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1. SCOPE:

- 1.1 This report lists military and industry specifications and standards which are used in Aero/Space Hydraulic and Pneumatic Systems. It is intended as a supplement to Specifications MIL-H-5440 and MIL-P-5518. Only those hardware standards which have been specifically designed for hydraulic or pneumatic use are listed. Revisions and amendments which are current for these specifications and standards are not listed.
- 1.2 Listing Documents: Attention is called to the following documents which list specifications and standards and are used as a basis for this report.
  - 1.2.1 Military Standards: Department of Defense, Index of Specifications and Standards; prepared by the Standardization Division, Armed Forces Supply Support Center, Washington 25, D. C. This document is published semi-annually, with monthly cumulative supplements.
  - 1.2.2 Society of Automotive Engineers, Inc. Standards: SAE Aerospace Standards, Recommended Practices, Information Reports (AS, ARP, AIR Index). This document is published annually by the Society of Automotive Engineers, Inc., 485 Lexington Avenue, New York 17, N. Y.

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2. SPECIFICATIONS:

2.1 Federal Specifications:

C-F-206 Felt, Sheet, Wool, Pressed  
VV-P-236 Petrolatum, Technical  
WW-T-787 Tube, Aluminum Alloy, Round, Square, Rectangular, and Other Shapes, Drawn, Seamless, 5052

2.2 Military Specifications

2.2.1 System and Subsystem Specifications:

MIL-H-5440 Hydraulic Systems, Aircraft, Types I and II, Design, Installation, and Data Requirements for  
MIL-P-5518 Pneumatic Systems; Design, Installation and Tests in Aircraft  
MIL-S-6644 Specifications, Equipment, Contractor Prepared, Instructions for Preparation of  
MIL-B-8075 Brake Control Systems, Anti Skid, Aircraft Wheels, Instructions for Preparation of Specifications for  
MIL-B-8584 Brake Systems, Wheel, Aircraft, Design of  
MIL-S-8812 Steering System; Aircraft, General Specification for  
MIL-H-8891 Hydraulic Systems, Manned Flight Vehicles, Type III, Design, Installation and Data Requirements for  
MIL-F-9490 Flight Control Systems, Design, Installation, and Test of, General Specification for  
MIL-F-18372 Flight Control Systems; Design, Installations and Tests of, Aircraft, (General Specification for)  
MIL-D-18717 Design; Airplane Arresting Hook Installations  
MIL-H-25475 Hydraulic Systems, Missile, Design, Installation, Tests, and Data Requirements (General Requirements for)  
MIL-D-25922 Data for Evaluation and Development of Air Vehicle Secondary Power Systems

2.2.2 Design Details and Test Specifications:

MIL-H-4970 Environmental Testing, Ground Support Equipment, General Specification for  
MIL-B-5087 Bonding; Electrical (for Aircraft)  
MIL-E-5272 Environmental Testing, Aeronautical and Associated Equipment, General Specification for  
MIL-P-5514 Packings; Installation and Gland Design, Hydraulic, General Specification for  
MIL-P-5517 Plastic Parts in Aircraft Hydraulic Equipment; General Tests for  
MIL-T-5522 Test Procedure for Aircraft Hydraulic and Pneumatic Systems, General  
MIL-C-6021 Castings, Classification and Inspection of (for Aeronautical Applications)  
MIL-T-6058 Tests, Impact, Shock Absorber, Landing Gear, Aircraft  
MIL-I-6866 Inspection, Penetrant Method of  
MIL-I-6868 Inspection Process, Magnetic Particle  
MIL-P-7105 Pipe Threads, Taper, Aeronautical National Form, Symbol ANPT  
MIL-S-7742 Screw Threads, Standard, Optimum Selected Series, General Specification for  
MIL-T-7935 Towing Requirements and Provisions for Land and Carrier Type Military Aircraft  
MIL-S-8879 Screw Thread, Controlled Radius Root with Increased Minor Diameter, General Specification for  
MIL-T-9107 Test Reports, Preparation of  
MIL-R-27542 Reliability Program Requirements for Aero-Space Systems, Subsystems and Equipment

