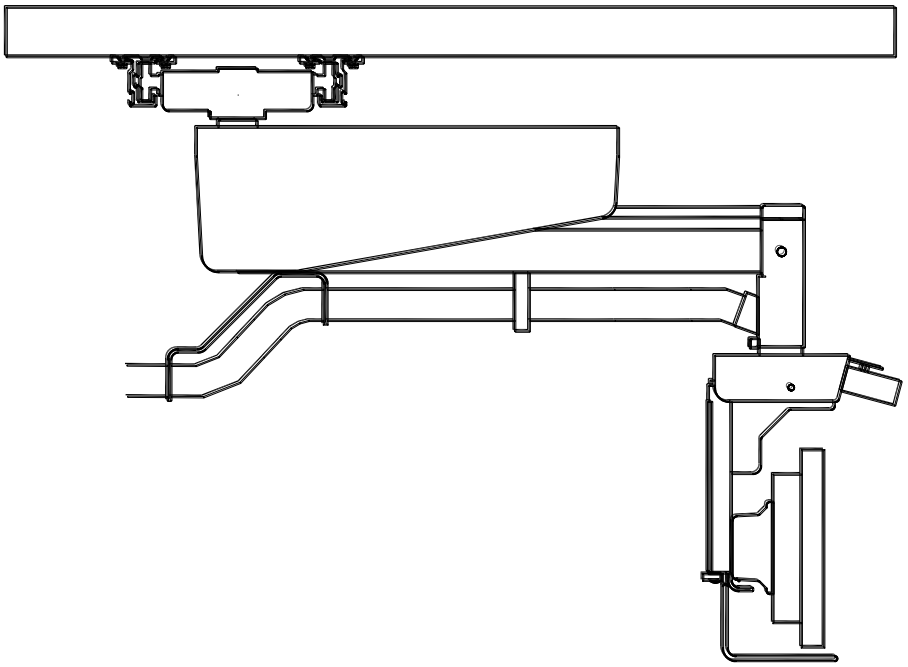
Image Diagnostics, Inc.

Manufacturer of Quality Medical Products

IDI 1000F Series Monitor Suspension System
Model IDI 1000F-1 thru 1000F-6
With Adapter to Shimadzu CH200



Installation and Maintenance Guide

The text of this manual was originally written, approved and published by the manufacturer in English.

The information in this manual is subject to change without notice.

Contents

A. INTRODUCTION

The IDI 1000F Flat Panel Suspension System transports monitors used in medical imaging procedures. The system features a counterbalanced arm with vertical travel and internal cable routing. A dual-axis flat panel monitor mount permits independent panel mounting and positioning.

PRODUCT DATA

Package Includes:

- Mobile gantry and counterbalanced swing arm with 42" sweep radius, 25" vertical travel and $\pm 180^{o}$ rotation.
- Anodized aluminum ceiling rails with *Easymount* clip system.
- Flat panel array with $\pm 180^{o}$ rotation.
- Array includes display panel mounts with $\pm 10^{o}$ tilt.
- Complete installation package; meter box mounts, all mounting hardware and cable management components; brackets, covers and 25' "flexhaust" hose.

OPERATION

The monitors are moved along the overhead rails, positioned vertically, and rotated manually using the handle.

B. SYMBOLS

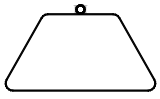
Consult accompanying documents.
Failure to follow these instructions can cause accidents resulting in serious injury to patient, user, and damage to equipment.

Warning!
Information or instructions shown near this symbol must be adhered to in order to prevent a potentially hazardous situation which if not avoided, could result in death, personal injury or damage to the equipment.

Electric Shock hazard.
Information or instructions shown near this symbol must be adhered to in order to prevent a potentially hazardous situation which if not avoided, could result in death, personal injury or damage to the equipment.

Protective Ground.
This is the common tie point between the AC monitor cord grounds, frame ground, and service (main) ground.

Alternating Current.



Weight Limit.

Recycle.
Some of the materials can be recycled rather than discarded.

C. GENERAL SAFETY

Attention, consult accompanying documents.
Failure to follow these instructions can cause accidents resulting in serious injury to patient, user, and damage to equipment.

Only qualified persons may install, operate or maintain this equipment.

Installation of this unit must adhere to applicable codes and authorities having any jurisdiction over this installation. The customer's architect or engineer is responsible for assuring that the structural support plans comply with all applicable codes and regulations.

The unit should be used only in rooms that comply with state, federal and local recommendations concerning electrical safety when used in medical installations. All electrical connections shall be done by licensed/approved electrician per national electric codes.

CAUTION:

- Always switch off mains before performing nonelectrical tests or maintenance.
- Many positions exist where equipment or patient collision may occur. Care must be exercised during equipment positioning to avoid a patient or equipment collision.

Changes and additions to the equipment may be performed only by an authorized representative. These changes must conform to regulations and accepted standards of good practice. To prevent defeat of the built-in safety mechanisms, changes must be submitted in writing to the manufacturer for review.

Use only parts specified by Image Diagnostics, Inc. when repairing or servicing this equipment.

This equipment is intended to only be used with Image Diagnostics, Inc. transverse rails.

D. SAFETY HAZARDS

Installers and Operators using this equipment should understand the safety issues and operating instructions provided.

Comments and questions regarding safety should be addressed to:

Customer Support
Image Diagnostics, Inc.
310 AUTHORITY DRIVE
FITCHBURG, MA 01420
USA

Or call IDI at (978)829-0009 or send fax to (978)829-0027
Or call Toll Free at (877)304-5434

SAFETY HAZARDS ALERTS

Alert	Circumstances for use
DANGER	Indicates an ***imminentl****y* hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a ***potentially*** hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a ***potentially*** hazardous situation which, if not avoided, may result in minor or moderate injury or equipment damage.

E. INSTALLATION

UNPACK

No special handling is required for unpacking this equipment at the site.
Conventional shipping materials are used.
Recycle or disposal of shipping material per local regulations

BUILD TRANSVERSE BRIDGE

Please note the X/Y ceiling carriage assembly consists of two rail adapter subassemblies, two bridge struts and two transverse rails. It is important to note the two adapters are not identical; the "guide" adapter can be identified by the spacer that positions the guide wheels out further. See Figure 1.

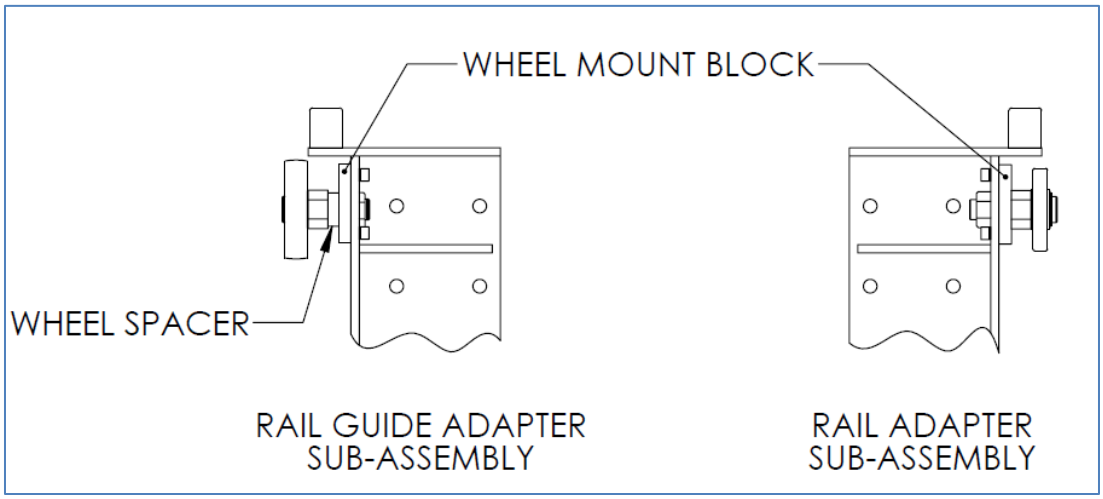


Figure 1

The bridge assembly can be accomplished in position on the Shimadzu supplied longitudinal rails on the ceiling (recommended) or on the floor and then end loaded into the longitudinal rails with a Hi-Jack if there is sufficient room between longitudinal rail ends and any walls or obstructions.

