

Locking Pin Modifications for GRIP Prehensors

(LOCK PIN not included. Must be ordered separately.)

Consumers have requested that TRS provide some type of accessory that allows them to lock a GRIP prehensor for specialized tasks. Typically the locking of GRIP prehensors has been used for weight lifting and archery, or specialized tool control. The LOCKING PIN accessory was introduced to help provide a simple, effective, manual locking option.

The locking pin, when properly installed, prevents the thumb from rotating forward to the fully open position. A hole(s) is drilled through the outer plates of the prehensor in a location suitable for the holding task desired. Use a new, sharp #11 drill to create the hole. The outer plates are titanium or stainless steel. A separate storage hole may also be considered in the area of the wrist (See instructions included with Lock Pin accessory). Care must be taken when drilling such holes to not destroy any other components in the prehensor.

Consult with the user to determine what task the locking pin will solve. Fix the thumb in a position to accomplish the holding task desired and mark the location where the pin hole will be needed, i.e. a spot immediately in front of the lever arm section of the thumb. Drill the hole, compensating for pin's 3/16 inch diameter. Take the diameter into account when placing the hole to insure the proper position for the locking pin. More than three locking pin locations are not recommended, not including a storage hole.

⚠ TRS cannot recommend that these modifications be performed and a modified prehensor cannot be returned. Locking devices are inherently dangerous because they prevent a user from spontaneously "releasing" or "letting go". TRS cannot guarantee that the modifications described are reliable or that they are safe. Proceed with caution.

In-Line Hook to GRIP Adaptor

(Not included. Order adaptor separately.)

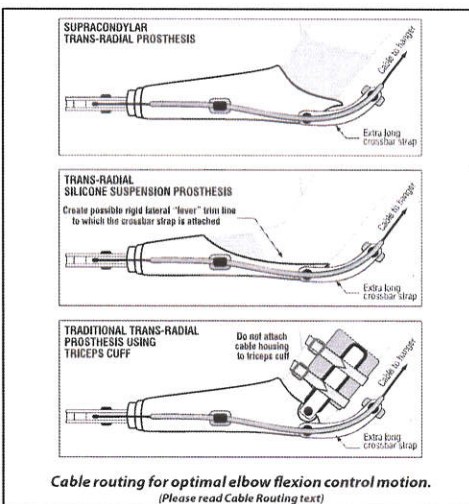
The TRS In-Line Hook to Grip Adaptor is provided to you with a standard triple swivel style grommet. This grommet was chosen to provide friction between the 3/16 inch diameter ball of the Adaptor and a GRIP prehensor. Connect the Hook to Grip Adaptor to the triple swivel on the cable using the 9/16 inch ball and standard grommet already on the triple swivel. The 9/16 inch ball will engage into the Hook to Grip Adaptor and prevent the Adaptor from becoming loose from the cable.

Cable Routing to Capture "Elbow Flexion" Control Motion

⚠ Important! Please read carefully and see illustration.

Optimal operation of all TRS voluntary closing prehensors and hands can be achieved by insuring that "Elbow-flexion" prosthetic motion control generates cable excursion pulling the thumb closed.

Typically, the prosthesis relies on humeral flexion and abduction and bilateral scapular abduction to generate cable excursion. Adding elbow flexion control via an extended crossbar strap, properly placed, will provide the user with another motion to generate cable excursion. This is especially important for prehensor operation at body midline, and eliminates the need for excess scapular abduction.



GRIP 25

Two Models: Titanium & Stainless Steel

Limited Warranty

Products manufactured by TRS, Inc. are covered by a written Limited Warranty for a period of one year from the date of purchase.

This Limited Warranty covers any defects in workmanship or materials by TRS, Inc. for the period stated, provided the product is used in a reasonable manner. The Limited Warranty is not applicable to normal wear and not applicable to spring or spring-like components. The Limited Warranty applies only to the end user/purchaser.

