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Comprehensive Analysis of General Aviation Accidents Volume 2: Pilot Experience and Aircraft Complexity

May 2012

Final Report

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16. Abstract The research team at Embry-Riddle Aeronautical University (ERAU) conducted a series of analyses to find patterns and associations among general aviation (GA) accidents. This research is intended to provide the Federal Aviation Administration (FAA) with analyses of Fatal, Serious, and Minor/None GA accidents by examining the National Transportation Safety Board (NTSB) database for each region. The analyses shown in this report focuses mainly on examining GA accidents that occurred between 1982 and 2009 for each FAA region. According to the NTSB coding manual, there are more 320 codes that are used to identify the sequence of events leading to an aviation accident. However, a major portion of Fatal, Serious, and Minor/None GA accidents can be attributed to the ten most frequent initiating causes. The team provided comprehensive analyses of these initiating causes for all nine regions. This report provides exploratory statistics for accidents resulting in Fatal, Serious, and Minor/None injuries based on month, time of day, phase, and purpose of the flight. This report also explores the role of top the ten initiating causes and, in particular, attempts to find associations between GA accidents and experience of pilots. Furthermore, the report explores the role of aircraft complexity (based on engine horsepower) in Fatal, Serious, and Minor/None GA accidents. This document is Volume 2 of a two-volume report: Volume 1: Trends, Distributions, and Causes Volume 2: Pilot Experience and Aircraft Complexity					
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TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	xix
1. INTRODUCTION	1
1.1 Scope	1
1.2 The NTSB Database	2
1.3 The GA Accidents Analyses Based on Regions	2
2. ALASKAN REGION	3
2.1 Most Frequent Initiating Causes of GA Accidents	3
2.2 Most Frequent Initiating Causes of GA Accidents Related to Pilot Experience in Hours	5
2.3 Most Frequent Initiating Causes of GA Accidents Related to Aircraft Complexity	12
3. CENTRAL REGION	15
3.1 Most Frequent Initiating Causes of GA Accidents	16
3.2 Most Frequent Initiating Causes of GA Accidents Related to Pilot Experience	17
3.3 Most Frequent Initiating Causes of GA Accidents Based on Aircraft Complexity	25
4. EASTERN REGION	28
4.1 Most Frequent Initiating Causes of GA Accidents	28
4.2 Most Frequent Initiating Causes of GA Accidents Related to Pilot Experience	30
4.3 Most Frequent Initiating Causes of GA Accidents Based on Aircraft Complexity	37
5. GREAT LAKES REGION	40
5.1 Most Frequent Initiating Causes of GA Accidents	41
5.2 Most Frequent Initiating Causes of GA Accidents Related to Pilot Experience	42
5.3 Most Frequent Initiating Causes of GA Accidents Based on Aircraft Complexity	50

6.	NEW ENGLAND REGION	53
6.1	Most Frequent Initiating Causes of GA Accidents	53
6.2	Most Frequent Initiating Causes of GA Accidents Related to Pilot Experience	55
6.3	Most Frequent Initiating Causes of GA Accidents Based on Aircraft Complexity	62
7.	NORTHWEST MOUNTAIN REGION	65
7.1	Most Frequent Initiating Causes of GA Accidents	66
7.2	Most Frequent Initiating Causes of GA Accidents Related to Pilot Experience	67
7.3	Most Frequent initiating Causes of GA Accidents Based on Aircraft Complexity	75
8.	SOUTHERN REGION	78
8.1	Most Frequent Initiating Causes of GA Accidents	78
8.2	Most Frequent Initiating Causes of GA Accidents Related to Pilot Experience	80
8.3	Most Frequent Initiating Causes of GA Accidents Based on Aircraft Complexity	87
9.	SOUTHWEST REGION	90
9.1	Most Frequent Initiating Causes of GA Accidents	91
9.2	Most Frequent Initiating Causes of GA Accidents Related to Pilot Experience	92
9.3	Most Frequent Initiating Causes of GA Accidents Related to Aircraft Complexity	100
10.	WESTERN-PACIFIC REGION	103
10.1	Most Frequent Initiating Causes of GA Accidents	103
10.2	Most Frequent Initiating Causes of GA Accidents Related to Pilot Experience	105
10.3	Most Frequent Initiating Causes of GA Accidents Related to Aircraft Complexity	112
11.	RESULTS	115
12.	REFERENCES	116

LIST OF TABLES

Table	Page
1 Top Ten Initiating Causes of Fatal GA Accidents in the Alaskan Region	3
2 Top Ten Initiating Causes of Serious GA Accidents in the Alaskan Region	4
3 Top Ten Initiating Causes of Minor/None GA Accidents in the Alaskan Region	5
4 Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Alaskan Region	5
5 Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Alaskan Region	6
6 Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Alaskan Region	6
7 Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Alaskan Region	7
8 Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Alaskan Region	7
9 Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Alaskan Region	8
10 Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Alaskan Region	8
11 Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Alaskan Region	9
12 Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Alaskan Region	9
13 Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Alaskan Region	10
14 Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Alaskan Region	10
15 Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Alaskan Region	11
16 Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (\geq 5000 hr) in the Alaskan Region	11

17	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Alaskan Region	12
18	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Alaskan Region	12
19	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Alaskan Region	13
20	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Alaskan Region	13
21	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Alaskan Region	14
22	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Alaskan Region	14
23	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Alaskan Region	15
24	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Alaskan Region	15
25	Top Ten Initiating Causes of Fatal GA Accidents in the Central Region	16
26	Top Ten Initiating Causes of Serious GA Accidents in the Central Region	16
27	Top Ten Initiating Causes of Minor/None GA Accidents in the Central Region	17
28	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (< 100 hr) in the Central Region	18
29	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (< 100 hr) in the Central Region	18
30	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (< 100 hr) in the Central Region	19
31	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Central Region	19
32	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Central Region	20
33	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Central Region	20
34	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Central Region	21

35	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Central Region	21
36	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Central Region	22
37	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Central Region	22
38	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Central Region	23
39	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Central Region	23
40	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Central Region	24
41	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Central Region	24
42	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Central Region	25
43	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Central Region	25
44	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Central Region	26
45	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Central Region	26
46	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Central Region	27
47	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Central Region	27
48	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Central Region	28
49	Top Ten Initiating Causes of Fatal GA Accidents in the Eastern Region	29
50	Top Ten Initiating Causes of Serious GA Accidents in the Eastern Region	29
51	Top Ten Initiating Causes of Minor/None GA Accidents in the Eastern Region	30
52	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (< 100 hr) in the Eastern Region	30

53	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Eastern Region	31
54	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Eastern Region	31
55	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Eastern Region	32
56	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Eastern Region	32
57	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Eastern Region	33
58	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Eastern Region	33
59	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Eastern Region	34
60	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Eastern Region	34
61	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Eastern Region	35
62	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Eastern Region	35
63	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Eastern Region	36
64	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (\geq 5000 hr) in the Eastern Region	36
65	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (\geq 5000 hr) in the Eastern Region	37
66	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (\geq 5000 hr) in the Eastern Region	37
67	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (<200 hp) in the Eastern Region	38
68	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (<200 hp) in the Eastern Region	38

69	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (<200 hp) in the Eastern Region	39
70	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (\geq 200 hp) in the Eastern Region	39
71	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (\geq 200 hp) in the Eastern Region	40
72	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (\geq 200 hp) in the Eastern Region	40
73	Top Ten Initiating Causes of Fatal GA Accidents in the Great Lakes Region	41
74	Top Ten Initiating Causes of Serious GA Accidents in the Great Lakes Region	41
75	Top Ten Initiating Causes of Minor/None GA Accidents in the Great Lakes Region	42
76	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Great Lakes Region	43
77	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Great Lakes Region	43
78	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Great Lakes Region	44
79	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Great Lakes Region	44
80	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Great Lakes Region	45
81	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Great Lakes Region	45
82	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Great Lakes Region	46
83	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Great Lakes Region	46
84	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Great Lakes Region	47
85	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Great Lakes Region	47
86	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Great Lakes Region	48

87	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Great Lakes Region	48
88	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Great Lakes Region	49
89	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Great Lakes Region	49
90	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Great Lakes Region	50
91	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Great Lakes Region	50
92	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Great Lakes Region	51
93	Top Ten Initiating Causes of Minor/None Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Great Lakes Region	51
94	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Great Lakes Region	52
95	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Great Lakes Region	52
96	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Great Lakes Region	53
97	Top Ten Initiating Causes of Fatal GA Accidents in the New England Region	54
98	Top Ten Initiating Causes of Serious GA Accidents in the New England Region	54
99	Top Ten Initiating Causes of Minor/None GA Accidents in the New England Region	55
100	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (< 100 hr) in the New England Region	55
101	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (< 100 hr) in the New England Region	56
102	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (< 100 hr) in the New England Region	56
103	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the New England Region	57
104	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the New England Region	57

105	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the New England Region	58
106	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the New England Region	58
107	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the New England Region	59
108	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the New England Region	59
109	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the New England Region	60
110	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the New England Region	60
111	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the New England Region	61
112	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the New England Region	61
113	Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥ 5000 hr) in the New England Region	62
114	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥ 5000 hr) in the New England Region	62
115	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the New England Region	63
116	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (< 200 hp) in the New England Region	63
117	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (< 200 hp) in the New England Region	64
118	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the New England Region	64
119	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the New England Region	65
120	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the New England Region	65

121	Top Ten Initiating Causes of Fatal GA Accidents in the Northwest Mountain Region	66
122	Top Ten Initiating Causes of Serious GA Accidents in the Northwest Mountain Region	66
123	Top Ten Initiating Causes of Minor/None GA Accidents in the Northwest Mountain Region	67
124	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Northwest Mountain Region	68
125	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Northwest Mountain Region	68
126	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Northwest Mountain Region	69
127	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Northwest Mountain Region	69
128	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Northwest Mountain Region	70
129	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Northwest Mountain Region	70
130	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Northwest Mountain Region	71
131	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Northwest Mountain Region	71
132	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Northwest Mountain Region	72
133	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Northwest Mountain Region	72
134	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Northwest Mountain Region	73
135	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Northwest Mountain Region	73
136	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (\geq 5000 hr) in the Northwest Mountain Region	74

137	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Northwest Mountain Region	74
138	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Northwest Mountain Region	75
139	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Northwest Mountain Region	75
140	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Northwest Mountain Region	76
141	Top Ten Initiating Causes of Minor/None Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Northwest Mountain Region	76
142	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Northwest Mountain Region	77
143	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Northwest Mountain Region	77
144	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Northwest Mountain Region	78
145	Top Ten Initiating Causes of Fatal GA Accidents in the Southern Region	79
146	Top Ten Initiating Causes of Serious GA Accidents in the Southern Region	79
147	Top Ten Initiating Causes of Minor/None GA Accidents in the Southern Region	80
148	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (< 100 hr) in the Southern Region	80
149	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (< 100 hr) in the Southern Region	81
150	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (< 100 hr) in the Southern Region	81
151	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southern Region	82
152	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southern Region	82
153	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southern Region	83
154	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southern Region	83

155	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southern Region	84
156	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southern Region	84
157	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southern Region	85
158	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southern Region	85
159	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southern Region	86
160	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Southern Region	86
161	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Southern Region	87
162	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Southern Region	87
163	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Southern Region	88
164	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Southern Region	88
165	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Southern Region	89
166	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Southern Region	89
167	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Southern Region	90
168	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Southern Region	90
169	Top Ten Initiating Causes of Fatal GA Accidents in the Southwest Region	91
170	Top Ten Initiating Causes of Serious GA Accidents in the Southwest Region	91
171	Top Ten Initiating Causes of Minor/None GA Accidents in the Southwest Region	92
172	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (< 100 hr) in the Southwest Region	93

173	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Southwest Region	93
174	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Southwest Region	94
175	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southwest Region	94
176	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southwest Region	95
177	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southwest Region	95
178	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southwest Region	96
179	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southwest Region	96
180	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southwest Region	97
181	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southwest Region	97
182	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southwest Region	98
183	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southwest Region	98
184	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Southwest Region	99
185	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Southwest Region	99
186	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Southwest Region	100
187	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (<200 hp) in the Southwest Region	100
188	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (<200 hp) in the Southwest Region	101

189	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (<200 hp) in the Southwest Region	101
190	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (\geq 200 hp) in the Southwest Region	102
191	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (\geq 200 hp) in the Southwest Region	102
192	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (\geq 200 hp) in the Southwest Region	103
193	Top Ten Initiating Causes of Fatal GA Accidents in the Western-Pacific Region	103
194	Top Ten Initiating Causes of Serious GA Accidents in the Western-Pacific Region	104
195	Top Ten Initiating Causes of Minor/None GA Accidents in the Western-Pacific Region	105
196	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Western-Pacific Region	105
197	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Western-Pacific Region	106
198	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Western-Pacific Region	106
199	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Western-Pacific Region	107
200	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Western-Pacific Region	107
201	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Western-Pacific Region	108
202	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Western-Pacific Region	108
203	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Western-Pacific Region	109
204	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Western-Pacific Region	109
205	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Western-Pacific Region	110

206	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Western-Pacific Region	110
207	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Western-Pacific Region	111
208	Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Western-Pacific Region	111
209	Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥ 5000 hr) in Western-Pacific Region	112
210	Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Western-Pacific Region	112
211	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Western-Pacific Region	113
212	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Western-Pacific Region	113
213	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Western-Pacific Region	114
214	Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Western-Pacific Region	114
215	Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Western-Pacific Region	115
216	Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Western-Pacific Region	115

LIST OF ACRONYMS

CFR	Code of Federal Regulations
ERAU	Embry-Riddle Aeronautical University
FAA	Federal Aviation Administration
GA	General aviation
hp	Horsepower
IMC	Instrument Meteorological Conditions
NTSB	National Transportation Safety Board
VFR	Visual Flight Rules

EXECUTIVE SUMMARY

This research was conducted at Embry-Riddle Aeronautical University (ERAU) and funded by the FAA (Federal Aviation Administration) Center of Excellence for General Aviation Research (CGAR).

The research team at ERAU conducted a series of analyses to find patterns and associations with general aviation (GA) accidents. This research focused on GA accidents that occurred in each FAA region. The nine FAA regions are the Alaskan, Central, Eastern, Great Lakes, New England, Northwest Mountain, Southern, Southwest, and Western-Pacific.

This research provided the FAA with analyses of Fatal, Serious, and Minor/None GA accidents by examining the National Transportation Safety Board (NTSB) database for each FAA region. This research analyzed data for GA accidents that occurred between 1982 and 2009.

Approximately 228,000 GA aircraft contributed over 80% of the total aviation accidents in the United States. This research analyzes the initiating causes of GA accidents under Title 14 Code of Federal Regulations (CFR) Part 91.

According to the NTSB coding manual, more than 320 codes that are used to identify the sequence of events leading to an aviation accident. However, a major portion of Fatal, Serious, and Minor/None GA accidents can be attributed to the ten most frequent initiating causes. The ERAU research team performed comprehensive analyses of these initiating causes for all nine FAA regions. This report provides exploratory statistics for GA accidents resulting in Fatal, Serious, and Minor/None injuries based on month, time of day, phase, and purpose of the flight. This report also explores the role of the top ten initiating causes and, in particular, it attempts to find associations between GA accidents and experience of pilots. Furthermore, the report explores the role of aircraft complexity (based on engine horsepower) in Fatal, Serious, and Minor/None GA accidents.

This document is Volume 2 of a two-volume report:

Volume 1: Trend, Distributions, and Causes

Volume 2: Pilot Experience and Aircraft Complexity

1. INTRODUCTION.

According to the General Aviation Manufacturer Association, of approximately 320,000 general aviation (GA) aircraft worldwide, 228,000 aircraft are based in the United States. In addition, the National Transportation Safety Board (NTSB) reports that GA aircraft contributes to more than 80% of aviation accidents nationwide. The Embry-Riddle Aeronautical University (ERAU) research team conducted a study to identify the initiating causes of GA accidents under Title 14 Code of Federal Regulations (CFR) Part 91 [1].

1.1 SCOPE.

An analysis of the top ten initiating causes leading to Fatal, Serious, and Minor/None GA accidents for each region by aircraft complexity and pilot experience was performed.

The following reports were produced:

- Volume 1: Trends, Distributions, and Causes
- Volume 2: Pilot Experience and Aircraft Complexity

Unlike previous FAA reports, this report has different classifications of accidents based on severity. This classification enables the FAA to achieve the objective of reducing the Fatal GA accident rate per 100,000 flight hours by 10% over a 10-year period (2009-2018). The intensity of the injuries used in this report was classified as Fatal, Serious, and Minor/None. According to NTSB Form 6120.1 [2], a Fatal accident is defined as any injury that results in death within 30 days of an accident. Serious injury is any injury that

- requires hospitalization for more than 48 hours, commencing within 7 days from the date of injury.
- results in a fracture of any bone (except simple fracture of fingers, toes, or nose).
- causes severe hemorrhages, nerve, muscle, or tendon damage.
- involves injury to any internal organ.
- involves second- or third-degree burns, or any burns affecting more than 5% of the body surface.

Minor/None accidents are accidents that do not result in Serious injury or death.

The analysis for finding the initiating causes of GA accidents was divided into three major categories:

1. Time Frame: The study was performed for four 7-year nonoverlapping periods between 1982 and 2009 (1982-1988, 1989-1995, 1996-2002, and 2003-2009) to find the rate of change in accidents over time.
2. Pilot Experience: Pilot experience is described as the amount of total flight hours for the pilot in all aircraft (based on the data in the NTSB database). For this analysis, the team divided the number of flight hours into the following ranges: <100, 100-299, 300-1999, 2000-4999, and more than 5000 hours.
3. Aircraft Complexity: Aircraft complexity is based on the presence of retractable gears, flaps, and controllable pitch propeller. However, since there were insufficient data available from the NTSB database regarding these attributes, the team decided to use aircraft engine horsepower as an indicator for aircraft complexity.

1.2 THE NTSB DATABASE.

Federal regulations require a pilot/operator that has been in an accident to immediately notify the nearest NTSB regional office. An accident is defined as an occurrence during an aircraft operation that takes place between the time any person boards the aircraft with the intention of flight and all such persons disembark and, in which, any person suffers death or serious injury, or the aircraft receives substantial damage. The NTSB database provides up to five occurrences (major events) for each accident and up to ten sequences of events for each occurrence. Occurrence explains the chain of events that led to the accident. The initiating or first cause of every accident is stated separately in this report because it triggered the chain of all the other events. The initiating cause is explained in terms of frequency and rank. Contributing factors were excluded from the analysis because they are not causal in nature.

The FAA provided the ERAU team with the database from the Aviation Safety Information Analysis and Sharing system in Microsoft® Access®. The team received an updated database in August 2010. The previous database used for the previous report [3] had 65,698 unique events; whereas, this report has 66,633 unique events from 1982 to 2009.

The FAA divided the U.S. into nine regions: Alaskan, Central, Eastern, Great Lakes, New England, Northwest Mountain, Southern, Southwest, and Western-Pacific.

1.3 THE GA ACCIDENTS ANALYSES BASED ON REGIONS.

GA accident data were analyzed for each FAA region. The following is a list of the states that comprise the nine regions.

- Alaskan Region: Alaska
- Central Region: Iowa, Kansas, Missouri, and Nebraska

- Eastern Region: Delaware, Maryland, New Jersey, New York, Pennsylvania, Virginia, West Virginia, and Washington DC
- Great Lakes Region: Illinois, Indiana, Michigan, Minnesota, North Dakota, Ohio, South Dakota, and Wisconsin
- New England Region: Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, and Vermont
- Northwest Mountain Region: Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming
- Southern Region: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Puerto Rico, South Carolina, and Tennessee
- Southwest Region: Arkansas, Louisiana, New Mexico, Oklahoma, and Texas
- Western Pacific Region: Arizona, California, Hawaii, and Nevada

All accident data used in this report were extracted from the NTSB database for 14 CFR Part 91 flights.

2. ALASKAN REGION.

This section discusses the Alaskan Region, which consists of Alaska.

2.1 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS.

Tables 1 through 3 show the frequency and rank of the top ten initiating causes of GA accidents between 1982 and 2009. The rank was based on four 7-year periods (1982-1988, 1989-1995, 1996-2002, and 2003-2009) and was sorted on the last period (2003-2009) in ascending order.

Table 1 suggests that stalling speed ranks the number one cause of Fatal GA accidents during the last 7 years (2003-2009), although VFR flight into IMC was the major cause of fatal GA accidents for the previous periods under study.

Table 1. Top Ten Initiating Causes of Fatal GA Accidents in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V_S)	13	2	8	2	0	0	1	11
24015	VFR flight into IMC	3	10	2	13	1	10	2	6
24577	Altitude/clearance	0	0	14	1	0	0	3	3

Table 1. Top Ten Initiating Causes of Fatal GA Accidents in the Alaskan Region (Continued)

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	3	6	0	0	4	2
17001	Fluid, fuel	13	2	14	1	0	0	4	2
24024	Instrument flight rules procedure	9	3	14	1	0	0	4	2
10104	Wing, attachment fitting	0	0	0	0	0	0	7	1
24023	Flight into known adverse weather	5	7	14	1	5	2	7	1
24022	Weather evaluation	0	0	0	0	3	5	7	1
24021	Visual lookout	7	4	4	5	4	3	7	1

V_S = Stalling speed

Stalling speed appears to be the number one cause for Serious GA accidents for the last period (2003-2009). For Minor/None accidents, unsuitable terrain or takeoff/landing/taxi area ranks as the number one cause.

Alaska has a unique pattern for Minor/None GA accident initiating causes. Instead of directional control, as in other regions, unsuitable terrain or takeoff/landing/taxi area is the number one initiating cause for Minor/None GA accidents in the 1982-1988 and 2003-2009 periods, as shown in table 3. Directional control was the highest between 1989 and 1995. Compensation for wind conditions has the highest frequency between 1996 and 2002.