1. To assemble the bridge structure in place you must first load each adapter subassembly onto the left and right longitudinal rails. If you have sufficient space between the ends of the longitudinal rails and the wall you can simply roll each adapter into the rails.
2. If the adapters cannot be rolled into the longitudinal rails, you must loosen or remove the wheel mount blocks from the rail adapter sub-assemblies by removing their mounting hardware. See Figure 1.
3. Insert the wheel sub-assemblies into the cavities of the longitudinal rails.
4. Reattach the wheel sub-assemblies into the adapters and tighten wheel mount block hardware using Loctite #242 or equivalent.
5. Mount the two guide bar sub-assemblies to the guide rail adapter sub-assembly using four screws and locknuts as shown in Figure 2. Press white covers over all eight locknuts fastened onto the two guide bars.

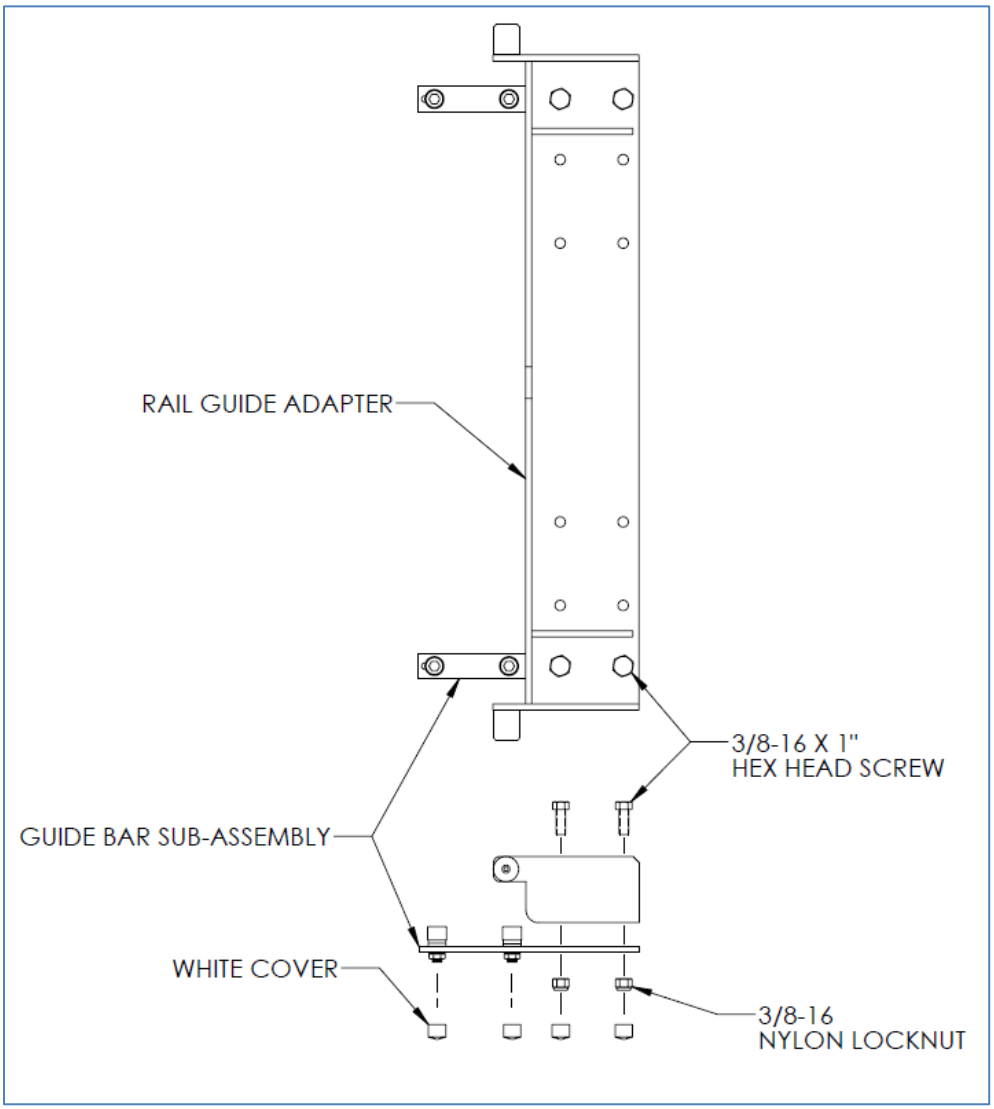


Figure 2

INSTALL BRIDGE STRUTS

1. Attach the two painted struts that make up the bridge between the rail adapter subassemblies using flathead screws and strut nuts as shown in the cut-away view at the bottom of Figure 3. Use Loctite #242 on screws. Snug up hardware to maintain required dimension and parallelism. Final tightening can be done after final adjustments.

