

# STERN ERA® AND ERA-RV

## Summary

- Extracoronal semi-precision attachment.
- Universal hinge with vertical resiliency.
- Nylon male, plastic pattern female.
- Female is waxed into the pattern of the abutment restoration for a one-piece casting. A gingival offset on the female allows room for the interdental papilla.
- Two offset females (2.5 and 4.5) that allow the female eyelet to be placed closer to the tissue and are packaged with RV males
- Black fabrication male with built-in spacer.
- Six color coded males for six levels of retention (lightest to strongest): white, orange, blue, grey, yellow, red. The white and orange are final males. The blue and grey males are oversize.
- Two Extra Oversized Males for greater retention in problem cases – yellow has a larger button than the grey; red has a larger button than the yellow.
- Nylon male greatly reduces the rate of female wear. Replacing a worn male with a new one of the same color restores the attachment's retention.
- Optional ERA Metal Jacket, or ERA-RV Metal Jacket, holds the attachment male in the denture base and is sold pre-loaded with a black processing male.
- Males easily changed without use of autopolymerizing acrylic.
- Standard and reduced vertical (ERA-RV) size males. Both size males fit the same females.

**Fixation:** Male - retained directly in processed denture acrylic or an ERA Metal Jacket.  
Female - cast as part of crown pattern.

Cast plastic components using alloys with a minimum Vickers hardness of 200 and at least 85,000 psi ultimate tensile strength. Appropriate choices are Pegasus ceramic alloy and Sterngold 100 crown and bridge alloy for yellow gold castings.

### Minimum Space Required:

	Height+	FC width	Prep depth	RC width
Standard	4.0mm	2.8mm	Normal crown	6.3mm
Stern ERA-RV and offsets	3.5mm	Normal crown	6.3mm	

ERA Metal Jacket thickness: 0.3mm

+Add 1.0mm for patients with habitually strong bites.

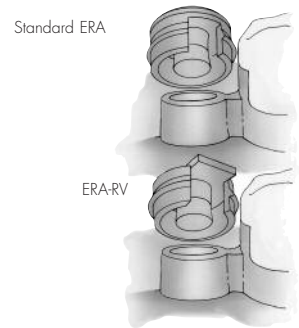
### Indications

- Unilateral or bilateral partial dentures where a resilient prosthesis is indicated.
- Used as a retentive element for overdenture bars.
- Well suited as a partial denture attachment for bonded retainers.

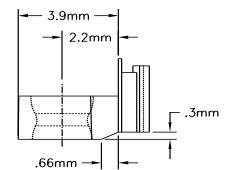
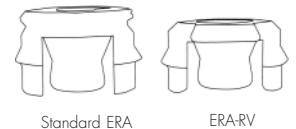
Because the ERA joint allows hinging around much of its radius, it is appropriate even where ridge alignment or abutment location forces the attachment to be set at an angle to the sagittal plane.

### Contraindications

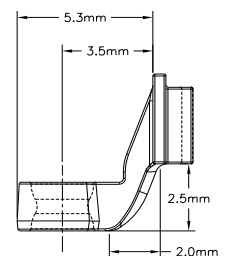
The ERA is not appropriate for case designs requiring rigidity in function.



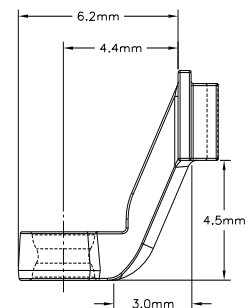
The same female is used with the ERA and the ERA-RV.



