

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

A4SW Rev. No. 39 THRUSH AIRCRAFT, LLC. (Snow, Rockwell, Ayres)		
600 S-2D	S2R-R1340	S2R-G10
S2R	S2R-R1820	S2R-G5
S2R-T34	S2R-T65	S2R-G1
S2R-T15	S2RHG-T65	S2RHG-T34
S2R-R3S	S2R-T45	S2R-T660
S2R-T11	S2R-G6	S2R-H80
February 27, 2020		

TYPE CERTIFICATE DATA SHEET NO. A4SW

This data sheet which is a part of Type Certificate No. A4SW, prescribes conditions and limitations under which the product, for which the type certificate was issued, meets the airworthiness requirements of the Civil Air Regulations (CAR) or later Code of Federal Regulations (CFR).

Type Certificate Holder Thrush Aircraft, LLC.
300 Old Pretoria Road
Albany, Georgia 31721

Type Certificate Holder Record Snow Aeronautical Company transferred TC to North American Rockwell Corporation on February 18, 1970
North American Rockwell Corporation transferred TC to Rockwell International, Albany Aircraft Division on April 3, 1973
Rockwell International, Albany Aircraft Division transferred TC to Rockwell International, Commander Aircraft Division on July 27, 1973
Rockwell International, Commander Aircraft Division transferred TC to Ayres Corporation on November 28, 1977
Ayres Corporation transferred TC to Quality Aerospace on November 26, 2001
Quality Aerospace transferred TC to Thrush Aircraft, Inc. on July 9, 2003
Thrush Aircraft, Inc transferred TC to Thrush Aircraft, LLC on November 5, 2019

I-Model 600 S-2D 1 PCLM (Restricted Category Only), Approved November 1, 1965

Engine Pratt & Whitney WASP R-1340-AN-1 (S3H1 Commercial designation) with carburetor parts list settings 395118-3 or A-18639-7

Fuel 80/87 minimum grade aviation gasoline

Engine Limits

	<u>H.P.</u>	<u>R.P.M.</u>	<u>M.P.(In. Hg.)</u>	<u>ALT.</u>
Takeoff	600	2,250	36.0	S.L.
Max. Continuous	550	2,200	34.0	S.L.
Max. Continuous	550	2,200	32.5	5,000

Page No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
Rev. No.	39	36	36	36	37	37	37	29	36	29	29	29	29	36	29	31	29

Page No.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Rev. No.	29	29	33	29	29	36	29	36	35	35	35	36	33	35	34	37	36

Page No.	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
Rev. No.	28	31	33	36	37	37	37	37	36	37	37	36	36	36	36

Propeller and Propeller Limits	Hamilton Standard, constant speed, 12D40 Hub, 6101-12 blades. Diameter 109 inches maximum, 107 inches minimum. Pitch settings, 11.5° low and 27.0° high at 42 inch station. Alternate settings, 11.5° low and 21.5° high at 42 inch station. Alternate blades, EAC AG100-2, settings 11.5° low and 18° high at 42 inches.		
Airspeed Limits (CAS) (See Note 2(n) for exceptions)	Vne (Never Exceed)	159 m.p.h. (138 knots)	
	Vp (Maneuvering)	126 m.p.h. (109 knots)	
	Vno (Max. Structural Cruising)	126 m.p.h. (109 knots)	
C.G. Range	(+22.5) to (+29.0)		
Maximum Weight	6,000 lbs.		
Number of Seats	1 (+89.0)		
Maximum Cargo Load	See weight and balance data		
Fuel Capacity	109 gallons (+38.5) (100 gallon usable capacity, one 54.5 gallon tank in each wing, tanks interconnected). See NOTE 1 for data on unusable fuel.		
Oil Capacity	11.4 gallons total. 84 lb. at (-13.6) (9 gallons usable).		
Control Surface Movements	Elevator	Up 27°	Down 17°
	Elevator Tab	Up 12°	Down 18°
	Rudder	Left 24°	Right 24°
	Aileron	Up 21°	Down 17°
Serial Numbers (S/N) Eligible	600-1311D and subsequent		
Equipment	<p>The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. In addition, the following equipment is required:</p> <p>(a) FAA approved flight manual, dated November 1, 1965, or later FAA approved revision.</p> <p>(b) Operative pre-stall warning system per Snow Dwg. No. 90096.</p> <p>Either or both of the following items may be installed as customer alternate equipment:</p> <p>(a) Canopy installation, Snow Dwg. No. 10131.</p> <p>(b) 12 or 24 volt electrical system, Snow Dwg. No. 90111.</p>		
Agricultural Dispersal Equipment	<p>Any one of the ten following agricultural dispersal systems may be installed:</p> <p>(a) 2" External Spray Installation, Snow Dwg. No. 80185.</p> <p>(b) 1-1/4" Internal Spray Installation, Snow Dwg. No. 80186.</p> <p>(c) Small Swathmaster Dispersal Installation, Snow Dwg. No. 80187 (See NOTE 2(n) for required placard).</p> <p>(d) Snow Spreader Dispersal Installation, Snow Dwg. No. 80188 (See NOTE 2(n) for required placard).</p> <p>(e) Quick Disconnect Flange and Snow Spreader Installation, Snow Dwg. No. 80609.</p>		

Agricultural Dispersal Equipment (cont'd)

- (f) Large Swathmaster Installation - Standard of Swedish Gates, Snow Dwg. No. 80610.
- (g) Large Swathmaster Installation - 6 inch Adapter Box, Snow Dwg. No. 80602.
- (h) Spray System Installation - Fire Bomber Hopper with Cast Door, Snow Dwg. No. 80602.
- (i) Cable Dump System - Swedish Gate, Snow Dwg. No. 80251.
- (j) Fire Bomber Installation and Hopper Modification, Snow Dwg. No. 5-8062, Rev. D.

II-Model S2R (S-2R, S2-R)*, 1 PCLM (Restricted Category Only), Approved March 21, 1968,

* See Note 26 regarding model names.

Engine Pratt & Whitney WASP R-1340-AN-1 (S3H1 or S1H1 Commercial designation) with carburetor parts list settings 395118-3 or A-18639-7. Manifold pressure gage is to be modified per Drawing 60600 when the S1H1 engine is used. (See NOTE 5 for alternate engine installation)

Fuel 80/87 minimum grade aviation gasoline

Engine Limits

	<u>S3H1</u>				<u>S1H1</u>	
	<u>H.P.</u>	<u>R.P.M.</u>	<u>M.P.(In. Hg.)</u>	<u>ALT.</u>	<u>M.P.(In. Hg.)</u>	<u>ALT.</u>
Takeoff (5 min.)	600	2,250	36.0	S.L.	36.5	S.L.
Max. Continuous	550	2,200	34.0	S.L.	35.0	S.L.
Max. Continuous	550	2,200	32.5	5,000	33.0	8,000

Propeller and Propeller Limits Hamilton Standard, constant speed, 12 D40 hub, 6101-12 blades.
Diameter 109 inches maximum, 107 inches minimum.
Pitch settings 11.5° low and 27.0° high at 42 inch station.
Alternate settings, 11.5° low and 21.5° high at 42 inch station.
Alternate blades, EAC AG100-2 - Diameter 106 inches (2 percent cutoff permitted).
Pitch setting, 11.5° low and 20° high at 42 inches.

Airspeed Limits (CAS) (See Notes 2(o), 2(p), and 2(q) for exceptions)	Vne (Never Exceed)	159 m.p.h. (138 knots)
	Vp (Maneuvering)	126 m.p.h. (109 knots)
	Vno (Max. Structural Cruising)	126 m.p.h. (109 knots)
	Vfe (Flap Extended)	123 m.p.h. (107 knots)

C.G. Range (+22.5) to (+30.0)

Maximum Weight 6,000 lbs.

Number of Seats 1 (+89.0)

Maximum Cargo Load See weight and balance data. Maximum baggage compartment, 60 lbs. (+112).
Maximum hopper load, 3,336 lbs. (+29.9).

Fuel Capacity S/N 1380R - 70 gallons (38.5) (66 gallons usable capacity, one 35 gallon tank in each wing, tanks interconnected).
S/N 1416R and subsequent - 106 gallons (38.5).
S/N 1416R thru 1418R - (100 gallon usable capacity, one 53 gallon tank in each wing, tanks interconnected).
S/N 1419R thru 1499R and subsequent and S/N 1501R thru 1510R - (98 gallon usable, one 53 gallon tank in each wing, tanks interconnected).
S/N 1500R, 1511R and subsequent - (104 gallon usable, one 53 gallon tank in each wing, tanks interconnected).

Fuel Capacity (cont'd)	See NOTE 1 for data on unusable fuel. Also see NOTE 9 for other approved fuel capacities.		
Oil Capacity	11.4 gallons total (84 lbs. at -13.6) (9 gallons usable).		
Control Surface Movements	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $13^{\circ} \pm 1^{\circ}$	Down $18^{\circ} \pm 1^{\circ}$
	Rudder	Left $24^{\circ} \pm 1^{\circ}$	Right $24^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps		Down $26^{\circ} - 30^{\circ}$
Serial Numbers Eligible	1380R, 1416R thru 4999R		
Equipment	<p>The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. In addition, the following equipment is required:</p> <ul style="list-style-type: none"> (a) Airplane Flight Manual, dated February 27, 1979, and Supplement for Restricted Category Operation, dated February 27, 1979, or later FAA approved revision. (Only required for S/N 2526R and up). (b) 24 volt electrical system, Rockwell Drawing 90159. (24 volt system includes required wing night lights), effective S/N 1380R, 1416R thru 1590R. (c) 24 volt electrical system, Rockwell Drawing 90326, effective S/N 1591R and subsequent. (d) Operative pre-stall warning system per Rockwell Drawing 90095, S/N 1416R thru 1440R. 		
Agricultural Dispersal Equipment	<p>Any one of the following agricultural dispersal systems may be installed with the R1340 engines, or with the alternate Wright R-1300-1B engine installation:</p> <ul style="list-style-type: none"> (a) 2" External Spray Installation, Aero Commander Dwg. No. 80680, S/N 1416R thru 1510R. (b) Spreader and Calibration Installation, Aero Commander Dwg. No. 80674, S/N 1416R and subsequent. (c) Fire Bomber Dump System Installation, Aero Commander Dwg. No. 80792 (See NOTE 2(o) for required placard), S/N 1416R thru 1576R. (d) Micronair Spray System, Aero Commander Dwg. No. 80870 (See NOTE 2(q) for required placard), S/N 1416R and subsequent. (e) 2" Low Drag Spray System, Aero Commander Dwg. No. 81012, S/N 1511R thru 1620R. (f) Boommaster Installation, Aero Commander Dwg. No. 80931, S/N 1416R and subsequent. (g) Standard Spray System, Rockwell Dwg. No. 81071, S/N 1621R and subsequent. (h) Spreader and Spreader Quick-Disconnect Installation, Rockwell Dwg. No. 80975, S/N 1416R and subsequent. (i) Large Swathmaster - Small Gate Installation, Rockwell Dwg. No. 80815, S/N 1416R thru 2068R. 		

Agricultural Dispersal Equipment (cont'd)

- (j) Swathmaster Installation, Rockwell Dwg. No. 81061, S/N 1416R thru 2068R.
- (k) 2" Spray System Installation, Rockwell Dwg. No. 80852, S/N 1511R thru 1620R.
- (l) Spray System Installation, Rockwell Dwg. No. 80854, S/N 1511R and subsequent.
- (m) Fire Bomber System Installation, Rockwell Dwg. No. 81069, S/N 1577R and subsequent.

III-Model S2R-T34, 1 PCLM (Restricted Category Only), Approved April 28, 1977

See Note 8 for two-place configuration. See Notes 18 and 19 for options. See Note 22 for life limited parts.

Engine

Pratt & Whitney (United Aircraft of) Canada PT6A-34AG
 Alternate Engines approved for S/N 6000 thru 6049 and T34-001 thru T34-450:
 Pratt & Whitney Canada PT6A-34 (See NOTE 12 for instructions),
 Pratt & Whitney Canada PT6A-36 (Dry Configuration Only),
 Pratt & Whitney Canada PT6A-41, PT6A-41AG, and PT6A-42 (See NOTE 14 for more information on airplanes with these alternate engines)

Fuel

Jet A, Jet B, JP-4, JP-5, Automotive Diesel Number 1D or 2D in accordance with P&WC Specifications CPW 204, CPW 46, and CPW 381. (If jet fuel is not available, aviation gasoline, MIL-G-5572, all grades, may be used for a maximum of 150 hours between overhauls.) Automotive diesel fuel is approved only for agricultural application flights and only when the free air temperature is above:
 +20°F for Grade No. 1D
 +40°F for Grade No. 2D

Oil

UACL PT6 Engine Service Bulletin Number 1001 lists approved brands of oil.

Engine Limits

PT6A-34AG/-34/-36:

	Takeoff and <u>Max. Cont.</u>	Transient <u>Start/Accel.</u>	<u>Reverse</u>	<u>Idle</u>
SHP	750			
Torque (PSI)	64.5	68.4 Trans (2 sec.)	64.5	
ITT (°C)	790	1,090 Start (2 sec.)	790	
Ng (%)	101.5	102.6 Trans (2 sec.)	101.5	
Np (RPM)	2,200	2,420 Trans (2 sec.)	2,100	
Oil Press (PSIG)	85 to 105	85 to 105	85 to 105	40 min.
Oil Temp (°C)	10 to 99	-40 minimum	0 to 99	-40 to 99

The ratings shown are based on the static sea level standard condition with no external accessory loads and no air bleed.

Propeller and Propeller Limits
 (See Note 24 for pitch limits)

Hartzell Hub Model HC-B3TN-3C (or HC-B3TN-3D) with Blade Model T-10282, Diameter 102.5 inches maximum, 92.5 inches minimum, or Alternate Blade Model T-10282(N)+4, Diameter 106 inches maximum, 98 inches minimum.

Airspeed Limits (CAS)

Vne (Never Exceed)	159 mph (138 knots)
Va (Maneuvering)	126 mph (109 knots)
Vno (Max. Structural Cruising)	126 mph (109 knots)
Vfe (Flap Extended)	123 mph (107 knots)

C. G. Range

(See Note 8 for two-place)

For S/N 6000 thru 6049 and T34-001 thru T34-450:
 Forward limit at 6,000 lbs., +26.5 inches aft of datum.
 Forward limit at 4,000 lbs. and below, +24.0 inches aft of datum.
 (Straight line variation in the forward limit between 4,000 and 6,000 lbs.)
 Aft limit +30.0 inches aft of datum.

	For S/N T34-451 and subsequent and for T34-273 thru T34-450 when modified in accordance with Thrush Custom Kit CK-AG-45: Forward limit at 10,500 lbs., +29.25 inches aft of datum. Forward limit at 6,000 lbs. and below , +25 inches aft of datum (Straight line variation in the forward limit between 6,000 ad 10,500 lbs.) Aft limit +30.0 inches aft of datum.		
	Datum is the leading edge of the wing.		
Maximum Weight	6,000 lbs. for S/N 6000 thru 6049 and T34-001thru T34-450. 10,500 lbs. for S/N T34-451 and subsequent and for T34-273 thru T34-450 when modified in accordance with Thrush Custom Kit CK-AG-45.		
Maximum Landing Weight	6,000 lbs. for S/N 6000 thru 6049 and T34-001thru T34-450. 7,600 lbs. for S/N T34-451 and subsequent and for T34-273 thru T34-450 when modified in accordance with Thrush Custom Kit CK-AG-45.		
Maximum Operating Altitude	12,000 feet		
Number of Seats	1 (+89) (see NOTE 8 for two-place).		
Maximum Cargo Load	See weight and balance data. Maximum baggage compartment, 60 lbs. (+112). (See NOTE 8 for two-place). Maximum hopper load: 3,336 lbs. (+29.9) S/N 6000 thru 6049 and T34-001 thru T34-081, 4,000 lbs. (+29.9) S/N T34-082 and subsequent.		
Fuel Capacity	For S/N 6000 thru 6049 and T34-001thru T34-450: 104 gallons usable, one 53 gallon tank in each wing, tanks interconnected. Also see NOTE 9 for other approved fuel capacities. For S/N T34-451 and subsequent and for T34-273 thru T34-450 when modified in accordance with Thrush Custom Kit CK-AG-45: 228 gallons usable, one 115 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel.		
Oil Tank Capacity	11 quarts - usable oil tank capacity 6 quarts.		
Control Surface Movements	Elevator Up 27° ± 1° Down 17° ± 1° Elevator Tab Up 13° ± 1° Down 18° ± 1° Rudder Left 24° ± 1° Right 24° ± 1° Aileron Up 21° ± 1° Down 17° ± 1° Flaps Down 15° ± 1°		
Serial Numbers Eligible (See Note 8 for two-place)	6000 thru 6049 T34-001 and subsequent		
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include the following: For serial numbers 6000 thru 6049 and T34-001 thru T34-272, Ayres Corporation Airplane Flight Manual approved June 23, 1978, and Supplement for Restricted Category Operation approved June 23, 1978, or later approved versions. For serial numbers T34-273 thru T34-450, Thrush Airplane Flight Manual dated February 23, 2005, with Restricted Category Aircraft Flight Manual Supplement #T34AFMS RC-001 dated February 23, 2005, or later approved versions.		

Required Equipment (cont'd)

For serial numbers T34-451 and subsequent, and for T34-273 thru T34-450 when modified in accordance with Thrush Custom Kit CK-AG-45, Thrush Airplane Flight Manual, Revision 6, dated February 14, 2014, with Restricted Category Aircraft Flight Manual Supplement #T34AFMS_RC-002, dated February 13, 2017, or later approved versions.

