Subject: Latitude® Arm System (P662C)—Installation Instructions

Tools required:

Ratchet	Hacksaw or power mitre box
Drill	Safety goggles
Tape measure	Level
Ladders	Wire cutters
Phillips head screwdriver	Torx®[1] screwdriver set
1/4" hex wrench	5/16" hex wrench
3/8" hex wrench	9/16" open end wrench
9/16" socket	11/32" open end wrench
3/4" open end wrench	3/4" socket
7/8" open end wrench	Jigsaw or tin snips
Adjustable pliers	Wire pulling compound
Anti-static strap	Brazing equipment and supplies
As-built drawings	3M™[2] Tape Primer 94

Torque wrench (5–75 ft-lb (6–102 N·m) range) w/socket for 3/8" hex wrench

Lifting device capable of lifting 600 lb (272 kg). 30" (76 cm) above the floor (for example, Lift-Rite®[3] Ergonomic 3000 or equivalent)

Parts required:

WittRock Healthcare supplies the following parts:

(1)	P662C010X	Rough-in
(1)	P662C016X	Manifold
(1)	P662C02X0	Wall structure module
(1)	M662C0250	Wall services chassis
(1)	M662C0X00	Upper arm
(1)	M662C0X02	Lower arm (optional)
(1)	M662C0500	Covers
(1)	M662C0600	Front panel

The installing contractor must supply the following parts:

(AR)	Copper tubing
(AR)	Floor anchoring hardware (as specified in the *Latitude® Arm System Design and Application Manual* (136745)
(AR)	Electrical hardware (per local codes and standards)

NOTE:

The same mounting plate is used for **all** configurations of the Latitude® Arm System.

The mounting structure is **not** provided by WittRock Healthcare.

The installing contractor must follow all applicable local, state, and national codes.

Reference Documents: *Latitude® Arm System Design and Application Manual* (136745)

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.
2. 3M™ is a trademark of 3M Company.
3. Lift-Rite® is a registered trademark of Lift Rite, Inc.

Structural Loading Requirements

WARNING:
The structural support system must be designed by a certified structural engineer to the correct specifications. Failure to do so could cause injury or equipment damage.

Refer to the *Latitude® Arm System Design and Application Manual* (136745) for structural requirements that must be met before proceeding with the installation.

System Installation

Follow each section in its entirety. Keep these instructions, as the complete system installation may not be completed all at once.

Install the Rough-in Plate

Time required to install the rough-in plate is approximately 45 minutes.

Figure 1. Attaching Parts: Rough-In and J-Box Cover

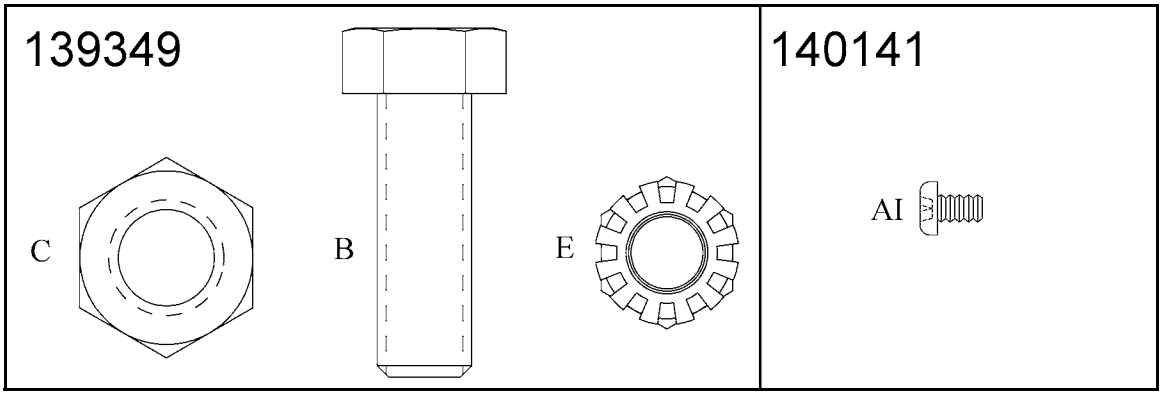


Table 1. Rough-In Bag #139349 and J-Box Cover Bag #140141

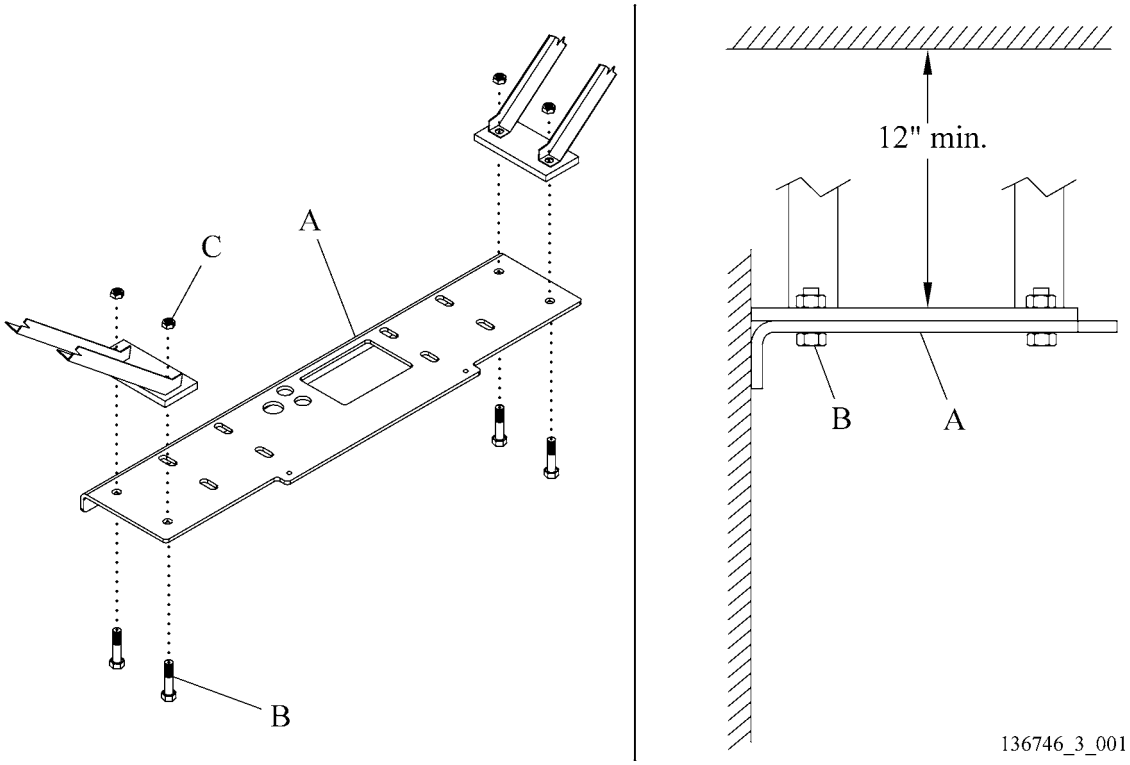
Callout	Part Number	Qty	Description
Bag #139349 (located in box with rough-in components)			
B	137724	4	Hex bolt, 1/2–13 x 1.5
C	137725	4	Locknut, 1/2–13
E	137945	6	KEPS nut, 3/8–16
Bag #140141 (located in box U-1 with upper arm)			
AI	393	4	Screw, #8–18 x 11/4 (J-box cover)

1. Find the anchor points on the overhead support structure where the rough-in plate (A) is being installed (see figure 2 on page 3).

Ceiling Height	Finished Floor to Rough-in Plate
8' to 8' 5 15/16"	106" to 124" (269 cm to 315 cm)
8' 6" to 10'	112" to 130" (284 cm to 330 cm)

2. Make sure the rough-in plate (A) is in the correct orientation, as shown below.

Figure 2. Rough-in Plate Installation



3. Position the rough-in plate (A) so the flange on the plate is flush with the finished wall.
4. Install the four hex bolts (B) and locknuts (C) to secure the rough-in plate (A) to the structural overhead support.
5. Make sure the rough-in plate (A) is level.
6. Tighten the nuts (C) firmly.

Install the J-Box

1. Install the two pieces of 3/8"-16 all-thread (D) in the front corner locations of the rough-in plate (A) (see figure 3 on page 4).
2. Install one KEPS nut (E) from above, and tighten against the top of the rough-in plate.

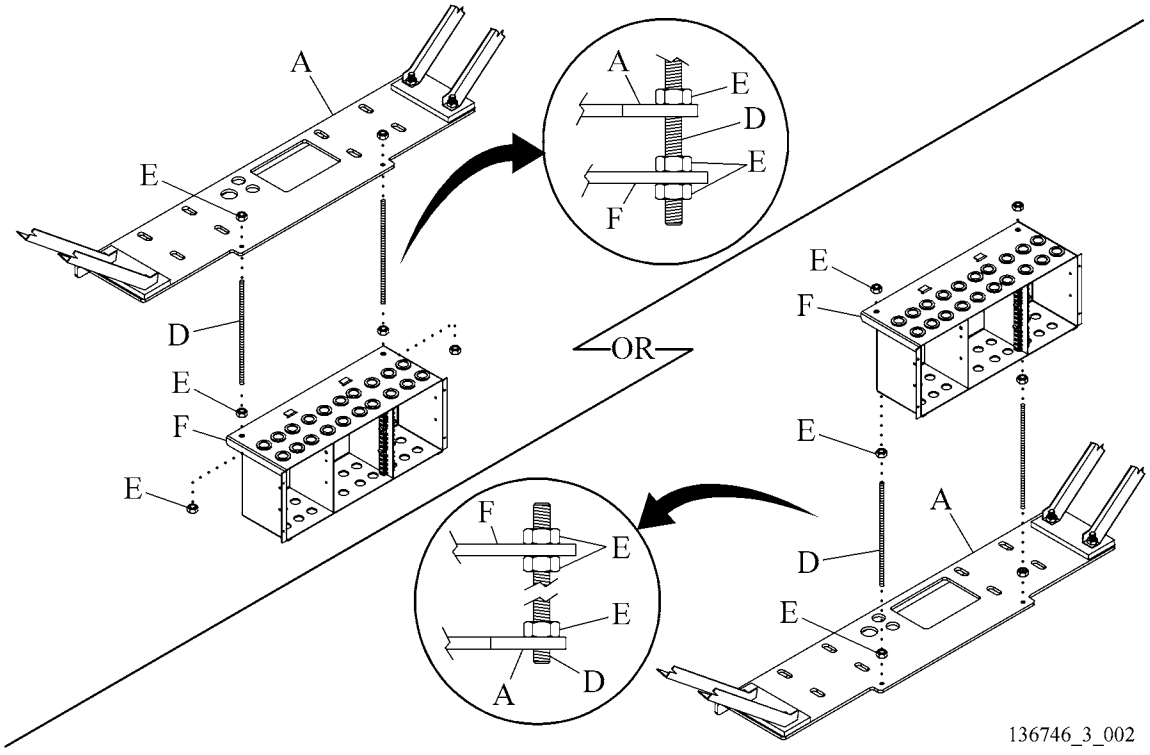
NOTE:
The J-box can be attached either above or below the rough-in plate, depending on the ceiling height and structural requirements.

NOTE:
Failure to mount the J-box at the correct height could cause interference with installation of other system components.

3. Adjust position of the J-box (F) on the all-thread (D) so that the **bottom** of the box is:

   a. 113 3/8" (289 cm) above finished floor (AFF) for ceiling heights of 8' 6" (259 cm) to 10' (304 cm),
   or
   107 3/8" (273 cm) AFF for ceiling heights of 8' (244 cm) up to 8' 5 15/16" (259 cm).

Figure 3. J-Box Installation



4. Attach the J-box (F) to the all-thread (D), with one nut (E) above and one nut below the flange.

5. Make sure the J-box (F) is level.

NOTE:
The J-box cover and screws are shipped in a separate box, U-1, with the upper arm (see figure 9 on page 13).

NOTE:
If additional or replacement all-thread is needed, use 3/8"-16 x 14" (36 cm) L.

Install the Manifold

Time required to install the manifold is approximately 30 minutes.

NOTE:
Make sure the rough-in copper lines have already been installed through the rough-in plate.

1. Slightly loosen the vacuum caps on the connections that will be used before installing the manifold (G) (see figure 4 on page 7).

NOTE:
Failure to mount the manifold at the correct height could cause interference with installation of other system components.

2. Attach the manifold (G) to the wall with two supplied screws (H) so the **bottom** of the manifold is at the following height:

   a. 86" (218 cm) AFF or ceilings 8' (244 cm) up to 8' 5 15/16" (259 cm),
   or
   92" (234 cm) AFF for ceilings 8' 6" (259 cm) to 10' (304 cm).

NOTE:
Depending on the wall construction, use different screws or anchors (supplied in accessory bag) if necessary.

3. Make sure the protective caps remain on the gas manifold (G).

Install the Gas Risers (If Necessary)

1. Refer to the supplied as-built drawings to determine if the unit configuration must use the medical gas risers to supply the gas outlets. If a gas riser is not necessary, the flexible gas hose will connect to the supplied gas manifold (Medical Air and Oxygen only).

2. After you install the rough-in plate (A) (see figure 5 on page 8), mount the medical gas risers (B) in the rough-in plate (A) with the supplied gas riser mount plate (C).The gas riser plate (C) will snap into the square hole in the rough-in plate (A).

Make the Facility Connections

WARNING:
Do not cross-connect the medical gas types or vacuum systems. Injury and equipment damage could occur.

1. Install the contractor-supplied service drops for medical gas and vacuum lines. Make sure the correct lines match the corresponding riser tubes:

   - For gas label and color codes in the **United States**, refer to table 2 on page 8.