Any implied warranties, including merchantability, are also limited to one year from the date of the original TRS Invoice and any action must be commenced within that period. This Limited Warranty is void if the product is misused or abused, if unauthorized alterations are made, or if maintenance is neglected.

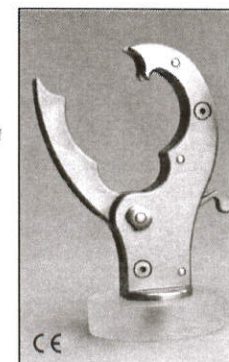
TRS, Inc. shall not be liable for any incidental or consequential damages, unless otherwise required by law. Some states do not allow the exclusion or limitation of incidental or consequential damages or the limitation on the period the implied warranty lasts so that the above limitation or exclusion may or may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

Product Serial #: _____

Training/Education Information

Voluntary Closing Prehensors and Hands

Comprehensive training with any prosthetic device is important to ensure your proper function and safety. Professional therapists can provide you with prosthetic training. Locate a Registered Occupational Therapist (OTR) or Registered Physical Therapist (RPT) with specific



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NOVEMBER 2012

experience in upper extremity prosthetic training to assist you in learning how to operate and excel with your prosthesis.

Responsibility and intelligent use are required to prevent injury to one's self or others using any prosthesis. Voluntary closing devices are pulled closed under cable tension. Activities which involve suspension, hanging or swinging by the arms automatically will cause the prehensor to close. The user must be strong enough to "lift or pull themselves up" to release tension on the cable and release the prehensor during such activities. This technique needs to be completely understood, practiced and mastered prior to unsupervised activities. High performance or more extreme physical activities, such as waterskiing, are never recommended with a body powered prosthesis if the user cannot "let go" or release spontaneously.

TRS has produced a training DVD Video designed to familiarize you with our technology. We encourage you to view **The Voluntary Closing Option**. The DVD Video illustrates efficient harness and cable system designs, as well as demonstrating the specifics of the arm and body prosthetic control motions required to successfully and safely operate TRS voluntary closing prehensors and hands.

TRS Product Restoration Services

TRS products require minimal maintenance. Certain moving parts and springs or spring-like parts will wear out and occasionally require replacement. TRS provides a very quick "turn-around" time on repairs. (24-72 hours max.) TRS Product Restoration Services are readily available, should you wish to have the factory maintain or repair your prosthetic device. Contact us for more information regarding these Restoration Services. 1-800-279-1865

General Maintenance Suggestions

Lubrication

Moving parts needing lubrication should be treated with a "light" spray oil like WD-40® or Tri-Flow®.



Do not use thick or viscous oils for lubrication. Wash with soap and water after lubrication to remove excess lubricants.

Cleaning

TRS products should be cleaned regularly. GRIP and ADEPT Prehensors and LITE TOUCH Bio-mechanical Hands, Super Sports and Free Flex Hands can and should be washed often. Daily cleansing with dish detergent is highly recommended. Steel wool soap pads are very useful for cleaning the rubber surfaces and removing grime and stains. Chlorine powdered cleansers applied with a sponge or brush are also useful for

this type of cleaning. Certain dyes, such as permanent marker, must be removed immediately from the rubber surfaces. Use a cleanser, soap pad or appropriate solvent. If left untouched, the dye will penetrate into the material permanently.

Coil Spring Replacement

Unscrew the two #10 fasteners and remove the "wrist" adaptor component and attached coil spring from the prehensor. The axle nuts may also need to be loosened to aid in the removal of the wrist adaptor. Pop the arms of the spring out of the channels in the wrist adaptor and discard the old or broken spring. Fit a new spring back into place with the spring arms fit properly into the appropriate holes and channels. Reinstall the wrist and spring simultaneously. Use constant pressure to hold the component in alignment as the #10 fasteners are replaced. TRS recommends using a "removable" type of thread adhesive on the fasteners prior to reassembly (Loctite® or similar). Tighten the #10 fasteners and the main axle nuts if they were loosened.

