



AEROSPACE RECOMMENDED PRACTICE

ARP1400™**REV. B**

Issued 1975-09
Revised 1999-11
Reaffirmed 2020-04

Superseding ARP1400A

(R) Recommended Practices for Lubricating Oil Filters, General Aviation
Reciprocating Engine (Piston Type) Aircraft

RATIONALE

ARP1400B has been reaffirmed to comply with the SAE five-year review policy.

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Documents

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1. SCOPE:

This SAE Aerospace Recommended Practice (ARP) establishes the requirements for lubricating oil filters for general aviation reciprocating engine applications with lubricating oil systems normally operating in a pressure range of 345 to 689 kPa (50 to 100 psig).

1.1 Purpose:

This document defines uniform parameters for the design, manufacture, and test of filters for general aviation lubricating oil systems for aircraft type piston engines.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J363	Filter Base Mountings
SAE HS 806	SAE Oil Filter Test Procedure
ARP24	Determination of Hydraulic Pressure Drop
AS478	Identification Marking Methods
AS567	General Practices for Use of Lock Wire, Key Washers and Cotter Pins
ARP901	Bubble Point Test Method
SAE J1260	Standard Oil Filter Test Oil
SAE J1858	Full Flow Lubricating Oil Filters Multipass Method
SAE J1899	Lubricating Oil, Aircraft Piston Engine (Ashless Dispersant)
SAE J1966	Lubricating Oil, Aircraft Piston Engine (Non-Dispersant Mineral Oil)

2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

FED-STD-595 Colors

MIL-STD-889 Dissimilar Metals

MIL-H-5606 Hydraulic Fluid, Petroleum Base

2.3 Industry Standards:

Available from American Society for Quality Control, 611 East Wisconsin Ave., Milwaukee, WI 53202.

ANSI/ASQC Z1.4-1993 Sampling Procedures and Tables for Inspection by Attributes

3. CLASSIFICATION OF FILTERS AND ACCESSORIES:

Lubricating oil filters shall be in accordance with the following categories:

3.1 Category IA:

Shell and bolt types (filter assemblies with reusable housings and noncleanable filter elements).

Consists of:

- a. 1 Shell per Figure 1
- b. 1 Bolt per Figure 2
- c. 1 Cover Plate per Figure 3
- d. 1 Cover to Shell Gasket per Figure 4
- e. 1 Cover to Adapter Gasket per Figure 5
- f. 1 Assembly Nut per Figure 6
- g. 1 Filter Element per Figure 7
- h. 1 Bolt to Shell Gasket per Figure 8
- i. 1 Installation Instruction Sheet

