



AMICO MOBILITY INSTALLATION MANUAL





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INTRODUCTION

This manual provides detailed instruction on the installation of Amico GoLifts. Since the introduction of ceiling mounted patient lifts, the frequency of installations has rapidly increased. This is due to greater awareness of the risks associated with manual patient transfer and repositioning, which has led to the enforcement of more strict lifting regulations. Amico Mobility strives to consistently provide exemplary service, design, and installation to all of its customers. In an ever more competitive market, it is important to standardize installation techniques, thus ensuring that the highest standards of quality and safety are met. The methods described in this manual are intended for use by employees of Amico Mobility or its authorized agents.

CHECKS BEFORE LEAVING BASE

1. A job file should be created for every installation. The file should include the following documents:
 - a) Architectural drawings provided by the customer. These include floor plans, construction drawings, and any structural specifications relevant to the track installation.
 - b) Architectural drawings showing the method of installation.
 - c) Track configuration drawings showing the position of the track system in the room.
 - d) A complete site assessment form provided by the surveyor of the job.
 - e) Customer contact information.
 - f) Commissioning report for the customer to sign off when the install is complete.
2. Refer to a master tool checklist to ensure that no tools are forgotten when loading the vehicle.
3. Review the bills of materials for the job and make sure that no component pieces are missing. Consider taking spare parts if there is any question as to the quantities that may be required.
4. Review the architectural drawing that shows the method of installation. Make sure that sufficient quantities of the hardware are shown on the drawing are packed. It is always a good idea to bring extra hardware, particularly when working in rural areas where industrial suppliers are not easily accessible.
5. Bring clear directions to the jobsite. Be sure to also have the name and phone number of the contact person you will be meeting. A courtesy call to remind the customer of your appointment will help ensure that they are ready for your arrival.
6. Check the job file for any special or unusual instructions for the job. Bring any safety equipment or certification that may be required to access the jobsite.



ARRIVING ON SITE

1. Be sure to arrive on site at the time agreed upon by the client.
2. Identify yourself to the customer and be sure to check in with the appropriate contact person.
3. Ask to see the room where the lift is to be installed. If you will be installing lifts in multiple rooms, ask the customer which room they would prefer you start in.
4. Use this time with the customer to answer any questions they may have about the installation process.
5. If not identified on the installation drawing, discuss options for placement of the lift's charging station (if applicable).
6. Determine a location for staging equipment and tools, and designate an area in which to cut track. Finalize and other logistical items before starting the installation.
7. With all installation methods, it is important to determine the lowest point in the ceiling. The first bracket installed will need to be at the lowest point in the ceiling and then a level used to determine the requirement for shims on the remainder of the brackets. A laser level can improve efficiency.

TYPES OF INSTALLATION

1. Attachment Across Wood Joists
2. Attachment Between Wood Joists
3. Attachment to T.G.I.'s
4. Attachment to Concrete
5. Attachment to Open Steel Web Joists
6. Attachment to Steel I-Beams
7. Attachment to Structural Walls
8. Attachment to Non-Structural Walls



ATTACHMENT ACROSS WOOD JOISTS

Attachment across wood joists means that the direction of the track line is perpendicular to the direction of the joists. If the wood joists are 2" x 4", The Top-Down Method must be used and the lift capacity cannot exceed 700 lbs. If the lift capacity is greater than 700 lbs., the Top-Down Method must be used and the minimum joist requirement is 2" x 6".

There are two methods than can be used to attach track across wood joists:

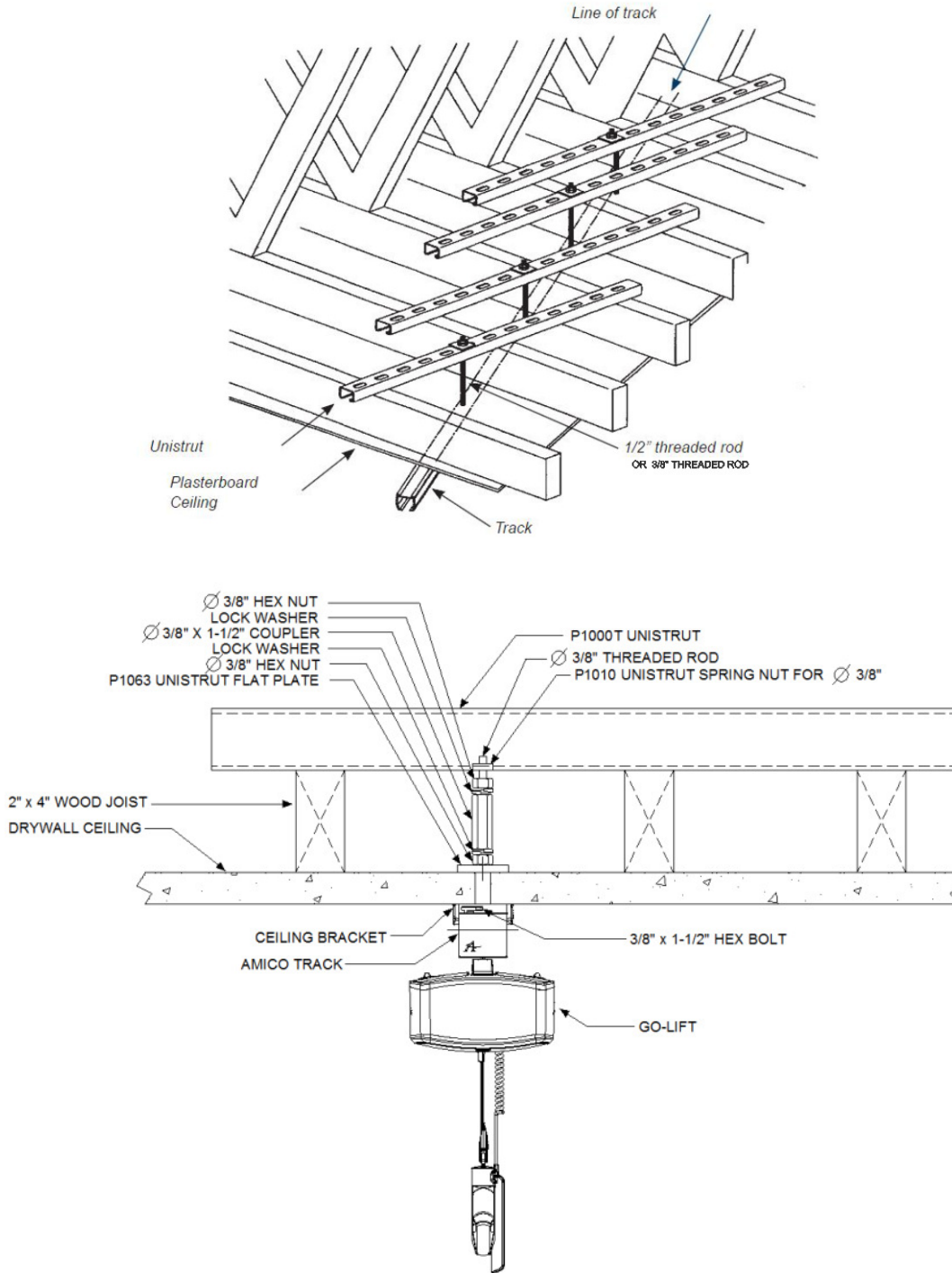
TOP-DOWN METHOD

This method is used when there is workable space above the finished ceiling. In most cases, this method applies to rooms that are on the uppermost floor of a building, below the roof trusses.

1. Determine the track layout. Mark the desired attachment points on the ceiling using a pencil. Do not make any permanent markings.
2. Position one installer in the attic space above the room, while another installer remains in the room. The installer working from the attic will need tools, hardware, Unistrut and a flash light.
3. **Installer above:** Remove any insulation above the track location.
4. **Installer below:** Drill a small pilot hole through the drywall at each of the attachment points. Communicate with the installer above to confirm that the attachment points are in acceptable locations. Once confirmed, the pilot holes can be re-drilled to accommodate the threaded rod.
5. **Installer above:** Lay sections of Unistrut across the ceiling joists, directly above the drilled holes. Note that the Unistrut must span at least three joists. (See Figure 1 – Top-Down Wood Joist Installation). Repeat this process for each attachment point.
6. **Installer below:** Cut threaded rods to size and feed through the drilled hole, hold the rod in place while the other installer attaches the appropriate hardware and fastens the rod through the Unistrut. Repeat this step for all attachment points. Do not tighten the attachment until all rods are in place and levelled using a laser level. Attach bracket assembly to rods.
7. **Installer above:** Tighten the Unistrut attachment. To increase lateral support use a nut and washer to “pinch” the drywall where the rod meets the drywall ceiling. Repeat this step for each attachment point.
8. **Installer above:** Use short lag screws to fasten the ends of each section of Unistrut to the wood joists. This will prevent the sections from moving. Replace the insulation.
9. The above-ceiling work is now complete. Mount the track and accessories to complete the installation. The system is now ready to be load tested.



Figure 1 – Top-Down Wood Joist Installation



NOTE: USE 1/2" THREADED ROD FOR LOAD CAPACITIES OVER 400 LBS



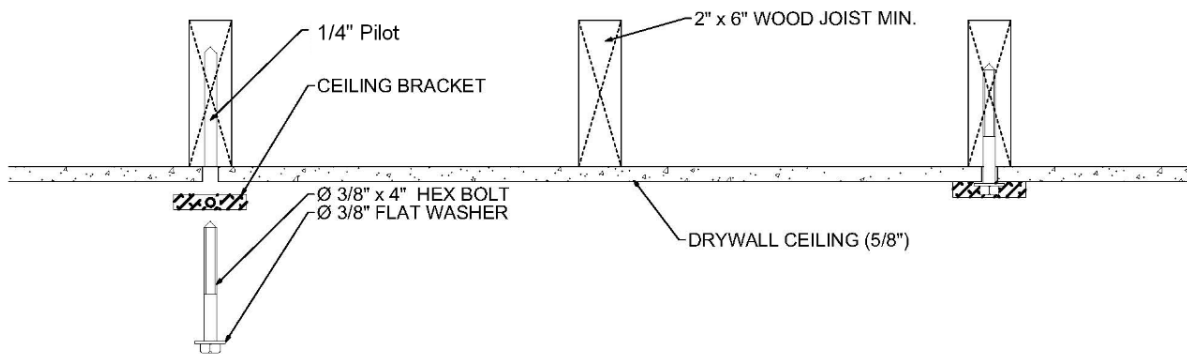
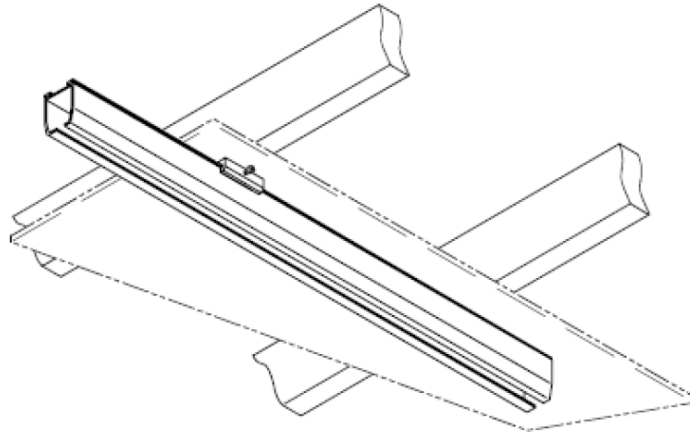
BOTTOM-UP METHOD

This method is used when the joists are located between floors, and where there is no workable access above the ceiling.