Thumb Alignment

The thumb of these prehensors rotates on a bushing and axle system. Spacer washers are used to align the thumb in the unit. The laminated construction and high strength materials used in these devices provide the prehensors with exceptional flexible strength. The units can absorb lateral forces without fracturing or bending the metal components. Some lateral shifting of the outer plates or minor deflection in the thumb can occur however. This can cause the tip of the thumb to mis-align. This is not a failure of the device or a significant problem. Realign the thumb by rapping the outer plate structure on the side *opposite* the interference. This should realign the thumb. If the unit has undergone a lot of use, the thumb itself might be loose or sloppy. Try tightening the axle nuts slightly to eliminate side to side play. If parts are worn, the GRIP might require new spacer washers, a new bearing and axle system or a general retuning. TRS can provide this service for you and ensure that your GRIP prehensor is in top condition. Contact us to discuss these Restoration Services. 1-800-279-1865.

Voluntary Closing Function

Optimizing with Trans-Humeral Prosthesis

GRIP, ADEPT, and LITE TOUCH products operate with a voluntary closing system. This system uses leverage generated around joints to create cable excursion to operate the terminal device.

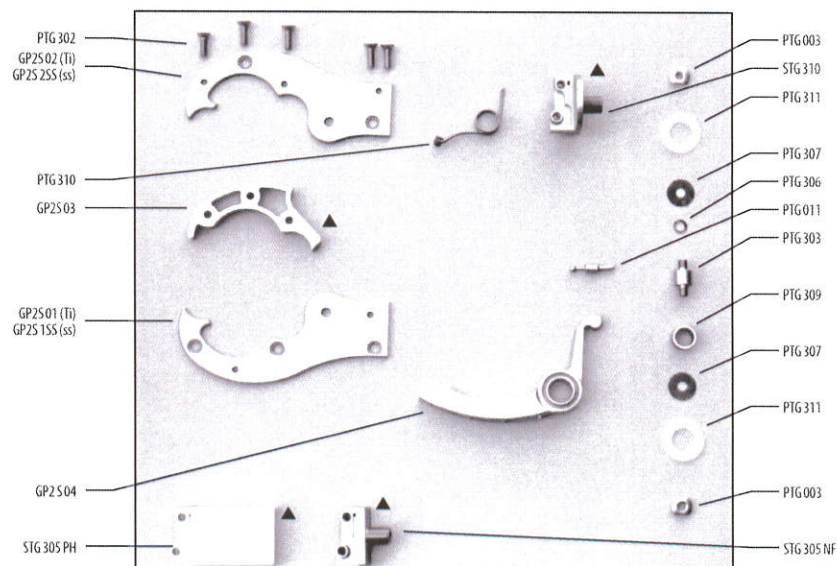
The trans-humeral patient is a candidate. Because no functional anatomical elbow exists, the user will be required to rely on motions other than elbow flexion to operate the prehensors. Focus should be placed on a highly efficient cable system, which allows for humeral flexion and abduction and bilateral scapular abduction to generate the cable excursion necessary to operate the prehensors. The higher

the level of the limb absence, the more difficult it will be for the user to generate the excursion necessary to use a voluntary closing system.

Attention to cable friction is important. Minimize cable friction. A single cable (dual control) design has proved functional with the cable providing both forearm "lift" and prehensor operation. Note however that in full forearm flexion, an acute angle is created in the

cable housing at the lift tab. The tight angle creates friction, which may impair the device's ability to operate easily.

TRS recommends using TRS Python standard stainless steel cable (1/16 inch diameter) or SPECTRA cable operating in an oversized (heavy duty) cable housing with a Teflon liner. Heavy duty cable is not recommended.



