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**Note:** For sterilization instructions refer to the **Sterilization Sheet, Star® Part #63037**, and use it as a quick reference.

63035 Rev. A

## Titan<sup>®</sup> E Motor

- **Star<sup>®</sup>** Part #62905
- Lubrication Free
- Recommended Air Pressure: 40-45 psi (2.81-3.16 kgs/cm<sup>2</sup>) (swivel motor)
- Air Flow: 2.1 SCFM @ 40 psi (2.81kgs/cm<sup>2</sup>) at Maximum Power Point (swivel motor)
- Rotation: Forward & Reverse
- **Motor** Speed: 100-20,000 rpm
- Internal Water and Chip Air
- Autoclave at 135° C. Max

## Swivels

- **Star<sup>®</sup>** Part #63000
- 2/3-Line Non-Fiber Optic Swivel with Chip Air
- **Star<sup>®</sup>** Part #62881
- 4-Line Non-Fiber Optic Swivel with Chip Air
- Autoclave at 135° C. Max

## Titan® E Handpieces (attachments)

**1:1 Contra Angle Handpiece with Autochuck\*, Star® Part #63017**

**1:5 Contra Angle Handpiece with Autochuck\*, Star® Part #63016**

**1:1 Contra Angle Handpiece with AutoLatch\*, Star® Part #63014**

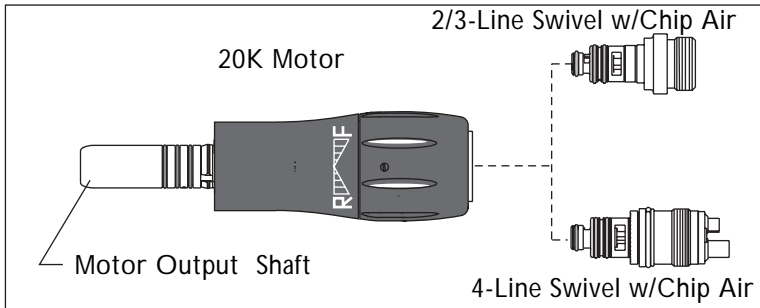
**4:1 Contra Angle Handpiece with AutoLatch\*, Star® Part #63015**

**1:1 Straight Handpiece\*, Star® Part #63018**

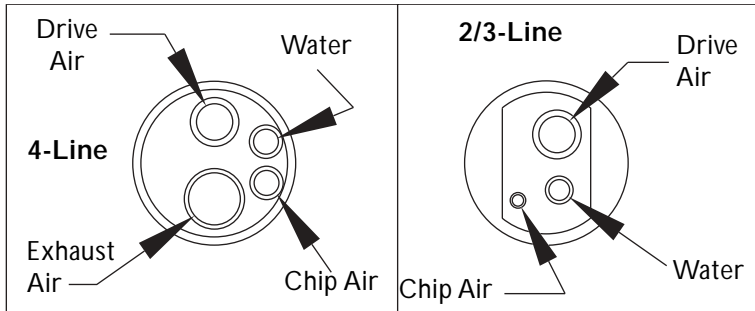
- Autoclave at 135° C. Max

- \* These handpiece attachments are designed to operate with the **Star® Dental Titan® E Motor**. However, they may also be used with any low speed motor up to maximum motor speed of 40,000 rpm. Lubrication required.

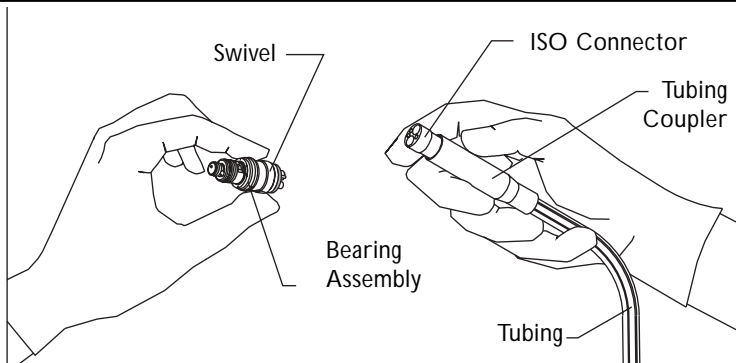
The expanded speed adjustment of the **Titan® E** is *more accurate and easier to control* during speed selection with a new 120° rotation speed adjustment ring and easy-to-read speed setting icons. *Smoother starting at lower pressure* assures a gentler start-up with no jumping in rotation. Designed for *better performance under load*, new **Titan® E** Motors are less likely to stall under higher torque requirements than other low speed motors.



