



400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

AEROSPACE RECOMMENDED PRACTICE

Submitted for recognition as an American National Standard

ARP1482

Issued 12-78
Revised 3-89

REV.
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RECOMMENDATIONS FOR FUEL AND OIL SYSTEM SCHEMATICS

1. PURPOSE:

This document defines a standard set of symbols for use in functional schematics of aircraft fuel and oil systems and components.

2. SCHEMATIC:

For purposes of this document, a schematic is defined as a diagram descriptive of the functions and flow paths of a system or component. Such a schematic is intended only to provide a general understanding of the system or component depicted in an easily understood format. As such, portrayal of the physical positions and aspects of the components is not required and may, in fact, be undesirable.

3. COMPONENTS:

The following figures set forth the basic component symbols, as well as modifiers that specify drives and accessories.

4. SPECIAL COMPONENTS:

It is recognized that most systems will require the occasional use of unique components not described in this document. Where possible, these should be represented by combinations of the symbols herein. The resulting combination for a given component should be surrounded by a dashed line, if necessary to make it clear that it is a single component. Several examples of composite symbols are presented in the figures.

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5. PLUMBING:

Tubing and hoses should be represented by solid double lines. Each line should be identified as to function by use of the appropriate cross-hatch code described in the figures. It is recommended that line size (outside diameter for tubing, inside diameter for hose) be specified in the format ØX.XX, suffixed with the appropriate material/type letter code listed in this document.

6. LEGENDS:

It is recommended that each system schematic contain a legend identifying the nomenclature of all symbols used. Numerical codes should be used to relate the symbols in the legend to the appropriate locations on the schematic.

7. COMPONENT DRAWINGS:

It is recommended that each component drawing include a schematic of the component represented thereon.

8. OTHER SYMBOLS AND SYSTEMS:

Refer to SAE AS1290 for symbols relevant to actuators, control valves, and other components associated with hydraulic and pneumatic systems.

9. NOMENCLATURE:

Refer to SAE AIR1660 and AIR1615 for definitions of the nomenclature used herein.

CODES FOR ELECTRICAL DRIVES:

AC MOTOR

ACM

DC MOTOR

DCM

STEPPER MOTOR

SM

TORQUE MOTOR

TM

AC SOLENOID

ACS

DC SOLENOID

DCS

CODES FOR PNEUMATIC DRIVES:

AIR TURBINE MOTOR

ATM

AIR PRESSURE MOTOR

APM

CODES FOR HYDRAULIC DRIVES:

FUEL TURBINE MOTOR

FTM

HYDRAULIC MOTOR

HM

FUEL PRESSURE MOTOR

FPM

CODES/SYMBOLS FOR
MECHANICAL DRIVES:

ENGINE DRIVEN

ED

FLOAT ACTUATED



MANUAL



GRAVITY ACTUATED

MISCELLANEOUS CODES:

NORMALLY-OPEN

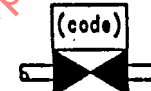
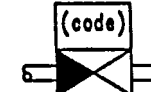
NO

NORMALLY-CLOSED

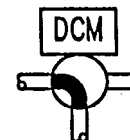
NC

CHECK VALVE:SHUTOFF VALVES:

MANUAL

ACTUATED,
NORMALLY-OPENACTUATED,
NORMALLY-CLOSEDROTARY VALVES:

