# FLYING A STAGGERWING

A lot has been written about the flying characteristics of the Staggerwing - some of it factual, but a good portion fiction. We thought some obersvations might be in order.

To begin with, an airplane has no bad habits which are not pilot induced. The Staggerwing was built in an era when all pilots learned to fly in tail wheel airplanes, many of which had terrible take-off and landing qualities. By comparison, the Staggerwing was docile. Today a different set of circumstances applies. Many present-day pilots received their training in tricycle gear airplanes on the basis of "if you can drive, you can fly". This is not to say that anyone who learned to fly in a Cessna 150 will get into trouble, but ten hours of take-offs and landings in a Luscombe or a Citabria are almost a "must" before tackling a Staggerwing if you have no previous tail wheel time. In fact, a couple of hours in a T6 would be most helpful.

Remember, it is your wellbeing that is on the line, plus we are dealing with a vanishing breed and an extremely valuable airplane.

After start-up, taxiing and control of the airplane can be accomplished by the use of brakes and rudder; in fact, during "S", turns very little braking will be required if 900 to 1000 RPM is used to give some air flow past the rudder, unless a cross-wind is present. Obviously, this does not apply to sharp turns.

Once the run-up is complete, the airplane should be centered on the runway and tail wheel locked. Most Staggerwings flying today have 450 HP in the nose, and the sudden application of power can be the beginning of an accident. Apply power slowly and smoothly. In fact, you may reach full power just about the time the tail starts to come up and the airplane becomes light on the gear. Above all, KEEP YOUR FEET OFF THE BRAKES. More people have gotten into trouble riding brakes on take-off than from any other cause. If you put your toes in the rudder cut-out, you lessen the chance of riding the brakes. Very little deflection of the rudder pedal from the top will activate the brakes if they are properly adjusted. Don't force the tail up at low speed. Wait until you have positive rudder control. KEEP YOUR FEET OFF THE BRAKES.

After take-off, keep air speed around 90 MPH to lessen the drag on the gear until fully retracted.

Landings are no problem if you follow a few simple rules. Be sure the tail wheel is in the locked position. It sounds like only an idiot would have it otherwise, but once changing pilots in the air, the control lever was moved into the unlocked position, which made for an interesting landing. Establish your glide at 80 to 90 MPH for a normal approach, decide whether a 3-point or tail low landing will be made, and plan accordingly.

If you are alone or without people in the rear seat, a 3-point landing can be made, but it takes more work. Most of us settle for a tail low landing under normal conditions. KEEP YOUR FEET OFF THE BRAKES. After touch-down of the main gear has been made, keep the airplane straight with the rudder. The most crucial time in the whole landing is the point where the tail stops

flying and the tail wheel contact is made. You must have the airplane straight with the runway during the 2 or 3 seconds the tail is dropping, because once the tail wheel is down, the direction the airplane is headed is where you are going. KEEP YOUR FEET OFF THE BRAKES until the airplane has slowed to a manageable speed - less than 40 MPH - then, if necessary, apply brakes evenly and sparingly.

Cross-wind landings call for a different technique. Unless a short runway is encountered, it is best to leave the flaps up and make a wheel landing. It's up to you whether to use "wind down" or "crab" approach; this is an argument which will never be resolved. Once ground contact has been made, apply down aileron into the wind and slowly lower the tail, with the airplane straight down the runway. KEEP YOUR FEET OFF THE BRAKES.

ROCKY WARREN DUB YARBROUGH JIM GORMAN

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Rocky reports he flew his D-17S 102 hours in September, 1973, at 23,000'-24,000' on a mapping contract for U.S. Forest Service.

## SERIAL NUMBERS AND APPROXIMATE DATES NEW MODELS WERE STARTED

| MODEL | SERIAL | DATE (APPROXIMATE) |
|---|---|---|
| B17L | 3 | May 1934 |
| A17F | 5 | |
| B17B | 20 | November 1934 |
| B17R | 38 | March 1935 |
| B17E | 49 | May 1935 |
| C17B | 67 | March 1936 |
| C17R | 73 | May 1936 |
| C17E | 78 | June 1936 |
| C17L | 83 | April 1936 |
| D17W | 136 | February 1937 (changed to D17S) |
| D17R | 137 | March 1937 |
| E17B | 138 | March 1937 |
| D17S | 146 | March 1937 |
| E17L | 161 | September 1937 |
| F17D | 211 | April 1938 |
| D17A | 305 | April 1939 |

## SERIAL NUMBERS

| B17L | | A17F | B17B | B17E | B17R | C17B | | C17R | C17E |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 29 | 5 | 20 | 22 | 38 | 67 | 106 | 73 | 78 |
| 4 | 30 | 11 | 48 | 49 | 50 | 84 | 108 | 74 | 117 |
| 6 | 31 | | | 51 | 52 | 85 | 110 | 75 | |
| 7 | 32 | | | | 53 | 86 | 111 | 76 | |
| 8 | 33 | | | | 54 | 87 | 112 | 77 | |
| 9 | 34 | | | | 55 | 88 | 121 | 79 | |
| 10 | 35 | | | | 56 | 89 | 123 | 80 | |
| 12 | 36 | | | | 63 | 90 | 125 | 81 | |
| 13 | 37 | | | | 64 | 91 | 126 | 82 | |
| 14 | 39 | | | | 65 | 92 | 127 | 113 | |
| 15 | 40 | | | | 66 | 93 | 128 | 114 | |
| 16 | 41 | | | | 68 | 94 | 129 | 115 | |
| 17 | 42 | | | | 69 | 95 | 130 | 116 | |
| 18 | 43 | | | | 70 | 96 | 131 | 118 | |
| 19 | 44 | | | | 71 | 97 | 132 | 119 | |
| 21 | 45 | | | | 72 | 98 | 133 | 120 | |
| 23 | 46 | | | | | 99 | 134 | 122 | |
| 24 | 47 | | | | | 101 | 135 | | |
| 25 | 57 | | | | | 102 | | | |
| 26 | 58 | | | | | 103 | | | |
| 27 | 59 | | | | | 104 | | | |
| 28 | 60 | | | | | | | | |
| | 61 | | | | | | | | |

## SERIAL NUMBERS

| C17L | D17S | | D17R | E17B | | E17L | D17W | F17D | | D17A |
|---|---|---|---|---|---|---|---|---|---|---|
| 83 | 136 | 304 | 137 | 138 | 196 | 161 | 164 | 211 | 276 | 305 |
| 100 | 146 | 306 | 148 | 139 | 197 | | | 225 | 277 | 356 |
| 105 (special) | 147 | 314 | 166 | 140 | 198 | | | 226 | 280 | 357 |
| 107 | 165 | 327 | 167 | 141 | 204 | | | 229 | 281 | 358 |
| 109 (special) | S168 | 354 | 180 | 142 | 205 | | | 230 | 282 | 359 |
| 124 | 179 | 355 | 181 | S143 | 206 | | | 240 | 283 | 360 |
| | 183 | 362 | 182 | 144 | 207 | | | 241 | 307 | 361 |
| | 185 | 385 | 184 | 145 | 208 | | | 242 | 308 | 363 |
| | 186 | 386 | 188 | 149 | 209 | | | 243 | 309 | |
| | 187 | 387 | 214 | S150 | S210 | | | 244 | 310 | |
| | 199 | 395 | 215 | 151 | 212 | | | 245 | 311 | |
| | 200 | 396 | 217 | 152 | 213 | | | 246 | 312 | |
| | 201 | 398 | 218 | 153 | 219 | | | 247 | 330 | |
| | 202 | 399 | 235 | 154 | 227 | | | 248 | 331 | |
| | 203 | 400 | 236 | 155 | 228 | | | 249 | 332 | |
| | 216 | 401 | 237 | 156 | 231 | | | 250 | 333 | |
| | 238 | 402 | 253 | 157 | 232 | | | 252 | 334 | |
| | 239 | 403 | 278 | 158 | 233 | | | 255 | 335 | |
| | 254 | 404 | 289 | 159 | 234 | | | 256 | 337 | |
| | 263 | 406 | 313 | S160 | 251 | | | 257 | 338 | |
| | 264 | 407 | 325 | 162 | 274 | | | 258 | 339 | |
| | 279 | 408 | 326 | 163 | 336 | | | 259 | 389 | |
| | 284 | 409 | 328 | 189 | 388 | | | 260 | 390 | |
| | 285 | 415 | 329 | 190 | 411 | | | 261 | 391 | |
| | 286 | 416 | 397 | 191 | | | | 262 | 392 | |
| | 287 | 417 | 405 | 192 | | | | 270 | 393 | |
| | 295 | 418 | | 193 | | | | 271 | 394 | |
| | 296 | 419 | | 194 | | | | 272 | 410 | |
| | 297 | 421 | | 195 | | | | 273 | 414 | |
| | 298 | | | | | | | 275 | | |
| | 299 | | | | | | | | | |
| | 300 | | | | | | | | | |
| | 301 | | | | | | | | | |
| | 302 | | | | | | | | | |
| | 303 | | | | | | | | | |

BEECHCRAFT MODEL 17
Engine Interchangeability

The following chart indicates the CAA approved airplane and engine combinations for this Model 17 series BEECHCRAFTS. Combinations, other than those on the chart, are not approved and engineering information is not available because required structural changes are considered prohibitive in cost.

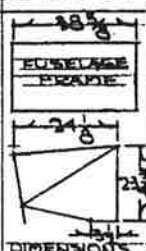
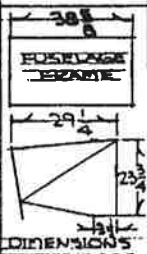
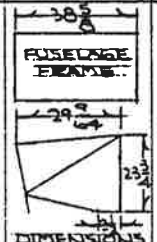
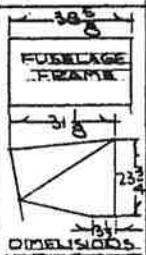
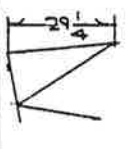
In the chart, original engine installations are indicated by an "X"; a numeral opposite the airplane model indicates the approved interchangeable engine installation and also references the footnote which outlines required changes.

| | BEECH ENGINE DESIGNATION | | | | | | |
|---|---|---|---|---|---|---|---|
| Airplane Model No. | A Wright R760-E-2 350 HP | B Jacobs L-5 285 HP | D Jacobs L-6 330 HP | E Wright 760-E-1 285 HP | L Jacobs L-4 225 HP | R Wright R975 420-450 HP | S P & W R-985 450 HP |
| B17L | | 1 | | | X | | |
| B17R | | | | 2 | | X | |
| B17E | | | | X | | 2 | |
| C17B | | X | | | 3 | | |
| C17R | | | | | | X | |
| C17L | | 4 | | | X | | |
| D17R | 1 | | | | | X | 5 |
| E17B | | X | 6 | | 7 | | |
| D17S | 5 | | | | | 5 | X |
| F17D | | 4 | X | | | | |
| D17A | X | | | | | 1 | 5 |

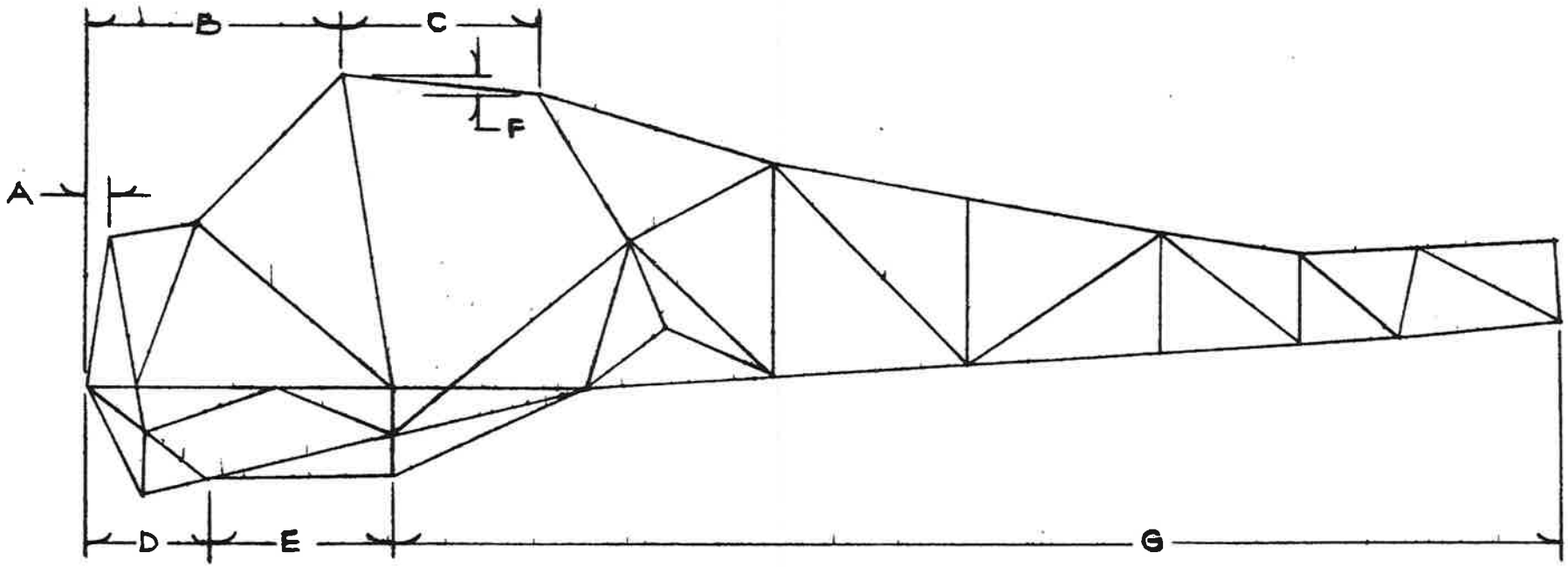
NOTES:

1. Major changes required in engine mounts, cowling, cowl support ring, cabin heater, carburetor heater, and exhaust stacks. Additional minor changes also required.
2. Only minor changes required.
3. Replacement of exhaust stacks and minor changes required.
4. Replacement of exhaust stacks, cabin heater, and carburetor heat required.
5. Complete change of all engine compartment components required.
6. Interchangeability effective only on airplanes with serial numbers above 211. Major changes required in engine mounts, cowling, cowl support ring, cabin heater, carburetor heater, and exhaust stacks. The battery must be moved to a new location. Airplane changes from E17 to F17 model.
7. Addition of engine baffles and minor installation changes required.

# RESUME OF BEECH MODELS C-17B, C-17L, C-17R, D-17R, D-17S, E-17B & F-17D

| MODEL | C-17R | D-17R | D-17S | C-17L | C-17B | E-17B | F-17D | |
|---|---|---|---|---|---|---|---|---|
| ENGINE | WRIGHT R-975E3 or E-2 | WRIGHT R-975E-3 | PRATT & WHITNEY JR. SB | JACOBS L-4 | JACOBS L-5 | JACOBS L-5, L-5M, L-5MB | JACOBS L-6, L-6M, L-6MB | PRATT & WHITNEY R-985-25 (T1B2) |
| METO LIMITS | 33 IN 1800 RPM 330 HP TO 28.5 IN 2100 RPM 330 HP | 34.5 IN 2200 RPM 420 HP | 33.5 IN 2200 RPM 400 HP | 2000 RPM 285 HP | 2000 RPM 285 HP | 2000 RPM 285 HP | 24.5 IN 2100 RPM 300 HP — 23.5 IN 2100 RPM 300 HP (3400 FT) | 37.5 IN 2300 RPM 450 HP SL — 37 IN 2300 RPM 450 HP (5000 FT) |
| TAKE-OFF (ONE MINUTE) | 1900 RPM 345 HP 35 IN 2200 RPM 420 HP | 36.5 IN 2250 RPM 450 HP | 34.5 IN 2200 RPM 400 HP 36.5 IN 2300 RPM 450 HP (WITH 87 OCTANE FUEL) | 2000 RPM 285 HP | 2000 RPM 285 HP | — | 26 IN 2200 RPM 330 HP | 37.5 IN 2300 RPM 450 HP |
| AIRSPEED LIMITS PLACARD $V_L$ $V_G$ | 206 MPH 225 MPH | 211 MPH 240 MPH | 211 MPH 240 MPH | 183 MPH 225 MPH | 183 MPH 225 MPH | 183 MPH 222 MPH | 189 MPH 222 MPH | |
| PROPELLER LIMITS MAXIMUM DIA. STATIC RPM | ——— ——— | 107 IN ——— | 107 IN ——— | ——— ——— | ——— ——— | 107 IN ——— | 107 IN ——— | |
| STANDARD WEIGHT LANDPLANE | 3915 LBS | 4250 LBS | 4250 LBS | 3165 LBS | 3165 LBS | 3390 LBS | 3590 LBS | |
| OIL CAPACITY | 6 GAL | 6.5 GAL | 6.5 GAL | 5 GAL | 5 GAL | 5 GAL | 5 GAL | |
| FUEL CAPACITY | 98 GAL | 102 GAL | 102 GAL | 74 GAL | 74 GAL | 77 GAL | 77 GAL | |
| C.G RANGE LANDPLANE | +16.6 IN TO +29.0 IN. | +16.4 IN TO +26.0 IN | +16.4 IN TO +26.0 IN. | +16.6 IN TO +29.4 IN | +16.6 IN TO +29.4 IN. | +17.4 IN TO +27.4 IN. | +17.4 IN TO +27.4 IN. | |
| DATUM | LEADING EDGE LOWER WING | ← | | | | | → | |
| ENGINE MOUNT DRAWING NUMBER | C17E910 | C17R910 | D17S910 D17S9100 | C17L910 | C17L910 | E17B910 | E17B910 | |
| ENGINE WEIGHT | 675 LBS | 675 LBS | 640 LBS | 480 LBS | 460 LBS | 460 LBS | 535 LBS | 653 LBS |
| FUSELAGE STRUCTURE DRAWING NUMBER | C17E400 | D17R400 | D17S400 | C17L400 | E17L400 (UP TO SERIAL NO 170) C17E400 (AFTER SERIAL NO 170) | E17B400 | E17B400 | |
| CONDITION I ULTIMATE GUST LOAD FACTOR | 5.846 | 5.696 | 5.696 | 6.39 | 6.39 | 6.072 | 6.383 | |
| CONDITION I ULTIMATE MANEUVERING LOAD FACTOR | 6.513 | 6.725 | 6.725 | 7.04 | 6.82 | 6.992 | 6.926 | |
| LANDING GEAR FRONT TRUSS | C17E410 | D17R410 | D17S410 | C17L410 | C17L410 (UP TO SERIAL NO 170) C17E410 (AFTER SERIAL NO 170) | E17B410 | E17B410 | |
| LANDING GEAR REAR TRUSS | C17E420 | D17R420 | D17S420 | C17L420 | C17L420 (UP TO SERIAL NO 170) C17E420 (AFTER SERIAL NO 170) | E17B420 | E17B420 | |
| LANDING GEAR ASSEMBLY | C17B800 | D17B800 | D17B800 | C17B800 | C17B800 | E17B800 | E17B800 | |
| WING ASSEMBLY | B17E100 | D17R100 | D17S100 | C17L100 | C17L100 | E17B100 | E17B100 | |
| "I" STRUT | B17E225 | D17R225 | D17S225 | C17L225 | C17L225 | E17B225 | E17B225 | |
| TAIL SURFACES ASSEMBLY | | D17B600 | D17B600 | | | | E17B6000 | |
| STABILIZER & ELEVATOR | B17B610 | D17B605 & D17B610 RESP. | D17B605 & D17B610 RESP. | B17B610 | B17B610 | B17B610 | B17B610 | |
| FIN & RUDDER | B17B620 | D17B630 & D17B620 RESP. | D17B630 & D17B620 RESP. | B17B620 | B17B620 | B17B620 | B17B6300 | |
| POWER LOADING | 12 | ← | | | | | → | |
| ENGINE MOUNT DIMENSIONS |   DIMENSIONS AT FUSELAGE |   DIMENSIONS AT FUSELAGE | SAME AS D-17R |   DIMENSIONS AT FUSELAGE | SAME AS C-17L |   DIMENSIONS AT FUSELAGE | SAME AS E-17B | MIN. POSSIBLE   |
| STANDARD WEIGHT SEAPLANE | 4105 | ——— | 4650 | 3525 | 3525 | 3740 | 3940 | |
| C.G RANGE SEAPLANE | +17.5 IN TO +25.9 IN. | ——— | +19.1 IN. TO +27.9 IN. | +19.4 IN TO +29.7 IN. | +19.4 IN TO +29.7 IN | +20.0 IN TO +28.7 IN. | +16.5 IN TO +23.5 IN. | |

# BEECH MODEL'S 17 FUSELAGE DIMENSIONS




| DRAWING | MODEL | DIMENSIONS | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G |
| D17400 | D17B, D17S | 3 1/2 | 39 1/2 | 70 1/2 | 16 1/2 | 47 1/2 | 3 1/32 | 229 5/8 |
| E17400 | E17B, E17D | 3 1/2 | 39 1/2 | 70 1/2 | 16 1/2 | 47 1/2 | 3 1/32 | 229 5/8 |
| C17L400 | C17B, C17L | 3 1/2 | 39 1/2 | 70 1/2 | 16 1/2 | 47 1/2 | 3 1/32 | 216 5/16 |
| C17E400 | C17B, C17E | 3 1/2 | 39 1/2 | 70 1/2 | 16 1/2 | 47 1/2 | 3 1/32 | 216 5/16 |

## STANDARD MODEL B17L

Power Plant:
- Engine - Jacobs L-4 - 225 h.p.
- Propeller - Hartzell #707 (wood)
- Carburetor
- Starter - Heywood Air or Eclipse E-80 Electric
- Fuel Pump
- Wobble Pump - D-2
- Vacuum Pump
- Generator - Bosch Type LE-70/12 - 1700 5-53
- Gen. Cont. Box
- Magneto
- Battery - Exide 6TS-13-1

Fuselage - Short Type:
- 216-5/16" long
- 39-1/2" across front
- 48-7/8" cabin depth

Landing Gear - Long Type:
- Retract - By air on and before Serial 36
  Electrical after Serial 36
- Retract Motor - Dumore Spec. 3549
- Brakes - Mechanical, cable cont.
- Wheels, Front - Autofan 24" streamline or Autofan 6.50x10 (optional)
- Wheels, Tail - Warner 10x3 Model B

Control Surfaces:
- Flaps & Aileron - on lower wing
- Flap Control - Lever & Cables
- Elevator Tabs - 1 R & 1 L

Tail Surfaces:
- Brace from fin to stabilizer (both sides)
- 2 braces from stabilizer to fuselage (both sides)

Instruments & Equipment:
- Instrument Panel, Standard Panel (B17380) consists of
  1 cut-out panel assembling on one main panel fastened with aluminum molding
  Optional Panel (B17380A) consists of floating panel mounted on one main solid panel with lord bushings

Standard Instruments:
- Air Speed Indicator - Kollsman Type 57-08
- Altimeter - Kollsman Type 19-011
- Oil Pressure Gage - Pioneer Type 505B
- Tachometer - Pioneer
- Oil Temperature Gage - Pioneer Type 506B
- Compass - Pioneer Type 718
- Ammeter - Standard Automobile

Performance Data:

Gross Weight - 3165 lbs.
Cruising Speed - 153 m.p.h.
Top Speed - 175 m.p.h.
Fuel Consumption Hourly - 13 gallons
Oil Consumption Hourly - 1 quart
Fuel Capacity - 50 gallons - consists of one 25 gallon tank located in each upper wing
Oil Capacity - 5 gallons
Landing Speed - 45 m.p.h.
Service Ceiling - 15,000 feet
Span - 32 feet
Height Overall - 8' 6"
Length Overall - 24' 5"

## STANDARD MODEL B17B

Power Plant:
- Engine - Jacobs L-5 - 285 H.P.
- Propeller - Curtiss #55501, Dia. 7' 9" fixed metal, pitch 8'
- Carburetor -
- Starter - Eclipse E-80 - Electric
- Fuel Pump -
- Wobble Pump -
- Vacuum Pump -
- Generator - Eclipse 15 amp.
- Gen. Cont. Box -
- Magneto -
- Battery - Exide 6TS-13-1

Fuselage - Short Type:
- 216-5/16" long
- 39-1/2" across front
- 48-7/8" cabin depth

Landing Gear - Long Type:
- Retract - by air on serial up to 20
  - Electric after serial 20
- Retract Motor - Dumore, Spec. 3549
- Brakes - Mechanical, cable cont.
- Wheels, Front - Autofan 24" streamline or Autofan 6.50 X 10 (optional)
- Wheel, Tail - Warner 10 X 3, Model B

Control Surfaces:
- Flaps & Ailerons - on lower wing
- Flap Control - Lever & cables
- Elevator Tabs - 1 R & 1 L

Tail Surfaces:
- Brace from fin to stabilizer (both sides)
- 2 braces from stabilizer to fuselage (both sides)

Instruments & Equipment:
- Instrument panel -
  - Standard Panel (B17380) consists of 1 cut-out panel assembling on 1 main panel, fastened with aluminum molding
  - Optional Panel (B17380A) consists of 1 floating panel mounted on 1 main solid panel with lord bushings.

