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Terms & Conditions of Sale

TRUTH HARDWARE'S WARRANTY FOR WINDOW & DOOR MANUFACTURERS & AUTHORIZED DISTRIBUTORS

All Truth Hardware products, with the exception of electrical products*, are warranted against defects in materials and workmanship for the life of the product¹.

Truth Hardware's warranty is expressly limited to window & door manufacturers and Truth Hardware Authorized Distributors, who purchase Truth Hardware products for the purpose of resale, or use in the ordinary course of the buyers business, and may not be assigned or transferred.

This warranty does not cover normal wear or discoloration on finishes, or any product which has been improperly installed, abused, misused, worn out, altered, used for a purpose other than that for which it was intended, or in a manner inconsistent with any instructions regarding its use, nor does it cover corrosion related damage. This warranty only covers electrical products that are used to drive manual hardware systems (operators and hinges) manufactured by Truth.

THIS WARRANTY IS EXCLUSIVE. TRUTH HARDWARE MAKES NO OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS MANUFACTURED AND SOLD BY IT, WHETHER AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER. No agent, employee or representative of Truth Hardware has any authority to bind Truth Hardware to any affirmation, representation, or warranty concerning Truth Hardware products or parts, except stated herein.

If any product manufactured by Truth Hardware is found to be defective by Truth Hardware, in its sole judgment, Truth Hardware will, at its option, either repair or replace such defective product. Truth's liability is limited only to the replacement value of the hardware. THIS REMEDY SHALL BE THE EXCLUSIVE REMEDY AVAILABLE FOR ANY DEFECTS IN THE PRODUCTS MANUFACTURED AND SOLD BY TRUTH HARDWARE OR FOR DAMAGES RESULTING FROM ANY OTHER CAUSE WHATSOEVER, INCLUDING WITHOUT LIMITATION, TRUTH HARDWARE'S NEGLIGENCE. TRUTH HARDWARE SHALL NOT IN ANY EVENT BE LIABLE TO ANY BUYER FOR CONSEQUENTIAL, OR INCIDENTAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR THE LABOR WHICH MAY BE REQUIRED FOR THE REPLACEMENT OF SAID PRODUCT, WHETHER FOR BREACH OF WARRANTY, NEGLIGENCE, ON THE BASIS OF STRICT LIABILITY, OR FOR ANY OTHER REASON.

The purpose of this exclusive remedy shall be to provide the window/door manufacturer, or Truth Hardware Authorized Distributor, with replacement of products, or parts, manufactured by Truth Hardware found to be defective in materials or workmanship, or negligently manufactured. This exclusive remedy shall not be

deemed to have failed of its essential purpose so long as Truth Hardware is willing and able to repair or replace said defective products or parts in the prescribed manner.

* All Truth Hardware electrical products, are warranted for one (1) year against defects in materials and workmanship.

¹ *Industry related testing has defined the typical lifetime of fenestration hardware to be 10 years.*

Terms -

1%/10 days - net 30 days on hardware purchases.
Net 30 days on freight charges. Tooling invoice terms available upon request.

Freight -

F.O.B. Factory

Conditions -

Initial orders, and all subsequent orders placed before credit is established with Truth Hardware, will be on a cash-in-advance or C.O.D. basis. Cash-in-advance orders will be entered by Truth Hardware upon the receipt of the order and payment. Pricing is determined at time of shipment.

Return Goods -

Authorization from our Sales Department is required in advance for all goods to be returned to Truth Hardware. Authorization will be granted in all cases of defective product or incorrect shipments due to an error on Truth Hardware's part. Truth Hardware may also, at its option, authorize the return of other goods subject to a 25% restocking charge and including and offsetting order equal in value to the amount of the return. Product considered for return must be standard product, built to current Truth Hardware manufacturing specifications, no older than the immediate past calendar year, clean, resalable, in full unopened cartons. The quantity to be returned cannot be excessive based on Truth Hardware's current level of sales and inventory position. Freight on all return goods must be prepaid to our plant and merchandise must be received within 30 days of date of authorization.



These hinges balance a sash as it opens for smooth, effortless operation. The stainless steel reinforced shoe provides continuous smooth action. Detachable support arms allow quick installation of the sash into the frame.

It is recommended to match the size of the hinge to the height and weight of the sash. Each size hinge is designed to balance a particular size and weight sash. Proper selection of a hinge can help prevent problems such as “window chatter” that are sometimes experienced when these hinges are used with Truth's Awning Operators. An adjustable friction screw allows one to customize ease of window movement.

Table within the drawings gives a recommended height and weight range for each hinge. The data in this table has been generated by computer simulation as a guide in matching the hinge with the window. If you have a sash that doesn't appear on this table, call Truth for selection assistance.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: Steel track. Heavy gauge steel support arms and acetal shoe with stainless steel insert. Corrosion resistant non-magnetic stainless steel package is also available.

FINISH: Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

ORDERING INFORMATION:

1. Choose hinge size desired (specify by part number).
2. Specify right- or left-hand (determined by the hinge side when looking at the window from the outside).
3. Hinges can be ordered assembled or K.D. (knocked down). K.D. hinges allow track and arm assemblies to be purchased separately for greater



efficiency when hardware is applied to sash and frames in separate locations.

4. Optional mounting hardware: #20585 - Adjustment screw, included with hinge. Replacement pieces sold separately. #30591 - Detach clip, included with hinge. Replacement pieces sold separately.

RECOMMENDED SCREWS:

Type of screws required determined by material of profile being used. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

1. **Special consideration should be given when designing an awning window.** Please consult Truth Tech Note #2 for further information.
2. Failure of the concealed awning hinge can occur under certain situations when opened to near 90°. For this reason, an operator and/or limit device must be used with the concealed awning hinge to prevent the window from being opened to 90°.
3. When an awning window is “under hinged” (i.e., when a hinge is used on a window larger than what it is recommended for), two areas of concern are created. First, chatter is likely to occur when operated with an awning operator (see Truth Tips for Awning Operator). Second, depending on the degree of under hinging, the hinge may fail at an amount of opening significantly less than 90°. For this reason, the amount of opening must be limited to 45° of opening, any #13 series Awning Hinge may be used on sash up to 42 inches high and 61 lbs.
4. Adding a snubber to the center of the top rail on an awning window may increase the negative air pressure rating

of the window. See Snubber section for proper application.

5. For vinyl window applications, mounting screws should pass through two PVC walls or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

6. To insure maximum screw thread engagement in vinyl profiles, a #7 screw with an undercut head should be used for mounting the Track (not available from Truth).

7. For accurate hardware placement in vinyl or metal applications, pre-drilling is recommended.

8. For metal window profiles Truth recommends machine screws however, in most applications sheet metal screws will provide adequate holding power.

9. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information, see Tech Note #11.

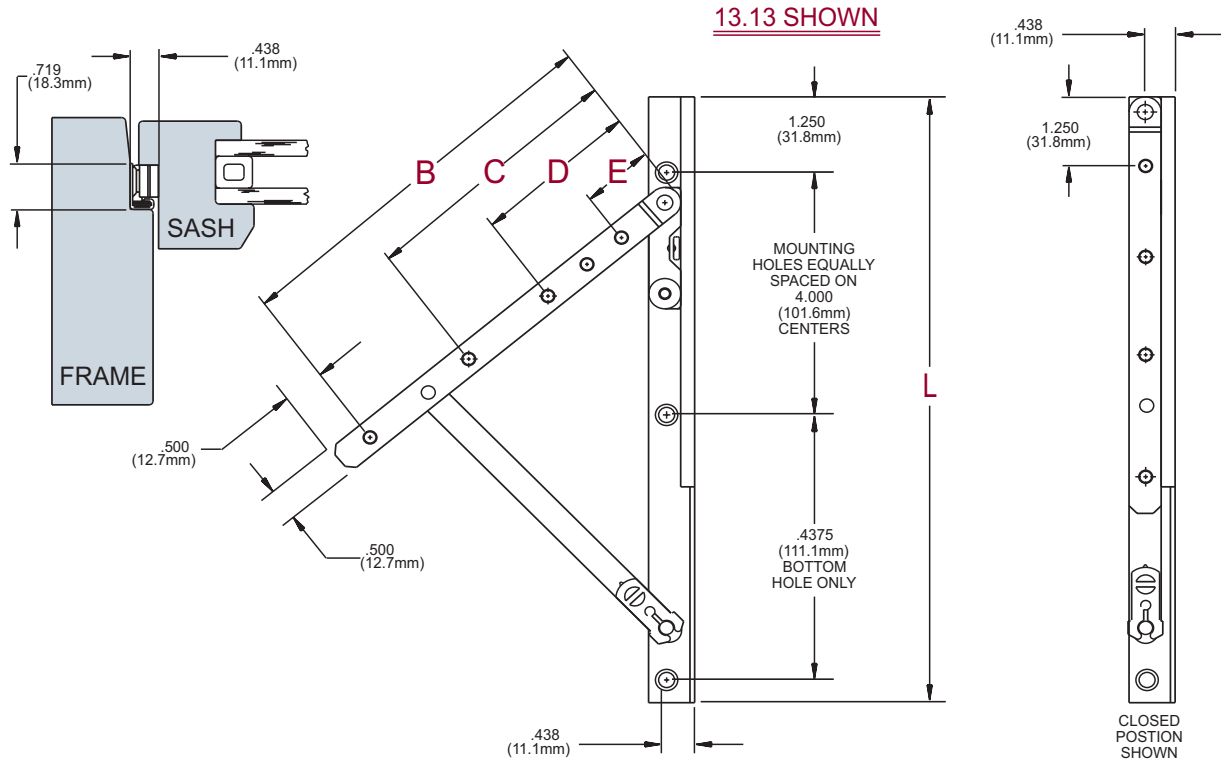
INCLUDE TRUTH SPECS IN YOUR NEXT WINDOW PROJECT

Sash balancing friction hinge for use on residential or commercial windows, which will be concealed between sash and frame for low maintenance and clean exterior aesthetics.

Awning window hinges shall be of sash balancing design, which provides a friction screw adjustment for fine tuning window sash operation. Constructed of E-Gard® components to provide enhanced corrosion protection.

Awning window hinges shall be 13 Series hinge, as manufactured by Truth Hardware, Owatonna, MN.

APPLICATION OF CONCEALED AWNING HINGE



AVAILABLE OPERATORS

		HINGE NO.	LEVER OPERATOR	AWNING OPERATOR	22 SERIES PIVOT SHOE	22 SERIES SCISSOR ARM	ENTRYGARD DUAL ARM *	ENTRYGARD DYAD *	SPLIT ARM *	23 SERIES DYAD *
ARM MATERIAL	STEEL	13.13	10.14	11.12, 11.30	22.17, 22.18	N/A	N/A	15.11, 15.62	15.18, 15.66	ALL 23 SERIES
		13.14	10.14	11.10, 11.12	22.10	22.22 THRU 22.29	15.10, 15.61 15.16			
		13.15	10.10	11.14, 11.16						
		13.16	10.11	11.14, 11.30						
		13.17	10.14	11.14, 11.30						
ST STEEL	N/A	13.43	N/A	11.32	N/A	N/A	N/A	15.19	N/A	N/A
		13.44	N/A	11.29, 11.32						
		13.42	N/A	11.27, 11.21						
		13.45	N/A	11.28						

* OPERATOR IS MOUNTED ON THE SIDE JAMB

HINGE		RECOMMENDED SASH HEIGHT	RECOMMENDED MAXIMUM SASH WEIGHT	L HINGE LENGTH	B	C	D	E	SCREWS REQ'D PER HINGE	F
STEEL	ST.STL									
13.13	13.43	10.0-14.0 (254.0mm-355.6mm)	7 LBS (3.2 KG)	10.0 (254.0mm)	6.250 (158.8mm)	4.250 (108.0mm)	2.625 (66.7mm)	1.250 (31.8mm)	7	N/A
13.14	13.44	14.0-19.0 (355.6mm-482.6mm)	20 LBS (9.1 KG)	14.0 (355.6mm)	8.250 (209.6mm)	6.250 (158.8mm)			8	N/A
13.15	13.42	19.0-26.0 (482.6mm-660.4mm)	38 LBS (17.3 KG)	18.0 (457.2mm)					9	N/A
13.16	13.45	26.0-34.0 (660.4mm-863.6mm)	50 LBS (22.7 KG)	22.0 (558.8mm)					10.250 (260.4mm)	10
13.17	N/A	34.0-42.0 (863.6mm-1066.8mm)	61 LBS (27.7 KG)	26.0 (660.4mm)	11.75 (298.4mm)	8.250 (209.6mm)			5.438 (138.1mm)	12

RECOMMENDED SCREWS: (P/N 119110.XX) NO. 7X .750 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS (STEEL)
(P/N 19105.XX) NO. 7X .750 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS (STAINLESS STEEL)

FOR USE WITH TRACK ON PVC: NO. 7X .750 PHILLIPS, FLAT HEAD, UNDERCUT, SHEET METAL SCREWS
(NOT AVAILABLE FROM TRUTH, QUANTITIES WILL DEPEND ON HINGE) (SEE TRUTH TIP NO. 5&6)



Through their quality, reliability, and features, Truth's Concealed Casement Hinges have become the standard by which others are measured in our industry. Here is why Truth has remained the industry leader.

STYLE & STRENGTH:

Truth's casement hinges provide tamper resistance and beautiful exterior sightlines to your windows. Being concealed these hinges can also reduce shipping problems with assembled windows. The sash and support arms are made from heavy gauge steel. Delrin shoe with stainless steel insert provides self-cleaning action in track for longer life.

OPTIONS & FEATURES:

Available in either assembled or K.D. (knocked down), which allows the support arm to be easily attached by using the snap-stud. This permits quick installation of the sash into the frame. Special stop feature on support arm prevents window from opening past 90° - refer to Truth Tip #4. The unique adjustable brass stud is antique plated for quick identification purposes in the field. All Truth Concealed Casement Hinge track is available with a standard flat bottom to help reduce "rocking" and an end notch to reduce corner cleaning on clad or welded vinyl windows. Optional models designed to provide "washability," or egress are also available.

ADJUSTMENTS MADE SIMPLE:

Truth also has a hinge model that helps make field adjustments to your windows to help reduce sash drag! Truth's Adjusta-Hinge with its easy to use adjustable stud. Truth's Adjusta-Hinge enables the manufacturer, or window installer, to quickly and precisely re-align the sash within the window frame without ever having to disconnect the support arms. Assembled with its specially designed stud in a centered position, the Adjusta-Hinge can be moved a full .062" (1.5mm) of an inch towards the outside of the sash, and .031" (0.8mm) towards the jamb. To obtain the full .062" (1.5mm) adjustment towards the jamb, the hinge must be mounted at least .031" (0.8mm) away from the jamb. Adjustments can be easily made while the hinge is fully assembled with the simple twist of Truth's slim-line



wrench #31887. See Figure #3 and Truth Tip #5 for adjustment procedures.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: Non-magnetic stainless steel track, heavy gauge steel or non-magnetic stainless steel arms, brass stud (not available on stainless steel models) and stainless steel reinforcing insert in Delrin shoe.

FINISH: Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

ORDERING INFORMATION:

1. Choose hinge style desired (specify by part number - see chart). Hinges can be ordered assembled or K.D. (knocked down). K.D. hinges allow track and arms to be purchased separately for greater efficiency when hardware is applied to the sash and frames in separate locations.
2. Specify left- or right-hand (handing determined by the hinge side when looking at the window from the

outside).

3. Optional mounting hardware (sold separately): #21223 Sash Lifter (refer to Truth Tip #9) #31887 - Slim Line-Wrench.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile being used. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

1. Truth recommends that when designing a casement window the **sash width should be limited to no greater than 66% of the sash height**. A sash width that exceeds 66% could develop sash sag over the life of the window. Refer to Truth Technical Note #3 for more information dealing with sash sag prevention.
2. The Concealed Casement Hinge with snap stud attachment was designed to be used on a casement window only. **Under no circumstances** should a casement hinge with a snap stud attachment be used on an awning window.
3. With the flat bottom track, screw heads will be raised above the track when installed. Truth's Delrin shoe now has a higher bridge to clear screw heads (.060" high).

4. Truth recommends a hinge with a 90° stop be used on any casement window, which uses a Dyad Operator unless the window has a Limit Device to keep it from opening past 90°.
5. A standard 3/8" wrench can be used to adjust a hinge equipped with the adjustable stud, however this will require detaching the support arms from the track. To adjust this hinge without detaching the support arms it is necessary to use Truth's slim-line Wrench #31887.
6. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information, see Tech Note #11.
7. On some window designs, binding can be experienced on the hinge side of the window between the outermost edge of the sash and the jamb. This problem often occurs when switching from standard hinge to an "Egress" hinge. If a window system is designed to work with an "Egress" hinge, the window system will work with all other Truth Concealed Casement Hinges. When binding is encountered, three solutions are available: a) move hinge location toward outside of sash, b) increase the clearance between the sash and jamb, and c) decrease the thickness of the sash.
8. Truth recommends that a Snubber be used at the center of the hinge side of any casement window, which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of a casement window.

9. The #21223 Sash Lifter is a device inserted in the shoe on the bottom hinge in a casement window. It is sometimes necessary to maintain a constant reveal around the outside edge of the window. This is because the nature of a casement window places the window weight entirely on the bottom hinge causing it to slightly compress while slightly stretching the top hinge creating a difference in the window reveal between top and bottom. The heavier the window, the greater the potential for a window reveal difference. The Sash Lifter Button is not intended to correct sash sag.
10. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
11. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
12. For metal window profiles Truth recommends machine screws however, in most applications sheet metal screws will provide adequate holding power.
13. For easy correction of out of square, or racked window installations, the use of Truth Jamb Jack III frame adjuster is recommended. Frame adjustment can improve both weather seal tightness and sash operation over the life of the window.

INCLUDE TRUTH SPECS IN YOUR NEXT WINDOW PROJECT

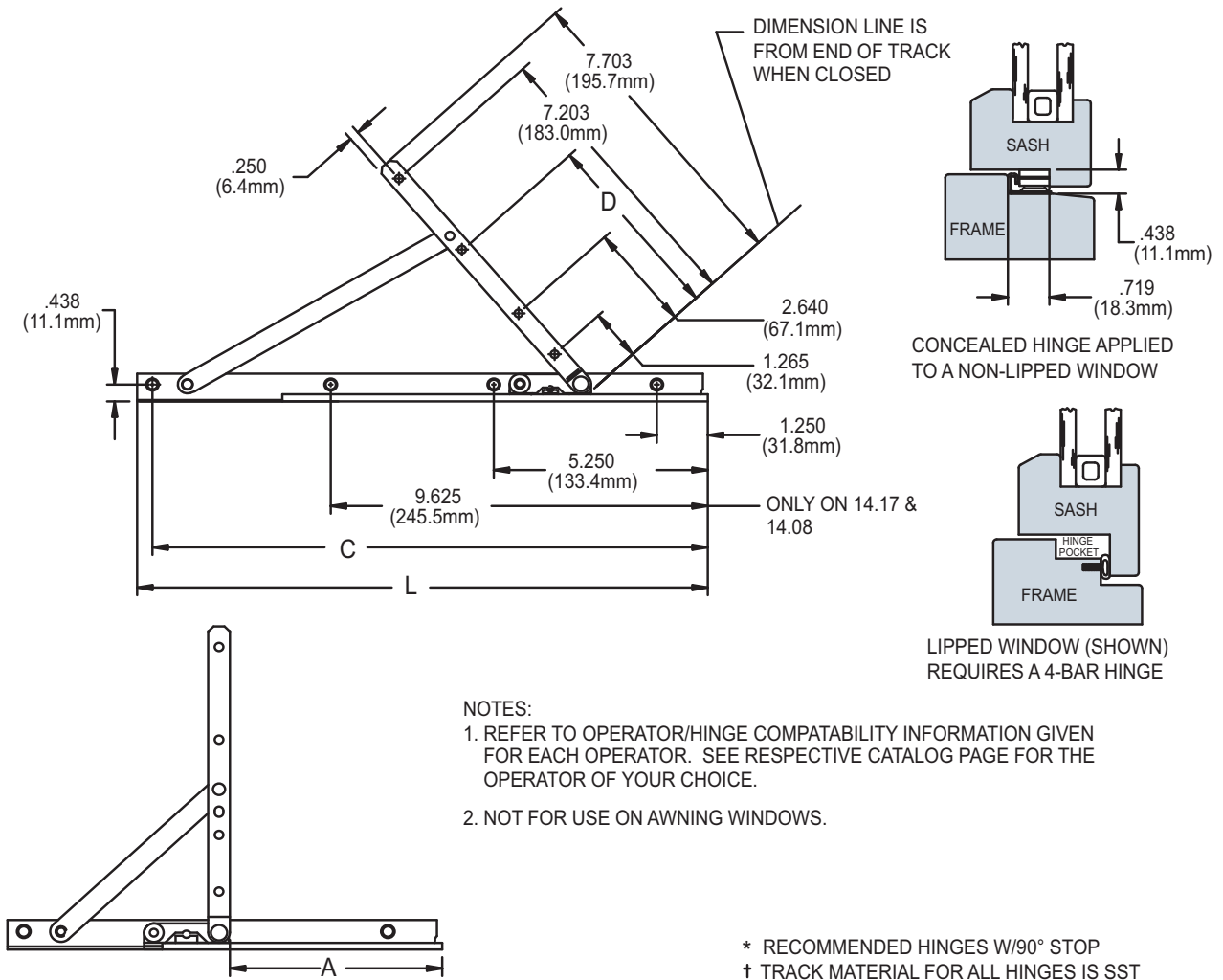
Low friction casement hinge for use on residential or commercial windows, which will be concealed between sash and frame for low maintenance and clean exterior aesthetics.

Casement window hinges will be of slide and pivot design, which uses a low friction slide shoe and stainless steel track. The slide shoe must be constructed with a high bridge bottom for screw head clearance and a stainless steel insert for strength. The hinge shall provide an easy means of disconnection to allow easy sash removal. Sash arms are to be constructed of E-Gard® components to provide enhanced corrosion protection.

Only On Adjustable Hinge Models:
The hinges shall provide a means of adjustment for sash drag. This adjustment must be accomplished without loosening or removing the mounting screws.

Casement window hinges shall be 14 Series hinge, as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF CONCEALED CASEMENT HINGE

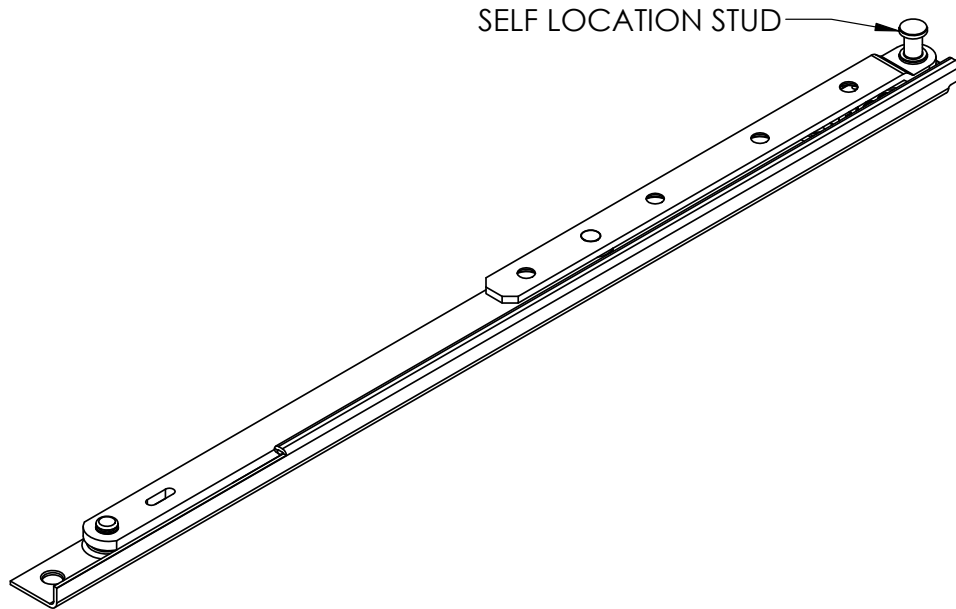


PART NO.	A	C	D	L	† ARM & RIVET	ATTACHMENT	SCREWS	
* 14.05	4.906 (124.6mm)	9.625 (244.5mm)	4.953 (125.8mm)	10.000 (254.0mm)	STEEL	ADJUSTABLE BRASS SNAP STUD	A	
* 14.06	5.531 (140.5mm)						C	
14.08	6.938 (176.2mm)	13.625(346.1mm)	4.805(122.1mm)	14.000(355.6mm)			C	
* 14.75	4.906 (124.6mm)	9.625 (244.5mm)	4.953 (125.8mm)	10.000 (254.0mm)		STAINLESS STEEL	STANDARD BRASS SNAP STUD	A
* 14.76	5.531 (140.5mm)							C
Δ 14.77	2.281 (57.9mm)							C
14.17	6.938 (176.2mm)				13.625(346.1mm)		4.805(122.1mm)	14.000(355.6mm)
14.80	4.906 (124.6mm)	9.625 (244.5mm)	4.953 (125.8mm)	10.000 (254.0mm)	STAINLESS STEEL	STAINLESS STEEL SNAP STUD	B	
14.91	5.531 (140.5mm)						B	
Δ 14.93	2.281 (57.9mm)						B	

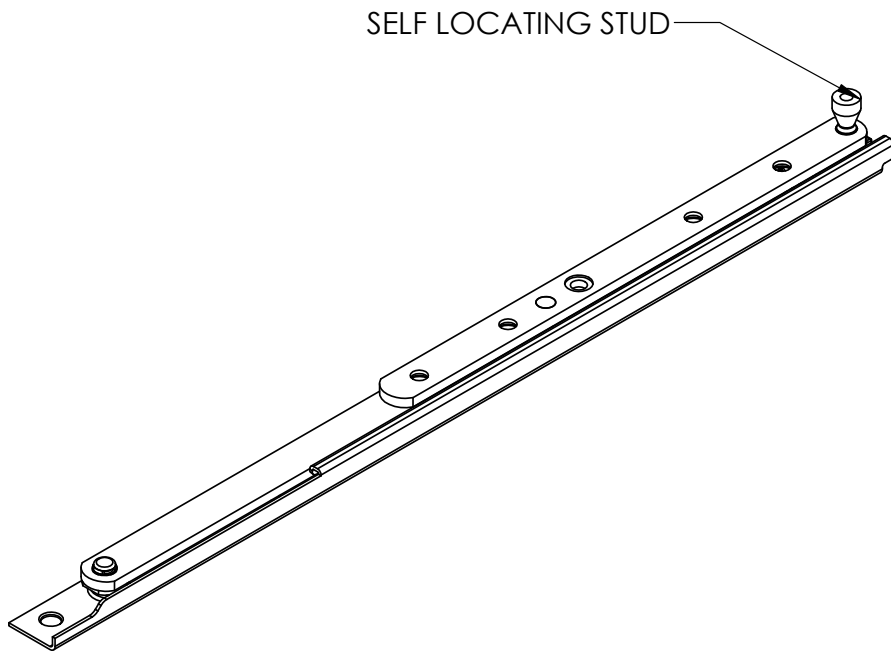
RECOMMENDED SCREWS: PER PAIR

- A - SASH ARM: 8(19110)#7X.750 PHILLIPS, FLAT HEAD, STEEL, SHEET METAL SCREW.
- TRACK: 6(19115)#7X.750 PHILLIPS, FLAT HEAD, UNDERCUT, SST, SHEET METAL SCREWS.
- B - SASH ARM: 8(19105)#7X.750 PHILLIPS, FLAT HEAD, SST, SHEET METAL SCREW.
- TRACK: 6(19115)#7X.750 PHILLIPS, FLAT HEAD, UNDERCUT, SST, SHEET METAL SCREWS.
- C - SASH ARM: 8(19110)#7X.750 PHILLIPS, FLAT HEAD, STEEL, SHEET METAL SCREW.
- TRACK: 8(19115)#7X.750 PHILLIPS, FLAT HEAD, UNDERCUT, SST, SHEET METAL SCREWS.

FIG. 2 SELF LOCATING HINGE OPTIONS

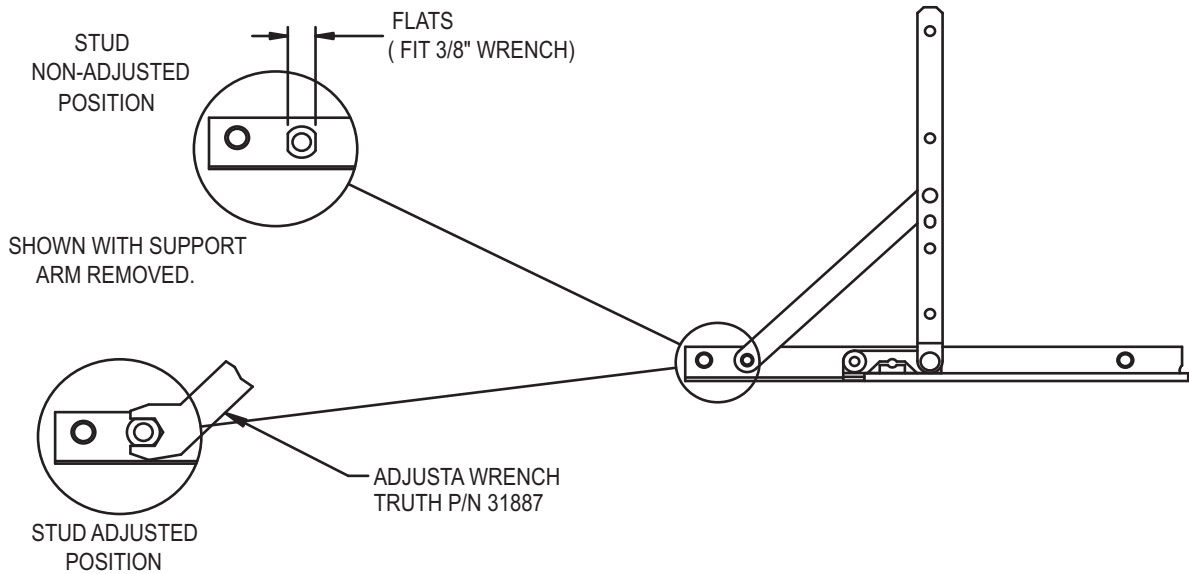


A SELF LOCATION STUD OPTION IS AVAILABLE ON THE FOLLOWING HINGES TO AIDE IN THE EASE OF INSTALLATION:
AWNING HINGES: 13.13 , 13.14 , 13.15 , 13.16 , 13.17 , AND 13.18
CASEMENT HINGES: 14.05 , AND 14.77



A SELF LOCATION STUD OPTION IS AVAILABLE ON THE FOLLOWING HINGES TO AIDE IN THE EASE OF INSTALLATION:
MAXIM HINGE: 14.12 AND 14.97

FIG. 3 INSTRUCTIONS FOR SASH ADJUSTMENT



INSTRUCTIONS FOR SASH ADJUSTMENT

1. THE AMOUNT OF SASH DRAG THAT THIS HINGE WILL CORRECT FOR IS DEPENDENT ON THE RATIO OF THE SASH WIDTH VS. SASH HEIGHT. TO CALCULATE THE AMOUNT OF SASH DRAG ADJUSTMENT FOR ANY GIVEN WINDOW SIZE, TAKE THE RATIO OF THE WIDTH TO HEIGHT MULTIPLIED BY 1/16".

EXAMPLE: SASH SIZE EQUALS 24" X 36", WIDTH TO HEIGHT RATIO IS .667.
 TOTAL ADJUSTMENT IS $.667 \times 1/16" = .042"$ (APPROX. 3/64")

2. TO ADJUST THE CASEMENT SASH, FIRST FULLY OPEN THE WINDOW. NEXT, SLIP THE ADJUSTMENT WRENCH (TRUTH PART NO. 31887) ONTO THE BASE OF THE STUD, FOUND BETWEEN THE SUPPORT ARM AND THE TRACK OF THE LOWER HINGE. SWINGING THE WRENCH AWAY FROM THE LOCK SIDE OF THE WINDOW WILL DECREASE THE AMOUNT OF SASH DRAG.

THE MAXIMIM SASH DRAG ADJUSTMENT IS REACHED WHEN THE STUD FLATS ARE PARALLEL TO THE TRACK. NOTE: TURNING THE STUD FLATS BEYOND PARALLEL WILL NOT INCREASE SASH DRAG CORRECTION.

3. FOR SEVERE SASH DRAG, A SIMILAR PROCEDURE CAN BE USED ON THE UPPER HINGE. UPPER HINGE ADJUSTMENT IS MADE BY SWINGING THE WRENCH TOWARD THE LOCK SIDE OF THE WINDOW. MAXIMUM ADJUSTMENT IS OBTAINED WHEN THE STUD FLATS ARE PARALLEL TO THE TRACK.

NOTE: MAXIMUM ADJUSTMENT MAY CAUSE BINDING AS THE WINDOW IS CLOSED. PLEASE USE CAUTION.

4. STUD MAY BE ADJUSTED WITH 3/8" WRENCH OF SUPPORT ARM IS REMOVED BEFORE ADJUSTMENT*.





WASHABILITY: When you are in need of venting a large casement window, Truth's #14.97 Washability Casement Hinge, in combination with Truth's Maxim Dual Arm Operator, is just the answer. This model will allow the sash to move 6-1/2" to provide washability access. The hinge provides 1.5" more "washability" area than Truth's standard #14.75 Casement Hinge, which makes it much easier for the homeowner to clean their windows from inside the home. Able to support a 40"x 84" frame size window (96 lb. Sash), the #14.97 Hinge has been rated to meet an average of 225 lbs. per hinge in negative air testing.

EGRESS: Truth's #14.12 Egress Casement Hinge is designed specifically to work with Truth's Maxim Dual Arm Operator, in order to achieve egress access in required situations. The hinge arms are made of heavy gage steel to give sash weight carrying capability of up to 69 lb. sash.

FIELD SERVICE SOLUTIONS: Field service problems can be easily corrected with our simple adjustment feature built right into the hinge. Often times a window may be installed out of square, or sash sag may occur which needs to be remedied. Now, without having to disconnect the sash, the window can be re-aligned by simply turning the "adjustment stud" with our Maxim Hinge Adjustment Wrench (#31887).

See Figure #3 and Truth Tip #8 for adjustment procedures.

DESIGN: These hinges have a notched track to clear corner welds in vinyl window frames, and has a .080" screw head clearance under the slide shoe. Hinges fit into existing hinge cavities of Truth's #14 series hinges (see drawings for optional 1/2" stack-height models). Both hinges meet an average of 225 lbs. per hinge, in negative air testing. The hinge arms are made of heavy gage steel to give sash weight carrying capability of up to a 69 lb. (#14.12), and 96 lb. (#14.97) sash when used with the Maxim Dual Arm Operator.

WARRANTY: Protected under the terms of the "Truth Warranty for Window & Door Manufacturers & Authorized Distributors". Refer to Truth's Terms & Conditions for further details.

MATERIAL: Non-magnetic stainless steel track, heavy gauge steel arms, brass stud and stainless steel reinforced insert in plastic shoe. Non-magnetic stainless steel arms are also available.

CORROSION RESISTANCE: Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes. For coastal applications, Truth also has stainless steel arms available (See Tech Note #7).

ORDERING INFORMATION:

1. Specify "standard" or "coastal" hinge.
2. Order Casement Hinge part number:
 - #14.97 (washability)
 - #14.12 (egress)
3. Hinges can be ordered assembled or K.D. (knocked down). K.D. hinges allow track and arms to be purchased separately for greater efficiency when hardware is applied to the sash and frames in separate locations.
 1. Specify left - or right-hand (handing determined by the hinge side when looking at the window from the outside). **A pair of hinges are required per window (1 left hand & 1 right hand).**
 2. #31887 - Maxim Hinge Adjustment Wrench (sold separately).

RECOMMENDED SCREWS:

Coating compatibility between the screws and the hinge is very important in order to maintain the optimum in corrosion resistance performance. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Truth recommends that when designing a casement window the sash width should be limited to no greater than 66% of the sash height. A sash width that exceeds 66% could develop sash sag over the life of the window. Refer to Tech. Note #3 for more

information dealing with sash sag prevention.

2. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information, see Tech Note #11.
3. The Washability Hinge with snap stud attachment was designed to be used on a casement window only. Under no circumstances should a casement hinge with a snap stud attachment be used on an awning window.
4. Screw heads will be raised above the track when installed. Truth's slide shoe is bridged (.080" high) to clear screw heads.
5. For accurate hardware placement, pre-drilling of the screw holes in the window profile is recommended.
6. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
7. For metal window profiles Truth recommends machine screws however, in most applications sheet metal screws will provide adequate holding power.
8. A standard 7/16" wrench can be used to adjust a hinge equipped with the adjustable stud, however this will require detaching the support arms from the track. To adjust this hinge without detaching the support arms it is necessary to use Truth's Maxim Hinge Adjustment Wrench #31887.
9. On some window designs, binding can be experienced on the hinge side of the window between the outermost edge of the sash and the jamb. This problem often occurs when switching from a standard hinge to an "Egress" hinge. If a window system is designed to work with an "Egress" hinge, the window system will work with all other Truth Concealed Casement Hinges. When binding is encountered, three solutions are available: a) move hinge location toward outside of sash,

b) increase the clearance between the sash and jamb, and c) adding a radius to outside corner of the sash.

10. Truth recommends that Snubbers be used at the center of the hinge side of any casement window that has a tendency to bow outwardly at the center in the closed position. Adding Snubbers may increase the negative air pressure rating of a casement window.

11. For easy correction of out of square, or racked window installations, the use of Truth Jamb Jack III frame adjuster is recommended. Frame adjustment can improve both weather seal tightness and sash operation over the life of the window.

INCLUDE TRUTH SPECS IN YOUR NEXT WINDOW PROJECT

Low friction casement hinge for use on residential or commercial windows, which will be concealed between sash and frame for low maintenance and clean exterior aesthetics. The hinge must provide a washable space between sash and side jamb when open 90°. **OR** The hinge must provide egress access when opened 90°.

Casement window hinges will be of slide and pivot design, which uses a low friction slide shoe and stainless steel track. The slide shoe must be constructed with a high bridge bottom for screw head clearance and a

stainless steel insert for strength. The hinge shall provide a snap-stud means of disconnection to allow easy sash removal. Sash arms are to be constructed of E-Gard® components to provide enhanced corrosion protection.

The hinges shall provide a means of adjustment for sash drag. This adjustment must be accomplished without loosening or removing the mounting screws.

Casement window hinges shall be 14 series Maxim® Hinge, as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF 14.97 CONCEALED MAXIM WASHABILITY HINGE

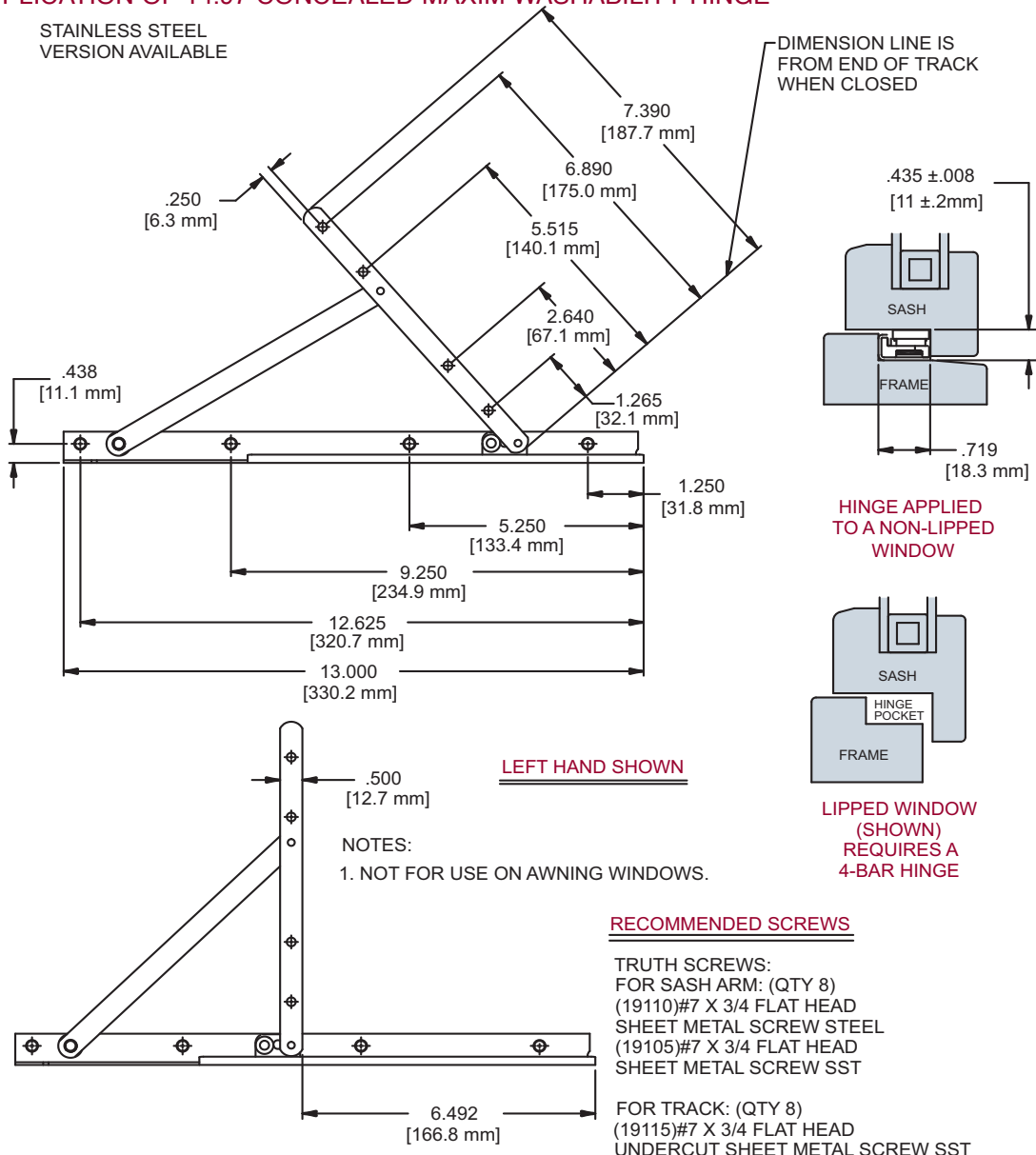
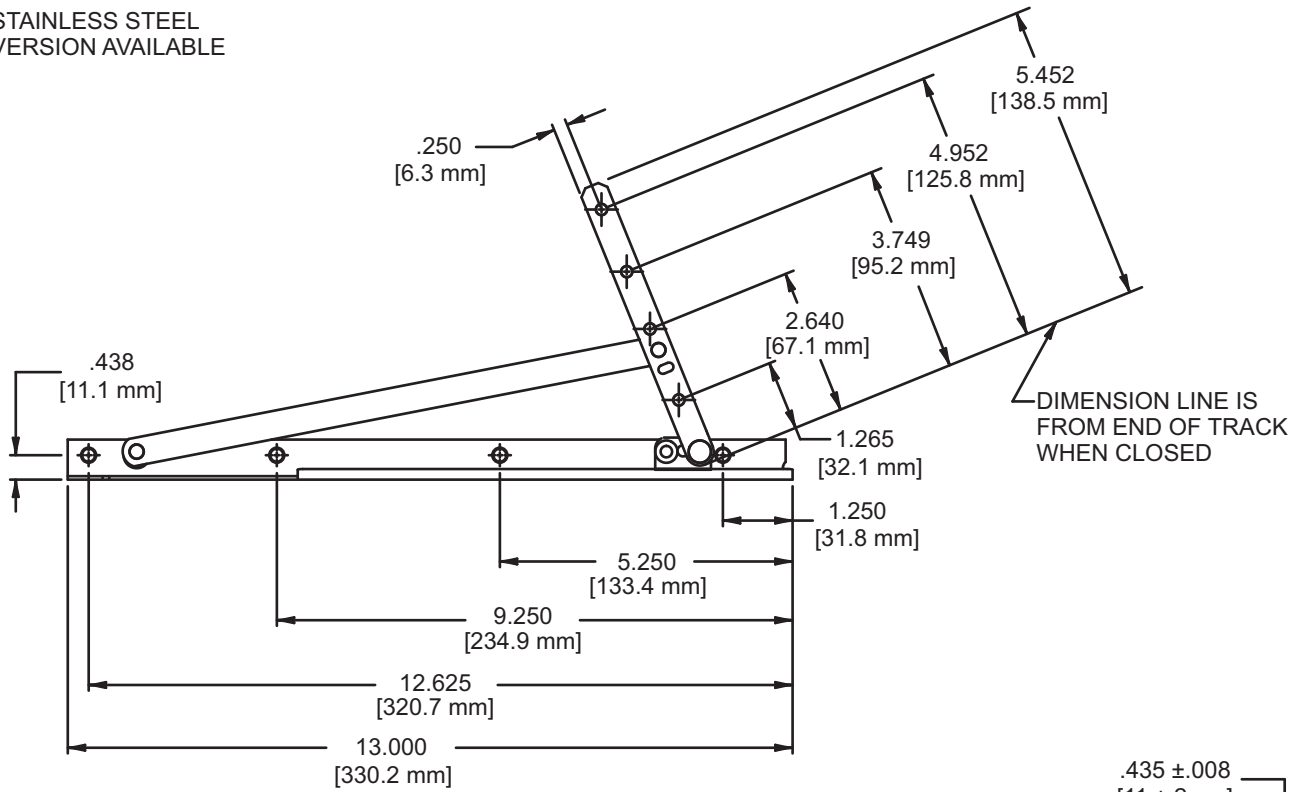


FIG. 2 APPLICATION OF 14.12 CONCEALED MAXIM EGRESS HINGE

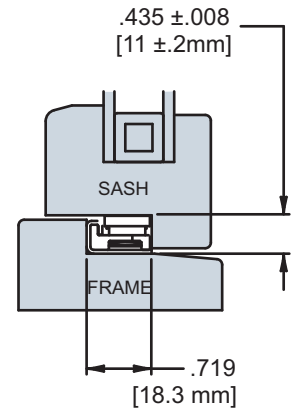
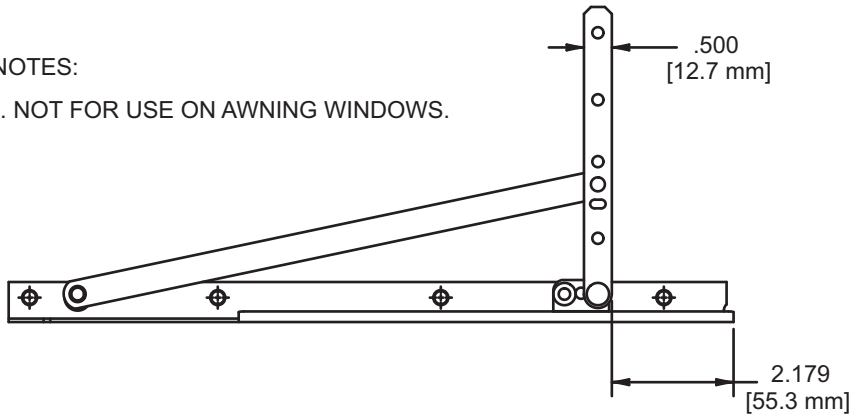
STAINLESS STEEL
VERSION AVAILABLE



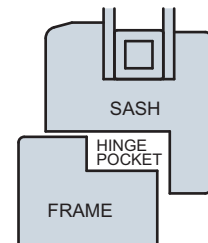
LEFT HAND SHOWN

NOTES:

- 1. NOT FOR USE ON AWNING WINDOWS.



HINGE APPLIED TO A NON-LIPPED WINDOW



LIPPED WINDOW (SHOWN) REQUIRES A 4-BAR HINGE

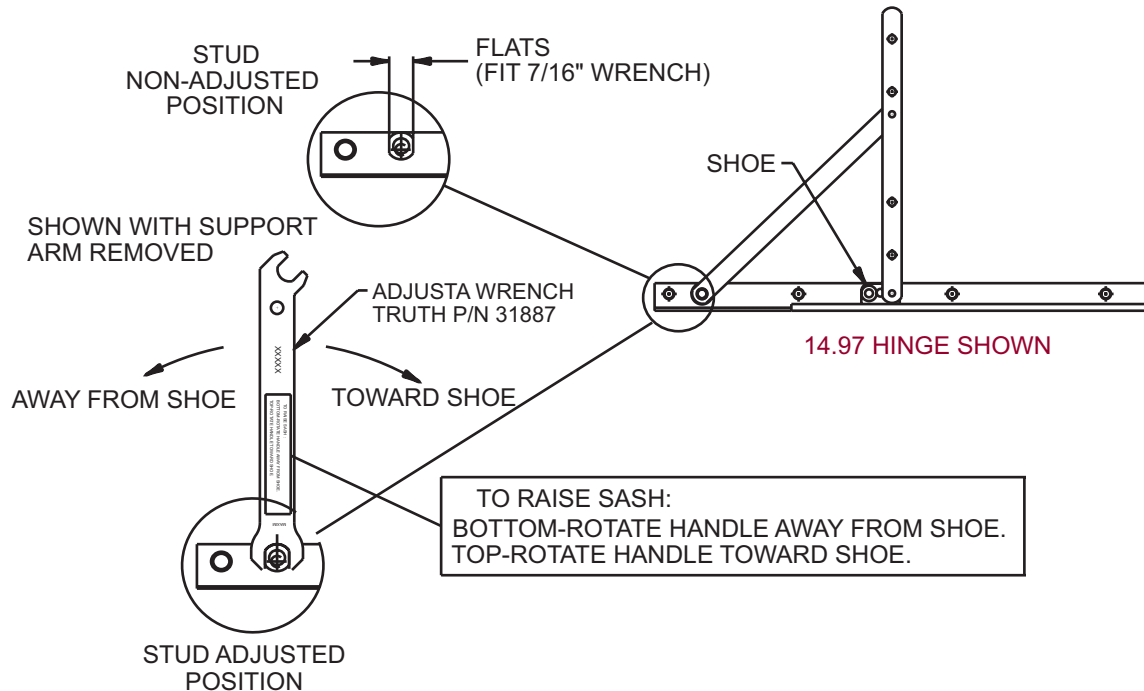
RECOMMENDED SCREWS FOR WOOD AND PVC APPLICATIONS:

(LENGTH AND THREAD TIE DETERMINED BY PROFILE)

TRUTH SCREWS:

- FOR SASH ARM: (QTY 8)
- (19110)#7 X 3/4 FLAT HEAD SHEET METAL SCREW STEEL
- (19105)#7 X 3/4 FLAT HEAD SHEET METAL SCREW SST
- FOR TRACK: (QTY 8)
- (19115)#7 X 3/4 FLAT HEAD UNDERCUT SHEET METAL SCREW SST

FIG. 3 INSTRUCTIONS FOR SASH ADJUSTMENT 14.12 AND 14.97 HINGES



INSTRUCTIONS FOR SASH ADJUSTMENT

1. THE AMOUNT OF SASH DRAG THAT THIS HINGE WILL CORRECT FOR, IS DEPENDENT ON THE RATIO OF THE SASH WIDTH VS. SASH HEIGHT. TO CALCULATE THE AMOUNT OF SASH DRAG ADJUSTMENT FOR ANY GIVEN WINDOW SIZE, TAKE THE RATIO OF THE WIDTH TO HEIGHT MULTIPLIED BY 1/16.

EXAMPLE: SASH SIZE EQUALS 24" X 36", WIDTH TO HEIGHT RATIO IS .667. TOTAL ADJUSTMENT IS $.667 \times 1/16" = .042"$ (APPROX. 3/64")

2. TO ADJUST THE CASEMENT SASH, FIRST FULLY OPEN THE WINDOW. NEXT, SLIP THE ADJUSTMENT WRENCH (TRUTH PART NO. 31887) ONTO THE BASE OF THE STUD, FOUND BETWEEN THE SUPPORT ARM AND THE TRACK OF THE LOWER HINGE. SWINGING THE WRENCH TOWARD THE LOCK SIDE OF THE WINDOW WILL DECREASE THE AMOUNT OF SASH DRAG. THE MAXIMUM SASH DRAG ADJUSTMENT IS REACHED WHEN THE STUD FLATS ARE 45° TO THE TRACK.

NOTE: DO NOT TURN PAST 45° OR ARM WILL BIND ON TRACK.

3. FOR SEVERE SASH DRAG, A SIMILAR PROCEDURE CAN BE USED ON THE UPPER HINGE. UPPER HINGE ADJUSTMENT IS MADE BY SWINGING THE WRENCH AWAY FROM THE LOCK SIDE OF THE WINDOW. MAXIMUM ADJUSTMENT IS OBTAINED WHEN THE STUD FLATS ARE 45° TO THE TRACK.

NOTE: MAXIMUM ADJUSTMENT MAY CAUSE BINDING AS THE WINDOW IS CLOSED. PLEASE USE CAUTION.

4. STUD MAY BE ADJUSTED WITH 7/16" WRENCH IF SUPPORT ARM IS REMOVED BEFORE ADJUSTMENT.



New energy specifications and requirements for increased window performance has necessitated the need for sashes to contain triple pane and or laminated glass. This combined with the move towards larger windows has pushed the envelope on what standard duty concealed casement hinges can handle. With Truth's new High Performance Hinge we have engineered a solution with impressive performance and weight carrying capabilities which will allow window manufacturers to meet these demanding new requirements.

STRENGTH & INNOVATION

Truth's new high performance casement hinge is designed for the future. Capable of supporting a 140 lb sash, this hinge allows manufacturers to use triple pane and laminate glass packages in larger windows. Engineered to fit into a larger 5/8" x 1-3/16" hinge cavity, Truth's new High Performance Casement Hinge is a more substantial version of Truth's popular Maxim® Hinge.

The new features of this hinge include:

- An innovative and patented shoe design with a built-in roller to reduce friction during operation thereby providing smoother travel even under maximum load (see Hardware Comparison Chart for maximum size based on passing the AAMA Load Test).
- An integrated negative air ramp on the track (see Fig. 1) for added strength in negative air performance when the window is in the closed position.
- A larger adjustable stud to provide more adjustment and weight carrying capacity.

Optional Accessories include:

- A new die cast zinc snubber (see Fig. 2), which fits into the 5/8" hinge cavity, helps complete this system by providing the needed strength to maintain the integrity of the window in negative air load.
- A hinge stop which can be installed to limit the window opening or help prevent sash disengagement if window is not handled properly.
- And for less demanding or smaller sized windows, Truth has

developed hinge shims/spacers to allow manufacturers to use standard hinges in the larger hinge cavity.

ADJUSTABILITY

Truth's High Performance Hinge comes equipped with an adjustable brass stud that allows the sash to be adjusted a full 0.125" (1/8") to ensure even reveal, weather seal, and to reduce sash drag. The adjustment can be moved a full 0.062" (1/16") from its neutral position in either direction. Adjustments can be made easily while the hinge is installed with the simple twist of Truth's slim-line wrench (# 31887). Truth's adjustable stud enables the manufacturer or installer to quickly and precisely realign the sash within the window frame without having to disconnect the support arms (See Fig. # 5 and the following Truth Tips for additional information).

ADDITIONAL OPTION

Hinge Stop: Truth's new Hinge Stop (33506) is a component that Truth highly recommends to be installed in the window. At a minimum, the upper hinge should have a hinge stop installed to help prevent the shoe from sliding out of the track in the event the support arm has been inadvertently disengaged from the stud. The Hinge Stop can also be used to limit the opening of the sash by installing it near the stud (see figure 3).

Hinge Shims/Spacers: Hinge shims/spacers are designed to allow standard



casement and awning hinges to fit in the new larger cavity for smaller and lighter sash. This is an economical solution to allow the manufacturer options when considering hardware application (see figure 4 for spacer application).

RECOMMENDED SCREWS

Types of screws required is determined by material of profile being used. Refer to catalogue drawings or application prints for complete information on screw type and quantity needed (sold separately). For additional information on screw selection see Truth Tips and Tech Note # 11.

WARRANTY

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL

High performance hinge is designed with stainless steel track, arms, rivet, metal shoe insert, UV resistance plastic shoe housing, and heavy duty brass stud. The austenitic stainless steel helps provide corrosion protection for standard application as well as the demanding environment as in coastal applications.

ORDERING INFORMATION

1 Review and consult Table 1 for high performance hinge hardware and

HIGH PERFORMANCE CASEMENT HINGE

accessories.

2 Choose High Performance Hinge style (and other recommended hardware) specified by part number using the hinge chart (Fig. 6) or application print.

3 Specify upper or lower hinge for High Performance Hinge and Left or Right handing for other hardware (handing determined by hinge side when looking at window from the outside)

4 Adjustable Stud Wrench #31887 (ordered separately).

5 Hinge Stop #33506 (ordered separately).

6 For standard hardware application in larger hinge cavity (5/8"x1 3/16"), hinge shims (23612, 23613, and 23638) are available for proper hinge arm length selected.

TRUTH TIPS

1. Truth recommends that when designing a casement window the sash width should be limited to no greater than 66% of the sash height. A sash width that exceeds 66% could develop sash sag over the life of the window. Refer to Tech Note # 3 for more information dealing with sash sag prevention.

2. Please refer to Tech Note # 15 for guideline to minimize shipping related damage to the hardware.

3. When selecting mounting screws for Truth Hardware, material and coating compatibility is one of the most important criteria. For best corrosion resistance the material and coating on the screws should be the same as the material and coating on the hardware. For more information see Tech Note # 11.

4. New Hinge Performance Hinges comes with adjustable stud. Hardware is shipped at the neutral position. Adjustment can be made once the window is properly (plumb and square and sash and frame are with correct dimensions) installed to ensure appropriate reveal, weather strip seal.

5. For accurate hardware placement pre-drilling (wood, aluminum, fiberglass) or dimple (vinyl) of the screw holes in the window profile is recommended.

6. For vinyl, aluminum, and fiberglass

window applications, mounting screws should pass through 2 walls, or one wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

7. For metal window profiles, Truth recommends machine screws; however in most applications sheet metal screws will provide adequate holding power.

8. To adjust the hinge, it is necessary to use Truth's Adjustment Wrench # 31887 without having to disconnect the hinge arm.

9. Truth recommends that snubbers be used starting at the center of the window on the hinge side that has a tendency to bow outwardly at the center in the closed position. Please refer to the application print for proper snubber locations. Adding snubbers may increase the negative air pressure

rating of a casement window. Truth's new die cast snubbers (23555.92 and 23557.92) will fit the new larger cavity. Please refer to application print or Truth technote 11 for screw selection.

10. Hinge stop (33506) is recommended as a safeguard for inadvertent disconnection of the arms.

INCLUDE TRUTH SPECS IN YOUR NEXT WINDOW PROJECT

Low friction casement hinge for use on larger and heavier window for residential or commercial windows, which will be concealed between sash and frame for low maintenance and clean exterior aesthetics. The hinge will provide a washable space between sash and side jamb when open to 90 degrees.

Casement high performance window hinges will be of slide and pivot design, which uses a low friction slide shoe and built-in roller. The hinge shall be stainless steel and provide a snap-stud attachment with built-in adjustability which can be accomplished without disconnecting the arm, loosening or removing mounting screws.

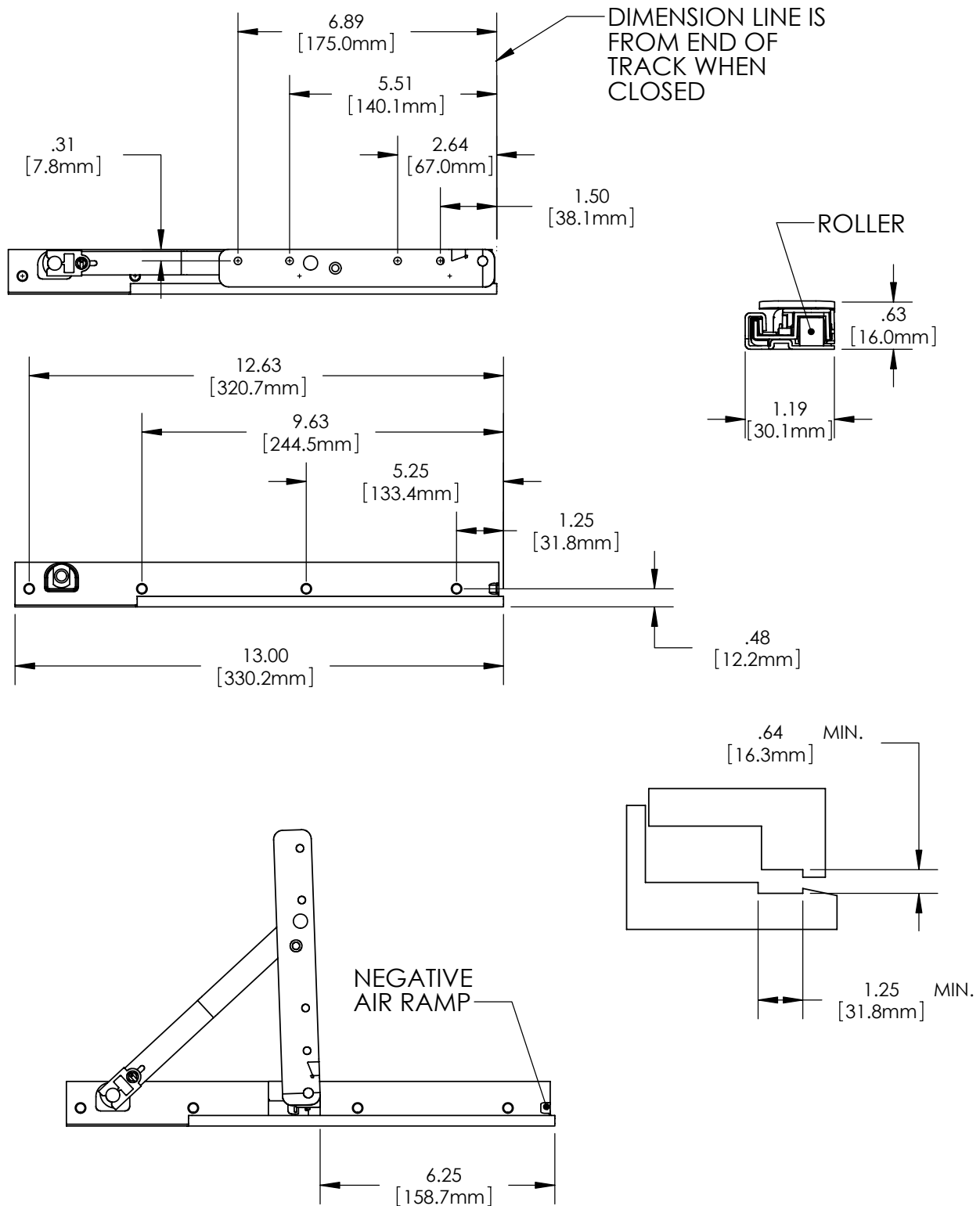
Casement window hinges shall be 14.10 Series High Performance Hinge as manufactured by Truth Hardware, Owatonna, MN.

Table 1 - High Performance Casement Hardware System

Hardware System	Part Number	Description	Application
High Performance Hinges	14.10.00.511.1 14.10.00.513.1	HGE CSM LL TRK NF WSH SS HGE CSM LL ARM WSH SS	KD LL Track and Arm
	14.10.00.512.1 14.10.00.514.1	HGE CSM UL TRK NF WSH SS HGE CSM UL ARM WSH SS	KD UL Track and Arm
	33506	SHOE STOP, HINGE SS3	Using screw hole on track or near stud to prevent shoe from sliding out of track
	23555.92	Die cast zinc (can be applied with #10 PH, or Pop rivet)	Using the same screw boss as hinge screw on the side wall
Adjustable Wrench	23557.92	Die cast zinc (To be applied with #8 FH)	Using the same screw boss as hinge screw on the side wall
	31887	WRENCH, ADJ STUD - COMBO	Adjustment made easy without disconnecting hinge arm
Operator		Please refer to Hardware Comparison Chart for operator selection along with hinges	
Standard Hinges		Please refer to Concealed casement for application information including the shim/spacer for larger cavity	
Locks		Please refer to Lock systems for application information	
Spacers	23612 - Shim, 5.744" 23613 - Shim, 8.616" 23638 - Shim, 11.488"	To be applied with standard Concealed Casement and Awning hinges to fit 5/8"x1 3/16" hinge cavity	
Screws		Please refer to application print for specific screw sizes. Refer to technote #11 Truth Tips for additional information on screw selection	

HIGH PERFORMANCE CASEMENT HINGE

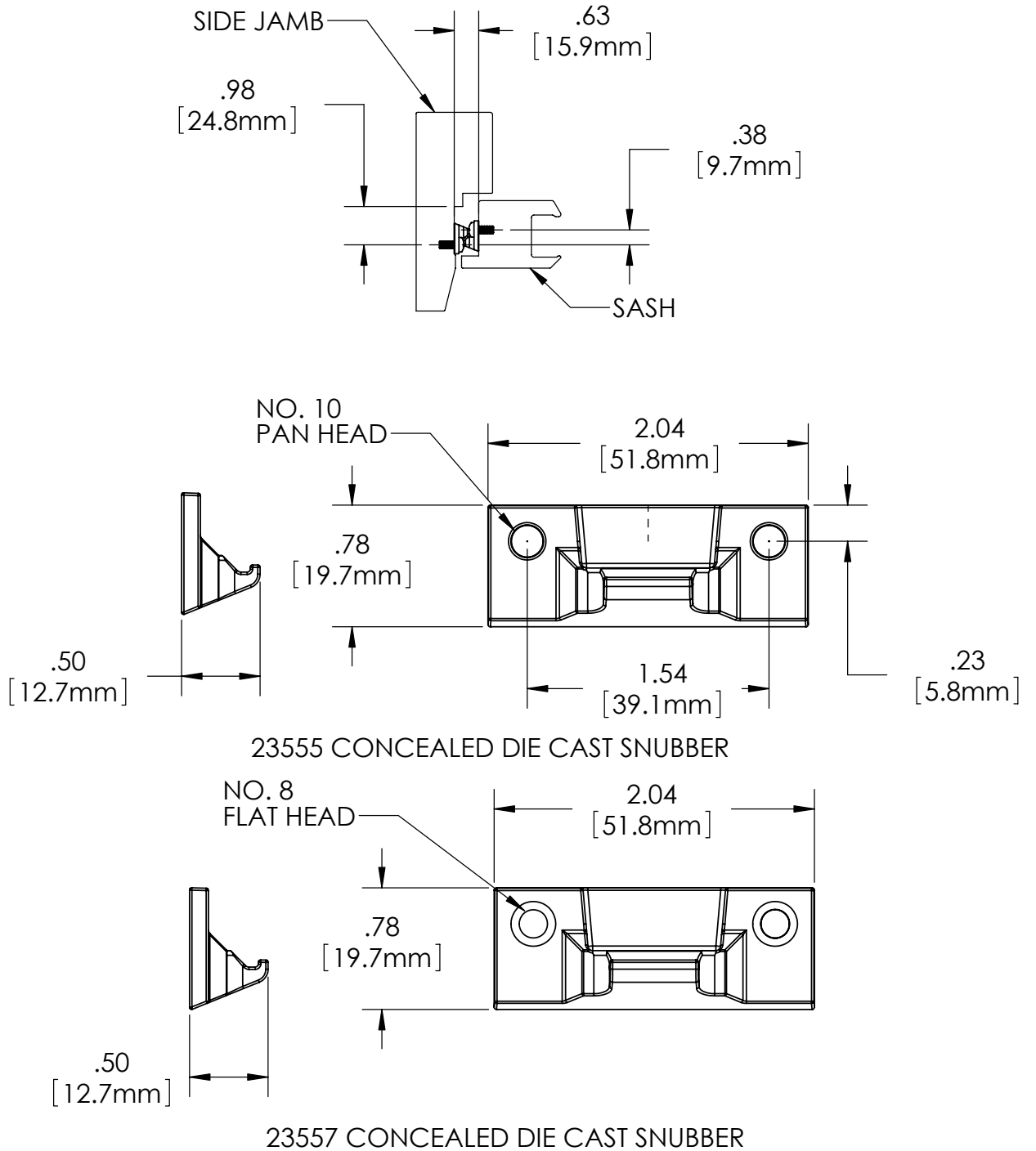
FIG. 1 APPLICATION OF CONCEALED HIGH PERFORMANCE CASEMENT HINGE



RECOMMENDED SCREWS: NO. 7 PHILLIPS FLAT HEAD SHEET METAL SCREWS (STAINLESS STEEL)

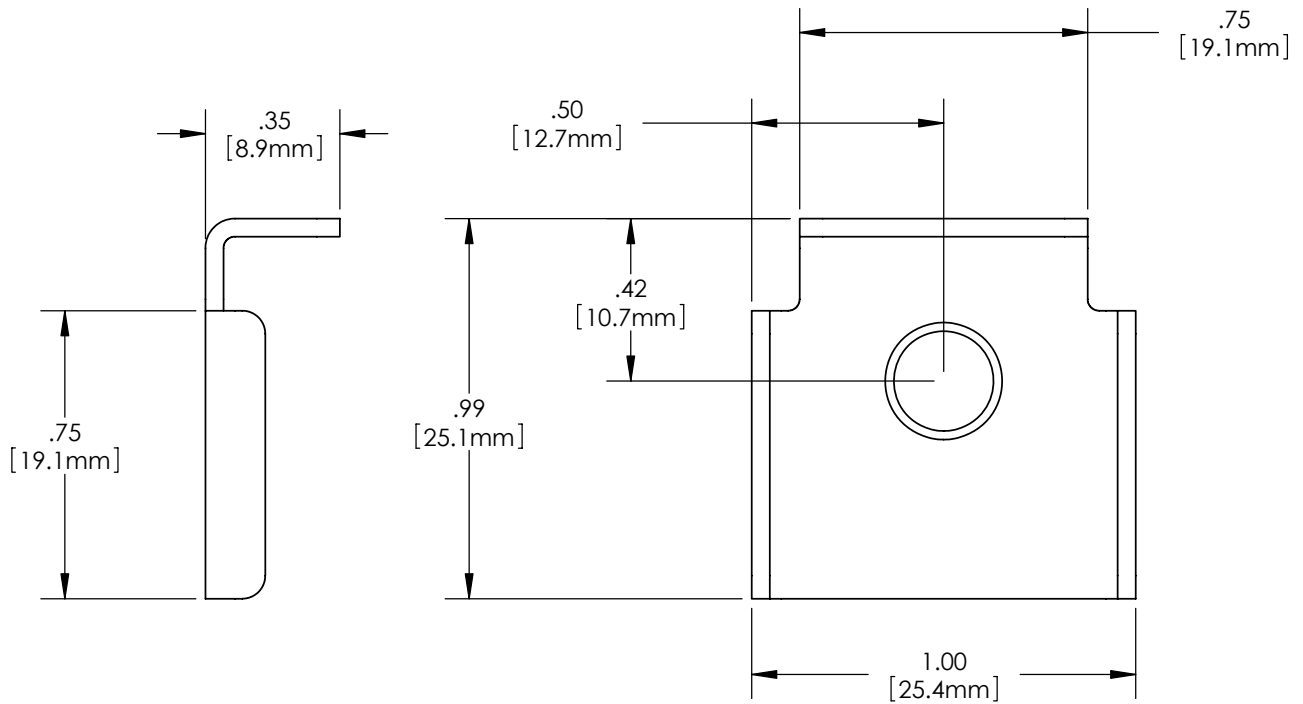
ON TRACK: NO. 7 PHILLIPS FLAT HEAD UNDERCUT SHEET METAL SCREWS (STAINLESS STEEL)

FIG. 2 23555 AND 23557 CONCEALED SNUBBER, DIE CAST

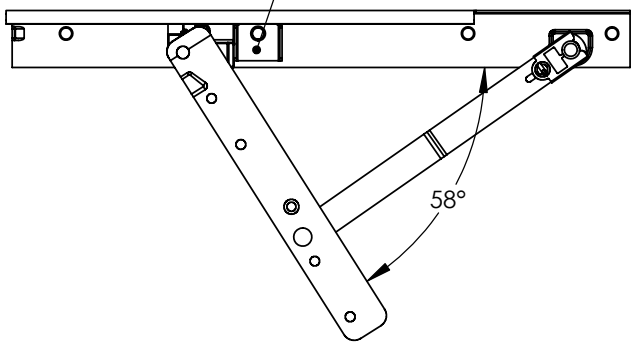


HIGH PERFORMANCE CASEMENT HINGE

FIG. 3 33506 HIGH PERFORMANCE HINGE STOP



HINGE STOP USED AS
A LIMIT DEVICE



HINGE STOP USED TO
KEEP SHOE IN TRACK

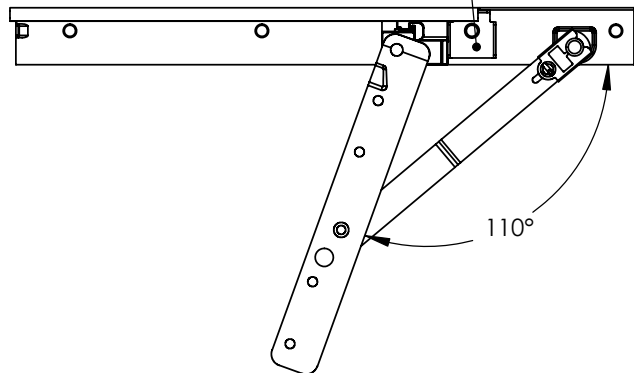
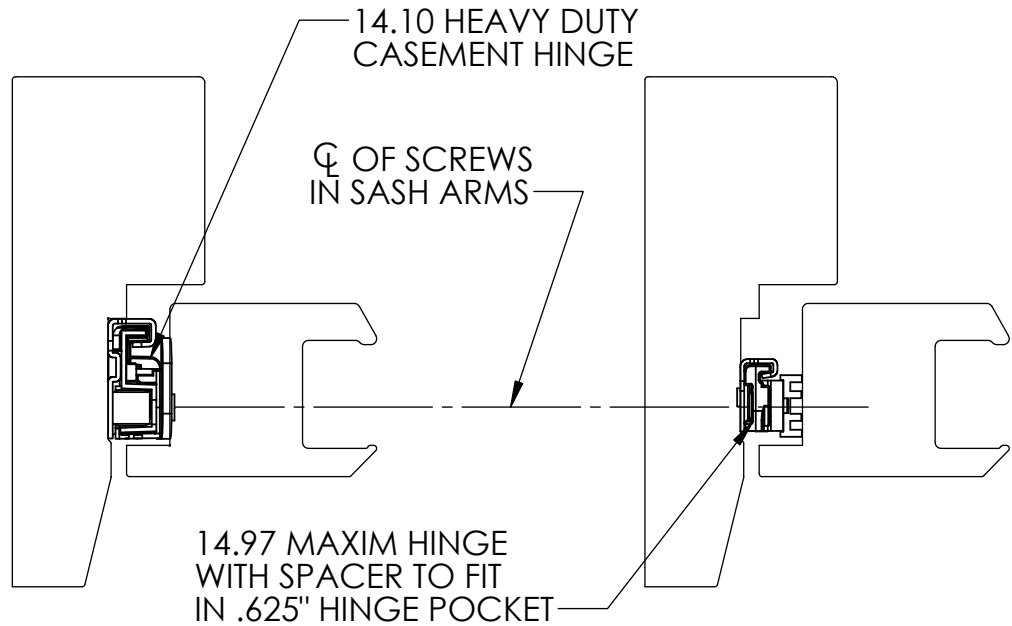


FIG. 4 MAXIM HINGE SPACER FOR USE IN .625" HINGE POCKET



SPACER #23638 FOR USE WITH 13.16, 13.17, 13.45, AND 13.46
AWNING HINGES



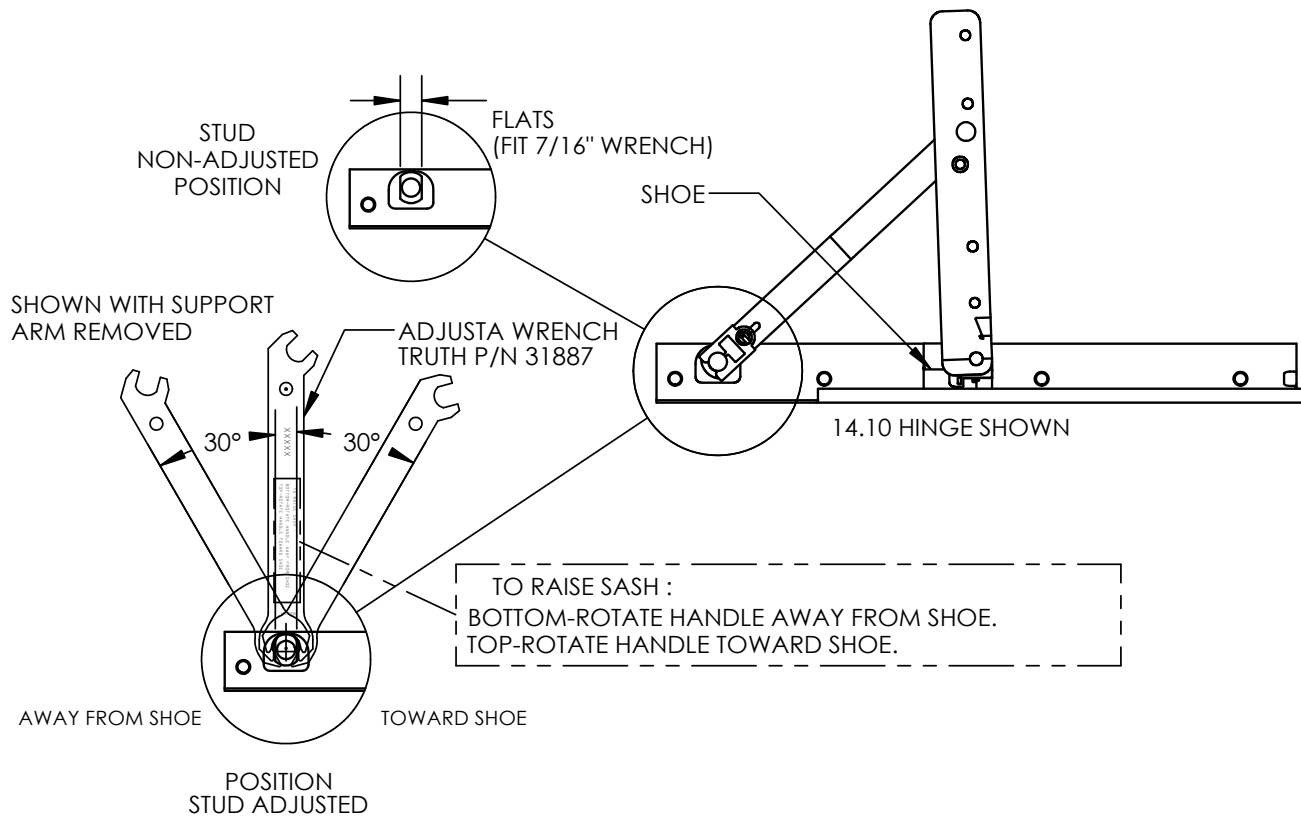
SPACER #23613 FOR USE WITH 13.15 AND 13.42 AWNING HINGES
AND 14.97 CONCEALED CASEMENT HINGE



SPACER #23612 FOR USE WITH 13.43, 13.13, AND 13.44 AWNING HINGES
AND 14.12 CONCEALED CASEMENT HINGE

HINGE SPACER ALLOWS STANDARD HINGES (14.12, 14.97)
TO FIT INTO THE HINGE POCKET FOR THE LARGER HEAVY
DUTY HINGE. ALSO WILL ALLOW AWNING HINGES (13.13,
13.15, 13.16, 13.17, 13.42, 13.43, 13.44, 13.45, and 13.46)

FIG. 5 INSTRUCTIONS FOR SASH ADJUSTMENT 14.10 HINGE



INSTRUCTIONS FOR SASH ADJUSTMENT

1. THE AMOUNT OF SASH DRAG THAT THIS HINGE WILL CORRECT FOR, IS DEPENDENT ON THE RATIO OF THE SASH WIDTH VS. SASH HEIGHT. TO CALCULATE THE AMOUNT OF SASH DRAG ADJUSTMENT FOR ANY GIVEN WINDOW SIZE, TAKE THE RATIO OF THE WIDTH TO HEIGHT MULTIPLIED BY 1/16.

EXAMPLE: SASH SIZE EQUALS 24" X 36", WIDTH TO HEIGHT RATIO IS .667. TOTAL ADJUSTMENT IS $.667 \times 1/16" = .042"$ (APPROX. 3/64")

2. TO ADJUST THE CASEMENT SASH, FIRST FULLY OPEN THE WINDOW. NEXT, SLIP THE ADJUSTMENT WRENCH (TRUTH PART NO. 31887) ONTO THE BASE OF THE STUD, FOUND BETWEEN THE SUPPORT ARM AND THE TRACK OF THE LOWER HINGE. SWINGING THE WRENCH TOWARD THE LOCK SIDE OF THE WINDOW WILL DECREASE THE AMOUNT OF SASH DRAG. THE MAXIMUM SASH DRAG ADJUSTMENT IS REACHED WHEN THE STUD FLATS ARE 30° TO THE TRACK.

3. FOR SEVERE SASH DRAG, A SIMILAR PROCEDURE CAN BE USED ON THE UPPER HINGE. UPPER HINGE ADJUSTMENT IS MADE BY SWINGING THE WRENCH AWAY FROM THE LOCK SIDE OF THE WINDOW. MAXIMUM ADJUSTMENT IS OBTAINED WHEN THE STUD FLATS ARE 30° TO THE TRACK.

NOTE: MAXIMUM ADJUSTMENT MAY CAUSE BINDING AS THE WINDOW IS CLOSED. PLEASE USE CAUTION.

Hardware Comparison for NAFS Casement Window Hardware Load Test

North American Fenestration Standard (AAMA/WDMA/CSA 101/1.S. 2/A440-08)

CAUTION: There are many factors in addition to the hardware which influence the maximum size casement window that should be produced. These include sash and frame stiffness and strength, screw holding strength, sash sag, weather tightness, and weatherstrip drag. For this reason, Truth recommends careful evaluation of the entire window before producing units as large as this matrix suggests.

Performance Class R: The Maximum Frame Size and Sash Weight are Listed in the Table.

Performance Classes LC, C, HC, AW: The Maximum Frame Area (Width x Height) Listed in the Table Must be Reduced by 20%.

Operator		Hinge										Approx. Minimum Frame Width to Fit Operator
		Maxim Washable	Maxim Egress	Heavy Duty	10" Standard	10" Washable	10" Egress	10" HP Concealed	10" HP Concealed Egress	Butt Hinge		
50.00	Maxim Dual Arm	40"W x 84"H; 108"(96) lbs	32"W x 68"H; 69 lbs	38"W x 84"H; 103 lbs* (140)"	32"W x 84"H; 85 lbs	32"W x 72"H; 73 lbs	32"W x 66"H; 69 lbs	38"W x 78"H; 95 lbs	32"W x 68"H; 69 lbs	Not Recommended	Not Recommended	24"
50.04	Maxim Short Dual Arm	Not Recommended	28"W x 78"H; 69 lbs	Not Recommended	32"W x 84"H; 85 lbs	32"W x 84"H; 85 lbs	28"W x 68"H; 69 lbs	32"W x 84"H; 85 lbs	32"W x 68"H; 69 lbs	Not Recommended	Not Recommended	21"
50.50	Maxim Dyad	Not Recommended	Not Recommended	32"W x 76"H; 77 lbs* (132)	24"W x 64"H; 47 lbs	24"W x 60"H; 45 lbs	Not Recommended	28"W x 69"H; 49 (44) lbs	Not Recommended	Not Recommended	16"	
50.70	Maxim Reverse Dyad	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 83 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	12"	
52.01	Maxim Single Arm	Not Recommended	32"W x 72"H; 73 lbs	Not Recommended	32"W x 70"H; 71 (56) lbs	32"W x 70"H; 71 (56) lbs	32"W x 72"H; 73 lbs	32"W x 70"H; 71 (56) lbs	32"W x 72"H; 73 lbs	30"W x 69"H; 65 lbs	20"	
52.06	Maxim Short Single Arm	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	32"W x 60"H; 60 lbs	32"W x 60"H; 60 lbs	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	Not Recommended	15"	
15.10	EntryGuard Dual Arm	Not Recommended	28"W x 60"H; 52 lbs	Not Recommended	Not Recommended	28"W x 60"H; 49 lbs	Not Recommended	28"W x 60"H; 52 lbs	Not Recommended	Not Recommended	18"	
15.15	EntryGuard Egress D.A.	Not Recommended	Not Recommended	Not Recommended	28"W x 61"H; 49 lbs	24"W x 67"H; 49 lbs	Not Recommended	30"W x 61"H; 57 lbs	Not Recommended	Not Recommended	13"	
15.11	EntryGuard Dyad	Not Recommended	Not Recommended	Not Recommended	22"W x 62"H; 42 lbs	Not Recommended	22"W x 62"H; 42 lbs	Not Recommended	Not Recommended	Not Recommended	16"	
15.94	EntryGuard Single Arm	Not Recommended	22"W x 62"H; 42 lbs	Not Recommended	26"W x 69"H; 55 (41) lbs	26"W x 69"H; 55 (41) lbs	26"W x 65"H; 52 lbs	26"W x 62"H; 40 lbs	26"W x 65"H; 52 lbs	20"W x 61"H; 36 lbs	16" - 18" †	
15.32	13.5" Single Arm	Not Recommended	24"W x 65"H; 48 lbs	Not Recommended	24"W x 67"H; 54 (50) lbs	24"W x 67"H; 54 (50) lbs	24"W x 65"H; 48 lbs	24"W x 67"H; 54 (50) lbs	24"W x 65"H; 48 lbs	24"W x 64"H; 47 lbs	22" - 24" †	
15.31	9.5" Single Arm	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	24"W x 61"H; 45 (27) lbs	24"W x 62"H; 45 (19) lbs	24"W x 65"H; 48 lbs	24"W x 61"H; 45 (27) lbs	24"W x 65"H; 48 lbs	20"W x 65"H; 43 lbs	18" - 20" †	
15.56	7.5" Single Arm	Not Recommended	18"W x 66"H; 35 lbs	Not Recommended	Not Recommended	Not Recommended	18"W x 66"H; 35 lbs	Not Recommended	18"W x 66"H; 35 lbs	16"W x 65"H; 39 lbs	16"	
15.39	6" Single Arm	Not Recommended	Not Recommended	Not Recommended	24"W x 70"H; 52 lbs	24"W x 64"H; 47 lbs	Not Recommended	30"W x 64"H; 60 (55) lbs	Not Recommended	Not Recommended	16"	
23.03	Split Arm	Not Recommended	26"W x 66"H; 53 lbs	Not Recommended	26"W x 71"H; 57 (43) lbs	26"W x 71"H; 57 (43) lbs	26"W x 66"H; 53 lbs	26"W x 66"H; 53 lbs	26"W x 66"H; 53 lbs	26"W x 62"H; 50 lbs	22" - 24" †	
23.09	23 Series Single Arm 13.5"	Not Recommended	24"W x 69"H; 51 lbs	Not Recommended	24"W x 69"H; 48 (31) lbs	24"W x 66"H; 48 (22) lbs	24"W x 69"H; 51 lbs	24"W x 65"H; 48 (31) lbs	24"W x 69"H; 51 lbs	24"W x 69"H; 50 lbs	18" - 20" †	
23.01	23 Series Single Arm 9.5"	Not Recommended	22"W x 69"H; 46 lbs	Not Recommended	Not Recommended	Not Recommended	22"W x 69"H; 46 lbs	Not Recommended	22"W x 69"H; 46 lbs	22"W x 64"H; 47 lbs	16"	
23.38	23 Series Single Arm 7.5"	Not Recommended	20"W x 60"H; 36 lbs	Not Recommended	Not Recommended	Not Recommended	20"W x 60"H; 36 lbs	Not Recommended	20"W x 60"H; 36 lbs	22"W x 68"H; 45 lbs	15"	
23.76	23 Series Single Arm 6"	Not Recommended	Not Recommended	26"W x 71"H; 58 lbs* (131)	26"W x 63"H; 51 lbs	24"W x 68"H; 50 lbs	Not Recommended	28"W x 61"H; 53 lbs	Not Recommended	Not Recommended	15"	
23.48	23 Series Dyad Short Link	Not Recommended	Not Recommended	32"W x 60"H; 60 lbs* (140)"	26"W x 62"H; 50 lbs	24"W x 67"H; 49 lbs	Not Recommended	Not Recommended	Not Recommended	Not Recommended	19"	
23.49	23 Series Dyad Long Link	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	19"	

Typical Mounting Positions - Used for Hardware Comparison

Hinge	Operator			Hinge Position			Bracket Position			Operator Position		
	Maxim Reverse Dyad	Other Maxim	EntryGuard Dual Arm w/10" Washable Hinge	Maxim Reverse Dyad	Other Maxim	EntryGuard Dual Arm Operators	Bracket Position A	Bracket Position B	Operator Position	Bracket Position A	Bracket Position B	Operator Position
14:XX Concealed Hinges	EntryGuard Dyad & Single Arm	EntryGuard Dyad & Single Arm	Traditional & Ellipse	2,375	1,625	1,625	1,625	1,563	Dual Arm & Dyad determined by Bracket Position A.	1,625	1,563	Dual Arm & Dyad determined by Bracket Position A.
	23 Series	23 Series	23 Series	2,125	1,375	1,375	1,375	1,563	Single Arm per catalog.	1,375	1,563	Single Arm per catalog.
	Maxim Reverse Dyad	Other Maxim	23 Series	2,812	1,750	1,750	1,750	2,000	Determined by Bracket Position A	1,750	2,000	Determined by Bracket Position A
14:10 Heavy Duty Hinges	Maxim Reverse Dyad	Other Maxim	23 Series	2,562	1,062	1,062	1,062	2,437	Catalog Dim B=8,000	1,062	2,437	Catalog Dim A=4,000
	EntryGuard Single Arm	Maxim Single Arm	Traditional & Ellipse Single Arm	4,000	NA	NA	NA	NA	Operator is fully open (arm against stop) at 90° window position.	NA	NA	Operator is fully open (arm against stop) at 90° window position.
	23 Series Single Arm	23 Series Single Arm	23 Series Single Arm	2,500	NA	NA	NA	NA	Operator is fully open (arm against stop) at 90° window position.	NA	NA	Operator is fully open (arm against stop) at 90° window position.

The maximum window size, ease of operation, and service life are strongly influenced by hardware mounting positions (see Fig. 1 below).

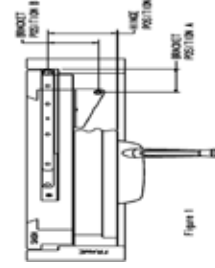
Applications with dimensions larger than the typical mounting positions given above will not be able to support a window as large as that shown in this Table.

* The first sash weight shown in the table is the maximum permitted for the AAMA Hardware Load Test. The sash weight shown in parenthesis is the maximum recommended by Truth to assure ease of operation.

** The Maxim Reverse Dyad Operator has been limited to use in windows 24" wide and narrower in order to ensure good performance near the closed position. In its full open position, it can support windows larger than those shown in the table.

† This is the maximum rating of the hinge. Ease of operation is provided up to this weight.

‡ The smaller number applies when the operator is used with Egress hinges while the larger number applies when it is used with the 10" Standard or 10" High Performance hinge.



**HIGH PERFORMANCE
CASEMENT HINGE**

**HIGH PERFORMANCE
CASEMENT HINGE**



700 WEST BRIDGE STREET, OWATONNA, MN 55060 ■ 507.451.5620 800.866.7884 ■ TRUTH.COM



These stainless steel Butt Hinges are designed to provide maximum egress opening. A majority of the hinge itself is concealed within the window's frame creating a more pleasing exterior appearance than is the case with most exposed hinge systems. Hinges provide tamper-resistance when the window is in the closed position by providing concealed mounting.

This hinge concept enables the window manufacturer to design a window that is not only easy to install, but is also relatively maintenance free.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: Available in 300 Series stainless steel.

ORDERING INFORMATION:

1. Order by part number.
#29.10.00.102 LH Butt Hinge (includes one pair).
#29.10.00.103 RH Butt Hinge (includes one pair). Note: Two left-handed or two right-handed hinges are required per window. Specify when ordering.

RECOMMENDED SCREWS:

Type of screws required determined by material of profile being used. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

1. Specify left- or right-hand, (determined by looking at hinge side of window from inside).
2. A Truth Single Arm Operator must be used with a Butt Hinge if an operator is required.
3. Truth Butt Hinges should be used where the shape of the window will not allow the use of a concealed hinge (i.e. round top, trapezoid).
4. Truth's Butt Hinges are not recommended for use on awning or hopper type windows.
5. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
6. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

7. Truth recommends that stainless steel screws be used to fasten stainless steel components to the window. If steel screws were to be used, a corrosion problem would develop between the dissimilar metals of the screw and hinge through a galvanic reaction. The result can be rusting of the screw heads that can eventually break off.

8. For metal window profiles Truth recommends machine screws however, in most applications sheet metal screws will provide adequate holding power.

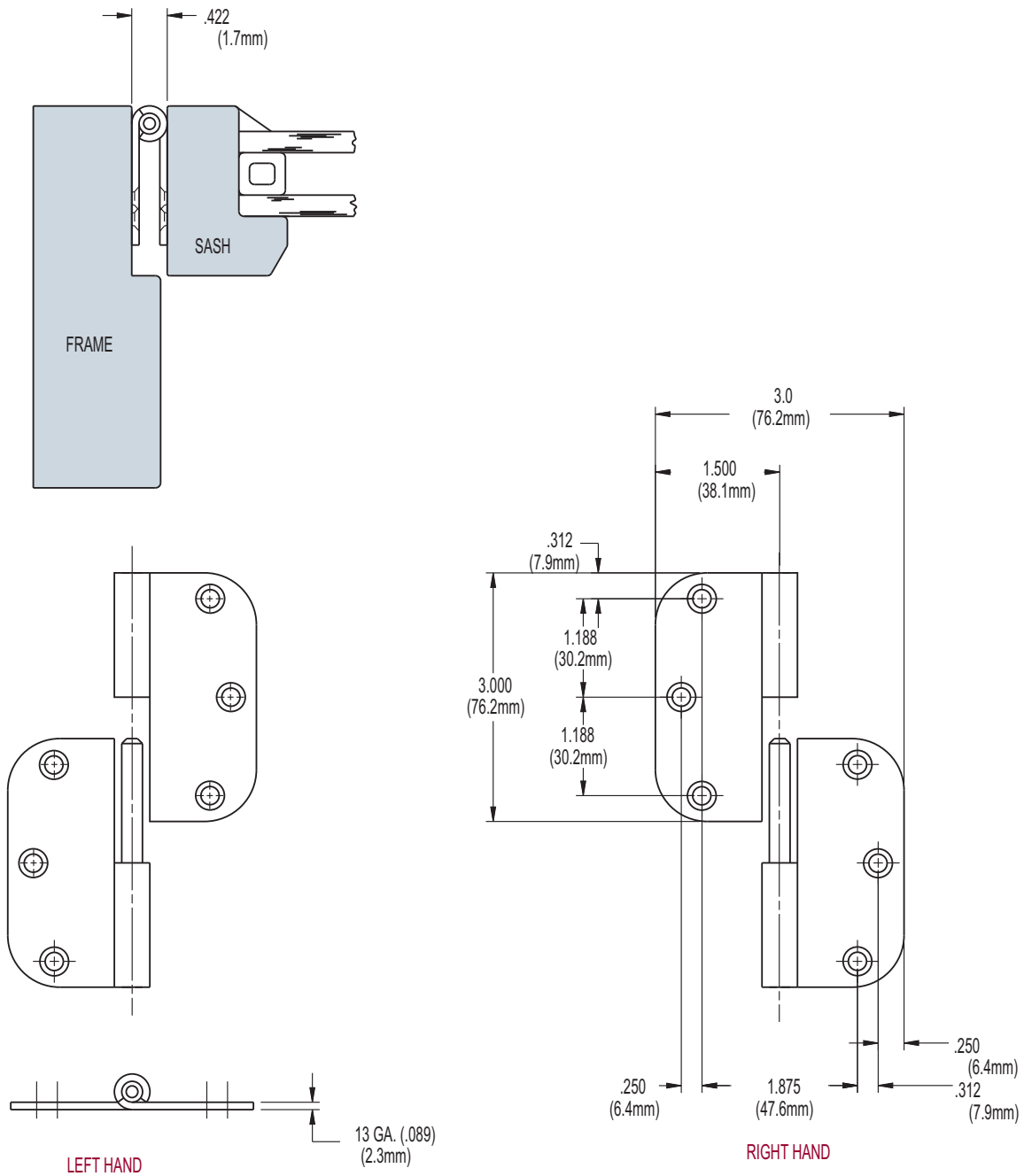
9. For easy correction of out of square, or racked window installations, the use of Truth Jamb Jack III frame adjusters is recommended. Frame adjustment can improve both weather seal tightness and sash operation over the life of the window.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Stainless steel butt hinge for use on casement, rounds top or trapezoid windows. This hinge system must allow easy installation/removal, and yet be tamper resistant in the closed position.

Butt Hinge shall be 29 series, as manufactured by Truth Hardware.

29.10 BUTT HINGE



RECOMMENDED SCREWS: 6 (P/N 19250) # 8 X 1.0 PHILLIPS, FLAT HEAD, STAINLESS STEEL
SHEET METAL SCREWS PER HINGE



Throughout the industry the names Anderberg and Truth have stood for engineered excellence, reliable and dependable performance, and above all “quality”. This is most evident in our expertly crafted 4-Bar Hinges.

Each style of hinge that you will find on the accompanying pages has a variety of sizes and options to choose from. Everything from hinges manufactured with or without stops to varying degrees of opening. A wide range of lengths and thicknesses are also available. 4-Bar Hinges are certified to AAMA 904.1.

4-Bar Hinges have been designed to be used primarily on vents with a lip on the outside edge. By design, Truth Hardware’s 4-Bar Hinges are engineered to project the vent out as it pivots to avoid interference between a lipped vent and frame. 4-Bar Hinges are adaptable to both casement and projected window applications. To aid you in your selection of 4-Bar Hinges, Truth has developed a guide (flow-chart) that provides you with a step-by-step procedure for determining the appropriate hinge for your use.

To help reduce the inventory of

"handed" products, each hinge is manufactured to be "non-handed", so that they can be used as either left-or right-handed hinges.

WARRANTY:

Truth 4-Bar Hinges are protected under the terms of the Truth Warranty for Window & Door Manufacturers & Authorized Distributors (Refer to Truth’s Terms & Conditions for further details). Truth’s 4-Bar Hinges are unmatched in dependability and performance.

NUMBERING SYSTEM:

The Truth product numbering system for hinges denotes the **product** with the first two numerals, **model** by the second two numerals, and the **finish** by the next two numerals (decorative finishes only -- this does not apply to hinges). In the case of Truth’s 4-Bar Hinges, the last three numerals represent the various hinge features with no commonalty between product models intended. The following chart illustrates this system using the #34.24.00.208 Heavy Duty 4-Bar Hinge as an example.

NUMBERING SYSTEM

Product No.	Model	Finish	Assembly
34	24	00	208
4-Bar Hinge	Heavy Duty 10" length	No decorative finish	W/Stop Std. open (Hinge Feature)

4-BAR HINGES

GUIDE TO 4-BAR HINGE SELECTION

DETERMINE STACK HEIGHT

The stack height is the overall height from the bottom of the track to the top of the sash arm. If the pocket area has a height that is not standard to the hinge stack height, shims may be necessary. This size will determine which chart you will need to refer to. The standard stack heights are .625" (15.9mm) (Heavy Duty Hinge), .500" (12.7mm) (Standard Duty Hinge).

DETERMINE APPLICATION

CASEMENT

PROJECTED AWNING

DETERMINE FUNCTION

DETERMINE HINGE MATERIAL

EGRESS

WASHABILITY

Egress is the amount of clear opening that is left between the frame and the sash when the window is in a fully opened position. These hinges require single arm type operators. (See your local codes for specifics.)

Washability is the ability to have enough clearance between the frame and the hinge side of the sash to extend an arm or device to clean the vent. These hinges require dyad type

It is important to match your window with the proper size hinge. A Table is available in each hinge section to be a guide in the selection of the appropriate hinge length. NOTE Awning applications require that the sash opening is no

DETERMINE HINGE LENGTH

DETERMINE HINGE LENGTH

SEE CHART FOR OPTIONS

The Egress Hinge is available in only one length:
 12" (304.8mm) - Standard Duty Hinge
 16.125" (409.6mm) - Standard Duty Hinge
 16.500" (419.1mm) - Heavy Duty Hinge.

The 12" (304.8mm) hinges are recommended for most casement applications because the extra length on larger hinges is not of any benefit for casement applications.

At this point you have specified enough requirements to choose the correct hinge for your specific application.

Stack height: _____

Application: _____

Length: _____

SEE CHART FOR OPTIONS

At this point you have specified enough requirements to choose the correct hinge for your specific application.

Stack height: _____

Application: _____

Length: _____

Functions: _____



TRUTH TIPS:

1. Placement of a 4-Bar Hinge relative to the outside edge of the frame depends on the amount of overlap of the sash on the frame. As a general rule the hinge should be mounted flush to .250" (6.3 mm) of the outside edge of the frame. This dimension depends on the amount of overlap. A .250" (6.3 mm) dimension will allow proper clearance for a window system having approximately .312" (7.9 mm) of sash overlap. If interference occurs between the sash and frame then the hinge must be moved further outboard on the frame or the overlap must be reduced. (See the application drawing of the particular hinge.)
2. Particular attention must be given to 4-Bar Hinge mounting. It is important that the ventilator bar be offset to a point where it is flush with the outside edge of the track. This results in an offset between the screw centerlines of the ventilator bar and hinge track. Particular attention must be given to 4-Bar Hinge mounting. It is important that the ventilator bar be offset to a point where it is flush with the outside edge of the track. This results in an offset between the screw centerlines of the ventilator bar and hinge track.
3. Ultimate sash weight & width for hinges as shown in the charts of this document are based on AAMA 904.1 "Specifications for Multi-Bar Hinges in Window Applications". The load carrying capacity is based on the vent height being at least twice the vent width. These numbers do not apply to windows being tested to ANSI/AAMA/WDMA 101/I.S.2/NAFS-02 "Casement Hardware Load Test".
4. To increase the overall hinge height of 4-Bar Hinges, aluminum shims applicable to the ventilator bar are available in various thicknesses. Truth provides some popular sizes of shims, however, other sizes must be provided by the window manufacturer.
5. Sash sag is a problem which affects many casement windows. 4-Bar Hinges tend to be more susceptible to sash sag than standard 2-bar hinges because they cantilever the sash outside of the frame, supporting the

entire sash weight on the support arms. While 2-Bar hinges are supported inside of the window frames so they transfer the sash weight back into the window. To minimize sash sag, Truth Hardware recommends utilizing the measures outlined in Tech Note #3

6. For proper balancing, Truth recommends a hinge with no greater than 60° of opening in projected and awning applications.
7. Special considerations should be given when designing an awning window. Please consult Truth Tech Bulletin #2 for further information.
8. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
9. Mounting screws must pass through two PVC walls or one PVC wall and one insert wall.
10. For metal window profiles Truth recommends machine screws however, in most applications sheet metal screws will provide adequate holding power.
11. Hinge life can be prolonged by periodically adding a drop of light weight oil at each riveted joint.
12. For easy correction of out of square, or racked window installations, the use of Truth Jamb Jack III frame adjusters is recommended. Frame adjustment can improve both weather seal tightness and sash operation over the life of the window.

STANDARD & HEAVY DUTY 4-BAR HINGES (201 - 301 Series)



These "non-handed" 4-Bar Hinges are specially designed for casement, awning, and projected vents with a lip on the outside edge. 4-Bar Hinges are designed to project the sash out as it pivots to avoid interference between a lipped vent and frame. In awning and projected window applications, friction adjustment is achieved by adjusting the screw which is located in the sliding shoe. Adjustments made to this screw affect shoe friction as it slides along the hinge track.

Standard Duty 4-Bar Hinges are generally used for residential projects requiring relatively light window sections (projected units up to 40 lbs.). These hinges are normally provided with a stop built into its track -- and is generally used with awning and projected windows. Hinges designed without the stop feature will open to approximately 65° in casement applications.

Heavy Duty 4-Bar Hinges are generally used for commercial projects requiring relatively heavy window sections (projected units up to 200 lbs.).

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL:

Standard & Heavy Duty Stainless Steel 4-Bar Hinges: Non-magnetic stainless steel. Manufactured with a brass shoe.

ORDERING INFORMATION:

1. Choose correct hinge size and style by part number. (Reference the 4-Bar Hinge Part Number Guide for the available options).
2. Order two hinges per window.

RECOMMENDED SCREWS:

Stainless Steel 4-Bar Hinges:
6 -- #10 Phillips Pan head screws. Length and thread type to be determined by profile design.

See Truth Tips for additional screw selection information.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

4-bar type window hinge for casement or awning windows, which projects the vent while opening to avoid interference between frame and sash.

Window hinges to be of 4-bar type design, utilizing a screw adjusted brass slide shoe to fine tune hinge to window application. Hinges shall be non-handed and constructed of high quality stamped and roll formed 300 series stainless steel materials. Hinges used must be certified to AAMA 904.1 specifications.

Window hinges shall be 201/301 series 4-bar, as manufactured by Truth Hardware.



FIG. 1 TRUTH STANDARD DUTY 4-BAR HINGE
(ANDERBERG 201SS SERIES)

STANDARD DUTY 4-BAR HINGE PART NUMBER GUIDE

MAT'L	HINGE CALL OUT & (ACTUAL LENGTH)		PART NUMBER	STD. STOP	NO STOP
SST	8"	8.22" [207.8 mm]	34.10.00	.101	.101
SST	10"	10.22" [258.6 mm]	34.11.00	.102	.101
SST	12"	12.22" [309.4 mm]	34.12.00	.100	.101
SST	14"	14.22" [360.2 mm]	34.13.00	.102	.101
SST	16"	16.22" [410.9 mm]	34.14.00	.100	.101
SST	18"	18.22" [461.8 mm]	34.15.00	.102	
SST	20"	20.22" [512.6 mm]	34.16.00	.100	.101

PART NUMBERING SYSTEM

PRODUCT NO.	MODEL	FINISH	ASSEMBLY
34	10	00	101
4-BAR HINGE	STANDARD DUTY 10" LENGTH	NO DECORATIVE FINISH	W/ STOP STD. OPEN (HINGE FEATURE)

NOTES:

1. *SPECIAL NOTE* A PROPERLY COUNTERBALANCED SASH IS RECOMMENDED IN AN AWNING OPERATION. AN UNBALANCED SASH WHEN USED WITH AN AWNING OPERATOR IS LIKELY TO PRODUCE SASH CHATTER AND AN UNEVEN FEEL DURING OPERATION.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. UNLESS OTHERWISE SPECIFIED ALL 201 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A STANDARD DUTY HINGE IS .500 (12.7mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
5. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/1.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".

STANDARD DUTY 4-BAR HINGE (201SS Series)

**FIG. 2 TRUTH STANDARD DUTY 4-BAR HINGE
(ANDERBERG 201SS SERIES)**

4-BAR HINGE APPLICATION TABLE FOR PROJECTED & AWNING HINGES (AS CERTIFIED TO AAMA 904.1)								
HINGE CALL OUT & (ACTUAL LENGTH)		*COUNTERBALANCED		**ULTIMATE (SEE NOTE #2)		DEGREES OF OPENING		
		SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	STD. STOP	NO + STOP	NO ++ STOP
8"	(8.18") [207.8 mm]	9"-16" [229-406 mm]	19 LBS [8.6 KG]	9"-16" [229-406 mm]	19 LBS [8.6 KG]	55°	55°	65°
10"	(10.18") [258.6 mm]	16"-20" [406-508 mm]	23 LBS [10.4 KG]	16"-20" [406-508 mm]	23 LBS [10.4 KG]	55°	55°	65°
12"	(12.18") [309.4 mm]	20"-24" [508-610 mm]	28 LBS [12.7 KG]	20"-24" [508-610 mm]	28 LBS [12.7 KG]	55°	55°	65°
14"	(14.18") [360.2 mm]	23"-28" [584-711 mm]	33 LBS [15.0 KG]	23"-28" [584-711 mm]	33 LBS [15.0 KG]	55°	55°	65°
16"	(16.18") [410.9 mm]	28"-34" [711-864 mm]	40 LBS [18.1 KG]	28"-34" [711-864 mm]	40 LBS [18.1 KG]	55°	55°	65°
18"	(18.18") [461.8 mm]	28"-34" [711-864 mm]	40 LBS [18.1 KG]	28"-34" [711-864 mm]	40 LBS [18.1 KG]	55°	55°	65°
20"	(20.18") [512.6 mm]	32"-34" [813-864 mm]	40 LBS [18.1 KG]	32" WIDE *** [813 mm]	47 LBS *** [213.2 KG]	55°	55°	65°

+ AAMA CYCLE TEST ANGLE
++ ULTIMATE OPENING ANGLE

4-BAR HINGE APPLICATION TABLE FOR CASEMENT (SIDE HUNG) HINGES (AS CERTIFIED TO AAMA 904.1)				
HINGE CALL OUT & (ACTUAL LENGTH)		ULTIMATE (SEE NOTE #2)		DEGREES OF OPENING
		SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	NO STOP + ++
8"	(10.50") [266.7mm]	12"-32" [305-914 mm]	65 LBS AT 32" [45.36 KG AT 914 mm]	55°
10"	(12.50") [317.5mm]	12"-32" [305-914 mm]	65 LBS AT 32" [45.36 KG AT 914 mm]	55°
12"	(14.50") [368.3mm]	12"-32" [305-914 mm]	65 LBS AT 32" [45.36 KG AT 914 mm]	55°
14"	(16.50") [419.1mm]	12"-32" [305-914 mm]	65 LBS AT 32" [45.36 KG AT 914 mm]	55°

DEFINITIONS:

*COUNTERBALANCED: A PAIR OF HINGES WILL BALANCE OR HOLD OPEN THE VENT/SASH WITH NO ADDED FRICTION AT THE HEIGHTS AND WEIGHTS LISTED IN THE CHART.

**ULTIMATE: A PAIR OF HINGES WILL NOT BALANCE OR HOLD OPEN THE VENT/SASH WITHOUT ADDED FRICTION AT THE HEIGHTS AND WEIGHTS LISTED IN THE CHART.

***NOT AAMA CERTIFIED.

NOTES:

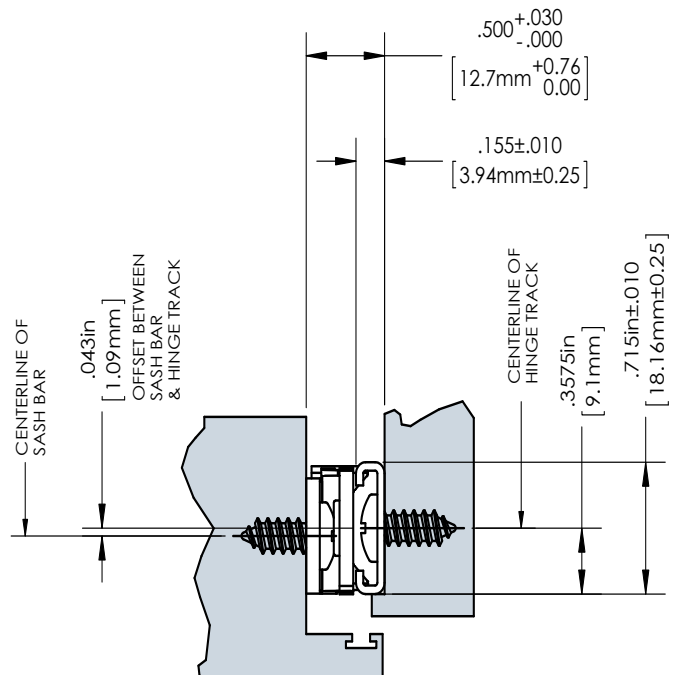
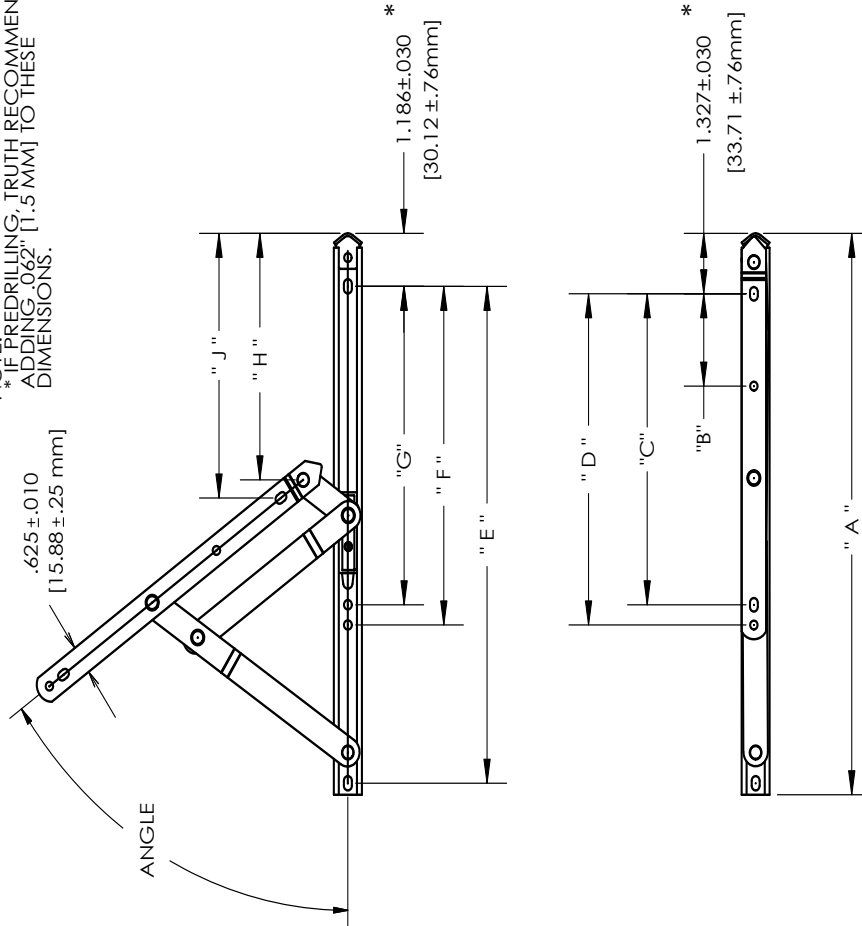
1. A PROPERLY COUNTERBALANCED SASH IS RECOMMENDED IN AN AWNING OPERATION. AN UNBALANCED SASH WHEN USED WITH AN AWNING OPERATOR IS LIKELY TO PRODUCE SASH CHATTER AND AN UNEVEN FEEL DURING OPERATION.
2. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHART ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/LS 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".



FIG. 3 TRUTH STANDARD DUTY 4-BAR HINGE W/STOP
(ANDERBERG 201SS SERIES)

RECOMMENDED SCREWS:
#10 SLOTTED OR #8 PHILLIPS
PAN HEAD STAINLESS STEEL SCREWS
(LENGTH AND THREAD TYPE TO BE
DETERMINED BY PROFILE DESIGN)

NOTE:
*IF PREDRILLING, TRUTH RECOMMENDS
ADDING .062" [1.5MM] TO THESE
DIMENSIONS.



STANDARD DUTY 4-BAR HINGE (201SS Series)

FIG. 4 TRUTH STANDARD DUTY 4-BAR HINGE W/STOP
(ANDERBERG 201SS SERIES)

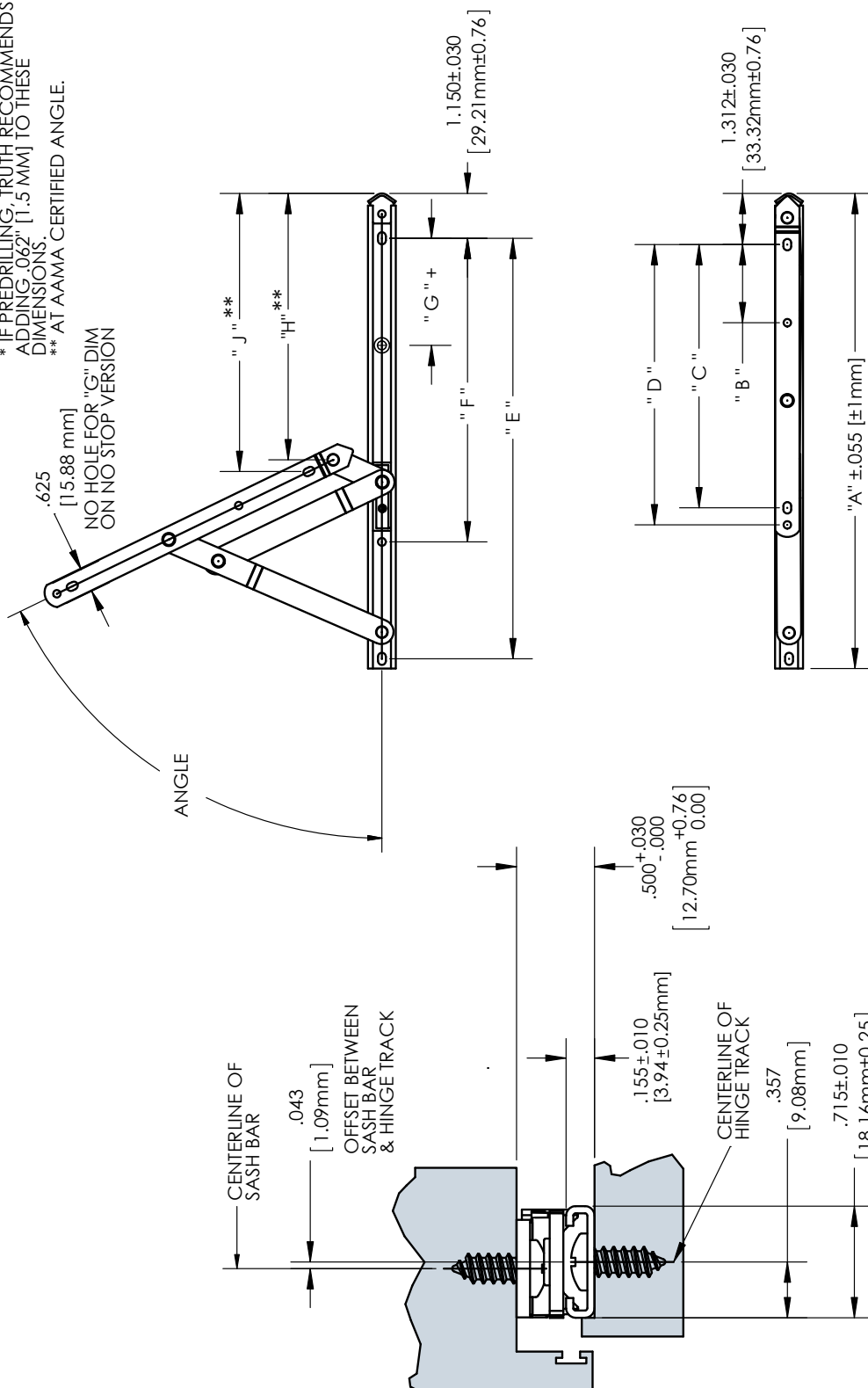
HINGE CALL OUT	HINGE PART NUMBER	"A" DIM HINGE LENGTH	"B" DIM	"C" DIM	"D" DIM	"E" DIM	"F" DIM	"G" DIM	"H" DIM	"J" DIM	APPROX. ANGLE OF OPENING	NUMBER OF SCREWS
8"	34.10.00.XXX	8.22" [208.8 mm]	NA	4.75" [120.7 mm]	5.19" [131.8 mm]	6.78" [172.2 mm]	5.59" [142.0 mm]	5.16" [131.1 mm]	3.63" [92.1 mm]	4.03" [102.4 mm]	55°	7
10"	34.11.00.XXX	10.22" [259.6 mm]	2.00" [50.8 mm]	5.75" [146.1 mm]	6.19" [157.3 mm]	8.78" [223.0 mm]	6.47" [164.3 mm]	6.03" [153.2 mm]	4.50" [114.3 mm]	4.99" [126.7 mm]	55°	8
12"	34.12.00.XXX	12.22" [310.4 mm]	2.00" [50.8 mm]	6.75" [171.5 mm]	7.19" [182.6 mm]	10.78" [273.8 mm]	7.34" [186.4 mm]	6.91" [175.5 mm]	5.35" [135.9 mm]	5.75" [146.0 mm]	55°	8
14"	34.13.00.XXX	14.22" [361.2 mm]	2.00" [50.8 mm]	7.75" [196.9 mm]	8.19" [208.0 mm]	12.78" [324.6 mm]	8.20" [208.3 mm]	7.78" [197.6 mm]	6.63" [168.3 mm]	6.41" [162.8 mm]	55°	8
16"	34.14.00.XXX	16.22" [411.9 mm]	2.00" [50.8 mm]	8.75" [222.3 mm]	9.19" [233.4 mm]	14.78" [375.4 mm]	9.09" [230.9 mm]	8.66" [219.9 mm]	7.10" [180.3 mm]	7.50" [190.5 mm]	55°	8
18"	34.15.00.XXX	18.22" [462.8 mm]	2.00" [50.8 mm]	9.75" [247.7 mm]	10.19" [258.8 mm]	16.78" [426.2 mm]	9.97" [253.2 mm]	9.53" [242.1 mm]	7.47" [189.7 mm]	8.15" [207.0 mm]	55°	8
20"	34.16.00.XXX	20.22" [513.6 mm]	2.00" [50.8 mm]	10.75" [273.1 mm]	11.19" [284.2 mm]	18.78" [477.0 mm]	10.844" [275.3 mm]	10.41" [264.4 mm]	8.84" [224.5 mm]	9.24" [234.7 mm]	55°	8



FIG. 5 TRUTH STANDARD DUTY 4-BAR HINGE W/O STOP (ANDERBERG 201SS SERIES)

RECOMMENDED SCREWS:
#10 SLOTTED OR #8 PHILLIPS
PAN HEAD STAINLESS STEEL SCREWS
(LENGTH AND THREAD TYPE TO BE
DETERMINED BY PROFILE DESIGN)
+ #8 PHILLIPS UNDERCUT FLATHEAD SCREW

NOTE:
* IF PREDRILLING, TRUTH RECOMMENDS
ADDING .062" [1.5 MM] TO THESE
DIMENSIONS.
** AT AAMA CERTIFIED ANGLE.



STANDARD DUTY 4-BAR HINGE (201SS Series)

FIG. 6 TRUTH STANDARD DUTY 4-BAR HINGE W/O STOP
(ANDERBERG 201SS SERIES)

HINGE CALL OUT	HINGE PART NUMBER	"A" DIM HINGE LENGTH	"B" DIM	"C" DIM	"D" DIM	"E" DIM	"F" DIM	"G" DIM	"H" DIM	"J" DIM	APPROX. + ANGLE OF OPENING	NUMBER OF SCREWS
8"	34.10.00.XXX	8.22" [208.8 mm]	NA	4.75" [120.7 mm]	5.19" [131.8 mm]	6.78" [172.2 mm]	5.53" [140.5 mm]	NA	5.13" [130.3 mm]	5.25" [133.4 mm]	55°	6
10"	34.11.00.XXX	10.22" [259.6 mm]	2.00" [50.8 mm]	5.75" [146.1 mm]	6.19" [157.3 mm]	8.78" [223.0 mm]	6.78" [172.2 mm]	NA	6.36" [161.5 mm]	6.37" [161.8 mm]	55°	7
12"	34.12.00.XXX	12.22" [310.4 mm]	2.00" [50.8 mm]	6.75" [171.5 mm]	7.19" [182.6 mm]	10.78" [273.8 mm]	7.78" [197.6 mm]	NA	7.29" [185.2 mm]	7.34" [184.6 mm]	55°	7
14"	34.13.00.XXX	14.22" [361.2 mm]	2.00" [50.8 mm]	7.75" [196.9 mm]	8.19" [208.0 mm]	12.78" [324.6 mm]	9.03" [229.4 mm]	4.75" [120.6 mm]	8.53" [216.7 mm]	8.69" [220.7 mm]	55°	7
16"	34.14.00.XXX	16.22" [411.9 mm]	2.00" [50.8 mm]	8.75" [222.4 mm]	9.19" [233.4 mm]	14.78" [375.4 mm]	10.28" [261.1 mm]	5.62" [142.7 mm]	9.78" [248.4 mm]	9.88" [251.0 mm]	55°	7
20"	34.16.00.XXX	20.22" [513.6 mm]	2.00" [50.8 mm]	10.75" [273.1 mm]	11.19" [284.2 mm]	18.78" [477.0 mm]	12.53" [318.3 mm]	7.32" [185.9 mm]	12.01" [305.0 mm]	12.21" [310.1 mm]	55°	7

+ AAMA CYCLE TEST ANGLE
ULTIMATE OPENING ANGLE IS 77°



**FIG. 7 TRUTH HEAVY DUTY 4-BAR HINGE
(ANDERBERG 301SS SERIES)**

HEAVY DUTY 4-BAR HINGE PART NUMBER GUIDE

MAT'L	HINGE CALLOUT & (ACTUAL LENGTH)		PART NUMBER	STD. STOP	NO STOP
SST	10"	(10.50") [266.7mm]	34.24.00	.208	.210
SST	12"	(12.50") [317.5mm]	34.25.00	.208	.210
SST	14"	(14.50") [368.3mm]	34.26.00	.208	.210
SST	16"	(16.50") [419.1mm]	34.27.00	.208	.210
SST	18"	(18.50") [469.9mm]	34.28.00	.208	.210
SST	20"	(20.50") [520.7mm]	34.29.00	.208	.210
SST	24"	(24.50") [622.3mm]	34.31.00	.208	.210
SST	28"	(28.50") [723.9mm]	34.86.00	.208	

PART NUMBERING SYSTEM

Product No.	Model	Finish	Assembly
34	24	00	208
4-Bar Hinge	Heavy Duty 10" Length	No Decorative Finish	W/ Stop Std. Open (Hinge Feature)

NOTES:

1. *SPECIAL NOTE* A PROPERLY COUNTERBALANCED SASH IS RECOMMENDED IN AN AWNING OPERATION. AN UNBALANCED SASH WHEN USED WITH AN AWNING OPERATOR IS LIKELY TO PRODUCE SASH CHATTER AND AN UNEVEN FEEL DURING OPERATION.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. UNLESS OTHERWISE SPECIFIED ALL 301 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A HEAVY DUTY HINGE IS .625 (15.9mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
5. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/I.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".

**HEAVY DUTY
4-BAR HINGE
(301SS Series)**

**FIG. 8 TRUTH HEAVY DUTY 4-BAR HINGE
(ANDERBERG 301SS SERIES)**

4-BAR HINGE APPLICATION TABLE FOR PROJECTED & AWNING HINGES (AS CERTIFIED TO AAMA 904.1)								
HINGE CALL OUT & (ACTUAL LENGTH)		*COUNTERBALANCED		**ULTIMATE (SEE NOTE #2)		DEGREES OF OPENING		
		SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	STD. STOP	NO STOP	NO ++ STOP
10"	(10.50") [266.7mm]	12"-20" [305-508 mm]	58 LBS [26.3 KG]	12"-20" [305-508 mm]	58 LBS [26.3 KG]	59°	55°	77°
12"	(12.50") [317.5mm]	20"-25" [508-635 mm]	73 LBS [33.1 KG]	20"-25" [508-635 mm]	73 LBS [33.1 KG]	53°	55°	77°
14"	(14.50") [368.3mm]	23"-29" [584-737 mm]	85 LBS [39.0 KG]	23"-29" [584-737 mm]	85 LBS [39.0 KG]	50°	55°	77°
16"	(16.50") [419.1mm]	25"-34" [635-864 mm]	99 LBS [44.9 KG]	25"-40" [635-1016 mm]	99 LBS [44.9 KG]	50°	55°	77°
18"	(18.50") [469.9mm]	32"-37" [813-940 mm]	108 LBS [49.0 KG]	32"-40" [813-1143 mm]	108 LBS [49.0 KG]	50°	55°	77°
20"	(20.50") [520.7mm]	34"-40" [864-1016 mm]	117 LBS [53.1 KG]	34"-50" [864-1270 mm]	117 LBS [53.1 KG]	49°	55°	77°
24"	(24.50") [622.3mm]	40"-44" [1016-1118 mm]	129 LBS [58.5 KG]	40"-60" [1016-1524 mm]	129 LBS [58.5 KG]	44°	55°	77°
28"	(28.50") [723.9mm]	50"-64" [1270-1626 mm]	175 LBS [79.4 KG]	50"-80" [1270-2032 mm]	234 LBS [106.1 KG]	42°	NA	77°

+ AAMA CYCLE TEST ANGLE
++ ULTIMATE OPENING ANGLE

4-BAR HINGE APPLICATION TABLE FOR CASEMENT (SIDE HUNG) HINGES (AS CERTIFIED TO AAMA 904.1)				
HINGE CALL OUT & (ACTUAL LENGTH)		ULTIMATE (SEE NOTE #2)		DEGREES OF + OPENING
		SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	NO STOP
10"	(10.50") [266.7mm]	12"-36" [305-914 mm]	100 LBS AT 36" [45.36 KG AT 914 mm]	55°
12"	(12.50") [317.5mm]	12"-36" [305-914 mm]	100 LBS AT 36" [45.36 KG AT 914 mm]	55°
14"	(14.50") [368.3mm]	12"-36" [305-914 mm]	100 LBS AT 36" [45.36 KG AT 914 mm]	55°
16"	(16.50") [419.1mm]	12"-36" [305-914 mm]	100 LBS AT 36" [45.36 KG AT 914 mm]	55°

DEFINITIONS:

*COUNTERBALANCED: A PAIR OF HINGES WILL BALANCE OR HOLD OPEN THE VENT/SASH WITH NO ADDED FRICTION AT THE HEIGHTS AND WEIGHTS LISTED IN THE CHART.

**ULTIMATE: A PAIR OF HINGES WILL NOT BALANCE OR HOLD OPEN THE VENT/SASH WITHOUT ADDED FRICTION AT THE HEIGHTS AND WEIGHTS LISTED IN THE CHART.

NOTES:

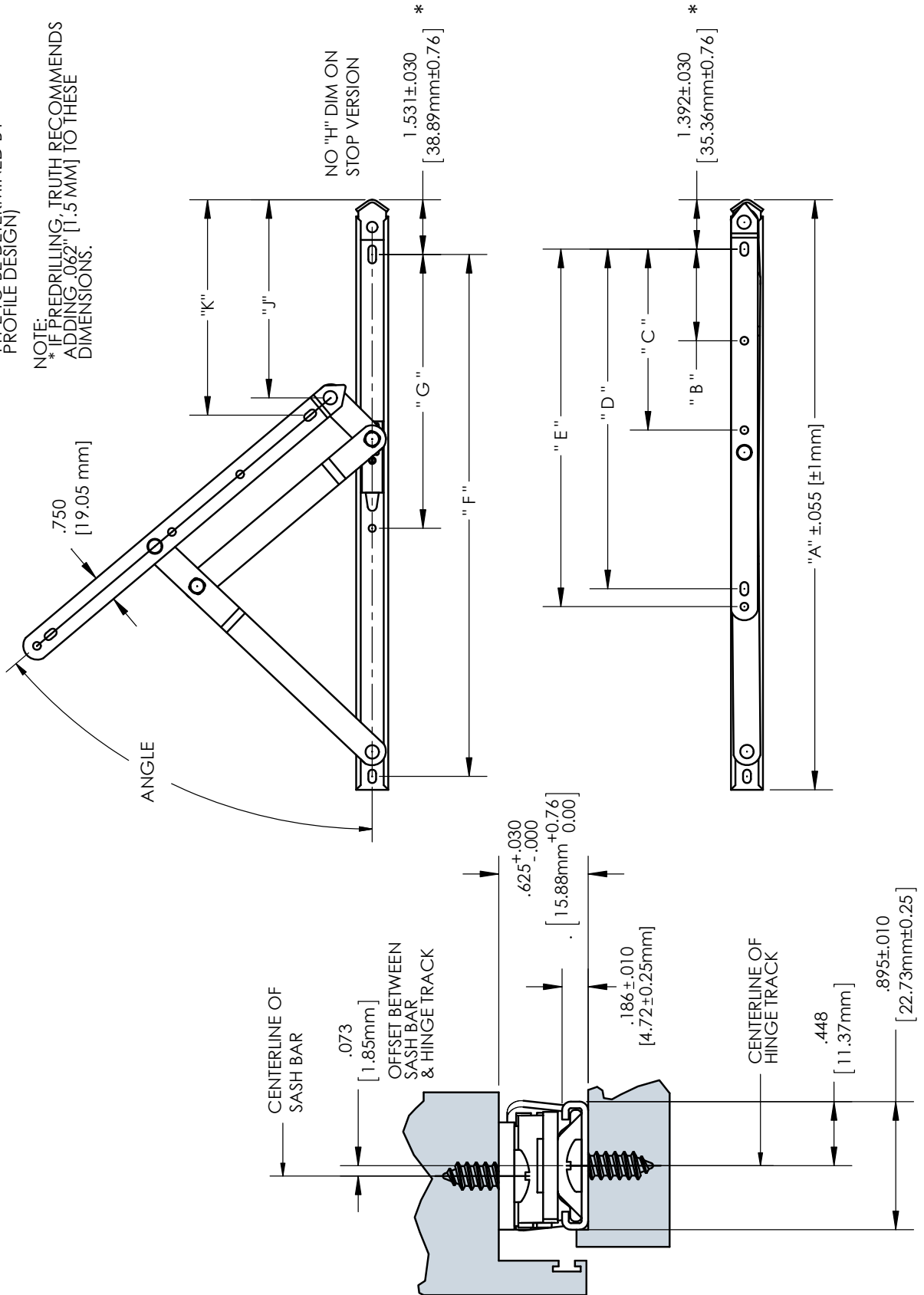
1. A PROPERLY COUNTERBALANCED SASH IS RECOMMENDED IN AN AWNING OPERATION. AN UNBALANCED SASH WHEN USED WITH AN AWNING OPERATOR IS LIKELY TO PRODUCE SASH CHATTER AND AN UNEVEN FEEL DURING OPERATION.
2. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/1.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".



FIG. 9 TRUTH HEAVY DUTY 4-BAR HINGE W/STOP
(ANDERBERG 301SS SERIES)

RECOMMENDED SCREWS:
#10 PHILLIPS, PAN HEAD STAINLESS
STEEL SCREWS (LENGTH AND THREAD
TYPE TO BE DETERMINED BY
PROFILE DESIGN)

NOTE:
* IF PREDRILLING, TRUTH RECOMMENDS
ADDING .062" [1.5 MM] TO THESE
DIMENSIONS.



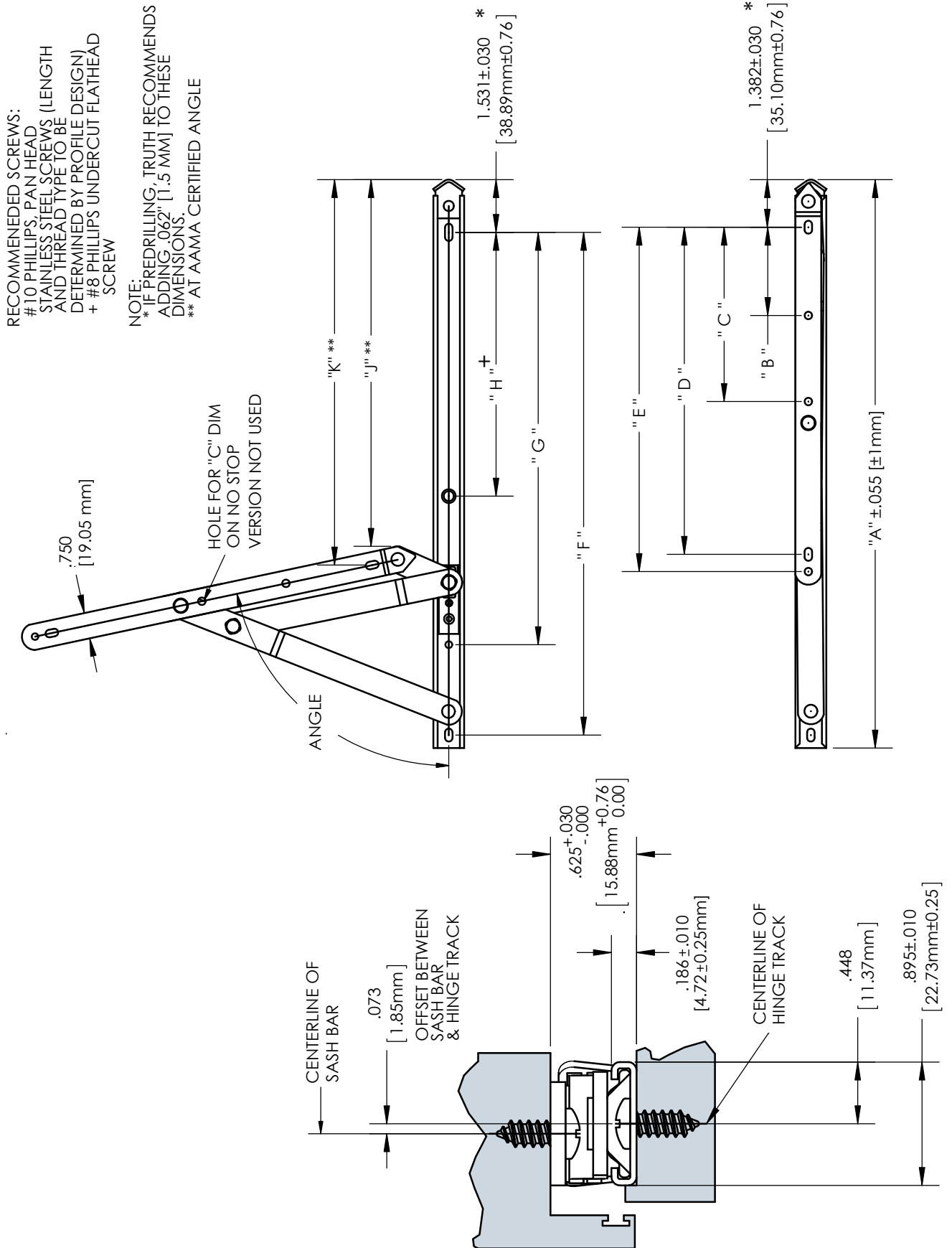
**HEAVY DUTY
4-BAR HINGE
(301SS Series)**

**FIG. 10 TRUTH HEAVY DUTY 4-BAR HINGE W/STOP
(ANDERBERG 301SS SERIES)**

TRUTH HEAVY DUTY 4-BAR HINGE W/STOP													
HINGE CALL OUT	HINGE PART #	"A" HINGE LG	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"	ANGLE	# OF SCREWS
10"	34.24.00.XXX	10.50" [266.7 mm]	NA	NA	6.50" [165.1 mm]	7.00" [177.8 mm]	8.59" [218.2 mm]	6.34" [161.0 mm]	NA	4.38" [111.2 mm]	4.72" [119.9 mm]	59°	7
12"	34.25.00.XXX	12.50" [317.5 mm]	2.56" [65.0 mm]	NA	7.50" [190.5 mm]	8.00" [203.2 mm]	10.59" [269.0 mm]	6.59" [167.4 mm]	NA	4.51" [114.6 mm]	4.96" [126.0 mm]	53°	7
14"	34.26.00.XXX	14.50" [368.3 mm]	2.56" [65.0 mm]	NA	8.50" [215.9 mm]	9.00" [228.6 mm]	12.59" [319.8 mm]	6.94" [176.3 mm]	NA	4.81" [122.2 mm]	5.30" [134.6 mm]	50°	7
16"	34.27.00.XXX	16.50" [419.1 mm]	2.56" [65.0 mm]	5.06" [128.5 mm]	9.50" [241.3 mm]	10.00" [254.0 mm]	14.59" [370.6 mm]	7.66" [194.6 mm]	NA	5.53" [140.5 mm]	6.02" [152.9 mm]	50°	8
18"	34.28.00.XXX	18.50" [469.9 mm]	2.56" [65.0 mm]	6.06" [153.9 mm]	10.50" [266.7 mm]	11.00" [279.4 mm]	16.59" [421.4 mm]	8.28" [210.3 mm]	NA	6.16" [156.5 mm]	6.66" [169.2 mm]	50°	8
20"	34.29.00.XXX	20.50" [520.7 mm]	2.56" [65.0 mm]	7.06" [179.3 mm]	11.50" [292.1 mm]	12.00" [304.8 mm]	18.59" [472.2 mm]	8.97" [227.8 mm]	NA	6.86" [174.2 mm]	7.35" [186.7 mm]	49°	8
24"	34.31.00.XXX	24.50" [622.3 mm]	2.56" [65.0 mm]	9.06" [230.1 mm]	13.50" [342.9 mm]	14.00" [355.6 mm]	22.59" [573.8 mm]	9.09" [230.1 mm]	NA	6.90" [175.3 mm]	7.44" [189.0 mm]	44°	8
28"	34.86.00.XXX	28.50" [723.9 mm]	2.56" [65.0 mm]	11.06" [280.9 mm]	15.50" [393.7 mm]	16.00" [406.4 mm]	26.59" [675.4 mm]	9.59" [243.6 mm]	NA	7.36" [186.9 mm]	7.93" [201.4 mm]	42°	8



FIG. 11 TRUTH HEAVY DUTY 4-BAR HINGE W/O STOP
(ANDERBERG 301SS SERIES)



**HEAVY DUTY
4-BAR HINGE
(301SS Series)**

**FIG. 12 TRUTH HEAVY DUTY 4-BAR HINGE W/O STOP
(ANDERBERG 301SS SERIES)**

TRUTH HEAVY DUTY 4-BAR HINGE W/O STOP													
HINGE CALL OUT	HINGE PART #	"A" HINGE LG	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"***	"K"***	AAMA CERTIFIED ANGLE	# OF SCREWS
10"	34-24.00.XXX	10.50" [266.7 mm]	NA	NA	6.50" [165.1 mm]	7.00" [177.8 mm]	8.59" [218.2 mm]	7.22" [183.4 mm]	NA	4.98" [126.5 mm]	5.30" [134.6 mm]	55°	7
12"	34-25.00.XXX	12.50" [317.5 mm]	2.56" [65.0 mm]	NA	7.50" [190.5 mm]	8.00" [203.2 mm]	10.59" [269.0 mm]	8.97" [227.8 mm]	NA	6.16" [156.5 mm]	6.48" [164.6 mm]	55°	7
14"	34-26.00.XXX	14.50" [368.3 mm]	2.56" [65.0 mm]	NA	8.50" [215.9 mm]	9.00" [228.6 mm]	12.59" [319.8 mm]	10.47" [265.9 mm]	NA	7.33" [186.2 mm]	7.65" [194.3 mm]	55°	7
16"	34-27.00.XXX	16.50" [419.1 mm]	2.56" [65.0 mm]	5.06" [128.5 mm]	9.50" [241.3 mm]	10.00" [254.0 mm]	14.59" [370.6 mm]	11.97" [304.0 mm]	7.66" [194.6 mm]	8.50" [215.9 mm]	8.83" [224.3 mm]	55°	8
18"	34-28.00.XXX	18.50" [469.9 mm]	2.56" [65.0 mm]	6.06" [153.9 mm]	10.50" [266.7 mm]	11.00" [279.4 mm]	16.59" [421.4 mm]	13.47" [342.1 mm]	8.28" [210.3 mm]	9.66" [245.4 mm]	9.98" [253.5 mm]	55°	8
20"	34-29.00.XXX	20.50" [520.7 mm]	2.56" [65.0 mm]	7.06" [179.3 mm]	11.50" [292.1 mm]	12.00" [304.8 mm]	18.59" [472.2 mm]	14.97" [380.2 mm]	8.97" [227.8 mm]	10.82" [274.8 mm]	11.14" [283.0 mm]	55°	8
24"	34-31.00.XXX	24.50" [622.3 mm]	2.56" [65.0 mm]	9.06" [230.1 mm]	13.50" [342.9 mm]	14.00" [355.6 mm]	22.59" [573.8 mm]	17.97" [456.4 mm]	9.09" [230.9 mm]	13.13" [333.5 mm]	13.45" [341.6 mm]	55°	8

*** AT AAMA CERTIFIED ANGLE

- ULTIMATE OPENING ANGLE IS 77°



All of our Egress Hinges are designed to be used in casement window applications and achieve approximately 90° of opening. When fully open the sash is positioned close to the side jamb to allow an average sized person the ability to escape through the window's opening in case of an emergency as required by Egress codes. Egress Hinges are non-handed and made of durable stainless steel. These Egress Hinges are designed to project the sash out as it pivots to avoid interference between a lipped vent and frame.

There is a wide variety of Egress Hinges available – each of which has its own unique set of features and benefits. For example:

Standard Duty & Heavy Duty Egress Hinges – will allow 90° of opening with the maximum amount of Egress opening (clear opening) depending upon application. Standard Duty recommended for a maximum vent weight of 82 lbs. Heavy Duty - recommended for maximum vent weight of 158 lbs.

Standard Duty & Heavy Duty Egress Hinge (with washability) – Similar to the Standard Duty & Heavy Duty Egress Hinges in that they allow 90° of opening, however these hinges have the added advantage of allowing the outside vent to be washed from the inside. This is accomplished by inserting a key and sliding the vent towards the center of the frame opening for a washing space of approximately 4.500” (11.43cm) depending upon application.

WARRANTY:

Truth 4-Bar Hinges are protected under the terms of the Truth Warranty for Window & Door Manufacturers & Authorized Distributors" (a copy of which can be obtained by contacting Truth). Truth's 4-Bar Hinges are unmatched in dependability and performance.

MATERIAL: Non-magnetic Stainless steel. Each hinge is manufactured with a sliding brass shoe which contains a nylon block for screw adjustment of friction.

ORDERING INFORMATION & OPTIONS

1. Choose correct hinge style by part number. Reference the 4-Bar Hinge Part Number Guide for the available options.
2. Order two hinges per window.
3. Washability Key #16000 ordered separately (2 required per window)

RECOMMENDED SCREWS:

Standard Duty 4-Bar Hinge 6 - #10 Slotted or #8 Phillips pan head stainless steel screws. Length and thread type to be determined by profile design.

Heavy Duty 4-Bar Hinge 6 - #10 Phillips pan head stainless steel screws.

Length and thread type determined by profile design.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

4-Bar type casement hinge for meeting residential and commercial egress code requirements. Utilizing a 4-bar action to project the vent while opening to avoid interference between frame and sash.

Window hinges to be of 4-bar design, which opens the sash to 90° position close to hinge side of jamb for widest possible egress opening. Hinges shall be non-handed and constructed of high quality stamped and roll formed materials. Hinges used must be certified to AAMA 904.1 specifications.

Only on Washability Equipped Models:

- Window hinges will have the ability to be unlocked and moved to a position which allows easy cleaning of the window from the inside.

Window hinges shall be 222/224 or 333/334 series 4-Bar, as manufactured by Truth Hardware.

**STANDARD DUTY
4-BAR EGRESS HINGE
(222SS - 224SS Series)**

**FIG. 1 TRUTH STANDAR DUTY 4-BAR EGRESS CASEMENT HINGE
(Truth 222SS and 224SS Series)**

TRUTH STD DUTY 4-BAR CASEMENT HINGE W/ STOP

MAT'L	HINGE CALLOUT & (ACTUAL LENGTH)		PART NUMBER	STD STOP	EGRESS TO WASHABILITY
SST	12"	12.61" [320.3 mm]	35.09.00	.100	N/A
SST	16"	16.41" [416.7 mm]	35.10.00	.100	N/A
SST	16"	16.41" [416.7 mm]	35.11.00	.100	YES

PART NUMBERING SYSTEM

Product No.	Model	Finish	Assembly
35	09	00	100
4-Bar Hinge	Standard Duty Egress 12" Length	No Decorative Finish	W/ Stop Std. Open (Hinge Feature)

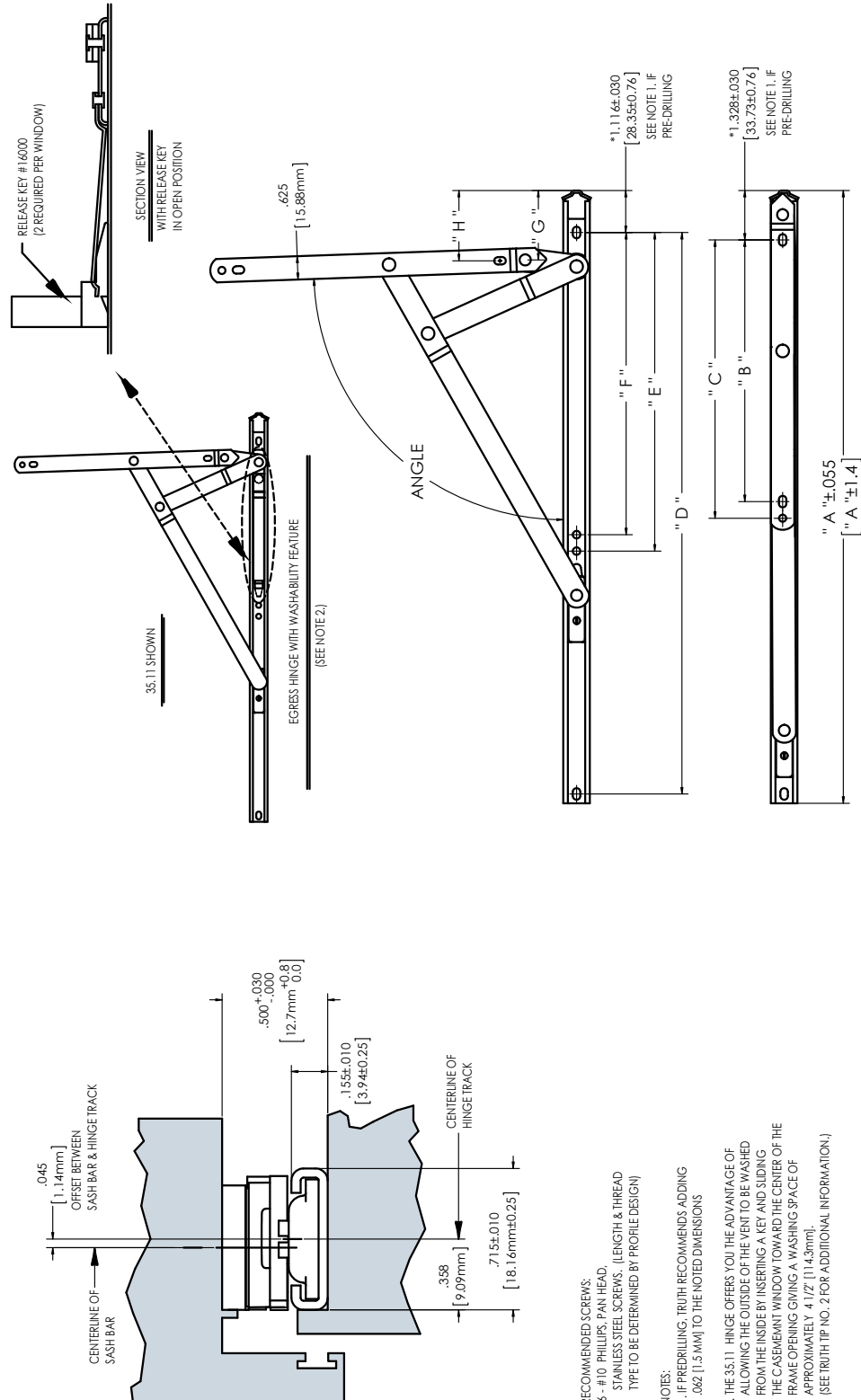
4-BAR HINGE APPLICATION TABLE FOR CASEMENT HINGES (SIDE HUNG) (As certified to AAMA 904.1)			
HINGE CALLOUT & (ACTUAL LENGTH)		Ultimate (see note #6)	
		Sash/Vent Width Range	Max Sash Vent Weight
12"	12.61" [320.3 mm]	14"-32" [356 mm-813 mm]	82 lbs at 32" [37.2 kg at 813 mm]
16"	16.41" [416.7 mm]	18"-32" [457 mm-813 mm]	82 lbs at 32" [37.2 kg at 813 mm]
16"	16.41" [416.7 mm]	18"-32" [457 mm-813 mm]	82 lbs at 32" [37.2 kg at 813 mm]

NOTES:

1. THESE STANDARD DUTY EGRESS 4-BAR HINGES ARE RECOMMENDED FOR CASEMENT APPLICATIONS ONLY.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. UNLESS OTHERWISE SPECIFIED ALL 222-224 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A STANDARD DUTY HINGE IS .500 (12.7mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
5. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/1.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".



FIG. 2 TRUTH STANDARD DUTY EGRESS (90°) 4-BAR HINGE
(Truth 222SS AND 224SS Series)



RECOMMENDED SCREWS:
6-#10 PHILLIPS PAN HEAD,
STAINLESS STEEL SCREWS. (LENGTH & THREAD
TYPE TO BE DETERMINED BY PROFILE DESIGN)

NOTES:
*1. IF PRE-DRILLING, TRUTH RECOMMENDS ADDING
.062 [1.5MM] TO THE NOTED DIMENSIONS

2. THE 35.11 HINGE OFFERS YOU THE ADVANTAGE OF
ALLOWING THE OUTSIDE OF THE VERT TO BE WASHED
FROM THE INSIDE BY INSERTING A KEY AND SLIDING
THE CASEMENT WINDOW TOWARD THE CENTER OF THE
FRAME OPENING GIVING A WASHING SPACE OF
APPROXIMATELY 4 1/2" [114.3mm].
(SEE TRUTH TIP NO. 2 FOR ADDITIONAL INFORMATION.)

HINGE PART #	"A" HINGE LENGTH	"B"	"C"	"D"	"E"	"F"	"G" MAX	"H" MAX	ANGLE
35.09	12.61" [320.3mm]	6.25" [158.6mm]	6.68" [169.8mm]	11.24" [285.4mm]	5.93" [150.6mm]	5.49" [139.4mm]	2.02" [51.3mm]	2.09" [53.1mm]	84°
35.10	16.41" [416.8mm]	7.01" [178.0mm]	7.45" [189.2mm]	15.03" [381.8mm]	8.53" [216.7mm]	8.09" [205.5mm]	2.02" [51.3mm]	2.05" [52.1mm]	88°
35.11	16.41" [416.8mm]	7.01" [178.0mm]	7.45" [189.2mm]	15.03" [381.8mm]	7.03" [178.6mm]	6.59" [167.4mm]	2.09" [53.1mm]	2.11" [53.6mm]	88°

**STANDARD DUTY
EGRESS/WASHABILITY
4-BAR HINGE
(224SS Series)**

**FIG. 3 TRUTH STANDARD DUTY EGRESS/WASHABILITY 4-BAR CASEMENT HINGE
(Truth 224SS Series)**

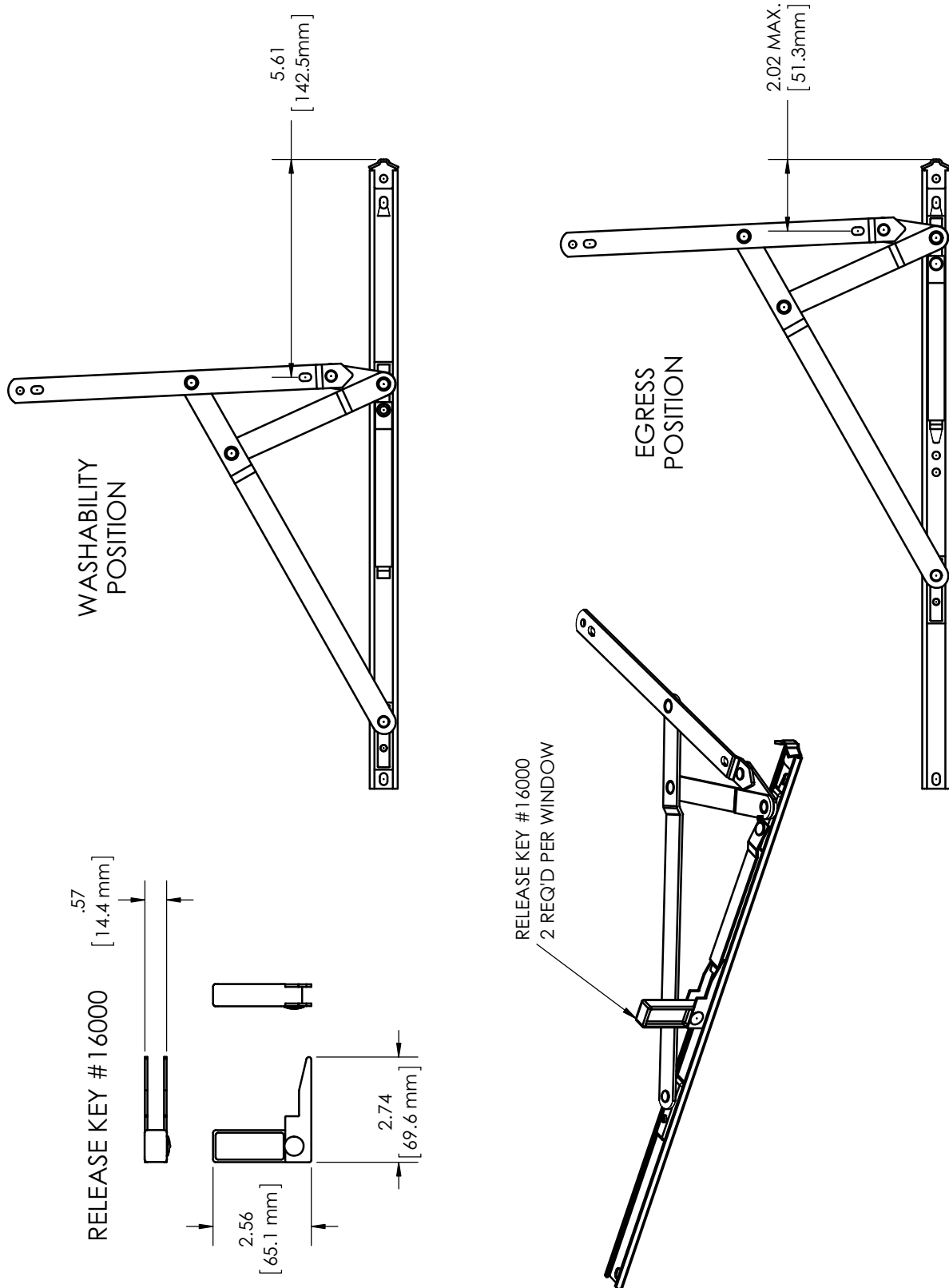




FIG. 4 TRUTH STANDARD DUTY 4-BAR EGRESS CASEMENT HINGE
(Truth 333SS-334SS Series)

TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE W/ STOP

MAT'L	HINGE CALLOUT & (ACTUAL LENGTH)		PART NUMBER	EGRESS TO WASHABILITY
SST	16"	16.76" [425.7mm]	35.12.00.208	N/A
SST	16"	16.72" [424.7mm]	35.13.00.208	YES

PART NUMBERING SYSTEM

PRODUCT NO.	MODEL	FINISH	ASSEMBLY
35	12	00	208
4-BAR HINGE	HEAVY DUTY EGRESS 16" LENGTH	NO DECORATIVE FINISH	W/ STOP STD. OPEN (HINGE FEATURE)

4-BAR HINGE APPLICATION TABLE FOR CASEMENT HINGES
(SIDE HUNG) (AS CERTIFIED TO AAMA 904.1)

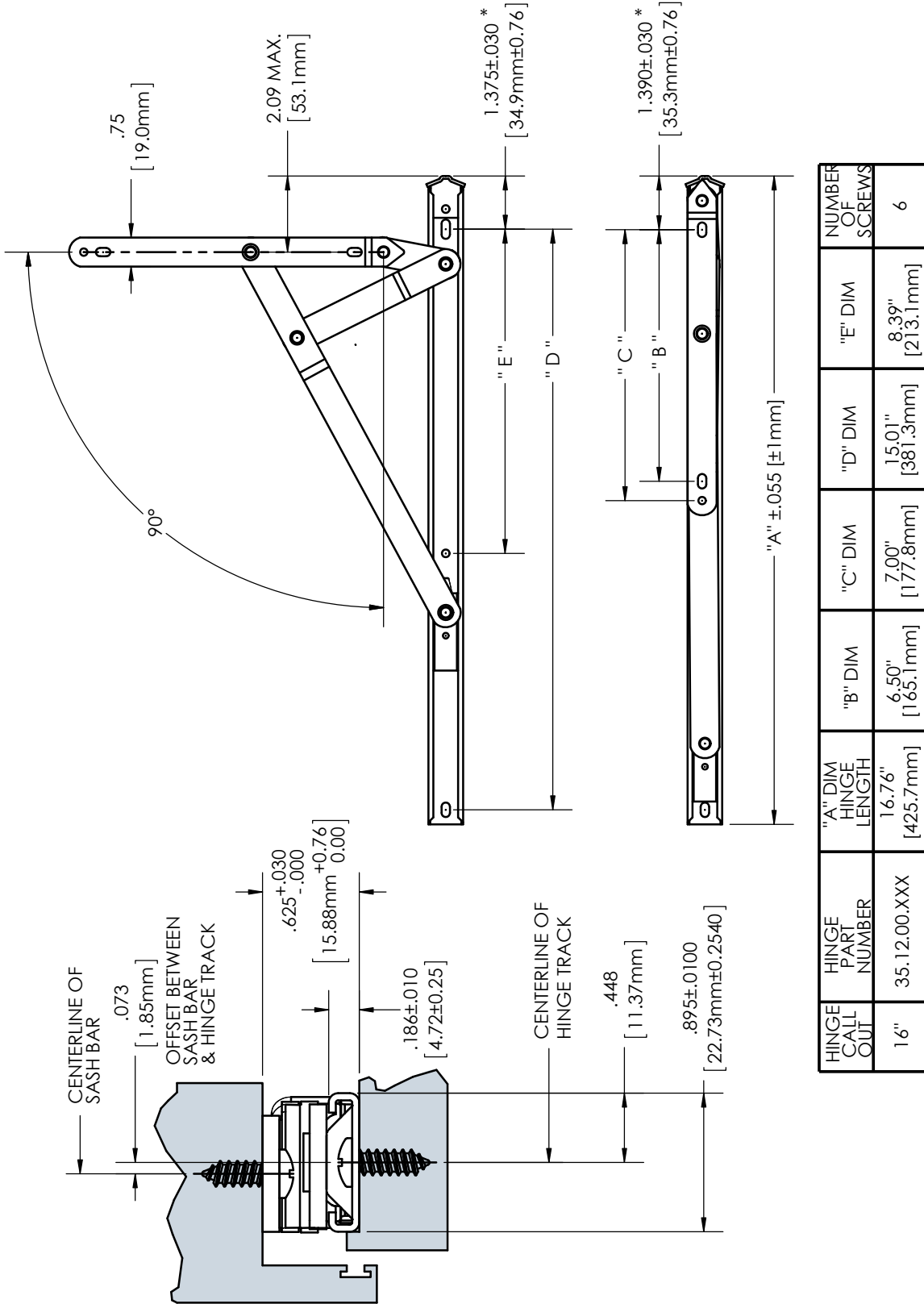
HINGE CALLOUT & (ACTUAL LENGTH)		ULTIMATE (SEE NOTE #6)	
		SASH/VENT WIDTH RANGE	MAX SASH VENT WEIGHT
35.12	16.76" [425.7mm]	18"-32" [457.2 mm-812.8 mm]	175 LBS AT 32" [79.4 KG AT 812.8 mm]
35.13	16.72" [424.7mm]	18"-32" [457.2 mm-812.8 mm]	158 LBS AT 32" [79.4 KG AT 812.8 mm]

NOTES:

1. THESE HEAVY DUTY EGRESS 4-BAR HINGES ARE RECOMMENDED FOR CASEMENT APPLICATIONS ONLY.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. ALL 333-334 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A HEAVY DUTY HINGE IS .625 (15.9 mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
6. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES, AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/I.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".

