

A7SO
Revision 13
PIPER
PA-34-200
PA-34-200T
PA-34-220T

December 18, 1996

TYPE CERTIFICATE DATA SHEET NO. A7SO

This data sheet which is a part of type certificate No. A7SO, prescribes conditions and limitations under which the product for which the type certificate was issued meets the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder The New Piper Aircraft, Inc.
2926 Piper Drive
Vero Beach, Florida 32960

I. - Model PA-34-200 (Seneca), 7 PCLM (Normal Category), Approved 7 May 1971.

Engines

S/N 34-E4, 34-7250001 through 34-7250214:
1 Lycoming LIO-360-C1E6 with fuel injector,
Lycoming P/N LW-10409 or LW-12586 (right side); and
1 Lycoming IO-360-C1E6 with fuel injector,
Lycoming P/N LW-10409 or LW 12586 (left side).

S/N 34-7250215 through 34-7450220:
1 Lycoming LIO-360-C1E6 with fuel injector,
Lycoming P/N LW-12586 (right side); and
1 Lycoming IO-360-C1E6 with fuel injector,
Lycoming P/N LW-12586 (left side).

Fuel

100/130 minimum grade aviation gasoline

Engine Limits

For all operations, 2700 r.p.m. (200 hp)

Propeller and Propeller Limits

Left Engine

1 Hartzell, Hub Model HC-C2YK-2 () E, Blade Model C7666A-0;
1 Hartzell, Hub Model HC-C2YK-2 () EU, Blade Model C7666A-0;
1 Hartzell, Hub Model HC-C2YK-2 () EF, Blade Model FC7666A-0;
1 Hartzell, Hub Model HC-C2YK-2 () EFU, Blade Model FC7666A-0;
1 Hartzell, Hub Model HC-C2YK-2CG (F), Blade Model (F) C7666A
(This model includes the Hartzell damper); or
1 Hartzell, Hub Model HC-C2YK-2CGU (F), Blade Model (F) C7666A
(This model includes the Hartzell damper).

| | | | | | | | | | | | | | | | |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
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Propeller and Propeller Limits**(continued)****Right Engine**

1 Hartzell, Hub Model HC-C2YK-2 () LE, Blade Model JC7666A-0;
 1 Hartzell, Hub Model HC-C2YK-2 () LEU, Blade Model JC7666A-0;
 1 Hartzell, Hub Model HC-C2YK-2 () LEF, Blade Model FJC7666A-0;
 1 Hartzell, Hub Model HC-C2YK-2 () LEFU, Blade Model FJC7666A-0;
 1 Hartzell, Hub Model HC-C2YK-2CLG (F), Blade Model (F) JC7666A
 (This model includes the Hartzell damper); or
 1 Hartzell, Hub Model HC-C2YK-2CLGU (F), Blade Model (F) JC7666A
 (This model includes the Hartzell damper).

Pitch setting: High 79° to 81°, Low 13.5° at 30" station.
 Diameter: Not over 76", not under 74".
 No further reduction permitted.

Spinner: Piper P/N 96388 Spinner Assembly and P/N 96836 Cap Assembly, or
 P/N 78359-0 Spinner Assembly and P/N 96836-2 Cap Assembly (See NOTE 4)

Governor Assembly:

1 Hartzell hydraulic governor, Model F-6-18AL (Right);
 1 Hartzell hydraulic governor, Model F-6-18A (Left).

Avoid continuous operation between 2200 and 2400 r.p.m. unless aircraft is
 equipped with Hartzell propellers which incorporates Hartzell damper on both left
 and right engine as noted above.

Airspeed Limits

| | | |
|---|------------|-------------|
| V _{NE} (Never exceed) | 217 m.p.h. | (188 knots) |
| V _{NO} (Maximum structural cruise) | 190 m.p.h. | (165 knots) |
| V _A (Maneuvering, 4200 lb.) | 146 m.p.h. | (127 knots) |
| V _A (Maneuvering, 4000 lb.) | 146 m.p.h. | (127 knots) |
| V _A (Maneuvering, 2743 lb.) | 133 m.p.h. | (115 knots) |
| V _{FE} (Flaps extended) | 125 m.p.h. | (109 knots) |
| V _{LO} (Landing gear operating) | | |
| Extension | 150 m.p.h. | (130 knots) |
| Retract | 125 m.p.h. | (109 knots) |
| V _{LE} (Landing gear extended) | 150 m.p.h. | (130 knots) |
| V _{MC} (Minimum control speed) | 80 m.p.h. | (69 knots) |

C.G. Range (Gear Extended)

S/N 34-E4, 34-7250001 through 34-7250214 (See NOTE 3):
 (+86.4) to (+94.6) at 4000 lb.
 (+82.0) to (+94.6) at 3400 lb.
 (+80.7) to (+94.6) at 2780 lb.

S/N 34-7250215 through 34-7450220:

(+87.9) to (+94.6) at 4200 lb.
 (+82.0) to (+94.6) at 3400 lb.
 (+80.7) to (+94.6) at 2780 lb.

Straight line variation between points given.

Moment change due to gear retracting landing gear (-32 in.-lb.)

Empty Weight C.G. Range

None

Maximum Weight

S/N 34-E4, 34-7250001 through 34-7250214:
 4000 lb.- Takeoff
 4000 lb. - Landing
 See NOTE 3.

S/N 34-7250215 through 34-7450220:

4200 lb. - Takeoff
 4000 lb. - Landing

| | | | | | | |
|-------------------------------------|---|---|------|-----------------|-------|------------|
| <u>No. of Seats</u> | 7 (2 at +85.5, 3 at +118.1, 2 at +155.7) | | | | | |
| <u>Maximum Baggage</u> | 200 lb. (100 lb. at +22.5, 100 lb. at +178.7) | | | | | |
| <u>Fuel Capacity</u> | 98 gallons (2 wing tanks) at (+93.6) (93 gallons usable) See NOTE 1 for data on system fuel. | | | | | |
| <u>Oil Capacity</u> | 8 qts. per engine (6 qts. per engine usable) See NOTE 1 for data on system oil. | | | | | |
| <u>Control Surface Movements</u> | Ailerons | (±2°) | Up | 30° | Down | 15° |
| | Stabilator | | Up | 12.5° (+0, -1°) | Down | 7.5° (±1°) |
| | Rudder | (±1°) | Left | 35° | Right | 35° |
| | Stabilator Trim | (±1°) | Down | 10.5° | Up | 6.5° |
| | Tab (Stabilator neutral) | | | | | |
| | Wing Flaps | (±2°) | Up | 0° | Down | 40° |
| | Rudder Trim | | | | | |
| | Tab | (±1°) | Left | 17° | Right | 22° |
| | (Rudder neutral) | | | | | |
| | Nose Wheel | S/N 34-E4, 34-7250001 through 34-7350353: | | | | |
| | Travel | (±1°) | Left | 21° | Right | 21° |
| | Nose Wheel | S/N 34-7450001 through 34-7450220: | | | | |
| | Travel | (±1°) | Left | 27° | Right | 27° |
| <u>Manufacturer's Serial Number</u> | 34-E4, 34-7250001 through 34-7450220 (See NOTE 7). | | | | | |

II. - Model PA-34-200T (Seneca II), 7 PCLM (Normal Category), Approved July 18, 1974.

Same as Model PA-34-200 series except engine installation, maximum gross weight, and other minor changes.

| | | | | | | |
|---------------------------------------|---|--|--|--|--|--|
| <u>Engines</u> | 1 Teledyne Continental TSIO-360-E or TSIO-360-EB (left engine), 1 Teledyne Continental LTSIO-360-E or LTSIO-360-EB (right engine). | | | | | |
| <u>Fuel</u> | 100/130 minimum grade aviation gasoline | | | | | |
| <u>Engine Limits</u> | For all operations, 2575 r.p.m. and 40" Hg. Manifold pressure, 200 hp @ S.L. and 215 hp @ 12,000 ft. | | | | | |
| <u>Propeller and Propeller Limits</u> | <u>Left engine</u> | | | | | |
| | 1 Hartzell, Hub Model BHC-C2YF-2 ()F (See NOTE 10) or BHC-C2YF-2 ()UF; Blade Model FC8459-8R or FC8459B-8R. | | | | | |
| | <u>Right engine</u> | | | | | |
| | 1 Hartzell, Hub Model BHC-C2YF-2 ()L ()F (See NOTE 10) or BHC-C2YF-2 ()L ()UF; Blade Model FJC8459-8R or FJC8459B-8R. | | | | | |
| | Pitch setting at 30" station: | | | | | |
| | Hub Serial Numbers prior to AN3943: | | | | | |
| | High 79.3° ± 2.0°, Low 14.4° ± 0.2° or High 80.0° to 81.5°, Low 14.4° ± 0.2°. | | | | | |
| | Hub Serial Numbers AN3943 and subsequent: | | | | | |
| | High 80.0° to 81.5°, Low 14.4° ± 0.2°. | | | | | |
| | Diameter: Not over 76", not under 75". No further reduction permitted. | | | | | |
| | Spinner: Piper P/N 37138-0 Spinner Assembly (left hand), Piper P/N 37138-1 Spinner Assembly (right hand) (See NOTE 4). | | | | | |

Propeller and Propeller Limits
(continued)**Governor Assembly:**

1 Woodward hydraulic governor, Model C210659 (left),
 1 Woodward hydraulic governor, Model 210658 (right); or
 1 Hartzell hydraulic governor, Model E-3 (left) and
 1 Hartzell hydraulic governor, Model E-3L (right); or
 1 Hartzell hydraulic governor, Model E-8L (right)
 (E-8L Governor used with Synchrophaser).

Avoid continuous operation between 2000 and 2200 r.p.m. with engine manifold pressure above 32" Hg.

Avoid continuous ground operation in cross and tail winds over 10 knots between 1700 and 2100 r.p.m..

S/N 34-7970001 through 34-8170092:

Left Engine

1 McCauley, Hub Model 3AF34C502, Blade Model 80 HA-4

Right Engine

1 McCauley, Hub Model 3AF34C503, Blade Model L80 HA-4

Pitch setting: High 81.0° to 83.5°, Low 12.0° ± .2° at 30" station.

Diameter: Not over 76", not under 75".
 No further reduction permitted.

Spinner: Piper P/N PS50077-49 Spinner Assembly See NOTE 4.

Governor Assembly:

1 Woodward hydraulic governor, Model C210659 (left),
 1 Woodward hydraulic governor, Model 210658 (right);
 1 Hartzell hydraulic governor, Model E-3 (left),
 1 Hartzell hydraulic governor, Model E-3L (right); or
 1 Hartzell hydraulic governor, Model E-8L (right)
 (E-8L Governor used with Synchrophasers).

Synchrophaser for S/N 34-7970001 through 34-8170092:
 Piper Drawing No. 36890 Synchrophaser Installation

Airspeed Limits

| | | |
|---|------------|-------------|
| V _{NE} (Never exceed) | 224 m.p.h. | (195 knots) |
| V _{NO} (Maximum structural cruise) | 190 m.p.h. | (165 knots) |
| V _A (Maneuvering) | 140 m.p.h. | (122 knots) |
| V _{FE} (Flaps extended) | 125 m.p.h. | (109 knots) |
| V _{LO} (Landing gear operating) | | |
| Extension | 150 m.p.h. | (130 knots) |
| Retract | 125 m.p.h. | (109 knots) |
| V _{LE} (Landing gear extended) | 150 m.p.h. | (130 knots) |
| V _{MC} (Minimum control speed) | 80 m.p.h. | (69 knots) |

C.G. Range (Gear Extended)

(+90.6) to (+94.6) at 4570 lb.
 (+82.0) to (+94.6) at 3400 lb.
 Straight line variation between points given.
 Moment change due to retracting landing gear (-32 in.-lb.).

Empty Weight C.G. Range

None

Maximum Weight

4570 lb. - Takeoff
 4342 lb. - Landing (All weight in excess of 4000 lb. must be fuel)
 Zero fuel weight may be increased up to a maximum of 4077.7 lb. when approved wing options are installed.
 See NOTE 11 for optional weights.

| | | | | | | |
|-------------------------------------|--|-------|------|------------------|-------|------------|
| <u>No. of Seats</u> | 7 (2 at +85.5, 3 at +118.1, 2 at +155.7) | | | | | |
| | 7 (2 at +85.5, 3 at +118.1, 2 at +157.6) | | | | | |
| | 6 (2 at +85.5, *2 at +119.1, 2 at +157.6) | | | | | |
| | * - Optional <u>Club Seats</u> | | | | | |
| <u>Maximum Baggage</u> | 200 lb. (100 lb. at +22.5, 100 lb. at +178) | | | | | |
| <u>Fuel Capacity</u> | 98 gallons (2 wing tanks) at (+93.6) (93 gallons usable) | | | | | |
| | * 128 gallons (2 wing tanks) at (+93.6) (123 gallons usable) | | | | | |
| | * - Optional for S/N 34-7570001, 34-7670114 through 34-8170092. See NOTE 1 for data on system fuel. | | | | | |
| <u>Oil Capacity</u> | 8 qts. per engine (5 qts. per engine usable) See NOTE 1 for data on system oil. | | | | | |
| <u>Maximum Operating Altitude</u> | 25,000 feet | | | | | |
| <u>Control Surface Movements</u> | Ailerons | (±2°) | Up | 35° | Down | 20° |
| | Stabilator | | Up | 12.5° (+0°, -1°) | Down | 7.5° (±1°) |
| | Rudder | (±1°) | Left | 35° | Right | 35° |
| | Stabilator Trim | (±1°) | Down | 10.5° | Up | 6.5° |
| | Tab (Stabilator neutral) | | | | | |
| | Wing Flaps | (±2°) | Up | 0° | Down | 40° |
| | Rudder Trim | | | | | |
| | Tab | (±1°) | Left | 25° | Right | 25° |
| | (Rudder neutral) | | | | | |
| | Nose Wheel | | | | | |
| | Travel | (±1°) | Left | 27° | Right | 27° |
| <u>Manufacturer's Serial Number</u> | 34-7570001 through 34-8170092 (See NOTE 7). | | | | | |

IIIA. - Model PA-34-220T (Seneca III), 7 PCLM (Normal Category), Approved December 17, 1980.

Same as model PA-34-200T series except engines, windshield, instrument panel, landing gear, maximum gross weight and other minor changes.

| | |
|---------------------------------------|--|
| <u>Engines</u> | 1 Teledyne Continental TSIO-360-KB (left engine), 1 Teledyne Continental LTSIO-360-KB (right engine). |
| <u>Fuel</u> | 100/100LL minimum grade aviation gasoline |
| <u>Engine Limits</u> | Takeoff, 5 minutes, 2800 r.p.m. and 40" Hg. manifold pressure (220 hp) Max. Continuous, 2600 r.p.m. and 40" Hg. manifold pressure (200 hp) |
| <u>Propeller and Propeller Limits</u> | <u>Left Engine</u> 1 Hartzell, Hub Model BHC-C2YF-2 () UF, Blade Model FC8459-8R. <u>Right Engine</u> 1 Hartzell, Hub Model BHC-C2YF-2 ()L ()UF, Blade Model FJC8459-8R. Pitch setting: High 80.0° to 81.5°, Low 12.6° ± 0.2° at 30" station. Diameter: Not over 76", not under 75". No further reduction permitted. Spinner: Piper P/N 37138-0 assembly (left hand), Piper P/N 37138-1 assembly (right hand). See NOTE 4. |

Propeller and Propeller Limits

(cont'd)

Governor Assembly:

1 Hartzell hydraulic governor; Model E-3-7 (left),
 1 Hartzell hydraulic governor; Model E-3-7L (right); or
 1 Hartzell hydraulic governor; Model E-8-7L (14V) or E-8-8L (28V) (right)
 with Synchrophaser Installation, Piper Drawing 36890 or 87719.

Avoid continuous ground operation in cross and tail winds of over 10 knots
 between 1700 and 2100 r.p.m.

Avoid continuous operation between 2000 and 2200 r.p.m. with manifold pressure
 above 32" Hg.

Left Engine

1 McCauley, Hub Model 3AF32C508, Blade Model 82NFA-6,

Right Engine

1 McCauley, Hub Model 3AF32C509, Blade Model L82NFA-6.

Pitch setting: High 81.0° to 83.5°, Low 11.0° ± 0.2° at 30" station.

Diameter: Not over 76", not under 75".
 No further reduction permitted.

Spinner: Piper P/N PS50077-49 or P/N PS50077-78 Assembly
 See NOTE 4.

Governor Assembly:

1 Hartzell hydraulic governor; Model E-3-7 (left),
 1 Hartzell hydraulic governor; Model E-3-7L (right); or
 1 Hartzell hydraulic governor; Model E-8-7L (14V) or E-8-8L (28V) (right) with
 Synchrophaser Installation, Piper Drawing No. 36890 or 87719.

Airspeed Limits (IAS)

| | |
|---|-----------|
| V _{NE} (Never exceed) | 205 knots |
| V _{NO} (Maximum structural cruise) | 166 knots |
| V _A (Maneuvering) at 4750 lb. | 140 knots |
| V _{FE} (Flaps extended) | 115 knots |
| V _{LO} (Landing gear retracting) | 108 knots |
| V _{LO} (Landing gear extending) | 130 knots |
| V _{LE} (Landing gear extended) | 130 knots |
| V _{MC} (Minimum control speed) | 66 knots |

C.G. Range (Gear Extended)

(+90.6) to (+94.6) at 4750 lb.
 (+86.7) to (+94.6) at 4250 lb.
 (+82.0) to (+94.6) at 3400 lb.
 Straight line variation between points given.
 Moment change due to retracting landing gear (-32 in.-lb.)

Empty Weight C.G. Range

None

Maximum Weight

4773 lb. - Ramp
 4750 lb. - Takeoff
 4513 lb. - Landing
 4470 lb. - Zero Fuel
 See NOTE 12 for optional weights.

No. of Seats

7 (2 at +85.5, 3 at +118.1, 2 at +157.6)
 6 (2 at +85.5, *2 at +119.1, 2 at +157.6)
 * - Optional Club Seats

Maximum Baggage

200 lb. (100 lb. at +22.5, 100 lb. at +178.7)

Fuel Capacity

98 gallons (2 wing tanks) at (+93.6) (93 gallons usable)
 * 128 gallons (2 wing tanks) at (+93.6) (123 gallons usable)
 * - Optional installation
 See NOTE 1 for data on system fuel.

Oil Capacity

8 qts. per engine (5 qts. per engine usable)
 See NOTE 1 for data on system oil.

Maximum Operating Altitude

25,000 feet

Control Surface Movements

| | | | | | |
|-----------------------------|-------|------|------------------|-------|------------|
| Ailerons | (±2°) | Up | 35° | Down | 20° |
| Stabilator | | Up | 12.5° (+0°, -1°) | Down | 7.5° (±1°) |
| Rudder | (±1°) | Left | 35° | Right | 35° |
| Stabilator Trim | (±1°) | Down | 10.5° | Up | 6.5° |
| Tab (Stabilator neutral) | | | | | |
| Wing Flaps | (±2°) | Up | 0° | Down | 40° |
| Rudder Trim | | | | | |
| Tab (Rudder neutral) | (±1°) | Left | 25° | Right | 25° |
| Nose Wheel | | | | | |
| Travel | (±1°) | Left | 27° | Right | 27° |

Manufacturer's Serial Number

34-8133001 through 34-8633031 (14V); 3433001 through 3433064; and 3448001 through 3448037 (28V) (See NOTE 7).

IIIB. - Model PA-34-220T (Seneca IV), 6 PCLM (Normal Category), Approved November 17, 1993.

Same as Model PA-34-220T (Seneca III) except nose bowl assembly, instrument panel, interior and other minor changes.

Engines

1 Teledyne Continental TSIO-360-KB (left engine),
 1 Teledyne Continental LTSIO-360-KB (right engine).

Fuel

100/100LL minimum grade aviation gasoline

Engine Limits

Takeoff, 5 minutes, 2800 r.p.m. and 40" Hg. manifold pressure (220 hp)
 Max. Continuous, 2600 r.p.m. and 40" Hg. manifold pressure (200 hp)

Propeller and Propeller LimitsLeft Engine

1 Hartzell, Hub Model BHC-C2YF-2 () UF, Blade Model FC8459-8R.

Right Engine

1 Hartzell, Hub Model BHC-C2YF-2 () L () UF, Blade Model FJC8459-8R.

Pitch setting: High 80.0° to 81.5°, Low 12.6° ± 0.2° at 30 " station.

Diameter: Not over 76", not under 75".

No further reduction permitted.

Spinner: Piper P/N 37138-0 Assembly (left hand),

Piper P/N 37138-1 Assembly (right hand).

Governor Assembly:

1 Hartzell hydraulic governor; Model E-3-7 (left),

1 Hartzell hydraulic governor; Model E-3-7L (right); or

1 Hartzell hydraulic governor; Model E-8-8L (right) with Synchrophaser
 Installation, Piper Drawing No. 87719.

Avoid continuous ground operation in cross and tail winds between 1700 and 2100 r.p.m..

Avoid continuous operation between 2000 and 2200 r.p.m. with manifold pressure above 32" Hg.

Propeller and Propeller Limits
(cont'd)Left Engine

1 McCauley, Hub Model 3AF32C508, Blade Model 82NFA-6.

Right Engine

1 McCauley, Hub Model 3AF32C509, Blade Model L82NFA-6.

Pitch setting: High 81.0° to 83.5°, Low 11.0° ± 0.2° at 30" station.

Diameter: Not over 76", not under 75".

No further reduction permitted.

Spinner: Piper P/N PS50077-78 Assembly

Governor Assembly:

1 Hartzell hydraulic governor; Model E-3-7 (left),

1 Hartzell hydraulic governor; Model E-3-7L (right); or

1 Hartzell hydraulic governor; Model E-8-8L (right) with Synchrophaser

Installation, Piper Drawing No. 87719.

Airspeed Limits (IAS)

| | |
|---|-----------|
| V _{NE} (Never exceed) | 205 knots |
| V _{NO} (Maximum structural cruise) | 166 knots |
| V _A (Maneuvering) at 4750 lb. | 140 knots |
| V _{FE} (Flaps extended) | 115 knots |
| V _{LO} (Landing gear retracting) | 108 knots |
| V _{LO} (Landing gear extending) | 130 knots |
| V _{LE} (Landing gear extended) | 130 knots |
| V _{MC} (Minimum control speed) | 66 knots |

C.G. Range (Gear Extended)

(+90.6) to (+94.6) at 4750 lb.

(+86.7) to (+94.6) at 4250 lb.

(+82.0) to (+94.6) at 3400 lb.

Straight line variation between points given.

Moment change due to retracting landing gear (-32 in.-lb.)

Emptv Weight C.G. Range

None

Maximum Weight

4773 lb. - Ramp

4750 lb. - Takeoff

4513 lb. - Landing

4470 lb. - Zero Fuel

See NOTE 12 for optional weights.

No. of Seats

6 (2 at +85.5, 2 at +119.1, 2 at +157.6)

Maximum Baggage

200 lb. (100 lb. at +22.5, 100 lb. at +178.7)

Fuel Capacity

128 gallons (2 wing tanks) at (+93.6) (123 gallons usable)

See NOTE 1 for data on system fuel.

Oil Capacity

8 qts. per engine (5 qts. per engine usable)

See NOTE 1 for data on system oil.

Maximum Operating Altitude

25,000 feet

Control Surface Movements

| | | | | | |
|-----------------------------|-------|------|------------------|-------|------------|
| Ailerons | (±2°) | Up | 35° | Down | 20° |
| Stabilator | | Up | 12.5° (+0°, -1°) | Down | 7.5° (±1°) |
| Rudder | (±1°) | Left | 35° | Right | 35° |
| Stabilator Trim | (±1°) | Down | 10.5° | Up | 6.5° |
| Tab (Stabilator neutral) | | | | | |
| Wing Flaps | (±2°) | Up | 0° | Down | 40° |
| Rudder Trim | | | | | |
| Tab | (±1°) | Left | 25° | Right | 25° |
| (Rudder neutral) | | | | | |
| Nose Wheel | | | | | |
| Travel | (±1°) | Left | 27° | Right | 27° |

Manufacturer's Serial Number

3448038 through 3448079, and 3447001 through 3447029.

IIIC. - Model PA-34-220T (Seneca V), 6 PCLM (Normal Category), Approved December 11, 1996.

Same as Model PA-34-220T (Seneca IV) except engine installation, instrument panel, interior and other minor changes.

Engines

1 Teledyne Continental TSIO-360-RB (left engine),
 1 Teledyne Continental LTSIO-360-RB (right engine).

Fuel

100/100LL minimum grade aviation gasoline

Engine Limits

Takeoff and Maximum Continuous Operation, 2600 r.p.m. and 38" Hg. manifold pressure (220 hp)

Propeller and Propeller LimitsLeft Engine

1 Hartzell, Hub Model BHC-J2YF-2CUF, Blade Model FC8459(B)-8R.

Right Engine

1 Hartzell, Hub Model BHC-J2YF-2CLUF, Blade Model FJC8459(B)-8R.

Pitch setting: High 80.0° to 81.5°, Low 14.6° ± 0.2° at 30" station.

Diameter: Not over 76", not under 75".

No further reduction permitted.

Spinner: Piper P/N 37138-6 Assembly (left hand),
 Piper P/N 37138-7 Assembly (right hand).

Governor Assembly:

1 Hartzell hydraulic governor; Model E-3-9 (left),

1 Hartzell hydraulic governor; Model E-3-9L (right); or

1 Hartzell hydraulic governor; Model E-8-9L (right) with Synchrophaser Installation.

Avoid continuous ground operation in cross and tail winds between 1600 and 2100 r.p.m..

Avoid continuous operation between 1900 and 2100 r.p.m. with manifold pressure above 32" Hg.

| | | | | | | | | | | | | | | | | | |
|--|---|-------------------------|-----------|--------------------------------------|-----------|---------------------------------|-----------|---------------------------|-----------|------------------------------------|-----------|-----------------------------------|-----------|----------------------------------|-----------|----------------------------------|----------|
| <u>Propeller and Propeller Limits</u> (continued) | <u>Left Engine</u> 1 McCauley, Hub Model 3AF32C522, Blade Model 82NJA-6. <u>Right Engine</u> 1 McCauley, Hub Model 3AF32C523, Blade Model L82NJA-6. Pitch setting: Feather $82.1^{\circ} \pm 0.5^{\circ}$, Low $12.6^{\circ} \pm 0.2^{\circ}$ at 30" station. Diameter: Not over 76", not under 75". No further reduction permitted. Spinner: Piper P/N 100738-2 Assembly Governor Assembly: 1 Hartzell hydraulic governor; Model E-3-9 (left), 1 Hartzell hydraulic governor; Model E-3-9L (right); or 1 Hartzell hydraulic governor; Model E-8-9L (right) with Synchrophaser Installation. | | | | | | | | | | | | | | | | |
| <u>Airspeed Limits (IAS)</u> | <table> <tr><td>V_{NE} (Never exceed)</td><td>204 knots</td></tr> <tr><td>V_{NO} (Maximum structural cruise)</td><td>164 knots</td></tr> <tr><td>V_A (Maneuvering) at 4750 lb.</td><td>139 knots</td></tr> <tr><td>V_{FE} (Flaps extended)</td><td>113 knots</td></tr> <tr><td>V_{LO} (Landing gear retracting)</td><td>107 knots</td></tr> <tr><td>V_{LO} (Landing gear extending)</td><td>128 knots</td></tr> <tr><td>V_{LE} (Landing gear extended)</td><td>128 knots</td></tr> <tr><td>V_{MC} (Minimum control speed)</td><td>66 knots</td></tr> </table> | V_{NE} (Never exceed) | 204 knots | V_{NO} (Maximum structural cruise) | 164 knots | V_A (Maneuvering) at 4750 lb. | 139 knots | V_{FE} (Flaps extended) | 113 knots | V_{LO} (Landing gear retracting) | 107 knots | V_{LO} (Landing gear extending) | 128 knots | V_{LE} (Landing gear extended) | 128 knots | V_{MC} (Minimum control speed) | 66 knots |
| V_{NE} (Never exceed) | 204 knots | | | | | | | | | | | | | | | | |
| V_{NO} (Maximum structural cruise) | 164 knots | | | | | | | | | | | | | | | | |
| V_A (Maneuvering) at 4750 lb. | 139 knots | | | | | | | | | | | | | | | | |
| V_{FE} (Flaps extended) | 113 knots | | | | | | | | | | | | | | | | |
| V_{LO} (Landing gear retracting) | 107 knots | | | | | | | | | | | | | | | | |
| V_{LO} (Landing gear extending) | 128 knots | | | | | | | | | | | | | | | | |
| V_{LE} (Landing gear extended) | 128 knots | | | | | | | | | | | | | | | | |
| V_{MC} (Minimum control speed) | 66 knots | | | | | | | | | | | | | | | | |
| <u>C.G. Range (Gear Extended)</u> | (+90.6) to (+94.6) at 4750 lb. (+86.7) to (+94.6) at 4250 lb. (+82.0) to (+94.6) at 3400 lb. Straight line variation between points given. Moment change due to retracting landing gear (-32 in.-lb.) | | | | | | | | | | | | | | | | |
| <u>Empty Weight C.G. Range</u> | None | | | | | | | | | | | | | | | | |
| <u>Maximum Weight</u> | 4773 lb. - Ramp 4750 lb. - Takeoff 4513 lb. - Landing 4479 lb. - Zero Fuel See NOTE 12 for optional weights. | | | | | | | | | | | | | | | | |
| <u>No. of Seats</u> | 6 (2 at +85.5, 2 at +119.1, 2 at +157.6) | | | | | | | | | | | | | | | | |
| <u>Maximum Baggage</u> | 185 lb. (100 lb. at +22.5, 85 lb. at +178.7) | | | | | | | | | | | | | | | | |
| <u>Fuel Capacity</u> | 128 gallons (2 wing tanks) at (+93.6) (122 gallons usable) See NOTE 1 for data on system fuel. | | | | | | | | | | | | | | | | |
| <u>Oil Capacity</u> | 8 qts. per engine (5 qts. per engine usable) See NOTE 1 for data on system oil. | | | | | | | | | | | | | | | | |
| <u>Maximum Operating Altitude</u> | 25,000 feet | | | | | | | | | | | | | | | | |

Control Surface Movements

| | | | | | |
|-----------------------------|-------------------|------|----------------------|-------|------------------------|
| Ailerons | ($\pm 2^\circ$) | Up | 35° | Down | 20° |
| Stabilator | | Up | 12.5° (+0°, -1°) | Down | 7.5° ($\pm 1^\circ$) |
| Rudder | ($\pm 1^\circ$) | Left | 35° | Right | 35° |
| Stabilator Trim | ($\pm 1^\circ$) | Down | 10.5° | Up | 6.5° |
| Tab (Stabilator neutral) | | | | | |
| Wing Flaps | | Up | 0° ($\pm 1^\circ$) | Down | 40° ($\pm 2^\circ$) |
| Rudder Trim | | | | | |
| Tab (Rudder neutral) | ($\pm 1^\circ$) | Left | 26° | Right | 26° |
| Nose Wheel | | | | | |
| Travel | ($\pm 1^\circ$) | Left | 27° | Right | 27° |

Manufacturer's Serial Number

3449001 and up.

DATA PERTINENT TO ALL MODELSDatum

78.4" forward of wing leading edge from the inboard edge of the inboard fuel tank.

Leveling Means

Two screws left side fuselage below window.

Certification Basis

Type Certificate No. A7SO issued May 7, 1971, obtained by the manufacturer under the delegation option authorization.
 Date of Type Certificate application July 23, 1968.

Model PA-34-200:

FAR 23 as amended by Amendment 23-6 effective August 1, 1967; FAR 23.959 as amended by Amendment 23-7 effective September 14, 1969; and FAR 23.1557(c)(1) as amended by Amendment 23-18 effective May 2, 1977. Compliance with FAR 23.1419 as amended by Amendment 23-14 effective December 20, 1973, has been established with optional ice protection provisions.

Model PA-34-200T:

FAR 23 as amended by Amendment 23-6 effective August 1, 1967; FAR 23.901, 23.909, 23.959, 23.1041, 23.1043, 23.1047, 23.1143, 23.1305(b)(c)(h)(p) and 23.1527(b) as amended by Amendment 23-7 effective September 14, 1969; and FAR 23.1557(c)(1) as amended by Amendment 23-18 effective May 2, 1977.

Model PA-34-220T (Seneca III and IV):

FAR 23 as amended by Amendment 23-6 effective August 1, 1967; FAR 23.207, 23.901, 23.909, 23.959, 23.1041, 23.1043, 23.1047, 23.1143, 23.1305(b)(c)(h)(p) and 23.1527 as amended by Amendment 23-7 effective September 14, 1969; FAR 23.201 and 23.203 as amended by Amendment 23-14 effective December 20, 1973; FAR 23.1557(c)(1) as amended by Amendment 23-18 effective May 2, 1977; FAR 23.175(a) and 23.1581(b)(2) as amended by Amendment 23-21 effective March 1, 1978; FAR 23.1545(a) as amended by Amendment 23-23 effective December 1, 1978; and FAR 36 through Amendment 36-9 effective January 15, 1979.

Certification Basis(continued)**Model PA-34-220T (Seneca V):**

FAR 23 as amended by Amendment 23-6 effective August 1, 1967; FAR 23.901, 23.909, 23.1041, 23.1043, 23.1047, 23.1143, 23.1305(b)(c)(h)(p) and 23.1527 as amended by Amendment 23-7 effective September 14, 1969; FAR 23.959 as amended by Amendment 23-18 effective May 2, 1977; FAR 23.175(a), 23.201, 23.203, 23.1557(c)(1) and 23.1581 as amended by Amendment 23-21 effective March 1, 1978; FAR 23.1545(a) as amended by Amendment 23-23 effective December 1, 1978; FAR 23.1529 as amended by Amendment 23-26 effective October 14, 1980; FAR 23.1322 as amended by Amendment 23-43 effective May 10, 1993; FAR 23.207 as amended by Amendment 23-45 effective September 7, 1993; Removal of FAR 23.205 per Amendment 23-50 effective March 11, 1996; FAR 23.1305(b)(4)(ii) as amended by Amendment 23-52 effective July 25, 1996; and FAR 36, Appendix G through Amendment 36-16 effective December 18, 1988.

Compliance with the requirements of FAR 23.1419 as amended by Amendment 23-14 effective December 20, 1973, and FAR 23.1441 as amended by Amendment 23-9 effective June 17, 1970, has been established with optional ice protection provisions and optional supplemental oxygen equipment, respectively.

Production Basis

Production Certificate No. 206.

Production Limitation Record issued and the manufacturer is authorized to issue an airworthiness certificate under the delegation option provisions of FAR 21.

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 items of equipment are required:

| <u>MODEL</u> | <u>AFM/POH</u> | <u>REPORT NO.</u> | <u>APPROVED</u> | <u>SERIAL EFFECTIVITY</u> |
|---------------------------|-----------------------|--------------------------|------------------------|---|
| PA-34-200 (Seneca) | AFM | VB-353 | 7/2/71 | 34-E4, 34-7250001 through 34-7250214 |
| | AFM | VB-423 | 5/20/72 | 34-7250001 through 34-7250189 when Piper Kit 760-607 is installed; 34-7250190 through 34-7250214 when Piper Kit 760-611 is installed; and 34-7250215 through 34-7350353 |
| | AFM | VB-563 | 5/14/73 | 34-7450001 through 34-7450220 |
| | AFM Supp. | VB-588 | 7/20/73 | 34-7250001 through 34-7450039 when propeller with dampers are installed |
| | AFM Supp. | VB-601 | 11/9/73 | 34-7250001 through 34-745017 when ice protection system is installed |
| PA-34-200T (Seneca II) | AFM | VB-628 | 7/18/74 | 34-7570001 through 34-7670371 |
| | POH | VB-850 | 8/23/76 | 34-7770001 through 34-8170092 |
| | POH | VB-1140 | 6/30/80 | 34-7770001 through 34-8170092 when Piper Kit 764-048V is installed |
| | AFM | VB-1245 | 3/9/84 | 34-7570001 through 34-7670371 when Piper Kit 765-110 is installed |

| <u>MODEL</u> | <u>AFM/POH</u> | <u>REPORT NO.</u> | <u>APPROVED</u> | <u>SERIAL EFFECTIVITY</u> |
|----------------------------|-----------------------|--------------------------|------------------------|---|
| PA-34-220T (Seneca III) | POH | VB-1110 | 1/8/81 | 34-8133001 through 34-8633031, and 3433001 through 3433064 |
| | POH | VB-1150 | 2/20/81 | 34-8133001 through 34-8633031, and 3433001 through 3433064 when Piper Kit 764-099V is installed |
| | POH | VB-1257 | 10/20/89 | 3448001 through 3448037 |
| | POH | VB-1259 | 11/20/89 | 3448001 through 3448037 when Piper Kit 766-203 is installed |
| PA-34-220T | POH | VB-1556 | 11/5/93 | 3448038 through 3448079 |
| (Seneca IV) | POH | VB-1558 | 12/6/93 | 3448038 through 3448079 when Piper Kit 766-283 is installed |
| | POH | VB-1615 | 7/12/95 | 3447001 through 3447029 |
| | POH | VB-1620 | 7/12/95 | 3447001 through 3447029 when Piper Kit 766-608 is installed |
| PA-34-220T | POH | VB-1638 | 12/6/96 | 3449001 and up |
| (Seneca V) | POH | VB-1649 | 1/23/97 | 3449001 and up when Piper Kit 766-632 is installed |

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 certificated empty weight and corresponding center of gravity locations must include undrainable system oil (not included in oil capacity) and unusable fuel as noted below:

Fuel: 30.0 lb. at (+103.0) for PA-34 series, except Model PA-34-220T (Seneca V), S/N 3449001 and up
 Fuel: 36.0 lb. at (+103.0) for Model PA-34-220T (Seneca V), S/N 3449001 and up
 Oil: 6.2 lb. at (+ 39.6) for Model PA-34-200
 Oil: 12.0 lb. at (+ 43.7) for Models PA-34-200T and PA-34-220T

NOTE 2

All placards required in the approved Airplane Flight Manual or Pilot's Operating Handbook and approved Airplane Flight Manual of Pilot's Operating Handbook supplements must be installed in the appropriate location.