### 2.2.3 Component Specifications:

#### 2.2.3.1 General Component Specifications:

MIL-W-5013	Wheel and Brake Assemblies; Aircraft
MIL-C-5503	Cylinders; Aircraft, Hydraulic Actuating, General Specification for
MIL-J-5513	Joints, Hydraulic Swivel
MIL-R-5520	Reservoirs, Hydraulic
MIL-V-5525	Valves; Aircraft Power Brake
MIL-P-5954	Pump Unit, Hydraulic, Electric Motor Driven, Fixed Displacement
MIL-P-5994	Pump, Hydraulic, Electric-Motor-Driven, Variable Delivery
MIL-C-6026	Control Unit, Pressure Generating, Manually Operated, Aircraft Hydraulic Brake System
MIL-C-6388	Compressor Unit; Air, Aircraft, Shaft Power Driven, General Specification for
MIL-C-6591	Compressor Unit, Aircraft, Electric Motor Driven, General Specification for
MIL-W-6624	Wiper, Aircraft Windshield, Hydraulic, General Specification for
MIL-T-7101	Transmission, Power, Constant Speed, General Specification (Aircraft Use)
MIL-V-7909	Valves, Hydraulic, Pressure Reducer
MIL-V-7915	Valves, Hydraulic, Directional Control, Slide Selector
MIL-C-7979	Cylinders; Hydraulic Brake, Master, Power Assisted
MIL-M-7997	Motors; Aircraft Hydraulic, Constant Displacement
MIL-C-8215	Compressor Unit, Air, Aircraft, Hydraulic Motor Driven, General Specification for
MIL-C-8216	Compressor Unit, Air, Aircraft, Hydraulic Motor Driven, Model Specification for, Outline and Instructions for Preparation of
MIL-G-8402	Gages, Pressure, Dial Indicating, General Specification for
MIL-S-8552	Strut; Aircraft Shock Absorber (Air-Oil Type)
MIL-P-8564	Pneumatic Components, Aeronautical, General Specification for
MIL-R-8573	Reservoirs, Air, Nonshatterable Steel
MIL-H-8775	Hydraulic System Components, Aircraft and Missiles, General Specification for
MIL-C-8838	Cylinder, Pneumatic Actuating, Aircraft Utility System, General Specification for
MIL-H-8890	Hydraulic Components, Type III, (-65 Deg. to +450 Deg. F.) General Specification for
MIL-V-19593	Valve - Control, Aircraft Pneumatic 28 Volt D-C Solenoid Operated
MIL-P-19692	Pumps, Hydraulic, Variable Delivery, General Specification for
MIL-S-19893	Switch-Pressure, Aircraft Pneumatic (Type II)
MIL-T-25363	Tank, Pneumatic Pressure, Aircraft, Glass Fiber
MIL-P-25868	Pump, Hydraulic, Power-Driven, Variable Delivery
MIL-V-27162	Valves, Servo Control, Electric-Hydraulic, General Specification for

#### 2.2.3.2 Detail Component Specifications:

MIL-A-5498	Accumulators, Aircraft Hydropneumatic Pressure
MIL-F-5504	Filters and Filter Elements, Fluid Pressure, Hydraulic Micronic Type
MIL-F-5508	Fuses; Aircraft, Automatic Quantity Measuring, Hydraulic
MIL-P-5515	Pump, Hydraulic Ram, Hand Driven
MIL-V-5519	Valves; Aircraft Hydraulic Unloading
MIL-V-5523	Valve; Relief, Hydraulic Pressure
MIL-V-5524	Valves; Check, Hydraulic, Aircraft, Type I Systems
MIL-V-5527	Valves; Aircraft, Hydraulic Thermal Expansion Relief
MIL-V-5528	Valves; Hydraulic Controllable Check
MIL-V-5529	Valves; Hydraulic Directional Control, Rotary Selector
MIL-V-5530	Valves; Aircraft Hydraulic Shuttle
MIL-I-6839	Indicator, Position, Landing Gear
MIL-I-7084	Indicator, Pressure, Hydraulic, 0-4000 PSI
MIL-T-7113	Transmitter, Pressure, Hydraulic, 0-4000 PSI
MIL-G-7734	Gages, Pressure, Engine and Utility, Aircraft

2.2.3.2 Detail Component Specifications: (Cont'd)

MIL-P-7858	Pump, Hydraulic, Power Driven, Fixed Displacement
MIL-C-7905	Cylinders, Compressed Gas, Nonshatterable
MIL-D-8278	Dehydrator Unit, High Pressure Air, Non-reactivating, Type A-4
MIL-G-8348	Gage Assemblies, Air Testing, High Pressure, Chuck Type, Self Contained, Aircraft
MIL-V-8566	Valves, Aircraft Hydraulic Flow Regulator
MIL-R-8572	Reducers, Pneumatic Pressure, Aircraft
MIL-V-8628	Valve, Pneumatic Check
MIL-V-8813	Valves; Aircraft, Hydraulic Pressure Relief, Type II Systems
MIL-F-8815	Filter and Filter Elements, Fluid Pressure, Hydraulic Line, 15 Micron Absolute, Type II Systems
MIL-A-8897	Accumulators, Hydraulic, Cylindrical, 3000 PSI, Type II
MIL-V-19067	Valves, Check, Controllable, Hydraulic, Aircraft, Type II Systems
MIL-V-19068	Valves, Shuttle, Hydraulic, Aircraft, Type II Systems
MIL-V-19069	Valves, Check, Hydraulic, Aircraft, Type II Systems
MIL-V-19593	Valve-Control, Aircraft, Pneumatic 28-Volt D-C Solenoid Operated
MIL-T-25307	Transmitter, Pressure, Hydraulic, Type MJ1
MIL-G-25308	Gages, Pressure, Dial Indicating, Hydraulic, Type ME-1
MIL-C-25427	Couplings, Aircraft Hydraulic Self-Sealing Quick-Disconnect
MIL-V-25517	Valve, Aircraft Hydraulic Restrictor
MIL-I-25540	Indicator, Pressure, Hydraulic, 0-4000 PSI, Type MT1
MIL-V-25675	Valves, Check, Hydraulic, Aircraft and Missile, Type III Systems
MIL-F-25682	Filter and Filter Element, Fluid Pressure, Hydraulic, Absolute, 25 Micron, Minus 65 Deg. to Plus 459 and Plus 600 Deg. F.
MIL-G-25867	Gage, Pressure, Dial Indicating, Pneumatic
MIL-F-27621	Filter, Fluid, Pressure, Absolute 10 Micron, Hydraulic
MIL-F-27656	Filter, Fluid, Pressure, Absolute 25 Micron, Hydraulic