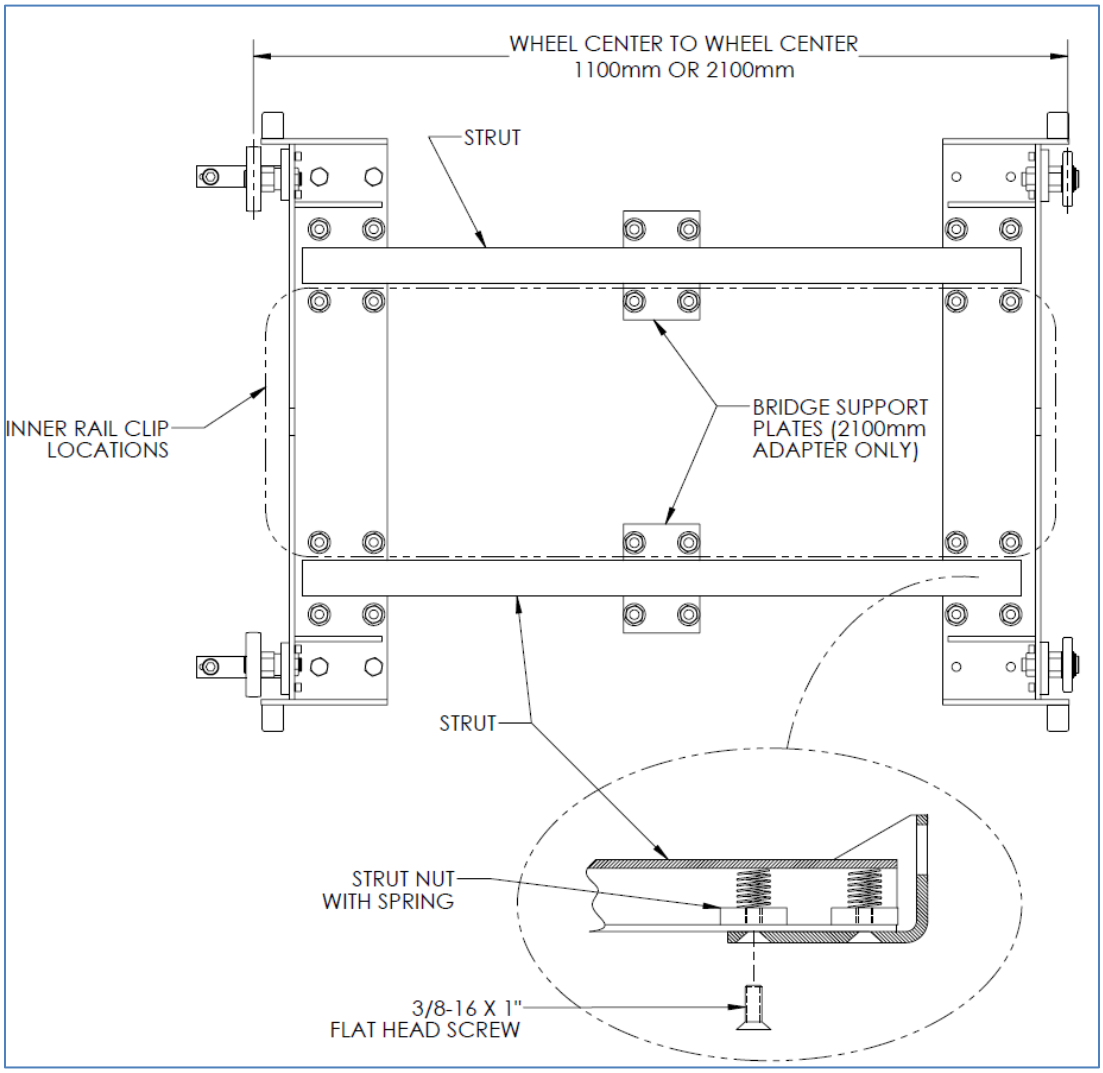


Figure 3

2. Check bridge assembly carefully for both parallelism between components and perpendicularity with the longitudinal rails. Verify the load bearing support wheels on both sides of the adapter run true and as close as possible to the center of the longitudinal rails.
3. <u>For the 2100mm adapters only</u>: Center the 2 bridge support plates underneath the struts and install
4. Once this check is complete tighten all flathead screws.

5. Loosely attach rail clips to the inner rail clip locations shown in Figure 3 on the rail adapter subassemblies with mounting hardware shown in Figure 4.

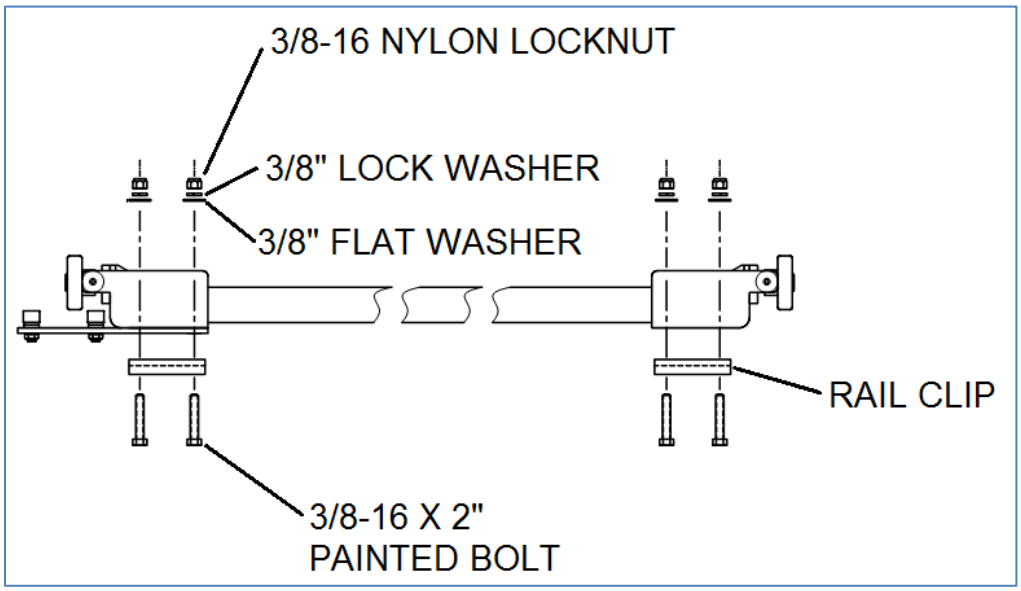


Figure 4

6. Place one transverse rail perpendicular to the rail adapter sub-assemblies and hold it in place. Install remaining rail clips over the outer edges of the transverse rail flanges. Lightly tighten hardware. Attach the second rail in the same manner.
7. Slide the transverse rails back and forth to center them under the rail adapter sub-assemblies and to align both ends. Make adjustments until the outside of the rails are spaced 17-1/8" (43.5cm) apart at both ends. See Figure 5. Tighten all hardware mounting the rail clips.

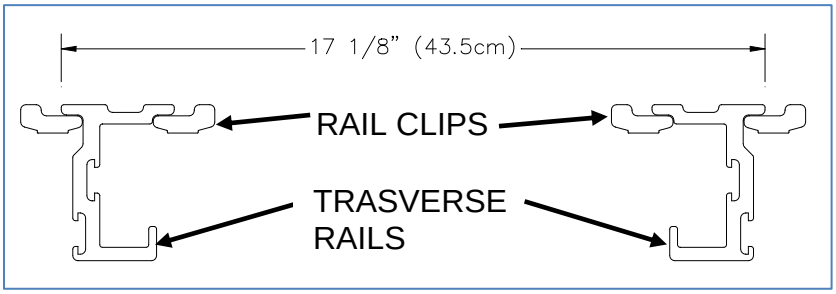


Figure 5

WARNING! **Failure to properly install this bridge system and securely attach all mounting hardware may result in serious injury to patient, user, and damage to equipment.**

INSTALL RAIL END PLATE

1. Install **only one** rail end plate at the far end of the rails, making sure rubber bumper faces in towards the transverse rails. See Figure 6. Use LOCTITE #242 on all threads. (The other rail end plate can only be installed after the cable handling hardware is installed.)

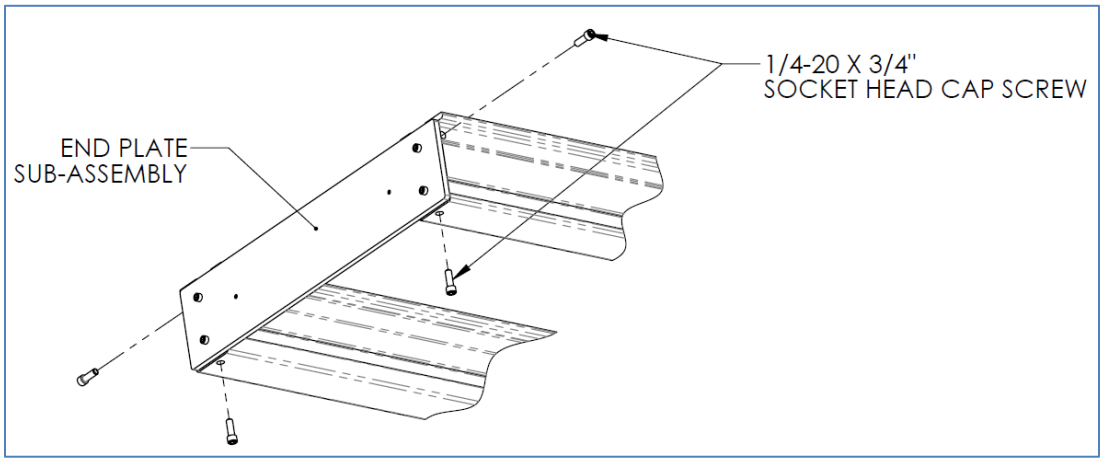


Figure 6

END-LOAD MONITOR MOUNT CARRIAGE

1. Remove shipping straps and packing material from carriage.
2. Using Hi-Jack or other suitable lift table, raise carriage (while it is still attached to pallet) up and slide its wheels into the open end of the transverse rails. ***Make sure all carriage wheels are engaged onto rails before lowering Hi-Jack.***
3. Remove pallet and shipping bars from support unit.
4. Install the second rail end plate on the open end of the transverse rails, making sure rubber bumper faces in towards the carriage. Use **LOCTITE #242** on all threads.

WARNING! **Failure to install both rail end plates may result in serious injury to user.**

INSTALL MONITOR MOUNT

NOTE TO INSTALLER: It is important that the load be balanced on the monitor mount. Take into account any differences in size and weight of the monitors. Refer to Figure 7 for steps 1-6.

