PILOT'S OPERATING HANDBOOK

with integrated

AIRCRAFT OPERATING INSTRUCTIONS
AND
FLIGHT TRAINING SUPPLIMENT

For
STORM RALLY 105 Btd
(Equipped with ROTAX 912 UL S3 Engine)

Under License from

STORMAIRCRAFT

Produced by

SCALED

Scaled Aviation Industries (Private) Limited,
Royal Hangar, Walton Aerodrome,
Lahore, Pakistan.

Storm Rally 105 Btd

Registration: AP-BKG

Serial Number: SAIRA2011-01

This S-LSA aircraft must be operated in compliance with information and limitations contained herein.

This POH must be available on-board the aircraft.

Approved by

Scaled Aviation Industries (Private) Limited

TABLE OF CONTENTS

PREFACE TO THE HANDBOOK

First of all, thank you for selecting Storm Rally as your aircraft. We hope it supersedes your expectations when you fly it.

Storm Rally 105 Btd is a Special Light Sport Aircraft (S-LSA) which is delivered to you as a Ready to fly aircraft. Before delivery the aircraft has been thoroughly tested in our factory. Its operation ability has been found compliant to the applicable standards.

Its certification is based on FAA Light Sport Aircraft category according to ASTM Standards F2245, F2279 and F 2295.

This Pilot Operating Handbook has been prepared to provide its owner / pilots with information for a safe and efficient operation of the aircraft. It also contains supplemental data supplied as Flight Training Supplement.

We strongly recommend you read this handbook in complete detail before entering the aircraft's cockpit for the first time. Please do not skip a section or page, as it may contain information that may save your life one day.

We wish you a countless number of happy landings.

COVERAGE OF CONTENT

This Pilots Operating Handbook (POH) contains information applicable to the Storm Rally 105 Btd S-LSA aircraft and to the airframe designated by the serial number and registration number shown on the Title Page. All information is based on data available at the time of publication.

This POH consists of ten sections that cover all operational aspects of a standard equipped airplane. Supplements are individual documents and may be issued or revised without regard to revision dates which apply to the POH itself. Supplements provide amended operating procedures, performance data and other necessary information for airplanes conducting special operations and/or are equipped with both standard and optional equipment. The Log of Effective Pages should be used to determine the status of each supplement.

REVISION TRACKING, FILING AND IDENTIFICATION

Pages to be removed or replaced in the Pilot's Operating Handbook are determined by the Log of Effective pages located in this section. This log contains the page number and revision level for each page within the POH. As revisions to the POH occur, the revision level on the effected pages is updated. When two pages display the same page number, the page with the latest revision shall be used in the POH. The revised page should be added to the end of the POH as an annexure for ready reference. The revision level on the Log Of Effective Pages shall also agree with the revision level of the page in question. Alternative to removing and/or replacing individual pages, the owner can also print out a whole new POH in its current form, which is always available from:

http://www.scaled.com.pk/stormrally/poh.php

Downloading the current version of the POH from the website is strongly recommended.

On the website, you will be presented with a choice of current version downloadable with revision markings or without them. If manually maintained, revised material is marked with a vertical double-bar that will extend the full length of deleted, new, or revised text added to new or previously existing pages. This marker will be located adjacent to the applicable text in the marking on the outer side of the page. The same system is in place when the header, figure, or any other element inside this POH was revised. Next to the double-bar, there is also a number indicative to which revision the change occurred in. A list of revisions is located at the beginning of the Log Of Effective Pages.

WARNINGS, CAUTIONS AND NOTES

Safety definitions used in the handbook are as following:

WARNING!

Disregarding the following instructions leads to severe deterioration of flight safety and hazardous situations, including such resulting in injury and loss of life.

CAUTION!

Disregarding the following instructions leads to serious deterioration of flight safety or may result in damage to the equipment.

NOTE

An operating procedure, technique, etc., which is considered essential to emphasize.

NOISE LEVELS

According to independent testing performed by the French DN Noise Regulation Authority, the equivalent exhibited noise measurement of less than 85 dB.

INDEX OF REVISIONS

The table below indicated the Revisions, which were made from the original release to this date. Always check our online page for new updates. Please make sure that you are fammiliar with the current release of the operation related documentation, which includes this POH.

Release date	Designation	Reason for Revision	Affected pages	Issuer
1 Jan 2006	Original	N/A	N/A	ATR Storm Group
10 Mar 2010	Revision 1	ASTM Compliance	All	ATR Storm Group
14 Nov 2014	Revision 2	ASTM Compliance	All	ATR Storm Group
11 Dec 2014	Revision 2.1	ASTM Compliance	All	Scaled Aviation

LOG OF EFFECTIVE PAGES

Use to determine the currency and applicability of your POH after major Revision 2.1

Pages if released separately would be reflected in this table. On the next major release of this POH, this table would be emptied to reflect all separately released pages have been incorporated in that release. **It is highly recommended that on every major release, one should download and print a new copy of this POH which should replace the older copy.**

Example of Log of Effective pages

To help you understand this better, please take a look at the example table below.

Page Number	Page Status	Revision No.
3	Original	0
18	Revised	1
62	Revised again	6

In this above example page number 3 is in its original form without any revisions (normally original pages are not listed in this table, to keep the size of the table smaller). Page 18 has been revised once. Whereas page 62 has been revised again for the 6th time.

Actual Log of Effective Pages

Page Number	Page Status	Revision No.	Page Number	Page Status	Revision No.

SECTION 1 - GENERAL

Section 1 provides basic data and information of general interest.

INTRODUCTION

This Handbook contains all information needed for appropriate and safe operational use of Storm Rally S-LSA. It is vital to receive proper training when transitioning into any aircraft. This is especially important for pilots with significant experience in type certified aircraft transitioning to an LSA in the airplane class. LSAs can be and are very safe given the proper training, but are often lighter in weight and more responsive to control inputs than the aircraft most experienced pilots are used to in the legacy fleet. LSA can also feature unfamiliar engines and avionics. Training is necessary to learn the specifics of any design

IT IS MANDATORY TO STUDY THIS HANDBOOK IN DETAIL PRIOR TO USE *OF THE AIRCRAFT IN ANY WAY*

In case of aircraft damage or people injury resulting from disobeying or neglecting instructions in the POH M/S Scaled Aviation Industries (Private) Limited, ATR Storm Group and/or the Civil Aviation Authorities involved, deny all responsibility.

QUICK REFERENCE FOR FLIGHT PLANNING

To help you work with the conversions, many tables are added on the following pages these include:

WEIGHT CONVERSIONS
Kilograms to Pounds (KG to Lbs), Pounds to Kilogram (Lbs to KG)

LENGTH CONVERSIONS
Meters to Feet (m to ft), Feet to Meters (ft to m), Feet to Inches (ft to in), Inches to Feet (in to ft), Inches to Centimeters (in to cm), Centimeters to Inches (cm to in)

DISTANCE CONVERSIONS
Statute Miles to Kilometers (Miles to Km), Kilometers to Statute Miles (Km to Miles), Statute Miles to Nautical Miles (Miles to nm), Nautical Miles to Statute Miles (nm to Miles), Nautical Miles to Kilometers (nm to Km), Kilometers to Nautical Miles (Km to nm)

VOLUME CONVERSIONS
Imperial Gallons to Liters (IG to Liters), Liters to Imperial Gallons (Liters to IG), Imperial Gallons to US Gallons (IG to UG), US Gallons to Imperial Gallons (UG to IG), US Gallons to Liters (UG to Liters), Liters to US Gallons (Liters to UG)

TEMPERATURE CONVERSIONS
Celsius to Fahrenheit (°C to °F), Fahrenheit to Celsius (°F to °C)25.

WEIGHT CONVERSIONS

Kilograms to Pounds (KG to Lbs)

Formula

In easy English Kilograms X 2.20462 = Pounds

Using Units Kg X 2.20462 = Lbs

Kilograms	0	1	2	3	4	5	6	7	8	9
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
0	0.000	2.205	4.409	6.614	8.818	11.023	13.228	15.432	17.637	19.842
10	22.046	24.251	26.455	28.660	30.865	33.069	35.274	37.479	39.683	41.888
20	44.092	46.297	48.502	50.706	52.911	55.116	57.320	59.525	61.729	63.934
30	66.139	68.343	70.548	72.752	74.957	77.162	79.366	81.571	83.776	85.980
40	88.185	90.389	92.594	94.799	97.003	99.208	101.413	103.617	105.822	108.026
50	110.231	112.436	114.640	116.845	119.049	121.254	123.459	125.663	127.868	130.073
60	132.277	134.482	136.686	138.891	141.096	143.300	145.505	147.710	149.914	152.119
70	154.323	156.528	158.733	160.937	163.142	165.347	167.551	169.756	171.960	174.165
80	176.370	178.574	180.779	182.983	185.188	187.393	189.597	191.802	194.007	196.211
90	198.416	200.620	202.825	205.030	207.234	209.439	211.644	213.848	216.053	218.257
100	220.462	222.667	224.871	227.076	229.280	231.485	233.690	235.894	238.099	240.304

Pounds to Kilogram (Lbs to KG)

Formula

In easy English Pounds X 0.453592 = Kilograms

Using Units Lbs X 0.453592 = Kg

Pounds	0	1	2	3	4	5	6	7	8	9
	Kilograms	Kilograms	Kilograms	Kilograms	Kilograms	Kilograms	Kilograms	Kilograms	Kilograms	Kilograms
0	0.000	0.454	0.907	1.361	1.814	2.268	2.722	3.175	3.629	4.082
10	4.536	4.990	5.443	5.897	6.350	6.804	7.257	7.711	8.165	8.618
20	9.072	9.525	9.979	10.433	10.886	11.340	11.793	12.247	12.701	13.154
30	13.608	14.061	14.515	14.969	15.422	15.876	16.329	16.783	17.236	17.690
40	18.144	18.597	19.051	19.504	19.958	20.412	20.865	21.319	21.772	22.226
50	22.680	23.133	23.587	24.040	24.494	24.948	25.401	25.855	26.308	26.762
60	27.216	27.669	28.123	28.576	29.030	29.483	29.937	30.391	30.844	31.298
70	31.751	32.205	32.659	33.112	33.566	34.019	34.473	34.927	35.380	35.834
80	36.287	36.741	37.195	37.648	38.102	38.555	39.009	39.463	39.916	40.370
90	40.823	41.277	41.730	42.184	42.638	43.091	43.545	43.998	44.452	44.906
100	45.359	45.813	46.266	46.720	47.174	47.627	48.081	48.534	48.988	49.442

LENGTH CONVERSIONS

Meters to Feet (m to ft)

Formula

In easy English Meters X 3.28084 = Feet

Using Units m X 3.28084 = ft

Meters	0	1	2	3	4	5	6	7	8	9
	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet
0	0.000	3.281	6.562	9.843	13.123	16.404	19.685	22.966	26.247	29.528
10	32.808	36.089	39.370	42.651	45.932	49.213	52.493	55.774	59.055	62.336
20	65.617	68.898	72.178	75.459	78.740	82.021	85.302	88.583	91.864	95.144
30	98.425	101.706	104.987	108.268	111.549	114.829	118.110	121.391	124.672	127.953
40	131.234	134.514	137.795	141.076	144.357	147.638	150.919	154.199	157.480	160.761
50	164.042	167.323	170.604	173.885	177.165	180.446	183.727	187.008	190.289	193.570
60	196.850	200.131	203.412	206.693	209.974	213.255	216.535	219.816	223.097	226.378
70	229.659	232.940	236.220	239.501	242.782	246.063	249.344	252.625	255.906	259.186
80	262.467	265.748	269.029	272.310	275.591	278.871	282.152	285.433	288.714	291.995
90	295.276	298.556	301.837	305.118	308.399	311.680	314.961	318.241	321.522	324.803
100	328.084	331.365	334.646	337.927	341.207	344.488	347.769	351.050	354.331	357.612

Feet to Meters (ft to m)

Formula

In easy English Feet X 0.3048 = Meters

Using Units ft X 0.3048 = m

Feet	0	1	2	3	4	5	6	7	8	9
	Meters	Meters	Meters	Meters	Meters	Meters	Meters	Meters	Meters	Meters
0	0.000	0.305	0.610	0.914	1.219	1.524	1.829	2.134	2.438	2.743
10	3.048	3.353	3.658	3.962	4.267	4.572	4.877	5.182	5.486	5.791
20	6.096	6.401	6.706	7.010	7.315	7.620	7.925	8.230	8.534	8.839
30	9.144	9.449	9.754	10.058	10.363	10.668	10.973	11.278	11.582	11.887
40	12.192	12.497	12.802	13.106	13.411	13.716	14.021	14.326	14.630	14.935
50	15.240	15.545	15.850	16.154	16.459	16.764	17.069	17.374	17.678	17.983
60	18.288	18.593	18.898	19.202	19.507	19.812	20.117	20.422	20.726	21.031
70	21.336	21.641	21.946	22.250	22.555	22.860	23.165	23.470	23.774	24.079
80	24.384	24.689	24.994	25.298	25.603	25.908	26.213	26.518	26.822	27.127
90	27.432	27.737	28.042	28.346	28.651	28.956	29.261	29.566	29.870	30.175
100	30.480	30.785	31.090	31.394	31.699	32.004	32.309	32.614	32.918	33.223

Feet to Inches (ft to in)

Formula

In easy English Feet X 12 = Inches

Using Units ft X 12 = in

Feet	0	1	2	3	4	5	6	7	8	9
	Inches	**Inches**	**Inches**	**Inches**	**Inches**	**Inches**	**Inches**	**Inches**	**Inches**	**Inches**
0	0.000	12.000	24.000	36.000	48.000	60.000	72.000	84.000	96.000	108.000
10	120.000	132.000	144.000	156.000	168.000	180.000	192.000	204.000	216.000	228.000
20	240.000	252.000	264.000	276.000	288.000	300.000	312.000	324.000	336.000	348.000
30	360.000	372.000	384.000	396.000	408.000	420.000	432.000	444.000	456.000	468.000
40	480.000	492.000	504.000	516.000	528.000	540.000	552.000	564.000	576.000	588.000
50	600.000	612.000	624.000	636.000	648.000	660.000	672.000	684.000	696.000	708.000
60	720.000	732.000	744.000	756.000	768.000	780.000	792.000	804.000	816.000	828.000
70	840.000	852.000	864.000	876.000	888.000	900.000	912.000	924.000	936.000	948.000
80	960.000	972.000	984.000	996.000	1008.000	1020.000	1032.000	1044.000	1056.000	1068.000
90	1080.000	1092.000	1104.000	1116.000	1128.000	1140.000	1152.000	1164.000	1176.000	1188.000
100	1200.000	1212.000	1224.000	1236.000	1248.000	1260.000	1272.000	1284.000	1296.000	1308.000

Inches to Feet (in to ft)

Formula

In easy English Inches X 0.0833333 = Feet

Using Units in X 0.0833333 = ft

Inches	0	1	2	3	4	5	6	7	8	9
	Feet	**Feet**	**Feet**	**Feet**	**Feet**	**Feet**	**Feet**	**Feet**	**Feet**	**Feet**
0	0.000	0.083	0.167	0.250	0.333	0.417	0.500	0.583	0.667	0.750
10	0.833	0.917	1.000	1.083	1.167	1.250	1.333	1.417	1.500	1.583
20	1.667	1.750	1.833	1.917	2.000	2.083	2.167	2.250	2.333	2.417
30	2.500	2.583	2.667	2.750	2.833	2.917	3.000	3.083	3.167	3.250
40	3.333	3.417	3.500	3.583	3.667	3.750	3.833	3.917	4.000	4.083
50	4.167	4.250	4.333	4.417	4.500	4.583	4.667	4.750	4.833	4.917
60	5.000	5.083	5.167	5.250	5.333	5.417	5.500	5.583	5.667	5.750
70	5.833	5.917	6.000	6.083	6.167	6.250	6.333	6.417	6.500	6.583
80	6.667	6.750	6.833	6.917	7.000	7.083	7.167	7.250	7.333	7.417
90	7.500	7.583	7.667	7.750	7.833	7.917	8.000	8.083	8.167	8.250
100	8.333	8.417	8.500	8.583	8.667	8.750	8.833	8.917	9.000	9.083

Inches to Centimeters (in to cm)

Formula

In easy English Inches X 2.54 = Centimeters

Using Units in X 2.54 = cm

in	0	1	2	3	4	5	6	7	8	9
	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm
0	0.000	2.540	5.080	7.620	10.160	12.700	15.240	17.780	20.320	22.860
10	25.400	27.940	30.480	33.020	35.560	38.100	40.640	43.180	45.720	48.260
20	50.800	53.340	55.880	58.420	60.960	63.500	66.040	68.580	71.120	73.660
30	76.200	78.740	81.280	83.820	86.360	88.900	91.440	93.980	96.520	99.060
40	101.600	104.140	106.680	109.220	111.760	114.300	116.840	119.380	121.920	124.460
50	127.000	129.540	132.080	134.620	137.160	139.700	142.240	144.780	147.320	149.860
60	152.400	154.940	157.480	160.020	162.560	165.100	167.640	170.180	172.720	175.260
70	177.800	180.340	182.880	185.420	187.960	190.500	193.040	195.580	198.120	200.660
80	203.200	205.740	208.280	210.820	213.360	215.900	218.440	220.980	223.520	226.060
90	228.600	231.140	233.680	236.220	238.760	241.300	243.840	246.380	248.920	251.460
100	254.000	256.540	259.080	261.620	264.160	266.700	269.240	271.780	274.320	276.860

Centimeters to Inches (cm to in)

Formula

In easy English Centimeters X 0.393701 = Inches

Using Units cm X 0.393701 = in

cm	0	1	2	3	4	5	6	7	8	9
	in	in	in	in	in	in	in	in	in	in
0	0.000	0.394	0.787	1.181	1.575	1.969	2.362	2.756	3.150	3.543
10	3.937	4.331	4.724	5.118	5.512	5.906	6.299	6.693	7.087	7.480
20	7.874	8.268	8.661	9.055	9.449	9.843	10.236	10.630	11.024	11.417
30	11.811	12.205	12.598	12.992	13.386	13.780	14.173	14.567	14.961	15.354
40	15.748	16.142	16.535	16.929	17.323	17.717	18.110	18.504	18.898	19.291
50	19.685	20.079	20.472	20.866	21.260	21.654	22.047	22.441	22.835	23.228
60	23.622	24.016	24.409	24.803	25.197	25.591	25.984	26.378	26.772	27.165
70	27.559	27.953	28.346	28.740	29.134	29.528	29.921	30.315	30.709	31.102
80	31.496	31.890	32.283	32.677	33.071	33.465	33.858	34.252	34.646	35.039
90	35.433	35.827	36.220	36.614	37.008	37.402	37.795	38.189	38.583	38.976
100	39.370	39.764	40.158	40.551	40.945	41.339	41.732	42.126	42.520	42.913

