The Engineering Society For Advancing Mobility Land Sea Air and Space®

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SAE J780 APR84

Engine Coolant Pump Seals

SAE Standard
Reaffirmed April 1984

an American National Standard

SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

HIGHWAY VEHICLE STANDARD

an American National Standard

SAE J780

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ENGINE COOLANT PUMP SEALS

This standard outlines physical dimensions and nomenclature for the sizes of seals commonly used in engine coolant pumps of automotive type engines. Its purpose is to define a standard envelope to accommodate installation of various seal designs and to promote uniformity in seal nomenclature.

For additional information on material combinations, drawing format, qualification and inspection information, and quality control data, please refer to SAE J1245 NOV78, Guide to the Application and Use of Engine Coolant Pump Face Seals.

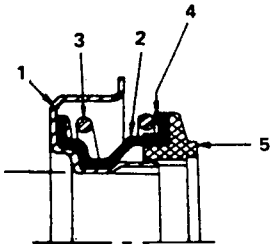


FIGURE 1 - Spring-Loaded

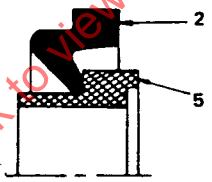


FIGURE 2 - Elastomer-Loaded

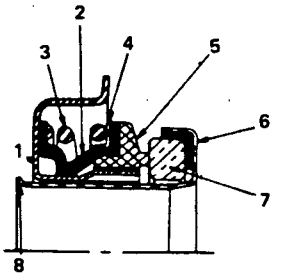
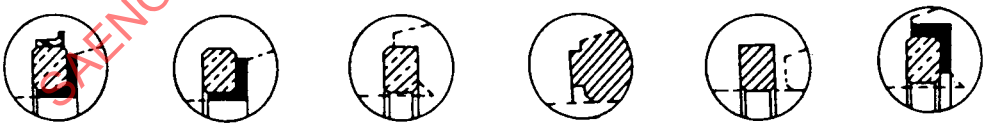


FIGURE 3 - Unitized

NOMENCLATURE

1. Cartridge
2. Bellows
3. Spring
4. Ferrule
5. Primary Seal Ring
6. Secondary Drive Seal
7. Mating Ring
8. Unitizer



1 2 3 4 5 6

FIGURE 4 - Mating Ring Types

1. Banded, I.D. Mounted
2. Plain, I.D. Mounted
3. Bonded
4. Lapped Pump Component
5. Press Fit
6. O.D. Mounted

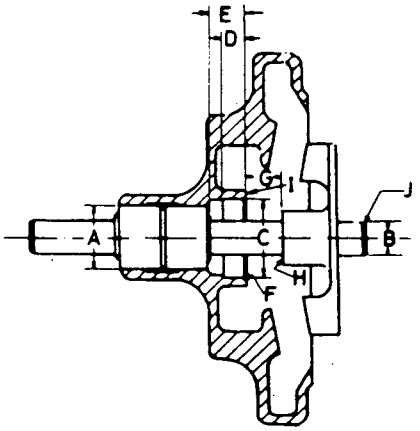


TABLE 1 – Reference Dimensions

A[a] Bearing Bore	B Nominal Shaft Dia, in	C Seal Housing Bore Dia, in	D Seal Housing Bore Depth, in	E Axial Clearance min, in	F[a] Seal Bore Lead-in Chamfer	G[a] Pump Housing to Impeller or Mating Ring, in	J[a] Lead-in Chamfer Bearing Shaft End
↓	3/8	1.124–1.126	0.360–0.380	0.400	0.040 x 45°	0.062	0.125 in x 30° Blended
	1/2	1.124–1.126	0.360–0.380	0.410	0.040 x 45°	0.187	
	5/8	1.434–1.436	0.360–0.380	0.410	0.040 x 45°	0.235	
	5/8	1.434–1.436	0.360–0.380	0.410	0.040 x 45°	0.265	
	5/8	1.498–1.500	0.360–0.380	0.410	0.040 x 45°	0.265	
	5/8	1.525–1.527	0.360–0.380	0.410	0.040 x 45°	0.265	
	5/8	1.548–1.550	0.360–0.380	0.410	0.040 x 45°	0.265	
	3/4	1.498–1.500	0.360–0.380	0.410	0.040 x 45°	0.265	
	3/4	1.574–1.576	0.360–0.380	0.410	0.040 x 45°	0.265	
↓	1	1.622–1.624	0.360–0.400	0.440	0.060 x 45°	0.578	↓

[a] To be determined jointly by the pump manufacturer, bearing and seal suppliers.

Roughness Average, Ra-μin		
	B max	C max
	32	100

Concentricity between A & C (F.I.M.)	0.002 in max
Concentricity between B & C (F.I.M.)	0.005 in max
Squareness between B & H (F.I.M.)	0.002 in max
Squareness between B & Surface I (F.I.M.)	0.005 in max
Shaft End Play	0.005 in max

A[a] Bearing Bore	B Nominal Shaft Dia, mm	C Seal Housing Bore Dia, mm	D Seal Housing Bore Depth, mm	E Axial Clearance min, mm	F[a] Seal Bore Lead-in Chamfer	G[a] Pump Housing to Impeller or Mating Ring, mm	J[a] Lead-in Chamfer Bearing Shaft End
↓	10	28.55–28.60	9.14–9.65	10.16	1.02 x 45°	1.57	3.18 mm x 30° Blended
	13	28.55–28.60	9.14–9.65	10.41	1.02 x 45°	4.75	
	16	36.43–36.47	9.14–9.65	10.41	1.02 x 45°	5.97	
	16	36.43–36.47	9.14–9.65	10.41	1.02 x 45°	6.73	
	16	38.05–38.10	9.14–9.65	10.41	1.02 x 45°	6.73	
	16	38.74–38.79	9.14–9.65	10.41	1.02 x 45°	6.73	
	16	39.32–39.37	9.14–9.65	10.41	1.02 x 45°	6.73	
	19	38.05–38.10	9.14–9.65	10.41	1.02 x 45°	6.73	
	19	39.98–40.03	9.14–9.65	10.41	1.02 x 45°	6.73	
↓	25	41.20–41.25	9.65–10.16	11.18	1.52 x 45°	14.68	↓

[a] To be determined jointly by the pump manufacturer, bearing and seal suppliers.

Roughness Average, Ra-μm		
	B max	C max
	0.81	2.54

Concentricity between A & C (F.I.M.)	0.05 mm max
Concentricity between B & C (F.I.M.)	0.13 mm max
Squareness between B & H (F.I.M.)	0.05 mm max
Squareness between B & Surface I (F.I.M.)	0.13 mm max
Shaft End Play	0.13 mm max