 to 424 N/cm²)
 REGULATED 470 to 500 psia (324 to 344 N/cm²)
 OUTLET-LOCKUP 484 psia primary (333 N/cm²)
 PROOF, INLET 4800 psia (3309 N/cm²)
 PROOF, OUTLET 780 psia (537 N/cm²)
 BURST, INLET 8000 psia (5515 N/cm²)
 BURST, OUTLET 1300 psia (896 N/cm²)
 DROP 190 psid (131 N/cm²)

RATED FLOW 30 SCFM (14,160 SCCS)
 LEAKAGE, INTERNAL-MAX INLET PRESS 405 SCCS He

EXTERNAL-MAX INLET PRESS _____
 MASS 2.6 lbm (1.1 kg)
 DIMENSIONS 6.87 in. length by 4.85 in. width (17.5 by 12.3 cm)

MATERIAL, BODY 17-4PH, 300 series CRES
 SEAT/SEAL Kynar, polyimide

SPRING _____
 PORTS, SIZE & TYPE, INLET MC 223 fitting w/MC-124-C4
 OUTLET Same as inlet

INTEGRAL RELIEF No

INTEGRAL FILTER 25 μm abs
 MOUNTING Bracket

OPERATING TEMPERATURE RANGE -85 to 160 °F (-65 to 72 °C)
 VIBRATION, RANDOM _____

SINE 20g
 ACCELERATION 8g X Y Z
 SHOCK _____

LIFE, SERVICE 1 yr; 5000 cycles
 SHELF 2 yr

RELIABILITY _____
 LEAD TIME _____

COST \$6000 to \$9000 in 1974
 REMARKS Not in production. Available by special order.

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Fairchild Control Systems Company
PART NUMBER 994000
DESCRIPTION Single stage, pneumatic
QUALIFICATION STATUS Japanese L.V.

PROPELLANT/FLUID N₂
PRESSURE, RANGE, INLET 3515 psia (2423 N/cm²) max.
REGULATED 285 psia (197 N/cm²)
OUTLET-LOCKUP 302 psia (208 N/cm²)
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET 7000 psia (4830 N/cm²)
BURST, OUTLET 800 psia (560 N/cm²)
DROP _____

RATED FLOW 1.2 to 10 SCFM (566 to 4720 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS 0.2 SCCS He

EXTERNAL-MAX INLET PRESS _____
MASS 1.5 lbm (0.7 kg)
DIMENSIONS 7.45 in. length by 3.46 in. width (18.9 by 8.6 cm)

MATERIAL, BODY 17-4PH CRES
SEAT/SEAL Kynar

SPRING _____
PORTS, SIZE & TYPE, INLET MS 24385

OUTLET Same as inlet

INTEGRAL RELIEF Yes

INTEGRAL FILTER 15 μm abs
MOUNTING Bracket

OPERATING TEMPERATURE RANGE 40 to 160 °F (3 to 72 °C)
VIBRATION, RANDOM 33g rms

SINE 6g
ACCELERATION 16g X Y Z
SHOCK _____

LIFE, SERVICE 1 yr; 15,000 cycles
SHELF 3 yr

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Futurecraft Corporation
 PART NUMBER 400176
 DESCRIPTION Pneumatic, spring referenced piston
 QUALIFICATION STATUS MIPDS

PROPELLANT/FLUID N₂
 PRESSURE, RANGE, INLET 3515 psia (2425 N/cm²)
 REGULATED 450 psig (311 N/cm²)
 OUTLET-LOCKUP _____
 PROOF, INLET _____
 PROOF, OUTLET _____
 BURST, INLET _____
 BURST, OUTLET _____
 DROP _____

RATED FLOW 1.75 lb/s
 LEAKAGE, INTERNAL-MAX INLET PRESS 0.017 SCCM He

EXTERNAL-MAX INLET PRESS _____
 MASS 2.5 lbm (1.13 kg)
 DIMENSIONS 4.13 in. length by 2.63 in. diam (10.5 by 6.7 cm)

MATERIAL, BODY 2024-T351 Al alloy
 SEAT/SEAL EPR

SPRING _____
 PORTS, SIZE & TYPE, INLET MS 33649-16

OUTLET Same as inlet

INTEGRAL RELIEF Yes

INTEGRAL FILTER _____

MOUNTING Bracket; two holes

OPERATING TEMPERATURE RANGE -36 to 125 °F (-38 to 52 °C)

VIBRATION, RANDOM 36.2g rms

SINE 2.5g

ACCELERATION 14g X Y Z

SHOCK 2500g

LIFE, SERVICE _____

SHELF _____

RELIABILITY _____

LEAD TIME 4 months

COST _____

REMARKS Five delivered

DATA SOURCE Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Futurecraft Corporation

PART NUMBER 400210

DESCRIPTION Adjustable, high flow capacity

QUALIFICATION STATUS Minuteman reentry stage (AVCO)

PROPELLANT/FLUID N₂

PRESSURE, RANGE, INLET 5000 to 750 psig

REGULATED 265±15 psig

OUTLET-LOCKUP 500 psi max.

PROOF, INLET 7500 psi

PROOF, OUTLET 1200 psi

BURST, INLET 11,000 psi w/outlet plugged

BURST, OUTLET _____

DROP _____

RATED FLOW 1.02 lbm/s

LEAKAGE, INTERNAL-MAX INLET PRESS Bubble-tight in lockup

EXTERNAL-MAX INLET PRESS _____

MASS 2.2 lbm

DIMENSIONS 4.500 by 2.38 by 3.63 in. nom.

MATERIAL, BODY 7075T6 and 2024T4 or T351

SEAT/SEAL Kel-F and Teflon backup rings; ethylene

propylene O-ring

SPRING Ni-plated spring steel

PORTS, SIZE & TYPE, INLET MS 33656-8

OUTLET Flange, 0.265- and 0.290-in.-diam holes

at 1.250 by 1.875 in.

INTEGRAL RELIEF _____

INTEGRAL FILTER Sintered CRES 85 µm nom., 130 µm abs

MOUNTING Port flange

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Futurecraft drawing 400210 - 1985

PRESSURE REGULATOR

MANUFACTURER Futurecraft Corporation
PART NUMBER 400236
DESCRIPTION Two stage, series redundant 2nd stage
QUALIFICATION STATUS P80-1 Teal Ruby (Rockwell)

PROPELLANT/FLUID GN₂
PRESSURE, RANGE, INLET 3700 to 500 psia
REGULATED 60±4 psia
OUTLET-LOCKUP 74 psig
PROOF, INLET 5550 psig
PROOF, OUTLET 3578 psi
BURST, INLET 9540 psig
BURST, OUTLET 9540 psig
DROP
RATED FLOW 0.0031 to 0.0093 lbm/s
LEAKAGE, INTERNAL-MAX INLET PRESS
EXTERNAL-MAX INLET PRESS
MASS 1.8 lbm
DIMENSIONS 9.25 by 2.63 by 1.75 in.

MATERIAL, BODY 2024-T351 Al alloy, 304L CRES
SEAT/SEAL EP, fluorosilicone, Teflon
SPRING 17-7 CRES
PORTS, SIZE & TYPE, INLET 1/4-in. tube
test port; four-bolt flange
OUTLET 3/8-in. tube

INTEGRAL RELIEF

INTEGRAL FILTER Inlet and test port 304 CRES 30 to 55 μm
MOUNTING

OPERATING TEMPERATURE RANGE -22 to 160 °F
VIBRATION, RANDOM
SINE
ACCELERATION
SHOCK

LIFE, SERVICE
SHELF
RELIABILITY
LEAD TIME
COST
REMARKS Pressure transducer on -2 model

DATA SOURCE Futurecraft drawing 400236 - 1985

PRESSURE REGULATOR

MANUFACTURER Futurecraft Corporation
PART NUMBER 400294
DESCRIPTION Precision, high flow capacity, adjustable
QUALIFICATION STATUS Minuteman reentry vehicle (Ball Aerospace)

PROPELLANT/FLUID GN₂
PRESSURE, RANGE, INLET 3600 psia max.
REGULATED 425/475 psia
OUTLET-LOCKUP _____
PROOF, INLET 5400 psia
PROOF, OUTLET 743 psia
BURST, INLET 7200 psia
BURST, OUTLET 3600 psia
DROP _____
RATED FLOW 6 SCFM min.
LEAKAGE, INTERNAL-MAX INLET PRESS _____
EXTERNAL-MAX INLET PRESS _____
MASS 0.40 lbm
DIMENSIONS 1.87 in. (less fitting) by 1.56 in. (less flange) by
1.13 in.
MATERIAL, BODY 2024-T351 Al alloy
SEAT/SEAL _____
SPRING Spring steel or CrV alloy
PORTS, SIZE & TYPE, INLET per MS 16142-1/4 modified
OUTLET MS 33656E-3
INTEGRAL RELIEF _____
INTEGRAL FILTER Vent screen, CRES
MOUNTING Four 8-32 holes on a 0.8125 in. square
OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Futurecraft drawing 400294 - 1985

PRESSURE REGULATOR

MANUFACTURER HTL Industries, Inc.
PART NUMBER 146650-10, 146931
DESCRIPTION Single stage, pneumatic
QUALIFICATION STATUS Centaur

PROPELLANT/FLUID He, N₂
PRESSURE, RANGE, INLET 490 to 455 psia (337 to 313 N/cm²)
REGULATED 297 to 315 psia (204 to 213 N/cm²)
OUTLET-LOCKUP 312 to 330 psia (215 to 227 N/cm²)
PROOF, INLET
PROOF, OUTLET 435 psia (299 N/cm²)
BURST, INLET
BURST, OUTLET
DROP

RATED FLOW 8.9 SCFM He (4200 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS

EXTERNAL-MAX INLET PRESS

MASS 2.5 lbm (1.1 kg)
DIMENSIONS

MATERIAL, BODY Al alloy and CRES
SEAT/SEAL

SPRING

PORTS, SIZE & TYPE, INLET
OUTLET

INTEGRAL RELIEF No

INTEGRAL FILTER 5 μm nom.
MOUNTING

OPERATING TEMPERATURE RANGE -100 to 125 °F (-73 to 52 °C)
VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE 200 cycles
SHELF

RELIABILITY
LEAD TIME
COST
REMARKS

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER HTL Industries, Inc.
PART NUMBER 146650-11, 146709
DESCRIPTION Single stage, pneumatic
QUALIFICATION STATUS Centaur

PROPELLANT/FLUID He, N₂
PRESSURE, RANGE, INLET 3375 to 715 psia (2326 to 492 N/cm²)
REGULATED 475 psig (327 N/cm²)
OUTLET-LOCKUP 455 to 490 psia (313 to 337 N/cm²)
PROOF, INLET
PROOF, OUTLET 640 psia
BURST, INLET
BURST, OUTLET
DROP

RATED FLOW 8.9 SCFM He (4200 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS

EXTERNAL-MAX INLET PRESS
MASS 2.5 lbm (1.1 kg)
DIMENSIONS

MATERIAL, BODY
SEAT/SEAL

SPRING
PORTS, SIZE & TYPE, INLET

OUTLET

INTEGRAL RELIEF

INTEGRAL FILTER 5 μm nom.
MOUNTING

OPERATING TEMPERATURE RANGE -100 to 125 °F (-73 to 52 °C)

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE 200 cycles
SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report
(ref. 9)

PRESSURE REGULATOR

MANUFACTURER Marotta Scientific Controls, Inc.
PART NUMBER 226154, model number RV74A
DESCRIPTION Pneumatic
QUALIFICATION STATUS Apollo, DMSP

PROPELLANT/FLUID Air, N₂
PRESSURE, RANGE, INLET 4500 to 800 psia (3102 to 551 N/cm²)
REGULATED 35 to 630 psig (24 to 434 N/cm²)
OUTLET-LOCKUP 500 psia (344 N/cm²)
PROOF, INLET 6765 psia (4664 N/cm²)
PROOF, OUTLET _____
BURST, INLET 11,265 psia (7766.9 N/cm²)
BURST, OUTLET _____
DROP _____

RATED FLOW _____
LEAKAGE, INTERNAL-MAX INLET PRESS _____

EXTERNAL-MAX INLET PRESS _____
MASS 2.0 lbm (0.91 kg)
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____
OUTLET _____

INTEGRAL RELIEF Yes

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE 0 to 160 °F (-18 to 72 °C)
VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Marotta Scientific Controls, Inc.
PART NUMBER 280601, model number RS572VB
DESCRIPTION Pneumatic
QUALIFICATION STATUS Safeguard

PROPELLANT/FLUID Inert gas
PRESSURE, RANGE, INLET 3015 to 565 psia (2080 to 390 N/cm²)
REGULATED 250 psig (172 N/cm²)
OUTLET-LOCKUP 315 psia (217 N/cm²)
PROOF, INLET 7515 psia (5181 N/cm²)
PROOF, OUTLET _____
BURST, INLET 20,015 psia (13,800 N/cm²)
BURST, OUTLET _____
DROP _____

RATED FLOW 420 SCFM (198,240 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS _____

EXTERNAL-MAX INLET PRESS _____
MASS 3.8 lbm (1.7 kg)
DIMENSIONS _____

MATERIAL, BODY Al alloy
SEAT/SEAL Nylon

SPRING _____
PORTS, SIZE & TYPE, INLET _____
OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE 45 to 160 °F (7 to 72 °C)
VIBRATION, RANDOM _____

SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Marotta Scientific Controls, Inc.
PART NUMBER 280778, model number RV99A
DESCRIPTION Two-stage reducer
QUALIFICATION STATUS Qualified

PROPELLANT/FLUID He, N₂, Air
PRESSURE, RANGE, INLET 3015 to 615 psia (2080 to 424 N/cm²)
REGULATED 470 psig (324 N/cm²)
OUTLET-LOCKUP 525 psia (361 N/cm²)
PROOF, INLET 4515 psia (3113 N/cm²)
PROOF, OUTLET 4515 psia (3113 N/cm²)
BURST, INLET 5015 psia (4147 N/cm²)
BURST, OUTLET 6015 psia (4147 N/cm²)
DROP

RATED FLOW 3.3 SCFM (1558 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS

EXTERNAL-MAX INLET PRESS

MASS 10 lbm (4.5 kg)
DIMENSIONS

MATERIAL, BODY 300 series CRES
SEAT/SEAL Nylon

SPRING

PORTS, SIZE & TYPE, INLET MS 33649-6

OUTLET Same as inlet

INTEGRAL RELIEF

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE 20 to 120 °F (-8 to 47 °C)

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Parker Hannifin
PART NUMBER 5660048
DESCRIPTION Pneumatic
QUALIFICATION STATUS LEM descent

PROPELLANT/FLUID _____
PRESSURE, RANGE, INLET 1750 psia (1208 N/cm²)
REGULATED 246 psia (170 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW _____
LEAKAGE, INTERNAL-MAX INLET PRESS _____

EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____

OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Pyronetics Devices, Inc.
PART NUMBER 2328-1
DESCRIPTION Pneumatic
QUALIFICATION STATUS Sandia (classified)

PROPELLANT/FLUID _____
PRESSURE, RANGE, INLET 500 psia (345 N/cm², max.
REGULATED 100 psia (69 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW _____
LEAKAGE, INTERNAL-MAX INLET PRESS _____

EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____

OUTLET _____
INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____

SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Pyronetics Devices, Inc.
PART NUMBER 2828-0
DESCRIPTION Pneumatic
QUALIFICATION STATUS Sandia (classified)

PROPELLANT/FLUID _____
PRESSURE, RANGE, INLET 4000 psia (2760 N/cm²) max.
REGULATED 500 psia (345 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW _____
LEAKAGE, INTERNAL-MAX INLET PRESS _____
EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____
OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Pyronetics Devices, Inc.
PART NUMBER 2832
DESCRIPTION Pneumatic
QUALIFICATION STATUS Sandia (classified)

PROPELLANT/FLUID _____
PRESSURE, RANGE, INLET 2000 psia (1380 N/cm²) max.
REGULATED 12 psia (8.3 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW _____
LEAKAGE, INTERNAL-MAX INLET PRESS _____
EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____
SPRING _____

PORTS, SIZE & TYPE, INLET _____
OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Pyronetics Devices, Inc.
PART NUMBER 2834
DESCRIPTION Pneumatic
QUALIFICATION STATUS Sandia (classified)

PROPELLANT/FLUID _____
PRESSURE, RANGE, INLET 515 psia (355 N/cm²) max.
REGULATED 35 psia (24 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW _____
LEAKAGE, INTERNAL-MAX INLET PRESS _____

EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____

PORTS, SIZE & TYPE, INLET _____

OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Sterer Engineering & Manufacturing Company
 PART NUMBER 25210-1
 DESCRIPTION Pneumatic
 QUALIFICATION STATUS Mariner Mars 1971

PROPELLANT/FLUID N₂
 PRESSURE, RANGE, INLET 3015 to 0 psia (2078 to 0 N/cm²)
 REGULATED 15 psig (10 N/cm²)
 OUTLET-LOCKUP 16.2 psig
 PROOF, INLET 4515 psia (3113 N/cm²)
 PROOF, OUTLET _____
 BURST, IN ET 6615 psia (4564 N/cm²)
 BURST, OUTLET _____
 DROP _____

RATED FLOW 1.13 SCFM (533 SCCS)
 LEAKAGE, INTERNAL-MAX INLET PRESS 0.017 SCCS He

EXTERNAL-MAX INLET PRESS Zero

MASS 0.617 lbm (0.279 kg)
 DIMENSIONS _____

MATERIAL, BODY 17-4PH CRES
 SEAT/SEAL _____

SPRING _____

PORTS, SIZE & TYPE, INLET 0.246 in.

OUTLET Same as inlet

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
 MOUNTING _____

OPERATING TEMPERATURE RANGE -4 to 167 °F (-20 to 75 °C)

VIBRATION, RANDOM _____
 SINE _____

ACCELERATION _____
 SHOCK _____

LIFE, SERVICE 2x10⁶ cycles
 SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Sterer Engineering & Manufacturing Company
PART NUMBER 33120-1
DESCRIPTION Pneumatic
QUALIFICATION STATUS ERTS

PROPELLANT/FLUID Freon 14
PRESSURE, RANGE, INLET 2015 psia (1390 N/cm²)
REGULATED 55 to 60 psig (37 to 41 N/cm²)
OUTLET-LOCKUP
PROOF, INLET 3015 psia (2078 N/cm²)
PROOF, OUTLET
BURST, INLET 8015 psia (5526 N/cm²)
BURST, OUTLET
DROP

RATED FLOW 8.3 SCFM (3900 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS 0.017 SCCS He

EXTERNAL-MAX INLET PRESS 2x10⁻⁵ SCCS
MASS 1.3 lbm (0.58 kg)
DIMENSIONS

MATERIAL, BODY 6Al-4V Ti
SEAT/SEAL Delrin

SPRING
PORTS, SIZE & TYPE, INLET
OUTLET MS 33656-4

INTEGRAL RELIEF

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE 20 to 125 °F (-7 to 107 °C)
VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE 10⁶ cycles
SHELF

RELIABILITY
LEAD TIME
COST
REMARKS

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Sterer Engineering & Manufacturing Company
PART NUMBER 34810
DESCRIPTION Pneumatic, series redundant stages
QUALIFICATION STATUS Project 169

PROPELLANT/FLUID N₂
PRESSURE, RANGE, INLET 365 psia (252 N/cm²) max.
REGULATED 50 psig (34 N/cm²)
OUTLET-LOCKUP 52.2 psia (36.1 N/cm²)
PROOF, INLET _____
PROOF, OUTLET 90 psia (62 N/cm²)
BURST, INLET 1015 psia (700 N/cm²)
BURST, OUTLET 335 psia (231 N/cm²)
DROP _____

RATED FLOW 2.5 SCFM (1100 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS 0.017 SCCS He

EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 6Al-4V Ti
SEAT/SEAL Kynar

SPRING _____

PORTS, SIZE & TYPE, INLET MS 33656-4

OUTLET Same as inlet

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -50 to 200 °F (-45 to 93 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE 500,000 cycles
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Sterer Engineering & Manufacturing Company
 PART NUMBER 46240
 DESCRIPTION Pneumatic
 QUALIFICATION STATUS Viking orbiter 1975

PROPELLANT/FLUID GN₂
 PRESSURE, RANGE, INLET 4515 to 515 psia (3113 to 355 N/cm²)
 REGULATED 25 psig (17 N/cm²)
 OUTLET-LOCKUP
 PROOF, INLET 6765 psia (4664 N/cm²)
 PROOF, OUTLET 105 psia (72.3 N/cm²)
 BURST, INLET 9015 psia (6215 N/cm²)
 BURST, OUTLET 135 psia (93 N/cm²)
 DROP

RATED FLOW 0 to 65 SCFM (0 to 3000 SCCS)
 LEAKAGE, INTERNAL-MAX INLET PRESS 0.017 SCCS He (1.0 SCCH N₂ at 2768 N/cm²)
 EXTERNAL-MAX INLET PRESS 1.39x10⁻⁵ SCCS GN₂
 MASS 0.88 lbm (0.39 kg)
 DIMENSIONS

MATERIAL, BODY 347 CRES, 7075-T73 Al alloy
 SEAT/SEAL Vespel

SPRING

PORTS, SIZE & TYPE, INLET 0.25-in. 347 CRES tube
 OUTLET 0.312-in. 347 CRES tube

INTEGRAL RELIEF

INTEGRAL FILTER

MOUNTING

OPERATING TEMPERATURE RANGE 32 to 160 °F (0 to 72 °C)
 VIBRATION, RANDOM
 SINE

ACCELERATION
 SHOCK

LIFE, SERVICE 10⁶ cycles
 SHELF

RELIABILITY
 LEAD TIME
 COST

REMARKS

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Sterer Engineering & Manufacturing Company
PART NUMBER 50750
DESCRIPTION Pneumatic
QUALIFICATION STATUS Delta, P72-2

PROPELLANT/FLUID N₂
PRESSURE, RANGE, INLET 2015 psia (1390 N/cm²)
REGULATED 215 to 255 psig (148 to 176 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW _____
LEAKAGE, INTERNAL-MAX INLET PRESS _____
EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____
OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Tavco, Inc.
PART NUMBER 234635
DESCRIPTION Pneumatic
QUALIFICATION STATUS Qualified

PROPELLANT/FLUID Air, N₂
PRESSURE, RANGE, INLET 3015 to 1015 psia (2078 to 700 N/cm²)
REGULATED 200 to 375 psia (137 to 258 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW 10 SCFM (4720 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS _____

EXTERNAL-MAX INLET PRESS Zero

MASS 0.6 lbm (0.27 kg)
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____

PORTS, SIZE & TYPE, INLET _____

OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Tavco, Inc.
PART NUMBER 2344344
DESCRIPTION Pneumatic
QUALIFICATION STATUS Qualified

PROPELLANT/FLUID Air, N₂
PRESSURE, RANGE, INLET 215 to 165 psia (148 to 113 N/cm²)
REGULATED 100 psia (69 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW 20 SCFM (9440 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS 0.017 SCCM He

EXTERNAL-MAX INLET PRESS Zero
MASS 0.7 lbm (0.32 kg)
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____
OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Tavco, Inc.
PART NUMBER 2346334
DESCRIPTION Pneumatic
QUALIFICATION STATUS Qualified

PROPELLANT/FLUID _____
PRESSURE, RANGE, INLET 3815 to 915 psia (2630 to 630 N/cm²)
REGULATED 700 psia (482 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW 4.33 SCFM (2044 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS 0.1 SCCH

EXTERNAL-MAX INLET PRESS _____
MASS 1.8 lbm (0.81 kg)
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____
OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Tavco, Inc.
PART NUMBER 2346340
DESCRIPTION Pneumatic
QUALIFICATION STATUS Qualified

PROPELLANT/FLUID Air, N₂
PRESSURE, RANGE, INLET 665 to 140 psia (458 to 96.5 N/cm²)
REGULATED 7.5 psia (5.1 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW 1.6 SCFM (755 SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS 0.025 lb/min

EXTERNAL-MAX INLET PRESS Zero
MASS 1.3 lbm (0.59 kg)
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____
OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER TRW
PART NUMBER JPL 10000055
DESCRIPTION Single stage, direct acting
QUALIFICATION STATUS Mariner 1964, 1969

PROPELLANT/FLUID GN₂
PRESSURE, RANGE, INLET 3600 to 360 psia (2482 to 248 N/cm²)
REGULATED 283 psig (195 N/cm²)
OUTLET-LOCKUP 316 psia (217 N/cm²)
PROOF, INLET 5400 psia (3723 N/cm²)
PROOF, OUTLET 2700 psia (1861 N/cm²)
BURST, INLET 7920 psia (5460 N/cm²)
BURST, OUTLET 3960 psia (2730 N/cm²)
DROP

RATED FLOW 0.12 SCFM at 308 psia (56 SCCS at 212 N/cm²)
LEAKAGE, INTERNAL-MAX INLET PRESS 4.0 SCCH GN₂ at 308 psia
(212 N/cm²)
EXTERNAL-MAX INLET PRESS 2.7x10⁻⁴ SCCS N₂ at 212 N/cm²
MASS 1.4 lbm (0.63 kg)
DIMENSIONS

MATERIAL, BODY 6061-T651 Al alloy
SEAT/SEAL 6061-T651 Al alloy

SPRING
PORTS, SIZE & TYPE, INLET 0.25-in. tube (welded)
OUTLET 0.25-in. tube (bolt flange)

INTEGRAL RELIEF

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE 14 to 167 °F (-10 to 75 °C)
VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE Limited
SHELF

RELIABILITY

LEAD TIME Not in manufacture

COST

REMARKS

DATA SOURCE IITRI lists (ref. 8)

PRESSURE REGULATOR

MANUFACTURER Whittaker Controls Division
PART NUMBER 123035
DESCRIPTION Single stage, pressure balanced gage
QUALIFICATION STATUS Agena

PROPELLANT/FLUID He
PRESSURE, RANGE, INLET 3015 psia (2080 N/cm²)
REGULATED 50 psia max. (35 N/cm²)
OUTLET-LOCKUP
PROOF, INLET 4515 psia (3113 N/cm²)
PROOF, OUTLET 100 psia (69 N/cm²)
BURST, INLET 6015 psia (4147 N/cm²)
BURST, OUTLET 125 psia (86 N/cm²)
DROP

RATED FLOW
LEAKAGE, INTERNAL-MAX INLET PRESS 12,000 SCCH

EXTERNAL-MAX INLET PRESS Zero
MASS 1.6 lbm (0.72 kg)
DIMENSIONS

MATERIAL, BODY Al alloy
SEAT/SEAL

SPRING
PORTS, SIZE & TYPE, INLET AND10050-8

OUTLET MS 24386-8
INTEGRAL RELIEF

INTEGRAL FILTER
MOUNTING

OPERATING TEMPERATURE RANGE -100 to 100 °F (-73 to 38 °C)
VIBRATION, RANDOM

SINE
ACCELERATION
SHOCK

LIFE, SERVICE
SHELF

RELIABILITY
LEAD TIME

COST
REMARKS

DATA SOURCE IITRI lists (ref. 8) and Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Whittaker Controls Division
PART NUMBER 227705
DESCRIPTION Pneumatic
QUALIFICATION STATUS Shuttle

PROPELLANT/FLUID _____
PRESSURE, RANGE, INLET 865 psia (597 N/cm²)
REGULATED 20 psia (14 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW 1170 SCFM (5.5x10⁵ SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS _____

EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____

OUTLET _____

INTEGRAL RELIEF _____

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

PRESSURE REGULATOR

MANUFACTURER Whittaker Controls Division
PART NUMBER 228045
DESCRIPTION Pneumatic
QUALIFICATION STATUS Shuttle

PROPELLANT/FLUID _____
PRESSURE, RANGE, INLET 4515 psia (3115 N/cm²) max.
REGULATED 750 psia (518 N/cm²)
OUTLET-LOCKUP _____
PROOF, INLET _____
PROOF, OUTLET _____
BURST, INLET _____
BURST, OUTLET _____
DROP _____

RATED FLOW 470 SCFM (2.2x10⁵ SCCS)
LEAKAGE, INTERNAL-MAX INLET PRESS _____
EXTERNAL-MAX INLET PRESS _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

SPRING _____
PORTS, SIZE & TYPE, INLET _____

OUTLET _____
INTEGRAL RELIEF Yes

INTEGRAL FILTER _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____

SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Aerospace Corporation report (ref. 9)

HEATER/HEAT EXCHANGER

No data have been obtained for this section.

LINE/THRUSTER VALVE

MANUFACTURER Abex Corporation
PART NUMBER Model 403
DESCRIPTION Four-way or three-way miniature servo valve
QUALIFICATION STATUS _____
PROPELLANT/FLUID Hydraulic
PRESSURE, OPERATING 300 to 4500 psi
PROOF _____
BURST _____
DROP 1000 psi
RATED FLOW 0.1 to 1.8 GPM
LEAKAGE, INTERNAL 0.08 GPM at 3000 psi
EXTERNAL _____
MASS 0.36 lbm
DIMENSIONS 2.20 by 1.54 by 1.28 in.
MATERIAL, BODY _____
SEAT/SEAL _____
PORTS, SIZE & TYPE In base mount
INTEGRAL FILTER 20 μ m
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING _____
PULL IN/DROP OUT _____
WATTS _____
ELECTRICAL CONNECTION _____
MOUNTING Base; four 0.149/0.154-in.-diam holes on 0.938- by
1.032-in. rectangle
OPERATING TEMPERATURE RANGE -65 to 275 °F
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Abex product data sheet - 1986

LINE/THRUSTER VALVE

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2665-0001-31
DESCRIPTION Control valve, solenoid
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID N₂

PRESSURE, OPERATING 0 to 295 psig
PROOF 430 psig
BURST 590 psig
DROP 2 psid at 200 psi
RATED FLOW 75 lbm/hr at 200 psi

LEAKAGE, INTERNAL 0.5 SCCH at 200 psi
EXTERNAL 0.2 SCCM

MASS 0.48 lbm
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____
PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING 18 to 32 Vdc
PULL IN/DROP OUT _____

WATTS 9.8 max.
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS w/position indicator

DATA SOURCE Carleton product data sheet - 1987

LINE/THRUSTER VALVE

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2666-0001-23
DESCRIPTION Motor-operated latching valve
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID N₂

PRESSURE, OPERATING 0 to 3300 psig
PROOF 4950 psig
BURST 6600 psig
DROP 10 psid max.

