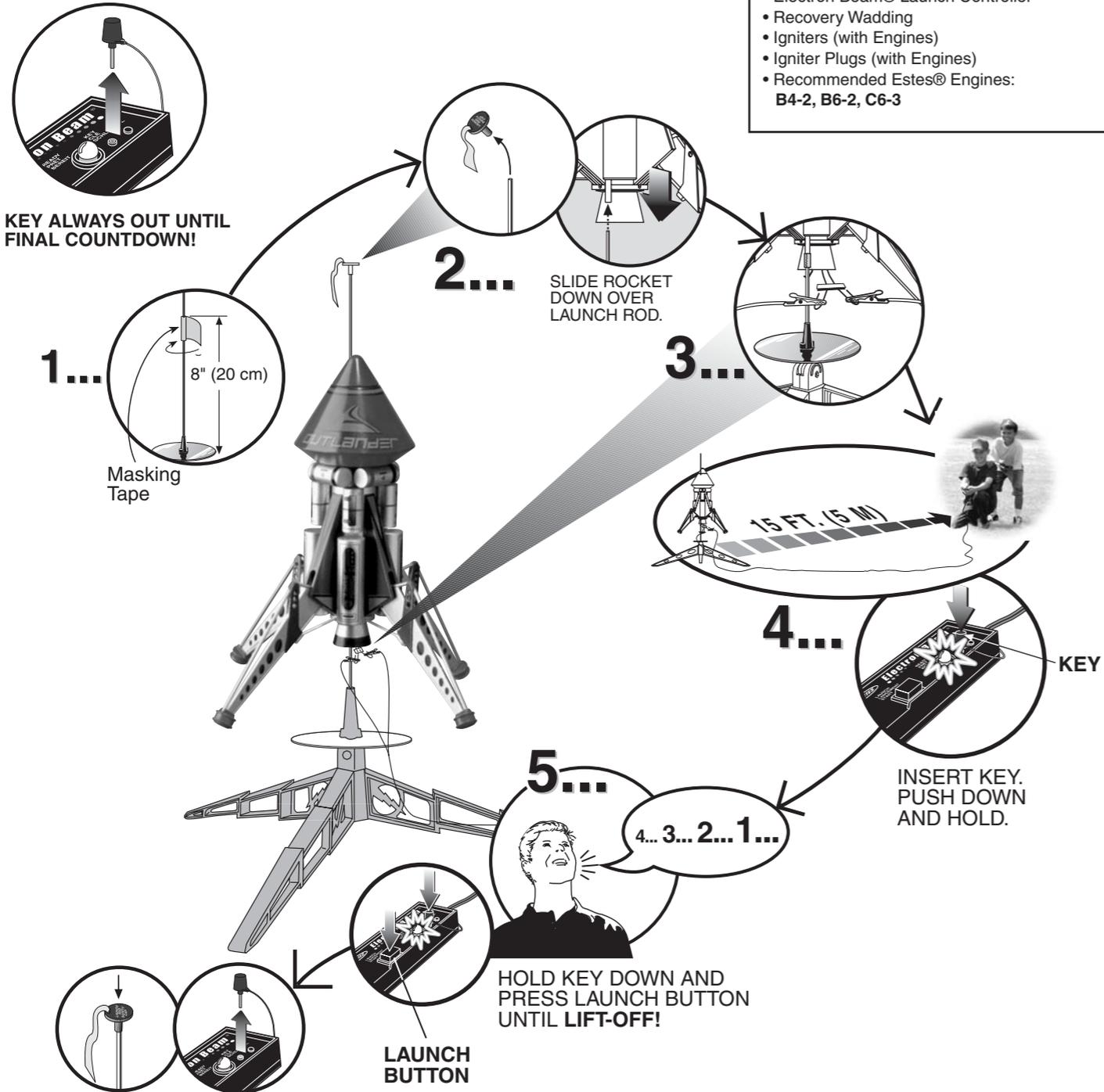


COUNTDOWN AND LAUNCH



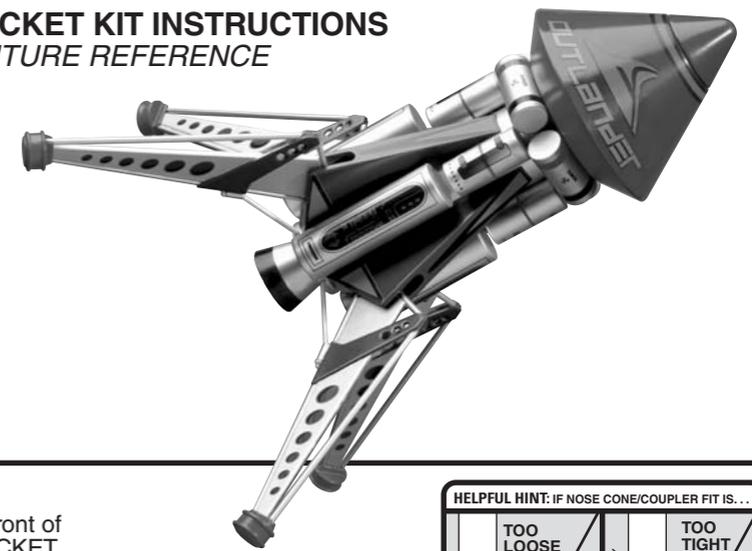
- LAUNCH SUPPLIES** (Sold Separately)
- Porta Pad® II Launch Pad
 - Electron Beam® Launch Controller
 - Recovery Wadding
 - Igniters (with Engines)
 - Igniter Plugs (with Engines)
 - Recommended Estes® Engines: B4-2, B6-2, C6-3



www.estesrockets.com
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 1295 H Street
 Penrose, CO 81240
 PRINTED IN CHINA

OUTLANDER™ EST 2110

FLYING MODEL ROCKET KIT INSTRUCTIONS
 KEEP FOR FUTURE REFERENCE

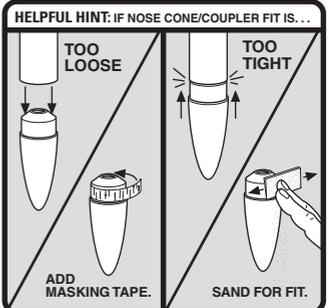


ASSEMBLY TIP: Read all instructions before beginning work on your model. Make sure you have all parts and supplies.

TEST FIT ALL PARTS TOGETHER BEFORE APPLYING ANY GLUE!
 If any parts don't fit properly, sand as required for precision assembly.

PARTS

Locate the parts shown below and lay them out on the table in front of you. **DO NOT USE THIS DRAWING TO ASSEMBLE YOUR ROCKET.**



PRECAUTIONS



NAR Safety Code



NO DRY GRASS OR WEEDS

FLYING YOUR ROCKET

Choose a large field (500 ft. [152 m] square) free of dry weeds and brown grass. The larger the launch area, the better the chance of recovering your rocket. Football fields and playgrounds are great. Launch only with little or no wind and good visibility.

Always follow the National Association of Rocketry (NAR) Safety Code.

MISFIRES

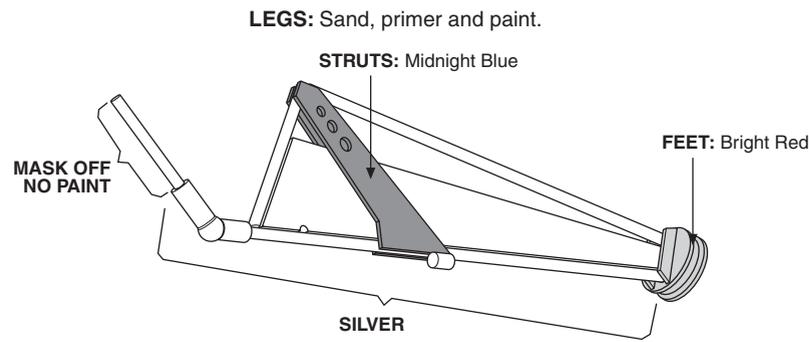
TAKE THE KEY OUT OF THE CONTROLLER. WAIT ONE MINUTE BEFORE GOING NEAR THE ROCKET! Disconnect the igniter clips and remove the engine. Take the plug and igniter out of the engine. If the igniter has burned, it worked but did not ignite the engine because it was not touching the propellant inside the engine. Put a new igniter all the way inside the engine without bending it. Push the plug in place. Repeat the steps under Countdown and Launch.

SUPPLIES In addition to the parts included in the kit you will also need:

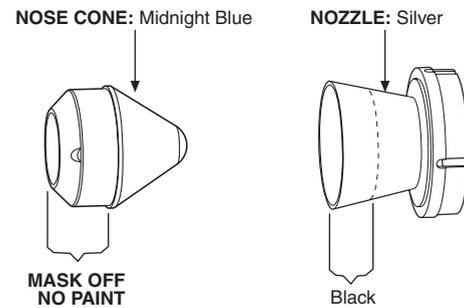


PAINTING GUIDE

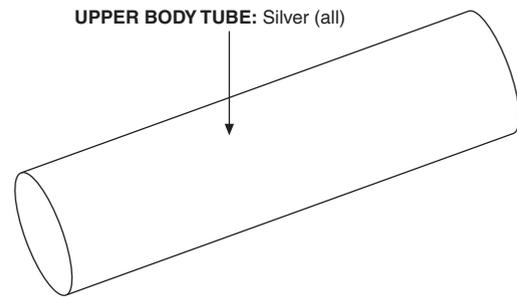
NOTE: In order to paint the model like you see it on the package, it will be necessary to paint some parts before final assembly. This guide can be used for reference to paint as you build.



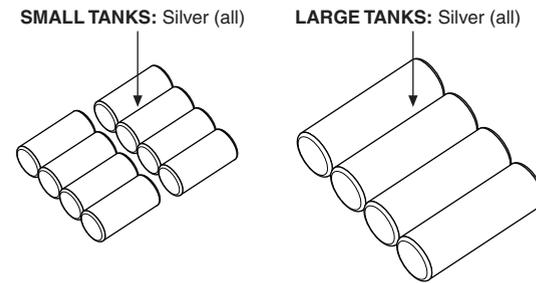
NOSE CONE, NOZZLE: Sand, primer and paint.



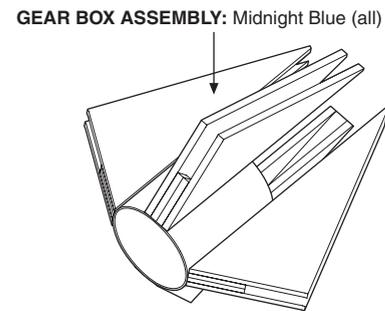
UPPER BODY TUBE: Sand, primer and paint.