2.2.4 Part Specifications:

MIL-S-4040	Solenoid, Electrical, General Specification for
MIL-O-4861	"O" Rings, Rubber, Preformed Packing; Packaging of
MIL-S-5049	Scrapers; Hydraulic Piston Rod
MIL-A-5070	Adapter, Hose to Tube, Pipe and Flange, Reuseable, Hydraulic, Pneumatic, Fuel and Oil Lines
MIL-C-5499	Cores, Aircraft High Pressure Air Valve
MIL-C-5500	Caps; High Pressure Air Valve
MIL-C-5501	Caps and Plugs, Protective, Dust and Moisture Seal
MIL-F-5506	Fittings; Method of Testing, Tube
MIL-F-5509	Fittings; Fluid Connection
MIL-G-5510	Gasket; Straight Thread Tube Fitting, Boss
MIL-P-5516	Packings and Gaskets, Preformed, Petroleum Hydraulic Fluid Resistant
MIL-R-5521	Rings; Aircraft Hydraulic Packing Back-Up
MIL-H-5593	Hose, Aircraft, Low Pressure Flexible
MIL-V-6164	Valve; Aircraft, Air, High Pressure
MIL-C-8603	Clamps, Tube Support, Loop Type
MIL-H-8788	Hose, Aircraft Hydraulic and Pneumatic, High Pressure
MIL-H-8789	Fitting End, Attachable, Hydraulic and Pneumatic, High Pressure Hose
MIL-H-8790	Hose Assemblies, Aircraft, Hydraulic and Pneumatic, High Pressure (3000 PSI)
MIL-R-8791	Retainer, Packing, Hydraulic and Pneumatic
MIL-H-8794	Hose, Rubber, Aircraft, Hydraulic and Pneumatic, Fuel and Oil Resistant
MIL-H-8795	Hose Assemblies, Rubber, Aircraft, Hydraulic, Pneumatic, Fuel and Oil Resistant
MIL-F-18280	Fittings, Flareless, Fluid Connection

2.2.4 Part Specifications: (Cont'd)

- MIL-H-25579 Hose Assembly, Tetrafluoroethylene, High Temperature, Power Plant, Aircraft
- MIL-P-25732 Packing, Preformed, Petroleum Hydraulic Fluid Resistant, 275<sup>o</sup>F
- MIL-H-26666 Hose Assembly, Pneumatic High Pressure
- MIL-H-27267 Hose, Tetrafluoroethylene, High Temperature, Medium Pressure
- MIL-H-27272 Fitting, Hose, Tetrafluoroethylene, High Temperature, Medium Pressure, General Requirements for
- MIL-H-27462 Hose Assembly, Pneumatic, High Pressure (8500 PSI)

2.2.5 Materials, Processes and Miscellaneous Specifications:

- MIL-L-4343 Lubricating Grease, Pneumatic System
- MIL-H-5606 Hydraulic Fluid, Petroleum Base, Aircraft and Ordnance
- MIL-H-6002 Marking; Standard Hose, Aircraft
- MIL-H-6088 Hydraulic Fluid, Petroleum Base, Preservative
- MIL-T-006845 Tubing; Steel, Corrosion-Resistant (304), Aircraft, Hydraulic System
- MIL-I-6869 Impregnants for Aluminum Alloy and Magnesium Alloy Castings
- MIL-T-7081 Tube, Aluminum Alloy, Seamless, Round, 6061 and 6062, Aircraft Hydraulic Quality
- MIL-H-7083 Fluid; Hydraulic Nonflammable, Hydrolube, Aircraft
- MIL-F-7179 Finishes and Coatings, General Specification for Protection of Aircraft and Aircraft Parts
- MIL-H-7644 Hydraulic Fluid (Castor Oil Base)
- MIL-H-8446 Hydraulic Fluid, Nonpetroleum Base, Aircraft
- MIL-T-8504 Tubing, Steel, Corrosion-Resistant (18-8) Annealed, Aircraft Hydraulic System
- MIL-A-8625 Anodic Coatings, for Aluminum and Aluminum Alloys
- MIL-T-8808 Tubing, Steel, Corrosion-Resistant (18-8 Stabilized) Aircraft Hydraulic Quality
- MIL-M-14077 Molding Plastic, Polytetrafluoroethylene (TFE - Fluorocarbon Resin)
- MIL-H-19457 Hydraulic Fluid, Fire Resistant
- MIL-G-22050 Gasket and Packing Material, Synthetic Rubber, Nonflammable Hydraulic Fluid Resistant
- MIL-T-25456 Tester, Hose Assemblies, Hydraulic, Pneumatic, Fuel, and Oil, Aircraft
- MIL-R-25897 Rubber, High Temperature, Fluid Resistant
- MIL-R-25988 Rubber, Silicone, Oil and Fuel Resistant
- MIL-H-46004 Hydraulic Fluid, Petroleum Base, Missile