NOTE 3

The Model PA-34-200; S/N 34-E4, 34-7250001 through 34-7250189, may be operated at a maximum takeoff weight of 4200 lb. when Piper Kit 760-607 is installed. S/N 34-7250190 through 34-7250214 may be operated at a maximum takeoff weight of 4200 lb. when Piper Kit 760-611 is installed.

NOTE 4

The Model PA-34-200; S/N 34-E4, 34-7250001 through 34-7250189, may be operated without spinner domes or without spinner domes and rear bulkheads when Piper Kit 760-607 has been installed. S/N 34-7250190 through 34-7250214 may be operated without spinner domes or without spinner domes and rear bulkhead when Piper Kit 760-611 has been installed. The Model PA-34-200; S/N 34-7250215 through 34-7450220, and the Model PA-34-200T; S/N 34-7570001 through 34-8170092, may be operated without spinner domes or without spinner domes and rear bulkheads.

The Model PA-34-200T; S/N 34-7970001 through 34-8170092, equipped with McCauley three-bladed propellers, may be operated with spinner dome and rear bulkhead removed.

The Model PA-34-220T; S/N 34-8133001 through 34-8633031, 3433001 through 3433064, and 3448001 through 3448037, with two-bladed Hartzell propellers may be operated without spinner domes or without spinner domes and rear bulkheads. With three-bladed McCauley propellers, this model may be operated without spinner dome and rear bulkhead.

NOTE 5

The Model PA-34-200 may be operated in known icing conditions when equipped with spinner assembly and the following kits:

(a) S/N 34-E4, 34-7250001 through 34-7250189: Piper Kit 760-781V and Piper Kit 760-607

(See NOTE 3).

(b) S/N 34-7250190 through 34-7250214: Piper Kit 760-781V and Piper Kit 760-611

(See NOTE 3).

(c) S/N 34-7250215 through 34-7450220: Piper Kit 760-781V.

NOTE 6

Model PA-34-200T; S/N 34-7570001 through 34-8170092, may be operated in known icing conditions when equipped with deicing equipment installed per Piper Drawing No. 37700 and spinner assembly.

NOTE 7

The following serial numbers are not eligible for import certification to the U.S.:

PA-34-200:

34-7350283, 34-7350299, 34-7350300, and 34-7450187.

PA-34-200T:

34-7570074, 34-7570136, 34-7570193, 34-7570292, 34-7670045, 34-7670071, 34-7670072, 34-7670168, 34-7670261, 34-7670312, 34-7770037, 34-7770137, 34-7770206, 34-7770288, 34-7770316, 34-7770357, 34-7770367, 34-7770368, 34-7770406, 34-7870069, 34-7870098, 34-7870133, 34-7870157, 34-7870171, 34-7870172, 34-7870173, 34-7870174, 34-7870212, 34-7870213, 34-7870214, 34-7870215, 34-7870216, 34-7870217, 34-7870252, 34-7870257, 34-7870258, 34-7870313, 34-7870314, 34-7870367, 34-7870368, 34-7870369, 34-7870410, 34-7870411, 34-7870443, 34-7870444, 34-7870445, 34-7870446, 34-7870473, 34-7870474, 34-7970021, 34-7970051, 34-7970052, 34-7970087, 34-7970088, 34-7970131, 34-7970132, 34-7970133, 34-7970205, 34-7970206, 34-7970207, 34-7970374, 34-7970375, 34-7970376, 34-7970472, 34-7970473, 34-7970474, 34-7970475, 34-7970512, 34-7970513, 34-7970514, 34-8070045, 34-8070096, 34-8070097, 34-8070098, 34-8070099, 34-8070132, 34-8070202, 34-8070203, 34-8070204, 34-8070205, 34-8070276, 34-8070277, 34-8070278, 34-8070279, 34-8070280, 34-8070298, 34-8070299, 34-8070300, 34-8070301, 34-8170012, 34-8170013, 34-8170014, and 34-8170015.

PA-34-220T:

34-8133039, 34-8133083, 34-8133125, 34-8133126, 34-8133127, 34-8133128, 34-8133129, 34-8133169, 34-8133208, 34-8133209, 34-8133210, 34-8133211, 34-8133212, 34-8133240, 34-8133241, 34-8133242, 34-8133243, 34-8133244, 34-8133261, 34-8133262, 34-8133263, 34-8133264, 34-8233129, 34-8233130, 34-8233131, 34-8233132, 34-8233158, 34-8233159, 34-8233160, 34-8233161, 34-8233196, 34-8233197, 34-8233198, 34-8233199, 34-8333014, 34-8333015, 34-8333016, 34-8333017, 34-8333034, 34-8333035, 34-8333036, 34-8333037, 34-8333081, 34-8333082, 34-8333083, 34-8333084, 34-8333121, 34-8333122, 34-8333123, 34-8333124, 34-8433010, 34-8433011, 34-8433012, 34-8433013, 34-8433042, 34-8433043, 34-8433044, 34-8433045, 34-8433084, 34-8433088, 34-8533014, 34-8533015, 34-8533016, 34-8533017, 34-8633018, 3433013, 3433014, 3433015, 3433026, 3433027, 3433028, 3433039, 3433040, 3433053, 3433054, 3433055, and 3433056.

- NOTE 8** Model PA-34-200; S/N 34-E4, S/N 34-7250001 through 34-7450220, and Model PA-34-200T; S/N 34-7570001 through 34-8170092, and Model PA-34-220T may be operated subject to the limitations listed in the Airplane Flight Manual or Pilot's Operating Handbook with rear cabin and cargo door removed.
- NOTE 9** In the following serial numbered aircraft, rear seat location is farther aft as shown and the center seats may be removed and replaced by CLUB SEAT INSTALLATION, which has a more aft C.G. location as shown in "No. of Seats," above:
- PA-34-200T: S/N 34-7770001 through 34-8170092.
- NOTE 10** These propellers are eligible on Teledyne Continental L/TSIO-360-E only.
- NOTE 11** With Piper Kit 764-048V installed weights are as follows:
 4407 lb. - Takeoff
 4342 lb. - Landing (All weight in excess of 4000 lb. must be fuel)
 Zero fuel weight may be increased to a maximum of 4077.7 lb. when approved wing options are installed (See POH VB-1140).
- NOTE 12** With Piper Kit 764-099V installed, weights are as follows:
 4430 lb. - Ramp
 4407 lb. - Takeoff, Landing, and Zero Fuel (See POH VB-1150).
- NOTE 13** With Piper Kit 766-203 installed, weights are as follows:
 4430 lb. - Ramp
 4407 lb. - Takeoff, Landing and Zero Fuel (See POH VB-1259).
- NOTE 14** With Piper Kit 766-283 installed, weights are as follows:
 4430 lb. - Ramp
 4407 lb. - Takeoff, Landing and Zero Fuel (See POH VB-1558).
- NOTE 15** With Piper Kit 766-608 installed, weights are as follows:
 4430 lb. - Ramp
 4407 lb. - Takeoff, Landing and Zero Fuel (See POH VB-1620).
- NOTE 16** With Piper Kit 766-632 installed, weights are as follows:
 4430 lb. - Ramp
 4407 lb. - Takeoff, Landing and Zero Fuel (See POH VB-1649).
- NOTE 17** The bolt and stack-up that connect the upper drag link to the nose gear trunnion are required to be replaced every 500 hours time-in-service. The part numbers are as follows:
1. Piper P/N 400 274 (AN7-35) bolt;
 2. Piper P/N 407 591 (AN960-716L) washer, as applicable;
 3. Piper P/N 407 568 (AN 960-716) washer, as applicable;
 4. Piper P/N 404 396 (AN 320-7) nut; and
 5. Piper P/N 424 085 cotter pin.

---END---

A11EA
Revision 9
American General
Aircraft Holding Co.
AA-1
AA-1A
AA-1B
AA-1C

June 7, 1995

TYPE CERTIFICATE DATA SHEET NO. A11EA

This data sheet, which is a part of Type Certificate No. A11EA, prescribes conditions and limitations under which the product for which the Type Certificate was issued meets the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder American General Aircraft Holding Co., Inc.
2900 One Liberty Place
1650 Market. St.
Philadelphia, PA 19103

I. - Model AA-1, Yankee. 2 PCLM. Utility Category, Approved August 29, 1967, Normal Category Approved July 16, 1968.

| | | | |
|--------------------------------|---|--------------------------------|------------------------|
| Engine | Lycoming O-235-C2C (Carburetor Setting 10-4953 or 10-3103-1) | | |
| Fuel | 80/87 minimum grade aviation gasoline | | |
| Engine limits | For all operations 2600 r.p.m. (108 h.p.) | | |
| Propeller and propeller limits | <ol style="list-style-type: none"> 1. McCauley Model 1A105/SCM-7157 fixed pitch propeller. Static r.p.m. at maximum permissible throttle setting; not over 2300; not under 2150. Diameters: not over 71 inches, not under 69.5 inches. 2. McCauley Model 1A105/SCM-7153 and 1A105/SCM-7154 fixed pitch propellers. Static r.p.m. at maximum permissible throttle setting; not over 2400; not under 2250. Diameter: not over 71 inches, not under 69.5 inches. 3. McCauley Model 1A106/NCM-7157 fixed pitch propellers. Static r.p.m. at maximum permissible throttle setting; not over 2400; not under 2300. Diameter: not over 71 inches, not under 69.5 inches. 4. McCauley Model 1A106/NCM-7153 hub and fixed pitch propellers. Static r.p.m. at maximum permissible throttle setting; not over 2475; not under 2375. Diameter: not over 71 inches, not under 69.5 inches. | | |
| Airspeed limits (CAS) | V _{ne} | Never exceed | 195 m.p.h. (169 knots) |
| | V _{no} | Maximum structural cruising | 144 m.p.h. (125 knots) |
| | V _a | Maneuvering (Utility Category) | 132 m.p.h. (115 knots) |
| | V _a | Maneuvering (Normal Category) | 125 m.p.h. (109 knots) |
| | V _{fe} | Flaps extended | 100 m.p.h. (87 knots) |
| | | Canopy half open | 130 m.p.h. (113 knots) |

| | | | | | | | | |
|----------|---|---|---|---|---|---|---|---|
| Page No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Rev. No. | 9 | 5 | 6 | 5 | 6 | 6 | 8 | 9 |

II. Model AA-1A (cont'd)

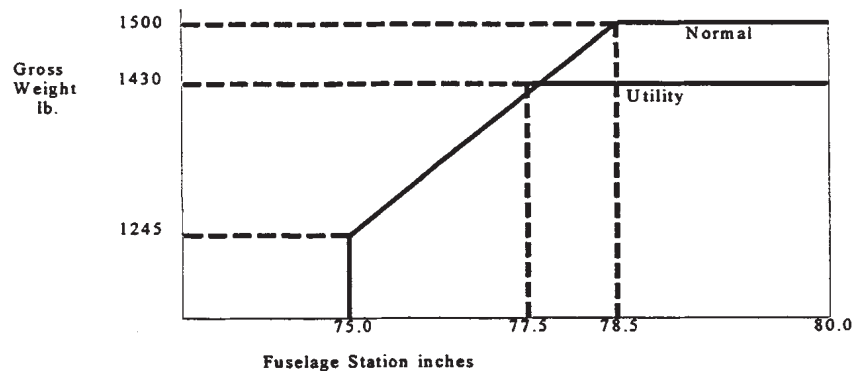
2. McCauley Model 1A105/SCM-7153 and 1A105/SCM-7154 fixed pitch propellers. Static r.p.m. at maximum permissible throttle setting; not over 2400; not under 2250. Diameter: not over 71 inches, not under 69.5 inches.
3. McCauley Model 1A106/NCM-7157 fixed pitch propellers. Static r.p.m. at maximum permissible throttle setting; not over 2400; not under 2300. Diameter: not over 71 inches, not under 69.5 inches.
4. McCauley Model 1A106/NCM-7153 hub and fixed pitch propellers. Static r.p.m. at maximum permissible throttle setting; not over 2475; not under 2375. Diameter: not over 71 inches, not under 69.5 inches.

Airspeed limits (CAS)

| | | |
|----------|--------------------------------|------------------------|
| V_{ne} | Never exceed | 195 m.p.h. (169 knots) |
| V_{no} | Maximum structural cruising | 144 m.p.h. (125 knots) |
| V_a | Maneuvering (Utility Category) | 127 m.p.h. (110 knots) |
| V_a | Maneuvering (Normal Category) | 120 m.p.h. (104 knots) |
| V_{fe} | Flaps extended | 115 m.p.h. (100 knots) |
| | Canopy half open | 130 m.p.h. (113 knots) |

Center of gravity (C.G.) range

(+78.5) to (+80.0) at 1500 lb.
 (+77.5) to (+80.0) at 1430 lb.
 (+75.0) to (+80.0) at 1245 lb.
 Straight line variation between points given.



Empty weight C.G. range

None

Maximum weight

1430 lb. (Utility Category)
 1500 lb. (Normal Category)

Number of seats

2 at (+92.5) (For optional child's seat refer to Equipment List.)

Maximum baggage

100 lb. at (+120)

Fuel capacity

24 gal. (2 wing tanks) at (+84.5) (See Note 1 for unusable fuel)

Oil capacity

6 qt. at (+39) (2 qt. minimum)

Control surface movements

| | | | | |
|-------------------|--------------------------|------|------------------------|-------|
| Elevator | $25^\circ \pm 2^\circ$ | up | $15^\circ \pm 2^\circ$ | down |
| Rudder | $25^\circ \pm 2^\circ$ | left | $25^\circ \pm 2^\circ$ | right |
| Ailerons | $25^\circ \pm 2^\circ$ | up | $20^\circ \pm 2^\circ$ | down |
| Flaps | | | $30^\circ \pm 2^\circ$ | down |
| Elevator tab trim | $14.5^\circ \pm 2^\circ$ | up | $18^\circ \pm 2^\circ$ | down |

Serial numbers eligible

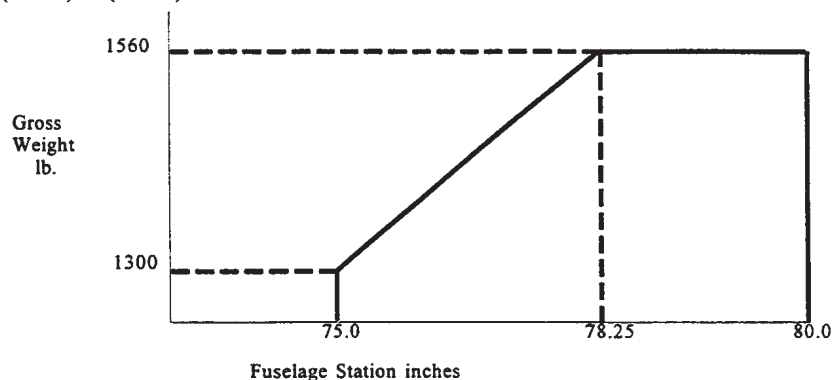
AA1A-0001 and up (Normal and Utility Category)

| | |
|------------------|--|
| Production basis | None. Prior to original certification of each aircraft manufactured subsequent to September 17, 1976, an FAA representative must perform a detailed inspection for workmanship, materials and conformity with the approved technical data and a check of the flight characteristics. |
|------------------|--|

III - Model AA-1B, Trainer/TR-2, 2 PCLM, Utility Category, Approved June 30, 1972

| | | | |
|--------------------------------|---|--|--|
| Engine | Lycoming O-235-C2C (Carburetor Setting 10-4953 or 10-3103-1) | | |
| Fuel | 80/87 minimum grade aviation gasoline | | |
| Engine limits | For all operations 2600 r.p.m. (108 h.p.) | | |
| Propeller and propeller limits | <div><div><div>1.</div><div>McCauley Model 1A105 with 1A105/SCM hub and 7157 blades. Static r.p.m. at maximum permissible throttle setting; not over 2300; not under 2150. Diameter: not over 71 inches, not under 69.5 inches.</div></div><div><div>2.</div><div>McCauley Model 1A105/SCM-7153 and 1A105/SCM-7154 fixed pitch propellers. Static r.p.m. at maximum permissible throttle setting; not over 2400; not under 2250. Diameter: not over 71 inches, not under 69.5 inches.</div></div><div><div>3.</div><div>McCauley Model 1A106/NCM-7153 fixed pitch propellers. Static r.p.m. at maximum permissible throttle setting; not over 2400; not under 2300. Diameter: not over 71 inches, not under 69.5 inches.</div></div><div><div>4.</div><div>McCauley Model 1A106/NCM-7157 fixed pitch propellers. Static r.p.m. at maximum permissible throttle setting; not over 2475; not under 2375. Diameter: not over 71 inches, not under 69.5 inches.</div></div></div> | | |
| Airspeed limits (CAS) | <div><div><div>V_{ne}</div><div>Never exceed</div><div>195 m.p.h. (169 knots)</div></div><div><div>V_{no}</div><div>Maximum structural cruising</div><div>144 m.p.h. (125 knots)</div></div><div><div>V_a</div><div>Maneuvering</div><div>135 m.p.h. (117 knots)</div></div><div><div>V_{fe}</div><div>Flaps extended</div><div>115 m.p.h. (100 knots)</div></div><div><div></div><div>Canopy half open</div><div>130 m.p.h. (113 knots)</div></div></div> | | |

| | |
|--------------------------------|---|
| Center of gravity (C.G.) range | (+78.25) to (+80.0) at 1560 lb. (+75.0) to (+80.0) at 1300 lb. |
|--------------------------------|---|



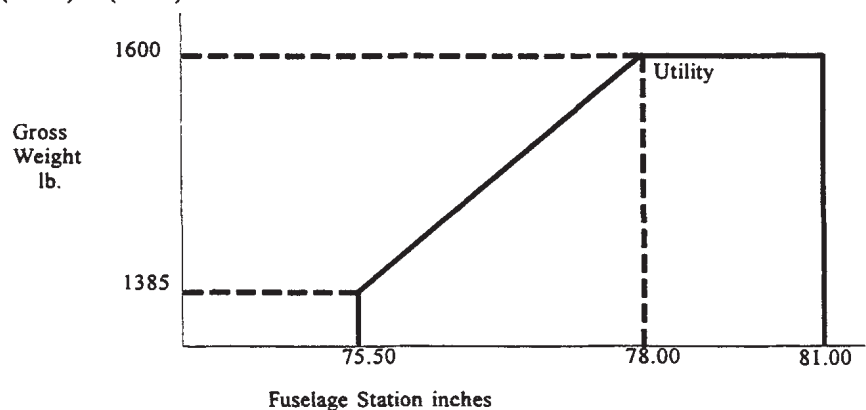
| | |
|-------------------------|---|
| Empty weight C.G. range | None |
| Maximum weight | 1560 lb. |
| Number of seats | 2 at (+92.5) (For optional child's seat refer to Equipment List.) |
| Maximum baggage | 100 lb. at (+120) |

III - Model AA-1B (cont'd)

| | | | | |
|---------------------------|--|------------------------------|------|----------------------------------|
| Fuel capacity | 24 gal. (2 wing tanks) at (+84.5) (See Note 1 for unusable fuel) | | | |
| Oil capacity | 6 qt. at (+39) (2 qt. minimum) | | | |
| Control surface movements | Elevator | $25^{\circ} \pm 2^{\circ}$ | up | $15^{\circ} \pm 2^{\circ}$ down |
| | Rudder | $25^{\circ} \pm 2^{\circ}$ | left | $25^{\circ} \pm 2^{\circ}$ right |
| | Ailerons | $25^{\circ} \pm 2^{\circ}$ | up | $20^{\circ} \pm 2^{\circ}$ down |
| | Flaps | | | $30^{\circ} \pm 2^{\circ}$ down |
| | Elevator tab trim | $14.5^{\circ} \pm 2^{\circ}$ | up | $18^{\circ} \pm 2^{\circ}$ down |
| Serial numbers eligible | AA1B-0001 and up (Utility Category) | | | |
| Production basis | Production Certificate No. 112/Production Certificate No. 3SO | | | |

IV - Model AA-1C, T-Cat/Lvnx, 2 PCLM, Utility Category, Approved December 21, 1976. (Same as AA-1B except for engine, propeller, engine mount/baffles, and AA-5 elevator).

| | | | |
|--------------------------------|--|-----------------------------|------------------------|
| Engine | Lycoming 0-235-L2C (Carburetor Setting 10-4953 or 10-3103-1) | | |
| Fuel | 100/130 minimum grade aviation gasoline | | |
| Engine limits | For all operations 2700 r.p.m. (115 h.p.) | | |
| Propeller and propeller limits | 1. Sensenich Model 72CK-0-56 fixed pitch propeller. Static r.p.m. at maximum permissible throttle setting; not over 2275; not under 2125. No additional tolerance permitted. Diameter: not over 72 inches, not under 70.5 inches. | | |
| | 2. Sensenich Model 72CK-0-52 fixed pitch propellers. Static r.p.m. at maximum permissible throttle setting; not over 2475; not under 2325. No additional tolerance permitted. Diameter: not over 72 inches, not under 70.5 inches. | | |
| Airspeed limits (CAS) | V_{ne} | Never exceed | 195 m.p.h. (169 knots) |
| | V_{no} | Maximum structural cruising | 144 m.p.h. (125 knots) |
| | V_a | Maneuvering | 135 m.p.h. (117 knots) |
| | V_{fe} | Flaps extended | 115 m.p.h. (100 knots) |
| | | Canopy half open | 130 m.p.h. (113 knots) |
| Center of gravity (C.G.) range | (+78.00) to (+81.0) at 1600 lb. | | |
| | (+75.5) to (+81.0) at 1385 lb. | | |



| | |
|-------------------------|---|
| Empty weight C.G. range | None |
| Maximum weight | 1600 lb. |
| Number of seats | 2 at (+92.5) (For optional child's seat refer to Equipment List.) |

IV - Model AA-1C (cont'd)

| | | | |
|---------------------------|--|---------------|----------------|
| Maximum baggage | 100 lb. at (+120) | | |
| Fuel capacity | 24 gal. (2 wing tanks) at (+84.5) (See Note 1 for unusable fuel) | | |
| Oil capacity | 6 qt. at (+39) (2 qt. minimum) | | |
| Control surface movements | Elevator | 12° ± 1° up | 28° ± 2° down |
| | Rudder | 25° ± 2° left | 25° ± 2° right |
| | Ailerons | 25° ± 2° up | 20° ± 2° down |
| | Flaps | | 30° ± 2° down |
| | Elevator tab trim | 15° ± 4° up | 15° ± 2° down |
| Serial numbers eligible | AA1B-0601 and AA1C-0001 and up (Utility Category) | | |
| Production basis | Production Certificate No. 3SO | | |

DATA PERTINENT TO ALL MODELS:

| | |
|---------------------|--|
| Datum | 50.0 inches forward of front face of firewall (wing chord 48 inches for Model AA-1 and 49.32 inches for Models AA-1A, AA-1B, and AA-1C). |
| Leveling means | Top of fuselage canopy slide rail. |
| Certification basis | FAR 23 effective February 1, 1965, and amendments 23-1 and 23-2; and FAR 36 amended through 36-4 for the Model AA-1C. |

Type Certificate No. A11EA issued August 29, 1967. Data of Application for Type Certificate October 22, 1965.

| | |
|-----------|---|
| Equipment | The basic required equipment prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the airplane for certification. In addition, equipment for the particular operation must be installed. |
|-----------|---|

NOTE 1. Current weight and balance report including a list of equipment included in the certificated empty weight, and loading instructions when necessary must be provided for each aircraft at the time of original certification.

The certificated empty weight and corresponding center of gravity location must include 12 lb. (2 gal.) at (+84.5) of unusable fuel.

NOTE 2. The following placards must be installed in full view of the pilot:

(a) Models AA-1 and AA-1A:

"THIS AIRPLANE MUST BE OPERATED AS A NORMAL OR UTILITY CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS, AND MANUALS."

| <u>NORMAL CATEGORY</u> | <u>AA-1</u> | <u>AA-1A</u> |
|---------------------------------|-------------|--------------|
| Maximum Design Weight | 1500 lb. | 1500 lb. |
| Design Maneuvering Speed, V_a | 125 mph CAS | 120 mph CAS |
| Flight Load Factors: | | |
| Flaps Up | +3.8, -1.52 | +3.8, -1.52 |
| Flaps Down | +2.0 | +3.5 |

NO ACROBATIC MANEUVERS INCLUDING SPINS APPROVED (AA-1 and AA-1A)

| <u>UTILITY CATEGORY</u> | <u>AA-1</u> | <u>AA-1A</u> |
|---------------------------------|-------------|--------------|
| Maximum Design Weight | 1430 lb. | 1430 lb. |
| Design Maneuvering Speed, V_a | 130 mph CAS | 127 mph CAS |
| Flight Load Factors: | | |
| Flaps Up | +4.4, -1.76 | +4.4, -1.76 |
| Flaps Down | +2.0 | +3.5 |

ACROBATIC MANEUVERS ARE LIMITED TO THE FOLLOWING:

| <u>MANEUVER</u> | <u>ENTRY SPEED (MPH, CAS)</u> | |
|-----------------------------|-------------------------------|-------------------|
| | <u>AA-1</u> | <u>AA-1A</u> |
| Chandelles | 132 | 127 |
| Lazy Eights | 132 | 127 |
| Steep Turns | 132 | 127 |
| Stalls (Except Whip Stalls) | Slow Deceleration | Slow Deceleration |

Models AA-1B and AA-1C:

"THIS AIRPLANE MUST BE OPERATED AS A UTILITY CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS, AND MANUALS."

| | <u>AA-1B</u> | <u>AA-1C</u> |
|---------------------------------|--------------|---------------|
| Maximum Design Weight | 1560 Lb. | 1600 Lb. |
| Design Maneuvering Speed, V_a | 135 Mph Cas | 117 Knots Cas |
| Flight Load Factors: | | |
| Flaps Up | +4.4, -1.76 | +4.4, -1.76 |
| Flaps Down | +3.5 | +3.5 |

ACROBATIC MANEUVERS ARE LIMITED TO THE FOLLOWING:

| <u>MANEUVER</u> | <u>ENTRY SPEED (MPH, CAS)</u> | <u>ENTRY SPEED (KNOTS, CAS)</u> |
|---------------------------------|-------------------------------|---------------------------------|
| | <u>AA-1B</u> | <u>AA-1C</u> |
| Chandelles | 135 | 117 |
| Lazy Eights | 135 | 117 |
| Steep Turns | 135 | 117 |
| Stalls (Except Whip Stalls) | Slow Deceleration | Slow Deceleration |
| Maximum Altitude Loss In Stalls | 300 Feet (AA-1) | |
| | 250 Feet (AA-1A) | |
| | 300 Feet (AA-1B) | |
| | 200 Feet (AA-1C) | |
| Demonstrated Crosswind Velocity | 15 Mph (AA-1) | |
| | 13 mph (AA-1A) | |
| | 18 mph (AA-1B) | |
| | 16 knots (AA-1C) | |

KNOWN ICING CONDITIONS TO BE AVOIDED. (Models AA-1, AA-1A, and AA-1B)

THIS AIRPLANE NOT APPROVED FOR FLIGHT IN ICING CONDITIONS. (Model AA-1C)

All Models:

THIS AIRPLANE IS CERTIFICATED FOR THE FOLLOWING OPERATIONS AS OF DATE OF ORIGINAL AIRWORTHINESS CERTIFICATE: IFR, VFR, DAY, NIGHT. (When properly equipped per FAR 91)

REFER TO WEIGHT AND BALANCE DATA FOR LOADING INSTRUCTIONS.

READ FUEL GAGES IN LEVEL FLIGHT ONLY.

FOR NORMAL OPERATION, MAINTAIN FUEL BALANCE.

DEMONSTRATED FUEL UNBALANCE 7 GAL.

- (b) On left side of cabin:

"130 MPH MAX WITH CANOPY OPEN TO HERE. NO FLIGHT WITH CANOPY OPEN BEYOND THIS POINT." Placard Part No. 5803007-22 or equivalent. (Models AA-1, AA-1A, AA-1B)

"113 KNOTS MAX WITH CANOPY OPEN TO HERE. NO FLIGHT WITH CANOPY OPEN BEYOND THIS POINT." Placard Part No. 5803007-51 or equivalent. (Model AA-1C).

- (c) In baggage compartment (All Models):

"BAGGAGE CAPACITY 100 LBS. MAX." Placard Part No. 803007-40 or equivalent.

- (d) On instrument panel in full view of pilot (All Models):

"SPINS PROHIBITED." Placard Part No. 803007-56 or equivalent.

- (e) On instrument panel near the airspeed indicator stall speed vs. bank angle placard.

Placard Part No. 803007-53 (Model AA-1), 803007-54 (Model AA-1A), 803007-55 (Model AA-1B), 803007-67 (Model AA-1C).

NOTE 3.

The FAA Atlanta Aircraft Certification Office retains oversight responsibility for American General. By virtue of licensing agreement, product support and parts availability reside with Fletchair Inc., 9000 Randolph St., Houston, TX 77061, (713)-649-8700 or (800)-329-4647.

....END....

1A6
Revision 32
PIPER

PA-22
PA-22-108
PA-22-135
PA-22S-135
PA-22-150
PA-22S-150
PA-22-160
PA-22S-160

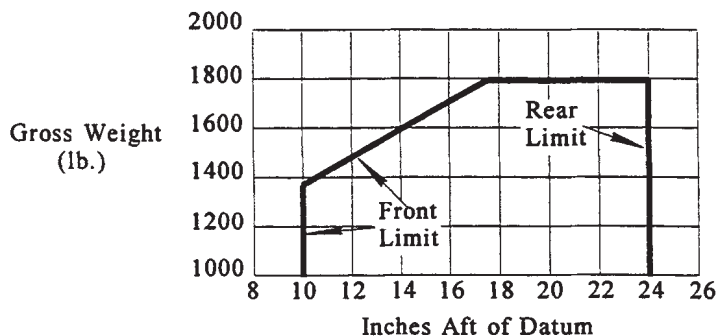
August 21, 1995

AIRCRAFT SPECIFICATION NO. 1A6

Type Certificate Holder The New Piper Aircraft, Inc.
2926 Piper Drive
Vero Beach, Florida 32960

I - Model PA-22, 4 PCLM (Normal Category Only), Approved December 20, 1950

| | | | |
|------------------------|---|---------|-------------|
| <u>Engine</u> | Lycoming O-290-D | | |
| <u>Fuel</u> | 80/87 minimum grade aviation gasoline | | |
| <u>Engine Limits</u> | For all operations, 2600 rpm (125 hp) | | |
| <u>Airspeed Limits</u> | V_{ne} (never exceed) | 158 mph | (137 knots) |
| <u>CAS</u> | V_{no} (maximum structural cruising) | 126 mph | (110 knots) |
| | V_p (maneuvering) | 106 mph | (92 knots) |
| | V_{fe} (flaps extended) | 80 mph | (70 knots) |
| <u>C. G. Range</u> | (+17.5) to (+24.0) at 1800 lb. (+10.0) to (+24.0) at 1380 lb. or less Straight line variation between points given. | | |



Empty Weight C. G. Range None

Maximum Weight 1800 lb.

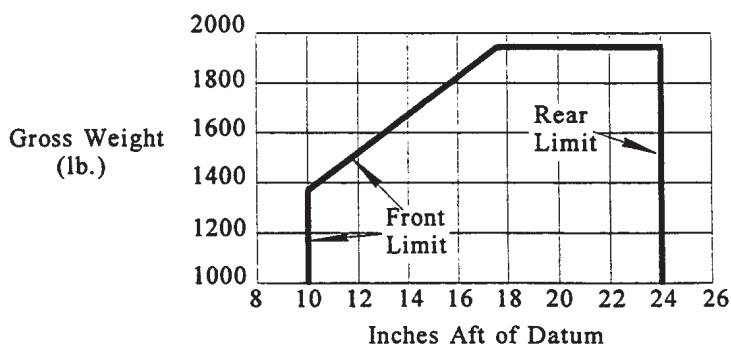
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| Rev. No. | 32 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 32 | 31 | 31 | 32 | 32 | 31 | 31 |

I - Model PA-22 (cont'd)

| | | |
|----------------------------------|--|-------------------------------------|
| <u>Number Seats</u> | 4 | (2 at +19.5 and 2 at +49) |
| <u>Maximum Baggage</u> | 50 lb. | (+67) |
| <u>Fuel Capacity</u> | 36 gallons | (2 Wing tanks at +24) |
| <u>Oil Capacity</u> | 2 gallons | (-29) |
| <u>Control Surface Movements</u> | Stabilizer | 1° Up 6½° Down |
| | Elevator | 24° Up 12° Down |
| | Aileron | 15° Up 15° Down |
| | Rudder | 16° Right 16° Left |
| | Flap | 40° Down |
| <u>Serial Numbers Eligible</u> | 22-1 and up. | |
| <u>Required Equipment</u> | In addition to the pertinent required basic equipment specified in CAR 3, the following items of equipment must be installed: Items 1, 101, 201(a), 202, 205(a), 206, and 401(a). | |

II. Model PA-22-135, 4 PCLM (Normal Category), Approved May 5, 1952

| | | | | |
|------------------------|---|---------|-------------|--|
| <u>Engine</u> | Lycoming O-290-D2 | | | |
| <u>Fuel</u> | 80/87 minimum grade aviation gasoline | | | |
| <u>Engine Limits</u> | For all operations, 2600 rpm (135 hp) | | | |
| <u>Airspeed Limits</u> | V_{ne} (never exceed) | 158 mph | (137 knots) | |
| <u>(CAS)</u> | V_{no} (maximum structural cruising) | 126 mph | (110 knots) | |
| | V_p (maneuvering) | 106 mph | (92 knots) | |
| | V_{fe} (flaps extended) | 80 mph | (70 knots) | |
| <u>C. G. Range</u> | (+17.5) to (+24.0) at 1950 lb. (+10.0) to (+24.0) at 1380 lb. or less Straight line variation between points given. | | | |



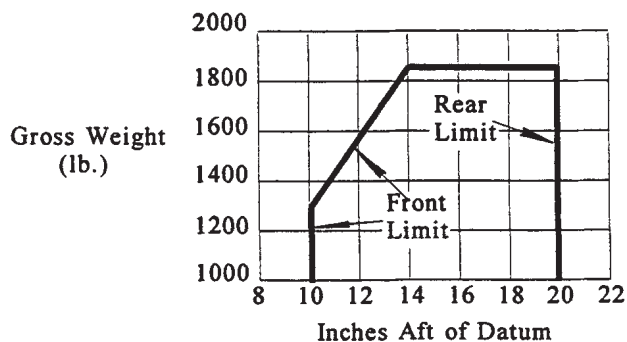
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|---------------------------------|---------------------------|
| <u>Empty Weight C. G. Range</u> | None |
| <u>Maximum Weight</u> | 1950 lb. |
| <u>Number of Seats</u> | 4 (2 at +21 and 2 at +49) |

II. Model PA-22-135 (cont'd)

| | | | |
|----------------------------------|--|---|----------|
| <u>Maximum Baggage</u> | 50 lb. (+67) | May be increased to 100 lb. provided: | |
| | (a) | Baggage compartment placard is changed to "Maximum Baggage 100 Pounds." | |
| | (b) | Airplane Flight Manual, Item 401(c), is available in the airplane. | |
| <u>Fuel Capacity</u> | 36 gallons | (2 wing tanks at +24). See Item 104 for reserve tank. | |
| <u>Oil Capacity</u> | 2 gallons | (-29) | |
| <u>Control Surface Movements</u> | Stabilizer | 1° Up | 6½° Down |
| | Elevator | 24° Up | 12° Down |
| | Aileron | 15° Up | 15° Down |
| | Rudder | 16° Right | 16° Left |
| | Flap | 40° Down | |
| <u>Serial Numbers Eligible</u> | 22-534 and up. | | |
| <u>Required Equipment</u> | In addition to the pertinent required basic equipment specified in CAR 3, the following items of equipment must be installed: Items 1, 103, 201(a), 202, 205(a), 206, and 401(b). | | |

III - Model PA-22S-135, 3 PCSM (Normal Category), Approved May 14, 1954

| | | | |
|------------------------|---|---------|-------------|
| <u>Engine</u> | Lycoming O-290-D2 | | |
| <u>Fuel</u> | 80/87 minimum grade aviation gasoline | | |
| <u>Engine Limits</u> | For all operations, 2600 r.p.m. (135 hp) | | |
| <u>Airspeed Limits</u> | V _{ne} (never exceed) | 140 mph | (122 knots) |
| <u>CAS</u> | V _{no} (maximum structural cruising) | 117 mph | (102 knots) |
| | V _p (maneuvering) | 105 mph | (91 knots) |
| | V _{fe} (flaps extended) | 80 mph | (70 knots) |
| <u>C. G. Range</u> | (+14.0) to (+20.0) at 1850 lb. (+10.0) to (+20.0) at 1300 lb. or less Straight line variation between points given. | | |



| | |
|---------------------------------|---------------------------|
| <u>Empty Weight C. G. Range</u> | None |
| <u>Maximum Weight</u> | 1850 lb. |
| <u>Number of Seats</u> | 4 (2 at +21 and 2 at +49) |
| <u>Maximum Baggage</u> | 50 lb. (+67) |

III - Model PA-22S-135 (cont'd)

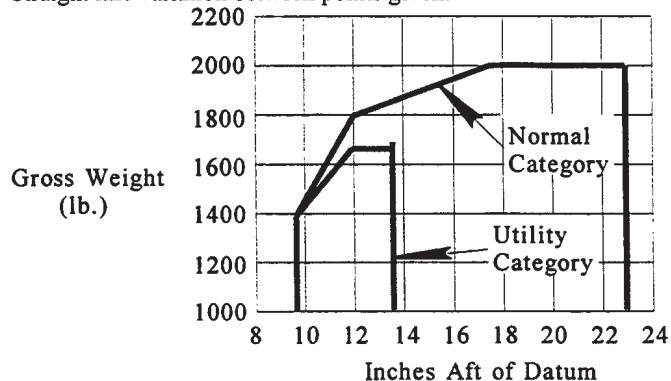
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|----------------------------------|---|---|----------|
| <u>Fuel Capacity</u> | 36 gallons | (2 wing tanks at +24). See Item 104 for reserve tank. | |
| <u>Oil Capacity</u> | 2 gallons | (-29) | |
| <u>Control Surface Movements</u> | Stabilizer | 1° Up | 6½° Down |
| | Elevator | 24° Up | 12° Down |
| | Aileron | 15° Up | 15° Down |
| | Rudder | 16° Right | 16° Left |
| | Flap | 40° Down | |
| <u>Serial Numbers Eligible</u> | 22-534 and up. | | |
| <u>Required Equipment</u> | In addition to the pertinent required basic equipment specified in CAR 3, the following items of equipment must be installed: Items 2, 103, 209, and 401(g). | | |

IV - Model PA-22-150, 4 PCLM (Normal Category), Approved September 3, 1954.

