

WEIGHT & BALANCE RECORD

N 3212T Model 177 S/N 17700512 G/W 2350.0
(utility) 2200.0

DATE	ITEMS ADDED OR REMOVED	WEIGHT	ARM	MOMENT
8/20/83	Remove the following--			
	One- ARC RT-540A Nav/Comm	-11.50	69.0	793.50
	One- Narco ADF-29 Reciever	- 5.25	69.0	362.25
	One- ADF sense loop antenna	- 2.50	190.0	475.00
	One- ADF sense loop antenna cable	- 1.50	127.5	191.25
	Installed the following--			
	Two- ARC RT-328T Nav/Comm's with indicators IN-525B & IN 514B	+16.6	1169.0	1145.40
	One- ARC R-546E ADF and indicator	+ 4.2	69.0	289.80
	One- ARC RT-359A Transponder	+ 3.5	69.0	241.50
	One- ARC Audio Panel	+ 1.5	69.0	103.50
	Two- power filters	+ 2.0	59.0	118.00
	One- ARC Marker Beacon reciever	+ .7	59.0	41.30
	One- Marker Beacon antenna	+ .5	99.75	49.90
	One- ARC R-443B Glideslope reciever	+ 2.0	184.5	369.00
	One- Comm antenna	+ 1.5	127.1	190.71
	One- ARC L-346A ADF sensor loop	+ 1.6	112.0	179.20
	One- ADF sensor loop cable	+ 1.0	90.5	+90.50
	New A/C empty weight	- 1467.65		
	New A/C empty weight C.G.	- 106.3		
	New A/C useful load (normal)	- 882.35		
	(utility)	- 732.35		

David C. Dadds
A7P 547027377

D. C. D. AERO SERVICE Co.
CESSNA BUILDING
FREDRICK MUNICIPAL AIRPORT
FREDRICK, Mo 21701

Date- 9/26/81

Aircraft weight and balance data list

Registration number - N3212T
Aircraft serial number - 17700512

	Weight	Arm	Moment
Old A/C empty weight-	1446.5	106.30	153911

All previous aircraft weight and balance data lost as of this date, Copy of original data obtained from factory. Aircraft weighed with empty fuel and full oil with the following items installed since factory-

Narco ADF-29 System
Dorne & Margolin ELT with battery kit

*SUPERSEDED
8/20/83
David C. Dodds
ATP 547027377*

Aircraft Gross Weight (normal) - 2350.0
(utility) - 2200.0

New aircraft empty weight - 1453.3

New aircraft empty weight C.G. - 106.70

New aircraft usefull load (normal) - 896.70
(utility) - 746.70

*David C. Dodds
ATP 547027377*

CESSNA AIRCRAFT COMPANY

WICHITA, KANSAS

MODEL 177

Weight & Balance Data

Aircraft Serial No. 17700512

F. A. A. Registration No. N3212T

Date: 12-6-67

ITEM	Weight (lbs.)	C.G. Arm (Inches)	Moment (lb. in.)
Standard Airplane (Empty, Dry & Unloaded)	1340.0	106.3	142442
Optional Equipment	81.0	94.1	7622
Special Installations (DOA Approved)	-----	-----	-----
Total 1421.0 Over-All	19.5	166.5	3247
Usable Fuel (11.0 Gal.)	8.2	101.0	828
Licensed Empty Weight - Total of Items Above	1446.5	106.4	153911

GROSS WEIGHT = (LICENSED EMPTY WT.) + USEFUL LOAD

(2300 LBS) - (1446.5 LBS) = 903.5 LBS

SAMPLE LOADING PROBLEM

	Weight (lbs.)	C.G. Arm (Inches)	Moment (lb.-in./1000)
Licensed Empty Wt.	1446.5		153.9
Oil (8 Qts.)	15	44.0	0.7
Pilot & Front Passenger	340	85.0	28.9
Fuel	88.5	112.0	9.9
Rear Seat Passengers	340	134.0	45.6
Baggage	120.0	162.0	19.4
Total Loaded Airplane =	2300		261.1

Locate this point (2300, 261.1) on the C.G. Moment Envelope. Since the point falls within the envelope, the loading meets all balance requirements.

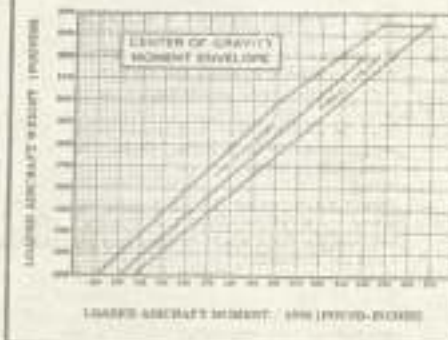
IT IS THE RESPONSIBILITY OF THE PILOT AND AIRPLANE OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY. THE EMPTY WEIGHT, C.G., & USEFUL LOAD ARE FOR THE AIRPLANE AS DELIVERED FROM THE FACTORY. REFER TO FORM FAA-320 WHEN ALTERATIONS HAVE BEEN MADE.

C.G. MOMENT ENVELOPE INSTRUCTIONS

To the licensed empty weight add weight of all items to be carried.

II To licensed empty weight moment add moment of all items to be carried.

III Locate point determined by I & II and if it falls within the C.G. moment envelope the loading is satisfactory.



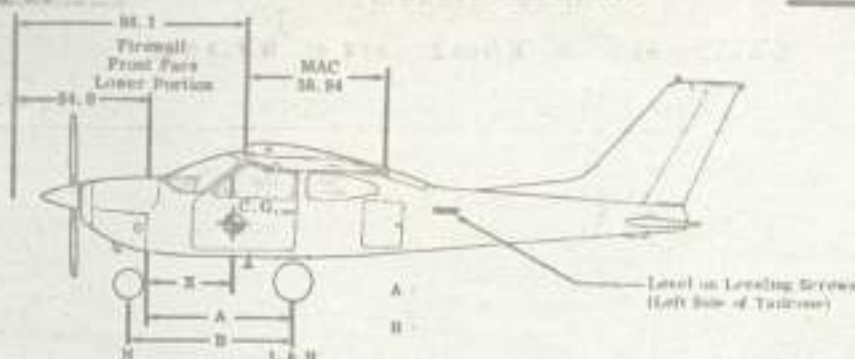
Form issue date: 24 July 1967

THIS IS A COPY OF THE WEIGHT & BALANCE AND
INSTALLED EQUIPMENT DATA FURNISHED AT TIME OF
ORIGINAL AIRWORTHINESS CERTIFICATION. IT DOES
NOT REFLECT EQUIPMENT CHANGES WHICH MAY
HAVE BEEN MADE SUBSEQUENT TO ISSUANCE OF AN

Diagram
No. 5.2

WEIGHT & BALANCE DATA

MODEL 177



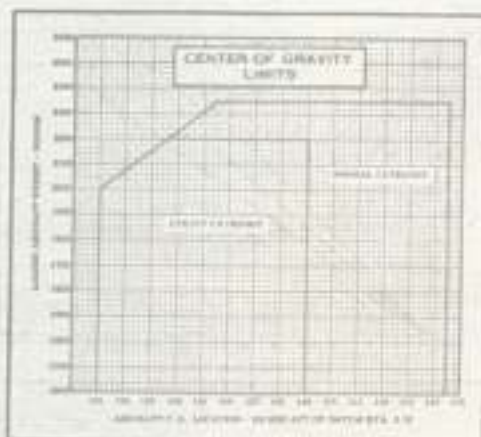
Scale Position	Scale Reading	Tare	Result	Net Weight
Left Wheel			L	
Right Wheel			R	
Nose Wheel			N	
Aircraft Empty Weight (As Weighed)			W	

$$X = (A) \cdot \frac{(N) \times (B)}{W} : X = (\quad) - (\quad) \times (\quad) = (\quad) \text{ IN.}$$

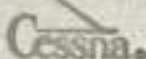
$$\text{C.G. ARM} = 54.0 + X = \quad \text{IN.}$$

WEIGHING PROCEDURE

- Preparation:
 - Inflate tires to recommended operating pressures.
 - Remove all wing tank and accumulator tank drain plugs to remove all fuel.
 - Remove all pump drain plug to drain all oil.
 - Move all sliding seats to the most forward position. All seat backs should be in the most nearly vertical position.
 - Put flaps in the fully retracted position.
 - Place all control surfaces in neutral position.
- Leveling:
 - Place scales under each wheel (500# scale, 4000# each main, maximum capacity for scales).
 - Deflate nose tire to center bubble on level (see diagram).
- Weighing:
 - With the airplane level and brakes released, record the weight shown on each scale. Deduct the tare, if any, from each reading.
- Measuring:
 - Obtain measurement "A" by measuring horizontally (along the airplane center line) from a line stretched between the main wheel centers to a plumb bob dropped from the firewall.
 - Obtain measurement "B" by measuring horizontally and parallel to the airplane center line, from center of nose wheel axle, left side, to a plumb bob dropped from the line between the main wheel centers. Repeat on right side and average the measurements.
- Completing the Form:
 - Using weights from (C) and measurements from (B) the airplane weight and C.G. can be determined.
- Obtain licensed empty weight by adding weight and moment of unusable fuel (see other side) to airplane empty weight and moment.



Form Issue date: 14 July 1967



CESSNA AIRCRAFT CO.

EQUIPMENT LIST
MODEL 177

WICHITA, KANSAS

AIRCRAFT SERIAL NO. 17700512

FAA REGISTRATION NO. N3212T

DATE 12-6-67

NOTES

- ▷ Suffix letters to item numbers:
- R = required items of equipment for FAA certification
 - S = standard equipment items
 - O = optional equipment items replacing required or standard items
 - A = optional equipment items which are in addition to required or standard items
- ▷ Status of equipment:
- ✓ = installed in the aircraft at the factory
 - L = loose item of equipment which is stowed in the aircraft when it left the factory but which is not included in the Optional Equipment Weight and Moment. (Installed ARM is listed.)
3. Unless otherwise indicated, true values (not net change values) for weight and arm are shown. Positive arms are distances aft of datum; negative arms are distances forward of datum (see weight and balance data sheet for datum location).
4. A separate FAA approval must be obtained if the following items are not installed per applicable Cessna drawings or accessory kit instructions.

ITEM NO		DESCRIPTION	REF DRAWING	WT LBS	ARM INS
001-R	✓	Engine, Lycoming O-320-E2D (includes all electric starter & vacuum pump pad)	O-320-E2D	266.0	39.0
002-R	✓	Propeller, Fixed Pitch (McCaughey 1C172/TM7653)	C161001-0301	32.5	21.0
003-R	✓	Spinner, Propeller (for 1C172/TM7653)	1750040	3.5	21.0
004-R	✓	Alternator, 60-Amp (14-Volt)	C611501-0101	11.5	30.0
005-R	✓	Regulator, Alternator (14-Volt)	C611001-0101	1.0	58.5
006-R	✓	Battery, 12-Volt, 25-Amp Hr.	0511319	23.0	184.5
006-O		Battery, 12-Volt, 35-Amp Hr.	0712605	28.0	184.5
007-R	✓	Filter, Carburetor Air (Air-Maze)	C294510-0601	1.5	26.5
008-R	✓	Heating System, Cabin & Carburetor Air (includes exhaust system)		17.5	36.0
009-R	✓	Pump, Fuel, Electric (Sundix)	1216012	2.0	53.0
010-R	✓	Oil Cooler	1750000	2.5	52.0

APPROVED
Cessna Aircraft Co. Commercial Div.
Wichita, Kansas 67209-0001

ISSUED: 7-12-67

REVISED:

APPROVED: 7-12-67

SHT 1 OF 4



CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT'D)

MODEL 177

WICHITA, KANSAS

ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS
011-R ✓	Wheel, Brake, & Tire Assy (two) 6.00 x 6 4-ply rating (main)	1241156	30.0	123.5
012-R ✓	Wheel & Tire Assy (one) 5.00 x 5 4-ply rating (nose)	1241156	8.0	47.0
012-0	Wheel & Tire Assy (one) 6.00 x 6 4-ply rating (nose)-Requires Item 128-A	1241156	12.0	47.0
013-R	Altimeter	S-1314N1	0.5	72.5
013-0 ✓	Altimeter, Sensitive	C661011-0105	1.0	72.0
013-0-1	Altimeter, Sensitive (Feet and Millibars)	C661011-0106	1.0	72.0
014-R ✓	Ammeter	S-1320-1	0.5	74.5
015-R ✓	Compass	C660501-0101	0.5	82.0
016-R ✓	Gage - Engine Cluster	C669504-0101	0.5	74.0
017-R ✓	Gage - Engine Cluster	C669505-0101	0.5	74.0
018-R ✓	Gage - Fuel Pressure	C662009-0101	0.5	74.0
019-R ✓	Indicator, Airspeed	C661010-1001	0.5	73.0
019-0	Indicator, True Airspeed	C661010-0103	0.5	73.0
020-R ✓	Indicator, Stall Warning Audible	1706014	0.5	115.5
021-R ✓	Light, Flashing Beacon	1731000	1.0	298.0
022-R ✓	Tachometer, Recording	S-1305-6	1.0	73.5
023-R	Seat, Pilot (vinyl back)	1715004	14.0	97.0
023-0	Seat, Vertically Adjusting, Pilot (vinyl back)	1715002	17.5	97.0
023-0-1 ✓	Seat, Pilot (ABS back)	1715004	16.5	97.0
023-0-2	Seat, Vertically Adjusting, Pilot (ABS back)	1715002	20.0	97.0
024-S	Seat, Copilot (vinyl back)	1715004	14.0	97.0
024-0	Seat, Vertically Adjusting, Copilot (vinyl back)	1715002	17.5	97.0
024-0-1 ✓	Seat, Copilot (ABS back)	1715004	16.5	97.0
024-0-2	Seat, Vertically Adjusting, Copilot (ABS back)	1715002	20.0	97.0
025-S	Seat, Rear (vinyl back)	1715003	24.5	138.0
025-0 ✓	Seat, Rear (ABS back)	1715003	28.0	138.0
026-R ✓	Belt, Safety, Pilot	S-1746-17	1.0	93.0
027-S ✓	Belt, Safety, Copilot	S-1746-17	1.0	93.0
028-S ✓	Belt, Safety, Rear Seat (two)	S-1746-16	2.0	134.0
029-S ✓	Baggage Net	0500236	0.5	162.0
030-S	Fairings, Speed (gear-spring)	1741020	1.5	127.0
030-0 ✓	Fairings, Speed (gear-spring)	1741004	2.0	126.0
031-S	Paint Scheme, Std. Stripe	1704000	3.0	173.0
031-0 ✓	Paint Scheme, Overall	1704001	19.5	166.5
032-R	Placard - Operational (VFR)	S-1784-2	Negl.	--
032-0 ✓	Placard - Operational (IFR) Requires gyro plus nav/com radio	S-1784-1	Negl.	--
100-A ✓	Clock, Electric	1713222	0.5	96.0
101-A	Cables Stainless Steel Control (net change)	1700123	Negl.	--
102-A ✓	Controls, Dual (wheel, pedals & toe brakes)	1760007	7.0	69.0

ISSUED: 7-12-67

REVISED:

SHT 2 OF 4



CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT'D)