HEAVY DUTY 4-BAR EGRESS HINGES (333SS Series)

FIG. 5 TRUTH HEAVY DUTY 4-BAR EGRESS CASEMENT HINGE
(Truth 333SS Series)



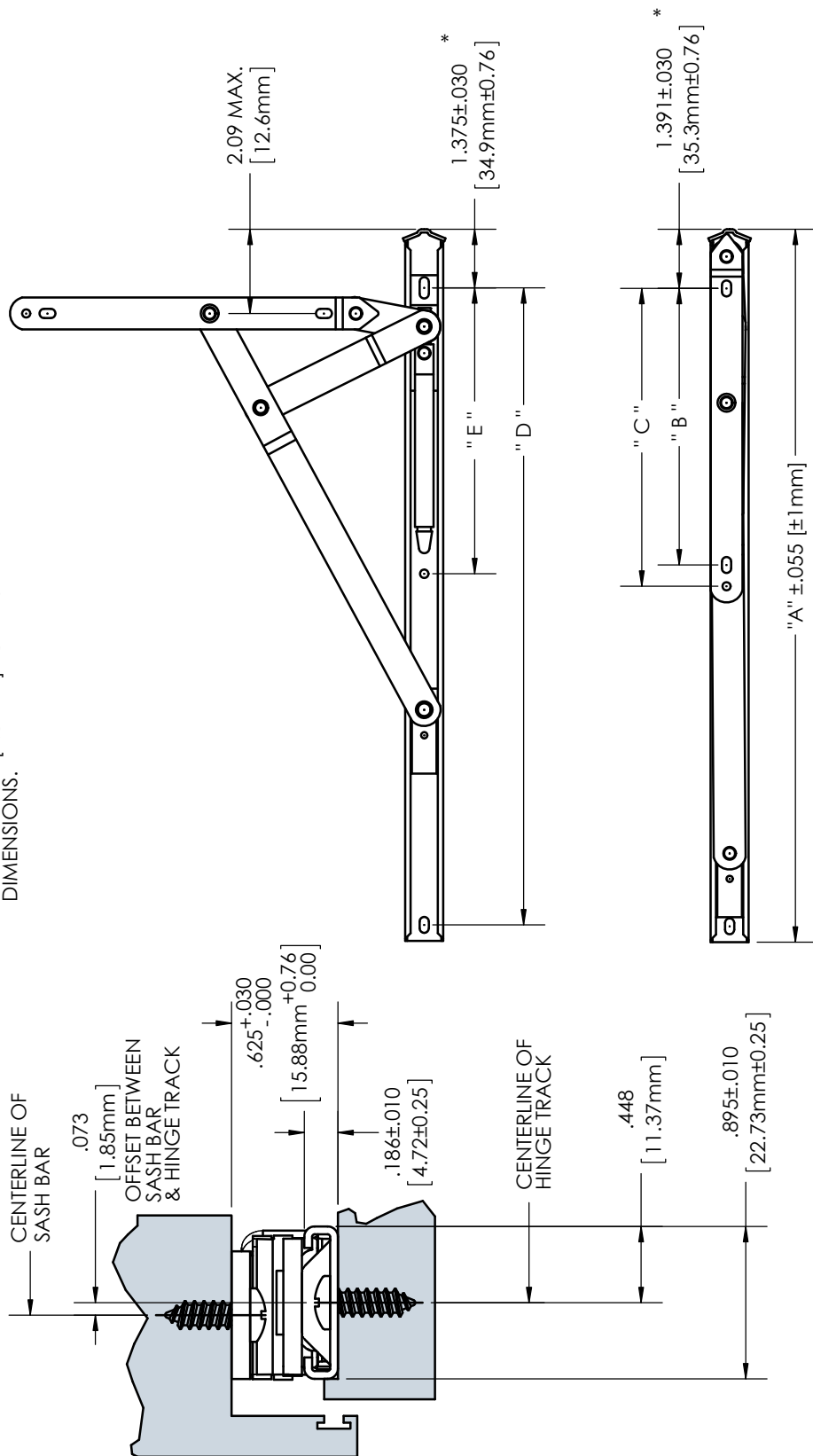
HINGE CALL OUT	HINGE PART NUMBER	"A" DIM HINGE LENGTH	"B" DIM	"C" DIM	"D" DIM	"E" DIM	NUMBER OF SCREWS
16"	35.12.00.XXX	16.76" [425.7mm]	6.50" [165.1mm]	7.00" [177.8mm]	15.01" [381.3mm]	8.39" [213.1mm]	6



**FIG. 6 TRUTH HEAVY DUTY 4-BAR EGRESS/WASHABILITY CASEMENT HINGE
(Truth 334SS Series)**

RECOMMENDED SCREWS:
#10 PHILLIPS PAN HEAD STAINLESS STEEL SCREWS
(LENGTH AND THREAD TYPE TO BE
DETERMINED BY PROFILE DESIGN)

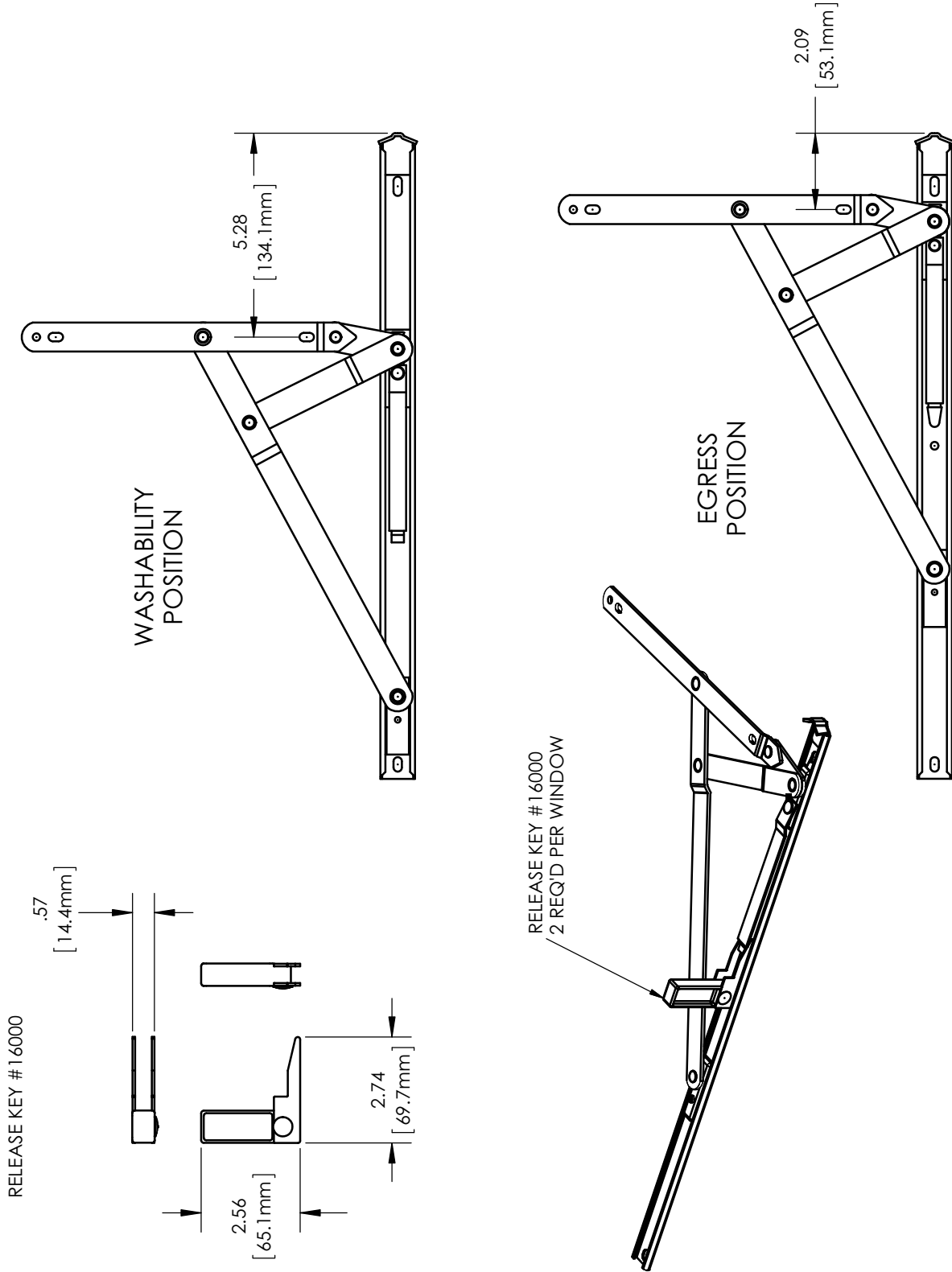
NOTE: * IF PREDRILLING, TRUTH RECOMMENDS
ADDING .062" [1.5 MM] TO THESE
DIMENSIONS.



HINGE CALL OUT	HINGE PART NUMBER	"A" DIM HINGE LENGTH	"B" DIM	"C" DIM	"D" DIM	"E" DIM	NUMBER OF SCREWS
16"	35.13.00.XXX	16.72" [424.7mm]	6.50" [165.1mm]	7.00" [177.8mm]	14.97" [380.2mm]	6.72" [170.6mm]	6

**HEAVY DUTY
EGRESS/WASHABILITY
4-BAR HINGE
(334SS Series)**

**FIG. 7 TRUTH HEAVY DUTY EGRESS/WASHABILITY 4-BAR CASEMENT HINGE
(Truth 334SS Series)**





These Truth 34 Series Standard Duty and Heavy Duty Stainless Steel 4-Bar Hinges are similar to the Anderberg 201SS & 301SS styles; however, these hinges also have the capability of producing 90° of window opening. Designed only for casement window applications, these non-handed, 4-Bar Hinges are designed to project the vent out as it pivots to avoid interference between a lipped vent and frame.

WARRANTY:

Protected under the terms of the Truth Warranty for window & Door Manufacturers & Authorized Distributors. For a copy of this warranty, please contact Truth.

MATERIAL: Non-magnetic stainless steel arms and track.

ORDERING INFORMATION & OPTIONS:

1. Choose correct hinge size and style by part number. (Reference 4-Bar Hinge Part Number Guide for the available options).
2. Order two hinges per window.

RECOMMENDED SCREWS:

Standard Duty (401 Series) 6 -- #10 Slotted or #8 Phillips pan head stainless steel screws. Length and thread type to be determined by profile design.

Heavy Duty (601 Series) 6 -- #10 Phillips pan head stainless steel screws. Length and thread type to be determined by profile design. See Truth Tip #11 for additional information on screw selection.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

4-bar type window hinge for casement windows, which projects the vent while opening to avoid interference between frame and sash.

Window hinges to be of 4-bar type design, allowing 90° opening and washability access to outside of window glass. Hinges shall be non-handed and constructed of 300 series stainless steel. Hinges used must be certified to AAMA 904.1 specifications.

Window hinges shall be 401/601 series 4-bar, as manufactured by Truth Hardware.

**STANDARD DUTY
4-BAR HINGE
(401SS Series)**

**FIG. 1 TRUTH STANDARD DUTY 4-BAR CASEMENT HINGE
(Truth 401SS Series)**

TRUTH STD DUTY 4-BAR CASEMENT HINGE W/ 90° STOP

MAT'L	HINGE CALLOUT & (ACTUAL LENGTH)		PART NUMBER
SST	12"	12.22" [310.4mm]	34.55.00.300

PART NUMBERING SYSTEM

PRODUCT NO.	MODEL	FINISH	ASSEMBLY
34	55	00	300
4-BAR HINGE	STANDARD DUTY 12" LENGTH	NO DECORATIVE FINISH	W/ STOP STD. OPEN (HINGE FEATURE)

4-BAR HINGE APPLICATION TABLE FOR CASEMENT HINGES (SIDE HUNG) (AS CERTIFIED TO AAMA 904.1)			
HINGE CALLOUT & (ACTUAL LENGTH)		ULTIMATE (SEE NOTE #6)	
		SASH/VENT WIDTH RANGE	MAX SASH VENT WEIGHT
12"	12.22" [310.4mm]	12"-32" [305mm-813mm]	65 lbs at 32" [29.5 kg at 813mm]

NOTES:

1. THESE STANDARD DUTY HINGES 90° 4-BAR HINGES ARE RECOMMENDED FOR CASEMENT APPLICATIONS ONLY.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. ALL 401 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A STANDARD DUTY HINGE IS .500 (12.7mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
5. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/I.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".

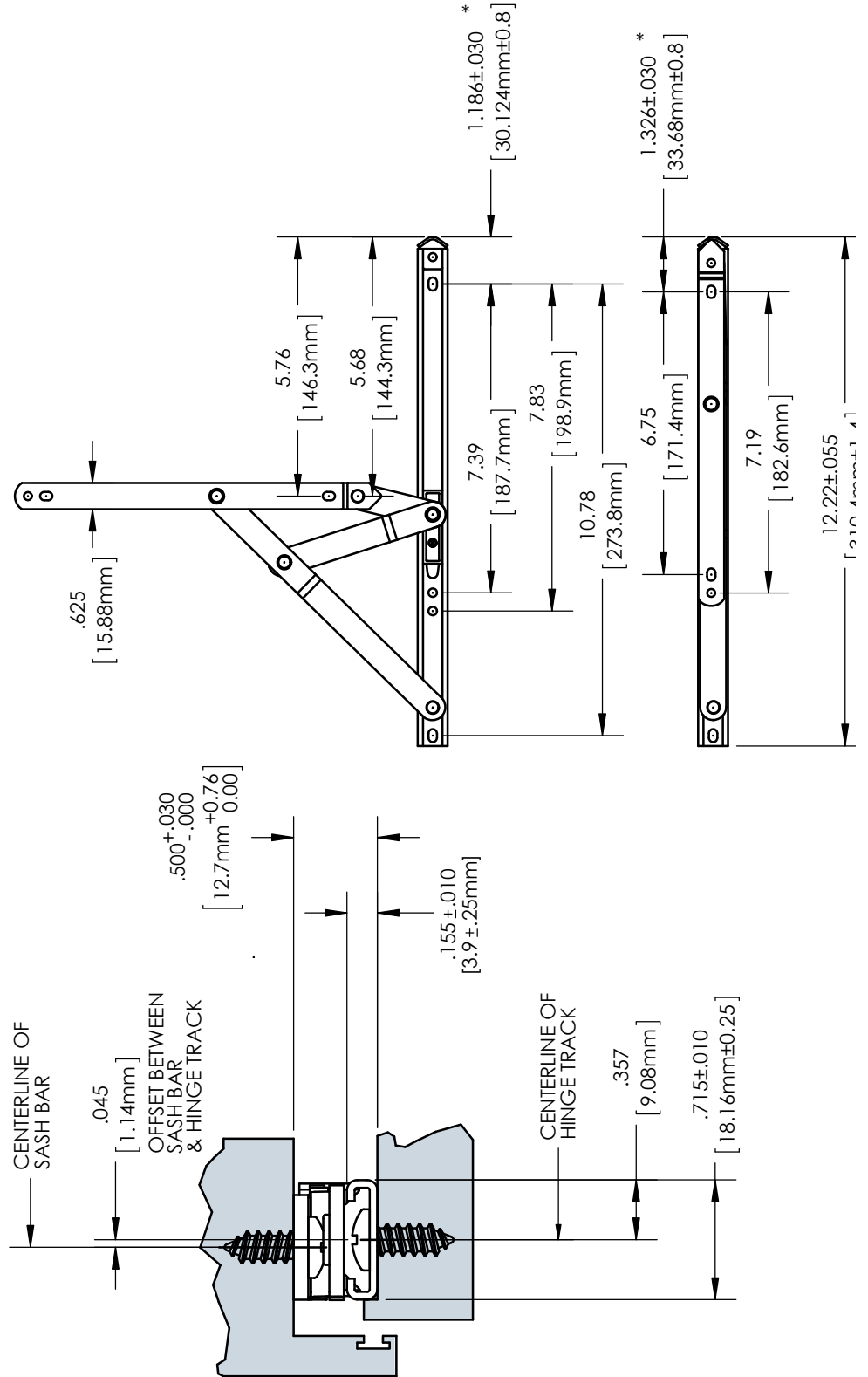


FIG. 2 TRUTH STANDARD DUTY 4-BAR CASEMENT HINGE
(Truth 401SS Series)

RECOMMENDED SCREWS:

#10 SLOTTED OR #8 PHILLIPS,
PAN HEAD STAINLESS STEEL SCREWS
(LENGTH AND THREAD TYPE TO BE
DETERMINED BY PROFILE DESIGN)

NOTE: * IF PREDRILLING, TRUTH RECOMMENDS
ADDING .062" [1.5 MM] TO THESE
DIMENSIONS.



**HEAVY DUTY
4-BAR HINGE
(601SS Series)**

**FIG. 3 TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE
(Truth 601SS Series)**

TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE W/ 90° STOP

MAT'L	HINGE CALLOUT & ACTUAL LENGTH		PART NUMBER
SST	14"	14.50" [368.3 mm]	34.59.00.208
SST	16"	16.50" [419.1 mm]	34.60.00.208
SST	18"	18.50" [469.9 mm]	34.61.00.208

PART NUMBERING SYSTEM

PRODUCT NO.	MODEL	FINISH	ASSEMBLY
34	59	00	208
4-BAR HINGE	HEAVY DUTY 14" LENGTH	NO DECORATIVE FINISH	W/ STOP STD. OPEN (HINGE FEATURE)

4-BAR HINGE APPLICATION TABLE FOR CASEMENT HINGES (SIDE HUNG) (AS CERTIFIED TO AAMA 904.1)			
HINGE CALLOUT & (ACTUAL LENGTH)		ULTIMATE (SEE NOTE #6)	
		SASH/VENT WIDTH RANGE	MAX SASH VENT WEIGHT
14"	14.52" [368.8 mm]	14"-36" [356mm-914mm]	120 lbs at 36" [54.4 kg at 914mm]
16"	16.52" [419.6 mm]	16"-36" [406mm-914mm]	120 lbs at 36" [54.4 kg at 914mm]
18"	18.52" [470.4 mm]	18"-36" [457mm-914mm]	120 lbs at 36" [54.4 kg at 914mm]

NOTES:

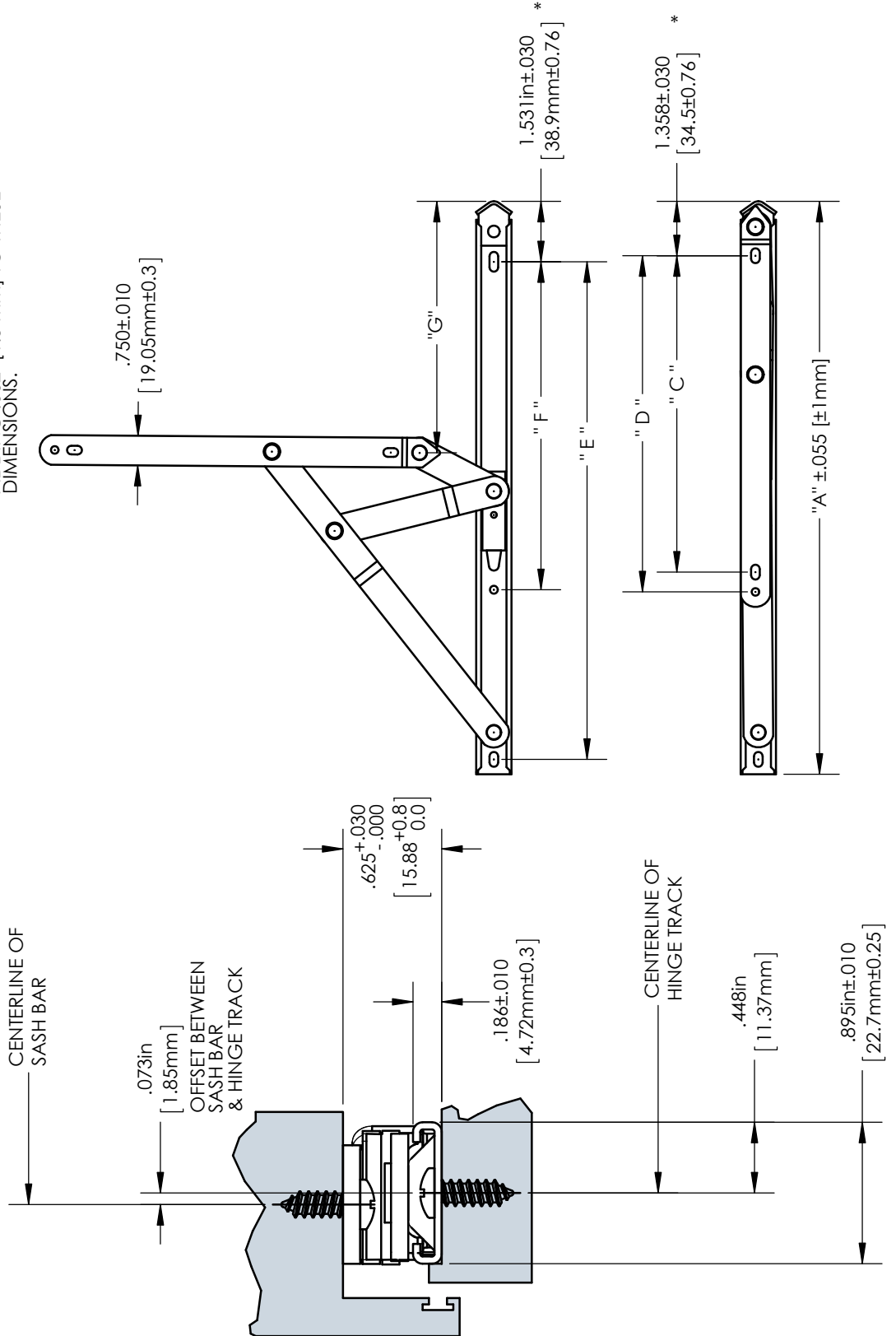
1. THESE HEAVY DUTY HINGES 90° 4-BAR HINGES ARE RECOMMENDED FOR CASEMENT APPLICATIONS ONLY.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. ALL 601 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A HEAVY DUTY HINGE IS .625 (15.9 mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
5. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/I.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".



FIG. 4 TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE
(Truth 601SS Series)

RECOMMENDED SCREWS:
#10 PHILLIPS PAN HEAD STAINLESS
STEEL SCREWS (LENGTH AND THREAD
TYPE TO BE DETERMINED BY PROFILE
DESIGN)

NOTE: * IF PREDRILLING, TRUTH RECOMMENDS
ADDING .062" [1.5 mm] TO THESE
DIMENSIONS.



HEAVY DUTY 4-BAR HINGE (601SS Series)

FIG. 5 TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE
(Truth 601SS Series)

HINGE CALL OUT	HINGE PART NUMBER	"A" DIM HINGE LENGTH	"C" DIM	"D" DIM	"E" DIM	"F" DIM	"G" DIM	# OF SCREWS
14"	34.59.00.XXX	14.52" [368.8 mm]	8.01" [203.4 mm]	8.51" [216.1 mm]	12.59" [319.9 mm]	8.30" [210.9 mm]	6.59" [167.4 mm]	7
16"	34.60.00.XXX	16.52" [419.6 mm]	8.01" [203.4 mm]	8.51" [216.1 mm]	14.59" [370.7 mm]	7.75" [196.8 mm]	6.09" [154.7 mm]	7
18"	34.61.00.XXX	18.52" [470.4 mm]	8.01" [203.4 mm]	8.51" [216.1 mm]	16.59" [421.5 mm]	7.51" [190.7 mm]	5.77" [146.6 mm]	7



Do you have a project requiring you to ventilate a large awning window in a commercial application? If so, Truth Hardware has the answer. The new Superior 4-Bar Hinge.

STRENGTH & PERFORMANCE

AAMA Certified in excess of 300 lbs. in load testing. Truth's new 300 series stainless steel Superior Hinge has been engineered to work on awning sashes ranging from 64" - 86" in height, and will provide a choice of 20°, 18°, or 14° of opening. In addition, the Superior Hinge surpasses AAMA's 904.1 Cycle Test measuring durability (over 8,000 cycles). A positive lead-in of the hinge arm into the "hat" aids in the travel of the hinge arm while opening and closing of the window.

INSTALLATION & FLEXIBILITY

With a standard stack height (5/8") equal to Truth's popular Heavy Duty 4-Bar Hinges, window manufacturing changes are eliminated, allowing for continuity in your window profile designs. To accommodate the larger window styles of today - the Superior

Hinge comes in a 28" length. The non-handed design of the Superior Hinge helps cut down on expensive inventories.

OPTIONS:

Riser Block (#16076) allows the ability to adjust the maximum opening angle from 20°, 18°, or 14°, depending upon number used (see table).

The Adjustment Block feature (#16088) will help enhance flexibility in installation. This will adjust the sash in relation to the frame. Providing plus/minus 2 mm worth of adjustment, the Adjustment Block has been load tested to 200 lbs., and can be used on all Truth 4-Bar Heavy Duty Hinges

WARRANTY:

Protected under the terms of the Truth Warranty for Window & Door Manufacturers and Authorized Distributors. Refer to Truth's Terms & Conditions for further details.

MATERIAL:

The Superior Hinge is made of a non-magnetic corrosion resistant stainless steel. Brass shoes which slide the hinge arm along the track help to provide the needed friction necessary for awning applications.

ORDERING INFORMATION & OPTIONS

1. Order Superior Hinge #34.87.00.200
2. Order two hinges per window.
3. Order optional items:

#16076 Riser Block for establishing opening angle. Quantity to be determined by amount of opening required.

#16088 Adjustment Block. Order one pRECOMMENDED SCREWSer hinge.

MATERIAL:

The Superior Hinge is made of a non-magnetic corrosion resistant stainless steel. Brass shoes which slide the hinge arm along the track help to

provide the needed friction necessary for awning applications. 7 - #10 Phillips pan head stainless steel screws. Length and thread type to be determined by profile design. See Truth Tips for additional screw selection information.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

4-Bar type hinge for awning windows, which projects the vent while opening to avoid interference between frame and sash.

Window hinges to be of 4-bar type design. Hinges shall be non-handed and constructed of 300 Series non-magnetic corrosion resistant stainless steel with a brass shoe. Hinges must be certified to AAMA 904.1 specifications, and will accommodate a sash height range of between 64" and 86", and provide a variety of openings.

Hinges shall be 34 Series 4-Bar, as manufactured by Truth Hardware.

TRUTH TIPS

1. Placement of a 4-Bar Hinge relative to the outside edge of the frame depends upon the amount of overlap of the sash on the frame. As a general rule the hinge should be mounted flush to .250" (6.3 mm) of the outside edge of the frame. This dimension depends upon the amount of overlap. A .250" (6.3 mm) dimension will allow proper clearance for a window system having approximately .312" (7.9 mm) of sash overlap. If interference occurs between the sash and the frame then the hinge must be moved further outboard on the frame, or the overlap must be reduced.

2. Particular attention must be given to 4-Bar Hinge mounting. It is important that the ventilator bar be offset to a point where it is flush with the outside edge of the track. This results in an offset between the screw centerlines of the ventilator bar and hinge track (see the application drawing of the particular hinge).

3. To increase the overall hinge height of 4-Bar Hinges, aluminum shims applicable to the ventilator bar are available in various thicknesses. Truth provides some popular sizes of shims, however, other sizes must be provided by the window manufacturer.

4. Special consideration should be given when designing an awning window. Please consult Truth Tech Bulletin #2 for further information.

5. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.

6. Mounting screws must pass through two PVC walls or one PVC wall and one insert wall.

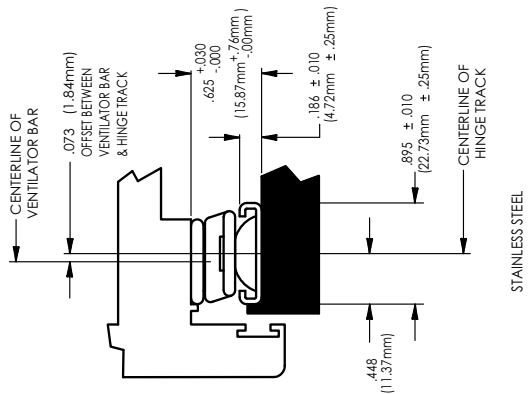
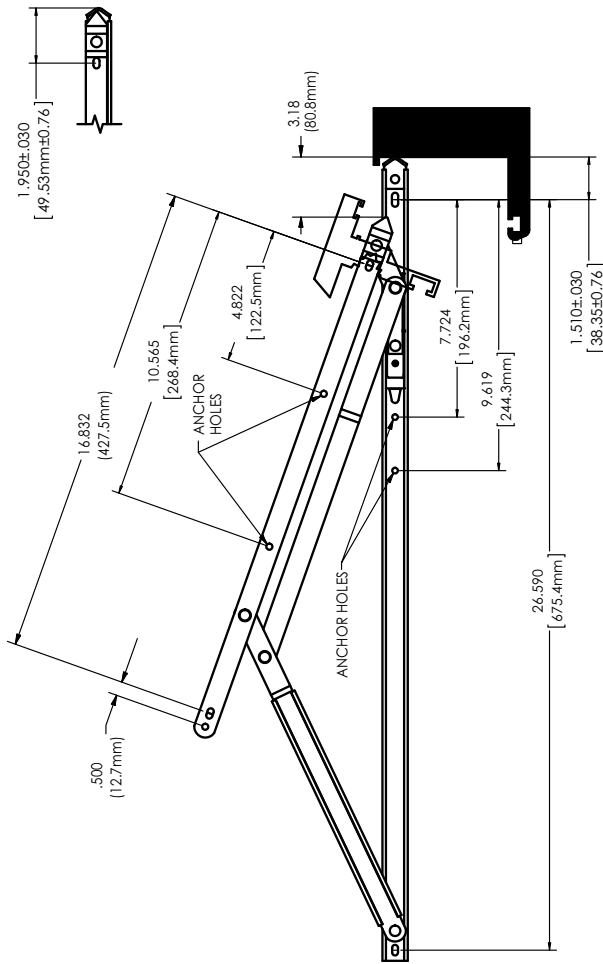
7. For metal window profiles, Truth recommends machine screws however, in most applications sheet metal screws will provide adequate holding power.

8. Hinge life can be prolonged by periodically adding a drop of light weight oil at each riveted joint.

9. For easy correction of out of square, or racked window applications, the use of Truth Jamb Jack frame adjusters is recommended. Frame adjustments can improve both weather seal tightness and sash operation over the life of the window.



TRUTH SUPERIOR 4-BAR HINGE
(Anderberg 301 Series)



TRUTH SUPERIOR 4 BAR HINGE
(ANDERBERG 301 SERIES)

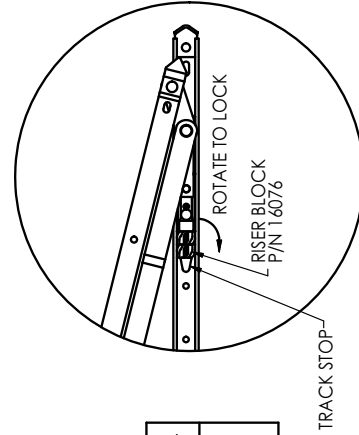
RECOMMENDED SCREWS:
STAINLESS STEEL: 8X NO. 10 PHILLIPS PAN HEAD STAINLESS STEEL SCREWS.
(LENGTH & THREAD TYPE TO BE DETERMINED BY PROFILE DESIGN)

PART NO.	HINGE LENGTH	VENT HEIGHT RANGE	DEGREE OF OPENING	REQUIRED NO. OF RISER BLOCKS PER HINGE	MAXIMUM VENT WEIGHT
3487	28.48" (723.4 mm)	6.4" (1625.6 mm) TO 87" (2209.8 mm)	20°	NONE	300lb (136.05kg)
			17°	ONE	
			14°	TWO	

INSTALLATION OF RISER BLOCK

REQUIRED ON BOTH HINGES OF WINDOW APPLICATION

- 1) OPEN HINGE HALF WAY
- 2) INSERT RISER BLOCK INTO THE TRACK BETWEEN THE SLIDE SHOE AND THE TRACK STOP
- 3) ROTATE RISER BLOCK 90° TO LOCK INTO POSITION USING A SLOTTED SCREW DRIVER
- 4) REPEAT STEPS 2 & 3 FOR SECOND RISER BLOCK IF NEEDED



INSTALLATION OF RISER BLOCK



Throughout the industry the names Anderberg and Truth have stood for engineered excellence, reliable and dependable performance, and above all “quality”. This is most evident in our expertly crafted 4-Bar Hinges.

Each style of hinge that you will find on the accompanying pages has a variety of sizes and options to choose from. Everything from hinges manufactured with or without stops to varying degrees of opening. A wide range of lengths and thicknesses are also available. 4-Bar Hinges are certified to AAMA 904.1.

4-Bar Hinges have been designed to be used primarily on vents with a lip on the outside edge. By design, Truth Hardware’s 4-Bar Hinges are engineered to project the vent out as it pivots to avoid interference between a lipped vent and frame. 4-Bar Hinges are adaptable to both casement and projected window applications. To aid you in your selection of 4-Bar Hinges, Truth has developed a guide (flow-chart) that provides you with a step-by-step procedure for determining the appropriate hinge for your use.

To help reduce the inventory of

"handed" products, each hinge is manufactured to be "non-handed", so that they can be used as either left-or right-handed hinges.

WARRANTY:

Truth 4-Bar Hinges are protected under the terms of the Truth Warranty for Window & Door Manufacturers & Authorized Distributors (Refer to Truth’s Terms & Conditions for further details). Truth’s 4-Bar Hinges are unmatched in dependability and performance.

NUMBERING SYSTEM:

The Truth product numbering system for hinges denotes the **product** with the first two numerals, **model** by the second two numerals, and the **finish** by the next two numerals (decorative finishes only -- this does not apply to hinges). In the case of Truth’s 4-Bar Hinges, the last three numerals represent the various hinge features with no commonalty between product models intended. The following chart illustrates this system using the #34.24.00.208 Heavy Duty 4-Bar Hinge as an example.

NUMBERING SYSTEM

Product No.	Model	Finish	Assembly
34	24	00	208
4-Bar Hinge	Heavy Duty 10" length	No decorative finish	W/Stop Std. open (Hinge Feature)

4-BAR HINGES

GUIDE TO 4-BAR HINGE SELECTION

DETERMINE STACK HEIGHT

The stack height is the overall height from the bottom of the track to the top of the sash arm. If the pocket area has a height that is not standard to the hinge stack height, shims may be necessary. This size will determine which chart you will need to refer to. The standard stack heights are .625" (15.9mm) (Heavy Duty Hinge), .500" (12.7mm) (Standard Duty Hinge).

DETERMINE APPLICATION

CASEMENT

PROJECTED AWNING

DETERMINE FUNCTION

DETERMINE HINGE MATERIAL

EGRESS

WASHABILITY

Egress is the amount of clear opening that is left between the frame and the sash when the window is in a fully opened position. These hinges require single arm type operators. (See your local codes for specifics.)

Washability is the ability to have enough clearance between the frame and the hinge side of the sash to extend an arm or device to clean the vent. These hinges require dyad type

It is important to match your window with the proper size hinge. A Table is available in each hinge section to be a guide in the selection of the appropriate hinge length. NOTE Awning applications require that the sash opening is no

DETERMINE HINGE LENGTH

DETERMINE HINGE LENGTH

SEE CHART FOR OPTIONS

The Egress Hinge is available in only one length:
 12" (304.8mm) - Standard Duty Hinge
 16.125" (409.6mm) - Standard Duty Hinge
 16.500" (419.1mm) - Heavy Duty Hinge.

The 12" (304.8mm) hinges are recommended for most casement applications because the extra length on larger hinges is not of any benefit for casement applications.

At this point you have specified enough requirements to choose the correct hinge for your specific application.

Stack height: _____
 Application: _____
 Length: _____

SEE CHART FOR OPTIONS

At this point you have specified enough requirements to choose the correct hinge for your specific application.

Stack height: _____
 Application: _____
 Length: _____
 Functions: _____



TRUTH TIPS:

1. Placement of a 4-Bar Hinge relative to the outside edge of the frame depends on the amount of overlap of the sash on the frame. As a general rule the hinge should be mounted flush to .250" (6.3 mm) of the outside edge of the frame. This dimension depends on the amount of overlap. A .250" (6.3 mm) dimension will allow proper clearance for a window system having approximately .312" (7.9 mm) of sash overlap. If interference occurs between the sash and frame then the hinge must be moved further outboard on the frame or the overlap must be reduced. (See the application drawing of the particular hinge.)
2. Particular attention must be given to 4-Bar Hinge mounting. It is important that the ventilator bar be offset to a point where it is flush with the outside edge of the track. This results in an offset between the screw centerlines of the ventilator bar and hinge track. Particular attention must be given to 4-Bar Hinge mounting. It is important that the ventilator bar be offset to a point where it is flush with the outside edge of the track. This results in an offset between the screw centerlines of the ventilator bar and hinge track.
3. Ultimate sash weight & width for hinges as shown in the charts of this document are based on AAMA 904.1 "Specifications for Multi-Bar Hinges in Window Applications". The load carrying capacity is based on the vent height being at least twice the vent width. These numbers do not apply to windows being tested to ANSI/AAMA/WDMA 101/I.S.2/NAFS-02 "Casement Hardware Load Test".
4. To increase the overall hinge height of 4-Bar Hinges, aluminum shims applicable to the ventilator bar are available in various thicknesses. Truth provides some popular sizes of shims, however, other sizes must be provided by the window manufacturer.
5. Sash sag is a problem which affects many casement windows. 4-Bar Hinges tend to be more susceptible to sash sag than standard 2-bar hinges because they cantilever the sash outside of the frame, supporting the

entire sash weight on the support arms. While 2-Bar hinges are supported inside of the window frames so they transfer the sash weight back into the window. To minimize sash sag, Truth Hardware recommends utilizing the measures outlined in Tech Note #3

6. For proper balancing, Truth recommends a hinge with no greater than 60° of opening in projected and awning applications.
7. Special considerations should be given when designing an awning window. Please consult Truth Tech Bulletin #2 for further information.
8. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
9. Mounting screws must pass through two PVC walls or one PVC wall and one insert wall.
10. For metal window profiles Truth recommends machine screws however, in most applications sheet metal screws will provide adequate holding power.
11. Hinge life can be prolonged by periodically adding a drop of light weight oil at each riveted joint.
12. For easy correction of out of square, or racked window installations, the use of Truth Jamb Jack III frame adjusters is recommended. Frame adjustment can improve both weather seal tightness and sash operation over the life of the window.

STANDARD & HEAVY DUTY 4-BAR HINGES (201 - 301 Series)



These "non-handed" 4-Bar Hinges are specially designed for casement, awning, and projected vents with a lip on the outside edge. 4-Bar Hinges are designed to project the sash out as it pivots to avoid interference between a lipped vent and frame. In awning and projected window applications, friction adjustment is achieved by adjusting the screw which is located in the sliding shoe. Adjustments made to this screw affect shoe friction as it slides along the hinge track.

Standard Duty 4-Bar Hinges are generally used for residential projects requiring relatively light window sections (projected units up to 40 lbs.). These hinges are normally provided with a stop built into its track -- and is generally used with awning and projected windows. Hinges designed without the stop feature will open to approximately 65° in casement applications.

Heavy Duty 4-Bar Hinges are generally used for commercial projects requiring relatively heavy window sections (projected units up to 200 lbs.).

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL:

Standard & Heavy Duty Stainless Steel 4-Bar Hinges: Non-magnetic stainless steel. Manufactured with a brass shoe.

ORDERING INFORMATION:

1. Choose correct hinge size and style by part number. (Reference the 4-Bar Hinge Part Number Guide for the available options).
2. Order two hinges per window.

RECOMMENDED SCREWS:

Stainless Steel 4-Bar Hinges:
6 -- #10 Phillips Pan head screws.
Length and thread type to be determined by profile design.

See Truth Tips for additional screw selection information.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

4-bar type window hinge for casement or awning windows, which projects the vent while opening to avoid interference between frame and sash.

Window hinges to be of 4-bar type design, utilizing a screw adjusted brass slide shoe to fine tune hinge to window application. Hinges shall be non-handed and constructed of high quality stamped and roll formed 300 series stainless steel materials. Hinges used must be certified to AAMA 904.1 specifications.

Window hinges shall be 201/301 series 4-bar, as manufactured by Truth Hardware.



FIG. 1 TRUTH STANDARD DUTY 4-BAR HINGE
(ANDERBERG 201SS SERIES)

STANDARD DUTY 4-BAR HINGE PART NUMBER GUIDE

MAT'L	HINGE CALL OUT & (ACTUAL LENGTH)		PART NUMBER	STD. STOP	NO STOP
SST	8"	8.22" [207.8 mm]	34.10.00	.101	.101
SST	10"	10.22" [258.6 mm]	34.11.00	.102	.101
SST	12"	12.22" [309.4 mm]	34.12.00	.100	.101
SST	14"	14.22" [360.2 mm]	34.13.00	.102	.101
SST	16"	16.22" [410.9 mm]	34.14.00	.100	.101
SST	18"	18.22" [461.8 mm]	34.15.00	.102	
SST	20"	20.22" [512.6 mm]	34.16.00	.100	.101

PART NUMBERING SYSTEM

PRODUCT NO.	MODEL	FINISH	ASSEMBLY
34	10	00	101
4-BAR HINGE	STANDARD DUTY 10" LENGTH	NO DECORATIVE FINISH	W/ STOP STD. OPEN (HINGE FEATURE)

NOTES:

1. *SPECIAL NOTE* A PROPERLY COUNTERBALANCED SASH IS RECOMMENDED IN AN AWNING OPERATION. AN UNBALANCED SASH WHEN USED WITH AN AWNING OPERATOR IS LIKELY TO PRODUCE SASH CHATTER AND AN UNEVEN FEEL DURING OPERATION.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. UNLESS OTHERWISE SPECIFIED ALL 201 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A STANDARD DUTY HINGE IS .500 (12.7mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
5. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/1.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".

STANDARD DUTY 4-BAR HINGE (201SS Series)

**FIG. 2 TRUTH STANDARD DUTY 4-BAR HINGE
(ANDERBERG 201SS SERIES)**

4-BAR HINGE APPLICATION TABLE FOR PROJECTED & AWNING HINGES (AS CERTIFIED TO AAMA 904.1)								
HINGE CALL OUT & (ACTUAL LENGTH)		*COUNTERBALANCED		**ULTIMATE (SEE NOTE #2)		DEGREES OF OPENING		
		SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	STD. STOP	NO + STOP	NO ++ STOP
8"	(8.18") [207.8 mm]	9"-16" [229-406 mm]	19 LBS [8.6 KG]	9"-16" [229-406 mm]	19 LBS [8.6 KG]	55°	55°	65°
10"	(10.18") [258.6 mm]	16"-20" [406-508 mm]	23 LBS [10.4 KG]	16"-20" [406-508 mm]	23 LBS [10.4 KG]	55°	55°	65°
12"	(12.18") [309.4 mm]	20"-24" [508-610 mm]	28 LBS [12.7 KG]	20"-24" [508-610 mm]	28 LBS [12.7 KG]	55°	55°	65°
14"	(14.18") [360.2 mm]	23"-28" [584-711 mm]	33 LBS [15.0 KG]	23"-28" [584-711 mm]	33 LBS [15.0 KG]	55°	55°	65°
16"	(16.18") [410.9 mm]	28"-34" [711-864 mm]	40 LBS [18.1 KG]	28"-34" [711-864 mm]	40 LBS [18.1 KG]	55°	55°	65°
18"	(18.18") [461.8 mm]	28"-34" [711-864 mm]	40 LBS [18.1 KG]	28"-34" [711-864 mm]	40 LBS [18.1 KG]	55°	55°	65°
20"	(20.18") [512.6 mm]	32"-34" [813-864 mm]	40 LBS [18.1 KG]	32" WIDE *** [813 mm]	47 LBS *** [213.2 KG]	55°	55°	65°

+ AAMA CYCLE TEST ANGLE
++ ULTIMATE OPENING ANGLE

4-BAR HINGE APPLICATION TABLE FOR CASEMENT (SIDE HUNG) HINGES (AS CERTIFIED TO AAMA 904.1)				
HINGE CALL OUT & (ACTUAL LENGTH)		ULTIMATE (SEE NOTE #2)		DEGREES OF OPENING
		SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	NO STOP + ++
8"	(10.50") [266.7mm]	12"-32" [305-914 mm]	65 LBS AT 32" [45.36 KG AT 914 mm]	55°
10"	(12.50") [317.5mm]	12"-32" [305-914 mm]	65 LBS AT 32" [45.36 KG AT 914 mm]	55°
12"	(14.50") [368.3mm]	12"-32" [305-914 mm]	65 LBS AT 32" [45.36 KG AT 914 mm]	55°
14"	(16.50") [419.1mm]	12"-32" [305-914 mm]	65 LBS AT 32" [45.36 KG AT 914 mm]	55°

DEFINITIONS:

*COUNTERBALANCED: A PAIR OF HINGES WILL BALANCE OR HOLD OPEN THE VENT/SASH WITH NO ADDED FRICTION AT THE HEIGHTS AND WEIGHTS LISTED IN THE CHART.

**ULTIMATE: A PAIR OF HINGES WILL NOT BALANCE OR HOLD OPEN THE VENT/SASH WITHOUT ADDED FRICTION AT THE HEIGHTS AND WEIGHTS LISTED IN THE CHART.

***NOT AAMA CERTIFIED.

NOTES:

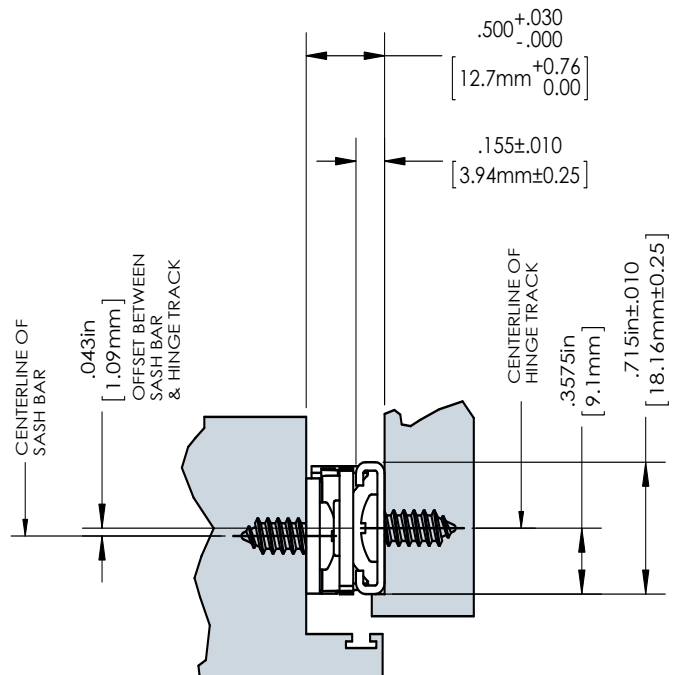
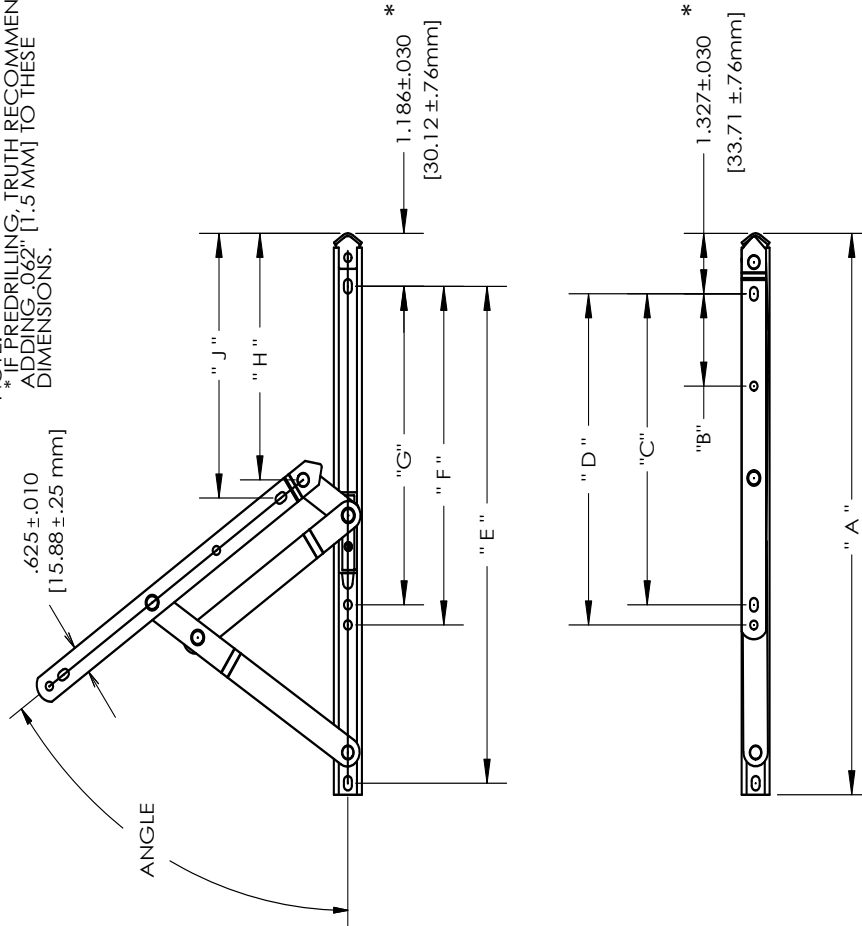
1. A PROPERLY COUNTERBALANCED SASH IS RECOMMENDED IN AN AWNING OPERATION. AN UNBALANCED SASH WHEN USED WITH AN AWNING OPERATOR IS LIKELY TO PRODUCE SASH CHATTER AND AN UNEVEN FEEL DURING OPERATION.
2. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHART ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/LS 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".



FIG. 3 TRUTH STANDARD DUTY 4-BAR HINGE W/STOP
(ANDERBERG 201SS SERIES)

RECOMMENDED SCREWS:
#10 SLOTTED OR #8 PHILLIPS
PAN HEAD STAINLESS STEEL SCREWS
(LENGTH AND THREAD TYPE TO BE
DETERMINED BY PROFILE DESIGN)

NOTE:
*IF PREDRILLING, TRUTH RECOMMENDS
ADDING .062" [1.5MM] TO THESE
DIMENSIONS.



STANDARD DUTY 4-BAR HINGE (201SS Series)

FIG. 4 TRUTH STANDARD DUTY 4-BAR HINGE W/STOP
(ANDERBERG 201SS SERIES)

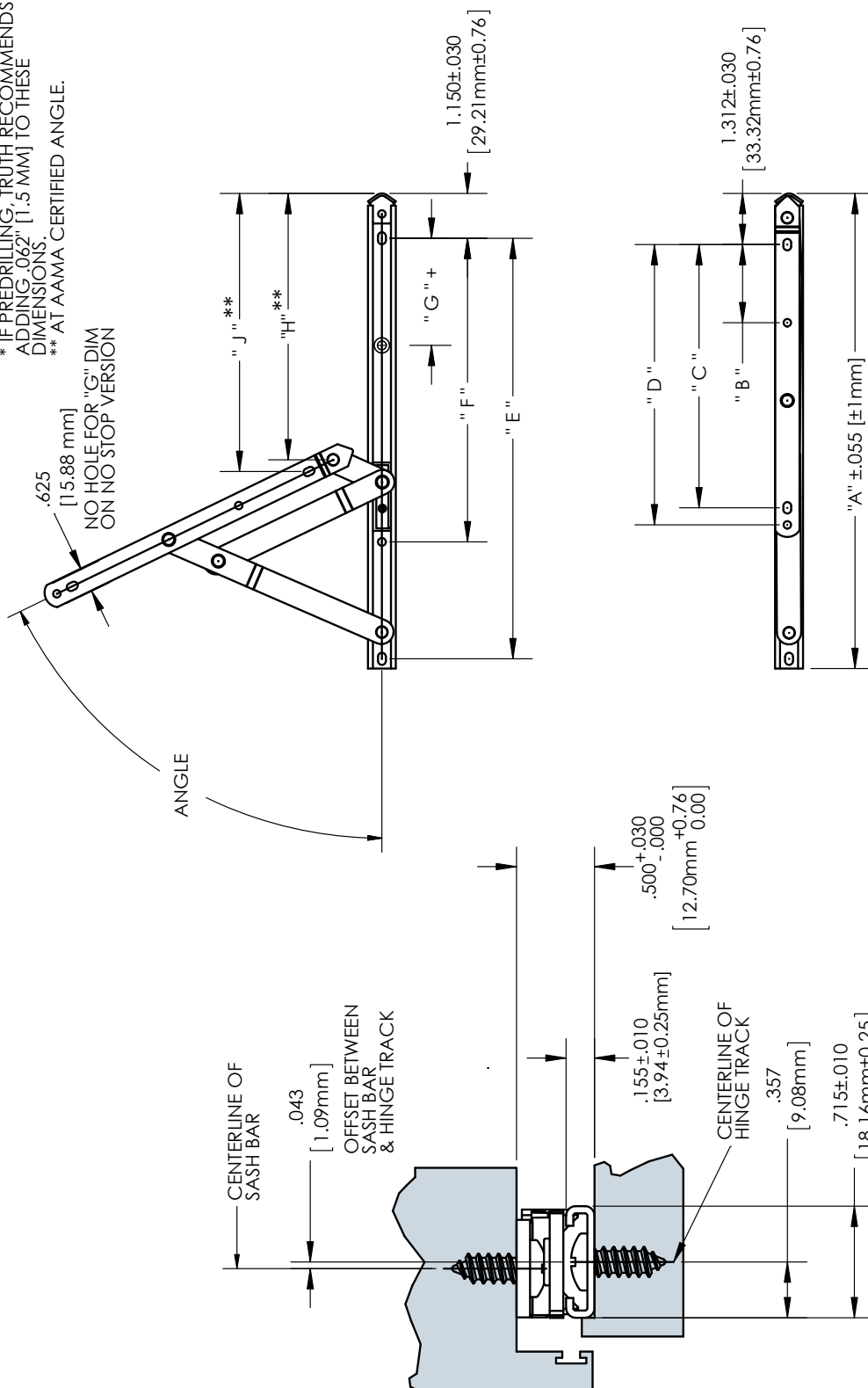
HINGE CALL OUT	HINGE PART NUMBER	"A" DIM HINGE LENGTH	"B" DIM	"C" DIM	"D" DIM	"E" DIM	"F" DIM	"G" DIM	"H" DIM	"J" DIM	APPROX. ANGLE OF OPENING	NUMBER OF SCREWS
8"	34.10.00.XXX	8.22" [208.8 mm]	NA	4.75" [120.7 mm]	5.19" [131.8 mm]	6.78" [172.2 mm]	5.59" [142.0 mm]	5.16" [131.1 mm]	3.63" [92.1 mm]	4.03" [102.4 mm]	55°	7
10"	34.11.00.XXX	10.22" [259.6 mm]	2.00" [50.8 mm]	5.75" [146.1 mm]	6.19" [157.3 mm]	8.78" [223.0 mm]	6.47" [164.3 mm]	6.03" [153.2 mm]	4.50" [114.3 mm]	4.99" [126.7 mm]	55°	8
12"	34.12.00.XXX	12.22" [310.4 mm]	2.00" [50.8 mm]	6.75" [171.5 mm]	7.19" [182.6 mm]	10.78" [273.8 mm]	7.34" [186.4 mm]	6.91" [175.5 mm]	5.35" [135.9 mm]	5.75" [146.0 mm]	55°	8
14"	34.13.00.XXX	14.22" [361.2 mm]	2.00" [50.8 mm]	7.75" [196.9 mm]	8.19" [208.0 mm]	12.78" [324.6 mm]	8.20" [208.3 mm]	7.78" [197.6 mm]	6.63" [168.3 mm]	6.41" [162.8 mm]	55°	8
16"	34.14.00.XXX	16.22" [411.9 mm]	2.00" [50.8 mm]	8.75" [222.3 mm]	9.19" [233.4 mm]	14.78" [375.4 mm]	9.09" [230.9 mm]	8.66" [219.9 mm]	7.10" [180.3 mm]	7.50" [190.5 mm]	55°	8
18"	34.15.00.XXX	18.22" [462.8 mm]	2.00" [50.8 mm]	9.75" [247.7 mm]	10.19" [258.8 mm]	16.78" [426.2 mm]	9.97" [253.2 mm]	9.53" [242.1 mm]	7.47" [189.7 mm]	8.15" [207.0 mm]	55°	8
20"	34.16.00.XXX	20.22" [513.6 mm]	2.00" [50.8 mm]	10.75" [273.1 mm]	11.19" [284.2 mm]	18.78" [477.0 mm]	10.844" [275.3 mm]	10.41" [264.4 mm]	8.84" [224.5 mm]	9.24" [234.7 mm]	55°	8



FIG. 5 TRUTH STANDARD DUTY 4-BAR HINGE W/O STOP (ANDERBERG 201SS SERIES)

RECOMMENDED SCREWS:
#10 SLOTTED OR #8 PHILLIPS
PAN HEAD STAINLESS STEEL SCREWS
(LENGTH AND THREAD TYPE TO BE
DETERMINED BY PROFILE DESIGN)
+ #8 PHILLIPS UNDERCUT FLATHEAD SCREW

NOTE:
* IF PREDRILLING, TRUTH RECOMMENDS
ADDING .062" [1.5 MM] TO THESE
DIMENSIONS.
** AT AAMA CERTIFIED ANGLE.



STANDARD DUTY 4-BAR HINGE (201SS Series)

FIG. 6 TRUTH STANDARD DUTY 4-BAR HINGE W/O STOP
(ANDERBERG 201SS SERIES)

HINGE CALL OUT	HINGE PART NUMBER	"A" DIM HINGE LENGTH	"B" DIM	"C" DIM	"D" DIM	"E" DIM	"F" DIM	"G" DIM	"H" DIM	"J" DIM	APPROX. + ANGLE OF OPENING	NUMBER OF SCREWS
8"	34.10.00.XXX	8.22" [208.8 mm]	NA	4.75" [120.7 mm]	5.19" [131.8 mm]	6.78" [172.2 mm]	5.53" [140.5 mm]	NA	5.13" [130.3 mm]	5.25" [133.4 mm]	55°	6
10"	34.11.00.XXX	10.22" [259.6 mm]	2.00" [50.8 mm]	5.75" [146.1 mm]	6.19" [157.3 mm]	8.78" [223.0 mm]	6.78" [172.2 mm]	NA	6.36" [161.5 mm]	6.37" [161.8 mm]	55°	7
12"	34.12.00.XXX	12.22" [310.4 mm]	2.00" [50.8 mm]	6.75" [171.5 mm]	7.19" [182.6 mm]	10.78" [273.8 mm]	7.78" [197.6 mm]	NA	7.29" [185.2 mm]	7.34" [184.6 mm]	55°	7
14"	34.13.00.XXX	14.22" [361.2 mm]	2.00" [50.8 mm]	7.75" [196.9 mm]	8.19" [208.0 mm]	12.78" [324.6 mm]	9.03" [229.4 mm]	4.75" [120.6 mm]	8.53" [216.7 mm]	8.69" [220.7 mm]	55°	7
16"	34.14.00.XXX	16.22" [411.9 mm]	2.00" [50.8 mm]	8.75" [222.4 mm]	9.19" [233.4 mm]	14.78" [375.4 mm]	10.28" [261.1 mm]	5.62" [142.7 mm]	9.78" [248.4 mm]	9.88" [251.0 mm]	55°	7
20"	34.16.00.XXX	20.22" [513.6 mm]	2.00" [50.8 mm]	10.75" [273.1 mm]	11.19" [284.2 mm]	18.78" [477.0 mm]	12.53" [318.3 mm]	7.32" [185.9 mm]	12.01" [305.0 mm]	12.21" [310.1 mm]	55°	7

+ AAMA CYCLE TEST ANGLE
ULTIMATE OPENING ANGLE IS 77°



**FIG. 7 TRUTH HEAVY DUTY 4-BAR HINGE
(ANDERBERG 301SS SERIES)**

HEAVY DUTY 4-BAR HINGE PART NUMBER GUIDE

MAT'L	HINGE CALLOUT & (ACTUAL LENGTH)		PART NUMBER	STD. STOP	NO STOP
SST	10"	(10.50") [266.7mm]	34.24.00	.208	.210
SST	12"	(12.50") [317.5mm]	34.25.00	.208	.210
SST	14"	(14.50") [368.3mm]	34.26.00	.208	.210
SST	16"	(16.50") [419.1mm]	34.27.00	.208	.210
SST	18"	(18.50") [469.9mm]	34.28.00	.208	.210
SST	20"	(20.50") [520.7mm]	34.29.00	.208	.210
SST	24"	(24.50") [622.3mm]	34.31.00	.208	.210
SST	28"	(28.50") [723.9mm]	34.86.00	.208	

PART NUMBERING SYSTEM

Product No.	Model	Finish	Assembly
34	24	00	208
4-Bar Hinge	Heavy Duty 10" Length	No Decorative Finish	W/ Stop Std. Open (Hinge Feature)

NOTES:

1. *SPECIAL NOTE* A PROPERLY COUNTERBALANCED SASH IS RECOMMENDED IN AN AWNING OPERATION. AN UNBALANCED SASH WHEN USED WITH AN AWNING OPERATOR IS LIKELY TO PRODUCE SASH CHATTER AND AN UNEVEN FEEL DURING OPERATION.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. UNLESS OTHERWISE SPECIFIED ALL 301 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A HEAVY DUTY HINGE IS .625 (15.9mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
5. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/I.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".

HEAVY DUTY 4-BAR HINGE (301SS Series)

**FIG. 8 TRUTH HEAVY DUTY 4-BAR HINGE
(ANDERBERG 301SS SERIES)**

4-BAR HINGE APPLICATION TABLE FOR PROJECTED & AWNING HINGES (AS CERTIFIED TO AAMA 904.1)								
HINGE CALL OUT & (ACTUAL LENGTH)		*COUNTERBALANCED		**ULTIMATE (SEE NOTE #2)		DEGREES OF OPENING		
		SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	STD. STOP	NO STOP	NO ++ STOP
10"	(10.50") [266.7mm]	12"-20" [305-508 mm]	58 LBS [26.3 KG]	12"-20" [305-508 mm]	58 LBS [26.3 KG]	59°	55°	77°
12"	(12.50") [317.5mm]	20"-25" [508-635 mm]	73 LBS [33.1 KG]	20"-25" [508-635 mm]	73 LBS [33.1 KG]	53°	55°	77°
14"	(14.50") [368.3mm]	23"-29" [584-737 mm]	85 LBS [39.0 KG]	23"-29" [584-737 mm]	85 LBS [39.0 KG]	50°	55°	77°
16"	(16.50") [419.1mm]	25"-34" [635-864 mm]	99 LBS [44.9 KG]	25"-40" [635-1016 mm]	99 LBS [44.9 KG]	50°	55°	77°
18"	(18.50") [469.9mm]	32"-37" [813-940 mm]	108 LBS [49.0 KG]	32"-40" [813-1143 mm]	108 LBS [49.0 KG]	50°	55°	77°
20"	(20.50") [520.7mm]	34"-40" [864-1016 mm]	117 LBS [53.1 KG]	34"-50" [864-1270 mm]	117 LBS [53.1 KG]	49°	55°	77°
24"	(24.50") [622.3mm]	40"-44" [1016-1118 mm]	129 LBS [58.5 KG]	40"-60" [1016-1524 mm]	129 LBS [58.5 KG]	44°	55°	77°
28"	(28.50") [723.9mm]	50"-64" [1270-1626 mm]	175 LBS [79.4 KG]	50"-80" [1270-2032 mm]	234 LBS [106.1 KG]	42°	NA	77°

+ AAMA CYCLE TEST ANGLE
++ ULTIMATE OPENING ANGLE

4-BAR HINGE APPLICATION TABLE FOR CASEMENT (SIDE HUNG) HINGES (AS CERTIFIED TO AAMA 904.1)				
HINGE CALL OUT & (ACTUAL LENGTH)		ULTIMATE (SEE NOTE #2)		DEGREES OF + OPENING
		SASH/VENT HEIGHT RANGE	MAX SASH VENT WEIGHT	NO STOP
10"	(10.50") [266.7mm]	12"-36" [305-914 mm]	100 LBS AT 36" [45.36 KG AT 914 mm]	55°
12"	(12.50") [317.5mm]	12"-36" [305-914 mm]	100 LBS AT 36" [45.36 KG AT 914 mm]	55°
14"	(14.50") [368.3mm]	12"-36" [305-914 mm]	100 LBS AT 36" [45.36 KG AT 914 mm]	55°
16"	(16.50") [419.1mm]	12"-36" [305-914 mm]	100 LBS AT 36" [45.36 KG AT 914 mm]	55°

DEFINITIONS:

*COUNTERBALANCED: A PAIR OF HINGES WILL BALANCE OR HOLD OPEN THE VENT/SASH WITH NO ADDED FRICTION AT THE HEIGHTS AND WEIGHTS LISTED IN THE CHART.

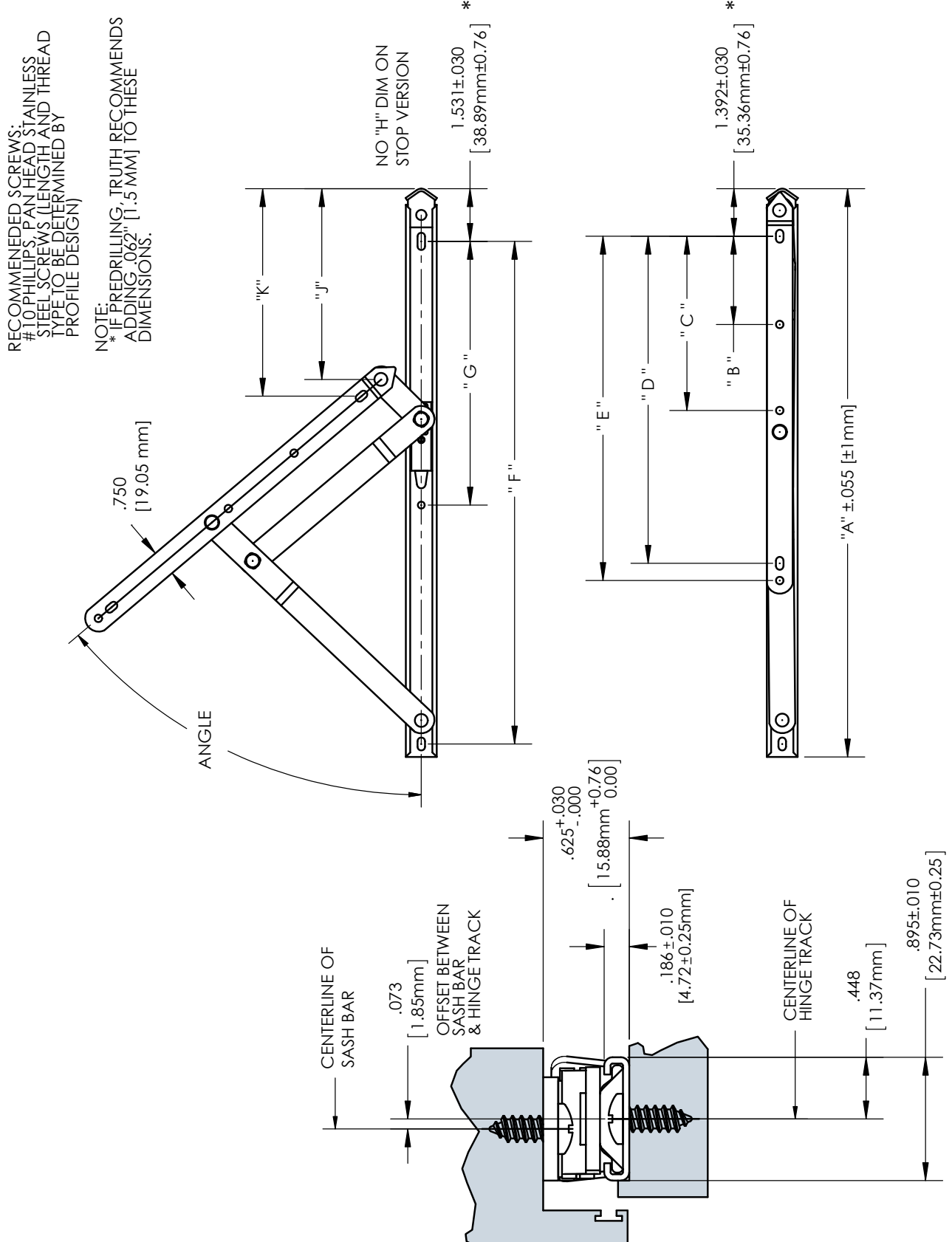
**ULTIMATE: A PAIR OF HINGES WILL NOT BALANCE OR HOLD OPEN THE VENT/SASH WITHOUT ADDED FRICTION AT THE HEIGHTS AND WEIGHTS LISTED IN THE CHART.

NOTES:

1. A PROPERLY COUNTERBALANCED SASH IS RECOMMENDED IN AN AWNING OPERATION. AN UNBALANCED SASH WHEN USED WITH AN AWNING OPERATOR IS LIKELY TO PRODUCE SASH CHATTER AND AN UNEVEN FEEL DURING OPERATION.
2. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/1.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".



FIG. 9 TRUTH HEAVY DUTY 4-BAR HINGE W/STOP
(ANDERBERG 301SS SERIES)



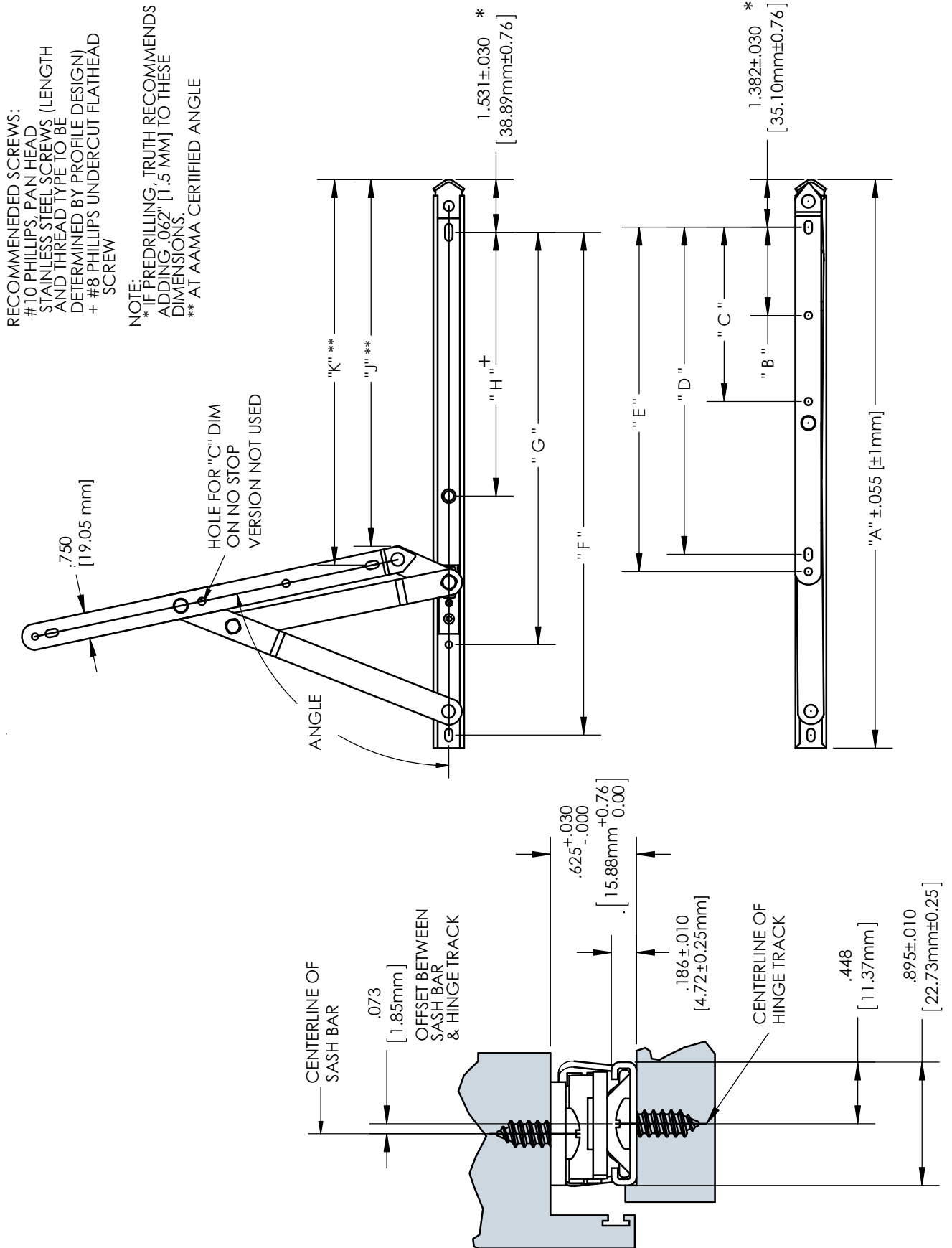
**HEAVY DUTY
4-BAR HINGE
(301SS Series)**

**FIG. 10 TRUTH HEAVY DUTY 4-BAR HINGE W/STOP
(ANDERBERG 301SS SERIES)**

TRUTH HEAVY DUTY 4-BAR HINGE W/STOP													
HINGE CALL OUT	HINGE PART #	"A" HINGE LG	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"	ANGLE	# OF SCREWS
10"	34.24.00.XXX	10.50" [266.7 mm]	NA	NA	6.50" [165.1 mm]	7.00" [177.8 mm]	8.59" [218.2 mm]	6.34" [161.0 mm]	NA	4.38" [111.2 mm]	4.72" [119.9 mm]	59°	7
12"	34.25.00.XXX	12.50" [317.5 mm]	2.56" [65.0 mm]	NA	7.50" [190.5 mm]	8.00" [203.2 mm]	10.59" [269.0 mm]	6.59" [167.4 mm]	NA	4.51" [114.6 mm]	4.96" [126.0 mm]	53°	7
14"	34.26.00.XXX	14.50" [368.3 mm]	2.56" [65.0 mm]	NA	8.50" [215.9 mm]	9.00" [228.6 mm]	12.59" [319.8 mm]	6.94" [176.3 mm]	NA	4.81" [122.2 mm]	5.30" [134.6 mm]	50°	7
16"	34.27.00.XXX	16.50" [419.1 mm]	2.56" [65.0 mm]	5.06" [128.5 mm]	9.50" [241.3 mm]	10.00" [254.0 mm]	14.59" [370.6 mm]	7.66" [194.6 mm]	NA	5.53" [140.5 mm]	6.02" [152.9 mm]	50°	8
18"	34.28.00.XXX	18.50" [469.9 mm]	2.56" [65.0 mm]	6.06" [153.9 mm]	10.50" [266.7 mm]	11.00" [279.4 mm]	16.59" [421.4 mm]	8.28" [210.3 mm]	NA	6.16" [156.5 mm]	6.66" [169.2 mm]	50°	8
20"	34.29.00.XXX	20.50" [520.7 mm]	2.56" [65.0 mm]	7.06" [179.3 mm]	11.50" [292.1 mm]	12.00" [304.8 mm]	18.59" [472.2 mm]	8.97" [227.8 mm]	NA	6.86" [174.2 mm]	7.35" [186.7 mm]	49°	8
24"	34.31.00.XXX	24.50" [622.3 mm]	2.56" [65.0 mm]	9.06" [230.1 mm]	13.50" [342.9 mm]	14.00" [355.6 mm]	22.59" [573.8 mm]	9.09" [230.1 mm]	NA	6.90" [175.3 mm]	7.44" [189.0 mm]	44°	8
28"	34.86.00.XXX	28.50" [723.9 mm]	2.56" [65.0 mm]	11.06" [280.9 mm]	15.50" [393.7 mm]	16.00" [406.4 mm]	26.59" [675.4 mm]	9.59" [243.6 mm]	NA	7.36" [186.9 mm]	7.93" [201.4 mm]	42°	8



FIG. 11 TRUTH HEAVY DUTY 4-BAR HINGE W/O STOP
(ANDERBERG 301SS SERIES)



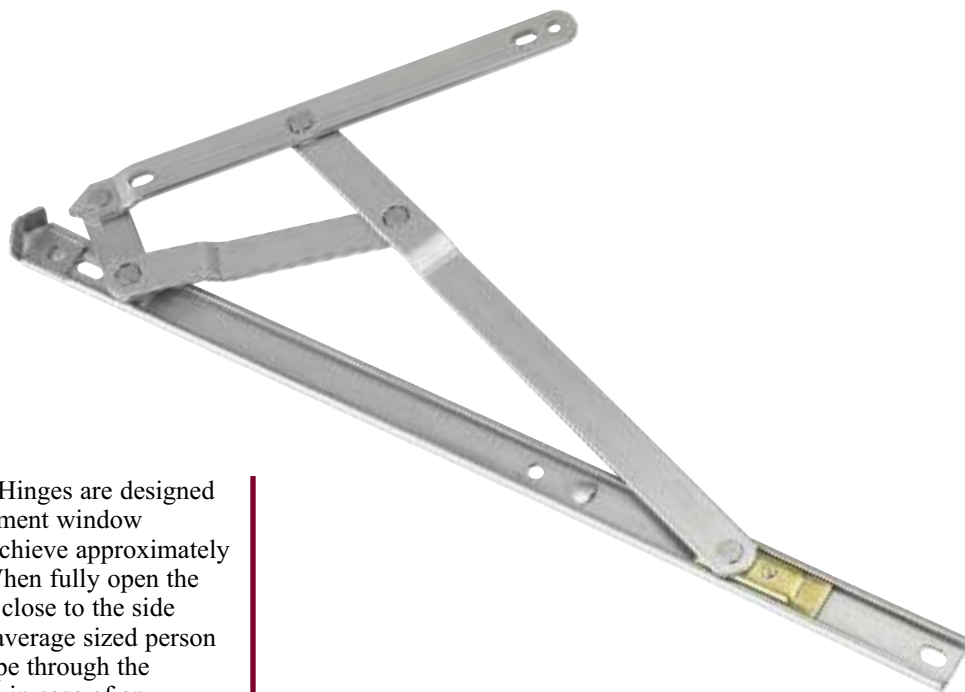
**HEAVY DUTY
4-BAR HINGE
(301SS Series)**

**FIG. 12 TRUTH HEAVY DUTY 4-BAR HINGE W/O STOP
(ANDERBERG 301SS SERIES)**

TRUTH HEAVY DUTY 4-BAR HINGE W/O STOP													
HINGE CALL OUT	HINGE PART #	"A" HINGE LG	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"***	"K"***	AAMA CERTIFIED ANGLE	# OF SCREWS
10"	34-24.00.XXX	10.50" [266.7 mm]	NA	NA	6.50" [165.1 mm]	7.00" [177.8 mm]	8.59" [218.2 mm]	7.22" [183.4 mm]	NA	4.98" [126.5 mm]	5.30" [134.6 mm]	55°	7
12"	34-25.00.XXX	12.50" [317.5 mm]	2.56" [65.0 mm]	NA	7.50" [190.5 mm]	8.00" [203.2 mm]	10.59" [269.0 mm]	8.97" [227.8 mm]	NA	6.16" [156.5 mm]	6.48" [164.6 mm]	55°	7
14"	34-26.00.XXX	14.50" [368.3 mm]	2.56" [65.0 mm]	NA	8.50" [215.9 mm]	9.00" [228.6 mm]	12.59" [319.8 mm]	10.47" [265.9 mm]	NA	7.33" [186.2 mm]	7.65" [194.3 mm]	55°	7
16"	34-27.00.XXX	16.50" [419.1 mm]	2.56" [65.0 mm]	5.06" [128.5 mm]	9.50" [241.3 mm]	10.00" [254.0 mm]	14.59" [370.6 mm]	11.97" [304.0 mm]	7.66" [194.6 mm]	8.50" [215.9 mm]	8.83" [224.3 mm]	55°	8
18"	34-28.00.XXX	18.50" [469.9 mm]	2.56" [65.0 mm]	6.06" [153.9 mm]	10.50" [266.7 mm]	11.00" [279.4 mm]	16.59" [421.4 mm]	13.47" [342.1 mm]	8.28" [210.3 mm]	9.66" [245.4 mm]	9.98" [253.5 mm]	55°	8
20"	34-29.00.XXX	20.50" [520.7 mm]	2.56" [65.0 mm]	7.06" [179.3 mm]	11.50" [292.1 mm]	12.00" [304.8 mm]	18.59" [472.2 mm]	14.97" [380.2 mm]	8.97" [227.8 mm]	10.82" [274.8 mm]	11.14" [283.0 mm]	55°	8
24"	34-31.00.XXX	24.50" [622.3 mm]	2.56" [65.0 mm]	9.06" [230.1 mm]	13.50" [342.9 mm]	14.00" [355.6 mm]	22.59" [573.8 mm]	17.97" [456.4 mm]	9.09" [230.9 mm]	13.13" [333.5 mm]	13.45" [341.6 mm]	55°	8

** AT AAMA CERTIFIED ANGLE

- ULTIMATE OPENING ANGLE IS 77°



All of our Egress Hinges are designed to be used in casement window applications and achieve approximately 90° of opening. When fully open the sash is positioned close to the side jamb to allow an average sized person the ability to escape through the window's opening in case of an emergency as required by Egress codes. Egress Hinges are non-handed and made of durable stainless steel. These Egress Hinges are designed to project the sash out as it pivots to avoid interference between a lipped vent and frame.

There is a wide variety of Egress Hinges available – each of which has its own unique set of features and benefits. For example:

Standard Duty & Heavy Duty Egress Hinges – will allow 90° of opening with the maximum amount of Egress opening (clear opening) depending upon application. Standard Duty recommended for a maximum vent weight of 82 lbs. Heavy Duty - recommended for maximum vent weight of 158 lbs.

Standard Duty & Heavy Duty Egress Hinge (with washability) – Similar to the Standard Duty & Heavy Duty Egress Hinges in that they allow 90° of opening, however these hinges have the added advantage of allowing the outside vent to be washed from the inside. This is accomplished by inserting a key and sliding the vent towards the center of the frame opening for a washing space of approximately 4.500” (11.43cm) depending upon application.

WARRANTY:

Truth 4-Bar Hinges are protected under the terms of the Truth Warranty for Window & Door Manufacturers & Authorized Distributors" (a copy of which can be obtained by contacting Truth). Truth's 4-Bar Hinges are unmatched in dependability and performance.

MATERIAL: Non-magnetic Stainless steel. Each hinge is manufactured with a sliding brass shoe which contains a nylon block for screw adjustment of friction.

ORDERING INFORMATION & OPTIONS

1. Choose correct hinge style by part number. Reference the 4-Bar Hinge Part Number Guide for the available options.
2. Order two hinges per window.
3. Washability Key #16000 ordered separately (2 required per window)

RECOMMENDED SCREWS:

Standard Duty 4-Bar Hinge 6 - #10 Slotted or #8 Phillips pan head stainless steel screws. Length and thread type to be determined by profile design.

Heavy Duty 4-Bar Hinge 6 - #10 Phillips pan head stainless steel screws.

Length and thread type determined by profile design.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

4-Bar type casement hinge for meeting residential and commercial egress code requirements. Utilizing a 4-bar action to project the vent while opening to avoid interference between frame and sash.

Window hinges to be of 4-bar design, which opens the sash to 90° position close to hinge side of jamb for widest possible egress opening. Hinges shall be non-handed and constructed of high quality stamped and roll formed materials. Hinges used must be certified to AAMA 904.1 specifications.

Only on Washability Equipped Models:

- Window hinges will have the ability to be unlocked and moved to a position which allows easy cleaning of the window from the inside.

Window hinges shall be 222/224 or 333/334 series 4-Bar, as manufactured by Truth Hardware.

**STANDARD DUTY
4-BAR EGRESS HINGE
(222SS - 224SS Series)**

**FIG. 1 TRUTH STANDARD DUTY 4-BAR EGRESS CASEMENT HINGE
(Truth 222SS and 224SS Series)**

TRUTH STD DUTY 4-BAR CASEMENT HINGE W/ STOP

MAT'L	HINGE CALLOUT & (ACTUAL LENGTH)		PART NUMBER	STD STOP	EGRESS TO WASHABILITY
SST	12"	12.61" [320.3 mm]	35.09.00	.100	N/A
SST	16"	16.41" [416.7 mm]	35.10.00	.100	N/A
SST	16"	16.41" [416.7 mm]	35.11.00	.100	YES

PART NUMBERING SYSTEM

Product No.	Model	Finish	Assembly
35	09	00	100
4-Bar Hinge	Standard Duty Egress 12" Length	No Decorative Finish	W/ Stop Std. Open (Hinge Feature)

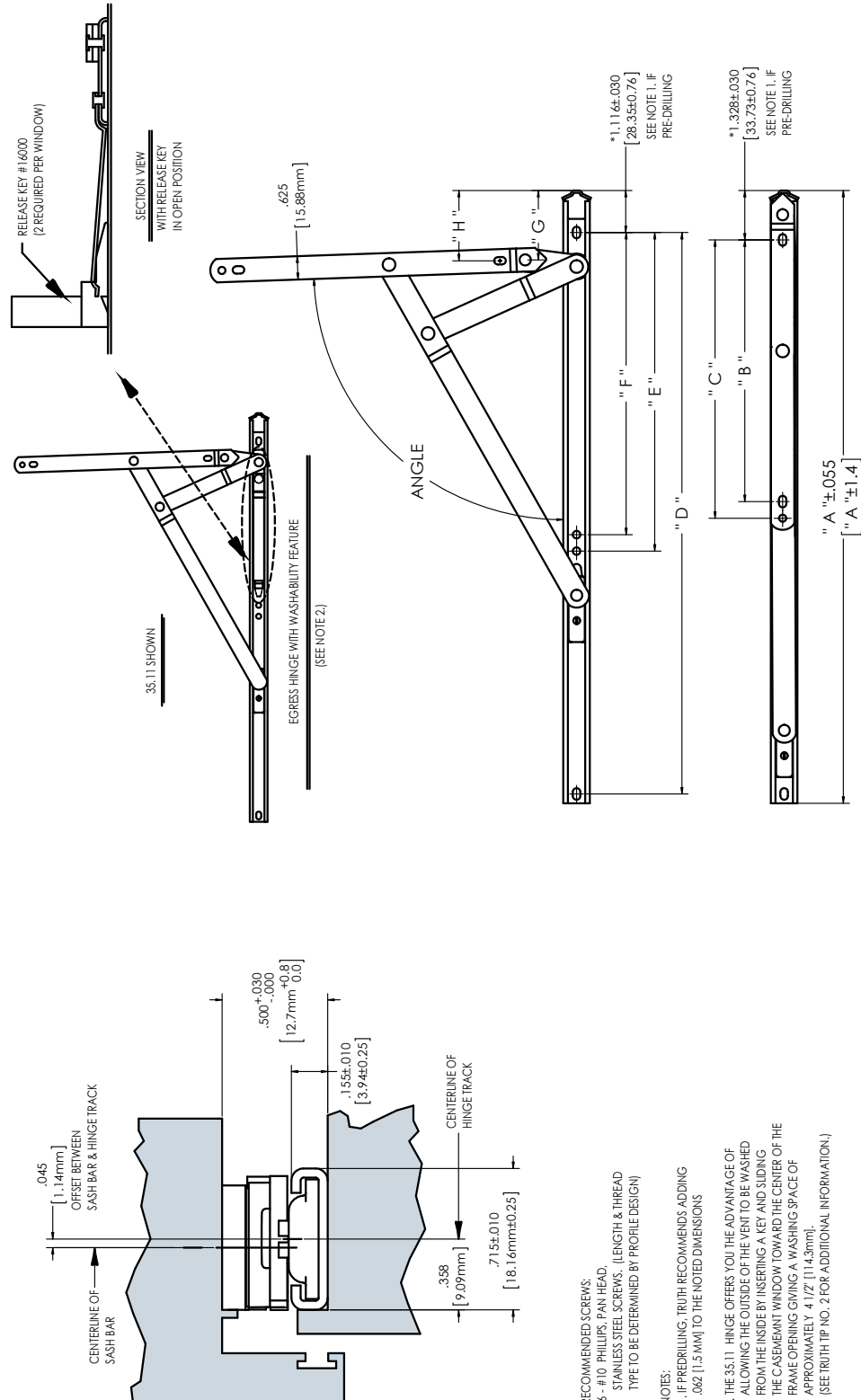
4-BAR HINGE APPLICATION TABLE FOR CASEMENT HINGES (SIDE HUNG) (As certified to AAMA 904.1)			
HINGE CALLOUT & (ACTUAL LENGTH)		Ultimate (see note #6)	
		Sash/Vent Width Range	Max Sash Vent Weight
12"	12.61" [320.3 mm]	14"-32" [356 mm-813 mm]	82 lbs at 32" [37.2 kg at 813 mm]
16"	16.41" [416.7 mm]	18"-32" [457 mm-813 mm]	82 lbs at 32" [37.2 kg at 813 mm]
16"	16.41" [416.7 mm]	18"-32" [457 mm-813 mm]	82 lbs at 32" [37.2 kg at 813 mm]

NOTES:

1. THESE STANDARD DUTY EGRESS 4-BAR HINGES ARE RECOMMENDED FOR CASEMENT APPLICATIONS ONLY.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. UNLESS OTHERWISE SPECIFIED ALL 222-224 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A STANDARD DUTY HINGE IS .500 (12.7mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
5. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/1.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".



FIG. 2 TRUTH STANDARD DUTY EGRESS (90°) 4-BAR HINGE
(Truth 222SS AND 224SS Series)



RECOMMENDED SCREWS:
6-#10 PHILLIPS PAN HEAD,
STAINLESS STEEL SCREWS. (LENGTH & THREAD
TYPE TO BE DETERMINED BY PROFILE DESIGN)

NOTES:
*1. IF PRE-DRILLING, TRUTH RECOMMENDS ADDING
.062 [1.5MM] TO THE NOTED DIMENSIONS

2. THE 35.11 HINGE OFFERS YOU THE ADVANTAGE OF
ALLOWING THE OUTSIDE OF THE VERT TO BE WASHED
FROM THE INSIDE BY INSERTING A KEY AND SLIDING
THE CASEMENT WINDOW TOWARD THE CENTER OF THE
FRAME OPENING GIVING A WASHING SPACE OF
APPROXIMATELY 4 1/2" [114.3mm].
(SEE TRUTH TIP NO. 2 FOR ADDITIONAL INFORMATION.)

HINGE PART #	"A" HINGE LENGTH	"B"	"C"	"D"	"E"	"F"	"G" MAX	"H" MAX	ANGLE
35.09	12.61" [320.3mm]	6.25" [158.6mm]	6.68" [169.8mm]	11.24" [285.4mm]	5.93" [150.6mm]	5.49" [139.4mm]	2.02" [51.3mm]	2.09" [53.1mm]	84°
35.10	16.41" [416.8mm]	7.01" [178.0mm]	7.45" [189.2mm]	15.03" [381.8mm]	8.53" [216.7mm]	8.09" [205.5mm]	2.02" [51.3mm]	2.05" [52.1mm]	88°
35.11	16.41" [416.8mm]	7.01" [178.0mm]	7.45" [189.2mm]	15.03" [381.8mm]	7.03" [178.6mm]	6.59" [167.4mm]	2.09" [53.1mm]	2.11" [53.6mm]	88°

**STANDARD DUTY
EGRESS/WASHABILITY
4-BAR HINGE
(224SS Series)**

**FIG. 3 TRUTH STANDARD DUTY EGRESS/WASHABILITY 4-BAR CASEMENT HINGE
(Truth 224SS Series)**

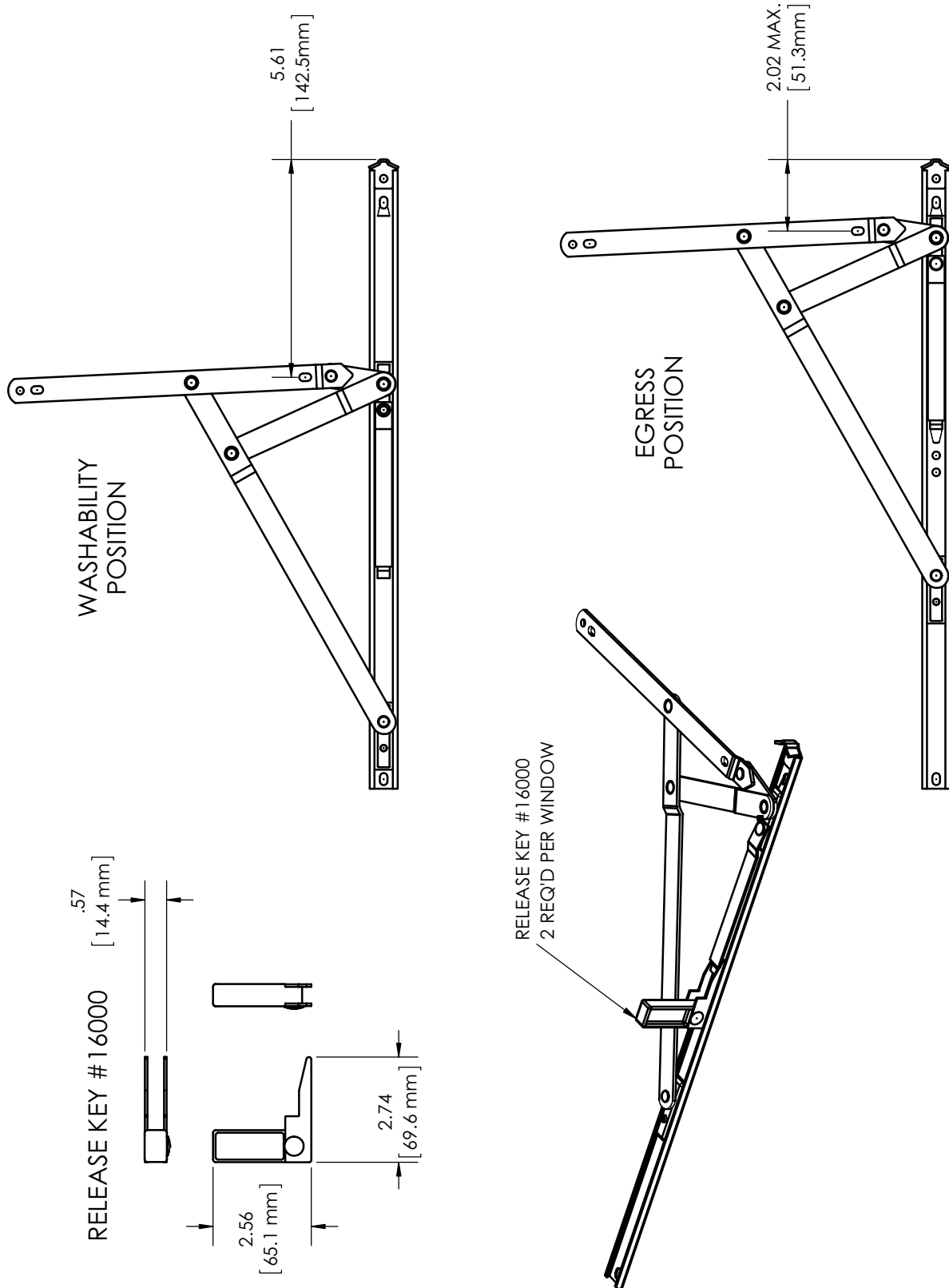




FIG. 4 TRUTH STANDARD DUTY 4-BAR EGRESS CASEMENT HINGE
(Truth 333SS-334SS Series)

TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE W/ STOP

MAT'L	HINGE CALLOUT & (ACTUAL LENGTH)		PART NUMBER	EGRESS TO WASHABILITY
SST	16"	16.76" [425.7mm]	35.12.00.208	N/A
SST	16"	16.72" [424.7mm]	35.13.00.208	YES

PART NUMBERING SYSTEM

PRODUCT NO.	MODEL	FINISH	ASSEMBLY
35	12	00	208
4-BAR HINGE	HEAVY DUTY EGRESS 16" LENGTH	NO DECORATIVE FINISH	W/ STOP STD. OPEN (HINGE FEATURE)

4-BAR HINGE APPLICATION TABLE FOR CASEMENT HINGES
(SIDE HUNG) (AS CERTIFIED TO AAMA 904.1)

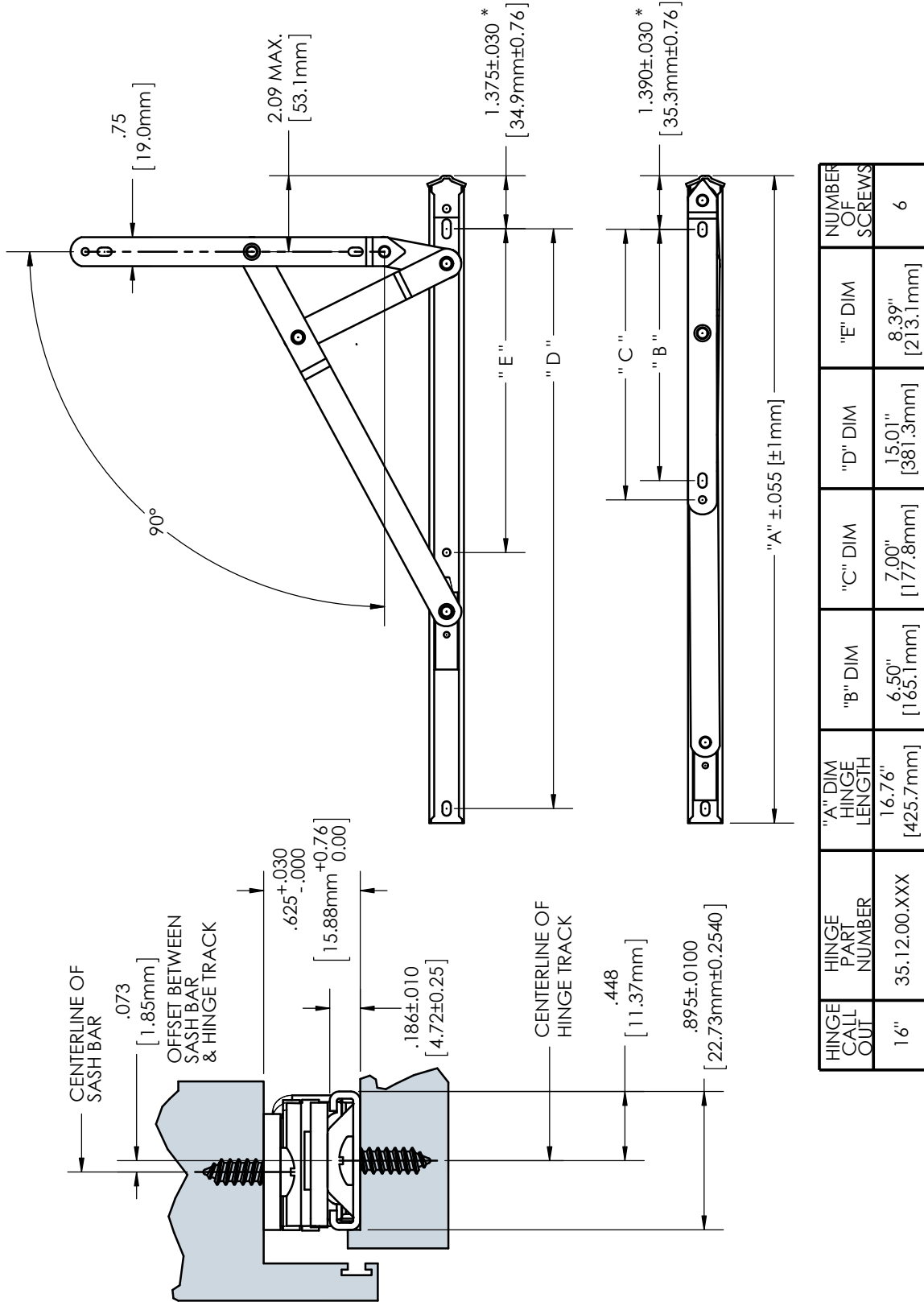
HINGE CALLOUT & (ACTUAL LENGTH)		ULTIMATE (SEE NOTE #6)	
		SASH/VENT WIDTH RANGE	MAX SASH VENT WEIGHT
35.12	16.76" [425.7mm]	18"-32" [457.2 mm-812.8 mm]	175 LBS AT 32" [79.4 KG AT 812.8 mm]
35.13	16.72" [424.7mm]	18"-32" [457.2 mm-812.8 mm]	158 LBS AT 32" [79.4 KG AT 812.8 mm]

NOTES:

1. THESE HEAVY DUTY EGRESS 4-BAR HINGES ARE RECOMMENDED FOR CASEMENT APPLICATIONS ONLY.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. ALL 333-334 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A HEAVY DUTY HINGE IS .625 (15.9 mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
6. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES, AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/I.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".

HEAVY DUTY 4-BAR EGRESS HINGES (333SS Series)

FIG. 5 TRUTH HEAVY DUTY 4-BAR EGRESS CASEMENT HINGE
(Truth 333SS Series)



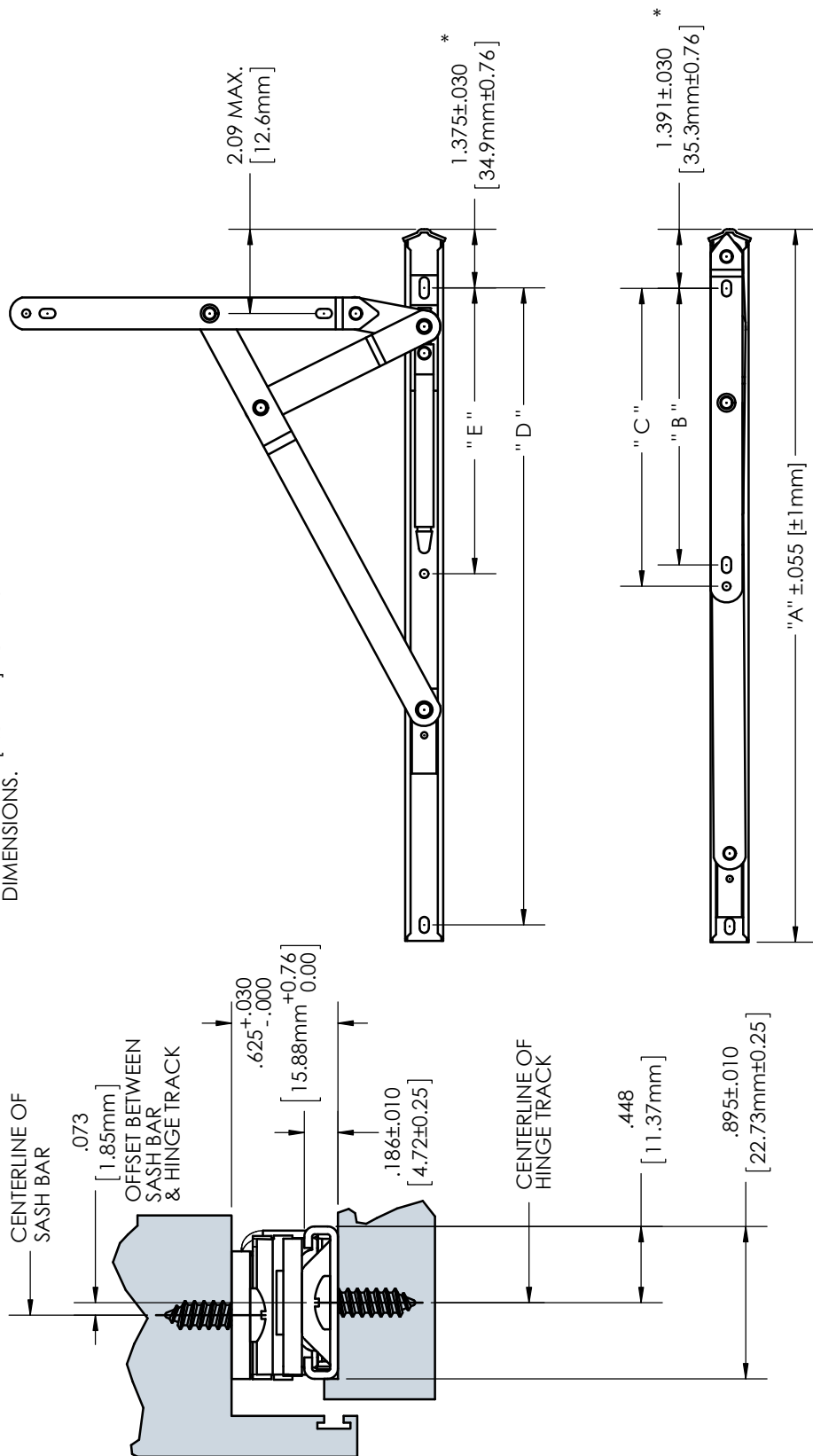
HINGE CALL OUT	HINGE PART NUMBER	"A" DIM HINGE LENGTH	"B" DIM	"C" DIM	"D" DIM	"E" DIM	NUMBER OF SCREWS
16"	35.12.00.XXX	16.76" [425.7mm]	6.50" [165.1mm]	7.00" [177.8mm]	15.01" [381.3mm]	8.39" [213.1mm]	6



**FIG. 6 TRUTH HEAVY DUTY 4-BAR EGRESS/WASHABILITY CASEMENT HINGE
(Truth 334SS Series)**

RECOMMENDED SCREWS:
#10 PHILLIPS PAN HEAD STAINLESS STEEL SCREWS
(LENGTH AND THREAD TYPE TO BE
DETERMINED BY PROFILE DESIGN)

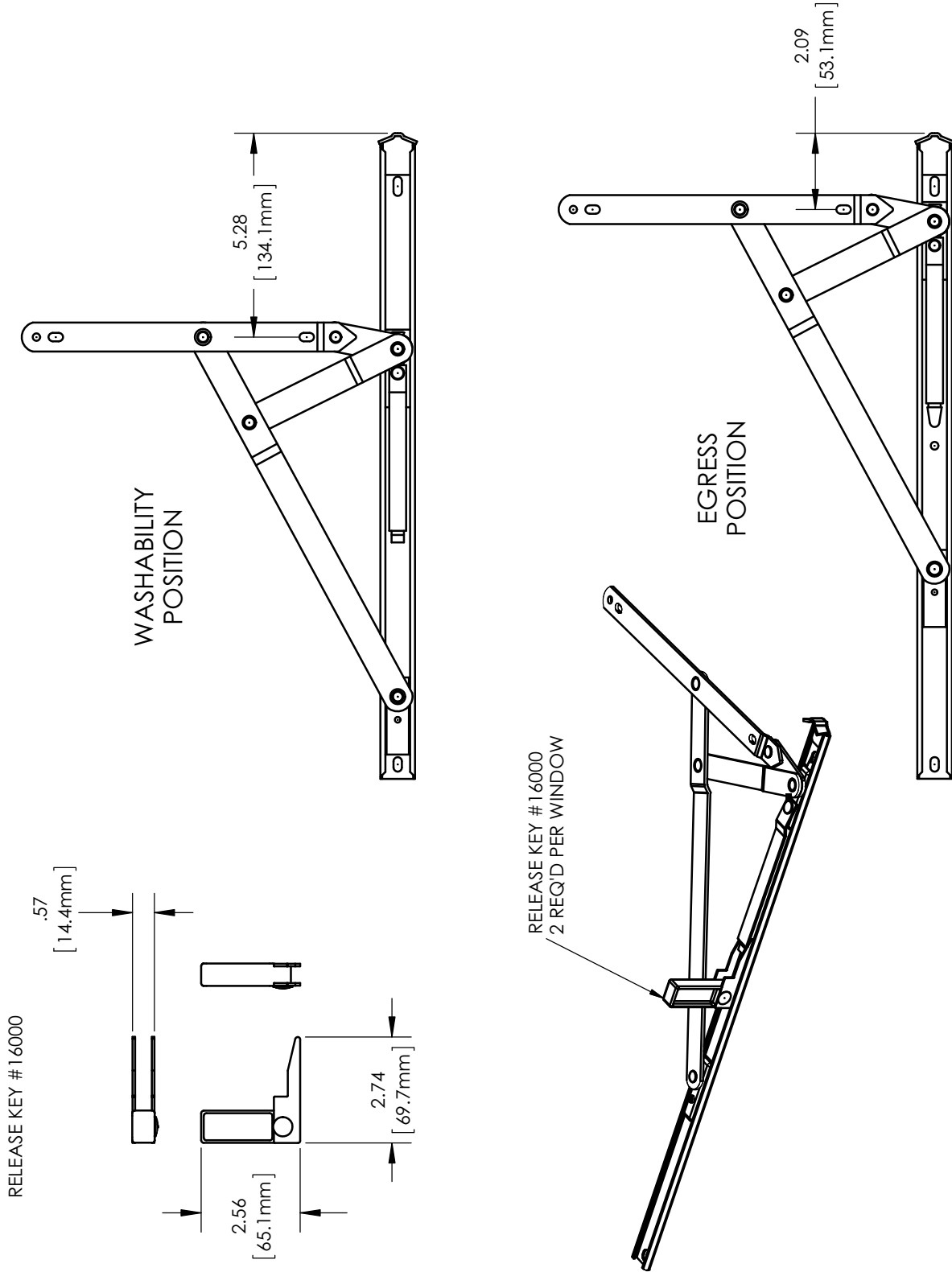
NOTE: * IF PREDRILLING, TRUTH RECOMMENDS
ADDING .062" [1.5 MM] TO THESE
DIMENSIONS.



HINGE CALL OUT	HINGE PART NUMBER	"A" DIM HINGE LENGTH	"B" DIM	"C" DIM	"D" DIM	"E" DIM	NUMBER OF SCREWS
16"	35.13.00.XXX	16.72" [424.7mm]	6.50" [165.1mm]	7.00" [177.8mm]	14.97" [380.2mm]	6.72" [170.6mm]	6

**HEAVY DUTY
EGRESS/WASHABILITY
4-BAR HINGE
(334SS Series)**

**FIG. 7 TRUTH HEAVY DUTY EGRESS/WASHABILITY 4-BAR CASEMENT HINGE
(Truth 334SS Series)**





These Truth 34 Series Standard Duty and Heavy Duty Stainless Steel 4-Bar Hinges are similar to the Anderberg 201SS & 301SS styles; however, these hinges also have the capability of producing 90° of window opening. Designed only for casement window applications, these non-handed, 4-Bar Hinges are designed to project the vent out as it pivots to avoid interference between a lipped vent and frame.

WARRANTY:

Protected under the terms of the Truth Warranty for window & Door Manufacturers & Authorized Distributors. For a copy of this warranty, please contact Truth.

MATERIAL: Non-magnetic stainless steel arms and track.

ORDERING INFORMATION & OPTIONS:

1. Choose correct hinge size and style by part number. (Reference 4-Bar Hinge Part Number Guide for the available options).
2. Order two hinges per window.

RECOMMENDED SCREWS:

Standard Duty (401 Series) 6 -- #10 Slotted or #8 Phillips pan head stainless steel screws. Length and thread type to be determined by profile design.

Heavy Duty (601 Series) 6 -- #10 Phillips pan head stainless steel screws. Length and thread type to be determined by profile design. See Truth Tip #11 for additional information on screw selection.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

4-bar type window hinge for casement windows, which projects the vent while opening to avoid interference between frame and sash.

Window hinges to be of 4-bar type design, allowing 90° opening and washability access to outside of window glass. Hinges shall be non-handed and constructed of 300 series stainless steel. Hinges used must be certified to AAMA 904.1 specifications.

Window hinges shall be 401/601 series 4-bar, as manufactured by Truth Hardware.

**STANDARD DUTY
4-BAR HINGE
(401SS Series)**

**FIG. 1 TRUTH STANDARD DUTY 4-BAR CASEMENT HINGE
(Truth 401SS Series)**

TRUTH STD DUTY 4-BAR CASEMENT HINGE W/ 90° STOP

MAT'L	HINGE CALLOUT & (ACTUAL LENGTH)		PART NUMBER
SST	12"	12.22" [310.4mm]	34.55.00.300

PART NUMBERING SYSTEM

PRODUCT NO.	MODEL	FINISH	ASSEMBLY
34	55	00	300
4-BAR HINGE	STANDARD DUTY 12" LENGTH	NO DECORATIVE FINISH	W/ STOP STD. OPEN (HINGE FEATURE)

4-BAR HINGE APPLICATION TABLE FOR CASEMENT HINGES (SIDE HUNG) (AS CERTIFIED TO AAMA 904.1)			
HINGE CALLOUT & (ACTUAL LENGTH)		ULTIMATE (SEE NOTE #6)	
		SASH/VENT WIDTH RANGE	MAX SASH VENT WEIGHT
12"	12.22" [310.4mm]	12"-32" [305mm-813mm]	65 lbs at 32" [29.5 kg at 813mm]

NOTES:

1. THESE STANDARD DUTY HINGES 90° 4-BAR HINGES ARE RECOMMENDED FOR CASEMENT APPLICATIONS ONLY.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. ALL 401 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A STANDARD DUTY HINGE IS .500 (12.7mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
5. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/I.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".

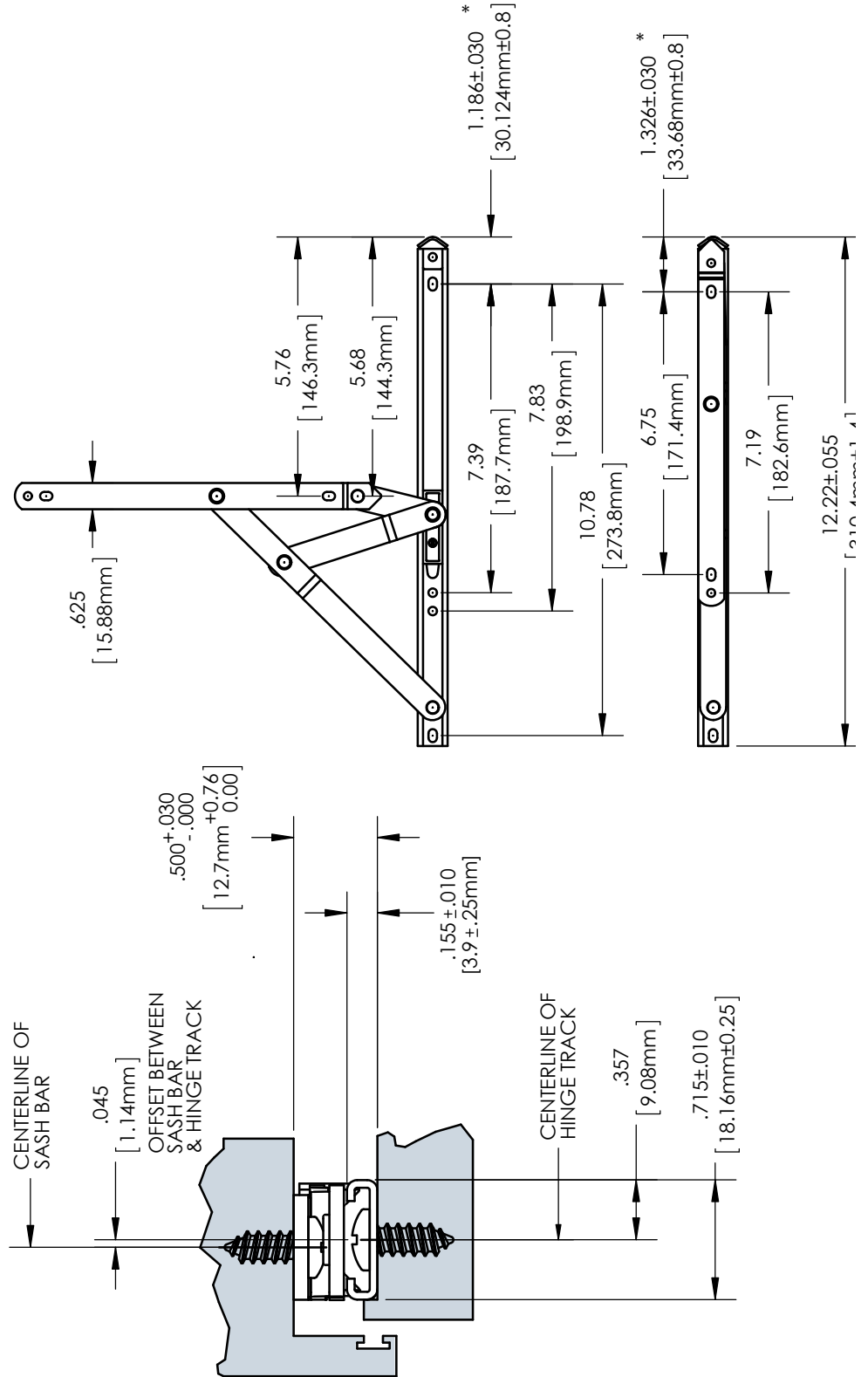


FIG. 2 TRUTH STANDARD DUTY 4-BAR CASEMENT HINGE
(Truth 401SS Series)

RECOMMENDED SCREWS:

#10 SLOTTED OR #8 PHILLIPS,
PAN HEAD STAINLESS STEEL SCREWS
(LENGTH AND THREAD TYPE TO BE
DETERMINED BY PROFILE DESIGN)

NOTE: * IF PREDRILLING, TRUTH RECOMMENDS
ADDING .062" [1.5 MM] TO THESE
DIMENSIONS.



**HEAVY DUTY
4-BAR HINGE
(601SS Series)**

**FIG. 3 TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE
(Truth 601SS Series)**

TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE W/ 90° STOP

MAT'L	HINGE CALLOUT & ACTUAL LENGTH		PART NUMBER
SST	14"	14.50" [368.3 mm]	34.59.00.208
SST	16"	16.50" [419.1 mm]	34.60.00.208
SST	18"	18.50" [469.9 mm]	34.61.00.208

PART NUMBERING SYSTEM

PRODUCT NO.	MODEL	FINISH	ASSEMBLY
34	59	00	208
4-BAR HINGE	HEAVY DUTY 14" LENGTH	NO DECORATIVE FINISH	W/ STOP STD. OPEN (HINGE FEATURE)

4-BAR HINGE APPLICATION TABLE FOR CASEMENT HINGES (SIDE HUNG) (AS CERTIFIED TO AAMA 904.1)			
HINGE CALLOUT & (ACTUAL LENGTH)		ULTIMATE (SEE NOTE #6)	
		SASH/VENT WIDTH RANGE	MAX SASH VENT WEIGHT
14"	14.52" [368.8 mm]	14"-36" [356mm-914mm]	120 lbs at 36" [54.4 kg at 914mm]
16"	16.52" [419.6 mm]	16"-36" [406mm-914mm]	120 lbs at 36" [54.4 kg at 914mm]
18"	18.52" [470.4 mm]	18"-36" [457mm-914mm]	120 lbs at 36" [54.4 kg at 914mm]

NOTES:

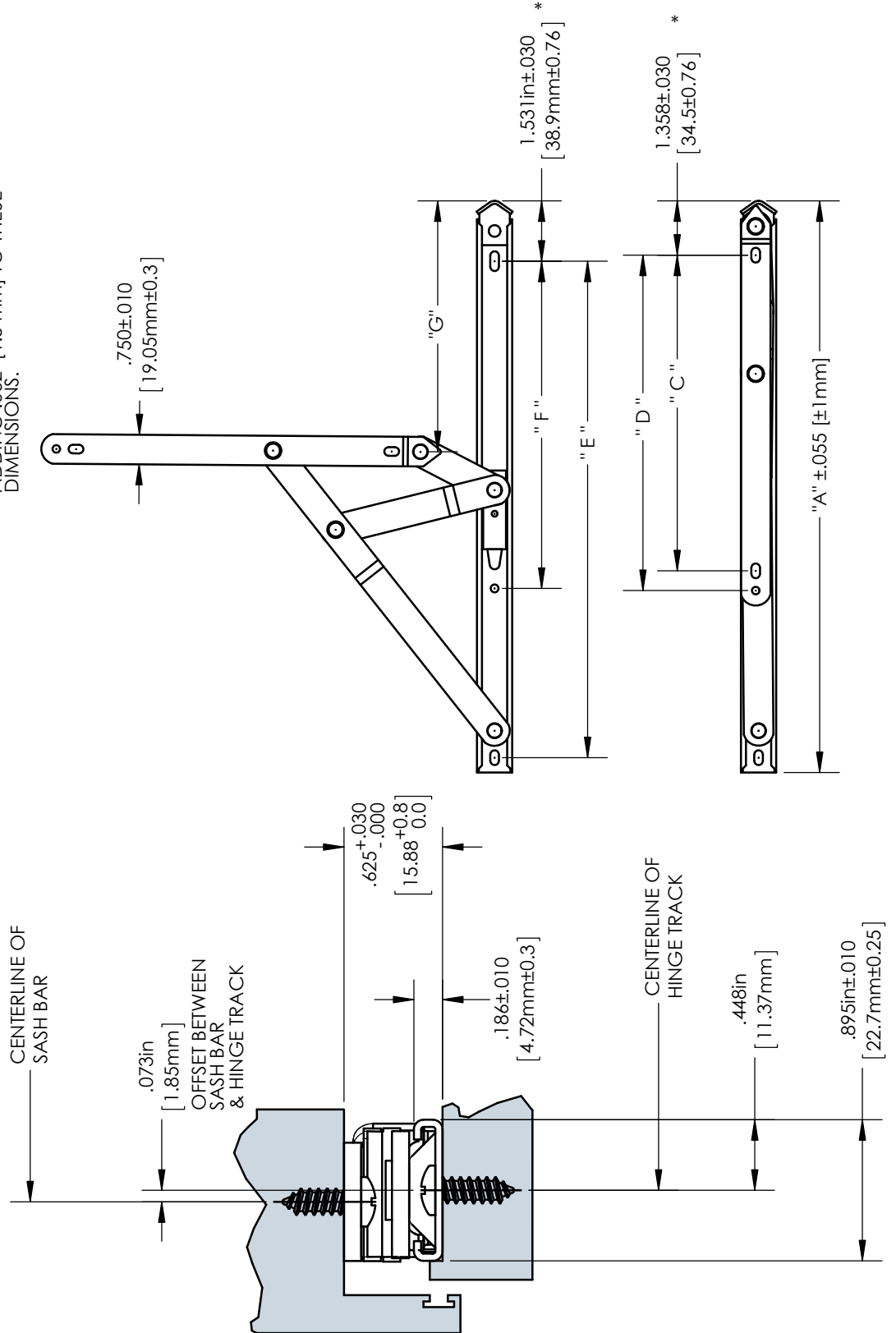
1. THESE HEAVY DUTY HINGES 90° 4-BAR HINGES ARE RECOMMENDED FOR CASEMENT APPLICATIONS ONLY.
2. FOR ADDITIONAL RECOMMENDATIONS REGARDING 4-BAR HINGES, PLEASE REFER TO THE TRUTH TIPS SECTION AND THE TECH NOTES SECTION AT THE END OF THE CATALOG.
3. ALL 601 SERIES HINGES HAVE A BRASS SHOE.
4. THE STANDARD STACK HEIGHT OF A HEAVY DUTY HINGE IS .625 (15.9 mm). IF A SHIM OR WASHER IS USED THE STACK HEIGHT WILL INCREASE BY THE SHIM OR WASHER THICKNESS.
5. ULTIMATE SASH WEIGHT & WIDTH FOR HINGES AS SHOWN IN CHARTS ARE BASED ON AAMA 904.1 "SPECIFICATION FOR MULTI-BAR HINGES IN WINDOW APPLICATIONS". THESE NUMBERS DO NOT APPLY TO WINDOWS BEING TESTED TO ANSI/AMMA/WDMA 101/I.S 2/NAFS-02 "CASEMENT HARDWARE LOAD TEST".



**FIG. 4 TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE
(Truth 601SS Series)**

RECOMMENDED SCREWS:
#10 PHILLIPS PAN HEAD STAINLESS
STEEL SCREWS (LENGTH AND THREAD
TYPE TO BE DETERMINED BY PROFILE
DESIGN)

NOTE: * IF PREDRILLING, TRUTH RECOMMENDS
ADDING .062" [1.5 mm] TO THESE
DIMENSIONS.



HEAVY DUTY 4-BAR HINGE (601SS Series)

FIG. 5 TRUTH HEAVY DUTY 4-BAR CASEMENT HINGE
(Truth 601SS Series)

HINGE CALL OUT	HINGE PART NUMBER	"A" DIM HINGE LENGTH	"C" DIM	"D" DIM	"E" DIM	"F" DIM	"G" DIM	# OF SCREWS
14"	34.59.00.XXX	14.52" [368.8 mm]	8.01" [203.4 mm]	8.51" [216.1 mm]	12.59" [319.9 mm]	8.30" [210.9 mm]	6.59" [167.4 mm]	7
16"	34.60.00.XXX	16.52" [419.6 mm]	8.01" [203.4 mm]	8.51" [216.1 mm]	14.59" [370.7 mm]	7.75" [196.8 mm]	6.09" [154.7 mm]	7
18"	34.61.00.XXX	18.52" [470.4 mm]	8.01" [203.4 mm]	8.51" [216.1 mm]	16.59" [421.5 mm]	7.51" [190.7 mm]	5.77" [146.6 mm]	7



Do you have a project requiring you to ventilate a large awning window in a commercial application? If so, Truth Hardware has the answer. The new Superior 4-Bar Hinge.

STRENGTH & PERFORMANCE

AAMA Certified in excess of 300 lbs. in load testing. Truth's new 300 series stainless steel Superior Hinge has been engineered to work on awning sashes ranging from 64" - 86" in height, and will provide a choice of 20°, 18°, or 14° of opening. In addition, the Superior Hinge surpasses AAMA's 904.1 Cycle Test measuring durability (over 8,000 cycles). A positive lead-in of the hinge arm into the "hat" aids in the travel of the hinge arm while opening and closing of the window.

INSTALLATION & FLEXIBILITY

With a standard stack height (5/8") equal to Truth's popular Heavy Duty 4-Bar Hinges, window manufacturing changes are eliminated, allowing for continuity in your window profile designs. To accommodate the larger window styles of today - the Superior

Hinge comes in a 28" length. The non-handed design of the Superior Hinge helps cut down on expensive inventories.

OPTIONS:

Riser Block (#16076) allows the ability to adjust the maximum opening angle from 20°, 18°, or 14°, depending upon number used (see table).

The Adjustment Block feature (#16088) will help enhance flexibility in installation. This will adjust the sash in relation to the frame. Providing plus/minus 2 mm worth of adjustment, the Adjustment Block has been load tested to 200 lbs., and can be used on all Truth 4-Bar Heavy Duty Hinges

WARRANTY:

Protected under the terms of the Truth Warranty for Window & Door Manufacturers and Authorized Distributors. Refer to Truth's Terms & Conditions for further details.

MATERIAL:

The Superior Hinge is made of a non-magnetic corrosion resistant stainless steel. Brass shoes which slide the hinge arm along the track help to provide the needed friction necessary for awning applications.

ORDERING INFORMATION & OPTIONS

1. Order Superior Hinge #34.87.00.200
2. Order two hinges per window.
3. Order optional items:

#16076 Riser Block for establishing opening angle. Quantity to be determined by amount of opening required.

#16088 Adjustment Block. Order one pRECOMMENDED SCREWSer hinge.

MATERIAL:

The Superior Hinge is made of a non-magnetic corrosion resistant stainless steel. Brass shoes which slide the hinge arm along the track help to

provide the needed friction necessary for awning applications. 7 - #10 Phillips pan head stainless steel screws. Length and thread type to be determined by profile design. See Truth Tips for additional screw selection information.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

4-Bar type hinge for awning windows, which projects the vent while opening to avoid interference between frame and sash.

Window hinges to be of 4-bar type design. Hinges shall be non-handed and constructed of 300 Series non-magnetic corrosion resistant stainless steel with a brass shoe. Hinges must be certified to AAMA 904.1 specifications, and will accommodate a sash height range of between 64" and 86", and provide a variety of openings.

Hinges shall be 34 Series 4-Bar, as manufactured by Truth Hardware.

TRUTH TIPS

1. Placement of a 4-Bar Hinge relative to the outside edge of the frame depends upon the amount of overlap of the sash on the frame. As a general rule the hinge should be mounted flush to .250" (6.3 mm) of the outside edge of the frame. This dimension depends upon the amount of overlap. A .250" (6.3 mm) dimension will allow proper clearance for a window system having approximately .312" (7.9 mm) of sash overlap. If interference occurs between the sash and the frame then the hinge must be moved further outboard on the frame, or the overlap must be reduced.

2. Particular attention must be given to 4-Bar Hinge mounting. It is important that the ventilator bar be offset to a point where it is flush with the outside edge of the track. This results in an offset between the screw centerlines of the ventilator bar and hinge track (see the application drawing of the particular hinge).

3. To increase the overall hinge height of 4-Bar Hinges, aluminum shims applicable to the ventilator bar are available in various thicknesses. Truth provides some popular sizes of shims, however, other sizes must be provided by the window manufacturer.

4. Special consideration should be given when designing an awning window. Please consult Truth Tech Bulletin #2 for further information.

5. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.

6. Mounting screws must pass through two PVC walls or one PVC wall and one insert wall.

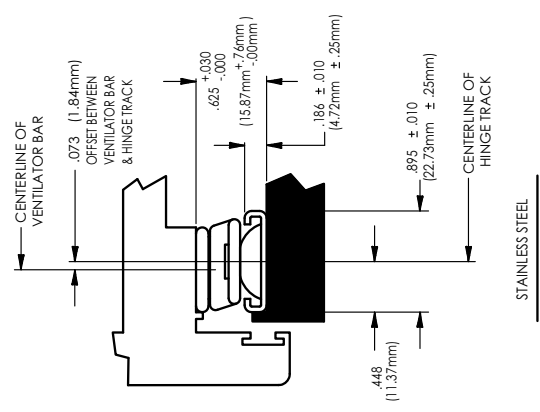
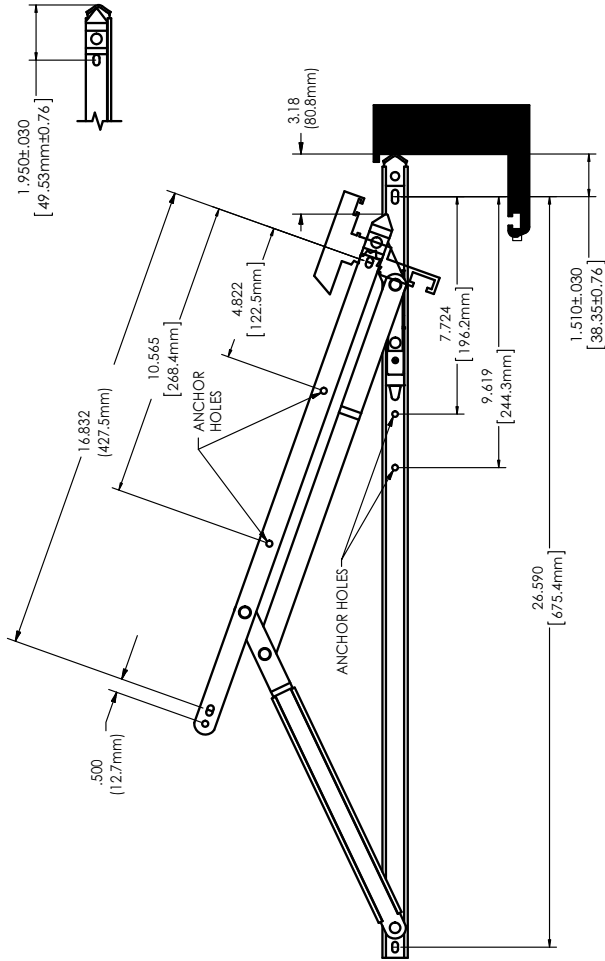
7. For metal window profiles, Truth recommends machine screws however, in most applications sheet metal screws will provide adequate holding power.

8. Hinge life can be prolonged by periodically adding a drop of light weight oil at each riveted joint.

9. For easy correction of out of square, or racked window applications, the use of Truth Jamb Jack frame adjusters is recommended. Frame adjustments can improve both weather seal tightness and sash operation over the life of the window.



TRUTH SUPERIOR 4-BAR HINGE
(Anderberg 301 Series)



TRUTH SUPERIOR 4 BAR HINGE
(ANDERBERG 301 SERIES)

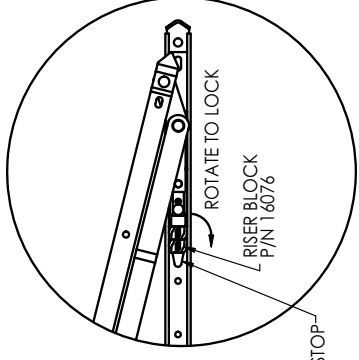
RECOMMENDED SCREWS:
STAINLESS STEEL: 8X NO. 10 PHILLIPS PAN HEAD STAINLESS STEEL SCREWS.
(LENGTH & THREAD TYPE TO BE DETERMINED BY PROFILE DESIGN)

PART NO.	HINGE LENGTH	VENT HEIGHT RANGE	DEGREE OF OPENING		REQUIRED NO. OF RISER BLOCKS PER HINGE	MAXIMUM VENT WEIGHT
			STD.	STOP		
3487	28.48" (723.4 mm)	6.4" (1625.6 mm) TO 8.7" (2209.8 mm)	20°	NONE	TWO	300lb (136.05kg)
			17°	ONE		
			14°	TWO		

INSTALLATION OF RISER BLOCK

REQUIRED ON BOTH HINGES OF WINDOW APPLICATION

- 1) OPEN HINGE HALF WAY
- 2) INSERT RISER BLOCK INTO THE TRACK BETWEEN THE SLIDE SHOE AND THE TRACK STOP
- 3) ROTATE RISER BLOCK 90° TO LOCK INTO POSITION USING A SLOTTED SCREW DRIVER
- 4) REPEAT STEPS 2 & 3 FOR SECOND RISER BLOCK IF NEEDED



INSTALLATION OF RISER BLOCK



FRICTION ADJUSTORS:

Friction Adjustors are used either as a limit device or for additional friction in conjunction with certain types of hinging on projected windows. By tightening a screw in the sliding brass shoe, a homeowner can easily adjust the tension required to open and close the window. When used as a Limit Device the hardware is designed to restrict the opening on projected or casement windows. This mechanism automatically stops the vent at a safety position as required by the user, or required by law. For cleaning and ease of window assembly, a key may be used to release the window to its maximum opening. See Models #37.26 through #37.34.

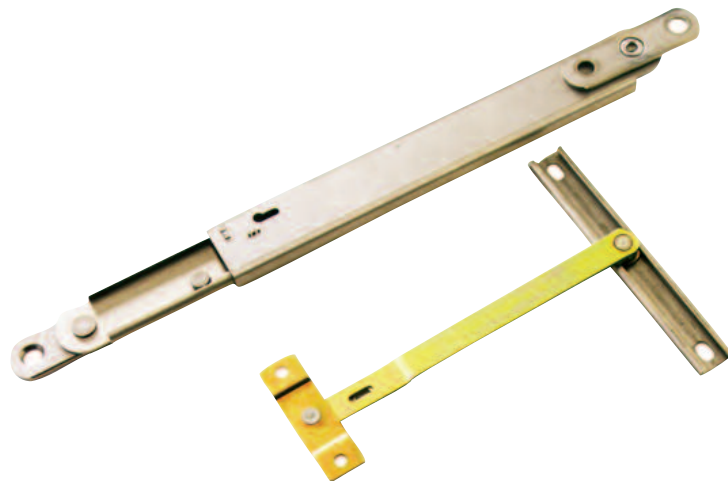
LIMIT DEVICES:

Two different varieties of Limit Devices are available. When properly installed and operated, the Limit Device will help prevent damage to casement and awning windows under high winds in high-rise applications. Two different methods of disconnecting the Limit Device from the sash for cleaning purposes - either by inserting a key, or by operating the detach clip.

A variety of track and arm lengths are available for this product. Consult the attached drawings to determine the correct length that will be required for the window based on the application of this product.

SUPPORT ARMS:

Designed for use on top-hung windows. Two Support Arm models are available – the first opens to full extension and automatically locks into place for ventilation or window maintenance. The second is designed to extend only 1.500” (first-position opening) under normal operating conditions for limited opening applications. This means an actual window opening of approximately 4” to 8” depending on mounting locations. A key can be inserted to release the arms to achieve its maximum-open position for window maintenance. The vent can then be locked open at this position by manually engaging a locking lever. The locking lever feature securely locks the window in the open position for



maintenance and to prevent sudden closing during wind gusts. To unlock either Support Arm from its maximum-open position, simply lift the sash slightly before closing.

The support arm with limited opening feature automatically engages back into the first-position opening when closed. For larger windows, adjustable friction is available in the #37.20 through #37.24 series which helps to stabilize the vent and prevent it from closing by its own weight or wind conditions.

MATERIAL: Friction Adjustor is non-magnetic stainless steel with nylon friction block encased in a sliding brass shoe. #99 Limit Devices are plated steel arms with stainless steel track and detach clip - or, an a non-magnetic stainless steel model is also available Support Arms are non-magnetic stainless steel.

ORDERING INFORMATION:

Friction Adjustor

1. From the information available on the following drawings – specify the correct arm and track length that will be required for your window. Reference numbers in table on next page.
2. All Heavy Duty Friction Adjustors come equipped with a .235” (5.9 mm) bracket unless otherwise specified – see Dimension A in Figure 2. Optional brackets not available for Standard

Duty Friction Adjustors.

Limit Device

1. Specify product by part number - refer to drawings for specific information.
2. Limit Device Key (#16002) sold separately — only required for #37.26 through #37.34.

Support Arms

1. Order 2 arms per vent.
2. Specify product by part number (length of hardware is measured in extended position).
3. Order Release Key (#16001) separately. Two keys required to open window for models #37.20 through 37.24.
4. These Support Arms provided without brackets. If brackets are required, please consult the tables within Support Arm drawings for the optional brackets. If brackets are ordered, a standard .015” (.4 mm) washer will be provided between the bracket and the Support Arm. To increase stack height, optional washers of .050 or .093 are available. Please specify when ordering.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

1. Truth recommends that a Friction Adjustor/Limit Device be used in any application over two stories to protect the window and hardware from excessive wind loads in the near fully open position. The degree of friction and limited opening depends on anticipated wind loads.

2. Friction Adjustors can be used either as a hold-open device or for additional friction in conjunction with some types of hinging on projected or casement sashes. The manufacturer determines for himself the placement of the unit and the correct track and arm length required to obtain whatever amount of opening is desired.

3. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.

4. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

5. For metal window profiles Truth recommends machine screws however, in most applications sheet metal screws will provide adequate holding power.

6. Support Arms should be mounted as low as possible on the sash and frame for maximum strength. The window manufacturer must determine the placement of the hardware dependent upon the amount of opening.

7. For easy correction of out of square or racked window installations, the use of Truth Jamb Jack III frame adjusters is recommended. Frame adjustment can improve both weather seal tightness and sash operation over the life of the window.

**INCLUDE TRUTH SPECS ON
YOUR NEXT WINDOW PROJECT**

Sash control devices as required by "life safety" codes. Friction adjustment features to be provided which allow fine tuning of sash motion.

Sash control devices of 37/99 series, as manufactured by Truth Hardware.

HEAVY DUTY FRICTION ADJUSTORS (See Fig. 2)

PART NUMBER	TRACK LENGTH*
37.41.00.100	10" (254.0mm)
37.42.00.100	12" (304.8mm)
37.43.00.100	14" (355.6mm)

*Bar length is always 2" shorter than Track length.

STANDARD DUTY FRICTION ADJUSTORS (See Fig. 3)

PART NUMBER	TRACK LENGTH*
37.35.00.100	8" (203.2mm)
37.36.00.100	10" (254.0mm)
37.37.00.100	12" (304.8mm)
37.38.00.100	14" (355.6mm)

*Bar length is always 2" shorter than Track length.

LIMIT DEVICE WITH THE KEY RELEASE FEATURE (See Fig. 4)

PART NUMBER	TRACK LENGTH	BAR LENGTH
37.26.00.200	5" (127.0mm)	5" (127.0mm)
37.27.00.200	6" (152.4mm)	6" (152.4mm)
37.28.00.200	7" (177.8mm)	7" (177.8mm)
37.29.00.200	8" (203.2mm)	8" (203.2mm)
37.31.00.200	10" (254.0mm)	8" (203.2mm)
37.31.00.201	10" (254.0mm)	10" (254.0mm)
37.33.00.200	12" (304.8mm)	6" (152.4mm)
37.33.00.201	12" (304.8mm)	10" (254.0mm)
37.33.00.202	12" (304.8mm)	12" (304.8mm)
37.34.00.200	14" (355.6mm)	12" (304.8mm)
37.34.00.201	14" (355.6mm)	14" (355.6mm)

1. The Heavy Duty Friction Adjustor is the only one of these products that has the option of different bracket heights. If a bracket is not specified it comes with the standard .235 (6.0mm) bracket. For other available brackets see the table in figure 2.

2. The accompanying tables show the options available to you in the selection of the limit device or friction adjustors required for your specific application.

FIG. 1 APPLICATION OF TRUTH FRICTION ADJUSTORS

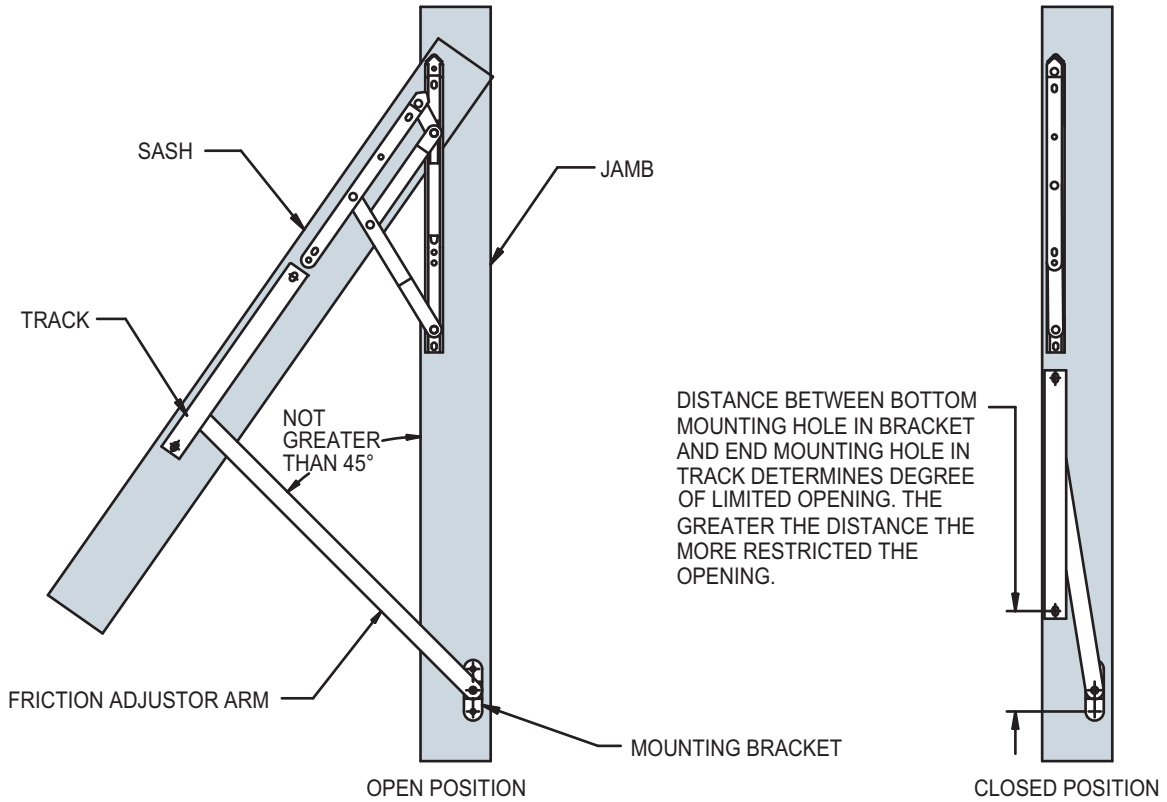


FIG. 2 TRUTH HEAVY DUTY FRICTION ADJUSTORS (Anderberg FA33SS Series)

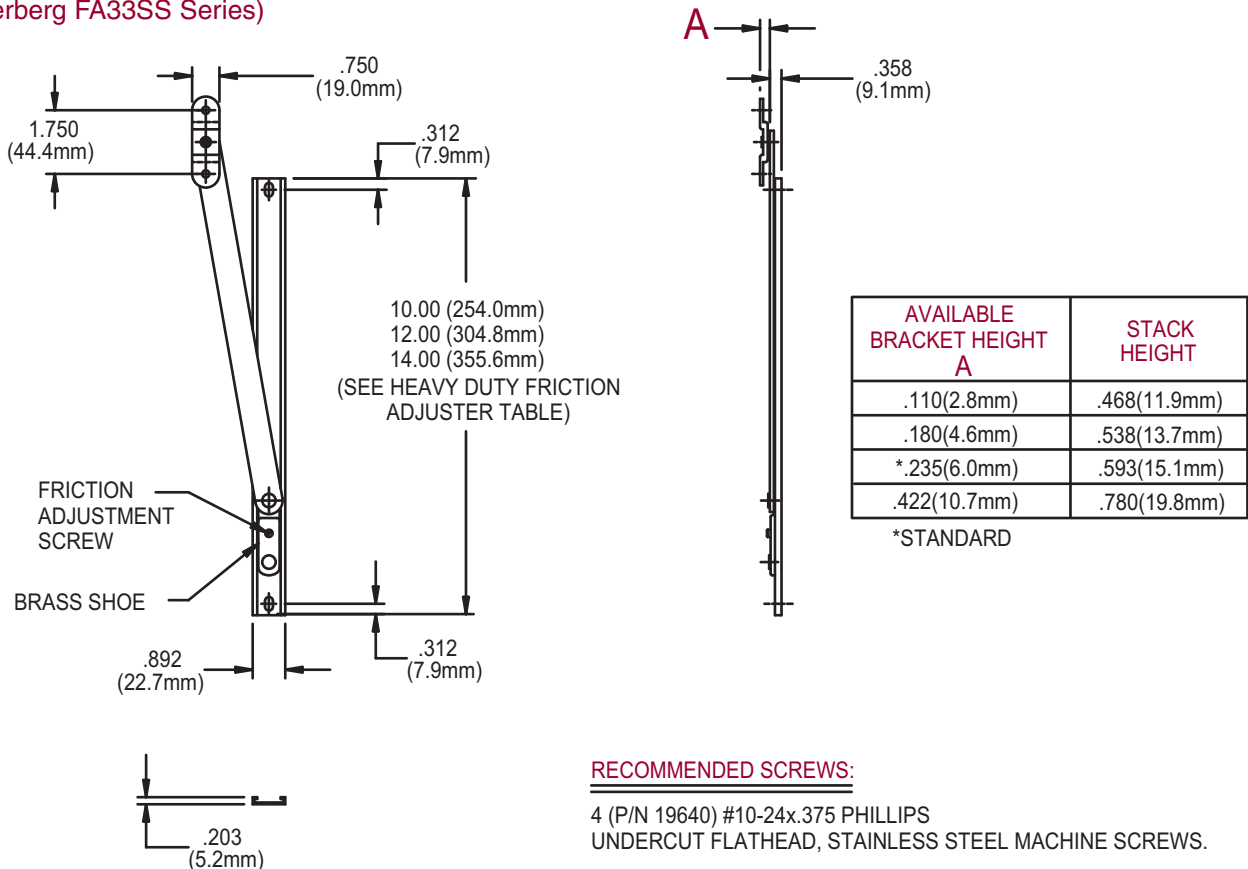
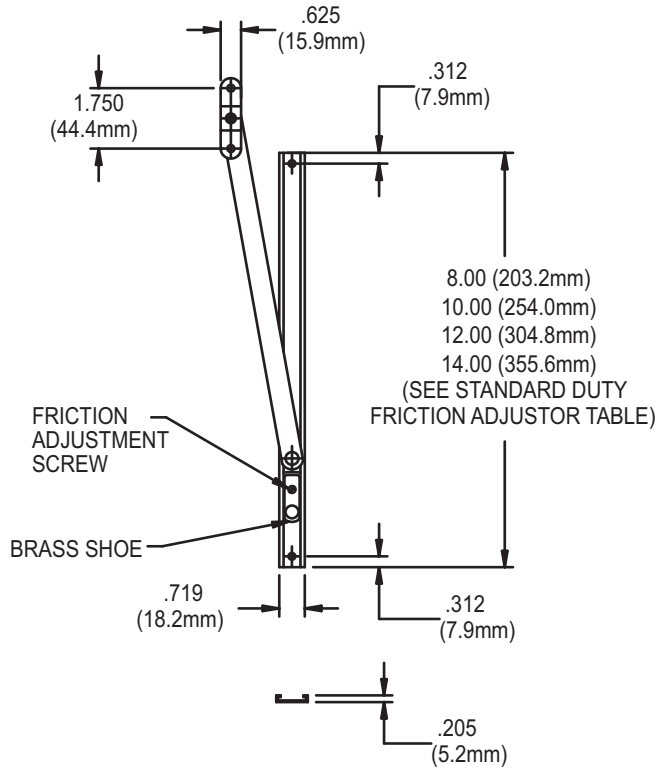


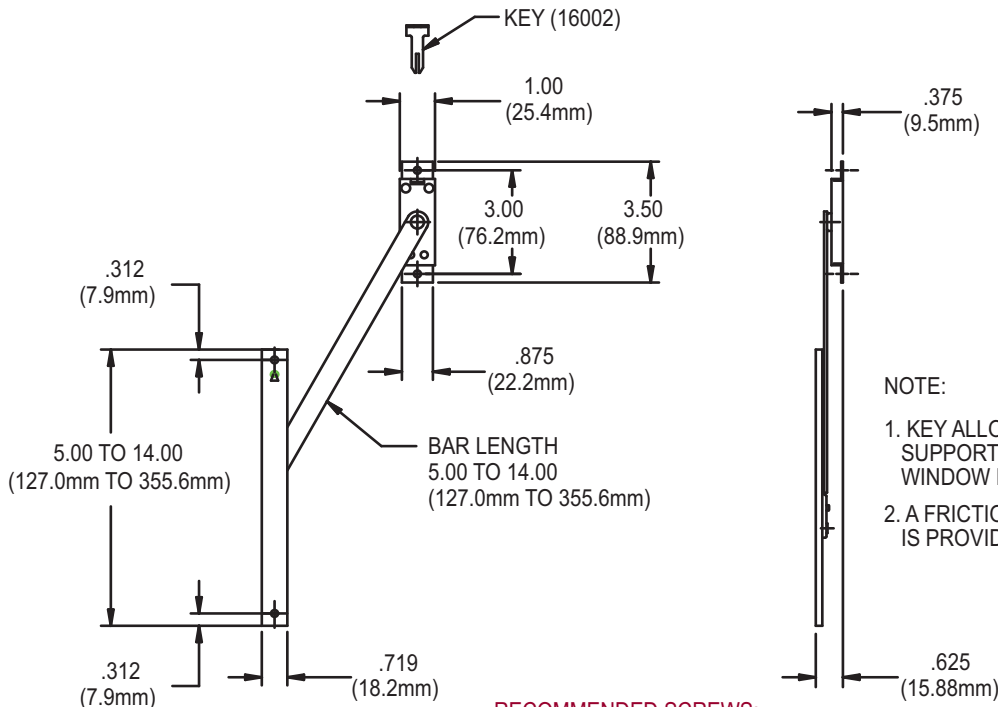
FIG. 3 TRUTH STANDARD DUTY FRICTION ADJUSTORS (Anderberg FA22SS Series)



RECOMMENDED SCREWS:

4 (P/N 19640) #10-24X.375 PHILLIPS, PAN HEAD, STAINLESS STEEL MACHINE SCREWS

FIG. 4 TRUTH LIMIT DEVICE WITH KEY RELEASE (Anderberg FA220SS Series)



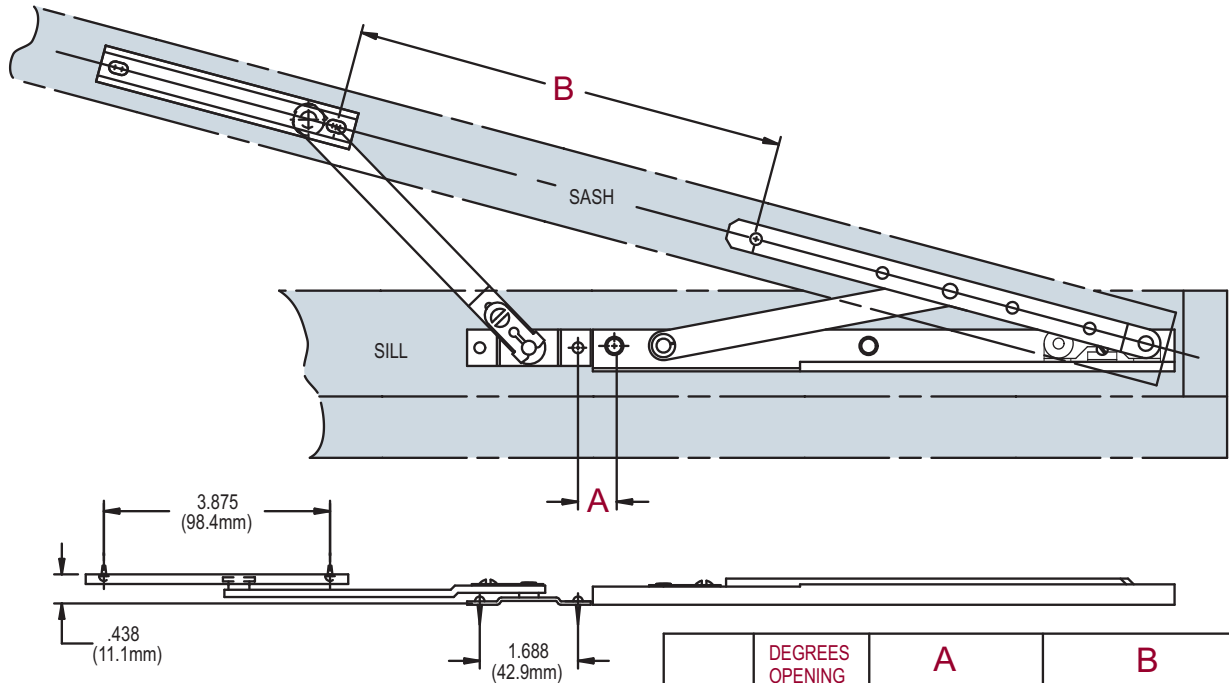
NOTE:

1. KEY ALLOWS YOU TO DETACH THE SUPPORT ARM TO OPEN THE WINDOW FURTHER FOR MAINTENANCE.
2. A FRICTION ADJUSTMENT SCREW IS PROVIDED IN THE SHOE.

RECOMMENDED SCREWS:

4 (P/N 19640) #10-24X.375 PHILLIPS, PAN HEAD, STAINLESS STEEL MACHINE SCREWS

FIG. 5 APPLICATION OF THE TRUTH LIMIT DEVICE
(When Used With Truth Concealed Casement Hinge)

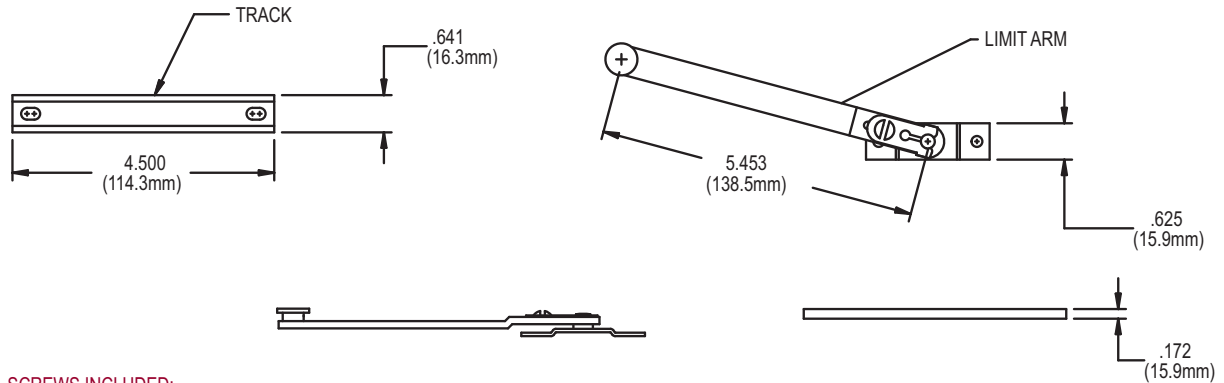


NOTE: MOUNTING DIMENSIONS MAY VARY WHEN USED WITH OTHER TYPES OF HINGES.

ADDITIONAL TYPES OF LIMIT DEVICES ARE AVAILABLE FROM TRUTH

	DEGREES OPENING	A	B
10" HINGE	5	6.125 (155.6mm)	14.188 (360.4mm)
	10	.625 (15.9mm)	8.375 (212.7mm)
	15	.625 (15.9mm)	7.656 (194.5mm)
	20	.625 (15.9mm)	6.625 (168.3mm)
13" HINGE	5	6.125 (155.6mm)	14.250 (362.0mm)
	10	.625 (15.9mm)	11.344 (288.1mm)
	15	.625 (15.9mm)	10.156 (258.0mm)
	20	.625 (15.9mm)	8.313 (211.2mm)

FIG. 6 99.20 LIMIT DEVICE

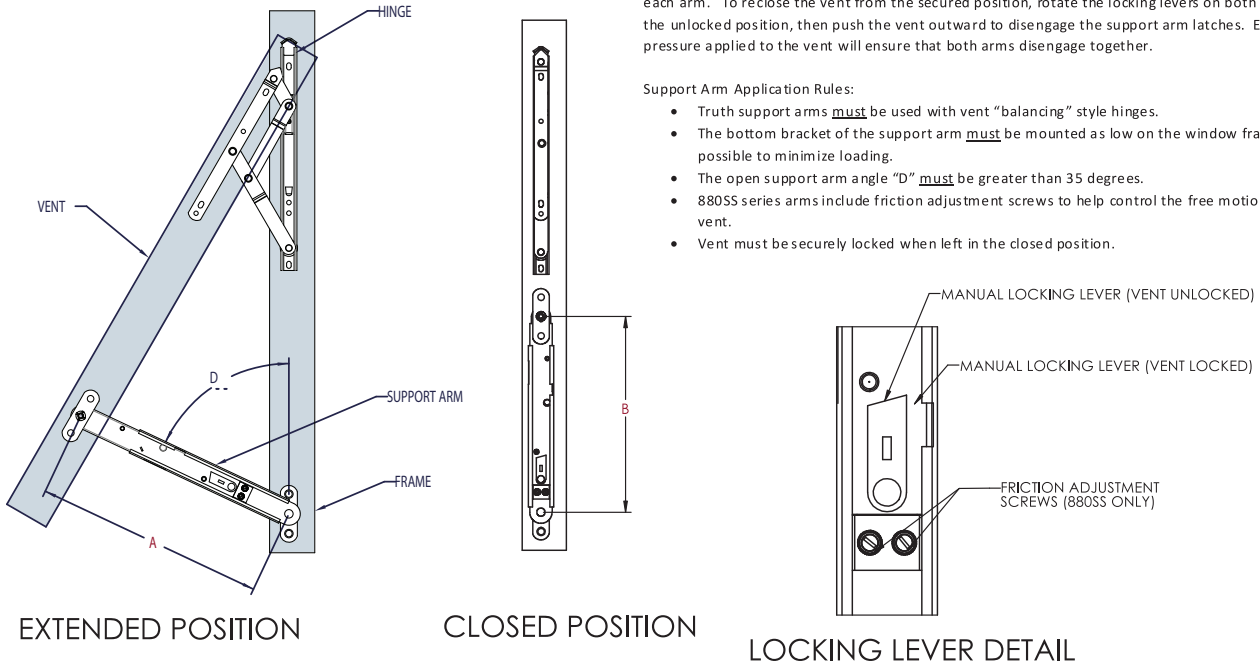


SCREWS INCLUDED:

2 (P/N 19090.92) #7 X .750 PHILLIPS, PAN HEAD, STEEL SHEET METAL SCREWS (BKT) - SUPPLIED WITH PRODUCT

2 (P/N 19091.92) #7 X .750 PHILLIPS, PAN HEAD, STAINLESS STEEL SHEET METAL SCREWS (TRACK) - SUPPLIED WITH PRODUCT

FIG. 7 APPLICATION OF TRUTH SUPPORT ARMS

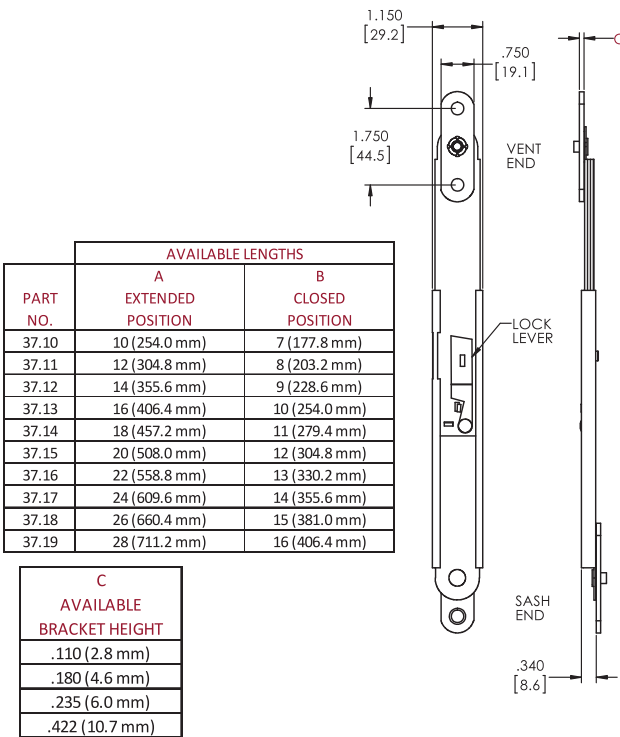


Pushing the vent open to the full extent of the support arms will automatically engage the arms. The vent should **ALWAYS** be secured in the open and latched position by engaging the lock levers on each arm. To reclose the vent from the secured position, rotate the locking levers on both arms to the unlocked position, then push the vent outward to disengage the support arm latches. Even pressure applied to the vent will ensure that both arms disengage together.