Standard Instruments:
- Airspeed Indicator - Kollsman, Type 57-08
- Altimeter - Kollsman, Type 19-011
- Oil Pressure Gage - Pioneer, Type 505B
- Tachometer - Pioneer, Type 347
- Oil Temperature Gage - Pioneer, Type 506-B
- Compass - Pioneer, Type 718
- Ammeter - Standard Automobile

Performance & Data:

Gross Weight - 3165 lbs.
Cruising Speed - 153 m.p.h.
Fuel Capacity - 50 gal. - consists of one 25-gallon tank located in each upper wing
Oil Capacity - 5 gal.

## STANDARD MODEL B17R

Power Plant:
- Engine - Wright R975-E-2 or R975-E-3 -- 450 h.p.
- Propeller - Curtiss #55503, 8' 3" dia. (fixed metal), 9' 0" pitch
- Carburetor
- Starter - Eclipse E-80
- Fuel Pump
- Wobble Pump - D-2
- Vacuum Pump
- Generator - Eclipse G-1 (15 volt, 15 amp.)
- Gen Cont. Box
- Magneto
- Battery - Exide 6TS-13-1

Fuselage - Short Type:
- 216-5/16" long
- 39-1/2" across front
- 48-7/8" cabin depth

Landing Gear - Short Type:
- Retraction - by hand before serial 50
  Electric on serial 50 and after
- Retract Motor - Dumore Spec. 3549
- Brakes - Mechanical, cable cont.
- Wheels, Front - Autofan 24" streamline or Autofan 7.50x10 (optional)
- Wheel - Tail - Warner 10x3, Model 695

Control Surfaces:
- Ailerons on lower wings
- Flaps on upper wing
- Flaps controlled by lever and cables
- Elevator Tabs - 1 R & 1 L
- Rudder Tab

Tail Surfaces:
- Brace from fin to stabilizer (both sides)
- 2 braces from stabilizer to fuselage (both sides)

Instruments & Equipment:
- Instrument Panel
  - Standard Panel (B17380) consists of 1 cut-out panel assembling on 1 main panel, fastened with aluminum molding
  - Optional Panel (B17380A) consists of 1 floating panel mounted on 1 main solid panel with lord bushings

Standard Instruments:
- Altimeter - Kollsman Type 19
- Air Speed Indicator - Kollsman Type 57
- Tachometer - Pioneer Type 347
- Ammeter - A.C.
- Oil Temperature - Pioneer Type 506B
- Oil Pressure - Pioneer Type 505B
- Compass - Pioneer Type 718B

Standard Instruments: (cont'd.)
Bank & Turn - Pioneer Type 385B
Rate of Climb - Pioneer Type 374B
Cyl. Head Temp. Gage - Lewis
Fuel Pressure Gage
Manifold Pressure Gage
Gas Gage
Clock

Performance & Data:
Fuel Capacity - 70 gallons - 2 tanks
1 fuselage front - 23 gallons
1 fuselage rear - 42 gallons
Oil Capacity - 6 gallons
Top Speed - 211 m.p.h.
Cruising Speed - 185 m.p.h.
Landing Speed - 50 m.p.h.
Never exceed - 225 m.p.h.
Flaps never exceed - 100 m.p.h.
Service Ceiling - 20,000 ft.
Climb at sea level, full load - 1,400 ft. p.m.
*Useful load - 1,131 lbs.
*Baggage with a passenger in rear seat - 125 lbs.

Placard limits with controllable metal propeller maximum, except take-off.

| | | |
|---|---|---|
| Below 4,000 ft. pressure alt. | 28.5 in. hg., 2,200 r.p.m. | (330 h.p.) |
| 4,000 ft. and up " " | 27.0 in. hg., 2,200 r.p.m. | (330 h.p.) |
| Take-Off (one minute) | 35.0 in. hg., 2,200 r.p.m. | (420 h.p.) |

*Based on Weight & Balance Report of June 25, 1938

## STANDARD MODEL B17E

Power Plant:
- Engine - Wright R760E-1 285 H.P.
- Propeller - Curtiss #55503, 7' 6" pitch, 7' 6" dia. fixed (metal)
- Carburetor -
- Starter - Eclipse E-80
- Fuel Pump -
- Wobble Pump -
- Vacuum Pump -
- Generator - Eclipse G-1, 15 volt, 15 amp.
- Gen. Cont. Box -
- Magneto -
- Battery - Exide 6TS-13-1

Fuselage - Short Type:
- 216-5/16" long
- 39-1/2" across front
- 48-7/8" cabin depth

Landing Gear - Short Type:
- Retract - By hand up to serial 49
  - Electric on Serial 49 and after
- Retract Motor - Dumore Spec. 3549
- Brakes - Mechanical, cable cont.
- Wheels, Front - Autofan 24" streamline or Autofan 7.50 X 10 (optional)
- Wheel, Tail - Warner, 10 X 3, Model 695

Control Surfaces:
- Ailerons on lower wing
- Flaps on upper wing
- Flaps controlled by lever and cables
- Elevator Tab - 1 R & 1 L
- Rudder Tab

Tail Surfaces:
- Brace from fin to stabilizer (both sides)
- 2 braces from stabilizer to fuselage (both sides)

Instruments & Equipment:
- Instrument Panel:
  - Standard Panel (B17380) consists of 1 cut-out panel assembling on 1 main panel, fastened with aluminum molding.
  - Optional Panel (B17380A) consists of 1 floating panel mounted on 1 main solid panel with lord bushings.

Standard Instruments:
- Oil Pressure Gage - Pioneer Type 505B
- Oil Temperature Gage - Pioneer Type 506B
- Tachometer - Pioneer Type 347
- Compass - Pioneer Type 718B
- Turn & Bank Indicator - Pioneer Type 385B
- Rate of Climb Indicator - Pioneer Type 374B
- Altimeter - Kollsman Type 19

Standard Instruments (cont.)
- Air Speed Indicator - Kollsman Type 57 0-300 m.p.h.
- Ammeter - A.C.
- Gas Gage
- Cyl. Head Temp. Gage - Lewis
- Fuel Pressure Gage -

Performance & Data:
- High Speed - 185 m.p.h.
- Cruising Speed - 165 m.p.h.
- Landing Speed - 55 m.p.h.
- Gross Weight - 3615 lbs.
- Fuel Capacity - 70 gallons
  - Fuselage front 28-gallon tank
  - Fuselage rear 42-gallon tank
- Oil Capacity - 6 gallons
- Fuel consumption 17-1/2 gallons per hour
- Service Ceiling - 18,000 ft.
- Span - 32 ft.
- Height Overall - 8' 2"
- Length Overall - 24' 5"

## STANDARD MODEL C17B

Power Plant:
- Engine - Jacobs L-5 285 H.P.
- Propeller - Curtiss #55501, dia. 7' 9", pitch 8' (fixed metal)
- Carburetor -
- Starter - Eclipse E-80
- Fuel Pump -
- Wobble Pump - D-2
- Vacuum Pump -
- Generator - Eclipse 3171-R - 15 amp.
- Gen. Cont. Box -
- Magneto -
- Battery - Exide 6TS-13-1

Fuselage - Short Type:
- 216-5/16" long
- 38-5/8" across front
- 48-7/8" cabin depth

Landing Gear - Short Type:
- Retraction - Electric
- Retract Motor - Dumore Type KL Spec. 3549C
- Brakes - Mechanical, cable controlled
- Wheels, Front - Autofan 24" streamline or Autofan 7.50 X 10 (optional)
- Wheel, Tail - Warner 10 X 3 Model 695

Control Surfaces:
- Flaps & Ailerons on lower wings
- Flaps controlled by lever and cables
- Elevator Tabs - 1 R & 1 L

Tail Surfaces:
- Brace from fin to stabilizer (both sides)
- 2 braces from stabilizer to fuselage (both sides)

Instruments & Equipment:
- Instrument Panel consists of:
  - 1 upper left floating panel
  - 1 right fixed or floating panel (optional) assembling on one main solid panel.

Standard Instruments:
- Air Speed Indicator - Pioneer #354
- Altimeter - Pioneer - 743-B (2 rev.)
- Ammeter - Moto-Meter 7079A
- Climb Indicator - Pioneer 374-B
- Compass - Pioneer 718-B
- Fuel Gage - Commercial
- Oil Pressure Gage - Pioneer 505-B
- Oil Temperature Gage - Pioneer 506-B
- Tachometer - Kollsman 170-01
- Turn & Bank Indicator - Pioneer 385-C
- Manifold Pressure (std. on serials 67,83, 84, 85, 86, and 87)

Performance & Data:

- Cruising Speed - 165 m.p.h.
- High Speed - 185 m.p.h. (approximately)
- Landing Speed - 45 m.p.h.
- Gross Weight - 3165 lbs.
- Fuel Capacity - 74 gallons - 3 tanks
  - 1 23-gallon tank in each upper wing
  - 1 28-gallon fuselage tank
- Oil Capacity - 5 gallons
- Fuel Consumption - 17-1/2 gallons per hour
- Service Ceiling - 18,000 ft.
- Span - 32 ft.
- Height Overall - 8' 6"
- Length Overall - 24' 5"

## STANDARD MODEL C17R

Power Plant:
- Engine - Wright R-975-E-2/ R-975-E-3/ 450 H.P.
- Propeller - Curtis #55503 (fixed metal) dia. 8' 3", pitch 9'-0"
- Carburetor -
- Starter - Eclipse E-80
- Fuel Pump - D-2
- Wobble Pump -
- Vacuum Pump -
- Generator - Eclipse 3171-R (15 volt - 15 amp.)
- Gen. Cont. Box
- Magneto
- Battery - Exide 6TS-13-1

Fuselage - Short Type:
- 216-5/16" long
- 38-5/8" across front
- 48-7/8" cabin depth

Landing Gear - Short Type:
- Retraction - Electric
- Retract Motor - Dumore KL Spec. 3549C
- Brakes - Mechanical, cable controlled
- Wheels, front - Autofan - 24" streamline or Autofan 7.50 X 10 (optional)
- Wheel, Tail - Warner 10 X 3 Model 695

Control Surfaces:
- Flaps - on upper wings
- Ailerons - on lower wings
- Flaps controlled by lever and cables
- Elevator Tabs - 1 R & 1 L

Tail Surfaces:
- Brace from fin to stabilizer (both sides)
- 2 braces from stabilizer to fuselage (both sides)

Instruments & Equipment:
- Instrument Panel consists of:
  - 1 upper left floating panel
  - 1 upper right fixed or floating panel (optional) assembling on one main solid panel

Standard Instruments:
- Air Speed Indicator - Pioneer #354
- Altimeter - Pioneer 743-B (2 rev.)
- Ammeter - Moto-Meter 7079-A
- Climb Indicator - Pioneer 374-B
- Clock - Pioneer 543-H
- Compass - Pioneer 941
- Fuel Pressure Gage - Pioneer 751
- Fuel Gage - Commercial
- Head Temperature Indicator - Weston 602-2
- Manifold Pressure Gage - Pioneer 791-B

Standard Instruments (cont.)
- Oil Pressure Gage - Pioneer 505-B
- Oil Temperature Gage - Pioneer 506-B
- Outside Air Temp. Thermometer - Taylor
- Tachometer - Pioneer 347-C
- Turn & Bank Indicator - Pioneer 385-C

Performance & Data:
- High Speed - 211 m.p.h.
- Cruising Speed - 185 m.p.h.
- Landing Speed - 50 m.p.h.
- Service Ceiling - 20,000 ft.
- Gross Weight - 3915 lbs.
- Fuel Capacity - 98 gallons - 3 tanks
  - 1 fuselage front tank - 28 gal.
  - 1 fuselage rear tank - 47 gal.
  - 1 lower wing tank - 23 gal.
- Oil Capacity - 6 gallons
- Span - 32 ft.
- Height Overall - 8' 2"
- Length Overall 24' 5"

## STANDARD MODEL C17E

Power Plant:
- Engine - Wright R-760-E-1 - 285 H.P.
- Propeller - Curtiss #55503 (fixed metal) pitch 7' 6", dia. 7' 6"
- Carburetor -
- Starter - Eclipse E-80
- Fuel Pump -
- Wobble Pump -
- Vacuum Pump -
- Generator - Eclipse 3171-R (15 volt, 15 amp.)
- Gen. Cont. Box -
- Magneto -
- Battery - Exide 6TS-13-1

Fuselage - Short Type
- 216-5/16" long
- 38-5/8" across front
- 48-7/8" cabin depth

Landing Gear - Short Type
- Retraction - Electric
- Retract Motor - Dumore KL Spec. 3549C
- Brakes - Mechanical, cable controlled
- Wheels, front - Autofan - 24" streamline or Autofan 7.50 X 10 (optional)
- Wheel, Tail - Warner 10 X 3 Model 695

Control Surfaces:
- Flaps - on upper wing
- Ailerons - on lower wings
- Flaps controlled by lever and cables
- Elevator Tabs - 1 R & 1 L

Tail Surfaces:
- Brace from fin to stabilizer (both sides)
- 2 braces from stabilizer to fuselage (both sides)

Instruments & Equipment:
- Instrument panel consists of:
  - 1 upper left floating panel
  - 1 upper right fixed or floating panel (optional) assembling on one main solid panel

Standard Instruments:
- Altimeter -
- Air Speed -
- Tachometer -
- Ammeter -
- Oil Temperature -
- Oil Pressure -
- Compass -
- Gas Gage -
- Bank & Turn -
- Rate of Climb -
- Cyl. Head Temp. Gage - Lewis
- Fuel Pressure Gage -

Performance & Data:

Cruising Speed - 185 m.p.h.
Gross Weight 3615 lbs.
Fuel Capacity - 98 gallons - 3 tanks;
1 fuselage front - 28 gals.
1 fuselage rear - 47 gals.
1 lower wing tank - 23 gals.
Oil Capacity - 6 gallons

## STANDARD MODEL C17L

Power Plant:
- Engine - Jacobs L-4 - 225 H.P.
- Propeller - Hartzell #707 (wood)
- Carburetor -
- Starter - Eclipse E-80
- Fuel Pump -
- Wobble Pump - Aero Supply - Type D-2
- Vacuum Pump -
- Generator - Bosch Type LE 70/12 - 1700 S-53 (10 amp.)
- Gen. Cont. Box -
- Magneto -
- Battery - Exide 6TS-13-1

Fuselage - Short Type:
- 216-5/16 in. long
- 38-5/8 in. across front
- 48-7/8 in. cabin depth

Landing Gear - Short Type
- Retraction - Electric
- Retract Motor - Dumore Type KL Spec. 3549C
- Brakes - Mechanical, cable controlled
- Wheels, front - Autofan - 24" streamline or Autofan 7.50 X 10 (optional)
- Wheels, Tail - Warner 10 X 3, Model 695

Control Surfaces:
- Flaps & Ailerons on lower wings
- Flaps controlled by lever and cables
- Elevator Tabs - 1 R & 1 L

Tail Surfaces:
- Brace from fin to stabilizer (both sides)
- 2 braces from stabilizer to fuselage (both sides)

Instruments & Equipment:
- Instrument Panel consists of:
  - 1 upper left floating panel
  - 1 right fixed or floating panel (optional) assembling on 1 main solid panel

Standard Instrument:
- Air Speed Indicator - Pioneer #354
- Altimeter - Pioneer 743-B (2 rev.)
- Ammeter - Moto-Meter 7079-A
- Compass - Pioneer 718-B
- Fuel Gage - Commercial
- Oil Pressure Gage - Pioneer 505-B
- Oil Temperature Gage - Pioneer 506-B
- Tachometer - Kollsman - 170-01

Performance & Data:

- High Speed - 175 m.p.h.
- Cruising Speed - 150 m.p.h. (with wood prop.)
- Landing Speed - 45 m.p.h.
- Service Ceiling - 15,000 ft.
- Gross Weight - 3165 lbs.
- Fuel Consumption - 14 gallons per hour
- Fuel Capacity - 74 gallons - 3 tanks
  - 1 23 - gal. tank in each upper wing
  - 1 28 - gal. fuselage tank
- Oil Capacity - 5 gals.
- Span - 32 ft.
- Height Overall - 8' 6"
- Length Overall - 24' 5"

## STANDARD MODEL D17R

Power Plant:
- Engine - Wright R-975E-3 Or 450 H.P.
  R-975E-2
- Propeller - Hamilton Std. Hub-2030-233 - Blades 6167A-15
- Carburetor -
- Starter - Eclipse E-80
- Fuel Pump - Romec RD-1760 (with fuel capacity up to 145 gal)
  Romec RD-2132 (with fuel capacity over 145 gal)
  (for serials up to 164)
  Romec RD-3080 (after serial 164 and on serials 235, 236, 237 and 239)
  Romec R400-BC (after serial 218 except as above)
- Wobble Pump - Aero Supply - Type D-2
- Vacuum Pump -
- Generator - Eclipse #3171 - 15 amp.(with radio - 25 amp.)
- Gen. Cont. Box - Eclipse CB-97 - 15 amp. (standard)
  Eclipse CB-67-10 - 25 amp. (with radio instal.)
- Magneto - Scintilla VAG9DF
- Battery - Exide 6TS- 13-1

Fuselage - Long Type
- 229-5/8" long
- 38-5/8" across front
- 48-5/8" cabin depth

Landing Gear - Short Type:
- Retraction - Electrical
- Retract Motor - S-38 (Dumore Type D-5)
- Brakes - Mechanical, cable controlled (before serial 145)
  Hydraulic (after serial 145)
- Wheels, front - Autofan 24" streamline or Autofan 7.50 X 10 (optional)
  (before and on serial 145)
  Goodyear Model HBM ATC 37 hyd. (after serial 145)
- Wheel, Tail - Hayes Industries K1AC-3 (before and on serial 305)
  Goodyear 95-021 - 10" smooth contour or any approved equivalent tail wheel) (after serial 305)

Control Surfaces:
- Ailerons on upper wings
- Flaps on lower wings
- Flaps controlled electrically - Chain Type (on serial 239 and on and before 237)
  Flexible shaft type (after serial 237 except serial 239)
- Flap Motor - Dumore KL (ratio as on Dwg. S-39)(up to and on serial 151)
  Dumore KL-34-1 (ratio as on Dwg. S-48)(after serial 151, up to and on serial 237 and on 239)
  Dumore Special 4253, Type K (after serial 237 except 239)
- Elevator Tabs - 1 R and 1 L
- Rudder Tab

Tail Surfaces:
The fixed surfaces are of cantilever construction and no struts or bracing wires are used.