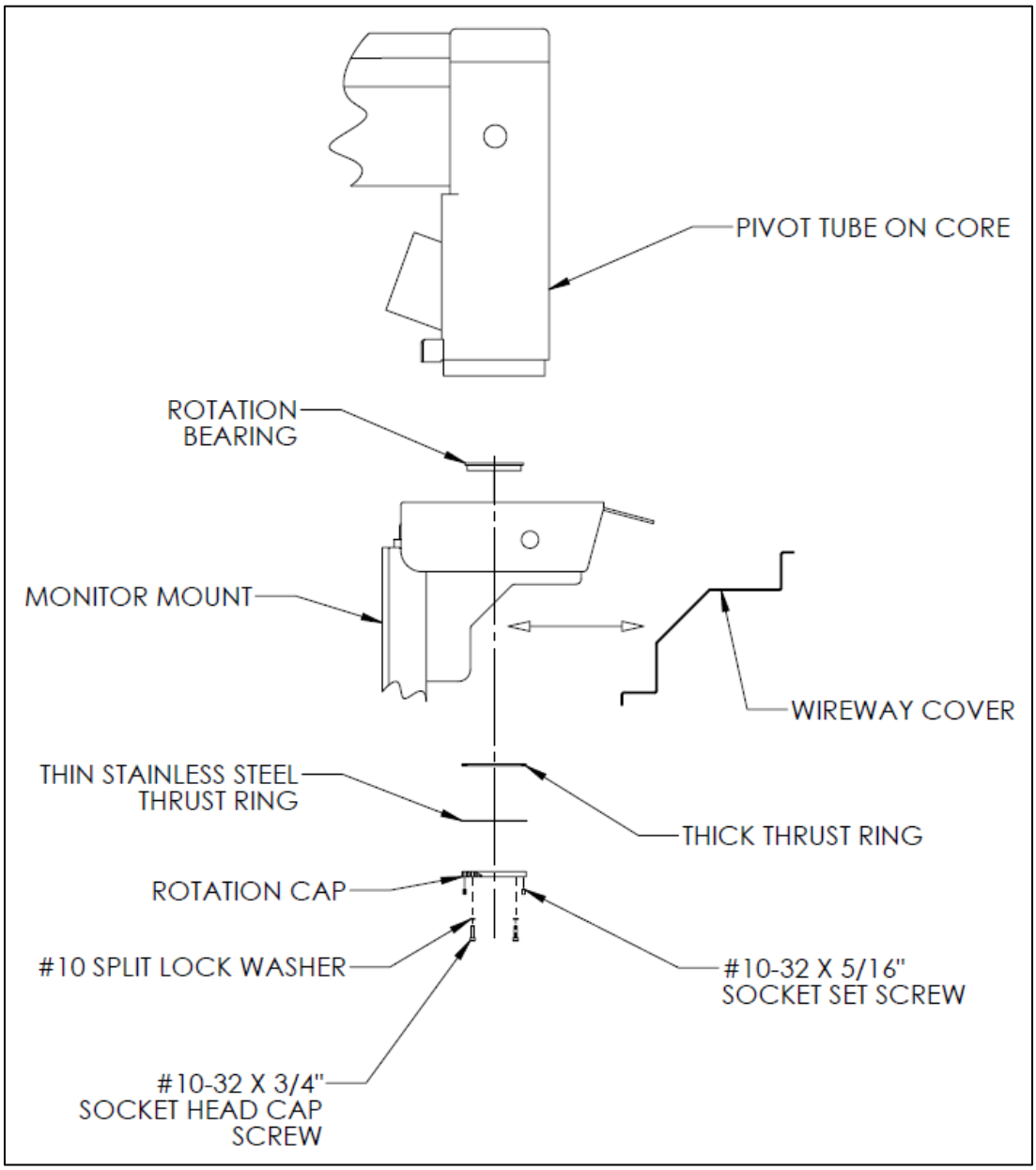


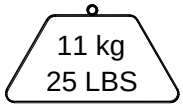
Figure 7

1. Remove wireway cover.
2. Insert rotation bearing into pivot plate on the top of the monitor mount.
3. Install the thicker thrust ring onto the rotation bearing from inside the monitor mount frame.

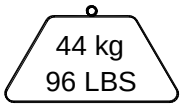
4. Install the thinner stainless-steel thrust ring onto the rotation bearing from inside the monitor mount frame.
5. Install six bolts with lockwashers through the rotation cap, then through the rotation bearing and into the pivot tube of the core assembly. Use **LOCTITE #242** on hardware.
6. Apply a very little amount of **LOCTITE #242** to six setscrews and install them into the threaded holes on rotation cap. Install the setscrews until they bottom out. The setscrews may be tightened or loosened later to adjust rotational resistance.

WARNING!	**Failure to securely attach hardware may result in serious injury to patient, user, and damage to equipment.**

INSTALL MONITOR



Maximum weight of any individual monitor.



Maximum total weight of monitors.

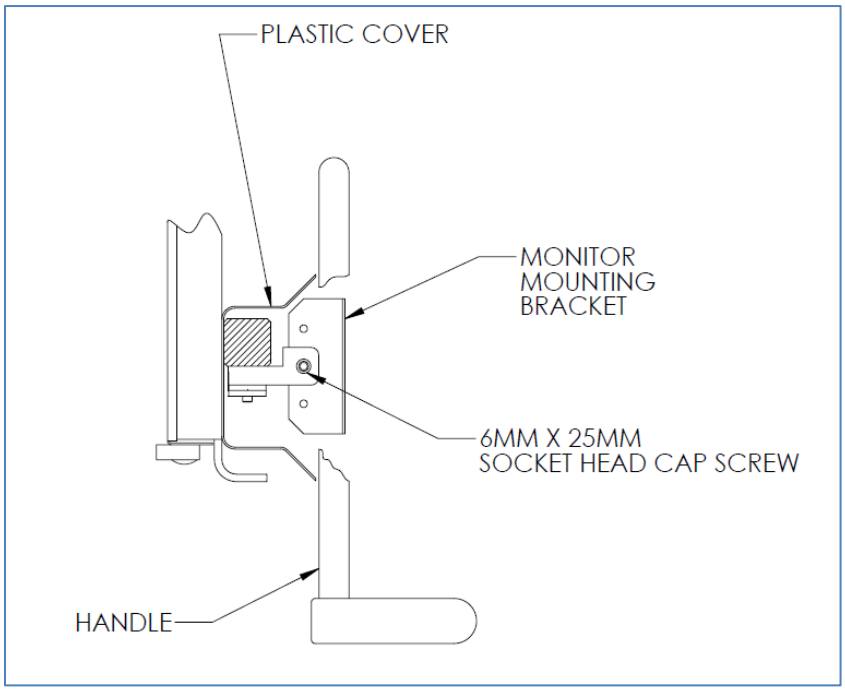


Figure 8

1. To attach a monitor to the system, first install mounting screws into the top two holes in the monitor leaving a gap below the head of the screw big enough to fit over the mounting bracket to which it is being mounted. Mount the monitor onto the mounting bracket by sliding top mounting screws into the slots on the top of the mounting bracket. Insert bottom mounting screws through mounting bracket and into monitor and tighten all four monitor mounting screws. See Figure 8.

WARNING! **Failure to securely attach hardware may result in serious injury to patient, user, and damage to equipment.**

2. Monitor can be tilted and rotated by hand. If monitor fails to stay in position and tilts without any outside assistance by hand, tighten the mounting screw on the bracket.

NOTE TO INSTALLER: Ground stud has been provided to properly ground monitor. Terminal strip has been provided for distribution of line voltage to monitor. See Figure 9. Cut and strip monitor power cord to fit.

