



**CATEGORY 2**

**CRITICAL SERVICE BULLETIN**  
 Compliance Necessary to Maintain Safety

**CSB97-1**  
**FAA DER APPROVED**

**SUBJECT:** ENGINE POWER CALIBRATION

**PURPOSE:** PROVIDE EXCHANGE MANIFOLD PRESSURE GAGES TO REDUCE ENGINE POWER TO FAA APPROVED LIMITS

**COMPLIANCE:** DURING NEXT SCHEDULED MAINTENANCE OR WITHIN 60 DAYS, WHICHEVER COMES FIRST

**MODELS AFFECTED:** CESSNA 340, 340A, 414 AND 414A AIRCRAFT IF MODIFIED BY BOTH RAM AND AMERICAN AVIATION INCORPORATED. SEE PAGE 4 CHART FOR DETAILS.

**GENERAL INFORMATION:**

RAM performed engine calibration tests to determine the maximum permissible manifold pressure settings for a TCM TSIO-520-NB engine as modified by RAM STC SA4546SW rated at 325 (+5-0%) hp with the addition of American Aviation intercoolers and air inlet scoops per STC SA4956NM. The results of these tests were properly FAA documented and witnessed with the results shown on Page 3.

The original TCM Type Certificate shows no approvals above the 325 (+5-0%) TSIO-520-VB equating to 341 hp maximum.

RAM originally issued power charts with a note to reduce manifold pressure if American Aviation intercoolers were installed. This limitation has, in a few cases, been ignored, resulting in serious engine damage, including cracked cylinder heads and one known broken crankshaft.

RAM has installed a few American Aviation Incorporated (AAI) intercooler kits on RAM modified aircraft when customers requested. RAM is not associated or affiliated with AAI in any way, nor does RAM provide warranty support for AAI products. RAM does warrant RAM engines with AAI intercoolers, but only if operated by RAM recommendations of reduced manifold pressure in compliance with this critical service bulletin.

RAM will, upon request, supply remarked manifold pressure gages with reduced red line limits. Takeoff fuel flow limits should be confirmed to be within Page 4 limits and, if not within limits, adjusted accordingly.

The Page 3 takeoff power of 365 hp was measured at 205 PPH fuel flow, which is richer than the standard Cessna/TCM fuel flow so as to not exceed 1560° F EGT and, therefore, maintain a significant detonation margin of safety during the test.

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**INSPECTION:**

Determine which STC's are incorporated and note existing manifold pressure gage marking and fuel flow during a normal takeoff.

**MANIFOLD PRESSURE GAGE:**

Have removed for remarking by an instrument repair station. RAM has a limited instrument repair station and will remark effected gages at no charge.

**PLACARDS:**

If any are installed that conflict with this critical service bulletin, black out manifold pressures above limits listed on Page 4.

**TAKEOFF FUEL FLOW:**

Should be adjusted to Page 4 limits per standard Cessna Maintenance Manual procedures. This step is required to avoid too rich of a mixture (power loss) or too lean of a mixture (reduced detonation margin).

**CLIMB FUEL FLOW:**

Adjusted manually in flight with mixture lever per Page 4 limits.

**CRUISE POWER:**

RAM Power Chart Fuel Flows no longer applicable. Peak EGT plus 100°, 75°, and 55° at 75%, 65%, and 55% is applicable. Two (2) inches manifold pressure reduction from shown is required. (414A required reduction in manifold pressure is 4")

**TAKEOFF MANIFOLD PRESSURE:**

At full travel of throttle, RPM and mixture levers the red line value should be achieved (+1.0-0.0) inches mercury with warm engines and oil on a standard day. Adjust to Page 4 limits using standard Cessna Maintenance Manual procedures.

**RAM ENGINE WARRANTY:**

RAM engines not operated per RAM operating procedures and recommendations are subject to denial of warranty coverage.


**CREDIT:**

RAM will remark manifold pressure gages from aircraft with RAM engines currently installed at no charge. Other tasks such as gage removal and reinstallation, fuel injection adjustments, manifold pressure adjustments and freight are to be at the aircraft owner's expense.

**COPIES:**

Copies of this critical service bulletin are available from RAM by mail, fax or web site. See title block.

**AFFECTED PUBLICATIONS:** We recommend that you make the appropriate annotations to applicable manuals and logbooks to call attention to this service bulletin.