DISTANCE CONVERSIONS

Statute Miles to Kilometers (Miles to Km)

Formula

In easy English Statute Miles X 1.60934 = Kilometers

Using Units Miles X 1.60934 = Km

Miles	0	1	2	3	4	5	6	7	8	9
	Km	Km	Km	Km	Km	Km	Km	Km	Km	Km
0	0.000	1.609	3.219	4.828	6.437	8.047	9.656	11.265	12.875	14.484
10	16.093	17.703	19.312	20.921	22.531	24.140	25.749	27.359	28.968	30.577
20	32.187	33.796	35.405	37.015	38.624	40.234	41.843	43.452	45.062	46.671
30	48.280	49.890	51.499	53.108	54.718	56.327	57.936	59.546	61.155	62.764
40	64.374	65.983	67.592	69.202	70.811	72.420	74.030	75.639	77.248	78.858
50	80.467	82.076	83.686	85.295	86.904	88.514	90.123	91.732	93.342	94.951
60	96.560	98.170	99.779	101.388	102.998	104.607	106.216	107.826	109.435	111.044
70	112.654	114.263	115.872	117.482	119.091	120.701	122.310	123.919	125.529	127.138
80	128.747	130.357	131.966	133.575	135.185	136.794	138.403	140.013	141.622	143.231
90	144.841	146.450	148.059	149.669	151.278	152.887	154.497	156.106	157.715	159.325
100	160.934	162.543	164.153	165.762	167.371	168.981	170.590	172.199	173.809	175.418

Kilometers to Statute Miles (Km to Miles)

Formula

In easy English Kilometers X 0.621371 = Statute Miles

Using Units Km X 0.621371 = Miles

Km	0	1	2	3	4	5	6	7	8	9
	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles
0	0.000	0.621	1.243	1.864	2.485	3.107	3.728	4.350	4.971	5.592
10	6.214	6.835	7.456	8.078	8.699	9.321	9.942	10.563	11.185	11.806
20	12.427	13.049	13.670	14.292	14.913	15.534	16.156	16.777	17.398	18.020
30	18.641	19.263	19.884	20.505	21.127	21.748	22.369	22.991	23.612	24.233
40	24.855	25.476	26.098	26.719	27.340	27.962	28.583	29.204	29.826	30.447
50	31.069	31.690	32.311	32.933	33.554	34.175	34.797	35.418	36.040	36.661
60	37.282	37.904	38.525	39.146	39.768	40.389	41.010	41.632	42.253	42.875
70	43.496	44.117	44.739	45.360	45.981	46.603	47.224	47.846	48.467	49.088
80	49.710	50.331	50.952	51.574	52.195	52.817	53.438	54.059	54.681	55.302
90	55.923	56.545	57.166	57.788	58.409	59.030	59.652	60.273	60.894	61.516
100	62.137	62.758	63.380	64.001	64.623	65.244	65.865	66.487	67.108	67.729

Statute Miles to Nautical Miles (Miles to nm)

Formula

In easy English Statute Miles X 0.868976 = Nautical Miles

Using Units Miles X 0.868976 = nm

Miles	0	1	2	3	4	5	6	7	8	9
	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm
0	0.000	0.869	1.738	2.607	3.476	4.345	5.214	6.083	6.952	7.821
10	8.690	9.559	10.428	11.297	12.166	13.035	13.904	14.773	15.642	16.511
20	17.380	18.248	19.117	19.986	20.855	21.724	22.593	23.462	24.331	25.200
30	26.069	26.938	27.807	28.676	29.545	30.414	31.283	32.152	33.021	33.890
40	34.759	35.628	36.497	37.366	38.235	39.104	39.973	40.842	41.711	42.580
50	43.449	44.318	45.187	46.056	46.925	47.794	48.663	49.532	50.401	51.270
60	52.139	53.008	53.877	54.745	55.614	56.483	57.352	58.221	59.090	59.959
70	60.828	61.697	62.566	63.435	64.304	65.173	66.042	66.911	67.780	68.649
80	69.518	70.387	71.256	72.125	72.994	73.863	74.732	75.601	76.470	77.339
90	78.208	79.077	79.946	80.815	81.684	82.553	83.422	84.291	85.160	86.029
100	86.898	87.767	88.636	89.505	90.374	91.242	92.111	92.980	93.849	94.718

Nautical Miles to Statute Miles (nm to Miles)

Formula

In easy English Nautical Miles X 1.15078 = Statute Miles

Using Units nm X 1.15078 = Miles

nm	0	1	2	3	4	5	6	7	8	9
	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles
0	0.000	1.151	2.302	3.452	4.603	5.754	6.905	8.055	9.206	10.357
10	11.508	12.659	13.809	14.960	16.111	17.262	18.412	19.563	20.714	21.865
20	23.016	24.166	25.317	26.468	27.619	28.770	29.920	31.071	32.222	33.373
30	34.523	35.674	36.825	37.976	39.127	40.277	41.428	42.579	43.730	44.880
40	46.031	47.182	48.333	49.484	50.634	51.785	52.936	54.087	55.237	56.388
50	57.539	58.690	59.841	60.991	62.142	63.293	64.444	65.594	66.745	67.896
60	69.047	70.198	71.348	72.499	73.650	74.801	75.951	77.102	78.253	79.404
70	80.555	81.705	82.856	84.007	85.158	86.309	87.459	88.610	89.761	90.912
80	92.062	93.213	94.364	95.515	96.666	97.816	98.967	100.118	101.269	102.419
90	103.570	104.721	105.872	107.023	108.173	109.324	110.475	111.626	112.776	113.927
100	115.078	116.229	117.380	118.530	119.681	120.832	121.983	123.133	124.284	125.435

Nautical Miles to Kilometers (nm to Km)

Formula

In easy English Nautical Miles X 1.852 = Kilometers

Using Units nm X 1.852 = Km

nm	0	1	2	3	4	5	6	7	8	9
	Km	Km	Km	Km	Km	Km	Km	Km	Km	Km
0	0.000	1.852	3.704	5.556	7.408	9.260	11.112	12.964	14.816	16.668
10	18.520	20.372	22.224	24.076	25.928	27.780	29.632	31.484	33.336	35.188
20	37.040	38.892	40.744	42.596	44.448	46.300	48.152	50.004	51.856	53.708
30	55.560	57.412	59.264	61.116	62.968	64.820	66.672	68.524	70.376	72.228
40	74.080	75.932	77.784	79.636	81.488	83.340	85.192	87.044	88.896	90.748
50	92.600	94.452	96.304	98.156	100.008	101.860	103.712	105.564	107.416	109.268
60	111.120	112.972	114.824	116.676	118.528	120.380	122.232	124.084	125.936	127.788
70	129.640	131.492	133.344	135.196	137.048	138.900	140.752	142.604	144.456	146.308
80	148.160	150.012	151.864	153.716	155.568	157.420	159.272	161.124	162.976	164.828
90	166.680	168.532	170.384	172.236	174.088	175.940	177.792	179.644	181.496	183.348
100	185.200	187.052	188.904	190.756	192.608	194.460	196.312	198.164	200.016	201.868

Kilometers to Nautical Miles (Km to nm)

Formula

In easy English Kilometers X 0.539957 = Nautical Miles

Using Units Km X 0.539957 = nm

Km	0	1	2	3	4	5	6	7	8	9
	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm
0	0.000	0.540	1.080	1.620	2.160	2.700	3.240	3.780	4.320	4.860
10	5.400	5.940	6.479	7.019	7.559	8.099	8.639	9.179	9.719	10.259
20	10.799	11.339	11.879	12.419	12.959	13.499	14.039	14.579	15.119	15.659
30	16.199	16.739	17.279	17.819	18.359	18.898	19.438	19.978	20.518	21.058
40	21.598	22.138	22.678	23.218	23.758	24.298	24.838	25.378	25.918	26.458
50	26.998	27.538	28.078	28.618	29.158	29.698	30.238	30.778	31.318	31.857
60	32.397	32.937	33.477	34.017	34.557	35.097	35.637	36.177	36.717	37.257
70	37.797	38.337	38.877	39.417	39.957	40.497	41.037	41.577	42.117	42.657
80	43.197	43.737	44.276	44.816	45.356	45.896	46.436	46.976	47.516	48.056
90	48.596	49.136	49.676	50.216	50.756	51.296	51.836	52.376	52.916	53.456
100	53.996	54.536	55.076	55.616	56.156	56.695	57.235	57.775	58.315	58.855

VOLUME CONVERSIONS

Imperial Gallons to Liters (IG to Liters)

Formula

In easy English Imperial Gallon X 4.54609 = Liters

Using Units IG X 4.54609 = Liters

IG	0	1	2	3	4	5	6	7	8	9
	Liters	Liters	Liters	Liters	Liters	Liters	Liters	Liters	Liters	Liters
0	0.000	4.546	9.092	13.638	18.184	22.730	27.277	31.823	36.369	40.915
10	45.461	50.007	54.553	59.099	63.645	68.191	72.737	77.284	81.830	86.376
20	90.922	95.468	100.014	104.560	109.106	113.652	118.198	122.744	127.291	131.837
30	136.383	140.929	145.475	150.021	154.567	159.113	163.659	168.205	172.751	177.298
40	181.844	186.390	190.936	195.482	200.028	204.574	209.120	213.666	218.212	222.758
50	227.305	231.851	236.397	240.943	245.489	250.035	254.581	259.127	263.673	268.219
60	272.765	277.311	281.858	286.404	290.950	295.496	300.042	304.588	309.134	313.680
70	318.226	322.772	327.318	331.865	336.411	340.957	345.503	350.049	354.595	359.141
80	363.687	368.233	372.779	377.325	381.872	386.418	390.964	395.510	400.056	404.602
90	409.148	413.694	418.240	422.786	427.332	431.879	436.425	440.971	445.517	450.063
100	454.609	459.155	463.701	468.247	472.793	477.339	481.886	486.432	490.978	495.524

Liters to Imperial Gallons (Liters to IG)

Formula

In easy English Liters X 0.219969 = Imperial Gallon

Using Units Liters X 0.219969 = IG

Liters	0	1	2	3	4	5	6	7	8	9
	IG	IG	IG	IG	IG	IG	IG	IG	IG	IG
0	0.000	0.220	0.440	0.660	0.880	1.100	1.320	1.540	1.760	1.980
10	2.200	2.420	2.640	2.860	3.080	3.300	3.520	3.739	3.959	4.179
20	4.399	4.619	4.839	5.059	5.279	5.499	5.719	5.939	6.159	6.379
30	6.599	6.819	7.039	7.259	7.479	7.699	7.919	8.139	8.359	8.579
40	8.799	9.019	9.239	9.459	9.679	9.899	10.119	10.339	10.559	10.778
50	10.998	11.218	11.438	11.658	11.878	12.098	12.318	12.538	12.758	12.978
60	13.198	13.418	13.638	13.858	14.078	14.298	14.518	14.738	14.958	15.178
70	15.398	15.618	15.838	16.058	16.278	16.498	16.718	16.938	17.158	17.378
80	17.598	17.817	18.037	18.257	18.477	18.697	18.917	19.137	19.357	19.577
90	19.797	20.017	20.237	20.457	20.677	20.897	21.117	21.337	21.557	21.777
100	21.997	22.217	22.437	22.657	22.877	23.097	23.317	23.537	23.757	23.977

Imperial Gallons to US Gallons (IG to UG)

Formula

In easy English Imperial Gallons X 1.20095 = US Gallons

Using Units IG X 1.20095 = UG

IG	0	1	2	3	4	5	6	7	8	9
	UG	UG	UG	UG	UG	UG	UG	UG	UG	UG
0	0.000	1.201	2.402	3.603	4.804	6.005	7.206	8.407	9.608	10.809
10	12.010	13.210	14.411	15.612	16.813	18.014	19.215	20.416	21.617	22.818
20	24.019	25.220	26.421	27.622	28.823	30.024	31.225	32.426	33.627	34.828
30	36.029	37.229	38.430	39.631	40.832	42.033	43.234	44.435	45.636	46.837
40	48.038	49.239	50.440	51.641	52.842	54.043	55.244	56.445	57.646	58.847
50	60.048	61.248	62.449	63.650	64.851	66.052	67.253	68.454	69.655	70.856
60	72.057	73.258	74.459	75.660	76.861	78.062	79.263	80.464	81.665	82.866
70	84.067	85.267	86.468	87.669	88.870	90.071	91.272	92.473	93.674	94.875
80	96.076	97.277	98.478	99.679	100.880	102.081	103.282	104.483	105.684	106.885
90	108.086	109.286	110.487	111.688	112.889	114.090	115.291	116.492	117.693	118.894
100	120.095	121.296	122.497	123.698	124.899	126.100	127.301	128.502	129.703	130.904

US Gallons to Imperial Gallons (UG to IG)

Formula

In easy English US Gallons X 0.832674 = Imperial Gallons

Using Units UG X 0.832674 = IG

UG	0	1	2	3	4	5	6	7	8	9
	IG	IG	IG	IG	IG	IG	IG	IG	IG	IG
0	0.000	0.833	1.665	2.498	3.331	4.163	4.996	5.829	6.661	7.494
10	8.327	9.159	9.992	10.825	11.657	12.490	13.323	14.155	14.988	15.821
20	16.653	17.486	18.319	19.152	19.984	20.817	21.650	22.482	23.315	24.148
30	24.980	25.813	26.646	27.478	28.311	29.144	29.976	30.809	31.642	32.474
40	33.307	34.140	34.972	35.805	36.638	37.470	38.303	39.136	39.968	40.801
50	41.634	42.466	43.299	44.132	44.964	45.797	46.630	47.462	48.295	49.128
60	49.960	50.793	51.626	52.458	53.291	54.124	54.956	55.789	56.622	57.455
70	58.287	59.120	59.953	60.785	61.618	62.451	63.283	64.116	64.949	65.781
80	66.614	67.447	68.279	69.112	69.945	70.777	71.610	72.443	73.275	74.108
90	74.941	75.773	76.606	77.439	78.271	79.104	79.937	80.769	81.602	82.435
100	83.267	84.100	84.933	85.765	86.598	87.431	88.263	89.096	89.929	90.761

US Gallons to Liters (UG to Liters)

Formula

In easy English US Gallons X 3.78541 = Liters

Using Units UG X 3.78541 = Liters

UG	0	1	2	3	4	5	6	7	8	9
	Liters	Liters	Liters	Liters	Liters	Liters	Liters	Liters	Liters	Liters
0	0.000	3.785	7.571	11.356	15.142	18.927	22.712	26.498	30.283	34.069
10	37.854	41.640	45.425	49.210	52.996	56.781	60.567	64.352	68.137	71.923
20	75.708	79.494	83.279	87.064	90.850	94.635	98.421	102.206	105.991	109.777
30	113.562	117.348	121.133	124.919	128.704	132.489	136.275	140.060	143.846	147.631
40	151.416	155.202	158.987	162.773	166.558	170.343	174.129	177.914	181.700	185.485
50	189.271	193.056	196.841	200.627	204.412	208.198	211.983	215.768	219.554	223.339
60	227.125	230.910	234.695	238.481	242.266	246.052	249.837	253.622	257.408	261.193
70	264.979	268.764	272.550	276.335	280.120	283.906	287.691	291.477	295.262	299.047
80	302.833	306.618	310.404	314.189	317.974	321.760	325.545	329.331	333.116	336.901
90	340.687	344.472	348.258	352.043	355.829	359.614	363.399	367.185	370.970	374.756
100	378.541	382.326	386.112	389.897	393.683	397.468	401.253	405.039	408.824	412.610

Liters to US Gallons (Liters to UG)

Formula

In easy English Liters X 0.264172 = US Gallons

Using Units Liters X 0.264172 = UG

Liters	0	1	2	3	4	5	6	7	8	9
	UG	UG	UG	UG	UG	UG	UG	UG	UG	UG
0	0.000	0.264	0.528	0.793	1.057	1.321	1.585	1.849	2.113	2.378
10	2.642	2.906	3.170	3.434	3.698	3.963	4.227	4.491	4.755	5.019
20	5.283	5.548	5.812	6.076	6.340	6.604	6.868	7.133	7.397	7.661
30	7.925	8.189	8.454	8.718	8.982	9.246	9.510	9.774	10.039	10.303
40	10.567	10.831	11.095	11.359	11.624	11.888	12.152	12.416	12.680	12.944
50	13.209	13.473	13.737	14.001	14.265	14.529	14.794	15.058	15.322	15.586
60	15.850	16.114	16.379	16.643	16.907	17.171	17.435	17.700	17.964	18.228
70	18.492	18.756	19.020	19.285	19.549	19.813	20.077	20.341	20.605	20.870
80	21.134	21.398	21.662	21.926	22.190	22.455	22.719	22.983	23.247	23.511
90	23.775	24.040	24.304	24.568	24.832	25.096	25.361	25.625	25.889	26.153
100	26.417	26.681	26.946	27.210	27.474	27.738	28.002	28.266	28.531	28.795

TEMPERATURE CONVERSIONS

Celsius to Fahrenheit (°C to °F)

Formula

In easy English (Celsius X 9/5) +32 = Fahrenheit

Using Units (°C X 9/5) +32 = °F

°C	0	1	2	3	4	5	6	7	8	9
	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F
0	32.000	33.800	35.600	37.400	39.200	41.000	42.800	44.600	46.400	48.200
10	50.000	51.800	53.600	55.400	57.200	59.000	60.800	62.600	64.400	66.200
20	68.000	69.800	71.600	73.400	75.200	77.000	78.800	80.600	82.400	84.200
30	86.000	87.800	89.600	91.400	93.200	95.000	96.800	98.600	100.400	102.200
40	104.000	105.800	107.600	109.400	111.200	113.000	114.800	116.600	118.400	120.200
50	122.000	123.800	125.600	127.400	129.200	131.000	132.800	134.600	136.400	138.200
60	140.000	141.800	143.600	145.400	147.200	149.000	150.800	152.600	154.400	156.200
70	158.000	159.800	161.600	163.400	165.200	167.000	168.800	170.600	172.400	174.200
80	176.000	177.800	179.600	181.400	183.200	185.000	186.800	188.600	190.400	192.200
90	194.000	195.800	197.600	199.400	201.200	203.000	204.800	206.600	208.400	210.200
100	212.000	213.800	215.600	217.400	219.200	221.000	222.800	224.600	226.400	228.200

Fahrenheit to Celsius (°F to °C)

Formula

In easy English (Fahrenheit - 32) X 5/9 = Celsius

Using Units (°F-32) X 5/9 = °C

°F	0	1	2	3	4	5	6	7	8	9
	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	-17.778	-17.222	-16.667	-16.111	-15.556	-15.000	-14.444	-13.889	-13.333	-12.778
10	-12.222	-11.667	-11.111	-10.556	-10.000	-9.444	-8.889	-8.333	-7.778	-7.222
20	-6.667	-6.111	-5.556	-5.000	-4.444	-3.889	-3.333	-2.778	-2.222	-1.667
30	-1.111	-0.556	0.000	0.556	1.111	1.667	2.222	2.778	3.333	3.889
40	4.444	5.000	5.556	6.111	6.667	7.222	7.778	8.333	8.889	9.444
50	10.000	10.556	11.111	11.667	12.222	12.778	13.333	13.889	14.444	15.000
60	15.556	16.111	16.667	17.222	17.778	18.333	18.889	19.444	20.000	20.556
70	21.111	21.667	22.222	22.778	23.333	23.889	24.444	25.000	25.556	26.111
80	26.667	27.222	27.778	28.333	28.889	29.444	30.000	30.556	31.111	31.667
90	32.222	32.778	33.333	33.889	34.444	35.000	35.556	36.111	36.667	37.222
100	37.778	38.333	38.889	39.444	40.000	40.556	41.111	41.667	42.222	42.778

INTRODUCTION TO AIRCRAFT

A light-sport aircraft, also known as light sport aircraft or LSA, is a small aircraft that is simple to fly and that meets certain regulations set by a national aviation authority restricting weight and performance. They are certified using consensus standards that the industry and aviation authorities together have agreed to develop and adapt. The accepted consensus standards are defined by ASTM Technical Committee F37. Aircraft built to the consensus standard may be factory-built and sold with a special airworthiness certification (S-LSA) or may be assembled from a kit under the experimental rules (E-LSA) under experimental airworthiness. The certification category would dictate the operation-ability of the certified aircraft.