2. At each gas riser and the gas manifold, do the following:

   a. Remove and discard the plastic cap from the end of the tubes being brazed.

   b. Prepare the tube for brazing in accordance with the latest edition of the National Fire Prevention Association®[1] (NFPA®) NFPA® 99 for United States installations.

CAUTION:
Do not expose the riser tubes to excessive heat. Equipment damage could occur.

   c. Wrap a wet sponge or cloth around the copper tube beyond the braze joint to reduce conduction of heat.

   d. Braze the tubes to the facility's service drops in accordance with the latest edition of the NFPA® 99 for United States installation.

1. National Fire Protection Association® and NFPA® are registered trademarks of National Fire Protection Association, Inc.

Figure 4. Manifold Installation

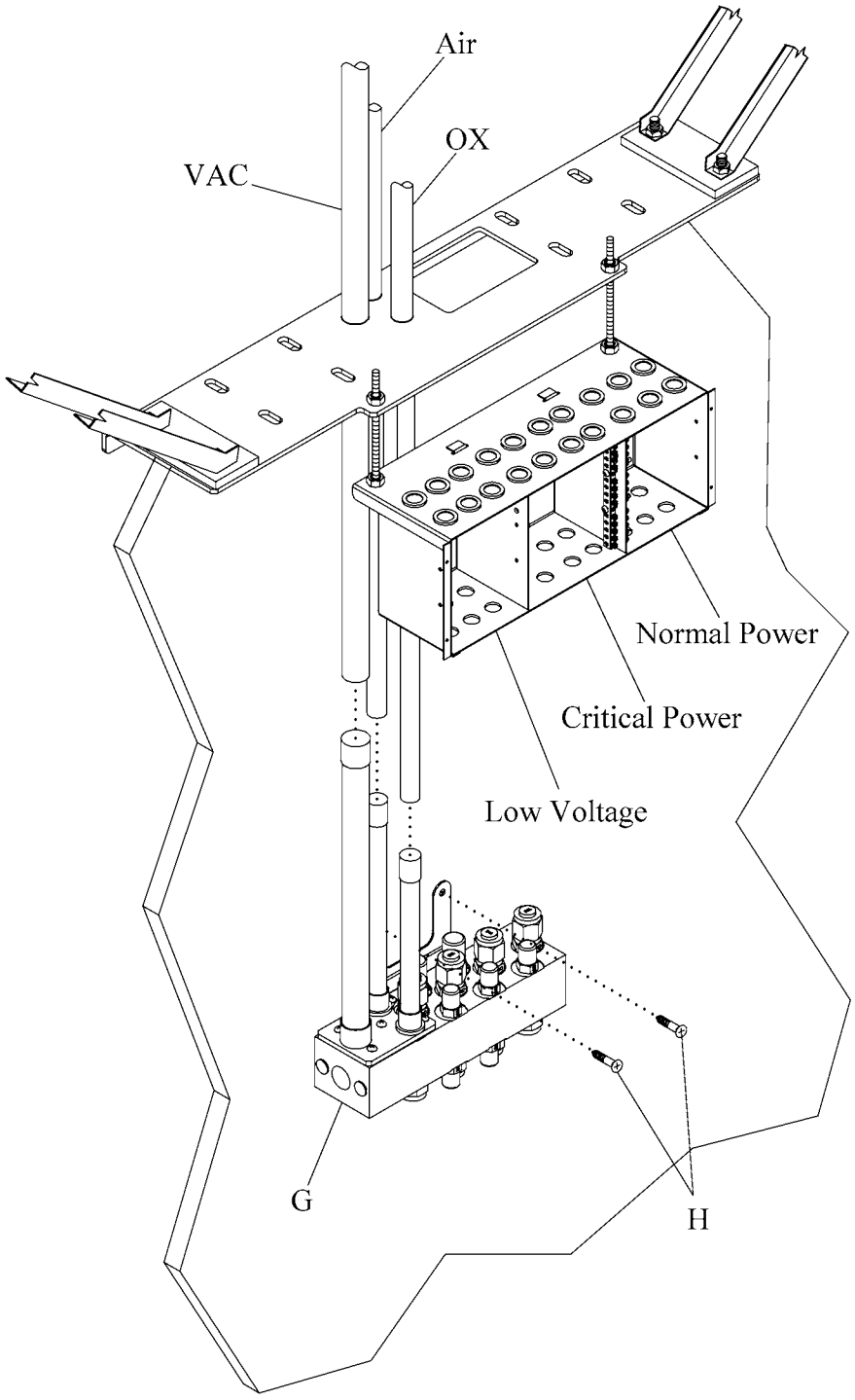


Figure 5. Gas Riser Installation

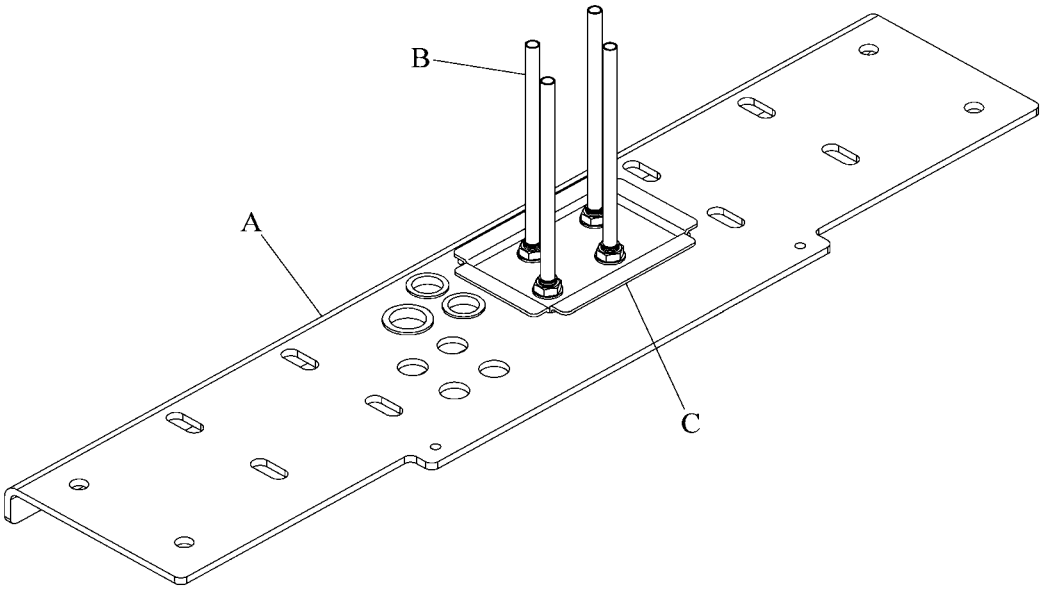


Table 2. Gas Label and Color Codes for the United States

Gas Service	Hose Color	Label
Oxygen	Green	White lettering, green background
Med-Air	Yellow	Black lettering, yellow background
Med-Vacuum	White	Black lettering, white background

SHOCK HAZARD:
The potential for electrical shock exists with electrical equipment. Failure to follow facility protocols may cause death or injury.

SHOCK HAZARD:
Make sure there is no live electricity connected to the wires in the facility conduit. Injury or equipment damage could occur.

3. If necessary, turn off the electricity at the circuit breaker, and follow facility lock-out/tag-out procedures.

NOTE:
If you decide to pull conduit and make wire connections at the same time, refer to “Connect the Hoses and Wiring” on page 21.

4. Pull the facility conduit to the J- box (F), and connect to the appropriate partitions: Normal Power, Critical Power, and/or Low Voltage in accordance with the shop drawings and the latest edition of NFPA®[1] 70, National Electrical Code® (NEC®) for United States installations, as well as all applicable state, and local codes.

Test the Lines

1. Do a test on the medical gas and vacuum system for leaks according to the latest edition of the NFPA® 99.

   NOTE:
   All **positive** pressure gas risers and manifolds have internal check valves. **Negative** pressure risers do **not** have internal check valves; they are supplied with test caps attached. On **negative** pressure gas risers, **retain** the test caps for future service activity.

2. If leaks are found, fix the problem, and repeat the test until no leaks are found.

3. Do a test on the medical gas and vacuum systems for flow and cross-connections according to the latest edition of the NFPA® 99.

4. If any problems are found with flow or cross-connections of the lines, fix the problems, and test the lines again until all problems are corrected.

Main System Installation

Time required to do the complete system installation is approximately 4 hours.

Install the Main Support Structure

WARNING:
Only facility-authorized personnel should install the Latitude® Arm System. Installation by non approved personnel could cause injury or equipment damage.

NOTE:
To aid in assembly, a lettering system is used to match up arm/head and wall services assemblies to the main support structure. Match “A” to “A,” and “B” to “B,” etc.

1. NFPA®, National Electrical Code®, and NEC® are registered trademarks of National Fire Protection Association, Inc.

Figure 6. Attaching Parts: Wall Structure and Wall Services Chassis

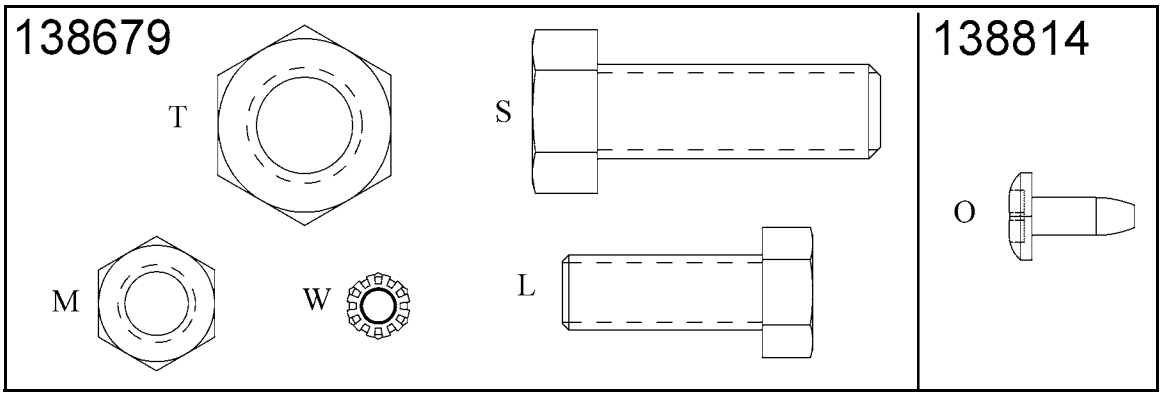


Table 3. Wall Structure Bag #138679 and Wall Services Chassis Bag #138814

Callout	Part Number	Qty	Description
Bag #138679 (located on the Wall Structure skid block)			
L	137726	8	Hex bolt, 3/8–16 x 1
M	137727	8	Locknut, 3/8–16
S	137724	8	Hex bolt, 1/2–13 x 1½
T	137725	8	Locknut, 1/2–13
W	15250	1	KEPS nut, #8
Bag #138814 (located in a box with the Wall Services Chassis)			
O	4388002	4	Screw, 1/4–20 x 5/8, tap, pan, torx

1. Make sure the rough-in assembly and gas manifold are correctly installed.

   NOTE:
   IMPORTANT: Be careful not to install the pedestal backwards. Note the position as shown in the detail of figure 7 on page 12. The pedestal and main support structure should be **flush** on the front side when raised into position.

2. Attach the pedestal (J) to the upper main support structure (K) with eight bolts (L) and locknuts (M) (see figure 7 on page 12).

WARNING:
Use caution to make sure no wiring is pinched or caught between the wall services chassis and main support structure. Failure to do so could cause injury or equipment damage.

3. Examine the wall services chassis (N) to make sure the wires are correctly routed in their tracks to prevent pinching between the assembly and main support structure (see figure 8 on page 12).

4. Position the wall services chassis (N) on the main support structure so that its **bottom** edge is 31" (79 cm) AFF, as shown in figure 9 on page 13.

   NOTE:
   There are two sets of mounting holes. Use the holes that attach the services chassis at the correct height specified.

5. Attach the wall services chassis (N) to the back of the upper main support structure with four screws (O).

6. Raise the main support structure (K) into position under the rough-in plate (A) (see figure 9 on page 13).

7. Loosen the jam nuts (P) and setscrews (Q) on the extension tubes (R).

8. Raise the extension tubes (R) up to the rough-in plate (A), and temporarily tighten the setscrews (Q) to hold the tubes in position.

9. Attach each extension tube (R) with four bolts (S) and locknuts (T). Snug the nuts only—do not tighten.

10. Loosen the set screws (Q) on the extension tubes (R).

11. Plumb the main support structure along the wall, and **make sure** the back flanges (U) rest flush against the finished vertical wall.

    NOTE:
    The main support structure does **not** need to be exactly vertical. It is more important for the back flanges to rest flush against the wall.

