

Fig. 1

For interior or exterior use on non-fire rated openings with metal frame and single or paired (double) metal or aluminum frame doors with or without reinforcement depending on the door weight. See note #5 below regarding wood door and/or frame installation.

Warranty Information

The following actions will void any warranty, expressed or implied:

- Failure to install the hinge according to the supplied manufacturer's requirements and installation instructions
- Use of fasteners, other than those supplied
- Unauthorized field modifications.



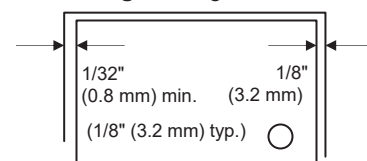
For doors 1 3/4"–2 1/4" (44.5–57 mm) thick, up to 48" (1210 mm) wide. Maximum door height is related to the length of the hinge - see Nominal Door Height chart below.

Can be installed on doors 2–2 1/4" (50–57mm) only if maximum weight, width, and height are not exceeded.

Installation Requirements

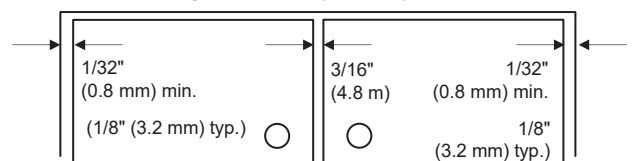
- Hinges are supplied approximately 15/16" to 1" (24-25.4 mm) shorter than the nominal door height, to avoid threshold and carpet interference issues. (e.g. the actual height for a nominal 84" high door is 83-1/4", while the actual hinge height will be 83" to 83-1/16").
- The minimum frame width that can be used is 1-3/4" (44 mm). In that case the door stile width must be minimum 1-1/2" (38 mm). Refer to Figure 1.
- Supplied hinge has an inset at the door of 1/32" (0.8 mm). If a deeper inset is required between the door and the frame surfaces, use a shim of the required thickness behind the hinge. Refer to Figure 1.
- Hollow metal doors must have sufficient interior support so that the door skin does not deflect or collapse after the through-bolt torquing. Refer to Figure 5.
- Supplied hardware is for installation on metal doors and frames. If installation on wood frame or door is required, appropriate hardware will be required (not supplied).
- Threaded mounting screws (# 12-24 x 5/8" long) require a minimum 3/32" (2.5 mm) metal thickness. The self-drilling and self-threading (TEK) screws should not be used to drill any mortar, cement or grout behind the door frame. Use the self-drilling TEK screws for drilling when material thickness is less than 0.110" (2.8 mm). For thicker material thickness, drill and tap for 12-24 UNC thread.
- All drilled and tapped holes must be perpendicular to the mounting surface and in the center of the hole in the hinge. Check every installed screw and ensure that the screw is not pulling/pushing the hinge out of its free position.
- For applications with door weight less than 200 lbs. (90 kg), in general, no hinge reinforcement is required.
- For door weights more than 200 lbs. (90 kg) and up to 400 lbs. (182 kg) the door and frame must have a proper reinforcement.
- The recommended clearances around the door(s) are indicated in the Figures 2 & 3.
- The frame surface must be flat where the hinge is installed. The frame must be solidly attached to the wall structure, and it should not flex as the door operates. Any frame flexing will affect the hinge operation and create noise.
- Frame must flat and vertical at the full height within 1/16" (1.5 mm)
- Geared hinges have self-lubricating bearings and normally do not need any lubrication.
- Ensure the geared sections of the hinges and the plastic thrust bearings are clean of any foreign particles. Any dirt or metal filings will affect the hinge operation
- Assemble hinge without the leaf cover and secure the gear-spine cover with two set screws located near the top and bottom edges. The screws are located on the plastic thrust bearing. Slight tightened the screws and ensure tightening does affect the hinge rotation/operation.

Fig. 2: Single Door



Hinge side clearance (typical) 1/8" (3.2 mm)
 Latch side clearance (typical) 1/8" (3.2 mm)
 TOTAL 1/4" (6.4 mm)

Fig. 3: Paired (Double) Doors



First hinge side clearance (typical) 1/8" (3.2 mm)
 Clearance between doors (typical) 3/16" (4.8 mm)
 Second hinge side clearance (typical) 1/8" (3.2 mm)
 TOTAL 7/16" (11.2 mm)

Nominal Door Height	Nominal Hinge Length	Frame Fasteners	Door Fasteners	
			Screws	Thru Bolts
84" (2134 mm)	83" (2108 mm)	19	19	8
96" (2438 mm)	95" (2413 mm)	20	20	9
120" (3048 mm)	119" (3023 mm)	22	22	10

Hinge Trimming (if required)

- If the hinge must be trimmed shorter, first determine the correct door handing and hinge orientation. Then, mark and trim only at the bottom of the hinge. DO NOT cut the top end.
- Remove the hinge leaf covers. Using a metal-cutting saw begin the cut through the gears cover first. Obtain a clean and smooth cut. Deburr carefully and clean all sharp edges, before sliding any covers.
- Do not cut through any holes of the nylon thrust bearings in the gears. Relocate any bearing with a setscrew (if required).


