

Computer Sports Medicine, Inc., (CSMi)

TEF MODULAR COMPONENT (TMC)

Assembly and Installation Manual for HUMAC NORM™ and CYBEX 6000 Testing & Rehabilitation Systems

WARNING

Assembly, Installation and Repair of the TEF Modular Component should be performed by qualified service personnel only.

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The CSMi HUMAC NORM™ and CYBEX NORM (also referred to as “NORM” in this document), TMC (also referred to as “Trunk Extension/Flexion Modular Component” and “TEF Modular Component” in this document) and CSMi 6000 and CYBEX 6000 (also referred to a “6000” in this document) Systems are designed to be operated with software that is installed at the time of shipment. Any additional software not authorized by CSMi, that is added to the factory installed program, is done at the user’s risk and may cause service problems not covered by the customer’s warranty.

The software used to operate either system is protected under copyright laws. Any use of the software other than its intended use with the 6000 or NORM Testing and Rehabilitation System is prohibited. Altering or tampering of the software in any manner constitutes an unwarranted use of the NORM system and immediately voids all warranties expressed or implied by CSMi. Additionally, such changes may render the device non-compliant with its’ regulated intended use. CSMi assumes no liability for damaged equipment or harm to any individual as a result of malfunction due to tampered software.

Trademark Note:

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IMPORTANT INFORMATION

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Terminology

The following names are used to refer to the Trunk Extension/Flexion Modular Component:

- Trunk Extension/Flexion Modular Component.
- TEF Modular Component.
- TMC.

The following names are used to refer to the NORM System.

- CYBEX NORM. – Instructions specific to the NORM as manufactured by CYBEX.
- HUMAC NORM. – Instructions specific to the NORM as manufactured by CSMi.
- NORM – Instructions which apply to either system.

The following names are used to refer to the 6000 System.

- CYBEX 6000. – Instructions specific to the 6000 as manufactured by CYBEX.
- HUMAC 6000. – Instructions specific to the 6000 as manufactured by CYBEX and upgraded to the CSMi HUMAC system.
- 6000 – Instructions which apply to either system.

Qualified Personnel Notice

WARNING: *The TMC System contains no user serviceable parts. Installation, Assembly and Repair of the TMC should only be performed by qualified service personnel.*

Classification Information

- The TMC is MET Labs Listed and CE Certified.
- The TMC has been classified for use in accordance with the following sections of the Standards for Medical Electrical Equipment:
 - IEC 60601-1 (1988), 'Medical Electrical Equipment, Part 1: General Requirements for Safety' + A1(91) + A2(95).
 - EN 60601-1 (1990), 'Medical Electrical Equipment, Part 1: General Requirements for Safety' + A1(93) + A2(95) UL 60601-1 (2003), 'Medical Electrical Equipment, Part 1: General Requirements for Safety'.
 - CAN/CSA C22.2 No 601.1-M90 (1990), 'Medical Electrical Equipment, Part 1: General Requirements for Safety'.
 - IEC 60601-1-1 (2000), 2nd Edition, 'Medical Electrical Equipment Part 1: General Requirements for Safety - Collateral Standard: Safety Requirements for Medical Electrical Systems'.
 - CB Scheme.

IMPORTANT INFORMATION

- The TMC System is rated as Class I, Type B as indicated by the  icon located on the Transformer box rating label.

Cleaning and Maintenance

CAUTION: Do not use Benzene, thinner, or any volatile substance to clean the unit as they may leave a permanent mark. Never leave the unit in contact with rubber or vinyl for an extended period.

- Mechanical parts which contact the patient that appear rusted or cannot be cleaned should be replaced.
- Clean/Sterilize removable mechanical parts only.

Upholstery: Use a cloth dampened with a mild household cleaner after each use.

Straps: The belts used on the TMC absorb large and repetitive loads. To ensure patient safety, it is important to check regularly for signs of wear. Any belt with significant wear should be immediately replaced. Keeping extra shin pads and stabilization belts on hand ensures timely replacement and avoids possible injury or downtime.

- The Calibration procedure should be run once per month to assure accurate measurements.
- The user is responsible for disposal of any TMC components per local regulations.

Assembly and Installation Notes

- The TMC System can be installed in any Ordinary Location.
- The system should be installed in such a way that the User is able to carry out the necessary cleaning, and where applicable the sterilization and disinfection measures as specified in this document.
- The system should be installed in such a way that the User is able to disconnect the system from the mains power if required to perform service or other procedures.
- Do not attempt to lift the TMC System.

IMPORTANT INFORMATION

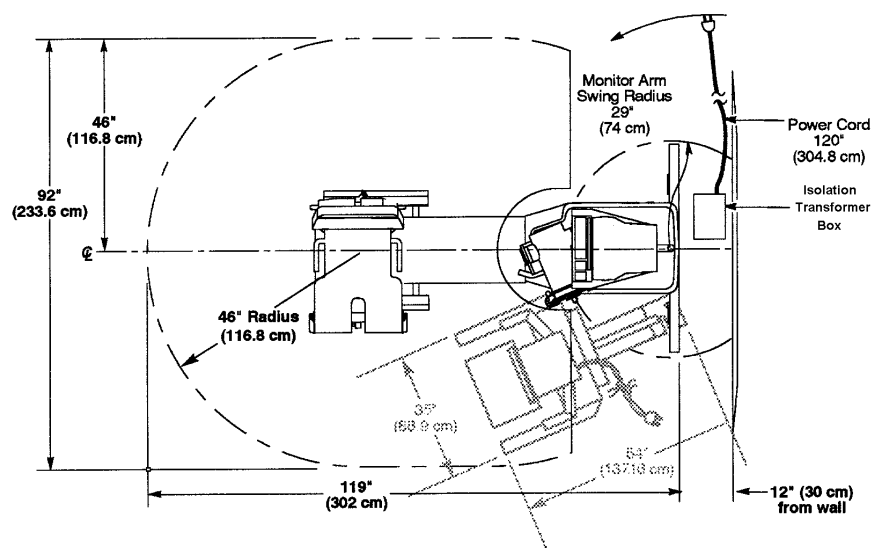


Figure 1-1 TMC Floorplan

Ratings

- The TMC System is not intended for use in the presence of flammable anesthetics.
- The TMC System is rated for Continuous Operation.
- Operating Temperature 10° Centigrade to 35° Centigrade.
- Storage Temperature -10° Centigrade to 55° Centigrade.
- Operating Relative Humidity 20% noncondensing to 80% noncondensing.
- Storage Relative Humidity 20% noncondensing to 80% noncondensing.
- Special cooling is not required for the operation of the TMC.

Note: It is not recommended that the TMC be changed in any way. If any changes are made, adherence to the CE standards becomes the owner's responsibility, if you have any questions, please contact the CSMi Customer Services Department at: (Voice) 781-297-2034 or (FAX) 781-297-2039 or (e-mail) service@csmisolutions.com.

Electrical Connections Notes



WARNING: To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth"

IMPORTANT INFORMATION

- The TMC can be wired for 100 VAC, 110 VAC or 220 VAC.
- The following ratings apply for 100 VAC:

100V ~
1Ø
50/60 Hz
3A

- The following ratings apply for 110 VAC:

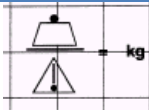
110V ~
1Ø
50/60 Hz
2.5A

- The following ratings apply for 220 VAC:

220V ~
1Ø
50/60 Hz
1.5A

- Any changes made to the transformer configuration must be done by a qualified technician.

Labels

Symbol	IEC Publication	Description
	417-5032	Alternating Current
	417-5019	Protective earth (ground)
	ISO15223-1:2012	Attention, consult accompanying documents
	417-...878-02-02	Type B applied part
	60601-2-38	Weight Limits on support parts
	ISO15223-1:2012	Operator should optionally refer to the accompany documents for additional advice.

IMPORTANT INFORMATION

Symbol	IEC Publication	Description
	60878	Operator must refer to the accompany documents for additional advice.
	2012/19/EU	WEES directive.
	ISO15223-1:2012	Temperature Limits
	ISO15223-1:2012	Humidity Limits
	ISO15223-1:2012	Pressure Limits
	ISO15223-1:2012	Manufacturer
	ISO15223-1:2012	Manufacture Date
	ISO15223-1:2012	Authorized Representative
	ISO15223-1:2012	Serial Number
	ISO15223-1:2012	Model Number

Additional Notes/Warnings

Symbol	Definition
	The user is responsible for disposal of the system in compliance with local regulations.

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SECTION 1. INTRODUCTION

INTRODUCTION

The TEF Modular Component is designed to test and rehabilitate the trunk musculature involved in daily lifting, carrying and reaching, as well as posture and movement. Upon docking, the unit becomes an integral part of the CSMi Testing and Rehabilitation System.

The CSMi Applications software is used for all back testing and exercise sessions. Detailed information on using this software can be found in the User's Manual of the respective system.

To help the clinician quantify trunk strength deficits, the TEF Modular Component combines safe, totally accommodating resistance with comfortable, secure stabilization. Scapular and chest pads provide upper body stabilization and are the cushions against which the patient flexes and extends.

The lower body is completely stabilized in a slightly bent-knee position by tibial, popliteal and thigh pads, and a pelvic belt. Starting posture for testing and exercising is located at biomechanically-derived anatomical zero. This positioning and stabilization ensure safety, and can be accurately reproduced.

Before placing a patient on the TEF Modular Component, the clinician should make sure that it is securely docked to the Testing and Rehabilitation System and that no parts of the unit bind when the input arm assembly is manually moved through the range of motion. The clinician should also be familiar with the clinical aspects of back testing and exercising as well as the CSMi Application and patient set-up procedure.

INSTALLATION

Prior to installing the TEF Modular Component, read through this Assembly and Installation Manual to become familiar with the procedures. Read each procedure completely, and follow the steps in order.

The TEF Modular Component is designed to be used with either the CSMi NORM or the CYBEX 6000 Testing and Rehabilitation System. For those TEF units currently being used with a CYBEX 6000, an Interface Adapter Kit (P/N 7700K535) is available to convert it for use with a NORM System.