Support Arm Application Rules:

- Truth support arms **must** be used with vent "balancing" style hinges.
- The bottom bracket of the support arm **must** be mounted as low on the window frame as possible to minimize loading.
- The open support arm angle "D" **must** be greater than 35 degrees.
- 880SS series arms include friction adjustment screws to help control the free motion of the vent.
- Vent must be securely locked when left in the closed position.

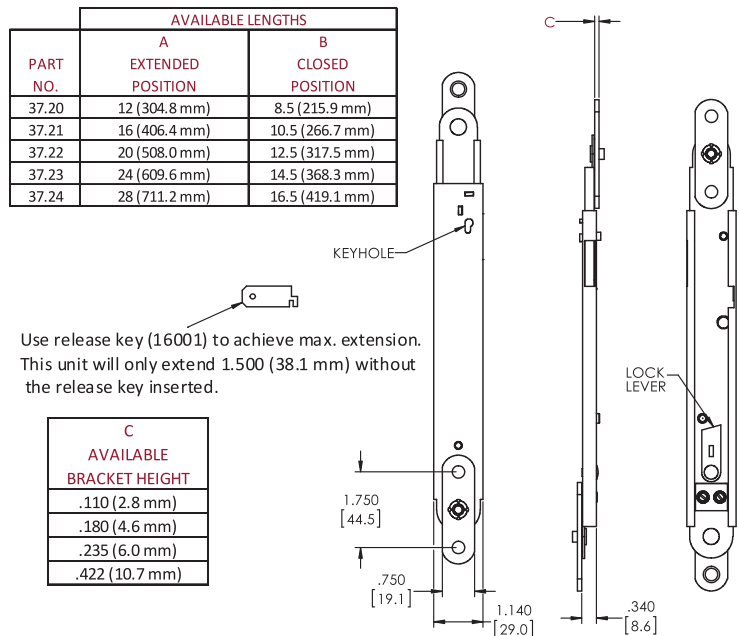
FIG. 8 TRUTH SUPPORT ARMS (Anderberg 88SS Series)



RECOMMENDED SCREW S:

4 (P/N 19640) #10-24 X .375 PHILLIPS UNDERCUT FLATHEAD STAINLESS STEEL MACHINE SCREW S.

FIG. 9 TRUTH SUPPORT ARMS W/LIMITED OPENING (Anderberg 880SS Series)



Use release key (16001) to achieve max. extension. This unit will only extend 1.500 (38.1 mm) without the release key inserted.

RECOMMENDED SCREW S:

4 (P/N 19640) #10-24 X .375 PHILLIPS UNDERCUT FLATHEAD STAINLESS STEEL MACHINE SCREW S.

**SafeGard™ WOCD is tested and certified to ASTM F2090-10**

Window opening control devices have become a very important subject among window manufacturers and onward through to builders, contractors, and homeowners. Being able to safely and securely operate a window which has safe guards in place to help control the windows opening so as to prevent accidental falls, while at the same time being able to be easily opened for egress purposes in case of an emergency, is critical in today's building projects.

As a market leader in fenestration hardware, Truth engineered, patented, and manufactured a WOCD that meets the requirements of ASTM F2090-10. The ASTM F2090 addresses window fall prevention that helps protect against potential falls by children through open windows. This is done by allowing the window opening to be set at a pre-determined position of less than four inches (4") and automatically re-latch when fully closed. Truth's Casement SafeGard™ WOCD provides a means that the window, when opened in an initial operation, will limit the venting to less than 4". By code, two actions are required to open the window fully for egress purposes. This additional operation can be performed without the use of keys, tools, or special knowledge.

SafeGard™ Window Opening Control Device is designed to allow for factory installation as well as field application by trained personnel. Please consult local building codes for WOCD and applicable requirements.

SafeGard is a reliable, easy to install and easy to operate solution which meets today's more stringent safety requirements. For additional information on installation and operation, please review the installation and operation instruction

www.truth.com/instructions or www.truth.com/instructionvideos to ensure proper application and operation of the device.

SafeGard™ WOCD:

Reliable operation and made entirely of austenitic stainless steel and plastic. WOCD was tested and certified to ASTM F2090-10. It is designed to fit



in the standard hinge cavity of 0.719"W X 0.438"H (nominal). Arm assembly has a decal with simple operating instruction, and track is assembled with visible colored plastic to discern the separate operations.

APPLICATION AND EASE OF INSTALLATION:

For ease of installation, the track will self locate to the frame. The arm is located on the sash using a template (#92251) with printed instructions. Please see Fig.1 for installation dimensions on window mounting surfaces. For additional information, please see installation and operating instructions.

(www.truth.com/instructions).

WARRANTY: Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: Austenitic stainless steel track, arm, rivet, and Delrin cover and tab. This device is recommended to be installed with stainless steel screws. Total of 4 stainless steel #7 undercut Phillip Flat Head screws to be used in this application; two for the track and two for the arm. Due to variation of profile, screw length can vary. Please

refer to application print specific to your profile and installation instruction for more details.

INCLUDE TRUTH SPECS IN YOUR NEXT PROJECT REQUIRING A WINDOW OPENING CONTROL DEVICE:

Window Opening Control Devices as required by ASTM F2090-10, the standard specification for window control devices with emergency (egress) release mechanisms. Product will limit the window opening to less than 4" and requires two actions to release the device allowing the window to open fully for egress purposes. Actions to release the device for egress purposes are to be performed without the use of keys, tools or special knowledge. WOCD will automatically re-latch when window is fully closed. This WOCD shall be "SafeGard™ Casement Window Opening Control Device" as offered by Truth Hardware, Owatonna, MN.

ORDERING INFORMATION:

Before ordering device for your application, please make sure the handing of the device is correct for your windows. To determine the correct handing, view the window from the exterior of the dwelling. When the hinge is on the left, it is a left handed window.

SAFEGARD™ CASEMENT WINDOW OPENING CONTROL DEVICE (WOCD)

Similarly, when the hinge is on the right it is a right handed window. Plastic cover on the device is clearly marked with letters L (left) or R (right) for ease of installation. Please follow the below steps for device selection:

1. Before installation, Truth Hardware recommends that you consult with local building codes for egress size applicability and requirements. Standard egress opening typically requires a 24" wide sash opening. For other applications, the minimum sash opening required for Truth's SafeGard™ device is a 21" wide sash.
2. Confirm the hinge cavity (Fig. 1) to ensure the mounting surfaces for the WOCD's track and arm are clearly identified. The WOCD's track should be the same plane as the hinge track, and the WOCD's arm should be mounted on the same plane as the sash arm on the sash profile.
3. Please check the hinge cavity dimension to confirm the casement WOCD will fit your window. The standard hinge cavity should nominally be 0.719" W x 0.438" H.

Please refer to Fig. 1 for WOCD (arm and track) mounting surface, Fig. 2a for arm installation on the sash, and 2b for installation position of the track on the frame. If you have any questions, please contact the window manufacturer for further information.

4. Determine the window handing. This will ensure the correct WOCD device for the application. Specify left or right hand device for your order (please see table 1 below for part numbers)
5. Determine if your order will be OEM* part numbers (bulk pack for factory installation) or kit part numbers (single packed for field installation by trained personnel). For OEM application, additional accessories (*) should also be identified and ordered along with the OEM part numbers. Field kit will be bagged to include complete WOCD arm and track, window label decal, screws, and installation template. If you have any questions, please contact Truth representative for additional information.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on

screw type and quantity needed (sold separately).

TRUTH TIPS:

1. Truth recommends that a casement WOCD be used in casement application where applicable and building codes require such application. Please check the local building codes for applicability and egress size requirements.
2. Casement WOCD can be factory installed or field retrofit on all profile material types where standard/nominal (0.719"W X 0.438"H) hinge cavity is available. Please observe all safety instructions and consult window manufacturer when you have questions or concerns. Please contact Truth sales for application to ensure form, fit, and function for your specific window application
3. Standard 2 walls (vinyl, fiberglass, aluminum and other composite materials) on the profile is required for proper screw retention
4. Correct handing with proper installation are important to ensure proper operation of the device
5. For additional product information or installation and operating instruction, please go to www.Truth.com/instructionvideos for more detail.

Table 1: Part Numbers for OEM and Field Kits

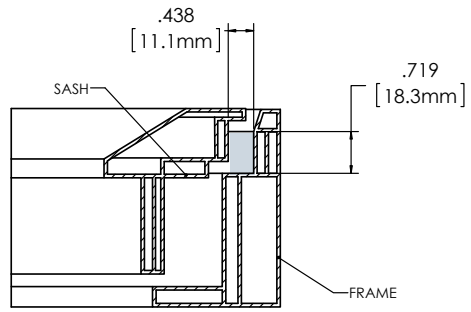
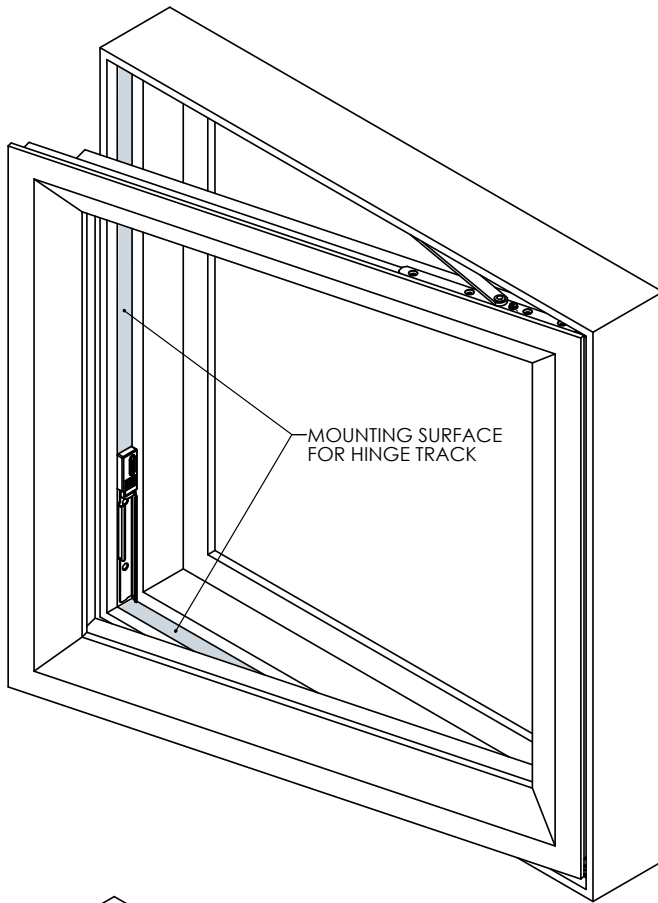
	Left Hand Casement WOCD	Right Hand Casement WOCD
OEM	14149	14150
Factory Installed	WOCD ASSY, OEM 7/16" LH Incl: arm assy and track assy	WOCD ASSY, OEM 7/16" RH Incl: arm assy and track assy
<i>Screw-Bulk* (5K/Box)</i>	19070	
<i>Screw pack*</i>	14176	
<i>Window Label (decal)*</i>	23681	
<i>Instruction*</i>	93221	
<i>Template*</i>	92251	
KIT	14151	14152
Field application by Trained Personnel	WOCD ASSY, Field Kit 7/16" LH Incl: arm assy, track assy, template, instruction and std screw pack (4 Screws), window label	WOCD ASSY, Field Kit 7/16" RH Incl: arm assy, track assy, template, instruction and std screw pack (4 Screws), window label

Note:

1. This device is not designed for Awning application.
2. * Specific SKU to be ordered separately for OEM application

SAFEGARD™ CASEMENT WINDOW OPENING CONTROL DEVICE (WOCD)

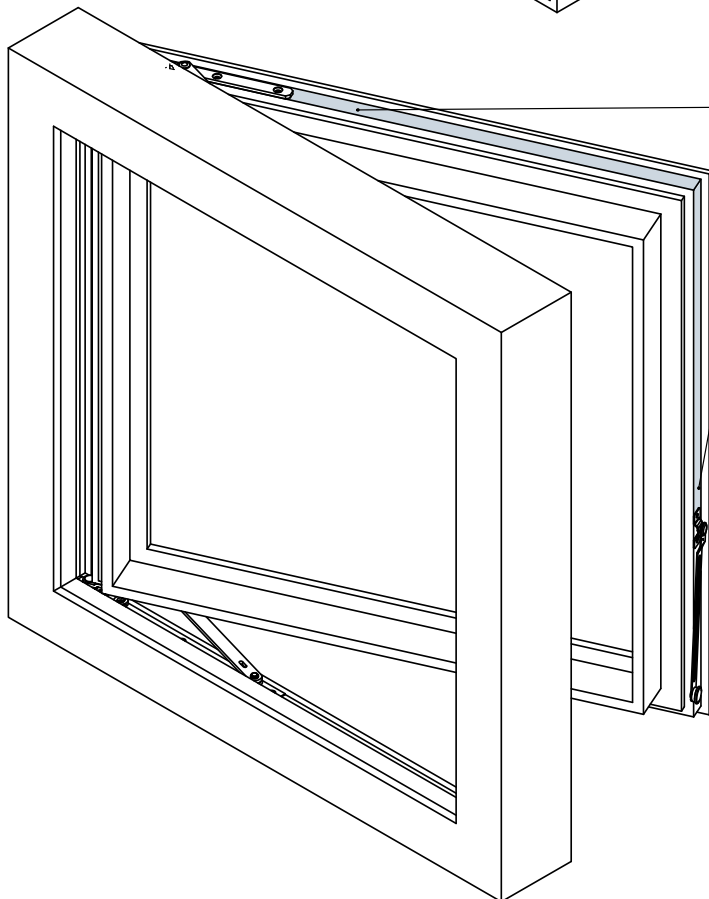
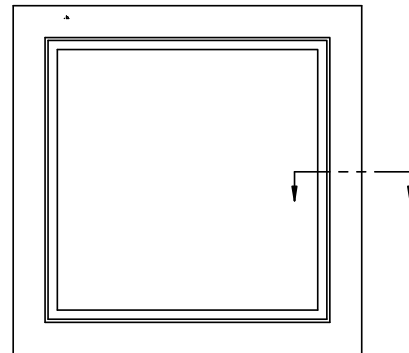
FIG. 1 SAFEGARD WOCD CASEMENT APPLICATION



WOCD CAVITY DIMENSIONALLY SAME AS HINGE CAVITY

NOTE: WOCD CAVITY DIMENSIONS MUST BE THE SAME AS THE HINGE CAVITY DIMENSIONS. CONSULT THE WINDOW MANUFACTURER TO CONFIRM THESE DIMENSIONS OR IF HINGE ADJUSTMENT IS NEEDED

WARNING: THE WOCD MAY NOT FUNCTION PROPERLY IF THESE DIMENSIONS ARE NOT ADHERED TO.



SAFEGARD™ CASEMENT WINDOW OPENING CONTROL DEVICE (WOCD)

FIG. 2A SAFEGARD WOCD (LEFT HAND SHOWN) ARM APPLICATION ON SASH

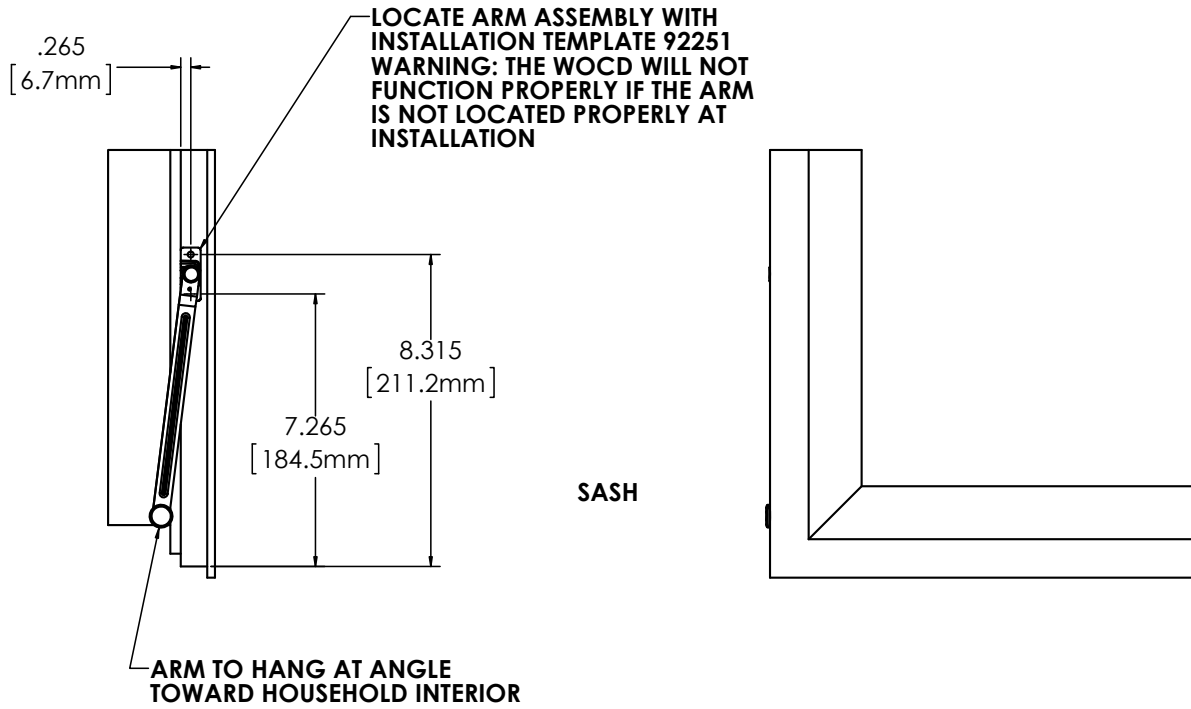
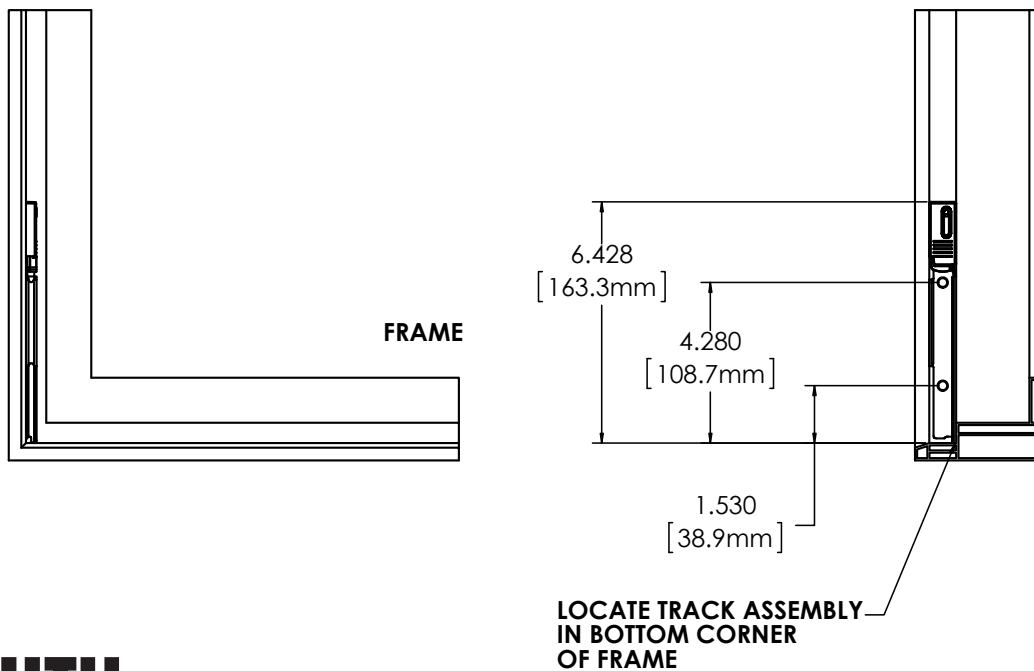


FIG. 2B SAFEGARD WOCD (LEFT HAND SHOWN) – TRACK APPLICATION ON FRAME





For use with concealed or exposed hinges, Truth Snubbers prevent bowing of tall casement windows, or wide awning windows and have been found to be useful with double-hung windows in improving the seals of the bottom and top rails in the closed position. Two models feature a PVC insert for use on Aluminum clad units. This PVC insert reduces wear on the finish of the cladding.

Also available is a Concealed Snubber which fits between the sash and frame in a Truth 14 Series Hinge cavity. This hardware eliminates the product from being visible on the exterior of the window

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: Heavy gauge steel. Model #10390 contains a PVC insert.

FINISH: #10390 models have a phosphate coated, electrostatically painted baked enamel finish which resists chipping and flaking. Standard colors are: 03 Bronze, 22 Clay, 24 Beige, and 32 or 78 White. Optional finishes are available upon request.

E-GARD® HARDWARE: Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

ORDERING INFORMATION:

1. Choose Snubber style desired (specify by part number).
2. Specify finish number (when applicable).
3. Select mounting hardware (sold separately).

RECOMMENDED SCREWS:

Type of screws required determined by



material of profile being used. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

1. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position.
2. Adding a Snubber may increase the negative air pressure rating of a casement, awning or double hung window.
3. If the sash has a clad exterior and requires a Snubber, then a Snubber with a PVC insert should be used to prevent marring.
4. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
5. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
6. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. See Tech. Note # 11 for further details.
7. For metal window profiles Truth recommends machine screws however,

in most applications sheet metal screws will provide adequate holding power. 8. For easy correction of out of square, or racked window installations, the use of Truth Jamb Jack III frame adjusters is recommended. Frame adjustment can improve both weather seal tightness and sash operation over the life of the window.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window sash pressure snubber to be used to increase weatherseal effectiveness by maintaining seal contact on large sash sizes.

Snubbers to be applied to sash and frame sections at points of high deflection to maintain positive seal contact when high negative air pressures are encountered. Constructed of plated steel or stainless steel utilizing a PVC insert where required by profile material.

Snubbers shall be 99 series, as manufactured by Truth Hardware.

FIG. 1 32939.XX CONCEALED SNUBBER AND 31496.XX CONCEALED SNUBBER COMPRESSION

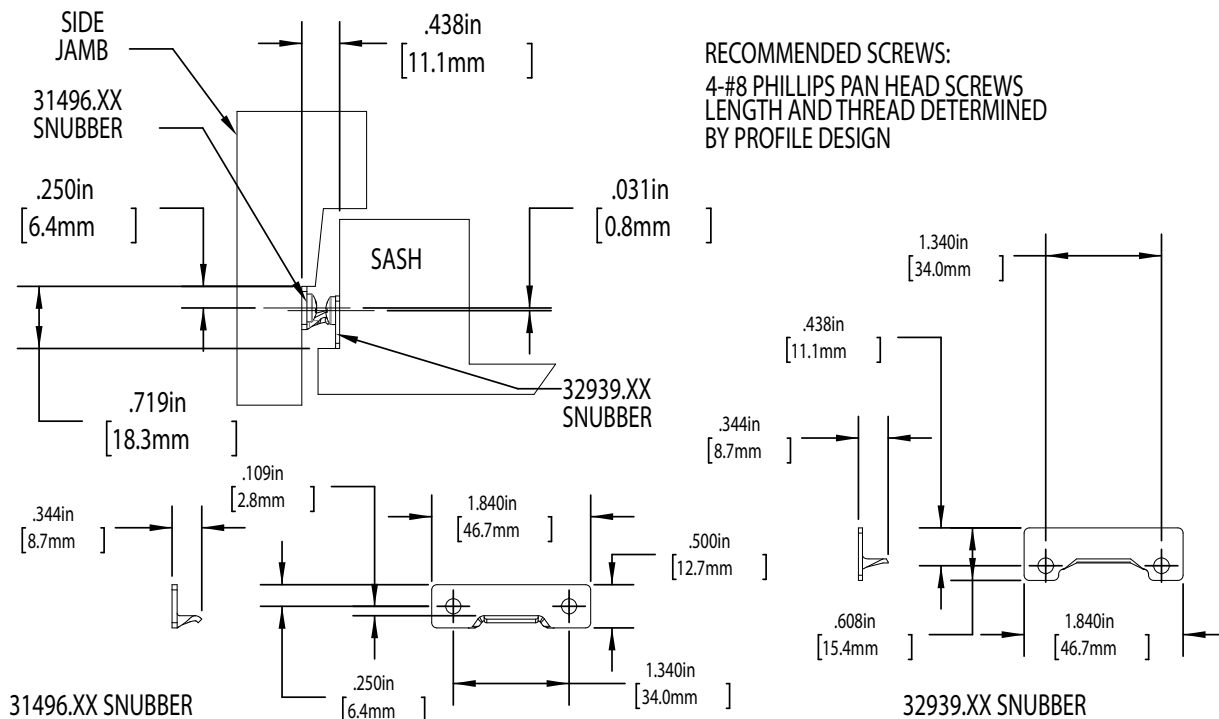
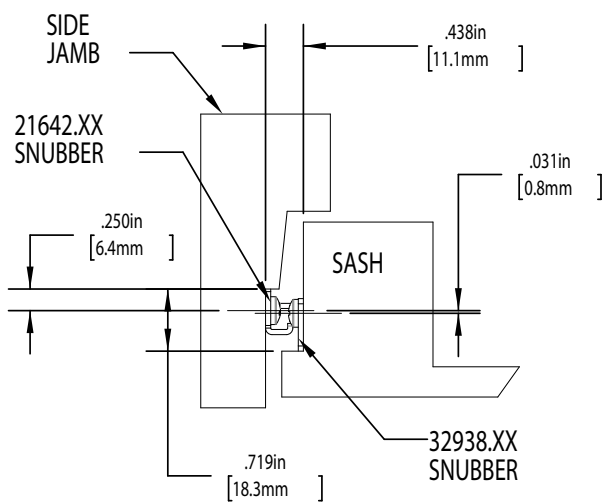
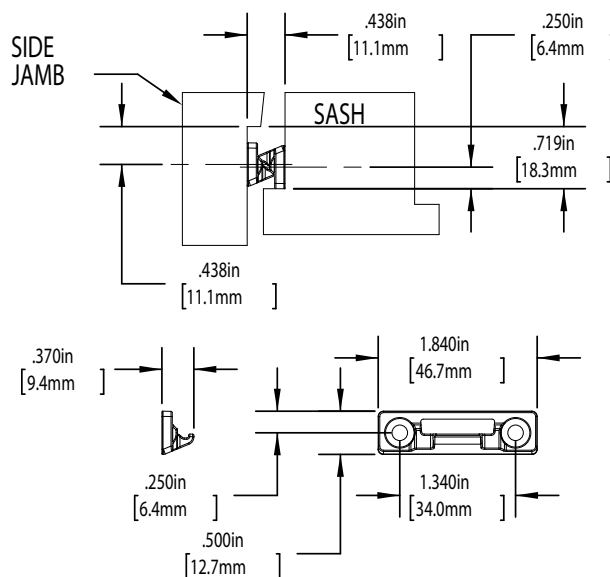


FIG. 2 32938.XX CONCEALED SNUBBER AND 21642.XX CONCEALED SNUBBER NEGATIVE AIR



RECOMMENDED SCREWS:
4-#8 PHILLIPS PAN HEAD SCREWS
LENGTH AND THREAD DETERMINED
BY PROFILE DESIGN

FIG. 3 22999.XX CONCEALED SNUBBER DIE CAST



RECOMMENDED SCREWS:
4-#8 PHILLIPS FLAT HEAD SCREWS
LENGTH AND THREAD DETERMINED
BY PROFILE DESIGN

Now you can install and adjust doors & windows quicker and easier than ever before. Truth's Jamb Jacks are a specially designed fastening system for mounting door & window frames into rough openings. Jamb Jacks replace the shims used to square the window or door in the rough opening.

FASTER INSTALLATION

Using the unique adjustable "screws" (Jamb Jacks) a single unit can be installed without shims in just minutes.

SIMPLE ADJUSTMENT

Jamb Jacks provide quick and precise window and door adjustment at the time of installation and when future problems develop caused by foundation settlement. No more need to tear apart a door or window to re-shim it. By simply turning the Jamb Jack screws all necessary adjustments can easily be made while the unit is in place.

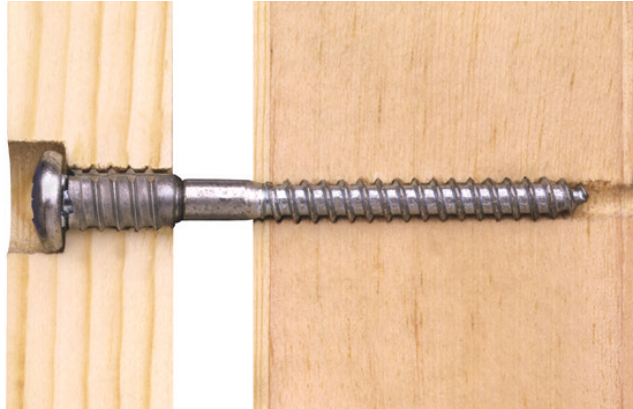
VERSATILE

Jamb Jacks are available for most wood door and window systems, including residential, light commercial or replacement applications, with wood or masonry openings.

MATERIAL

Steel screws. Acetal insert and finishing cap.

ORDERING INFORMATION



Jamb Jack III

1. Order Insert & Screw separately.
2. Order **#21146** White Finishing Cap. (See Truth Tip #3).

Door Application (See Truth Tip #2):

#21150 Door Insert

#21171 Door Screw

Window Application:

#21151 Window Insert

#21175 Window Screw

3. Order **#21183** Turbo Driver Installation Bit (power installation of insert).

TRUTH TIPS:

1. When installing the Jamb Jack III screw into the frame, make sure that the screw snaps twice into the insert.
2. Truth recommends that six Jamb Jacks be used in every door application (three per jamb) and four be used in window applications (two per jamb). NOTE: Additional Jamb Jacks may be required for window applications depending on the size of the unit.
3. White Finishing Cap may be painted to match non-standard colors.
4. T25 Torx Driver is required for installing and adjusting Jamb Jack III Screws. Not available from Truth Hardware.
5. Solid shims are recommended behind the strike plate locations on door jamb installations.
6. Due to the design of both Jamb Jack II and Jamb Jack III, neither system can be removed once they are installed. Care must be used when selecting installation points for any Jamb Jack unit.

FIG. 1 INSTALLATION OF JAMB JACK III WINDOW INSERT

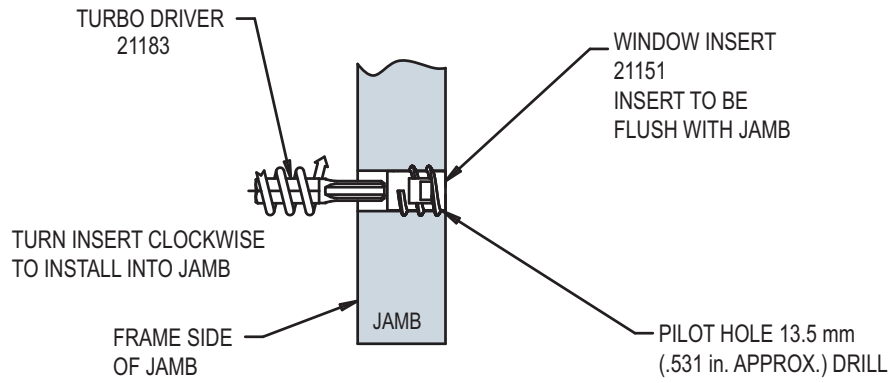


FIG. 2 ADJUSTMENT OF JAMB JACK III FOR WINDOWS

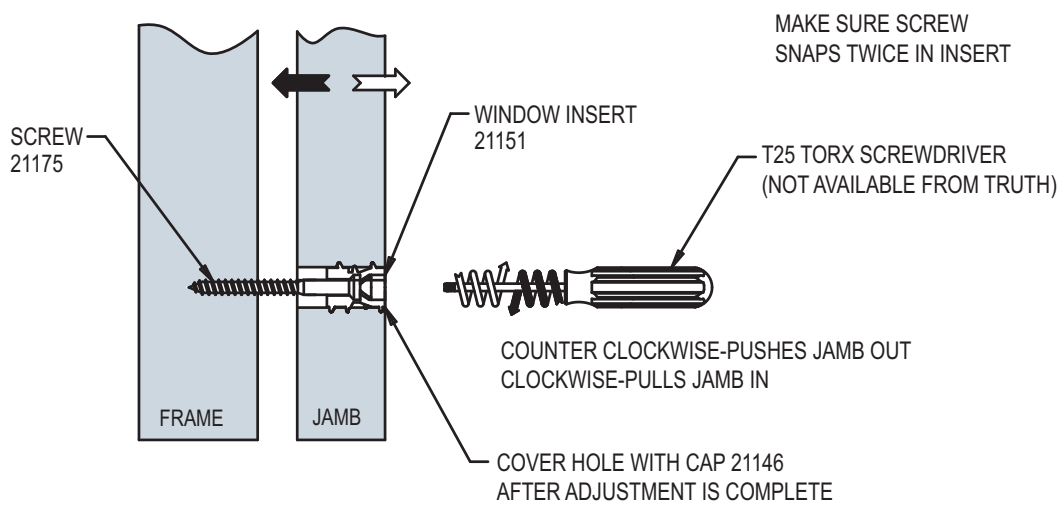


FIG. 3 INSTALLATION OF JAMB JACK III DOOR INSERT

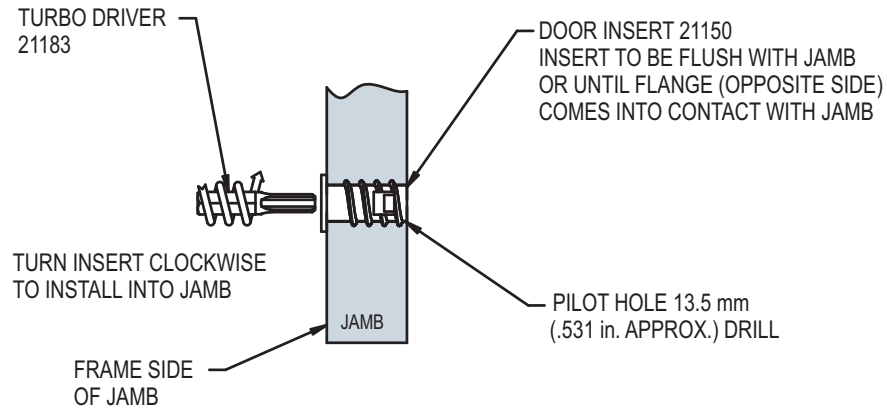


FIG. 4 ADJUSTMENT OF JAMB JACK III FOR DOORS

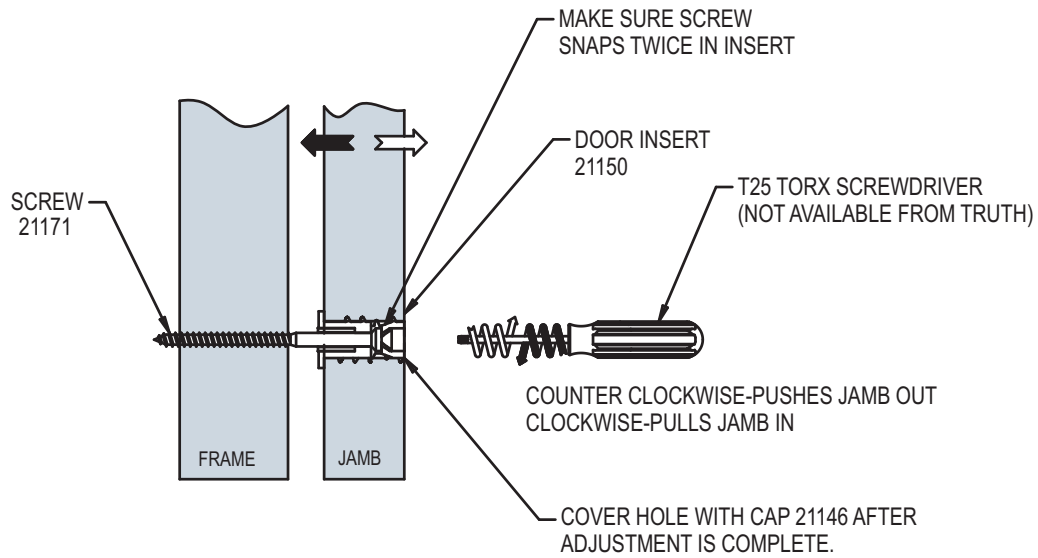


FIG. 5 JAMB JACK III INSERT 21150 (For doors)

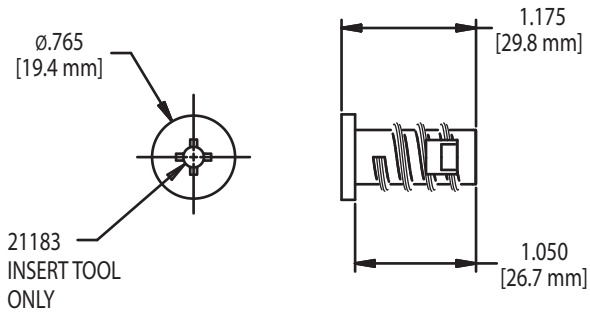


FIG. 6 JAMB JACK III INSERT 21151 (For windows)

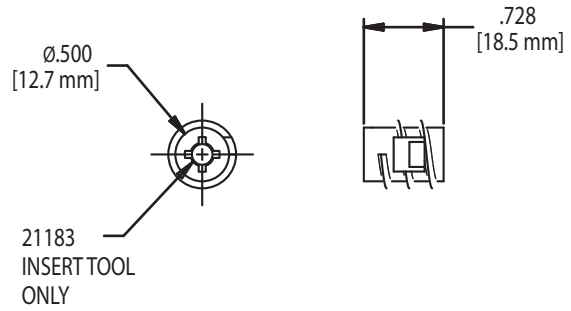


FIG. 7 JAMB JACK III SCREW 21171 (For doors)

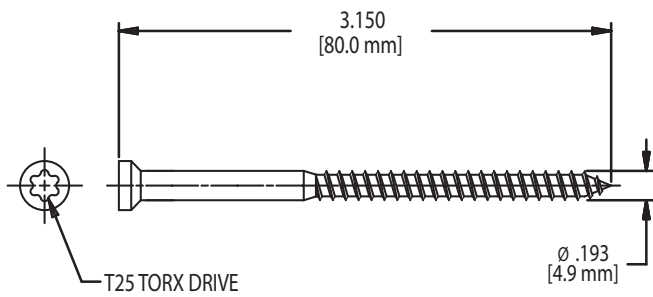


FIG. 8 JAMB JACK III 21175 (For windows)

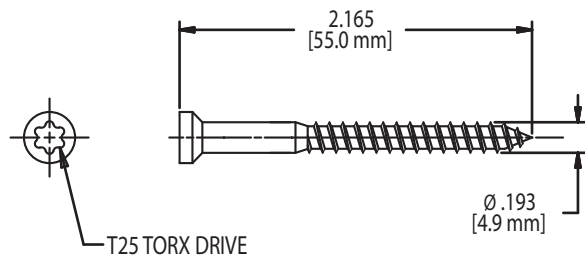
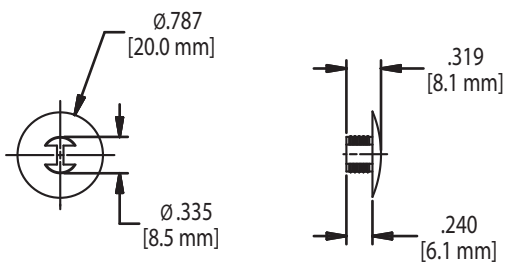
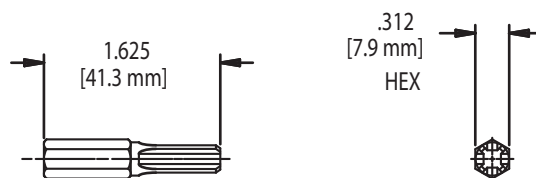


FIG. 9 COVER CAP 21146



FOR USE WITH JAMB JACK III WINDOW OR DOOR INSERTS (SNAPS INTO INSERT)

FIG. 10 TURBO DRIVER 21183



FOR INSTALLATION OF JAMB JACK III INSERT #21150 OR #21151

Hardware Comparison for NAFS Casement Window Hardware Load Test

North American Fenestration Standard (AAMA/WDMA/CSA 101/I.S. 2/A440-08)

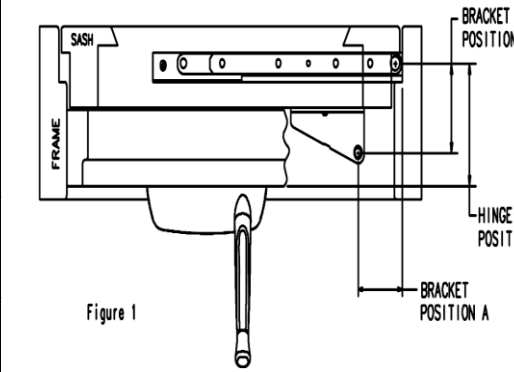
CAUTION: There are many factors in addition to the hardware which influence the maximum size casement window that should be produced. These include sash and frame stiffness and strength, screw holding strength, sash sag, weather tightness, and weatherstrip drag. For this reason, Truth recommends careful evaluation of the entire window before producing units as large as this matrix suggests.

Performance Class R: The Maximum Frame Size and Sash Weight are Listed in the Table.

Performance Classes LC, C, HC, AW: The Maximum Frame Area (Width x Height) Listed in the Table Must be Reduced by 20%.

Maximum Frame Size & Sash Weight for Operator & Hinge Combination Shown											
Operator	Maxim Washable 14.97 14.92	Maxim Egress 14.12 14.13	Heavy Duty 14.10	Hinge						Butt Hinge	Approx. Minimum Frame Width to Fit Operator
				10" Standard 14.75 14.80 14.05 14.19	10" Washable 14.76 14.91 14.06	10" Egress 14.77 14.93	10" HP Concealed 14.96	10" HP Concealed Egress 14.00			
Maxim Dual Arm 50.00	40"W x 84"H; 108*(96) lbs	32"W x 68"H; 69 lbs	38"W x 84"H; 103 lbs* (140) [^]	32"W x 84"H; 85 lbs	32"W x 72"H; 73 lbs	32"W x 68"H; 69 lbs	38"W x 78"H; 95 lbs	32"W x 68"H; 69 lbs	Not Recommended	24"	
Maxim Short Dual Arm 50.04	Not Recommended	28"W x 78"H; 69 lbs	Not Recommended	32"W x 84"H; 85 lbs	32"W x 84"H; 85 lbs	28"W x 78"H; 69 lbs	32"W x 84"H; 85 lbs	32"W x 68"H; 69 lbs	Not Recommended	21"	
Maxim Dyad 50.50	32"W x 72"H; 73*(55) lbs	Not Recommended	32"W x 76"H; 77 lbs* (132)	24"W x 64"H; 47 lbs	24"W x 60"H; 45 lbs	Not Recommended	28"W x 69"H; 49*(44) lbs	Not Recommended	Not Recommended	16"	
Maxim Reverse Dyad 50.70	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 83 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	24"W x 72"H; 53 lbs**	12"	
Maxim Single Arm 52.01	Not Recommended	32"W x 72"H; 73 lbs	Not Recommended	32"W x 70"H; 71*(36) lbs	32"W x 70"H; 71*(29) lbs	32"W x 72"H; 73 lbs	32"W x 70"H; 71*(36) lbs	32"W x 72"H; 73 lbs	30"W x 69"H; 65 lbs	20"	
Maxim Short Single Arm 52.06	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	Not Recommended	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	22"W x 63"H; 42 lbs	20"W x 60"H; 36 lbs	15"	
EntryGard Dual Arm 15.10	Not Recommended	Not Recommended	Not Recommended	32"W x 60"H; 60 lbs	32"W x 60"H; 60*(54) lbs	Not Recommended	32"W x 60"H; 60 lbs	Not Recommended	Not Recommended	20"	
EntryGard Egress D.A. 15.15	Not Recommended	28"W x 60"H; 52 lbs	Not Recommended	Not Recommended	Not Recommended	28"W x 60"H; 52 lbs	Not Recommended	28"W x 60"H; 52 lbs	Not Recommended	18"	
EntryGard Dyad 15.11	Not Recommended	Not Recommended	Not Recommended	26"W x 61"H; 49 lbs	24"W x 67"H; 49 lbs	Not Recommended	30"W x 61"H; 57 lbs	Not Recommended	Not Recommended	13"	
EntryGard Single Arm 15.94	Not Recommended	22"W x 62"H; 42 lbs	Not Recommended	22"W x 60"H; 40 lbs	Not Recommended	22"W x 62"H; 42 lbs	22"W x 60"H; 40 lbs	22"W x 62"H; 42 lbs	20"W x 61"H; 36 lbs	16" - 18" †	
13.5" Single Arm 15.32	Not Recommended	26"W x 65"H; 52 lbs	Not Recommended	26"W x 67"H; 54*(50) lbs	26"W x 69"H; 55*(41) lbs	26"W x 65"H; 52 lbs	26"W x 67"H; 54(50) lbs	26"W x 65"H; 52 lbs	24"W x 64"H; 47 lbs	22" - 24" †	
9.5" Single Arm 15.31	Not Recommended	24"W x 65"H; 48 lbs	Not Recommended	24"W x 61"H; 45*(27) lbs	24"W x 62"H; 45*(19) lbs	24"W x 65"H; 48 lbs	24"W x 61"H; 45*(27) lbs	24"W x 65"H; 48 lbs	22"W x 65"H; 43 lbs	18" - 20" †	
7.5" Single Arm 15.56	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	Not Recommended	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	22"W x 63"H; 42 lbs	20"W x 65"H; 39 lbs	16"	
6" Single Arm 15.39	Not Recommended	18"W x 66"H; 35 lbs	Not Recommended	Not Recommended	Not Recommended	18"W x 66"H; 35 lbs	Not Recommended	18"W x 66"H; 35 lbs	16"W x 70"H; 33 lbs	15"	
Split Arm 15.18	Not Recommended	Not Recommended	Not Recommended	24"W x 70"H; 52 lbs	24"W x 64"H; 47 lbs	Not Recommended	30"W x 64"H; 60*(56) lbs	Not Recommended	Not Recommended	16"	
23 Series Single Arm 13.5" 23.03	Not Recommended	26"W x 66"H; 53 lbs	Not Recommended	26"W x 69"H; 55 lbs	26"W x 71"H; 57*(43) lbs	26"W x 66"H; 53 lbs	26"W x 69"H; 55 lbs	26"W x 66"H; 53 lbs	26"W x 62"H; 50 lbs	22" - 24" †	
23 Series Single Arm 9.5" 23.01	Not Recommended	24"W x 69"H; 51 lbs	Not Recommended	24"W x 65"H; 48*(31) lbs	24"W x 66"H; 48*(22) lbs	24"W x 65"H; 51 lbs	24"W x 65"H; 48*(31) lbs	24"W x 69"H; 51 lbs	24"W x 69"H; 50 lbs	18" - 20" †	
23 Series Single Arm 7.5" 23.38	Not Recommended	22"W x 69"H; 46 lbs	Not Recommended	Not Recommended	Not Recommended	22"W x 69"H; 46 lbs	Not Recommended	22"W x 69"H; 46 lbs	24"W x 64"H; 47 lbs	16"	
23 Series Single Arm 6" 23.78	Not Recommended	20"W x 60"H; 36 lbs	Not Recommended	Not Recommended	Not Recommended	20"W x 60"H; 36 lbs	Not Recommended	20"W x 60"H; 36 lbs	22"W x 68"H; 45 lbs	15"	
23 Series Dyad Short Link 23.46	30"W x 63"H; 59 lbs	Not Recommended	26"W x 71"H; 58 lbs* (131)	26"W x 63"H; 51 lbs	24"W x 68"H; 50 lbs	Not Recommended	28"W x 61"H; 53 lbs	Not Recommended	Not Recommended	15"	
23 Series Dyad Long Link 23.49	32"W x 67"H; 68 lbs	Not Recommended	32"W x 60"H; 60 lbs* (140) [^]	26"W x 62"H; 50 lbs	24"W x 67"H; 49 lbs	Not Recommended	28"W x 66"H; 58 lbs	Not Recommended	Not Recommended	19"	

Typical Mounting Positions - Used for Hardware Comparison					
Hinge	Operator	Hinge Position	Bracket Position A	Bracket Position B	Operator Position
14.XX Concealed Hinges	Maxim Reverse Dyad	2.375	11.062	.813	Dual Arm & Dyad determined by Bracket Position A.
	Other Maxim		1.750	1.563	
	EntryGard Dual Arm w/10" Washable Hinge		1.625	.875	
	Other EntryGard Dual Arm Operators		1.375	1.563	Single Arm per catalog.
	Entrygard Dyad & Single Arm				
	Traditional & Ellipse				
23 Series	2.125				
14.10 Heavy Duty Hinges	Maxim Reverse Dyad	2.812	11.062	1.250	Determined by Bracket Position A
	Other Maxim		1.750	2.000	
	23 Series	2.562	1.375	2.000	
Butt Hinges	Maxim Reverse Dyad	4.000	11.062	2.437	Catalog Dim B=8.000
	EntryGard Single Arm		NA	NA	Catalog Dim A=4.000
	Maxim Single Arm				
	Traditional & Ellipse Single Arm				
	23 Series Single Arm		2.500		



The maximum window size, ease of operation, and service life are strongly influenced by hardware mounting positions (see Fig. 1 below).

Applications with dimensions larger than the typical mounting positions given above will not be able to support a window as large as that shown in this Table.

Applications with smaller dimensions may be able to support a larger window. Contact Truth for recommendations specific to your application.

* The first sash weight shown in the table is the maximum permitted for the AAMA Hardware Load Test. The sash weight shown in parenthesis is the maximum recommended by Truth to assure ease of operation.

If the sash weight in parenthesis exceeds the maximum permitted for the AAMA Hardware Load Test, a counteracting upward force must be applied to the sash during the test to reduce the load to the level specified by AAMA.

** The Maxim Reverse Dyad Operator has been limited to use in windows 24" wide and narrower in order to ensure good performance near the closed position. In its full open position, it can support windows larger than those shown in the table.

[^] This is the maximum rating of the hinge. Ease of operation is provided up to this weight.

† The smaller number applies when the operator is used with Egress hinges while the larger number applies when it is used with the 10" Standard or 10" High Performance hinge.



These specially designed sash locks are loaded with “hidden features”! The clean, low profile design of these locks requires a stop thickness of only .625” (15.8 mm) while still providing a full .250” (6.3 mm) screen rabbet. When properly installed, the revolving cam locking mechanism provides a .625” (15.8 mm) draw-in at the sash. Using a #31358 Keeper, when properly installed this produces a minimum forced entry resistance capability of 250 lbs. per lock (200 lbs. minimum per lock using a #31344 Keeper). An added bonus is that the non-handed design helps hold down expensive inventories.

Wherever architect requirements, or purchaser’s preference, call for *tandem* sash lock operation, the #16.19 sash lock is readily adaptable to a tandem configuration. A single rabbet cut into the lock side of the jamb is all that is necessary for tie bar installation. Rabbet and tie bar are completely concealed by the application of the customary stop. Tie bar application is optional (please specify when ordering). In either case, special profile considerations will need to be addressed. Contact Truth’s Technical Service Department for further information.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth’s Terms and Conditions for further details.

E-GARD® HARDWARE:

Truth’s E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

MATERIAL: High-pressure die-cast zinc case and handle. Painted steel back plate. Steel keeper and steel locking cam.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color



stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose Sash Lock style desired (specify by part number).
 #16.18 - Sash Lock
 #16.19 - Sash Lock (tandem application)
2. Specify finish number
3. Select mounting hardware (sold separately):
 #31344 - Standard Keeper
 #31345 - Offset Keeper
 #31358 - High Strength Keeper
 #31437 - Slotted Hole Keeper
 #91555 - Template (#31344 Keeper)
 Tie Bars - See table for the tie bar that best meets your application.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. See Tech Note #11. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TIE BARS

Tie Bar Part No.	B Dimension
10542	18.500 (469.9mm)
10412	20.375 (517.5mm)
10309	22.875 (581.0mm)
10353	23.312 (592.1mm)
10492	27.750 (704.9mm)
10413	28.875 (733.4mm)
10543	30.500 (774.7mm)
10310	34.875 (885.8mm)
10347	35.312 (896.9mm)
31359	37.375 (949.3mm)
10544	38.500 (977.9mm)
10348	43.312 (1100.1mm)
10311	46.875 (1190.6mm)

TRUTH TIPS:

1. Mounting templates are available to aid in locating the correct mounting hole positions for the sash lock and keeper.
2. When tandem operation of two sash locks are used, the tie bar must be confined to prevent buckling. This is most easily accomplished by confining the tie bar route within the frame (See drawings).
3. To apply a tie bar to a pair of sash locks, simply insert the pins on the tie bar into the holes provided on the back of the tie bar compatible sash locks.
4. In wood window applications, make sure that fasteners do not interfere with movement of the tie bar.
5. Sash Lock has .625" (15.8 mm) of reach-out to pull the sash in tight against the weatherstripping.
6. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware.
7. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
8. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
9. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.
10. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of the window.

**INCLUDE TRUTH SPECS ON
YOUR NEXT WINDOW PROJECT**

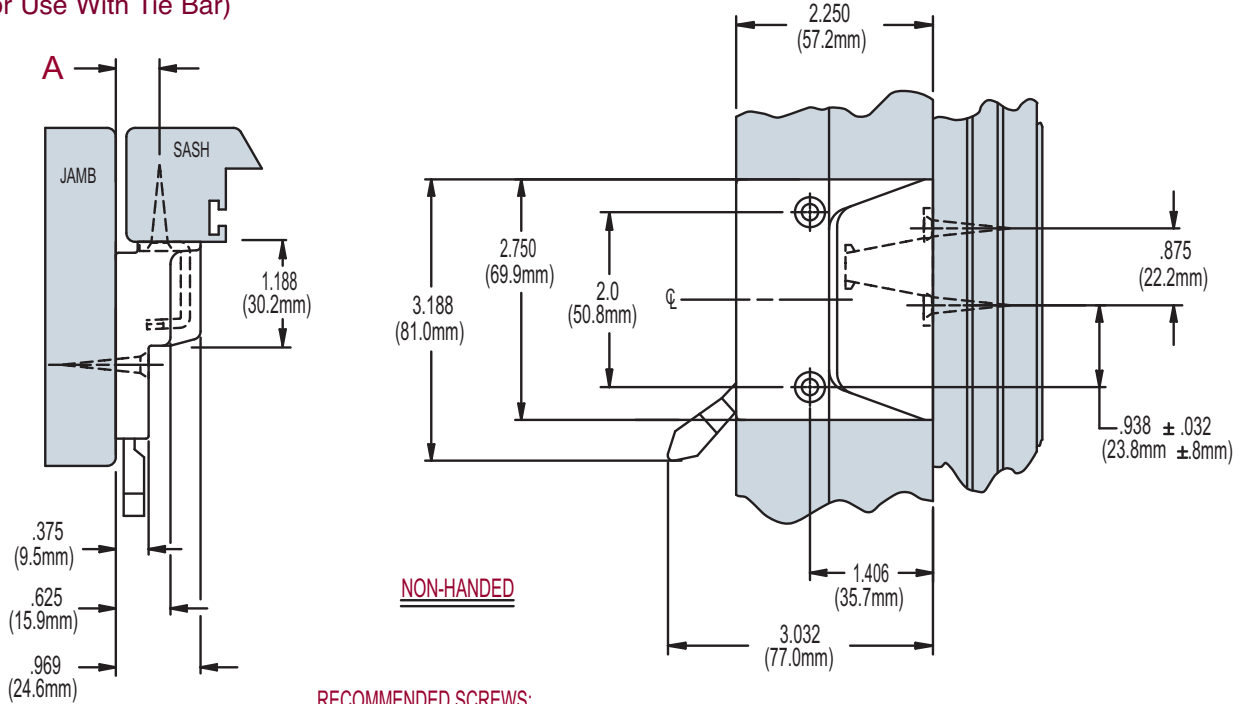
Window sash locks shall be included which will increase both security and weather seal tightness. The lock must also allow easy removal of window screen panel. The locks must hold securely up to 200 lbs. of force per lock for negative air pressure and forced entry resistance.

Window sash locks will be used which provide .625" (15.8 mm) of pull-in created by a revolving cam locking mechanism. The lock must also allow tandem operation of two locks to meet ADA hardware height standards.

The lock shall be constructed of high pressure zinc alloy die castings and E-Gard® Hardware internal components.

Window locks shall be 16 series Low Profile, as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 16.18 AND 16.19 LOW PROFILE CASEMENT SASH LOCK (16.19) For Use With Tie Bar



NON-HANDED

RECOMMENDED SCREWS:

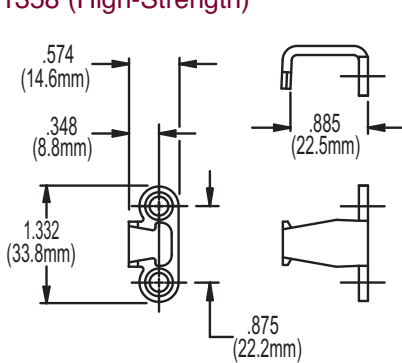
WOOD: 2-(P/N 19240) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC/METAL: 2- #8 PHILLIPS, FLAT HEAD SCREWS

(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE:
FOR PROPER KEEPER
ALIGNMENT USE A
MOUNTING TEMPLATE.

FIG. 2 KEEPER
31344 (Steel) 31359 (SST)
31358 (High-Strength)



AVAILABLE LOCKS	MOUNTING TEMPLATE	A
16.18	91555	.500
16.19		(12.7mm)

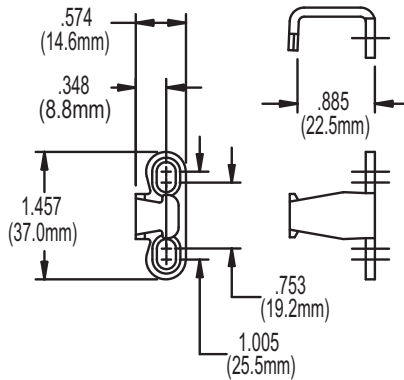
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19240) #8 X 1.0
PHILLIPS, FLAT HEAD
SHEET METAL SCREWS

PVC/METAL: LENGTH AND THREAD
TYPE DETERMINED BY PROFILE.

STAINLESS STEEL SCREWS
(P/N 19250) MUST BE USED WITH
SST KEEPERS.

FIG. 3 SLOTTED KEEPER 31437



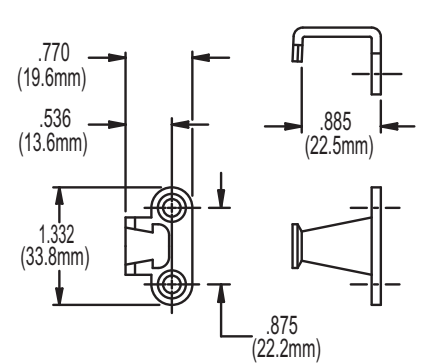
AVAILABLE LOCKS	MOUNTING TEMPLATE	A
16.18	91555	.500
16.19		(12.7mm)

RECOMMENDED SCREWS:

WOOD: 2 (P/N 19240) #8 X 1.0
PHILLIPS, FLAT HEAD
SHEET METAL SCREWS

PVC/METAL: LENGTH AND THREAD
TYPE DETERMINED BY PROFILE.

FIG. 4 OFFSET KEEPER
31345 (Steel)



AVAILABLE LOCKS	MOUNTING TEMPLATE	A
16.18	91568	.312
16.19		(7.9mm)

RECOMMENDED SCREWS:

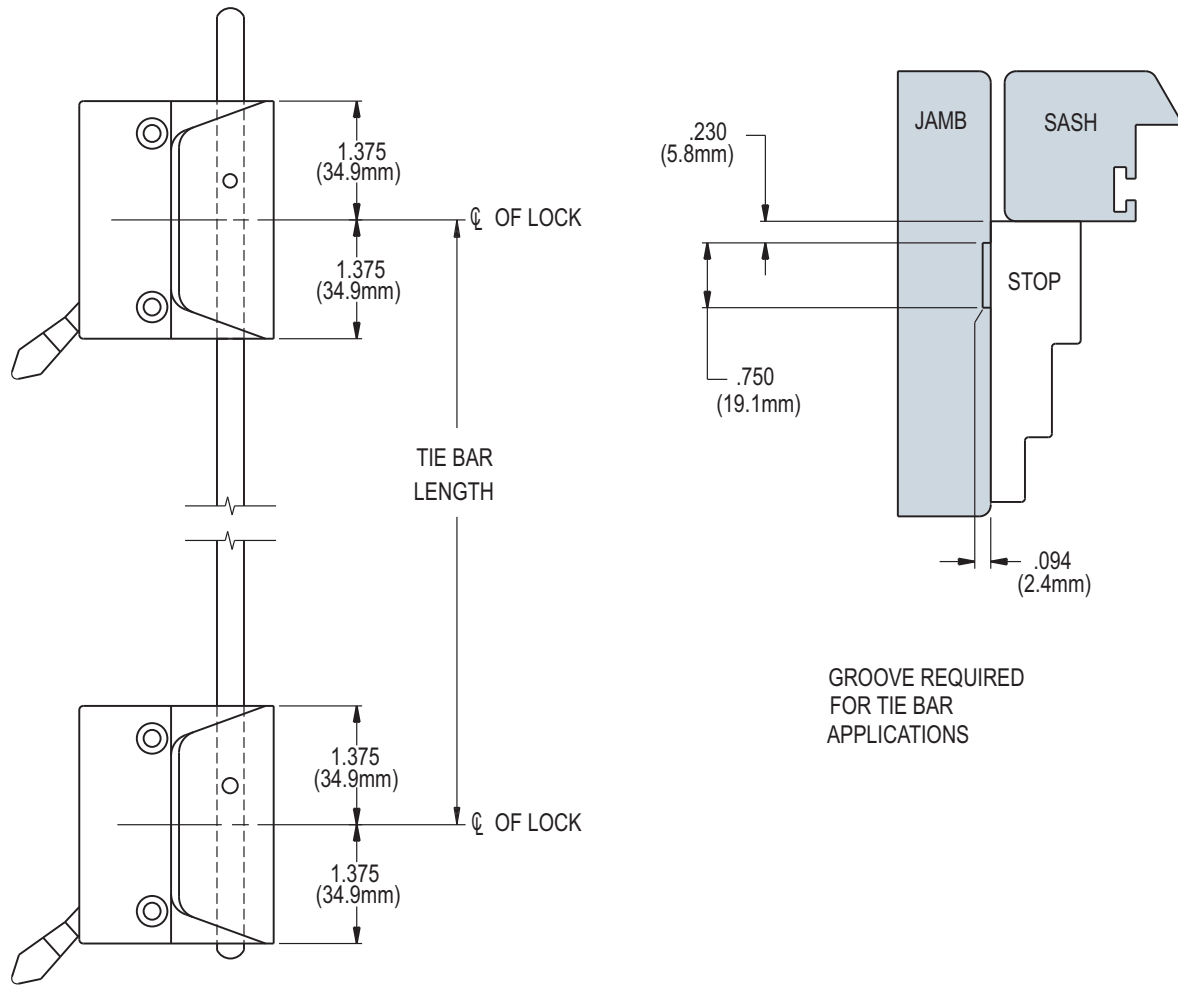
WOOD: 2 (P/N 19240) #8 X 1.0
PHILLIPS, FLAT HEAD
SHEET METAL SCREWS

PVC/METAL: LENGTH AND THREAD
TYPE DETERMINED BY PROFILE.

STAINLESS STEEL SCREWS
(P/N 19250) MUST BE USED WITH

16 NON-HANDED, LOW PROFILE SASH LOCK

FIG. 5 APPLICATION OF TIE-BAR FOR LOW PROFILE CASEMENT SASH LOCK



LEFT HAND SHOWN

CONTACT TRUTH FOR AVAILABLE TIE BAR SIZES



HOMEWARD® SASH LOCK

Truth Hardware's new HomeGard Sash Lock with its smooth contemporary styling and impressive list of features is certain to be a hit. Designed around our very popular Low Profile Sash Lock dimensions, the #16.52 HomeGard Sash Lock will be a perfect replacement for someone wishing to upgrade their window system without having to alter current stops or screen sizes.

INSTALLATION

The HomeGard Sash Lock is engineered to be more forgiving when applying the locks and keepers on the sash and frame. This benefit is of even greater importance in the field where installation and sash drag can affect lock-up.

CONSISTENT, SECURE FEEL

A strong detent at fully locked and unlocked positions provide the homeowner with a consistent feeling of security each time the lock is operated. Another advantage of this detent is that it makes this lock virtually pick-proof (depending upon window design).

STYLISH APPEARANCE

The HomeGard Sash Lock has new attractive aesthetics which continue Truth's efforts to design hardware for the 21st century. The softer lines follow in the footsteps of Truth Hardware's Multi-Point® Locks, Metal Operator Cover and Folding Handle. We have also eliminated the infamous "black hole" from the front of the HomeGard Lock. This change not only improves aesthetics, but also increases weathertightness.

SUPERIOR CAPABILITIES

Exceptional .625" (15.8 mm) reach-out for maximum pull-in of the sash. When properly installed, the HomeGard has been tested to withstand negative air pressure of a minimum 275 lbs. per lock. The HomeGard Sash Lock is capable of tandem locking when dual locking is required and the #16.53 HomeGard Secondary Lock and tie bar are used.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.



E-GARD® HARDWARE

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

MATERIAL: High-pressure die-cast zinc locking handle and case with galvanized steel back plate. High-strength plastic latch and steel keeper.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. For tandem operation lower (primary) and upper (secondary) locks must be ordered separately (specify by part number):
#16.52 HomeGard Sash Lock
#16.53 HomeGard (secondary) Sash Lock. Note: #16.53 only used in tie bar applications.
2. Specify finish number.
3. Select mounting hardware sold separately.
#41268 LH Keeper with slotted hole.
#41269 RH Keeper with slotted hole.
4. Specify between galvanized wire tie bars and flat steel tie bars. Contact Truth Hardware for additional information.
5. Optional mounting hardware:
#90082 LH Keeper Template
#90083 RH Keeper Template

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. See Tech Note #11. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

1. Mounting templates are available to aid in locating the correct mounting hole positions for the sash lock and keeper.
2. When tandem operation of two sash locks are used, the tie bar must be confined to prevent buckling. This is most easily accomplished by confining the tie bar route within the frame (See drawings for routing options).
3. To apply a tie bar to a pair of sash locks, simply insert the pins on the tie bar into the holes provided on the back of the sash locks.
4. In wood window applications, make sure that fasteners do not interfere with movement of the tie bar.
5. Sash Lock has .625" (15.8 mm) of reach-out to pull the sash in tight against the weatherstripping.
6. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware.
7. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
8. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
9. For metal window profiles, Truth Hardware recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.
10. Truth Hardware recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of the window.

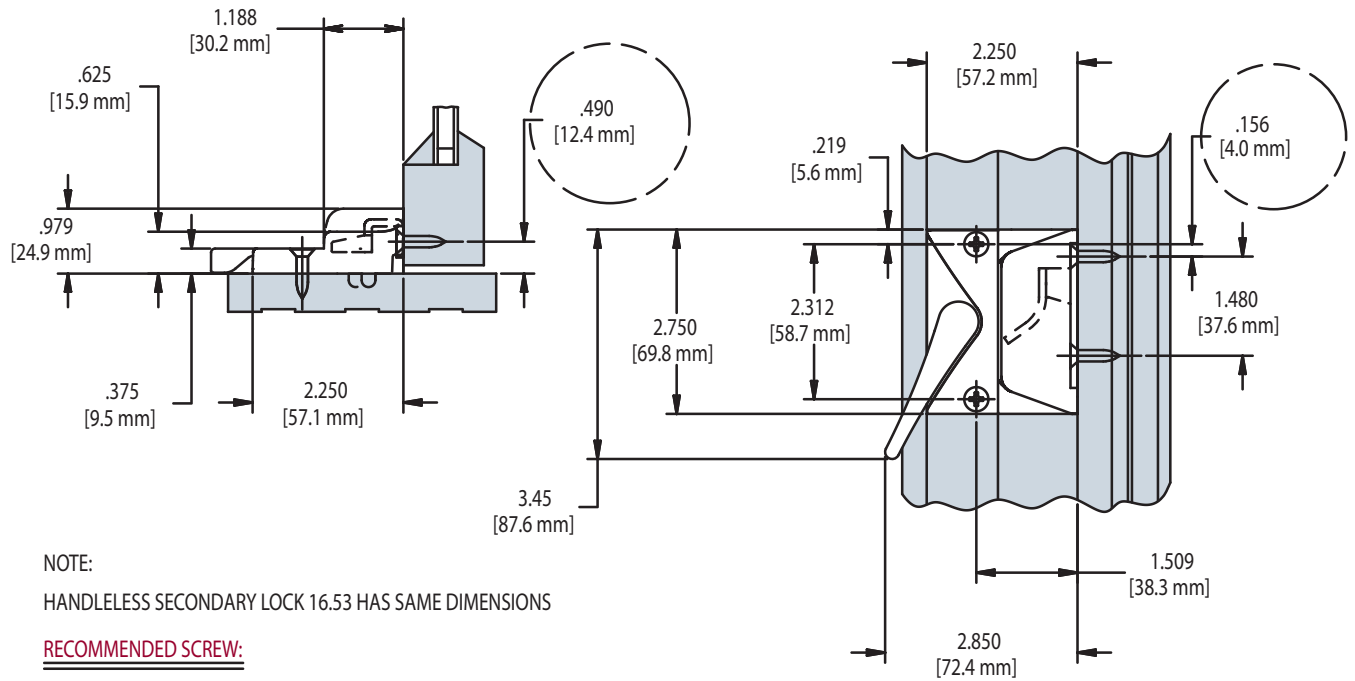
INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window sash locks shall be included which will increase both security and weather seal tightness. The lock must also allow easy removal of window screen panel. The locks must hold securely up to 275 lbs. of force per lock for negative air pressure and forced entry resistance.

Window sash locks will be used which provide .625" (15.8 mm) of pull-in created by a sliding latch locking mechanism. The lock must also allow tandem operation of two locks to meet ADA hardware height standards. The lock shall be constructed of high pressure zinc alloy die castings, stainless steel spring, high strength plastic latch, galvanized back plate, and E-Gard® Hardware keepers.

Window locks shall be 16 series HomeGard Sash Locks as manufactured by Truth Hardware, Owatonna, Minnesota.

FIG. 1 16.52 CASEMENT SASH LOCK



NOTE:
HANDLESS SECONDARY LOCK 16.53 HAS SAME DIMENSIONS

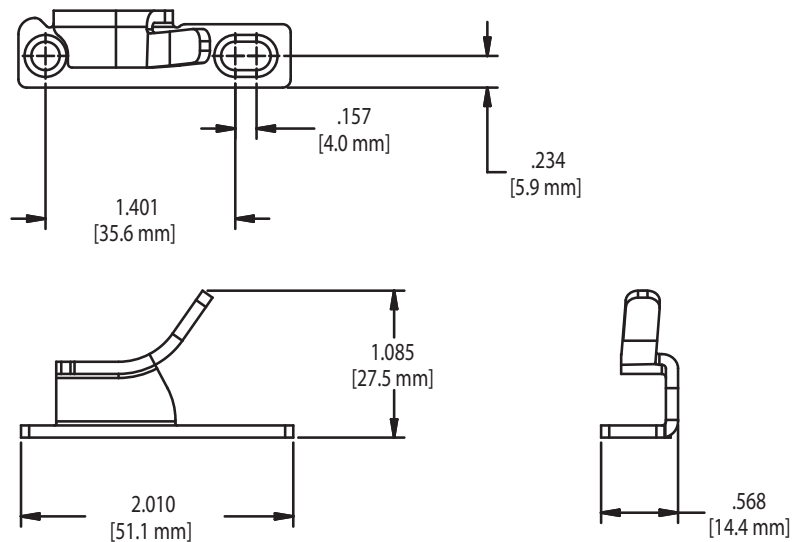
RECOMMENDED SCREW:

WOOD: 2 (P/N 19260) #8 X 1.25 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS (PAINTED)

PVC/METAL: 2-#8 PAN HEAD SCREW (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NON-HANDED

FIG. 2 16.52 & 16.53 KEEPERS 41268 (LH) & 41269 (RH)



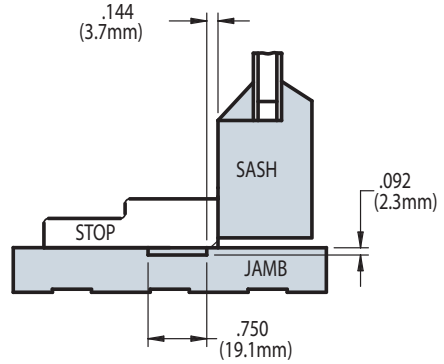
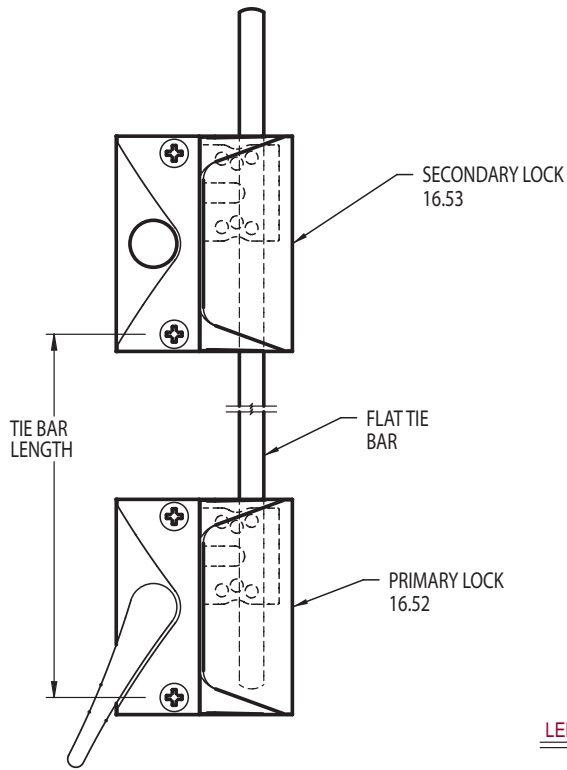
RECOMMENDED SCREW:

WOOD: 2 (P/N 19240) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS (PAINTED)

PVC/METAL: 2-#8 PAN HEAD SCREW (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

LEFT HAND SHOWN

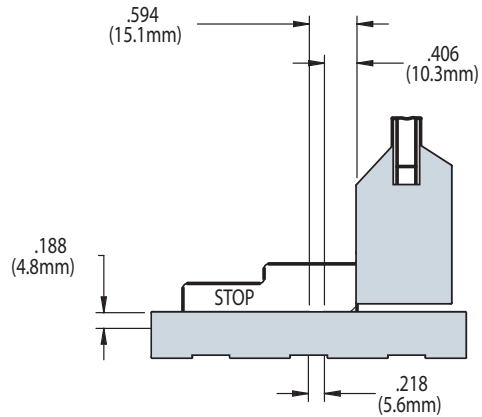
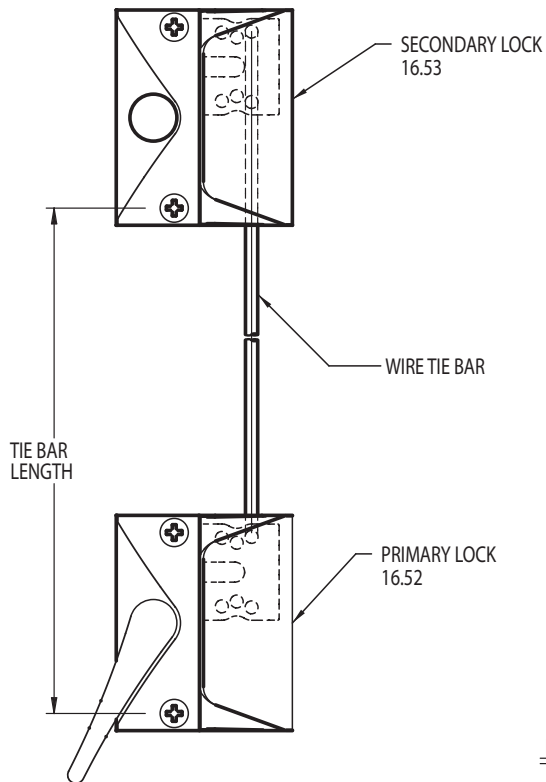
FIG. 3 APPLICATION OF TIE-BAR FOR 16.52 CASEMENT SASH LOCK



ROUTE PROFILE FOR FLAT TIE BAR CAVITY

CONTACT TRUTH FOR AVAILABLE TIE BARS

LEFT HAND SHOWN



ROUTE PROFILE FOR WIRE TIE BAR CAVITY

CONTACT TRUTH FOR AVAILABLE TIE BARS

LEFT HAND SHOWN



The EntryGard® Sash Lock has a big .625” (15.8 mm) reach-out for maximum pull-in of the sash. This lock design comes in handed and non-handed versions for standard or optional tandem applications on large casement windows. When properly mounted, this lock withstands negative air pressure in commercial and high-wind geographic areas —up to 200 lbs. of force per lock. These locks will securely hold the sash against weather-stripping to help prevent water and air leakage. A cut-out along the lock case allows for continuous weatherstrip.

Designed as a replacement for Truth’s #16.16 Sash Lock, this lock features a keeper larger than that used on the #16.16 Lock providing better stability and strength. The EntryGard Casement Sash Lock will immediately retrofit into any screen stop profile presently designed around Truth’s #16.16 Sash Lock.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth’s Terms and Conditions for further details.

MATERIAL: High-pressure die-cast zinc case and locking handle. Zinc dichromate plated steel back plate and keeper. Steel locking cam.

E-GARD® HARDWARE

Truth’s E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth’s Color Chart for examples of Truth’s most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.



ORDERING INFORMATION & OPTIONS:

1. Choose EntryGard Sash Lock style desired (specify by part number):
#16.27 - Handed
#16.30 - Handed (tie bar compatible)
 Note: Handing is determined by the side the hinge is on when viewed from the outside.
2. Specify finish number.
3. Select mounting hardware (sold separately):
#30827 - Keeper
#91674 - Template (optional)
 Tie Bars —See table for the tie bar that best meets your application needs.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. See Tech Note #11. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TIE BARS

Tie Bar Part No.	B Dimension
10542	18.500 (469.9mm)
10412	20.375 (517.5mm)
10309	22.875 (581.0mm)
10353	23.312 (592.1mm)
10492	27.750 (704.9mm)
10413	28.875 (733.4mm)
10543	30.500 (774.7mm)
10310	34.875 (885.8mm)
10347	35.312 (896.9mm)
10544	38.500 (977.9mm)
10348	43.312 (1100.1mm)
10311	46.875 (1190.6mm)

TRUTH TIPS:

1. Mounting templates are available to aid in locating the correct mounting hole positions for the sash lock and keeper.
2. When tandem operation of two sash locks are used, the tie bar must be confined to prevent buckling. This is most easily accomplished by confining the tie bar in a route or channel on the back side of the stop (See drawings).
3. To apply a tie bar to a pair of sash locks, simply insert the pins on the tie bar into the holes provided on the back of the tie bar compatible sash locks.
4. In wood window applications, make sure that fasteners do not interfere with movement of the tie bar.
5. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware.
6. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
7. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
8. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.
9. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of the window.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window sash locks shall be included which will increase both security and weather seal tightness. The lock will also allow easy removal of window screen panel. The locks must hold securely up to 200 lbs. of force per lock for negative air pressure and forced entry resistance.

Window sash locks will be used which provide .625" (15.8 mm) of pull-in created by a revolving cam locking mechanism. The lock must also allow tandem operation of two locks to meet ADA hardware height standards. The lock shall be constructed of high pressure zinc alloy die castings and E-Gard® Hardware internal components.

Window locks shall be 16 series, EntryGard® as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF TRUTH ENTRYGARD CASEMENT SASH LOCK

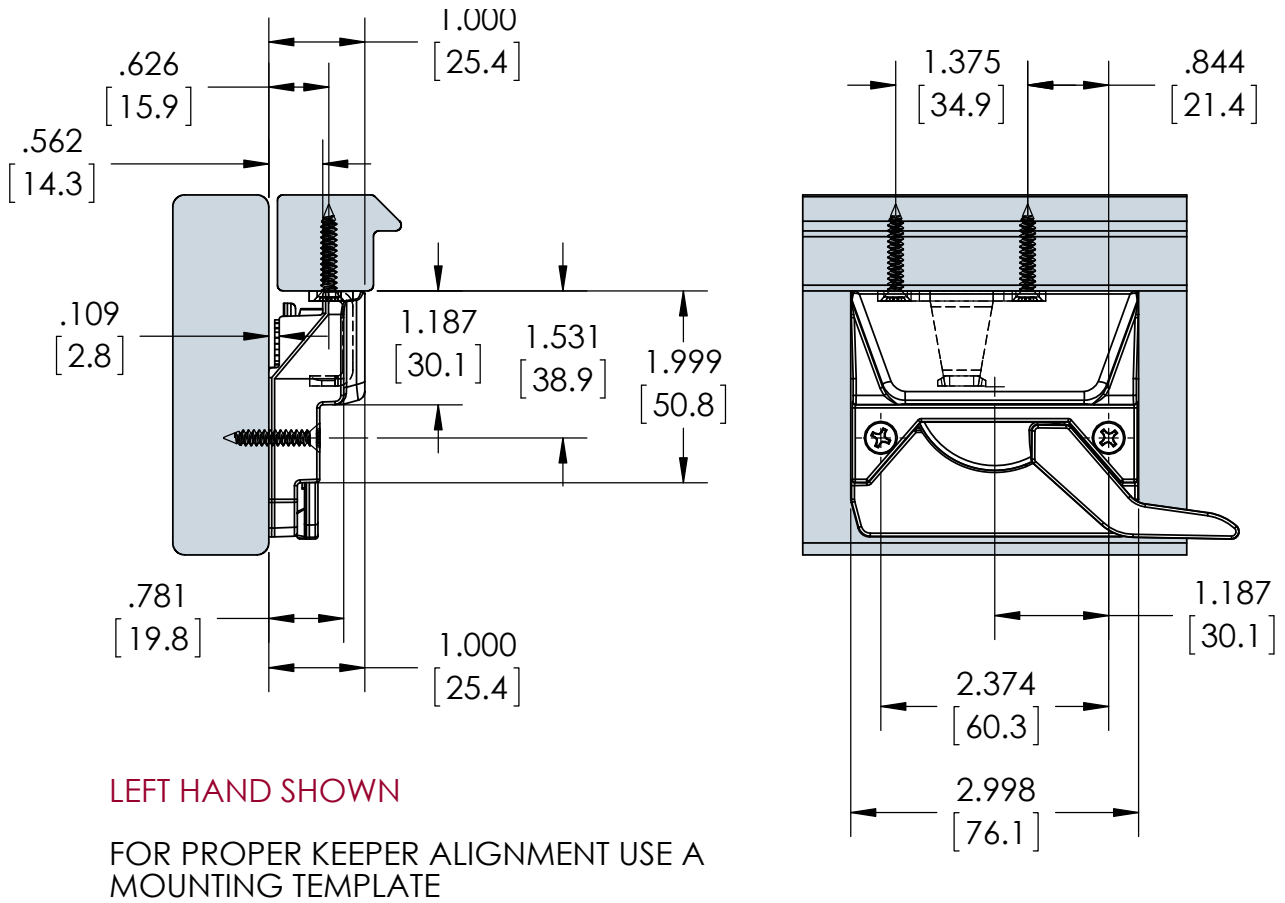
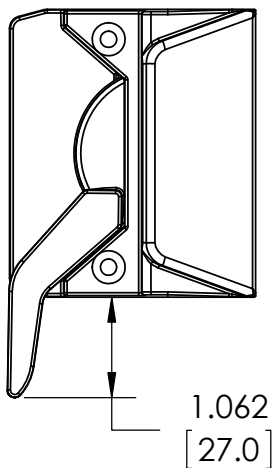


FIG. 2 16.27 AND 16.30 CASEMENT SASH LOCK
(16.30 For Use With Tie Bars)



LEFT HAND SHOWN

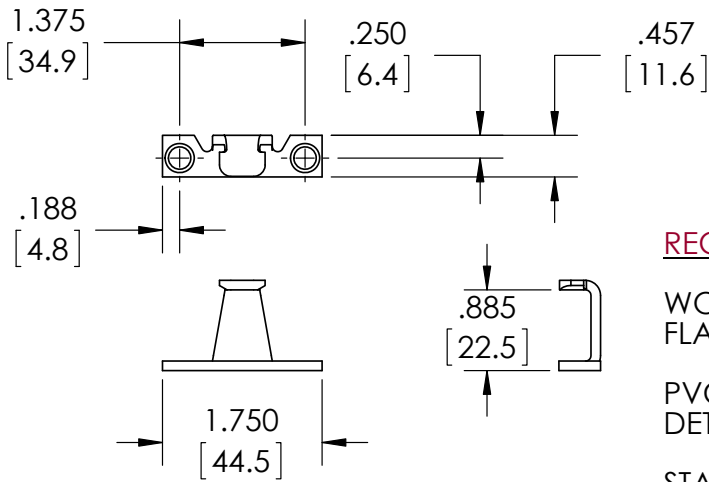
AVAILABLE KEEPERS	MOUNTING TEMPLATE
30827	91674
30899	91674

RECOMMENDED SCREWS:

WOOD: 2 (P/N 19260) #8 X 1.25 PHILLIPS HEAD SHEET METAL SCREWS.

PVC/METAL: 2 #8 PHILLIPS FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 3 CASEMENT SASH LOCK KEEPERS
30827 (Steel) AND 30899 (SST)



AVAILABLE SASH LOCKS
16.27
16.30

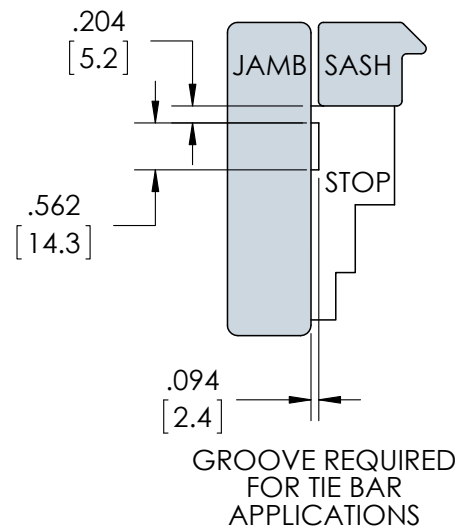
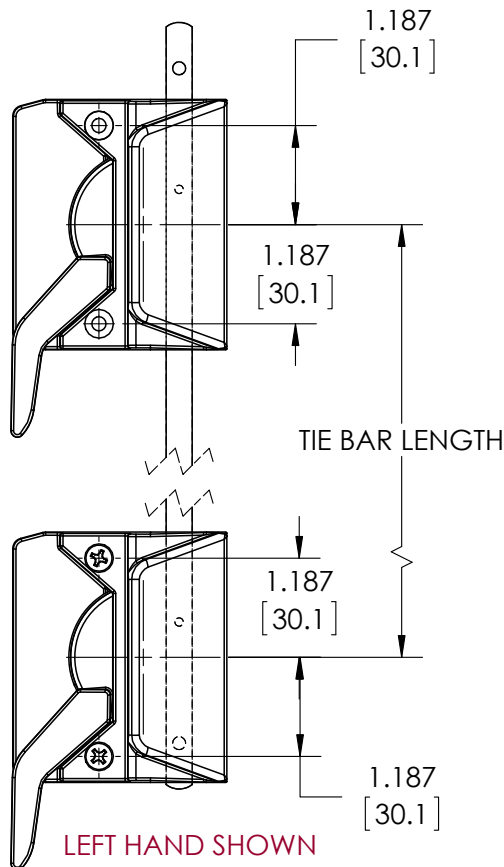
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19240) #8 X 1.0 PHILLIPS
FLAT HEAD SHEET METAL SCREWS

PVC/METAL: LENGTH AND THREAD TYPE
DETERMINED BY PROFILE

STAINLESS STEEL SCREWS (P/N 19250)
MUST BE USED WITH STAINLESS KEEPERS

FIG. 4 APPLICATION OF TIE BAR FOR TRUTH CASEMENT SASH LOCK



16.30 SASH LOCK SHOWN

CONTACT TRUTH FOR AVAILABLE
TIE BAR LENGTHS.



Expanding our product offering in the line of Multi-Point Locking Systems, Truth introduces - the **Mirage® Concealed Multi-Point Locking System.**

VERSATILE & EFFICIENT

The attractiveness of this system lies in great part to the things that you can't see, because the Mirage's slim-line handle and escutcheon are barely noticeable! The unique design of this locking system also allows the handle and escutcheon to be removable for color changes in the field, or for painting or staining wood trim. Non-handed parts will help in ordering, inventory reduction, and applying this hardware.

CONCEALED MULTI-POINT LOCKING

Truth's multi-point locking feature is unique in that it sequentially locks the window from bottom to top. Up to three locking points are achievable using this system allowing the homeowner to securely lock tall, or poorly installed windows, all from just one, convenient location. All locking points are concealed to create a clean look for your window system. The tie bar guides are "pre-located" on the tie bars for quick and easy installation onto the window frame. This system is mounted directly onto the frame thus eliminating any modifications to the frame. Only the stop requires any routing to accept the hardware.

PERFORMANCE & FUNCTION

The secret behind the smooth, low torque, operation of this system is the unique interaction between the tie bars and keeper rollers. Truth's new Mirage Lock has an exceptional .625" (15.9 mm) pull-in. The design of this system has been tested to an average of 245 lbs. per locking point in forced entry testing. It has + .125" vertical and + .075" horizontal lock-up and application forgiveness.

PRODUCT APPLICATION ASSISTANCE

If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

CORROSION RESISTANCE

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High pressure zinc die-cast handle and escutcheon. Steel tie bar with engineered plastic guides. Keepers made of high strength steel and UV resistant acetal rollers.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.



ORDERING INFORMATION

Contact Truth Hardware for an application drawing providing complete details.

For both Casement & Awning windows:

1. Order non-handed part:
#16.60.XX.001 Mirage® Lock with insert (for solid wood stops), or
#16.61.XX.002 Mirage® Lock with insert (for extended stops or vinyl windows.).
2. Specify finish number
3. Order Keeper(s):
#11498.92 Non-handed Keeper
4. Determine tie bars required. Refer to accompanying drawings for part #'s and standard available lengths (handing determined by hinge side when viewed from the outside).

RECOMMENDED SCREWS

Types of screw required determined by material of profile used - see Tech Note #11. Refer to drawings for complete information on screw type and quantity needed on your specific window profiles (sold separately).

TRUTH TIPS

1. Make sure that screen stop fasteners do not interfere with the movement of the tie bar.
2. Application drawings show correct orientation of keepers to insure sequential lock-up.
3. When selecting mounting screws for Truth hardware, coating compatibility is a very important criteria. For best corrosion resistance, the coating on the screws should be the same as the coating on the hardware.
4. For accurate hardware placement pre-drilling the window profile is recommended. The most critical is the Insert Link screw.
5. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of the window.

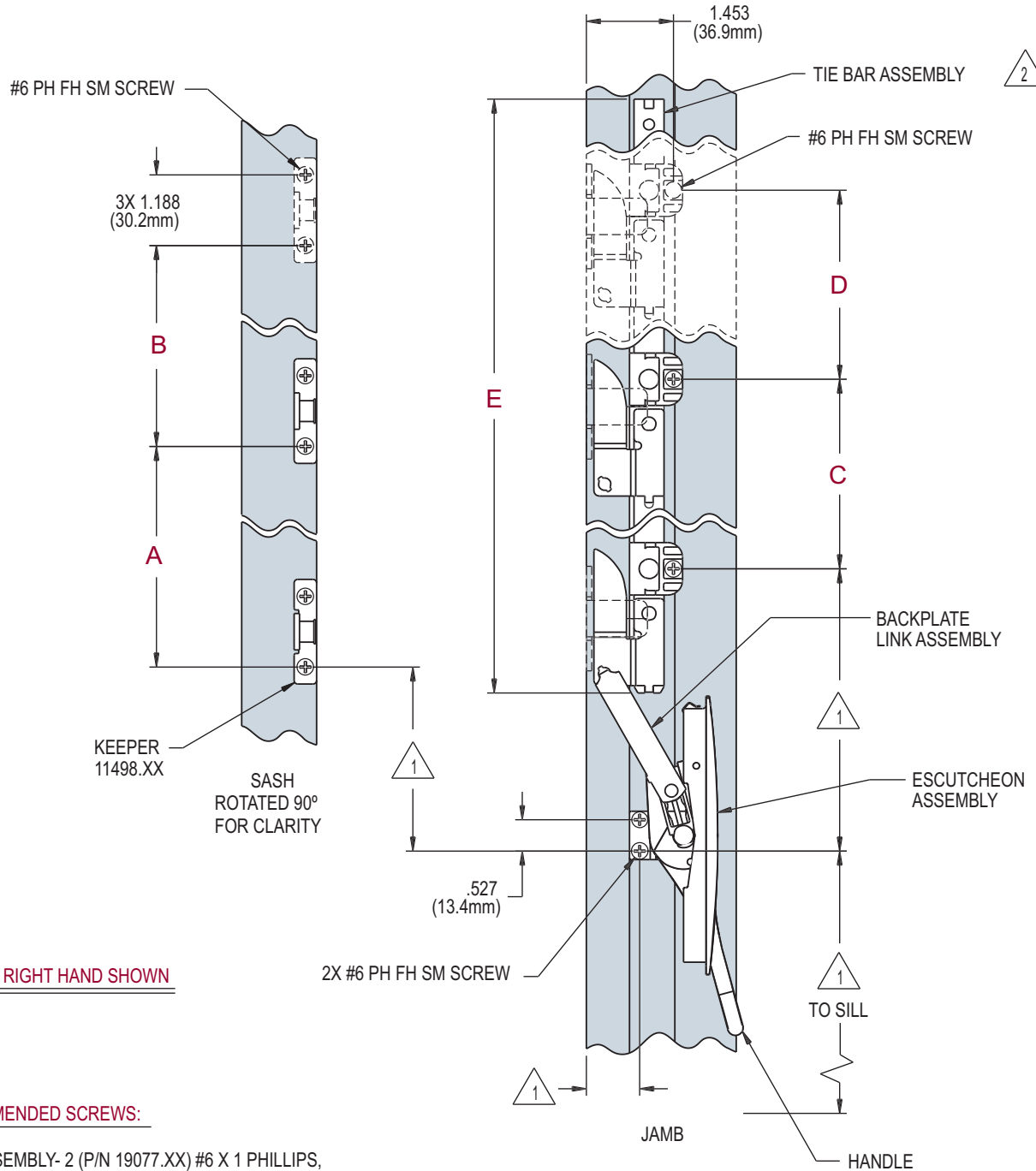
**INCLUDE TRUTH SPECS ON
YOUR NEXT WINDOW PROJECT**

Window locking system shall be included which will increase both security and weather seal tightness. The locking points must hold securely for negative air pressure and forced entry resistance.

Window sash locks will be used which provides .625" (15.9 mm) of pull-in. The lock must utilize a tie bar driven by a single locking handle to meet ADA hardware height standards. The lock must incorporate a multi-point locking feature that sequentially locks the window from bottom to top. The lock must provide for a removable handle and escutcheon for ease in color changes and/or for ease in painting or staining the window. The lock shall be constructed of high pressure zinc alloy die castings, internal E-Gard® hardware, and high quality engineered plastics.

Window locks shall be 16 series, **Mirage®** as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION WITH TWO OR THREE LOCKING POINTS



RIGHT HAND SHOWN

RECOMMENDED SCREWS:

- LINK ASSEMBLY- 2 (P/N 19077.XX) #6 X 1 PHILLIPS, PAN HEAD, SHEET METAL SCREW
- TIE BAR ASSEMBLY - (P/N 19077.XX) #6 X 1 PHILLIPS, PAN HEAD, SHEET METAL SCREW (1 PER LOCKING POINT)
- KEEPER - (P/N 19051.XX) #6 X 1 PHILLIPS, FLAT HEAD, SHEET METAL SCREW (2 PER LOCKING POINT)

PART NUMBER	DESCRIPTION
16.60.XX	ESCUTCHEON, HANDLE AND LINK ASSEMBLY
△ 2	TIE BAR ASSEMBLY (HANDED)
11498.XX	KEEPER (NON-HANDED)

XX DENOTES FINISH CODE


NOTES:

- △ 1 VARIABLE DIMENSION - DEPENDENT ON CUSTOMER PROFILE. CONTACT TRUTH FOR YOUR SPECIFIC APPLICATION.
- △ 2 SEE FIGURE 3 FOR PART NUMBERS AND DIMENSIONS **A, B, C, D** AND **E**
- 3. SEE FIGURE 2 FOR STOP ROUTING DETAIL
- 4. SEE FIGURE 10 FOR PROFILE VIEW.
- 5. SEQUENTIAL LOCK-UP BETWEEN FIRST AND SECOND KEEPERS ONLY.



16 MIRAGE® CONCEALED MULTI-POINT LOCKING SYSTEM (Tie Bar in Jamb version)

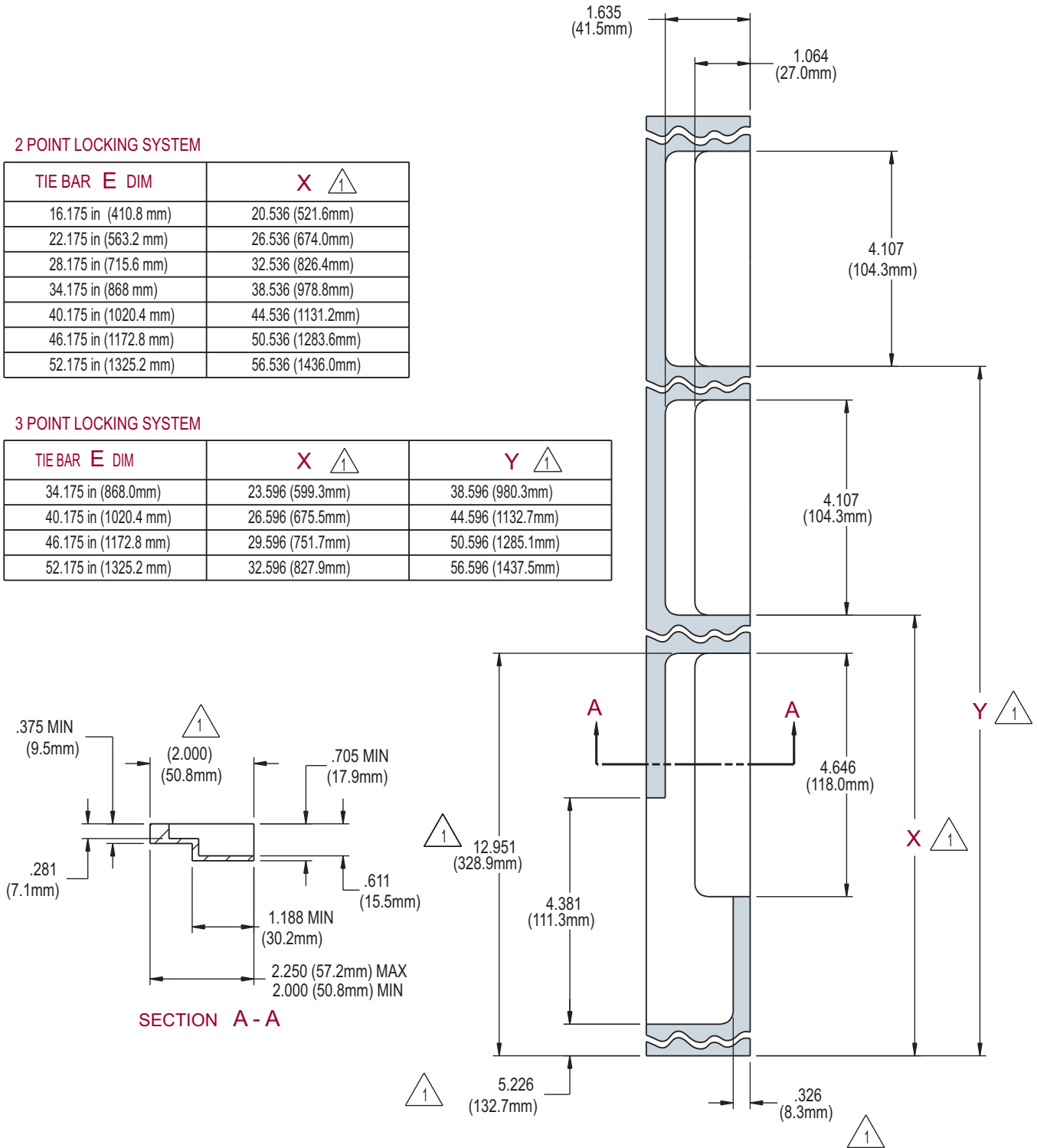
FIG. 2 SIDE STOP ROUTING DETAIL (2 AND 3 LOCKING POINT)

2 POINT LOCKING SYSTEM

TIE BAR E DIM	X 
16.175 in (410.8 mm)	20.536 (521.6mm)
22.175 in (563.2 mm)	26.536 (674.0mm)
28.175 in (715.6 mm)	32.536 (826.4mm)
34.175 in (868 mm)	38.536 (978.8mm)
40.175 in (1020.4 mm)	44.536 (1131.2mm)
46.175 in (1172.8 mm)	50.536 (1283.6mm)
52.175 in (1325.2 mm)	56.536 (1436.0mm)

3 POINT LOCKING SYSTEM

TIE BAR E DIM	X 	Y 
34.175 in (868.0mm)	23.596 (599.3mm)	38.596 (980.3mm)
40.175 in (1020.4 mm)	26.596 (675.5mm)	44.596 (1132.7mm)
46.175 in (1172.8 mm)	29.596 (751.7mm)	50.596 (1285.1mm)
52.175 in (1325.2 mm)	32.596 (827.9mm)	56.596 (1437.5mm)



RIGHT HAND SHOWN

NOTES:


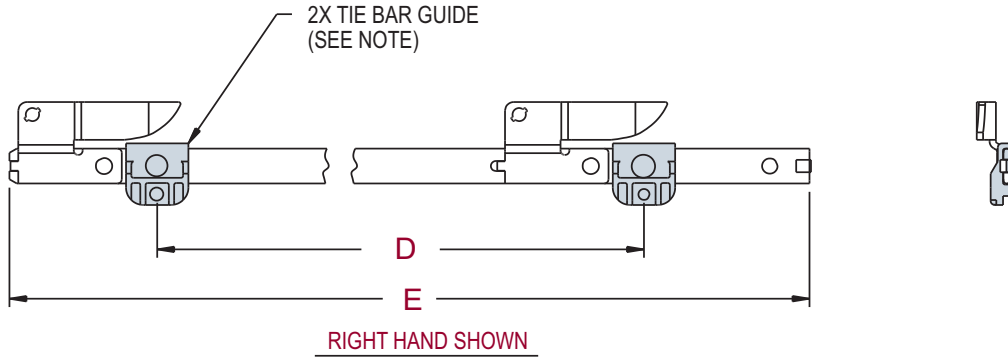
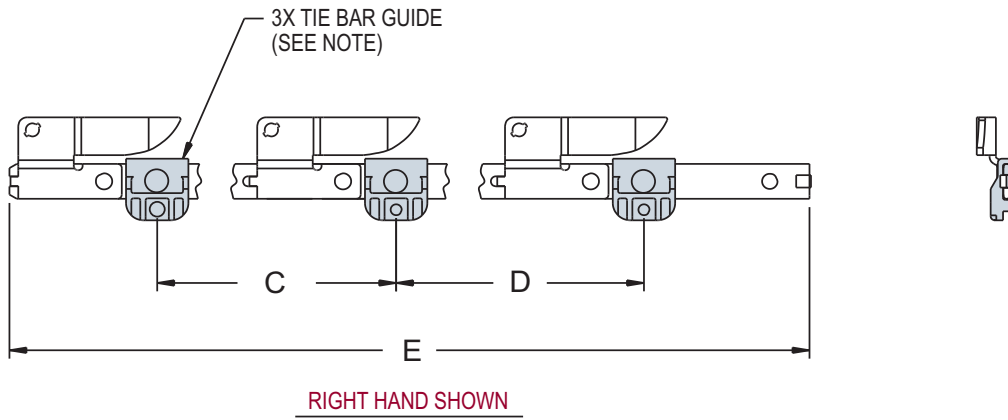
 VARIABLE DIMENSION - DEPENDENT ON CUSTOMER HANDLE LOCATION PREFERENCE AND PROFILES. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY. EXAMPLE SHOWN OF A 2.000" STOP. CONTACT TRUTH FOR YOUR SPECIFIC APPLICATION.

FIG. 3 TIE BAR ASSEMBLY CHART



2 POINT TIE BAR ASSEMBLIES				KEEPER TO KEEPER	
PART NUMBER		DIMENSIONS		DIMENSIONS	
LH	RH	D DIM	E DIM	A DIM	
11507.XX	11508.XX	11.75 in (298.5mm)	16.175 in (410.8mm)	12.00 in (304.8mm)	
11509.XX	11510.XX	17.75 in (450.9mm)	22.175 in (563.2mm)	18.00 in (457.2mm)	
11511.XX	11512.XX	23.75 in (603.3mm)	28.175 in (715.6mm)	24.00 in (609.6mm)	
11513.XX	11514.XX	29.75 in (755.7mm)	34.175 in (868mm)	30.00 in (762mm)	
11515.XX	11516.XX	35.75 in (908.1mm)	40.175 in (1020.4mm)	36.00 in (914.4mm)	
11517.XX	11518.XX	41.75 in (1060.5mm)	46.175 in (1172.8mm)	42.00 in (1066.8mm)	
11519.XX	11520.XX	47.75 in (1212.9mm)	52.175 in (1325.2mm)	48.00 in (1219.2mm)	



3 POINT TIE BAR ASSEMBLIES					KEEPER TO KEEPER	
PART NUMBER		DIMENSIONS			DIMENSIONS	
LH	RH	C DIM	D DIM	E DIM	A DIM	B DIM
11521.XX	11522.XX	14.75 in (298.5mm)	15.00 in (381 mm)	34.175 in (868 mm)	15.00 in (381 mm)	15.00 in (381 mm)
11523.XX	11524.XX	17.75 in (450.9mm)	18.00 in (457.2mm)	40.175 in (1020.4 mm)	18.00 in (457.2mm)	18.00 in (457.2mm)
11525.XX	11526.XX	20.75 in (527.1mm)	21.00 in (533.4mm)	46.175 in (1172.8 mm)	21.00 in (533.4mm)	21.00 in (533.4mm)
11527.XX	11528.XX	23.75 in (603.3mm)	24.00 in (609.6mm)	52.175 in (1325.2 mm)	24.00 in (609.6mm)	24.00 in (609.6mm)

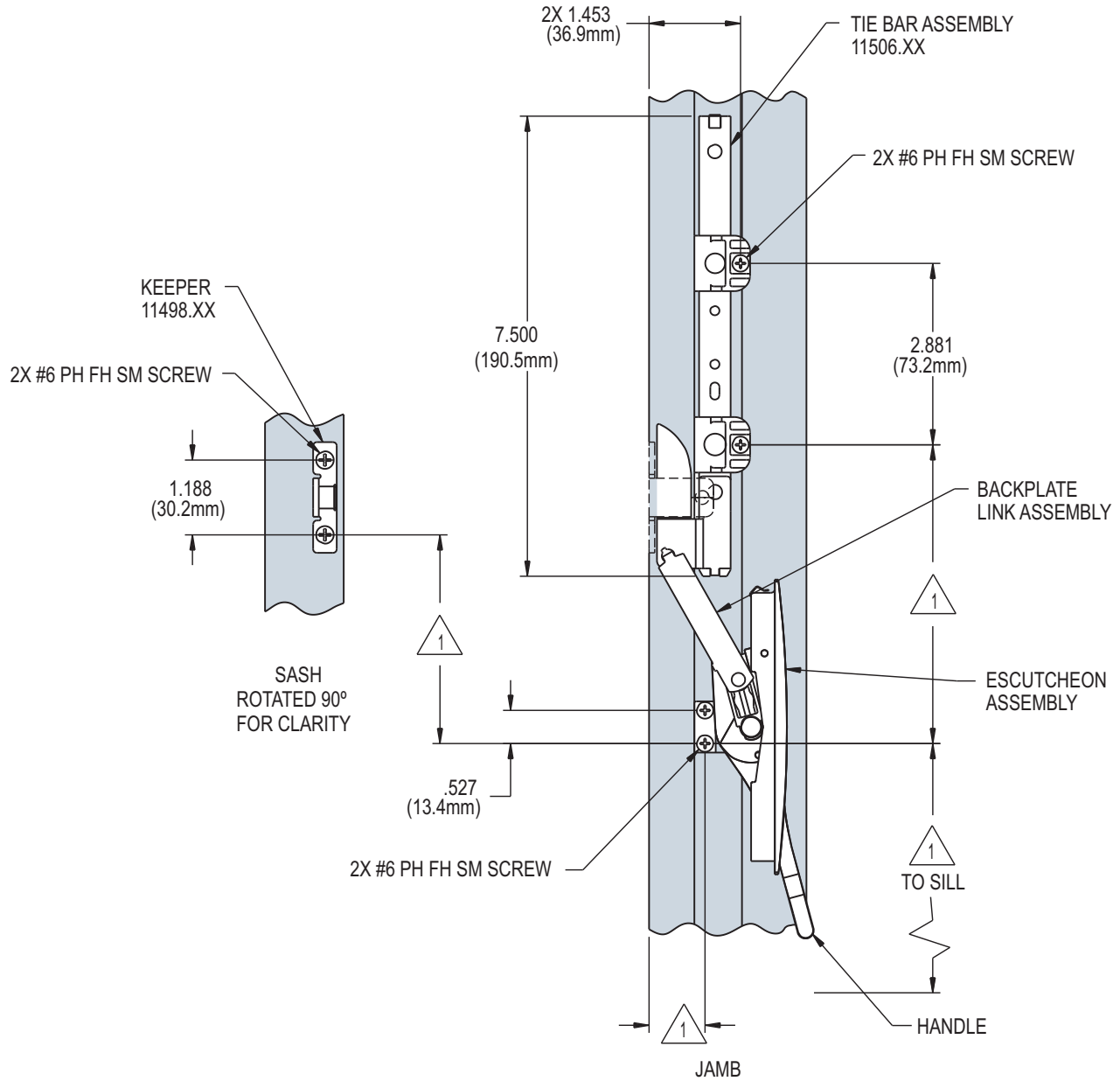
XX DENOTES FINISH CODE

NOTE:

1. TIE BAR GUIDES ARE PRE-LOCATED ON BAR.

16 MIRAGE® CONCEALED MULTI-POINT LOCKING SYSTEM (Tie Bar in Jamb version)

FIG. 4 APPLICATION OF SINGLE LOCKING POINT



RECOMMENDED SCREWS:

- LINK ASSEMBLY- 2 (P/N 19077.XX) #6 X 1 PHILLIPS, PAN HEAD, SHEET METAL SCREW
- TIE BAR ASSEMBLY - 2 (P/N 19077.XX) #6 X 1 PHILLIPS, PAN HEAD, SHEET METAL SCREW
- KEEPER- 2 (P/N 19051.XX) #6 X 1 PHILLIPS, FLAT HEAD, SHEET METAL SCREW

RIGHT HAND SHOWN

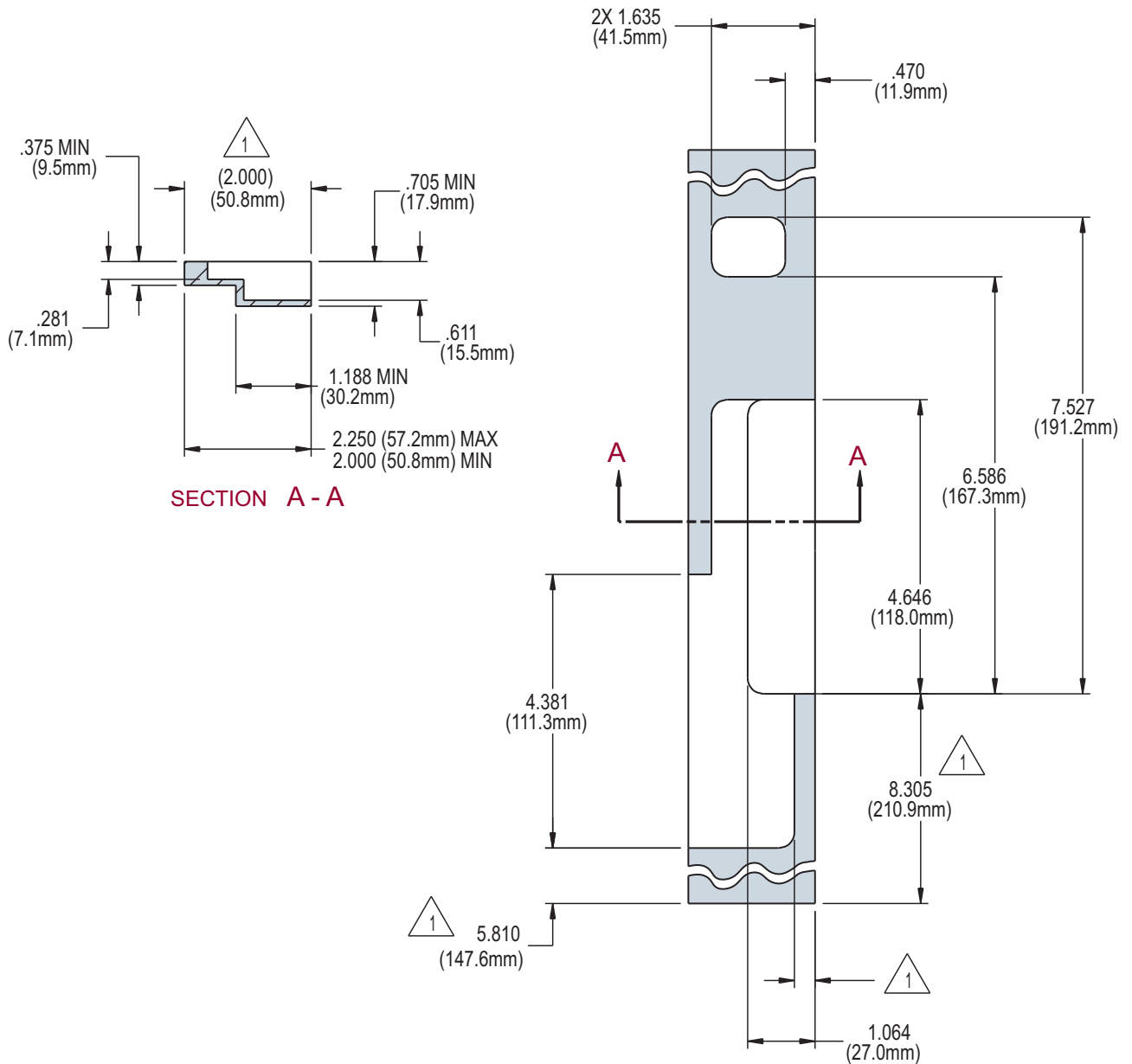
PART NUMBER	DESCRIPTION
16.60.XX	ESCUTCHEON, HANDLE AND LINK ASSEMBLY
11506.XX	RH TIE BAR ASSEMBLY (LH P/N 11505.XX)
11498.XX	KEEPER (NON-HANDED)

XX DENOTES FINISH CODE

NOTE:


- 1 VARIABLE DIMENSION - DEPENDENT ON CUSTOMER PROFILE. CONTACT TRUTH FOR YOUR SPECIFIC APPLICATION.
- 2. SEE FIGURE 5 FOR STOP ROUTING DETAIL.
- 3. SEE FIGURE 10 FOR PROFILE VIEW.

FIG. 5 SIDE STOP ROUTING DETAIL (SINGLE LOCKING POINT)



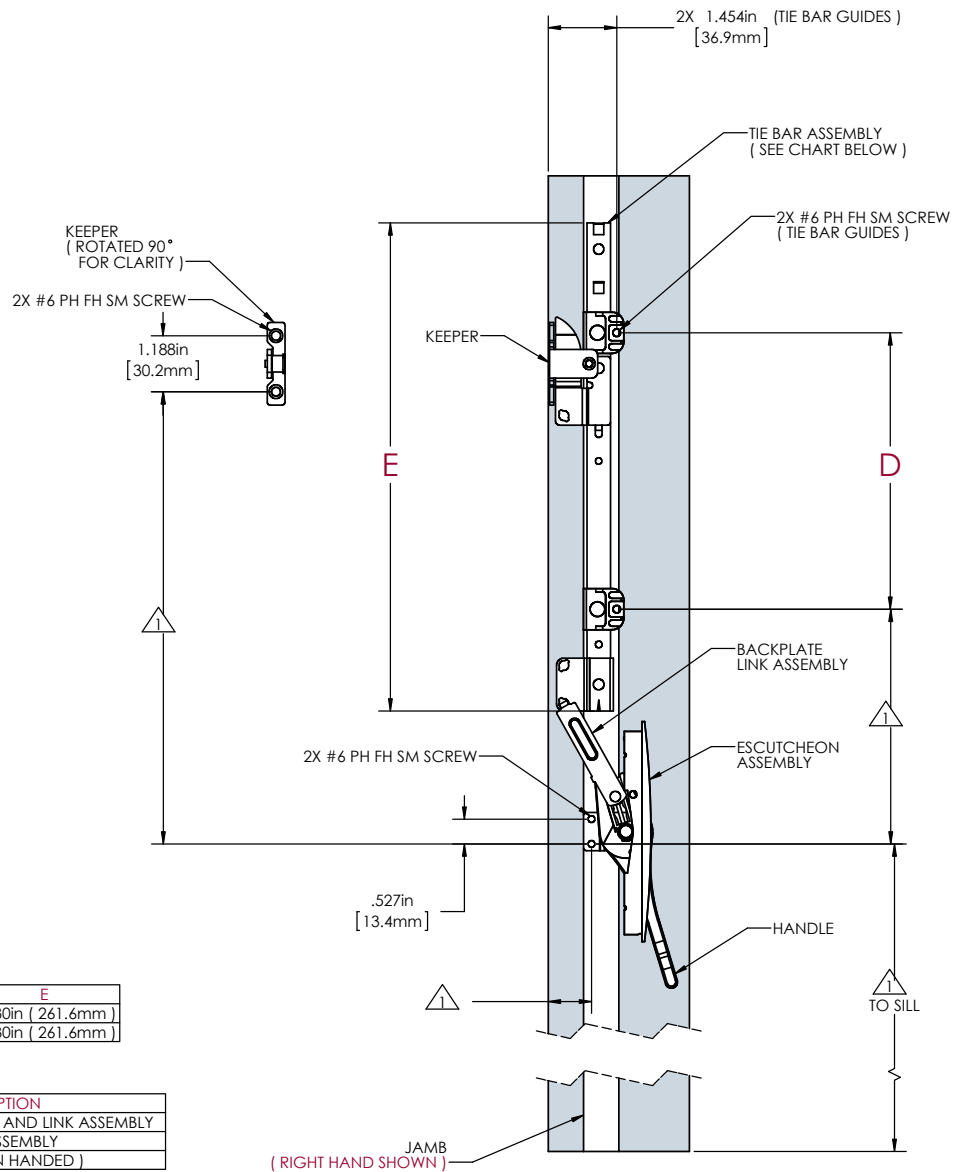
RIGHT HAND SHOWN

NOTES:

- 
 VARIABLE DIMENSION - DEPENDENT ON CUSTOMER HANDLE LOCATION PREFERENCE AND PROFILES. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY. EXAMPLE SHOWN IS A 2.000" STOP. CONTACT TRUTH FOR YOUR SPECIFIC APPLICATION.

16 MIRAGE® CONCEALED MULTI-POINT LOCKING SYSTEM (Tie Bar in Jamb version)

FIG. 6 APPLICATION OF SINGLE POINT WITH DRIVER MECHANISM



PART NUMBER	D	E
11503.XX (LH)	5.80in (147.3mm)	10.30in (261.6mm)
11504.XX (RH)	5.80in (147.3mm)	10.30in (261.6mm)

PART NUMBER	DESCRIPTION
16.60.XX.XXX	ESCUTCHEON HANDLE AND LINK ASSEMBLY
SEE CHART ABOVE	TIE BAR ASSEMBLY
11498.XX	KEEPER (NON HANDED)

XX DENOTES FINISH CODE

NOTES:

1. VARIABLE DIMENSION - DEPENDENT ON CUSTOMER PROFILE. CONTACT TRUTH HARDWARE FOR YOUR SPECIFIC APPLICATION.
2. SEE FIGURE 7 FOR STOP ROUTING DETAIL.
3. SEE FIGURE 10 FOR PROFILE VIEW.

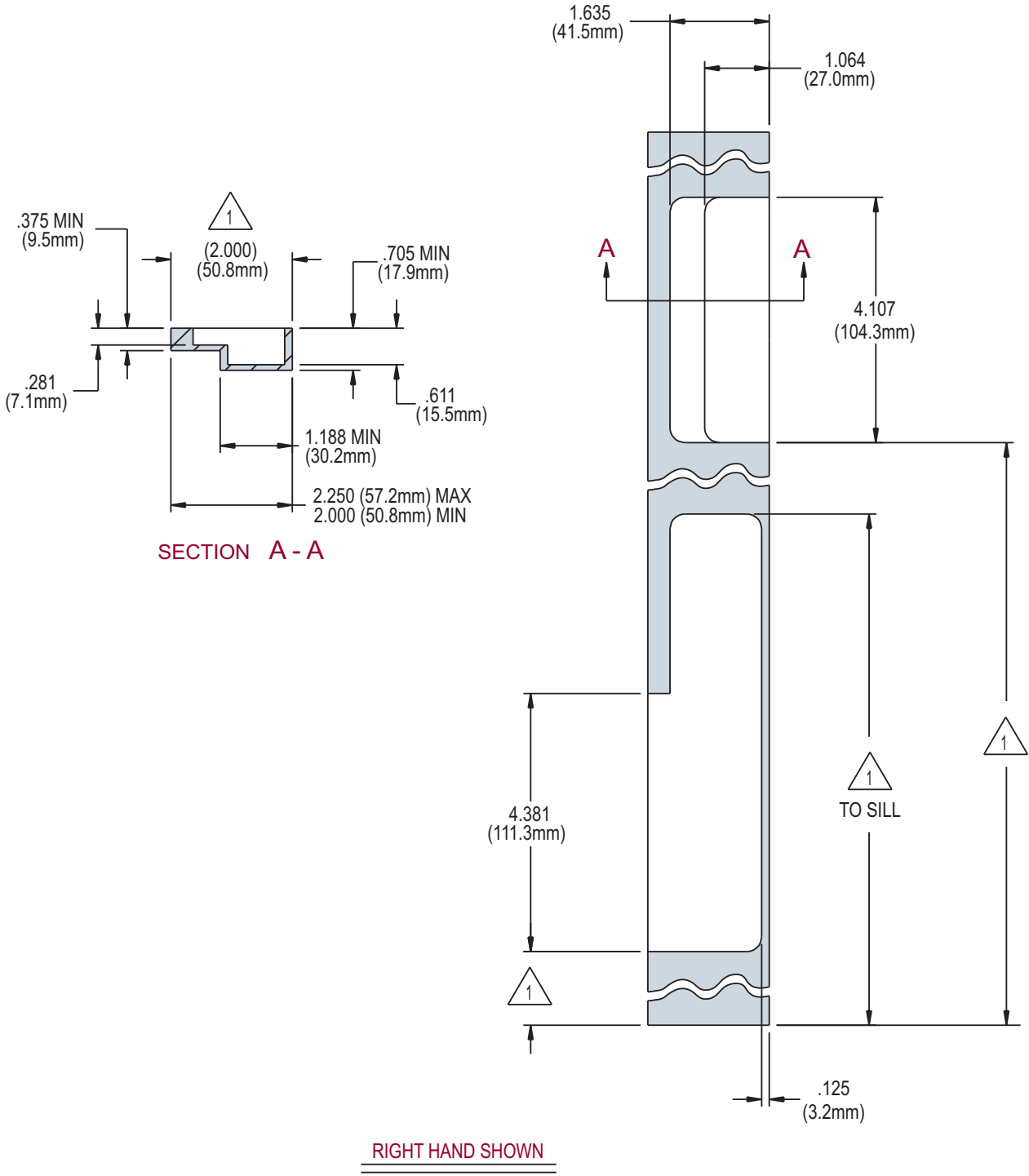
RECOMMENDED SCREWS:

LINK ASSEMBLY - 2 (P/N 19077.XX) #6 X 1 PHILLIPS PAN HEAD SHEET METAL SCREW.


TIE BAR ASSEMBLY - 2 (P/N 19077.XX) #6 X 1 PHILLIPS PAN HEAD SHEET METAL SCREW.

KEEPER - 2 (P/N 19051.XX) #6 X 1 PHILLIPS FLAT HEAD SHEET METAL SCREW.

FIG. 7 SIDE STOP ROUTING DETAIL (SINGLE POINT WITH DRIVER MECHANISM)

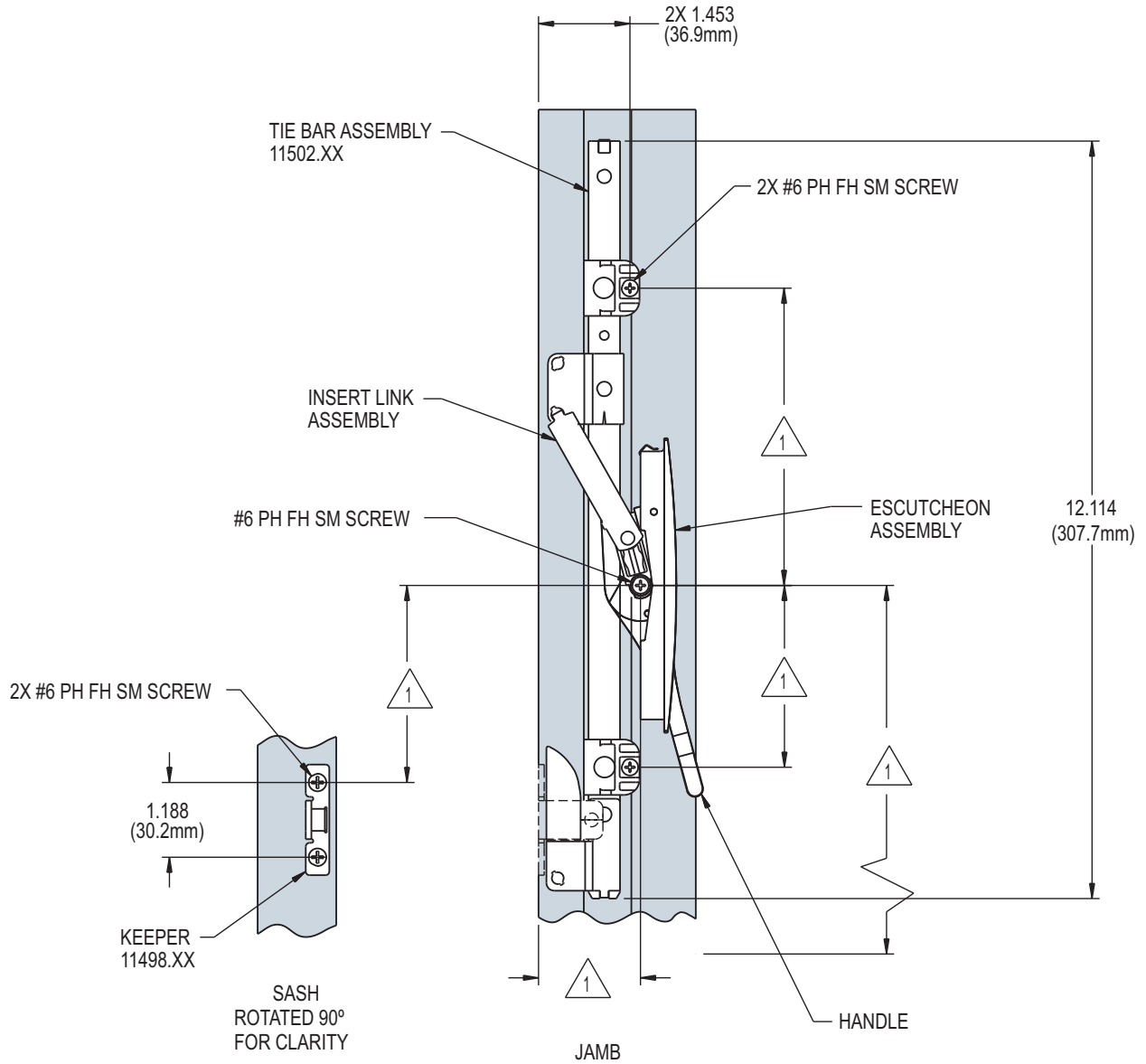


NOTES:

 VARIABLE DIMENSION - DEPENDENT ON CUSTOMER HANDLE LOCATION PREFERENCE AND PROFILES. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY. EXAMPLE SHOWN IS A 2.000" STOP. CONTACT TRUTH FOR YOUR SPECIFIC APPLICATION.

16 MIRAGE® CONCEALED MULTI-POINT LOCKING SYSTEM (Tie Bar in Jamb version)

FIG. 8 AWNING APPLICATION



RIGHT HAND SHOWN

RECOMMENDED SCREWS:

- LINK ASSEMBLY- 1 (P/N 19077.XX) #6 X 1 PHILLIPS, PAN HEAD, SHEET METAL SCREW
- TIE BAR ASSEMBLY - 2 (P/N 19077.XX) #6 X 1 PHILLIPS, PAN HEAD, SHEET METAL SCREW
- KEEPER- 2 (P/N 19051.XX) #6 X 1 PHILLIPS, FLAT HEAD, SHEET METAL SCREW

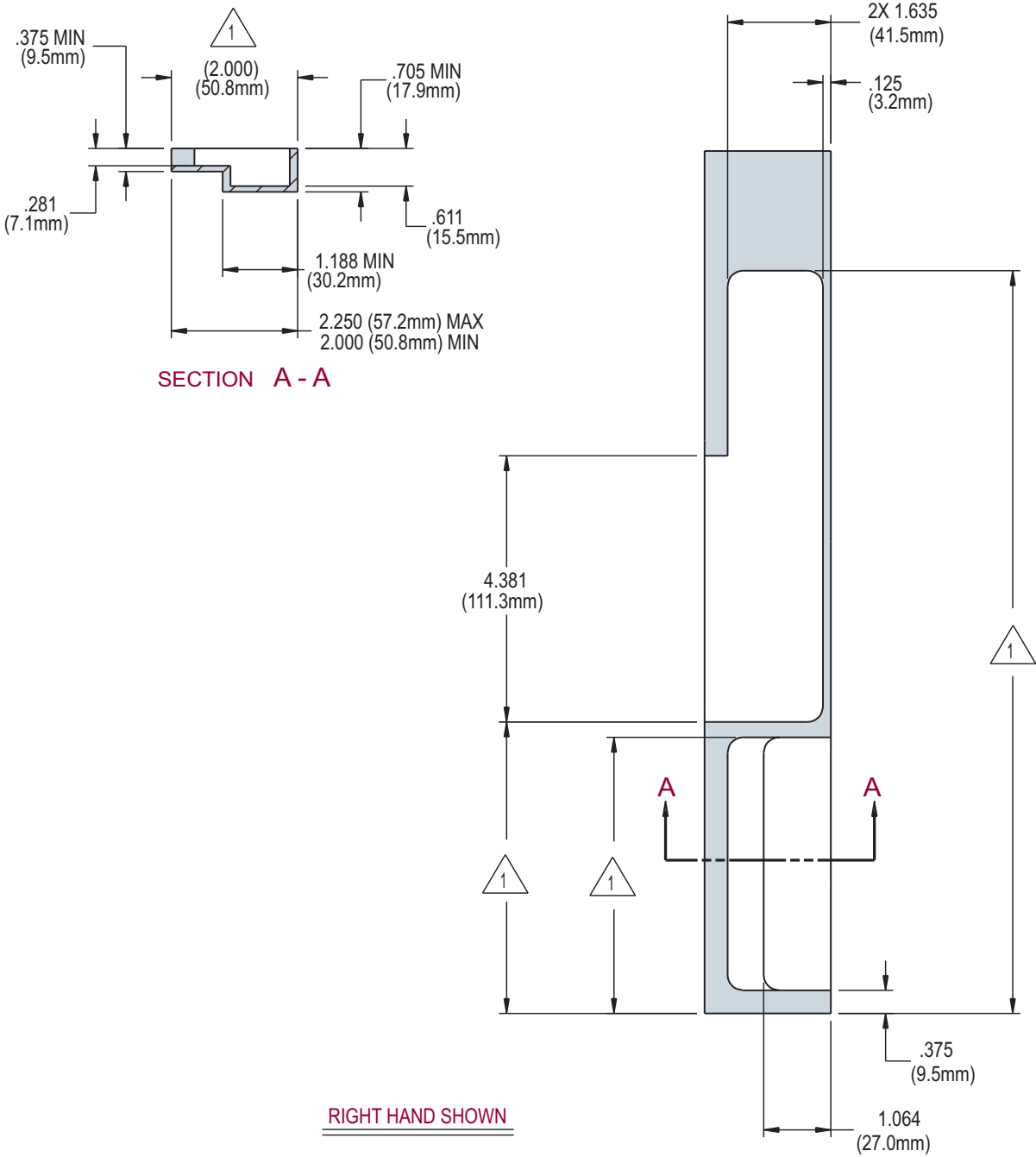
PART NUMBER	DESCRIPTION
16.61.XX	ESCUTCHEON, HANDLE AND LINK ASSEMBLY
11502.XX	RH TIE BAR ASSEMBLY (LH P/N 11501.XX)
11498.XX	KEEPER (NON-HANDED)

NOTE:

- 1. VARIABLE DIMENSION - DEPENDENT ON CUSTOMER PROFILE. CONTACT TRUTH FOR YOUR SPECIFIC APPLICATION.
- 2. SEE FIGURE 9 FOR STOP ROUTING DETAIL.
- 3. SEE FIGURE 10 FOR PROFILE VIEW.


XX DENOTES FINISH CODE

FIG. 9 SIDE STOP ROUTING DETAIL (AWNING)



RIGHT HAND SHOWN

NOTES:

- 
 VARIABLE DIMENSION - DEPENDENT ON CUSTOMER HANDLE LOCATION PREFERENCE AND PROFILES. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY. EXAMPLE SHOWN IS A 2.000" STOP. CONTACT TRUTH FOR YOUR SPECIFIC APPLICATION.

16 MIRAGE® CONCEALED MULTI-POINT LOCKING SYSTEM (Tie Bar in Jamb version)

FIG. 10 END VIEW DETAIL

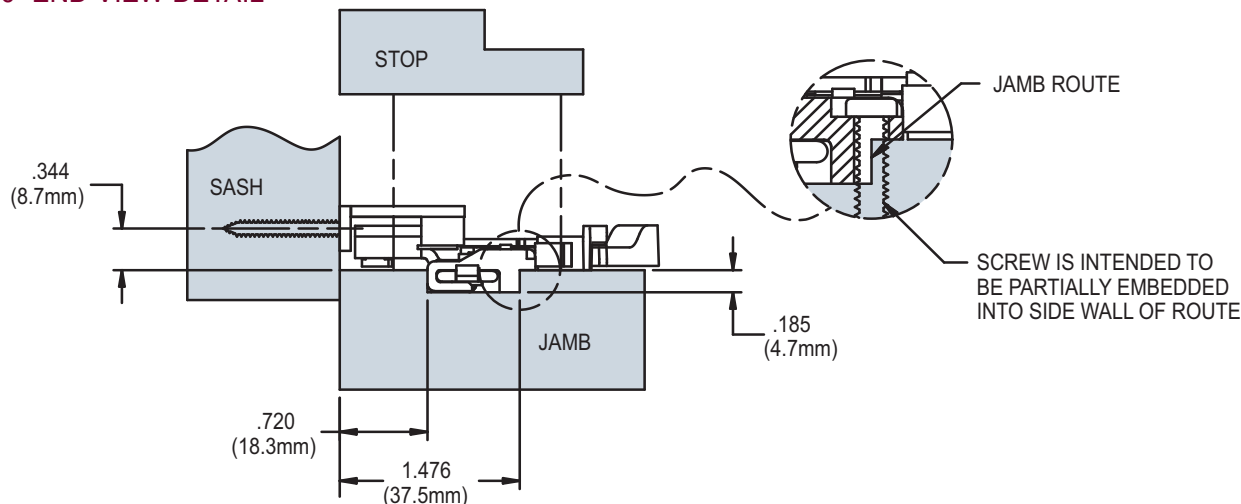
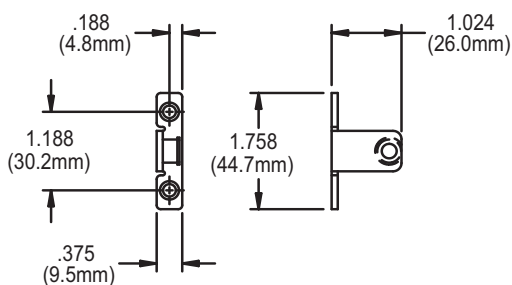


FIG. 11 KEEPER 11498.XX



RECOMMENDED SCREWS:

2 (P/N 19051.XX) #6 X 1 PHILLIPS, FLAT HEAD, SHEET METAL SCREW

FIG. 12 HANDLE (45265), ESCUTCHEON (45376)

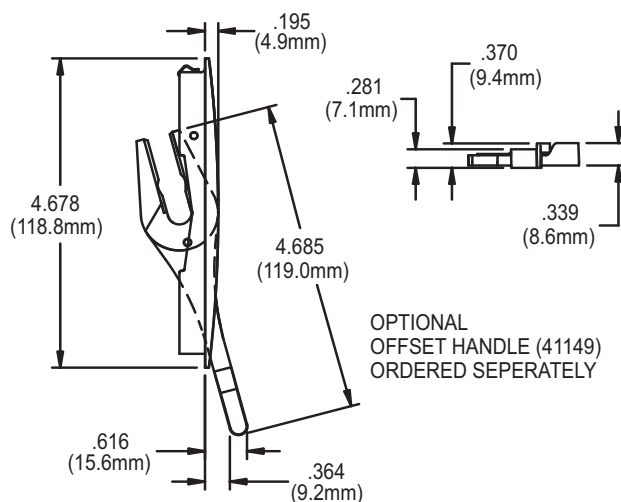
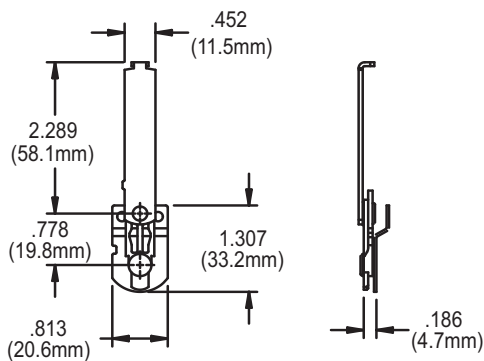


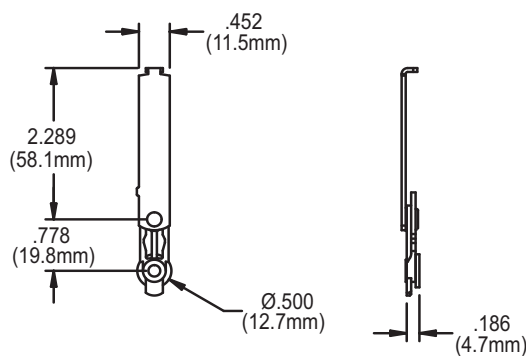
FIG. 13 BACKPLATE LINK ASSEMBLY (11645.92)



RECOMMENDED SCREWS:

2 (P/N 19077.XX) #6 X 1 PHILLIPS, PAN HEAD, SHEET METAL SCREW

FIG. 14 INSERT LINK ASSEMBLY (11648.92)



RECOMMENDED SCREW:

1 (P/N 19077.XX) #6 X 1 PHILLIPS, PAN HEAD, SHEET METAL SCREW



The world of window automation is about to take another leap forward, as Truth is proud to introduce the Sentry 2000® Motorized Sash Lock. This product enhances the window automation capabilities of Truth's revolutionary Sentry 2000® Motorized Window System for casement and awning windows.

FEATURES: The Sentry 2000 Motorized Sash Lock will fit any wood casement or awning window currently designed for use with Truth's three most popular sash lock styles - EntryGard®, Low Profile, and #16.16 Sash Locks. This new system meets the .625" (15.8 mm) pull-in which is standard on Truth's #16.18 and EntryGard Sash Locks, and has been designed with .093" (2.3 mm) kick-out to free sticky sashes before opening. The low profile non-handed design does not protrude into the sight line of the glass. For an added sense of assurance, the Sentry 2000 Motorized Sash Lock has a visual indicator to show if the lock is in the locked or unlocked position. The Sentry 2000 Motorized Sash Lock meets all known Forced Entry requirements.

SEQUENTIAL LOCKING:

To achieve maximum efficiency during the lock-up, this system sequentially locks your window at two different locking points. In a casement application, the bottom lock will always lock first, thereby pulling the sash and frame tightly together to insure proper engagement at the secondary locking point.

CONVENIENT INSTALLATION:

The lock will be sold with an eight foot cable allowing the wiring to be run from the lock location to the operator motor location, or to a junction box where it can be wired back to the switch. See drawing for further details. This locking system comes complete with keepers and screws included - as well as, a complete set of easy to follow installation instructions.

CONSUMER NOTICE:

Truth's Sentry 2000 Motorized Window System must be installed by a qualified electrician.



ORDERING INFORMATION:

The motorized lock is powered and controlled by the transformer and switch supplied with Truth's Sentry 2000 Motorized Operator.

- 1a. Order **#16.49** to replace a #16.18 style non-handed Truth Sash Lock.
- 1b. Order a **#16.50** to replace an EntryGard or #16.16 style Truth Sash Lock. Note: If your window does not use the listed Truth Sash Locks, contact Truth.
- 2. Specify color.
- 3. Keepers - Both standard and offset keepers are supplied with each lock.
- 4. Handing - The Sentry 2000 Motorized Sash Lock is non-handed.

RECOMMENDED SCREWS:

Screws for wood window applications included with Lock Kit. Length and thread type of screws used on vinyl or metal applications dependent upon profile design.

TRUTH TIPS

- 1. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of the window.

HARDWARE SPECIFICATIONS:

Motorized sash lock for awning or casement windows, provides sequential locking on Sentry 2000® equipped windows.

Window locks must be compatible with Sentry 2000® Motorized Window Systems. Locks shall be constructed using high torque motors, hardened steel gears and a high pressure zinc alloy case. Lock to be provided with a decorative plastic cover. A visual indicator will verify lock-up of window. Motorized locks will provide sequential locking with .625" (15.8 mm) pull-in and be able to free sticky sashes with .093" (2.3 mm) kick-out.

Window locks shall be 16 Series Sentry 2000® Motorized Sash Lock, as manufactured by Truth Hardware, Owatonna, MN.

16 SENTRY 2000® MOTORIZED SASH LOCK

FIG. 1 PRE-WIRING INSTRUCTION FOR SENTRY 2000 MOTORIZED WINDOW SYSTEM WITH LOCKS

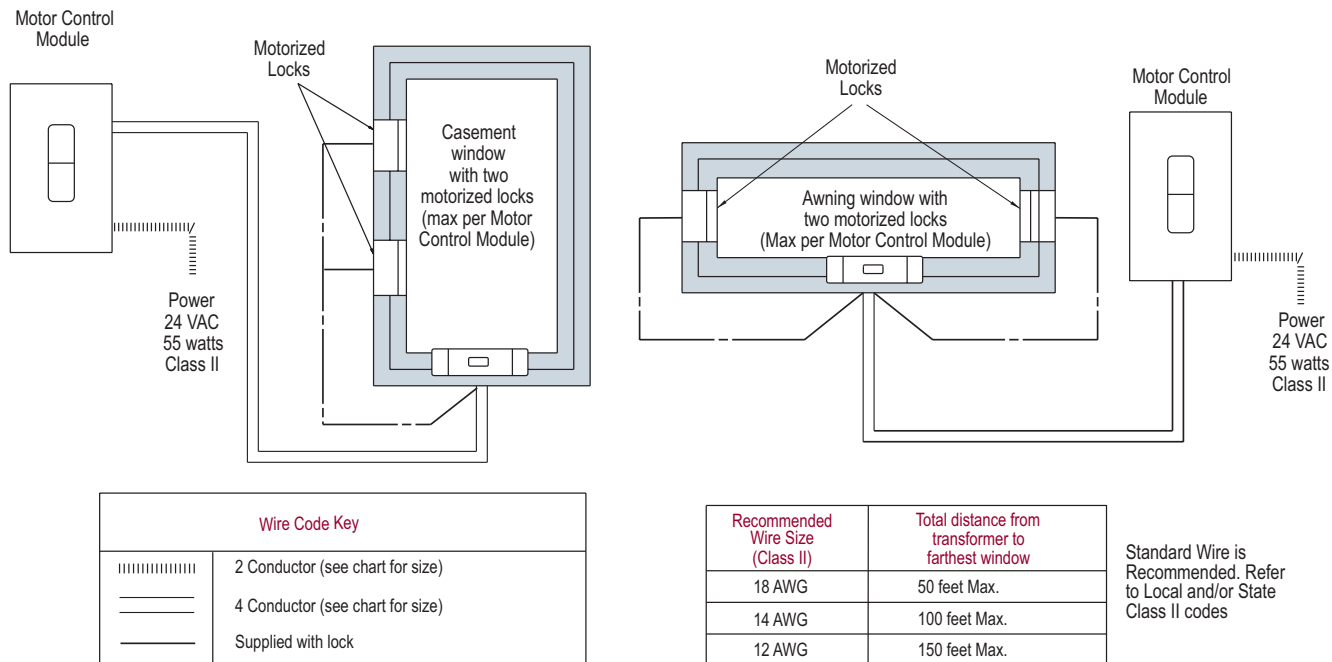
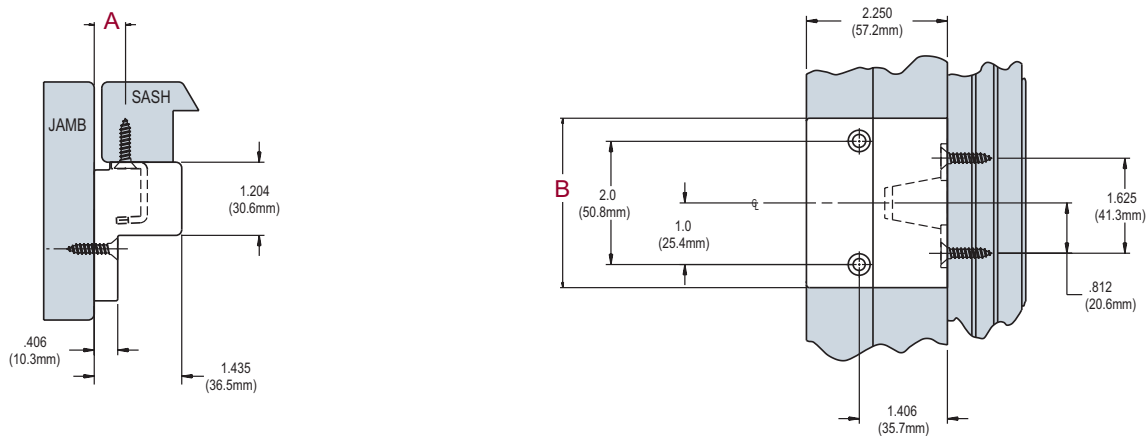


FIG. 2 16.49 AND 16.50 MOTORIZED SASH LOCK



NOTE:
FOR PROPER KEEPER ALIGNMENT USE MOUNTING TEMPLATE.

AVAILABLE LOCKS	A KEEPER		B COVER	REPLACES
	STANDARD	OFFSET		
16.49	.500 (12.7mm)	.312 (7.9mm)	2.750 (69.9mm)	16.18, *16.19
16.50	.500 (12.7mm)	.312 (7.9mm)	3.0 (76.2mm)	16.16, 16.27, 16.28, *16.30, *16.31

- * TIE BAR MUST BE REMOVED BEFORE LOCK IS INSTALLED.
 LOCK KIT INCLUDES: (1) MOTORIZED LOCK (INCLUDES 8' OF CONNECTING WIRE)
 (1) DECORATIVE COVER
 (1) HARDWARE PACK: (4) 8 X 1.0 PH FH SM SCREWS
 (1) OFFSET KEEPER
 (1) STANDARD KEEPER



Designed to compliment Truth's window operators. The vertical movement of these handles lock and unlock the sash. Face-mounted and rear-mounted styles are available within this product line. For casement applications that may have a hard to reach second locking point, many of the #24 Series Locking Handles are able to use a Tie Bar which allows the two locking points to work in tandem. Consult the following tables for detailed information regarding the dimensional differences of each.

While a number of models are available from Truth, listed below are a few of the exciting characteristics of Truth's new #24.25 Locking Handle with its specially designed zinc die-cast handle and housing. The unique construction of this lock, with its *new gasket*, helps to produce a more insect-free, air-free and light-free seal.

IMPROVED CAM DESIGN:

The #24.25 locking cam has been redesigned with a slight taper to its nose to help improve keeper engagement, and to produce a smoother locking action with .437" (11.1 mm) pull-in. *Alignment indicators on the cam provide quick visual verification of keeper placement.*

POSITIVE LOCKING ACTION:

A strong detent in both open and closed positions creates a solid and secure feel to the #24.25 Locking Handle - no more "flopping" handles. Helps resist window opening during shipment.

VARIETY OF COLORS:

Available in a variety of standard colors to complement all window profiles. The new zinc housing is painted to match the handle which eliminates the possibility of color variances between the two components. A perfect match to your operator also.

TANDEM OPERATION:

For tandem locking operation, a concealed tie bar is easily adaptable. Unlike other models, this same model (#24.25) can be used in both tie bar and non-tie bar applications greatly reducing unnecessary cost and inventory.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door

Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High pressure zinc die-cast locking handle and housing. Stainless steel strike. Aluminum tie bar.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION & OPTIONS:

1. Choose Locking Handle style desired - specify by part number.
2. Select mounting hardware (sold separately).
Stainless Steel Strikes - Specify by part number per your application requirements.
Tie Bars - See table located in drawings for the Tie Bar that best meets your application.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selections - see Truth Tips and refer to Tech Note #11.

TRUTH TIPS

1. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
2. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
3. Truth recommends that stainless steel screws be used to fasten stainless steel components to the window. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware.



4. For metal window profiles, Truth recommends machine screws. However in most applications, sheet metal screws will provide adequate holding power.
5. Keepers with positive pick-up tabs cannot be used in tie bar applications.
6. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of the window.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window locking handles shall be included which will increase both security and weather seal tightness. The locks must hold securely up to 200 lbs. of force per lock for negative air pressure and forced entry resistance.

Window sash locks will be used which provide up to .437" (11.1 mm) of pull-in. The lock must also allow tandem operation of two locks to meet ADA hardware height standards. The lock shall be constructed of high pressure zinc alloy die castings and utilize a stainless steel strike.

Window locks shall be 24 series, Locking Handle as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF TRUTH FACE MOUNTED LOCKING HANDLES

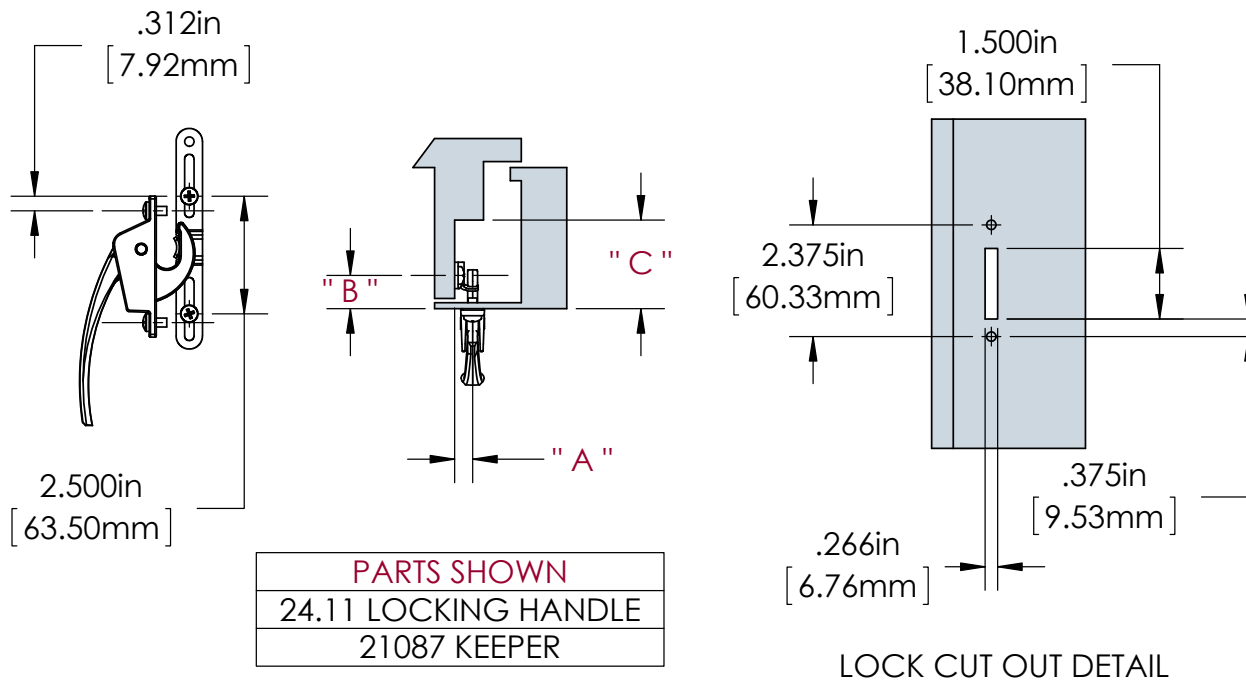
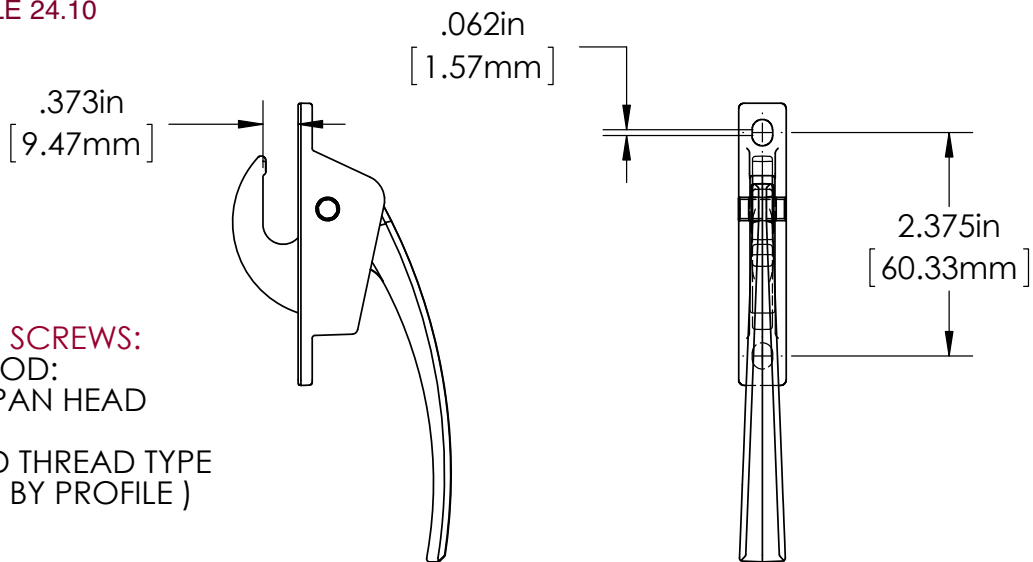


FIG. 2 LOCKING HANDLE 24.10



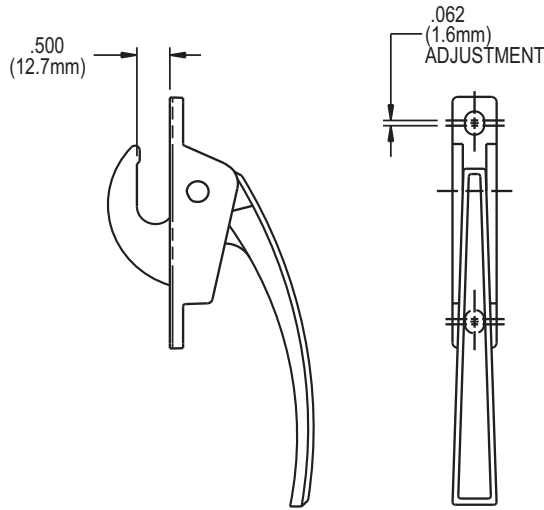
RECOMMENDED SCREWS:
 PVC/METAL/WOOD:
 2 - #10 PHILLIPS PAN HEAD
 SST SCREWS.
 (LENGTH AND THREAD TYPE
 DETERMINED BY PROFILE)

NOTE:
 NOT TIE BAR COMPATIBLE.

AVAILABLE KEEPERS	" A "	" B "	" C "
21087	.250 (6.4mm)	.594 (15.1mm)	.750 (19.1mm)
21088	.375 (9.5mm)	.594 (15.1mm)	.750 (19.1mm)
21089	.438 (11.1mm)	.594 (15.1mm)	.750 (19.1mm)
20800	.250 (6.4mm)	.688 (17.5mm)	.750 (19.1mm)
31384	.250 (6.4mm)	.594 (15.1mm)	.750 (19.1mm)

FIG. 3 LOCKING HANDLE 24.11

NOTE:
NOT TIE BAR COMPATIBLE.