Model PA-22-150, 2 PCLM (Utility Category), Approved May 24, 1957 (See NOTE 3 for limitations)

| | | | |
|------------------------|--|--------------------|---------------------|
| <u>Engine</u> | Lycoming O-320-A2A or O-320-A2B (Carburetor setting #10-3678-11, #10-3678-12 or #10-3678-32) (See Item 106 for optional engines) | | |
| <u>Fuel</u> | 80/87 minimum grade aviation gasoline | | |
| <u>Engine Limits</u> | For all operations, 2700 r.p.m. (150 hp) | | |
| <u>Airspeed Limits</u> | V _{ne} (never exceed) | 170 mph | (148 knots) |
| <u>CAS</u> | V _{no} (maximum structural cruising) | 135 mph | (117 knots) |
| | V _p (maneuvering) | 112 mph | (97 knots) |
| | V _{fe} (flaps extended) | 95 mph | (82 knots) |
| <u>C. G. Range</u> | Normal Category: | (+17.5) to (+23.0) | at 2000 lb. |
| | | (+12.0) to (+23.0) | at 1800 lb. |
| | | (+9.5) to (+23.0) | at 1400 lb. or less |
| | Utility Category: | (+13.5) | at 1680 lb. |
| | | (+12.0) to (+13.5) | at 1665 lb. |

Straight line variation between points given.



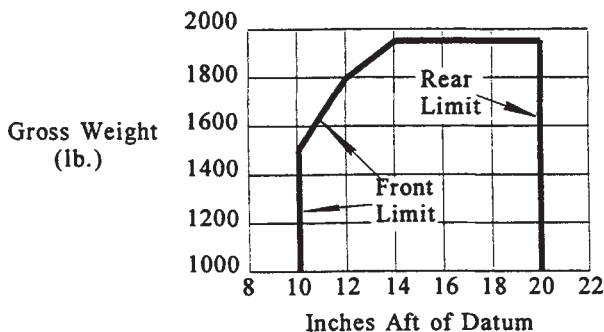
| | |
|---------------------------------|---|
| <u>Empty Weight C. G. Range</u> | None |
| <u>Maximum Weight</u> | Normal Category: 2000 lb. |
| | Utility Category: 1680 lb. |
| <u>Number of Seats</u> | 4 (2 at +21 and 2 at +49) |
| | Rear seats not to be used when operating in the Utility Category. |

IV - Model PA-22-150, 2 PLCM (cont'd).

| | | | | | | | | | | | | | | | | |
|----------------------------------|---|------------|-------|----------|----------|--------|----------|---------|--------|----------|--------|-----------|----------|------|----------|--|
| <u>Maximum Baggage</u> | 100 lb. (+67) (No baggage allowed when operating in the Utility Category) | | | | | | | | | | | | | | | |
| <u>Fuel Capacity</u> | 36 gallons (2 wing tanks at +24) See Item 104 for reserve tank. | | | | | | | | | | | | | | | |
| <u>Oil Capacity</u> | 2 gallons (-29) | | | | | | | | | | | | | | | |
| <u>Control Surface Movements</u> | <table><tr><td>Stabilizer</td><td>1° Up</td><td>6½° Down</td></tr><tr><td>Elevator</td><td>24° Up</td><td>12° Down</td></tr><tr><td>Aileron</td><td>15° Up</td><td>15° Down</td></tr><tr><td>Rudder</td><td>16° Right</td><td>16° Left</td></tr><tr><td>Flap</td><td>40° Down</td><td></td></tr></table> | Stabilizer | 1° Up | 6½° Down | Elevator | 24° Up | 12° Down | Aileron | 15° Up | 15° Down | Rudder | 16° Right | 16° Left | Flap | 40° Down | |
| Stabilizer | 1° Up | 6½° Down | | | | | | | | | | | | | | |
| Elevator | 24° Up | 12° Down | | | | | | | | | | | | | | |
| Aileron | 15° Up | 15° Down | | | | | | | | | | | | | | |
| Rudder | 16° Right | 16° Left | | | | | | | | | | | | | | |
| Flap | 40° Down | | | | | | | | | | | | | | | |
| <u>Serial Numbers Eligible</u> | 22-2378, 22-2425 and up (Normal Category). See NOTE 3 for Utility Category. | | | | | | | | | | | | | | | |
| <u>Required Equipment</u> | <p>In addition to the pertinent required basic equipment specified in CAR 3, the following Items of equipment must be installed:</p> <p>Normal Category: Items 5, 103, 201(a), 202, 205(a), 206, and 401(h).</p> <p>Normal and Utility Category: Items 5, 103, 201(a), 202, 205(a), 206, 401(h), 401(r), and 407.</p> | | | | | | | | | | | | | | | |

V. - Model PA-22S-150, 3 PCSM (Normal Category), Approved September 3, 1954

| | | | |
|------------------------|---|---------|-------------|
| <u>Engine</u> | O-320-A2A Lycoming (Carburetor setting #10-3678-11, #10-3678-12) or O-320-A2B (Carburetor setting #10-3678-32) (See Item 106 for optional engines) | | |
| <u>Fuel</u> | 80/87 minimum grade aviation gasoline | | |
| <u>Engine Limits</u> | For all operations, 2700 r.p.m. (150 hp) | | |
| <u>Airspeed Limits</u> | | | |
| <u>CAS</u> | V _{ne} (never exceed) | 158 mph | (137 knots) |
| | V _{no} (maximum structural cruising) | 126 mph | (109 knots) |
| | V _p (maneuvering) | 111 mph | (96 knots) |
| | V _{fe} (flaps extended) | 80 mph | (70 knots) |
| <u>C. G. Range</u> | (+14.0) to (+20.0) at 1950 lb. (+12.0) to (+20.0) at 1800 lb. (+10.0) to (+20.0) at 1500 lb. or less Straight line variation between points given. | | |



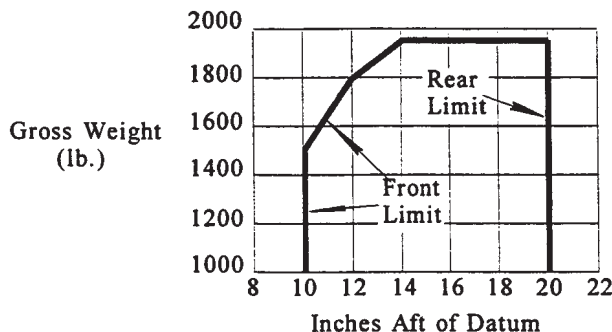
| | |
|---------------------------------|---------------------------|
| <u>Empty Weight C. G. Range</u> | None |
| <u>Maximum Weight</u> | 1950 lb. |
| <u>Number Seats</u> | 4 (2 at +21 and 2 at +49) |

VI - Model PA-22-160, 4 PCLM; Model PA-22-160, 2 PCLM (cont'd)

| | | | |
|----------------------------------|--|-----------|----------|
| <u>Maximum Weight</u> | Normal Category: 2000 lb. Utility Category: 1680 lb. | | |
| <u>Number of Seats</u> | 4 (2 at +21 and 2 at +49) Rear seats not to be used when operating in the Utility Category. | | |
| <u>Maximum Baggage</u> | 100 lb. (+67) No baggage allowed when operating in the Utility Category. | | |
| <u>Fuel Capacity</u> | 36 gallons (2 wing tanks at +24). See Item 104 for reserve tank. | | |
| <u>Oil Capacity</u> | 2 gallons (-29) | | |
| <u>Control Surface Movements</u> | Stabilizer | 1° Up | 6½° Down |
| | Elevator | 24° Up | 12° Down |
| | Aileron | 15° Up | 15° Down |
| | Rudder | 16° Right | 16° Left |
| | Flap | 40° Down | |
| <u>Serial Numbers Eligible</u> | 22-2378, 22-2425 and up (Normal Category). See NOTE 3 for Utility Category. | | |
| <u>Required Equipment</u> | In addition to the pertinent required basic equipment specified in CAR 3, the following items of equipment must be installed: Normal Category: Items 7, 103, 201(a), 202, 205(a), 206, and 401(s). Normal and Utility Category: Items 7, 103, 201(a), 202, 205(a), 206, 401(s), 401(t), and 407. | | |

VII - Model PA-22S-160, 3 PCSM (Normal Category), Approved October 25, 1957

| | | | |
|------------------------|---|---------|-------------|
| <u>Engine</u> | Lycoming O-320-B2A (Carburetor setting #10-3678-11, #10-3678-12) or O-320-B2B (Carburetor setting #10-3678-32) (See Item 106 for optional engines). | | |
| <u>Fuel</u> | 91/96 minimum grade aviation gasoline | | |
| <u>Engine Limits</u> | For all operations, 2700 r.p.m. (160 hp) | | |
| <u>Airspeed Limits</u> | V _{ne} (never exceed) | 158 mph | (137 knots) |
| | V _{no} (maximum structural cruising) | 126 mph | (109 knots) |
| | V _p (maneuvering) | 111 mph | (96 knots) |
| | V _{fe} (flaps extended) | 80 mph | (70 knots) |
| <u>C. G. Range</u> | (+14.0) to (+20.0) at 1950 lb. | | |
| | (+12.0) to (+20.0) at 1800 lb. | | |
| | (+10.0) to (+20.0) at 1500 lb. or less | | |
| | Straight line variation between points given. | | |



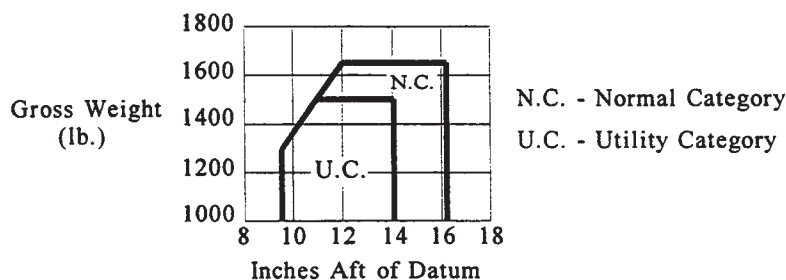
Empty Weight C. G. Range None

VII - Model PA-22S-160, 3 PCSM (cont'd)

| | | | | | | | | | | | | | | | | |
|--|--|------------|-------|----------|----------|--------|----------|---------|--------|----------|--------|-----------|----------|------|----------|--|
| <u>Maximum Weight</u> | 1950 lb. | | | | | | | | | | | | | | | |
| <u>Number of Seats</u> | 4 (2 at +21 and 2 at +49) | | | | | | | | | | | | | | | |
| <u>Maximum Baggage</u> | 100 lb. (+67) | | | | | | | | | | | | | | | |
| <u>Fuel Capacity</u> | 36 gallons (2 wing tanks at +24). See Item 104 for reserve tank. | | | | | | | | | | | | | | | |
| <u>Oil Capacity</u> | 2 gallons (-29) | | | | | | | | | | | | | | | |
| <u>Control Surface</u> <u>Movements</u> | <table><tr><td>Stabilizer</td><td>1° Up</td><td>6½° Down</td></tr><tr><td>Elevator</td><td>24° Up</td><td>12° Down</td></tr><tr><td>Aileron</td><td>15° Up</td><td>15° Down</td></tr><tr><td>Rudder</td><td>16° Right</td><td>16° Left</td></tr><tr><td>Flap</td><td>40° Down</td><td></td></tr></table> | Stabilizer | 1° Up | 6½° Down | Elevator | 24° Up | 12° Down | Aileron | 15° Up | 15° Down | Rudder | 16° Right | 16° Left | Flap | 40° Down | |
| Stabilizer | 1° Up | 6½° Down | | | | | | | | | | | | | | |
| Elevator | 24° Up | 12° Down | | | | | | | | | | | | | | |
| Aileron | 15° Up | 15° Down | | | | | | | | | | | | | | |
| Rudder | 16° Right | 16° Left | | | | | | | | | | | | | | |
| Flap | 40° Down | | | | | | | | | | | | | | | |
| <u>Serial Numbers Eligible</u> | 22-2378, 22-2425 and up. | | | | | | | | | | | | | | | |
| <u>Required Equipment</u> | In addition to the pertinent required basic equipment specified in CAR 3, the following Items of equipment must be installed: Items 7, 103, 209, and 401(v). | | | | | | | | | | | | | | | |

VIII - Model PA-22-108, 2 PCLM (Normal and Utility Category), Approved October 21, 1960

| | | | | | |
|------------------------|--|-------------------------------|---------|-------------|---------------------|
| <u>Engine</u> | Lycoming O-235-C1 or O-235-C1B (Carburetor setting #10-3103-1) | | | | |
| <u>Fuel</u> | 80/87 minimum grade aviation gasoline | | | | |
| <u>Engine Limits</u> | For all operations, 2600 r.p.m. (108 hp) | | | | |
| <u>Airspeed Limits</u> | V_{ne} | (never exceed) | 138 mph | (120 knots) | |
| <u>(CAS)</u> | V_{no} | (maximum structural cruising) | 110 mph | (96 knots) | |
| | V_p | (maneuvering) | 104 mph | (90 knots) | |
| <u>C. G. Range</u> | Normal Category: | (+12.0) | to | (+16.25) | at 1650 lb. |
| | | (+9.5) | to | (+16.25) | at 1300 lb. or less |
| | Utility Category: | (+10.9) | to | (+14.00) | at 1500 lb. |
| | | (+9.5) | to | (+14.00) | at 1300 lb. or less |
| | Straight line variation between points given. | | | | |



| | |
|---------------------------------|---|
| <u>Empty Weight C. G. Range</u> | None |
| <u>Maximum Weight</u> | Normal Category: 1650 lb. Utility Category: 1500 lb. |
| <u>Number of Seats</u> | 2 at (+21) |
| <u>Maximum Baggage</u> | 100 lb. (+45) (Normal category only) |

VIII - Model PA-22-108, 2 PCLM (cont'd)

Fuel Capacity 18 gallons (+24) (See Item 108 for auxiliary tank)

Oil Capacity 1.5 gallons (-29)

| | | | |
|------------------------|------------|-----------|----------|
| <u>Control Surface</u> | Stabilizer | 1° Up | 6½° Down |
| <u>Movements</u> | Elevator | 24° Up | 12° Down |
| | Aileron | 15° Up | 15° Down |
| | Rudder | 16° Right | 16° Left |

Serial Numbers Eligible 22-8000 and up.

Required Equipment In addition to the pertinent required basic equipment specified in CAR 3, the following Items of equipment must be installed:
Items 8, 201(a) or 211(a), 202, 205(a), 206, and 401(y).

Specifications Pertinent to All Models

Datum Wing leading edge

Leveling Means Plumb from hole in upper channel of front door to center punch mark on front seat cross tube.

Certification Basis CAR 3, effective November 1, 1949, and Amendments 3-1 through 3-6, effective June 4, 1951.
Type Certificate No. 1A6 issued December 20, 1950.
Date of Application for Type Certificate September 13, 1950.

Production Basis Approved for manufacture of spare parts only under Production Certificate No. 206.

Equipment A plus (+) or minus (-) sign preceding the weight of an Item of equipment indicates net weight change when that Item is installed.

Approval for the installation of all Items of equipment listed herein has been obtained by the aircraft manufacturer except those Items preceded by an asterisk (*). The asterisk denotes that approval has been obtained by someone other than the aircraft manufacturer. An Item marked with an asterisk may not have been manufactured under an FAA monitored or approved quality control system, and therefore conformity must be determined if the Item is not identified by a Form FAA-186, PMA or other evidence or FAA production approval.

Propeller and Propeller Accessories

The following propellers are eligible at the limits shown for diameter and static r.p.m. at maximum permissible throttle setting, no additional tolerance permitted:

1. Propeller (with Lycoming O-290D or O-290-D2 engine)
Sensenich 74FM59 or any other fixed pitch wood propeller which is rated for the engine power and speed: +11 lb. (-50)
Static r.p.m.: Not over 2400, not under 2200.
Diameter: Not over 74 inches, not under 70.5 inches
2. Propeller (with Lycoming O-290D or O-290-D2 engine) - fixed pitch metal
 - (a) Sensenich M76AM-2 or +25 lb. (-50)
 - (b) Sensenich M74DM +30 lb. (-50)
 Airplane Flight Manual shall be revised to reflect the subject propeller and limits.
 Landplane:
 Static r.p.m.: Not over 2450, not under 2150
 Diameter: Not over 74 inches, not under 72.5 inches
 Seaplane:
 Static r.p.m.: Not over 2450, not under 2350
 Diameter: Not over 74 inches, not under 72.5 inches

3. Propeller (with Lycoming O-290D or O-290-D2 engine)
Koppers Aeromatic, F200-H/00-74E +34 lb. (-50)
Parts List Assembly No. 4394H-1. Installation and operation must be accomplished in accordance with Koppers "Adjustment Instructions and Operation Limitations No. 58."
Low pitch setting 14° at 24 in. sta.
Static r.p.m.: Not over 2600, not under 2550.
Diameter: Not over 74 inches, not under 72.5 inches
4. Propeller (with Lycoming O-290D or O-290-D2 engine)
Sensenich hub CS3FM-4, blades PC374A7 or C374E, two position controllable. +34 lb. (-50)
Propeller control installation required as per Sensenich Dwg. D-3028, Revision E.
Blade pitch setting at 3/4 radius (27.75 in. station):
Low 13°, high 16.6°
Diameter: Not over 74 inches, not under 72.5 inches
5. Propeller (with Lycoming O-320-A2A or O-320-A2B engine) - Fixed pitch metal
Sensenich M74DM +30 lb. (-50)
Landplane:
Static r.p.m.: Not over 2480, not under 2250.
Diameter: Not over 74 inches, not under 72.5 inches
Seaplane:
Static r.p.m.: Not over 2500, not under 2400
Diameter: Not over 74 inches, not under 72.5 inches
6. Propeller (with Lycoming O-320-A1A or O-320-A1B engine) - constant speed
controllable
Hartzell hub HC82XG-6, blades 7636D-4 +54 lb. (-50)
Installed per Piper Dwg. No. 14747 when Item 105 (vacuum pump) is installed, or per Piper Dwg. No. 14792, without vacuum pump.
Not eligible when Item 407 is installed.
Note 2(f) placard required.
Blade pitch settings at 30 in. sta.: Low 12°, high 26°.
Diameter: Not over 72 inches, not under 70 inches
Eligible only on Models PA-22-150 and PA-22S-150, Serial Nos. 22-3218, 22-3387 and up.
When this propeller is used on Model PA-22S-150, the engine side cowls shall be installed per Piper Dwg. No. 14450.
7. Propeller (with Lycoming O-320-B2A or O-320-B2B engine) - fixed pitch metal
Sensenich M74DM +34 lb. (-50)
Landplane:
Static r.p.m.: Not over 2450, not under 2250
Diameter: Not over 74 inches, not under 72 inches
Seaplane:
Static r.p.m.: Not over 2500, not under 2400
Diameter: Not over 74 inches, not under 72 inches
Applicable Airplane Flight Manual shall be revised by the Modifier and approved by the applicable FAA Aircraft Certification Office to reflect this installation change.
8. Propeller (with Lycoming O-235-C1 or O-235-C1B engine) - fixed pitch metal
Sensenich M76AM-2 +25 lb. (-50)
Static r.p.m.: Not over 2450, not under 2200
Diameter: Not over 74 inches, not under 72.5 inches

Engines and Engine Accessories - Fuel and Oil Systems

- | | | | |
|------|--|---------|---------|
| 101. | Oil cooler - Harrison No. AP06CJ04-02 or AP06CU04-2 and Piper Air Duct | +3 lb. | (-18) |
| 102. | Oil filter, Fram PB-5, Kit No. K-520, Fram Dwg. No. 62832 and Instruction Sheet No. 62831 (weight includes 1 quart oil) | +5 lb. | (-18.5) |
| 103. | Oil Cooler Harrison No. AP13SJ03-01 or AP12CU03-01 installed in accordance with Piper Dwg. 13724 or 14368 | +6 lb. | (-46) |
| 104. | Reserve 8 gallons fuel tank with electric transfer fuel pump installed in accordance with Piper Dwg. 14454. When installed on Models PA-22S-135, PA-22S-150 or PA-22S-160, fuselage reinforcement channel, Part No. 14725, also required. NOTE 2(e) placard required. Airplane Flight Manual Supplement required: Item 401(j), Model PA-22-150 Item 401(k) Model PA-22-135 (Serial Nos. 22-534 and up eligible), Item 401(p) Model PA-22S-135 (Serial Nos. 22-807 and up eligible), Item 401(q) Model PA-22S-150 (Serial Nos. 22-2378, 22-2425 and up eligible), Item 401(u) Model PA-22-160 (Serial Nos. 22-2378, 22-2425 and up eligible), or Item 401(w) Model PA-22S-160 (Serial Nos. 22-2378, 22-2425 and up eligible). | +12 lb. | (+46) |
| 105. | Vacuum pump | | |
| | (a) Pesco Model 3P-194-F, Type B-11 | +4 lb. | (-25) |
| | (b) Airborne Mechanisms Model 113A1 installed in accordance with Piper Dwg. 15163. (PA-22-108 only). | +4 lb. | (-25) |
| | (c) Airborne Mechanisms Model 113A5 installed in accordance with Piper Dwg. 15163 or 15208. (PA-22-108 only). | +4 lb. | (-25) |
| 106. | Engines (Lycoming) O-320 Series | | |
| | A. Model PA-22-150 | | |
| | (1) O-320 | | |
| | (2) O-320-A1A | | |
| | (3) O-320-A1B | | |
| | B. Model PA-22S-150 | | |
| | (1) O-320 | | |
| | (2) O-320-A1A | | |
| | (3) O-320-A1B | | |
| 107. | Starter, Delco Remy Model 1109657 (12 v.) | +17 lb. | (-40) |
| 108. | Auxiliary 18 gallons fuel tank installed in accordance with Piper Dwg. 15147 (PA-22-108 only). NOTE 2(j) placard required. | +25 lb. | (+24) |

Landing Gear

- | | | | |
|-------|---|---------|--------------------------|
| 201. | Two main wheel-brake assemblies, 6.00-6, Type III | +14 lb. | (+31.5) |
| | (a) Cleveland Aircraft Products Model 6:00 DHB-3 Wheel Assembly No. C-38500H Brake Assembly No. C-2000H | | |
| 202. | Two main 4-ply rating tires, 6.00-6, Type III, with regular tubes | +17 lb. | (+31.5) |
| 205. | One nose wheel, 6.00-6, Type III | +5 lb. | (-36) |
| | (a) Cleveland Aircraft Products Wheel Assembly No. C-38500H (less brake-drum) | | |
| | (b) Cleveland Aircraft Products Wheel Assembly No. 38501 | | |
| 206. | One nose wheel 4-ply rating, tire, 6.00-6, Type III, with regular tube | +9 lb. | (-36) |
| *207. | Nose wheel centering kit installed according to Javelin Aircraft Company (Wichita, Kansas) Dwg. 723 and Installation Instructions dated April 15, 1953. | +2. lb. | (-29) |
| 208. | Skis: | | |
| | *(a) Federal A-2000A main skis and NA-1200A nose ski, per Federal Dwg. 11R951, Change E. | | |
| | *(b) Federal AWB-2100 main skis and AWN-1200 nose ski, per Federal Dwg. 11R1117. | | |
| | The following placard is required with this installation: "Do not extend or retract skis while in motion on the ground." | | Use Actual Weight Change |

209. Edo Model 89-2000 floats with water rudder installed in accordance with Edo Dwg. No. 16270.
Piper modifications must be made and installed in accordance with Piper Dwg. 14375 (Model PA-22S-135, Serial Nos. 22-534 to 22-2377, 22-2379 to 22-2424, inclusive) and Piper Dwg. 14450 (Model PA-22S-150 and PA-22S-160, Serial Nos. 22-2378, 22-2425 and up.) Serial Nos. 22-534 to 22-806, inclusive, require a fuselage reinforcement brace, Piper Part No. 12480.
210. (a) Doyn Fiberglass wheel fairings installed in accordance with Doyn Dwg. No. 1300 and Doyn Process Specification for Fiberglass Part No. PS-100
Nose Fairing +5.5 lb. (-36)
Main Fairing +15.0 lb. (+31.5)
- or (b) Piper wheel fairings installed in accordance with Piper Dwg. 15054 and 15058
Nose Fairing +5.5 lb. (-36)
Main Fairing +15.0 lb. (+31.5)
- or (c) Piper wheel fairings installed in accordance with Piper Dwg. 15083
Nose Fairing +5.5 lb. (-36)
Main Fairing +15.0 lb. (+31.5)
211. Two Main Wheel-Brake Assemblies, 6.00-6, Type III
(a) Cleveland Aircraft Products, Model 20-6 (Model PA-22-108 only) + 14.5 lb. (+31.5)
Wheel Assembly No. 40-28
Brake Assembly No. 30-18

Electrical Equipment

301. Battery - Reading S24-12V +25 lb. (+21)
302. Landing lights in wing leading edge per Piper Dwg. No. 12534 +4 lb. (+5)
(Serial Nos. 22-534 to 22-2377, 22-2379 to 22-2424, inclusive)
Piper Dwg. No. 14442 (Serial Nos. 22-2378, 22-2425 and up).
303. Battery - Reading R33-12V +28 lb. (+21)
Serial Nos. 22-267, 22-340, 22-349, 22-350, 22-351, 22-354 through 22-7999.

Interior Equipment

401. (a) CAA (FAA) approved Airplane Flight Manual dated December 20, 1950, for airplanes equipped with Lycoming O-290-D engines. (Required with 100 lb. baggage allowance.)
(b) FAA-DOA approved Airplane Flight Manual dated May 5, 1952, for airplanes equipped with Lycoming O-290-D2 engines.
(c) FAA-DOA approved Airplane Flight Manual dated October 23, 1952, for airplanes equipped with Lycoming O-290-D2 engines.
*(d) Supplement to Airplane Flight Manual dated January 17, 1952.
(Required with Item 402(a) without altitude controller.)
*(e) Revised Supplement to Airplane Flight Manual dated January 19, 1953.
(Required with Item 402(a) without altitude controller.)
*(f) Revised Supplement to Airplane Flight Manual dated November 18, 1953.
(Required with Item 402(b) with approach coupler.)
(g) FAA-DOA approved Airplane Flight Manual dated May 14, 1954, for Model PA-22S-135 seaplanes equipped with Edo Model 89-2000 floats.
(h) FAA-DOA approved Airplane Flight Manual dated September 3, 1954, for Model PA-22-150.
(i) FAA-DOA approved Airplane Flight Manual dated September 3, 1954, for Model PA-22S-150 seaplanes equipped with Edo Model 89-2000 floats.
(j) FAA-DOA approved Supplement No. 1 to Airplane Flight Manual dated September 3, 1954, (Required with Item 104 Auxiliary Fuel System) for Model PA-22-150.
(k) FAA-DOA approved Supplement No. 1 to Airplane Flight Manual dated October 23, 1952, (Required with Item 104 Auxiliary Fuel System) for Model PA-22-135, Serial No. 22-534 and up.
*(l) Supplement to Airplane Flight Manual dated November 17, 1954.
(Required with Item 404).
*(m) Supplement to Airplane Flight Manual dated April 20, 1955. (Required with Item 405).
(n) FAA-DOA approved Supplement to Airplane Flight Manual dated September 3, 1954, for Model PA-22-150 (Required with Item 6).

- (o) FAA-DOA approved Supplement to Airplane Flight Manual dated September 3, 1954, for Model PA-22S-150 (Required with Item 6).
 - (p) FAA-DOA approved Supplement No. 1 to Airplane Flight Manual dated October 23, 1952, (Required with Item 104 Auxiliary Fuel System) for Model PA-22S-135.
 - (q) FAA-DOA approved Supplement No. 1 to Airplane Flight Manual dated September 3, 1954, (Required with Item 104 Auxiliary Fuel System) for Model PA-22S-150.
 - (r) FAA-DOA approved Supplement No. 3 to Airplane Flight Manual dated September 3, 1954, for Model PA-22-150 (Required with Item 407.).
 - (s) FAA-DOA approved Airplane Flight Manual dated August 27, 1957, for airplanes equipped with Lycoming O-320-B2A or O-320-B2B engines.
 - (t) FAA-DOA approved Supplement No. 1 to Airplane Flight Manual dated August 27, 1957, for Model PA-22-160 (Required with Item 407).
 - (u) FAA-DOA approved Supplement No. 2 to Airplane Flight Manual dated August 27, 1957, for Model PA-22-160 (Required with Item 104 Auxiliary Fuel System).
 - (v) FAA-DOA approved Airplane Flight Manual dated October 25, 1957, for Model PA-22S-160 seaplanes equipped with Edo Model 89-2000 floats.
 - (w) FAA-DOA approved Supplement No. 1 to Airplane Flight Manual dated October 25, 1957, for Model PA-22S-160 (Required with Item 104 Auxiliary Fuel System).
 - (x) FAA-DOA approved Supplement No. 3 to Airplane Flight Manual dated August 27, 1957 (Model PA-22-160); or FAA-DOA approved Supplement No. 4 to Airplane Flight Manual dated September 3, 1954 (Model PA-22-150) (Required with Item 408 Piper AutoControl, Mitchell Model AKO-64, Automatic Pilot) for Models PA-22-150 and PA-22-160, Serial No. 22-6328, 22-6344, 22-6352 and up.
 - (y) FAA-DOA approved Airplane Flight Manual dated October 21, 1960, revised November 22, 1960, for Model PA-22-108.
 - (z) FAA-DOA approved Supplement No. 1 to Airplane Flight Manual dated October 21, 1960, (Required with Item 409 Piper AutoControl, Mitchell Model AKO-64, Automatic Pilot) for Model PA-22-108, Serial No. 22-8000 and up.
 - (aa) FAA-DOA approved Supplement to Airplane Flight Manual dated December 20, 1950, for Model PA-22 (Required when rear door removed under provisions of NOTE 4).
 - (ab) FAA-DOA approved Supplement No. 3 to Airplane Flight Manual dated October 23, 1952, for Model PA-22-135 (Required when rear door removed under provisions of NOTE 4).
 - (ac) FAA-DOA approved Supplement No. 5 to Airplane Flight Manual dated September 3, 1954, for Model PA-22-150 (Required when rear door removed under provisions of NOTE 4).
 - (ad) FAA-DOA approved Supplement No. 4 to Airplane Flight Manual dated August 27, 1957 for Model PA-22-160 (Required when rear door removed under provisions of NOTE 4).
- *402. Lear L-2B Automatic Pilot:
(An approved vacuum system to operate automatic pilot gyros and a 35 ampere generator meeting requirements of Aircraft Engine Specification E-229 are required. Servo pitch drum diameter for all three axes 1.375 inches.)
- (a) Automatic pilot and altitude controller (optional equipment) installed in accordance with Lear Dwg. 95650. +51 lb. (+63)
 Servo slip clutch stall torque, +0, -5 in.-lb. tolerance:

| | |
|----------|------------|
| Aileron | 40 in.-lb. |
| Elevator | 25 in.-lb. |
| Rudder | 50 in.-lb. |

 Items 401(d) or 401(e) and the following placard, installed in clear view of pilot, are required with this installation:
 "Do not use Autopilot in normal operation below 75 feet above terrain including take-off, approach and landing."

- (b) Automatic pilot and approach coupler (optional equipment) and altitude control (optional equipment) installed in accordance with Lear Dwg. 95650, Revision D. Servo slip clutch stall torque + 0, - 5 in.-lb tolerance:
 Aileron 40 in.-lb.
 Elevator 40 in.-lb.
 Rudder 50 in.-lb.
- Item 401(f) and the following placards, installed in clear view of the pilot, are required with this installation:
 "Do not use Autopilot in normal operation below 300 feet above terrain except during take-off, approach and landing."
 "During take-off, approach and landing, do not use Autopilot below 75 feet above terrain."
 "Do not use transmitter #1 during an automatic approach."
- *403. Javelin A2 single axis automatic pilot installed in accordance with Javelin Dwg. 721 and Instructions dated June 15, 1954. Item 207 required with this installation. +18 lb. (+94)
- *404. Lear Arcon (Automatic rudder control) installed in accordance with Lear Dwg. 701944. Item 401(1) required with this installation. Model PA-22-135 only. +12 lb. (+65)
- *405. Ross Control System Conversion Kit Model 10 installed in accordance with Ross (F. W. Ross, 755 Kalamath Drive, Del Mar, California) Dwgs. 10R100 through 9A114 on Drawing List dated November 5, 1955, and Installation Instructions dated November 5, 1955. Placard required on instrument panel:
 "Equipped with Ross Control System - See Flight Manual Supplement."
 Item 401(m) required with this installation. Use Actual Weight and Balance Change
- *406. Deleted - November 26, 1957. Now covered by Supplemental Type Certificate No. SA1-108
407. Control modification kit (eliminating rudder and aileron interconnection) per Piper Dwg. No. 14926. Item 401(r) or 401(t) and NOTE 2(g) placard required. See limitations in NOTE 3.
408. Piper AutoControl (Mitchell Model AKO-64) Automatic Pilot installed in accordance with Piper Dwg. No. 14970. Item 105 and 401(x), and NOTE 2(h) placard required. (Models PA-22-150 and PA-22-160) +5 lb. (-10)
409. Piper Autocontrol (Mitchell Model AKO-64) Automatic Pilot installed in accordance with Piper Dwg. No. 14970. Item 105(b) or 105(c), and 401(z), and NOTE 2(h) placards required. (Model PA-22-108) +5 lb. (-10)

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.

- NOTE 2. The following placards must be displayed:
- (a) On the instrument panel in full view of the pilot (For all Models except PA-22-108):
 - (1) "Operate in Normal Category in compliance with approved Flight Manual. Acrobatics (including spins) prohibited."
 - (b) On the baggage compartment (Serial Nos. 22-534 to 22-2377, 22-2379 to 22-2424):
 - (1) "Maximum Baggage 50 Pounds." or
 - (2) "Maximum Baggage 100 Pounds." (For Model PA-22-135 when Airplane Flight Manual, Item 401(c), is available in the airplane.)
 - (c) On the baggage compartment (Serial Nos. 22-2378, 22-2425 and up):
 - (1) "Maximum Baggage 100 Pounds."
 - (d) Deleted, December 30, 1955.
 - (e) Adjacent to reserve tank selector valve when Item 104 is installed in aircraft:
 - (1) "Reserve fuel
pull on
transfer fuel level flight only
operate only in accordance with flight manual."
 - (f) Adjacent to the propeller pitch control when Item 6 is installed:
 - (1) "Propeller-Push Increase R.P.M."
 - (g) On the instrument panel in full view of the pilot when Item 407 is installed:
 - (1) "Operate in Normal or Utility Category in compliance with the approved Flight Manual. Airplane marked for Normal Category. Acrobatics (including spins) prohibited in Normal Category."

- (h) When Item 408 or 409 is installed:
 - (1) On left side of circuit breaker panel:
 - "Piper Autocontrol
 - Push to Engage
 - Disengage During Take-off and Landing."
 - (2) Between Directional Gyro and Gyro Horizon:
 - "Turn Control
 - Pull For Direction Control
 - On 0° Heading Only"
 - (3) On left side window channel in full view of the pilot:
 - "Piper Autocontrol
 - To Engage: Push turn control at D. G. in and center knobs then push in engaging control, rocking heel if necessary.
 - To Turn: Move turn control in desired direction.
 - For Heading
 - Lock: Set D. G. at 0° pull put turn control knob, use trim knob to maintain exact 0° heading."
- (i) On the instrument panel in full view of the pilot (For Model PA-22-108 only):
 - "This airplane must be operated as a normal or utility category airplane in compliance with approved Airplane Flight Manual. All markings and placards on this airplane apply to its operation as a normal category airplane. For utility category operation, refer to the Airplane Flight Manual. No acrobatics maneuvers (including spins) are approved for normal category operation."
- (j) On the instrument panel in full view of the pilot (When Item 108 is installed):
 - "Right tank level flight only."
- (k) On right fuel quantity gauge (Serial Nos. 22-1 to 22-7642)
 - "No take-off on right tank with less than 1/3 tank."