Table 2. Top Ten Initiating Causes of Serious GA Accidents in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V_S)	7	2	15	1	6	2	1	6
24577	Altitude/clearance	0	0	0	0	9	1	2	2
22119	Removal of control/gust lock(s)	0	0	0	0	0	0	2	2
24026	Compensation for wind conditions	0	0	15	1	1	4	2	2
17001	Fluid, fuel	12	1	4	3	2	3	2	2
24111	Maintenance, installation	0	0	0	0	0	0	6	1
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	6	1
24580	Distance/altitude	0	0	0	0	0	0	6	1
22304	Carburetor heat	12	1	0	0	9	1	6	1
24021	Visual lookout	7	2	0	0	0	0	6	1

V_S = Stalling speed

Table 3. Top Ten Initiating Causes of Minor/None GA Accidents in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24029	Unsuitable terrain or takeoff/landing/taxi area	1	89	2	80	2	106	1	77
24026	Compensation for wind conditions	5	49	3	43	1	108	2	52
24539	Directional control	2	73	1	107	3	50	3	31
22004	Brakes (normal)	17	10	19	7	5	18	4	14
24566	Aircraft control	0	0	4	29	16	6	5	13
24511	Airspeed, stall (V_S)	50	2	29	5	0	0	6	12
24577	Altitude/clearance	0	0	58	2	16	6	7	11
24580	Distance/altitude	0	0	0	0	47	2	8	10
22304	Carburetor heat	15	13	19	7	20	5	9	9
24627	Supervision	42	3	78	1	12	7	9	9

V_S = Stalling speed

2.2 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO PILOT EXPERIENCE IN HOURS.

Tables 4 through 18 show the frequency and rank of each category based on pilot experience, measured in hours. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 4. Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24015	VFR flight into IMC	0	0	1	2	0	0	0	0
24566	Aircraft control	0	0	1	2	0	0	0	0
24506	Airspeed	1	1	2	1	0	0	0	0
24001	Preflight planning/preparation	1	1	0	0	0	0	0	0
24010	In-flight planning/decision	1	1	0	0	0	0	0	0
24023	Flight into known adverse weather	1	1	0	0	0	0	0	0
24031	Judgement	1	1	0	0	0	0	0	0
24500	Aircraft handling	1	1	0	0	0	0	0	0

The number of Serious accidents related to pilots with less than 100 hours of experience is very low. There are only two occurrences between 2003 and 2009, as shown in table 5.

Table 5. Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V_S)	0	0	0	0	0	0	1	1
24536	Go-around	0	0	0	0	0	0	1	1
24506	Airspeed	2	1	1	1	0	0	0	0
24001	Preflight planning/preparation	1	2	0	0	0	0	0	0
24002	Aircraft preflight	2	1	0	0	0	0	0	0
24029	Unsuitable terrain or takeoff/landing/taxi area	0	0	0	0	1	1	0	0
24020	Refueling	2	1	0	0	0	0	0	0

V_S = Stalling speed

Similar to other pilot experience categories, directional control is the number one initiating cause of Minor/None GA accidents involving pilots with less than 100 hours of experience, as shown in table 6.

Table 6. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	17	1	18	1	5	1	6
22004	Brakes (normal)	5	2	4	1	4	1	2	3
24627	Supervision	0	0	0	0	3	3	2	3
24026	Compensation for wind conditions	3	7	0	0	2	4	4	2
24029	Unsuitable terrain or takeoff/landing/taxi area	3	7	2	5	3	3	5	1
24537	Ground loop/swerve	0	0	0	0	3	3	5	1
24562	Recovery from bounced landing	6	1	0	0	0	0	5	1
24542	Remedial action	0	0	0	0	0	0	5	1
24511	Airspeed, stall (V_S)	0	0	0	0	0	0	5	1
22303	Mixture	0	0	0	0	0	0	5	1

V_S = Stalling speed

Table 7. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V_S)	0	0	0	0	0	0	1	3
24015	VFR flight into IMC	3	1	2	1	1	3	2	2
24010	In-flight planning/decision	2	3	0	0	0	0	0	0
24006	Aircraft weight and balance	3	1	2	1	0	0	0	0
24543	Maneuver	3	1	0	0	0	0	0	0
34330	Lack of total experience	0	0	2	1	0	0	0	0
24566	Aircraft control	0	0	2	1	0	0	0	0
24580	Distance/altitude	0	0	2	1	0	0	0	0
24518	Altitude	0	0	2	1	0	0	0	0
24021	Visual lookout	0	0	2	1	0	0	0	0

V_S = Stalling speed

Table 8. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V_S)	0	0	0	0	0	0	1	1
24010	In-flight planning/decision	1	3	0	0	0	0	0	0
24506	Airspeed	1	3	0	0	0	0	0	0
24551	Stall	0	0	1	1	1	1	0	0
24023	Flight into known adverse weather	2	2	0	0	0	0	0	0
24533	Liftoff	3	1	0	0	0	0	0	0
24015	VFR flight into IMC	0	0	1	1	0	0	0	0
24001	Preflight planning/preparation	3	1	0	0	0	0	0	0
24530	Proper alignment	0	0	1	1	0	0	0	0
24022	Weather evaluation	0	0	0	0	1	1	0	0

V_S = Stalling speed

Table 9. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24029	Unsuitable terrain or takeoff/landing/taxi area	1	14	2	8	1	19	1	10
24026	Compensation for wind conditions	4	7	7	1	2	12	2	7
24539	Directional control	2	13	1	18	3	9	3	5
24511	Airspeed, stall (V_S)	0	0	7	1	0	0	3	5
22004	Brakes (normal)	10	1	4	4	4	6	5	4
24562	Recovery from bounced landing	9	2	0	0	5	3	6	2
24627	Supervision	0	0	0	0	6	2	6	2
24580	Distance/altitude	0	0	0	0	7	1	6	2
24567	Touchdown	0	0	0	0	7	1	9	1
24577	Altitude/clearance	0	0	0	0	0	0	9	1

V_S = Stalling speed

Table 10. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V_S)	0	0	0	0	0	0	1	4
24015	VFR flight into IMC	2	4	2	6	2	3	2	2
24627	Supervision	4	2	0	0	0	0	2	2
24566	Aircraft control	0	0	5	1	0	0	4	1
24577	Altitude/clearance	0	0	0	0	0	0	4	1
24500	Aircraft handling	4	2	0	0	0	0	0	0
24526	Clearance	0	0	4	2	0	0	0	0
24543	Maneuver	5	1	0	0	0	0	0	0
24007	Operation with known deficiencies in equipment	0	0	0	0	4	1	0	0
24000	Planning/decision	5	1	0	0	0	0	0	0

V_S = Stalling speed

Table 11. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V_S)	3	1	0	0	1	1	1	2
24577	Altitude/clearance	0	0	0	0	0	0	1	2
24021	Visual lookout	3	1	0	0	0	0	3	1
24026	Compensation for wind conditions	0	0	4	1	0	0	3	1
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	3	1
24551	Stall	0	0	1	4	1	1	0	0
24022	Weather evaluation	2	2	0	0	1	1	0	0
24518	Altitude	3	1	4	1	0	0	0	0
24001	Preflight planning/preparation	3	1	4	1	0	0	0	0
24526	Clearance	0	0	0	0	1	1	0	0

V_S = Stalling speed

Table 12. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24029	Unsuitable terrain or takeoff/landing/taxi area	1	41	2	32	2	34	1	26
24026	Compensation for wind conditions	2	24	3	21	1	45	2	19
24539	Directional control	3	23	1	40	3	21	3	14
24577	Altitude/clearance	0	0	14	1	9	1	4	6
24580	Distance/altitude	0	0	0	0	9	1	4	6
24566	Aircraft control	0	0	5	14	7	3	6	5
22004	Brakes (normal)	9	5	13	2	6	4	7	4
24022	Weather evaluation	12	2	0	0	4	6	7	4
24627	Supervision	11	3	0	0	0	0	7	4
24505	Aborted takeoff	12	2	12	3	7	3	10	3

Table 13. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V_S)	2	2	3	1	0	0	1	3
24015	VFR flight into IMC	0	0	3	1	1	3	2	1
24526	Clearance	1	3	0	0	0	0	2	1
24024	Instrument flight rules procedure	0	0	3	1	0	0	2	1
24577	Altitude/clearance	0	0	0	0	0	0	2	1
24021	Visual lookout	2	2	1	4	2	2	0	0
24010	In-flight planning/decision	2	2	3	1	0	0	0	0
24002	Aircraft preflight	3	1	0	0	3	1	0	0
24518	Altitude	0	0	3	1	0	0	0	0
24023	Flight into known adverse weather	3	1	0	0	0	0	0	0

V_S = Stalling speed

Table 14. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V_S)	1	1	0	0	0	0	1	1
24526	Clearance	0	0	0	0	0	0	1	1
24580	Distance/altitude	0	0	0	0	0	0	1	1
22119	Removal of control/gust lock(s)	0	0	0	0	0	0	1	1
24536	Go-around	0	0	0	0	0	0	1	1
24022	Weather evaluation	0	0	2	1	2	1	0	0
24006	Aircraft weight and balance	0	0	2	1	0	0	0	0
24505	Aborted takeoff	0	0	0	0	2	1	0	0
24552	Stall/spin	0	0	0	0	2	1	0	0
24015	VFR flight into IMC	0	0	2	1	0	0	0	0

V_S = Stalling speed

Table 15. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24029	Unsuitable terrain or takeoff/landing/taxi area	1	12	1	20	2	18	1	17
24026	Compensation for wind conditions	5	5	3	9	1	23	2	8
24566	Aircraft control	0	0	4	7	6	2	3	4
24539	Directional control	4	6	2	15	3	5	4	3
24577	Altitude/clearance	0	0	10	1	5	3	4	3
22304	Carburetor heat	7	3	10	1	0	0	6	2
24526	Clearance	9	1	9	2	0	0	6	2
24021	Visual lookout	6	4	0	0	7	1	8	1
24535	Flare	0	0	9	2	7	1	8	1
24567	Touchdown	0	0	10	1	0	0	8	1

Table 16. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24015	VFR flight into IMC	1	3	1	3	2	1	1	3
24021	Visual lookout	0	0	2	2	1	2	2	2
24024	Instrument flight rules procedure	2	2	0	0	0	0	3	1
24511	Airspeed, stall (V_S)	0	0	3	1	0	0	3	1
24022	Weather evaluation	0	0	0	0	2	1	3	1
24577	Altitude/clearance	0	0	0	0	0	0	3	1
24566	Aircraft control	0	0	0	0	0	0	3	1
24023	Flight into known adverse weather	3	1	3	1	0	0	0	0
24542	Remedial action	0	0	0	0	2	1	0	0
24519	Proper altitude	0	0	3	1	0	0	0	0

V_S = Stalling speed

Table 17. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥5000 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V _S)	0	0	0	0	1	1	1	1
22119	Removal of control/gust lock(s)	0	0	0	0	0	0	1	1
24026	Compensation for wind conditions	0	0	0	0	0	0	1	1
22304	Carburetor heat	0	0	0	0	0	0	1	1
24000	Planning/decision	0	0	1	3	0	0	0	0
24539	Directional control	1	1	0	0	1	1	0	0
24627	Supervision	0	0	0	0	1	1	0	0
24015	VFR flight into IMC	0	0	0	0	1	1	0	0
24500	Aircraft handling	1	1	0	0	0	0	0	0
24022	Weather evaluation	0	0	2	1	0	0	0	0

V_S = Stalling speed

Table 18. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥5000 hr) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24029	Unsuitable terrain or takeoff/landing/taxi area	3	5	1	13	1	25	1	20
24026	Compensation for wind conditions	4	4	3	10	2	22	2	16
24539	Directional control	1	9	2	12	3	11	3	5
24627	Supervision	0	0	0	0	4	6	4	4
24526	Clearance	6	2	6	3	6	3	5	3
24566	Aircraft control	0	0	6	3	8	1	5	3
24022	Weather evaluation	0	0	0	0	5	4	5	3
24015	VFR flight into IMC	6	2	8	1	0	0	5	3
22004	Brakes (normal)	0	0	0	0	6	3	5	3
22304	Carburetor heat	0	0	8	1	8	1	5	3

2.3 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO AIRCRAFT COMPLEXITY.

Tables 19 through 24 show the frequency and rank of each category based on aircraft engine power. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 19. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (<200 hp) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V_S)	5	2	6	1	0	0	1	8
24021	Visual lookout	5	2	2	8	3	2	2	2
24566	Aircraft control	0	0	3	5	0	0	2	2
24015	VFR flight into IMC	4	4	3	5	2	4	4	1
17001	Fluid, fuel	6	1	6	1	3	2	4	1
24031	Judgement	2	7	0	0	0	0	0	0
24500	Aircraft handling	3	5	0	0	0	0	0	0
24512	Airspeed, stall in the landing configuration (V_{SO})	6	1	6	1	0	0	0	0
24705	Control interference	6	1	0	0	0	0	0	0
22110	Raising of flaps	6	1	0	0	0	0	0	0

V_S = Stalling speed

V_{SO} = The power off stall speed

Table 20. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (<200 hp) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24511	Airspeed, stall (V_S)	5	2	5	1	0	0	1	5
17001	Fluid, fuel	6	1	3	3	1	4	2	1
24026	Compensation for wind conditions	6	1	5	1	2	3	2	1
22304	Carburetor heat	6	1	0	0	4	1	2	1
24577	Altitude/clearance	0	0	0	0	4	1	2	1
24536	Go-around	0	0	0	0	0	0	2	1
22119	Removal of control/gust lock(s)	0	0	0	0	0	0	2	1
24500	Aircraft handling	3	4	0	0	0	0	0	0
24552	Stall/spin	0	0	3	3	4	1	0	0
15101	Fuel system, tank	6	1	0	0	0	0	0	0

V_S = Stalling speed

Table 21. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (<200 hp) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24029	Unsuitable terrain or takeoff/landing/taxi area	1	67	2	47	1	69	1	44
24026	Compensation for wind conditions	5	25	3	26	2	67	2	22
24539	Directional control	2	53	1	77	3	38	3	17
22004	Brakes (normal)	12	8	12	6	5	13	4	12
24511	Airspeed, stall (V_S)	19	1	13	5	0	0	5	9
24566	Aircraft control	0	0	4	25	8	6	6	7
24577	Altitude/clearance	0	0	16	2	7	7	6	7
24580	Distance/altitude	0	0	0	0	12	2	6	7
24526	Clearance	16	4	12	6	9	5	9	6
24627	Supervision	17	3	17	1	9	5	9	6

V_S = Stalling speed

Table 22. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24015	VFR flight into IMC	2	12	1	24	1	17	1	7
24511	Airspeed, stall (V_S)	8	1	5	1	0	0	2	4
24577	Altitude/clearance	0	0	4	2	0	0	3	3
24506	Airspeed	0	0	3	3	5	2	4	2
24024	Instrument flight rules procedure	8	1	5	1	0	0	4	2
24023	Flight into known adverse weather	4	6	5	1	2	5	6	1
24526	Clearance	7	2	0	0	5	2	6	1
24036	Flight into adverse weather	0	0	0	0	3	4	6	1
17505	External load sling/harness	0	0	5	1	0	0	6	1
17002	Fluid, oil	0	0	0	0	0	0	6	1

V_S = Stalling speed

Table 23. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
17001	Fluid, fuel	4	1	3	1	4	1	1	3
24026	Compensation for wind conditions	0	0	2	2	4	1	2	2
24526	Clearance	4	1	3	1	4	1	2	2
24577	Altitude/clearance	0	0	0	0	4	1	2	2
24021	Visual lookout	4	1	3	1	3	2	5	1
24029	Unsuitable terrain or takeoff/landing/taxi area	4	1	3	1	0	0	5	1
20000	Weather condition	4	1	3	1	0	0	5	1
24511	Airspeed, stall (V_S)	0	0	0	0	3	2	5	1
24036	Flight into adverse weather	0	0	3	1	0	0	5	1
12013	Electrical system, electric wiring	0	0	0	0	0	0	5	1

V_S = Stalling speed

Table 24. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Alaskan Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24026	Compensation for wind conditions	2	34	3	27	2	54	1	27
24029	Unsuitable terrain or takeoff/landing/taxi area	1	47	1	44	1	63	2	25
17001	Fluid, fuel	9	12	8	11	3	15	3	11
24526	Clearance	14	6	9	10	4	14	4	10
24577	Altitude/clearance	0	0	0	0	7	9	5	8
24539	Directional control	5	26	2	43	4	14	6	7
24022	Weather evaluation	15	5	15	3	9	7	7	5
24580	Distance/altitude	0	0	17	1	14	2	7	5
24535	Flare	12	8	10	8	7	9	9	4
24581	Distance/speed	0	0	0	0	15	1	9	4

3. CENTRAL REGION.

This section discusses the Central Region, which consists of Iowa, Kansas, Missouri, and Nebraska.

3.1 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS.

Tables 25 through 27 show the frequency and rank of the top ten initiating causes of GA accidents between 1982 and 2009. The rank was based on four 7-year periods (1982-1988, 1989-1995, 1996-2002, and 2003-2009) and was sorted on the last period (2003-2009) in ascending order.

Table 25 shows that airspeed was the number one initiating cause of Fatal GA accidents from 2003-2009, although aircraft control was the number one initiating cause for the 1989-1995 and 1996-2002 periods.

Table 25. Top Ten Initiating Causes of Fatal GA Accidents in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	2	14	2	9	2	8	1	13
24566	Aircraft control	23	1	1	21	1	17	2	8
24577	Altitude/clearance	60	0	14	1	3	6	3	4
24001	Preflight planning/preparation	2	14	11	2	5	4	4	3
24583	Low-altitude flight/maneuver	60	0	14	1	16	1	5	2
24015	VFR flight into IMC	1	17	2	9	5	4	5	2
33400	Spatial disorientation	23	1	14	1	10	2	5	2
24010	In-flight planning/decision	4	13	14	1	16	1	8	1
24526	Clearance	13	2	4	4	10	2	8	1
17001	Fluid, fuel	23	1	7	3	16	1	8	1

Fluid, fuel initiated the most Serious GA accidents for the 2003-2009 period, as shown in table 26. For Minor/None GA accidents, directional control was the number one initiating cause for all periods, as shown in table 27. This is also the trend nationwide.

Table 26. Top Ten Initiating Causes of Serious GA Accidents in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
17001	Fluid, fuel	2	7	6	3	1	3	1	5
24526	Clearance	8	2	10	2	23	0	2	3
24506	Airspeed	1	9	10	2	4	2	2	3
24539	Directional control	48	0	2	4	23	0	4	2
24029	Unsuitable terrain or takeoff/landing/taxi area	17	1	53	0	23	0	4	2

Table 26. Top Ten Initiating Causes of Serious GA Accidents in the Central Region (Continued)

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
14016	Engine assembly, valve, exhaust	48	0	18	1	23	0	4	2
10729	Flight control system, aileron control cable/rod	48	0	53	0	7	1	7	1
24566	Aircraft control	48	0	53	0	1	3	7	1
15109	Fuel system, carburetor	17	1	53	0	23	0	7	1
14023	Engine assembly, gear	48	0	53	0	23	0	7	1

Table 27. Top Ten Initiating Causes of Minor/None GA Accidents in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	72	1	50	1	34	1	32
24566	Aircraft control	91	1	4	16	2	19	2	15
24535	Flare	3	38	9	9	3	17	2	15
24026	Compensation for wind conditions	4	34	3	19	8	11	4	11
24010	In-flight planning/decision	6	30	12	7	6	14	5	10
24001	Preflight planning/preparation	2	45	5	13	3	17	6	8
17001	Fluid, fuel	5	33	2	23	3	17	7	7
24506	Airspeed	7	25	22	4	9	8	8	6
24029	Unsuitable terrain or takeoff/landing/taxi area	9	16	8	10	7	12	8	6
24526	Clearance	11	13	22	4	10	7	10	5

3.2 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO PILOT EXPERIENCE.

Tables 28 through 42 show the frequency and rank of each category based on pilot experience, measured in hours. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 28. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	1	0	0	0	0	1	3
24505	Aborted takeoff	0	0	0	0	0	0	2	1
24015	VFR flight into IMC	1	1	1	1	0	0	0	0
24539	Directional control	1	1	0	0	2	1	0	0
24526	Clearance	0	0	1	1	2	1	0	0
24566	Aircraft control	0	0	0	0	1	2	0	0
24022	Weather evaluation	1	1	0	0	0	0	0	0
24521	Buzzing	1	1	0	0	0	0	0	0
24548	Rotation	0	0	0	0	2	1	0	0
24551	Stall	1	1	0	0	0	0	0	0

The number of Serious accidents related to pilots with less than 100 hours of experience is negligible, as shown in table 29.

Table 29. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24551	Stall	0	0	0	0	1	1	0	0
24518	Altitude	0	0	0	0	1	1	0	0
24031	Judgement	1	2	0	0	0	0	0	0
22004	Brakes (normal)	2	1	0	0	0	0	0	0
24006	Aircraft weight and balance	0	0	1	1	0	0	0	0
24511	Airspeed, stall (V_S)	0	0	1	1	0	0	0	0
24506	Airspeed	2	1	0	0	0	0	0	0
24010	In-flight planning/decision	2	1	0	0	0	0	0	0
24028	Wrong runway	0	0	1	1	0	0	0	0
24533	Liftoff	0	0	1	1	0	0	0	0

V_S = Stalling speed

Similar to other pilot experience categories, directional control is the number one initiating cause of Minor/None GA accidents involving pilots with less than 100 hours of experience, as shown in table 30.