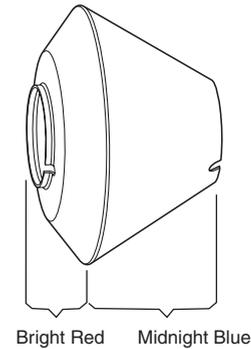
SMALL AND LARGE TANKS: Sand, primer, paint.



GEAR BOX ASSEMBLY: Sand, primer and paint.

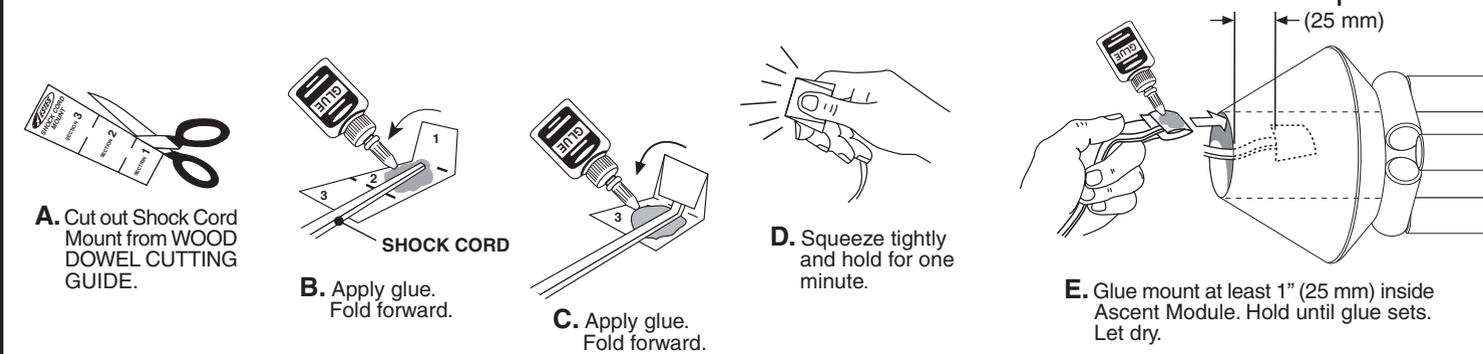


ASCENT MODULE: Sand, primer and paint.

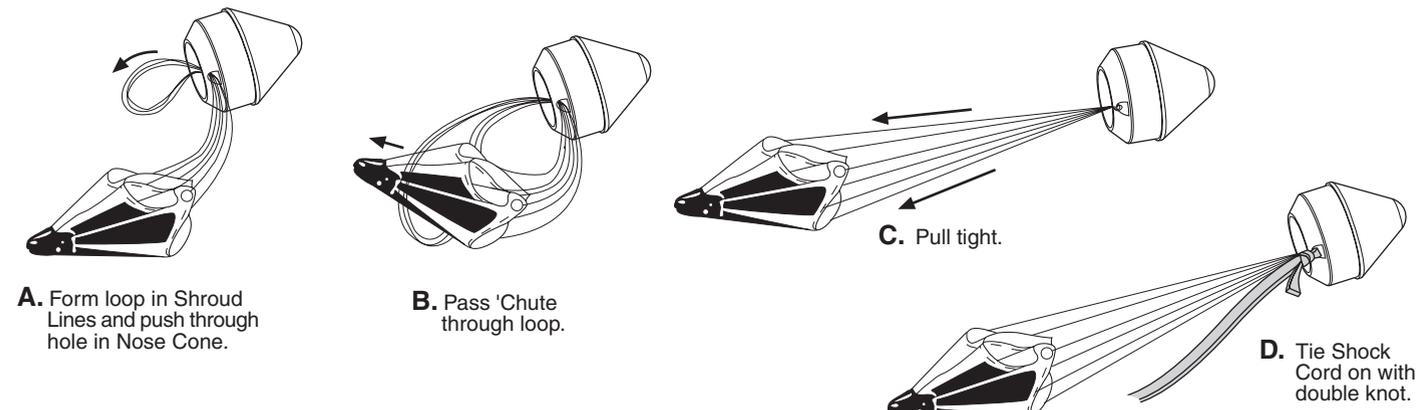


NOTE: On areas where surfaces are to be glued, mask off prior to painting or remove paint before gluing.