MODEL 177

WICHITA, KANSAS

AIRCRAFT SERIAL NO. 17700512		FAA REGISTRATION NO. N3212T		DATE 12-6-67	
ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS	
103-A	Corrosion Proofing, Internal	1700123	6.0	140.0	
104-A	Detectors, Nav. Light	1723002	Negl.	--	
105-A	✓ Pairing, Speed (nose wheel) (net change)	0743625	4.0	19.0	
106-A	✓ Pairing, Speed (main wheel) (net change)	0741046	14.5	123.5	
107-A	Filter, Oil (full flow)	1756004	4.5	54.0	
108-A	Fire Extinguisher, Hand Type	1701008	6.0	125.5	
109-A	Gage, Carburetor Air Temp.	1713216	1.0	68.5	
110-A	✓ Gage, Outside Air Temp.	1713117	Negl.	--	
111-A	Ground Service Plug Receptacle	1770004	2.5	66.0	
112-A	✓ Gyros, New Horizon and Directional - Requires Item 138-A	1713217	6.5	69.5	
113-A	Gyros, New Horizon and New A.R.C. Directional - Requires Item 138-A	1713253	6.5	69.5	
114-A	Gyros, New A.R.C. Horizon and Directional - Requires Item 138-A	1713254	7.0	70.0	
115-A	Harness, Shoulder, Front (set of 2)	1711040	0.5	93.0	
116-A	Harness, Shoulder, Rear (set of 2)	1711040	0.5	134.0	
117-A	Head Rests, Front (set of 2)	1714040	2.0	107.0	
118-A	Head Rests, Rear (set of 2)	1714040	2.0	148.0	
119-A	✓ Heating System, Pitot (net change)	1720099	1.0	113.5	
120-A	Hourmeter	1701007	1.0	53.5	
121-A	✓ Indicator, Rate of Climb	1706000	1.0	72.5	
122-A	Indicator, Turn and Bank	1713220	2.0	71.5	
123-A	✓ Indicator, Turn Coordinator	1713223	2.5	71.5	
124-A	✓ Light, Landing (dual beam)	1722056	2.0	103.5	
125-A	Light, Map	1770008	0.5	83.0	
126-A	Lights, Courtesy (set of 3)	1770005	1.0	109.0	
127-A	Mirror, Rear View	1713224	0.5	72.5	
128-A	Nose Wheel Fork & Barrel (net change) Required with Item 012-0	1743000	1.0	53.5	
129-A	Priming System (3-cylinder) (net change)	1756003	0.5	42.0	
130-A	Rings, Cargo Tie-Down	1712017	1.0	147.5	
131-A	Rings, Airplane Hoisting	1700122	2.0	120.5	
132-A	Seat, Childs (includes seat belt)	1714030	9.5	169.0	
133-A	Seats, Vinyl Cushion (net change)	1715000	Negl.	--	
134-A	Static Source, Alternate	1713076	0.5	69.5	
135-A	Stretcher Installation (Custom-Air)	1710007	Use Actual Installed Weight & Arm Change		
136-A	✓ Sun Visors (2)	1701001	1.0	93.0	
137-A	✓ Upholstery, Cardinal Interior (net change)	1715000	5.5	136.5	
138-A	✓ Vacuum System, Engine Driven	1713217	6.5	56.5	
139-A	Valves, Fuel, Quick Drain (net change)		Negl.	--	
140-A	✓ Ventilation System, Rear Seat	1706032	2.0	123.5	
141-A	✓ Windows, Tinted (net change)	1701010	Negl.	--	
142-A	Winterization Kit, Engine	1752100	0.5	25.0	
143-A	Wing Leveler, Brittain (includes Turn Coordinator) - Requires Item 138-A	1700124	13.0	126.0	
144-A	✓ Tow Bar (Stowed)	0706315	2.0	162.0	

ISSUED: 2-13-67

REVISED:

SHT 3 OF 4

FORM NO. 80-172



CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT'D)

MODEL 172

WICHITA, KANSAS

ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS
500-A	Cessna Nav-O-Matic 300 (includes new A.R.C. gyros, Turn Coordinator and Vacuum System)	1701009	24.5	80.0
501-A	Cessna Nav-O-Matic 300 (includes new A.R.C. directional gyro, new horizon gyro, Turn Coordinator and Vacuum System)	1701009	24.5	80.0
502-A	Cessna Nav-O-Matic 400 (includes new A.R.C. gyros and vacuum system)	1701009	34.0	122.5
503-A	Electronic Installation-Partial-Option A	1770000	5.0	140.0
504-A	Electronic Installation-Partial-Option B	1770000	1.0	111.0
505-A	Electronic Installation-Partial-Option C	1770000	1.5	82.0
506-A	Electronic Installation-Partial-Option D	1200014	0.5	127.5
507-A	✓ Antenna and Cable - Communication (VHF)	1770000	1.0	111.0
508-A	Antenna and Cable - Dual Communication (VHF)		1.5	111.0
509-A	✓ Antenna and Cable - Navigation (VHF)		1.5	231.5
510-A	✓ Headset and Microphone		1.0	71.0
511-A	✓ Cabin Speaker		1.5	111.0
512-A	Radio Selector Switches		0.5	73.0
513-A	Audio Amplifier		1.5	64.0
514-A	✓ Radio Cooling System		0.5	66.5
515-A	Cessna ADF 300 (521B) (includes loop and antenna)		9.0	79.5
516-A	Cessna Transceiver 300 (524A)		8.0	69.0
517-A	Cessna Nav-Com 300R (517R)		11.0	69.0
518-A	✓ Cessna Nav-Com 300 (540A) with IN-514R		11.5	69.0
519-A	Cessna Nav-Com 300 (540A) with IN-525A		12.0	69.0
520-A	Cessna Marker Beacon 300 (502B) (includes antenna and cable)		1.0	90.5
521-A	Cessna DME 300 (KN-60) (includes antenna and cable)		9.5	74.0
522-A	Cessna Glideslope (543A) (includes antenna and cable)		5.5	155.5
523-A	King KY-95		9.0	119.0
524-A	King KX-150B		9.5	68.0
525-A	King KX-160 with KI-201		14.0	104.5
526-A	King KX-160 with KI-211		15.0	103.0
527-A	Narco Mark 12A with VOA-4		16.0	102.5
528-A	Narco Mark 12A with VOA-5		16.0	102.5
529-A	Narco UGR-2 Glideslope Receiver (includes antenna and cable)		6.0	152.0
530-A	Pantronics DX-10DA H.F. Transceiver	1770000		
531-A	Pantronics DX-10DA H.F. Transceiver (includes reel-out antenna)			

ISSUED: 7-12-67

REVISED:

SHT 4 OF 4

D. C. D. AERO SERVICE Co.
CESSNA BUILDING
FREDRICK MUNICIPAL AIRPORT
FREDRICK, Mo 21701

Date- 9/26/81

Aircraft weight and balance data list

Registration number - N3212T
Aircraft serial number - 17700512

	Weight	Arm	Moment
Old A/C empty weight-	1446.5	106.40	153911

All previous aircraft weight and balance data lost as of this date, Copy of original data obtained from factory. Aircraft weighed with empty fuel and full oil with the following items installed since factory-

Narco ADF-29 System
Dorne & Margolin ELT with battery kit

Aircraft Gross Weight (normal)	-	2350.0
(utility)	-	2200.0

New aircraft empty weight	-	1453.3
---------------------------	---	--------

New aircraft empty weight C.G.	-	106.70
--------------------------------	---	--------

New aircraft usefull load (normal)	-	896.70
(utility)	-	746.70

David C. Dodds
ATP 547027377

CESSNA AIRCRAFT COMPANY

WICHITA, KANSAS

MODEL 177

Weight & Balance Data

Aircraft Serial No. 17700512

F. A. A. Registration No. N3212T

Date: 12-6-67

ITEM	Weight (Lbs.)	x	C.G. Arm (Inches)	=	Moment (Lb. ins.)
Standard Airplane (Empty, Dry & Unpainted)	1340.0		106.3		142442
Optional Equipment	81.0		94.1		7622
Special Installations (DOM Approved)	----		----		----
Paint EXCESSIVE Over-All	19.5		166.5		3247
Usable Fuel (1.0 Gal.)	8.0		100.0		800
Licensed Empty Weight - Total of Items Above	1446.5		106.4		153911

GROSS WEIGHT - (LICENSED EMPTY WT.) + USEFUL LOAD
(2350 LBS) - (1446.5 LBS) = 903.5 LBS

SAMPLE LOADING PROBLEM

	Weight (Lbs.)	C.G. Arm (Inches)	Moment (Lb.-ins./1000)
Licensed Empty Wt.	1446.5		153.9
Oil (8 Qts.)	15	44.0	0.7
Pilot & Front Passenger	340	83.0	28.2
Fuel	88.5	112.0	9.9
Rear Seat Passengers	340	134.0	45.6
Baggage	120.0	162.0	19.4

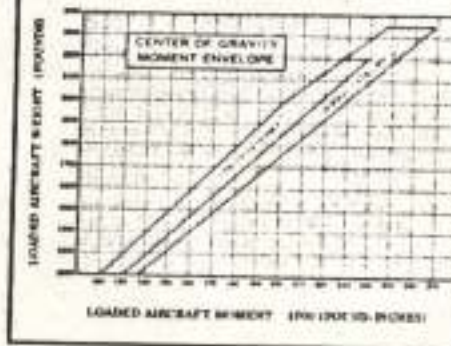
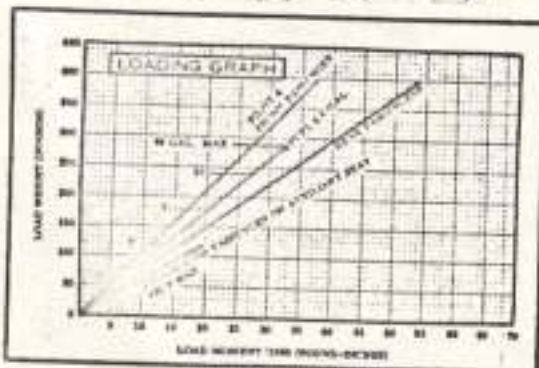
Total Loaded Airplane = 2350 261.1

Locate this point (2350; 261.1) on the C.G. Moment Envelope. Since the point falls within the envelope, the loading meets all balance requirements.

IT IS THE RESPONSIBILITY OF THE PILOT AND AIRPLANE OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY. THE EMPTY WEIGHT, C.G., & USEFUL LOAD ARE FOR THE AIRPLANE AS DELIVERED FROM THE FACTORY. REFER TO FORM FAA-337 WHEN ALTERATIONS HAVE BEEN MADE.

C.G. MOMENT ENVELOPE INSTRUCTIONS

- To the licensed empty weight add weight of all items to be carried.
- To licensed empty weight moment add moment of all items to be carried.
- Locate point determined by I & II and if it falls within the C.G. moment envelope the loading is satisfactory.



Form issue date: 26 July 1957

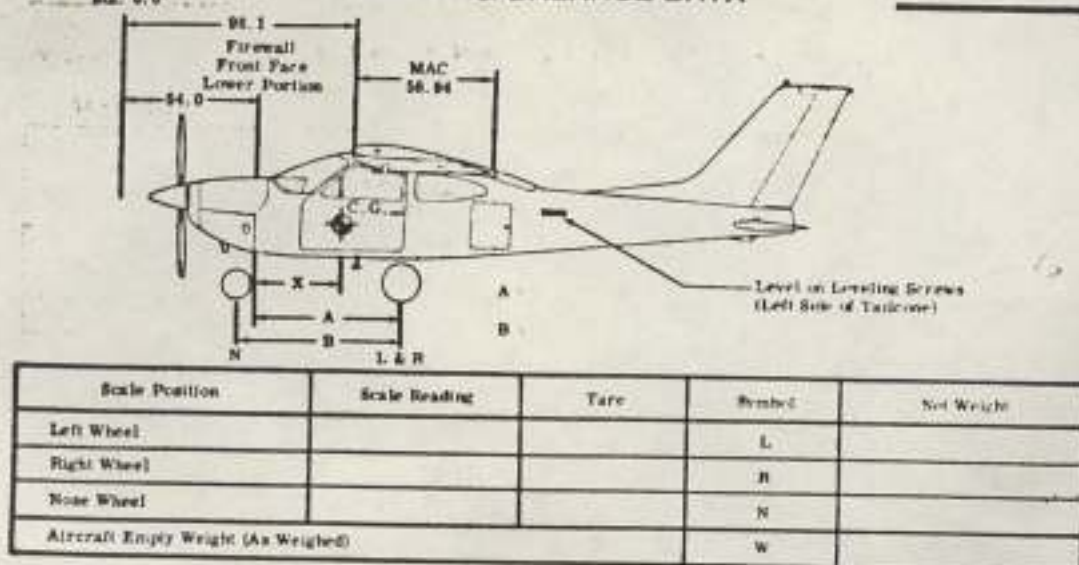
THIS IS A COPY OF THE WEIGHT & BALANCE AND INSTALLED EQUIPMENT DATA FURNISHED AT TIME OF ORIGINAL AIRWORTHINESS CERTIFICATION. IT DOES NOT REFLECT EQUIPMENT CHANGES WHICH MAY HAVE BEEN MADE SUBSEQUENT TO ISSUANCE OF AN AIRWORTHINESS CERTIFICATE.

C. Vanderbeke 8-25-81
CESSNA AIRCRAFT COMPANY DATE

Datum
Sta. 0.0

WEIGHT & BALANCE DATA

MODEL 177

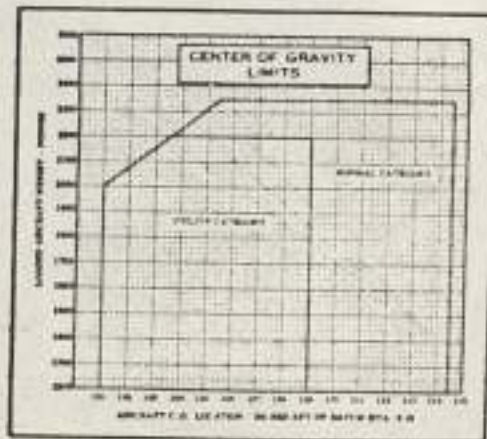


$$X = \frac{(A) - (N) \times (B)}{W} ; X = (\quad) - (\quad) \times (\quad) = (\quad) \text{ IN.}$$

$$\text{C.G. ARM} = 54.0 + X = \quad \text{IN.}$$

WEIGHING PROCEDURE

- Preparation:
 - Inflate tires to recommended operating pressures.
 - Remove all wing tank and accumulator tank drain plugs to remove all fuel.
 - Remove oil pump drain plug to drain all oil.
 - Move all sliding seats to the most forward position. All seat backs should be in the most nearly vertical position.
 - Put flaps in the fully retracted position.
 - Place all control surfaces in neutral position.
- Leveling:
 - Place scales under each wheel (500# max., 1000# each min., minimum capacity for scales).
 - Deflate nose tire to center bubble on level (see diagram).
- Weighing:
 - With the airplane level and brakes released, record the weight shown on each scale. Deduct the tare, if any, from each reading.
- Measuring:
 - Obtain measurement "A" by measuring horizontally (along the airplane center line) from a line stretched between the main wheel centers to a plumb bob dropped from the firewall.
 - Obtain measurement "B" by measuring horizontally and parallel to the airplane center line, from center of nose-wheel axle, left side, to a plumb bob dropped from the line between the main wheel centers. Repeat on right side and average the measurements.
- Completing the Form:
 - Using weights from (3) and measurements from (4) the airplane weight and C.G. can be determined.
- Obtain licensed empty weight by adding weight and moment of unusable fuel (see other side) to airplane empty weight and moment.



Form issue date: 25 July 1967



CESSNA AIRCRAFT CO

EQUIPMENT LIST
MODEL 177

WICHITA, KANSAS

AIRCRAFT SERIAL NO. 17700512 FAA REGISTRATION NO. N3212T

DATE 12-6-67

NOTES

1. Suffix letters to item numbers:
- R = required items of equipment for FAA certification
 - S = standard equipment items
 - O = optional equipment items replacing required or standard items
 - A = optional equipment items which are in addition to required or standard items
2. Status of equipment:
- ✓ = installed in the aircraft at the factory
 - L = loose item of equipment which is stowed in the aircraft when it left the factory but which is not included in the Optional Equipment Weight and Moment. (Installed ARM is listed.)
3. Unless otherwise indicated, true values (not net change values) for weight and arm are shown. Positive arms are distances aft of datum; negative arms are distances forward of datum (see weight and balance data sheet for datum location).
4. A separate FAA approval must be obtained if the following items are not installed per applicable Cessna drawings or accessory kit instructions.