2.3 Industry Specifications:

2.3.1 Society of Automotive Engineers Specifications:

- ARP 219 Procedure and Method for Conducting Test of Hydraulic Components in Contamination Controlled System
- AS 408 Pressure Instruments - Fuel, Oil, and Hydraulic
- AS 483 Skid Control Equipment
- ARP 490 Electric Input Hydraulic Servo Valve
- ARP 560 Missile Hydraulic Pumps
- ARP 575 Procedure and Method, Evaluation of Filter Patch Testing for Aircraft Hydraulic Pumps
- ARP 576 Outline and Instructions for Preparation of Model Specifications for Hydraulic System Equipment
- AS 595 Aircraft Variable Delivery Hydraulic Pumps
- ARP 598 Procedure for the Determination of Particulate Contamination of Hydraulic Fluids by the Particulate Count Method
- ARP 599 A Dynamic Test Method for Determining the Degree of Cleanliness of the Downstream Side of Filter Elements
- ARP 600 Torque Determination, Method of, for Tube or Hose End Fitting Connections, Flared, Flareless or Miscellaneous Screw Thread Style

2.3.1 Society of Automotive Engineers Specifications: (Cont'd)

- ARP 601 Hose Assemblies, Flexible Metal, Aeronautical, Low Pressure
- ARP 602 Hose Assemblies, Flexible Metal, Aeronautical, Medium Pressure
- ARP 603 Impulse Test Equipment for Testing Hydraulic System Components
- ARP 604 Hose Assemblies; Aircraft and Missiles, High Temperature, High Pressure (250,000 Cycles)
- AS 608 High Pressure Compressed Gas Hose Assemblies for Aircraft and Missile Ground Support Equipment
- ARP 610 Synthetic or Natural Rubber Lined Pneumatic Hose Assemblies, Aircraft
- ARP 664 Aircraft Compressor Lubricating Oil
- ARP 696 Aircraft Constant Displacement Hydraulic Motor
- ARP 719 Gas Motor
- ARP 743 Procedure for the Determination of Particulate Contamination of Air in Dust Controlled Spaces by the Particle Count Method
- ARP 785 Procedure for the Determination of Particulate Contamination in Hydraulic Fluids by the Control Filter Gravimetric Procedure
- ARP 788 Procedure for the Determination of the Silting Index of a Fluid

2.3.2 National Aircraft Standards Committee Specifications:

- NAS 810 Protection of Fluid Lines and Equipment
- NAS 1095 Flareless Fitting Connections Fabrication and Assembly
- NAS 1613 Packing, O-Ring, Phosphate Ester Resistant
- NAS 1629 O-Ring Elongation Modulus Test

3. DESIGN STANDARDS:

3.1 Military Standards (MIL-STD):

- MIL-STD-10 Surface Roughness Waviness and Lay
- MIL-STD-17 Mechanical Symbols
- MIL-STD-29 Springs, Mechanical, Drawing Requirements for
- MIL-STD-105 Sampling Procedure and Tables for Inspection by Attributes
- MIL-STD-177 Rubber Products, Terms for Visible Defects of
- MIL-STD-190 Identification Marking of Rubber Products
- MIL-STD-276 Impregnation of Porous Nonferrous Metal Castings
- MIL-STD-407 Visual Inspection Guide for Rubber Molded Items
- MIL-STD-413 Visual Inspection Guide for Rubber O-Rings

3.1.1 Specification Bulletins:

- USAF Spec. Bulletin 528 Fitting, Hose, Tetrafluoroethylene, High Temperature, Medium Pressure, Classification of Defects

3.2 Military Standards (MS):

- MS-21931 Fitting Installation, Cluster
- MS-21932 Fitting End, Bolt Cluster Fitting End, Bolt Cluster Fitting, Single Port
- MS-21933 Fitting End, Bolt Cluster Fitting, Single Port Through, Flareless
- MS-21934 Fitting End, Bolt Cluster Fitting, Double Port
- MS-21935 Fitting End, Bolt Cluster Fitting, Double Port, Through, Flareless
- MS-21936 Contour and Mounting End, Cluster Fitting Body, Semi-Finished
- MS-21947 Fitting End - Bolt Cluster Fitting Single Port Through Flare
- MS-21948 Fitting End - Bolt Cluster Fitting Double Port Through - Flare
- MS-24385 Fitting End, Flared Tube Connection and Gasket Seal, Precision Type, Standard Dimensions

