



AEROSPACE RECOMMENDED PRACTICE

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc.

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FLUID SYSTEM CHARACTERISTICS AFFECTING HYDRAULIC PUMP OPERATION

1. PURPOSE - Suppliers of variable delivery hydraulic pumps require certain pertinent information to permit complete and successful products for aerospace applications to be developed as early in the program as possible. This recommended practice provides a composite list of the numerous variables, not always recognized to be of importance, that may affect the pump design.
2. SCOPE - This practice is intended to cover only the application of variable delivery hydraulic pumps. The same recommendation applies regardless of the type of drive used, the type of service intended, such as utility or emergency systems, or the procuring activity involved.
3. APPLICATION - The procuring agency for the hydraulic pump should use this procedure to supply the information to the pump supplier. In cases where complete information is not available, partial information should be supplied as early in the program as possible. Additional information may be added as it becomes available. The information supplied is not intended to supplant or add to contractual requirements of the model specification but to provide supplementary material for consideration during the design and development of the pump. Where any conflict exists with the pump model specification, the pump model specification shall govern.
4. RECOMMENDED PRACTICE - The information listed in paragraph 4.1 should be supplied, generally in the form shown, to the hydraulic pump manufacturer. Values which are questionable should be so indicated. Preliminary information, however, should be entered and revised as system design and characteristics are changed and/or finalized. If actual values are unknown and cannot be estimated, it should be so stated under the appropriate items. In addition, the principal category headings in 4.2 may be utilized as a check-off for additional factors peculiar to the specific application.

In order to define the complete system configuration, a schematic diagram should be provided.

Fluid System Information

General

Hydraulic system - (Name Usage)

Hydraulic fluid specification _____, special properties _____

Applicable system specifications _____

Expected service life to first overhaul _____

Typical mission, pressure-speed-flow envelope
(attach curve if available) _____

CANCELLED

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Physical Constraints

Installation confines, Drawing No. _____ supplied
Drive flange specification _____
Drive flange drain port configuration _____
Discharge port configuration _____, general location _____
Inlet port configuration _____, general location _____
Case drain port configuration, _____, general location _____

Operating Environment

Rated fluid temperature _____ F (at pump inlet)
Minimum fluid temperature _____ F
Fluid temperature at pump outlet, maximum allowable _____ F
Fluid temperature at case drain, maximum allowable _____ F
Ambient temperature, maximum _____ F
Minimum cooling flow available _____ fps
Fluid system contamination level _____
Drive flange temperature, maximum _____ F
Vibration (if other than Military Specification _____

Operating Input

Drive power source _____
Drive speed, maximum _____, minimum _____, rated _____
Speed droop, minimum load to maximum load _____ rpm
Acceleration rate, maximum _____ rpm/sec or minimum to maximum
speed in seconds _____
Drive direction of rotation _____ looking toward pump drive end
Rated fluid inlet pressure _____ at pump inlet
Type of fluid reservoir-Bootstrap, gas pressurized at _____ psia, atmospheric vent
Inlet line length to reservoir _____
Inlet line size _____
Pressure drop, reservoir to pump _____
Inlet filtration, specification _____, capacity _____ gpm bypass
opening pressure _____ psi
Inlet fluid air entrainment, degree expected _____
(high) (normal) (low)

Operating Feedback

Case drain line size _____
Case drain filtration, specification _____, capacity _____ gpm
Case drain back pressure, maximum _____ psi
Pressure transients on case drain, amplitude _____
duration _____
Discharge pressure, rated at: full flow _____ psi
minimum flow _____ psi
High pressure system volume, minimum _____ cu. in.