Table 30. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	20	1	19	2	6	1	7
24535	Flare	1	20	5	3	1	10	2	6
24566	Aircraft control	0	0	4	4	3	3	3	4
24010	In-flight planning/decision	5	3	0	0	4	2	4	3
24026	Compensation for wind conditions	2	14	3	5	4	2	5	2
24562	Recovery from bounced landing	6	2	2	6	4	2	5	2
24532	Proper glidepath	7	1	7	1	0	0	5	2
22304	Carburetor heat	3	5	7	1	0	0	8	1
24029	Unsuitable terrain or takeoff/landing/taxi area	6	2	6	2	0	0	8	1
24021	Visual lookout	5	3	7	1	0	0	8	1

Table 31. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	1	5	2	2	1	3
24506	Airspeed	3	3	3	2	1	3	2	2
24526	Clearance	0	0	4	1	0	0	3	1
24551	Stall	0	0	0	0	3	1	3	1
24022	Weather evaluation	5	1	0	0	0	0	3	1
24519	Proper altitude	0	0	0	0	0	0	3	1
24007	Operation with known deficiencies in equipment	0	0	0	0	0	0	3	1
33400	Spatial disorientation	0	0	0	0	0	0	3	1
24028	Wrong runway	0	0	0	0	0	0	3	1
24015	VFR flight into IMC	2	4	2	3	3	1	0	0

Table 32. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24001	Preflight planning/preparation	2	1	2	1	1	2	0	0
22100	Flight controls	2	1	0	0	0	0	0	0
22205	Fuel management	0	0	2	1	0	0	0	0
22304	Carburetor heat	0	0	2	1	0	0	0	0
24020	Refueling	0	0	2	1	0	0	0	0
24006	Aircraft weight and balance	2	1	0	0	0	0	0	0
24010	In-flight planning/decision	2	1	0	0	0	0	0	0
24022	Weather evaluation	2	1	0	0	0	0	0	0
24026	Compensation for wind conditions	2	1	0	0	0	0	0	0
24028	Wrong runway	0	0	2	1	0	0	0	0

Table 33. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	19	1	7	1	7	1	5
24026	Compensation for wind conditions	5	7	3	5	4	2	1	5
24506	Airspeed	4	8	0	0	4	2	3	2
24535	Flare	7	5	6	2	5	1	3	2
22004	Brakes (normal)	11	1	6	2	5	1	3	2
24034	Planned approach	0	0	0	0	0	0	3	2
24010	In-flight planning/decision	3	10	4	4	3	3	7	1
24007	Operation with known deficiencies in equipment	11	1	7	1	5	1	7	1
24021	Visual lookout	11	1	6	2	0	0	7	1
24530	Proper alignment	9	3	0	0	0	0	7	1

Table 34. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	1	10	1	7	1	6
24506	Airspeed	1	7	2	4	4	1	2	5
24001	Preflight planning/preparation	3	3	5	1	4	1	3	2
24577	Altitude/clearance	0	0	0	0	4	1	3	2
24015	VFR flight into IMC	1	7	3	3	2	3	5	1
24031	Judgement	4	2	5	1	0	0	5	1
24000	Planning/decision	0	0	4	2	0	0	5	1
24519	Proper altitude	4	2	0	0	0	0	5	1
24002	Aircraft preflight	5	1	5	1	0	0	5	1
24515	Airspeed, design maneuvering (V _A)	0	0	0	0	0	0	5	1

V_A = Design maneuvering speed

Table 35. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	3	1	2	1	1	1	2
24526	Clearance	2	2	2	1	0	0	1	2
24019	Performance data	0	0	0	0	0	0	3	1
24539	Directional control	0	0	0	0	0	0	3	1
24029	Unsuitable terrain or takeoff/landing/taxi area	0	0	0	0	0	0	3	1
24025	Flight to alternate destination	0	0	0	0	0	0	3	1
24010	In-flight planning/decision	0	0	1	2	0	0	0	0
24523	Distance	2	2	0	0	0	0	0	0
24530	Proper alignment	0	0	2	1	0	0	0	0
24012	Fuel consumption calculations	0	0	2	1	0	0	0	0

Table 36. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	18	1	13	2	7	1	14
24566	Aircraft control	0	0	2	6	1	8	2	8
24535	Flare	7	6	4	3	4	4	2	8
24001	Preflight planning/preparation	2	14	3	4	1	8	4	4
24010	In-flight planning/decision	5	8	5	2	2	7	4	4
24026	Compensation for wind conditions	4	9	2	6	3	5	6	3
24506	Airspeed	5	8	5	2	5	2	6	3
24526	Clearance	8	5	6	1	3	5	6	3
24029	Unsuitable terrain or takeoff/landing/taxi area	9	4	4	3	5	2	6	3
24581	Distance/speed	0	0	6	1	0	0	6	3

Table 37. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	3	1	3	2	3	1	1	1
24526	Clearance	3	1	0	0	3	1	1	1
24036	Flight into adverse weather	0	0	0	0	2	2	1	1
24577	Altitude/clearance	0	0	0	0	3	1	1	1
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	1	1
24566	Aircraft control	3	1	1	5	1	3	0	0
24001	Preflight planning/preparation	1	3	0	0	0	0	0	0
24015	VFR flight into IMC	3	1	4	1	0	0	0	0
24021	Visual lookout	3	1	4	1	0	0	0	0
24521	Buzzing	3	1	0	0	0	0	0	0

Table 38. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	1	0	0	1	1	1	1
24526	Clearance	0	0	2	1	0	0	1	1
24577	Altitude/clearance	0	0	0	0	0	0	1	1
24001	Preflight planning/preparation	1	1	2	1	0	0	0	0
22204	Fuel supply	0	0	2	1	0	0	0	0
24026	Compensation for wind conditions	1	1	0	0	0	0	0	0
22600	Anti-ice/deice system	0	0	0	0	1	1	0	0
24530	Proper alignment	0	0	2	1	0	0	0	0
22110	Raising of flaps	1	1	0	0	0	0	0	0
24500	Aircraft handling	1	1	0	0	0	0	0	0

Table 39. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	11	1	4	1	4	1	2
24010	In-flight planning/decision	3	6	0	0	0	0	1	2
24566	Aircraft control	6	1	3	2	4	1	1	2
30000	Improper use of procedure	0	0	0	0	0	0	1	2
24026	Compensation for wind conditions	5	2	4	1	3	2	5	1
24536	Go-around	4	3	4	1	0	0	5	1
24535	Flare	6	1	4	1	4	1	5	1
24012	Fuel consumption calculations	6	1	0	0	0	0	5	1
24529	Minimum descent altitude	0	0	0	0	0	0	5	1
24538	Design stress limits of aircraft	0	0	0	0	0	0	5	1

Table 40. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	1	2	1	0	0	1	2
24010	In-flight planning/decision	1	1	0	0	0	0	1	2
24566	Aircraft control	0	0	0	0	1	3	3	1
24577	Altitude/clearance	0	0	2	1	2	1	3	1
24001	Preflight planning/preparation	1	1	2	1	0	0	3	1
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	3	1
24015	VFR flight into IMC	0	0	0	0	0	0	3	1
24545	Emergency procedure	0	0	1	2	0	0	0	0
24023	Flight into known adverse weather	1	1	0	0	2	1	0	0
24512	Airspeed, stall in the landing configuration (V_{SO})	0	0	2	1	0	0	0	0

V_{SO} = The power off stall speed

Table 41. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24022	Weather evaluation	0	0	0	0	1	1	0	0
24566	Aircraft control	0	0	0	0	1	1	0	0
24506	Airspeed	1	2	0	0	0	0	0	0
24001	Preflight planning/preparation	2	1	0	0	0	0	0	0
24002	Aircraft preflight	2	1	0	0	0	0	0	0
24023	Flight into known adverse weather	0	0	1	1	0	0	0	0
24026	Compensation for wind conditions	0	0	1	1	0	0	0	0
24034	Planned approach	0	0	1	1	0	0	0	0
34335	Lack of total experience in type operation	0	0	1	1	0	0	0	0
24527	Climb	2	1	0	0	0	0	0	0

Table 42. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	4	1	4	1	7	1	7
24566	Aircraft control	0	0	3	1	2	3	2	5
24577	Altitude/clearance	0	0	0	0	3	2	3	2
24506	Airspeed	3	2	3	1	4	1	5	1
22303	Mixture	0	0	0	0	4	1	0	0
24032	Procedures/directives	4	1	2	2	0	0	0	0
24505	Aborted takeoff	0	0	0	0	0	0	3	2
24528	Proper climb rate	4	1	0	0	0	0	0	0
24100	Maintenance	0	0	3	1	0	0	0	0
22304	Carburetor heat	0	0	0	0	0	0	5	1

3.3 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS BASED ON AIRCRAFT COMPLEXITY.

Tables 43 through 48 show the frequency and rank of each category based on aircraft engine power. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 43. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	1	12	1	9	1	6
24506	Airspeed	1	12	2	7	2	5	2	5
24001	Preflight planning/preparation	3	7	6	1	4	3	3	2
24577	Altitude/clearance	0	0	0	0	3	4	3	2
24583	Low-altitude flight/maneuver	0	0	6	1	0	0	3	2
24526	Clearance	8	1	6	1	5	2	6	1
24551	Stall	7	2	0	0	6	1	6	1
24007	Operation with known deficiencies in equipment	8	1	6	1	6	1	6	1
10107	Wing, bracing strut	8	1	0	0	0	0	6	1
33400	Spatial disorientation	8	1	0	0	0	0	6	1

Table 44. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (<200 hp) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	0	0	0	0	0	0	1	2
24506	Airspeed	1	9	0	0	1	2	2	1
17001	Fluid, fuel	4	3	4	1	0	0	2	1
24526	Clearance	6	1	3	2	0	0	2	1
24566	Aircraft control	0	0	4	1	2	1	2	1
14016	Engine assembly, valve, exhaust	0	0	4	1	0	0	2	1
15109	Fuel system, carburetor	0	0	0	0	0	0	2	1
24551	Stall	6	1	3	2	1	2	0	0
14501	Propeller system/accessories, blade	0	0	2	4	0	0	0	0
24021	Visual lookout	6	1	0	0	2	1	0	0

Table 45. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (<200 hp) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	47	1	37	1	20	1	13
24535	Flare	3	29	9	4	2	12	2	6
24566	Aircraft control	0	0	4	14	2	12	2	6
17001	Fluid, fuel	4	26	2	20	4	10	4	5
24010	In-flight planning/decision	7	16	9	4	3	11	4	5
24029	Unsuitable terrain or takeoff/landing/taxi area	8	13	6	8	6	7	6	4
24026	Compensation for wind conditions	5	25	3	15	6	7	7	3
22004	Brakes (normal)	19	1	9	4	8	4	8	2
15100	Fuel system	17	3	12	1	9	3	8	2
24542	Remedial action	18	2	9	4	0	0	8	2

Table 46. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	4	5	3	5	4	2	1	7
24566	Aircraft control	8	1	1	11	1	10	2	4
24526	Clearance	7	2	2	6	5	1	2	4
24015	VFR flight into IMC	1	13	4	4	5	1	4	2
24577	Altitude/clearance	0	0	6	2	3	3	4	2
24529	Minimum descent altitude	8	1	0	0	5	1	6	1
24519	Proper altitude	8	1	7	1	0	0	6	1
24002	Aircraft preflight	0	0	0	0	4	2	6	1
24505	Aborted takeoff	0	0	7	1	0	0	6	1
24022	Weather evaluation	8	1	0	0	0	0	6	1

Table 47. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
17001	Fluid, fuel	3	4	4	1	1	3	1	2
24506	Airspeed	3	4	4	1	0	0	1	2
15202	Lubricating system, oil line	6	1	0	0	0	0	1	2
24029	Unsuitable terrain or takeoff/landing/taxi area	0	0	0	0	0	0	1	2
24577	Altitude/clearance	0	0	0	0	0	0	1	2
24021	Visual lookout	1	6	3	2	0	0	6	1
24526	Clearance	2	5	0	0	3	1	6	1
24036	Flight into adverse weather	0	0	0	0	0	0	6	1
14023	Engine assembly, gear	0	0	0	0	0	0	6	1
24019	Performance data	0	0	0	0	0	0	6	1

Table 48. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Central Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	26	1	14	1	14	1	14
24566	Aircraft control	16	1	6	4	2	13	2	8
24010	In-flight planning/decision	2	17	6	4	5	7	3	5
24577	Altitude/clearance	0	0	0	0	7	4	3	5
17001	Fluid, fuel	4	15	5	5	4	8	5	4
24535	Flare	8	9	4	7	6	5	5	4
24506	Airspeed	6	11	6	4	0	0	5	4
24526	Clearance	3	16	2	12	3	10	8	3
24026	Compensation for wind conditions	7	10	5	5	7	4	8	3
24029	Unsuitable terrain or takeoff/landing/taxi area	11	6	7	3	4	8	8	3

4. EASTERN REGION.

This section discusses the Eastern Region, which consists of Delaware, Maryland, New Jersey, New York, Pennsylvania, Virginia, West Virginia, and Washington, DC.

4.1 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS.

Tables 49 through 51 show the frequency and rank of the top ten initiating causes of GA accidents between 1982 and 2009. The rank was based on four 7-year periods (1982-1988, 1989-1995, 1996-2002, and 2003-2009), and the data were sorted on the last period (2003-2009) in ascending order.

Table 49 shows that airspeed was the number one initiating cause of Fatal GA accidents during 2003-2009. However, aircraft control was the initiating cause of Serious GA accidents during 2003-49, as shown in table 50. For Minor/None GA accidents, directional control was the top initiating cause for all four periods, as shown in table 51. This was also the trend nationwide.

Table 49. Top Ten Initiating Causes of Fatal GA Accidents in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	2	22	2	27	2	22	1	19
24566	Aircraft control	12	5	3	25	1	32	2	12
24010	In-flight planning/decision	4	19	4	13	5	11	3	10
24024	Instrument flight rules procedure	4	19	6	10	6	7	4	7
24000	Planning/decision	11	6	13	3	7	6	5	6
24577	Altitude/clearance	97	0	15	2	4	13	5	6
24001	Preflight planning/preparation	2	22	10	5	7	6	7	4
24021	Visual lookout	9	8	7	7	9	4	7	4
24511	Airspeed, stall (V_S)	16	3	31	1	25	1	7	4
24526	Clearance	48	1	10	5	25	1	10	3

V_S = Stalling speed

Table 50. Top Ten Initiating Causes of Serious GA Accidents in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	32	1	7	3	4	7	1	5
24506	Airspeed	1	16	1	15	3	8	2	4
22304	Carburetor heat	14	2	9	2	11	2	3	3
17001	Fluid, fuel	2	15	1	15	1	16	3	3
24032	Procedures/directives	14	2	9	2	11	2	5	2
24526	Clearance	5	6	4	6	11	2	5	2
22205	Fuel management	81	0	69	0	11	2	5	2
24539	Directional control	7	4	4	6	6	4	5	2
24002	Aircraft preflight	32	1	9	2	4	7	5	2
24026	Compensation for wind conditions	3	8	7	3	11	2	5	2

Table 51. Top Ten Initiating Causes of Minor/None GA Accidents in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	102	1	63	1	68	1	57
24535	Flare	4	60	3	37	2	43	2	36
24566	Aircraft control	N/A	0	11	14	3	38	3	25
24562	Recovery from bounced landing	31	7	9	18	5	25	4	16
24026	Compensation for wind conditions	2	68	6	26	4	31	5	13
24001	Preflight planning/preparation	7	32	7	24	11	12	6	12
24531	Proper touchdown point	14	17	14	11	9	14	7	10
24506	Airspeed	5	43	2	41	7	19	8	9
24002	Aircraft preflight	12	18	18	9	13	10	9	8
24021	Visual lookout	12	18	14	11	21	6	9	8

4.2 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO PILOT EXPERIENCE.

Tables 52 to 66 show the frequency and rank of each category based on pilot experience, measured in hours. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 52. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	3	1	2	1	1	3
24577	Altitude/clearance	0	0	0	0	2	1	2	2
24506	Airspeed	2	1	1	3	1	4	3	1
24010	In-flight planning/decision	2	1	2	2	2	1	3	1
24000	Planning/decision	0	0	0	0	2	1	3	1
24511	Airspeed, stall (V_S)	0	0	0	0	0	0	3	1
24535	Flare	2	1	0	0	2	1	0	0
24524	Descent	2	1	0	0	0	0	0	0
24581	Distance/speed	0	0	3	1	0	0	0	0
24403	Hazardous weather advisory	0	0	3	1	0	0	0	0

V_S = Stalling speed

The number of Serious GA accidents related to pilots with less than 100 hours of experience is very low.

Table 53. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	8	1	1	1	1	1	1
24566	Aircraft control	0	0	1	1	1	1	1	1
22304	Carburetor heat	0	0	0	0	1	1	1	1
24526	Clearance	0	0	1	1	0	0	1	1
24551	Stall	0	0	0	0	0	0	1	1
24002	Aircraft preflight	0	0	1	1	0	0	0	0
24535	Flare	0	0	0	0	1	1	0	0
24014	Became lost/disoriented	2	1	0	0	0	0	0	0
24542	Remedial action	0	0	1	1	0	0	0	0
24001	Preflight planning/preparation	2	1	0	0	0	0	0	0

Similar to other pilot experience categories, directional control is the number one initiating cause of Minor/None GA accidents involving pilots with less than 100 hours of experience, as shown in table 54.

Table 54. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24535	Flare	2	29	3	7	2	12	1	18
24539	Directional control	1	32	1	20	1	14	2	16
24562	Recovery from bounced landing	8	3	2	10	5	5	3	6
24566	Aircraft control	0	0	7	2	3	8	4	3
24026	Compensation for wind conditions	3	19	4	6	4	6	5	1
24536	Go-around	8	3	6	3	7	2	5	1
24000	Planning/decision	10	1	6	3	8	1	5	1
24021	Visual lookout	9	2	7	2	8	1	5	1
24532	Proper glidepath	10	1	0	0	0	0	5	1
24007	Operation with known deficiencies in equipment	0	0	0	0	0	0	5	1

Table 55. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	3	4	2	5	2	3	1	3
24015	VFR flight into IMC	1	9	1	8	3	2	2	2
24021	Visual lookout	6	1	4	2	4	1	2	2
24120	Maintenance, design change	0	0	0	0	0	0	2	2
24001	Preflight planning/preparation	2	5	0	0	0	0	5	1
24010	In-flight planning/decision	5	2	4	2	0	0	5	1
24577	Altitude/clearance	0	0	5	1	4	1	5	1
24542	Remedial action	6	1	0	0	0	0	5	1
24582	Evasive maneuver	0	0	0	0	0	0	5	1
24111	Maintenance, installation	0	0	0	0	0	0	5	1

Table 56. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24010	In-flight planning/decision	2	1	3	1	0	0	1	1
24528	Proper climb rate	0	0	3	1	0	0	1	1
24562	Recovery from bounced landing	0	0	0	0	2	1	1	1
24032	Procedures/directives	0	0	3	1	0	0	1	1
22201	Fuel tank selector position	2	1	0	0	0	0	1	1
22304	Carburetor heat	0	0	3	1	0	0	1	1
22119	Removal of control/gust lock(s)	0	0	0	0	0	0	1	1
24012	Fuel consumption calculations	0	0	0	0	0	0	1	1
24022	Weather evaluation	0	0	0	0	0	0	1	1
24539	Directional control	2	1	3	1	0	0	0	0

Table 57. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	17	1	15	1	18	1	13
24566	Aircraft control	0	0	8	2	4	7	2	6
24535	Flare	7	5	2	12	2	12	3	5
24026	Compensation for wind conditions	2	14	6	4	3	8	4	3
24562	Recovery from bounced landing	8	4	5	5	4	7	4	3
24531	Proper touchdown point	7	5	7	3	6	5	4	3
24010	In-flight planning/decision	3	12	7	3	7	3	7	2
24505	Aborted takeoff	0	0	9	1	7	3	7	2
24581	Distance/speed	0	0	0	0	7	3	7	2
24036	Flight into adverse weather	0	0	0	0	0	0	7	2

Table 58. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	14	3	11	2	9	1	11
24577	Altitude/clearance	0	0	0	0	3	8	2	5
24566	Aircraft control	9	1	2	16	1	17	3	4
24010	In-flight planning/decision	2	10	4	7	4	5	3	4
24024	Instrument flight rules procedure	2	10	5	6	4	5	3	4
24032	Procedures/directives	0	0	0	0	6	2	6	3
24526	Clearance	9	1	6	3	7	1	7	2
24000	Planning/decision	8	2	8	1	6	2	7	2
24002	Aircraft preflight	8	2	7	2	0	0	7	2
24532	Proper glidepath	9	1	0	0	0	0	7	2

Table 59. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	6	1	6	3	2	1	2
24010	In-flight planning/decision	3	2	3	2	1	6	1	2
24002	Aircraft preflight	4	1	0	0	2	5	1	2
24026	Compensation for wind conditions	2	3	3	2	4	1	4	1
24566	Aircraft control	4	1	4	1	3	2	4	1
24539	Directional control	3	2	4	1	4	1	4	1
22304	Carburetor heat	3	2	0	0	4	1	4	1
24536	Go-around	0	0	4	1	3	2	4	1
24526	Clearance	4	1	4	1	4	1	4	1
24531	Proper touchdown point	0	0	4	1	4	1	4	1

Table 60. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	31	1	16	1	25	1	21
24535	Flare	4	15	2	13	2	16	2	12
24566	Aircraft control	0	0	6	7	4	11	3	9
24026	Compensation for wind conditions	2	26	4	10	6	8	4	8
24001	Preflight planning/preparation	3	17	5	9	7	6	5	5
24000	Planning/decision	10	5	3	11	11	2	5	5
24562	Recovery from bounced landing	0	0	10	3	5	10	5	5
24531	Proper touchdown point	12	3	8	5	10	3	5	5
24032	Procedures/directives	14	1	11	2	12	1	5	5
24021	Visual lookout	6	10	5	9	8	5	10	4

Table 61. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24000	Planning/decision	5	1	0	0	2	4	1	4
24010	In-flight planning/decision	4	2	0	0	4	2	2	3
24024	Instrument flight rules procedure	2	4	3	1	5	1	3	2
24506	Airspeed	5	1	2	2	4	2	3	2
24511	Airspeed, stall (V_S)	5	1	0	0	5	1	3	2
24566	Aircraft control	4	2	3	1	1	6	6	1
24015	VFR flight into IMC	3	3	1	4	4	2	6	1
24001	Preflight planning/preparation	3	3	3	1	0	0	6	1
24577	Altitude/clearance	0	0	0	0	3	3	6	1
24501	Aerobatics	5	1	0	0	4	2	6	1

V_S = Stalling speed

Table 62. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24010	In-flight planning/decision	0	0	0	0	3	1	1	1
24566	Aircraft control	0	0	0	0	3	1	1	1
24548	Rotation	0	0	0	0	0	0	1	1
24577	Altitude/clearance	0	0	0	0	0	0	1	1
24007	Operation with known deficiencies in equipment	0	0	0	0	0	0	1	1
22205	Fuel management	0	0	0	0	0	0	1	1
24526	Clearance	1	3	0	0	0	0	0	0
24002	Aircraft preflight	0	0	1	1	3	1	0	0
22201	Fuel tank selector position	0	0	1	1	3	1	0	0
24004	Ice/frost removal from aircraft	0	0	0	0	3	1	0	0

Table 63. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	8	2	7	4	3	1	5
24566	Aircraft control	0	0	6	2	3	4	2	4
24001	Preflight planning/preparation	5	3	7	1	5	2	3	3
24506	Airspeed	2	7	1	8	2	5	4	2
24535	Flare	5	3	5	3	5	2	4	2
24542	Remedial action	0	0	0	0	6	1	4	2
24577	Altitude/clearance	0	0	0	0	0	0	4	2
24581	Distance/speed	0	0	0	0	0	0	4	2
24010	In-flight planning/decision	4	4	5	3	1	6	9	1
24531	Proper touchdown point	5	3	6	2	0	0	9	1

Table 64. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	4	1	2	3	1	5	1	5
24024	Instrument flight rules procedure	1	4	2	3	4	1	2	2
24566	Aircraft control	0	0	3	2	2	3	2	2
24010	In-flight planning/decision	2	3	4	1	4	1	2	2
24015	VFR flight into IMC	1	4	1	4	4	1	5	1
24001	Preflight planning/preparation	3	2	3	2	4	1	5	1
24542	Remedial action	0	0	3	2	0	0	5	1
24526	Clearance	0	0	4	1	0	0	5	1
24014	Became lost/disoriented	4	1	0	0	0	0	5	1
24511	Airspeed, stall (V_S)	0	0	0	0	0	0	5	1

V_S = Stalling speed

Table 65. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥5000 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24032	Procedures/directives	2	1	0	0	0	0	1	2
24566	Aircraft control	0	0	0	0	0	0	1	2
24026	Compensation for wind conditions	1	3	0	0	2	1	3	1
24539	Directional control	0	0	1	2	0	0	3	1
24506	Airspeed	0	0	0	0	0	0	3	1
22316	Engine shutdown	0	0	0	0	0	0	3	1
24531	Proper touchdown point	0	0	0	0	0	0	3	1
24526	Clearance	2	1	2	1	0	0	0	0
24011	Wind information	2	1	0	0	0	0	0	0
24523	Distance	2	1	0	0	0	0	0	0

Table 66. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥5000 hr) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	8	2	3	1	8	1	7
24562	Recovery from bounced landing	0	0	0	0	5	2	2	4
24002	Aircraft preflight	6	2	2	3	6	1	3	3
24001	Preflight planning/preparation	0	0	1	5	0	0	3	3
24021	Visual lookout	7	1	2	3	6	1	3	3
24542	Remedial action	7	1	4	1	5	2	3	3
24531	Proper touchdown point	5	3	0	0	4	3	7	2
24535	Flare	6	2	3	2	0	0	7	2
24010	In-flight planning/decision	7	1	3	2	0	0	7	2
22205	Fuel management	0	0	0	0	6	1	7	2

4.3 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS BASED ON AIRCRAFT COMPLEXITY.