RATED FLOW 0 to 75 lbm/hr

LEAKAGE, INTERNAL 2.5 SCCM max. at max. inlet
EXTERNAL 0.3 SCCM

MASS 2.21 lbm
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING 24 to 32 Vdc
PULL IN/DROP OUT _____

WATTS 4.4 max.
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 200 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS w/microswitch position indicator

DATA SOURCE Carleton product data sheet - 1987

LINE/THRUSTER VALVE

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2666-0001-25
DESCRIPTION Motor-operated latching valve
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂

PRESSURE, OPERATING 0 to 3300 psig
PROOF 4950 psig
BURST 6600 psig
DROP 30 psid at 200 psi
RATED FLOW 150 lbm/hr at 200 psi

LEAKAGE, INTERNAL 2.5 SCCM max. at max. inlet
EXTERNAL 0.3 SCCM max.

MASS 2.21 lbm
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____
PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING 24 to 32 Vdc
PULL IN/DROP OUT _____

WATTS 4.4 max.
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 200 °F

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS w/microswitch position indicator

DATA SOURCE Carleton product data sheet - 1987

LINE/THRUSTER VALVE

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2710-0001-1
DESCRIPTION Airlock isolation valve
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID Air, O₂

PRESSURE, OPERATING 16 psig
PROOF 24 psig
BURST 32 psig
DROP

RATED FLOW 150 lbm/hr at 16 psi

LEAKAGE, INTERNAL 1.5 SCCM
EXTERNAL

MASS 1.25 lbm

DIMENSIONS

MATERIAL, BODY

SEAT/SEAL

PORTS, SIZE & TYPE

INTEGRAL FILTER

RESPONSE TIME, OPEN/CLOSE

VOLTAGE, OPERATING 18 to 32 Vdc

PULL IN/DROP OUT

WATTS 5.5, motor running; 14, motor stalled

ELECTRICAL CONNECTION

MOUNTING

OPERATING TEMPERATURE RANGE -65 to 200 °F

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

CYCLE

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS w/microswitch position indicator

DATA SOURCE Carleton product data sheet - 1987

LINE/THRUSTER VALVE

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2722-0001-9
DESCRIPTION Solenoid valve
QUALIFICATION STATUS _____

PROPELLANT/FLUID O₂

PRESSURE, OPERATING 0 to 1250 psig
PROOF 1875 psig
BURST 2500 psig
DROP 4 psid at 200 psi

RATED FLOW 75 lbm/hr at 200 psi

LEAKAGE, INTERNAL 1.0 SCCM at 900 psi inlet
EXTERNAL 0.2 SCCM

MASS 1.367 lbm (valve), 0.8 lbm (power saver 2928-0001-5)
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING 18 to 32 Vdc
PULL IN/DROP OUT _____

WATTS 11.2 max.
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS w/position indicator

DATA SOURCE Carleton product data sheet - 1987

LINE/THRUSTER VALVE

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2724-0001-3
DESCRIPTION Solenoid valve
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂, N₂

PRESSURE, OPERATING 0 to 20 psig
PROOF 30 psig
BURST 45 psig
DROP _____

RATED FLOW 0.5 lbm/hr

LEAKAGE, INTERNAL 5 SCCH at 20 psig
EXTERNAL 0.2 SCCM

MASS 0.42 lbm

DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING 18 to 32 Vdc
PULL IN/DROP OUT _____

WATTS 9.2

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE 35 to 120 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS w/position indicator

DATA SOURCE Carleton product data sheet - 1987

LINE/THRUSTER VALVE

MANUFACTURER Carleton Technologies, Inc.

PART NUMBER 2763-0001-9

DESCRIPTION Equalization valve

QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID Air, O₂

PRESSURE, OPERATING 14.7 psig

PROOF 22 psig

BURST 29.4 psig

DROP _____

RATED FLOW 0.1, 0.5 psi/s

LEAKAGE, INTERNAL 5.0 SCCM max.

EXTERNAL 5.0 SCCM max.

MASS 1.09 lbm

DIMENSIONS _____

MATERIAL, BODY _____

SEAT/SEAL _____

PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____

RESPONSE TIME, OPEN/CLOSE _____

VOLTAGE, OPERATING _____

PULL IN/DROP OUT _____

WATTS _____

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE -100 to 160 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Carleton product data sheet - 1987

LINE/THRUSTER VALVE

MANUFACTURER Carleton Technologies, Inc.
PART NUMBER 2874-0001-3
DESCRIPTION Cabin pressure bleed valve, motor operated
QUALIFICATION STATUS Space shuttle ARPCS

PROPELLANT/FLUID O₂, N₂

PRESSURE, OPERATING 16.7 psig
PROOF 24 psig
BURST 32 psig
DROP _____

RATED FLOW 15±1 lbm/min at 2 psid

LEAKAGE, INTERNAL 1 SCCM
EXTERNAL _____

MASS 2.39 lbm

DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____

PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____

RESPONSE TIME, OPEN/CLOSE _____

VOLTAGE, OPERATING 24 to 32 Vdc

PULL IN/DROP OUT _____

WATTS 6.72 motor running, 32.2 motor stalled

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 200 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____
CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS w/microswitch position indicator

DATA SOURCE Carleton product data sheet - 1987

LINE/THRUSTER VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P9-649 (Gen. Dyn. P/N GD/C27-08250-1)
DESCRIPTION Bleed valve
QUALIFICATION STATUS Atlas staging (General Dynamics Convair)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 3000 psig
PROOF _____
BURST _____
DROP _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 2024-T351 Al alloy
SEAT/SEAL Teflon

PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING _____
PULL IN/DROP OUT _____

WATTS _____
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -200 to 160 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

LINE/THRUSTER VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P22-406 (Ham. Stan. SV701612)
DESCRIPTION Shutoff valve
QUALIFICATION STATUS Gemini backpack (Hamilton Standard)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 7500 psig
PROOF _____
BURST _____
DROP _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Silicone, Teflon
PORTS, SIZE & TYPE AND10050-4

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING _____
PULL IN/DROP OUT _____

WATTS _____
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 175 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

LINE/THRUSTER VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P38-717 (Bell P/N 8250-472095)
DESCRIPTION Shutoff valve
QUALIFICATION STATUS Gemini, Agena engine (Bell Aerospace)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 255 psig
PROOF _____
BURST _____
DROP _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 2024-T351 Al alloy
SEAT/SEAL Buna-N
PORTS, SIZE & TYPE MS 24385-5

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING _____
PULL IN/DROP OUT _____

WATTS _____
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -65 to 160 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

LINE/THRUSTER VALVE

MANUFACTURER Circle Seal Controls, Brunswick

PART NUMBER P54-717

DESCRIPTION Shutoff valve

QUALIFICATION STATUS Gemini O₂ and H₂ system (AiResearch)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 1050 psig

PROOF _____

BURST _____

DROP _____

RATED FLOW _____

LEAKAGE, INTERNAL _____

EXTERNAL _____

MASS _____

DIMENSIONS _____

MATERIAL, BODY 2024-T351 Al alloy

SEAT/SEAL Ethylene propylene

PORTS, SIZE & TYPE MS 24386-4, MS 24385-4

INTEGRAL FILTER _____

RESPONSE TIME, OPEN/CLOSE _____

VOLTAGE, OPERATING _____

PULL IN/DROP OUT _____

WATTS _____

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE -20 to 160 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

LINE/THRUSTER VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P58-717 (GE P/N 47C14003)
DESCRIPTION Shutoff valve
QUALIFICATION STATUS Biosatellite capsule (General Electric)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 20 psig
PROOF _____
BURST _____
DROP _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 2024-T351 Al alloy
SEAT/SEAL Buna-N
PORTS, SIZE & TYPE MS 24385-4

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING _____
PULL IN/DROP OUT _____

WATTS _____
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -30 to 125 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

LINE/THRUSTER VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P76-717 (GE P/N 47C145477)
DESCRIPTION _____
QUALIFICATION STATUS BIOSAT capsule reentry system (General Electric)
PROPELLANT/FLUID _____
PRESSURE, OPERATING 20 psig
PROOF _____
BURST _____
DROP _____
RATED FLOW _____
LEAKAGE, INTERNAL _____
EXTERNAL _____
MASS _____
DIMENSIONS _____
MATERIAL, BODY 303 CRES
SEAT/SEAL Buna-N
PORTS, SIZE & TYPE MS 24385-4
INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING _____
PULL IN/DROP OUT _____
WATTS _____
ELECTRICAL CONNECTION _____
MOUNTING _____
OPERATING TEMPERATURE RANGE 35 to 120 °F
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

LINE/THRUSTER VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER P79-717 (AiResearch P/N 630226)
DESCRIPTION Shutoff valve
QUALIFICATION STATUS Mercury ECS Airlock (AiResearch)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 250 psig
PROOF _____
BURST _____
DROP _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Viton
PORTS, SIZE & TYPE AND10050-4

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING _____
PULL IN/DROP OUT _____

WATTS _____
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -20 to 200 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

LINE/THRUSTER VALVE

MANUFACTURER Circle Seal Controls, Brunswick
PART NUMBER 9213T-2PP
DESCRIPTION Shutoff valve
QUALIFICATION STATUS Apollo (Martin Marietta)

PROPELLANT/FLUID _____

PRESSURE, OPERATING 150 psi
PROOF _____
BURST _____
DROP _____

RATED FLOW _____

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS _____
DIMENSIONS _____

MATERIAL, BODY 303 CRES
SEAT/SEAL Neoprene

PORTS, SIZE & TYPE 1/4-in. NPT

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING _____
PULL IN/DROP OUT _____

WATTS _____
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE 0 to 240 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Circle Seal Controls list (ref. 10)

LINE/THRUSTER VALVE

MANUFACTURER Consolidated Controls Corporation
PART NUMBER _____
DESCRIPTION Low flow, torque motor, latching
QUALIFICATION STATUS Intelsat IV and V, ETS-III, MOS-I, Westar,
SynCom, FLTSATCOM, TDRSS, Tiros-N, etc.
PROPELLANT/FLUID N₂H₄, N₂O, GN₂

PRESSURE, OPERATING 300 to 600 psi
PROOF _____
BURST _____
DROP 3 to 85 psid
RATED FLOW 0.015 to 0.06 lbm/s

LEAKAGE, INTERNAL 1.0 SCCH GN₂
EXTERNAL _____
MASS 0.5 to 1.0 lbm
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL _____
PORTS, SIZE & TYPE Tube, colinear inlet and outlet

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 8/50 ms
VOLTAGE, OPERATING 28 Vdc
PULL IN/DROP OUT _____
WATTS 5 to 18
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS N.C. or N.O. available

DATA SOURCE Consolidated Controls product data booklet - 1986

LINE/THRUSTER VALVE

MANUFACTURER Consolidated Controls Corporation
 PART NUMBER _____
 DESCRIPTION Dual-solenoid thruster valve
 QUALIFICATION STATUS Intelsat IV and VI, space shuttle, MMS
 PROPELLANT/FLUID N₂H₄, NTO, MMH, GN₂, H₂O
 PRESSURE, OPERATING 200 to 400 psig
 PROOF _____
 BURST _____
 DROP 3 to 30 psid
 RATED FLOW _____
 LEAKAGE, INTERNAL 0.5 to 1.0 SCCH GN₂
 EXTERNAL _____
 MASS 0.2 to 1.0 lbm
 DIMENSIONS _____
 MATERIAL, BODY CRES
 SEAT/SEAL _____
 PORTS, SIZE & TYPE Flange mount; tube
 INTEGRAL FILTER _____
 RESPONSE TIME, OPEN/CLOSE 5/20 ms
 VOLTAGE, OPERATING 28 Vdc
 PULL IN/DROP OUT _____
 WATTS 5 to 30
 ELECTRICAL CONNECTION _____
 MOUNTING _____
 OPERATING TEMPERATURE RANGE 20 to 250 °F
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE _____
 CYCLE _____
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS N.C. or N.O. available; clapper-type valve, series
 solenoids

DATA SOURCE Consolidated Controls product data booklet - 1986

LINE/THRUSTER VALVE

MANUFACTURER Consolidated Controls Corporation
PART NUMBER _____
DESCRIPTION Medium-flow torque motor, latching
QUALIFICATION STATUS Tiros-N, DMSP, COBE
PROPELLANT/FLUID N₂H₄, NTO, GN₂
PRESSURE, OPERATING 300 to 600 psi
PROOF _____
BURST _____
DROP 8 to 30 psid
RATED FLOW 0.05 to 0.30 lbm/s
LEAKAGE, INTERNAL 1.0 to 5.0 SCCH GN₂
EXTERNAL _____
MASS 1.2 to 1.5 lbm
DIMENSIONS _____
MATERIAL, BODY _____
SEAT/SEAL _____
PORTS, SIZE & TYPE Tube; colinear inlet and outlet
INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 20/50 ms
VOLTAGE, OPERATING 28 Vdc
PULL IN/DROP OUT _____
WATTS 24 to 50
ELECTRICAL CONNECTION _____
MOUNTING _____
OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS N.C. or N.O. available

DATA SOURCE Consolidated Controls product data booklet - 1986

LINE/THRUSTER VALVE

MANUFACTURER Consolidated Controls Corporation
PART NUMBER _____
DESCRIPTION Single-solenoid thruster valve
QUALIFICATION STATUS Space shuttle, GRO, Intelsat IV and VI,
Peace and Courage
PROPELLANT/FLUID N₂H₄, NTO, MMH, GN₂, H₂O
PRESSURE, OPERATING 200 to 400 psig
PROOF _____
BURST _____
DROP 1.5 to 300 psid
RATED FLOW 0.001 to 0.30 lbm/s
LEAKAGE, INTERNAL 0.5 to 1.0 SCCH GN₂
EXTERNAL _____
MASS 0.2 to 0.51 lbm
DIMENSIONS _____
MATERIAL, BODY CRES
SEAT/SEAL _____
PORTS, SIZE & TYPE Flange mount, tube
INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 5/20 ms
VOLTAGE, OPERATING 28 Vdc
PULL IN/DROP OUT _____
WATTS 5 to 30
ELECTRICAL CONNECTION _____
MOUNTING _____
OPERATING TEMPERATURE RANGE 20 to 250 °F
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS N.C. or N.O. available; clapper type valve

DATA SOURCE Consolidated Controls product data booklet - 1986

LINE/THRUSTER VALVE

MANUFACTURER Consolidated Controls Corporation
PART NUMBER _____
DESCRIPTION Gas generator valve module
QUALIFICATION STATUS Space shuttle APU
PROPELLANT/FLUID N₂H₄
PRESSURE, OPERATING 0 to 2000 psig
PROOF _____
BURST _____
DROP 0 to 500 psid
RATED FLOW 0 to 0.3 lbm/s
LEAKAGE, INTERNAL 18 to 180 SCCH He at 400 psid
EXTERNAL _____
MASS 2.5 lbm
DIMENSIONS _____
MATERIAL, BODY _____
SEAT/SEAL _____
PORTS, SIZE & TYPE _____
INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 20/40 ms
VOLTAGE, OPERATING 28 Vdc
PULL IN/DROP OUT _____
WATTS 25 steady state
ELECTRICAL CONNECTION _____
MOUNTING _____
OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS Torque-motor actuated, dual w/bypass