A Service and Parts manual is also available for the TEF Modular Component (P/N 200020). The manual outlines procedures for period maintenance, and provides a complete list of replacement parts and adapters. To order a copy of the manual, contact the Customer Service department.

If you encounter any difficulty with the installation procedure, have a problem with the unit or would like to order an Interface Adapter Kit call CSMi Customer Service at 781-297-2034

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SUGGESTED FLOOR PLAN FOR THE CSMi NORM SYSTEM

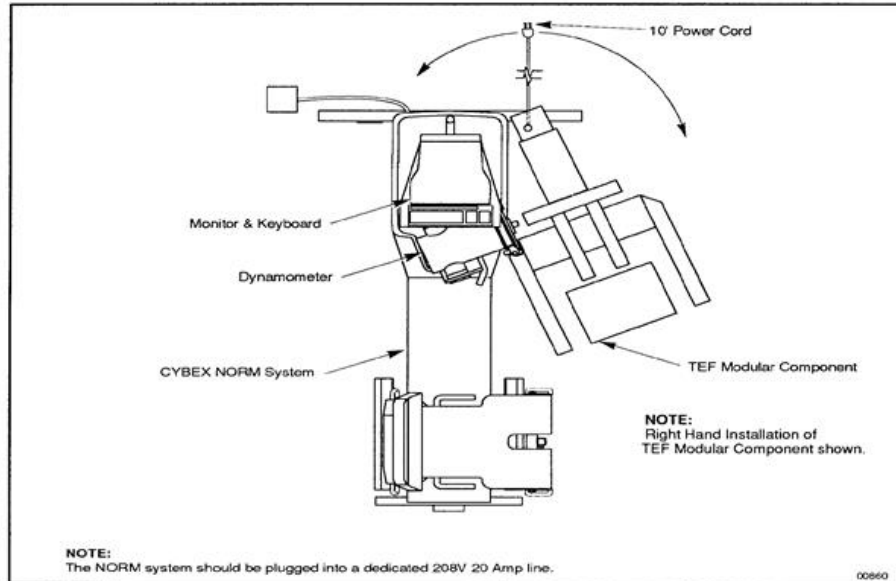


Figure 1-1 Suggested CSMi NORM Floor Plan with TEF Modular Component Installed

Notes:

- The TEF Modular Component can be positioned on either the left or right side of the NORM Testing and Rehabilitation System. (Shown on right side in above illustration.)
- See Appendix B for instructions when installing on left side of system.
- To adapt a TEF Modular Component that was previously used on a CYBEX 6000 System to the Norm System, order Interface Assembly Kit P/N 7700K535.
- To install the TEF Modular Component on a NORM System, refer to Section 3 of this manual.
- The TEF Modular component can be plugged into a wall outlet. (115V domestic, 100, 200 or 230V International.)
- The NORM System should be plugged into a dedicated 208V 20Amp line. Nothing else should be on this outlet. Check the line by locating its circuit breaker and turning it off. The NORM System should be the only unit in the facility without power.

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SUGGESTED FLOOR PLAN FOR THE CYBEX 6000

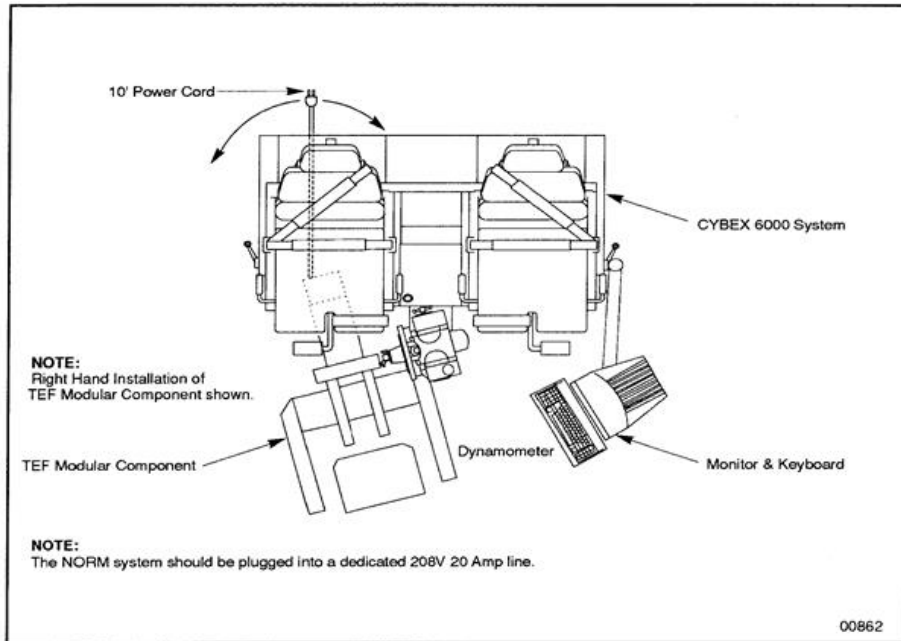


Figure 1-2 Suggested CYBEX 6000 Floor Plan with the TEF Modular Component Installed.

Notes:

- The TEF Modular Component can be positioned on either the left or right side of the CYBEX 6000 Testing and Rehabilitation System. (Shown on right side in above illustration.)
- See Appendix B for instructions when installing on left side of system.
- To install the TEF Modular Component on a CYBEX 6000 System, refer to SECTION 4. of this manual.
- The TEF Modular component can be plugged into a wall outlet. (115V domestic, 100, 200 or 230V International.)
- The CYBEX 6000 should be plugged into a dedicated 208V 20Amp line. Nothing else should be on this outlet. Check the line by locating its circuit breaker and turning it off. The CYBEX 6000 should be the only unit in the facility without power.

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PHYSICAL SPECIFICATIONS

- Doorway Opening Requirement: 30" (76 cm) MINIMUM (See Section 2)

Note: Domestically shipped TEF Modular Component units are not crated.

Domestic

- Assembled Dimensions: 54" L x 35" W x 70" H (137.2 cm x 88.9 cm x 177.8 cm)
- Shipping Weight: 500 lbs. (225 kg.)

International

- Shipped Dimensions (crated): 57" L x 40" W x 70" H (144.8 cm x 101.6 cm x 177.8 cm)
- Shipping Weight: 685 lbs. (308.3 kg.)

Note: Number of Containers: 1 each Volume of Shipping Container: 92.4 cu. ft. (2.8 cu. m.)

- Recommended Minimum Installation Area: (See Figure 1-3)

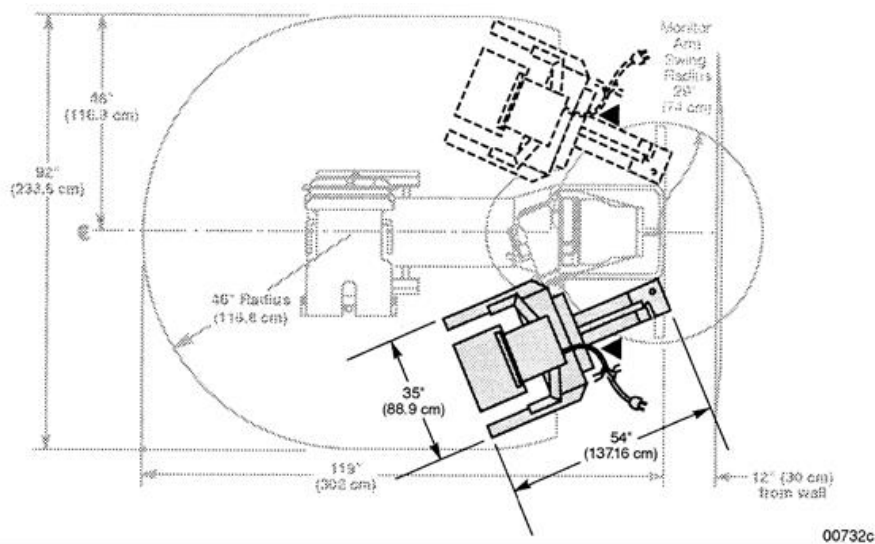


Figure 1-3 CSMi NORM / TEF Modular Component Minimum Floor Space.

Additional Installation Notes

- To determine which side to mount the TEF Modular Component on, sit in the patient chair facing the dynamometer. Your right side would be a right mounted unit, your left side a left mounted unit. If it is necessary to change the mounting orientation of the

TEF Modular Component, refer to *Appendix B: Installation Re-configuration*.

- The wall outlet for the TEF Modular Component should be located within a 10 radius of the point indicated by the symbol ◀ in Figure 1-3.

SECTION 2. DELIVERY DELIVERY THROUGH NARROW DOORWAYS

The TEF Modular Component is designed to fit through standard size doorways within a facility. (Refer to Figure 1-3 for dimensions.) If your facility doorway is smaller, use the following procedure to remove the Rear Strut Assembly from the TEF Modular Component.

Tools Required For This Procedure

- 9/16" wrench
- Screwdriver
- Loctite® 242

HOW TO REMOVE THE REAR STRUT ASSEMBLY

1. Remove all shipping and banding materials from the TEF Modular Component.
2. Locate the four screw caps, two at the top and two at the bottom, on the rear strut. See Figure 2-2.
3. With a small screwdriver, carefully pry off the four screw caps so as not to damage them.
4. With a 9/16" wrench, remove the four hex head screws securing the rear strut.
5. With the rear strut removed, maneuver the TEF Modular Component through facility doorway.

NOTE

The hardware removed during delivery must be reinstalled in its original location. Failure to do so can result in damage and improper operation of the unit.

6. Apply Loctite 242 to the two **short** screw threads. Reinstall the screws with screw

cap washers through the **bottom** of the strut. Tighten with a 9/16" wrench.

7. Loctite 242 to the two long screw threads. Reinstall the screws with screw cap washers through the top of the strut. Tighten with a 9/16" wrench.
8. Reinstall the four screw caps.