3.2 Military Standards (MS): (Cont'd)

- MS-24386 Fitting End, Bulkhead Flared Tube Connection and Gasket Seal, Precision Type, Standard Dimensions
- MS-33514 Fitting End, Standard Dimensions for Flareless Tube Connection and Gasket Seal
- MS-33515 Fitting End, Standard Dimensions for Bulkhead Flareless Tube Connections
- MS-33524 Recommended Port Sizes for Hydraulic Pumps, Aircraft
- MS-33566 Fittings, Installation of Flareless Tube, Straight-Threaded Connectors
- MS-33583 Tubing End, Double Flare, Standard Dimensions for
- MS-33584 Tubing End, Standard Dimensions for Flared
- MS-33586 Metals, Definition of Dissimilar
- MS-33611 Tube End Radii
- MS-33620 Chart, Hose Selection
- MS-33656 Fitting End, Standard Dimensions for Flared Tube Connection and Gasket Seal
- MS-33657 Fitting End, Standard Dimensions for Bulkhead Flared Tube Connections
- MS-33675 Ring, Wiper, Installation and Gland Design
- MS-33786 Fitting Installation, Flared Tube and Hose, Swivel
- MS-33790 Bend Data, Minimum, Hydraulic, Pneumatic, Fuel and Oil Hose

3.3 Air Force/Navy Design Standards (AND):

- AND 10050 Bosses, Standard Dimensions for Gasket Seal Straight Thread
- AND 10059 Fittings - Styles of Pipe Threaded, Flared Tube and Hose
- AND 10064 Fittings - Installation of Flared Tube, Straight Threaded Connectors
- AND 10067 Valve Installation - Hydraulic Bleeder, Standard Dimensions for
- AND 10071 Boss and Installation - Air Connection
- AND 10074 Boss - Spacing - Hydraulic
- AND 10080 Fittings - Installation of Universal Elbow
- AND 10104 Tubing, Steel, Corrosion-Resistant, Round, Standard Dimensions for
- AND 10106 Tubing - Standard Sizes for Aluminum Alloy (52SO) Round
- AND 10230 Reference Chart, Aircraft Engine Accessory Drive
- AND 10260 Flange - Type X Accessory Mounting
- AND 10261 Flange - Type XI Accessory Mounting
- AND 10262 Flange - Type XII Accessory Mounting
- AND 10302 Installation Clearance - IX Drive
- AND 10313 Relief Valve Installation Clearance - Hydraulic
- AND 10331 Installation Clearance - Type XII-J Drive (Fluid Power Pump)
- AND 10338 Installation Clearance - Type XII-K (Fluid Power Pump)
- AND 10375 Colors - Fluid Line Identification
- AND 20000 Drive - Type X Engine Accessory
- AND 20001 Drive - Type XI Engine Accessory
- AND 20002 Drive - Type XII Engine Accessory

3.4 Industry Design Standards:

3.4.1 Society of Automotive Engineers Standards:

- AS 468 Drive - Accessory, 5" Bolt Circle
- AS 469 Drive - Accessory, 8" Bolt Circle
- AS 470 Drive - Accessory, 10" Bolt Circle
- AS 471 Flange - Accessory, 5" Bolt Circle
- AS 472 Flange - Accessory, 8" Bolt Circle
- AS 473 Flange - Accessory, 10" Bolt Circle
- ARP 568 Uniform Dash Numbering System for O-Rings
- ARP 584 Coiled Tubing