WARNING! **Remove plastic cover and remove block of wood between gantry core and arm. Failure to do so may result in serious injury to user and damage to equipment.**

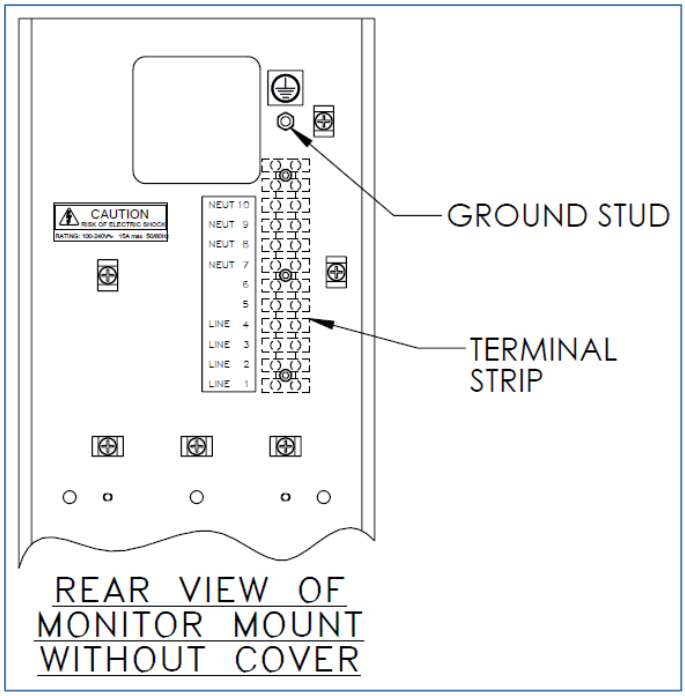


Figure 9

SET ROTATIONAL LIMITS

If desired, the rotational stop pin can be relocated to one of four possible mounting locations. See Figure 10.

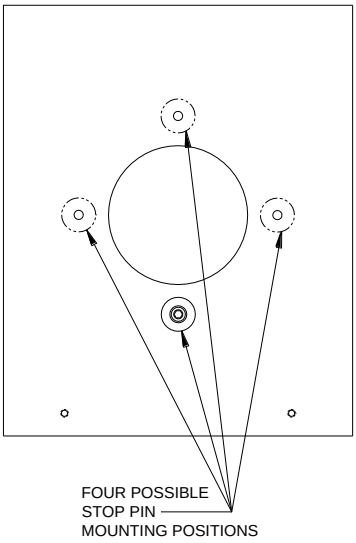


Figure 10

ELECTRICAL CONNECTIONS

1. Colors of conductors in power supply cords must be in accordance with IEC publication 60227 (amendment #1) or with IEC publication 60245.

   Wiring Color Codes:
   International: brown (line), blue (neutral), green/yellow (ground)
   North America: black (line), white (neutral), green/yellow (ground)

2. Cable tie mounting platforms are supplied near the terminal block for anchoring the monitor cords and the wires from the mains. Use nylon cable ties. (Tying the cord into a knot or tying the ends with string shall not be used for cord anchorage).

3. Arrange the conductors of the power supply cord so that the protective earth conductor is not subject to strain as long as the phase conductors are in contact with their terminals.
4. All power cords used for mains connection must have double insulation. Conduit provided for routing cables must not be relied on for insulation.

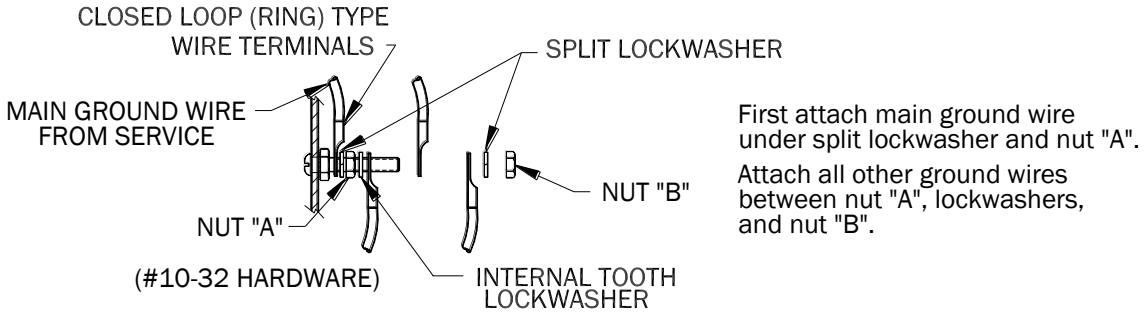


Figure 11

5. Connect all monitor ground wires and the service ground wire as shown in Figure 11. (The number of wires varies with the number of monitors installed).

INSTALL STATIONARY CABLE HANDLING ASSEMBLY

1. Determine which rail end the stationary cable handling kit will be positioned. If it is to be at the far end of the rail, slide kit into rail track prior to positioning the mobile cable handling kit. If stationary kit is to be positioned at the near end of rail, slide into rail after positioning mobile cable handling kit. Stationary kit is typically mounted approximately 6 inches (15cm) from rail end. See Figure 12.

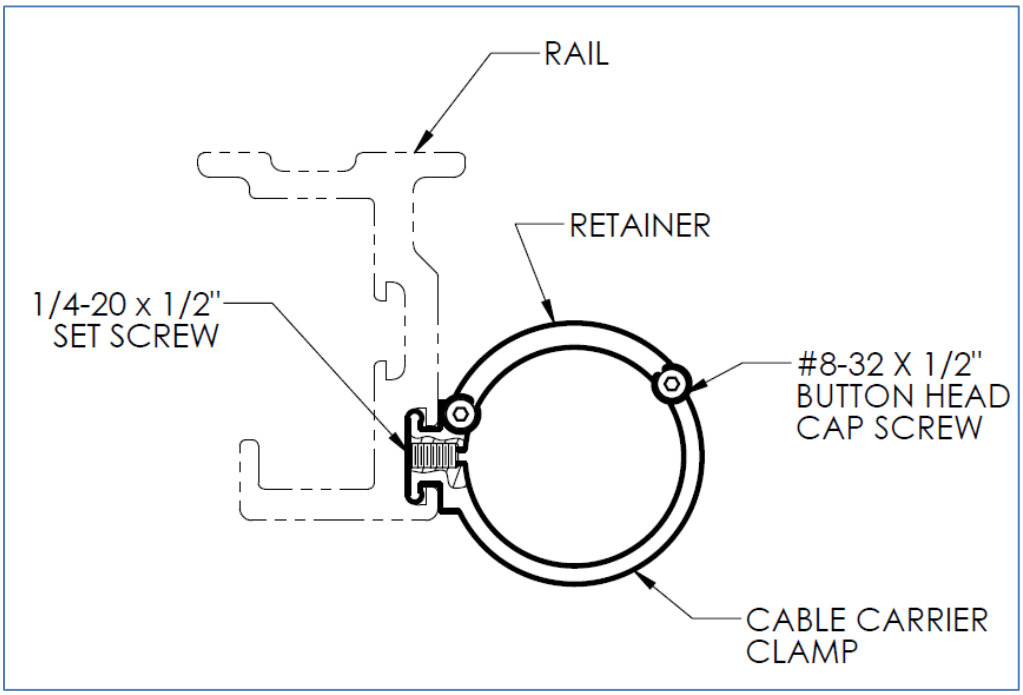


Figure 12

2. Apply **LOCTITE #242** to threads on set screws and then tighten until secured in place.
3. Remove retainer by taking out the both mounting screws.
4. Place cable hose into cable carrier clamp.
5. Reinstall retainer and mounting screws.

INSTALL MOBILE CABLE HANDLING ASSEMBLY

1. Slide two nut plates into rail track. Apply **LOCTITE #242** to the threads of two standoffs and then loosely thread into nut plates. See Figure 13
2. Slide cable trolley assembly onto open end of cable hanger shaft.
3. Assemble cable hanger shaft to standoffs by inserting end into side hole of shaft supports. Then install mounting screw through the shaft supports, through the hole in the end of the cable hanger shafts and into the standoffs. Lightly tighten socket head cap screws.

