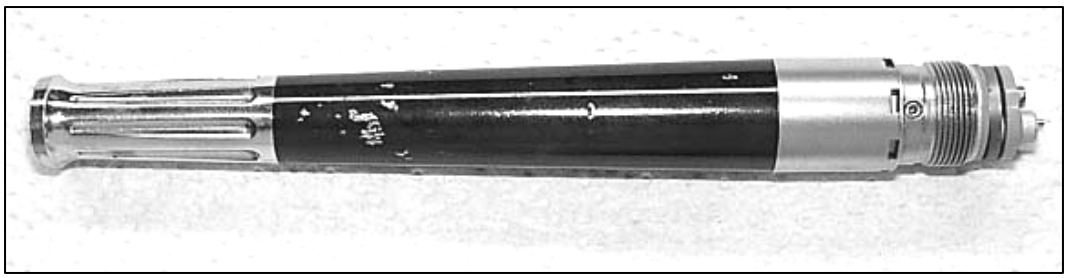
# Star Scaler
# Repair Procedure

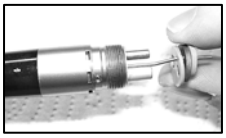


The Star Scaler is a handpiece that has existed for a long time. They will be a common sight in any area of the world. It has gone through very little change since its inception so the following procedure will be relevant for any Star non-swivel scaler you encounter. All replacement parts are available for this scaler. As always, try to determine the problem before disassembling the motor.

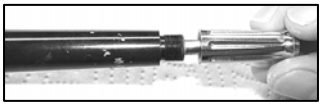
Some of the most common problems with the scaler are:

- There is no vibration at the tip.
- The scaler has low vibration.
- The threads are worn.
- The spindle spins around.
- The tip can not be removed.
- There is a water leak.

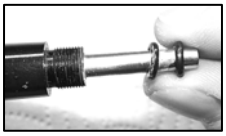
The repair procedures for each of these problems is addressed below

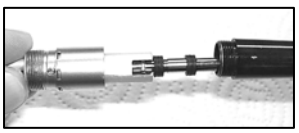


**STEP 1**
Remove the water line from the scaler. To do this, simply pull it out of the rear of the scaler. Be sure to take the water line gasket with the water line. This will keep it from being torn.



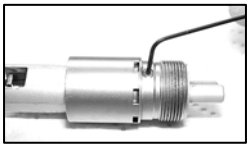
**STEP 2**
Now unscrew the nose piece from the scaler. Use a couple pieces of rubber and a tight grip to unscrew it from the main housing. Once this is done, remove the two large o-rings from the spindle. Sometimes the o-rings will be stuck up inside the nose piece and can be removed with some tweezers.





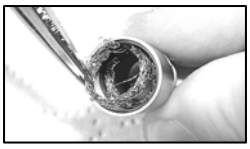
**STEP 3**
The next step is to unthread the main housing from the connector housing. Once again the threads are regular and you may need to use a couple pieces of rubber and a tight grip to unscrew this portion. Once you unscrew this piece, the internal workings of the scaler will be visible.

**STEP 4**
In this step, pull the four quad o-rings and rotor off of the spindle. Look to see if the o-rings are cracked. Also look to see if the rotor is damaged.



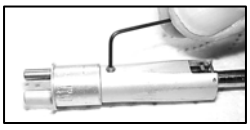
**STEP 5**

The connector housing on these scalers is secured to the internal air connector by an allen screw or a pin. If it is an allan screw, it can be removed by unscrewing counterclockwise with a .035" allan wrench. If it is a pin, tap it into the internal air connector. Tap it into the point where the top of the pin is countersunk just below the inner diameter of the connector housing. This will keep you from damaging the internal air connector.



**STEP 6**

You may notice that the aluminium baffel is still inside the connector housing. Remove it with a pair of tweezers. Remove the connector housing by pulling it off of the air connector and spindle assembly. If you had to tap a pin into the air connector to remove the housing, you will need to tap the pin onto your worksurface and reuse it during reassembly.



**STEP 7**

Some scalers will have an allen screw holding the spindle stop onto the air connector, others are crimped on. Again, use a .035" allen wrench to remove the screw. Removing the spindle stop from the air connector may still require you to use a couple of channel lock pliers.

**STEP 8**

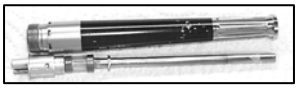
Now that you have removed the spindle stop from the air connector, pull it off of the spindle assembly. Then you will need to pull the spindle and flex tubing from the air connector. Removing the two crimp rings will allow you to remove the flex tubing from the end of the spindle.