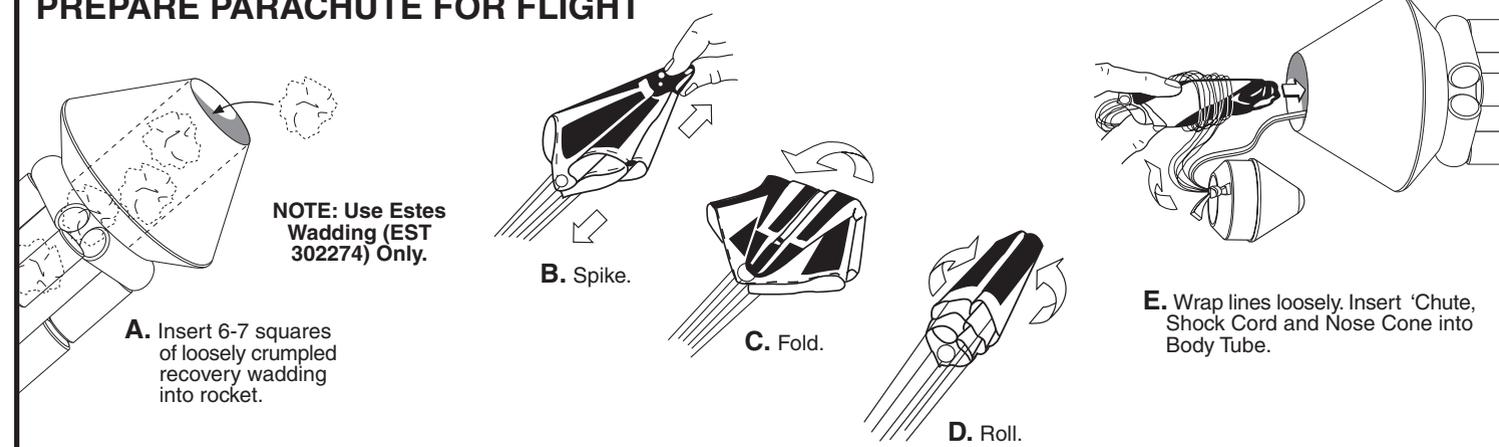
INSTALL SHOCK CORD MOUNT



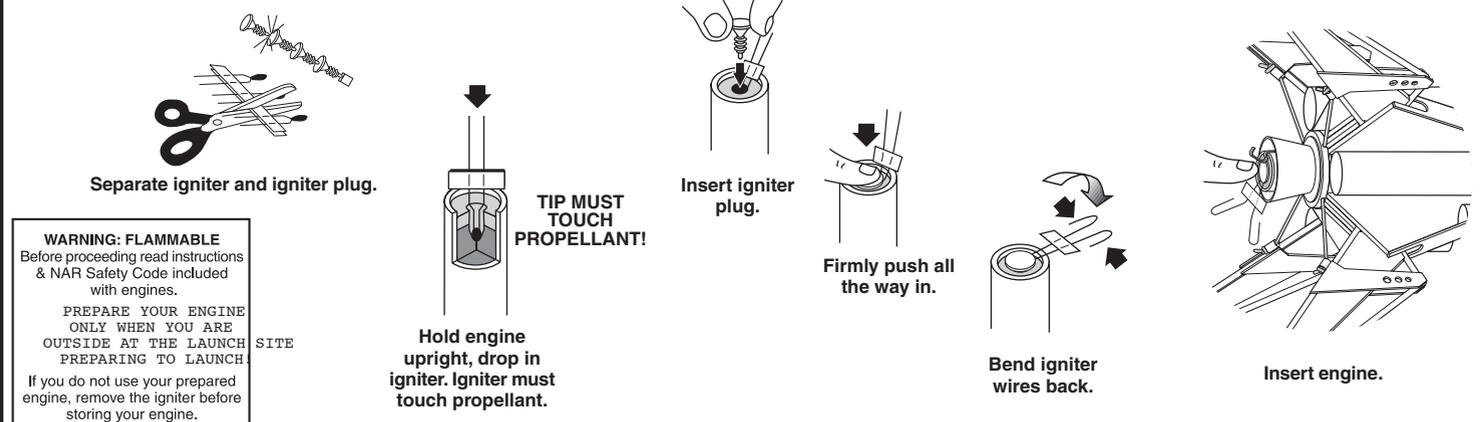
ATTACHING PARACHUTE & SHOCK CORD



PREPARE PARACHUTE FOR FLIGHT



ENGINE PREP

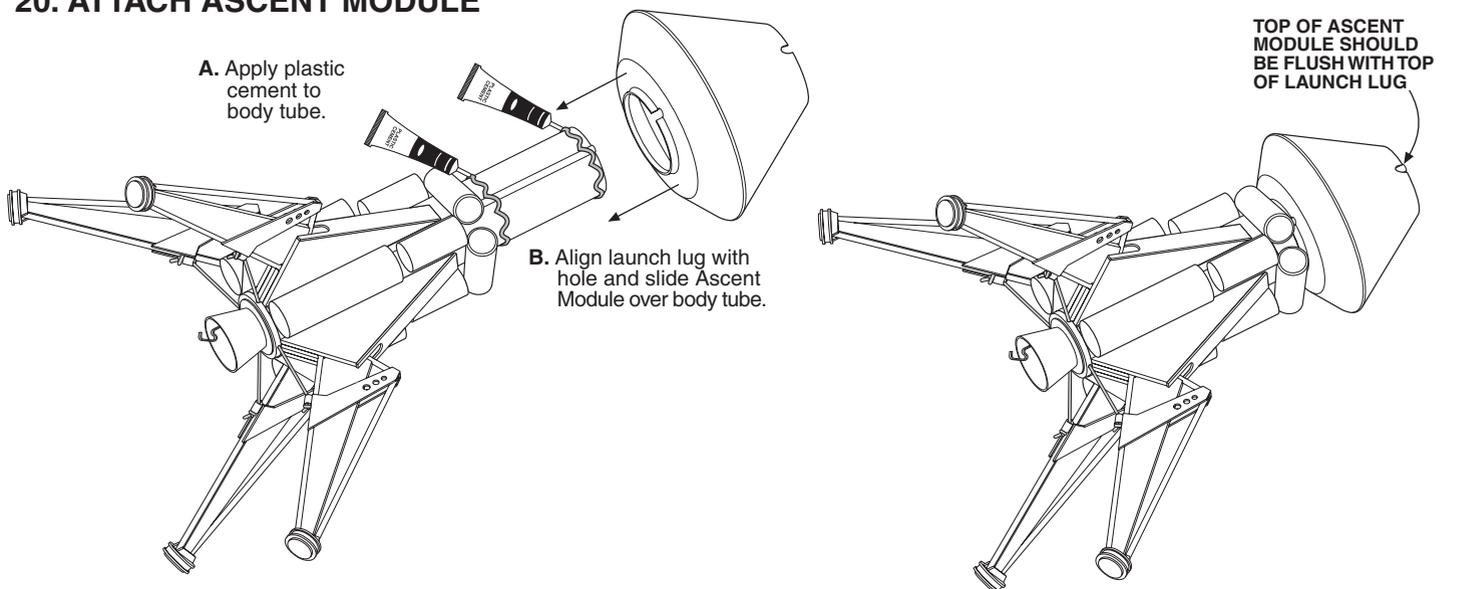


20. ATTACH ASCENT MODULE

A. Apply plastic cement to body tube.

B. Align launch lug with hole and slide Ascent Module over body tube.

TOP OF ASCENT MODULE SHOULD BE FLUSH WITH TOP OF LAUNCH LUG



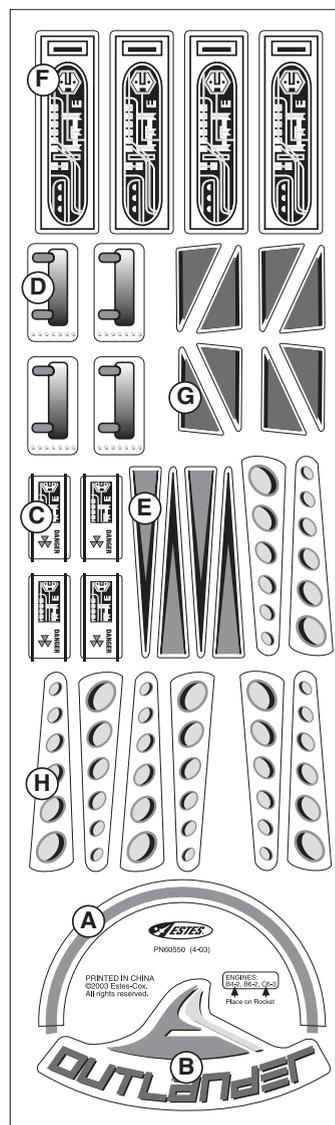
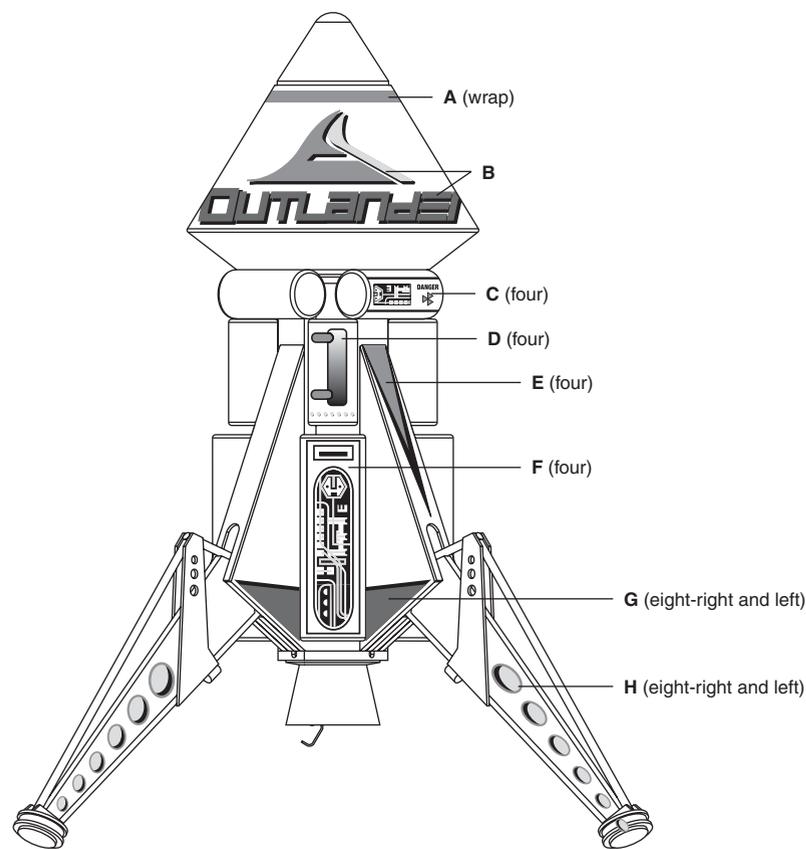
FINISHING YOUR ROCKET

If you have chosen not to paint your parts before final assembly, now you can sand, prime and paint. The easiest way to get good results is to spray paint the entire rocket all one color. You may also paint the Ascent Module a different color than the body. When completely dry, proceed to decal placement.

If you have already painted your parts prior to assembly, proceed to decal placement.

DECAL PLACEMENT

Remove decals from backing one at a time and refer to the drawing below or to the picture on the front of the package.



1. CUT WOOD DOWELS

Refer to the Wooden Dowel Cutting Guide and carefully cut all the dowels needed for the leg assemblies. Lightly sand ends smooth.

2. PREPARE HINGE ASSEMBLY

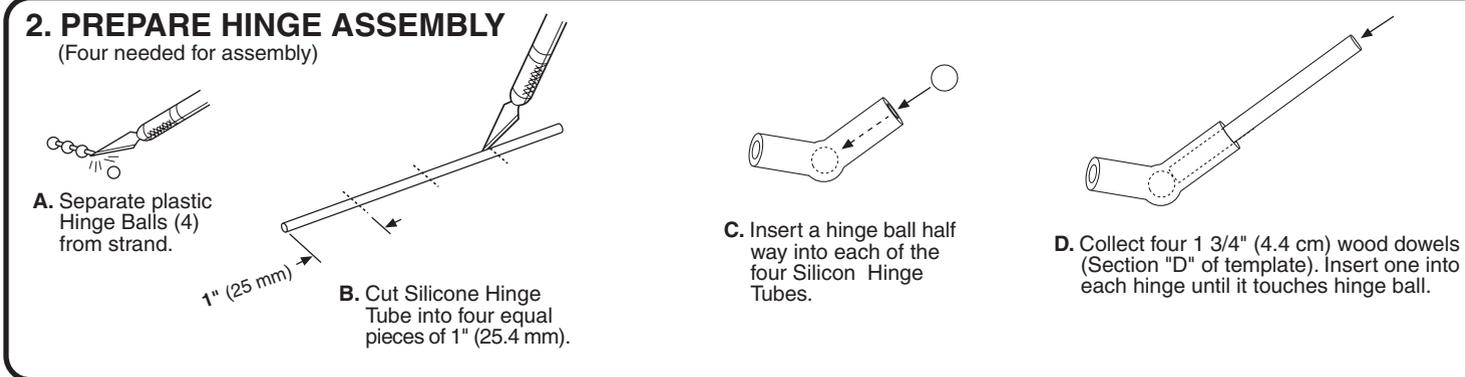
(Four needed for assembly)

A. Separate plastic Hinge Balls (4) from strand.

B. Cut Silicone Hinge Tube into four equal pieces of 1" (25.4 mm).

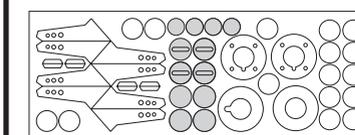
C. Insert a hinge ball half way into each of the four Silicon Hinge Tubes.

D. Collect four 1 3/4" (4.4 cm) wood dowels (Section "D" of template). Insert one into each hinge until it touches hinge ball.

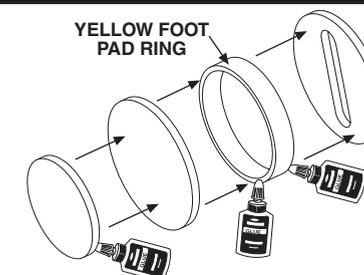


3. LANDING FOOT ASSEMBLY

(Four needed for assembly)



A. Remove die-cut discs in gray from card. Remove the outside nubs with sandpaper.

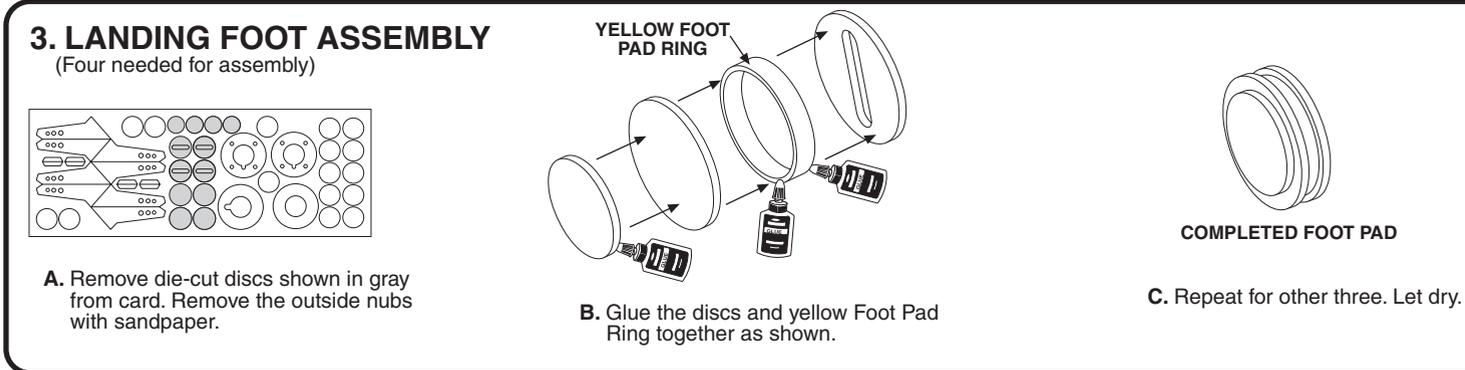


B. Glue the discs and yellow Foot Pad Ring together as shown.



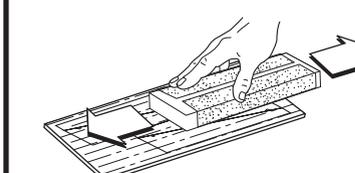
COMPLETED FOOT PAD

C. Repeat for other three. Let dry.

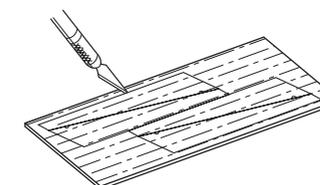


4. LEG ASSEMBLY

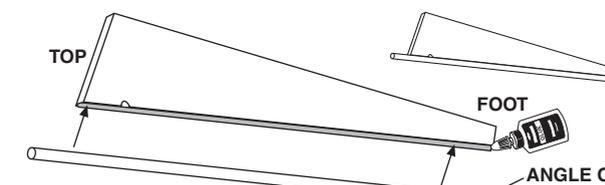
(Four needed for assembly)



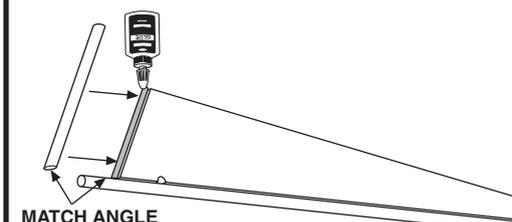
A. Sand smooth the die-cut balsa sheet.