Agricultural Dispersal Equipment

See NOTE 17 for dispersal systems.

CAUTION: For operation with the Micronair Spray Equipment System or the Fire Bomber System, or with any system when an Agavenco pump is installed, the placards for airspeed limitations referred to in NOTE 2(q), 2(o), or 2(p), respectively, for the S2R are applicable.

Certification Basis

For S/N 6000 thru 6049 and T34-001 thru T34-450: CAR 8 effective October 11, 1950, Restricted Category

For S/N T34-451 and subsequent, and for S/N T34-273 thru T34-450 when modified in accordance with Thrush Custom Kit CK-AG-45:

Airworthiness Standards for Components and Areas Not Affected by the Change:

The original certification basis (*airworthiness standards only*) for the S2R-T34 airplane (as equipped prior to modification):

CAR 3 effective May 15, 1956, with Amendments 3-1 through 3-8; and

Only for regulations applicable to turboprop engine installations, 14 CFR Part 23 effective February 1, 1965, with Amendments 23-1 through 23-16.

Airworthiness Standards for Components and Areas Affected by the Change:

14 CFR 21.101

14 CFR 21.25(a)(1) for the special purposes of

a. 21.25(b)(1) agricultural aircraft operations, and

b. 21.25(b)(2) forest conservation (only for aerial dispensing of liquids or other materials for fires).

Civil Air Regulations (CAR) 3, effective May 15, 1956, including Amendments 3-1 through 3-8.

14 CFR Part 23, Subpart C, effective February 1, 1965, Amendments 23-1 through 23-34, only Subpart C regulations.

14 CFR Part 23, effective February 1, 1965, Regulations and Amendments as listed below: (Note: Dash number in parentheses is amendment level)

23.49(c)(1) (-21) *	23.175 (-14)	23.1043 (-7) *
---------------------	--------------	----------------

23.65(c) (-21) *	23.177 (-0)	23.1045 (-7)
------------------	-------------	--------------

23.75(b) (-7)	23.562 (-50) *	23.1529 (-26)
---------------	----------------	---------------

23.77(b) (-21)	23.629(e)(-31)	23.1583 (-10)
----------------	----------------	---------------

23.173 (-14)	23.1041 (-7)	23.1587(a)(-7)
--------------	--------------	----------------

* Compliance with the regulation was demonstrated in accordance with FAA policy memorandum ACE-110_19971201, dated December 1, 1997.

Compliance with §23.221 Spinning was not required in accordance with FAA Advisory Circular 21.25-1, Appendix 1, and compliance was not shown.

Equivalent Level of Safety Finding (ELOS) No. ACE-04-05 to 14 CFR 23.473(b), dated July 26, 2004, for a landing weight of 7,600 lbs.

CAR 8 is not part of the certification basis for S/N T34-451 and up, or for S/N T34-273 thru S/N T34-450 when equipped or modified with Thrush Custom Kit CK-AG-TBD for operating at 10,500 pounds. These airplanes are certified to an approved maximum takeoff weight of 10,500 pounds and cannot use the provisions of CAR 8 to operate over 10,500 pounds.

IV-Model S2R-T15, 1 PCLM (Restricted Category Only), Approved April 3, 1979

See Note 8 for two-place configuration. See Notes 18 and 19 for options. See Note 22 for life limited parts.

Engine

Pratt & Whitney (United Aircraft of) Canada PT6A-15AG or PT6A-27

Due to anticipated operating environment, servicing and overhaul interval for both the PT6A-15AG and PT6A-27 engines shall be in accordance with Pratt & Whitney's recommendations for the PT6A-15AG engine.

Fuel Jet A, Jet B, JP-4, JP-5, Automotive Diesel Number 1D or 2D in accordance with UACL Service Bulletin Number 1344. (If jet fuel is not available, aviation gasoline, MIL-G-5572, all grades, may be used for a maximum of 150 hours between overhauls.) Automotive diesel fuel is approved only for agricultural application flights and only when the free air temperature is above:
+20°F for Grade No. 1D
+40°F for Grade No. 2D

Oil UACL PT6 Engine Service Bulletin Number 1001 lists approved brands of oil.

Engine Limits

	<u>Takeoff and Max. Cont.</u>	<u>Transient Start/Accel.</u>	<u>Reverse</u>	<u>Idle</u>
SHP	680			
Torque (PSI)	53.0	68.8 Trans (2 sec.)	53.0	
ITT (°C)	725	1,090 Start (2 sec.)	725	
Ng (%)	101.5	102.7 Trans (10 sec.)	101.5	
Np (RPM)	2,200	2,420 Trans (10 sec.)	2,100	
Oil Press (PSIG)	80 to 100	80 to 100	80 to 100	40 min.
Oil Temp (°C)	10 to 99	-40 minimum	0 to 99	-40 to 99

The ratings shown are based on the static sea level standard condition with no external accessory loads and no air bleed.

Propeller and Propeller Limits (See Note 24 for pitch limits) Hartzell Hub Model HC-B3TN-3C (or HC-B3TN-3D) with Blade Model T-10282, Diameter 102.5 inches maximum, 92.5 inches minimum or alternate Blade Model T-10282(N)+4, Diameter 106 inches maximum, 98 inches minimum.

Airspeed Limits (CAS)

Vne (Never Exceed)	159 mph (138 knots)
Vp (Maneuvering)	126 mph (109 knots)
Vno (Max. Structural Cruising)	126 mph (109 knots)
Vfe (Flap Extended)	123 mph (107 knots)

C. G. Range (See Note 8 for two-place)
Forward limit at 6,000 lbs., +26.5 inches aft of datum.
Forward limit at 4,000 lbs. and below, +24.0 inches aft of datum.
(Straight line variation in the forward limit between 4,000 and 6,000 lbs.)
Aft limit +30.0 inches aft of datum.
Datum is the leading edge of the wing.

Maximum Weight 6,000 lbs.

Maximum Operating Altitude 12,000 feet

Number of Seats 1 (+89) (see NOTE 8 for two-place)

Maximum Cargo Load See weight and balance data.
Maximum baggage compartment, 60 lbs. (+112). (See NOTE 8 for two-place).
Maximum hopper load, 3,336 lbs. (+29.9). (See NOTE 10 for increased load limit).

Fuel Capacity 104 gallons usable, one 53 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel. Also see NOTE 9 for other approved fuel capacities.

Oil Tank Capacity 11 quarts - usable oil tank capacity 6 quarts.

Control Surface Movements	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $13^{\circ} \pm 1^{\circ}$	Down $18^{\circ} \pm 1^{\circ}$
	Rudder	Left $24^{\circ} \pm 1^{\circ}$	Right $24^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps		Down $15^{\circ} \pm 1^{\circ}$

Serial Numbers Eligible (See Note 8 for two-place)	T15-001 and subsequent
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved April 3, 1979, and Supplement for Restricted Category Operation approved April 3, 1979, or later approved versions.
Agricultural Dispersal Equipment	See NOTE 17 for dispersal systems. CAUTION: For operation with the Micronair Spray Equipment System or the Fire Bomber System, or with any system when an Agavenco pump is installed, the placards for airspeed limitations referred to in NOTE 2(q), 2(o), or 2(p), respectively, for the S2R are applicable.

V-Model S2R-R3S, 1 PCLM (Restricted Category Only), Approved August 1, 1979

See Note 8 for two place configuration.

Engine	Wsk - "Pezetel" PZL-3S			
Fuel	100/130 Minimum grade aviation gasoline			
Oil	Aeroshell 100 or equivalent			
Engine Limits				
	<u>H.P.</u>	<u>R.P.M.</u>	<u>M.P.(In. Hg.)</u>	<u>ALT.</u>
Takeoff (1 min.)	592	2,200	37.0	S.L.
Max. Continuous	594	2,050	36.2	S.L.
Propeller and Propeller Limits	One Dowty Rotol, Ltd., Model (C) R. 289/3-110-F/1, Constant Speed, Hydraulic, Non-Feathering, Non-Reversing Pitch Control with Pezetel Governor 0719-812008. Blade Model 660705200, Diameter: 102" ± 0.0 Pitch Setting at 37" Blade Radius Low 12° ± 1/4°; High 20° ± 1/4°.			
or	One WSK Model US-132000/A Hub, US-132500 Blades, Diameter 103.15 inches maximum, 102.0 minimum, Pitch Setting at 37" Blade Radius Low 12° ± 1/2°; High 32° ± 1°.			
Airspeed Limits (CAS)	Vne (Never Exceed)		159 mph (138 knots)	
	Vp (Maneuvering)		126 mph (109 knots)	
	Vno (Max. Structural cruising)		126 mph (109 knots)	
	Vfe (Flap Extended)		123 mph (107 knots)	
C. G. Range	(+22.5) to (+27.5) (See NOTE 8 for two-place)			
Maximum Weight	6,000 lbs.			
Number of Seats	1 (+89) (See NOTE 8 for two-place)			
Maximum Cargo Load	See weight and balance data. Maximum baggage compartment, 60 lbs. (+112). (See NOTE 8 for two-place). Maximum hopper load, 3,336 lbs. (+29.9).			
Fuel Capacity	S/N R3S-001 and subsequent - (104 gallons usable, one 53 gallon tank in each wing, tanks interconnected). See NOTE 1 for data on unusable fuel.			
Oil Tank Capacity	11.4 gallons total (84 lbs. at -13.6) (9.0 gallons usable).			

Control Surface Movements	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $13^{\circ} \pm 1^{\circ}$	Down $18^{\circ} \pm 1^{\circ}$
	Rudder	Left $24^{\circ} \pm 1^{\circ}$	Right $24^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps		Down $26^{\circ} - 30^{\circ}$
Serial Numbers Eligible	R3S-001 and subsequent. (See NOTE 8 for two-place)		
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved August 1, 1979, or later approved versions.		
Agricultural Dispersal Equipment	See NOTE 17 for dispersal systems.		

VI-Model S2R-T11, 1 PCLM (Restricted Category Only), Approved October 26, 1979

See Notes 8 for two-place configuration. See Notes 18 and 19 for options. See Note 22 for life limited parts.

Engine	Pratt & Whitney (United Aircraft of) Canada PT6A-11AG
Fuel	Jet A, Jet B, JP-4, JP-5, Automotive Diesel Number 1D or 2D in accordance with UACL Service Bulletin Number 1344. (If jet fuel is not available, aviation gasoline, MIL-G-5572, all grades, may be used for a maximum of 150 hours between overhauls.) Automotive diesel fuel is approved only for agricultural application flights and only when the free air temperature is above: +20°F for Grade No. 1D +40°F for Grade No. 2D
Oil	UACL PT6 Engine Service Bulletin Number 1001 lists approved brands of oil.

Engine Limits

	<u>Takeoff and Max. Cont.</u>	<u>Transient Start/Accel.</u>	<u>Reverse</u>	<u>Idle</u>
SHP	500			
Torque (PSI)	38.6	48.5 Trans (2 sec.)	38.6	
ITT (°C)	700	1,090 Start (2 sec.)	700	
Ng (%)	101.5	102.6 Trans (10 sec.)	101.5	
Np (RPM)	2,200	2,420 Trans (10 sec.)	2,068	
Oil Press (PSIG)	80 to 100	80 to 100	80 to 100	40 min.
Oil Temp (°C)	10 to 99	-40 min.	0 to 99	-40 to 99

The ratings shown on the United Aircraft of Canada PT6A-11AG engine are based on the static sea level standard condition with no external accessory loads and no air bleed.

Propeller and Propeller Limits (See Note 24 for pitch limits)	Hartzell Hub Model HC-B3TN-3C (or HC-B3TN-3D) with Blade Model T-10282, Diameter 102.5 inches maximum, 92.5 inches minimum or alternate Blade Model T-10282(N)+4, Diameter 106 inches maximum, 98 inches minimum.	
Airspeed Limits (CAS)	Vne (Never Exceed)	159 mph (138 knots)
	Vp (Maneuvering)	126 mph (109 knots)
	Vno (Max. Structural Cruising)	126 mph (109 knots)
	Vfe (Flap Extended)	123 mph (107 knots)
C. G. Range (See Note 8 for two-place)	Forward limit at 6,000 lbs., +26.5 inches aft of datum. Forward limit at 4,000 lbs. and below, +24.0 inches aft of datum. (Straight line variation in the forward limit between 4,000 and 6,000 lbs.). Aft limit +30.0 inches aft of datum. Datum is the leading edge of the wing.	

Maximum Weight	6,000 lbs.		
Maximum Operating Altitude	12,000 feet		
Number of Seats	1 (+89) (See NOTE 8 for two-place)		
Maximum Cargo Load	See weight and balance data. Maximum baggage compartment, 60 lbs. (+112). (See NOTE 8 for two-place). Maximum hopper load, 3,336 lbs. (+29.9). (See NOTE 10 for increased load limit).		
Fuel Capacity	104 gallons usable, one 53 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel. Also see NOTE 9 for other approved fuel capacities.		
Oil Tank Capacity	11 quarts - usable oil tank capacity 6 quarts.		
Control Surface Movements (See Note 8 for two-place)	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $13^{\circ} \pm 1^{\circ}$	Down $18^{\circ} \pm 1^{\circ}$
	Rudder	Left $24^{\circ} \pm 1^{\circ}$	Right $24^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps		Down $15^{\circ} \pm 1^{\circ}$
Serial Numbers Eligible	T11-001 and subsequent. (See NOTE 8 for two-place)		
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved October 26, 1979, and Supplement for Restricted Category Operation approved October 26, 1979, or later approved versions.		
Agricultural Dispersal Equipment	See NOTE 17 for dispersal systems. CAUTION: For operation with the Micronair Spray Equipment System or the Fire Bomber System, or with any system when an Agavenco pump is installed, the placards for airspeed limitations referred to in NOTE 2(q), 2(o), or 2(p), respectively, for the S2R are applicable.		

VII-Model S2R-R1340, 2 PCLM (Restricted Category Only)*, Approved May 6, 1980

*See Note under certification basis for approved special purpose operations. Also see Note 15 for one-place configuration.

Engine Pratt & Whitney WASP R-1340-AN-1 (S3H1 or S1H1 Commercial designation) with carburetor parts list settings 395118-3 or A-18639-7. Manifold pressure gage is to be modified per Drawing 60600 when the S1H1 engine is used.

Fuel	80/87 minimum grade aviation gasoline
------	---------------------------------------

Engine Limits		S3H1				S1H1		
	<u>H.P.</u>	<u>R.P.M.</u>	<u>M.P.In.</u>	<u>H.G.</u>	<u>ALT.</u>	<u>M.P.In.</u>	<u>H.G.</u>	<u>ALT.</u>
Takeoff (5 min.)	600	2,250	36.0	S.L.	S.L.	36.5	S.L.	S.L.
Max. Continuous	550	2,200	34.0	S.L.	S.L.	35.0	S.L.	S.L.
Max. Continuous	550	2,200	32.5	5,000		33.0	8,000	

Propeller and Propeller Limits	<p>Hamilton Standard, constant speed, 12D40 Hub, 6101-12 blades. Diameter 109 inches maximum, 107 inches minimum. Pitch settings, 11.5° low and 27.0° high at 42 inch station. Alternate settings, 11.5° low and 21.5° high at 42 inch station.</p> <p>Alternate blades, EAC AG100-2, Diameter 106 inches (2 percent cutoff permitted). Pitch settings 11.5° low and 20° high at 42 inches.</p>
--------------------------------	---

Airspeed Limits (CAS)	Vne (Never Exceed)	159 m.p.h. (138 knots)
	Vp (Maneuvering)	126 m.p.h. (109 knots)
	Vno (Max. Structural Cruising)	126 m.p.h. (109 knots)
	Vfe (Flap Extended)	123 m.p.h. (107 knots)
C.G. Range	(+22.5) to (+30.0) with Elevator Down Spring, P/N 19661-1, and for S/N R1340-036DC and up (+22.5) to (+27.5) without P/N 19661-1 installed.	
Maximum Weight	6,000 lbs.	
Number of Seats	1 (+89.0) (See NOTE 15 for one-place configuration) 1 (+127 - Forward Facing) or (+111 - Aft Facing)	
Maximum Cargo Load	See weight and balance data. Maximum passenger/cargo compartment, 200 lbs. (+120) (See NOTE 15 for one-place configuration) Maximum hopper load, 3,336 lbs. (+29.9).	
Fuel Capacity	S/N R1340-001DC to R1340-035: 104 gallons usable, one 53 gallon tank in each wing, tanks interconnected; S/N R1340-001DC and up: 133 gallons usable, one 68 gallon tank in each wing. See NOTE 1 for data on unusable fuel. See NOTE 9 for other approved fuel capacities.	
Oil Tank Capacity	11.4 gallon total (84 lbs. at -13.6) (9.0 gallons usable).	
Control Surface Movements	Elevator	Up $27^{\circ} \pm 1^{\circ}$ Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $8^{\circ} \pm 1^{\circ}$ Down $22^{\circ} \pm 1^{\circ}$
	Rudder	Left $24^{\circ} \pm 1^{\circ}$ Right $24^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$ Down $17^{\circ} \pm 1^{\circ}$
	Flaps	Down $15^{\circ} \pm 1^{\circ}$
Serial Numbers Eligible	R1340-001DC and subsequent See NOTE 15 for S/N R1340-011 and subsequent (one-place configuration)	
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include for S/N R1340-001DC to S/N R1340-035 the Airplane Flight Manual and Supplement for Restricted Category Operation, dated May 6, 1980, or later approved versions; or for S/N R1340-036 and up, the Thrush Airplane Flight Manual, dated November 29, 2007, or later approved versions.	
Agricultural Dispersal Equipment	See NOTE 17 for dispersal systems.	
Structural Limitations	For S/N R1340-036DC and up (with or without DC suffix) wing lower spar cap p/n's 20207-015 and 20207-016 must be replaced at 28,800 hours time in service and tail landing gear spring p/n 5079-1 must be replaced every 5,000 hours time in service. For S/N R1340-036DC and up (with or without DC suffix), mandatory inspections in accordance with the Airworthiness Limitations contained in Thrush Aircraft Maintenance Manual for the S2R-R1340 effective January 1, 2008, or later FAA accepted revision, are required.	