Storm Rally is an S-LSA aircraft produced under strict factory control using the ASTM consensus standards accepted by Civil Aviation Authority of Pakistan. It comes with a special airworthiness certificate that must be kept onboard for ready reference.

AIRFRAME CONSTRUCTION

The aircraft Storm Rally has been produced with all composite parts which are made of glass, carbon and kevlar fabrics. All raw materials, parts and assemblies used are of general aviation industry grade and therefore comply with internationally accepted aviation standards.

All parts have been tested at safety factor of a minimum 1.65

All composite parts are made in molds therefore no shape or structural differences can occur.

DESCRIPTIVE DATA OF STORM RALLY

Engine:

Number of engine 1
Engine manufacturer... ROTAX
Engine model... Normally aspirated, 4- cylinder, 4-stroke, liquid/air cooled engine with opposed cylinders, dry sump forced lubrication with separate 3 Liters oil tank/sump, 2 carburetors, mechanical and electric fuel pumps, dual breakerless capacitor discharge electronic ignition, electric starter, integrated reduction gear 2.43:1 and a time before overhaul of 2000 Hours.

Horsepower rating and engine speed .... 100 BHP at 5800 RPM (max. 5 min.)

95 BHP at 5500 (continuous).

Propeller:
Number of blades 3
Propeller Manufacturer.. DUC Helices
Propeller type .... Three-blade Inconel SWIRL ground adjustable

Fuel:
Number of tank .... 2 Wings Leading edges tanks
Fuel capacity both .... 135 Liters
Total usable .... 130 Liters

Oil:
Oil tank capacity .... 3 Liters

Detailed information on the ROTAX 912 ULS3 engine can be found in the Engine Manufacturer's operating manual.

WARNING

Please study and understand the Engine Manufacturer's Operating Manual completely before flying the aircraft. Strictly adhere to the recommendations of the engine manufacturer.

Maximum Aircraft Weights (S-LSA):

Standard Empty Weight Basic .... 347 kg
Maximum useful load... 253 kg

G-load factors

Maximum positive wing load allowed................................ + 4 G
Maximum negative wing load allowed .... – 2 G

These values correspond to ASTM standards for LSAs. All parts have been tested to a safety factor of a minimum 1.65, meaning they were subjected to at least a load of 6.6 Gs

CABIN AND ENTRY DIMENSIONS

Detailed dimensions of the cabin interior and canopy opening are illustrated in sect. 4.

SEATS AND SAFETY HARNESSES

Storm rally S-LSA has Side-by-side seating where each seat has a composite support structure internally and therefore cannot be folded for luggage access. Seats are designed to be removable, hence they are easily cleanable and dryable.

Each seat is sliding adjustable with fixed paddles, capable of catering for people with heights upto 7’ 0”. Storm rally is shipped with H type safety harness, for each seat separately, attached to the fuselage at three mounting points.

Additional seat upholstery to raise the small pilot or move him forward can be ordered, optionally.

WARNING

Before each flight, ensure that the seat belts are firmly secured to the airframe and that the belts are not damaged. Bring the buckle, by adjusting it, to the central of the body.

BAGGAGE SPACE

The rear baggage area is located behind the seats. It may accommodate up to 50 KG of baggage.

WARNING

Before each flight, make sure that baggage does not exceed maximum allowable weight, and that the aircraft C.G. is within limits with loaded baggage. All baggage must be properly secured.

Dimensions of the baggage area are illustrated in detail in section 4.

PITOT-STATIC SYSTEM

Storm Rally pitot-static probe is located below the right wing. Pressure distribution to the instruments is through flexible plastic hoses. Keep the pitot head clean to ensure proper function of the system.

WARNING

Before each flight, make sure that the pitot-Static cover is removed and there is nothing blocking the pitot or its static tube.

DESCRIPTION CONTROLS IN THE COCKPIT

Storm Rally aircraft is equipped with two center sticks for easy dual control of the aircraft. Each stick grip is separately equipped with a set of Trim control and a Push-to-Talk button. It comes with 2 sets of two rudder paddles each equipped with differential breaking, separately. There is a throttle lever, located on the center console, in easy access of both seats and is colored gray. There is a choke for cold starts only, colored red, also located on the center console. Two Parking Breaks are located on the rear end of the central console. They are both side-by-side and are colored red. There is a flap extension/retraction button, colored black, present on the center of the central console for the easy control of the electrically actuated flaps. On the top of the center console, we have the master fuel valve. On the extreme left side of the control panel we have the starter switch. Above the starter switch we have the in-cockpit speaker audio control switch which is also colored black for easy identification. On the left bottom of the control panel we have the master switch, colored red, followed by the lighting switches, the strobe and the electrical fuel pump switch. On the extreme right side we have the Circuit breakers marked separately for easy identification. Above the Circuit breakers, we have the ELT control unit. Above this unit, we have Radio direct connection jacks that can be used for transmission/reception in case of intercom or audio panel malfunction.

The controls are designed to be simplistic with clear separations for easy remembrance.

INSTRUMENTS AND AVIONICS INSTALLED

- Dynon Skyview next generation of glass panel with Integrated EFIS, EMS, GPS Navigation, HSI, NAV, , 3D Terrain / Synthetic Vision, Jeppesen Maps, Terrain awareness and FDR with backup battery other than the aircraft battery.
- MGL Backup Instrument with Airspeed and Altitude Indicator
- Garmin SL30 Nav/Com
- Garmin GTX 327 Transponder
- AMERI-KING Emergency Locator Transmitter (ELT) AK-451
- Pannel Mount Intercom (SPA-400)

MINIMUM INSTRUMENTS AND EQUIPMENT LIST FOR VFR FLIGHTS

- Dynon Skyview with EFIS and EMS where the following are working properly
  - Altimeter
  - Compass(is not required by ASTM F 2245)
  - Fuel quantity indicator
  - Tachometer (RPM)
  - Engine instruments as recommended by the engine manufacturer :
    - Oil temperature indicator
    - Oil pressure indicator
    - Cylinder head temperature indicator
- MGL Backup instrument where Airspeed and Altitude is being displayed
- Garmin SL30 for communications

AIRCRAFT 3D VIEW DRAWINGS

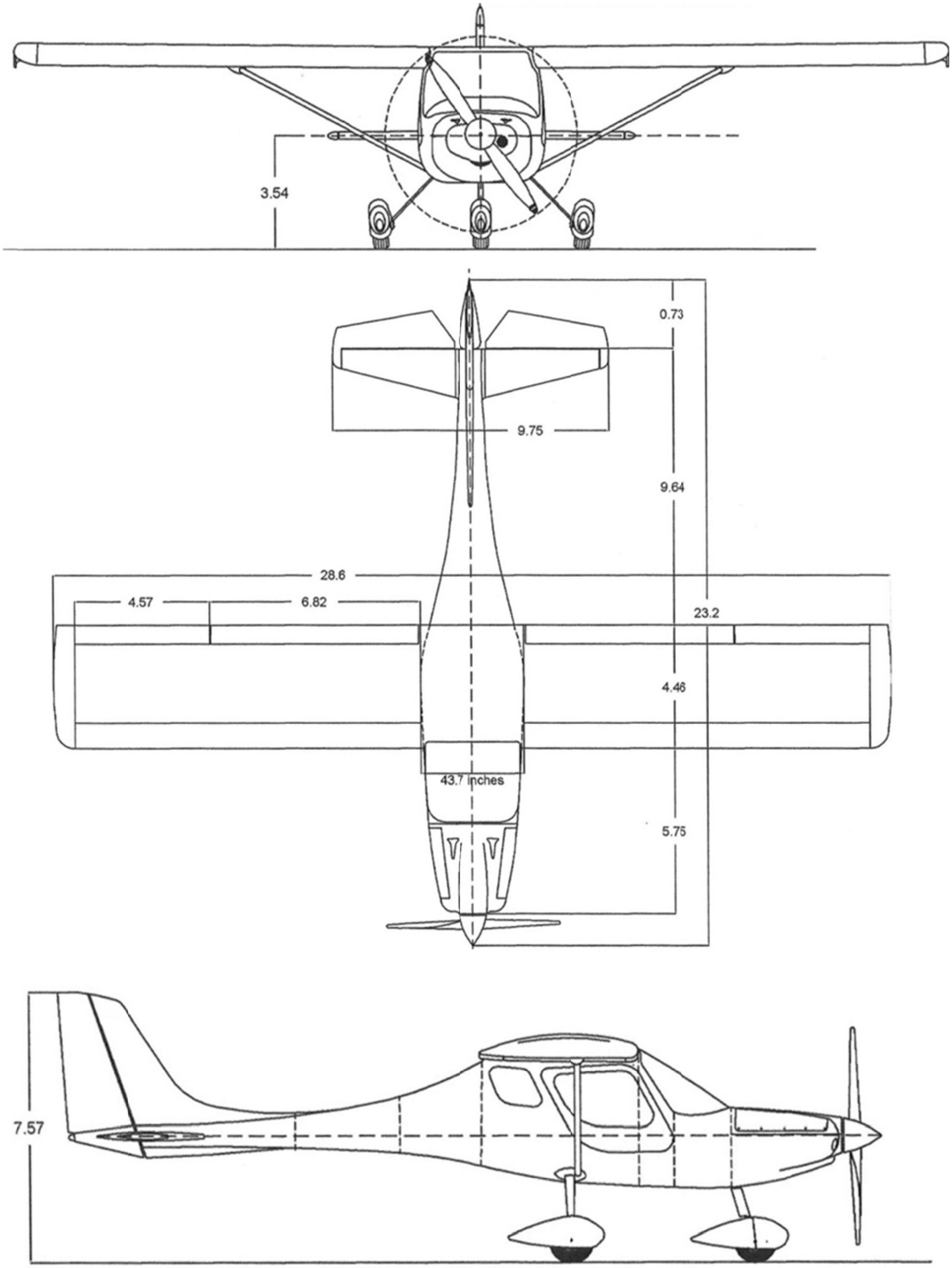


fig. 1-1 Principal Dimensions (in meter)

SECTION 2 PERFORMANCE SPECIFICATIONS FOR LSA ACTIVITY

SPEED:

Maximum at sea level .... 120 knots
Cruise (75% power at 2000 feet, ISA conditions)................. 107 knots

CRUISE:

75% at 2000 feet (ISA conditions) Range .... 800 nm........... 1481 km
34 gal usable fuel... 7.2 hours
Rate of climb at sea level: .... 244 m .... 800 fpm
Service ceiling: .... 3658 m.......... 12000 feet

TAKEOFF PERFORMANCE (ISA conditions, sea level):

Ground roll .... 110 m .... 361 feet
Total distance over 50 feet obstacle .... 270 m .... 886 feet

LANDING PERFORMANCE (ISA conditions, sea level):

Ground roll .... 140 m............ 460 feet
Total distance over 50 feet obstacle .... 330 m............ 1083 feet

STALL SPEED:

Flaps up, power off... 44 knots
Flaps down, power off... 35 knots

MAXIMUM WEIGHT:

Sport light aircrafts rules .... 600 kg

STANDARD EMPTY WEIGHT:

Sport light aircraft .... 347 kg

MAXIMUM USEFUL LOAD:

Sport light aircraft .... 252 kg

BAGGAGE ALLOWANCE:.................................... 45 kg

WING LOADING:

Sport light aircraft .... 49.5 kg/m^2

POWER LOADING:.. 6 kg/hp

TOTAL FUEL CAPACITY:

Standard wing tanks .... 135 Liters
Oil capacity: .... 3 Liters

ENGINE:

Model .... Rotax 912 UL S3
Power/rpm .... 100 hp / 5800 rpm

PROPELLER:

Manufacturer .... DUC Helices
Model .... Three-blade Inconel SWIRL
Type .... 3 blades ground adjustable
Diameter... 72” when installed

SECTION 3 - LIMITATIONS

INTRODUCTION

Section 3 includes operating limitations and instrument markings necessary for the safe operation of the airplane, its engine, standard system and standard equipment.

AIRSPEED LIMITATIONS

Airspeed limitation and their operational significance are shown in figure 3-1.

Speed	Knots	Remarks
V_{NE} never exceed speed	**140**	do not exceed this speed under all conditions
S-LSA limited to	**120**	Limited for safety
V_{NO} maximum structural cruising speed	**120**	do not exceed this speed except in smooth air, and then only with caution.
V_A maneuvering speed	**88**	do not make full or abrupt control movements above this speed.
V_{FE} 10° flap	**85**	do not exceed this speed with 10° flap selected
V_{FE} max. flap V_{LE} extended speed	**70**	Do not exceed this speed with flap down

fig. 3-1 Airspeed Limitations

AIRSPEED RECOMMANDATIONS

Airspeed indicator representation and their color code significance are shown in figure 3-2.

REPRESENTATION	Knots VALUE or RANGE	SIGNIFIANCE
Gray	**0-45**	Avoid flying at these speeds under all conditions
White	**45-65**	Full flap operating range.
Green	**50-110**	Normal operating range.
Yellow	**110-120**	operation must be conducted with caution
Red	**120**	Max. speed all operations

POWER PLANT LIMITATIONS

Engine Model:		**ROTAX 912 ULS**
Engine Manufacturer:		**Bombardier-Rotax GMBH**
Power	*Max Take-off:*	100 hp **at 5800 rpm (max. 5 min.)**
	Max. Continuous:	90 **hp** **at 5500 rpm**
	Cruising:	**71 hp** **at 4800 rpm**
Engine RPM	*Max. Take-off:*	5800 rpm **(max. 5 min.)**
	Max. Continuoust:	**5500 rpm**
	Cruising:	**4800 rpm**
	Idling:	2300 rpm (Recommanded)
	Idling Minimum:	**1400 rpm**
Cylinder head temperature	*Minimum:*	122° F ***(50° C)***
	Maximum:	**275 ° F *(135 ° C)* ***
	Optimum:	**167 - 230° F *(75 - 110° C)***
Oil temperature	*Minimum:*	122° F ***(50° C)***
	Maximum:	**266° F *(130° C)***
	Optimum:	**194 - 230° F *(90 - 110° C)***
Oil pressure	*Minimum:*	12 psi ***(0.8 bar) - below 3500 rpm***
	Maximum:	**102 psi *(7 bar)* - cold engine starting**
	Optimum:	**29 - 73 psi *(2 - 5 bar) - above 3500 rpm***
Fuel	*Minimum:*	2.2 psi ***(0.15 bar)***
	Maximum:	**5.8 psi *(0.4 bar)***

Detailed operating information can be found in the Engine Manufacturer Manuals. For specifically these values see the Rotax Operator's manual section 10.1.2 Operating speeds and limits.

POWER PLANT INSTRUMENT REPRESENTATIONS

Power plant instrument representations and their color code significance are shown in figure 3-3.

INSTRUMENT	Gray Portion minimum limit	GREEN Portion normal operating	RED Portion maximum limit
tachometer	not ind	1500 - 5500 rpm	5800 rpm
oil temp.	not ind	50°C - 120°C	130°C - 140°C
oil pressure	2 bar – 29 psi	2 - 5 bar - 29 – 73 psi	7 bar 100 psi
Cylinder Head temp.	50° C – 120° F	75° – 125°C 167° – 257° F	58° - 140°C
fuel pressure	0.15 bar – 2.2 psi	0,2 - 0,4bar - 3 – 5.8 psi	0,5 bar - 7.2 psi

fig. 3-3 Power Plant Instrument Markings

WARNING

If you ever exceed 5800 rpm, may it be because of any reason, you are bound to make an entry in the maintenance log of the aircraft. It is criminal and extremely dangerous if such an occurrence is concealed.

WEIGHT LIMITS FOR SPORT PILOT AIRCRAFT FLYING ACTIVITY

Maximum takeoff weight (MTOW) .... 600 kg
Maximum landing weight... 600 kg
Maximum weight in baggage area .... 50 kg

WARNING

Do not exceed maximum take-off weight of 1 320 lb (600 kg) and Never exceed the allowed baggage weight, if exceeded, under conditions it may make your aircraft uncontrollable.