1. Select the appropriate swivel connector for delivery system tubing.

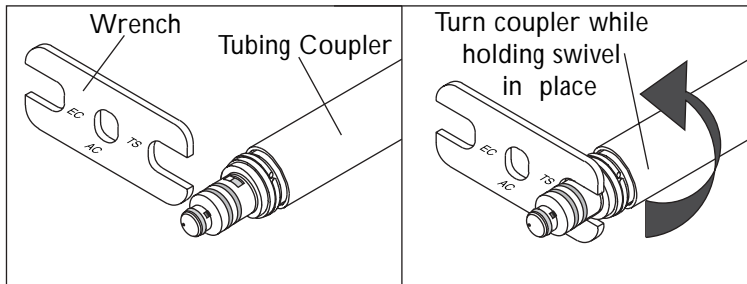


2. Disconnect swivel from handpiece if necessary. Grasp the swivel in front of the bearing assembly between the thumb and index finger as shown on next page.



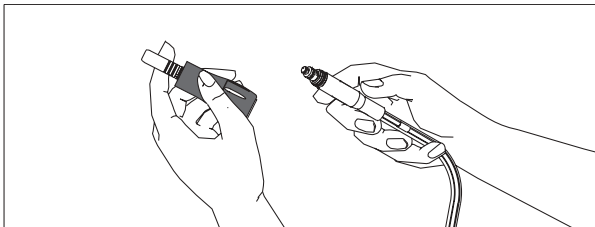
3. Slide tubing coupler until the end of the ISO connector is exposed; hold in hand as shown with fingers securing the tubing.
4. Align and insert swivel tubes into the ISO connector holes.

5. While applying slight pressure to hold fittings in the connector holes, slide coupler forward and engage threads. Continue threading coupler clockwise until hand tight against the swivel.
6. Using the wrench as shown, tighten the swivel to the tubing coupler. Be sure to turn tubing coupler, *not* swivel. **DO NOT OVER TIGHTEN.**



**Note:** *This joint loosens over time, resulting in loss of power. Check for tightness periodically.*

7. Connect Motor to swivel.
8. Using an air pressure gauge for 2/3-line, **Star**® Part #57492, or for 4-line, **Star**® #59875, between swivel and tubing, obtain a reading. Adjust the air pressure at delivery head until gauge reads 40-45 psi while operating handpiece and with foot control completely depressed.

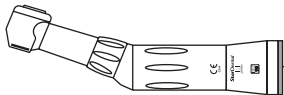


9. Attach desired Handpiece to Motor. Note Make sure that Handpiece is securely engaged to the motor by hearing 'click'.

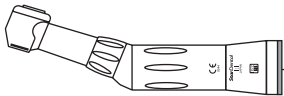
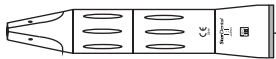


Handpieces marked with blue collars represent the same speed  
1:1 = 20,000 rpm @ Titan® E motor full speed.

## 1:1 Contra Angle Autochuck Handpiece

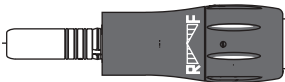


## 1:1 Straight Handpiece



## 1:1 Contra Angle AutoLatch Handpiece

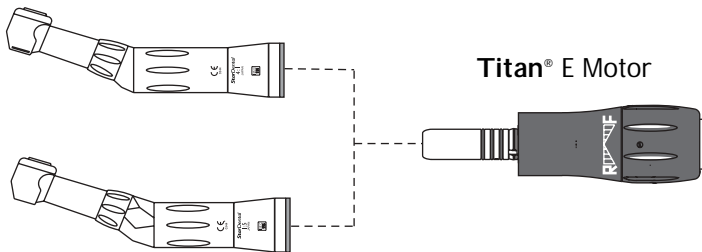
Titan® E Motor



Handpieces marked with red collar represent the speed multiplied  
 $1:5 = 100,000$  rpm @ **Titan® E** motor full speed.