DATA SOURCE Consolidated Controls product data booklet - 1986

LINE/THRUSTER VALVE

MANUFACTURER Futurecraft Corporation
 PART NUMBER 200787-39
 DESCRIPTION Solenoid, dual-coil, two-way
 QUALIFICATION STATUS Space shuttle OMS (Aerojet)
 PROPELLANT/FLUID GN₂
 PRESSURE, OPERATING 3000 psig
 PROOF 6000 psig
 BURST 12,000 psig
 DROP _____
 RATED FLOW ESEOD = 0.08 in. min. (C_D = 0.65)
 LEAKAGE, INTERNAL _____
 EXTERNAL _____
 MASS 1.25 lbm
 DIMENSIONS 5.20 by 3.52 by 1.75 in.
 MATERIAL, BODY 6061-T6 Al alloy
 SEAT/SEAL Ethylene propylene, Teflon
 PORTS, SIZE & TYPE Stub in pad mount
 INTEGRAL FILTER Inlet sintered CRES wire; 6 μm nom., 18 μm abs
 RESPONSE TIME, OPEN/CLOSE _____
 VOLTAGE, OPERATING 23 to 32 Vdc
 PULL IN/DROP OUT 18/2 Vdc
 WATTS 40
 ELECTRICAL CONNECTION 1186680-1, -2, -5 (Aerojet)
 MOUNTING Pad; four 0.218/0.228-in.-diam holes on 0.750- by
 1.375-in. rectangle
 OPERATING TEMPERATURE RANGE -40 to 160 °F
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE _____
 CYCLE _____
 SHELF _____
 RELIABILITY _____
 LEAK TIME _____
 COST _____
 REMARKS _____

DATA SOURCE Futurecraft drawing 200787 - 1985

LINE/THRUSTER VALVE

MANUFACTURER Futurecraft Corporation
PART NUMBER 200788-59, -69
DESCRIPTION Dual coil, three-way
QUALIFICATION STATUS Space shuttle OMS (Aerojet)

PROPELLANT/FLUID GN₂

PRESSURE, OPERATING 450 psig
 PROC 1000 psig
 BURST 2000 psig
 DROP
RATED FLOW ESEOD = 0.035 and 0.070 in. min. (C_D = 0.60)

LEAKAGE, INTERNAL
 EXTERNAL
MASS 1.4 lbm
DIMENSIONS 5.60 in. less inlet by 3.12 by 2.47 in.

MATERIAL, BODY 6061-T6 Al alloy
 SEAT/SEAL Ethylene propylene, Teflon
PORTS, SIZE & TYPE 1/4-in.-tube inlet, pad-mounted stub outlet,
 threaded vent port
INTEGRAL FILTER Inlet - CRES sintered wire; 6 μm nom., 18 μm abs
RESPONSE TIME, OPEN/CLOSE
VOLTAGE, OPERATING 23 to 32 Vdc
 PULL IN/DROP OUT 18/2 Vdc
WATTS 40
ELECTRICAL CONNECTION 1186680-3, -4, -5, -6, -8 (Aerojet)
MOUNTING Pad; four 0.155-in.-diam holes at 1.000 by 1.250 in.

OPERATING TEMPERATURE RANGE 0 to 160 °F

VIBRATION, RANDOM
 SINE
ACCELERATION
SHOCK

LIFE, SERVICE
 CYCLE
 SHELF
RELIABILITY
LEAD TIME
COST
REMARKS -69 RH, -59 LH; has position indicator

DATA SOURCE Futurecraft drawing 200788 - 1985

LINE/THRUSTER VALVE

MANUFACTURER Futurecraft Corporation
PART NUMBER 200851
DESCRIPTION Solenoid, dual, two-way, N.C.
QUALIFICATION STATUS Space shuttle OMS (Aerojet)

PROPELLANT/FLUID GN₂

PRESSURE, OPERATING 450 psig
PROOF 900 psig
BURST 1800 psig min.
DROP _____

RATED FLOW ESEOD = 0.08 in. min. (C_D = 0.65)

LEAKAGE, INTERNAL _____
EXTERNAL _____

MASS 2.13 lbm

DIMENSIONS 5.56 by 1.20 by 6.5 in.

MATERIAL, BODY 6061-T6 Al alloy
SEAT/SEAL Ethylene propylene, Teflon

PORTS, SIZE & TYPE Redundant sealed bayonet inlet, four-bolt
flange outlet

INTEGRAL FILTER Inlet sintered CRES wire; 6 μm nom., 18 μm abs

RESPONSE TIME, OPEN/CLOSE _____

VOLTAGE, OPERATING 23 to 32 Vdc
PULL IN/DROP OUT 18/2 Vdc

WATTS 40

ELECTRICAL CONNECTION 1186680-2, -5 (Aerojet)

MOUNTING Pad; four 0.218/0.228-in.-diam holes on 1.625- by
3.500-in. rectangle

OPERATING TEMPERATURE RANGE -40 to 160 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Futurecraft drawing 200851 - 1985

LINE/THRUSTER VALVE

MANUFACTURER Futurecraft Corporation
PART NUMBER 200916
DESCRIPTION Latching, solenoid
QUALIFICATION STATUS Teal Ruby (Rockwell)

PROPELLANT/FLUID GN₂, GHe, others

PRESSURE, OPERATING 85 psig
PROOF 128 psig
BURST 9555 psia
DROP _____
RATED FLOW 0.0093 lbm/s GN₂

LEAKAGE, INTERNAL _____
EXTERNAL _____
MASS 2.63 lbm
DIMENSIONS 5.31 by 4.28 by 1.88 in.

MATERIAL, BODY 304L CRES
SEAT/SEAL Teflon
PORTS, SIZE & TYPE 3/8-in. tubes

INTEGRAL FILTER 304 CRES RIGIMESH 30 to 55 μm
RESPONSE TIME, OPEN/CLOSE 1/2 cycle; 80 ms max.
VOLTAGE, OPERATING 28 Vdc
PULL IN/DROP OUT 18/18 Vdc
WATTS 52.3 max.
ELECTRICAL CONNECTION Number-22 M81044/12 lead wires
MOUNTING Clamp

OPERATING TEMPERATURE RANGE -22 to 160 °F

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE 5000 min.
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Futurecraft drawing 200916 - 1985

LINE/THRUSTER VALVE

MANUFACTURER The Marquardt Company
PART NUMBER 234883-502, 234884-502
DESCRIPTION Solenoid open, spring return, thruster
QUALIFICATION STATUS Space shuttle vernier thrusters

PROPELLANT/FLUID NTO, MMH

PRESSURE, OPERATING 264 psig
PROOF
BURST
DROP 40 psid max.

RATED FLOW

LEAKAGE, INTERNAL 50 SCCH max. He
EXTERNAL

MASS 0.65 lbm

DIMENSIONS 3.12 in. by 1.38 in. diam

MATERIAL, BODY
SEAT/SEAL

PORTS, SIZE & TYPE

INTEGRAL FILTER 25 μ m abs

RESPONSE TIME, OPEN/CLOSE 12/7 ms nom.

VOLTAGE, OPERATING 18 to 32 Vdc
PULL IN/DROP OUT

WATTS 16.5 nom.

ELECTRICAL CONNECTION

MOUNTING

OPERATING TEMPERATURE RANGE To 225 °F

VIBRATION, RANDOM 28g rms
SINE

ACCELERATION 5g

SHOCK 1.5g

LIFE, SERVICE 10 yr

CYCLE 500,000 min.

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS

DATA SOURCE Marquardt report (ref. 12)

LINE/THRUSTER VALVE

MANUFACTURER Moog Inc.
 PART NUMBER 50-353
 DESCRIPTION Redundant seat, torque motor, thruster valve
 QUALIFICATION STATUS Moog R&D, none known

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 250 psig
 PROOF _____
 BURST _____
 DROP 16 psid
 RATED FLOW 0.025 lb/s

LEAKAGE, INTERNAL 1.0 SCCH max.
 EXTERNAL _____

MASS 0.82 lbm
 DIMENSIONS _____

MATERIAL, BODY _____
 SEAT/SEAL Teflon

PORTS, SIZE & TYPE _____

INTEGRAL FILTER 20 μm nom., 35 μm abs
 RESPONSE TIME, OPEN/CLOSE 5.5/5.5 ms
 VOLTAGE, OPERATING 24 to 32 Vdc
 PULL IN/DROP OUT _____

WATTS 21.3 max.
 ELECTRICAL CONNECTION _____
 MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
 SINE _____

ACCELERATION _____
 SHOCK _____

LIFE, SERVICE _____
 CYCLE _____
 SHELF _____

RELIABILITY _____
 LEAD TIME _____
 COST _____

REMARKS 5-lbf thruster

DATA SOURCE Moog catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Moog Inc.
PART NUMBER 50X366
DESCRIPTION Torque motor, thruster valve
QUALIFICATION STATUS ATS - Moog

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 350 psig
PROOF _____
BURST _____
DROP 12 psid
RATED FLOW 0.0025 lb/s

LEAKAGE, INTERNAL 5.0 SCCH max.
EXTERNAL _____
MASS 0.40 lbm
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL Teflon
PORTS, SIZE & TYPE _____

INTEGRAL FILTER 10 μm nom., 25 μm abs
RESPONSE TIME, OPEN/CLOSE 1/1 ms
VOLTAGE, OPERATING 18 to 32 Vdc
PULL IN/DROP OUT _____
WATTS 7.9
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS 0.5-lbf thruster

DATA SOURCE Moog catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Moog Inc.
PART NUMBER 50-391
DESCRIPTION _____
QUALIFICATION STATUS Grand Tour (Rocket Research)
PROPELLANT/FLUID N₂H₄
PRESSURE, OPERATING 400 psig
PROOF _____
BURST _____
DROP 5 psid
RATED FLOW 0.0005 lb/s
LEAKAGE, INTERNAL 1.0 SCCH max.
EXTERNAL _____
MASS 0.20 lbm
DIMENSIONS _____
MATERIAL, BODY _____
SEAT/SEAL Teflon
PORTS, SIZE & TYPE _____
INTEGRAL FILTER 5 μm nom., 15 μm abs
RESPONSE TIME, OPEN/CLOSE 10/10 ms
VOLTAGE, OPERATING 24 to 32 Vdc
PULL IN/DROP OUT _____
WATTS 10 max.
ELECTRICAL CONNECTION _____
MOUNTING _____
OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS 0.1-lbf thruster

DATA SOURCE Moog catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Moog Inc.
PART NUMBER 50-438
DESCRIPTION Redundant solenoid thruster valve
QUALIFICATION STATUS FLTSATCOM (Hamilton Standard)

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 210 psig
PROOF _____
BURST _____
DROP 4 psid
RATED FLOW 0.0005 lb/s

LEAKAGE, INTERNAL 5.0 SCCH max.
EXTERNAL _____
MASS 0.80 lbm
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL Teflon
PORTS, SIZE & TYPE _____

INTEGRAL FILTER 10 μ m nom., 25 μ m abs
RESPONSE TIME, OPEN/CLOSE 12/17 ms
VOLTAGE, OPERATING 18 to 28 Vdc
PULL IN/DROP OUT _____
WATTS 8.43 max.
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS 0.1-lbf thruster

DATA SOURCE Moog catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Moog Inc.
PART NUMBER 51-109
DESCRIPTION Solenoid thruster valve
QUALIFICATION STATUS MJS (Rocket Research)

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 420 psig
PROOF _____
BURST _____
DROP 5 psid
RATED FLOW 0.0009 lb/s

LEAKAGE, INTERNAL 2 SCCH
EXTERNAL _____
MASS 0.24 lbm
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL AFE-411
PORTS, SIZE & TYPE _____

INTEGRAL FILTER 25 μm abs
RESPONSE TIME, OPEN/CLOSE 8/6 ms
VOLTAGE, OPERATING 24 to 34 Vdc
PULL IN/DROP OUT _____
WATTS 5.4 max.
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS 0.2-lbf thruster

DATA SOURCE Moog catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Moog Inc.
PART NUMBER 51E110
DESCRIPTION Solenoid thruster valve
QUALIFICATION STATUS MJS (Bell)

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 420 psig
PROOF _____
EURST _____
DROP 5 psid
RATED FLOW 0.0009 lb/s

LEAKAGE, INTERNAL 2 SCCH
EXTERNAL _____
MASS 0.24 lbm
DIMENSIONS _____

MATERIAL, BODY _____
SEAT/SEAL AFE-411
PORTS, SIZE & TYPE _____

INTEGRAL FILTER 25 μm abs
RESPONSE TIME, OPEN/CLOSE 8/6 ms
VOLTAGE, OPERATING 24 to 34 Vdc
PULL IN/DROP OUT _____
WATTS 5.4 max.
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS 0.2-lbf thruster

DATA SOURCE Moog catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Moog Inc.
PART NUMBER 51-122A
DESCRIPTION Series redundant solenoid thruster valve
QUALIFICATION STATUS 8623 (TRW)

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 310 psig

PROOF _____

BURST _____

DROP 10 psid

RATED FLOW 0.005 lb/s

LEAKAGE, INTERNAL 0.5 SCCH

EXTERNAL _____

MASS 0.54 lbm

DIMENSIONS _____

MATERIAL, BODY _____

SEAT/SEAL AFE-411

PORTS, SIZE & TYPE _____

INTEGRAL FILTER 10 μ m nom., 15 μ m abs

RESPONSE TIME, OPEN/CLOSE 37/20 ms

VOLTAGE, OPERATING 23 to 38 Vdc

PULL IN/DROP OUT _____

WATTS 12 max.