DESIGN CENTER OF GRAVITY LIMITS AND RANGE

Forward: 29.97 centimeters from the Wing Leading edge at 410 kg or less, with straight line variation to 46.99 cm aft of Datum at all weights.

Afterward: 50,80 cm aft of datum at all weights.

The reference datum is the Leading edge of the wing.

MANEUVERING LIMITS

This airplane is designed for limited aerobatics flight and is released to service in the utility category.

No aerobatics maneuvers are approved except those listed below:

Chandelles	maximum entry speed............................... 105 knots
Lazy eights	maximum entry speed............................... 105 knots
Steep turns	maximum entry speed............................... 105 knots
Stalls	use slow deceleration

Higher speed can be used if abrupt use of controls is avoided.

Aerobatics that may impose high loads should not be attempted.

The important thing to bear in mind in flight maneuvers is that the airplane is clean in aerodynamic design and will build up speed quickly with nose down attitude.

Proper speed control is an essential requirement for execution of any maneuver, and care should always be exercised to avoid excessive speed which in turn can impose excessive loads.

In the execution of all maneuvers avoid abrupt use of controls.

FLIGHT LOAD FACTOR LIMITS (NORMAL CATEGORY RULES)

Gross Weight : 600Kg - 1320lbs

Flaps up... + 4.4 g - 1.76 g
Flaps down... + 4 g - 1 g

The design load factors are at least 165% of the above, calculated for the S-LSA version of the aircraft (i.e. MTOW of 600 kg), and in all cases, the structure meets or exceed the design loads.

However, it is highly recommended not to reach the above mentioned Load Factor Limits.

FUEL LIMITS

The aircraft is equipped with 2 fuel tanks, located in leading edge of wings, for 135 Liters total capacity. However the total usable fuel (all flight conditions) is 130 Liters.

The unusable fuel which remains in the bottom of the fuel tank is approximately 5 Liters.

OTHER LIMITATIONS

Limitations

- No smoking onboard the aircraft
- Flying into known icing conditions is not permitted.
- Flying in heavy rainfalls is not permitted;
- Flying during thunderstorm activity is not permitted;
- Flying in a blizzard is not permitted;
- Flying according to instrumental flight rules (IFR) under IMC or attempt to fly in zero visibility conditions (IMC) is not permitted;
- Flying when outside air temperature (OAT) reaches 47°C or higher;
- Aerobatic flying except approved maneuvers is not permitted ;
- Take off and land with flaps retracted or set to non-approved position is also not permitted

Permits

- Day VFR flight / training under visual meteorological conditions (VMC) is permitted
- Day IFR flight training under visual meteorological conditions (VMC) is permitted
- ILS flight training under visual meteorological conditions (VMC) is permitted
- Approved aerobatic maneuvers in visual meteorological conditions (VMC) are permitted, provided done in smooth air and under strict control of a trained rated pilot.

INTENTIONAL FLIGHTS UNDER KNOWN ICING CONDITIONS AND/OR FLIGHT UNDER INSTRUMENT METEOROLOGICAL CONDITIONS (IMC) IS STRICTLY PROHIBITED

FLIGHT IN RAIN

When flying in light rain, no additional steps are required. Aircraft qualities and performance are not substantially changed. However visual meteorological conditions must be maintained.

Caution should be exercised when flying in the rain, all steps should be taken to avoid entering areas with rain and thunderstorms.

SECTION 4 - WEIGHT AND BALANCE

INTRODUCTION

This section describes the procedure for establishing the basic empty weight and moment of the airplane. Sample forms are provided for reference. It is recommended to use the digital excel template to determine the weight and balance. If it is not possible for you to use the digital template, then use the method described below.

Procedures for calculating the weight and moment for various operations are also provided.

AIRPLANE WEIGHING PROCEDURE

a) Preparation:

1) Inflate tires to recommended operating pressure
2) Drain all fuel
3) Drain all oil
4) Raise flap to the fully retracted position
5) Place the aircraft leveled

b) Leveling:

1) Place scales under each wheel (200 kg minimum capacity for scales)
2) Release brakes
3) Check aircraft leveled

c) Weighing:

1) Record the weight shown on each scale deducting the tare if any.

d) Measuring (ref. figure 4-1):

1) Obtain measurement A by measuring horizontally (along the airplane center Line) from a line stretched between the main wheel centers to a plumb bob Dropped from the firewall

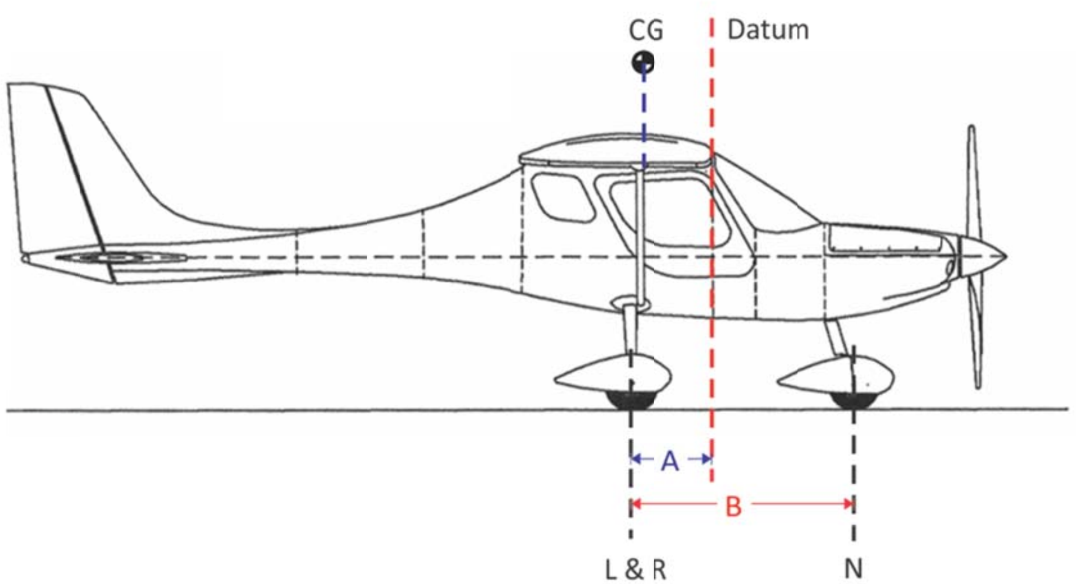
2) Obtain measurement B by measuring horizontally and parallel to the Airplane center line, from center of nose wheel axle, left side, to a Plumb bob dropped from the line between the main wheel centers. Repeat on right side and average the measurements.

Using weights from (L –R - N) and measurements from (B) the airplane weight and C.G. can be determined by completing figure 4-5.

The basic empty weight may be determined completing figure 4-6.

WEIGHT AND BALANCE

The following procedure will enable you to operate your aircraft within the prescribed weight and C.G. limitations.



To figure weight and balance, use the sample problem form, loading graph and C.G. moment envelope as follows:

take the basic empty weight and moment from appropriate weight and balance records carried in your airplane and enter them in the column titled "YOUR AIRPLANE" on the sample loading problem.

Use the loading graph to determine the moment/1000 for each additional item to be carried on the aircraft, then list these on the loading problem.

Total the weights and moments/1000 and plot these values on the C.G. moment envelope to determine whether the point falls within the envelope, and if the loading is acceptable.

SCALE POSITION	SCALE READING(Kg)	TARE	SYMBOL	NET WEIGHT(Kg)
LEFT WHEEL	140.9	0	L	140.9
RIGHT WHEEL	140.25	0	R	140.25
NOSE WHEEL	59.9	0	N	59.9
SUM OF NET WEIGHTS			W	341.15

$$X = ARM = \frac{(A) - (N) * (B)}{W}$$

(A) = 123 cm

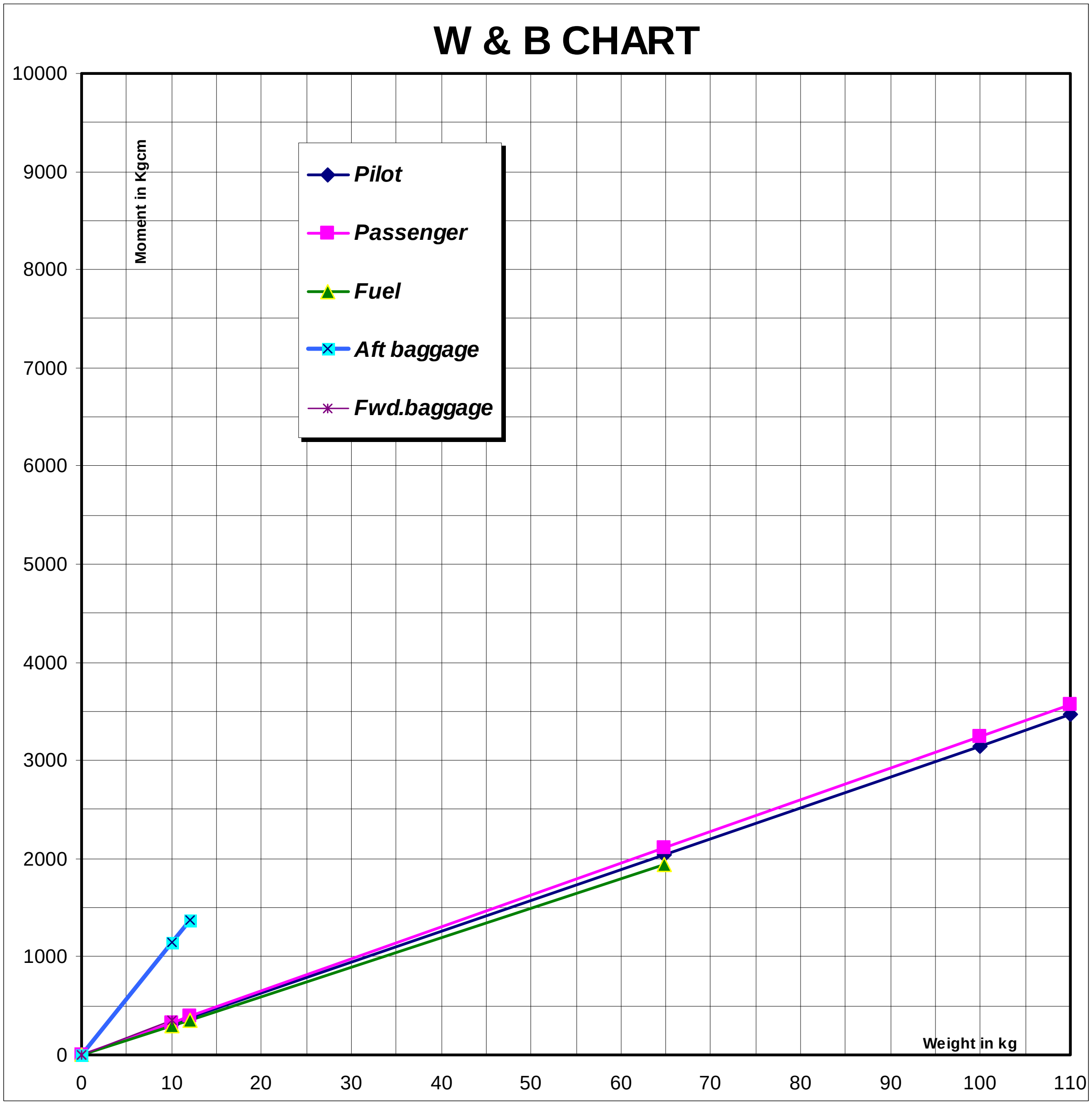
(B) = 193 cm

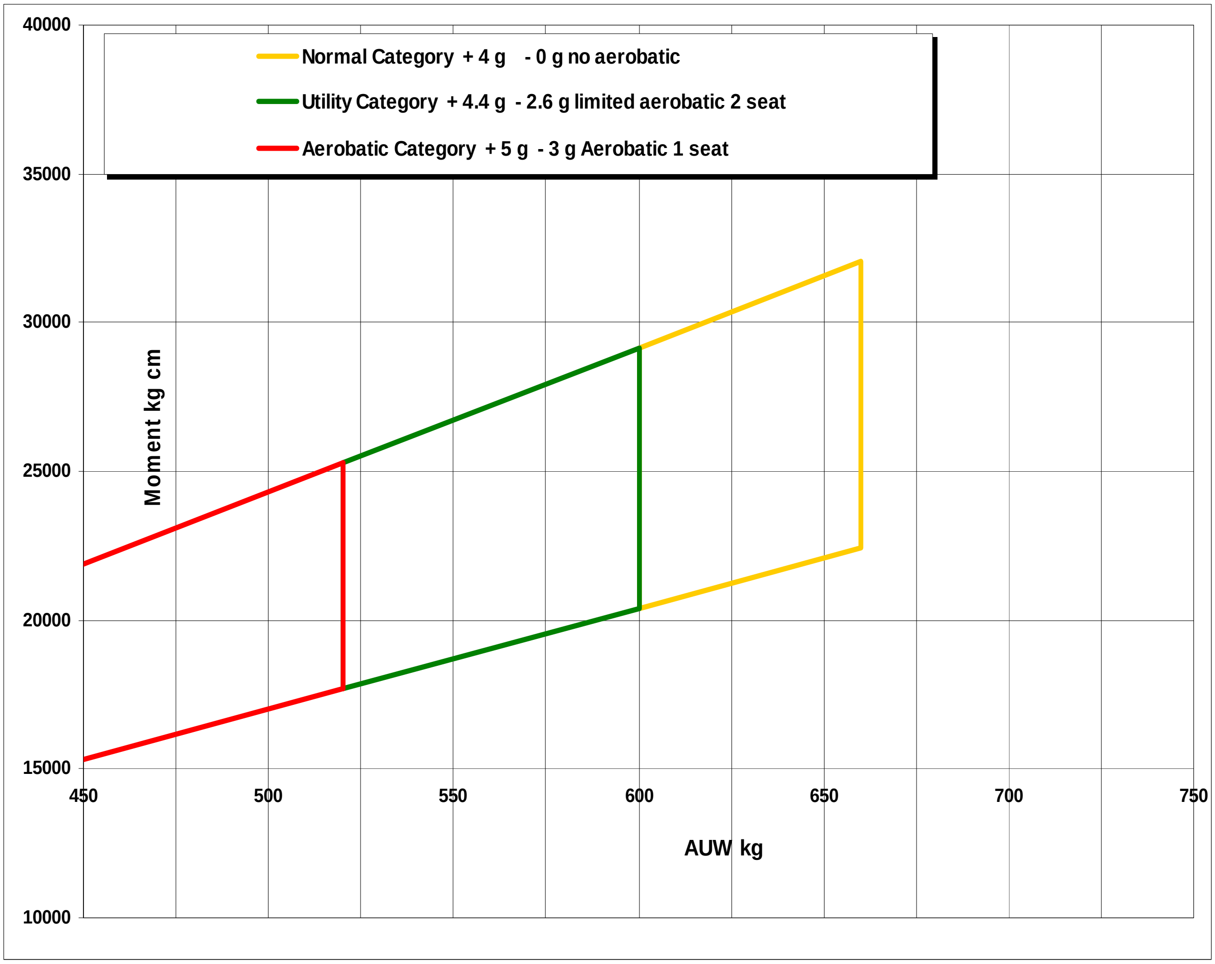
Fig. 4-5 Sample Aircraft Weighing and determination of CG station

	ITEMWEIGHT (Kg) X	CG ARM (cm)	= MOMENT (Kg/cm)
AIRCRAFT BASIC EMPTY WEIGHT	341.15	35.6	12144.94

Fig. 4-6 Sample Aircraft Basic Empty Weight and Moment

SAMPLE LOADING PROBLEM	SAMPLE AIRPLANE		YOUR AIRPLANE	
	WEIGHT(Kg)	MOMENT(Kgxcm)	WEIGHT(Kg)	MOMENT(Kgxcm)
BASIC EMPTY WEIGHT	341,05	12144.94		
FUEL 98,4 Liters.	71.7	-5062.02		
PILOT & PASSENGER	160	16160		
BAGGAGE AREA	18.1	2068.8		
TOTAL WEIGHT & MOMENT	590.85	25410.92		
Locate this point (590.85 at 25410.92 on the CG Moment Envelope graph)				


W & B CHART
Moment in Kgcm
Weight in kg
Pilot
Passenger
Fuel
Aft baggage
Fwd.baggage
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
10
20
30
40
50
60
70
80
90
100
110


Normal Category + 4 g - 0 g no aerobatic
Utility Category + 4.4 g - 2.6 g limited aerobatic 2 seat
Aerobatic Category + 5 g - 3 g Aerobatic 1 seat
Moment kg cm
AUW kg
40000
35000
30000
25000
20000
15000
10000
450
500
550
600
650
700
750

SECTION 5 - PERFORMANCE

INTRODUCTION

Performance data charts on the following pages are presented so that you may know what to expect from the airplane under various conditions, and also, to facilitate the planning of flights in detail and with reasonable accuracy.

The data in the charts has been computed from actual flight tests with the airplane and engine in good condition and using average piloting techniques.

USE OF PERFORMANCE CHARTS

Performance data is presented in tabular form to illustrate the effect of different variables. Conservative values can be selected and used to determine the particular performance figure with reasonable accuracy.

SAMPLE PROBLEM

The following sample flight problems utilizes information from the various charts to determine the predicted performance data for a typical flight.

The following information is known:

EXAMPLE

Airplane configuration:

- Takeoff weight .... 600 kg
- Usable fuel .... 75 Liters

Takeoff conditions:

- Field pressure altitude... 1500 feet
- Temperature... 28°C (16°C above standard)
- Wing component along runway .... 13 knots headwind
- Field length .... 427 m

Cruise conditions:

- Total distance .... 400 sm
- pressure altitude .... 5500 feet
- Temperature... 20°C (16°C above standard)
- Expected wind enroute .... 10 knots headwind

Landing conditions:

- Field pressure altitude .... 2000 ft
- Temperature .... 25°C
- Field length .... 457 m

TAKE-OFF

The takeoff distance chart (fig.5-3) should be consulted keeping in mind that the distances shown are based on normal takeoff technique.

Conservative distances can be established by reading the chart at the next higher value of altitude and temperature.