VIII-Model S2R-R1820, 2 PCLM (Restricted Category Only)*, Approved February 20, 1981

*See Note under certification basis for approved special purpose operations. Also see Note 15 for one-place configuration.

Engine	Wright R-1820-71, -60, -97, -99; GR-1820G-202A; 702C9GC1, 2, 3, 4; 704C9GC1, 2, 3, 4			
Fuel	100/130 minimum grade aviation gasoline			
Engine Limits	<u>H.P.</u>	<u>R.P.M.</u>	<u>M.P.(In. Hg.)</u>	<u>ALT.</u>
Takeoff (1 min.)	1200	2,500	45.5	S.L.
Max. Continuous	1000	2,300	39.5	S.L.
Max. Continuous	1000	2,300	37.2	6,900
Propeller and Propeller Limits	Straight line variation between points given.			
	a. With Wright R-1820-71, -60, GR-1820G-202A; 702C9GC1, 2, 3, 4; 704C9GC1, 2, 3, 4 engines: Hamilton Standard 43D50 or 33D50 constant speed -			
	1.	Hub Model:	43D50-321	
		Blade Model:	6933A-9	
		Diameter:	111" Maximum, 109" Minimum	
		Pitch Settings:	At 42 inch Station - Low 21.5 ⁰ , High 52.5 ⁰	
	2.	Hub Model:	33D50-119	
		Blade Model:	6601-18S or 7005-18S	
		Diameter:	120-5/8" Maximum, 117-5/8" Minimum	
		Pitch Settings:	At 42 inch Station -Low 19 ⁰ , High 39 ⁰	
Airspeed Limits (CAS)	b. With Wright R-1820-97 or R-1820-99 engines: Hamilton Standard 23E50 constant speed -			
		Blade Model:	Serv-Aero SA10P-18Q	
		Diameter:	120-1/4" Maximum, 117-3/4" Minimum	
		Pitch Settings:	At 42 inch Station - Low 26 ⁰ , High 50 ⁰	
	c. Governor: Hamilton Standard 4G-10-7			
C.G. Range (See Note 15 for one-place)	Vne (Never Exceed)	159 m.p.h. (138 knots)		
	Vp (Maneuvering)	126 m.p.h. (109 knots)		
	Vno (Max. Structural Cruising)	126 m.p.h. (109 knots)		
	Vfe (Flap Extended)	123 m.p.h. (107 knots)		
Maximum Weight	(±23) to (±30.0) with Elevator Down Spring, P/N 19661-1			
	(±23) to (±27.5) without P/N 19661-1 installed.			
Number of Seats	6,000 lbs.			
Maximum Cargo Load	1 (±89.0) (See NOTE 15 for one-place configuration) 1 (±127 - Forward Facing) or (±111 - Aft Facing)			
Fuel Capacity	See weight and balance data. Maximum passenger/cargo compartment, 200 lbs. (±120). See NOTE 15 for one-place configuration. Maximum hopper load, 3,336 lbs. (±29.9). See NOTE 10 for increased load limit.			
	S/N R1820-001DC and subsequent - (190 gallons usable, one 96 gallon tank in each wing, tanks interconnected). See NOTE 1 for data on unusable fuel. Also see NOTE 9 for other approved fuel capacities.			

Oil Tank Capacity	13 gallons total at Station (+153). See NOTE 15 for one-place configuration.		
Control Surface Movements	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $12^{\circ} \pm 1^{\circ}$	Down $22^{\circ} \pm 1^{\circ}$
	Rudder	Left $24^{\circ} \pm 1^{\circ}$	Right $24^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps		Down $15^{\circ} \pm 1^{\circ}$
Serial Numbers Eligible	R1820-001DC and subsequent		
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved February 20, 1981, or later approved version.		
Agricultural Dispersal Equipment	See NOTE 17 for dispersal systems.		

IX-Model S2R-T65, 2 PCLM (Restricted Category Only)*, Approved September 3, 1987

*See Note under certification basis for approved special purpose operations. See Note 22 for life limited parts.

Engine	Pratt & Whitney (United Aircraft of) Canada PT6A-65AG		
Fuel	Jet A, Jet B, JP-4, JP-5, in accordance with P&WC Service Bulletin Number 13244. (If jet fuel is not available, aviation gasoline, MIL-G-5572, all grades, may be used for a maximum of 150 hours between overhauls.)		
Oil	UACL PT6 Engine Service Bulletin Number 1001 lists approved brands of oil.		
Engine Limits		Takeoff and	Transient
		<u>Max. Cont.</u>	<u>Start/Accel.</u>
			<u>Idle</u>
	SHP	1,230	
	Torque (PSI) (2 sec.)	45.4	61.0 Trans
	ITT ($^{\circ}$ C)	810	1,000 Start (5 sec.)
	Ng (%)	104	
	Np (RPM)	1,700	1,870 Trans (5 sec.)
Propeller and Propeller Limits (See Note 24 for pitch limits)	Oil Press (PSIG)	90 to 135	60 min.
	Oil Temp ($^{\circ}$ C)	0 to 110	-40 to 110
Hartzell HC-B5MP-3C propeller, constant speed, feathering and reversing; Hub Model HC-B5MP-3C; Blade Model M10876ANS. Diameter 111.0 maximum, 110.7 inches minimum.			
Certification Basis	(1) CAR 8.10(a)(1), dated October 11, 1950, including the Airworthiness requirements of Appendix B.		

Certification Basis (cont'd)

- (2) 14 CFR Part 23, effective February 1, 1965, only as applicable to turboprop engine installations and listed by Part 23 section below.
(The Part 23 amendment level is shown in parentheses.)

23.49(e)(2)(-21)	23.933(-7)	23.1045(-7)	23.1305(-15)
23.65(c)(-21)	23.937(-7)	23.1091(-7)	23.1323(-7)
23.75(b)(-7)	23.951(-15)	23.1093(-15)	23.1337(-7)
23.77(b)(-21)	23.955(-7)	23.1103(-7)	23.1353(-20)
23.173(-14)	23.959(-7)	23.1105(0)	23.1521(0)
23.175(-14)	23.977(-17)	23.1111(-7)	23.1527(-7)
23.177(0)	23.991(-7)	23.1121(-7)	23.1529(-8)
23.371(-7)	23.997(-15)	23.1141(-14)	23.1545(-7)
23.629(e)(-31)	23.1013(-15)	23.1143(-7)	23.1549(-17)
23.831(0)	23.1015(-15)	23.1145(-18)	23.1557(-14)
23.901(-7)	23.1019(-15)	23.1155(-7)	23.1583(-10)
23.903(-14)	23.1027(-14)	23.1165(0)	23.1587(a)(-7)
23.905(0)	23.1041(-7)	23.1183(-15)	
23.929(-14)	23.1043(-7)	23.1303(0)	

- (3) The intent of §25.305(c) regarding the dynamic response of the engine mount structure.

Airspeed Limits (CAS)

Vne (Never Exceed)	159 m.p.h. (138 knots)
Vp (Maneuvering)	126 m.p.h. (109 knots)
Vno (Max. Structural Cruising)	126 m.p.h. (109 knots)
Vfe (Flap Extended)	123 m.p.h. (107 knots)

C.G. Range

Forward Limit +22.5 inches aft of datum
Aft Limit +29.0 inches aft of datum.
Datum is the leading edge of the wing.

Maximum Weight

6,000 lbs.

Maximum Operating Altitude

12,000 feet

Number of Seats

1 (+89)
1 (+127)

Maximum Cargo Load

See weight and balance data.
Maximum cargo compartment, 200 lbs. (+120).
Maximum hopper load, 4,000 lbs. (+29.9).

Fuel Capacity

228 gallon usable, one 115 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel.

Oil Tank Capacity

11 quarts - usable oil tank capacity 6 quarts.

Control Surface Movements
(See Note 8 for two-place)

Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
Elevator Tab	Up $8^{\circ} \pm 1^{\circ}$	Down $22^{\circ} \pm 1^{\circ}$
Rudder	Left $24^{\circ} \pm 1^{\circ}$	Right $24^{\circ} \pm 1^{\circ}$
Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
Flaps		Down $15^{\circ} \pm 1^{\circ}$

Serial Numbers Eligible

T65-001DC and subsequent

Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved September 3, 1987, and Supplement for Restricted Category Operation approved September 3, 1987, or later approved version.
Agricultural Dispersal Equipment	See NOTE 17 for dispersal systems. CAUTION: For operation with the Micronair Spray Equipment System or the Fire Bomber System, or with any system when an Agavenco pump is installed, the placards for airspeed limitations referred to in NOTE 2(q), 2(o), or 2(p), respectively, for the S2R are applicable.

X Model S2RHG-T65, 2 PCLM (Restricted Category Only)*, Approved June 8, 1988

*See Note under certification basis for approved special purpose operations. See NOTE 25 for single cockpit configuration with alternate engines. See NOTE 22 for life limited parts.

Engine	S/N T65-002DC thru T65-012DC: Pratt & Whitney Canada PT6A-65AG S/N T65HG-013DC and up: Pratt & Whitney Canada PT6A-60AG					
Fuel	Jet A, Jet B, JP-4, JP-5, in accordance with P&WC Service Bulletin Number 13244. (If jet fuel is not available, aviation gasoline, MIL-G-5572, all grades, may be used for a maximum of 150 hours between overhauls.)					
Oil	UACL PT6 Engine Service Bulletin Number 1001 lists approved brands of oil.					
Engine Limits						
<u>PT6A-65AG:</u>		<u>Takeoff and Max. Cont.</u>	<u>Transient Start/Accel.</u>	<u>Idle</u>		
SHP		1,230				
Torque (PSI) (2 sec.)		45.4	61.0 Trans			
ITT (°C)		810	1,000 Start (5 sec.)	715		
Ng (%)		104		58		
Np (RPM)		1,700	1,870 Trans (5 sec.)			
Oil Press (PSIG)		90 to 135		60 min.		
Oil Temp (°C)		0 to 110	0 to 110	-40 to 110		
<u>PT6A-60AG:</u>		<u>Max. Cont.</u>	<u>Transient*</u>		<u>Idle</u>	
	<u>Takeoff</u>		<u>Start</u>	<u>Accel.</u>	<u>Reverse</u>	
SHP	1,050	1,020			900	
Torque (PSI)**	38.8	37.7				
ITT (°C)	820	775	1,000	850	760	750
Ng (%)	104	104		104		58
Np (RPM)	1700	1700		1,870	1,650	
Oil Press (PSIG)	90 to 135	90 to 135	0 to 200	40 to 200	90 to 135	60 Minimum
Oil Temp (°C)	10 to 110	0 to 110	-40 Min.	0 to 110	0 to 104	-40 to 110

*Transient engine limits are 5 seconds for starting and 20 seconds for acceleration.

**The Torque pressure limits listed are for NP=1,700 RPM only.

Propeller and Propeller Limits (See Note 24 for pitch limits)	Hartzell HC-B5MP-3C propeller, constant speed, feathering and reversing; Hub Model HC-B5MP-3C; Blade Model M10876AS or M10876ANS. Diameter 111.0 inches maximum, 110.7 inches minimum.
--	--

Certification Basis

- (1) 14 CFR Part 21.25(a)(1)
- (2) CAR 3, effective May 15, 1956, including Amendments 3-1 through 3-8 as modified by CAR 8.10(a)(1) effective October 11, 1950.
- (3) Part 23, effective February 1, 1965, Amendments 23-1 through 23.34, only applicable to Subpart C, excluding 23.571 and 23.572.
- (4) 14 CFR Part 23, effective February 1, 1965, only as applicable to turboprop engine installations and listed by Part 23 section below.
(The Part 23 amendment level is shown in parentheses.)

23.49(e)(2)(-21)	23.933(-7)	23.1045(-7)	23.1305(-15)
23.65(c)(-21)	23.937(-7)	23.1091(-7)	23.1323(-7)
23.75(b)(-7)	23.951(-15)	23.1093(-15)	23.1337(-7)
23.77(b)(-21)	23.955(-7)	23.1103(-7)	23.1353(-20)
23.173(-14)	23.959(-7)	23.1105(0)	23.1521(0)
23.175(-14)	23.977(-17)	23.1111(-7)	23.1527(-7)
23.177(0)	23.991(-7)	23.1121(-7)	23.1529(-8)
23.371(-7)	23.997(-15)	23.1141(-14)	23.1545(-7)
23.629(e)(-31)	23.1013(-15)	23.1143(-7)	23.1549(-17)
23.831(0)	23.1015(-15)	23.1145(-18)	23.1557(-14)
23.901(-7)	23.1019(-15)	23.1155(-7)	23.1583(-10)
23.903(-14)	23.1027(-14)	23.1165(0)	23.1587(a)(-7)
23.905(0)	23.1041(-7)	23.1183(-15)	
23.929(-14)	23.1043(-7)	23.1303(0)	

- (5) Exemption No. 4898 (CAR 3.83 - 70 mph stall speed) issued January 21, 1988. For S/N T65HG-013DC and up, compliance with FAA Policy Memorandum ACE-110_19971201, dated December 1, 1997, Section 23.49, has been shown (61 knot stall speed met with hopper empty), in lieu of previously required Exemption No. 4898.
- (6) Equivalent Safety Finding to §23.473(b), dated March 15, 1988 for 7,600 pound landing weight.
- (7) The intent of §25.305(c) regarding the dynamic response of the engine mount structure.

Airspeed Limits (CAS)

Vne (Never Exceed)	220 m.p.h. (191 knots)
Vp (Maneuvering)	167 m.p.h. (145 knots)
Vno (Max. Structural Cruising)	187 m.p.h. (163 knots)
Vfe (Flap Extended)	157 m.p.h. (137 knots)

C.G. Range

Forward Limit 7,600 pounds and below is +24.0 inches aft of datum
 Forward limit at 10,500 pounds is 26 inches aft of datum with straight line variation to 7,600 pounds at 24.0 inches.
 For S/N T65-002DC thru T65-012DC: Aft Limit at all weights is +29.0 inches aft of datum.
 For S/N T65HG-013DC and subsequent: Aft limit at all weights is +28.0 inches aft of datum.
 Datum is the leading edge of the wing.

Maximum Takeoff Weight

10,500 lbs.

Maximum Landing Weight

7,600 lbs.

Minimum Weight

5,000 lbs.

Maximum Operating Altitude

12,000 feet

Number of Seats	1 (+89) 1 (+127)		
Maximum Cargo Load	See weight and balance data. Maximum cargo compartment, 200 lbs. (+120). Maximum hopper load, 4,000 lbs. (+29.9).		
Fuel Capacity	228 gallon usable, one 115 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel.		
Oil Tank Capacity	11 quarts - usable oil tank capacity 6 quarts.		
Control Surface Movements	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $8^{\circ} \pm 1^{\circ}$	Down $22^{\circ} \pm 1^{\circ}$
	Rudder	Left $24^{\circ} \pm 1^{\circ}$	Right $24^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps		Down $15^{\circ} \pm 1^{\circ}$
Serial Numbers Eligible	T65-002DC thru T65-012DC, and T65HG-013DC and subsequent. For T65HG-011 and subsequent one-place configuration information see NOTE 25.		
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include for S/N T65-002DC thru T65-009DC Ayres Corporation Airplane Flight Manual approved June 8, 1988, and Supplement for Restricted Category Operation approved June 8, 1988, or for S/N T65HG-013DC and subsequent, Thrush Airplane Flight Manual approved October 28, 2005, or later approved versions.		
Agricultural Dispersal Equipment	Equipment eligible on S/N T65-002DC thru T65-012DC: High Volume Dispersal System, Ayres Dwg. No. 21563. See NOTE 17 for additional optional equipment. CAUTION: For operation with the Micronair Spray System or the Fire Bomber System, or with any system when an Agavenco pump is installed, the placards for airspeed limitations referred to in NOTE 2(q), 2(o), or 2(p), respectively, for the S2R are applicable. Equipment eligible on S/N T65HG-013DC and up: Standard Spray System, Thrush Dwg. No. 81071.		
<u>XI-Model S2R-T45, 2 PCLM (Restricted Category Only)*, Approved July 23, 1990</u>			
*See Note under certification basis for approved special purpose operations. See Note 15 for one-place configuration. See Note 22 for life limited parts.			
Engine	Pratt & Whitney (United Aircraft of) Canada PT6A-45, -45A, -45B, -45R (Dry ratings only)		
Fuel	See Airplane Flight Manual		
Oil	UACL PT6 Engine Service Bulletin Number 1001 lists approved brands of oil.		