Tables 67 through 72 show the frequency and rank of each category based on aircraft engine power. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 67. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (<200 hp) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	21	1	18	2	14	1	12
24566	Aircraft control	9	4	3	11	1	18	2	6
24021	Visual lookout	3	11	4	10	8	2	2	6
24010	In-flight planning/decision	4	10	5	6	4	7	4	4
24000	Planning/decision	12	1	9	1	6	4	4	4
24577	Altitude/clearance	0	0	0	0	5	6	6	2
24526	Clearance	12	1	7	3	9	1	6	2
24002	Aircraft preflight	12	1	9	1	0	0	6	2
24558	Rotor rpm	0	0	0	0	0	0	6	2
24511	Airspeed, stall (V_S)	10	3	9	1	9	1	10	1

V_S = Stalling speed

Table 68. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (<200 hp) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
17001	Fluid, fuel	2	9	1	10	1	13	1	3
24506	Airspeed	1	15	2	9	3	5	1	3
24566	Aircraft control	7	2	5	3	2	7	3	2
24010	In-flight planning/decision	6	3	5	3	3	5	3	2
24002	Aircraft preflight	0	0	5	3	5	3	3	2
24562	Recovery from bounced landing	0	0	0	0	7	1	3	2
24111	Maintenance, installation	0	0	0	0	0	0	3	2
22205	Fuel management	0	0	0	0	0	0	3	2
24026	Compensation for wind conditions	3	7	6	2	7	1	9	1
24548	Rotation	0	0	0	0	7	1	9	1

Table 69. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (<200 hp) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	79	1	52	1	50	1	28
24535	Flare	2	48	3	21	3	29	2	18
24566	Aircraft control	0	0	6	15	2	30	3	14
24026	Compensation for wind conditions	3	47	5	19	4	21	4	8
17001	Fluid, fuel	4	44	4	20	5	16	5	7
24562	Recovery from bounced landing	20	5	7	14	5	16	5	7
24021	Visual lookout	12	13	8	13	12	5	7	5
24542	Remedial action	24	1	16	2	9	8	7	5
24577	Altitude/clearance	0	0	17	1	11	6	7	5
24506	Airspeed	5	28	2	31	7	12	10	4

Table 70. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	11	1	2	15	1	16	1	7
24506	Airspeed	8	4	5	8	4	6	1	7
24010	In-flight planning/decision	3	13	3	13	4	6	3	6
24024	Instrument flight rules procedure	1	18	4	12	2	8	4	5
24000	Planning/decision	7	5	9	2	6	2	5	4
24577	Altitude/clearance	0	0	9	2	2	8	6	3
17001	Fluid, fuel	10	2	10	1	7	1	6	3
24032	Procedures/directives	10	2	0	0	7	1	6	3
24511	Airspeed, stall (V_S)	0	0	0	0	0	0	6	3
24015	VFR flight into IMC	2	16	1	20	3	7	10	2

V_S = Stalling speed

Table 71. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	6	1	4	3	1	3
24111	Maintenance, installation	0	0	0	0	6	1	2	2
24001	Preflight planning/preparation	3	4	1	7	5	2	3	1
24010	In-flight planning/decision	5	2	4	3	2	5	3	1
24506	Airspeed	4	3	3	4	6	1	3	1
24026	Compensation for wind conditions	6	1	6	1	6	1	3	1
24007	Operation with known deficiencies in equipment	6	1	0	0	0	0	3	1
12100	Hydraulic system	6	1	0	0	0	0	3	1
10700	Flight control system	0	0	0	0	0	0	3	1
10418	Landing gear, normal brake system	0	0	0	0	0	0	3	1

Table 72. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Eastern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	34	3	14	2	16	1	15
24566	Aircraft control	0	0	11	3	3	15	2	10
24535	Flare	5	15	1	17	1	19	3	6
24531	Proper touchdown point	15	4	10	4	11	3	3	6
24021	Visual lookout	4	18	5	9	8	6	5	5
24010	In-flight planning/decision	11	8	7	7	8	6	5	5
17001	Fluid, fuel	2	27	3	14	4	11	7	4
22205	Fuel management	0	0	0	0	10	4	7	4
24100	Maintenance	18	1	0	0	13	1	7	4
24577	Altitude/clearance	0	0	0	0	13	1	7	4

5. GREAT LAKES REGION.

This section discusses the Great Lakes Region, which consists of Illinois, Indiana, Michigan, Minnesota, North Dakota, Ohio, South Dakota, and Wisconsin.

5.1 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS.

Tables 73 through 75 show the frequency and rank of the top ten initiating causes of GA accidents between 1982 and 2009. The rank was based on four 7-year periods (1982-1988, 1989-1995, 1996-2002, and 2003-2009), and the data were sorted on the last period (2003-2009) in ascending order.

Table 73 shows that aircraft control was number one initiating cause of Fatal GA accidents during the 2003-2009 period.

Table 73. Top Ten Initiating Causes of Fatal GA Accidents in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	15	5	1	42	1	52	1	24
24506	Airspeed	1	28	2	38	2	24	2	20
24577	Altitude/clearance	100	0	42	1	3	23	3	13
24015	VFR flight into IMC	1	28	3	19	5	11	4	9
24021	Visual lookout	10	10	10	8	35	1	5	5
24001	Preflight planning/preparation	4	20	24	3	9	6	6	4
24551	Stall	29	2	15	5	6	8	6	4
24526	Clearance	17	4	6	9	4	12	6	4
33400	Spatial disorientation	100	0	15	5	35	1	6	4
24023	Flight into known adverse weather	7	14	6	9	6	8	6	4

Airspeed initiated the most Serious GA accidents for the 2003-2009 period, as shown in table 74. For Minor/None GA accidents, directional control is the top initiating cause for all four periods, as shown in table 75. This is also the trend nationwide.

Table 74. Top Ten Initiating Causes of Serious GA Accidents in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	20	2	18	2	10	1	11
24566	Aircraft control	38	1	3	9	1	16	2	7
24577	Altitude/clearance	86	0	75	0	8	3	3	5
24526	Clearance	9	5	6	5	13	2	4	3
17001	Fluid, fuel	2	17	1	19	3	8	4	3
24001	Preflight planning/preparation	3	11	6	5	3	8	4	3
24535	Flare	14	3	75	0	24	1	4	3

Table 74. Top Ten Initiating Causes of Serious GA Accidents in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24518	Altitude	9	5	20	2	24	1	8	2
24562	Recovery from bounced landing	86	0	75	0	24	1	8	2
14004	Engine assembly, crankshaft	38	1	31	1	72	0	8	2

Table 75. Top Ten Initiating Causes of Minor/None GA Accidents in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	169	1	163	1	131	1	97
24535	Flare	3	105	3	52	3	52	2	65
24026	Compensation for wind conditions	2	119	2	79	4	45	3	40
24506	Airspeed	5	55	6	40	6	30	4	33
17001	Fluid, fuel	4	103	4	50	5	38	5	28
24029	Unsuitable terrain or takeoff/landing/taxi area	8	43	17	16	10	18	6	27
24566	Aircraft control	60	5	6	40	2	62	7	26
24001	Preflight planning/preparation	7	50	5	42	7	28	8	20
24526	Clearance	24	15	15	18	8	26	9	15
24531	Proper touchdown point	24	15	12	25	9	22	10	13

5.2 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO PILOT EXPERIENCE.

Tables 76 through 90 show the frequency and rank of each category based on pilot experience, measured in hours. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 76. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	4	1	2	2	2	2	1	3
24506	Airspeed	2	3	1	5	1	3	2	1
24015	VFR flight into IMC	1	5	2	2	3	1	2	1
24577	Altitude/clearance	0	0	0	0	1	3	2	1
24705	Control interference	0	0	0	0	0	0	2	1
24023	Flight into known adverse weather	0	0	0	0	0	0	2	1
24544	Missed approach	0	0	0	0	0	0	2	1
24707	Suicide	0	0	0	0	0	0	2	1
24036	Flight into adverse weather	0	0	0	0	0	0	2	1
24001	Preflight planning/preparation	3	2	3	1	0	0	0	0

The number of Serious accidents related to pilots with less than 100 hours of experience is very low, as shown in table 77.

Table 77. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	3	1	1	2	1	2	1	2
24518	Altitude	3	1	0	0	0	0	2	1
24029	Unsuitable terrain or takeoff/landing/taxi area	3	1	0	0	0	0	2	1
24627	Supervision	0	0	0	0	0	0	2	1
24007	Operation with known deficiencies in equipment	0	0	0	0	0	0	2	1
24581	Distance/speed	0	0	0	0	0	0	2	1
24002	Aircraft preflight	0	0	1	2	2	1	0	0
24577	Altitude/clearance	0	0	0	0	1	2	0	0
24000	Planning/decision	3	1	0	0	0	0	0	0
24532	Proper glidepath	0	0	2	1	0	0	0	0

Similar to other pilot experience categories, directional control is the number one initiating cause of Minor/None GA accidents involving pilots with less than 100 hours of experience, as shown in table 78.

Table 78. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	62	1	77	1	50	1	27
24535	Flare	2	52	3	14	2	18	2	17
24026	Compensation for wind conditions	3	28	2	15	4	9	3	11
24506	Airspeed	4	14	6	6	7	4	4	5
24562	Recovery from bounced landing	6	9	6	6	5	7	4	5
24566	Aircraft control	14	1	4	9	3	11	6	4
24536	Go-around	9	6	11	1	9	1	6	4
24505	Aborted takeoff	12	3	11	1	9	1	6	4
24526	Clearance	13	2	0	0	6	5	9	3
24010	In-flight planning/decision	5	12	8	4	8	2	10	2

Table 79. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	2	5	2	4	2	5	1	8
24015	VFR flight into IMC	1	7	1	5	3	3	2	5
24566	Aircraft control	0	0	2	4	1	7	3	4
24577	Altitude/clearance	0	0	0	0	0	0	4	2
24001	Preflight planning/preparation	1	7	5	1	3	3	5	1
24010	In-flight planning/decision	5	1	4	2	0	0	5	1
24022	Weather evaluation	4	2	0	0	5	1	5	1
33400	Spatial disorientation	0	0	5	1	0	0	5	1
24545	Emergency procedure	0	0	0	0	0	0	5	1
24586	Short field landing/procedure	0	0	0	0	0	0	5	1

Table 80. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	5	1	6	1	3	1	5
24566	Aircraft control	4	1	3	2	1	3	2	2
24001	Preflight planning/preparation	2	3	2	3	0	0	3	1
24526	Clearance	4	1	4	1	0	0	3	1
22201	Fuel tank selector position	0	0	4	1	0	0	3	1
24547	Pull-up	0	0	0	0	0	0	3	1
24511	Airspeed, stall (V_S)	4	1	0	0	3	1	0	0
22304	Carburetor heat	4	1	4	1	0	0	0	0
24542	Remedial action	0	0	3	2	0	0	0	0
24532	Proper glidepath	0	0	4	1	0	0	0	0

V_S = Stalling speed

Table 81. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	39	1	26	1	19	1	20
24535	Flare	3	17	4	9	3	12	2	16
24026	Compensation for wind conditions	2	36	2	19	4	7	3	13
24566	Aircraft control	0	0	6	6	2	15	4	6
24001	Preflight planning/preparation	5	13	3	11	5	6	5	5
24506	Airspeed	4	14	5	7	6	5	5	5
24562	Recovery from bounced landing	13	3	7	5	8	3	5	5
24526	Clearance	14	2	11	1	7	4	5	5
24531	Proper touchdown point	12	4	5	7	5	6	9	4
24002	Aircraft preflight	9	8	9	3	10	1	10	3

Table 82. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	8	4	1	20	1	32	1	9
24506	Airspeed	1	12	2	18	3	8	2	8
24577	Altitude/clearance	0	0	8	1	2	11	3	6
24015	VFR flight into IMC	2	11	3	8	5	6	4	5
24021	Visual lookout	7	5	4	6	9	1	5	4
24526	Clearance	0	0	7	2	4	7	5	4
24023	Flight into known adverse weather	3	9	4	6	6	5	7	2
24551	Stall	0	0	6	3	7	4	7	2
24000	Planning/decision	11	1	7	2	8	2	7	2
24036	Flight into adverse weather	0	0	7	2	9	1	7	2

Table 83. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24518	Altitude	5	2	0	0	4	1	1	3
24577	Altitude/clearance	0	0	0	0	0	0	1	3
24506	Airspeed	1	9	1	5	2	3	3	2
24566	Aircraft control	0	0	2	3	1	6	3	2
24001	Preflight planning/preparation	4	3	3	2	2	3	3	2
24526	Clearance	6	1	0	0	4	1	3	2
22307	Propeller feathering	0	0	0	0	0	0	3	2
24581	Distance/speed	0	0	0	0	3	2	8	1
24536	Go-around	0	0	4	1	4	1	8	1
24029	Unsuitable terrain or takeoff/landing/taxi area	0	0	0	0	3	2	8	1

Table 84. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	39	2	32	1	45	1	35
24535	Flare	3	23	3	24	4	15	2	22
24506	Airspeed	4	21	4	19	5	14	3	17
24026	Compensation for wind conditions	2	35	1	33	2	22	4	12
24029	Unsuitable terrain or takeoff/landing/taxi area	5	19	9	9	10	7	4	12
24566	Aircraft control	16	2	5	18	3	19	6	9
24526	Clearance	12	7	9	9	9	8	7	7
24001	Preflight planning/preparation	5	19	7	13	6	12	8	6
24010	In-flight planning/decision	6	18	8	11	7	10	8	6
24531	Proper touchdown point	13	5	11	7	6	12	8	6

Table 85. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	1	8	1	5	1	6
24577	Altitude/clearance	0	0	0	0	1	5	2	4
24506	Airspeed	4	2	2	5	2	4	3	2
24627	Supervision	0	0	4	2	0	0	3	2
24021	Visual lookout	3	3	4	2	0	0	5	1
24001	Preflight planning/preparation	5	1	0	0	3	3	5	1
24551	Stall	0	0	5	1	4	2	5	1
24002	Aircraft preflight	0	0	5	1	5	1	5	1
24543	Maneuver	0	0	0	0	0	0	5	1
24532	Proper glidepath	5	1	0	0	5	1	0	0

Table 86. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	2	1	1	3	1	2	1	2
24566	Aircraft control	0	0	2	2	2	1	1	2
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	1	2
24010	In-flight planning/decision	2	1	0	0	1	2	4	1
24539	Directional control	0	0	3	1	0	0	4	1
22304	Carburetor heat	2	1	0	0	0	0	4	1
24577	Altitude/clearance	0	0	0	0	0	0	4	1
24627	Supervision	0	0	0	0	0	0	4	1
24562	Recovery from bounced landing	0	0	0	0	0	0	4	1
24005	Aircraft unattended/engine(s) running	0	0	0	0	0	0	4	1

Table 87. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24535	Flare	5	4	8	1	2	5	1	9
24539	Directional control	1	16	3	7	5	2	2	5
24029	Unsuitable terrain or takeoff/landing/taxi area	5	4	6	3	6	1	2	5
24026	Compensation for wind conditions	4	5	1	10	4	3	4	4
24506	Airspeed	7	2	4	5	3	4	4	4
24001	Preflight planning/preparation	3	6	2	8	5	2	6	3
24566	Aircraft control	0	0	5	4	1	8	6	3
24002	Aircraft preflight	3	6	6	3	6	1	6	3
24531	Proper touchdown point	8	1	7	2	3	4	9	2
22001	Landing gear retraction	8	1	7	2	0	0	9	2

Table 88. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥5000 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	1	5	1	5	1	4
24526	Clearance	0	0	2	3	1	5	2	2
24542	Remedial action	0	0	0	0	5	1	2	2
24506	Airspeed	2	2	2	3	2	4	4	1
24000	Planning/decision	0	0	2	3	2	4	4	1
24021	Visual lookout	0	0	2	3	5	1	4	1
24577	Altitude/clearance	0	0	0	0	3	3	4	1
24001	Preflight planning/preparation	2	2	0	0	0	0	4	1
24023	Flight into known adverse weather	0	0	0	0	5	1	4	1
24030	Checklist	0	0	0	0	0	0	4	1

Table 89. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥5000 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24535	Flare	0	0	0	0	0	0	1	2
24506	Airspeed	1	3	2	1	0	0	2	1
24000	Planning/decision	2	2	0	0	3	1	0	0
24001	Preflight planning/preparation	3	1	0	0	3	1	0	0
24545	Emergency procedure	3	1	2	1	0	0	0	0
24530	Proper alignment	0	0	2	1	0	0	0	0
24002	Aircraft preflight	0	0	2	1	0	0	0	0
24525	Proper descent rate	3	1	0	0	0	0	0	0
33115	Physical impairment (other toxic)	0	0	2	1	0	0	0	0
22900	Autopilot	0	0	0	0	3	1	0	0

Table 90. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥5000 hr) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	8	1	12	1	8	1	11
24566	Aircraft control	0	0	6	1	2	5	2	5
24526	Clearance	5	3	5	2	1	8	3	4
24506	Airspeed	5	3	6	1	6	1	3	4
24021	Visual lookout	3	6	5	2	4	3	5	3
24010	In-flight planning/decision	4	5	4	3	5	2	5	3
24029	Unsuitable terrain or takeoff/landing/taxi area	5	3	6	1	4	3	5	3
24001	Preflight planning/preparation	5	3	6	1	3	4	8	2
24002	Aircraft preflight	5	3	3	4	6	1	8	2
22304	Carburetor heat	0	0	3	4	6	1	8	2

5.3 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS BASED ON AIRCRAFT COMPLEXITY.

Tables 91 through 96 show the frequency and rank of each category based on aircraft engine power. The amount of data was sometimes insufficient to rank the top initiating causes of GA accidents.

Table 91. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (<200 hp) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	7	4	1	25	1	29	1	14
24506	Airspeed	1	24	2	23	2	15	2	11
24577	Altitude/clearance	0	0	10	1	3	14	3	7
24021	Visual lookout	3	13	3	9	9	1	4	6
24015	VFR flight into IMC	2	17	3	9	5	6	5	5
24001	Preflight planning/preparation	3	13	8	3	7	3	6	3
24526	Clearance	6	5	6	5	4	8	6	3
17001	Fluid, fuel	5	6	8	3	6	4	6	3
24551	Stall	9	2	8	3	5	6	9	2
24023	Flight into known adverse weather	6	5	10	1	6	4	9	2

Table 92. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (<200 hp) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	21	1	14	3	7	1	6
24566	Aircraft control	10	1	2	8	1	11	2	4
24518	Altitude	6	5	6	2	0	0	2	4
24577	Altitude/clearance	0	0	7	1	6	2	2	4
17001	Fluid, fuel	2	12	1	14	5	3	5	2
24001	Preflight planning/preparation	3	10	3	5	2	8	5	2
24526	Clearance	7	4	3	5	7	1	5	2
24539	Directional control	9	2	5	3	6	2	5	2
14004	Engine assembly, crankshaft	0	0	7	1	0	0	5	2
24029	Unsuitable terrain or takeoff/landing/taxi area	10	1	0	0	7	1	10	1

Table 93. Top Ten Initiating Causes of Minor/None Fatal GA Accidents Based on Aircraft Engine Power (<200 hp) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	130	1	123	1	108	1	41
24535	Flare	3	77	3	37	3	31	2	32
24506	Airspeed	5	43	7	27	7	19	3	16
24029	Unsuitable terrain or takeoff/landing/taxi area	9	31	15	15	8	16	3	16
24026	Compensation for wind conditions	2	84	2	57	4	29	5	15
17001	Fluid, fuel	4	65	6	31	5	24	6	14
24566	Aircraft control	27	4	5	32	2	52	7	13
24001	Preflight planning/preparation	6	40	4	36	8	16	8	8
15109	Fuel system, carburetor	14	20	16	14	9	13	8	8
24526	Clearance	19	12	17	13	6	21	10	7

Table 94. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	10	2	1	20	1	27	1	14
24577	Altitude/clearance	0	0	0	0	2	12	2	10
24526	Clearance	10	2	6	7	4	10	3	7
24506	Airspeed	5	7	2	11	3	11	4	6
24021	Visual lookout	5	7	7	5	8	1	5	5
17001	Fluid, fuel	7	5	8	4	7	2	5	5
24015	VFR flight into IMC	2	13	3	10	5	5	7	4
24023	Flight into known adverse weather	3	11	5	8	6	3	8	2
24001	Preflight planning/preparation	4	8	11	1	6	3	8	2
24000	Planning/decision	9	3	10	2	6	3	8	2

Table 95. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24526	Clearance	7	1	4	2	1	9	1	3
24535	Flare	7	1	0	0	0	0	1	3
17001	Fluid, fuel	3	5	1	7	2	8	3	2
24506	Airspeed	6	2	2	4	5	4	3	2
24577	Altitude/clearance	0	0	0	0	6	3	3	2
14007	Engine assembly, cylinder	0	0	0	0	0	0	3	2
24010	In-flight planning/decision	4	4	4	2	4	5	7	1
24001	Preflight planning/preparation	2	6	4	2	8	1	7	1
24518	Altitude	7	1	4	2	8	1	7	1
16800	Propeller governor control	0	0	0	0	0	0	7	1

Table 96. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Great Lakes Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	47	1	48	1	32	1	28
24535	Flare	6	27	5	19	2	23	2	19
17001	Fluid, fuel	1	50	4	23	3	21	3	16
24526	Clearance	9	18	2	29	4	20	4	14
24566	Aircraft control	0	0	5	19	4	20	5	12
24577	Altitude/clearance	0	0	16	2	6	16	6	11
24506	Airspeed	9	18	7	17	7	13	7	8
24026	Compensation for wind conditions	3	38	3	26	5	18	8	6
24021	Visual lookout	4	32	6	18	15	3	8	6
24029	Unsuitable terrain or takeoff/landing/taxi area	8	19	13	5	14	4	8	6

6. NEW ENGLAND REGION.

This section discusses the New England Region, which consists of Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, and Vermont.

