



CESARONI
TECHNOLOGY
INCORPORATED

P.O. Box 246
2561 Stouffville Rd.
Gormley, Ontario
Canada L0H 1G0
Tel.: (905) 887-2370
Fax: (905) 887-2375

Pro98® Product Notes

Special instructions (supplements standard Pro98® instruction sheets)

Scope

These notes supplement the standard Pro98® instructions for the following motors:

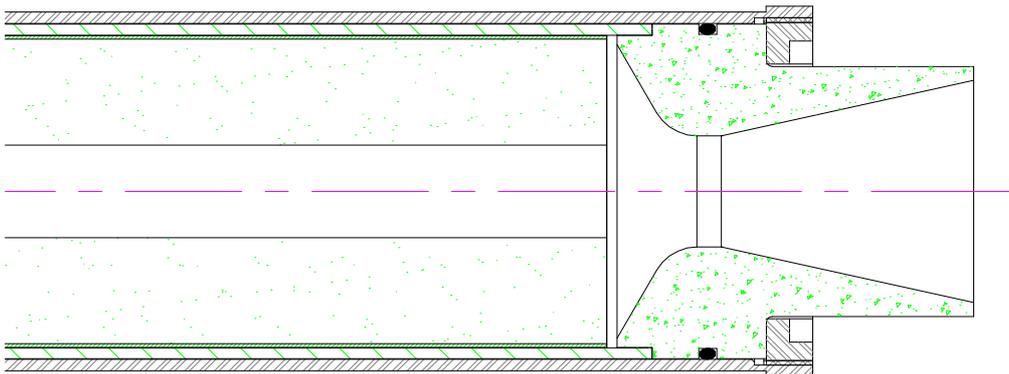
- Pro98® motors with XL-style nozzle (M3400, M4770, M6400, N2850, N2900, N3180, N3301, N3400, N3800, N4100, N5800, N10,000 and O3400)
- All Pro98® - 6GXL motors
- Pro98® motors requiring grain bonding with customer-supplied urethane adhesive (M3400, M4770, N2200, N2501, N3301, N3800, N5600 and N5800)
- Pro98® motors requiring grain bonding with reload-supplied adhesive kit (M6400, N10,000 and O3400)

This note also explains the proper use of the Pro98® casing spacers and boat tail.

Pro98® loads with XL-style nozzle:

M3400, M4770, M6400, N2850, N2900, N3180, N3301, N3400, N3800, N4100, N5800, N10,000, O3400

The M3400, M4770, M6400, N2850, N2900, N3180, N3301, N3400, N3800, N4100, N5600, N5800 and N10000 Pro98® motors use a XL-style nozzle. This is a larger nozzle than used by other Pro98® -motors. For these motors, simply leave out the nozzle carrier, and install the nozzle without the carrier. The larger o-ring that normally goes on the outside of the carrier goes directly onto the large nozzle. The smaller o-ring, if included in the package, is not required. The drawing below shows the XL-style nozzle located inside the motor and retained by the threaded retainer ring.



Assembled Pro98® motor with XL-style nozzle. Note the single o-ring and the lack of the nozzle carrier. The nozzle is retained by the threaded retaining ring only. The o-ring is installed directly on the nozzle.

Pro98® - 6GXL motor liners

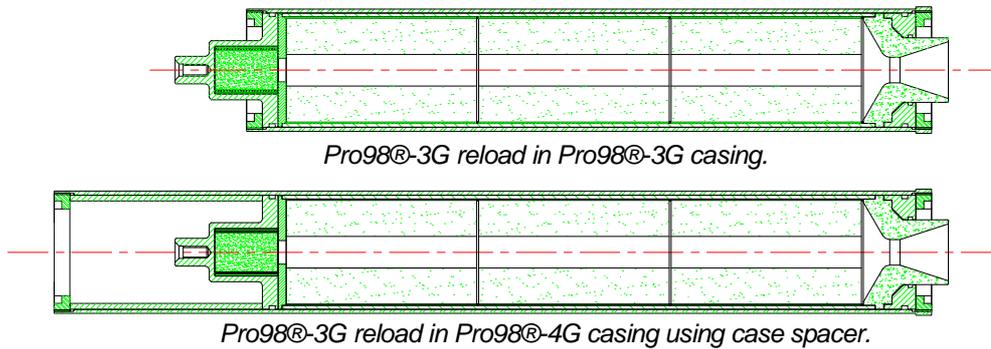
All Pro98-6GXL motors come with the forward insulator plate bonded to the liner assembly. This is required for proper sealing of the motor at the forward end. Ensure that the forward insulator plate is bonded properly, and leave it in place. Remove the nozzle, and load the grains from the other end.

Pro98® casing spacers

Pro98® casing spacers allow the use of a reload kit intended for a smaller casing size to be used in the next casing size up. For example, a 3-grain reload kit can be used in a 4-grain casing. When assembling a Pro98® motor with a casing spacer, follow the regular instructions provided with the reload kit, and install the casing spacer between the forward closure and forward closure retaining ring as shown in the example below.

Please ensure that the spacer is located between the forward closure and the threaded closure ring. Do not put the spacer between the forward closure and the insulator plate!