NOTE 3. Serial Nos. 22-3218, 22-3387 and up, of Model PA-22-150 or PA-22-160, are eligible to be operated as a Normal or Utility Category Airplane in compliance with the approved Airplane Flight Manual provided Item 407 (Control modification kit) is installed. Propeller Item 6 is not eligible when Item 407 is installed.

NOTE 4. Serial Nos. 22-1 through 22-7999 of Models PA-22, PA-22-135, PA-22-150, and PA-22-160, are eligible to be operated in the Normal Category with the rear door removed in compliance with the pertinent approved Flight Manual. Item 401(aa) for the PA-22; Item 401(ab) for the PA-22-135; Item 401(ac) for the PA-22-150; or Item 401(ad) for the PA-22-160, must be in each aircraft operated in this configuration.

(a) Airspeed Limits (CAS)

| | | | |
|----------|----------------------------|---------|-------------|
| V_{ne} | (never exceed) | 128 mph | (111 knots) |
| V_{no} | (max. structural cruising) | 100 mph | (87 knots) |
| V_p | (maneuvering) | 100 mph | (87 knots) |
| V_{fe} | (flaps extended) | 80 mph | (70 knots) |

- (b) When the rear door is removed the following placards must be displayed in full view of the pilot:
 - (1) "Airplane maneuvers are limited to normal take-offs, climbs, banks not to exceed 30°, glides and landings at speeds not in excess of 128 mph."
 - (2) "No smoking permitted."
- (c) No baggage may be carried when the aircraft is flown with the rear door removed.

.....END.....

E-273
Revision 36

CONTINENTAL

O-470-A, -B, -E, -G, -H, -J, -K, -L, -M,
-N, -P, -R, -S, -T, -U
O-470-B-CI, -G-CI, K-CI, L-CI, M-CI
(NOTE 6)
IO-470-A, -C

September 29, 1995

TYPE CERTIFICATE DATA SHEET NO. E-273

Engines of models described herein conforming with this data sheet (which is part of type certificate No. 273) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Civil Air Regulations provided they are installed, operated and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Type Certificate Holder Teledyne Continental Motors
P.O. Box 90
Mobile, Alabama 36601

| Model | O-470-A | O-470-E | O-470-J | O-470-K, -L, -R, -S | O-470-B, -M, -N |
|---|------------------|----------|----------|------------------------------|-----------------|
| Type | 6HOA | --- | --- | --- | --- |
| Rating, ICAO or ARDC standard atmosphere | | | | | |
| Max. continuous hp, rpm, at sea level pressure altitude | 225-2600 | 225-2600 | 225-2550 | 230-2600 | 240-2600 |
| Takeoff hp, 5 min., rpm, full throttle at sea level pressure altitude | 225-2600 | 225-2600 | 225-2550 | 230-2600 | 240-2600 |
| Fuel, (aviation gasoline, minimum grade) | 80/87 | --- | --- | --- | 91/96 |
| Lubricating oil, ambient air temperature: Above 40° F. | See NOTE 9 | --- | --- | --- | --- |
| Below 40° F. | Oil Grade SAE 50 | --- | --- | --- | --- |
| | Oil Grade SAE 30 | --- | --- | --- | --- |
| Bore and stroke, in. | 5.00 x 4.00 | --- | --- | --- | --- |
| Displacement, cu. in. | 471 | --- | --- | --- | --- |
| Compression ratio | 7:1 | --- | --- | --- | --- |
| Weight (dry), lb. | 378 | 390 | 378 | 404 (-K, -L) 401 (-R, -S) | 410 |
| C.G. location (basic engine) | | | | | |
| Fwd. of rear face, engine | | | | | |
| Accessory case, in. | 12.8 | --- | --- | 12.0 | 11.3 |
| Below crankshaft center line, in. | 0.1 | --- | --- | 0.3 | 0.5 |
| Beside crankshaft center line, toward 1-3-5 side, in. | == | == | == | == | 0.2 |

| | | | | | | |
|----------|----|----|----|----|----|----|
| Page No. | 1 | 2 | 3 | 4 | 5 | 6 |
| Rev. No. | 35 | 36 | 36 | 36 | 36 | 36 |

| Model | O-470-A | O-470-E | O-470-J | O-470-K, -L, -R, -S | O-470-B, -M, -N |
|-------------------------------|--|---------------------------------------|--|--|---------------------------------------|
| Propeller Shaft | Special integral flange 4 7/8 in. o.d. with six ½ in. bolt holes in 4 in. diameter circle | --- | --- | --- | --- |
| Carburetion or Fuel Injection | Marvel-Schebler MA-4-5 (TCM #535207 or 538872) | Bendix-Stromberg PSD-5C (TCM #536911) | Marvel-Schebler MA-4-5 (TCM #535207 or 538872) | Marvel-Schebler M-4-5 (TCM #539883) (-L, -R) 641139 (-S, -R) | Bendix-Stromberg PSD-5C (TCM #535503) |
| Ignition, dual magnetos | NOTE 13 | --- | --- | --- | --- |
| Timing, ° BTC | 26 | --- | 20 | 22 | 24 |
| Spark plugs | See NOTE 11 | --- | --- | --- | --- |
| Oil sump capacity, qt. | 12; 6 usable at 15° noseup and nosedown attitudes; 7 usable at 10° noseup and nosedown attitudes | --- | --- | --- | --- |
| NOTES | 1, 2, 3, 4, 9, 10, 11 | 1, 2, 3, 4, 5, 9, 10, 11 | 1, 2, 3, 4, 5, 9, 10, 11 | 1, 2, 3, 4, 5, 6, 9, 10, 11 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 |

| Model | O-470-H | O-470-G, -P | IO-470-A | IO-470-C | O-470-T, -U |
|---|-------------------------|---|----------|----------|---------------------------|
| Type | 6HOA | --- | --- | --- | --- |
| Rating, ICAO or ARDC standard atmosphere | | | | | |
| Max. continuous hp, rpm, at sea level pressure altitude | 240-2600 | 240-2600 | 240-2600 | 250-2600 | 230-2400 |
| Takeoff hp, 5 min., rpm, full throttle at sea level pressure altitude | 240-2600 | 240-2600 | 240-2600 | 250-2600 | 230-2400 |
| Fuel, (aviation gasoline, minimum grade) | 91/96 | --- | --- | --- | 100, 100LL or B95/130 CIS |
| Lubricating oil, ambient air temperature: Above 40° F. | See NOTE 9 | --- | --- | --- | --- |
| Below 40° F. | Oil Grade SAE 50 | --- | --- | --- | --- |
| | Oil Grade SAE 30 | --- | --- | --- | --- |
| Bore and stroke, in. | 5.00 x 4.00 | --- | --- | --- | --- |
| Displacement, cu. in. | 471 | --- | --- | --- | --- |
| Compression ratio | 8:1 | --- | --- | --- | 8.6:1 |
| Weight (dry), lb. | 495 | 432 | 410 | 432 | 410 (-T) 412 (-U) |
| C.G. location (basic engine) | | | | | 11.76 (U-T) 12.07 (-U) |
| Fwd. of rear face, engine | 14.2 | 12.0 | 11.3 | 12.0 | .88 (-T) .31(-U) |
| Accessory case, in. Below crankshaft center line, in. | 1.0 | 1.2 | 0.5 | 1.2 | .35 (-T), .11 (-U) |
| Beside crankshaft center line, toward 1-3-5 side, in. | 0.2 | 0.5 | 0.2 | 0.5 | --- |
| Propeller Shaft | SAE 20 Spline Extension | Special integral flange 4 7/8 in. o.d. with six ½ in. bolt holes in 4 in. diameter circle | --- | --- | --- |

| Model | O-470-H | O-470-G, -P | IO-470-A | IO-470-C | O-470-T, -U |
|-------------------------------|---|---|---|--|--|
| Carburetion or Fuel Injection | Bendix-Stromberg PSD-5C (TCM#535503) | Bendix-Stromberg PSH-5BO (TCM#625203) | TCM Injector Eq #5580 | TCM Injector Eq. #5620 or 5827 | Marvel-Schebler MA-4-5 (TCM #641860) |
| Ignition, dual magnetos | NOTE 13 | --- | --- | --- | --- |
| Timing, ° BTC | 24 | --- | --- | 26 | 24 |
| Spark plugs | See NOTE 11 | --- | --- | --- | --- |
| Oil sump capacity, qt. | 12; 6 usable at 15° noseup and nosedown attitudes; 7 usable at 10° noseup and nosedown attitudes | 12; 10 usable at 18° noseup and 14° nosedown attitudes | 12; 6 usable at 15° noseup and nosedown attitudes; 7 usable at 10° noseup and nosedown attitudes | 12; 9 usable at 34° noseup and 27° nosedown attitudes; 10 usable at 28° noseup and nosedown attitudes; 11 usable at 16° noseup and nosedown attitudes | 12; 6 usable at 15° noseup and nosedown attitudes |
| NOTES | 1, 2, 3, 5, 9, 10, 11 | 1, 2, 3, 5, 6, 9, 10, 11 | 1, 2, 3, 5, 9, 10, 11 | 1, 2, 3, 5, 9, 10, 11 | 1, 2, 3, 4, 5, 9, 10, 11 |

" - - - " indicates "same as preceding model."

" = " indicates "does not apply."

Certification Basis

CAR 13

Type Certificate No. 273 issued December 4, 1952.

Production Basis

P.C. 508

NOTE 1.

Maximum permissible temperatures:

Cylinder head

(Spark plug gasket)

All engines except

O-470-G, -N

525° F.

O-470-G, -N

500° F.

O-470-A, -E, -J, -N

450° F.

O-470-B, -H, -IO-470-A

475° F.

O-470-G, -K, -L, -P, -R, -S, -R, -U; IO-470-C

460° F.

Cylinder barrel

290° F.

Oil inlet

225° F., 240° F. (-S, -T, -U)

NOTE 2.

Fuel inlet and oil pressure limits:

| Model | Minimum | Maximum |
|--|------------------------|-------------|
| -A, -J, -K, -L | 0.5 p.s.i. | 6.0 p.s.i. |
| -B, -E, -G, -H, -M, -N | 9.0 p.s.i. | 15.0 p.s.i. |
| IO-470-A, O-470-B-CI, -M-CI | minus 0.75 p.s.i. plus | 1.50 p.s.i. |
| -G-CI | minus 2.25 p.s.i. plus | 10.0 p.s.i. |
| -K-CI, -L-CI | minus 1.0 p.s.i. plus | 12.0 p.s.i. |
| IO-470-C | minus 2.0 p.s.i. plus | 10.0 p.s.i. |
| O-470-R, -S | 15.5 in. gasoline | 6.0 p.s.i. |
| O-470-T, -U | 14.0 in. gasoline | 6.0 p.s.i. |
| Oil pressure limits: 2-4-6 side (normal) 30 to 60 p.s.i. (idle 10 p.s.i. min.) | | |

NOTE 3. The following accessory drive or mounting provisions are available:

| Original Accessory | **Direction of Rotation | Speed Ratio to Crankshaft | Max. Torque Continuous | (in.-lb.) Static | Maximum Overhang Moment (in.-lb.) |
|--------------------------|-------------------------|---------------------------|------------------------|------------------|-----------------------------------|
| Governor | C | 1.0:1 | 29 | 825 | 50 |
| ****Tachometer | CC | .5:1 | | | 25 |
| Optional (2) | | | | | |
| Left & Right Hand | C | 1.5:1 | ***100 | 800 | 40 |
| Generator (Belt driven) | CC | 2:1 | 100 | 800 | 100 |
| Alternator (Gear driven) | CCW | 3:1 | 150 | 800 | 150 |
| *Fuel pump | C | 1.0:1 | 25 | 680 | 60 |
| Oil cooler | == | == | == | == | 65 |
| Starter: | CC | 32:1 | 200 | 400 | 60 |

O-470-B, -B-CI engines eligible with TCM P/N 537241.

All others eligible with TCM P/N 535856, 539910, 626960, 627842, 628482, or 637847.

- * Special equipment on O-470-A, -J, -K, and -L models.
- ** "C" indicates clockwise viewing drive pad; "CC" counter clockwise.
- *** One drive eligible at 160 in.-lb. continuous torque load provided the other drive does not exceed 100 in.-lb. continuous torque load.
- **** O-470-G clockwise; O-470-V and -VO optional rotation.

NOTE 4. Crankshaft damper configuration: O-470-A, S/N 41000 and up, and -E, -J, -R, -S, and -T engines are equipped with one 5th and one 6th order damper.
 O-470-B, -H, and -N have two 6-½ order dampers.
 O-470-K, -L, -M, -P and IO-470-A and -C have four 6th order dampers.
 O-470-G has one 6-½ and one 9th order damper.
 O-470-A, S/N 40001 through 40655, and -P, have two 6th order dampers.
 O-470-U has two 6th, one 5th, and one 4½ order dampers.

NOTE 5. The following similarities and differences exist between the various models:
 O-470-B is similar to O-470-A except for increased power rating, different damper configuration, incorporation of inclined valve cylinders, downdraft pressure carburetor and related induction system changes.
 O-470-E is same as O-470-A except for incorporation of downdraft pressure carburetor and related induction system changes.
 O-470-G is similar to O-470-M except for crankshaft damper configuration, revised oil sump integral cast intake air passage and mounting brackets.
 O-470-J is same as O-470-A except for reduced rated speed and minor changes in induction system risers, manifold and balance tube.
 O-470-K is similar to O-470-J except for ratings, crankshaft damper configuration and incorporation of shell-molded cylinder heads and revised mounting brackets.
 O-470-L is same as O-470-K except for relocated carburetor and revised intake manifold oil sump.
 O-470-M is same as O-470-B except for crankshaft damper configuration and incorporation of shell-molded cylinder heads.
 O-470-N is same as O-470-M except for crankshaft damper configuration.
 O-470-P is identical to O-470-G except for crankshaft damper configuration.
 IO-470-A is same as O-470-M except incorporates CMC continuous flow fuel injection system instead of Bendix carburetor.
 IO-470-C is same as O-470-G except for crankshaft damper configuration and incorporation of CMC continuous flow fuel injection system instead of Bendix carburetor.
 O-470-H is same as O-470-B except incorporates extension propeller shaft and is approved for pusher operation.
 O-470-R is same as O-470-L except for crankshaft damper configuration.
 O-470-S is same as O-470-R except for piston oil cooling and semi-keystone piston rings.
 O-470-T is similar to the O-470-S except for crankcase design and rating.
 O-470-U is similar to the O-470-S except for rating and crankshaft damper configuration.

- NOTE 6. O-470-B, -G, -K, -L, and -M engines are eligible for incorporation of TCM continuous flow fuel injection system (Eq. No. 5580 for -B, -M; Eq. No. 5701 or 5702 for -G; Eq. No. 5613 for -K, -L) replacing carburetion system with no change in weight. When this modification is accomplished the engines will be designated as O-470-B-CI, O-470-G-CI, O-470-K-CI, O-470-L-CI and O-470-M-CI and the nameplate changed accordingly.
- NOTE 7. O-470-B engine mounting brackets are eligible for use with O-470-M engines.
- NOTE 8. O-470-M engines with S/N's suffixed with the letter "P" are approved for pusher type installation.
- NOTE 9. Straight mineral or ashless disperant oil meeting TCM Spec. MHS #24 is approved for use in engines, except the O-470-S, -T, and -U which must use ashless disperant oil conforming to MHS-24. TCM instructions should be followed when changing types of oil.
- NOTE 10. A full flow oil filter may be used with these engines if the installation incorporates a filter bypass valve which opens between 12 and 16 p.s.i. Oil sump housing is eligible for direct mounting of oil filter having a maximum weight of 6 lb. and overhang moment of 25 in.-lb.
- NOTE 11. The following spark plugs are approved on these engines:
Models O-470-A, -E, -J, -K, -L, -R, -S
 AC HSR83IR, SR83IR, HSR83P, SR83P, HSR87, SR87, A88, S88, HSR88, HS88, SR88, S88D, SR88D
 Auto Lite SH2M, SH15, SH15R, SH20, SH20A, SH200A, SH150
 BG RB485S, 706S, RB919SR, 919SR5, RB955S
 Champion RC26S, C27S, REM38P, RHM38P, RED39N, RHD39N, REM39N, RHM39N, REM40E, RHM40E, D41N, ED41N, EM41N, EM42E
 Red Seal SE190, SE230, SJ190, SJ230
Models O-470-B, -G, -H, -M, -N, -P, IO-470-A
 AC SR83IR, HSR83IR, HSR83P, SR83P, S86R, SR86, HSR86, SR87, HSR87
 Auto Lite SH20A, SH200A, SH26, SH260, PH26, PH260
 BG RB485S, RB955S
 Champion RC26S, REM38E, REM38P, RHM38E, RHM38P, RED39N, REM39N, RHD39N, RHM39N, REM40E, RHM40E
 Red Seal SE230, SJ230, SE270, SJ270
Model IO-470-C
 AC SR83IR, HSR83IR, HSR83P, SR83P, SR86, HSR86, S86R, HSR87, SR87
 Auto Lite SH26, SH260, PH26, PH260
 Champion R25S, RC26CS, RED37N, REM37N, RHD37N, REM38E, REM38P, RHM38E, RHM39P, RED39N, RHD39N, RHM39N, REM40E, RHM40E, RHM37N, REM39N
 Red Seal SE270, SJ270
Model O-470-T, -U
 AC SR86L, HSR86L, HSR87LIR, HSR87LP, 171, 181, 271, 273, 281, 281IR, 283, 283IR
 Auto Lite SL350
 Champion RHA32N, RHB32N, RHB32E, RHB33E, RHB36P, RHB37E, REA37N, REB37N, RHA37N, RHB37N, RHB38E, R115
 Red Seal LE310, LJ8310
- NOTE 12. Teledyne Crittenden Alternator P/N 642056 and Drive Coupling P/N 642362 eligible for use with Model O-470-T engine. Alternator compatibility with aircraft must be accomplished by installer.

| | | |
|----------|--|--------|
| NOTE 13. | The following magnetos equipped with an appropriate harness are eligible on these engines at the Indicated Weight Changes: | |
| | Two TCM/Bendix S6RN-25 | None |
| | One Ea. TCM/Bendix S6RN-201 & S6RN-205 | -2 lb. |
| | Two Bendix Scintilla 1225 | -1 lb. |
| | Two TCM S6RSC-25 | None |
| | One Ea. TCM S6RSC-201(L) & S6RSC-205(R) | None |
| | Two Slick Electro 662 | None |
| | Two Slick Electro 680 | None |
| | Two Slick Electro 6210 | -5 lb. |
| | Two Slick model 6310 | -5 lb. |

.....END.....

P57GL
 REVISION 9
 McCauley
 3AF32C(5--)
 3AF34C(5--)
 3AF36C(5--)
 3AF37C(5--)
 August 16, 1996

TYPE CERTIFICATE DATA SHEET NO. P57GL

Propellers of models described herein conforming with this data sheet, which is part of Type Certificate No. P57GL and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated aircraft in accordance with the pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Type Certificate Holder: McCauley Propeller Systems
3535 McCauley Drive
Vandalia, Ohio 45377

Type Constant speed; hydraulic (see Notes 3 and 4)
 Engine Shaft Special flange 4.00 inch B.C.
 Hub Material Aluminum Alloy
 Blade Material Aluminum Alloy
 No. of Blades Three
 Hubs Eligible 3AF34C502, 3AF34C503, 3AF32C504, 3AF32C505, 3AF32C506,
 3AF32C507, 3AF32C508, 3AF32C509, 3AF37C510, 3AF32C511,
 3AF32C512, 3AF36C514, 3AF32C515, 3AF37C516, 3AF32C521,
 3AF32C522 and 3AF32C523

| Blades (See Note 2) | Maximum <u>Continuous</u> | | <u>Take-Off</u> | | Diameter Limits (See Note 2) | Approx. Max. Weight Complete (For Ref. Only) |
|--|------------------------------|------|-----------------|------|------------------------------------|--|
| | HP | RPM | HP | RPM | | |
| <u>Hub Model 3AF34C502</u> | | | | | | |
| 80H[X]-0 to 80H[X]-8 | 215 | 2575 | 215 | 2575 | 80" - 72" (-0 to -8) | 76.0 Lbs. |
| <u>Hub Model 3AF34C503</u> | | | | | | |
| L80H[X]-0 to L80H[X]-8 | 215 | 2575 | 215 | 2575 | 80" - 72" (-0 to -8) | 76.0 Lbs. |
| <u>Hub Models 3AF32C504, 3AF32C505, 3AF32C511, and 3AF32C512</u> | | | | | | |
| 82NE[X]-2 to 82NE[X]-8 | 325 | 2700 | 325 | 2700 | 80" - 74" (-2 to -8) | 70.0 Lbs. 75.8 Lbs. * |

| | | | | | |
|----------|---|---|---|---|---|
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| Rev. No. | 9 | 9 | 9 | 8 | 9 |

| Blades (See Note 2) | Maximum Continuous HP RPM | Take-Off HP RPM | Diameter Limits (See Note 2) | Approx. Max. Weight Complete (For Ref. Only) |
|---------------------------------|---------------------------------|--------------------|------------------------------------|--|
| <u>Hub Model 3AF32C506</u> | | | | |
| 82NE[X]-2 to 82NE[X]-10 | 250 2400 | 250 2400 | 80" - 72" (-2 to -10) | 71.5 Lbs. |
| <u>Hub Model 3AF32C507</u> | | | | |
| L82NE[X]-2 to L82NE[X]-10 | 250 2400 | 250 2400 | 80" - 72" (-2 to -10) | 71.5 Lbs. |
| <u>Hub Model 3AF32C508</u> | | | | |
| 82NF[X]-2 to 82NF[X]-8 | 220 2800 | 220 2800 | 80" - 74" (-2 to -8) | 69.5 Lbs. |
| <u>Hub Model 3AF32C509</u> | | | | |
| L82NF[X]-2 to L82NF[X]-8 | 220 2800 | 220 2800 | 80" - 74" (-2 to -8) | 69.5 Lbs. |
| <u>Hub Model 3AF37C510</u> | | | | |
| 90LF[X]-0 to 90LF[X]-10 | 375 2400 | 375 2400 | 90" - 80" (-0 to -10) | 86.9 Lbs. |
| <u>Hub Model 3AF36C514</u> | | | | |
| 80VMF[X]-0 to 80VMF[X]-6 | 350 2700 | 350 2700 | 80" - 74" (-0 to -6) | 75.8 Lbs. |
| <u>Hub Model 3AF32C515</u> | | | | |
| 82NL[X]-2 to 82NL[X]-8 | 350 2700 | 350 2700 | 80" - 74" (-2 to -8) | 74.0 Lbs. |
| <u>Hub Model 3AF37C516</u> | | | | |
| 90LF[X]-0 to 90LF[X]-6 | 375 2275 | 375 2275 | 90" - 84" (-0 to -6) | 86.9 Lbs. |
| <u>Hub Model 3AF32C521</u> | | | | |
| 82NL[X]-4 to 82NL[X]-10 | 350 2700 | 350 2700 | 78" - 72" (-4 to -10) | 80.5 Lbs. |
| <u>Hub Model 3AF32C522</u> | | | | |
| 82NJ[X]-2 to 82NJ[X]-8 | 220 2800 | 220 2800 | 80" - 74" (-2 to -8) | 69.5 Lbs. |
| <u>Hub Model 3AF32C523</u> | | | | |
| L82NJ[X]-2 to L82NJ[X]-8 | 220 2800 | 220 2800 | 80" - 74" (-2 to -8) | 69.5 Lbs. |

* Higher Weight applies to -C511 model only.

Certification Basis

Type Certificate No. P57GL issued July 17, 1978, under Delegation Option Authorization Provisions of Part 21, Subpart J, of the Federal Aviation Regulations.

Date of application for Type Certificate, July 12, 1978.

Models 3AF34C502, 3AF34C503, 3AF32C504, 3AF32C505, 3AF32C508, 3AF32C509:

Federal Aviation Regulations Part 35 including Amendments 35-1 through 35-4 (May 2, 1977) thereto.

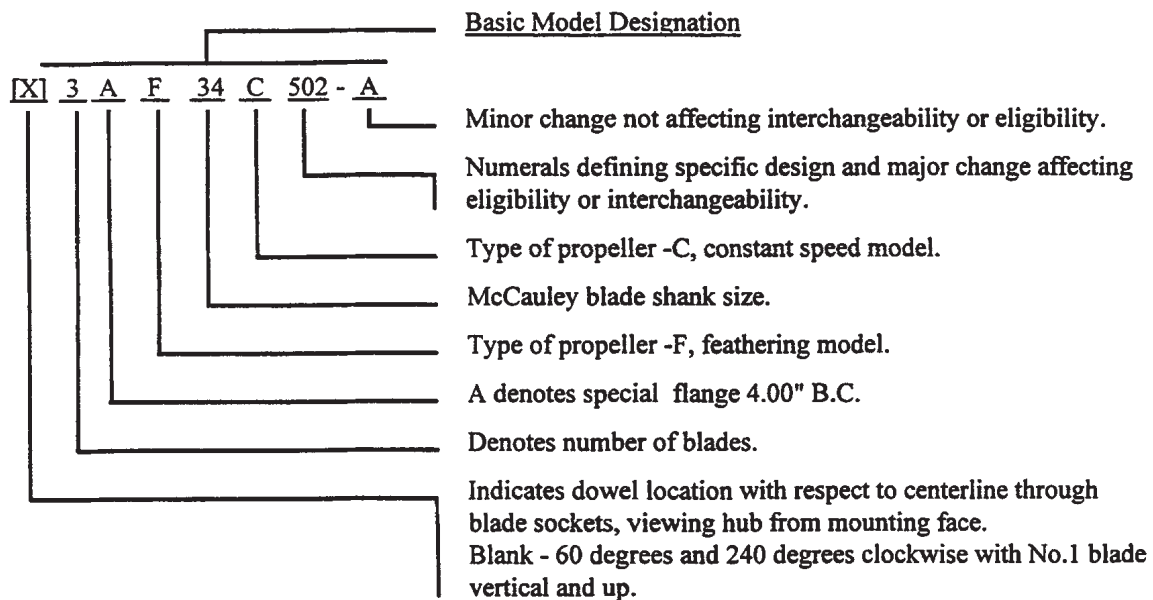
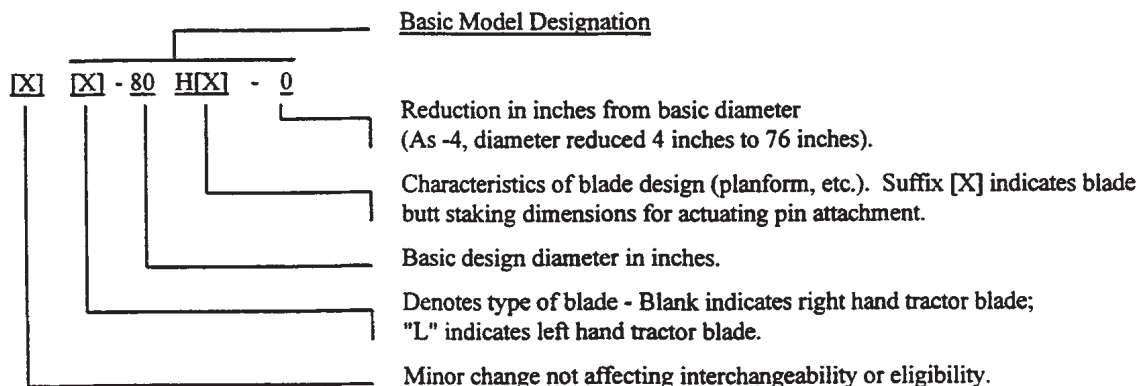
Models 3AF32C506, 3AF32C507, 3AF32C511, 3AF32C512, 3AF36C514: Federal Aviation Regulations Part 35 including Amendments 35-1 through 35-5 (October 14, 1980) thereto.

Models 3AF37C510, 3AF32C515, 3AF37C516, 3AF32C521, 3AF32C522, 3AF32C523:

Federal Aviation Regulations Part 35 including Amendments 35-1 through 35-6 (August 18, 1990) thereto.

Production Basis

Production Certificate No. 3

NOTE 1. Hub Model Designation.**NOTE 2. Blade Model Designation.**

NOTE 3. Pitch Control. With the following governors:

| | |
|----------------------------------|--------------|
| McCauley Model DCF290D[X]/T[X] | Wt. 3.0 lbs. |
| McCauley Model DCFU290D[X]/T[X] | Wt. 3.0 lbs. |
| McCauley Model DCFS290D[X]/T[X] | Wt. 3.0 lbs. |
| McCauley Model DCFUS290D[X]/T[X] | Wt. 3.0 lbs. |
| Hartzell Model E-[X]-[X] | Wt. 4.5 lbs. |
| Hartzell Model E-[X]-[X]L | Wt. 4.5 lbs. |
| Hartzell Model U-[X]-[X] | Wt. 4.5 lbs. |
| Hartzell Model U-[X]-[X]L | Wt. 4.5 lbs. |
| Woodward Model [X]2106[X][X] | Wt. 3.5 lbs. |

NOTE 4. Feathering. With full feathering control installed in accordance with the propeller manufacturer's instructions. Controls may include unfeathering, synchronizing or synchrophasing features.

NOTE 5. Not applicable.

NOTE 6. Not applicable.

NOTE 7. Accessories

a. Propeller Anti-icing/Deicing

(1) Model 80HA, L80HA, 82NFA, and L82NFA blades per Goodrich installation drawing 7E1391.

(2) Model -C504/82NEA and -C505/82NEA blades per McCauley assembly drawing E-5186.

(3) Model -C511/82NEA and -C512/82NEA blades per McCauley assembly drawing E5358.

(4) Model 82NEB or L82NEB blades per McCauley assembly drawing E-5203.

(5) Model 80VMF blades per McCauley assembly drawing E-6312, and deice installation drawing D-40486.

(6) Model 3AF32C515/82NLA per McCauley assembly drawing E-5186 and deice installation drawing C-40219.

(7) Model 3AF37C516/90LFB per McCauley assembly drawing E-7110.

(8) Model 3AF37C510/90LFB per McCauley assembly drawing E-7272.

b. Propeller Spinners

(1) Model 3AF34C502/80HA or 3AF34C503/L80HA with plain or electric deice spinner; reference D-4986 Dome, D-4984 Bulkhead and D-4987 Installation.

(2) Model 3AF32C504/82NEA or 3AF32C505/NEA with plain or electric deice spinner; reference D-3651 Dome, D-3925 Bulkhead and D-4042 Installation.

(3) Model 3AF32C506/82NEB or 3AF32C507/L82NEB with plain or electric deice spinner; reference D-5285 Dome, D-5274 Bulkhead and D-5275 Installation.

(4) Model 3AF32C508/82NFA or 3AF32C509/L82NFA with plain or electric deice spinner; reference D-4986 Dome, D-4984 Bulkhead and D-4987 Installation.

(5) Model 3AF32C511/82NEA with plain or electric deice spinner; reference D5370 Dome, D5371-2 Bulkhead and D-5311 Installation.

(6) Model 3AF32C512/82NEA with plain or electric deice or liquid anti-ice spinner; reference D-5370 Dome, D-5499-1 and -3 Bulkhead and D-5309 and D-5310 Installation.

(7) Model 3AF36C514/80VMFA with plain or electric deicing spinner; reference E-6190 Dome, E-6178 Bulkhead and D-6176 Installation.

(8) Model 3AF32C515/82NLA with electric deice spinner; reference D-5215 Installation.

(9) Model 3AF37C516/90LFB per assembly drawing E-7110.

(10) Model 3AF37C510/90LFB per assembly drawing E-7272.

| _____ (11) Model 3AF32C522/82NJA per assembly drawing E-7315.

| _____ (12) Model 3AF32C523/L82NJA per assembly drawing E-7316.

NOTE 8. Not applicable.

NOTE 9. Not applicable.

NOTE 10. Special Notes. Aircraft installation must be approved as part of the aircraft type certificate upon compliance with the applicable aircraft airworthiness requirements.

... END ...

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

P-920
Revision 21
HARTZELL
HC-C2Y
BHC-C2Y
CHC-C2Y
DHC-C2Y
April 25, 1996

TYPE CERTIFICATE DATA SHEET NO. P920

Propellers of models described herein conforming with this data sheet, (which is part of Type Certificate No. P-920) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Type Certificate Holder

Hartzell Propeller, Inc.
Piqua, Ohio 45356

Type

Constant speed; hydraulic (See NOTES 3 and 4)

Engine shaft

SAE #2 flange, special flange 4" B.C.