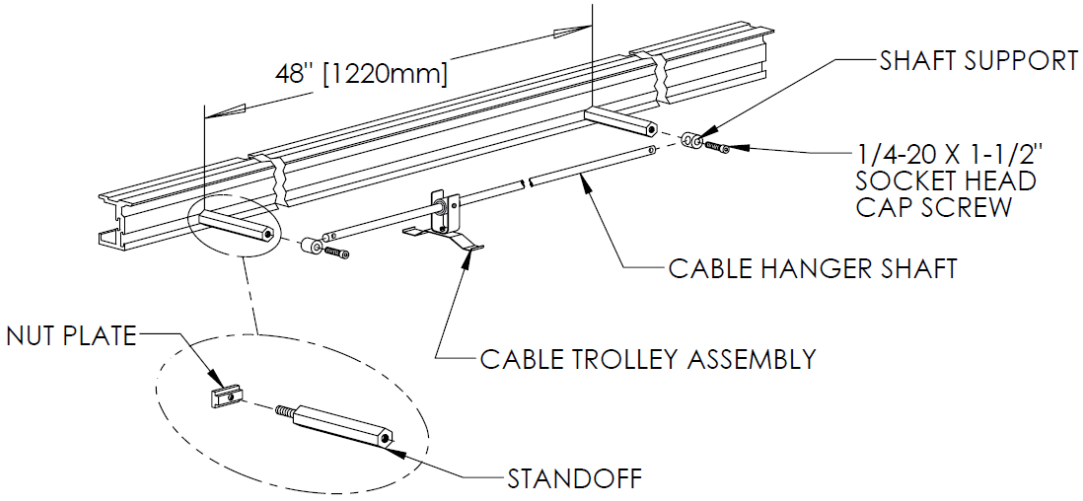


Figure 13

4. Position shaft/cable handling subassemblies (steps 1-5) to desired location along length of rail. Torque standoffs to nut plates ~35-50 inch pounds, 4.2-6.0(Nm) and tighten socket head cap screws. Use **LOCTITE #242** on threaded hardware.

CAUTION! **Over tightening the standoff will weaken or break the thread connecting the standoff to the nut plate causing attached components to fall. *DO NOT* loosen or adjust the exposed length of the setscrew on the standoff.**

DRESS CABLES

1. When the monitors have been properly installed, it is recommended that the cables run through the pivot tube as shown in Figure 14. Attach 2" (5cm) flexaust (provided) to pivot tube and route underneath the arm via the cable hose clamps. Rotate entire system to maximum positions. The system should not drift from any position. If it does, check that enough cable has been left to allow freedom of motion.

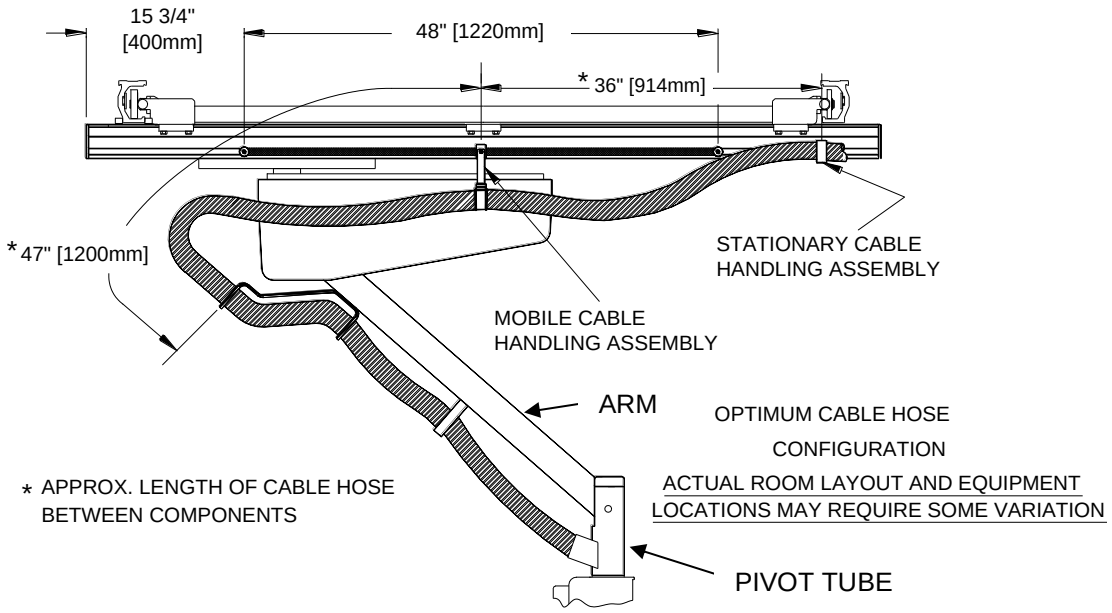


Figure 14

ADJUST WEIGHT COUNTERBALANCE

Note: System balance has been set at factory based upon quoted monitor weight.

1. Note initial settings from gas spring data label. See Figure 15.

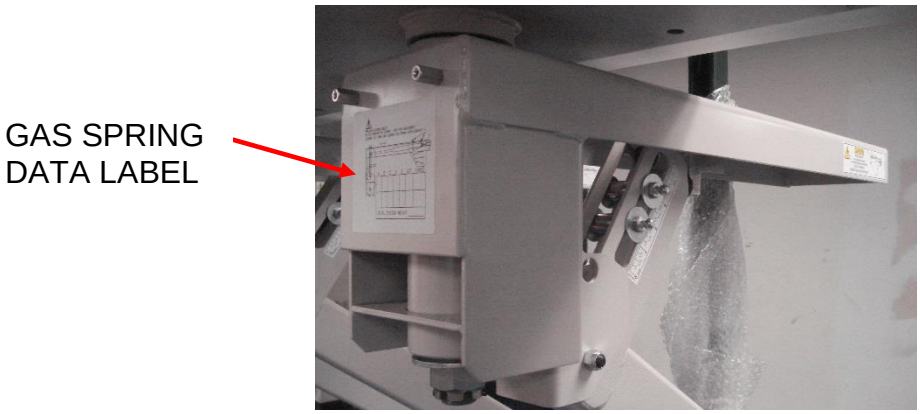


Figure 15

2. *Prior to adjustment* - payload must be secure. The arm can be pulled down to make access to adjustment nut easier. Fine adjustment to compensate monitor counterbalance can be made by turning adjustment nut located on the top surface of the core unit as shown in Figure 16.

Rotate adjustment nut clockwise to *increase* weight capacity.

Rotate adjustment nut counter clockwise to *decrease* weight capacity.

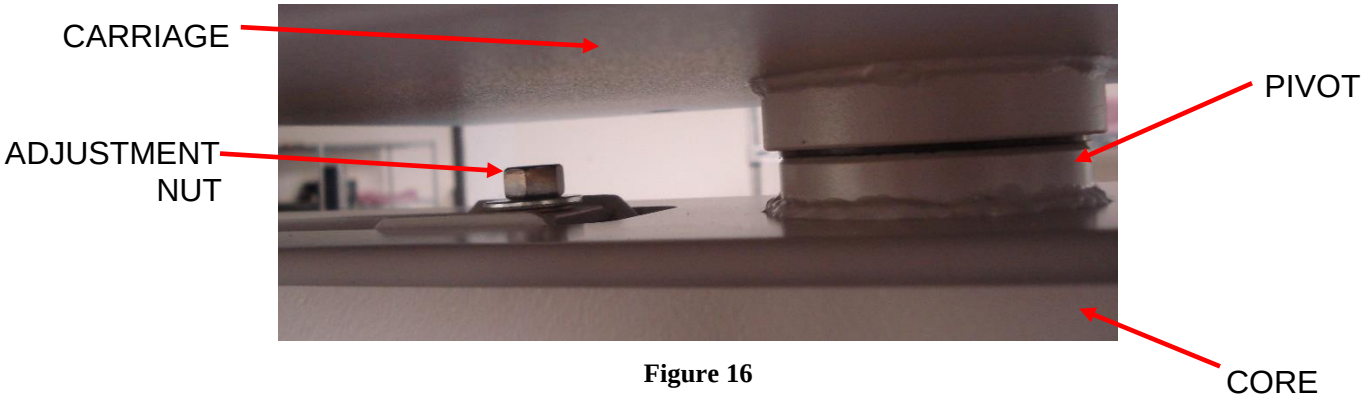


Figure 16

YOKE BALANCE ADJUSTMENT

WARNING!	**Yoke has been leveled at manufacturers. Make adjustment only if absolutely necessary to compensate for an unbalanced load.**

NOTE: *Prior to yoke adjustment* - payload must be secure and arm *horizontal.*

Fine adjustment, to compensate for yoke balance, can be made by turning the link. Loosen threaded hex nut at outboard rod end; spin link until yoke is in a horizontal position; retighten hex nut. See Figure 17.