Engine Limits

	Takeoff and <u>Max. Cont.</u>	Transient (2 sec.) <u>Start/Accel.</u>	<u>Reverse</u>	<u>Idle</u>
SHP	1,173 (TO) 1,020 (MC)		900	
Torque (PSI)	43.3	61 Accel.		
ITT (°C)	800*	1,000 Start 850 Accel.	800	700
Ng (%)	104	104		52
Np (RPM)	1,700	1,870	1650	
Oil Press (PSIG)	100 to 135		100 to 135	60 min.
Oil Temp (°C)	10 to 99	-40 min. start 0 to 104 accel.	0 to 99	-40 to 99

*760 °C for the PT6A-45 engine

Propeller and Propeller Limits
(See Note 24 for pitch limits)

Hartzell HC-B5MP-3C propeller, constant speed, feathering and reversing; Hub Model HC-B5MP-3C; Blade Model M-10876ANS.
Diameter 111 inches maximum, 106.0 inches minimum.

Airspeed Limits (CAS)

Vne (Never Exceed)	159 mph (138 knots)
Vp (Maneuvering)	126 mph (109 knots)
Vno (Max. Structural Cruising)	126 mph (109 knots)
Vfe (Flap Extended)	123 mph (107 knots)
Maximum Dump Speed	120 mph (104 knots)

C. G. Range

(+22.5) to (+27.5) without Elevator Down Spring, P/N 19661-1
(+22.5) to (+29.0) with P/N 19661-1 installed.

Maximum Weight

6,000 lbs.

Maximum Operating Altitude

12,000 feet

Number of Seats

1 (+89) (See NOTE 15 for one-place configuration.)
1 (+127)

Maximum Cargo Load

Passenger/cargo compartment 200 lbs. maximum. See NOTE 15 for one-place configuration.
Maximum hopper load, 4,000 lbs. (+29.9).

Fuel Capacity

228 gallons usable, one 115 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel.

Oil Tank Capacity

11 quarts - usable oil tank capacity 6 quarts.

Control Surface Movements (See Note 15 for one-place configuration)	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $8^{\circ} \pm 1^{\circ}$	Down $22^{\circ} \pm 1^{\circ}$
	Rudder	Left $24^{\circ} \pm 1^{\circ}$	Right $24^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps		Down $15^{\circ} \pm 1^{\circ}$

Serial Numbers Eligible

T45-001DC and subsequent

Required Equipment

The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved July 20, 1990, or later approved version.

Agricultural Dispersal Equipment

See NOTE 17 for dispersal systems.

XII-Model S2R-G6, 1 PCLM (Restricted Category Only)*, Approved March 5, 1992

*See Note under certification basis for approved special purpose operations. See Note 8 for two-place configuration. See Note 22 for life limited parts.

Engine Honeywell (Garrett) TPE331-6

Fuel See Airplane Flight Manual

Oil MIL-L-23699B

Engine Limits

	Takeoff (5 min.)	Max. Continuous	Ground Idle	Starting
SHP	750	715		
Torque (%)	100	95		
ITT (°C)	923	923		1,149 max.
RPM (%)*	100	100	65 to 85	
Oil Press (PSIG)	70 to 120	70 to 120	40 to 120	
Oil Temp (°C)	55 to 127	55 to 127	-40 to 127	-40 to 127

* Avoid operation between 18 and 28 percent RPM, except for transient during start and shutdown.

Propeller and Propeller Limits Hartzell propeller, Hub Model HCB3TN-5M, Blade Model T10282N+4.
(See Note 24 for pitch limits) Diameter 106.0 inches maximum, 102.0 inches minimum.

Airspeed Limits (CAS)	Vne (Never Exceed)	159 mph (138 knots)
	Vp (Maneuvering)	126 mph (109 knots)
	Vno (Max. Structural Cruising)	126 mph (109 knots)
	Vfe (Flap Extended)	123 mph (107 knots)
	Maximum Dump Speed	120 mph (104 knots)

C. G. Range (+26.5) to (+30.0) at 6,000 lbs.
(+24.0) to (+30.0) at 4,000 lbs.
Straight line variation in the forward limit between 4,000 lbs. and 6,000 lbs.

Maximum Weight 6,000 lbs.

Maximum Operating Altitude 12,000 feet

Number of Seats 1 (+89) (See NOTE 8 for two-place configuration)

Maximum Cargo Load Maximum baggage compartment 60 lbs. See NOTE 8 for two-place configuration.
Maximum hopper load, 4,000 lbs. (+29.9).

Fuel Capacity 228 gallons usable, one 115 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel.

Oil Tank Capacity 8 quarts - usable oil tank capacity 7 quarts.

Control Surface Movements	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $8^{\circ} \pm 1^{\circ}$	Down $22^{\circ} \pm 1^{\circ}$
	Rudder	Left $19^{\circ} \pm 1^{\circ}$	Right $19^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps		Down $15^{\circ} \pm 1^{\circ}$

Serial Numbers Eligible G6-101 and subsequent

Required Equipment The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved March 5, 1992, or later approved version.

Agricultural Dispersal Equipment See NOTE 17 for dispersal systems.

XIII-Model S2R-G10, 1 PCLM (Restricted Category Only)*, Approved January 12, 1993

*See Note under certification basis for approved special purpose operations. See Note 8 for two-place configuration. See Note 22 for life limited parts.

Engine Honeywell (Garrett) TPE331-10

Fuel See Airplane Flight Manual

Oil MIL-L-23699B

Engine Limits

	Takeoff (5 min.)	Max. Continuous	Ground Idle	Starting
SHP	900	900		
Torque (%)	100	100		
EGT (°C)	**	**	**	770 max.
RPM (%)*	100	100	72 to 85	
Oil Press (PSIG)	70 to 120	70 to 120	40 to 120	
Oil Temp (°C)	55 to 127	55 to 110	-40 to 110	-40 to 110

*Avoid operation between 18 and 28 percent RPM, except for transient during start and shutdown.

**EGT Limits: 600°C EGT at 45°C OAT and 540°C EGT at -15°C OAT, straight line variation in between.

Propeller and Propeller Limits McCauley Hub Model 4HFR34C653-[X], Blade Model [X]-L106FA-0.
(See Note 24 for pitch limits) Diameter 106.0 inches maximum, 105.0 inches minimum.

McCauley Hub Model 4HFR34C662-[X], Blade Model [X]-L108FA-0.
Diameter 108.0 inches maximum, 105.0 inches minimum.

Hartzell Model HC-B4TN-5NL, Blade Model LT10890N.
Diameter 109.5 inches maximum, 107.5 inches minimum.

Airspeed Limits (CAS)

Vne (Never Exceed)	159 mph (138 knots)
Vp (Maneuvering)	126 mph (109 knots)
Vno (Max. Structural Cruising)	126 mph (109 knots)
Vfe (Flap Extended)	123 mph (107 knots)
Maximum Dump Speed	120 mph (104 knots)

C. G. Range (+26.5) to (+30.0) at 6,000 lbs.
(+24.0) to (+30.0) at 4,000 lbs.
Straight line variation in the forward limit between 4,000 lbs. and 6,000 lbs.

Maximum Weight 6,000 lbs.

Maximum Operating Altitude 12,000 feet

Number of Seats 1 (+89) (See NOTE 8 for two-place configuration)

Maximum Cargo Load	Maximum baggage compartment 60 lbs. See NOTE 8 for two-place configuration. Maximum hopper load, 4,000 lbs. (+29.9).		
Fuel Capacity	228 gallons usable, one 115 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel.		
Oil Tank Capacity	8 quarts - usable oil tank capacity 7 quarts.		
Control Surface Movements	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $8^{\circ} \pm 1^{\circ}$	Down $22^{\circ} \pm 1^{\circ}$
	Rudder	Left $19^{\circ} \pm 1^{\circ}$	Right $19^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps		Down $15^{\circ} \pm 1^{\circ}$
Serial Numbers Eligible	G10-101 and subsequent		
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved January 12, 1993, or later approved version. For serial number G10-169 and subsequent, Thrush Airplane Flight Manual dated March 25, 2000, or later approved version.		
Agricultural Dispersal Equipment	See NOTE 17 for dispersal systems.		

XIV-Model S2R-G5, 1 PCLM (Restricted Category Only)*, Approved August 20, 1993

*See Note under certification basis for approved special purpose operations. Also see Note 8 for two-place configuration. See Note 22 for life limited parts.

Engine	Honeywell (Garrett) TPE331-5			
Fuel	See Airplane Flight Manual			
Oil	MIL-L-23699B			
Engine Limits		<u>Takeoff (5 min.)</u>	<u>Max.Continuous</u>	<u>Ground Idle</u>
	SHP	750	715	
	Torque (%)	100	95	
	ITT (°C)	923	923	1,149 max.
	RPM (%)*	100	100	72 to 85
	Oil Press (PSIG)	70 to 120	70 to 120	40 to 120
	Oil Temp (°C)	55 to 127	55 to 110	-40 to 110

* Avoid operation between 18 and 28 percent RPM, except for transient during start and shutdown.

Propeller and Propeller Limits (See Note 24 for pitch limits)	McCauley Hub Model 4HFR34C653-[X], Blade Model [X]-L106FA-0. Diameter 106.0 inches maximum, 105.0 inches minimum.
	McCauley Hub Model 4HFR34C662-[X], Blade Model [X]-L108FA-0. Diameter 108.0 inches maximum, 105.0 inches minimum.
	Hartzell Model HC-B4TN-5NL, Blade Model LT10890N. Diameter 109.5 inches maximum, 107.5 inches minimum.

Airspeed Limits (CAS)	Vne (Never Exceed)	159 mph (138 knots)
	Vp (Maneuvering)	126 mph (109 knots)
	Vno (Max. Structural Cruising)	126 mph (109 knots)
	Vfe (Flap Extended)	123 mph (107 knots)
	Maximum Dump Speed	120 mph (104 knots)
C. G. Range	(+26.5) to (+30.0) at 6,000 lbs. (+24.0) to (+30.0) at 4,000 lbs. Straight line variation in the forward limit between 4,000 lbs. and 6,000 lbs.	
Maximum Weight	6,000 lbs.	
Maximum Operating Altitude	12,000 feet	
Number of Seats	1 (+89) (See NOTE 8 for two-place configuration)	
Maximum Cargo Load	Maximum baggage compartment 60 lbs. See NOTE 8 for two-place configuration. Maximum hopper load, 4,000 lbs. (+29.9).	
Fuel Capacity	228 gallons usable, one 115 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel.	
Oil Tank Capacity	8 quarts - usable oil tank capacity 7 quarts.	
Control Surface Movements	Elevator Up $27^{\circ} \pm 1^{\circ}$ Down $17^{\circ} \pm 1^{\circ}$ Elevator Tab Up $8^{\circ} \pm 1^{\circ}$ Down $22^{\circ} \pm 1^{\circ}$ Rudder Left $19^{\circ} \pm 1^{\circ}$ Right $19^{\circ} \pm 1^{\circ}$ Aileron Up $21^{\circ} \pm 1^{\circ}$ Down $17^{\circ} \pm 1^{\circ}$ Flaps Down $15^{\circ} \pm 1^{\circ}$	
Serial Numbers Eligible	G5-101 and subsequent	
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved August 20, 1993, or later approved version.	
Agricultural Dispersal Equipment	See NOTE 17 for dispersal systems.	

XV-Model S2R-G1, 1PCLM (Restricted Category Only*), Approved August 29, 1995.

*See Note under certification basis for approved special purpose operations. See Note 22 for life limited parts.

Engine	Honeywell (Garrett) TPE331-1				
Fuel	See Airplane Flight Manual				
Engine Limits					
	<u>Takeoff (5 min)</u>	<u>Max. Continuous</u>	<u>Ground Idle</u>	<u>Starting</u>	
SHP	665	665			
Torque (%)	100	100			
EGT (°C)	**	**	**		
RPM (%)*	100	100	65 to 85		
Oil Pressure (PSIG)	70 - 130	70 - 120	40 - 120		
Oil Temp (°C)	55 - 127	55 - 110	-40 to 110	-40 to 110	

* Avoid operation between 18 and 28 percent RPM except for transient during start and shutdown.

** EGT Limits: 600°C EGT at 120°F OAT and 520°C EGT at 0°F OAT, straight line variation between.

Propeller and Propeller Limits (See Note 24 for pitch limits)	Hartzell Hub Model HCB3TN-5M, Blade Model T10282N+4. Diameter 106.0 inches maximum, 102.0 inches minimum.		
Airspeed Limits (CAS)	V _{NE} (Never Exceed)	159 mph (138 knots)	
	V _a (Maneuvering)	126 mph (109 knots)	
	V _{no} (Max. Structural Cruising)	126 mph (109 knots)	
	V _{re} (Flap Extended)	123 mph (107 knots)	
	Maximum Dump Speed	120 mph (104 knots)	
C.G. Range	(+26.5) to (+30.0) at 6,000 lbs. (+24.0) to (+30.0) at 4,000 lbs. Straight line variation in the forward limit between 4,000 lbs. and 6,000 lbs.		
Maximum Weight	6,000 lbs.		
Maximum Operating Altitude	12,000 feet		
Number of Seats	1 (+89)		
Maximum Cargo Load	See weight and balance data. Maximum baggage compartment, 60.0 lbs. Maximum hopper load, 4,000 lbs. (+29.9).		
Fuel Capacity	104 gallons usable (one 53 gallon tank in each wing, tanks interconnected). 140 gallons usable (one 69 gallon tank in each wing, tanks interconnected). See NOTE 1 for data on unusable fuel.		
Oil Tank Capacity	8 quarts - usable oil tank capacity 7 quarts.		
Control Surface Movements	Elevator	Up 27° ± 1°	Down 17° ± 1°
	Elevator Tab	Up 8° ± 1°	Down 22° ± 1°
	Rudder	Left 19° ± 1°	Right 19° ± 1°
	Aileron	Up 21° ± 1°	Down 17° ± 1°
	Flaps		Down 17° ± 1°
Serial Numbers Eligible	G1-101 and subsequent.		
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulation (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved August 29, 1995, or later approved revision.		
Agricultural Dispersal Equipment	See NOTE 17 for dispersal systems.		
<u>XVI-Model S2RHG-T34, 2 PCLM (Restricted Category Only)*, Approved November 5, 1997</u>			
*See Note under Certification Basis for approved special purpose operations. See Note 15 for one-place configuration. See Note 22 for life limited parts.			
Engine	Pratt & Whitney (United Aircraft of) Canada PT6A-34AG Alternate Engines: Pratt & Whitney Canada PT6A-34 (See NOTE 12 for information) Pratt & Whitney Canada PT6A-36 (Dry Configuration Only) Pratt & Whitney Canada PT6A-41, PT6A-41AG, and PT6A-42 (See NOTE 14 for information)		

Fuel Jet A, Jet B, JP-4, JP-5, Automotive Diesel Number 1D or 2D in accordance with UACL Service Bulletin Number 1344. (If jet fuel is not available, aviation gasoline, MIL-G-5572, all grades, may be used for a maximum of 150 hours between overhauls.) Automotive diesel fuel is approved only for agricultural application flights and only when the free air temperature is above:
+20°F for Grade No. 1D
+40°F for Grade No. 2D

Oil UACL PT6 Engine Service Bulletin Number 1001 lists approved brands of oil.

Engine Limits PT6A-34AG/-34/-36:

	<u>Takeoff and Max. Cont.</u>	<u>Transient Start/Accel.</u>	<u>Reverse</u>	<u>Idle</u>
SHP	750			
Torque(PSI)(2sec)	64.5	68.4 Trans	64.5	
ITT (°C)	790	1,090 Start (2 sec.)	790	
Ng (%)	101.6	102.6 Trans (2 sec.)	101.6	
Np (RPM)	2,200	2,420 Trans (2 sec.)	2,100	
Oil Press(PSIG)	85 to 105	85 to 100	85 to 105	40 min.
Oil Temp (°C)	10 to 99	-40 min.	0 to 99	-40 to 99

The ratings shown are based on the static sea level standard condition with no external accessory loads and no air bleed.

Propeller and Propeller Limits (See Note 24 for pitch limits) Hartzell Hub Model HC-B3TN-3C (or HC-B3TN-3D) with Blade Model T-10282, Diameter 102.5 inches maximum, 92.5 inches minimum or alternate Blade Model T-10282N+4, Diameter 106 inches maximum, 98 inches minimum.

Certification Basis

- (1) 14 CFR Part 21.25(a)(1)
- (2) CAR 3, effective May 15, 1956, including Amendments 3-1 through 3-8 as modified by CAR 8.10(a)(1) effective October 11, 1950, except the following paragraphs (allowed under § 21.25(a)(1)):
CAR 3.83
CAR 3.780(a)(3)
CAR 3.780(a)(4)
- (3) Part 23, effective February 1, 1965, Amendments 23-1 through 23-34, only applicable to Subpart C, and other Part 23 sections listed below.
- (4) Part 23, effective February 1, 1965, only as applicable to turboprop engine installations and listed by Part 23 section below.
(The Part 23 amendment level is shown in parentheses.)