3.2 Category IB:

Replacement Filter Element Kits for Shell and Bolt Type Filter Assemblies

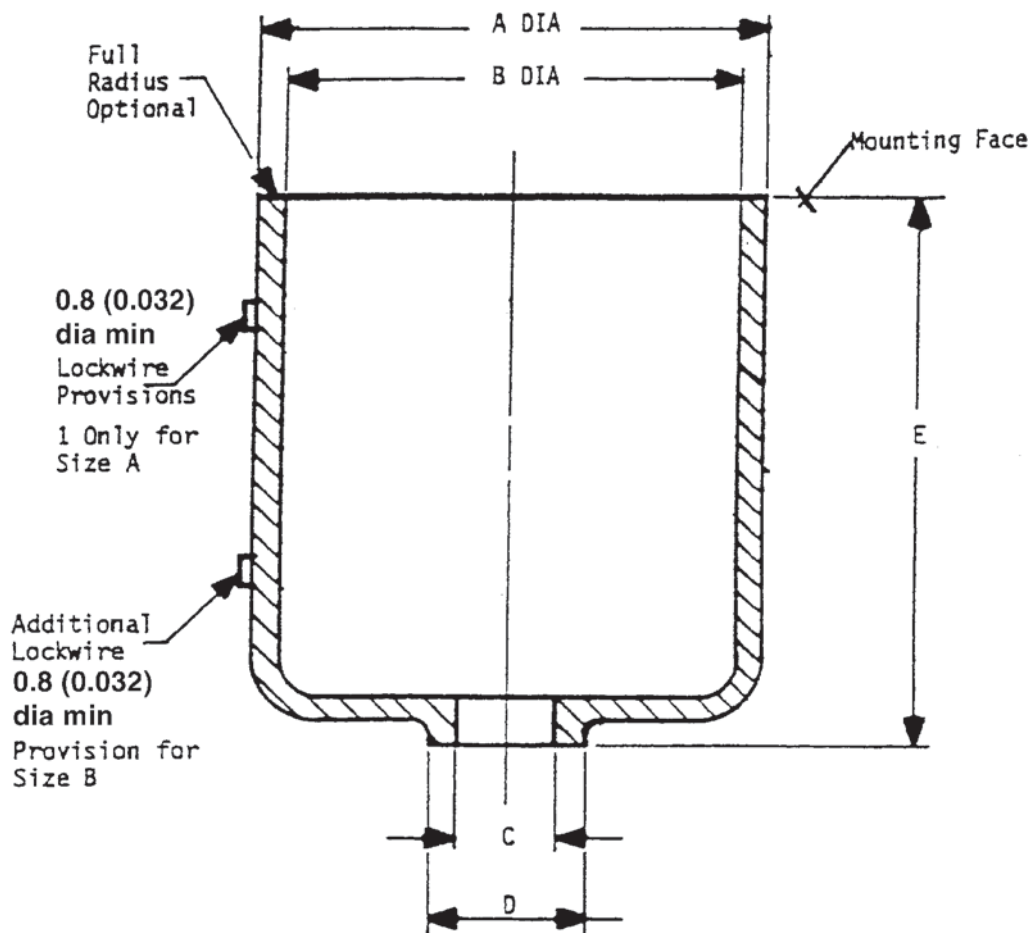
Consists of:

- a. 1 Filter Element per Figure 7
- b. 1 Cover to Shell Gasket per Figure 4
- c. 1 Cover to Adapter Gasket per Figure 5
- d. 1 Bolt to Shell Gasket per Figure 8