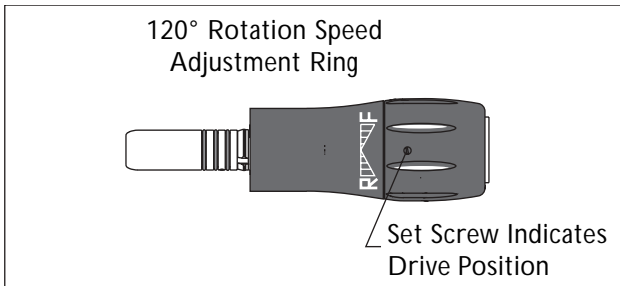
Handpieces marked with green collar represent the speed reduction  
 $4:1 = 5,000$  rpm @ **Titan® E** motor full speed.

### 4:1 Contra Angle AutoLatch Handpiece



### 1:5 Contra Angle Autochuck Handpiece

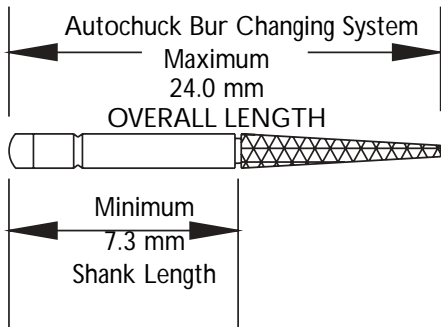
The 120° rotation speed adjustment ring sets direction and speed. To run motor forward at full speed, rotate ring towards the letter 'F' while operating the foot control. Rotate to the letter 'R' to yield full speed in reverse. Vary speed by rotating ring in either direction towards center. Note the small Set Screw for the current setting. After setting, the motor runs at current speed and direction until reset. Pausing the motor is not needed to alter direction or speed using the ring.



# Page 12 Handpiece Operation

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Use standard length concentric diamond and carbide burs with .0628" nominal diameter friction grip shanks designed for high speed handpieces. Every **Star**<sup>®</sup> Diamond Bur meets specifications below for recommended lengths. Contact your dealer for a complete list of **Star**<sup>®</sup> Diamond Burs. **Star**<sup>®</sup> autochuck turbines have the following bur requirements:



Use only burs with hardened, tempered steel shanks. Every **Star**<sup>®</sup> Diamond Bur maintains required hardness. Before use, verify concentric rotation by operating handpiece outside the oral cavity in a safe place.

**Note:** *Do not use burs that produce excessive noise or do not run concentrically. Do not use burs that are modified, eccentrically designed, or have bent or `soft` (non-heat treated) shanks.*

## **Autochuck Bur Changing System**

1. **To insert**, grasp handpiece firmly so your thumb touches the end cap and push.
2. Insert bur fully into chuck until it stops; release thumb.
3. Tug on bur to confirm that bur is secured in chuck.

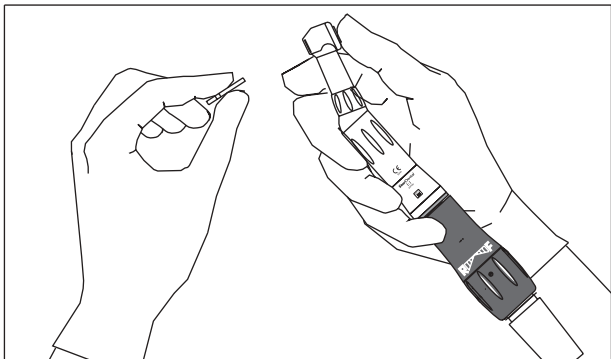
**Note:** *As a recommended safety measure, after installation, push button one time while holding bur; then release button to properly align gripping mechanism.*

1. **To remove**, grasp handpiece firmly so your thumb touches the end cap and push until a slight `click` is felt.

# Page 14 Handpiece Operation

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2. Pull bur straight out.
3. Release end cap.