For example, in this particular sample problem, the take-off distance information presented for a pressure altitude of 2000 feet and a temperature of 30°C should be used and results in the following:

- Ground roll .... 160 m
- Total distance to clear a 50 feet obstacle .... 390 m

These distances are well within the available take-off field length, however, a correction for the effect of wind may be made based on **Note 3** of the take-off chart: decrease the ground roll by 10% for 10 knots head wind.

The correction for a 13 knots headwind is:

(13 knots: 10 knots) x 10 = 13%

This result in the following distances corrected for wind:

a) Ground roll (zero wind) .... 160 m
b) Decrease in ground roll (160 m x 13%) .... 20 m
c) Corrected ground roll (a-b) .... 146 m
d) Total distance to clear a 50 ft obstacle (zero wind) .... 390 m
e) Decrease in total distance (4300 ft x 13%) .... 50 m
f) Corrected total distance to clear a 50 ft obstacle (d-f) ...... 340 m

CRUISE

The cruising altitude should be selected based on a consideration of trip length, wind aloft, and the airplane's performance.

A typical cruising altitude and the expected wind enroute have been given for this sample problem. The cruise performance chart (fig. 5-5) is entered at 6000 feet altitude and 20°C above standard temperature.

The engine speed chosen is 4500 RPM, which result in the following:

Power.. 48%
True airspeed.. 100 knots
Cruise fuel flow.. 14.5 Liters/hour

FUEL REQUIRED

The total fuel requirement for the flight may be estimated using the performance information in figure 5-4 and 5-5. For this sample problem, figure 5-4 shows that a climb from 2000 feet to 6000 feet requires 3,8 liter of fuel.

The corresponding distance during the climb is 10 knots.

These value are for standard temperature and are sufficiently accurate for most flight planning purposes.

However, a further correction for the effect of a non-standard temperature is to increase the time, fuel, and distance by 10% for each -13°C above standard temperature, due to the lower rate of climb.

In this case, assuming a temperature 61°F above standard, the correction would be:

(16°F : 8°F) x 10 = 20%

With this factor included the fuel estimate would be calculated as follows:

a) Fuel to climb (standard temperature)................................ 4.5 Liters
b) Increase due to non-standard temp. (4,5Liters x 20%)..... 0.75 Liters
c) Corrected fuel to climb (a + b)... 5.5 Liters

Using a similar procedure, the distance to climb results 14 miles. The resultant cruising distance is:

d) Total distance .... 400 sm
e) Climb distance .... 15 sm
f) Cruise distance (d - e).. 385 sm

With an expected 10 knots headwind, the ground speed for cruise is predicted to be:

100 knots – 10 knots = 90 knots

Therefore, the time required for the cruise portion of the trip is:

385 sm : 90 knots = 4 hours 20 minutes

The fuel required for cruise is: 4.3 hours x 14.5Liters = 62.3Liters

The total estimate fuel required is as follows:

g) Engine start, taxi, and takeoff .... 3 Liters
h) Climb .... 5.5 Liters
i) Cruise.. 62.3 Liters
j) Total fuel required (g + h + i).. 70.8 Liters

This will leave a reserve of: 76Liters – 70.8Liters = 5.2 liters

Once a flight is underway, ground speed checks will provide a more accurate basis for estimating the time enroute and the corresponding fuel required to complete the trip with ample reserve.

LANDING

A procedure similar to takeoff should be used for estimating the landing distance at the destination airport.

Figure 5-6 presents landing distances for various airport altitude and temperature combinations, using the short field landing technique.

The distances corresponding to 609.60 m and 30°C are as follows:

Ground roll .... 130 m
Total distance to clear a 50-ft obstacle .... 300 m

A correction for the effect of wind may be made based on Note 2 of the landing chart using the same procedure as outlined for takeoff.

STALL SPEEDS CHART

Condition: power off;

STALL SPEED CHART		Speed (Knots)			
		Angle of Bank			
Gross Weight	Flaps	0° Knots	30° Knots	45° Knots	60° Knots
600 kg	UP	40	45	57	75
	10°	39	44	53	67
	20°	37	42	51	65
	32°	35	37	45	60

Fig. 5 - 1 Stall speed chart

RATE OF CLIMB (maximum)

Conditions: flaps up; full throttle

RATE OF CLIMB CHART		Engine: Rotax 912 ULS3 100 HP Propeller: DUC 3 blades Ground Adjustable				
Gross Weight	Pressure Altitude feet	Climb Speed Knots	Rate of Climb in fpm			
			- 20° C	-17.8° C	21.1° C	37.8° C
600 kg	SL	60	930	858	792	721
	2000	59	816	742	675	604
	4000	58	701	628	562	489
	6000	56	586	519	451	375
	8000	55	471	405	339	261
	10000	54	356	290	223	45
	12000	53	242	223	206	-

Fig. 5 - 2 Rate of climb chart

TAKE-OFF DISTANCE CHART

Conditions: flaps 15°; full throttle prior to brake release; paved, level, and dry runway; zero wind; distances are given in feet.

Notes:

1. Normal take-off technique as specified in Section 7
2. Decrease distances 10% for each 10 knots headwind. For operation with a tailwind up to 10 knots, increase distances 10% for each 2 knots
3. Where distance value has been deleted, climb performance after lift-off is less than 150 fpm at take-off speed
4. For operation on a grass runway, increase distances by 15% of the ground roll figure

TAKE-OFF DISTANCE CHART

Gross Weight (Kg)	Take off Speeds		Temp	0°C	0°C	10°C	10°C	21°C	21°C	29.5°C	29.5°C	37.7°C	37.7°C
	Lift off	At 50'	Pressure Altitude in feet	ground roll Normal	ground roll for 50' obstacle	ground roll Normal	ground roll for 50' obstacle	ground roll Normal	ground roll for 50' obstacle	ground roll Normal	ground roll for 50' obstacle	ground roll Normal	ground roll for 50' obstacle
600 kg	45 Knot	55 Knot	S.L	300	558	348	626	404	797	488	1011	601	1346
			1000	342	622	400	792	480	1004	586	1328	709	1701
			2000	393	779	468	997	581	1308	703	1671	876	2058
			3000	464	986	571	1302	686	1656	851	2025	1129	2462
			4000	557	1295	680	1642	837	2008	1098	2431	1401	2899
			5000	668	1627	824	1988	1075	2405	1361	2862	1619	3343
			6000	815	1973	1046	2380	1333	2827	1586	3315	1943	3921
			7000	1027	2358	1303	2807	1565	3281	1911	3859	-	-
			8000	1284	2787	1544	3257	1888	3813	-	-	-	-

Fig. 5 - 3 Take-off distance chart

TIME, FUEL, AND DISTANCE TO CLIMB CHART (MAXIMUM RATE OF CLIMB)

Conditions: flaps up; full throttle (5500 RPM); standard temperature; zero wind.

Notes:

1. Add 4 Liters of fuel for engine start, taxi and takeoff
2. Increase time, fuel and distance by 10% for each 7.78°C above standard temp.

Weight	Pressure altitude	Temp.	Climb Speed	Rate of climb	Time	From sea level	
[Kg]	[feet]	[C°]	[knots]	[fpm]	[min.]	Fuel used [lt]	Distance [sm]
600	Sea Level	15.5	72	720	0	0	0
	1000	12.7	72	700	2	0.76	2.5
	2000	11.1	71	660	3	1.9	4.2
	3000	8.8	71	620	5	2.65	6.7
	4000	6.6	70	580	7	3.8	9
	5000	5	70	530	9	4.9	11.5
	6000	2.8	69	480	11	6.1	15
	7000	1.1	69	425	14	7.2	18
	8000	-1.1	68	375	17	8.7	21
	9000	-3.3	68	315	20	10.2	26
	10000	-5	67	275	23	12.1	30
	11000	-6.7	67	220	27	14	36
	12000	-8.9	66	180	33	15.9	42.5

fig. 5-4 Time, fuel and distance to climb chart

CRUISE PERFORMANCE CHART

Conditions: weight 600 kg; zero wind.

Pressure Altitude	RPM	20°C below Standard Temperature			Standard Temperature			20°C above Standard Temperature		
		BHP	knots	Lt/h	BHP	knots	Gal/h	BHP	knots	Lt/h
2000	5500	95	120	26.5	95	118	7.2	72	116	20.4
	5200	90	116	22.7	73	113	5.4	68	111	18.9
	5000	75	110	19.7	65	107	4.8	60	106	17
	4500	65	105	17.4	57	103	4.3	53	102	15.1
	4400	54	110	15.1	50	98	3.8	47	96	14
	4200	47	95	13.6	44	93	3.5	42	90	12.1
4000	5500	90	118	25	78	116	5.8	70	113	19.3
	5200	85	113	20.8	69	110	5.1	64	108	18.2
	5000	70	106	18.6	61	105	4.5	57	103	16.7
	4500	60	103	16.7	54	102	4	50	100	14.8
	4400	51	100	14.4	48	98	3.6	45	95	13.3
	4200	45	95	13.3	42	93	3.2	40	91	12.2
6000	5500	84	116	23.9	77	113	5.5	69	111	19.3
	5400	79	112	22	73	110	5.3	67	108	18.9
	5200	70	108	19.3	64	107	4.7	60	105	17
	5000	62	105	17.4	57	103	4.3	53	100	15
	4500	54	101	15.5	51	100	3.9	48	97	14.4
	4400	48	96	13.6	45	95	3.5	42	93	12.1
8000	5400	74	112	20	68	110	5	63	106	18.2
	5200	65	107	18.2	60	106	4.5	57	104	16.7
	5000	58	105	16.3	54	102	4	51	101	14.8
	4500	52	100	15.2	48	99	3.7	45	98	12.3
	4400	46	96	13.3	43	94	3.2	40	93	12.1
10000	5400	69	110	19.3	64	110	4.8	59	108	17
	5200	61	107	17	57	107	4.3	53	106	15.2
	5000	55	104	15.5	51	103	3.9	48	102	13.6
	4500	49	99	14	45	98	3.6	43	98	12.2
12000	5300	61	108	17	57	107	4.4	53	106	15.5
	5200	58	106	16.3	54	105	4	50	104	14.4
	5000	52	102	15.2	48	102	3.7	45	101	13.3
	4500	46	100	13.3	43	99	3.2	41	98	12

fig. 5-5 Cruise performance chart

LANDING DISTANCE CHART

Conditions: flaps 32°; power off; normal braking; paved, level, and dry runway; zero wind.

Notes:

1. Normal landing technique as specified in Section 7.
2. Decrease distances 10% for each 10 knots headwind. For operation with a tailwind up to 10 knots, increase distances 10% for each 2 knots
3. For operation on a grass runway, increase distances by 15% of the ground roll figure

TAKE-OFF DISTANCE CHART

Gross Weight (Kg)	Landing Speed	Temp	0°C	0°C	10°C	10°C	20°C	20°C	30°C	30°C	40°C	40°C
	At 50’	Pressure Altitude in feet	ground roll Normal	ground roll for 50’ obstacle Approach	ground roll Normal	ground roll for 50’ obstacle Approach	ground roll Normal	ground roll for 50’ obstacle Approach	ground roll Normal	ground roll for 50’ obstacle Approach	ground roll Normal	ground roll for 50’ obstacle Approach
600 kg	50 Knots	S.L	430	1000	440	1050	460	1090	470	1100	560	1100
		1000	440	1050	460	1090	470	1100	490	1140	505	1160
		2000	460	1100	470	1115	490	1140	505	1160	530	1200
		3000	470	1120	490	1140	505	1160	530	1200	550	1230
		4000	490	1140	505	1160	530	1200	550	1230	570	1250
		5000	505	1175	530	1200	550	1230	570	1260	585	1290
		6000	530	1200	550	1230	570	1260	585	1290	605	1320
		7000	550	1230	570	1260	590	1290	610	1320	630	1350
		8000	570	1260	600	1290	610	1320	630	1350	650	1390

fig. 5-6 Landing distance chart (feet)

SECTION 6 - EMERGENCY PROCEDURES

INTRODUCTION

Section 6 provides checklist and amplified procedures for coping with emergencies that may occur. Emergencies caused by airplane or engine malfunctions are extremely rare if proper preflight inspections and maintenance is practiced. Enroute weather emergencies can be minimized or eliminated by careful flight planning and good judgment when unexpected weather is encountered.

However should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem.

AIRSPEEDS FOR EMERGENCY OPERATION

Engine failure after takeoff .... 48 knots

Recommended Maneuvering speeds

600 Kg .... 105 knots
544.31 kg .... 100 knots
453.59 kg .... 90 knots
Maximum glide speed .... 60 knots
Landing without engine power flap up .... 58 knots
Landing without engine power flap down .... 52 knots

OPERATIONAL CHECKLISTS

ENGINE FAILURE

Engine failure during takeoff run:
1) Throttle .... IDLE
2) Brakes .... APPLY
3) Wing flap .... RETRACT
4) Fuel pump .... OFF
5) Ignition switch .... OFF
6) Master switch .... ON

Engine failure immediately after takeoff:

Check current altitude:

If below 200’ .... Land in Takeoff direction using the procedure given below
If Above 200’ .... Choose a landing area, and land using the procedure given below

1) Airspeed .... Glide at 48 knots
2) Fuel shut off valve .... OFF
3) Fuel pump .... OFF
4) Ignition switch .... OFF
5) Flaps .... AS REQUIRED
6) Master switch .... ON
7) Land.

Engine failure during flight:

1) Airspeed .... 70 knots
2) Fuel shut off valve .... Check ON
3) Fuel pump .... ON, count to 3, OFF
4) Ignition switch .... START if propeller is stopped
5) If engine starts .... execute a precautionary landing
6) If it does not start .... execute an emergency landing

FORCED LANDINGS

Emergency landing without engine power:

1) Airspeed .... 58 knots (flap up) 52 knots (flap down)
2) Fuel shut off valve .... OFF
3) Fuel pump .... OFF
4) Ignition switch .... OFF
5) Wing flap .... AS REQUIRED (in short final FULL)
6) Master switch .... ON
7) Touchdown .... SLIGHTLY TAIL LOW
8) Brakes .... APPLY HEAVILY

Precautionary landing with engine power:

1) Airspeed.. 55 knots
2) Wing flap .... 20°
3) Selected field .... FLY OVER note terrain and obstruction
4) Wing flap .... RETRACT after reaching safe altitude and speed
5) Strobe, Nav, Beacon switches .... ON
6) Wing flap.. FULL DOWN in short final
7) Airspeed... 50 knots
8) Master switch .... ON
9) Touchdown... SLIGHTLY TAIL LOW
10) Brakes .... APPLY HEAVILY
11) Ignition switch .... OFF

Ditching into the Sea:

1) Radio... TRANSMIT MAYDAY on 121.5 MHz
2) Object in baggage area.. SECURE
3) Approach with high winds, heavy seas .... INTO THE WIND
4) Approach with light winds, heavy swells .... PARALLEL TO SWELLS
5) Wing flap... FULL IN SHORT FINAL
6) Power .... ESTABLISH 300 FT/MIN DESCENT AT 50 knots
7) Touchdown.. LEVEL ATTITUDE AT 300 FT/MIN DESCENT
8) At touchdown protect face with folded coat or similar
9) Airplane .... EVACUATE
10) Life vest and raft... INFLATE AS LEAVING THE AIRCRAFT

FIRES

During start on ground:

1) Cranking .... CONTINUE to get a start which would suck the flames and accumulated fuel through the carburetor and into the engine.

IF ENGINE STARTS

2) Power .... 2500 RPM for a few minutes.
3) Engine .... SHUTDOWN, Evacuate and inspect for damage.

IF ENGINE FAILS TO START

4) Cranking................ CONTINUE to obtain a start
5) Fire extinguisher................ OBTAIN and Use
6) Engine .... SECURE
   a. Master switch .... OFF
   b. Ignition switch .... OFF
   c. Fuel pump................ OFF
   d. Fuel valve................ OFF
7) Fire .... EXTINGUISH using fire extinguisher, wool blanket or dirt.

8) Pilots onboard .... Evacuate the aircraft
9) Fire damage................ INSPECT.

Engine fire in flight:

1) Choke................ Check to make sure OFF position
2) Fuel shutoff valve .... OFF
3) Master switch................ ON
4) Throttle................ IDLE (at minimum)
5) Airspeed................ 92 knots (if fire is not extinguished increase glide speed to find an airspeed which will provide an incombustible mixture).
6) Forced landing................ EXECUTE an emergency landings.

Electrical fire in flight:

1) Master switch... ON
2) All other switches .... OFF (except ignition switch)
3) Choke.. Make sure it is in closed position
4) Fire extinguisher.. ACTIVATE if available

WARNING

After discharging an extinguisher within a closed cabin, ventilate the cabin.

If fire has been extinguished and electrical power is necessary for continuance of flight:

5) Master switch... ON
6) Circuit breakers .... CHECK for faulty circuit, DO NOT RESET
7) Radio-electrical Switches .... ON, one at time to localize short circuit

Cabin fire:

1) Master switch .... ON
2) Fire extinguisher.. ACTIVATE if available

WARNING

After discharging an extinguisher within a closed cabin, ventilate the cabin.

3) Land the airplane as soon as possible.

LANDING WITH A MAIN FLAT TIRE

1) Wing flaps.. FULL DOWN
2) Approach .... Normal
3) During landing, keep the flat tire above the ground for as long as possible using the ailerons
4) Maintain the direction using the rudders.

LANDING WITH A FLAT NOSE WHEEL TIRE

1) Wing flaps.. FULL DOWN
2) Approach .... Normal
3) Perform a touch down at 45-50 knots and hold the tire off using elevator control as long as possible.
4) Maintain the direction using the rudders.

ICING

Inadvertent icing encounter:

The carburetor Icing shows itself through a decrease in engine power and an increase of engine temperature. To recover the engine power the following procedure is recommended.

1) Turn back or change altitude to obtain an outside air temperature that is less Conducive to icing
2) Open the throttle to increase engine speed and minimize ice build-up on propeller blades, this will also help in reducing the ice formation on the carburetors.
3) Plan a landing at the nearest airport. In case select a suitable off airport landing site.
4) With an ice accumulation of 1 cm or more on the wing leading edge, be preparedFor significantly higher stall speed
5) Approach at 65 to 70 knots depending upon the amount of ice accumulation
6) Perform a landing in level attitude.

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

Over-voltage indication illuminates:

If in flight and at an altitude of above 1000’ do the following procedure otherwise execute a precautionary landing.