ITEM NO		DESCRIPTION	REF DRAWING	WT LBS	ARM INS
001-R	✓	Engine, Lycoming O-320-E2D (includes all electric starter & vacuum pump pad)	O-320-E2D	266.0	39.0
002-R	✓	Propeller, Fixed Pitch (McCaughey IC172/TM7653)	C161001-0301	32.5	21.0
003-R	✓	Spinner, Propeller (for IC172/TM7653)	1750040	3.5	21.0
004-R	✓	Alternator, 60-Amp (14-Volt)	C611501-0101	11.5	30.0
005-R	✓	Regulator, Alternator (14-Volt)	C611001-0101	1.0	58.5
006-R	✓	Battery, 12-Volt, 25-Amp Hr.	0511319	23.0	184.5
007-R	✓	Battery, 12-Volt, 33-Amp Hr.	0712605	28.0	184.5
008-R	✓	Filter, Carburetor Air (Air-Maze)	C294510-0601	1.5	26.5
009-R	✓	Heating System, Cabin & Carburetor Air (includes exhaust system)		17.5	36.0
010-R	✓	Pump, Fuel, Electric (Bendix)	1216012	2.0	53.0
		Oil Cooler	1750000	2.5	52.0

APPROVED
Boris Strout Jr. Commercial Pilot
Boris Strout Jr. - Wichita, Kansas, Mo.

ISSUED: 7-12-67

REVISED:

APPROVED: *Bill* 7-12-67

PCRM HCL 90-187

SHT 1 OF 4



CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT'D)

MODEL 177

WICHITA, KANSAS

ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS
011-R ✓	Wheel, Brake, & Tire Assy (two) 6.00 x 6 4-ply rating (main)	1241156	30.0	123.5
012-R ✓	Wheel & Tire Assy (one) 5.00 x 5 4-ply rating (nose)	1241156	8.0	47.0
012-0	Wheel & Tire Assy (one) 6.00 x 6 4-ply rating (nose)-Requires Item 128-A	1241156	12.0	47.0
013-R	Altimeter	S-1314N1	0.5	72.5
013-0 ✓	Altimeter, Sensitive	C661011-0105	1.0	72.0
013-0-1	Altimeter, Sensitive (Feet and Millibars)	C661011-0106	1.0	72.0
014-R ✓	Ammeter	S-1320-1	0.5	74.5
015-R ✓	Compass	C660501-0101	0.5	82.0
016-R ✓	Gage - Engine Cluster	C669504-0101	0.5	74.0
017-R ✓	Gage - Engine Cluster	C669505-0101	0.5	74.0
018-R ✓	Gage - Fuel Pressure	C662009-0101	0.5	74.0
019-R ✓	Indicator, Airspeed	C661010-1001	0.5	73.0
019-0 ✓	Indicator, True Airspeed	C661010-0103	0.5	73.0
020-R ✓	Indicator, Stall Warning Audible	1706014	0.5	115.5
021-R ✓	Light, Flashing Beacon	1731000	1.0	298.0
022-R ✓	Tachometer, Recording	S-1305-6	1.0	73.5
023-R ✓	Seat, Pilot (vinyl back)	1715004	14.0	97.0
023-0	Seat, Vertically Adjusting, Pilot (vinyl back)	1715002	17.5	97.0
023-0-1 ✓	Seat, Pilot (ABS back)	1715004	16.5	97.0
023-0-2	Seat, Vertically Adjusting, Pilot (ABS back)	1715002	20.0	97.0
024-S	Seat, Copilot (vinyl back)	1715004	14.0	97.0
024-0	Seat, Vertically Adjusting, Copilot (vinyl back)	1715002	17.5	97.0
024-0-1 ✓	Seat, Copilot (ABS back)	1715004	16.5	97.0
024-0-2	Seat, Vertically Adjusting, Copilot (ABS back)	1715002	20.0	97.0
025-S	Seat, Rear (vinyl back)	1715003	24.5	138.0
025-0 ✓	Seat, Rear (ABS back)	1715003	28.0	138.0
026-R ✓	Belt, Safety, Pilot	S-1746-17	1.0	93.0
027-S ✓	Belt, Safety, Copilot	S-1746-17	1.0	93.0
028-S ✓	Belt, Safety, Rear Seat (two)	S-1746-16	2.0	134.0
029-S ✓	Barrage Net	0500236	0.5	162.0
030-S ✓	Fairings, Speed (gear-spring)	1741020	1.5	127.0
030-0 ✓	Fairings, Speed (gear-spring)	1741004	2.0	126.0
031-S ✓	Paint Scheme, Std. Stripe	1704000	3.0	173.0
031-0 ✓	Paint Scheme, Overall	1704001	19.5	166.5
032-R ✓	Placard - Operational (VFR)	S-1784-2	Negl.	--
032-0 ✓	Placard - Operational (IFR) Requires gyros plus nav/com radio	S-1784-1	Negl.	--
100-A ✓	Clock, Electric	1713222	0.5	96.0
101-A	Cables Stainless Steel Control (not change)	1700123	Negl.	--
102-A ✓	Controls, Dual (wheel, pedals & toe brakes)	1760007	7.0	69.0

ISSUED: 7-12-67

REVISED:

SHT 2 OF 4

FORM NO. 80-190



CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT'D)

MODEL 177

WICHITA, KANSAS

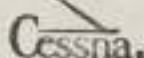
AIRCRAFT SERIAL NO. 17700512		FAA REGISTRATION NO. N3212T		DATE 12-6-67	
ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS	
103-A	Corrosion Proofing, Internal	1700123	6.0	140.0	
104-A	Detectors, Nav. Light	1723002	Negl.	--	
105-A	Fairing, Speed (nose wheel) (net change)	0743625	4.0	49.0	
106-A	Fairings, Speed (main wheel) (net change)	0741046	14.5	123.5	
107-A	Filter, Oil (full flow)	1756004	4.5	54.0	
108-A	Fire Extinguisher, Hand Type	1701008	6.0	125.5	
109-A	Gage, Carburetor Air Temp.	1713216	1.0	68.5	
110-A	Gage, Outside Air Temp.	1713117	Negl.	--	
111-A	Ground Service Plug Receptacle	1770004	2.5	66.0	
112-A	Gyros, New Horizon and Directional - Requires Item 138-A	1713217	6.5	69.5	
113-A	Gyros, New Horizon and New A.R.C. Directional - Requires Item 138-A	1713253	6.5	69.5	
114-A	Gyros, New A.R.C. Horizon and Directional - Requires Item 138-A	1713254	7.0	70.0	
115-A	Harness, Shoulder, Front (set of 2)	1711040	0.5	93.0	
116-A	Harness, Shoulder, Rear (set of 2)	1711040	0.5	134.0	
117-A	Head Rests, Front (set of 2)	1714040	2.0	107.0	
118-A	Head Rests, Rear (set of 2)	1714040	2.0	148.0	
119-A	Heating System, Pitot (net change)	1720099	1.0	113.5	
120-A	Hourmeter	1701007	1.0	53.5	
121-A	Indicator, Rate of Climb	1706000	1.0	72.5	
122-A	Indicator, Turn and Bank	1713220	2.0	71.5	
123-A	Indicator, Turn Coordinator	1713223	2.5	71.5	
124-A	Light, Landing (dual beam)	1722050	2.0	103.5	
125-A	Light, Map	1770008	0.5	83.0	
126-A	Lights, Courtesy (set of 3)	1770005	1.0	109.0	
127-A	Mirror, Rear View	1713224	0.5	72.5	
128-A	Nose Wheel Fork & Barrel (net change) Required with Item 012-0	1743000	1.0	53.5	
129-A	Priming System (3-cylinder) (net change)	1756003	0.5	42.0	
130-A	Rings, Cargo Tie-Down	1712017	1.0	147.5	
131-A	Rings, Airplane Hoisting	1700122	2.0	120.5	
132-A	Seat, Childs (includes seat belt)	1714030	9.5	169.0	
133-A	Seats, Vinyl Cushion (net change)	1715000	Negl.	--	
134-A	Static Source, Alternate	1713076	0.5	69.5	
135-A	Stretcher Installation (Custom-Air)	1710007	Use Actual Installed Weight & Arm Change		
136-A	Sun Visors (2)	1701001	1.0	93.0	
137-A	Upholstery, Cardinal Interior (net change)	1715000	5.5	136.5	
138-A	Vacuum System, Engine Driven	1713217	6.5	56.5	
139-A	Valves, Fuel, Quick Drain (net change)		Negl.	--	
140-A	Ventilation System, Rear Seat	1706032	2.0	123.5	
141-A	Windows, Tinted (net change)	1701010	Negl.	--	
142-A	Winterization Kit, Engine	1752100	0.5	25.0	
143-A	Wing Leveler, Brittain (includes Turn Coordinator) - Requires Item 138-A	1700124	13.0	126.0	
144-A	Tow Bar (Stowed)	0700315	2.0	162.0	

ISSUED: 7-12-67

REVISED:

SHT 3 OF 4

FORM NO. 80-113



CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT'D)

MODEL 177

WICHITA, KANSAS

ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS
500-A	Cessna Nav-O-Matic 300 (includes new A.R.C. gyros, Turn Coordinator and Vacuum System)	1701009	24.5	80.0
501-A	Cessna Nav-O-Matic 300 (includes new A.R.C. directional gyro, new horizon gyro, Turn Coordinator and Vacuum System)	1701009	24.5	80.0
502-A	Cessna Nav-O-Matic 400 (includes new A.R.C. gyros and vacuum system)	1701009	34.0	122.5
503-A	Electronic Installation-Partial-Option A	1770000	5.0	140.0
504-A	Electronic Installation-Partial-Option B	1770000	1.0	111.0
505-A	Electronic Installation-Partial-Option C	1770000	1.5	82.0
506-A	Electronic Installation-Partial-Option D	1200014	0.5	127.5
507-A	Antenna and Cable - Communication (VHF)	1770000	1.0	111.0
508-A	Antenna and Cable - Dual Communication (VHF)		1.5	111.0
509-A	Antenna and Cable - Navigation (VHF)		1.5	231.5
510-A	Headset and Microphone		1.0	71.0
511-A	Cabin Speaker		1.5	111.0
512-A	Radio Selector Switches		0.5	73.0
513-A	Audio Amplifier		1.5	64.0
514-A	Radio Cooling System		0.5	66.5
515-A	Cessna ADF 300 (521B) (includes loop and antenna)		9.0	79.5
516-A	Cessna Transceiver 300 (524A)		8.0	69.0
517-A	Cessna Nav-Com 300R (517R)		11.0	69.0
518-A	Cessna Nav-Com 300 (540A) with IN-514R		11.5	69.0
519-A	Cessna Nav-Com 300 (540A) with IN-525A		12.0	69.0
520-A	Cessna Marker Beacon 300 (502B) (includes antenna and cable)		3.0	90.5
521-A	Cessna DME 300 (KH-60) (includes antenna and cable)		9.5	74.0
522-A	Cessna Glideslope (543A) (includes antenna and cable)		5.5	155.5
523-A	King KY-95		9.0	119.0
524-A	King KX-150B		9.5	68.0
525-A	King KX-160 with KI-201		14.0	104.5
526-A	King KX-160 with KI-211		15.0	103.0
527-A	Narco Mark 12A with VOA-4		16.0	102.5
528-A	Narco Mark 12A with VOA-5		16.0	102.5
529-A	Narco UGR-2 Glideslope Receiver (includes antenna and cable)		6.0	152.0
530-A	Pantronics DX-10DA H.F. Transceiver	1770000		
531-A	Pantronics DX-10DA H.F. Transceiver (includes reel-out antenna)			

ISSUED: 7-12-67

REVISED:

SHT 4 OF 4

FORM NO. 80-180

NAV/COMMS

2EA RT 328T - P/N 43340-1124 S/N's 10731 + 10852

1EA ADF R-546E - P/N 41240-0101 S/N 11630

1EA Audio panel with marker beacon NO #s

1EA X-pander RT-359A - P/N 41420-1114 S/N 7495
Damaged face + knobs

1EA ~~R~~ Glideslope RECEIVER R-443B S/N 4595

1EA Course Indicator NAV head IN-525B w/ cables
1EA " " " " IN-514B

No ADF Indicator

No Altimeter

GW - 2350.

Empty W - 1446.5

Useful 903.5

Empty W

C.G.

Moment

1446.5

153.9

ADF

5.25

18.0

loop

2.50

144.0

Antenna

1.00

63.0

ELT

E.W.

stol"

Moment

1446.5

106.4

153.911

ADF Panel

5.25

65.1"

341.25

Sensor loop

2.50

190.0

475.0

Sensor cable

1.50

127.5 (dis.)

191.25

Sensor Antenna

1.0

198.375 (dis.)

198.375

ELT

3.25

184.50

599.625

Battery diff.

5.0

184.50

922.5

C.G.

mom.

New EW

1465.0

106.68

156297.74

New useful

885.0

"

CG

106.68

Weight After Radio Removal

	1432.55	106.9	153245.11
Added - 1 2 ea RT 328T ⁺ ind.	16.6	69.0	1145.4
✓ 1 EA Audio	1.5	"	103.5
✓ 1 EA R-546E ⁺ ind.	4.2	"	239.8
✓ 1 EA RT 359A	3.5	"	241.5
✓ 2 EA power filter	2.0	59.0	118.0
✓ 1 EA M/B RECEIVER	.7	59.0	41.3
P/N R443B 1 EA G/S RECEIVER	2.0	184.5	369.0
1 EA Comm ANT	1.5	127.14	190.71
✓ 1 EA M/B ANT	.5	99.75	49.875
P/N L-346A 1 EA ADF loop	1.6	112.0	179.2
1 EA ADF loop cable	1.0	90.5	90.5
	35.1		2818.785

	1432.55	106.9	153245.11
+	35.1		2818.785
⊗	1467.65	106.3	156063.89

Useful 882.35
732.35

Radios comp 8/20/83 Tach 1259.0
 Annual 1/8/84 Tach 1273.6

RT540A 143
 REMOVE - NAV-Comm 300 11.5 at 69.0 793.
 - Narco ADF-29 5.25 - 69.0 862.2
 - ADF loop 2.50 190.0 475.
 cable 1.50 127.5 191.2

1453.3

155067.

- 20.75

1432.55

106.9

1822.

153245.

ADDED 2- Nav Comm's + indicators 16.6 at 69.0
 1- Audio panel 1.5 69.0
 1- ADF + indicator 4.2 69.0
 1- X powder 3.5 69.0
 1- ~~Comm~~ Comm ant 1.5 127.14
 1- M/D RECEIVER .7 59.0
 2- Nav-Comm filters 2.0 59.0
 1- G/S RECEIVER 2.0 184.5
 1- ADF loop 1.6 112.0
 1- ADF loop cable 1.0 90.5
 1- M/B ANT .5 99.75

original

REMOVE ARC RT-540A NAV/Comm and NARCO ADF-29 systems, retaining existing NAV/Comm ANTENNAS AND ADF SENSE ANTENNA.

Installed the following:

TWO ARC RT-328T NAV/Comm with indicators IN-525B and IN-514B at sta. 69.0 and ONE Comm ANTENNA at 127.14.

ONE ARC R-546E ADF with indicator at sta. 69.0 and SENSOR loop L-346A at sta. 112.0 and loop cable distributed weight at sta. 90.5

ONE ARC RT-359A Transponder at sta. 69.0

ONE ARC Audio panel at ^{sta.} 69.0

ONE ARC 1 MARKER BEACON RECEIVER at sta. 59.0 with ANTENNA at sta. 99.75.

ONE ARC R-443B Glideslope Receiver at sta. 184.5

{ Except of previous 337 }

NEW A/C Empty Weight - 1467.6

E.W.C.G - 106.3

CESSNA 177

17700512

USA

N3212T

Dodds James A
Dodds David C

17831 mill creek Dr
Derwood Md 20855

Aug.
8/20/83

distributed

CESSNA AIRCRAFT COMPANY

WICHITA, KANSAS

MODEL 177

Weight & Balance Data

Aircraft Serial No. 17700012

F. A. C. Registration No. N3212T

Date: 12-6-67

ITEM	Weight (lbs.)	X	C.G. Arm (inches)	Moment (lb. in.)
Increased Airplane Weight, Dry & Unloaded	1340.0		106.3	142442
Optional Equipment	81.0		94.1	7622
Special Installation (ACFT Approved)	----		----	----
Pilot & Front Passenger	19.5		166.5	3247
Usable Fuel (2.0 Gal.)	6.0		100.0	600
Loaded Empty Weight - Total of Items Above	1446.5		106.4	153911

ADDED WEIGHTS - LICENSED EMPTY WT. - USEFUL LOAD

(2200 LBS. - 1) 1446.5 (1800 - 903.5) 130

SAMPLE LOADING PROBLEM

	Weight (lbs.)	C.G. Arm (inches)	Moment (lb. in. 1000)
Licensed Empty Wt.	1446.5		153.9
Oil (6 Qts.)	15	44.0	0.7
Pilot & Front Passenger	160	91.0	14.6
Fuel	88.5	112.3	9.9
Rear Seat Passengers	140	134.0	18.8
Baggage	120.0	162.0	19.4

Total Loaded Airplane - 2200 261.1

Locate this point (2200, 261.1) on the C.G.