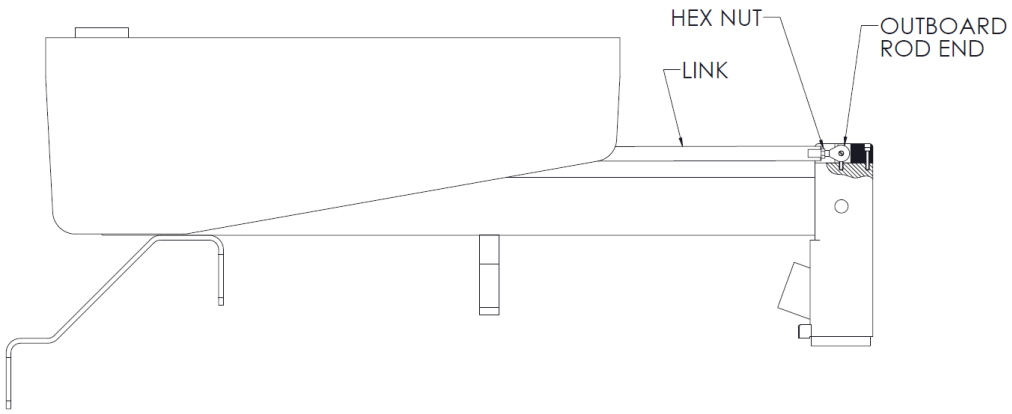


Figure 17

MONITOR MOUNT ASSEMBLY ROTATION RESISTANCE

1. The setscrews shown in Figure 7 that were installed in step 6 of "INSTALL MONITOR MOUNT" on page 12 can be loosened or tightened to adjust the rotation resistance of the suspended monitor mount assembly.
2. Replace wireway cover after making adjustment.

F. CLEANING THE EQUIPMENT

No part of this unit is designed to be sterilized in an autoclave. Do not allow water or other liquids to enter the equipment as this may cause short circuits or corrosion. Clean parts with a clean cloth dampened with disinfectant or a mild detergent solution. Do not use abrasives, solvents, sprays or corrosive cleaning agents. Gently rub with a clean soft cloth to dry.

If room is to be disinfected by means of an atomizer, the equipment must be covered with plastic or similar sheeting. The equipment must be turned off well in advance of this procedure to prevent convection currents from drawing the disinfectant mist into the equipment. After the mist disperses completely, the sheeting may be removed and the equipment disinfected as described above.

G. MAINTENANCE

"Authorized Technician"

All maintenance procedures should be done by an experienced technician with demonstrated knowledge and skills (electrical and mechanical) relative to this type of equipment.

This individual must have access to this manual and the proper tools.

Daily Maintenance Checks:

1. **Pre-Operational and Post-Operational Checks**
   Perform daily checks of the monitor suspension BEFORE and AFTER operating the equipment.

CAUTION! If any abnormality is found in the monitor suspension, stop using it. Post a sign reading "DO NOT USE" so that the system is not used by mistake.

2. **Visual check**

Before checking the operation, confirm the following:

- The monitor suspension is not tilted. Refer to Figure 18.
- Although "A" in the following figure shows a gap, there is no gap at the monitor frame rotation section.
- Monitors installed on the monitor suspension are not tilted.
- Screws or some parts are not loosened or removed.
- The pad mounted to the bottom of the monitor mount assembly is not damaged or missing.

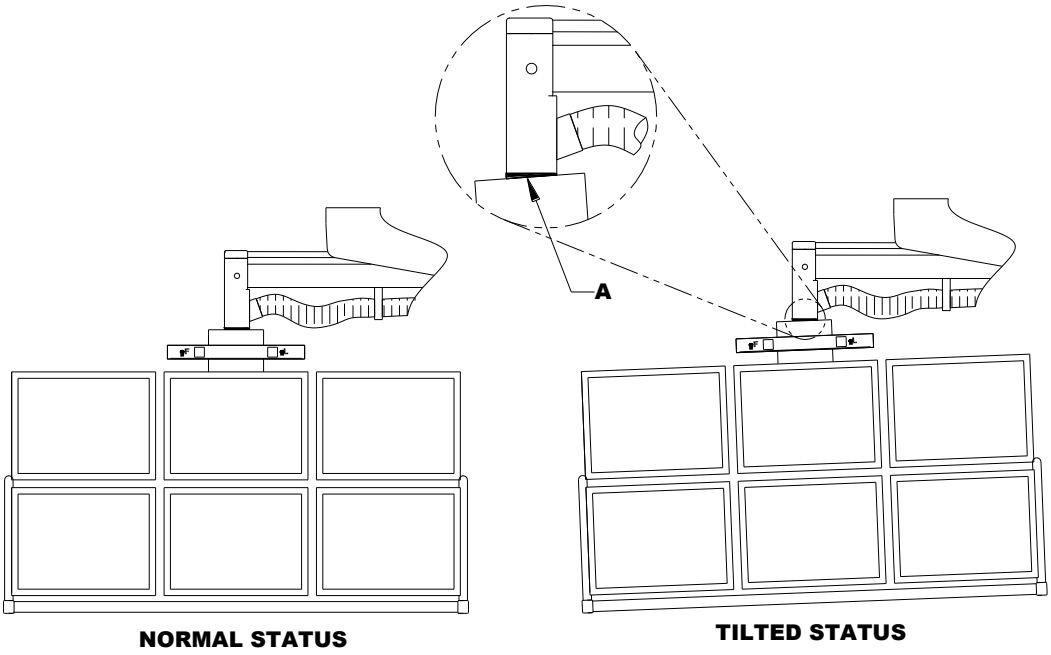


Figure 18

Pad attached to the underside of the monitor mount bracket must be complete and undamaged

3. **Operational check**

Articulate all the movable sections and confirm the following:

- Operation does not lack smoothness compared to when the monitor suspension was installed.
- There is no play.
- There are no abnormal sounds.
- The monitors or monitor suspension are not tilted due to looseness of secured sections.