The XL spacer will space the Pro98®-6GXL case to a Pro98®-6G case. An additional regular spacer can be used for 5G reloads in a 6GXL casing.



Pro98® boat tail

The Pro98® boat tail can significantly reduce base drag on minimum diameter flights.

The boat tail can only be used with reloads using the XL-style nozzle!

A special adapter ring (left) is required (regular closure ring shown on the right for comparison).



Assemble the reload as per the instructions, but use the adapter ring at the nozzle end. Additional threads will remain exposed after assembly of the reload into the case.



Next, thread the boat tail onto the exposed threads of the adapter ring.

Pro98® motors requiring grain bonding using customer-supplied adhesive:

M3400, M4770, N2200, N2501, N3301, N3800, N5600, N5800

The following motors require bonding of the grains into the liner: M3400/N5600 White Thunder™, N2200 Pink™, N2501 and N3301 White™, N3800 Blue Streak™, N5800 C-Star™ and M4470 and N10,000 Vmax™. Bonding the grains in the liner prevents premature blowout of the grains under high acceleration loads or by high core mass flows.

Note the special 'base grain' for the N2501 and N3301 motors. These grains should be installed at the nozzle end.

Use a foaming polyurethane glue such as Gorilla Polyurethane Glue or Elmer's Glue-All Max (do not use the white Elmer's Glue Max). A single 2-oz bottle is sufficient for all Pro98 motors and it is not supplied. The process for bonding the grains is as follows:

1. Open all grain packages and the liner inert kit.
2. Verify that all required parts are present and that all the grains fit properly in the liner.
3. Wear gloves during the bonding process!
4. Apply adhesive on the outside (paper liner) of the first grain. Ensure no adhesive is applied on the grain faces or bore of the propellant.
5. Push the grain in the liner from the nozzle end while twisting it. Twisting the grain while inserting it will properly distribute the adhesive. Push it about 1" into the liner.
6. Install a grain spacer o-ring.
7. Repeat steps 7 and 8 for all six grains. Excess adhesive might be scraped off around the end of the liner. This can simply be wiped off.
8. Do not install a spacer o-ring between the bottom grain and the nozzle.
9. Re-install the nozzle and wipe off any excess adhesive.
10. Set the liner/grain assembly upright with the nozzle facing down.
11. Push the top grain down gently through the hole in the forward insulator plate.
12. Let the liner/grain assembly cure in an upright position
13. Continue with the regular assembly process as outlined in the instructions.

Notes:

1. Do not insert the bottom grain from the forward closure end of the liner. Most adhesive will have been scraped off when the grain is pushed through all the way and it reaches the end of the liner.
2. For the Pink™ N2200 reload the red grain should be located at the nozzle end. (All other motors use identical grains.)

When installing the liner in the casing it is important to fill the gap between the liner and the ID of the casing with grease. Grease the outside of the liner with an ample amount of grease before installing it in the casing. While insert the liner/grain/nozzle assembly into the casing the grease should be scraped off the casing. This will minimize the blow-by of hot propellant gasses at ignition.

Pro98® motors requiring grain bonding using reload-supplied adhesive kit:

M6400, N10,000 and O3400

The following motors require bonding of the grains into the liner using the supplied adhesive kit: M6400 and N10,000 Vmax™ and O3400 Imax™. Bonding the grains in the liner prevents premature blowout of the grains under high acceleration loads or by high core mass flows.

Note the special 'base grain' for the O3400 reload. The base grain should be installed at the nozzle end.

Only use the CTI supplied adhesive kit for the reloads in this section. The process for bonding the grains is as follows:

1. Open all grain packages and the liner inert kit.
2. Verify that all required parts are present and that all the grains fit properly in the liner.
3. Wear gloves during the bonding process!
4. Open the adhesive kit.
5. Empty the contents of the hardener bottle (dark brown fluid) into the main adhesive bottle.
6. Use the supplied stirring stick and stir for at least two minutes.
7. Apply adhesive on the outside (paper liner) of the first grain using the supplied brush. Ensure no adhesive is applied on the grain faces or bore of the propellant.
8. Push the grain in the liner from the nozzle end while twisting it. Twisting the grain while inserting it will properly distribute the adhesive. Push it about 1" into the liner.
9. Install a grain spacer o-ring.
10. M6400 and N10,000: Repeat steps 7 and 8 for all grains. Excess adhesive might be scraped off around the end of the liner. This can simply be wiped off. When completed proceed to step 11.
11. O3400: Repeat steps 7 and 8 for the top four (4) grains. The fifth regular and sixth base grain also need to be bonded together by applying a generous amount of adhesive on the propellant ends between these two grains. Do not install a spacer o-ring between grains 5 and 6.
12. Do not install a spacer o-ring between the bottom grain and the nozzle.
13. Re-install the nozzle and wipe off any excess adhesive.
14. Set the liner/grain assembly upright with the nozzle facing down.
15. Push the top grain down gently through the hole in the forward insulator plate.
16. Let the liner/grain assembly cure in an upright position
17. Continue with the regular assembly process as outlined in the instructions.

Notes: Do not insert the bottom grain from the forward closure end of the liner. Most adhesive will have been scraped off when the grain is pushed through all the way and it reaches the end of the liner.