6.1 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS.

Tables 97 through 99 show the frequency and rank of the top ten initiating causes of GA accidents between 1982 and 2009. The rank was based on four 7-year periods (1982-1988, 1989-1995, 1996-2002, and 2003-2009) and was sorted on the last period (2003-2009) in ascending order.

Table 97 shows that aircraft control is the number one initiating cause of Fatal GA accidents during the last period. Airspeed and directional control are the number one initiating causes of Serious and Minor/None GA accidents, as shown in tables 98 and 99, respectively.

Table 97. Top Ten Initiating Causes of Fatal GA Accidents in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	46	0	1	11	1	18	1	5
24577	Altitude/clearance	46	0	17	1	3	6	2	2
24024	Instrument flight rules procedure	3	9	9	3	3	6	2	2
24000	Planning/decision	21	1	9	3	7	3	2	2
24583	Low-altitude flight/maneuver	46	0	N/A	0	N/A	0	2	2
24015	VFR flight into IMC	1	13	3	7	7	3	2	2
24506	Airspeed	2	11	3	7	2	8	2	2
17001	Fluid, fuel	13	2	17	1	5	4	8	1
33212	Incapacitation (cardiovascular)	21	1	N/A	0	N/A	0	8	1
22121	Flaps	46	0	N/A	0	N/A	0	8	1

Table 98. Top Ten Initiating Causes of Serious GA Accidents in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	9	1	4	7	1	1	4
24566	Aircraft control	50	0	5	2	1	6	1	4
24000	Planning/decision	50	0	5	2	7	1	3	2
14707	Accessory drive assembly, drive gear	50	0	33	0	26	0	4	1
33400	Spatial disorientation	50	0	33	0	26	0	4	1
14008	Engine assembly, piston	50	0	33	0	26	0	4	1
20000	Weather condition	50	0	33	0	26	0	4	1
24026	Compensation for wind conditions	7	2	13	1	26	0	4	1
14007	Engine assembly, cylinder	50	0	33	0	26	0	4	1
24532	Proper glidepath	50	0	13	1	26	0	4	1

Table 99. Top Ten Initiating Causes of Minor/None GA Accidents in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	43	2	17	1	21	1	23
24566	Aircraft control	N/A	0	8	7	4	13	2	13
24535	Flare	5	20	4	15	2	18	3	12
24026	Compensation for wind conditions	2	25	1	25	3	15	4	8
24562	Recovery from bounced landing	21	5	8	7	8	9	4	8
24506	Airspeed	4	21	2	17	9	8	4	8
24001	Preflight planning/preparation	8	11	10	6	5	12	7	6
24526	Clearance	16	6	15	5	19	2	8	5
24010	In-flight planning/decision	12	7	5	11	7	11	9	4
24581	Distance/speed	N/A	0	55	1	13	4	9	4

6.2 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO PILOT EXPERIENCE.

Tables 100 through 114 show the frequency and rank of each category based on pilot experience, measured in hours. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 100. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
22121	Flaps	0	0	0	0	0	0	1	1
24021	Visual lookout	2	1	1	2	1	1	0	0
24015	VFR flight into IMC	1	2	2	1	0	0	0	0
24010	In-flight planning/decision	2	1	2	1	1	1	0	0
24518	Altitude	2	1	2	1	0	0	0	0
24506	Airspeed	0	0	2	1	1	1	0	0
22110	Raising of flaps	1	2	0	0	0	0	0	0
24536	Go-around	2	1	0	0	0	0	0	0
24519	Proper altitude	0	0	2	1	0	0	0	0
24002	Aircraft preflight	2	1	0	0	0	0	0	0

Table 101. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	2	0	0	0	0	0	0
22201	Fuel tank selector position	2	1	0	0	0	0	0	0
24015	VFR flight into IMC	0	0	1	1	0	0	0	0
24539	Directional control	2	1	0	0	0	0	0	0
24010	In-flight planning/decision	2	1	0	0	0	0	0	0
24031	Judgement	0	0	1	1	0	0	0	0
31120	Inattentive	0	0	0	0	1	1	0	0
24001	Preflight planning/preparation	2	1	0	0	0	0	0	0
24113	Maintenance, modification	0	0	0	0	1	1	0	0

Similar to other pilot experience categories, directional control is the number one initiating cause of Minor/None GA accidents involving pilots with less than 100 hours of experience, as shown in table 102.

Table 102. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	17	1	9	2	8	1	5
24562	Recovery from bounced landing	6	2	3	3	3	5	2	4
24535	Flare	2	12	3	3	1	11	3	2
24026	Compensation for wind conditions	3	6	2	8	6	1	4	1
24506	Airspeed	6	2	3	3	4	3	4	1
24536	Go-around	7	1	0	0	6	1	4	1
24566	Aircraft control	0	0	0	0	6	1	4	1
24526	Clearance	0	0	0	0	6	1	4	1
24527	Climb	0	0	0	0	0	0	4	1
24531	Proper touchdown point	7	1	5	1	6	1	0	0

Table 103. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24001	Preflight planning/preparation	2	2	2	1	0	0	1	1
24010	In-flight planning/decision	3	1	2	1	0	0	1	1
24566	Aircraft control	0	0	2	1	2	1	1	1
24015	VFR flight into IMC	1	5	1	2	2	1	0	0
24506	Airspeed	3	1	2	1	1	2	0	0
24021	Visual lookout	0	0	2	1	2	1	0	0
24519	Proper altitude	3	1	2	1	0	0	0	0
24533	Lift-off	0	0	2	1	0	0	0	0
24547	Pull-up	3	1	0	0	0	0	0	0
24504	Aborted landing	3	1	0	0	0	0	0	0

Table 104. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	1	2	1	0	0	1	1
24566	Aircraft control	0	0	0	0	1	1	1	1
24000	Planning/decision	0	0	0	0	0	0	1	1
24015	VFR flight into IMC	0	0	0	0	0	0	1	1
24010	In-flight planning/decision	0	0	0	0	0	0	1	1
24562	Recovery from bounced landing	0	0	0	0	0	0	1	1
24002	Aircraft preflight	1	1	1	2	0	0	0	0
24525	Proper descent rate	1	1	0	0	0	0	0	0
24552	Stall/spin	1	1	0	0	0	0	0	0
24531	Proper touchdown point	0	0	0	0	1	1	0	0

Table 105. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	3	1	0	0	1	4
24539	Directional control	1	7	3	1	1	5	2	3
24562	Recovery from bounced landing	0	0	3	1	0	0	2	3
24026	Compensation for wind conditions	2	6	1	3	1	5	4	2
24526	Clearance	5	2	3	1	0	0	4	2
24505	Aborted takeoff	5	2	0	0	0	0	4	2
24535	Flare	3	4	2	2	2	2	7	1
24536	Go-around	4	3	2	2	0	0	7	1
22004	Brakes (normal)	5	2	3	1	0	0	7	1
24030	Checklist	0	0	0	0	3	1	7	1

Table 106. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	1	5	1	12	1	5
24024	Instrument flight rules procedure	3	3	4	1	2	6	2	2
24577	Altitude/clearance	0	0	4	1	3	3	2	2
24000	Planning/decision	5	1	0	0	5	1	2	2
24010	In-flight planning/decision	4	2	2	4	4	2	5	1
24015	VFR flight into IMC	3	3	3	2	4	2	5	1
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	5	1
24001	Preflight planning/preparation	0	0	4	1	4	2	0	0
24518	Altitude	5	1	4	1	5	1	0	0
24535	Flare	5	1	4	1	0	0	0	0

Table 107. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	5	1	3	2	1	1	3
24566	Aircraft control	0	0	2	2	1	3	2	2
24010	In-flight planning/decision	2	3	0	0	0	0	3	1
24000	Planning/decision	0	0	2	2	2	1	3	1
24539	Directional control	0	0	3	1	2	1	3	1
24001	Preflight planning/preparation	0	0	2	2	0	0	3	1
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	3	1
24002	Aircraft preflight	4	1	3	1	2	1	0	0
22205	Fuel management	0	0	0	0	2	1	0	0
24519	Proper altitude	4	1	0	0	0	0	0	0

Table 108. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	10	5	4	2	7	1	11
24535	Flare	9	1	3	7	4	5	2	7
24506	Airspeed	3	9	1	10	6	3	3	4
24026	Compensation for wind conditions	2	10	2	9	3	6	4	3
24566	Aircraft control	0	0	5	4	1	9	4	3
24010	In-flight planning/decision	7	3	4	5	5	4	4	3
24001	Preflight planning/preparation	7	3	6	3	6	3	4	3
24000	Planning/decision	6	4	7	2	6	3	8	2
24526	Clearance	7	3	6	3	8	1	8	2
24542	Remedial action	0	0	0	0	8	1	8	2

Table 109. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	1	2	1	3	1	2
24506	Airspeed	0	0	1	2	1	3	2	1
24010	In-flight planning/decision	2	1	2	1	0	0	2	1
24716	Navaid Signal	0	0	0	0	0	0	2	1
24555	Wheels-down landing in water	0	0	0	0	0	0	2	1
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	2	1
24036	Flight into adverse weather	0	0	0	0	0	0	2	1
33212	Incapacitation (cardiovascular)	0	0	0	0	0	0	2	1
24532	Proper glidepath	0	0	2	1	0	0	0	0
24522	Decision height	0	0	2	1	0	0	0	0

Table 110. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24010	In-flight planning/decision	0	0	0	0	1	1	1	1
24532	Proper glidepath	0	0	0	0	0	0	1	1
24026	Compensation for wind conditions	0	0	0	0	0	0	1	1
24001	Preflight planning/preparation	1	1	2	1	1	1	0	0
22304	Carburetor heat	0	0	1	2	0	0	0	0
22111	Lowering of flaps	0	0	2	1	0	0	0	0
24535	Flare	1	1	0	0	0	0	0	0
24526	Clearance	0	0	2	1	0	0	0	0
24566	Aircraft control	0	0	0	0	1	1	0	0
24504	Aborted landing	1	1	0	0	0	0	0	0

Table 111. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	4	1	2	2	2	2	1	6
24001	Preflight planning/preparation	4	1	3	1	1	3	2	2
24531	Proper touchdown point	4	1	3	1	3	1	2	2
24581	Distance/speed	0	0	0	0	3	1	2	2
24566	Aircraft control	0	0	3	1	0	0	2	2
24026	Compensation for wind conditions	2	3	1	3	2	2	6	1
24535	Flare	0	0	2	2	0	0	6	1
24577	Altitude/clearance	0	0	0	0	3	1	6	1
24022	Weather evaluation	0	0	0	0	3	1	6	1
24580	Distance/altitude	0	0	0	0	3	1	6	1

Table 112. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	1	2
24010	In-flight planning/decision	0	0	1	1	2	1	2	1
24015	VFR flight into IMC	2	2	0	0	0	0	2	1
33140	Impairment (drugs)	0	0	0	0	0	0	2	1
24532	Proper glidepath	0	0	0	0	0	0	2	1
22205	Fuel management	0	0	0	0	0	0	2	1
24024	Instrument flight rules procedure	1	3	0	0	0	0	0	0
24023	Flight into known adverse weather	3	1	0	0	2	1	0	0
24031	Judgment	0	0	1	1	0	0	0	0
24622	ATC clearance	0	0	0	0	2	1	0	0

Table 113. Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥5000 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24580	Distance/altitude	0	0	0	0	0	0	1	1
24010	In-flight planning/decision	2	1	1	1	1	1	0	0
24021	Visual lookout	2	1	0	0	1	1	0	0
24024	Instrument flight rules procedure	1	2	0	0	0	0	0	0
24566	Aircraft control	0	0	0	0	1	1	0	0
24531	Proper touchdown point	2	1	0	0	0	0	0	0
24034	Planned approach	2	1	0	0	0	0	0	0
24032	Procedures/directives	0	0	1	1	0	0	0	0

Table 114. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥5000 hr) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	2	1	2	2	1	3
24539	Directional control	2	3	0	0	3	1	2	2
24535	Flare	0	0	0	0	0	0	2	2
24001	Preflight planning/preparation	3	2	2	1	1	3	4	1
24010	In-flight planning/decision	4	1	2	1	1	3	4	1
24026	Compensation for wind conditions	0	0	1	2	3	1	4	1
24549	Starting procedure	4	1	0	0	3	1	4	1
22002	Landing gear extension	4	1	0	0	0	0	4	1
24581	Distance/speed	0	0	0	0	0	0	4	1
24530	Proper alignment	0	0	0	0	0	0	4	1

6.3 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS BASED ON AIRCRAFT COMPLEXITY.

Tables 115 through 120 show the frequency and rank of each category based on aircraft engine power. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 115. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (<200 hp) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24015	VFR flight into IMC	2	9	2	5	3	3	1	2
24010	In-flight planning/decision	4	5	2	5	3	3	1	2
24577	Altitude/clearance	0	0	0	0	2	4	3	1
24001	Preflight planning/preparation	6	2	6	1	5	1	3	1
24500	Aircraft handling	6	2	6	1	0	0	3	1
33212	Incapacitation (cardiovascular)	7	1	0	0	0	0	3	1
14510	Propeller system/accessories, propeller blade retention	0	0	0	0	0	0	3	1
16902	Power plant	0	0	0	0	0	0	3	1
22121	Flaps	0	0	0	0	0	0	3	1
33140	Impairment (drugs)	0	0	0	0	0	0	3	1

Table 116. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (<200 hp) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	8	1	3	0	0	1	4
24566	Aircraft control	0	0	3	1	1	4	2	3
24000	Planning/decision	0	0	2	2	3	1	3	2
24539	Directional control	5	1	3	1	3	1	4	1
24015	VFR flight into IMC	0	0	3	1	0	0	4	1
24580	Distance/altitude	0	0	0	0	3	1	4	1
20000	Weather condition	0	0	0	0	0	0	4	1
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	4	1
24562	Recovery from bounced landing	0	0	0	0	0	0	4	1
14007	Engine assembly, cylinder	0	0	0	0	0	0	4	1

Table 117. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (<200 hp) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	32	1	16	1	18	1	12
24566	Aircraft control	0	0	6	4	4	7	1	12
24026	Compensation for wind conditions	2	20	1	16	2	12	3	5
24506	Airspeed	5	14	2	12	4	7	4	4
24001	Preflight planning/preparation	6	9	7	3	5	6	4	4
24010	In-flight planning/decision	11	4	6	4	3	8	6	3
24505	Aborted takeoff	12	3	9	1	10	1	6	3
24535	Flare	2	20	3	10	2	12	8	2
17001	Fluid, fuel	4	15	5	5	2	12	8	2
24526	Clearance	9	6	5	5	10	1	8	2

Table 118. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	1	10	1	14	1	7
24024	Instrument flight rules procedure	1	10	3	3	2	4	2	2
24000	Planning/decision	0	0	5	1	4	2	2	2
24716	Navaid Signal	0	0	0	0	0	0	2	2
24010	In-flight planning/decision	4	4	2	4	4	2	5	1
24506	Airspeed	7	1	4	2	2	4	5	1
24577	Altitude/clearance	0	0	5	1	4	2	5	1
17001	Fluid, fuel	7	1	5	1	0	0	5	1
24555	Wheels-down landing in water	0	0	0	0	0	0	5	1
24115	Maintenance, replacement	0	0	0	0	0	0	5	1

Table 119. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24001	Preflight planning/preparation	2	2	2	2	3	1	1	1
24010	In-flight planning/decision	3	1	3	1	3	1	1	1
24026	Compensation for wind conditions	3	1	3	1	0	0	1	1
24545	Emergency procedure	0	0	2	2	0	0	1	1
24111	Maintenance, installation	3	1	0	0	0	0	1	1
14707	Accessory drive assembly, drive gear	0	0	0	0	0	0	1	1
15100	Fuel system	3	1	0	0	3	1	0	0
24529	Minimum descent altitude	3	1	3	1	0	0	0	0
24504	Aborted landing	3	1	0	0	0	0	0	0
24028	Wrong runway	3	1	0	0	0	0	0	0

Table 120. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the New England Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	10	5	4	7	1	1	7
24535	Flare	6	3	3	6	2	6	2	6
24566	Aircraft control	0	0	4	5	1	10	3	5
24562	Recovery from bounced landing	7	2	8	1	6	2	4	3
24526	Clearance	7	2	0	0	6	2	4	3
24026	Compensation for wind conditions	5	4	1	12	5	3	6	2
24506	Airspeed	1	10	2	7	7	1	6	2
17001	Fluid, fuel	2	8	5	4	5	3	6	2
20000	Weather condition	0	0	6	3	0	0	6	2
24032	Procedures/directives	8	1	8	1	7	1	6	2

7. NORTHWEST MOUNTAIN REGION.

This section discusses the Northwest Mountain Region, which consists of Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming.

7.1 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS.

Tables 121 through 123 show the frequency and rank of the top ten initiating causes of GA accidents between 1982 and 2009. The rank was based on four 7-year periods (1982-1988, 1989-1995, 1996-2002, and 2003-2009) and was sorted on the last period (2003-2009) in ascending order.

Table 121 shows that, unlike the other regions and nationwide, clearance was the number one initiating cause of Fatal GA accidents during the 2003-2009 period. But like the other regions and nationwide, aircraft control and directional control were number one for the last period (2003-2009) in Serious and Minor/None GA accidents, respectively.

Table 121. Top Ten Initiating Causes of Fatal GA Accidents in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24526	Clearance	14	6	4	25	2	34	1	29
24566	Aircraft control	43	1	3	27	1	43	2	28
24506	Airspeed	5	19	4	25	3	27	3	27
24010	In-flight planning/decision	1	65	2	29	6	11	4	15
24577	Altitude/clearance	80	0	18	4	5	14	5	12
24511	Airspeed, stall (V_S)	11	7	7	10	20	2	6	10
24023	Flight into known adverse weather	3	34	12	7	14	4	7	6
24015	VFR flight into IMC	2	43	1	37	4	25	7	6
24001	Preflight planning/preparation	4	27	10	8	7	6	7	6
24036	Flight into adverse weather	80	0	21	3	9	5	7	6

V_S = Stalling speed

Table 122. Top Ten Initiating Causes of Serious GA Accidents in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	80	0	9	3	2	9	1	17
24506	Airspeed	4	9	5	10	4	6	2	12
24526	Clearance	18	2	3	12	6	5	3	8
17001	Fluid, fuel	3	10	1	13	1	13	4	6
24010	In-flight planning/decision	1	15	1	13	4	6	5	5

Table 122. Top Ten Initiating Causes of Serious GA Accidents in the Northwest Mountain Region (Continued)

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24026	Compensation for wind conditions	27	1	14	2	6	5	6	4
15109	Fuel system, carburetor	80	0	9	3	63	0	7	3
24539	Directional control	27	1	27	1	6	5	8	2
24002	Aircraft preflight	6	4	7	4	12	2	8	2
24518	Altitude	27	1	7	4	63	0	8	2

Table 123. Top Ten Initiating Causes of Minor/None GA Accidents in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	110	1	163	1	155	1	136
24566	Aircraft control	N/A	0	15	15	3	50	2	101
24026	Compensation for wind conditions	2	91	2	66	2	86	3	56
24535	Flare	5	65	5	32	6	36	4	40
24010	In-flight planning/decision	3	76	4	44	8	26	5	35
24526	Clearance	12	18	5	32	4	41	6	33
24506	Airspeed	9	30	7	30	7	33	7	29
17001	Fluid, fuel	6	62	3	64	5	37	8	27
24001	Preflight planning/preparation	4	70	10	21	10	24	9	18
24581	Distance/speed	N/A	0	110	1	29	8	10	12

7.2 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO PILOT EXPERIENCE.