12. When plumb, mark the edges of the base (J) on the floor.

Figure 7. Main Support Structure Pedestal

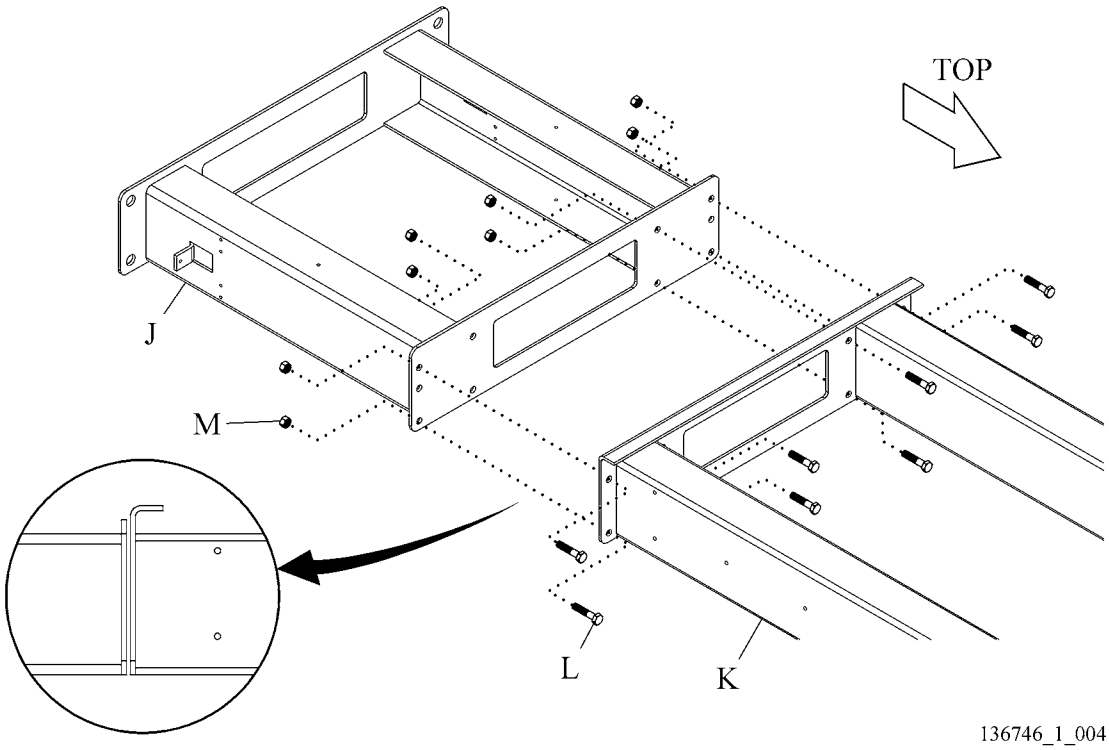


Figure 8. Wall Services Chassis Installation

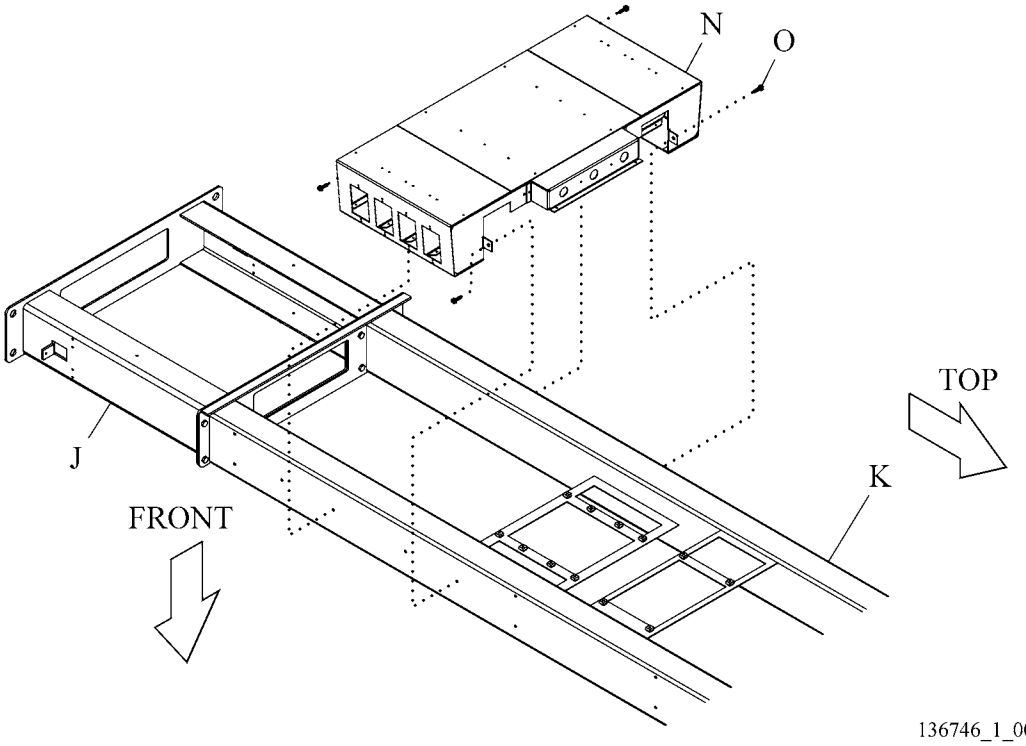
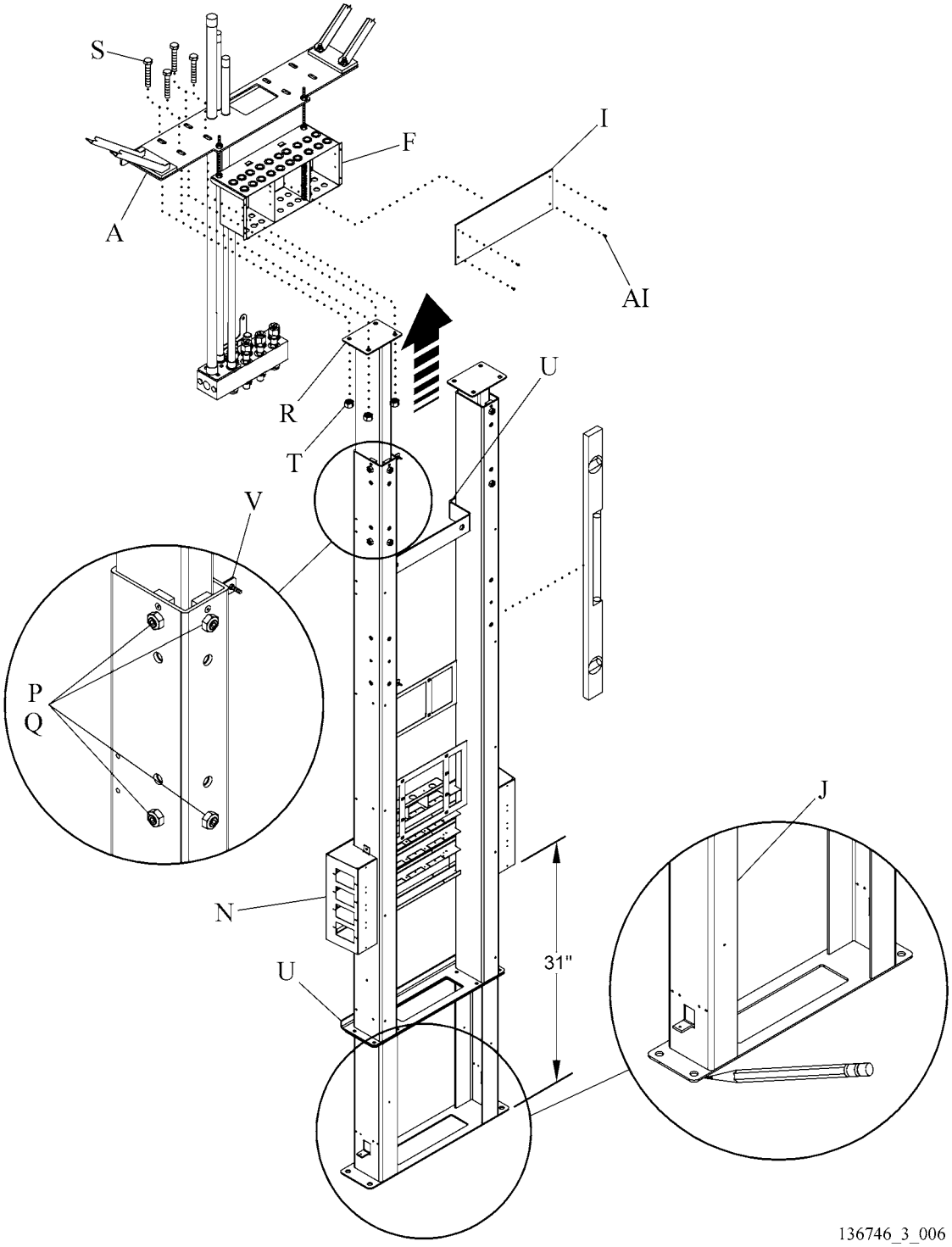


Figure 9. Main Support Structure to Rough-in



13. Tighten the setscrews (Q) and jam nuts (P) on the extension tubes (R).

14. Tighten all attaching hardware on the rough-in plate (A).

15. Make sure that the base (J) has not moved; check that the edges are still on the marks.

16. Check again that the unit is plumb, and the back flanges (U) are flush against the finished wall.

WARNING:
Wear eye protection. Failure to do so may cause injury.

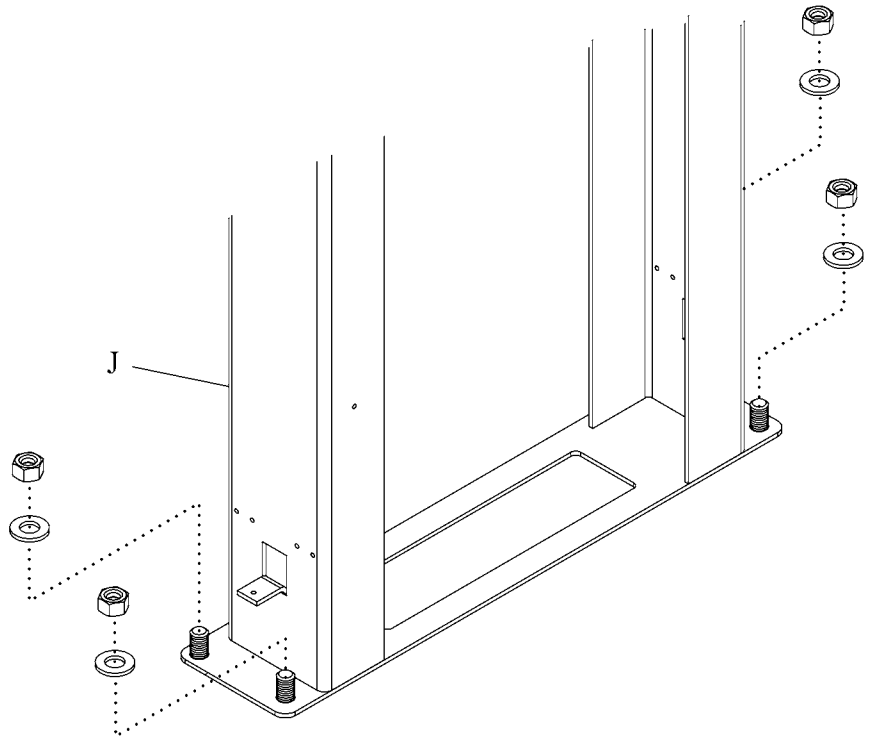
17. Put on safety goggles.

18. Drill one **or** two holes on each side of the base, and install the floor anchoring hardware according to the seismic anchorage requirements in the *Latitude® Arm System Design and Application Manual* (136745) (see figure 10 on page 14).

NOTE:
Check seismic requirements. Two anchors per side may be required.

NOTE:
If the anchor is larger than the hole opening in the base, make the necessary marks on the floor, and move the base to drill the larger holes.

Figure 10. Floor Anchoring



CAUTION:
Make sure to run the conduit between the cross braces and the wall. Failure to do so could cause equipment damage.

19. Route the conduit from the wall services chassis (N) to the appropriate sections of the J-box (F) (low voltage, normal or critical), using the knockouts closest to the wall.

WARNING:
Do not connect the AC power until the side panels are available and installed. Failure to do so could cause injury or equipment damage.

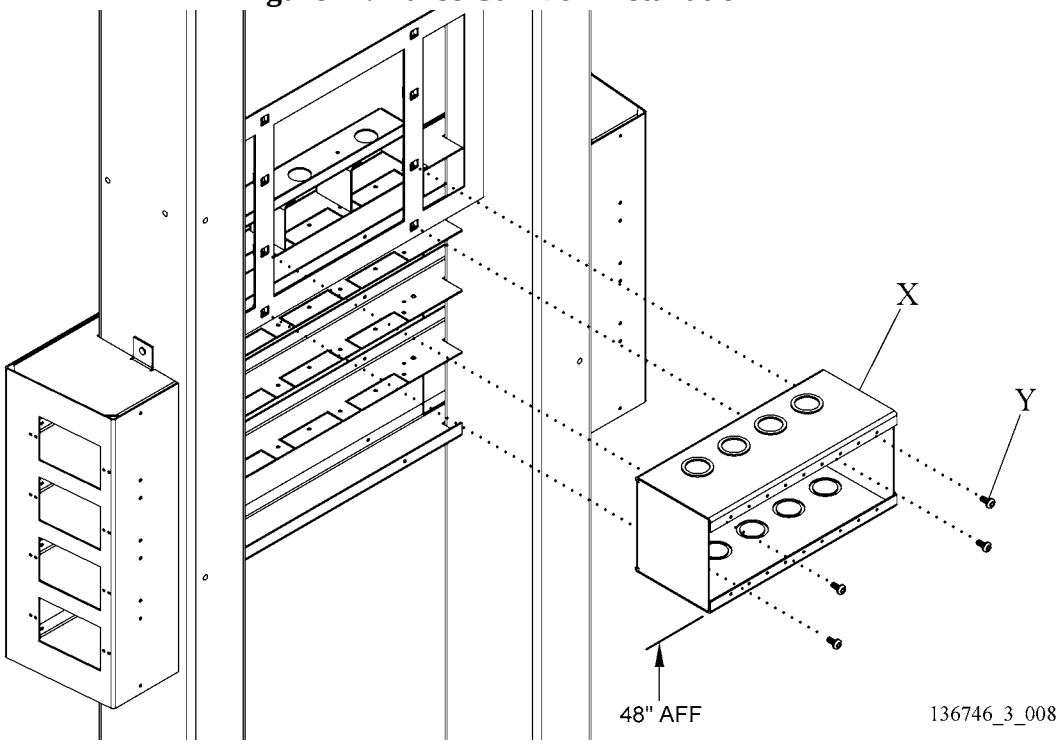
20. Use a KEPS nut (W) to attach the ground strap from the J-box (F) to the upper ground stud (V) on the inside of the left riser near the top of the main support structure (see figure 9 on page 13).

