Cross
~~B-24D~~
B-17-B-

WAR DEPARTMENT
AIR CORPS, MATERIEL DIVISION

MEMORANDUM REPORT ON

JCD:gob

Date May 30, 1942

SUBJECT: Performance Comparison Between the B-17E and B-24D Airplanes.

SECTION EXPERIMENTAL ENGINEERING

Contract No. AC-26120
Expenditure Order No. 425-1-80
Purchase Order No.

SERIAL No. EXP-M-51/B24-1

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A. Purpose

1. To make the comparisons between the B-17E and B-24D airplanes requested in D. & D.T.R. No. 50-B-344 dated May 6, 1942.

B.. Factual Data

1. The requested performance comparison between the B-17E and B-24D airplanes which is found in Appendix 1, includes the following items:

a. High speed at 25,000 feet, gross weight 40,000 pounds.

b. Range at 70, 60, 50, and 40 percent power, starting gross weight of 60,000, 55,000 and 50,000 pounds and fuel loads of 1,500, 2,000 and 2,500 gallons.

c. Service ceiling at 40,000, 50,000 and 60,000 pounds gross weight.

d. Time to climb to 25,000 feet.

e. Take-off and landing distances to clear a 50 foot obstacle at design gross weight (B-17E, 40,260 pounds; B-24D, 41,000 pounds).

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CROSS B-24D

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Experimental Engineering Section
M. R. Serial No. EXP-M-51/B$64-1
May 30, 1942

2. Data necessary to determine the speeds, ranges, and ceilings, were taken from the composite curising control charts for the subject airplanes, using Consolidated Chart dated April 17, 1942, and Boeing Chart D-3802 dated April 8, 1942. Take-off and landing distances for the B-24D were takem from Memorandum Report PHQ-M-19-1326A and for the B-17E from Memorandum Report PHQ-M-19-1315A.

3. In the range comparisons requested, the B-17E airplane appears far superior to the B-24D. The comparison on the same percentages of power is not quite fair, because, although take-off power is the same for both airplanes, 100 percent power on the B-24D is 100 horsepower per engine more than on the B-17E. Appendix 2 has been included to show a range comparison of the two airplanes at the same brake horsepower per engine.

C. Conclusions

1. The data requested are tabulated in Appendix 1.

2. Ranges for the two airplanes at the same brake horsepower per engine are tabulated in Appendix 2.

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APPENDIX 1

ITEM AND CONDITION	PERCENT NORMAL POWER	B-17E	B-24D
High Speed at 25,000 feet 40,000 LB. Gr. Wt.	100	300 mph/4000 HP	306 mph/4400 HP
Range at 10,000 feet Density Altitude	70	1405 miles	870 miles
Initial Gr. Wt. 60,000 Lb. Fuel load 1500 gal.	60	1680	1400
	50		1575
Fuel load 200 gal.	70	1892	1165
	60	2236	1880
	50		2150
Fuel load 2500 gal.	70	2400	1460
	60	2910	2380
	50		2735
Initial Gr. Wt. 55,000 Lb.			
Fuel load 1500 gal.	70	1460	885
	60	1778	1445
	50		1675
Fuel load 2000 gal.	70	1956	1185
	60	2396	1928
	50		2260
	40		2080
Fuel load 2500 gal.	70	2465	1488
	60	3045	1928
	50	3060	2860
	40		2720
Initial Gr. Wt. 50,000 Lb.			
Fuel load 1500 gal.	70	1487	895
	60	1850	1475
	50	1950	1748
	40		1700
Fuel load 2000 gal.	70	2004	1200
	60	2610	1984
	50	2656	2340
	40		2320

NOTE: It is not possible to have a 2500 gallon fuel load and an initial gross weight of 50,000 pounds. The reason for not showing many of the ranges at 40 and 50 percent power is that the airplanes at these powers and weights are flying at speeds below maximum range speed.

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APPENDIX 1 (con't)

	B-17E	B-24D
* Service Ceiling at 40,000 pounds Gross Weight	**36,600 feet	34,000 feet
Service Ceiling at 50,000 pounds Gross Weight	34,500 feet	33,000 feet
Service Ceiling at 60,000 pounds Gross Weight	31,500 feet	31,000 feet
Time to climb to 25,000 feet	**20.6 min.	****18.4 min
Gross Weight	40,260 pounds	41,600 pounds
Take-off distance to clear 50-foot obstacle	**2150 feet	***1750 feet
Landing distance to clear 50-foot obstacle	**2690 feet	***1900 feet
Gross Weight	40,260 pounds	41,000 pounds

NOTE: * Taken from composite cruising control charts for:
Consolidated B-24D dated April 17, 1942
Boeing B-17E Report No. D-3802 dated April 8, 1942.

** Taken from M. R. Serial No. PHQ-M-19-1315A dated November 22, 1941.

*** Taken from M. R. Serial No. PHQ-M-19-1326A dated December 20, 1941.

**** Taken from M. R. Serial No. PHQ-M-19-1401A dated May 22, 1942.

APPENDIX 2

	Brake HP Per Engine	B-17E	B-24D
Range - Speed at 10,000 Ft.			
Initial Gr. Wt. 60,000 Lb. Fuel load 1500 gal.	770	1188 - 222	870 - 225
	660	1550 - 202	1400 - 205
	550		1575 - 181
Initial Gr. Wt. 60,000 Lb. Fuel load 2000 gal.	770	1800 - 224	1165 - 226
	660	2095 - 205	1880 - 207
	550	2238 - 171	2150 - 185
Initial Gr. Wt. 60,000 Lb. Fuel load 2500 gal.	770	2050 - 226	1460 - 227
	660	2640 - 208	2380 - 210
	550	2910 - 178	2735 - 188
Initial Gr. Wt. 55,000 Lb. Fuel load 1500 gal.	770	1220 - 228	885 - 228
	660	1622 - 212	1445 - 212
	550	1815 - 185	1675 - 192
Initial Gr. Wt. 55,000 Lb. Fuel load 2000 gal.	770	1636 - 230	1185 - 230
	660	2176 - 212	1928 - 212
	550	2430 - 186	2260 - 194
	440		2080 - 158
Initial Gr. Wt. 55,000 Lb. Fuel load 2500 gal.	770	2055 - 231	1488 - 231
	660	2750 - 213	1928 - 213
	550	3110 - 190	2860 - 197
	440		2720 - 165
Initial Gr. Wt. 50,000 Lb. Fuel load 1500 gal.	770	1242 - 232	895 - 232
	660	1665 - 216	1475 - 216
	550	1905 - 194	1748 - 200
	440		1700 - 172
Initial Gr. Wt. 50,000 Lb. Fuel load 2000 gal.	770	1666 - 233	1200 - 233
	660	2240 - 218	1984 - 218
	550	2576 - 197	2340 - 201
	440		2320 - 176