

# Service Information Letter - Fuel Systems

SMALL RECIPROCATING ENGINES

ALL RS/RSA

Issued 7/11/08

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**SUBJECT: Alternate Flow Bench Test Fluid - MIL-PRF-7024\* Type II.**

**PURPOSE:** To provide repair shops with a suitable substitute for the Naphtha calibrating fluid currently specified in RS and RSA overhaul manuals.

Revision 1. To clarify acceptable test fluids and use of calibration and service limits flow sheets that call out specific test fluids. Stoddard specification was MIL-C-7024.

- A) Current RS and RSA Calibration and Service Limits flow sheets may specify either Naphtha base calibration fluid or Stoddard calibrating fluid. These fluids may be used interchangeably.
- B) Either fluid can be used with the existing flow meter limits as published in the applicable overhaul manual or service bulletin. Changing the fluid type will require recalibration of flow bench fluid flow meters and Inches of Fuel gauge. The accuracy of all flow meters shall be verified after conversion to a new fluid type.

**NOTE: FLUID TYPES SHALL NOT BE MIXED. FLOW BENCH SHOULD BE DRAINED AND CLEANED PRIOR TO THE ADDITION OF A NEW FLUID.**

- C) Precision Airmotive has confirmed the flow values as stated on the Calibration and Service limits flow sheets remain the same whether Naphtha or Stoddard fluids are used as long as the flow meters and gauging have been calibrated for the type of fluid in use.
- D) Burette time limits must be revised to accommodate this new fluid. Flow meter to burette conversion factors for Naphtha and Calibrating Stoddard are shown in Table 2.
- E) Test fluid should be replaced if contaminated to the extent that accuracy of servo metering or service life is affected. The extent of contamination can usually be determined by change in specific gravity, viscosity, and visual inspection.
- F) Fluid should meet the following requirements:

**\* NOTE- MIL-PRF-7024E IS THE CURRENT REVISION OF MIL-PRF-7024 AND SUPERCEDES MIL-C-7024. MIL-PRF-7024E OR LATER REVISIONS SHALL BE CONSIDERED SUITABLE ALTERNATES.**

<b><u>NAPHTHA</u></b>	
Specific Gravity 60°F (15.5°C)	0.738-0.742
Viscosity, Centistokes 70°F (21.1°C)	0.740-0.770
Color	Water White
Doctor (A.S.T.M.)	Negative
Copper Stripe (A.S.T.M.)	Negative
Initial Boiling Point (A.S.T.M.)	66°C (150°F)
10% Distillation (A.S.T.M.) at or over	93°C (200°F)
End Point (A.S.T.M.)	204°C (400°F) Max.
Material must be lead-free	
Material must be 100% paraffin base	
<b><u>STODDARD CALIBRATION FLUID</u></b>	
Military Specification	MIL-PRF-7024E Type II*
Specific Gravity @ 60°F (15.5°C)	0.770 ± 0.005
Viscosity, Centistokes @ 77°F (25°C)	1.17 ± 0.05
Distillation Range	
Initial Boiling Point	300°F min
Final Boiling Point	410°F max
Recovery	98.5%
Flash Point	100°F min
Residue, per 100ml. air jet	5.0 mg. max
*Or later superseding revision	

**Test Fluid Specifications**

Table 1

1 FLOWMETER LIMITS (lbs/hr)		2 VOLUME TO BE TIMED (cc)	3 NAPHTHA CONSTANT	4 STODDARD CAL FLUID CONSTANT
Min.	Max.			
0	6	50	291.5	305.1
6	20	100	583	610.2
20	40	200	1166	1220.4
40	60	300	1749	1831
60	100	500	2915	3051
100	165	850	4955	5187
165	195	1000	5830	6102
195	250	2000	11660	12204
250	390	2500	14575	15255
390	650	3000	17490	18306
650	1000	5000	29150	30510
1000	1400	7000	40810	42714
1400	up	9000	52470	54918
Minimum Time Limit (in seconds)		=	$\frac{\text{Constant}}{\text{Maximum Flow}}$	
Maximum time Limit (in seconds)		=	$\frac{\text{Constant}}{\text{Minimum Flow}}$	
Minimum lbs/hr		=	$\frac{\text{Constant}}{\text{Maximum Time Limit (in seconds)}}$	
Maximum lbs/hr		=	$\frac{\text{Constant}}{\text{Minimum Time Limit (in seconds)}}$	

**Flow meter to Burette Conversion Factors**

Table 2