1) Master switch.. OFF
2) Master switch.. ON
3) Over-voltage light... OFF
If over-voltage light illuminates again:
4) Flight.. TERMINATE as soon as practical.

Ammeter shows discharge

1) Alternator (if installed) .... OFF
2) Non essential electrical equipment .... OFF
3) Flight .... TERMINATE as soon as practical.

AMPLIFIED PROCEDURES

ENGINE FAILURE

If an engine failure occurs during the takeoff run, the most important thing to do is to stop the airplane on the remaining runway.

Those extra items on the checklist will provide added safety during a failure of this type.

Prompt lowering the nose to maintain airspeed and establish a glide attitude is the first response to an engine failure after takeoff. In most cases, the landing should be planned straight ahead with only small changes in direction to avoid obstructions.

Altitude and airspeed are seldom sufficient to execute a 180° gliding turn necessary to return to the runway.

WARNING

Never try to get back to the runway.

The checklist procedures assume that adequate time exists to secure the fuel and ignition system prior to touchdown.

After an engine failure in flight, the best glide speed of 60-65 knots should be established as soon as possible.

While gliding toward a suitable landing area, an effort should be made to identify the cause of the failure.

If time permits, an engine restart should be attempted as shown in the checklist. If the engine cannot be restarted, a forced landing without power must be completed.

FORCED LANDINGS

If all attempts to restart the engine fail and a forced landing is imminent, select a suitable field and prepare for the landing as discussed in the checklist for engine-off emergency landings.

Before attempt an off airport landing with engine power available, one should drag the landing area at a safe but low altitude to inspect the terrain for obstructions and surface conditions, proceeding as discussed under the precautionary landing with engine power checklist.

Prepare for ditching by securing heavy objects located in the baggage area and collect folded coats for protection of occupants face at touchdown.

Transmit Mayday message on 121.5 Mhz giving location and intentions.

LANDING WITHOUT ELEVATOR CONTROL

Trim the airplane for horizontal flight with an airspeed of approximately 60-65 knots and flap lowered to 10° by using throttle and elevator trim controls.

Then, DO NOT CHANGE THE ELEVATOR TRIM SETTING; control the glide angle by adjusting power exclusively.

At flareout, the nose-down moment resulting from power reduction is an adverse factor and the airplane may hit on the nose wheel. Consequently, at flareout, the trim control should be set at the full nose-up position and the power adjusted so that the airplane will rotate to the horizontal attitude for touchdown.

Close the throttle at touchdown.

ENGINE FIRES

Although engine fires are extremely rare in flight, the steps of the appropriate checklist should be followed if one is encountered.

After completion of this procedure, execute a forced landing.

DO NOT ATTEMPT TO RESTART THE ENGINE.

The initial indication of an electrical fire is usually the odor of burning insulation.

The checklist for this problem should result in elimination of the fire.

FLIGHT IN ICING CONDITION

The flight into icing condition is prohibited. An inadvertent encounter with this condition can best be handled using the checklist procedures. The best procedure, of course, is to turn back or change altitude to escape icing conditions.

SPINS

INTENTIONAL SPINS ARE PROHIBITED

Should an inadvertent spin occurs, the following recovery procedure should be used:

1) Retard throttle to idle position
2) Place aileron in neutral position
3) Apply and HOLD full rudder opposite to the direction of rotation
4) Just AFTER the rudder reaches the stop, move the control stick BRISKLY forward far enough to break the stall
5) HOLD these control inputs until rotation stops
6) As rotation stops, neutralize rudder, and make smooth recovery from the resulting dive.

ROUGH ENGINE OPERATION OR LOSS OF POWER

Spark plug fouling:

A slight engine roughness in flight may be caused by one or more spark plugs becoming fouled by carbon or lead deposits.

Proceed to the nearest airfield for repairs.

An obvious power loss in single ignition operation is evidence of spark plug or ignition unit trouble.

Ignition malfunction:

A sudden engine roughness or misfiring is usually evidence of ignition problems. Proceed to the nearest airfield for repair.

Low oil pressure:

If a loss of oil pressure is accompanied by normal oil temperature, there is the possibility that the oil pressure gage or relief valve is malfunctioning.

A leak in the line to the gage is not necessarily cause for an immediate precautionary landing because an orifice in this line will prevent a sudden oil loss from the engine sump.

However, a landing at the nearest airfield would be advisable to inspect the source of trouble.

If a total loss of oil pressure is accompanied by a raise in oil temperature, there is a good reason to suspect that an engine failure is imminent. Reduce engine power immediately and select a suitable forced landing field.

Use only the minimum power required to reach the desired touchdown spot.

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

Introduction:

Malfunctions in the electrical power supply system can be detected by periodic monitoring of the ammeter and over-voltage warning.

However the cause of these malfunctions is usually difficult to determine.

Broken or loose alternator wiring is most likely the cause of alternator failures, although other factors could cause the problem.

A damaged or improperly adjusted voltage regulator can also cause malfunctions.

Problem of this nature constitute an electrical emergency and should be dealt with immediately.

Electrical power malfunctions usually fall into two categories:

1) Excessive rate of charge
2) Insufficient rate of charge

The paragraphs below describe the recommended remedy for each situation.

Excessive rate of charge:

After engine starting and heavy electrical usage at low engine speeds (such as extended taxiing) the battery condition will be low enough to accept above normal charging during the initial part of the flight.

However, after thirty minutes of cruising flight, the ammeter should be indicating normal readings of the charging current. If the charging rate were to remain above this value on a long flight, the battery would overheat and evaporate the electrolyte at an excessive rate.

Electronic components in the electrical system could be adversely affected by higher than normal voltage if a faulty voltage regulator setting is causing the overcharging.

Try resetting the electrical system by turning the master switch off and then on again.

If the problem no longer exists, normal charging will resume and the warning will go off.

If the warning comes on again, a malfunction is confirmed.

In this event, the flight should be terminated and/or the current drain on the battery minimized because the battery can supply the electrical system for only a limited period of time.

Insufficient rate of charge:

If the ammeter indicates a continuous discharge rate in flight, the alternator is not supplying power to the system and should be shut down since the alternator field circuit may be placing an unnecessary load on the system. All nonessential equipment should be turned off and the flight terminated as soon as practical.

SECTION 7 - NORMAL PROCEDURES

INTRODUCTION

Section 7 provides checklist and amplified procedures for the conduct of normal operations.

SPEEDS FOR NORMAL OPERATION

Unless otherwise noted the following speeds are based on maximum weight of 600 kg and may be used for any lesser weight.

Climb right after Takeoff:

- Normal climb out.. 55 - 65 knots
- Short field takeoff (flaps 20°) .... 45 knots

Climb, flaps up:

- Normal.. 55 – 65 knots
- Best rate of climb (sea level) .... 65 knots
- Best rate of climb (10000 ft) .... 60 knots
- Best angle of climb .... 55 knots

Landing approach:

- Normal approach (flaps up) .... 55 – 58 knots
- Normal approach (flaps 20°) .... 55 knots
- Short field approach (full flaps).. 50 knots

Balked landing **(go around):**

- Maximum power (flaps 20°)... 50 knots

Maximum recommended turbulent air penetration speed:

- weight 600 kg .... 105 knots
- weight 544,31 kg .... 100 knots
- weight 453,59 kg .... 95 knots

In case of severe turbulence reduce to 80 knots at all weight.

Maximum demonstrated crosswind velocity:

- all weights.. 20 knots

CHECKLIST PROCEDURES

Preflight inspection

Visually check the airplane for general conditions during walk around inspection.

In cold weather, remove even small accumulation of frost, ice or snow from wing, tail and control surfaces. Also make sure that control surfaces contain no internal accumulation of ice or debris.

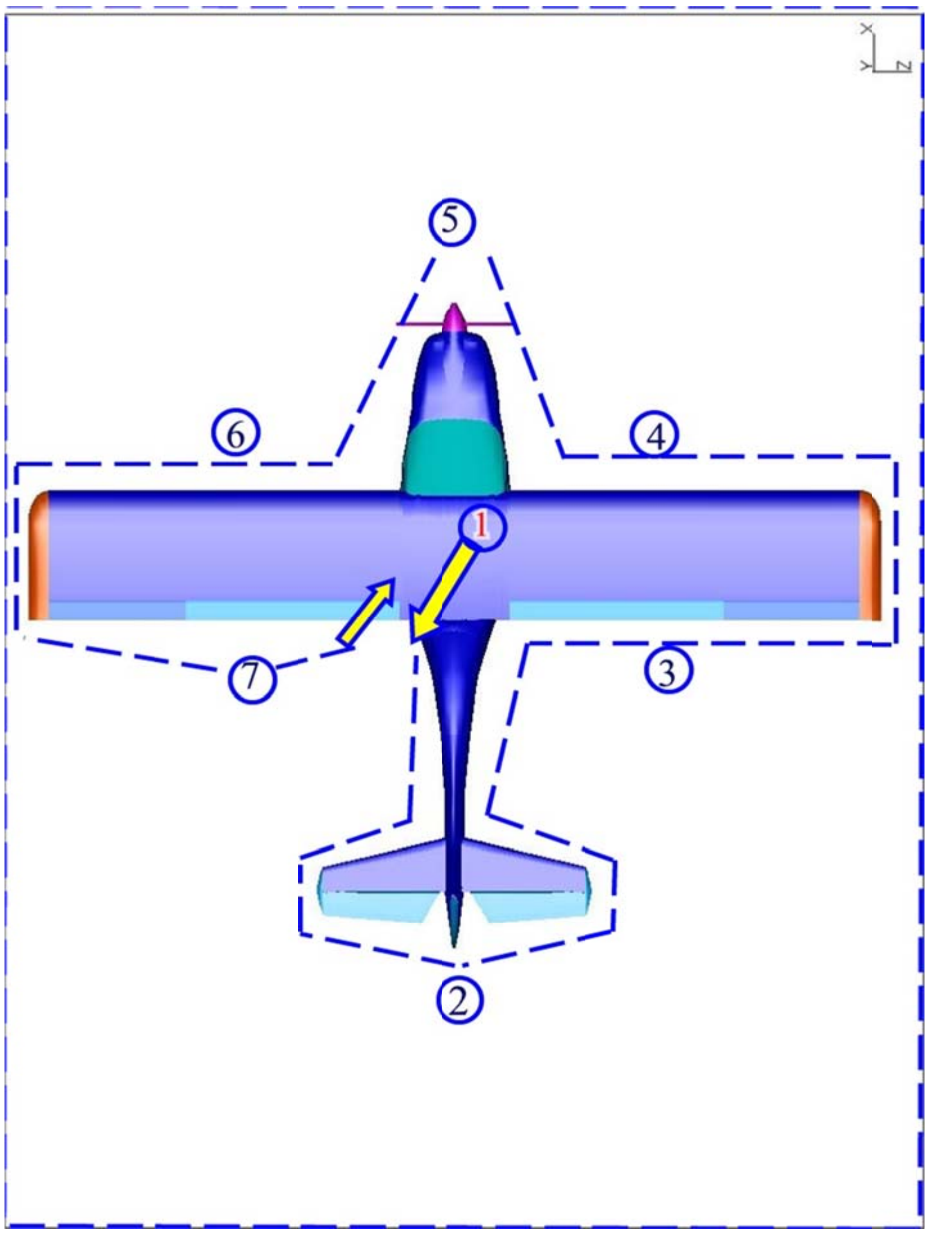


fig. 7-1 Preflight inspection

Cabin:

1) Control stick lock .... REMOVE (if installed)
2) Ignition switch .... OFF
3) Master switch .... ON
4) fuel quantity indicator .... CHECK QUANTITY
5) Switch Dynon .... OFF
6) Master switch .... OFF
7) Fuel shutoff valve .... ON

Empennage:

1) Rudder gust lock.. REMOVE (if installed)
2) Tail tie down .... DISCONNECT (if installed)
3) control surfaces .... CHECK freedom of movement and security

Right wing trailing edge:

1) Aileron .... CHECK freedom of movement and security
2) Wing flap .... CHECK security

Right wing leading edge:

1) Wing tie down .... DISCONNECT
2) Stall warning opening.. CHECK for stoppage (if installed)
3) Main wheel strut- tire .... CHECK for proper inflation and wear
4) Wing strut.. CHECK BOLTS SECURITY

Nose:

1) Engine oil level.. CHECK fill to 3Liters for extended flight
2) Propeller and spinner .... CHECK for nicks and security
3) Carburetor air filter .... CHECK for foreign matter
4) Nose wheel strut-tire .... CHECK condition
5) Nose tie down .... DISCONNECT

Left wing leading edge:

1) Main wheel strut-tire .... CHECK for proper inflation and wear
2) Static source and pitot .... CHECK for cleanliness.
3) Landing lights .... CHECK for condition and cleanliness (if installed)
4) Wing tie down .... DISCONNECT
5) Wing strut.. CHECK BOLTS SECURITY

Left wing trailing edge:

1) Aileron .... CHECK freedom of movement and security
2) Wing flap .... CHECK security

Before first flight of the day and after each refueling, use sampler cap and drain small quantity of fuel from gasculator quick drain valve to check for water, sediment and proper fuel grade.

Before starting engine:

1) Preflight inspection .... COMPLETE
2) Seats, belts, shoulder harnesses .... ADJUST and LOCK
3) Fuel shutoff valve .... ON
4) Radios, electrical equipment .... OFF
5) Brakes .... TEST and SET
6) Circuit breakers .... CHECK IN

Starting engine:

1) Master switch .... ON
2) Fuel pump .... ON, count to 3, OFF
3) Choke .... AS REQUIRED
4) Throttle .... OPEN 1 cm
5) Propeller area .... CLEAR
6) Ignition switch .... START (release when engine starts)
7) Oil pressure .... CHECK, if no pressure in 10 sec, switch off engine immediately

Before takeoff:

1) Doors lock .... CLOSED and LATCHED
2) Parking brake .... SET to open
3) Flight controls .... FREE and CORRECT
4) Flight instruments .... SET
5) Fuel shutoff valve .... ON
6) Fuel pump .... OFF
7) Elevator trim .... TAKE OFF position
8) Throttle .... 3000 RPM
9) Throttle .... CHECK IDLE
10) Throttle .... 1500 - 2400 RPM
11) Engine instruments and ammeter .... CHECK
12) Radios .... SET
13) Flashing beacon, nav. Lights .... AS REQUIRED (if installed)
14) Throttle friction .... ADJUSTED

TAKEOFF

Normal takeoff:

1) Wing flaps.. TAKEOFF position
2) Throttle.. FULL OPEN
3) Elevator control... LIFT NOSE WHEEL at 19-20 knots
4) Climb out .... 49 – 60 knots

Short field takeoff:

1) Wing flaps.. TAKEOFF position
2) Brakes .... APPLY
3) Throttle.. FULL OPEN
4) Brakes .... RELEASE
5) Elevator control... SLIGHTLY TAIL LOW
6) Climb out .... 55 knots (with obstacles ahead)

ENROUTE CLIMB

Normal climb:

1) Airspeed .... 55 – 60 knots
2) Throttle.. FULL OPEN (5500 RPM)
3) Fuel pump.. OFF

CRUISE

Normal cruise:

1) Power .... 4800 - 5000 RPM
2) Elevator trim.. ADJUST

BEFORE LANDING

Prior to the downwind:

1) seats, belts, harnesses .... ADJUST and LOCK
2) airspeed .... Reduce and trim to 65 knots

In the traffic pattern:

1) altitude.. As required (standard 1000 ft over airfield)
2) fuel pump.. OFF
3) airspeed .... 55 – 65 knots
4) flaps.. 10°

LANDING (FINAL LEG)

Normal landing:

1) Airspeed .... 50 –55 knots
2) Wing flaps.. FULL DOWN
3) Airspeed .... 55 – 50 knots
4) Touchdown.. MAIN WHEELS FIRST
5) Landing roll.. LOWER NOSE WHEEL GENTLY
6) Braking.. MINIMUM REQUIRED

Short field landing:

1) airspeed.. 47 – 50 knots
2) wing flaps .... FULL DOWN
3) airspeed.. MAINTAIN 45 knots
4) power .... REDUCE to idle as obstacle is cleared
5) touchdown .... MAIN WHEELS FIRST
6) brakes.. APPLY HEAVILY
7) flaps .... RETRACT

Bulked landing (Go Around):

1) Throttle.. FULL OPEN
2) Wing flaps.. RETRACT to 10°
3) Airspeed .... 50 knots
4) Wing flaps.. RETRACT

After landing:

1) Wing flaps.. UP
2) Fuel pump.. check fuel pump to be OFF

SECURING AIRPLANE

Engine shutoff:

1) Brakes.. SET
2) Radios, electrical equipment.. OFF
3) Throttle.. 2000 RPM
4) Ignition switch .... OFF
5) Master switch.. OFF
6) Control lock .... INSTALLED (if installed)

AMPLIFIED PROCEDURES

BEFORE ENGINE START

Carry out pre-flight checks.

PRE-FLIGHT CHECKS

> ⚠ **WARNING**
>
> ***Ignition "OFF" Before cranking the propeller switch off both ignition circuits and anchor the aircraft. Have the cockpit occupied by a competent person.***

Operating media:

> ⚠ **WARNING**
>
> ***Carry out pre-flight checks on the cold or Juke warm engine only! Risk of burning and scalds.***

Check for any oil, coolant and fuel leaks. If leaks are evident, rectify before next flight.

Check coolant level in the overflow bottle.

A pressurized leak test must be performed anytime the Gasolator has been disassembled for cleaning, or inspection. Once service is completed turn on the electric fuel pump during test. Make this operation with cowling off before engine start-up.

> ***NOTE***
>
> *The level in the overflow bottle should be between min. and max. mark.*

Check oil level and replenish as required.

Prior to oil check, turn the propeller by hand several times to pump oil from the engine into the oil tank, or let the engine idle for 1 minute.

This process is finished when air is returning back to the oil tank and can be noticed by a murmur from the open oil tank. This is also known as burping the tank.

NOTE: Oil level should be between max. and min. mark of the oil level gauge but must never be below min. mark. Before longer periods of operation ensure that oil level is at least up to mid-position. **Difference between max.- and min.- mark = 0,75 litre (1.6 liq pt)**

STARTING ENGINE

Ordinarily the engine starts easily with one or two strokes of primer in warm temperatures to six strokes in cold weather, with the throttle open approximately 1 cm. In extremely cold temperatures, it may be necessary to continue priming while cranking.