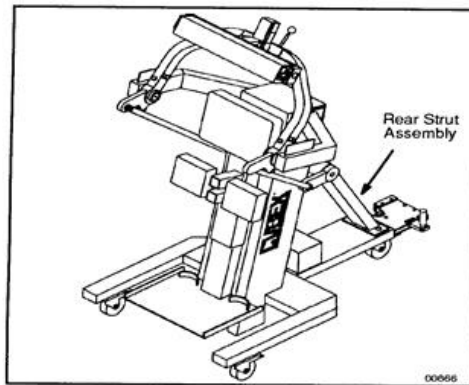


Figure 2-1 TEF Modular Component

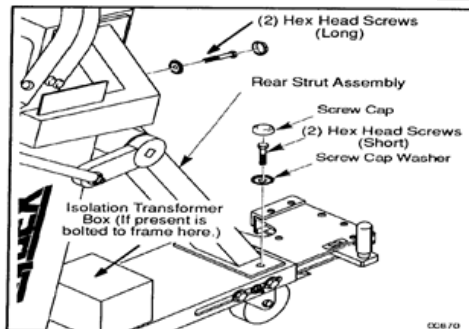


Figure 2-2 Rear Strut Assembly

DELIVERY

NOTES:



SECTION 3. NORM SYSTEM

INITIAL INSTALLATION

Installation is a three-step process involving:

1. attaching the docking post to the NORM system's rear support leg;
2. adjusting the TEF Modular Component's rear base extension, and;
3. performing a weight calibration.

INSTALLATION NOTE

To adapt the CYBEX 6000 TEF Modular Component for use with the NORM System, order Kit P/N 7700K535

Note: To change an existing installation from the right side to the left, refer to Appendix B.

Tools Required for Installation

- 1/2" Wrench
- 9/16" Wrench
- 7/32" Allen wrench
- Loctite® 242
- NORM User's Guide

HOW TO ASSEMBLE DOCKING POST PLATE

Perform this procedure only if the Docking Post Plate is not pre-assembled.

1. Apply Loctite 242 to the thread of a 3/8–16 socket flat HD screw.
2. Insert the screw through the Docking Pivot Plate and into the Pivot Shaft. Securely tighten with a 7/32" Allen wrench. Refer to Figure 3–1.
3. Repeat procedure for the second screw.

NOTE

The Rear Support Leg on the NORM System **MUST** be oriented as shown in Figure 3-1 with the welded plate facing in. If it is not, block up the electronics module and remove the leg. Remember to clean the screws and screw holes and apply Loctite 242 to the screw threads before re-using them. Re-install the Rear Support Leg in the proper orientation. Check that the NORM System is LEVEL before proceeding to Procedure #1.

1. HOW TO ATTACH THE DOCKING POST

1. Locate the two holes in the rear support leg of the CSMi NORM System (left or right side). These holes may have plastic plugs or screw caps covering them. Remove as necessary.
2. Slide a screw cap washer onto each of the hex head screws. Slide the screws through the slots in the docking post plate and docking spacer. (See Figure 3-1.)

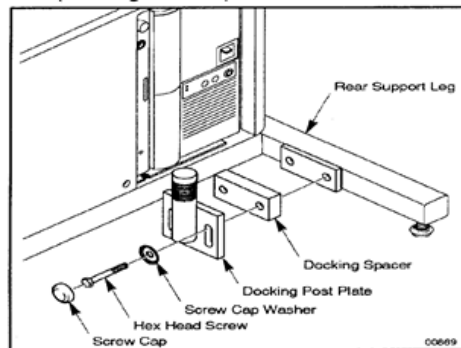


Figure 3-1 Docking Post.(Right Hand Installation Shown)

3. Position the docking post and spacer against the rear support leg, apply Loctite 242 to the screw threads and thread the screws into the rear support leg. *The screws should be installed finger tight.*
4. Position the docking post assembly so that the highest part of leg. The screws should be installed finger tight of the docking plate is even with the top edge of the rear support leg. With a 1/2" wrench, snug the two screws. *Do not fully tighten.*
5. Position the TEF Modular Component docking clamp (on rear base extension) next to the docking post. There should be an even amount of grooved area on the post above and below the clamp. Adjust plate up or down as needed. (See Figure 1-2.) With a 1/2" wrench, fully tighten the two hex head screws holding the docking plate and spacer to the rear support leg.
6. Install the two screw cap washers.

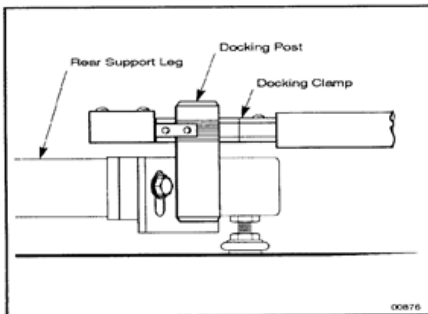


Figure 1-2 Docking Clamp and Post

7. Lock the TEF Modular Component onto the system by pushing against the unit until the docking clamp is fully engaged with the docking post. The teeth on the docking clamp must be fully engaged

with docking post. If they are not, use a wrench to loosen the lock-nut and tighten the adjusting screw until the teeth on the clamp engage the docking post. (See Figure 1-3.)

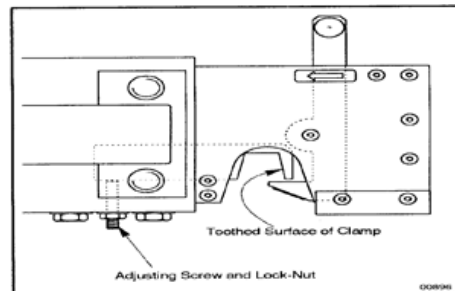


Figure 1-3 Top View, Docking Clamp and Post

2. HOW TO ADJUST THE REAR BASE EXTENSION

The TEF Modular Component is docked to the NORM system before adjusting the rear base extension.

1. Power up the NORM System. Access the Application's Dynamometer Control Window. Flip the Range of Motion Stops open.
2. Position the dynamometer input arm vertically so that the end with the locking knob and pull-button is pointing up. (See Figure 3-5.) Holding the input arm in that position, click the light pen on the Lock button on the screen.
3. With a 9/16" wrench, loosen the four hex head screws at the bottom along the sides on the rear base extension. (See Figure 3-4.)
4. Unlock the Dyna Pedestal Clamp and raise the dyna all the way up.

CAUTION

Carefully, using both hands, position the TEF Modular Component input arm assembly fully forward (full flexion).

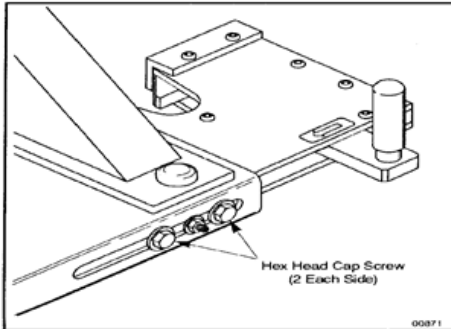


Figure 1-4 Rear Base Extension

Note: The TEF Modular Component docking adapter and the CSMi NORM System dynamometer input arm will require fore/aft alignment. Do not push down on the dynamometer at this time.

5. Rotate the dynamometer and TEF Modular Component toward each other until the dynamometer input arm is directly above the docking adapter. (See Figure 3–5).

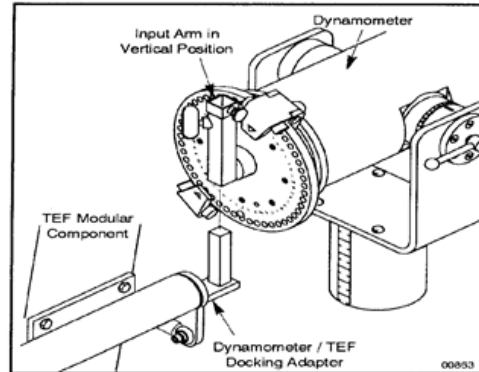


Figure 1-5 Input Arm and Adapter Alignment

TECH TIP

If necessary, slide the TEF unit fore/aft until the docking adapter is centrally aligned within the dynamometer input tube.

Look down, through the input adapter tube to align the input adapter on the TEF unit with the dynamometer input tube.

6. Hold the dynamometer input arm in position and click on the Lock button to unlock the dynamometer arm.
7. While holding the input arm vertically, slowly push down on the dynamometer. The TEF Modular Component docking adapter should slide into the dynamometer input arm. Adapter should be approximately 1/4" (~0.64cm) from top of arm when fully seated.

Note: If docking adapter and input arm cannot be joined, it will be necessary to realign the TEF Modular Component fore/aft position.

CAUTION

In the next two steps be sure to use only moderate hand pressure when pressing down on the dynamometer to slowly lower it onto the TEF Modular Component input adapter. Avoid exerting excessive force when pushing down. Keep dynamometer input arm vertical.

8. With the dynamometer as far down on the docking adapter as it can go, maintain hand pressure and finger tighten the input arm locking knob (do not fully tighten the knob yet). *Continue downward pressure through the next step.*
9. Fully tighten both dynamometer pedestal levers by pressing downward.
10. Rotate the TEF Modular Component input arm assembly to its full upright position against the rear stops (full extension). Fully tighten the input arm locking knob. (See Figure 3-6.)
11. With a 9/16" wrench, tighten the four hex head screws on the sides of the rear base extension. (See Figure 3-4.)
12. Move the TEF Modular Component input arm assembly through the range of motion several times. It should be free of any binding.

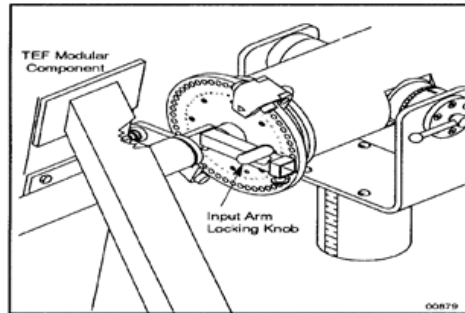


Figure 1-6 Dyna Input Arm with TEF Input Arm Assembly in Full Upright Position (Extension)

Note: The TEF Modular Component should not shift or move when its input arm is rotated through a full arc. If it does, the alignment is not proper. Undock and repeat the procedure beginning with Step #2.