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS 1-lbf thruster

DATA SOURCE Moog catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Moog Inc.
 PART NUMBER 51-128
 DESCRIPTION Series redundant
 QUALIFICATION STATUS _____

 PROPELLANT/FLUID N₂H₄

 PRESSURE, OPERATING 350 psig
 PROOF 1150 psig
 BURST 1700 psig
 DROP 30 psid
 RATED FLOW 0.0027 lb/s

 LEAKAGE, INTERNAL 3.0 SCCH GN₂ max.
 EXTERNAL 1x10⁻⁶ SCCS GHe
 MASS 0.45 lbm max.
 DIMENSIONS 3.29 in. LOA; 0.88 in. diam plus flange, inlet, and
wires
 MATERIAL, BODY _____
 SEAT/SEAL _____
 PORTS, SIZE & TYPE Inlet, 0.25-in. diam tube; outlet, three-bolt
flange
 INTEGRAL FILTER 20 μm abs
 RESPONSE TIME, OPEN/CLOSE 10/10 ms
 VOLTAGE, OPERATING 22 to 34 Vdc
 PULL IN/DROP OUT 16/1.5
 WATTS 15.46 max.
 ELECTRICAL CONNECTION Free leads
 MOUNTING Three-bolt flange; 1.0-in.-diam BC, EQ SP holes

 OPERATING TEMPERATURE RANGE Fluid, 40 to 140 °F; ambient, 40 to
300 °F
 VIBRATION, RANDOM No GN₂ leakage at 43g rms w/50 psi inlet
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE _____
 CYCLE 1,000,000
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS _____

DATA SOURCE Moog catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Parker Hannifin
PART NUMBER 5720002
DESCRIPTION Solenoid, 0.5 lbf thruster valve, N.C.
QUALIFICATION STATUS Classified program

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 255 psig
PROOF _____
BURST _____
DROP _____
RATED FLOW Effective flow area, 0.0000131 in.²

LEAKAGE, INTERNAL _____
EXTERNAL _____
MASS 0.21 lbm
DIMENSIONS _____

MATERIAL, BODY CRES
SEAT/SEAL Teflon
PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 4.2/3.0 ms at 170 psig and 70 °F
VOLTAGE, OPERATING 21 Vdc min.
PULL IN, DROP OUT 3 Vdc drop out
WATTS 4.6 min.
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE Fluid, 35 °F min.; ambient, 250 °F
max.
VIBRATION, RANDOM 18.8g rms
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE 1,500,000 min.
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Parker Aerospace product data sheet - 1984

LINE/THRUSTER VALVE

MANUFACTURER Parker Hannifin
 PART NUMBER 5720004 "Peanut valve"
 DESCRIPTION Miniature latching solenoid
 QUALIFICATION STATUS Viking Lander Biology Experiment (flown)
HEAO-B, HPG8DA (flown)
 PROPELLANT/FLUID _____
 PRESSURE, OPERATING 0 to 175 psig
 PROOF _____
 BURST _____
 DROP _____
 RATED FLOW Effective flow area, 0.000148 in.²
 LEAKAGE, INTERNAL 1x10⁻⁶ SCCH He
 EXTERNAL _____
 MASS 0.018 lbm
 DIMENSION 0.8 in. length by ≈ 0.5 in. diam
 MATERIAL, BODY _____
 SEAT/SEAL Ethylene propylene
 PORTS, SIZE & TYPE _____
 INTEGRAL FILTER _____
 RESPONSE TIME, OPEN/CLOSE 1.5/1.5 ms
 VOLTAGE, OPERATING 28 to 32 Vdc
 PULL IN/DROP OUT _____
 WATTS 9 max.
 ELECTRICAL CONNECTION _____
 MOUNTING Bolt to manifold, valve seat in manifold

 OPERATING TEMPERATURE RANGE _____
 VIBRATION, RANDOM 700g peak to unlatch
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE _____
 CYCLE _____
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS Latch magnetically in both directions; polarity shift to
open/close

 DATA SOURCE Parker Aerospace product data sheet - 1984

LINE/THRUSTER VALVE

MANUFACTURER Parker Hannifin
PART NUMBER 5720048 "Walnut valve"
DESCRIPTION Miniature latching solenoid
QUALIFICATION STATUS Viking GCMS

PROPELLANT/FLUID _____

PRESSURE, OPERATING 0 to 1000 psig
PROOF _____
BURST _____
DROP _____

RATED FLOW Effective flow area, 0.000198 in.²

LEAKAGE, INTERNAL 1x10⁻⁶ SCCH He
EXTERNAL _____

MASS 0.090 lbm

DIMENSIONS ≈ 1.25 in. length by 0.5 in. diam by 0.8 in. wide

MATERIAL, BODY _____
SEAT/SEAL _____

PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____

RESPONSE TIME, OPEN/CLOSE 1 to 2/1 to 2 ms

VOLTAGE, OPERATING 8 Vdc nom., current driver

PULL IN/DROP OUT _____

WATTS 20 max.

ELECTRICAL CONNECTION _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM 400g peak to unlatch

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Latches magnetically in both directions; polarity reversal
for open/open

DATA SOURCE Parker Aerospace product data sheet - 1984

LINE/THRUSTER VALVE

MANUFACTURER Valcor Engineering Corporation
PART NUMBER V27200-195
DESCRIPTION Isolation valve
QUALIFICATION STATUS USAF classified reentry vehicle

PROPELLANT/FLUID N₂H₄, NTO

PRESSURE, OPERATING 295 psia (203 N/cm²)
PROOF 615 psia (424 N/cm²)
BURST 915 psia (630 N/cm²)
DROP _____

RATED FLOW _____

LEAKAGE, INTERNAL 015 SCCH N₂H₄ at 295 psia
EXTERNAL Zero
MASS 0.5 lbm (0.2 kg)
DIMENSIONS _____

MATERIAL, BODY CRES
SEAT/SEAL CRES/Teflon
PORTS, SIZE & TYPE 1/4 in.

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 10/10 ms
VOLTAGE, OPERATING 28 Vdc
PULL IN/DROP OUT _____
WATTS 56 at 28 Vdc and 70 °F
ELECTRICAL CONNECTION _____
MOUNTING _____

OPERATING TEMPERATURE RANGE -20 to 165 °F (-28 to 73.8 °C)

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE IITRI lists (ref. 8)

LINE/THRUSTER VALVE

MANUFACTURER Valcor Engineering Corporation
PART NUMBER V27200-411
DESCRIPTION Propellant isolation
QUALIFICATION STATUS USAF classified project (Hamilton Standard)
PROPELLANT/FLUID N₂H₄
PRESSURE, OPERATING 576 psia (397 N/cm²)
PROOF 857 psia (590 N/cm²)
BURST 1193 psia (822 N/cm²)
DROP _____
RATED FLOW _____
LEAKAGE, INTERNAL 20 SCCH N₂ at 561 psia
EXTERNAL 5x10⁻⁶ SCCS He at 561 psia
MASS 0.6 lbm (0.2 kg)
DIMENSIONS _____
MATERIAL, BODY 304 CRES
SEAT/SEAL Teflon
PORTS, SIZE & TYPE Face seals
INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 15/15 ms
VOLTAGE, OPERATING _____
PULL IN/DROP OUT _____
WATTS _____
ELECTRICAL CONNECTION _____
MOUNTING _____
OPERATING TEMPERATURE RANGE 40 to 160 °F (4 to 71 °C)
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE _____
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____
DATA SOURCE IITRI lists (ref. 8)

LINE/THRUSTER VALVE

MANUFACTURER Valcor Engineering Corporation
PART NUMBER V27200-520
DESCRIPTION Coaxial solenoid isolation valve
QUALIFICATION STATUS Apollo, shuttle
PROPELLANT/FLUID Pneumatic, water
PRESSURE, OPERATING 43 psia (29 N/cm²)
PROOF
BURST 90 psia (62 N/cm²)
DROP
RATED FLOW
LEAKAGE, INTERNAL
EXTERNAL
MASS 0.35 lbm (0.15 kg)
DIMENSIONS
MATERIAL, BODY
SEAT/SEAL Buna-N
PORTS, SIZE & TYPE
INTEGRAL FILTER
RESPONSE TIME, OPEN/CLOSE 20/15 ms
VOLTAGE, OPERATING 22 to 32 Vdc
PULL IN/DROP OUT
WATTS 20
ELECTRICAL CONNECTION
MOUNTING
OPERATING TEMPERATURE RANGE 0 to 150 °F (255 to 338 K)
VIBRATION, RANDOM
SINE
ACCELERATION
SHOCK
LIFE, SERVICE
CYCLE 100,000
SHELF
RELIABILITY
LEAD TIME
COST
REMARKS

DATA SOURCE Aerospace Corporation report (ref. 9)

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
 PART NUMBER 12240
 DESCRIPTION Solenoid, two-way N.C.
 QUALIFICATION STATUS Shuttle APU (Sunstrand), flown
 PROPELLANT/FLUID GN₂
 PRESSURE, OPERATING 0 to 315 psia; 315 to 340 psia nonoperating
 PROOF 600 psig
 BURST 1200 psig
 DROP 0.8 psid
 RATED FLOW FEOD = 0.19 to 0.23 in.; C_n = 0.61 at 70 °F
 LEAKAGE, INTERNAL 1x10⁻⁶ SCCH He
 EXTERNAL 1x10⁻⁶ SCCH He
 MASS 0.43 lbm
 DIMENSIONS 3.655 by 1.02 by 1.02 in.; body, 0.880 in. diam
 MATERIAL, BODY 430 and 304 CRES
 SEAT/SEAL Viton
 PORTS, SIZE & TYPE Special coaxial inlet and outlet
 INTEGRAL FILTER _____
 RESPONSE TIME, OPEN/CLOSE 40/40 ms
 VOLTAGE, OPERATING 21.3 to 31
 PULL IN/DROP OUT 18/1.0 Vdc
 WATTS 3.4
 ELECTRICAL CONNECTION NB3H8-98N/MSFC40M39569C
 MOUNTING Four EQ SP holes on 0.79-in. square
 OPERATING TEMPERATURE RANGE _____
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE _____
 CYCLE 250,000
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS Duty cycle - 30 s on, 5 min off (continuous)

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
 PART NUMBER 15398-1, -2, -3, -4
 DESCRIPTION Pulse coaxial solenoid, N.C.
 QUALIFICATION STATUS ATS (Avco), flown
 PROPELLANT/FLUID NH₃
 PRESSURE, OPERATING 0 to 300 psig
 PROOF 450 psig
 BURST 750 psig
 DROP _____
 RATED FLOW 10⁻⁵ lbm/s gas at 8 psia (-1, -3), 10⁻⁶ lbm/s at
 50 psia (-2, -4)
 LEAKAGE, INTERNAL 6x10⁻⁶ SCCS He
 EXTERNAL 1x10⁻⁶ SCCS He
 MASS 0.34 lbm
 DIMENSIONS 2.00 in. LOA, 0.96 in. height and width
 MATERIAL, BODY _____
 SEAT/SEAL Ethylene propylene 515-8
 PORTS, SIZE & TYPE Four-bolt flange mount, both ends
 INTEGRAL FILTER _____
 RESPONSE TIME, OPEN/CLOSE 15/15 ms
 VOLTAGE, OPERATING 24 (18 to 28) Vdc
 PULL IN/DROP OUT 18/6 Vdc
 WATTS 1 at 24 Vdc and 70 °F
 ELECTRICAL CONNECTION Free leads
 MOUNTING 0.128/0.133-in.-diam holes, four each EQ SP on 1.045-in.
 BC, both ends
 OPERATING TEMPERATURE RANGE Fluid, 95 to 125 °F; ambient, 0 to
 125 °F
 VIBRATION, RANDOM 45g sustained
 SINE _____
 ACCELERATION 30g
 SHOCK _____
 LIFE, SERVICE 2000 hr or 5 yr
 CYCLE 25,000,000
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS Seat diam, 0.018 in. (for -1, -3); 0.01 in. (for -2, -4)

 DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
PART NUMBER 15447
DESCRIPTION Pulse coaxial solenoid, N.C.
QUALIFICATION STATUS NRL Radiation (NRL), flown
PROPELLANT/FLUID GNH₃
PRESSURE, OPERATING 350 psig
PROOF _____
BURST _____
DROP _____
RATED FLOW 0.2 SCFM air
LEAKAGE, INTERNAL 2x10⁻⁶ SCCS He
EXTERNAL 2x10⁻⁶ SCCS He
MASS 0.35 lbm
DIMENSIONS _____
MATERIAL, BODY 303 CRES
SEAT/SEAL EPR 515-8
PORTS, SIZE & TYPE _____
INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 15/15 ms
VOLTAGE, OPERATING 24
PULL IN/DROP OUT 12/6 Vdc
WATTS 3
ELECTRICAL CONNECTION PT1H-8-2P
MOUNTING _____
OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE 2,000,000
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
PART NUMBER 15457 (-2, -5)
DESCRIPTION Pulse coaxial solenoid, N.C.
QUALIFICATION STATUS IMP (NASA), flown; NRL Radiation (Avco),
flown
PROPELLANT/FLUID CF₄ (-2), NH₃ (-5)

PRESSURE, OPERATING 60 psig
PROOF _____
BURST _____
DROP _____
RATED FLOW 1.4 SCFM air

LEAKAGE, INTERNAL 6x10⁻⁵ SCCS He
EXTERNAL Same as internal
MASS 0.25 lbm
DIMENSIONS _____

MATERIAL, BODY 300 series CRES
SEAT/SEAL Neoprene (for -2), EPR 515-8 (for -5)
PORTS, SIZE & TYPE _____

INTEGRAL FILTER Yes; 300 series CRES
RESPONSE TIME, OPEN/CLOSE 15/15 ms
VOLTAGE, OPERATING 26 Vdc
PULL IN/DROP OUT 20/5 Vdc
WATTS 2
ELECTRICAL CONNECTION Free leads
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE 25,000,000
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
 PART NUMBER 15548
 DESCRIPTION Pulse coaxial solenoid, N.C.
 QUALIFICATION STATUS NRL Radiation (JPL), flown
 PROPELLANT/FLUID NH₃
 PRESSURE, OPERATING 0 to 350 psig
 PROOF 450 psig
 BURST 750 psig
 DROP _____
 RATED FLOW 0.2 SCFM air
 LEAKAGE, INTERNAL 2x10⁻⁶ SCCS He
 EXTERNAL Same as internal
 MASS 0.27 lbm
 DIMENSIONS 1.625 by 0.95 by 1.854 in.
 MATERIAL, BODY 302, 304, 347, 430 CRES
 SEAT/SEAL Ethylene propylene 515-8
 PORTS, SIZE & TYPE Flanges
 INTEGRAL FILTER _____
 RESPONSE TIME, OPEN/CLOSE 15/15 ms
 VOLTAGE, OPERATING 24 Vdc (22 to 26 Vdc)
 PULL IN/DROP OUT 16/5 Vdc
 WATTS 3
 ELECTRICAL CONNECTION PTDH-8-2P
 MOUNTING Two flanges; 4-40 UNC-2B holes on 1.000-in. BC
 (inlet and outlet)
 OPERATING TEMPERATURE RANGE 32 to 140 °F
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE 5 yr
 CYCLE 2,000,000
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS _____

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
 PART NUMBER 15548-2
 DESCRIPTION Pulse coaxial solenoid, N.C.
 QUALIFICATION STATUS Solrad-X (NRL), flown
 PROPELLANT/FLUID N₂H₄
 PRESSURE, OPERATING 0 to 350 psig
 PROOF 450 psig
 BURST 750 psig
 DROP _____
 RATED FLOW 0.2 SCFM air
 LEAKAGE, INTERNAL 2x10⁻⁶ SCCS He
 EXTERNAL Same as internal
 MASS 0.30 lbm
 DIMENSIONS 1.625 by 0.95 by 1.854 in.
 MATERIAL, BODY 302, 304, 347, 430 CRES
 SEAT/SEAL Ethylene propylene 515-8
 PORTS, SIZE & TYPE Flanges
 INTEGRAL FILTER _____
 RESPONSE TIME, OPEN/CLOSE 15/15 ms
 VOLTAGE, OPERATING 24 Vdc (22 to 26 Vdc)
 PULL IN/DROP OUT 16/4 Vdc
 WATTS 3
 ELECTRICAL CONNECTION PT1H-8-2P
 MOUNTING Two flanges; 4-40 UNC-2B holes on 1.000-in. BC
 (inlet and outlet)
 OPERATING TEMPERATURE RANGE 32 to 140 °F
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE 5 yr
 CYCLE 2,000,000
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS _____

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
PART NUMBER 15554
DESCRIPTION Pulse coaxial solenoid
QUALIFICATION STATUS DISCOS (Avco), flown

PROPELLANT/FLUID CF₄ (Freon 14), GN₂

PRESSURE, OPERATING 0 to 45 psig
PROOF 68 psig
BURST 180 psig
DROP 1 psid at 15 psia
RATED FLOW 2.3x10⁻⁵ lb/s Freon 14

LEAKAGE, INTERNAL 3x10⁻⁵ SCCS GN₂
EXTERNAL Same as internal
MASS 0.28 lbm
DIMENSIONS 1.656 by 0.952 by 1.360 in.