Instruments & Equipment:
Instrument Panel consists of:
1 upper left floating panel
1 upper right fixed or floating panel (optional)
Auxiliary panel assembling on 1 main solid panel

Standard Instruments:
Turn & Bank Ind. - Pioneer 1700-1A-A1
Vertical Speed - Pioneer 374G (up to and on serial 208)
Kollsman 164-02 (after serial 208)
Altimeter - Pioneer 2100-4A1-A2
Manifold Pressure - Pioneer 1905-1C-A1 (up to and on 404)
Kollsman 175H-01 (after serial 404)
Tachometer - Pioneer 347C (up to and on serial 216)
Kollsman 218H-01 (after serial 216)
Air Speed - Pioneer 1404-1A-A1 (up to and on serial 404)
Kollsman 157-H-09 (after serial 404)
Fuel Pressure - Pioneer 751 (up to and on serial 225)
Kollsman 130F-01 (after serial 225)
(fuel pressure gage not used after serial 264)
Oil Pressure - Pioneer 505B (up to and on serial 237)
Kollsman 131-01 (after serial 237)
(oil pressure gage not used after serial 264)
Oil Temperature - Pioneer 506B
(not used after serial 264)
Engine Gage Unit - Kollsman Type 150-03 (beginning with Serial 264)
U.S. Gage Company - BU-1619A (after serial 404)
Head Temp. Gage - Weston 602
Clock - Pioneer 543-H (up to and on serial 404)
Kollsman 133-01 (after serial 404)
Compass - Pioneer 1803A-2 (up to and on serial 404)
Kollsman Type 58-BL (after serial 404)
Ammeter - Weston 606
Fuel Gage - Chevrolet AC363779
Elev. Tab Position Gage - Chevrolet AC363779 (with Beech D17773-5 face)

Performance & Data:
Cruising Speed - 202 m.p.h.
Landing Speed - 50 m.p.h.
Service Ceiling - 24,000 ft.
Fuel Consumption - 23 gallons per hour
Oil consumption - 1/2 to 1 gallon per hour
Gross Weight - 4250 lbs.
Fuel Capacity - 102 gallons - 3 tanks:
(1 fuselage - 29 gal. - 1 fuselage 49 gals. and
1 right lower wing 24 gals.)
101 gallons (after serial 329) - wing tanks 23 gals.
Oil Capacity - 6-1/2 gallons
Span - 32 ft.
Overall Height - 8 ft.
Overall Length - 26 ft. 10-11/16 in.

## STANDARD MODEL E17B

Power Plant:
- Engine - Jacobs L-5, 285 H.P.
- Propeller - Curtiss-Reed #55501, dia. 7' 9", pitch 7' 9"
- Carburetor
- Starter - Eclipse E-80
- Fuel Pump - Romec RD 2124 (on serials 138 & 139)
  Romec RD 1760 (on L-5 eng. after serial 139)
  Romec RD 3080 (on L-5 eng. after serial 153)
  (and on serials 204, 205, 206, 208, 209, 210, 213, 219, 227)
  Romec RD 2022 (on L-5M & L-5MB eng. after serial 153)
  (and on serial 207)
  Pesco R400BA (on serial 228)
  Pesco R400BLH (after serial 228)
  (on L-5M, L-5MB eng. - used on L-5MB only with vacuum pump)
  Pesco R400BC (after serial 228 for L-5 eng.)
- Wobble Pump - Aero Supply Type D-2
- Vacuum Pump - Pesco #194, Type B-2A (optional equipment)
- Generator - Eclipse #3171, 15 amp, (if radio was used, 25 amp.)
- Gen. Cont. Box - Eclipse CB-97, 15 amp.
- Magneto - Scintilla MN7-DF5
- Battery - Exide 6TS-13-1

Fuselage - Long Type:
- 229-5/8" long
- 38-5/8" across front
- 48-5/8" cabin depth

Landing Gear - Short Type:
- Retraction - Electrical
- Retract Motor - S-38 (Dumore Type D5, Ratio 5-1)
- Brakes - Mechanical, cable controlled (before and on serial 150)
  hydraulic (after serial 150)
- Wheels, Front - Auto fan 24" streamline or 7.50 X 10 (before and on serial 150) Goodyear 7.50 X 10 Model 10HBM ATC 37 hyd. (after serial 150)
- Wheels, Tail - Hayes Industries 10 X 3, No. K1AC3 (before & on serial 305)
  Goodyear 95-021 10" smooth contour or approved equivalent (after serial 305)

Control Surfaces:
- Ailerons on upper wing
- Flaps on lower wing
- Flaps controlled electrically Chain Type (before and on 234 except 211)
  Flexible shaft mech. (used on serial 211 and after 234)
- Flap Motor - Dumore KL (ratio as on Dwg. S-39) (up to and on serial 151)
  Dumore KL-341 (ratio as on Dwg. S-48)
  (after serial 151 except 211 and up to and on serial 234)
  Dumore Special 4253 Type K (on serial 211 and after serial 234)
- Elevator Tab - 1 L.H. only

Tail Surfaces:
- Strut from Fin to Stabilizer (both sides)
- 2 struts from Stabilizer to fuselage (both sides)

Instruments & Equipment:
Instrument Panel consists of:
1 upper left floating panel
1 upper right fixed or floating panel (optional)
Auxiliary panel assembly on 1 main solid panel

Standard Instruments:
Bank & Turn - Pioneer 1700-1A-A1
Vertical Speed - Pioneer Type 374G (up to and on serial 208)
Kollsman 164-02 (after serial 208)
Altimeter - Pioneer 2100-4A1-A2
Tachometer - Pioneer 347C (up to and on serial 216)
Kollsman 218H-01 (after serial 216)
Air Speed - Pioneer 1404-1A-A1 (up to and on serial 409)
Kollsman 157-H-09 (after serial 409)
Fuel Pressure - Pioneer 751 (on and before serial 225)
Kollsman 130F-01 (after serial 225)
(inst. not used after serial 409)
Oil Pressure - Pioneer 505B (on and before serial 237)
Kollsman 131-01 (after serial 237)
(inst. not used after serial 409)
Oil Temperature - Pioneer 506B (on and before serial 409)
(inst. not used after serial 409)
Engine Gage Unit - U.S. Gage Co. BU-1619-A (beginning after serial 409)
Compass - Pioneer 1810-1A
Ammeter - Weston Model 606
Fuel Gage - Chevrolet AC363779
Elev. Tab Position Gage - Chevrolet AC363779 (with Beech D17773-5 face)

Performance & Data:
Cruising Speed - 177 m.p.h. at 7,200 ft.
Landing Speed - 45 m.p.h.
Service Ceiling - 18,000 ft.
Gross Weight - 3390 lbs.
Span - 32 ft.
Overall Height - 8 ft.
Overall Length - 25' 11-1/4"
Fuel Consumption - 16.8 gallons per hour
Fuel Capacity - 77 gallons - 3 tanks
1 front fuselage - 29 gals.
1 right lower wing - 24 gals.
1 left lower wing - 24 gals. (on and before serial 329)
Fuel capacity 75 gals. and all wing tanks 23 gals. (after serial 329)

Oil Capacity - 6-1/2 gallons (before and on serial 404)
5 gallons (after serial 404)

## STANDARD MODEL D17S

Power Plant:
- Engine - Pratt & Whitney Wasp JR-SB 450 H.P.
- Propeller - Hamilton Std. Hub 2D30-227 - Blades 6167A-15
- Carburetor -
- Starter - Eclipse E-80
- Fuel Pump - Romec RD-176C (with fuel cap. up to 145 gal.) /for serials to 164
  Romec RD-2132 (with fuel cap. over 145 )
  Romec RD 3080 (after serial 164)
  Romec R-400BA (on serial 216)
  Romec R-400BC (after serial 216)
- Wobble Pump - Aero Supply - Type D-2
- Vacuum Pump - Pesco 194-D
- Generator - Eclipse #3171 - 15 amp. (with radio - 25 amp.)
- Gen. Cont. Box - Eclipse CB-97 - 15 amp.
- Magneto - Scintilla SB9R
- Battery - Exide 6TS-13-1

Fuselage - Long Type:
- 229-5/8 in. long
- 38-5/8 in. across front
- 48-5/8 in. cabin depth

Landing Gear - Short Type:
- Retraction - Electrical
- Retract Motor - S-38 (Dumore Type D-5)
- Brakes - Mechanical, cable controlled (before serial 145)
  Hydraulic (after serial 145)
- Wheels: front - Autofan 24" streamline or autofan 7.50 X 10 (optional) (before serial 145)
  Goodyear Model HBM ATC 37 hyd. (after serial 145)
- Wheel, Tail - Hayes Industries #K1AC-3 (before and on serial 305)
  Goodyear 95-021 - 10" smooth contour or any approved equivalent tail wheel (after serial 305)

Control Surfaces:
- Ailerons on upper wings
- Flaps on lower wings
- Flaps controlled electrically - Chain Type (on serial 239 and on and before serial 237)
  Flexible Shaft Type (after serial 237 except serial 239)
- Flap Motor - Dumore KL (ratio as on dwg. S-39) (up to and on serial 151)
  Dumore KL-34-1 (ratio as on dwg. S-48) (after serial 151 - up to and on serial 237 and on serial 239)
  Dumore Special 4253 Type K (after serial 237 except serial 239)
- Elevator Tabs - 1 R & 1 L
- Rudder Tab

Tail Surfaces:
The fixed surfaces are of cantilever construction and no struts or bracing wires are used.

Instruments & Equipment:
Instrument Panel consists of:

Instruments & Equipment (cont.)
1 upper left floating panel
1 upper right fixed or floating panel (optional)
Auxiliary Panel - Assembling on 1 main solid panel

Standard Instruments:
Turn and Bank Ind. - Pioneer 1700-1A-A1
Vertical Speed - Pioneer 3746 (up to and on serial 208)
Kollsman 164-02 (after serial 208)
Altimeter - Pioneer 2100-4A1-A2
Manifold Pressure - Pioneer 1905-1C-A1 (up to and on serial 404)
Kollsman 175H-01 (after serial 404)
Tachometer - Pioneer 347C (up to and on serial 216)
Kollsman 218H-01 (after serial 216)
Air Speed - Pioneer 14041A-A1 (up to and on serial 404)
Kollsman 157-H-09 (after serial 404)
Fuel Pressure - Pioneer 751 (up to and on serial 225)
Kollsman 130F-01 (after serial 225)
(fuel pressure gage not used after serial 264)
Oil Pressure - Pioneer 505B (up to and on serial 237)
Kollsman 131-01 (after serial 237)
(oil pressure gage not used after serial 264)
Oil Temperature - Pioneer 500B
Engine gage Unit - Kollsman Type 150-03 (after serial 264)
U.S. Gage Company BU-1619A (after serial 404)
Head Temp. Gage - Weston 602
Clock - Pioneer 543-H (up to and on serial 404)
Kollsman 133-01 (after serial 404)
Compass - Pioneer 1803A-2 (up to and on serial 404)
Kollsman Type 58 BL (after serial 404)
Ammeter - Weston 606
Fuel Gage - Chevrolet AC363779
Elevator Tab Position Gage - Chevrolet AC363779 (with Beech D17773-5 face)

Performance & Data:
Cruising Speed - 202 m.p.h.
Landing Speed - 50 m.p.h.
Service Ceiling - 26,000 ft.
Fuel Consumption - 23 gallons per hour
Oil Consumption - 1/2 to 1 gallon per hour
Gross Weight - 4250 lbs.
Fuel Capacity - 102 gallons - 3 tanks
1 fuselage - 29 gals.
1 fuselage - 49 gals.
1 lower right wing - 24 gals.
- 101 gallon capacity (after serial 329)
(wing tanks 23 gals. after serial 329)
Oil Capacity - 6-1/2 gals.
Span - 32 ft.
Overall Height - 8 ft.
Overall Length - 25 ft. 11-1/16 in.

## STANDARD MODEL F17D

Power Plant:
- Engine - Jacobs L-6, L-6M, L-6MB - 330 HP
- Propeller - Curtiss-Reed #55501, dia. 8' - pitch 8' 3"
- Carburetor -
- Starter - Eclipse E-80
- Fuel Pump - Romec RD 3080 (on serials 211, 225 & 226)
  Pesco R400BA (on serials 229 and 230)
  Pesco R400BC (after serial 230)
  Pesco R400BLH (after serial 230) - when vacuum pump was installed
- Wobble Pump - Aero Supply - Type D-2
- Vacuum Pump - Pesco #194 - Type B-2A (optional equipment)
- Generator - Eclipse #3171 - 15 amp. (if radio was installed - 25 amp.)
- Gen. Cont. Box - Eclipse CB-97 - 15 amp.
- Magneto -
- Battery - Exide 6TS-13-1

Fuselage - Long Type:
- 229-5/8" long
- 38-5/8" across front
- 48-5/8" cabin depth

Landing Gear - Short Type:
- Retraction Electrical
- Retract Motor - S-38 (Dumore Type D5 - ratio 5-1)
- Brakes - Hydraulic
- Wheels, Front - Goodyear 7.50 X 10 - Model HBM ATC 37 hyd.
- Wheels, Tail - Hayes Industries 10 X 3 No. K1AC3 (before and on serial 305)
  Goodyear 95-021 - 10" smooth contour (after serial 305)

Control Surfaces:
- Ailerons on upper wing
- Flaps on lower wing
- Flaps controlled electrically - Chain Type (on and before serial 234 except serial 211) - flexible shaft mech. (used on serial 211 and after serial 234)
- Flap Motor - Dumore KL-34-1 (ratio as on dwg. S-48) (on and before serial 234 except serial 211)
  Dumore Special 4253 - Type K (on serial 211 and after serial 234)
- Elevator Tab - 1 L. H. only

Tail Surfaces:
- Strut from fin to stabilizer (both sides)
- 2 struts from stabilizer to fuselage (both sides)

Instruments & Equipment:
- Instrument Panel - consists of:
  - 1 upper left floating panel
  - 1 upper right fixed or floating panel (optional)
  - Auxiliary Panel assembling on one main solid panel

Standard Instruments:
- Bank and Turn - Pioneer 1700-1A-A1
- Vertical Speed - Kollsman 164-02
- Altimeter - Pioneer 2100-4A1-A2

Standard Instruments (cont)
- Manifold Pressure - Pioneer 1905-1C-A1 (before and on serial 409)
  - Kollsman 175H-01 (after serial 409)
- Air Speed - Pioneer 1404-1A-A1 (before and on serial 409)
  - Kollsman 157-H-09 (after serial 409)
- Tachometer - Pioneer 347C (before and on serial 216)
  - Kollsman 218H-01 (after serial 216)
- Fuel Pressure - Pioneer 751 (before and on serial 225)
  - Kollsman 130F-01 (after serial 225)
    - (inst. not used after serial 409)
- Oil Pressure - Pioneer 505B (before and on serial 237)
  - Kollsman 131-01 (after serial 237)
    - (inst. not used after serial 409)
- Oil Temperature - Pioneer 506B (on and before serial 409)
  - (inst. not used after serial 409)
- Engine Gage Unit - U.S. Gage Company BU-1619-A (beginning after serial 409)
- Compass - Pioneer 1810-1A
- Ammeter - Weston Model 606
- Fuel Gage - Chevrolet AC363779
- Elev. Tab Position Gage - Chevrolet AC363779 (with Beech D17773-5 face)

Performance & Data:
- Cruising Speed - 182 m.p.h. at 10,000 ft.
- Landing Speed - 46 m.p.h.
- Service Ceiling - 18,000 ft.
- Gross Weight - 3590 lbs.
- Span - 32 ft.
- Overall Height - 8 ft.
- Overall Length - 25 ft. 11-1/2 in.
- Fuel Consumption - 17 gallons per hour
- Fuel Capacity - 77 gallons - 3 tanks:
  - 1 front fuselage - 29 gals.
  - 1 right lower wing - 24 gals.
  - 1 left lower wing - 24 gals. (on and before serial 329)
- Fuel Capacity - 75 gallons - wing tanks 23 gals.) (After serial 329)
- Oil Capacity - 6-1/2 gallons (before serial 394)
  - 5 gallons (serial 394 and after)

## STANDARD MODEL D17A

Power Plant:
- Engine - Wright R-760E-2 - 350 HP
- Propeller - Hamilton Std. controllable - Hub 2B20-209, Blades 6135A-9
- Carburetor - Stromberg NAR 7A
- Starter - Eclipse E-80
- Fuel Pump - Pesco R400-BC
- Wobble Pump - Aero Supply Type D-2
- Vacuum Pump -
- Generator - Eclipse Type G-2 (15 v. - 15 amp.) (25 amp. with radio instal.)
- Gen. Cont. Box - Eclipse CB-97 (std.) (CB67-ID - 25 amp. if radio was instal.)
- Magneto -
- Battery - Exide 6TS-13-1

Fuselage - Long Type:
- 229-5/8" long
- 38-5/8" across front
- 48-5/8" cabin depth

Landing Gear - Short Type:
- Retraction - Electrical
- Retract Motor - S-38 (Dumore Type D-5)
- Brakes - Hydraulic
- Wheels, front - Goodyear Model HBM ATC37 Hyd.
- Wheel, Tail - Hayes Industries K1AC-3 (on serial 305)
  - Goodyear 95-021 - 10" smooth contour or approved equivalent (after serial 305)

Control Surfaces:
- Ailerons on upper wings
- Flaps on lower wings
- Flaps electrically controlled with flexible shaft mech.
- Flap Motor - Dumore Special 4253 Type K
- Elevator Tabs - 1 R & 1 L
- Rudder Tab

Tail Surfaces:
The fixed surfaces are of cantilever construction and no struts or bracing wires are used.

Instruments & Equipment:
- Instrument Panel consists of:
  - 1 upper left floating panel
  - 1 upper right fixed or floating panel (optional)
  - Auxiliary Panel assembling on 1 main solid panel

Standard Instruments:
- Turn & Bank Ind. - Pioneer 1700-1A-A1
- Vertical Speed - Kollsman 164-02
- Altimeter - Pioneer 2100-4A1-A2
- Manifold Pressure - Pioneer 1905-1C-A1
- Tachometer - Kollsman 218H-01
- Air Speed - Pioneer 1404-1A-A1
- Engine Gage Unit - Kollsman Type 150-03
- Head Temp. Gage - Weston 602

Standard Instruments (contd)
- Clock - Pioneer 543-H
- Compass - Pioneer 1803A-2
- Ammeter - Weston 606
- Fuel Gage - Chevrolet AC363779
- Elev. Tab Position Gage - Chevrolet AC363779 (with Beech D17773-5 face)

Performance & Data:
- Cruising Speed - 170 m.p.h. at 9,600 ft.
- Landing Speed - 50 m.p.h.
- Service Ceiling - 15,500 ft.
- Gross Weight - 4250 lbs.
- Span - 32 ft.
- Overall Height - 8 ft.
- Overall Length - 26 ft. 7-7/8 in.
- Fuel Consumption - 17 gallons per hour
- Fuel Capacity - 98 gallons - 4 tanks:
  - 1 front fuselage - 29 gallons
  - 1 left lower wing - 23 gallons
  - 1 right lower wing - 23 gallons
  - 1 right upper wing - 23 gallons
- Oil Capacity - 6-1/2 gallons (before and on serial 363)
  5 gallons (after serial 363)

(D17A serials only go to 363)

# MODEL G17S SPECIFICATION

February 11, 1946

## A. GENERAL DESCRIPTION

The Beechcraft Model G17S is a five-place, single-engine cabin biplane with conventional landing gear. The seating arrangement is similar to a coach-type automobile. There are two adjustable front seats (pilot and co-pilot or passenger) and one rear seat with ample seating capacity for three passengers. In back of the rear seat is the baggage compartment, which is accessible either from the inside or through a lockable door from without. Entrance to the cabin is made through the cabin door opening on the left side of the airplane just ahead of the rear seat.

All instruments except the compass are mounted in a panel which spans the cabin from sidewall to sidewall. The compass is supported in a mounting in the center of the windshield above the instrument panel. A throwover type column is provided for control of the elevator and ailerons. All other controls, with the exception of the auxiliary landing gear control (a crank at the pilot's left side), rudder tab control (over pilot's head), and elevator tab control (on control column), are located in the center of the instrument panel.

The standard model will be upholstered as follows:

(1) Sidewall - (a) Instrument panel to pilot's seat - Beige Spanish grain leather
(b) Pilot's seat to baggage compartment - Grey-green Candair broadcloth
(2) Ceiling - Beige Candair broadcloth
(3) Seats - Grey-green Bedford cord
(4) Carpet - Candair Lock-tite - Sand color

The standard model will have the following exterior color combinations as optional:

| Principal Color | Trim Color |
|---|---|
| Leoning Yellow | Consolidated Blue or Insignia Red |
| Consolidated Blue | Leoning Yellow or Insignia Red |
| Insignia Red | Leoning Yellow or Consolidated Blue |

The customer will be charged on a time and material basis for deviations from the standard airplane.

## B. PERFORMANCE DATA

| | |
|---|---|
| High Speed at 5,500 feet | 212 MPH |
| Cruising Speed at 10,000 feet (75% power) | 201 MPH |
| Recommended cruising speed at 5,000 feet (65% power) | 175 MPH |
| Range at 5,000 feet at 65% power (124 gal. fuel) | 1,000 Miles |
| Endurance at cruising speed at 10,000 feet (75% power, 124 gal. fuel) | 4.90 Hr. |
| Time to climb to 10,000 feet | 12.5 Min. |
| Rate of climb | 1,250 Ft./Min. |
| Service Ceiling | 20,000 Ft. |

B. PERFORMANCE (CONT.)

| | |
|---|---|
| Distance to clear 50' obstacle on take-off (zero wind) | 1,130 Ft. |
| Distance to land over 50' obstacle (zero wind) | 980 Ft. |
| Landing Speed (flaps down) | 64 MPH |

C. WEIGHT

| | |
|---|---|
| Gross weight | 4,250 lbs. |
| Empty weight | 2,800 lbs. |
| Useful load | 1,450 lbs. |
| Baggage | 125 lbs. |
| Fuel - 124 gal. (Standard) | 744 lbs. |
| 170 gal. (Optional) | 1,020 lbs. |
| Oil - 6-1/2 gal. (Standard) | 49 lbs. |
| 9 gal. (Optional) | 60 lbs. |

Payload at 50% power with 45 min. reserve:

| Safe Range Miles | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
|---|---|---|---|---|---|---|---|---|---|
| Computed Payload Pounds | 1031 | 965 | 900 | 835 | 770 | 705 | 640 | 575 | 510 |

D. STRUCTURE AND DESIGN

(1) Wing Group

(a) Airfoil Section Designation:
Upper: Root and Tip NACA 23012
Lower: Root and Tip NACA 23012

(b) Dimensions:

| | Upper | Lower | Total |
|---|---|---|---|
| Area (Including ailerons and flaps) | 148.2 sq.ft. | 148.2 sq.ft. | 296.4 sq.ft. |
| Span | 32 ft. | 32 ft. | |
| Root Chord | 60 in. | 60 in. | |
| Taper Station | 1:1 | 1:1 | |
| Incidence | 5°30' | 5°30' | |
| Dihedral | 0° | 1° | |
| Sweep Back | 0° | 0° | |
| Stagger at Lower Wing Root Center Line Level | | 23.5 in. | |
| Gap at Lower Wing Root | | 59.5 in. | |
| Aspect Ratio | | 3.45 | |
| Decalage | | 0 | |
| Mean Aerodynamic Chord Length Location Relative to LE. IW. Horizontal (12.62 in.) | | 57.16 | |

D. STRUCTURE AND DESIGN (CONT.)

(2) Control Surfaces

(a) Ailerons:

| | | |
|---|---|---|
| Area | 22.96 sq. ft. | |
| Angular Movement | Up 33° | Down 25° |
| Distance from Plane of Symmetry to Centroid of Aileron Area | 98.5 in. | |
| Balance - Dynamically balanced to give static overbalanced of 13.74 in. lb. | | |
| Tabs - None | | |

(b) Horizontal Tail Surfaces:

(1) Stabilizer:

| | | |
|---|---|---|
| Area | 24.477 sq. ft. | |
| Normal Setting to Thrust Line | 1°10 ft. Neg. | |

(2) Elevator:

| | | |
|---|---|---|
| Area | 16.56 | |
| Angular Movement | Up 30° | Down 28° |
| Balance - Dynamically balanced | | |
| Tabs - 2 Trimming Tabs, each 3 x 30.6" | | |

(c) Vertical Tail Surfaces:

(1) Fin:

| | | |
|---|---|---|
| Area | 7.98 sq. ft. | |
| Normal Setting | 0.43 ft. - To Left | |

(2) Rudder:

| | | |
|---|---|---|
| Area | 8.71 sq. ft. | |
| Angular Movement | Right 28° | Left 28° |
| Balance - Dynamically balanced | | |
| Tabs - 1 Trimming Tab, 3" x 9" | | |

(d) Flaps

| | | |
|---|---|---|
| Area | 23.47 sq. ft. | |
| Travel | 43° Down | |
| Balance - Statically Balanced | | |

(3) Detail Design

(a) Maximum Applied Flight Load Factors:

(1) Maximum Applied Load Factors (Flaps Up)
Positive 4.483 Negative 2.398
(2) Applied Gust Factors (Flaps Up)
Positive 3.797 Negative 1.797
(3) Maximum Applied Load Factors (Flaps Up)
Positive 1.863
(4) Applied Gust Factors (Flaps Down)
Positive 1.863

D. STRUCTURE AND DESIGN (Cont.)

(3) Detail Design (Cont.)