Hub material

Aluminum alloy

Blade material

Aluminum alloy

Number of blades

Two

Hub models

HC-C2YF-1, -2, -4; BHC-C2YF-1, -2, -4; CHC-C2YF-1, -2, -4; DHC-C2YF-1, -2, -4;
HC-C2YK-1, -2, -4; CHC-C2YK-1, -2, -4; HC-C2YL-1, -2, -4; HC-C2YR-1, -2, -4;
CHC-C2YR-1, -2, -4 (See NOTES 1 and 4)

| Blades (See NOTES 2 & 6) | Maximum Continuous HP | RPM | Takeoff HP | RPM | Diameter Limits | *Hub and Blades Approx. Wt. (See NOTES 3 and 7) |
|--|-----------------------------|--------------|------------------|--------------|-------------------------------|---|
| Non-Counterweighted Blades - Hub Models: All -1 | | | | | | |
| 7068-0 to 7068-10 | 300 | 2700 | 300 | 2700 | 70" - 60" (-0 to -10) | 55.5 lb |
| 7280+1/2 to 7280-7 | 250 | 2700 | 250 | 2700 | 72-1/2" - 65" (+1/2 to -7) | 51 lb. |
| 7663-0 to 7663-8 | 210 | 2800 | 210 | 2800 | 76" - 68" (-0 to -8) | 46 lb. |
| 7666-0 to 7666-8 | 180 or 250 | 2900 2700 | 180 or 250 | 2900 2700 | 76" - 68" (-0 to -8) | 51 lb. |
| 7681-0 to 7681-8 | 250 | 2700 | 250 | 2700 | 76" - 68" (-0 to -8) | 51 lb. |
| 7692-0 to 7692-8 | 180 or 250 | 2900 2700 | 180 or 250 | 2900 2700 | 76" - 68" (-0 to -8) | 46 lb. |
| 8052-0 to 8052-8 | 310 | 2600 | 310 | 2600 | 80" - 72" (-0 to -8) | 50.5 lb. |
| 8459-0 to 8459-18 | 260 | 2800 | 260 | 2800 | 84" - 66" (-0 to -18) | 48 lb. |

| | | | | | | | | | | |
|----------|----|----|----|----|----|----|----|----|----|----|
| Page No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Rev. No. | 21 | 21 | 20 | 20 | 21 | 20 | 20 | 20 | 21 | - |

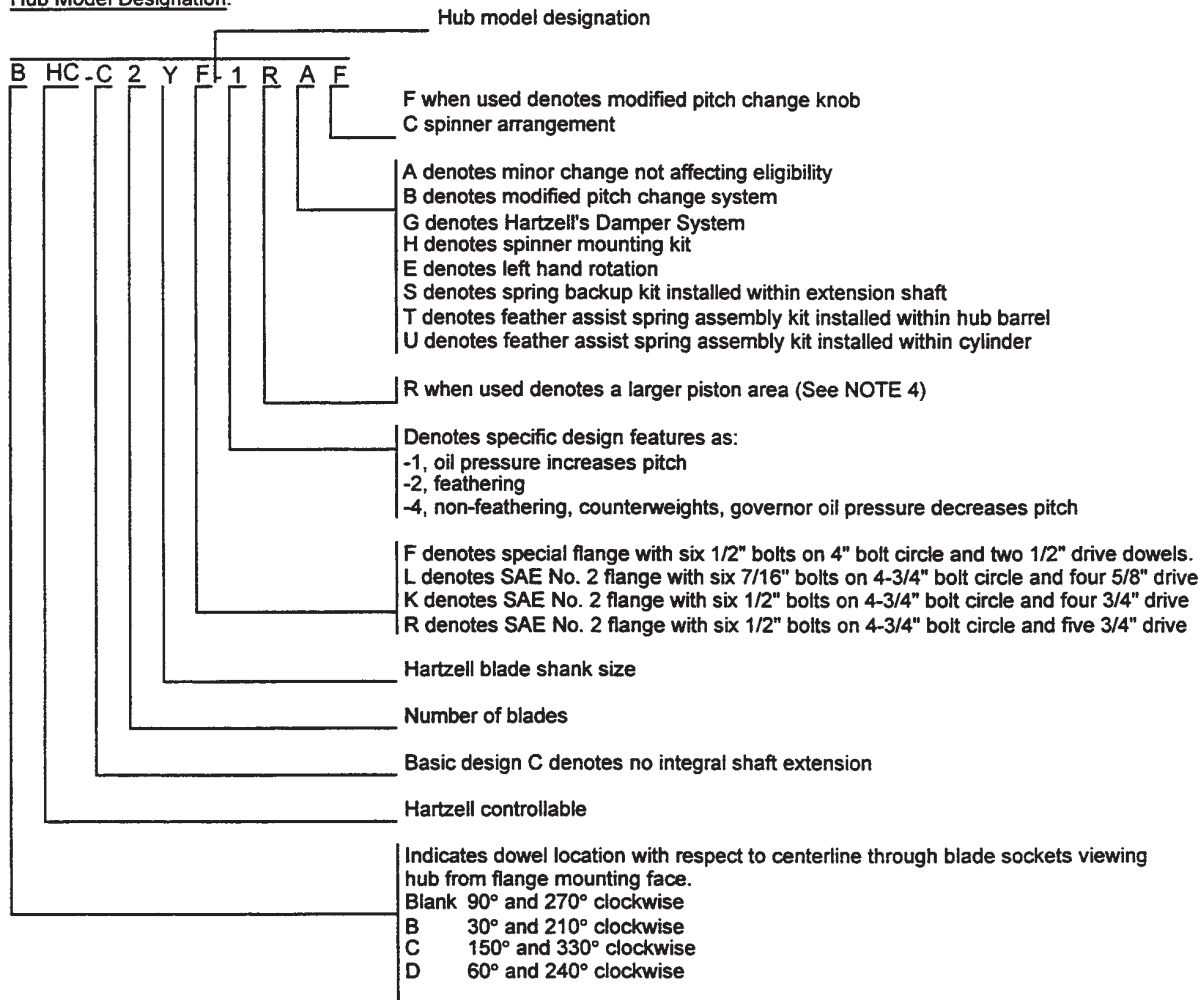
| Blades (See NOTES 2 & 6) | Maximum Continuous | | Takeoff | | Diameter Limits | *Hub and Blades Approx. Weight (See NOTES 3 and 7) |
|---|-----------------------|--------------------|------------------|--------------------|--------------------------|--|
| | HP | RPM | HP | RPM | | |
| 8465-0 to 8465-14 | 315 | 2575 | 2575 | 315 | 84" - 70" (-0 to -14) | 50 lb. |
| 8467-0 to 8467-12 | 285 | 2700 | 285 | 2700 | 84" - 72" (-0 to -12) | 52 lb. |
| 8468-0 to 8468-12 | 260 | 2700 | 260 | 2700 | 84" - 72" (-0 to -12) | 50 lb. |
| 8470-0 to 8470-8 | 260 | 2700 | 250 | 2700 | 84" - 76" (-0 to -8) | 49 lb. |
| 8475+2 to 8475-4 | 310 | 2700 | 310 | 2700 | 86" - 80" (+2 to -4) | 52 lb. |
| 8475-4 to 8475-6 | 350 | 2700 | 350 | 2700 | 80" - 78" (-4 to -6) | 51 lb. |
| 8475-6 to 8475-14 | 310 | 2700 | 310 or 300 | 2700 or 2850 | 78" - 70" (-6 to -14) | 50 lb. |
| 8477-0 to 8477-4 | 310 or 260 | 2575 or 2700 | 310 or 260 | 2575 or 2700 | 84" - 80" (-6 to -4) | 54 lb. |
| 8477-4 to 8477-6 | 350 | 2700 | 350 | 2700 | 80" - 78" (-4 to -6) | 53 lb. |
| 8477-6 to 8477-14 | 310 | 2700 | 310 or 300 | 2700 or 2850 | 78" - 70" (-6 to -14) | 52 lb. |
| 9587-0 to 9587-2 | 320 | 2200 | 320 | 2200 | 95" - 93" (-0 to -2) | 50 lb. |
| 9587-2 to 9587-20 | 320 or 300 | 2200 or 2400 | 320 or 300 | 2200 or 2400 | 93" - 75" (-2 to -20) | 50 lb. |
| <u>Counterweighted Blades - Hub Models: All -2 and -4</u> | | | | | | |
| C7663-0 to C7663-8 | 210 | 2800 | 210 | 2800 | 76" - 68" (-0 to -8) | 50 lb. |
| C7666-0 to C7666-8 | 180 or 250 | 2850 or 2700 | 180 or 250 | 2850 or 2700 | 76" - 68" (-0 to -8) | 55 lb. |
| C7681-0 to C7681-8 | 250 | 2700 | 250 | 2700 | 76" - 68" (-0 to -8) | 55 lb. |
| C7692-0 to C7692-8 | 180 or 250 | 2900 or 2700 | 180 or 250 | 2900 or 2700 | 76" - 68" (-0 to -8) | 50 lb. |

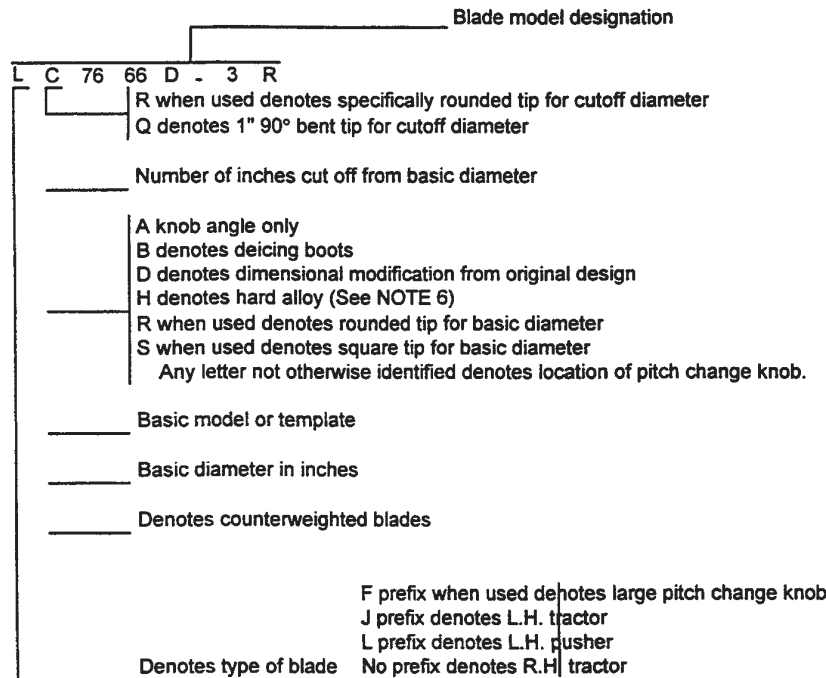
| Blades (See NOTES 2 & 6) | Maximum Continuous | | Takeoff | | Diameter Limits | *Hub and Blades Approx. Weight (See NOTES 3 and 7) |
|-----------------------------|-----------------------|--------------|------------------|--------------------|--------------------------|--|
| | HP | RPM | HP | RPM | | |
| C8052-0 to C8052-8 | 310 | 2600 | 310 | 2600 | 80" - 72" (-0 to -8) | 54.4 lb. |
| C8459-0 to C3459-12 | 260 | 2800 | 260 | 2800 | 84" - 72" (-0 to -12) | 52 lb. |
| C8465-0 to C8465-14 | 315 | 2575 | 315 | 2575 | 84" - 70" (-0 to -14) | 54 lb. |
| C8465-6 to C8465-14 | 260 | 2700 | 250 | 2700 | 78" - 70" (-6 to -14) | 53 lb. |
| C8467-0 to C8467-12 | 285 | 2700 | 285 | 2700 | 84" - 72" (-0 to -12) | 56 lb. |
| C8468-0 to C8468-12 | 260 | 2700 | 260 | 2700 | 84" - 72" (-0 to -12) | 54 lb. |
| C8470-0 to C8470-8 | 260 | 2700 | 260 | 2700 | 84" - 76" (-0 to -8) | 53 lb. |
| C8475+2 to C8475-4 | 310 | 2700 | 310 | 2700 | 86" - 80" (+2 to -4) | 56 lb. |
| C8475-4 to C8475-6 | 350 | 2700 | 350 | 2700 | 80" - 78" (-4 to -6) | 55 lb. |
| C8475-6 to C8475-14 | 310 | 2700 | 310 or 300 | 2700 or 2850 | 78" - 70" (-6 to -14) | 54 lb. |
| C8477-0 to C8477-4 | 310 or 260 | 2575 2700 | 310 or 260 | 2575 2700 | 84- 80" (-0 to -4) | 58 lb. |
| C8477-4 to C8477-6 | 350 | 2700 | 350 | 2700 | 80" - 78" (-4 to -6) | 57 lb. |
| C8477-6 to C8477-14 | 310 | 2700 | 310 or 300 | 2700 or 2850 | 78" - 70" (-6 to -14) | 56 lb. |
| C9587-0 to C9587-2 | 320 | 2200 | 320 | 2200 | 95" - 93" (-0 to -2) | 54 lb. |
| C9587-2 to C9587-20 | 320 or 300 | 2200 2400 | 320 or 300 | 2200 2400 | 93" - 75" (-2 to -20) | 54 lb. |

*Weights apply to -1 constant speed hub with "F" flange. Add 1.2 lb. for "L", "K", and "R": flange, 3.0 lb. for feathering -2 hubs, and 5.5 lb. for feathering -2R hubs. Add 4 lb. for -4 model.

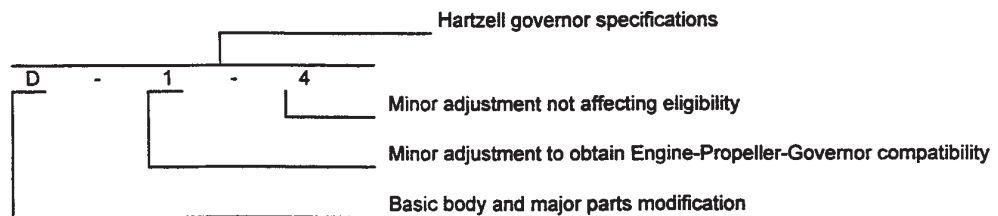
Certification basis Civil Air Regulations Part 14 effective December 25, 1956
 Type Certificate No. P-920 issued July 24, 1961
 Date of Application for Type Certificate March 24, 1959
 Models listed are approved under Delegation Option
 Authorization Provisions of FAR 21 Subpart J with corresponding approval dates indicated below.
 HC-C2Y()-1/7681 & HC-C2Y()-2/C7681 approved May 23, 1967
 HC-C2YF-4 & HC-C2YK-4 approved June 16, 1970
 HC-C2YL-4 approved February 17, 1971

Production basis Production Certificate No. 10

NOTE 1. Hub Model Designation.

NOTE 2. Blade Model Designation.

NOTE 3: Pitch Control. (See Note 10).
Approved with Hartzell governors per drawing list C-4770 or C-4772.
Governor model designation sample:



Approved with the following governors:

*Woodward Model X210XXX or X210X-XXX

*Edo-Aire Model 34-828-xxx

Wt. 3.0 lb.

**McCauley Model C290D3-X/TXX

Wt. 2.8 lb.

* Not approved with air feathering propellers without counterweights.

**Not approved with counterweights or feathering propeller.

- NOTE 4.** (a) Feathering. The -1 and -4 models do not feather. The -2 models incorporate feathering and unfeathering features.
(b) Reversing. Not applicable.
(c) Piston size. The -2R model differs from the -2 model in that the -2R has a piston area of 20.2 sq. in. and the -2 has a piston area of 16.25 sq. in.

NOTE 5. Left-Hand Models. The left-hand version of a model propeller is approved at the same rating and diameter as listed for right-hand model. See NOTES 1 and 2.

NOTE 6. Interchangeability.

- (a) Blades.
- (1) Blades with counterweights (having "C" prefix) can replace non-counterweighted blades on feathering propellers (Hub Model Suffix -2 or -2R) only, providing the air charge is reduced to 80 p.s.i. @ 70° F. Attached decal specifying air charge must be changed accordingly.
- (2) Hard and soft alloy blades of the same model designation are interchangeable but only on seaplanes and amphibious aircraft.
- (b) Propellers.
- (1) "F" type propellers with larger pitch change knobs are interchangeable with corresponding propellers with standard pitch change system (See NOTES 1 and 2 above).

NOTE 7. Accessories. (See NOTE 10)

- (a) **Propeller Anti-Icing**
 - (1) Fluid feed shoes or Ice boots installed in accordance with Hartzell Special Instructions No. 59A.
 - (2) Hartzell fluid feed equipment on propeller models for which the equipment is available.
- (b) **Propeller Deicing.**
 - (1) Goodyear Ice Guards (electrical propeller deicer) when installed in accordance with instructions outlined in Goodyear Report No. AP-147 dated October 23, 1961.
 - (2) Goodrich De-icing Kit 77-xxx, 67-xxx, or 65-xxx when installed in accordance with Goodrich Report No. 59-728 ().
- (c) **Propeller Spinner**
 - (1) Approved with Hartzell spinners (weight of spinner extra).
- (d) **Propeller Damper C-1576**
 - (1) Approved for Hartzell Propeller Model HC-C2Y.

NOTE 8. Shank Fairings. Not applicable.NOTE 9. Special Limits.

Table of Propeller-Engine Combinations
Approved Vibrationwise for Use on Normal Category Single-Reciprocating Engine Tractor Aircraft

The maximum and minimum propeller diameters that can be used from a vibrationwise standpoint are shown below. No reduction below the minimum diameter listed is permissible, since this figure includes the diameter reduction allowable for repair purposes.

| <u>Hub Model</u> | <u>Blade Model</u> | <u>Engine Model</u> | <u>Max. Dia. (Inches)</u> | <u>Min. Dia. (Inches)</u> | <u>Placards</u> |
|---------------------|--------------------|--|---------------------------|---------------------------|---|
| HC-C2YR | F7068-() | Lycoming IO-360-B1A, -B1B, -B1C, -B1D, -B1E, -B1F, -E1A, -F1A O-360-A1A, -A1AD, -A1C, -A1D, -A1F, -A1G, -A1H, -A1LD | 68 | 67 | "Stabilized operation is prohibited above 25" manifold pressure between 2300-2350 RPM and below 15" manifold pressure above 2600 RPM" |
| BHC-C2YF | 7663 | Continental O-300-E | 72 | 70 | None |
| HC-C2YK | 7663 | Continental IO-346-B | 76 | 76 | None |
| BHC-C2YF | 7663 | Continental IO-346-A, -B, -C, -D, -E | 76 | 72 | None |
| BHC-C2YF | F7663() | Continental IO-360-H, -HB | 76 | 72 | None |
| HC-C2YL | 7663 | Lycoming O-290-D2A | 72 | 70 | None |
| HC-C2YL | 7663 | Lycoming O-320-A3A, -A3B, -A3C, -B3A, -B3B, -B3C, -C3A, -C3B, -C3C, -D1A, -D1B, -D1C, -E1A, -E1B, -E1C, -E1F | 72 | 70 | None |
| HC-C2YL | 7663 | Lycoming IO-320-A1A, -A2A, -B1A, -B1B, -B1C, -B1D, -B2A, -C1A, -D1A, -D1B, -E1A | 72 | 70 | None |
| HC-C2YL | 7663 | Lycoming IO-320-E1A | 72 | 70 | None |
| HC-C2YK HC-C2YR | 7666 F7666 | Lycoming O-360-A1A, -A1AD, -A1C, -A1D, -A1F, -A1G, -A1LD, -B1A, -B1B, -C1A, -C1C, -C1F, -D1A | 76 | 72 | "Avoid continuous operation between 2000 and 2250 r.p.m." |
| HC-C2Y(KR) | F7666A-2Q | Lycoming O-360-A1A, -A1C, -A1D, -A1F, -A1G, -B1A, -B1B, -C1A, -C1C, -C1F, -D1A | 74 | 74 | "Avoid continuous operation between 2000 and 2250 r.p.m." |
| HC-C2YK CHC-C2YK | 7666 C7666 | Lycoming IO-360-A1A, -A1B, -A1C, -B1A, -B1C, -C1A, -C1B, -C1C, -D1A | 74 | 72 | "Avoid continuous operation between 2000 and 2350 r.p.m." |

| Hub Model | Blade Model | Engine Model | Max. Dia. (Inches) | Min. Dia. (Inches) | Placards |
|--------------------------|-------------------------------|--|--------------------|--------------------|--|
| HC-C2YR HC-C2YK | F7666()-3Q | Lycoming IO-360-A3B6D | 73 | 73 | None |
| HC-C2YK HC-C2YR | FC7666 F7666A FJC7666 | Lycoming O-360-E1A6D Lycoming LO-360-E1A6D | 74 | 72 | None |
| HC-C2YK HC-C2YR | F7666A-2 | Lycoming O-360-A1F6D | 74 | 73 | None |
| HC-C2YR | FJC7666A-()R FC7666A-()R | Lycoming LTO-360-E1A6D TO-360-E1A6D | 74 | 72 | None |
| ()HC-C2YK ()HC-C2YR | () 7666 () -4Q | Lycoming IO-360-B1A, -B1B, -B1D, -B1E, -B1F, -E1A, -F1A | 72 | 72 | "Avoid continuous operation between 2000 and 2250 r.p.m." |
| HC-C2YK HC-C2YR | F()7666A -4Q | Lycoming O-360-A1A, -A1C, -A1D, - A1F, -A1G, -B1A, -B1B, -C1A, -C1C, - D1A | 72 | 72 | "Avoid continuous operation between 2000 and 2250 r.p.m." |
| HC-C2YK | F7666A -4Q | Lycoming IO-360-A1B6 | 72 | 72 | None |
| HC-C2YK HC-C2YR | 7666 -4Q | Lycoming IO-360-A1A, -A1B, -A1C, -C1A, -C1B, -C1C, -D1A | 72 | 72 | "Avoid continuous operation between 2000 and 2250 r.p.m." |
| HC-C2YK | 7666 | Lycoming IO-360-B1A, -B1B, -B1C, -B1D, -B1E, -B1F, -E1A, -F1A | 74 | 72 | "Avoid continuous operation between 2000 and 2250 r.p.m." |
| HC-C2YK | 7666 | Lycoming IO-360-B1A, -B1B, -B1D, -B1E, -B1F, -E1A, -F1A | 76 | 74 1/2 | "Avoid continuous operation between 2000 and 2250 r.p.m." |
| HC-C2YK HC-C2YR | 7666 C7666 | Lycoming IO-360-A1B6, -A1D6, -C1E6, -C1C6 | 76 | 76 | "None - which contain inertia damper Hartzell P/N C1576" |
| HC-C2YK HC-C2YR | 7666 C7666 | Lycoming IO-360-A1B6, -A1D6, -C1E6, -C1C6 | 76 | 76 | "Avoid continuous operation between 2000 and 2400 r.p.m." |
| HC-C2YK HC-C2YR | 7666 | Lycoming O-360-F1A6 | 74 | 72 | None |
| HC-C2YK HC-C2YR | ()7666 | Lycoming IO-360-A1B6D | 74 | 72 | None |
| HC-C2YK HC-C2YR | JC7666 | Lycoming IO-360-C1E6 | 76 | 76 | "None - which contain inertia damper Hartzell P/N C1576" |
| HC-C2YK HC-C2YR | JC7666 | Lycoming LIO-360-C1E6 | 76 | 76 | "Avoid continuous operation between 2200 and 2400 r.p.m." |
| HC-C2YK | 7666 | Lycoming AIO-360-A1A, -A1B, -B1B | 74 | 72 | "Avoid continuous operation between 2000 and 2350 r.p.m." |
| HC-C2YK HC-C2YR | FC7666A F7666A | Lycoming TO-360-C1A6D | 76 | 75 | "Do not operate about 36 inches of manifold pressure at engine speeds below 2400 r.p.m." |

| Hub Model | Blade Model | Engine Model | Max. Dia. (Inches) | Min. Dia. (Inches) | Placards |
|----------------------------------|---------------|--|--------------------|--------------------|--|
| HC-C2YR | 7666 | Lycoming AEIO-360-H1A | 74 | 72 | "Avoid continuous operation between 2000 and 2350 r.p.m." |
| HC-C2YK HC-C2YR | F7666 | Lycoming IO-360-A1B6, -A1D6, -C1E6, -C1C6 | 74 | 72 | None |
| BHC-C2YF | 8052 | Continental TSIO-520-BE | 80 | 78 | None |
| BHC-C2YF | FC8459 | Continental TSIO-360-E, -EB, -KB | 76 | 75 | "Avoid continuous operation between 2000 and 2200 r.p.m. with engine manifold pressure above 32 in. Hg. Avoid continuous ground operation in cross and tail winds of over 10 knots between 1700 and 2100 r.p.m." |
| | FJC8459 | Continental LTSIO-360-E, -EB, -KB | | | |
| | F8459-()R | Continental TSIO-360-F, -FB, -G | | | |
| BHC-C2YF | F8459()-()R | Continental IO-360-ES | 76 | 75 | "Avoid continuous ground operation between 1700 and 2100 RPM in cross and tail winds of over 10 knots." |
| HC-C2YF | 8459 C8459 | Franklin 6A-350-C1, -C2 | 80 | 76 | None |
| HC-C2YL | 8459 | Lycoming O-320-A3A, -A3B, -A3C, -B3A, -B3B, -B3C, -C3A, -C3B, -C3C, -D1A, -D1B, -D1C, -E1A, -E1B, -E1C, -E1F | 66 | 66 | None |
| HC-C2YL | 8459 | Lycoming IO-320-A1A, -A2A, -B1A, -B2A, -B1B, -B1C, -B1D, -C1A, -E2A | 66 | 64 | None |
| BHC-C2YK CHC-C2YK DHC-C2YK | 8465 | Continental IO-470-L | 78 | 76 | None |
| HC-C2YK HC-C2YR | 8467 | Lycoming IO-540-D4A5 | 77 | 75 | "Avoid continuous operation between 2500 and 2600 r.p.m. above 25" Hg. manifold pressure." |
| HC-C2YK HC-C2YR | F8467 | Lycoming IO-540-R1A5 with Ray Jay turbosuper charger (up to 29" Hg manifold pressure absolute) | 77 | 75 | None |
| HC-C2YK HC-C2YR | 8467-()R | Lycoming O-540-B4A5, -B4B5, -E4A5, -E4B5, -E4C5 | 77 | 75 | "Avoid continuous operation between 2500 and 2600 r.p.m. above 25" Hg. manifold pressure." |
| HC-C2YK HC-C2YR | 8467-()R | Lycoming IO-540-T4A5D | 77 | 75 | None |
| HC-C2YF BHC-C2YF | 8468 | Continental O-470-R | 84 | 80 | None |
| HC-C2YF BHC-C2YF | 8468 | Continental IO-470-E | 84 | 83 | "Avoid continuous operation between 2100 and 2225 r.p.m." |
| HC-C2YF | 8468 | Continental IO-470-D, -E, -F, -G, -H, -M, -N, -R, -S | 82 | 80 | None |

| Hub Model | Blade Model | Engine Model | Max. Dia. (Inches) | Min. Dia. (Inches) | Placards |
|--------------------|--------------------------|--|--------------------|--------------------|---|
| HC-C2YF | 8468 C8468 | Continental IO-470-D, -E, -F, -G, -H, -M, -N, -R, -S | 78 | 78 | "Do not exceed 23" Hg. manifold pressure below 2300 r.p.m." |
| HC-C2YF | 8468R | Continental IO-520-BA | 84 | 84 | None |
| BHC-C2YF | F8468R F8468AR | Continental IO-520-BB | 84 | 84 | None |
| HC-C2YL | 8468 | Lycoming O-320-A3A, -A3B, -A3C, -B3A, -B3B, -B3C, -C3A, -C3B, -C3C, -D1A, -D1B, -D1C, -E1A, -E1B, -E1C, -E1F | 80 | 74 | None |
| HC-C2YK | 8468-10R C8468-10R | Lycoming TIO-360-A1A, -A1B | 74 | 74 | "Avoid continuous operation between 1975 and 2200 r.p.m." |
| HC-C2YK HC-C2YR | 8468 | Lycoming O-540-B4A5, -B4B5 | 84 | 77 | None |
| HC-C2YR | F8468A-3R | Lycoming O-540-J1A5D | 81 | 77 | None |
| HC-C2YF | 8475 C8475 | Continental IO-520-A, -J Continental TSIO-520-A, -C, -H | 80 | 77 | None |
| HC-C2YF | 8475 C8475 | Continental IO-520-D, -E, -F, -K, -L Continental TSIO-520-G | 78 | 77 | None |
| BHC-C2YF | 8475 C8475 | Continental IO-520-B & -C Continental TSIO-520-B, -D | 80 | 77 | None |
| BHC-C2YF | 8475 C8475 | Continental TSIO-520-E | 78 | 77 | None |
| HC-C2YK HC-C2YR | 8475R | Lycoming IO-540-K1B5, -K1C5, -L1A5, -M1A5 | 84 | 84 | None |
| HC-C2YK HC-C2YR | 8475R | Lycoming IO-540-K1A5 | 84 | 78 | None |
| HC-C2YK HC-C2YR | 8475 | Lycoming IO-540-K1A5, -K1B5, -K1C5, -K1D5, -L1A5, -M1A5 | 86 | 86 | "Do not exceed 24 in. Hg. manifold pressure between 2300 and 2475 r.p.m." |
| HC-C2YK HC-C2YR | 8475D | Lycoming IO-540-K1G5, -K1G5D, -K1A5D | 83 | 78 | None |
| HC-C2YK HC-C2YR | 8475 | Lycoming IO-540-K1A5, -K1B5, -K1C5, -L1A5, -M1A5 | 83 | 78 | None |
| HC-C2YK HC-C2YR | 8475 | Lycoming TIO-541-A1A | 80 | 80 | None |
| HC-C2YK HC-C2YR | F8477-6Q or FC8477-6Q | Lycoming IO-540-D4A5, -D4B5, -D4C5 | 78 | 78 | None |
| HC-C2YK HC-C2YR | 8477 | Lycoming O-540-A4A5, -A4B5, -A4C5, -A4D5, -E4A5, -E4B5, -E4C5 | 84 | 76 | None |
| HC-C2YK HC-C2YR | C8477 | Lycoming O-540-A4A5, -A4B5, -A4C5, -A4D5, -E4A5, -E4B5, -E4C5 | 80 | 78 | None |

| <u>Hub Model</u> | <u>Blade Model</u> | <u>Engine Model</u> | <u>Max. Dia. (Inches)</u> | <u>Min. Dia. (Inches)</u> | <u>Placards</u> |
|--------------------|--------------------|---|---------------------------|---------------------------|---|
| HC-C2YK HC-C2YR | 8477-8R | Lycoming O-540-A4A5, -A4B5, -A4C5, -A4D5, -E4A5, -E4B5, -E4C5 | 76 | 76 | None |
| HC-C2YK HC-C2YR | 8477 | Lycoming O-540-G1A5 | 84 | 83 | None |
| HC-C2YK HC-C2YR | 8477 C8477 | Lycoming IO-540-C4B5, -C4C5, -D4A5 | 84 | 76 | None |
| HC-C2YK HC-C2YR | C8477 | Lycoming IO-540-K1A5, -K1B5, -K1C5, -K1D5, -L1A5, -M1A5 | 80 | 80 | "Do not exceed 23" Hg. manifold pressure below 2200 r.p.m." |
| HC-C2YK HC-C2YR | FC8477A | Lycoming IO-540-K1D5 | 80 | 78 | "Do not exceed 23" Hg. manifold pressure below 2200 r.p.m." |
| HC-C2YF | 9587A | Continental 6-285-B, 6-285-C | 95 | 93 | "Avoid continuous operation on the ground between 1900 and 2300 engine r.p.m. in winds above 15 m.p.h." |

NOTE 10. Special Notes. Aircraft installation must be approved as part of the aircraft type certificate and demonstrate compliance with the applicable aircraft airworthiness requirements.

...END...

| | |
|-----------------|------|
| 2A4 | |
| Revision 45 | |
| Twin Commander | |
| 560-F | 681 |
| 680 | 690 |
| 680E | 685 |
| 680F | 690A |
| 720 | 690B |
| 680FL | 690C |
| 680FL(P) | 690D |
| 680T | 695 |
| 680V | 695A |
| 680W | 695B |
| January 1, 1990 | |

TYPE CERTIFICATE DATA SHEET NO.2A4

This data sheet, which is a part of Type Certificate No. 2A4 prescribes conditions and limitations under which the product for which the Type Certificate was issued meets the airworthiness requirements of the Civil Air Regulations.

Type Certificate Holder: Twin Commander Aircraft Corporation
19003 - 59th Drive N.E.
Arlington, Washington 98223

I - Model 680, 7 PCLM (Normal Category), Approved October 14, 1955 (See NOTE 3 for RL-26-D)
(See NOTE 7 for conversion to Model 680E)

Engines 2 Lycoming GSO-480-A1A6, Carburetor Bendix PS-7BD, Part Listing
No. 391663-3, -4, -5, -6, or -7, or GSO-480-B1A6 (See NOTE 4).

Fuel 100/130 minimum grade aviation gasoline.

Engine Limits (Straight line manifold pressure variation with altitudes shown)

| | <u>HP.</u> | <u>R.P.M.</u> | <u>M.P.</u> | <u>ALT.</u> |
|--------------------|------------|---------------|-------------|-------------|
| Takeoff | 340 | 3400 | 48.0 | S.L. |
| Takeoff | 340 | 3400 | 44.5 | 8000 |
| Maximum continuous | 320 | 3200 | 45.0 | S.L. |
| Maximum continuous | 320 | 3200 | 43.0 | 8000 |

Propeller and Propeller Limits 2 Hartzell 3-Bladed feathering propellers

a. H.C.-83x20-2 Hubs with 9333c blades
Pitch settings at 30 in. Station: Low 17°, Feather 83°
Diameter: 93 in., no cutoff permitted
NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization, hubs with different numbers should not be combined on the same aircraft.

b. Spinner: 2 Hartzell, Dome C-888-3, Bulkhead C-807-3 or 2 Hartzell 835-10 assemblies or 2 Hartzell 836-7A assemblies (installed with alcohol anti-icing system per P/N 5890047).

c. Governor: 2 Woodward 210075

| | | | | | | | | | | | | | |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Page No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Rev. No. | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| Page No. | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| Rev.No. | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| Page No. | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | | | | | |
| Rev.No. | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | | | | | |

I - Model 680 (cont'd)

| | | | |
|-------------------------|---|--------------------|-------------------|
| Airport Limits | Maneuvering | 160 m.p.h. | (139K) True Ind. |
| | Max. Struc. cruising | 210 m.p.h. | (182K) True Ind. |
| | Never exceed | 270 m.p.h. | (235K) True Ind. |
| | Flaps extended - half | 150 m.p.h. | (230K) True Ind. |
| | Flaps extended - full | 130 m.p.h. | (113K) True Ind. |
| | Landing gear extended | 180 m.p.h. | (156K) True Ind. |
| C.G. range | (+166.4) to +175.8) (Gear extended) Effect of retracting landing gear +6655 in.-lb. | | |
| Empty Weight C.G. range | None | | |
| Datum | 152 in. forward of wing landing edge at center section. | | |
| Leveling means | Longitudinal - Top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams a: front or rear of baggage compartment floor. | | |
| Maximum weight | 7000 lb. | | |
| No. of seats | 7 (2 at +95, 2 at +128, and 3 at +168) | | |
| Maximum baggage | 350 lb. (+200) | | |
| Fuel capacity | Center tank 158.5 gal. (+187), usable fuel 156 gal. Outboard tanks 33.5 gal. each (+178), usable fuel 33.5 gal. each. Total capacity 225.5 gal., usable fuel 223 gal. (See NOTE 1 for system fuel) | | |
| Oil capacity | 8.5 gal. total (4.25 gal. each tank) (+191) 8.5 gal. usable (See NOTE 1 for system oil) | | |
| Control surface | Elevator | Up 20° ± 1 0 | Down 10° ± 2 0 |
| | Elevator tab | Up 20° ± 2 0 | Down 20° ± 2 0 |
| | Rudder | Right 20° ± 2 0 | Left 20° ± 2 0 |
| | Rudder tab | Right 26° ± 2 0 | Left 26° ± 2 0 |
| | Aileron | Up 23° ± 2 | Down 15° ± 2 |
| | Flap outboard | | Down 40° ± 2 |
| | Flap inboard | | Down 40° ± 2 |
| | | | |
| | | | |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to approve design and production charges on airplane serial numbers 680-244-2 to 680-658-255. (See NOTES 15 and 22) | | |

II. - Model 680-E, 7 PCLM (Normal Category) Approved June 19, 1958

(Same as Model 680 except for extended wing and increased maximum weight)

| | |
|---------|--|
| Engines | 2 Lycoming GSO-480-B1A6, Carburetor Bendix PA-7 BD, Part Listing No. 391663-3, -4, -5, -6, and -7. |
| Fuel | 100/130 minimum grade aviation gasoline. |

II. - Model 680-E (cont'd)**Engine limits**

(Straight line manifold pressure variation with altitudes shown)

| | <u>HP.</u> | <u>R.P.M.</u> | <u>M.P.</u> | <u>ALT.</u> |
|--------------------|------------|---------------|-------------|-------------|
| Takeoff | 340 | 3400 | 48.0 | S.L. |
| Takeoff | 340 | 3400 | 44.5 | 8000 |
| Maximum continuous | 320 | 3200 | 45.0 | S.L. |
| Maximum continuous | 320 | 3200 | 43.0 | 8000 |

Propeller and Propeller Limits

2 Hartzell 3-Bladed feathering propellers

a. HC-83x20-2 or HC-A3x20-2 Hubs with 9333c blades.

Pitch settings at 30 in. Station: Low 17°, Feather 83°

Diameter: 93 in., no cutoff permitted

NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft.

b. Spinner: 2 Hartzell, Dome C-888-3, Bulkhead C-807-3 or 2 Hartzell 835-10 assemblies or 2 Hartzell 836-7A assemblies (installed with alcohol anti-icing system per P/N 5890047) or 2 Hartzell 836-22S assemblies (installed with alcohol anti-icing system per P/N 5890047).

c. Governor: 2 Woodward 210075

Airspeed Limits

| | | |
|-----------------------|------------|------------------|
| Maneuvering | 160 m.p.h. | (139K) True Ind. |
| Max. Struc. cruising | 210 m.p.h. | (182K) True Ind. |
| Never exceed | 270 m.p.h. | (235K) True Ind. |
| Flaps extended - half | 150 m.p.h. | (130K) True Ind. |
| Flaps extended - full | 135 m.p.h. | (117K) True Ind. |
| Landing gear extended | 180 m.p.h. | (156K) True Ind. |

C.G. range

(+166.0) to (+175.1) (Gear extended)

Effect of retracting landing gear +6655 in.-lb.

Empty Weight C.G. Range

None

Datum

152 in. forward of wing leading edge at center section.

Leveling means

Longitudinal - Top of fuselage on centerline aft of wing trailing edge.

Lateral: Transverse beams at front or rear of baggage compartment floor.

Maximum Weight

7500 lb.

No. of seats

7 (2 at +94, 2 at +128, and 3 at +168)

Maximum baggage

350 lb. (+200)

Fuel capacity

Center tank 158.5 gal. (+187), usable fuel 156 gal.

Outboard tanks 33.5 gal. each (+178), usable fuel 33.5 gal. ea.

total capacity 225.5 gal., usable fuel 223 gal.

(See NOTE 1 for system fuel)

Oil capacity

8.5 gal. total (4.25 gal. each tank) (+191)

8.5 gal. usable (See NOTE 1 for system oil)

II. - Model 680-E (cont'd)

| | | | | | |
|---------------------------|---------------|-------|-------------------|------|--------------|
| Control surface movements | Elevator | Up | 30° ± 1 0 | Down | 10° ± 2 0 |
| | Elevator Tab | Up | 2 1/2° ± 2 1/2 | Down | 20° ± 2 0 |
| | Rudder | Right | 20° ± 2 0 | Left | 20° ± 2 0 |
| | Rudder tab | Right | 26° ± 2 0 | Left | 26° ± 2 0 |
| | Aileron | Up | 23° ± 2 | Down | 15° ± 2 |
| | Flap outboard | | | Down | 40° ± 2 |
| | Flap inboard | | | Down | 40° ± 2 |
| | | | | | |

Serial Nos. eligible Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to approve design and production changes on airplane serial numbers 680-E-242-102, 680-E-623-1 to 680-E-892-100. (See NOTES 15 and 22.)

III. - Model 720, 6 PCLM (Normal Category), Approved December 5, 1958

(Same as Model 680 except for pressurized cabin, structural modifications to the fuselage, extended wing and increased maximum weight)

Engines 2 Lycoming GSO-480-B1A6, AMC Carburetor Bendix PS-7BD, Part Listing Nos. 391714-1, -2, -3, and -4.

Fuel 100/130 minimum grade aviation gasoline.

| | | | | |
|---------------|--|-----------|---------------|-------------------------|
| Engine limits | (Straight line manifold pressure variation with altitudes shown) | | | |
| | | <u>HP</u> | <u>R.P.M.</u> | <u>M.P.</u> <u>ALT.</u> |
| | Takeoff | 340 | 3400 | 48.0 S.L. |
| | Takeoff | 340 | 3400 | 44.5 8000 |
| | Maximum continuous | 320 | 3200 | 45.0 S.L. |
| | Maximum continuous | 320 | 3200 | 43.0 8000 |

Propeller and Propeller Limits 2 Hartzell 3-Bladed feathering propellers

a. HC-83x20-2 Hubs with 9333c blades
Pitch settings at 30 in. Station: Low 17°, Feather 83°
Diameter: 93 in., no cutoff permitted
NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft.

b. Spinner: 2 Hartzell, Dome C-888-3, Bulkhead C-807-3 or 2 Hartzell 835-10 assemblies or 2 Hartzell 836-7A assemblies (installed with alcohol anti-icing system per P/N 5890047).

c. Governor: 2 Woodward 210075

| | | | |
|-----------------|-----------------------|------------|------------------|
| Airspeed Limits | Maneuvering | 160 m.p.h. | (139K) True Ind. |
| | Max. Struc. cruising | 210 m.p.h. | (182K) True Ind. |
| | Never exceed | 270 m.p.h. | (235K) True Ind. |
| | Flaps extended - half | 150 m.p.h. | (130K) True Ind. |
| | Flaps extended - full | 135 m.p.h. | (117K) True Ind. |
| | Landing gear extended | 180 m.p.h. | (156K) True Ind. |

C.G. Range (+166.0) to (+175.1) (Gear extended)
Effect of retracting landing gear +6655 in.-lb.