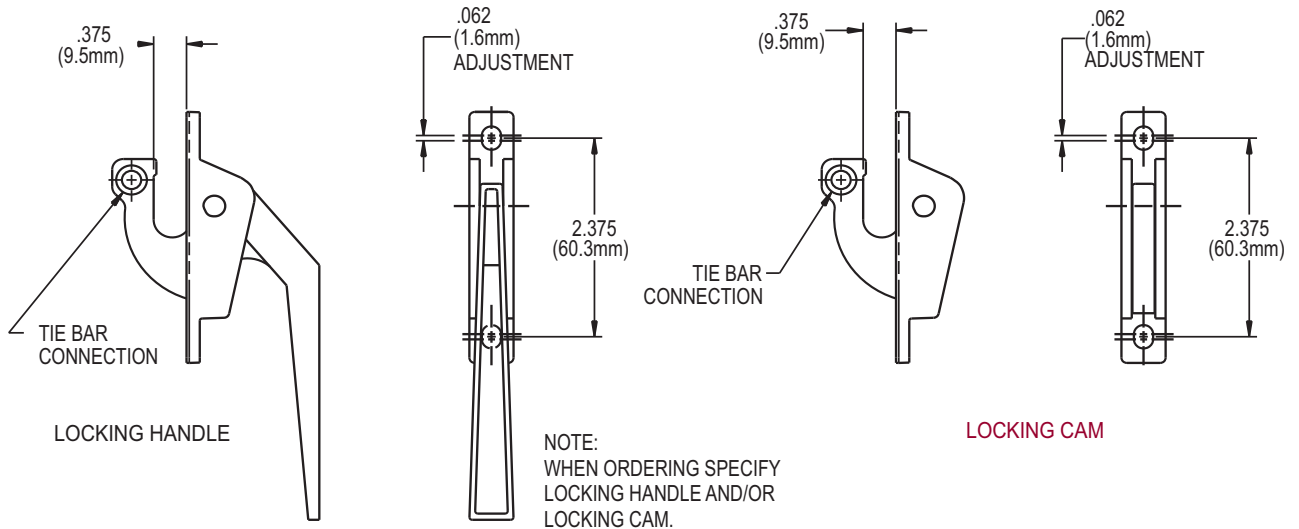


AVAILABLE KEEPERS	A	B	C
21087	.250 (6.4mm)	.718 (18.3mm)	.844 (21.4mm)
21088	.375 (9.5mm)		
21089	.438 (11.1mm)	.812 (20.6mm)	
20800	.250 (6.4mm)		
31376	.438 (11.1mm)	.718 (18.3mm)	
31384	.250 (6.4mm)		

RECOMMENDED SCREWS:

PVC/METAL/WOOD: 2 - #10 PHILLIPS, PAN HEAD, SST SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 4 LOCKING HANDLE AND LOCKING CAM 24.12

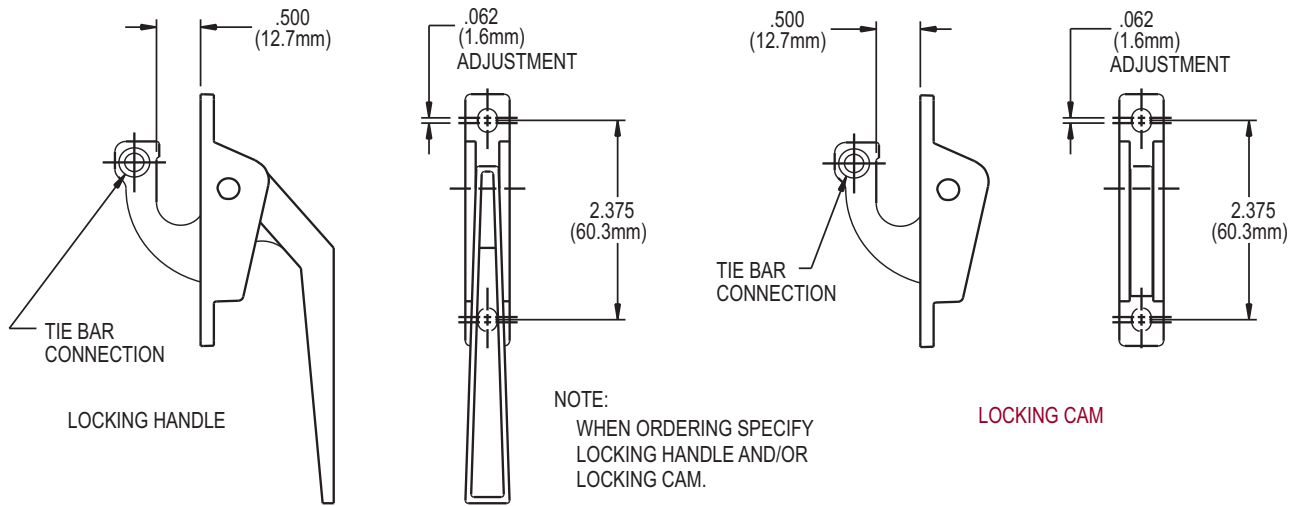


AVAILABLE KEEPERS	A	B	C
21087	.250 (6.4mm)	.594 (15.1mm)	1.0 (25.4mm)
21088	.375 (9.5mm)		
21089	.438 (11.1mm)	.688 (17.46mm)	
20800	.250 (6.4mm)		
31376	.438 (11.1mm)	.594 (15.1mm)	
31384	.250 (6.4mm)		

RECOMMENDED SCREWS:

PVC/METAL/WOOD: 2 - #10 PHILLIPS, PAN HEAD, SST SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 5 LOCKING HANDLE AND LOCKING CAM 24.13



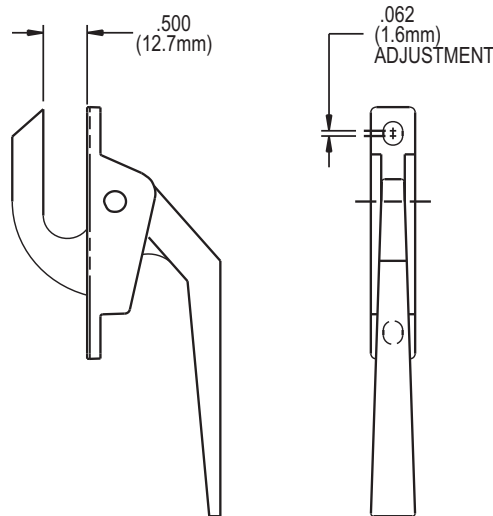
AVAILABLE KEEPERS	A	B	C
21087	.250 (6.4mm)	.718 (18.3mm)	1.0 (25.4mm)
21088	.375 (9.5mm)		
21089	.438 (11.1mm)		
20800	.250 (6.4mm)	.812 (20.6mm)	
31376	.438 (11.1mm)	.718 (18.3mm)	
31384	.250 (6.4mm)		

RECOMMENDED SCREWS:

PVC/METAL/WOOD: 2 - #10 PHILLIPS, PAN HEAD, SST SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 6 LOCKING HANDLE 24.23

NOTE:
NOT TIE BAR COMPATIBLE.

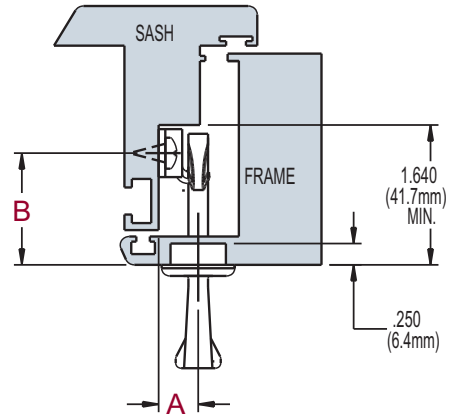
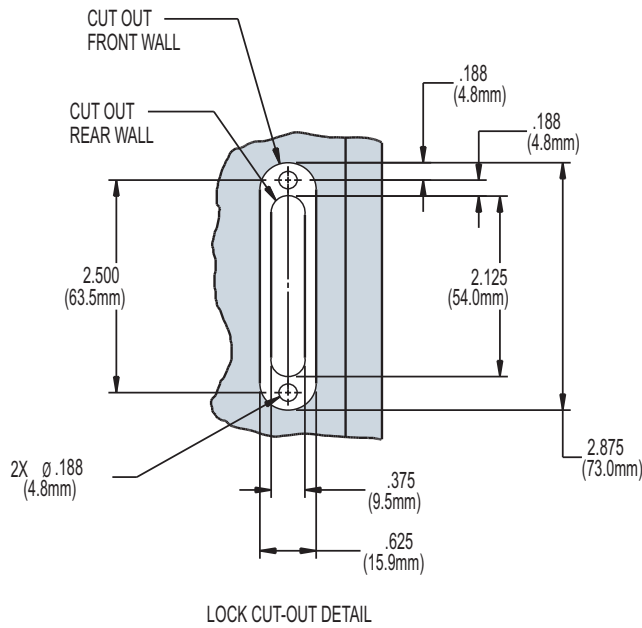


AVAILABLE KEEPERS	A	B	C
21087	.250 (6.4mm)	.718 (18.3mm)	1.156 (29.4mm)
21088	.375 (9.5mm)		
21089	.438 (11.1mm)		
20800	.250 (6.4mm)	.812 (20.6mm)	
31376	.438 (11.1mm)	.718 (18.3mm)	
31384	.250 (6.4mm)		

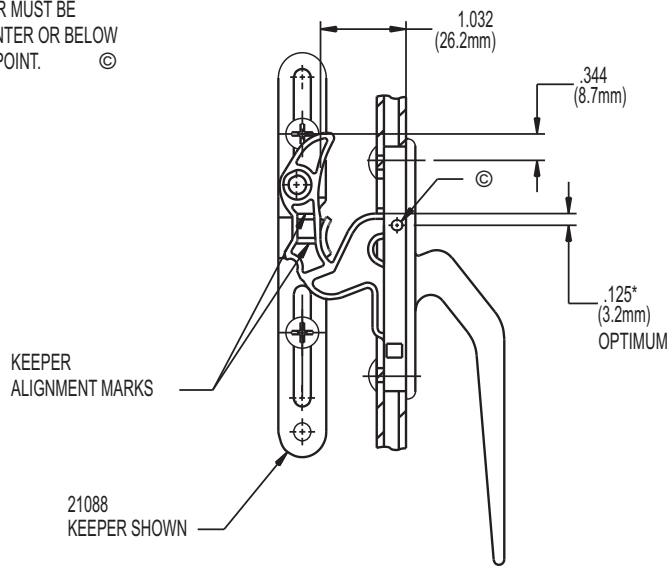
RECOMMENDED SCREWS:

PVC/METAL/WOOD: 2 - #10 PHILLIPS, PAN HEAD, SST SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 7 APPLICATION OF REAR MOUNTED 24.25 LOCKING HANDLE



* NOTE:
KEEPER MUST BE
ON CENTER OR BELOW
PIVOT POINT. ©



RECOMMENDED SCREWS:

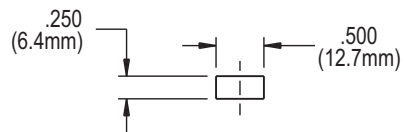
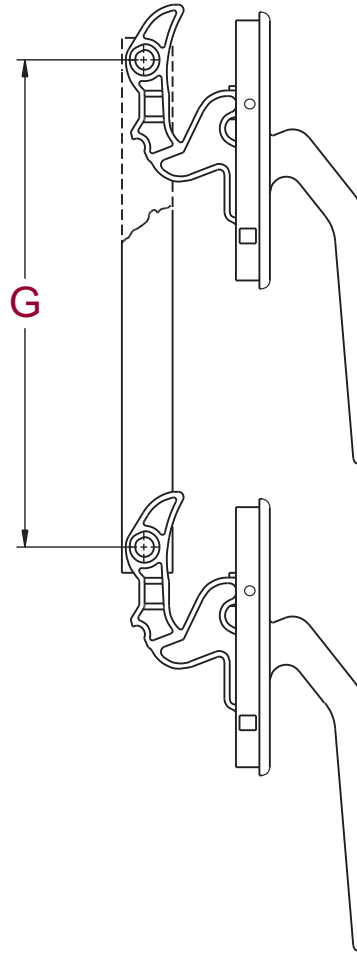
WOOD/PVC/METAL: 2 (P/N 19214) #8 X .375 PHILLIPS, PAN HEAD
SELF TAPPING SST SCREWS (LENGTH
DETERMINED BY PROFILE)

AVAILABLE KEEPERS	A	B
20800	.218 (5.6mm)	1.375 (34.9mm)
21087	.218 (5.6mm)	1.282 (32.5mm)
21088	.344 (8.7mm)	
21089	.406 (10.3mm)	
31384	.218 (5.6mm)	
31376	.406 (10.3mm)	

FIG. 8 TIE BAR APPLICATION FOR ALL TIE BAR COMPATIBLE LOCKS

TIE BAR	G
20049	18.0 (457.2mm)
20050	24.0 (609.6mm)
20051	30.0 (762.0mm)
20280	36.0 (914.4mm)
20698	42.0 (1066.8mm)

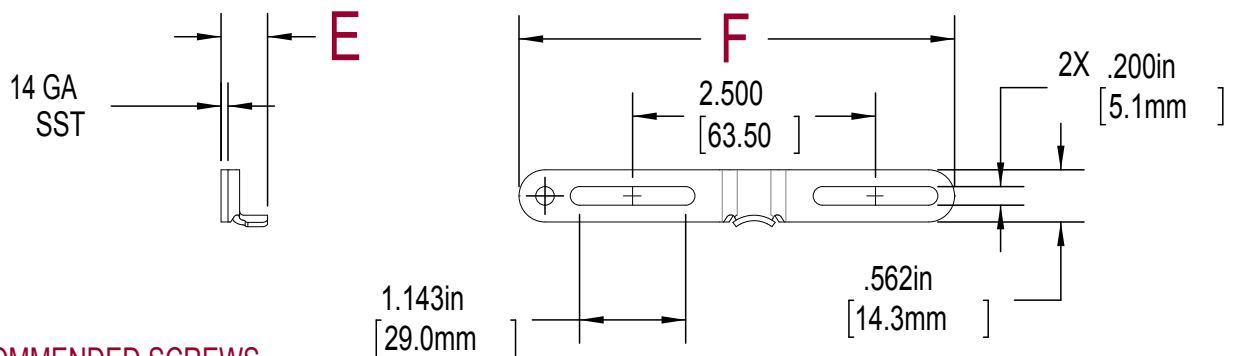
NOTE:
TIE BARS CANNOT BE USED WITH
KEEPERS WITH POSITIVE PICK-UP TABS.



RECOMMENDED SCREWS:

2 (P/N 20410) #8-32 X .500
PHILLIPS, FLAT HEAD, SHOULDERED STEEL
MACHINE SCREWS

FIG. 9 KEEPERS 21087, 21088, 21089 AND 21325

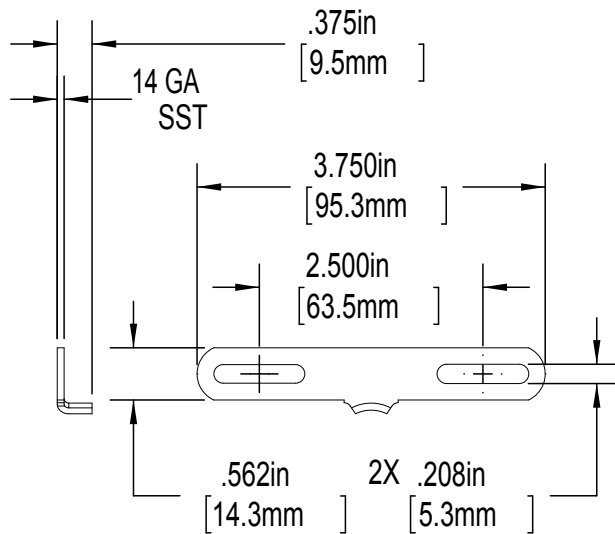


RECOMMENDED SCREWS

WOOD, PVC, METAL - 2 #10 PHILIPS PAN HEAD SST SCREWS.
LENGTH AND THREAD TYPE DETERMINED BY PROFILE.

KEEPER NUMBER	E	F
21087	.375 [9.5mm]	4.735 [120.3mm]
21088	.500 [12.7mm]	4.647 [118.0mm]
21089	.562 [14.3mm]	4.593 [116.7mm]
21325	.688 [17.5mm]	4.647 [118.0mm]

FIG. 10 KEEPER 20800

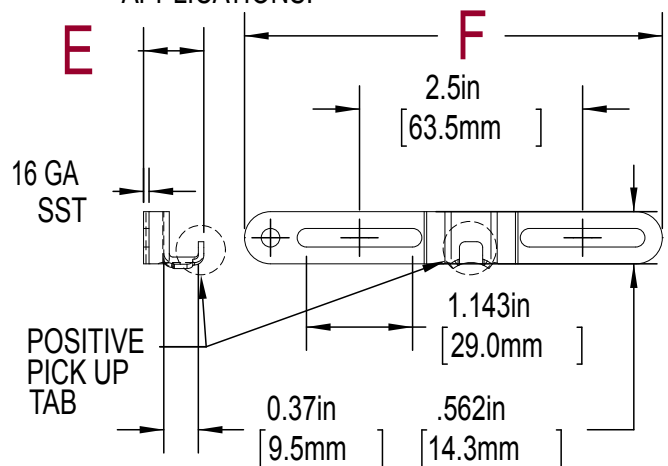


RECOMMENDED SCREWS

WOOD, PVC, METAL - 2 #10 PHILIPS PAN HEAD SST SCREWS. LENGTH AND THREAD TYPE DETERMINED BY PROFILE.

FIG. 11 KEEPERS 31376 AND 31384 (with positive pick-up tab)

NOTE; CANNOT BE USED IN TIEBAR APPLICATIONS.



KEEPER NO.	E	F
31376	.590 [15.0mm]	4.593 [116.7mm]
31384	.373 [9.5mm]	4.735 [120.3mm]

RECOMMENDED SCREWS

WOOD, PVC, METAL - 2 #10 PHILIPS PAN HEAD SST SCREWS. LENGTH AND THREAD TYPE DETERMINED BY PROFILE.



Complementing the already popular Maxim® Operator & Hinge System, the new Maxim® Locking System proves to be the most attractive, easiest operating, highest performing, best value in casement and awning window locking hardware.

Check out these amazing features & benefits:

ORDERING & INSTALLATION MADE SIMPLE

- Non-Handed - You will like the advantage of ordering and inventorying just one lock for both left- and right-hand windows.
- Quick and easy lock-to-tie bar attachment and the simple one-piece lock support plates reduce installation time.
- Most current Truth #24.84 lock system users will be able to use their current tie bar guides and keepers with the new Maxim lock and tie bar models.
- On casement windows the addition of a lock point below the handle improves sealing and lock-up
- Maxim offers a single point system for awning windows using existing stainless steel keepers. No tie bars or tie bar guides required.
- Custom-designed, profile-specific tie bar guides and keepers offer maximum hardware application flexibility. Guides “index” (locate) the tie bars in two directions for consistent and efficient application. (Contact Truth, or refer to catalog drawing details, to identify correct guides and keepers for your profile).
- An optional gasket, installed around the base ensures the assembly is tightly sealed to protect against air, water, and light infiltration.
- New tie bar models offer the benefit of a lock point below the lock itself when used with the Maxim System. Truth’s #24.84 Multi-Point Lock will also use the new tie bar models, however the lock-below feature is not available.

CONSUMER ADVANTAGES

- Secure, solid detent lets you “feel” when the Maxim System is locked.
- The unique design makes the lock highly pick-resistant.
- Homeowners will appreciate the excellent “reach-out” capability. No need to fully close the window before locking it. Just close the window to within .625” (15.8 mm) and actuate the lock handle.
- The heart of this system is the “progressive” locking action. Watch as the tie bar engages and pulls in the lowest lock point first, followed by the remaining keeper(s) in sequence. This “zippered effect” assures the top lock point on tall units always engages and pulls in, even in less-than-perfect installations. Feel the smooth and easy lock operation the sequential lock action also provides.

ATTRACTIVE LOOK

- Multi-Point Locks for Casement (#24.30, #24.31 & #24.33 models) and Single-Point Locks for awning (#24.32) look identical – for a consistent appearance throughout the home.
- Contemporary aesthetics and styling complement the Maxim Operator System.
- With its sleek, low-profile design, homeowners will love the fact that in either the locked or unlocked position, these locks won’t interfere with curtains or blinds.
- With its attractive painted finish, the zinc handle & base precisely match the color of your vinyl profile.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth’s Terms and Conditions for further details.



MATERIAL & PROTECTIVE FINISH:

High pressure zinc die-cast handle, case, and sliders (liquid or powder coat painted finish). Steel tie bar (powder coat painted finish). Keepers made of either E-Gard® Hardware, steel or UV stabilized acetal.

E-GARD® HARDWARE

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to perform approximately three times better than common zinc plated finishes.

FINISH:

Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

If application assistance is needed, please contact Truth Hardware's Product Specialists.

1. Order Casement or Awning Maxim® Sash Lock by part number.

Casement Multi-Point Locks

#24.30 Multi-Point (short slider)

#24.31 Multi-Point (long slider)

#24.33 Multi-Point (medium slider)

Awning Lock

#24.32 Maxim Single Point

2. Specify finish number.
3. Specify gasket (.004) or non-gasket (.003) model.

4. Order keepers by part number - refer Fig. 10-20.
5. Specify tie bar needed by length - refer to Fig. 5 & 6.
6. Specify Tie Bar Guides by number - refer to Fig. 7.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. See Tech Note #11. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

1. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
2. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
3. For power drivers used to install mounting screws, recommended torque for screw installation (#19298) is 35 in./lbs; not to exceed 50 in./lbs.
4. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.
5. Truth recommends the use of a Snubber at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of the window.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window locking system shall be included which will increase both security and weather seal tightness. The locking points must hold securely for negative air pressure and forced entry resistance.

Window sash locks will be used which provide sequential locking with up to .625" (15.9 mm) of pull-in. The lock must utilize a tie bar driven by a single locking handle to meet ADA hardware height standards. The lock drive handle must provide a weather tight seal by providing a gasket between lock and window frame. The lock shall be constructed of high pressure zinc alloy die castings and either painted or E-Gard® components and accessories.

Window locks shall be 24 series, Maxim® Multi and Single Point Lock Systems as manufactured by Truth Hardware, Owatonna, MN.

HARDWARE SELECTION FOR MAXIM® MULTI AND SINGLE POINT LOCKS:

Casement Windows

Lock Selection

- Choose a lock based on the hardware cavity depth available.
See J dimension if Fig. 1. Choose lock from Fig. 3.

Keeper and Tie Bar Guide Selection

The keeper and tie bar guide need to be selected together. To aid in your hardware selection, you need to consider:

- Hardware Cavity Size. If you currently use the Truth Hardware 24.84 Multi-point system, chances are the same Tie Bar Guide and Keeper can be used with the new Maxim Lock system.
- Refer to Fig. 1. Dimensions given for keepers and tie bar guides are to the center of tie bar roller/keeper engagement point. These dimensions will allow you to choose the appropriate components based on your hardware cavity dimensions. Choose a Tie Bar Guide with an **E** dimension and a keeper with a **K** dimension that add up as close as possible to the cavity dimensions available.
 - Be aware that the Tie Bar Guide height impacts both the keeper selection as well as the lock's horizontal location on the frame. It is important that the lock be positioned to allow clearance for Support Plate (see fig. 8), if used.
- Mounting screw location - Choose components that will place the mounting screws where they will

have strongest engagement (i.e. - screws should engage a double wall of vinyl or screw boss or insert).

- Keeper/weather-strip interference can occur as the window closes and must be considered when selecting a Tie Bar Guide and Keeper.

Tie Bar Selection

- **Cone Verses Interlock -**
 - Interlock tie bars - Over-size rivet head minimizes the potential for the keeper to slip off the roller in performance testing. Also, there are more Interlock keeper options/models to choose from.
 - Cone tie bar - Tapered roller and keepers.
- Make sure selected tie bar and keeper models are the same series - both Cone or both Interlock style.

Awning Windows

- #24.32 (Fig. 4) - Single Point Lock

Keeper selection

- Select a keeper with or without positive pick-up tab. (See fig. 21 and 22) A keeper with positive pick-up tab will give better negative air pressure and forced entry ratings, however they are more sensitive to mounting tolerances.

Select a keeper with the appropriate **M** dimension based on the centerline of the lock housing.

24 MAXIM® MULTI-POINT & SINGLE POINT LOCKING SYSTEMS

FIG. 1 MAXIM MULTI-POINT APPLICATION INTERLOCK ROLLERS

REFER TO CATALOG "HARDWARE SELECTION INSTRUCTIONS" FOR STEP-BY-STEP HARDWARE SECTION ASSISTANCE. IF FURTHER ASSISTANCE IS NEEDED, CALL TRUTH HARDWARE PRODUCT SPECIALIST.

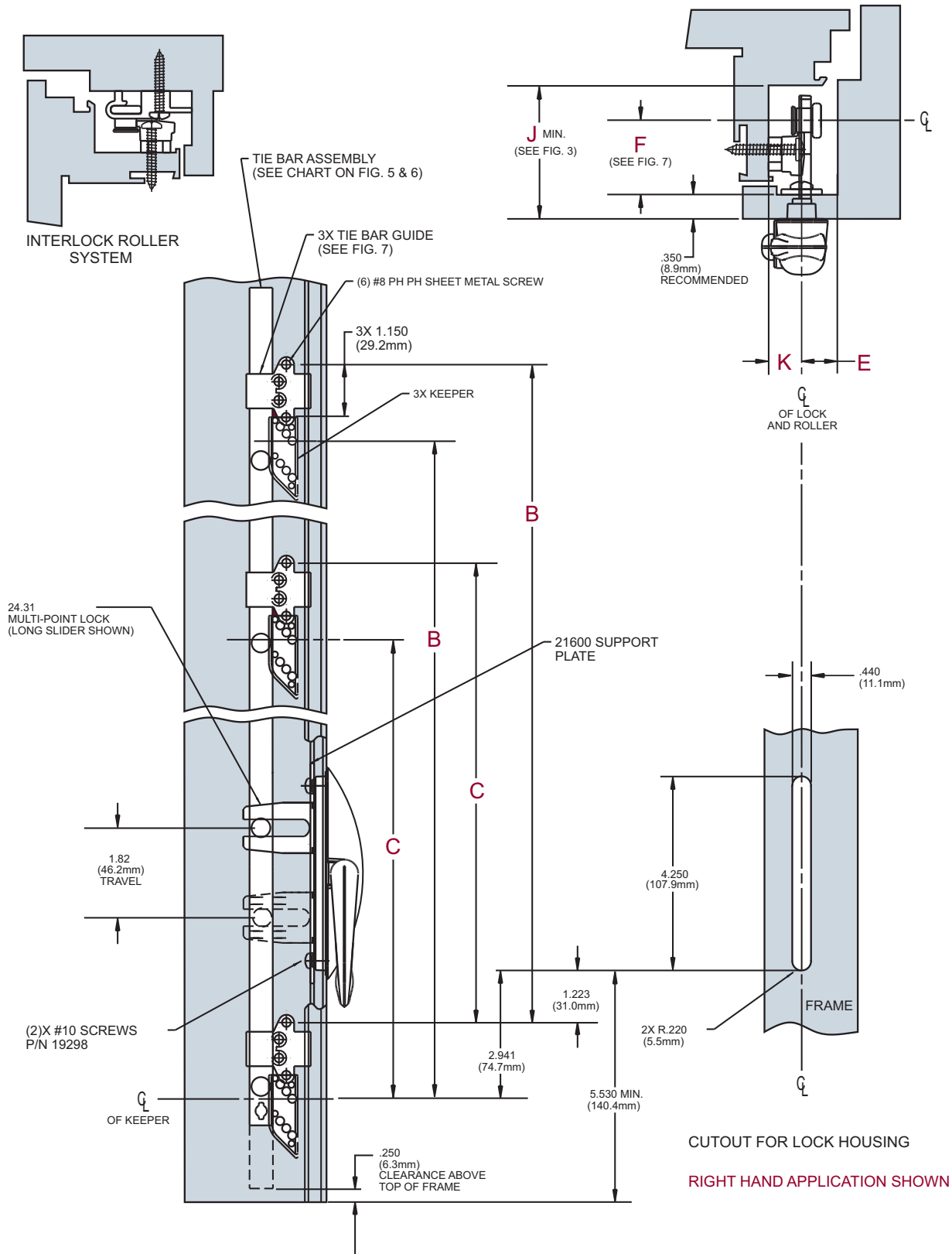
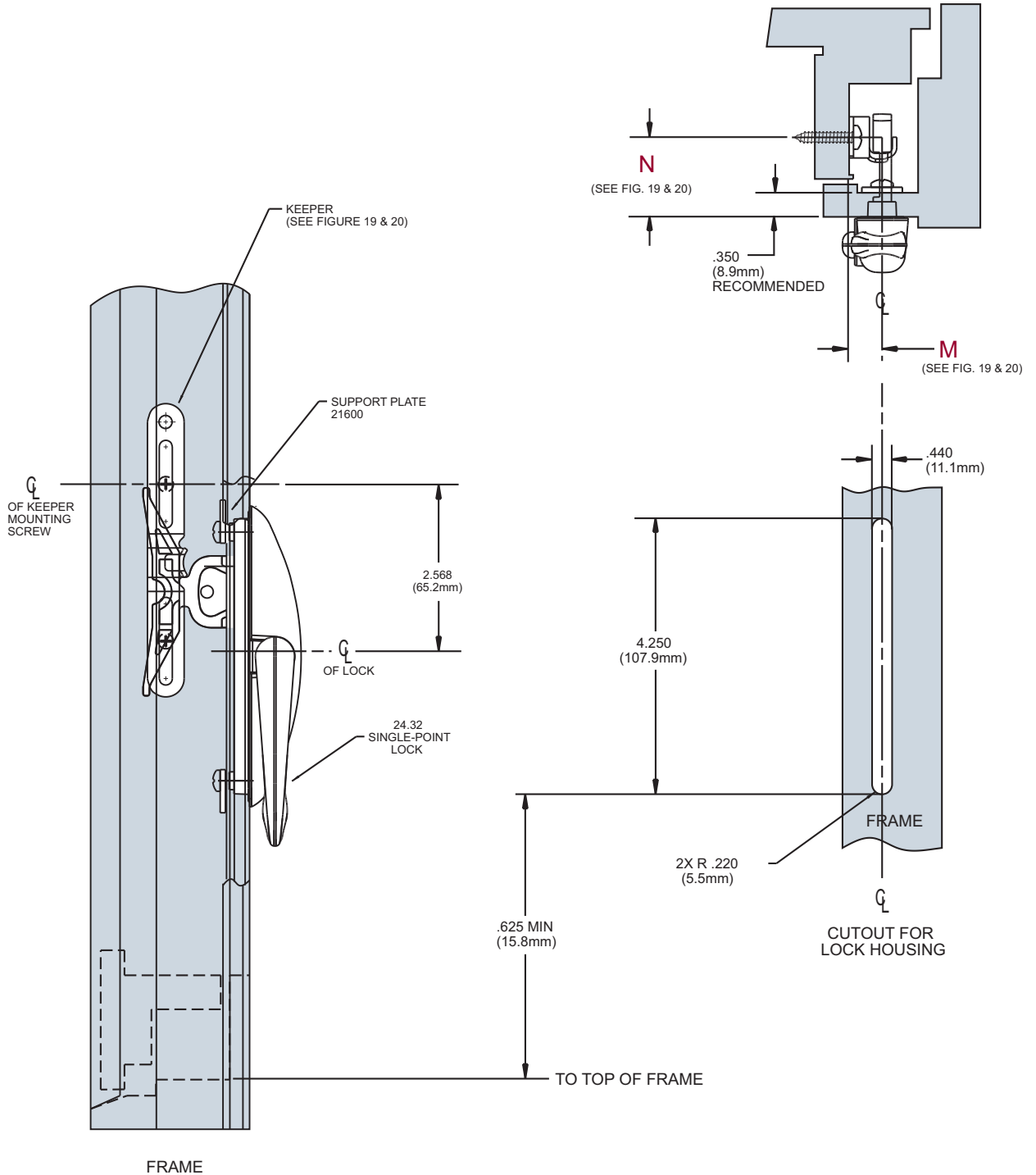


FIG. 2 MAXIM SINGLE-POINT / AWNING APPLICATION

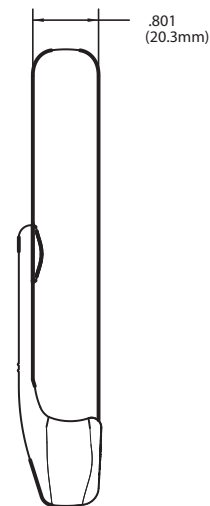
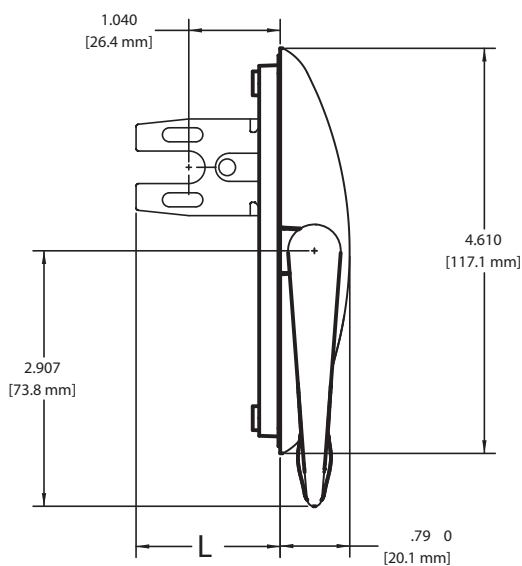
REFER TO CATALOG COPY "HARDWARE SELECTION INSTRUCTIONS" FOR STEP-BY-STEP HARDWARE SELECTION ASSISTANCE. IF FURTHER ASSISTANCE IS NEEDED, CALL TRUTHHARDWARE PRODUCT SPECIALIST.



RIGHT HAND APPLICATION SHOWN

24 MAXIM® MULTI-POINT & SINGLE POINT LOCKING SYSTEMS

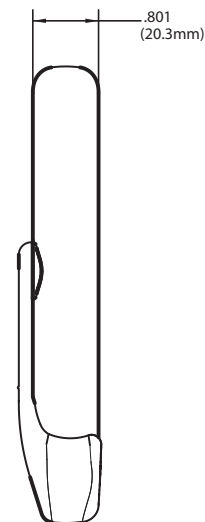
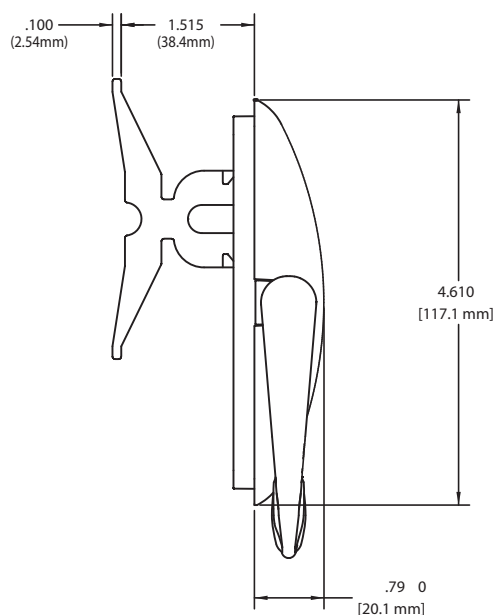
FIG. 3 MAXIM MULTI-POINT LOCK



RECOMMENDED SCREWS:
2-P/N 19298 #10-24 PH PH THREAD
FORMING MACHINE SCREW

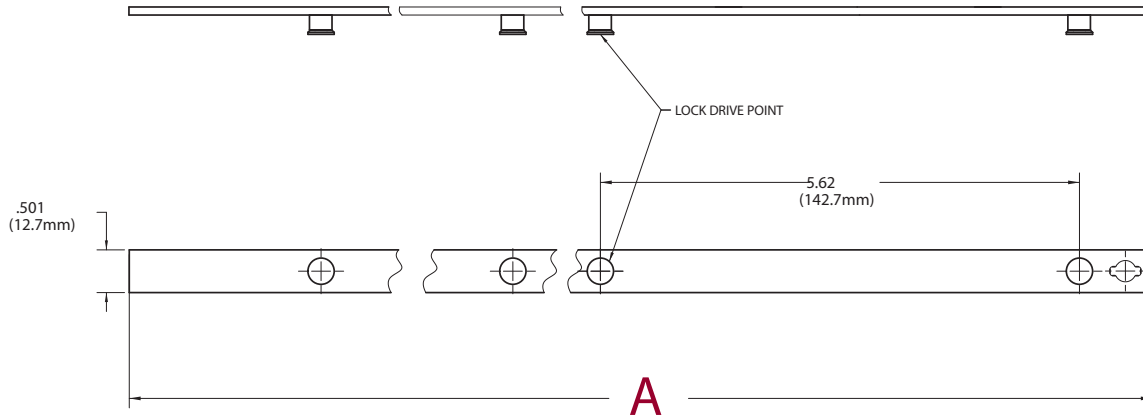
PART NO.	L	J SEE FIG. 1
24.30	1.390	1.450
24.31	1.890	1.950
24.33	1.640	1.700

FIG. 4 24.32 MAXIM SINGLE-POINT LOCK (AWNING)



RECOMMENDED SCREWS:
2-P/N 19298 #10-24 PH PH THREAD
FORMING MACHINE SCREW

FIG. 5 TIE BAR CHART FOR INTERLOCK ROLLER



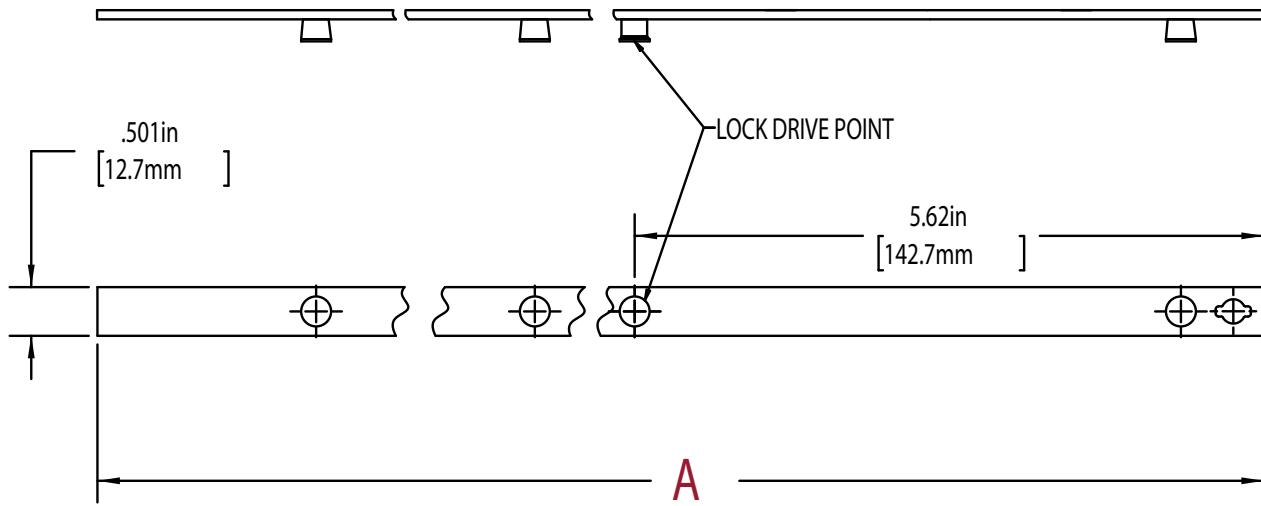
RECOMMENDED MINIMUM FRAME HEIGHT	TIE BAR ASSEMBLY								
	PART NO.					"A" DIM TIEBAR LENGTH	"B" DIM SEE FIG.1	"C" DIM SEE FIG.1	"D" DIM SEE FIG.1
	2 ROLLERS	3 ROLLERS	4 ROLLERS	5 ROLLERS	6 ROLLERS				
20in (508.0mm)	11901	NA	NA			14.9 (378.5mm)	11.00 (279.4mm)	NA	NA
24in (609.6mm)	11902	NA	NA			18.9 (480.1mm)	15.00 (381.0mm)	NA	NA
28in (711.2mm)	11903	11913	NA			22.9 (581.7mm)	19.00 (482.6mm)	10.00 (254.0mm)	NA
32in (812.8mm)	11904	11914	NA			26.9 (683.3mm)	23.00 (584.2mm)	12.00 (304.8mm)	NA
36in (914.4mm)	11905	11915	NA			30.9 (784.9mm)	27.00 (685.8mm)	14.00 (355.6mm)	NA
40in (1016.0mm)	11906	11916	NA			34.9 (886.5mm)	31.00 (787.4mm)	16.00 (406.4mm)	NA
44in (1117.6mm)	11907	11917	NA			38.9 (988.1mm)	35.00 (889.0mm)	18.00 (457.2mm)	NA
48in (1219.2mm)	11908	11918	NA			42.9 (1089.7mm)	39.00 (990.6mm)	20.00 (508.0mm)	NA
52in (1320.8mm)	11909	11919	*13092			46.9 (1191.3mm)	43.00 (1092.2mm)	22.00 (558.8mm)	NA
56in (1422.4mm)	11910	11920	*13093			50.9 (1292.9mm)	47.00 (1193.8mm)	24.00 (609.6mm)	NA
60in (1524.0mm)	11911	11921	*13094			54.9 (1394.5mm)	51.00 (1295.4mm)	26.00 (660.4mm)	NA
64in (1625.6mm)	11912	11922	*13095			58.9 (1496.1mm)	55.00 (1397.0mm)	28.00 (711.2mm)	NA
68in (1727.2mm)	NA	NA	*12925	*13096		62.9 (1597.6mm)	59.00 (1498.6mm)	39.56 (1004.8mm)	19.78 (50.2mm)
72in (1828.8mm)	NA	NA	*12926	*13097		66.9 (1699.2mm)	63.00 (1600.2mm)	42.22 (1072.3mm)	21.11 (536.1mm)
76in (1930.4mm)	NA	NA	*12927		*13098	70.9 (1800.8mm)	67.00 (1701.8mm)	44.89 (1140.2mm)	22.45 (570.2mm)

NOTE:

- "D" DIMENSION NOT SHOWN. FOR KEEPER AND TIE BAR GUIDE PLACEMENT. DIMENSION "D" HAS THE SAME ORIGIN AS B AND C DIMENSIONS IN FIG. 1.
- B AND C DIMENSIONS ARE CONFIGURED TO GIVE SEQUENTIAL AND PROGRESSIVE LOCKING STARTING WITH THE BOTTOM LOCKING POINT.
- *3. TIE BARS WITH ADDITIONAL LOCK POINTS FOR HIGHER DP RATINGS. CONTACT TRUTH APPLICATION SPECIALIST FOR MORE INFORMATION.

24 MAXIM® MULTI-POINT & SINGLE POINT LOCKING SYSTEMS

FIG. 6 TIE BAR CHART FOR CONE ROLLER



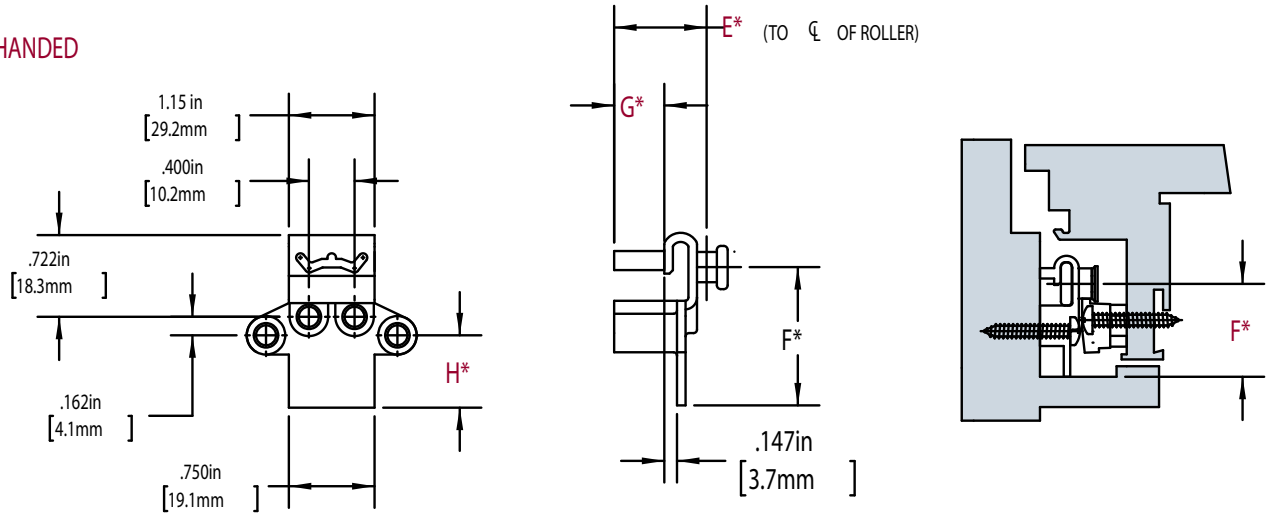
TIE BAR ASSEMBLY							
RECOMMENDED FRAME SIZE (MIN.)	PART NO.			"A" DIM	"B" DIM SEE FIG.1	"C" DIM SEE FIG.1	"D" DIM SEE FIG.1
	2 ROLLERS	3 ROLLERS	4 ROLLERS				
21in (533.4mm)	12005	NA	NA	14.9 (378.5mm)	11.00 (279.4mm)	NA	NA
25in (635.0mm)	12006	NA	NA	18.9 (480.1mm)	15.00 (381.0mm)	NA	NA
29in (736.6mm)	12008	12020	NA	22.9 (581.7mm)	19.00 (482.6mm)	10.00 (254.0mm)	NA
33in (838.2mm)	12009	12021	NA	26.9 (683.3mm)	23.00 (584.2mm)	12.00 (304.8mm)	NA
37in (939.8mm)	12012	12022	NA	30.9 (784.9mm)	27.00 (685.8mm)	14.00 (355.6mm)	NA
41in (1041.4mm)	12013	12023	NA	34.9 (886.5mm)	31.00 (787.4mm)	16.00 (406.4mm)	NA
45in (1143.0mm)	12015	12024	NA	38.9 (988.1mm)	35.00 (889.0mm)	18.00 (457.2mm)	NA
49in (1244.6mm)	12016	12025	NA	42.9 (1089.7mm)	39.00 (990.6mm)	20.00 (508.0mm)	NA
53in (1346.2mm)	NA	12026	NA	46.9 (1191.3mm)	43.00 (1092.2mm)	22.00 (558.8mm)	NA
57in (1447.8mm)	NA	12027	NA	50.9 (1292.9mm)	47.00 (1193.8mm)	24.00 (609.6mm)	NA
61in (1549.4mm)	NA	12028	NA	54.9 (1394.5mm)	51.00 (1295.4mm)	26.00 (660.4mm)	NA
65in (1651.0mm)	NA	12029	NA	58.9 (1496.1mm)	55.00 (1397.0mm)	28.00 (711.2mm)	NA
69in (1752.6mm)	NA	NA	12058	62.9 (1597.6mm)	59.00 (1498.6mm)	39.56 (1004.8mm)	19.78 (502mm)
73in (1854.2mm)	NA	NA	12059	66.9 (1699.2mm)	63.00 (1600.2mm)	42.22 (1072.3mm)	21.11 (536.1mm)
77in (1955.8mm)	NA	NA	12060	70.9 (1800.8mm)	67.00 (1701.8mm)	44.89 (1140.2mm)	22.45 (570.2mm)

NOTE:

1. "D" DIMENSION NOT SHOWN. FOR KEEPER AND TIE BAR GUIDE PLACEMENT. DIMENSION "D" HAS THE SAME ORIGIN AS B AND C DIMENSIONS IN FIG. 1.
2. B AND C DIMENSIONS ARE CONFIGURED TO GIVE SEQUENTIAL AND PROGRESSIVE LOCKING STARTING WITH THE BOTTOM LOCKING POINT.

FIG. 7 TIE BAR GUIDE

NON HANDED



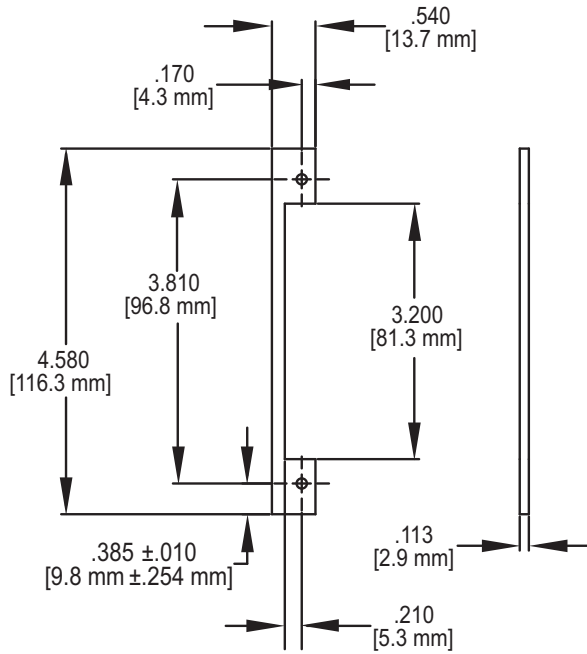
* DIMENSION CAN BE VARIED TO SUIT CUSTOMER PROFILE
CONTACT TRUTH PRODUCT SPECIALIST FOR ASSISTANCE

RECOMMENDED SCREWS:

WOOD/PVC/METAL: 2-#8 PHILLIPS,PAN HEAD,SST
SCREWS (LENGTH AND THREAD TYPE
TO BE DETERMINED BY PROFILES)

PART #	E		G	H	F SEE FIG. 1
	INTERLOCK ROLLER	CONE ROLLER			
40823	0.333	0.400	0.010	0.219	0.765
45145	0.333	0.400	0.010	0.316	0.862
45148	0.333	0.400	0.010	0.398	0.944
40862	0.333	0.400	0.010	0.466	1.012
40726	0.333	0.400	0.010	0.493	1.039
45143	0.333	0.400	0.010	0.619	1.165
45152	0.363	0.430	0.040	0.628	1.174
45157	0.367	0.434	0.044	0.636	1.182
45172	0.383	0.450	0.060	0.369	0.915
40847	0.386	0.453	0.063	0.501	1.047
45260	0.411	0.478	0.088	0.278	0.824
45363	0.412	0.479	0.089	0.531	1.077
45128	0.420	0.487	0.097	0.601	1.147
45124	0.431	0.496	0.108	0.589	1.135
45224	0.437	0.504	0.114	0.201	0.747
45144	0.422	0.509	0.119	0.617	1.163
45198	0.443	0.510	0.120	0.462	1.008
45151	0.466	0.533	0.143	0.549	1.095
45150	0.471	0.538	0.148	0.671	1.217
45300	0.477	0.544	0.154	0.394	0.940
45222	0.491	0.558	0.168	0.356	0.902
40635	0.492	0.559	0.169	0.552	1.098
45195	0.493	0.560	0.170	0.471	1.017
45147	0.496	0.563	0.173	0.523	1.069
45130	0.496	0.563	0.173	0.545	1.091
40837	0.496	0.563	0.173	0.646	1.192
40910	0.502	0.569	0.179	0.324	0.870
45137	0.515	0.582	0.192	0.631	1.177
45141	0.526	0.593	0.203	0.582	1.128
45248	0.539	0.606	0.216	0.394	0.940
31374	0.539	0.606	0.216	0.454	1.000
31289	0.552	0.619	0.229	0.556	1.102
45177	0.583	0.650	0.260	0.375	0.921
45140	0.583	0.650	0.260	0.462	1.008
45209	0.597	0.664	0.274	0.527	1.073
41604	0.637	0.704	0.314	0.281	0.827

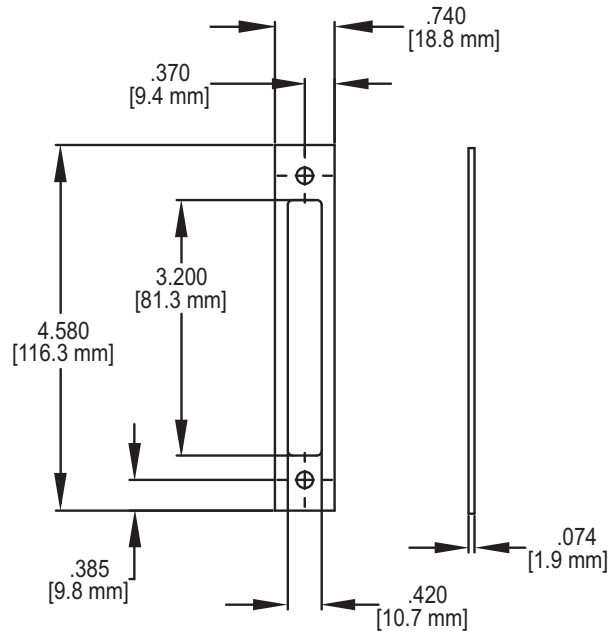
FIG. 8 21600 SUPPORT PLATE



RECOMMENDED SCREWS:

2-P/N 19298 #10-24 X 9/16 PH PAN HEAD
THREAD FORMING MACHINE SCREW

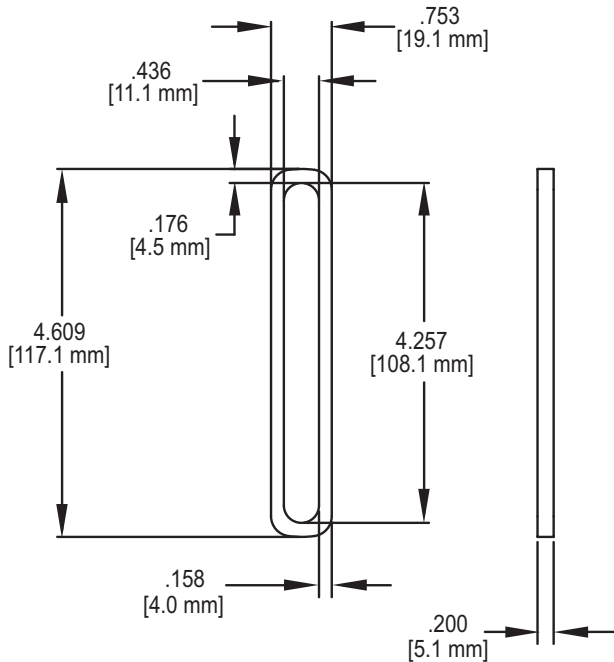
FIG. 9 21710 SUPPORT PLATE



RECOMMENDED SCREWS:

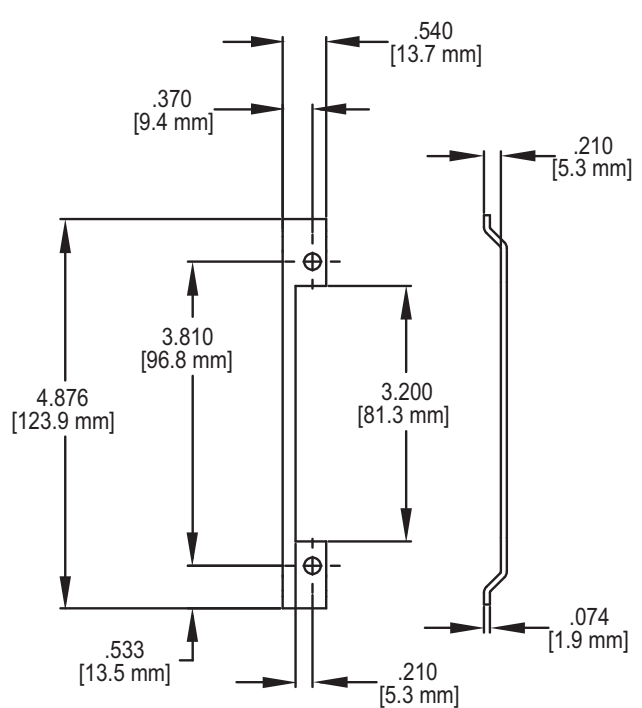
2-P/N 19298 #10-24 X 9/16 PH PAN HEAD
THREAD FORMING MACHINE SCREW

FIG. 10 21709 SPACER



NOTE: FOR USE ON SINGLE WALL PROFILE
OR WHEN ADDED SPACE IS NEEDED
FOR THE BAR OR KEEPER CLEARANCE

FIG. 11 23050 OFFSET SUPPORT PLATE

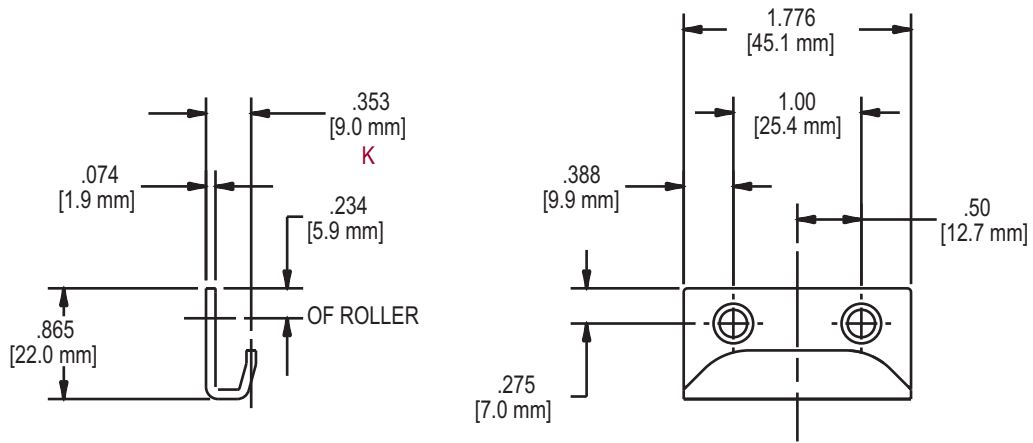


RECOMMENDED SCREWS:

2-P/N 19298 #10-24 X 9/16 PH PAN HEAD
THREAD FORMING MACHINE SCREW

NOTE: FOR USE ON SINGLE WALL PROFILES

FIG. 12 31964 NON-HANDED INTERLOCK KEEPER

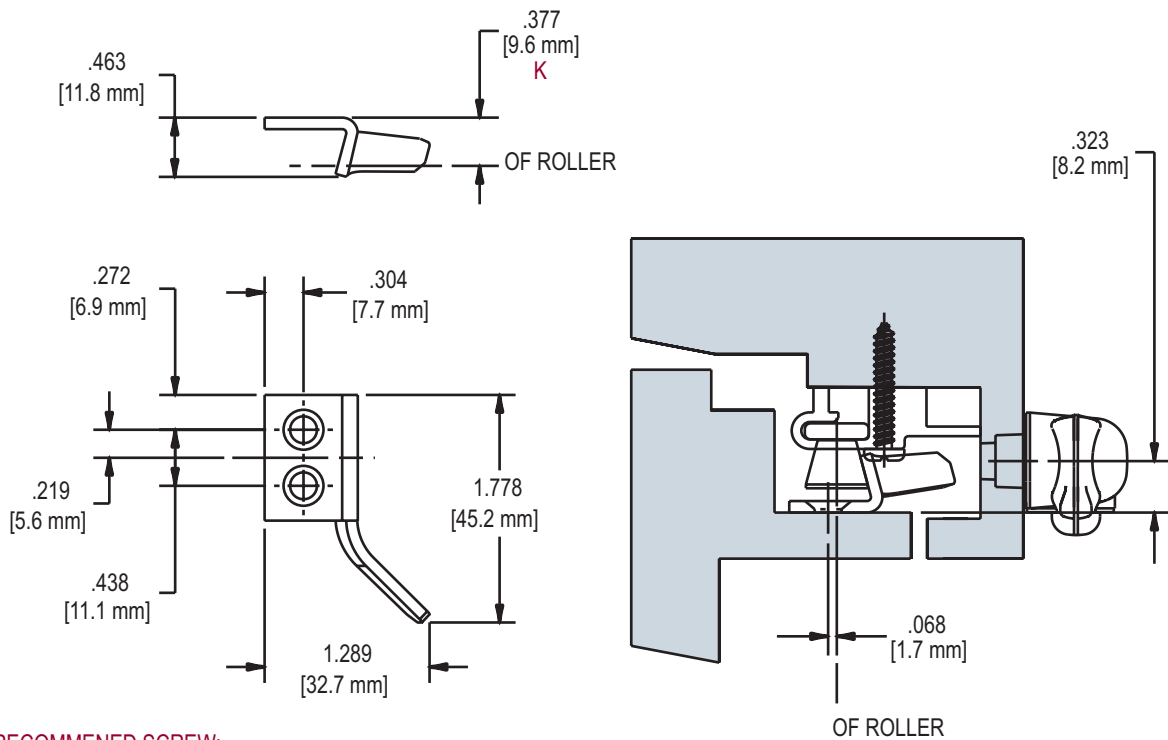


RECOMMENDED SCREWS:

(QYT 2)-#8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

COMPATIBLE WITH INTERLOCK TIE BARS

FIG. 13 KEEPER 31218 AND 31217 (FOR CONE ROLLER SYSTEM)



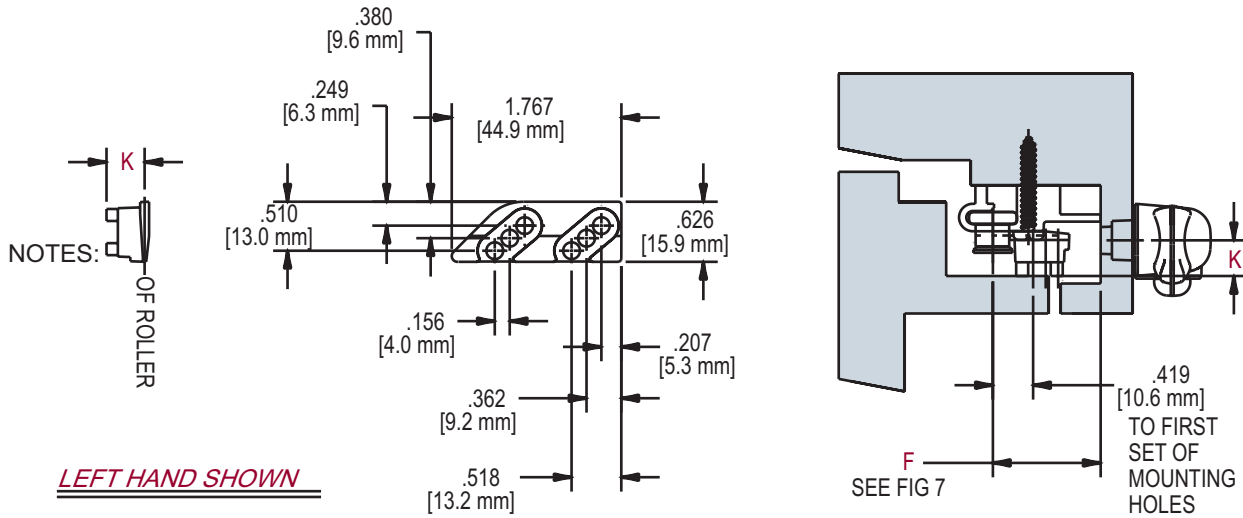
RECOMMENDED SCREW:

WOOD/PVC/METAL:
SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

T

24 MAXIM® MULTI-POINT & SINGLE POINT LOCKING SYSTEMS

FIG. 14 ADJUSTABLE KEEPER (FOR INTERLOCK ROLLER SYSTEM)



LEFT HAND SHOWN

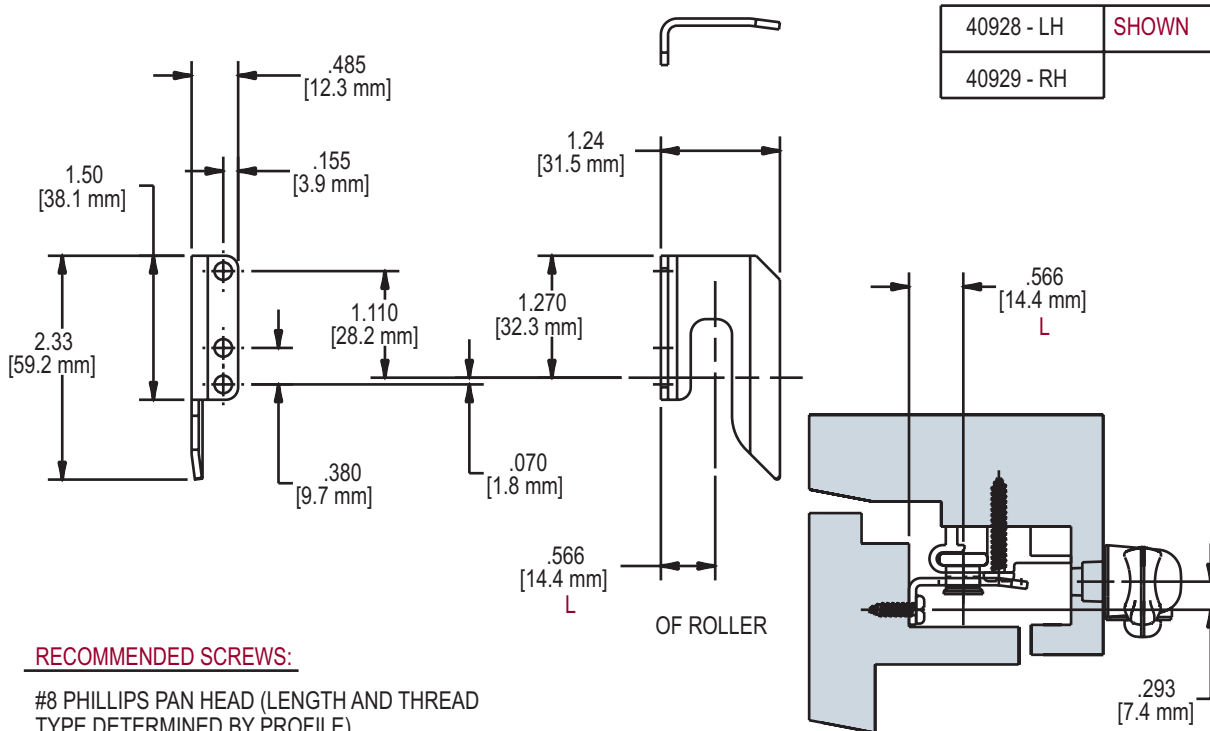
K DIMENSION CAN BE VARIED TO SUIT CUSTOMER PROFILE CONTACT TRUTH PRODUCT SPECIALIST

RECOMMENDED SCREWS:

WOOD/PVC/METAL: (QTY 2) #8 PHILLIPS, PAN HEAD, SST SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

KEEPER NUMBER		
RH	LH	K
40684	40685	0.278
40724	40725	0.331
40773	40774	0.228
40709	40710	0.371

FIG. 15 40928 (LH) AND 40929 (RH) KEEPER USE WITH INTERLOCK TIE BARS
USE WITH INTERLOCK TIE BARS

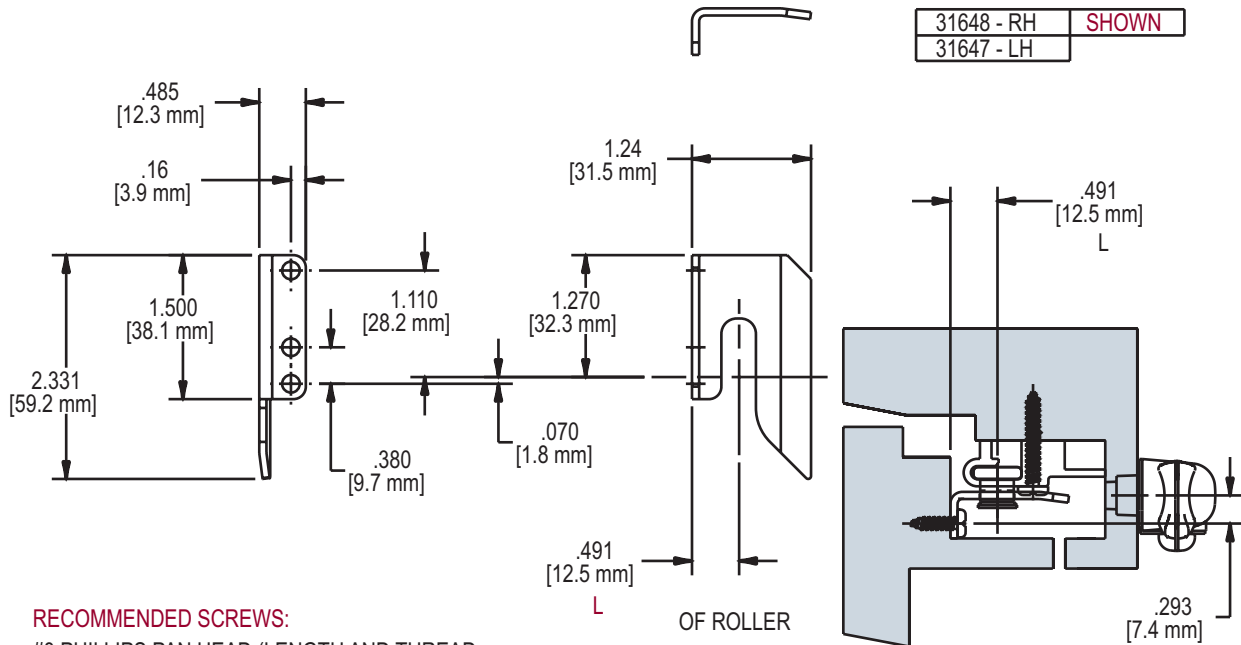


40928 - LH	SHOWN
40929 - RH	

RECOMMENDED SCREWS:

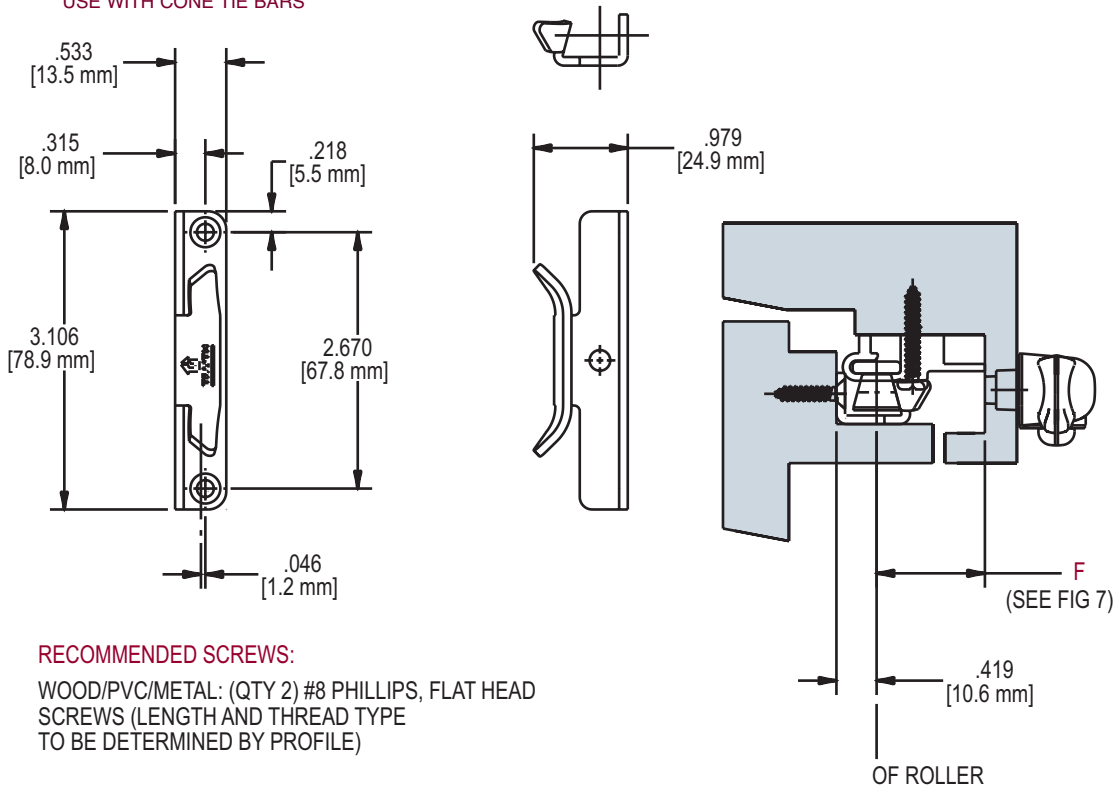
#8 PHILLIPS PAN HEAD (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 16 31647 (LH) AND 31648 (RH) KEEPER
USE WITH INTERLOCK TIE BARS



RECOMMENDED SCREWS:
#8 PHILLIPS PAN HEAD (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

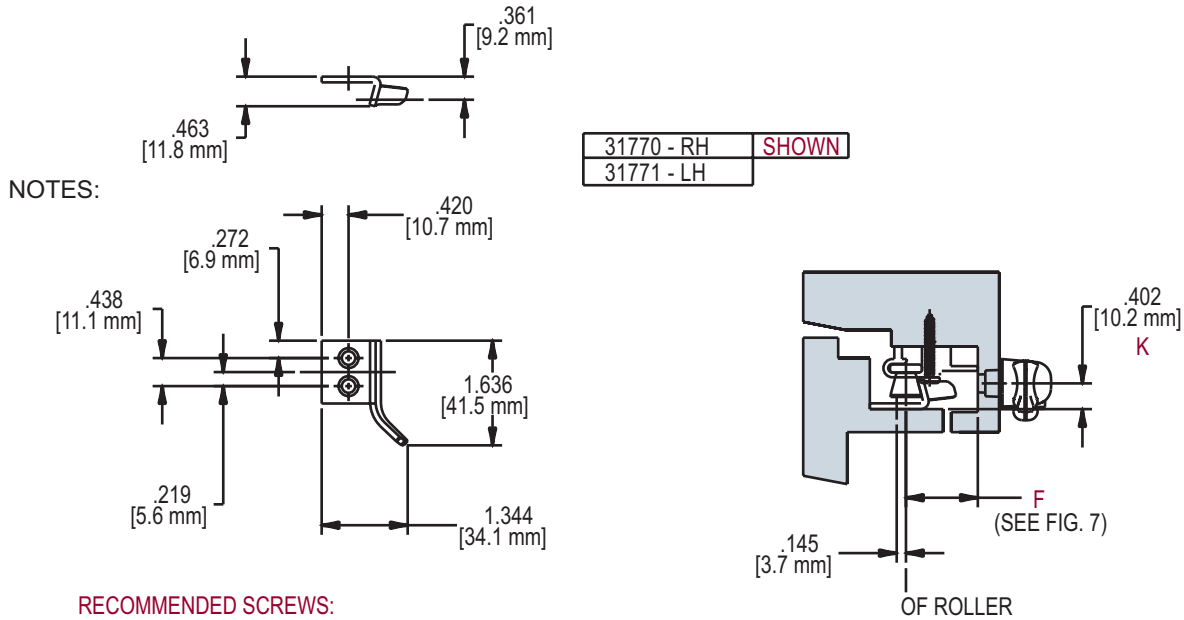
FIG. 17 40970 NON-HANDED KEEPER
USE WITH CONE TIE BARS



RECOMMENDED SCREWS:
WOOD/PVC/METAL: (QTY 2) #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

24 MAXIM® MULTI-POINT & SINGLE POINT LOCKING SYSTEMS

FIG. 18 31770 (RH) AND 31771 (LH) KEEPER
USE WITH CONE TIE BARS

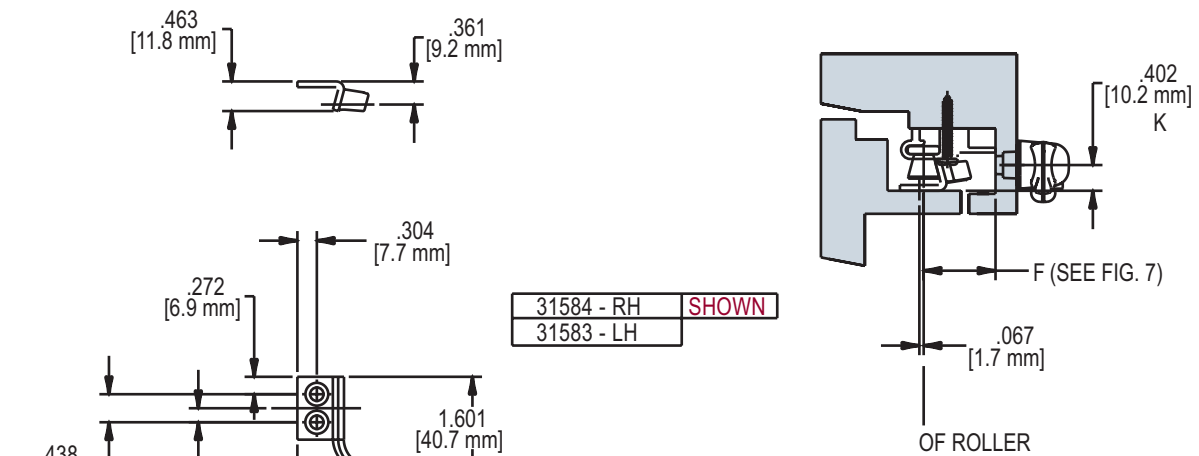


NOTES:

RECOMMENDED SCREWS:

WOOD/PVC/METAL: (QTY 2) #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

FIG. 19 31583 (RH) AND 31584 (LH) KEEPER
USE WITH CONE TIE BARS



RECOMMENDED SCREWS:

WOOD/PVC/METAL: (QTY 2) #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

FIG. 20 31414 (RH) AND 31415 (LH) KEEPER (USE WITH CONE TIE BARS)

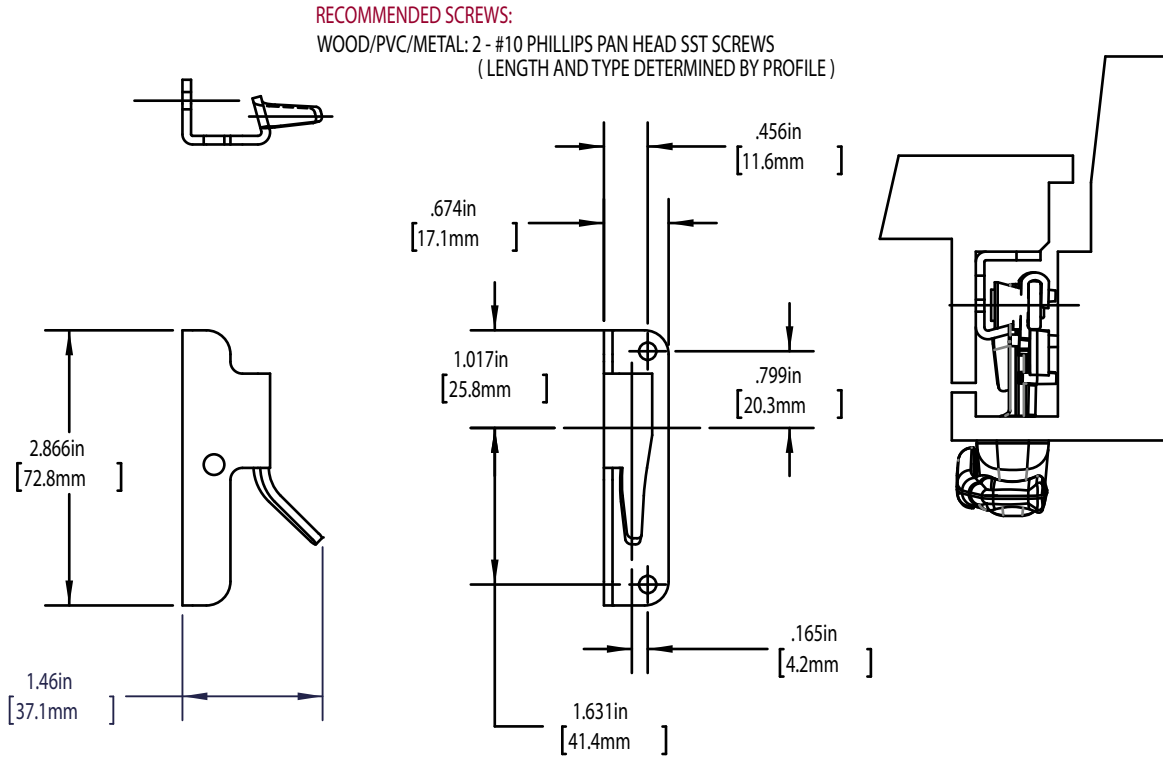
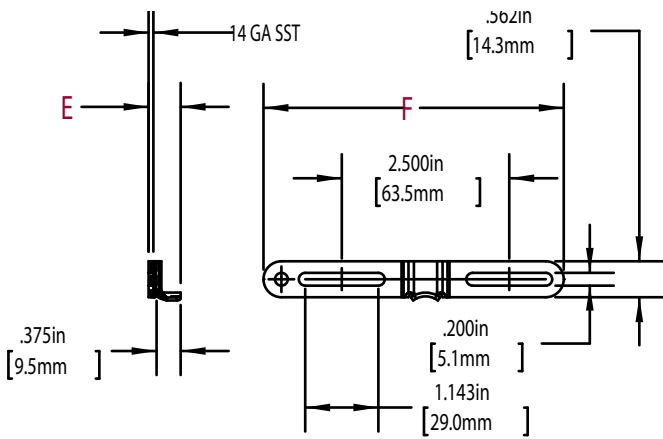


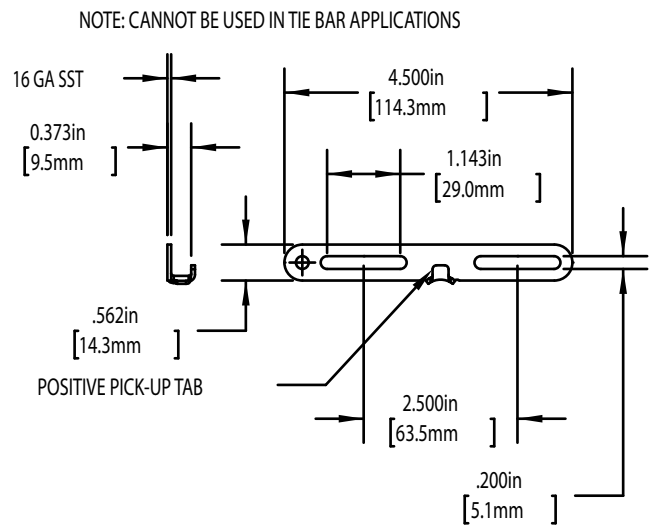
FIG. 21 KEEPERS 21087, 21088 AND 21089



KEEPER	E	F
21087	.375 (9.5mm)	4.735 (120.3mm)
21088	.500 (12.7mm)	4.647 (118.0mm)
21089	.562 (14.3mm)	4.593 (116.7mm)
21325	.688 (17.5mm)	4.647 (118.0mm)

RECOMMENDED SCREWS:
WOOD/PVC/METAL: 2 - #10 PHILLIPS PAN HEAD SST SCREWS
(LENGTH AND TYPE DETERMINED BY PROFILE)

FIG. 22 KEEPERS 31384 (WITH POSITIVE PICK-UP TAB)



RECOMMENDED SCREWS:
WOOD/PVC/METAL: 2 - #10 PHILLIPS PAN HEAD SST SCREWS
(LENGTH AND TYPE DETERMINED BY PROFILE)



700 WEST BRIDGE STREET, OWATONNA, MN 55060 ■ 507.451.5620 800.866.7884 ■ TRUTH.COM



The new Contour Multipoint Locking System for commercial aluminum windows, proves to be the most attractive, easiest operating, highest performing, best value in Commercial casement and awning window locking hardware.

Check out these amazing features & benefits:

- Non-Handed Lock Drive- You will like the advantage of ordering and inventorying just one lock handle for both left- and right-hand windows.
- The unique handle design is longer and more robust to meet ADA requirements on larger windows.
- With its sleek, low-profile design, homeowners will love the fact that in either the locked or unlocked position, these locks won't interfere with curtains or blinds.
- The casement roller keeper is hex key adjustable for fine tuning operating force or weather seal compression.
- The casement lock points are capable of resisting up to 350 lbs per lock point. With optional tiebars for sash sizes from 16" to 102" in frame height, and providing up to (5) locking points.
- Quick and easy lock-to-tie bar attachment and the simple two screw mounting reduce installation time.
- On some casement windows the option of a lock point below the handle improves sealing and lock-up.
- Contour offers a single point system for awning windows using 300 series stainless steel keepers, with a lock point load resistance of up to 350 lbs. No tie bars required.



- Custom-designed, profile-specific tie bar guides and keepers offer maximum hardware application flexibility. Guides "index" (locate) the tie bars in two directions for consistent and efficient application. (Contact Truth to identify correct tiebar assembly and keepers for your profile).
- A pre-installed gasket, which surrounds the base ensures the installation is tightly sealed to protect against air, water, and light infiltration.

CONSUMER ADVANTAGES

- Secure, solid detent lets you "feel" when the Contour System is locked.
- The unique design makes the lock highly pick-resistant.
- Homeowners will appreciate the excellent "reach-out" capability. No need to fully close the window before locking it. Just close the window to within .625" (15.8 mm) and actuate the lock handle.

- The heart of this system is the "progressive" locking action. Watch as the tie bar engages and pulls in the lowest lock point first, followed by the remaining keeper(s) in sequence. This "zippered effect" assures the top lock point on tall units always engages and pulls in, even in less-than-perfect installations. Feel the smooth and easy lock operation the sequential lock action also provides.

ATTRACTIVE LOOK

- Multi-Point Locks for Casement (#24.50) and Single-Point Locks for Awning (#24.51) look identical – for a consistent appearance throughout the home.
- Contemporary aesthetics and styling complement the soon to be released Contour Operator System, and existing Maxim and Encore operators.
- With its attractive painted or plated finish, the zinc handle & base precisely match the color of your finished profile.

CONTOUR LOCKS

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL & PROTECTIVE FINISH:

High pressure zinc die-cast handle, case, and sliders (liquid or powder coat painted finish). Steel tie bar (powder coat painted finish). Keepers made of either coated steel, or 300 series stainless steel.

E-GARD® HARDWARE

Truth's E-Gard® Hardware has a multistage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to perform approximately three times better than common zinc plated finishes.

FINISH:

Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

Due to the complexity of the possible variables in the Tempo tiebar and keepers we ask that you please contact Truth Hardware's Product Specialists for custom application drawings.

1. Order Casement or Awning
Contour Sash Lock by part number.
Casement Multi-Point Lock #24.50
Multi-Point Awning Lock #24.51
Contour Single Point
2. Specify finish number.
3. Order keepers by part number - refer to your custom application drawing
4. Specify tie bar needed by length - refer to the sizing chart on your custom application drawing.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to your custom application drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

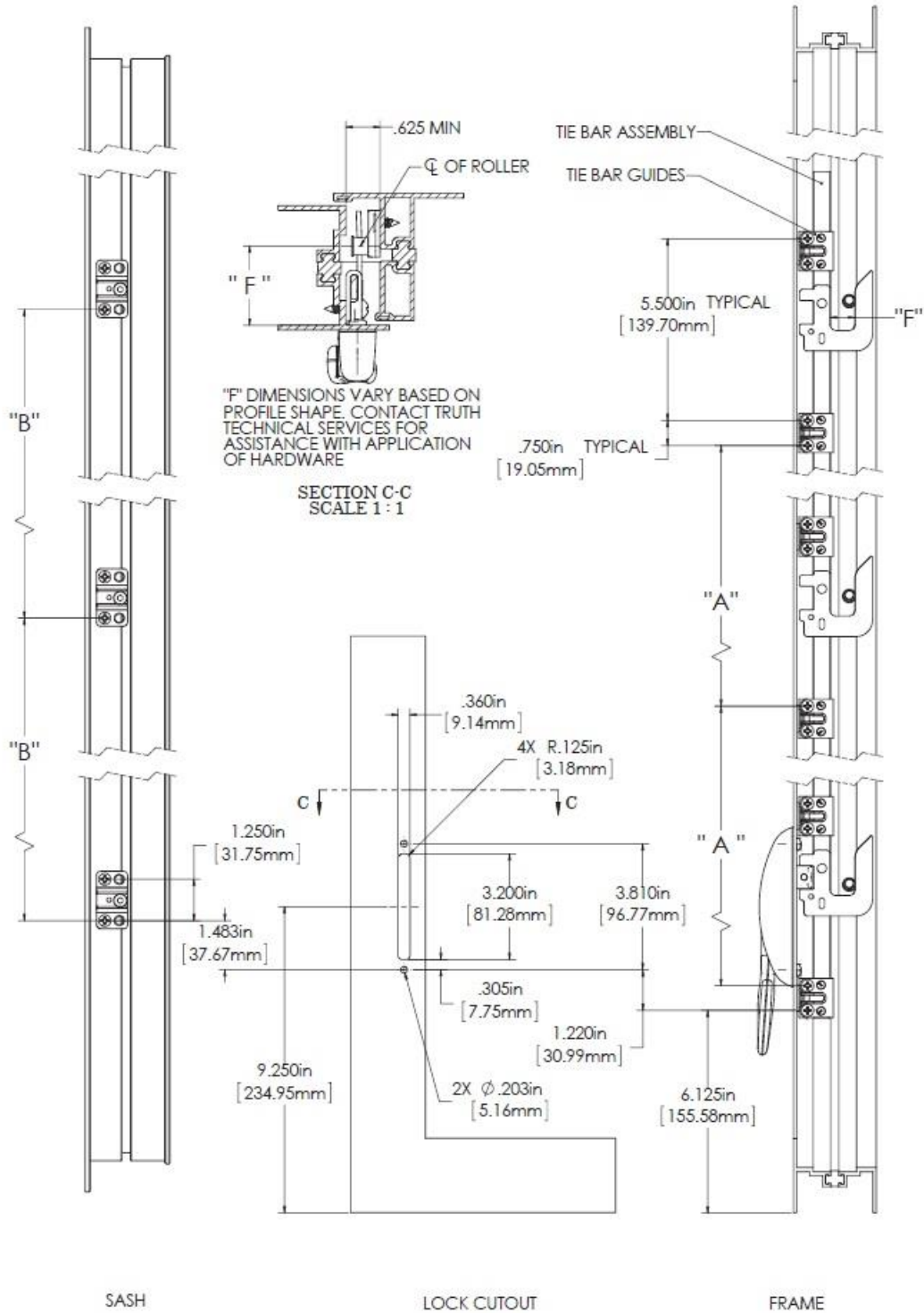
1. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
2. For power drivers used to install mounting screws, recommended torque for screw installation (#19298) is 35 in./lbs; not to exceed 50 in./lbs.
4. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power. Please review screw recommendations given in your custom application drawings.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Contour window locking system shall be included which will increase both security and weather seal tightness. The locking points must hold securely for negative air pressure and forced entry resistance.

Window sash locks will be used which provide sequential locking with up to .625" (15.9 mm) of pull-in. The lock must utilize a tie bar driven by a single locking handle to meet ADA hardware standards. The lock drive handle must provide a weather tight seal by providing a gasket between lock and window frame. The lock shall be constructed of high pressure zinc alloy die castings and either painted, plated or E-Gard® components and accessories. Window locks shall be 24 series, Contour Multi and Single Point Lock Systems as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 MULTI-POINT CASEMENT APPLICATION



CONTOUR LOCKS

FIG. 2 SINGLE POINT / AWNING APPLICATION

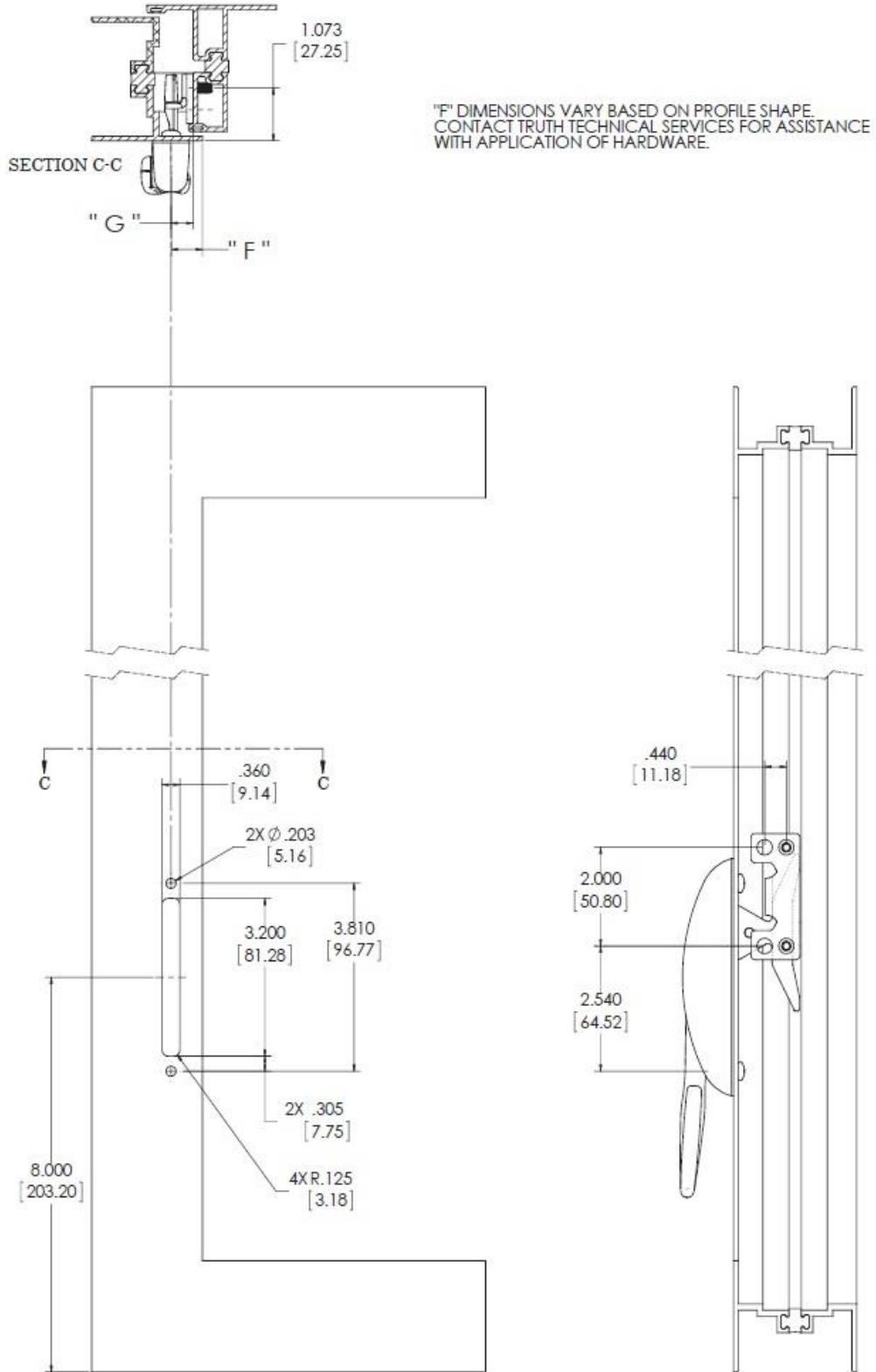


FIG. 3A LOCK TIE BARS

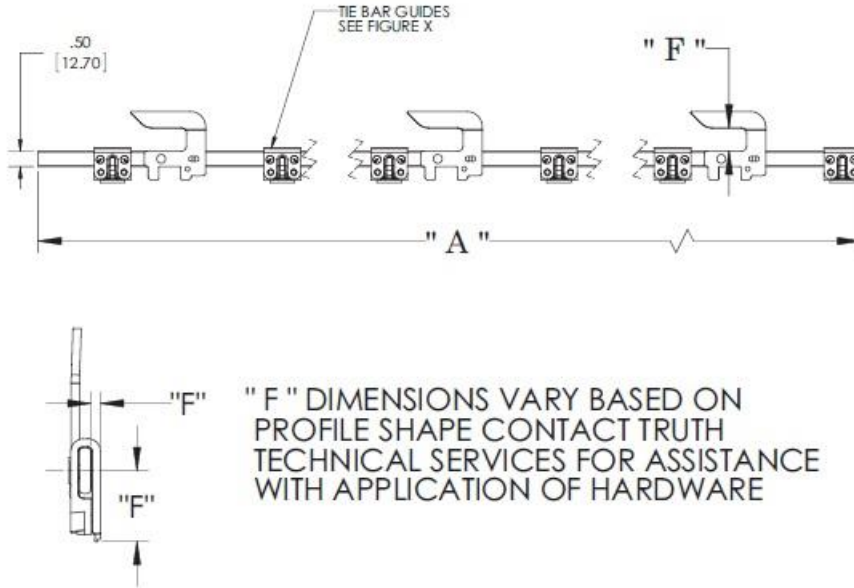
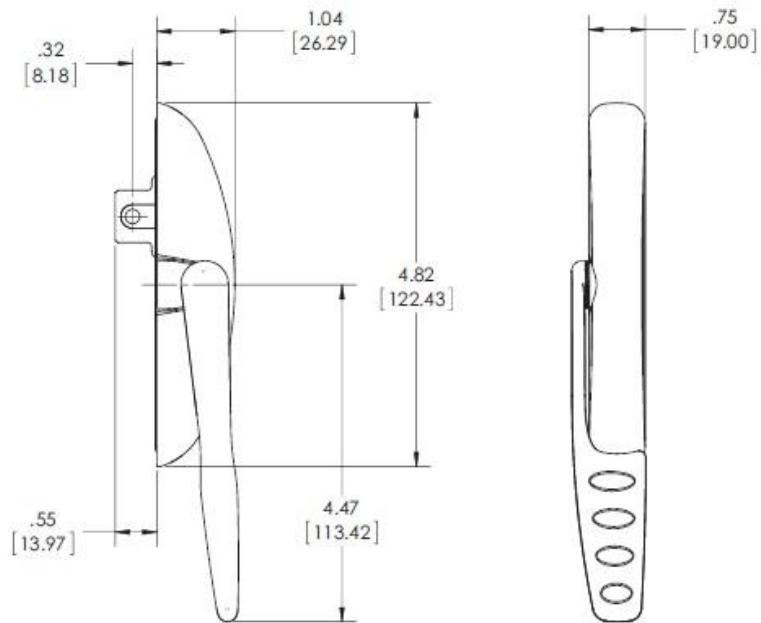


FIG. 3B TIEBAR CHART

Window Frame Height (inches)	Tie bar Length (inches)	Number of Lock Points	Spacing Between Tie Bar Guides "A" (inches)	Spacing Between Keepers "B" (inches)	Tiebar Part Number
16-24	8.5	1	5.500	0.000	*
24-30	16.5	2	8.000	8.560	*
30-36	22.5	2	14.000	14.560	*
36-42	28.5	2	20.000	20.560	*
42-48	34.5	3	13.000	13.280	*
48-54	40.5	3	16.000	16.280	*
54-60	46.5	3	19.000	19.280	*
60-66	52.5	4	14.667	14.853	*
66-72	58.5	4	16.667	16.853	*
72-78	64.5	4	18.667	18.853	*
78-84	70.5	4	20.667	20.853	*
84-90	76.5	5	17.000	17.140	*
90-96	82.5	5	18.500	18.640	*
96-102	88.5	5	20.000	20.140	*

* Contact Truth Tech Services for tiebar part numbers

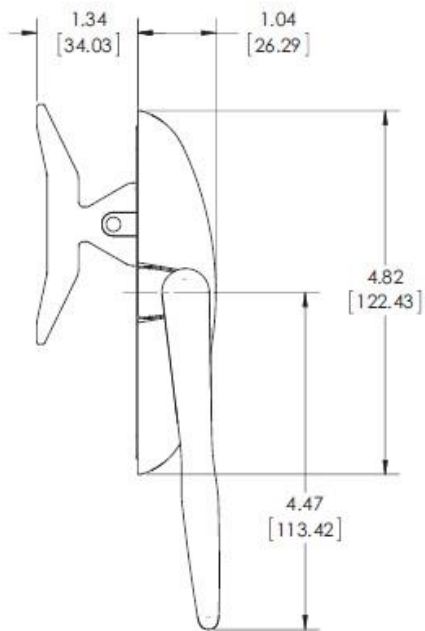
FIG. 4 24.50 MULTIPOINT LOCK



RECOMMENDED SCREWS:

2 P/N-19298 # 10-24 PH PH THREAD
FORMING MACHINE SCREWS

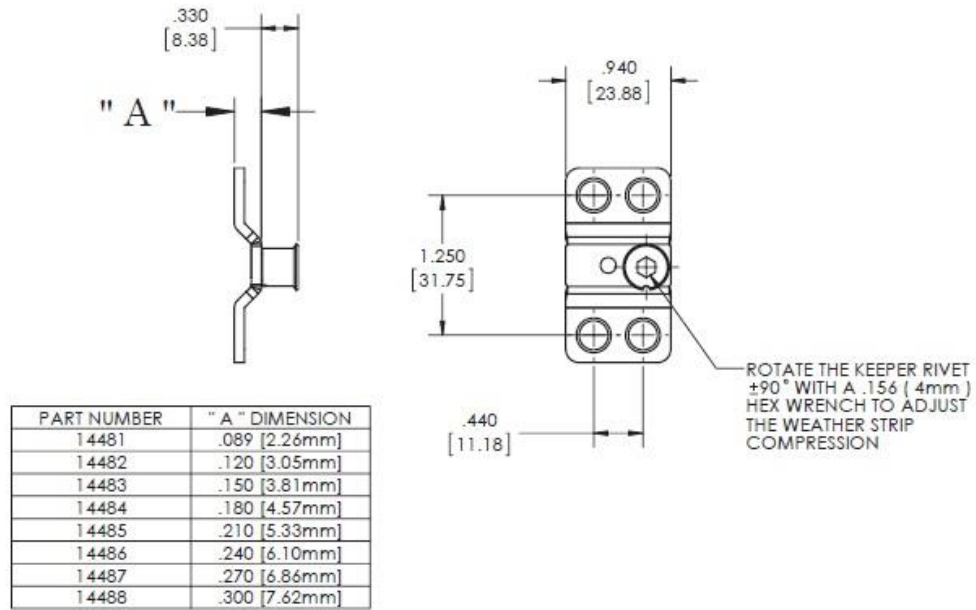
FIG. 5 24.51 SINGLE POINT LOCK



RECOMMENDED SCREWS:

2 P/N-19298 # 10-24 PH PH THREAD
FORMING MACHINE SCREWS

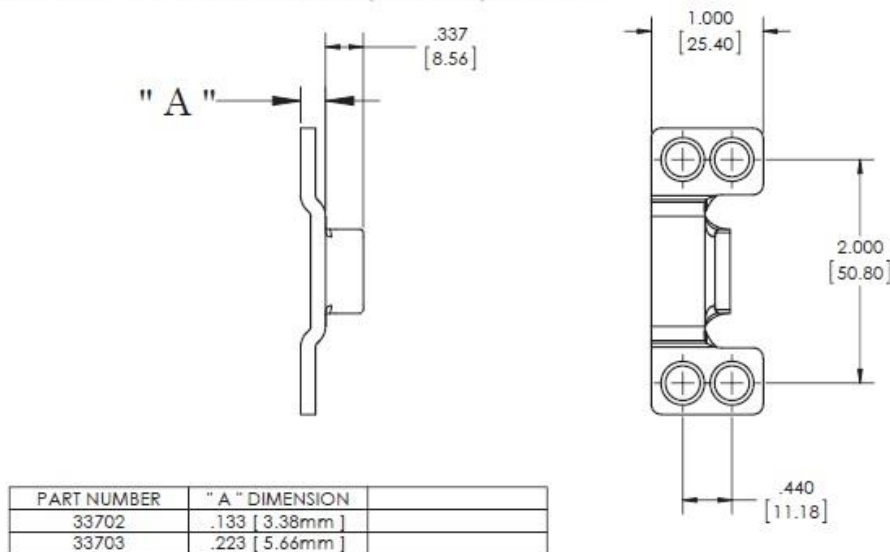
FIG. 6 NON HANDED ADJUSTABLE KEEPER



RECOMMENDED SCREWS:

2 - #10-32 PHILLIPS FLAT HEAD MACHINE SCREWS.
LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE

FIG. 7 NON HANDED SINGLE POINT (AWNING) KEEPER



RECOMMENDED SCREWS:

2 - #10-32 PHILLIPS FLAT HEAD MACHINE SCREWS.
LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE



Providing trouble free operation with fully concealed locking and sequential engagement the Encore Multi-Point Locking System is the most complete locking system for casement and awning windows. The Encore Lock brings a number of new features unique to the window industry – including an option for securing round-top windows and a built-in construction handle which allows windows to be operable prior to painting or staining. In addition, the Encore Lock features the following advancements:

Easy to install – fewer screws, fewer parts, prelocated guides and simpler side stop machining are sure to benefit the manufacturer.

Stronger – Tested to beyond DP 85 on a 36" x 72" window with only three lock points. The Encore is also rated to 400 lbs. per lock point, depending upon application.

Handle Action – Built-in detents, reduced handle to jamb contact and a tighter escutcheon means the Encore lock is more reliable and resistant to insect and light infiltration.

ADDITIONAL FEATURES & BENEFITS INCLUDE:

- Interchangeable handle and escutcheon allows homeowner to easily change the color and style of the hardware
- Escutcheon snaps into lock drive rather than into wood, producing a more secure connection.
- Locking points can be both above and below the handle for added flexibility.
- Detent in locked and unlocked positions eliminates tie bar drop in shipping and helps to pass impact testing.
- Window preparation for Encore does not require CNC machining of the stop.
- Pre-located guides on tie bars makes them easier to install.
- Single kerf locating allows use of a single screw at each guide which reduces machining and installation time and cost.
- Handed tie bar with 1 to 4 locking points.
- Available with surface mount (flange) or recessed (biscuit-style) keepers

- Stainless steel components for coastal applications are also available.
- Convert from Truth’s Mirage™ Lock to the Encore system without recertifying your window.

PRODUCT APPLICATION ASSISTANCE

If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

CORROSION RESISTANCE

Truth’s E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes. Stainless steel components for coastal applications are also available.

WARRANTY:

Protected under the terms of the Truth Warranty for Window & Door Manufacturers & Authorized Distributors. Refer to Truth’s Terms & Conditions for further details.

MATERIAL:

Molded in color plastic handle and escutcheon, Stamped steel and engineered plastic lock drive, Steel tiebar with engineered plastic guides, keepers of high strength steel or stainless steel.

FINISH:

The removable handle and escutcheon are constructed of durable, fade and scratch resistant plastic. These are supplied with color molded in for consistency with our painted products. Please refer to Truth’s Color Chart for examples of Truth’s most popular finish options.

Truth also offers a wide range of decorative “plated” finishes – contact Truth for additional information on availability of these finishes on specific product lines.



Encore Lock (locked position)



Encore Built-in Construction Handle

ORDERING INFORMATION

If application assistance is needed, please contact Truth Hardware’s Product Specialists.

1. Order Non-handed Encore™ lock drive by part number.
#12642.92 Encore lock drive assembly
2. Order Non-handed Encore Tango Sash Lock handle and escutcheon pack
#12662.XX Encore Tango handle and escutcheon (painted)
3. Specify finish number.

ENCORE™ MULTI-POINT LOCKING SYSTEM

4. Order Keepers:

#41341.92 non-handed biscuit keeper.
Or
#33593.92 (LH) and #33592.92 (RH)
flange keeper.

5. Determine tie bars required. Refer to the accompanying drawings for part numbers and standard available lengths (handing determined by hinge side when viewed from the outside).

RECOMMENDED SCREWS

Types of screw required determined by material of profile used - see Tech Note #11. Refer to drawings for complete information on screw type and quantity needed on your specific window profiles (sold separately).

TRUTH TIPS:

1. Make sure that screen stop fasteners do not interfere with the movement of the tie bar.
2. Application drawings show correct orientation of keepers to insure sequential lock-up.
3. When selecting mounting screws for Truth hardware, coating compatibility is a very important criteria. For best corrosion resistance, the material and coating on the screws should be the same as the hardware.
4. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of the window.
5. For maximum strength, stainless steel keepers are recommended.
6. When converting from Truth's Mirage™ Lock System to the Encore Lock System, recertifying your window is not necessary. Contact Truth for more information.
7. Application of Encore Lock and Flange Keepers – Because of the self-locating features in the Encore Lock System, only one screw hole of the Lock Drive assembly needs to be pre-marked on the jamb. The locations of the Tie Bar Guides do not need to be pre-marked. The application steps are as follows:
 - A. Place the Lock Drive assembly in its locating kerf in the jamb and position it over the pre-marked hole.

B. Screw it down.

C. Move the handle to the locked position. This is necessary to correctly locate the tie bar guides.

D. Place the hook end of the Tie Bar over the mating hook on the end of the Lock Drive and place the ribs on the bottom of the Tie Bar Guides into the tie bar locating kerf in the jamb.

E. Screw down the Tie Bar Guides.

F. The Tie Bar is indexed to the Tie Bar Guides with tear away tabs. Actuate the handle to break the tie bar loose so that it can freely slide.

G. Pre-drill all screw holes in the sash for the keepers.

H. Screw down the keeper. This is easiest if the lower screw (the one under the hook part of the keeper) is applied before the upper one.

8. Application of Encore Round Top Lock and Flange Keepers – Because of the self-locating features in the Encore Lock System, only one screw hole of the Lock Drive assembly needs to be pre-marked on the jamb. The locations of the Tie Bar Guides do not need to be pre-marked. The application steps are as follows:

A. Place the Lock Drive assembly in its locating kerf in the jamb and position it over the pre-marked hole. Screw it down.

B. Move the handle to the locked position. This is necessary to correctly locate the tie bar guides.

C. Measure or calculate the length of the Connecting Link that is needed (see fig. 12). Break the connecting link to achieve the required length.

D. Bend the Round top Tie Bar to match the radius of the round top window. If the radius of the Round top Tie Bar does not closely match the radius of the window, the force to move the lock handle will increase.

E. Slide Round Top Tie Bar Guides F and G onto the Round Top Tie Bar between the roller and Connecting Link, being careful to orient them correctly.

F. Screw the Connecting Link to the ends of the straight and round top tie bars.

G. Place the hook end of the straight Tie Bar over the mating hook on the

end of the Lock Drive and place the ribs on the bottom of the Tie Bar Guides into the tie bar locating kerf in the jamb.

H. Screw down the straight Tie Bar Guides.

I. Slide Round Top Tie Bar Guide F into contact with the end of the Connecting Link and screw it down.

J. The Tie Bar is indexed to the Tie Bar Guides with tear away tabs. Actuate the handle to break the tie bar loose so that it can freely slide and then move the lock handle to the unlocked position.

K. Slide Round Top Tie Bar Guide G against the roller and screw it down.

L. Slide Round Top Tie bar Guide H onto the top end of the Round Top Tie Bar. Position the guide flush with the end of the bar and screw it down.

M. Pre-drill all screw holes in the straight portion of the sash for the keepers.

N. Move the handle to the locked position and mark the screw holes for the keeper.

O. Screw down the keepers. This is easiest if the lower screw (the one under the hook part of the keeper) is applied before the upper one.

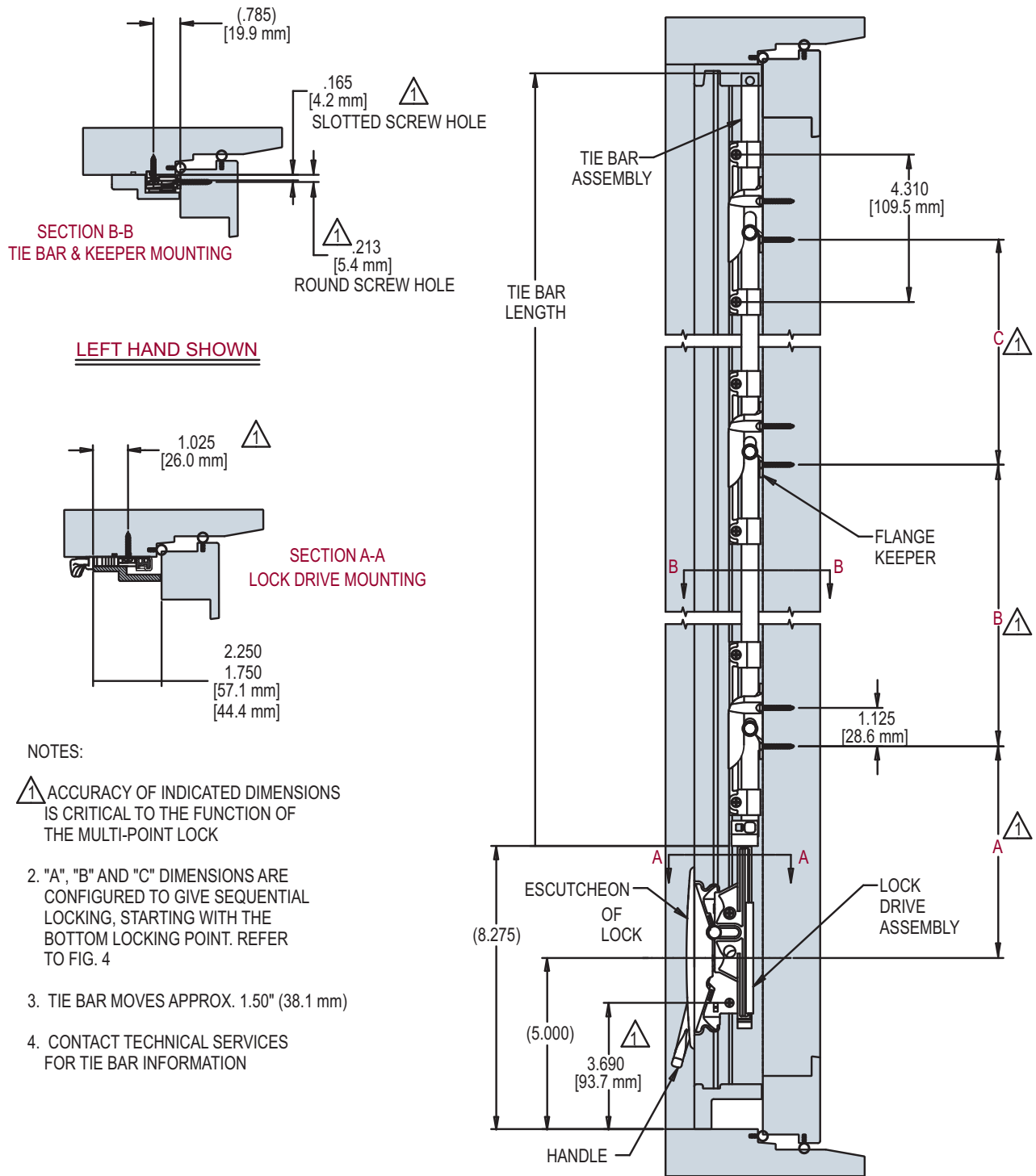
INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window locking system shall be included which will increase both security and weather seal tightness. The locking points must hold securely for negative air pressure and forced entry resistance.

The lock must incorporate a multi-point locking feature that sequentially locks the window from bottom to top. The lock must provide for a removable handle and escutcheon for ease in color changes and/or for ease in painting or staining the window. The lock shall incorporate a construction handle to allow operation of the window prior to finished hardware being applied. The locking drive and tiebar system shall be constructed of stamped steel protected with E-Gard® and high quality engineered plastics.

Window locks shall be Encore™ series, as manufactured by Truth Hardware.

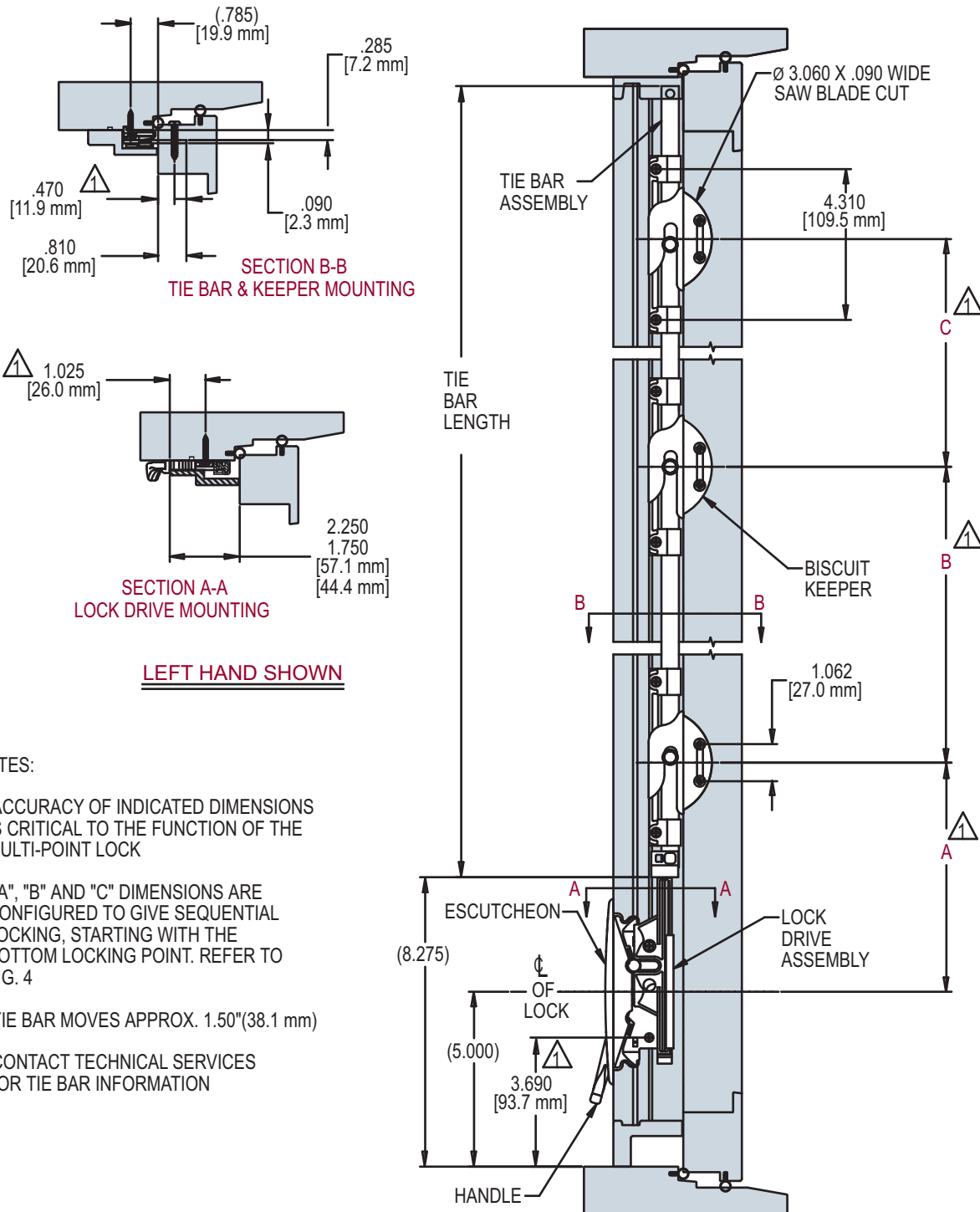
FIG. 1 CASEMENT APPLICATION WITH FLANGE KEEPER



HARDWARE SHOWN	
PART NO.	DESCRIPTION
12662.XX	ENCORE TANGO HANDLE AND ESCUTCHEON
SEE FIG. 5	ENCORE TIE BAR ASSEMBLY
33593.92	STEEL KEEPER, LH FLANGE (33592.92 RH)(QTY:1 PER LOCK POINT)
12642.92	ENCORE LOCK DRIVE ASSEMBLY

ENCORE™ MULTI-POINT LOCKING SYSTEM

FIG. 2 CASEMENT APPLICATION WITH BISCUIT KEEPER



HARDWARE SHOWN	
PART NO.	DESCRIPTION
12662.XX	ENCORE TANGO HANDLE AND ESCUTCHEON
SEE FIG. 5	ENCORE TIE BAR ASSEMBLY
41341.92	STEEL KEEPER, NON-HANDED BISCUIT(QTY:1 PER LOCK POINT)
12642.92	ENCORE LOCK DRIVE ASSEMBLY

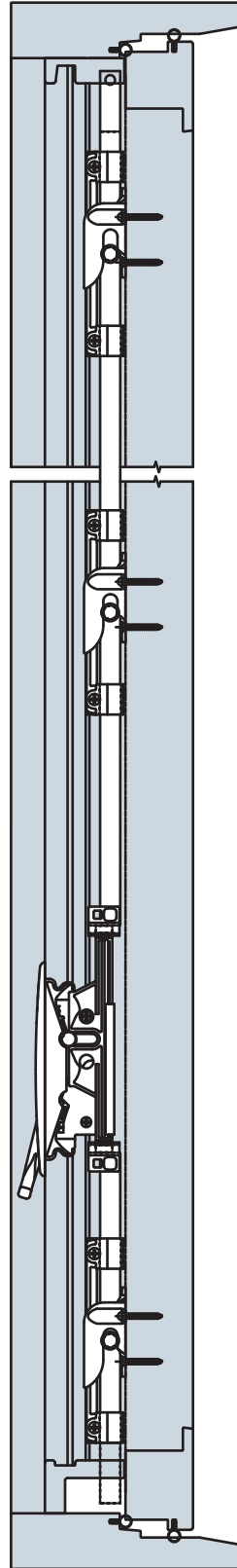
FIG. 3 TIE BARS ABOVE AND BELOW LOCK DRIVE

NUMBER OF LOCK POINTS ON UPPER TIE BAR	ADJUSTMENT TO DIMENSIONS IN FIG. 5		
	A	B	C
1	+ .310		
2	+ .155	- .155	
3	+ .100	- .050	- .050

LEFT HAND SHOWN

NOTES: 1. ADD THE ADJUSTMENTS SHOWN ABOVE TO DIMENSIONS A,B, AND C SHOWN IN FIG. 5 TO CORRECTLY SEQUENCE THE KEEPERS IN TWO TIE BAR APPLICATIONS.

2. REFER TO CASEMENT AND AWNING APPLICATIONS FOR OTHER DIMENSIONS.



ENCORE™ MULTI-POINT LOCKING SYSTEM

FIG. 4 SIDE STOP AND JAMB ROUTING DETAIL

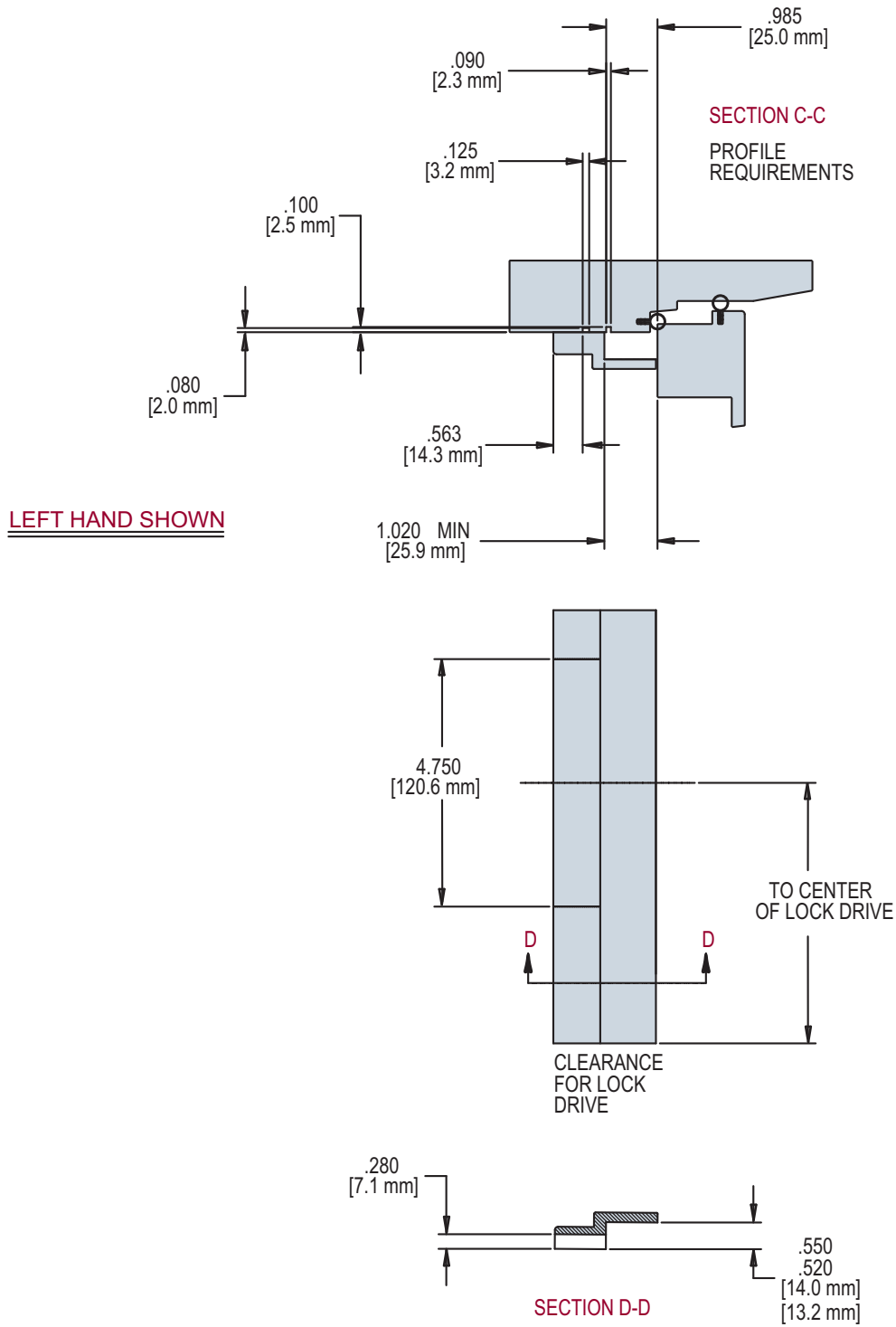
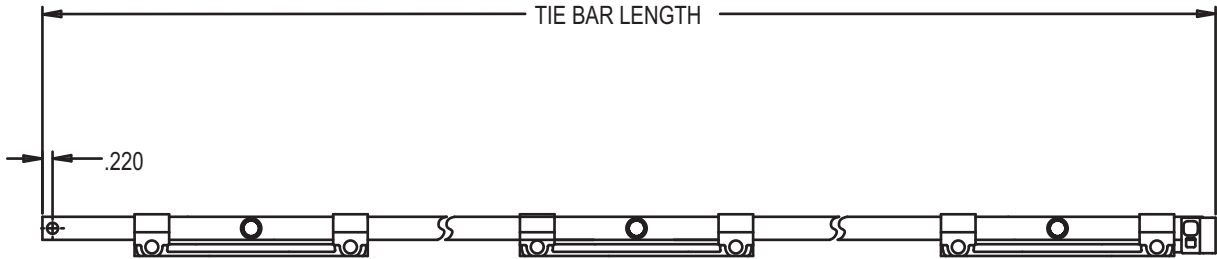


FIG. 5 TIE BAR ASSEMBLY CHART



LEFT HAND SHOWN

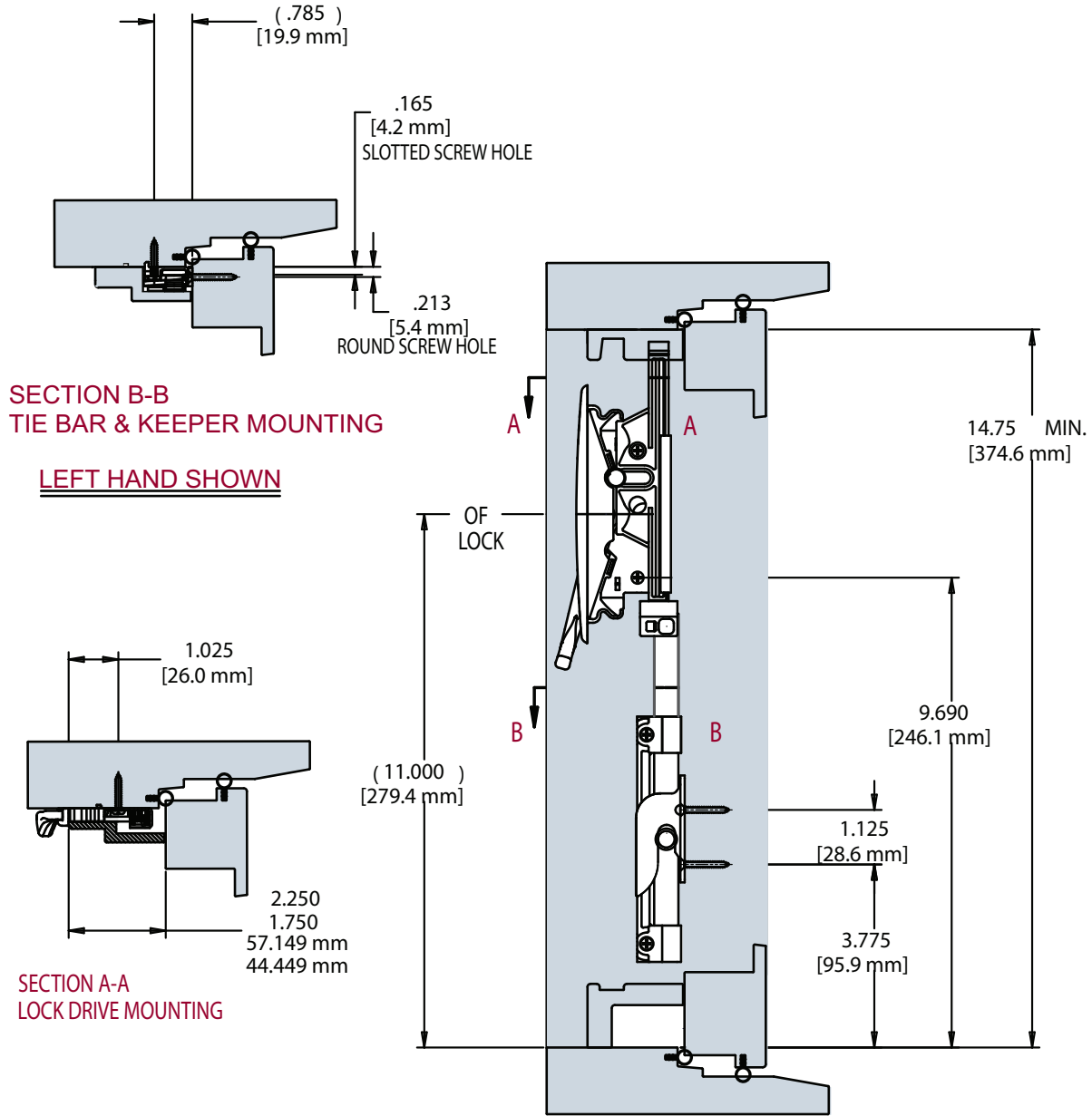
RECOMMENDED SCREWS

2 (P/N 19077.92)
#6 X 1 PAN HEAD
SHEET METAL SCREW

ENCORE CASEMENT TIE BAR ASSEMBLIES									
APPROX. WINDOW HEIGHT	"E" DIM ROUND TOP WINDOWS ONLY	# OF LOCK POINTS	PART NO.		TIE BAR LENGTH	"A" DIM FLANGE KEEPER \triangle	"A" DIM BISCUIT KEEPER \triangle	"B" DIM \triangle	"C" DIM \triangle
			LH	RH					
69"-75"	60"-66"	3	12659	12660	57.44	6.185	6.550	24.905	24.905
63"-69"	54"-60"	3	12657	12658	51.44			21.905	21.905
57"-63"	48"-54"	3	12696	12697	45.44			18.905	18.905
		2	12655	12656	45.44			37.810	
51"-57"	42"-48"	3	12694	12695	39.44			15.905	15.905
		2	12653	12654	39.44			31.810	
45"-51"	36"-42"	2	12651	12652	33.44			25.810	
39"-45"	30"-36"	2	12649	12650	27.44			19.810	
33"-39"	24"-30"	2	12647	12648	21.44	13.810			
27"-33"	18"-24"	1	12645	12646	15.44	13.685	14.050		
21"-27"	12"-18"	1	12643	12644	9.44	7.685	8.050		

ENCORE™ MULTI-POINT LOCKING SYSTEM

FIG. 6 AWNING APPLICATION WITH FLANGE KEEPER

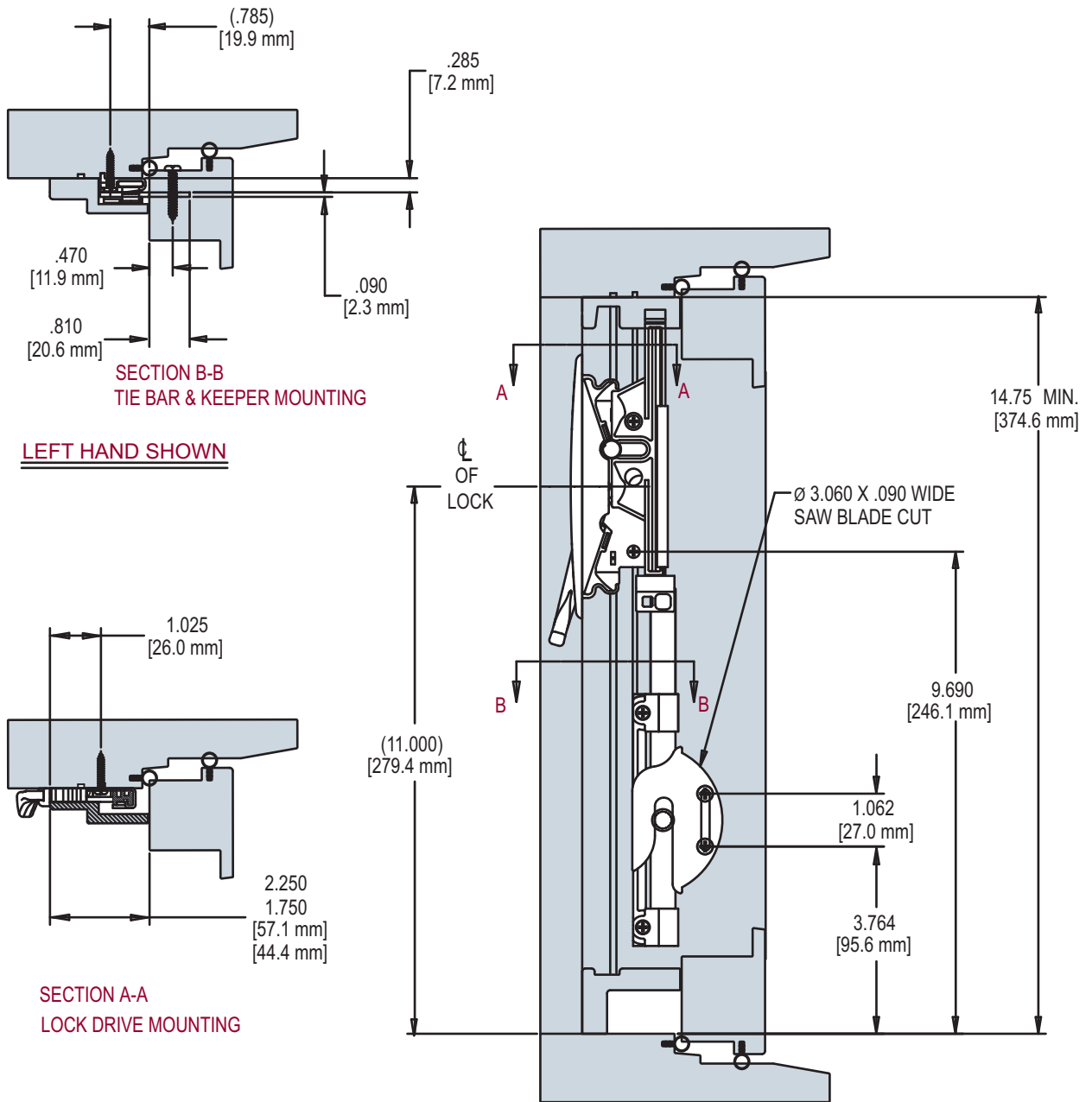


NOTES:

APPROXIMATE MINIMUM WINDOW FRAME HEIGHT IS 17.5 INCHES.

HARDWARE SHOWN	
PART NO.	DESCRIPTION
12662.XX	ENCORE TANGO HANDLE AND ESCUTCHEON
12665.92	ENCORE TIE BAR ASSEMBLY, AWNING LH (12666.92 RH)
33593.92	STEEL KEEPER, LH FLANGE (33592.92 RH)
12642.92	ENCORE LOCK DRIVE ASSEMBLY

FIG. 7 AWNING APPLICATION WITH BISCUIT KEEPER



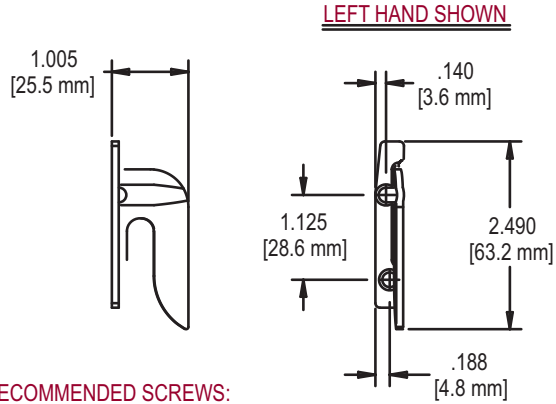
NOTES:

APPROXIMATE MINIMUM WINDOW FRAME HEIGHT IS 17.5 INCHES.

HARDWARE SHOWN	
PART NO.	DESCRIPTION
12662.XX	ENCORE TANGO HANDLE AND ESCUTCHEON
12665.92	ENCORE TIE BAR ASSEMBLY. AWNING LH (12666.92 RH)
41341.92	STEEL KEEPER, NON-HANDED BISCUIT
12642.92	ENCORE LOCK DRIVE ASSEMBLY

ENCORE™ MULTI-POINT LOCKING SYSTEM

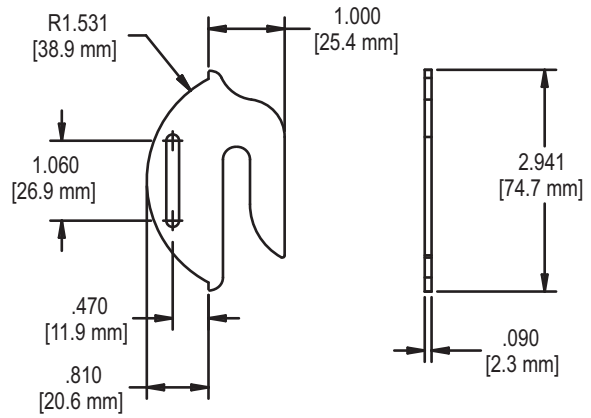
FIG. 8 KEEPER FLANGE 33592 (RH) 33593 (LH)



RECOMMENDED SCREWS:

2 (P/N 19051.92) #6 X 1 FLAT HEAD
SHEET METAL SCREW

FIG. 9 KEEPER, BISCUIT 41341 (NON-HANDED)



RECOMMENDED SCREWS:

2 (P/N 19230.92) #8 X 1 PAN HEAD
SHEET METAL SCREW

FIG. 10 HANDLE AND ESCUTCHEON 12662.XX

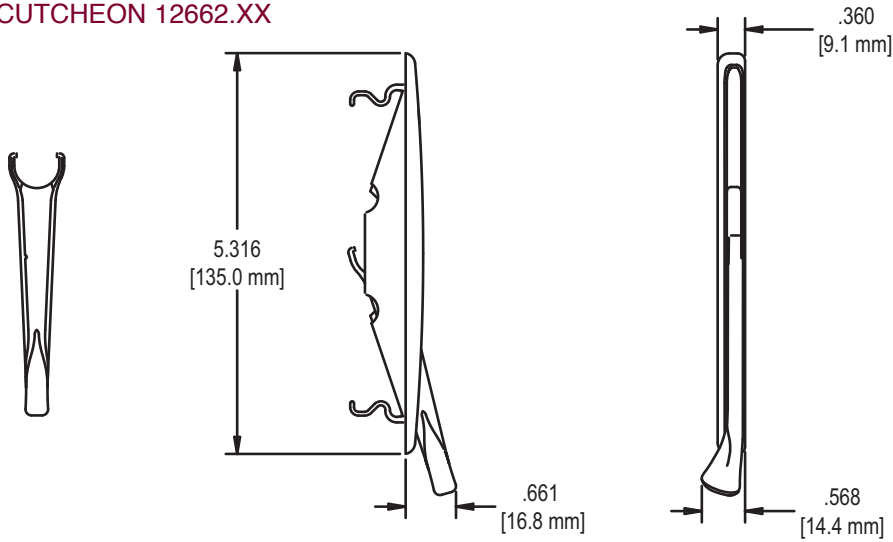
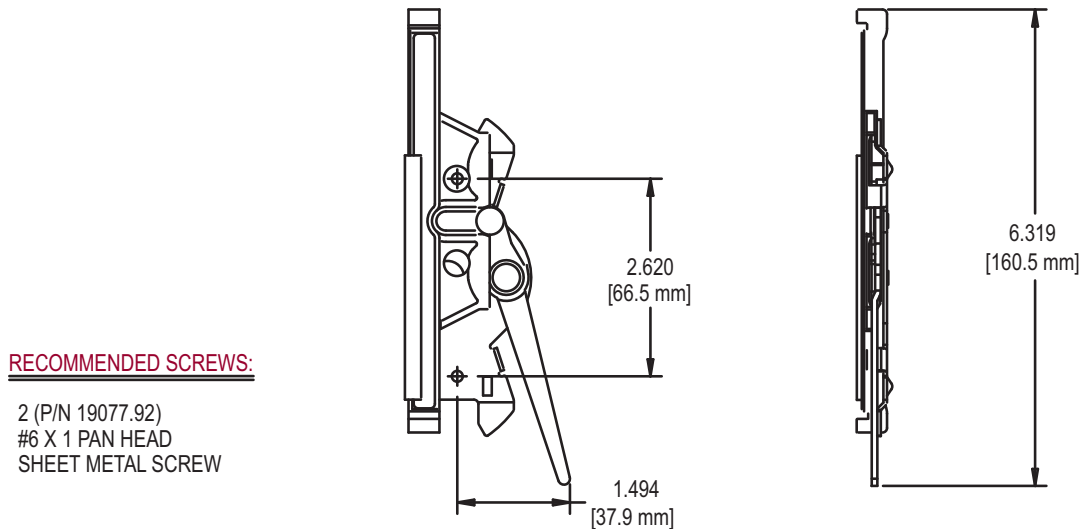


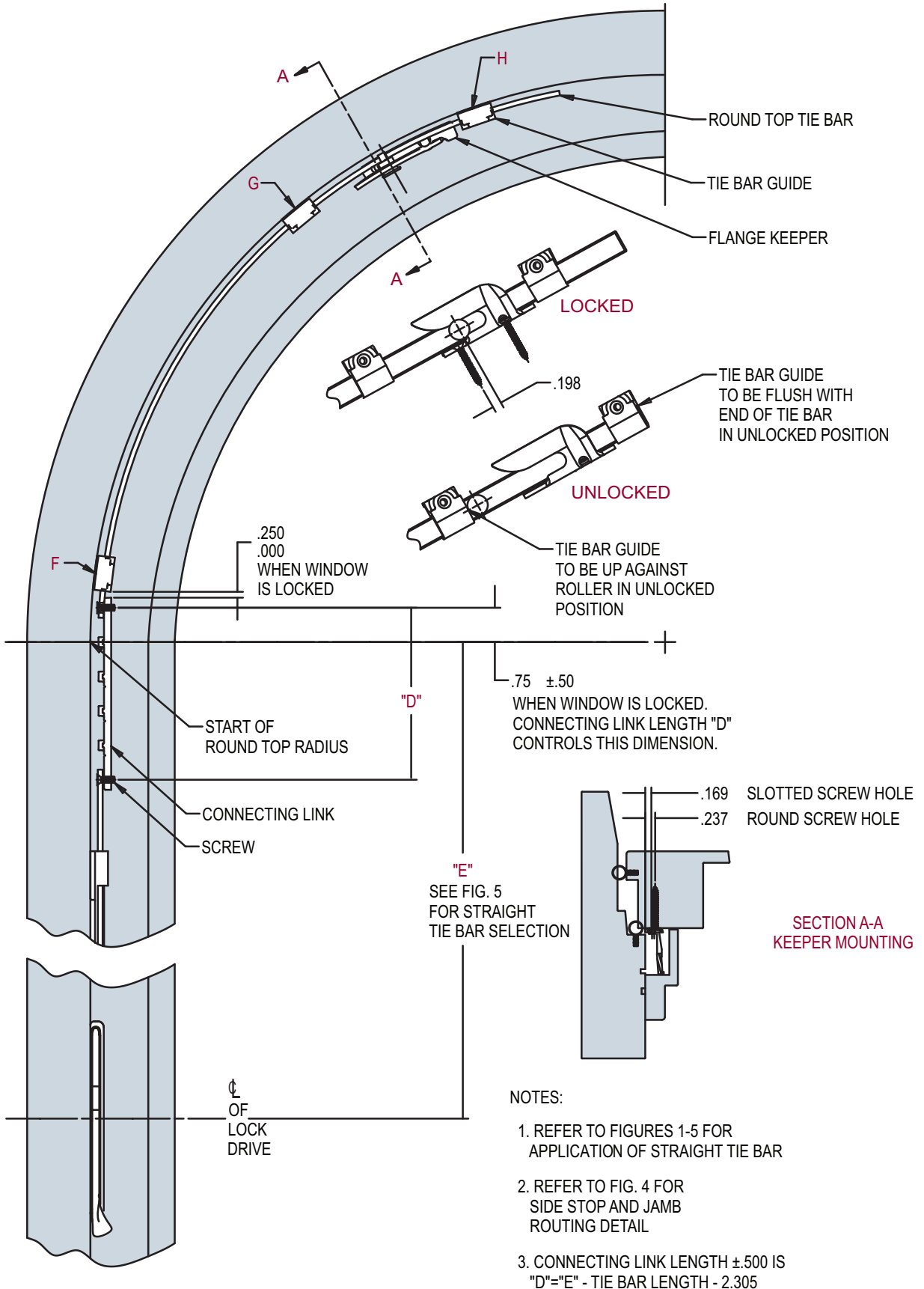
FIG. 11 LOCK DRIVE ASSEMBLY 12642.92



RECOMMENDED SCREWS:

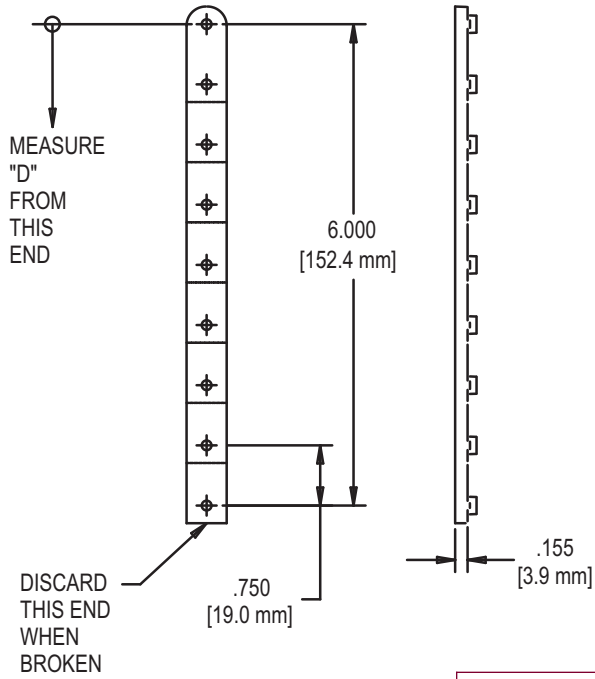
2 (P/N 19077.92)
#6 X 1 PAN HEAD
SHEET METAL SCREW

FIG. 12 ROUND TOP APPLICATION



ENCORE™ MULTI-POINT LOCKING SYSTEM

FIG. 13 CONNECTING LINK 45459

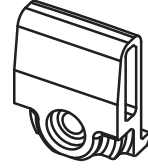


BREAK CONNECTING LINK
AT APPROPRIATE "V" GROOVE
TO ACHIEVE REQUIRED LENGTH

RECOMMENDED SCREWS:

(2)#6-32 X 3/8 FLAT HEAD
SELF TAPPING SCREW

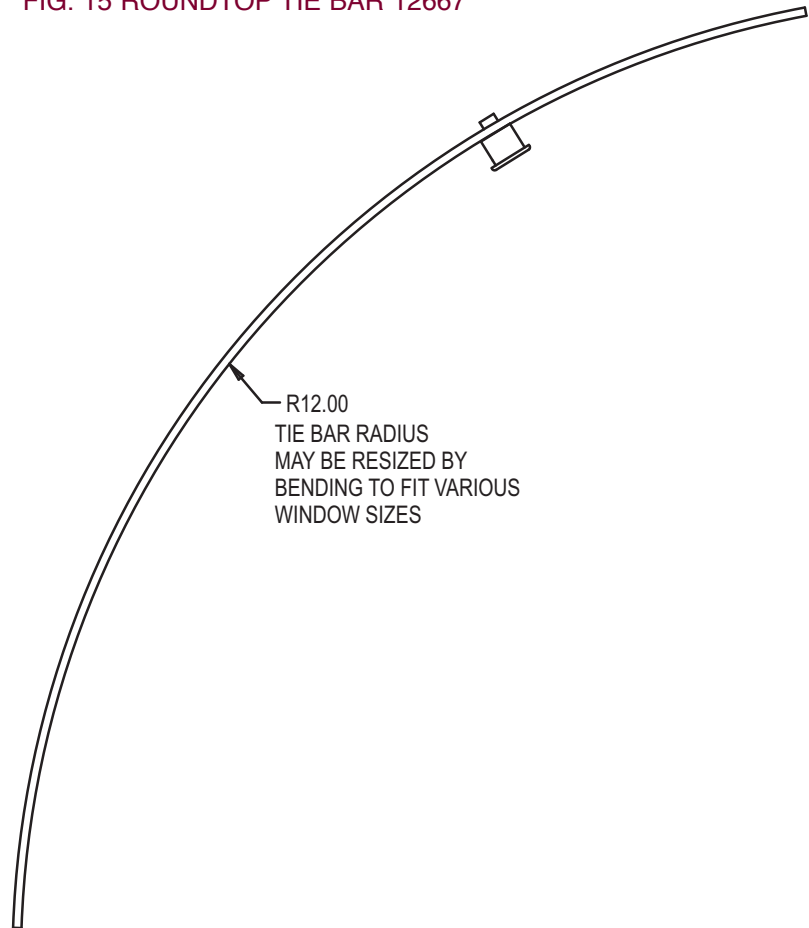
FIG. 14 TIE BAR GUIDE 41392



RECOMMENDED SCREW:

1 (P/N 19077.92)
#6 X 1 PAN HEAD
SHEET METAL SCREW

FIG. 15 ROUNDTOP TIE BAR 12667



**STYLISH & EFFICIENT**

With its sleek, low-profile design, homeowners will love the fact that in either the locked or unlocked position it doesn't interfere with curtains or blinds. With its attractive painted finish, the locks' all-metal handle & base precisely match the color of your vinyl profile.

Homeowners will appreciate the extended "reach-out" capability. Instead of having to fully close the window before locking it, all you do now is close the window to within .625" (15.8 mm) and turn the "one" lock.

EASE OF INSTALLATION

Truth's locking system for vinyl casement windows is now easier to install than ever before. With less parts than comparable models, Truth's #24.84 Locking System is designed with parts that actually align themselves!

The self-locating snap-on tie bar guides have "feet" protruding from within, that automatically "index" the tie bar the correct distance away from the frame, for precise installation everytime! The keepers too, have these unique "feet" designed into their construction to insure accurate hardware placement. Contact Truth for the guides and keepers specially created for your profile. And even the tie bar itself, which has been designed so it will connect directly to the lock without the need for any additional screws, has been created with the manufacturer in mind.

PROGRESSIVE LOCKING OPERATION

The heart of this system is the "progressive" locking action. The first half of the handle's rotation fully engages the keeper closest to the bottom of the window, near the operator. The second half of the handle's rotation then engages and pulls-in the keeper at the top of the sash. Thus, you have Truth's positive sequential locking of the window.

WEATHER-TIGHT

A special O-ring around the base is an added feature Truth has included to ensure that the assembly is completely sealed against the leakage of air, water, or light.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High pressure zinc die-cast handle and case. Steel tie bar. Keepers made of either steel or UV stabilized acetal.

E-GARD® HARDWARE

Truth's E-Gard® has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

Contact Truth for an application drawing providing complete details on your specific window profiles.

1. Order part #24.84
2. Specify finish number.
3. Specify left or right hand (determined by the hinge side when viewed from the outside).



4. Order keepers by part number - refer to chart. Handed the same as the lock.
5. Specify tie bar needed by length - refer to chart.
6. Specify Tie Bar Guides by number - refer to chart.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. See Tech Note #11. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

1. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
2. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
3. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.
4. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of the window.

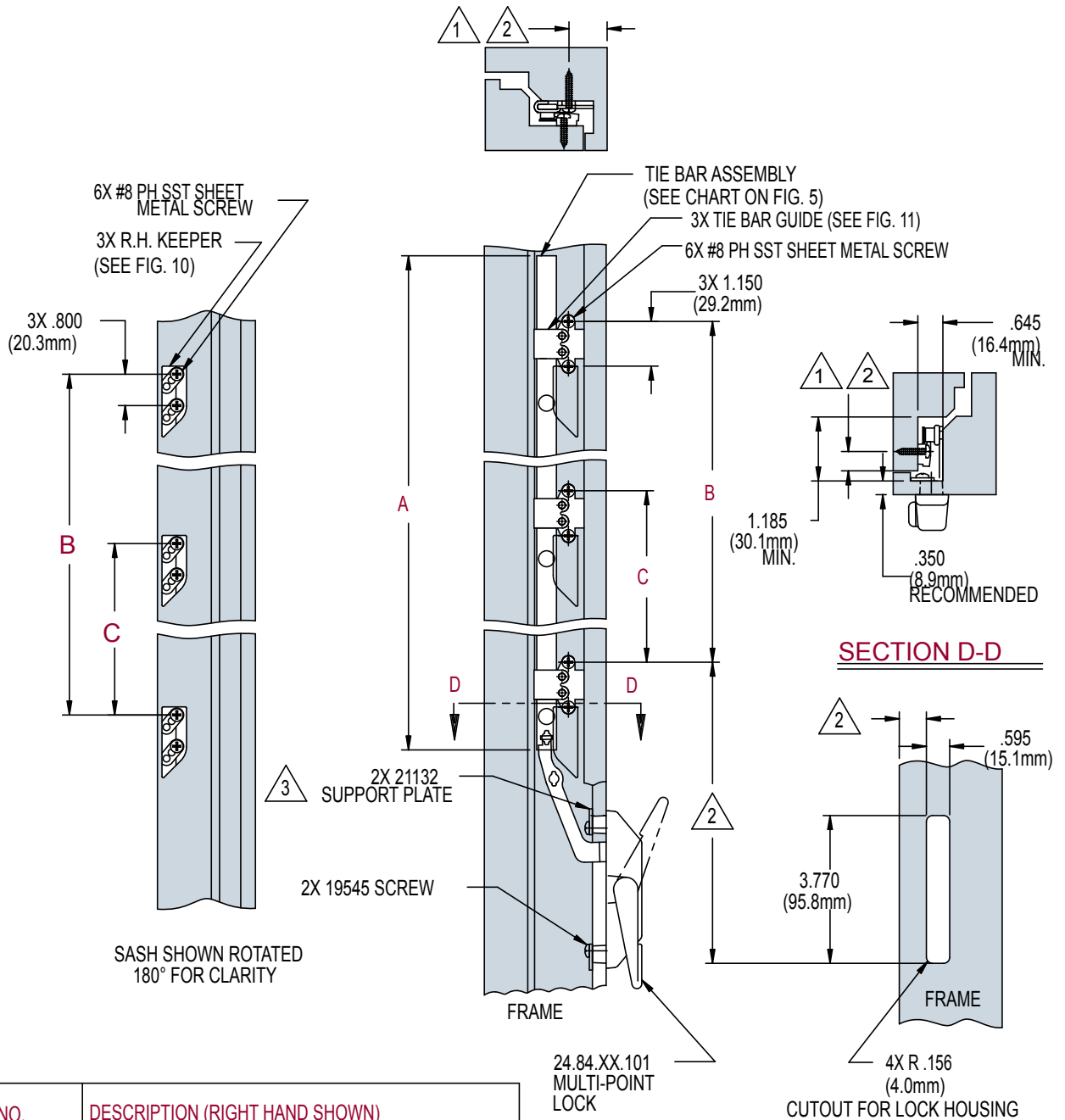
INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window locking system shall be included which will increase both security and weather seal tightness. The locking points must hold securely for negative air pressure and forced entry resistance.

Window sash locks will be used which provides sequential locking with up to .625" (15.9 mm) of pull-in. The lock must utilize a tie bar driven by a single locking handle to meet ADA hardware height standards. The lock drive handle must provide a weather tight seal by providing a O-ring between lock and window frame. The lock shall be constructed of high pressure zinc alloy die castings and E-Gard® internal components.

Window locks shall be 24 series, Multi-Point as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION WITH THREE LOCKING POINTS ABOVE MASTER LOCK SHOWING INTERLOCK ROLLER SYSTEM



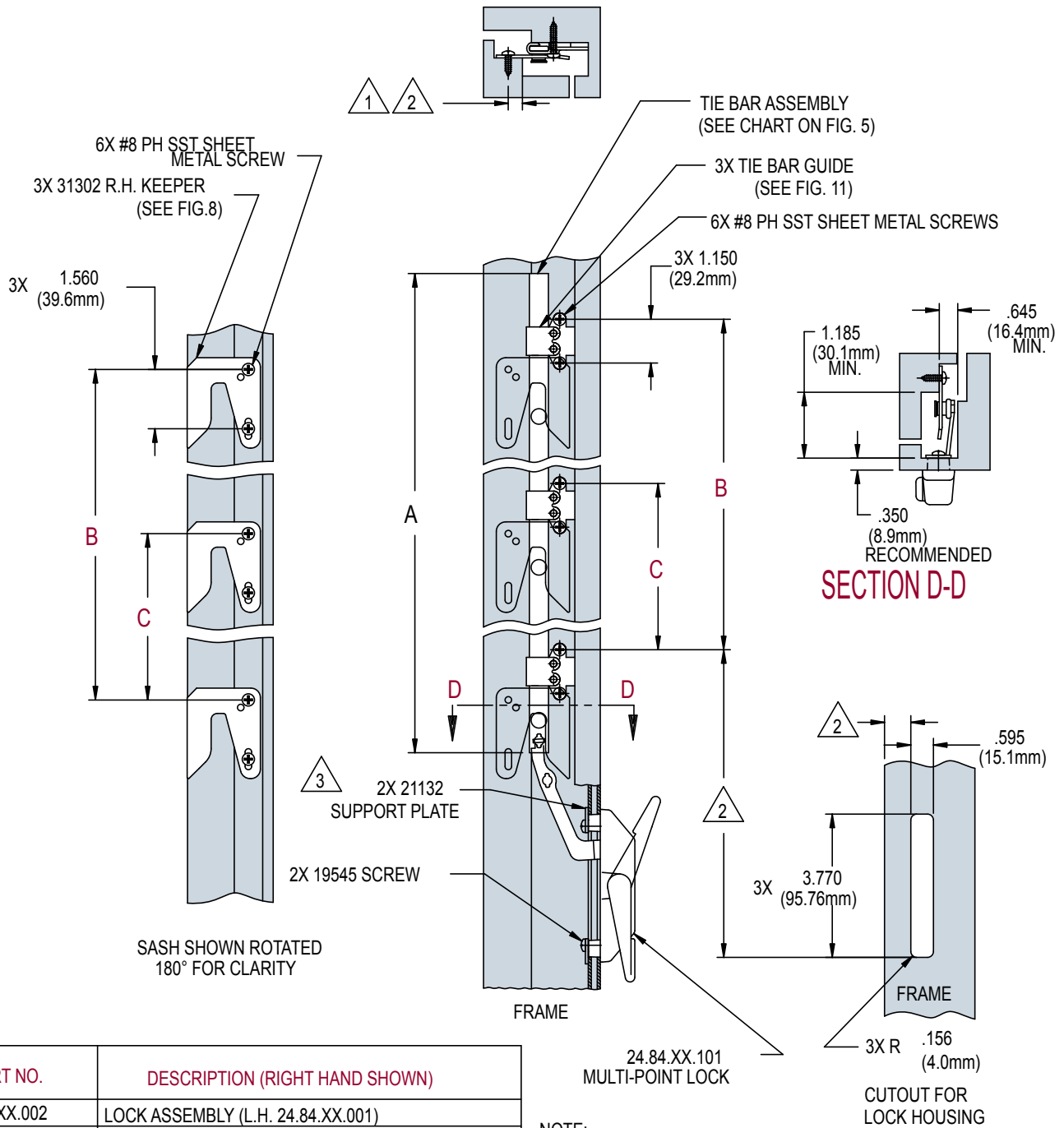
PART NO.	DESCRIPTION (RIGHT HAND SHOWN)
24.84.XX.002	LOCK ASSEMBLY (L.H. 24.84.XX.001)
21132	SUPPORT PLATE
19545	#8-32 PHILLIPS SELF THREADING SCREW
*	TIE BAR GUIDE (NON HANDED)
**	#8 PH SST SHEET METAL SCREW BAR GUIDE
*	KEEPER R.H. (L.H. IS *)
**	#8 PH SST SHEET METAL SCREW (KEEPER)
SEE CHART ***	TIE BAR ASSEMBLY (NON HANDED)

* DEPENDENT ON PROFILE DESIGN
 ** SCREWS NOT FURNISHED BY TRUTH
 *** OTHER LENGTHS AVAILABLE UPON REQUEST
 XX PAINT COLOR CODE

NOTE:

- 1 MOUNTING SCREWS FOR KEEPER AND TIE BAR GUIDE MUST PASS THRU TWO WALLS.
- 2 DIMENSION VARIABLE-DEPENDENT ON CUSTOMER PROFILES.
- 3 WASHERS OR TRUTH PART NO. 31491 MAY ALSO BE USED. (SEE FIG. 7)
- 4 DIMENSIONS A, B, & C FOUND ON TIE BAR CHART (SEE FIG. 5)

FIG. 2 APPLICATION WITH THREE LOCKING POINTS ABOVE MASTER LOCK

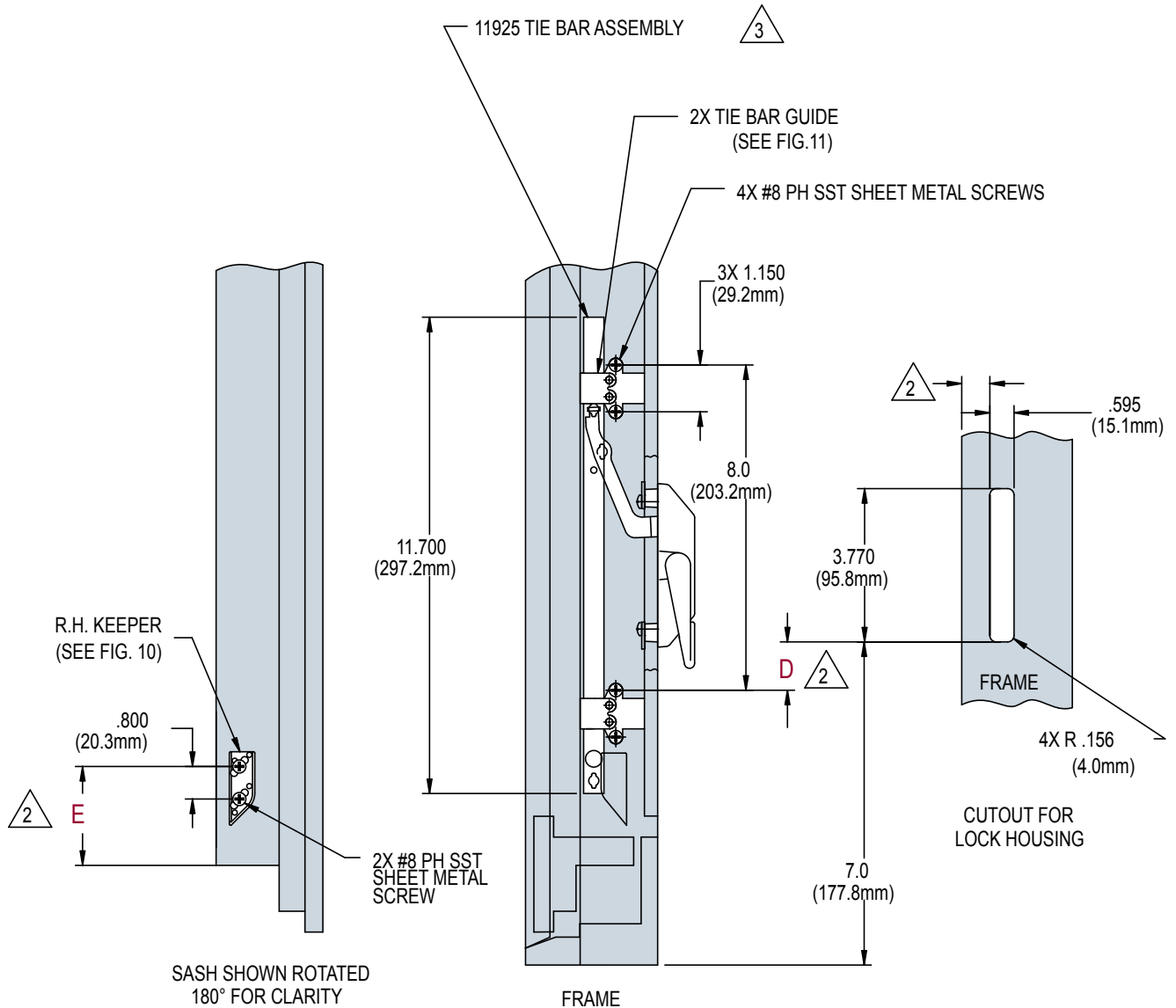


PART NO.	DESCRIPTION (RIGHT HAND SHOWN)
24.84.XX.002	LOCK ASSEMBLY (L.H. 24.84.XX.001)
21132	SUPPORT PLATE
19545	#8-32 PHILLIPS SELF THREADING SCREW
*	TIE BAR GUIDE (NON HANDED)
**	#8 PH SST SHEET METAL SCREW BAR GUIDE
31302	KEEPER R.H. (L.H. IS 31301)
**	#8 PH SST SHEET METAL SCREW (KEEPER)
SEE CHART ***	TIE BAR ASSEMBLY (NON HANDED)

* DEPENDENT ON PROFILE DESIGN
 ** SCREWS NOT FURNISHED BY TRUTH
 *** OTHER LENGTHS AVAILABLE UPON REQUEST
 XX PAINT COLOR CODE

- NOTE:
- 1 MOUNTING SCREWS FOR KEEPER AND TIE BAR GUIDE MUST PASS THRU TWO WALLS.
 - 2 DIMENSION VARIABLE-DEPENDENT ON CUSTOMER PROFILES.
 - 3 WASHERS OR TRUTH PART NO. 31491 MAY ALSO BE USED. (SEE FIG. 7)
4. DIMENSIONS A, B, & C FOUND ON TIE BAR CHART. (SEE FIG. 5)

FIG. 3 AWNING APPLICATION WITH ONE LOCKING POINT BELOW MASTER LOCK SHOWING INTERLOCK ROLLER SYSTEM (available with cone roller system)



NOTE:

1 REFER TO CASEMENT MULTI-POINT APPLICATION DRAWING FOR REMAINING DIMENSIONS AND BILL OF MATERIALS.

2 DIMENSIONS **D** AND **E** VARY ACCORDING TO THE PROFILE. DIMENSIONS CAN BE ACQUIRED FROM TRUTH.

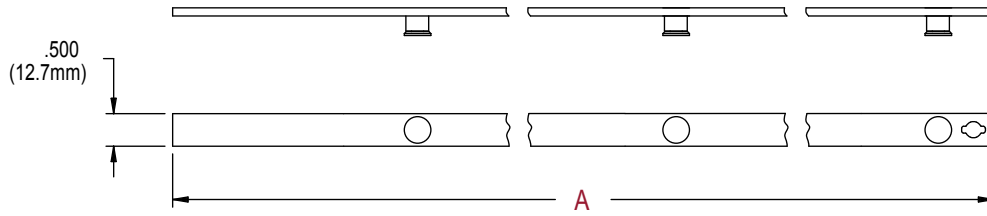
3 TIE BAR ASSEMBLIES TRUTH PART NO. 12032 (CONE ROLLER) OR PART NO. 11901 (INTERLOCK ROLLER) MAY BE USED.