1. Use a stud finder to locate the position of the wood joists and determine the spacing between them. Stud finders may find strapping, wiring or plumbing, so verify before drilling.
2. Determine the track layout. Mark the desired attachment points on the ceiling using a pencil. Each attachment point must fall on a joist location. Only one attachment point can be used per joist. Never use a single joist to attach multiple mounting brackets.
3. Use a small drill bit to locate the edges of each joist where the attachment points are marked. Once the edges are identified, mark the location of the center of the joist. Sweep the sides of the joists to make sure there are no wires or pipes running through them.
4. Drill a pilot hole into the center of the joist at each attachment point. The appropriate drill bit size will be determined by the type of lag screw being used. The pilot hole should be drilled to a maximum depth of $2/3$ of the joist height. Be sure to keep the drill as straight as possible. Holes that are not drilled straight will cause the mounting bracket to sit at an angle to the ceiling.
5. Start at the lowest point on the ceiling and attach the track mounting bracket using a lag screws in the pre-drilled hole. Tighten the bracket so that it is snug against the ceiling, but can still be turned by hand. (See Figure 2 – Bottom-Up Wood Joist Installation)
6. Repeat the previous step with each attachment point. Use shims to keep the mounting brackets level.
7. If there are joints in the track, make sure that the track is cut so that the joint falls on a joist.
8. Once all attachment points are fitted, mount the track and accessories to complete the installation. The system is now ready to be load tested.



Figure 2 – Bottom-Up Wood Joist Installation



ATTACHMENT BETWEEN WOOD JOISTS

Attachment between wood joists means that the direction of the track line is parallel to the direction of the joists. If the joists are 2" x 4", either the Top-Down Method or the Bottom-Up Method can be used, but lifting capacity cannot exceed 700 lbs. If the joists are at least 2" x 6", there are no limitations on lifting capacity. If there is workable space above the ceiling, use the Top-Down Method, as described in the previous section. If there is no workable space above the ceiling, The Bottom-Up Method must be used. When attaching between joists, the Bottom-Up Method of attachment is different than described in the previous section.

Bottom-Up Method:



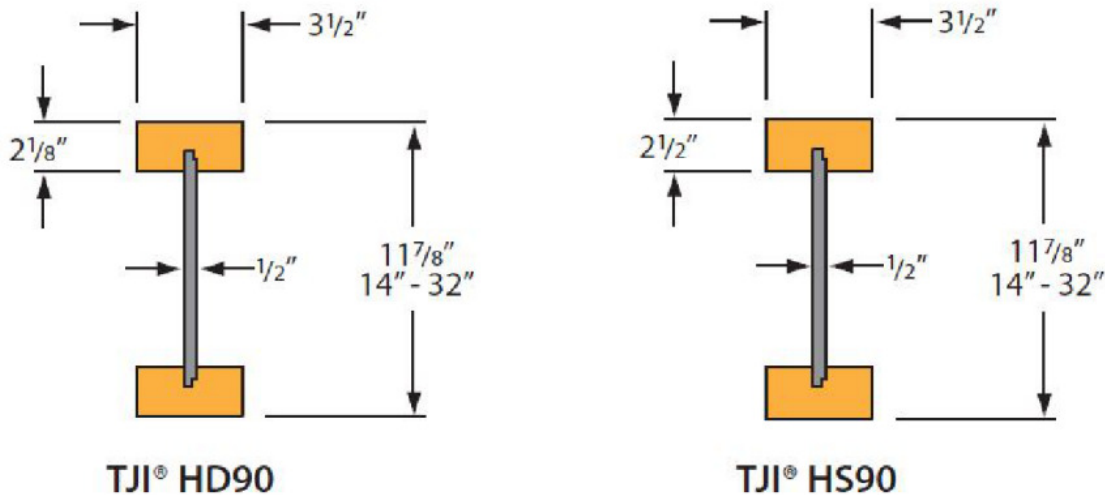
This method is used when the joists are located between floors, and where there is no workable access above the ceiling.

1. Use a stud finder to locate the position of the wood joists and determine the spacing between them.
2. Determine the track layout. Mark the desired attachment points on the ceiling using a pencil. Each attachment point must fall between two joists. The ideal position for bracket attachment is in the exact center of span, but can be biased toward one side in order to accommodate the desired pick-up point. Mark the attachment points on the ceiling using a pencil.
3. For each attachment point, use a section of Unistrut to span two joists. Attach the Unistrut using lag screws. Make sure that the lag screw is fastened in the exact center of each joist. Keep in mind that a stud finder is helpful to locate edges, but few are 100% accurate. Use a stud finder to locate edges and check by drilling a very small hole into the ceiling beside each edge. Use the drill bit to feel the side of the joist. Once the location of both edges is known, a pilot hole for the lag screw can be drilled in the center of the joist. Make sure to sweep the sides of the joist for any plumbing or electric that may be running through it. The test holes will normally be covered by the Unistrut, but can also be patched if they will be exposed.
4. Since the Unistrut is being affixed below the ceiling, it is important that it is powder coated to match the colour of the finished ceiling. It is also important that the exposed structural work is aesthetically pleasing. Take extra care when cutting the Unistrut, so that the edges are smooth and straight. Keep a bottle of white paint to touch-up the edges after the installation is complete. Unistrut capping can be used to give the exposed Unistrut a less industrial appearance. Make sure that the sections of Unistrut are parallel with each other, as much as possible. The result should resemble train tracks on the ceiling – straight and evenly spaced.
5. Once all sections of Unistrut are attached to the ceiling joists, the mounting brackets can be attached using a spring nut and bolt. The brackets will sit flush with the Unistrut. Use shims to keep the brackets level.
6. Once all mounting brackets are in place, the track can be cut. Cut one section of track at a time, taking measurements to the next track joint after each cut.
7. Since the track is flush-mounted to the Unistrut, which is flush-mounted to the ceiling, there is no need to add any lateral support.
8. Mount the track and accessories to complete the installation. The system is now ready to be load tested.



ATTACHMENT TO I-JOISTS

A modern method of construction is to use I-joists, also called, TGI joists, TJI joists or silent floor joists (examples below) instead of traditional wood joists.



Knowledge of structural I-joists components is crucial when working with these types of joists. There is only one way to determine the best way to attach to I-joists. The most important fact to remember is that the bottom cord of the I-joist is never a structural member. Similarly, the vertical plywood portion of the joist is also not structural.

Furthermore, the joist as a whole cannot be attached to until the necessary support is added. This means that the I-joist must be "packed" in order to add any significant structural pullout value. Packing is a method commonly used to turn a non-structural member into a structural member by significantly increasing the pullout value. There are instances when the shape of the I-joist will limit the materials that can be used for packing. When preparing for a job that involves attachments to I-joists, it is always a good idea to have the manufacturer specs, so that the packing material can be predetermined and will be ready at the time of installation. It is very costly to show up at a job and not be able to do the installation because the proper materials were not planned for or packed.



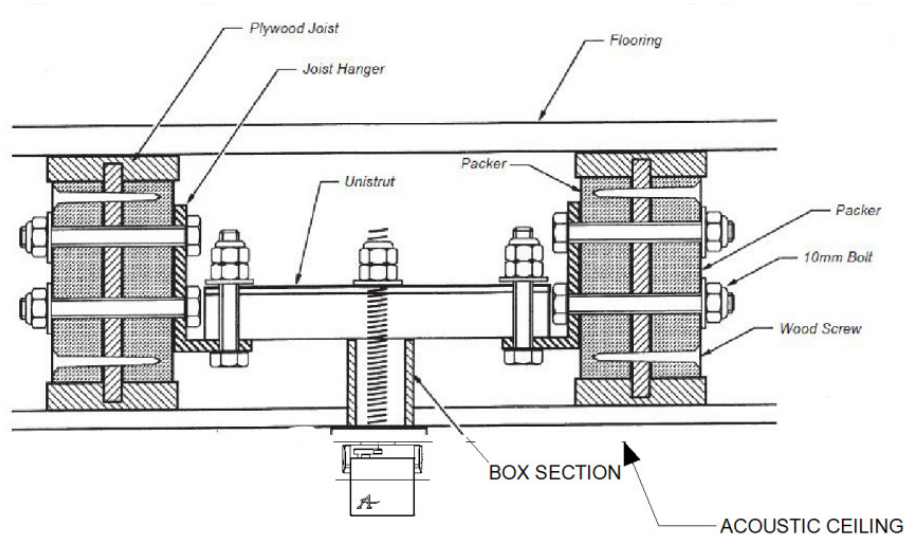
PACKING I-JOISTS:

For every bracket attachment, two T.G.I. joists must be packed, and the attachment point suspended directly between the joists. (See Figure 3 – Packing T.G.I. joists) If the attachment point is biased toward either side of center, the weight will not be evenly distributed among the joists. This will decrease the pullout value of the member.

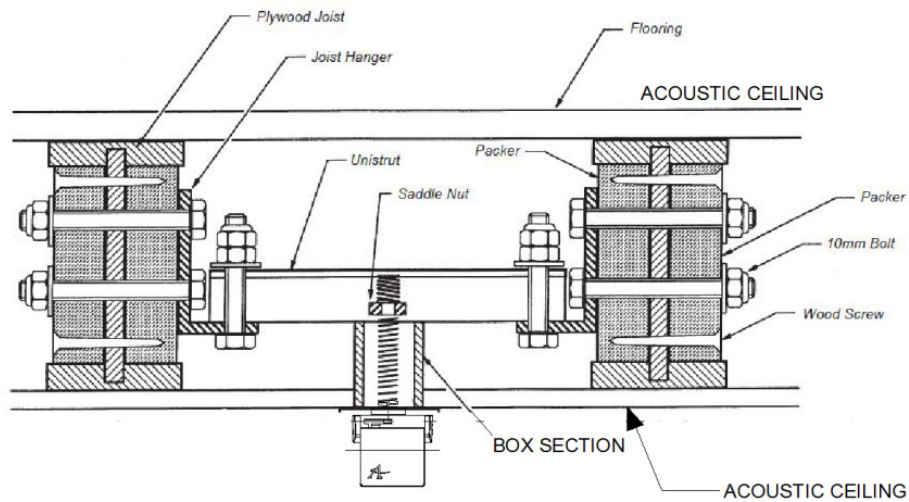
1. Determine the track layout. Mark the desired attachment points on the ceiling using a pencil. Each attachment point must fall between two joists. The ideal position for bracket attachment is in the exact center of the span, but can be biased toward one side in order to accommodate the desired pick-up point. Mark the attachment points on the ceiling using a pencil.
2. Once all attachment points have been marked, begin at one end of the track system and repeat the next steps for every attachment point.
3. Determine the best packing material based on the specs of the T.G.I. Joist. Solid sections of wood are ideal for packing and the size and shape will be predetermined based on the dimensions of the joists. When placed on either side of the plywood, the material should be as thick as the top cord of the joist.
4. Fasten the packing material to both sides of the plywood portion of the T.G.I. using wood screws. Fasten one screw just beneath the top cord of the joist, and the other just above the bottom cord.
5. Hold a 90 degree angle fitting against the inside of one of the joists and trace the mounting holes onto the packing material. Do the same on the inside wall of the opposite joist, using a laser to make sure the second angle fitting is at the same level as the first.
6. Using a ½” drill bit, drill holes through the packing material (and through the plywood) for each of the traced mounting holes. Make sure the holes will not interfere with the wood screws. They should be at least two inches apart.
7. Cut sections of 3/8” threaded rod two inches longer than the width of the newly packed joist. These will be used to attach the angle fittings.
8. Using the attachment method (See Figure 3 – Packing I-Joists), secure the angle fittings and cut a section of Unistrut to fit between them.
9. Secure the Unistrut and attach the threaded rod for the mounting bracket connection. Lateral support may be required, depending on the length of suspension and the type of threaded rod used.
10. Attach the track mounting bracket.
11. Once all brackets are attached, begin at one end of the system and cut track to size based on the position of the joining brackets.

