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12/20/02

Thanks for your order for the T-18 Tailspring Plans. I'm sure you will enjoy the difference in takeoff and landing performance. If you measure carefully you will find there is also a couple of knots airspeed gain. To get the most from your increased aircraft ground angle you might like to try the technique I have used for many years, especially with a 180 HP engine; Set the flaps to 20 degrees for takeoff, and raise them when you have a positive rate of climb. Use 10 degrees for takeoff flaps for lower horsepower airplanes. (If you have the newer flap settings of 15 and 30 degrees, just use 15 degrees).

A word of caution; keep just enough tension on your compression type tailwheel steering springs so that you have positive steering with a minimum of play in the tiller bar, and are still able to break the tailwheel out of the steering centering lock position and make it swivel 360 degrees with a push on the tail. From the cockpit, you should be able to lock one brake and pivot on one wheel. That's not recommended for normal practice, but nice to have if you need it. RV-4 builders generally leave their tailspring steering chains slack, and it works good for that airplane, however, I've found through my own experimentation that that is a dangerous thing to do with a T-18. Just a well worn Scott tiller bar increases your landing workload to an uncomfortable level, and putting on a new tiller bar and yoke results in a gratifying improvement. I also recommend that you put your feet up on the brake pedals so that you can respond quickly to get control of a diverging, turn that the rudder and tailwheel steering can't handle at speeds under 50 mph.

Good luck, and call me if you have any questions.

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INSTALLATION NOTES FOR T-18 TAILSPRING DRAWINGS

NOTE 1: .DO NOT DRILL THIS HOLE UNTIL THE TAILWHEEL ADAPTER IS INSTALLED ON THE SPRING AFTER HEAT TREATMENT. USE A QUARTER INCH (.250") DRILL, OR DRILL UNDERSIZE WITH A "D" DRILL (.246), (MY PREFERENCE) AND REAM FOR A PRESS FIT. I RECOMMEND A NAS, OR A MS BOLT FOR A PRECISION FIT AND SUBSEQUENTLY A HIGHER LOAD BEARING CAPABILITY.

NOTE 2: MAKE THE REAR ATTACH POINT FITTING (WELDMENT) FROM 1.010" ID X 1.25" OD, .120" HEAVY WALL 4130 STEEL TUBING AND .125" 4130 STEEL PLATE. I RECOMMEND THE OXY-ACETYLENE GAS WELDING PROCESS, FOLLOWED BY AIR COOLING, AS THE PREFERRED WELDING METHOD FOR AIRCRAFT GRADE 4130 CHROME "MOLY" STEEL TUBING USED IN THIS APPLICATION.

NOTE 3: MACHINE FROM ANNEALED (AS RECEIVED) 1" 6150 COIL SPRING STEEL BAR STOCK.

NOTE 4: AFTER MACHINING, BEFORE DRILLING HOLES, AND BEFORE HEAT TREATING, HEAT THE SPRING APPROXIMATELY ONE INCH ON EACH SIDE OF THE BEND CENTERLINE AREA TO CHERRY RED AND BEND TEN DEGREES. USE A TEMPLATE TO GET AN ACCURATE BEND ANGLE.

NOTE 5: AFTER HEAT-TREATING, SECURE THE SPRING IN AN INVERTED POSITION IN A DRILL FIXTURE, MAKING SURE THE RAISED END OF THE SPRING IS 90 DEGREES TO THE HORIZONTAL. DRILL THE FRONT ATTACH POINT HOLE TO MATCH THE BOLT SIZE IN YOUR AIRCRAFT, AND MACHINE THE SPOT FACES, TOP AND BOTTOM. NEXT, LOCATE THE REAR ATTACH POINT FITTING (WELDMENT) ON THE SPRING AND ATTACH THE SPRING TO THE BOLSTER WITH THE FRONT BOLT. NOW DRILL THE HOLES IN THE REAR ATTACH POINT FITTING, USING THE BOLSTER AS THE DRILL TEMPLATE TO MATCH THE HOLES IN YOUR AIRPLANE. NEXT, ROTATE THE FIXTURE 90 DEGREES AND DRILL THE HORIZONTAL HOLE THROUGH THE WELDMENT AND THE SPRING. AGAIN, IT'S BEST TO DRILL

UNDERSIZE AND REAM TO A PRESS FIT (DO NOT OMIT THIS BOLT. DOING SO COULD SUBJECT THE FRONT ATTACHMENT TO TORSIONAL LOADS FOR WHICH IT WAS NOT DESIGNED, AND CONSEQUENTLY COULD TWIST OFF THE #591 FITTING RIVETED TO THE #575 .032" ALUMINUM FRAME ASSY AT FUSELAGE STA 191.75, THE FRONT ATTACH BOLT LOCATION. THE MAJOR PORTION OF TORSIONAL LOADS ARE NORMALLY TRANSFERRED INTO THE #583 FITTING RIVETED TO THE STA. #199.75 .032" ALUM. FUSELAGE FRAME BY TWO QUARTER INCH BOLTS THROUGH THE REAR ATTACH FITTING IN JOHN THORP'S ORIGINAL TAILSPRING DESIGN. THE LOAD PATH IS THE SAME IN THIS TAILSPRING DESIGN, AND, THEREFORE, REQUIRES THIS BOLT TO TRANSFER THOSE LOADS.)