13. Make sure all hardware is tight. Install the screw caps onto the screw cap washers.
14. Plug the power cord into the wall outlet. (See Appendix A for Electrical Requirements.)
15. Using the footplate switch, verify operation of the footplate motor.

3. HOW TO CALIBRATE THE TEF MODULAR COMPONENT

Note: The TEF Modular Component should be calibrated periodically to ensure the accuracy of the data collected.

The calibration procedure is a two phase process. During the first phase, the "input arm/ T-bar assembly" is dropped with no weight added to the T-bar, in the second drop, the T-bar has 100 lbs placed on it.

Parts Needed for Calibration

- **Calibration Weights** – Weights, totaling 75 lbs. are needed for the procedure.

NORM SYSTEM

The three 25-lb. weights provided with the NORM System are used for this purpose.

Note: The weights, which are included with the NORM, are certified by the Bureau of Standards.

- **Calibration T-Bar and Locking Knob** - The T-bar is locked onto the TEF Modular Component's input arm assembly during calibration and is used to hold the specified weight.

WARNING

Exercise caution whenever the T-bar is attached to the input arm assembly.

2. Stand in front of the chair facing the dynamometer. Your right hand corresponds to the right side, your left hand corresponds to the left side. The NORM power switch is located on the Left side of the enclosure.
3. From the **File** menu, select **Preferences**.
4. Select the **TMC Side**.
5. Click the **OK** button to save the preference.
6. On the **Utilities** menu, click **Calibration**.
7. From the **Calibration Menu**, click **Calibrate TMC**.
8. Setup the TMC for the calibration. **Note:** Click the box or press the space key after the TMC is setup is completed.

4. PHASE 1 CALIBRATION SETUP

1. Set the side of your machine on which the TMC is installed.

- ❑ Set the stops at White "O" and Teal "C".
Slide chair to end of monorail (position 75).
Set dynamometer tilt to position 0.
Rotate chair to position 90.
Attach TMC to docking hitch, lower dynamometer over TMC input adapter and mate with TMC. Input adapter should be flush with TMC adapter.

Move scapular pad as far down as possible and secure. (Chest pad should be removed)
Secure the Calibration T-Bar next to the scapular pad adjustment.
Move the Sacral/Seat pad to Position 7.

9. Position the reclining chair and dynamometer as indicated on the screen.
10. Dock the TEF Modular Component as indicated.
11. Prepare the TEF Modular Component.
 - Remove the chest pad and hang it on the chest pad storage bracket.
 - Loosen the scapular pad locking lever and move the scapular pad to its lowest position.
 - Tighten the scapular pad but leave its locking lever in a position where it will not interfere with the calibration T-bar's locking lever. See Figure 1-8.

- Notice the holes in the base of the T-bar. The inside of one hole is smooth while the other is threaded. Place the T-bar over the input arm assembly as close to the scapular pad adjustment channel as possible, with the threaded hole toward the front of the TEF Modular Component (the push buttons on the top of the T will be facing forward). See Figure 1-7.

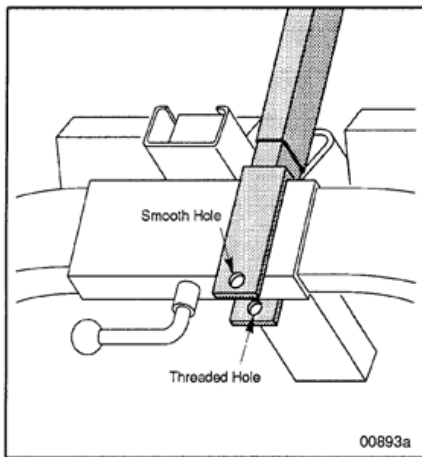


Figure 1-7 Calibration T-Bar Attachment

Note: When performing a calibration it does not matter if the T-bar is placed to the left or right of the scapular pad adjustment channel. However, it is recommended that the T-bar be consistently placed in the same position whenever a calibration or verification is performed.

- Insert the T-bar's locking lever through the first hole in the base of the T-bar and screw it into the second. See Figure 1-8.

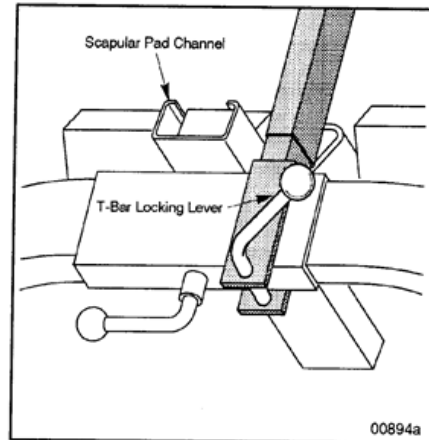


Figure 1-8 Calibration T-Bar Locking Lever

- Move the TEF Modular Component's input arm through its range of motion. Make sure there are no obstructions in the path of the input arm assembly as it should not be hindered during the data collection process. It should move freely within the range of motion indicated by the ROM stops.

4. PHASE 2 CALIBRATION DROP WITH NO WEIGHT

1. Raise the input adapter toward full extension until the arm locks into isometric mode. Click the box or press the space key to continue.

☐ Position the arm against the "O" stop.

2. Verify no weights are on the T-bar. Stand clear of the dyna input arm, and check the box. The T-bar will begin to fall and will pause near horizontal for a few seconds.

- ☐ Remove all weight from the input arm assembly. Keep clear of the input arm.

5. PHASE 3 CALIBRATION DROP WITH 75 POUNDS

1. When the first drop is completed, the following box will be enabled. Raise the input adapter toward full extension until the arm locks into isometric mode. Click the box or press the space key to continue.

- ☐ Position the arm against the "O" stop.

2. Carefully load 75 pounds onto the T-bar. Two 25-pound weights should be placed on one side of the T-bar. One 25-pound weight should be placed on the other side. Important: Stand clear of the TEF Modular Component and T-bar assembly when placing the weights on the T-bar. Do not stand below the T-bar. Check this box when the weights are loaded on the arm. The TMC will

begin the weight drop and will pause near horizontal for a few seconds.

- ☐ Load calibration T-bar with 75 pounds.
2-25 pound weights on one side.
1-25 pound weight on the other side.
Keep clear of the input arm.

3. When the second drop is completed, the following box will be enabled. Remove the weights from the T-bar and then check this box.

- ☐ Remove all weight from the input arm assembly.

Note: After performing a calibration, you should Verify the TMC Torque.

6. HOW TO VERIFY THE TEF MODULAR COMPONENT

1. From the **Calibration Menu**, click **Verify TMC**.
2. Setup the TMC for the calibration. Click the box or press the space key when the TMC is setup correctly.

- ☐ Set the stops at White "O" and Teal "C".
Slide chair to end of monorail (position 75).
Set dynamometer tilt to position 0.
Rotate chair to position 90.
Attach TMC to docking hitch, lower dynamometer over TMC input adapter and mate with TMC. Input adapter should be flush with TMC adapter.

Move scapular pad as far down as possible and secure. (Chest pad should be removed)
Secure the Calibration T-Bar next to the scapular pad adjustment.
Move the Sacral/Seat pad to Position 7.

7. PHASE 1 VERIFICATION DROP WITH NO WEIGHT

1. Raise the input adapter toward full extension until the arm locks into isometric mode. Click the box or press the space key to continue.

☐ Position the arm against the "0" stop.

2. Verify no weights are on the T-bar. Stand clear of the dyna input arm, and check the box. The T-bar will begin to fall and will pause near horizontal for a few seconds.

☐ Remove all weight from the input arm assembly. Keep clear of the input arm.

8. PHASE 2 VERIFICATION DROP WITH 75 POUNDS

1. When the first drop is completed, the following box will be enabled. Raise the input adapter toward full extension until the arm locks into isometric mode. Click the box or press the space key to continue.

☐ Position the arm against the "0" stop.

2. Carefully load 75 pounds onto the T-bar. Two 25-pound weights should be placed on one side of the T-bar. One 25-pound weight should be placed on the other side. Important Stand clear of the TEF Modular Component and T-bar assembly when placing the weights on the T-bar. Do not stand below the T-bar. Check this box when the weights are loaded on the arm. The TMC will begin the weight drop and will pause near horizontal for a few seconds.

☐ Load calibration T-bar with 75 pounds.
2-25 pound weights on one side.
1-25 pound weight on the other side.
Keep clear of the input arm.

3. When the second drop is completed, the following box will be enabled. Remove the weights from the T-bar and then check this box.

☐ Remove all weight from the input arm assembly.

3. The HUMAC will display the verification results.

Calibration Results			
Success			
Expected Value:	22.0	202.0	ft-lbs
Measured Value:	21.7	201.2	ft-lbs
Percent Error:	1.4	0.4	%
Percent Full Scale Error:	0.1	0.2	%



NORM SYSTEM

Note: *If the HUMAC reports Verification Error, you should repeat the calibration and verification procedures. If the HUMAC reports an error a second time, contact CSMi Technical Support.*

NORM SYSTEM

Note: The tension on the clocking handle clamp is factory set but may be adjusted. To adjust the tension, locate the set screw diagonally across from the handle and between the two rear base extension hex head screws.

With a 7/16" wrench, loosen the locknut. With a 1/8" Allen wrench, turn the set screw clockwise to increase tension or counterclockwise to decrease tension. When the desired tension is

obtained, hold the set screw and tighten the locknut.

9. HOW TO SHUT DOWN

1. From the HUMAC program, select **File, Exit**.
2. From the Windows Desktop, select **Start, Shut Down**.
3. Turn the NORM power switch OFF.

Installation Is Complete

SECTION 4. 6000 SYSTEM INITIAL INSTALLATION

Installation is a three step process involving:

1. attaching the docking post to the 6000 system's front support leg;
2. adjusting the TEF Modular Component's rear base extension, and;
3. performing a weight calibration.