PARTIAL DENTURE FEMALE



ERA OFFSET 2.5



ERA OFFSET 4.5



## ATTACHMENT DESCRIPTION

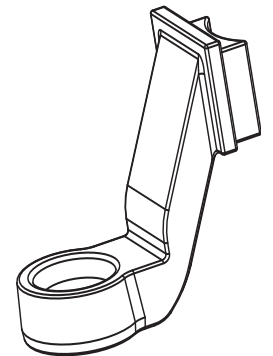
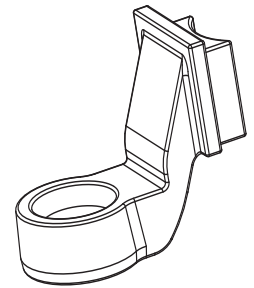
Attachment	Female	Male	Overall Height	Width Male
Standard	Burnout pattern	Nylon	3.00 mm	4.3 mm
ERA-RV and offsets	Burnout pattern	Nylon	2.5 mm	4.3 mm

### Male Color Code:

Black	fabrication male
White	final male with light retention
Orange	final male with moderate retention
Blue	oversize male with heavy retention
Grey	oversize male with very heavy retention
Yellow	extra oversized male with more retention than grey
Red	extra oversized male with more retention than yellow



Item	Number
Stern ERA starter kit 2 attachments, 2 processing jigs, 1 core cutter bur, 1 seating tool and 1 paralleling mandrel	811100
Stern ERA-RV starter kit 2 attachments, 2 processing jigs, 1 core cutter bur, 1 seating tool and 1 paralleling mandrel	811105
Stern ERA attachment 1 female, 5 assorted males: 2 black, 2 white, 1 orange	811110
Stern ERA-RV attachment 1 female, 5 assorted males: 2 black, 2 white, 1 orange	811115
ERA-RV Offset 2.5 1 female, 5 assorted males: 2 black, 2 white, 1 orange	811203
ERA-RV Offset 4.5 1 female, 5 assorted males: 2 black, 2 white, 1 orange	811204
ERA/ERA-RV female	811190
ERA ERA Offset female 4.5	811201
ERA ERA-Offset female 2.5	811202
ERA black fabrication males, 5	811120
ERA-RV black fabrication males, 5	811125
ERA white males, 5	811130
ERA-RV white males, 5	811135
ERA orange males, 5	811140
ERA-RV orange male, 5	811145
ERA blue males, 5	811150
ERA-RV blue males, 5	811155
ERA grey males, 5	811160
ERA-RV grey males, 5	811165
ERA yellow males, 5	811170
ERA-RV yellow males, 5	811175
ERA red males, 5	811180
ERA-RV red males, 5	811176
Assorted males, 1 each: black, white, orange, blue, grey:	
ERA	811161
ERA-RV	811166
ERA Metal Jacket with black male	811163
ERA-RV Metal Jacket with black male	811168



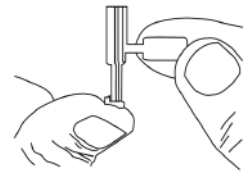
## TOOLS LIST

Item	Number
Laboratory tool kit	811200
Core cutter bur, seating tool, and paralleling mandrel	
Dentist tool kit	811240
Core cutter bur and seating tool	
ERA paralleling mandrel	811210
ERA core cutter bur	811220
ERA seating tool	811230
ERA/ERA-RV partial denture processing jig	811250

## FABRICATION INSTRUCTIONS

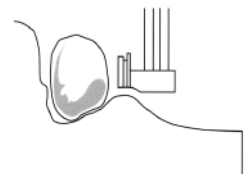
1. Check that the knurled thumb-screw on the Paralleling Mandrel is loose.

Place the female plastic pattern on the mandrel. While holding the female firmly against the shoulder of the mandrel, tighten the thumb-screw to secure the female in place (Fig. 1).



**Fig. 1**

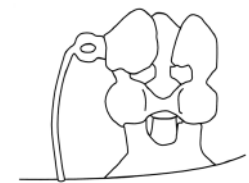
2. Using your surveyor, position the female against the waxed abutment pattern (coping, crown or apron for bonding). The preferred placement is over the crest of the ridge or slightly lingual to it. Also place the female close to, but not in contact with, the tissue. The three different gingival offsets of the eyelet help to maintain the embrasure space while permitting the female to be placed close to the tissue (Fig.2).