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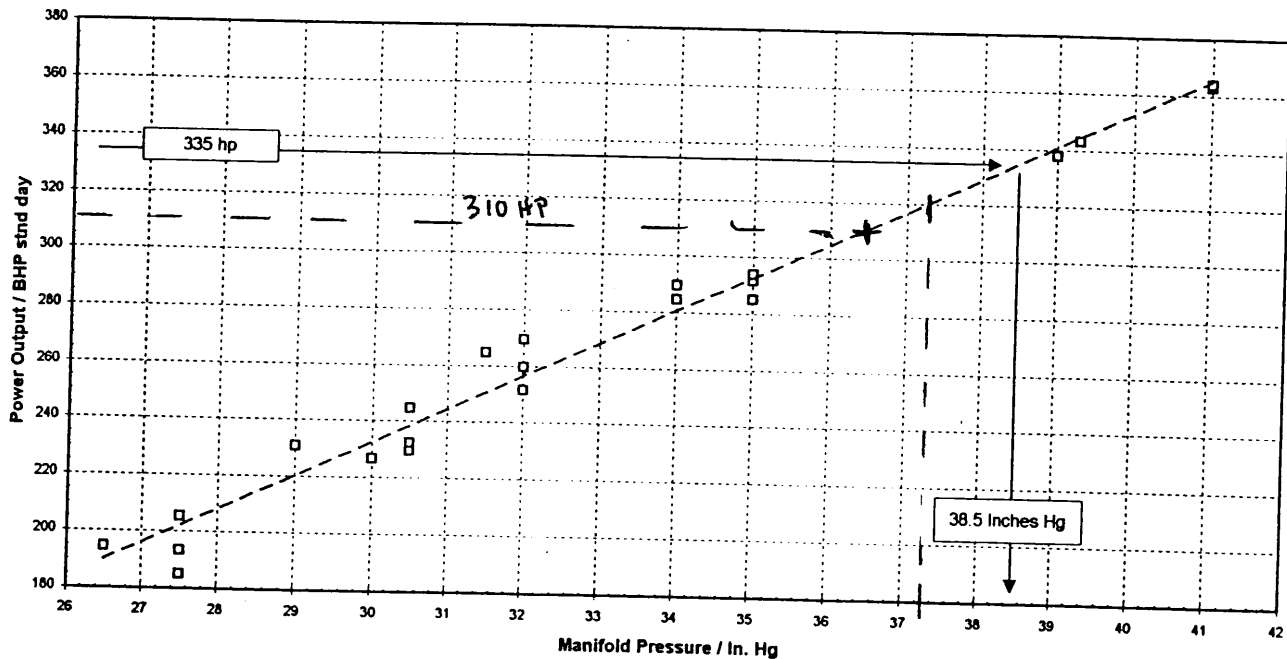
# TORQUEMETER CALIBRATION DATA:

Aircraft : N36957  
Dec. 16, 1992

## ENGINE CALIBRATION TEST

Pressure Altitude	Manifold Pressure	Fuel Flow	Engine Speed	Torque	Outside Air Temperature	Induction Temperature	Temperature Rise	Standard Day Temperature	Exhaust Gas Temperature	Airspeed	Measured Power	Standard Day Power
feet	Inches Hg	gph	rpm	lb-ft	deg F	deg F	deg F	deg F	deg F	KIAS	HP	HP
1000	41.0	205	2700	710	52	87	35	55	1560	110	365	363
5000	41.0	205	2700	700	48	99	51	41	1560	110	360	364
1000	39.3	205	2700	660	48	96	48	41	1510	110	339	338
1000	35.0	155	2500	600	53	85	32	55	1500	110	339	343
5000	35.0	155	2500	605	54	74	20	55	1520	120	286	285
15000	35.0	155	2500	600	49	80	31	41	1520	125	288	292
5000	34.0	155	2500	590	23	94	71	5	1525	115	286	294
15000	34.0	155	2500	590	49	77	28	41	1490	125	281	285
1000	32.0	123	2400	550	24	91	67	5	1520	115	281	290
5000	32.0	117	2400	560	56	69	13	55	1575	160	251	252
15000	32.0	117	2400	570	50	71	21	41	1550	170	256	260
15000	31.5	117	2400	560	26	75	49	5	1620	155	260	269
1000	30.5	101	2300	520	26	73	47	5	1610	157	256	265
5000	30.5	101	2300	522	60	69	9	55	1560	160	228	229
15000	30.5	101	2300	540	51	66	15	41	1590	165	229	232
5000	30.0	101	2300	510	26	68	42	5	1610	155	236	245
15000	29.0	101	2300	510	50	65	15	41	1580	165	223	227
1000	27.5	88	2200	440	25	63	38	5	1560	155	223	231
5000	27.5	88	2200	455	58	66	8	55	1500	150	184	185
15000	27.5	88	2200	475	50	61	11	41	1540	155	191	193
15000	26.5	88	2200	450	25	59	34	5	1575	140	199	205
					25	58	33	5	1565	140	188	195


RAM Series IV C-414A w/ AA Intercooler Installation



N36957 December 16, 1992, Lebow Electronic Torquemeter Data is applicable to Cessna Model 414A Aircraft modified as follows:

RAM Engine STC No. SE4327SW  
 RAM Engine Installation STC No. SA4546SW  
 American Aviation Incorporated STC No. SA4956NM


} RAM 414A  
 Series IV

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**MODELS AFFECTED INCLUDING REQUIRED FUEL FLOW AND MANIFOLD PRESSURE SETTINGS & LIMITS**