B. Carefully remove the die-cut pieces using a modeling knife.

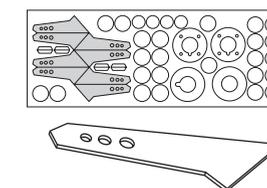


C. Collect the four 6 3/4" (17.1 cm) dowels (Section "C" of template). Match the angled cut to the foot end. Glue as shown. Repeat for all four legs and let dry.

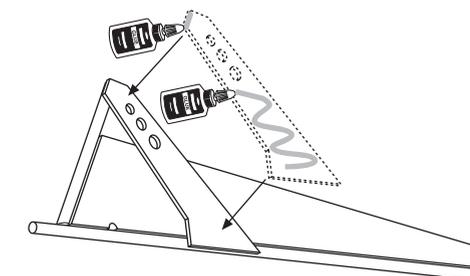


MATCH ANGLE

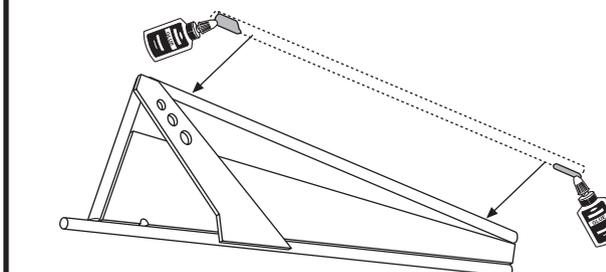
D. Collect the four 2 3/16" (8.1 cm) dowels with angle cuts at both ends (Section "A" of template). Glue as shown. Make sure angles match. Repeat for all four legs. Let dry.



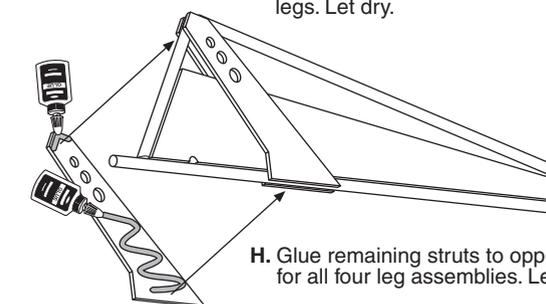
E. Remove Support Struts from die-cut card. Sand the nubs smooth.



F. Glue Support Strut to assembly as shown. Make sure strut is flush with ends of dowel. Repeat for all four legs. Let dry.



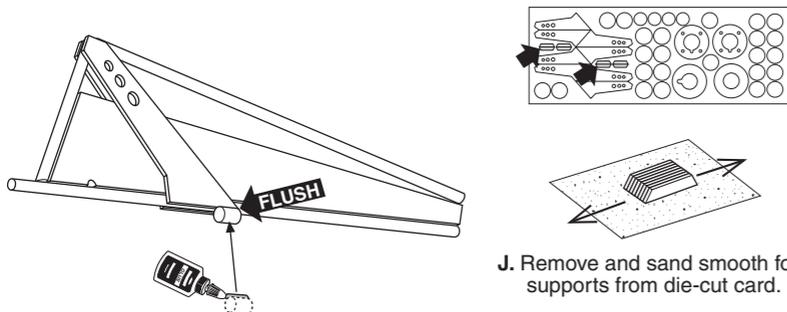
G. Collect the four 5 5/8" (14.3 cm) dowels (section "B" of template). Glue as shown. Make sure dowel is flush with end of leg and butts up to end of top dowel. Repeat for all four legs. Let dry.



H. Glue remaining struts to opposite sides for all four leg assemblies. Let dry.

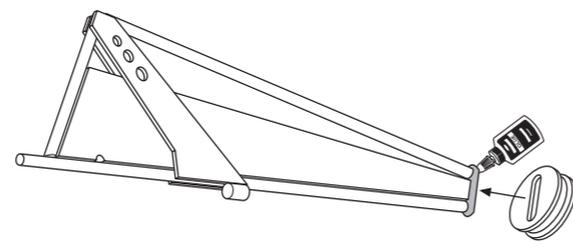
...Continued Page 4

4. LEG ASSEMBLY (continued)

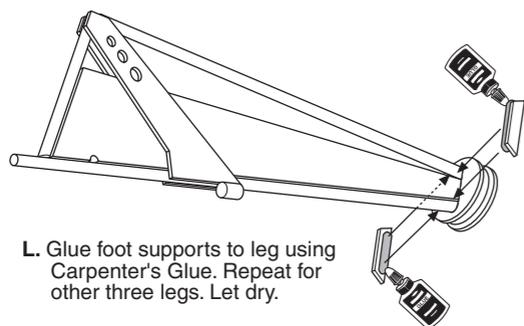


I. Glue 1/4" (6.4 mm) Launch Lug to inside leg dowel using Carpenter's Glue. Repeat for all four legs. Let dry.

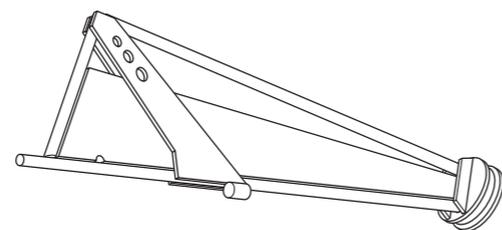
J. Remove and sand smooth foot supports from die-cut card.



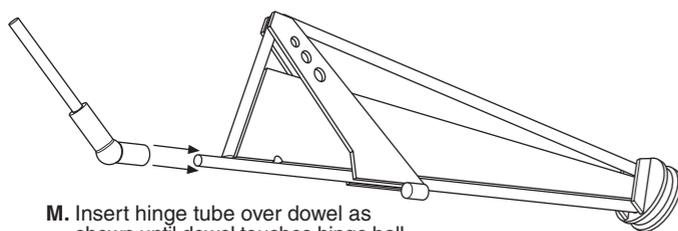
K. Glue foot to leg using Carpenter's Glue. Repeat for other three legs. Let dry.



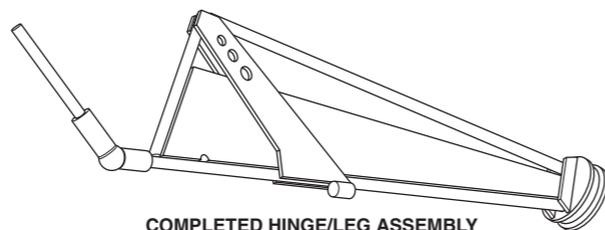
L. Glue foot supports to leg using Carpenter's Glue. Repeat for other three legs. Let dry.



COMPLETED LEG ASSEMBLY



M. Insert hinge tube over dowel as shown until dowel touches hinge ball. Repeat for other three legs.

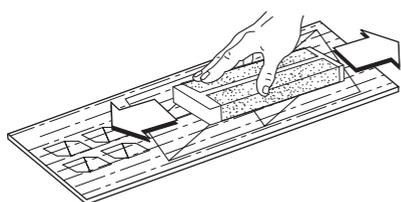


COMPLETED HINGE/LEG ASSEMBLY

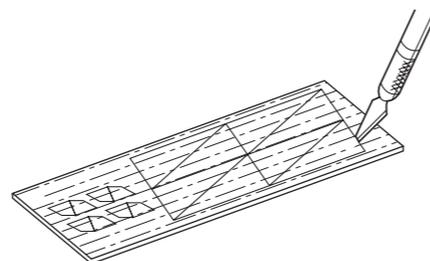
NOTE: You may want to primer, sand, and paint the Leg Assembly at this time. See PAINTING GUIDE (page 2).

5. PREPARE GEAR HOUSING COVERS

(Four needed for assembly)

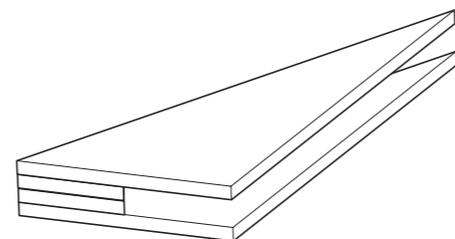
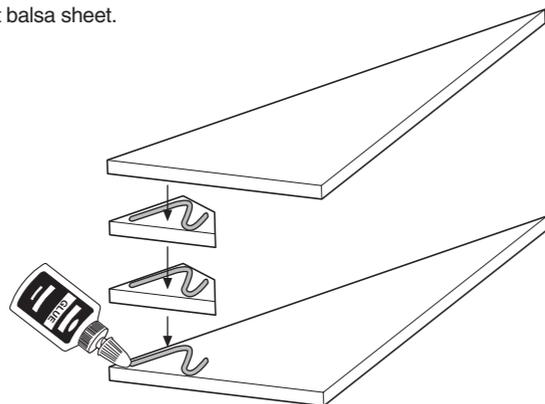


A. Sand smooth the die-cut balsa sheet.



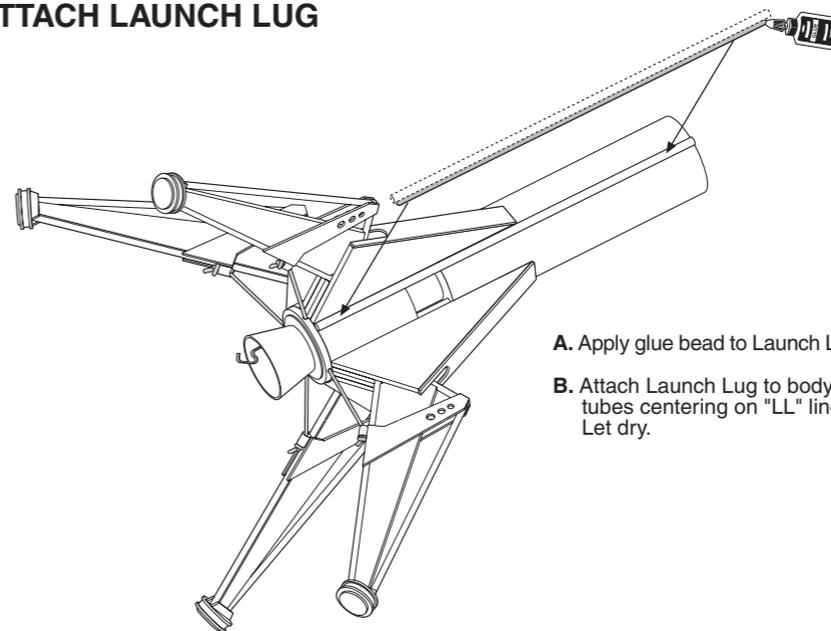
B. Remove the gear housing pieces from the die cut-balsa using a modeling knife.