23.49(e)(2)(-21)	23.907(0)	23.1041(-7)	23.1183(-15)
23.65(c)(-21)	23.929(-14)	23.1043(-7)	23.1303(0)
23.75(b)(-7)	23.933(-7)	23.1045(-7)	23.1305(-15)
23.77(b)(-21)	23.937(-7)	23.1091(-7)	23.1323(-7)
23.173(-14)	23.951(-15)	23.1093(-15)	23.1337(-7)
23.175(-14)	23.955(-7)	23.1103(-7)	23.1353(-20)
23.177(0)	23.959(-7)	23.1105(0)	23.1521(0)
23.371(-7)	23.977(-17)	23.1111(-7)	23.1527(-7)
23.572(a)(1)(-34)	23.991(-7)	23.1121(-7)	23.1529(-8)
23.629(e)(-31)	23.997(-15)	23.1141(-14)	23.1545(-7)
23.831(0)	23.1013(-15)	23.1143(-7)	23.1549(-17)
23.901(-7)	23.1015(-15)	23.1145(-18)	23.1557(-14)
23.903(-14)	23.1019(-15)	23.1155(-7)	23.1583(-10)
23.905(0)	23.1027(-14)	23.1165(0)	23.1587(a)(-7)

Certification Basis (cont'd)	(6) Equivalent Safety Finding to §23.473(b), dated March 15, 1988 for 7,650 pound landing weight and Equivalent Level of Safety Finding No. ACE-04-05 dated July 26, 2004 for 8,800 pound landing weight.		
	(7) The intent of §25.305(c) regarding the dynamic response of the engine mount structure.		
Airspeed Limits (CAS)	Vne (Never Exceed)	190 mph (165 knots)	
	Vp (Maneuvering)	154 mph (134 knots)	
	Vno (Max. Structural Cruising)	162 mph (141 knots)	
	Vfe (Flap Extended)	144 mph (125 knots)	
C. G. Range	Forward limit at 7,600 lbs. and below, +22.5 inches aft of datum. Forward limit at 9,500 lbs., +26.0 inches aft of datum. (Straight line variation in the forward limit between 7,600 and 9,500 lbs.) Aft limit +29.0 inches aft of datum. Datum is the leading edge of the wing.		
Maximum Weight	9,500 lbs.		
Maximum Landing Weight	7,650 lbs. for S/N T34HG-101 and T34HG-102 aircraft equipped with Main Landing Gear p/n 50111-503/-504/-505/-506 8,800 lbs. for S/N T34HG-103 and up equipped with Main Landing Gear p/n 94200		
Minimum Weight	5,000 lbs.		
Maximum Operating Altitude	12,000 feet		
Number of Seats	1 (+89) (See NOTE 15 for one-place configuration.) 1 (+127 forward facing) or (+111 aft facing)		
Maximum Cargo Load	See weight and balance data. Maximum passenger/cargo compartment, 200 lbs. (+120). (See NOTE 15 for one-place configuration) Maximum hopper load, 4,000 lbs. (+29.9).		
Fuel Capacity	228 gallons usable, one 115 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel.		
Oil Tank Capacity	11 quarts - usable oil tank capacity 6 quarts.		
Control Surface Movements	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $8^{\circ} \pm 1^{\circ}$	Down $22^{\circ} \pm 1^{\circ}$
	Rudder	Left $24^{\circ} \pm 1^{\circ}$	Right $24^{\circ} \pm 1^{\circ}$
	S/N T34HG-103 and up:		
		Left $22^{\circ} \pm 1^{\circ}$	Right $22^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps	Down $15^{\circ} \pm 1^{\circ}$	
Serial Numbers Eligible	T34HG-101DC and subsequent		
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved November 5, 1997, or later approved versions. For S/N T34HG-103 and up, Thrush Aircraft, Inc. Airplane Flight Manual dated April 16, 2004, or later FAA approved revision, is required.		

Agricultural Dispersal Equipment See NOTE 17 for dispersal systems.
 CAUTION: For operation with the Micronair Spray Equipment System or the Fire Bomber System, or with any system when an Agavenco pump is installed, the placards for airspeed limitations referred to in NOTE 2(q), 2(o), or 2(p), respectively, for the S2R are applicable.

XVII-Model S2R-T660, 1 PCLM (Restricted Category Only)*, Approved March 13, 2000

*See Note under Certification Basis for approved special purpose operations, Note 27 for patrolling, and Note 8 for two-place configuration.

Engine Pratt & Whitney Canada PT6A-60AG
 (See Note 8 for two-place) Alternate Engines: Pratt & Whitney Canada PT6A-65AG, -65AR, -65B
 (See Note 27 for patrolling) (-65AR must have automatic power reserve feature disabled)
 Pratt & Whitney Canada PT6A-45A, -45B, -45R eligible on S/N T660-108 and up
 Pratt & Whitney Canada PT6A-67AG eligible on S/N T660-109 and up

Fuel Jet A, Jet B, JP-4, JP-5, Automotive Diesel Number 1D or 2D in accordance with P&WC Specifications CPW 204, CPW 46, CPW 381, and Service Bulletin 13244. (If jet fuel is not available, aviation gasoline, MIL-G-5572, all grades, may be used for a maximum of 150 hours between overhauls.) Automotive diesel fuel is approved only for agricultural application flights and only when the free air temperature is above:
 +20°F for Grade No. 1D
 +40°F for Grade No. 2D

Oil UACL PT6 Engine Service Bulletin Number 1001, 3001, 4001, 11001, 12002 and 13001 lists approved brands of engine oil.

Engine Limits

<u>PT6A-60AG:</u>		<u>Max.</u>	<u>Transient*</u>			
	<u>Takeoff</u>	<u>Cont.</u>	<u>Start</u>	<u>Accel.</u>	<u>Reverse</u>	<u>Idle</u>
SHP	1,050	1,020			900	
Torque (PSI)**	38.8	37.7		61		
ITT (°C)	820	775	1,000	850	760	750
Ng (%)	104	104	104	104		58
Np (RPM)	1,700	1,700		1,870	1,650	
Oil Press (PSIG)	90 to 135	90 to 135	0 to 200	40 to 200	90 to 135	60 Minimum
Oil Temp (°C)	0 to 110	0 to 110	-40 Min.	0 to 110	0 to 99	-40 to 110

*Transient engine limits are 5 seconds for starting and 20 seconds for acceleration.

**The Torque pressure limits listed are for NP=1,700 RPM only.

<u>PT6A-45A/-45B/-45R:</u>		<u>Max.</u>	<u>Transient*</u>			
	<u>Takeoff</u>	<u>Cont.</u>	<u>Start</u>	<u>Accel.</u>	<u>Reverse</u>	<u>Idle</u>
SHP	1,050	1,020			900	
Torque (PSI)**	38.8	37.7				
ITT (°C)	800	765	1,000	850	760	750
Ng (%)	104	104		104		56
Np (RPM)	1,700	1,700		1,870	1,650	
Oil Press (PSIG)	90 to 135	90 to 135	0 to 200	40 to 200	90 to 135	60 min.
Oil Temp (°C)	10 to 99	10 to 99	-40 min.	10 to 99	0 to 99	-40 to 99

Engine Limits (cont'd)

<u>PT6A-67AG:</u>	<u>Transient*</u>					
	<u>Takeoff</u>	<u>Max.Cont.</u>	<u>Start</u>	<u>Accel.</u>	<u>Reverse</u>	<u>Idle</u>
SHP	1,300	1220			900	
Torque (PSI)**	48.0	45.1		61		
ITT (°C)	800	800	1,000	850	760	750
Ng (%)	104	104	104	104		51
Np (RPM)	1,700	1,700		1,870	1,650	
Oil Press (PSIG)	90 to 135	90 to 135	0 to 200	40 to 200	90 to 135	60 min.
Oil Temp (°C)	0 to 110	0 to 110	-40 min.	0 to 110	10 to 105	-40 to 110

*Transient engine limits are 5 seconds for starting and 20 seconds for acceleration.

**The Torque pressure limits listed are for NP=1,700 RPM only.

<u>PT6A-65AG/-65AR/-65B:</u>	<u>Transient*</u>					
	<u>Takeoff</u>	<u>Max.Cont.</u>	<u>Start</u>	<u>Accel.</u>	<u>Reverse</u>	<u>Idle</u>
SHP	1,300 [†]	1,220 [†]			900	
Torque (PSI)**	48.0	45.1		61*		
ITT (°C)	810	810	1,000*	850*	760	750 ^{††}
Ng (%)	104	104		104		56
Np (RPM)	1,700	1,700		1,870	1,650	
Oil Press (PSIG)	90 to 135	90 to 135	0 to 200	40 to 200	90 to 135	60 min.
Oil Temp (°C)	0 to 110 ^{†††}	0 to 110 ^{†††}	-40 min.	-40 to 110	0 to 110 [†]	-40 to 110

*Transient engine limits are 5 seconds for starting and 20 seconds for acceleration.

**The Torque pressure limits listed are for NP=1,700 RPM only.

[†] For PT6A-65B 1100 SHP Take off & Max. Continuous, Torque 43.34 psi Takeoff & max continuous, ITT 820°C Take off; 0 to 99 (°C) Oil Temp Maximum Reverse. For PT6A-65AR ITT 810°C Take off, 810°C Max continuous, 10 to 105 (°C) Oil Temp Maximum Reverse.

^{††} For PT6A-65B 700°C, For PT6A-65AR 715°C.

^{†††} For PT6-65AR 10 to 110.

Propeller and Propeller Limits
(See Note 27 for Patrolling)

For PT6A-60AG/-45/-45A/-45B/-45R:

Hartzell HC-B5MP-3C propeller, constant speed, feathering and reversing;
Hub Model HC-B5MP-3C with Blade Model M10876ANS or M10876AS
Diameter 111.2 inches maximum, 110.7 inches minimum.
Pitch (42 in. Sta.) 16.5° low, 79.0° feather, -11.0° reverse

For PT6A-67AG:

Hartzell HC-B5MA-3D propeller, constant speed, feathering and reversing;
Hub Model HC-B5MA-3D with Blade Model M11276NS
Diameter 115.2 inches maximum, 114.7 inches minimum.
Pitch (42 in. Sta.) 13.9° low, 83.1° feather, -10.0° reverse

For PT6A-65AG/-65AR/-65B:

Hartzell HC-B5MP-3F propeller, constant speed, feathering and reversing;
Hub Model HC-B5MP-3F with Blade Model M11276NS
Diameter 115.2 inches maximum, 114.7 inches minimum.
Pitch (42 in. Sta.) 13.9° low, 83.1° feather, -10.0° reverse

Certification Basis (See Note 27 for patrolling)	(1) 14CFR Part 21.25(a)(1)		
	(2) 14CFR Part 23 - Subpart A, Amendment 23-53; Subpart B, Amendment 23-53; Subpart C, Amendment 23-53 (with A23.9(c)(3) used to calculate aileron deflections for use with 23.349(b)), but §§23.423, 23.425, 23.427, 23.441, and 23.443 are at Amendment 23-34 with Appendix B used; Subpart D, Amendment 23-53; but §23.607 is at Amendment 23-34, §23.629 is at Amendment 23-31, §§23.785, 23.787, 23.807, 23.853, 23.865 and 23.867 are at Amendment 23-14; and §23.863 is at Amendment 23-23; Subpart E, Amendment 23-14; Subpart F, Amendment 23-0; Subpart G, Amendment 23-53; except those regulations found inappropriate for restricted category agricultural airplanes as listed in FAA Advisory Circular 21.25-1, dated December 1, 1997, and compliance with regulations listed in FAA policy memorandum ACE-110_19971201, dated December 1, 1997, was demonstrated in accordance with that memorandum. (See NOTE 23 for basis above 12,500 lbs. and NOTE 27 for patrolling basis)		
Airspeed Limits (CAS)	Vne (Never Exceed)	219 mph (191 knots)	
	V _A (Maneuvering)	160 mph (140 knots)	
	V _{no} (Max. Structural Cruising)	206 mph (180 knots)	
	V _{fe} (Flap Extended)	143 mph (126 knots)	
	(See NOTE 23 and Airplane Flight Manual for decreased airspeeds at 14,150 lbs.)		
C. G. Range	Forward Limit at 12,500 lbs. is 24 inches aft of datum with straight line variation to 8,000 lbs. at 27 inches aft of datum. Forward Limit below 8,000 pounds is 27 inches aft of datum. Aft Limit at 12,500 lbs. is 27 inches aft of datum with straight line variation to 8,000 lbs. at 30 inches aft of datum. Aft Limit below 8,000 lbs. is +30.0 inches aft of datum. Datum is the leading edge of the wing.		
Maximum Takeoff Weight	12,500 lbs. (See NOTE 23 for limitations at 14,150 lbs.) (See NOTE 27 for patrolling)		
Maximum Landing Weight	12,500 lbs.		
Minimum Weight	6,100 lbs.		
Maximum Operating Altitude	12,000 feet		
Number of Seats	1 (+89) (See NOTE 8 for two-place configuration and NOTE 27 for patrolling)		
Maximum Cargo Load	See weight and balance data. Maximum baggage compartment load is 200 lbs.(+112). Maximum hopper load, 5,500 lbs.(+20.6).		
Fuel Capacity	225.6 gallons usable, one 115 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel.		
Oil Tank Capacity	10 U.S. quarts - usable oil tank capacity 6 quarts.		
Control Surface Movements (See Note 8 for two-place)	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $8^{\circ} \pm 1^{\circ}$	Down $22^{\circ} \pm 1^{\circ}$
	Rudder	Left $19^{\circ} \pm 1^{\circ}$	Right $19^{\circ} \pm 1^{\circ}$
	S/N T660-109 and up:		
		Left $22^{\circ} \pm 1^{\circ}$	Right $22^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps	Down $15^{\circ} \pm 1^{\circ}$	

Serial Numbers Eligible	T660-101 and subsequent. See NOTE 8 for two-place and NOTE 27 for patrolling.																							
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Ayres Corporation Airplane Flight Manual approved March 13, 2000, or later approved revision. For S/N T660-109 and up, Thrush Aircraft, Inc. Airplane Flight Manual dated March 5, 2004, or later FAA approved revision, is required. (See NOTE 23 for operation at 14,150 lbs.) See NOTE 8 for two-place Airplane Flight Manual and NOTE 27 for patrolling.																							
Agricultural Dispersal Equipment	Standard Spray System, Ayres Dwg. No. 95340 Spreader Installation, Ayres Dwg. No. 95370 Transland Hydraulic Fire Door Installation, Ayres Dwg. No. 95385																							
Structural Limitations	The following parts must be replaced at the times in service indicated: (See NOTE 23 for life limits if ever operated between 12,500 lbs. and 14,150 lbs.) <table><tr><td><u>Part Name</u></td><td><u>Part Number</u></td><td><u>Life Limit</u></td></tr><tr><td>Rear Spar Doubler, Lower</td><td>95627-3</td><td>20,000</td></tr><tr><td>Rear Spar, Inboard, L&R</td><td>95623-1/-2</td><td>20,000</td></tr><tr><td>Aft Main Spar Lug, L&R</td><td>95605-1/-2</td><td>21,750</td></tr><tr><td>Forward Main Spar Lug, L&R</td><td>95606-1/-2</td><td>20,000</td></tr><tr><td>Spar Cap Assy, L&R</td><td>95603-1/-2</td><td>26,625</td></tr><tr><td>Steel Doubler Plate</td><td>95614-1</td><td>38,400</td></tr></table>			<u>Part Name</u>	<u>Part Number</u>	<u>Life Limit</u>	Rear Spar Doubler, Lower	95627-3	20,000	Rear Spar, Inboard, L&R	95623-1/-2	20,000	Aft Main Spar Lug, L&R	95605-1/-2	21,750	Forward Main Spar Lug, L&R	95606-1/-2	20,000	Spar Cap Assy, L&R	95603-1/-2	26,625	Steel Doubler Plate	95614-1	38,400
<u>Part Name</u>	<u>Part Number</u>	<u>Life Limit</u>																						
Rear Spar Doubler, Lower	95627-3	20,000																						
Rear Spar, Inboard, L&R	95623-1/-2	20,000																						
Aft Main Spar Lug, L&R	95605-1/-2	21,750																						
Forward Main Spar Lug, L&R	95606-1/-2	20,000																						
Spar Cap Assy, L&R	95603-1/-2	26,625																						
Steel Doubler Plate	95614-1	38,400																						

XVIII-Model S2R-H80, 1 PCLM (Restricted Category Only)*, Approved October 9, 2012

*See Note under Certification Basis for approved special purpose operations. See Note 8 for two-place configuration.

Engine	GE Aviation Czech H80-100
Fuel	Jet A per ASTM D1655 Jet A-1 per ASTM D1655 or DEF STAN 91-91 NATO F-35 (formerly DERD 2494)
Oil	Aero Shell Turbine Oil 500 per MIL-L-23699C Aero Shell Turbine Oil 560 per MIL-L-23699C Mobile Jet Oil II per MIL-L-23699C Synthetic oil B3V per TJU 38 101295 85 BPTO 2380 Castrol 599 Royco Turbine Oil Oil purity should be maximum grade 8 in accordance with NAS 1638 standard or maximum grade 11 in accordance with GHOST 17216-71 standard.