4 THIS SYSTEM WOULD BE REPEATED ON BOTH JAMBS OF AN AWNING WINDOW.

PART NO.	DESCRIPTION (RIGHT HAND SHOWN)
24.84.XX.002	LOCK ASSEMBLY (L.H. 24.84.XX.001)
21132	SUPPORT PLATE
19545	#8-32 PHILLIPS SELF THREADING SCREW
*	TIE BAR GUIDE (NON HANDED)
**	#8 PH SST SHEET METAL SCREW BAR GUIDE
*	KEEPER R.H. (L.H. IS 31301)
**	#8 PH SST SHEET METAL SCREW (KEEPER)
11925	TIE BAR ASSEMBLY (NON HANDED)

* DEPENDENT ON PROFILE DESIGN
 ** SCREWS NOT FURNISHED BY TRUTH
 XX PAINT COLOR CODE

FIG. 4 TIE BAR CHART FOR INTERLOCK ROLLER



TIE BAR ASSEMBLY					
WINDOW SIZE	PART NO.		A DIM	B DIM	C DIM
	2 ROLLERS	3 ROLLERS			
22 in (558.8mm)	11113	NA	10.9 (276.9mm)	7.0 (177.8mm)	NA
26 in (660.4mm)	11114	NA	14.9 (378.5mm)	11.0 (279.4mm)	NA
30 in (762.0mm)	11115	NA	18.9 (480.1mm)	15.0 (381.0mm)	NA
34 in (863.6mm)	11116	11126	22.9 (581.7mm)	19.0 (482.6mm)	10.0 (254.0mm)
38 in (965.2mm)	11117	11127	26.9 (683.3mm)	23.0 (584.2mm)	12.0 (304.8mm)
42 in (1066.8mm)	11118	11128	30.9 (784.9mm)	27.0 (685.8mm)	14.0 (355.6mm)
46 in (1168.4mm)	11119	11129	34.9 (886.5mm)	31.0 (787.4mm)	16.0 (406.4mm)
50 in (1270.0mm)	11120	11130	38.9 (988.1mm)	35.0 (889.0mm)	18.0 (457.2mm)
54 in (1371.6mm)	11121	11131	42.9 (1089.7mm)	39.0 (990.6mm)	20.0 (508.0mm)
58 in (1473.2mm)	11122	11132	46.9 (1191.3mm)	43.0 (1092.2mm)	22.0 (558.8mm)
62 in (1574.8mm)	11123	11133	50.9 (1292.9mm)	47.0 (1193.8mm)	24.0 (609.6mm)
66 in (1676.4mm)	11124	11134	54.9 (1394.5mm)	51.0 (1295.4mm)	26.0 (660.4mm)
70 in (1778.0mm)	11125	11135	58.9 (1496.1mm)	55.0 (1397.0mm)	28.0 (711.2mm)

FIG. 5 SUPPORT PLATES

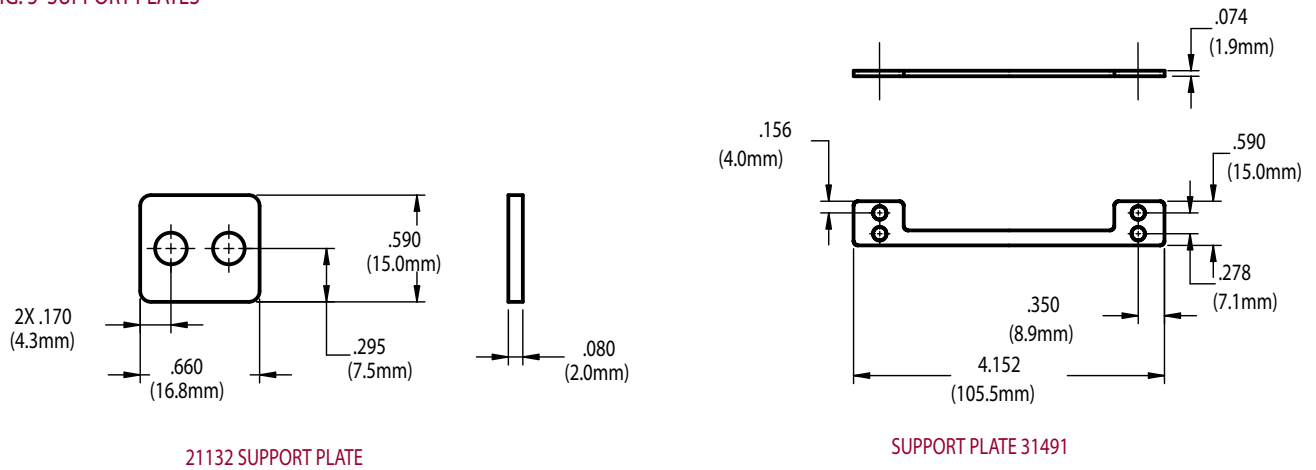
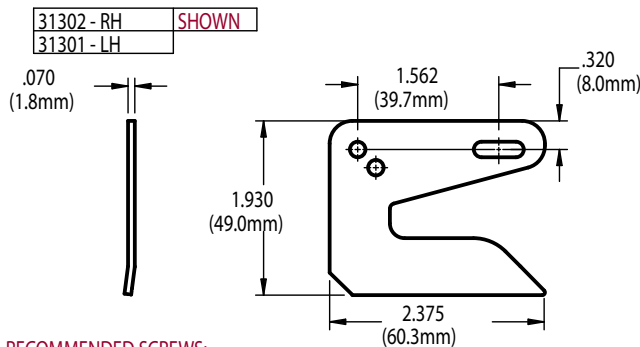


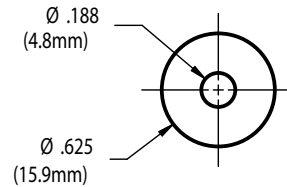
FIG. 6 KEEPER 31302 AND 31301 (FOR INTERLOCK ROLLER SYSTEM)



RECOMMENDED SCREWS:

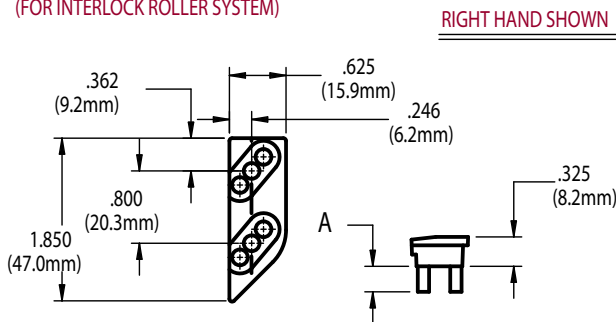
WOOD/PVC/METAL: 2 - #8 PHILLIPS, PAN HEAD, SST SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

FIG. 7 SUPPORT WASHER



21134 WASHER

FIG. 8 ADJUSTABLE KEEPER (FOR INTERLOCK ROLLER SYSTEM)

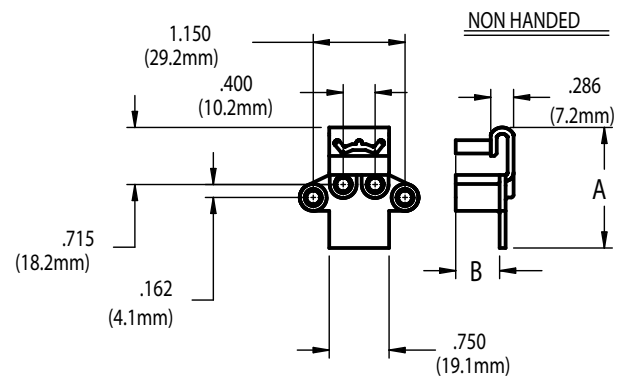


A DIMENSION WILL VARY TO SUIT CUSTOMER PROFILE

RECOMMENDED SCREWS:

WOOD/PVC/METAL: 2 - #8 PHILLIPS, PAN HEAD, SST SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

FIG. 9 ADJUSTABLE TIE BAR GUIDE



A & B DIMENSIONS WILL VARY TO SUIT CUSTOMER PROFILE

RECOMMENDED SCREWS:

WOOD/PVC/METAL: 2 - #8 PHILLIPS, PAN HEAD, SST SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

When your project requires hardware that looks like casement window from the turn of the century, turn to Truth Hardware for our new line of hardware for push-out windows which combines the aesthetic characteristics from yesteryear with the performance requirements of today.

Push-out window systems have seen a resurgence in recent times with the popularity of timber frame, log and craftsman style homes, and builders are also incorporating this manual style window into sidelights for doors.

Following extensive research and engineering, Truth is launching a full line of hinges, locks and related push-out hardware to meet the requirements of this popular market segment.

Available in both “classic” and “retro” looks, Truth’s hardware systems for push-out windows are designed to meet your historic application needs.

LOCK BAR SYSTEMS

Truth has designed two types of lock bar systems – one for standard push-out windows and the other specifically designed for French style double casement window applications.

The standard lock bar system is available in either steel or stainless steel and allows up to four locking points on sash heights up to 7 feet high. With a standard backset of 22mm, this lock bar is a single integrated unit which allows for quick installation by the window manufacturer.

The locking systems provide a range of handle activation heights which permits the manufacturer to place the handle wherever they would like, including centered low on the window sash to help comply with ADA restricted applications.

The French locking system is even more flexible since the lock drive box is separate from the driven lock bars. This allows the upper and lower lock bars to be selected from a wide range of lengths and then cut to specific size for applications. All French lock bars incorporate a shoot bolt for added security. The French locking system is available in steel with a coastal plating package as an option.



HINGES

Truth also offers special high friction hinges which were engineered to fit the standard hinge cavity to help provide resistance to wind moving the sash while in the open position. Available in stainless steel as a standard, these hinges are available in two sizes (10” and 14”). With egress or washability options to choose from, these hinges use the same snap-stud design as Truth’s standard 2-Bar hinges and optional hinge stops are available for larger window applications.

STAY BARS

If even more wind resistance is required, or the window sash is too large to reach the activation handle on the lock bar system, then Truth recommends using our sill mounted Stay Bars. Available in 2 lengths, this hardware provides more stability when open and will assist the homeowner when closing a wider sash. One unique feature of our stay bar is the ability to hold the sash in any position and not interfere with the closed screen.

OPTIONAL HARDWARE

Truth Hardware also offers a full complement of swing screen hardware including hinges which allow easy seasonal removal of the screens. In addition, Truth offers an assortment of screen handle options to complement the sash hardware.

PRODUCT APPLICATION ASSISTANCE:

If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

WARRANTY:

Protected under the terms of the Truth Warranty for Window & Door Manufacturers & Authorized Distributors. Refer to Truth’s Terms & Conditions for further details.

MATERIALS:

Locking bars: Steel with zinc plating or 300 series Stainless Steel

Locking handles: High pressure zinc diecast, powder coated or decorative plate

Hinges: 300 series Stainless Steel

Stay Bars: Solid brass with powder coat or decorative plate

Screen Handles: High pressure zinc diecast, powder coated or decorative plate

Screen Hinges: Solid brass with powder coat or decorative plate

FINISH:

Available in a wide range of powder coat paint or decorative plating

ORDERING INFORMATION:

Because of the variety of push out window profile designs on the market, Truth suggests that you contact Truth Hardware's Product Specialists to help you identify the components that will best meet your requirements and to provide application assistance when requested. To assist us in helping you identify the product that need, please be prepared to provide Truth with the type and style of profile that you are mounting your hardware to.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. See Tech Note #11. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS

1. Screen hinges are designed to be detachable to allow seasonal screen removal, therefore orientation of the hinges must be considered when selecting and mounting hinge components.
2. The Stay Bar utilizes a loose rivet at the sash bracket to allow easy sash disconnection for maintenance. Orientation of the sash bracket and pin must be considered to avoid the pin falling out and becoming lost.
3. Friction hinges and Stay bars provide only limited resistance to wind driven sash movement. Push out windows using this hardware should not be left unattended in windy conditions.
4. A construction handle (PN 23377) is available for operation of the locking systems without having the decorative handles in place.

5. The tongued version of the "classic" or "retro" handles are intended for aesthetic purposes only, they are intended to be used in conjunction with a locking bar system to carry weather and forced entry loads applied to the sash. Use of these handles as single point locks is not recommended.

6. Truth recommends that when designing a casement window the sash width should be limited to no greater than 66% of the sash height. A sash width that exceeds 66% could develop sash sag over the life of the window. Refer to Truth Technical Note # 3 for more information dealing with sash sag prevention.

7. The Concealed Casement Hinge with snap stud attachment was designed to be used on a casement window only. Under no circumstances should a casement hinge with a snap stud be used on an awning window

8. With the flat bottom track, screw heads will be raised above the track when installed. Truth's Delrin shoe now has a higher bridge to clear screw heads (.060" high).

9. A standard 3/8" wrench can be used to adjust a hinge equipped with the adjustable stud, however this will require detaching the support arms from the track. To adjust this hinge without detaching the support arms it is necessary to use Truth's slim-line wrench #31887

10. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

11. On some window designs, binding can be experienced on the hinge side of the window between the outermost edge of the sash and the jamb. This problem often occurs when switching from standard to and "egress" hinge. If a window system is designed to work with an "egress" hinge, the window system will work with all other Truth Concealed Casement Hinges. When binding is encountered, three solutions are available: a) move hinge location toward outside of sash, b) increase the clearance between the sash and jamb, and c) decrease the thickness of the sash.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Push out window hinges shall be provided which allow easy adjustment of window position and maintain position in light wind conditions. The locking system will provide a craftsman period aesthetic with hidden multiple security points. The Stay bar must allow a 90° open sash projection and not interfere with the screen in any position.

Push out window hardware shall be provided by Truth Hardware, Owatonna, MN.

FIG. 1 CLASSIC MULTI-POINT 60.00.XX.001/.002

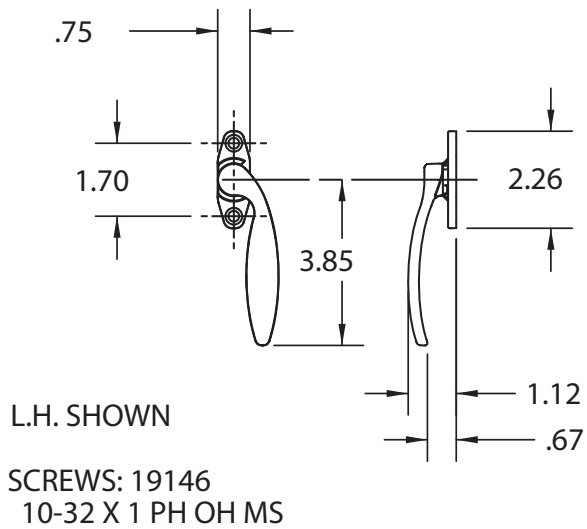


FIG. 2 CLASSIC SINGLE POINT 60.01.XX.001/.002

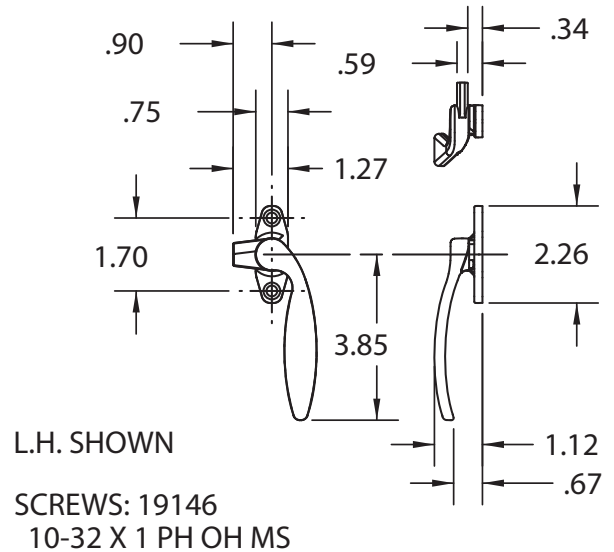


FIG. 3 RETRO MULTI-POINT 60.02.XX.001/.002

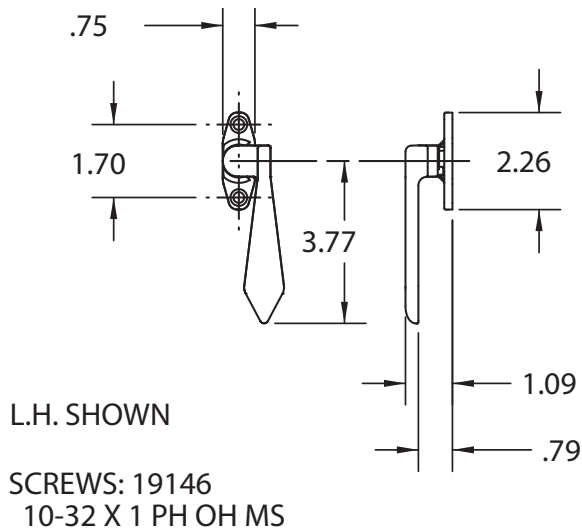


FIG. 4 RETRO SINGLE POINT 60.03.XX.001/.002

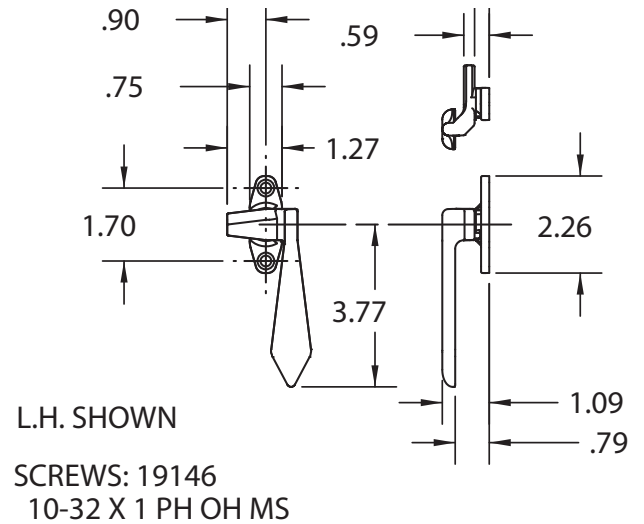
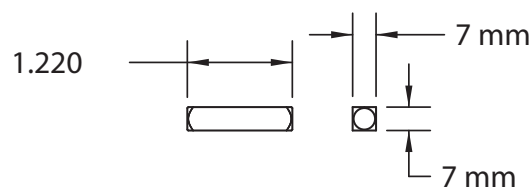


FIG. 5 SPINDLE 22852



NOTE: CUSTOM LENGTHS OFFERED
CLEARANCE HOLE IS Ø.4375

PUSH OUT HARDWARE

BAR LENGTH "A"		2 PT. LOCATIONS "B"	4 PT. LOCATIONS "C"	HDL SETBACK "D" = 22mm		Handle Height "E"
				9mm ROLLER		
mm	in			STEEL	SST	
250	9.84			13594	13602	4.92
400	15.75	11.26		13595	13603	7.88
600	23.62	19.13		13596	13604	11.81
800	31.50	27.01		13597	13605	15.75
1000	39.37	34.88	11.57	13598	13606	19.69
1200	47.24	42.76	15.51	13599	13607	23.62
1400	55.11	50.62	19.45	13600	23.62	
1600	63.00	58.51	23.39	13601	13609	23.62

FIG. 6 LOCK BAR CENTER HANDLE (SEE CHART ABOVE)

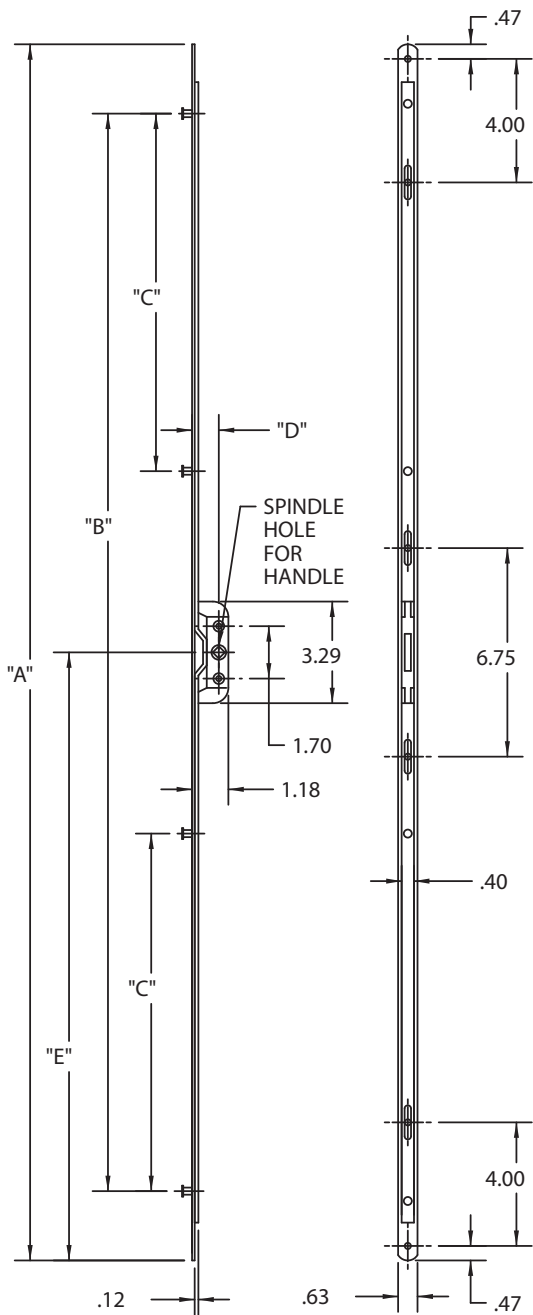
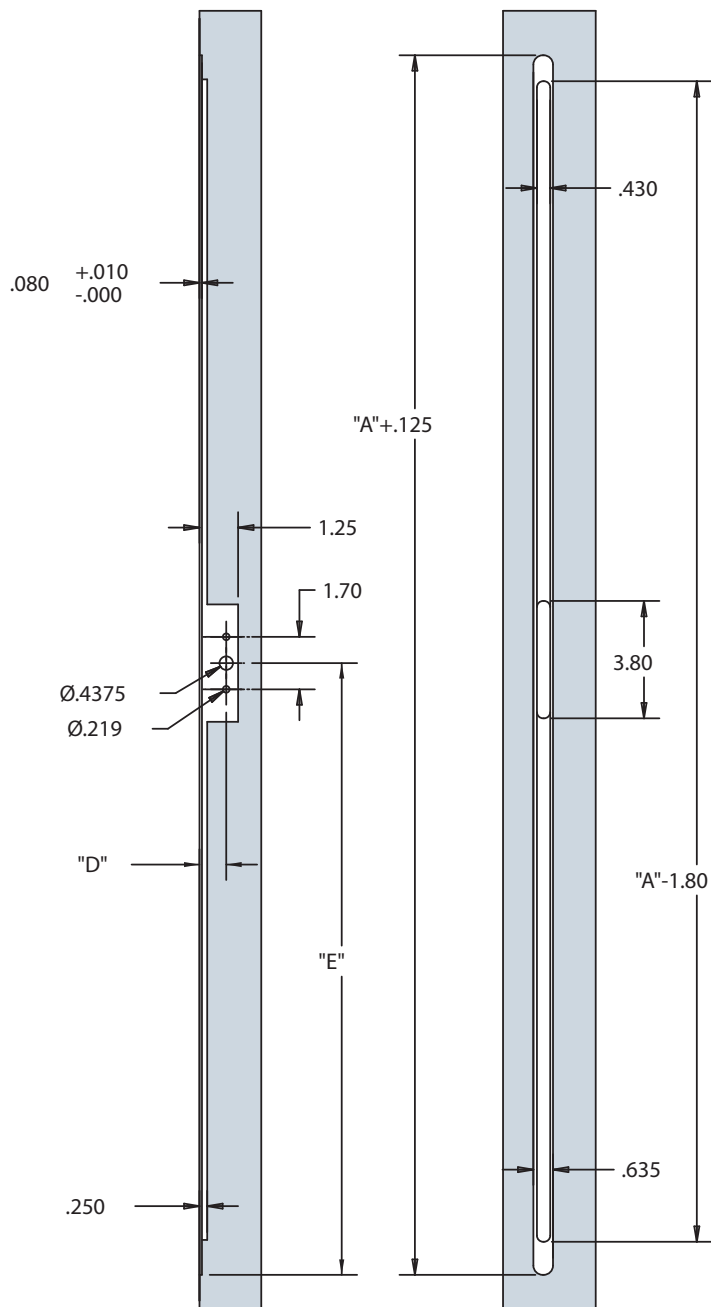


FIG. 7 APPLICATION OF LOCK BAR INTO SASH ROUTING AND DRILLING PATTERN



BAR LENGTH "A"		2 PT. LOCATIONS "B"	4 PT. LOCATIONS "C"	HDL SETBACK "D" = 22mm		Handle Height
mm	in			9mm ROLLER		
				STEEL	SST	
600	23.62	19.13		13750	13760	8.00
800	31.50	27.01		13751	13761	8.00
1000	39.37	34.88	11.57	13752	13762	8.00
1200	47.24	42.76	15.51	13753	13763	8.00
1400	55.11	50.62	19.45	13754	8.00	
1600	63.00	58.51	23.39	13755	13765	8.00

FIG. 8 LOCK BAR LOW HANDLE (SEE CHART ABOVE)

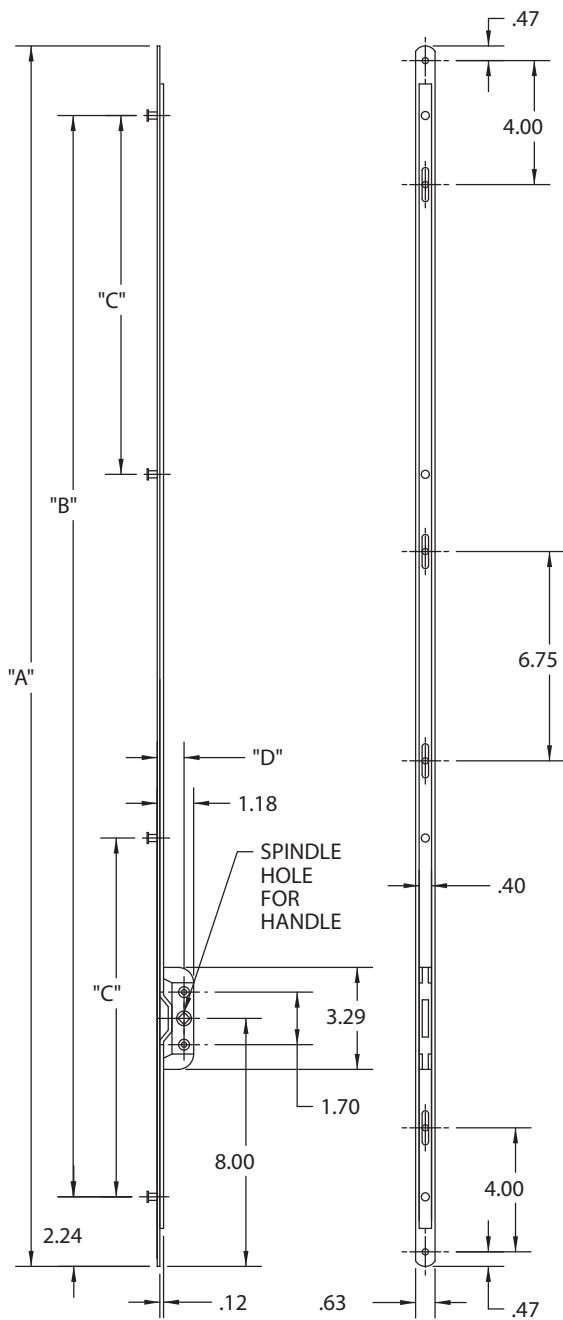


FIG. 9 APPLICATION OF LOCK BAR INTO SASH ROUTING AND DRILLING PATTERN

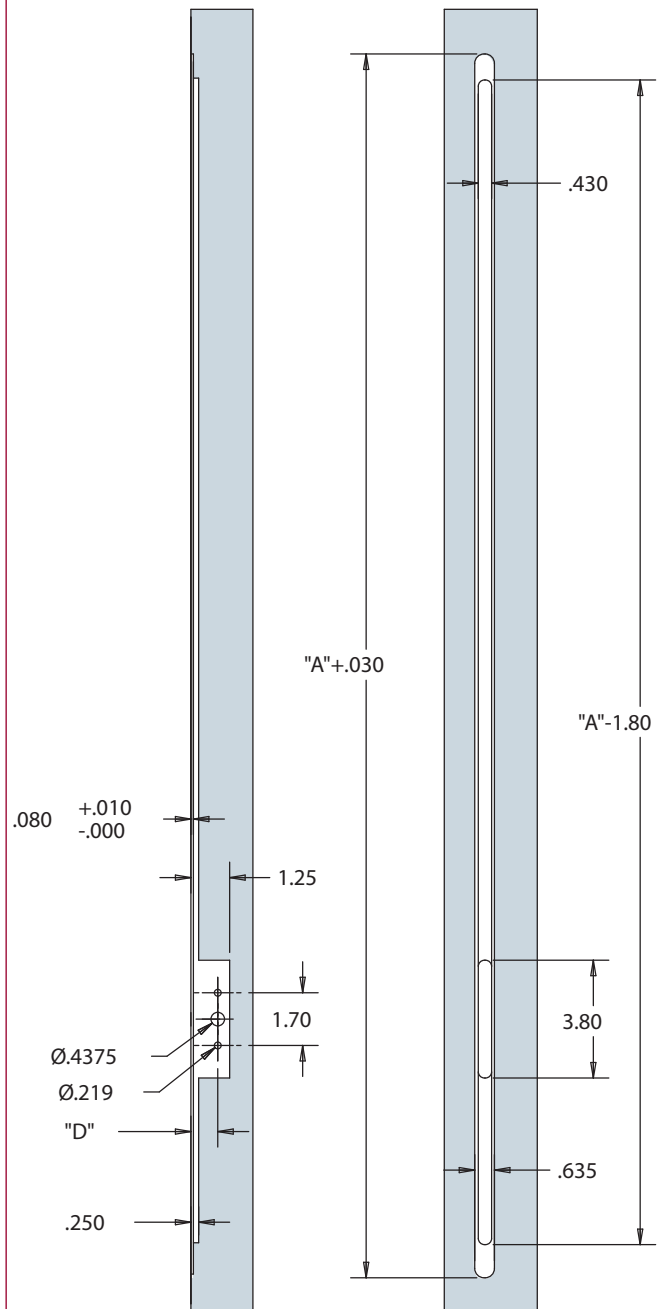
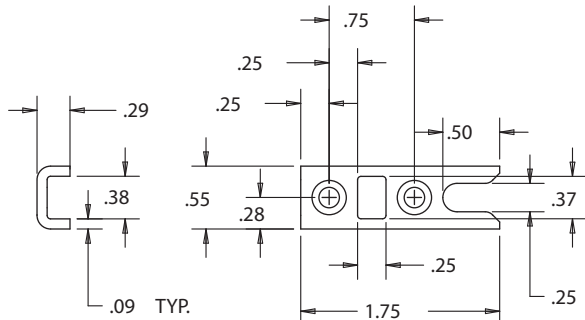
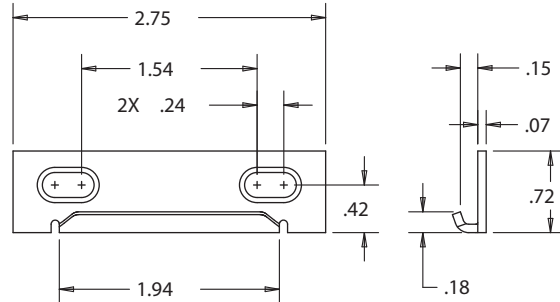


FIG. 10 KEEPER-JAMB 23230



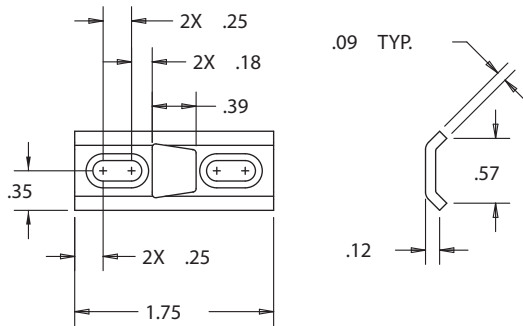
NOTE: ALSO FUNCTIONS AS SHOOT BOLT KEEPER
SCREWS: 19240 - 8 X 1 PH FH SMS

FIG. 11 KEEPER-JAMB 23321



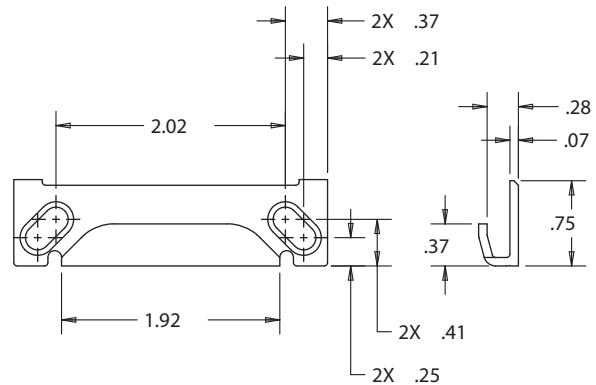
SCREWS: 19240 - 8 X 1 PH FH SMS

FIG. 12 SHOOT BOLT KEEPER 23323



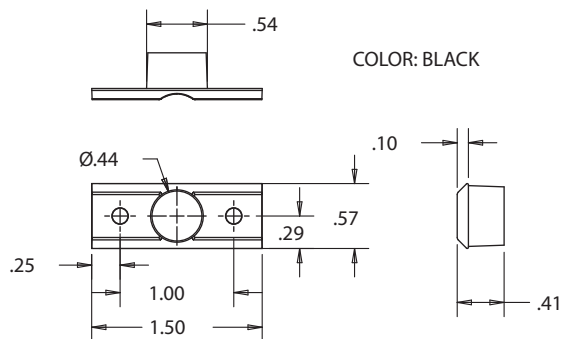
SCREWS: 19240 - 8 X 1 PH FH SMS

FIG. 13 KEEPER-JAMB 33004



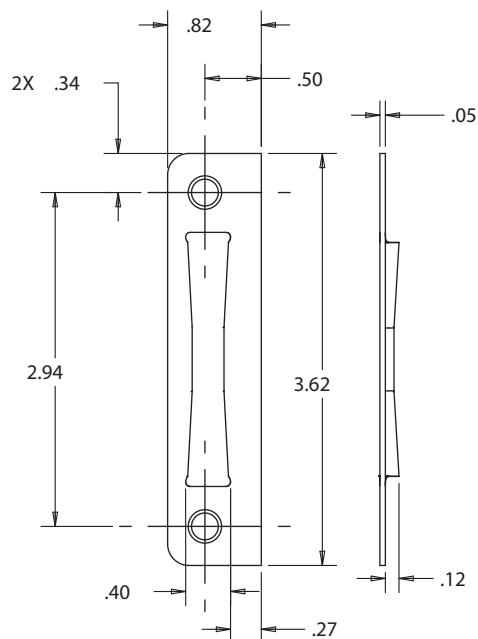
SCREWS: 19240 - 8 X 1 PH FH SMS

FIG. 14 SHOOT BOLT INSERT 23298



NOTE: FITS BELOW 23323 SHOOT BOLT KEEPER

FIG. 15 KEEPER-SINGLE POINT 30569



SCREWS: 19110 - 7 X 3/4 PH FH SMS

FIG. 16 FRENCH LONG LOCK BOX 13485

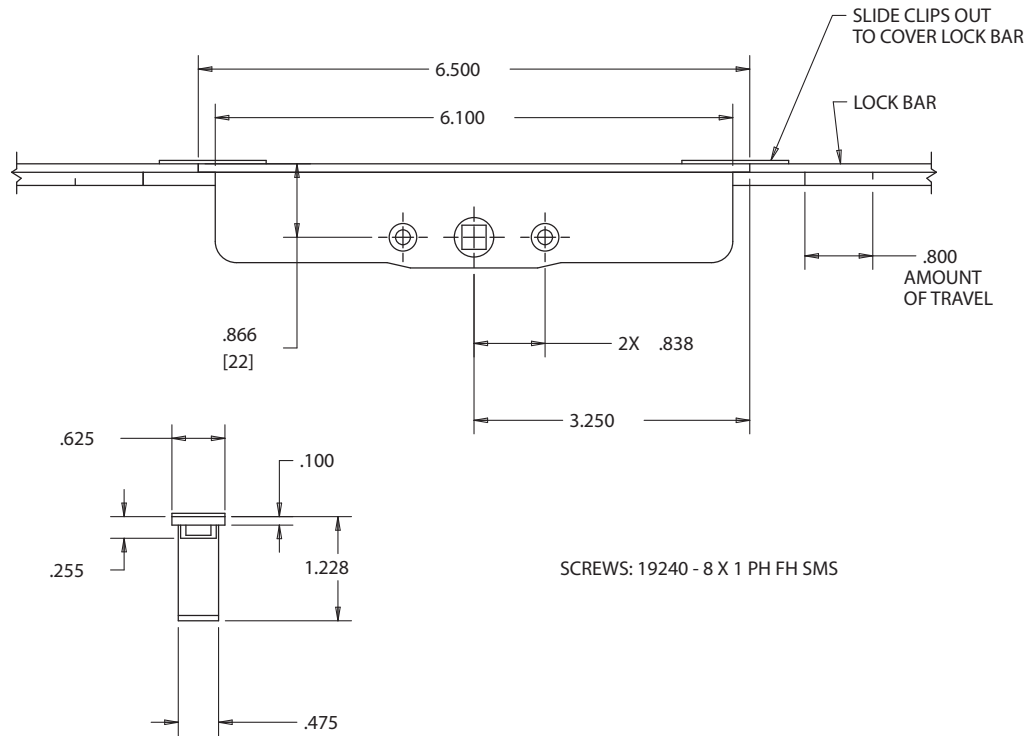
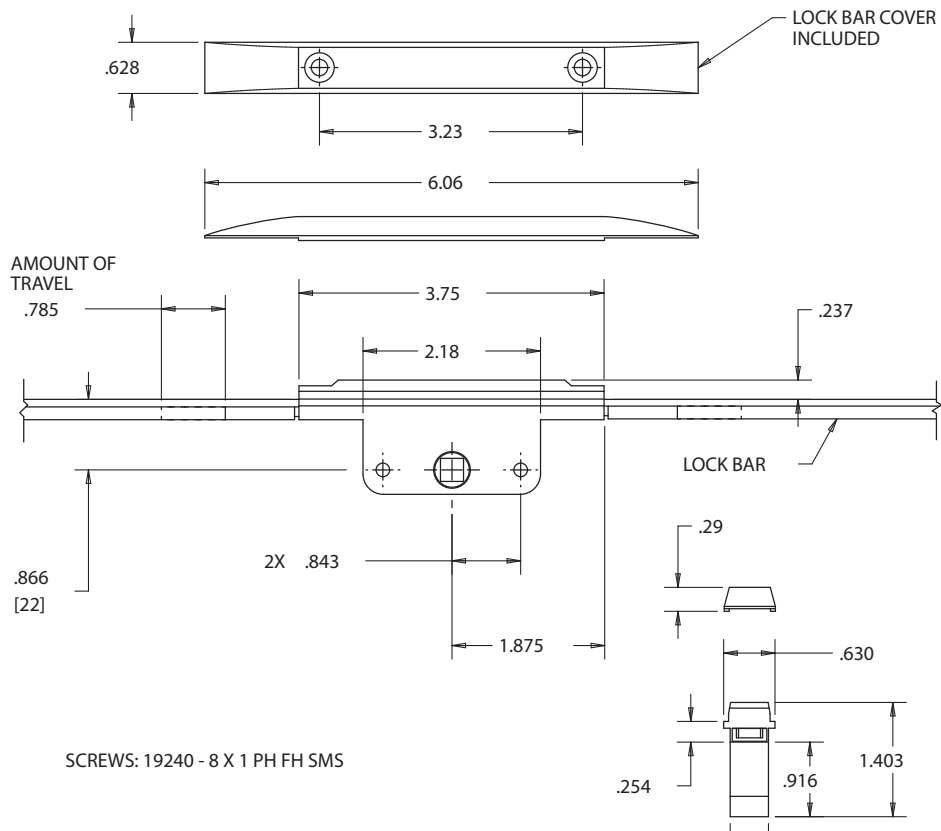


FIG. 17 FRENCH SHORT LOCK BOX 7 COVER 13875



PUSH OUT HARDWARE

SASH SIZE "A" Handle Centered	BAR LENGTH "B"			LOCK POINT HEIGHT "C"		HANDLE HEIGHT "D"	LOCKING POINTS		SCREW HOLES		
	MM	MAX	MIN	9MM			"E"	"F"	"G"	"H"	"I"
		IN	IN	ROLLER	NO ROLLER						
27.02	260	10.31	5.11	13860	13469	13.51		4.17	1.87		
37.26	390	15.43	10.23	13861	13470	18.63		9.30	1.87		6.98
47.36	520	20.48	15.28	13862	13471	23.68		14.21	1.87	5.70	12.04
57.76	650	25.68	20.48	13863	13472	28.88		19.44	1.87	8.36	17.26
67.86	780	30.73	25.53	13864	13473	33.93	4.38	24.65	2.06	12.12	22.36
78.12	910	35.86	30.66	13865	13474	39.06	4.23	29.63	2.06	14.68	27.47
88.38	1040	40.99	35.79	13866	13475	44.19	4.38	34.89	2.06	17.22	32.56

FIG. 18 FRENCH CASEMENT LOCK BAR - LONG BOX (SEE CHART ABOVE)

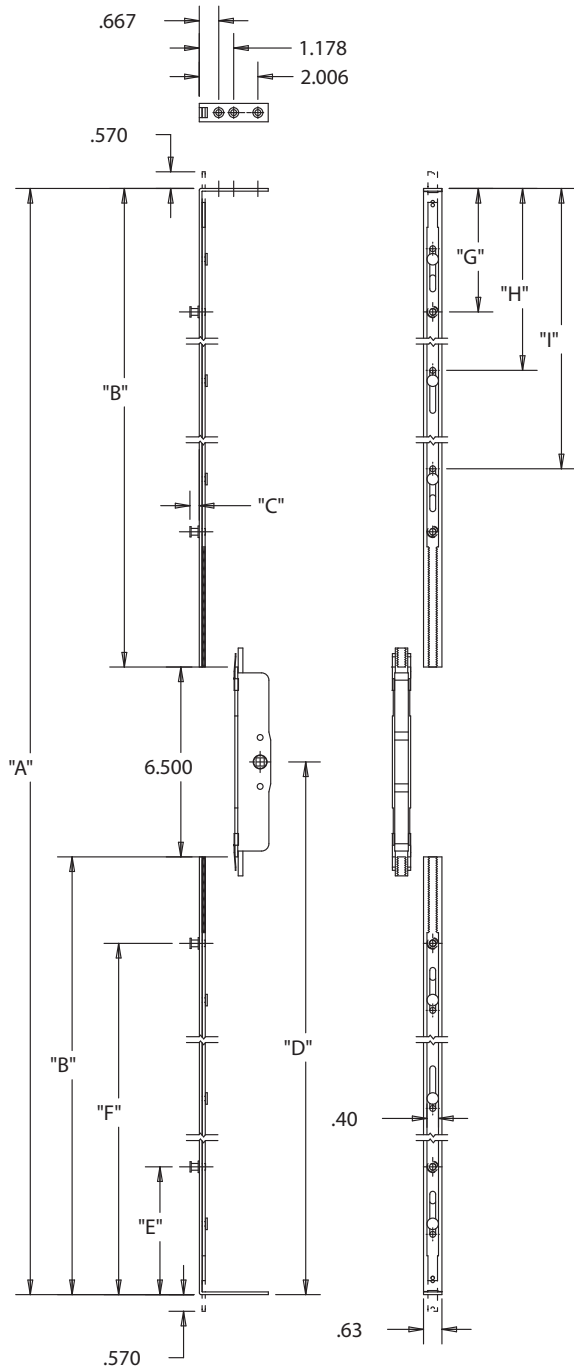
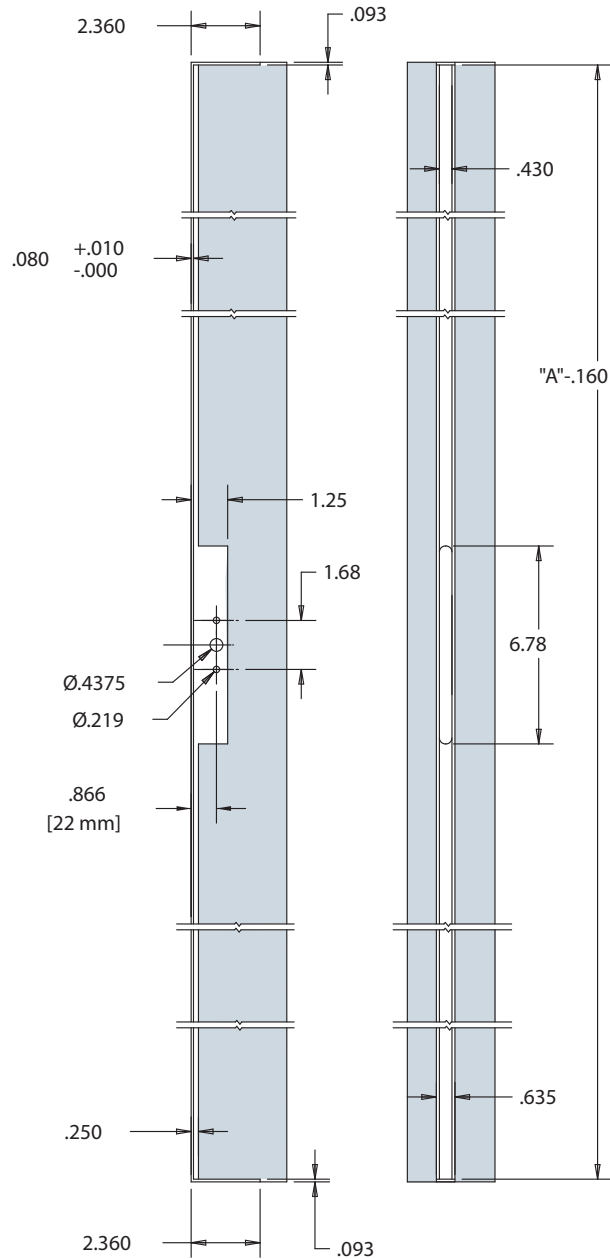


FIG. 19 APPLICATION OF LOCK BAR INTO SASH ROUTING AND DRILLING PATTERN



SASH SIZE "A" Handle Centered	BAR LENGTH "B"		LOCK POINT HEIGHT "C"		HANDLE HEIGHT "D"	LOCKING POINTS		SCREW HOLES			
	MM	MAX	MIN	9MM		"E"	"F"	"G"	"H"	"I"	
		IN	IN	ROLLER							NO ROLLER
24.38	260	10.31	5.11	13860	13469	12.19		4.17	1.87		
34.61	390	15.43	10.23	13861	13470	17.31		9.30	1.87		6.98
44.41	520	20.48	15.28	13862	13471	22.21		14.21	1.87	5.70	12.04
55.1	650	25.68	20.48	13863	13472	27.55		19.44	1.87	8.36	17.26
65.21	780	30.73	25.53	13864	13473	32.61	4.38	24.65	2.06	12.12	22.36
75.46	910	35.86	30.66	13865	13474	37.73	4.23	29.63	2.06	14.68	27.47
85.72	1040	40.99	35.79	13866	13475	42.86	4.38	34.89	2.06	17.22	32.56

FIG. 20 FRENCH CASEMENT LOCK BAR - SHORT BOX (SEE CHART ABOVE)

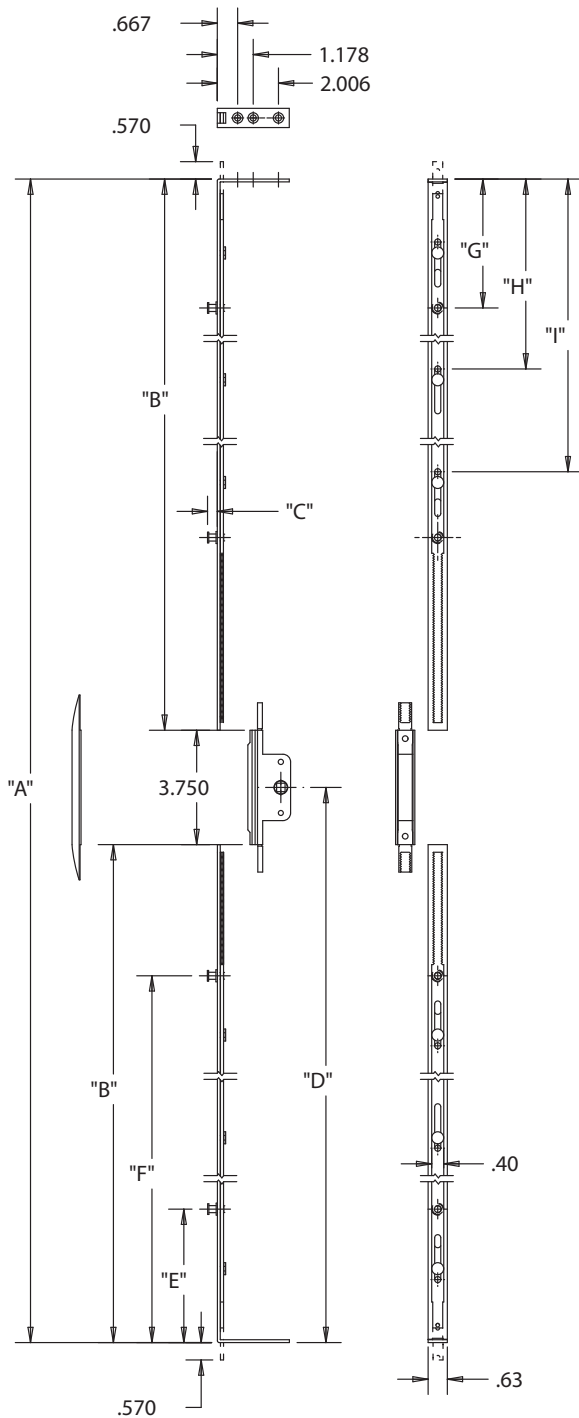
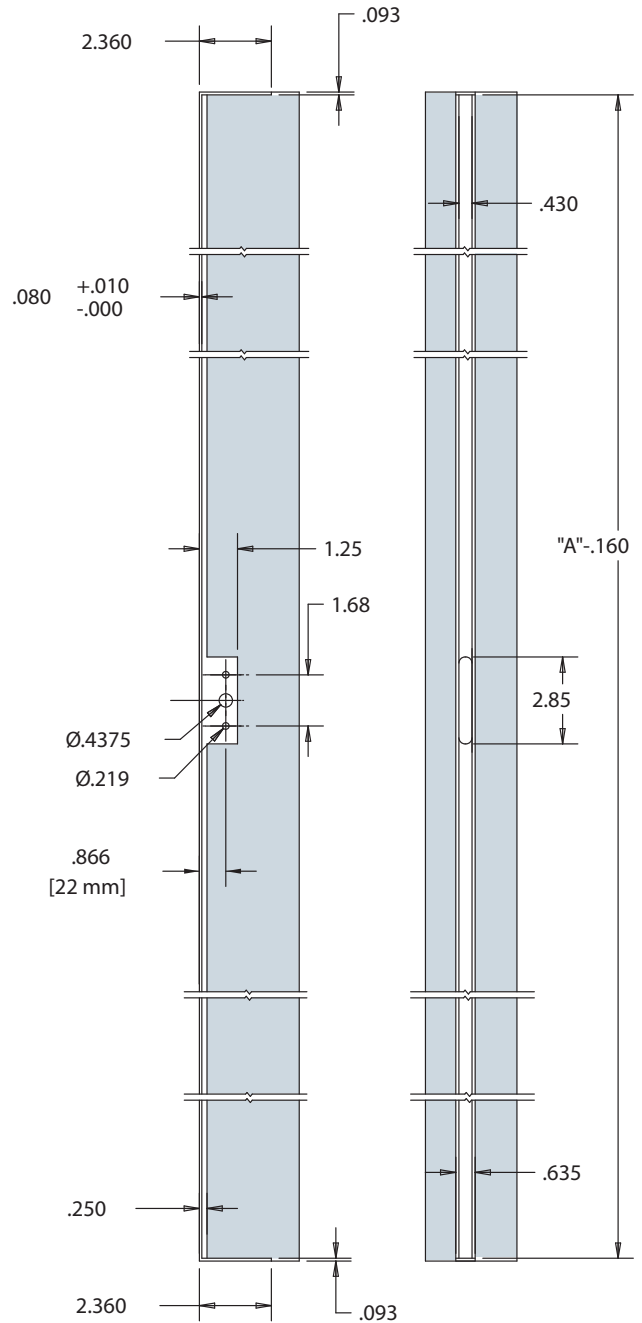


FIG. 21 APPLICATION OF LOCK BAR INTO SASH ROUTING AND DRILLING PATTERN



PUSH OUT HARDWARE

FIG. 22 SCREEN HINGE - METAL 29.20.XX.00/.002

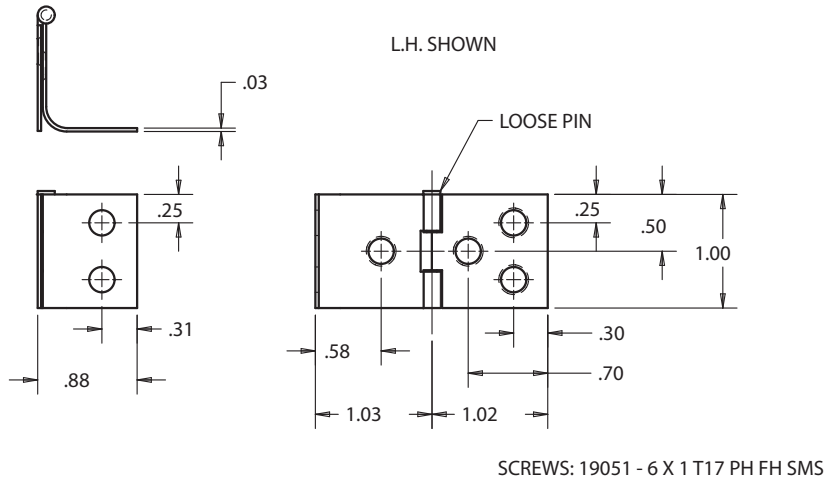


FIG. 23 SCREEN HINGE - WOOD 29.21.XX.001/.002

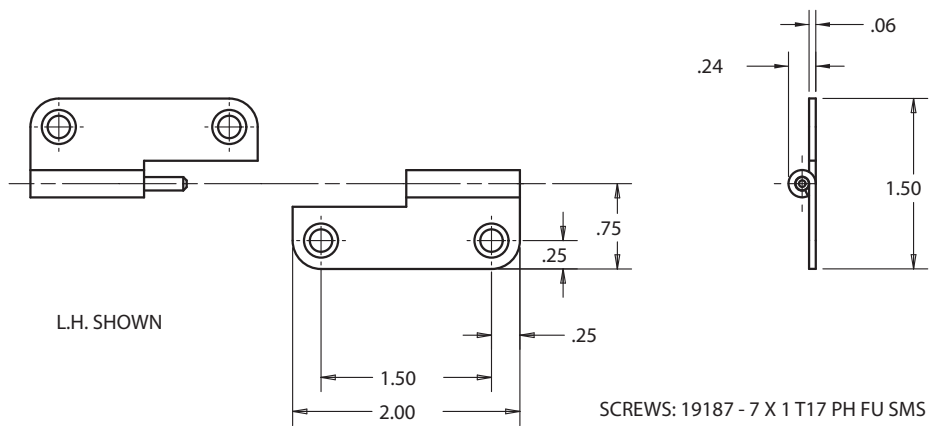


FIG. 24 SCREEN KNOB 13301.XX

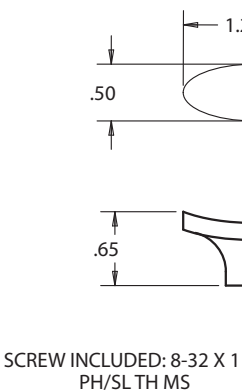


FIG. 25 SCREEN PULL 41678.XX/41679.XX

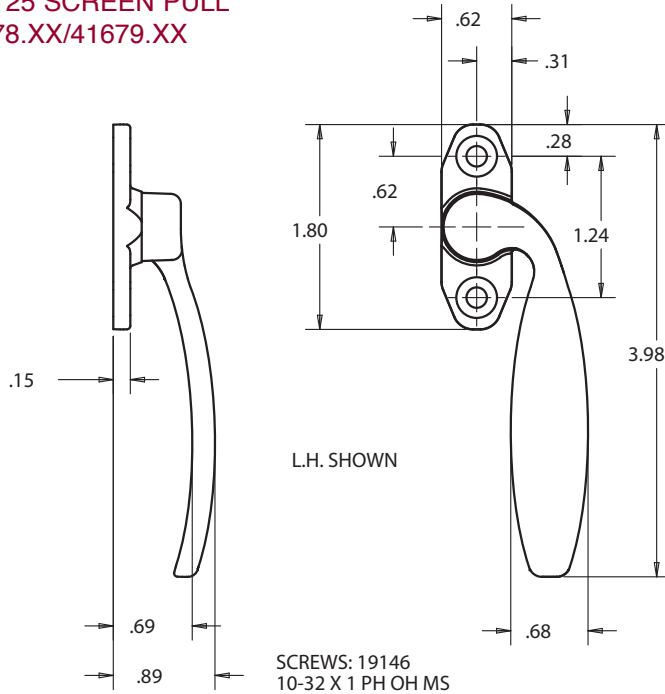
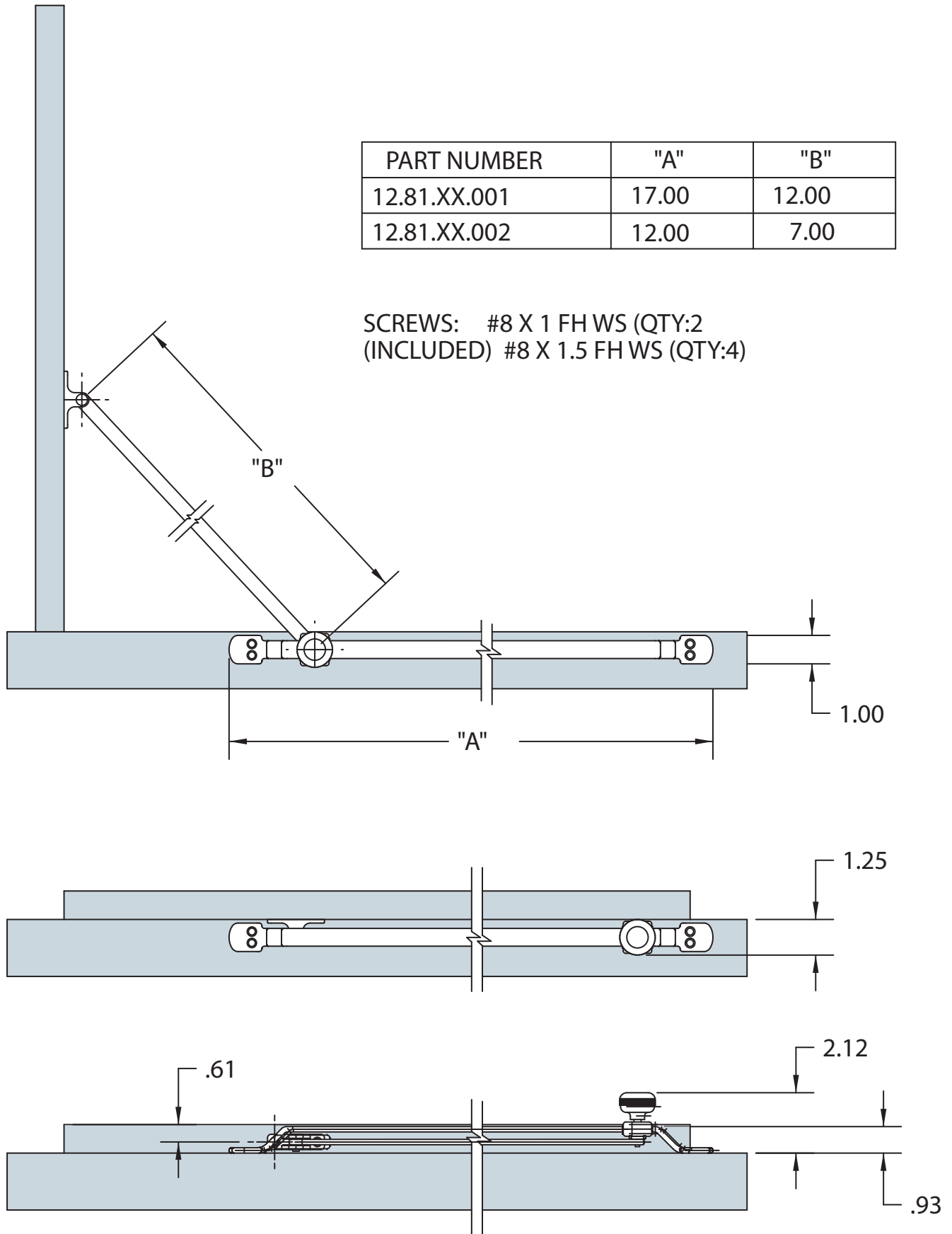


FIG. 26 12.81 STAY BAR

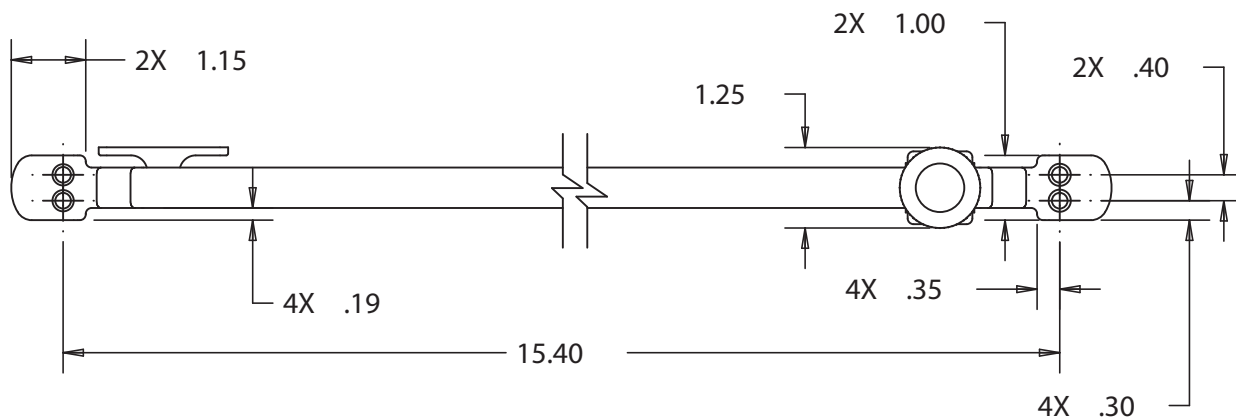
PART NUMBER	"A"	"B"
12.81.XX.001	17.00	12.00
12.81.XX.002	12.00	7.00

SCREWS: #8 X 1 FH WS (QTY:2
(INCLUDED) #8 X 1.5 FH WS (QTY:4)



PUSH OUT HARDWARE

FIG. 27 12.81 STAY BAR



PART NUMBER	"A"	"B"
12.81.XX.001	12.00	17.00
12.81.XX.002	7.00	12.00

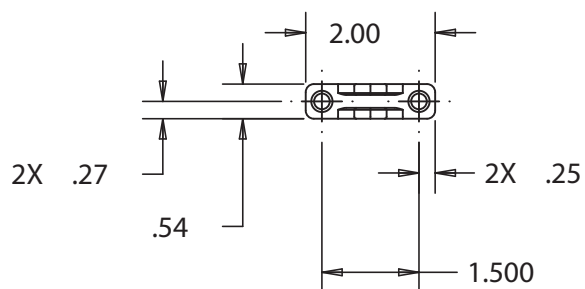
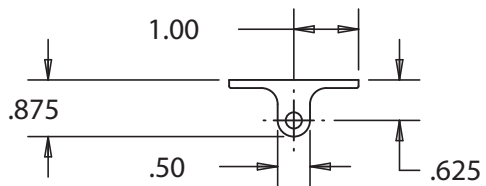
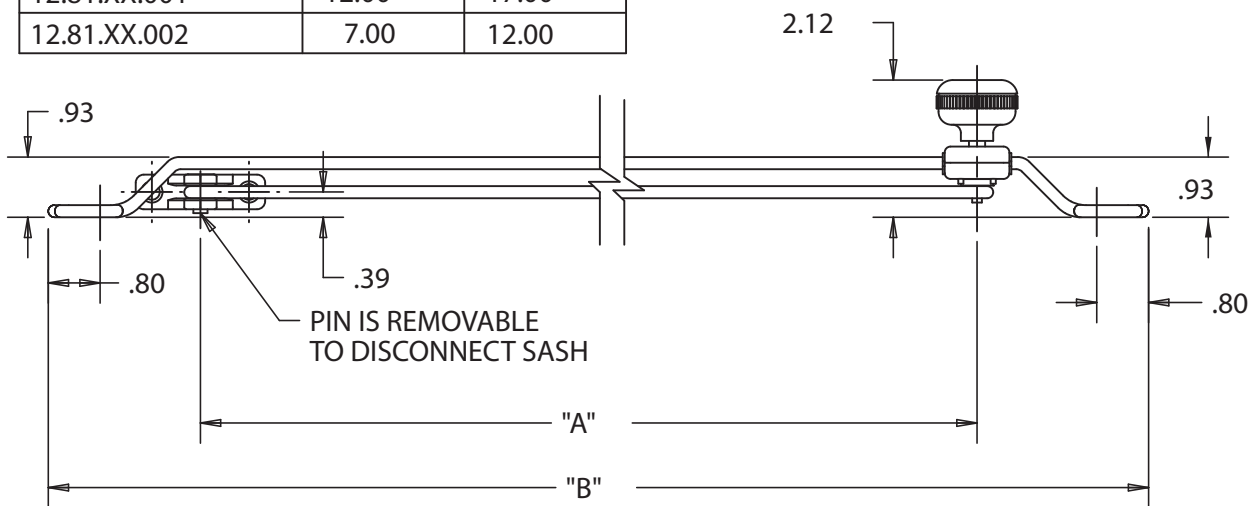
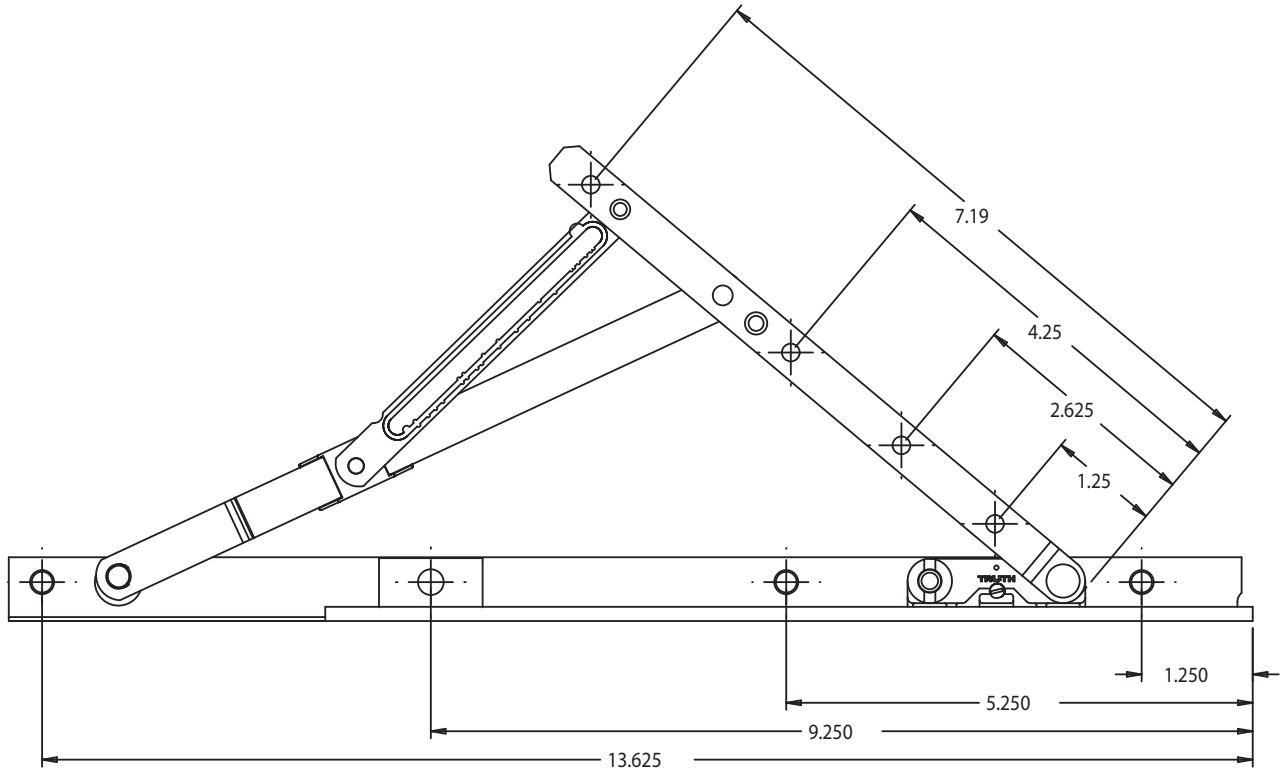
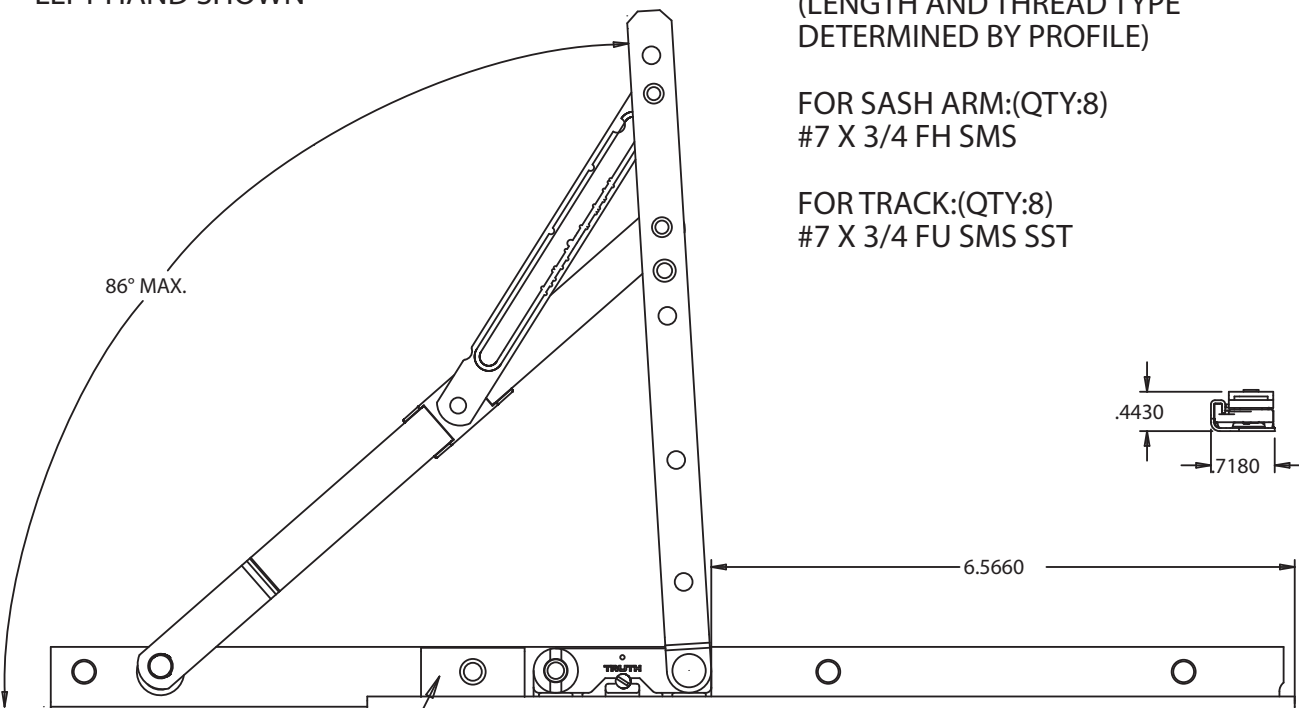


FIG. 28 14.61 FRICTION HINGE 14" - STANDARD WASH



LEFT HAND SHOWN



OPTIONAL
STOP
33045

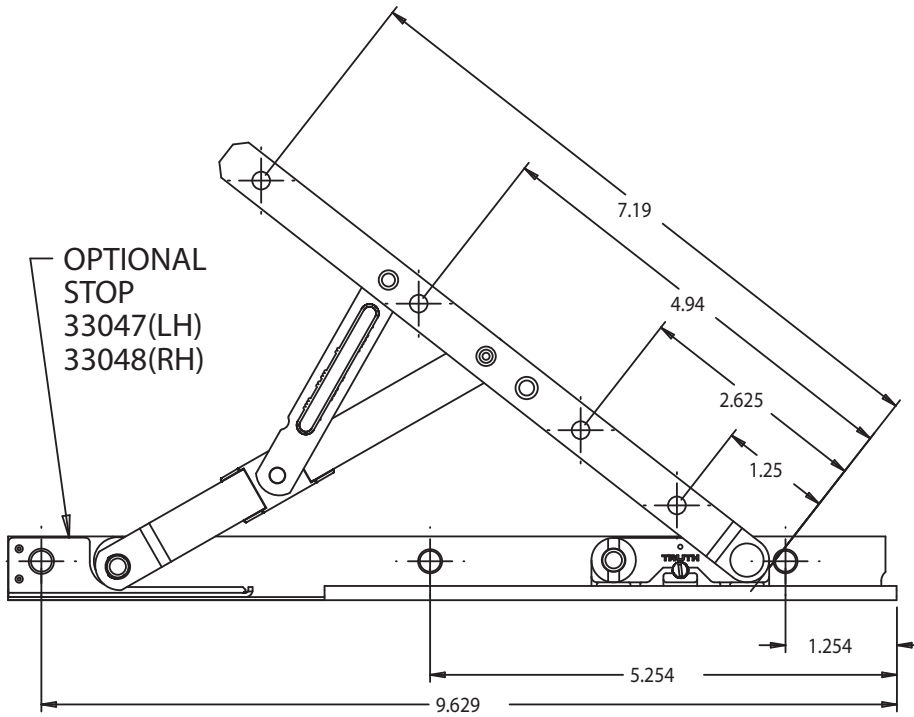
RECOMMENDED SCREWS:

(LENGTH AND THREAD TYPE
DETERMINED BY PROFILE)

FOR SASH ARM:(QTY:8)
#7 X 3/4 FH SMS

FOR TRACK:(QTY:8)
#7 X 3/4 FU SMS SST

FIG. 29 14.60 FRICTION HINGE 10" - STANDARD WASH



RECOMMENDED SCREWS:

(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FOR SASH ARM:(QTY:8) #7 X 3/4 FH SMS

FOR TRACK:(QTY:8) #7 X 3/4 FU SMS SST

LEFT HAND SHOWN

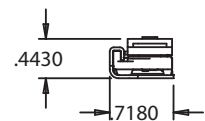
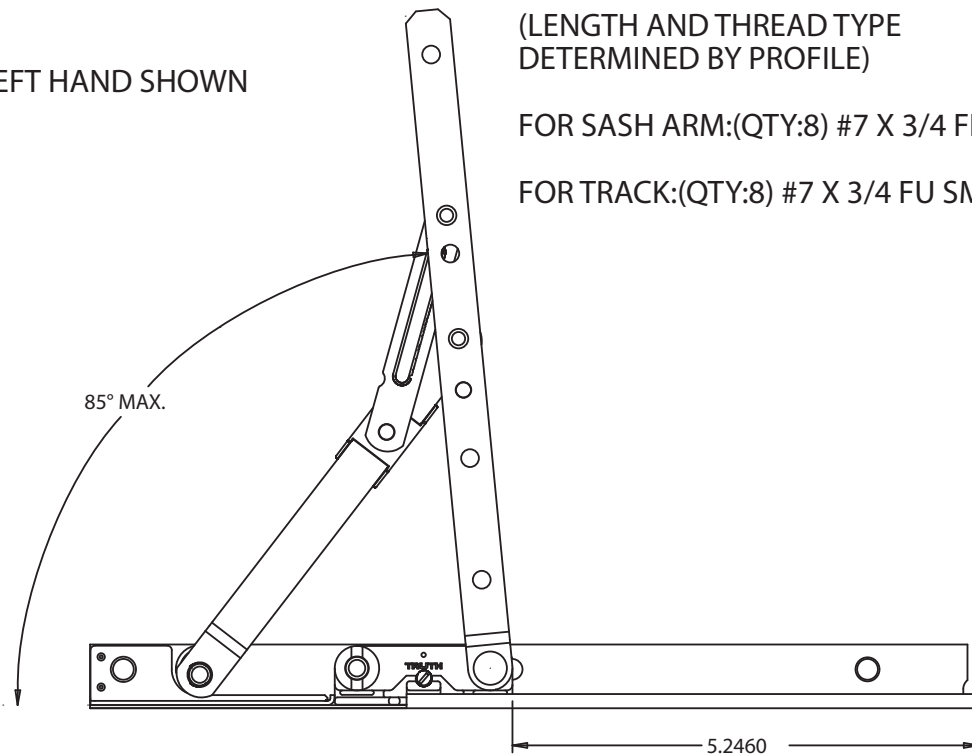
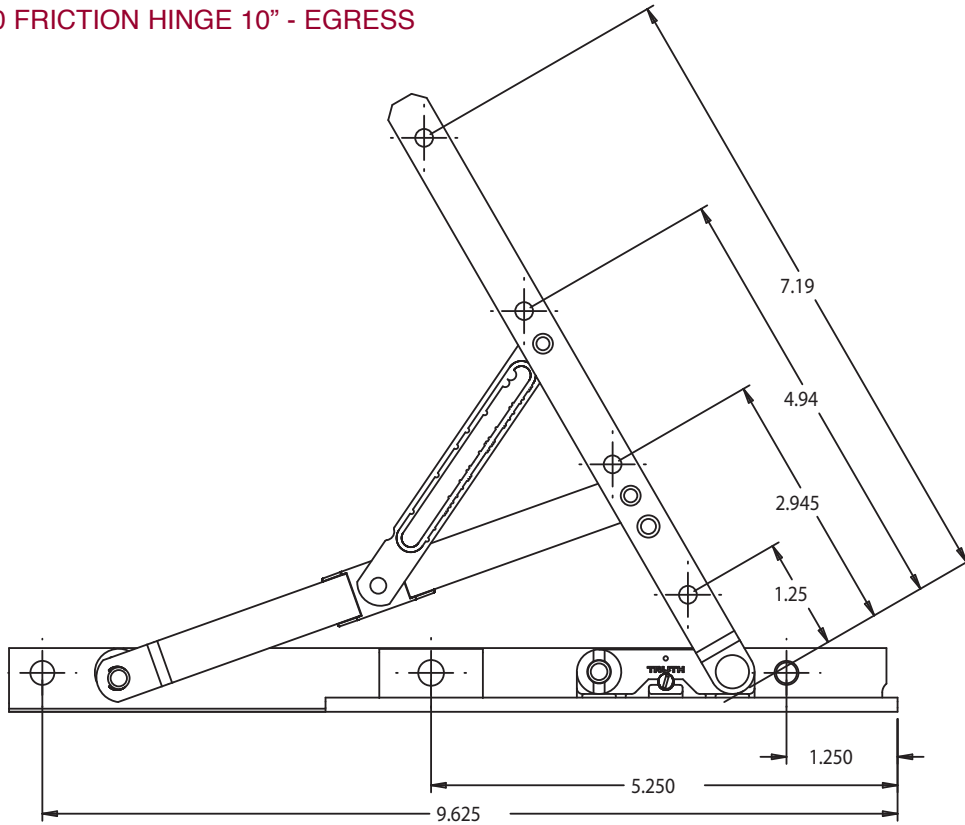
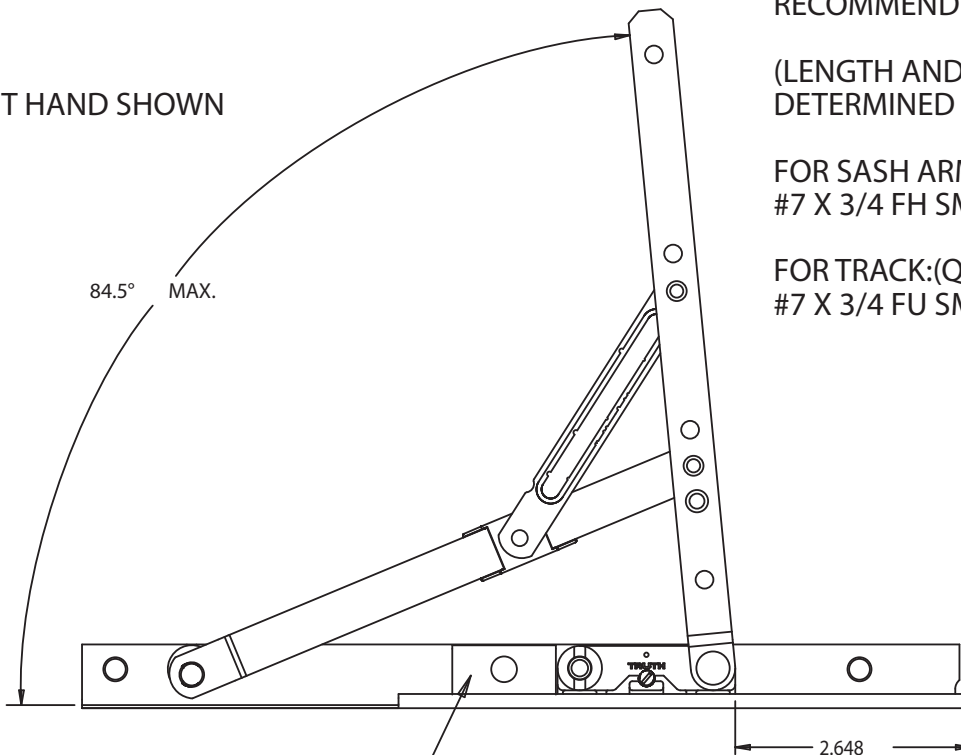


FIG. 30 14.60 FRICTION HINGE 10" - EGRESS



LEFT HAND SHOWN



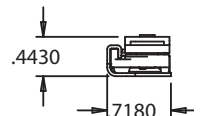
OPTIONAL
STOP
33045

RECOMMENDED SCREWS:

(LENGTH AND THREAD TYPE
DETERMINED BY PROFILE)

FOR SASH ARM:(QTY:8)
#7 X 3/4 FH SMS

FOR TRACK:(QTY:8)
#7 X 3/4 FU SMS SST



PUSH OUT HARDWARE

FIG. 31 HINGE SASH SIZE TABLE

HIGH FRICTION PUSHOUT HINGE (Stainless Steel is Standard)				Maximum Recommended (sash)			
Hinge Size/Type	Arm & Track Assembly P/N	KD Arm Assembly P/N	Stops Used	Width (in.)	Height (in.)	Weight (lbs)	To Meet AAMA
10" Egress	14.60.00.005/006	14.60.00.007/008	No Track Stops	18	38	29	Commercial
10" Egress	14.60.00.005/006	14.60.00.007/008	No Track Stops	20	42	29	Residential
14" Wash	14.61.00.005/006	14.61.00.007/008	No Track Stops	24	46	47	Commercial
14" Wash	14.61.00.005/006	14.61.00.007/008	No Track Stops	26	54	47	Residential
10" Wash	14.60.00.001/002	14.60.00.003/004	No Track Stops	24	54	54	Commercial
10" Wash	14.60.00.001/002	14.60.00.003/004	No Track Stops	28	56	54	Residential
10" Wash	14.60.00.001/002	14.60.00.003/004	33047/8	34	60	82	Commercial
10" Wash	14.60.00.001/002	14.60.00.003/004	33047/8	36	66	82	Residential
10" Egress	14.60.00.005/006	14.60.00.007/008	33045	36	66	90	Commercial
10" Egress	14.60.00.005/006	14.60.00.007/008	33045	36	72	90	Residential
14" Wash	14.61.00.005/006	14.61.00.007/008	26110	36	72	100	Commercial
14" Wash	14.61.00.005/006	14.61.00.007/008	26110	38	76	100	Residential



The Ascent Lock by Truth Hardware is our ultra flexible variation on the classic European style Euro Groove Locking System. With multi-point systems available for both hinged window and door systems, the Ascent Lock allows for “plug n play” adaptability for a wide range of applications without sparing on the quality and reliability that you expect from Truth Hardware.

Designed for aluminum hinged window and doors, this multi-point locking system is designed to fit most common European style profile grooves. With various keeper designs to fit a wide range of frame styles and handles which are interchangeable and reconfigurable for maximum “in-house” flexibility, the Ascent System has been designed to help manufacturers produce a reliable and attractive window and door system

EASY INSTALLATION

The Ascent System consists of pre-assembled components which, compared to competitive systems, greatly reduces the effort needed to install this hardware. Simple “slide-in” design ensures quick production rates and virtually mistake proof installation. Combine this with standardized fasteners which helps keep the number of installation tools to a minimum and your manufacturing efficiencies have been greatly enhanced.

ADJUSTABILITY

Truth’s Ascent System offers adjustability of both the lock point and the keeper producing maximum mounting flexibility and allows each installation to be optimized for peak performance and ease of operation. Lock point load capacity is +300 lbs per roller.

STYLISH

Ascent handles are available in both “classic” and “radius” styling across the window and door offering to help complement the décor of their surroundings. Both handle designs are available in single- or double-throw locking mechanisms and a range of 4 standard finishes which coordinate with existing Truth Hardware offerings.

WINDOW SYSTEMS

Our window lock system provides a wide range of available drive components which enable almost any locking application to be accommodated. From corner drives which allow locking of up to 3 sides on the same sash, to shoot bolts for integrated terrace door applications, our system provides a solution. Rollers on all active lock points help reduce operating force to support ADA requirements.

DOOR SYSTEMS

We also have door handles and escutcheons style matched to the window handles to provide coordinated styling from window to door for combination applications. The door lock drive also utilizes the same lock drive components for easy integration in to your profile systems.

PRODUCT APPLICATION ASSISTANCE:

If you are designing a new window or door profile, or having difficulty selecting hardware, please contact Truth Hardware. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

MATERIALS:

Aluminum compatible design ensures maximum corrosion resistance. Coatings allow no direct contact with ferrous materials.

Locking Handles: Cast zinc or aluminum for high quality feel and reliability.

Lock Components: Cast zinc for strength and durability.



“Classic”
#14051
#14056



“Radius”
#14054
#14058



Adjustable
Lock Point

Center
Drive Block

Adjustable
Lock Point

ASCENT EURO GROOVE LOCKING SYSTEM

WARRANTY:

Protected under the terms of the Truth Warranty for Window & Door Manufacturers & Authorized Distributors. Refer to Truth's Terms & Conditions for further details.

FINISH:

Handles are available in a range of 4 standard decorative powder coated finishes. All functional components are finished in satin "anodized" aluminum plating for maximum durability and corrosion resistance.

ORDERING INFORMATION:

Because of the variety of window and door profiles on the market, Truth recommends that you contact Truth Hardware's Product Specialists to help you identify the components that will best meet your requirements and to provide application assistance when requested. To assist us in helping you identify the products you need, please be prepared to provide Truth with the type and style of profile that you are mounting your hardware to.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. See Tech Note #11. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

1. Truth recommends that when designing a hinged window the sash width should be limited to no greater than 66% of the sash height. A sash width that exceeds 66% could develop sash sag over the life of the window. Refer to Truth Tech Note # 3 for more information dealing with sash sag prevention.
2. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Truth Tech Note #11.
3. On some window designs, binding can be experienced on the hinge side of the window between the outermost edge of the sash and the

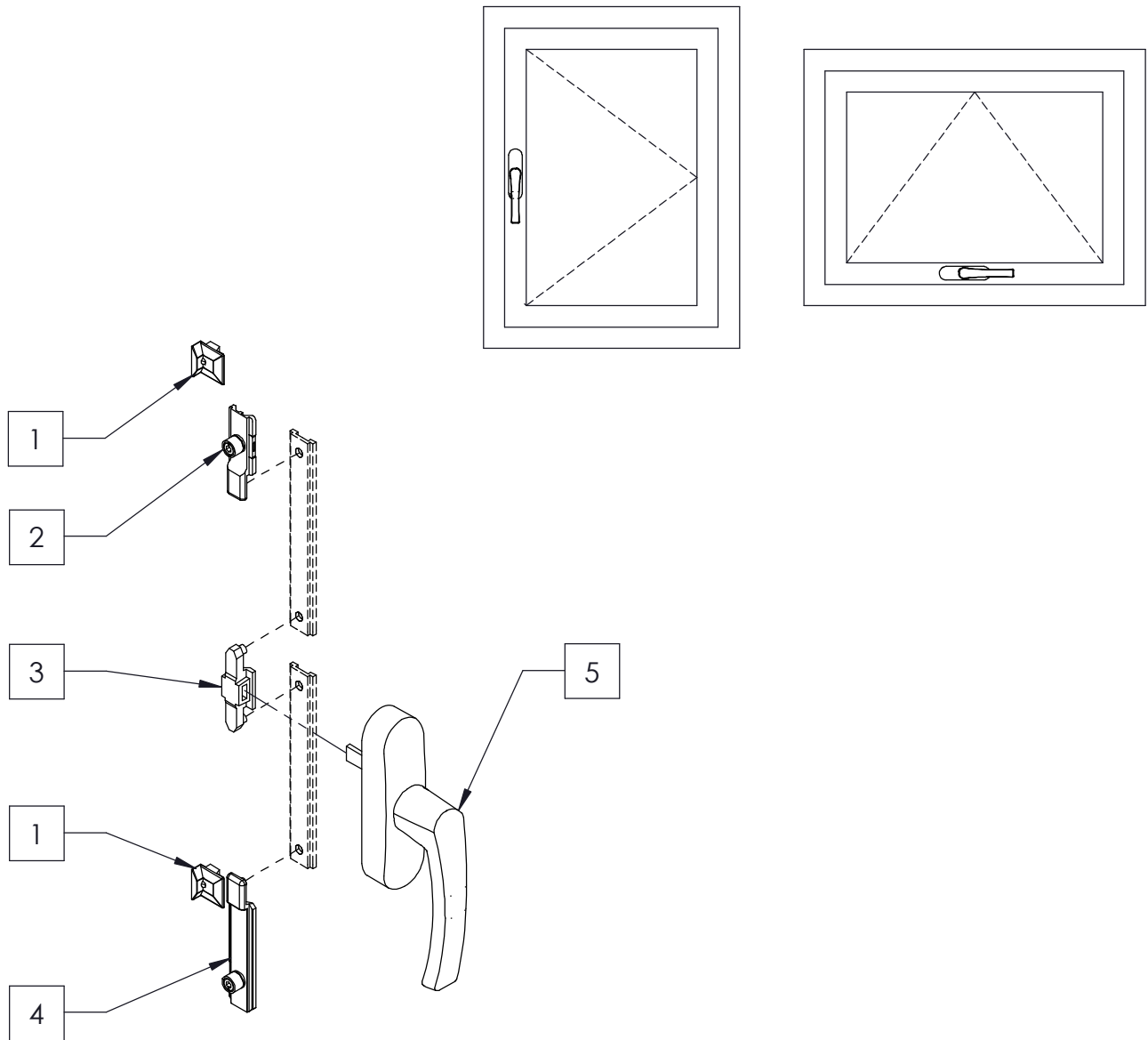
jamb. This problem occurs when switching from standard to and "egress" hinge. If a window system is designed to work with an "egress" hinge, the window system will work with all other Truth Concealed Casement Hinges. When binding is encountered, three solutions are available; a) move hinge location toward outside of the sash, b) increase the clearance between the sash and jamb, and c) decrease the thickness of the sash.

4. Truth's Euro style door lock system utilizes a commonly available European style lock cylinder, available from Truth hardware.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW OR DOOR PROJECT

European locking system integrated into window profiles to provide maximum performance for casement and awning window applications. All components are high pressure die castings protected with durable powder coat finishes. Locking points offer adjustability of both lock roller and independent keepers. Ascent locking system as provided by Truth Hardware.

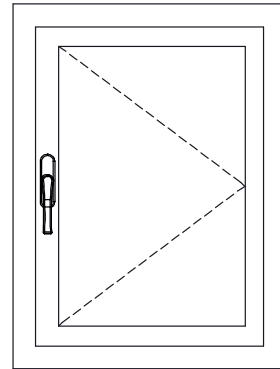
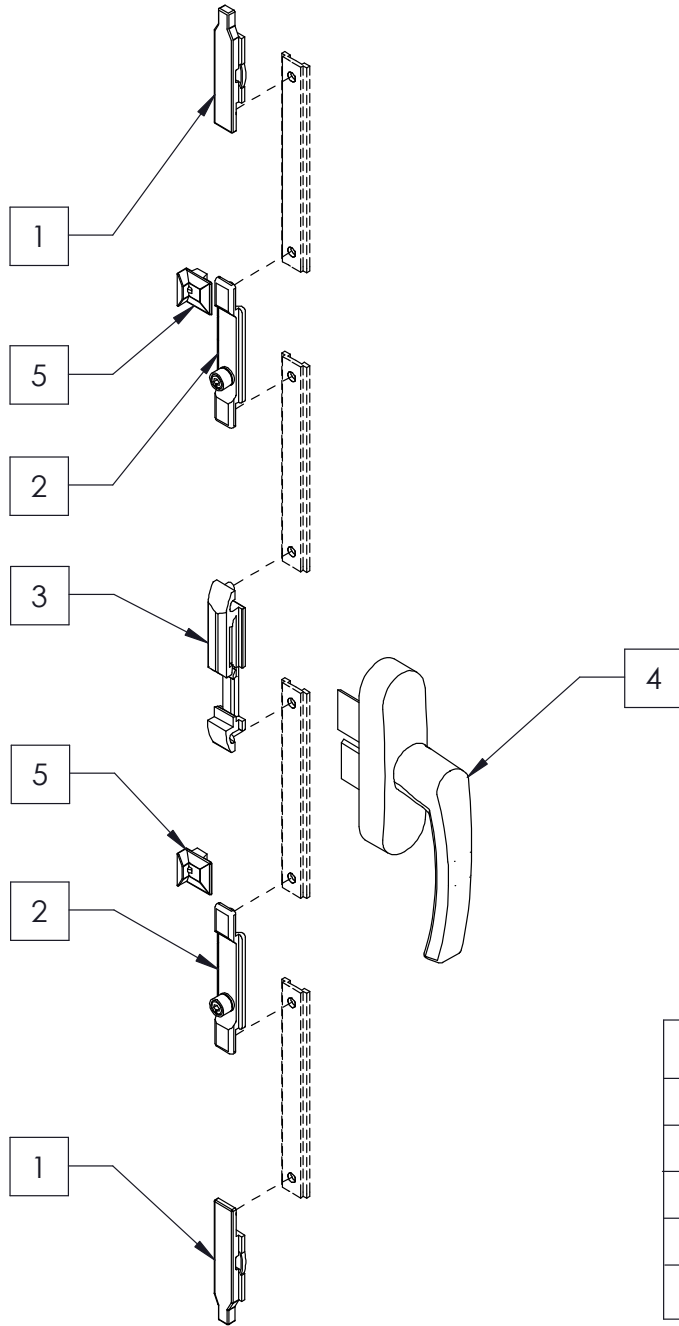
FIG. 1 STANDARD 2 POINT LOCK



NO.	QTY	PART NO.	DESCRIPTION
1	2	14048	SHORT KEEPER
2	1	14061	SHORT END LOCK PT
3	1	14049	DRIVE BLOCK
4	1	14062	LONG END LOCK PT
5	1	14051	CLASSIC STD HANDLE

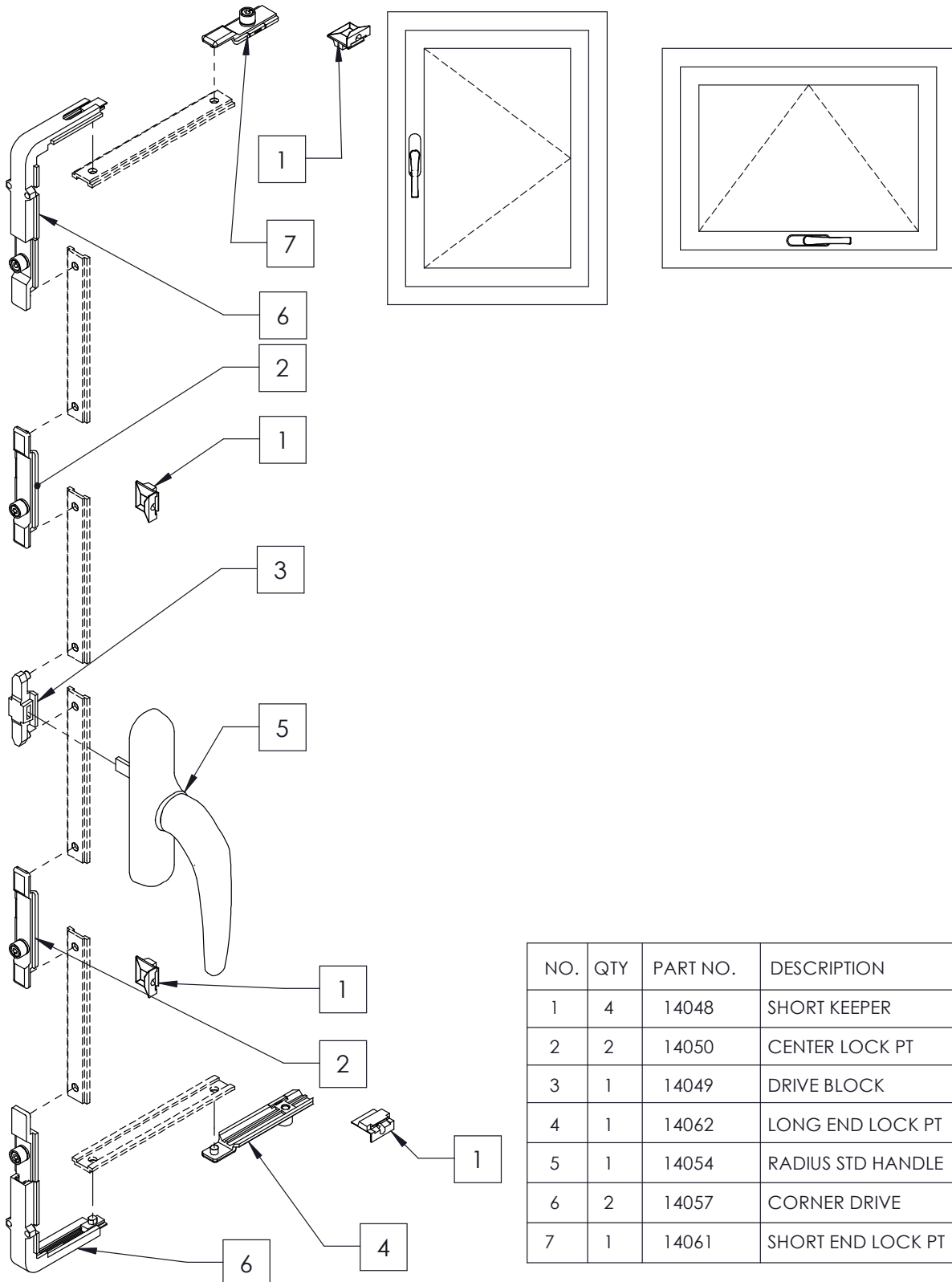
ASCENT EURO GROOVE LOCKING SYSTEM

FIG. 2 2 POINT LOCK WITH SHOOT BOLTS (DUAL DRIVE HANDLE)



NO.	QTY	PART NO.	DESCRIPTION
1	2	14063	SHOOT BOLT
2	2	14050	CENTER LOCK PT
3	1	14058	BI - DRIVE BLOCK
4	1	14056	CLASSIC DUAL HANDLE
5	2	14048	SHORT KEEPERS

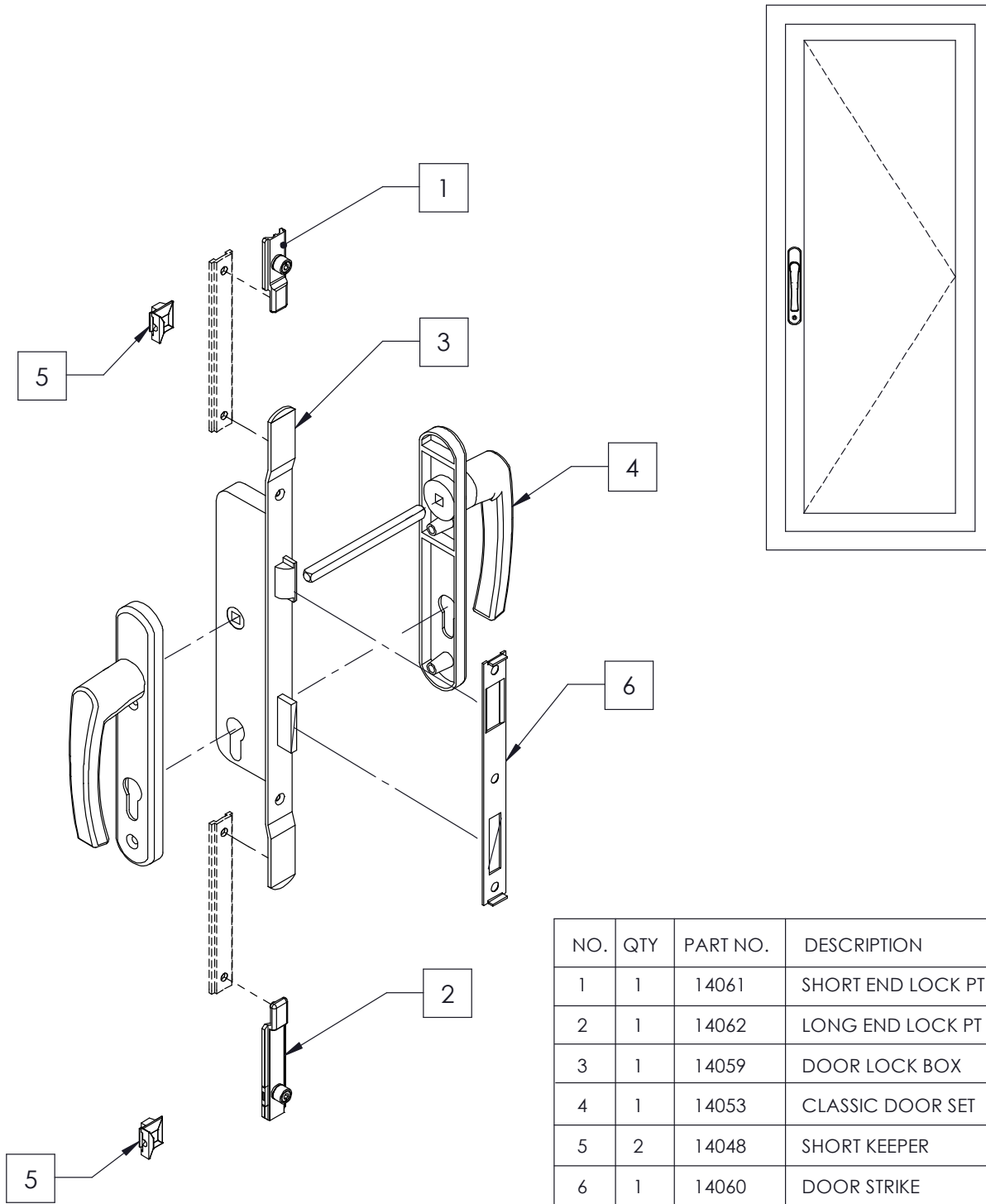
FIG. 3 6 POINT LOCKING ON 3 SIDES OF VENT



NO.	QTY	PART NO.	DESCRIPTION
1	4	14048	SHORT KEEPER
2	2	14050	CENTER LOCK PT
3	1	14049	DRIVE BLOCK
4	1	14062	LONG END LOCK PT
5	1	14054	RADIUS STD HANDLE
6	2	14057	CORNER DRIVE
7	1	14061	SHORT END LOCK PT

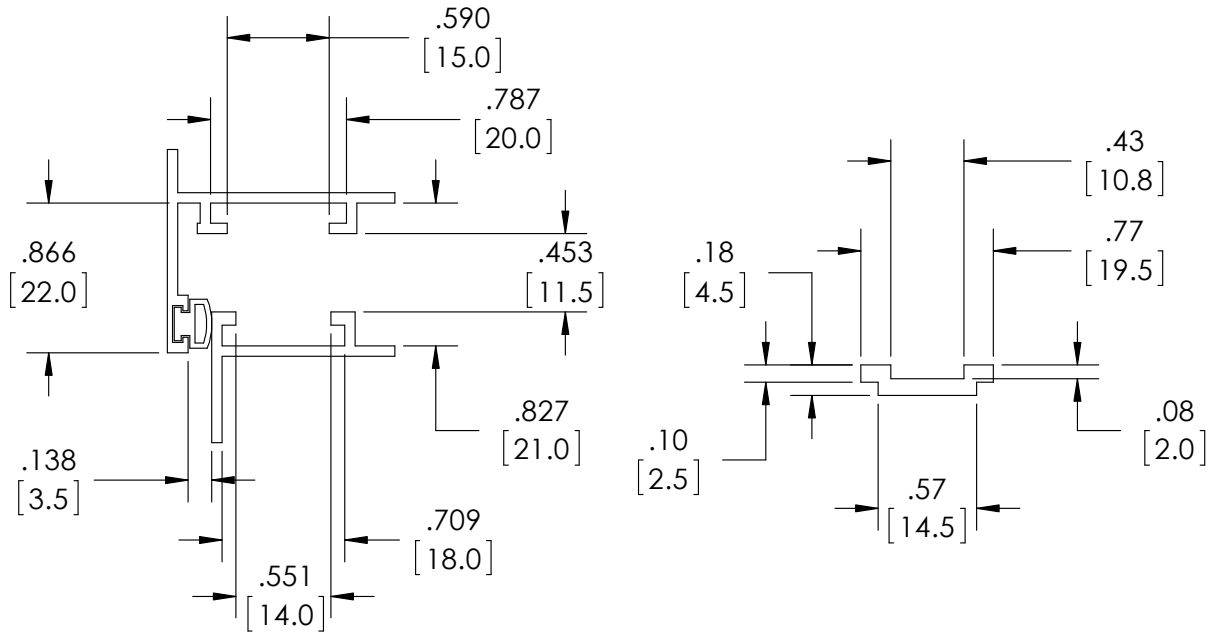
ASCENT EURO GROOVE LOCKING SYSTEM

FIG. 4 TERRACE DOOR SYSTEM WITH 2 POINT LOCKING

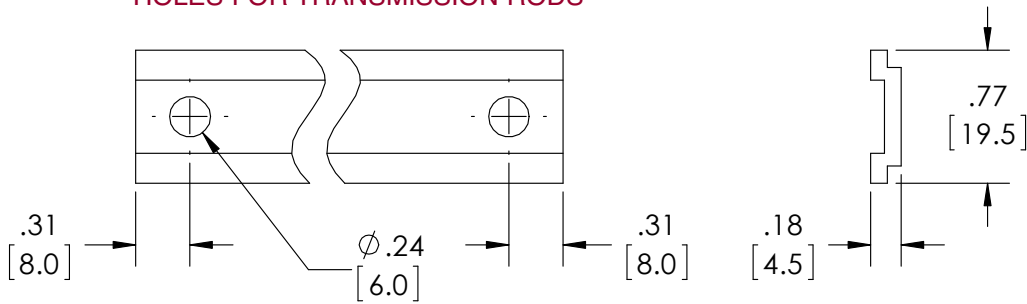


NO.	QTY	PART NO.	DESCRIPTION
1	1	14061	SHORT END LOCK PT
2	1	14062	LONG END LOCK PT
3	1	14059	DOOR LOCK BOX
4	1	14053	CLASSIC DOOR SET
5	2	14048	SHORT KEEPER
6	1	14060	DOOR STRIKE

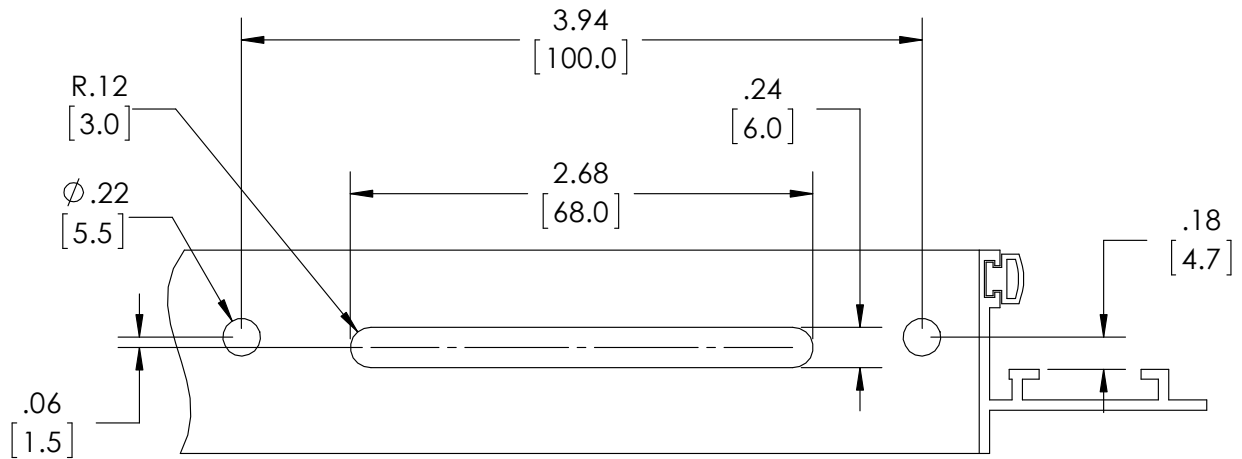
FIG. 5 SPECIFICATION OF THE SLOT SECTION FOR MOVEABLE FITTINGS



HOLES FOR TRANSMISSION RODS



DIMENSION FOR THE HANDLE INSTALLATION



ASCENT EURO GROOVE LOCKING SYSTEM

FIG. 6 OUTSWING 2 POINT LOCK

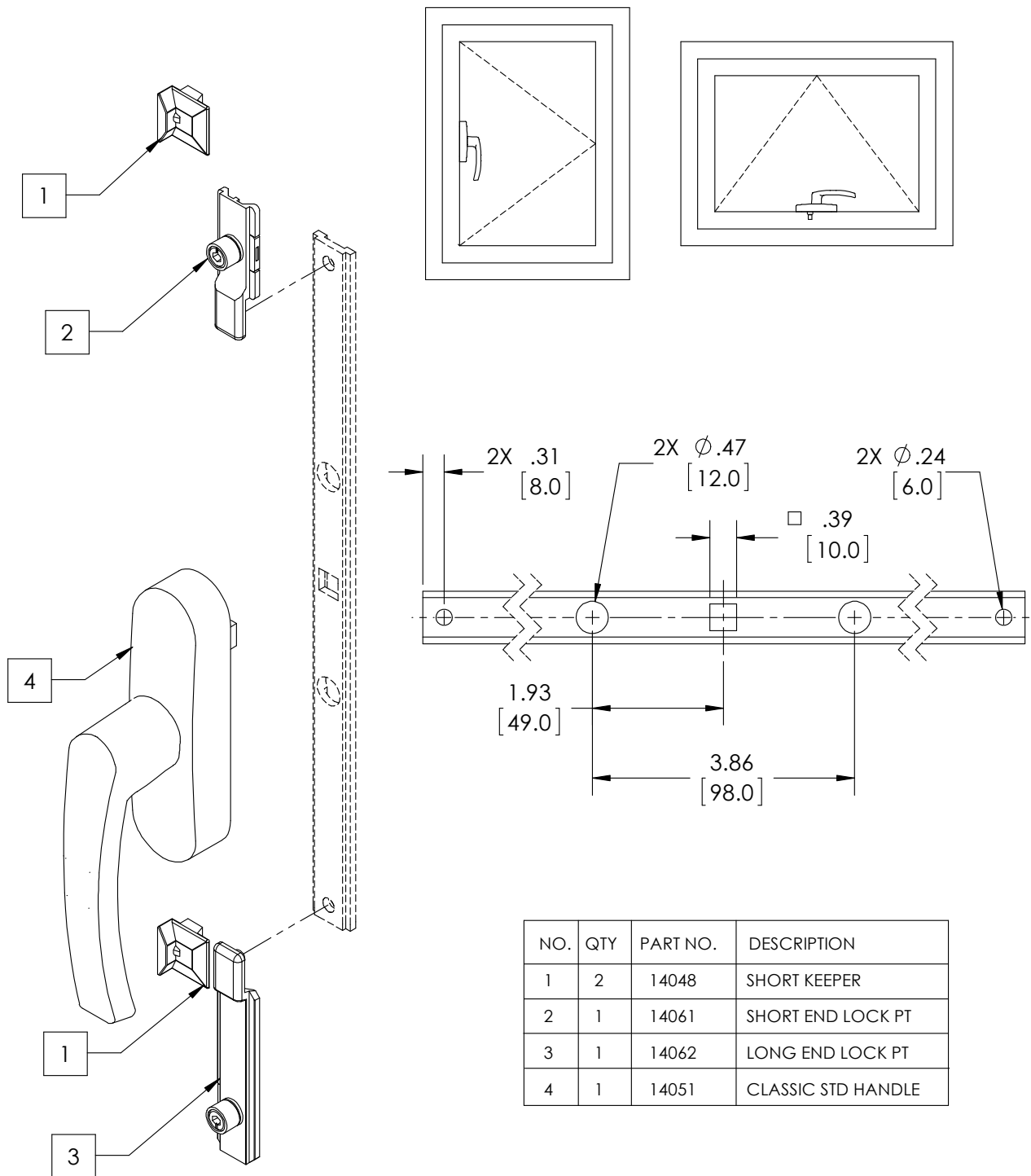
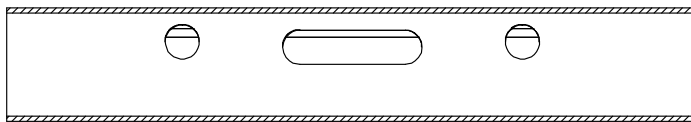
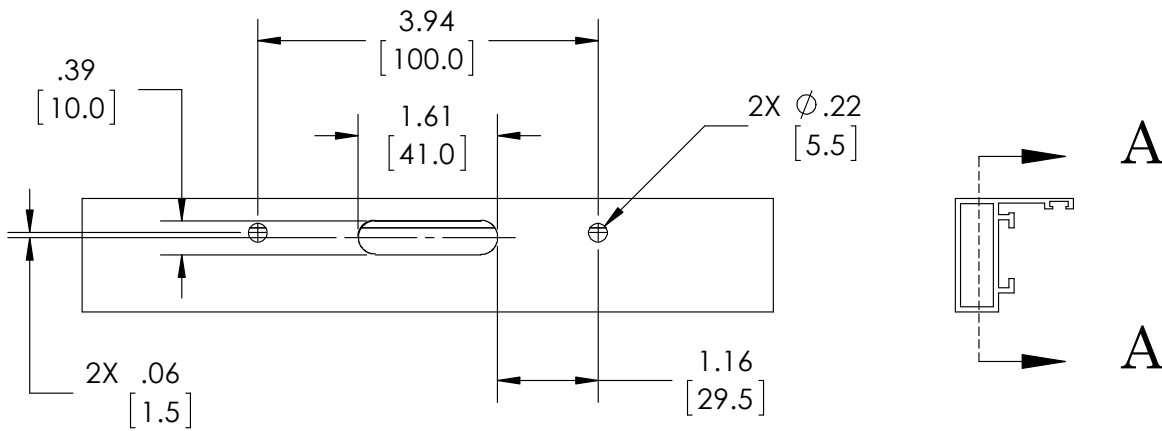
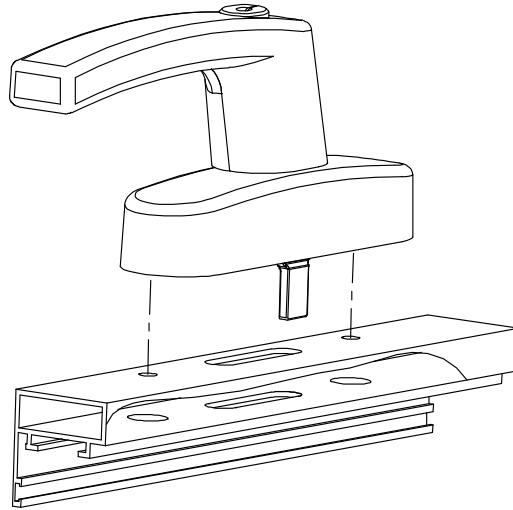


FIG. 7 OUT-SWING MOUNTING CUTOUT



SECTION A-A

ASCENT EURO GROOVE LOCKING SYSTEM

FIG. 8 DRIVE BLOCK 14049

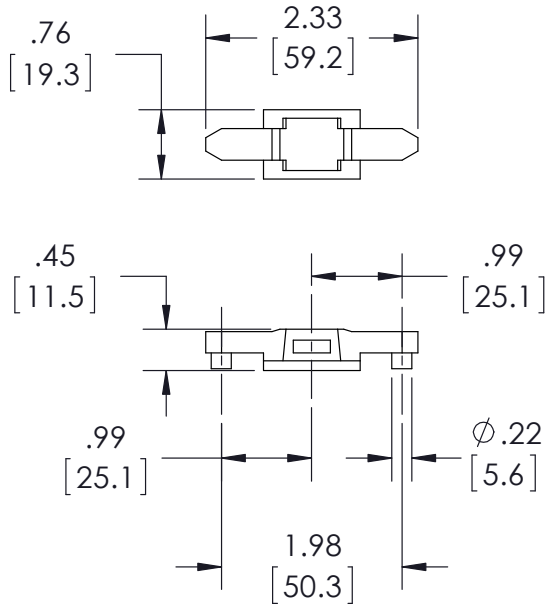


FIG. 9 CENTER LOCK POINT 14050

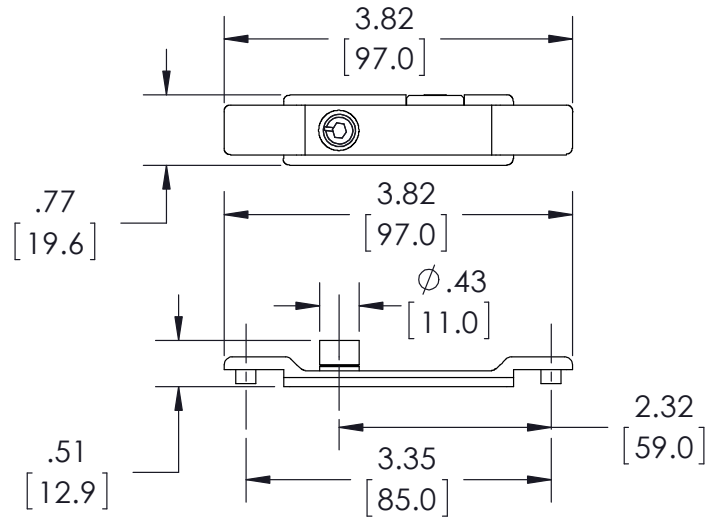


FIG. 10 SHORT END LOCK POINT 14061

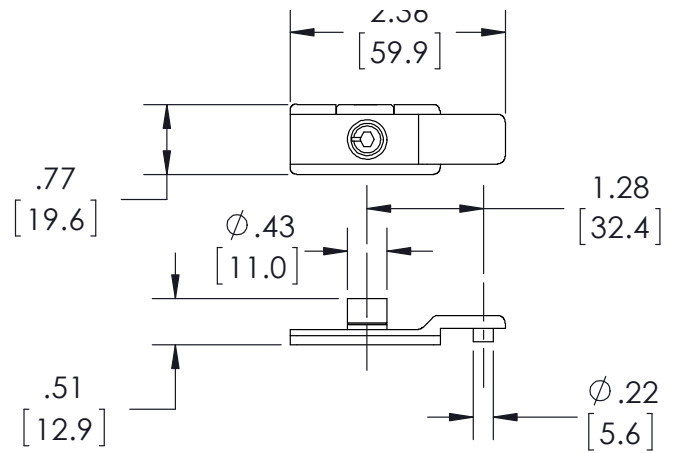


FIG. 11 DUAL-DRIVE BLOCK 14058

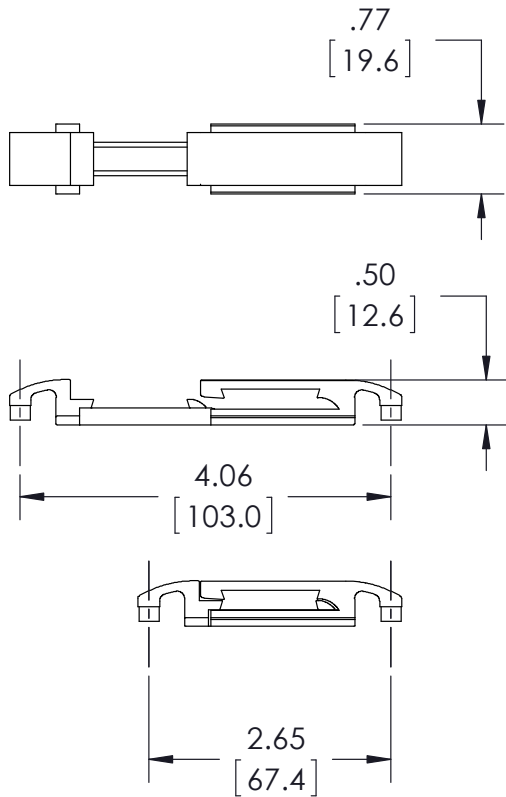


FIG. 12 LONG END LOCK POINT 14062

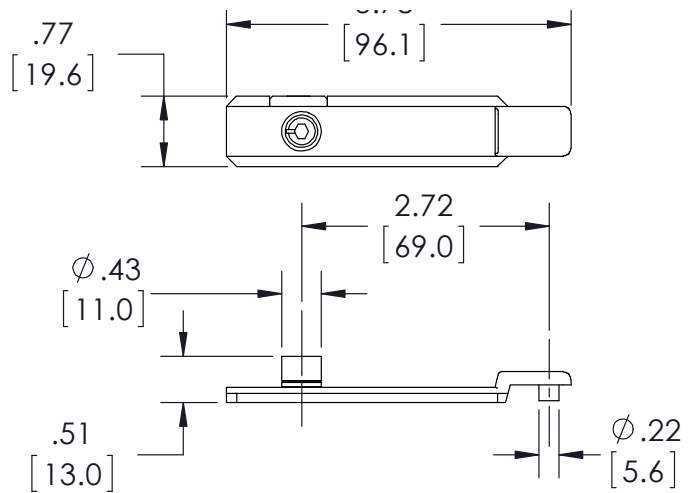


FIG. 13 CURTAIN WALL POINT 14046

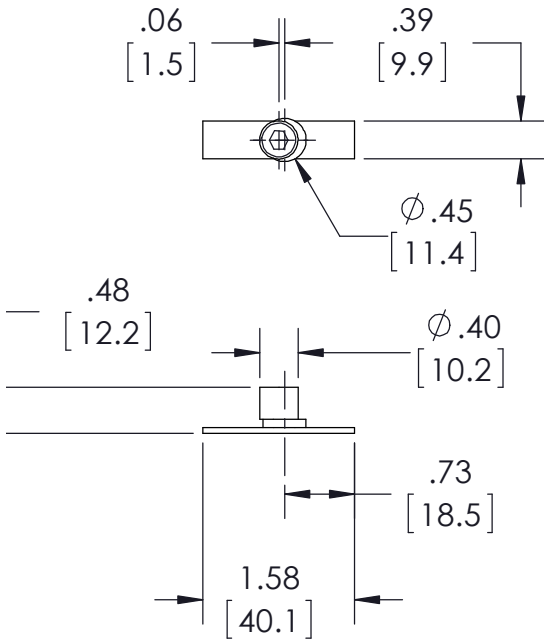


FIG. 14 SHOOT BOLT 14063

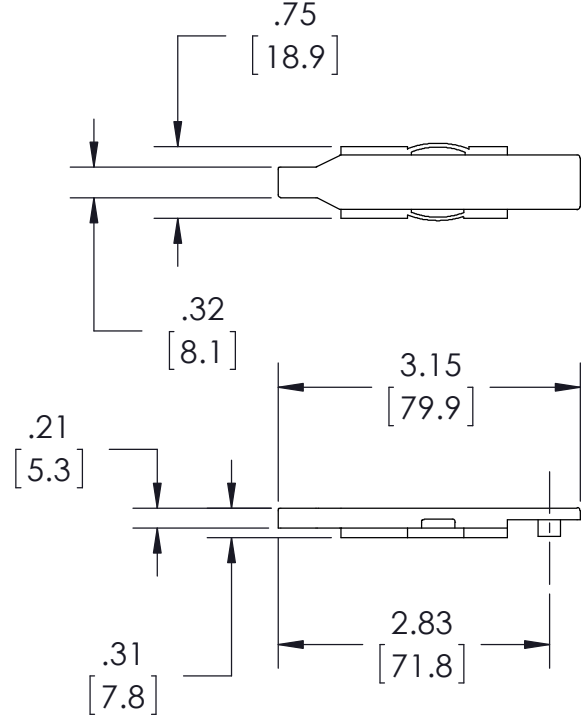
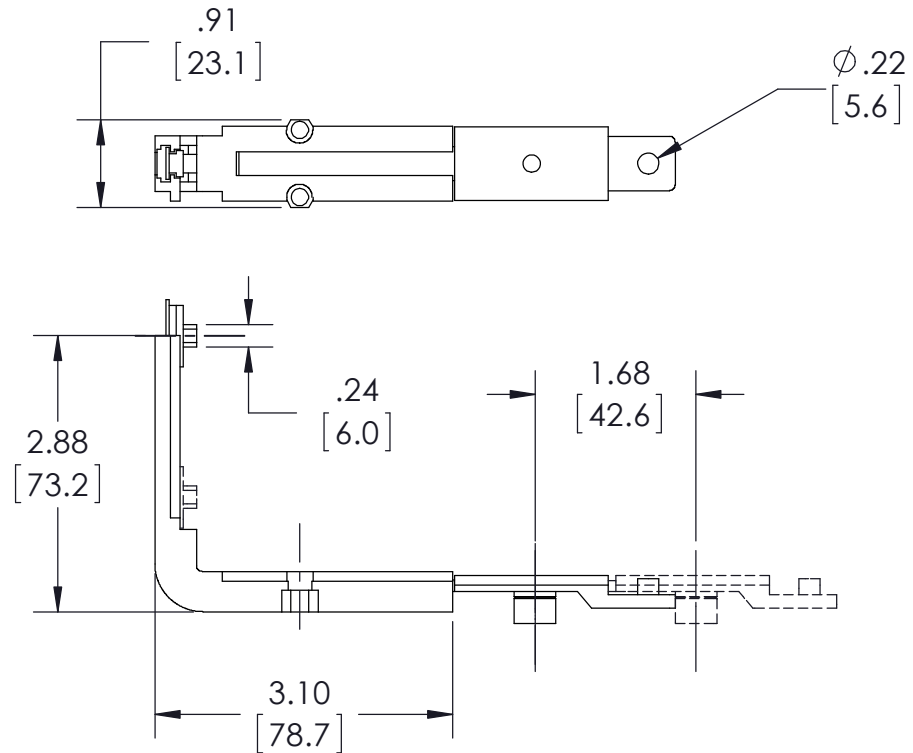


FIG. 15 CORNER DRIVE 14057



ASCENT EURO GROOVE LOCKING SYSTEM

FIG. 16 CLASSIC STANDARD HANDLE 14051

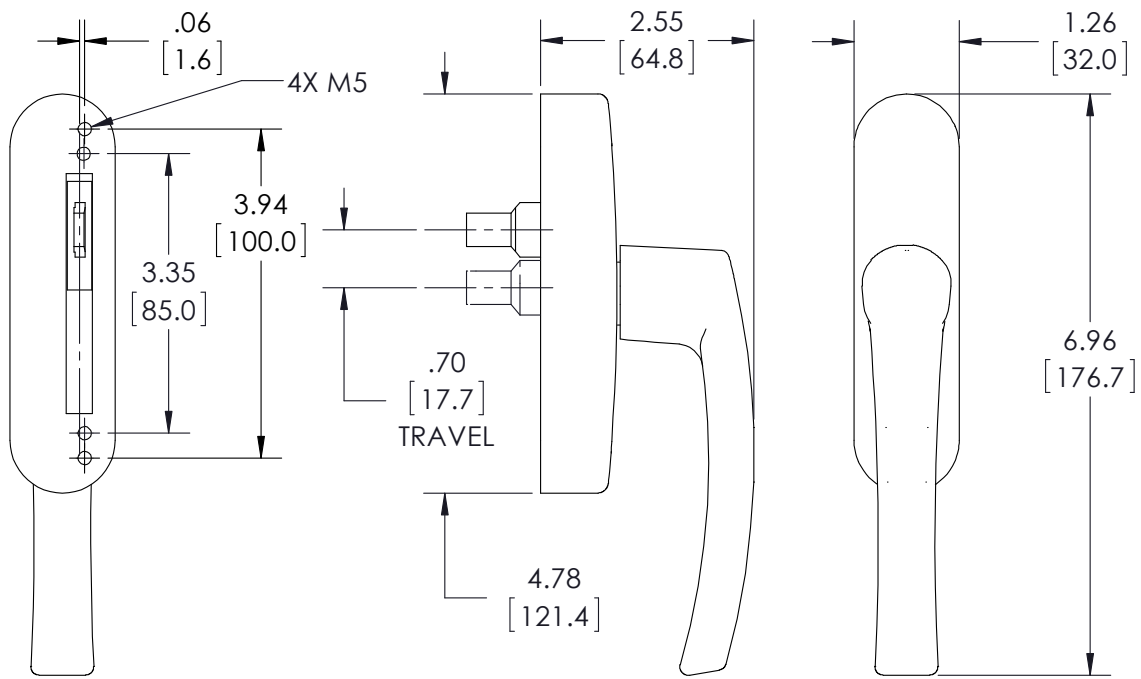


FIG. 17 CLASSIC DUAL HANDLE 14056

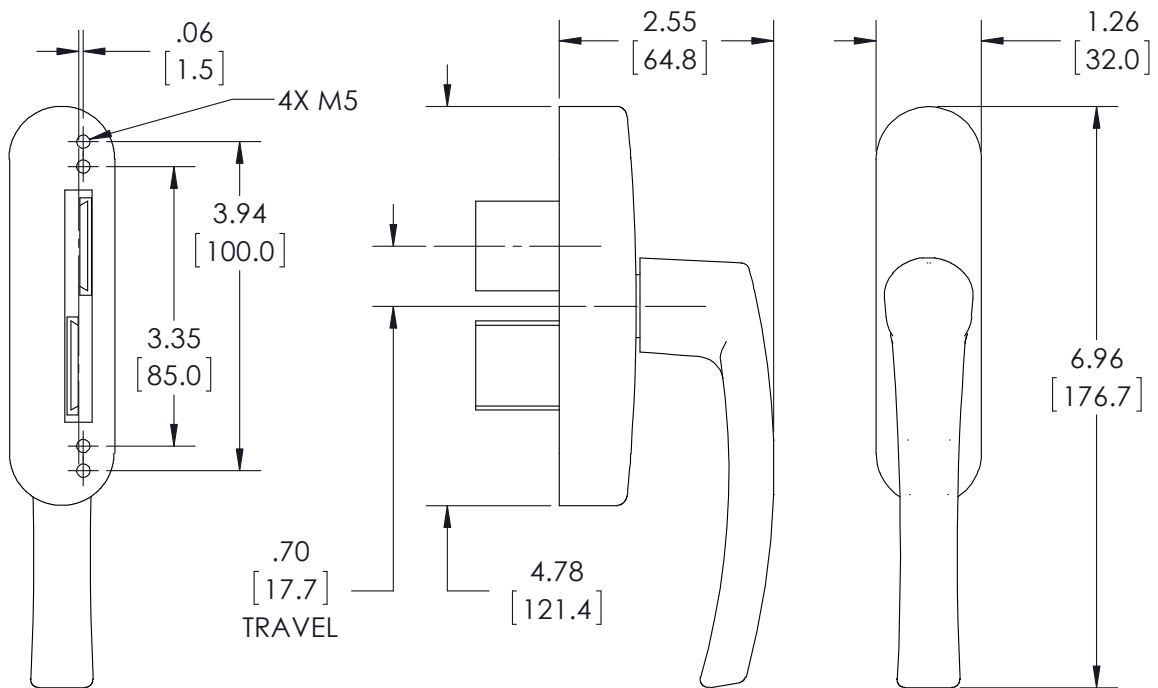


FIG. 18 RADIUS STANDARD HANDLE 14054

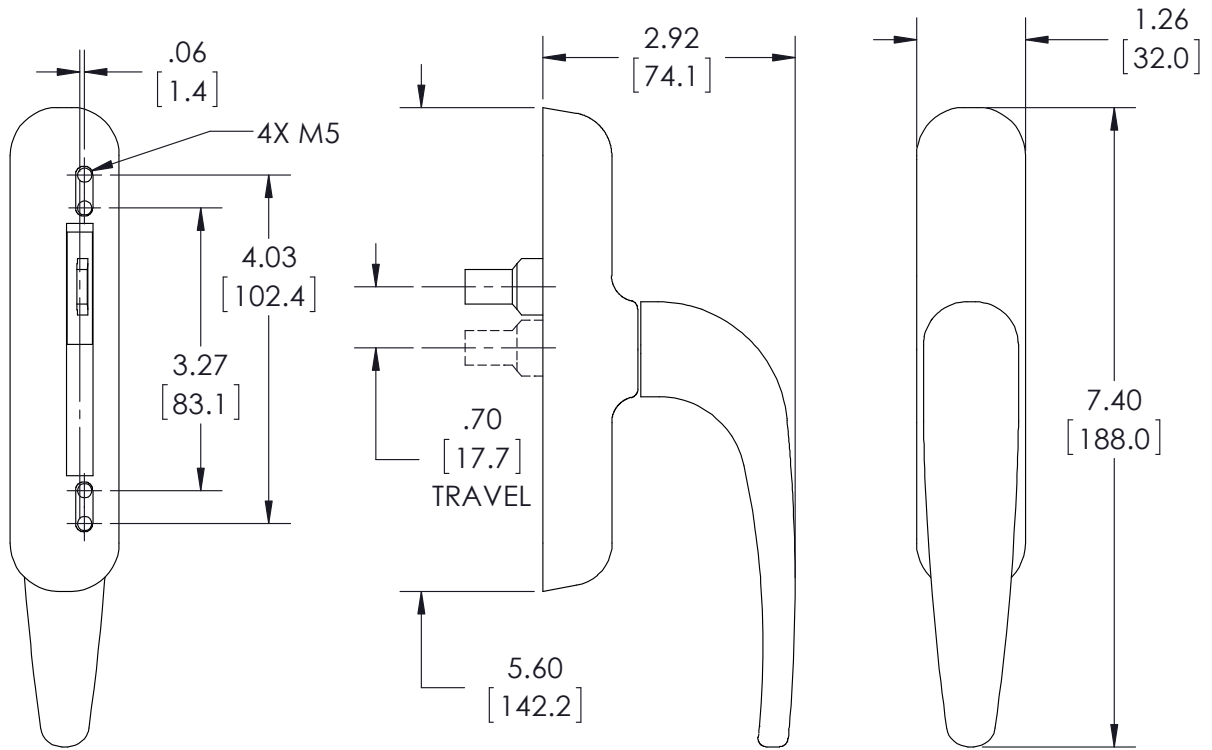
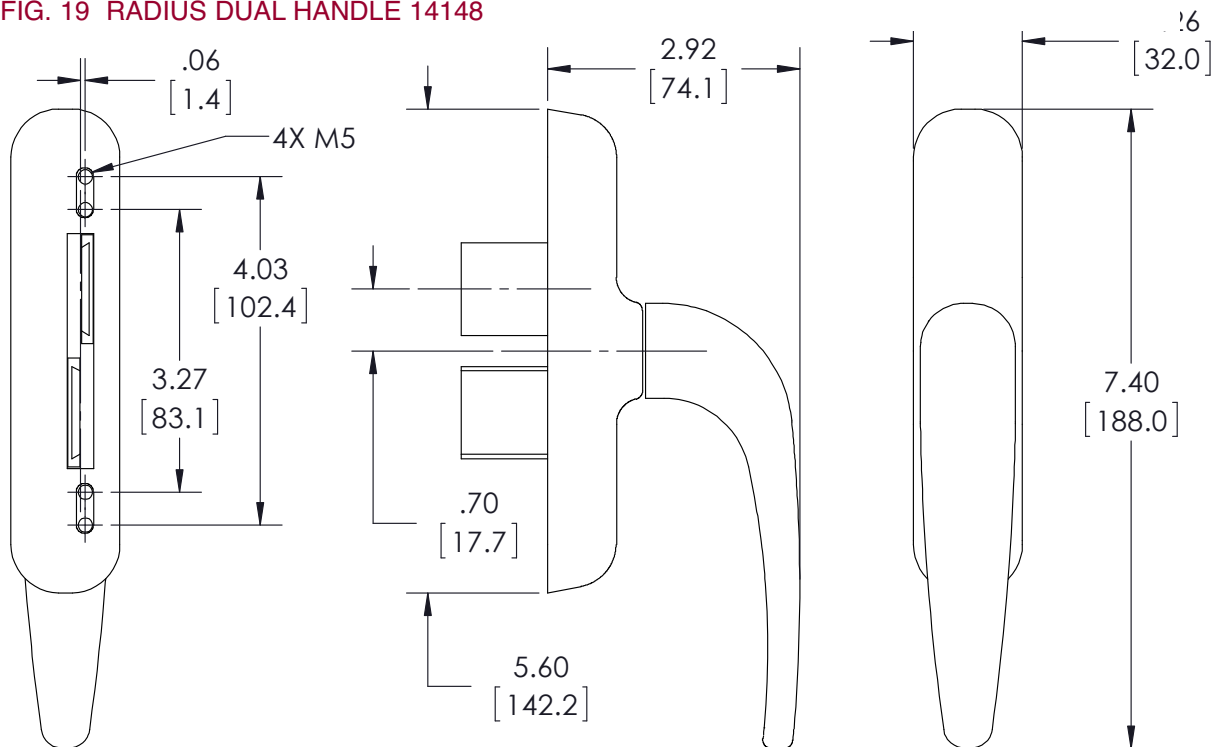


FIG. 19 RADIUS DUAL HANDLE 14148



ASCENT EURO GROOVE LOCKING SYSTEM

FIG. 20 LOCK BOX 14059

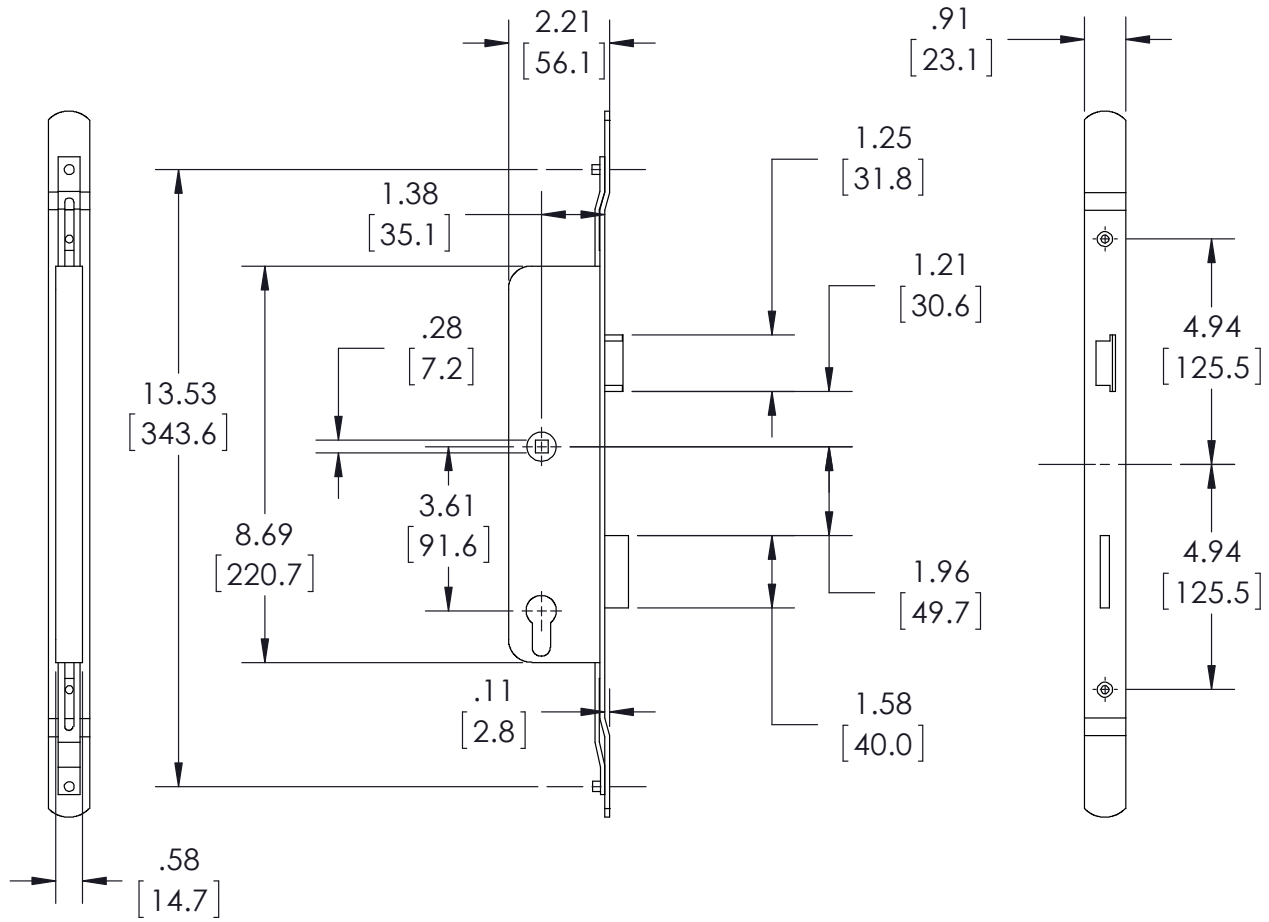


FIG. 21 DOOR STRIKE 14060

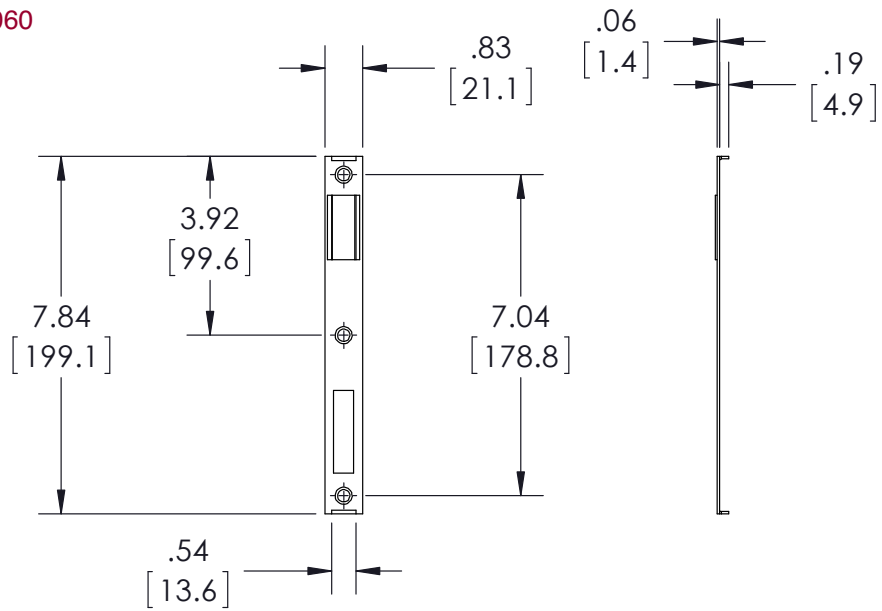
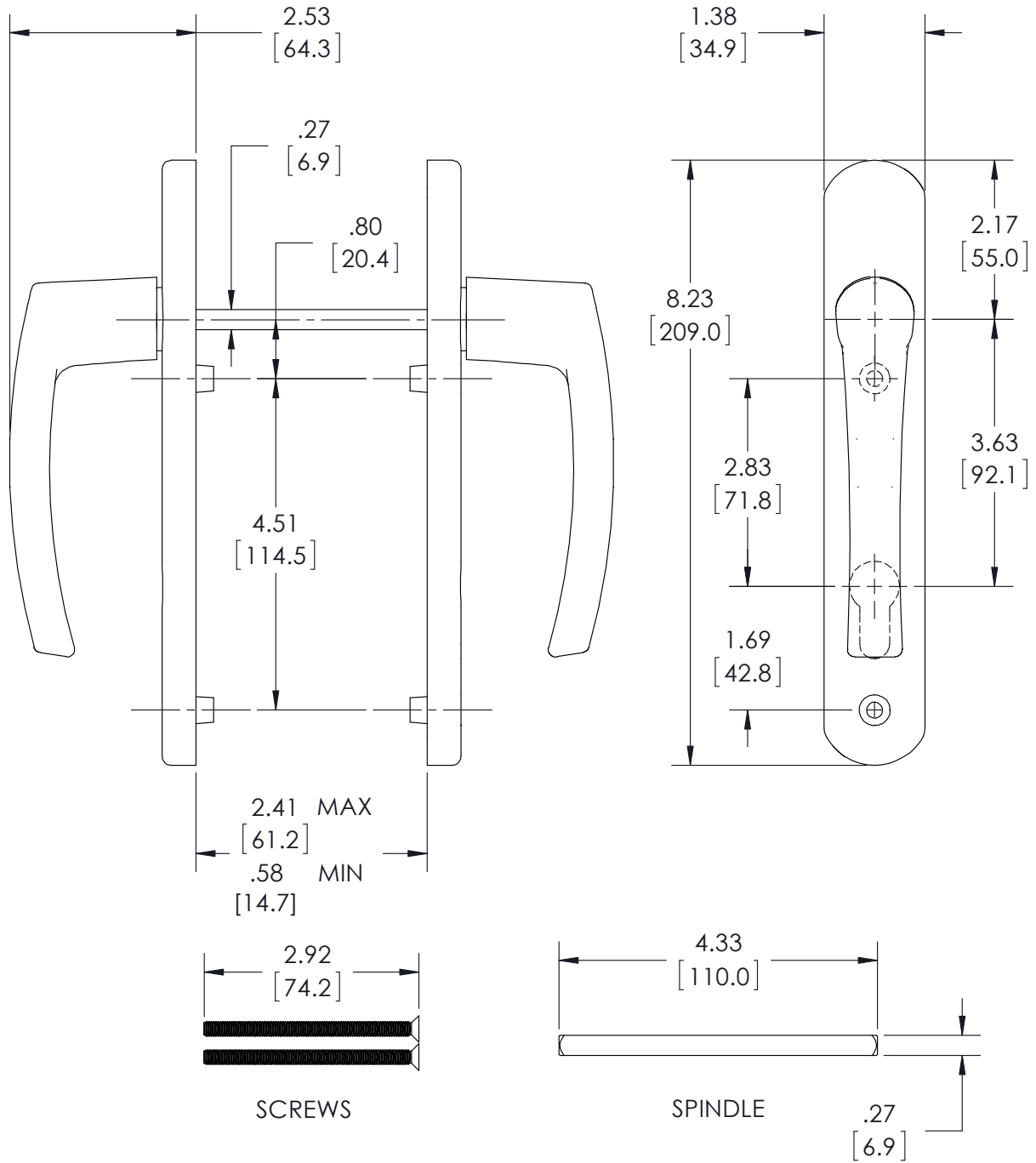


FIG. 22 CLASSIC DOOR HANDLE 14053



ASCENT EURO GROOVE LOCKING SYSTEM

FIG. 23 #14228 CLASSIC STANDARD HANDLE WITH CYLINDER LOCK AND KEYS

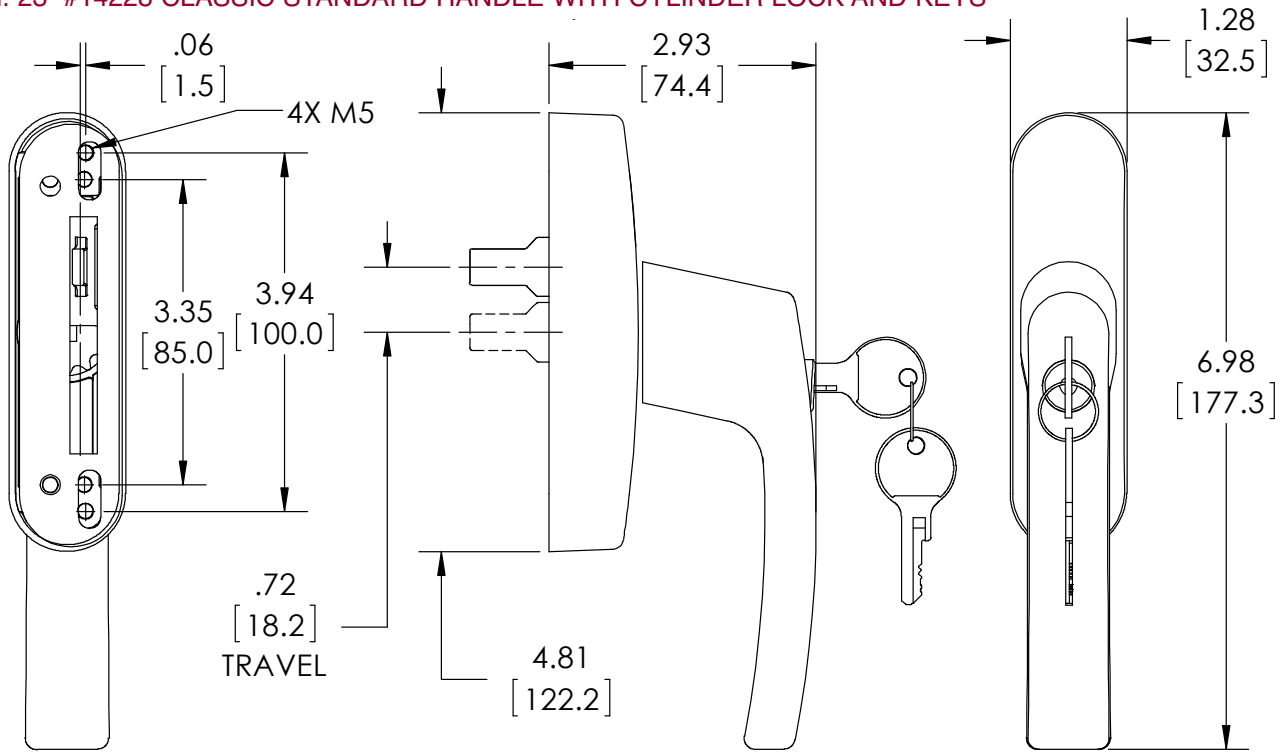


FIG. 24 #14230 CLASSIC DUAL HANDLE WITH CYLINDER LOCK AND KEYS

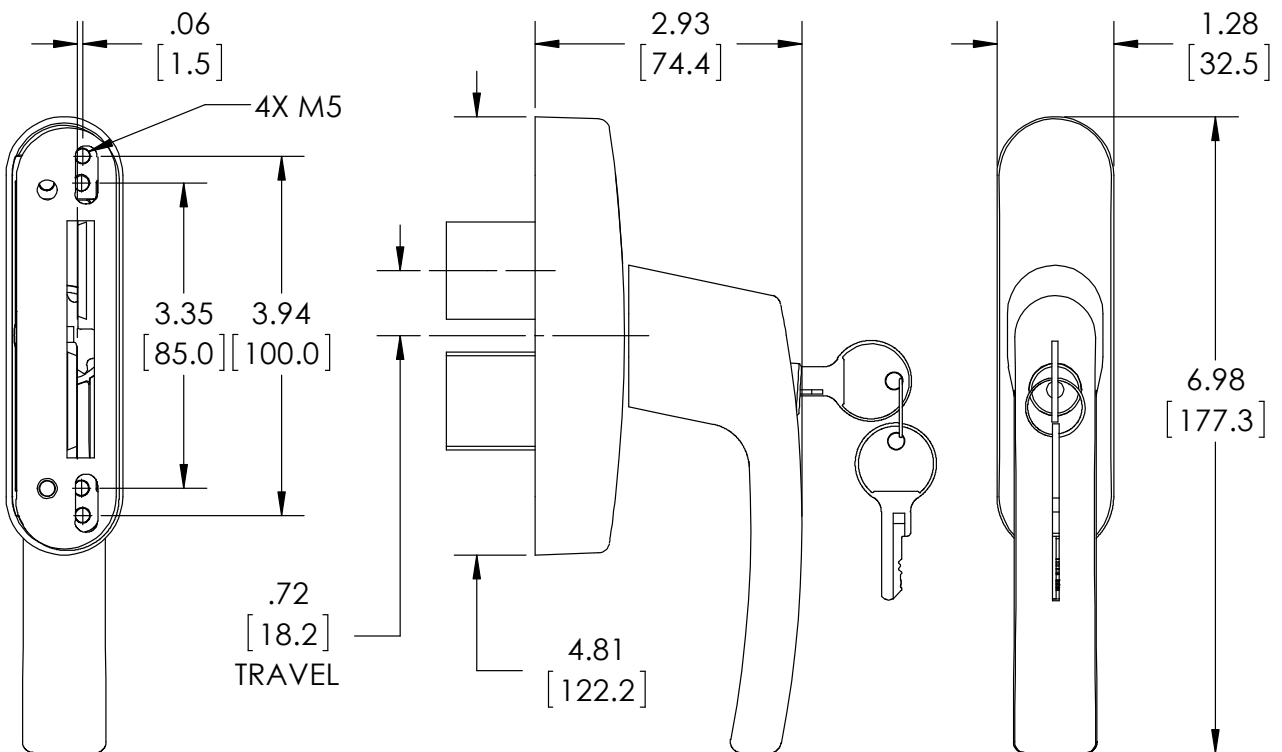


FIG. 25 14232 KEYS ONLY

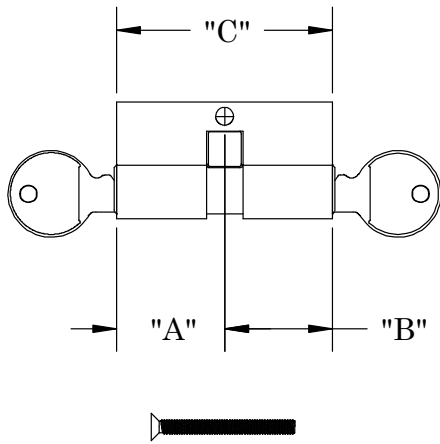
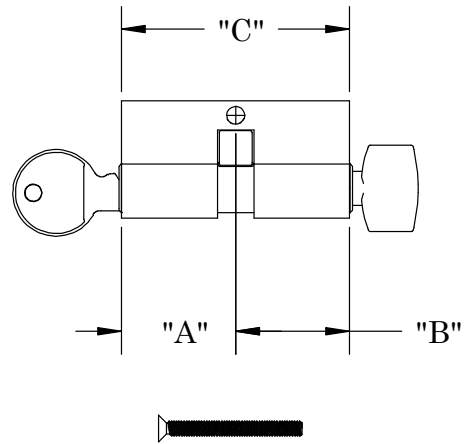


FIG. 26 14231 THUMB TURN AND KEY



PART NO.	"A"	"B"	"C"
14231	1.08 [27.5]	1.08 [27.5]	2.16 [54.9]
14232	1.25 [31.8]	1.25 [31.8]	2.50 [63.5]

ASCENT EURO GROOVE LOCKING SYSTEM

FIG. 27 TALL KEEPER 14047

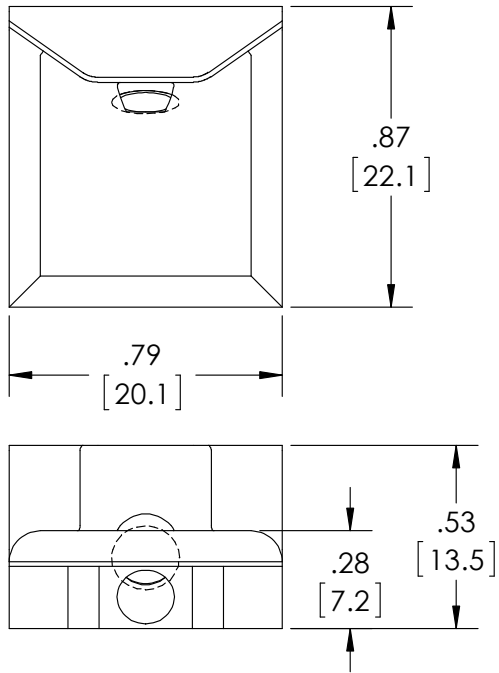


FIG. 28 SHORT KEEPER 14048

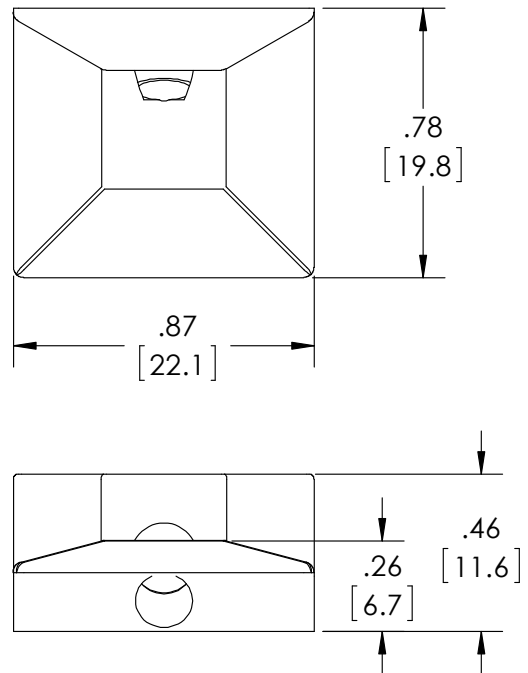
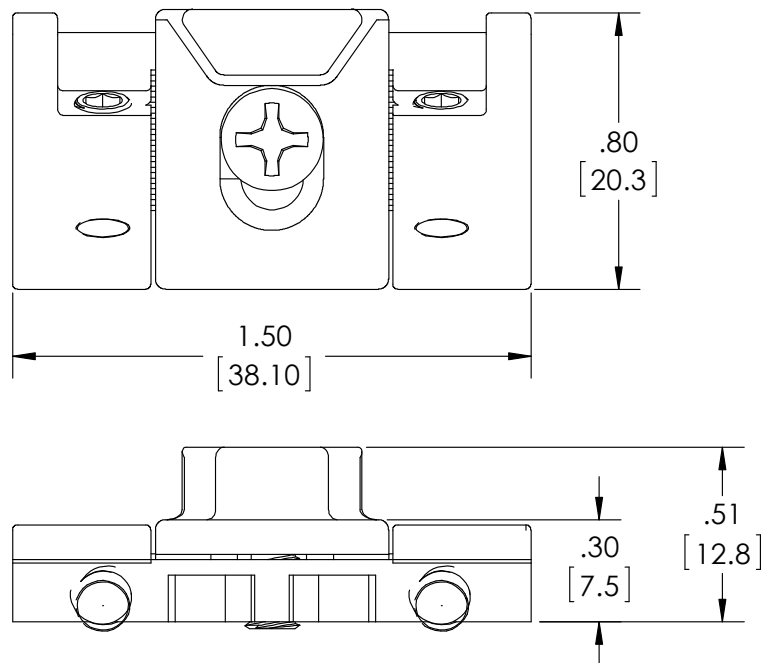


FIG. 29 ADJUSTABLE KEEPER 14064



**ASCENT EURO GROOVE
LOCKING SYSTEM**



Truth cam handle locks are designed to provide long and trouble-free service. Two-piece strike design includes a black polyester insert to provide a smooth operation and reduce wear. Inserts are available in various heights to assure tight lock-up of ventilator up to 300 lbs. of forced entry resistance per locking point. The 90° rotation of the handle locks or unlocks the sash. Easily mounts to the face of the window frame.