MATERIAL, BODY 300 and 400 series CRES
SEAT/SEAL Ethylene propylene 515-8
PORTS, SIZE & TYPE Four-bolt flanges

INTEGRAL FILTER 5 μm nom. at inlet and outlet
RESPONSE TIME, OPEN/CLOSE 50/50 ms
VOLTAGE, OPERATING 20 to 31 Vdc
PULL IN/DROP OUT 16/1.5 Vdc
WATTS 1.12 at 28 Vdc
ELECTRICAL CONNECTION Free leads
MOUNTING Four 0.12-in.-diam holes on 1.172 by 1.469-in. base

OPERATING TEMPERATURE RANGE -20 to 120 °F

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE 2 yr
CYCLE 3,000,000
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
PART NUMBER 15607-2
DESCRIPTION Pulse coaxial solenoid, pneumatic N.C.
QUALIFICATION STATUS LES 8/9 (TRW), flown
PROPELLANT/FLUID NH₃
PRESSURE, OPERATING 225 psig
PROOF _____
BURST _____
DROP _____
RATED FLOW _____
LEAKAGE, INTERNAL 1x10⁻⁶ SCCS He
EXTERNAL 8x10⁻⁶ SCCS He
MASS 0.25 lbm
DIMENSIONS 2.03 in. by 0.96 in.²
MATERIAL, BODY _____
SEAT/SEAL AF-E-102
PORTS, SIZE & TYPE 0.343 in. o.d.
INTEGRAL FILTER 50 μm nom. inlet and outlet
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING 28 Vdc
PULL IN/DROP OUT 20/5 Vdc
WATTS 2 at 26 Vdc
ELECTRICAL CONNECTION Free leads
MOUNTING Four 0.13-in.-diam holes EQ SP on 1.045-in. diam. BC
at both ends
OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE 5 yr w/2000 hr powered
CYCLE 2,000,000
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
 PART NUMBER 15607-3
 DESCRIPTION Pulse coaxial solenoid, pneumatic, N.C.
 QUALIFICATION STATUS HEAO (NASA)
 PROPELLANT/FLUID Propane
 PRESSURE, OPERATING 280 psig
 PROOF _____
 BURST _____
 DROP _____
 RATED FLOW 1.2×10^{-4} lbm/s
 LEAKAGE, INTERNAL 1×10^{-6} SCCS He
 EXTERNAL Same as internal
 MASS 0.25 lbm
 DIMENSIONS 2.03 by 0.96 by 0.96 in.
 MATERIAL, BODY _____
 SEAT/SEAL Fluorosilicone
 PORTS, SIZE & TYPE 0.343 in. o.d.
 INTEGRAL FILTER 50 μ m nom., inlet and outlet
 RESPONSE TIME, OPEN/CLOSE _____
 VOLTAGE, OPERATING 28 Vdc
 PULL IN/DROP OUT 20/5 Vdc
 WATTS 2 at 26 Vdc
 ELECTRICAL CONNECTION Free leads
 MOUNTING Four 0.13-in.-diam holes EQ SP on 1.045-in.-diam BC at
both ends
 OPERATING TEMPERATURE RANGE _____
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE 5 yr w/2000 hr powered
 CYCLE 350,000
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS _____

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
PART NUMBER 15607-4
DESCRIPTION Pulse coaxial solenoid, pneumatic, N.C.
QUALIFICATION STATUS HEAO (NASA), flown

PROPELLANT/FLUID Propane

PRESSURE, OPERATING 40 psig
PROOF _____
BURST _____
DROP _____
RATED FLOW _____

LEAKAGE, INTERNAL 1x10⁻⁶ SCCS He
EXTERNAL Same as internal
MASS 0.25 lbm
DIMENSIONS 2.03 by 0.96 by 0.96 in.

MATERIAL, BODY _____
SEAT/SEAL Fluorosilicone
PORTS, SIZE & TYPE 0.343 in. o.d.

INTEGRAL FILTER 50 µm nom., inlet and outlet
RESPONSE TIME, OPEN/CLOSE _____
VOLTAGE, OPERATING 28 Vdc
PULL IN/DROP OUT 20/5 Vdc
WATTS 2 at 26 Vdc
ELECTRICAL CONNECTION Free leads
MOUNTING Four 0.13-in.-diam holes EQ SP on 1.045-in.-diam BC at both ends

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE 5 yr w/2000 hr powered
CYCLE 250,000
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
PART NUMBER 15617-3
DESCRIPTION Pulse coaxial solenoid
QUALIFICATION STATUS CTS (Hamilton Standard), flown

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 396 psig
PROOF 594 psig
BURST 1584 psig
DROP _____
RATED FLOW 0.0005 lbm/s

LEAKAGE, INTERNAL 2x10⁻⁶ SCCS He
EXTERNAL 1x10⁻⁶ SCCS He
MASS 0.17 lbm (not including lead wires)
DIMENSIONS 2.51 in. by 0.875 in. diam

MATERIAL, BODY 302, 304, 347, or 430 CRES
SEAT/SEAL AF-E-102
PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 8/10 ms
VOLTAGE, OPERATING 28 Vdc (25 to 29 Vdc)
PULL IN/DROP OUT 16/2 Vdc
WATTS 5
ELECTRICAL CONNECTION Free leads
MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE 3 yr
CYCLE 1,000,000
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
 PART NUMBER 15617-5
 DESCRIPTION Pulse coaxial solenoid
 QUALIFICATION STATUS BSE (Hamilton Standard), flown
 PROPELLANT/FLUID N₂H₄
 PRESSURE, OPERATING 400 psig
 PROOF 594 psig
 BURST 1584 psig
 DROP _____
 RATED FLOW 0.0005 lbm/s
 LEAKAGE, INTERNAL 2x10⁻⁶ SCCS He
 EXTERNAL 1x10⁻⁶ SCCS He
 MASS 0.17 lbm (not including lead wire)
 DIMENSIONS 2.5 in. by 0.875 in. diam
 MATERIAL, BODY 302, 304, 347, or 430 CRES
 SEAT/SEAL AF-E-102
 PCRTS, SIZE & TYPE _____
 INTEGRAL FILTER _____
 RESPONSE TIME, OPEN/CLOSE 8/10 ms
 VOLTAGE, OPERATING 28 Vdc (25 to 29 Vdc)
 PULL IN/DROP OUT 16/2 Vdc
 WATTS 5.7
 ELECTRICAL CONNECTION Free leads
 MOUNTING _____
 OPERATING TEMPERATURE RANGE _____
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE 3 yr
 CYCLE 500,000
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS _____

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
PART NUMBER 15626-2
DESCRIPTION Pulse coaxial solenoid, N.C.
QUALIFICATION STATUS Solrad XI, classified program (Hamilton Standard), flown
PROPELLANT/FLUID N₂H₄ (per MIL-P-26536)

PRESSURE, OPERATING 250 psig, 300 max. psig
PROOF 600 psig
BURST 1200 psig
DROP 40 psid
RATED FLOW 0.0009 lbm/s

LEAKAGE, INTERNAL 1.5x10⁻⁶ SCCS He
EXTERNAL 1.0x10⁻⁶ SCCS He
MASS 0.28 lbm
DIMENSIONS 0.018-in.-seat diam, 0.962 in. width less case,
1.627 in. length, 2.01 in. height
MATERIAL, BODY 304 CRES, 430 CRES spool
SEAT/SEAL AF-E-102
PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 10/10 ms
VOLTAGE, OPERATING 24 to 32 Vdc
PULL IN/DROP OUT 16/4 Vdc
WATTS 5
ELECTRICAL CONNECTION JT1H-8-3P-(101)
MOUNTING Two 0.120/0.130-in.-diam holes spaced at 1.176/1.168 in.

OPERATING TEMPERATURE RANGE 40 to 160 °F

VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE 500,000
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS Ref. P/N 15626-4

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
PART NUMBER 15626-4
DESCRIPTION Pulse coaxial
QUALIFICATION STATUS Classified (Hamilton Standard), flown
PROPELLANT/FLUID N₂H₄
PRESSURE, OPERATING 250 psig
PROOF _____
BURST _____
DROP _____
RATED FLOW 0.0009 lbm/s
LEAKAGE, INTERNAL 1x10⁻⁶ SCCS He
EXTERNAL Same as internal
MASS 0.28 lbm
DIMENSIONS 0.018-in.-seat diam
MATERIAL, BODY _____
SEAT/SEAL AF-E-411
PORTS, SIZE & TYPE _____
INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 10/8 ms
VOLTAGE, OPERATING 24 to 32 Vdc
PULL IN/DROP OUT 12.6/1.0
WATTS 5
ELECTRICAL CONNECTION JT1H-8-3P-(101)
MOUNTING _____
OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE 500,000
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS Ref. P/N 15626-2

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc
PART NUMBER 15637
DESCRIPTION Pulse coaxial solenoid, two-way, N.C.
QUALIFICATION STATUS X-ray experiment (Univ. of Wisconsin), flown
PROPELLANT/FLUID Methane, propane, N₂
PRESSURE, OPERATING 5 to 50 psia
PROOF 100 psia
BURST 200 psia
DROP 15 psia
RATED FLOW 15 to 20 SCCS
LEAKAGE, INTERNAL 1x10⁻⁵ SCCS N₂
EXTERNAL Same as internal
MASS 0.32 lbm
DIMENSIONS 2.48 in. LOA, 1.58 in. body length, 1.00 in. diam
MATERIAL, BODY 430 and 300 series CRES
SEAT/SEAL Nitrile
PORTS, SIZE & TYPE MS 24385-2 (both ends)
INTEGRAL FILTER
RESPONSE TIME, OPEN/CLOSE 15/10 ms
VOLTAGE, OPERATING 28 Vdc (23 to 33 Vdc)
PULL IN/DROP OUT 16/4 Vdc
WATTS 5.6
ELECTRICAL CONNECTION Free leads
MOUNTING Port
OPERATING TEMPERATURE RANGE
VIBRATION, RANDOM
SINE
ACCELERATION
SHOCK
LIFE, SERVICE
CYCLE 2,000,000
SHELF
RELIABILITY
LEAD TIME
COST
REMARKS Continuous duty cycle
DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
 PART NUMBER 15726-4
 DESCRIPTION Dual coaxial
 QUALIFICATION STATUS DSCS III (Hamilton Standard), flown

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 0 to 400 psig
 PROOF _____
 BURST _____
 DROP _____

RATED FLOW 0.0010 lbm/s

LEAKAGE, INTERNAL 1x10⁻⁶ SCCS N₂
 EXTERNAL Same as internal

MASS 0.44 lbm

DIMENSIONS 0.015-in. seat diam

MATERIAL, BODY _____
 SEAT/SEAL AF-E-411

PORTS, SIZE & TYPE _____

INTEGRAL FILTER _____

RESPONSE TIME, OPEN/CLOSE 10/10 ms

VOLTAGE, OPERATING 24 to 32 Vdc

PULL IN/DROP OUT 12/1.7 Vdc

WATTS 10

ELECTRICAL CONNECTION Free leads

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
 SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE 500,000

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS Ref. P/N 15726-5, 15726-7

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
 PART NUMBER 15726-5
 DESCRIPTION Dual coaxial, solenoid
 QUALIFICATION STATUS Indian Apple (Hamilton Standard), flown
 PROPELLANT/FLUID N₂H₄
 PRESSURE, OPERATING 0 to 400 psig
 PROOF 600 psig
 BURST 1600 psig
 DROP _____
 RATED FLOW 0.001 lbm/s at 5.0 psid, 0.004 lbm/s at 80 psid
 LEAKAGE, INTERNAL 2x10⁻⁶ SCCS He
 EXTERNAL 1x10⁻⁶ SCCS He
 MASS 0.40 lbm
 DIMENSIONS 0.015-in. seat diam, 3.2-in. body, 4.20 in. LOA,
 1.5 in. diam
 MATERIAL, BODY 430 CRES, 304 CRES, 17-7 CRES
 SEAT/SEAL AF-E-411
 PORTS, SIZE & TYPE 0.128/0.125 in. o.d. by 0.017/0.0145-in. wall;
 304L CRES tube inlet
 INTEGRAL FILTER 10 μm nom., 25 μm abs at inlet
 RESPONSE TIME, OPEN/CLOSE 10/10±0.5 ms repeat
 VOLTAGE, OPERATING 24 to 32 Vdc
 PULL IN/DROP OUT 15/1.7
 WATTS 10
 ELECTRICAL CONNECTION Free leads
 MOUNTING Three 4-40 UNC holes EQ SP on 1.250-in. BC (outlet port)
 OPERATING TEMPERATURE RANGE Fluid, 40 to 160 °F; ambient, 40 to
 200 °F
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE 3 yr
 CYCLE 500,000
 SHELF 3 yr
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS Ref. P/N 15726-4, 15726-7

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.

PART NUMBER 15726-7

DESCRIPTION Dual coaxial

QUALIFICATION STATUS DSCS III (Hamilton Standard), flown

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 415 psia

PROOF

BURST

DROP

RATED FLOW 0.1 lb thrust

LEAKAGE, INTERNAL 1x10⁻⁵ SCCS He

EXTERNAL 1x10⁻⁶ SCCS He

MASS 0.44 lbm

DIMENSIONS 0.014-in. seat diam

MATERIAL, BODY

SEAT/SEAL AF-E-411

PORTS, SIZE & TYPE

INTEGRAL FILTER

RESPONSE TIME, OPEN/CLOSE 12/10 ms

VOLTAGE, OPERATING 24 to 32 Vdc

PULL IN/DROP OUT 12/1.7 Vdc

WATTS 10

ELECTRICAL CONNECTION Free leads

MOUNTING

OPERATING TEMPERATURE RANGE

VIBRATION, RANDOM

SINE

ACCELERATION

SHOCK

LIFE, SERVICE

CYCLE 500,000

SHELF

RELIABILITY

LEAD TIME

COST

REMARKS Ref. P/N 15726-4, 15726-5

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
PART NUMBER 15750
DESCRIPTION Pulse coaxial
QUALIFICATION STATUS Classified (Avco), flown
PROPELLANT/FLUID NH₃
PRESSURE, OPERATING 350 psig
PROOF _____
BURST _____
DROP _____
RATED FLOW _____
LEAKAGE, INTERNAL 2.5x10⁻⁷ SCCS He
EXTERNAL 5x10⁻⁷ SCCS He
MASS 0.27 lbm
DIMENSIONS 0.018-in. seat diam
MATERIAL, BODY _____
SEAT/SEAL AF-E-102
PORTS, SIZE & TYPE _____
INTEGRAL FILTER _____
RESPONSE TIME, OPEN/CLOSE 15/8 ms
VOLTAGE, OPERATING 25 Vdc
PULL IN/DROP OUT 16/4 Vdc
WATTS 3
ELECTRICAL CONNECTION JT1H-8-3P
MOUNTING _____
OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE _____
CYCLE 1,000,000
SHELF _____
RELIABILITY _____
LEAD TIME _____
COST _____
REMARKS _____