Engine Limits

<u>H80-100:</u>	<u>Takeoff</u>	<u>Max.Cont.</u>	<u>Start</u>	<u>Transient*</u>	<u>Reverse</u>	<u>Idle</u>
	<u>(5 min. limit)</u>			<u>Accel.</u>		
SHP	800	800				
Torque (%)	100	100		106*		
ITT (°C)	780	750	730	780	710	550
Ng (%)	101.5	100.1		102.5*	96	57-60
Np (RPM)	2080	2080		2140*	1900	
Oil Press (PSIG)	26 to 39	26 to 39	26 to 39	26 to 39	26 to 39	18 min.
Oil Temp (°C)	20 to 85	20 to 85	-20 to 85	20 to 85	20 to 85	20 to 85

*Short term overshoot

Propeller and Propeller Limits	Hartzell HC-B4TW-3 propeller, constant speed, feathering and reversing with Hub Model HC-B4TW-3, Spinner C-3425(P), and: With Blade Model T10282N or T10282NS – Diameter 103 inches maximum, 102 inches minimum, or With Blade Model T10702N – Diameter 108 inches maximum, 107 inches minimum. Pitch (42 in. Sta.) $11.5^{\circ} \pm 0.2^{\circ}$ low, $82.0^{\circ} \pm 0.5^{\circ}$ feather, $-15.0^{\circ} \pm 0.5^{\circ}$ reverse. Stabilized ground operation is prohibited between 400 & 1100 RPM. Propeller may be operated when feathered at or below 400 RPM.		
Airspeed Limits (IAS)	Vne (Never Exceed)	186 mph (162 knots)	
	V _A (Maneuvering)	158 mph (137 knots)	
	Vno (Max. Structural Cruising)	165 mph (143 knots)	
	Vfe (Flap Extended)	157 mph (136 knots)	
C. G. Range	Forward Limit at 10,500 lbs. is 28.0 inches aft of datum with straight line variation to 6,000 lbs. at 25 inches aft of datum. Forward Limit below 6,000 pounds is 25 inches aft of datum. Aft Limit at 10,500 lbs. is 30.5 inches aft of datum with straight line variation to 7,600 lbs. at 31 inches aft of datum. Aft Limit below 7,600 lbs. is +31.0 inches aft of datum. Datum is the leading edge of the wing.		
Maximum Takeoff Weight	10,500 lbs.		
Maximum Landing Weight	7,600 lbs.		
Minimum Weight	4,500 lbs.		
Maximum Operating Altitude	12,000 feet		
Number of Seats	1 (+89) (See NOTE 8 for two-place configuration)		
Maximum Cargo Load (See Note 8 for two-place)	See weight and balance data. Maximum nose baggage compartment load is 100 lbs.(-14.0). Maximum hopper load is 4,000 lbs.(+29.9).		
Fuel Capacity	228 gallons usable, one 115 gallon tank in each wing, tanks interconnected. See NOTE 1 for data on unusable fuel.		
Oil Tank Capacity	11.6 U.S. quarts - usable oil tank capacity 7.4 quarts.		
Control Surface Movements	Elevator	Up $27^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Elevator Tab	Up $8^{\circ} \pm 1^{\circ}$	Down $22^{\circ} \pm 1^{\circ}$
	Rudder	Left $24^{\circ} \pm 1^{\circ}$	Right $24^{\circ} \pm 1^{\circ}$
	Aileron	Up $21^{\circ} \pm 1^{\circ}$	Down $17^{\circ} \pm 1^{\circ}$
	Flaps		Down $15^{\circ} \pm 1^{\circ}$
Serial Numbers Eligible	H80-101 and subsequent, (See NOTE 8 for two-place)		
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Thrush Aircraft, Inc. Airplane Flight Manual for single place airplanes dated October 9, 2012, or Airplane Flight Manual for single and two- place airplanes dated July 2, 2013, or later approved versions. See NOTE 8 for two-place.		
Agricultural Dispersal Equipment	Standard Spray System, Thrush Dwg. No. 81071		

Structural Limitations

The following parts must be replaced at the times in service indicated:

<u>Part Name</u>	<u>Part Number</u>	<u>Life Limit</u>
Wing Lower Spar Cap Assy, L & R	22507T001/T002	60,000
Wing Lower Spar Splice Block	22508T001/T002	10,000
See Thrush Maintenance Manual H80-1MM airworthiness limitations section.		

Certification Basis

Based on the Model S2R-H80 application date of July 8, 2010, under the provisions of §21.101, the applicable type certification standards for the Model S2R-H80 are as follows:

CAR 8 is not part of the certification basis for the S2R-H80.

1) Airworthiness & Environmental Standards for components and areas not affected by the change:

Some portions of the original certification basis for the Model S2RHG-T65 are retained as follows:

14 CFR 21.25(a)(1)

Civil Air Regulations (CAR) 3, effective May 15, 1956, including Amendments 3-1 through 3-8.

14 CFR Part 23, Subpart C, effective February 1, 1965, Amendments 23-1 through 23-34, only Subpart C regulations.

2) Airworthiness and Environmental Standards for components and areas affected by the change:

14 CFR 21.25(a)(1), 21.101

Civil Air Regulations (CAR) 3, effective May 15, 1956, including Amendments 3-1 through 3-8 unless superseded by a later regulation that is specifically listed in this section 2.

14 CFR Part 23, Subpart C, effective February 1, 1965, Amendments 23-1 through 23-34, only Subpart C regulations.

14 CFR Part 23, Subpart G, effective February 1, 1965, Amendments 23-1 through 23-59, only Subpart G regulations.

14 CFR part 23, effective February 1, 1965, Regulations and Amendments as listed below:

Note: Dash number in parentheses is amendment level

23.33	(-50)	23.905	(-0)	23.1017	(-14)	23.1182	(-14)
23.49	(-50) *	23.907	(-51)	23.1019	(-15)	23.1183	(-51)
23.65(c)	(-21) *	23.929	(-14)	23.1021	(-43)	23.1189(b)	(-43)
23.75	(-7)	23.933	(-39)	23.1027	(-14)	23.1191	(-51)
23.77(b)	(-21)	23.937	(-43)	23.1041	(-7)	23.1303	(-0)
23.147(c)	(-50)	23.939	(-42)	23.1043	(-7) *	23.1305	(-52)
23.173	(-14)	23.943	(-43)	23.1045	(-51)	23.1308	(-57)
23.175	(-14) *	23.951	(-15)	23.1091	(-51)	23.1309	(-49)
23.177	(-0) *	23.954	(-7) *	23.1093	(-51) *	23.1311	(-49)
23.201	(-50)	23.955	(-7)	23.1103	(-43)	23.1321	(-49)
23.203	(-50)	23.959	(-7)	23.1107	(-51)	23.1322	(-43)
23.562	(-50) *	23.961	(-0)	23.1121	(-7)	23.1323	(-7)
23.629(a) -	(-31)	23.977	(-17)	23.1141	(-51)	23.1331	(-43)
(e) only		23.979	(-51)	23.1143	(-51)	23.1337	(-51)
23.831	(-0)	23.991	(-7)	23.1145	(-43)	23.1351	(-49)
23.851	(-45)	23.993	(-43)	23.1155	(-7)	23.1353	(-49)
23.901	(-53)	23.997	(-15)	23.1163	(-42)		
23.903	(-29)	23.1013	(-15)	23.1165	(-34)		
		23.1015	(-15)	23.1181	(-51)		

*Compliance with the regulation was demonstrated in accordance with FAA policy memorandum ACE-110_19971201, dated December 1, 1997.

Unless listed in the table above, compliance with the 14 CFR Part 23 regulations listed in FAA Advisory Circular 21.25-1, dated December 1, 1997, Appendix 1, has not been shown and is not required. The Administrator finds these regulations to be inappropriate for restricted category agricultural airplanes as allowed by 14 CFR 21.25(a)(1).

Equivalent Level of Safety Finding (ELOS) No. ACE-04-05 to 14 CFR 23.473(b), dated July 26, 2004, for a landing weight of 7,600 lbs.

Approved for Day-Night VFR operations only.

Data Pertinent to All Models

Certification Basis	CAR 8 effective October 11, 1950, Restricted Category, except see Certification Basis in Model Sections III, IX, X, XVI, XVII, and XVIII above for Models S2R-T34, S2R-T65, S2RHG-T65, S2RHG-T34, S2R-T660, and S2R-H80.	
	Type certificate A4SW was issued November 1, 1965.	
	All models are approved for the special purpose operations of 21.25(b)(1) Agricultural and 21.25(b)(2) Forest and wildlife conservation for aerial dispensing of liquids for fires. Due to 14 CFR 36.1(a)(2), Models approved after January 1, 1980, which includes the Model S2R-R1340 and all other models certificated after the S2R-R1340, are limited to the special purposes of 21.25(b)(1) Agricultural and 21.25(b)(2) Forest and wildlife conservation for aerial dispensing of liquids for fires unless they are shown to comply with the aircraft noise requirements in 14 CFR Part 36. Only the S2R-T660 model, serial numbers T660-114DC and T660-132DCP up, has been shown to comply with the noise requirements in 14 CFR Part 36 and is approved for the special purpose of 21.25(b)(4) Patrolling when the airplane is configured for Patrolling per NOTE 27.	
Production Basis	Production Certificate Number 5SO.	
Export Eligibility	Aircraft will be eligible for issuance of an Export Certificate of Airworthiness subject to compliance with Federal Aviation Regulations Part 21, Subpart L, Sections 21.321 through 21.339. Special requirements of specific foreign countries are contained in Advisory Circular 21-2. Note: Restricted category aircraft may not be operated in a foreign country without the express written approval of that country. These aircraft have not been shown to meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 of the Convention on International Civil Aviation.	
Datum	Wing leading edge.	
Leveling Means	Lower longeron below cockpit.	
Number of Passengers	None	
Empty Weight C.G. Range	None	
NOTE 1:	Current weight and balance report including list of equipment included in certificated empty weight, and loading instructions when necessary, must be provided for each aircraft at the time of original certification. The empty weight and corresponding center of gravity location must include the following unusable fuel:	
	Model 600 S-2D, all serial numbers	54 lbs. at (+38.5)
	Model S2R, S/N 1380R	24 lbs. at (+38.5)
	Model S2R, S/N 1416R and 1418R	36 lbs. at (+38.5)
	Model S2R, S/N 1419R thru 1499R, 1501R thru 1510R	48 lbs. at (+38.5)
	Model S2R, S/N 1500R, 1511R thru 4999R, 5000R and subsequent	18 lbs. at (+38.5)
	Models S2R-T34, S2R-T15, S2R-T65, S2RHG-T65, S2R-R3S, S2R-T11, S2R-R1340, S2R-R1820, S2R-T45, S2R-G6, S2R-G10, S2R-G5, S2R-G1, S2RHG-T34, and S2R-H80 all serial numbers	18 lbs. at (+38.5)
	Model S2R-T660, all serial numbers	30 lbs. at (+38.5)

NOTE 2: The following information on placards pertaining to flight and operating instructions and limitations must be displayed in full view of the pilot:

- (a) "Restricted"
- (b) "This airplane must be operated as a restricted category airplane in accordance with the operating limitations stated in the form of placards and the Airplane Flight Manual."
- (c) "No acrobatic maneuvers including spins approved."
- (d) (1) Model 600 S-2D: "The operation of this airplane is limited to day VFR conditions.
Flight into known icing conditions prohibited."
Model 600 S-2D is eligible for day and night VFR conditions if approved light system, Snow Dwg. No. 90119 and 90132, is installed, in which case placard under NOTE 2(d)(2) applies.
(2) Model S2R: "The operation of this airplane is limited to day and night VFR conditions.
Flight into known icing conditions prohibited."
- (e) 600 S-2D and S2R only: "Design Maneuvering Speed: 126 mph
Maximum Crosswind Velocity: 15 mph"
"Maximum flap-down speed: 123 mph" (S2R only)
- (f) 600 S-2D and S2R only: "Avoid continuous ground operation between 1,280 and 1,900 R.P.M."
- (g) Adjacent to stall warning switch when dry battery stall warning system is installed (S/N 1311D thru 1415D, S/N 1380R, 1416R thru 1440R):
"Stall warning switch must be on in flight. Change battery every four months to dated Eveready 6V No. 1461. Mark date battery changed on battery."
- (h) Adjacent to stall warning switch when 12 or 24 volt electrical system installed (S/N 1311D thru 1415D, S/N 1380R, 1416R thru 1440R):
"Stall warning system is inoperative with generator and battery switches off."
- (i) When stall warning system is installed (S/N 1311D thru 1415D, S/N 1380R, 1416R thru 1440R):
"Stall warning light -- test light daily before flight by moving lift indicator until light comes on."
- (j) When canopy is installed: "No smoking"
- (k) Park brake: "On, depress pedals and pull lever. Off, depress pedals"
- (l) When locking tail wheel is installed: "Push stick forward to unlock tail wheel."
- (m) Usable tank capacity (See "Fuel Capacity")
- (n) 600 S-2D Only - when Snow Spreader, Dwg. No. 80188, or Small Swathmaster, Dwg. No. 80187, is installed:
"When the Snow Spreader or Small Swathmaster dispersal systems are installed, the following airspeed limitations must be observed:
Maximum Maneuvering Speed 111 mph CAS
Never Exceed Speed 140 mph"

- (o) S2R Only - when the Fire Bomber System, Dwg. No. 80792 for S/N 1416R thru 1576R or Dwg. No. 81069 for S/N 1577R and subsequent, is installed the following airspeed limitations must be observed:
 "With Fire Bomber Dump System installation and any disposal load, do not exceed 120 mph CAS."
- (p) S2R Only (Agavenco Pump Only): "Do not operate pump above 115 mph CAS"
- (q) S2R Only: "Do not operate Micronair Units above 125 mph (CAS)"
- (r) The following placard must be displayed on the wings and adjacent to the fuel filler caps:
 "FUEL (*) US GAL. MIN. OCTANE 87 FUEL TANKS ARE INTERCONNECTED - ALLOW SUFFICIENT TIME FOR FUEL LEVEL TO EQUALIZE BEFORE TOP-OFF OF TANKS. NO AROMATIC FUEL."
 *54.5 for 600 S-2D Models, 35 for S/N 1380R Model S2R,
 53 for S/N 1416R and subsequent (See NOTE 9 for other approved fuel capacities)
- (s) The following placard must be displayed adjacent to the oil filler cap:
 "OIL TANK (*) GAL. CAP."
 *9.2 for S2R, 10.9 for 600 S-2D
- (t) "Sulphur dusting is prohibited unless special fire prevention measures have been incorporated in the aircraft."
- (u) Placards for Model S2R-R1820 -
 1. In clear view of the pilot:
 "ENGINE OPERATION LIMITS
 Takeoff only (1 min.) 2,500 RPM at 45.5" hg. at sea level (1,200 H.P.)
 For all other Operations - 1,000 H.P. at 2,300 RPM, 39.5 in. hg. & S.L.
 - 1,000 H.P. at 2,300 RPM, 37.2 in. hg. at 6,900 ft.
 STRAIGHT LINE VARIATION BETWEEN POINTS GIVEN
 100/130 MIN. GRADE AVIATION GASOLINE".
2. At aux. fuel pump circuit breaker switch:
 "AUX. FUEL PUMP ON
 OFF"
3. On throttle quadrant:
 - MAN RICH
 - AUTO RICH
 "MIXTURE - AUTO LEAN
 - FUEL CUTOFF".
4. At the primer switch and at the appropriate detent:
 "PRIMER ON
 OFF"
5. At the auxiliary fuel pump switch:
 "AUX. PUMP ON
 OFF"
6. At circuit breaker:
 "PRIMER
 2 AMPS"
7. At generator circuit breaker (if newly installed):
 "CB GEN." (50 AMP)."

8. At fuel filler caps:
"Fuel 96 U.S. Gal. Min. Octane 100/130. Aviation Gasoline Fuel Tanks are interconnected. Allow sufficient time for fuel level to equalize before top-off of tank. No Aromatic Fuel." (See NOTE 9 for other approved fuel capacities)
9. On inside of oil tank filler door:
"Oil Grade - Aero Shell or equivalent Above 32°F 120; Below 32°F 100
NOTE: Detergent oil W120 and W100 may be used after a 50 hour break-in period on new piston rings. New rings must be seated on non detergent oil. Capacity 13 gallons."
(See NOTE 15 for one-place configuration oil capacity.)
10. If not already installed on instrument panel, at Stall Warning Light and fuse (1 AMP):
"STALL WARNING"
11. With H.S. 43D50/6933A-9 propeller only. Adjacent to the tachometer:
"AVOID CONTINUOUS GROUND OPERATION BETWEEN 1200 AND 1500 RPM
AND BETWEEN 1,900 AND 2,200 RPM"
12. For dual cockpit aircraft, in rear passenger/cargo area (all models except S2R-T65 and S2RHG-T65):
"PASSENGER OR CARGO 200 LBS. MAXIMUM"
13. For dual cockpit S2R-T65 and S2RHG-T65, in rear passenger/cargo area:
"CARGO 200 LBS. MAXIMUM"

See the FAA approved Airplane Flight Manual for required placards which takes precedence over this type certificate data sheet. (Not applicable to early Models 600 S-2D and S2R which did not have mandatory Airplane Flight Manuals.)

NOTE 3: Airworthiness Limitations for mandatory retirement life or mandatory inspection are included in the Maintenance Manual (Instructions for Continued Airworthiness), Airworthiness Limitations Section, for each model.

NOTE 4: Refer to Type Certificate Data Sheet Number A3SW for conditions and limitations applicable to the "Normal Category", Models 600 S-2D, S2R, S2R-T34, S2R-T15, S2R-T11, S2R-R3S, and S2R-R1340. The configuration of airplanes eligible for a standard airworthiness certificate is controlled by Thrush Drawing 30007.

NOTE 5. Model S2R, Alternate Engine Installation
(Only sections different from II are shown.)