3.4.2 National Aircraft Standards Committee Standards:

- NAS 550 Fitting - Installation of Universal Elbow

4. STANDARD COMPONENTS:

4.1 Military Standard Components:

- MS-24333 Coupling Assembly, Hydraulic, Self-Sealing, Quick Disconnect, Flared Fitting to Internal Thread Boss
- MS-24334 Coupling Assembly, Hydraulic, Self-Sealing, Flareless Fitting to Internal Thread Boss
- MS-24335 Flange, Bulkhead Mounting, Hydraulic Self-Sealing Coupling
- MS-24337 Union Nut, Hydraulic Self-Sealing Coupling, Type A
- MS-24352 Valve, Aircraft Hydraulic Restrictor, One-Way, Filtered
- MS-24353 Valve, Aircraft Hydraulic Restrictor, Two-Way, Filtered
- MS-24418 Valve, Aircraft Hydraulic Restrictor, One-Way, Unfiltered
- MS-24419 Valve, Aircraft Hydraulic Restrictor, Two-Way, Unfiltered
- MS-24423 Valve, Check-Hydraulic, Minus 65 Deg. F. to Plus 450 Deg. F., 3000 PSI, Flareless Tube
- MS-24427 Filter, Fluid, Pressure-Hydraulic, 3000 PSI, Absolute 25 Micron, Style A, Minus 65 Deg. to Plus 450 Deg. F.
- MS-24428 Filter, Fluid, Pressure-Hydraulic, 3000 PSI, Absolute 25 Micron, Style B, Minus 65 Deg. to Plus 450 Deg. F.
- MS-24429 Filter, Fluid, Pressure-Hydraulic, 3000 PSI, Absolute 25 Micron, Style A, Minus 65 Deg. to Plus 600 Deg. F.
- MS-24430 Filter, Fluid, Pressure-Hydraulic, 3000 PSI, Absolute 25 Micron, Style B, Minus 65 Deg. to Plus 600 Deg. F.
- MS-24431 Filter Element, Fluid, Pressure-Hydraulic, 3000 PSI, Absolute 25 Micron, Style A, Minus 65 Deg. to Plus 6000 Deg. F.
- MS-24432 Filter Element, Fluid, Pressure-Hydraulic, 3000 PSI, Absolute 25 Micron, Style B, Minus 65 Deg. to Plus 6000 Deg. F.
- MS-24478 Gage, Single 1 Inch Dial, Pneumatic Pressure
- MS-24593 Valve, Check-Hydraulic, Minus 65 Deg. F. to Plus 450 Deg. F., 3000 PSI, Flared Tube
- MS-27201 Tank, Pneumatic Pressure, Aircraft, Glass Fiber Sphere
- MS-28005 Transmitters, Pressure, Synchro, Aircraft
- MS-28016 Valve - Hydraulic Dual Thermal Expansion Relief
- MS-28061 Gages, Pressure, Engine and Utility, 2-Inch, Flange Mounted, Back Ports
- MS-28063 Gages, Pressure, Engine and Utility, 2-Inch, Flange or Port Mounted, Bottom Port
- MS-28700 Accumulator - Cylindrical, 3000 PSI
- MS-28720 Filter, Aircraft Hydraulic Line Type, 3000 PSI
- MS-28764 Valve, Check, Controllable, Rotary Action, Hydraulic, 3000 PSI, Type II Systems
- MS-28765 Valve, Check, Hydraulic, Internal Ports, 3000 PSI, Type II Systems
- MS-28766 Valve, Shuttle, Hydraulic, Direct Mounting, 3000 PSI, Type II Systems
- MS-28767 Valve, Shuttle, Hydraulic, Internal-Thread, Tube Fitting Outlet, 3000 PSI, Type II Systems
- MS-28768 Valve, Check, Controllable, Plunger-Type, Hydraulic, 3000 PSI, Type II Systems
- MS-28771 Valve, Check, Hydraulic, Flared, 3000 PSI, Type II Systems
- MS-28797 Accumulator, Hydraulic, Cylindrical, 3000 PSI, Type II
- MS-28880 Valve - Controllable Hydraulic Check, Rotating Action, 3000 PSI
- MS-28881 Valve - Hydraulic, Directional Control, Slide Selector 4 Way, 3000 PSI
- MS-28886 Valve, Aircraft Hydraulic Flow Regulator
- MS-28888 Valve, Pneumatic Check
- MS-28889 Valve, Air, High-Pressure Charging
- MS-28890 Valve, Hydraulic Check, 3000 PSI, Flareless, Type II Systems
- MS-28891 Valve, Shuttle, Hydraulic, 3000 PSI, Direct Mounting
- MS-28892 Valve, 3000 PSI Hydraulic Check, Flareless, Type II Systems
- MS-28893 Valve, Hydraulic Relief, Cylindrical, Type II Systems
- MS-28895 Filter, Fluid, Pressure, Hydraulic Line, 3000 PSI, Absolute 15 Micron, Style A, By Pass, 275 Deg. F.

4.1 Military Standard Components: (Cont'd)

- MS-28896 Filter, Fluid, Pressure, Hydraulic Line, 3000 PSI, Absolute 15 Micron, Style B, Non By Pass, 275°F.
- MS-28897 Filter Element, Fluid, Pressure, Hydraulic Line, 3000 PSI, Absolute 15 Micron, 275 Deg. F.