Weak intermittent firing followed by puffs of black smoke from the exhaust stake indicate overpriming or flooding. If this happens, the starting should be suspended for a while before attempting again without priming.

If the engine is underprimed, most likely in cold weather with a cold engine, it will not fire at all and additional priming will be necessary. **Normally 3 second priming is all the engine needs to start.**

As soon as the cylinders begin to fire, open the throttle slightly to keep it running.

After starting, if the oil gage does not begin to show pressure within 10 seconds in the summertime and about twice that long in very cold weather, stop the engine and investigate.

Lack of oil pressure can cause serious engine damage.

WARNING

Do not start the engine if any person is near the propeller of the aircraft.

Fuel cock... open

Choke.. activated, only if the weather is cold. Or it's the first start of the day.

> ***NOTE***
>
> ***If the engine is already in operating temperature, start the engine without choke.***

Throttle lever .... set to near idle position, about 5% open
Master switch.................................. ON, wait for the avionics to load and be operational
Ignition .... both circuits switched on

Starter button .... actuate

> ***CAUTION***
>
> ***Activate starter for max. 10 sec. only (without interruption), followed by a cooling period of 2 minutes!***

As soon as engine runs, adjust throttle to achieve smooth running at approx. 2500 rpm.

Check if oil pressure has risen within 10 seconds and monitor oil pressure. Increase of engine speed is only permitted at steady oil pressure readings above 2 bar (30 psi).

At an engine start with low oil temperature, continue to observe the oil pressure as it could drop again due to the increased flow resistance in the suction line.

De-activate starting carb (choke).

ATTENTION: Since the engine comprises a reduction gear with shock absorber, take special care of the following:

To prevent impact load, start with throttle lever in idle position or at the most up to 10% open. For the same reason, wait for around 3 sec. after throttling back to partial load to reach constant speed before re-acceleration.

For checking the two ignition circuits, only one circuit may be switched off and on at a time.

ATTENTION: Do not actuate starter button (switch) as long as the engine is running. Wait until complete stop of engine!

TAXIING

While taxiing, it is important that speed and the use of brakes should be held to a minimum and that all controls be utilized to maintain directional control and balance.

See figure 7-2 Taxiing diagram.

Taxiing over loose gravel or cinders should be done at low engine speed to avoid abrasion and stone damage to the propeller tips.

The nose wheel is designed to automatically center straight ahead. Taxiing the airplane is accomplished by the use rudder pedals and brakes.

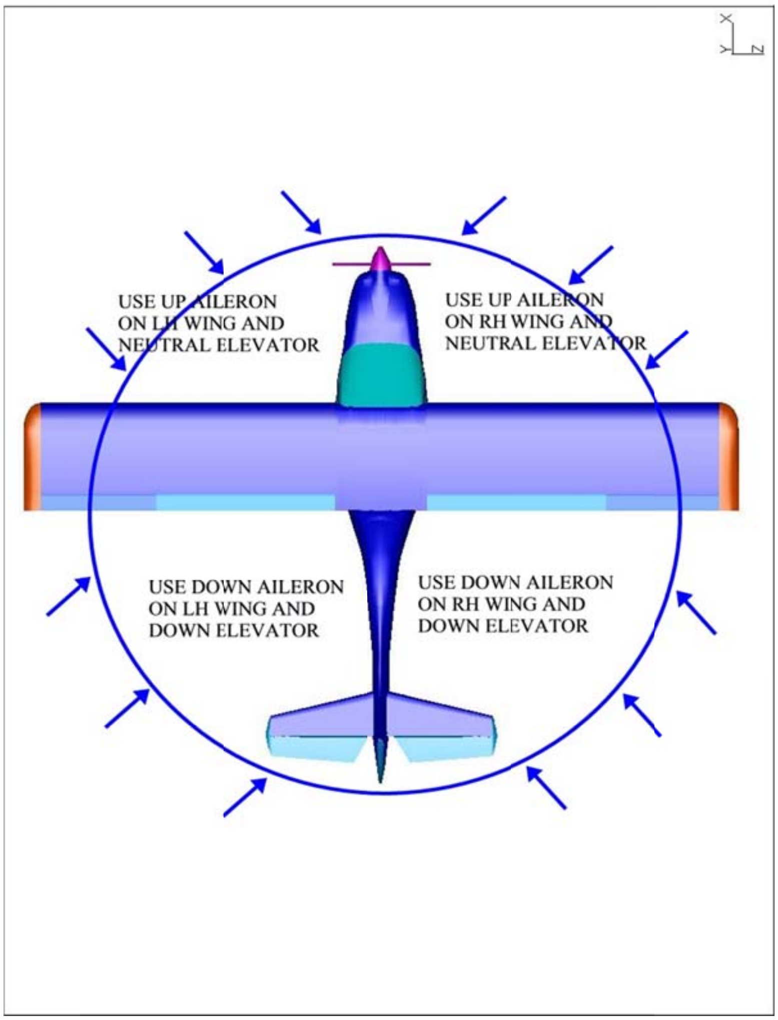


fig. 7-2 Taxiing diagram

PRIOR TO TAKE-OFF

Warm-up:

Most of the warm-up will have been conducted during taxi, an additional warm-up before takeoff should be restricted to the checklist procedure.

Since the engine is cowled for efficient in-flight cooling, precaution should be taken to avoid overheating on the ground.

Warming up period:

Start warming up period at 2500 rpm. for approximately 2-5 minutes, continue at 3000 rpm., duration depending on ambient temperature, until oil temperature reaches 50° C (120° F).

— Check temperatures and pressures.

Throttle response:

— Short full throttle ground test can be conducted at rpms of 5600 Max, for maximum of 3 minutes.

ATTENTION: After a full-load ground test allow a short cooling run to prevent vapour formation in the cylinder head.

IGNITION CHECK

Prior to flights verification of proper alternator and voltage regulator operation is essential. Such verification can be made by loading the electrical system momentarily (3 to 5 seconds) with the installed lights or by operating the wing flaps during the engine run-up (3000 rpm).

In all the cases, the ammeter will remain within range if the alternator and voltage regulator are operating properly.

Ignition check:

- Check the two ignition circuits at **4000 rpm.**
- Speed drop with only one ignition circuit must not exceed **300** r.p.m.
- **120 r.p.m.** max. difference of speed by use of either circuit, A or B.

NOTE: The propeller speed depends on the actual reduction ratio.

TAKEOFF

Power check:

It is important to check full-throttle engine operation early in the takeoff run. Any sign of rough engine operation or sluggish engine acceleration is good cause for discontinuing the takeoff. If this occurs you are justified in making a thorough full-throttle static run-up before another takeoff is attempted.

In the takeoff run the engine should run smoothly and turn approximately 5400 to 5800 RPM.

Full throttle run-ups over gravel are especially harmful to propeller tips; when takeoff must be made over a gravel surface, it is very important that the throttle be advanced slowly.

This allows the airplane to start rolling before high RPM is developed, and the gravel will be blow back of the propeller rather than pulled into it.

When unavoidable small dents appear in the propeller blades, they should be immediately corrected as described in Section 8 under Propeller care.

After full throttle is applied, adjust the throttle friction lock, clock-wise to prevent the throttle from creeping back from a maximum power position.

Similar friction lock adjustment should be made as required by other flight conditions to maintain a fixed throttle setting.

Flap setting:

Normal Take offs : Position 1 down = ± 10°

Short field takeoffs are performed with flaps at position. = ± 20°

Takeoffs with no flap is however suggested in case of sensible cross wind component.

Short field takeoff:

If an obstruction dictates the use of a steep climb angle, after liftoff accelerate to and climb out at 60 knots with flaps retracted. This speed provides the best overall climb speed to clear obstacles when taking into account the turbulence often found near ground level.

Crosswind takeoff:

Takeoff into strong crosswinds normally are performed with the minimum or no flap setting necessary for the field length, in order to minimize the drift angle immediately after takeoff.

The airplane must be accelerated to a speed slightly higher than normal, than pulled off firmly to prevent possible setting back to the runway while drifting.

When clear of the ground, make a coordinated turn into the wind to correct for drift.

Climbing with engine running at take-off performance is permissible (max. 5 minutes). See Rotax Operator's Manual Chapter 10.1), 10.1.1) and 10.1.2).

> ⚠ ***WARNING***
>
> ***Monitor oil temperature, cylinder head temperature and oil pressure. Limits must not be exceeded! See Chapter 10.1) Operating Limits.***

<u>**ATTENTION**</u>**: Respect "cold weather operation" recommendations, see Chapter 10.3.9).**

ENROUTE CLIMB

When conducting the following climbs, the engine shall be set at 5500 RPM.

Normal climb:

Normal climbs are conducted at 60 knots with flaps up and full throttle for best engine cooling.

Best rate of climb:

The best rate of climb speeds range from 65 knots at sea level to 60 knots at 10000 ft with flaps up and full throttle.

Best angle of climb:

If enroute terrain dictates the use of a steep climb angle, climb at the best angle of climb speed of 55 knots with flaps up and full throttle.

CRUISE

Normal cruising is performed between 55% and 75% power. The engine RPM and corresponding fuel consumption for various altitudes can be determined by the data contained in Section 5.

The data in Section 5 shows the increased range and improved fuel economy that is obtainable when operating at lower power settings and higher altitudes.

The use of lower power settings and the selection of cruise altitudes on the basis of the most favorable wind conditions are significant factors that should be considered on every trip to reduce fuel consumption.

To determine the most reliable and most favorable altitude and power setting for a given trip, refer to Section 5, fig. 5-5.

STALL

The stall characteristics are conventional for the flaps up and flaps down configurations. Slight elevator buffeting may occur just before the stall with flaps and landing gears down.

The Dynon stall warning comes uo 5 to 10 knots before the actual stall is reached and remains on until the airplane attitude is changed.

Stall speeds for various combinations of flap setting and bank angle are summarized in Section 5.

SPINS

WARNING

Intentional spins are prohibited.

In case an inadvertent spin occurs, the following recovery technique should be used:

1. VERIFY THAT THROTTLE IS IN THE IDLE POSITION AND AILERONS ARE NEUTRAL
2. APPLY AND HOLD FULL RUDDER OPPOSITE TO THE DIRECTION OF ROTATION
3. JUST AFTER THE RUDDER REACHES THE STOP, MOVE ELEVATOR CONTROL BRISKLY FORWARD FAR ENOUGH TO BREAK THE STALL
4. HOLD THIS CONTROL INPUT UNTIL ROTATION STOPS
5. AS ROTATION STOPS, NEUTRALIZE RUDDER AND MAKE ASMOOTH RECOVERY FROM THE RESULTING DIVE.

Variations in basic airplane rigging or in weight and balance due to installed equipment or cockpit occupancy can cause differences in behavior, particularly in extended spins. However the above recovery procedure should always be used and will result in the most expeditious recovery from any spin.

LANDING

The traffic pattern can be made with power-on or power-off at speed of 60 – 65 knots with flaps up, in “Base” and “Final” legs, reduce speed to 60 – 55 knots with flaps down.

Surface winds and air turbulence are usually the primary factors in determining the most comfortable approach speed.

Actual touchdown should be made with power-off and on the main wheels first.

The nose wheel should be lowered smoothly to the runway as speed is diminished controlling direction with rudder.

Short field landing

For a short field landing in very smooth air conditions, make a short final approach at 52 knots with full flaps , using enough power to control the glide path and the speed.

After all approach obstacles are cleared, progressively reduce power and maintain 46 knots by lowering the nose of the airplane.

Touchdown should be made with power-off and on the main wheels first.

Immediately after touchdown, apply heavy braking as required.

For maximum brake effectiveness, retract the flaps, hold full nose-up elevator, and apply maximum brake pressure without sliding the tires.

Slightly higher approach speeds 62 knots should be used under turbulent air conditions or hot weather.

Crosswind landing

When landing in a strong crosswind, use the minimum flap setting required for the field length and at an airspeed of 65 knots. Use a low wing into the wind, crab angle, or a combination method of drift correction and land in a nearly level attitude.

Bulked landing

In a bulked landing (go-around) climb, the wing flaps setting should be reduced to position 1 = 10° apply full power, check positive ROC, then climb out at 60 knots.

Upon reaching a safe altitude and airspeed, the flaps should be retracted to the full up position.

COLD WEATHER OPERATION

Prior to starting in cold mornings, it is advisable to pull the propeller through several times by hand to break loose or limber the oil, thus conserving battery energy.

WARNING

***Ignition switch should be off!* But when pulling the propeller through by hand, treat it as if the ignition switch is turned on.**

A loose or broken ground wire on either magneto could cause the engine to fire.

In extremely cold weather, the use of an external preheater is recommended to reduce wear and abuse to the engine and its electrical system.

Cold weather starting procedures are as follows:

1) with ignition switch OFF and throttle closed, PRIME the engine four to ten strokes as the propeller is being turned over by hand

2) Propeller area.. CLEAR
3) Master switch.. ON
4) Fuel pump... OFF
5) Throttle.. OPEN 1 cm, about 5%
6) Ignition switch .... START
7) Oil pressure .... CHECK

NOTE

For tempratures below -5° ,If the engine does not start during the first few attempts, it is probable that the spark plugs have been frosted over. Preheat must be used before another start is attempted.

WARNING

Pumping the throttle may cause raw fuel to accumulate in the intake air duct, creating a fire hazard in the event of a backfire. If this occurs, maintain a cranking action to suck flames into the engine.

During cold weather operations, no indication will be apparent on the oil temperature gauge prior to takeoff if outside air temperatures are very cold.

After a suitable warm-up period (2 to 5 minutes at 2000 RPM), accelerate the engine several times to higher engine RPM. If the engine accelerates smoothly and the oil pressure remains normal and steady, the airplane is ready for takeoff.

SECTION 8 - HANDLING, SERVICE AND MAINTENANCE

INTRODUCTION

This section contains recommended basic procedure for proper ground handling, routine care and servicing of your airplane.

GROUND HANDLING

The airplane is maneuvered on ground by hand with the tow-bar attached to the nose wheel or by pulling the aircraft by the propeller blades.

When towing with a vehicle, do not exceed the nose gear turning angle of 35° either side of center, or damage to the gear may result.

While towing with a vehicle, do not exceed the man-walk speed.

PARKING DURING DAY TIME

When parking the airplane, head into the wind and set the parking brakes.

Do not set the parking brakes during cold weather when accumulated moisture may freeze the brakes, or when the brakes are overheated.

Tie-down the aircraft if parking brakes are not installed.

TIE-DOWN

In severe weather, proper tie-down procedure is the best precaution against damage by gusty or strong winds.

To tie-down the airplane proceed as follows:

1. Set the parking brake by holding the breaks and install the control stick lock, if present.
2. Install surface control locks on ailerons and rudder, if present.
3. Tie sufficiently strong ropes to the wing strut top fittings and secure each rope to a ramp tie-down.
4. Tie a rope to an exposed portion of the engine mount and secure to a ramp tie-down for extremely high speed winds.
5. Install pitot and static source tubes cover.

JACKING

When a requirement exists to jack the entire airplane off the ground, i.e. for landing gears maintenance and operational tests, use the jacking points located under each wing root, firewall pad and in the tail skid.

Individual main landing gear may be jacked by using the jack pad which is incorporated in the main landing gear vertical strut (optional).

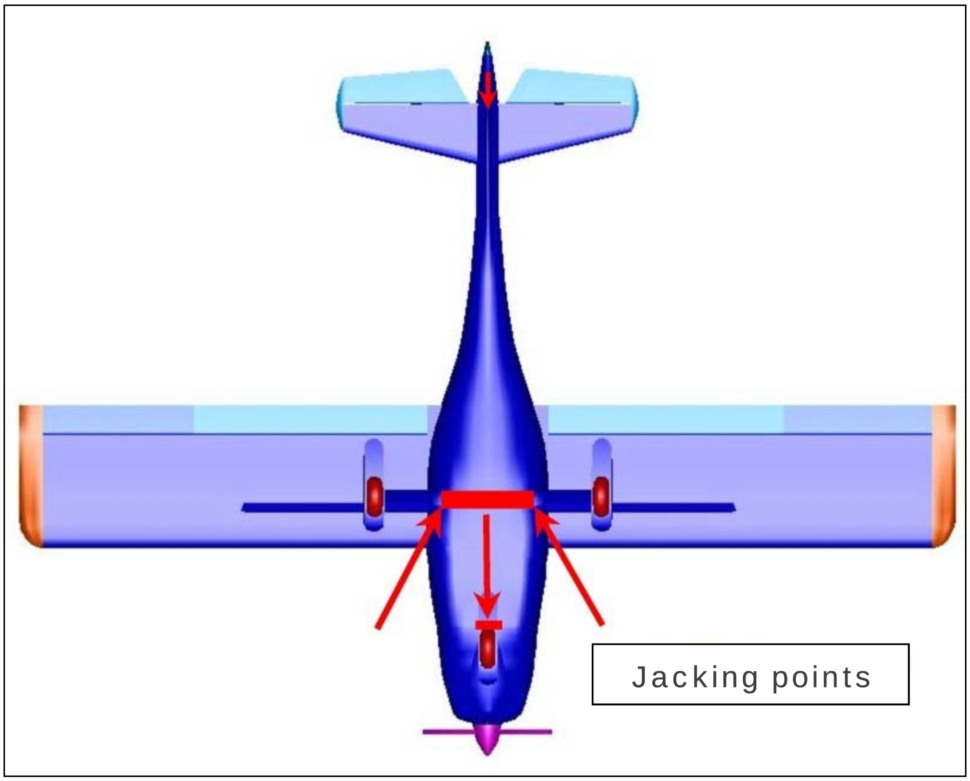


Fig. 8-1 Jacking points

LEVELING

Longitudinal leveling of the airplane is accomplished by placing a level on the baggage compartment floor behind the pilot and passenger seat.

FLYABLE STORAGE

The aircraft is ideally stored in a hangar and should not be parked in direct sunlight for extended periods. Airplanes placed in a non-operational storage for a maximum of 30 days are considered in flyable storage status.

Every seventh day during these periods, the propeller should be rotated by hand through at least fifteen revolutions; this action limbers the oil and prevents any accumulation of corrosion on engine cylinder walls.

For maximum safety check that the ignition switch is OFF, the throttle is CLOSED, and the airplane is secured before rotating the propeller by hand.