- e. 1 Installation Instruction Sheet

3.3 Category II: Spin-on Types (Non-cleanable Filter Assemblies):

3.3.1 Category IIA consists of

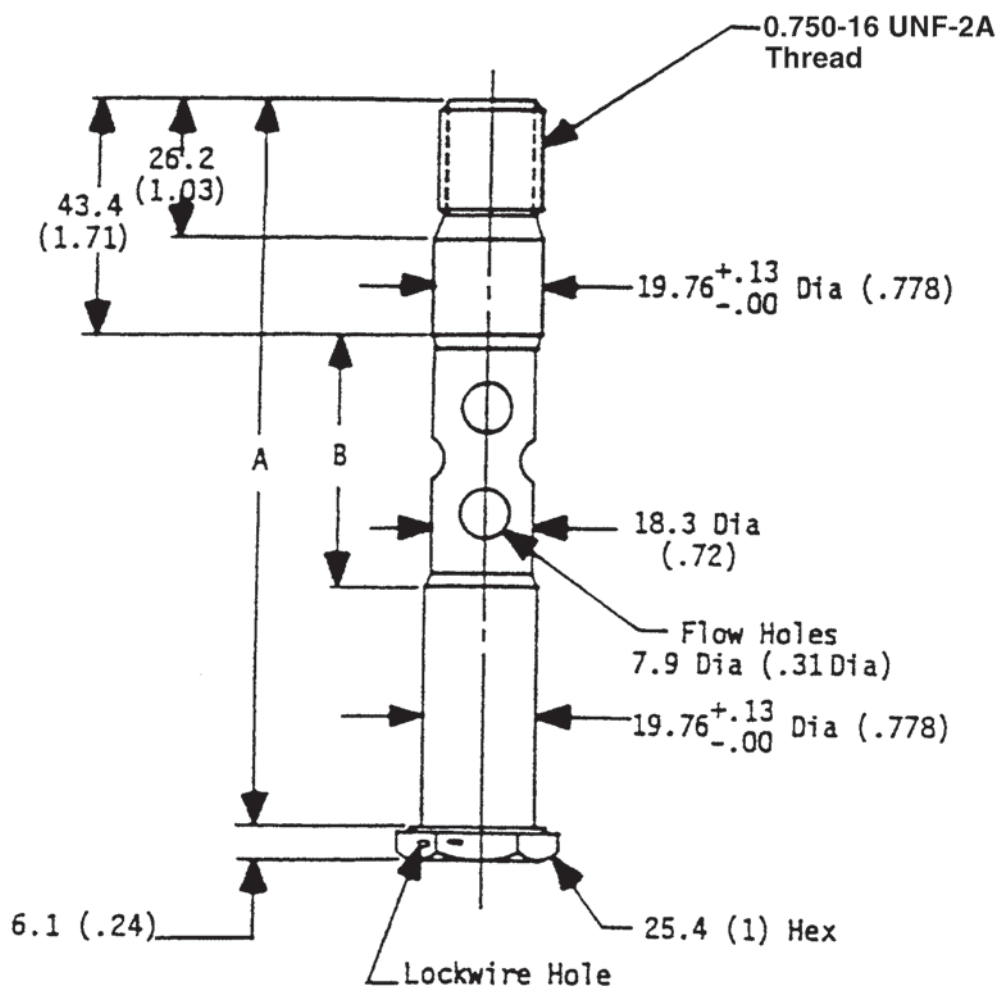
1 Female Threaded Non-cleanable Housing Containing Integral Filter Element and Attached Adapter-to-Filter Seal. See Figure 9.