Tables 124 through 138 show the frequency and rank of each category based on pilot experience, measured in hours. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 124. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24010	In-flight planning/decision	1	8	3	1	4	1	1	1
24526	Clearance	3	1	2	2	1	5	1	1
24511	Airspeed, stall (V_S)	0	0	1	3	0	0	1	1
24015	VFR flight into IMC	3	1	0	0	4	1	1	1
24618	Visual separation	0	0	0	0	0	0	1	1
24527	Climb	0	0	0	0	0	0	1	1
24036	Flight into adverse weather	0	0	0	0	0	0	1	1
24566	Aircraft control	0	0	0	0	3	2	0	0
24023	Flight into known adverse weather	2	2	0	0	0	0	0	0
24528	Proper climb rate	3	1	0	0	0	0	0	0

V_S = Stalling speed

Table 125. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	0	0	3	1	1	1	1	3
24526	Clearance	0	0	3	1	0	0	1	3
24518	Altitude	3	1	0	0	0	0	3	1
24010	In-flight planning/decision	1	3	1	3	0	0	0	0
24539	Directional control	0	0	3	1	1	1	0	0
24566	Aircraft control	0	0	3	1	0	0	0	0
24519	Proper altitude	0	0	3	1	0	0	0	0
24535	Flare	3	1	0	0	0	0	0	0
24011	Wind information	3	1	0	0	0	0	0	0
24000	Planning/decision	0	0	3	1	0	0	0	0

Table 126. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	25	1	37	1	28	1	21
24535	Flare	1	27	2	14	2	11	2	14
24566	Aircraft control	0	0	9	1	3	10	3	9
24026	Compensation for wind conditions	3	23	3	10	4	7	4	4
24562	Recovery from bounced landing	6	6	5	5	5	6	5	3
24010	In-flight planning/decision	4	14	4	8	7	3	6	2
24506	Airspeed	7	5	6	4	6	4	6	2
24021	Visual lookout	9	3	9	1	8	2	6	2
24526	Clearance	11	1	8	2	9	1	6	2
24577	Altitude/clearance	0	0	9	1	9	1	6	2

Table 127. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	4	3	1	9	1	7
24526	Clearance	0	0	5	2	3	4	2	4
24010	In-flight planning/decision	3	10	1	6	4	2	3	3
24506	Airspeed	5	4	1	6	0	0	4	2
24021	Visual lookout	7	2	6	1	0	0	4	2
24015	VFR flight into IMC	1	13	2	5	2	6	6	1
24023	Flight into known adverse weather	2	11	5	2	0	0	6	1
24577	Altitude/clearance	0	0	0	0	4	2	6	1
24539	Directional control	0	0	0	0	5	1	6	1
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	6	1

Table 128. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	0	0	2	1	1	3
24010	In-flight planning/decision	2	3	1	4	2	1	2	1
24526	Clearance	0	0	2	3	2	1	2	1
24026	Compensation for wind conditions	0	0	0	0	2	1	2	1
24627	Supervision	0	0	0	0	0	0	2	1
24544	Missed approach	0	0	0	0	0	0	2	1
24032	Procedures/directives	0	0	0	0	0	0	2	1
24015	VFR flight into IMC	1	4	4	1	2	1	0	0
24519	Proper altitude	4	1	4	1	0	0	0	0
24523	Distance	3	2	0	0	0	0	0	0

Table 129. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	24	1	30	1	34	1	27
24566	Aircraft control	0	0	8	2	4	7	2	20
24026	Compensation for wind conditions	2	22	2	11	2	20	3	12
24010	In-flight planning/decision	3	17	3	8	4	7	4	7
24535	Flare	5	11	4	7	3	8	5	6
24506	Airspeed	7	5	5	5	6	5	6	5
24526	Clearance	7	5	9	1	5	6	7	3
24001	Preflight planning/preparation	4	14	7	3	7	4	8	2
24029	Unsuitable terrain or takeoff/landing/taxi area	5	11	6	4	7	4	8	2
24531	Proper touchdown point	8	4	4	7	10	1	8	2

Table 130. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	11	1	3	13	2	11	1	17
24506	Airspeed	6	7	4	12	1	12	2	14
24526	Clearance	10	2	2	14	3	10	3	13
24511	Airspeed, stall (V_S)	10	2	7	3	0	0	4	8
24010	In-flight planning/decision	1	20	4	12	6	4	5	6
24577	Altitude/clearance	0	0	9	1	5	6	5	6
24023	Flight into known adverse weather	4	12	7	3	6	4	7	5
24036	Flight into adverse weather	0	0	7	3	8	2	8	4
24015	VFR flight into IMC	2	18	1	22	4	8	9	3
24001	Preflight planning/preparation	3	16	6	4	6	4	10	2

V_S = Stalling speed

Table 131. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	4	2	1	4	1	7
24506	Airspeed	2	4	2	4	3	2	2	5
24010	In-flight planning/decision	1	7	3	3	3	2	3	3
24539	Directional control	0	0	0	0	0	0	4	2
24526	Clearance	5	1	2	4	2	3	5	1
24026	Compensation for wind conditions	5	1	4	2	1	4	5	1
24505	Aborted takeoff	0	0	0	0	4	1	5	1
24518	Altitude	0	0	5	1	0	0	5	1
24583	Low-altitude flight/maneuver	0	0	0	0	0	0	5	1
22304	Carburetor heat	0	0	0	0	0	0	5	1

Table 132. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	39	1	53	1	58	1	52
24566	Aircraft control	0	0	9	8	4	18	2	46
24026	Compensation for wind conditions	2	33	2	29	2	38	3	27
24526	Clearance	9	9	4	14	3	22	4	21
24535	Flare	6	15	8	9	5	15	5	19
24506	Airspeed	7	13	5	12	5	15	6	16
24010	In-flight planning/decision	3	28	3	20	6	13	7	11
24001	Preflight planning/preparation	4	25	6	11	6	13	8	10
22002	Landing gear extension	14	3	14	2	11	5	9	8
24581	Distance/speed	0	0	0	0	13	3	9	8

Table 133. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	5	3	3	3	4	3	1	7
24001	Preflight planning/preparation	5	3	0	0	5	2	2	4
24526	Clearance	7	1	1	5	1	10	3	3
24566	Aircraft control	0	0	2	4	1	10	3	3
24010	In-flight planning/decision	1	10	2	4	3	4	5	2
24577	Altitude/clearance	0	0	0	0	4	3	5	2
24511	Airspeed, stall (V_S)	0	0	0	0	0	0	5	2
24015	VFR flight into IMC	3	5	2	4	2	6	8	1
24023	Flight into known adverse weather	2	7	4	2	0	0	8	1
24000	Planning/decision	7	1	4	2	6	1	8	1

V_S = Stalling speed

Table 134. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24526	Clearance	2	1	0	0	0	0	1	2
24015	VFR flight into IMC	2	1	2	1	2	1	2	1
24506	Airspeed	2	1	2	1	0	0	2	1
24566	Aircraft control	0	0	0	0	2	1	2	1
24032	Procedures/directives	2	1	0	0	0	0	2	1
24542	Remedial action	0	0	0	0	0	0	2	1
22001	Landing gear retraction	0	0	0	0	0	0	2	1
24551	Stall	2	1	1	2	0	0	0	0
22201	Fuel tank selector position	1	2	0	0	0	0	0	0
24524	Descent	2	1	0	0	0	0	0	0

Table 135. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	10	1	14	1	18	1	23
24566	Aircraft control	0	0	6	2	4	6	2	16
24026	Compensation for wind conditions	4	7	2	12	2	12	3	7
24526	Clearance	0	0	3	5	4	6	4	6
24506	Airspeed	5	4	5	3	3	7	5	5
24010	In-flight planning/decision	2	10	6	2	9	1	5	5
24535	Flare	5	4	0	0	8	2	7	4
24531	Proper touchdown point	8	1	5	3	8	2	7	4
24001	Preflight planning/preparation	1	11	6	2	8	2	9	3
24518	Altitude	7	2	5	3	9	1	9	3

Table 136. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥5000 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24526	Clearance	5	1	6	1	4	4	1	8
24566	Aircraft control	0	0	1	7	1	10	2	5
24506	Airspeed	0	0	3	4	2	8	2	5
24577	Altitude/clearance	0	0	4	3	5	1	4	4
24010	In-flight planning/decision	1	11	2	5	0	0	5	3
24015	VFR flight into IMC	2	5	2	5	3	5	6	2
24502	Abort	0	0	0	0	0	0	6	2
24021	Visual lookout	5	1	3	4	4	4	8	1
24001	Preflight planning/preparation	5	1	6	1	0	0	8	1
24036	Flight into adverse weather	0	0	0	0	5	1	8	1

Table 137. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥5000 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	0	0	2	1	1	5
24506	Airspeed	2	1	2	1	0	0	2	4
24010	In-flight planning/decision	2	1	1	2	0	0	3	1
24002	Aircraft preflight	2	1	0	0	2	1	3	1
24518	Altitude	0	0	2	1	0	0	3	1
24021	Visual lookout	0	0	0	0	0	0	3	1
24627	Supervision	0	0	0	0	0	0	3	1
24524	Descent	0	0	0	0	0	0	3	1
24026	Compensation for wind conditions	0	0	0	0	0	0	3	1
24015	VFR flight into IMC	2	1	0	0	0	0	0	0

Table 138. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	8	1	25	1	17	1	24
24566	Aircraft control	0	0	6	2	2	9	2	21
24010	In-flight planning/decision	4	4	4	4	0	0	3	7
24026	Compensation for wind conditions	4	4	5	3	3	7	4	5
24021	Visual lookout	6	2	6	2	4	6	5	4
24542	Remedial action	0	0	6	2	7	3	6	3
22004	Brakes (normal)	7	1	0	0	5	5	7	2
24022	Weather evaluation	6	2	5	3	0	0	7	2
24530	Proper alignment	7	1	7	1	9	1	7	2
24556	Wheels-up landing	0	0	0	0	0	0	7	2

7.3 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS BASED ON AIRCRAFT COMPLEXITY.

Tables 139 through 144 show the frequency and rank of each category based on aircraft engine power. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 139. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24526	Clearance	11	3	1	17	2	19	1	17
24506	Airspeed	2	18	3	15	2	19	2	15
24566	Aircraft control	0	0	5	13	1	24	3	14
24010	In-flight planning/decision	1	33	4	14	3	7	4	8
24511	Airspeed, stall (V_S)	9	5	6	7	7	2	5	6
24001	Preflight planning/preparation	4	14	10	3	7	2	6	4
24577	Altitude/clearance	0	0	11	2	3	7	7	3
15109	Fuel system, carburetor	0	0	0	0	0	0	7	3
24021	Visual lookout	3	15	6	7	6	3	9	2
24023	Flight into known adverse weather	5	12	11	2	0	0	9	2

V_S = Stalling speed

Table 140. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (<200 hp) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	7	3	3	5	1	11
24506	Airspeed	3	7	2	10	2	6	2	8
24526	Clearance	7	3	1	11	3	5	3	6
17001	Fluid, fuel	4	6	6	4	2	6	4	4
24010	In-flight planning/decision	2	8	3	9	4	4	5	3
24026	Compensation for wind conditions	9	1	0	0	4	4	5	3
24518	Altitude	9	1	7	3	0	0	7	1
24542	Remedial action	0	0	9	1	7	1	7	1
14501	Propeller system/accessories, blade	9	1	0	0	7	1	7	1
14007	Engine assembly, cylinder	0	0	0	0	7	1	7	1

Table 141. Top Ten Initiating Causes of Minor/None Fatal GA Accidents Based on Aircraft Engine Power (<200 hp) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	15	8	4	30	1	60
24539	Directional control	1	66	1	101	1	113	2	48
17001	Fluid, fuel	6	35	3	37	7	22	3	22
24535	Flare	4	50	5	25	6	24	4	17
24010	In-flight planning/decision	3	52	5	25	7	22	4	17
24026	Compensation for wind conditions	2	65	2	40	2	45	6	16
24526	Clearance	11	15	4	26	3	34	7	15
24506	Airspeed	10	16	7	18	5	26	8	11
24577	Altitude/clearance	0	0	20	2	13	11	9	6
24001	Preflight planning/preparation	5	49	6	19	10	14	10	5

Table 142. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24526	Clearance	10	7	2	19	1	27	1	20
24566	Aircraft control	15	1	3	17	2	21	2	16
24506	Airspeed	12	4	4	14	4	11	3	12
24577	Altitude/clearance	0	0	9	5	4	11	4	9
24010	In-flight planning/decision	1	42	2	19	7	5	5	7
24015	VFR flight into IMC	2	30	1	25	3	20	6	6
17001	Fluid, fuel	15	1	11	3	9	3	6	6
24021	Visual lookout	9	8	7	7	5	8	8	5
24036	Flight into adverse weather	0	0	11	3	8	4	8	5
24023	Flight into known adverse weather	3	24	6	8	6	7	10	4

Table 143. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	6	2	4	4	1	6
24526	Clearance	5	5	4	4	2	8	2	4
24010	In-flight planning/decision	1	13	2	6	3	5	3	2
24506	Airspeed	4	6	6	2	7	1	3	2
24539	Directional control	9	1	7	1	4	4	3	2
15109	Fuel system, carburetor	0	0	0	0	0	0	3	2
24026	Compensation for wind conditions	9	1	6	2	7	1	7	1
24518	Altitude	8	2	7	1	0	0	7	1
15209	Lubricating system, oil gasket	0	0	7	1	0	0	7	1
24505	Aborted takeoff	0	0	0	0	7	1	7	1

Table 144. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Northwest Mountain Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	57	1	71	2	45	1	31
24566	Aircraft control	0	0	13	8	5	26	2	29
24526	Clearance	11	13	5	22	3	30	3	22
17001	Fluid, fuel	2	44	2	41	4	29	4	16
24026	Compensation for wind conditions	4	35	3	36	1	50	5	15
24010	In-flight planning/decision	5	34	4	26	12	9	5	15
24535	Flare	9	20	9	12	7	15	7	14
24001	Preflight planning/preparation	3	40	13	8	8	14	8	10
10426	Landing gear, normal retraction/extension assembly	19	4	19	2	18	3	9	8
22002	Landing gear extension	19	4	15	6	13	8	10	7

8. SOUTHERN REGION.

This section discusses the Southern Region, which consists of Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Puerto Rico, South Carolina, and Tennessee.

8.1 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS.

Tables 145 through 147 show the frequency and rank of the top ten initiating causes of GA accidents between 1982 and 2009. The rank was based on four 7-year periods (1982-1988, 1989-1995, 1996-2002, and 2003-2009) and was sorted on the last period (2003-2009) in ascending order.

Tables 145 and 146 show that airspeed is the number one initiating cause of Fatal and Serious GA accidents during the last period. Table 147 shows directional control is the number one initiating cause for Minor/None GA accidents for the last two periods.

Table 145. Top Ten Initiating Causes of Fatal GA Accidents in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	2	33	2	34	1	44	1	32
24566	Aircraft control	51	1	3	32	2	25	2	26
24015	VFR flight into IMC	1	36	1	42	4	22	3	20
24511	Airspeed, stall (V_S)	21	5	4	25	2	25	4	14
17001	Fluid, fuel	9	13	13	7	5	14	5	10
24021	Visual lookout	10	11	9	10	7	10	5	10
24526	Clearance	19	6	6	12	7	10	7	9
24577	Altitude/clearance	130	0	22	4	6	11	7	9
33400	Spatial disorientation	37	2	28	3	9	9	7	9
24023	Flight into known adverse weather	3	32	6	12	11	7	7	9

V_S = Stalling speed

Table 146. Top Ten Initiating Causes of Serious GA Accidents in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	6	9	2	16	1	17	1	26
17001	Fluid, fuel	1	38	1	28	1	17	2	9
24001	Preflight planning/preparation	3	20	4	7	8	5	3	8
24010	In-flight planning/decision	2	22	3	10	3	8	4	7
24002	Aircraft preflight	5	10	4	7	13	3	5	5
22205	Fuel management	97	0	36	1	13	3	6	4
24511	Airspeed, stall (V_S)	17	3	4	7	5	6	6	4
24566	Aircraft control	97	0	9	5	4	7	6	4
24505	Aborted takeoff	97	0	87	0	72	0	6	4
24111	Maintenance, installation	97	0	23	2	18	2	10	3

V_S = Stalling speed

Table 147. Top Ten Initiating Causes of Minor/None GA Accidents in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	110	2	85	1	129	1	145
24535	Flare	4	87	3	62	2	68	2	85
24506	Airspeed	7	50	6	36	7	30	3	36
24566	Aircraft control	139	1	14	17	9	29	4	34
24562	Recovery from bounced landing	43	10	23	10	10	25	5	28
17001	Fluid, fuel	1	122	1	94	3	48	6	25
24026	Compensation for wind conditions	5	70	4	48	7	30	7	23
24531	Proper touchdown point	23	17	15	16	12	18	8	18
24111	Maintenance, installation	88	3	39	6	13	16	9	17
24001	Preflight planning/preparation	6	62	9	29	6	33	9	17

8.2 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO PILOT EXPERIENCE.

Tables 148 through 162 show the frequency and rank of each category based on pilot experience, measured in hours. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 148. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	2	2	3	1	1	3
24506	Airspeed	4	2	2	2	1	4	2	2
24526	Clearance	5	1	3	1	1	4	3	1
24021	Visual lookout	5	1	1	3	0	0	3	1
24512	Airspeed, stall in the landing configuration (V _{SO})	0	0	3	1	3	1	3	1
24000	Planning/decision	0	0	3	1	0	0	3	1
24538	Design stress limits of aircraft	0	0	0	0	0	0	3	1
24542	Remedial action	0	0	0	0	0	0	3	1
24015	VFR flight into IMC	1	6	2	2	3	1	0	0
24531	Proper touchdown point	5	1	0	0	0	0	0	0

V_{SO} = The power off stall speed

Table 149. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	3	1	1	2	1	1	4
24511	Airspeed, stall (V _S)	0	0	1	1	1	2	2	1
24010	In-flight planning/decision	2	2	1	1	0	0	2	1
24562	Recovery from bounced landing	3	1	0	0	2	1	2	1
24566	Aircraft control	0	0	1	1	0	0	2	1
24022	Weather evaluation	3	1	0	0	0	0	2	1
24551	Stall	0	0	0	0	0	0	2	1
24026	Compensation for wind conditions	0	0	0	0	0	0	2	1
24014	Became lost/disoriented	1	3	0	0	0	0	0	0
22304	Carburetor heat	3	1	1	1	0	0	0	0

V_S = Stalling speed

Table 150. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	41	1	34	1	36	1	39
24535	Flare	2	39	2	21	2	22	1	39
24562	Recovery from bounced landing	10	5	5	6	3	14	3	19
24566	Aircraft control	0	0	5	6	5	6	4	7
24026	Compensation for wind conditions	3	19	3	9	4	8	5	5
24506	Airspeed	5	12	6	5	8	2	6	3
24627	Supervision	14	1	10	1	8	2	6	3
24542	Remedial action	13	2	0	0	9	1	6	3
24000	Planning/decision	9	6	4	7	7	3	9	2
24526	Clearance	12	3	8	3	9	1	9	2

Table 151. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	3	4	2	6	1	11
24506	Airspeed	6	4	2	6	1	8	2	6
24518	Altitude	5	5	2	6	7	1	3	2
24511	Airspeed, stall (V_S)	0	0	3	4	3	5	3	2
24001	Preflight planning/preparation	6	4	3	4	7	1	3	2
24015	VFR flight into IMC	1	12	1	9	5	3	6	1
24526	Clearance	9	1	4	3	7	1	6	1
24000	Planning/decision	9	1	5	2	7	1	6	1
33400	Spatial disorientation	0	0	0	0	7	1	6	1
24536	Go-around	9	1	0	0	0	0	6	1

V_S = Stalling speed

Table 152. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	4	1	3	1	3	1	1	6
24010	In-flight planning/decision	1	4	2	2	1	3	2	3
24001	Preflight planning/preparation	2	3	1	3	0	0	3	2
24535	Flare	4	1	0	0	3	1	3	2
24511	Airspeed, stall (V_S)	0	0	2	2	3	1	5	1
24002	Aircraft preflight	4	1	3	1	3	1	5	1
24566	Aircraft control	0	0	0	0	2	2	5	1
24526	Clearance	0	0	3	1	0	0	5	1
24592	Torque/P-factor	0	0	0	0	0	0	5	1
22205	Fuel management	0	0	0	0	0	0	5	1

V_S = Stalling speed

Table 153. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	5	11	1	12	1	23	1	26
24535	Flare	4	12	2	11	2	12	2	23
24506	Airspeed	3	13	2	11	6	7	3	5
24566	Aircraft control	0	0	10	1	5	8	3	5
24002	Aircraft preflight	12	2	0	0	10	2	3	5
24505	Aborted takeoff	12	2	10	1	11	1	6	4
24030	Checklist	12	2	10	1	0	0	6	4
24010	In-flight planning/decision	1	16	4	8	4	9	8	3
24000	Planning/decision	11	3	5	7	8	4	8	3
24021	Visual lookout	8	7	4	8	3	11	10	2

Table 154. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	2	17	3	13	1	18
24506	Airspeed	1	15	1	19	1	17	2	16
24015	VFR flight into IMC	2	13	2	17	4	10	3	11
24511	Airspeed, stall (V_S)	10	2	3	12	2	15	4	9
24023	Flight into known adverse weather	5	10	5	6	5	5	5	5
24024	Instrument flight rules procedure	5	10	7	4	5	5	5	5
24021	Visual lookout	7	6	8	3	4	10	5	5
24001	Preflight planning/preparation	4	11	6	5	7	3	8	4
24010	In-flight planning/decision	6	7	8	3	7	3	8	4
24526	Clearance	0	0	6	5	5	5	10	3

V_S = Stalling speed

Table 155. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	5	3	1	11	1	7	1	10
24010	In-flight planning/decision	2	7	4	1	2	5	2	3
24001	Preflight planning/preparation	1	8	4	1	5	1	2	3
24539	Directional control	0	0	4	1	5	1	2	3
24505	Aborted takeoff	0	0	0	0	5	1	2	3
24021	Visual lookout	4	4	3	2	3	3	6	2
24002	Aircraft preflight	3	5	3	2	5	1	6	2
24566	Aircraft control	0	0	0	0	3	3	6	2
22004	Brakes (normal)	0	0	0	0	0	0	6	2
24511	Airspeed, stall (V_S)	7	1	2	3	4	2	10	1

V_S = Stalling speed

Table 156. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	3	25	1	26	1	40	1	46
24506	Airspeed	9	10	7	14	6	13	2	19
24535	Flare	4	19	4	18	2	24	3	16
24026	Compensation for wind conditions	2	27	5	16	5	15	4	10
24566	Aircraft control	18	1	13	6	10	8	5	9
24531	Proper touchdown point	15	4	14	5	7	12	6	8
22004	Brakes (normal)	14	5	15	4	13	4	6	8
22205	Fuel management	0	0	0	0	12	5	6	8
24021	Visual lookout	8	11	3	19	3	19	9	7
24562	Recovery from bounced landing	17	2	18	1	16	1	9	7

Table 157. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	3	3	3	3	1	11	1	4
24015	VFR flight into IMC	4	2	1	5	2	4	1	4
24511	Airspeed, stall (V_S)	0	0	2	4	3	3	1	4
24566	Aircraft control	0	0	2	4	2	4	4	3
24021	Visual lookout	4	2	4	2	3	3	4	3
24010	In-flight planning/decision	2	4	0	0	5	1	4	3
24577	Altitude/clearance	0	0	0	0	4	2	4	3
24023	Flight into known adverse weather	1	5	0	0	0	0	8	2
24007	Operation with known deficiencies in equipment	0	0	5	1	0	0	8	2
24512	Airspeed, stall in the landing configuration (V_{SO})	0	0	5	1	5	1	10	1

V_S = Stalling speed

V_{SO} = The power off stall speed

Table 158. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	4	1	2	2	1	3	1	4
24021	Visual lookout	3	2	3	1	0	0	2	2
22205	Fuel management	0	0	0	0	2	2	2	2
24002	Aircraft preflight	0	0	3	1	0	0	2	2
24001	Preflight planning/preparation	2	3	0	0	3	1	5	1
24512	Airspeed, stall in the landing configuration (V_{SO})	0	0	3	1	0	0	5	1
22100	Flight controls	4	1	0	0	0	0	5	1
24518	Altitude	0	0	0	0	0	0	5	1
24542	Remedial action	0	0	0	0	0	0	5	1
24577	Altitude/clearance	0	0	0	0	0	0	5	1

V_{SO} = The power off stall speed

Table 159. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	12	2	5	1	14	1	18
24566	Aircraft control	0	0	4	3	4	5	2	8
24531	Proper touchdown point	7	2	5	2	8	1	3	7
24026	Compensation for wind conditions	5	4	1	6	7	2	4	5
24506	Airspeed	6	3	3	4	5	4	4	5
24535	Flare	3	10	2	5	5	4	6	4
24030	Checklist	6	3	6	1	7	2	6	4
24021	Visual lookout	4	7	2	5	3	6	8	3
22004	Brakes (normal)	7	2	0	0	6	3	8	3
24627	Supervision	0	0	0	0	6	3	8	3

Table 160. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	4	2	4	2	1	5	1	5
24000	Planning/decision	5	1	0	0	4	2	1	5
24010	In-flight planning/decision	3	3	5	1	4	2	3	3
24021	Visual lookout	1	5	2	4	2	4	4	2
24015	VFR flight into IMC	0	0	1	5	4	2	4	2
24526	Clearance	3	3	5	1	5	1	4	2
24024	Instrument flight rules procedure	4	2	3	3	0	0	4	2
24577	Altitude/clearance	0	0	0	0	4	2	4	2
24509	Airspeed, minimum control speed with the critical engine inoperative (V_{MC})	0	0	5	1	5	1	4	2
24036	Flight into adverse weather	0	0	0	0	0	0	4	2

V_{MC} = Minimum control speed

Table 161. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥5000 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24545	Emergency procedure	0	0	0	0	3	1	1	2
24700	Miscellaneous	0	0	0	0	0	0	1	2
24010	In-flight planning/decision	1	3	1	3	0	0	3	1
24001	Preflight planning/preparation	3	1	2	2	3	1	3	1
24627	Supervision	3	1	0	0	2	2	3	1
24506	Airspeed	0	0	0	0	1	3	3	1
24031	Judgement	2	2	0	0	0	0	3	1
24526	Clearance	0	0	3	1	0	0	3	1
22120	Trim setting	0	0	0	0	0	0	3	1
24029	Unsuitable terrain or takeoff/landing/taxi area	0	0	0	0	0	0	3	1

Table 162. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥5000 hr) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	14	2	6	1	10	1	19
24566	Aircraft control	0	0	5	1	6	2	2	7
24535	Flare	7	5	5	1	4	4	3	6
24580	Distance/altitude	0	0	0	0	0	0	4	4
24021	Visual lookout	1	15	1	8	2	8	5	3
24506	Airspeed	6	6	4	2	5	3	5	3
24000	Planning/decision	7	5	5	1	7	1	5	3
22004	Brakes (normal)	11	1	4	2	7	1	5	3
24511	Airspeed, stall (V_S)	0	0	0	0	0	0	5	3
24544	Missed approach	0	0	0	0	0	0	5	3

V_S = Stalling speed

8.3 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS BASED ON AIRCRAFT COMPLEXITY.