4.2 Air Force/Navy Standard Components:

- AN 4146 Pump - 1/2GPM at 3000 PSI Power Driven Hydraulic
- AN 4147 Pump - 1GPM at 3000 PSI Power Driven Hydraulic
- AN 4148 Pump - 2GPM at 3000 PSI Power Driven Hydraulic
- AN 4149 Pump - 3GPM at 3000 PSI Power Driven Hydraulic
- AN 4150 Pump - 4GPM at 3000 PSI Power Driven Hydraulic
- AN 4151 Pump - 5GPM at 3000 PSI Power Driven Hydraulic
- AN 6201 Pump - Hydraulic Hand
- AN 6204 Valve, Hydraulic Bleeder
- AN 6206 Regulator - 10 GPM Hydraulic Pressure
- AN 6207 Valve - 1500 PSI Hydraulic Check
- AN 6209 Valve - Hydraulic Shuttle, Tube Fitting Outlet
- AN 6235 Filter Element - Hydraulic Replaceable Micronic Line Type
- AN 6236 Filter Element - Hydraulic Replaceable Micronic Reservoir Type
- AN 6237 Filter Element - Hydraulic Replaceable Micronic Vent Type
- AN 6238 Gasket - Hydraulic Replaceable Reservoir Type Filter Element
- AN 6240 Filter - Hydraulic Replaceable Vent Type
- AN 6245 Valve - Hydraulic Thermal Expansion Relief
- AN 6247 Valve - Controllable Check, Rotating Action
- AN 6248 Pump - Hydraulic Hand, Type 3000
- AN 6249 Valve, 3000 PSI Hydraulic Check
- AN 6250 Pump - 1 GPM at 1500 PSI Power Driven Hydraulic
- AN 6251 Pump - 2 GPM at 1500 PSI Power Driven Hydraulic
- AN 6252 Pump - 3 GPM at 1500 PSI Power Driven Hydraulic
- AN 6253 Pump - 5 GPM at 1500 PSI Power Driven Hydraulic
- AN 6277 Valve - Hydraulic Shuttle, 3000 PSI, Internal Thread Tube Fitting Outlet
- AN 6278 Valve - Hydraulic Shuttle, 3000 PSI, Universal and Internal Thread Fitting Outlet
- AN 6279 Valve - Hydraulic Pressure Relief - Two Port
- AN 6280 Valve - 3000 PSI Hydraulic Check Internal Ports
- AN 6281 Fuse - Hydraulic Quantity Measuring, Class 3000, Type 1
- AN 6282 Fuse - Hydraulic Quantity Measuring, Class 3000, Type 2
- AN 6293 Valve - 4-Way Rotary Selector, 3000 PSI, Non-Interflow
- AN 6294 Valve - 4-Way Rotary Selector, 3000 PSI, Interflow
- AN 6295 Regulator - 10 GPM Hydraulic Pressure
- AN 6296 Valve, Controllable Check, Plunger Type, 3000 PSI

5. HYDRAULIC AND PNEUMATIC FITTINGS:

5.1 Military Standard Fittings (MS):

- MS-9015 Plug - Straight Thread, "O" Ring Seal
- MS-20819 Sleeve, Flared Tube Fitting
- MS-21900 Adapter, Flareless Tube to AN Flared Tube
- MS-21901 Adapter, Flareless Tube for 3/8 Bulkhead and Universal to AN Flared Tube
- MS-21902 Union, Flareless Tube
- MS-21903 Union, Flareless Tube, 3/8 Bulkhead and Universal
- MS-21904 Elbow, Flareless Tube, 90 Degree
- MS-21905 Tee, Flareless Tube

5.1 Military Standard Fittings (MS):

MS-21906 Cross, Flareless Tube  
MS-21907 Elbow, Flareless Tube and Universal 45 Degree  
MS-21908 Elbow, Bulkhead Universal 90 Degree, Flareless Tube  
MS-21909 Tee, Bulkhead and Universal, Flareless Tube  
MS-21910 Tee, Flareless Tube, Internal Thread on Run  
MS-21911 Tee, Flareless Tube, Internal Thread on Side  
MS-21912 Tee, Flareless Tube with Bulkhead on Run  
MS-21913 Plug, Flareless Tube  
MS-21914 Cap, Pressure Seal, Flareless Tube Fitting  
MS-21915 Bushing, Screw-Thread Expander, Flareless Tube Connection  
MS-21916 Reducer, External Thread, Flareless Tube  
MS-21917 Nut-Sleeve Coupling Flareless  
MS-21918 Sleeve-Coupling Flareless  
MS-21921 Nut, Sleeve Coupling Flareless  
MS-21922 Sleeve Coupling Flareless  
MS-21923 Adapter, Flareless Tube, Bulkhead and Universal to Flared Tube  
MS-21924 Union, Flareless Tube, Bulkhead and Universal  
MS-21925 Elbow, 90 Degree Universal, Flareless Tube, High Profile  
MS-21926 Elbow, 90 Degree Universal, Flareless Tube, Low Profile  
MS-21937 Nut, Cluster Fitting, Retainer  
MS-21938 Bolt, Cluster Fitting, Single Port, Flareless  
MS-21939 Bolt, Cluster Fitting, Single Port, Through, Flareless  
MS-21940 Bolt, Cluster Fitting, Double Port, Flareless  
MS-21941 Bolt, Cluster Fitting, Double Port, Through, Flareless  
MS-21942 Body, Cluster Fitting, One Way, Flareless  
MS-21943 Body, Cluster Fitting, Two Way, 90 Degree, Flareless  
MS-21944 Body, Cluster Fitting, Two Way, 180 Degree, Flareless  
MS-21945 Body, Cluster Fitting, Three Way, Flareless  
MS-21946 Body, Cluster Fitting, One Way, Internal Boss  
MS-21949 Bolt - Cluster Fitting Single Port - Flare  
MS-21950 Bolt - Cluster Fitting Single Port Through - Flare  
MS-21951 Bolt - Cluster Fitting Double Port - Flare  
MS-21952 Bolt - Cluster Fitting Double Port Through - Flare  
MS-21953 Body - Cluster Fitting One Way - Flare  
MS-21954 Body - Cluster Fitting Two Way 90 Degree - Flare  
MS-21955 Body - Cluster Fitting Two Way 180 Degree - Flare  
MS-21956 Body - Cluster Fitting Three Way - Flare  
MS-21958 Body - Cluster Fitting, Two Way 180 Degree, Internal Boss  
MS-21959 Body - Cluster Fitting, Two Way, 90 Degree, Internal Boss  
MS-21960 Body - Cluster Fitting, Three Way, Internal Boss  
MS-24387 Bolt, Flared Tube Fitting End Universal, Precision Type  
MS-24388 Tee, Flared Tube, Internal Thread on Side, Precision Type  
MS-24389 Tee, Flared Tube, Internal Thread on Run, Precision Type  
MS-24390 Tee, Flared Tube, with Bulkhead on Run, Precision Type  
MS-24391 Plug-Bleeder, Screw Thread, Precision Type  
MS-24392 Union, Flared Tube, Precision Type  
MS-24393 Union, Flared Tube 3/8 Bulkhead and Universal, Precision Type  
MS-24394 Elbow, Flared Tube Bulkhead and Universal, 90 Degree, Precision Type  
MS-24395 Tee, Bulkhead and Universal Flared Tube, Precision Type  
MS-24396 Elbow, Flared Tube and Universal, 45 Degree, Precision Type  
MS-24397 Bushing, Screw Thread Reducer, Precision Type  
MS-24398 Bushing, Screw Thread Expander, Precision Type  
MS-24399 Reducer, External Thread Flared Tube, Precision Type  
MS-24400 Nut, Flared Tube, Bulkhead and Universal Fitting, Precision Type  
MS-24401 Elbow, Flared Tube, 90 Degree, Precision Type

