# THRUSH AIRCRAFT, INC.

P.O. Box 3149 Albany, GA 31706-3149 Phone (229) 883-1440 Fax (229) 439-9790


CUSTOM KIT

## No. CK-AG-37

Date: 8/11/06

# FIELD CONVERSION OF S2R-T34 AND S2R-T34DC TO ALLOW INSTALLATION OF PT6A-34AG ENGINE WITH SINGLE LINE FUEL CONTROL SYSTEM

**MODELS AFFECTED: S2R-T34: Single cockpit Serial numbers: T34-001 through T34-008, T34-010 through T34-026, T34-028 through T34-032, T34-055, T34-076, T34-084, T34-085, T34-087 through T34-089, T34-099, T34-105 through T34-108, T34-156 through T34-158, T34-161 THROUGH T34-167, T34-174, T34-176, T34-177, T34-179, T34-191 through T34-199, T34-201, T34-202, T34-204, T34-208, T34-210, T34-212 through T34-217, T34-219 through T34-224, T34-226 through T34-232, T34-234, T34-237 through T34-242, T34-244, T34-246 through T34-249, T34-251 through T34-263. Dual cockpit serial numbers: T34-033DC through T34-035DC, T34-037DC through T34-039DC, T34-042DC through T34-044DC, T34-046DC through T34-054DC, T34-056DC through T34-065DC, T34-067DC through T34-075DC, T34-077DC through T34-079DC, T34-081DC through T34-083DC, T34-086DC, T34-091DC through T34-098DC, T34-100DC through T34-104DC, T34-109DC through T34-114DC, T34-122DC through T34-126DC, T34-128DC through T34-139DC, T34-147DC, T34-152DC, T34-159DC, T34-160DC, T34-170DC, T34-171DC, T34-173DC, T34-180DC, T34-203DC, T34-205DC through T34-207DC, T34-211DC, T34-218DC, T34-236DC, T34-243DC, T34-250DC.**

**NOT BUILT: Model S2R-T34, S/N T34-009, T34-031, T34-036, T34-41, T34-045, T34-066, T34-080, T34-144, T34-146, T34-168, T34-169, T34-181 through T34-189, T34-233, T34-235, T34-245.**

**REASON FOR PUBLICATION:**

**In the late 1990's Pratt & Whitney Canada started producing PT6A-34 & 34AG engines with a single line fuel control system (Ref. P&WC S.B. 1557R1, Build Specification No. 970). This is the type FCU current new S2R-T34's are delivered with.**

**The engine controls of the older S2R-T34's that had the dual line fuel control system engine will not hook up properly to the new single line FCU. CK-AG-37 offers guidance and parts to install engine controls that will work with the single line FCU.**

**COMPLIANCE:** **At owner's discretion.**

**BY WHOM WORK WILL BE ACCOMPLISHED:** **Installation by an A&P Mechanic or equivalent. Inspection by IA inspector or foreign equivalent.**

**APPROVAL:** **FAA approved.**

**Estimated Man-hours:** **25**

**PARTS DATA:** **The parts required to comply with this custom kit may be obtained from your nearest Thrush dealer. A parts list is attached to this publication.**

***NOTE***

**It is strongly recommended that drawing 95223 Rev. D be obtained and studied prior to ordering parts. This drawing shows the 95223-7 installation for the PT6A-34AG engine. The control cables will work for your installation, but cable routing may have to be adapted to your particular aircraft. By comparing your aircraft to the drawing, you should be able to determine what hardware and brackets will work for you. Obviously there are many ways to route and secure the control cables, but deviations from this Custom Kit are the owner's responsibility.**

**ACCOMPLISHMENT INSTRUCTIONS**

1. **Remove engine cowling panels.**
2. **Remove L.H. side fuselage skins up to the throttle quadrant station.**
3. **Disconnect and remove the prop control, throttle and FCU cables/push-pull tube rods and rod ends.**
4. **Remove existing FCU and throttle bellcranks, detent and support set-ups.**

***Note***

**Tag and identify all tubes, hoses, electrical leads, and electrical connector plugs. Upon disassembly, cap all openings, tubing,**

**hoses, drive pads, fittings, plugs, and connectors to prevent contamination and/or damage.**

5. **Remove the existing propeller control cable, mounting bracket and clamps.**
6. **Install 94371-1 Angle (for fuel control cable installation) on airconditioner mounting plate as shown on View J-J of drawing 95223.**
7. **Install 21026-1 Bracket (for throttle cable installation) on right hand side lateral diagonal tube of engine mount as shown in R/H Side View and Detail F of drawing 95223.**
8. **Install 9025-26 Bracket (for prop cable installation) to top RH lateral engine mount tube and airconditioner mounting plate as shown in Detail H of 95223 drawing.**
9. **Install the new cables with the specified hardware per Drawing 95223, Engine Control Installation P&W PT6A (95223-7 installation for PT6A-34AG engine).**