Moment Envelope. Since the point falls within the envelope, the loading meets all balance requirements.

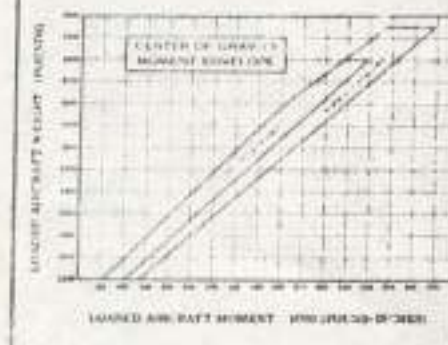
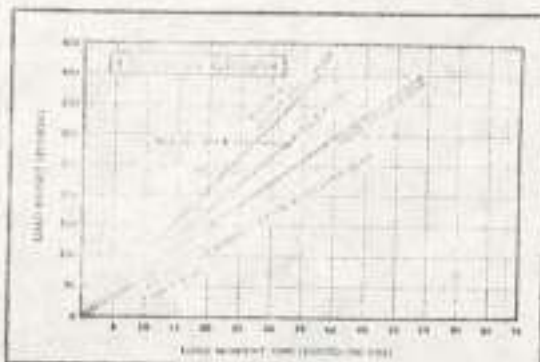
IT IS THE RESPONSIBILITY OF THE PILOT AND AIRPLANE OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY. THE EMPTY WEIGHT, C.G. & USEFUL LOAD ARE FOR THE AIRPLANE AS DELIVERED FROM THE FACTORY. REFER TO FORM FAA-337 WHEN ALTERATIONS HAVE BEEN MADE.

C.G. MOMENT ENVELOPE INSTRUCTIONS

To the licensed empty weight add weight of all items to be carried.

II To licensed empty weight moment add moment of all items to be carried.

III Locate point determined by I & II and if it falls within the C.G. moment envelope the loading is satisfactory.



Form issue date: 26 July 1967

THIS IS A COPY OF THE WEIGHT & BALANCE AND
INSTALLED EQUIPMENT DATA FURNISHED AT TIME OF
ORIGINAL AIRWORTHINESS CERTIFICATION. IT DOES
NOT REFLECT EQUIPMENT CHANGES WHICH MAY
HAVE BEEN MADE SUBSEQUENT TO ISSUANCE OF AN
AIRWORTHINESS CERTIFICATE.

E. Vanderbeke 8-25-81
CESSNA AIRCRAFT COMPANY DATE

D. C. D. AERO SERVICE Co.
CESSNA BUILDING
FREDRICK MUNICIPAL AIRPORT
FREDRICK, Mo 21701

Date- 9/26/81

Aircraft weight and balance data list

Registration number - N3212T
Aircraft serial number - 17700512

	Weight	Arm	Moment
Old A/C empty weight-	1446.5	106.30	153911

All previous aircraft weight and balance data lost as of this date, Copy of original data obtained from factory. Aircraft weighed with empty fuel and full oil with the following items installed since factory-

Narco ADF-29 System
Dorne & Margolin ELT with battery kit

*SUPERSEDED
8/20/83
David C. Dodds
ATP 547027377*

Aircraft Gross Weight (normal)	-	2350.0
(utility)	-	2200.0
New aircraft empty weight	-	1453.3
New aircraft empty weight C.G.	-	106.70
New aircraft usefull load (normal)	-	896.70
(utility)	-	746.70

*David C. Dodds
ATP 547027377*

WEIGHT & BALANCE RECORD

N 3212T Model 177 S/N 17700512 G/W 2350.0
 (utility) 2200.0

DATE	ITEMS ADDED OR REMOVED	WEIGHT	ARM	MOMENT
8/20/83	Remove the following--			
	One- ARC RT-540A Nav/Comm	-11.50	69.0	793.50
	One- Narco ADF-29 Reciever	- 5.25	69.0	362.25
	One- ADF sense loop antenna	- 2.50	190.0	475.00
	One- ADF sense loop antenna cable	- 1.50	127.5	191.25
	Installed the following--			
	Two- ARC RT-328T Nav/Comm's with indicators IN-525B & IN 514B	+16.6	69.0	1145.40
	One- ARC R-546E ADF and indicator	+ 4.2	69.0	289.80
	One- ARC RT-359A Transponder	+ 3.5	69.0	241.50
	One- ARC Audio Panel	+ 1.5	69.0	103.50
	Two- power filters	+ 2.0	59.0	118.00
	One- ARC Marker Beacon reciever	+ .7	59.0	41.30
	One- Marker Beacon antenna	+ .5	99.75	49.90
	One- ARC R-443B Glideslope reciever	+ 2.0	184.5	369.00
	One- Comm antenna	+ 1.5	127.1	190.71
	One- ARC L-346A ADF sensor loop	+ 1.6	112.0	179.20
	One- ADF sensor loop cable	+ 1.0	90.5	+90.50
	New A/C empty weight -	1467.65		
	New A/C empty weight C.G. -	106.3		
	New A/C useful load (normal) -	882.35		
	(utility) -	732.35		

D. C. D. AERO SERVICE Co.
CESSNA BUILDING
FREDRICK MUNICIPAL AIRPORT
FREDRICK, Md 21701

Date- 9/26/81

Aircraft weight and balance data list

Registration number - N3212T
Aircraft serial number - 17700512

	Weight	Arm	Moment
Old A/C empty weight-	1446.5	106.70	153911

All previous aircraft weight and balance data lost as of this date, Copy of original data obtained from factory. Aircraft weighed with empty fuel and full oil with the following items installed since factory-

Narco ADF-29 System
Dorne & Margolin ELT with battery kit

*SUPERSEDED
8/29/83
David C. Dadds
ATP 547027377*

Aircraft Gross Weight (normal)	- 2350.0
(utility)	- 2200.0

New aircraft empty weight	- 1453.3
---------------------------	----------

New aircraft empty weight C.G.	- 106.70
--------------------------------	----------

New aircraft usefull load (normal)	- 896.70
(utility)	- 746.70

*David C. Dadds
ATP 547027377*

CESSNA AIRCRAFT COMPANY

WICHITA, KANSAS

MODEL 177

Weight & Balance Data

Aircraft Serial No. 17700512

F. A. A. Registration No. N3212T

Date: 12-6-67

ITEM	Weight (lbs.)	X	C.G. Arm (inches)	Moment (lb. in.)
Standard Airplane (Empty, Dry & Unloaded)	1340.0		106.3	142442
Optional Equipment	81.0		94.1	7622
Special Installations (DOM Approved)				
Paint DELUXE Over-All	19.5		166.5	3247
Usable Fuel (1.0 Gal.)	8.0		105.0	840
Licensed Empty Weight - Total of Items Above	1446.5		106.4	153911

GROSS WEIGHT - (LICENSED EMPTY WT.) + USEFUL LOAD

(2350 LBS) - (1446.5 LBS) = 903.5 LBS

SAMPLE LOADING PROBLEM

	Weight (lbs.)	C.G. Arm (inches)	Moment (lb.-in./1000)
Licensed Empty Wt.	1446.5		153.9
Oil (8 Qts.)	15	44.0	0.7
Pilot & Front Passenger	340	83.0	28.2
Fuel	88.5	112.0	9.9
Rear Seat Passengers	340	134.0	45.6
Baggage	120.0	163.0	19.4

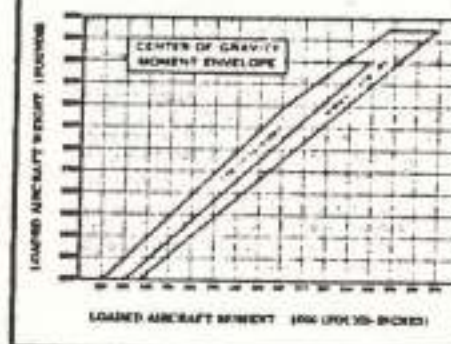
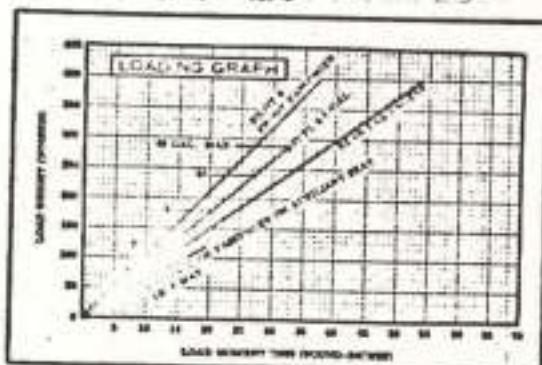
Total Loaded Airplane = 2350 261.1

Locate this point (2350, 261.1) on the C.G. Moment Envelope. Since the point falls within the envelope, the loading meets all balance requirements.

IT IS THE RESPONSIBILITY OF THE PILOT AND AIRPLANE OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY. THE EMPTY WEIGHT, C.G., & USEFUL LOAD ARE FOR THE AIRPLANE AS DELIVERED FROM THE FACTORY. REFER TO FORM FAA-337 WHEN ALTERATIONS HAVE BEEN MADE.

C.G. MOMENT ENVELOPE INSTRUCTIONS

- To the licensed empty weight add weight of all items to be carried.
- To licensed empty weight moment add moment of all items to be carried.
- Locate point determined by I & II and if it falls within the C.G. moment envelope the loading is satisfactory.



Form issue date: 26 July 1967

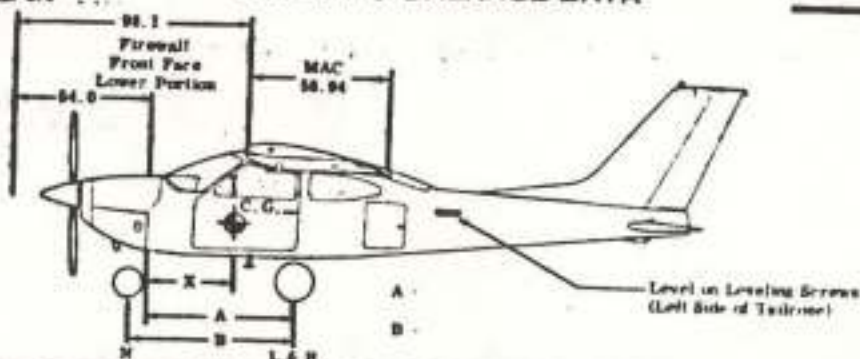
THIS IS A COPY OF THE WEIGHT & BALANCE AND INSTALLED EQUIPMENT DATA FURNISHED AT TIME OF ORIGINAL AIRWORTHINESS CERTIFICATION. IT DOES NOT REFLECT EQUIPMENT CHANGES WHICH MAY HAVE BEEN MADE SUBSEQUENT TO ISSUANCE OF AN AIRWORTHINESS CERTIFICATE.

C. Vanderbeke 8-25-81
CESSNA AIRCRAFT COMPANY DATE

Date
Sta. 0.0

WEIGHT & BALANCE DATA

MODEL 177



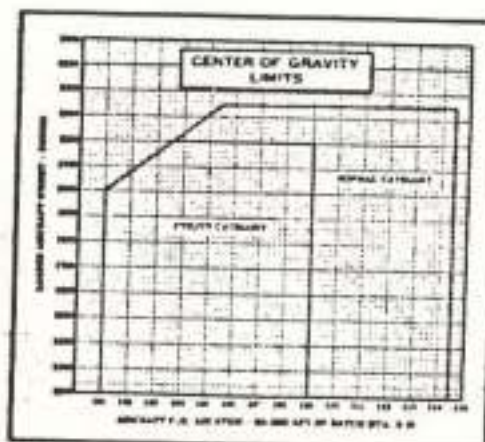
Scale Position	Scale Reading	Tare	Weight	Net Weight
Left Wheel			L	
Right Wheel			R	
Nose Wheel			N	
Aircraft Empty Weight (As Weighed)			W	

$$X = \frac{(A) - (N) \times (B)}{W} ; X = (\quad) - (\quad) \times (\quad) = (\quad) \text{ IN.}$$

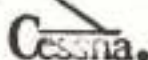
$$\text{C.G. ARM} = 54.0 + X = \quad \text{IN.}$$

WEIGHING PROCEDURE

- Preparation:
 - Inflate tires to recommended operating pressures.
 - Remove all wing tank and accumulator tank drain plugs to remove all fuel.
 - Remove oil pump drain plug to drain all oil.
 - Move all sliding seats to the most forward position. All seat backs should be in the most nearly vertical position.
 - Put flaps in the fully retracted position.
 - Place all control surfaces in neutral position.
- Leveling:
 - Place scales under each wheel (500+ each, 1000+ each main, minimum capacity for scales).
 - Deflate nose tire to center bubble on level (see diagram).
- Weighing:
 - With the airplane level and brakes released, record the weight shown on each scale. Deduct the tare, if any, from each reading.
- Measuring:
 - Obtain measurement "A" by measuring horizontally (along the airplane center line) from a line stretched between the main wheel centers to a plumb bob dropped from the firewall.
 - Obtain measurement "B" by measuring horizontally and parallel to the airplane center line, from center of nose-wheel axle, left side, to a plumb bob dropped from the line between the main wheel centers. Repeat on right side and average the measurements.
- Completing the Form:
 - Using weights from (3) and measurements from (4) the airplane weight and C.G. can be determined.
- Obtain licensed empty weight by adding weight and moment of usable fuel (see other side) to airplane empty weight and moment.



Form issue date: 20 July 1967



CESSNA AIRCRAFT CO

EQUIPMENT LIST
MODEL 177

WICHITA, KANSAS

AIRCRAFT SERIAL NO. 17700512

FAA REGISTRATION NO. N3212T

DATE 12-6-67

NOTES



Suffix letters to item numbers:

- R = required items of equipment for FAA certification
- S = standard equipment items
- O = optional equipment items replacing required or standard items
- A = optional equipment items which are in addition to required or standard items



Status of equipment:

- ✓ = installed in the aircraft at the factory

L = loose item of equipment which is stowed in the aircraft when it left the factory but which is not included in the Optional Equipment Weight and Moment. (Installed ARM is listed.)

3. Unless otherwise indicated, true values (not net change values) for weight and arm are shown. Positive arms are distances aft of datum; negative arms are distances forward of datum (see weight and balance data sheet for datum location).

4. A separate FAA approval must be obtained if the following items are not installed per applicable Cessna drawings or accessory kit instructions.