BASIC SYMBOL

EXAMPLE- 3 WAY,
2 POSITION, DC
MOTOR ACTUATEDLEVEL CONTROL SHUTOFF VALVES:BASIC SYMBOLS

INTEGRAL

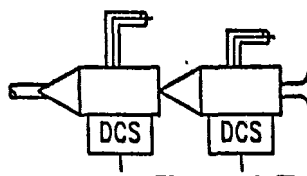
REMOTE PILOT-
OPERATED

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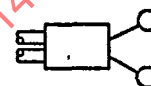
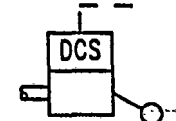
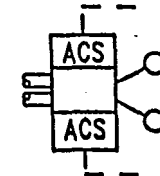
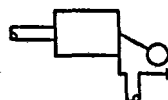
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LEVEL CONTROL SHUTOFF VALVES:
(continued)MOUNTINGTANK MOUNTED
(REFUEL)LINE MOUNTED
(REFUEL OR DEFUEL)REDUNDANCYDUAL,
SERIES
(REFUEL,
TANK MOUNTED)DUAL,
PARALLEL,
(REFUEL,
TANK MOUNTED)VARIATIONSDEFUEL,
INTEGRAL,
TANK MOUNTEDREFUEL/DEFUEL,
INTEGRAL,
TANK MOUNTEDDUAL,
REFUEL,
TANK MOUNTED,
REMOTE PILOT,
DC SOLENOID PRECHECKLEVEL CONTROL PILOT VALVES:BASIC SYMBOLS

SINGLE



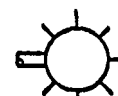
DUAL

VARIATIONSSINGLE, DC
SOLENOID
PRECHECKDUAL, AC
SOLENOID
PRECHECKSINGLE, FLOTA-
TION PRECHECKRELIEF VALVE:

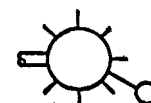
flow direction →

VENT VALVES:

BASIC SYMBOL

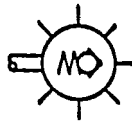


FLOAT OPERATED

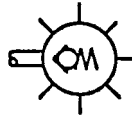
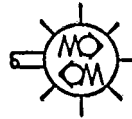


VENT VALVES:
(continued)

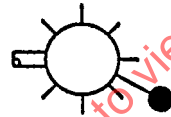
PRESSURE RELIEF



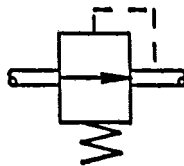
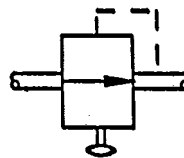
VACUUM RELIEF

PRESSURE AND
VACUUM RELIEF

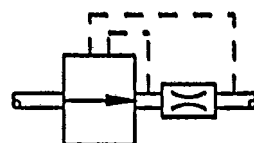
GRAVITY OPERATED

REGULATORS:

GAUGE PRESSURE

ABSOLUTE
PRESSURE

FLOW

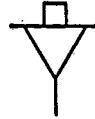
DRAIN VALVES:

BASIC SYMBOL

flow direction



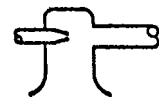
EXTERNAL



INTERNAL OR FLUSH

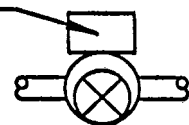
PUMPS:

EJECTOR



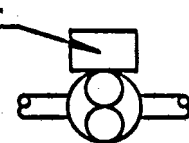
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CENTRIFUGAL



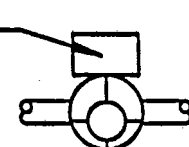
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GEAR



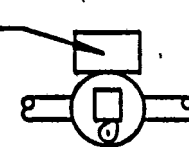
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VANE



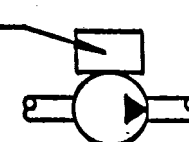
add code

PISTON



add code

TYPE UNSPECIFIED



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GRAVITY REFUELING CONNECTIONS:

CAP- BASIC SYMBOL



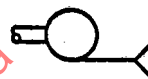
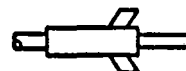
FLUSH CAP



EXTENDED CAP



SCUPPER

AERIAL REFUELING CONNECTIONS:REFUELING HOSE AND
DROGUE (mates with
probe)RECEIVER PROBE
(mates with drogue)REFUELING BOOM
(mates with
receptacle)RECEIVER RECEPT-
ACLE (mates with
boom)PRESSURE REFUELING CONNECTIONS:SINGLE POINT CAP AND
ADAPTER (BASIC SYMBOL)