GRIP 2S Prehensor Parts

Part Name	Part Number
Right Outer Plate	1 GP2 501
Left Outer Plate	1 GP2 502
Aluminum Spacer	1 GP2 503
Stainless Thumb	1 GP2 504
Wrist Adapter	1 STG 310
Brass Bushing	1 PTG 309
Axle	1 PTG 303
Shaft Spacer Washer	1 PTG 306
Wear Washers	2 PTG 307

Part Name	Part Number
Polyethylene Hub Washers	2 PTG 311
Axle Nuts	2 PTG 003
# 10 Fasteners	5 PTG 302
Coil Spring	1 PTG 310
Triple Swivel * (1/16" cable)	1 PTG 011
No Flange Wrist	1 STG 305 NF
Partial Hand Wrist	1 STG 305 PH

1001

Cable Control System and Accessory Pack (not shown) are included with the product
* Triple Swivel for 1/16" cable (not shown), Part No. PTG 011, require special order.

▲Product serial number can be found here.

GRIP 3

completely. Let the adhesive cure fully before using the unit aggressively.

7. Check the hub area between the thumb sleeve and the unit to make sure there is no adhesive residue.

NOTE: Remember to call TRS for any questions or concerns regarding these instructions.

Polymer Index Component Replacement

In order to replace the Polymer Index Component, the GRIP 3 must be partially disassembled. Remove the Wrist Adaptor and Spring. (See Coil Spring Replacement Instructions) Next remove the Axle Nut on the unit's right side. Now remove the middle #10 fastener from the unit's left side, then lay the unit on it's left side. Remove the two remaining #10 fasteners from the right side. Lift off the right plate and then remove the Polymer Index Component.

Do not remove any of the washers or spacers from the axle.

Re-fit the new Polymer Index Component. Reinstall the outer plate using the #10 fasteners and the Axle Nut. Check the unit for proper thumb tip alignment. If you intend to replace the Bushing/Axle and Spacers in the GRIP then you may wish to request a copy of GRIP Bearing and Axle Cross-Section Diagram, which TRS can provide to you when you purchase these parts.

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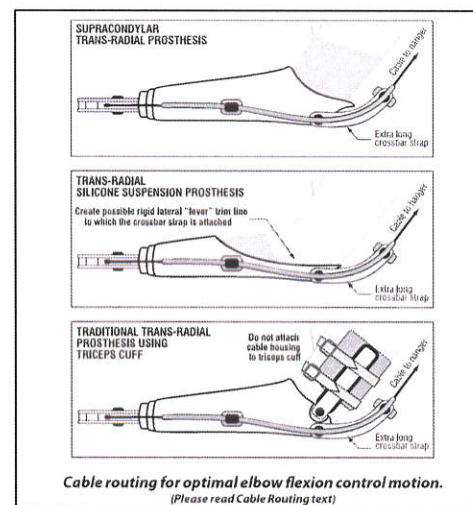
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Product Serial #: _____

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General Maintenance Suggestions

Lubrication

Moving parts needing lubrication should be treated with a "light" spray oil like WD-40® or Tri-Flow®.



Do not use thick or viscous oils for lubrication. Wash with soap and water after lubrication to remove excess lubricants.

Cleaning

TRS products should be cleaned regularly. GRIP and ADEPT Prehensors and LITE-TOUCH Bio-mechanical Hands, Super Sports and Free Flex Hands can and should be washed often. Daily cleansing with dish detergent is highly recommended. Steel wool soap pads are very useful for cleaning the rubber

surfaces and removing grime and stains. Chlorine powdered cleansers applied with a sponge or brush are also useful for this type of cleaning. Certain dyes, such as permanent marker, must be removed immediately from the rubber surfaces. Use a cleanser, soap pad or appropriate solvent. If left untouched, the dye will penetrate into the material permanently.

Coil Spring Replacement

Unscrew the two #10 fasteners and remove the "wrist" adaptor component and attached coil spring from the prehensor. The axle nuts may also need to be loosened to aid in the removal of the wrist adaptor. Pop the arms of the spring out of the channels in the wrist adaptor and discard the old or broken spring. Fit a new spring back into place with the spring arms fit properly into the appropriate holes and channels. Reinstall the wrist and spring simultaneously. Use constant pressure to hold the component in alignment as the #10 fasteners are replaced. TRS recommends using a "removable" type of thread adhesive on the fasteners prior to reassembly (Loctite® or similar). Tighten the #10 fasteners and the main axle nuts if they were loosened.