ITEM NO.		DESCRIPTION	REF DRAWING	WT LBS	ARM INS
001-R	✓	Engine, Lycoming O-320-E2D (includes all electric starter & vacuum pump pad)	O-320-E2D	266.0	39.0
002-R	✓	Propeller, Fixed Pitch (McCaughey 1C172/TM7653)	C161001-0301	32.5	21.0
003-R	✓	Spinner, Propeller (for 1C172/TM7653)	1750040	3.5	21.0
004-R	✓	Alternator, 60-Amp (14-Volt)	C611501-0101	11.5	30.0
005-R	✓	Regulator, Alternator (14-Volt)	C611001-0101	1.0	58.5
006-R	✓	Battery, 12-Volt, 25-Amp Hr.	0511319	23.0	184.5
006-O		Battery, 12-Volt, 33-Amp Hr.	0712605	28.0	184.5
007-R	✓	Filter, Carburetor Air (Air-Mase)	C294510-0601	1.3	26.5
008-R	✓	Heating System, Cabin & Carburetor Air (includes exhaust system)		17.5	36.0
009-R	✓	Pump, Fuel, Electric (Bendix)	1216012	2.0	53.0
010-R	✓	Oil Cooler	1750000	2.5	52.0

ISSUED: 7-12-67

REVISED:

APPROVED: 7-12-67

SHT 1 OF 4

FORM NO. 80-187



EQUIPMENT LIST (CONT'D)

CESSNA AIRCRAFT CO

MODEL 177

WICHITA, KANSAS

ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS
011-R ✓	Wheel, Brake, & Tire Assy (two) 6.00 x 6 4-ply rating (main)	1241156	30.0	123.5
012-R ✓	Wheel & Tire Assy (one) 5.00 x 5 4-ply rating (nose)	1241156	8.0	47.0
012-0	Wheel & Tire Assy (one) 6.00 x 6 4-ply rating (nose)-Requires Item 128-A	1241156	12.0	47.0
013-R	Altimeter	S-1314W1	0.5	72.5
013-0 ✓	Altimeter, Sensitive	C661011-0105	1.0	72.0
013-0-1	Altimeter, Sensitive (Feet and Millibars)	C661011-0106	1.0	72.0
014-R ✓	Ammeter	S-1320-1	0.5	74.5
015-R ✓	Compass	C660501-0101	0.5	82.0
016-R ✓	Gage - Engine Cluster	C669504-0101	0.5	74.0
017-R ✓	Gage - Engine Cluster	C669505-0101	0.5	74.0
018-R ✓	Gage - Fuel Pressure	C662009-0101	0.5	74.0
019-R ✓	Indicator, Airspeed	C661010-1001	0.5	73.0
019-0	Indicator, True Airspeed	C661010-0103	0.5	73.0
020-R ✓	Indicator, Stall Warning Audible	1706014	0.5	115.5
021-R ✓	Light, Flashing Beacon	1731000	1.0	298.0
022-R ✓	Tachometer, Recording	S-1305-6	1.0	73.5
023-R	Seat, Pilot (vinyl back)	1715004	14.0	97.0
023-0	Seat, Vertically Adjusting, Pilot (vinyl back)	1715002	17.5	97.0
023-0-1 ✓	Seat, Pilot (ABS back)	1715004	16.5	97.0
023-0-2	Seat, Vertically Adjusting, Pilot (ABS back)	1715002	20.0	97.0
024-S	Seat, Copilot (vinyl back)	1715004	14.0	97.0
024-0	Seat, Vertically Adjusting, Copilot (vinyl back)	1715002	17.5	97.0
024-0-1 ✓	Seat, Copilot (ABS back)	1715004	16.5	97.0
024-0-2	Seat, Vertically Adjusting, Copilot (ABS back)	1715002	20.0	97.0
025-S	Seat, Rear (vinyl back)	1715003	24.5	138.0
025-0 ✓	Seat, Rear (ABS back)	1715003	28.0	138.0
026-R ✓	Belt, Safety, Pilot	S-1746-17	1.0	93.0
027-S ✓	Belt, Safety, Copilot	S-1746-17	1.0	93.0
028-S ✓	Belt, Safety, Rear Seat (two)	S-1746-16	2.0	134.0
029-S ✓	Baggage Net	0500236	0.5	162.0
030-S	Fairings, Speed (gear-spring)	1741020	1.5	127.0
030-0 ✓	Fairings, Speed (gear-spring)	1741004	2.0	126.0
031-S	Paint Scheme, Std. Stripe	1704000	3.0	173.0
031-0 ✓	Paint Scheme, Overall	1704001	19.5	166.5
032-R	Placard - Operational (VFR)	S-1784-2	Negl.	--
032-0 ✓	Placard - Operational (IFR) Requires gyros plus nav/com radio	S-1784-1	Negl.	--
100-A ✓	Clock, Electric	1713222	0.5	96.0
101-A	Cables Stainless Steel Control (net change)	1700123	Negl.	--
102-A ✓	Controls, Dual (wheel, pedals & toe brakes)	1760007	7.0	69.0

ISSUED: 7-12-67

REVISED:

SHT 2 OF 4

FORM NO. 80-191



CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT'D)
MODEL 177

WICHITA, KANSAS

AIRCRAFT SERIAL NO. 17700512		FAA REGISTRATION NO. N3212T		DATE 12-6-67	
ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS	
103-A	Corrosion Proofing, Internal	1700123	6.0	140.0	
104-A	Detectors, Nav. Light	1723002	Negl.	--	
105-A	✓ Fairing, Speed (nose wheel) (net change)	0743625	4.0	49.0	
106-A	✓ Fairings, Speed (main wheel) (net change)	0741046	14.5	123.5	
107-A	Filter, Oil (full flow)	1756004	4.5	54.0	
108-A	Fire Extinguisher, Hand Type	1701008	6.0	125.5	
109-A	Gage, Carburetor Air Temp.	1713216	1.0	68.5	
110-A	✓ Gage, Outside Air Temp.	1713117	Negl.	--	
111-A	Ground Service Plug Receptacle	1770004	2.5	66.0	
112-A	✓ Gyros, New Horizon and Directional - Requires Item 138-A	1713217	6.5	69.5	
113-A	Gyros, New Horizon and New A.R.C. Directional - Requires Item 138-A	1713253	6.5	69.5	
114-A	Gyros, New A.R.C. Horizon and Directional - Requires Item 138-A	1713254	7.0	70.0	
115-A	Harness, Shoulder, Front (set of 2)	1711040	0.5	93.0	
116-A	Harness, Shoulder, Rear (set of 2)	1711040	0.5	134.0	
117-A	Head Rests, Front (set of 2)	1714040	2.0	107.0	
118-A	Head Rests, Rear (set of 2)	1714040	2.0	148.0	
119-A	✓ Heating System, Pitot (net change)	1720099	1.0	113.5	
120-A	Hourmeter	1701007	1.0	53.5	
121-A	✓ Indicator, Rate of Climb	1706000	1.0	72.5	
122-A	Indicator, Turn and Bank	1713220	2.0	71.5	
123-A	✓ Indicator, Turn Coordinator	1713223	2.5	71.5	
124-A	✓ Light, Landing (dual beam)	1722050	2.0	103.5	
125-A	Light, Map	1770008	0.5	83.0	
126-A	Lights, Courtesy (set of 3)	1770005	1.0	109.0	
127-A	Mirror, Rear View	1713224	0.5	72.5	
128-A	Nose Wheel Fork & Barrel (net change) Required with Item 012-0	1743000	1.0	53.5	
129-A	Priming System (3-cylinder) (net change)	1756003	0.5	42.0	
130-A	Rings, Cargo Tie-Down	1712017	1.0	147.5	
131-A	Rings, Airplane Hoisting	1700122	2.0	120.5	
132-A	Seat, Childs (includes seat belt)	1714030	9.5	169.0	
133-A	Seats, Vinyl Cushion (net change)	1715000	Negl.	--	
134-A	Static Source, Alternate	1713076	0.5	69.5	
135-A	Stretcher Installation (Custom-Air)	1710007	Use Actual Installed Weight & Arm Change		
136-A	✓ Sun Visors (2)	1701001	1.0	93.0	
137-A	✓ Upholstery, Cardinal Interior (net change)	1715000	5.5	136.5	
138-A	✓ Vacuum System, Engine Driven	1713217	6.5	56.5	
139-A	Valves, Fuel, Quick Drain (net change)		Negl.	--	
140-A	✓ Ventilation System, Rear Seat	1706032	2.0	123.5	
141-A	✓ Windows, Tinted (net change)	1701010	Negl.	--	
142-A	Winterization Kit, Engine	1752100	0.5	25.0	
143-A	Wing Leveler, Brittain (includes Turn Coordinator) - Requires Item 138-A	1700124	13.0	126.0	
144-A	✓ Tow Bar (Stowed)	0700315	2.0	162.0	

ISSUED: 7-12-67

REVISED:

SHT 3 OF 4

FORM NO. 80-193



CESSNA AIRCRAFT CO

EQUIPMENT LIST (CONT'D)

MODEL 177

WICHITA, KANSAS

ITEM NO	DESCRIPTION	REF DRAWING	WT LBS	ARM INS
500-A	Cessna Nav-O-Matic 300 (includes new A.R.C. gyros, Turn Coordinator and Vacuum System)	1701009	24.5	80.0
501-A	Cessna Nav-O-Matic 300 (includes new A.R.C. directional gyro, new horizon gyro, Turn Coordinator and Vacuum System)	1701009	24.5	80.0
502-A	Cessna Nav-O-Matic 400 (includes new A.R.C. gyros and vacuum system)	1701009	34.0	122.5
503-A	Electronic Installation-Partial-Option A	1770000	5.0	140.0
504-A	Electronic Installation-Partial-Option B	1770000	1.0	111.0
505-A	Electronic Installation-Partial-Option C	1770000	1.5	82.0
506-A	Electronic Installation-Partial-Option D	1200014	0.5	127.5
507-A	Antenna and Cable - Communication (VHF)	1770000	1.0	111.0
508-A	Antenna and Cable - Dual Communication (VHF)		1.5	111.0
509-A	Antenna and Cable - Navigation (VHF)		1.5	231.5
510-A	Headset and Microphone		1.0	71.0
511-A	Cabin Speaker		1.5	111.0
512-A	Radio Selector Switches		0.5	73.0
513-A	Audio Amplifier		1.5	64.0
514-A	Radio Cooling System		0.5	66.5
515-A	Cessna ADF 300 (521B) (includes loop and antenna)		9.0	79.5
516-A	Cessna Transceiver 300 (524A)		8.0	69.0
517-A	Cessna Nav-Com 300R (517R)		11.0	69.0
518-A	Cessna Nav-Com 300 (540A) with IN-514R		11.5	69.0
519-A	Cessna Nav-Com 300 (540A) with IN-525A		12.0	69.0
520-A	Cessna Marker Beacon 300 (502B) (includes antenna and cable)		3.0	90.5
521-A	Cessna DME 300 (KN-60) (includes antenna and cable)		9.5	74.0
522-A	Cessna Glideslope (543A) (includes antenna and cable)		5.5	155.5
523-A	King KY-95		9.0	119.0
524-A	King EX-150B		9.5	68.0
525-A	King EX-160 with KI-201		14.0	104.5
526-A	King EX-160 with KI-211		15.0	103.0
527-A	Narco Mark 12A with VOA-4		16.0	102.5
528-A	Narco Mark 12A with VOA-5		16.0	102.5
529-A	Narco UGR-2 Glideslope Receiver (includes antenna and cable)		6.0	152.0
530-A	Pantronics DX-10DA H.F. Transceiver	1770000		
531-A	Pantronics DX-10DA H.F. Transceiver (includes reel-out antenna)			

ISSUED: 7-12-67

REVISED:

SHT 4 OF 4

FORM NO. 80-190

WEIGHT & BALANCE RECORD

3212T Model 177 S/N 17700512 G/W 2350.0
(utility) 2200.0

DATE	ITEMS ADDED OR REMOVED	WEIGHT	ARM	MOMENT
8/20/83	Remove the following--			
	One- ARC RT-540A Nav/Comm	-11.50	69.0	793.50
	One- Narco ADF-29 Reciever	- 5.25	69.0	362.25
	One- ADF sense loop antenna	- 2.50	190.0	475.00
	One- ADF sense loop antenna cable	- 1.50	127.5	191.25
	Installed the following--			
	Two- ARC RT-328T Nav/Comm's with indicators IN-525B & IN 514B	+16.6	1169.0	1145.40
	One- ARC R-546E ADF and indicator	+ 4.2	69.0	289.80
	One- ARC RT-359A Transponder	+ 3.5	69.0	241.50
	One- ARC Audio Panel	+ 1.5	69.0	103.50
	Two- power filters	+ 2.0	59.0	118.00
	One- ARC Marker Beacon reciever	+ .7	59.0	41.30
	One- Marker Beacon antenna	+ .5	99.75	49.90
	One- ARC R-443B Glideslope reciever	+ 2.0	184.5	369.00
	One- Comm antenna	+ 1.5	127.1	190.71
	One- ARC L-346A ADF sensor loop	+ 1.6	112.0	179.20
	One- ADF sensor loop cable	+ 1.0	90.5	+90.50
	New A/C empty weight	- 1467.65		
	New A/C empty weight C.G.	- 106.3		
	New A/C useful load (normal)	- 882.35		
	(utility)	- 732.35		

David C. Dadds
A4P 547027377



C² ENTERPRISE, INC. 701-727-9554

Steve Conners
Ceecy Nucker

127 Delta Drive
Minot ND 58704
April 1990

GENERAL INFORMATION

The C² in our name is pronounced "cee squared." We produce FAA certified, unique, efficient, and cost effective speed modifications and other parts for Cessnas. Our mods are available only from us and our dealers. Our fiberglass parts are made of strong, light weight, high quality cloth, not matt. Kits are complete with all the high quality stainless AN hardware and rivets needed for installation. We provide after sales support for you and your mechanic. You may have seen pictures and articles on our modifications in past issues of the Cessna Pilot Association, the Cardinal Club newsletter, Aviation Consumer, AOPA Pilot, and Aero.

When our complete kits are installed, there is usually some increase in the rate of climb, and throttling back to your old airspeed will lower your fuel flow. Even at your old power settings, you will burn less total fuel to go faster; it will take less time to reach your destination at the higher speed.

CAFE 400 WINNER

We competed in the 1987 CAFE 400 and won first place in the Production Unlimited Fixed Gear category. The exceptionally demanding course required multiple steep climbs to 9000 foot density altitude; difficult navigation over mountains and valleys; and there was a 20 mph headwind at altitude.

Several aircraft couldn't make it and dropped out. Our average speed of 124 mph was greater than the stock cruise speed before modification. The top 180hp Grumman Tiger was less than 9 mph faster; it landed only 0.2 hours before our 150 hp Cardinal. An instrumented test boom showed 146 mph TAS at 6000 foot density altitude and mid weight; average rate of climb from 3000 to 6000 foot density altitude was 816 fpm.

THE BOTTOM LINE

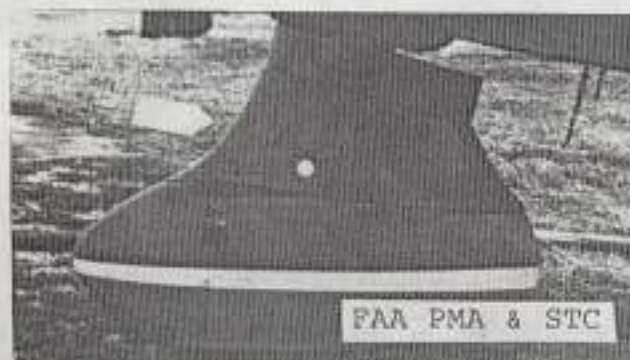
So far, our 1968 150 hp fixed pitch Cardinal (with 2500 original hours on the engine) will cruise about 150 mph; the testbed 1974 180 hp Cardinal cruises at 165 mph or better. We have achieved 167 mph TAS at full power in level flight in N2213Y, the 150 hp Cardinal mentioned above. Cessna claims 144 mph top, 134 mph cruise. It actually got about 125 mph before modification. These figures have been cross checked by the following methods: calibration of airspeed gauge; DME: timed groundspeed runs upwind and downwind across section lines; Loran C; CAFE 400 test boom.

Several fly-off races against stock 180hp Cardinals by modified 150hp Cardinals (both ours and customers!) have been conducted. The result was that the 150hp passed the 180hp in the climb after an in-trail takeoff. Wide open level speed runs are a dead heat. The useful load advantage of a 180hp Cardinal shrinks next to the lower fuel consumption and autogas diet of a 150hp Cardinal. On long trips at max gross weight, the 150hp Cardinal has arrived hours ahead of even Bonanzas, because the competition had to stop for fuel!

One of our customers installed our complete performance package on his 177B and documented an airspeed increase of 17mph, +/- 2mph. We have since come out with more mods.

PRODUCT INFORMATION

• FANCY PANT™ (177, 177A, 177B, 182E&up)



The Fancy Pant™ is FAA STC'd and consists of two parts. The lower part screws to the nose gear fairing; the upper part bolts to the bottom part of the upper nose gear strut, just below the nose steering pushrod. The upper fairing telescopes inside the lower fairing, completely enclosing the oleo strut. This not only looks much better than other nose gear modifications available, it protects the polished strut and seals from gravel, dust, bugs, etc.

An additional advantage of the Fancy Pant™ over other type nose strut kits is that the fairing also serves as a flow straightener for the propeller airflow. Theoretically, this should reduce the rudder trim needed and increase the propeller efficiency by thrust recovery. It is practical results pilots are interested in, however. The Fancy Pant™ should increase the cruise airspeed 5 to 8 mph, depending on model.