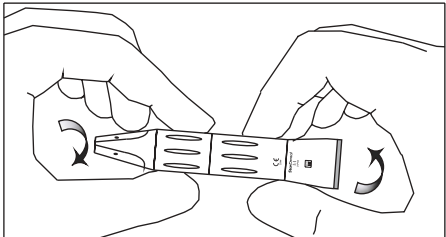


**CAUTION:** *Never depress the autochuck end cap button or rest the end cap against any part of the oral anatomy during handpiece operation. Depressing the end cap while a bur is rotating can activate the chuck mechanism and result in end cap heat-up and/or loss of bur retention.*

# Straight Handpiece Operation

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To open chuck, grasp the chuck locking collar with one hand, the sleeve with the other, and rotate counterclockwise until a 'click' is heard



With the chuck open, insert an .0925" (2.350 mm) shank burr, Doriot Angle or Disposable Angle the full length of the chuck. Close chuck and lock by reversing the opening procedure.

**CAUTION:** *Operate the Straight Handpiece with a burr, Doriot Angle or Disposable Angle in chuck. Operating either with the chuck open or without a burr, Doriot Angle or Disposable Angle installed will damage the chuck.*

<i>Procedure</i>	<i>Systems Configuration Options</i>	<i>Star® Part Number</i>	<i>Operating RPM Range</i>
<b>Prophy</b>	20,000 rpm <b>Titan® E Motor</b>	62905	1,000-3,000
	<b>4:1 Contra Angle Handpiece with AutoLatch</b>	63015	
<b>Grinding &amp; Trimming:</b> Denture work, crown & bridge work, adjustment, disking, fabrication & trimming of temporaries	20,000 rpm <b>Titan® E Motor</b>	62905	10,000-20,000
	<b>Straight Handpiece</b>	63018	
<b>Post &amp; Pin Drilling</b>	20,000 rpm <b>Titan® E Motor</b>	62905	1,000-5,000
	<b>4:1 Contra Angle Handpiece with AutoLatch</b>	63015	



<i>Procedure</i>	<i>Systems Configuration Options</i>	<i>Star® Part Number</i>	<i>Operating RPM Range</i>
<b>Pin Setting</b>	20,000 rpm Titan® E Motor <b>4:1 Contra Angle Handpiece with AutoLatch</b>	62905 63015	1,000-5,000
<b>Finishing</b> Cavity & crown preps	20,000 rpm Titan® E Motor <b>1:1 Contra Angle Handpiece with AutoLatch</b> <b>OR 1:1 Contra Angle Handpiece with AutoChuck</b>	62905 62014  63017	10,000-20,000
<b>Polishing</b> Amalgam, composites, gold margins	20,000 rpm Titan® E Motor <b>1:1 Contra Angle Handpiece with AutoLatch</b> <b>OR 1:1 Contra Angle Handpiece with AutoChck</b>	62905 63014  63017	10,000-20,000

<i>Procedure</i>	<i>Systems Configuration Options</i>	<i>Star® Part Number</i>	<i>Operating RPM Range</i>
<b>Endodontic:</b> Condensing gutta percha	20,000 rpm Titan® E Motor <b>1:1 Contra Angle Handpiece with AutoLatch OR 1:1 Contra Angle Handpiece with AutoChuck</b>	62905 63014  63017	10,000-20,000
<b>Caries Removal</b>	20,000 rpm Titan® E Motor <b>4:1 Contra Angle Handpiece with AutoLatch</b>	62905 63015	2,000-5,000
<b>Conventional Friction Grip High Speed Handpiece Techniques</b>	20,000 rpm Titan® E Motor <b>1:5 Contra Angle Handpiece with AutoChuck</b>	62905 63016	70,000-100,000

## **PLEASE OBSERVE SAFETY RULES**

1. Always tug on bur after chuck is loaded to confirm that the bur is secured.
2. Before use, verify concentric rotation by operating the handpiece outside the oral cavity in a safe place. Do not use burs that do not run concentrically or produce excessive noise.
3. Never operate handpiece without a bur installed.
4. Always use burs with an overall length of less than 24 mm. Shank length must be at least 7.3 mm.
5. Use only recommended burs to prevent damage to autochuck and in some cases to prevent burs from improper or incorrect placement. An improperly clamped bur may dislodge during

use, causing injury to you or your patient. A sudden high-pitched sound or increased vibration while handpiece is operating alerts the operator to the possibility that the chuck is not clamped sufficiently to retain the bur or a bent bur is inserted.