Thumb Alignment

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Thumb Sleeve Replacement

1. Cut off old thumb sleeve with a razor knife. Make slits down both sides of the thumb sleeve and then pry the rubber sleeve off the metal tang.

2. Clean the metal tang by scraping/sanding/using steel wool on any glue residue and wiping with a solvent (Acetone or MEK).



Do not get these solvents on any other rubber components.

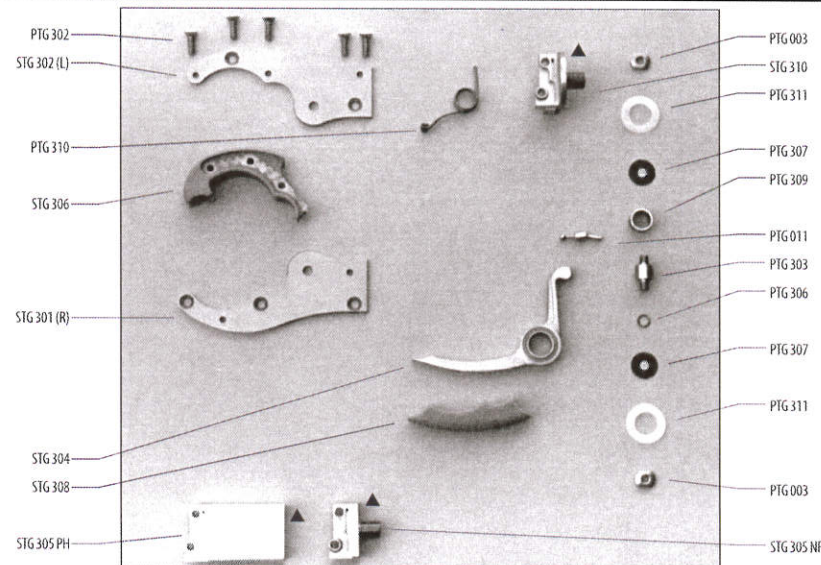
3. Trial fit the new thumb sleeve onto the metal tang. Make sure the sleeve fits on all the way. Check to insure that the thumb tip clears the index tips properly when the unit is fully closed. If there is interference, the thumb sleeve might not be on all the way. If the thumb sleeve will not go on all the way or if there is some other difficulty, please call TRS for additional help at 1-800-279-1865.

5. Prepare a small amount of urethane adhesive.



Do not use instant adhesives.

6. Apply a very small amount of adhesive to both sides of the tip of the metal tang and slide the thumb sleeve on



GRIP 3 Prehensor Parts

Part Name	Quantity	Part Number
Right Outer Plate	1	STG 301
Left Outer Plate	1	STG 302
Stainless Thumb	1	STG 304
Wrist Adaptor*	1	STG 310
Polymer Index Component	1	STG 306
Polymer Thumb Sleeve	1	STG 308
Brass Bushing	1	PTG 309
Axle	1	PTG 303

▲ Product serial number can be found here.

NOTE:
Cable (Cord System and Accessory Pack (not shown)) are included with the product.

Part Name	Quantity	Part Number
Shaft Spacer Washer	1	PTG 306
Wear Washers	2	PTG 307
Polyethylene Hub Washers	2	PTG 311
Axle Nuts	2	PTG 003
# 10 Fasteners	5	PTG 302
Coil Spring	1	PTG 310
Triple Swivel** (1/16" cable)	1	PTG 011
No Flange Wrist	1	STG 305 NF
Partial Hand Wrist	1	STG 305 PH

* Special wrist includes STG 305 PH (partial hand) and STG 305 NF (the flange for use with Flexon Wrist.)

** Triple swivel for 1/32" cable (not shown). Part No. PTG 012, requires special order.