Install the Optional Nurse Call Box

1. If required, install the optional nurse call box (X) with the four screws (Y) supplied with the box (see figure 11 on page 15). The **bottom** of the box should be approximately 48" (122 cm) AFF.

NOTE:
There are two sets of mounting holes for the Nurse Call Box. Make sure to use the holes that will set the box at the correct height.

Figure 11. Nurse Call Box Installation



CAUTION:
Make sure to run the conduit between the cross braces and the wall. Failure to do so could cause equipment damage.

2. Route the conduit from the nurse call box (X) to the J-box (F), and attach it to the appropriate (low voltage) section of the J-box (knockouts closest to the wall).

Install the Arm and Head Assembly

WARNING:
The crated assembly is top heavy. Do not transport it without assistance. Go slowly, and use care when transporting the packaged arm and head assembly, especially at turns. Failure to do so could cause injury or equipment damage.

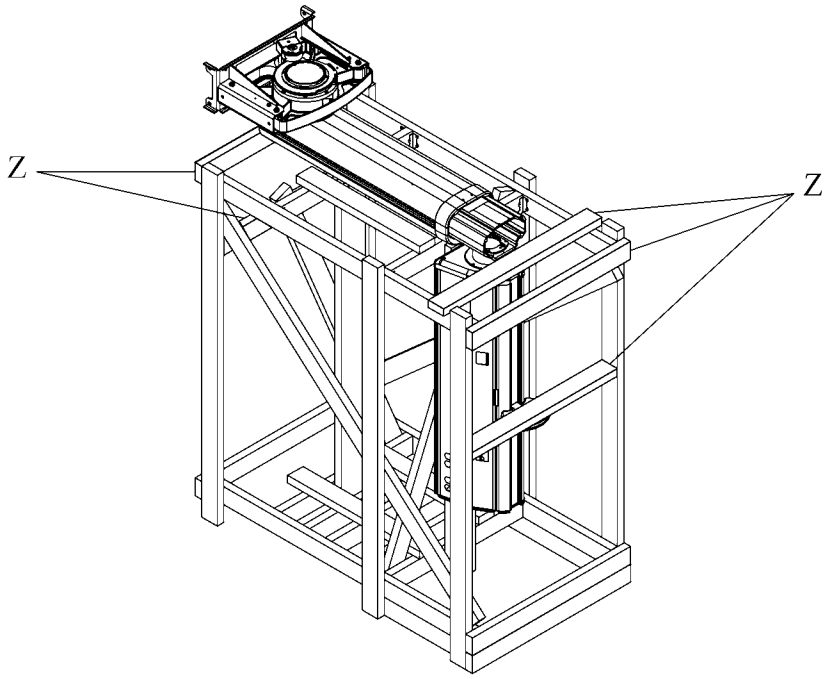
WARNING:
Do not allow anyone to be under the wall arm during installation. The arm could fall, and cause injury or equipment damage.

CAUTION:
Do not remove the arm and head assembly from the shipping container until the assembly is securely attached to the main support structure. Failure to do so could cause equipment damage.

NOTE:
If two arms are included, attach the **upper** arm first. To distinguish, the upper arm is attached **under** the main pivot; the lower arm is attached **above** the pivot.

1. Remove the braces (Z) from the shipping container (see figure 12 on page 16). If necessary, you may use these braces in step 4 below.

Figure 12. Packaged Arm and Head Assembly Brace Removal (Upper Arm Assembly Shown)



136746_3_021

2. Balance the packaged arm and head assembly on the lift (see figure 13 on page 18).

NOTE:
The packaged weight of the arm assembly is 550 lb (250 kg).

NOTE:
Depending on the type of lifting device you use, some of these steps may not be necessary.

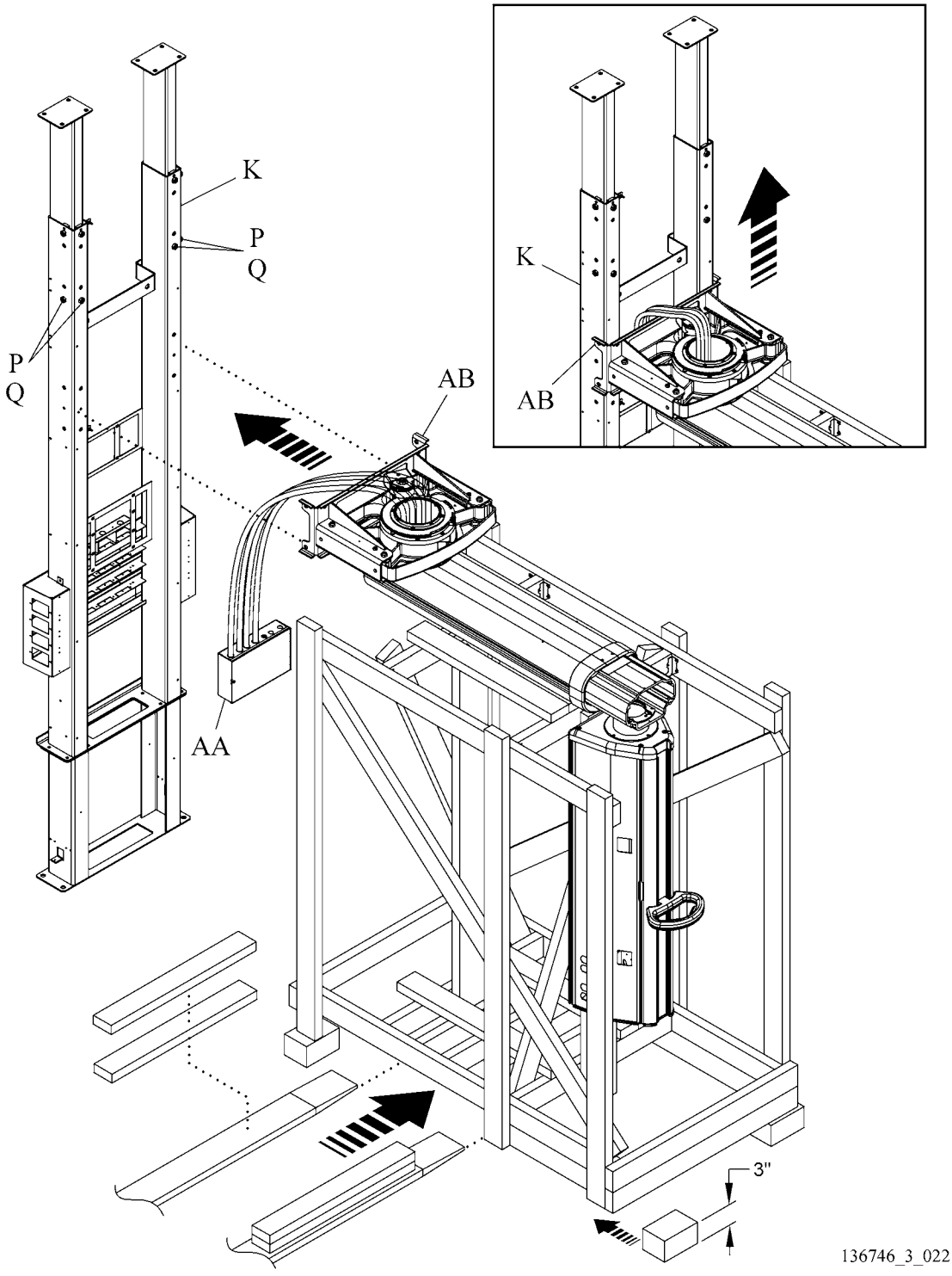
a. Lift the packaged arm and head assembly off the floor and put 3" (76 mm) wood blocks under each corner.

b. Lower and extract the lifting device.

c. Stack two 2 x 4s and put them lengthwise on each fork of the lifting device.

d. Push the forks of the lifting device back under the packaged arm and head assembly, as shown.

Figure 13. Positioning the Arm and Head Assembly for Installation



3. Lift the packaged arm and head assembly slightly off the floor, just enough to move it.

4. Move the packaged arm and head assembly to the installation area, in front of the main support structure (K).

5. Cut the banding on the brake box (AA) and position it (or let it hang) down and below the pivot assembly.

6. Move the assembly so that the **mounting bracket (AB) rests flush against the main support structure (K)**.

7. Remove and keep the four **lower** setscrews (Q) and jam nuts (P) from the main support structure.

Figure 14. Attaching Parts: Arms

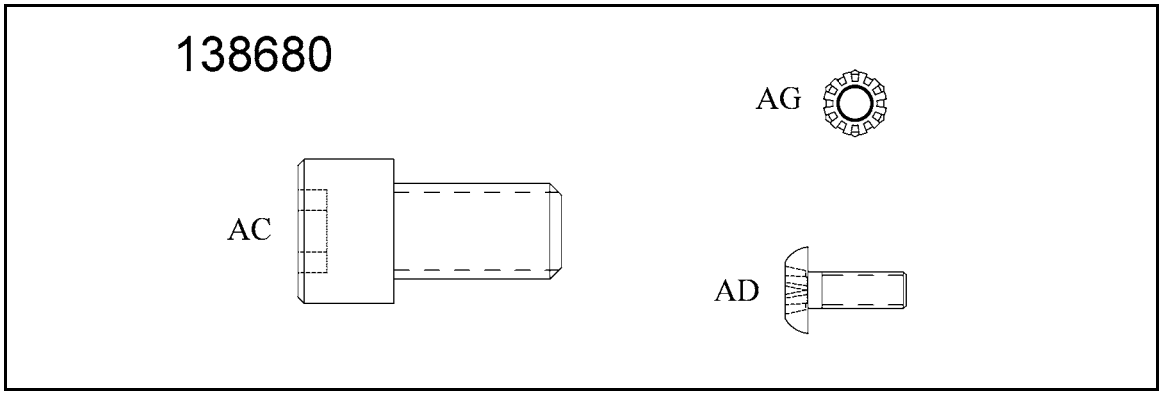


Table 4. Arm Bag #138680
(#138680 is located in box U-1–upper arm, or box L-1–lower arm)

Item	Part Number	Qty	Description
AC	137728	8	½–13 x.875, SHCS
AG	15250	1	KEPS nut, #8
AD	51637	4	Screw

NOTE:
Make sure the “ears” of the mounting bracket remain wrapped around the uprights of the main support structure while lifting the arm and head assembly to its final position. This will add stability and help in alignment.

8. Slowly raise the lift until the holes in the mounting bracket (AB) align with the top set of threaded mounting holes in the main support structure (K).

9. Adjust the position of the arm and head assembly to get all four bolts (AC) on each side started (see figure 15 on page 20).

NOTE:
Start the front bolts first, then start the side bolts. **Use care to avoid cross-threading!**

10. Securely tighten each front bolt (AC).

11. Securely tighten each side bolt (AC) so that the outer side of the mounting bracket (AB) is pulled tight against the flat side of the main support structure (K).

12. Torque all bolts (AC) to a minimum of 30 ft-lb (40.67 N·m).

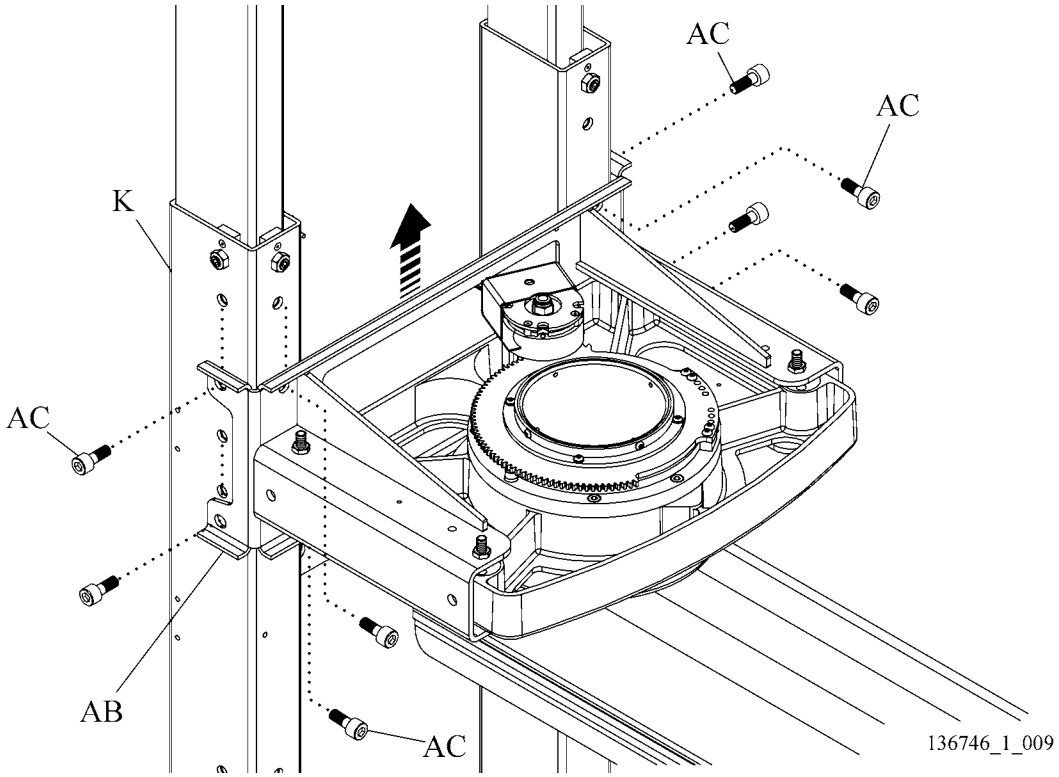
WARNING:
Make sure all mounting bolts are installed and torqued to specification before removing the shipping container. Failure to do so could cause injury or equipment damage.