C. Glue Support Spacers and Gear Housing Covers together with Carpenter's Glue. Repeat for other three. Let dry.



COMPLETED ASSEMBLY
Set aside to let dry.

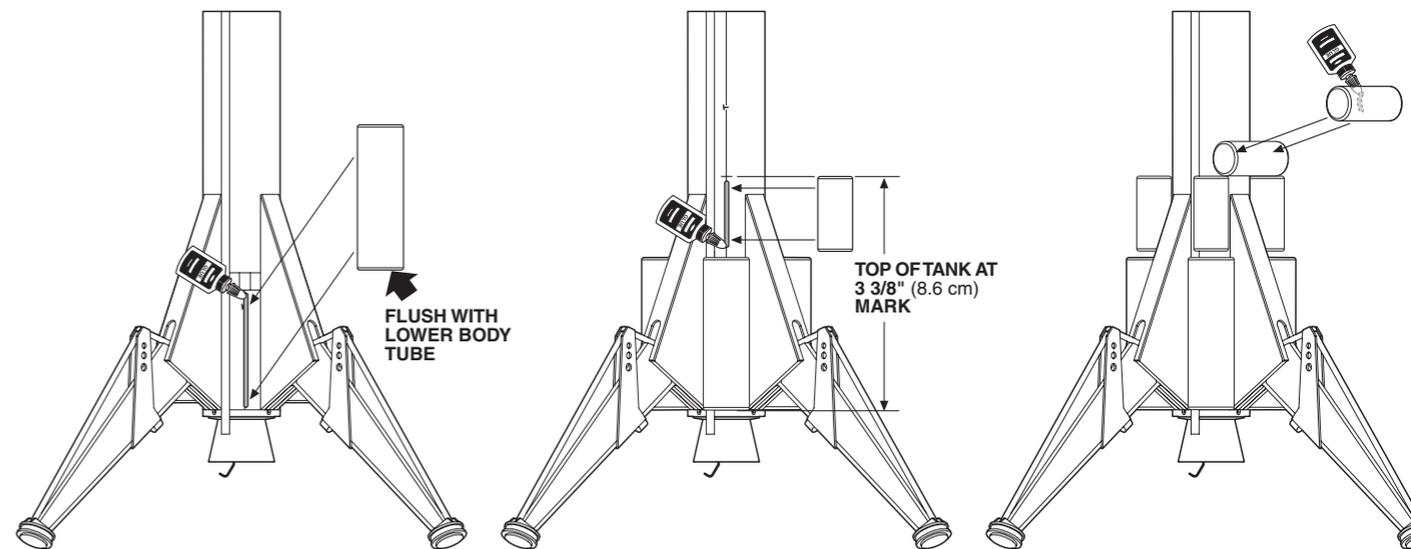
18. ATTACH LAUNCH LUG



A. Apply glue bead to Launch Lug.

B. Attach Launch Lug to body tubes centering on "LL" line. Let dry.

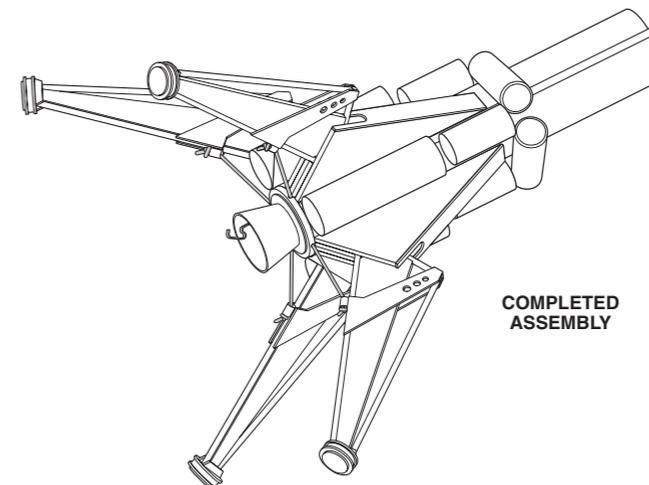
19. ATTACH LARGE AND SMALL TANKS



A. Apply glue bead to Lower Body Tube on line marked "T" for Tank. Attach Large Tank. Repeat for other three Large Tanks. Let dry.

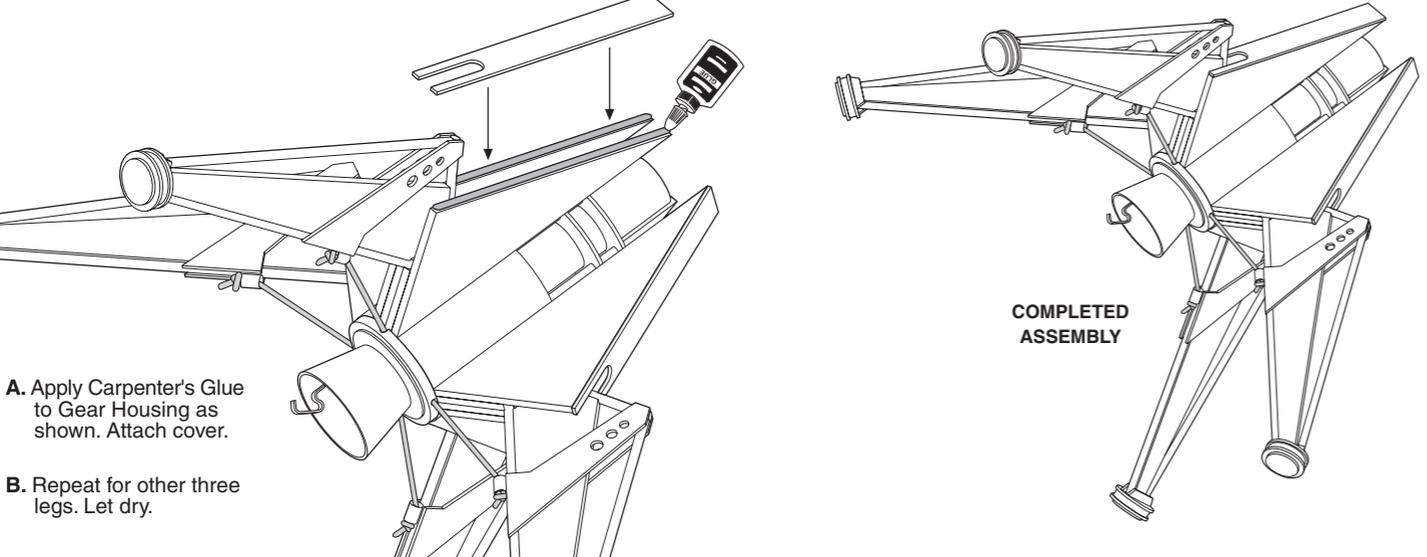
B. Apply glue bead to Upper Body Tube on line marked "T" for Tank. Attach Small Tank. Repeat for other three Small Tanks. Let dry.

C. Apply glue bead to center of Small Tank. Attach Small Tank-center over Gear Housing. Repeat for other three Small Tanks. Let dry.



COMPLETED ASSEMBLY

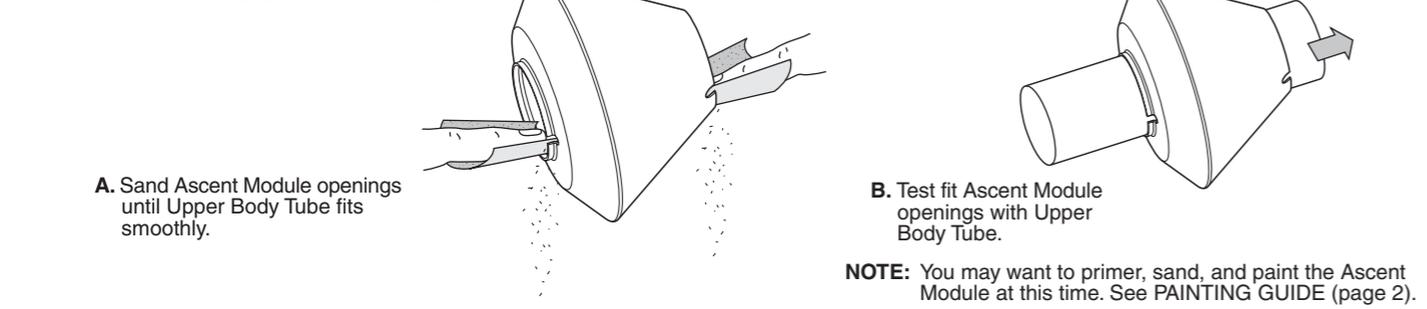
15. ATTACH GEAR HOUSING COVERS



- A. Apply Carpenter's Glue to Gear Housing as shown. Attach cover.
- B. Repeat for other three legs. Let dry.