(b) Maximum Applied Landing Factors

4250 Gross Weight 3.898

(c) Airplane is designed for applied load produced by a positive or negative 15 ft./sec. gust at 285 MPH plus 1.5 safety factor. The airplane is placarded to never exceed 240 MPH I.A.S.

(d) Airplane is designed for applied load produced by a positive or negative 30 ft./sec. gust at 211 MPH plus 1.5 safety factor. The airplane is placarded for a cruising speed of 190 MPH L.A.S.

(e) With flaps down, the airplane is designed for applied load produced by a positive 30 ft./sec. gust at 130 MPH plus 1.5 safety factor. The airplane isplacarded for a maximum speed of 115 MPH with flaps extended.

E. EQUIPMENT

Power Plant:

| | |
|---|---|
| 1 | Engine - Pratt & Whitney Wasp Jr., AN-1 or AN-3 (Army Surplus) |
| 1 | Propeller - Hamilton Standard Constant Speed 2D30-237 Hub, 6167A-15 Blades |
| 1 | Propeller Governor - Hamilton Standard 1A2-A5 or G5 |
| 1 | Spinner - Montgomery Metal Spinning Work, Tulsa, Okla. |
| 1 | Starter - Eclipse Type 397, Model 13 |
| 1 | Generator - Eclipse Type 309, Model 8, 25 Amp. |
| 1 | Wobble Pump - United Aircraft Products, U550-BE(1/2 Ports), UB401648 Handle |
| 1 | Fuel Pump (Engine-Driven) - AN4100, Type G6 |
| 1 | Oil Drain Cock - Army Drawing 37D6114-4 |
| 1 | Primer - Eclipse No. 29894 |
| 1 | Fuel Strainer - United Aircraft Products C-1A |
| 1 | Oil By-Pass Valve - Beech S-80 |
| 1 | Fuel Tank - Selector Valve - United Aircraft Products, U-875, Type K1 |
| 1 | Thermocouple, Cylinder Head - Weston D102143 |
| 1 | Thermocouple Lead - Weston D75378, 10' |
| 1 | Fuel Tank - Front Fuselage - Beech (29 gal.) |
| 1 | Fuel Tank - Rear Fuselage - Beech (49 gal.) |
| 2 | Fuel Tank - LowerWing - Beech (23 gal.) |

INSTRUMENT:

| | |
|---|---|
| 1 | Airspeed Indicator - Kollsman 586Bk-0148 |
| 1 | Turn & Bank Indicator - Pioneer 1722-1AR-B1 |
| 1 | Rate of Climb Indicator - Kollsman 613K-023 |
| 1 | Altimeter - Kollsman 671CK-01 |
| 1 | Compass - Kollsman 758L |
| 1 | Clock - Kollsman 505-1 |
| 1 | Tachometer - Kollsman 218H-01 |
| 1 | Manifold Pressure - Kollsman 788K-02 |
| 1 | Head Temp. Gauge - Weston 602, Type 128Y |

E. EQUIPMENT (Cont.)

Instrument: (Cont.)

| | |
|---|---|
| 1 | Thermometer - Carburetor & Outside Air - Weston 728, Type 34Y |
| 2 | Bulb - Resistance - Weston B112638 |
| 1 | Engine Gauge Unit - U. S. Gauge AW-2 3/4-19Ak-6 |
| 1 | Fuel Analyzer - Cambridge, Type A-7A |
| 1 | Elevator Tab Indicator - Stewart Warner 106336 |
| *1 | Ventur Tube - Bendix 10017-2-A |
| 1 | Throttling Valve - Pioneer 1521 Model 1 |
| 1 | Fuel Quantity Gauge - AC Spark Plug Division - GG-6196 |
| 1 | Ammeter - Autolite 10264A |
| 1 | Selector Switch - Weston ND21439 |

*Not used when Gyro Horizon or Directional Gyro is installed.

Electrical:

| | |
|---|---|
| 1 | Battery - Reading - R37 (Leakproof) 12 Volt |
| 1 | Motor - Landing Gear - Dumore D5 (3843C) |
| 1 | Motor - Flap - Dumore - Type K (4253) |
| 2 | Landing Light - Grimes ST 1220 |
| 1 | Pitot Tube - Kollsman 373D-01, 12 Volt |
| 2 | Light - Instrument - Grimes, Type C3 |
| 1 | Light - Wing Position - Grimes, Model C (Red & Green) |
| 1 | Light - Tail - Grimes - Model C (Clear) |
| 2 | Light - Map - Ford 094-1S777A |
| 1 | Light - Cabin Dome - Cowles No. 403 |
| 1 | Light - Fuel Pressure Warning - Searle VM-400-2 |
| 1 | Light - Landing Gear Warning - Searle VM-400-2 &-3 |
| 1 | Fuel Pressure Signal Unit - Manning, Maxwell & Moore - Type C-3 |
| 1 | Coil - Booster - Eclipse 1538-1 |
| 1 | Solenoid - Starter - Delco-Remy 1520 |
| 1 | Solenoid - Battery - Cutler-Hammer 6041H105 |
| 1 | Cigarette Lighter - Casco Products #80-AV |
| 1 | Regulator-Generator Control - Eclipse Type 1337, Model 2 |
| 1 | Relay - Generator Control- Eclipse Type 350, Model 3 |
| 1 | Avia Base - Generator Control Box - Eclipse Drawing 40D8445 |

Landing Gear:

| | |
|---|---|
| 2 | Wheel Assembly - Main Landing - Goodyear 95-2902 |
| 2 | Brake Assembly - Goodyear 95-2791 |
| 2 | Wheel Assembly - Tail - Goodyear 10" Smooth Contour |
| 1 | Tire - Tail Wheel, Goodyear 10" Smooth Contour 6-Ply |
| 2 | Tire - Mainwheel - Goodyear 750 x 10, 6-Ply, H.D. |

Miscellaneous:

| | |
|---|---|
| 1 | Fire Extinguisher, Fyr-Fyter, Type A-2, With Bracket (Mft. #83) |
| 1 | Flas Light (3 Cell) |
| 1 | Map Case - Cabin Door, Beech D175650 |
| 5 | Safety Belt - Beech S-26 |

A.L.Clark:ad

BEECH AIRCRAFT CORPORATION

MODEL G17S PRICE LIST

1. Standard G17S with Pratt & Whitney 450-HP New Army Surplus Engines and Hamilton Standard Constant-Speed Propeller . . . . . .$29,000.00
   (Allowance for Customer-Furnished Engine Complete . . $4000.00)
   (Allowance for Customer-Furnished Propeller Complete . 500.00)

| OPTIONAL EQUIPMENT: | Extra Weight | List |
|---|---|---|
| 2. Sperry Gyro Horizon | 5.5 lb. | $ 340.00 |
| 3. Sperry Directional Gyro | 5.5 lb. | 285.00 |
| 4. Miscellaneous Equipment required for installing either or both the gyro horizon and the directional finder (Consists of vacuum pump, oil separator, vacuum relief valve, suction gauge) | | 270.00 |
| 5. Upper Wing Fuel Tanks, 23-Gal. (RH, LH, or Both) | 20 lb. | 150.00 ea. |
| 6. Fire Extinguisher (Remote Control) Engine (Lux 5 lb. Type 5TA) | 19 lb. | 275.00 |
| 7. Flares - 3 ea. (International 1-1/2 Minute MK-1) | 18 lb. | 175.00 |
| 8. Flares - 4 ea. (International 1-1/2 Minute MK-1) | 24 lb. | 215.00 |
| 9. Quick Release Mechanism for Cabin Door | 2 lb. | 60.00 |
| **RADIO EQUIPMENT:** | | |
| 10. Lear UT-6 Transmitter, 12-Volt | 30 lb. | 800.00 |
| 11. Lear RCBB Receiver, 12-Volt | 28 lb. | 395.00 |
| 12. Bendix RA-10C Receiver | 40 lb. | 1275.00 |

## *SAFETY – AN ATTITUDE*

*By: The Staggerwing Club Safety Committee*

There are two kinds of pilots – those who have landed gear up and those who are **going** to land gear up. Have you ever heard that statement before? I'll bet you have, and I'll bet you've heard it said about ground looping too. Staggerwings will do both maneuvers real good – gear up landings and ground loops. But, they don't HAVE to!

An accident – any accident – is almost always accompanied by an attitude on the part of the pilot of "It was bound to happen". His attitude is such that he feels an accident was eventually bound to happen to him. So now one has happened and how could he have prevented it? If he ground looped, isn't it true that eventually every pilot flying a conventional gear airplane is going to ground loop? Isn't it true that a pilot flying a retractable gear airplane is sooner or later going to land gear up?

These are weak excuses dreamed up by pilots who have accidents. There are other kinds of pilots whose attitude is: "A pilot makes his own luck." By that we mean a pilot can, to a large degree, be in control of what is going to happen to him, including NOT having an accident. This kind of pilot has a positive attitude; he never intends to land gear up and he ensures that he won't by remembering, ON EVERY FINAL APPROACH, to recheck the gear down. This man has trained himself to recheck the landing gear to the point where his brain goes into some sort of grand mal convulsion if he starts the flare without having rechecked the gear down and locked. The key word is TRAINING. He has trained himself by MAKING himself do it on hundreds of landings, even in fixed gear airplanes, until it has become such an ingrained habit he will NEVER forget it.

You do not EVER have to land gear up any more than you ever HAVE to ground loop. It depends on your attitude. And your attitude determines what you will do about it. You must take positive steps to avoid an accident. To avoid gear up landings you must develop some memory gimmick (the GUMP check or something) to remind you to check the gear down prior to EVERY landing. You won't ground loop if you practice a lot and stay proficient. You won't get caught in bad weather if you exercise the positive judgment to stay the hell on the ground when the weather isn't flyable.

It takes a lot of guts to be humble enough to realize your own limitations and get professional help when you need it. The pain of a toothache will send you running to your dentist – what kind of pain does it take to send you to a **qualified** flight instructor? Obviously, with a Staggerwing, qualified flight instructors are limited to Dub Yarbrough, Bill Halverson, Bill Freeman, Lane Leonard, and people like that. But they ARE available and they WILL help you.

Naturally, nobody likes to publicize his own shortcomings. If you're a little shaky on landings, no point in announcing it to the entire Club. Get one of the people just mentioned aside and get their PROFESSIONAL advice, counsel, and help. If you don't know who is available, write the Safety Committee – your request will be kept confidential. We will put you in touch with a flight instructor nearest you who is qualified and current in Staggerwings.

Our safety record with Staggerwings is the envy of the aviation industry, but it won't stay that way unless we take positive steps to make it happen. Safety is not something you attain and then sit back and relax – it is a continuing thing that must have your attention constantly. A lot of pilots feel that being safe is being sissy. Those of us who fly professionally take safety as the hallmark of our profession – we have dedicated our careers, our fortunes (such as they are), and our honor to the premise that we will never hurt a passenger or scratch an airplane.

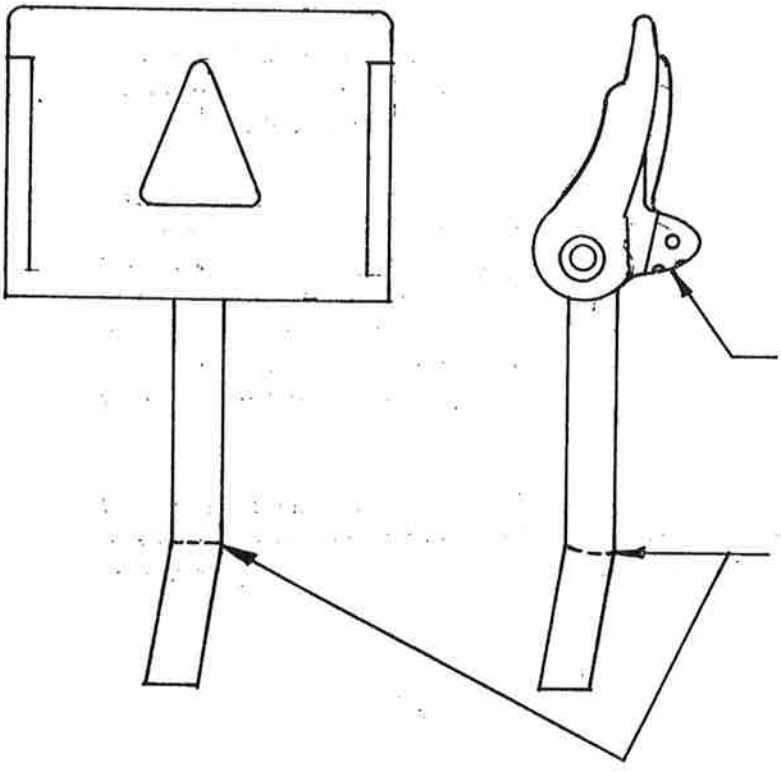
Lindbergh felt the greatest sin a pilot could commit was to bend an airplane or hurt a passenger. Are we any better than he was?

## PILOT RUDDER PEDALS - SAFETY

We have discovered something that started off a full hundred and eighty degrees from what we were after. We installed a set of Aero Comm. wheels and brakes on a D Model. The installation was routine, one handled on a field approval basis. We took the D Model out for engine run and to check the brakes. At 1800 RPM we started to roll - back to the hangar we came. The first thing that crossed our mind was that the brake blocks were glazed. Inspection proved we were wrong. We brought out the pressure pot and had another go at bleeding thinking it was air in the system. After another engine run and the same results, it was time for a break and some head scratching. I pulled myself up into the cabin and sat there looking at the pilot's rudder pedals thinking about what I had missed. The following is a very good point for your inspection and could save you and your aircraft.

I found both the pilot's rudder pedals canted very evenly to the left as if they were built that way. Being a nosey person by nature, I crawled down to have a look. The first thing I found was that the rivets holding the rudder pedal casting to the vertical steel tubular member were stretched to the point that they were almost sheared in two. The tubular member was bent, both right and left. I pulled the boots down and found the vertical members not only bent but also twisted. I had the pedals removed and installed a new serviceable set. The results were just great. We found that we now have brakes that will hold at static RPM. I contribute this to the correct vertical pedal movement in relation to the master cylinder piston travel.

I feel this is a point for inspection. I also feel that this is one place that can be overlooked at the inspection period. So guys, take a few minutes, push your captain seat all the way back, and wind down next to your baby doll's rudder pedals and have a look see. You might find what Eastern found - bent, twisted, and cracked rudder pedals. It could be somewhat embarrassing if they did let go at the wrong time.




HAPPY FLYING

George Yezman
Eastern Aircraft Corp.
Grosse Ile, Michigan 48138

BOB SMITH, our Safety Committee Chairman, advises - I designed a "Form One" for aircraft records since one of the safety committee members recommending a good record of work done on the airplanes as a method to help. As sign off annual inspections, I am having the instruction sheets printed up. They are designed to go into a three ring binder. The instruction sheets will contain complete instructions on how to fill them out. The ideal situation is to keep a current set plus the last set in a three ring binder in the airplane with all the older ones in a permanent maintenance and flight record at the owner's home.

Each page of the Form One, Parts One and Two are designed to record flight time and maintenance data for 12 flights. Part Three is designed to record inspections (100 hour, annual, etc.). Part Four is for AD notes and service bulletins. Part Five is for anything else (weight and balance data, 91.170 altimeter static test, equipment installed, etc.)

They are printed on 60 lb. paper for durability. A copy of the Part Three and Part Four should be completed for the airframe, the engine, and the prop.

I had 1,000 copies of each page printed up and a set of all the forms including a set of instructions runs about $7.50 for enough forms to record 300 flights (25 sheets of each page). No binder is furnished. I started to try to do that, but some guys might want a stiff binder and others a flexible cover binder.

Form One is designed to replace both the aircraft and engine log books and to provide a better method of recording what is happening to the airplane. The price may seem a trifle high, but I had to estimate postage and packing costs. Any profit I make will go to the museum. Actually, what I'd like to do is have guys write me and tell me ways to change the form after they have used them and give me suggestions as to how to improve it or add things to it. Eventually, we might develop a set of flight and maintenance records that would be outstanding, and this will help in getting annuals done and in keeping records on the airplanes.

I plan to advertise these in Trade-A-Plane just to see what the market might be for such a thing and will probably advertise at a higher price than the $7.50 for a 300 flight set.

If anyone wants a set, tell them to send me $7.50, and I'll ship them postpaid. If they use them for a while and want to suggest changes, tell them to mark the changes on the forms and send them to me. I will replace the forms they mark up free of charge.

I am also working on a check list for the airplanes and have one suggested from a safety committee member. I haven't done much on it yet. I really need suggestions from the owners as to what they would like to see on a check list. I planned to furnish a check list to all club members/owners free, if we ever get one firmed up.

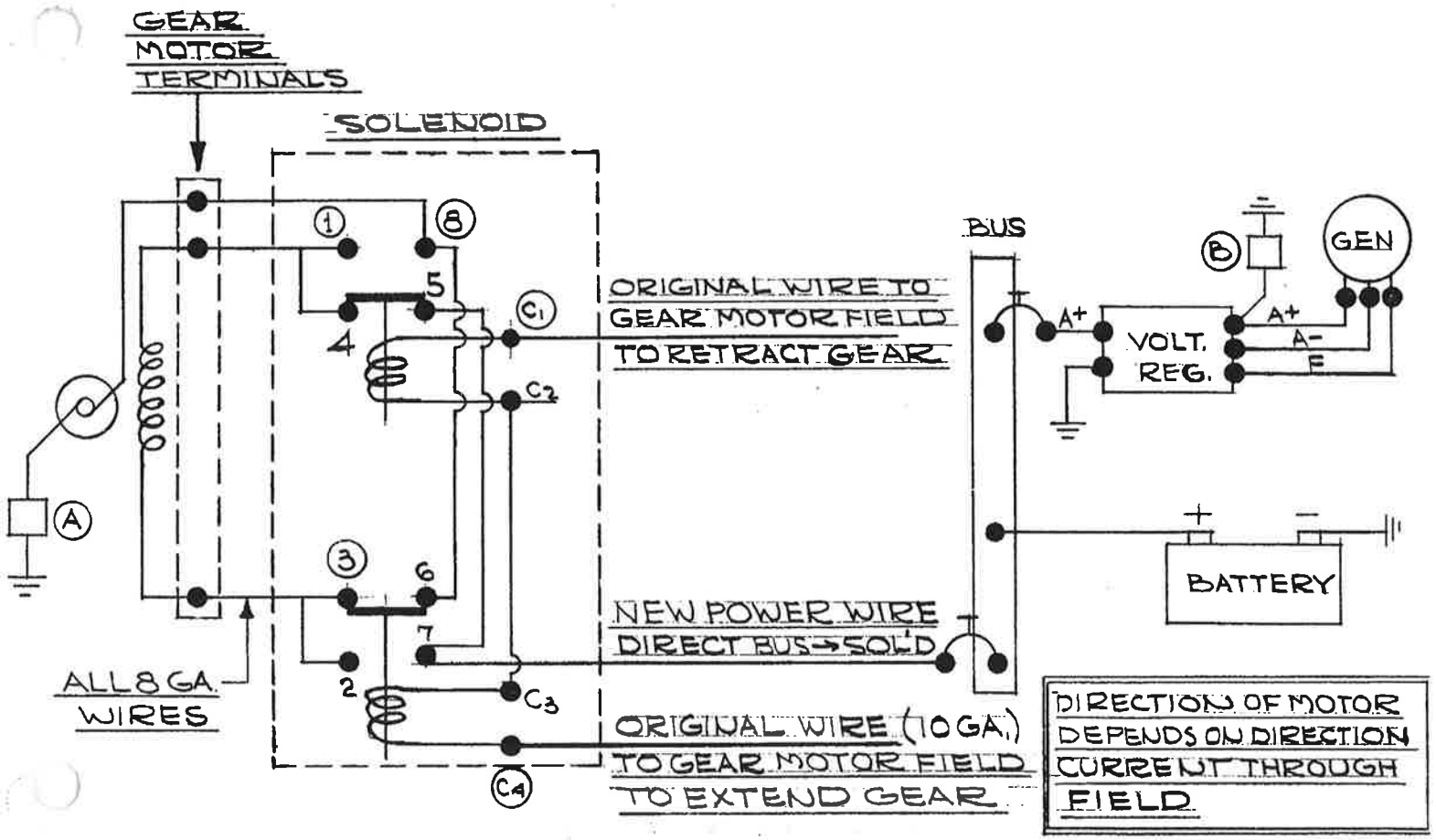
Robert T. Smith
Safety Committee Chairman

SAFETY - IS YOUR ENGINE BONDED? By the Staggerwing Club Safety Committee (R.T. Smith) --In a recent inflight fire with a Cessna 150, it was discovered the PRIMER LINE MELTED and caught fire. Reason? The bonding strap from the engine to the fuselage had broken and electric current flowing from the air-frame to the engine (ground) had to go someplace so it went along the tiny primer line.