13. Remove the banding from the shipping container.

14. Use the lift to lower the shipping container to the floor.

15. Remove the lift from under the shipping container.

Figure 15. Arm and Head Assembly Installation



CAUTION:
Failure to use caution when removing the arm from the shipping container could cause equipment damage.

16. Remove the shipping container:

    a. For telescoping arms, manually pull out and extend the arm (a squeal may be heard when overriding the brake) to remove the container,
    or
    partially disassemble the container to fully remove it.

17. Install and tighten the previously removed lower setscrews (Q) and jam nuts (P).

18. If a lower arm and head assembly is included, attach it in the same manner as above.

NOTE:
To prevent interference with the installation of the covers later make sure the gas lines and electrical cables are routed behind the horizontal support in step 19.

19. Route all gas and electrical cables **behind** the horizontal support (see figure 17 on page 23).

Connect the Hoses and Wiring

WARNING:
Turn off power to the rough-in box before you route any conduit to it or connect any wiring. Failure to do so could cause injury or equipment damage.

CAUTION:
Wear an anti-static wrist strap when you handle the brake box and circuit board. Failure to do so could cause equipment damage.

1. Put on an anti-static wrist strap.

2. Remove the lid, and fasten the brake box (AA) to the main support structure with the four screws (AD) (see figure 16 on page 22) in box U1 (see table 4 on page 19).

3. If the system does not have a lower arm, go to step 6; otherwise, go to the next step.

4. If the system has a lower arm, route its brake cables (smaller diameter cables) to the brake box (AA).

5. Connect the lower arm brake conduit to the brake box (AA). Make sure the low voltage conduit (with four small gauge wires) goes in the outside hole.

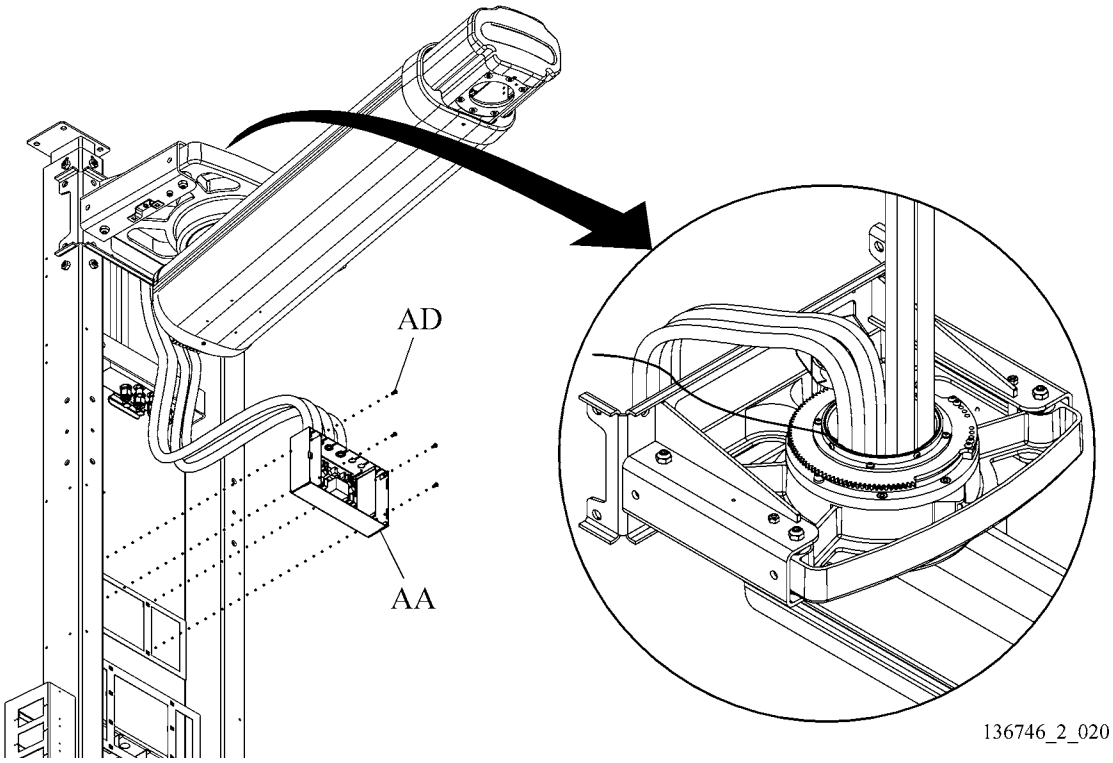
6. Connect the 4-cable connector to the circuit board. Make sure the low voltage cable with four small gauge wires goes around the divider.

7. Connect the rest of the cables to the circuit board.

NOTE:
The two-pin cable connectors are interchangeable and can go in either of the two-pin board connectors on that side of the board.

8. Install the lid (AE) on the brake box (AA) with the screw (AF) removed in step 2.

Figure 16. Upper Arm Assembly Cable Routing



9. Route the brake box power conduit (large diameter) behind the main support structure up to the J-box and connect it to the appropriate section (normal or critical).

10. Route the electrical conduits from the upper arm to the J-box and attach them to the appropriate section (low voltage, normal or critical). Use the knockouts farthest from the wall.

11. Route the electrical conduits from the lower arm to the J-box, and attach them to the appropriate section (low voltage, normal or critical). **Route the cables behind the horizontal support** to prevent interference with installation of the covers later (note how the cables are routed in figure 17 on page 23).

12. Use wire ties to secure all conduits to the main support structure just below the J-box.

13. Connect facility wiring to the product wiring in accordance with all applicable state and local codes, as well as the latest edition of NFPA®[1] 70, National Electrical Code® (NEC®) for United States installations, as well as all applicable state and local codes.

14. Use a KEPS nut (AG) (see table 4 on page 19) to attach the upper arm ground strap to the upper ground stud (V) on the main support structure (see figure 9 on page 13).

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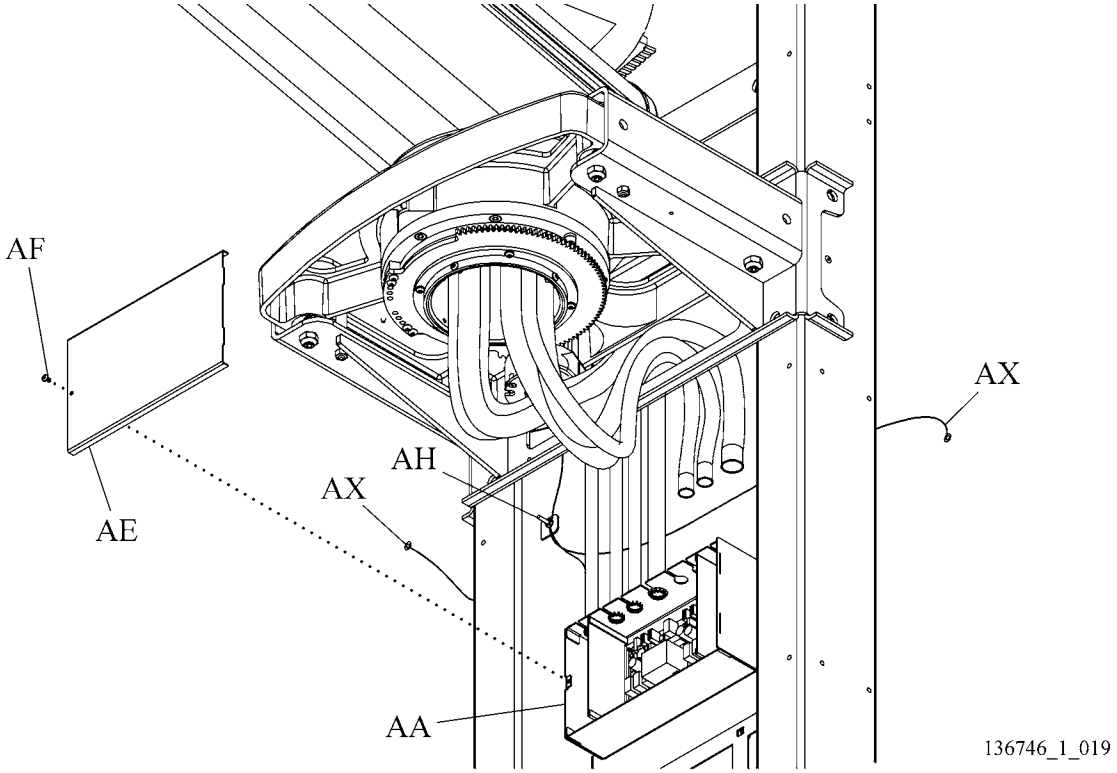
15. If a lower arm is installed, use a KEPS nut (AG) to attach the lower arm ground strap to the lower ground stud (AH) on the main support structure (see figure 17 on page 23).

16. After all wiring is complete, install the J-box cover (I) with 4 screws (AI) (see figure 9 on page 13) and (see table 1 on page 2).

Figure 17. Lower Arm Cable Routing



Low Voltage Cable Pulling Instructions

For Fixed Length Arm, Wall Service Chassis, and Nurse Call Box

NOTE:
It is highly recommended to pull all cables through a conduit at the same time.

1. Remove the front cover of the J-box.

2. Remove the front plate at the device you wish to pull the cable to.

3. Locate the conduit you wish to pull the wire through.

4. At the J-box, attach the cable to the pull string provided in the conduit. Tie a loop in the pull string to make the attachment more secure. Also attach a second pull string if needed for future provisions.

NOTE:
If you pull more than one cable, stagger them so the ends are at least 6" (15 cm) apart.

5. Lubricate the end of the cable with a wire pulling compound.
6. Push the cable into the conduit, lubricating it as it enters the conduit. Gently pull the string at the device end to take up the slack.
7. Attach the conduit to the boxes at each end.
8. After all electrical connections have been pulled, attach the covers to the J-box and device boxes.

Test the Brake System

1. With no buttons activated, check to make sure both arms resist movement.
2. Squeeze the handle on the service head to activate the brake switch. You should hear an audible click, and all axes on that arm should move freely (main arm pivot, service head pivot, and telescoping, if available).
3. Release the brake switch. The unit should resist movement.
4. Repeat this test for the other arm (if installed).

Test the AC Electrical System

1. Test the electrical system to make sure it complies with local and national codes.

Make the Gas Connections

NOTE:
The Latitude® Arm System is provided with DISS capping devices for use on the vacuum lines during installation, maintenance, and repair.

CAUTION:
Do not overtighten the connections. Overtightened connections could cause equipment damage.

1. Connect the air hose(s) from the upper arm to the air connection(s) on the top side of the manifold (G) (see figure 4 on page 7). Snug the connection(s) with a wrench.
2. Connect the vacuum hoses from the upper arm to the vacuum connections on the top side of the manifold (G). Snug the connections with a wrench. **Do not overtighten**.

NOTE:
On single fixed arm systems with more than four vacuum hoses, route the four shorter vacuum hoses to the top of the manifold and the remaining longer vacuum hose(s) to the bottom of the manifold.

3. Connect the oxygen hose(s) from the upper arm to the oxygen connection(s) on the top of the manifold (G). Snug the connection(s) with a wrench, but do not overtighten.

4. Repeat the steps above for the lower arm, routing the hoses to the bottom side of the manifold (G), if required.

Install the Wall Structure Gases (If Necessary)

1. Refer to the supplied as-built drawings to determine which sides of the wall structure the gas outlets will be installed. The gas outlet mount bracket (A) (see figure 18 on page 26) has locations for two gas outlets. There are multiple holes in the gas outlet mount bracket (A) to correspond with the two locations for the ceiling height. The lower outlet should be 49.1/2" (125.73 cm) above finished floor (AFF) and the upper outlet should be 55.1/2" (140.97 cm) AFF.

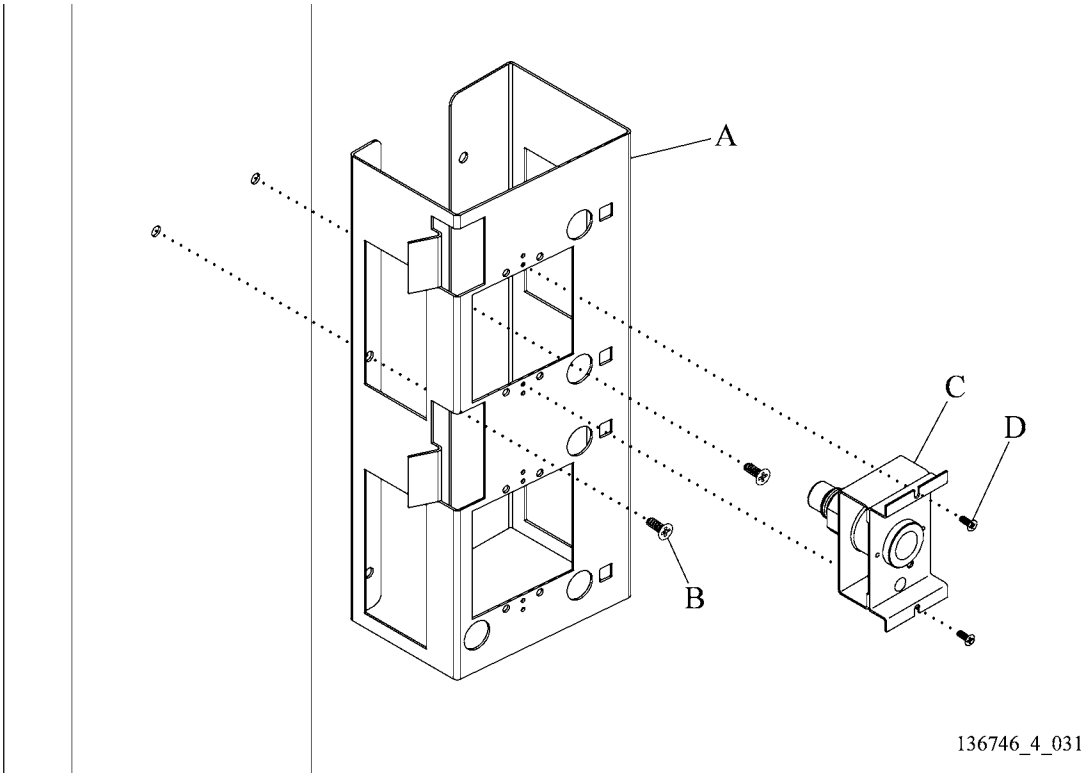
2. Install the two screws (B) to attach the gas outlet bracket (A) immediately above the wall services chassis. This new gas outlet bracket (A) will replace the side cover bracket at this location.