***NOTE* All parts required are specified in the engine control installation kit list at the end of this section.**

***NOTE***

**Torque all hardware in accordance with Pratt & Whitney Canada maintenance manual (for engine related components), Thrush Aircraft Inc. drawings and TORQUE CHART on the last page.**

***NOTE***

**Using sound judgement, prep, prime, and paint component pieces as necessary for corrosion control.**

10. **Connect all engine control rod-ends to the appropriate engine control. Rig engine controls by using procedures outlined in chapter 4 of the appropriate Thrush Airplane Maintenance Manual and P&W Maintenance Manual. Refer to the appropriate Pratt & Whitney Maintenance Manual for depreservation procedures of the engine oil and fuel systems in case of new or overhauled engine installation.**
11. **Install fully recharged batteries. Using brass safety wire, safety battery connectors.**
12. **Assure the engine air inlet plenum is free of all foreign objects and install cannular inlet skin panels.**
13. **Place airframe fuel shutoff valve to ON position. Purge engine fuel system of preservative compound and air as per appropriate Pratt & Whitney Maintenance Manual.**
14. **Assure engine installation is free of F.O.D. and all hoses, wires, and non-moving components are secured and ready for run-up operational check.**
15. **Check that the engine start and run-up area is clear of F.O.D.**
16. **Start engine using start procedures per S2R-T34 Airplane Flight Manual or Airplane Maintenance Manual. Have safety crew look for any anomalies. Shut down engine immediately and correct any squawks before continuing run-up.**

17. **Perform the engine ground test and checks outlined in chapter 4 of Thrush Aircraft, Inc. S2R-T34 Airplane Maintenance Manual. Adjust engine and rigging to meet all specifications.**
18. **Install propeller spinner after beta nut adjustment and propeller balancing.**
19. **Install cowling.**
20. **Conduct a maintenance test flight of the aircraft and fix any discrepancies found.**
21. **New engine control installation is now complete and ready for the applicable 337 (Or foreign aviation agency approval) and log entry.**

**WEIGHT AND BALANCE: No Change**

**RECORD OF COMPLIANCE: Make appropriate entry in airplane maintenance records as follows: Field conversion of S2R-T34/T34DC, serial number _____ according to Thrush Aircraft, Inc. CK-AG-37 accomplished by (signature) (date) at airplane total time hours.**

**KIT PARTS LIST (Parts are available through your area authorized service center).**

**KIT PARTS LIST for 95223-7 Engine Control Installation:**

| QTY | P/N | DESCRIPTION |
|---|---|---|
| 1 ea. | 95223 Rev. D | Drawing, Engine Control Inst. P&W PT6A |
| 4 ea. | REB3N | Rod End |
| 1 ea. | 1746LTT3 156 | Fuel control cable |
| 1 ea. | 1746LTT3 156 | Throttle cable |
| 1 ea. | 1746LTT3 180 | Prop cable |
| 1 ea. | 21026-1 | Bracket |
| 1 ea. | 19305-22 | Bracket |
| 1 ea. | 21027-19 | Rod Assy (Prop governor) |
| 6 ea. | 60184-1 | Fair lead |
| 6 ea. | 40081-00 | Locking ring |
| 1 ea. | 9077-1 | Input lever |
| 2 ea. | 95229-1 | Cable clamp half |
| 1 ea. | 9025-26 | Bracket |
| 1 ea. | 21285-140 | Quadrant assy |
| 1 ea. | 9025-26 | Bracket |
| 1 ea. | 19803-7 | Bracket |
| 5 ea. | AN3-4A | Bolt |
| 2 ea. | AN4-12A | Bolt |
| 7 ea. | AN960-416 | Washer |
| A/R | AN316-4 | Jam nut |
| 5 ea. | AN3-10A | Bolt |
| 2 ea. | NAS43HT3-24 | Spacer |
| 38 ea. | AN960-10 | Washer |
| 24 ea. | MS21044-N3 | Nut |
| 2 ea. | AN3-7A | Bolt |

| | | |
|---|---|---|
| **2 ea.** | **NAS43HT3-12** | **Spacer** |
| **3 ea.** | **MS27975-4** | **Clevis** |
| **3 ea.** | **MS20392-2C11** | **Clevis pin** |
| **3 ea.** | **MS4665-298** | **Cotter pin** |
| **5 ea.** | **AN3-6A** | **Bolt** |
| **1 ea.** | **AN4-12** | **Bolt** |
| **1 ea.** | **AN970-4** | **Washer** |
| **1 ea.** | **AN310-4** | **Nut** |
| **1 ea.** | **MS24665-283** | **Cotter pin** |
| **A/R** | **MS20995-C20** | **Safety wire** |
| **1 ea.** | **AN970-3** | **Washer** |
| **1 ea.** | **AN4C-6A** | **Bolt** |
| **2 ea.** | **MS21044-N4** | **Nut** |
| **5 ea.** | **MS21919DG7** | **Clamp** |
| **2 ea.** | **MS21919WD20** | **Clamp** |
| **2 ea.** | **AN3-5A** | **Bolt** |
| **1 ea.** | **MS21266-1N** | **Grommet** |
| **1 ea.** | **MS21919DG20** | **Clamp** |