12. Mount the track and accessories to complete the installation. The system is now ready to be load tested.

Figure 3 – Packing I-Joists



A spring (saddle) nut can also be used to secure the threaded rod, as shown below.





ATTACHING TO CONCRETE

There are a number of different types of concrete and every individual concrete structure is unique. It is very important that the structural details of concrete are investigated and scrutinized before ever determining if it is suitable for supporting a patient lift system. It is equally important that the specifications of the concrete anchor being used are known. Many manufacturer specs will provide pullout values for concrete with a number of different compression values. Compression values are measured in pounds-per-square-inch (P.S.I.). It is important to know this value before deciding that the combination of anchor and concrete will be sufficient for the requirements of the lift. If there is any doubt as to the adequacy of either the concrete or the concrete anchor, consult a structural engineer before proceeding with the installation.

This manual does not provide instructions on use of different concrete anchors. Refer to the manufacturer specs for instructions for use.

ATTACHING TO A CONCRETE SLAB

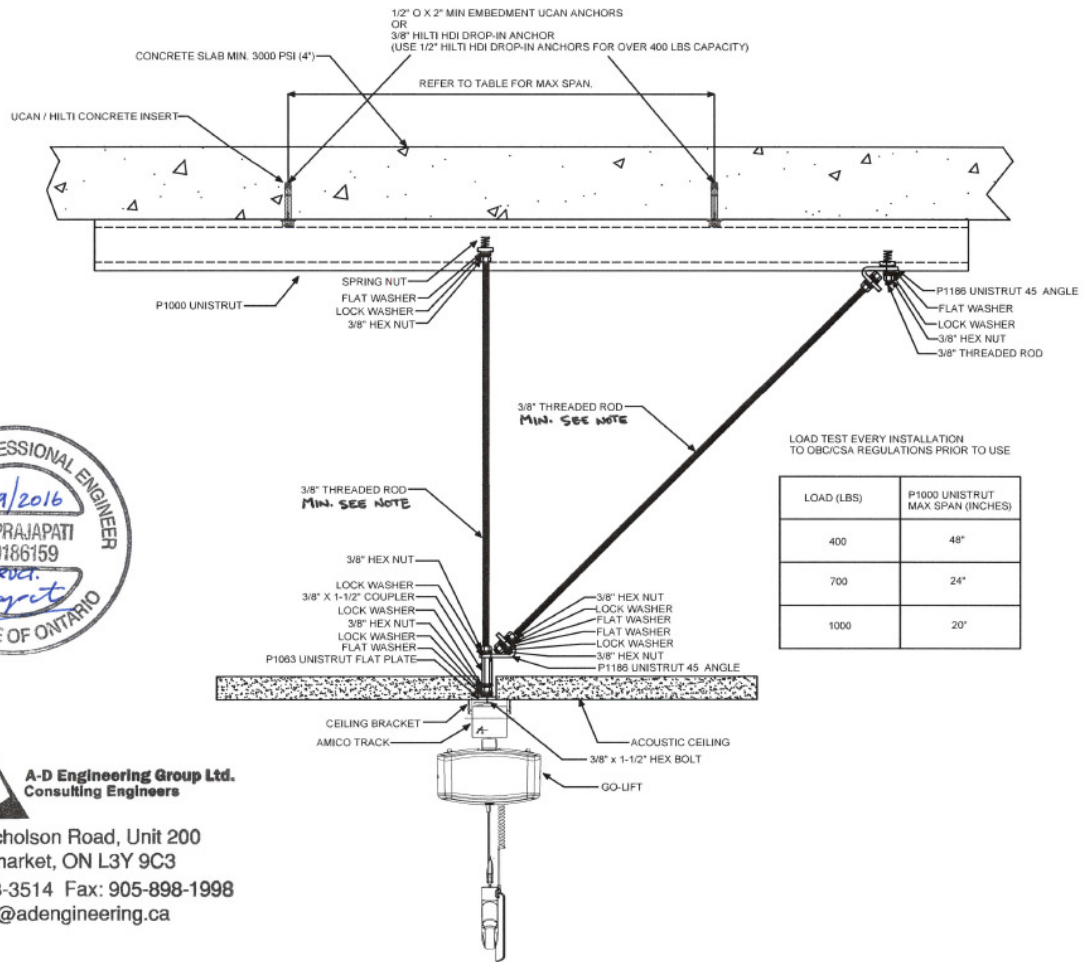
A concrete slab must be at least 4" thick to receive a typical heavy-duty concrete anchor. It is possible to attach to a thinner slab, but anchor selection will limit the load-bearing capability of the system. As a general rule, the concrete should be approximately three times as thick as the anchor embedment.

1. If the ceiling is a drop-tile ceiling, remove the tiles on and around the desired track location to observe what obstacles might exist above the ceiling. If the ceiling is a drywall or plaster ceiling, use existing access panels, or cut working holes to access the structure above.
2. Determine the track layout. Mark the desired attachment points on the ceiling using a pencil.
3. Drill threaded-rod-sized holes into the ceiling at each attachment point. Shine a laser up through the hole to mark the anchor location on the concrete. Note: If using a single concrete anchor, the laser will mark the location for drilling. If using multiple anchors per attachment point, the laser will mark the location for the threaded rod, but not necessarily for the concrete anchors. When using more than one anchor, be sure to have the attachment point suspended directly between two anchors for optimal weight distribution. See Figure 4 – Multiple Anchor Attachments.



Figure 4 – Multiple Anchor Attachments

MULTIPLE ANCHOR ATTACHMENTS



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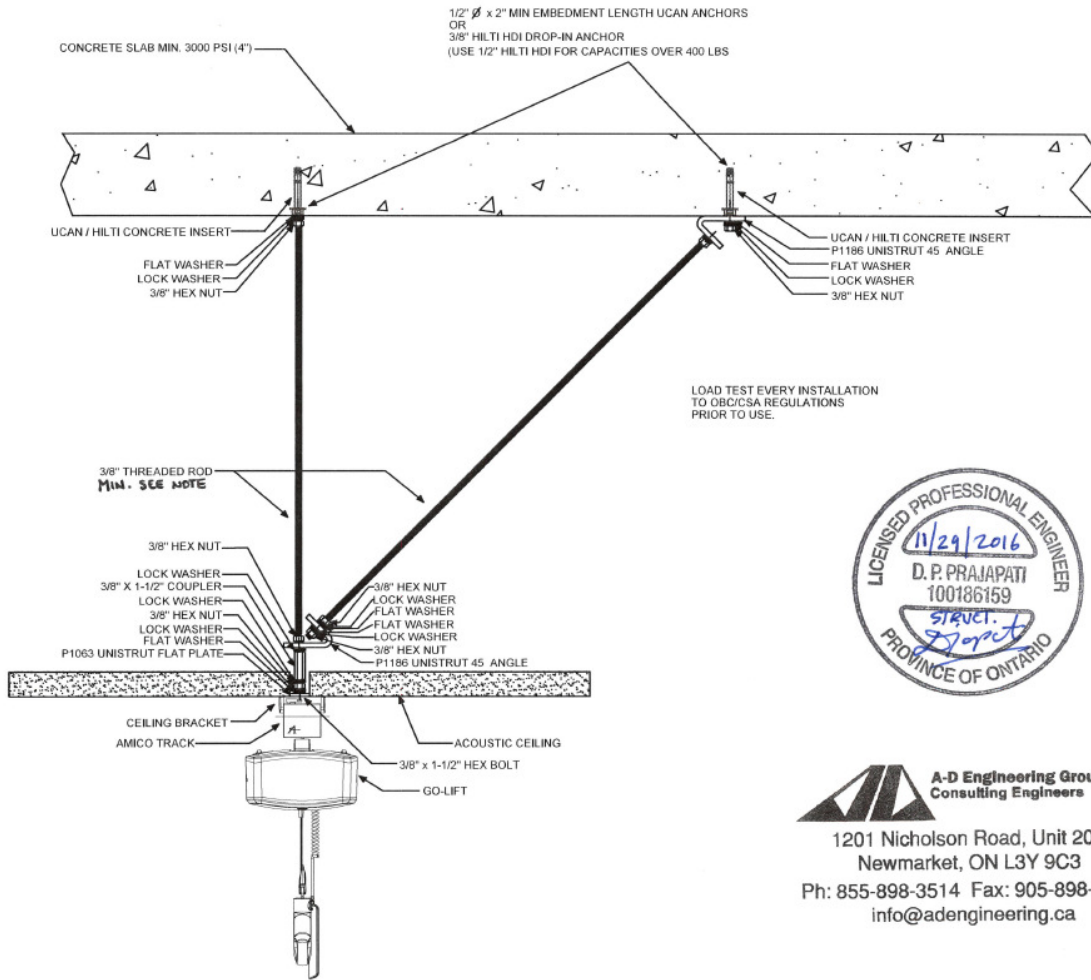
NOTE: USE 1/2" THREADED ROD, WASHERS, COUPLERS AND NUTS FOR LOAD CAPACITIES OVER 400 LBS



4. When drilling holes for concrete anchors, be sure to keep the drill as straight and as steady as possible. Holes that are drilled on a slight angle may cause the mounting bracket to be crooked. This will cause added stress on the anchor when it is under load.
5. Once the hole is drilled, clean out any dust or debris and insert the anchor. If using a hit-insert (also called a drop-in) anchor, the hole should be drilled at least as deep as the length of the anchor. If using a wedge anchor, the hole should be drilled as deep as the length of the anchor, minus half the length of threaded section. Use the stopper on the drill (or mark the drill bit with tape) to accurately gauge the depth. Refer to anchor manufacturer instructions to verify.
6. Insert the anchor and set it. If using a hit-insert anchor, the anchor is set when the setting tool is bottomed-out. If using a wedge anchor, the anchor is set when the nut can no longer be turned. Never use a lock washer with a wedge anchor. The lock washer will stop the nut from turning before the anchor is set.
7. Once the anchor is set, attach the threaded rod to the anchor. If the track mounting bracket will be attached directly to the threaded rod, the rod should hang $\frac{1}{4}$ " to $\frac{1}{2}$ " above the finished ceiling, but only if the bracket will be flush-mounted to the ceiling. If suspending the track system below the finished ceiling, the threaded rod should protrude through the ceiling, as far as the system is to be suspended.
8. Lateral support should be used as close to the ceiling as possible to provide optimal stability. If suspending the system more than 6" below the finished ceiling (12" if using $\frac{1}{2}$ " rod), it will be necessary to add lateral support below the ceiling. In this case, all exposed fittings must be painted or powder-coated for aesthetic appeal. Lateral supports should be used at each track end, and wherever else required to prevent any lateral movement in the track.
9. Repeat the above steps for each attachment point and attach all mounting brackets. See Figure 5 – Concrete Slab Installation.
10. Mount the track and accessories to complete the installation. The system is now ready for to be load tested.