3. Install the gas outlet backbody (C) to the gas outlet bracket (A) with the two supplied flat head screws (D).

4. Put the supplied flexible gas hose from the DISS connection on the backbody outlet (C) to the applicable gas connection on the gas manifold or the installed gas risers.

5. After the installation of the covers has been completed, install the supplied two flat head screws (D) to attach the frontbody outlets to the applicable backbody outlets (C). Do not overtighten the screws.

Figure 18. Wall Structured Gases



Do a Test on the Unit

1. Do a pressure test on the medical gas and vacuum system to check for leaks according to the latest edition of the NFPA®[1] 99 for United States installations.

   NOTE:
   All positive pressure gas risers have internal check valves. All negative gas pressure risers do not have internal check valves, but are supplied with test caps attached.

2. If leaks are found, fix the problem, and repeat the test until no leaks are found.

3. Check the medical gas and vacuum system for flow and cross-connections according to the latest edition of the NFPA® 99 for United States installations.

4. If any problems are found with flow or cross-connections of the hoses, correct the problems, and retest until all problems are corrected. Additionally, assure compliance to all state and local codes.

1. NFPA® is a registered trademark of National Fire Protection Association, Inc.

Level the Arm and Head Assembly

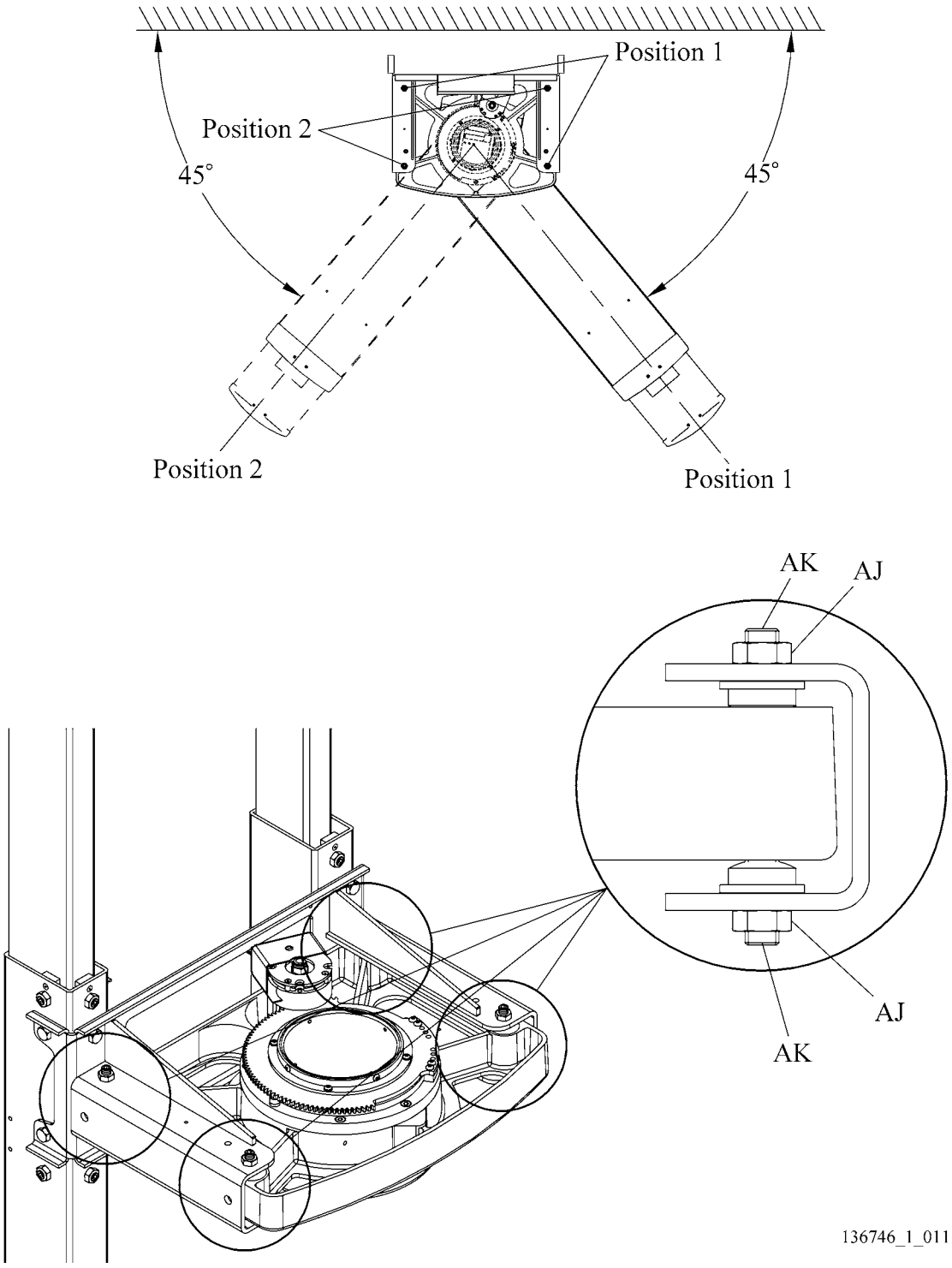
CAUTION:
The horizontal alignment is important for the Arm System to operate properly. Failure to correctly align the wall arm could cause equipment damage.

1. Level the arm as follows (see figure 19 on page 28):
   a. Turn the arm to approximately a 45° angle (Position 1), but make sure you have access to the front adjusting screw.
   b. Place a level lengthwise on top of the arm.
   c. Loosen the jam nuts (AJ) as required.
   d. Loosen the upper screw (AK) and tighten the lower screw to raise the corner of the casting. Do the opposite to the lower corner.
   e. Turn the screws (AK) on opposite corners along the axis of the arm until the arm is as close to level as possible.

CAUTION:
After adjustment, make sure both adjusting screws are firmly seated. Failure to do so could cause equipment damage.

2. Make sure both screws (AK) are firmly seated.
3. Tighten the jam nuts (AJ). Make sure both are tight.
4. Swing the arm 90° so that it is approximately 45° from the wall on the other side of the unit (Position 2), and repeat the previous steps.
5. After everything is tight, check again that the arm is level in all directions, and all adjusting screws (AK) are firmly seated. Repeat the procedure if anything has shifted.

Figure 19. Leveling the Arm



Adjust the Stops (If Necessary)

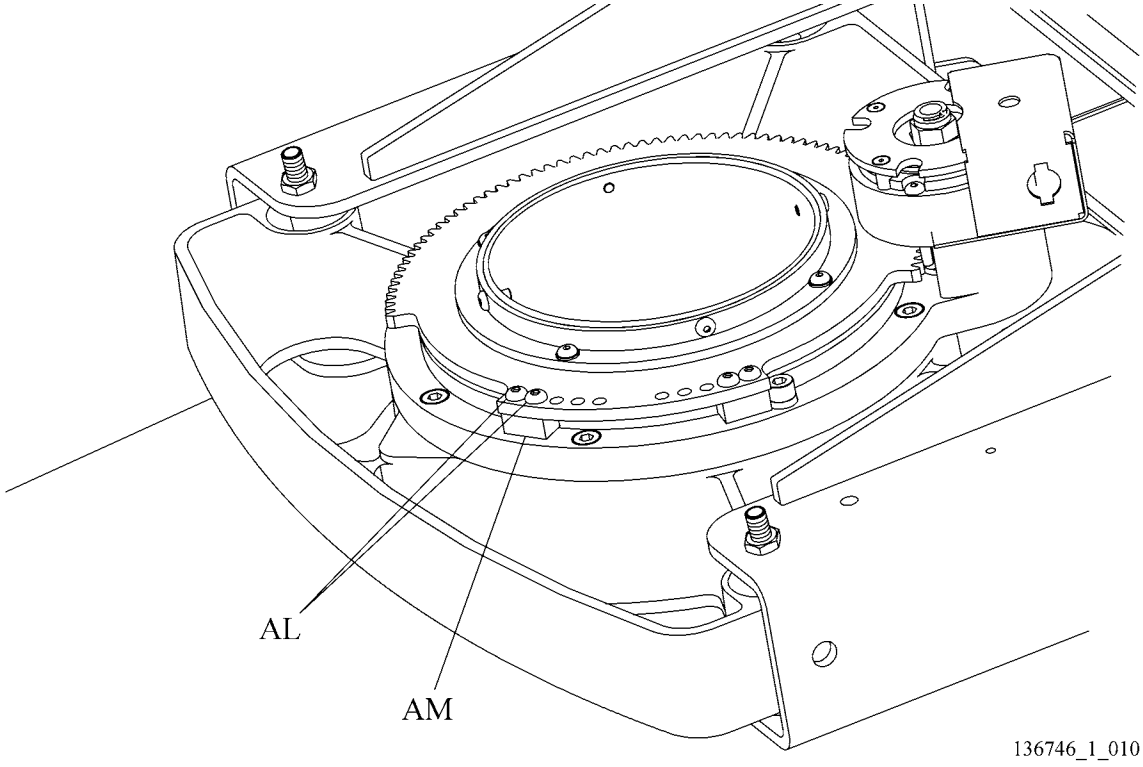
NOTE:
The stops are factory set for maximum 190° rotation. Moving a stop one hole equates to a 5° change in the rotational limit.

1. Remove the two screws (AL) that attach the stop (AM) (see figure 20 on page 29).
2. Move the stop (AM) to the desired position.

CAUTION:
Do not move the stop to a position where it is not secured with both screws. Failure to secure the stop properly could cause equipment damage.

3. Tighten the two screws (AL) on the stop (AM).
4. Slowly move the service head toward the finished walls and make sure it does not contact the walls.

Figure 20. Stop Adjustment



Install the Outer Covers

NOTE:
Some covers will require trimming to fit.

Figure 21. Attaching Parts: Covers

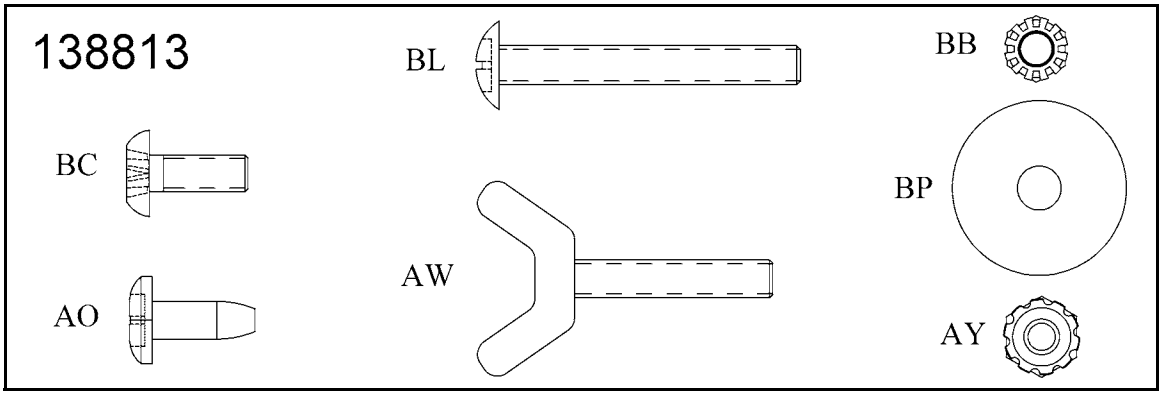
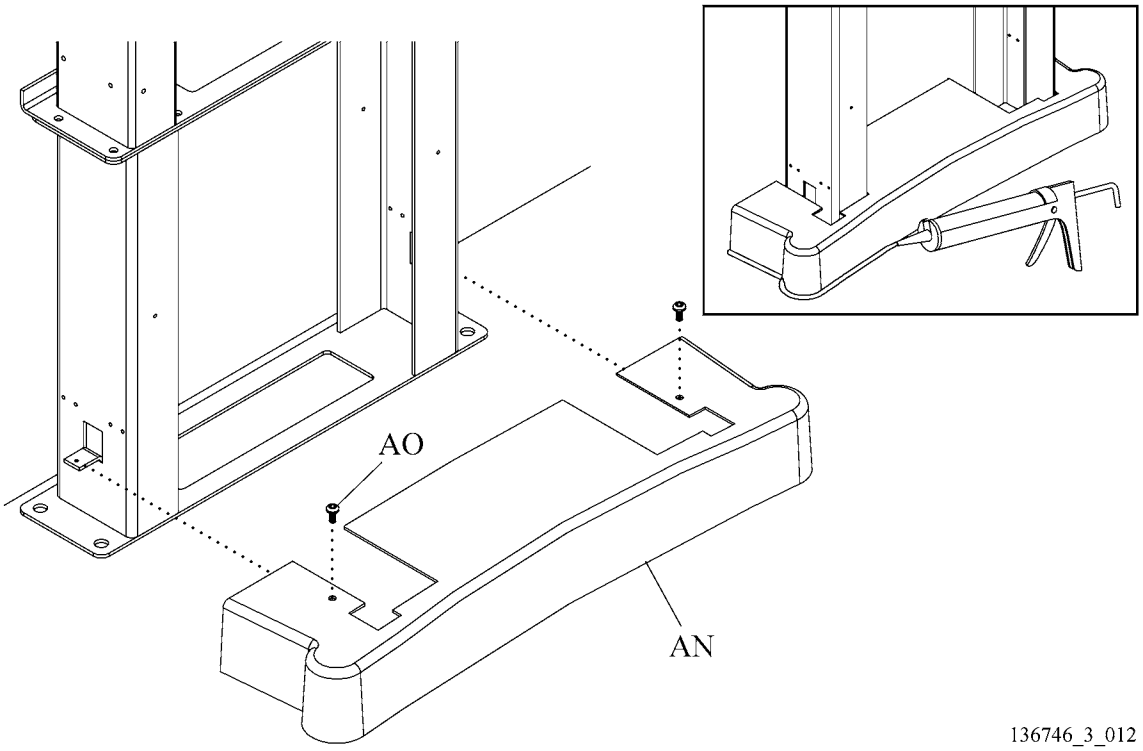


Table 5. Covers Bag #138813
(located in box U-2 with upper arm)

Item	Part Number	Qty	Description
BL	136640	2	Screw, 10–32 x 1½, type 1
AO	4388002	34	Screw, 1/4–20 x 5/8, tap, pan, Torx
AW	137573	2	Wing screw, 10–32 x 1
BB	138210	4	KEPS nut, 10–24
AY	15250	4	KEPS locknut, 8–32, washer base
BC	51637	16	Screw, 10–32 x 39/64, FH PH
BP	3869	12	Washer, 17/64" ID x 1" OD, 16 ga.