Tables 163 through 168 show the frequency and rank of each category based on aircraft engine power. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 163. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (<200 hp) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	25	1	25	1	24	1	23
24015	VFR flight into IMC	2	22	2	19	5	7	2	10
24566	Aircraft control	0	0	5	9	3	10	3	8
24021	Visual lookout	4	14	4	13	3	10	4	7
24511	Airspeed, stall (V _S)	10	5	3	16	2	13	5	6
24526	Clearance	10	5	6	8	4	8	5	6
24001	Preflight planning/preparation	6	12	6	8	9	1	7	3
17001	Fluid, fuel	9	7	9	3	5	7	7	3
24024	Instrument flight rules procedure	12	3	0	0	9	1	7	3
24518	Altitude	9	7	4	13	7	3	10	2

V_S = Stalling speed

Table 164. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (<200 hp) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	5	6	2	11	1	13	1	22
17001	Fluid, fuel	2	15	1	15	2	9	2	6
24010	In-flight planning/decision	1	16	3	6	3	5	2	6
24001	Preflight planning/preparation	3	12	4	5	0	0	4	5
24002	Aircraft preflight	5	6	3	6	4	3	5	3
24566	Aircraft control	0	0	6	3	3	5	5	3
24535	Flare	6	4	8	1	4	3	5	3
24526	Clearance	7	3	5	4	0	0	5	3
24021	Visual lookout	4	11	5	4	3	5	9	2
24539	Directional control	9	1	4	5	3	5	9	2

Table 165. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (<200 hp) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	79	1	69	1	85	1	72
24535	Flare	3	67	3	44	2	50	2	56
24566	Aircraft control	29	1	12	13	7	20	3	19
17001	Fluid, fuel	2	68	2	54	4	35	4	18
24506	Airspeed	6	40	6	29	6	24	5	16
24026	Compensation for wind conditions	5	56	4	34	7	20	6	15
24562	Recovery from bounced landing	22	8	16	9	7	20	6	15
24021	Visual lookout	8	33	5	30	3	38	8	11
20200	Object	27	3	19	6	16	6	9	9
24526	Clearance	16	14	8	24	12	11	10	8

Table 166. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	14	1	1	25	1	21	1	25
24015	VFR flight into IMC	5	14	2	24	3	18	2	10
24506	Airspeed	7	10	4	9	2	19	3	9
20000	Weather condition	13	2	10	2	10	3	3	9
24023	Flight into known adverse weather	1	20	5	7	9	4	5	7
24021	Visual lookout	8	7	4	9	4	14	5	7
17001	Fluid, fuel	9	6	7	5	6	7	5	7
24511	Airspeed, stall (V_S)	14	1	6	6	5	9	5	7
24577	Altitude/clearance	0	0	11	1	5	9	5	7
24010	In-flight planning/decision	3	18	4	9	6	7	10	6

V_S = Stalling speed

Table 167. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
17001	Fluid, fuel	1	27	1	16	1	11	1	3
24506	Airspeed	3	5	2	5	4	4	1	3
24566	Aircraft control	0	0	3	3	5	3	1	3
24010	In-flight planning/decision	2	9	2	5	3	6	4	2
24001	Preflight planning/preparation	2	9	4	2	5	3	4	2
24002	Aircraft preflight	5	3	2	5	0	0	4	2
22201	Fuel tank selector position	5	3	3	3	6	2	4	2
24511	Airspeed, stall (V_s)	5	3	5	1	6	2	4	2
22205	Fuel management	0	0	5	1	5	3	4	2
17002	Fluid, oil	7	1	5	1	0	0	4	2

V_s = Stalling speed

Table 168. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Southern Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	46	4	19	1	46	1	43
24535	Flare	8	26	3	21	4	19	2	21
17001	Fluid, fuel	1	76	1	52	3	27	3	15
24506	Airspeed	13	16	7	15	10	9	4	13
24566	Aircraft control	0	0	13	6	6	17	4	13
22205	Fuel management	0	0	18	1	13	6	4	13
24111	Maintenance, installation	22	6	12	7	9	10	7	10
24531	Proper touchdown point	22	6	11	9	13	6	8	9
24026	Compensation for wind conditions	10	23	5	18	9	10	9	8
24526	Clearance	12	18	10	10	5	18	9	8

9. SOUTHWEST REGION.

This section discusses the Southwest Region, which consists of Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.

9.1 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS.

Tables 169 through 171 show the frequency and rank of the top ten initiating causes of GA accidents between 1982 and 2009. The rank was based on four 7-year periods (1982-1988, 1989-1995, 1996-2002, and 2003-2009) and was sorted by the last period (2003-2009) in ascending order.

Table 169 shows that aircraft control is the number one initiating cause of Fatal GA accidents for the last three periods (1989-2009). Airspeed, on the other hand, was ranked in the top three initiating causes of Fatal accidents since 1982, and became the number one initiating cause, along with aircraft control, in the 2003-2009 period.

Table 169. Top Ten Initiating Causes of Fatal GA Accidents in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	29	3	1	28	1	51	1	33
24506	Airspeed	2	33	3	21	3	18	1	33
24526	Clearance	19	5	6	10	2	19	3	12
24010	In-flight planning/decision	6	21	17	4	8	8	4	8
24577	Altitude/clearance	0	0	20	3	5	11	5	5
24001	Preflight planning/preparation	4	22	39	1	23	1	6	4
24036	Flight into adverse weather	0	0	23	2	6	10	6	4
24511	Airspeed, stall (V_S)	16	6	6	10	12	6	8	3
24562	Recovery from bounced landing	50	1	0	0	0	0	9	2
24538	Design stress limits of aircraft	29	3	23	2	0	0	9	2

V_S = Stalling speed

The top three initiating causes for Serious GA accidents (table 170) were the same as Fatal accidents (table 169). However, fluid, fuel was the number one initiating cause from 1982 to 2002.

Table 170. Top Ten Initiating Causes of Serious GA Accidents in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	97	0	5	5	2	11	1	9
24506	Airspeed	2	17	3	7	3	8	2	8
24526	Clearance	15	3	4	6	3	8	3	6
17001	Fluid, fuel	1	33	1	12	1	16	3	6

Table 170. Top Ten Initiating Causes of Serious GA Accidents in the Southwest Region
(Continued)

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	43	1	14	2	5	5	5	3
22303	Mixture	97	0	77	0	64	0	6	2
24535	Flare	23	2	5	5	12	2	6	2
24001	Preflight planning/preparation	3	15	14	2	64	0	6	2
24026	Compensation for wind conditions	9	4	14	2	5	5	6	2
24010	In-flight planning/decision	5	9	27	1	64	0	6	2

Despite being the number one initiating cause for Minor/None GA accidents for three different periods, directional control was second between 1989 and 1995, as shown in table 171. This pattern is different than the nationwide trend and most of the other regions in which directional control was usually the number one initiating cause in all four periods.

Table 171. Top Ten Initiating Causes of Minor/None GA Accidents in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	118	2	76	1	85	1	74
24566	Aircraft control	N/A	0	9	15	3	54	2	40
24026	Compensation for wind conditions	3	74	3	57	4	49	3	32
24535	Flare	4	54	4	33	5	41	4	30
24010	In-flight planning/decision	7	48	26	6	23	6	5	26
24506	Airspeed	6	52	6	18	7	16	6	25
24526	Clearance	14	19	5	21	6	23	7	22
17001	Fluid, fuel	2	86	1	90	2	79	8	19
24562	Recovery from bounced landing	32	10	15	11	9	13	9	16
24001	Preflight planning/preparation	5	53	9	15	16	9	10	10

9.2 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO PILOT EXPERIENCE.

Tables 172 through 186 show the frequency and rank of each category based on pilot experience, measured in hours. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 172. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	7	2	2	0	0	1	3
24566	Aircraft control	0	0	1	3	1	5	1	3
24036	Flight into adverse weather	0	0	0	0	3	1	1	3
24026	Compensation for wind conditions	0	0	0	0	0	0	4	2
24552	Stall/spin	4	1	3	1	0	0	5	1
24577	Altitude/clearance	0	0	0	0	0	0	5	1
24021	Visual lookout	2	3	3	1	3	1	0	0
24000	Planning/decision	4	1	3	1	3	1	0	0
24010	In-flight planning/decision	0	0	3	1	2	2	0	0
24015	VFR flight into IMC	0	0	2	2	0	0	0	0

The number of Serious accidents related to pilots with less than 100 hours of experience is very low. In total, there are only six occurrences between 2003 and 2009. Each initiating cause has only one occurrence, as shown in table 173.

Table 173. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	3	1	1	2	1	2	1	1
24010	In-flight planning/decision	2	3	0	0	0	0	1	1
24026	Compensation for wind conditions	3	1	2	1	0	0	1	1
24535	Flare	0	0	2	1	0	0	1	1
24577	Altitude/clearance	0	0	0	0	0	0	1	1
24001	Preflight planning/preparation	0	0	0	0	0	0	1	1
24031	Judgement	1	4	0	0	2	1	0	0
24525	Proper descent rate	0	0	0	0	2	1	0	0
24539	Directional control	0	0	2	1	0	0	0	0
24551	Stall	0	0	2	1	0	0	0	0

Similar to other pilot experience categories, directional control is the number one initiating cause of Minor/None GA accidents involving pilots with less than 100 hours of experience, as shown in table 174.

Table 174. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	42	1	25	1	19	1	17
24535	Flare	2	21	2	12	2	18	2	15
24026	Compensation for wind conditions	3	19	3	10	3	10	3	11
24562	Recovery from bounced landing	7	4	5	4	4	8	4	7
24566	Aircraft control	0	0	7	2	4	8	5	5
24526	Clearance	6	5	6	3	5	5	6	4
24506	Airspeed	4	8	7	2	0	0	6	4
24010	In-flight planning/decision	4	8	0	0	0	0	8	3
24523	Distance	6	5	0	0	0	0	9	1
24564	Porpoise/pilot-induced oscillation	0	0	8	1	0	0	9	1

Table 175. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	3	7	2	5	3	3	1	4
24566	Aircraft control	7	1	4	3	1	7	2	3
24001	Preflight planning/preparation	2	8	6	1	0	0	3	2
24526	Clearance	0	0	5	2	5	1	3	2
24015	VFR flight into IMC	1	13	1	7	4	2	5	1
24010	In-flight planning/decision	4	4	0	0	5	1	5	1
24519	Proper altitude	5	3	6	1	0	0	5	1
24583	Low-altitude flight/maneuver	0	0	0	0	5	1	5	1
24538	Design stress limits of aircraft	0	0	0	0	0	0	5	1
24551	Stall	0	0	3	4	5	1	0	0

Table 176. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	0	0	0	0	1	2	1	2
24566	Aircraft control	0	0	2	1	2	1	1	2
24506	Airspeed	3	2	1	2	1	2	3	1
24001	Preflight planning/preparation	1	5	0	0	0	0	3	1
24526	Clearance	0	0	2	1	2	1	3	1
22110	Raising of flaps	0	0	0	0	0	0	3	1
24022	Weather evaluation	0	0	0	0	0	0	3	1
24532	Proper glidepath	4	1	2	1	2	1	0	0
24015	VFR flight into IMC	2	3	0	0	0	0	0	0
24021	Visual lookout	2	3	0	0	0	0	0	0

Table 177. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	19	1	14	1	16	1	9
24506	Airspeed	4	12	3	6	5	3	2	7
24566	Aircraft control	0	0	4	5	4	6	2	7
24026	Compensation for wind conditions	2	15	2	10	2	10	4	6
24010	In-flight planning/decision	3	14	8	1	6	2	5	4
24562	Recovery from bounced landing	0	0	6	3	5	3	5	4
24535	Flare	6	8	2	10	3	8	7	3
24022	Weather evaluation	10	2	0	0	0	0	7	3
24526	Clearance	7	6	5	4	6	2	9	2
24531	Proper touchdown point	0	0	8	1	6	2	10	1

Table 178. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	8	2	1	13	1	21	1	16
24506	Airspeed	2	9	3	6	2	10	2	14
24526	Clearance	8	2	4	5	5	4	3	4
24023	Flight into known adverse weather	4	7	1	13	0	0	4	2
24010	In-flight planning/decision	3	8	8	1	7	2	4	2
24001	Preflight planning/preparation	3	8	0	0	8	1	4	2
24577	Altitude/clearance	0	0	8	1	6	3	4	2
24562	Recovery from bounced landing	0	0	0	0	0	0	4	2
24015	VFR flight into IMC	1	10	4	5	3	8	9	1
24024	Instrument flight rules procedure	8	2	7	2	0	0	9	1

Table 179. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	3	2	1	7	1	4
24506	Airspeed	1	7	3	2	4	2	2	3
24526	Clearance	4	1	3	2	2	4	3	2
22303	Mixture	0	0	0	0	0	0	3	2
24511	Airspeed, stall (V_S)	0	0	3	2	5	1	5	1
24021	Visual lookout	4	1	3	2	0	0	5	1
24026	Compensation for wind conditions	3	2	0	0	5	1	5	1
24010	In-flight planning/decision	3	2	0	0	0	0	5	1
24535	Flare	4	1	4	1	0	0	5	1
24536	Go-around	4	1	0	0	0	0	5	1

V_S = Stalling speed

Table 180. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	25	2	24	1	26	1	25
24566	Aircraft control	0	0	7	5	3	19	2	13
24026	Compensation for wind conditions	2	24	1	26	2	20	3	12
24506	Airspeed	3	20	4	9	6	8	4	11
24010	In-flight planning/decision	5	13	7	5	11	2	5	9
24526	Clearance	12	3	3	11	7	6	6	8
24535	Flare	7	10	4	9	4	11	7	7
24001	Preflight planning/preparation	4	19	5	8	9	4	8	4
24562	Recovery from bounced landing	10	5	10	2	11	2	9	3
24542	Remedial action	12	3	0	0	10	3	10	2

Table 181. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	1	6	1	11	1	9
24506	Airspeed	4	2	3	3	3	4	2	8
24511	Airspeed, stall (V_S)	0	0	4	2	6	1	3	3
24526	Clearance	5	1	5	1	2	6	4	2
24581	Distance/speed	0	0	0	0	0	0	4	2
24501	Aerobatics	4	2	5	1	5	2	6	1
24000	Planning/decision	5	1	4	2	6	1	6	1
24536	Go-around	5	1	0	0	0	0	6	1
24029	Unsuitable terrain or takeoff/landing/taxi area	0	0	0	0	6	1	6	1
24539	Directional control	5	1	0	0	0	0	6	1

V_S = Stalling speed

Table 182. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	3	2	1	0	0	1	2
24539	Directional control	0	0	2	1	1	2	2	1
24566	Aircraft control	0	0	2	1	2	1	2	1
24518	Altitude	0	0	2	1	0	0	2	1
24026	Compensation for wind conditions	0	0	2	1	0	0	2	1
24041	Wrong taxi route	0	0	0	0	0	0	2	1
24526	Clearance	0	0	1	2	1	2	0	0
24511	Airspeed, stall (V_S)	2	2	0	0	0	0	0	0
24536	Go-around	3	1	0	0	0	0	0	0
24519	Proper altitude	3	1	0	0	0	0	0	0

V_S = Stalling speed

Table 183. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	15	1	7	2	9	1	16
24566	Aircraft control	0	0	3	3	1	10	2	7
24535	Flare	4	5	0	0	6	2	3	5
24010	In-flight planning/decision	5	4	0	0	0	0	3	5
24020	Refueling	0	0	5	1	0	0	5	3
24026	Compensation for wind conditions	6	3	3	3	4	4	6	2
24021	Visual lookout	5	4	5	1	4	4	6	2
24030	Checklist	8	1	5	1	7	1	6	2
24526	Clearance	0	0	4	2	3	7	9	1
24562	Recovery from bounced landing	0	0	4	2	0	0	9	1

Table 184. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥5000 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	4	3	1	4	2	3	1	7
24566	Aircraft control	0	0	4	1	1	6	1	7
24526	Clearance	6	1	3	2	1	6	3	4
24010	In-flight planning/decision	3	4	3	2	3	2	4	2
24538	Design stress limits of aircraft	6	1	4	1	0	0	4	2
23100	Flight/navigation instrument(s)	0	0	0	0	0	0	4	2
24528	Proper climb rate	5	2	3	2	0	0	7	1
24577	Altitude/clearance	0	0	4	1	2	3	7	1
24036	Flight into adverse weather	0	0	0	0	2	3	7	1
22303	Mixture	0	0	0	0	0	0	7	1

Table 185. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥5000 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	0	0	1	1	1	2	1	2
24506	Airspeed	1	2	0	0	2	1	2	1
24021	Visual lookout	0	0	0	0	0	0	2	1
24000	Planning/decision	0	0	0	0	1	2	0	0
24528	Proper climb rate	0	0	1	1	0	0	0	0
24549	Starting procedure	0	0	0	0	2	1	0	0
22106	Rudder	0	0	0	0	2	1	0	0
24002	Aircraft preflight	2	1	0	0	0	0	0	0
24546	Precautionary landing	2	1	0	0	0	0	0	0
24626	Passenger briefing	2	1	0	0	0	0	0	0

Table 186. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	9	3	4	1	11	1	10
24566	Aircraft control	0	0	0	0	2	7	2	8
24506	Airspeed	8	1	6	1	6	1	3	6
24526	Clearance	5	4	5	2	3	4	4	5
24021	Visual lookout	1	9	1	7	2	7	5	4
24010	In-flight planning/decision	2	8	0	0	6	1	6	3
22002	Landing gear extension	5	4	0	0	5	2	6	3
24535	Flare	5	4	6	1	0	0	6	3
24026	Compensation for wind conditions	3	7	1	7	3	4	9	2
24001	Preflight planning/preparation	4	6	6	1	6	1	9	2

9.3 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO AIRCRAFT COMPLEXITY.

Tables 187 through 192 show the frequency and rank of both categories based on aircraft engine power.