Figure 5 – Concrete Slab Installation

CONCRETE SLAB INSTALLATION



NOTE: USE 1/2" THREADED ROD, WASHERS, COUPLERS AND NUTS FOR LOAD CAPACITIES OVER 400 LBS



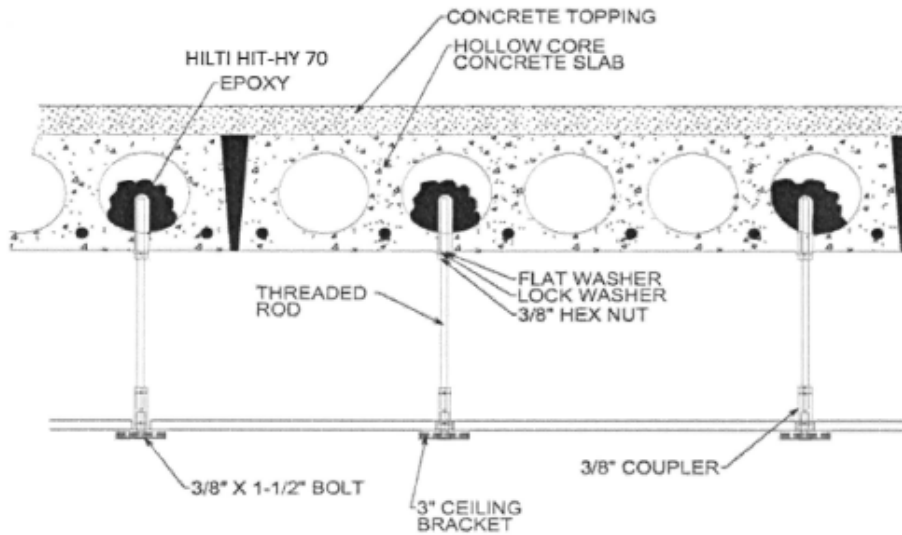
ATTACHING TO HOLLOW-CORE CONCRETE & OTHER HOLLOW STRUCTURE:

Chemical anchors are used when the ceiling is constructed of pre-cast reinforced concrete, poured reinforced concrete, pre-cast concrete sections or Beam & Block Construction (Beam and Block only on new builds or where access is available to visually inspect the beam). See Figure 6 – Epoxy Anchors in Hollow-Core Concrete.

****Always verify load capacities with the anchor manufacturer's specs before installing****

1. Determine the track layout. Mark the position of each attachment point on the ceiling using a pencil.
2. Drill holes into the concrete to a depth recommended by the anchor manufacturer.
3. If the ceiling is solid, clear it of any debris. See Figure 7 – Anchoring to Hollow Structures.
4. If the holes go into a hollow section, then drill a larger hole to suit the hollow fixing sleeve supplied. Insert sleeves into holes. See Figure 7 – Anchoring to Hollow Structures.
5. Cut the track to length.
6. Measure and cut threaded rod so that it is a few inches longer than the depth of the hole or epoxy sleeve.
7. Insert the chemical into the hole or sleeve and fill until the epoxy almost starts to ooze out of the bottom of the hole.
8. Insert the threaded rod into the epoxy-filled hole and position it so that it is as straight as possible.
9. Allow the epoxy to cure (refer to manufacturer specs for cure times) and then cut any excess length off the threaded rods.
10. Attach all track mounting brackets.
11. Mount the track and accessories to complete the installation. The system is now ready to be load tested.

Figure 6 – Epoxy Anchors in Hollow-Core Concrete



Notes:

- Use 1/2 " threaded rod, bolts, washers and couplers for load capacities over 400 lbs.
- Load Test every installation to OBC/CSA Regulations prior to use.



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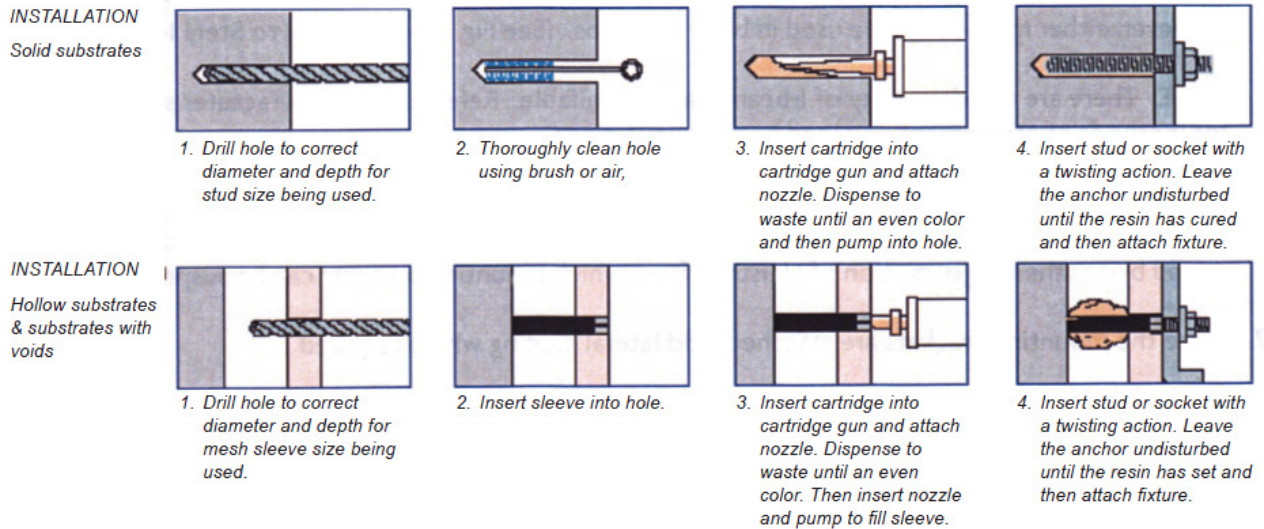


Notes:

- Use 1/2 " threaded rod, bolts, washers and couplers for load capacities over 400 lbs.
- Load Test every installation to OBC/CSA Regulations prior to use.



Figure 7 – Anchoring to Hollow Structures



ATTACHMENT TO STEEL I-BEAMS

As with any structural member, the specifications and load bearing limitations should be checked at the time of the site assessment. The most significant determining factor with respect to material and labour cost is the span between beams. When surveying a room, the surveyor should note the exact distances between beams, how many beams are in each room, and where they are located. In some cases, it may be necessary to penetrate the firewalls between rooms to attach structural steel between I-beams in adjoining rooms.

1. Determine the track layout. Mark the attachment points on the ceiling using a pencil.
2. Drill a hole through the finished ceiling at each attachment point.
3. If the track line does not cross under at least two I-beams, extend an imaginary line along the track line so that a laser can be used to shine on any beam that will be used for attachment.
4. Position a plumb laser to mark the position on the I-beam where a clamp will attach. If the system involves curved track, precise clamp locations are not needed. Rather, a structural steel “box” can be built to accommodate a range of attachment points.
5. (A) Use two I-beam clamps to attach a section of Unistrut between two beams OR



(B) Use two U-clamps to secure a small section of Unistrut to the bottom of each beam. Make sure that the open end of the channel is facing down, as a spring nut will be used to attach the threaded rod.

The former method is typically used when the track line runs in the same direction as the beams. The latter method is typically used when the track line runs in the opposite direction of the beams. However, either method can be used in both scenarios (See Figure 8 – Attaching to Steel I-beams)

NOTE: There are a wide variety of I-beams clamps available. Refer to the manufacturer specifications for methods of attachment and load bearing limitations.

6. If method (A) above is used, attach threaded rod directly to the Unistrut. If method (B) is used, suspend threaded rod from each section of Unistrut using a spring nut. The rods can then be joined by another larger section of Unistrut, from which mounting brackets can be suspended.
7. Once the mounting brackets are attached, add lateral bracing where required.
8. Mount the track and accessories. The system is now ready to be load tested.