1. Install the base cover (AN) with two screws (AO) (see figure 22 on page 31).
2. If necessary, caulk the base cover (AN) to the floor.
3. Install the screw (AO) to attach the eight side cover brackets (AP) (see figure 23 on page 33).
4. Loosen the metal connectors (AQ) on the back of the upper front extrusions (AR), slide them down halfway, and retighten (see figure 24 on page 34).
5. Slide the connectors (AQ) into the slots on the lower front extrusions (AS), and tighten the screws on the back of the connectors so that the lower and upper extrusions are secured to one another.

Figure 22. Base Cover



6. Use a power mitre box or hacksaw to cut the upper front extrusion (AR) to the length necessary to meet the ceiling:

   a. For a drop ceiling, hold the extrusion in place and mark where it meets the ceiling.

   b. For a solid ceiling, measure from the floor to the ceiling, subtract 4" (10 cm) for the base elevation, and cut the extrusion to that length.

7. Attach the right and left front extrusions (AS) with twelve screws (AO) and washers (BP). **Leave the screws slightly loose**.

8. Measure the width of the front panels (BD, BE - figure 25 on page 36). Adjust the space between the front extrusions (AS) for the exact width of the front panels (approximately 23 5/8" (60 cm)) and then tighten the screws (AO).

9. Install the brackets (AU) for the upper side covers with screws (AO)(see figure 24 on page 34).

   NOTE:
   The brackets can be mounted in two locations, depending on ceiling height. Use the lower holes for ceilings 8' 5 15/16" (259 cm) and below; use the upper holes for taller ceilings.

10. Attach the top side covers (AV) with wing screws (AW) (see figure 25 on page 36).

a. Fit the slots on the side covers (AV) over the tabs on the bracket (AU).

b. Slide the side covers (AV) up or down to adjust the height: 3" (76 mm) below tall (8' 6" (259 cm) to 10' (305 cm)) ceiling; 1/4" (6 mm) below short (8' (244 cm) up to 8' 5 15/16" (259 cm)) ceiling.

Figure 23. Front Extrusion Brackets

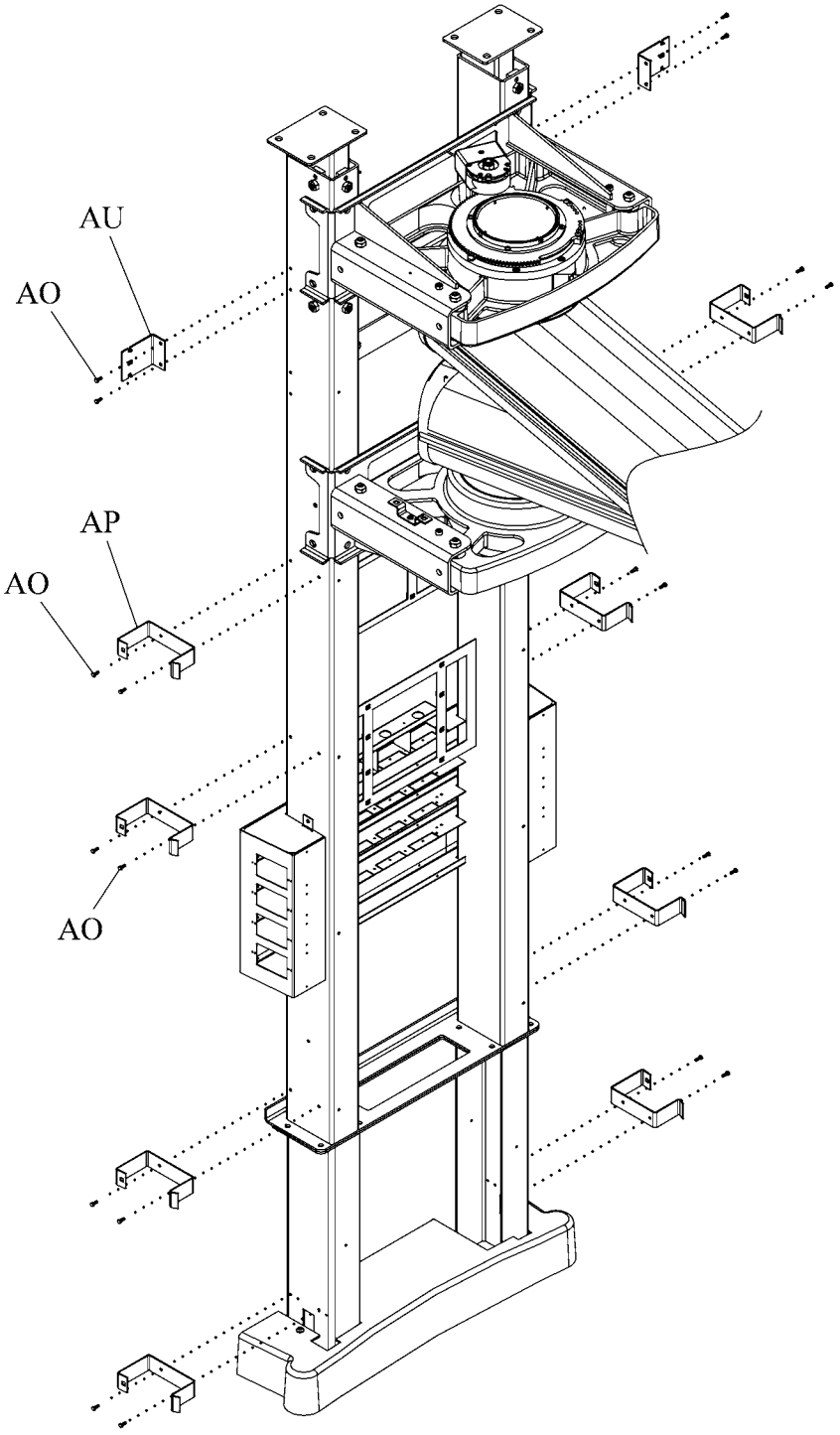
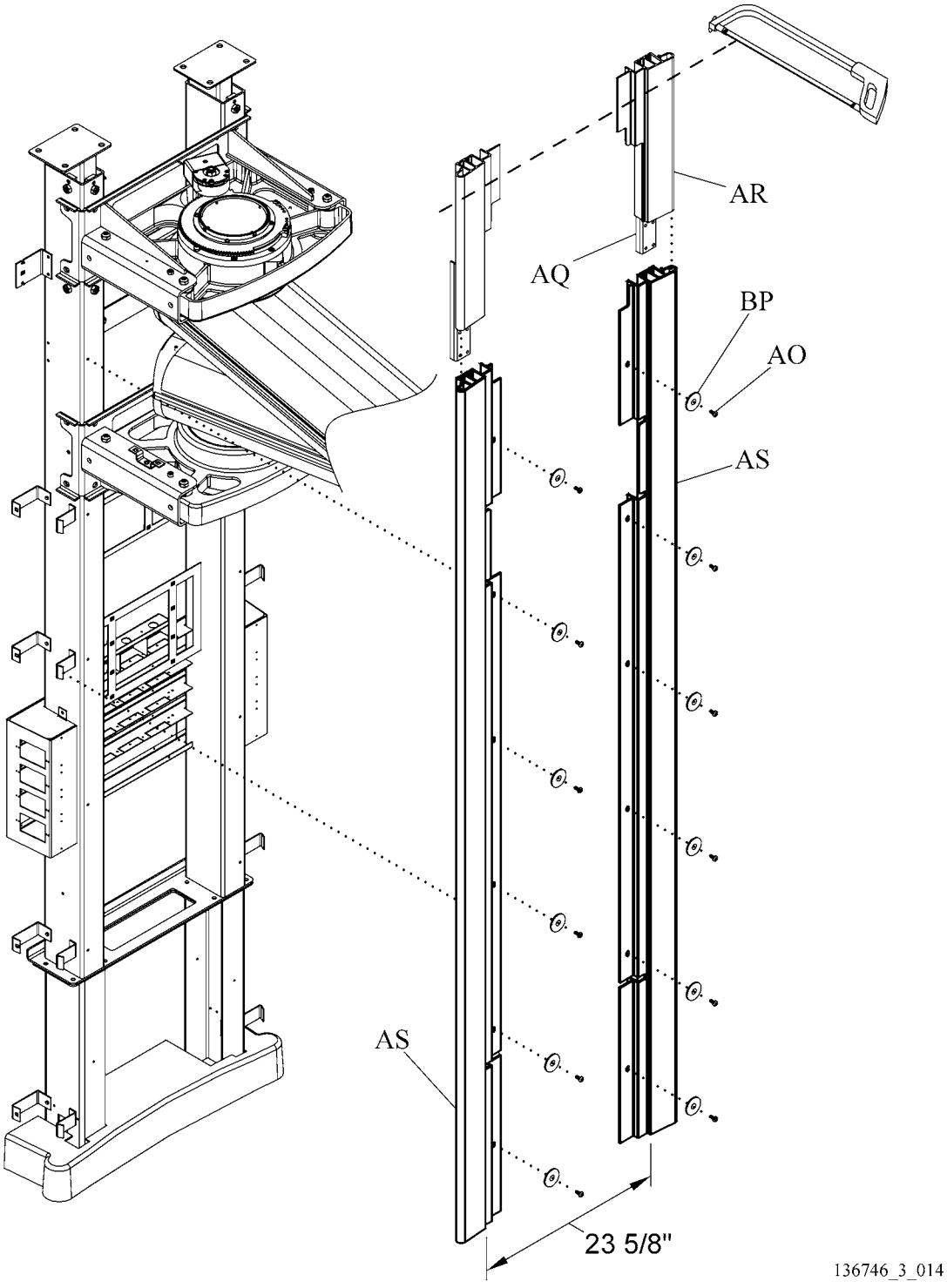


Figure 24. Front Extrusions



11. Use a KEPS nut (AY) to attach the ground wires (AX) to the lower ground stud (AH) on the inner left upright of the main support assembly (see figure 17 on page 23).

12. Hold the side panels (AZ) close, and feed the ground wires (AX) around the back of the main support structure (see figure 25 on page 36).

13. Attach the ground wires (AX) (short wire on the left, longer wire on the right) to the ground studs (BA) on the back of the side panels (AZ). Attach a nut (BB), then the ground wire (AX), then another nut (BB).

CAUTION:
Make sure the receptacles on the wall services chassis are exactly aligned with the holes in the side panels before tightening the panels. Failure to do so could cause equipment damage.

14. Install the side panels (AZ) into the slots on the back edge of the front extrusions (AS). See detail in figure 25 on page 36. Attach with screws (BC).

15. Attach the lower front panel (BD), curved edge down, with hook-and-loop fasteners.

16. Attach the small filler panels (BF) on each side of the head assemblies with hook-and-loop fasteners.

17. Slide the smaller upper front panel (BE) behind the rear leveling bolts, and attach the front panel (BE) to the main support assembly with the hook-and-loop fasteners.

18. Install the top cover retaining brackets (BG) (see figure 26 on page 37).

19. Install the upper bearing cover (BH):

    a. Measure the distance (XX) from the mounting bracket (BI) to the ceiling (see detail DL in figure 26 on page 37). Make a note of that number.

    b. Lay the upper bearing cover (BH) upside down, and measure from the inside raised mounting area (where the bracket attaches) up the inner wall of the cover.

    c. Make a mark on the inside of the cover at the distance noted in step a.

    d. Use a jigsaw or straight tin snips to shorten the upper bearing cover (BH).

    e. With the arm pointing straight out, install the bearing cover (BH) with four screws (BC).

20. With the arm to the side, attach the gap filler (BJ) behind the bearing cover (BH) with hook-and-loop fasteners.

21. For taller ceiling heights, (above 8' 5 15/16" (259 cm)) attach the ceiling cover (BK) with a screw (BL) on each side (see figure 27 on page 40).

    NOTE:
    When you install the ceiling cover, make sure the bearing cover is trimmed so it does **not** contact the ceiling; otherwise, a gap may exist between the ceiling cover and the ceiling.

