ATTENTION DEALERS

1 Important Information on Tilt Actuator Warranty Claims:
Dealers must contact our Technical Service Department prior to installing a new/replacement tilt actuator. An authorization code will be provided Motion Concepts and must be recorded on the Warranty Claim Reimbursement Tag (incl. with the Tilt Actuator Replacement Kit) to be eligible for reimbursement.
Before You Start! - ⚠ Important!

Please be certain to read through this entire manual prior to proceeding with the installation. This manual provides the general installation procedure for a tilt and/or recline actuator. Please also reference the General TRx Set-Up Manual (provided separately). This manual contains additional information that is crucial for the proper installation, set-up, adjustment and safe operation of the seating system.

It is essential that you also take time to read the TRx Owner's Manual (provided separately). The owner's manual contains very important information related to the maintenance, safety and operation of our power positioning systems.

If you have any questions or concerns, please contact our Technical Service Department for assistance.

Safety Symbols:
Installing a TRx Power Positioning System safely depends upon your diligence in following the warnings, cautions and information provided in this Installation Manual.

The symbols below are used throughout all Motion Concepts' manuals to identify warnings, cautions and important notes. It is very important for you to read and understand them completely.

⚠ CAUTION! Failure to heed the cautions in this Manual may result in damage to your TRx Power Positioning System.

⚠ WARNING! Failure to heed the warnings in this manual may result in personal injury.

ℹ Important! Important information to remember when installing your TRx seating system.
Actuator Installation/ Replacement Instructions

Important!
Please read through this entire instruction manual before proceeding with any actuator installation.

I. Actuator Wiring

Please Note: Motion Concepts uses color coded a-mode connectors for the wiring of our actuators. The actuator motors are designed to operate in one of 2 methods (depending on the design of the seating system and the wiring of the actuator).

i) If an actuator is wired “positive over negative”, this will create a pushing action (the actuator barrel begins fully retracted and extends outward).

ii) If an actuator is wired “negative over positive”, this will create a pulling action (the actuator barrel begins fully extended and retracts inward).

Note: By separating the a-mode connectors and reversing the orientation of the individual connectors, the ‘push’ actuator can become a ‘pull’ actuator. The black a-mode connector will always be negative, and the colored a-mode connector will always be positive. See photos below illustrating the change from positive over negative to negative over positive.

II. Rod Ends

Rod ends are available in various lengths and are threaded into the end of the actuator barrel. Using the correct sized rod end is very important for the proper set-up and operation of the seating system. The actuator barrel length (also referred to as the stroke—e.g. 7” stroke) can also vary depending on the functional requirements of the actuator. Changing the rod end size can significantly alter the actuators functional range, and may not be recommended depending on the actuator’s location on the seating system (please contact our Technical Service Dept. prior to changing the rod end size). Minor set-up adjustments (i.e pre-tilt, back angle etc.) can be achieved by adjusting the thread depth of the rod end inside the barrel (see Important! note below). (Also refer to section V. Actuator Set-Up and Adjustment).

1. Before installing the rod end, ensure that the actuator barrel has been fully retracted or fully extended (depending on whether the actuator operates via a pushing or pulling action, respectively).

2. Thread the rod end into the actuator barrel leaving approximately 1/8”-1/4” of thread exposed. Minor adjustments can be made following installation. (note: ensure a minimum 1/2” of threads remains inside the barrel* -see image/note below)

Important!* - For safety purposes, the maximum exposed gap between the top of the actuator barrel and the bottom of the rod end is 5/16” (this will ensure that at least 1/2” of thread has penetrated into the actuator barrel). If a rod end adjustment is required beyond the max. 5/16” limit, a larger rod end will be needed. (Please contact Motion Concepts to request a longer rod-end).

The rear pivot assembly for our tilt and/or recline actuators is typically secured to the seating system via mounting tabs that are located on various pivot plates, mounting brackets or sub-frames (depending on the type of power positioning system on which it is being installed). Although the mounting location/orientation may vary, the assembly process is consistent for all actuators:

1. Insert nylon spacers (x2) between the actuator and the inside of the mounting tabs (one spacer per side).
2. Insert the shoulder bolt through the rear actuator pivot and nylon spacers. *(Note: where provided, place the lead washer onto the shoulder bolt prior to installing it).*
3. Install the outer washer(s) and secure* the assembly using a nyloc nut- refer to sample images below.

**WARNING! Do Not Overtighten** the rear actuator pivot assembly. The rear pivot should be fastened snugly between the mounting tabs, but it must remain able to pivot freely around the shoulder bolt (the nylon spacers must be able to spin freely after tightening).
Actuator Installation/ Replacement Instructions

IV. Rod End Pivot Assembly

**IMPORTANT!** - When installing/replacing a tilt actuator, the pre-tilt angle must be properly set-up prior to assembly and pinning of the actuator. Please refer to the Ultra-Low CGT Set-Up Instructions provided separately - TRD0252 (1° Pre-Tilt) or TRD0262 (0° Pre-Tilt).

The size and assembly location of the actuator rod end may vary depending on the type of power positioning system on which it is installed. However, as with the actuator rear pivot, the hardware and installation process remains very consistent for all rod end assemblies:

1. Ensure the brass bushing is in place inside the rod end.
2. Insert 2 nylon spacers between the rod end and the inside of the mounting tabs or brackets (1 spacer per side). *(Note: nylon spacers may vary in size (length) depending on the type of power positioning system. The spacers serve to ensure proper alignment of the actuator).*
3. Slide the shoulder bolt through the actuator rod end and nylon spacers. *(Note: where provided, place any lead washer(s) onto the shoulder bolt prior to installation).*
4. Install the outer washer(s) and secure* the assembly via a nyloc nut - refer to sample images below.