**WARNING:** Always insert bur the full length of chuck. If you attempt to extend it from chuck, bur may dislodge during use and cause injury to you or your patient.

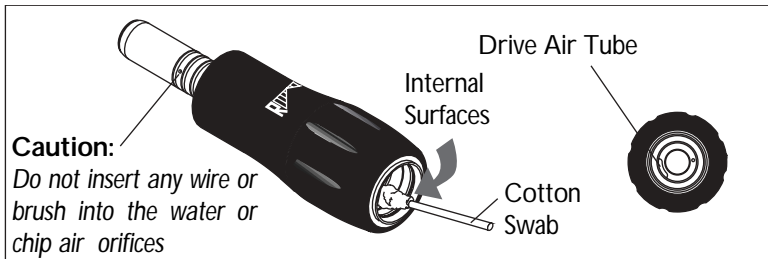
# Cleaning and Lubricating Page 21

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## Cleaning the Titan® E Motor

**Titan® E** Motor is LubeFree and, therefore, requires no lubrication.

Clean internal surfaces with cotton swab soaked in isopropyl alcohol.  
Dry using syringe air.



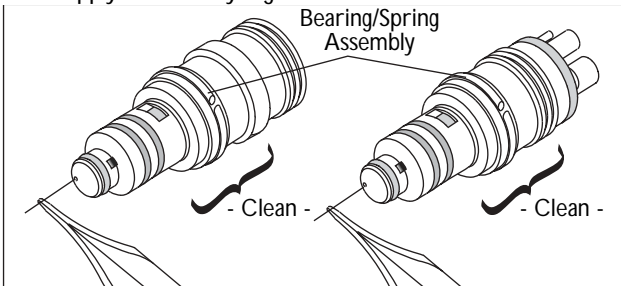
# Page 22 Cleaning and Lubricating

## **CLEANING the Swivel** – Clean swivel daily.

1. Disconnect swivel from motor & tubing. Depress foot control; verify that water exits tubing.
2. Connect swivel to tubing. Depress foot control; if almost no water exits front of swivel, clean as follows.
3. Detach swivel from tubing & find water tube (shown above).
4. Insert cleaning wire **Star**® Part #56719, into water tube until wire emerges at opposite end. When wire will not insert, move wire back & forth to loosen debris.
5. Remove wire & apply a blast of syringe air into water tube.

### **CAUTION:**

*Do not insert any wire or brush into the chip air orifices.*



# Cleaning and Lubricating Page 23

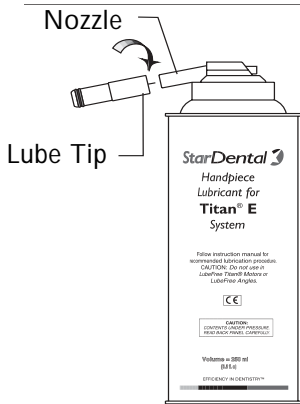
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## CLEANING the Handpiece

Always lubricate handpiece after use, and before autoclaving with **Handpiece Lubricant for Titan® E System, Star® Part #63022**.

1. Remove **Handpiece** from **Titan® E** motor.
2. Install Lube Tip **Star®** Part #63026 onto spray can applicator, by threading it 10 turns clockwise.