**Fig. 2**

Note: If necessary you may remove some or all of the contoured retention plate to better position the female in the wax.

3. Lute the female to the wax pattern, incorporating the contoured retention plate in the wax. Do not wax beyond the flat rectangular surface.
4. Sprue the abutments. It is strongly recommended that you create a gas vent off the outer part of the ERA female ring (Fig. 3). This will ensure a dense casting. Attach an 18 or 20 gauge round wax rod to the outside of the ring farthest from the crown pattern. Connect the other end of the wax rod to the flat area of the sprue base. Do not connect to the button area since the vent would then fill with alloy. A blind "vent" is of little use in this application.



**Fig. 3**

Burnout for plastic components requires two stages:

- a. Slow rate of rise to 600°F (316°C) and hold for 30 minutes. This assures a clean and complete burnout of the plastic piece.
- b. Complete the burnout procedure by following your alloy manufacturer's instructions.

Note: Cast using a hard alloy Minimum Vickers hardness of 200 and at least 85,000 psi ultimate tensile strength. Appropriate choices are Pegasus ceramic alloy and Sterngold 100 crown and bridge alloy for yellow gold castings.



5. Carefully clean the investment off the finished casting. If air abrasive is used, care should be taken to avoid enlarging the interior of the eyelet. In order to protect the accuracy of the internal clearance, do not grind inside the eyelet. As with any plastic pattern, there may be some flash, bubbles, or roughness on the castings. Carefully remove any bubbles or flash using a Bard Parker blade or small bur. If working inside the eyelet, be careful to only work with very smooth rubber points so that you will not oversize the eyelet.

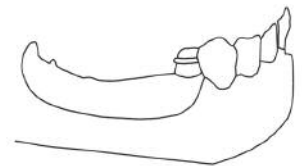


Fig. 4

Remove any investment remaining in the eyelet using a pointed instrument, or you may sand blast lightly. The Sterngold-ImplaMed fiberglass brush is helpful in cleaning the attachment without abrasion.

When finishing or polishing the outside of the female ring, do not reduce the wall thickness.

6. Seat the casting on the master model, snap the black fabrication male into the female eyelet and block out the area gingival to the attachment. The black male will hold the partial denture framework at the upper limit of the attachment's 0.4mm vertical resiliency. Complete the preparation of the model for duplication in refractory material (relieve the saddles, block out undesirable under-cuts, etc.). Take an impression and pour the refractory model for the RPD framework (Fig. 4).

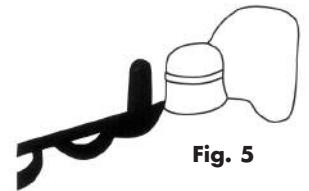


Fig. 5

7. Wax the partial denture framework. Do not wax directly against the representation of the attachment. Create mechanical retention for the acrylic adjacent to the attachment representation (Fig. 5). For all partial dentures we recommend waxing temporary struts and rests for framework orientation and stabilization during try-in (Fig. 6). The struts normally should extend from the major connector over the incisal of the selected remaining dentition. Along with the rests and soft tissue stops, these will provide stable, accurate seating of the framework during fabrication.



Fig. 6

### **Alternate method when vertical space is very limited**

Use a silicone duplicating material (hydrocolloid will probably not be accurate enough) to create the refractory model. Mount the refractory model to the opposing cast. Wax completely over the refractory representation of the black male - creating what looks like an acrylic veneer crown with a metal occlusal surface. Incorporate this into the partial denture framework. After casting, the facial surface is veneered with composite or acrylic. The nylon ERA males will be housed directly in this metal receptacle in the partial denture.