Empty Weight C.G. Range None

Datum 152 in. forward of wing leading edge at center section.

III. - Model 720 (cont'd)

| | | | | |
|---------------------------|--|-------|-------------------|-------------------|
| Leveling means | Longitudinal - top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front or rear of baggage compartment floor. | | | |
| Maximum weight | 7500 lb. | | | |
| No. of seats | 6 (2 at +94, 2 at +128, and 3 at +168) | | | |
| Maximum baggage | 175 lb. (+200) | | | |
| Fuel capacity | Center tank 158.5 gal. (+187), usable fuel 156 gal. Outboard tanks 33.5 gal. each (+178), usable fuel 33.5 gal. ea. Total capacity 225.5 gal., usable fuel 223 gal. (See NOTE 1 for system fuel) | | | |
| Oil capacity | 8.5 gal. total (4.25 gal. each tank) (+191) 8.5 gal. usable (See NOTE 1 for system oil) | | | |
| Control surface movements | Elevator | Up | 30° ± 1 0 | Down 10° ± 2 0 |
| | Elevator tab | Up | 2 1/2° ± 2 1/2 | Down 20° ± 2 0 |
| | Rudder | Right | 20° ± 2 0 | Left 20° ± 2 0 |
| | Rudder tab | Right | 26° ± 2 0 | Left 26° ± 2 0 |
| | Aileron | Up | 23° ± 2 | Down 15° ± 2 |
| | Flap outboard | | | Down 40° ± 2 |
| | Flap inboard | | | Down 40° ± 2 |
| | | | | |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to approve design and production changes on airplane serial numbers 720-501-1 to 720-850. (See NOTES 15 and 22). | | | |

IV - MODEL 680-F, 7 PCLM (Normal Category), Approved August 23, 1960

(Same as 680-E, except for fuel injection engine, new nacelles, new main gear and increased maximum weight.)
(See NOTE 5 for pressurized version).

| | | | | |
|--------------------------------|---|-----------|---------------|-------------|
| Engines | 2 Lycoming IGSO-540-B1A or IGSO-540-B1C, fuel injector Simmonds Model 580, Parts Listing No. 580056-B or Model 582 Parts Listing No. 582025 or Model 582, Parts Listing No. 582026. | | | |
| Fuel | 100/130 minimum grade aviation gasoline. | | | |
| Engine limits | (Straight line manifold pressure variation with altitudes shown) | | | |
| | | <u>HP</u> | <u>R.P.M.</u> | <u>M.P.</u> |
| | Takeoff (2 min. limit) | 380 | 3400 | 47.0 |
| | Takeoff (2 min. limit) | 380 | 3400 | 43.5 |
| | Maximum continuous | 360 | 3200 | 45.0 |
| | Maximum continuous | 360 | 3200 | 40.5 |
| Propeller and Propeller Limits | 2 Hartzell 3-Bladed feathering propellers a. HC-B3Z-30-2 Hubs with 9349 or 9349-6.5 propellers Pitch settings at 30 in. Station: Low 18°, Feather 86° Diameter: (For 9349) 93.5 in. (For 9349-6.5) 87.0 in., no cutoff permitted NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft. | | | |

IV - MODEL 680-F (cont'd)

- b. Spinner: 2 Hartzell C2504 assemblies or 2 Hartzell C2535 assemblies (installed with alcohol anti-icing system per P/N 5890047).
- c. Governor: 2 Woodward B210310 or 2 Woodward B210410 (when propeller unfeathering system, Drawing 5640030, is installed). **NOTE:** Prefix B on part number or type number denotes based orientation only and may or may not be stamped on the nameplate. Governor part numbers may differ from governor type numbers. For best synchronization, governors with different part numbers should not be combined on the same aircraft.

| | | | |
|-------------------------|--|--------------------|-------------------|
| Airspeed Limits | Maneuvering | 157 m.p.h. | (137K) True Ind. |
| | Max. Struc. cruising | 230 m.p.h. | (200K) True Ind. |
| | Never exceed | 288 m.p.h. | (250K) True Ind. |
| | Flaps extended - half | 150 m.p.h. | (130K) True Ind. |
| | Flaps extended - full | 136 m.p.h. | (118K) True Ind. |
| | Landing gear extended | 180 m.p.h. | (156K) True Ind. |
| C.G. Range | (+167.4) to (+174.4) (Gear extended) Effect of retracting landing gear +10,073 in.-lb. | | |
| Empty Weight C.G. Range | None | | |
| Datum | 152 in. forward of wing leading edge at center section. | | |
| Leveling means | Longitudinal - Top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front or rear of baggage compartment floor. | | |
| Maximum weight | 8000 lb. | | |
| No. of seats | 7 (2 at +94, 2 at +128, and 3 at +168) | | |
| Maximum baggage | 350 lb. (+200) | | |
| Fuel capacity | Center tank 158.5 gal. (+187), usable fuel 156 gal. Outboard tanks 33.5 gal. each (+187), usable fuel 33.5 gal. ea. Total capacity 225.5 gal., usable fuel 223 gal. (See NOTE 1 for system fuel) | | |
| Oil capacity | 10 gal. total (5.00 gal. each tank) (+191) 9.12 gal. usable (See NOTE 1 for system oil) | | |
| Control surface | Elevator | Up 30° + 1 0 | Down 10° + 2 0 |
| | Elevator tab | Up 2 1/2° + 2 0 | Down 20° + 2 0 |
| | Rudder | Right 20° + 2 0 | Left 20° + 2 0 |
| | Rudder tab | Right 26° + 2 0 | Left 26° + 2 0 |
| | Aileron | Up 23° ± 2 | Down 15° ± 2 |
| | Flap outboard | | Down 40° ± 2 |
| | Flap inboard | | Down 40° ± 2 |
| | *Elevator tab 680-F-971 and up | | Down 26° ± 2 0 |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to approve design and production changes on airplane serial numbers 680-F-871-1, 680-F-820-2 to 680-F-1447-152. (See NOTES 15 and 22.) | | |

V - Model 560-F, 7 PCLM (Normal Category), Approved February 8, 1961

(Same as Model 680-F except unsupercharged engine and reduced gross weight)

| | | | |
|--------------------------------|--|------------|------------------|
| Engine | 2 Lycoming IGO-B1A or 2 Lycoming IGO-540 B1C with Aero Commander Vapor Separator 4630193 installed, fuel injector Bendix Model RS10ED2, Parts Lifting No. 391825-1 (or any combination of these installations). | | |
| Fuel | 100/130 minimum grade aviation gasoline. | | |
| Engine limits | | <u>HP.</u> | <u>R.P.M.</u> |
| | Takeoff (2 min.) | 350 | 3400 |
| | Minimum continuous | 325 | 3000 |
| Propeller and Propeller Limits | <ol style="list-style-type: none"> 1. 2 Hartzell 3-Bladed feathering propellers <ol style="list-style-type: none"> a. HC-B3Z-20-2 Hubs with 9349 blades Pitch settings at 30 in. Station: Low 15°, Feather 87° Diameter: 93.5 in., no cutoff permitted <u>NOTE:</u> Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft. b. Spinner: 2 Hartzell C2504 assemblies or 2 Hartzell C2535 assemblies (installed with alcohol anti-icing system per P/N 5890047). c. Governor: 2 Woodward B210310 or 2 Woodward B210410 (when propeller unfeathering system, Drawing 5640030, is installed). <u>NOTE:</u> Prefix B on part number or type number denotes based orientation only and may or may not be stamped on the nameplate. Governor part numbers may differ from governor type numbers. For best synchronization, governors with different part numbers should not be combined on the same aircraft. 2. 2 Hartzell 3-Bladed feathering propellers <ol style="list-style-type: none"> a. HC-B3Z-30-2 Hubs with 9349-6.5 blades Pitch settings at 30 in. Station: Low 18°, Feather 86° Diameter: 87.0 in., no cutoff permitted <u>NOTE:</u> Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft. b. Spinner: 2 Hartzell C2504 assemblies or 2 Hartzell C2535 assemblies (installed with alcohol anti-icing system per P/N 5890047). c. Governor: 2 Woodward B210310 or 2 Woodward B210410 (when propeller unfeathering system, Drawing 5640030, is installed). <u>NOTE:</u> Prefix B on part number or type number denotes based orientation only and may or may not be stamped on the nameplate. Governor part numbers may differ from governor type numbers. For best synchronization, governors with different part numbers should not be combined on the same aircraft. | | |
| Airspeed Limits | Maneuvering | 155 m.p.h. | (135K) True Ind. |
| | Max. Struc. cruising | 230 m.p.h. | (200K) True Ind. |
| | Never exceed | 288 m.p.h. | (250K) True Ind. |
| | Flaps extended - half | 150 m.p.h. | (130K) True Ind. |
| | Flaps extended - full | 136 m.p.h. | (118K) True Ind. |
| | Landing gear extended | 180 m.p.h. | (156K) True Ind. |
| C.G. Range | (+167.4) to (+174.4) (Gear extended) Effect of retracting landing gear +10,073 in.-lb. | | |
| Empty Weight C.G. Range | None | | |
| Datum | 152 in. forward of wing leading edge at center section. | | |

V - Model 560-F (cont'd)

| | | | | |
|---------------------------|--|-------|-------------------|-------------------|
| Leveling means | Longitudinal - Top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front or rear of baggage compartment floor. | | | |
| Maximum weight | 7500 lb. | | | |
| No. of seats | 7 (2 at +94, 2 at +128, and 3 at +168) | | | |
| Maximum baggage | 350 lb. (+200) | | | |
| Fuel capacity | Center tank 158.5 gal. (+187), usable fuel 156 gal. Outboard tanks 33.5 gal. each (+178), usable fuel 33.5 gal. ea. Total capacity 225.5 gal., usable fuel 223 gal. (See NOTE 1 for system fuel) | | | |
| Oil capacity | 10 gal. total (5.0 gal. each tank) (+191) 9.12 gal. usable (See NOTE 1 for system oil) | | | |
| Control surface movements | Elevator | Up | 30° ± 1 0 | Down 10° ± 2 0 |
| | Elevator tab | Up | 2 1/2° ± 2 1/2 | Down 26° ± 2 0 |
| | Rudder | Right | 20° ± 2 0 | Left 20° ± 2 0 |
| | Rudder tab | Right | 26° ± 2 0 | Left 26° ± 2 0 |
| | Aileron | Up | 23° ± 2 | Down 15° ± 2 |
| | Flap outboard | | | Down 40° ± 2 |
| | Flap inboard | | | Down 40° ± 2 |
| | | | | |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to approve design and production changes on airplane serial numbers 560-F-951-1 to 560-F-1496-73. (See NOTES 15 and 22). | | | |

VI - MODEL 680-FL, 11 PCLM (Normal Category), Approved May 24, 1963

(Same as 680-F, except extended fuselage)

| | | | | |
|--------------------------------|---|-----------|---------------|-------------------------|
| Engines | 2 Lycoming IGSO-540-B1A or IGSO-540-B1C, fuel injector Simmonds Model 580, Parts Listing No. 580056-B or Model 582 Parts Listing No. 582025 or Model 582 Parts Listing No. 582026. (582026 required for 8500 lb. aircraft.) | | | |
| Fuel | 100/130 minimum grade aviation gasoline | | | |
| Engine limits | (Straight line manifold pressure variation with altitudes shown) | | | |
| | | <u>HP</u> | <u>R.P.M.</u> | <u>M.P.</u> <u>ALT.</u> |
| | Takeoff (2 min. limit) | 380 | 3400 | 47.0 S.L. |
| | Takeoff (2 min. limit) | 380 | 3400 | 43.5 12,000 |
| | Maximum continuous | 360 | 3200 | 45.0 S.L. |
| | Maximum continuous | 360 | 3200 | 40.5 11,500 |
| Propeller and Propeller Limits | 2 Hartzell 3-Bladed feathering propellers a. HC-B3Z-30-2 Hubs with 9349 or 9349-6.5 propellers Pitch settings at 30 in. Station: Low 28°, Feather 86° Diameter: (For 9349) 93.5 in. (For 9349-6.5) 87.0 in., no cutoff permitted NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft. | | | |

V - Model 560-F (cont'd)

- b. Spinner: 2 Hartzell C2504 assemblies
- c. Governor: 2 Woodward B210310 or 2 Woodward B210410 (when propeller unfeathering system, Drawing 5640030, is installed). **NOTE:** Prefix B on part number or type number denotes based orientation only and may or may not be stamped on the nameplate. Governor part numbers may differ from governor type numbers. For best synchronization, governors with different part numbers should not be combined on the same aircraft.

| | | |
|-----------------|-----------------------|--|
| Airspeed Limits | Maneuvering | 157 m.p.h. (137K) True Ind. @ 8000 lb. 161 m.p.h. (140K) True Ind. @ 8500 lb. |
| | Max. Struc. cruising | 230 m.p.h. (200K) True Ind. @ 8000 lb. and 8500 lb. |
| | Never exceed | 288 m.p.h. (250K) True Ind. @ 8000 lb. and 8500 lb. |
| | Flaps extended - half | 150 m.p.h. (130K) True Ind. @ 8000 lb. and 8500 lb. |
| | Flaps extended - full | 136 m.p.h. (118K) True Ind. @ 8000 lb. 146 m.p.h. (127K) True Ind. @ 8500 lb. |
| | Landing gear extended | 180 m.p.h. (156K) True Ind. @ 8000 lb. and 8500 lb. |
| | | |

| C.G. Range (Gear extended) | Weight | Fwd. | | Aft. | |
|-------------------------------|---|----------|-------|----------|-------|
| | lb. | Sta.(in) | % MAC | Sta.(in) | % MAC |
| | Up to 7000 | 203.0 | 10 | 218.4 | 32 |
| | 8000 | 206.5 | 15 | 218.4 | 32 |
| | 8500 | 208.3 | 17.5 | 218.4 | 32 |
| | Straight line variation between points given | | | | |
| | Effect of retracting landing gear +10,073 in.-lb. | | | | |

Empty Weight C.G. Range

None

Datum

196 in. forward of wing leading edge at center section.

Leveling means

Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front or rear of baggage compartment floor.

Maximum weight

(See NOTE 6)

No. of seats

11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)

Maximum baggage (std)

400 lb. (+258)

Maximum baggage (with
extended baggage compartment)

600 lbs. (+258)

Fuel capacity

Center tank 158.5 gal. (+231), usable fuel 156 gal.
Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea.
Total capacity 225.5 gal., usable fuel 223 gal. (See NOTE 1 for system fuel)

Oil capacity

10 gal. total (5.00 gal. each tank) (+235)
9.12 gal. usable (See NOTE 1 for system oil)

Control surface movements

| | | | | |
|--------------|-------|------------|------|---------|
| Elevator | Up | 30° ± 1 | Down | 10° ± 2 |
| | | 0 | | 0 |
| Elevator tab | Up | 2 1/2° ± 2 | Down | 26° ± 2 |
| | | 1/2 | | 0 |
| Rudder | Right | 20° ± 2 | Left | 20° ± 2 |
| | | 0 | | 0 |
| Rudder tab | Right | 26° ± 2 | Left | 26° ± 2 |
| | | 0 | | 0 |
| Aileron | Up | 23° ± 2 | Down | 15° ± 2 |
| | | | Down | 40° ± 2 |
| | | | Down | 40° ± 2 |

V - Model 560-F (cont'd)

Serial Nos. eligible

(See NOTE 6). Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates for airplane serial numbers 680-FL-1553-107 and up; and approve design and production changes on airplane serial numbers 680-FL-1261 through 1853-157. (See NOTES 15 and 22).

VII - MODEL 680-FL(P), 11 PCLM (Normal Category), approved October 8, 1964

(Same as 680-FL, S/N 1461 and up, except pressurization)

Engines 2 Lycoming IGSO-540-B1A or IGSO-540-B1C, fuel injector Simmonds Model 582, Parts Listing No. 582026.

Fuel 100/130 minimum grade aviation gasoline.

Engine limits (Straight line manifold pressure variation with altitudes shown)

| | <u>HP.</u> | <u>R.P.M.</u> | <u>M.P.</u> | <u>ALT.</u> |
|------------------------|------------|---------------|-------------|-------------|
| Takeoff (2 min. limit) | 380 | 3400 | 47.0 | S.L. |
| Takeoff (2 min. limit) | 380 | 3400 | 43.5 | 12,000 |
| Maximum continuous | 360 | 3200 | 45.0 | S.L. |
| Maximum continuous | 360 | 3200 | 40.5 | 11,500 |

Propeller and Propeller limits 2 Hartzell 3-Bladed feathering propellers

a. HC-B3Z-30-2 Hubs with 9349-6.5 blades
Pitch settings at 30 in. Station: Low 18°, Feather 86°
Diameter: 87.0 in., no cutoff permitted
NOTE: Letters appearing after the dash numbers of the above listed hub model do not affect eligibility; however, for best synchronization hubs with different numbers should not be combined on the same aircraft.

b. Spinner: 2 Hartzell C2504 assemblies

c. Governor: 2 Woodward B210310 or 2 Woodward B210410 (when propeller unfeathering system, Drawing 5640030, is installed). **NOTE:** Prefix B on part number or type number denotes based orientation only and may or may not be stamped on the nameplate. Governor part numbers may differ from governor type numbers. For best synchronization, governors with different part numbers should not be combined on the same aircraft.

Airspeed Limits

| | |
|-----------------------|-----------------------------|
| Maneuvering | 161 m.p.h. (140K) True Ind. |
| Max. Struc. cruising | 230 m.p.h. (200K) True Ind. |
| Never exceed | 288 m.p.h. (250K) True Ind. |
| Flaps extended - half | 150 m.p.h. (130K) True Ind. |
| Flaps extended - full | 146 m.p.h. (127K) True Ind. |
| Landing gear extended | 180 m.p.h. (156K) True Ind. |

C.G. Range (Gear extended)

| <u>Weight</u> | <u>Fwd.</u> | <u>Aft.</u> |
|---------------|------------------------------|------------------------------|
| <u>lb.</u> | <u>Sta.(in)</u> <u>% MAC</u> | <u>Sta.(in)</u> <u>% MAC</u> |
| Up to 7000 | 203.0 10 | 218.4 32 |
| 8500 | 208.3 17.5 | 218.4 32 |

Straight line variation between points given.
Effect of retracting landing gear +10,073 in.-lb.

Empty Weight C.G. Range None

Datum 196 in. forward of wing leading edge at center section

Leveling means Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front or rear of baggage compartment floor.

Maximum weight 8500 lb.

VII - MODEL 680-FL(P) (cont'd)

| | | | | |
|---------------------------|--|-------|--------------|-------------------|
| Maximum No. of seats | 11 (Pilot - 10 passengers; pilot, co-pilot +9 passengers) | | | |
| Maximum baggage | 400 lb. (+258) | | | |
| Fuel capacity | Center tank 158.5 gal. (+231), usable fuel 156 gal. Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea. Total capacity 225.5 gal. usable fuel 223 gal. (See NOTE 1 for system fuel) | | | |
| Oil capacity | 10 gal. total (5.00 gal. each tank) (+235) 9.12 gal. usable (See NOTE 1 for system oil) | | | |
| Control surface movements | Elevator | Up | 30° ± 1 0 | Down 10° ± 2 0 |
| | Elevator tab | Up | 6 1/2° ± 1 | Down 24° ± 1 |
| | Rudder | Right | 20° ± 2 0 | Left 20° ± 2 0 |
| | Rudder tab | Right | 26° ± 2 0 | Left 26° ± 2 0 |
| | Aileron | Up | 23° ± 2 | Down 15° ± 2 |
| | Flap outboard | | | Down 40° ± 2 |
| | Flap inboard | | | Down 40° ± 2 |
| | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates for airplane serial numbers 680-FLP-1559-25 and up; and approve design and production changes on airplane serial numbers 680-FLP-1471-2 through 1854-38. (See NOTES 15 and 22) | | | |
| | | | | |

VIII - MODEL 680-T - 11 PCLM (Normal Category), approved September 15, 1965

(See NOTE 9 conversion to Model 680V)

| | | | | |
|--------------------------------|--|------------|---------------|------------|
| Engines | 2 AiResearch Model TPE-331-43 Turboprop engines (Rockwell P/N 6610400-501) or TPE-331-43A (Rockwell P/N 6610400-505) (See NOTE 11 for requirements) | | | |
| Fuel | Aviation turbine fuels ASTM designation D1655-63T, Types Jet A, Jet B, and Jet A-1; and MIL-J-5624G(1), Grades JP-4 & JP-5 and MIL-F-5516-1, JP-1 (See Aerocom Serv. Ltr. 170) | | | |
| Oil | BRACO 880F (MIL-L-7808D) and Sinclair Turbo S Oil 15 (MIL-L-7808D&E) (See Aerocom Service Letter 170) | | | |
| Engine limits | | <u>HP.</u> | <u>R.P.M.</u> | <u>EGT</u> |
| | Takeoff | 575 | 100% | 576°C |
| | Maximum continuous | 500 | 100% | 550°C |
| Propeller and Propeller Limits | 2 Hamilton Standard 3-bladed feathering and reversing propellers Rockwell Assembly No. 640050. a. 33LF-325 Hubs with 1033A-O Blades Pitch settings at 30 in. Station: Flt. Idle 9.0° ± 0.2°, Feather 86.5° ± 0.5°, Reverse -9.5° ± 1.5° Diameter: 90 in., no cutoff permitted. <u>NOTE:</u> Use AiResearch oil transfer tube No. 866678-2. b. Spinner: 2 Rockwell 2640050-7 c. Governor: 2 AiResearch 865423-4 or 865423-5-1 | | | |

VIII - MODEL 680-T (cont'd)

| | | | |
|----------------------------|--|------------------------|--------------|
| Airspeed Limits | Maneuvering | 164 m.p.h. ((143K) CAS | |
| | Maximum Operating | 250 m.p.h. (217K) CAS | |
| | Flaps extended - half | 150 m.p.h. (130K) CAS | |
| | Flaps extended - full | 146 m.p.h. (127K) CAS | |
| | Landing gear extended | 180 m.p.h. (156K) CAS | |
| C.G. range | Rear: 217.78 (30.19%) | 8950 lbs. (Gear down | |
| | 216.94 (29.02%) | 5300 lbs. (Gear down) | |
| | Fwd: 208.14 (16.83%) | 8950 lbs. (Gear down) | |
| | 203.50 (10.40%) | 7500 lbs. (Gear down) | |
| | Straight line variation between points given. | | |
| | Effect of retracting landing gear +10,073 in.-lb. | | |
| Datum | 196 in. forward of wing landing edge at center section | | |
| Leveling means | Longitudinal - Top of fuselage on centerline aft of wing trailing edge. | | |
| | Lateral - Transverse beams at front of rear baggage compartment floor. | | |
| Maximum weight | Maximum takeoff 8950 lbs. (ramp weight 9000 lbs.) | | |
| | Maximum landing 8500 lbs. | | |
| Maximum operating altitude | 25,000 feet | | |
| Maximum No. of seats | 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers) | | |
| Maximum baggage | 400 lb. (+258) | | |
| Fuel capacity | Center tank 221.5 gal. (+231), usable fuel 219.5 gal. | | |
| | Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea. | | |
| | Total capacity 288.5 gal., usable fuel 286.5 gal. | | |
| | (See NOTE 1 for system fuel) (See NOTE 12 for auxiliary fuel) | | |
| Oil capacity | 15.0 qts. total (7.5 qts. each tank) (+188) | | |
| | 11.8 qts. usable (See NOTE 1 for system oil) | | |
| Control surface movements | Elevator | Up 30° ± 1 | Down 10° ± 2 |
| | | 0 | 0 |
| | Elevator tab | Up 6 1/2° ± 1 | Down 24° ± 1 |
| | Rudder | Right 20° ± 2 | Left 20° ± 2 |
| | | 0 | 0 |
| | Rudder tab | Right 26° ± 2 | Left 26° ± 2 |
| | | 0 | 0 |
| | Aileron | Up 23° ± 2 | Down 15° ± 2 |
| | Flap outboard | | Down 40° ± 2 |
| | Flap inboard | | Down 40° ± 2 |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates for airplane serial numbers 680-T-1473, 680-T-1519, 680-T-1532, 680-T-1536, and 680-T-1550-11 and up; and approve design and production changes on airplane serial numbers 680-T-1473 through 1720. (See NOTES 15 and 22). | | |

IX - MODEL 680-V, 11 PCLM (Normal Category), Approved June 13, 1967

| | | | |
|--------------------------------|---|---------------------------------------|---------------|
| Engines | 2 AiResearch Model TPE-331-43 Turboprop engines (Rockwell P/N 6610400-501) or TPE-331-43A (Rockwell P/N 6610400-505) (See NOTE 11 for requirements). | | |
| Fuel | Aviation turbine fuels ASTM designation D1655-63T, Types Jet A, Jet B, and Jet A-1; and MIL-J-5624G(1), Grades JP-4 & JP-5 and MIL-F-5616-1, JP-1. (See Aerocom Serv. Ltr. 170) | | |
| Oil | BRACO 880F (MIL-L-7808D) and Sinclair Turbo S Oil 15 (MIL-L-7808D&E) (See Aerocom Service Letter 170) | | |
| Engine Limits | | <u>HP.</u> | <u>R.P.M.</u> |
| | Takeoff | 575 | 100% |
| | Maximum continuous | 500 | 100% |
| | | | <u>EGT</u> |
| | | | 576°C |
| | | | 550°C |
| Propeller and Propeller Limits | 2 Hamilton Standard 3-bladed feathering and reversing propellers. Rockwell Assembly No. 640050. | | |
| | a. 33LF-325 Hubs with 1033A-0 blades | | |
| | Pitch settings at 30 in. Station: Flt. Idle 9.0° ± 0.2° | | |
| | Feather 86.5° ± 0.5°, Reverse -9.5° ± 1.5° | | |
| | Diameter: 90 in., no cutoff permitted | | |
| | NOTE: Use AiResearch oil transfer tube No. 866678-2. | | |
| | b. Spinner: 2 Rockwell 2640050-7 | | |
| | c. Governor: 2 AiResearch 865423-4 or 865423-5-1 | | |
| Airspeed Limits | Maneuvering | 164 m.p.h. (143K) CAS | |
| | Maximum Operating | 250 m.p.h. (217K) CAS | |
| | Flaps extended - half | 150 m.p.h. (130K) CAS | |
| | Flaps extended - full | 146 m.p.h. (127K) CAS | |
| | Landing gear extended | 180 m.p.h. (156K) CAS | |
| C.G. Range | Rear: | 215.68 (27.28%) 9450 lbs. (Gear down) | |
| | | 216.73 (28.73%) 9400 lbs. (Gear down) | |
| | | 217.87 (30.31%) 9346 lbs. (Gear down) | |
| | | 216.94 (29.02%) 5300 lbs. (Gear down) | |
| | Fwd: | 209.74 (19.04%) 9450 lbs. (Gear down) | |
| | | 209.60 (18.83%) 9400 lbs. (Gear down) | |
| | | 203.50 (10.40%) 7500 lbs. (Gear down) | |
| | Straight line variation between points given. | | |
| | Effect of retracting landing gear +10,073 in.-lb. | | |
| Datum | 196 in. forward of wing leading edge at center section. | | |
| Leveling means | Longitudinal - Top of fuselage on centerline aft of wing trailing edge. | | |
| | Lateral - Transverse beams at front of rear baggage compartment floor. | | |
| Maximum weight | Maximum takeoff 9400 lbs. (ramp weight 9450 lbs.) | | |
| | Maximum landing 9000 lbs. | | |
| | Zero fuel 8000 lbs. | | |
| Maximum operating altitude | 25,000 feet | | |
| Maximum No. of seats | 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers) | | |
| Maximum baggage | 500 lb. (+258) | | |
| Fuel capacity | Center tank 221.5 gal. (+231), usable fuel 219.5 gal. | | |
| | Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea. | | |
| | Total capacity 288.5 gal., usable fuel 286.5 gal. | | |
| | (See NOTE 1 for system fuel) (See NOTE 12 for auxiliary fuel). | | |

IX - MODEL 680-V, 11 PCLM (Normal Category), Approved June 13, 1967

Oil capacity 15.0 qts. total (7.5 qts. each tank) (+188)
11.8 qts. usable (See NOTE 1 for system oil)

| | | | | | |
|---------------------------|---------------|-------|--------------|------|--------------|
| Control surface movements | Elevator | Up | 30° + 1 0 | Down | 10° + 2 0 |
| | Elevator tab | Up | 6 1/2° ± 1 | Down | 24° ± 1 |
| | Rudder | Right | 20° + 2 0 | Left | 20° + 2 0 |
| | Rudder tab | Right | 26° + 2 0 | Left | 26° + 2 0 |
| | Aileron | Up | 23° ± 2 | Down | 15° ± 2 |
| | Flap outboard | | | Down | 40° ± 2 |
| | Flap inboard | | | Down | 40° ± 2 |

Serial Nos. eligible Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates for airplane serial numbers 680-V-1550 through 680-V-1725; and approve design and production changes on airplane serial numbers 680-V-1473 through 1720. (See NOTES 15 and 22).

X - MODEL 680-W, 11 PCLM (Normal Category), approved February 5, 1968

Engines 2 AiResearch Model TPE-331-43BL Turboprop engines (Rockwell P/N 6610400-503)

Fuel Aviation turbine fuels ASTM designation D1655-63T, Types A, Jet B, and Jet A-1; and MIL-J-5624G(1), Grades JP-4 & JP-5; and MIL-F-5616-1, JP-1, (See Aerocom Serv. Ltr. 170)

Oil BRACO 880F (MIL-L-7808D) and Sinclair Turbo S Oil 15 (MIL-L-7808D&E)
(See Aerocom Service Letter 170)

| | | | | |
|---------------|--------------------|------------|---------------|------------|
| Engine limits | | <u>HP.</u> | <u>R.P.M.</u> | <u>EGT</u> |
| | Takeoff | 575 | 100% | 576°C |
| | Maximum continuous | 500 | 100% | 550°C |

Propeller and Propeller Limits 2 Hamilton Standard 3-bladed feathering and reversing propellers. Rockwell Assembly No. 640050.

- 33LF-325 Hubs with 1033A-0 Blades
Pitch settings at 30 in. Station: Flt. Idle 9.0° ± 0.2°, Feather 86.5° ± 0.5°, Reverse -9.5° ± 1.5°. Diameter: 90 in., no cutoff permitted.
NOTE: Use AiResearch oil transfer tube No. 866678-2.
- Spinner: 2 Rockwell 2640050-7
- Governor: 2 AiResearch 869132-2-1

| | | |
|-----------------|-----------------------|-----------------------|
| Airspeed Limits | Maneuvering | 164 m.p.h. (143K) CAS |
| | Maximum Operating | 250 m.p.h. (217K) CAS |
| | Flaps extended - half | 150 m.p.h. (130K) CAS |
| | Flaps extended - full | 146 m.p.h. (127K) CAS |
| | landing gear extended | 180 m.p.h. (156K) CAS |

C.G. Range

Rear: 215.68 (27.28%) 9450 lbs. (Gear down)
216.73 (28.73%) 9400 lbs. (Gear down)
217.87 (30.31%) 9346 lbs. (Gear down)
216.94 (29.02%) 5300 lbs. (Gear down)

Fwd.: 209.74 (19.04%) 9450 lbs. (Gear down)
209.60 (18.83%) 9400 lbs. (Gear down)
203.50 (10.40%) 7500 lbs. (Gear down)

Straight line variation between points given.
Effect of retracting landing gear +10,073 in.-lb.

X - MODEL 680-W (cont'd)

| | | | |
|----------------------------|--|--------------------|-------------------|
| Datum | 196 in. forward of wing leading edge at center section. | | |
| Leveling means | Longitudinal - Top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front of each baggage compartment floor. | | |
| Maximum weight | Maximum takeoff 9400 lbs. (ramp weight 9450 lbs.) Maximum landing 9000 lbs. Zero fuel 8000 lbs. | | |
| Maximum operating altitude | 25,000 feet | | |
| Maximum No. of seats | 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers) | | |
| Maximum baggage | 500 lb. (+258) Serial numbers eligible for Model 680-W-1721 through 1850. | | |
| Fuel capacity | Center tank 221.5 gal. (+231), usable fuel 219.5 gal. Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea. Total capacity 288.5 gal., usable fuel 286.5 gal. (See NOTE 1 for system fuel.) (See NOTE 12 for auxiliary fuel.) | | |
| Oil capacity | 15.0 qts. total (7.5 qts. each tank) (+188) 11.8 qts. usable (See NOTE 1 for system oil) | | |
| Control surface movements | Elevator | Up 30° ± 1 0 | Down 10° ± 2 0 |
| | Elevator tab | Up 6 1/2° ± 1 | Down 24° ± 1 |
| | Rudder | Right 20° ± 2 0 | Left 20° ± 2 0 |
| | Rudder tab | Right 26° ± 2 0 | Left 26° ± 2 0 |
| | Aileron | Up 23° ± 2 | Down 15° ± 2 |
| | Flap outboard | | Down 40° ± 2 |
| | Flap inboard | | Down 40° ± 2 |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 680-W-1721 through 1850, (See NOTES 15 and 22). | | |

XI - MODEL 681, 11 PCLM (Normal Category), Approved March 20, 1969

| | | | |
|---------------|--|------------|---------------|
| Engines | 2 AiResearch Model TPE-331-43BL Turboprop engines (Rockwell P/N 6610400-507) | | |
| Fuel | Aviation turbine fuels ASTM designation D1655-64T, Types Jet A, Jet B, and Jet A-1; and MIL J-5624G(1), Grades JP-4 & JP-5. (See Aerocom Service Letter 170) | | |
| Oil | BRACO 880F (MIL-L-7808D) and Sinclair Turbo S Oil 15 (MIL-L-7808D&E) (See Aerocom Service Letter 170) | | |
| Engine limits | | <u>HP.</u> | <u>R.P.M.</u> |
| | Takeoff | 575 | 100% |
| | Maximum continuous | 500 | 100% |
| | | | <u>EGT</u> |
| | | | 576°C |
| | | | 550°C |

XI - MODEL 681 (cont'd)**Propeller and Propeller limits**

- 2 Hamilton Standard 3-bladed feathering and reversing propellers
Rockwell Assembly No. 640050.
- a. 33LF-325 Hubs with 1033 A-0 Blades
Pitch settings at 30 in. Station: Flt. Idle $9.0^\circ \pm 0.2^\circ$
Feather $86.5^\circ \pm 0.5^\circ$, Reverse $-9.5^\circ \pm 1.5^\circ$
Diameter: 90 in., no cutoff permitted.
NOTE: Use AiResearch oil transfer tube No. 866678-2.
- b. Spinner: 2 Rockwell 2640050-7
- c. Governor: 2 AiResearch 869132-2-1

Airspeed Limits

| | |
|-----------------------|-----------------------|
| Maneuvering | 164 m.p.h. (143K) CAS |
| Maximum Operating | 250 m.p.h. (217K) CAS |
| Flaps extended - half | 150 m.p.h. (130K) CAS |
| Flaps extended - full | 149 m.p.h. (129K) CAS |
| Landing gear extended | 180 m.p.h. (156K) CAS |

C.G. Range

Rear: 215.68 (27.28%) 9450 lbs. (Gear down)
216.73 (28.73%) 9400 lbs. (Gear down)
217.87 (30.31%) 9346 lbs. (Gear down)
216.94 (29.02%) 5300 lbs. (Gear down)

Fwd.: 209.74 (19.04%) 9450 lbs. (Gear down)
209.60 (18.83%) 9400 lbs. (Gear down)
203.50 (10.40%) 7500 lbs. (Gear down)

Straight line variation between points given.
Effect of retracting landing gear +10,073 in.-lb.

Datum

196 in. forward of wing leading edge at center section

Leveling means

Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum weight

Maximum takeoff 9400 lbs. (ramp weight 9450 lbs.)
Maximum landing 9000 lbs.
Zero fuel 8500 lbs.

Maximum operating altitude

25,000 feet

Maximum No. of seats

11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)

Maximum baggage

500 lb. (+258)

Fuel capacity

Center tank 221.5 gal. (+231), usable fuel 219.5 gal.
Outboard tanks 33.5 gal. each (+222), usable fuel 33.5 gal. ea.
Total capacity 288.5 gal., usable fuel 286.5 gal.
(See NOTE 1 for system fuel) (See NOTE 12 for auxiliary fuel)

Oil capacity

15.0 qts. total (7.5 qts. each tank) (+188)
11.8 qts. usable (See NOTE 1 for system oil)

Control surface movements

| | | | | |
|---------------|-------|-----------------------|------|-----------------------|
| Elevator | Up | $30^\circ \pm 1$ 0 | Down | $10^\circ \pm 2$ 0 |
| Elevator tab | Up | $6\ 1/2^\circ \pm 1$ | Down | $24^\circ \pm 1$ |
| Rudder | Right | $20^\circ \pm 2$ 0 | Left | $20^\circ \pm 2$ 0 |
| Rudder tab | Right | $26^\circ \pm 2$ 0 | Left | $26^\circ \pm 2$ 0 |
| Aileron | Up | $23^\circ \pm 2$ | Down | $15^\circ \pm 2$ |
| Flap outboard | | | Down | $40^\circ \pm 2$ |
| Flap inboard | | | Down | $40^\circ \pm 2$ |

XI - MODEL 681 (cont'd)

Serial Nos. eligible

Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 681-6001 through 6072. (See NOTES 15 and 22).