Tools Required for Installation

- 1/2" Wrench
- 9/16" Wrench
- Loctite® 242
- 6000 User's Guide

1. HOW TO ATTACH THE DOCKING POST PLATE

1. Remove all shipping and banding materials from the TEF Modular Component.
2. Locate the two holes in the front base frame rail of the side of the CYBEX 6000 to which the TEF Modular Component will be mounted (opposite the monitor). These holes may have plastic plugs or screw caps covering them. Remove as necessary.
3. Slide a screw cap washer onto each of the hex head screws. (See Figure 4-1.) Slide one of the screws and screw cap washer through the slot in the docking post plate.
4. Hold the backing plate against the rear of the front base frame rail in line with the existing holes. Position the docking post plate against the front base frame rail. Apply Loctite 242 to the screw then, slide the screw through the base frame rail and thread it into the backing plate.

The screw should be installed finger tight only.

5. Install the remaining screw and screw cap washer into the backing plate of the base frame rail. *Tighten the screw finger tight.*

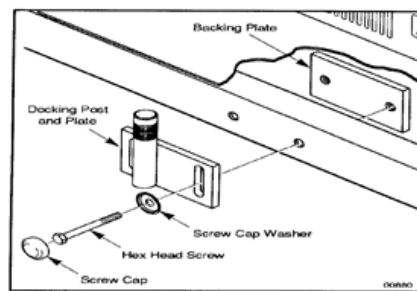


Figure 4-1 Docking Post Plate Installation

5. Position the docking post so that the plate is even with the top edge of the base frame rail. With a 1/2" wrench, snug the two screws so that the post is held in place but may be moved. (See Figure 4-2.)

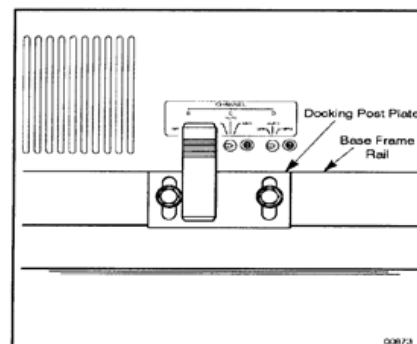


Figure 4-2 Docking Post Alignment

6. Make sure the contralateral limb stabilizer is in its up position and the seat is fully aft.
7. Position the TEF Modular Component docking clamp against the docking post. Position the plate so that there is an even amount of grooved area on the post above and below the clamp. (See Figure 4-3.) Adjust plate up or down as needed. With a 1/2" wrench, fully tighten the two hex head screws.

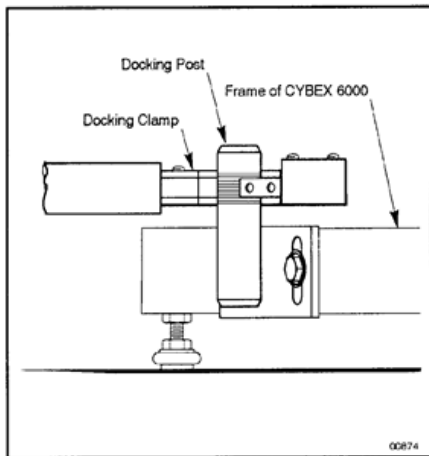


Figure 4-3 Docking Clamp and Post

8. Lock the TEF Modular Component onto the system by pushing against the unit until the clamping clamp is fully engaged with the docking post. The teeth on the clamping clamp must be fully engaged with docking post. If they are not, use a wrench to loosen the lock-nut and tighten the adjusting screw until the teeth on the clamp engage the docking post. (See Figure 4-4.)

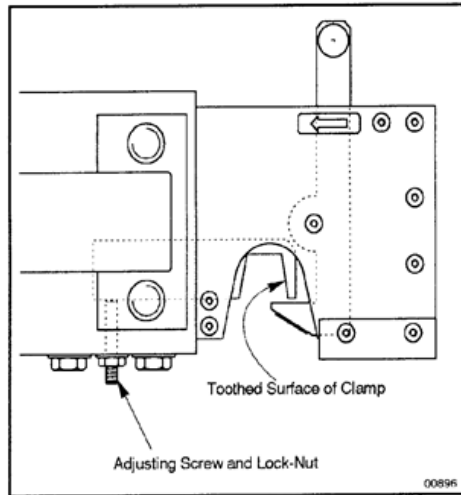


Figure 4-4 Top View, Docking Clamp and Post

2 HOW TO ADJUST THE REAR BASE EXTENSION

1. Power up the CYBEX 6000 and set it to Manual Mode. Set the dynamometer speed to 30°/sec. Move "O" Range of Motion Stop to 34 and secure. Move "X" Range of Motion Stop to 36 and secure.
2. Position the dynamometer input arm vertically so that the end with the locking knob and pullbutton is pointing up. Holding the dynamometer input arm in that position, return the dynamometer speed to 0°/sec.
3. With a 9/16" wrench, loosen the four hex head screws at the bottom along the sides on the rear base extension. (See Figure 4-5.)
4. Loosen the dynamometer pedestal and raise the dynamometer all the way up.

CAUTION

Carefully, using both hands, position the TEF Modular Component input arm assembly fully forward (full flexion).

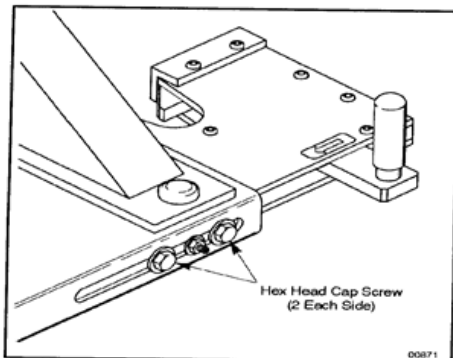


Figure 4-5 Rear Base Extension

Note: The TEF Modular Component docking adapter and the CYBEX 6000 dynamometer input arm will require fore/aft alignment. Do not push down on the dynamometer at this time.

5. Rotate the dynamometer towards the TEF Modular Component. Position both so that the dynamometer input arm is directly above the docking adapter. See Figure 4-6.
6. Slide the TEF Modular Component fore/aft until the input adapter is centrally aligned within the CYBEX 6000 dynamometer input arm.

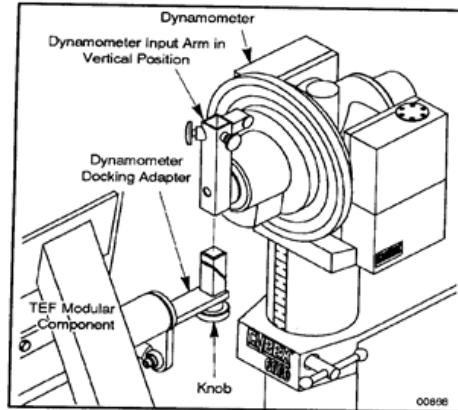


Figure 4-6 Input Arm and Adapter Alignment

TECH TIP

If necessary, slide the TEF unit fore/aft until the docking adapter is centrally aligned within the dynamometer input tube.

7. Hold the dynamometer input arm in position and set the dynamometer speed to 30°/sec.
8. While holding the input arm vertically, slowly push down on the dynamometer. The TEF Modular Component docking adapter should slide into the dynamometer input arm. (See Figure 4-6.)

Note: If docking adapter and input arm cannot be joined, it will be necessary to realign the TEF Modular Component fore/aft position.

CAUTION

In the next two steps be sure to use only moderate hand pressure when pressing down on the dynamometer to slowly lower it onto the TEF Modular Component input adapter. Avoid exerting excessive force when pushing down. Keep dynamometer input arm vertical.

9. With the dynamometer as far down as it can go, maintain hand pressure and finger tighten the docking adapter locking knob (do not fully tighten the knob yet). Continue downward pressure through the next step.
10. Fully tighten the dynamometer pedestal.
11. Rotate the TEF Modular Component input arm assembly to its full upright position against the rear stops (full extension). Fully tighten the docking adapter locking knob.
12. With a 9/16" wrench, tighten the four hex head screws. (See Figure 4–5.)
13. Move the TEF Modular Component input arm assembly through the range of motion several times. It should be free of any binding.

Note: The TEF Modular Component should not shift or move when its input arm is rotated through a full arc. If it does, the alignment is not proper. Undock and repeat the procedure beginning with Step #3.

14. Make sure all hardware is tight. Install the screw caps onto the screw cap washers.
15. Plug the power cord into the TEF Modular Component Interface Panel on the CYBEX 6000 or a wall outlet (units without TEF Modular Component

Interface Panel). (See Appendix A for Electrical Requirements.)

16. Using the footplate switch verify operation of the footplate motor.

3. HOW TO CALIBRATE THE TEF MODULAR COMPONENT

Note: The TEF Modular Component should be calibrated periodically to ensure the accuracy of the data collected.

The calibration procedure is a two-phase process. During the first phase, the "input arm/T-bar assembly" is dropped with no weight added to the T-bar, in the second drop, the T-bar has 75 lbs placed on it.

Parts Needed for Calibration

- **Calibration Weights** – Weights, totaling 75 lbs. (~34kg) are needed for the procedure. The three 25-lb. (~11.33kg) calibration weights provided with the NORM System are used for this purpose.

Note: The weights, which are included with the NORM, are certified by the Bureau of Standards.

- **Calibration T-Bar and Locking Knob** - The T-bar is locked onto the TEF Modular Component's input arm assembly during calibration and is used to hold the specified weight.

WARNING

Exercise caution whenever the T-bar is attached to the input arm assembly.

4. PHASE 1 CALIBRATION SETUP

1. Set the side of your machine on which the TMC is installed.
2. Stand in front of the 6000 facing the dynamometer. Your right hand

corresponds to the right side, your left hand corresponds to the left side.

3. From the **File** menu, select **Preferences**.
4. Select the **TMC Side**.
5. Click the **OK** button to save the preference.
6. On the **Utilities** menu, click **Calibration**.
7. From the **Calibration Menu**, click **Calibrate TMC**.
8. Setup the TMC for the calibration. **Note:** Click the box or press the space key after the TMC is setup is completed.