Engine Wright R-1300-1B

Fuel 100/130 Minimum grade aviation gasoline

Engine Limits

	<u>H.P.</u>	<u>R.P.M.</u>	<u>M.P.(In. Hg.)</u>	<u>ALT.</u>
Takeoff (1 min.)	800	2,600	44.0	S.L.
Takeoff (1 min.)	800	2,600	42.5	3,500
Max. Continuous	700	2,400	39.5	S.L.
Max. Continuous	700	2,400	38.0	5,000

Propeller and Propeller Limits	Hamilton Standard, constant speed, 3D40 Hub, (as modified by STC SP148NW) EAC-AG100-0S blades. Diameter 108 5/16 inches maximum, 106 5/16 inches minimum. Pitch settings, 23° low and 38.0° high at 42 inch station. Governor, Hamilton Standard 4M-12-5			
or	Hamilton Standard, constant speed, 23D40 Hub, 6601A-30S blades. Diameter 108 inches maximum, 106 inches minimum. Pitch settings, 24.5° low and 44.5° high at 42 inch station. Governor, Hamilton Standard 4G-10-5			
C.G Range	(+22.5) to (+28.0)			
Control Surface Movements	Elevator	Up 27° ± 1°	Down 17° ± 1°	
	Elevator Tab	Up 8° ± 1°	Down 22° ± 1°	
	Rudder	Left 24° ± 1°	Right 24° ± 1°	
	Aileron	Up 21° ± 1°	Down 17° ± 1°	
	Flaps		Down 26° - 30°	
Serial Numbers Eligible	5000R and subsequent			
Certification Basis	CAR 8 effective October 11, 1950, restricted category. Type Certificate A4SW issued November 1, 1965, revised March 21, 1968, to add Model S2R. Engine installed per STC SA2969WE.			
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. In addition, the following equipment is required: (1) 24 volt electrical system, Rockwell Dwg. No. 90326.			
Weight and Balance	See NOTE 1 for weight and balance information			
Placards	Remove the following placards previously installed: (1) "AVOID CONTINUOUS GROUND OPERATION BETWEEN 1,280 AND 1,900 RPM." (2) If alternator was installed: "DO NOT TURN OFF ALTERNATOR IN FLIGHT EXCEPT IN CASE OF EMERGENCY" "75 AMP MAX." (on left instrument panel) "C/B - LAT." (on left instrument panel) (3) At fuel filler caps: "87 OCTANE"			
	Add the following placards: (1) Adjacent to manifold pressure gage:			
		<u>H.P.</u>	<u>R.P.M.</u>	<u>M.P.(In. Hg.)</u>
	Takeoff (1 min.)	800	2,600	44.0
	Takeoff (1 min.)	800	2,600	42.5
	Max. Continuous	700	2,400	39.5
	Max. Continuous	700	2,400	38.0
	Straight line variation between points given.			
	"100/130 MINIMUM GRADE AVIATION GASOLINE"			
	(2) At auxiliary fuel pump/circuit breaker: "AUXILIARY FUEL PUMP ON/OFF"			

- (3) At primer switch:
"PRIMER ON/OFF"
- (4) At generator circuit breaker:
"CB GEN"
- (5) At fuel filler cap:
"100/130 MINIMUM GRADE AVIATION GASOLINE"
- (6) At altimeter:
"ALTITUDE LOSS IN STALL RECOVERY - 300 FEET"

NOTE 6: These aircraft have demonstrated satisfactory operation in the Restricted Category under the following conditions:

- (a) Model S2R (with P & W R-1340 Engine) at 6,900 lbs., Standard Day, 400 ft. Altitude, C.G. Limits of 25.0 to 30.0 inches, Stall Speed 78 mph CAS, Maximum Speed 126 mph CAS.
- (b) Model S2R (with Wright R-1300-1B Engine at 7,800 lbs., Standard Day, 1,700 ft. Altitude, C.G. Limits of 24.0 to 28.0 inches, Stall Speed 83 mph CAS, Maximum Speed 126 mph CAS.
- (c) Model S2R-T34 at 8,500 lbs., 2,500 Altitude, Outside Air Temperature 45 °F, C.G. Limits of 30.0 inches, Stall Speed 78 mph CAS with 15° Flaps, Maximum Speed 126 mph CAS.
- (d) Model S2R-T15 at 8,000 lbs., 3,000 ft. Altitude, Outside Air Temperature 65°F, C.G. Limits of 30.0 inches, Stall Speed 76 mph CAS, with 15° Flaps, Maximum Speed 126 mph CAS.
- (e) Deleted.

While items (a) through (d) have been satisfactorily demonstrated, all parts of CAR 3 have not necessarily been complied with for restricted category operations at the increased weights. Also additional operating instructions may need to be established for individual restricted operation approvals under 14 CFR 21.25.

NOTE 7: The following models and serial numbers were produced by the Ayres Corporation (originally Rockwell) at its Albany, Georgia, facility (later serial numbers not listed below were manufactured after July 2003 by Thrush Aircraft, Inc.):

- 1. Model S2R (600 HP), S/N 1526 through 3002
- 2. Model S2R (800 HP), S/N 5000 through 5100
- 3. Model S2R-T34, S/N 6000 through 6049, T34-001 through T34-272 with or without DC suffix, S/N T41-090DC through T41-225DC, and T42-209DC
- 4. Model S2R-T15, S/N T15-001 through T15-044
- 5. Model S2R-R3S, S/N R3S-001 through R3S-011, R3S-009DC through R3S-010DC
- 6. Model S2R-T11, S/N T11-001 through T11-005
- 7. Model S2R-R1340, S/N R1340-001DC through R1340-010DC, S/N R1340-011 through R1340-035
- 8. Model S2R-R1820, S/N R1820-001DC through R1820-032DC, R1820-033 through R1820-036
- 9. Model S2R-T65, S/N T65-001DC through T65-018DC (T65-010DC converted to S2RHG-T65)
- 10. Model S2RHG-T65, S/N T65-002DC through T65-010DC
- 11. Model S2R-T45, S/N T45-001DC through T45-014DC, T45-008 through T45-015
- 12. Model S2R-G6, S/N G6-101 through G6-155, G6-116DC through G6-151DC
- 13. Model S2R-G10, S/N G10-101 through G10-168, G10-106DC through G10-165DC
- 14. Model S2R-G5, S/N G5-101 through G5-105
- 15. Model S2R-G1, S/N G1-101 through G1-115
- 16. Model S2RHG-T34, S/N T34HG-101DC through T34HG-102DC
- 17. Model S2R-T660, S/N T660-101 through T660-108

NOTE 8: For Models S2R-R3S, S2R-T34, S2R-T15, S2R-T11, S2R-G6, S2R-G10, S2R-G5, S2R-T660, and S2R-H80 with the serial number suffixed with "DC" (Dual Cockpit), the following data apply. All other data listed for these models remain unchanged.

Model S2R-R3S Dual Cockpit, 2PCLM

C.G. Range	Forward limit at 6,000 lbs. is 22.5 inches Aft of Datum. Aft limits at 6,000 lbs. are 27.5 inches Aft of Datum without P/N 19661-1 (elevator down spring) installed. 30.0 inches Aft of Datum with P/N 19661-1 (elevator down spring) installed.
Number of Seats	1 (+89), 1 (+127 Forward Facing) or (+111 Aft Facing)
Maximum Cargo Load	See weight and balance data. Maximum passenger/cargo compartment, 200 lbs. (+120). Maximum hopper load, 3336 lbs. (+29.9).
Control Surface Movements	Flaps Down $15^{\circ} \pm 1^{\circ}$
Serial Numbers Eligible	R3S-009DC and subsequent.
Required Equipment	This equipment must include Airplane Flight Manual and Supplement for Restricted Category Operation, dated March 28, 1980, or later approved versions.

Model S2R-T34 Dual Cockpit, 2PCLM

C.G. Range	S/N T34-033DC thru S/N T34-250DC: (+22.5) to (+27.5) without P/N 19661-1 (elevator down spring) installed. (+22.5) to (+30.0) with P/N 19661-1 (elevator down spring) installed. S/N T34-279DC and subsequent: C.G. range is same as Section III and P/N 19661-1 (elevator down spring) is installed.
Number of Seats	1 (+89), 1 (+127 Forward Facing) or (+111 Aft Facing).
Maximum Cargo Load	Passenger/Cargo compartment, 200 lbs. (+120).
Control Surface Movements	Elevator Tab $8^{\circ} \pm 1^{\circ}$ up; $22^{\circ} \pm 1^{\circ}$ down
Serial Numbers Eligible	T34-033DC and subsequent
Required Equipment	This equipment must include the following: For serial numbers T34-033DC thru T34-250DC, Ayres Airplane Flight Manual and Supplement for Restricted Category Operation, dated August 25, 1980, or later approved versions. For serial numbers T34-279DC thru T34-448DC, Thrush Airplane Flight Manual dated April 7, 2005, with Restricted Category Aircraft Flight Manual Supplement #T34AFMS_RC-001 dated April 7, 2005, or later approved versions. For serial numbers T34-453DC and subsequent, Thrush Airplane Flight Manual, Revision 6, dated February 14, 2014, with Restricted Category Aircraft Flight Manual Supplement #T34AFMS_RC-002 dated February 13, 2017, or later approved versions.

Model S2R-T15 Dual Cockpit, 2PCLM

C.G. Range	(+22.5) to (+27.5) without P/N 19661-1 (elevator down spring) installed. (+22.5) to (+30.0) with P/N 19661-1 (elevator down spring) installed.
Number of Seats	1 (+89), 1 (+127 Forward Facing) or (+111 Aft Facing)
Maximum Cargo Load	Passenger/Cargo compartment, 200 lbs. (+120). Maximum hopper load, 3,336 lbs. (+29.9). (See NOTE 10 for increased load limit.)
Control Surface Movements	Elevator Tab $8^{\circ} \pm 1^{\circ}$ up; $22^{\circ} \pm 1^{\circ}$ down
Serial Numbers Eligible	T15-010DC and subsequent
Required Equipment	This equipment must include Airplane Flight Manual and Supplement for Restricted Category Operation, dated October 7, 1980, or later approved versions.

Model S2R-T11 Dual Cockpit, 2PCLM

Same as S2R-T15 Dual Cockpit except

Serial Numbers Eligible	T11-004DC and subsequent
-------------------------	--------------------------

Model S2R-G6 Dual Cockpit, 2PCLM

Number of Seats	1 (+89), 1 (+127)
Maximum Cargo Load	See weight and balance data. Passenger/cargo compartment, 200 lbs. (+120.0)
Serial Numbers Eligible	G6-101DC and subsequent.
Required Equipment	This equipment must include Airplane Flight Manual dated February 24, 1994, or later approved versions.

Model S2R-G10 Dual Cockpit, 2PCLM

Number of Seats	1 (+89), 1 (+127)
Maximum Cargo Load	See weight and balance data. Passenger/cargo compartment, 200 lbs. (+120.0)
Serial Numbers Eligible	G10-106DC and subsequent.
Required Equipment	This equipment must include Airplane Flight Manual dated August 19, 1994, or later approved versions. For serial number G10-169 and subsequent, Thrush Airplane Flight Manual dated March 25, 2000, or later approved version.

Model S2R-G5 Dual Cockpit, 2PCLM

Number of seats	1 (+89), 1 (+127)
Maximum Cargo Load	See weight and balance data. Passenger/cargo compartment, 200 lbs. (+120.0)
Serial Numbers Eligible	G5-105DC and subsequent.
Required Equipment	This equipment must include Airplane Flight Manual dated August 19, 1994, or later approved versions.

Model S2R-T660 Dual Cockpit, 2PCLM

Engine	Pratt & Whitney Canada PT6A-65AG, -65AR, -65B (-65AR must have automatic power reserve feature disabled) Alternate Engine: Pratt & Whitney Canada PT6A-67AG		
Engine Limits	PT6A-65AG/-65AR/-65B: Engine Limits same as shown in Section XVII PT6A-67AG: Engine Limits same as shown in Section XVII		
Propeller and Propeller Limits	For PT6A-65AG/-65AR/-65B: Same as shown in Section XVII For PT6A-67AG: Same as shown in Section XVII		
Number of seats	1 (+89), 1 (+127)		
Control Surface Movements	Rudder	Left $20^{\circ} \pm 1^{\circ}$	Right $20^{\circ} \pm 1^{\circ}$
Serial Numbers Eligible	T660-114DC and subsequent		
Required Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Thrush Aircraft, Inc. Airplane Flight Manual Dual Cockpit dated August 12, 2005, or later FAA approved revision, is required.		
Agricultural Dispersal Equipment	Standard Spray System, Ayres Dwg. No. 95340 Transland Hydraulic Fire Door Installation, Ayres Dwg. No. 95385		

Model S2R-H80 Dual Cockpit, 2PCLM

Number of Seats	1 (+89), 1 (+127)		
Maximum Cargo Load	See weight and balance data. Rear cockpit cargo, 200 lbs. maximum (+114.0)		
Serial Numbers Eligible	H80-111DC and subsequent.		
Required Equipment	This equipment must include Airplane Flight Manual dated July 2, 2013, or later approved versions.		

NOTE 9. The following table summarizes increased fuel capacity limits for the models and serial numbers listed:

<u>Configuration*</u>	<u>A.</u> <u>S/N</u>	<u>B.</u> <u>S/N</u>
<u>Model</u>		
S2R	2564R-4999R	2577R-4999R
S2R-R3S	N/A	N/A
S2R-R1340	R1340-006 to R1340-035	R1340-010 to R1340-035
S2R-T34	T34-034 thru T34-450	T34-080 and up, Required on T34-451 and up
S2R-T15	T15-010 and up	T15-021 and up
S2R-T11	T11-004 and up	T11-004 and up
S2R-R1820	R1820-001 and up	R1820-032 and up

*Configuration:

- A. Eligible for alternate installation
-190 gallons usable, one 96 gallon tank in each wing, tanks interconnected;
standard on S2R-R1820.
- B. Eligible for alternate installation
-228 gallons usable, one 115 gallon tank in each wing, tanks interconnected.

NOTE 10. The following table summarizes models and serial numbers eligible for increased hopper load limits - Restricted Category operation only. The certificated maximum take-off gross weight of 6,000 pounds applies to these models and serial numbers.

<u>Hopper Load Limit 4,000 lbs.</u>	
<u>Model</u>	<u>S/N</u>
S2R-T15	T15-020 and up
S2R-T11	T11-006 and up
S2R-R1820	R1820-033 and up

NOTE 11. Use of the Ayres P/N 20500 and 20511 (optional) wing tip extension is limited to Restricted Category operation only.

NOTE 12. The Pratt & Whitney (United Aircraft of) Canada PT6A-34 engine is approved as an alternate engine on Model S2R-T34, S/N T34-084 thru T34-450, and Model S2RHG-T34, S/N T34HG-101 and up, when installed in accordance with Ayres Dwg. 19870 with the following additions:

- A. Bleed Air Case Assy. P/N 3029769; Ref. Pratt & Whitney Service Bulletins 1278 & 1279.
- B. P-3 Air Filter Installation, Ref. Pratt & Whitney Service Bulletins 1253 & 3106.
- C. Replacement of Compressor Delivery Heated Air Tube by a non-metallic hose, P/N 3026687; Ref. Pratt & Whitney Service Bulletin 1315.

Due to the anticipated operating environment, servicing and overhaul interval shall be in accordance with Pratt & Whitney's recommendations for the PT6A-34AG engine.

NOTE 13. The following table summarizes models and serial numbers eligible for Ayres P/N 40220 metal tail as an alternate installation if a fabric tail was originally installed by the factory**:

<u>Model**</u>	<u>S/N</u>
S2R	1416R and up
S2R-R1340	R1340-001 to R1340-035*
S2R-R1820	R1820-001 and up*
S2R-T34	6001-6049, T34-001 and up*, T41-001 and up*, T15-001 and up*, T27-001 and up*
S2R-T15	T15-001 and up*, T27-001 and up*
S2R-T11	T11-001 and up*
S2R-T65	T65-001DC and up
S2R-T45	T45-001DC and up*

*S/N with or without DC suffix

** All other models or serial numbers on this data sheet are eligible for the metal tail only (except the 600 S-2D).

Control surface movements (rudder only) for metal tail installations on models listed in Note 13 are the same as for the Model S2R-R1820.

NOTE 14. Models S2R-T34, S/N 6000 thru 6049 and S/N T34-001 thru T34-450 only, and S2RHG-T34, Alternate Engine Installation
(Only sections different from Sections III and XVI are shown.)

Engine Pratt & Whitney (United Aircraft of) Canada PT6A-41AG, PT6A-41, or PT6A-42

Due to the anticipated operating environment, servicing and overhaul interval shall be in accordance with Pratt & Whitney's recommendations for the PT6A-41AG engine for the PT6A-41, PT6A-41AG, and PT6A-42 engines.

Fuel PT6A-41AG same requirements as Section III.
PT6A-41 and PT6A-42 same requirements as Section III except use of Automotive Diesel Number 1D and 2D is prohibited.

Engine Limits for PT6A-41AG, PT6A-41, and PT6A-42:

	Takeoff and <u>Max. Cont.</u>	Transient <u>Start/Accel.</u>	<u>Reverse</u>	<u>Idle</u>
SHP	750		750	
Torque (PSI)	64.5	68.4 Trans	64.5	
ITT (°C)	750	850	750	660
Ng (%)	101.5	102.6	101.5	
Np (RPM)	2,000	2,200	2,000	
Oil Press (PSIG)	105 to 135		105 to 135	60 min.
Oil Temp (°C)	10 to 99	0 to 99.	0 to 99	-40 to 99

Number of Seats 1 (+89) for S/N's without DC suffix; 1 (+89) and 1 (+127) for S/N's with DC suffix.

Serial Numbers Eligible 6000-6049, T41-089 and up, T42-089 and up, T41HG-101 and up, T42HG-101 and up

Placards Located adjacent to the torque meter:
"Maximum Torque is 64.5 PSI at 2,000 RPM"

NOTE 15. For the Models listed in this note with a serial number without a "DC" suffix, the following Single Cockpit configuration data apply; all other data listed for these models remain unchanged:

Model S2R-R1340, Alternate Single Cockpit Configuration, 1 PCLM
(Only sections different from VII are shown.)