1. Installation to the Frame

- Remove cover on hinge leaf.
- Place the door in the frame. Use appropriate shims or wedges all around the door to obtain the required clearances as indicated in Figures 2 and 3. On the door lock-side top edge increase the clearance by 1/32" (0.8 mm). The door may shift a little after installation.
- Mark a vertical line on the frame at 1-3/4" (44 mm) from the hinge center gap between the door and the frame. Consult Figures 1 & 4 and note 2 in Installation Requirements.
- With door leveled and secured inside the frame, open and position hinge on the frame. Ensure top edge of the hinge is at least 1/8" (3 mm) below the frame header or at the same level with the door top edge or 1/32" (0.8 mm) below the door top edge. The hinge edge must perfectly vertical and at the desired distance from the hinge-gear centerline or gap centerline.
- Hold hinge in place and use the supplied punching tool to mark the centers of the two top mounting holes. Secure using supplied self-drilling/tapping TEK screws. Ensure the drilling is perfectly perpendicular to the frame surface. Verify that the hinge is vertical and repeat this step at the bottom of the hinge on the two lowest mounting holes. Install two more screws at the middle of the hinge after ensuring that the hinge is vertical and the door leaf hinge is operating normally. If an issue is noticed, repeat steps 1(b) to 1(e).
- If the frame wall thickness is insufficient for the supplied machine screws, steel rive-nuts (not supplied) must be used.
- Install remaining screws, ensuring that all screw holes are centered in the hole on the hinge. If any screw hole is not centered, drill another hole close-by. Once the door is attached to the hinge, the door will follow the hinge motion.
- Verify that the hinge rotates freely and smoothly.

2. Installation to the Door

- Ensure door hinge-side stile width is of appropriate size for the hinge mounting as shown in Figure 1. Ensure door is placed in the frame, plumb and with required clearances.
- Position hinge door leaf on the door. Adjust the door position so that the door top edge is level or 1/32" (0.8 mm) higher than the hinge top edge. The door must be perfectly vertical and plumb. If door surface requires an inset more than 1/32" (1.7 mm) refer to note 3 in installation Requirements section.
- While door is secured in place, use the supplied punching tool to mark the centers of the three top mounting holes. Secure using supplied self-drilling/tapping TEK screws. Ensure the drilling is perfectly perpendicular to the door surface. Verify that the hinge is vertical and repeat this step at the bottom of the door on the two lowest mounting holes. Ensure the drilling is perpendicular to the mounting surface and on the marked centers of the mounting holes.
- Remove shims and check clearances around the door. If clearances at the top and lock side door edges are not within specification/requirements the door must be repositioned with corrected clearances (shims/wedges) and re-drilled at new locations.
- Verify that door opens and closes properly, smoothly and with no noticeable noise. If any noise or friction is noticed, then the installation and frame/door arrangement must be investigated.
- Shim door again to have the required clearances and install the remaining screws. Ensure screws do not affect the hinge leaf position on the door. If after installation of all screws there is a noticeable noise, loosen up all the screws and starting tightening them alternately to ensure no single screw is applying stress at the hinge. Firmly tighten all screws and continue with the through-bolt installation.
- Through-bolt barrel nuts must be installed on the secured side of the door. Use supplied punching tool to mark the centers of the through-bolt mounting holes. To ensure the through-bolt hole is in the center of the hole in the hinge leaf, pre-drill with 1/4" (6.5 mm) drill through the door and perpendicular to the door surface. Enlarge the hole to 3/8" (9.5 mm) diameter on the door side where the barrel nut is installed. Refer to Figure 5.
- Install barrel nuts and machine screws. Do not tightened until all through bolts are properly installed.

3. Verify Operation

- Verify that door opens and closes smoothly and tighten firmly all screws and through-bolts.
-  If excessive friction or noise is noticed, the frame and door must be checked again. Loosen all screws and check again. DO NOT install any hinge leaf covers until the door operation is smooth and acceptable.

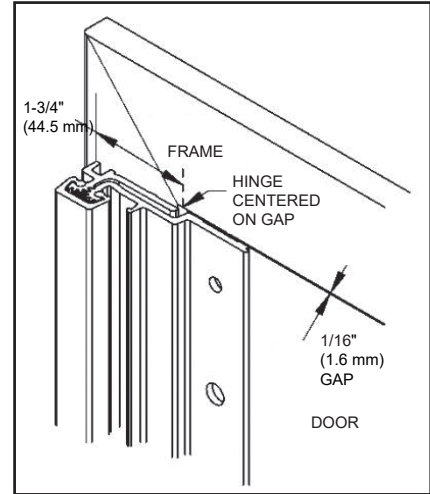


Fig. 4

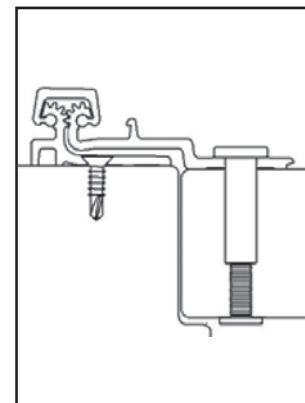


Fig. 5

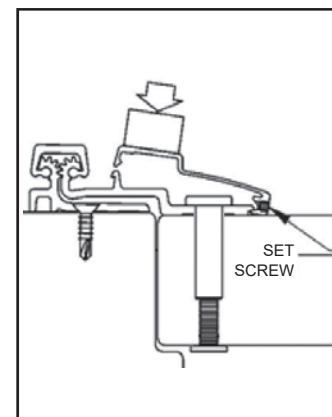


Fig. 6

4. Install Cover

- Before installing the cover, ensure that all screws are tightened and that the door is operating without any friction or noise. DO NOT install the hinge leaf cover until the door operation is smooth and acceptable.
- To install the cover on the hinge door leaf, unscrew the setscrew on the longer leg of the cover and hook that side of the cover under the outside edge of the leaf along the full length. Starting at the top and working downwards, press and tap the short leg of the cover in place. Use a rubber hammer if required while taking care not to damage the cover surface. Once in place secure with setscrew (Figure 6).