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
 PART NUMBER 15751
 DESCRIPTION Pulse coaxial, solenoid, N.C. w/thruster
 QUALIFICATION STATUS Earth Limb Measurement Satellite (Grumman),
 flown
 PROPELLANT/FLUID N₂ (clean GN₂ per MIL-P-27401B)
 PRESSURE, OPERATING 15 to 75 psig
 PROOF 200 psig
 BURST 250 psig
 DROP _____
 RATED FLOW 0.05 lb thrust
 LEAKAGE, INTERNAL 2 SCCS He
 EXTERNAL Same as internal
 MASS 0.60 lb
 DIMENSIONS 2.60 in. length w/o nozzle, 1.6 in. height w/o leads
 and mount, 1.0 in. width w/o mount
 MATERIAL, BODY 430F CRES, 303 CRES
 SEAT/SEAL Fluorosilicone
 PORTS, SIZE & TYPE MS 33656-6 inlet
 INTEGRAL FILTER _____
 RESPONSE TIME, OPEN/CLOSE 20/20 ms
 VOLTAGE, OPERATING 28 Vdc
 PULL IN/DROP OUT 16/4 Vdc
 WATTS 6
 ELECTRICAL CONNECTION Free leads
 MOUNTING Three 8-32 UNF2B holes EQ SP at outlet end on
 1.50-in.-diam BC
 OPERATING TEMPERATURE RANGE -80 to 150 °F
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE _____
 CYCLE 500,000 min.
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS Coil resistance 78±3 Ω at 75 °F; thruster may be remova-
 ble. Specs: propellants per MIL-P-27401B, MIL-P-27407; test per
 WCI ATP 15751; environment per Grumman spec number B71P26DCV905
 DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
PART NUMBER 15770
DESCRIPTION Pulse coaxial, solenoid, N.C.
QUALIFICATION STATUS International Ultraviolet Explorer Satellite
(Hamilton Standard), flown
PROPELLANT/FLUID N₂H₄ (per MIL-P-26536)

PRESSURE, OPERATING 400 psia
PROOF 600 psig
BURST 1600 psig
DROP 28 psid max.
RATED FLOW 0.0250 lb/s

LEAKAGE, INTERNAL 2x10⁻⁶ SCCS He
EXTERNAL 1x10⁻⁶ SCCS He
MASS 0.28 lbm (not including lead wires)
DIMENSIONS 2.87 in. LOA, 1.664 in. width, 1.211 in. height

MATERIAL, BODY
SEAT/SEAL AF-E-102
PORTS, SIZE & TYPE 0.190/0.180-in. diam by 0.0175/0.0145-in. wall,
304L CRES tube inlet
INTEGRAL FILTER
RESPONSE TIME, OPEN/CLOSE 15/8 ms ±0.0002 s repeat
VOLTAGE, OPERATING 24 to 28 Vdc
PULL IN/DROP OUT 16/4 Vdc
WATTS 13.2
ELECTRICAL CONNECTION Free leads
MOUNTING Four 0.120/0.130-in.-diam holes on 1.426 by 1.312-in.
rectangle (outlet)

OPERATING TEMPERATURE RANGE Fluid, 40 to 160 °F; ambient, 40 to
200 °F
VIBRATION, RANDOM
SINE
ACCELERATION
SHOCK

LIFE, SERVICE
CYCLE 500,000 min.
SHELF
RELIABILITY
LEAD TIME
COST
REMARKS Ref. P/N 15770-5

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
 PART NUMBER 15770-5
 DESCRIPTION Pulse
 QUALIFICATION STATUS TRW, qualified
 PROPELLANT/FLUID N₂H₄
 PRESSURE, OPERATING 400 psia
 PROOF _____
 BURST _____
 DROP _____
 RATED FLOW 0.025 lb/s
 LEAKAGE, INTERNAL 1 SCCH GN₂
 EXTERNAL 1x10⁻⁶ SCCS He
 MASS 0.33 lbm
 DIMENSIONS _____
 MATERIAL, BODY _____
 SEAT/SEAL AF-E-411
 PORTS, SIZE & TYPE _____
 INTEGRAL FILTER _____
 RESPONSE TIME, OPEN/CLOSE 17/8 ms
 VOLTAGE, OPERATING 27 Vdc
 PULL IN/DROP OUT 16/2 Vdc
 WATTS 16.4
 ELECTRICAL CONNECTION Free leads
 MOUNTING _____
 OPERATING TEMPERATURE RANGE _____
 VIBRATION, RANDOM _____
 SINE _____
 ACCELERATION _____
 SHOCK _____
 LIFE, SERVICE _____
 CYCLE 500,000
 SHELF _____
 RELIABILITY _____
 LEAD TIME _____
 COST _____
 REMARKS Ref. P/N 15770

DATA SOURCE Wright Components catalog - 1984

LINE/THRUSTER VALVE

MANUFACTURER Wright Components, Inc.
 PART NUMBER 15771
 DESCRIPTION Pulse coaxial
 QUALIFICATION STATUS IUE (Hamilton Standard), flown
 PROPELLANT/FLUID N₂H₄
 PRESSURE, OPERATING 400 psia
 PROOF 600 psig
 BURST 1600 psig
 DROP 8.4 psid
 RATED FLOW 0.0005 lb/s
 LEAKAGE, INTERNAL 2x10⁻⁶ SCCS He
 EXTERNAL 1x10⁻⁶ SCCS He
 MASS 0.20 lbm (not including lead wires)
 DIMENSIONS 2.877 in. LOA, 1.51-in. mound diam, 0.870-in. body diam
 MATERIAL, BODY
 SEAT/SEAL AF-E-102
 PORTS, SIZE & TYPE 0.128/0.125-in.-diam by 0.0175/0.0145-in. wall,
 304L CRES tube inlet
 INTEGRAL FILTER
 RESPONSE TIME, OPEN/CLOSE 10/5 ms
 VOLTAGE, OPERATING 24 to 28 Vdc
 PULL IN/DROP OUT 16/2 Vdc
 WATTS 5.4
 ELECTRICAL CONNECTION Free leads
 MOUNTING Three 4-40 UNC-2B holes on 1.25-in.-diam BC
 OPERATING TEMPERATURE RANGE Fluid, 40 to 160 °F; ambient, 40 to
 200 °F
 VIBRATION, RANDOM
 SINE
 ACCELERATION
 SHOCK
 LIFE, SERVICE
 CYCLE 500,000 min.
 SHELF
 RELIABILITY
 LEAD TIME
 COST
 REMARKS
 DATA SOURCE Wright Components catalog - 1984

GAS GENERATOR

MANUFACTURER Hughes Aircraft Company
PART NUMBER 3354474
DESCRIPTION Thruster assembly w/catalyst-bed gas generator and valve
QUALIFICATION STATUS Intelsat IV A
PROPELLANT/FLUID N₂H₄
PRESSURE, OPERATING 50 to 300 psia inlet (34 to 206 N/cm²)
CHAMBER _____
PROOF _____
BURST _____
RATED FLOW _____
TOTAL THROUGHPUT _____
TOTAL IMPULSE 160,000 lbf-s (711,680 N-s)
MASS _____
DIMENSIONS _____
MATERIAL, BODY _____
CATALYST/CORE Shell 405ABSG; 14 to 18 or 20 to 30 mesh
PORTS, SIZE & TYPE _____
VOLTAGE _____
WATTS _____
ELECTRICAL CONNECTION _____
DUTY CYCLE On, 40 and 117 s nom.; off, 1160 and 1083 s (pulse)
MOUNTING _____
OPERATING TEMPERATURE RANGE _____
VIBRATION, RANDOM _____
SINE _____
ACCELERATION _____
SHOCK _____
LIFE, SERVICE 2000 s max. ontime, 39,177 s total ontime
CYCLE 899 cold starts; 55,600 pulses
SHELF _____
RELIABILITY _____
LEAD TIME 9 months in 1974
COST \$25,000 in 1974
REMARKS Specification for whole assembly except as noted; catalyst bed screen retained
DATA SOURCE IITRI lists (ref. 8)

GAS GENERATOR

MANUFACTURER The Marquardt Company
PART NUMBER T19093 (MDAC spec 029-71B)
DESCRIPTION Spiral passage, resistance heater

QUALIFICATION STATUS Developed for MORL, not qualified
(McDonnell Douglas)
PROPELLANT/FLUID Water

PRESSURE, OPERATING 3 atm +2/-20 psi (44.1 psia)
CHAMBER _____
PROOF _____
BURST _____

RATED FLOW 0 to 0.250 g/s
TOTAL THROUGHPUT _____
TOTAL IMPULSE _____
MASS _____
DIMENSIONS _____

MATERIAL, BODY CRES shell, MIN K-503 insulation
CATALYST/CORE Chromalox CI-505R heater

PORTS, SIZE & TYPE _____
VOLTAGE 120 Vac
WATTS 700
ELECTRICAL CONNECTION _____
DUTY CYCLE _____

MOUNTING _____

OPERATING TEMPERATURE RANGE Inlet, 32 to 70 °F; outlet, 400±40 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS Includes power controller

DATA SOURCE Marquardt report (ref. 12)

GAS GENERATOR

MANUFACTURER Rocket Research Corporation
PART NUMBER MR-50M
DESCRIPTION 5-lbf N₂H₄ thruster w/gas generator

QUALIFICATION STATUS Intelsat V

PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 320 to 200 psia
CHAMBER 115 to 80 psia
PROOF _____
BURST _____

RATED FLOW 0.0271 to 0.0193 lbm/s
TOTAL THROUGHPUT 225 lbm
TOTAL IMPULSE _____
MASS 0.82 lbm w/o valve (1.30 lbm w/valve)
DIMENSIONS _____

MATERIAL, BODY _____
CATALYST/CORE _____

PORTS, SIZE & TYPE _____
VOLTAGE 42 Vdc (valve)
WATTS 22 W (valve)
ELECTRICAL CONNECTION _____
DUTY CYCLE _____

MOUNTING _____

OPERATING TEMPERATURE RANGE _____

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE 1.28-hr steady state run time
CYCLE _____
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS Assembled w/Parker Hannifin valve; expansion ratio, 40:1

DATA SOURCE Rocket Research product data sheet - 1986

GAS GENERATOR

MANUFACTURER Rocket Research Corporation
PART NUMBER MR-74A
DESCRIPTION N₂H₄ thruster assembly w/shell 405 catalyst gas
generator, Clayborne heater
QUALIFICATION STATUS ATS F and G
PROPELLANT/FLUID N₂H₄
PRESSURE, OPERATING 395 to 125 psia inlet (272 to 86 N/cm²)
CHAMBER
PROOF 600 psia (413 N/cm²)
BURST
RATED FLOW
TOTAL THROUGHPUT
TOTAL IMPULSE 18,000 lbf-s
MASS
DIMENSIONS
MATERIAL, BODY 347 CRES
CATALYST/CORE 25 to 30 mesh; shell 405
PORTS, SIZE & TYPE
VOLTAGE 28 Vdc
WATTS 1.53
ELECTRICAL CONNECTION
DUTY CYCLE
MOUNTING
OPERATING TEMPERATURE RANGE 200 to 350 °F (93 to 176 °C)
VIBRATION, RANDOM 17g rms
SINE
ACCELERATION
SHOCK
LIFE, SERVICE 1.81x10⁵ s ontime
CYCLE 10⁵, (2x10⁴ for cold starts)
SHELF
RELIABILITY
LEAD TIME
COST
REMARKS Specifications quoted for whole assembly or as noted;
screen re ained catalyst bed
DATA SOURCE IITRI lists (ref. 8)

GAS GENERATOR

MANUFACTURER Rocket Research Corporation
PART NUMBER MR-103C
DESCRIPTION 0.2 lbf thruster with shell 405 catalyst gas generator
QUALIFICATION STATUS SATCOM, SPACENET, G-Star (RCA)
PROPELLANT/FLUID N₂H₄
PRESSURE, OPERATING 420 to 70 psia
CHAMBER 370 to 60 psia
PROOF
BURST
RATED FLOW 0.001 to 0.0002 lbm/s
TOTAL THROUGHPUT 173 lbm
TOTAL IMPULSE
MASS 0.28 lbm w/o valve (0.73 w/valve)
DIMENSIONS 2.28 in. by 1.35 in. diam (w/o valve)
MATERIAL, BODY
CATALYST/CORE
PORTS, SIZE & TYPE
VOLTAGE 28 Vdc (valve)
WATTS 9 W (valve)
ELECTRICAL CONNECTION
DUTY CYCLE
MOUNTING Three-bolt flange
OPERATING TEMPERATURE RANGE
VIBRATION, RANDOM
SINE
ACCELERATION
SHOCK
LIFE, SERVICE 18-hr steady state run time
CYCLE 410,000
SHELF
RELIABILITY
LEAD TIME
COST
REMARKS Assembled with Wright dual seat valve; expansion ratio,
100:1

DATA SOURCE Rocket Research product data sheet - 1986

GAS GENERATOR

MANUFACTURER Rocket Research Corporation
PART NUMBER MR-111
DESCRIPTION 0.45 lbf N₂H₄ thruster w/shell 405 catalyst-bed gas generator
QUALIFICATION STATUS Intelsat V (Ford)
PROPELLANT/FLUID N₂H₄
PRESSURE, OPERATING 320 to 120 psia
CHAMBER 184 to 84 psia
PROOF
BURST
RATED FLOW 0.002 to 0.0009 lbm/s
TOTAL THROUGHPUT 272 lbm
TOTAL IMPULSE
MASS 0.259 lbm w/o valve (0.704 lbm w/valve)
DIMENSIONS 3.10 in. by 1.40 in. diam (w/o valve)
MATERIAL, BODY
CATALYST/CORE
PORTS, SIZE & TYPE
VOLTAGE 42 Vdc (valve)
WATTS 12 W (valve)
ELECTRICAL CONNECTION
DUTY CYCLE
MOUNTING Three-bolt flange
OPERATING TEMPERATURE RANGE
VIBRATION, RANDOM
SINE
ACCELERATION
SHOCK
LIFE, SERVICE 2.36-hr steady state run time
CYCLE 420,000
SHELF
RELIABILITY
LEAD TIME
COST
REMARKS Assembled with Wright components valve; expansion ratio, 200:1

DATA SOURCE Rocket Research product data sheet - 1986

GAS GENERATOR

MANUFACTURER Rocket Research Corporation
PART NUMBER MR-111A
DESCRIPTION 0.5 lbf thruster w/shell 405 catalyst-bed gas
generator
QUALIFICATION STATUS ERBS (Ball Aerospace)
PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 370 to 60 psia
CHAMBER 204 to 45 psia
PROOF
BURST
RATED FLOW 0.00223 to 0.00047 lbm/s
TOTAL THROUGHPUT 127 lbm
TOTAL IMPULSE
MASS 0.28 lbm w/o valve (0.76 lbm w/valve)
DIMENSIONS 3.10 in. by 1.40 in. diam (w/o valve)

MATERIAL, BODY
CATALYST/CORE

PORTS, SIZE & TYPE
VOLTAGE 28 Vdc (valve)
WATTS 9 W (valve)
ELECTRICAL CONNECTION
DUTY CYCLE

MOUNTING Three-bolt flange

OPERATING TEMPERATURE RANGE

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE 15-hr steady state run time
CYCLE 15,082
SHELF