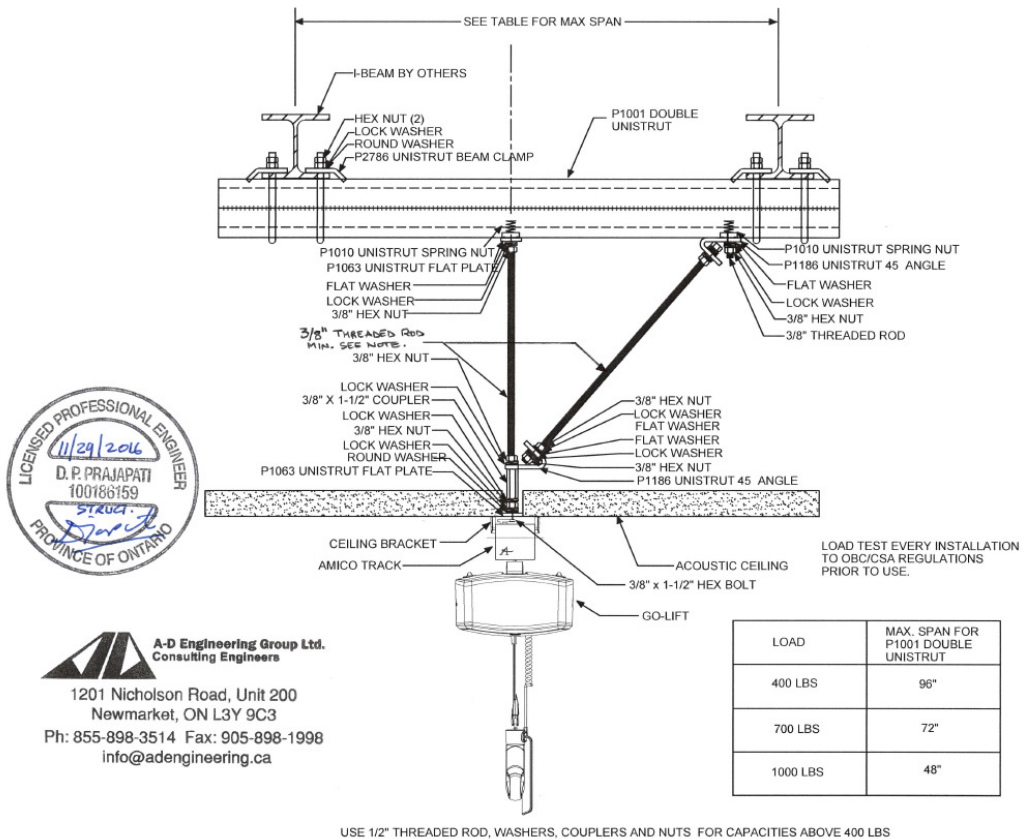


Figure 8 – Attaching to Steel I-Beams

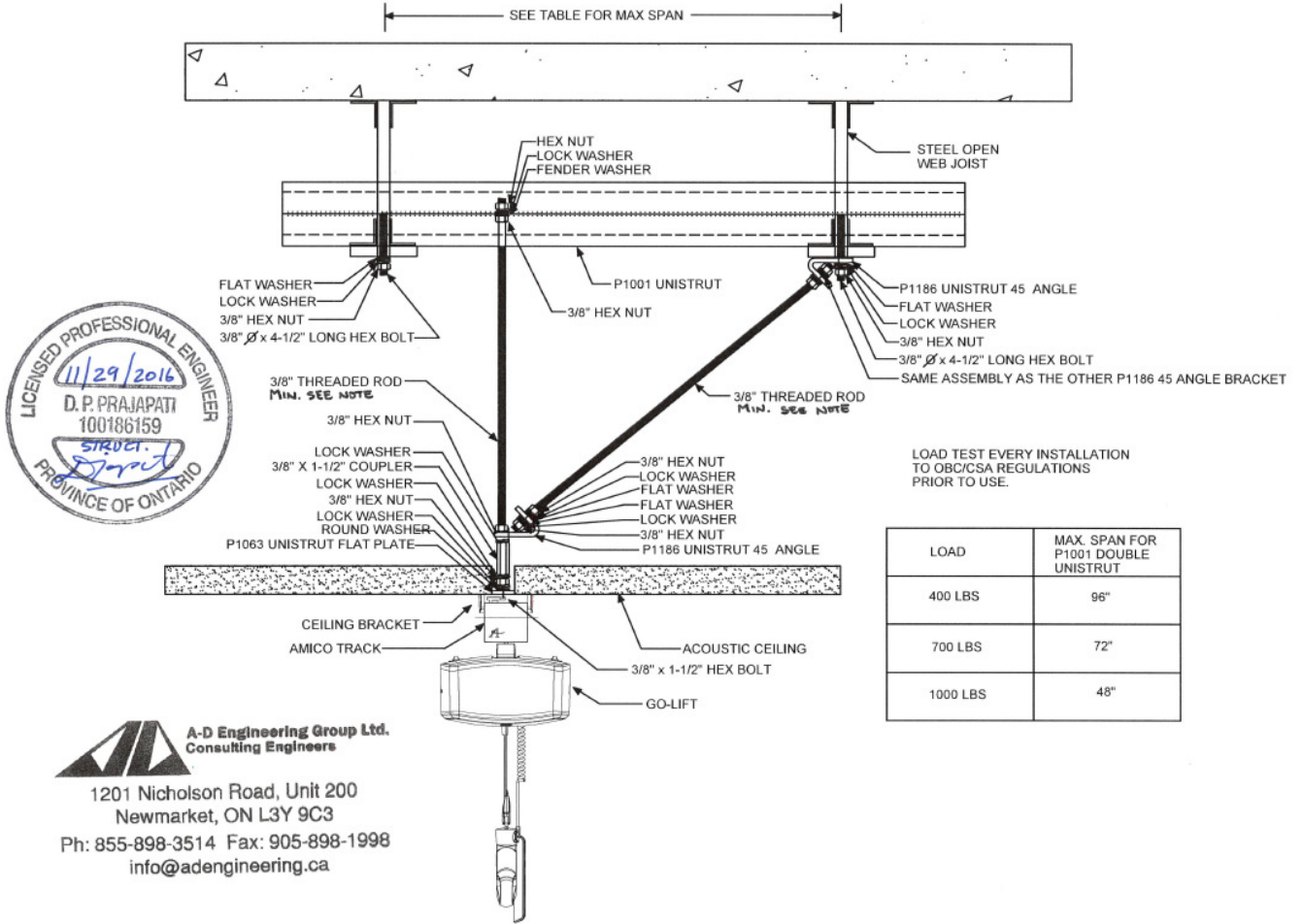


ATTACHMENT TO OPEN STEEL WEB JOISTS

There are a number of different types and sizes of open steel web joists (OSWJ), each with varying load bearing limitations. It is important to know the specifications of the joists before beginning the installation. When possible, obtain input from an engineer to verify the adequacy of the joists for the purposes of the track system.

1. Determine the track layout. Mark the attachment points on the ceiling using a pencil.
2. Drill a hole into the finished ceiling at each attachment point.
3. Determine the spacing between joists, and cut sections of Unistrut approximately one to two feet longer than the span. Lay the sections of Unistrut across the bottom cord of the joist, above the desired track position. Use a plumb laser to accurately gauge the position.
4. Place the plumb laser over one of the drill holes in the ceiling. The laser should shine on the Unistrut at each hole.
5. Threaded rod can now be suspended from the Unistrut. Note: Do not secure the Unistrut to the joists until all rods are suspended and mounting brackets are attached.
6. Attach the mounting brackets to the threaded rod. Make sure the brackets are seated properly and are level. Once all brackets are checked, the Unistrut can be secured to the steel joist. This can be accomplished by clamping the Unistrut, using smaller sections of Unistrut, or, in some cases, the steel joists will have a slot in the bottom cord, through which a long bolt or threaded rod can be used to attach the Unistrut. Whichever method is used, it is very important that all connections are secure. The Unistrut should not be able to move. See Figure 9 – Attaching to Open Steel We Joists
7. Add lateral bracing where required.
8. Mount track and accessories to complete the installation. The system is now ready to be load tested.

Figure 9 – Attaching To Open Steel Web Joists



Note:

- For installations where the threaded rods are shown below the ceiling, use Octagonal Bracing to cover up the exposed threaded rod.
- For additional safety in the event of an endstop failure, drill a hole at the end of track to fit a clevis pin (0.3125" x 2.75") and split ring (0.9375").

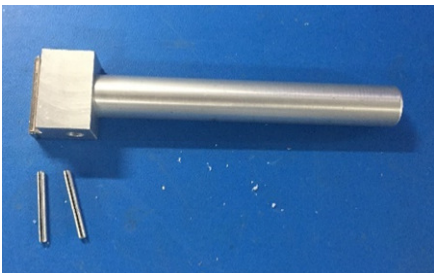


Octagonal Bracing

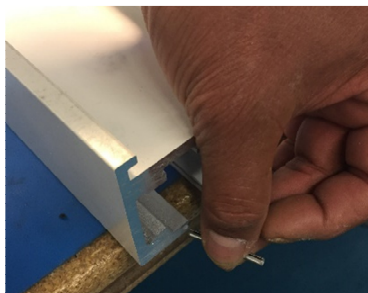


Clevis pin and split ring at end of track

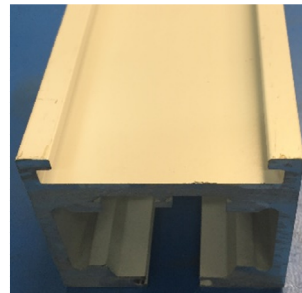
- To join two tracks together use the track joiner tool and a hammer to insert the two pins ("TRK-J-PIN") in the round openings in the profile of the track.

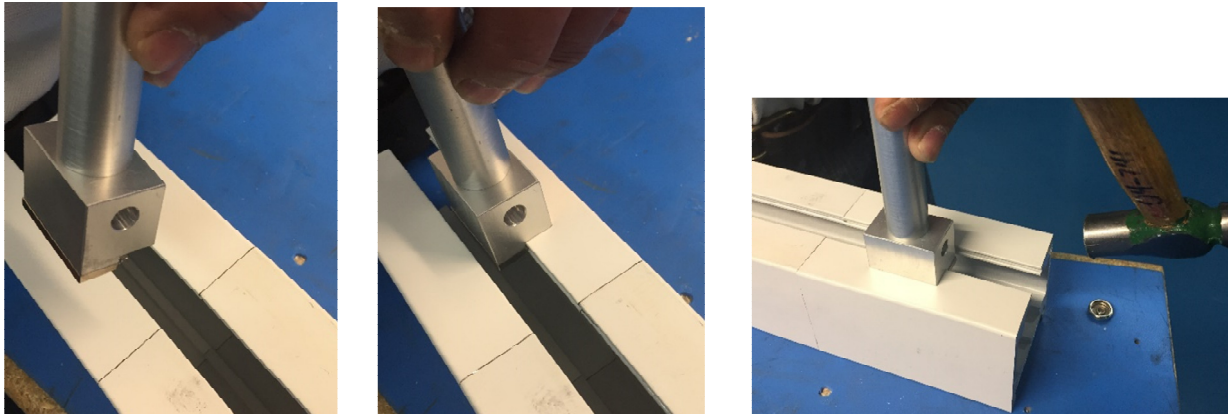


TRK-J-Pins and tool

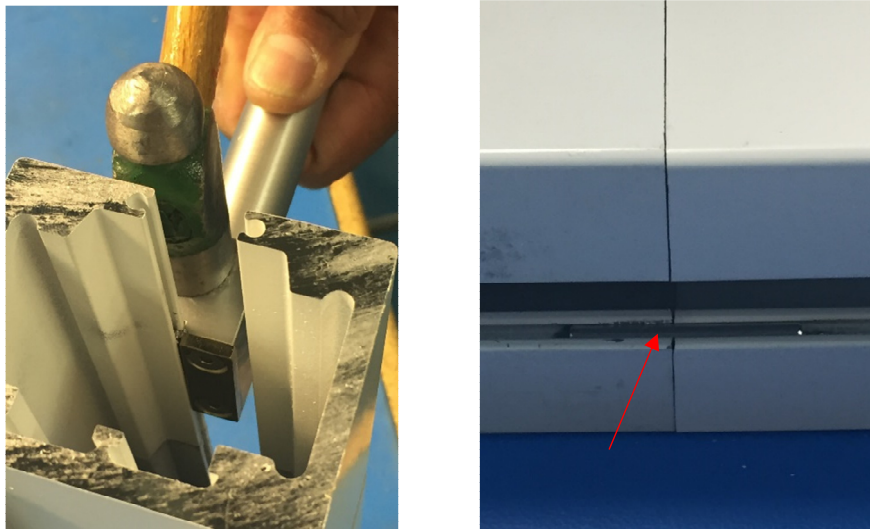


Insert the pins all the way





Align the tool with the edge of the track and use a hammer to slide the pin until it is between the seam in the two tracks



The Pins are now joining the ends of the track together.