THE LAST OPERATION IS TO INSTALL AND DRILL THE HOLE THROUGH THE TAILWHEEL ADAPTER AND THE .625" STUB ON THE AFT END OF THE SPRING. THE FIT BETWEEN THESE TWO PARTS SHOULD BE TIGHT, BUT NOT SO TIGHT THAT YOU CAN'T ROTATE THE ADAPTER ON THE SPRING WITH THE HELP OF A TOOL. FIRST, ASSEMBLE ALL THE PARTS TO THE AIRPLANE, EXCEPT FOR THE ADAPTER WITH THE FORK AND WHEEL INSTALLED. MAKE SURE THE MLG TIRES HAVE NORMAL AND EQUAL TIRE PRESSURE, AND THE AIRPLANE IS SITTING ON A LEVEL SURFACE. (AT LEAST IN THE HORIZONTAL DIRECTION) NOW INSTALL THE ADAPTER/TAILWHEEL ASSEMBLY ON THE SPRING, MAKING SURE THAT THE WHEEL IS ABSOLUTELY, POSITIVELY, SET AT ZERO DEGREES CAMBER, - IN OTHER WORDS VERTICAL WITH RESPECT TO YOUR LEVEL HORIZONTAL REFERENCE. (The press fit should hold the parts in alignment for drilling, and increase the load bearing capability too) PAINT AN AREA COMMON TO BOTH PARTS WITH DYKEM OR A MAGIC MARKER, AND SCRIBE A VERY FINE INDEX LINE ACROSS THE JOINT OF THE TWO PARTS. CAREFULLY REMOVE THE TAILWHEEL AND FORK FROM THE ADAPTER, AND THEN REMOVE THE SPRING AND ADAPTER FROM THE AIRPLANE. CLAMP THE PARTS SECURELY IN A DRILL FIXTURE, AND DRILL THE HOLE THROUGH BOTH PARTS IN ONE OPERATION, WITHOUT ROTATING THE ADAPTER ON THE SPRING. (CHECK FREQUENTLY THAT THE REFERENCE INDEX LINES HAVE

REMAINED IN ALIGNMENT) UPON COMPLETION, SPOT FACE THE ADAPTER PER THE DRAWING.

DRILLING HEAT TREATED STEEL

A GOOD DRILL PRESS IS REQUIRED, ALONG WITH WEARING PROPER SAFETY EQUIPMENT AND USING PLENTY OF "CUTTING OIL FOR STEEL". THE COMBINATION OF A SHARP, HIGH QUALITY DRILL, MODERATE PRESSURE, AND SLOW DRILL RPM ARE RECOMMENDED. CLAMP YOUR WORK SECURELY IN THE HORIZONTAL AND VERTICAL AXIS AND IN A MANNER TO BLOCK THE SPRING FROM TURNING IN THE EVENT THE DRILL GRABS AS IT PUNCHES THROUGH THE LAST FEW THOUSANDS OF THE WORKPIECE. (I LIKE TO DRILL INTO A PIECE OF SCRAP STEEL UNDER THE WORKPIECE, WHENEVER POSSIBLE, TO AVOID THAT PROBLEM.)

HEAT TREATMENT PROCESS FOR 6150 STEEL

HARDEN: 1550 – 1600 DEGREES F., OIL QUENCH.
TEMPER: DRAW AT 725 –925 DEGREES F., ROCKWELL HARDNESS C-43 – 47 FOR TENSILE PSI 210,000, YIELD PSI 194,000.

ABOUT 4130 STEEL

4130 CHROM "MOLY" STEEL IS ESPECIALLY SUITABLE FOR USE IN AIRCRAFT CONSTRUCTION FOR PRACTICALLY ALL PARTS MADE FROM SHEET AND TUBING. THE GENERAL USE OF THIS MATERIAL IS DUE TO ITS EXCELLENT WELDING CHARACTERISTICS, ITS EASE OF FORMING, ITS RESPONSE TO HEAT TREATMENT, AND ITS AVAILABILITY IN ALL SIZES OF SHEET AND SEAMLESS DRAWN TUBING. WHEN WELDED WITH THE OXY-ACETYLENE SYSTEM AND ALLOWED TO AIR COOL, THE PROCESS WILL NORMALIZE THE WELDED AREA FROM AN ANNEALED STATE OF 78,000 PSI TENSILE STRENGTH TO 90,000 - 110,000 PSI TENSILE STRENGTH.