Annual Maintenance Check:

1. Clean carriage wheels and guides and the rails where carriage wheels and guides ride inside the rails. See Figure 20.

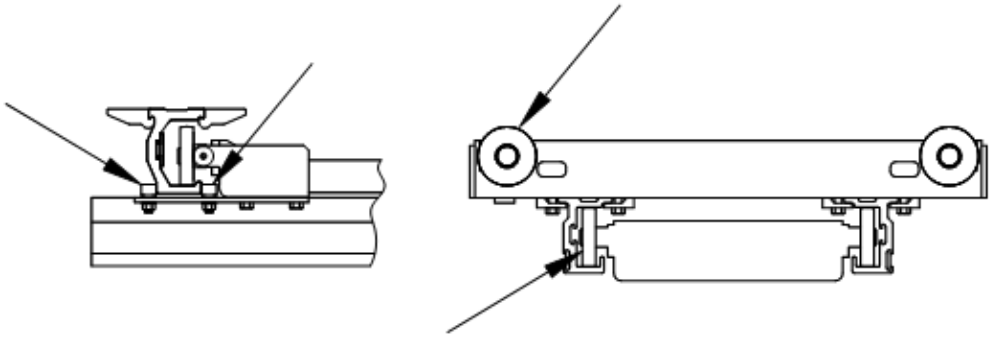


Figure 20

2. Check that the rail mounting hardware has not become loose. See Figure 21.

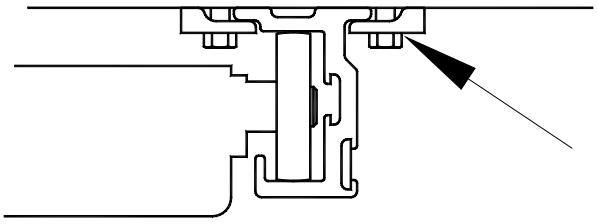


Figure 21

3. Check that the hardware securing the end plates are tight. See Figure 22.

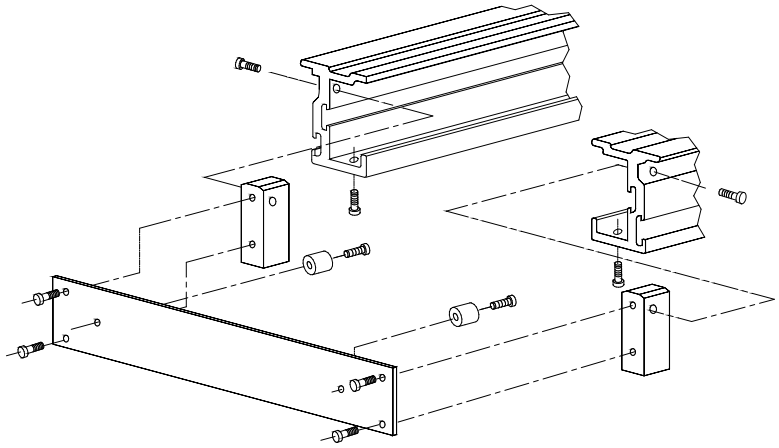


Figure 22

4. Perform a complete functional inspection:

   -Rotate monitor mount assembly through complete range.

   -Raise and lower monitor mount assembly.

   -Roll carriages to complete range of rails.

5. Clean and touch up the painted surfaces.

6. Check that the hardware is tight and that there is no wear at (A) the end of the gantry core arm, (B) the rotational section between the gantry core arm and the monitor mount assembly, (C) the monitor mount assembly pivot joint, (D) the monitor bracket pivot (E), and the monitor. Should the screws labeled (F) become loose, there will be an opening of the mechanical junction between the gantry core arm and the monitor mount assembly (G). See Figure 23.

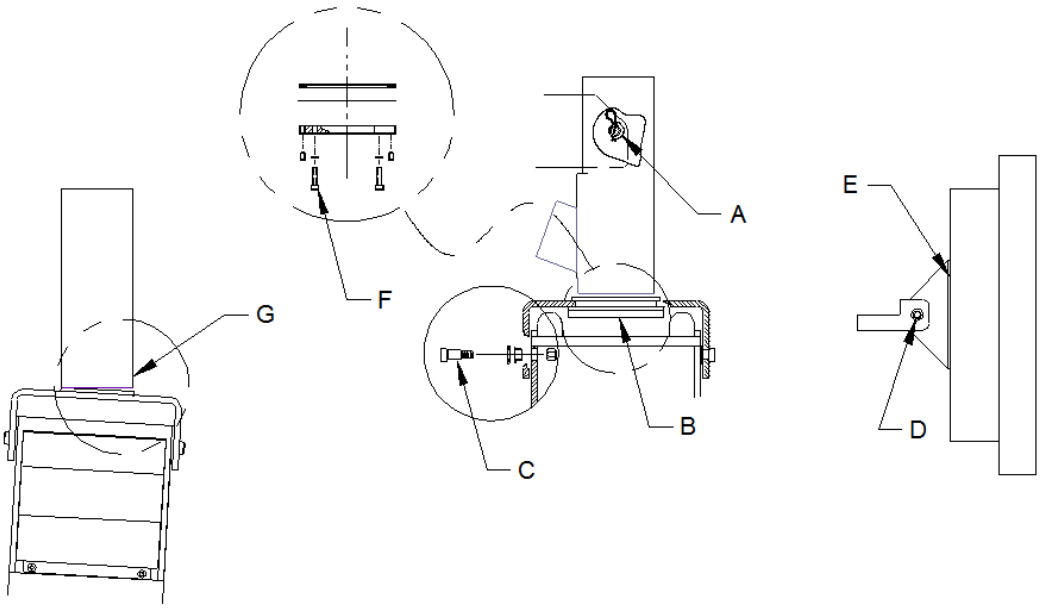
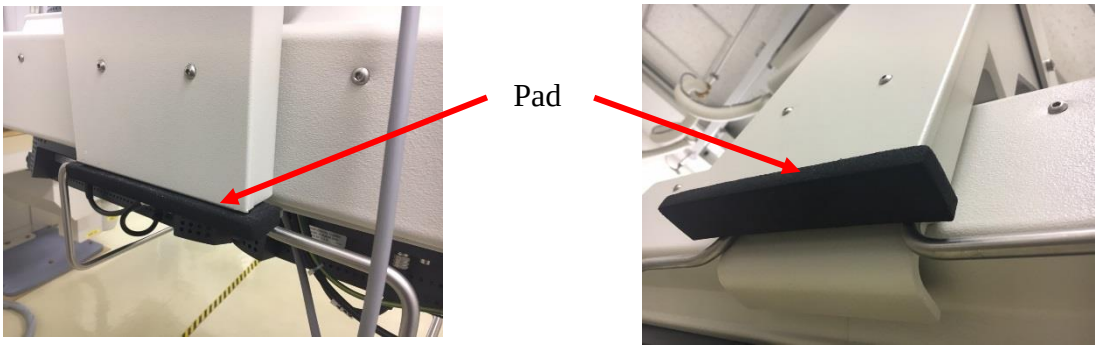


Figure 23

7. Check the pad attached to the underside of the monitor mount. If there is any damage to the pad or if the pad is not properly attached to the unit, it must be replaced. See Figure 24.



The procedures mentioned in these instructions are based on the recommendations of HHS, I.E.C., etc.

In cases of increased wear or where severe working conditions exist, maintenance checks should be made at shorter than the specified intervals.

Should any control or indicator fail to operate properly, do not use the equipment until a repair has been affected. Operating equipment with defective components may expose the operator or the patient to safety hazards.

The manufacturer strongly recommends that a maintenance program be initiated and that a maintenance record be kept detailing dates and nature of maintenance performed, the name of the service engineer, and any other relevant information.

WARNING! **Removal of any hardware requires re-assembly with Loctite #242 or equivalent (depending on hardware size) following manufacturer's instructions.**

H. CUSTOMER SUPPORT

For technical assistance, be sure you have the complete model and serial number before contacting the local or national service office.

I. DISPOSAL GUIDELINES

Most of the components used in this suspension system are made of metal, usually aluminum or steel, and are easily recycled.

The gas springs are nearly 100% recyclable. They must be decompressed, with the remaining oil drained, before processing. (The compressed gas inside is nitrogen).

J. APPROVALS

SGS Testing Service

The system was tested and found to be in compliance with the requirements of all relevant directives and standards in effect within the European Union at the time of manufacture.

EC REP

European Authorized Representative:

Advena Ltd. Tower Business Centre, 2nd Flr., Tower Street, Swatar, BKR 4013 Malta

REVISIONS TO THIS MANUAL

Rev	Date	Description
A	January 2006	Release
B	August 2009	Monitor Mount Revised
C	May 2018	ECO E571 Added warnings for pad.
D	December 2018	Added 2100mm option.