ATTACHMENT TO STRUCTURAL WALLS

Wall mounted track systems are typically used when it is not possible to hang from the existing ceiling. Special consideration is required when fastening wall brackets to the walls. Wall mounted brackets can only be attached to structural load-bearing walls. (See Figure 10 – Wall Mount Bracket). There are a number of different types of structural walls, each requiring a specific anchor type. Extra care should be taken when preparing to attach each bracket. Use a laser to make sure the brackets will be level. If the track system is an XY configuration, make sure that the brackets are evenly spaced between parallel tracks, as to prevent any potential for the gantry to bind.



ATTACHING TO CINDERBLOCK:

There are three anchoring options when attaching to cinderblock walls.

1. Epoxy anchors can be used in any hollow portion of the block, as well as through the mortar. Refer to the manufacturer specs for application instructions and cure times. Remember that the epoxy must cure 100% before a load test can be performed on the track system.
2. Sleeve anchors or lag shield anchors can be used, but are not recommended if the track span exceeds (a) 92" with Single Track (b) 149" with Double Track (c) 262" with Triple Track. These anchors are intended for use in hollow blocks.
3. The mounting bracket can be attached by drilling through the structural wall and using a back plate on the opposite side of the wall. A back plate is simply a small steel plate (1/4" thick) with mounting holes that mirror the holes on the mounting bracket. The plate should be painted to match the colour of the wall. Connect the plate to the bracket using long bolts or threaded rod. In the rare event that the opposite side of the wall is a room that is also being tracked, and the position of the back plate is a suitable location to mount, a mounting bracket can be used instead of a back plate.

ATTACHING TO SOLID CONCRETE WALLS:

If the wall is solid concrete, a drop-in anchor or a wedge anchor can be used refer to the manufacturer specs to determine the pullout value of the anchor. Since the anchor is being used horizontally (into the wall), rather than vertically (into the ceiling), the type and amount of stress that the anchor causes on the concrete is not the same. The former causes "shear force", while the latter causes tensile force.

Tensile Force is force that is applied in the direction of the anchor length. In other words, a concrete anchor that is inserted vertically into concrete will undergo stress, as the load is also vertical.

Shear Force is force that is applied in a direction that is opposite of the anchor length. In other words, a concrete anchor that is inserted horizontally into concrete will undergo shear stress, as the load is vertical.

ATTACHING TO STUD WALLS:

Wood studs are considered to be structural studs, as long as they are at least 2" x 4" studs, and are attached to both the top and bottom cord of the frame. Most wood studs are spaced 16" apart, but it is important to confirm the spacing during the initial assessment, to ensure that the appropriate back plate is selected. The back plate attaches directly to the wall and must span and anchor into at least three studs. The plate can be made of steel, wood, or any structural material that can support the load. Mounting holes are needed at the stud locations (using two anchors per stud), and where the wall mount bracket will attach. The wall mount bracket should be positioned between two studs for optimal weight distribution.



1. Use a stud finder to locate the position of the wall studs, and determine the spacing between them.
2. Use a small drill bit to locate the edges of each stud. Mark the center of each stud at the height that the back plate is to be mounted. Do this twice for each stud, so that a line can be drawn along the length of each stud.
3. Hold the back plate against the wall at the desired height and line up the mounting holes with the lines that you have drawn. Trace the mounting holes onto the wall.
4. Drill pilot holes at each of the anchor locations. The pilot holes should be drilled approximately two thirds of the way into each stud. For example, if drilling into 2" x 4" studs, the pilot hole should be approximately 2 ½" deep (not including the thickness of the drywall). Make sure that the hole is drilled as straight as possible and that it is centered in the stud.
5. Attach the wall mount bracket to the back plate.
6. Hold the back plate against the wall and line up the mounting holes with the pilot holes. Secure a lag screw into each hole and tighten the back plate so that it is snug against the wall. Do not over torque the screws, as this may cause to damage to the drywall.
7. Repeat these steps for each wall mount bracket. Use a laser to make sure that all brackets are level.
8. Mount the track and accessories to complete the installation. The system is now ready to be load tested.

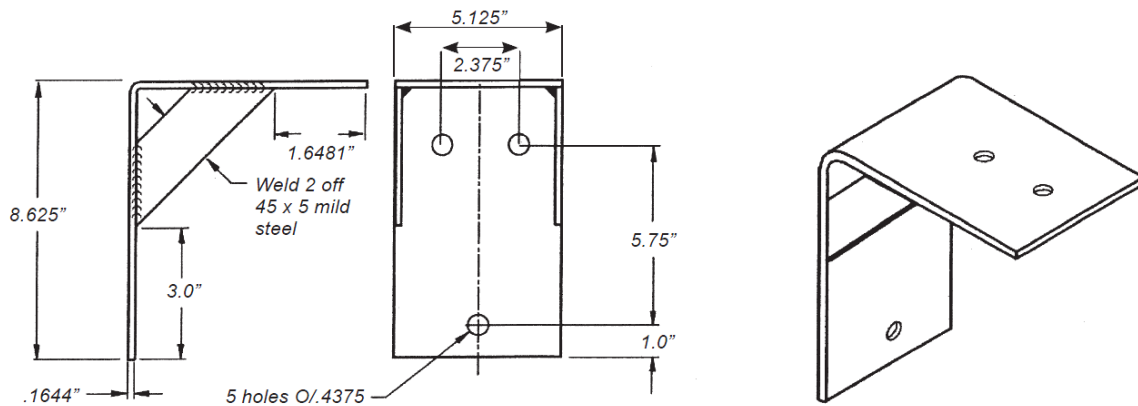


Figure 10 – Wall Mount Bracket

Note: Brackets can only be fixed to solid walls.



ATTACHMENT TO NON-STRUCTURAL WALLS

When attaching to walls that are not structural walls, a post system is used instead of a wall mount bracket. The wall post is attached to the wall, but the anchors used to attach it do not bare any load. Their purpose is simply to brace the post against the wall, while the load is borne by the post itself. In other words, the load is transferred down the post and is absorbed by the floor.

1. Use a rotational laser to shine a beam at the desired post height in the room.
2. Cut the first post to length, attach the post foot and hold the assembly against the wall in the desired position.
3. Hold a 4' level against the side of the post and adjust its position until the post is level. Trace each mounting hole onto the wall using a pencil and remove the post.
4. Using the appropriate sized drill bit, drill holes at each anchor point.
5. Insert a drywall toggle anchor into each hole. Zip toggles are ideal for this application, as they hold themselves in place while the post is being lined up.
6. Hold the post against the wall so that the mounting holes are lined up with their respective toggle anchors. Starting at the top of the post, screw the appropriate sized bolt into each toggle anchor. Do not tighten the bolts until all are in place. Tighten only until snug. Do not over-torque the bolt, as this will put added stress on the drywall, which can cause it to crack.

LOAD TESTING

After the installation is complete, the system must be load tested to 125% of the maximum load stated on the label of the ceiling lift. Once loaded with the test weights, the lift must be traversed along the entire track system to qualify the integrity of the installation.

To measure track deflection, only 100% of the SWL is used. Position the load directly between two attachment points. Light the weight, and measure the amount of track deflection using a laser. The track may only deflect 1" for every 200" of unsupported track (1:200 ratio)

After the load test has been completed, the Amico Final Inspection Checklist must be filled out. This form must be signed by both the Installer and the customer.



CHECKS BEFORE LEAVING SITE

Ensure that:

1. All brackets have been tightened using an Allen key.
2. All end stops are tight & end stop pins in place on tracks.
3. The tracks and lift are clean.
4. The lift is in full working order.
5. The entire length of the track has been load tested to 125% of the SWL and that the load test sticker is on the side of the track.
6. The site is clean and tidy and that all furniture and ornaments, etc., are back in their original places to the satisfaction of the occupant/facility.
7. The load test certificate is completed and signed by the client.
8. Charger operation is validated.
9. The lift Installation / repair / service / inspection sheet has been completed and signed and a copy left with the client.
10. The client has been given an explanation and a copy of the operating instructions for the lift, a copy of the load test certificate, a copy of the delivery note and of the details of the warranty and servicing.
11. The client has signed all the relevant forms.



GENERAL INFORMATION

Bracket Spacing Requirements

- This chart applies to straight sections of track only.
- All ceiling mounted track sections must have a minimum of two (2) brackets.
- All curved tracks must have a minimum of three (3) brackets. The middle bracket is 3" and two 6" brackets connecting the ends.
- Make sure that all edges of tracks are without debris or excess powder coat in the running surfaces to ensure smooth GoLift/trolley traversing.
- Use 6" brackets with structural drop to join two tracks.

Amico Ceiling & Gantry Track Span			
Lift Capacity (lb)	Regular Track (in)	Double Track (in)	Triple Track (in)
400	92	149	262
700	60	106	189
1000	44	93	166

- 1) Service load = rated lifting capacity (400, 700, 1000 lbs).
- 2) Factored load = 125% test load of the rated lifting capacity (400 X 1.25% = 500 lbs)
- 3) Maximum deflection = $L/200$ (where "L" is the span between supports). A 96" span = 0.48" maximum deflection. Note: deflection should only be measured under Service Load and not the Factored Load.
- 4) The table values are at the maximum and installers are allowed to use smaller spans as required.



INSTALLATION OF 3" CEILING BRACKETS

Place the ceiling brackets (with two jib keys installed) with the two screws facing outwards. Use a 3mm T-Handle to tighten the screws. Make sure that ALL screws in the brackets are facing the same direction (outwards).

Make that the ends of the track are flushed which each other by removing any excess powder coating to ensure smooth GoLift/trolley traversing.



Figure 11 – 3" ceiling Bracket



Figure 12 – Note orientation of ceiling brackets

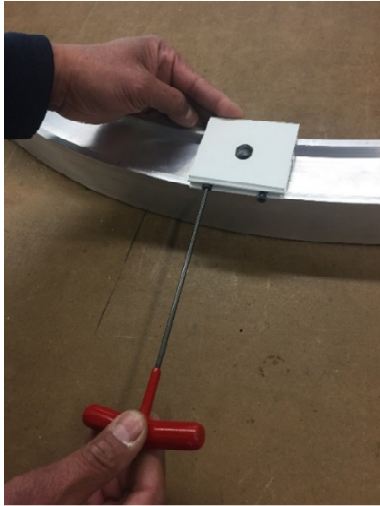


Figure 13 – Tighten with 3 mm T-Handle

INSTALLATION OF 6" CEILING BRACKETS

Place the ceiling brackets (with two jib keys installed) with the two screws facing outwards. Use a 3mm Allen key to tighten the screws. Make sure the ALL screws in the brackets are facing the same direction (outwards).

Make that the ends of the track are flushed which each other by removing any excess powder coating to ensure smooth GoLift/trolley traversing.



Figure 14 – 6" bracket



Figure 15 – Tighten with 3mm T-Handle



TURNTABLE

The Amico Turntable is ideal for situations where junctions are required in a track or when a track turn is required that standard curved sections cannot accommodate.

The Amico Turntable provides the end-user with ultimate flexibility in lift and transfer situations that demand a wide range of locations, or require specialized options. Whether used in a multi-user institutional environment or in a private residential setting the turntable provides different ceiling take-off points that will meet the requirements of even the most demanding situations.