XII - MODEL 690, 11 PCLM (Normal Category), approved July 19, 1971

| | | | |
|--------------------------------|---|-----------------------|---------------|
| Engines | 2 AiResearch Model TPE-331-5-251K Turboprop engines (Rockwell P/N 610495) | | |
| Fuel | Aviation turbine fuels ASTM designation D1655-68, Types Jet A, Jet B, and Jet A-1; and MIL-T-5624G(1), Grades JP-4 & JP-5. (See Rockwell Service Letter 170H) | | |
| Oil | MIL-L-23699A and MIL-L-7808G. (See Rockwell Service Letter 170H) | | |
| Engine limits | | <u>HP.</u> | <u>R.P.M.</u> |
| | Takeoff | 717.5 | 101% |
| | Maximum continuous | 717.5 | 101% |
| Propeller and Propeller limits | | <u>I.T.T.</u> | |
| | | 923°C | |
| | | 923°C | |
| Propeller and Propeller limits | 2 Hartzell 3-bladed feathering and reversing propellers. | | |
| | Rockwell Assembly No. 640053. | | |
| | a. HC-B3TN-5FL Hubs with LT10282H-4 or LT10282H(B)+4 or LT10282+4 or LT10282(B)+4 or LT10282A+4 or LT10282AB+4 blades | | |
| | <u>OR</u> HC-B3TN-5DL or HC-B3TN-5NL hubs with LT10282A+4 or LT10282AB+4 blades. | | |
| | Pitch settings at 30 in. Station: Low $13.5^\circ \pm 0.2^\circ$, | | |
| | Feather $90.0^\circ \pm 0.5^\circ$, Reverse $-8.0^\circ \pm 0.5^\circ$, | | |
| | Start Locks $+2.5^\circ \pm 0.2^\circ$ | | |
| | Diameter: 106 in, 1/2 in. reduction per blade allowed. | | |
| | <u>NOTE:</u> Use AiResearch oil transfer tube No. 866533-3. | | |
| | See NOTE 16. | | |
| Airspeed Limits | b. Spinner: 2 Hartzell 836-57 | | |
| | c. Governor: 2 AiResearch 895490-1 or 895490-3. | | |
| | Maneuvering | 167 m.p.h. (145K) CAS | |
| Airspeed Limits | Maximum Operating | 280 m.p.h. (234K) CAS | |
| | Flaps extended - half | 180 m.p.h. (156K) CAS | |
| | Flaps extended - full | 157 m.p.h. (136K) CAS | |
| | Landing gear extended | 230 m.p.h. (200K) CAS | |
| C.G. Range | Forward | | |
| | 212.93 inches aft of datum (22.72% MAC) at 10,250 lbs. | | |
| | 203.75 inches aft of datum (10.40% MAC) at 7,500 lbs. | | |
| | 203.75 inches aft of datum (10.40% MAC) at 5,750 lbs. | | |
| | Straight line variation between points. | | |
| | Aft | | |
| | 218.70 inches aft of datum (30.47% MAC) at 10,250 lbs. | | |
| | 217.81 inches aft of datum (29.28% MAC) at 5,750 lbs. | | |
| | Variation between points: | | |
| | Inches aft of datum = $219.84 - (11653/\text{Weight})$ | | |
| Datum | 196 in. forward of wing leading edge at center section. | | |
| Leveling means | Longitudinal - top of fuselage on centerline aft of wing trailing edge. | | |
| | Lateral - Transverse beam at front of rear baggage compartment floor. | | |

XII - MODEL 690 (cont'd)

| | | | | |
|----------------------------|---|-------|--------------|-------------------|
| Maximum weight | Maximum takeoff 10,250 lbs. (ramp weight 10,300 lbs.) Maximum loading 9600 lbs. Zero fuel 8750 lbs. | | | |
| Maximum operating altitude | 25,000 feet | | | |
| Maximum No. of seats | 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers) | | | |
| Maximum baggage | 600 lbs. (+260) | | | |
| Fuel capacity | Total capacity 389.0 gal., usable fuel 384.0 gal. (see NOTE 1 for system fuel) | | | |
| Oil capacity | Oil capacity per engine @ +188 AiResearch Tank No. 896062-1 6.25 qt. total 5.25 qt. usable AiResearch Tank No. 896417-1 6.00 qt. total 5.00 qt. usable (See NOTE 1 for system oil) | | | |
| Control surface movements | Elevator | Up | 30° + 1 0 | Down 10° + 2 0 |
| | Elevator tab | Up | 1/2° ± 1 | Down 4° ± 1 |
| | Rudder | Right | 0° ± 2 0 | Left 0° ± 2 0 |
| | Rudder tab | Right | 26° ± 2 0 | Left 26° ± 2 0 |
| | Aileron | Up | 23° ± 2 | Down 15° ± 2 |
| | Flaps | | | Down 40° ± 2 |
| | Aileron tab | Up | 17° ± 2.5° | Down 17° ± 2.5° |
| | | | | |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificate and approve design and production changes on airplane serial numbers 690-11001 through 11099. (See NOTES 15 and 22). | | | |

XIII - MODEL 685, 9 PCLM (Normal Category), Approved September 17, 1971

| | | | | |
|--------------------------------|--|-----------|---------------|---------------|
| Engines | 2 Continental Model GTSIO-520-F or GTSIO-520-K Turbosupercharged engines (See NOTE 14) (Rockwell P/N 610503) | | | |
| Fuel | Aviation gasoline, 100/130 octane. | | | |
| Oil | Teledyne Continental Specification MHS-24A. | | | |
| Engine limits | | <u>HP</u> | <u>R.P.M.</u> | <u>M.A.P.</u> |
| | Takeoff | 435 | 3400 | 44.5 In.Hg |
| | Maximum continuous | 435 | 3400 | 44.5 In.Hg |
| Propeller and Propeller limits | 2 Hartzell 3-bladed feathering propellers Rockwell Drawing No. 610505 | | | |
| | a. HC-H3YN-2 or HC-H3YN-2F Hubs with C8475+2, FC8475+2, or FC8475B+2 blades. Pitch settings at 30 in. Station: Low 18.1° ± 1.0° Feathered 83.5° ± 1.0° Diameter: 88 in., 1/2 in. reduction per blade allowed. | | | |
| | b. Spinner: 2 Hartzell D-3273-1 | | | |
| | c. Governor: 2 Rockwell 610445-1, 610445-501, or 610445-503 | | | |
| | | | | |

XIII - MODEL 685 (cont'd)

| | | | | | |
|---|---|---|--------------|------|--------------|
| Airspeed Limits | Maneuvering | 156 m.p.h. (136K) CAS | | | |
| | Never exceed | 290 m.p.h. (252K) CAS | | | |
| | Never exceed Mach | 0.554 | | | |
| | Flaps extended - half | 180 m.p.h. (156K) CAS | | | |
| | Flaps extended - full | 149 m.p.h. (130K) CAS | | | |
| | Landing gear extended | 230 m.p.h. (200K) CAS | | | |
| | Max structural cruise | 258 m.p.h. (224K) | | | |
| | Max. structural cruise Mach | 0.493 | | | |
| | C.G.Range | Rear: 216.88 (28.0%) 9,000 lbs. (Gear down) | | | |
| 216.18 (27.1%) 5, 850 lbs. (Gear down) | | | | | |
| Variation between points: inches = 218.15 - (11653/Weight) | | | | | |
| Fwd: 208.67 (17.0%) 9,000 lbs. (Gear down) | | | | | |
| 203.45 (10.0%) 7,500 lbs. (Gear down) | | | | | |
| 203.45 (10.0%) 5,850 lbs. (Gear down) | | | | | |
| Straight line variation between points given. Effect of retracting landing gear +11,653 in.-lb. | | | | | |
| Datum | 196 in. forward of wing leading edge at center section. | | | | |
| Leveling means | Longitudinal - Top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front of rear baggage compartment floor. | | | | |
| Maximum weight | Maximum takeoff 9000 lbs. (ramp weight 9050 lbs.) Maximum landing 9000 lbs. | | | | |
| Maximum operating altitude | 25,000 feet | | | | |
| Maximum number of seats | 9 (Pilot + 8 passengers; pilot, co-pilot + 7 passengers) | | | | |
| Maximum baggage | 600 lb. (+260) | | | | |
| Fuel capacity | Total capacity 261.0 gal., usable fuel 256.0 gal. Auxiliary (option) 66.0 gal. total usable 322.0 gal. Total undrainable 10.7 lbs. (without auxiliary option) total undrainable 13.0 lbs. (with auxiliary option) | | | | |
| Oil capacity | 24.0 qts. total (12.0 qts. each engine, 9.0 qts. usable - (See NOTE 1 for system oil) (+188) Auxiliary with optional fuel 27.2 qts. total (13.6 qts. each engine, 10.6 qts. usable) (+188) | | | | |
| Control surface movements | Elevator | Up | 30° ± 1 0 | Down | 10° ± 2 0 |
| | Elevator tab | Up | 6 1/2° ± 1 | Down | 24° ± 1 |
| | Rudder | Right | 20° ± 2 0 | Left | 20° ± 2 0 |
| | Rudder tab | Right | 26° ± 2 0 | Left | 26° ± 2 0 |
| | Aileron | Up | 23° ± 2 | Down | 15° ± 2 |
| | Flaps | | | Down | 40° ± 2 |
| | Aileron tab | Up | 17° ± 2.5° | Down | 17° ± 2.5° |
| | | | | | |
| | | | | | |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 685-12000 through 12066. (See NOTES 15 and 22). | | | | |

XIV - MODEL 690A, 11 PCLM (Normal Category), Approved April 25, 1973

| | | | | |
|--------------------------------|--|--------------------------------|---------------|---------------|
| Engines | 2 AiResearch Model TPE-331-5-251K Turboprop engines (Rockwell P/N 610495) | | | |
| Fuel | Aviation turbine fuels ASTM designation D1655-68, Types Jet A, Jet B, and Jet A-1; and MIL-T-5624G(1), Grades JP-4 & JP-5. (See Rockwell Service Letter 170H) (See Mfg. Data Part V Approved F/M for List of Approved Fuels) | | | |
| Oil | MIL-L-23699A and MIL-L-7808G. (See Mfg. Data Part V Approved F/M for List of Approved Lubricants) | | | |
| Engine limits | | <u>HP.</u> | <u>R.P.M.</u> | <u>I.T.T.</u> |
| | Takeoff | 717.5 | 101% | 923°C |
| | Maximum continuous | 717.5 | 101% | 923°C |
| Propeller and Propeller Limits | 2 Hartzell 3-bladed feathering and reversing propellers. Rockwell Assembly No. 640053. a. HC-B3TN-5FL Hubs with LT10282H-4 or LT10282H(B)+4 or LT10282+4 or LT10282(B)+4 or LT10282+4 or LT10282AB+4 blades <u>OR</u> HC-B3TN-5DL or HC-B3TN-5NL hubs with LT10282A+4 or LT10282AB+4 blades. Pitch settings at 30 in. Station: Low $13.5^{\circ} \pm 0.2^{\circ}$ Feather $90.0^{\circ} \pm 0.5^{\circ}$, Reverse $-8.0^{\circ} \pm 0.5^{\circ}$ Start Locks $+2.5^{\circ} \pm 0.2^{\circ}$ Diameter: 106 in, 1/2 in. reduction per blade allowed. <u>NOTE:</u> Use AiResearch oil transfer tube No. 866533-3. (See NOTE 16) b. Spinner: 2 Hartzell 836-57P c. Governor: 2 AiResearch 895490-1 or 895490-3 | | | |
| Airspeed Limits | Maneuvering | 167 m.p.h. (145K) CAS | | |
| | Maximum Operating | 280 m.p.h. (243K) CAS .52 MACH | | |
| | Flaps extended - half | 207 m.p.h. (180K) CAS | | |
| | Flaps extended - full | 161 m.p.h. (140K) CAS | | |
| | Landing gear extended | 230 m.p.h. (200K) CAS | | |
| C.G. Range | Forward | | | |
| | 212.93 inches aft of datum (22.72% MAC) at 10,250 lbs. | | | |
| | 203.75 inches aft of datum (10.40% MAC) at 7,500 lbs. | | | |
| | 203.75 inches aft of datum (10.40% MAC) at 6,749 lbs. | | | |
| | 214.58 inches aft of datum (24.93% MAC) at 6,000 lbs. | | | |
| | Straight line variation between points | | | |
| | Aft | | | |
| | 218.70 inches aft of datum (30.47% MAC) at 10,250 lbs. | | | |
| | 217.98 inches aft of datum (29.50% MAC) at 6,278 lbs. | | | |
| | Variation between points: | | | |
| | Inches aft of datum = $219.84 - (11653/\text{Weight})$ | | | |
| Datum | 196 in forward of wing leading edge at center section | | | |
| Leveling means | Longitudinal - top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front of rear baggage compartment floor. | | | |
| Maximum weight | Maximum takeoff 10,250 lbs. (ramp weight 10,300 lbs.) Maximum landing 9600 lbs. Zero fuel 8750 lbs. | | | |
| Maximum operating altitude | 31,000 feet | | | |
| Maximum No. of seats | 11 (Pilot +10 passengers; pilot, co-pilot + 9 passengers) | | | |

XIV - MODEL 690A (cont'd)

| | | | | |
|---------------------------|--|-------|--------------|-------------------|
| Maximum baggage | 600 lb. (+260) | | | |
| Fuel capacity | Total capacity 389.0 gal., usable fuel 384.0 gal. (See NOTE 1 for system fuel) | | | |
| Oil capacity | 12.0 qts. total (6.0 qts. total each tank) (+188) 10.0 qts. usable (See NOTE 1 for system oil) | | | |
| Control surface movements | Elevator | Up | 30° ± 1 0 | Down 10° ± 2 0 |
| | Elevator tab | Up | 6 1/2° ± 1 | Down 24° ± 1 |
| | Rudder | Right | 20° ± 2 0 | Left 20° ± 2 0 |
| | Rudder tab | Right | 26° ± 2 0 | Left 26° ± 2 0 |
| | Aileron | Up | 23° ± 2 | Down 15° ± 2 |
| | Flaps | | | Down 40° ± 2 |
| | Aileron tab | Up | 17° ± 2.5° | Down 17° ± 2.5° |
| | | | | |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 690A-11100 through 11349. (See NOTES 15 and 22). | | | |

XV - MODEL 690B, 10 PCLM (Normal Category), Approved October 5, 1976

| | | | | |
|--------------------------------|---|------------|---------------|---------------|
| Engines | 2 AiResearch Model TPE-331-5-251K Turboprop engines (Rockwell P/N 610495), S/N 11350 through 11542 2 AiResearch Model TPE-331-5-252K Turboprop engines (Rockwell P/N 610495), S/N 11431, S/N 11543 and subs. | | | |
| Fuel | Aviation turbine fuels ASTM designation D1655-68, Types Jet A, Jet B, and Jet A-1; and MIL-T-5624G(1), Grades JP-4 & JP-5. (See Rockwell Services Letter 170H) (See Mfg. Data Part V Approved F/M for List of Approved Fuels). | | | |
| Oil | MIL-L-23699A and MIL-L-7808G (See Mfg. Data Part V Approved F/M for List of Approved Lubricants). | | | |
| Engine limits | | <u>HP.</u> | <u>R.P.M.</u> | <u>I.T.T.</u> |
| | Takeoff | 717.5 | 101% | 923°C |
| | Maximum continuous | 717.5 | 101% | 923°C |
| Propeller and Propeller Limits | 2 Hartzell 3-bladed feathering and reversing propellers. Rockwell Assembly No. 640053. a. HC-B3TN-5FL Hubs with LT10282H-4 or LT10282H(B)+4 or LT10282+4 or LT10282(B)+4 or LT10282+4 or LT10282AB+4 blades <u>OR</u> HC-B3TN-5DL or HC-B3TN-5NL hubs with LT10282A+4 or LT10282AB+4 blades. Pitch settings at 30 in. Station: Low $13.5^{\circ} \pm 0.2^{\circ}$ Feather $90.0^{\circ} \pm 0.5^{\circ}$, Reverse $-8.0^{\circ} \pm 0.5^{\circ}$ Start Locks $+2.5^{\circ} \pm 0.2^{\circ}$ Diameter: 106 in, 1/2 in. reduction per blade allowed. <u>NOTE:</u> Use AiResearch oil transfer tube No. 866533-3. (See NOTE 16) b. Spinner: 2 Hartzell 836-57P c. Governor: 2 AiResearch 895490-1 or 895490-3 (for aircraft with TPE 331-5-251K engines) 2 AiResearch 895490-5 (for aircraft with TPE 331-5-252K engines) | | | |

XV - MODEL 690B (cont'd)

| | | | |
|----------------------------|--|-----------------------------|-------------------------------|
| Airspeed Limits | Maneuvering | 171 m.p.h. (149K) CAS | |
| | Maximum Operating | 280 m.p.h. (243K) CAS | .52 MACH |
| | Flaps extended - half | 207 m.p.h. (180K) CAS | |
| | Flaps extended - full | 161 m.p.h. (140K) CAS | |
| | Landing gear extended | 230 m.p.h. (200K) CAS | |
| C.G. Range | Forward | | |
| | 213.14 inches aft of datum (23.00% MAC) at 10,325 lbs. | | |
| | 203.75 inches aft of datum (10.40% MAC) at 7,500 lbs. | | |
| | 203.75 inches aft of datum (10.40% MAC) at 6,749 lbs. | | |
| | 214.58 inches aft of datum (24.93% MAC) at 6,000 lbs. | | |
| | Straight line variation between points. | | |
| | Aft | | |
| | 218.64 inches aft of datum (30.39% MAC) at 10,325 lbs. | | |
| Datum | 217.85 inches aft of datum (29.33% MAC) at 6,267 lbs. | | |
| | Variation between points. | | |
| | Inches aft of datum = $219.84 - (12444/\text{Weight})$ | | |
| Leveling means | Longitudinal - Top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front of rear baggage compartment floor. | | |
| Maximum weight | Maximum takeoff 10,325 lbs. (ramp weight 10,375 lbs.) Maximum landing 9675 lbs. Zero fuel 8750 lbs. | | |
| Maximum operating altitude | 31,000 feet | | |
| Maximum No. of seats | 10 (Pilot + 9 passengers; pilot, co-pilot + 8 passengers) | | |
| Maximum baggage | 600 lb. (+260) | | |
| Fuel capacity | Total capacity 389.0 gal., usable fuel 384.0 gal. (See NOTE 1 for systems fuel) | | |
| Oil capacity | 12.0 qts. total (6.0 qts. total each tank) (+188) 10.0 qts. usable (See NOTE 1 for system oil) | | |
| Control surface movements | Elevator | Up $30^\circ \pm 1$ 0 | Down $10^\circ \pm 2$ 0 |
| | Elevator tab | Up $6\ 1/2^\circ \pm 1$ | Down $24^\circ \pm 1$ |
| | Rudder | Right $20^\circ \pm 2$ 0 | Left $20^\circ \pm 2$ 0 |
| | Rudder tab | Right $26^\circ \pm 2$ 0 | Left $26^\circ \pm 2$ 0 |
| | Aileron | Up $23^\circ \pm 2$ | Down $15^\circ \pm 2$ |
| | Flaps | | Down $40^\circ \pm 2$ |
| | Aileron tab | Up $17^\circ \pm 2.5^\circ$ | Down $17^\circ \pm 2.5^\circ$ |
| | | | |
| | | | |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 690B-11350 through 11566. (See NOTES 15 and 22). | | |

XVI - MODEL 690C, 11 PCLM (Normal Category), Approved September 7, 1979

| | | | |
|--------------------------------|---|--|---------------|
| Engines | 2 AiResearch Model TPE-331-5-254K Turboprop engines (Rockwell P/N 610495). | | |
| Fuel | Aviation turbine fuels ASTM designation D1655-68, Types Jet A, Jet A-1, and Jet B; MIL-T-5624G-1, Grades JP-4 and JP-5; MIL-T-83133, Grade JP-8 and MIL-F-46005A(MR)-1, Types I and II. | | |
| Oil | MIL-L-23699B Type II, MIL-L-7808G Type I (See Mfg. Data Part VIII Approved POH for List of Approved Lubricants). | | |
| Engine limits | | <u>HP.</u> | <u>R.P.M.</u> |
| | Takeoff | 717.5 | 101% |
| | Maximum continuous | 717.5 | 101% |
| | | | <u>I.T.T.</u> |
| | | | 923°C |
| Propeller and Propeller Limits | 2 Dowty-Rotol Ltd. 3-bladed feathering and reversing propellers. Rockwell Assembly No. 640080. a. Dowty-Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP2926 includes B. F. Goodrich propeller de-icing kit No. 65-330-1 or Dowty Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP 3027 includes Dowty Rotol Drice Boots 660709275 as B. F. Goodrich De-Ice Boots 4E 2598-10. See NOTE 17. Dowty-Rotol Propeller Blade Assembly P/N 660706330-XX Pitch settings at .7 radius station: Feather 83 10' ± 20", Reverse -13.75° ± 1.0° Start Locks -1.25° ± 1.0°, Flight Idle 6.0° ± 0.5° Diameter: 106 in., 1/2 in. reduction per blade allowed. <u>NOTE:</u> Use AiResearch oil transfer tube No. 897458-2. <u>NOTE:</u> All engine ground running for maintenance test purposes with the airplane stationary, must be done with the airplane headed into the wind. b. Spinner: 2 Dowty-Rotol Ltd. Type No. (C)SB7/3/1 c. Governor: 2 AiResearch P/N 895490-5, 897410-2B, or 897410-4 | | |
| Airspeed Limits | Maneuvering | 158 m.p.h. (137K) CAS | |
| | Maximum Operating | 280 m.p.h. (234K) CAS .52 MACH | |
| | Flaps extended - half | 207 m.p.h. (180K) CAS (S/N 11600-11729) | |
| | | 230 m.p.h. (200K) CAS (S/N 11730-11999) | |
| | Flaps extended - full | 161 m.p.h. (140K) CAS (S/N 11600-11729) | |
| | | 184 m.p.h. (160K) CAS (S/N 11730-11999) | |
| | Landing gear extended | 230 m.p.h. (200K) CAS | |
| C.G. Range | Forward | 210.51 inches aft of datum (20.06% MAC) at 10,325 lbs. 204.70 inches aft of datum (12.03% MAC) at 7,500 lbs. 204.70 inches aft of datum (12.03% MAC) at 6,798 lbs. 215.10 inches aft of datum (26.42% MAC) at 6,240 lbs. Straight line variation between points. Aft 218.67 inches aft of datum (31.35% MAC) at 10,325 lbs. 217.88 inches aft of datum (30.25% MAC) at 6,332 lbs. Variation between points: Inches aft of datum = 219.93 - (13029/Weight) | |
| Datum | 196 in. forward of wing leading edge at center section | | |
| Leveling means | Longitudinal - Top of fuselage on centerline aft of wing trailing edge. Lateral - Transverse beams at front of rear baggage compartment floor. | | |
| Maximum weight | Maximum takeoff 10,325 lbs. (ramp weight 10,375 lbs.) Maximum landing 9675 lbs. Zero fuel 8800 lbs. | | |

XVI - MODEL 690C (cont'd)

| | | | | | |
|----------------------------|--|-------|--------------|------|--------------|
| Maximum operating altitude | 31,000 feet | | | | |
| Maximum No. of seats | 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers) | | | | |
| Maximum baggage | 600 lb. (+260) | | | | |
| Fuel capacity | Total standard capacity 430 gal., usable 425 gal. Total capacity with optional system 482 gal., usable 474 gal. (See NOTE 1 for systems fuel.) | | | | |
| Oil capacity | 12.0 qts. total (6.0 qts. total each tank) (+188) 10.0 qts. usable (See NOTE 1 for system oil) | | | | |
| Control surface movements | Elevator | Up | 30° ± 1 0 | Down | 10° ± 2 0 |
| | Elevator tab | Up | 3° ± 1 | Down | 24° ± 1 |
| | Rudder | Right | 20° ± 2 0 | Left | 20° ± 2 0 |
| | Rudder tab | Right | 20° ± 2 0 | Left | 20° ± 2 0 |
| | Aileron | Up | 23° ± 2 | Down | 15° ± 2 |
| | Flaps | | | Down | 40° ± 2 |
| | Aileron tab | Up | 17° ± 2.5° | Down | 17° ± 2.5° |
| | | | | | |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 11600 through 11735. (See NOTE 22) | | | | |

XVII - MODEL 695, 11 PCLM (Normal Category), Approved November 1, 1979

| | | | | |
|--------------------------------|---|-----------|---------------|---------------|
| Engines | 2 AiResearch Model TPE-331-10-501K Turboprop Engines (Rockwell P/N 610653) or 2 Garrett Model TPE-331-10-511K Turboprop Engines (Gulfstream P/N 610653) See NOTE 19. | | | |
| Fuel | Aviation turbine fuel ASTM designation D1655-68, Types Jet A and Jet A-1, and Jet B; MIL-T-5624G-1, Grades JP-4 and JP-5; MIL-T-83133, Grade JP-8, MIL-F-46005A(MR)-1, Types I and II. | | | |
| Oil | MIL-L-23699B Type II, MIL-L-7808G Type I (See Mfg. Data Part VIII Approved POH for List of Approved Lubricants). | | | |
| Engine Limits | | <u>HP</u> | <u>R.P.M.</u> | <u>E.G.T.</u> |
| | Takeoff | 733 | 101% | 650°C |
| | Maximum continuous | 733 | 101% | 650°C |
| Propeller and Propeller Limits | 2 Dowty-Rotol Ltd. 3-bladed feathering and reversing propellers. Rockwell Assembly No. 640080. a. Dowty-Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP2926 includes B. F. Goodrich propeller de-icing kit No. 65-330-1 or Dowty Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP 3027 includes Dowty Rotol Deice Boots 660709275 as B. F. Goodrich De-Ice Boots 4E 2598-10. See NOTE 17. Dowty-Rotol Propeller Blade Assembly P/N 660706330-XX Pitch settings at .7 radius station: Feather 83 10' ± 20', Reverse -13.75° ± 1.0°, Start Locks -1.25° ± 1.0°, Flight Idle 6.0° ± 0.5°. Diameter: 106 in., 1/2 in. reduction per blade allowed. <u>NOTE:</u> Use AiResearch oil transfer tube Part No. 897458-2. <u>NOTE:</u> Downwind ground operation above taxi power is prohibited when airplane is stationary. | | | |

XVII - MODEL 695 (cont'd)**Propeller and Propeller Limits**
(cont'd)

- b. Spinner: 2 Dowty-Rotol Ltd. Type No. (C)SB7/3/1
 c. Governor: 2 AiResearch P/N 897410-2B or 897410-4.

Airspeed Limits

| | |
|-----------------------|--------------------------------|
| Maneuvering | 158 m.p.h. (137K) CAS |
| Maximum Operating | 280 m.p.h. (143K) CAS .52 MACH |
| Flaps extended - half | 207 m.p.h. (180K) CAS |
| Flaps extended - full | 161 m.p.h. (140k) CAS |
| Landing gear extended | 230 m.p.h. (200K) CAS |

C.G. Range

Forward
 210.51 inches aft of datum (20.06% MAC) at 10,325 lbs.
 204.70 inches aft of datum (12.03% MAC) at 7,500 lbs.
 204.70 inches aft of datum (12.03% MAC) at 6,798 lbs.
 215.10 inches aft of datum (26.42% MAC) at 6,240 lbs.
 Straight line variation between points.
Aft
 218.67 inches aft of datum (31.35% MAC) at 10,325 lbs.
 217.88 inches aft of datum (30.25% MAC) at 6,332 lbs.
 Variation between points:
 Inches aft of datum = 219.93 - (13029/Weight)

Datum

196 in. forward of wing leading edge at center section

Leveling means

Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
 Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum weight

Maximum takeoff 10,325 lbs. (ramp weight 10,375 lbs.)
 Maximum landing 9,675 lbs.
 Zero fuel 8,800 lbs.

Maximum operating altitude

31,000 feet

Maximum No. of seats

11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)

Maximum baggage

600 lb. (+260)

Fuel capacity

Total standard capacity 430 gal., usable 425 gal. (S/N 95000 thru 95040).
 Total standard capacity 482 gal., usable 474 gal. (S/N 95041 thru 95999).
 (See NOTE 1 for systems fuel.)

Oil capacity

12.0 qts. total (6.0 qts. total each tank) (+188)
 10.0 qts. usable (See NOTE 1 for system oil).

Control Surface movements

| | | | | |
|-------------|--------------|--------------------|------|--------------|
| Elevator | Up | 30° ± 1 0 | Down | 10° ± 2 0 |
| | Elevator tab | Up 3° ± 1 | Down | 24° ± 1 |
| Rudder | Right | 20° ± 2 0 | Left | 20° ± 2 0 |
| | Rudder tab | Right 20° ± 2 0 | Left | 20° ± 2 0 |
| Aileron | Up | 23° ± 2 | Down | 15° ± 2 |
| | Down | 40° ± 2 | | |
| Aileron tab | Up | 17° ± 2.5° | Down | 17° ± 2.5° |

Serial Nos. eligible

Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 95000 through 95084. (See NOTE 22.)

XVIII - MODEL 695A, 11 PCLM (Normal Category), Approved April 30, 1981

| | | | | |
|--------------------------------|---|---|------------|------------|
| Engines | 2 AiResearch Model TPE-331-10-501K Turboprop Engines (Rockwell P/N 610653) or 2 Garrett Model TPE-331-10-511K Turboprop Engines (Gulfstream P/N 610653) See NOTE 19. | | | |
| Fuel | Aviation turbine fuels ASTM designation D1655-68, Types Jet A, Jet A-1, and Jet B; MIL-T-5624G-1, Grades JP-4 and JP-5; MIL-T-83133, Grade JP-8, and MIL-F-46005A(MR)-1, Types I and II. | | | |
| Oil | MIL-L-23699B Type II (See Mfg. Data Part VIII Approved POH for List of Approved Lubricants). | | | |
| Engine Limits | | <u>Torque</u> | <u>RPM</u> | <u>EGT</u> |
| | Takeoff and Maximum continuous | 102.5%(820) | 101.0% | 650°C |
| Propeller and Propeller Limits | <p>2 Dowty-Rotol Ltd. 3-bladed feathering and reversing propellers. Rockwell Assembly No. 640080.</p> <p>a. Dowty-Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP2926 includes B. F. Goodrich propeller de-icing kit No. 65-330-1 or Dowty Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP 3027 includes Dowty Rotol Deice Boots 660709275 as B. F. Goodrich De-Ice Boots 4E 2598-10. See NOTE 17.</p> <p>Dowty-Rotol Propeller Blade Assembly P/N 660706330-XX</p> <p>Pitch settings at .7 radius station:</p> <p>Feather 83 10' ± 20', Reverse -13.75° ± 1.0°, Start Locks -1.25° ± 1.0°, Flight Idle 6.0° ± 0.5°.</p> <p>Diameter: 106 in., 1/2in. reduction per blade allowed.</p> <p><u>NOTE:</u> Use AiResearch oil transfer tube Part No. 897458-2.</p> <p><u>NOTE:</u> Downwind ground operation above taxi power is prohibited when airplane is stationary, must be done with the airplane headed into the wind.</p> <p>b. Spinner: 2 Dowty-Rotol Ltd. Type No. (C)SB7/3/1</p> <p>c. Governor: 2 AiResearch P/N 897410-2B or 897410-4.</p> | | | |
| Airspeed Limits | Maneuvering | 162 m.p.h. (141K) CAS | | |
| | Maximum Operating | 290 m.p.h. (252K) CAS .60 MACH | | |
| | Flaps extended - half | 207 m.p.h. (180K) CAS (S/N 96000-96055) | | |
| | | 230 m.p.h. (200K) CAS (S/N 96056-96999) | | |
| | Flaps extended- full | 161 m.p.h. (140K) CAS (S/N 96000-96055) | | |
| | | 184 m.p.h. (160K) CAS (S/N 96056-96999) | | |
| | Landing gear extended | 230 m.p.h. (200K) CAS | | |
| C.G. Range | <p>Forward</p> <p>209.78 inches aft of datum (19.1% MAC) at 11,200 lbs.</p> <p>204.34 inches aft of datum (11.5% MAC) at 8,500 lbs.</p> <p>204.34 inches aft of datum (11.5% MAC) at 7,010 lbs.</p> <p>214.18 inches aft of datum (25.1% MAC) at 6,466 lbs.</p> <p>Straight line variation between points</p> <p>Aft</p> <p>218.77 inches aft of datum (31.5% MAC) at 11,200 lbs.</p> <p>217.95 inches aft of datum (30.4% MAC) at 6,582 lbs.</p> <p>Variation between points:</p> <p>Inches aft of datum = 219.93 - (13029/Weight)</p> | | | |
| Datum | 196 in forward of wing leading edge at center section. | | | |
| Leveling means | <p>Longitudinal - Top of fuselage on centerline aft of wing trailing edge.</p> <p>Lateral - Transverse beams at front of rear baggage compartment floor.</p> | | | |

XVIII - MODEL 695A (cont'd)

| | | | | | |
|----------------------------|--|---------------------------------------|--------------|------|--------------|
| Maximum weight | Maximum takeoff | 11,200 lbs. (ramp weight 11,250 lbs.) | | | |
| | Maximum landing | 10,550 lbs. | | | |
| | Zero fuel | 9,500 lbs. | | | |
| Maximum operating altitude | 35,000 feet | | | | |
| Maximum No. of seats | 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers) | | | | |
| Maximum baggage | 600 lb. (+290) Non pressurized compartment (See NOTE 18) 100 lb. (+245) Pressurized compartment | | | | |
| Fuel capacity | Total standard capacity 482 gal., usable 474 gal. (See Note 1 for systems fuel) | | | | |
| Oil capacity | 12.0 qts. total (6.0 qts. total each tank) (+188) 10.0 qts. usable (See Note 1 for system oil) | | | | |
| Control Surface movements | Elevator | Up | 30° ± 1 0 | Down | 10° ± 2 0 |
| | Elevator tab | Up | 3° ± 1 | Down | 24° ± 1 |
| | Rudder | Right | 20° ± 2 0 | Left | 20° ± 2 0 |
| | Rudder tab | Right | 20° ± 2 0 | Left | 20° ± 2 0 |
| | Aileron | Up | 23° ± 2 | Down | 15° ± 2 |
| | Flaps | | | Down | 40° ± 2 |
| | Aileron tab | Up | 17° ± 2.5° | Down | 17° ± 2.5° |
| | | | | | |
| Serial Nos. eligible | Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 96000 through 96100. (See Note 21 and 22) | | | | |

XIX - MODEL 690D, 11 PCLM (Normal Category) Approved December 2, 1981

| | | | | |
|--------------------------------|---|-----------|---------------|------------|
| Engines | 2 AiResearch Model TPE 331-5-254K Turboprop Engines (Gulfstream P/N 610495). | | | |
| Fuel | Aviation turbine fuels ASTM designation D1655-68, types Jet A, Jet A-1 and Jet B; MIL-T-5624G-1, Grades JP-4 and JP-5; MIL-T-83133, Grade JP-8 and MIL-F-46005A(MR)-I, Types I and II. | | | |
| Oil | MIL-L-23699B Type II or MIL-L-7808G type I (See Mfg. Data Part VIII Approved POH for List of Approved Lubricants). | | | |
| Engine limits | | <u>HP</u> | <u>R.P.M.</u> | <u>ITT</u> |
| | Takeoff and Maximum continuous | 748 | 101.0% | 923° |
| Propeller and Propeller Limits | 2 Dowty-Rotol Ltd. 3-bladed feathering and reversing propellers. Rockwell Assembly No. 640080. a. Dowty-Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP2926 includes B. F. Goodrich propeller de-icing kit No. 65-330-1 or Dowty Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP 3027 includes Dowty Rotol Deice Boots 660709275 as B. F. Goodrich De-Ice Boots 4E 2598-10. See NOTE 17. Dowty-Rotol Propeller Blade Assembly P/N 660706330-XX Pitch settings at .7 radius station: | | | |

XIX - MODEL 690D (cont'd)**Propeller and Propeller Limits**
(cont'd)Feather $83^{\circ} 10' \pm 20'$, Reverse $-13.75^{\circ} \pm 1.0^{\circ}$ Start Locks $-1.25^{\circ} \pm 1.0^{\circ}$, Flight Idle $6.0^{\circ} \pm 0.5^{\circ}$.

Diameter: 106 in., 1/2in. reduction per blade allowed.

NOTE: Use AiResearch oil transfer tube Part No. 897458-2.**NOTE:** All engine ground running for maintenance test purposes, with the airplane stationary, must be done with the airplane head into the wind.

b. Spinner: 2 Dowty-Rotol Ltd. Type No. (C)SB7/3/1

c. Governor: 2 AiResearch P/N 897410-2B or -4.