SAFETY - IS YOUR ENGINE BONDED? (Cont.)

The current flow was enoughto melt the small primer line,and the fuel in the line caught fire. Of course, this situation applies to any airplane with an electrical system. First, check the existing bonding wires for security and condition. Second, check to see if your engine has more than one bonding strap and that all bonding straps are secure. Third, if your engine has only one bonding strap, install at least one more. This sort of inflight fire is uncomfortable, ruins your primer line, and causes sleepless nights. A little checking now will prevent this.

## SOLENOID INSTALLATION – GEAR MOTOR
## BEECHCRAFT D-17S




1. Solenoid – Cutler-Hammer, Double Pole, 12V–50 Amp. Available from dealer, terminals numbered as marked.

2. Consider Power Sources First. Ideally should have 50 Amp. Generator. Use 6GA wire A+ and A- to bus. If you have 30 Amp. Generator, 8GA is fine (Original wire my aircraft was 10GA and burned medium-well!!)

   Battery to bus – minimum use 4GA. I installed "O" size (originally my aircraft wired 4GA battery to M/Switch – 6GA M/Switch to bus!) Also, I have installed battery solenoid resulting in battery-solenoid-bus (total 7 feet) vs. 14 feet originally, battery–M/Switch–bus.

3. Bus to solenoid (new route) 6GA wire as direct as possible.

4. Solenoid to gear motor 8GA (same GA as motor leads). Terminals (1) (8) and (3).

   This wiring results in negligible voltage loss – solenoid without upgrading wiring helps but dramatic change depends on adequate GA wires.

5. In diagram above, gear is enroute **up.**

6. In old wiring, there will be 3 wires to motor – wire to armature (power to) not used – remove entirely – only field wires used to activate solenoid up to C1, down to C4.

## RADIO NOISE – ERRATIC ADF OR ADF WHICH DOESN'T POINT TO STATION – POINTS 5 DEGREES – 15 DEGREES OFF

If you have had these problems and can't get them fixed or been told "Sorry, but these old planes are just electrically dirty", here are some suggestions which cured my problems.

1. All motors/generators create noise.

   Generator – field wire must be shielded, ground shield at both ends.

   (My A/C Ex-Navy – had beat-up shielded conduit throughout. I replaced all of this. So now generator circuit (all wires) is shielded to bus).

   Voltage Regulator – Generator Noise. Get 4 MFD 50V (100V O.K.) suppressor. Attach to A+ at regulator as diagrammed (B). Standard part Beech, Cessna, etc.

   Gear Motor. I used shielded 6GA wire bus to solenoid (ground both ends shield) shielded conduit solenoid to motor (containing 3 8GA wires).

   My gear solenoid is in box located forward of (L) wheel well.

   If you can't hear anything due to rapid interference when gear is cycling, Hisonic Filter RF1 40, Part No. 20-0222-10 – Hisonic, Inc., Olathe, Kansas, attached as diagrammed (A) will solve the problem.

2. Don't forget to shield Rot. Bcn. wire (ADF interference).

3. ADF Loop Cables – Route far away from other electrical cables, etc.

If you have trouble finding any of the relays or filters, they can all be purchased through:

Johnson Aircraft Service
P. O. Box 812
Santa Paula, California 93060

*TRY IT – YOU'LL LIKE IT!*

Roy G. Larson, M.D.

## TECH TIPS

Following article is from a 1944 "Beechcraft Engineering Service" report, zerox copy as furnished by member Rick Stowe.

### Biplane Landing and Flying Wires
### by Dave Peterson

The landing and flying wires on the Model 17 airplane have a natural frequency of fore-and-aft vibration just below the cruising rpm range of the engine. It has been called to our attention that some of the airplanes in the field have a natural frequency as high as 1800 beats per minute. If a pilot chooses to cruise at an engine rpm within 10 to 20 revolutions of the natural frequency of the particular set of wires, a vibration of the wires is naturally going to be induced to some extent.

The extent of amplitude of the vibration depends on the degree of vibration set up by the engine. Therefore, a propeller out of balance or an engine that is rough for some other reason will cause the amplitude to be greater.

There are two common methods of changing the natural frequency of vibration of any unit; namely, changing weight or rigidity. In the case of vibrating wires, it is obvious that the easiest way is to change the tension of the wires themselves, which will of course also change the rigidity. Changing the weight of the "birdie" will have the same effect. However, if the period is over 1800, the trouble is definitely caused by too-high tensions in the wires. It must be remembered that temperature effects the tension of the wires approximately 1-1/2 pounds for every degree; therefore, the frequency will not always be exactly the same. Also, it is possible to have different tensions on opposite sides, causing different frequencies.

The vibrating wires should not cause any serious trouble, as it is only necessary to change the rpm 20 to 30 revolutions to separate the frequency enough to stop vibration.

A rigging chart is shown on opposite page.

*Editor's Note: Sorry we don't have the rigging chart. Also first reference I ever heard to changing the weight of the "birdie" (wire separator).*

**The fuel line** and fuel vent lines are protected with padding or loom material. This is automotive wire loom and available at automotive supply/parts stores. For the 1/2" fuel lines use Delco's (or Packard) 9/16" Auto Loom, Part No. 1208 or Standard Motor Product Co. (Long Island City, NY) Part No. CL9. Approximate price $6.00 per 50 ft. roll.

John Averill/George York

**Tail Wheel and Tires** – The C-124 aircraft uses the same wheel, tire and tube (but not as a tailwheel) as the D17. One assembly is found at the forward end on each of the two nose cargo loading ramp assemblies. Since the C-124 has been phased out of the USAF inventory, these items have probably been sold as surplus, and could be available at some of the many government surplus dealers. Part numbers and descriptions are:

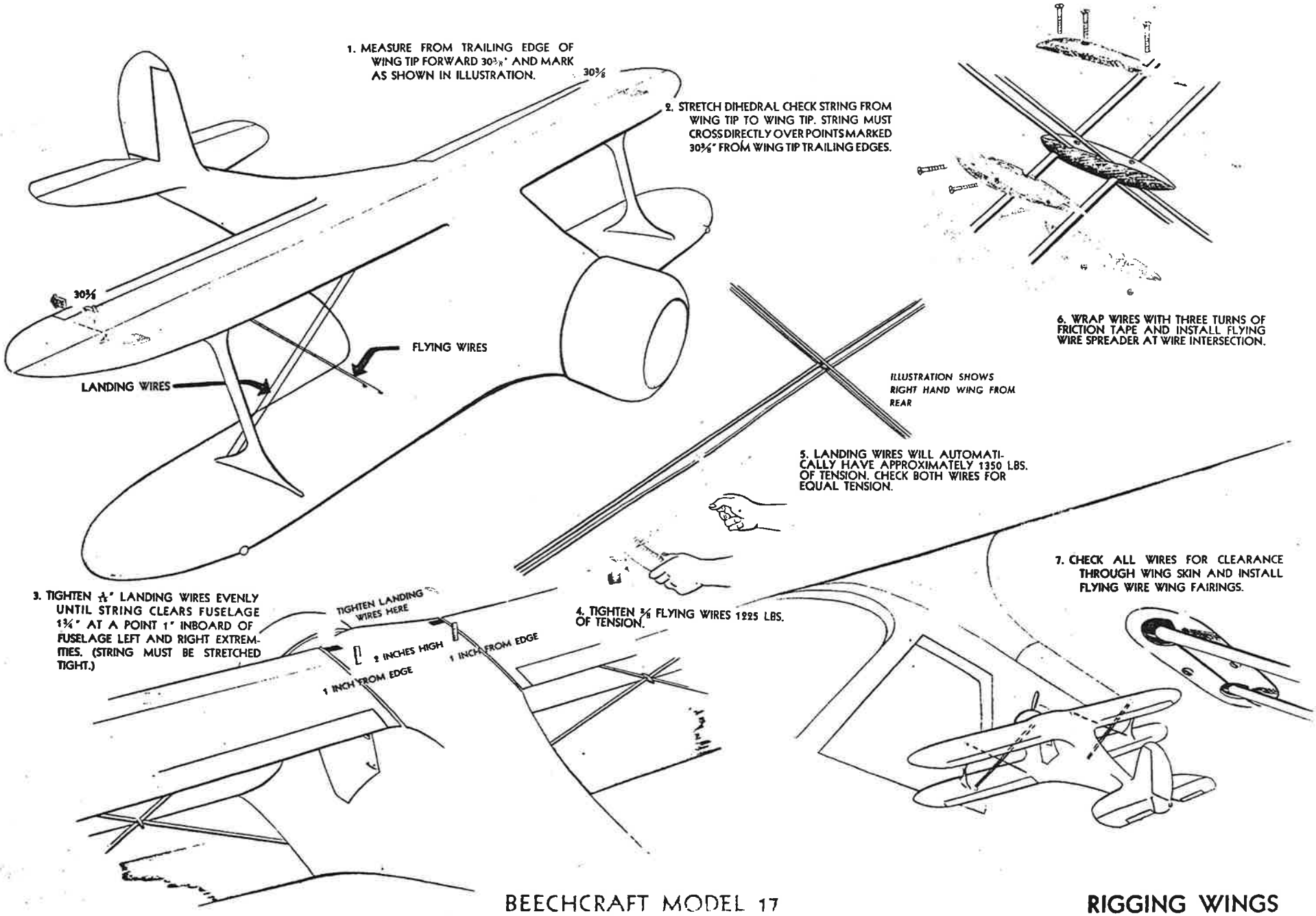
No. 510646-M Wheel (Spec. AN-W-6A)
FSC2620-269-7442 Tube 10", smooth contour (Spec. AN-T-78B)
FSC2620-269-7662 Tire Casing 10", smooth contour (Spec. AC-C-55E)

*John Averill*

*Note from George York – No. 510646-M Wheel Assembly - 10" Goodyear is identical part number used on D17S, UC-43 and GB-2 listed on Page 174, Figure 14, Index 35 in Military Parts Manual TO No. 01-90CC-4.*

**Multi-Disc Brake Tips** – When the wheels are retracted the weight of the discs can force the hydraulic fluid from the rubber brake pistons back into the hydraulic reservoir, especially after long flights and/or rough air. After lowering the landing gear, give the brakes a couple pumps prior to touch down. It could save you from a cross country trip through the bean patch.

by Glenn McNabb


1. MEASURE FROM TRAILING EDGE OF WING TIP FORWARD 30 3/8" AND MARK AS SHOWN IN ILLUSTRATION.
30 3/8
2. STRETCH DIHEDRAL CHECK STRING FROM WING TIP TO WING TIP. STRING MUST CROSS DIRECTLY OVER POINTS MARKED 30 3/8" FROM WING TIP TRAILING EDGES.
30 3/8
FLYING WIRES
LANDING WIRES
6. WRAP WIRES WITH THREE TURNS OF FRICTION TAPE AND INSTALL FLYING WIRE SPREADER AT WIRE INTERSECTION.
ILLUSTRATION SHOWS RIGHT HAND WING FROM REAR
5. LANDING WIRES WILL AUTOMATICALLY HAVE APPROXIMATELY 1350 LBS. OF TENSION. CHECK BOTH WIRES FOR EQUAL TENSION.
3. TIGHTEN 1/4" LANDING WIRES EVENLY UNTIL STRING CLEARS FUSELAGE 1 3/4" AT A POINT 1" INBOARD OF FUSELAGE LEFT AND RIGHT EXTREMITIES. (STRING MUST BE STRETCHED TIGHT.)
TIGHTEN LANDING WIRES HERE
2 INCHES HIGH
1 INCH FROM EDGE
1 INCH FROM EDGE
4. TIGHTEN 3/8 FLYING WIRES 1225 LBS. OF TENSION.
7. CHECK ALL WIRES FOR CLEARANCE THROUGH WING SKIN AND INSTALL FLYING WIRE WING FAIRINGS.

## RIGGING OF MODEL 17 WITHOUT USE OF TENSIONOMETER

With flying wires completely loose at wing root, stretch string across upper wings from center of wing tip to wing tip. Pull landing wires up until door clears bottom side of left upper wing at the low point, approximately three-eighth inches (3/8"). There should be approximately two inches (2") to two and one-fourth inches (2 1/4") dihedral before pull down. After the above procedure, pull flying wires down to arrive at the approximate tension. Check as follows: Where the wires intersect on the left wings, place first joint of left thumb on flying wires. At that point, pull down landing wire (one at a time) with right thumb and fore-finger until approximately one inch (1") of travel on landing wire can be pulled without too much effort. Then by letting each wire (one at a time) snap, check tone caused by the vibration of the wire to see if each wire has the same tone. From this tone, you can rig the right hand wires. Check dihedral after all wires are taut. Dihedral will be between one and one-half inches (1 1/2") to one and seven-eighth inches (1 7/8").

NOTE: In some cases, the above measurements cannot be used. If not, be sure that clearance on the door and wing has three-eighth inches (3/8") clearance even though it is necessary to rig wings over and above the mentioned measures.

NOTE: It is not necessary that a Beechcraft be in leveling or flying position to rig wings.

## INSTALLING BUNGEE CORDS

During our Annual Meeting at Ottumwa, a request was made for information on installing new bungee. I will describe how I change this system on Big Red.

1. Place hose clamps 6" to 8" up the landing gear slide tubes from the bottom stop. This will keep the gear from retracting.

2. Jack the tail up on the pad aft of the tail wheel door. Use a cloth pad at the jack point to keep from damaging the door fairing. Make sure you jack at a structure point and not on the fairing.

3. Chock main wheels before you jack tail.

4. Retract the gear manually to the clamps. Place gear handle back to the "up" position.

5. Remove the two large fuselage panels aft of the wheel well. This will allow access to the forward attach point of the bungee.

6. While someone is holding the tail wheel down, disconnect the turnbuckle on the cable that retracts the tail wheel. It is located just aft of the baggage compartment. Access is through the baggage door. Attach safety wire to each end so routing will be maintained.

7. Tie a small rope to the tail wheel fork and let wheel retract.

8. Disconnect the forward bungee attachment by removing one bolt. You may have to tie a rope at this end to pull to relieve the tension while the bolt is being removed. Again, use a long piece of safety wire or small rope to replace the bungee while it is out of the airplane. Pull the bungee out the rear of the fuselage. Disconnect from safety wire and the rear connection.

9. It will take 18' to 25' of 5/16" bungee cord to replace the old unit. It should be four strands and should be stretched about 8" to 10" on installation to hold tail wheel in the "up" position. Plan your splice joint just aft of the baggage compartment so it can be changed if necessary.

10. After you have the bungee installed and the tail wheel is retracted to your satisfaction, recheck the main wheel chocks to make sure they are snug. Then have someone pull the tail wheel down by use of the rope attached to the fork. Connect the turnbuckle on the retract cable and safety.

11. Extend the landing gear manually and remove the clamps on the slide tubes.

12. Replacing the single strand cord is easy, as nothing has to be done other than making sure it goes back the same way it came out.

13. Hope this will help, and let me know if I can add anything to this procedure.

Dub Yarbrough

## TECH TIPS

**SOME NOTES ON SHOCK CORD** (from *New England Sport Aviation News*)

Often called "bungee cord" (nobody seems to know the origin of the word), it is properly referred to as "shock absorber cord". It was much used on early aircraft as it is much lighter than spring steel for an equivalent load capacity. It consists of numerous rubber strands enclosed in a woven cotton covering. The covering holds the many strands together and protects them from the elements. The weave of the covering is such that when the rubber stretches, the cover goes with it without strain.

Since rubber ages, a color code is used to identify the date of manufacture:

SHOCK ABSORBER COLOR CODE

| Year Marking: | | | | Quarter Marking | |
|---|---|---|---|---|---|
| **Year** | **Threads** | **Color** | **Quarter** | **Threads** | **Color** |
| 1969 | 2 | Yellow | Jan-Feb-Mar | 1 | Red |
| 1970 | 2 | Black | Apr-May-June | 1 | Blue |
| 1971 | 2 | Green | July-Aug-Sept | 1 | Green |
| 1972 | 2 | Red | Oct-Nov-Dec | 1 | Yellow |
| 1973 | 2 | Blue | | | |
| 1974 | 2 | Yellow | | | |

The vital thing to know is that this code repeats itself every five years. That is why inexperienced airmen sometimes get outdated cord. You cannot tell if some "new" cord offer by an unethical vendor is 5, 10, 15, 20 or more years old just by looking at it. But the aged rubber in it will fail early. Your only safeguard is to buy this material from reputable vendors.

Also, so-called "exerciser cord" looks similar but isn't. This has a four-color thread code compared to the three-color cord used for shock cord. Exerciser cord is said to have about 50% of the load capacity of shock cord for a given diameter.

Shock cord is available in made-up ring form in various sizes to fit popular light aircraft such as the Cub, Taylorcraft, etc., which used it for landing gear shock absorber material. Cord diameter and ring length vary for different makes and models, and thus so does the tension and load capacity. These ratings vary from 400 lbs. for the prewar Taylorcraft to 950 lbs. for late J-3 Cubs. . . . landing gear geometry, number of rings used, etc. dictates this variety. Be sure to use the right size!

To make up your own tailored rings or to make eyes at the ends of lengths of the cord, it is necessary to stretch the cord about 10% to reduce its diameter and secure a very tight wrapping. The wrapping can be of linen rib-stitching cord or any substitute of similar strength and durability. Wrapping length is in proportion to cord diameter, typically four times the diameter of 2" on 1/2" cord. After each turn of wrapping cord has been put on, put a half hitch into it before making the next turn. Trim loose ends very carefully with a single edge razor blade to avoid cutting the working cord.

Gasoline, oil and sunlight are shock cord's enemies. That, more than appearance or streamlining, is the prime reason for using flexible or metal shock cord covers. A typical break in shock cord begins with a few broken strands. They tend to bulge at their broken ends and then create a bulge in the wrapping which, in time, fractures the wrapping cotton. Replace your cord before small bulges reach the danger point and let you down. . . literally!

## TIP FOR THE MONTH

A lot of Staggerwings are getting new interiors. This is part of the rebuilding program and a must to complete the restoration. We have lost several good aircraft because the gas selector placards or valve handles were reinstalled incorrectly. Just a suggestion; before you remove the handles, place the pointer straight up, then drive the tapered pins out. Make sure you identify the placard top and bottom. This may save you a lot of headaches in the future. The detents are so worn on most valves, you can't feel them when you activate the valve handles.

Ed Burger writes for the E-17 owners:

> "For Staggerwing operators of Model E-17-L series and others that use the 10 X 3 tail wheel tire, you may have trouble finding a replacement tire.
>
> I am now using a 10 X 3.50-4 that fits inside the yoke and is the right hub size (4"). This type is a little larger in diameter and works fine.
>
> As a spare, I now have a General No. 4.10/3.50-4 andthis can be purchased under a Scott No. 3246 for tire and No. 3247 for tube. This is the tire used on Cessna 185.
>
> Before I located the above 10" tires, I used an 8" from a Cessna 180 which is No. 280/2.50-4 and, while it worked OK on runways, I think the larger 10" is better for turf, mud, etc. strips."

One of the items always brought up in discussions about the Model 17 is the gear system. I have heard a lot of suggestions to improve the system, but after trying many of them, I believe the following is the answer:

1) Have clean slide tubes (the new silicone sprays are a lot easier and less messy than graphite)
2) Only enough slack in the chains so they will not touch the slide tubes
3) Some slack in all chains
4) Clean brushes in motor
5) Fresh and charged battery
6) Last but not least, (and I think the answer to most problems), fresh bungee cords for the tail wheel retract system. This balances the whole retract system. It helps the gear up, and slows the gear as it comes down.

Don't get your motor chain too tight. I did this last year at Ottumwa and was lucky to get my gear back down on Big Red. I made the mistake of changing things without running a gear retract cycle on the ground before I flew.

Brake Master Cylinders

Original equipment was Goodyear Code 95-0582, Assembly 218073, now obsolete since 1945; replaced with Goodyear Code 395-2973, Assembly 517738, which is available from Goodyear aviation dealers at approximately $182.00 each list. Repair parts are available also for new and old master cylinders, as they are the same; the only difference is the old assembly had a cast aluminum body and the new cylinder has a machined aluminum and steel body. Some larger surplus dealers have both type assemblies available at approximately $35.00 to $50.00

## TECH TIP OF THE MONTH

In the older aircraft, felt was the commonly used padding for oil and fuel tank installations. The eventual result from use of this material is a leaking tank. Felt readily absorbs and retains moisture. The moist felt constitutes a corrosive environment and will, in time, cause corrosion on the tank surfaces in contact with the padding. The damage is masked by the pad itself and, consequently, is difficult to detect until a leak begins.

I found several such damages which required weld repairs when refurbishing the tanks for D-17-S N69H. The solution is to utilize a more current aircraft industry standard material which is not water absorbent, such as the AN 8031 or MS 27833 tank strap pads. These pads are made from a synthetic rubber and cork composition and are a vast improvement over felt for this usage. Also, the pads are in a flat "C" shape to grip and prevent their displacement from the strap.

For 3/4" wide straps, use P/N AN 8031-6 (or MS 27833-6) and for 1" wide straps, use P/N AN 8031-8 (or MS 27833-8). This material is available as Part Numbers 2600-1 and 2600-19 from:

DeLaval Turbine, Inc.
Adel Products Div.
1444 Washington Ave.
Huntington, W.Va. 25704

John M. Averill
Byromville, Ga. 31007

## D17S Gear Chains

I needed new main landing gear retraction/extension chains. No problems were anticipated since I had previously found new Diamond Nr. 35 chain (for the small size on left side) and links at the local Diamond Roller Chain distributor. Unfortunately, the distributor reported that the large main chain, Diamond Nr. 867, had been discontinued several years ago as it was a non-standard item. No other roller chain manufacturer had anything even close. I thought I had finally run into a part of component for which there was no currently available equivalent or substitute. However, the situation changed when I checked with the U.S. Branch of a British roller chain manufacturer, Renold-Crofts Co. Their number 110044 chain is a sixty-fourth of an inch wider, but it will work. The two chains compare as follows:

| | Diamond No. 867 | Renold Crofts 110044 |
|---|---|---|
| Pitch | 1/2 | 1/2 |
| Roller Width | .1875 | .205 |
| Roller Dia. | .335 | .335 |
| Pin Dia. | .172 | .175 |
| Linkplate Thickness | .060 | .061 |
| Linkplate Height | .452 | .465 |
| Strength in Lb. | 4200 (ave) | 4000 (min) |

This new chain is available from the following sources (at approx. $2.16 per ft.) Use their nr. 26 connecting links and nr. 30 offset links.