- ☐ Set the stops at White "O" and Teal "C".
- Slide chair to end of monorail (position 75).
- Set dynamometer tilt to position 0.
- Rotate chair to position 90.
- Attach TMC to docking hitch, lower dynamometer over TMC input adapter and mate with TMC. Input adapter should be flush with TMC adapter.
- Move scapular pad as far down as possible and secure. (Chest pad should be removed)
- Secure the Calibration T-Bar next to the scapular pad adjustment.
- Move the Sacral/Seat pad to Position 7.

9. Position the reclining chair and dynamometer as indicated on the screen.
10. Dock the TEF Modular Component as indicated.
11. Prepare the TEF Modular Component.
 - Remove the chest pad and hang it on the chest pad storage bracket.
 - Loosen the scapular pad locking lever and move the scapular pad to its lowest position.
 - Tighten the scapular pad but leave its locking lever in a position where it will not interfere with the calibration T-bar's locking lever. See Figure 1-8.
 - Notice the holes in the base of the T-bar. The inside of one hole is smooth while the other is threaded. Place the T-bar over the input arm assembly as close to the scapular pad adjustment channel as possible,

with the threaded hole toward the front of the TEF Modular Component (the push buttons on the top of the T will be facing forward). See Figure 1-7.

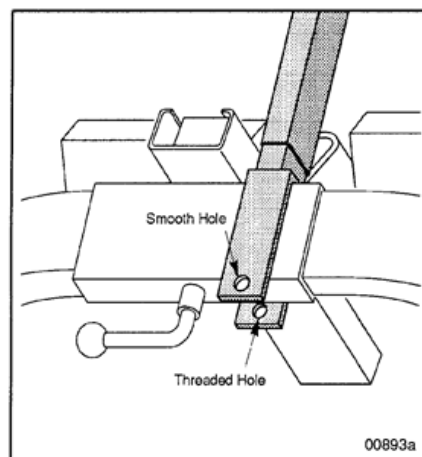


Figure 4-7 Calibration T-Bar Attachment

Note: When performing a calibration it does not matter if the T-bar is placed to the left or right of the scapular pad adjustment channel. However, it is recommended that the T-bar be consistently placed in the same position whenever a calibration or verification is performed.

- Insert the T-bar's locking lever through the first hole in the base of the T-bar and screw it into the second. See Figure 1-8.

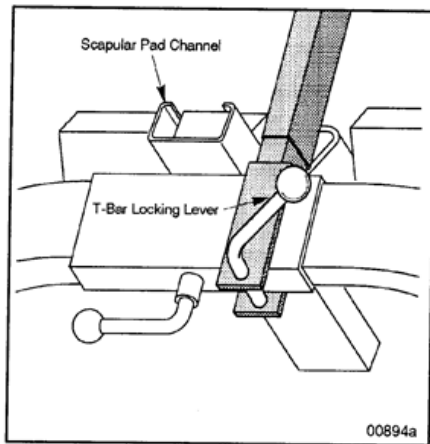


Figure 4-8 Calibration T-Bar Locking Lever

- Move the TEF Modular Component's input arm through its range of motion. Make sure there are no obstructions in the path of the input arm assembly as it should not be hindered during the data collection process. It should move freely within the range of motion indicated by the ROM stops.

4. PHASE 2 CALIBRATION DROP WITH NO WEIGHT

3. Raise the input adapter toward full extension until the arm locks into

isometric mode. Click the box or press the space key to continue.

☐ Position the arm against the "O" stop.

4. Verify no weights are on the T-bar. Stand clear of the dyna input arm, and check the box. The T-bar will begin to fall and will pause near horizontal for a few seconds.

☐ Remove all weight from the input arm assembly. Keep clear of the input arm.

5. PHASE 3 CALIBRATION DROP WITH 75 POUNDS

4. When the first drop is completed, the following box will be enabled. Raise the input adapter toward full extension until the arm locks into isometric mode. Click the box or press the space key to continue.

☐ Position the arm against the "O" stop.

5. Carefully load 75 pounds onto the T-bar. Two 25-pound weights should be placed on one side of the T-bar. One 25-pound weight should be placed on the other side. Important Stand clear of the TEF Modular Component and T-bar assembly when placing the weights on the T-bar. Do not stand below the T-bar. Check this box when the weights are loaded on the arm. The TMC will begin the weight drop and will pause near horizontal for a few seconds.

☐ Load calibration T-bar with 75 pounds.
2-25 pound weights on one side.
1-25 pound weight on the other side.
Keep clear of the input arm.

6. When the second drop is completed, the following box will be enabled. Remove the weights from the T-bar and then check this box.

☐ Remove all weight from the input arm assembly

Note: After performing a calibration, you should Verify the TMC Torque.

- ☐ Set the stops at White "O" and Teal "C".
 Slide chair to end of monorail (position 75).
 Set dynamometer tilt to position 0.
 Rotate chair to position 90.
 Attach TMC to docking hitch, lower dynamometer over TMC input adapter and mate with TMC. Input adapter should be flush with TMC adapter.
 Move scapular pad as far down as possible and secure. (Chest pad should be removed)
 Secure the Calibration T-Bar next to the scapular pad adjustment.
 Move the Sacral/Seat pad to Position 7.

7. PHASE 1 VERIFICATION DROP WITH NO WEIGHT

3. Raise the input adapter toward full extension until the arm locks into isometric mode. Click the box or press the space key to continue.

☐ Position the arm against the "O" stop.

4. Verify no weights are on the T-bar. Stand clear of the dyna input arm, and check the box. The T-bar will begin to fall and will pause near horizontal for a few seconds.

☐ Remove all weight from the input arm assembly
 Keep clear of the input arm.

6. HOW TO VERIFY THE TEF MODULAR COMPONENT

4. From the **Calibration Menu**, click **Verify TMC**.
5. Setup the TMC for the calibration. Click the box or press the space key when the TMC is setup correctly.

8. PHASE 2 VERIFICATION DROP WITH 75 POUNDS

4. When the first drop is completed, the following box will be enabled. Raise the input adapter toward full extension until the arm locks into isometric mode. Click the box or press the space key to continue.

☐ Position the arm against the "O" stop.

5. Carefully load 75 pounds onto the T-bar. Two 25-pound weights should be placed on one side of the T-bar. One 25-pound weight should be placed on the other side. Important Stand clear of the TEF Modular Component and T-bar assembly when placing the weights on the T-bar. Do not stand below the T-

bar. Check this box when the weights are loaded on the arm. The TMC will begin the weight drop and will pause near horizontal for a few seconds.

- ☐ Load calibration T-bar with 75 pounds.
2-25 pound weights on one side.
1-25 pound weight on the other side.
Keep clear of the input arm.

6. When the second drop is completed, the following box will be enabled. Remove the weights from the T-bar and then check this box.

- ☐ Remove all weight from the input arm assembly.

6. The HUMAC will display the verification results.

Calibration Results			
Success			
Expected Value:	22.0	202.0	ft-lbs
Measured Value:	21.7	201.2	ft-lbs
Percent Error:	1.4	0.4	%
Percent Full Scale Error:	0.1	0.2	%


OK

Note: If the HUMAC reports Verification Error, you should repeat the calibration and verification procedures. If the HUMAC reports an error a second time, contact CSMi Technical Support.

Note: The tension on the clocking handle clamp is factory set but may be adjusted. To adjust the tension, locate the set screw diagonally across from the handle and between the two rear base extension hex head screws.

With a 7/16" wrench, loosen the locknut. With a 1/8" Allen wrench, turn the set screw clockwise to increase tension or counterclockwise to decrease tension. When the desired tension is

obtained, hold the set screw and tighten the locknut.

9. HOW TO SHUT DOWN

1. From the HUMAC program, select **File, Exit**.
2. From the Windows Desktop, select **Start, Shut Down**.
3. Turn the 6000 power switches OFF.

Installation Is Complete

INPUT VOLTAGE SELECTION

APPENDIX A. INPUT VOLTAGE SELECTION

NOTE

Input Voltage Selection procedure must be done on all TEF Modular Component units shipped internationally. It is not required on units shipped within the USA.

INPUT VOLTAGE SELECTION FOR INTERNAL ISOLATION TRANSFORMER

Tools Required

- Digital Volt Meter (DVM)
- Phillips Screwdriver

CAUTION

***DO NOT** plug the TEF Modular Component into the wall outlet until **AFTER** you have checked the taps*

1. HOW TO CHECK THE VOLTAGE SELECTION

1. Set the DVM to the 250VAC range. Measure and record the line voltage at the outlet to be used during the typical time of day when the TEF Modular Component will be operating.
2. All units are factory wired for the input voltage specified by the customer or, if no voltage was specified, for the typical voltage of the destination country.

2. HOW TO RECONFIGURE THE TRANSFORMER

Note: Use this procedure to access and change the isolation transformer settings on TEF Modular Component units with an internal Isolation Transformer Box.

1. Use a Phillips screwdriver to remove the 10 pan-L screws from the isolation transformer cover.
2. The isolation transformer is mounted on a shelf mid-way up the back housing. It contains two rows of jumper connection points, one on either side.
3. Figure A-1 contains 8 TOP view, jumper configuration diagrams of the transformer. Find the correct diagram for the installation site.

CAUTION

The jumpers shown in Figure A-1 are indicated by a double line. Do not move the wires indicated with a solid line.

4. Move one jumper point at a time. Pull it straight up off the terminal, and push it firmly down on the destination terminal. See Figure 4-9.
5. Make sure the jumper connections are secure.
6. Replace the back cover.

ADDITIONAL NOTES

- It is the distributor's responsibility to remove the plug shipped with the system. A new plug end compatible with the customer's facilities is to be installed by the distributor.
- All internal ground wires are green with a yellow trace to meet European standards.