Airspeed Limits

| | |
|-----------------------|---|
| Maneuvering | 160 m.p.h. (139K) CAS |
| Maximum Operating | 290 m.p.h. (252K) CAS .60 MACH |
| Flaps extended - half | 207 m.p.h. (180K) CAS (S/N 15000-15024) |
| | 230 m.p.h. (200K) CAS (S/N 15025-15999) |
| Flaps extended - full | 161 m.p.h. (140K) CAS (S/N 15000-15024) |
| | 184 m.p.h. (160K) CAS (S/N 15025-15999) |
| landing gear extended | 230 m.p.h. (200K) CAS |

C.G. Range**Forward**

208.77 inches aft of datum (17.7% MAC) at 10,700 lbs.

204.34 inches aft of datum (11.5% MAC) at 8,500 lbs.

204.34 inches aft of datum (11.5% MAC) at 7,010 lbs.

214.18 inches aft of datum (25.1% MAC) at 6,466 lbs.

Straight line variation between points.

Aft

218.72 inches aft of datum (31.4% MAC) at 10,700 lbs.

217.94 inches aft of datum (30.4% MAC) at 6,582 lbs.

Variation between points

Inches aft of datum = $219.93 - (13029/\text{Weight})$ **Datum**

196 in. forward of wing leading edge at center section

Leveling means

Longitudinal - Top of fuselage on centerline aft of wing trailing edge.

Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum weight

Maximum takeoff 10,700 lbs. (ramp weight 10,775 lbs.)

Maximum landing 10,550 lbs.

Zero fuel 9,500 lbs.

Maximum operating altitude

31,000 feet

Maximum No. of seats

11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)

Maximum baggage

600 lb. (+290) Non pressurized compartment

100 lb. (+245) Pressurized compartment

Fuel capacity

Total standard capacity 430 gal., usable fuel 425.0 gal.

Total capacity with optional system 482 gal., usable 474 gal.

(See NOTE 1 for systems fuel).

Oil capacity

12.0 qts. total (6.0 qts. total each tank) (+188)

10.0 qts. usable (See NOTE 1 for system oil)

XIX - MODEL 690D (cont'd)

| | | | | | |
|---------------------------|--------------|-------|--------------|------|--------------|
| Control Surface movements | Elevator | Up | 30° + 1 0 | Down | 10° + 2 0 |
| | Elevator tab | Up | 3° ± 1 | Down | 24° ± 1 |
| | Rudder | Right | 20° + 2 0 | Left | 20° + 2 0 |
| | Rudder tab | Right | 20° + 2 0 | Left | 20° + 2 0 |
| | Aileron | Up | 23° ± 2 | Down | 15° ± 2 |
| | Flaps | | | Down | 40° ± 2 |
| | Aileron tab | Up | 17° ± 2.5° | Down | 17° ± 2.5° |
| | | | | | |

Serial Nos. eligible

Under the delegation option, provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to: Issue Airworthiness Certificates and approve design and production changes on airplane serial numbers 15000 through 15042. (See Notes 21 and 22.)

XX - MODEL 695B, 11 PCLM (Normal Category), Approved February 15, 1984

| | | | | |
|--------------------------------|--|--------------------------------|------------|------------|
| Engines | 2 Garrett Model TPE 331-10-511K Turboprop engines (Gulfstream P/N 610653). | | | |
| Fuel | Aviation Turbine fuels ASTM designation D1655-68, types Jet A, Jet A-1, and Jet B; MIL-T-5624G-1, Grades JP-4 and JP-5; MIL-T-83133, Grade JP-8; and MIL-F-46005A(MR)-1, Types I and II; British D.ENG.R.D. 2486 Issue 2; British D.ENG.R.D. 2494 Issue 4; and NATO Equivalents. | | | |
| Oil | MIL-L-23699B type II (See Mfg. Data Part VIII Approved POH for List of approved lubricants.) | | | |
| Engine Limits | | <u>Torque (HP)</u> | <u>RPM</u> | <u>EGT</u> |
| | Takeoff and Maximum Continuous | 102.5% (820) | 101.0% | 650°C |
| Propeller and Propeller Limits | 2 Dowty-Rotol Ltd. 3-bladed feathering and reversing propellers. Gulfstream Assembly No. 640080 | | | |
| | a. Dowty-Rotol Ltd. Type No. (C) R306/3-82-F/7-(c) VP 3027 includes Dowty-Rotol Deice Boots 660709275 or B. F. Goodrich De-ice Boots 4E2498-10. Dowty-Rotol Propeller Blade Assembly P/N 660706330-XX | | | |
| | Pitch settings at .7 radius stations: | | | |
| | Feather 83° 10' ± 20', Reverse -13.75° ± 1.0° | | | |
| | Start Locks -1.25° ± 1.0°, Flight Idle 6.0° ± 0.5° | | | |
| | Diameter: 106 In., 1/2 in. reduction per blade allowed. | | | |
| Airspeed Limits | <u>NOTE:</u> Use Garrett oil transfer tube Part No. 897458-2. | | | |
| | <u>NOTE:</u> All engine ground running for maintenance and test purposes, with the airplane stationary, must be done with the airplane headed into the wind. | | | |
| | b. Spinner: 2 Dowty-Rotol Ltd. Type No. (C) SB7/3/1 | | | |
| | c. Governor: 2 Garrett P/N 897410-4 | | | |
| Airspeed Limits | Maneuvering | 182 m.p.h. (158K) CAS | | |
| | Maximum Operating | 290 m.p.h. (252K) CAS .60 MACH | | |
| | Flaps extended - half | 230 m.p.h. (200K) CAS | | |
| | Flaps extended - full | 184 m.p.h. (160K) CAS | | |
| | Landing gear extended | 230 m.p.h. (200K) CAS | | |

XX - MODEL 695B (cont'd)**C.G. Range**

Forward
 210.91 inches aft of datum (20.6% MAC) at 11,750 lbs.
 204.34 inches aft of datum (11.5% MAC) at 8,500 lbs.
 204.34 inches aft of datum (11.5% MAC) at 6,836 lbs.
 211.56 inches aft of datum (21.5% MAC) at 6,410 lbs.
 Straight line variation between points.
 Aft
 217.03 inches aft of datum (29.1% MAC) at 11,750 lbs.
 218.71 inches aft of datum (31.4% MAC) at 11,628 lbs.
 217.85 inches aft of datum (30.2% MAC) at 6,639 lbs.
 Straight line variation except between 11,628 lbs. and 6,639 lbs.
 Inches aft of datum = $219.87 - (13402/\text{weight})$

Datum 196 In. forward of wing leading edge at center section

Leveling means Longitudinal - Top of fuselage on centerline aft of wing trailing edge.
 Lateral - Transverse beams at front of rear baggage compartment floor.

Maximum Weight Maximum takeoff 11,750 lbs. (Maximum Ramp 11,800 lbs.)
 Maximum landing 11,000 lbs.
 Zero Fuel 9,800 lbs.

Maximum operating altitude 35,000 feet

Maximum No. of seats 11 (Pilot + 10 passengers; pilot, co-pilot + 9 passengers)

Maximum baggage 750 lb. (+290) Nonpressurized compartment
 100 lb. (+245) Pressurized compartment

Fuel capacity Total standard capacity 482 gal., usable 474 gal.
 (See NOTE 1 for systems fuel).

Oil capacity 12.0 qts. total (6.0 qts. total each tank) (+188)
 10.0 qts. usable (See NOTE 1 for system oil).

| | | | | | |
|---------------------------|--------------|-------|--------------------------|------|--------------------------|
| Control Surface movements | Elevator | Up | $30^\circ \pm 1$ 0 | Down | $10^\circ \pm 2$ 0 |
| | Elevator tab | Up | $3^\circ \pm 1$ | Down | $24^\circ \pm 1$ |
| | Rudder | Right | $20^\circ \pm 2$ 0 | Left | $20^\circ \pm 2$ 0 |
| | Rudder tab | Right | $20^\circ \pm 2$ 0 | Left | $20^\circ \pm 2$ 0 |
| | Aileron | Up | $23^\circ \pm 2$ | Down | $15^\circ \pm 2$ |
| | Flaps | | | Down | $40^\circ \pm 2$ |
| | Aileron tab | Up | $17^\circ \pm 2.5^\circ$ | Down | $17^\circ \pm 2.5^\circ$ |

Serial Nos. eligible Under the Delegation Option Provisions of Part 21 of the Federal Aviation Regulations, Delegation Option Manufacturer No. SW-2 is authorized to:
 Issue Airworthiness Certificates and approve design and production changes
 on airplane Serial Numbers 96201 thru 96208 (See NOTES 20 and 22).

Specifications Pertinent to All Models**Certification basis Type Certificate No. 2A4**

| | |
|--|--|
| Models 680, 680E: Model 720: | CAR 3 effective Nov. 1, 1949, through Amdt. 3-12 dated May 18, 1954. CAR 3 effective Nov. 1, 1949, through Amdt. 3-12 dated May 18, 1954, and 3.197, 3.395, 3.396 of Amdt. 3-2 dated August 12, 1957. |
| Models 560, 680F, 680FL: | CAR 3 effective May 15, 1956, including Amdts. 3-3 dated May 17, 1958, and 3-4 dated October 6, 1958. |
| Models 680F (Pressurized) 680 FL (Pressurized): | CAR 3 effective May 15, 1956, including 3.197, 3.395, 3.396 of Amd. 3-2 dated Aug.12, 1957, and Amdt. 3-3 dated May 17, 1958, and 3-4 dated October 6, 1958. |
| Model 680T: | CAR 3 effective May 15, 1956, including 3.197, 3.395, 3.396 of Amdt. 3-2 dated August 12, 1957, and Amdts. 3-3 dated May 17, 1958, 3-4 dated Oct. 6, 1958, Amdt. 3-6 dated Sept.13, 1961, plus Special Conditions dated April 1, 1965. |
| Models 680V, 680W, 681: | CAR 3 effective May 15, 1956, including 3.197, 3.270, 3.395, 3.396 of Amdt. 3-2 dated August 12, 1957, and Amdts. 3-3 dated May 17, 1958, 3-4 dated Oct.6, 1958, Amdt. 3-6 dated Sept.13, 1961, plus Special Conditions dated April 1, 1965. |
| Models 690, 690A, 690B | CAR 3 dated May 15, 1956, including Pars. 3.197, 3.270, 3.395, and 3.396 of Amdt. 3-2 dated Aug.12, 1957, and Amdt. 3-3 dated May 17, 1958, 3-4 dated Oct.6, 1958, 3-6 dated Sept.13, 1961, Par. 23.473, 23.479, 23.481, and 23.483 of FAR 23, Amdt. 23-7 dated Sept.14, 1969, plus Special Conditions dated April 1, 1965, and August 12, 1970; Docket #10506 |
| Model 685: | CAR 3 dated May 15, 1956, including Pars. 3.197, 3.270, 3.395, and 3.396 of Amdt. 3-2 dated August 12, 1957, and Amdt. 3-3 dated May 17, 1958, 3-4 dated Oct.6, 1958, 3-6 dated Sept. 13, 1961. |
| Models 690C, 695 | CAR 3 dated May 15, 1956, including Pars. 3.197, 3.270, 3.395, and 3.396 of Amdt. 3-2 dated August 12, 1957, and Amdt. 3-3 dated May 17, 1958, 3-4 dated Oct.6, 1958, 3-6 dated Sept. 13, 1961, Pars. 23.473, 23.479, 23.481, and 23.483 of FAR 23, Amdt. 23-7 dated Sept. 14, 1969, plus Special Conditions dated April 1, 1965, and Aug.12, 1970; Docket #10506, and FAR 36 dated Dec.1, 1969, through Amdt. 36-6 dated Jan.24, 1977. |
| Model 695A, 690D | CAR 3 dated May 15, 1956, including Pars. 3.197, 3.270, 3.395, and 3.396 of Amdt. 3-2 dated August 12, 1957, and Amdt. 3-3 dated May 1, 1958, 3-4 dated Oct. 6, 1958, 3-6 dated Sept. 13, 1961, Pars. 23.253, 23.335(b)(4), 23.473, 23.479, 23.481, 23.483, 23.571(a), 23.572(a)(1), and 23.1505(c) of FAR 23, Amdt. 23-7 dated Sept. 14, 1969, FAR 23.1303(e)(2) of Amdt. 23-17 dated Feb. 1, 1977, plus special Conditions dated April 1, 1965, and August 12, 1970, Docket No. 10506, and FAR 36 dated December 1, 1969, through Amdt. 36-6 dated Jan.24, 1977. |
| Model 695B | CAR 3 dated May 15, 1956, including Pars. 3.395 and 3.396 of Amdt.3-2 dated August 12, 1957, and Amdt. 3-3 dated May 1, 1958, 3-4 dated Oct. 6, 1958, 3-6 dated Sept.13, 1961, except for Subpart C, plus Pars. 23.253, 23.1303(e)(2), and 23.1505(c), and Subpart C of FAR 23 as amended thru Change 17 dated Sept.13, 1982, plus Special Conditions dated April 1, 1965, and Aug.12, 1970, Docket No. 10506 and FAR 36 dated December 1, 1969, through Amdt. 36-6 dated January 24, 1977. |

Production basis**Production Certificate No. 203**

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 a current Airplane Flight Manual except for Models 690B, 690C, 690D, 695, 695A, and 695B which require a current Pilot's Operating Handbook.

In addition, the following item(s) are required:

1. Stall warning system:
Models 560F, 680F, 680F(P), 680FL, 680FLP, 680T, 680W, 681, 690, 685, 690A (through S/N 11268 except 11249) - Gulfstream Dwg. 850016 and 850195.
Models 690A (11249, 11269 through 11349), 690B - Gulfstream Dwg. 850016 and 8000644
Model 690C, 690D and 695 - Gulfstream Dwg. 200036 and 800644.
Model 695A and 695B - Gulfstream Dwg. 200036, 800644 and 800746.
2. Outside Air Temperature Thermometer
Models 680T, 680V, 680W, 681 - Gulfstream Dwg. 850295
Models 690, 690A, 690B, 690C, 690D, 695, 695A, and 695B - Gulfstream Dwg. 850478.
3. EGT System
Model 685 (with Service Letter 300 installed) Gulfstream Dwg. 890412.

NOTE 1: Current weight and balance report, including list of equipment, included in certificated empty weight and loading instructions must be in each aircraft at the time of original airworthiness certification and at all times thereafter (except in the case of air carrier operators having an approved weight control system.)

The certificated empty weight and corresponding center of gravity location must include unusable fuel (included in total fuel capacity and undrainable oil (included in total oil capacity) as follows:

| Model | 680 | 680-E | 720 | 680-F & 680-F Press | 680-FL & 680-FL(P) |
|-------|----------------|----------------|----------------|------------------------|-----------------------|
| Fuel | 15.5 lb.(+187) | 15.5 lb.(+187) | 15.5 lb.(+187) | 15.5 lb.(+187) | 15.5 lb.(+231) |
| Oil | 15.0 lb.(+191) | 15.0 lb.(+191) | 15.0 lb.(+191) | 17.4 lb.(+150) | 17.4 lb.(+194) |

| Model | 560-F | 680W, 681 680T, 680V | 690, 690A 690B | 685 |
|-------|----------------|-------------------------|-------------------|--------------|
| Fuel | 15.5 lb.(+187) | 13 lb. (+231) | 31 lb.(+231) | 27 lb.(+231) |
| Oil | 17.4 lb.(+191) | 6.5 lb.(+188) | 4 lb.(+188) | 0 lb.(+188) |

| Model | 690C, 690D | | 695 | | 695A, 695B |
|-------|----------------|----------------|----------------------|----------------|----------------|
| | Standard | Std + Optional | (SN 95000- 95040) | (95041-95999) | |
| Fuel | 33.5 lb.(+230) | 53.6 lb.(+230) | 33.6 lb.(+230) | 53.6 lb.(+230) | 53.6 lb.(+230) |
| Oil | 4.0 lb.(+188) | 4.0 lb.(+188) | 4.0 lb.(+188) | 4.0 lb.(+188) | 4.0 lb.(+188) |

NOTE 2: The placards specified in the Airplane Flight Manual must be displayed in front of and in clear view of the pilots.

NOTE 3: Serial Numbers 466, 471, 529, and 530 of Military RL-26-D as defined by Aero Commander Dwg. 6100012-A are eligible as Model 680 airplanes.

NOTE 4: When Lycoming GSO-480-B1A6 engines are installed, the following pertains: The oil cooler outlet gills must be relocated in accordance with Service Letter No. 62 and oil temperature gage markings changed per Service Letter No. 63. Engines must be operated in accordance with Airplane Flight Manual.

NOTE 5: An optional pressurized version of the Model 680-F designated "680-F (Pressurized)" was approved June 29, 1962. This model is a standard 680-F incorporating a factory modification per Aero Commander Dwg. 610021. Note the special required equipment list and the special equipment column for this modified 680-F in Revision No. 24 or Service Information SI-118.

- NOTE 6: Model 680FL S/N 1471 and up are manufactured as 8500 lb. gross weight aircraft. Serial Numbers 1261 through 1470 are manufactured as 8000 lb. gross weight aircraft and become 8500 lb. aircraft when modified per Aero Commander Dwg. 6100028. Serial Number 1441 through 1470 were modified per Rockwell Dwg. 6100028 at the factory.
- NOTE 7: The Model 680 is eligible as a Model 680E when modified in accordance with Aero Commander Report G10-163.
- NOTE 8: All Model 680T aircraft are to be modified or manufactured per Aero Commander Report G10-227 and are to be 8950 lb. gross weight aircraft.
- NOTE 9: The Model 680T is eligible as a Model 680V when modified in accordance with Aero Commander Dwg. 6100034.
- NOTE 10: Icing Approval:
- a. The Models 680T, 680V, 680W, and 681 may be flown through known icing conditions when equipped in accordance with Aero Commander Service Letter No. 196.
 - b. The Model 690 may be flown through known icing conditions when equipped in accordance with Aero Commander Service Letter No. 241A or Drawing 890338. Flight Manual Supplement 4 dated 6/10/71 is required.
 - c. Models 690A and 690B are fully equipped and approved for flight into known icing. See Flight Manual (Pilots Operating Handbook) for list of required operable equipment. Safe Flight P/N C-01426 and C-01427 required to provide stall warning.
 - d. Model 690C Serial Numbers 11600 thru 11619 approved for flight into known icing after compliance with Rockwell Service Letter No. 329. Serial Numbers 11620 and Subs are fully equipped for flight into known icing. See Pilots Operating Handbook for list of required operable equipment.
 - e. Model 695, 695A, 695B and 690D are fully equipped for flight into known icing. See Pilots Operating Handbook for list of required operable equipment.
- NOTE 11: The Models 680T and 680V may have the AiResearch engines TPE-331-43A installed as a product improvement item and in accordance with Aero Commander Service Letter No. 208.
- NOTE 12: The Models 680T, 680V, 680W, and 681 may have auxiliary fuel tanks installed in accordance with Aero Commander Drawing 890326. These provide 25.5 usable gals. each side. (51 gal. total) Unusable added is negligible.
- NOTE 13: The Model 685 may be approved for flight into known icing conditions when equipped in accordance with Aero Commander Service Letter No. 241 or Drawing No. 890338. Flight Manual Supplement 5 dated April 15, 1972, is required.
- NOTE 14: With GTS10-520-K engine installed, 2 Alcor turbine inlet temperature indicators must be installed per Rockwell Service Letter 300. Flight Manual Revision No. 5.
- NOTE 15: In some cases, the serial number contains the basic number plus a dash followed by a second set of numbers. This second number is a model unit number and the basic serial number applies with or without the second number. Example as follows: 680FL-1779-148 can be referred to as S/N 1779-148 or by S/N 1779.
- NOTE 16: If blades LT10673 or LT10673B are installed per STC SA546GL, propeller blade angles at the 42 inch station are: Reverse $14.0^{\circ} \pm .5^{\circ}$, Start Locks $-8.7^{\circ} \pm .5^{\circ}$; Low $6.0^{\circ} \pm .5^{\circ}$, and Feather $77.9^{\circ} \pm .5^{\circ}$.
- NOTE 17: Airframe electrical modifications per 800 788 required when installing Dowty Rotol boots 660709275 or B. F. Goodrich boots 4E2498-10 in place of previously installed B. F. Goodrich de-ice Kit 65-330-1.
- NOTE 18: Maximum Baggage Weight increased to 750 pounds for Model 695A Serial Numbers 96063, 96069, 96075, 96078, and 96085.
- NOTE 19: TPE 331-10-501K effective on Models 695 S/N 95000 through 95084, 695A S/N 96001 through 96071 except those complying with Service Information Letter 189. TPE 331-1Q-511K effective on Models 695 S/N 95087 and Subs. 695A S/N 96000, 96072 and Subs. plus those complying with Service Information Letter 189. It is acceptable to have one each -501K and -511K engine installed.

- NOTE 20: Model 695A Serial Numbers 96062, 96063, 96069, 96075, and 96078, and 96085 are eligible as a Model 695B when modified in accordance with Gulfstream Aerospace Drawing 100062 Rework EO No. 3 except that the maximum value of zero fuel weights is limited to 9500 pounds.
- NOTE 21: Model 690D airplanes, Serial Numbers 15000 through 15042, are eligible for conversion to Model 695A when modified in accordance with Gulfstream Drawing 100068.
- NOTE 22: Delegation Option Authorization No. SW-2 expired July 17, 1986.

...END...

E-284

Revision 9

Textron Lycoming

GSO-480-A1A6, -A1C6, -A2A6

GSO-480-B1A6, -B1B6 (O-480-1), -B1C6, -B1E6

-B1F6, -B1G6, -B1J6, -B2C6, -B2D6,

-B1B3, -B2G6, -B2H6

IGSO-480-A1A6 (O-480-3), -A1B6, -A1C6, -A1D6,

-A1E6, -A1F3-A1F6, -A1G6

May 15, 1988

TYPE CERTIFICATE DATA SHEET NO. E-284

Engines of models described herein conforming with this data sheet (which is a part of type certificate No. 284) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Civil Air Regulations/Federal Air Regulations provided they are installed, operated and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Type Certificate Holder

Textron Lycoming/Subsidiary of Textron, Inc.
Williamsport Plant
Williamsport, Pennsylvania 17701

| Model | Lycoming | GSO-480-A1A6, -A1C6, -A2A6, -B1A6, -B1B6, -B1C6, -B1E6, -B1F6, -B1G6, -B1J6, -B2C6, -B2D6, -B2G6, -B2H6, -B1B3 | IGSO-480-A1A6, -A1B6, -A1C6, -A1D6, -A1E6, -A1F6, -A1G6, -A1F3 |
|---|---------------------------|---|---|
| Type | 6HOA-Reduction Gear Ratio | 77:120 | -- |
| Rating | | | |
| Max. continuous, hp, r.p.m., in Hg., at: | | | |
| Rated pressure alt. (ft.) | | 320-3200-43.3-8000 | 320-3200-41.3-11,000 |
| Sea level pressure alt. (ft.) | | 320-3200-45.0-S.L. | 320-3200-45.0-S.L. |
| Takeoff (5 min.), hp, r.p.m. in Hg., at: | | | |
| Rated pressure alt. (ft.) | | 340-3400-45.8-8000 | 340-3400-44.0-11,000 |
| Sea level pressure alt. (ft.) | | 340-3400-48.0-S.L. | 340-3400-48.0-S.L. |
| Fuel (min. grade aviation gasoline)* | | 100/130 | -- |
| Lubricating Oil | | | |
| (lubricant should conform to the specifications as listed or to subsequent revisions thereto) | | Lycoming Spec. No. 301-F and Service Instruction No. 1014 | -- |
| Bore and stroke, in. | | 5.125 x 3.875 | -- |
| Displacement, cu. in. | | 479.7 | -- |
| Supercharging ratio | | 11.27:1 | -- |
| Compression ratio | | 7.3:1 | -- |
| Weight (dry) lb. | | See NOTE No. 8 | -- |
| C.G. location (dry) | | See NOTE No. 8 | -- |
| Propeller shaft, SAE No. | | See NOTE No. 8 | -- |
| Carburetion | | See NOTE No. 8 | -- |
| Ignition, dual | | See NOTE No. 8 | -- |
| Timing °BTC | | 25 | -- |
| Spark Plugs | | See NOTE No. 9 | -- |
| Oil Sump - capacity | | Dry Sump | -- |
| Notes 1 through 9 as applicable | | 1,2,3,4,5,6,7,8,9 | -- |

"- " indicates "same as preceding model"

"#" indicates "does not apply"

"***" See latest revision of Lycoming Service Instruction No. 1070 for alternate fuel grades.

| | | | | |
|----------|---|---|---|---|
| Page No. | 1 | 2 | 3 | 4 |
| Rev. No. | 9 | 9 | 9 | 9 |

Reformatted 1/95

E-284

Certification basis:

| <u>Regulations & Amendments</u> | <u>Model</u> | <u>Date of Application</u> | <u>Date of Type Certificate No. 284 Issued/Revised</u> |
|-------------------------------------|---------------|----------------------------|--|
| CAR 13 Effective March 5, 1952 | | | |
| As Amended by 13-1 and 13-2 | GSO-480-A1A6 | December 13, 1954 | June 30, 1955 |
| CAR 13 Effective June 15, 1956 | 0-480-1 | November 27, 1956 | December 5, 1956 |
| | GSO-480-B1A6 | April 26, 1957 | May 9, 1957 |
| | GSO-480-B1B6 | April 26, 1957 | May 9, 1957 |
| | GSO-480-B1C6 | April 26, 1957 | May 9, 1957 |
| | GSO-480-A1C6 | June 18, 1957 | June 27, 1957 |
| As Amended by 13-1 | IGSO-480-A1A6 | January 10, 1958 | May 14, 1958 |
| | GSO-480-B2D6 | February 21, 1958 | March 6, 1958 |
| CAR 13 Effective June 15, 1956 | | | |
| As Amended by 13-1, 13-2, 13-3 | GSO-480-A2A6 | April 13, 1960 | May 3, 1960 |
| | IGSO-480-A1B6 | June 11, 1960 | August 25, 1960 |
| | GSO-480-B1E6 | May 26, 1961 | June 19, 1961 |
| | GSO-480-B1F6 | May 26, 1961 | June 19, 1961 |
| | GSO-480-B1G6 | May 26, 1961 | June 19, 1961 |
| | GSO-480-B2H6 | May 26, 1961 | June 19, 1961 |
| | GSO-480-B2C6 | June 1, 1961 | June 19, 1961 |
| | GSO-480-B2G6 | June 1, 1961 | June 19, 1961 |
| | 0-480-3 | June 26, 1961 | June 14, 1961 |
| | IGSO-480-A1C6 | September 13, 1961 | October 17, 1961 |
| | IGSO-480-A1D6 | May 2, 1962 | May 6, 1963 |
| And 13-4 | IGSO-480-A1F6 | July 6, 1962 | August 16, 1962 |
| | IGSO-480-A1E6 | August 27, 1964 | October 23, 1964 |
| | IGSO-480-A1G6 | August 16, 1966 | August 26, 1966 |
| | IGSO-480-B1J6 | January 5, 1967 | January 21, 1967 |
| | GSO-480-B1B3 | June 21, 1971 | July 7, 1971 |
| | IGSO-480-A1F3 | January 28, 1980 | February 21, 1980 |

Production basis: Production Certificate No. 3

NOTE 1. Maximum permissible temperatures:

Cylinder Head

Well type

500°F

Cylinder Base*

350°F

Oil Inlet

225°F - GSO-480-A1A6, -A2A6, -A1C6

245°F - All others

*This parameter dispensed with where pistons are internally cooled by oil jets.

NOTE 2. Fuel Pressure Limits:

Minimum

9 p.s.i.

Maximum

15 p.s.i. (17 p.s.i. min., 65 p.s.i. max. for
IGSO-480-A1E6, -A1D6, -A1G6)

Oil Pressure Limits:

(Normal Operations)

55 p.s.i.

85 p.s.i.

(Idling)

25 p.s.i. (35 p.s.i. for IGSO-480-A1A6, -A1B6, -A1C6, -A1F6, -A1F3)

NOTE 3. The following accessory provisions are made:

| <u>Accessory</u> | <u>Rotation Facing Drive Pad</u> | <u>Speed Ratio to Crankshaft</u> | <u>Maximum Torque (in. -lb.)</u> | | <u>Maximum Overhang Moment (in. -lb.)</u> |
|--------------------|----------------------------------|----------------------------------|----------------------------------|---------------|---|
| | | | <u>Continuous</u> | <u>Static</u> | |
| Starter | C | 1.000:1 | # | 12000 | 300 |
| Generator | C | 2.600:1 | 500 | 2200 | 400 |
| Fuel Pump | CC | .803:1 | 25 | 450 | 25 |
| Vacuum Pump | C | 1.219:1 | 200 | 800 | 25 |
| Hydraulic Pump | C | 1.083:1 | 400 | 1650 | 175 |
| Tachometer | CC | .500:1 | 7 | 50 | # |
| Propeller Governor | C | .801:1 | 125 | 1200 | 25 |

"C" - Clockwise, "CC" - Counter-Clockwise

"#" Indicates "does not apply"

- NOTE 4. The "6" in the engine model designation indicates the crankshaft has five 3rd order and one 6th order torsional vibration dampers. The IGSO-480-A1F3 and GSO-480-B1B3 have four heavy 3rd order and two 6th order torsional vibration dampers.
- NOTE 5. All engines incorporate provisions for absorbing propeller thrust in both tractor and pusher type installations.
- NOTE 6. Military Models 0-480-1 and -3 are identical to the corresponding civil designated engines except for ignition, which are the Scintilla S6LN-22 and S6RN-23 with AN 3105, primary ground terminal. When installed in certificate aircraft, the corresponding commercial model designations and type certificate number should be added to the engine data plate.
- NOTE 7. The above models incorporate additional characteristics as follows:

| <u>Models</u> | <u>Characteristics</u> |
|---------------|---|
| GSO-480-A1A6 | Basic model. Geared drive, six cylinder, horizontally opposed, supercharged, dry sump, aircooled engine with side mounted accessory drives and accessories. |
| GSO-480-A1C6 | Similar to GSO-480-A1A6 except has provisions for a supercharger bearing thermocouple. |
| GSO-480-A2A6 | Similar to GSO-480-A1A6 except has flange type propeller shaft with 2-way oil for reversible propeller. |
| GSO-480-B1A6 | Similar to GSO-480-A1C6 except incorporates crankcase oil jets for increased piston cooling, provisions for supercharger inlet and an updraft carburetor. |
| GSO-480-B1B6 | Similar to GSO-480-B1A6 except has a horizontal elbow and carburetor under the engine. |
| GSO-480-B1B3 | Same as GSO-480-B1B6 except that the torsional damper system has been modified. (SEE NOTE 4) |
| GSO-480-B1C6 | Similar to GSO-480-B1A6 except has a horizontal carburetor mounted directly on a straight-through air inlet supercharger housing. |
| GSO-480-B1E6 | Similar to GSO-480-B1A6 excepting magnetos. |
| GSO-480-B1F6 | Similar to GSO-480-B1B6 excepting magnetos. |
| GSO-480-B1G6 | Similar to GSO-480-B1C6 excepting magnetos. |
| GSO-480-B1J6 | Same as GSO-480-B1A6 except incorporates 1200 series Bendix magnetos. |
| GSO-480-B2C6 | Similar to GSO-480-B1C6 except has flanged propeller shaft and provision for reversible propeller. |
| GSO-480-B2D6 | Similar to GSO-480-A2A6 except has internal piston cooling, special supercharger inlet for down-draft carburetor and is also similar to the -B1 series engines except incorporates a flange type propeller shaft. |
| GSO-480-B2G6 | Similar to GSO-480-B2C6 excepting magnetos. |
| GSO-480-B2H6 | Similar to GS-470-B2D6 excepting magnetos. |
| IGSO-480-A1A6 | Basic fuel injection model. |
| IGSO-480-A1B6 | Similar to IGSO-480-A1A6 except has retard breaker magnetos. |
| IGSO-480-A1C6 | Similar to IGSO-480-A1A6 except has horizontal air inlet housing and throttle. |
| IGSO-480-A1D6 | Similar to GSO-480-B1A6, except for incorporation of service kit which included Bendix RS10-FB1 fuel injector and supercharger air inlet housing assembly, P/N 74323. |
| IGSO-480-A1E6 | Similar to IGSO-480-A1D6 except for different configuration of supercharger air inlet housing and incorporation of retard breaker magnetos. |
| IGSO-480-A1F3 | Similar to IGSO-480-A1F6 except that it has two 6th and four heavy 3rd order dynamic counterweights. |
| IGSO-480-A1F6 | Similar to IGSO-480-A1C6 except has retard breaker magnetos in place of impulse type magnetos. |
| IGSO-480-A1G6 | Same as IGSO-A1E6 with 1200 series magnetos but without the Bendix modulator unit. |

NOTE 8. For all models - weights, carburetion, ignition, C.G. location and propeller shaft SAE designations.

| Models | Weight (dry) lb. | Carburetion | Ignition, dual | From front face of thrust nut, in. | C.G. Location, Dry | | Propeller shaft, SAE No. |
|---------------|---------------------|------------------------------------|---|--|---------------------------------|------------|--------------------------------|
| | | | | | Off propeller shaft C.L. in. | | |
| | | | | | lateral | vertical | |
| GSO-480-A1A6 | 498 | Bendix PS-7BD | Bendix S6LN-20, S6RN-21 | 21.74 | 0.22 left | 0.59 above | 20 spline |
| -A1C6 | 498 | Bendix PS-7BD | Bendix S6LN-20, S6RN-21 | 21.74 | 0.22 left | 0.59 above | 20 spline |
| -A2A6 | 498 | Bendix PS-7BD | Bendix S6LN-20, S6RN-21 | 21.74 | 0.22 left | 0.59 above | flange, ARP 502 |
| -B1A6 | 513 | Bendix PS-7BD | Bendix S6LN-20, S6RN-21 | 22.32 | 0.18 left | 0.22 above | 20 spline |
| -B1B6 | 515 | Bendix PSH-7BD | Bendix S6LN-20, S6RN-21 | 22.18 | 0.18 left | 0.01 below | 20 spline |
| *O-480-1 | | | | | | | |
| -B1B3 | 517 | Bendix PSH-7BD | Bendix S6LN-20, S6RN-21 | 22.18 | 0.18 left | 0.01 below | 20 spline |
| GSO-480-B1C6 | 512 | Bendix PSH-7BD | Bendix S6LN-20, S6RN-21 | 22.54 | 0.16 left | 0.59 above | 20 spline |
| -B1E6 | 513 | Bendix PS-7BD | Bendix S6LN-204, S6RN-200 or S6LN- 604, S6RN-600 | 22.32 | 0.18 left | 0.22 above | 20 spline |
| -B1F6 | 515 | Bendix PSH-7BD | Bendix S6LN-204, S6RN-200 or S6LN- 604, S6RN-600 | 22.18 | 0.18 left | 0.01 below | 20 spline |
| -B1G6 | 512 | Bendix PSH-7BD | Bendix S6LN-204, S6RN-200 or S6LN- 604, S6RN-600 | 22.54 | 0.16 left | 0.59 above | 20 spline |
| -B1J6 | 515 | Bendix PS-7BD | Bendix S6LN-1209, S6RN-1227 | 22.29 | 0.18 left | 0.22 above | 20 spline |
| -B2C6 | 512 | Bendix PSH-7BD | Bendix S6LN-20, S6RN-21 | 22.54 | 0.16 left | 0.59 above | flange, ARP 502 |
| GSO-480-B2D6 | 513 | Bendix PSD-7BD | Bendix S6LN-20, S6RN-21 | 22.39 | 0.25 left | 0.71 above | flange, ARP 502 |
| -B2G6 | 512 | Bendix PSH-7BD | Bendix S6LN-20, S6RN-21, S6LN- 204, S6RN-200, S6LN-604, S6RN- 600 | 22.54 | 0.16 left | 0.59 above | flange, ARP 502 |
| -B2H6 | 513 | Bendix PSD-7BD | Bendix S6LN-204, S6RN-200, S6LN- 604, S6RN-600 | 22.39 | 0.25 left | 0.71 above | flange, ARP 502 |
| IGSO-480-A1A6 | 512 | Fuel Injector Simmonds Type 570 | Bendix S6LN-20, S6RN-21 | 22.00 | 0.34 left | 0.71 above | 20 spline |
| *O-480-3 | | | | | | | |
| IGSO-480-A1B6 | 512 | Simmonds Type 570 | Bendix S6LN-204, S6RN-200, S6LN- 604, S6RN-600 | 22.00 | 0.34 left | 0.71 above | 20 spline |
| -A1C6 | 513 | Simmonds Type 570 | Bendix S6LN-20, S6RN-21 | 22.00 | 0.34 left | 0.71 above | 20 spline |
| -A1D6 | 514 | Bendix RS10-FB1 | Bendix S6LN-20, S6RN-21 | 22.29 | 0.21 left | 0.35 above | 20 spline |
| -A1E6 | 514 | Bendix RS10-FB1 | Bendix S6LN-204, S6RN-200 | 22.29 | 0.21 left | 0.35 above | 20 spline |
| -A1F6 | 513 | Simmonds Type 570 | Bendix S6LN-204, S6RN-200, S6LN- 604, S6RN-600 | 22.00 | 0.34 left | 0.71 above | 20 spline |
| -A1G6 | 515 | Bendix RS10-FB1 | Bendix S6LN-1209, S6RN-1208 | 22.29 | 0.21 left | 0.35 above | 20 spline |
| -A1F3 | 517 | Simmonds Type 570 | Bendix S6LN-204 S6RN-200 | 22.00 | 0.34 left | 0.71 above | 20 spline |

* See NOTE No. 6.

NOTE 9. Spark Plugs: See latest revision of Lycoming Service Instruction No. 1042 for approved equipment.

.....END.....