Note that another mod claims 7 mph for a nose strut fairing, about the same speed increase that we see; our agreement indicates that the speed increase is real and predictable. What is not the same is the price; our Fancy Pant™ is much less expensive than the other nose strut mod. It is also simpler and takes less time to install.

The Fancy Pant™ is designed to fit properly on the latest model (1975-1985) Cessna nose wheel fairings. Excellent quality fiberglass replicas of the Cessna fairings are available from us if desired (see below). For Cessnas built from 1967 to 1974, our nose wheel pant can add an additional 1 to 3 mph to the speed gain provided by the Fancy Pant™.

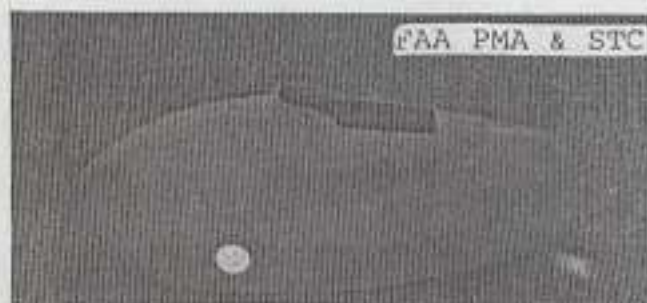
• FILLER FAIRINGS Fore (177B) Aft (177, 177A, 177B)



The Cardinal Fancy Pant™ is designed to cover all of the oleo, but small areas in front of the strut on the cowling and behind the strut on

the belly are left open so that the fairing will not interfere with nose wheel steering. These areas can be filled in with our "Filler Fairings" designed to improve the appearance of the installation. They also improve the airflow around the strut.

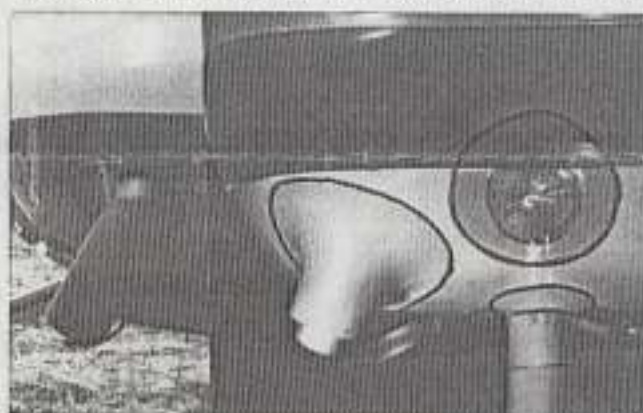
• WHEEL PANTS (all 150, 152, 172, 177, 182, 206)



The Fancy Pant™ is designed to fit the late model (75-85) Cessna nose wheel fairing (Part Number 0543079-x). The later fairing by itself will increase the speed of post '66 model aircraft by 1-3 mph. Cessna fairings are very expensive and are made out of plastic; we have available PMA'd and STC'd fiberglass versions of this fairing. Fiberglass main gear fairings of the 75-85 style are also available; they do not increase speed a lot (1mph), but they look better than earlier models and are much more durable than plastic. Oversize fiberglass fairings for 6.00x6 nose wheels and 8.00x6 main wheels are also available.

These wheel pants are of the highest quality; multi-layer cloth, not heavy matt. They have reinforced mounts, are drilled, primed for painting, and have access for the air valve. They can be drilled to fit any pre-'74 mounting plate.

• EXHAUST FAIRING (172 [68-85], 177[all], 182)

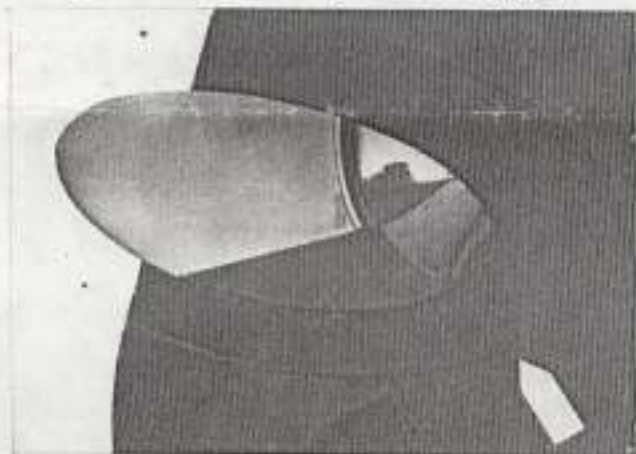


A typical result for the Exhaust Fairing is an increased cruise speed of 2 mph and CHT's 75 degrees lower. The fairing serves several functions. (1)-It fair in the exhaust stack and reduces turbulence behind it. (2)-It prevents ram air from entering the large hole in the lower cowl around the exhaust stack; this reduces drag and lowers the pressure on the inside of the lower cowl. (3)-It acts as a fixed cowl flap, increasing the airflow cooling the engine. (4)-It reduces drag by injecting high pressure cooling air behind the exhaust pipe.

If your engine temperatures are already cool enough, the fairing can be trimmed so that the cooling effect is cancelled but the speed increase remains. The fairing also makes the plane look much better; it gives a streamlined appearance rather than having a big pipe stick out 90 degrees. On a Cessna 182, the fairing will cover any of the available exhaust pipe extensions; this will keep exhaust stains off your belly without a speed or appearance penalty.

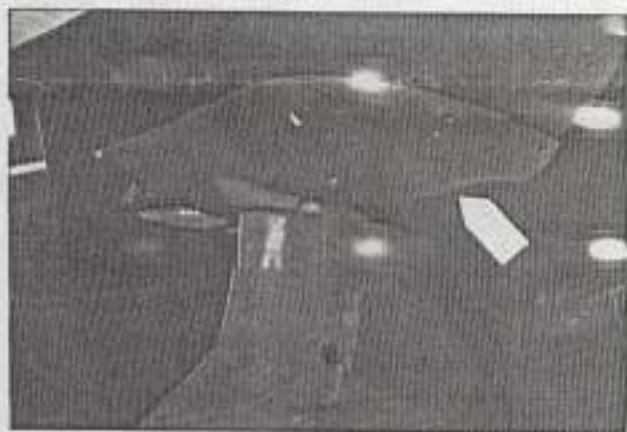
The Exhaust Fairing is made of a special high temperature fiberglass resin, although the fairing never gets more than warm to the touch. We recommend that 177's and 177A's install the Fixed Cowl Flap (see below) with the Exhaust Fairing.

• **LANDING LIGHT FAIRING (172, 172RG, 177B, 182 single or dual cowl mounted lights)**



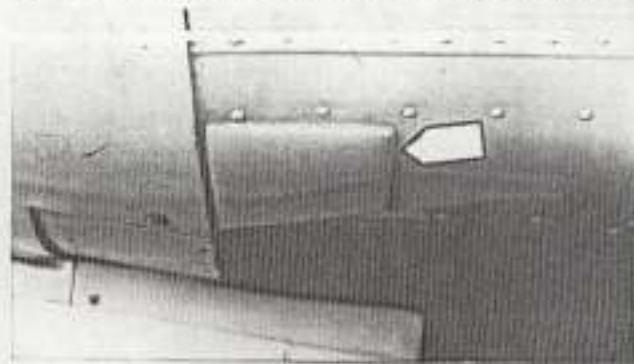
This is not just a hunk of plastic. The lens is flush mounted by an aluminum ring attached to the cowl with machine screws. The lens does NOT use plexiglass; it uses Lexan, which is more flexible, tougher, and will not crack or scratch as plexiglass will. The Landing Light cover provides a speed increase of 1 to 2 mph depending on model. Covers for other aircraft can be made to order.

• **FIXED COWL FLAP (177, 177A)**



For early Cardinals (stock or 180 hp, constant speed, or turbo conversions). This fairing provides the lower cowl contour of the 177B for the earlier models. Has 'fixed cowl flaps' rather than the large hole in the bottom of the cowl. Benefits are improved cooling airflow and a speed increase of 6 to 8 mph. Made from high temperature resin.

• **COWLING CHEEK FAIRINGS (177B, 177RG)**



These fill the gap between the lower cowl and the fuselage just outboard of the cowl flaps. Improves appearance and reduces drag.

• **TAIL FAIRING (177A, 177B, 177RG)**



The Tail Fairing adds 4 to 6 mph, depending on model. Our fiberglass fairing is a partial copy of the 177 tail fairing, but is much easier to install and remove, looks better, and is more durable.

The speed gain by this fairing seems unlikely until you look at your stab in cruise position. There's a large gap between the tailcone and the stab, and the rear spar of the stab is exposed to the slipstream. Also, the hole in the middle of the stab acts as a spoiler, increasing both the parasite drag and the trim drag. Our fairing fills the gap and smooths the airflow.

• **FUEL DRAIN FAIRINGS (all aircraft)**

Small fiberglass teardrops are attached with silicone RTV. On flush type drains, still allows fuel to be drained with a sample cup. Will also cover the unsightly fuel drain doublers on aircraft affected by the Cessna fuel cell AD.

• **ADF LOOP COVER (all aircraft)**

These fairings will fit any of the modern square flatpack antennas mounted on a reasonably flat surface. A better appearance, a cleaner belly, and a speed increase of 1-2 mph are the benefits. The fairing will also tend to prevent ice buildup on the antenna in IFR conditions. Two sizes.

• **STAINLESS STEEL SCREW KITS (172, 177, 182)**

Replace rusted and worn out screws with bright new stainless steel. Paint or looks great bare. Extra screws and countersunk washers are included.

*** STAINLESS COWLING FASTENERS (172, 177, 182)**

Also available is a Stainless Steel Cowling Fastener kit. You get 24 Southco 1/4 turn fasteners with retainers. They have a straight slot, not a Phillips head, so you can tell that they are fastened or unfastened at a glance during preflight.

*** STAINLESS ADF/LORAN ANTENNA (all aircraft)**

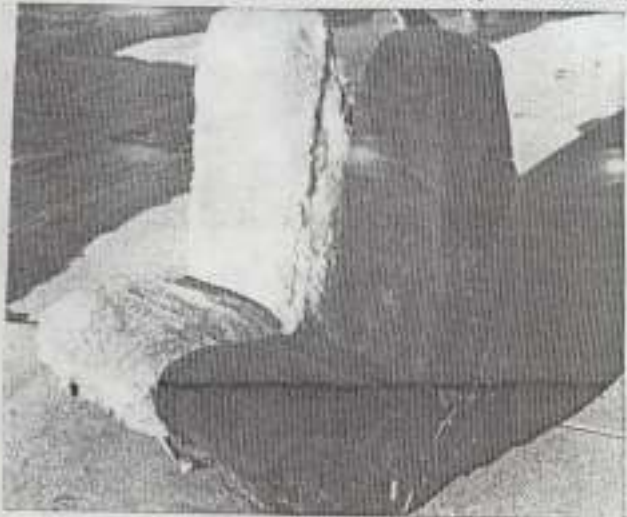
This is the highest quality long wire antenna around. Comes with fail-safe quality ceramic insulator; watch out for the cheap imitations with a plastic strip instead. Includes a new ceramic standoff with a plated brass feedthrough.

*** LEVER ACTION TOWBAR (most singles)**



Fits Cessna singles and similar aircraft - fixed or RG. It's the best towbar we've ever seen. Made of strong 6061T6 aircraft aluminum tubing, it is heat treated and anodized after bending. Color is anodized, not painted - can't chip or fade. It only weighs 20 ounces, but holds tighter than other towbars due to a stainless steel spring. The lever action spreader is similar to a late model Cessna towbar. Last but not least, steel collars (4130 aircraft chrome-moly) are included to prevent the bending and "mushrooming" typical of a "cheap" Cessna towbar. This towbar is lighter, stronger, and easier to use than Cessna's or any other towbar, and is much less expensive.

*** GENUINE WOOL SEATCOVERS (all aircraft)**



These hi-back sheepskin seatcovers are deep,

dense, and plush - an even 1/2" thick. Wrap around design covers faded and worn vinyl, fabric, and plastic, including the headrest. Replaces need for reupholstery, installs in minutes. Custom fit covers look a little better (maybe), fit a little better - cost \$300! Try ours at 80% less. "Warm in winter, Cool in summer." Get a matching set for your car. Colors: Charcoal Grey and Tan. Try it, you'll like it - guaranteed.

*** ARP CARB ICE DETECTOR (all aircraft)**

Fits any Marvel-Schebler carburetor, and is FAA STC'd. Detects ice using a light beam; vastly superior to carburetor temperature gauge because it detects the actual presence of ice rather than the potential for buildup. Warns you only when carb heat is really needed.

*** 177 NOSE STRUT O'HAUL KIT (177, 177A, 177B)**

Contains all gaskets, seals, bushings, recently manufactured O rings and scraper rings needed to overhaul strut. The Cardinal strut is unique and used on no other aircraft. Not for use on RG strut. Includes exploded parts diagram. FAA PMA'd.

*** FUEL SELECTOR O'HAUL KIT (172, 177, 177A, 177B)**

FAA PMA'd kit includes all gaskets and O rings necessary to overhaul the main fuel selector valve (Left-Both-Right). Exploded diagram provided.

*** SHIMMY DAMPNER O'HAUL KIT (177, 177A, 177B)**

FAA PMA'D kit includes all necessary seals, bushings, gaskets, and O rings to overhaul shimmy dampner. The 177 shimmy dampner is unique and used on no other aircraft. Not for use on RG.

*** *REAL* VALVE COVER GASKETS (all aircraft)**

These valve cover (rocker box) gaskets are FAA STC'd and are made from resilient red silicone rubber, not flimsy cork. They are reusable and will last until engine overhaul. They are installed dry with no messy gasket sealant. Specify make and model of engine and number of cylinders for engine when ordering.

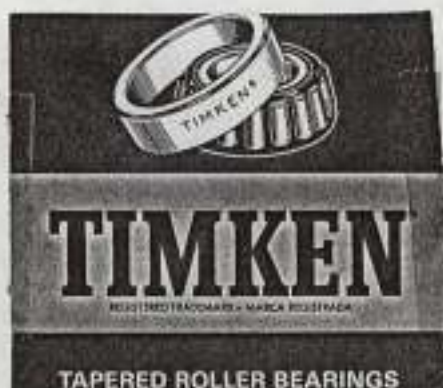
*** GAS CAP COVERS (all aircraft)**

Prevents rain from pooling in flush-type gas caps. For ground use, they are removed before flight. They are attached with a ball-lock fastener (similar to Velcro but stronger and more durable).



Pictures above are of the Main Brake Fairings, Strut/Fuselage Fairings, and Main Strut Fairings described on reverse.

Main Brake Fairings will also fit standard 177 (all) and 182 (all tubular gear) [this fairing has a longer neck; not pictured].



Complete Cleveland wheel bearing/race Overhaul Kit; OEM Timken parts

2@ 08231	Nose Race		
2@ 08125	Nose Bearing		
4@ 13836	Main Race		
4@ 13889	Main Bearing	List	Cash Discount
1@ 14oz.	Lubriplate Grease	\$158.00	\$150.00
("Street Price" \$211.00)			

Complete McCauley wheel bearing/race Overhaul Kit; OEM Timken parts
TBD TBD

NOTE: This replaces all bearing races and all wheel bearings for all three wheels, and includes enough grease for several years. The only tools needed to replace the bearing races are a drift pin or pin punch and a hammer. A small screwdriver is needed to remove and replace the bearings. Bearings and races should be replaced every 5 to 10 years, or at once if either bearings or races become rusty, rough, or display corrosion (black marks). Bad bearings/races frequently cause bad nose or main wheel shimmy or vibration. A single bad winter with the plane tied down outside rusted our wheel bearings solid and prevented taxiing!

CARDINAL MAIN FANCY PANTS™

For Cessna Cardinal 177, 177A, 177B.

The Main Fancy Pants™ consist of six assemblies. The main landing gear strut fairings, the brake fairings, and the strut to fuselage fairings. Our aluminum main landing gear strut fairings are already formed and ready to install. A 177B could gain 2 to 4 mph over stock. A 177 or 177A would be slightly less, unless a larger engine has been installed.