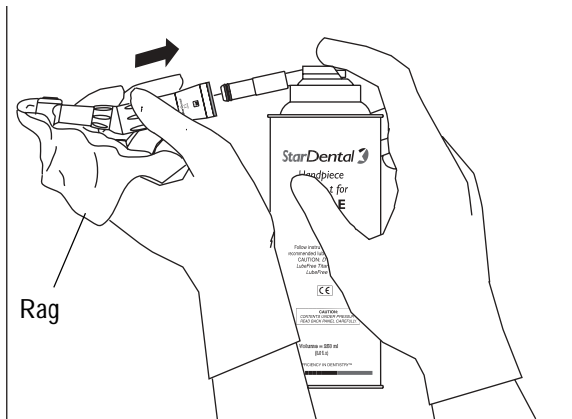
**CAUTION:** *Lubricant propellant pressure could eject the handpiece from spray nozzle. Cover the head with rag.*



# Page 24 Cleaning and Lubricating

3. Hold handpiece firmly, insert the Lube Tip into rear of Handpiece and spray for 2 seconds.

**CAUTION:** *Lubricant propellant pressure could eject the handpiece from spray nozzle. Cover the head with a rag.*





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<b>Problem</b>	<b>Cause(s)</b>	<b>Correction</b>
Lack of power	Air pressure	Verify proper Motor air pressure 40-45 psi. Refer to <b>Installation, Pages 4-10.</b>
	Crimped tubing	Straighten tubing inside and outside delivery head.
	Debris build-up in handpiece	Clean and Lubricate Motor and/or Handpiece. Refer to <b>Cleaning and Lubricating, Pages 21-24.</b>
	Motor turbine is worn	Verify speed by attaching an alternate handpiece with same gear ratio. If alternate handpiece has same low power performance, return Motor to factory for repair through your authorized dealer.

<b>Problem</b>	<b>Cause(s)</b>	<b>Correction</b>
Lack of power	Debris build-up in Motor	Place 3 drops of <b>DentaLube® II, Star®</b> Part #62539 into the drive air tube of motor, and alternately operate the motor in forward and reverse.
	Handpiece cartridge is worn	Verify speed by attaching an alternate handpiece with same gear ratio. If alternate handpiece has better power performance, return Handpiece to factory for repair through your authorized dealer.
Water leakage	Swivel not threaded fully onto tubing	Refer to <b>Installation, Pages 4-10.</b>
	Brittle handpiece silicone rear seal	Replace silicone rear seal for 2/3-line swivel with <b>Star®</b> Part #3103; and 4-line with <b>Star®</b> Part #2897.

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<b>Problem</b>	<b>Cause(s)</b>	<b>Correction</b>
Water leakage	Swivel w/chip air O-rings worn	Replace 2/3-line or for 4-line with chip air, non fiber optic swivel O-Rings, <b>Star</b> <sup>®</sup> Part #63025; refer to <b>Swivel O-Rings &amp; Rear Seal Replacement, Pages 30.</b>
Swivel will not disengage from handpiece	Build-up of debris	Place 3 drops of DentaLube <sup>®</sup> II, <b>Star</b> <sup>®</sup> Part #62539, into the swivel/tubing connector. Rotate swivel to circulate lube. Disengage handpiece. Contact dealer if unable to disengage swivel. To prevent reoccurrence, refer to <b>Cleaning and Lubricating, Pages 21-24.</b>
Improper Spray or No Spray	Clogged filters, tubes or water ports	Inspect and clean water filter in delivery head

Problem	Cause(s)	Correction
Improper Spray or no Spray	Clogged water and/or chip air tubing at handpiece	Disconnect handpiece. Depress foot control; verify water and/or air exits motor. If water and/or air exits motor, return handpiece to factory for repair through your authorized dealer.
	Clogged water and/or chip air tubing at Motor	Disconnect Motor. Depress foot control; verify water and/or air exits swivel. If water and/or air exits swivel, return Motor to factory for repair through your authorized dealer.

**Note:** *If a problem persists, contact dealer for further assistance; or, contact Star<sup>®</sup> Dental Technical Service at 1-866-DTE-INFO.*

## Problem

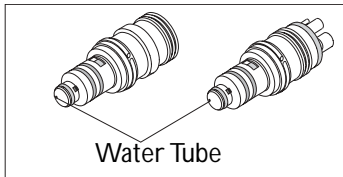
Improper Spray  
or no Spray

## Cause(s)

Clogged water  
and/or chip air  
tubing at Swivel

## Correction

Disconnect Swivel. Depress foot control; verify water and/or air exits tubing coupler. If water and/or air exits tubing coupler, Insert cleaning wire **Star**® Part #56719 into the swivel water tube to clean debris. Remove wire; aerate water tube with syringe air. Do not attempt to clean chip air out. Refer to **Cleaning and Lubricating** , Pages 21 to 24.