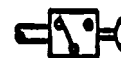
FLUSH CAP AND ADAPTER

EXTENDED CAP AND
ADAPTERCLOSED CIRCUIT
RECEPTACLE (RETURN
TO REFUEL STATION)INDICATOR SWITCHES:

GAUGE PRESSURE



ABSOLUTE PRESSURE



DIFFERENTIAL PRESSURE



FLOAT



TEMPERATURE



FLOW RATE



TRANSDUCERS:

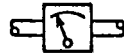
GAUGE PRESSURE



ABSOLUTE PRESSURE



DIFFERENTIAL PRESSURE



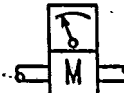
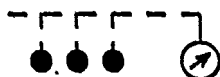
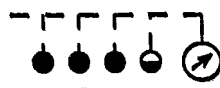
FLOAT



TEMPERATURE



FLOW RATE (VOLUMETRIC)

FLOW RATE (POSITIVE
DISPLACEMENT)MASS FLOW RATE
(ANGULAR MOMENTUM
RECOVERY TYPE)QUANTITY MEASURING DEVICES:ELECTRONIC
(BASIC SYMBOL)EXTERNAL
COMPENSATIONSELF COMPEN-
SATIONQUANTITY MEASURING DEVICES:
(continued)

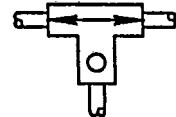
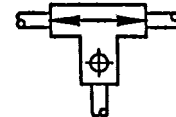
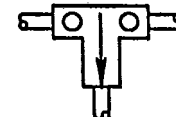
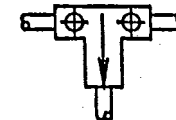
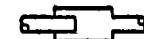
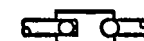
DENSITOMETER



DRIP STICK



DIP STICK

FLOWRATE PROPORTIONERS:VOLUMETRIC
DIVIDERPOSITIVE DISPLACE-
MENT DIVIDERVOLUMETRIC
EQUALIZERPOSITIVE DISPLACE-
MENT EQUALIZERCOUPLINGS:QUICK DISCONNECT-
NON-SELF-SEALINGQUICK DISCONNECT-
SELF-SEALING

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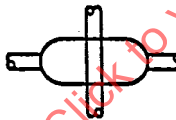
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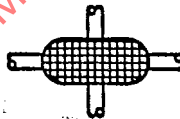
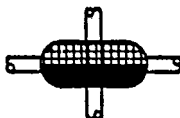
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COUPLINGS: (continued)BREAKAWAY VALVE-
SELF-SEALINGCOMBINATION SELF-
SEALING DISCONNECT
AND BREAKAWAY VALVEHEAT EXCHANGERS:

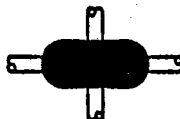
BASIC SYMBOL



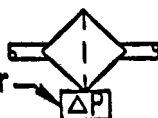
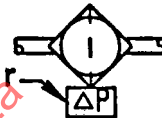
GAS TO GAS

LIQUID TO GAS
OR
GAS TO LIQUID

LIQUID TO LIQUID

SEPARATORS:

FILTER

 ΔP indicator
(if used)SEPARATORS:MICRONIC
FILTER ΔP indicator
(if used)

SCREEN



STRAINER



GAS/LIQUID

LINES:

ENGINE FEED

 ϕ X.XX YY

MOTIVE FLOW

 ϕ X.XX YY

REFUEL

 ϕ X.XX YY

TRANSFER

 ϕ X.XX YY

REFUEL/TRANSFER

 ϕ X.XX YY

DEFUEL

 ϕ X.XX YY

VENT

 ϕ X.XX YY

PRESSURIZATION

 ϕ X.XX YY

SENSING

 ϕ X.XX YY

DRAIN

 ϕ X.XX YY

ELECTRICAL



note: X.XX = line size; YY = material (see pg. 2)