COMPLETED ASSEMBLY

16. PREPARE ASCENT MODULE

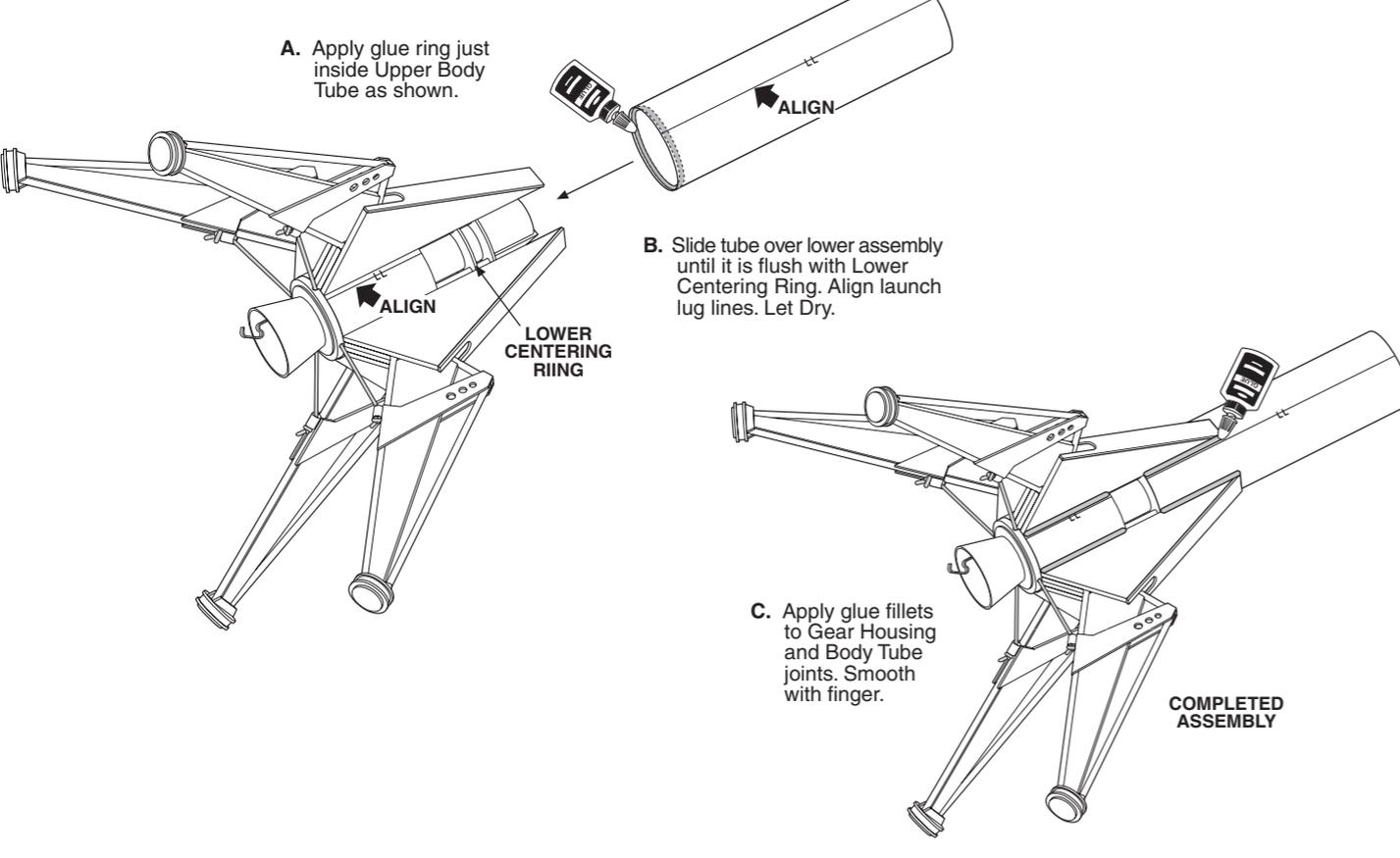


- A. Sand Ascent Module openings until Upper Body Tube fits smoothly.

- B. Test fit Ascent Module openings with Upper Body Tube.

NOTE: You may want to primer, sand, and paint the Ascent Module at this time. See PAINTING GUIDE (page 2).

17. INSERT UPPER BODY TUBE



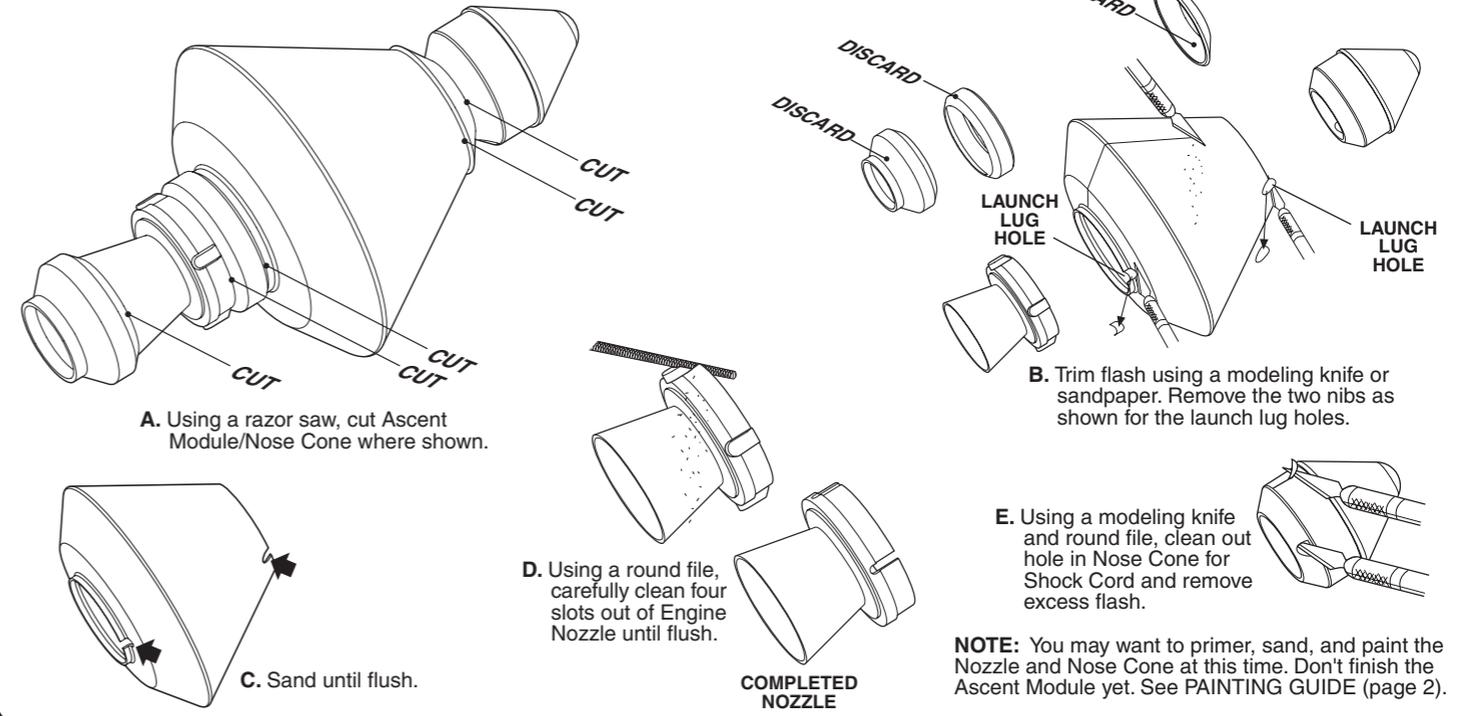
- A. Apply glue ring just inside Upper Body Tube as shown.

- B. Slide tube over lower assembly until it is flush with Lower Centering Ring. Align launch lug lines. Let Dry.

- C. Apply glue fillets to Gear Housing and Body Tube joints. Smooth with finger.

COMPLETED ASSEMBLY

6. CUT & TRIM PLASTICS PARTS



- A. Using a razor saw, cut Ascent Module/Nose Cone where shown.

- C. Sand until flush.

- D. Using a round file, carefully clean four slots out of Engine Nozzle until flush.

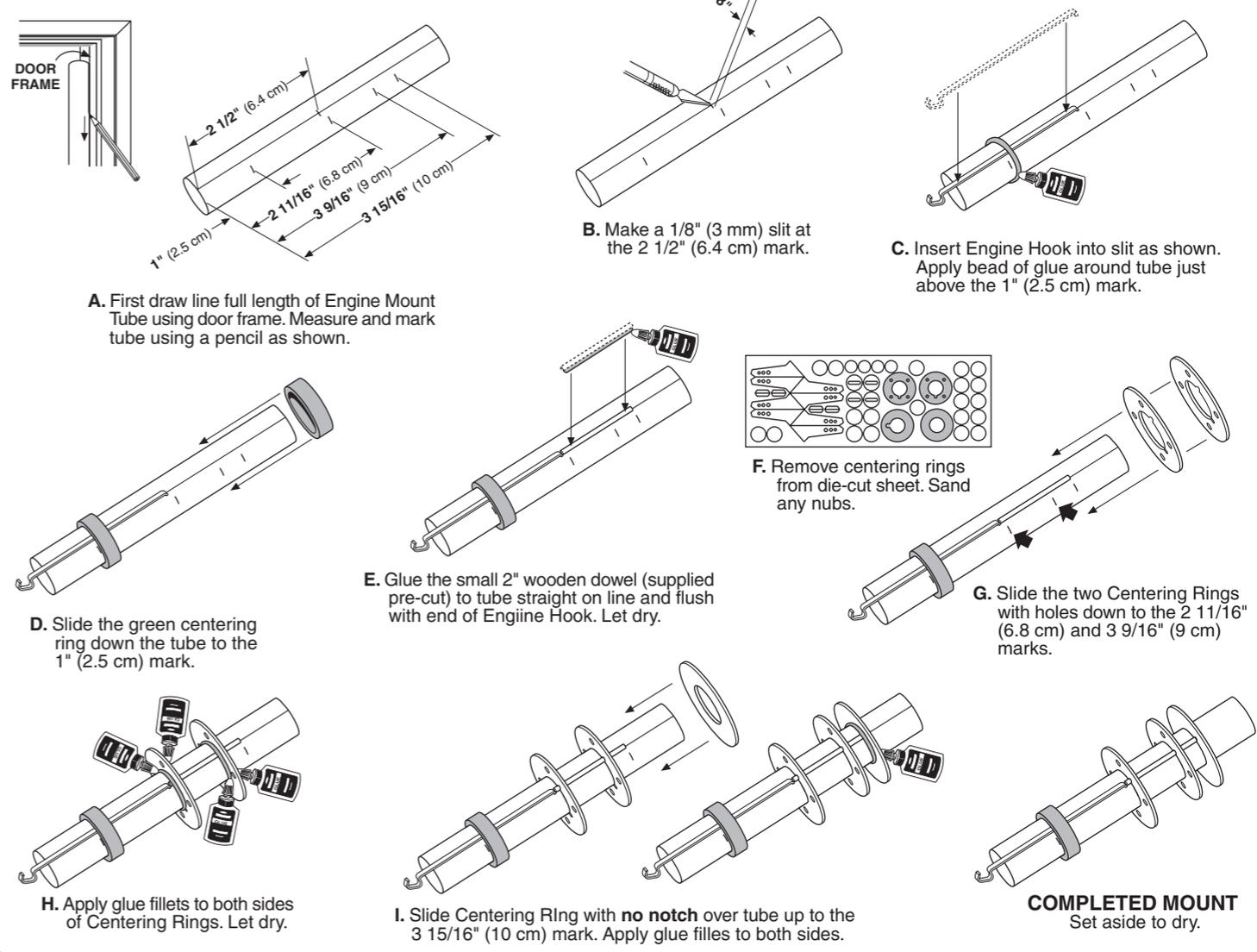
COMPLETED NOZZLE

- B. Trim flash using a modeling knife or sandpaper. Remove the two nibs as shown for the launch lug holes.