8. While the RPD framework is being fabricated, the ceramic steps of the fixed units maybe completed.

9. Send the finished RPD framework and the abutment units to the dentist for try-in.

## 10. In the operatory

Though the black fabricating males can be luted to the RPD framework directly in the mouth, many dentists prefer to have the laboratory affix the males. That is the technique described here.

After checking marginal fit, occlusion and framework fit:

- a. seat the black fabricating males onto the females,
- b. block out the space between the attachment and the tissue,
- c. make a full-arch passive tissue impression with the uncemented crowns in place\* (but not the RPD framework)
- d. pull the crowns in the impression.

This will provide the processing model. Send all components, along with bite registration, back to the laboratory.

## 11. In the laboratory

Lubricate inside the crowns and fill with resin die material. Seat dowel pins or other retentive devices in the resin before it sets. Pour the impression in stone.

Or, you can seat the master dies into the crowns, seal with sticky wax, and pour the impression in dental stone.

12. If the black males remain in the impression after recovery of the cast, remove them and place them back on the ERA females which are now on the model.

This would be the time to switch to the black males with the metal jacket if you are using that option. The metal jacket serves as a permanent holding socket in the denture base and is processed into the acrylic just like the regular black males. They take up 0.2mm more vertical space, but they assist in providing attachment stability in the processed denture acrylic and a stable environment for changing attachment males.

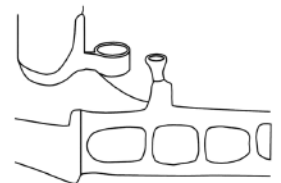
Block out any remaining undercuts and lubricate the surfaces to which acrylic should not adhere.

Carefully paint autopolymerizing acrylic over the top and sides of the black fabrication male. Make certain that the external retention ridge on the outside of the cylindrical housing is covered with acrylic. Then seat the partial denture framework on the cast and extend the self-curing acrylic to include the mechanical retention you provided on it in Step 7 (Figs. 7 and 8).

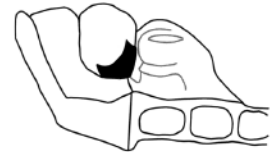
Note: If picking up the males in the mouth, carefully block out the undercuts and attach the males to the framework with self-curing acrylic as has been described above. Make sure the partial denture framework is sitting passively on the tissue.

13. After the resin sets, remove and reseat the RPD framework to check the placement of the fabrication males.

The males should snap home at the same instant the positioning struts contact the anterior teeth.



**Fig. 7**



**Fig. 8**

\* When working with resin-bonded castings, it may be necessary to cement the retainers at this step. If so, use "Alternate Processing Technique" on next page.

14. Wax the partial denture and complete its final check and approval before processing.
15. Prior to flasking, remove the crowns with attachment females from the processing model. Fill the inside of the black fabrication males with soft plaster. Seat the framework back on the processing model and fill the remaining open space below the males and around the abutments with plaster.
16. Invest and process the partial denture in a technique of your choice.
17. Deflask and clean the partial denture. Remove the soft plaster from inside the male.
18. Remove any temporary stabilizing features (struts, etc.), and finish the partial denture.

NOTE: If the acrylic pulls away from the male during curing, the male may be loose in the prosthesis. To correct, just paint the male with a thin wash of acrylic and snap back into position.

## Alternate Processing Technique Using Processing Jigs

### 1. In the operatory

Temporarily cement the crowns, or permanently cement the bonded retainers, and snap black fabrication males into the female eyelets.

2. Block out the space under the attachments, and take a full arch passive tissue impression without the RPD framework. If the black fabrication males remain in the females after the impression is taken, remove them from the females and send them along with the impression to the laboratory.

Note: If the crowns or bonded retainers are left in the mouth the females must be protected. Provide a temporary acrylic partial denture which covers the ERA females - otherwise they could be damaged from chewing hard foods. This is why it is generally recommended that crowns not be cemented until the partial denture is delivered.