mm (inch)					
SIZE	A (MAX.)	B	C	D	E
SHORT	101.1	92.7	$20.32^{+.25}_{-.13}$	30.2	110.2
	(3.98)	(3.65)	$0.8^{+.010}_{-.005}$	(1.19)	(4.34)
LONG	101.1	92.7	$20.32^{+.25}_{-.13}$	30.2	150.9
	(3.98)	(3.65)	$0.8^{+.010}_{-.005}$	(1.19)	(5.94)

ALL DIMENSIONS: mm (inch)

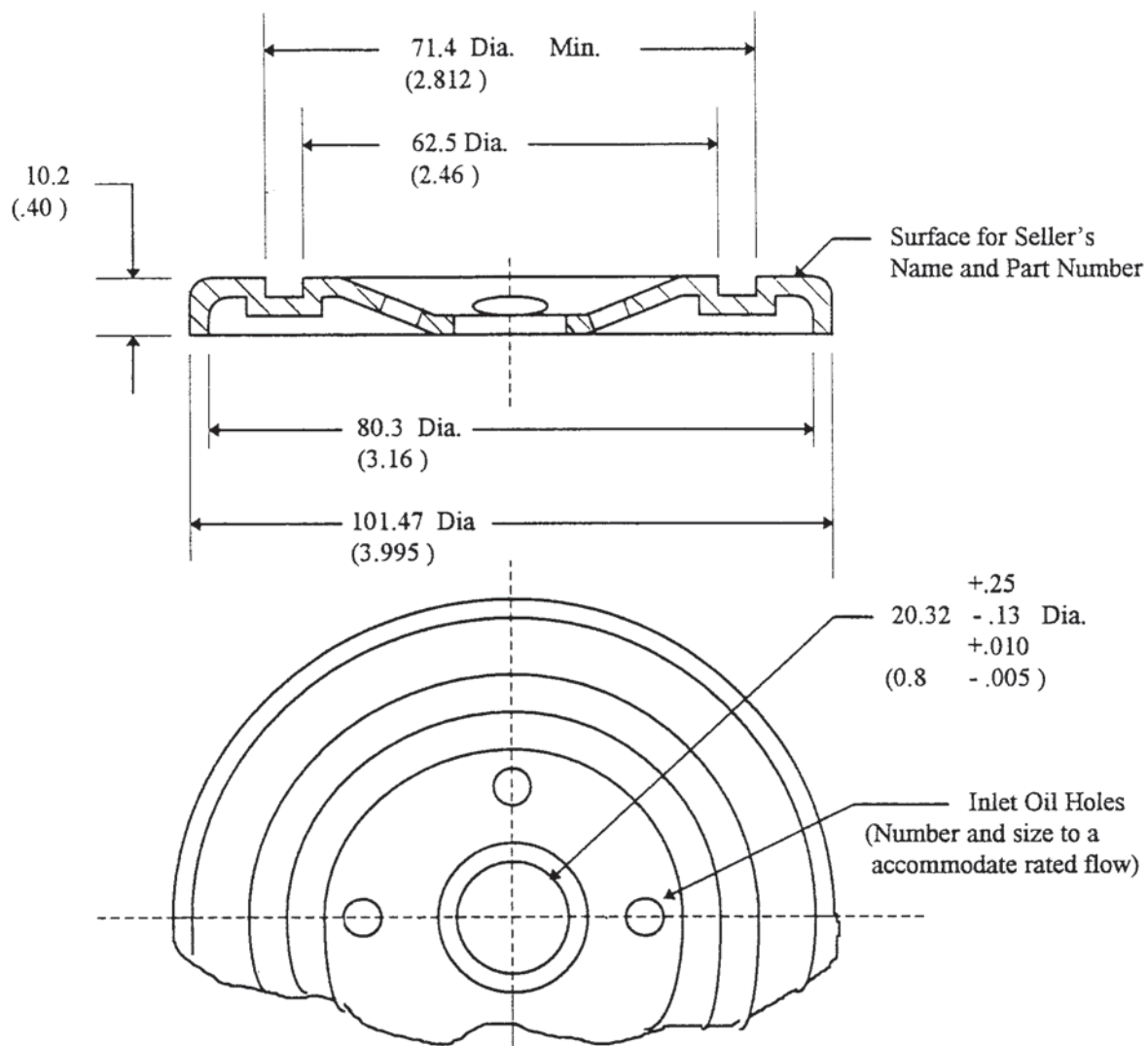
FIGURE 1 - Shell (Bolt-on Types) Category IA