RELIABILITY
LEAD TIME
COST

REMARKS Assembled with Wright Components valve

DATA SOURCE Rocket Research product data sheet - 1986

GAS GENERATOR

MANUFACTURER Rocket Research Corporation
PART NUMBER _____
DESCRIPTION Catalyst bed w/integral pressure transducer and
temperature sensor
QUALIFICATION STATUS Space shuttle orbiter and solid rocket
boosters
PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 1300 psia
CHAMBER _____
PROOF _____
BURST _____

RATED FLOW 0.265 lbm/s nom., 0.310 lbm/s max.
TOTAL THROUGHPUT _____
TOTAL IMPULSE _____
MASS _____
DIMENSIONS _____

MATERIAL, BODY _____
CATALYST/CORE _____

PORTS, SIZE & TYPE _____
VOLTAGE _____
WATTS _____
ELECTRICAL CONNECTION _____
DUTY CYCLE _____

MOUNTING _____

OPERATING TEMPERATURE RANGE Input, 45 to 150 °F; output 1700 °F

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK 40g

LIFE, SERVICE 10 yr minimum (including storage) 60 hr
CYCLE 100 minimum
SHELF _____

RELIABILITY _____
LEAD TIME _____
COST _____

REMARKS 20 hr TBO, serviceable

DATA SOURCE AIAA paper 83-1381 (ref. 13)

GAS GENERATOR

MANUFACTURER TRW
PART NUMBER MRE-4 series
DESCRIPTION Thruster assembly w/catalyst-bed gas generator and
Parker valve
QUALIFICATION STATUS Intelsat III, DSCS II, Atmosphere Explorer
(flown)
PROPELLANT/FLUID N₂H₄

PRESSURE, OPERATING 600 psia inlet
CHAMBER
PROOF 1000 psia (681 N/cm²)
BURST 1200 psia (816 N/cm²)

RATED FLOW
TOTAL THROUGHPUT 500 lbm (227 kg)
TOTAL IMPULSE 115,000 lbf-s (511,500 N-s)

MASS
DIMENSIONS Bed, 1.06 in. length by 0.75 in. diam (2.7 by 1.9 cm)

MATERIAL, BODY Haynes 25
CATALYST/CORE Shell 405ABSG 14-18 or 20-30 mesh

PORTS, SIZE & TYPE
VOLTAGE
WATTS
ELECTRICAL CONNECTION
DUTY CYCLE Pulse, nom. 0.883 s off, 1.7 s on

MOUNTING

OPERATING TEMPERATURE RANGE 40 to 150 °F (5 to 66 °C)

VIBRATION, RANDOM
SINE

ACCELERATION
SHOCK

LIFE, SERVICE
CYCLE 177 cold starts; 101,944 pulses
SHELF

RELIABILITY
LEAD TIME 8 months for assembly in 1974

COST
REMARKS Specifications for whole assembly except as noted; screen
retained catalyst bed

DATA SOURCE Aerospace Corporation report (ref. 9)

TEMPERATURE TRANSDUCER

MANUFACTURER Weed Instrument Company, Inc.

PART NUMBER Model A9506-4

DESCRIPTION Platinum resistance sensor

QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

INDICATED TEMPERATURE, MAX _____

MIN _____

PRESSURE, OPERATING 0 to 90 psig

PROOF _____

BURST _____

MASS _____

DIMENSIONS 3.38 in. by 0.62 in. hex

MATERIAL Platinum, 316 CRES

PORT, SIZE & TYPE _____

VOLTAGE, INPUT _____

WATTS _____

SIGNAL 0.003850 $\Omega/\Omega/^\circ\text{C}$, 100 Ω element

ELECTRICAL CONNECTION Mates w/M83723/75R0803N

MOUNTING MS 33656E4 modified (0.4375-20-UNJF-3A)

OPERATING TEMPERATURE RANGE -65 to 500 °F

VIBRATION, RANDOM _____

SINE _____

ACCELERATION _____

SHOCK _____

LIFE, SERVICE _____

CYCLE _____

SHELF _____

RELIABILITY _____

LEAD TIME _____

COST _____

REMARKS _____

DATA SOURCE Weed drawing 0550-009-0002T Rev. 1 - 1985

TEMPERATURE TRANSDUCER

MANUFACTURER Weed Instrument Company, Inc.
PART NUMBER Model A9515
DESCRIPTION Surface sensor
QUALIFICATION STATUS _____

PROPELLANT/FLUID _____

INDICATED TEMPERATURE, MAX _____
MIN _____

PRESSURE, OPERATING _____
PROOF _____
BURST _____

MASS _____
DIMENSIONS 0.425 by 0.425 by 0.100 in. (1.080 by 1.080 by
0.254 cm)

MATERIAL _____
PORT, SIZE & TYPE _____
VOLTAGE, INPUT _____
WATTS _____
SIGNAL 0.00385±0.00003 Ω/Ω/°C; 500 Ω element
ELECTRICAL CONNECTION Two 12-in. wire leads
MOUNTING Adhesive

OPERATING TEMPERATURE RANGE -67 to 311 °F (-55 to 155 °C)

VIBRATION, RANDOM _____
SINE _____

ACCELERATION _____
SHOCK _____

LIFE, SERVICE _____
CYCLE _____
SHELF 5 yr

RELIABILITY _____
LEAD TIME _____

COST _____
REMARKS Rated current, 5 mA min.

DATA SOURCE Weed product data sheet - 1985

REFERENCES

1. Tacina, R., "Conceptual Design and Integration of a Space Station Resistojet Propulsion Assembly," AIAA paper 87-1860, July 1987.
2. Heckert, B. J., "Space Station Resistojet System Requirements and Interface Definition Study," NASA CR 179581, February 1987.
3. Peterson, T. T., "Space Station Fluid Inventories of the Integrated Waste Fluid and Integrated Water Systems," NASA PIR 191, March 25, 1987. Tables updated by Mr. Dan Briehl of the Propulsion Project Office, NASA LeRC, September 15, 1987, for this report.
4. World Aviation Directory, Winter 1984-85, No. 89, (New York: Ziff-Davis Publishing Company).
5. "Aerospace Tanks, Characteristics of Existing Propellant Tanks and Pressure Vessels for Spacecraft Application", Volumes I & II, IIT Research Institute, NASA-CR-142666 & NASA-CR-142531, July 1974.
6. Aldridge, L. L., Berliner, E., and Smith, J. H., Jr., "STS Manned Maneuvering Unit Propulsion System," Shuttle Propulsion Systems; Proceedings of the Winter Annual Meeting, Phoenix, AZ, Nov.14-19, 1982, ASME, pp. 15-25.
7. Morris, Edgar E., "Filament Wound Composite Pressure Vessels In Transportation Applications," 28th National SAMPE Symposium & Exhibition, Anaheim, CA, April 12-14, 1983.
8. "Attitude Control Propulsion Components," Volumes I & II, IIT Research Institute, Nov. 1974.

9. "Standardization and Program Practice Analysis, (Study 2.4) Final Report", Vol. III: Auxiliary Propulsion Components Compendium, The Aerospace Corporation, ATR-77(7375-01)-1, Vol. III, Dec. 15, 1976.
10. "List of Circle Seal Controls Valves Used on Rockets/Missiles/Spacecraft and Space Related Programs," Circle Seal Controls, Brunswick Corporation, February 13, 1978.
11. Sund, D. C., Hill, C. S., "Reaction Control System Thrusters for Space Shuttle Orbiters," AIAA paper 79-1144, June 1979.
12. Lynch, R., "Development of a Water Vaporizer for Resistojet Applications," Final Report, The Marquardt Company, S-1244, Nov. 1972.
13. Patterson, I. J., Swink, D. G., "Hydrazine Gas Generator Performance on Space Shuttle", AIAA paper 83-1381, June 1983.

TABLE I IOC PLUS GROWTH STATION ANNUAL WASTE GAS PRODUCTION/ BOSCH ECLSS (lbm/year)

| FLUID | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| (BOSCH ECLSS) | | | | | | | | | | |
| ARGON | 1264 | 1264 | 1264 | 1264 | 1348 | 1348 | 1348 | 1026 | 1026 | 1109 |
| CO2 | 208 | 208 | 208 | 451 | 745 | 503 | 260 | 260 | 260 | 312 |
| CO2/CH4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREON | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 8 | 9 |
| HELIUM | 36 | 36 | 124 | 896 | 813 | 813 | 813 | 813 | 813 | 817 |
| HYDROGEN | 182 | 182 | 322 | 322 | 702 | 394 | 254 | 254 | 254 | 325 |
| NITROGEN | 1680 | 1680 | 1680 | 1835 | 2647 | 2483 | 2338 | 2108 | 2108 | 2765 |
| OXYGEN | 243 | 243 | 243 | 243 | 335 | 335 | 335 | 335 | 335 | 426 |
| XENON | 88 | 88 | 88 | 88 | 110 | 110 | 110 | 110 | 110 | 132 |
| KRYPTON | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| TOTALS: | 3787 | 3787 | 4015 | 5185 | 6788 | 6084 | 5546 | 4994 | 4994 | 5975 |

TABLE II IOC PLUS GROWTH STATION ANNUAL WASTE GAS PRODUCTION/ SABATIER ECLSS (lbm/year)

| FLUID | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| (SABAT.ECLSS) | | | | | | | | | | |
| ARGON | 1264 | 1264 | 1264 | 1264 | 1348 | 1348 | 1348 | 1026 | 1026 | 1109 |
| CO2 | 208 | 208 | 208 | 451 | 745 | 503 | 260 | 260 | 260 | 312 |
| CO2/ CH4 | 2256 1484 | 2256 1484 | 2256 1484 | 2256 1484 | 3384 2226 | 3384 2226 | 3384 2226 | 3384 2226 | 3384 2226 | 4512 2968 |
| FREON | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 8 | 9 |
| HELIUM | 36 | 36 | 124 | 896 | 813 | 813 | 813 | 813 | 41 | 45 |
| HYDROGEN | 42 | 42 | 182 | 182 | 492 | 184 | 44 | 44 | 44 | 45 |
| NITROGEN | 1680 | 1680 | 1835 | 2647 | 2493 | 2338 | 2338 | 2108 | 2108 | 2765 |
| OXYGEN | 243 | 243 | 243 | 243 | 335 | 335 | 335 | 335 | 335 | 426 |
| XENON | 88 | 88 | 88 | 88 | 110 | 110 | 110 | 110 | 110 | 132 |
| KRYPTON | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| TOTALS: | 7569 | 7569 | 7937 | 9107 | 12890 | 11878 | 10946 | 10394 | 10394 | 13195 |

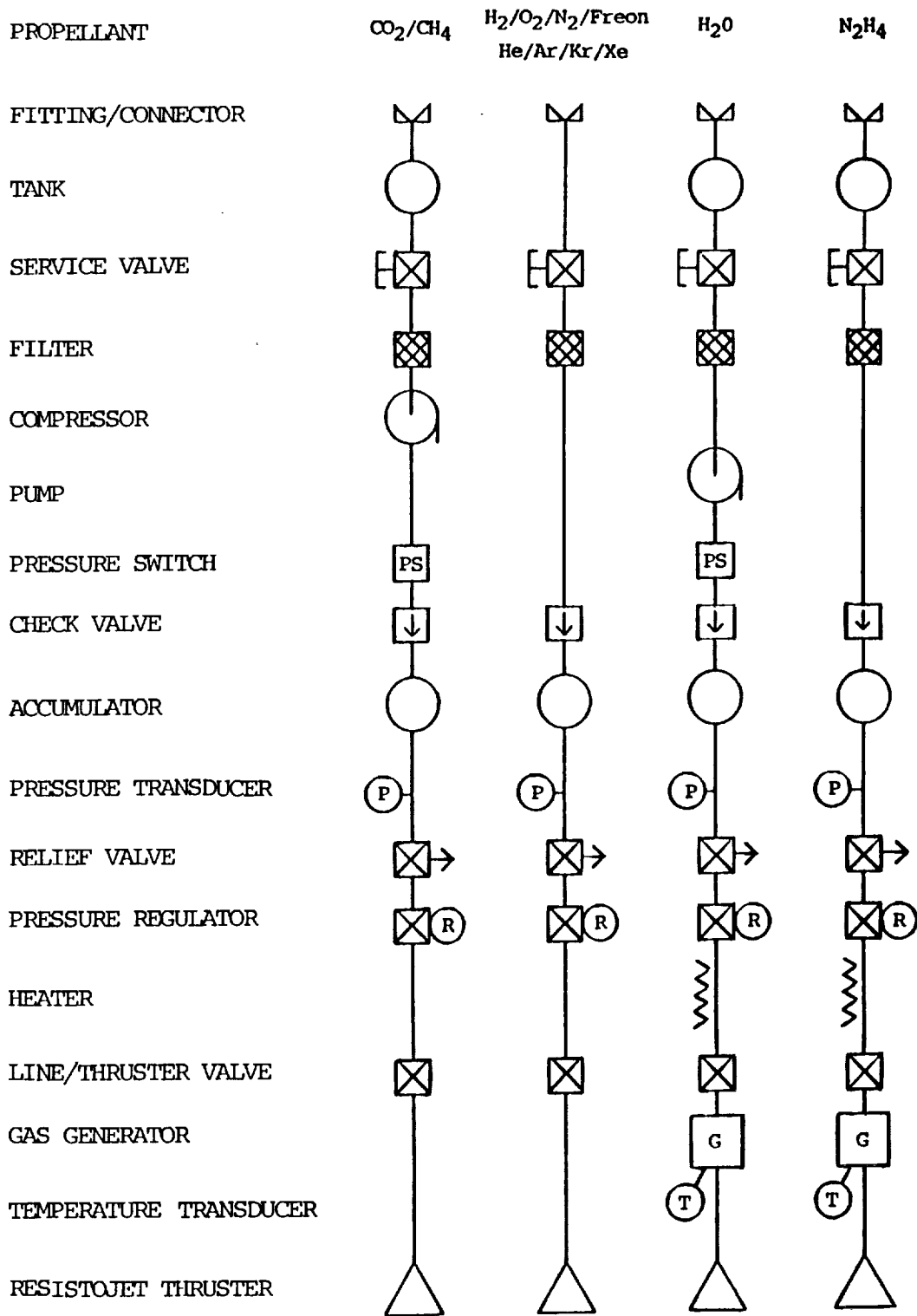


FIGURE 1. Simplified Component/System Comparison
 (Note: Order and number of components in system may vary,
 and components may be deleted.)

| | | | | | |
|--|--|---|--|---|-------------------|
| 1. Report No. NASA CR-180834 | | 2. Government Accession No. | | 3. Recipient's Catalog No. | |
| 4. Title and Subtitle Component Data Base for Space Station Resistojet Auxiliary Propulsion | | | | 5. Report Date January 1988 | |
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| 7. Author(s) Clayton H. Bader | | | | 8. Performing Organization Report No. None (E-3856) | |
| | | | | 10. Work Unit No. 481-02-02 | |
| 9. Performing Organization Name and Address Sverdrup Technology, Inc. Lewis Research Center Cleveland, Ohio 44135 | | | | 11. Contract or Grant No. NAS3-24105 | |
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| 15. Supplementary Notes Project Manager, James S. Sovey, Space Propulsion Technology Division, NASA Lewis Research Center. | | | | | |
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| 17. Key Words (Suggested by Author(s)) Resistojet; Space Station; Propulsion; Components | | | | 18. Distribution Statement Unclassified - Unlimited Subject Category 20 | |
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