Truth has also come up with a unique combination of lock and keeper to fill the void in the area of locking handles for basement/hopper windows. By slightly modifying Truth's TrimLine Cam Handle Lock and designing a new high strength steel keeper that can easily be mounted to the window frame, Truth has developed a hardware system that, by simply rotating the handle 90°, easily locks or unlocks these basement/hopper vents.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High-pressure die-cast zinc handle, base and strike housing. Strike for use on basement/hopper windows made of high strength steel. #30569 Strike made of painted steel.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose cam handle mounting style desired by part number (see drawings for various options). Note: for basement/hopper window applications, order part #25.80 or #25.81 and appropriate steel keepers.
2. Specify finish number desired.
3. Specify left- or right-hand



(determined by which direction the handle points, when viewed from the inside on an awning window).

4. Select mounting hardware (sold separately):
 - a. Choose strike and insert part numbers. Make sure strike coincides with handle (offset or in-line). NOTE: #25.29 and #25.31 can be used with a #30569 strike plate allowing use of either left- or right-hand cam handles with the same strike placement.
 - b. Optional —
 - (1) #20408 —Rubber-cork adhesive backed gasket for In-line bases
 - (1) #20556 —Rubber-cork adhesive backed cam handle gasket for Offset bases.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and refer to Tech Note #11.

TRUTH TIPS:

1. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.

2. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

3. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

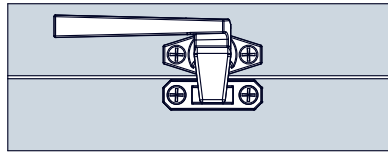
Cam handle locks shall be included which will increase both security and weather seal tightness. The locks must hold securely up to 300 lbs. of force per lock for negative air pressure and forced entry resistance.

Window locks shall be of cam handle design and utilize a two-piece strike. The cam handle must be constructed of high pressure zinc alloy die castings. Marring of window surfaces will be eliminated by using a plastic insert mounted in a high pressure zinc die cast strike housing.

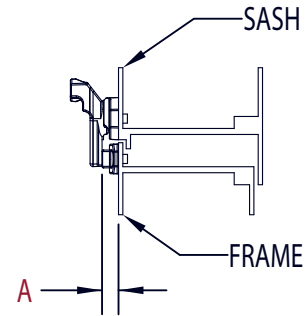
Window locks shall be 25 series, TrimLine™ as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF INLINE AND ANGLE BASE TRIMLINE CAM HANDLES

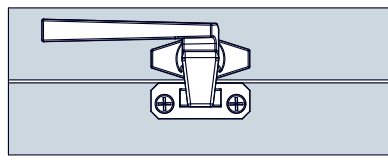
HARDWARE SHOWN
25.31 CAM HANDLE
20236 STRIKE HOUSING
20233 INSERT



INLINE BASE
LEFT HAND SHOWN



HARDWARE SHOWN
25.39 CAM HANDLE
20237 STRIKE HOUSING
20233 STRIKE INSERT



ANGLED BASE
LEFT HAND SHOWN

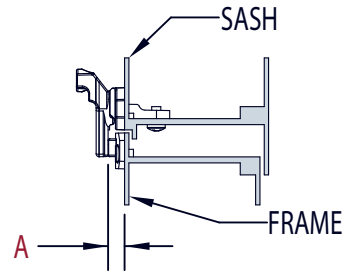


FIG. 2 25.29 CAM HANDLE (Offset Base)

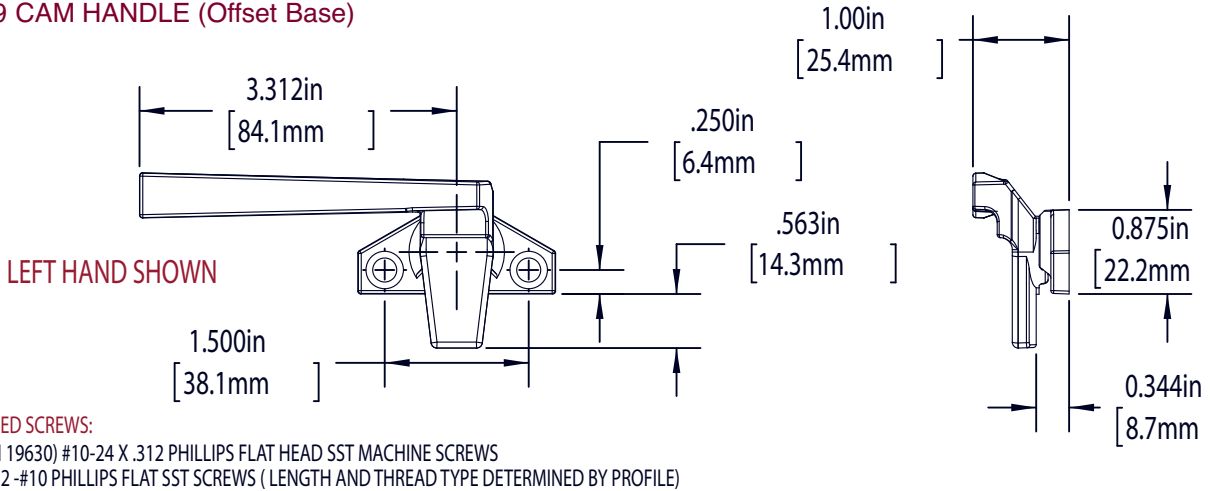


FIG. 3 25.31 CAM HANDLE (In-Line Base)

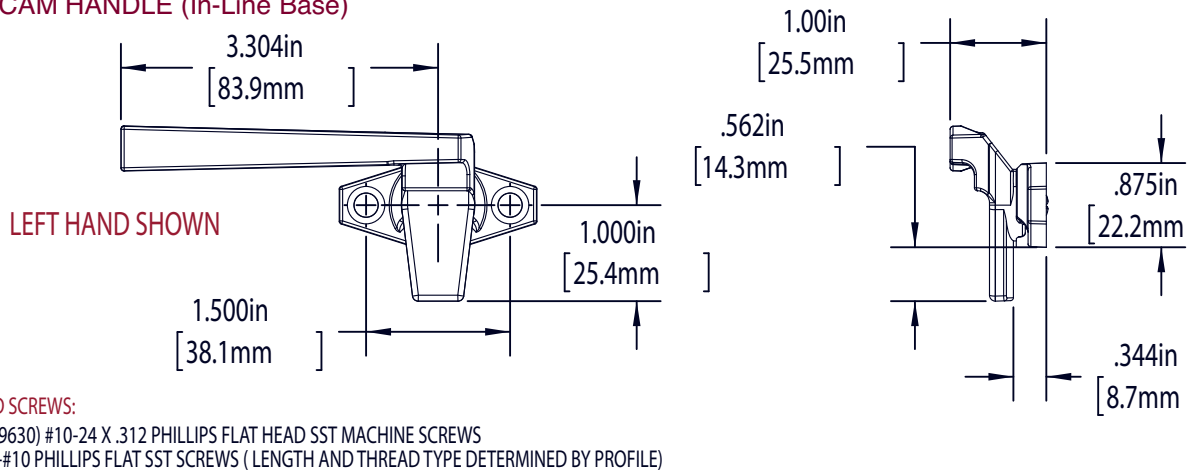
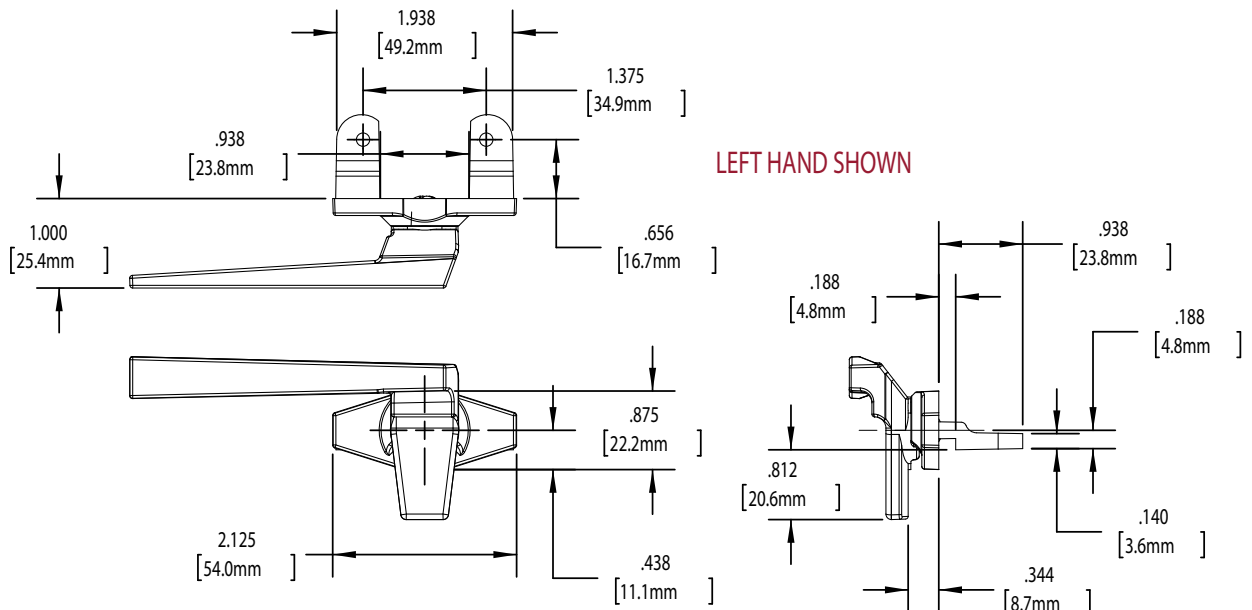


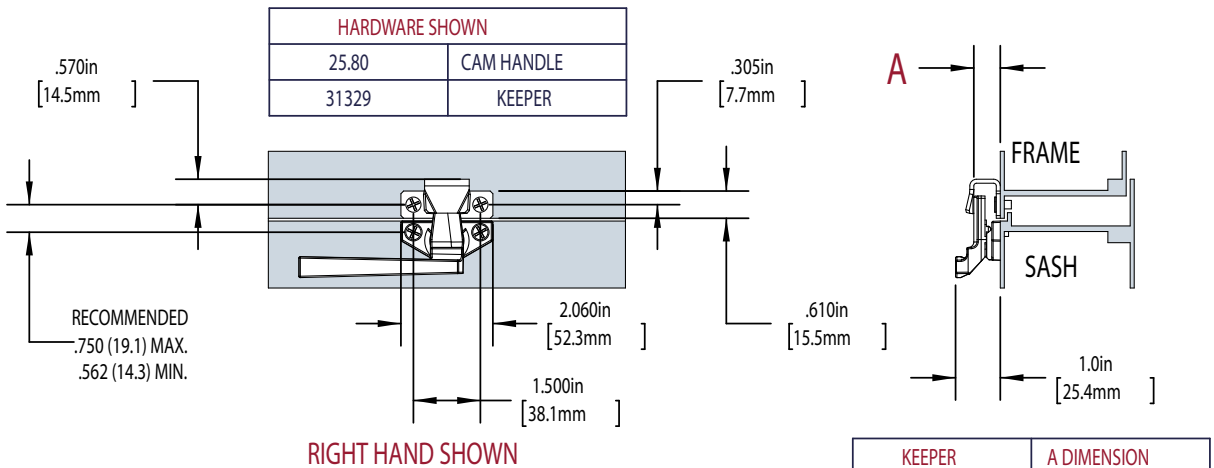
FIG. 4 25.39 CAM HANDLE (A-1 angle base)



RECOMMENDED SCREWS:

METAL : 2 (P/N 19640) #10 - 24 X .375 PHILLIPS PAN HEAD SST METAL MACHINE SCREWS
 PVC / WOOD : 2 - #10-24 PHILLIPS PAN HEAD SST METAL MACHINE SCREWS
 (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 5 25.80 CAM HANDLE FOR LOOPER WINDOWS
25.81 (inline base)

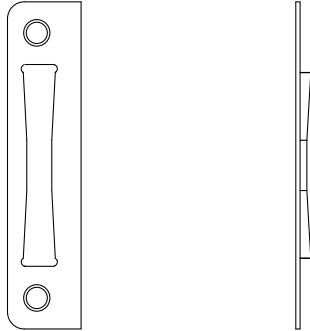


KEEPER	A DIMENSION
31447	.350 (8.9mm)
31439	.407 (10.3mm)
31329	.593 (15.1mm)

RECOMMENDED SCREWS:

PVC / WOOD / METAL: 4 - #10-24 PHILLIPS FLAT HEAD SST SCREWS.
 (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 6 STRIKE PLATE 30569



RECOMMENDED SCREWS:

WOOD/PVC/METAL:
4 - #10 PHILLIPS FLAT HEAD SST SCREWS.
LENGTH AND THREAD TYPE DETERMINED BY PROFILE.

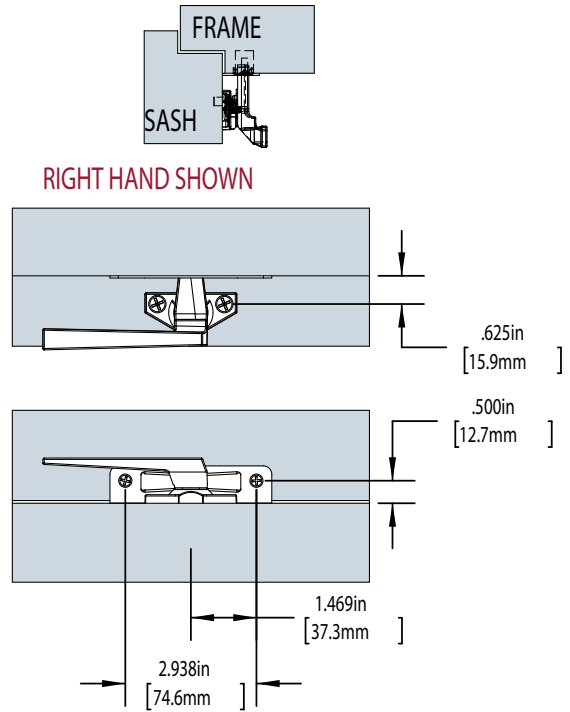
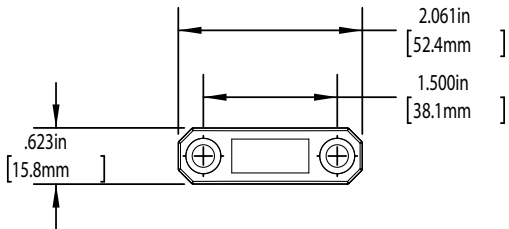
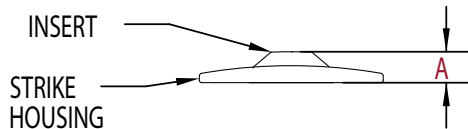


FIG. 7 IN-LINE STRIKE HOUSING 20236



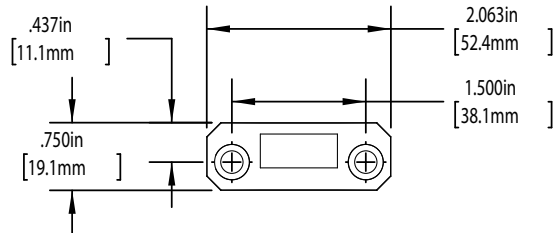
A	STRIKE HOUSING NUMBER	INSERT NUMBER
.218	20236	20231
.282		20232
.344		20233



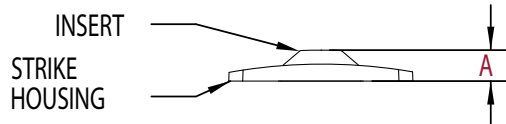
RECOMMENDED SCREWS:

METAL: 2 (P/N 19630) FLAT HEAD SST SCREWS
PVC/WOOD: 2-#10 PHILLIPS FLAT HEAD SST SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 8 OFFSET STRIKE HOUSING 20237



A	STRIKE HOUSING NUMBER	INSERT NUMBER
.218	20237	20231
.282		20232
.344		20233



RECOMMENDED SCREWS:

METAL: 2 (P/N 19630) FLAT HEAD SST SCREWS
PVC/WOOD: 2-#10 PHILLIPS FLAT HEAD SST SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 9 GASKET 20556 (offset base)

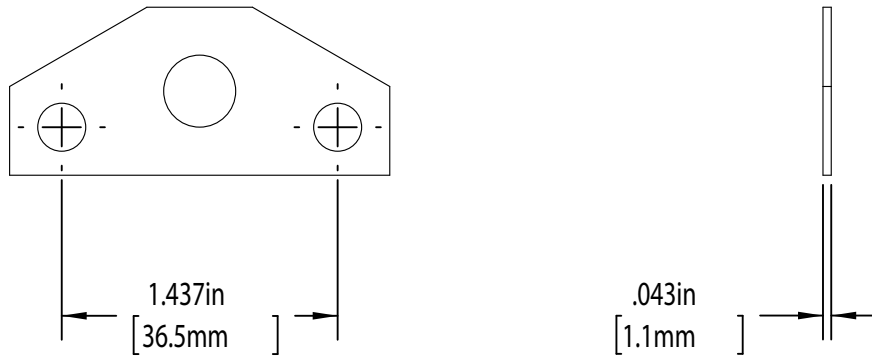
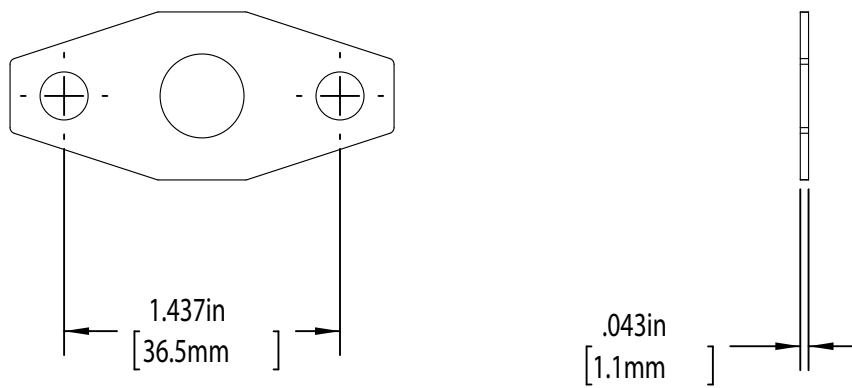


FIG. 10 GASKET 20406 (inline base)





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Truth Cam Handle Locks are designed to provide long and trouble-free service. The hole in the handle allows operation of cam lock in elevated locations. Two-piece strike design includes a black polyester insert to provide a smooth operation and reduce wear. Inserts are available in various heights to assure tight lock-up of window. The 90° rotation of the handle locks or unlocks the sash. This product can exceed 300 lbs. of forced entry resistance per locking point.

Truth offers two different ways in which this product can be mounted to the window sash - Face Mounted (In-line or Offset options), or for concealed mounting applications, an Angle Base feature is available. Consult the drawings for further details.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High-pressure die-cast zinc handle, base and strike housing. Strike housing materials and finishes match cam handles. Inserts are black polyester. #30569 Strike made of painted steel.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.



ORDERING INFORMATION & OPTIONS:

1. Choose cam handle mounting desired by part number (see drawings for various options).
2. Specify finish number desired.
3. Specify left- or right-hand (determined by which direction the handle points in the locked position, when viewed from the inside, on a project out bottom window).
4. Select mounting hardware (sold separately):
 - a. Choose strike and insert part numbers. Make sure strike coincides with handle (offset or in-line). NOTE: #25.70 and #25.72 can be used with a #30569 strike plate allowing use of either left- or right-hand cam handles with the same strike placement.
 - b. Optional —
 - (1) #20408 —Rubber-cork adhesive backed gasket for In-line bases.
 - (1) #20556 —Rubber-cork adhesive backed cam handle gasket for Offset bases.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and refer to Tech Note #11.

TRUTH TIPS:

1. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
2. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
3. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Cam handle locks shall be included which will increase both security and weather seal tightness. The locks must hold securely up to 300 lbs. of force per lock for negative air pressure and forced entry resistance. A hole shall be provided in the handle for pole operation in out-of-reach applications.

Window locks shall be of cam handle design and utilize a two-piece strike. The cam handle must be constructed of high pressure zinc alloy die castings. Marring of window surfaces will be eliminated by using a plastic insert mounted in a high pressure zinc die cast strike housing.

Window locks shall be 25 series Pole Operated, as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF IN-LINE AND ANGLE BASE POLE OPERATED CAM HANDLES

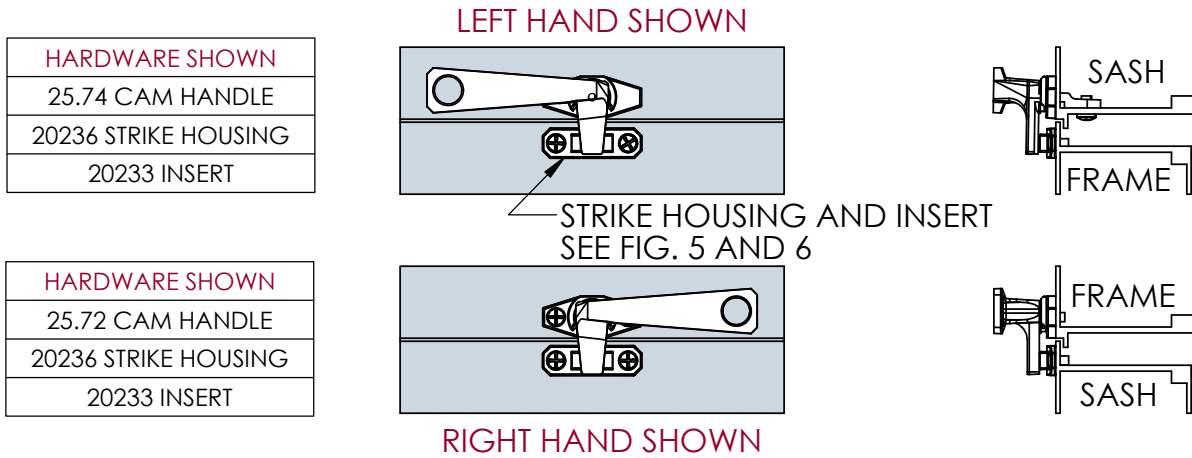
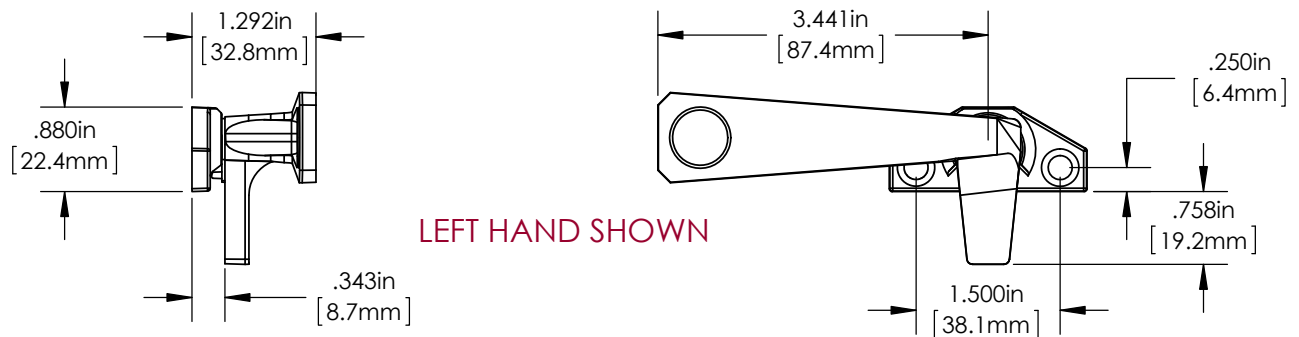


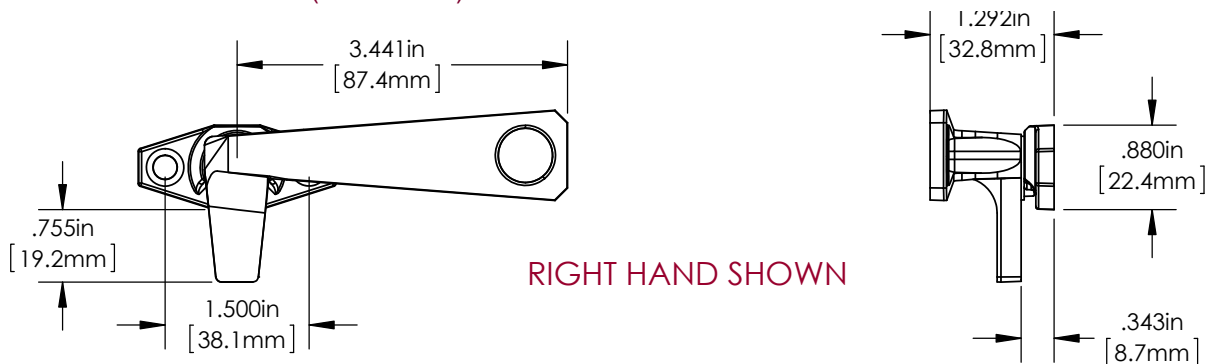
FIG. 2 CAM HANDLE 25.70 (offset base)



RECOMMENDED SCREWS:

METAL: 2(P/N 19630) #10-24 X .312 PHILLIPS FLAT HEAD SST MACHINE SCREWS
 PVC / WOOD: 2- #10-24 PHILLIPS FLAT HEAD SST SCREWS.
 (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 3 CAM HANDLE 25.72 (in-line base)



RECOMMENDED SCREWS:

METAL: 2(P/N 19630) #10-24 X .312 PHILLIPS FLAT HEAD SST MACHINE SCREWS
 PVC / WOOD: 2- #10-24 PHILLIPS FLAT HEAD SST SCREWS.
 (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 4 CAM HANDLE 25.41 (A-3 angle base)

RECOMMENDED SCREWS:

METAL: 2 (P/N 19640) #10-24 X .375 PHILLIPS PAN HEAD SST MACHINE SCREWS

PVC/WOOD: 2 #10-24 PHILLIPS PAN HEAD SST MACHINE SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

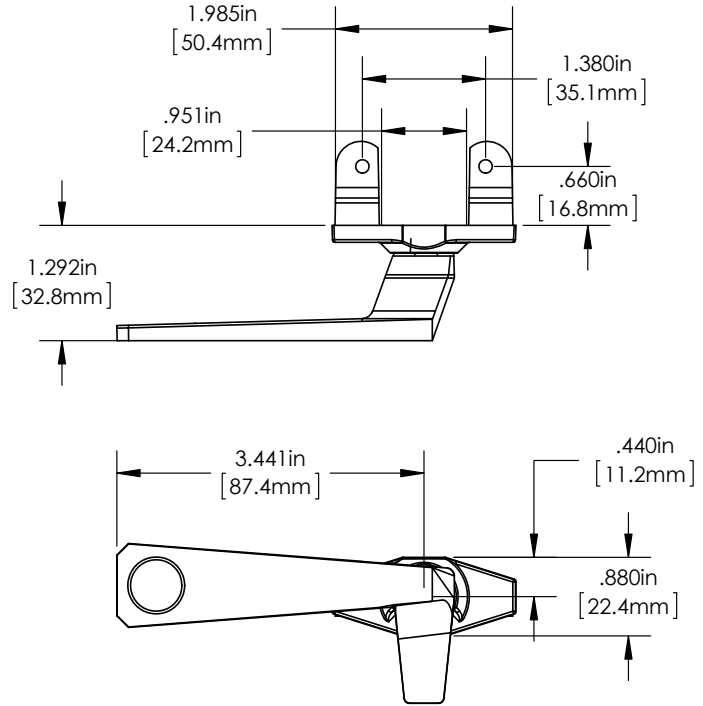
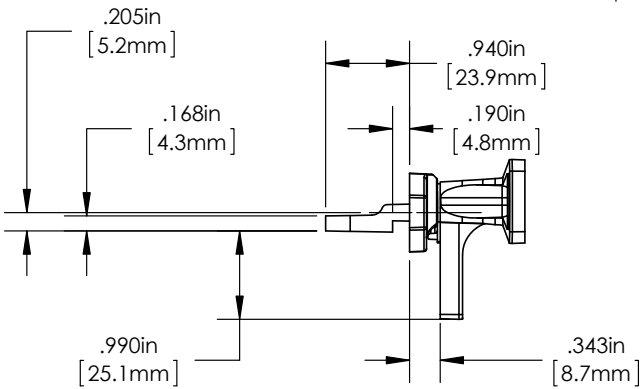
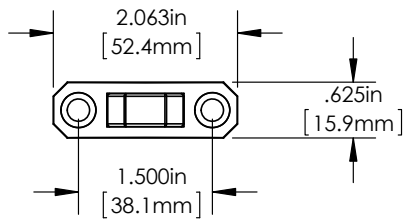
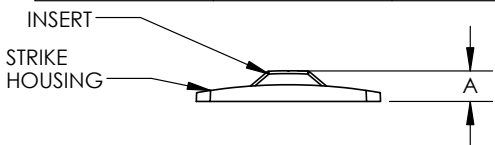


FIG. 5 IN-LINE STRIKE HOUSING 20236



A	STRIKE HOUSING	INSERT
.218 (5.6mm)	20236	20231
.282 (7.1mm)		20232
.344 (8.7mm)		20233

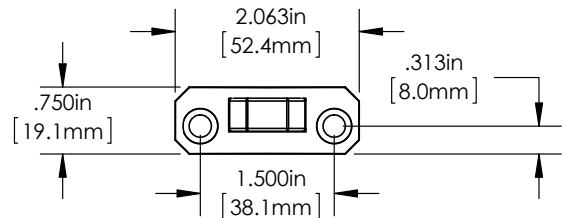


RECOMMENDED SCREWS:

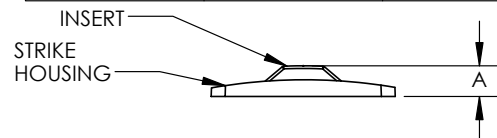
METAL: 2 (P/N 19630) #10-24 X .312 PHILLIPS FLAT HEAD SST MACHINE SCREWS

PVC / WOOD: 2-#10-24 PHILLIPS FLAT HEAD SST SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 6 OFFSET STRIKE HOUSING 20237



A	STRIKE HOUSING	INSERT
.218 (5.6mm)	20237	20231
.282 (7.1mm)		20232
.344 (8.7mm)		20233



RECOMMENDED SCREWS:

METAL: 2 (P/N 19630) #10-24 X .312 PHILLIPS FLAT HEAD SST MACHINE SCREWS

PVC / WOOD: 2-#10-24 PHILLIPS FLAT HEAD SST SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 7 STRIKE PLATE 30569 APPLICATION

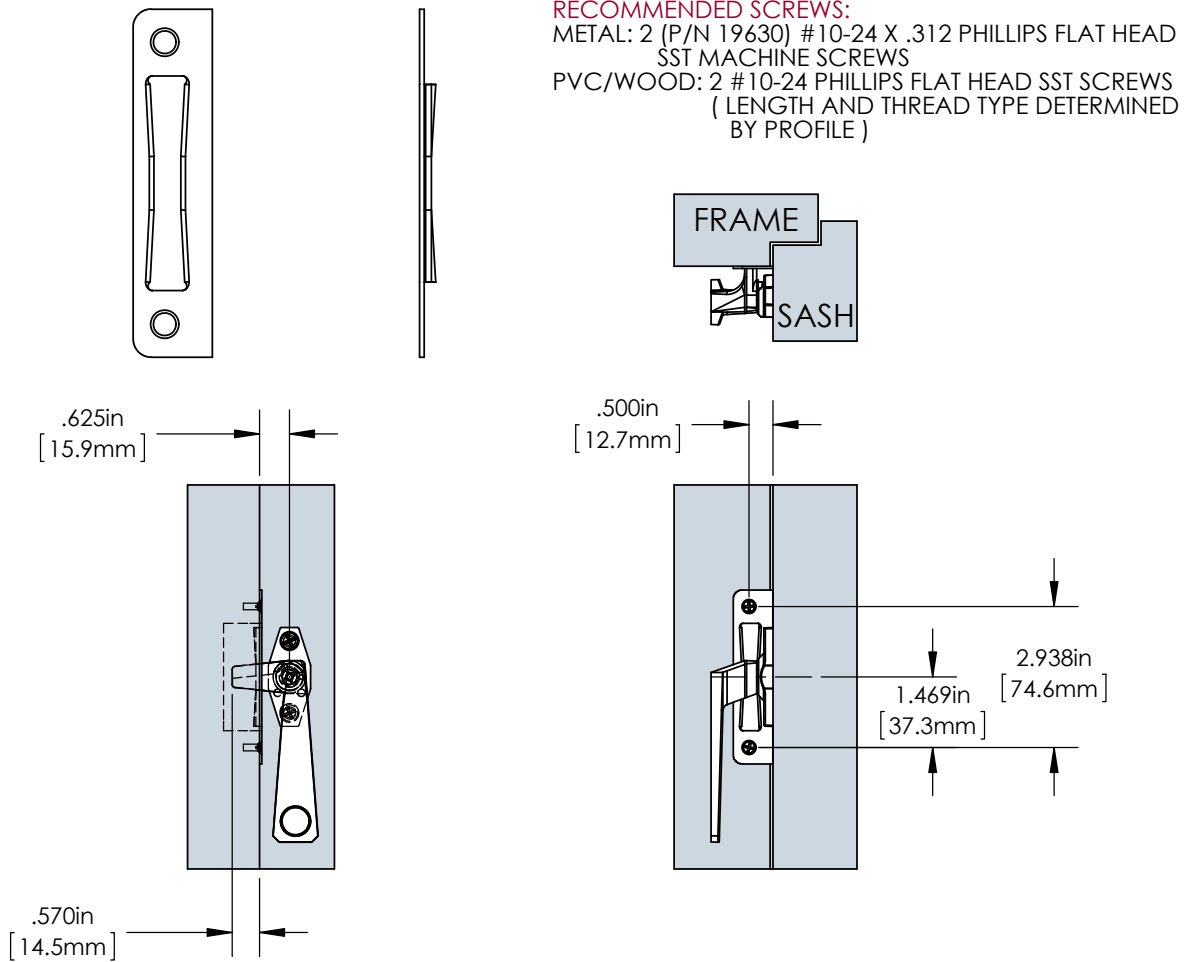


FIG. 8 GASKET 20408 (in-line base)

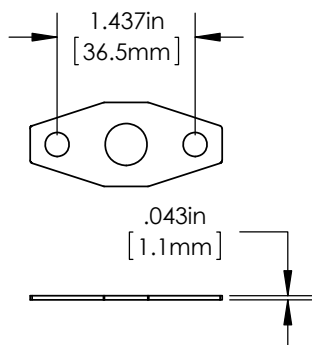
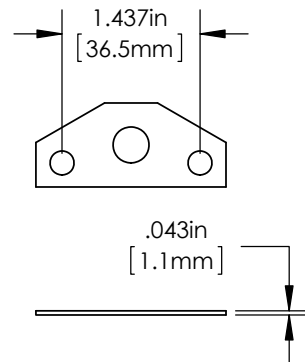


FIG. 9 GASKET 20556 (offset base)





Concealed pawl design provides internal lock-up of in-swinging ventilator. Various concealed pawl and keeper designs are available to accommodate most window styles on the market today. A 90° rotation of handle locks or unlocks sash.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High-pressure die-cast zinc handle and base. Zinc-plated steel pawl. Non-magnetic (300 Series) stainless steel keepers.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose style of cam handle desired (specify by part number).
2. Specify finish number.
3. Specify left- or right-hand (determined by the direction the handle points in the locked position, when viewed from the inside on an awning window). Handle points in opposite direction when used on a hopper window (see Figure 1).
4. Select mounting hardware (sold separately):
 - a. Choose keeper style (specify by part number).
 - b. Optional:
 - (1) **#20408** - Rubber-cork adhesive backed gasket for In-line bases.
 - (1) **#20556** Rubber-cork adhesive backed gasket for Offset base.



RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and refer to Tech Note #11.

TRUTH TIPS:

1. Keeper part #30238 is recommended because the lead-in provided helps insure smooth lock operation.
2. Keepers #20303 and #20404 must be backed up against a PVC wall to prevent failure of the keeper.
3. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
4. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
5. Truth recommends that stainless steel screws be used to fasten stainless steel components to the window. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware.

6. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Cam handle locks shall be included which will increase both security and weather seal tightness. The locks must hold securely up to 150 lbs. of force per lock for negative air pressure and forced entry resistance.

Window locks shall be of concealed pawl design and utilize a stainless steel keeper. The cam handle must be constructed of high pressure zinc alloy die castings and a nickel plated steel pawl.

Window locks shall be 27 series TrimLine™, as manufactured by Truth Hardware, Owatonna, MN.

27 TRIMLINE™ CAM HANDLE WITH CONCEALED PAWL

FIG. 1 APPLICATION OF TRIMLINE CAM HANDLES WITH CONCEALED PAWL

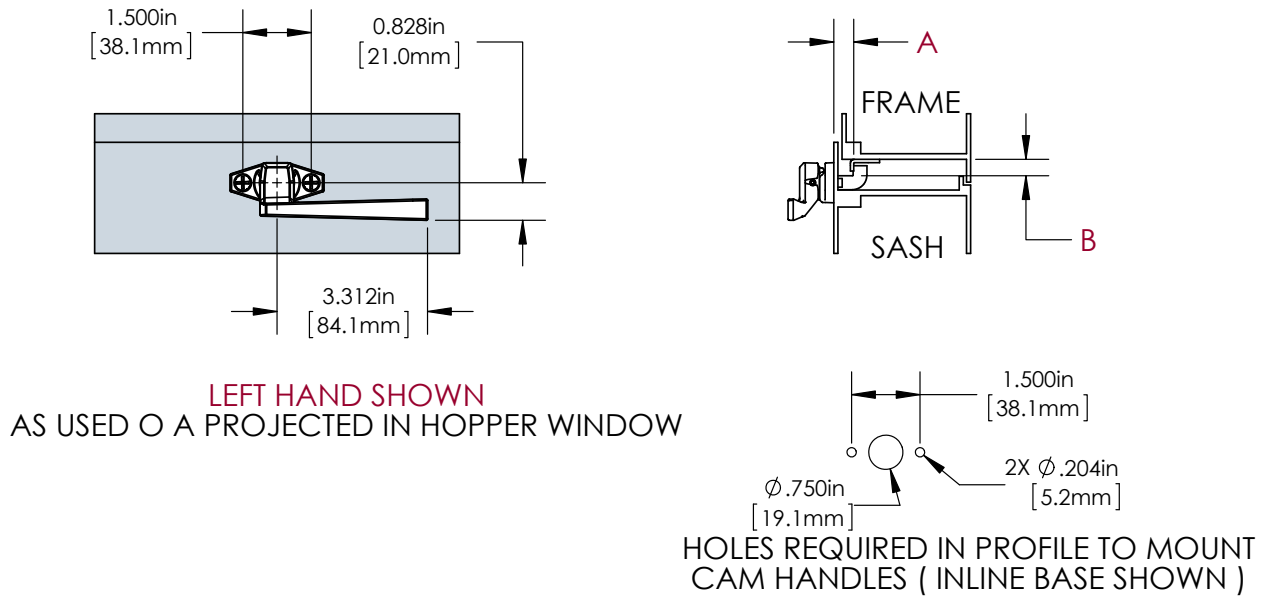
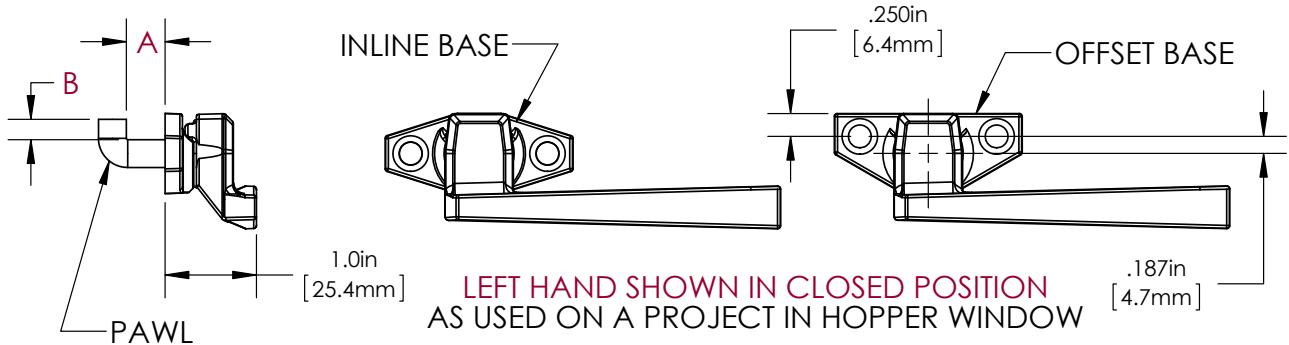


FIG. 2 TRIMLINE CAM HANDLE WITH CONCEALED PAWL



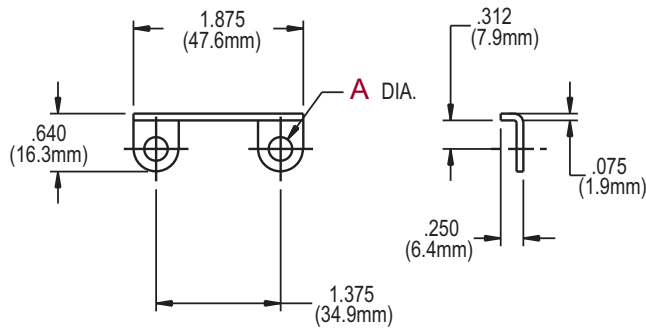
NOTE: SPECIFY HANDLE ROTATION TO OPEN (CW) OR (CCW)

PART NUMBER	A	B	BASE TYPE	PAWL OFFSET DIRECTION CLOSED POSITION
27.13	.438 (11.1mm)	.218 (5.6mm)	OFFSET	UP
27.19	.438 (11.1mm)	.218 (5.6mm)	INLINE	UP
27.20	.500 (12.7mm)	.218 (5.6mm)	INLINE	UP
27.21	.523 (13.3mm)	.344 (8.7mm)	INLINE	UP
27.46	.562 (14.3mm)	.625 (15.9mm)	INLINE	UP

RECOMMENDED SCREWS:

WOOD/METAL/PVC: 2-#10 PHILLIPS FLAT HEAD SST SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 3 20303 AND 20404 KEEPERS

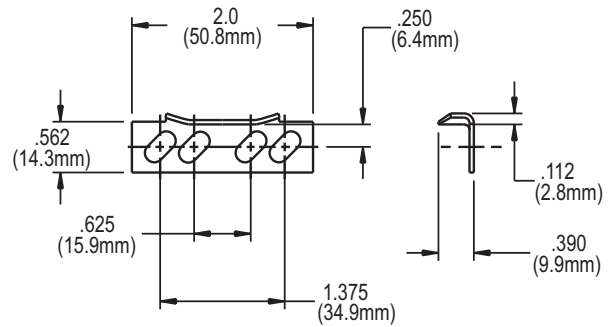


PART NO.	A DIA.
20303	.204 (5.2mm)
20404	.250 (6.4mm)

RECOMMENDED SCREWS:

WOOD/PVC/METAL: 2 - #10 PHILLIPS, PAN HEAD, STAINLESS STEEL SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

FIG. 4 30238 KEEPER



RECOMMENDED SCREWS:

WOOD/PVC/METAL: 2 - #10 PHILLIPS, PAN HEAD, STAINLESS STEEL SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

FIG. 5 20408 GASKET (in-line base)

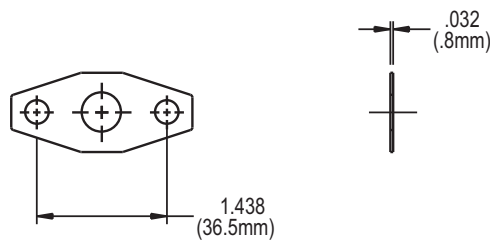
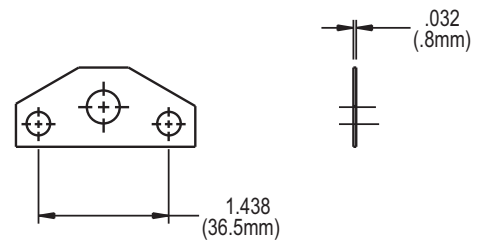


FIG. 6 20556 GASKET (offset base)





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Truth cam locks are designed to give long and trouble-free service. Hole in handle allows operation of cam lock in elevated locations. Concealed pawl design provides internal lock-up of in-swinging ventilator. Various concealed pawl and keeper designs are available to accommodate most window styles on the market today. A 90° rotation of the handle locks or unlocks the sash.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High-pressure die-cast zinc handle and base. Zinc-plated steel pawl. Non-magnetic (300 Series) stainless steel keepers.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose style of cam handle desired (specify by part number).
2. Specify finish number.
3. Specify left- or right-hand (determined by the direction the handle points when viewed from the inside on an awning window). Handle points in opposite direction when used on a hopper top window (see drawings).
4. Select mounting hardware (sold separately):
 - a. Choose keeper style (specify by part number).
 - b. Optional:
 - (1) #20408 - Rubber-cork adhesive backed gasket for offset base (1 per handle).
 - (2) #20556 - Rubber-cork adhesive backed gasket for in-line base (1 per handle).



RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and refer to Tech Note #11.

TRUTH TIPS:

1. Keeper part #30238 is recommended because the lead-in provided helps insure smooth lock operation.
2. Keepers #20303 and #20404 must be backed up against a PVC wall to prevent failure of the keeper.
3. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
4. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
5. Truth recommends that stainless steel screws be used to fasten stainless steel components to the window. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware.

6. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Cam handle locks shall be included which will increase both security and weather seal tightness. The locks must hold securely up to 150 lbs. of force per lock for negative air pressure and forced entry resistance. A hole shall be provided in the handle for pole operation in out-of-reach applications.

Window locks shall be of concealed pawl design and utilize a stainless steel keeper. The cam handle must be constructed of high pressure zinc alloy die castings and a nickel plated steel pawl.

Window locks shall be 27 series Pole Operated, as manufactured by Truth Hardware, Owatonna, MN.

27 POLE-OPERATED CAM HANDLE WITH CONCEALED PAWL

FIG. 1 APPLICATION OF CAM HANDLE WITH CONCEALED PAWL

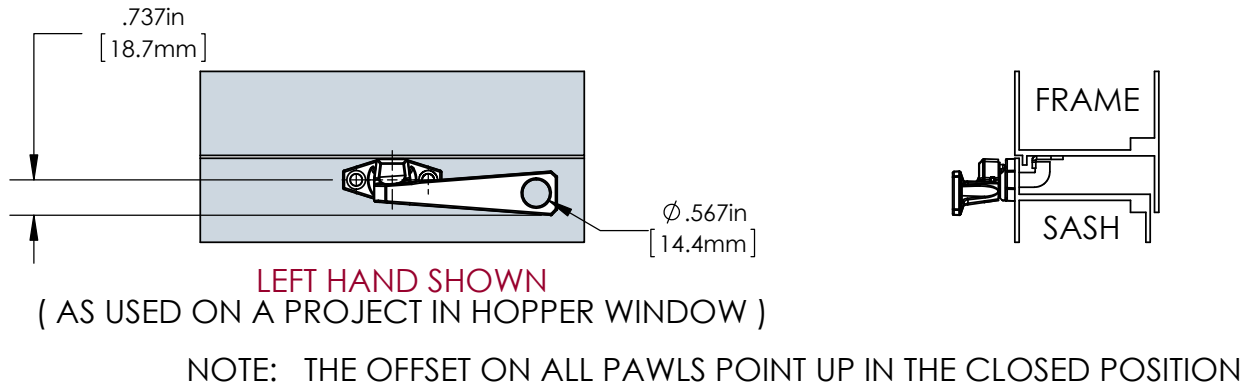
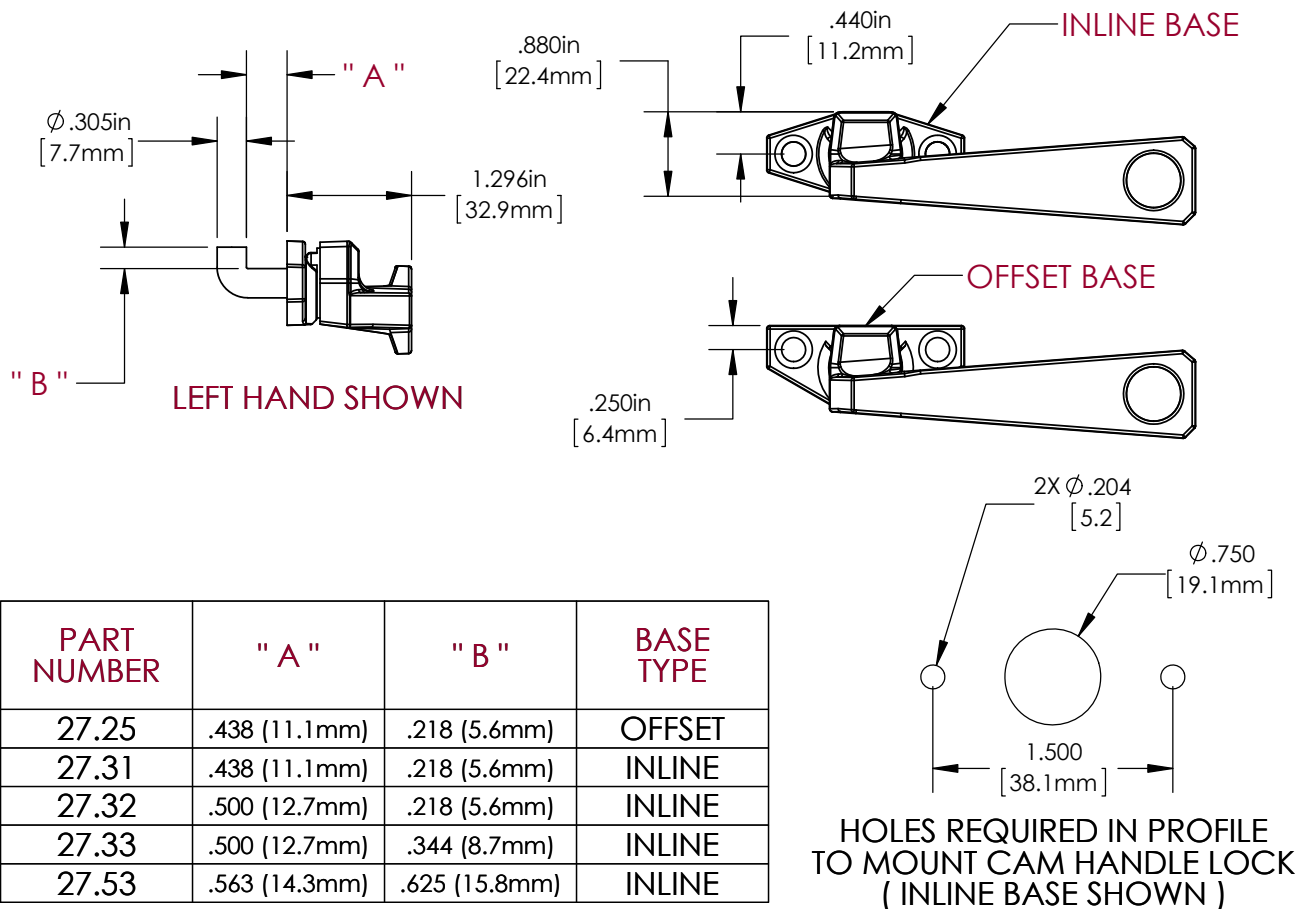


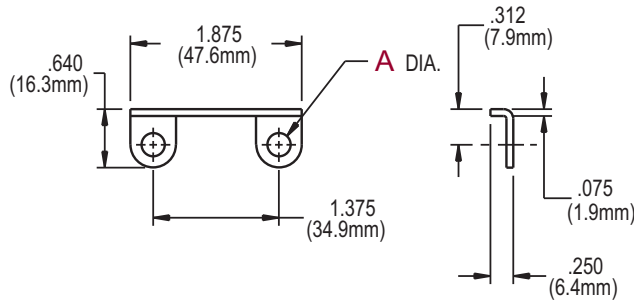
FIG. 2 CAM HANDLE WITH CONCEALED PAWL



RECOMMENDED SCREWS:

WOOD/METAL/PVC: 2-#10 PHILLIPS FLAT HEAD SST SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 3 KEEPERS 20303 AND 20404

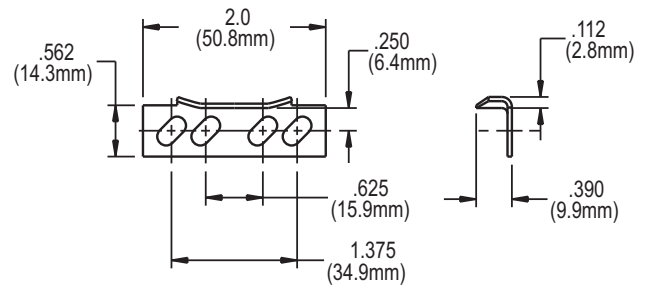


PART NO.	A DIA.
20303	.204 (5.2mm)
20404	.250 (6.4mm)

RECOMMENDED SCREWS:

WOOD/PVC/METAL: 2 - #10 PHILLIPS, PAN HEAD, STAINLESS STEEL SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

FIG. 4 KEEPER 30238



RECOMMENDED SCREWS:

WOOD/PVC/METAL: 2 - #10 PHILLIPS, PAN HEAD, STAINLESS STEEL SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

FIG. 5 GASKET 20408 (in-line base)

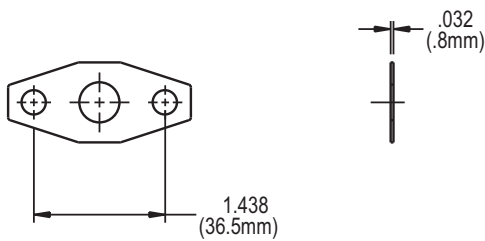
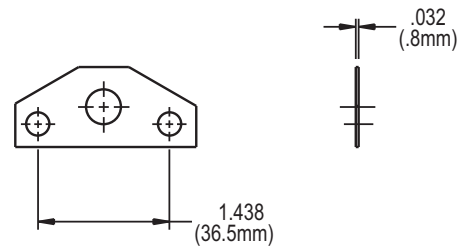


FIG. 6 GASKET 20556 (offset base)





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This spring-loaded lock design provides tamper-resistant lock-up of ventilator. A key slot in the housing requires a special key to operate the lock. One end of the key is removable only in the locked position, while the opposite end of the key is removable in either the locked or unlocked position. This key also acts as a handle when operating the vent. A 90° movement of the operating key locks or unlocks the vent.

Custodial locks unlock by turning counter-clockwise. Special clockwise-turning models are also available upon request. Rear mounted models have concealed screws, while front-mounted models have in-line elongated holes for mounting. Up to 300 lbs. of forced entry resistance per locking point is achievable with this product — see table for further details.

WARRANTY:

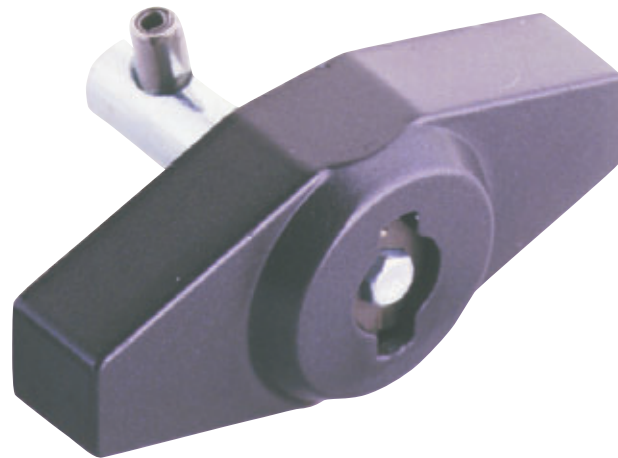
Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High-pressure die cast zinc housing, zinc-plated steel pawl, stainless steel spiral pin, zinc plated steel operating key, and stainless steel keepers.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose lock style desired (specify by part number).
2. Specify finish number.
3. Select mounting hardware (sold separately):
 - a. Specify keeper number.
 - b. Optional:
 - (1) #20408 - Rubber-cork adhesive backed gasket (1 per lock).
 - (1) #20313 - Key (removable handle).



RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and refer to Tech Note #11.

TRUTH TIPS:

1. Keeper #30238 is recommended because the lead-in provided helps insure smooth lock operation.
2. Keeper #20303 and #20404 must be backed up against a PVC wall to prevent failure of the keeper.
3. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
4. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
5. Truth recommends that stainless steel screws be used to fasten stainless steel components to the window. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware.

6. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

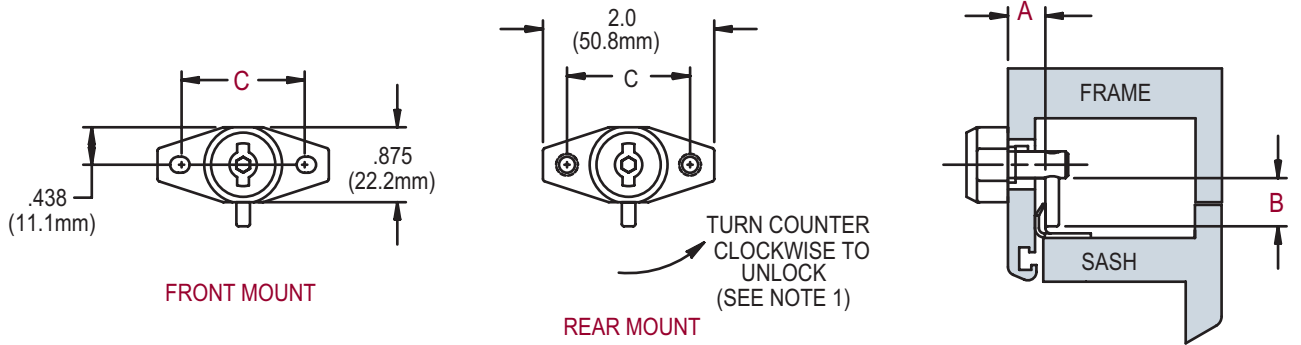
Custodial locks must be provided which allow tamper-resistant key/handle operation. The locks must hold securely up to 300 lbs. of force per lock for negative air pressure and forced entry resistance.

Window locks shall be of concealed pawl type design which allows operation with a removable key/handle. The lock must be constructed of a high pressure zinc housing, zinc-plated steel pawl and stainless steel spiral pin. Keepers used with this lock will be stainless steel.

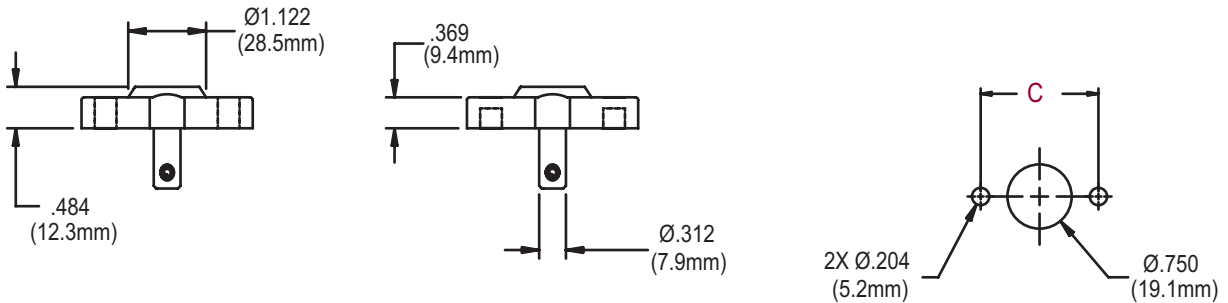
Window locks shall be 28 series Custodial, as manufactured by Truth Hardware, Owatonna, MN.

28 KEY OPERATED CUSTODIAL LOCK (REMOVEABLE HANDLE)

FIG. 1 CUSTODIAL LOCK (key operated)



NOTE:
1. SPECIAL LOCKS ARE AVAILABLE THAT UNLOCK IN A CLOCKWISE ROTATION; SPECIFY OPPOSITE HAND.



***RECOMMENDED SCREWS:**

WOOD/PVC/METAL:

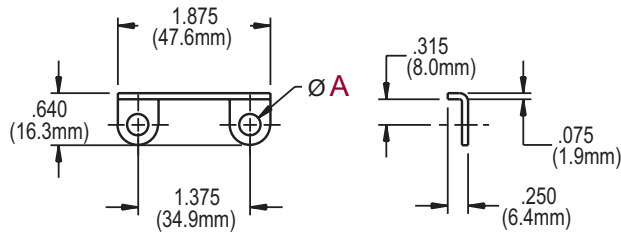
FRONT MOUNT: 2 - #10-24 PHILLIPS, PAN HEAD, STAINLESS STEEL SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

REAR MOUNT: 2 - #10-24 PHILLIPS, PAN HEAD, SELF TAPPING, STAINLESS STEEL SCREWS (LENGTH TO BE DETERMINED BY PROFILE)

LOCK CUT-OUT (BOTH TYPES)

PART NO.	A	B	C	MOUNTING	FORCED ENTRY RESISTANCE
28.23	.438 (11.1mm)	.218 (5.6mm)	1.500 (38.1mm)	REAR	300 LBS.
28.24	.438 (11.1mm)	.344 (8.7mm)	1.500 (38.1mm)	REAR	250 LBS.
28.26	.875 (22.2mm)	.218 (5.6mm)	1.500 (38.1mm)	REAR	300 LBS.
28.27	.875 (22.2mm)	.344 (8.7mm)	1.500 (38.1mm)	REAR	250 LBS.
28.29	.438 (11.1mm)	.218 (5.6mm)	1.375 - 1.500 (34.9mm-38.1mm) SLOTTED HOLES	FRONT	300 LBS.
28.31	.438 (11.1mm)	.562 (14.3mm)		FRONT	160 LBS.
28.32	.875 (22.2mm)	.218 (5.6mm)		FRONT	300 LBS.
28.34	.875 (22.2mm)	.562 (14.3mm)		FRONT	160 LBS.
28.66	.875 (22.2mm)	.938 (23.8mm)		FRONT	50 LBS.

FIG. 2 20303 AND 20404 KEEPERS

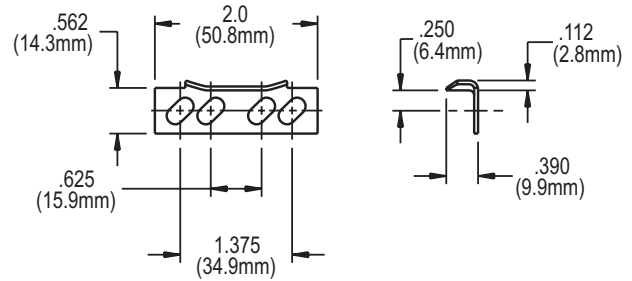


PART NO.	A DIA
20303	.204 (5.2mm)
20404	.250 (6.4mm)

RECOMMENDED SCREWS:

WOOD/PVC/METAL: 2 - #10 PHILLIPS, PAN HEAD, STAINLESS STEEL SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

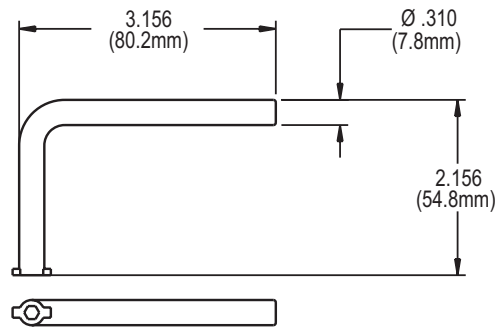
FIG. 3 30238 KEEPER



RECOMMENDED SCREWS:

WOOD/PVC/METAL: 2 - #10 PHILLIPS, PAN HEAD, STAINLESS STEEL SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

FIG. 4 20313 KEY



REMOVEABLE HANDLE



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The Maxim Series is a window operating “system” where the hinges and operators are developed to work together to meet or exceed the “maximum” performance requirements of larger more versatile casement and awning windows.

HANDLE & COVER OPTIONS

The Maxim Operators are available with a unique combination of aesthetic options.

- Standard is Maxim’s zinc die-cast case and handle. Each of which are available in a wide variety of standard and plated finishes.
- An optional Folding Handle can be added to minimize interference with window treatments, and a plastic nesting cover designed to cradle Truth’s Folding Handle is also available.
- The uniqueness of this Folding Handle and Nesting Cover combination is such that it allows the homeowner to easily change the color of their window hardware after the windows have been installed in the home.

SEALABLE HOUSING/GASKET

The Maxim Operator’s streamlined design helps:

- Reduce water/air infiltration and eliminates need for caulking.
- Minimize mounting surface damage in punching or routing of operator cut-out.
- Create a more stable mounting surface and improves seal endurance with its overlapping lip design.
- Enclosed gear train keeps dirt and construction debris out of the operator for smoother operation and longer life.

STANDARDIZATION OF PRODUCT & PROCESSES

- Allows manufacturer to use same operator mounting location on every window size whether it be a small window with a dyad operator or a larger window with a dual arm, thus helping to reduce manufacturing and inventory costs.
- Dual arm is specially designed to support both washability and egress applications while mounted in a consistent location.
- Brackets and track have been standardized and include features designed to reduce installation time.



*Maxim® Dual Arm Operator
with Folding Handle and
Nesting Cover option shown*

SMOOTH & EFFICIENT

- 33% less effort to operate than EntryGard style operators
- Provides “Maxim-size” large window operation
- Allows larger applications to meet ADA requirements
- Certified to meet AAMA 901-07 cycle test at commercial rating
- Based on application, the Maxim and Encore systems provide reduced sash play - thus reducing the tendency of the window to “walk” in buffeting wind conditions when compared to EntryGard® and similar style operators.
- Time proven design.

LOW PROFILE AND REAR MOUNT OPERATOR STYLES AVAILABLE

Designed to fit a wider range of profiles and window types, Truth’s Maxim Operators design options greatly increase the mounting stability of the system.

While sill mounting is standard, dual-axis mounting (sill and rear mounting

in same operator) is available on certain models for companies manufacturing both wood & vinyl windows. Other benefits include:

- Easily mounts to thin wall profiles such as fiberglass, aluminum, and steel
- Increases gasket compression resulting in enhanced water and air tightness on rear mount.

PRODUCT APPLICATION ASSISTANCE:

If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Technical Service Staff can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS:

Have you considered personalizing your window? Contact Truth for further details on how you can add your own “signature” to the Maxim handle and cover.

MAXIM® SYSTEM OPERATORS

WARRANTY: Protected under the terms of the “Truth Warranty for Window & Door Manufacturers & Authorized Distributors”. Refer to Truth’s Terms & Conditions for further details.

MATERIAL:

High-pressure die-cast zinc operator housing, crank handle and knob. Hardened steel drive worm and gear. 300 series stainless steel packages are available for most models.

CORROSION RESISTANCE:

Truth’s E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes. For coastal applications, Truth also has stainless steel packages available (see Tech Note #7).

FINISH:

Electrostatically applied, durable coatings provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth’s Color Chart for examples of Truth’s most popular finish options. Truth also offers a wide range of decorative “plated” finishes – contact Truth for additional information on availability of these finishes on specific product lines (see Truth Tip #9).

RECOMMENDED SCREWS:

All Maxim Operator components have been designed to use the same standardized screw style and size, please refer to the drawings for further details. Coating compatibility between the screws and the operator components is very important in order to optimize the corrosion resistance performance. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection – see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Operator base handing is determined by the window hinge side when viewed from the outside.

2. Handing of the optional Maxim Nesting Cover is determined by the direction the handle points when in the nested position.

3. For accurate hardware placement, pre-drilling of the screw holes in the window profile is recommended.

4. For PVC and composite window applications, mounting screws should pass through two profile walls, or one wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

5. For metal window profiles, Truth recommends machine screws.

However, in most applications, sheet metal screws will provide adequate holding power.

6. When operator is installed in high-rise applications over two stories, a Truth Limit Device, to restrict the amount of opening, is recommended. Contact Truth for wind load information.

7. A Spline Cap (#21306) is available to protect the operator splines from dirt and other windows from damage during shipping, installation, and final building construction.

8. Truth recommends that Snubbers be used on the hinge side on any casement window that has a tendency to bow outwardly at the center in the closed position. Adding Snubbers may increase the negative air pressure rating of a casement window.

9. Decorative plated finishes are not recommended for coastal or highly corrosive environments.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated.

The operator must be constructed of E-Gard® coated components. High-pressure die-cast zinc operator base, crank handle and knob. Hardened steel drive worm and gear.

Window Operators shall be Maxim® Series Operators as manufactured by Truth Hardware, Owatonna, MN.



MAXIM® DUAL ARM OPERATOR

Drawings begin on pg. 25d.

- Provides for egress or washability with the same operator in the same location thereby minimizing sill cover inventory.
- Operates sash sizes up to 24" to 40" wide, and 84" high and weighing up to 108 lbs. No need to change operators for standard and custom-sized windows.
- Maxim Dual Arm provides over 7" of washability with the standard Maxim® 13" hinge and is compatible with Truth’s standard 10" hinge, with reduced washability.
- Maxim Dual Arm and Dyad Operators share standardized bracket and mounting location reducing inventory and manufacturing complexities.

ORDERING INFORMATION:

1. Specify “standard” or “coastal” package.
 2. Order item number:
#50.00 or
#50.01 (low profile) or
#50.02 (rear-mount)
 3. Specify finish number.
 4. Specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).
 5. Select mounting hardware (sold separately).
#12510.XX – LH Bracket
#12511.XX – RH Bracket, or
#11661.XX – LH Bracket (low profile)
#11662.XX – RH Bracket (low profile)
- NOTE:** Handing of Brackets does not



necessarily match handing of Operator – refer to table within application drawing page, or contact Truth’s Technical Service Department for further information.

Optional brackets for unique profile applications are available – see Truth’s Stud Bracket & Track section, or contact Truth Hardware for further details.

#11576.XX – Track & Slider, or
#32384.92 – Low profile track

Optional Accessories:

#11329.XX Folding Handle
#41211.XX LH Nesting Cover
#41212.XX RH Nesting Cover
#31882 – Gasket
#31883 – Gasket Applicator
#23058.92 – Backplate (required for Rear Mount options)
#21306 – Protective red plastic spline cap.

MAXIM® DYAD OPERATOR



Drawings begin on pg. 25l.

- Designed for narrow windows, but will operate a frame width from 16" to 32", and up to 72" high and a sash weight of 55 lbs.
- Fits in all profiles currently using the EntryGard® or Encore® Dyad operators.
- Maxim Dyad provides over 7" of washability with the standard Maxim® 13" hinge and is compatible with Truth’s standard 10" hinge, with reduced washability.

ORDERING INFORMATION:

1. Specify “standard” or “coastal” package.
 2. Order item number:
#50.50 or
#50.51 (low profile) or
#50.52 (rear-mount)
 3. Specify finish number.
 4. specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).
 5. Select mounting hardware (sold separately).
#12510.XX – LH Bracket
#12511.XX – RH Bracket, or
#11661.XX – LH Bracket (low profile)
#11662.XX – RH Bracket (low profile)
- NOTE:** Handing of Brackets does not necessarily match handing of Operator – refer to table within application drawing page, or contact Truth’s Technical Service Department for further information.

Optional brackets for unique profile applications are available – see Truth’s Stud Bracket & Track section, or contact Truth Hardware for further details.

Optional Accessories:

#11329.XX Folding Handle
#41211.XX LH Nesting Cover
#41212.XX RH Nesting
#31882 – Gasket
#31883 – Gasket Applicator
#23058.92 – Backplate (required for Rear Mount options)
#21306 – Protective red plastic spline cap.

MAXIM® REVERSE DYAD OPERATOR

Drawings begin on pg. 25r.



- Uniquely designed for narrow windows and specialty windows like round tops, half round, trapezoid, garden, octagon and windows that require Butt Hinges.
- Will work on frame widths down to a minimum of 12" depending upon the thickness of the frame.
- Uses a non-handed bracket which will help reduce inventory issues.

ORDERING INFORMATION:

1. Specify “standard” or “coastal” package.
2. Order item number:
#50.70 or
#50.71 (low profile) or
#50.72 (rear-mount)
3. Specify finish number.
4. specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).
5. Select mounting hardware (sold separately).

#11674.XX – Non-Handed Bracket

Optional brackets for unique profile applications are available – see Truth’s Stud Bracket & Track section, or contact Truth Hardware for further details.

Optional Accessories:

#11329.XX Folding Handle
#41211.XX LH Nesting Cover
#41212.XX RH Nesting Cover
#31882 – Gasket
#31883 – Gasket Applicator

MAXIM® SYSTEM OPERATORS

#23058.92 – Backplate (required for Rear mount options)

#21306 – Protective red plastic spline cap.

MAXIM® SINGLE ARM OPERATOR

Drawings begin on pg. 25x.



- Created for casements which are 20"-32" wide up to 72" high and with a 73lb. sash weight.
- Fits in all profiles currently using the EntryGard® or Encore® Single Arm operators.

ORDERING INFORMATION:

1. Specify "standard" or "coastal" package.

2. Order item number:

#52.01 or

#52.03 (low profile)

NOTE: Rear-mount version available upon request.

3. Specify finish number.

4. Specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).

5. Select mounting hardware (sold separately).

#11576.XX – Track & Slider, or

#30175 – Low profile track

Optional Accessories:

#11329.XX Folding Handle

#41211.XX LH Nesting Cover

#41212.XX RH Nesting Cover

#31882 – Gasket

#31883 – Gasket Applicator

#21306 – Protective red plastic spline cap.

MAXIM® AWNING OPERATORS



Drawings begin on pg. 25see Maxim Narrow Awning Operator Shown

- Allows the manufacturer to offer the same look throughout the home on both casements and awnings.

- Will provide for maximum opening combined with wide "pull-in" connection to sash.

- Operates frame widths from 20" to 60", reducing inventory requirements for operator sizes.

- New narrow gauge version (#51.01) fits smaller cavity profiles and smaller window sizes.

- "Quick disconnect" feature on operator arms does not require tools.

ORDERING INFORMATION:

1. Specify "standard" or "coastal" package.

2. Order Operator item number:

#51.00 or

#51.02 (rear-mount) or

#51.01 (Narrow Awning Operator)

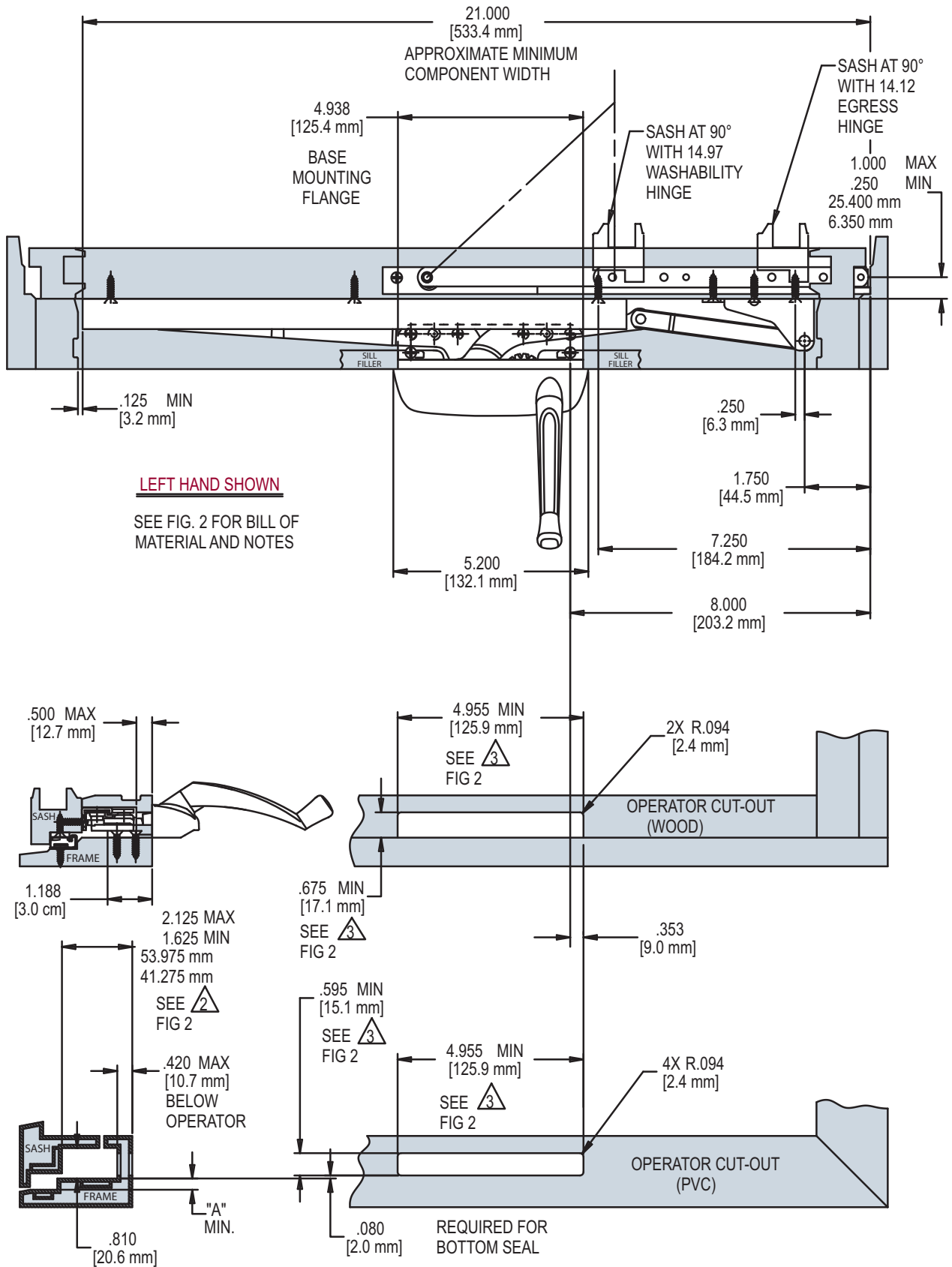
3. Specify finish number.

4. Select mounting hardware (sold separately).

#11577.XX – Track and Pivot Slides

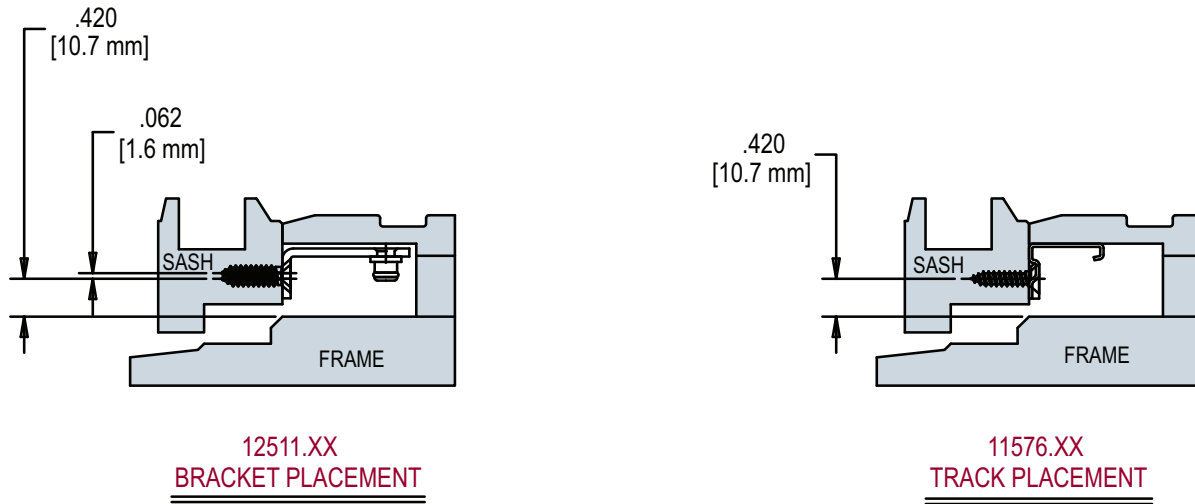
Optional Accessories:

FIG. 1 APPLICATION OF MAXIM DUAL ARM OPERATOR (SILL MOUNT VERSION)



MAXIM® DUAL ARM OPERATORS (SILL MOUNT)

FIG. 2 APPLICATION OF MAXIM DUAL ARM OPERATOR (CONTINUED)
(SILL MOUNT VERSION)



HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1

PART NUMBER	DESCRIPTION
50.00.XX.011	DUAL ARM OPERATOR
12511.XX	STUD BRACKET
11576.XX	TRACK ASSEMBLY
14.97.00.XXX	WASHABILITY HINGE
11454.XX	CONTOUR HANDLE
31882	GASKET (PVC)

HINGE	"A"
14.97.00.XXX	.300 [7.6 mm]
14.12.00.XXX	
OTHER 14 SERIES CASEMENT HINGES	.250 [6.4 mm]

NOTES:

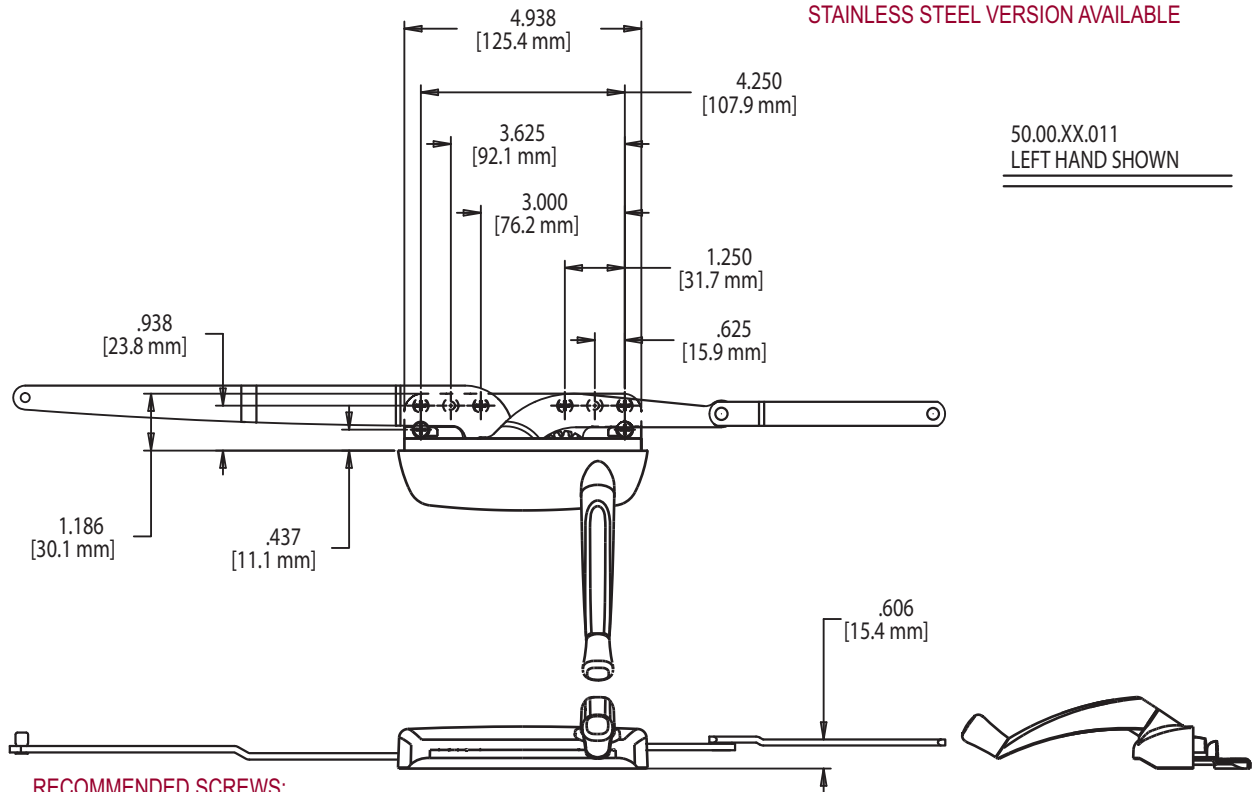
1. STUD BRACKET 12510.XX AND 12511.XX REQUIRES THE SAME MOUNTING LOCATION FOR BOTH THE ENCORE DUAL ARM OPERATOR AND THE ENCORE DYAD OPERATOR.

2. STUD BRACKET 12510.XX AND 12511.XX MAY NOT FIT IF 2.125/1.625 DIMENSION IS LESS THAN 1.875. CONTACT TRUTH FOR RECOMMENDATIONS.

3. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING

4. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

FIG. 3 STANDARD MAXIM DUAL ARM OPERATOR (SILL MOUNT VERSION)

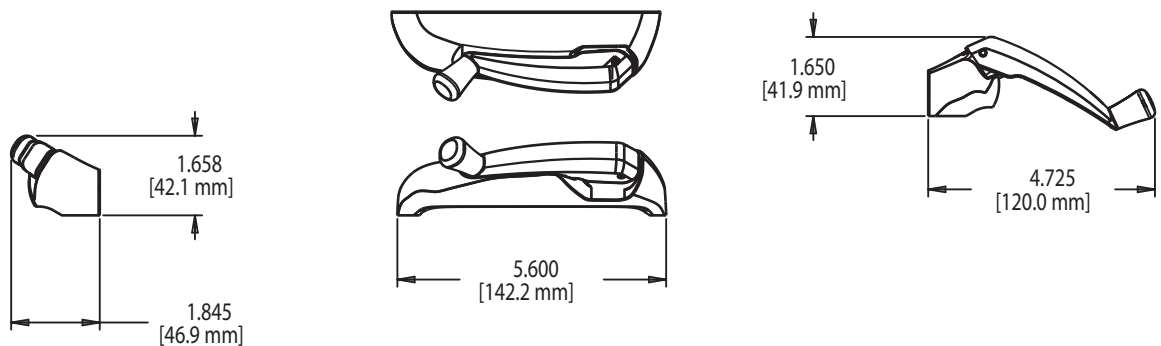


RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)FOR REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

FIG. 4 MAXIM COVER 41211.XX /HANDLE 11329.XX(LH) (SHOWN)



MAXIM® DUAL ARM OPERATORS (SILL MOUNT)

FIG. 5 BACK PLATE 23058.92

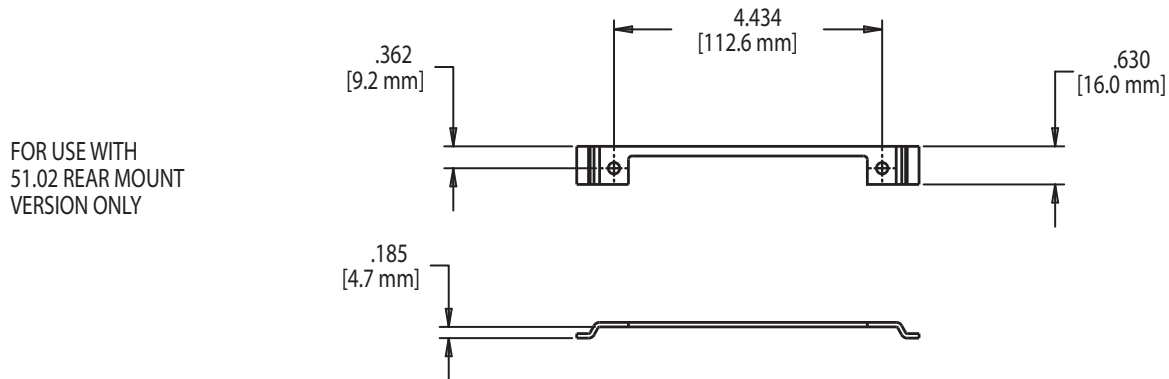


FIG. 6 TRACK & SLIDER ASSEMBLY 11576.XX

STAINLESS STEEL VERSION AVAILABLE

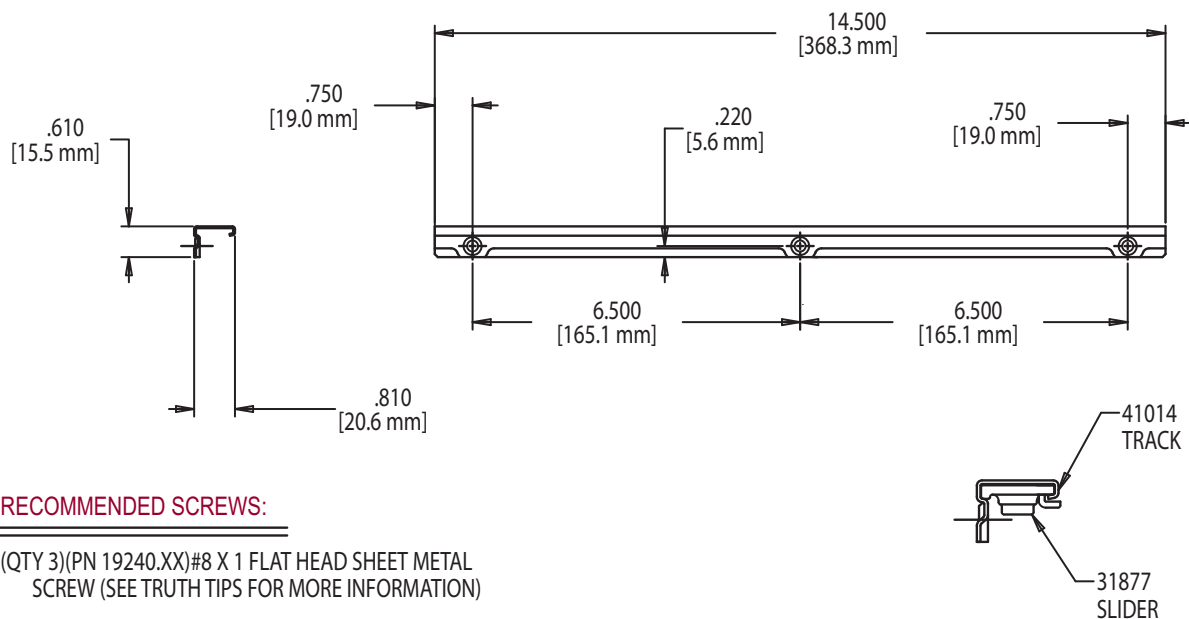
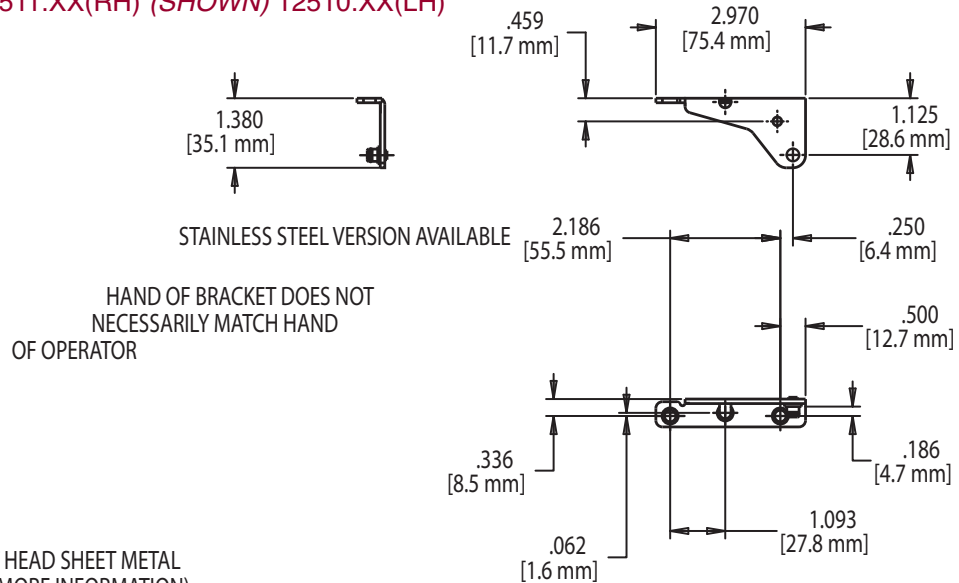


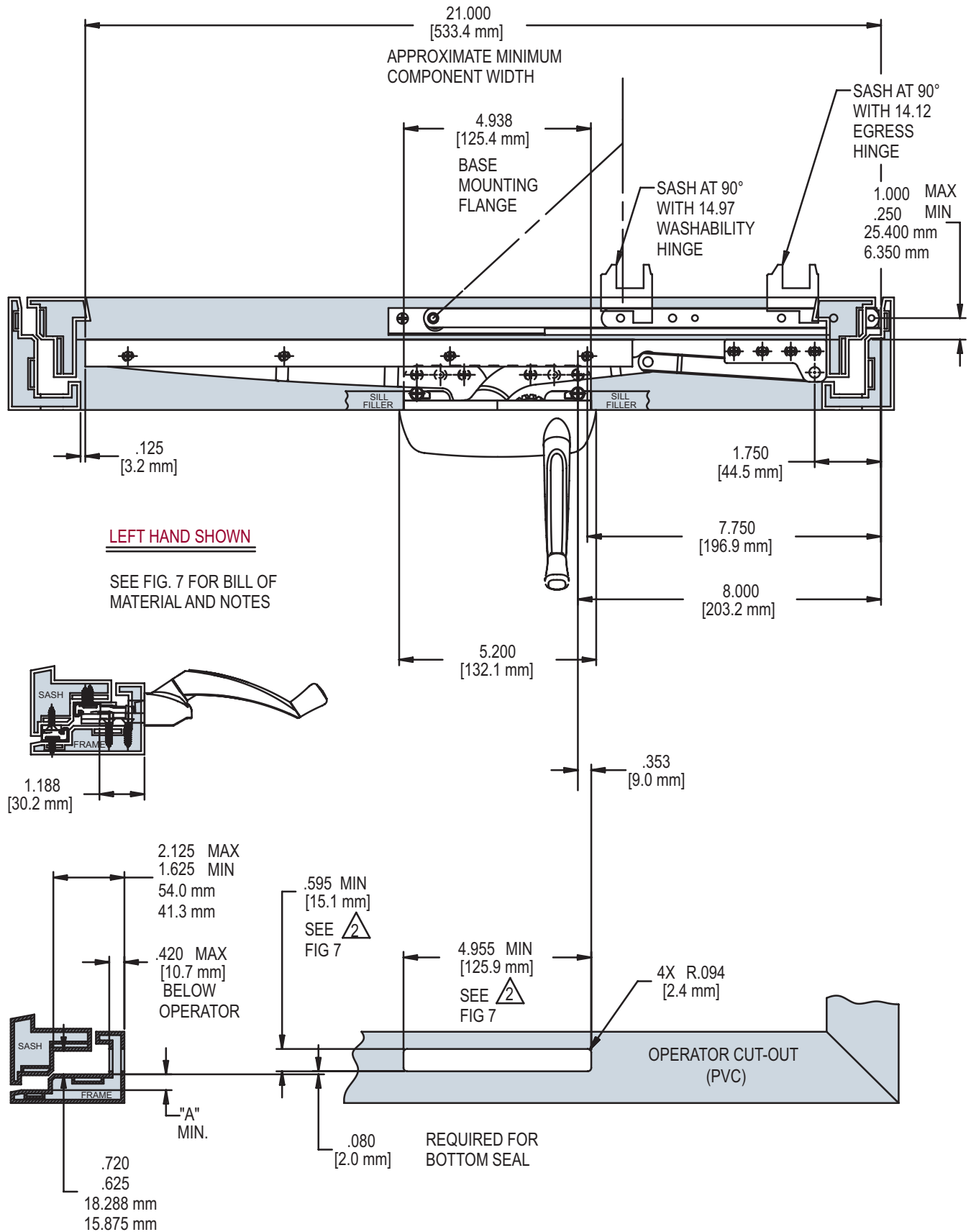
FIG. 7 STUD BRACKET 12511.XX(RH) (SHOWN) 12510.XX(LH)



RECOMMENDED SCREWS:

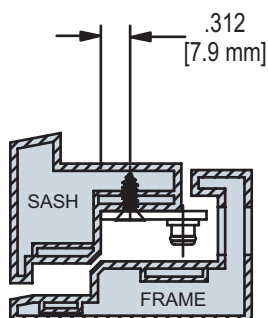
(QTY 3)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

FIG. 8 APPLICATION OF STANDARD MAXIM DUAL ARM OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)

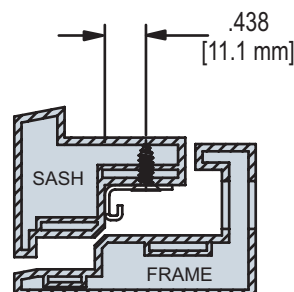


MAXIM® DUAL ARM OPERATORS (LOW PROFILE)

FIG. 9 APPLICATION OF STANDARD MAXIM DUAL ARM OPERATOR (CONTINUED)
(SILL MOUNT VERSION) (LOW PROFILE)



11661.XX
BRACKET PLACEMENT



32384.XX
TRACK PLACEMENT

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.6	
PART NUMBER	DESCRIPTION
50.01.XX.011	DUAL ARM OPERATOR
11661.XX	STUD BRACKET
32384.XX	TRACK
14.97.00.XXX	WASHABILITY HINGE
11454.XX	CONTOUR HANDLE
31882	GASKET (PVC)

HINGE	"A"
14.97.00.XXX 14.12.00.XXX	.422 [10.7 mm]
OTHER 14 SERIES CASEMENT HINGES	.375 [9.5 mm]

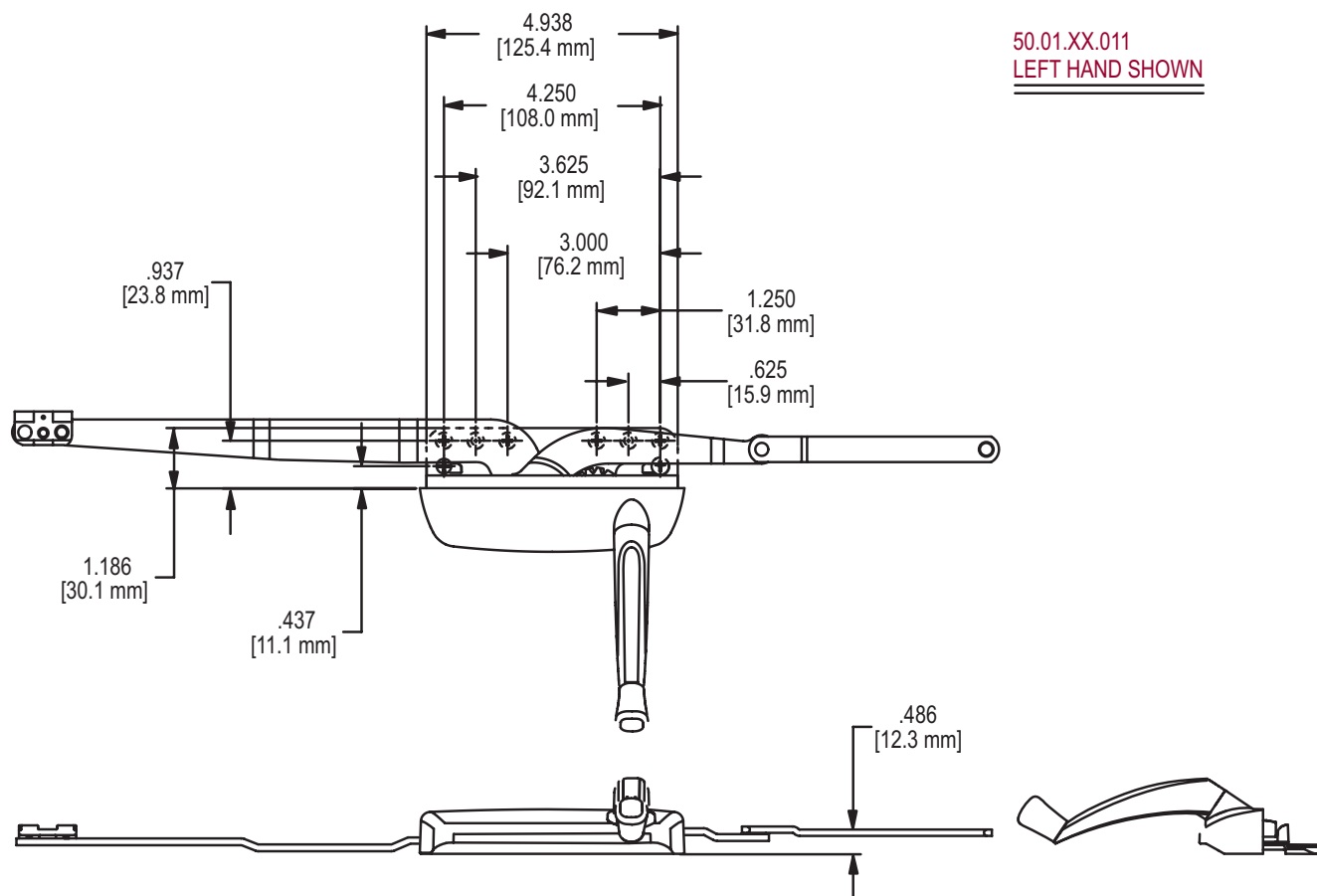
NOTES:

1. STUD BRACKET 11661.XX AND 11662.XX WILL BE PLACED IN THE SAME LOCATION FOR BOTH THE ENCORE DUAL ARM OPERATOR AND THE ENCORE DYAD OPERATOR.

2. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING.

3. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

**FIG. 10 MAXIM STANDARD DUAL ARM OPERATOR
(SILL MOUNT VERSION) (LOW PROFILE)**

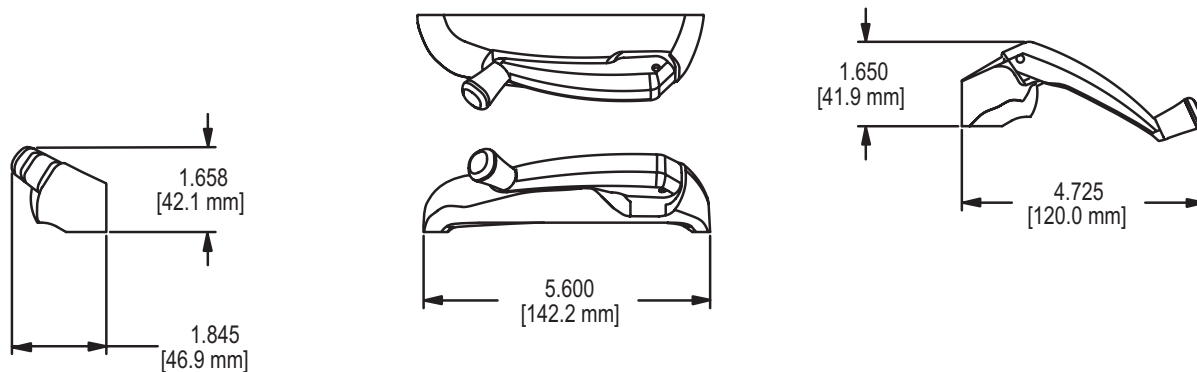


RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX) #8 X 1 FLAT HEAD
SHEET METAL SCREWS (SEE TRUTH TIPS
FOR MORE INFORMATION)

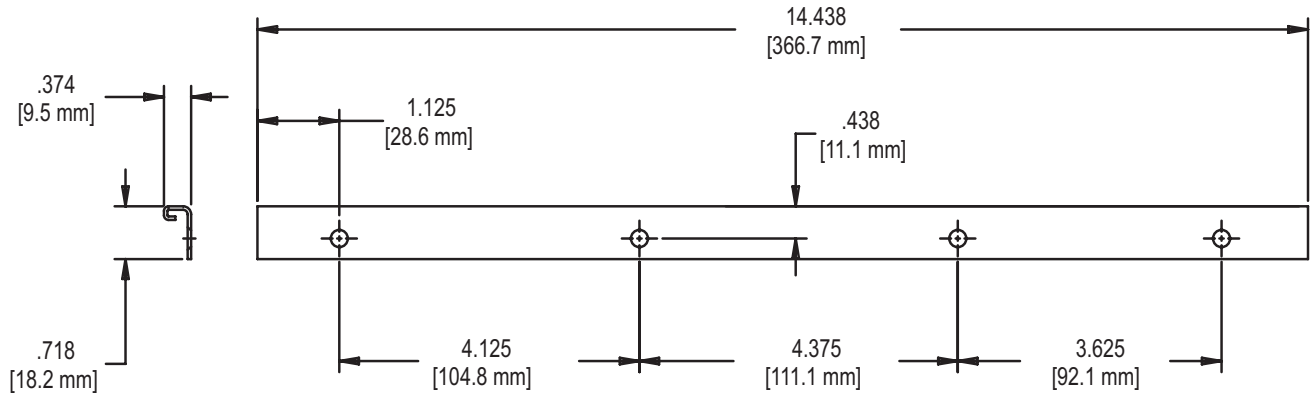
(QTY 2)REAR MOUNT:#8-32 X 3/8 PAN HEAD
MACHINE SCREW PN 19545.XX

FIG. 11 MAXIM COVER 41211.XX /HANDLE 11329.XX(LH) (SHOWN)



MAXIM® DUAL ARM OPERATORS (LOW PROFILE)

FIG. 12 TRACK 32384.XX

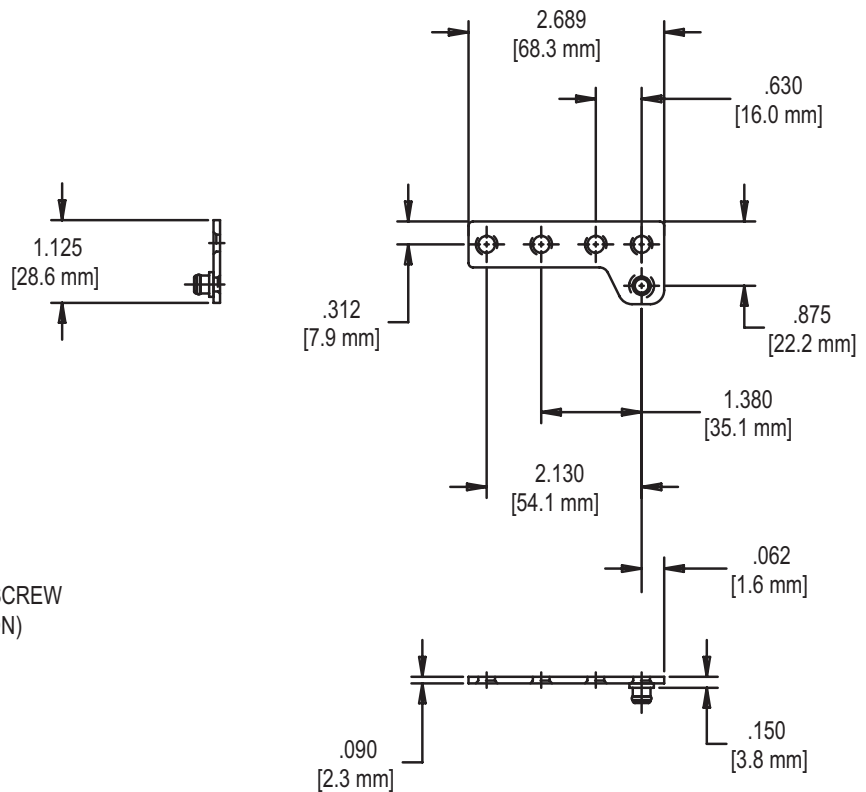


RECOMMENDED SCREWS:

(QTY 4) (PN 19070.XX) #7 X 1/2 FLAT HEAD UNDERCUT SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

FIG. 13 STUD BRACKET 11661.XX(LH) (SHOWN), 11662.XX(RH)

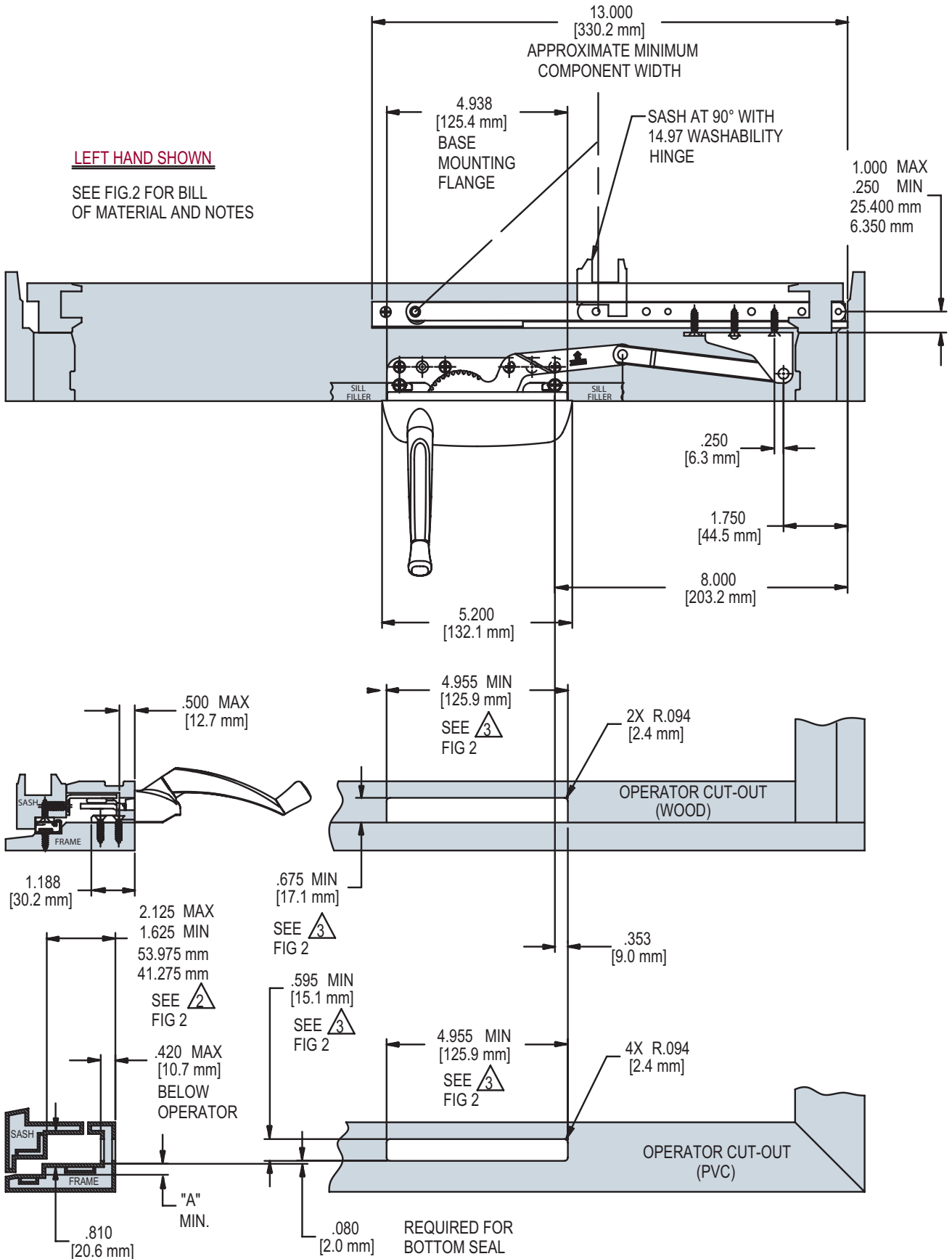
HAND OF BRACKET DOES NOT NECESSARILY MATCH HAND OF OPERATOR



RECOMMENDED SCREWS:

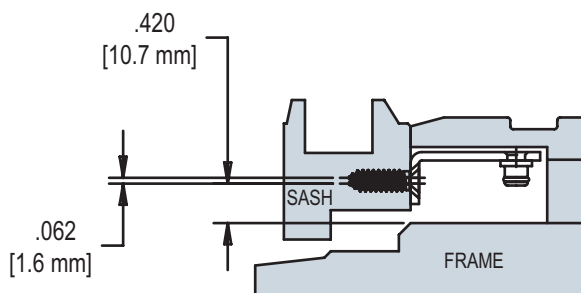
(QTY 4) (PN 19205.XX) #8 X 1/2 SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

**FIG. 1 APPLICATION OF STANDARD MAXIM DYAD OPERATOR
(SILL MOUNT VERSION)**



MAXIM® DYAD OPERATORS (SILL MOUNT)

FIG. 2 APPLICATION OF STANDARD MAXIM DYAD OPERATOR (CONTINUED)
(SILL MOUNT VERSION)



12511.XX BRACKET PLACEMENT

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG. 1	
PART NUMBER	DESCRIPTION
50.50.XX.011	DYAD OPERATOR
12511.XX	STUD BRACKET
14.97.00.XXX	WASHABILITY HINGE
11454.XX	CONTOUR HANDLE
31882	GASKET (PVC)

HINGE	"A"
14.97.00.XXX	.300 [7.6 mm]
14.12.00.XXX	
OTHER 14 SERIES CASEMENT HINGE	.250 [6.4 mm]

NOTES:

1. STUD BRACKET 12510.XX AND 12511.XX REQUIRES THE SAME MOUNTING LOCATION FOR BOTH THE ENCORE DUAL ARM OPERATOR AND THE ENCORE DYAD OPERATOR.

2. STUD BRACKET 12510.XX AND 12511.XX MAY NOT FIT IF 2.125/1.625 DIMENSION (SEE FIG. 1) IS LESS THAN 1.875. CONTACT TRUTH FOR RECOMMENDATIONS.

3. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING.

4. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

5. HANDLE/COVER IS OPPOSITE HAND ON ENCORE DYAD OPERATORS. EXAMPLE: LH ENCORE DYAD OPERATORS REQUIRE RH HANDLE/COVER

**FIG. 3 STANDARD MAXIM DYAD OPERATOR
(SILL MOUNT VERSION)**

50.50.XX.011 LEFT HAND SHOWN

50.52 REAR MOUNT
VERSION AVAILABLE

RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD
SHEET METAL SCREW (SEE TRUTH TIPS FOR
MORE INFORMATION)

(QTY 2)FOR REAR MOUNT;(PN 19545.XX)
#8-32 X 3/8 PAN HEAD MACHINE SCREW

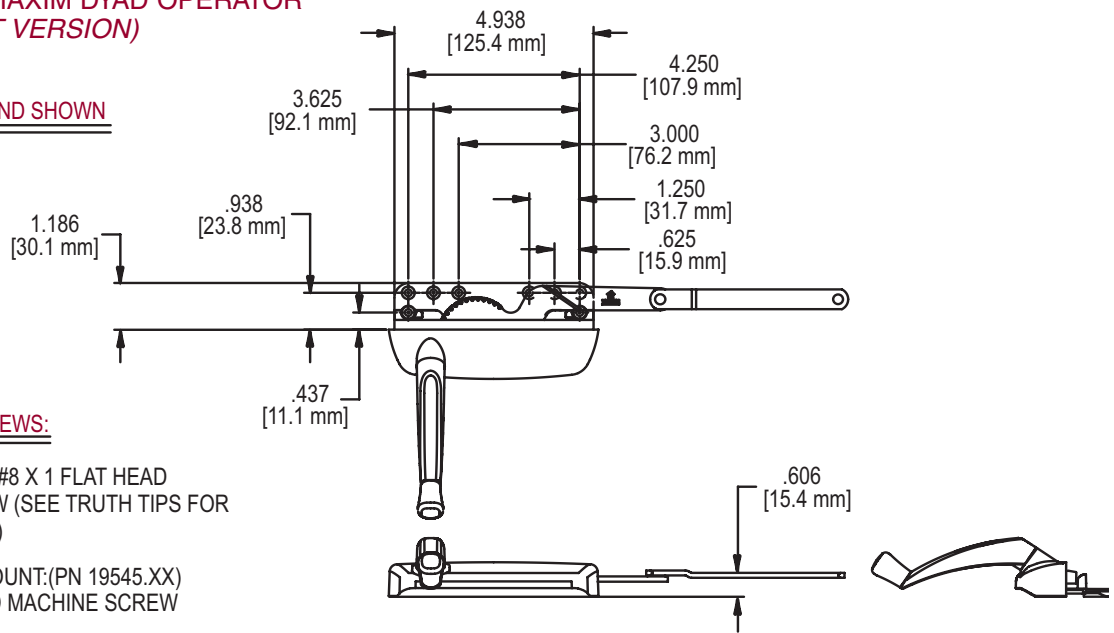


FIG. 4 MAXIM COVER 41211.XX /HANDLE 11329.XX(LH) (SHOWN)

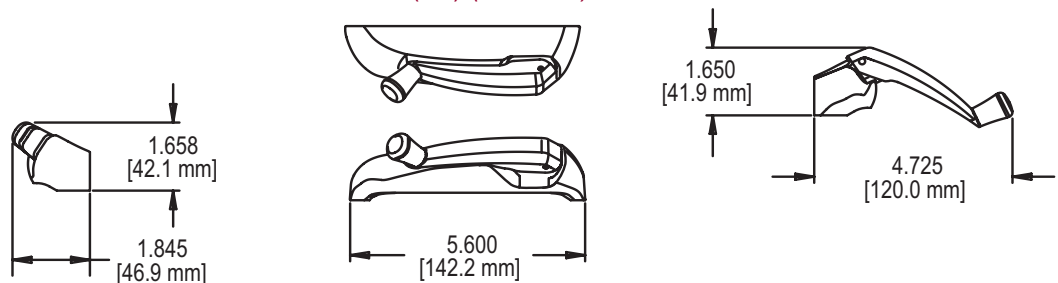


FIG. 5 BACK PLATE 23058.92

FOR USE WITH
50.52 REAR MOUNT
VERSION ONLY

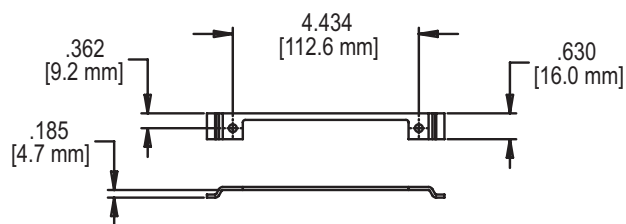


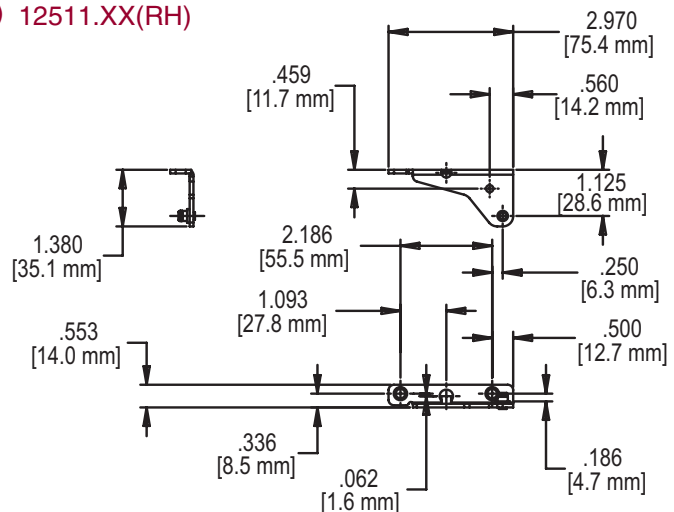
FIG. 6 STUD BRACKET 12510.XX(LH) (SHOWN) 12511.XX(RH)

STAINLESS STEEL VERSION AVAILABLE

HAND OF BRACKET DOES NOT NECESSARILY
MATCH HAND OF OPERATOR

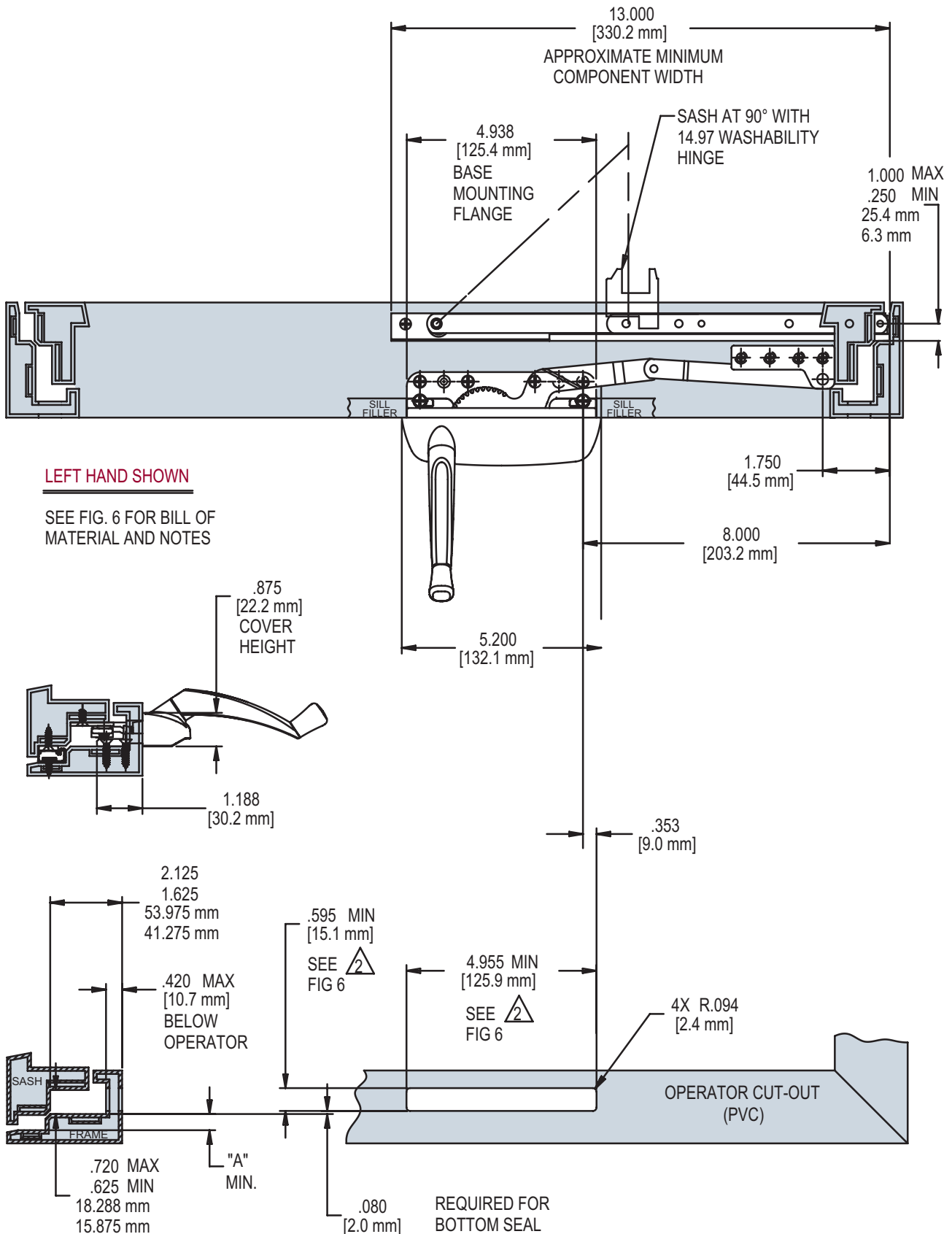
RECOMMENDED SCREWS:

(QTY 3)(PN 19240.XX)#8 X 1 FLAT
HEAD SHEET METAL SCREW (SEE TRUTH
TIPS FOR MORE INFORMATION)

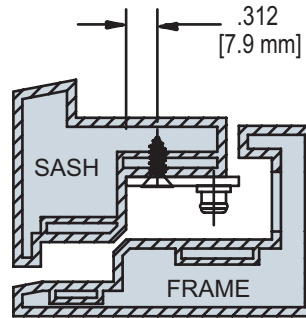


MAXIM® DYAD OPERATORS (LOW PROFILE)

FIG. 7 APPLICATION OF MAXIM DYAD OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)



**FIG. 8 APPLICATION OF MAXIM DYAD OPERATOR (CONTINUED)
(SILL MOUNT VERSION) (LOW PROFILE)**




**11661.XX
BRACKET PLACEMENT**

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.5	
PART NUMBER	DESCRIPTION
50.51.XX.XXX	DYAD OPERATOR
11661.XX	STUD BRACKET
14.97.00.XXX	WASHABILITY HINGE
11454.XX	CONTOUR HANDLE
31882	GASKET (PVC)

HINGE	"A"
14.97.00.XXX 14.12.00.XXX	.422 [10.7 mm]
OTHER 14 SERIES CASEMENT HINGES	.375 [9.5 mm]

NOTE:

1. ENCORE LOW PROFILE DYAD OPERATOR WITH 11661.XX L.H. OR 11662.XX R.H. STUD BRACKET REQUIRES THE SAME MOUNTING POSITION AS ENCORE LOW PROFILE DUAL ARM OPERATOR
2.  HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING
3. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL
4. HANDLE/COVER IS OPPOSITE HAND ON ENCORE DYAD OPERATORS. EXAMPLE: LH ENCORE DYAD OPERATORS REQUIRE RH HANDLE/COVER

MAXIM® DYAD OPERATORS (LOW PROFILE)

FIG. 9 MAXIM DYAD OPERATOR
(SILL MOUNT VERSION)
(LOW PROFILE)

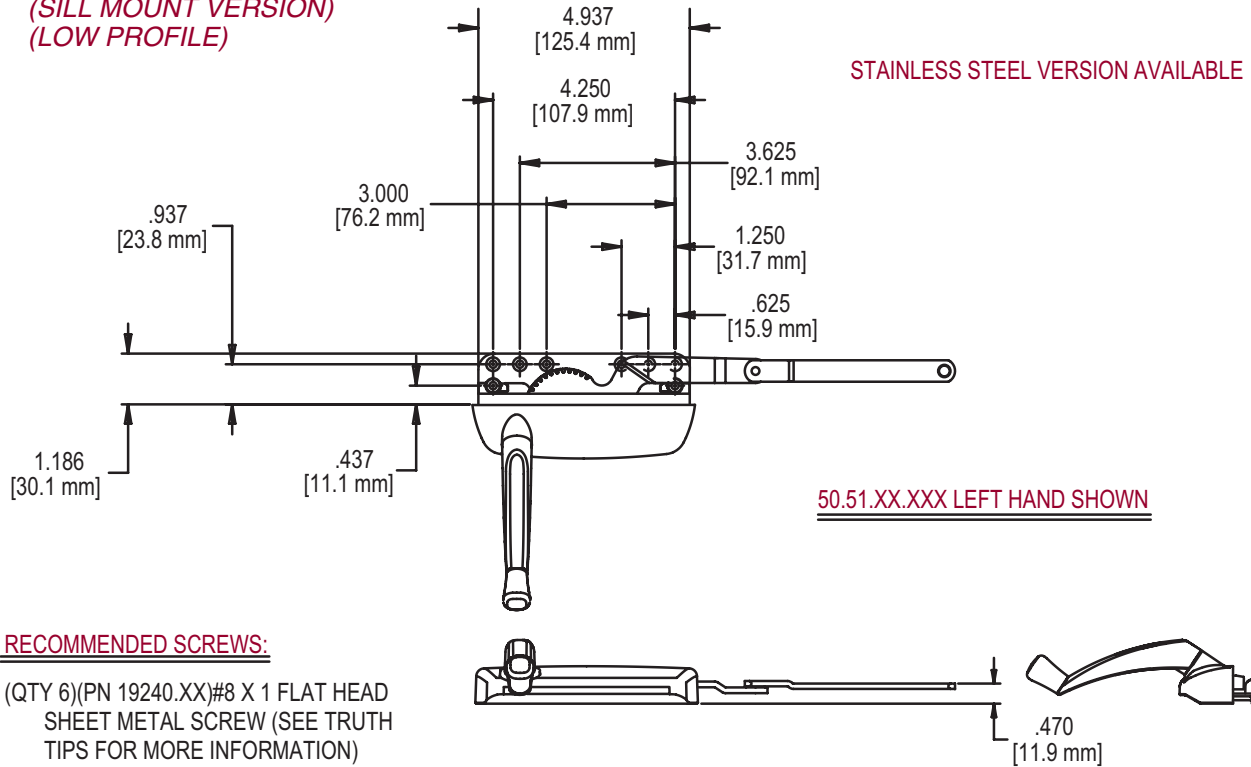


FIG. 10 MAXIM COVER 41212.XX /HANDLE 11329.XX (RH) (SHOWN)

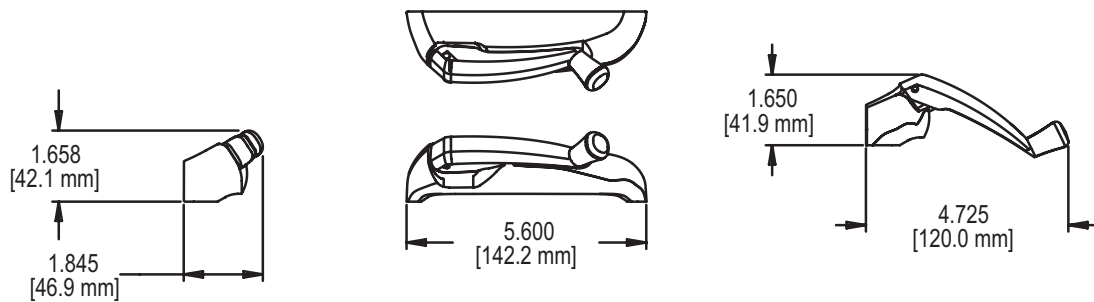
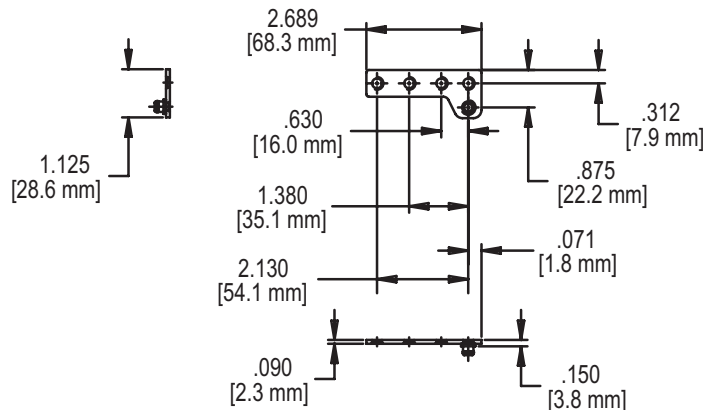


FIG. 11 STUD BRACKET 11661.XX(LH) (SHOWN), 11662.XX(RH)

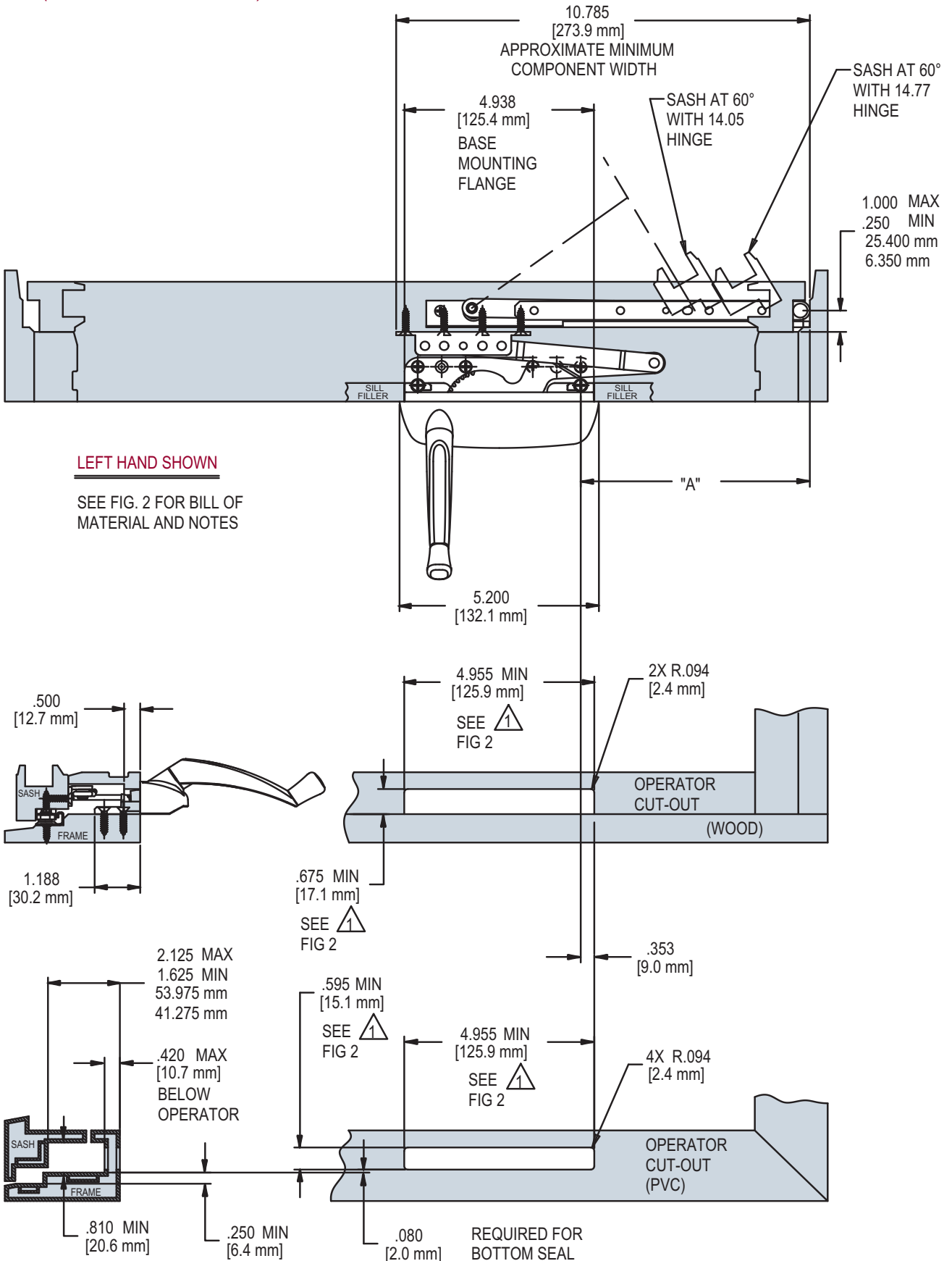
HANDING OF BRACKET DOES NOT NECESSARILY MATCH HANDING OF OPERATOR



RECOMMENDED SCREWS:

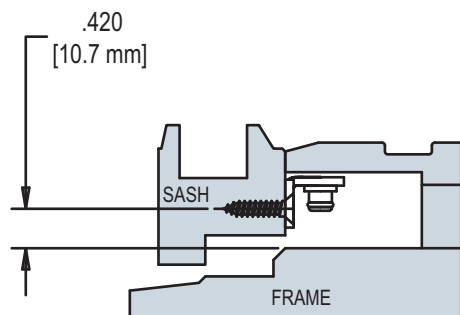
(QTY 4)(PN 19205.XX)#8 X 1/2 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

FIG. 1 APPLICATION OF MAXIM REVERSE DYAD OPERATOR (SILL MOUNT VERSION)

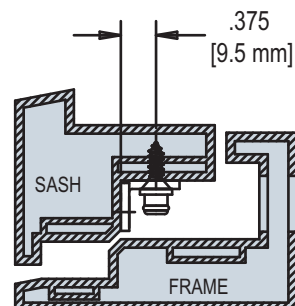


MAXIM® REVERSE DYAD OPERATORS (SILL MOUNT)

FIG. 2 APPLICATION OF MAXIM REVERSE DYAD OPERATOR (CONTINUED)
(SILL MOUNT VERSION)



11674.XX
BRACKET PLACEMENT



11674.XX
BRACKET PLACEMENT

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1	
PART NUMBER	DESCRIPTION
50.70.XX.XXX	REVERSE DYAD OPERATOR
11674.XX	STUD BRACKET
14.05.00.XXX	HINGE
11454.XX	CONTOUR HANDLE
31882	GASKET (PVC)

HINGE	"A"
14.05.00.XXX	5.973 [151.7 mm]
14.77.00.XXX	5.532 [140.5 mm]

NOTES:


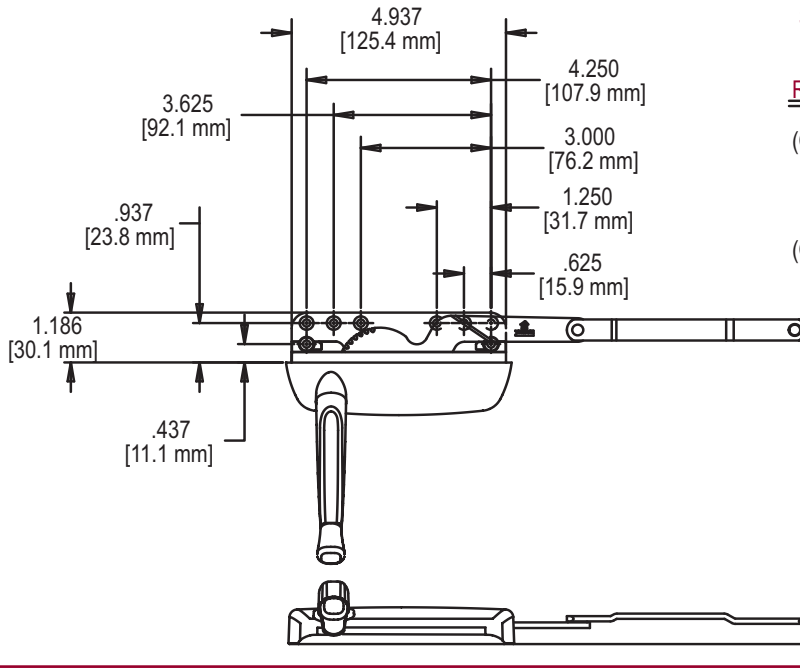
1.  HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING
2. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL
3. HANDLE/COVER PACK IS OPPOSITE HAND ON ENCORE DYAD OPERATOR. EXAMPLE:
LH ENCORE REVERSE DYAD OPERATOR REQUIRES A RH HANDLE/COVER

FIG. 3 STANDARD MAXIM REVERSE DYAD OPERATOR (SILL MOUNT VERSION)



STAINLESS STEEL VERSION AVAILABLE

RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)REAR MOUNT:8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

50.70.XX.011 LEFT HAND SHOWN

50.72 REAR MOUNT VERSION AVAILABLE

FIG. 4 MAXIM COVER 41211.XX/HANDLE 11329.XX (LH) (SHOWN)

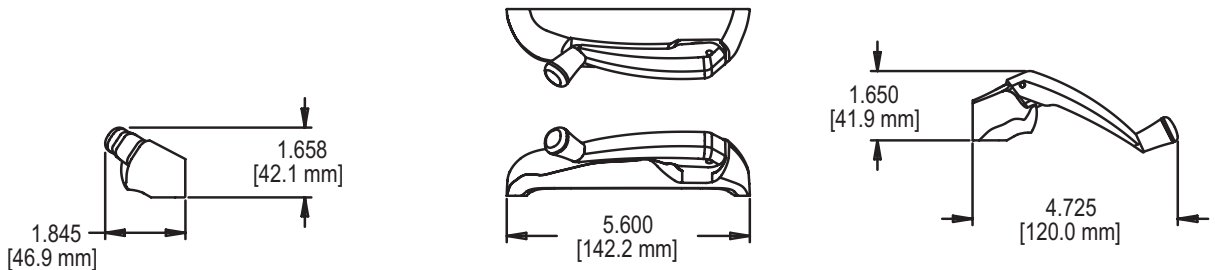


FIG. 5 BACK PLATE 23058.92

FOR USE WITH 50.72 REAR MOUNT VERSION ONLY

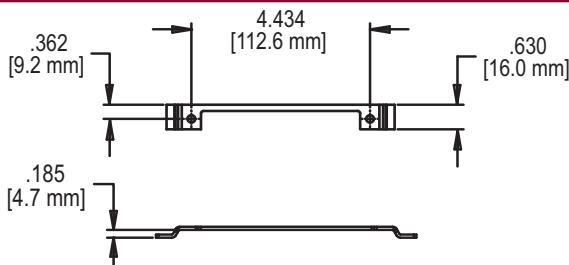
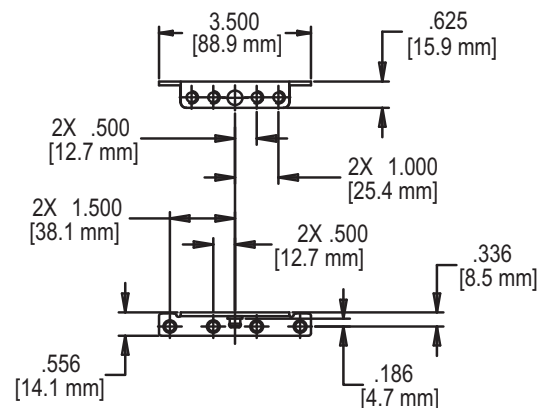


FIG. 6 STUD BRACKET 11674.XX (NON-HANDED)

STAINLESS STEEL VERSION AVAILABLE

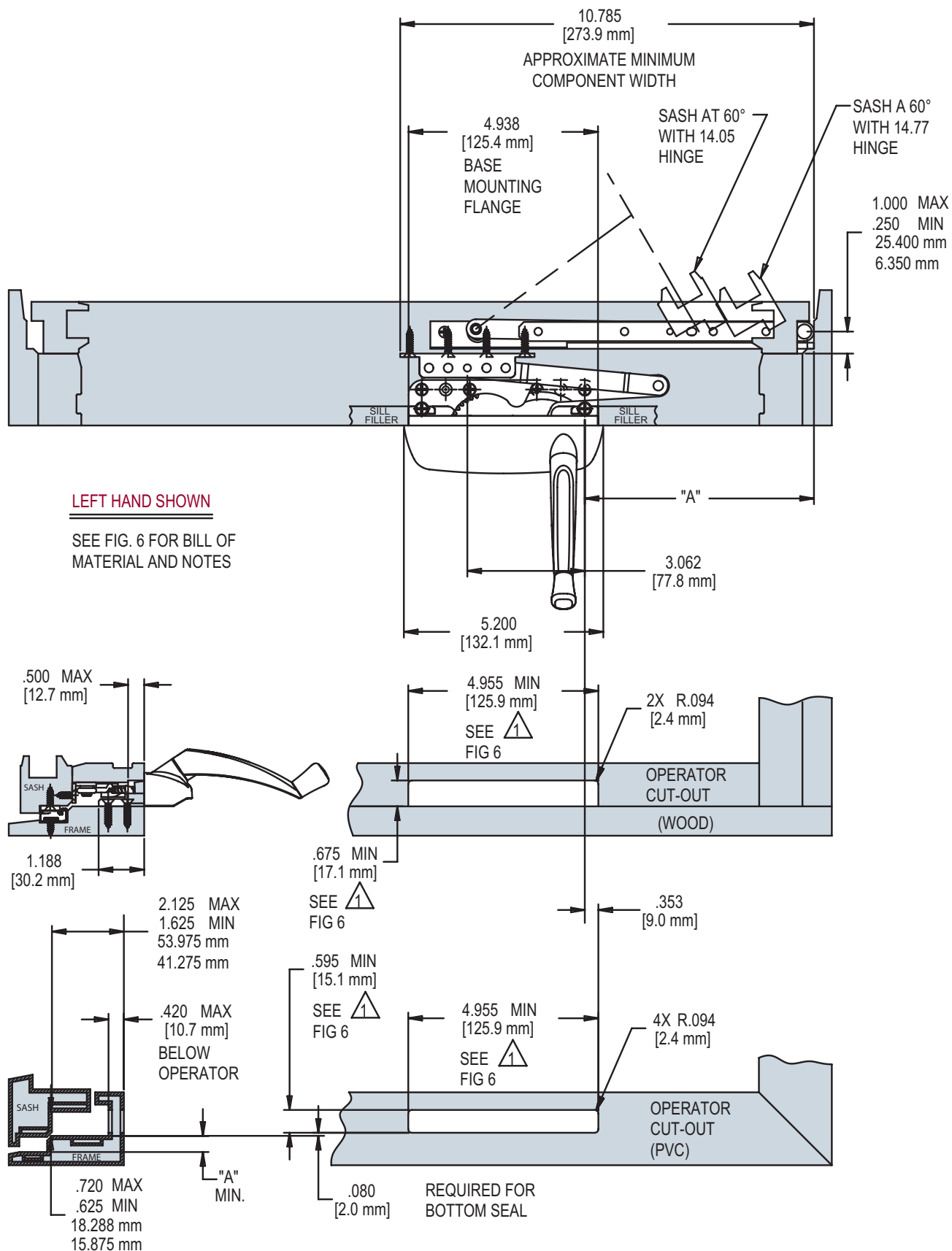
RECOMMENDED SCREWS:

(QTY 4)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

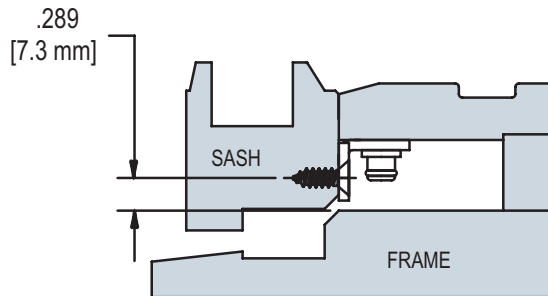


MAXIM® REVERSE DYAD OPERATORS (LOW PROFILE)

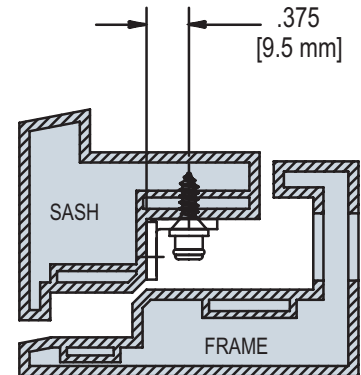
FIG. 7 APPLICATION OF MAXIM REVERSE DYAD OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)



**FIG. 8 APPLICATION OF MAXIM REVERSE DYAD OPERATOR (CONTINUED)
(SILL MOUNT VERSION) (LOW PROFILE)**



**11674.XX
BRACKET PLACEMENT**



**11674.XX
BRACKET PLACEMENT**

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.5	
PART NUMBER	DESCRIPTION
50.71.XX.011	REVERSE DYAD OPERATOR
11674.XX	STUD BRACKET
14.05.00.XXX	HINGE
11454.XX	CONTOUR HANDLE
31882	GASKET (PVC)

HINGE	"A"
14.05.00.XXX	5.973 [151.7 mm]
14.77.00.XXX	5.532 [140.5 mm]

NOTES:

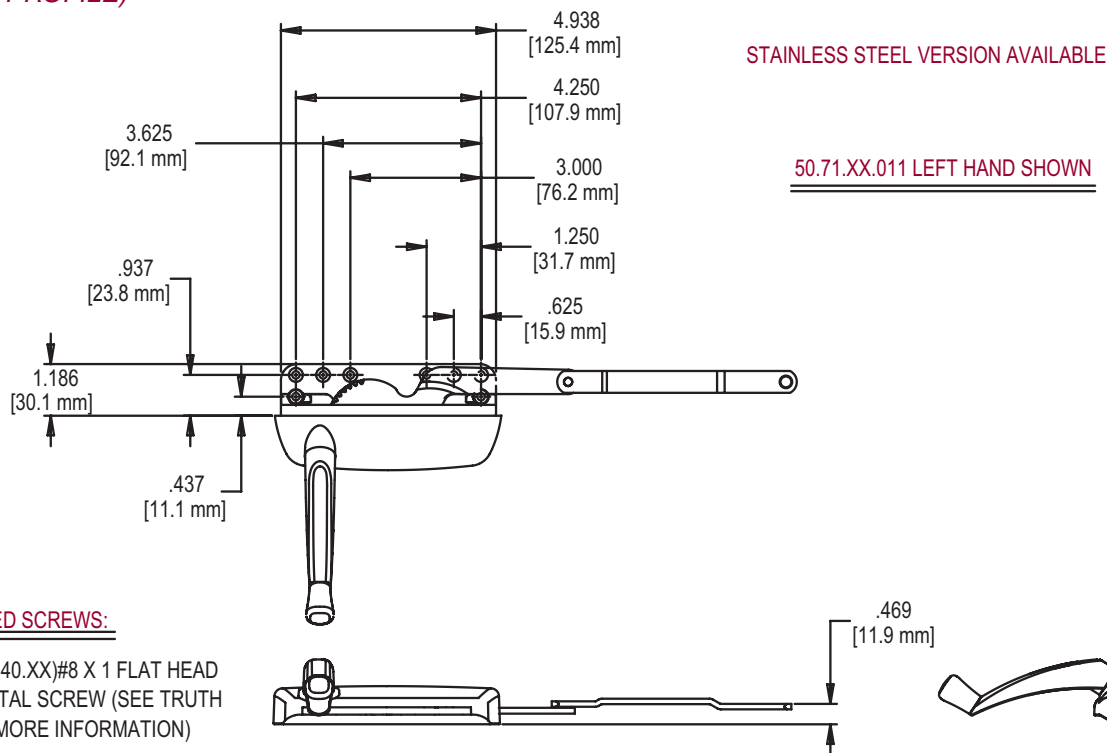
1. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW.
A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING.

2. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

3. HANDLE/COVER PACK IS OPPOSITE HAND ON ENCORE DYAD OPERATOR. EXAMPLE: LH ENCORE REVERSE DYAD OPERATOR REQUIRES A RH HANDLE/COVER

MAXIM® REVERSE DYAD OPERATORS (LOW PROFILE)

FIG. 9 STANDARD MAXIM REVERSE DYAD OPERATOR
(SILL MOUNT VERSION)
(LOW PROFILE)



RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

FIG. 10 MAXIM COVER 41212.XX/HANDLE 11329.XX (RH) (SHOWN)

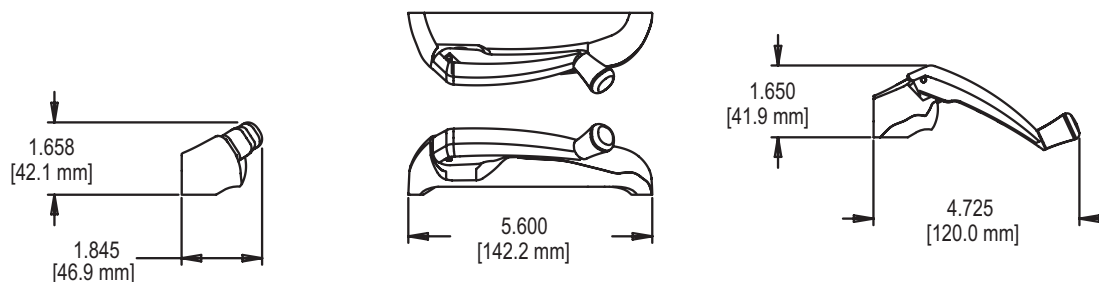


FIG. 11 STUD BRACKET 11661.XX(LH) (SHOWN), 11662.XX(RH)

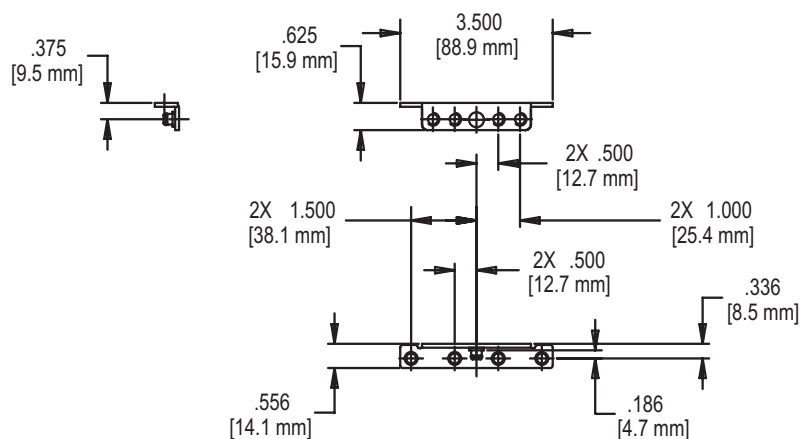
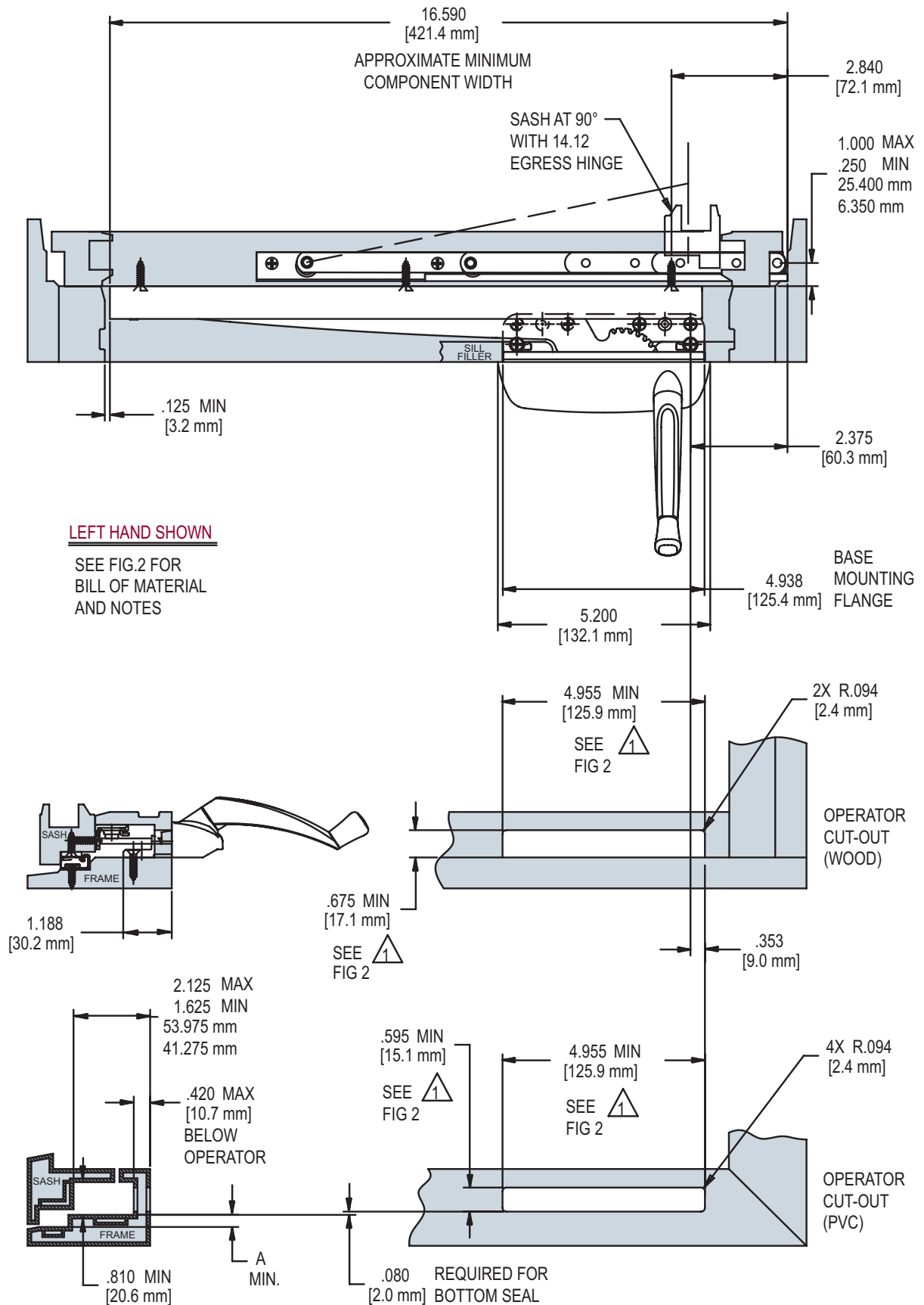
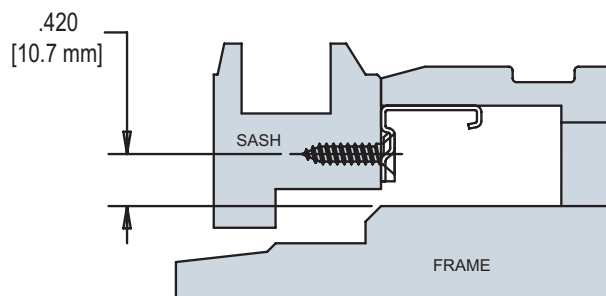


FIG. 1 APPLICATION OF STANDARD MAXIM SINGLE ARM OPERATOR (SILL MOUNT VERSION)



MAXIM® SINGLE ARM OPERATORS (SILL MOUNT)

FIG. 2 APPLICATION OF MAXIM SINGLE ARM OPERATOR (CONTINUED)
(SILL MOUNT VERSION)



11576.XX TRACK PLACEMENT

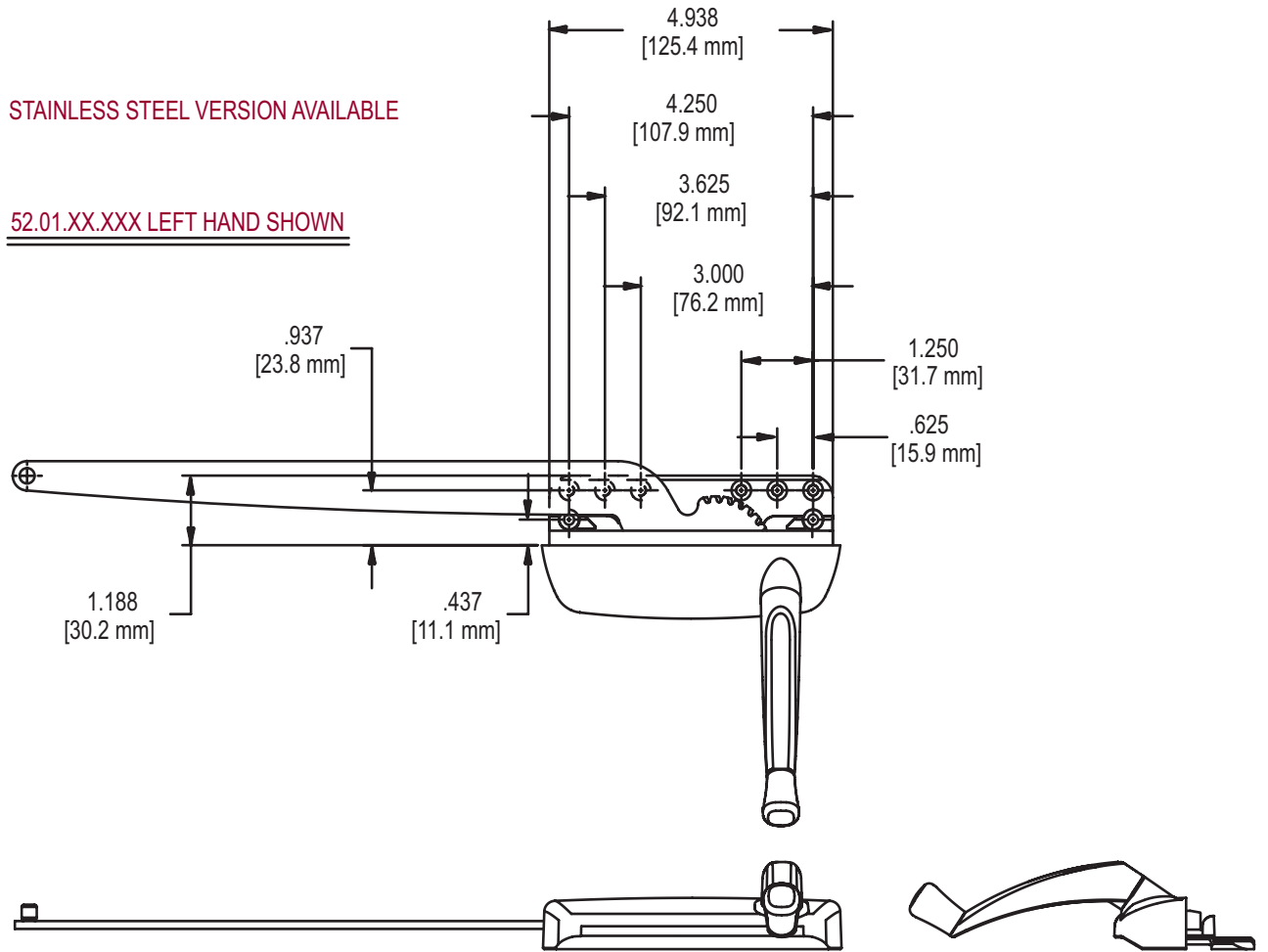
HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1	
PART NUMBER	DESCRIPTION
52.01.XX.XXX	SINGLE ARM OPERATOR
11576.XX	TRACK ASSEMBLY
14.12.00.XXX	EGRESS HINGE
11454.XX	CONTOUR HANDLE
31882	GASKET (PVC)

HINGE	"A"
14.97.00.XXX 14.12.00.XXX	.300 [7.6 mm]
OTHER 14 SERIES CASEMENT HINGES	.250 [6.4 mm]

NOTE:

1. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING
2. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

FIG. 3 STANDARD MAXIM SINGLE ARM OPERATOR (SILL MOUNT VERSION)

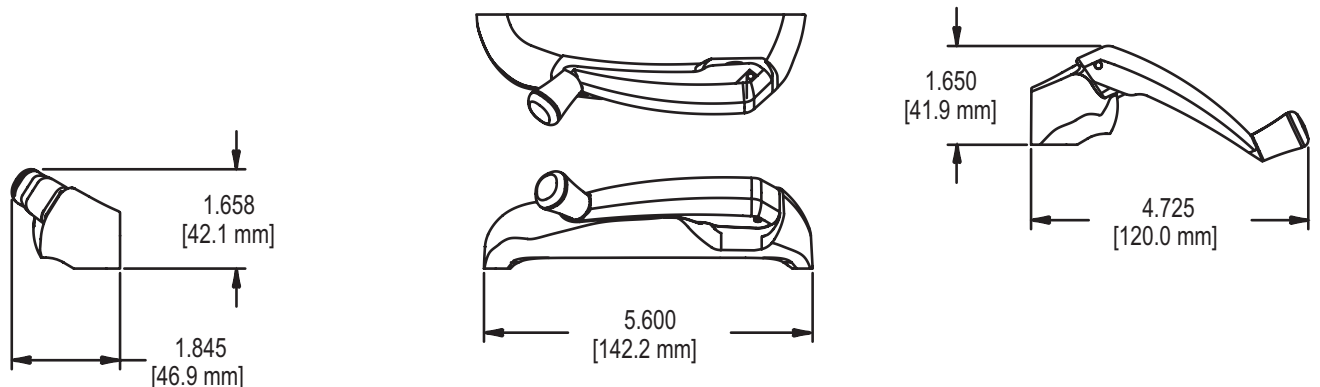


RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX) #8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)FOR REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

FIG. 4 MAXIM COVER 41211.XX/HANDLE 11329.XX(LH) (SHOWN)



MAXIM® SINGLE ARM OPERATORS (SILL MOUNT)

FIG. 5 BACK PLATE 21969.92

FOR USE WITH
REAR MOUNT
VERSION ONLY

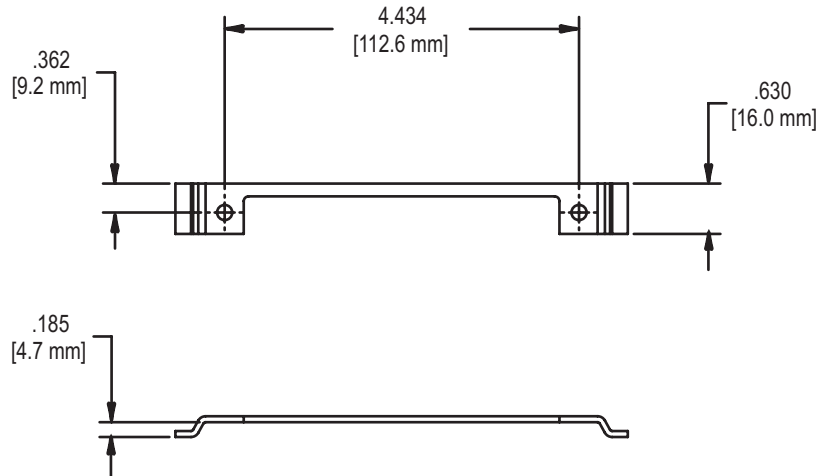
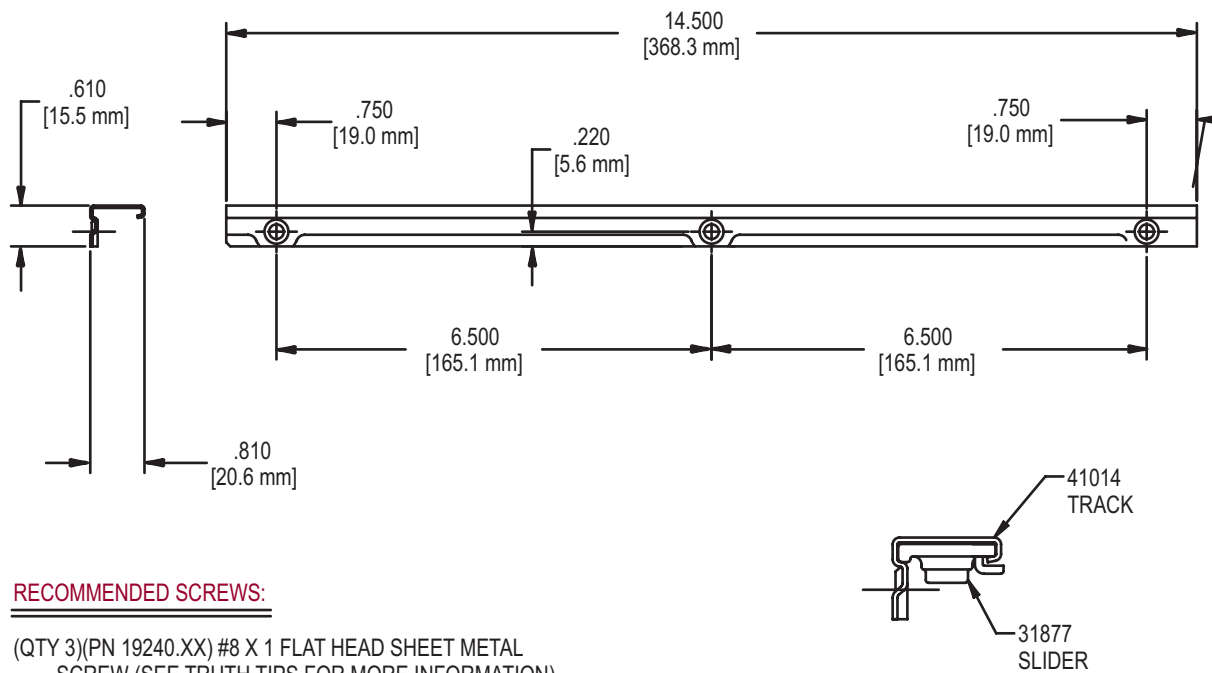


FIG. 6 TRACK & SLIDER ASSEMBLY 11576.XX

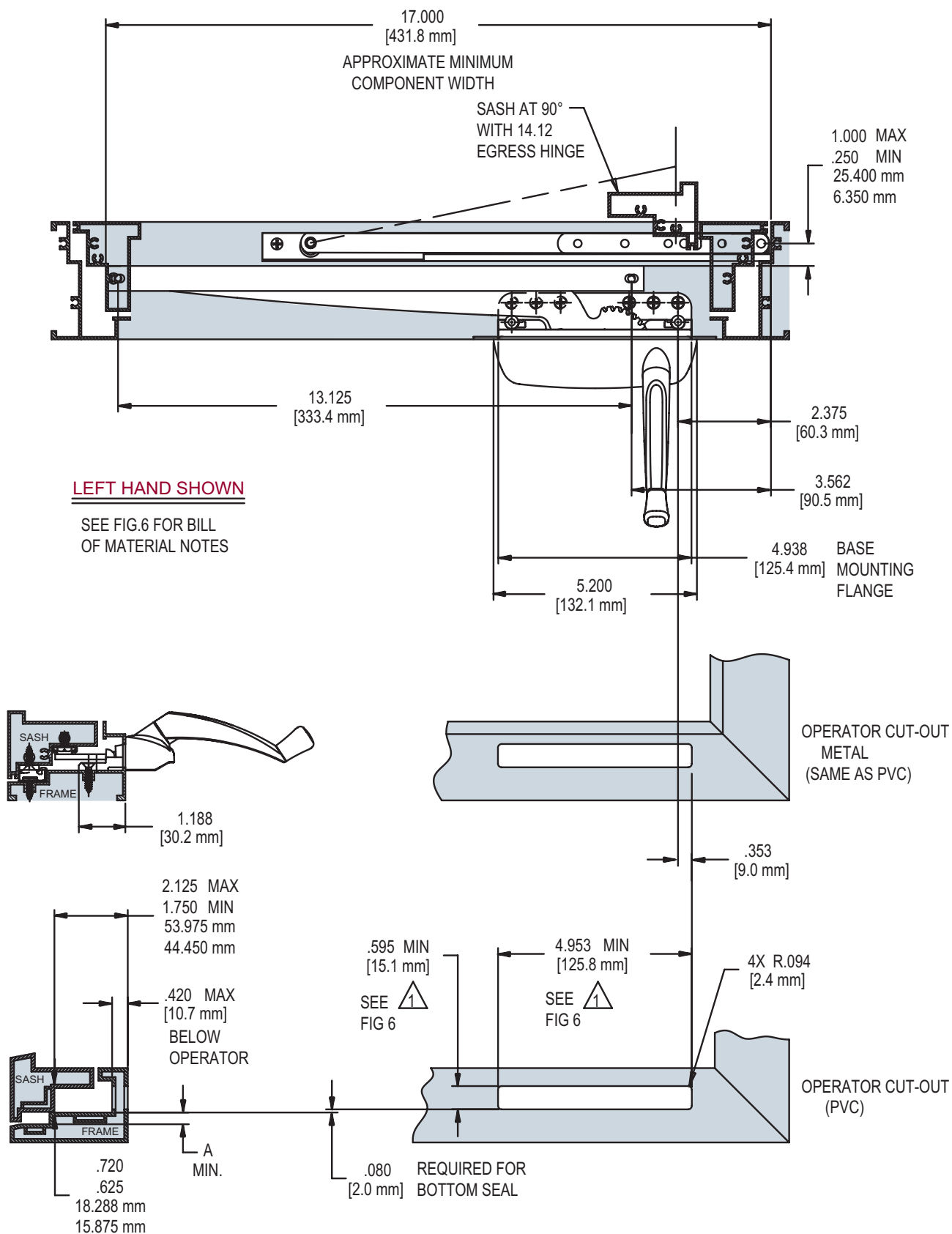
STAINLESS STEEL VERSION AVAILABLE



RECOMMENDED SCREWS:

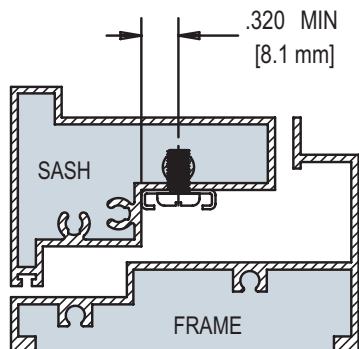
(QTY 3)(PN 19240.XX) #8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

FIG. 7 APPLICATION OF STANDARD MAXIM SINGLE ARM OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)



MAXIM® SINGLE ARM OPERATORS (LOW PROFILE)

FIG. 8 APPLICATION OF MAXIM SINGLE ARM OPERATOR (CONTINUED)
(SILL MOUNT VERSION) (LOW PROFILE)



30175 TRACK PLACEMENT

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.5	
PART NUMBER	DESCRIPTION
52.03.XX.011	SINGLE ARM OPERATOR
30175	TRACK
14.12.00.XXX	EGRESS HINGE
11454.XX	CONTOUR HANDLE
31882	GASKET

HINGE	"A"
14.12.00.XXX	.322 [8.2 mm]
OTHER 14 SERIES CASEMENT HINGES	.275 [7.0 mm]

NOTE:

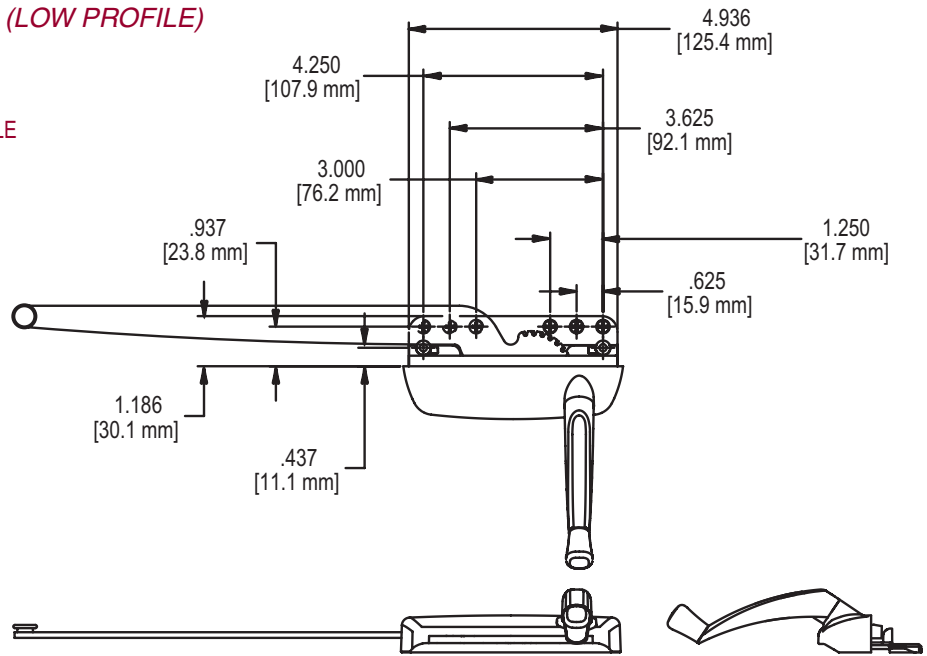
1. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING

2. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

FIG. 9 STANDARD MAXIM SINGLE ARM OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)

STAINLESS STEEL VERSION AVAILABLE

52.03.XX.011 LEFT HAND SHOWN



RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

FIG. 10 MAXIM COVER 41212.XX/HANDLE 11329.XX(RH) (SHOWN)

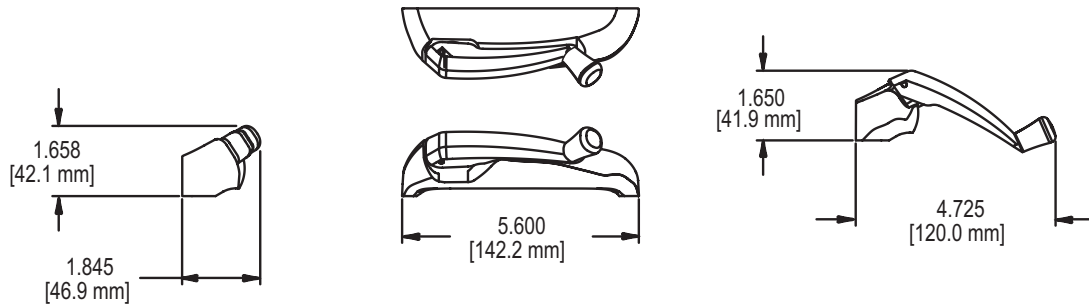
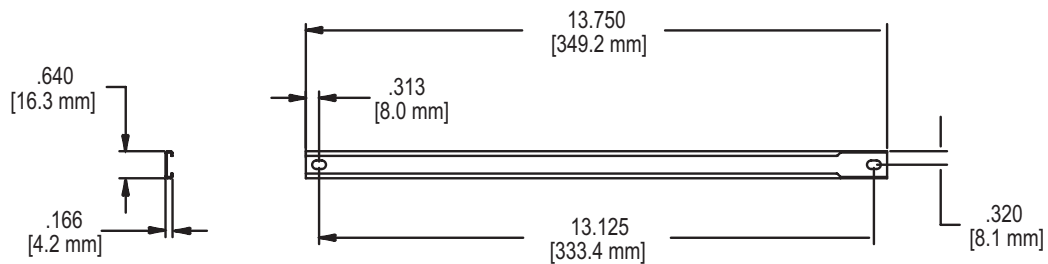


FIG. 11 TRACK 30175

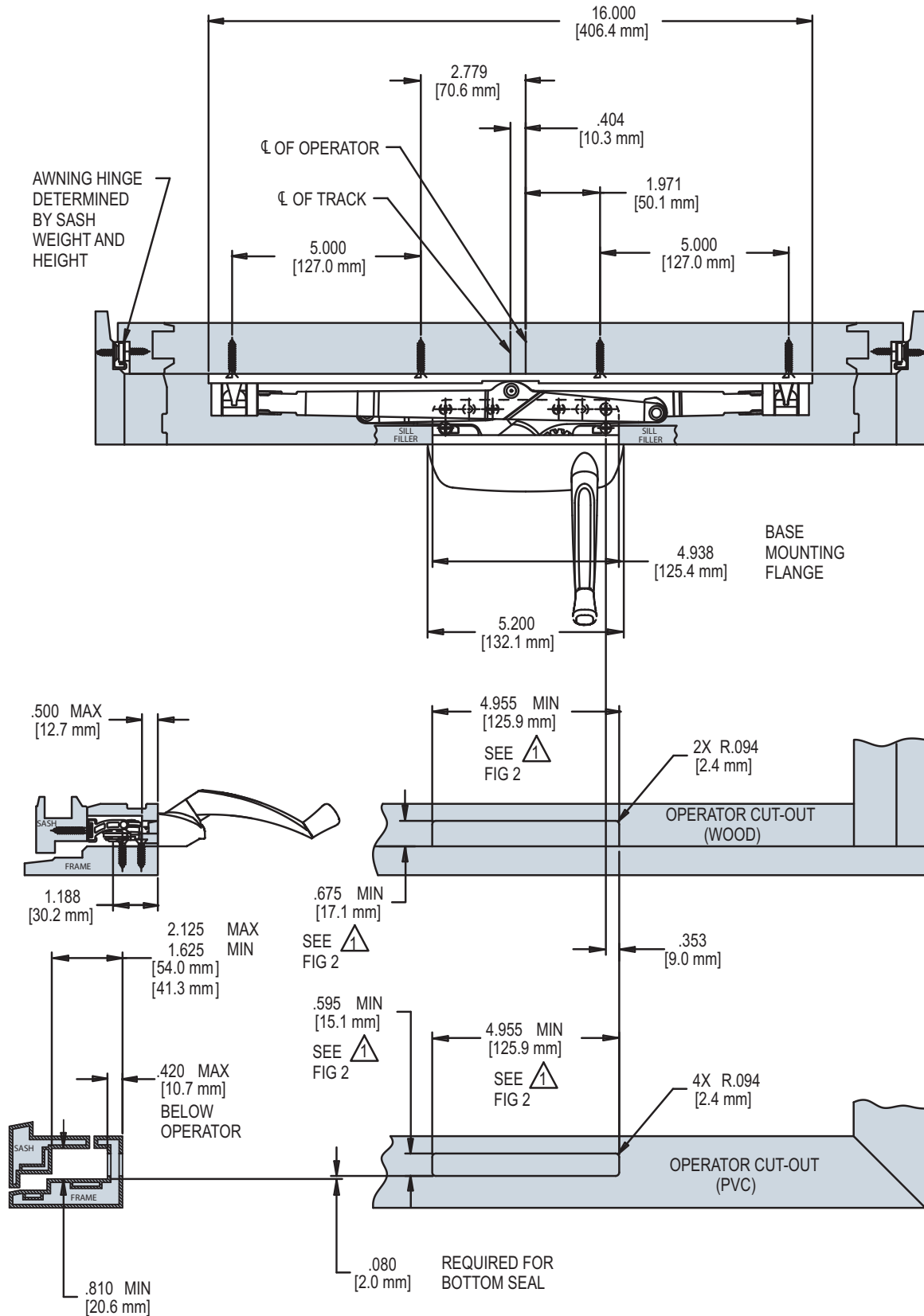


RECOMMENDED SCREWS:

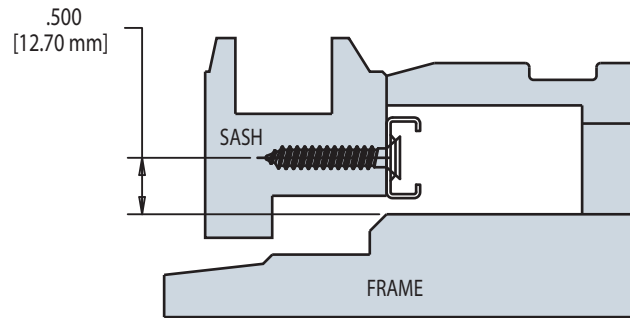
(QTY 2)(PN 19214.XX)#8 X 1 FLAT HEAD SHEET METAL (SEE TRUTH TIPS FOR MORE INFORMATION)

MAXIM® AWNING OPERATOR (SILL MOUNT)

FIG. 1 APPLICATION OF STANDARD MAXIM AWNING OPERATOR (SILL MOUNT VERSION)



**FIG. 2 APPLICATION OF STANDARD MAXIM AWNING OPERATOR (CONTINUED)
(SILL MOUNT VERSION)**



**11577.92
TRACK PLACEMENT**

HARDWARE SHOWN, SEE FIG.1	
PART NUMBER	DESCRIPTION
51.00.XX.011	AWNING OPERATOR
11577.92	TRACK ASSEMBLY
13.XX.XX.XXX	HINGE
11454.XX	CONTOUR HANDLE
31882	GASKET (PVC)

NOTE:

1. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING

2. GASKET 31882 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

MAXIM® AWNING OPERATORS (SILL MOUNT)

FIG. 3 STANDARD MAXIM AWNING OPERATOR (SILL MOUNT VERSION)

STAINLESS STEEL VERSION AVAILABLE

51.00.XX.011 SHOWN

51.02 REAR MOUNT VERSION ALSO AVAILABLE

RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

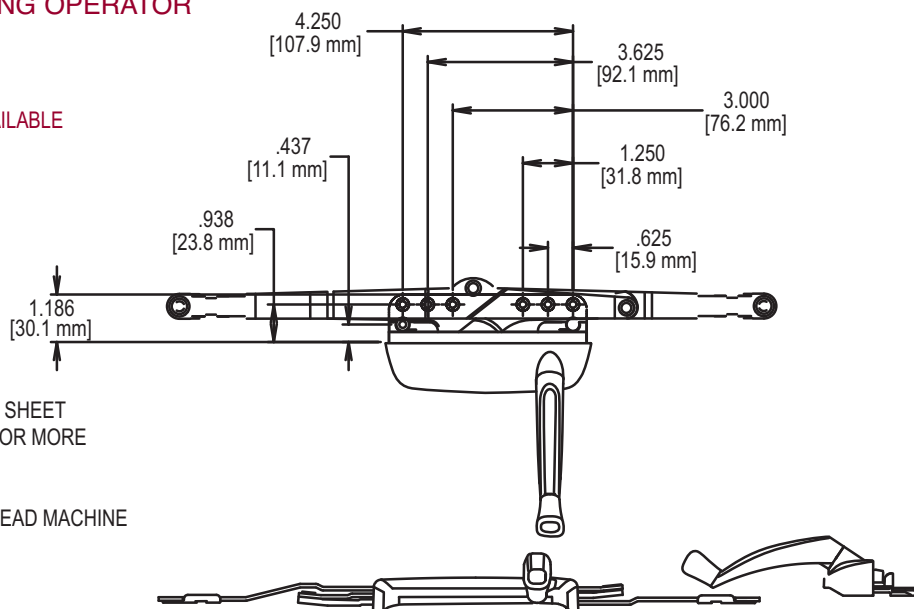


FIG. 4 MAXIM COVER 41211.XX /HANDLE 11329.XX (LH) (SHOWN)

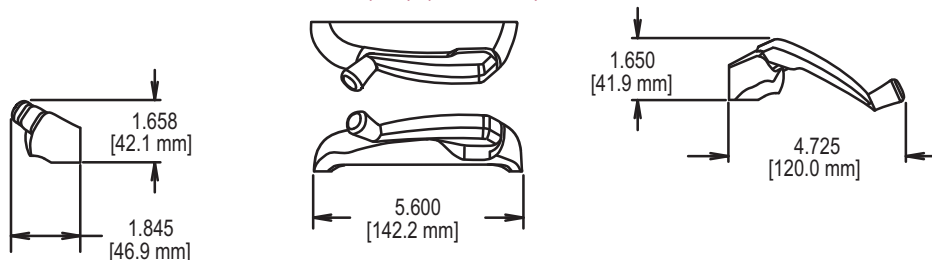


FIG. 5 BACK PLATE 23058.92

FOR USE WITH 51.02 REAR MOUNT VERSION ONLY

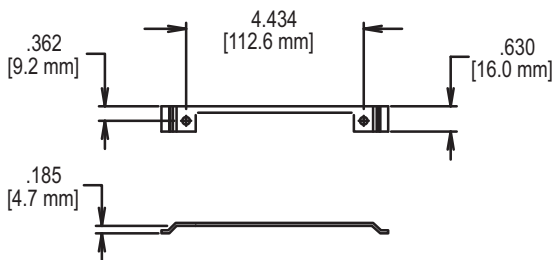
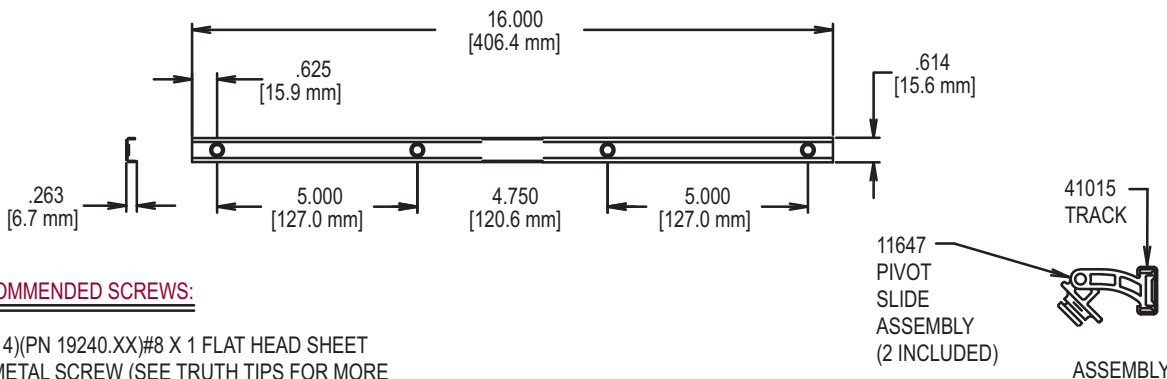


FIG. 6 MAXIM AWNING TRACK & SLIDER ASSEMBLY 11577.92

STAINLESS STEEL VERSION AVAILABLE



RECOMMENDED SCREWS:

(QTY 4)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

FIG. 1 APPLICATION OF MAXIM NARROW AWNING OPERATOR

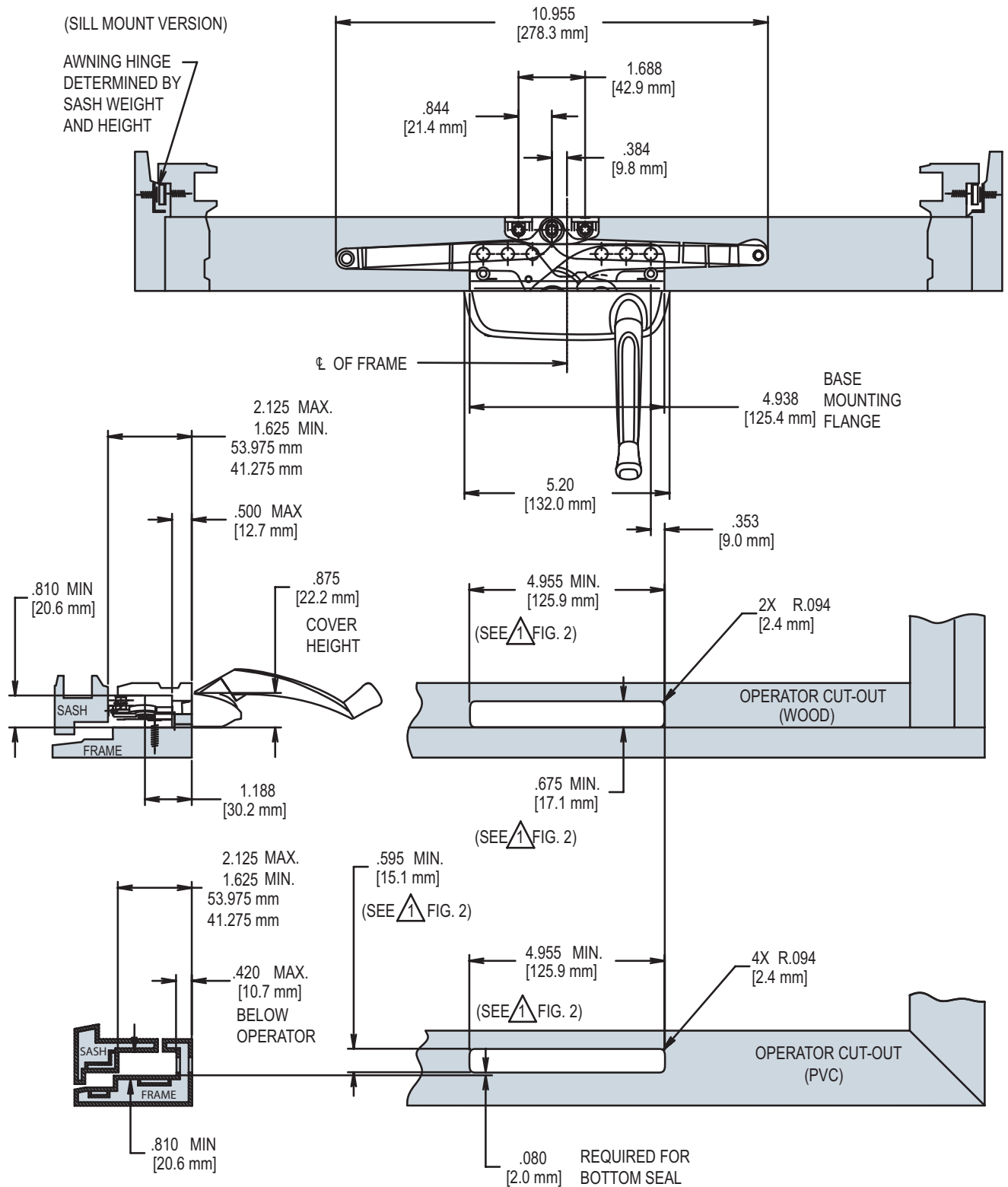
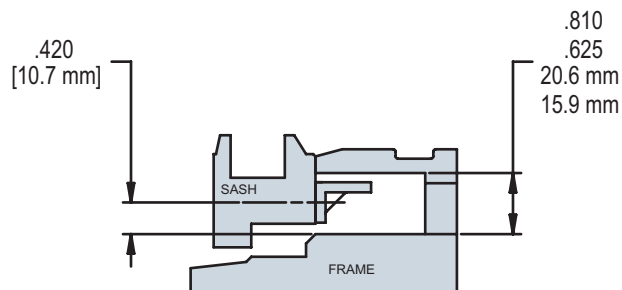
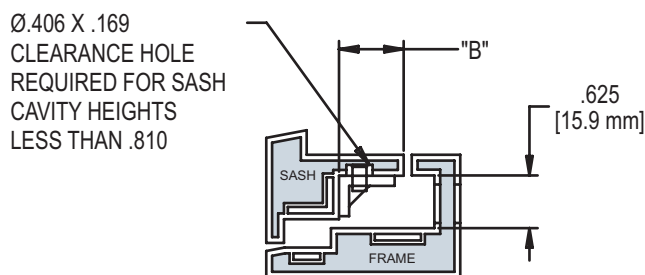


FIG. 2 APPLICATION OF MAXIM NARROW AWNING OPERATOR (CONTINUED)



BRACKET PLACEMENT



BRACKET PLACEMENT

HARDWARE SHOWN SEE FIG. 1	
PART NUMBER	DESCRIPTION
51.01.XX.011	AWNING OPERATOR
22143	BRACKET
13.XX.XX.XXX	HINGE
11454.XX	CONTOUR HANDLE
31882	GASKET (PVC)

NOTE:


1.  HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING
2. USE 31882 GASKET ON PVC AND METAL PROFILES
3. ALL AWNING OPERATORS USE 41211.XX COVER/11329.XX L.H. HANDLE
4. MINIMUM RECOMMENDED SASH HEIGHT 16" (DEPENDENT ON PROFILE)
5. SASH OVERHANG "B" SHOULD BE AS SMALL AS POSSIBLE
BRACKET MAY NEED TO BE MOUNTED CLOSER TO SASH EDGE TO ELIMINATE
BRACKET DETACH AT FULL OPEN ON SHORT SASH SIZES

FIG. 3 MAXIM NARROW AWNING OPERATOR (SILL MOUNT VERSION)

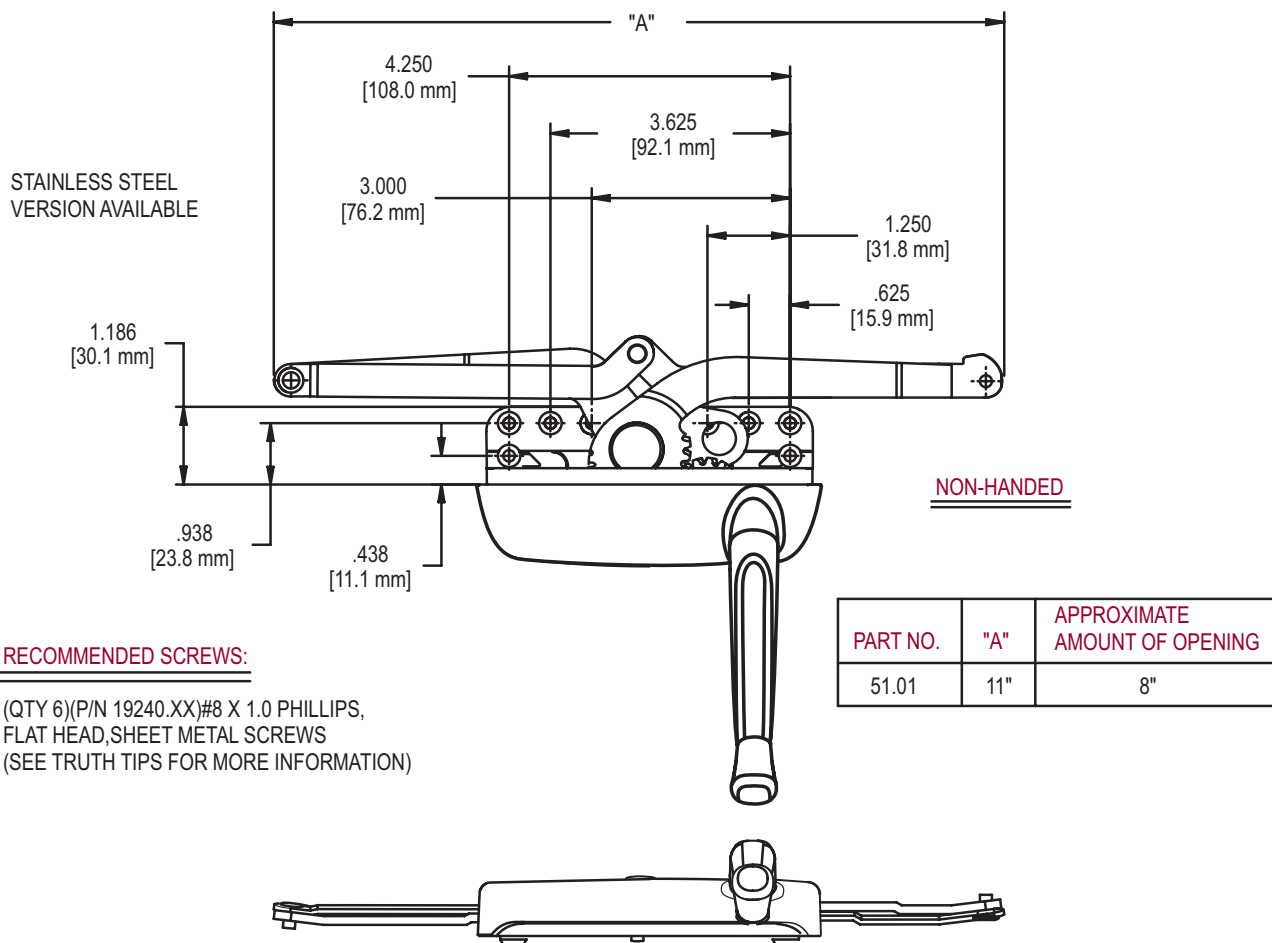
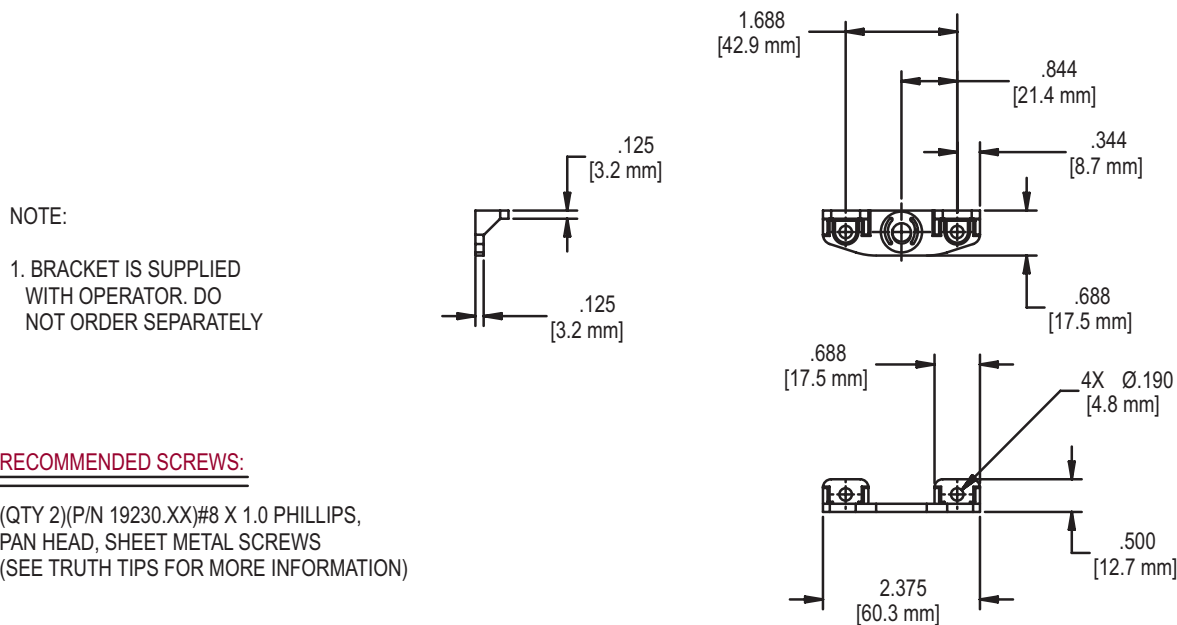


FIG. 4 BRACKET 22143



Hardware Comparison for NAFS Casement Window Hardware Load Test

North American Fenestration Standard (ANSI/AAMA/WDMA 107/I.S.2/NAFS-02)

CAUTION: There are many factors in addition to the hardware which influence the maximum size casement window that should be produced. These include sash and frame stiffness and strength, screw holding strength, sash sag, weather tightness, and weatherstrip drag. For this reason, Truth recommends careful evaluation of the entire window before producing units as large as this matrix suggests.

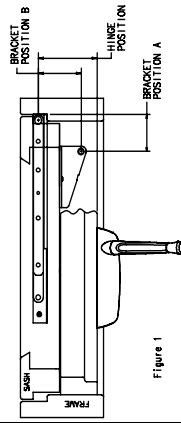
Performance Class R: The Maximum Frame Size and Sash Weight are Listed in the Table.

Performance Classes L, C, HC, AW: The Maximum Frame Area (Width x Height) Listed in the Table Must be Reduced by 20%.

Operator	Hinge										Approx. Minimum Frame Width to Fit Operator
	Maxim Washable 14.97 14.92	Maxim Egress 14.12 14.13	10" Standard 14.75 14.80 14.05 14.19	10" Washable 14.76 14.91 14.06	10" Egress 14.77 14.93	10" HP Concealed 14.96	10" HP Concealed Egress 14.00	Butt Hinge			
Maxim Dual Arm	50.00	40"W x 84"H, 108" (96) lbs	32"W x 84"H, 85 lbs	32"W x 72"H, 73 lbs	32"W x 68"H, 69 lbs	38"W x 78"H, 95 lbs	32"W x 68"H, 69 lbs	Not Recommended	24"		
Maxim Dyad	50.50	32"W x 72"H, 73" (55) lbs	Not Recommended	24"W x 64"H, 47 lbs	Not Recommended	28"W x 69"H, 49" (44) lbs	Not Recommended	Not Recommended	16"		
Maxim Reverse Dyad	50.70	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	12"		
Maxim Single Arm	52.01	Not Recommended	32"W x 70"H, 71" (36) lbs	32"W x 70"H, 71" (29) lbs	32"W x 72"H, 73 lbs	32"W x 70"H, 71" (36) lbs	32"W x 72"H, 73 lbs	30"W x 69"H, 65 lbs	20"		
Maxim Short Single Arm	52.06	Not Recommended	32"W x 60"H, 60 lbs	32"W x 60"H, 60" (54) lbs	Not Recommended	32"W x 60"H, 60 lbs	Not Recommended	Not Recommended	20"		
EntryGard Dual Arm	15.10	Not Recommended	28"W x 60"H, 52 lbs	Not Recommended	28"W x 60"H, 52 lbs	Not Recommended	28"W x 60"H, 52 lbs	Not Recommended	18"		
EntryGard Egress D.A.	15.15	Not Recommended	26"W x 61"H, 49 lbs	24"W x 67"H, 49 lbs	Not Recommended	30"W x 61"H, 57 lbs	Not Recommended	Not Recommended	13"		
EntryGard Dyad	15.11	Not Recommended	22"W x 62"H, 42 lbs	Not Recommended	22"W x 62"H, 42 lbs	22"W x 61"H, 40 lbs	Not Recommended	20"W x 61"H, 36 lbs	16" - 18" †		
EntryGard Single Arm	15.94	Not Recommended	26"W x 65"H, 52 lbs	26"W x 67"H, 54" (50) lbs	26"W x 65"H, 52 lbs	26"W x 67"H, 54" (50) lbs	26"W x 65"H, 52 lbs	24"W x 64"H, 47 lbs	22" - 24" †		
13.5" Single Arm	15.32	Not Recommended	24"W x 65"H, 48 lbs	24"W x 62"H, 45" (19) lbs	24"W x 65"H, 48 lbs	24"W x 61"H, 45" (27) lbs	24"W x 65"H, 48 lbs	22"W x 65"H, 39 lbs	16"		
9.5" Single Arm	15.31	Not Recommended	18"W x 66"H, 35 lbs	Not Recommended	22"W x 63"H, 42 lbs	Not Recommended	22"W x 63"H, 42 lbs	16"W x 70"H, 33 lbs	15"		
7.5" Single Arm	15.56	Not Recommended	Not Recommended	24"W x 64"H, 47 lbs	Not Recommended	30"W x 64"H, 60" (56) lbs	Not Recommended	Not Recommended	16"		
6" Single Arm	15.39	Not Recommended	26"W x 70"H, 52 lbs	26"W x 68"H, 51 lbs	26"W x 66"H, 53 lbs	26"W x 68"H, 51 lbs	26"W x 66"H, 53 lbs	26"W x 62"H, 50 lbs	22" - 24" †		
Split Arm	15.18	Not Recommended	26"W x 69"H, 55 lbs	24"W x 66"H, 48" (22) lbs	24"W x 66"H, 48" (22) lbs	24"W x 69"H, 55 lbs	24"W x 69"H, 55 lbs	24"W x 69"H, 50 lbs	18" - 20" †		
23 Series Single Arm 13.5"	23.03	Not Recommended	24"W x 65"H, 48" (31) lbs	Not Recommended	22"W x 69"H, 46 lbs	24"W x 65"H, 48" (31) lbs	24"W x 65"H, 48" (31) lbs	24"W x 69"H, 51 lbs	16"		
23 Series Single Arm 9.5"	23.01	Not Recommended	20"W x 69"H, 46 lbs	Not Recommended	20"W x 69"H, 46 lbs	Not Recommended	20"W x 69"H, 46 lbs	Not Recommended	15"		
23 Series Single Arm 7.5"	23.38	Not Recommended	26"W x 63"H, 51 lbs	24"W x 68"H, 50 lbs	24"W x 67"H, 49 lbs	28"W x 66"H, 58 lbs	28"W x 66"H, 58 lbs	Not Recommended	19"		
23 Series Single Arm 6"	23.78	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended		
23 Series Dyad Short Link	23.46	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended		
23 Series Dyad Long Link	23.32	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended		

Typical Mounting Positions - Used for Hardware Comparison

Operator	Hinge Position			Operator Position
	Bracket Position A	Bracket Position B	Operator Position	
14 XX Concealed Hinges	Maxim Reverse Dyad	11,062	813	Dual Arm & Dyad determined by Bracket Position A.
	Other Maxim	1,750	1,563	
	EntryGard Dual Arm w/10" Washable Hinge	2,375	.875	
	Other EntryGard Dual Arm Operators	1,625		
	EntryGard Dyad & Single Arm	1,375	1,563	Single Arm per catalog
Butt Hinges	Traditional & Ellipse	2,125	2,437	Catalog Dim A=8,000
	22 Series			Catalog Dim A=4,000
	Maxim Reverse Dyad	4,000	NA	Operator is fully open (arm against stop) at 90° window position.
	EntryGard Single Arm			
	Maxim Single Arm			



The maximum window size, ease of operation, and service life are strongly influenced by hardware mounting positions (see Fig. 1 below).

Applications with dimensions larger than the typical mounting positions given above will not be able to support a window as large as that shown in this Table.

Applications with smaller dimensions may be able to support a larger window. Contact Truth for recommendations specific to your application.

* The first sash weight shown in the table is the maximum permitted for the AAMA Hardware Load Test. The sash weight shown in parenthesis is the maximum recommended by Truth to assure ease of operation.

** The Maxim Reverse Dyad Operator has been limited to use in windows 24" wide and narrower in order to ensure good performance near the closed position. In its full open position, it can support windows larger than those shown in the table.

† The smaller number applies when the operator is used with Egress hinges while the larger number applies when it is used with the 10" Standard or 10" High Performance hinge.



There are numerous accessories that have been designed to help provide the optimum results in both installation and function. The items listed here, such as the #31882 Gasket and #31883

Applicator are two such items. In instances where an additional level of sealing is necessary the Maxim Gaskets will help you achieve this.

ORDERING INFORMATION

1. Please refer to the following drawings for specific information regarding the item numbers to order.

FIG. 1 APPLICATION OF MAXIM OPERATOR GASKET

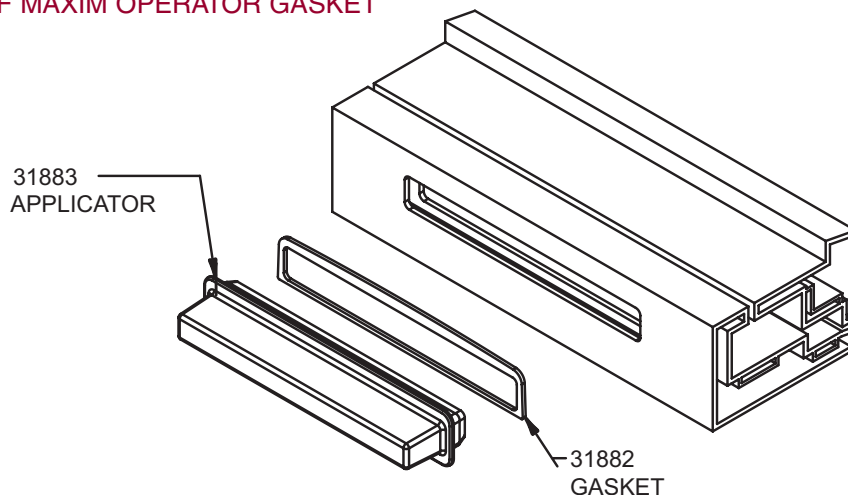


FIG. 2 MAXIM OPERATOR GASKET 31882

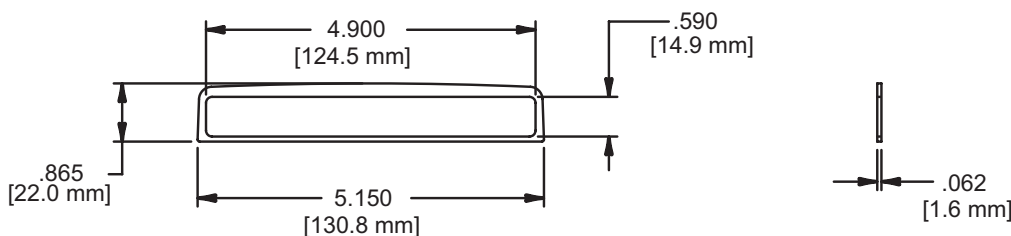


FIG. 3 MAXIM OPERATOR GASKET APPLICATOR 31883

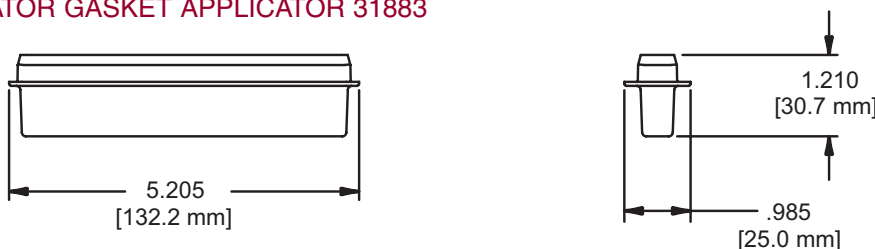
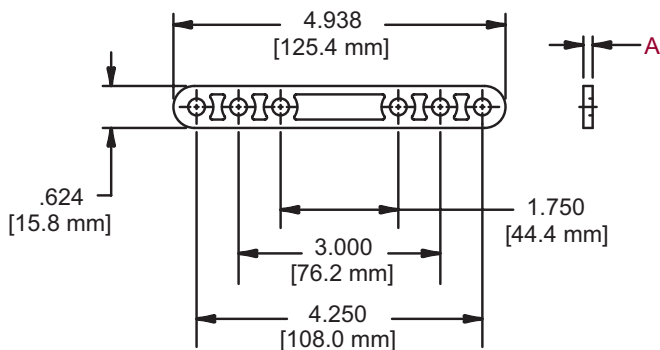


FIG. 4 MAXIM OPERATOR SHIMS



SHIM	"A"
21544	.048 [1.2 mm]
21545	.096 [2.4 mm]
21546	.138 [3.5 mm]
21547	.189 [4.8 mm]
21548	.205 [5.2 mm]

FIG. 5 APPLICATION OF MAXIM FOLDING HANDLE COVER

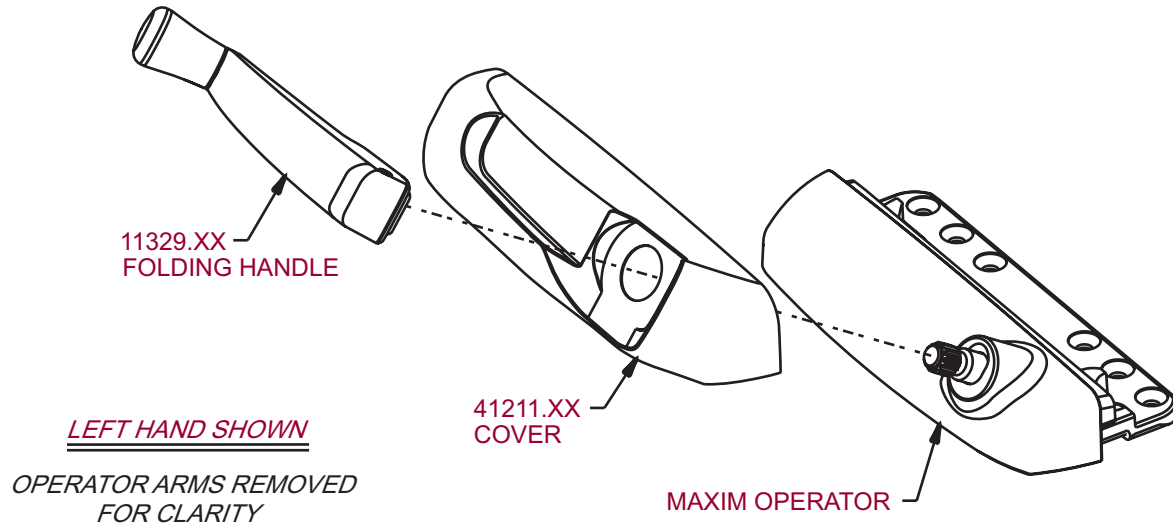
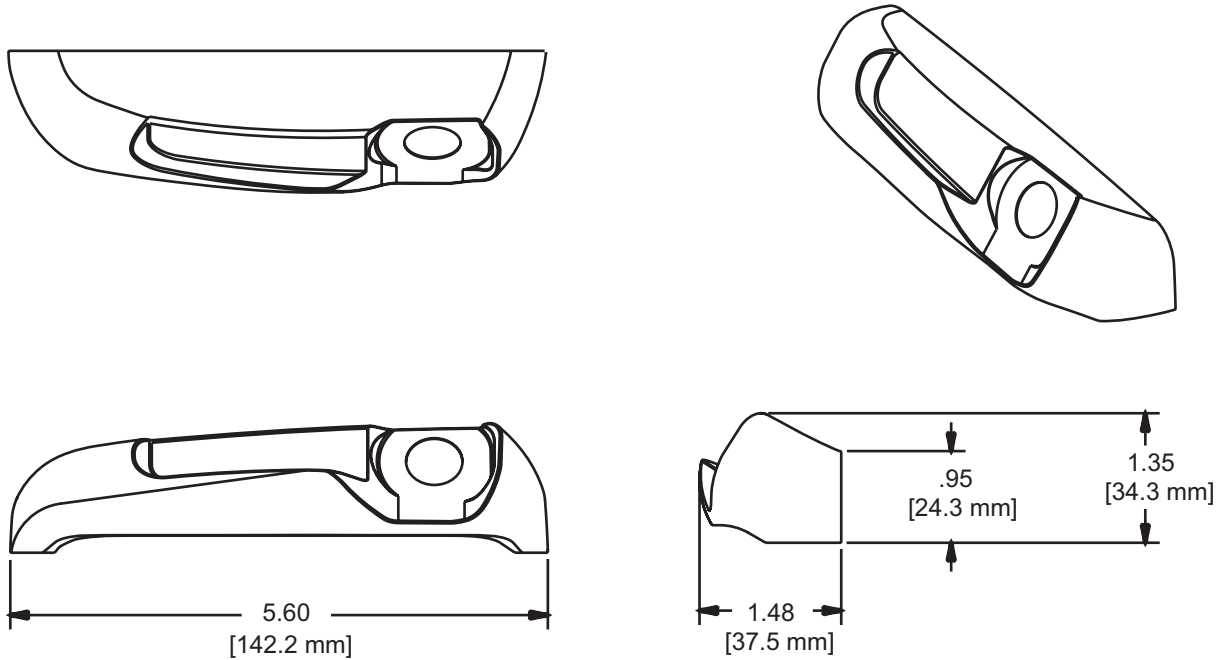


FIG. 6 MAXIM FOLDING HANDLE COVER 41211.XX (LH) (SHOWN) 41212.XX (RH)



NOTES:

1. FURNISHED WITH DOUBLE SIDED TAPE PRE-APPLIED TO COVER FOR ATTACHING COVER TO MAXIM OPERATOR.

Hardware Comparison for NAFS Casement Window Hardware Load Test

North American Fenestration Standard (ANSI/AAMA/WDMA 101/1.S.2/NAFS-02)

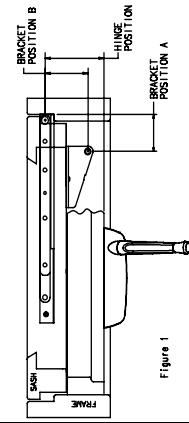
CAUTION: There are many factors in addition to the hardware which influence the maximum size casement window that should be produced. These include sash and frame stiffness and strength, screw holding strength, sash sag, weather-tightness, and weatherstrip drag. For this reason, Truth recommends careful evaluation of the entire window before producing units as large as this matrix suggests.

Performance Class R: The Maximum Frame Size and Sash Weight are Listed in the Table.

Performance Classes LC, C, HC, AW: The Maximum Frame Area (Width x Height) Listed in the Table Must be Reduced by 20%.

Operator	Hinge										Approx. Minimum Frame Width to Fit Operator
	Maxim Washable 14.97 14.92	Maxim Egress 14.12 14.13	10" Standard 14.75 14.80 14.05 14.19	10" Washable 14.76 14.91 14.06	10" Egress 14.77 14.93	10" HP Concealed 14.96	10" HP Concealed Egress 14.00	Butt Hinge			
Maxim Dual Arm	50.00	40"W x 84"H, 108"(99) lbs	32"W x 64"H, 85 lbs	32"W x 72"H, 73 lbs	32"W x 68"H, 69 lbs	38"W x 78"H, 95 lbs	32"W x 68"H, 69 lbs	Not Recommended	Not Recommended	24"	
Maxim Dyad	50.50	32"W x 72"H, 73"(55) lbs	24"W x 64"H, 47 lbs	24"W x 60"H, 45 lbs	Not Recommended	28"W x 69"H, 49"(44) lbs	Not Recommended	Not Recommended	Not Recommended	16"	
Maxim Reverse Dyad	50.70	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	12"	
Maxim Single Arm	52.01	Not Recommended	32"W x 70"H, 71"(36) lbs	32"W x 70"H, 71"(29) lbs	32"W x 72"H, 73 lbs	32"W x 70"H, 71"(36) lbs	32"W x 72"H, 73 lbs	32"W x 69"H, 65 lbs	30"W x 69"H, 65 lbs	20"	
Maxim Short Single Arm	52.06	Not Recommended	Not Recommended	Not Recommended	22"W x 63"H, 42 lbs	Not Recommended	22"W x 63"H, 42 lbs	20"W x 60"H, 42 lbs	20"W x 60"H, 36 lbs	15"	
EntryGard Dual Arm	15.10	Not Recommended	32"W x 60"H, 60 lbs	32"W x 60"H, 60"(54) lbs	Not Recommended	32"W x 60"H, 60 lbs	Not Recommended	Not Recommended	Not Recommended	20"	
EntryGard Egress D.A.	15.15	Not Recommended	28"W x 60"H, 52 lbs	Not Recommended	28"W x 60"H, 52 lbs	Not Recommended	28"W x 60"H, 52 lbs	Not Recommended	Not Recommended	18"	
EntryGard Dyad	15.11	Not Recommended	22"W x 61"H, 49 lbs	24"W x 67"H, 49 lbs	Not Recommended	30"W x 61"H, 57 lbs	Not Recommended	Not Recommended	Not Recommended	13"	
EntryGard Single Arm	15.94	Not Recommended	22"W x 62"H, 42 lbs	Not Recommended	22"W x 62"H, 42 lbs	22"W x 61"H, 40 lbs	22"W x 62"H, 42 lbs	22"W x 61"H, 36 lbs	22"W x 61"H, 36 lbs	16" - 18" †	
13.5" Single Arm	15.32	Not Recommended	26"W x 67"H, 54"(50) lbs	26"W x 69"H, 55"(41) lbs	26"W x 65"H, 52 lbs	26"W x 67"H, 54"(50) lbs	26"W x 65"H, 52 lbs	24"W x 64"H, 47 lbs	24"W x 64"H, 47 lbs	22" - 24" †	
9.5" Single Arm	15.31	Not Recommended	24"W x 61"H, 45"(27) lbs	24"W x 62"H, 45"(19) lbs	24"W x 65"H, 48 lbs	24"W x 61"H, 45"(27) lbs	24"W x 65"H, 48 lbs	22"W x 65"H, 43 lbs	22"W x 65"H, 43 lbs	18" - 20" †	
7.5" Single Arm	15.56	Not Recommended	Not Recommended	Not Recommended	22"W x 63"H, 42 lbs	Not Recommended	22"W x 63"H, 42 lbs	20"W x 65"H, 39 lbs	20"W x 65"H, 39 lbs	16"	
6" Single Arm	15.39	Not Recommended	18"W x 66"H, 35 lbs	Not Recommended	18"W x 66"H, 35 lbs	Not Recommended	18"W x 66"H, 35 lbs	16"W x 70"H, 33 lbs	16"W x 70"H, 33 lbs	15"	
Split Arm	15.18	Not Recommended	24"W x 70"H, 52 lbs	24"W x 64"H, 47 lbs	Not Recommended	30"W x 64"H, 60"(56) lbs	Not Recommended	Not Recommended	Not Recommended	16"	
23 Series Single Arm 13.5"	23.03	Not Recommended	26"W x 67"H, 57 lbs	24"W x 71"H, 57"(43) lbs	26"W x 66"H, 53 lbs	26"W x 67"H, 57 lbs	26"W x 66"H, 53 lbs	26"W x 62"H, 50 lbs	26"W x 62"H, 50 lbs	22" - 24" †	
23 Series Single Arm 9.5"	23.01	Not Recommended	24"W x 65"H, 51 lbs	24"W x 66"H, 48"(22) lbs	24"W x 69"H, 51 lbs	24"W x 65"H, 48"(31) lbs	24"W x 69"H, 51 lbs	24"W x 69"H, 50 lbs	24"W x 69"H, 50 lbs	18" - 20" †	
23 Series Single Arm 7.5"	23.38	Not Recommended	20"W x 60"H, 36 lbs	Not Recommended	22"W x 69"H, 46 lbs	Not Recommended	22"W x 69"H, 46 lbs	22"W x 68"H, 47 lbs	22"W x 68"H, 47 lbs	16"	
23 Series Single Arm 6"	23.78	Not Recommended	20"W x 60"H, 36 lbs	Not Recommended	20"W x 60"H, 36 lbs	Not Recommended	20"W x 60"H, 36 lbs	Not Recommended	Not Recommended	15"	
23 Series Dyad Short Link	23.46	30"W x 63"H, 59 lbs	Not Recommended	24"W x 68"H, 50 lbs	Not Recommended	28"W x 61"H, 53 lbs	Not Recommended	Not Recommended	Not Recommended	15"	
23 Series Dyad Long Link	23.32	32"W x 67"H, 68 lbs	Not Recommended	26"W x 62"H, 50 lbs	24"W x 67"H, 49 lbs	28"W x 66"H, 58 lbs	Not Recommended	Not Recommended	Not Recommended	19"	

Hinge	Typical Mounting Positions - Used for Hardware Comparison			
	Operator	Hinge Position	Bracket Position A	Bracket Position B
14 XX Concealed Hinges	Maxim Reverse Dyad	11,062	813	
	Other Maxim	1,750	1,563	
	EntryGard Dual Arm w/10" Washable Hinge	2,375	.875	Single Arm per catalog
	Other EntryGard Dual Arm Operators			
	EntryGard Dyad & Single Arm	1,375	1,563	
Traditional & Ellipse	2,125	2,437		
Butt Hinges	Maxim Reverse Dyad	11,062	2,437	Catalog Dim A=8,000
	EntryGard Single Arm	NA	NA	Catalog Dim A=4,000
	Maxim Single Arm			
	Traditional & Ellipse Single Arm	4,000	NA	Operator is fully open (arm against stop) at 90° window position.
	23 Series Single Arm	2,500		



The maximum window size, ease of operation, and service life are strongly influenced by hardware mounting positions (see Fig. 1 below).

Applications with dimensions larger than the typical mounting positions given above will not be able to support a window as large as that shown in this Table.

Applications with smaller dimensions may be able to support a larger window. Contact Truth for recommendations specific to your application.

* The first sash weight shown in the table is the maximum permitted for the AAMA Hardware Load Test. The sash weight shown in parenthesis is the maximum recommended by Truth to assure ease of operation.

** The Maxim Reverse Dyad Operator has been limited to use in windows 24" wide and narrower in order to ensure good performance near the closed position. In its full open position, it can support windows larger than those shown in the table.

† The smaller number applies when the operator is used with Egress hinges while the larger number applies when it is used with the 10" Standard or 10" High Performance hinge.

**MAXIM® AWNING
OPERATORS**



700 WEST BRIDGE STREET, OWATONNA, MN 55060 ■ 507.451.5620 800.866.7884 ■ TRUTH.COM



The Encore™ Operator from Truth Hardware – style and versatility all in one brand new package. Truth Hardware, the name synonymous with quality, reliability and innovation has once again proven why we are the leaders in the industry. The Encore family of operators, with all its features and benefits is arguably the industry’s best value in window hardware.

Engineered to incorporate all of the strength and performance characteristics of Truth’s Maxim® Series of operators, the Encore has been created to take window manufacturers to a level of differentiation that they have been searching for. Manufacturers will also appreciate the cost savings they will realize through standardization of operators and manufacturing efficiencies.

The Encore, from Truth Hardware, the beginning of a whole new show!

FULL-FLIP FOLDING HANDLE

- The new Encore folding handle offers a smoother, more contemporary, integrated look when nesting in the operator cover.
- This system is uniquely designed to prevent handle collapse during operation.
- The streamlined design allows for easy screen release without removing the crank handle.
- Interference with window treatments such as curtains and blinds is also greatly reduced.

REMOVABLE “SNAP-FIT” COVER

The removable cover design has numerous advantages to the manufacturer and the homeowner alike.

- The window manufacturer will notice the reduced inventory costs by allowing non-color specific operators to be stocked.
- An integrated snap-fit feature allows fastenerless cover attachment offering the product a cleaner look, and removes easily for painting and staining of the window.
- This product opens the door to additional cover and handle design possibilities that will soon be available.
- The manufacturer can also take advantage of the possibility for unique cover designs to help them personalize and differentiate their window line.



Encore™ Dual Arm Operator with Tango™ Series Handle & Cover option shown



- Plated finishes are less expensive and more durable.
- Installation of both the cover and handle after the home is completed helps eliminate damage during construction.

SMALLER SEALABLE HOUSING/GASKET

Designed to drop in the same location as Truth’s Maxim System, the Encore Operator’s streamlined design helps:

- Reduce water/air infiltration and eliminates need for caulking.
- Minimize mounting surface damage in punching or routing of operator cut-out.
- Create a more stable mounting surface and improves seal endurance with its overlapping lip design.
- Enclosed gear train keeps dirt and construction debris out of the operator for smoother operation and longer life.

STANDARDIZATION OF PRODUCT & PROCESSES

- Allows manufacturer to use same operator mounting location on every window size whether it be a small window with a dyad operator or a

larger window with a dual arm, thus helping to reduce manufacturing and inventory costs.

- Dual arm is specially designed to support both washability and egress applications while mounted in a consistent location.

- Brackets and track have been standardized and include features designed to reduce installation time.

ENCORE IS BASED ON MAXIM MECHANICALS

- 33% less effort to operate than EntryGard style operators
- Provides “Maxim-size” large window operation
- Allows larger applications to meet ADA requirements
- Certified to meet AAMA 901-07 cycle test at commercial rating
- Based on application, the Maxim and Encore systems provide reduced sash play - thus reducing the tendency of the window to “walk” in buffeting wind conditions when compared to EntryGard® and similar style operators.
- Time proven design.

LOW PROFILE AND REAR MOUNT OPERATOR STYLES AVAILABLE

Designed to fit a wider range of profiles and window types, Truth's Encore Operators design options greatly increase the mounting stability of the system.

While sill mounting is standard, dual-axis mounting (sill and rear mounting in same operator) is available on certain models for companies manufacturing both wood & vinyl windows. Other benefits include:

- Easily mounts to thin wall profiles such as fiberglass, aluminum, and steel
- Increases gasket compression resulting in enhanced water and air tightness on rear mount.

PRODUCT APPLICATION ASSISTANCE:

Truth Hardware has prepared a matrix based on AAMA 101 Load Tests which will help you choose the best hardware for your window requirements. *The sizes and weights which Truth recommends throughout this catalog section are based upon "typical" mounting locations as outlined in the matrix on page 40hh.*

If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Technical Service Staff can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS:

Have you considered personalizing your window? Contact Truth for further details on how you can add your own "signature" to the Encore handle and cover.

WARRANTY: Protected under the terms of the "Truth Warranty for Window & Door Manufacturers & Authorized Distributors". Refer to Truth's Terms & Conditions for further details.

MATERIAL:

High-pressure die-cast zinc operator housing, crank handle and knob. Hardened steel drive worm and gear. High-quality plastic operator cover. 300 series stainless steel packages are available for most models.

CORROSION RESISTANCE:

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes. For coastal applications, Truth also has stainless steel packages available (see Tech Note #7).

FINISH:

Electrostatically applied, durable coatings in combination with our high quality molded plastic cover provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes – contact Truth for additional information on availability of these finishes on specific product lines (see Truth Tip #9).

RECOMMENDED SCREWS:

All Encore Operator components have been designed to use the same standardized screw style and size, please refer to the drawings for further details. Coating compatibility between the screws and the operator components is very important in order to optimize the corrosion resistance performance. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Operator base handing is determined by the window hinge side when viewed from the outside.
2. Handing of Encore Handle and cover is determined by the direction the handle points when in the nested position.
3. Encore's unique spline design will only accept Tango or Encore specific handle designs.
4. For accurate hardware placement, pre-drilling of the screw holes in the window profile is recommended.

5. For PVC and composite window applications, mounting screws should pass through two profile walls, or one wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

6. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

7. Rear mount back plate #21969.92 is designed for use on profiles up to .25" (6.35mm) thick. Contact Truth regarding back plates for thicker applications.

8. When operator is installed in high-rise applications over two stories, a Truth Limit Device, to restrict the amount of opening, is recommended. Contact Truth for wind load information.

9. A Spline Cap (#21306) is available to protect the operator splines from dirt and other windows from damage during shipping, installation, and final building construction.

10. Truth recommends that Snubbers be used on the hinge side on any casement window that has a tendency to bow outwardly at the center in the closed position. Adding Snubbers may increase the negative air pressure rating of a casement window.

11. Decorative plated finishes are not recommended for coastal or highly corrosive environments.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated.

Window operators will have removable cover with folding handle that nests in the operator cover when retracted. The operator must be constructed of E-Gard® coated components. High-pressure die-cast zinc operator base, crank handle and knob. Hardened steel drive worm and gear. High-strength plastic operator cover.

Window Operators shall be Encore™ Series Operators as manufactured by Truth Hardware, Owatonna, MN.



ENCORE™ DUAL ARM OPERATOR

Drawings begin on pg. 26d

- Provides for egress or washability with the same operator in the same location thereby minimizing sill cover inventory.
- Operates sash sizes up to 24" to 40" wide, and 84" high and weighing up to 108 lbs. No need to change operators for standard and custom-sized windows.
- Encore Dual Arm provides over 7" of washability with the standard Maxim® 13" hinge and is compatible with Truth's standard 10" hinge, with reduced washability.
- Encore Dual Arm and Dyad Operators share standardized bracket and mounting location reducing inventory and manufacturing complexities.

ORDERING INFORMATION:

1. Specify "standard" or "coastal" package.
 2. Order item number:
#50.10 or
#50.11 (low profile) or
#50.12 (rear-mount)
 3. Specify finish number.
 4. Specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).
 5. Select mounting hardware (sold separately).
#12510.XX LH Bracket
#12511.XX – RH Bracket, or
#11661.XX – LH Bracket (low profile)
#11662.XX – RH Bracket (low profile)
- NOTE:** Handing of Brackets does not necessarily match handing of Operator

– refer to table within application drawing page, or contact Truth's Technical Service Department for further information.

Optional brackets for unique profile applications are available – see Truth's Stud Bracket & Track section, or contact Truth Hardware for further details.

- #11576.XX – Track & Slider, or
- #32384.92 – Low profile track

Tango™ Style Cover & Handle pack (handed*)

- #12614.XX – Left-hand
- #12616.XX – Right-hand

***NOTE:** Handle & cover handing is determined by direction the handle points in the nested position.

Optional accessories:

- #32658 – Gasket
- #31883 – Gasket Applicator
- #21969.92 – Backplate (required for Rear mount options)
- #21306 – Protective red plastic spline cap.



ENCORE™ DYAD OPERATOR

Drawings begin on pg. 26l

- Designed for narrow windows, but will operate a frame width from 16" to 32", and up to 72" high and a sash weight of 55 lbs.
- Fits in all profiles currently using the EntryGard® or Maxim® Dyad operators.
- Encore Dyad provides over 7" of washability with the standard Maxim® 13" hinge and is compatible with Truth's standard 10" hinge, with reduced washability.
- Provides over 7" of washability with standard Maxim® Hinge.

ORDERING INFORMATION:

1. Specify "standard" or "coastal" package.
2. Order item number:
#50.60 or
#50.61 (low profile) or
#50.62 (rear-mount)
3. Specify finish number.
4. specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).
5. Select mounting hardware (sold separately).
#12510.XX – LH Bracket
#12511.XX – RH Bracket, or
#11661.XX – LH Bracket (low profile)
#11662.XX – RH Bracket (low profile)

NOTE: Handing of Brackets does not necessarily match handing of Operator – refer to table within application drawing page, or contact Truth's Technical Service Department for further information.

Optional brackets for unique profile applications are available – see Truth's Stud Bracket & Track section, or contact Truth Hardware for further details.

Tango™ Style Cover & Handle pack (handed*)

- #12614.XX – Left-hand
- #12616.XX – Right-hand

***NOTE:** Handle & cover handing is determined by direction the handle points in the nested position.

Optional accessories:

- #32658 – Gasket
- #31883 – Gasket Applicator
- #21969.92 – Backplate (required for Rear mount options)
- #21306 – Protective red plastic spline cap.



ENCORE™ REVERSE DYAD OPERATOR

Drawings begin on pg. 26r

- Uniquely designed for narrow windows and specialty windows like round tops, half round, trapezoid, garden, octagon and windows that require Butt Hinges.
- Will work on frame widths down to a minimum of 12" depending upon the thickness of the frame.
- Uses a non-handed bracket which will help reduce inventory issues.

ORDERING INFORMATION:

1. Specify "standard" or "coastal" package.
2. Order item number:
#50.80 or
#50.81 (low profile) or
#50.82 (rear-mount)
3. Specify finish number.
4. Specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).
5. Select mounting hardware (sold separately).

#11674.XX – Non-Handed Bracket
Optional brackets for unique profile applications are available – see Truth's Stud Bracket & Track section, or contact Truth Hardware for further details.

Tango™ Style Cover & Handle pack (handed*)

- #12614.XX** – Left-hand
- #12616.XX** – Right-hand

***NOTE:** Handle & cover handing is determined by direction the handle points in the nested position.

Optional accessories:

- #32658** – Gasket
- #31883** – Gasket Applicator
- #21969.92** – Backplate (required for Rear mount options)
- #21306** – Protective red plastic spline cap.



ENCORE™ SINGLE ARM OPERATOR

Drawings begin on pg. 26x

- Created for casements which are 20"-32" wide up to 72" high and with a 73lb. sash weight.
- Fits in all profiles currently using the EntryGard® or Maxim® Single Arm operators.

ORDERING INFORMATION:

1. Specify "standard" or "coastal" package.
 2. Order item number:
#52.11 or
#52.13 (low profile)
- Note:** Rear-mount version available upon request.
3. Specify finish number.
 4. Specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).
 5. Select mounting hardware (sold separately).

- #11576.XX** – Track & Slider, or
- #30175** – Low profile track

Tango™ Style Cover & Handle pack (handed*)

- #12614.XX** – Left-hand
- #12616.XX** – Right-hand

***NOTE:** Handle & cover handing is determined by direction the handle points in the nested position.

Optional accessories:

- #32658** – Gasket
- #31883** – Gasket Applicator
- #21306** – Protective red plastic spline cap.



ENCORE™ AWNING OPERATORS

Drawings begin on pg. 26ee and 26hh

- Allows the manufacturer to offer the same look throughout the home on both casements and awnings.
- Will provide for maximum opening combined with wide "pull-in" connection to sash.
- Operates frame widths from 20" to 60", reducing inventory requirements for operator sizes.
- New narrow gauge version (#51.13) fits smaller cavity profiles and smaller window sizes.
- "Quick disconnect" feature on operator arms does not require tools.

ORDERING INFORMATION:

1. Specify "standard" or "coastal" package.
2. Order Operator item number:
#51.10 or
#51.12 (rear-mount) or
#51.11 (narrow awning)
3. Specify finish number.
4. Select mounting hardware (sold separately).

#11577.XX – Track and Pivot Slides
Tango™ Style Cover & Handle pack (handed*)

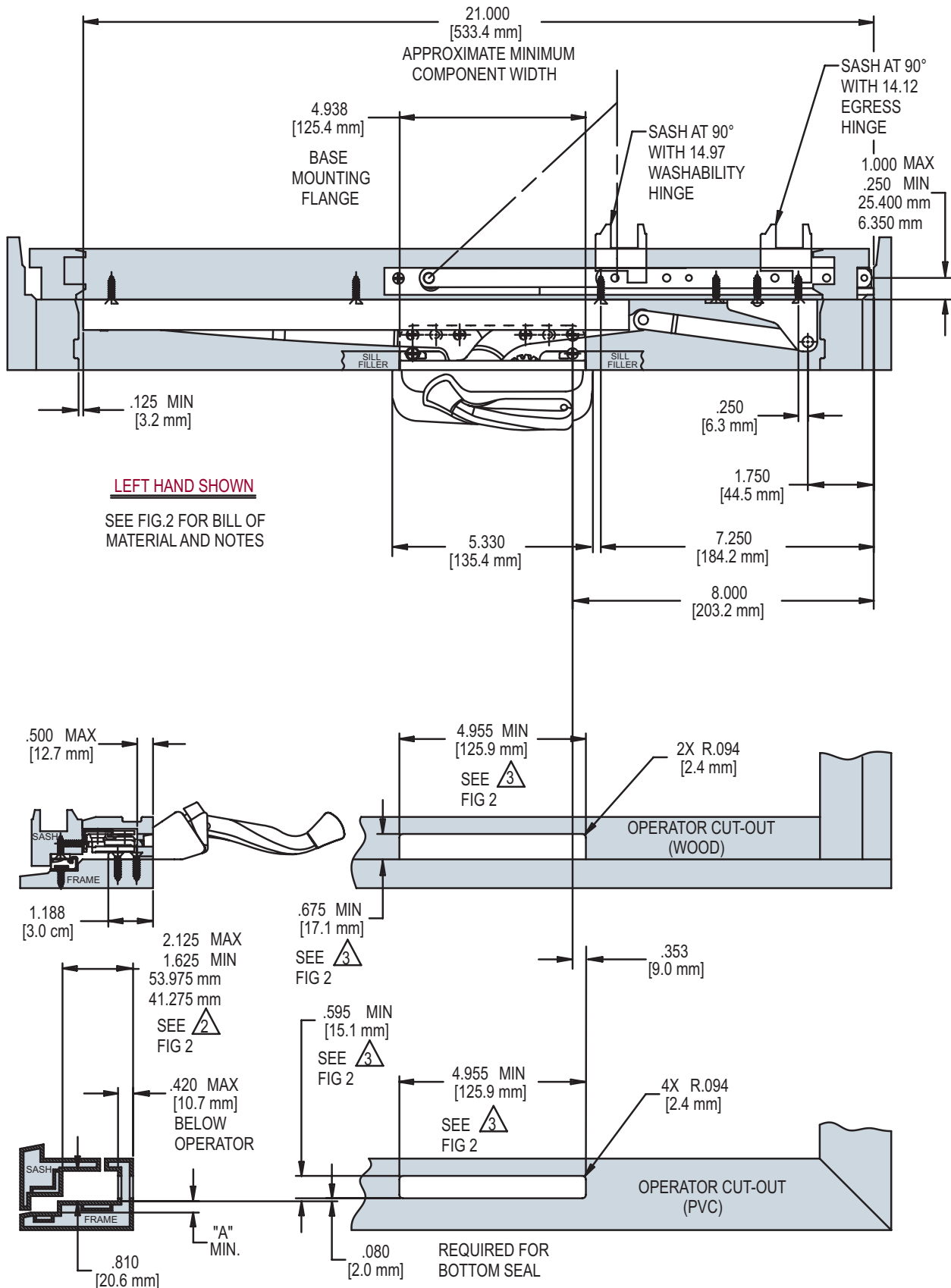
- #12614.XX** – Left-hand

***NOTE:** Handle & cover handing is determined by direction the handle points in the nested position.

Optional accessories:

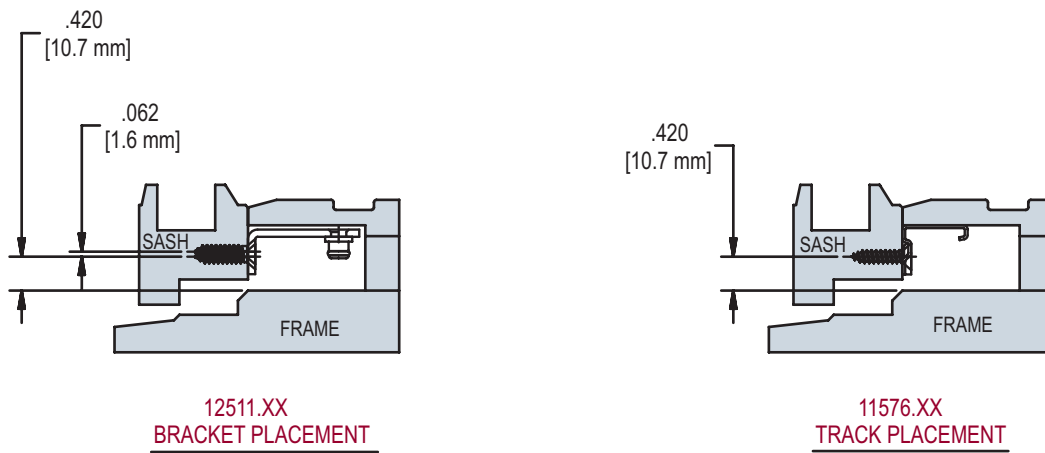
- #32658** – Gasket
- #31883** – Gasket Applicator
- #21969.92** – Backplate (required for Rear mount options)
- #21306** – Protective red plastic spline cap.

FIG. 1 APPLICATION OF ENCORE DUAL ARM OPERATOR (SILL MOUNT VERSION)



ENCORE™ DUAL ARM OPERATOR (SILL MOUNT)

FIG. 2 APPLICATION OF ENCORE DUAL ARM OPERATOR CONTINUED (SILL MOUNT VERSION)



HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1

PART NUMBER	DESCRIPTION
50.10.00.011	DUAL ARM OPERATOR
12511.XX	STUD BRACKET
11576.XX	TRACK ASSEMBLY
14.97.00.XXX	WASHABILITY HINGE
12614.XX	TANGO HANDLE/COVER PACK
32658	GASKET (PVC)

HINGE	"A"
14.97.00.XXX	.300 [7.6 mm]
14.12.00.XXX	
OTHER 14 SERIES CASEMENT HINGES	.250 [6.4 mm]

NOTES:

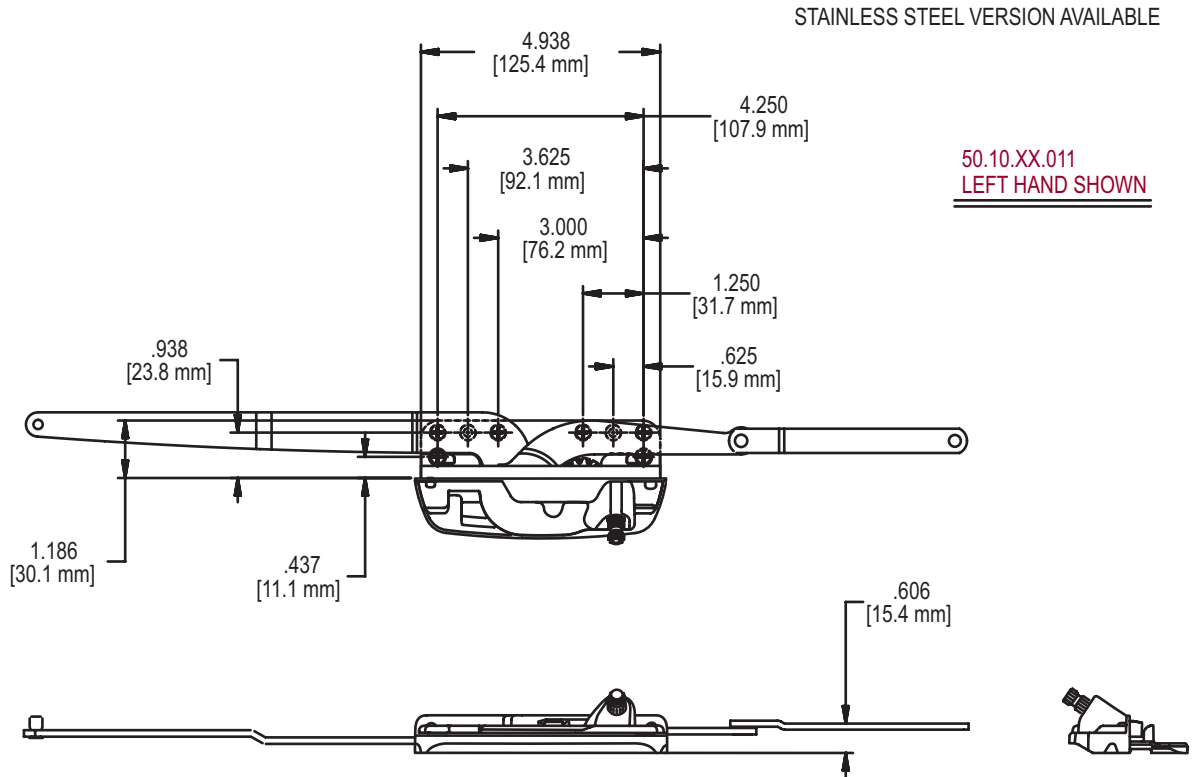
1. STUD BRACKET 12510.XX AND 12511.XX REQUIRES THE SAME MOUNTING LOCATION FOR BOTH THE ENCORE DUAL ARM OPERATOR AND THE ENCORE DYAD OPERATOR.

2. STUD BRACKET 12510.XX AND 12511.XX MAY NOT FIT IF 2.125/1.625 DIMENSION IS LESS THAN 1.875. CONTACT TRUTH FOR RECOMMENDATIONS.

3. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING

4. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

FIG. 3 ENCORE DUAL ARM OPERATOR (SILL MOUNT VERSION)

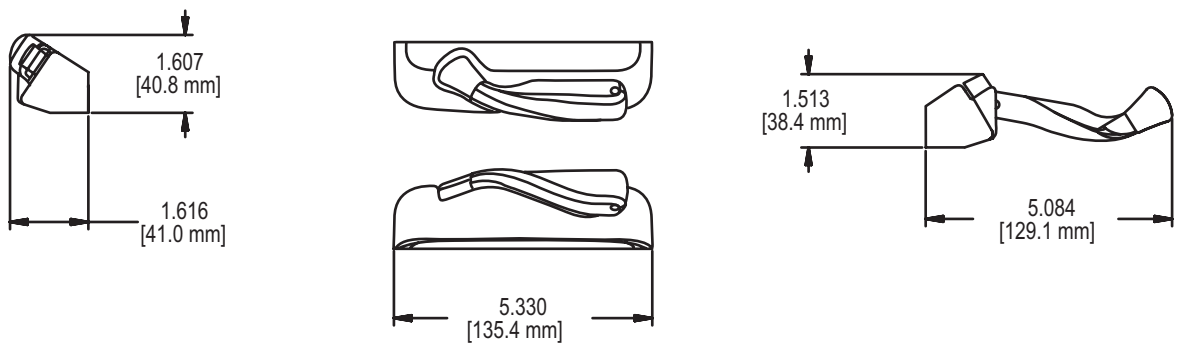


RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)FOR REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

FIG. 4 ENCORE TANGO HANDLE/COVER 12614.XX(LH) (SHOWN), 12616.XX(RH)



ENCORE™ DUAL ARM OPERATOR (SILL MOUNT)

FIG. 5 BACK PLATE 21969.92

FOR USE WITH
51.12 REAR MOUNT
VERSION ONLY

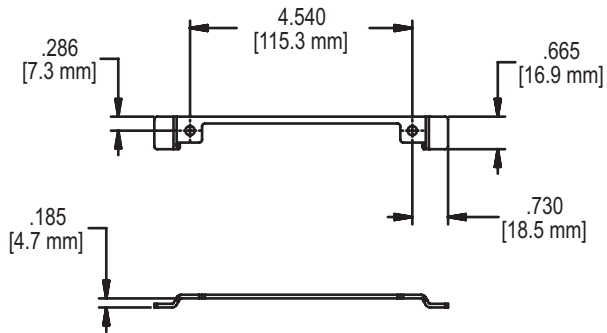
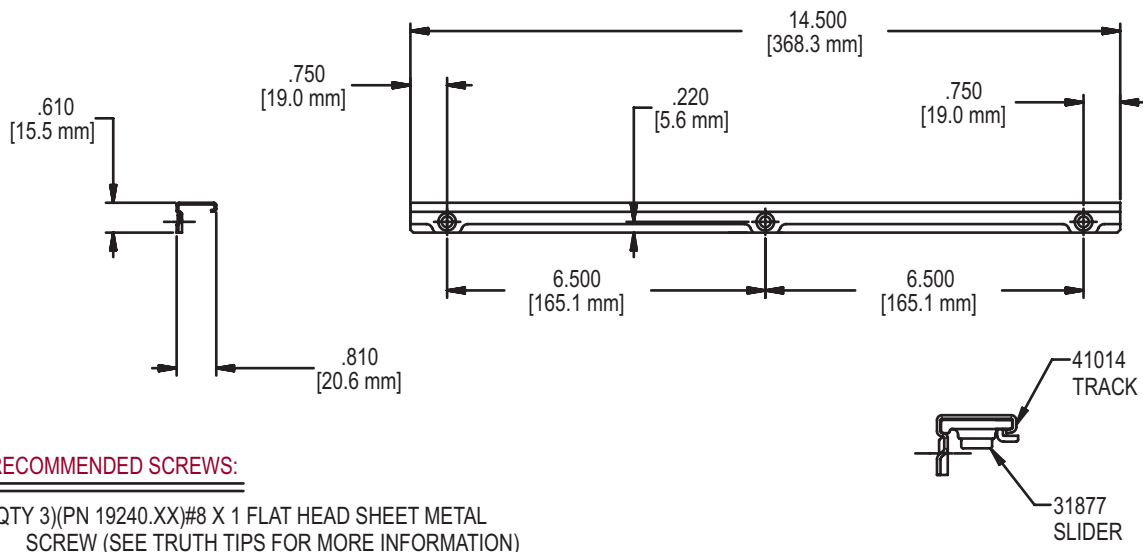


FIG. 6 TRACK & SLIDER ASSEMBLY 11576.XX

STAINLESS STEEL VERSION AVAILABLE



RECOMMENDED SCREWS:

(QTY 3)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

FIG. 7 STUD BRACKET 12511.XX(LH) (SHOWN) 12510.XX(RH)

STAINLESS STEEL VERSION AVAILABLE

HAND OF BRACKET DOES NOT
NECESSARILY MATCH HAND
OF OPERATOR

RECOMMENDED SCREWS:

(QTY 3)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

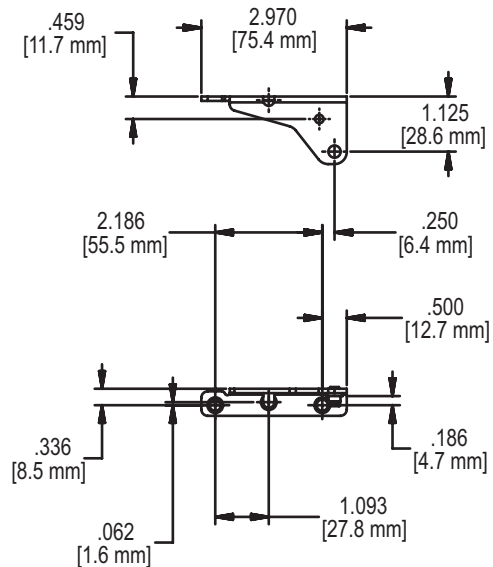
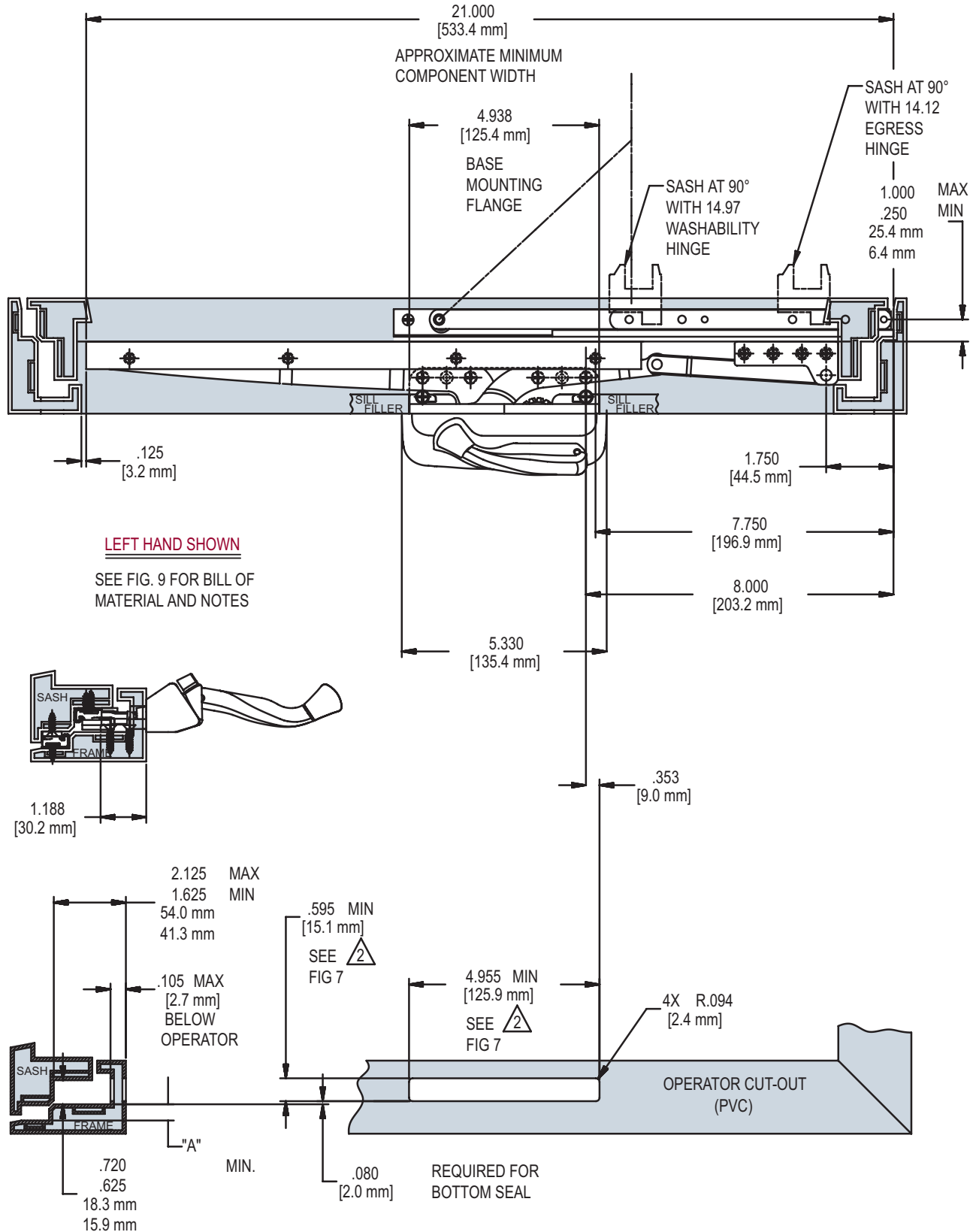
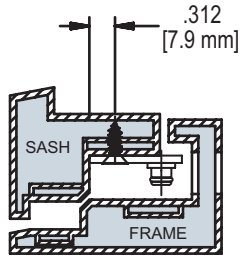


FIG. 8 APPLICATION OF ENCORE DUAL ARM OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)

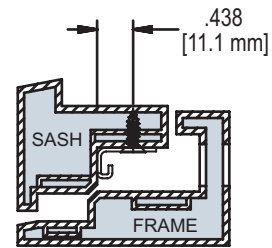


ENCORE™ DUAL ARM OPERATOR (LOW PROFILE)

FIG. 9 APPLICATION OF ENCORE DUAL ARM OPERATOR CONTINUED
(SILL MOUNT VERSION)
(LOW PROFILE)



11661.XX
BRACKET PLACEMENT



32384.XX
TRACK PLACEMENT

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.8	
PART NUMBER	DESCRIPTION
50.11.00.011	DUAL ARM OPERATOR
11661.XX	STUD BRACKET
32384.XX	TRACK
14.97.00.XXX	WASHABILITY HINGE
12614.XX	TANGO HANDLE/COVER PACK
32658	GASKET (PVC)

HINGE	"A"
14.97.00.XXX 14.12.00.XXX	.422 [10.7 mm]
OTHER 14 SERIES CASEMENT HINGES	.375 [9.5 mm]

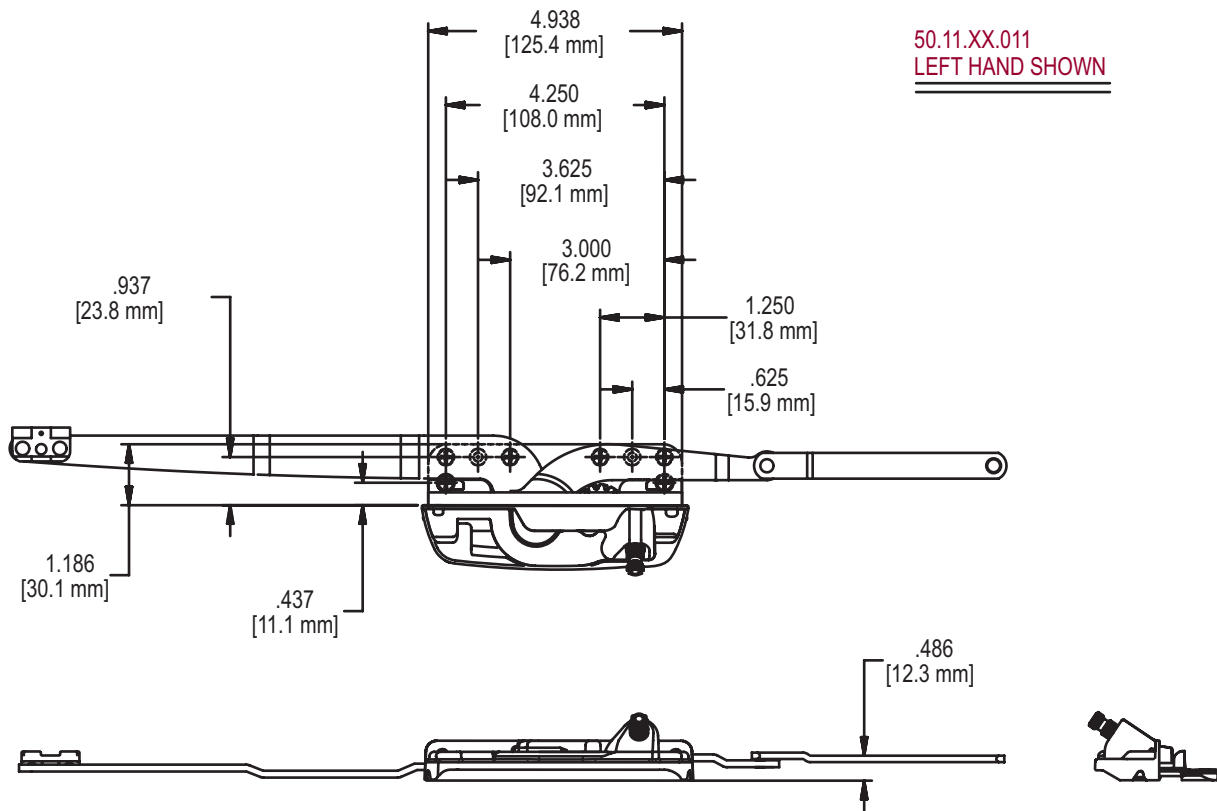
NOTES:

1. STUD BRACKET 11661.XX AND 11662.XX WILL BE PLACED IN THE SAME LOCATION FOR BOTH THE ENCORE DUAL ARM OPERATOR AND THE ENCORE DYAD OPERATOR.

2. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING.

3. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

FIG. 10 ENCORE DUAL ARM OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)

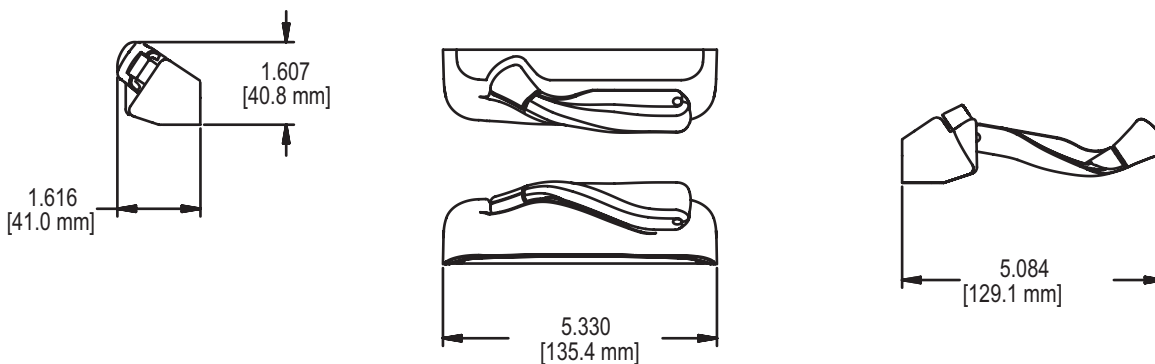


RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX) #8 X 1 FLAT HEAD SHEET METAL SCREWS (SEE TRUTH TIPS FOR MORE INFORMATION)

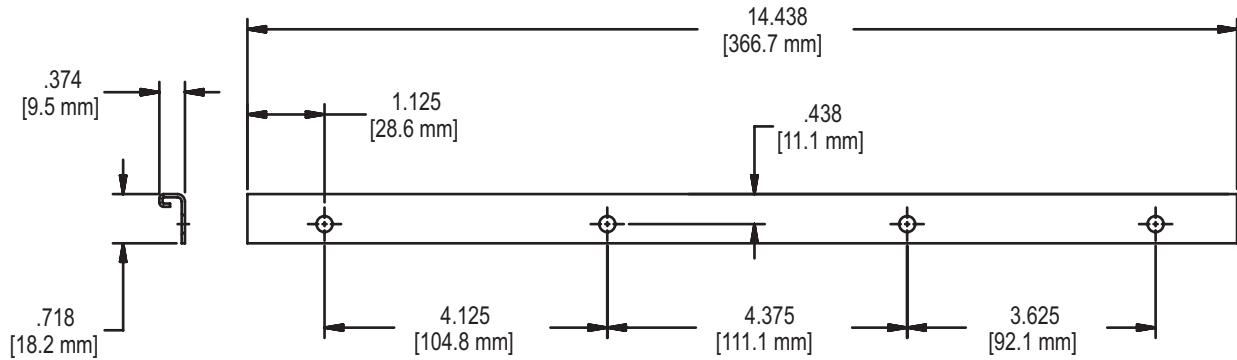
(QTY 2)REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

FIG. 11 ENCORE TANGO HANDLE/COVER 12614.XX(LH) (SHOWN), 12616.XX (RH)



ENCORE™ DUAL ARM OPERATOR (LOW PROFILE)

FIG. 12 TRACK 32384.XX

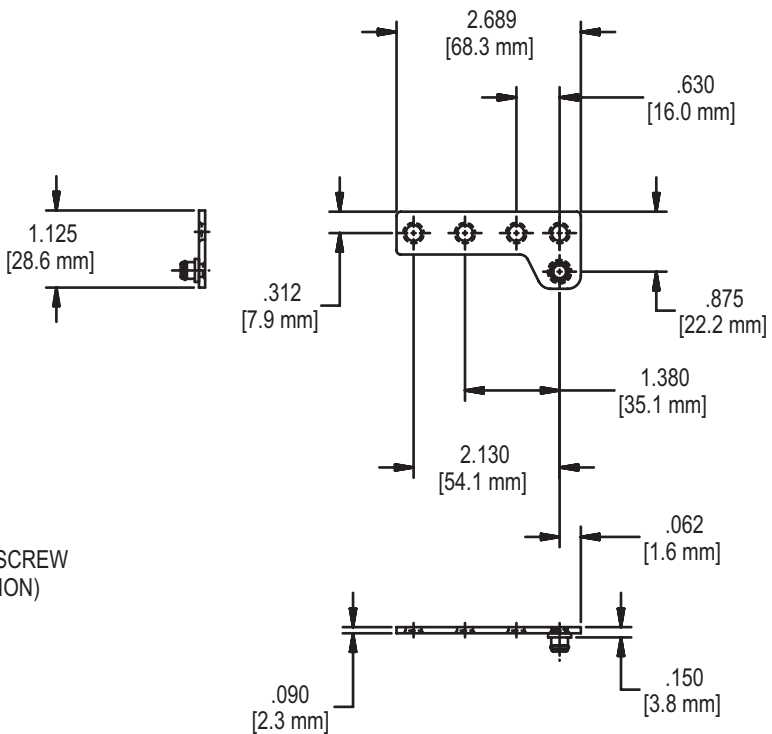


RECOMMENDED SCREWS:

(QTY 4)(PN 19070.XX) #7 X 1/2 FLAT HEAD UNDERCUT SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

FIG. 13 STUD BRACKET 11661.XX(LH) (SHOWN) 11662.XX(RH)

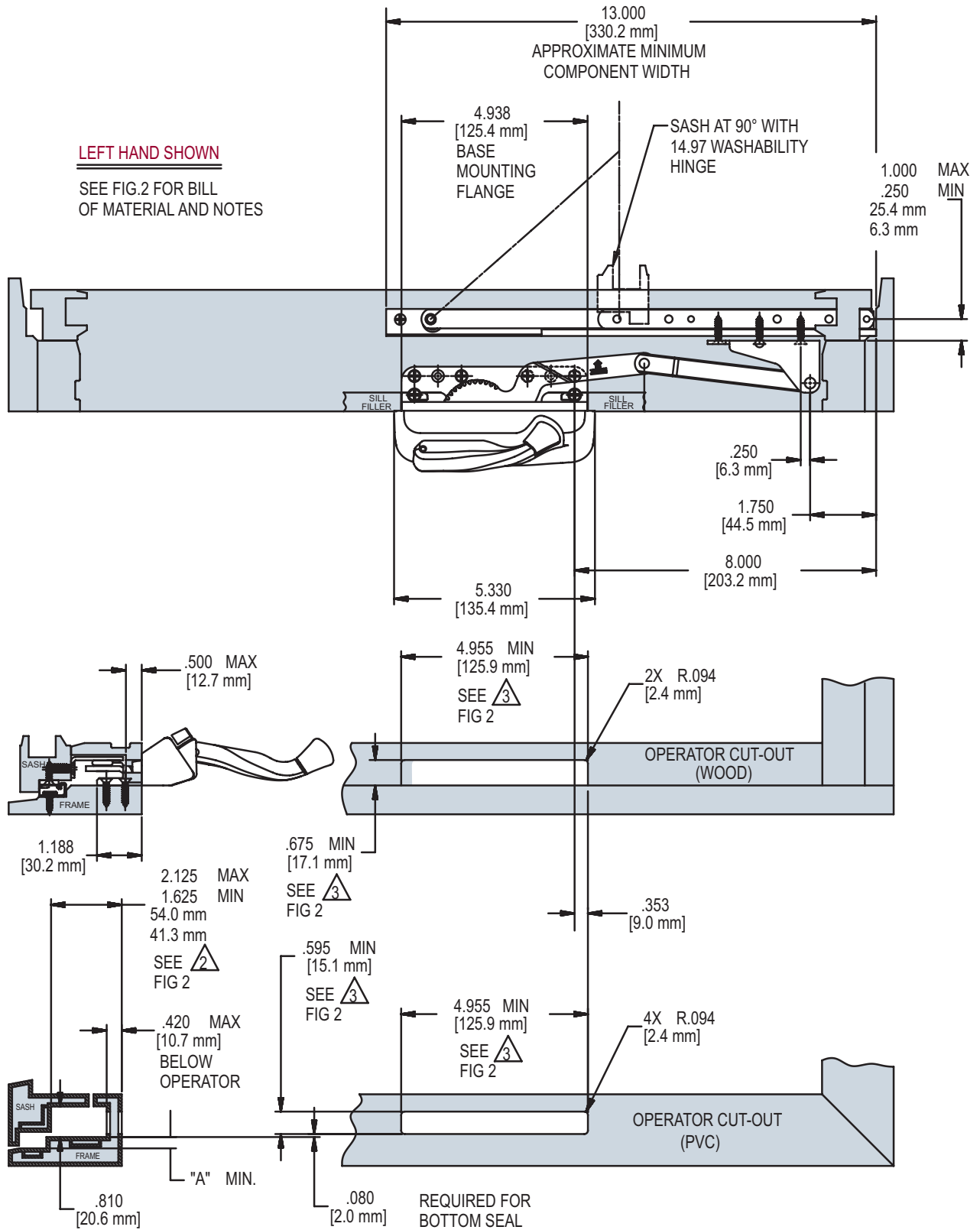
HAND OF BRACKET DOES NOT NECESSARILY MATCH HAND OF OPERATOR



RECOMMENDED SCREWS:

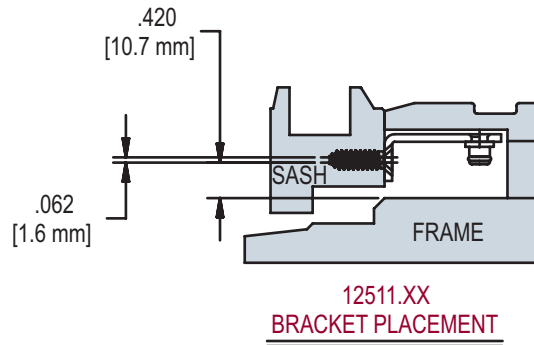
(QTY 4)(PN 19205.XX)#8 X 1/2 SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

**FIG. 1 APPLICATION OF ENCORE DYAD OPERATOR
(SILL MOUNT VERSION)**



ENCORE™ DYAD OPERATOR (SILL MOUNT)

FIG. 2 APPLICATION OF ENCORE DYAD OPERATOR CONTINUED (SILL MOUNT VERSION)



HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG. 1	
PART NUMBER	DESCRIPTION
50.60.00.011	DYAD OPERATOR
12511.XX	STUD BRACKET
14.97.00.XXX	WASHABILITY HINGE
12616.XX	TANGO HANDLE/COVER PACK
32658	GASKET (PVC)

HINGE	"A"
14.97.00.XXX	.300 [7.6 mm]
14.12.00.XXX	
OTHER 14 SERIES CASEMENT HINGE	.250 [6.4 mm]

NOTES:

1. STUD BRACKET 12510.XX AND 12511.XX REQUIRES THE SAME MOUNTING LOCATION FOR BOTH THE ENCORE DUAL ARM OPERATOR AND THE ENCORE DYAD OPERATOR.

2. STUD BRACKET 12510.XX AND 12511.XX MAY NOT FIT IF 2.125/1.625 DIMENSION (SEE FIG. 1) IS LESS THAN 1.875. CONTACT TRUTH FOR RECOMMENDATIONS.

3. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING.

4. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

5. HANDLE/COVER IS OPPOSITE HAND ON ENCORE DYAD OPERATORS. EXAMPLE: LH ENCORE DYAD OPERATORS REQUIRE RH HANDLE/COVER

**FIG. 3 ENCORE DYAD OPERATOR
(SILL MOUNT VERSION)**

STAINLESS STEEL VERSION AVAILABLE

50.60.XX.011 LEFT HAND SHOWN

50.62 REAR MOUNT
VERSION AVAILABLE

RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD
SHEET METAL SCREW (SEE TRUTH TIPS FOR
MORE INFORMATION)

(QTY 2)FOR REAR MOUNT:(PN 19545.XX)
#8-32 X 3/8 PAN HEAD MACHINE SCREW

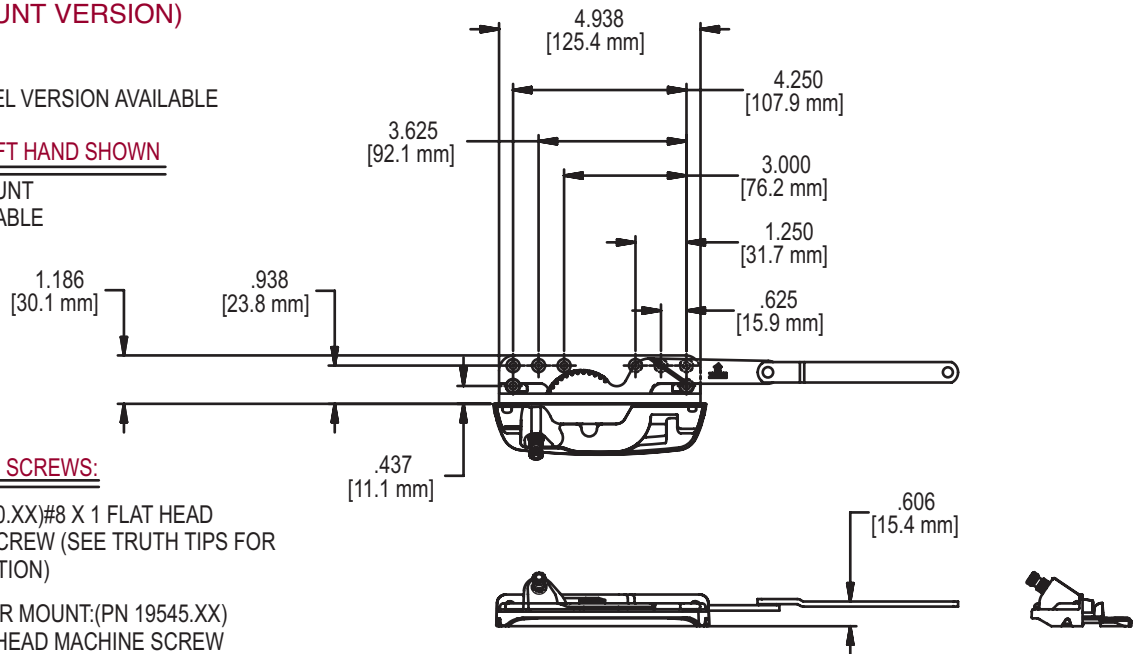


FIG. 4 ENCORE TANGO HANDLE/COVER 12616.XX(RH) (SHOWN) 12614.XX(LH)

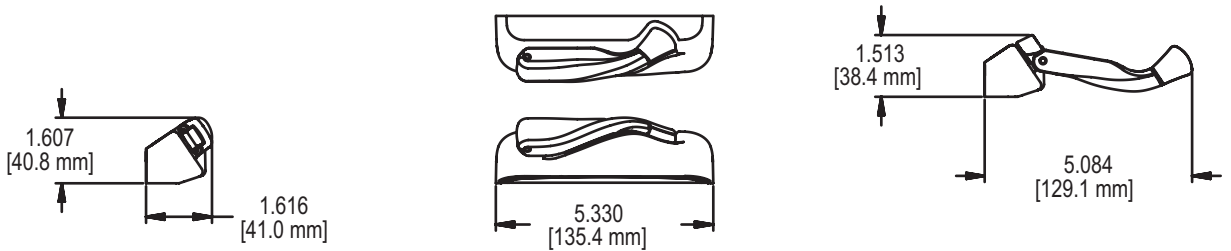


FIG. 5 BACK PLATE 21969.92

FOR USE WITH
50.62 REAR MOUNT
VERSION ONLY

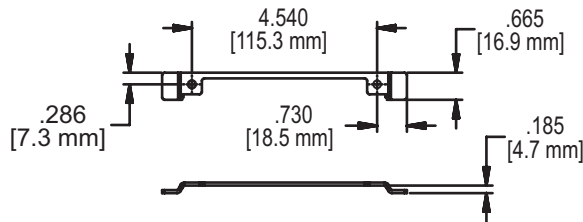


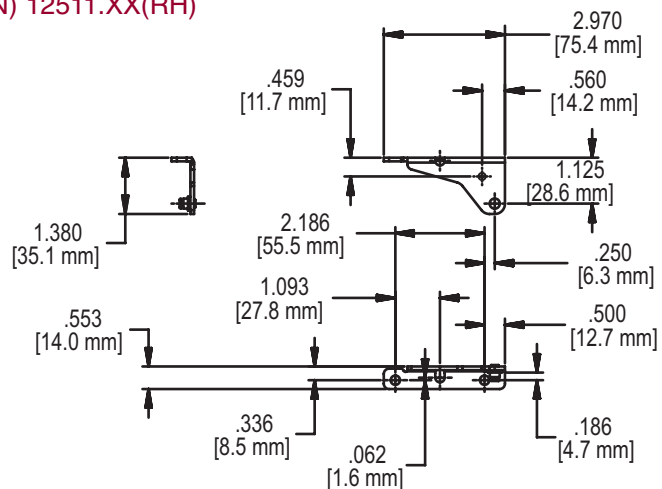
FIG. 6 STUD BRACKET 12510.XX(LH) (SHOWN) 12511.XX(RH)

STAINLESS STEEL VERSION AVAILABLE

HAND OF BRACKET DOES NOT NECESSARILY
MATCH HAND OF OPERATOR

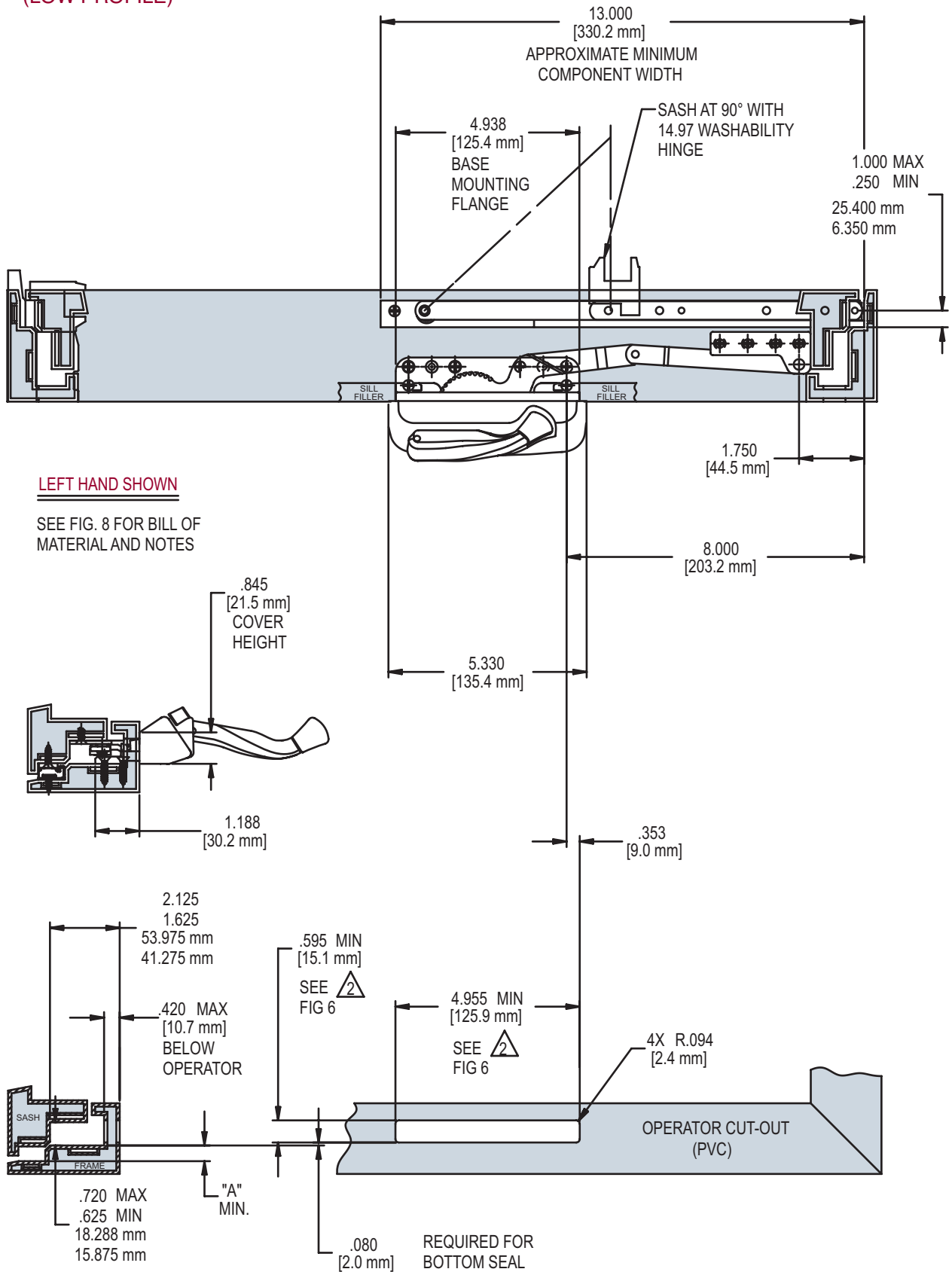
RECOMMENDED SCREWS:

(QTY 3)(PN 19240.XX)#8 X 1 FLAT
HEAD SHEET METAL SCREW (SEE TRUTH
TIPS FOR MORE INFORMATION)

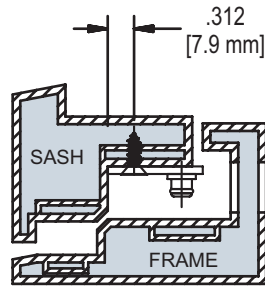


ENCORE™ DYAD OPERATOR (LOW PROFILE)

FIG. 7 APPLICATION OF ENCORE DYAD OPERATOR
(SILL MOUNT VERSION)
(LOW PROFILE)



**FIG. 8 APPLICATION OF ENCORE DYAD OPERATOR CONTINUED
(SILL MOUNT VERSION)
(LOW PROFILE)**




**11661.XX
BRACKET PLACEMENT**

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.7	
PART NUMBER	DESCRIPTION
50.61.00.XXX	DYAD OPERATOR
11661.XX	STUD BRACKET
14.97.00.XXX	WASHABILITY HINGE
12616.XX	TANGO HANDLE/COVER PACK
32658	GASKET (PVC)

HINGE	"A"
14.97.00.XXX	.422 [10.7 mm]
14.12.00.XXX	
OTHER 14 SERIES CASEMENT HINGES	.375 [9.5 mm]

NOTE:

1. ENCORE LOW PROFILE DYAD OPERATOR WITH 11661.XX L.H. OR 11662.XX R.H. STUD BRACKET REQUIRES THE SAME MOUNTING POSITION AS ENCORE LOW PROFILE DUAL ARM OPERATOR

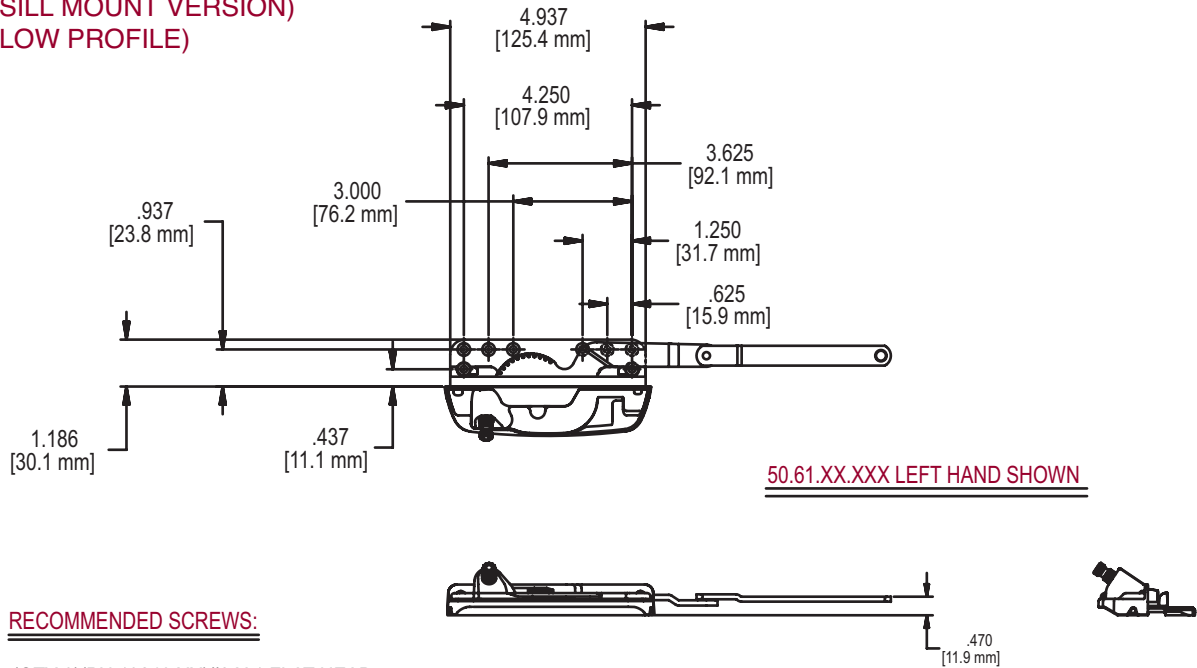
2.  HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING

3. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

4. HANDLE/COVER IS OPPOSITE HAND ON ENCORE DYAD OPERATORS. EXAMPLE: LH ENCORE DYAD OPERATORS REQUIRE RH HANDLE/COVER

ENCORE™ DYAD OPERATOR (LOW PROFILE)

FIG. 9 ENCORE DYAD OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)



RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

FIG. 10 ENCORE TANGO HANDLE/COVER 12616.XX(RH) (SHOWN) 12614.XX(LH)

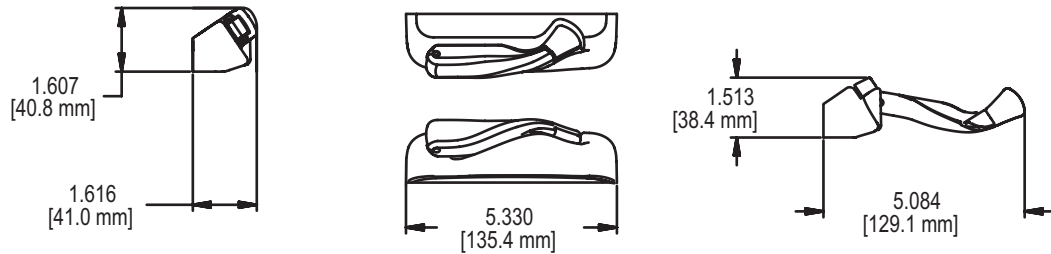


FIG. 11 STUD BRACKET 11661.XX(LH) (SHOWN) 11662.XX(RH)

HANDING OF BRACKET DOES NOT NECESSARILY MATCH HANDING OF OPERATOR

RECOMMENDED SCREWS:

(QTY 4)(PN 19205.XX)#8 X 1/2 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

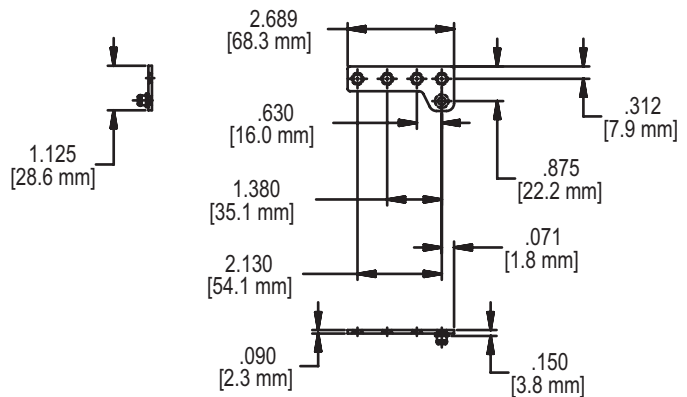
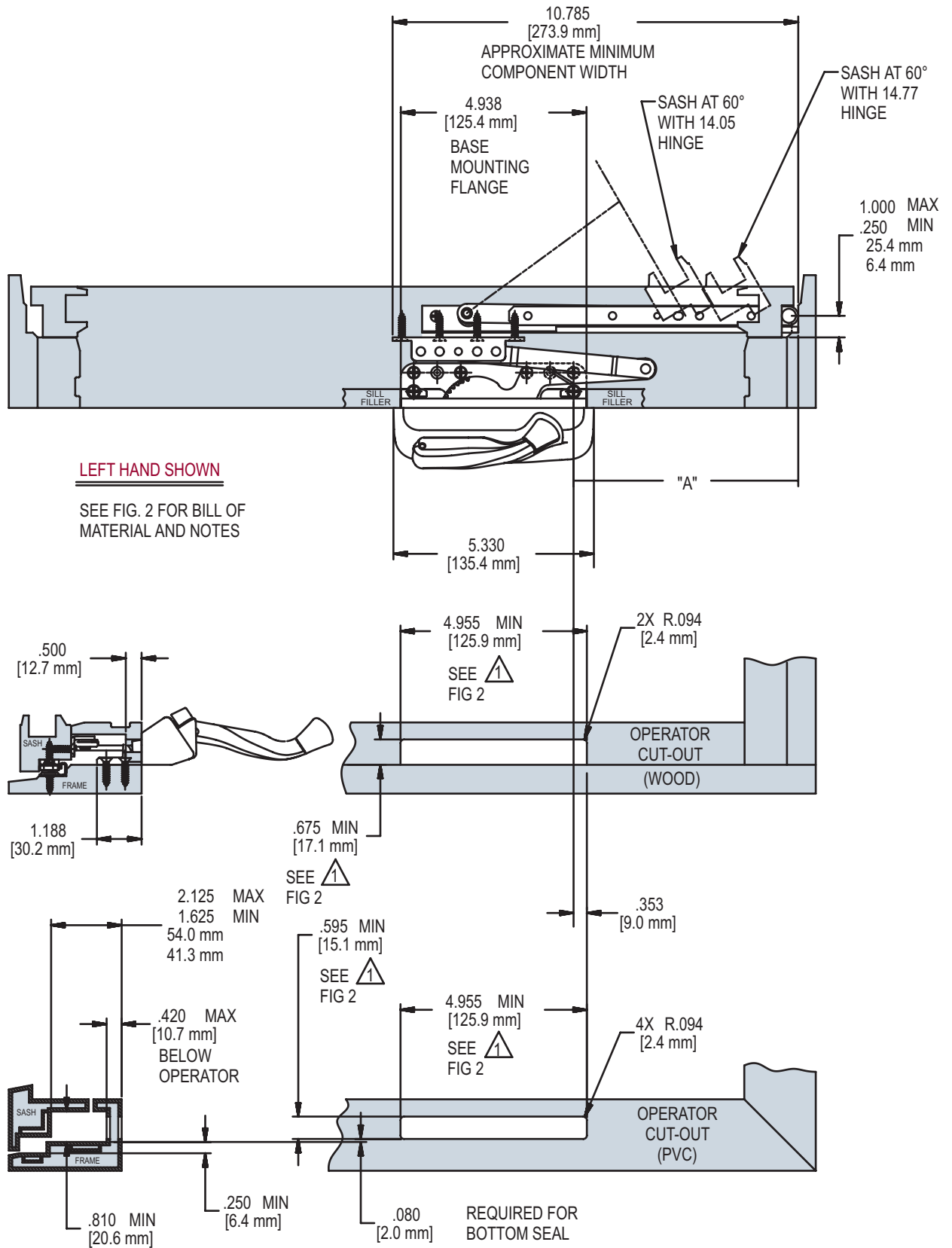
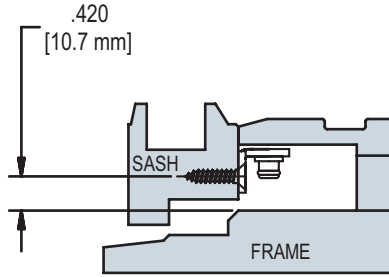


FIG. 1 APPLICATION OF ENCORE REVERSE DYAD OPERATOR (SILL MOUNT VERSION)

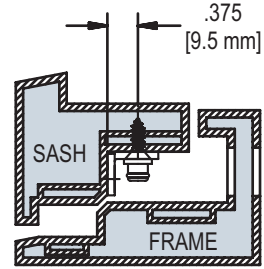


ENCORE™ REVERSE DYAD OPERATOR (SILL MOUNT)

FIG. 2 APPLICATION OF ENCORE REVERSE DYAD OPERATOR CONTINUED (SILL MOUNT VERSION)



11674.XX
BRACKET PLACEMENT



11674.XX
BRACKET PLACEMENT

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1	
PART NUMBER	DESCRIPTION
50.80.00.XXX	REVERSE DYAD OPERATOR
11674.XX	STUD BRACKET
14.05.00.XXX	HINGE
12616.XX	TANGO HANDLE/COVER PACK
32658	GASKET (PVC)

HINGE	"A"
14.05.00.XXX	5.973 [151.7 mm]
14.77.00.XXX	5.532 [140.5 mm]

NOTES:


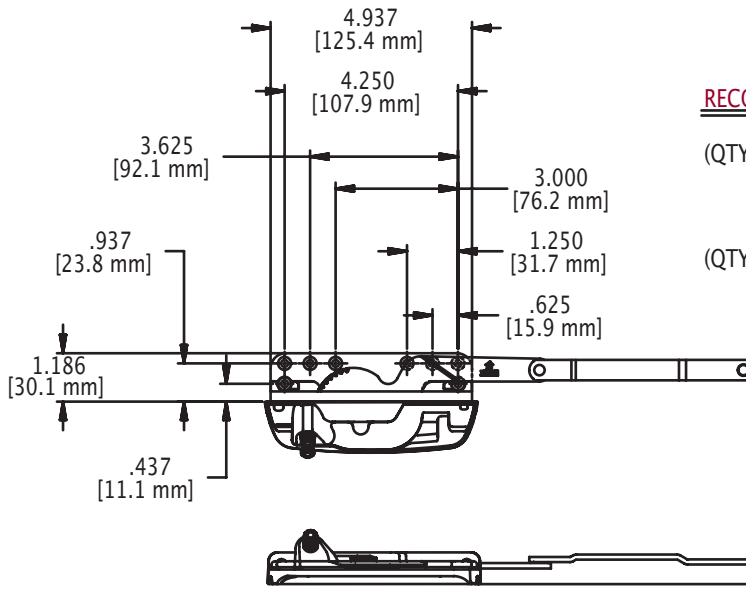
1.  HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING
2. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL
3. HANDLE/COVER PACK IS OPPOSITE HAND ON ENCORE DYAD OPERATOR. EXAMPLE: LH ENCORE REVERSE DYAD OPERATOR REQUIRES A RH HANDLE/COVER

FIG. 3 ENCORE REVERSE DYAD OPERATOR (SILL MOUNT VERSION)

STAINLESS STEEL VERSION AVAILABLE



RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)REAR MOUNT:8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

50.80.XX.011 LEFT HAND SHOWN

50.82 REAR MOUNT VERSION AVAILABLE

FIG. 4 ENCORE TANGO HANDLE/COVER 12616.XX(RH) (SHOWN) 12614.XX(LH)

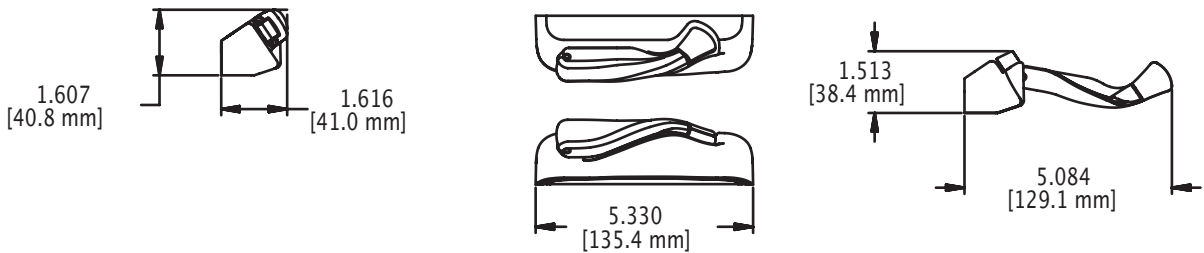


FIG. 5 BACK PLATE 21969.92

FOR USE WITH 50.82 REAR MOUNT VERSION ONLY

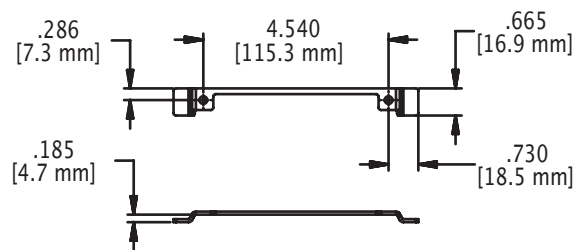
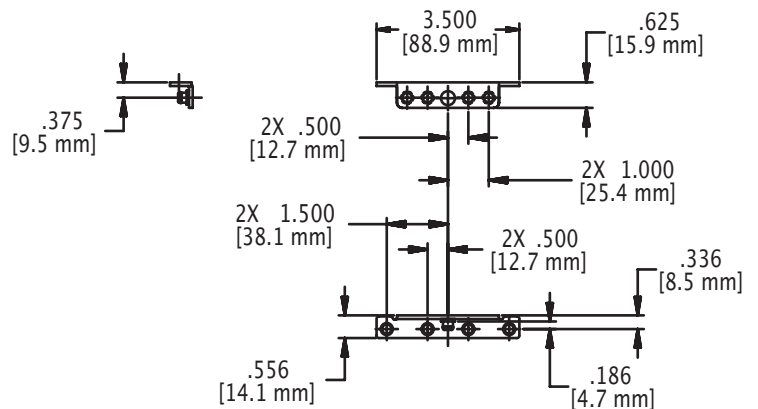


FIG. 6 STUD BRACKET 11674.XX(NON-HANDED)

STAINLESS STEEL VERSION AVAILABLE

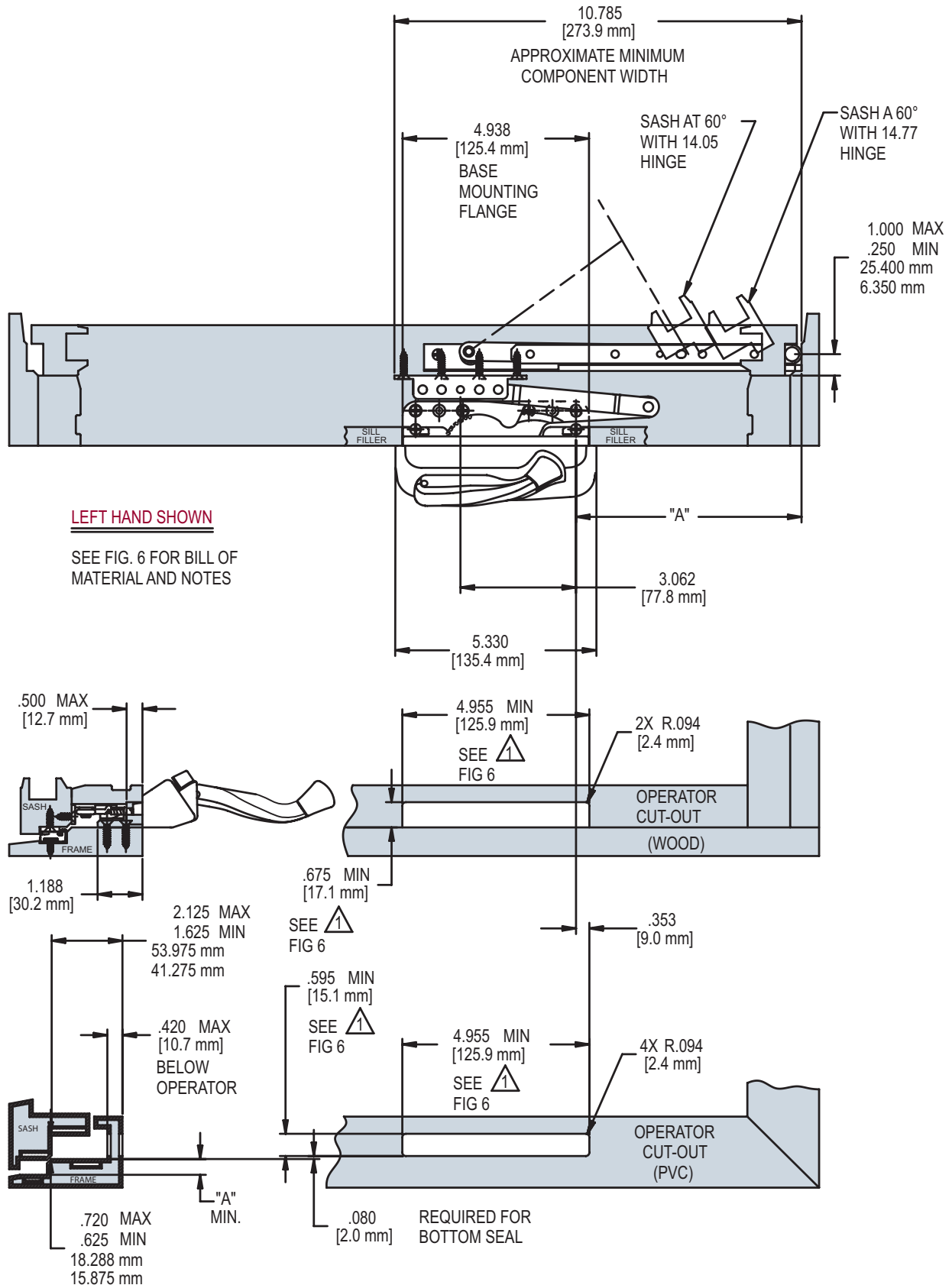


RECOMMENDED SCREWS:

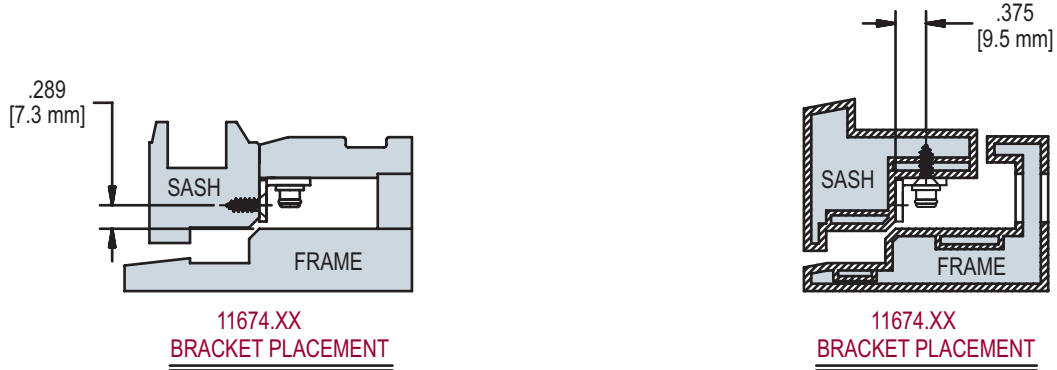
(QTY 4)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

ENCORE™ REVERSE DYAD OPERATOR (LOW PROFILE)

FIG. 7 APPLICATION OF ENCORE REVERSE DYAD OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)



**FIG. 8 APPLICATION OF ENCORE REVERSE DYAD OPERATOR CONTINUED
(SILL MOUNT VERSION)
(LOW PROFILE)**



HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG. 7	
PART NUMBER	DESCRIPTION
50.81.00.011	REVERSE DYAD OPERATOR
11674.XX	STUD BRACKET
14.05.00.XXX	HINGE
12616.XX	TANGO HANDLE/COVER PACK
32658	GASKET (PVC)

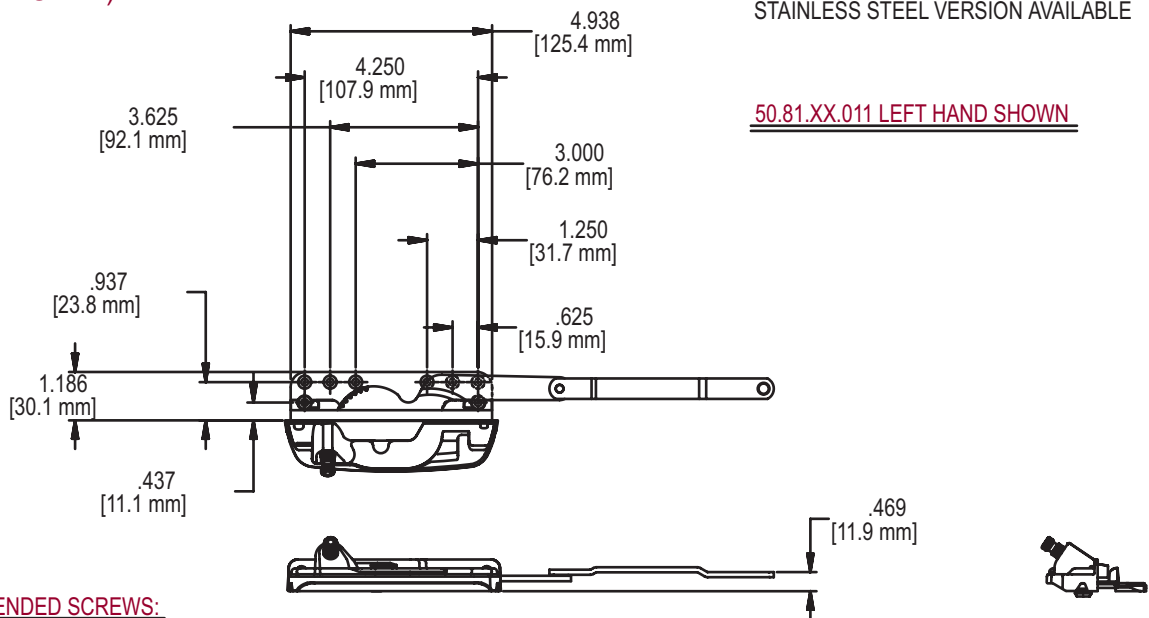
HINGE	"A"
14.05.00.XXX	5.973 [151.7 mm]
14.77.00.XXX	5.532 [140.5 mm]

NOTES:

1. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING.
2. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL
3. HANDLE/COVER PACK IS OPPOSITE HAND ON ENCORE DYAD OPERATOR. EXAMPLE: LH ENCORE REVERSE DYAD OPERATOR REQUIRES A RH HANDLE/COVER

ENCORE™ REVERSE DYAD OPERATOR (LOW PROFILE)

FIG. 9 ENCORE REVERSE DYAD OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)



RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

FIG. 10 ENCORE TANGO HANDLE/COVER 12616.XX(RH) (SHOWN) 12614.XX(LH)

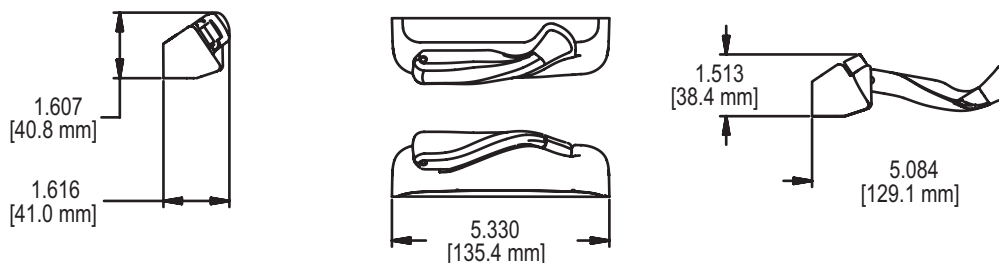
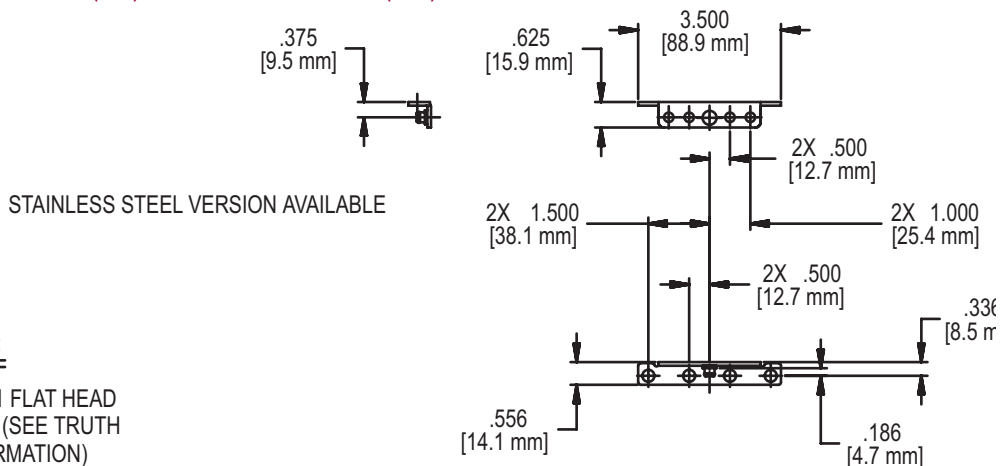


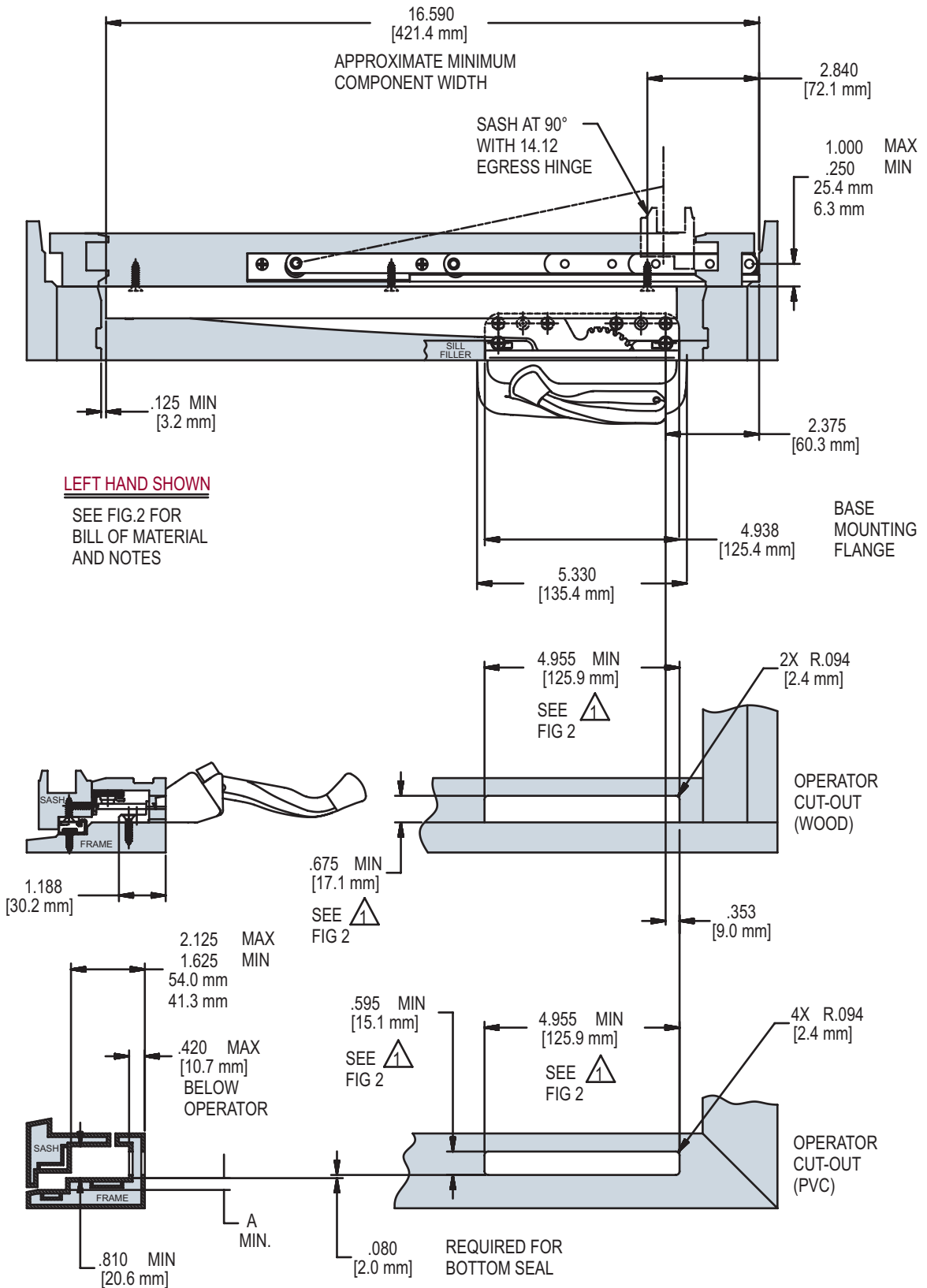
FIG. 11 STUD BRACKET 11661.XX(LH) SHOWN, 11662.XX(RH)



RECOMMENDED SCREWS:

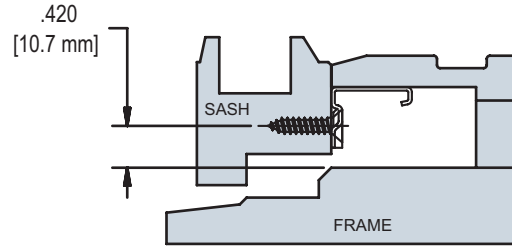
(QTY 4)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

FIG. 1 APPLICATION OF ENCORE SINGLE ARM OPERATOR (SILL MOUNT VERSION)



ENCORE™ SINGLE ARM OPERATORS (SILL MOUNT)

FIG. 2 APPLICATION OF ENCORE SINGLE ARM OPERATOR CONTINUED (SILL MOUNT VERSION)



**11576.XX
TRACK PLACEMENT**

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG.1	
PART NUMBER	DESCRIPTION
52.11.00.XXX	SINGLE ARM OPERATOR
11576.XX	TRACK ASSEMBLY
14.12.00.XXX	EGRESS HINGE
12614.XX	TANGO HANDLE/COVER PACK
32658	GASKET (PVC)

HINGE	"A"
14.97.00.XXX 14.12.00.XXX	.300 [7.6 mm]
OTHER 14 SERIES CASEMENT HINGES	.250 [6.4 mm]

NOTE:


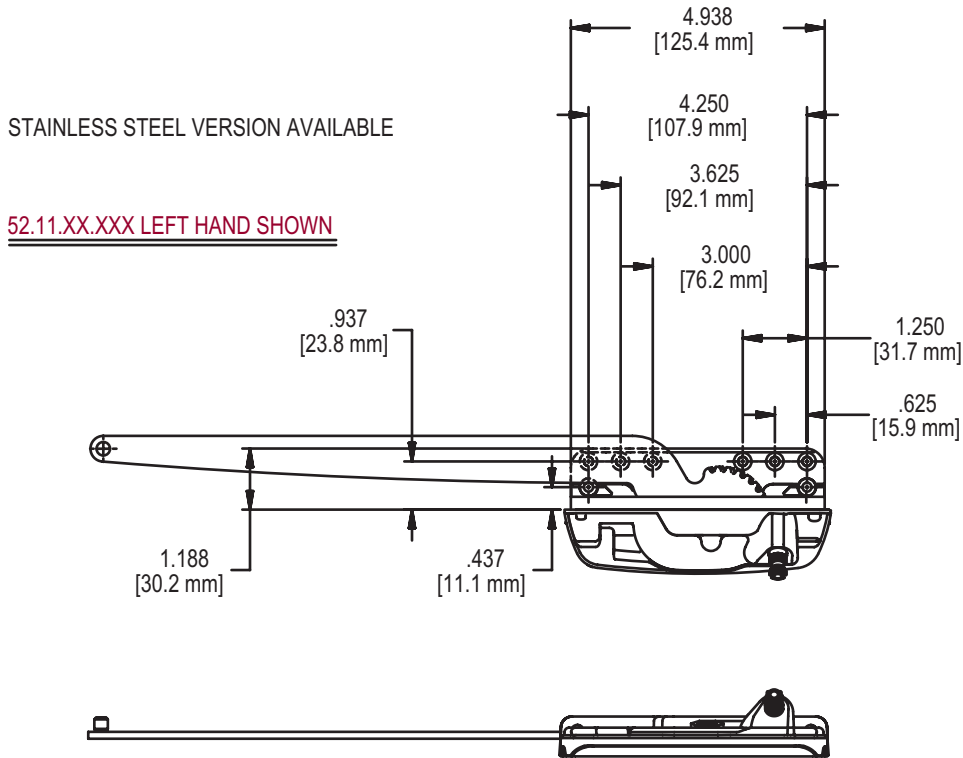
1.  HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING
2. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

FIG. 3 ENCORE SINGLE ARM OPERATOR (SILL MOUNT VERSION)

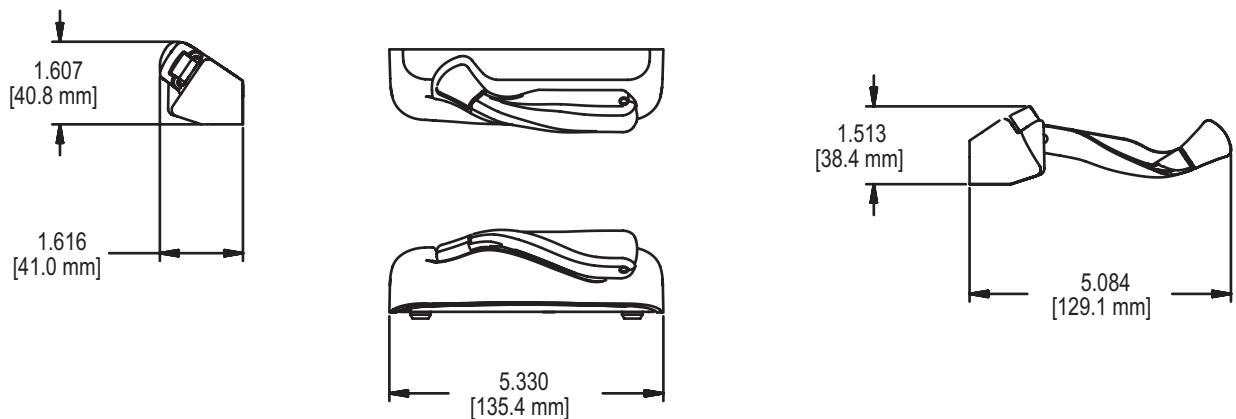


RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX) #8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)FOR REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

FIG. 4 ENCORE TANGO HANDLE/COVER 12614.XX(LH) (SHOWN) 12616.XX(RH)



ENCORE™ SINGLE ARM OPERATORS (SILL MOUNT)

FIG. 5 BACK PLATE 21969.92

FOR USE WITH
REAR MOUNT
VERSION ONLY

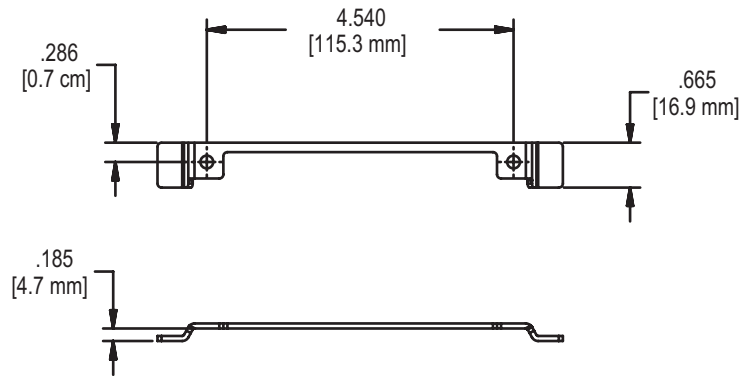
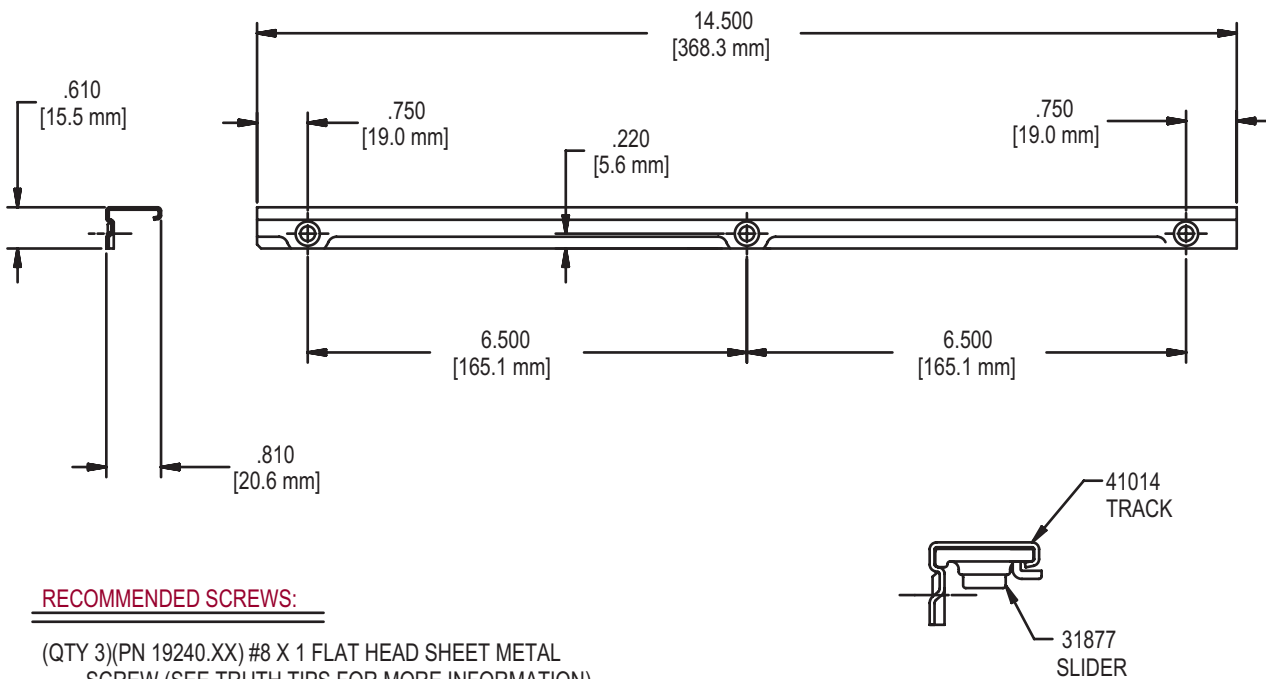