**WARNING! Do Not Overtighten** the rod end pivot assembly. The rod end should be fastened just enough to snug the bolt up against the mounting tabs. A small amount of play between the mounting tabs is recommended to allow self alignment of the actuator during operation.

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Rod End Assembly: Ultra-Low CG Tilt Actuator

Rod End Assembly: Ultra-Low Recline Actuator

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**Actuator Installation/ Replacement Instructions**

**V. Actuator Set-Up/ Adjustment**

**TILT ACTUATOR:**

The tilt actuator is placed under significant load due to its position and function on our seating systems. Before pinning a Tilt Actuator it is critical that the actuator is properly set-up/ adjusted so that there is zero load on the actuator motor when the actuator reaches its range limitations. To prevent damage to the actuator and/or seating system, the actuator motor must free-wheel or clutch* when the actuator barrel is fully extended and/or fully retracted. When set-up properly, the actuator motor will continue to free-wheel when it reaches its established range limits (very minimal motor noise). Conversely, if the actuator is not properly set-up, there are typically two ways in which the motor may react:

1. If the set-up is off significantly, the motor will stall after the actuator reaches full extension. This indicates that significant strain is being placed on the actuator motor as it attempts to push beyond an established limit. (i.e., significant motor noise / motor gears may seize due to the excess load).

2. If the set-up is slightly off, the actuator motor will continue to labor (audible motor noise/ strain) as it tries to push beyond the established limit. (i.e., the motor does not free-wheel as desired, and may eventually stall as the load builds up)

*Note: in order to test that the motor is ‘clutching’ correctly, the joystick or switch operating the actuator must remain activated after the seating system has reached the retracted and/or extended position.

For complete set-up instructions for an Ultra-Low CG Tilt Actuator, please refer to the appropriate Ultra-Low CGT Set-Up Instructions provided separately: TRD0252 (for 1° Pre-Tilt) or TRD0262 (for 0° Pre-Tilt).

Prior to pinning, measure the amperage draw of the tilt actuator (using a voltmeter) to verify that the actuator is set-up properly. Detailed instructions for measuring amperage draw are provided in TRD0251- Testing For Amperage Draw on a Tilt Actuator (provided separately). The target amperage draw for proper set-up should register between 1.9 amps and 2.3 amps.

**RECLINE ACTUATOR:**

Before pinning a Recline Actuator (see section VI. Pinning the Actuator) the actuator/ rod-end must be properly set-up/ adjusted to achieve the initial back angle.

**Important!** the initial back angle is measured relative to the seat frame. The recommended initial back angle is between 93°- 95°

**To adjust the recline actuator/ rod-end:**

1. With the actuator installed (not pinned) and the seating system placed in the full upright position, measure the current back angle along the back canes using an angle gauge.
2. Recline the seating system back approximately half-way through its recline cycle via the associated seat control switch (i.e.; push-button/ toggle/ joystick).
3. Begin returning the seat to its upright position and while continuing to activate the switch, hold and turn the actuator barrel clockwise to increase the back angle or counter-clockwise to decrease the back angle.
4. After the desired back angle has been established, cycle the recline actuator up and down several times and verify the back angle setting with the angle gauge.
5. With the final back angle set, ensure that there is sufficient rod-end thread inside the actuator barrel to proceed with pinning- see Important! note below.
6. For pinning instructions please refer to Section VI. Pinning the Actuator.

**Important!** - For safety purposes, the maximum exposed gap between the top of the actuator barrel and the bottom of the rod end is 5/16” (this will ensure that at least 1/2° of thread has penetrated into the actuator barrel). If a rod end adjustment is required beyond the max. 5/16” limit, a larger rod end will be needed. (Please contact Motion Concepts to request a longer rod-end).
VI. Pinning the Actuator

⚠️ WARNING! - All tilt and recline actuators must be pinned following set-up. This prevents the actuator barrel from unwinding and disengaging from the rod-end; Failure to comply with this warning may result in serious personal injury. All Motion Concepts tilt and recline actuator will be factory pinned, or supplied with a pin for installation by a trained technician.

Once the Recline or Tilt Actuator has been set-up as bearing in mind that the rod-end threads must extend at least 1/2" into the actuator barrel. (Note: minor adjustments to the rod end can alter the set-up angle by up to 2-3° depending on the system). If the desired initial angle can not be achieved through adjustment of the existing rod end, contact Motion Concepts and request a longer/shorter rod-end. Once the appropriate rod-end is installed and the actuator is properly set-up per Section V., the actuator can be pinned.

To pin the actuator, use the hole in the actuator barrel as a locator to drill a 1/8" hole through the rod-end. Knock the roll pin (1/8" diameter x 1 1/8" long) all the way into the hole so that it protrudes 1/16" on both sides.

⚠️ IMPORTANT! Once an actuator has been pinned, any subsequent/future adjustment to the initial angle or pre-tilt angle will require the rod to be re-pinned*. Never adjust the pre-tilt angle of a seating system without re-pinning the actuator.

⚠️ Warning!* Never use a rod end with more than two holes drilled into it (including the hole being pinned). Make sure that the secondary hole is drilled at a sufficiently different orientation on the rod-end so as to provide proper and complete pinning, and not compromise the strength of the rod-end.

If you have any questions or concerns when installing/ replacing an actuator please contact our Technical Service Department for assistance:

Canada: 800-680-4191
USA: 888-433-6818