After 30 days the airplane should be flown for 30 minutes or a ground run-up should be made just long enough to produce an oil temperature within the lower green arc range.

Engine run-up also helps to eliminate excessive accumulations of water in the fuel system and other air spaces in the engine.

Keep fuel tank full to minimize condensation in the tank.

SERVICING

In addition to the preflight inspection covered in Section 7, servicing the airplane is also necessary.

OIL SERVICING

Use only lubricating oils recommended by the manufacturer, for Pakistan the only approved oil is

- Mobil 1 Racing 4T 10W-40 Advanced Fully Synthetic oil.

Always check the batch number and year produced to make sure that it is a recent produce, do not use old, stored version of this oil that has been stored for more than 5 years.

Do not operate on less than 2 Liters of oil in the engine oil tank.

> ***NOTE***
>
> ***Change engine oil at least every 6 months even though less than the recommended hours have accumulated.***

Reduce intervals for prolonged operation in dusty areas and extremely cold cold climates.

COOLANT

Coolant type

Please refer to the ROTAX Operator's manual section 10.1.2 Operating speeds and limits and section 10.2.1 Coolant, Rotax Installation manual section 12 Cooling system, Rotax Service Instruction SI-912-016

Approved Coolant Type

In principle, 2 different types of coolant are permitted:

- Conventional coolant based on ethylene glycol
- Waterless coolant based on propylene glycol

But for Pakistan, it is recommended that only Ethylene Glycol based premixed with water is allowed to be used.

Propylene glycol based coolant is discouraged because of its shorter stable life. It also effects the rubber piping used in the aircraft.

Blending ethylene glycol and propylene glycol based coolants is strictly prohibited.

Coolant liquid volume

It is approximately ....0.66 US gal 2.5 liters

Coolant servicing

It is recommended that if ethylene glycol based coolant is used it should be changed every 500 hours of operation. Coolant circuit pipes are to be replaced on condition.

If propylene glycol based coolant is used the change period is recommended to be 200 hours of operation and the coolant circuit pipes should be replaced every 600 hours.

FUEL SERVICING

The approved fuel for use with ROTAX 912 ULS engine that has been thoroughly tested is:

- SUPER automotive gasoline (MoGas) by TOTAL PARCO (RON 95)

NOTE

Under Emergencies PSO SUPER Automotive gasoline can also be used for limited period.

- AVGAS 100 LL grade aviation fuel (blue) (ASTM D910), with extreme caution can be used. It places greater stress on the valve seats due to its high lead content and forms increased deposits in the combustion chamber and lead sediments in the oil system. Thus it should only be used when other types of gasoline are unavailable.

CAUTION

100LL is a discouraged fuel because its use changes the maintenance period requirements. As Rotax engines were primarily designed to be run on MoGas, on use of 100 LL many parts and piping would require extra inspections and may corrode away without notice. This may lead to dangerous conditions. Before use of 100LL, kindly read the Engine Manufacturer's manuals thoroughly.

WARNING

UNDER ALL CONDITIONS, FUEL BLENDING OF 100 LL WITH MOGAS IS STRICTLY PROHIBITED.

Strictly follow the filtration recommendations as described in maintenance manual. Fuel use without proper filtration may lead to engine problems.

IMPORTANT NOTES

To ensure maximum fuel capacity and to minimize cross feeding when refueling, always park the aircraft in a wings level normal ground attitude.

The visual fuel representation in Dynon Skyview to show fuel status is in Liters. Due to the placement of the fuel sensor, the fuel indicator tops before the fuel tank is full. Therefore, pilot caution is advised.

Maximum full capacity is ensured only through the fuel filler on the wing, by visual check. At the same time, verify that the vent tubes remain unobstructed from contamination.

FUEL FILTRATION SYSTEM APPROVED FOR FUELING

Fuel filtration is very important when it comes to flying with automotive gasoline. To make sure that no oil, water, particles and/or microbial growths make it to the fuel tanks, use only the approved fuel filter with approved fuel cartridge.

The only fuel filter approved for Storm Rally S-LSA Operations is Mr. Funnel Fuel Filter, models F3, F8 or F15.

FUEL CHECKS BEFORE FLIGHT

Before each flight draining of water and/or particles is carried out by draining the contents of the gasculator, installed below the bottom engine cover and reachable through a dedicated placarded opening. Unscrew the discharge valve and drain at least one cup of fuel in a transparent container, verify for water/particle contamination. Always fasten the draining valve before flight.

WARNING

USE OF UNAPPROVED FUELS MAY RESULT IN DAMAGE TO THE ENGINE AND FUEL SYSTEM COMPONENTS, RESULTING IN POSSIBLE ENGINE FAILURE.

LANDING GEAR

The suggested nose and main wheels tire pressure is 26 psi (1.8 bar).

EXTERIOR WASHING USING AUTOMOTIVE SHAMPOO

Clean your aircraft of any dust, dirt or particles using running water without rubbing. Clean as you would clean your car starting at the top and working your way downwards using a soft sponge. Be careful not to use a sponge that was contaminated with particles (e.g. mud, fine sand) so not to grind the surface. While cleaning, soak the surface and the sponge many, many times. Use a separate sponge to clean the bottom fuselage, as is it usually more greasy than the rest of the air-frame. When pouring water over the airframe, be careful not to direct it over the fuel tank caps, wing-fuselage joining section, pitot tube, tail inspection openings and engine covers.

EXTERIOR CLEANING AND CARE

The plastic windshield and canopy should be cleaned with an aircraft windshield cleaner; if it is not available, the plastic can be cleaned with soft cloths moistened with Stoddard solvent to remove oil and grease; then, carefully washing with mild detergent and plenty of water; rinse and dry with a clean moist chamois.

Never use gasoline, benzene, acetone, carbon tetrachloride, anti-ice fluid or glass cleaner to clean the plastic since these materials will attack the plastic and may cause it to craze.

Unless freezing rain or sleet is anticipated, do not use a canvas cover on the windshield since the cover may scratch the plastic surface.

Normally, waxing is necessary to keep the painted surfaces bright, the airplane may be waxed with a automotive turtle wax.

EVERY-DAY CARE AFTER FLIGHT

Bugs, which represent the most of the dirt to be found on the airframe, are to be removed with clean water and a soft cloth (which can be a drying towel). To save time, soak all the leading edges of the airframe first. Make sure to wipe all the aircraft’s surface until it is completely dry.

Clean the propeller and the areas with eventual greasy spots separately using a mild car shampoo with a wax.

Do not, under any circumstances attempt to use aggressive cleaning solutions, as you will severely damage the paint, which is the only protective layer before the structural laminate.

When using the aircraft in difficult atmospheric conditions (intense sunshine, dusty winds, coastline, acid rains etc.) make sure to clean the outer surface more thoroughly.

If you notice you cannot remove the bug-spots from the leading edges of the aircraft, this means the paint is not protected anymore and would require a factory fix, therefore it is necessary to polish these surfaces.

PROPELLER CARE

Preflight inspection of propeller blades for nicks, and wiping them occasionally with a damp cloth to clean them of grass and bug stains, this will assure long trouble-free service.

Small nicks on the propeller should be dressed out as soon as possible since these nicks produce stress concentrations, and if ignored may result in cracks.

Never use an alkaline cleaner on the propeller blades.

ENGINE CARE

The engine may be cleaned with Stoddard solvent, or equivalent, then dried thoroughly.

Particular care should be given to electrical equipment before cleaning; ignition units, starter, alternator etc., should be protected before using solvents.

INTERIOR CARE

To remove dust and loose dirt from the upholstery and carpet, clean interior regularly with a vacuum cleaner.

Oily spots may be cleaned with household spot removers.

The plastic trim, instrument panel and control knobs need only to be wiped off with a damp cloth.

Never use volatile solvents since they likely craze the plastic.

Please follow the recommendations of the OEM for all avionics installed on the S-LSA.

SECTION 9 - AIRCRAFT OPERATING INSTRUCTIONS

This chapter has been written to assist the owners, pilots and instructors of Storm Rally S-LSA, to learn how to safely and efficiently fly this aircraft in addition to the information already presented in the Pilot Operating Handbook. This section will cover most operations the aircraft offers in an order established in section Normal procedures and recommended speeds. Please consider what follows as additional yet necessary supplement to the previous chapters.

ENGINE START-UP

First and foremost make sure you have sufficient fuel quantity on board for the desired length of flight. If you are not completely confident there is enough, step out of the aircraft and add more fuel into the tanks. There is an old aviators' saying: "The only time you have too much fuel is when you are on fire."

When engaging the engine starter, wheel brakes MUST be engaged. To keep your propeller in perfect condition, avoid starting up on areas where there are small stones on the ground. Those little stones can easily be picked up by the propellers causing damage to the blades.

Warming up must be conducted below 2500 RPM. When safe operational engine temperatures are reached, verify maximum engine ground RPM. Hold the stick back completely and slowly add throttle to full power, then verify RPM.

TAXI

Taxiing with the Storm Rally S-LSA is rather simple considering the steerable nose wheel. For sharper turns on the ground you can also use the differential wheel brakes to assist yourself. It is recommended that you taxi slow, up to 10 km/s (5 kts), while holding the stick back partially to ease the pressure on the nose wheel.

During taxing monitor engine temperatures. Due to low airflow around the radiators the CHT and Oil temperature will rise during long taxi periods. If you are holding position, do not leave throttle at idle. It is recommended that you have a power setting of about 2500 RPM as this will provide some airflow from the propeller to the radiators and the temperatures will not rise quickly. **Should you see engine temperatures exceed safe operational values, shut off the engine, point the aircraft's nose into the wind and wait for the temperatures to reduce. This normally would happen at ambient temperatures of above 45 °C and long taxi or holding times.**

TAKE OFF AND INITIAL CLIMB

Having checked and set all engine and aircraft parameters, you should be ready for takeoff. Verify again that fuel valve be open and the flaps retracted to takeoff position and Trim should be in the middle.

Start the take-off roll gradually. **Keep adding throttle slowly and smoothly to achieve full power.** There are two reasons for this. First, you change flight stage from zero movement to acceleration slowly; this provides you with time to react to conditions. Second, especially if taking-off from a gravel runway, this method of adding full throttle will prevent the little stones on the runway from damaging the propeller. Extremely short runways are an exception. There you should line up the aircraft, set flaps to takeoff position, step on the brakes, apply full power and release the brakes.

As you start to move, pull the stick 1/3 of elevator’s deflection backwards to ease the pressure on the nose wheel and lift it off the runway slightly. **Do not use full back deflection as this will cause the aircraft’s tail to touch the ground.**

When the nose wheel has lifted off the ground, just hold the same pitch attitude and the aircraft will become airborne. Crosswind takeoffs, depending on wind strength, require a little bit of aileron deflection into the wind. Remember, wings must stay level though out ground-roll, rotation and initial climb.

Having lifted off the ground, gently push the stick forward just a bit to accelerate.

CLIMB

A comfortable setting for climb is flaps in neutral position, use rpm of 5800 for first 4 minutes of climb. After which RPM slightly below 5500 should be used to climb further. In summer time or when outside temperature exceeds 30°C you should consider 10 to 15 knots higher recommended climbing speeds to provide more airflow to the engine radiators. Trim the aircraft for comfortable stick forces.

CRUISE

Passing through 70 knots, set flaps to zero. A confortable cruise setting is 5300 engine RPM. As the Storm Rally is sensitive to flap settings, especially when it comes to fuel efficiency, Always use zero flaps for level flight ABOVE 70 knots.

Cruising fast, do not kick-in rudder for turns! Above 85 kts (160 km/h) the rudder becomes almost insignificant in comparison to aileron deflections when it comes to making a turn. **Cruising fast, it is extremely important to fly coordinated (ball in the middle) as this increases efficiency and de-creases side-pressure onto vertical tail surfaces.** Also, pay attention to turbulence. If you hit turbulence at speeds greater than recommended maneuvering speed, reduce power immediately and pull the nose up to reduce speed.

If flying a traffic pattern, keep flaps in neutral position and set engine power so that airspeed does not exceed 150 km/h (80 knots).

DESCENT

Descending with the Storm Rally is the stage of flight where the most care should be taken. As the aircraft is essentially clean in aerodynamic design, it is very slippery and builds up speed very fast.

Start the descent by reducing throttle and keep your speed below 65 knots, but above 55 knots.

During initial descent it is recommended you trim for a 10 kts lower speed than the one you decided to descent at. Do this for safety. In case you hit turbulence simply release forward pressure on the stick and the aircraft will slow down.

Also, keep in mind you need to begin your descent quite some time before destination. A comfortable rate of descent is 500 fpm (2.5 m/s). So it takes you some 2 minutes for a 1000 feet (300 m) drop.

Entering the traffic pattern the aircraft must be slowing down. In order to do this, hold your altitude and reduce throttle to idle. When going below 70 knots, set flaps as needed. Set proper engine RPM to maintain speed of 70 knots (130 km/h). Trim the aircraft for comfortable stick forces.

Before turning to base leg, reduce power to idle and set flaps to 10° at 60 knots (110 km/h). Once out of the turn, reduce speed towards 55 knots (100 km/h). Power remains idle from the point of turning base all the way to touch-down, unless you go below recommended speeds. If you plan your approach this way, you will always be on the safe side even if your engine fails, you will still be able to safely reach the runway!

Turn to final at 55 kts (100 km/h). When in runway heading, set flaps to full.

Maintain a 3° glide slope for landing. Observe the runway. If the runway treshold is moving up, you are dropping too fast. If the runway treshold is disappearing below your aircraft, you are dropping too slowly. It is important to keep the airspeed/pitch angle constant thoughout final all the way to flare, once reached, Roundout (Flare) and touchdown.

Your speed should be a constant 55 kts (100 km/h) throughout the final with the descent path constant as well. At higher approach angles beyond 3°, speed would build up quickly, take care. At a height of 10 meters (25 feet) start a gentle flare and approach the aircraft must touch down with the main (back) wheels first, so that you will not bounce on the runway. After touchdown, operate the rudder pedals if necessary to maintain runway heading and try to have the nose wheel off the ground for as long as possible. When the nose wheel is to touch the ground, rudder pedals MUST be exactly in the middle not to cause damage to the steering mechanism. While braking and below 25 knots, hold the stick back fully! Once you have come to a standstill, retract flaps.

Should you bounce off the runway after touch-down, do not, under any circumstances, push stick forward.

Crosswind landings, depending on the wind speed, require some sort of drift correction. Most efficient is the low-wing method, where you are to lower the wing into the wind slightly and maintain course by applying appropriate rudder deflection. You can also try the crab method.

CROSSWIND LANDINGS ON PAVED RUNWAYS

(asphalt, concrete, tarmac...etc)

In this case, special attention must be paid to straightening the aircraft before touchdown in order not to damage the undercarriage because of increased surface grip on impact.

Should the crosswind component be strong (8 knots and over), it is recommended to gently flare in such a manner, that one of the main wheels touches-down an instant before the other (e.g. if there is crosswind from your left, the left wheel should touch down just before the right wheel does). This way the undercarriage almost cannot be damaged due to side forces on cross-wind landings.

LANDING IN STRONG TURBULENCE AND/OR GUSTY WINDS

First of all airspeed must be increased for half of the value of wind gusts (e.g. if the wind is gusting for 6 knots , add 3 knots to the final approach speed). In such conditions, it is recommend to only use 15° of flaps for increased maneuverability. In very strong winds (20 knots and more), use neutral flaps (0°) for the complete approach and roundout.

PARKING

Taxi to the apron with flaps at zero. Again, taxi slow for reasons mentioned under “Taxi”. Come to a standstill, shut down the engine. It is recommended to shut fuel valve for longer parking or when parked on a slope. Engage the parking breaks. Move throttle to recommended parking position.

SECTION 10 - FLIGHT TRAINING SUPPLEMENT

The Storm Rally S-LSA flying characteristics and behavior is similar to the conventional Type Certified single engine Trainers.

Following training procedure is applicable if the pilot is holder of PPL or is a student of a flight training institution who flies under the strict supervision of an instructor pilot.

The training flight hours are recommended minimum and depends on the Flight Instructor if student pilot is ready to continue on in next training step. Training can be performed by Flight Instructor or a rated pilot.

TYPE RATING TRAINING PROCEDURE:

Ground Training

Before practical Flight Training the pilot has to get familiar with following procedures and documentation:

1. Pilot Operating Handbook (POH)
2. Aircraft Maintenance and Inspection Procedures
3. Aircraft preflight inspection procedure
4. Control Checklists
5. Dynon Skyview, Radio, Backup Avionics and engine controls procedures
6. Differences in control and aircraft handling
7. Emergency procedures

At least 2 hours of ground training is recommended on the Dynon Skyview before commencing on the first flight.

A gound test should be conducted to confirm the student understands how to read, interpret and utilize Dynon Skyview readings and is able to utilize menus to navigate the panel.

Flight Training Program – *(Recommended)*

Flight Training Procedure		*Dual for IP's with 500+ hours*		*Dual training for students*	
		Flights	*hr/min*	***Flights***	***hr/min***
1.	*Level Flight*	1	30'	1	30'
2.	*Landing and Takeoff procedures*	4 (as needed)	20'	4 (Minimum)	20'
3.	*Pattern training flights up to 1000 ft AGL*	4 (as needed)	20'	4 (Minimum)	20'
4.	*Stall speed, 45°turns, side slips*	1	30'	2	30'
5.	*Emergency landing training*	4 (as needed)	20'	4 (Minimum)	20'
Total		***14***	***2 hours***	*15*	***5 hours 30 minutes***

People without prior stick control experience must fly with the instructor to get use to the new controls before staring the above mentioned exercises. The time needed for this conversion would be as seen appropriate by the flight instructor.

The checkride would be conducted for as long as seen appopriate by the CFI/Check Inspector.

Flight Training Procedure - Description

1. Level flight – Student Pilot will fly the airplane in local flight, instructor is giving advises as necessary.

2. Landing and Takeoff procedures, instructor is giving advises as necessary.

3. Pattern training flights up to 1000 feet AGL - pattern procedures, instructor is giving advises as necessary.

4. Stall speed, 45°turns, sideslips – stall speed flaps retracted and extended (landing configuration), sideslips at landing configuration.

5. Emergency landing training – emergency procedures and landing to 1/3 of runway.

ENDORSEMENT PROCEDURE

Instructor will endorse the Rating on to the Pilots Logbook and would forward a copy of it to the concerned CAA department for endorsement of license.