Table 187. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (< 200 hp) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	24	3	11	3	8	1	19
24566	Aircraft control	12	2	2	13	1	26	2	15
24526	Clearance	10	4	4	9	3	8	3	4
17001	Fluid, fuel	11	3	8	5	6	3	4	3
24577	Altitude/clearance	0	0	10	3	4	6	4	3
24015	VFR flight into IMC	3	16	5	8	4	6	6	2
24010	In-flight planning/decision	7	8	12	1	5	4	6	2
24511	Airspeed, stall (V_S)	12	2	8	5	5	4	6	2
24001	Preflight planning/preparation	6	9	0	0	0	0	6	2
24562	Recovery from bounced landing	0	0	0	0	0	0	6	2

V_S = Stalling speed

Table 188. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (<200 hp) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	2	15	4	7	3	5	1	6
24566	Aircraft control	0	0	7	2	3	5	1	6
24526	Clearance	8	3	3	8	1	8	3	5
24551	Stall	9	2	1	10	6	2	4	2
24021	Visual lookout	5	9	7	2	0	0	4	2
24026	Compensation for wind conditions	8	3	6	3	3	5	4	2
24535	Flare	9	2	6	3	7	1	4	2
20000	Weather condition	9	2	0	0	0	0	4	2
24577	Altitude/clearance	0	0	8	1	0	0	4	2
15109	Fuel system, carburetor	7	4	8	1	7	1	10	1

Table 189. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (<200 hp) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	77	1	58	1	60	1	33
24566	Aircraft control	0	0	10	11	3	39	2	22
24026	Compensation for wind conditions	3	46	3	35	5	28	3	20
24535	Flare	5	34	4	25	4	30	4	18
17001	Fluid, fuel	2	53	2	53	2	52	5	17
24526	Clearance	10	17	5	18	6	22	5	17
24562	Recovery from bounced landing	18	6	13	7	9	8	7	14
24506	Airspeed	6	33	7	16	8	9	8	13
24010	In-flight planning/decision	5	34	12	8	13	4	9	11
15102	Fuel system, line	18	6	17	3	15	2	10	4

Table 190. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24566	Aircraft control	15	2	2	20	1	29	1	24
24506	Airspeed	6	14	3	13	3	11	2	15
24526	Clearance	7	11	1	21	1	29	3	11
24010	In-flight planning/decision	5	17	7	5	9	5	4	7
24577	Altitude/clearance	0	0	0	0	6	8	5	4
24021	Visual lookout	2	22	4	9	4	10	6	3
24036	Flight into adverse weather	0	0	10	2	5	9	6	3
24023	Flight into known adverse weather	3	20	3	13	13	1	8	2
17001	Fluid, fuel	9	8	9	3	10	4	8	2
24501	Aerobatics	15	2	10	2	11	3	8	2

Table 191. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24526	Clearance	5	4	1	9	1	12	1	7
17001	Fluid, fuel	1	19	2	5	1	12	2	6
24566	Aircraft control	0	0	3	4	2	9	3	3
24506	Airspeed	3	7	0	0	4	2	3	3
24010	In-flight planning/decision	5	4	0	0	5	1	5	2
20200	Object	6	3	0	0	0	0	5	2
22303	Mixture	0	0	0	0	0	0	5	2
24577	Altitude/clearance	0	0	0	0	0	0	5	2
15100	Fuel system	7	2	6	1	5	1	9	1
14100	Compressor assembly	0	0	0	0	5	1	9	1

Table 192. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Southwest Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	55	4	27	3	37	1	37
24566	Aircraft control	24	1	9	11	4	29	2	24
17001	Fluid, fuel	2	46	1	49	2	44	3	20
24526	Clearance	4	31	2	40	1	45	4	18
24506	Airspeed	3	36	10	10	7	13	5	11
15100	Fuel system	20	5	17	2	11	8	5	11
24021	Visual lookout	5	27	6	21	8	12	7	10
24535	Flare	8	22	7	15	6	17	7	10
24026	Compensation for wind conditions	4	31	3	33	5	21	9	9
24010	In-flight planning/decision	7	25	16	3	16	3	10	7

10. WESTERN-PACIFIC REGION.

This section discusses the Western-Pacific Region, which consists of Arizona, California, Hawaii, and Nevada.

10.1 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS.

Tables 193 through 195 show the frequency and rank of the top ten initiating causes of GA accidents between 1982 and 2009. The rank was based on four 7-year periods (1982-1988, 1989-1995, 1996-2002, and 2003-2009) and was sorted by the last period (2003-2009) in ascending order.

Table 193 shows that airspeed was the number one initiating cause of GA accidents during the last period, although VFR flight into IMC was the number one initiating cause for the previous three periods and contributed the highest number of initiating causes for all four periods.

Table 193. Top Ten Initiating Causes of Fatal GA Accidents in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	6	35	3	32	4	22	1	28
24526	Clearance	13	9	17	5	12	6	2	23
24015	VFR flight into IMC	1	59	1	54	1	28	3	19
24566	Aircraft control	36	2	2	35	2	27	4	16
24010	In-flight planning/decision	2	48	5	20	5	17	5	14

Table 193. Top Ten Initiating Causes of Fatal GA Accidents in the Western-Pacific Region
(Continued)

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24577	Altitude/clearance	118	0	24	3	3	24	6	12
24511	Airspeed, stall (V_S)	28	4	8	17	10	7	7	10
24021	Visual lookout	8	20	9	15	6	15	8	9
24583	Low-altitude flight/maneuver	118	0	52	1	16	4	9	7
17001	Fluid, fuel	20	6	10	13	12	6	10	5

V_S = Stalling speed

Table 194 shows the top ten initiating causes of Serious GA accidents, although there are five other initiating causes that have the same number of occurrence as engine assembly, piston. They are procedures/directives, aircraft control, VFR flight into IMC, Maintenance/installation, and one engine. As the table shows, airspeed and fluid, fuel caused the most Serious GA accidents in the last period.

Table 194. Top Ten Initiating Causes of Serious GA Accidents in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	2	16	3	12	2	7	1	10
17001	Fluid, fuel	3	15	1	30	1	22	1	10
24026	Compensation for wind condition	13	4	17	2	4	5	3	5
24539	Directional control	7	6	17	2	6	4	3	5
24532	Proper glidepath	97	0	89	0	72	0	5	3
24010	In-flight planning/decision	4	12	2	14	2	7	5	3
24002	Aircraft preflight	97	0	6	5	4	5	5	3
20000	Weather condition	26	2	5	7	20	1	5	3
14008	Engine assembly, piston	39	1	89	0	20	1	9	2
24032	Procedures/directives	13	4	17	2	72	0	9	2

For Minor/None GA accidents, directional control was the top initiating cause for four consecutive periods, as shown in table 195. This is also the trend nationwide.

Table 195. Top Ten Initiating Causes of Minor/None GA Accidents in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	148	1	143	1	133	1	123
24026	Compensation for wind conditions	3	99	3	72	2	101	2	99
24535	Flare	4	81	4	60	4	55	3	66
17001	Fluid, fuel	2	106	2	91	3	80	4	46
24506	Airspeed	11	27	9	26	5	26	5	31
24526	Clearance	20	17	15	16	8	19	6	21
24562	Recovery from bounced landing	22	16	11	24	12	18	7	19
24010	In-flight planning/decision	7	54	5	34	7	20	8	16
22002	Landing gear extension	24	15	54	4	46	4	9	13
24021	Visual lookout	6	55	7	30	6	25	10	12

10.2 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO PILOT EXPERIENCE.

Tables 196 through 210 show the frequency and rank of each category based on pilot experience, measured in hours. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 196. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (<100 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24526	Clearance	20	0	18	0	10	0	1	3
24010	In-flight planning/decision	3	2	18	0	2	2	1	3
24577	Altitude/clearance	20	0	18	0	4	1	3	2
24015	VFR flight into IMC	9	1	1	4	4	1	3	2
24511	Airspeed, stall (V_S)	3	2	2	2	10	0	3	2
24506	Airspeed	3	2	8	1	1	3	6	1
24566	Aircraft control	20	0	2	2	10	0	6	1
24718	Propeller/jet blast encounter	20	0	18	0	10	0	6	1
24543	Maneuver	20	0	18	0	4	1	9	0
24535	Flare	20	0	8	1	10	0	9	0

V_S = Stalling speed

The number of Serious accidents based on pilots with less than 100 hours of experience is very low, as shown in table 197. In total, there are only six occurrences between 2003 and 2009. Compensation for wind conditions and directional control have two occurrences each.

Table 197. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (<100 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24026	Compensation for wind conditions	3	1	8	0	8	0	1	2
24539	Directional control	2	2	8	0	8	0	1	2
24506	Airspeed	1	4	1	2	8	0	3	1
24010	In-flight planning/decision	15	0	2	1	1	1	3	1
22200	Fuel system	3	1	8	0	8	0	5	0
22204	Fuel supply	15	0	8	0	1	1	5	0
24031	Judgement	3	1	8	0	8	0	5	0
24000	Planning/decision	15	0	8	0	1	1	5	0
24519	Proper altitude	3	1	8	0	1	1	5	0
24001	Preflight planning/preparation	3	1	8	0	8	0	5	0

Similar to other pilot experience categories, directional control is the number one initiating cause of Minor/None GA accidents involving pilots with less than 100 hours of experience, as shown in table 198.

Table 198. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (<100 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	36	1	29	1	28	1	32
24535	Flare	2	31	2	24	2	19	2	26
24026	Compensation for wind conditions	3	26	3	14	3	11	3	22
24506	Airspeed	10	6	5	4	8	3	4	7
24562	Recovery from bounced landing	7	8	4	11	4	5	5	5
24526	Clearance	13	4	15	2	8	3	6	4
24580	Distance/altitude	48	0	50	0	36	0	7	3
24532	Proper glidepath	19	2	50	0	20	1	8	2
24030	Checklist	48	0	24	1	36	0	9	1
24536	Go-around	19	2	15	2	13	2	9	1

Table 199. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (100 to 299 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24526	Clearance	20	0	18	0	10	0	1	3
24506	Airspeed	3	2	18	0	2	2	1	3
24015	VFR flight into IMC	20	0	18	0	4	1	3	2
24566	Aircraft control	9	1	1	4	4	1	3	2
24511	Airspeed, stall (V_S)	3	2	2	2	10	0	3	2
24021	Visual lookout	3	2	8	1	1	3	6	1
24532	Proper glidepath	20	0	2	2	10	0	6	1
24007	Operation with known deficiencies in equipment	20	0	18	0	10	0	6	1
24577	Altitude/clearance	20	0	18	0	4	1	9	0
24539	Directional control	20	0	8	1	10	0	9	0

V_S = Stalling speed

Table 200. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (100 to 299 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24026	Compensation for wind conditions	28	0	4	2	3	1	1	2
24010	In-flight planning/decision	2	2	4	2	1	2	1	2
24002	Aircraft preflight	28	0	7	1	15	0	3	1
24024	Instrument flight rules procedure	6	1	19	0	15	0	3	1
24509	Airspeed, minimum control speed with the critical engine inoperative (V_{MC})	28	0	19	0	15	0	3	1
24015	VFR flight into IMC	6	1	2	3	15	0	3	1
24032	Procedures/directives	28	0	19	0	15	0	3	1
24543	Maneuver	6	1	19	0	15	0	8	0
24523	Distance	2	2	19	0	15	0	8	0
24517	Airspeed, reference (V_{REF})	28	0	19	0	3	1	8	0

V_{MC} = Minimum control speed
 V_{REF} = Landing approach speed

Table 201. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (100 to 299 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	37	1	26	2	15	1	22
24535	Flare	4	17	3	20	3	14	2	16
24026	Compensation for wind conditions	2	21	2	22	1	17	2	16
24526	Clearance	17	3	28	1	14	1	4	10
24562	Recovery from bounced landing	23	2	7	5	10	2	5	8
24506	Airspeed	7	7	7	5	4	8	6	7
24566	Aircraft control	61	0	16	2	14	1	7	3
24001	Preflight planning/preparation	2	21	5	8	42	0	7	3
24532	Proper glidepath	61	0	16	2	10	2	9	2
24577	Altitude/clearance	61	0	49	0	6	3	9	2

Table 202. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	3	16	2	20	3	11	1	11
24015	VFR flight into IMC	1	22	1	24	2	13	2	10
24511	Airspeed, stall (V_S)	27	1	9	6	5	6	2	10
24526	Clearance	10	5	17	2	39	0	4	9
24566	Aircraft control	48	0	3	18	1	17	4	9
24010	In-flight planning/decision	2	20	5	11	5	6	4	9
24577	Altitude/clearance	48	0	31	1	5	6	7	7
24021	Visual lookout	5	12	7	9	8	5	8	6
24583	Low-altitude flight/maneuver	48	0	57	0	14	1	9	3
24001	Preflight planning/preparation	8	9	7	9	10	4	9	3

V_S = Stalling speed

Table 203. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	1	8	2	5	1	5	1	4
24533	Liftoff	35	0	26	0	23	0	2	1
24028	Wrong runway	35	0	26	0	23	0	2	1
22100	Flight controls	16	1	26	0	23	0	2	1
24536	Go-around	5	4	26	0	23	0	2	1
22202	Fuel boost pump selector position	35	0	26	0	23	0	2	1
24030	Checklist	35	0	26	0	6	1	2	1
24001	Preflight planning/preparation	3	7	3	4	6	1	2	1
24532	Proper glidepath	35	0	26	0	23	0	2	1
24010	In-flight planning/decision	1	8	1	7	23	0	2	1

Table 204. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (300 to 1999 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	49	1	55	1	52	1	54
24026	Compensation for wind conditions	2	35	2	24	2	46	2	44
24535	Flare	7	17	9	11	3	18	3	18
24506	Airspeed	11	10	7	12	5	11	4	13
22002	Landing gear extension	15	6	27	3	42	1	5	10
24581	Distance/speed	82	0	84	0	16	3	5	10
24526	Clearance	15	6	12	9	7	10	7	8
24577	Altitude/clearance	82	0	84	0	42	1	8	7
24021	Visual lookout	3	34	3	20	3	18	8	7
24010	In-flight planning/decision	5	25	4	15	9	8	10	6

Table 205. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	34	0	5	4	3	4	1	4
24526	Clearance	8	3	12	1	4	3	2	3
24010	In-flight planning/decision	3	5	10	2	4	3	2	3
24566	Aircraft control	13	2	2	6	8	2	2	3
24026	Compensation for wind conditions	34	0	12	1	11	1	2	3
24583	Low-altitude flight/maneuver	34	0	28	0	23	0	2	3
24577	Altitude/clearance	34	0	28	0	2	6	7	2
24024	Instrument flight rules procedure	8	3	12	1	23	0	7	2
24023	Flight into known adverse weather	8	3	5	4	4	3	7	2
24512	Airspeed, stall in the landing configuration (V_{SO})	34	0	28	0	23	0	10	1

V_{SO} = The power off stall speed

Table 206. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	3	1	3	1	9	0	1	3
24539	Directional control	23	0	3	1	9	0	2	2
24528	Proper climb rate	23	0	12	0	9	0	3	1
24030	Checklist	3	1	12	0	9	0	3	1
24532	Proper glidepath	23	0	12	0	9	0	3	1
24026	Compensation for wind conditions	23	0	12	0	2	1	3	1
24509	Airspeed, minimum control speed with the critical engine inoperative (V_{MC})	23	0	12	0	9	0	3	1
24566	Aircraft control	23	0	12	0	9	0	3	1
24518	Altitude	3	1	3	1	1	2	9	0
24011	Wind information	3	1	12	0	9	0	9	0

V_{MC} = Minimum control speed

Table 207. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (2000 to 4999 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	12	1	13	1	20	1	19
24026	Compensation for wind conditions	4	8	2	7	2	11	2	12
24566	Aircraft control	40	0	27	1	4	3	3	4
24580	Distance/altitude	40	0	48	0	15	1	3	4
24526	Clearance	16	2	13	2	4	3	3	4
24535	Flare	22	1	5	4	4	3	6	3
24506	Airspeed	22	1	8	3	4	3	6	3
24032	Procedures/directives	22	1	8	3	15	1	6	3
24562	Recovery from bounced landing	22	1	5	4	15	1	9	2
24549	Starting procedure	40	0	48	0	38	0	9	2

Table 208. Top Ten Initiating Causes of Fatal GA Accidents Based on Pilot Experience (≥ 5000 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	5	4	26	0	7	1	1	6
24526	Clearance	13	1	7	2	4	3	2	5
24015	VFR flight into IMC	2	6	2	4	7	1	2	5
24566	Aircraft control	29	0	2	4	2	5	2	5
24577	Altitude/clearance	29	0	7	2	3	4	5	3
24021	Visual lookout	5	4	2	4	1	6	5	3
24542	Remedial action	29	0	12	1	7	1	7	2
24010	In-flight planning/decision	3	5	1	5	4	3	7	2
24583	Low-altitude flight/maneuver	29	0	26	0	7	1	7	2
24036	Flight into adverse weather	29	0	26	0	7	1	7	2

Table 209. Top Ten Initiating Causes of Serious GA Accidents Based on Pilot Experience (≥5000 hr) in Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	0	0	0	0	0	0	1	1
24511	Airspeed, stall (V _S)	0	0	0	0	0	0	1	1
24506	Airspeed	3	2	2	1	1	1	1	1
22303	Mixture	0	0	0	0	0	0	1	1
24532	Proper glidepath	0	0	0	0	0	0	1	1
24015	VFR flight into IMC	1	3	0	0	0	0	1	1
24022	Weather evaluation	0	0	0	0	0	0	1	1
22121	Flaps	0	0	0	0	0	0	1	1
24535	Flare	6	1	0	0	0	0	0	0
24524	Descent	0	0	2	1	0	0	0	0

V_S = Stalling speed

Table 210. Top Ten Initiating Causes of Minor/None GA Accidents Based on Pilot Experience (≥5000 hr) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	8	1	9	1	20	1	11
24026	Compensation for wind conditions	6	3	4	4	2	14	1	11
24535	Flare	4	4	0	0	20	1	3	4
24506	Airspeed	21	1	0	0	7	2	3	4
22004	Brakes (normal)	10	2	2	5	7	2	5	3
24566	Aircraft control	0	0	7	3	20	1	5	3
24032	Procedures/directives	0	0	14	1	7	2	5	3
24010	In-flight planning/decision	0	0	4	4	7	2	8	2
24021	Visual lookout	1	9	7	3	3	5	8	2
24526	Clearance	0	0	9	2	3	5	8	2

10.3 MOST FREQUENT INITIATING CAUSES OF GA ACCIDENTS RELATED TO AIRCRAFT COMPLEXITY.

Tables 211 through 216 show the frequency and rank of each category based on aircraft engine power. The amount of data was sometimes insufficient to rank the top ten initiating causes of GA accidents.

Table 211. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (<200 hp) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24506	Airspeed	6	16	2	17	1	17	1	18
24526	Clearance	14	4	0	0	17	1	2	11
24015	VFR flight into IMC	2	29	1	24	3	14	3	8
24010	In-flight planning/decision	1	30	5	12	6	7	4	7
24021	Visual lookout	5	19	7	9	2	16	5	6
24566	Aircraft control	26	2	2	17	5	10	6	5
24577	Altitude/clearance	0	0	32	1	4	11	7	4
24511	Airspeed, stall (V_S)	14	4	6	10	7	6	8	3
24583	Low-altitude flight/maneuver	0	0	32	1	12	2	8	3
24001	Preflight planning/preparation	4	20	8	7	11	3	10	2

V_S = Stalling speed

Table 212. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (<200 hp) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24026	Compensation for wind conditions	10	3	19	1	4	3	1	4
24539	Directional control	10	3	19	1	4	3	1	4
24506	Airspeed	2	13	2	10	2	4	3	3
17001	Fluid, fuel	7	4	1	13	1	8	3	3
24010	In-flight planning/decision	3	9	3	9	2	4	3	3
24001	Preflight planning/preparation	1	14	4	8	4	3	6	2
24002	Aircraft preflight	0	0	8	2	4	3	6	2
24566	Aircraft control	0	0	19	1	0	0	8	1
24104	Maintenance, annual inspection	0	0	0	0	0	0	8	1
24028	Wrong runway	27	1	19	1	0	0	8	1

Table 213. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (<200 hp) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	1	102	1	95	1	88	1	34
24026	Compensation for wind conditions	2	67	3	46	2	59	2	25
24535	Flare	3	57	4	43	3	41	3	20
17001	Fluid, fuel	4	55	2	47	4	38	4	9
24562	Recovery from bounced landing	18	13	6	20	9	11	5	8
24526	Clearance	16	14	16	10	12	10	5	8
24010	In-flight planning/decision	7	40	6	20	7	14	5	8
24021	Visual lookout	6	45	5	29	6	20	8	7
24580	Distance/altitude	0	0	53	2	32	3	9	5
24506	Airspeed	11	18	10	17	5	21	9	5

Table 214. Top Ten Initiating Causes of Fatal GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24015	VFR flight into IMC	1	30	1	30	2	14	1	11
24566	Aircraft control	0	0	2	18	1	16	1	11
24506	Airspeed	3	19	3	15	8	4	3	9
24526	Clearance	14	4	15	4	7	5	4	8
24577	Altitude/clearance	0	0	20	2	3	12	4	8
24010	In-flight planning/decision	5	18	9	7	4	10	6	7
24511	Airspeed, stall (V_S)	0	0	9	7	23	1	6	7
24021	Visual lookout	7	12	4	13	5	7	6	7
17001	Fluid, fuel	18	3	8	8	12	3	9	5
20000	Weather condition	22	2	28	1	8	4	10	4

V_S = Stalling speed

Table 215. Top Ten Initiating Causes of Serious GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
17001	Fluid, fuel	1	10	1	17	1	12	1	5
24506	Airspeed	4	3	6	2	2	3	1	5
24002	Aircraft preflight	0	0	3	3	2	3	3	2
16905	1 engine	0	0	0	0	0	0	3	2
24032	Procedures/directives	11	2	12	1	0	0	3	2
24111	Maintenance, installation	16	1	12	1	4	2	3	2
24532	Proper glidepath	0	0	0	0	0	0	3	2
20000	Weather condition	0	0	12	1	7	1	3	2
24607	Control tower service	0	0	0	0	7	1	3	2
22204	Fuel supply	0	0	0	0	0	0	3	2

Table 216. Top Ten Initiating Causes of Minor/None GA Accidents Based on Aircraft Engine Power (≥ 200 hp) in the Western-Pacific Region

Subject Code	Initiating Cause	1982-1988		1989-1995		1996-2002		2003-2009	
		Rank	Frequency	Rank	Frequency	Rank	Frequency	Rank	Frequency
24539	Directional control	2	42	1	47	1	44	1	26
24026	Compensation for wind conditions	4	29	3	25	2	42	2	18
17001	Fluid, fuel	1	49	2	43	3	41	3	17
24526	Clearance	44	3	15	7	6	12	4	9
24535	Flare	6	23	5	16	5	13	4	9
24021	Visual lookout	3	36	7	13	4	19	6	7
24506	Airspeed	15	9	11	8	14	4	7	6
22002	Landing gear extension	12	11	32	3	24	3	7	6
24032	Procedures/directives	59	2	11	8	24	3	9	5
17002	Fluid, oil	44	3	76	1	0	0	10	4

11. RESULTS.

This research identified and analyzed the trends, distributions, and initiating causes of GA accidents that occurred in each of the nine FAA regions. The GA accidents were further categorized as Fatal, Serious, and Minor/None.

The research analyzed GA accidents that occurred in the United States from 1982 to 2009, which revealed the associations between GA accidents and a set of factors, including month, time of day, purpose and phase of flight, pilot flight experience, and aircraft complexity.

The top ten initiating causes of GA accidents for different combinations of GA accident categories and factors were thoroughly identified and analyzed. The findings from each region were compared with nationwide results to identify the unique patterns for each region.

This report provides comprehensive information of GA accidents that occurred in a 28-year timeframe. The findings can be used as guidance for each FAA region to improve its GA safety.

12. REFERENCES.

1. U.S. Federal Register, FAA Title 14 CFR Part 91, “General Operating and Flight Rules.”
2. National Transportation Safety Board, NTSB Form 6120.1, “Pilot/Operator Accident/Incident Report.”
3. Bazargan, M., Kosalim, H., and Williams, M., “A Database Management System for General Aviation Safety,” FAA report, to be published.