### 3. In the laboratory

Remove the black fabrication males from the impression. Snap the processing jigs into the black males with the jig's tapered smaller diameter in first. Then fully seat the male/jig assembly into the male's recess in the impression.

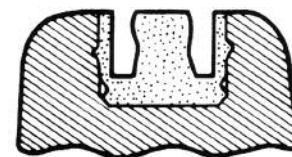
4. Pour the processing model. The processing jigs will accurately position the ERA males.

## SERVICING

### Replacement of the Males

The ERA attachment has two color-coded final males. There are also two oversized males. Each color provides a different degree of retention. From the least retentive to the most retentive they are: White, Orange, Blue, and Grey

As with all attachments, the least amount of retention that will properly hold a prosthesis in place is the best amount of retention.



Male to be replaced

It is best to deliver the finished partial denture with the fabrication male still in it. This allows clinical evaluation of occlusion with the ERA attachment in a non-resilient condition. The dentist then activates the resiliency of the attachment by replacing the fabrication male with a final male of the appropriate retentive strength.

A dentist's tool kit (core cutter, seating tool and instructions) is necessary for replacement of the ERA males.

## Steps

1. Place the self-limiting Core Cutter bur into a straight handpiece.
2. Cut out the core of the old male at low speed, using a short cutting cycle and an in-and-out motion. Push in for about one second at a time, checking to see if the core has been removed.

The core will remain in the Core Cutter. It can be ejected by sliding a thin blade along the cutter's side slot.

3. Using a blade or explorer-like instrument, collapse the remaining ring into the open space created by removal of the core and lift it out.

4. Place the white (least retentive) male on the Seating Tool.

### Standard ERA male -

Align the small rectangular projection running from the top to the bottom of the male with the corresponding slot in the acrylic recess or ERA Metal Jacket. Push hard to snap the final male into place. You can hear a definite snap when the male seats.

### Reduced vertical (ERA-RV) male -

Align the small horizontal tab at the occlusal of the male with the corresponding depression in the acrylic recess or ERA Metal Jacket. Push hard to snap the final male into place. You can hear a definite snap when the male seats.

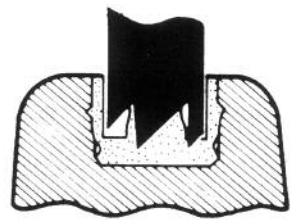
Deliver the completed case along with the other color-coded males. If the prosthesis does not demonstrate adequate retention in the mouth, the dentist can easily remove the white male as described above and replace it with the orange male.

On bilateral or bounded cases, different color males may be used on different females without compromising the attachments' function.

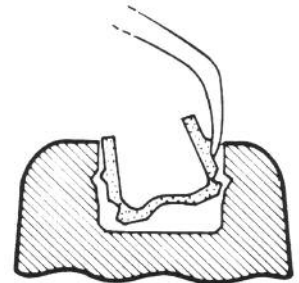
## Relining and Rebasing

### Steps

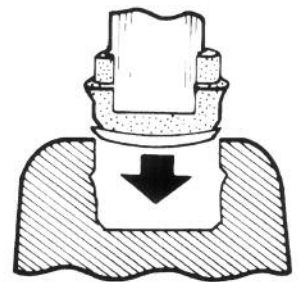
1. Block out the gingival aspect of the female.
2. Remove the existing males as outlined above and replace them with the black fabrication males. The built-in spacer of the fabrication male will hold the partial denture in the upper limit of its 0.4mm vertical resiliency.



Remove center with core cutter



Using explorer collapse and remove male shell



Snap new male in place with seating tool

3. Lubricate the attachment male and female with a small amount of petroleum jelly. This will prevent the impression material from entering the attachment.
4. Make a wash impression.
5. Snap processing jigs on the fabrication males in the impression and pour a stone model.
6. After processing, try the denture in the mouth and adjust the occlusion if necessary. Replace the black fabrication males with the final males utilizing the Core Cutter and Seating Tool as described above.

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