**STEP 9**

**If, and only if there is a water leak problem, you will need to change the water line brace**. Insert the water brace tool (00039) into the bottom end of the spindle. Once it makes contact with the water line brace, press hard and turn the tool clockwise. After you turn the tool a few times, it should be embedded into the brace. Pull the tool out of the spindle and replace it.

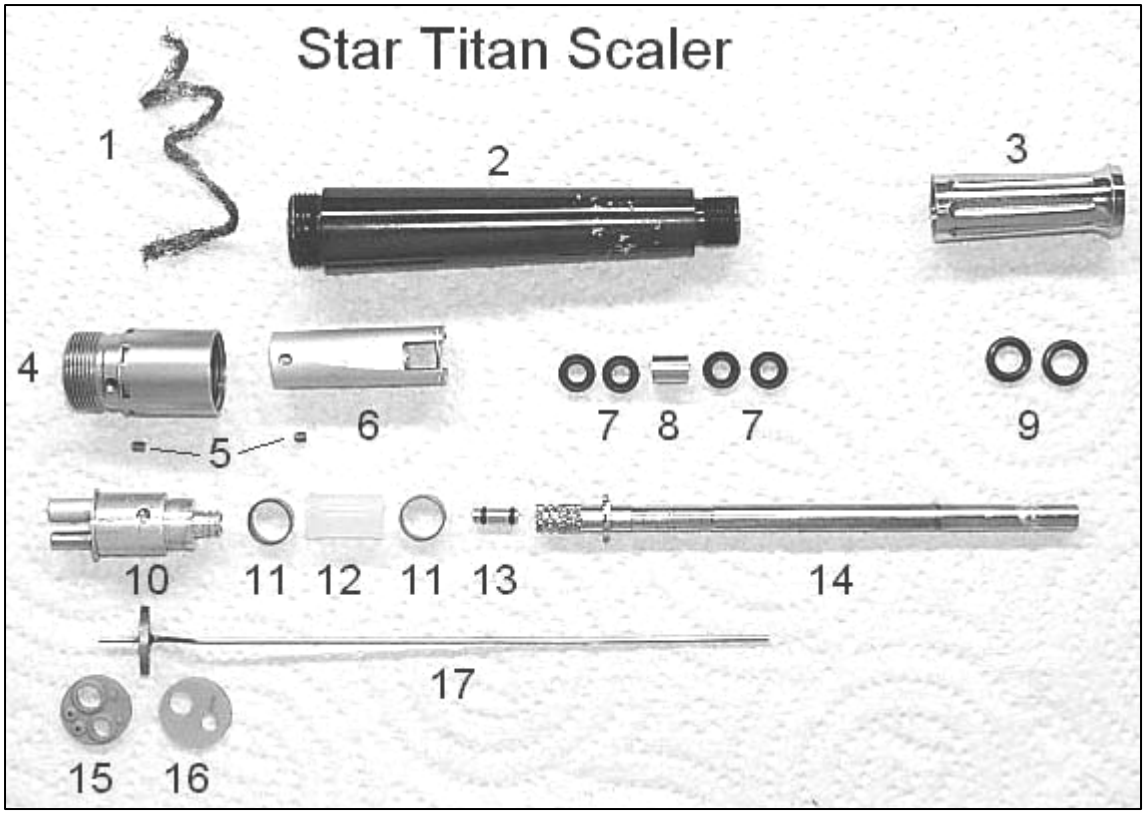
**STEP 10**

To reassemble the main shaft of the scaler, place a crimp ring over one end of your flex tubing. Make sure the ring is flush with the end of the tubing. Next, push the flex tubing all the way onto the nurled end of the air connector. Once this is done, you can crimp the crimp ring securely onto the air connector. Crimp the ring with your crimp ring tool (00029).



**STEP 11**

To attach the spindle, place the second crimp ring flush with the top edge of the flex tubing. Insert the bottom of the spindle into the tubing. Adjust the height of the spindle by laying the internal assembly next to the assembled outer housings. Set the bottom edge of the air connector even with the bottom of the threads on the connector housing. Now, the tip of the spindle must be even with, or slightly above, the edge of the nose piece. Adjust if needed.