- E. Using a modeling knife and round file, clean out hole in Nose Cone for Shock Cord and remove excess flash.

NOTE: You may want to primer, sand, and paint the Nozzle and Nose Cone at this time. Don't finish the Ascent Module yet. See PAINTING GUIDE (page 2).

7. ASSEMBLE ENGINE MOUNT



- A. First draw line full length of Engine Mount Tube using door frame. Measure and mark tube using a pencil as shown.

- B. Make a 1/8" (3 mm) slit at the 2 1/2" (6.4 cm) mark.

- C. Insert Engine Hook into slit as shown. Apply bead of glue around tube just above the 1" (2.5 cm) mark.

- D. Slide the green centering ring down the tube to the 1" (2.5 cm) mark.

- E. Glue the small 2" wooden dowel (supplied pre-cut) to tube straight on line and flush with end of Engine Hook. Let dry.

- F. Remove centering rings from die-cut sheet. Sand any nubs.

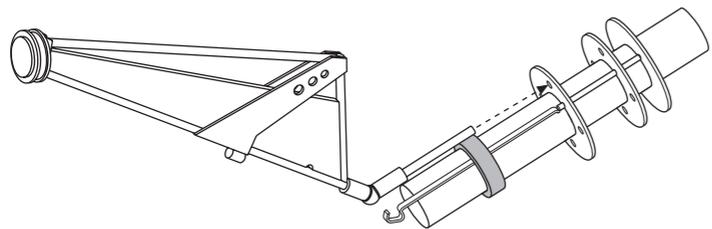
- G. Slide the two Centering Rings with holes down to the 2 11/16" (6.8 cm) and 3 9/16" (9 cm) marks.

- H. Apply glue fillets to both sides of Centering Rings. Let dry.

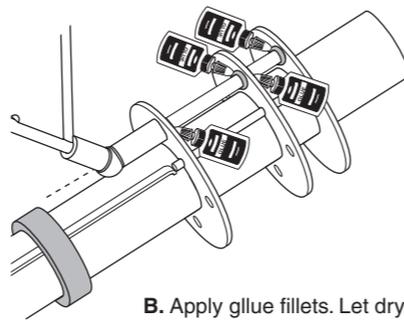
- I. Slide Centering Ring with no notch over tube up to the 3 15/16" (10 cm) mark. Apply glue fillets to both sides.

COMPLETED MOUNT
Set aside to dry.

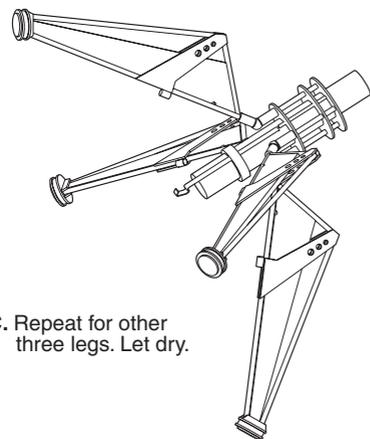
8. ATTACH LEG HINGE & ENGINE MOUNT ASSEMBLY



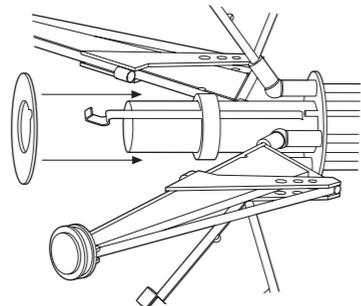
A. After Engine Mount Assembly has dried, slide Leg Hinge Assembly into place as shown.



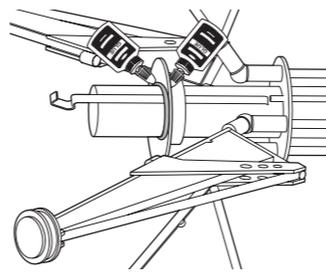
B. Apply glue fillets. Let dry.



C. Repeat for other three legs. Let dry.

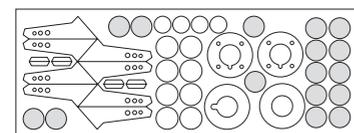


D. Slide Centering Ring with notch over Engine Mount Tube, aligning notch with Engine Hook, until it butts up to Green Adapter Ring.



E. Apply glue fillets. Let dry.

9. PREPARE TANK ASSEMBLIES

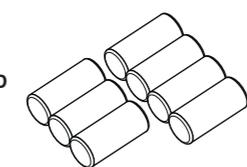


SMALL TANKS:

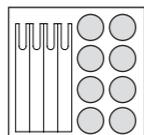


COMPLETED TANK

A. Remove the 16 small discs from die-cut sheet. Glue a disc to each end of small tube as shown.



B. Repeat for other seven tanks. Let dry.

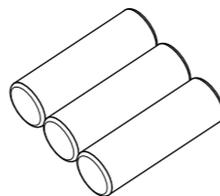


LARGE TANKS:



COMPLETED TANK

C. Remove the eight large discs from die-cut sheet. Glue a disc to each end of large tube as shown.

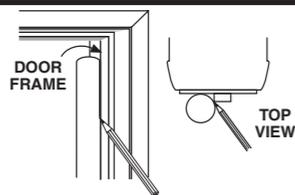


D. Repeat for other three. Let dry.

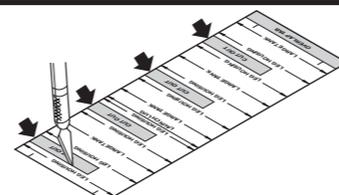
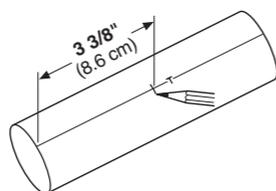
NOTE: You may want to sand, primer, and paint the Small and Large Tanks at this time. See PAINTING GUIDE (page 2).

10. MARK BODY TUBES

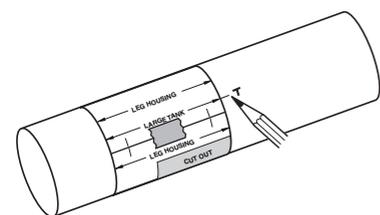
NOTE: You may want to sand, primer, and paint the Upper Body Tube prior to marking. See PAINTING GUIDE (page 2).



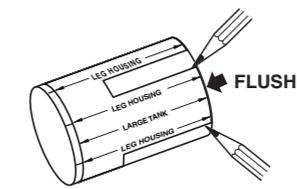
B. Extend all lines using door frame. Mark tank lines ("T") at 3 3/8" (8.6 cm).



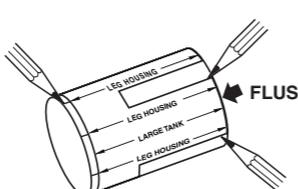
C. Cut out tube slot locations on marking guide.



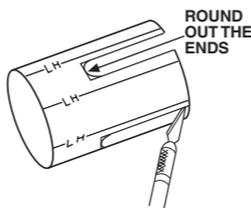
A. Cut out Tube Marking Guide and wrap around UPPER BODY TUBE. Tape to secure. Mark all LARGE TANK lines and label "T". Mark LAUNCH LUG line and label "LL". Carefully remove Tube Marking Guide and save.



D. Wrap around and tape to LOWER BODY TUBE. Draw an outline of the cutouts.

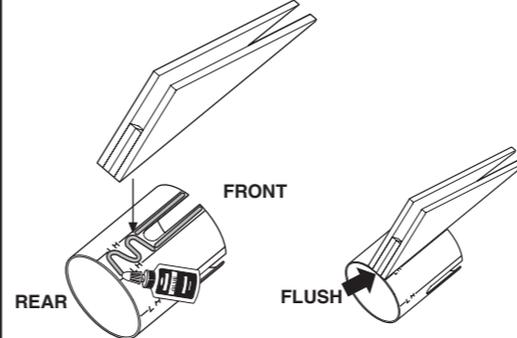


E. Mark LAUNCH LUG line and label "LL". Mark all eight LEG HOUSING lines and label "LH". Extend all lines using door frame.

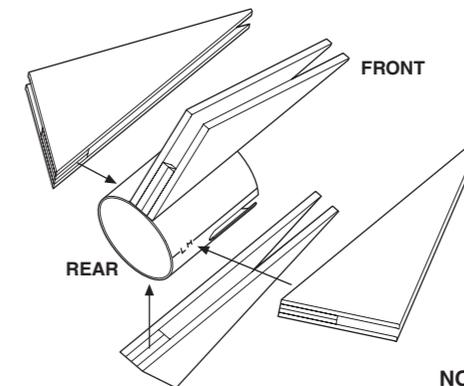


F. Using a modeling knife & sandpaper, cut out and smooth slots.

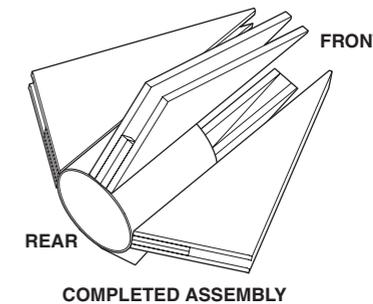
11. ASSEMBLE GEAR HOUSING



A. Apply glue to body tube as shown. Attach Gear Housing Assembly. Make sure it is flush with rear of tube and aligned with slots.