Renold-Crofts Co.
570 Smith Street
Farmingdale, N. Y. 11735
(516) 293-8464
Mr. Jack Davies

Renold-Crofts Co.
Cleveland, Ohio
(216) 524-4076

John Averill

FUEL GAUGES (WING)
Member Bob Hayes - F-17-D, S/N 258 - On the wing tank fuel gauge sender unit, the resistance from terminal to ground should approximate zero with float down and 32 bhms with float up. The float should operate freely, dropping its own weight. Right and left tank units are identical.

LANDING GEAR MOTOR
Beech D17.8900, purchase S-38, Dumore Electric Co. #3843. No longer manufactured. Dumore (their Mr. Art Grau) advised nothing! No motors - no parts - not even drawings. Everything destroyed. They suggest we obtain good motor and have a motor shop run peak torque test, and try to find a new manufacturer. Can anyone help, as this is a problem?

Member Scott Ferguson advises he had the fiber gear that goes in the gear motor drive made by Mantel Gear Works, Inc., 500 South Portland, Seattle, Washington, 98108, Phone 205/762-3333. Price in 1968 was $26.13 each.

Member Ray Jones advises that a Twin Beech D-18 flap motor can be used as a gear motor; says it is 24 volt (can convert) - otherwise interchangeable.

Member Joe Moriarty advises he has heard that the gear motor from a Cessna T-50 will work, even much faster.

ENGINE MOUNTS
On D-17-S there are at least two different types; lower serial numbers had different type shock bushings.

ENGINE MOUNT BUSHINGS (LORD)
Member O. S. Poer advises he secured for his F-17-D engine mount rubbers from Vibration Isolation Products, Inc., Burbank, California (Mr. W. O. LaDow, Marketing Manager). These were their part number VIP 117-D-17-S for use with installation of L6-MB Jacobs engine. Three rubber insert mounts (1 set) were $15.00 plus $1.00 postage. They do not have an STC and are thus unable to give certification.

BOOSTER COIL
Member Dr. Rodney Barnes has obtained for his G-17-S part #1367-1A booster coil, by Bendix Utica from Cord Industries, Box 149, 767 Totowa Road, Totowa, New Jersey 07511. (Mrs. Marie Vander Vliet - date 8/4/70). The booster coil completely overhauled (certified newly rebuilt) is $55.00 each; delivery, two weeks. Used spares for parts can be obtained in repairable condition at $10.00 each.

FUEL SELECTOR VALVES
Members advise that this item wears, and fuel drains down through from the upper wing tanks. Replacement valve plugs are scarce. Anyone knowing of a source or ideas for replacement, please advise.

Club member Ralph Wilson advises he made a plug of nylon which works well. He removed the plug and machined so he could press on a nylon plug, machined to fit the body of the valve.

LANDING GEAR SHOCK ABSORBERS
Member Bob Hayes informs us these should be carefully checked, especially if rebuilding an Older "bird" that has been sitting out or idle for a while. The F-17-L, S/N 258, was found to have both piston assemblies badly rusted and ruined beyond repair. In disassembly, we have found a strap wrench recommended but not suitable on old assemblies if corroded; possibly a chain wrench will work. A large pipe wrench will scar and should be avoided if possible. Note that the poppet piston valve is threaded on the piston arm, secured from turning by a small soft drive pin, which must be driven out first. After poppet piston valve is unscrewed, remove

LANDING GEAR SHOCK ABSORBERS (cont)
the chevron packing rings and service as needed.

It appears the later models, such as the D-17, had chrome-plated piston arm and the F-17 and older models only steel. Should you obtain a complete new fork and piston absorber assembly, these should be checked for fluid type. Some we found to have red hydraulic fluid; others motor oil or preservation oil. Clean and fill with correct hydraulic fluid.

BRAKES
The biggest improvements on G-17-S over the D-17-S was the change to Goodyear single disc puck type brakes. Many airplanes have been changed to this later type, but there does not seem to be a single installation on a 337 or an STC. It appears they are being installed on the basis it is standard equipment on the G-17-S.

However, a safer method, cleared with the Atlanta FAA office, is to install the later type brakes and get your A & P or A1 to issue a 337 stating the new brakes conform to the latest configuration of Model G-17-S.

Now the question arises - how does one get his hands on a set? Several ways:

#1 - and expensive

A complete set of new brakes is priced as follows:

| | | | |
|---|---|---|---|
| 2 - #395-2791 Goodyear brake assemblies | @ | $285.00 | $570.00 |
| 2 - #395-2902 Goodyear wheels | @ | 371.30 | 742.60 |
| | | | $1312.60 |

Even if your friendly FBO gives you all of his 25% discount, you still have a bundle of money to lay out.

#2 - and possible

The #395-2791 brake assembly was also used on the Aero Commander 520 and is in current use on the De Havilland Beaver. If you can find a crack-up or a plane being dismantled for parts, you are half way home.

Part #395-2902 wheel assembly was used on Aero Commanders 500, 500A, 520, 560, and 560A and, of course, on the De Havilland Beaver. These should be more plentiful.

#3 - Hardwick Aircraft Company
1612 Chico
South El Monte, Calif. 91733 (phone: 213/444-9922)

has #395-2902 wheels and #395-30997 brakes for #395.00 per airplane exchange. Note #395-30997 is different than Goodyear calls for on G-17-S. It is listed as applying to Aero Commanders 500, 500A, and 520 and to De Havilland Beaver. Might be a later part number, but should fit with little trouble.

Once you have acquired the parts, one change will have to be made upon installation. The bolt holding brake arm to fork must have a very thin head, or it will drag on wheel.

#4 - Use Cessna 310 wheels and brakes

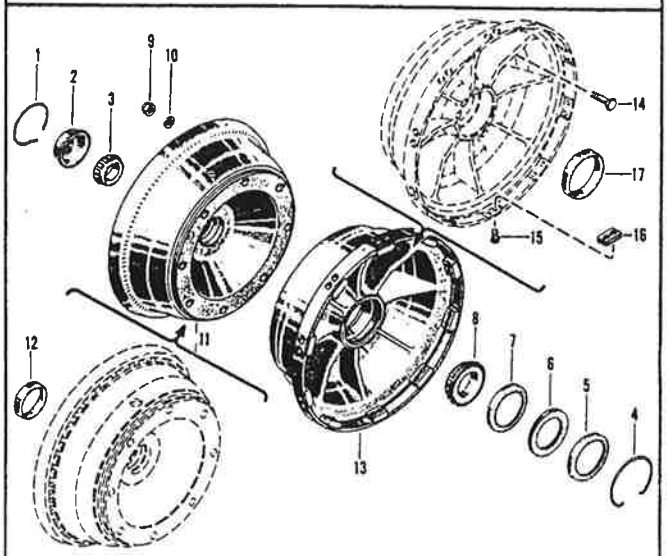
This may require an STC, but Goodyear #395-3238 wheel and #395-31053 or #395-31731 brake will fit without the bolt problem, so this may be one solution. Best to check with FAA before you jump. On either assembly, the brake should be placed on outside of wheel and half way up, facing forward. Use old axle assembly to install brake. A new hydraulic line must be used; suggest a flexible line.

Assembly No. 530462M-1

## 7.50-10 MAIN WHEEL

TUBE TYPE SINGLE DISC MAIN WHEEL

USED ON: Aero Commander 500, 500A, 520, 560 and 560A with 8.50-10 Tire 6PR TT.
Beech 17 with 7.50-10 Tire 6PR TT.
De Havilland Beaver with 7.50-10 Tire 6PR TT.



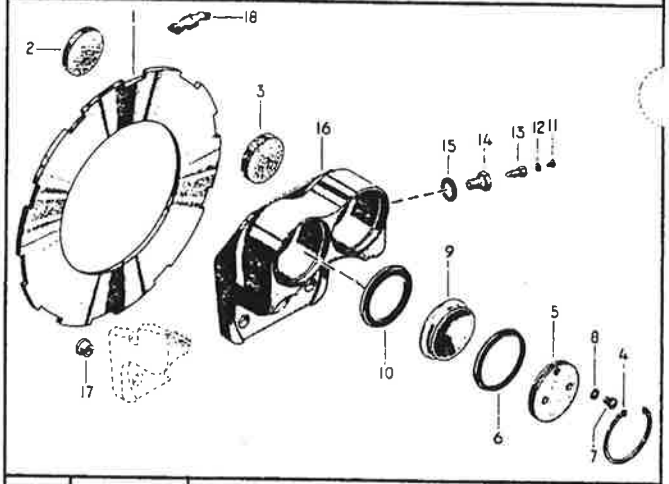
| INDEX NO. | PART NO. | DESCRIPTION | GOODYEAR CODE NUMBER | NUMBER PER ASSY |
|---|---|---|---|---|
| | 530462M-1 | WHEEL ASSEMBLY | 395-2902 | 1 |
| -1 | 511705-1 | . RING, Retaining | 395-2882 | 1 |
| -2 | 511706-1 | . HUBCAP | 395-2892 | 1 |
| -3 | 07100 | . CONE, Bearing | 395-0222 | 1 |
| -4 | 510779-12 | . RING, Retaining | 395-1595 | 1 |
| -5 | 214595 | . RING, Bearing closure | 395-968 | 1 |
| -6 | 510525-6 | . RING, Felt seal | 395-969 | 1 |
| -7 | 214595 | . RING, Bearing closure | 395-968 | 1 |
| -8 | 19150 | . CONE, Bearing | 395-0389 | 1 |
| -9 | AN365-524 | . NUT, Self locking | 395-1733 | 8 |
| -10 | COML | . WASHER | 395-4792 | 8 |
| -11 | 511156M | . WHEEL SUBASSEMBLY, Outboard | 395-2903 | 1 |
| -12 | 07196 | . . CUP, Bearing | 395-0231 | 1 |
| -13 | 511155M | . WHEEL SUBASSEMBLY, Inboard | 395-2904 | 1 |
| -14 | AN5-12A | . . BOLT | 395-1844 | 8 |
| -15 | 9520856 | . . SCREW, Disc drive key | 9520856 | 20 |
| -16 | 512171-2 | . . KEY, Disc drive | 395-4234 | 10 |
| -17 | 19268 | . . CUP, Bearing | 395-0386 | 1 |

Assembly No. 511659

## 7.50-10 BRAKE

LOCKRING RETAINED CYLINDER HEAD, SINGLE DISC BRAKE

USED ON: Aero Commander 520
Beech 17
De Havilland Beaver



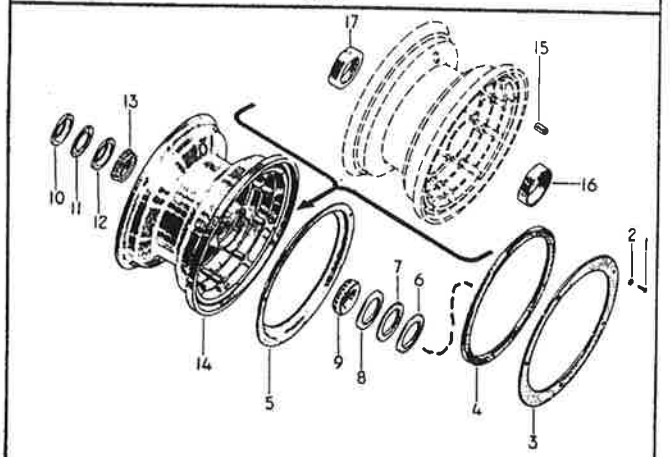
| INDEX NO. | PART NO. | DESCRIPTION | GOODYEAR CODE NUMBER | NUMBER PER ASSY |
|---|---|---|---|---|
| | 511659M | BRAKE ASSEMBLY | 395-2791 | 1 |
| -1 | 511431-2 | . DISC, Brake | 395-2566 | 1 |
| -2 | 9521591 | . LINING, Anvil | 39521591 | 2 |
| -3 | 9521589 | . LINING, Piston | 39521589 | 2 |
| -4 | NAS50-250 | . RING, Cylinder head retaining | 395-3335 | 2 |
| -5 | 511738M | . HEAD, Cylinder | 395-2899 | 2 |
| -6 | AN6230B6 | . SEAL, O-ring | 395-4806 | 2 |
| -7 | COML | . SCREW | 395-4796 | 1 |
| -8 | 511846-4 | . WASHER | 395-4486 | 2 |
| -9 | 511607M | . PISTON | 395-2666 | 2 |
| -10 | AN6227B33 | . SEAL, O-ring | 395-4733 | 2 |
| -11 | AN500A10-5 | . SCREW | 395-1343 | 2 |
| -12 | 511846-4 | . WASHER | 395-4486 | 1 |
| -13 | AN6204-2 | . VALVE, Bleeder | 395-5039 | 1 |
| -14 | 511951 | . ADAPTER, Bleeder | 395-3218 | 1 |
| -15 | MS28778-4 | . GASKET | 395-5761 | 2 |
| -16 | 9522072 | . HOUSING SUBASSEMBLY, Brake | 39522072 | 1 |
| -17 | 511657-2 | . . BUSHING, Mounting bolt | 395-2796 | 8 |
| -18 | 9510375 | . CLIP, Disc | 39510375 | 5 |

Assembly No. 218264

## 7.50-10 MAIN WHEEL

TUBE TYPE MULTIPLE DISC MAIN WHEEL

USED ON: Beech 17 with 7.50-10 Tire 6PR TT.
Cessna T50 with 7.50-10 Tire 6PR TT.
Howard DG&NH with 7.50-10 Tire 6PR TT.
Spartan Executive with 7.50-10 Tire 6PR TT.
Stinson SR-6 to SR-9 with 8.50-10 Tire 6PR TT.
Waco E & N with 7.50-10 Tire 6PR TT.



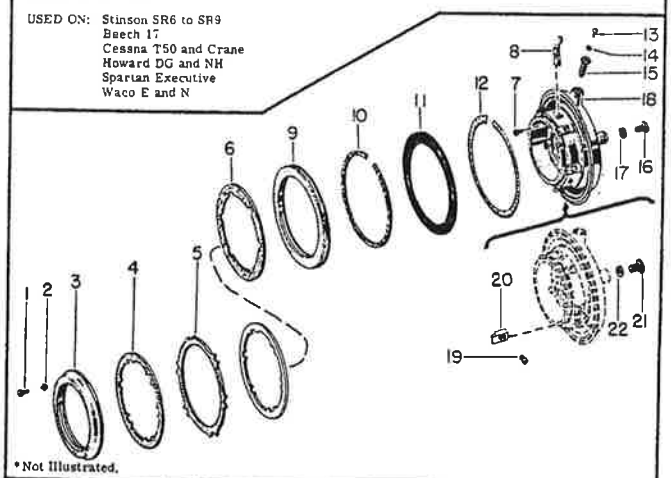
| INDEX NO. | PART NO. | DESCRIPTION | GOODYEAR CODE NUMBER | NUMBER PER ASSY |
|---|---|---|---|---|
| | 218264M-1 | WHEEL ASSEMBLY | 395-0638 | 1 |
| -1 | AN515-8-4 | . SCREW | 395-339 | 5 |
| -2 | AN935-8 | . WASHER, Lock | 395-618 | 5 |
| -3 | 216008 | . RING SUBASSEMBLY, Brake seal | 395-976 | 1 |
| -4 | 510525-7 | . RING, Felt seal | 395-987 | 1 |
| -5 | 9520392 | . RING SUBASSEMBLY, Key retaining | 39520392 | 1 |
| -6 | 510590 | . RING, Bearing closure shaped | 395-0776 | 1 |
| -7 | 510525-6 | . RING, Felt seal | 395-969 | 1 |
| -8 | 214595 | . RING, Bearing closure shaped | 395-968 | 1 |
| -9 | 19150 | . CONE, Bearing | 395-0389 | 1 |
| -10 | 510589 | . RING, Bearing closure shaped | 395-0775 | 1 |
| -11 | 510525-8 | . RING, Felt seal | 395-970 | 1 |
| -12 | 216024 | . RING, Bearing closure shaped | 395-971 | 1 |
| -13 | 07100 | . CONE, Bearing | 395-0222 | 1 |
| -14 | 218601M | . WHEEL SUBASSEMBLY | 395-0226 | 1 |
| -15 | 216017-4 | . . KEY, Disc drive | 395-0196 | 10 |
| -16 | 19268 | . . CUP, Bearing | 395-0386 | 1 |
| -17 | 07196 | . . CUP, Bearing | 395-0231 | 1 |

Assembly No. 218262M

## 7.50-10 BRAKE

MULTIPLE DISC BRAKE

USED ON: Stinson SR6 to SR9
Beech 17
Cessna T50 and Crane
Howard DG and NH
Spartan Executive
Waco E and N



*Not Illustrated.

| INDEX NO. | PART NO. | DESCRIPTION | GOODYEAR CODE NUMBER | NUMBER PER ASSY |
|---|---|---|---|---|
| | 218262M | BRAKE ASSEMBLY (6 Disc) | 395-0189 | 1 |
| -1 | AN510-10-8 | . SCREW | 395-0199 | 1 |
| -2 | 1510 | . WASHER, Lock | 395-0188 | 1 |
| -3 | 218263 | . NUT, Adjusting | 395-0194 | 1 |
| -4 | 216005 | . DISC, Stationary (steel) | 395-095 | AR |
| -5 | 216004 | . DISC, Rotating (bronze) | 395-097 | AR |
| -6 | 272295 | . DISC, Insulating and spacing | 395-093 | AR |
| -7 | H62-100851-52 | . SCREW WASHER and CLAMP | 395-3133 | 3 |
| -8 | 217435 | . SPRING, Piston return | 395-0225 | 3 |
| -9 | 216205M | . PISTON | 395-959 | 1 |
| -10 | 511298 | . WIPER, Felt | 395-1858 | 1 |
| -11 | 217076-2 | . SEAL, Piston | 395-3194 | 1 |
| -12 | 218065 | . EXPANDER, Piston seal | 395-3015 | 1 |
| -13 | 216950 | . SCREW, Bleeder | 395-131 | 1 |
| -14 | 216929 | . WASHER, Bleeder | 395-132 | 1 |
| -15 | 213933 | . VALVE, Bleeder | 395-130 | 1 |
| -16 | 218375 | . PLUG, Inlet | 395-126 | 2 |
| -17 | MS26778-5 | . GASKET | 395-5774 | 2 |
| -18 | 218654M | . BRACKET SUBASSEMBLY | 395-0228 | 1 |
| -19 | 9510922 | . . SCREW, Key | 39510922 | 6 |
| -20 | 218261 | . . KEY | 395-0195 | 6 |
| -21 | 511771 | . . BUSHING, Inlet | 395-2991 | 2 |
| -22 | MS28778-8 | . . GASKET | 395-5762 | 2 |

## MAINTENANCE TIP OF THE MONTH - WING FUEL TANK BAY AREAS

For aircraft operated over a 2-year period, our annual inspections have revealed that the rear spar forward facings in the tank bay areas have lost their protective coatings. Also, the 3/16" bottom tank bay plywood covers have deteriorated along the spar glue joint. Deeper investigation revealed that the corner blocking and trailing edge ribs have all loosened in their mounting and have dried out. You folks who own the Model 17 that has a metal tank cover are in a fortunate position, inasmuch as you can remove the cover and run this inspection.

What we are concerned with is the fact that all of this sub-structure has a direct load supporting factor to the rear spar, and once it has loosened and dried out, the total load could possibly be transmitted to the rear spar-to-fuselage attach point. The end result of this could possibly be a split rear spar, which could go undetected until airframe overhaul time, or until a total failure occurs. We have already run into this. The first thought was that the aircraft was continually operated in a dry and arid region, but upon disassembly of the components, we found it was caused by raw fuel lying in and along the rear portion of the tank bay.

The inspection we perform is to remove the tank cover and then lift out the fuel cell. The original 3/16" lower plywood tank bay bottom had 1/4" drain holes drilled in it just forward of the rear spar front facing. Design thought was to keep the area aerated. We have found (1) the holes totally covered over and (2) they were totally missing, possibly forgotten at some repair period. Raw fuel lying in this or any area will have a definite effect on any finish applied as protective coating.

a) At your earliest convenience, lift off the tank bay cover. Remove the fuel cell from the wings and inspect the bottom of the tank bay, giving particular attention to the trailing area of the bay. Reseal the tank bay area, if the protective coating shows signs of deterioration, with aluminized varnish. We here make up our own sealer by using aluminum powder and a good grade of spar varnish. The cost to you would most likely be $1.75 per pound for the powder and $6.00 per gallon for the varnish. This can be purchased at your local aircraft supplier. Make sure your tank bays have their drain holes; if not, then install them. Use a .250 drill bit. Factory print shows five holes; they are located just forward of the front face of the rear spar, approximately 1/2" from each rib.

b) If the tank leaks, have it repaired.

c) Use NEW RUBBER TANK PLUMBING CONNECTORS. H-6000 fuel and oil hose. Don't save a fifty-cent piece; all this will do is cause you grief at a later date.

d) Complete your tank installation and replace the cover. Make sure you seal the opening around the tank filler neck and tank cover; this will eliminate the over-servicing of the fuel to run back into the tank bay. Seal the leading edge of your tank bay cover to the wing leading edge with 2" surface tape and refinish in the normal manner. This will help keep the water out when you wash your aircraft, and you would be surprised at how it helps while flying through the rain.

HAPPY FLYING!

George Yezman

## STRIPPING PAINT FROM HIGH HEAT TREAT STEEL

The center section "carry thru" structure for the lower wings on the D17S (Staggerwing Beech, N69H) I'm restoring, is made of 4130 steel tubing heat treated to 180,000-200,000 psi. It was made as a separate sub-assembly, heat treated and welded to the frame (which is not heat treated) via short stub tubes so as not to destroy the heat treatment of the carry thru truss sub-assembly.