INPUT VOLTAGE SELECTION

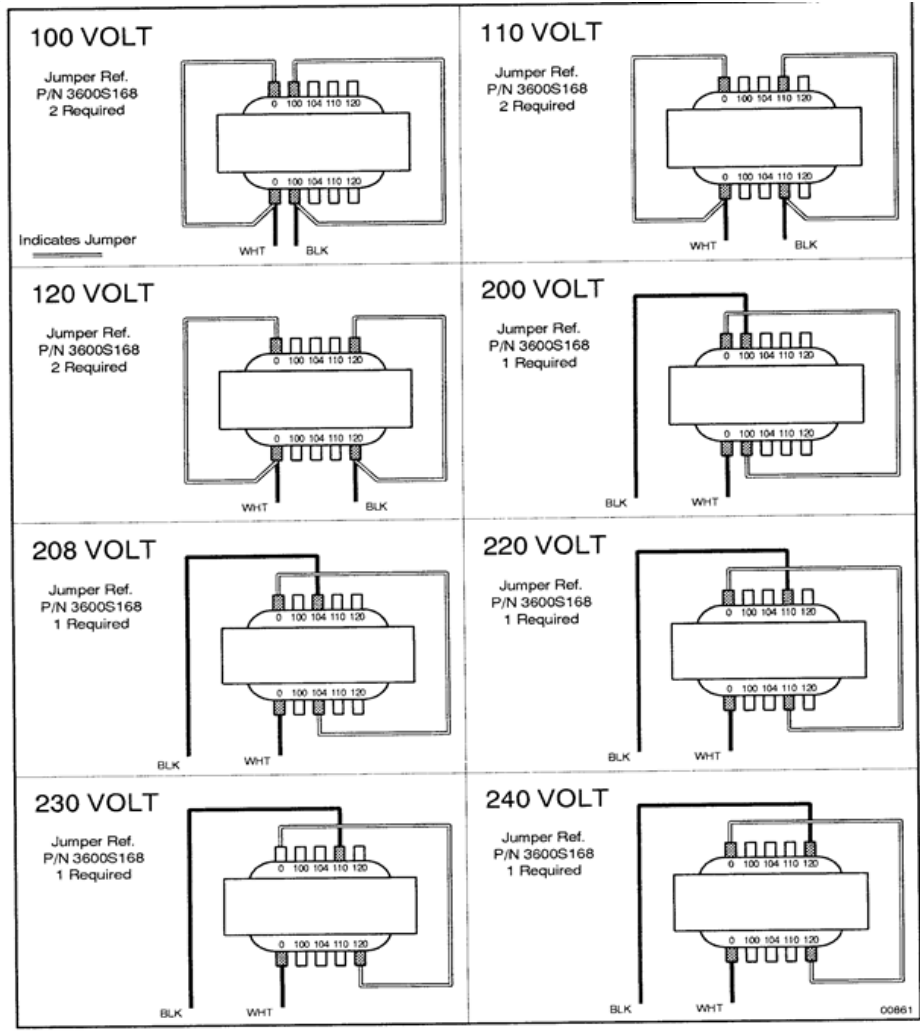


Figure 4-9 Isolation Transformer Voltage Diagrams. (Internal, Column Mounted)

Commented [RP1]: Update figure numbering for the Appendix.

INPUT VOLTAGE SELECTION

INPUT VOLTAGE SELECTION FOR EXTERNAL ISOLATION TRANSFORMER

Tools Required

- Screwdriver

CAUTION

DO NOT plug the TEF Modular Component into the wall outlet until **AFTER** you have checked the taps

1. HOW TO CHECK THE VOLTAGE SELECTION

1. Refer to Step 1 on Page A-1 to measure the wall outlet voltage.

2 HOW TO RECONFIGURE THE TRANSFORMER

Note: Use this procedure to access and change the isolation transformer settings on TEF Modular Component units with an external Isolation Transformer Box.

1. Use a screwdriver to remove the (10) 6-32 screws securing the Isolation Transformer Box cover.
2. The isolation transformer contains two rows of jumper connection points. Do NOT move the Black or White wires.
3. Figure 5-1 contains 3 wiring diagrams showing jumper configurations. Find the correct diagram for the installation site.
4. Move one jumper point at a time. Pull it straight up off the terminal and push it firmly down on the destination terminal. See Figure 5-1.
5. Make sure the jumper connections are secure.
6. Replace the Isolation Transformer Box cover.

Additional Notes

- It is the distributor's responsibility to remove the plug shipped with the system. A new plug end compatible with the customer's facilities is to be installed by the distributor.
- All internal ground wires are green with a yellow trace to meet European standard.

INPUT VOLTAGE SELECTION

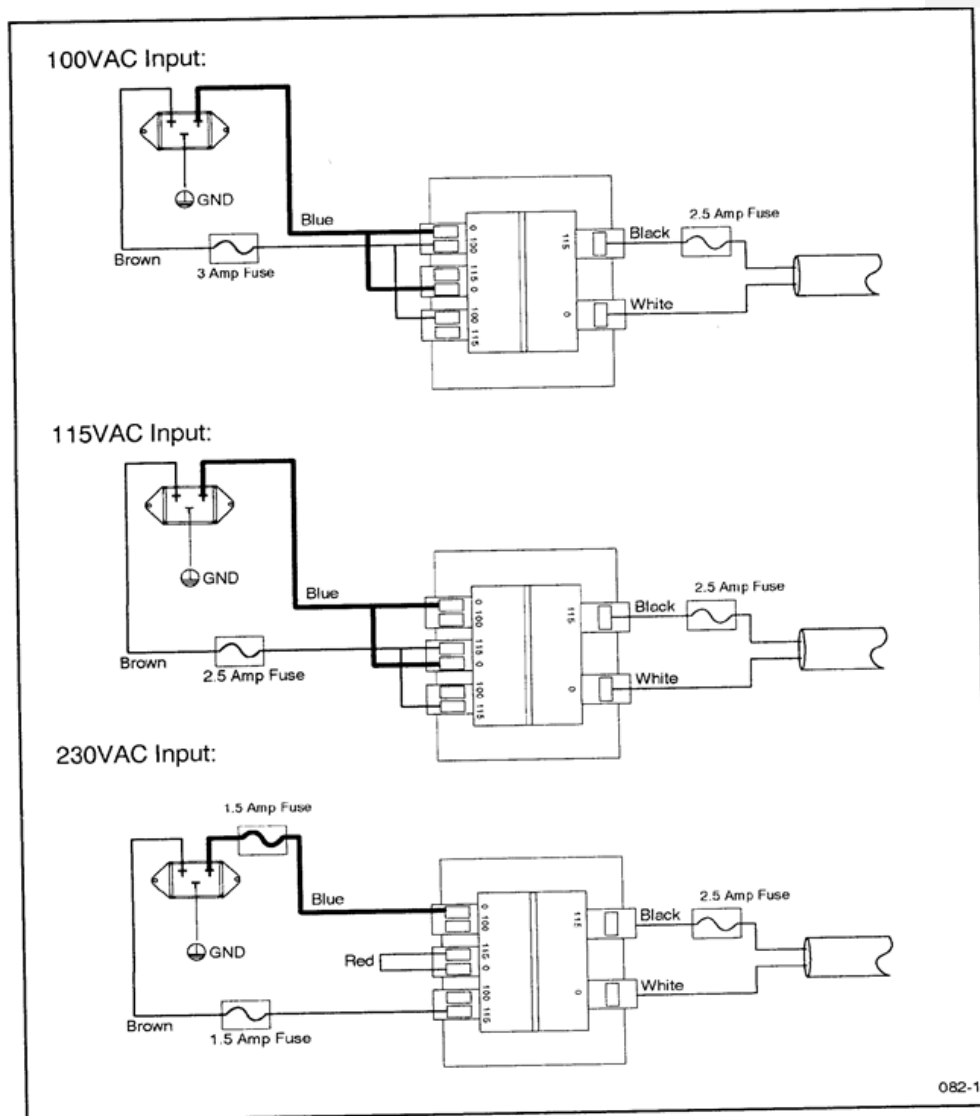


Figure 5-1 Isolation Transformer Voltage Diagrams. (External, Isolation Transformer Box.)

INSTALLATION RECONFIGURATION

APPENDIX B. INSTALLATION RECONFIGURATION

CONFIGURATION CONVERSION

The following procedure is used to reverse the Rear Base Extension (Docking Clamp) on the TEF Modular Component so that the unit can be docked on the opposite side of the 6000 or NORM system. *Follow instructions for applicable system.*

During the reconfiguration:

1. the rear base extension docking clamp is flipped;
2. the docking adapter is installed on the reverse side of the TEF Modular Component counter shaft;
3. the docking post plate is changed to the opposite side of the 6000 or NORM system;
4. the docking clamp is adjusted and
5. the TEF Modular Component is calibrated.

Tools Required

- 7/16" Wrench
- 1/2" Wrench
- 9/16" Wrench
- 1/8" Allen Wrench
- 3/16" Allen Wrench
- 7/32" Allen Wrench

1. HOW TO REVERSE THE DOCKING CLAMP

 NORM or 6000

Remove Rear Base Extension

1. With a 9/16" wrench remove the four hex head screws securing the docking hitch to the TEF Modular Component. (See Figure 5-2.)

2. With a 7/16" wrench, loosen the locking nut on the tension adjustment set screw in the docking hitch.
3. With a 1/8" Allen wrench, remove the set screw from the docking hitch.
4. Remove the docking hitch from the unit.
5. With a 1/2" wrench, remove the screw securing the docking hitch release handle.

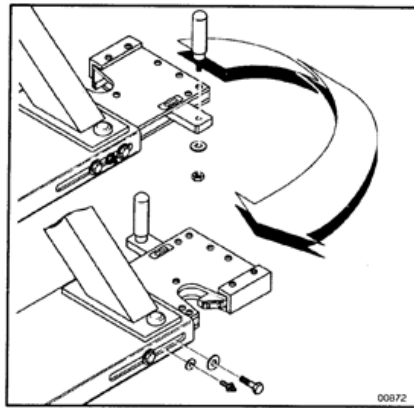


Figure 5-2 Rear Base Extension (Docking Clamp) Reversal.

Re-Attaching the Docking Clamp

Note: Remember to flip the rear base extension (Docking Clamp) over before proceeding. See Figure 5-2 for orientation.