The existing Cessna MLG strut fairings are not much, if any, better than not having any fairings at all. NOTE: On a Cardinal, the only struts are the gear struts, so for brevity only the word strut will be used.

Cessna plastic brake fairings are short, blunt, and thick; they make the gear look better by hiding the brake assembly, and they do protect the flexible brake hose from deterioration by sunlight and abrasion from rocks, weeds, and runway lights. They do not provide any noticeable aerodynamic improvement, and in fact icing patterns indicate that the brake fairings have more drag due to ice build up in icing conditions than do bare brakes. Our flexible fiberglass brake fairings are paintable, will not crack, and are repairable. They are designed to fit tighter and blend into the main wheel pants much better.

Cessna MLG strut fairings are very thick and very narrow, making it impossible to keep the airflow attached on both sides of the strut. This means that the airfoil shaped strut fairing is always in a separated flow, stalled condition. The only effective and practical way to keep the airflow attached in a low drag fashion is to make them thinner or wider. They can't be made thinner due to the diameter of the MLG strut, so our solution was to make them wider, nearly twice as wide, and rotating the fairing to a more "nose down" attitude to align it with the local airflow.

Cessna plastic strut to fuselage fairings project out from the fuselage several inches, which means that when the main gear strut moves up and down or back and forth (during braking or landing) the plastic flexes and eventually cracks and breaks. Our fairings are designed to fit tighter to the fuselage, reducing frontal area and reducing the relative movement of the main gear strut. The opening in the fairing is designed slightly longer than the new main strut fairing to allow for strut movement. Also, the fairings are made of a more flexible than usual fiberglass resin.

CARDINAL BRAKE FAIRINGS

For Cessna 177, 177A, 177B, 182 (all tubular strut)

These are the same high quality fairings mentioned above, but modified to fit the existing Cessna main landing gear strut fairings. At any later time, if you wish to install the remaining four pieces of the Main Fancy Pants™, this can be easily done without needing to buy new brake fairings or wheel pants. The cost of converting to the full 177MFP will be the cost of the full kit minus the cost of the 177BF.

PRICES June 90

LIST
COD
MC

DISCOUNT

Cash

Check

VISA Money Order

GENUINE WOOL SEATCOVERS (all seats)
Charcoal Grey or Tan

58 55

PRODUCT/

AIRCRAFT MODEL

STAINLESS STEEL SCREW KITS

177, 177A, 177B, 177RG

53 50

172, 172RG

42 40

182, 182RG

42 40

NOSE FANCY PANT™

172

\$545 \$520

177, 177A, 177B - STC

545 520

182E & up - STC

545 520

STAINLESS STEEL COWL FASTENERS

172 (all), 177 (all)

32 30

182 (73-85)

95 90

(Must have a PN D543079-x nosewheel fairing
[75-85 style]. These are available below.)

STAINLESS STEEL ADF/LORAN ANTENNA
(all aircraft)

42 40*

FORE FILLER FAIRING
177B

47 45

ARP CARB ICE DETECTOR -STC

310 295

(for Marvel-Shebler carburetors)

AFT FILLER FAIRING
177, 177A, 177B

47 45

"REAL" VALVE COVER GASKETS - STC

(specify engine)

4 cylinder engines

47 45

6 cylinder engines

74 70

MAIN FANCY PANT™ (fiberglass & aluminum)

177, 177A, 177B

695 665

BRAKE FAIRINGS (fiberglass) [2]

177, 177A, 177B (improved)

260 245

177 NOSE STRUT O'HAUL KIT - PMA

47 45

177, 177A, 177B

FIBERGLASS WHEEL PANTS - PMA

150, 152, 172, 177, 182, 206

177 SHIMMY DAMPNER O'HAUL KIT - PMA

16 15*

177, 177A, 177B

Nose (5.00x5)

185 175

Main (6.00x6) (each)

185 175

Oversize Nose (6.00x6)

205 185

Oversize Main (8.00x6) (each)

188 180

FUEL SELECTOR O'HAUL KIT - PMA

21 15

172, 177, 177A, 177B

GAS CAP COVERS

14 13*

(all aircraft)

EXHAUST FAIRING

177(all), 172(68-85), 182

203 195

SHIPPING, HANDLING, INSURANCE (per order) 15

* Shipped free of charge.

LANDING LIGHT FAIRING

172, 177B, 182 (1 or 2 light)

68 65

172RG (pair) (MTO)

310 295

NOTE: Prices subject to change without notice.

FIXED COWL FLAP

177, 177A

257 245

THE STANDARD PERFORMANCE KITS include
those items identified as useable on
your aircraft from the price list
including the following:

Nose Fancy Pant™, Fore Filler
Fairing, Aft Filler Fairing, Fiberglass
Nose Wheel Pants, Exhaust Fairing,
Landing Light Fairing(s), Fixed Cowl
Flap, Cowling Cheek Fairings, Tail
Fairing, Fuel Drain Fairings, ADF Loop
Cover, and Towbar.

For example, a 1976 177B Kit would
include a Nose Fancy Pant™, Fore Filler
Fairing, Aft Filler Fairing, Exhaust
Fairing, Landing Light Cover, Tail Cone
Fairing, Fuel Drain Fairings, ADF Loop
Cover and Towbar.

COWLING CHEEK FAIRINGS (2)

177B, 177RG

40 38*

TAIL FAIRING

177B, 177RG

289 275

FUEL DRAIN FAIRINGS (3)

(all aircraft, 3 each)

32 30*

ADF LOOP COVER

small (4"x6"x1 1/4") loop

47 45

large loop

47 45

TOWBAR (lever action)

48 46

COMPLETE STANDARD PERFORMANCE KIT PRICES

Separate KIT Kit Cash
List List Discount

DELUXE KIT - Two wool seatcovers, S/S Screw Kit,
S/S ADF Antenna S/S Cowl Fasteners

ADD TO PRICES BELOW \$225 \$210 \$195

177 (full kit) 1245 1180 1170

177A (full kit) 1520 1425 1360

177, 177A
(partial kit, FCF & EX) 460 435 410

177B (70-74) 1468 1385 1320

177B (75-78) 1313 1235 1180

177RG 633 595 570

182 (63-74) 1065 1005 970

182 (75-85) 910 860 820

A price list is attached. We accept
COD, Mastercharge, and Visa. A 5%
discount applies to orders paid by cash,
check, or money order. A \$15 charge on
each order covers shipping, handling,
and insurance. Items marked * are
shipped free. Overnight shipment is
available for an additional fee. NE and
ND addresses must include 5% state tax.
Prices subject to change without
notice.

Name: _____
Address: _____
City: _____ State: _____ Zip: _____
Phone: _____
Aircraft Type: _____ Model: _____ Year: _____
N #: _____ Serial #: _____

Circle the desired items.

Subtotal:

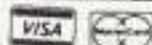
Tax (if applicable):

Shipping, Handling, Insurance: \$15

Total:

MC or Visa #:

Expiration date:



CERTIFICATION

Our 177 and 182 Fancy Pants™ and our
fiberglass wheel pants are FAA PMA'd and
STC'd. All STC's and field approvals may be
installed by the pilot, owner, or A&P, but must
be signed off by an IA and submitted to the
local GADO for approval. We supply copies of
previously approved 337's for most installations
to use for a reference by your IA.

DEALERS

On request, we can provide a list of dealers
and shops in your area that have had experience
installing our modifications. Installation times
vary depending on the kit. Previous experience
can cut installation time by about 25%. If you
are interested in becoming a dealer, write us for
more information.

INSURANCE

Insurance rates for modified aircraft are
equal to or less than the rates for stock
aircraft. All insurance companies checked were
only too happy to hear about a performance
improvement for Cardinals. Some insurance
companies charge up to twice as much for stock
1968 Cardinals as they do for later model
Cardinals. The lower rate is available if either a
180hp engine or our complete aerodynamic
performance package is installed on a 1968
Cardinal. Our kits are about \$11,000 less than
an engine change. You decide.

CAVEATS

Actual speed increase will depend on the
condition and rigging of the airplane; the cruise
power and altitude used; flight conditions and
pilot technique. The largest increase in speed
will occur at high altitudes and cruise power
settings. High power settings at low altitudes
will have reduced gains. In addition to speed
gains, there may be an increase in the rate of
climb, and throttling back to your old airspeed
will lower your fuel flow. Most people buy
speed kits to go fast, though, and it is
interesting to note that even if you maintain
your old power settings, you will use less fuel
while going faster. This is because it will take
less time to reach your destination, especially
against headwinds.



(701) 727-8554

C² ENTERPRISE, INC.

Cessna Conversions
Better Performance • Better Appearance

STEPHEN P. CONNERS
CEECEY NUCKER

127 Delta Dr.
Minot, ND 58704

Customer Care



WILLIAM W. COX
1396-7

Owner Advisory

RT 1 BOX 222C
EASTON, MD
21601

January 20, 1984

N 3212 T

SE84-2A

17700512

Dear Cessna Owner,

CESSNA 177

Attached is Lycoming Service Instruction 1425 which provides suggested maintenance procedures to reduce valve sticking in your Lycoming engine.

Field experience has shown that valve guide cleaning is beneficial for reducing valve sticking when accomplished every 500 to 1000 hours, depending on individual engine operating conditions. The cleaning procedure is recommended if you have experienced valve guide sticking, which is often identified by an intermittent engine hesitation or miss.

Your Cessna Dealer can accomplish the valve guide cleaning procedure as necessary.

To obtain satisfactory results, procedures referenced in this Owner Advisory must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of the work performed in accomplishing this Owner Advisory.

Piston Aircraft Marketing Division Cessna Aircraft Company, P.O. Box 1521, Wichita, Kansas 67201 U.S.A. 316/585-9111, Telex: 417-400

COPYRIGHT © 1984

AVCO LYCOMING WILLIAMSPORT DIVISION
AVCO CORPORATION
WILLIAMSPORT, PENNSYLVANIA 17701

Service Instruction



DATE:

October 21, 1983

Service Instruction No. 1425

Engineering Aspects are

FAA Approved

(717) 327-7267

SUBJECT:

Suggested Maintenance Procedures to Reduce the Possibility of Valve Sticking.

MODELS AFFECTED:

All Avco Lycoming Reciprocating Engines.

Field experience has shown that engine oil contamination increases the possibility of sticking and/or stuck valves. This situation occurs when the contaminants in the engine lubrication oil become deposited on the valve stems, restricting the valve movement, and resulting in intermittent engine hesitation or miss. If corrective action is not taken to remove the deposits, a valve could become stuck causing engine damage.

Since the rate of oil contaminant accumulation is increased by high ambient temperatures, slow flight with reduced cooling, and high lead content of fuel, owners and operators experiencing these conditions are encouraged to consider the following suggestions for operation and maintenance if they have experienced valve sticking.

PART I — OIL AND FILTER CHANGES

More frequent oil and filter changes (50-hour) will minimize the accumulation of harmful contaminants, the prime cause of valve sticking. This procedure is advisable whether the engine has a pressure-screen oil filter or a full-flow oil filter. Operating the engine with a clean air filter is also important for keeping dirt from accumulating in the oil supply. Therefore, the entire air-induction system should be well sealed to prevent the entry of unfiltered air.

It is also important that the cooling air baffles and baffle strips be in good condition to prevent localized overheating problems.

When the aircraft cannot be flown frequently, the oil should be changed even sooner than a 50-hour interval. The oil should then be changed every 25 hours to eliminate moisture and acids that collect in the oil of an inactive engine. For aircraft that are not flown for long periods of time, the oil should be changed every six (6) months, if the aircraft is not flown at least 25 hours within this 6-month period. Short ground runs should be avoided.

Exposing the engine to sudden cool down, as in a rapid descent with the power reduced, or shutting the engine down before it has sufficiently cooled down can also induce valve sticking.

PART II

Investigations have shown that exhaust valve sticking occurs more frequently during hot ambient conditions. The lead salts that accumulate in the lubricating oil from the use of leaded fuels contribute to the deposit build-up in the valve guides. They are mostly eliminated each time the oil and filter are changed. Depending on the amount of deposits, sticking between the valve stem

and guide can restrict the valve movement. This condition is often identified by an intermittent engine hesitation or miss.

Operating with any of the following conditions present can promote deposit build-up reducing valve guide clearance and result in valve sticking.

- a. High ambient temperatures.
- b. Slow flight with reduced cooling
- c. High lead content of fuel

If any of the above is present or hesitation is observed, then inspection and cleaning is recommended (Refer to Part III of this instruction). Inspection and cleaning intervals can only be determined as a function of individual operating conditions.

PART III — CLEANING PROCEDURE

1. Remove all spark plugs and/or exhaust manifold. If compressed air is to be used to reseat valve, the exhaust manifold should not be removed.
2. Remove rocker box cover and gasket from cylinder.
3. On all engines except the 76 series, push out rocker shaft to remove exhaust rocker and rotator cap. On 76 series engines, remove rocker box covers, rocker arm retaining nuts, rocker arm fulcrums, spacer washers, and rocker arms.

CAUTION

Physically separate and identify by cylinder and valve location, the valve train components as they are disassembled, so that each part may be reinstalled in exactly the same location from which it was removed. Pay particular attention to valve stem keys. These tend to wear in uniform distinctive patterns, and should be returned to the same position as they were before removal.

4. Position crankshaft just after bottom center on the intake stroke.
5. Insert about 8 feet of 3/8-inch nylon rope through the spark plug hole; then turn the crankshaft until the piston moves the rope snugly against the exhaust valve.
- (a) An alternate technique for holding the valve in position is with air pressure using shop air and a compression check fitting.

— CAUTION —

The piston is held at bottom dead center by firmly holding the propeller to prevent the engine from turning when air pressure is applied through the differential compression device to the combustion chamber.

Use gloves or rags to protect the hands while holding the propeller blade. Also, before attaching the compression tester, check the air supply regulator to make sure the air pressure to the cylinder is not excessive.

6. Compress the exhaust valve spring and remove valve keys. (The rope or air pressure inserted in the combustion chamber in the preceding step provides a base to support the valve in the event the keys tend to stick.)
7. Remove the nylon rope or bleed off the air pressure and insert light through the upper spark plug hole. Then start pushing the valve from its guide. Before the valve stem is free from the guide, secure it from falling into the cylinder with mechanical pickup fingers, working through the spark plug holes and/or exhaust port. As shown in Fig. 1.



Figure 1. View Through Exhaust Port Showing Mechanical Fingers Holding Valve Stem

8. Move the valve (secured by the mechanical fingers) completely out of the guide and position it away

from the guide to avoid interference when the guide is reamed. See Fig. 2.

NOTE

Refer to Avco Lycoming Service Table of Limits and Torque Value Recommendations, SSP1776, or latest revision thereof, for valve guide dimensions when selecting a reamer. See special tools section of this instruction for reamer part numbers.

9. Place ordinary cup grease on the flutes of the reamer so the deposits will be removed with the reamer.
10. Work the reamer by hand and make sure cutting position has gone through entire length of guide. The one-inch pilot should be completely visible through the exhaust port or through spark plug hole using a dental mirror.
11. Wash the guide with Varsol or equivalent solvent and blow out with compressed air. Check the ID of the valve guide using the correct plug gage. Inspect the reamed hole to determine if the reamer has cut all the way to the exhaust port end of the guide; if it has not, and the exhaust port end of the hole appears dark colored, it is evident the guide is bell-mouthed and should be replaced. Lubricate valve guide.



Figure 2. View Through Exhaust Port Showing Mechanical Fingers Supporting Exhaust Valve Away From Guide

12. Using a magnetic pencil (reference Special Tool List) and flexible mechanical fingers, position tip of valve in guide and very carefully work the valve back into its guide. Extreme caution should be exercised

during this operation, making sure the valve is placed within the guide and not cocked, as damage could be done to the guide or valve.

CAUTION

Never use the piston to push the valve through the guide.

13. Install valve springs and valve spring seats in same position as removed. Compress valve spring and install keys in their respective position. In some cases it has been found that when the valve spring is compressed, the valve slides down the guide, making it impossible to install the keys. If this condition exists, reinsert the nylon rope (steps 4 & 5) to hold valve firmly on its seat while installing valve keys.
14. Remove hydraulic lifter and clean free of all oil; inspect for any malfunction. Clean ID of cam follower, reinstall hydraulic lifter.
15. Install push rod, then rotating cap, rocker arm and shaft.
16. Install rocker box cover and new gasket.

