

## TYPICAL METAL PARTS

ALL CUT EDGES AND DRILLED HOLE EDGES MUST BE SMOOTH.  
ALL CUTS SHOULD BE SMOOTHED BY FILING OR DE-BURRING.

HOLES ARE TO BE  
DRILLED GENEROUSLY  
LARGE FOR LOOSE BOLT  
FITS (IN MOST CASES)  
FOR EASE OF ASSEMBLY.

NOMINAL TOLERANCE  
IS 1/16 INCH, SO THIS  
DIMENSION IS 2 INCHES  
PLUS OR MINUS 1/16 INCH.

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THE ENDS OF TUBULAR SLEEVES MUST BE SMOOTH. SLEEVES ARE TO BE  
PADDED BY WRAPPING THEM WITH LAYERS OF 10 MIL. VINYL TAPE (PIPE  
WRAP) TO FILL THE GAP BETWEEN THE TUBES, RESULTING IN A MARGINAL  
SLIDING FIT. TAPE PADDING NEED NOT BE USED WHEN A CLOSE TELESCOPING  
FIT IS ALREADY POSSIBLE (I.E., WHEN THE OUTER TUBE WALL IS .058 THICK &  
FITS THE INNER TUBE CLOSELY, NO TAPE PADDING IS USED).

MOVING PARTS (PARTS ROTATING  
AROUND BOLTS) REQUIRE THE USE  
OF DRILLED BOLTS WITH CASTEL-  
ATED NUTS & COTTER PINS.

ALL RIVETS ARE 1/8 INCH CHERRY  
BSP OR BSPTS ALUMINUM BLIND RIVETS  
WITH STEEL MANDREL (HIGH QUALITY  
POP RIVETS). NOMINAL MINIMAL RIVET  
SEPARATION IS 1/2 INCH.

MINIMUM BEND RADIUS FOR ANY ALUMINUM  
BAR OR STEEL TANG SHOULD BE 3 THICK-  
NESSES (MAKE LARGER THAN MINIMUM  
RADIUS BENDS WHEREVER POSSIBLE)

SMALL TUBES (1/4 OR 3/8 DIAM.) MAY BE  
SPLICED WITH A PIECE OF LARGER TUBE OR SPLIT  
TUBE OF THE SAME SIZE, SECURED BY RIVETS.

ALL TUBE, BAR, & ANGLE STOCK ARE  
6061-T6 ALUMINUM OR EQUIVALENT.  
CHANNEL IS 6063-T52, BAR & SOME LARGE  
ANGLES ARE 6061 T6511 DUE TO AVAILABILITY.  
NUTS, BOLTS, WASHERS, AND COTTER PINS ARE  
AIRCRAFT GRADE UNLESS OTHERWISE SPECIFIED.  
DO NOT OVER TIGHTEN BOLTS OR PARTS WILL  
BE CRUSHED. FOR BOLTS THROUGH SOLID PARTS,  
AGAIN DO NOT OVER TIGHTEN, OR ELSE BOLTS  
MAY BE WEAKENED OR BROKEN. NUTS ARE  
ELASTIC STOP NUTS UNLESS OTHERWISE  
SPECIFIED. DEPICTIONS OF THE USE OF NUTS  
AND WASHERS MAY NOT BE EXACT (USE MORE  
OR FEWER WASHERS AS NEEDED).

IF THREADED END OF BOLT MUST BE LOADED, USE  
LONG BOLTS WITH WASHERS TO AVOID SHEAR  
LOADING ACROSS THREADS

TUBE OVALIZING IS DONE IN A PADDED  
VICE. SMALL IRREGULARITIES ARE  
ACCEPTABLE SINCE WHEN OVALIZATION  
IS FULL LENGTH THERE IS A ROUND TUBE  
INSIDE FOR ADDITIONAL STRENGTH. WHEN  
THE END OF AN OVALIZED TUBE IS CLOSED  
TO FLATNESS, THE TRANSITION MUST BE  
SMOOTH AND NOT CREASED. WHEN THE END  
OF A TUBE IS FLATTENED OR OVALIZED  
THERE MUST BE NO SHARP CREASE.

# B4A4

## METAL FABRICATION & FASTENERS

BLOOP 4  
ULTRALIGHT  
AIRPLANE

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