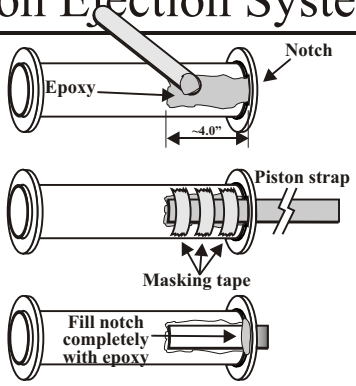
Piston Ejection System Assembly

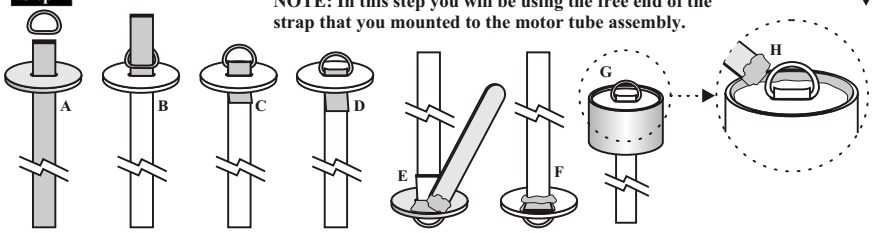
Step 1



Spread a layer of epoxy about 1" wide and 4" long on the motor tube just below the notch in the upper centering ring. Slip one end of the piston strap (the widest strap in the kit) through the notch in the centering ring. Pull through about 4" of this strap through the notch and press it firmly into the epoxy on the side of the motor tube. Hold the strap in place against the tube with masking tape until the epoxy cures. Remove the masking tape. ***Fill the entire centering ring notch with epoxy.*** Stuff the free end of the strap into the motor tube to keep it out of the way for the next step.

Step 2

NOTE: In this step you will be using the free end of the strap that you mounted to the motor tube assembly.



A) Pull the free end of the strap through the slot in the piston bulk plate.
B) Slip the metal "D" ring over the strap.
C) Feed the strap back through the slot.
D) Pull on the strap until the "D" ring is wedged at the slot.
E) Flip the assembly over. Spread a layer of epoxy on the underside of the piston plate as shown. Fold the short end of the strap flat against the piston plate and press it into the epoxy. You can use a clamp to hold the strap in the epoxy while it sets.
F) When the epoxy has cured, pull the strap until the "D" ring is wedged tight at the slot. Apply epoxy to the strap at the "D" ring.
G) Epoxy the piston plate inside the piston body 1/8" from the top.
H) Apply an epoxy fillet to both sides of the piston plate.

A special note on Piston Ejection Systems.

A piston ejection system is the most effective and reliable means of parachute deployment. Using our piston ejection system greatly reduces the risk of partial ejection and burnt parachutes. Because not all rockets use a piston ejection system, the motor manufacturers are forced to supply the large amounts of ejection powder needed to eject a `standard' recovery system. We have determined that one of the most likely causes of recovery system failure (besides incorrect ejection timing) is due to an improper amount of ejection charge. For example, a typical G motor contains approx. 0.7 grams of ejection powder. 0.7 grams of ejection powder is ideal for a 2.5" to 3" dia. rocket with 20" to 30" of piston travel but is twice the required amount for a 1.5" to 2" dia. rocket of the same length. Under most circumstances, exceeding the design limits of the recovery system in this way may not result in immediate failure but the additional stress imposed on critical areas can lead to failure during subsequent flights.
The chart below is intended as a guide for determining the proper amount of ejection powder used with various size rockets using a piston ejection system and a piston travel of under 30".

1.5 - 2.0 dia.	0.3 to 0.5 grams
2.5 - 3.0 dia.	0.6 to 0.8 grams
4.0 dia.	0.8 to 1.2 grams
6.0 dia.	1.4 to 1.7 grams
7.5 dia	1.7 to 2.0 grams

The following chart will give you a rough idea of how much ejection powder is commonly supplied with various size motors.

G motor	0.7 grams
H motor	1.4 grams
I motor	2.0 grams
J motor	2.1 grams
K motor	2.1 grams

We have also determined that a small amount of flame retardant wadding placed in the motor tube just above the motor greatly reduces the chance of piston strap failure.