# TORQUE CHART

**FINE THREAD SERIES ONLY**

## BOLTS

| STEEL - TENSION |
|---|
| AN 3 thru AN 20 |
| AN 42 thru AN 49 |
| AN 73 thru AN 81 |
| AN 173 thru AN 186 |
| AN 509 NK9 |
| AN 525 NK525 |
| MS 20033 thru MS 20046 |
| MS 20073 |
| MS 24604 |
| MS 27039 |

## NUTS

| STEEL - TENSION | STEEL - SHEAR |
|---|---|
| AN 310 | AN 320 |
| AN 315 | AN 364 |
| AN 363 | MS 17825 |
| AN 365 | MS 20364 |
| MS 17829F | MS 21083N |
| MS 20365 | MS 21245 |
| MS 20500 | NAS 679 |
| MS 21042 | NAS 1022N or A |
| MS 21044N | NAS 1291 |
| MS 21045 | |
| NAS 1021 | |

## BOLTS

| STEEL - TENSION | STEEL - SHEAR | STEEL |
|---|---|---|
| MS 20004 thru MS 20024 | NAS 333 thru NAS 340 | ANY |
| NAS 144 thru NAS 158 | NAS 464 | |
| NAS 624 thru NAS 644 | NAS 583 thru NAS 590 | |
| NAS 1202 thru NAS 1210 | NAS 1103 thru | |
| NAS 1303 thru NAS 1320 | NAS 1120 | |
| NAS 6603 thru NAS 6620 | NAS 6203 thru NAS 6220 | |
| NAS 172 | | |
| NAS 174 | | |
| NAS 517 | | |

## NUTS

| STEEL - TENSION | STEEL - SHEAR | |
|---|---|---|
| AN310 | AN320 | MS17826 |
| AN315 | AN364 | |
| AN363 | MS 17825 | |
| AN365 | MS 20364 | |
| MS18729F | MS 21083N | |
| MS20365 | MS 21245 | |
| MS20500 | NAS 679 | |
| MS21042 | NAS 1022N or A | |
| MS21044N | NAS 1291 | |
| MS21045 | | |
| NAS 1021 | | |

| Torque Limits, in# | | Torque Limits, in# | | NUT/BOLT | Torque Limits, in# | | Torque Limits, in# | | |
|---|---|---|---|---|---|---|---|---|---|
| Min. | Max. | Min. | Max. | SIZE | Min. | Max. | Min. | Max. | +/- 5% |
| 12 | 15 | 7 | 9 | **8-36** | -- | -- | -- | -- | -- |
| 20 | 25 | 12 | 15 | **10-32** | 25 | 30 | 15 | 20 | 16 |
| 50 | 70 | 30 | 40 | **1/4-28** | 80 | 100 | 50 | 60 | 35 |
| 100 | 140 | 60 | 85 | **5/16-24** | 120 | 145 | 70 | 90 | 70 |
| 160 | 190 | 95 | 110 | **3/8/24** | 200 | 250 | 120 | 150 | 100 |
| 450 | 500 | 270 | 300 | **7/16-20** | 520 | 630 | 300 | 400 | 180 |
| 480 | 690 | 290 | 410 | **1/2-20** | 770 | 950 | 450 | 550 | 240 |
| 800 | 1,000 | 480 | 600 | **9/16-18** | 1,100 | 1,300 | 650 | 800 | 320 |
| 1,100 | 1,300 | 660 | 780 | **5/8-18** | 1,250 | 1,550 | 750 | 950 | 480 |
| 2,300 | 2,500 | 1,300 | 4,500 | **3/4-16** | 2,650 | 3,200 | 1,600 | 1,900 | 880 |
| 2,500 | 3,000 | 1,500 | 4,800 | **7/8-14** | 3,550 | 4,350 | 2,100 | 2,600 | 1,500 |
| 3,700 | 4,500 | 2,200 | 3,300 | **1-14** | 4,500 | 5,500 | 2,700 | 3,300 | 2,400 |
| 5,000 | 7,000 | 3,000 | 4,200 | **1 1/8-12** | 6,000 | 7,300 | 3,600 | 4,400 | 4,000 |
| 9,000 | 11,000 | 5,400 | 6,600 | **1 1/4-12** | 11,000 | 13,400 | 6,600 | 8,000 | 5,600 |

**CAUTION:** Torques given are for dry threads. Clean bolts/nuts suspected of oil contamination with acetone.
NOTE: Tension nuts may be used on shear bolts, but shear nuts may not be used on tension bolts.