1. Position the docking hitch release handle on the opposite side of the docking hitch release lever and reinstall the screw and lockwasher. Tighten with a 1/2" wrench.
2. With the release handle pointing up, reinstall the docking hitch into the rear of the unit.
3. Reinstall the four hex head screws removed earlier. Finger tighten only.

INSTALLATION RECONFIGURATION

4. Reinstall the set screw with locknut approximately halfway into the docking hitch. Finger tighten only. The set screw

2. HOW TO REVERSE THE DOCKING ADAPTER

 NORM or 6000

1. With a 3/16" Allen wrench, remove the flat head screw securing the end cap to the end of the countershaft. (See Figure 5-3.)

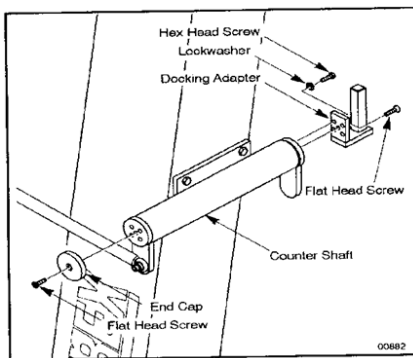


Figure 5-3 Docking Adapter Reversal.

2. With a 3/16" Allen wrench, remove the flat head screw securing the docking adapter to the end of the countershaft.
3. With a 9/16" wrench, remove the four hex head screws securing the docking adapter.
4. Assemble the docking adapter to the opposite end of the countershaft assembly with the hex head screws and lockwashers removed in the previous step. Install the flat head screw previously removed from the docking adapter and tighten with a 3/16" Allen wrench.
5. Assemble the end cap to the opposite end of the countershaft assembly with

will be adjusted at the time of installation.

the flat head screw originally used to secure it. Tighten with a 3/16" Allen wrench.

3. HOW TO REVERSE THE DOCKING POST

 NORM

When reversing the docking side on a NORM System, refer to the docking post attachment instructions within Section 3 of this manual. The peg on the docking post plate is centered on the plate, therefore, it doesn't matter if its left or right mounted. See Figure 5-4.

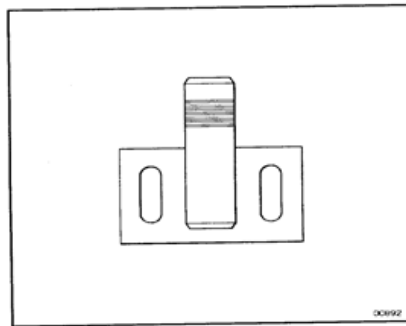


Figure 5-4 NORM Docking Post Plate.

Remove Existing Docking Post

 6000

Note: The following procedure is to be used when reversing the TEF Modular Component's docking side on a CYBEX 6000 System.

1. If the docking post is attached to the 6000 base frame, remove the screw caps and then with a 1/2" wrench, remove the hex head screws. Remove the docking post and backing plate.

INSTALLATION RECONFIGURATION

2. With a 7/32" Allen wrench remove the two flat head screws securing the docking post to its mounting plate. Rotate the docking post 180° and reinstall the two flat head screws. Tighten with a 7/32" Allen wrench.

Replace Docking Post on CYBEX 6000

Note: Hold the post vertically with the grooves towards the top. The long side of the mounting plate should point toward the dynamometer. Refer to Figure B-4.

1. Install Docking Post and plate as described in Section 4 of this manual.
2. Proceed with TEF Modular Component installation and calibration instructions for the applicable system.

4. HOW TO ADJUST THE DOCKING CLAMP TENSION

☞ NORM or 6000

1. Locate the set screw diagonally across from the handle and between the two screws securing the docking hitch.

2. With a 1/8" Allen wrench, set the release tension for the docking clamp by turning the set screw clockwise to increase tension or counterclockwise to decrease tension.
3. When the desired tension is obtained, hold the set screw with the Allen wrench and tighten the locknut with a 7/16" wrench.

5. RE-CALIBRATE

Re-calibrate the TEF Modular Component after reconfiguration.

☞ NORM

1. Refer to Section 3 of this manual to set the TMC Side and perform a weight calibration.

☞ 6000

1. Refer to Section 4 of this manual to set the TMC Side and perform a weight calibration.

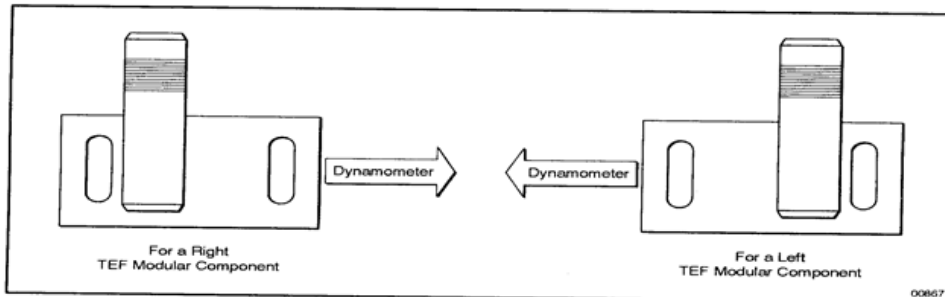


Figure 5-5 CYBEX 6000 Docking Post Plate Orientation.

INSTALLATION RECONFIGURATION



NOTES:

ELECTROMAGNETIC COMPATABILITY

APPENDIX C. ELECTROMAGNETIC COMPATIBILITY

GUIDANCE AND MANUFACTURER'S DECLARATION – EMISSIONS

Guidance and Manufacturer's Declaration – Electromagnetic Emissions			
The TMC is intended for use in the electromagnetic environment specified below. The customer or user of the TMC should ensure that it is used in such an environment.			
Emissions Test	Compliance	Electromagnetic Environment – Guidance	
RF Emissions CISPR 11	Group 1	The TMC uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.	
RF Emissions CISPR 11	Class A or B	B	
Harmonics IEC 61000-3-2	Class A,B,C,D or N/A	A	
Flicker IEC 61000-3-3	Complies or N/A	Complies	
	[See 6.8.3.201 a) 3) and Figure 201]	The TMC is suitable for use in all establishments, including domestic, and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.	
RF Emissions CISPR 14-1	Complies	The TMC is not suitable for interconnection with other equipment.	
RF Emissions CISPR 15	Complies	The TMC is not suitable for interconnection with other equipment.	

ELECTROMAGNETIC COMPATABILITY

GUIDANCE AND MANUFACTURER'S DECLARATION – IMMUNITY ALL EQUIPMENT AND SYSTEMS

Guidance and Manufacturer's Declaration – Electromagnetic Immunity				
The TMC is intended for use in the electromagnetic environment specified below. The customer or user of the TMC should ensure that it is used in such an environment.				
Immunity Test	EN/IEC Test Level	60601 Compliance Level	Electromagnetic Environment – Guidance	
ESD 61000-4-2	±6kV Contact ±8kV Air	As specified	Floors should be wood, concrete or ceramic tile. If floors are synthetic, the r/h should be at least 30%.	
EFT 61000-4-4	±2kV Mains ±1kV I/Os	As specified	Mains power quality should be that of a typical commercial or hospital environment.	
Surge 61000-4-5	±1kV Differential ±2kV Common	As specified	Mains power quality should be that of a typical commercial or hospital environment.	
Voltage Dips/Dropout EN/IEC 61000-4-11	>95% Dip for 0.5 Cycle	As specified	Mains power quality should be that of a typical commercial or hospital environment. If the user of the TMC expects dips as specified and requires continued operation during power mains interruptions, it is recommended that the TMC be powered from an uninterruptible power supply or battery.	
	60% Dip for 5 Cycles	As specified		
	30% Dip for 25 Cycles	As specified		
	>95% Dip for 5 seconds	As specified		
Power Frequency 50/60Hz EN/IEC 61000-4-8	3A/m	As specified	Power frequency magnetic fields should be that of a typical commercial or hospital environment.	

ELECTROMAGNETIC COMPATABILITY

GUIDANCE AND MANUFACTURER'S DECLARATION – EMISSIONS EQUIPMENT AND SYSTEMS THAT ARE NOT LIFE-SUPPORTING

Guidance and Manufacturer's Declaration – Electromagnetic Immunity				
The TMC is intended for use in the electromagnetic environment specified below. The customer or user of the TMC should ensure that it is used in such an environment.				
Immunity Test	EN/IEC Test Level	60601 Compliance Level	Electromagnetic Environment – Guidance	
Conducted RF EN/IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	(V1)Vrms	Portable and mobile communications equipment should be separated from the TMC by no less than the distances calculated/listed below: $D=(3.5/V1)(\text{Sqrt } P)$ 80 to 800 MHz $D=(3.5/E1)(\text{Sqrt } P)$ 800 MHz to 2.5 GHz where P is the max power in watts and D is the recommended separation distance in meters. Field strengths from fixed transmitters, as determined by an electromagnetic site survey, should be less than the compliance levels (V1 and E1). Interference may occur in the vicinity of equipment containing a transmitter.	
Radiated RF EN/IEC 61000-4-3	3V/m 80 MHz to 2.5 GHz	(E1)V/m		

ELECTROMAGNETIC COMPATABILITY

RECOMMENDED SEPARATION DISTANCES BETWEEN PORTABLE AND MOBILE RF COMMUNICATIONS EQUIPMENT AND THE TMC EQUIPMENT AND SYSTEMS THAT ARE NOT LIFE-SUPPORTING

Recommended Separations Distances for the TMC			
The TMC is intended for use in the electromagnetic environment in which radiated disturbances are controlled. The customer or user of the TMC can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF Communications Equipment and the TMC as recommended below, according to the maximum output power of the communications equipment.			
Max Output Power (Watts)	Separation (m) 150kHz to 80MHz $D=(3.5/V1)(\text{Sqrt } P)$	Separation (m) 80 to 800MHz $D=(3.5/E1)(\text{Sqrt } P)$	Separation (m) 800MHz to 2.5GHz $D=(7/E1)(\text{Sqrt } P)$
0.01	.1166	.1166	.2333
0.1	.3689	.3689	.7378
1	1.1666	1.1666	2.3333
10	3.6893	3.6893	7.3786
100	11.6666	11.6666	23.3333