CAUTION

During reassembly, valve train components must be replaced in their original location. On 76 series engines, give special attention during reassembly to alignment of rocker arms, spacers and rocker arm fulcrums with the rocker arm retaining stud. All parts must be in proper alignment to assure correct dry tappet clearance. Misalignment could result in engine damage.

17. Make sure all flashlights, ropes, etc., have been removed from within the cylinder before proceeding to the next cylinder.
18. Install spark plugs (install exhaust manifold after all exhaust valve guides are cleaned).

NOTE

Any available reamer that is of the correct dimension can be used for this valve guide cleaning procedure. The following special tools section lists all Avco Lycoming valve guide reamers along with the reamer dimensions and corresponding plug gage. Reamers are manufactured with cutting tips made from various materials to ream valve guides made from different materials. Always consult Avco Lycoming Tool Catalog SSP-578, or the latest revision thereof, for the correct reamer when finish reaming a newly installed valve guide.

SPECIAL TOOLS REQUIRED:

Lycoming P/N	Nomenclature	Plug Gage
64684	Reamer, .4040/.4050 Finished ID	64514
ST-27	Reamer, .4370/.4380 Finished ID	ST-26
64900	Reamer, .4375/.4385 Finished ID	64901
ST-113-1	Reamer, (Ni-Resist) .4985/.4995 Finished ID	64927
ST-113-2	Reamer, (Ni-Resist) .4985/.4995 Finished ID	64927
ST-143-1	Reamer, (Ni-Resist) .4995/.5005 Finished ID	ST-155
ST-143-2	Reamer, (Ni-Resist) .4995/.5005 Finished ID	ST-155
ST-309-1	Reamer, (Ni-Resist) .5000/.5010 Finished ID	ST-314
ST-309-2	Reamer, (Ni-Resist) .5000/.5010 Finished ID	ST-314
ST-315	Reamer, (Bronze) .5000/.5010 Finished ID	ST-314
ST-338	Reamer, (Hand Expansion) .5000/.5010 Finished ID	ST-314
ST-25	Compressor, Valve Spring and Bar (all engines except 76 series and T10-541)	
ST-266	Compressor, Valve Spring and Bar (T10/T1G0-541)	
ST-419	Compressor, Valve Spring and Bar (76 Series)	
	A Flexible Two-Prong Mechanical Finger	
	A (pencil) Magnet (Maximum diameter 3/8") capable of reaching a minimum of 4"	



LIMITED WARRANTY ADJUSTMENT CERTIFICATE

BATTERY
PART NO. _____

ATTACH SERIAL NO.
LABEL FROM BATTERY

DESCRIPTION OF DEFECT _____

CELL S.G. AFTER
FULL CHARGE

1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.

INSTALLATION DATE _____

AIRCRAFT TIME IN _____

ADJUSTMENT DATE _____

AIRCRAFT TIME OUT _____

USEFUL SERVICE MONTHS _____

TOTAL SERVICEABLE TIME _____

CUSTOMER _____

DEALER _____

DISTRIBUTOR _____

PLEASE RETAIN WITH AIRCRAFT RECORDS TO PROCESS ADJUSTMENT

DEALER

Warranty claim will not be processed
unless this card is completed.

LIMITED WARRANTY

The battery described on this Limited Warranty form is warranted from the date of installation for the applicable warranty period against defects in workmanship and material and against failure, except where such failure is due to shipping damage, fire, crash, freezing, abuse, i.e. failure to regularly perform maintenance service or a faulty electrical system. To protect your investment the postage paid registration card must be completed and returned to Teledyne Battery Products within 30 days of installation. This warranty does not cover any consequential damage or injury, batteries that need recharging only, rental service costs, loss of time or use of the aircraft.

Should this battery fail to hold a charge within 6 months or 300 flight hours (whichever occurs first), it, at the Seller's option, will be repaired or replaced free of charge. Should this battery fail to hold a charge after 6 months or 300 flight hours (whichever occurs first), but within the warranty period, it, at the Seller's option, will be repaired or replaced for a pro rata charge based upon the useful service life of the battery, computed as follows:

The purchase price of the battery divided by the total months of warranty determines the monthly service charge. The number of months of useful service, multiplied by the monthly service charge, determines the total pro rata charge.

Freight and installation may be an extra charge and is not included in this warranty. This warranty and pro rata service adjustment agreement does not apply if: electrolyte other than as recommended by the factory has been used; if the manufacturer's code markings have been destroyed; if a battery is used of an electrical size smaller than that specified by the aircraft manufacturer.

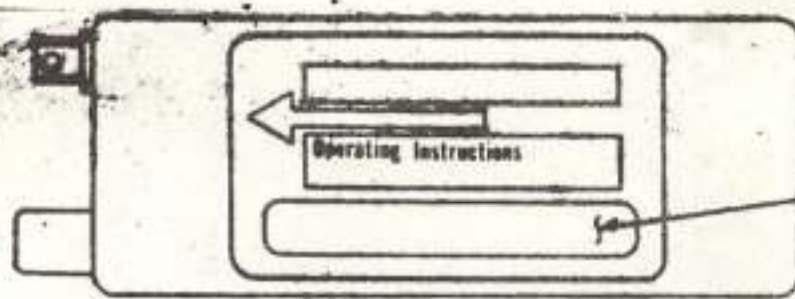
This warranty and adjustment agreement constitutes the entire agreement between Teledyne Battery Products and the Purchaser, and there are no other agreements or understandings regarding the subject matter hereof. Alterations or erasures in this agreement will render same void and of no effect.

TELEDYNE BATTERY PRODUCTS, REDLANDS, CALIFORNIA, U.S.A.

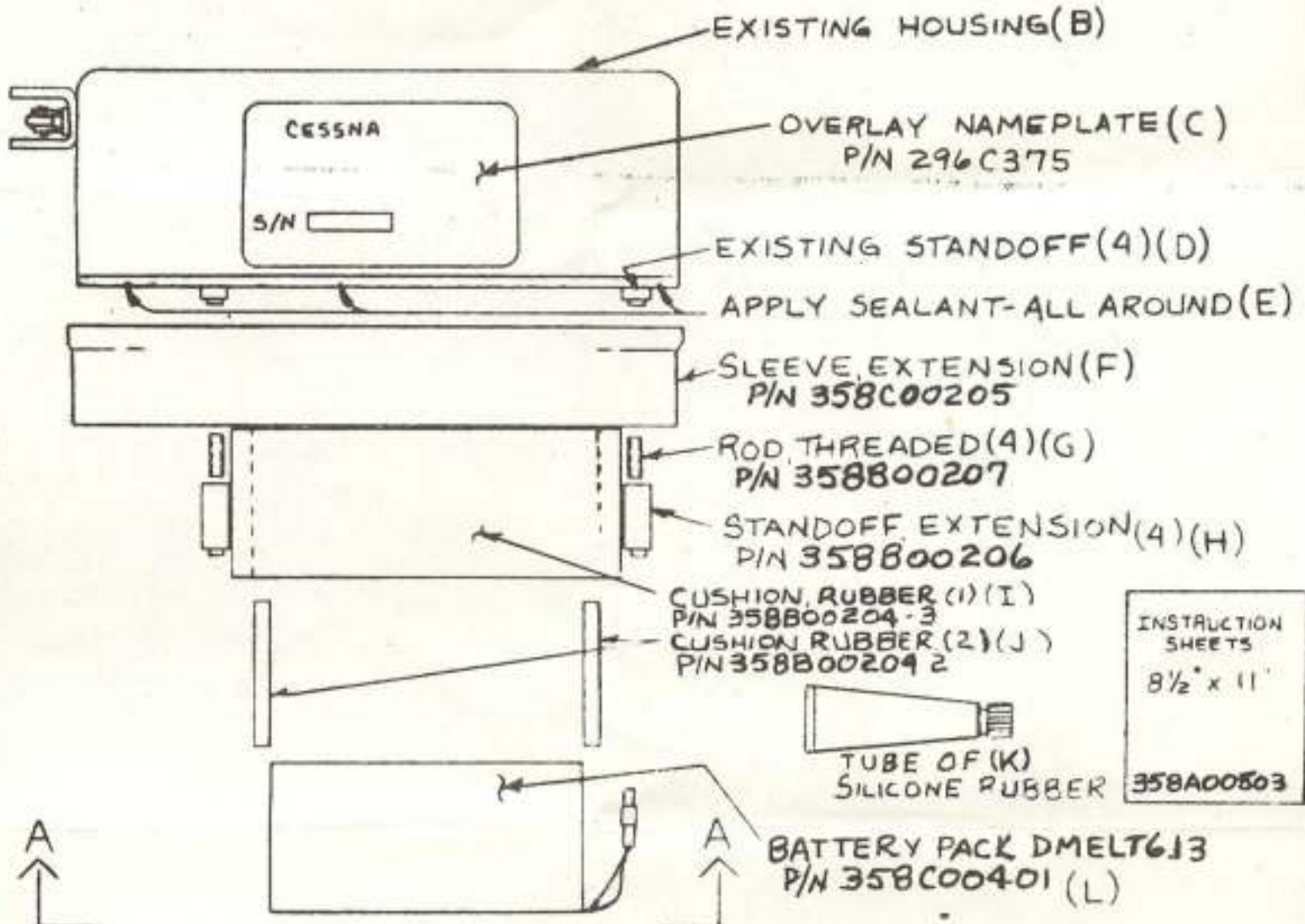
NOTE: THIS MODIFICATION MUST BE PERFORMED BY AN FAA APPROVED REPAIR STATION OR FAA CERTIFIED MECHANIC. AN ENTRY MUST BE MADE IN THE AIRCRAFT LOG SHOWING SATISFACTORY ACCOMPLISHMENT OF THIS MODIFICATION.

1. Remove the transmitter from the aircraft.
2. Place the transmitter switch in the "OFF" position.
3. Remove the four screws which secure the housing to the base plate and uncover the battery compartment. NOTE: Retain the screws.
4. Disconnect the battery pack electrical connector and remove the battery pack (DM ELT 6.11) and associated cushioning material. CAUTION: When disposing of battery do not incinerate or compact.
5. Apply loctite on each of the four threaded rods (Ref. G*) and thread into the four posts (Ref. D). If a threaded rod does not bottom into a standoff, then allow 15/32 to 17/32 of threaded rod length to extend beyond the existing standoff. After adjusting the threaded rods, the loctite must dry for 12 hours before proceeding to step 6.
6. Using loctite, thread each of the four stand-off extensions, counterbore end down (Ref. H), onto the four rods and tighten down.
7. Wipe the bottom edge of the ELT housing (Ref. B) with a clean rag. Alcohol can be used to remove any oil or grease residues.
8. Lay a 1/4" bead of adhesive-sealer (Silicone rubber) (Ref. K) around the entire perimeter on the outside bottom edge of the housing (Ref. E) and continue with step 9 immediately.
9. Press the edge of the housing into the extension sleeve joggle (Ref. F). Be sure that the two are firmly seated. Wipe off excess sealer on the inside and outside of the housing.
10. Peel paper backing from rubber cushion (Ref. I, 15" lg.) exposing adhesive side. Install rubber cushion to form rectangular perimeter, as shown in View A-A. Start by locating one end as shown near the battery connector and proceed by pressing it firmly against the standoffs and housing which it makes contact with. Be certain corners are square. Rubber cushion edge should come to within 1/16" of the edge of the extension sleeve (Ref. F) which contacts the baseplate. Peel paper backing from the two remaining rubber cushions (Ref. J) and install each one inside the area formed by the rubber cushion (Ref. I) by pressing the adhesive side against the existing rubber cushion, as shown in View A-A. (Top and bottom edges of Ref. J should be flush with the edges of Ref. I).
11. The electrical connectors of the battery pack (ELT 6.13) (Ref. L) and the ELT circuit, should be connected before battery installation.
12. Slide the battery pack (DM ELT 6.13) into the space formed by the rubber cushions while holding wires and connector. Battery replacement date must be visible. Press assembled electrical connector (Ref. R) onto the exposed adhesive side of the rubber cushion (Ref. J) as shown in View A-A.
13. Make note of battery replacement date.
14. Replace the base plate (Ref. M) so that the rubber seal covers the bottom of the ELT housing, use four screws (Ref. N). Tighten screws securely. (CAUTION: Make certain battery wires are not crimped or pinched between housing and base plate).
15. Remove the protective cover from the adhesive side of the nameplate overlay P/N 2968366 (Ref. A).
16. Locate the overlay on the nameplate on top of the transmitter so as to cover everything below "Operating Instructions" box (Ref. A).
17. Remove the protective cover sheet from the adhesive side of the Cessna nameplate overlay, P/N 296C375 (Ref. C).
18. Locate Cessna nameplate overlay over existing nameplate making sure the serial number is clearly visible in the window (Ref. C). Trim bottom of nameplate if it overlaps extension sleeve.
19. Verify the proper operation of the DM ELT 6, by listening to the ELT on a receiver tuned to 121.5 MHz and 243.0 MHz.
20. Add new battery replacement date to space provided in overlay (Ref. A). Remove date from front of unit under switch using MEK or other solvent and add new battery replacement date. Use permanent type of ink for marking.
21. The ELT retrofit should be cured for 12 hrs. at room temperature before reinstalling in the aircraft.
22. Reinstall the transmitter in the aircraft. (Entry must be made in aircraft log book showing satisfactory accomplishment of this modification.
23. Set the AUTO/OFF/ON Switch to the AUTO position.

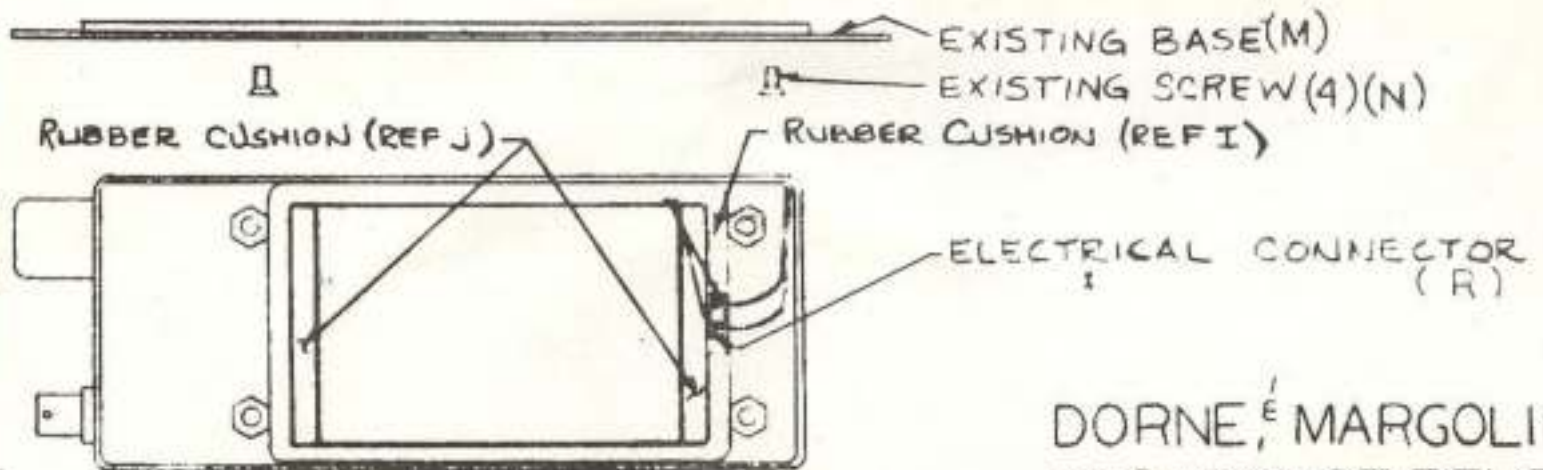
Installed ELT units must be tested periodically. Check with the control tower for the local regulations governing the testing of ELTS.



OVERLAY, NAMEPLATE (A)
P/N 296B366



INSTRUCTION
SHEETS
8 1/2" x 11"
358A00503



VIEW A-A

DORNE, MARGOLIN
358A00503 REVE