	mm (inch)	
SIZE	A	B
SHORT	131.8 (5.19)	45.2 (1.78)
LONG	172.0 (6.79)	85.9 (3.38)

ALL DIMENSIONS: mm (inch)

FIGURE 2 - Bolt (for Shell and Bolt Style Filters)



All Dimensions: mm (inch)

FIGURE 3 - Cover Plate (Category IA)

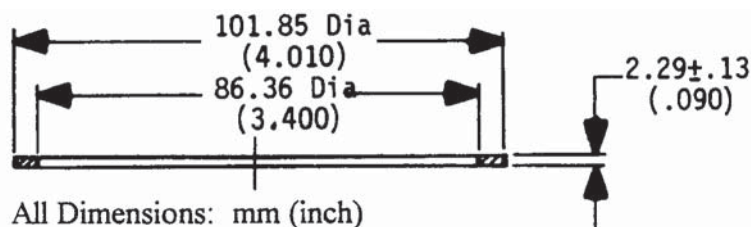


FIGURE 4 - Cover to Shell Gasket

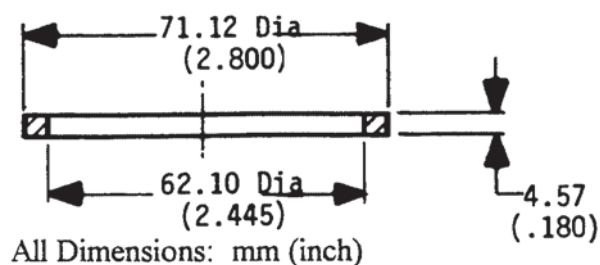


FIGURE 5 - Cover to Adapter Gasket

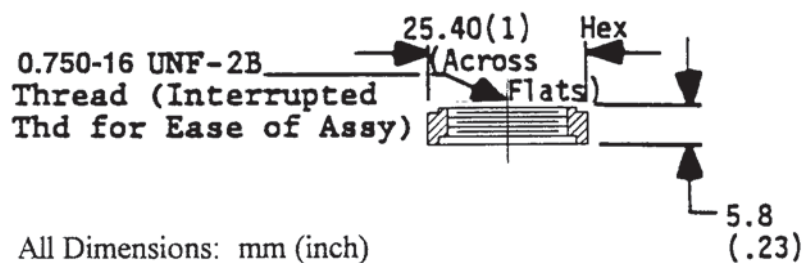
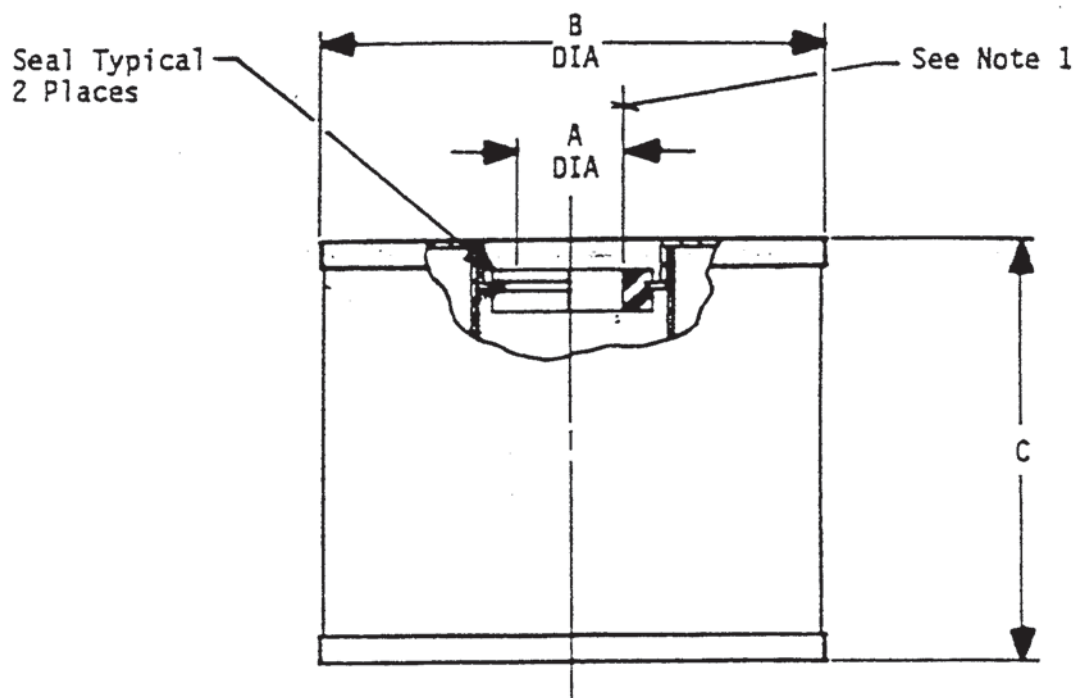


FIGURE 6 - Assembly Nut



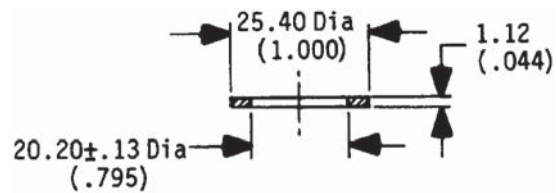
Note 1: This installed seal diameter shall permit assembly on bolt per Figure 2 when lubricated with SAE 40 or 50 wt. aviation oil without extrusion or undue force. An oil tight seal shall be established between bolt and filter element.

Note 2: End caps must be perpendicular to filter media within 3.2 (0.126) over length of filter element.

SIZE	mm (inch)		
	A DIA.	B DIA.	C
SHORT	19.30 ± .13 (0.76 ± 0.005)	87.9 ± 1.0 (3.46 ± 0.04)	74.9 ± 1.5 (2.95 ± 0.06)
LONG	19.30 ± .13 (0.76 ± 0.005)	87.9 ± 1.0 (3.46 ± 0.04)	116.1 ± 1.5 (4.57 ± 0.06)