Number of Seats 1 (+89)

Maximum Cargo Load Maximum baggage compartment, 60 lbs. (+112)

Serial Numbers Eligible R1340-011 and subsequent

Required Equipment This equipment must include Ayres Airplane Flight Manual dated April 25, 1995, for S/N R1340-001 to R1340-035, or Thrush Airplane Flight Manual dated November 29, 2007 for S/N R1340-036 and up, or later approved versions.

Model S2R-R1820, Alternate Single Cockpit Configuration, 1 PCLM
(Only sections different from VIII are shown.)

C.G. Range (+23.0) to (+27.5) without P/N 19661 Elevator Down Spring Assy. Installed
(+23.0) to (+30.0) with P/N 19661 Elevator Down Spring Assy. Installed

Number of Seats 1 (+89)

Maximum Cargo Load Maximum baggage compartment, 60 lbs. (+112)

Oil Capacity 18 gallons at Station (-12)

Serial Numbers Eligible R1820-033 and subsequent

Required Equipment This equipment must include Airplane Flight Manual dated April 28, 1989, or later approved versions.

Model S2R-T45 Alternate Single Cockpit Configuration, 1 PCLM

(Only sections different from XI are shown)

Number of Seats	1 (+89)
Maximum Cargo Load	See weight and balance data. Maximum baggage compartment 60 lbs. (+112).
Control Surface Movements	Rudder Left $19^{\circ} \pm 1^{\circ}$ Right $19^{\circ} \pm 1^{\circ}$
Serial Numbers Eligible	T45-001 and subsequent.
Required Equipment	This equipment must include Airplane Flight Manual dated April 25, 1995, or later approved versions.

Model S2RHG-T34, Alternate Single Cockpit Configuration, 1 PCLM

(Only sections different from XVI are shown.)

Number of Seats	1 (+89)
Maximum Cargo Load	Maximum baggage compartment, 60 lbs. (+112)
Serial Numbers Eligible	T34HG-103 and subsequent

NOTE 16. Deleted. (Combined with Note 15)

NOTE 17. Any one of the following agricultural dispersal systems may be installed on Models S2R-T15, S2R-R3S, S2R-T11, S2R-R1340, S2R-R1820, S2R-T65, S2R-T45, S2R-G6, S2R-G10, S2R-G5, S2R-G1, and S2RHG-T34 all serial numbers; and S2RHG-T65, serial numbers T65-002DC thru T65-018DC; and S2R-T34 serial numbers 6000 thru 6049 and T34-001 thru T34-450:

- (a) Micronair Spray System, Aero Commander Dwg. No. 80870.
- (b) Boommaster Installation, Aero Commander Dwg. No. 80931.
- (c) Standard Spray System, Rockwell Dwg. No. 81071.
- (d) Spreader and Spreader Quick-Disconnect Installation, Rockwell Dwg. No. 80975.
- (e) Spray System Installation, Rockwell Dwg. No. 80854.
- (f) Fire Bomber System Installation, Rockwell Dwg. No. 81069.
- (g) Spreader and Calibration Installation, Aero Commander Dwg. No. 80674.

For S2R-T34, serial numbers T34-451 and subsequent, and for T34-273 thru T34-450 when modified in accordance with Thrush Custom Kit CK-AG-45:

- (a) Micronair Spray System, Thrush Dwg. No. 81082
- (b) Standard Spray System, Thrush Dwg. No. 81071
- (c) Calibrator Installation, Thrush Dwg. No. 19680

NOTE 18. For Models S2R-T34, S2R-T15 and S2R-T11 equipped with optional Air Inlet Barrier Filter, P/N 21402, refer to the Airplane Flight Manual Supplement approved February 4, 1991, or later approved revision, for limitations and procedures. For S2R-T34 serial number T34-273 and subsequent, the S2R-T34 Airplane Flight Manual dated February 23, 2005, or later versions, incorporates the information from the Air Inlet Barrier Filter Airplane Flight Manual Supplement so the Supplement is not required for those aircraft.

NOTE 19. External pitot type engine air inlet, P/N's 21900-1 and 21900-21, or screened fairing panel, P/N 21922, are approved alternate equipment on the following models:

<u>Model</u>	<u>S/N</u>
S2R-T34	T34-150 thru T34-450
S2R-T15	T15-028 and up
S2R-T11	T11-006 and up

NOTE 20. Model S2R, S/N 2584R and subsequent (Diet Thrush)
The following major components have been reduced in weight and structural strength:

<u>ASSEMBLY</u>	<u>PART NUMBER</u>
Wings	20209-600 L/R
Fuselage	10601-600
Horizontal Stabilizer	40087-100

These components are identified at the time of manufacture with the part numbers listed above. This weight and strength reduction effectively reverts these assemblies to their 1977 capabilities. Ayres Corporation will use these components only on Ayres models with a hopper capacity of 400 gallons or less and with engines that are rated at no more than 680 SHP.

NOTE 21. Deleted. (Combined with Note 15.)

NOTE 22. For models listed in this note, Lower Spar Caps, P/N's 22507T001 and 22507T002, are life limited and must be replaced at 29,000 hours time in service. These P/N's are installed as original equipment on the following serial numbers:

T34/41-271 and up	G6-156 and up
T15/27-041 and up	G10-166 and up
T11-006 and up	G5-106 and up
T65-019 and up	G1-116 and up
T65HG-011 and up	T34HG-103 and up
T45-016 and up	

NOTE 23. For agricultural or forest and wildlife preservation special purpose operations, the Maximum Weight of the S2R-T660 may be increased from 12,500 pounds to 14,150 pounds if operated in accordance with the limitations shown in the Airplane Flight Manual including airspeed indicator marking changes (for example, Vne is decreased from 219 mph to 160 mph).

Applicable Airplane Flight Manuals for operations above 12,500 pounds are Revision 3 of the Ayres S2R-T660 Airplane Flight Manual, or later FAA approved revision, or Thrush Aircraft Inc. S2R-T660 Airplane Flight Manual for serial number T660-109 and up, dated March 5, 2004, or later FAA approved revision, or Thrush Aircraft Inc. S2R-T660 Airplane Flight Manual Dual Cockpit for serial number T660-114DC and up, dated August 12, 2005.

For operations in the United States above 12,500 pounds, an exemption to the pilot type rating requirements of 14 CFR Part 61.31(a)(1) obtained by the manufacturer is required.

At weights between 12,500 lbs. and 14,150 lbs. the certification basis includes:

Equivalent Level of Safety Finding No. ACE-04-05 to 14 CFR Part 23.473(b) regarding the landing weight being less than the takeoff weight, and

Vc and Vne are lowered to Va for 23.333, 23.335, 23.337 and 23.1505 (Amendment 23-53), and At and below Va, the airplane will stall before 2.8 g's can be exceeded.

If operated at weights between 12,500 pounds and 14,150 lbs. the structural limitations shown in Section XVII of this type certificate data sheet are decreased and the following parts must be replaced at the time in service indicated below:

<u>Part Name</u>	<u>Part Number</u>	<u>Life Limit</u>
Rear Spar Doubler, Lower	95627-3	11,000
Rear Spar, Inboard, L&R	95623-1/-2	11,000
Aft Main Spar Lug, L&R	95605-1/-2	11,000
Forward Main Spar Lug, L&R	95606-1/-2	11,000
Spar Cap Assy, L&R	95603-1/-2	13,680
Steel Doubler Plate	95614-1	19,700

NOTE 24.

Propeller Pitch Limits

Hartzell HC-B3TN-3C and -3D with T10282N+4 blades at 30 inch station:

Reverse $-8.0^{\circ} \pm 0.5^{\circ}$, Low $18.0^{\circ} \pm 0.1^{\circ}$, Feather $87.0^{\circ} \pm 1.0^{\circ}$

Hartzell HC-B3TN-3C with T10282N blades at 30 inch station:

Reverse $-11.0^{\circ} \pm 1.0^{\circ}$, Low $16.0^{\circ} \pm 0.1^{\circ}$, Feather $89.0^{\circ} \pm 1.0^{\circ}$

Hartzell HC-B5MP-3C with M10876ANS or M10876AS blades at 42 inch station:

Reverse $-11.0^{\circ} \pm 0.5^{\circ}$, Low $11.5^{\circ} \pm 0.1^{\circ}$, Feather $79.0^{\circ} \pm 0.5^{\circ}$

Hartzell HC-B4TN-5NL with LT10890N blades at 42 inch station:

Reverse $-6.0^{\circ} \pm 0.5^{\circ}$, Low $-1.4^{\circ} \pm 0.1^{\circ}$, Feather $81.2^{\circ} \pm 0.5^{\circ}$

Hartzell HC-B4TN-5M with T10282N+4 blades at 30 inch station:

Reverse $-6.0^{\circ} \pm 0.5^{\circ}$, Low $2.0^{\circ} \pm 0.1^{\circ}$, Feather $89.0^{\circ} \pm 0.5^{\circ}$

McCauley 4HFR34C653 with -(X/X)-L106FA-0 blades at 30 inch station:

Reverse $-4.0^{\circ} \pm 0.2^{\circ}$, Low $12.0^{\circ} \pm 0.5^{\circ}$, Feather $87.4^{\circ} \pm 0.2^{\circ}$

McCauley X4HFR34C662 with /XL108FA-0 blades at 30 inch station:

Reverse $-4.0^{\circ} \pm 0.2^{\circ}$, Low $12.0^{\circ} \pm 0.5^{\circ}$, Feather $87.4^{\circ} \pm 0.2^{\circ}$

NOTE 25.

Model S2RHG-T65, Alternate Engine Installation and single cockpit configuration, 1 PCLM

(Only sections different from Section X are shown.)

Engine

Pratt & Whitney Canada PT6A-45A, -45B, -45R

Pratt & Whitney Canada PT6A-60AG

Honeywell (Garrett) TPE331-10

Engine Limits

PT6A-45A, -45B, -45R(shown):

	<u>Takeoff</u>	Max. <u>Continuous</u>	Transient <u>Start/Accel.</u>	<u>Idle</u>
SHP	1,050	1,020		
Torque (PSI) (2 sec.)	38.8	37.7	61.0 Trans	
ITT ($^{\circ}$ C)	800	800	1,000 Start (5 sec.)	750
Ng (%)	104	104	104	56
Np (RPM)	1,700	1,700	1,870 Trans (5 sec.)	
Oil Press (PSIG)	90 to 135	90 to 135	40 to 200	60 min.
Oil Temp ($^{\circ}$ C)	0 to 110	0 to 110	99 to 110	-40 to 110

PT6A-60AG:

	<u>Takeoff</u>	Max. <u>Continuous</u>	Transient <u>Start/Accel.</u>	<u>Idle</u>
SHP	1,050	1,020		
Torque (PSI) (2 sec.)	38.8	37.7		
ITT ($^{\circ}$ C)	820	775	1,000 Start (5 sec.)	750
Ng (%)	104	104	104	58
Np (RPM)	1,700	1,700	1,870 Trans (5 sec.)	
Oil Press (PSIG)	90 to 135	90 to 135	40 to 200	60 min.
Oil Temp ($^{\circ}$ C)	10 to 110	0 to 110	0 to 110	-40 to 110

TPE331-10:

	<u>Takeoff</u>	<u>Max. Continuous</u>	<u>Transient Start/Accel.</u>	<u>Idle</u>
SHP	900	900		
Torque (PSI)	*	*		
EGT (°C)	**	**	770 Start (5 sec.)	
RPM% †	100	100		72 to 85
Oil Press (PSIG)	70 to 120	70 to 120	40 to 120	
Oil Temp (°C) ‡	55 to 127	55 to 110	-40 to 110	-40 to 110

*Takeoff torque limit is 2,972 lb/ft at 100%RPM. See current engine logbook for PSI equivalent.

**EGT Limits: 600°C at 45 °C OAT, 540 °C EGT at -15 °C OAT, straight line variation between points.

† Avoid operation between 18% and 28% rpm, except for transient during start and shut down.

‡ Limitation for MIL-L-23699B oil

Certification Basis

Compliance with FAA Policy Memorandum ACE-110_19971201, dated December 1, 1997, Section 23.49, has been shown (61 knot stall speed met with hopper empty), in lieu of previously required Exemption No. 4898.

Equivalent Level of Safety Finding No. ACE-04-05 dated July 26, 2004 for 8,800 pound landing weight.

C. G. Range

For S/N T65HG-011 and subsequent: Aft limit +29.0 inches aft of datum, at all weights.

For S/N T65HG-015G and subsequent: Aft limit +28.0 inches aft of datum, at all weights.

Maximum Landing Weight

8,800 lbs. (Aircraft equipped with any engine above and Main Landing Gear p/n 94200 light weight spring gear)
10,500 lbs. (Only on S/N T65HG-015G and subsequent aircraft which have the Honeywell (Garrett) TPE331-10 engine and when equipped with alternate Main Landing Gear p/n 94140 heavy weight spring gear. See Airplane Flight Manual for description of gear.)

Number of Seats

1 (+89)

Maximum Cargo Load

Maximum baggage compartment, 60 lbs. (+112)

Control Surface Movements

S/N T65HG-011 and subsequent:	Rudder	Left 22° ± 1°	Right 22° ± 1°
S/N T65HG-015G and subsequent:	Rudder	Left 19° ± 1°	Right 19° ± 1°

Serial Numbers Eligible

S/N T65HG-011 and subsequent
S/N T65HG-015G and subsequent

Required Equipment

Thrush Aircraft, Inc. S2RHG-T65 Airplane Flight Manual dated July 26, 2004, for S/N T65HG-011 and subsequent; or Thrush Aircraft, Inc. S2RHG-T65 with TPE-331-10 Engine Airplane Flight Manual dated July 22, 2005, for S/N T65HG-015G and subsequent or later FAA approved revision is required.

Agricultural Dispersal Equipment

Standard Spray System, Thrush Dwg. No. 81071.

NOTE 26. The Model S2R may also be designated as a S-2R or S2-R. These three designations for the same model are all official model names and were used interchangeably by Snow, Rockwell, and Ayres on airplane identification data plates, manuals, and drawings.

NOTE 27. Model S2R-T660 Patrolling Special Purpose Operations, 2 PCLM
(Only sections different from Section XVII are shown.)

Engine	Pratt & Whitney Canada PT6A-65AG, -65AR (-65AR must have automatic power reserve feature disabled) Alternate Engine: Pratt & Whitney Canada PT6A-67AG		
Engine Limits	PT6A-65AG/-65AR: Engine Limits same as shown in Section XVII PT6A-67AG: Engine Limits same as shown in Section XVII		
Propeller and Propeller Limits	<p>For PT6A-65AG/-65AR: Hartzell HC-B5MP-3F propeller, constant speed, feathering and reversing; Hub Model HC-B5MP-3F with Blade Model M11276NS Diameter 115.2 inches maximum, 114.7 inches minimum. Pitch (42 in. Sta.) 13.9° low, 83.1° feather, -10.0° reverse</p> <p>For PT6A-67AG: Hartzell HC-B5MA-3D propeller, constant speed, feathering and reversing; Hub Model HC-B5MA-3D with Blade Model M11276NS Diameter 115.2 inches maximum, 114.7 inches minimum. Pitch (42 in. Sta.) 13.9° low, 83.1° feather, -10.0° reverse</p>		
Maximum Takeoff Weight	12,500 lbs.		
Number of seats	1 (+89), 1 (+127)		
Control Surface Movements	Rudder	Left $20^{\circ} \pm 1^{\circ}$	Right $20^{\circ} \pm 1^{\circ}$
Serial Numbers Eligible	T660-132DCP and subsequent		
Certification Basis	<p>For 14CFR Part 21.25(b)(4) patrolling special purpose operations,</p> <p>Airworthiness Standards for Components and Areas Affected by the Change:</p> <p>(1) 14CFR Part 21.25(a)(1), and</p> <p>(2) 14CFR Part 23 - Subpart A, Amendment 23-53; Subpart B, Amendment 23-53; Subpart C, Amendment 23-53 (with A23.9(c)(3) used to calculate aileron deflections for use with 23.349(b)), but §§23.423, 23.425, 23.427, 23.441, and 23.443 are at Amendment 23-34 with Appendix B used; Subpart D, Amendment 23-53; but §23.629 is at Amendment 23-31, §§23.785, 23.787, 23.807, 23.853, 23.865 and 23.867 are at Amendment 23-14; and §23.863 is at Amendment 23-23; Subpart E, Amendment 23-14; Subpart F, Amendment 23-0; Subpart G, Amendment 23-53; except those regulations found inappropriate for restricted category agricultural airplanes as listed in FAA Advisory Circular 21.25-1, dated December 1, 1997, and compliance with regulations listed in FAA policy memorandum ACE-110_19971201, dated December 1, 1997, demonstrated in accordance with that memorandum, and</p>		

Certification Basis (cont'd)

- (3) 14 CFR part 36, effective December 1, 1969, including the latest applicable requirements of Amendments 36-1 through 36-29.

Patrolling special purpose operations are limited to 12,500 lbs. where compliance to airworthiness regulations at full speeds and load factors has been met and compliance with Part 36 noise standards has been shown.

Required Equipment

The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the aircraft for certification. This equipment must include Thrush Aircraft, Inc. Airplane Flight Manual Dual Cockpit dated August 12, 2005, and Airplane Flight Manual Supplement for Special Purpose Patrolling Operations dated October 7, 2015, or later FAA approved revision, are required.

Equipment

Gatebox installation 95209-21 using gatebox 94441 TC

Or

Gatebox installation 95209-25 using either gatebox 23565 or 94441 TCL

....END.....