The Amico turntable has 4 possible exits which allow great flexibility for the system designer and gives the user more options for the installation. An adaptation that is being planned can be designed around the angles of the turntable. For instance, a turntable in a bathroom could be positioned so as to allow transfer between chair, bath, wheelchair, shower area and or changing stretcher.

BEFORE INSTALLATION:

Take the following into account when selecting the position for the turntable:

- You will need to be able to fix at a minimum of four equally spaced points round the outside of the turntable. The station where the pull cord is situated on a manual turntable is not a fixing point.
- When choosing installation position, ensure that a clear space can be maintained around the turntable, GoLift and track.
- At the end of each fixed track, connecting to a turntable, create a ramp by filing the edge so as to ensure a smooth traversing when trolley moves through the tracks.



Figure 16 – File the edges of the track

TURNTABLE COMPONENTS:



TURNTABLE INSTALLATION

When choosing installation position, ensure that a clear space can be maintained around the turntable, hoist and track,

When installing a turntable, the turntable should be fitted first and the track then fitted from the turntable.

Curves that come directly from a turntable must not be cut back past the straight section otherwise the GoLift will not pass from the turntable to the track. A minimum of 4" (100mm) of straight track must be left on the bend.

SETTING UP THE TURNTABLE

1. Determine the take-off points you will need

Note: The turntable is provided with angle brackets, two of which are fitted with stops. These two brackets are referred to as stop brackets. Unless otherwise specified the turntables are supplied with the stop brackets set in a position to turn through 90 degrees.

2. If it is desired to position the take off track through another angle, exchange the positions of the stop brackets with the respective ordinary angle bracket so that the rubber bumper/micro-switch is on the side of the bracket where it will stop the travel of the turntable track.
3. If it is desired to take more than one exit option from the turntable then this position must be between the two stop brackets. The turntable locks into position through correct alignments of the turntable track with the chosen take off track. More careful operation of the turntable is required. Remove the angle bracket opposite the take-off points and reposition them in the empty bracket spaces available (having more than one take off point will result in a spare angle bracket)



4. If the desired take off points mean that the same station is to be used for two stop positions, remove the stop block from the second stop bracket and attach the stop block to the first stop bracket, above its existing stop block through the upper two slotted 1/2" holes in the stop bracket.

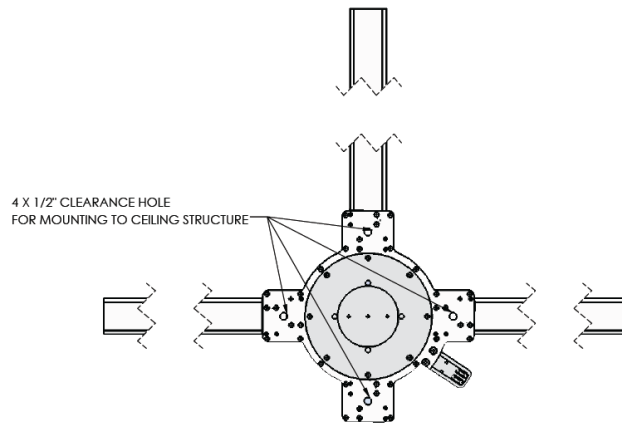
INSTALLING THE TURNTABLE

The turntable can be supported in a variety of ways, but must always be supported at 4 points that are evenly distributed to prevent the back plate from twisting when under load.

1. Mark the central point where the unit is to be mounted. This is usually done either using a template, the base itself or by using a chalk-line to mark the ceiling to form a cross.



Typical Installation using Unistrut hardware and 1/2" (12.7 mm) threaded rods.



Location of 4 x 1/2" (114.3 mm) holes for the 1/2" (12.7 mm) threaded rods

2. Once this has been done the turntable or a template can be offered up to the ceiling to enable the fixing holes to be marked (these are most commonly the holes that fall exactly between the bracket mounting points on a standard 90° installation. To accurately position the turntable on the ceiling, the pencil marks that were made earlier should be visible through the holes in the turntable plate. Once all four marks are visible, these should be marked and drilled.
3. Secure turntable to ceiling with appropriate hardware (e.g.: threaded holes, lag bolts – See general installation manual).

Note: If it is desired to use a fixing point at a take of position, it is possible to attach through the slotted track bracket to be fitted to the turntable.

WHEN SECURING THE TURNTABLE IT IS IMPORTANT TO KEEP THE TURNTABLE LEVEL



If the ceiling/joists are misaligned in some way, it may be necessary to introduce shims under the turntable base plate. We suggest you do not completely tighten the hardware until you are sure the turntable will be level. After securing, check turntable is level, if not, the operation of the turntable will be affected.

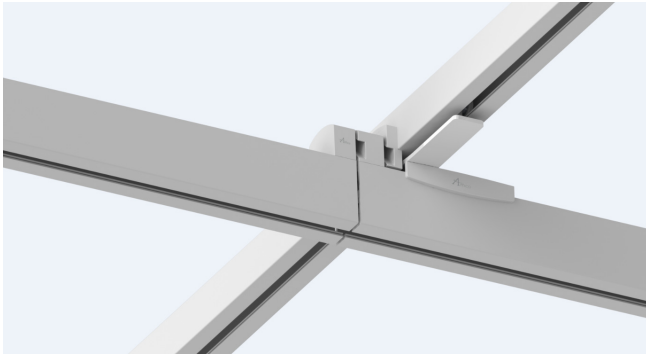


Typical turntable installation with Unistrut hardware and 1/2" threaded rods.

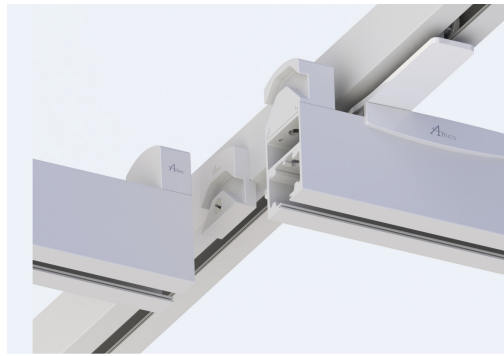
TRANSFER GATE

The transfer gate is an H system gate that permits a GoLift to travel between an H -System travelling track and a fixed track. A low-maintenance, mechanical device, the transition gate has a double failsafe action to ensure that the gate will only open when the two tracks are properly aligned and locked together.

Track References:

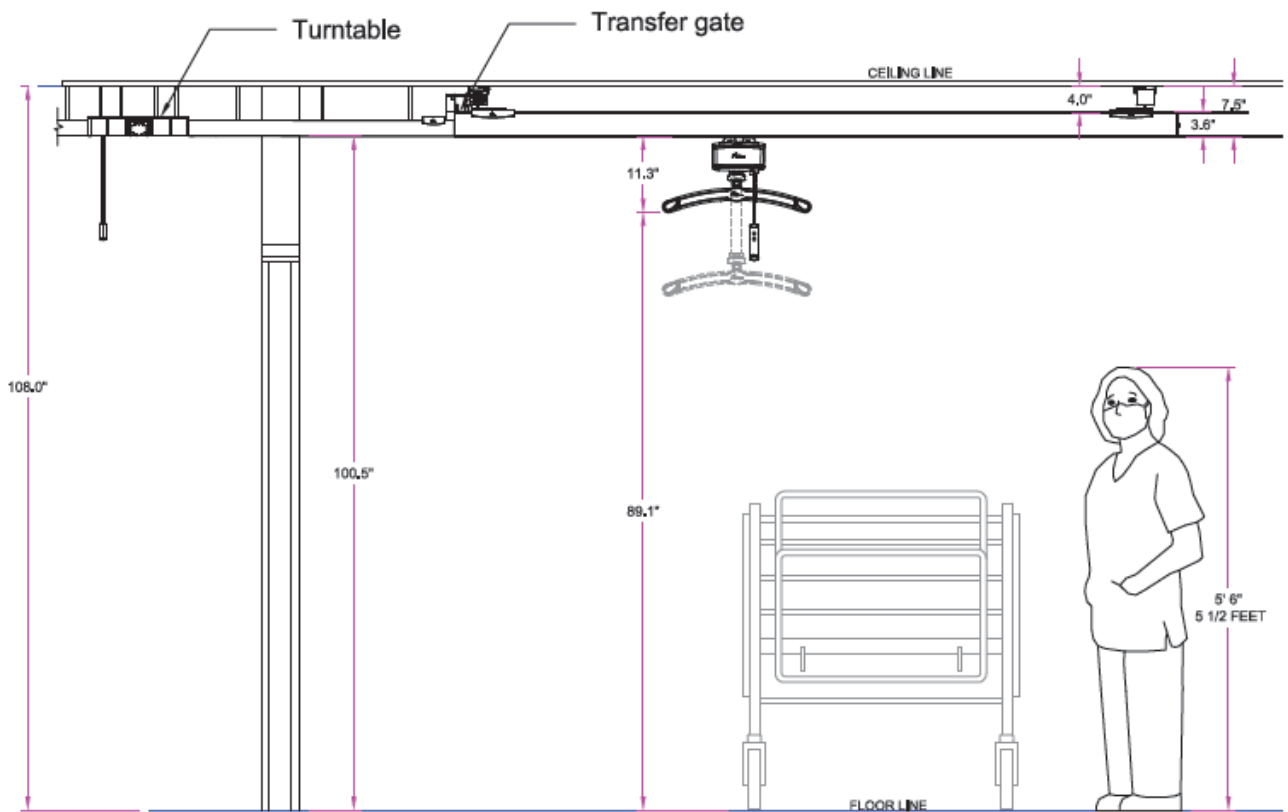


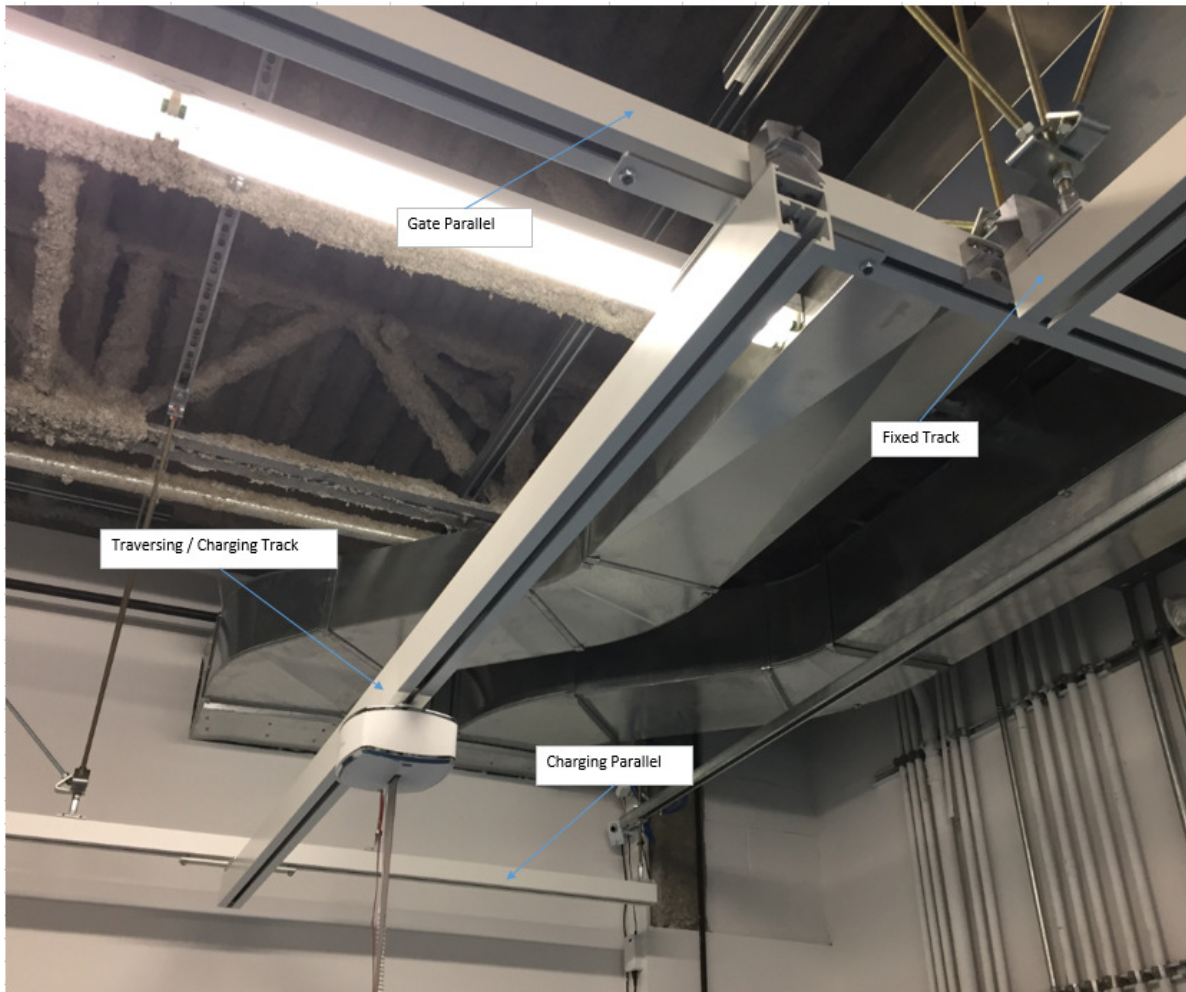
Closed Gate



Open Gate

Typical Amico Transition Gate Installation





Transfer Gate and Track Components

The transfer gate has two blocks, one mounted to the traversing/charging track of the H system and the other to the fixed track. To eliminate relative movement between the blocks under dynamic load, the fixed track must be suspended from a rigid ceiling such as concrete, timber or steelwork.

The end of the traversing track carrying the linear bearing block extends 80mm beyond the center of the Gate parallel. This distance cannot be altered (except for minor adjustment) after installation.

The ends of the fixed track and the traversing track must have no less than 1mm and no more than 2mm gap between them when aligned. This means that the fixed track must be positioned in its brackets appropriately. It is recommended that no more than 5" (125mm) of track is unsupported beyond the last bracket.

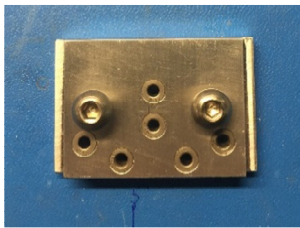
Note: the quality and stability of the fixed track is paramount for the smooth operation of this system. It is therefore advisable to have the second bracket from the end of the fixed track positioned a maximum of 450mm from the first bracket.



The charging assembly cannot be positioned at either end of the parallel on which the gate is positioned (i.e.: Gate parallel) and must be positioned on the charging parallel track.

Installing the Transfer Gate components unto the Tracks:

1. Use the supplied jig to drill the required holes in the fixed track and the traversing track. Tighten the screws using a 5/32" Allen Key. Drill the front holes size 15/64" (0.232") in the fixed track as shown to mount the "Track Gate Fixed Track Lock Pin Housing". Drill a larger hole 0.550" in the track for the gate pin.



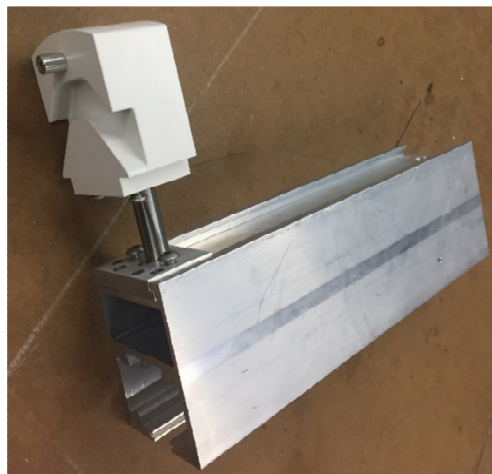
Installation Jig



2. Mount the jig onto the Traversing track and drill the second set of holes so that the "Track Gate Ceiling block" lines up with the holes in the track.



Track Gate fixed Track Lock Pin Housing



Track Gate Ceiling Mount Block



3. Install the two H-System parallel tracks (Gate and Charging) so they are parallel and level, leaving the bracket screws untightened at this stage in order to give some adjustments if required.

Note: If the installation is up to the wall, remember to place the H-System trolley sets, charger and required endstops onto the parallels before installing onto the ceiling.

4. Cut the fixed track and the traversing track to the required lengths, taking into account:
 - a) The overhang on the travelling beam is 3" from the center of the parallel track and;
 - b) The tracks need to pass each other with a minimum of 1/16" and maximum of 1/8" between them.
5. Measure from one end of the Gate parallel to the center of the desired position for the fixed track and mark the outside of the track with a vertical line.
6. Take the template supplied and place it on the top of the marked Gate parallel and position it so that it is central to your mark. Drill through the three holes on the template with the supplied self-tapping screws.



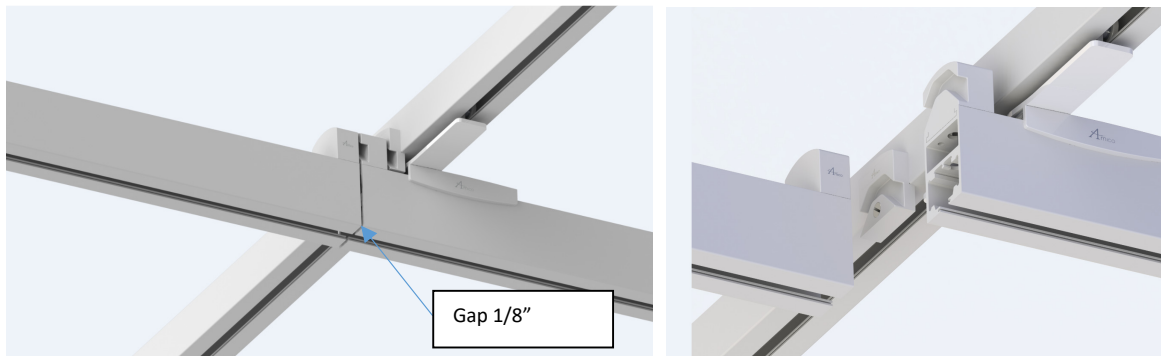
Track Gate Ceiling Mount Block

7. Slide the trolley set onto the Gate parallel.
8. Place the charger into the end of the charging parallel and fasten the endstop bolts.
9. Mount the traversing track onto the two trolley sets and set the drilled end of the traveling beam to the 3" overhang, leaving the bracket screws loose for adjustment.
10. With a laser level or string line, mark the position of the fixed track ensuring that it will be square to the traversing track when the two tracks meet. Install the relevant fixings.

Note: It is essential to ensure fixed track and travelling track are level with each other.



11. Mount the fixed track to the ceiling, including end stops if appropriate. Ensure that it is rigid. There should be a gap between the two tracks of about 1/8"



Note:

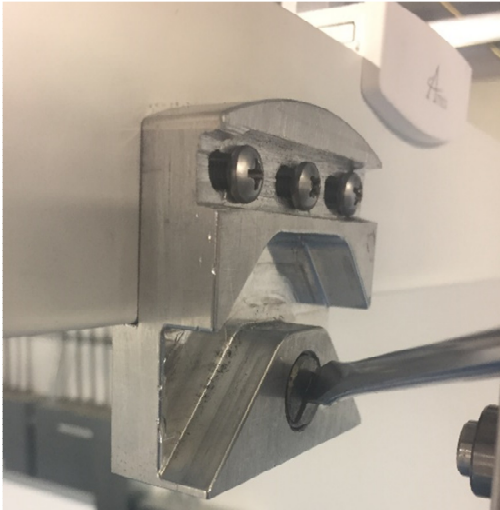
- a) Only minor adjustments can be made via the travelling track.
 - b) The quality and stability of the fixed track is paramount for the smooth operation of this system. It is therefore advisable to have the second bracket from the end of the fixed track positioned a maximum of 18" from the first bracket.
12. Move the travelling beam so it clicks into place in line with the fixed track (i.e.: - close the gate). If the two tracks do not line up slide the Gate parallel through brackets until they do.
 13. Check the tracks (travelling and fixed) are level. If they are not, the fixed track needs adjustment through its fixings.
 14. Tighten all bracket screws and apply track lock brackets to all tracks.



SETTING THE BALL SCREW

The ball screw tension will require setting to give the appropriate amount of force to open and close the gate.

This is done by adjusting the screw on the back of the aluminum block installed on the Gate parallel. Once set, the lock nut on the back of the ball screw must be tightened.





TESTING AND ALIGNMENT

Once the transition gate is installed and the GoLift is on the travelling beam, the system should be weight tested to 100% of the safe working load (SWL) to comply with the ISO10535 standard along the whole of its length including passing through the gate. We recommend where possible, the system should be tested to 125% of its safe working load along all of its length. The deflection should be measured on the travelling track and checked for compliance.

Note: Alignment of the two tracks is critical with or without load. In the case of too much movement in the ceiling itself, the gate could become difficult to operate and may require extra fitting/bracing above.

LOAD TESTING

After the installation is complete, the system must be proof tested to 125% of the maximum load stated on the label of the lift. Once loaded with the test weights, the lift must be traversed along the entire system to qualify the integrity of the installation.

To measure track deflection, only 100% of the SWL is used. Position the load directly between two attachment points. Lift the weight, and measure the amount of track deflection using a laser. The track may only deflect 1" for every 200: of unsupported track (1:200 ratio)

After the load test has been completed, the Amico Final Inspection Checklist must be filled out. This form must be signed by both the installer and customer and a copy is provided back to Amico.

ELECTRICAL CONNECTION

In most cases, the lift systems' wiring is taken from the premises ring main circuit. Although this only involves basic wiring, every care must be taken to ensure that all wiring and connections are in line with the current state or local regulations. All wiring should be done in such a manner that it is agreeable with the client. It is advisable to consult the client as to the positioning of any switches and the routes of any surface mounted conduit.

IMPORTANT NOTES:

All wiring to comply with the current edition of the state and local regulations.