MODEL	RAM Series	RAM S.T.C. Number	RAM Horsepower & % Tolerance	RAM TAKEOFF			RAM CLIMB		
				RPM	M.P. Redline	Fuel Flow GPH	RPM	M.P.-Top of Green	Fuel Flow GPH
340	II	SA7382SW	310 hp (+5%; -0%)	2700	39.0"	33.3-34.2	2500	35.0"	26.5
	III	SA2346SW	325 hp (+5%; -0%)	2700	40.0"	33.5-34.5	2500	35.0"	26.5
	IV	SA2346SW	325 hp (+5%; -0%)	2700	41.0"	34.0-35.0	2500	35.0"	26.5
	VI	SA8604SW	335 hp (+2%; -3%)	2700	41.0"	34.5-35.5	2500	35.0"	27.0
340A	II	SA7365SW	310 hp (+5%; -0%)	2700	39.0"	33.3-34.2	2500	35.0"	26.5
	III	SA4241SW	325 hp (+5%; -0%)	2700	40.0"	33.5-34.5	2500	35.0"	26.5
	IV	SA4241SW	325 hp (+5%; -0%)	2700	41.0"	34.0-35.0	2500	35.0"	26.5
	VI	SA8604SW	335 hp (+2%; -3%)	2700	41.0"	34.5-35.5	2500	35.0"	27.0
414	II	SA7570SW	310 hp (+5%; -0%)	2700	39.0"	33.3-34.2	2500	35.0"	26.5
	III	SA4379SW	325 hp (+5%; -0%)	2700	40.0"	33.5-34.5	2500	35.0"	26.5
	IV	SA4379SW	325 hp (+5%; -0%)	2700	41.0"	34.0-35.0	2500	35.0"	26.5
	VI	SA8424SW	335 hp (+5%; -0%)	2700	41.0"	34.5-35.5	2500	35.0"	27.0
414A	II	SA7463SW	310 hp (+5%; -0%)	2700	39.0"	33.3-34.2	2500	35.0"	26.5
	III	SA4546SW	325 hp (+5%; -0%)	2700	40.0"	33.5-34.5	2500	35.0"	26.5
	IV	SA4546SW	325 hp (+5%; -0%)	2700	41.0"	34.0-35.0	2500	35.0"	26.5


MODEL	RAM Series	RAM S.T.C. Number	American Aviation		RAM w/AA combined TAKEOFF			RAM w/AA combined CLIMB		
			S.T.C. Number	M.P. Redline	RPM	M.P. Redline	Fuel Flow GPH	RPM	M.P.-Top of Green	Fuel Flow GPH
340	II	SA7382SW	SA4158NM	38.3"	2700	36.5"	33.3-34.2	2500	33.0"	26.5
	III	SA2346SW	SA4158NM	39.3"	2700	38.0"	33.5-34.5	2500	33.0"	26.5
	IV	SA2346SW	SA4158NM	40.3"	2700	39.0"	34.0-35.0	2500	33.0"	26.5
	VI	SA8604SW	SA4158NM	40.3"	2700	39.0"	34.5-35.5	2500	33.0"	27.0
340A	II	SA7365SW	SA4158NM	38.3"	2700	36.5"	33.3-34.2	2500	33.0"	26.5
	III	SA4241SW	SA4158NM	39.3"	2700	38.0"	33.5-34.5	2500	33.0"	26.5
	IV	SA4241SW	SA4158NM	40.3"	2700	39.0"	34.0-35.0	2500	33.0"	26.5
	VI	SA8604SW	SA4158NM	40.3"	2700	39.0"	34.5-35.5	2500	33.0"	27.0
414	II	SA7570SW	SA4956NM	38.3"	2700	36.5"	33.3-34.2	2500	33.0"	26.5
	III	SA4379SW	SA4956NM	39.3"	2700	38.0"	33.5-34.5	2500	33.0"	26.5
	IV	SA4379SW	SA4956NM	40.3"	2700	39.0"	34.0-35.0	2500	33.0"	26.5
	VI	SA8424SW	SA4956NM	40.3"	2700	39.0"	34.5-35.5	2500	33.0"	27.0
414A	II	SA7463SW	SA4956NM	38.3"	2700	36.5"	33.3-34.2	2500	33.0"	26.5
	III	SA4546SW	SA4956NM	39.3"	2700	38.0"	33.5-34.5	2500	33.0"	26.5
	IV	SA4546SW	SA4956NM	40.3"	2700	38.5"	34.0-35.0	2500	32.0"	26.5

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Reference Information:

Cross Reference of RAM Engine and RAM Airframe STC's

<u>Model</u>	<u>STC Airframe</u>	<u>STC Engine</u>
340 II	SA7382SW	SE3714SW
340 III	SA2346SW	SE4327SW
340 IV	SA2346SW	SE4327SW
340 VI	SA8604SW	SE4327SW
340A II	SA7365SW	SE3714SW
340A III	SA4241SW	SE4327SW
340A IV	SA4241SW	SE4327SW
340A VI	SA8604SW	SE4327SW
414 II	SA7570SW	SE3714SW
414 III	SA4379SW	SE4327SW
414 IV	SA4379SW	SE4327SW
414 VI	SA8424SW	SE4327SW
414A II	SA7463SW	SE3714SW
414A III	SA4546SW	SE4327SW
414A IV	SA4546SW	SE4327SW

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