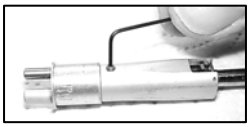



| Picture Number | Part Number | Description |
|---|---|---|
| 1 | 20112 | Baffle |
| 2 | 20101 | Main Housing |
| 3 | 20102 | Nose Housing |
| 4 | 20103 | Connector Housing |
| 5 | 20115 | Allen Screws |
| 6 | 20106 | Spindle Stop |
| 7 | 20117 | Quad O-Ring |
| 8 | 20107 | Rotor |
| 9 | 20118 | Large O-ring |
| 10 | 20105 | Air Connector |
| 11 | 20110 | Crimp Ring |
| 12 | 20111 | Flex Tubing |
| 13 | 20109 | Water Line Brace |
| 14 | 20104 | Scaler Spindle |
| 15 | 02897 | Star Green Gasket |
| 16 | 20113 | Water Line Gasket |
| 17 | 20108 | Water Line |

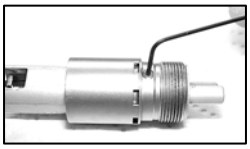
We will address some of the troubleshooting tips now that we are about to reassemble our adapter.

- *There is no vibration at all*. This is usually caused by the rotor being cracked. Remove the main housing as in **STEP 3**. Pull off the rotor and quad o-rings as in **STEP 4** and simply replace them following **STEP 16.**
- *The Motor Has Low Torque*. Make sure the gasket is in good condition and the air intake port is not loose. If those are in good condition look at the following. A scaler can have low torque if the quad o-rings are pushed on too close to the rotor. This would limit the travel of the rotor and limit torque. Look to **STEP 16** to properly space the o-rings. Be sure the rotor is not damaged and there is no debris on the spindle. A split flex tube would also cause low torque. After removing the spindle stop in **STEP 8**, closely examine the flex tube and replace it if damaged.
- *The Threads are Worn Out*. Simply replace the connector housing as described in **STEP 5,6 & 14**.
- *The spindle spins around*. Check to see that the pin or allen screw is in place following **STEP 5**. If it missing, replace it. Otherwise, spinning can be caused by a split flex tube or faulty crimp ring. They must be replaced using **STEP 10,11,12**. In addition, the dog ears on the bottom of the spindle could be loose. In this case, the spindle must be replaced. Very often, the spindle stop will be loose on the air connector as well. You will need to replace the spindle stop in this instance.
- *The tip cannot be removed.* If the tip does not spin, use a wrench to unscrew it from the spindle. If the tip simply spins around and around, it must be removed using force. Grab the spindle with needle nose pliers just below the scaler tip and above the nose piece. This is not easy and will take some effort. Then grab the scaler tip with channel lock pliers and unscrew it.
- *There is a water leak.* Water leaks can be caused by a bad gasket or faulty water line brace. First check to see that the gasket is in good condition. If so, change the water line brace using **STEP 9**.

**STEP 12**
With the spindle properly aligned you need to crimp the top crimp ring onto the flex tube and spindle. You will need to crimp the ring, then turn the unit 90 degrees and crimp again. This will ensure a tight crimp.

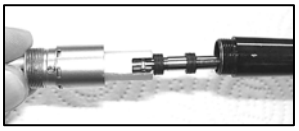


**STEP 13**
Install the new spindle stop. Be sure that the dog ears on the spindle are lined up with the openings in the spindle stop. If it has an allen screw that holds it in place, install the screw.

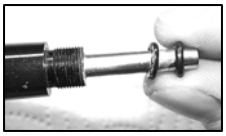


**STEP 14**
Next, slide the spindle assembly into the back of the connector housing. If it requires an allen screw, insert the screw until the top edge of the screw is even with the outer edge of the housing. Applying a small dab of Loctite to the screw will ensure it does not back out during use. If it requires a pin, tap the pin into the alignment hole until the top edge of the pin is even with the outer edge of the housing.

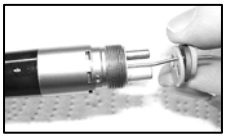
**STEP 15**
Install the aluminium baffel using tweezers. Press the baffel into the connector housing in a circular pattern as shown. Be sure to push the baffle down as far as possible as loose bands will bind the threads.



**STEP 16**
Now, push the first two quad o-rings onto the spindle. There is a small groove just below the holes in the spindle. This is where the bottom o-rings sit. Push the rotor onto the spindle until it touches the bottom o-rings. Place the top o-rings on the spindle just above the rotor. There is a groove above the rotor where the top two o-rings sit. Once this is done, screw the main housing onto the connector housing. There should be a gap between the rotor and the o-rings.



**STEP 17**
Place the top two large o-rings over the tip of the spindle. Push them all the way to the top of the main housing and screw on the nose piece.



**STEP 18**
Insert the water line into the air connector. Make sure it is seated properly. Connect to the coupler and test.