4130 heat treated to this range is subject to a phenomenon known as hydrogen embrittlement (H.E.). This mechanism results from contact with highly acidic or alkaline compounds whereby hydrogen is liberated and infiltrates the grain boundaries in the steel. This hydrogen intrusion causes extreme embrittlement and results in the formation of microscopic cracks which link up, grow, and can result in failure of the component whether under load or not!

Fortunately, the circumstances leading to initiation of H. E. (hydrogen embrittlement) in 4130 heat treated to 180,000 psi and above are not normally encountered in aircraft service. Except, that is, when stripping such items for repaint.

For such a seemingly simple task, wherein lies the danger? Most strippers contain ammonium hydroxide or sodium hydroxide which will cause H. E. However, since this characteristic is recognized, the stripper manufacturers add an inhibiting agent to their products qualified for use on steel susceptible to H.E. Two such strippers are:

A. Intex 857 from Intex Products, Inc.
P. O. Box 6648
Greenville, SC 29606

B. B & B 1776 from B & B Chem Co., Inc.
P. O. Box 796
Miami, Fl 33166

Like everything else, there are a couple of catches. The inhibitor has nine month shelf-life after which its effectivity begins to fall off. Also, the strippers are hygroscopic (they will absorb moisture from the air each time the container is opened). Additional compounds are thus formed which further reduce the inhibitors' power.

How about the strippers containing methylene chloride and alcohol which do not cause H.E.? Fine, but (another catch) the poorer grades of these strippers may have some hydrochloric acid impurity which would cause H. E. and most of these strippers have no inhibitors. In the face of the 'howevers', qualifications, cautions, and shelf-life problems associated with the chemical strippers, I gave up and resorted to mechanical means for removing the paint from the heat treated area. (The rationalization was that N69H was one day going to tote 'ol number one's can around and 'one' can't be too safe.)

One of the old wing walkway non-skid coverings was the cloth-backed abrasive type. I tore this into long narrow strips and with a back and forth motion (like polishing shoes) removed the old paint and surface rust. I was careful, of course, not to excessively abrade the metal itself (Remember, this is thin wall tubing.) I had to resort to solvent cleaning and wire brushing the tube cluster joints. This scheme worked very well and without the danger of H. E. Being proud of my achievement, I related it to the chemical engineering friend who had provided the original advice on strippers. He replied, "It's good you

didn't use a carbon abrasive." It seems carbon materials will cause corrosion. He recommended using a silica or aluminum oxide abrasive. I breathed a sigh of relief--the non-skid I used was of the latter material. Some days it just doesn't pay to get out of bed.

INSTRUMENT PANEL SHOCK MOUNTS

Original shock mount on D17 identify as Lord Mfg. Company's #6 in their 150 Series. Current Lord Mfg. Company catalog shows Part #150PL-6 identical in size, design, and capacity. The load rating is 6 lbs. per 1/16" deflection. Some surplus sources may identify the part as AN8008-D17.

ENGINE SHOCK MOUNTS

Lord Kinematics of Erie, Pa. advises original mount bushings Part #J-1103 and #SK-694 superceded by Part #J-1278 and #J-1279, which in turn are superceded by upper mount Part #J-5385-14 and lower mount Part #J-5384-11. Lord still manufactures latter part numbers, but only in small quantities or on special order at $47.85 each (March-1974). Order from Lordco Supply Co., P. O. Box 8069, Erie, Pa., 16505.

Lord Engineering said Twin Beech D-18 bushings are the same (spring rate and exterior dimensions) except for bolt size. D-18 bushings have a .4375/.4415" hole for a 7/16" bolt whereas D-17 bushings have a .375/.379" hold for a 3/8" bolt. We would not recommend enlarging holes in the engine mount.

However, modifications of D-18 bushing is possible. One route is to use a close fitting sleeve, but difficult to make wall thickness of 1/32". The steel core center in those bushings is quite thick and should accept enlargement of 7/16" hole to .500". This will accommodate a sleeve with a more reasonable wall thickness.

Vibration Isolation Products, P. O. Box 7029, Los Angeles, Calif., 91505, Phone 212/896-1191 had D-18 bushings at $25.00 a set and will supply their drawing number VIP-503 ($1.85 extra) outlining this modification in detail. FAA approval of this alteration may be required.

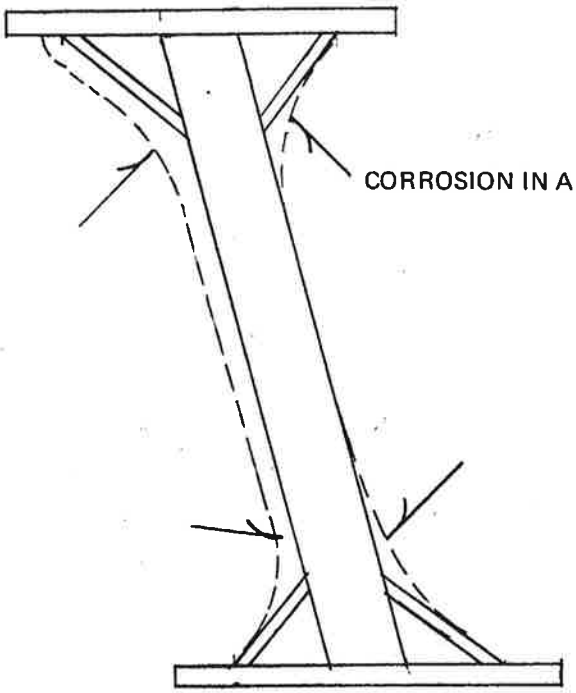
John Averill

NOTE: Member Jess Shryack advises that D-18 Twin Beech mounts are numbers J5384-5 and J5385-5 (we guarantee nothing! - Editor)

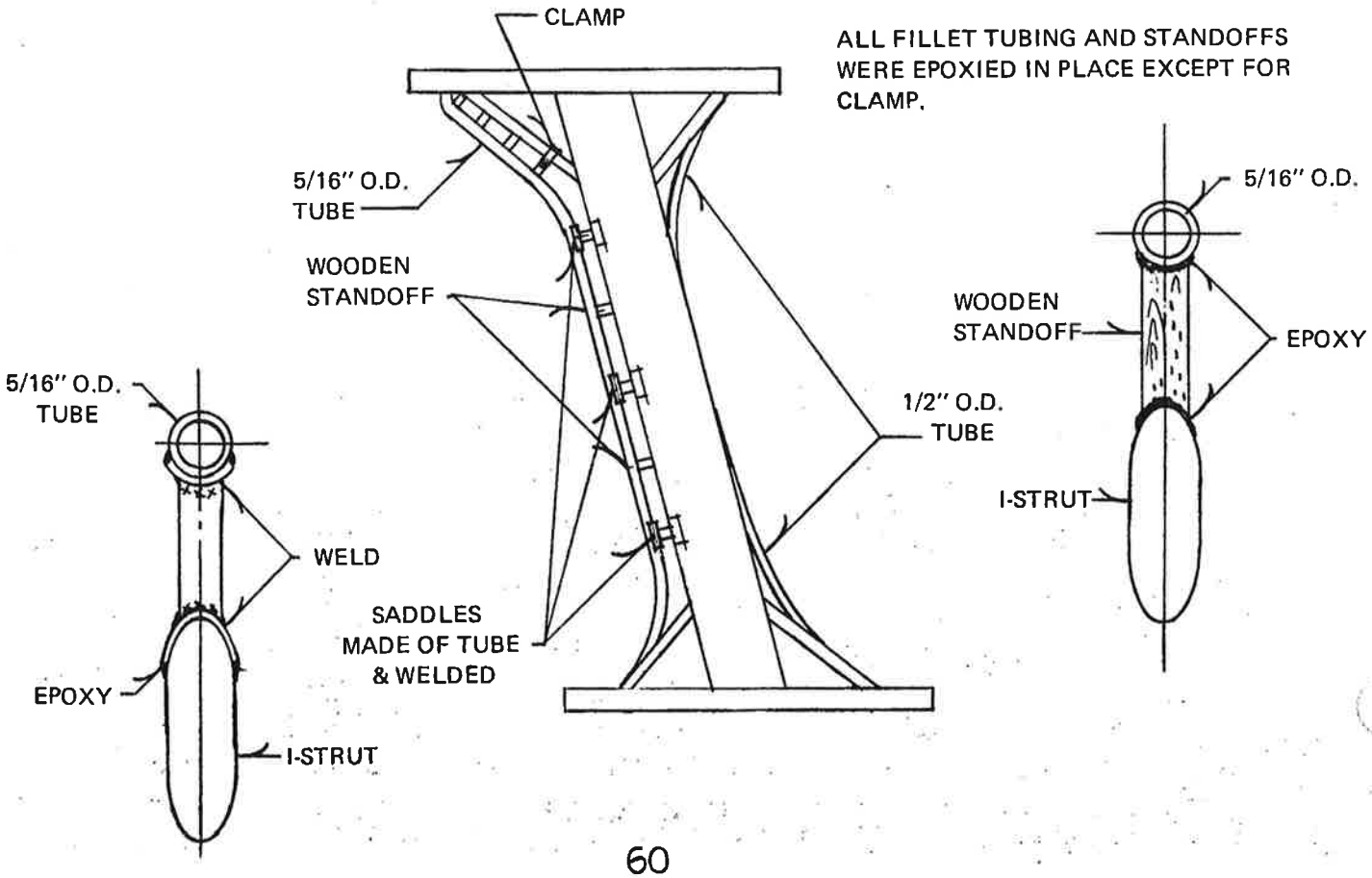
FLAP CABLE

Joe Moriarty needed 1/2" longer flap cable and made new cable 55-3/4". Used standard automotive speedometer cable, a few thousandths smaller than the original Beech. For ends, he used Alemite Stewart Warner #409353 - almost identical to the original with exception of length of large end - and material appears to be a brass alloy (original was steel). The total length of fitting is 1", same as original, and the length of the large end can be reduced to original dimensions. The diameters of both ends are OK.

Chad Koppie advises he has replaced his defective landing gear cross shaft gear with one from Browning Gear Co. Says he purchased No. NCG1640, 16 pitch, 40 tooth Browning gear with 14-1/2$^{0}$ pressure angle, 1/2" face, 1/2" bore (drilled to 3/4" bore) and machined out to make concave face to original Staggerwing type. This is Part No. D17850-13 in T.O. No. 01-90CC-4, Page 167, Fig. 16. Chad worked with Bearing Headquarters Co., 25th Ave. & 16th St., Broadview, Illinois, 312/379-0300.




COVERED WITH STITS POLY FIBER, MACHINE SEWED COVER INSIDE OUT AND IN REVERSE. THEN PULLED OUTSIDE OUT, BASEBALL STITCHED ENDS AND HEAT SHRUNK. ALSO PUT IN DRAIN GROMMETS TO ASSURE VENTILATION.



**RADIO GEAR** - Doug Koeppen, S/N 4807, advises after much searching he has finally located some panel mounted radios that will properly fit a D17 Staggerwing. The units are made by Becker of Germany, are self-contained (not remote), and can use 14 or 18 volts. They are:

| UNIT | FRONT PANEL DIMENSIONS | MOUNT DEPTH | WEIGHT | LIST PRICE |
|---|---|---|---|---|
| AR 2010 720CH VHF Transceiver | 5-3/4 X 1.87" | 7" | 2.86 lbs. | $1,950.00 |
| NR 2030 200CH VOR LOC RCVR | 5-3/4 X 1.87" | 6-1/2" | 2.64 lbs. | $1,300.00 |
| NR 2020 200CH VOR LOC GS MKR | 5-3/4 x 1.87" | 6-1/2" | 2.64 lbs. | $2,250.00 |
| NI 2031 CONV/IND CONVERTER INDICATOR | 3.25 X 3.25" | 7.87" | 2.64 lbs. | $1,550.00 |
| NI 2020 CON/IND VOR LOC GS MKR | 3.25 X 3.25" | 7.87" | 2.64 lbs. | $2,100.00 |
| ADF2000 DIGITAL | 5-3/4 X 1.87" | 6-1/2" | 2.42 lbs. | $2,300.00 |

Doug further comments that these are very expensive, but, hopefully, skillful bargaining may help. Above data obtained by Doug from Memphis Aero at International Airport, Memphis, Tennessee. Contact Doug if interested.

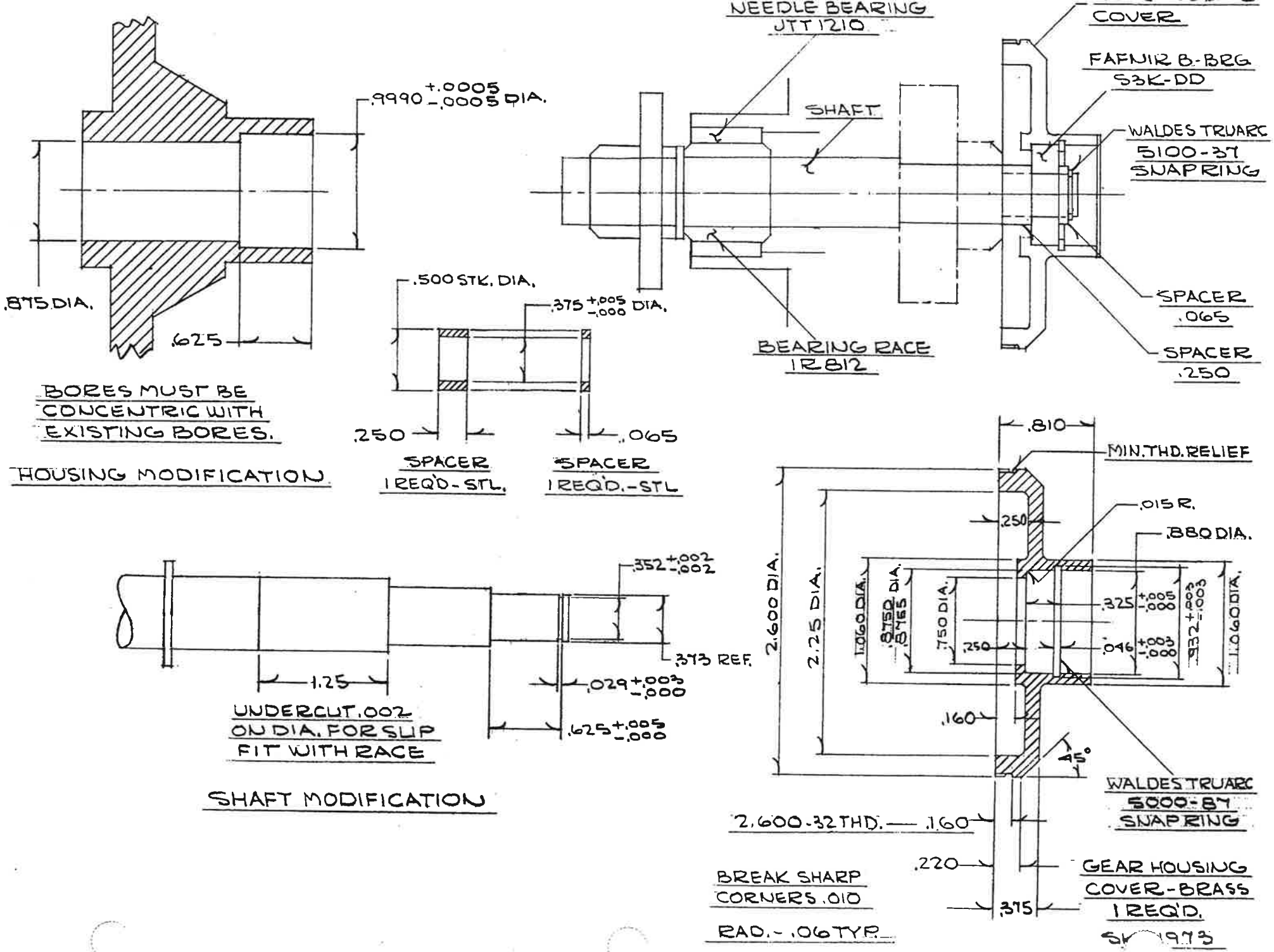
## TECH TIPS
## LANDING GEAR GEARMOTOR MODIFICATION (Sketch No. 11973)

The modification was developed to reduce friction due to radial and axial loads in the gearbox in that the needle bearing adjacent to the sprocket takes the radial load of the chain; the ball bearing at the opposite end of the gear. Box output shaft takes the combined radial-thrust load of the gears.

The bearing arrangement in the motor should be checked also. Although very desirable, the end bracket configuration of the motor did not permit a change from sleeve bearing to ball bearing, so the sleeves for motor radial loads were retained. In our particular motor, the end thrust from the gears was taken on thrust washers between the end brackets and collars on the rotor shaft, which was a high-friction arrangement. Close inspection of the motor disclosed that the original design intention was to take axial thrust on ball clusters at both ends of the rotor shaft (one end is in the gearbox). We removed the thrust washers and reinstalled the ball clusters with a resultant substantial reduction of friction.

We have had over 100 hours of operating experience since making this modification and have not had one moments operation problem with the landing gear gearmotor. One bit of evidence of the value of this improvement is the fact there has been negligible brush wear in the motor, indicating loads well within the motor capability.

R. R. HAYES


NEEDLE BEARING
JTT 1210
COVER
FAFNIR B-BRG
S3K-DD
SHAFT
WALDES TRUARC
5100-37
SNAP RING
.9990 +.0005 -.0005 DIA.
.875 DIA.
.625
.500 STK. DIA.
.375 +.005 -.000 DIA.
SPACER
.065
BEARING RACE
1R812
SPACER
.250
BORES MUST BE
CONCENTRIC WITH
EXISTING BORES.
HOUSING MODIFICATION
.250
SPACER
1 REQ'D - STL.
.065
SPACER
1 REQ'D. - STL
.810
MIN. THD. RELIEF
.015 R.
.880 DIA.
.250
2.600 DIA.
2.25 DIA.
1.060 DIA.
.8752 DIA.
.8745
.750 DIA.
.325 +.005 -.005
.250
.046 +.003 -.003
.932 +.003 -.003
1.060 DIA.
.160
45°
WALDES TRUARC
5000-87
SNAP RING
.352 +.002 -.002
.373 REF.
1.25
.029 +.003 -.000
.625 +.005 -.000
UNDERCUT .002
ON DIA. FOR SLIP
FIT WITH RACE
SHAFT MODIFICATION
2.600-32 THD. — .160
.220
.375
GEAR HOUSING
COVER - BRASS
1 REQ'D.
BREAK SHARP
CORNERS .010
RAD. - .06 TYP.

## FIRE!! FIRE!!

Bob Ellis, our staunch member from Barranquilla, Columbia, had a most serious fire in his plane. He wrote us as follows:

"I had a fire cranking up the engine and it took four weeks to get the damage repaired. For the benefit of other owners, I think it is worthwhile to know how my fire apparently started and how to do some preventative maintenance to avoid it by other owners.

I had just started up the engine, oil pressure came up, and I switched on the King KX 100/K1 200 radio which was mounted on the lower right panel. The engine had backfired once, not too loudly, upon catching (field altitude about 3300', so I probably had the mixture a bit too rich), so when I saw some smoke it did not alarm me unduly until a couple of seconds later I smelled the acrid fumes and noted the smoke continuing.

I told my son to get quickly out, followed him looked carefully at the engine cowl from about the left I strut and flew back into the cabin. (I had already shut off all switches and fuel) and pulled the engine $CO^2$, but the fumes, biting and burning my eyes in spite of the two roll-down windows and door being open, increased with the smoke then obviously coming out from the instrument panel. I pulled off the instrument cowl pad and the paint raised up in blisters by the windshield, and smoke poured out.

I grabbed the cabin dry chemical extinguisher and with one hand pulled the top of the panel outward and stuck the nozzle in, but the fire still continued, so I also shot the extinguisher upward from below the panel. As this was not putting it out, I rapidly unlocked the compartment in the door, took out my pliers, took my Swiss "tool" knife from my pocket and went out onto the wings and pulled the cheek cowl hinge pins and unscrewed the six screws holding the accessory section cover in front of the windshield. I opened the leather cover snaps to get to the instrument section and finally after about 2½ minutes got the bloody fire doused.

By that moment my son had returned with the gas truck and its large $CO^2$ equipment. It took me (there were no facilities or mechanical services there) 4½ hours to tape up the burned wires, disconnect the lines for fuel pressure, oil pressure, manifold pressure, etc., and revise all electrical systems to be able to go on and fly the plane back to San Antonio, Texas, to Tex-Sun Beech for repairs. Fortunately, my HF, ADF, and old back-up ARC 15 VHF and Omni functioned in spite of the scorched wiring.

It took four weeks of work for the repairs, as the heat had been transmitted to the wires for a far greater distance than the area of the burn, and as a consequence the insulation was damaged for long distances, which required a lot of rewiring. Incidentally, I cranked up the gear by hand so that all that heavy power would not have to flow through the wires.

My two totally destroyed radios were replaced. I got a King KX 130 with K1 211, including 10 channels for glideslope. Tex-Sun Beech was surprised the electrical system had functioned after the fire, as the damage was so extensive. It was also necessary to overhaul all gyros due to their ingesting the powder from the extinguisher, and most of the other engine instruments. They had to remove the entire panel!

When they finally got down into the area, they found that the main fuel line, coming from the wobble pump to the carburetor, was metal tubing from pump to just inside the cabin area where it ran across the rear of the firewall in the form of a rubber hose, then it converted back to tubing of metal to go through the firewall and go to the carburetor. It was this hose that had a small pinhole and apparently let a fine spray of gas out to either touch the King radio and arc to start the fire, or it created a vapor that exploded into flame when the electricity was turned on for the King radio.

As most of us have more equipment in our Staggerwings than at the time of manufacture, it is difficult to see,check, or even imagine that there could be a rubber hose for the main fuelline back up behind the instrument panel; like mine, it may not have been checked in years by an A & E at annual inspection. I recommend that all owners do so! It may be that not all models are so set up, but it is certainly worthwhile to investigate. My repair bill was $3,500.00 (happily, I had $100.00 deductible insurance!!!!)

For added information, my fuel line now runs in metal tubing, and it runs in front of the firewall (and enclosing the Air-Flex rubber hose is a heavy sleeve of asbestos, where it runs across the firewall area), except for a short distance. It is to be noted that if this fire had started in the air, it would have been nearly impossible, if not actually impossible to get out while in flight. It was also fortunate that I know nearly every nut and bolt on the plane so that I could swiftly open up and get access to the fire to put it out."