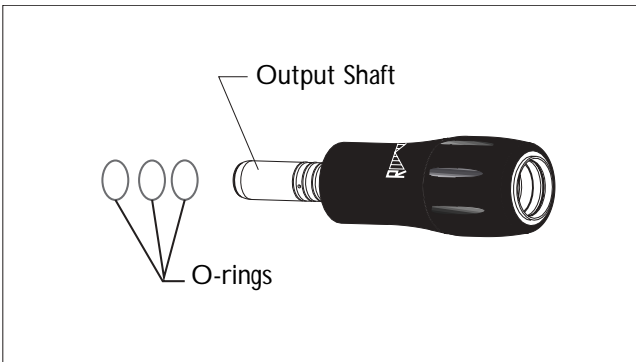
**Warning:** Do not attempt to clean chip air tube out, wire may break inside of tubing causing internal damage.

# Page 30      Output Shaft O-Rings Replacement

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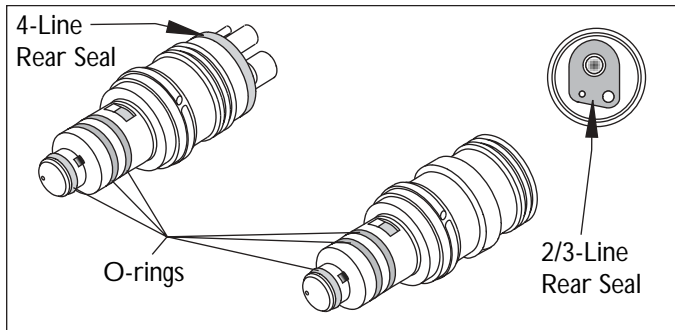
When O-rings became nicked or cracked through repeated use, replace the Output Shaft O-rings, with **Star**® Part #62900.

**Note:** Prior to use O-rings, apply a thin layer of **DentaLube**® II, **Star**® Part #62539



# Swivel O-Rings & Rear Seal Replacement

Periodically Replace 2/3-line or for 4-line with chip air, non fiber optic swivel O-Rings, **Star**® Part #63025, as shown.



Seals wear with repeated use. Once a year or as needed, replace the rear seal on the 2/3-line with **Star**® Part #3103, or on the 4-line with **Star**® Part #2897.

# Page 32 Replacement Part Nos.

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**Always insist on Star® Parts for best performance.**

Description	Item Number
<b>Titan® E Motor</b> .....	62905
<b>1:1 Contra Angle Autochuck Handpiece for Titan® E</b> .....	63017
<b>1:5 Contra Angle Autochuck Handpiece for Titan® E</b> .....	63016
<b>1:1 Contra Angle AutoLatch Handpiece for Titan® E</b> .....	63014
<b>4:1 Contra Angle AutoLatch Handpiece for Titan® E</b> .....	63015
<b>1:1 Straight Handpiece for Titan® E</b> .....	63018
<b>2/3-Line Swivel with Chip Air Non-Fiber Optic</b> .....	63000
<b>4-Line Swivel with Chip Air Non-Fiber Optic</b> .....	62881



# Replacement Part Nos. Page 33

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**Always insist on Star® Parts for best performance.**

Description	Item Number
Air Pressure Gauge for 2/3-Line .....	57492
Air Pressure Gauge for 4/6-Line .....	62539
2/3-Line Silicone Rear Seal (Pkg. of 2) .....	3103
4-Line Silicone Rear Seal (Pkg. of 2) .....	2897
O-Rings for 2/3- and 4-line Swivel w/chip air (3 Large, 2 Small) .....	63025
O-Rings, Motor <b>Titan® E</b> output shaft (2 pkg of 3) .....	62900
Cleaning Wire (Gauge: 0.008, Package of 2) .....	56719
<b>Handpiece Lubricant for Titan® E System</b> .....	63022
Lubricant Tip .....	63026