Figure 25. Side and Front Covers

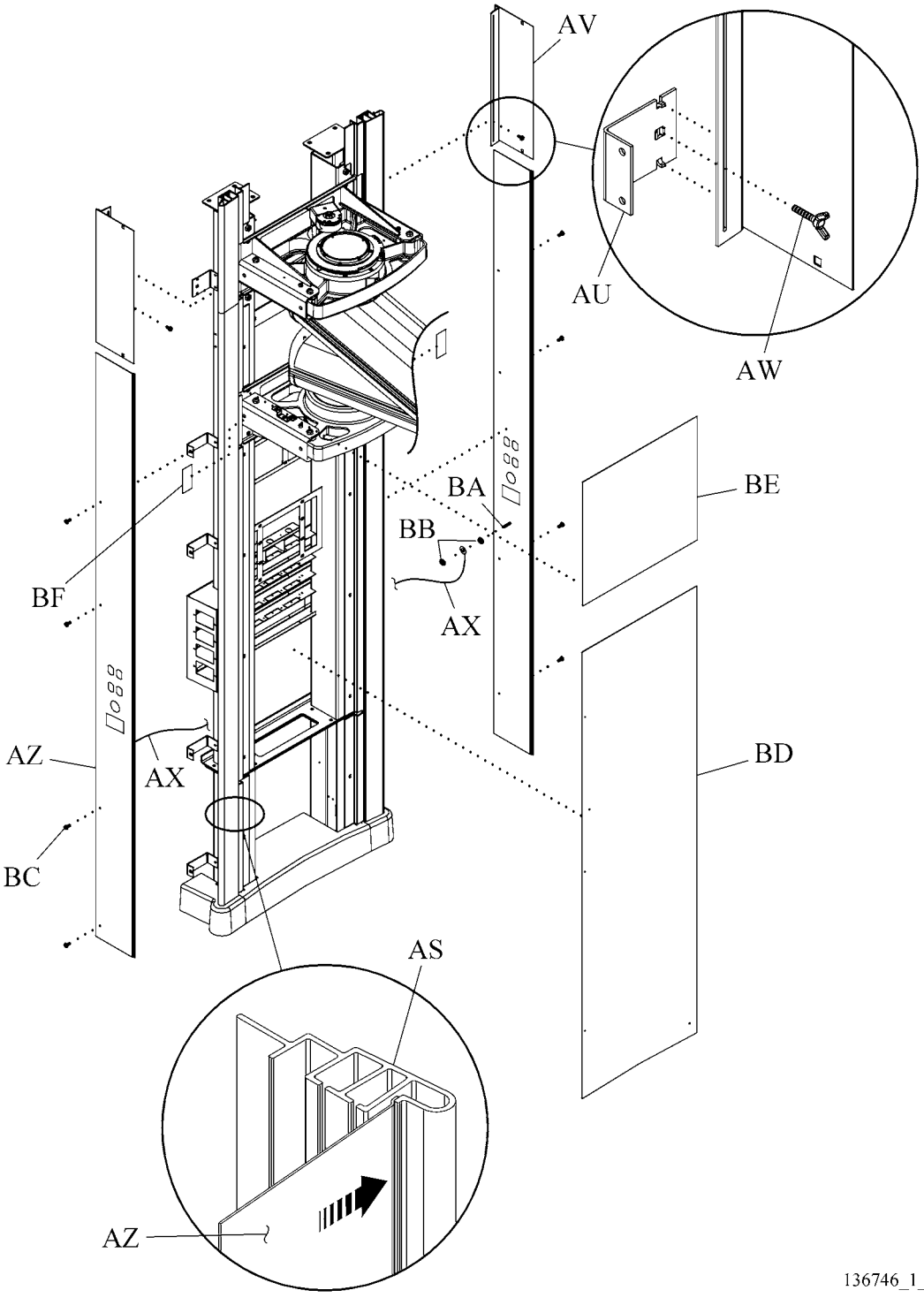
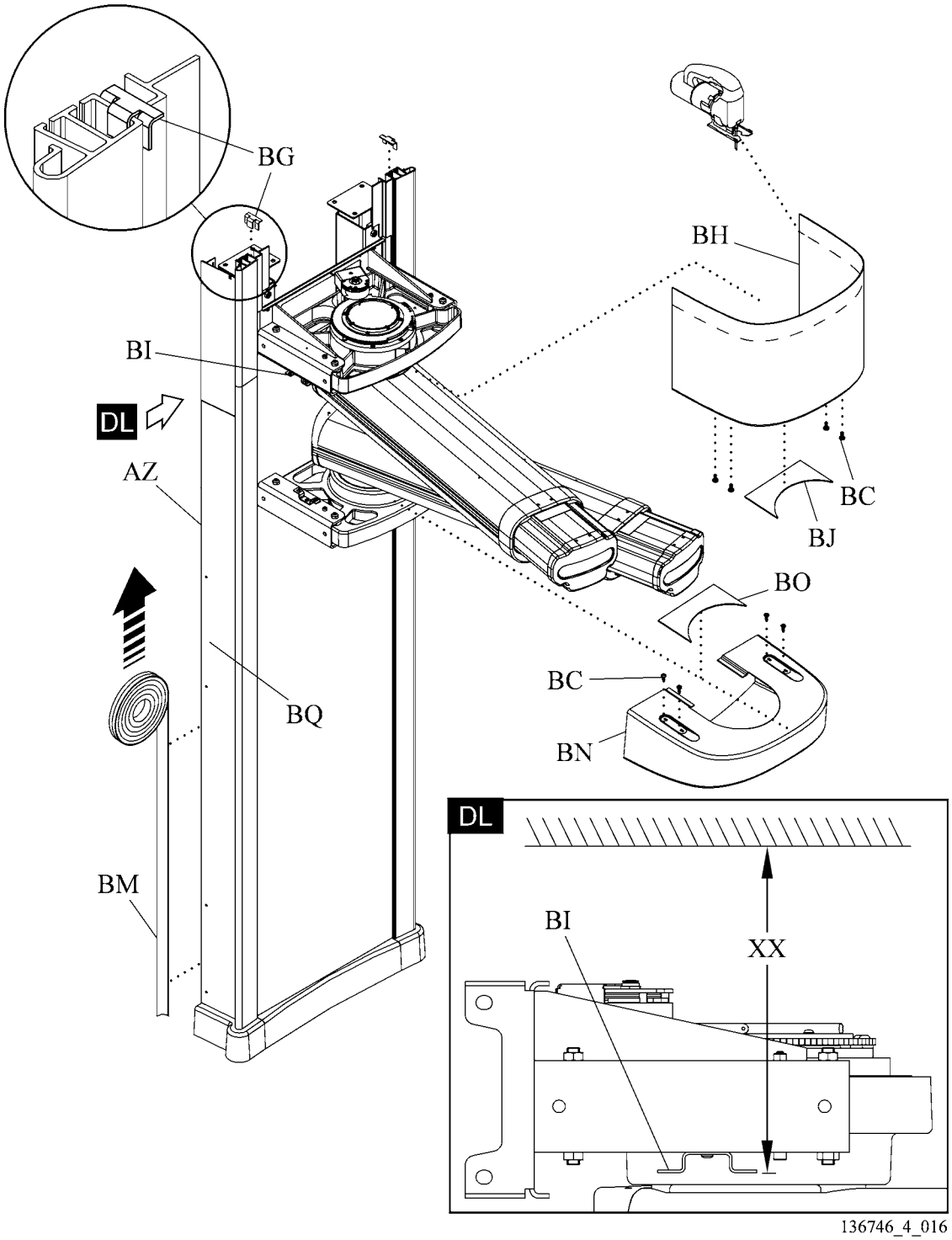


Figure 26. Bearing Covers



WARNING:
The 3M™[1] Tape Primer is an extremely flammable liquid and vapor and may cause an allergic skin reaction. Keep the primer away from flame and ignition sources. For more information about this product and its safety precautions, refer to its MSDS. Failure to do so could cause injury.

22. Prepare the bearing cover (BH) for the stick-on molding (BM).

    a. Put the bearing cover (BH) on the ceiling cover (BK) at the position the bearing cover (BH) is to be installed.

    b. Make a note the position of the outside edge of the bearing cover (BH) on the ceiling cover (BK) surface.

    c. Use the included alcohol pads to clean the surface of the bearing cover (BH) where the stick-on molding (BM) is to be installed.

    d. Let the surface dry completely.

    e. Shake the 3M™ Tape Primer ampule well.

    f. Crush at the dot on the ampule.

    NOTE:
    Placement of the 3M™ Tape Primer 94 is critical. The stick-on molding may bond initially but may not stick permanently.

    g. Apply a thin uniform coat of the 3M™ Tape Primer 94 to the bonding surface interface (BP) of the bearing cover (BH). Use the minimum amount that fully coats the bearing cover (BH) to the stick-on molding (BM) surface interface (BP) (see figure 27 on page 40).

    h. Let the primer dry thoroughly before you apply the stick-on molding (BM). This takes approximately five minutes at room temperature.

    NOTE:
    Make sure the primed surface and the stick-on molding remain free from contaminates prior to the placement of the stick-on molding.

23. Cut the stick-on molding (BM) to length, and add the stick-on molding (BM) to hold the ceiling cover (BK) flush against the ceiling. **Apply the adhesive side to the bearing cover** (BH).

24. Use the included alcohol pads to clean excessive 3M™ Tape Primer 94 residue.

1. 3M™ is a trademark of the 3M Company.

25. Install the lower bearing cover (BN) (if required) (see figure 26 on page 37):

    a. With the arm pointing straight out, install the bearing cover (BN) with four screws (BC).

    b. With the arm to the side, attach the gap filler (BO) behind the bearing cover (BN) with hook-and-loop fasteners.

WARNING:
The 3M™[1] Tape Primer is an extremely flammable liquid and vapor and may cause an allergic skin reaction. Keep the primer away from flame and ignition sources. For more information about this product and its safety precautions, refer to its MSDS. Failure to do so could cause injury.

26. Prepare the side panels (AZ), for the stick-on molding (BM) (see figure 26 on page 37).

    a. Use the included alcohol pads to clean the surface of the side panels (AZ) where the stick-on molding (BM) is to be installed.

    b. Let the surface dry completely.

    c. Shake the 3M™ Tape Primer ampule well.

    d. Crush at the dot on the ampule.

    NOTE:
    Placement of the 3M™ Tape Primer 94 is critical. The stick-on molding may bond initially but may not stick permanently.

    e. Apply a thin uniform coat of the 3M™ Tape Primer 94 to the bonding surface interface (BQ) of the side panels (AZ). Use the minimum amount that fully coats the side panels (AZ) to the stick-on molding (BM) surface interface (BQ) (see figure 27 on page 40).

    f. Let the primer dry thoroughly before you apply the stick-on molding (BM). This takes approximately five minutes at room temperature.

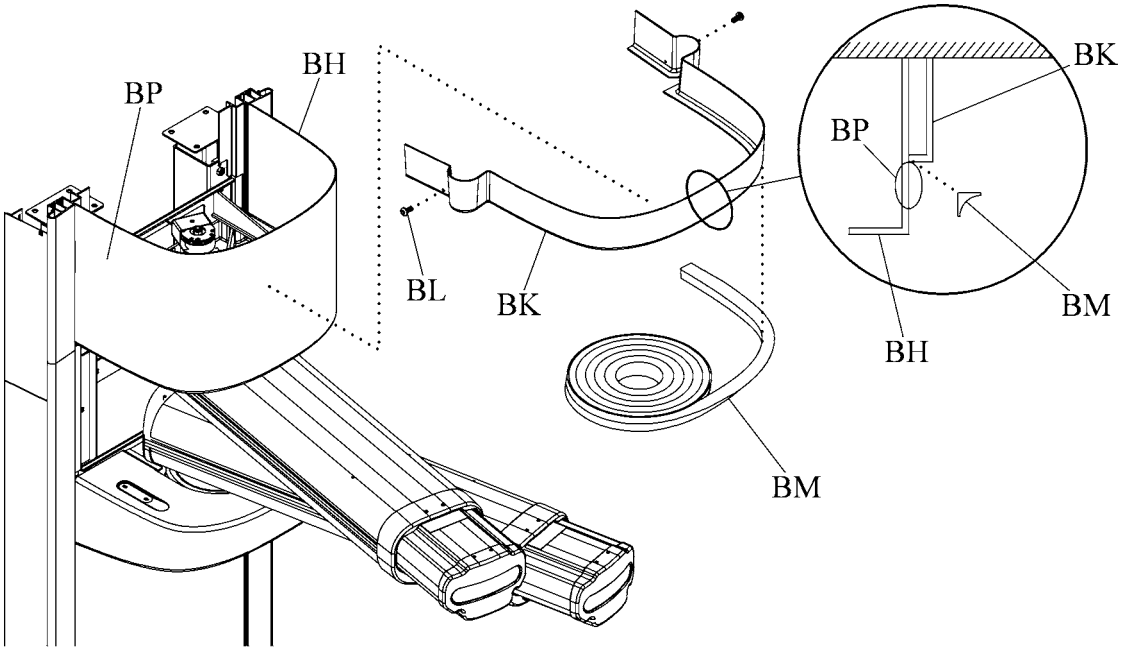
    NOTE:
    Make sure the primed surface and the stick-on molding remain free from contaminates prior to the placement of the stick-on molding.

27. Cut the stick-on molding (BM) to length, and apply the stick-on molding (BM) to where the side panels (AZ) meet the finished wall.

28. Use the included alcohol pads to clean excessive 3M™ Tape Primer 94 residue.

1. 3M™ is a trademark of the 3M Company.

Figure 27. Ceiling Cover Trim



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