Bob Ellis

TOM MAYER-D17S, S/N 6908, writes to correct article in Newsletter 75-2 and furnish details on his Jasco alternator installation.

Tom writes, "My Jasco alternator is not, as reported in last Newsletter, a 24 volt conversion though Jasco does make a 24 volt set up for 985's and 1340's. I did not modify a Twin Beech regulator.

Mine is 12 volts, Jasco Model 6555. It comes with a regulator. I paid around $300.00 for the thing installed, but that was 3 years ago. It will be more now. I bought mine from Skytronics, 277 Oregon, El Segundo, CA, 90245, PH: 213/772-3231.

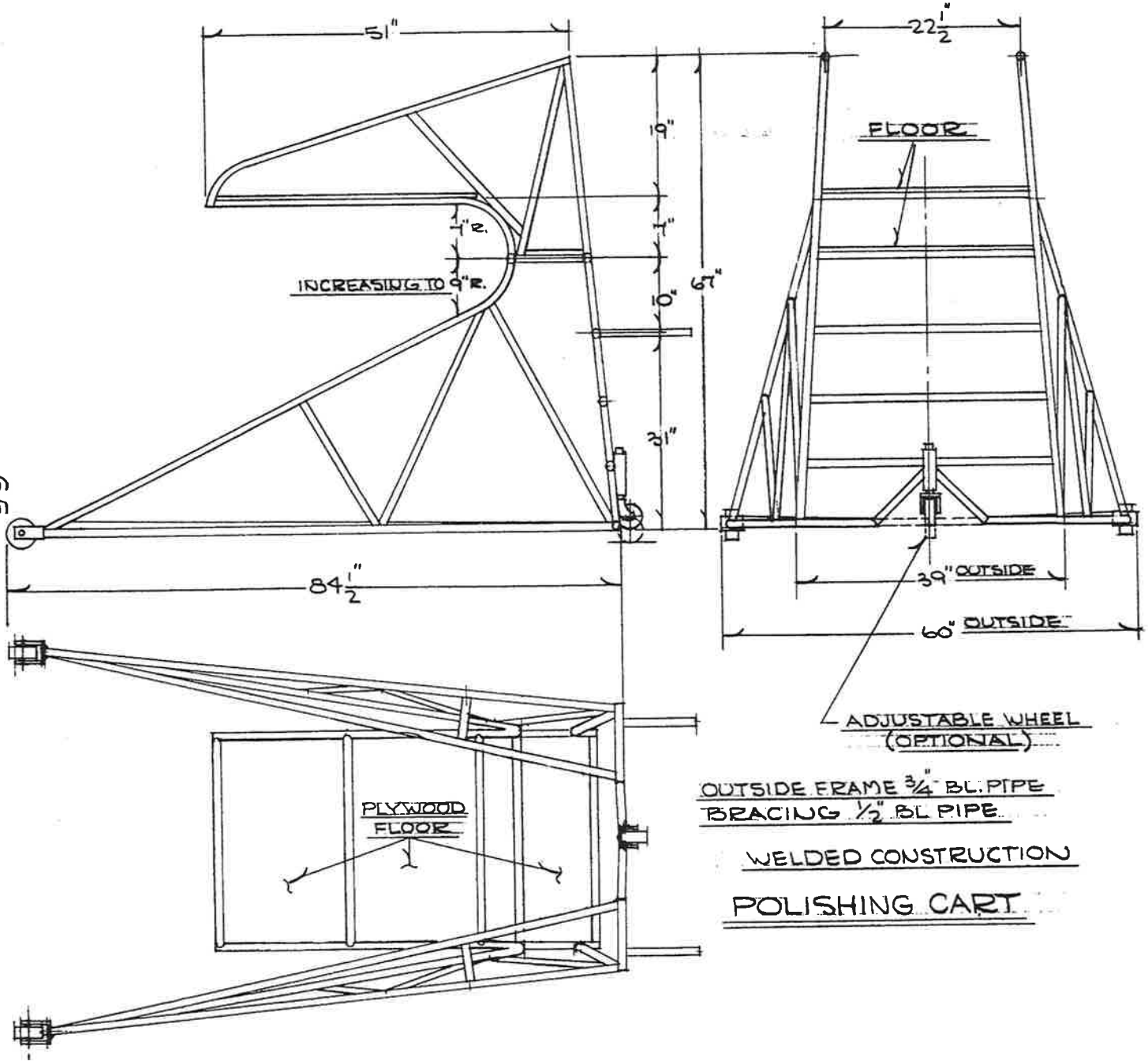
The kit is not STC'd for Beech 17's, 985's, or 1340's but for either of those engines on a Grumman Ag Cat. The Albuquerque CADO gave me a 337 with blessings. I think they were tired of hearing about my electrical problems.

The kit was the best investment I've ever made for the Beech. It had gone through two generators - one overhauled, one bought fresh overhauled from Duster Sprayers - an outfit I would avoid like nuclear fallout. It went through five or six regulators. Three shops worked on the problem, six or seven mechanics, and two electrical engineers. I struck out all the way around.

I had one total electrical failure IFR - about ten altogether. I was going to sell the bird. I fly 400 hours a year, IFR, Latin America and cannot put up with that sort of unreliability.

Jasco cured all. Maybe others can make old generators and regulators work. I couldn't nor could a number of people with Beech experience and excellent reputations. I would not own a Beech 17 without the conversion."

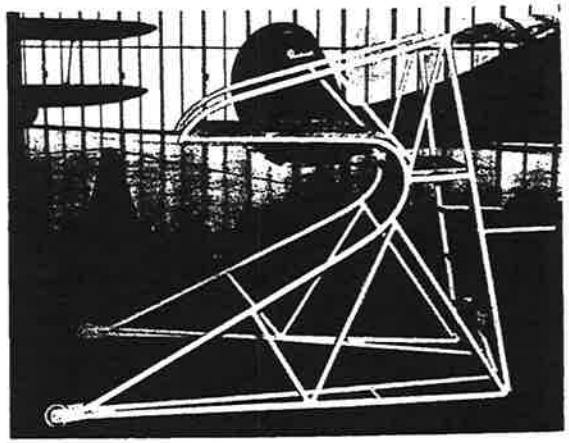
Tom Mayer

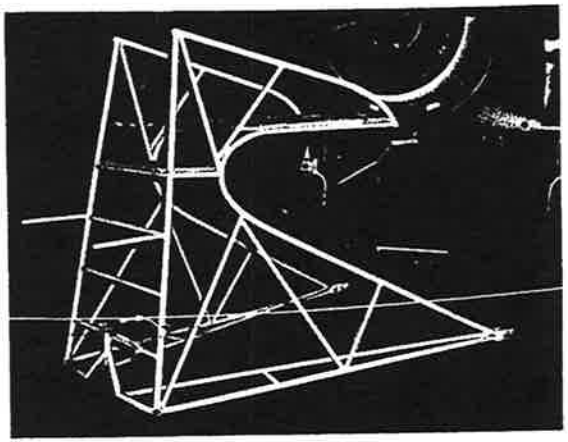



OUTSIDE FRAME ¾" BL. PIPE
BRACING ½" BL PIPE

WELDED CONSTRUCTION

## POLISHING CART





EASTERN AIRCRAFT CORPORATION

INSTALLATION INSTRUCTIONS
FUEL INDICATING SYSTEM
MARCH 26, 1976

The following system has been established to aid you, the mechanic, with the installation of our fuel system sending units and fuel quantity gauge:

A. MAIN TANK

1. Remove main tank sending unit access cover plate, located under the pilot's seat.

2. Disconnect the power lead; disconnect the ground lead.

3. Remove cap nut safety wire; remove cap nuts. Retain the original cap nuts.

4. Remove original sending unit from tank; remove original parting surface gasket.

5. Clean parting surface with M.E.K., be careful not to get any debris into unit opening, as the tank has no finger screen in it.

6. Install new parring surface gasket P/N S1588-1, supplied with kit. Gasket will align itself as the hole pattern will match the sending unit mounting studs.

7. Install the new main fuel cell sending unit (Eastern Aircraft P/N FST17-0013) into parting surface opening. Be careful not to force unit into opening as you may damage it. The sending unit will automatically align itself to the correct position by its mounting hole pattern.

8. Secure sending unit into position with the original cap nuts that you have retained, and resafety as per original.

9. If at one time in maintenance history the cap nuts have been replaced with self-locking nuts, discard old nuts and replace with new.

10. Reinstall power lead to terminal post, reinstall ground lead.

B. 49 GALLON REAR FUSELAGE AUXILIARY TANK

1. Remove fuel sending unit access cover plate, located under carpeting on left side of the cabin floor just forward of the rear seat.

2. Disconnect power lead and ground lead from original sending unit.

3. Remove safety wire from cap nuts, remove cap nuts and retain them. Remove sending unit from tank. Remove parting surface gasket.

4. Clean parting surface with M.E.K., be careful not to get any

debris into unit opening, as the tank has no finger screen in it.

5. Install new parting surface gasket P/N S1588-1, supplied with kit. Gasket will align itself as the hole pattern will match the sending unit mounting studs.

6. Install the new rear auxiliary tank sending unit (Eastern Aircraft P/N FST17-0013) into parting surface opening, be careful not to force unit into opening as damage to unit might occur. Note that both the main and rear fuselage auxiliary tank use the same sending unit; this is not in error as the aircraft left the factory with the same sending unit arrangement.

7. The sending unit will align itself automatically into the correct position as the mounting hole pattern will match with the unit tank mounting studs.

8. Secure unit into position with cap nuts, and resafety as per original. If cap nuts have at one time been replaced with self-locking nuts, replace all nuts with new.

9. Reconnect power lead; reconnect ground lead.

C. LOWER RIGHT WING

1. Remove sending unit access cover from wing fuel cell cover, located at the forward inboard corner of the tank cover. For early Model 17's, and those aircraft that have not incorporated the metal tank covers, you will have to cut open the wing fabric in the sending unit area to gain access to the sending unit.

2. Remove sending unit power lead; remove ground lead. Remove all retaining nuts that secure sending unit to tank. Remove sending unit from tank. Remove parting surface gasket. Clean parting surface with M.E.K., be careful not to get any debris into unit opening, as the tank has no finger screen in it.

3. Install new parting surface gasket P/N S1588-1, supplied with kit. Gasket will position itself automatically through its hole pattern in relation with the sending unit mounting studs.

4. Install new sending unit (Eastern Aircraft P/N FST17-0011-2) into parting surface opening being careful not to force unit through parting surface as damage might occur to unit.

5. Sending unit will align itself automatically through its hole pattern, in relation to unit mounting studs.

6. Secure unit into position with new self-locking nuts; reinstall power lead to sending unit terminal post; reinstall ground lead.

7. Reinstall sending unit access cover plate. For early Model 17's or those that do not incorporate metal tank covers,

you will have to perform a standard fabric repair over the area of the sending unit. Procedures for this are outlined in A.C.43.13-1, sections applicable to fabric repair.

D. LOWER LEFT WING

1. Install new sending unit (Eastern Aircraft P/N FST17-0012-2) and parting surface gasket P/N S1588-1 in the same manner as outlined in Section C of this Instruction Sheet.

2. If you are installing units into an early Model 17 without metal fuel cell covers, follow steps outlined in Section C of this Instruction Sheet for access to sending unit and repair to fabric after installation is completed.

E. UPPER RIGHT WING

1. Remove sending unit access cover plate located on top-side forward-inboard corner of fuel cell cover plate. On early Model 17's that do not have metal fuel cell covers and do have upper fuel cell options, you will have to open the wing fabric over the sending unit area.

2. Remove the power lead and ground lead from the sending unit. Remove sending unit from fuel cell; remove parting surface gasket.

3. Clean parting surface area with M.E.K., be careful not to get any debris into parting surface opening, as the tank has no finger screen in it.

4. Install new parting surface gasket supplied with kit P/N S1588-1.

5. Install new sending unit (Eastern Aircraft P/N FST17-0011-1). Both the parting surface gasket and sending unit will align themselves automatically as their hole patterns will match the unit mounting studs. Be careful not to force sending unit through parting surface opening, as damage might occur to unit.

6. Secure unit into position with new self-locking nuts; reinstall power lead to sending unit terminal post; reinstall ground lead.

7. Reinstall sending unit access cover plate, for early Model 17's with upper fuel cell options, you will have to perform a fabric repair in the area of the sending unit. Procedures for this are outlined in A.C.43.13-1, sections applicable to fabric repair.

F. UPPER LEFT WING

1. Install new sending unit (Eastern Aircraft P/N FST 17-0012-1) and parting surface gasket P/N S1588-1 as outlined in Section E above, of these Installation Instructions.

2. If you are installing an upper left wing sending unit into an early Model 17 without a metal fuel cell cover, you will have

to perform a fabric repair to the access area as outlined in Section E of this Installation Sheet. Procedures for this repair are outlined in A.C.43.13-1, sections applicable to fabric repair.

G. ELECTRICAL

The Beech Model 17 used only one fuel gauge, a fuel tank quantity selector switch, and a 75 Ohm resistor in its system. All wiring is 18GA unshielded wire. You, as the mechanic, installing our system will be concerned with only the removal of the 75 Ohm resistor, and the panel gauge installation P/N FS117-001. The original fuel gauge was normally installed in the lower left-hand corner of the stationary panel, but due to the age of the aircraft and the number of owners it has had, it could be located at any position on the instrument panel in front of the pilot. The 75 Ohm resistor can normally be found in the power lead, in series from the Buss fuse to the power side of the fuel quantity selector switch. But again, due to the age of the aircraft, it can be located any place along the circuit to the power side of the switch. You will have to locate it and remove it from the circuit.

1. Remove original fuel quantity gauge from instrument panel.

2. Enlarge meter hole to a 2" diameter.

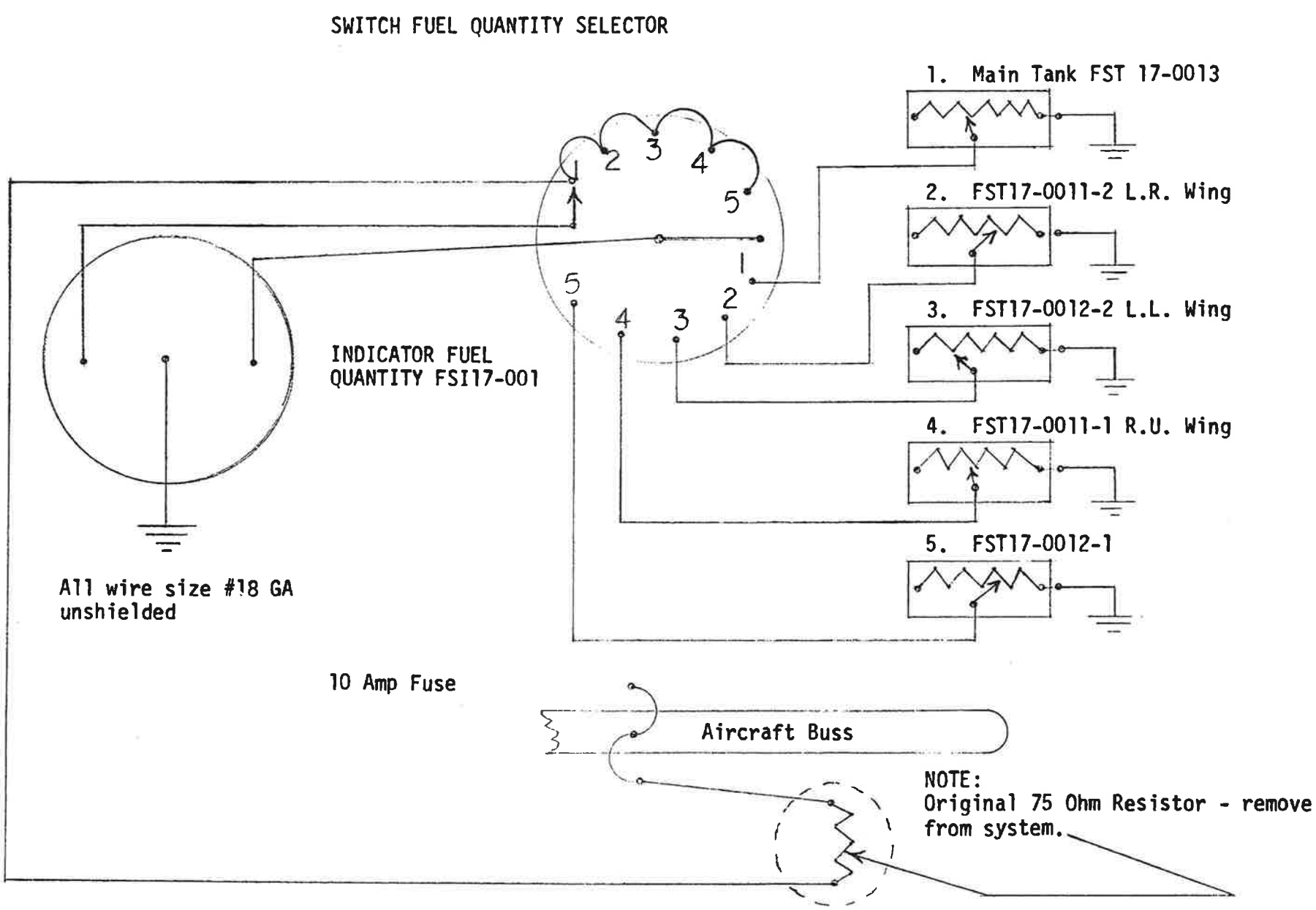
3. Connect meter into system as supplied wiring diagram illustrates.

4. Remove 75 Ohm resistor from circuit, and either replace the #18 GA wire completely, or splice in a new piece in accordance with A.C.43.13-1, Section 247.

5. A systems check can now be performed, place fuel quantity selector switch in main tank position, turn on master switch, fuel quantity gauge will indicate that amount of fuel in the tank. Select the various tank positions, and you will receive quantity information.

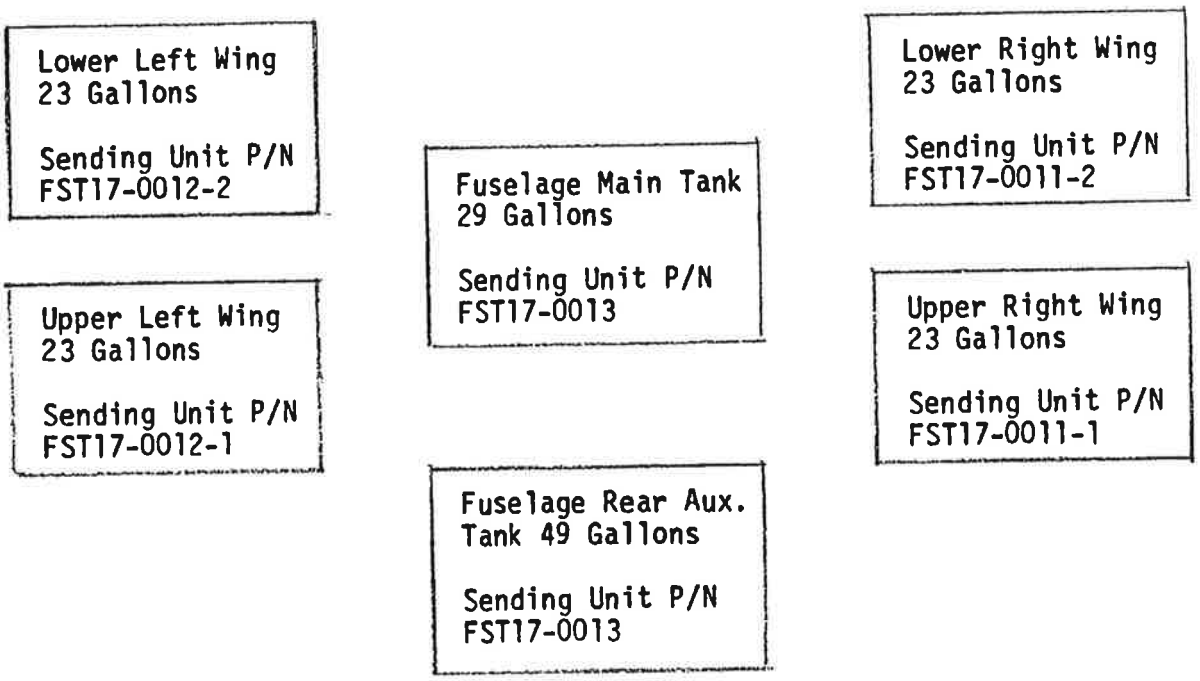
6. If you have any problem in a given tank position, check the grounding of the sending unit. A normal indication while in a given position will be a smooth movement of the meter needle. A rapid off scale full indication will show a poor ground connection.

7. Upon completion of the installation, you, as the mechanic, will have to complete the required 337, and log book entry. Weight and balance computations will not be necessary, as the weight change is negligible.


SWITCH FUEL QUANTITY SELECTOR
1. Main Tank FST 17-0013
2. FST17-0011-2 L.R. Wing
3. FST17-0012-2 L.L. Wing
4. FST17-0011-1 R.U. Wing
5. FST17-0012-1
INDICATOR FUEL QUANTITY FSI17-001
All wire size #18 GA unshielded
10 Amp Fuse
Aircraft Buss
NOTE:
Original 75 Ohm Resistor - remove from system.

EASTERN AIRCRAFT CORPORATION

SENDING UNIT LOCATION BY P/N




STANDARD SIX TANK ARRANGEMENT

EASTERN AIRCRAFT CORPORATION

FUEL INDICATING SYSTEM BEECH

MODEL 17 SERIES

PARTS LIST

| | | |
|---|---|---|
| 1. | FST17-0013 | Sending Unit Fuselage Main Tank |
| 1A. | FST17-0013 | Sending Unit Fuselage Rear Aux. Tank |
| 2. | FST17-0011-1 | Sending Unit Upper Right Wing |
| 3. | FST17-0011-2 | Sending Unit Lower Right Wing |
| 4. | FST17-0012-1 | Sending Unit Upper Left Wing |
| 5. | FST17-0012-2 | Sending Unit Lower Left Wing |
| 6. | FSI17-001 | Meter Fuel Quantity |
| 7. | S1588-1 | Gasket (CESSNA STD.) |
| 8. | | System Wiring Diagram |