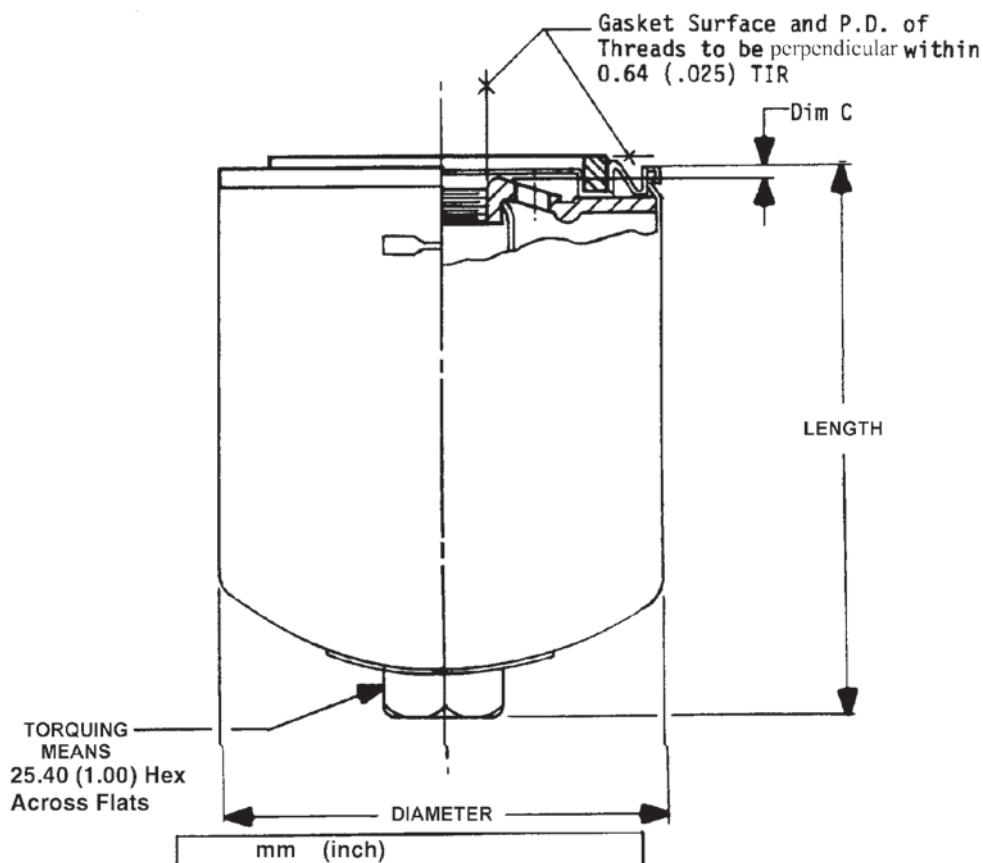
All Dimensions: mm (inch)

FIGURE 7 - Filter Element (Category IA and IB)



All Dimensions: mm (inch)

FIGURE 8 - Bolt to Shell Gasket



mm (inch)				
SIZE	LENGTH (MAX)	DIA (MAX)	C (REF)	RECOM. THD SIZE
SHORT	124.0 (4.88)	99.1 (3.90)	4.06 (0.16)	0.750-16 UNF-2B
LONG	165.1 (6.50)	99.1 (3.90)	4.06 (0.16)	0.750-16 UNF-2B

All Dimensions: mm (inch)

FIGURE 9 - Spin-on Filter Assembly (Category IIA)

3.3.2 Category IIB¹ consists of:

1 Male Threaded Non-cleanable Housing Containing Integral Filter Element and Attached Adapter-to-Filter Seal. See Figure 10.

3.4 Category III: Converter Kit - for conversion from Bolt and Shell Type Filters (Categories IA and IB) to Spin-on type non-cleanable filter (Category II):

Consists of:

- a. 1 Converter Plate Assembly
- b. 1 Converter Stud
- c. 1 Instruction Sheet

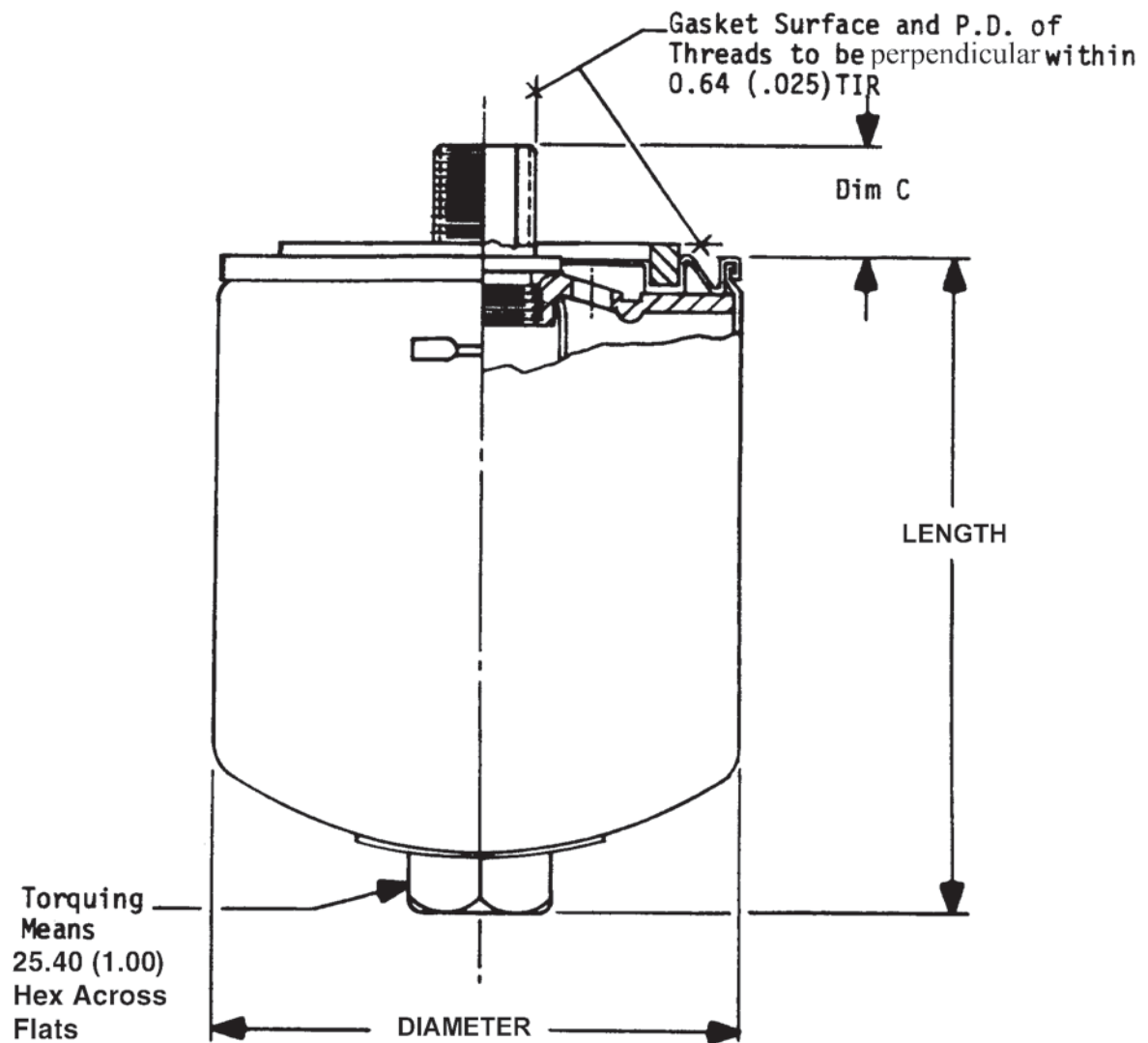
(See Interface Definition - Figure 11)

4. REQUIREMENTS:

4.1 Design and Construction:

- 4.1.1 Shell and Bolt Type Filter Assemblies (Category IA) shall be designed and constructed such that the filter elements and housing seals may be readily removed from and replaced in the filter housing without the use of special tools.
- 4.1.2 Spin-on Type Filter Assemblies (Category II) shall be designed such that the filter housing, filter element and mounting base seal are preferably discarded as a unit.
- 4.1.3 The filter assemblies covered by this document shall be of the full-flow type (i.e., the total pump outlet flow shall be filtered; not a partial flow "slip stream" filter).
- 4.1.4 All filter assemblies shall incorporate suitable provisions for safety-wiring the filter assembly to the aircraft engine, if permitted by the procuring authority, otherwise an alternate secondary locking arrangement may be necessary. Lockwire shall be 0.8 mm (0.032 in) dia min.
- 4.1.5 AS567 shall be used as a guide for safety wiring requirements.
- 4.1.6 The weight of the filter assembly shall be kept to the practical minimum consistent with good design practice. The vendor shall specify the maximum weight of each filter assembly on the applicable drawing.
- 4.1.7 Wrench caps or nuts shall be designed to withstand 9.0 N·m (80 lbf-in) torque (minimum) without damage or permanent deformation (Category II Filters).

1. For usage, refer to filter or engine manufacturers' catalogs.



mm (inch)				
SIZE	LENGTH (MAX)	DIA (MAX)	C (REF)	RECOM. THD SIZE
SHORT	124.0 (4.88)	99.1 (3.90)	9.7 (0.38)	0.750-16 UNF-2A
LONG	165.1 (6.50)	99.1 (3.90)	9.7 (0.38)	0.750-16 UNF-2A

All Dimensions: mm (inch)

FIGURE 10 - Spin-on Filter Assembly (Category IIB)