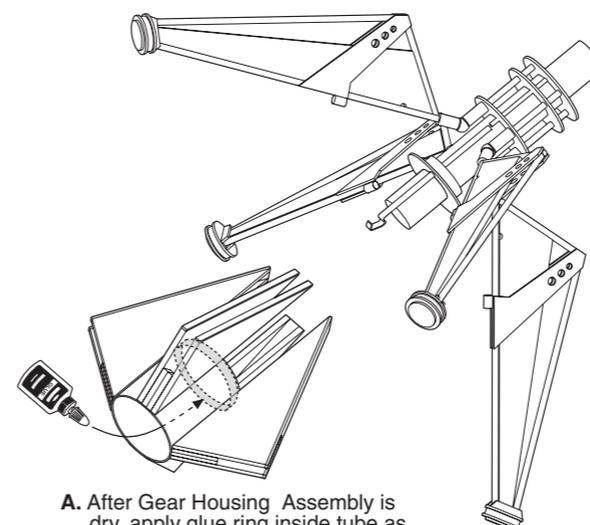


B. Repeat for other three. Allow assembly to dry.

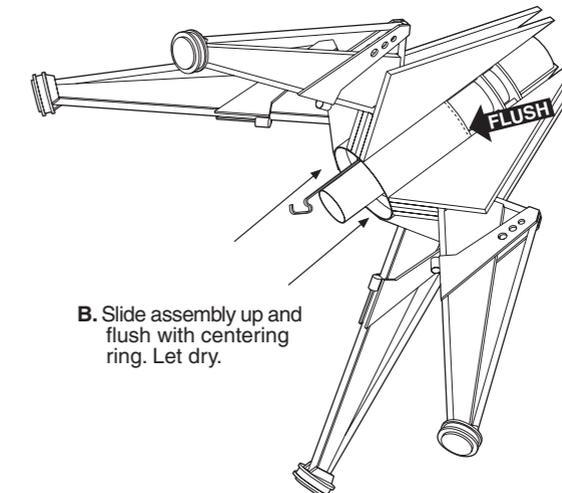


NOTE: You may want to sand, primer, and paint the Gear Housing Assembly at this time. See PAINTING GUIDE (page 2).

12. ATTACHING GEAR HOUSING TO LANDING GEAR

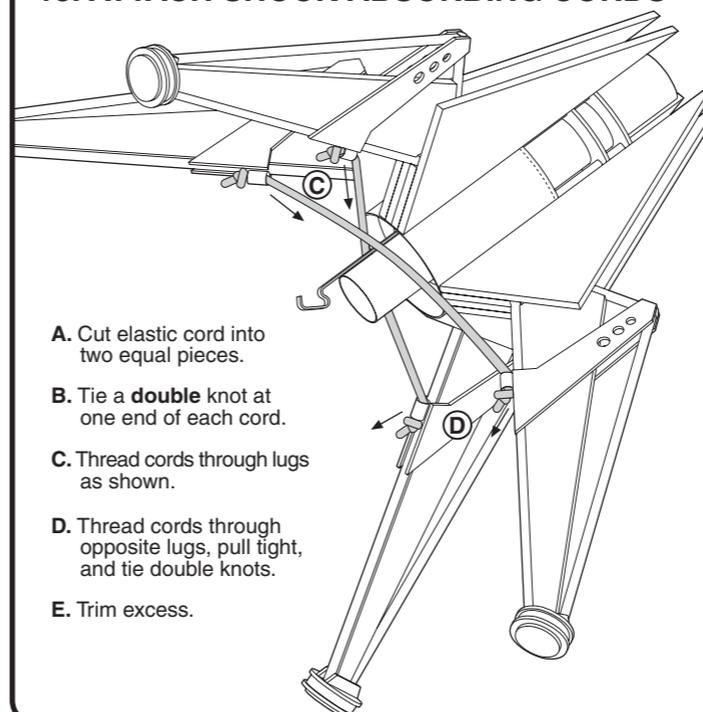


A. After Gear Housing Assembly is dry, apply glue ring inside tube as shown.



B. Slide assembly up and flush with centering ring. Let dry.

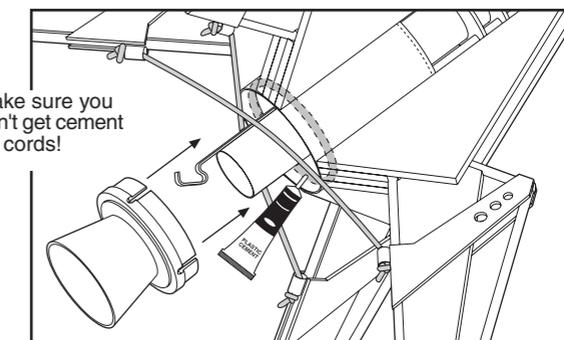
13. ATTACH SHOCK ABSORBING CORDS



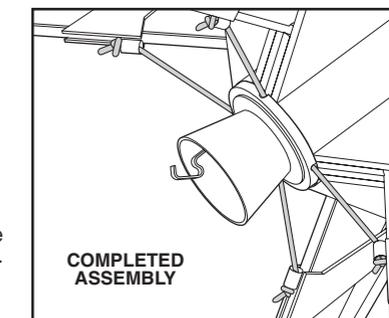
- Cut elastic cord into two equal pieces.
- Tie a **double knot** at one end of each cord.
- Thread cords through lugs as shown.
- Thread cords through opposite lugs, pull tight, and tie double knots.
- Trim excess.

14. ATTACH ENGINE NOZZLE

NOTE: Make sure you don't get cement on cords!



- Apply plastic cement ring inside Gear Housing Assembly Tube as shown.
- Carefully push nozzle over engine hook and engine tube. Fit cords into notches.
- Push Engine Nozzle all the way into Lower Body Tube. Make sure cords move freely in notches. Let dry.

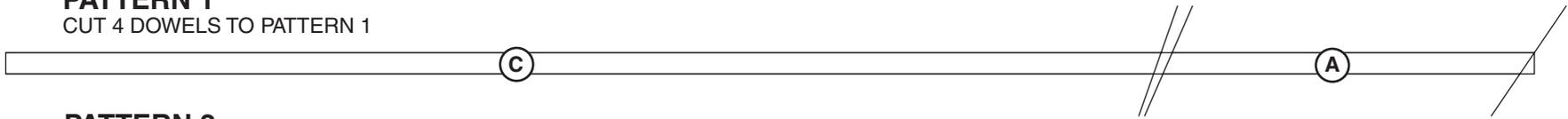


COMPLETED ASSEMBLY

1/8" x 9" WOOD DOWEL CUTTING GUIDE

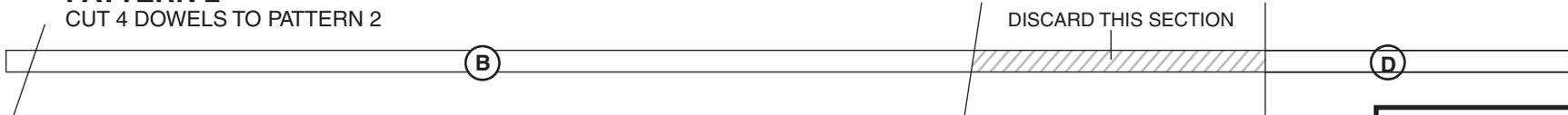
PATTERN 1

CUT 4 DOWELS TO PATTERN 1



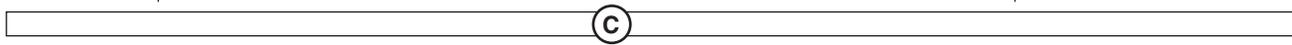
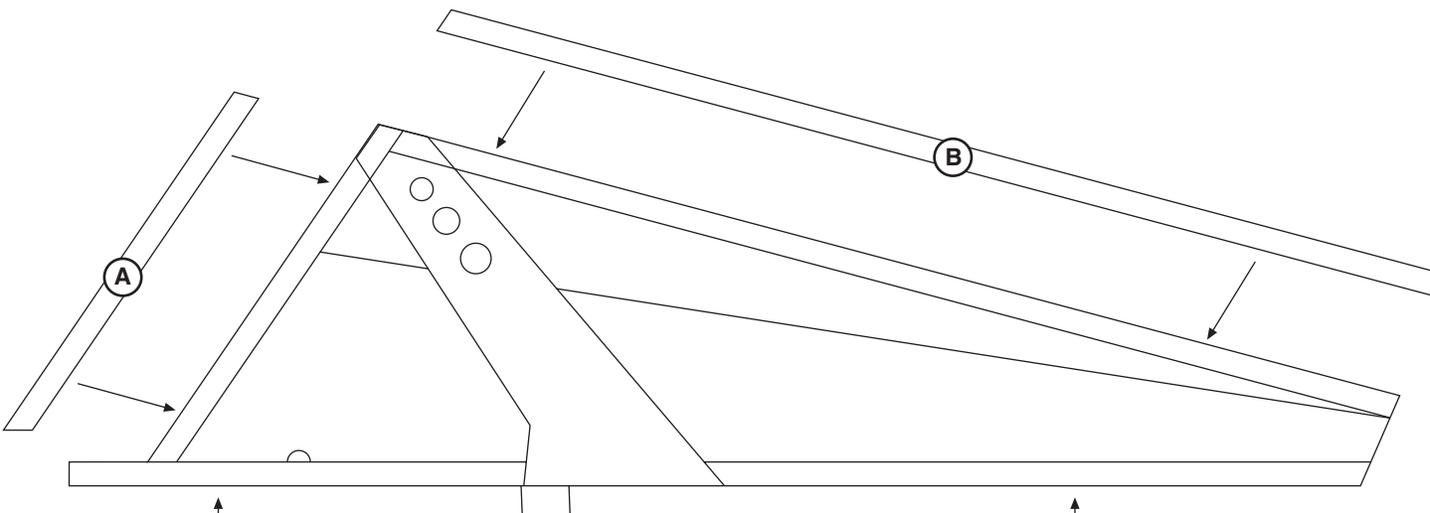
PATTERN 2

CUT 4 DOWELS TO PATTERN 2



NOTE: Lay dowels over pattern and carefully cut with razor saw. Lightly sand ends smooth. Cut the exact length and angles shown above.

Drawing below shows the placement of the dowels on the leg assemblies. You will build four leg assemblies.



FITS INTO HINGE (STEP 2)