5.1 Military Standard Fittings (MS): (Cont'd)

MS-24402 Tee, Flared Tube, Precision Type  
MS-24403 Cross, Flared Tube, Precision Type  
MS-24404 Plug, Flared Tube, Precision Type  
MS-24405 Adapter, Flareless Tube to AN Flared Tube, Precision Type  
MS-24487 Union - Tube, Flared, Universal  
MS-24651 Elbow, Tube - 90 Degree, Bulkhead, Flareless Tube Universal to Flared Tube  
MS-24652 Elbow, Tube - 90 Degree, Bulkhead, Flared Tube Universal to Flareless Tube  
MS-24653 Elbow, Tube - 45 Degree, Bulkhead, Flared Tube Universal to Flareless Tube  
MS-24654 Elbow, Tube - 45 Degree, Bulkhead, Flareless Tube Universal to Flared Tube

5.2 Air Force/Navy Standard Fittings (AN):

AN 774 Bolt - Flared Tube Fitting End Universal  
AN 775 Bolt - Universal Fitting  
AN 776 Elbow - Universal 90 Degree  
AN 777 Elbow - Universal 75 Degree  
AN 778 Elbow - Universal 45 Degree  
AN 779 Tee - Universal Fitting  
AN 783 Tee, Flared Tube, Internal Thread on Side  
AN 784 Tee, Flared Tube, Internal Thread on Run  
AN 804 Tee, Flared Tube with Bulkhead on Run  
AN 806 Plug - Flared Tube  
AN 814 Plug and Bleeder - Flared Tube  
AN 815 Union - Flared Tube  
AN 817 Nut - Sleeve, Coupling  
AN 818 Nut - Coupling  
AN 821 Elbow - Flared Tube, 90 Degree  
AN 824 Tee - Flared Tube  
AN 827 Cross - Flared Tube  
AN 832 Union - Flared Tube 3/8 Bulkhead and Universal  
AN 833 Elbow - Flared Tube and Bulkhead Universal 90 Degree  
AN 834 Tee - Bulkhead and Universal Flared Tube  
AN 837 Elbow - Flared Tube and Universal, 45 Degree  
AN 871 Flange - Straight Thread Boss Welding  
AN 893 Bushing - Screw Thread Reducer  
AN 894 Bushing - Screw Thread Expander  
AN 919 Reducer - External Thread Flared Tube  
AN 924 Nut - Flared Tube Bulkhead and Universal Fitting  
AN 929 Cap Assembly, Pressure Seal Flared Tube Fitting  
AN 937 Cross - Internal Screw Thread  
AN 938 Tee - Internal Screw Thread  
AN 939 Elbow - Internal Screw Thread, 90 Degree  
AN 941 Elbow - Internal Screw Thread, 45 Degree  
AN 6289 Nut - Flared Tube Universal Fitting

5.3 Industry Standard Fittings:

5.3.1 Society of Automotive Engineers Standards:

AS 1000 Cap Assembly - Pressure Seal, Flareless Tube Fittings  
AS 1017 Union Assembly - Adjustable Flareless  
AS 1018 Nut - Adjustable Flareless Union Assembly  
AS 1019 Bulkhead Union Assembly - Adjustable Flareless  
AS 1020 Screw, Adjustable Union Flareless  
AS 1021 Nut, Adjustable Flareless Bulkhead Union Assembly