FIG. 6 TRACK & SLIDER ASSEMBLY 11576.XX

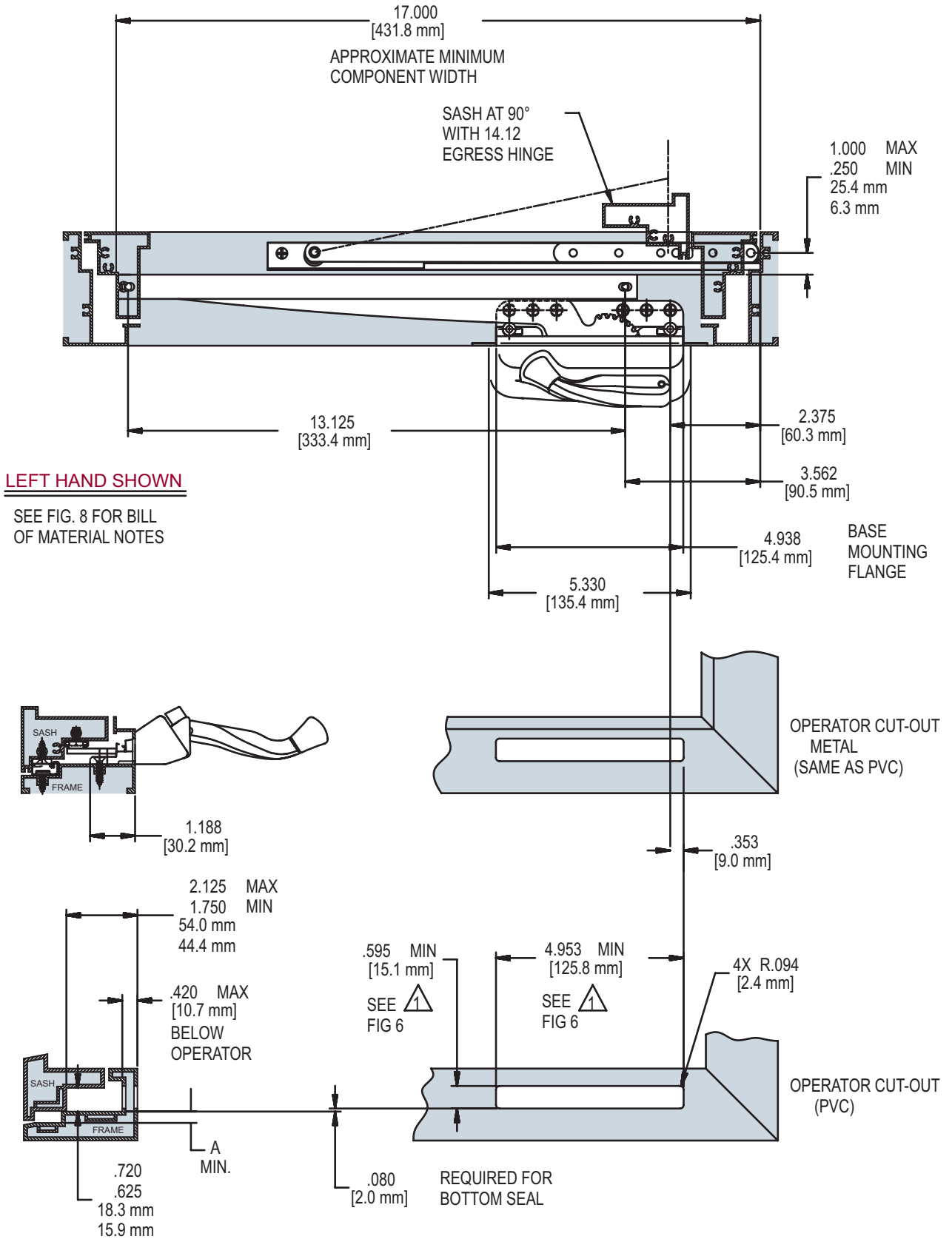
STAINLESS STEEL VERSION AVAILABLE



RECOMMENDED SCREWS:

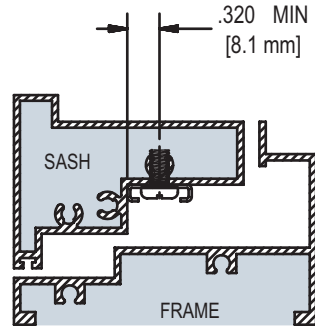
(QTY 3)(PN 19240.XX) #8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

FIG. 7 APPLICATION OF ENCORE SINGLE ARM OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)



ENCORE™ SINGLE ARM OPERATORS (LOW PROFILE)

FIG. 8 APPLICATION OF ENCORE SINGLE ARM OPERATOR CONTINUED
(SILL MOUNT VERSION)
(LOW PROFILE)



30175 TRACK PLACEMENT

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG. 7	
PART NUMBER	DESCRIPTION
52.13.00.011	SINGLE ARM OPERATOR
30175	TRACK
14.12.00.XXX	EGRESS HINGE
12614.XX	TANGO HANDLE/COVER PACK
32658	GASKET

HINGE	"A"
14.12.00.XXX	.322 [8.2 mm]
OTHER 14 SERIES CASEMENT HINGES	.275 [7.0 mm]

NOTE:

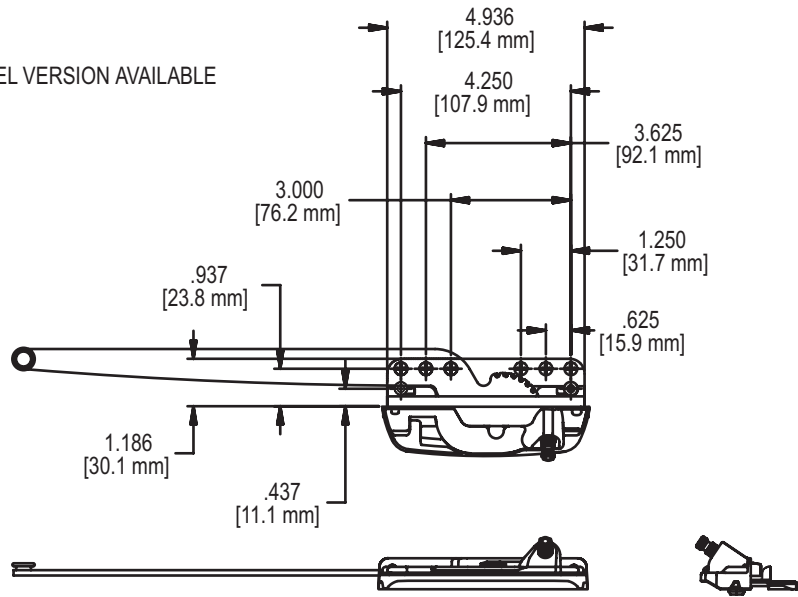
1. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING

2. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

FIG. 9 ENCORE SINGLE ARM OPERATOR (SILL MOUNT VERSION) (LOW PROFILE)

STAINLESS STEEL VERSION AVAILABLE

52.13.XX.011 LEFT HAND SHOWN



RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

FIG. 10 ENCORE TANGO HANDLE/COVER 12614.XX(LH) (SHOWN) 12616.XX(RH)

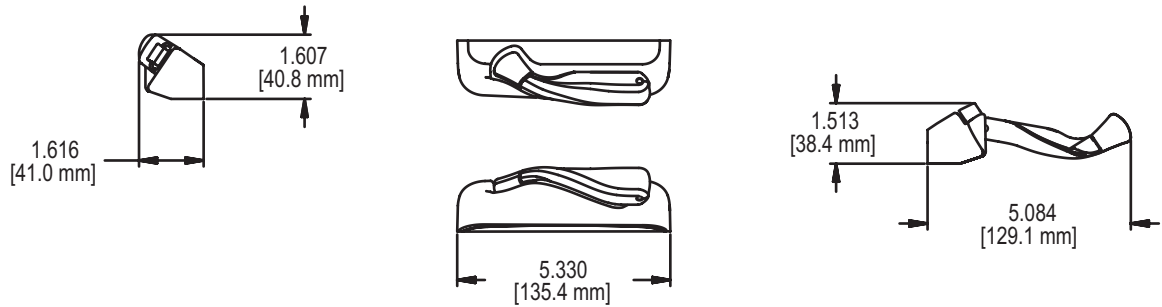
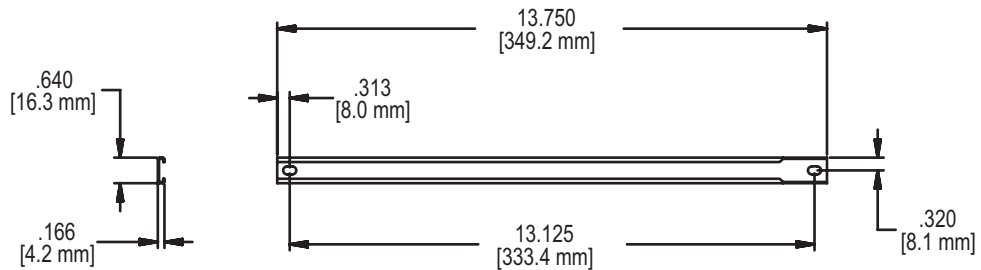


FIG. 11 TRACK 30175

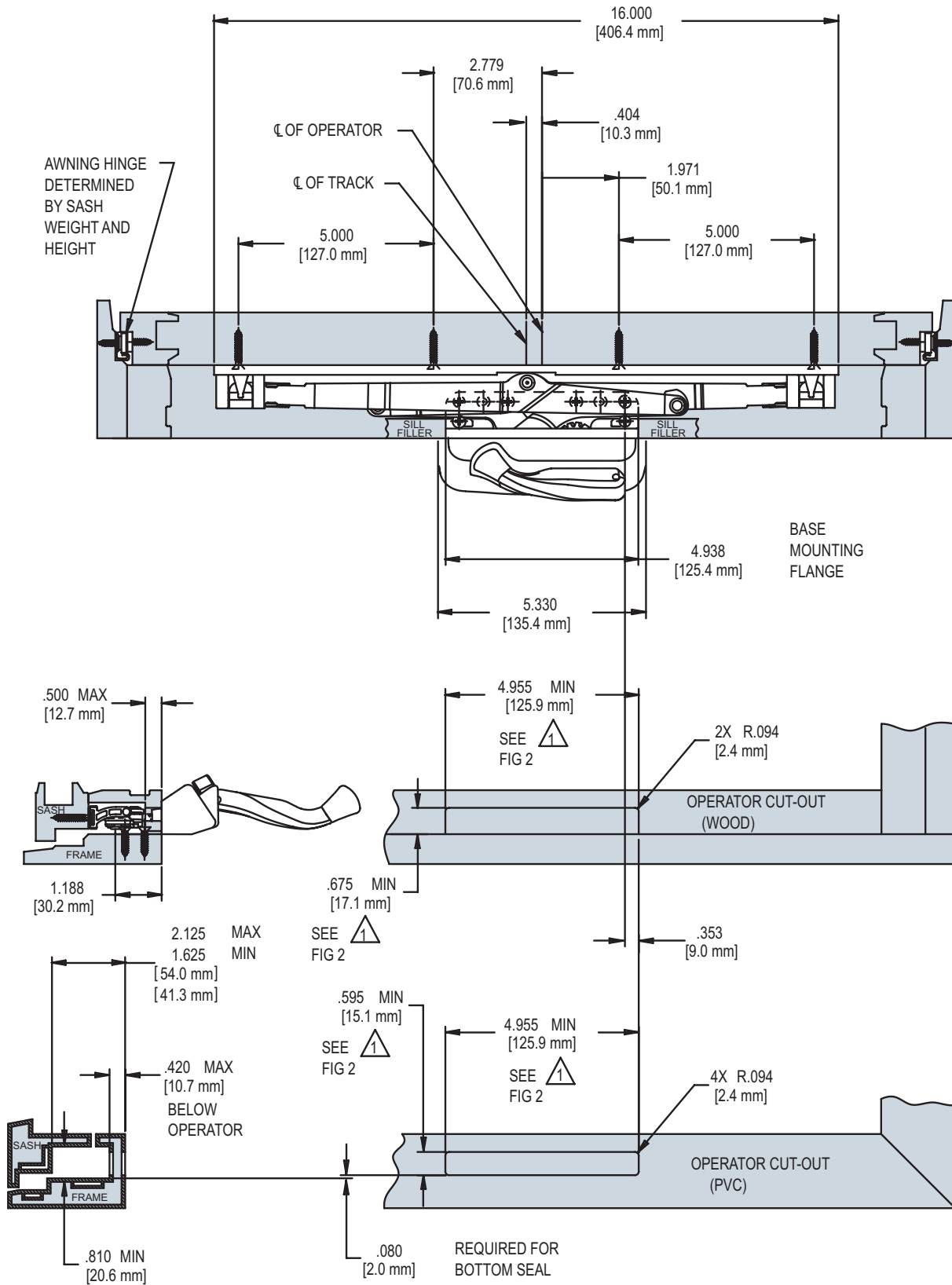


RECOMMENDED SCREWS:

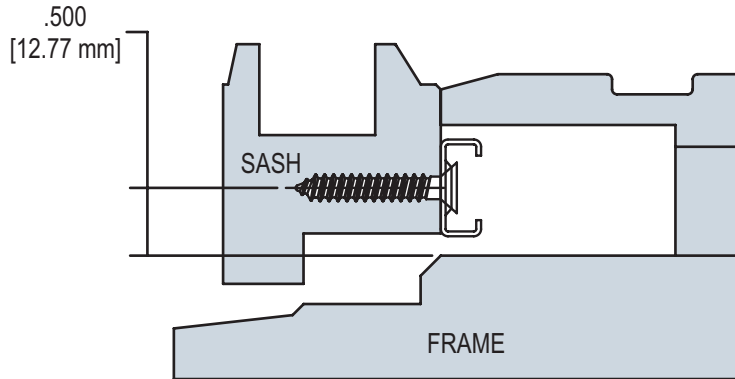
(QTY 2)(PN 19214.XX)#8 X 1 FLAT HEAD SHEET METAL (SEE TRUTH TIPS FOR MORE INFORMATION)

ENCORE™ AWNING OPERATOR (SILL MOUNT)

FIG. 1 APPLICATION OF ENCORE AWNING OPERATOR (SILL MOUNT VERSION)



**FIG. 2 APPLICATION OF ENCORE AWNING OPERATOR CONTINUED
(SILL MOUNT VERSION)**



**11577.92
TRACK PLACEMENT**

HARDWARE SHOWN FOR LEFT HAND WINDOW, SEE FIG. 1	
PART NUMBER	DESCRIPTION
51.10.00.X11	AWNING OPERATOR
11577.XX	TRACK ASSEMBLY
13.XX.XX.XXX	HINGE
12614.XX	TANGO HANDLE/COVER PACK
32658	GASKET (PVC)

NOTE:

1. HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING

2. GASKET 32658 IS REQUIRED ON PVC AND METAL PROFILES FOR AN IMPROVED AIR AND WATER SEAL

3. ALL AWNING OPERATORS USE 12614.XX LEFT HAND TANGO HANDLE/COVER PACK

ENCORE™ AWNING OPERATOR (SILL MOUNT)

FIG. 3 ENCORE AWNING OPERATOR (SILL MOUNT VERSION)

STAINLESS STEEL VERSION AVAILABLE

51.10.XX.011 SHOWN

51.12 REAR MOUNT VERSION ALSO AVAILABLE

RECOMMENDED SCREWS:

(QTY 6)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

(QTY 2)REAR MOUNT:#8-32 X 3/8 PAN HEAD MACHINE SCREW PN 19545.XX

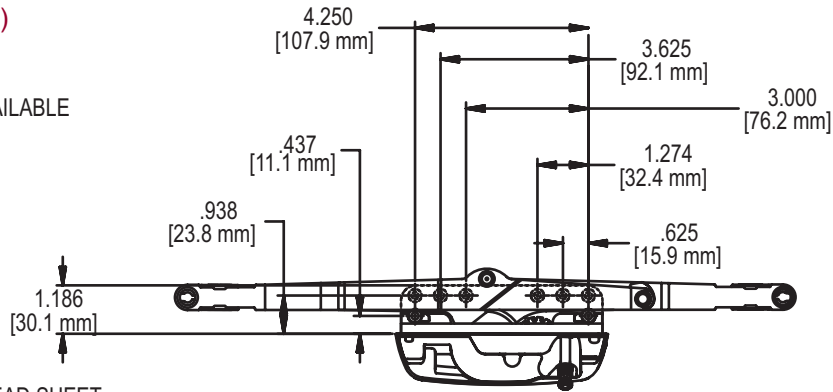


FIG. 4 ENCORE TANGO HANDLE/COVER 12614.XX(LH) (SHOWN), 12616.XX(RH)

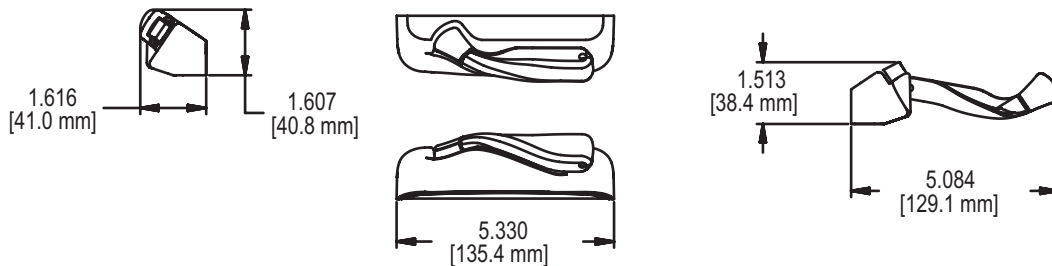


FIG. 5 BACK PLATE 21969.92

FOR USE WITH 51.12 REAR MOUNT VERSION ONLY

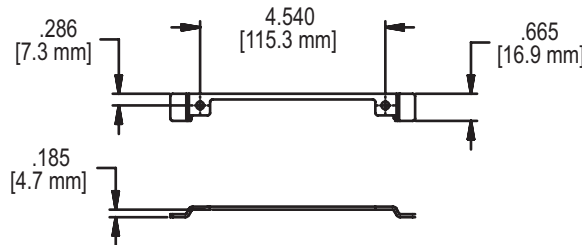
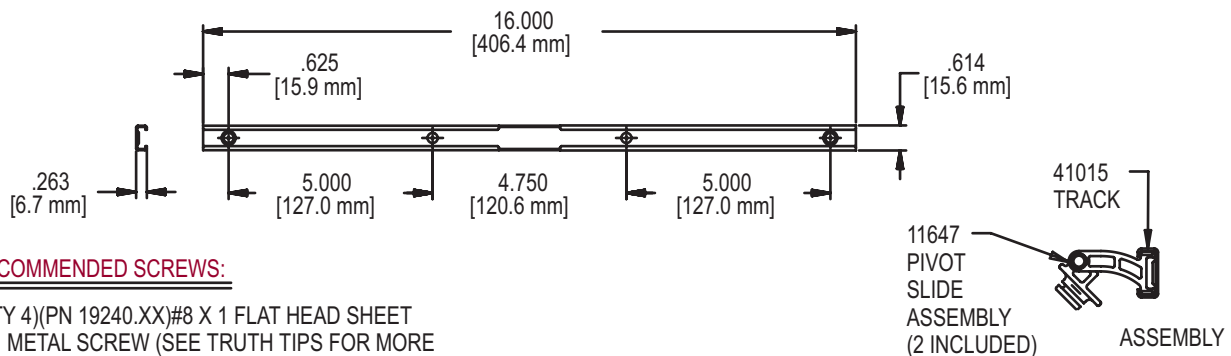


FIG. 6 ENCORE AWNING TRACK & SLIDER ASSEMBLY 11577.XX

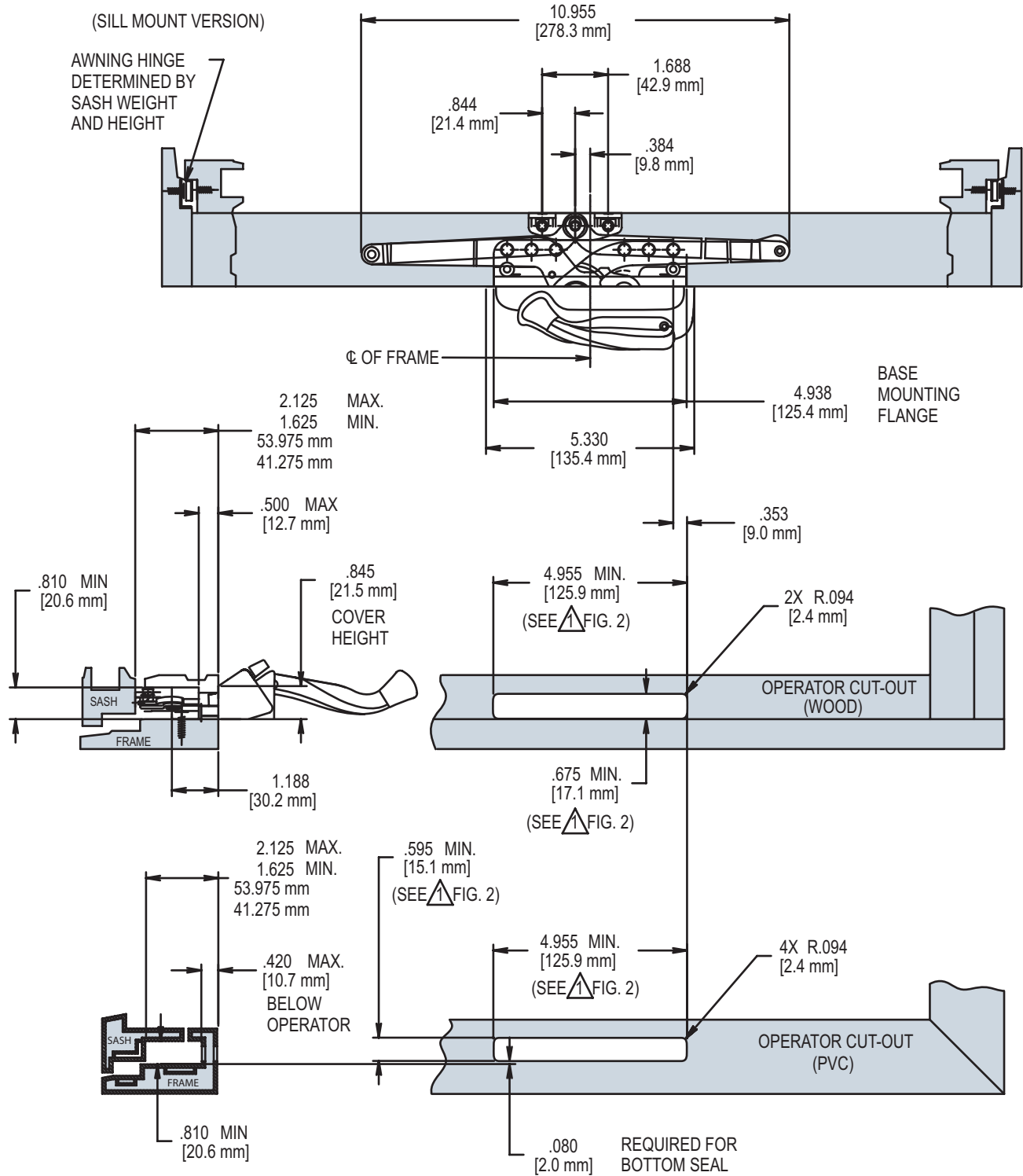
STAINLESS STEEL VERSION AVAILABLE



RECOMMENDED SCREWS:

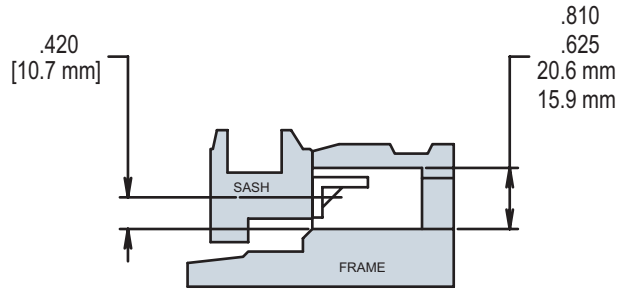
(QTY 4)(PN 19240.XX)#8 X 1 FLAT HEAD SHEET METAL SCREW (SEE TRUTH TIPS FOR MORE INFORMATION)

FIG. 1 APPLICATION OF ENCORE NARROW AWNING OPERATOR

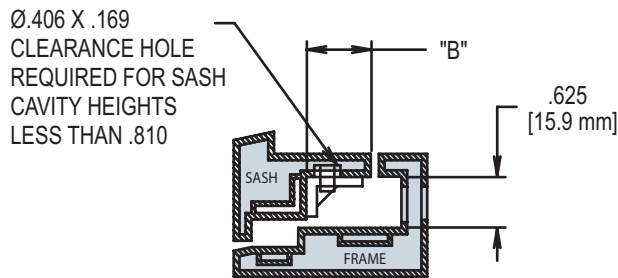


ENCORE™ AWNING OPERATOR (SILL MOUNT)

FIG. 2 APPLICATION OF ENCORE NARROW AWNING OPERATOR (CONTINUED)



BRACKET PLACEMENT



BRACKET PLACEMENT

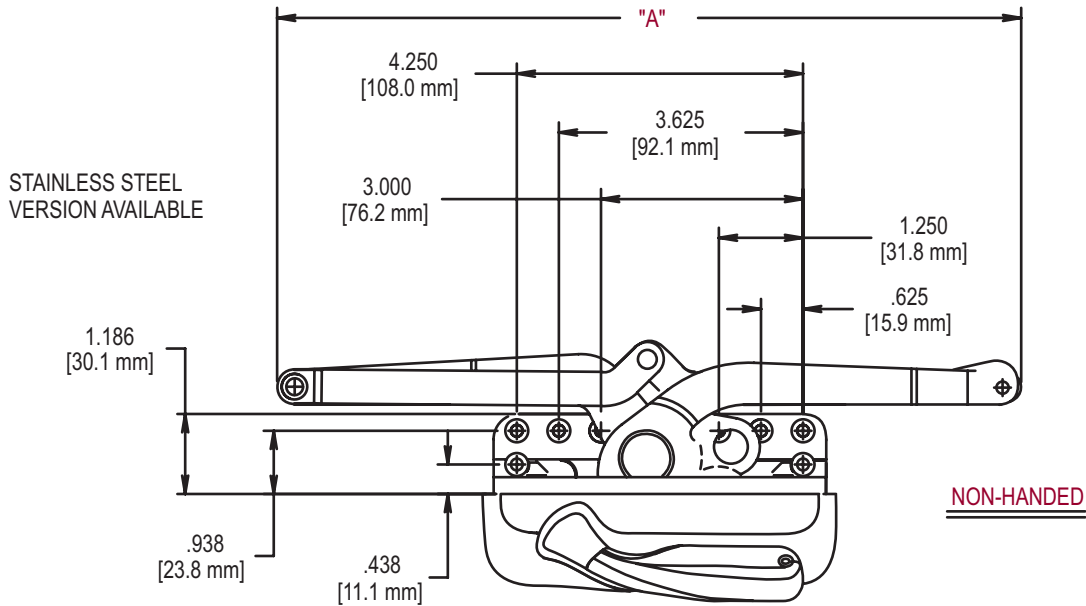
HARDWARE SHOWN SEE FIG. 1	
PART NUMBER	DESCRIPTION
51.11.XX.011	AWNING OPERATOR
22143	BRACKET
13.XX.XX.XXX	HINGE
12614.XX	TANGO HANDLE/COVER PACK
32658	GASKET (PVC)

NOTE:

⚠ HOLD THIS DIMENSION AS CLOSE TO THE MINIMUM AS MANUFACTURING TOLERANCES ALLOW. A CLOSE FITTING CUT-OUT HELPS TO STABILIZE THE OPERATOR AGAINST ROCKING

2. USE 32658 GASKET ON PVC AND METAL PROFILES
3. ALL AWNING OPERATORS USE 12614.XX LEFT HAND TANGO HANDLE/COVER PACK
4. MINIMUM RECOMMENDED SASH HEIGHT 16" (DEPENDENT ON PROFILE)
5. SASH OVERHANG "B" SHOULD BE AS SMALL AS POSSIBLE
BRACKET MAY NEED TO BE MOUNTED CLOSER TO SASH EDGE TO ELIMINATE BRACKET DETACH AT FULL OPEN ON SHORT SASH SIZES

FIG. 3 ENCORE NARROW AWNING OPERATOR (SILL MOUNT VERSION)



RECOMMENDED SCREWS:

(QTY 6)(P/N 19240.XX)#8 X 1.0 PHILLIPS,
FLAT HEAD, SHEET METAL SCREWS
(SEE TRUTH TIPS FOR MORE INFORMATION)

PART NO.	"A"	APPROXIMATE AMOUNT OF OPENING
51.11	11"	8"

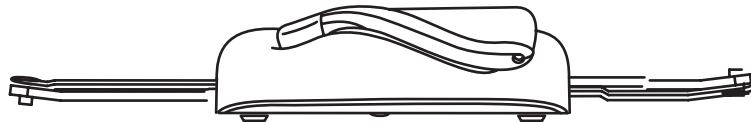
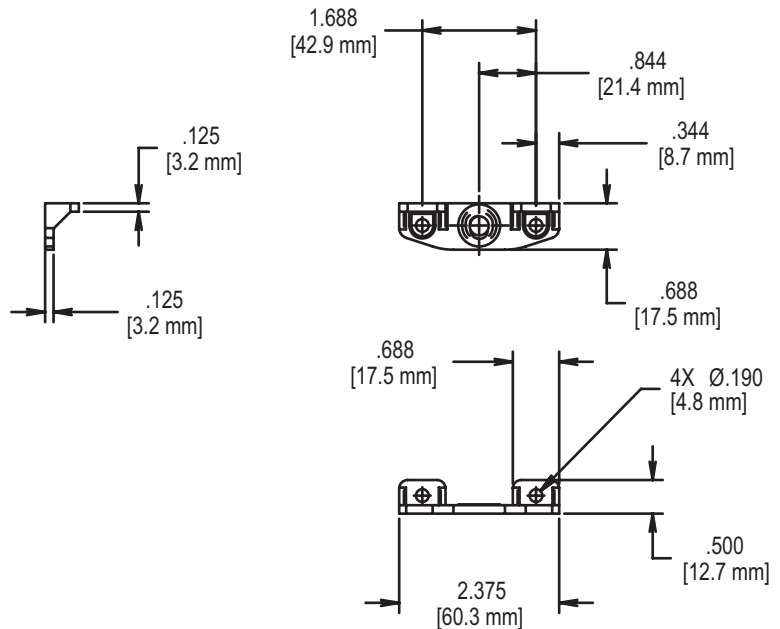


FIG. 4 BRACKET 22143

NOTE:

1. BRACKET IS SUPPLIED
WITH OPERATOR. DO
NOT ORDER SEPARATELY



RECOMMENDED SCREWS:

(QTY 2)(P/N 19230.XX)#8 X 1.0 PHILLIPS,
PAN HEAD, SHEET METAL SCREWS
(SEE TRUTH TIPS FOR MORE INFORMATION)

Hardware Comparison for NAFS Casement Window Hardware Load Test

North American Fenestration Standard (ANSI/AAMA/WDMA 101/1.S.2/NAFS-02)

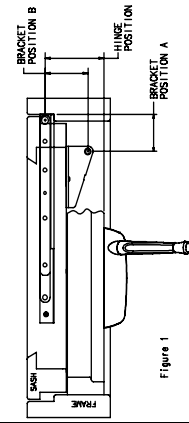
CAUTION: There are many factors in addition to the hardware which influence the maximum size casement window that should be produced. These include sash and frame stiffness and strength, screw holding strength, sash sag, weather-tightness, and weatherstrip drag. For this reason, Truth recommends careful evaluation of the entire window before producing units as large as this matrix suggests.

Performance Class R: The Maximum Frame Size and Sash Weight are Listed in the Table.

Performance Classes LC, C, HC, AW: The Maximum Frame Area (Width x Height) Listed in the Table Must be Reduced by 20%.

Operator	Hinge										Approx. Minimum Frame Width to Fit Operator
	Maxim Washable 14.97 14.92	Maxim Egress 14.12 14.13	10" Standard 14.75 14.80 14.05 14.19	10" Washable 14.76 14.91 14.06	10" Egress 14.77 14.93	10" HP Concealed 14.96	10" HP Concealed Egress 14.00	Butt Hinge			
Maxim Dual Arm	50.00	40"W x 84"H, 108"(99) lbs	32"W x 68"H, 69 lbs	32"W x 72"H, 73 lbs	32"W x 68"H, 69 lbs	38"W x 78"H, 95 lbs	32"W x 68"H, 69 lbs	Not Recommended	Not Recommended	24"	
Maxim Dyad	50.50	32"W x 72"H, 73"(55) lbs	Not Recommended	24"W x 64"H, 47 lbs	24"W x 60"H, 45 lbs	28"W x 69"H, 49"(44) lbs	Not Recommended	Not Recommended	Not Recommended	16"	
Maxim Reverse Dyad	50.70	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	24"W x 72"H, 53 lbs**	12"	
Maxim Single Arm	52.01	Not Recommended	32"W x 70"H, 71"(36) lbs	32"W x 70"H, 71"(29) lbs	32"W x 72"H, 73 lbs	32"W x 70"H, 71"(36) lbs	32"W x 72"H, 73 lbs	32"W x 69"H, 65 lbs	30"W x 69"H, 65 lbs	20"	
Maxim Short Single Arm	52.06	Not Recommended	Not Recommended	Not Recommended	22"W x 63"H, 42 lbs	Not Recommended	22"W x 63"H, 42 lbs	20"W x 60"H, 42 lbs	20"W x 60"H, 36 lbs	15"	
EntryGard Dual Arm	15.10	Not Recommended	32"W x 60"H, 60 lbs	32"W x 60"H, 60"(64) lbs	Not Recommended	32"W x 60"H, 60 lbs	Not Recommended	Not Recommended	Not Recommended	20"	
EntryGard Egress D.A.	15.15	Not Recommended	28"W x 60"H, 52 lbs	Not Recommended	28"W x 60"H, 52 lbs	Not Recommended	28"W x 60"H, 52 lbs	Not Recommended	Not Recommended	18"	
EntryGard Dyad	15.11	Not Recommended	22"W x 61"H, 49 lbs	22"W x 61"H, 49 lbs	22"W x 62"H, 42 lbs	30"W x 61"H, 57 lbs	22"W x 62"H, 42 lbs	20"W x 61"H, 36 lbs	20"W x 61"H, 36 lbs	13"	
EntryGard Single Arm	15.94	Not Recommended	22"W x 62"H, 42 lbs	Not Recommended	22"W x 62"H, 42 lbs	22"W x 62"H, 42 lbs	22"W x 62"H, 42 lbs	22"W x 61"H, 36 lbs	22"W x 61"H, 36 lbs	16" - 18" †	
13.5" Single Arm	15.32	Not Recommended	26"W x 67"H, 54"(50) lbs	26"W x 69"H, 55"(41) lbs	26"W x 69"H, 52 lbs	26"W x 67"H, 54"(50) lbs	26"W x 65"H, 52 lbs	24"W x 64"H, 47 lbs	24"W x 64"H, 47 lbs	22" - 24" †	
9.5" Single Arm	15.31	Not Recommended	24"W x 65"H, 48 lbs	24"W x 62"H, 45"(19) lbs	24"W x 65"H, 48 lbs	24"W x 61"H, 45"(27) lbs	24"W x 65"H, 48 lbs	22"W x 65"H, 43 lbs	22"W x 65"H, 43 lbs	18" - 20" †	
7.5" Single Arm	15.56	Not Recommended	22"W x 63"H, 42 lbs	Not Recommended	22"W x 63"H, 42 lbs	Not Recommended	22"W x 63"H, 42 lbs	20"W x 65"H, 39 lbs	20"W x 65"H, 39 lbs	16"	
6" Single Arm	15.39	Not Recommended	18"W x 66"H, 35 lbs	Not Recommended	18"W x 66"H, 35 lbs	Not Recommended	18"W x 66"H, 35 lbs	16"W x 70"H, 33 lbs	16"W x 70"H, 33 lbs	15"	
Split Arm	15.18	Not Recommended	24"W x 70"H, 52 lbs	24"W x 64"H, 47 lbs	24"W x 70"H, 52 lbs	30"W x 64"H, 60"(56) lbs	Not Recommended	Not Recommended	Not Recommended	16"	
23 Series Single Arm 13.5"	23.03	Not Recommended	26"W x 66"H, 53 lbs	26"W x 71"H, 57"(43) lbs	26"W x 66"H, 53 lbs	26"W x 69"H, 55 lbs	26"W x 66"H, 53 lbs	26"W x 62"H, 50 lbs	26"W x 62"H, 50 lbs	22" - 24" †	
23 Series Single Arm 9.5"	23.01	Not Recommended	24"W x 65"H, 51 lbs	24"W x 66"H, 48"(22) lbs	24"W x 69"H, 51 lbs	24"W x 65"H, 48"(31) lbs	24"W x 69"H, 51 lbs	24"W x 69"H, 50 lbs	24"W x 69"H, 50 lbs	18" - 20" †	
23 Series Single Arm 7.5"	23.38	Not Recommended	20"W x 69"H, 46 lbs	Not Recommended	22"W x 69"H, 46 lbs	Not Recommended	22"W x 69"H, 46 lbs	22"W x 64"H, 47 lbs	22"W x 64"H, 47 lbs	16"	
23 Series Single Arm 6"	23.78	Not Recommended	20"W x 60"H, 36 lbs	Not Recommended	20"W x 60"H, 36 lbs	Not Recommended	20"W x 60"H, 36 lbs	20"W x 68"H, 45 lbs	20"W x 68"H, 45 lbs	15"	
23 Series Dyad Short Link	23.46	Not Recommended	26"W x 63"H, 51 lbs	24"W x 68"H, 50 lbs	Not Recommended	28"W x 61"H, 53 lbs	Not Recommended	Not Recommended	Not Recommended	15"	
23 Series Dyad Long Link	23.32	Not Recommended	26"W x 62"H, 50 lbs	24"W x 67"H, 49 lbs	Not Recommended	28"W x 66"H, 58 lbs	Not Recommended	Not Recommended	Not Recommended	19"	

Hinge	Typical Mounting Positions - Used for Hardware Comparison			
	Operator	Hinge Position	Bracket Position A	Bracket Position B
14 XX Concealed Hinges	Maxim Reverse Dyad	11,062	813	
	Other Maxim	1,750	1,563	
	EntryGard Dual Arm w/10" Washable Hinge	2,375	.875	Dual Arm & Dyad determined by Bracket Position A.
	Other EntryGard Dual Arm Operators			
	EntryGard Dyad & Single Arm	2,125	1,563	Single Arm per catalog
Traditional & Ellipse				
Butt Hinges	Maxim Reverse Dyad	11,062	2,437	Catalog Dim A=8,000
	EntryGard Single Arm	4,000	NA	Catalog Dim A=4,000
	Maxim Single Arm			
	Traditional & Ellipse Single Arm	2,500	90° window position.	



The maximum window size, ease of operation, and service life are strongly influenced by hardware mounting positions (see Fig. 1 below).

Applications with dimensions larger than the typical mounting positions given above will not be able to support a window as large as that shown in this Table.

Applications with smaller dimensions may be able to support a larger window. Contact Truth for recommendations specific to your application.

* The first sash weight shown in the table is the maximum permitted for the AAMA Hardware Load Test. The sash weight shown in parenthesis is the maximum recommended by Truth to assure ease of operation.

** The Maxim Reverse Dyad Operator has been limited to use in windows 24" wide and narrower in order to ensure good performance near the closed position. In its full open position, it can support windows larger than those shown in the table.

† The smaller number applies when the operator is used with Egress hinges while the larger number applies when it is used with the 10" Standard or 10" High Performance hinge.

**MAXIM® AWNING
OPERATORS**



There are numerous accessories that have been designed to help provide the optimum results in both installation and function. The items listed here such as the #32658 and #32855

Gaskets and the #31883 Applicator are examples of such. In instances where an additional level of sealing is necessary, the Encore Gaskets will help you achieve this.

ORDERING INFORMATION

1. Please refer to the following drawings for specific information regarding the item numbers to order.

FIG. 1 APPLICATION OF 32658 ENCORE OPERATOR GASKET (.062 thickness)

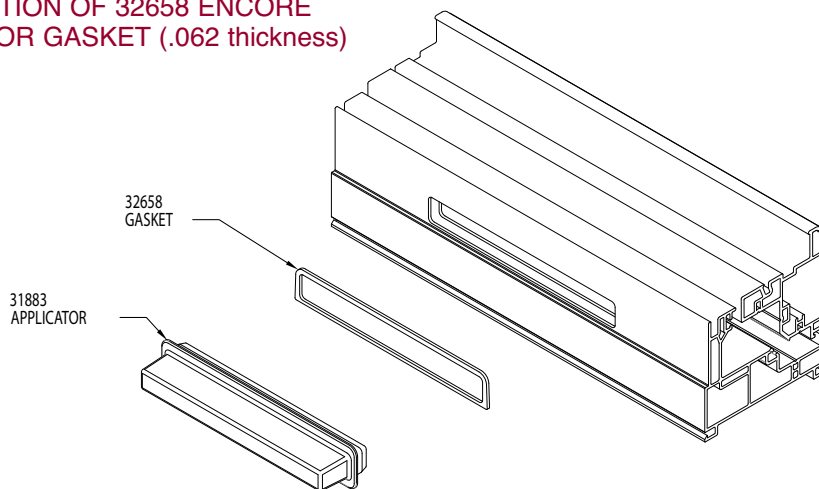


FIG. 2 ENCORE OPERATOR GASKET 32658 (32855 Gasket with .093 thickness not shown)

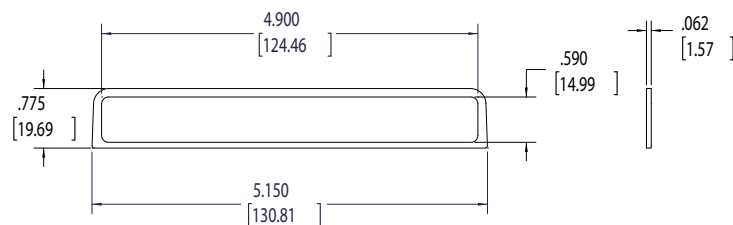


FIG. 3 ENCORE OPERATOR GASKET APPLICATOR 31883

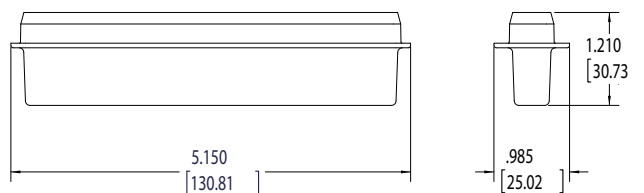


FIG. 4 ENCORE OPERATOR SHIMS

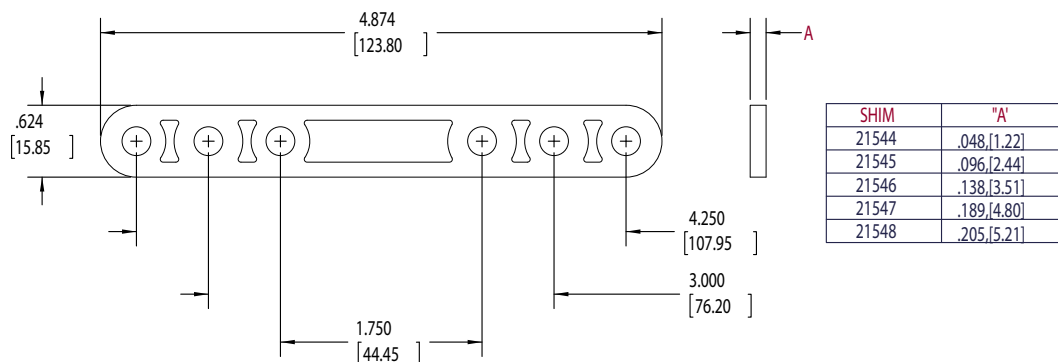


FIG. 5 APPLICATION OF TANGO FOLDING HANDLE COVER 12614.XX (LH) (SHOWN) 12616.XX (RH)
(Sold as cover and handle package only)

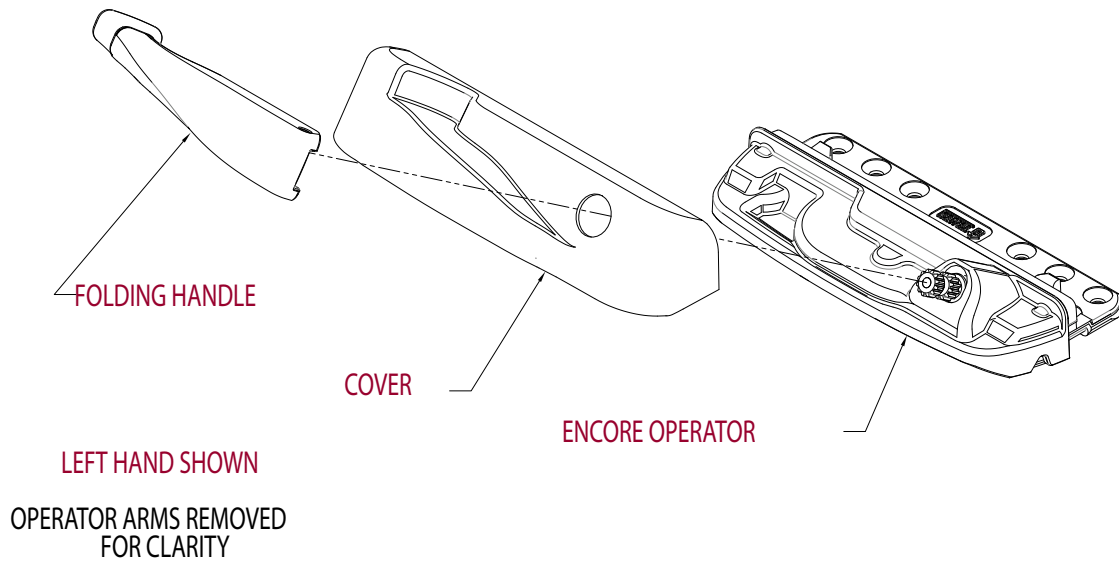


FIG. 6 DIMENSIONS FOR TANGO FOLDING HANDLE COVER (LH) (SHOWN)

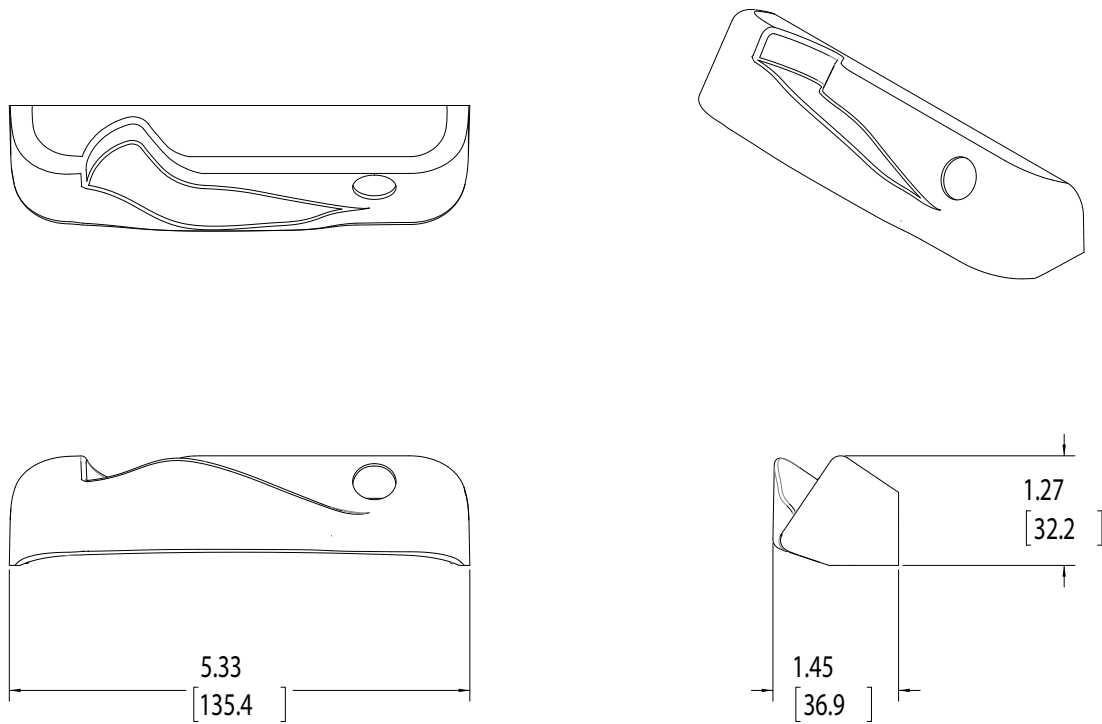


FIG. 7 APPLICATION OF CLASSIC FOLDING HANDLE COVER 13342.XX (LH) (SHOWN) 13343.XX (RH)
(Sold as cover and handle package only)

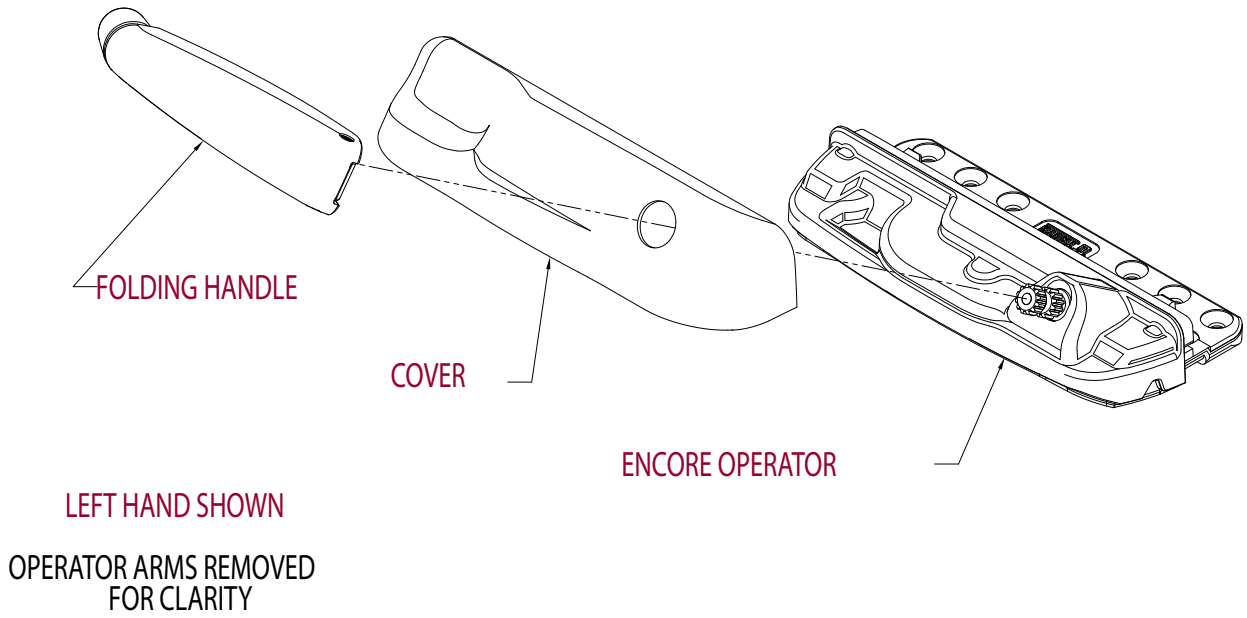


FIG. 8 DIMENSIONS FOR CLASSIC FOLDING HANDLE COVER (LH) (SHOWN)

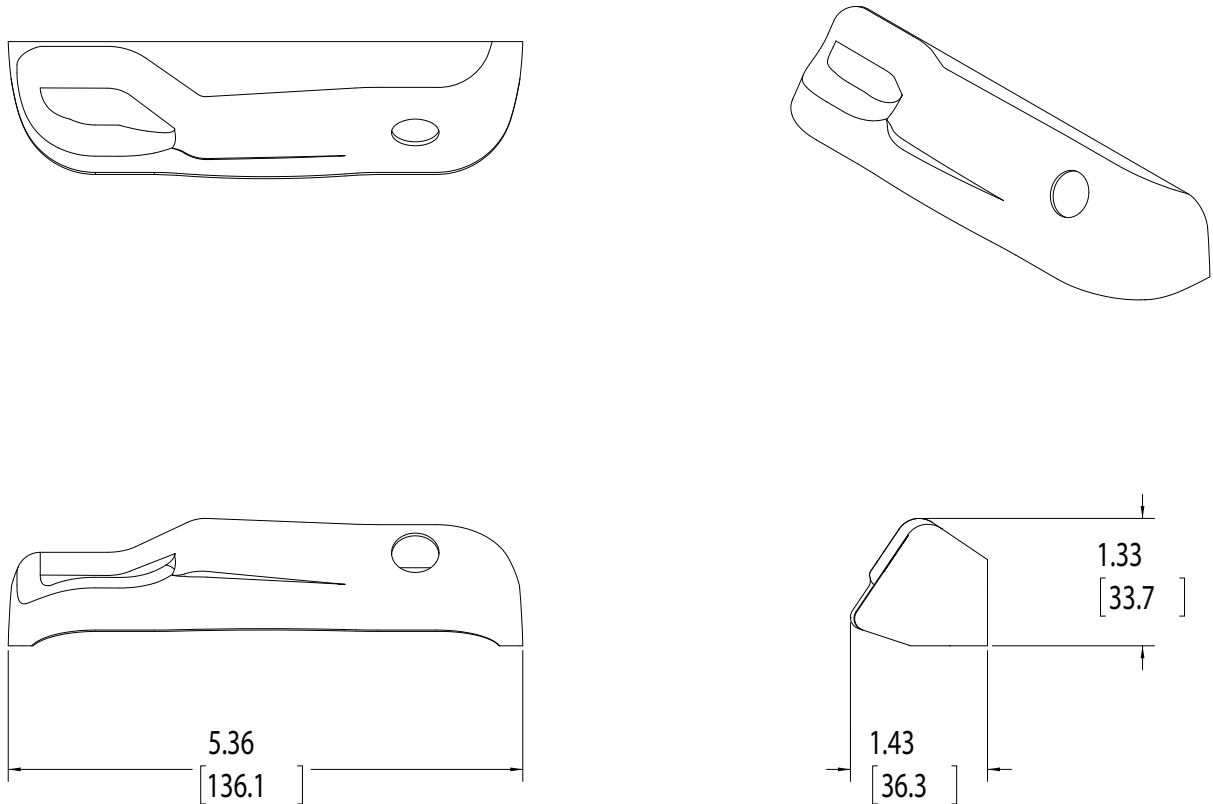


FIG. 9 APPLICATION OF FOLDING HANDLE COVER 13541.XX (LH) (SHOWN) 13542.XX (RH)
(Sold as cover and handle package only)

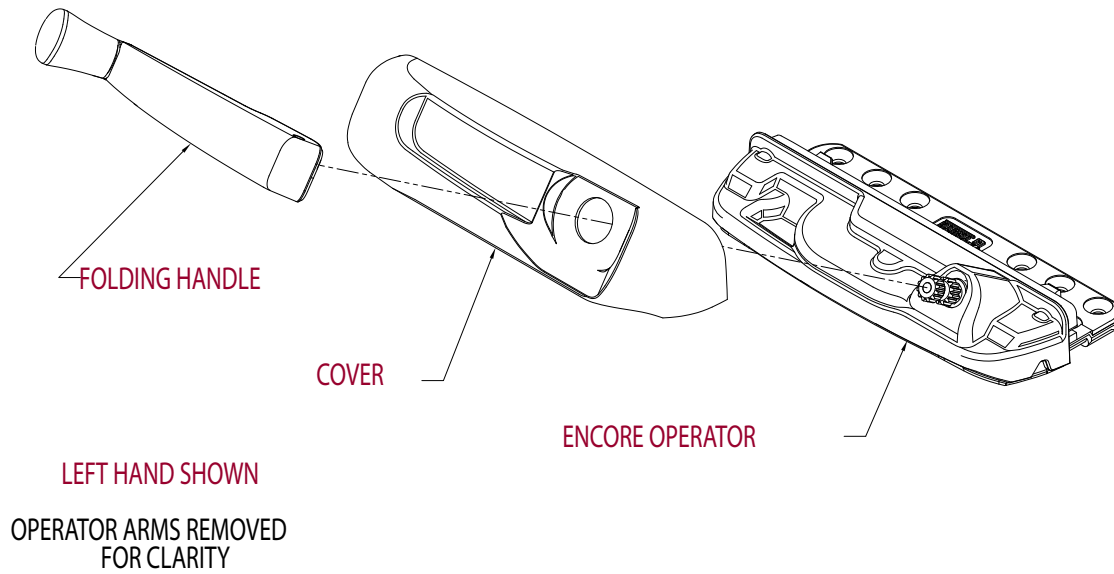


FIG. 10 DIMENSIONS FOR FOLDING HANDLE COVER (LH) (SHOWN)

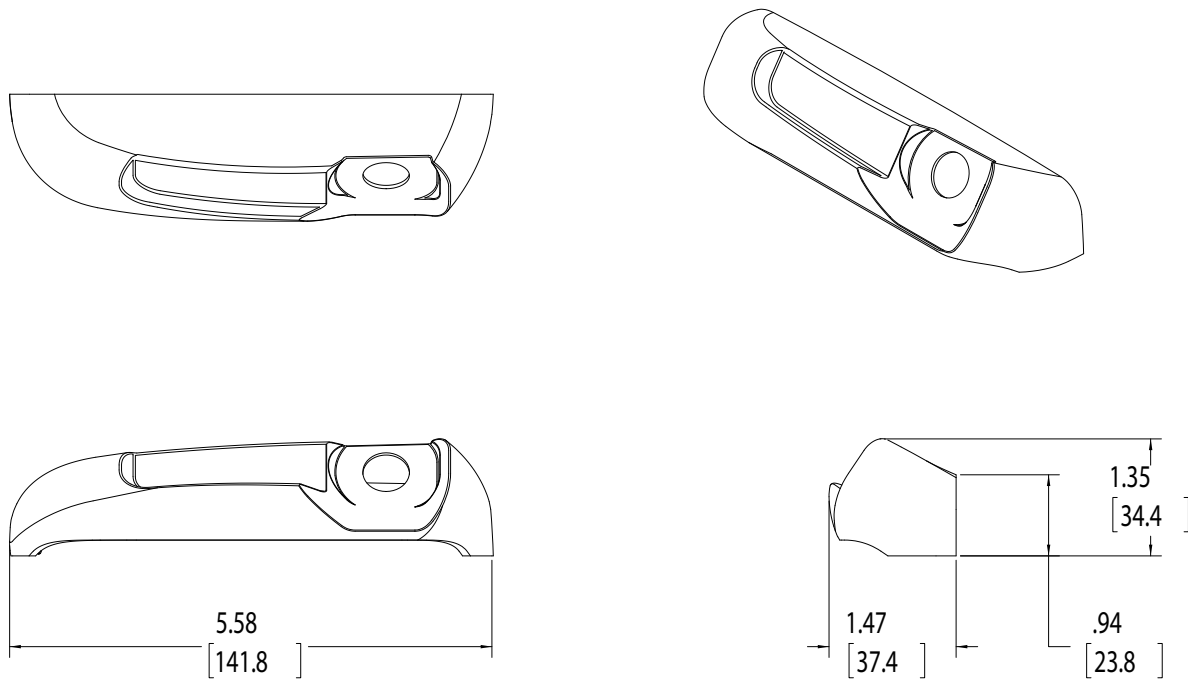


FIG. 11 APPLICATION OF ADA HANDLE COVER 14267.XX (LH) (SHOWN) 14268.XX (RH)
(Sold as cover and handle package only)

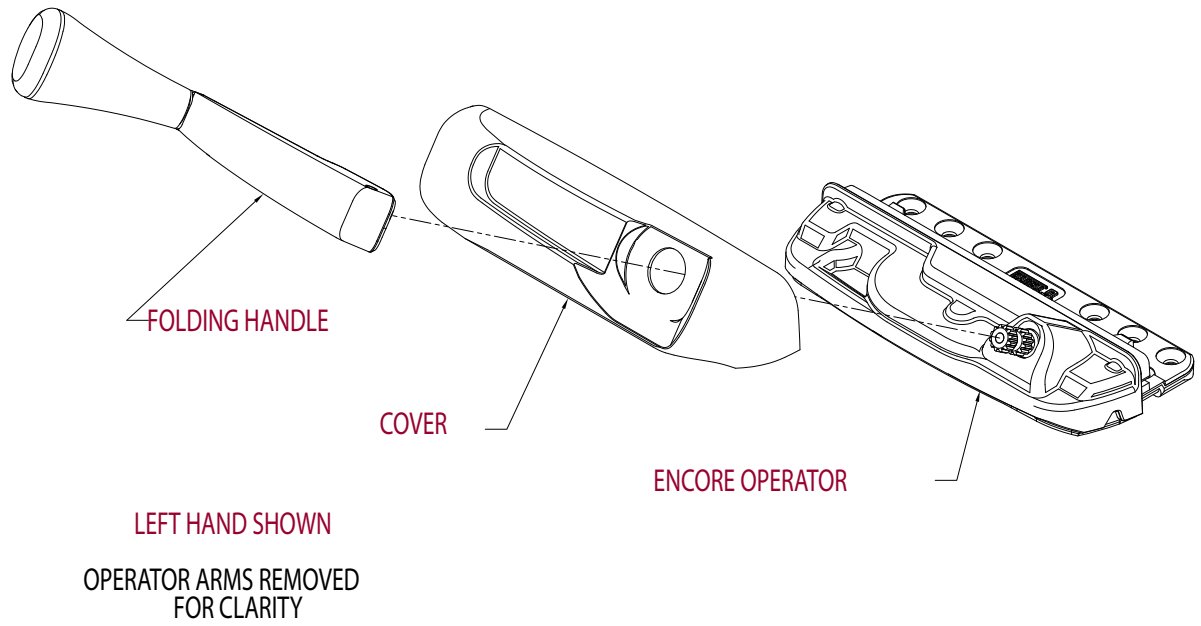
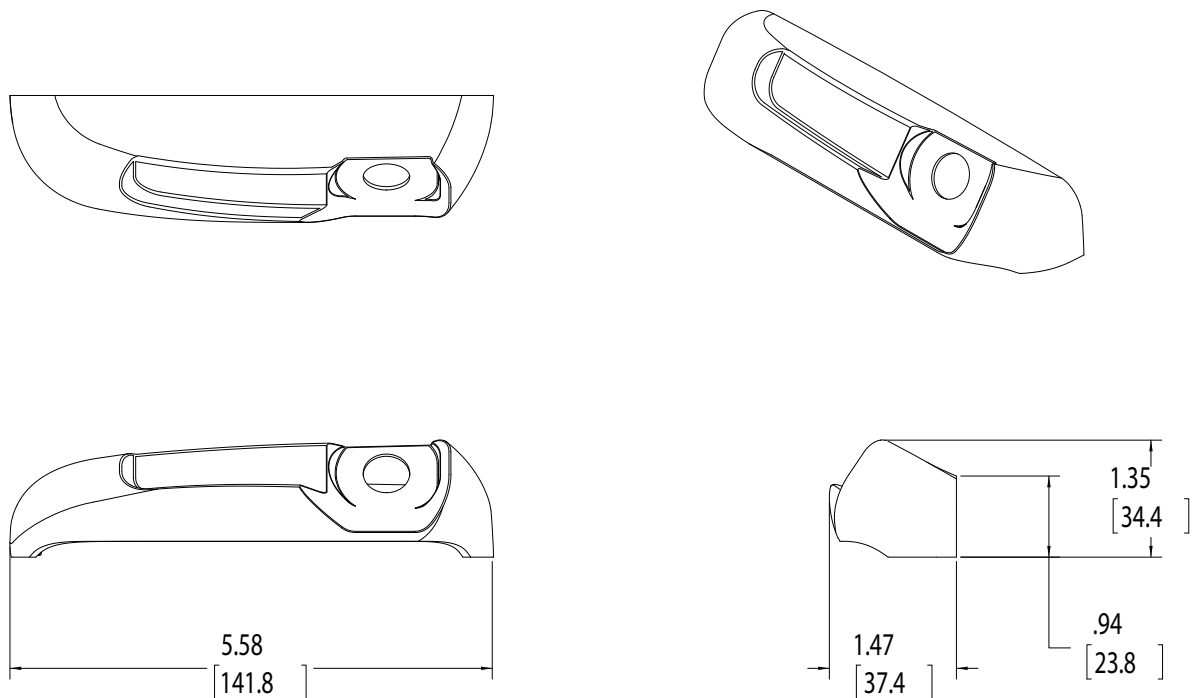


FIG. 12 DIMENSIONS FOR FOLDING HANDLE COVER (LH) (SHOWN)



**THE ENCORE™ SYSTEM
OPERATOR ACCESSORIES**



Dual arm action pushes the sash open while pulling the hinge side of the sash to the open position. When properly installed this operator results in almost effortless operation of both casement and awning-type windows of many sizes and weights, even those with insulated and double-insulated glass (typical operating torque is less than one foot-pound to open and close a 60 lb. sash 90°).

INVENTORY/COST REDUCTIONS

The same operator, when mounted on the side jamb, and combined with the recommended awning hinge, can be used on an awning window also. The result is reduced volume of both hardware and window parts and fewer sizes and models to inventory which turns inventory faster and reduces cost. The snap-on cover has a flange which works as an escutcheon. The cover eliminates visible light around the operator and also saves time and money by hiding any cover routing imperfections. Note, also, that the mounting location and the full 90° opening capability provides unrestricted egress access.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you ever considered *personalizing* your window? The operator handle has the ability to attractively display your company name or logo. For further details on where your company identification would appear, please refer to the following drawings.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High-pressure die-cast zinc operator base. Hardened steel drive worm and gears. High-strength plastic operator cover.



(Inset photo) EntryGard with new 11454 Contour Handle & 11553 Contour Cover

CORROSION PROTECTION:

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

For the severe conditions associated with coastal areas, Truth has developed certain product lines utilizing either **CoastGard® Hardware**, or stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose operator style desired (specify by part number).

2. Specify finish number.

3. Specify right-or left-hand (determined by the side the hinge is on when viewed from the outside).

4. Select mounting hardware (sold separately):

#11454 - Contour Handle (painted) or #10579 - Roto Gear Operator Handle shown above (painted). **Optional handle and cover style**, such as Truth's *Folding Handle*, are also available.

#10341 - Operator cover (specify finish number).

Face-mounted Track and handed Stud Brackets - select from tables in the following drawings. Optional brackets for special profile applications - see Brackets & Track Section. #21306 - Protective red plastic spline cap (optional).

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection, see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Operator handing is determined by the hinge side when viewed from the outside.

TRUTH TIPS (con't):

2. If operator placement, as calculated in Figure #1, is not desirable, the operator can be shifted up to .343" (8.7 mm) away from the hinge side of the window. Shifting the operator will cause slightly higher operator torque and reduces resistance to wind load. If 90° of opening is not necessary, the operator can be shifted toward the hinge side of the window. The best operator performance can be achieved by minimizing dimensions "A" and "X" - see Figure 1.

3. When a Dual Arm Operator is installed in high rise applications over two stories, a Truth Limit Device, to restrict the amount of opening, is recommended. Contact Truth for wind load information.

4. Sash weight should be limited to 60 lbs. to insure ease of operation for the lifetime of the window. When used on a sash weighing over 60 lbs., operating torque will noticeably increase and operator life will be reduced.

5. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outward at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of a casement window.

6. A Spline Cap (part #21306) is available to protect the operator splines from dirt and other windows from damage during shipping, installation and final building construction.

7. The Dual Arm Operator should not be used in conjunction with Butt Hinge or 4-Bar Hinges (except the #34.81). In most cases, the motion of the two operating arms do not complement the motion of these types of hinges resulting in higher operating torque.

8. The location of the operator and stud bracket (dimension A and B) is based on a sill cover width of 1.938" (23.8 mm) as specified in Figure. 1. If the sill cover depth must be increased, dimensions A & B will be decreased proportionately and operator torque may increase.

9. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.

10. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

11. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

12. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

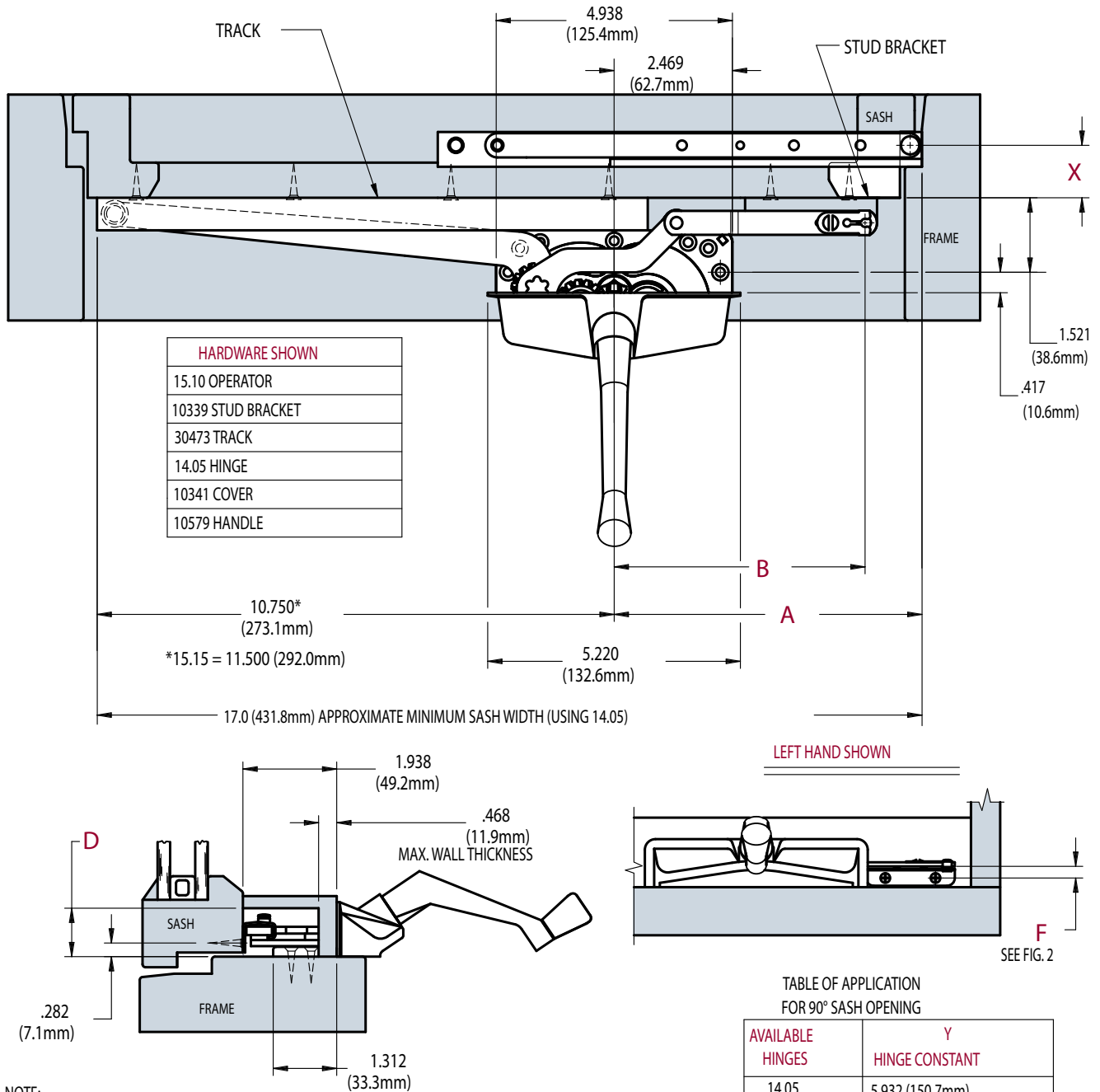
INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide superior operation throughout the windows range of motion. Connection to the movable sash must be easily detachable for window cleaning and maintenance. Removable EntryGard® interior cover will allow matching hardware styling as well as easier finishing of frame and sill.

Window operators will be of combined push arm and drag arm/link design driven by a hand crank. The operator must be constructed of E-Gard® components, hardened steel worm and gearing and high pressure zinc alloy die castings. High-strength plastic trim cover.

Window operators shall be 15 series EntryGard® Dual Arm Operator as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF TRUTH ENTRYGARD DUAL ARM OPERATOR



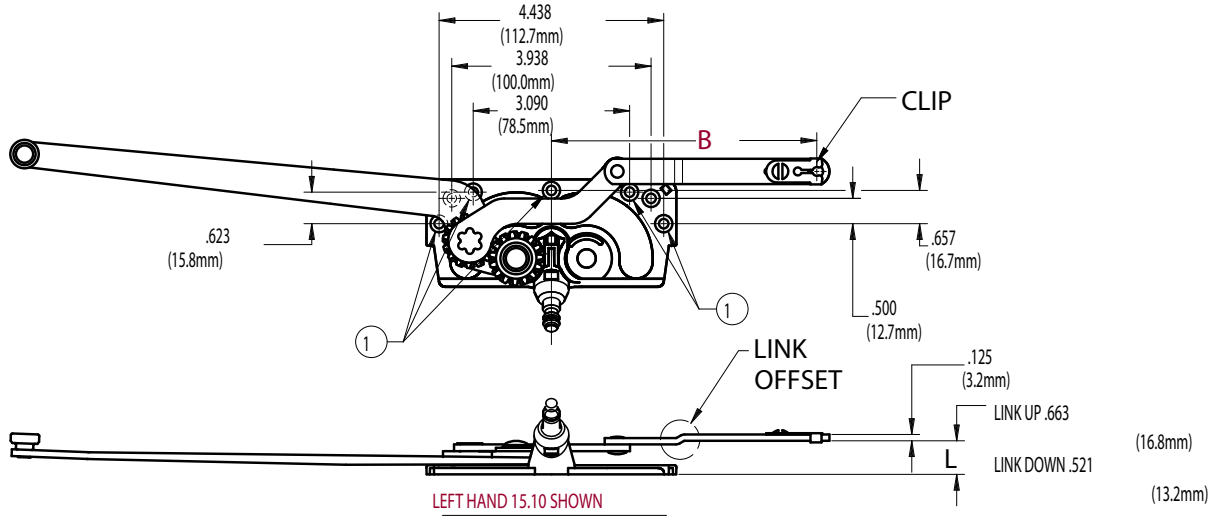
NOTE:

1. TO DETERMINE THE **A** DIMENSION FOR OPERATOR PLACEMENT
ADD SASH DIMENSION **X** TO HINGE CONSTANT **Y** ($A = X + Y$)
SEE TRUTH TIP NO. 8.
2. MINIMIZE THE **X** DIMENSION FOR BEST OPERATOR PERFORMANCE.
THE RECOMMENDED RANGE FOR DIMENSION **X** IS .250 (6.4mm)
TO 1.0 (25.4mm).
3. NOT ALL DUAL ARM OPERATORS CAN BE USED WITH ALL HINGES.
CONSULT THE TABLE IN FIG. 2.
4. OPERATOR CUTOUT SIZE 5.0 (127.0mm) X .750 (19.1mm).
5. USE L, F, AND LINK THICKNESS TO CALCULATE MOUNTING HEIGHT.

TABLE OF APPLICATION
FOR 90° SASH OPENING

AVAILABLE HINGES	Y HINGE CONSTANT
14.05	5.932 (150.7mm)
14.06	6.560 (166.8mm)
14.75	5.932 (150.7mm)
14.76	6.560 (166.8mm)
14.77	3.591 (91.2mm)
14.80	5.932 (150.7mm)
14.91	6.560 (166.8mm)
14.93	3.591 (91.2mm)
34.81	5.692 (144.6mm)

FIG. 2 ENTRYGARD DUAL ARM OPERATOR



RECOMMENDED SCREWS:

WOOD: 5 (P/N 19240.XX) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS.

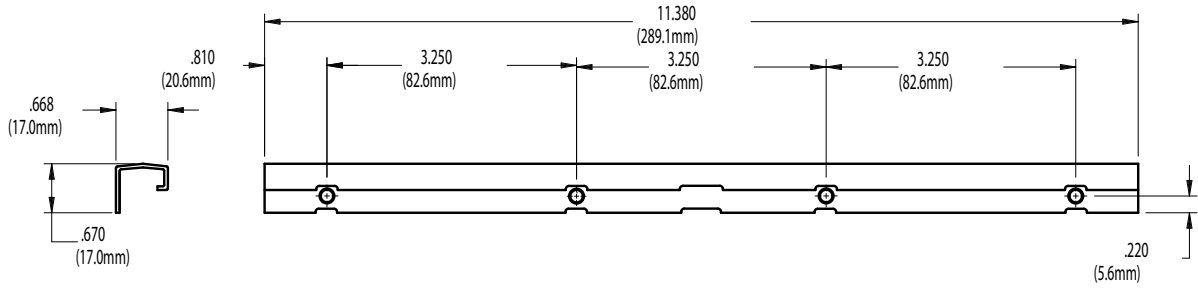
PVC & METAL: 5 - #8 PHILLIPS, FLAT HEAD SCREWS. (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

- ① PREFERRED MOUNTING HOLES
USE L, F, AND LINK THICKNESS TO
CALCULATE BRACKET MOUNTING HEIGHT
(SEE STUD BRACKETS FOR "F" DIM.)

OPERATORS	LINK OFFSET	CLIP	HINGES	B STUD LOCATION	BRACKET CLEARANCE				D	
					10339 L 10340 R	10402 L 10403 R	10498 L 10499 R	10745 L 10746 R		10986 L 10987 R
15.10	UP	TOP	14.05 14.06 14.75 14.76 34.81	5.270 (133.9mm)	.900 (22.9mm)	1.130 (28.7mm)	.900 (22.9mm)	.900 (22.9mm)	.900 (22.9mm)	N/C
15.61	DOWN		N/C		1.000 (25.4mm)	N/C	N/C	N/C	N/C	
15.63	UP	BOTTOM			1.430 * (36.3mm)	.960 (24.4mm)	1.430 * (36.3mm)	1.430 * (36.3mm)	1.430 (36.3mm)	.952 (24.2mm)
15.73	DOWN		1.280 * (32.5mm)		.780 (19.8mm)	1.280 * (32.5mm)	1.280 * (32.5mm)	1.280 * (32.5mm)	.810 (20.6mm)	
15.15 EGRESS	UP	TOP	14.77 EGRESS	2.929 (74.4mm)	N/C	N/C	.900 (22.9mm)	N/C	N/C	N/C

D=MINIMUM CLEARANCE HEIGHT AT STUD BRACKET
*=OPPOSITE HAND INVERTED BRACKET
N/C=NOT COMPATIBLE

FIG. 3 CASEMENT OPERATOR (4 HOLE) TRACK 30473.XX



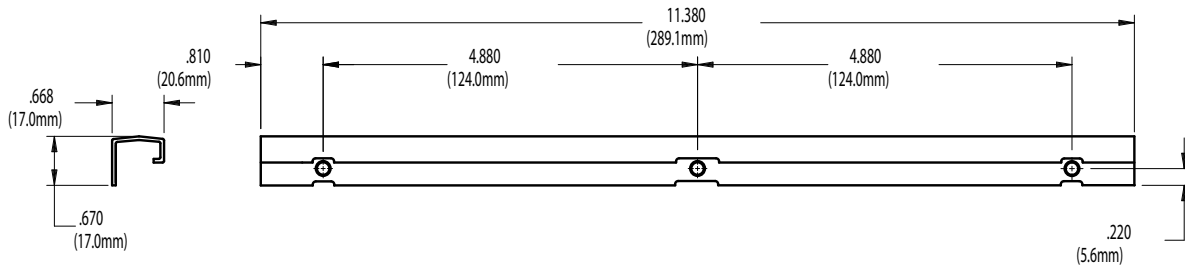
NOTE: ALSO AVAILABLE AS 31727 LIMITER TRACK

RECOMMENDED SCREWS:

WOOD: 4 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 4 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 4 CASEMENT OPERATOR (3 HOLE) TRACK 30706.XX

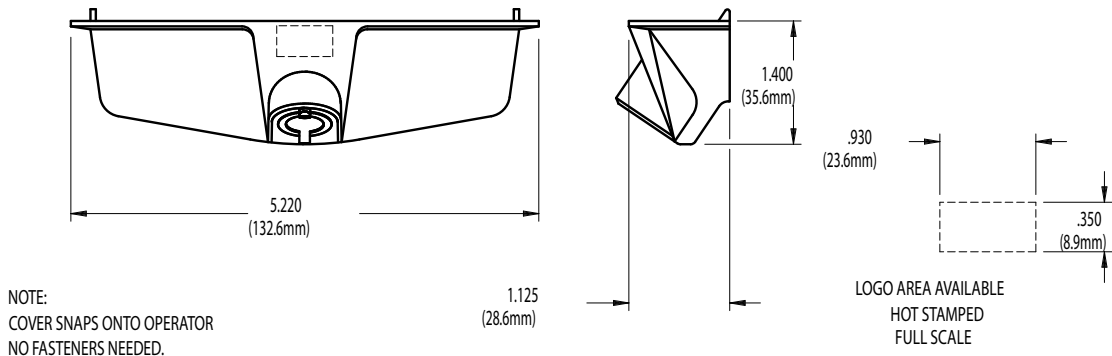


RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 4 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

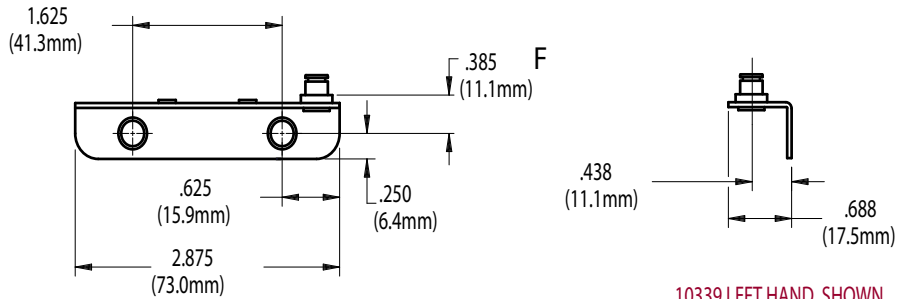
FIG. 5 ENTRYGARD OPERATOR COVER 10341



NOTE:
COVER SNAPS ONTO OPERATOR
NO FASTENERS NEEDED.

LOGO AREA AVAILABLE
HOT STAMPED
FULL SCALE

FIG. 6 STUD BRACKET 10339.XX, 10340.XX



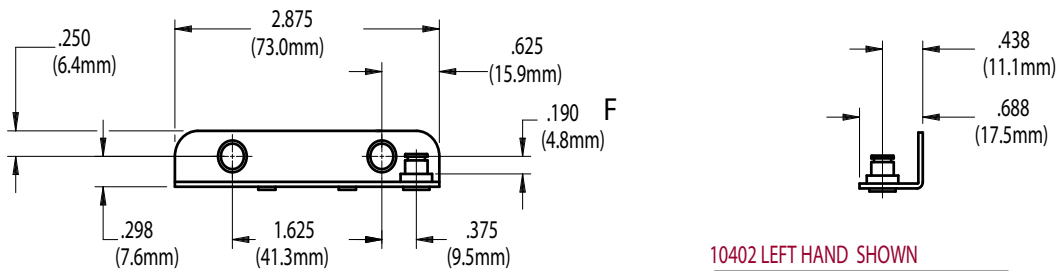
10339 LEFT HAND SHOWN

NOTE: 10340 RIGHT HAND

RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 7 STUD BRACKET 10402.XX, 10403.XX



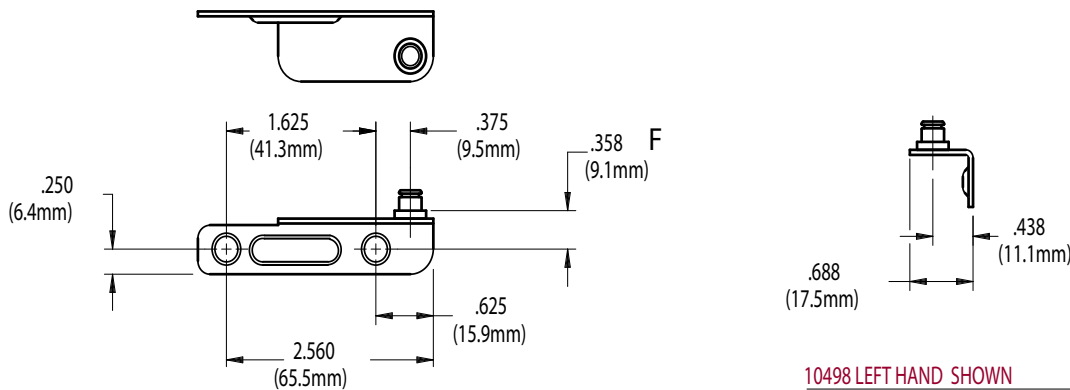
10402 LEFT HAND SHOWN

NOTE: 10403 RIGHT HAND

RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 8 STUD BRACKET 10498.XX, 10499.XX



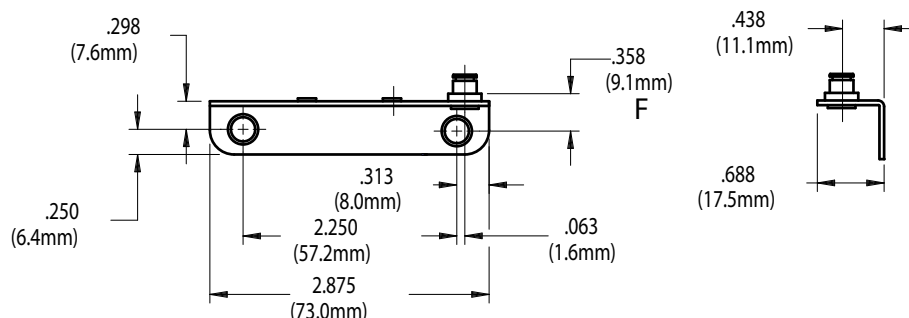
10498 LEFT HAND SHOWN

NOTE: 10499 RIGHT HAND

RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND

FIG. 9 STUD BRACKET 10745.XX, 10746.XX



10745 LEFT HAND SHOWN

NOTE: 10746 RIGHT HAND

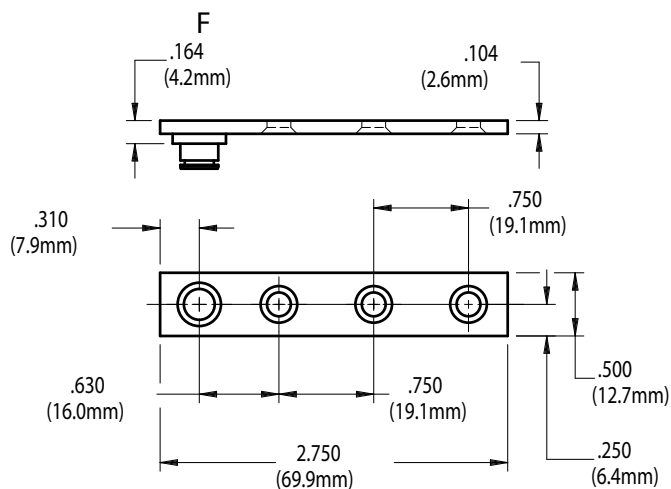
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS,
FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD
SCREWS (LENGTH AND THREAD
TYPE DETERMINED BY PROFILE)

FIG. 10 STUD BRACKET 10558.XX

NON HANDED



RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS,
FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD
SCREWS (LENGTH AND THREAD
TYPE DETERMINED BY PROFILE)



700 WEST BRIDGE STREET, OWATONNA, MN 55060 ■ 507.451.5620 800.866.7884 ■ TRUTH.COM



Designed for use on windows that are too narrow to accept the EntryGard® Dual Arm Operator, this hardware can be used on windows as narrow as eleven inches between stops (nine inches between stops if less than 90° of opening is acceptable). The result is excellent low-torque operation of narrow casement windows through a full 90° of opening.

VERSATILE & ECONOMICAL:

By using the same cover as on the EntryGard Dual Arm Operator, the same family appearance can be maintained. The cover has a flange which acts as an escutcheon. That means lower cost in the making of sill covers since the cut around the operator can be less exacting. The EntryGard Dyad Operator also adapts to an awning window application when mounted to the side jamb and used with Truth Awning Hinges. This dual purpose feature allows for casement/awning unit standardization, reducing costs of exterior cladding, parts inventory and dealers' inventories.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Technical Service Staff can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you considered *personalizing* your window? The EntryGard series of Truth Operators provide a unique area in which to feature your company's name &/or logo. All of Truth's operator handles are capable of accepting your own "signature." Contact Truth for further details.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High-pressure die-cast zinc base, crank handle and knob. Hardened steel worm and gear. High-strength plastic cover.



(Inset photo) EntryGard with new 11454 Contour Handle & 11553 Contour Cover



CORROSION PROTECTION:

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

For the severe conditions associated with coastal areas, Truth has developed certain product lines utilizing either **CoastGard® Hardware**, or stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose operator style desired (specify by part number).
2. Specify finish number.

3. Specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).
4. Select mounting hardware (sold separately):
#11454 - Contour Handle (painted) or #10579 - Roto Gear Operator Handle shown above (painted). **Optional handle and cover style**, such as Truth's *Folding Handle*, are also available.
#10341 - Operator cover (specify finish number).

LH and RH Stud Bracket - Select a bracket from the following drawings. Optional brackets for special profile applications - see Brackets & Track Section.

#21306 - Protective red plastic spline cap (optional).

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Operator handing is determined by the hinge side when viewed from the outside.
2. Sash weight should be limited to 45 lbs. to insure ease of operation for the lifetime of the window. When used on a sash weighing over 45 lbs., operating torque will noticeably increase and operator life will be reduced.

TRUTH TIPS (con't):

3. The EntryGard® Dyad Operator can be used with the following Truth Hinges:

- #14.05, #14.06, #14.75, #14.76. Concealed Casement Hinges.
- All 8", 10", and 12" Standard Duty 4-Bar Hinges.
- All 10" and 12" Heavy Duty 4-Bar Hinges with standard stops (except #34.85).

Note: This Operator should not be used with egress style or Butt Hinges.

4. Dimensions A and B become more critical as sash weight increases. Decreasing the B dimension increases operator performance. Increasing the

5. A dimension increases operator performance near the fully closed position, but may decrease operator performance near the fully open position. Recommended A dimension range: 1.375" (35.3 mm) to 2.125" (54.0 mm). Recommended B dimension range: 1.00" (19.1 mm) to 1.750" (44.5 mm).

6. #10917 and #10918 Stud Brackets are recommended because of the added strength given by the third mounting hole, and in most cases the A dimension is maximized.

7. Application of indicated brackets can vary greatly. Dimension C locates the operator in relation to the bracket. If there is interference between the operator linkage and the window, dimension C must be increased. If the window does not close fully, dimension C must be reduced.

8. When a Dyad Operator is installed in high-rise applications over two stories, a Truth Limit Device, to restrict the amount of opening, is recommended. Contact Truth for wind load information.

9. The EntryGard Dyad Operator is not recommended for windows with stiff, slide-by weatherstrip. To insure proper operation and long operator life,

10. Weatherstrip forces should be minimized. To find out if the weatherstrip forces are acceptable, the following procedure is suggested using the largest window size: A. From a complete window package, disconnect the operator so that the sash opens and closes freely. B. Mount window plumb and square. C. Connect spring scale or other force measuring device to lower lock side of the sash and measure the force required to completely close the window through its final one inch of travel. D. Multiply the force from Step C by the sash width and divide by dimension "A" from Figure 1. For acceptable performance, this calculated force must be less than 150 lbs.

11. If your window exceeds the forces as measured by the procedure outlined above, Truth recommends that the Dyad Operator not be used.

12. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.

13. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

14. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

15. A Spline Cap (#21306) is available to protect the operator splines from dirt and other windows from damage during shipping, installation, and final building construction.

16. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of a casement window.

17. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

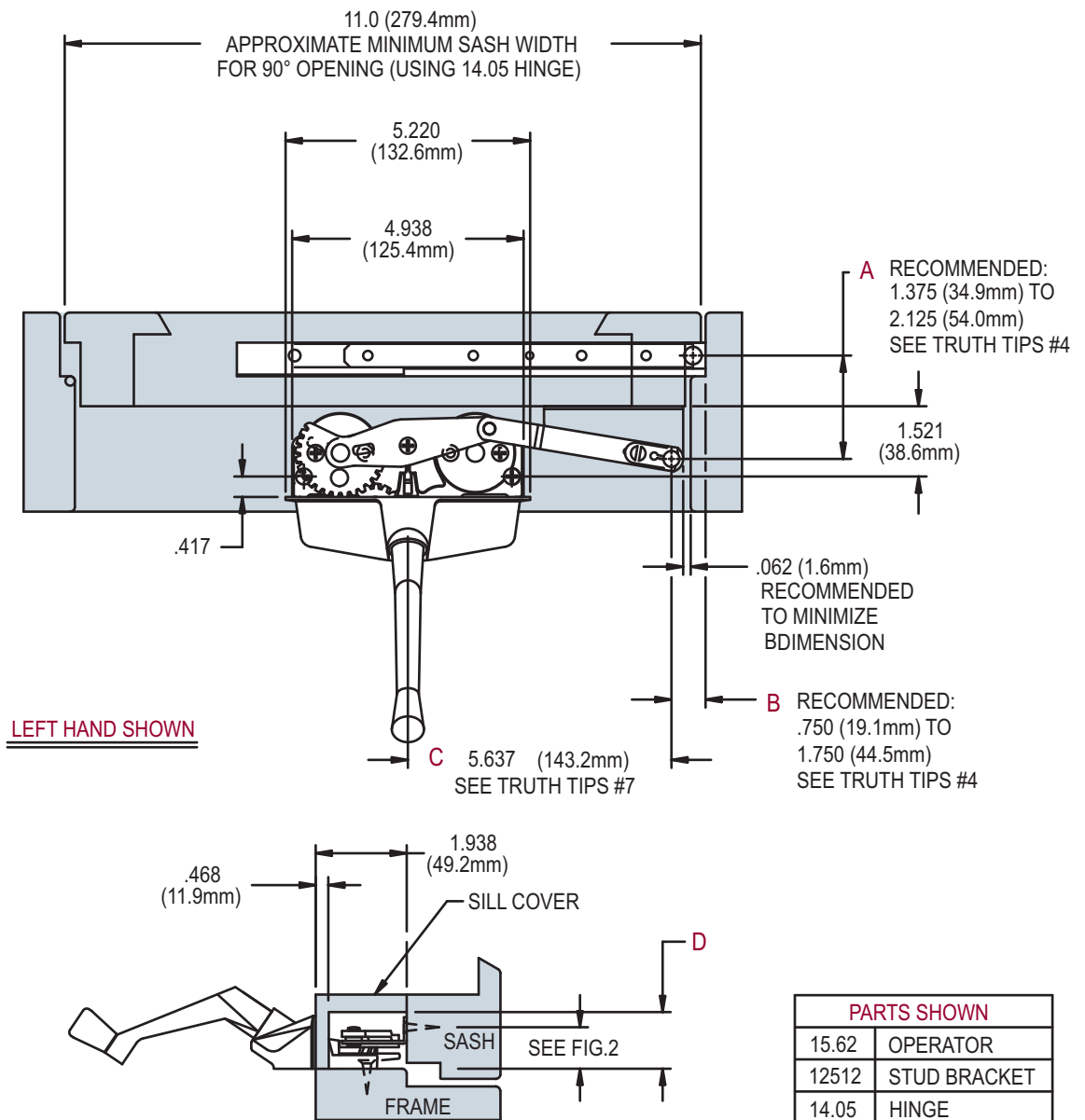
INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide smooth operation out to 90° of sash opening. Connection to the movable sash must be easily detachable for window cleaning and maintenance. Removable EntryGard® interior cover will allow matching hardware styling as well as easier finishing of frame and sill.

Window operators will be of drag arm/link design driven by a hand crank. The operator must be constructed of E-Gard® components, hardened steel worm and gearing and high pressure zinc alloy die castings. High-strength plastic trim cover.

Window Operators shall be 15 series EntryGard® Dyad Operator as manufactured by Truth Hardware, Owatonna, MN.

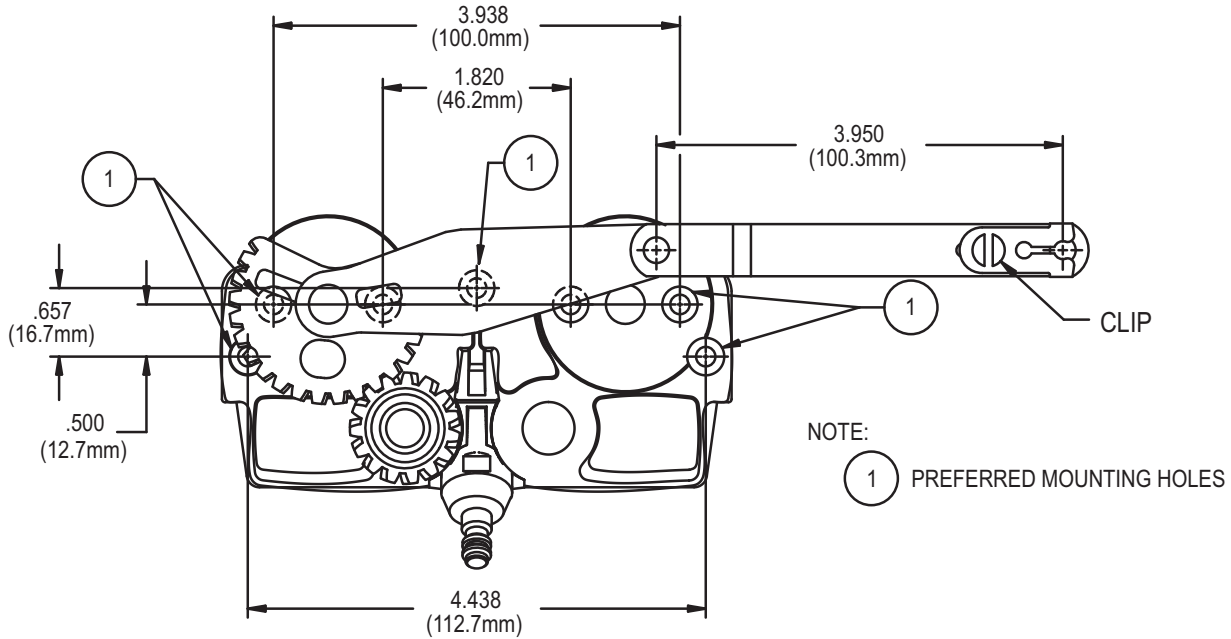
FIG. 1 APPLICATION OF TRUTH ENTRYGARD DYAD OPERATOR



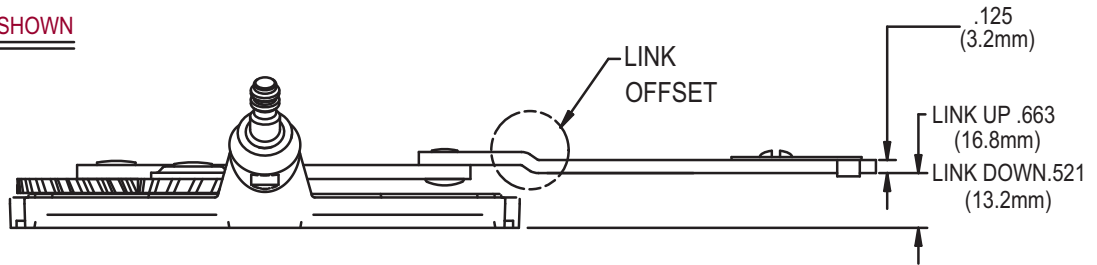
NOTES:

1. CRITICAL **A** RANGES FROM 1.375 (34.9mm) TO 2.125 (54.0mm).
CRITICAL **B** RANGES FROM .750 (19.1mm) TO 1.750 (44.5mm).
2. MAXIMIZE THE **A** DIMENSION AND MINIMIZE THE **B** DIMENSION FOR BEST OPERATOR PERFORMANCE.
3. CONTACT TRUTH IF YOUR PROFILE DOES NOT FIT INTO **A** OR **B** RANGES.
4. THIS OPERATOR MUST NOT BE USED WITH BUTT HINGES, 4 BAR EGRESS HINGES OR ANY CONCEALED CASEMENT HINGES WITH AN **A** DIM. OF LESS THAN 4.00 (101.6mm).
5. OPERATOR CUTOUT 5.0(127.0mm) X .750(19.1mm).

FIG. 2 ENTRYGARD DYAD OPERATOR



15.11 LEFT HAND SHOWN



BRACKET MOUNTING HEIGHT= "L" = "F"
(SEE STUD BRACKETS FOR "F" DIM.)

RECOMMENDED SCREWS:

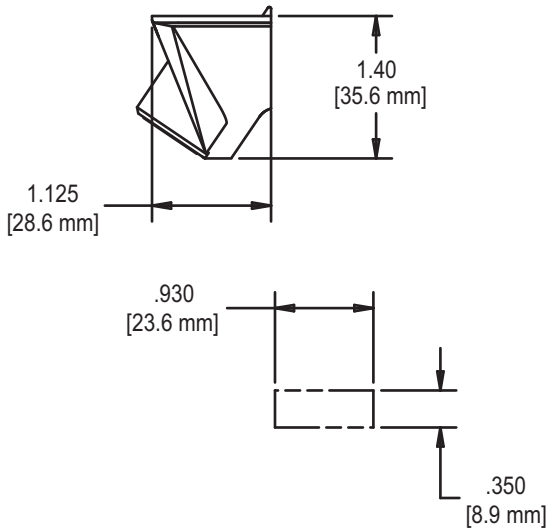
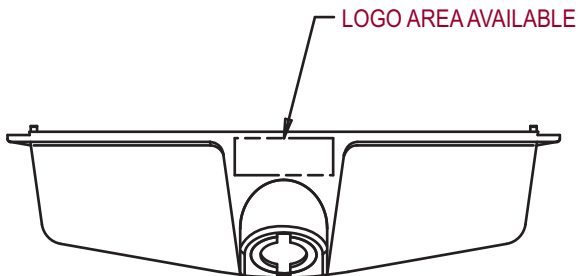
WOOD: 5 (P/N 19240.XX) #8 X 1.0 PHILLIPS,
FLAT HEAD, SHEET METAL, SCREWS.

PVC & METAL: 5 - #8 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE TO BE
DETERMINED BY PROFILE)

AVAILABLE OPERATORS	LINK OFFSET	CLIP	BRACKETS
			10917 L 10918 R
15.11	DOWN	TOP	D= .95 (24.1mm)
15.62	UP		D= 1.09 (27.7mm)
15.64	UP	BOTTOM	D= .952 * (24.1mm)
15.76	DOWN		D= .810 * (20.6mm)

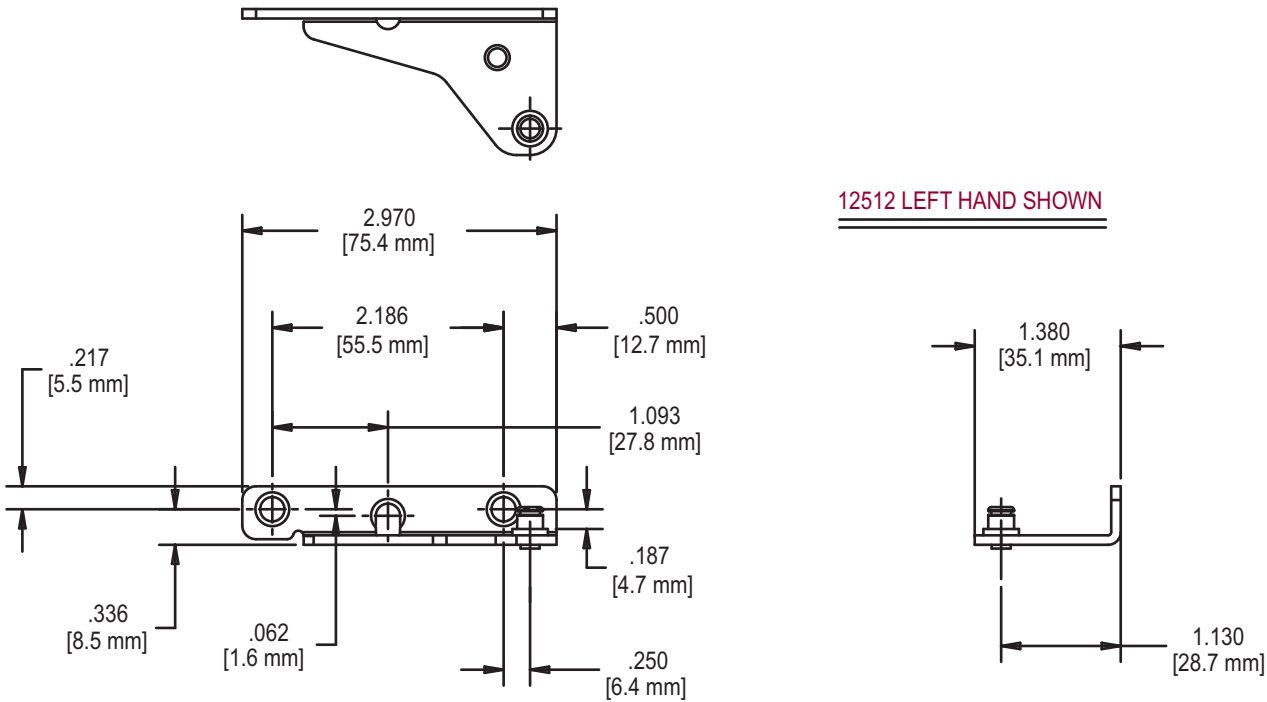
(*= OPPOSITE HAND INVERTED BRACKET)

FIG. 3 ENTRYGARD OPERATOR COVER 10341



NOTE:
COVER SNAPS ONTO OPERATOR
NO FASTENERS NEEDED

FIG. 4 STUD BRACKETS 12512.XX, 12513.XX



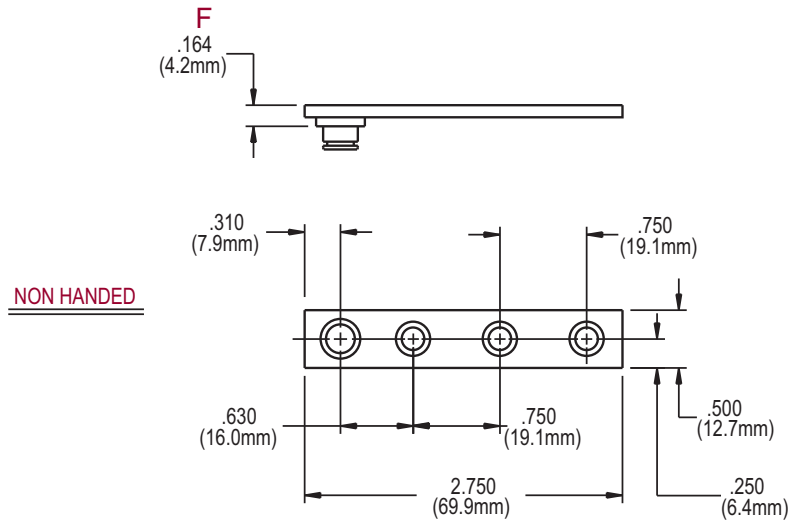
12512 LEFT HAND SHOWN

NOTE: 12513 RIGHT HAND

RECOMMENDED SCREWS:

WOOD: (QTY 3) (P/N 19140.XX)#7 X .875 PHILLIPS,FLAT HEAD,SHEET METAL SCREWS:
PVC&METAL: (QTY 3)#7 PHILLIPS,FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 5 STUD BRACKETS 10558.XX

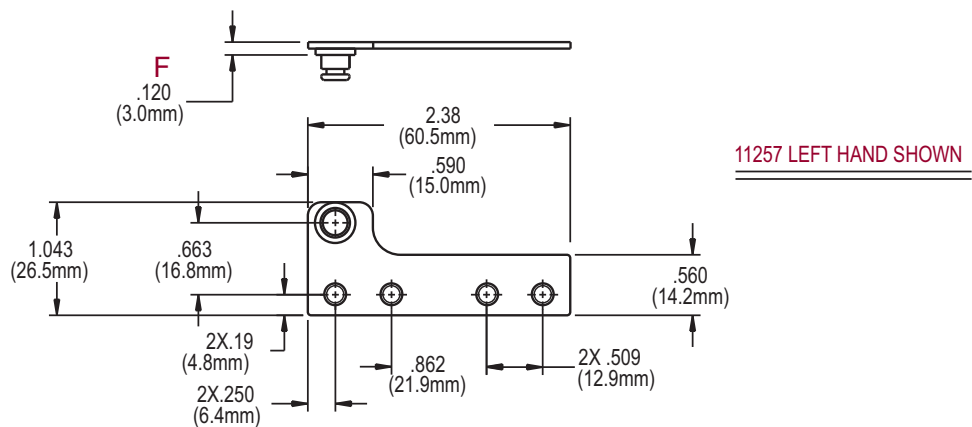


RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 6 STUD BRACKETS 11257.XX, 11258.XX



RECOMMENDED SCREWS:

WOOD: 4 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 4 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 11258 RIGHT HAND



New to Truth's family of EntryGard® Operators is our Single Arm Model. This product combines all the functional advantages of Truth's Standard Single Arm Operator with the aesthetic features of our popular EntryGard model. Recommended for use on narrow windows, or for round-top and trapezoid windows that use a Butt Hinge.

VERSATILE: The roto gear casement operator arm can be easily disconnected from the sash to aid in cleaning and installation. When properly mounted, this operator will provide a full 90° of window opening. For smooth operation, a nylon roller located on the end of the arm, glides easily along the track.

STYLISH & ECONOMIC:

To tie this product in with the EntryGard family, Truth has designed this Single Arm Operator to accept the standard operator cover. The cover, available in a variety of colors, has a flange which acts as an escutcheon. This will result in lower costs in the making of the sill covers since the cut around the operator can be less exacting.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you considered *personalizing* your window? The EntryGard Single Arm Operator provides a unique area in which to feature your company's name and/or logo. All of Truth's operator handles are capable of accepting your own "signature". Contact Truth for further details.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.



(Inset photo) EntryGard with new 11454 Contour Handle & 11553 Contour Cover

MATERIAL: High-pressure die-cast zinc base, crank handle, and knob. Hardened steel worm and gear. High-strength plastic cover.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

CORROSION PROTECTION:

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

For the severe conditions associated with coastal areas, Truth has developed certain product lines utilizing either **CoastGard® Hardware**, or stainless steel hardware. See Tech Note #7 for

further information about corrosion protection and these special hardware options

ORDERING INFORMATION:

1. Choose operator style desired.
#15.94 - Single Arm Operator.
2. Specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).
3. Specify operator track number.
#30706.XX Track - 3-hole.
4. Order mounting hardware (sold separately).
#11454 - Contour Handle (painted) or **#10579** - Roto Gear Operator Handle - shown above (painted). **Optional handle and cover style**, such as Truth's *Folding Handle*, are also available.
#10341 - Operator cover (specify finish number).
#21306 - Protective red plastic spline cap (optional).

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Operator handing is determined by the hinge side when viewed from the outside.
2. When used in high rise applications of over two stories, Truth recommends using a Truth Limit Device.
3. A Spline Cap (#21306) is available to protect the operator splines from dirt and other windows from damage during shipping, installation, and final building construction.
4. Truth recommends that a Truth Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outward at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of a casement window.
5. Sash weight should be limited to 40 lbs. to insure ease of operation for the lifetime of the window. When used on a sash weighing over 40 lbs., operating torque will noticeably increase and operator life will be reduced.

6. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
7. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
8. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.
9. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.
10. This operator may be mounted closer to the lock side of the window to effectively limit opening and improve corner pull-in performance.

**INCLUDE TRUTH SPECS ON
YOUR NEXT WINDOW PROJECT**

Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide smooth operation of egress or butt hinges. Connection to the movable sash must be easily detachable for window cleaning and maintenance. Removable EntryGard® interior cover will allow matching hardware styling as well as easier finishing of frame and sill.

Window operators will be of single push arm design driven by a hand crank. The operator must be constructed of E-Gard® components, hardened steel worm and gearing and high pressure zinc alloy die castings. High-strength plastic trim cover.

Window Operators shall be 15 series EntryGard® Single Arm Operator as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF TRUTH ENTRYGARD SINGLE ARM OPERATOR

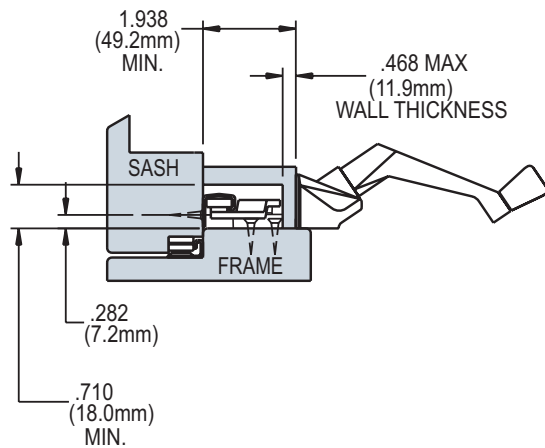
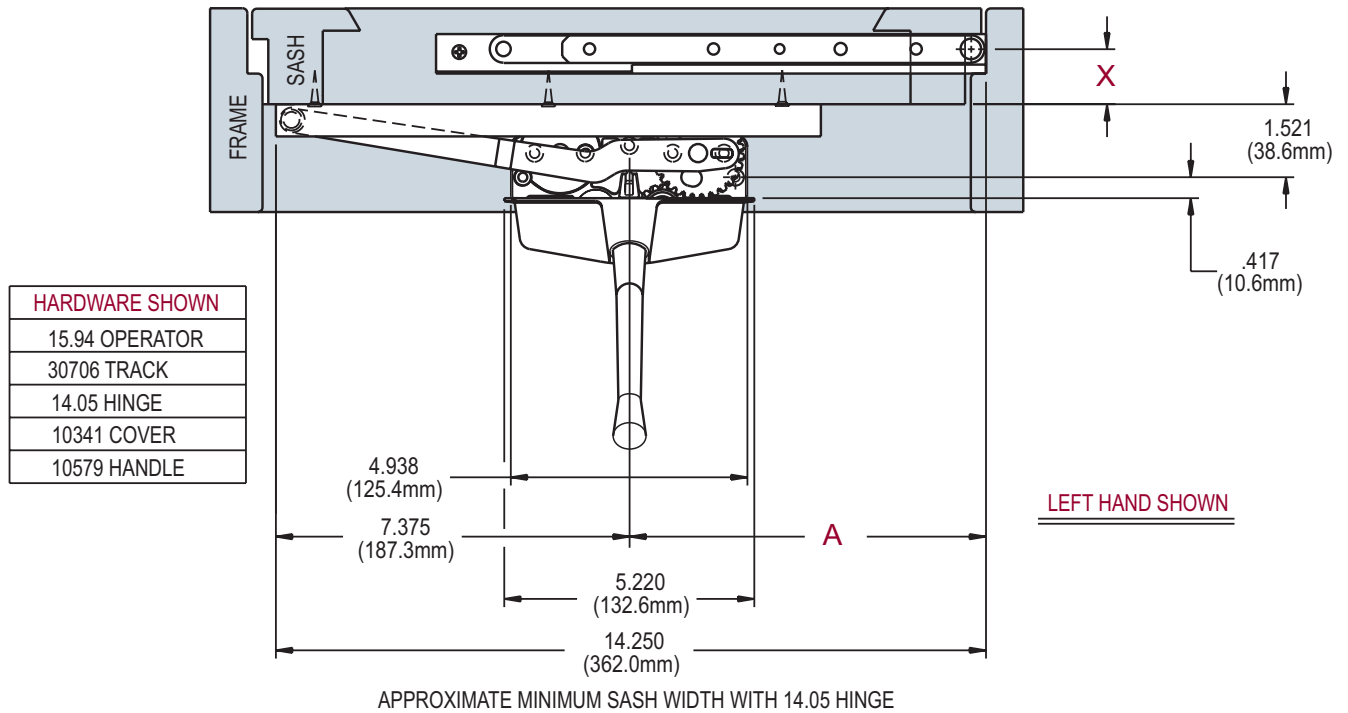


TABLE OF APPLICATION
FOR 90° SASH OPENING

AVAILABLE HINGES	Y HINGE CONSTANT
*14.02	7.997 (203.1mm)
14.05	7.008 (178.0mm)
14.06	7.655 (194.4mm)
14.75	6.947 (176.5mm)
14.76	7.575 (192.4mm)
14.77	4.318 (109.7mm)
*14.80	6.947 (176.5mm)
*14.91	7.575 (192.4mm)
*14.93	4.068 (103.3mm)
14.96	6.986 (177.4mm)

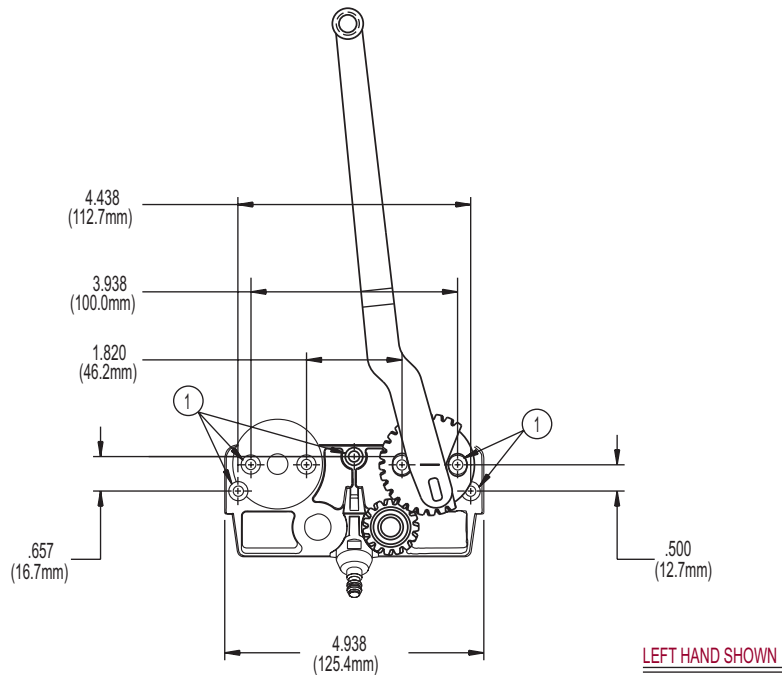
* STAINLESS STEEL HINGES

NOTE:

1. TO DETERMINE THE **A** DIMENSION FOR OPERATOR PLACEMENT ADD SASH DIMENSION **X** TO HINGE CONSTANT **Y**. $(A=X+Y)$
2. MINIMIZE THE **X** DIMENSION FOR BEST OPERATOR PERFORMANCE. THE RECOMMENDED RANGE FOR DIMENSION **X** IS .250 TO 1.00.
3. OPERATOR CUT OUT SIZE: 5.0 (127.0mm) X .750 (19.1mm)

15 ENTRYGARD® SINGLE ARM OPERATOR

FIG. 2 TRUTH ENTRYGARD SINGLE ARM OPERATOR



RECOMMENDED SCREWS:

OPERATOR:

WOOD: 5 (P/N 19240.XX) #8 X 1.0 PHILLIPS,
FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 5 - #8 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED
BY PROFILE)

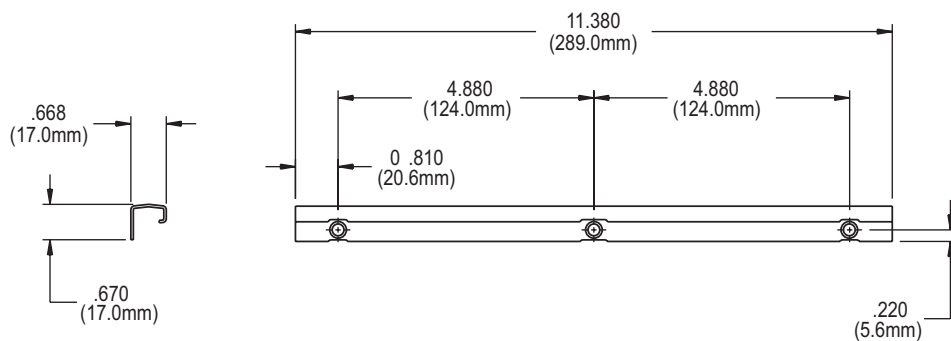
NOTE:

① PREFERRED MOUNTING HOLES

AVAILABLE
OPERATORS

15.94

FIG. 3 SINGLE ARM OPERATOR TRACK 30706



RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS,
FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #7 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



Now an awning operator that offers the same “family appearance” that’s available with Truth’s popular EntryGard® Casement Operators. Designed to accept the same operator cover that the casement models use.

VERSATILE & EFFICIENT:

With three different arm lengths available (12.0", 20.750", & 28.750") in both steel and stainless steel, this operator reduces the torque needed to open or close the sash. Truth’s new guide bar type operator does a beautiful job of pulling the sash snug to the weatherstrip, even on wide awning windows. A simple detach feature disengages the operator from the sash for quick window removal.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you considered *personalizing* your window? The EntryGard series of Truth Operators provide a unique area in which to feature your company’s name &/or logo. All of Truth’s operator handles are capable of accepting your own “signature”. Contact Truth for further details.

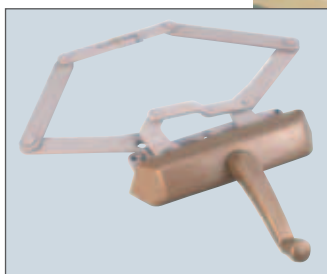
WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth’s Terms and Conditions for further details.

MATERIAL: High-pressure die-cast zinc operator base. Hardened steel drive worm and gears. High-strength polycarbonate operator cover.

CORROSION PROTECTION:

Truth’s E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.



(Inset photo) EntryGard with new 11454 Contour Handle & 11328 Metal Cover



For the severe conditions associated with coastal areas, Truth has developed certain product lines utilizing either **CoastGard® Hardware**, or stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth’s Color Chart for examples of Truth’s most popular finish options. Truth also offers a wide range of decorative “plated” finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose operator style desired (specify by part number).
 2. Specify finish number.
 3. Select mounting hardware (sold separately):
 - #11454 - Contour Handle (painted) or #10579 - Roto Gear Operator Handle - shown above (painted).
 - #10341 - Operator Cover (specify finish number).
 Optional handle and cover styles, such as Truths *Folding Handle* and metal cover, are also available.
- Sash Hook-** three styles to choose from - refer to drawings for sizes and part numbers (used with #11.42).
 #10005 - Shoes Studs (#11.43, #11.44, #11.46, #11.47) require 2 each.

- #31641 - Guide Bar (used with #11.43 & #11.46) or,
- #31642 - (used with #11.44 & #11.47).
- #21306 - Protective red plastic spline cap (optional).

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. The EntryGard Awning Operator can be used with all Truth 13 Series Awning Hinges. To insure maximum operator efficiency and avoid sash chatter, it is important that the operator, hinge, and sash height be properly matched. For more complete information on proper hinge sizing and how to overcome corner pull-in problems, see Truth Tech Note #2.
2. Butt Hinges can be used with the EntryGard Awning Operator, however, some degree of sash chatter will usually occur. Chatter is caused by the weight of the window pushing the operator closed rather than the operator pulling the window closed.
3. When security and/or a tighter weather seal is desired, sash locks should be added to either the sill or side jambs.
4. A Truth Spline Cap (#21306) is available to protect the operator spline from dirt and damage during shipping, window installation, and final building construction.

5. Adding a Truth Snubber to the center of the top rail on an awning window may increase the negative air pressure rating of the window.
6. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
7. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
8. For metal window profiles Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

9. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

**INCLUDE TRUTH SPECS ON
YOUR NEXT WINDOW PROJECT**

Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide wide range of open positions. Connection to the movable sash must be easily detachable for window cleaning and maintenance. Removable EntryGard® interior cover will allow matching hardware styling to casement windows.

Window operators will be of scissors arm design driven by hand crank. The operator must be constructed of E-Gard® components, hardened steel worm and gearing and high pressure zinc alloy die castings. High-strength plastic trim cover.

Window Operators shall be 11 series EntryGard® Awning Operator as manufactured by Truth Hardware, Owatonna, MN.

11 ENTRYGARD® AWNING OPERATOR

FIG. 1 APPLICATION OF TRUTH ENTRYGARD AWNING OPERATOR

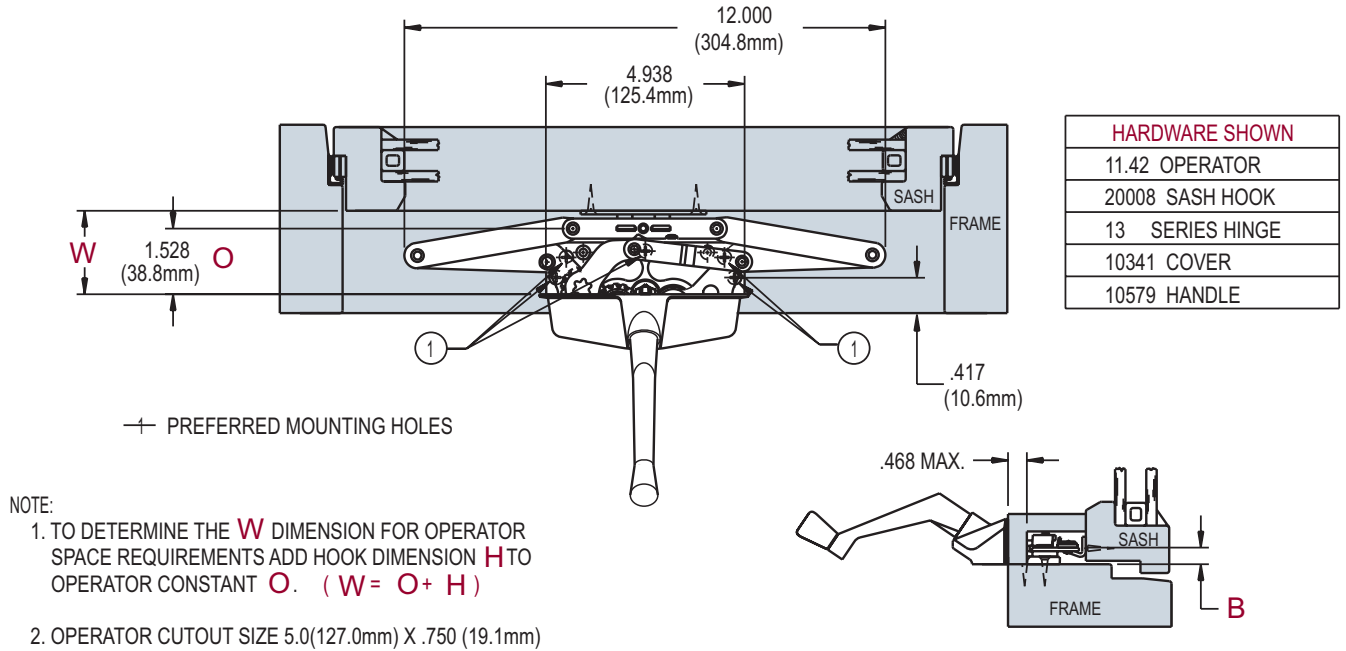
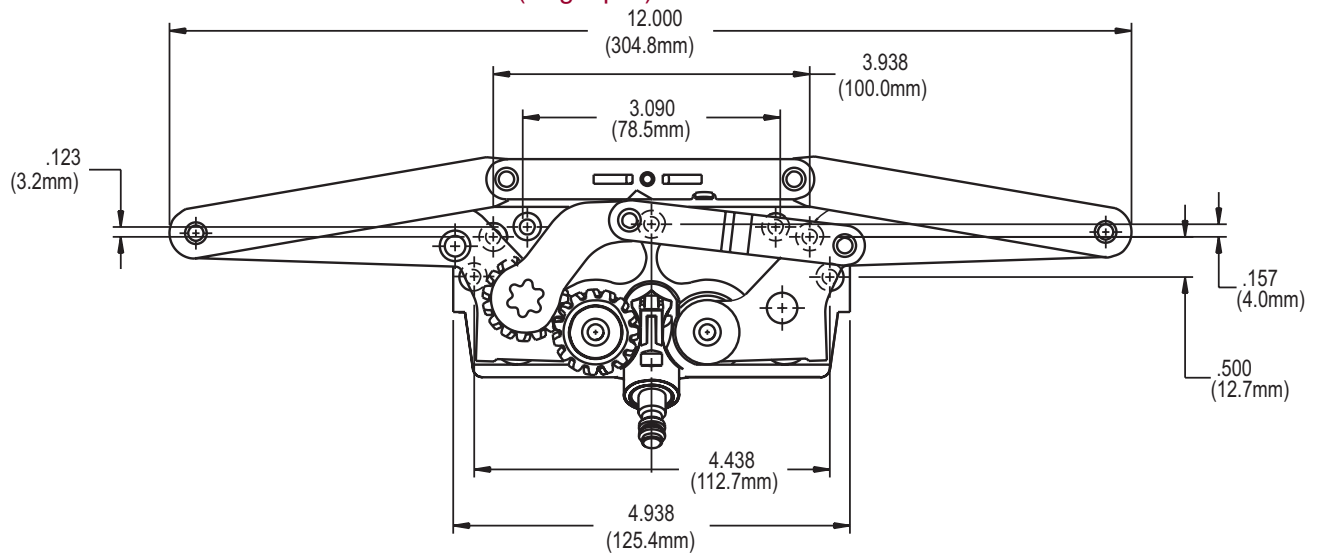


FIG. 2 ENTRYGARD AWNING OPERATOR (single pull)



AVAILABLE OPERATOR	SASH OPENING	SASH HOOKS	DIMENSION B	DIMENSION H
11.42	7.25 (184.2mm)	20008	.555 (14.1mm)	+ .410 (10.4mm)
		*31336	N/A	+ .160 (4.1mm)
		40543		± .845 (21.5mm)

*31336 MAY ADD OR SUBTRACT FROM **O**

RECOMMENDED SCREWS:

OPERATORS:

WOOD: 5 (P/N 19240.XX) STEEL #8 X 1.0
 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 5 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 3 ENTRYGARD AWNING OPERATOR (GUIDE BAR)

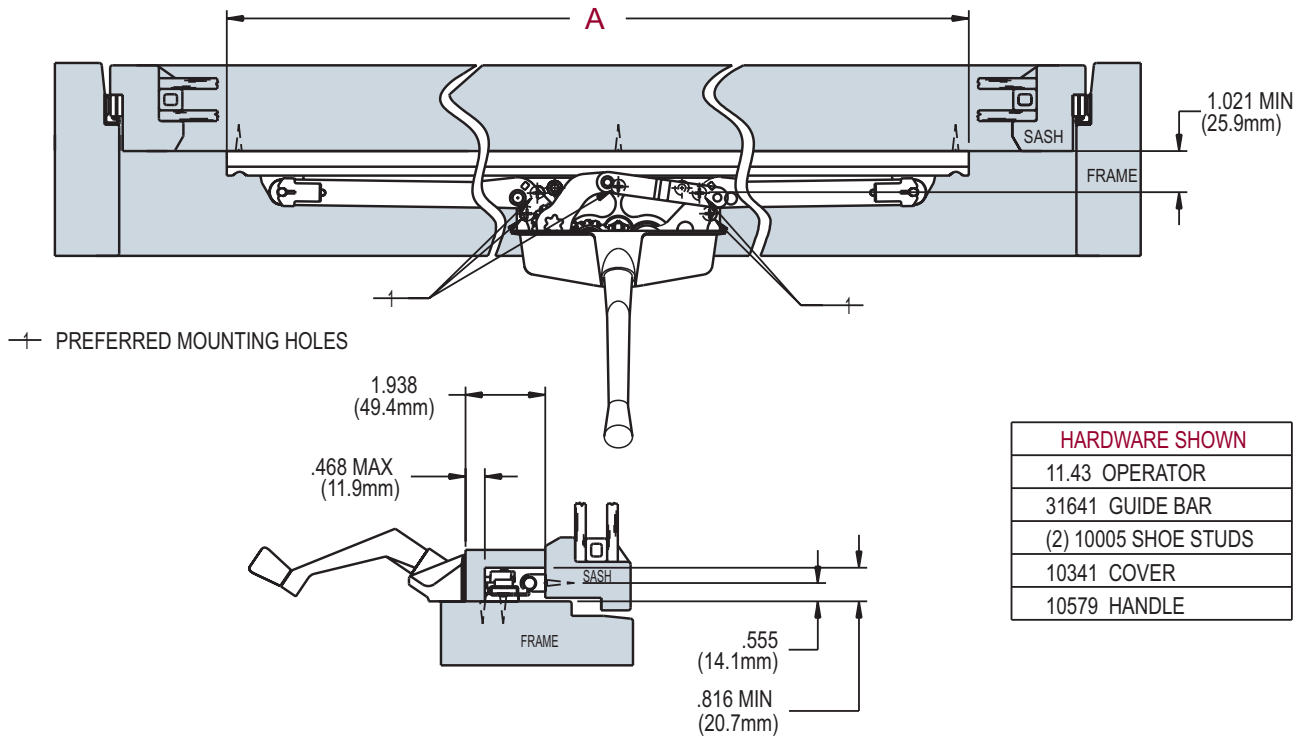
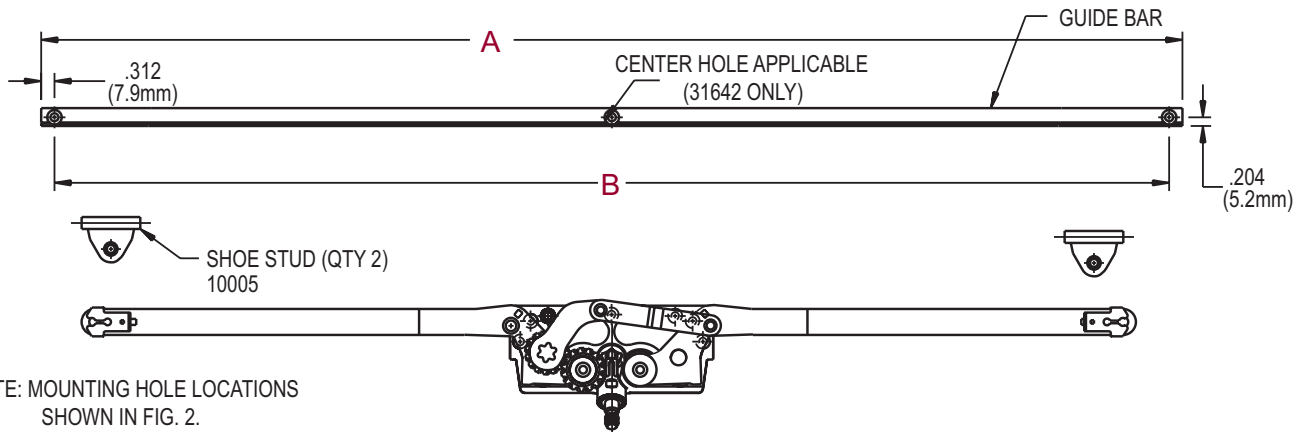


FIG. 4 ENTRYGARD AWNING OPERATOR (GUIDE BAR)



NOTE: MOUNTING HOLE LOCATIONS SHOWN IN FIG. 2.

AVAILABLE OPERATOR	AVAILABLE GUIDE BAR	SCREW REQD.	GUIDE BAR OVERALL LENGTH A	GUIDE BAR HOLE TO HOLE DIM B	APPROXIMATE SASH OPENING	DIMENSION C
11.43	31641	2	22.750 (577.9mm)	22.125 (562.0mm)	7.688 (195.3mm)	.599 (14.2mm)
11.44	31642	3	30.750 (781.1mm)	30.125 (765.2mm)	11.312 (287.3mm)	

RECOMMENDED SCREWS:

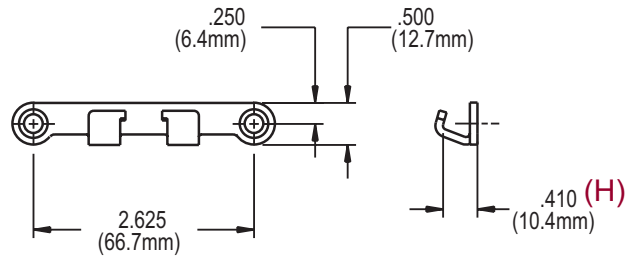
OPERATORS:

- WOOD: 5 (P/N 19240.XX) STEEL #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
- PVC & METAL: 5 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)
- GUIDE BAR: (P/N 19240.XX) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

NOTE: *2 (30385) CLIPS INCLUDED WITH OPERATOR.

GUIDE BAR (PN/31641 AND 31642) AND SHOE (P/N 10005) MUST BE ORDERED SEPARATELY.

FIG. 5 SASH HOOK 20008

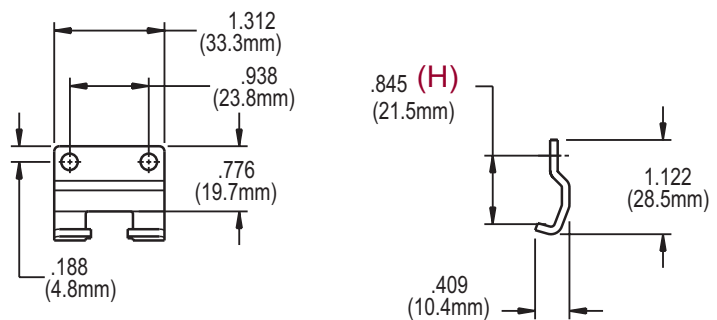
**RECOMMENDED SCREWS:**

WOOD: 2 (P/N 19240.XX) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

STAINLESS STEEL SCREWS REQUIRED WITH STAINLESS STEEL SASH HOOK

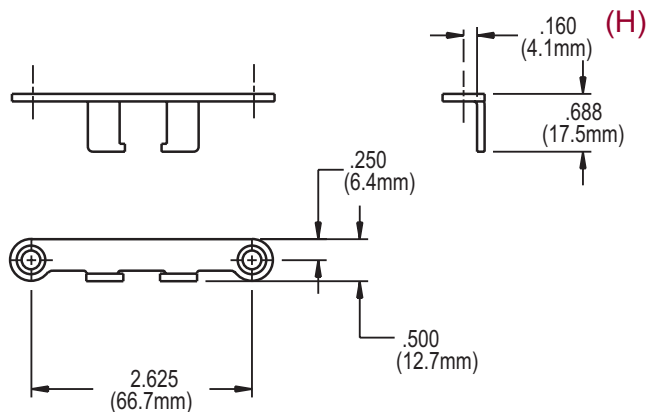
FIG. 6 SASH HOOK 40543

**RECOMMENDED SCREWS:**

WOOD: 2 (P/N 19230.XX) #8 X 1.0 PHILLIPS, PAN HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #8 PHILLIPS, PAN HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 7 SASH HOOK 31336

**RECOMMENDED SCREWS:**

WOOD: 2 (P/N 19240.XX) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



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Made of the highest quality materials, the Ellipse Single Arm Casement Operator has provided years of continuous and trouble-free service for our customers. This operator will provide a full 90° window opening and disconnects easily from the sash. Nylon roller runs in the steel track to further assure smooth operation. Concealed mounting screws produce a neat overall appearance.

SEALABLE CASE: The unique case design complements the smooth contour styling of the Maxim® family of products, while retaining the same mounting and mechanical features of Truth's Traditional Operator lines. A special "lip" around the operators' case will accept a gasket, which will help the window achieve a higher air and water performance rating, while at the same time; eliminate the need for slow, messy and often expensive caulking during the installation process.

LOGO OPTIONS: Have you considered *personalizing* your window with your company name or logo? All of Truth's operator handles are capable of accepting your own "signature". Contact Truth for further details.

WARRANTY: Protected under the terms of the Truth Warranty for Window & Door Manufacturers & Authorized Distributors. Refer to Truth's Terms & Conditions for further details.

CORROSION RESISTANCE: Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

For the severe conditions associated with coastal areas, Truth has developed certain product lines utilizing either CoastGard® Hardware, or stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.

MATERIAL: High-pressure die-cast zinc case, crank handle and knob. Hardened steel drive worm and gear arm with nylon roller. Track available in steel or 300 Series stainless steel.



FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose operator model desired (see table in Fig. 3 for options).
2. Specify Ellipse style housing.
3. Specify finish number.
4. Specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).
5. Select mounting hardware (sold separately):
 #11454.XX - Contour™ Handle - shown above (painted) or
 #11329.XX - Folding Handle (painted)
 #30706.92 - Face-mount track (3-hole)
Optional track for special profile applications - see Brackets & Track Section.
 #21306 - Protective red plastic spline cap (optional)
 #21504 - Ellipse Gasket (optional)
 #21494 - Gasket Applicator (optional)

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection-see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Operator handing is determined by the hinge side when viewed from the outside.
2. Before selecting an operator, the hinge model should be chosen based upon desired window hinging requirements (example: egress vs. washability).
3. Sash weight should be limited to 40 lbs. to insure ease of operation for the lifetime of the window. When used on a sash weighing over 40 lbs., operating torque will noticeably increase and operator life will be reduced.
4. Operator torque can be kept to a minimum by using the longest possible arm that will fit between the side jambs.
5. Recommended range for Dimension "X" is .250" (6.4 mm) to 1.000" (25.4 mm).
6. Selecting the longest operator arm possible and minimizing dimensions "X" and "C" will result in best operator performance.

7. Arm lengths shorter than 9.5" will not allow easy operation of a window to 90° unless used with Truth's #14.77 hinge.

8. When used in high rise applications of over two stories, Truth recommends using a Limit Device (or see Tip 10).

9. For limited opening applications, Truth recommends using #31727 Track.

10. This operator may be mounted closer to the lock side of the window to effectively limit opening and improve corner pull-in performance.

11. A spline cap (#21306) is available to protect the operator splines from dirt and other windows from damage during shipping, installation, and final building construction.

12. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of a casement window.

13. The Truth Single Arm Operator works well with a Butt Hinge. Always use an operator with the longest arm possible for best operation.

14. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.

15. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

16. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

17. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

18. Single Arm Operators do not work well with 4-Bar Hinges unless the 4-Bar Hinge is an egress hinge. If a 4-Bar Hinge other than an egress hinge is required, a Truth Dyad or Split Arm Operator is the best choice.

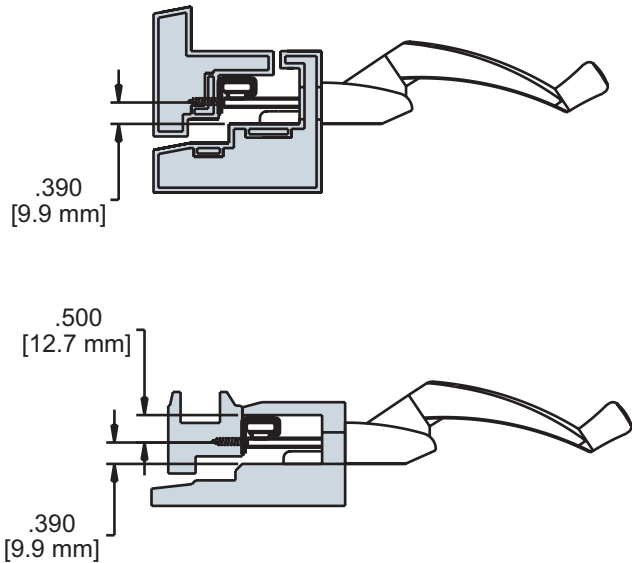
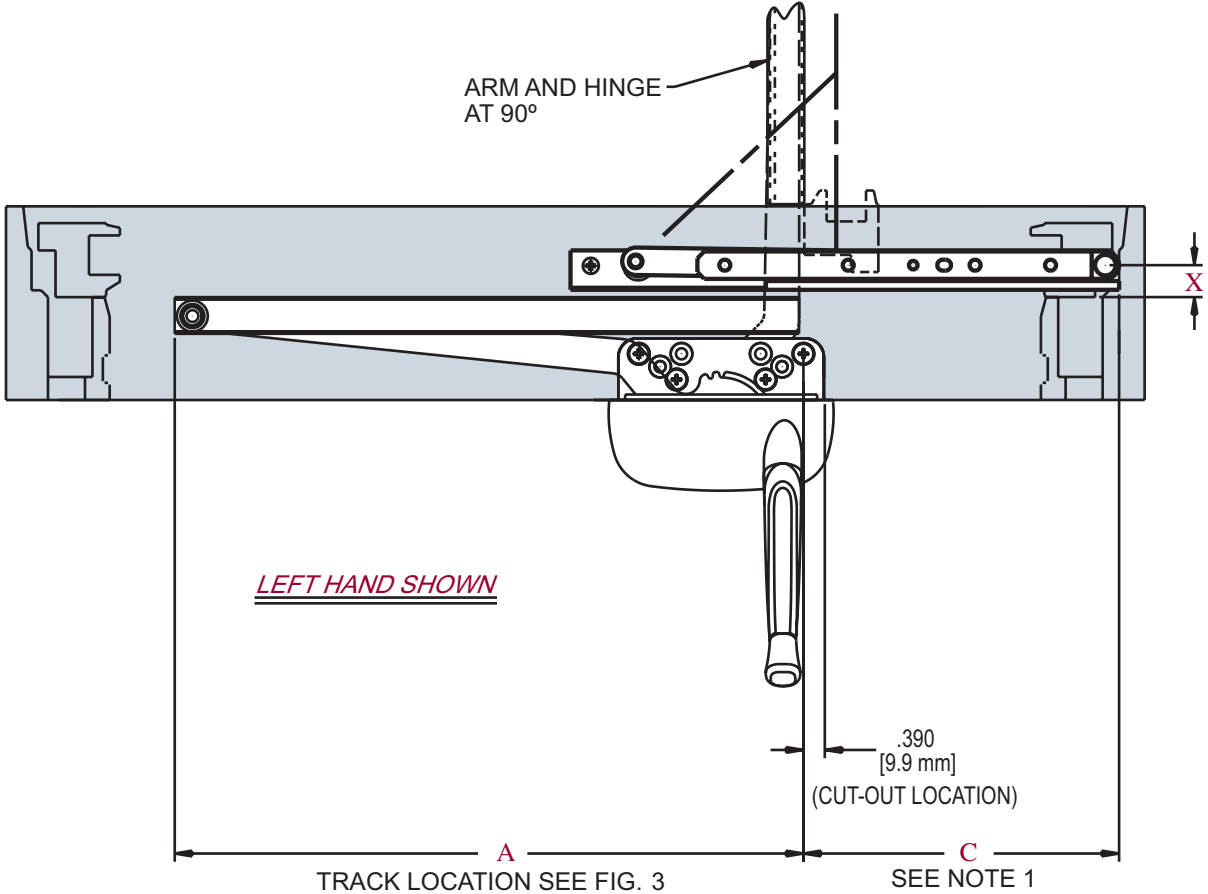
INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide smooth operation of egress or butt hinges. Connection to the movable sash must be easily detachable for window cleaning and maintenance.

Window operators will be of single push arm design driven by a hand crank. The operator must be constructed of E-Gard® components, hardened steel worm and gear arm and high pressure zinc alloy die cast base.

Window Operators shall be 15 series Ellipse Single Arm Operator as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF TRUTH ELLIPSE SINGLE ARM OPERATOR



AVAILABLE HINGES	Y HINGE CONSTANT
14.05	5.290 (134.4mm)
14.06	5.915 (150.2mm)
14.75	5.290 (134.4mm)
14.76	5.915 (150.2mm)
14.77	3.110 (79.0mm)
14.91	5.915 (150.2mm)
35.10	1.758 (44.7mm)
35.11	1.758 (44.7mm)
35.12	1.645 (41.8mm)
35.13	1.645 (41.8mm)

HARDWARE SHOWN	
15.31	OPERATOR
30706.92	TRACK
14.05	HINGE
11454.XX	HANDLE

- NOTE:
1. TO DETERMINE THE C DIMENSION, ADD DIMENSIONS X TO HINGE CONSTANT Y TAKEN FROM TABLE . $C = X + Y$
 2. SEE TRUTH TIPS FOR ADDITIONAL HINGE INFORMATION

FIG. 2 ELLIPSE SINGLE ARM WOOD/PVC CUT-OUT DETAIL

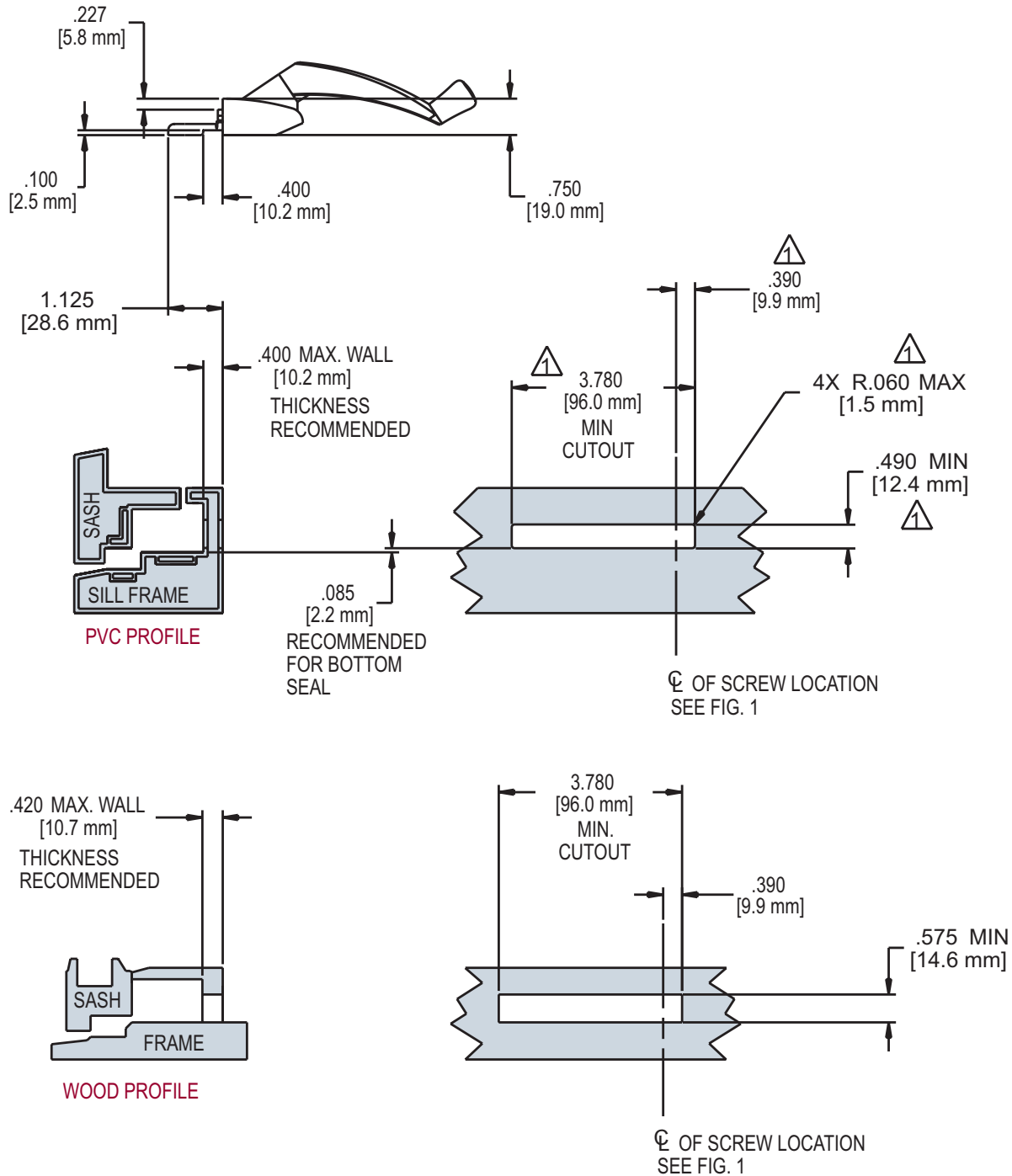
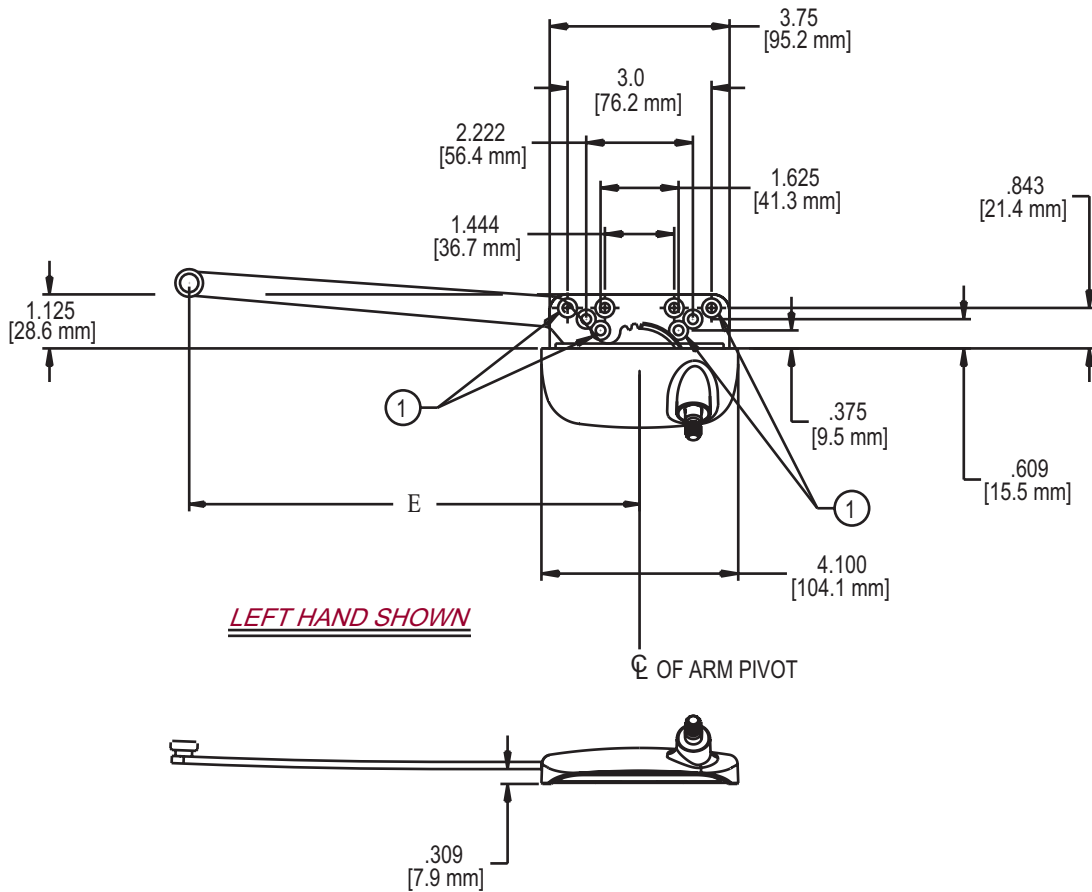


FIG. 3 ELLIPSE SINGLE ARM OPERATOR



LEFT HAND SHOWN

☉ OF ARM PIVOT

① PREFERRED MOUNTING HOLES (WOOD APPLICATIONS)

RECOMMENDED SCREWS:

WOOD: (QTY 4) (P/N 19380.92) #10 X 1.0 PHILLIPS
FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: (QTY 4) #10 PHILLIPS, FLAT HEAD
SCREWS (LENGTH AND THREAD TYPE
TO BE DETERMINED BY PROFILE)

AVAILABLE OPERATOR	ARM LENGTH E	A SEE FIG. 1	TRACK FOR USE WITH EGRESS HINGE	TRACK FOR USE WITH WASHABILITY HINGE
15.32	13.500 (342.9mm)	15.310 (388.9mm)	30150.92	30706.92
15.31	9.500 (241.3mm)	11.310 (287.3mm)		
15.56	7.500 (190.5mm)	9.310 (236.5mm)	30706.92	NOT RECOMMENDED
15.39	6.0 (152.4mm)	7.810 (198.4mm)	31375.92	

FIG. 4 GASKET APPLICATION FOR ELLIPSE SINGLE ARM OPERATOR

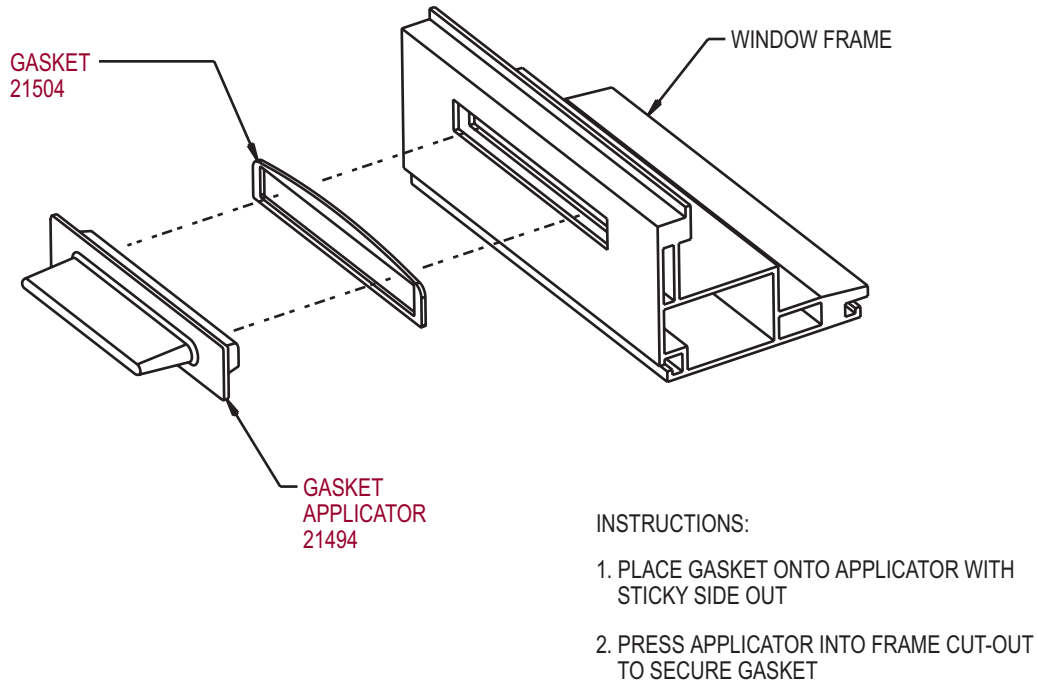
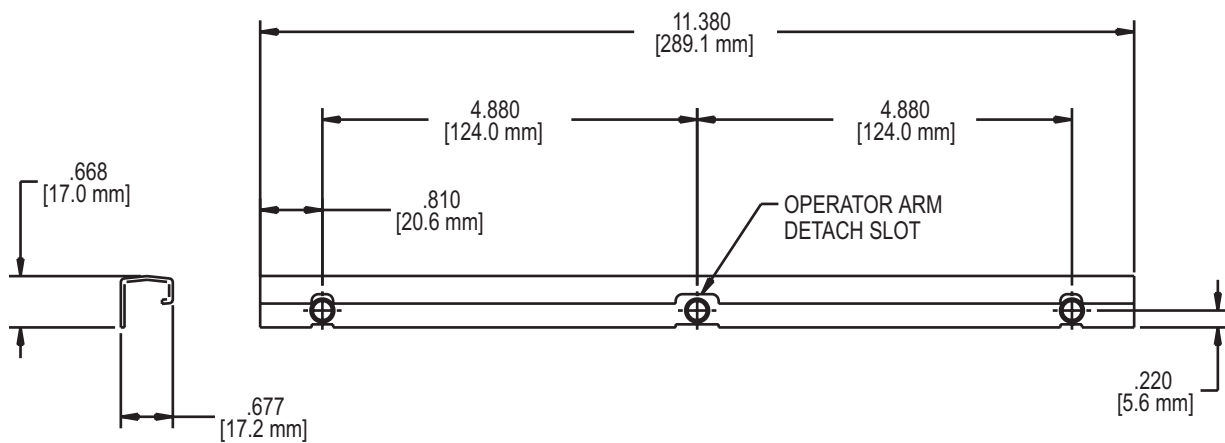


FIG. 5 SINGLE ARM OPERATOR TRACK (3 HOLE) 30706.92

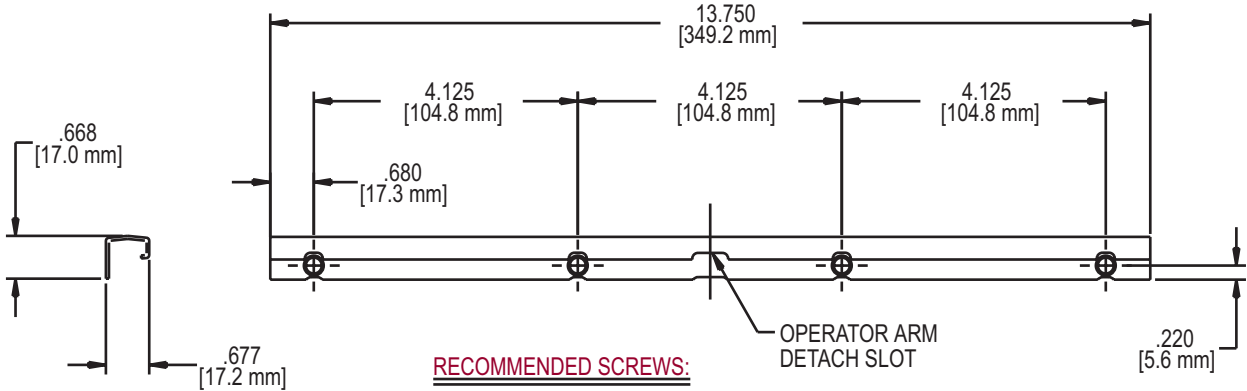


RECOMMENDED SCREWS:

WOOD: (QTY 3) (P/N 19140.92) #7 X .875 PHILLIPS
FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: (QTY 3) #7 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

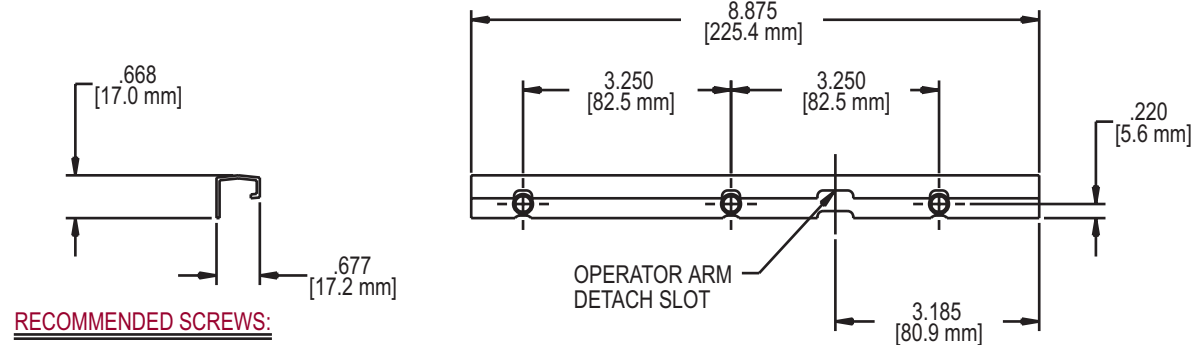
FIG. 6 SINGLE ARM OPERATOR TRACK (4 HOLE) 30150.92



RECOMMENDED SCREWS:

WOOD: (QTY 3) (P/N 19140.92) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC & METAL: (QTY 3) #7 PHILLIPS, FLAT HEAD SCREWS
 (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

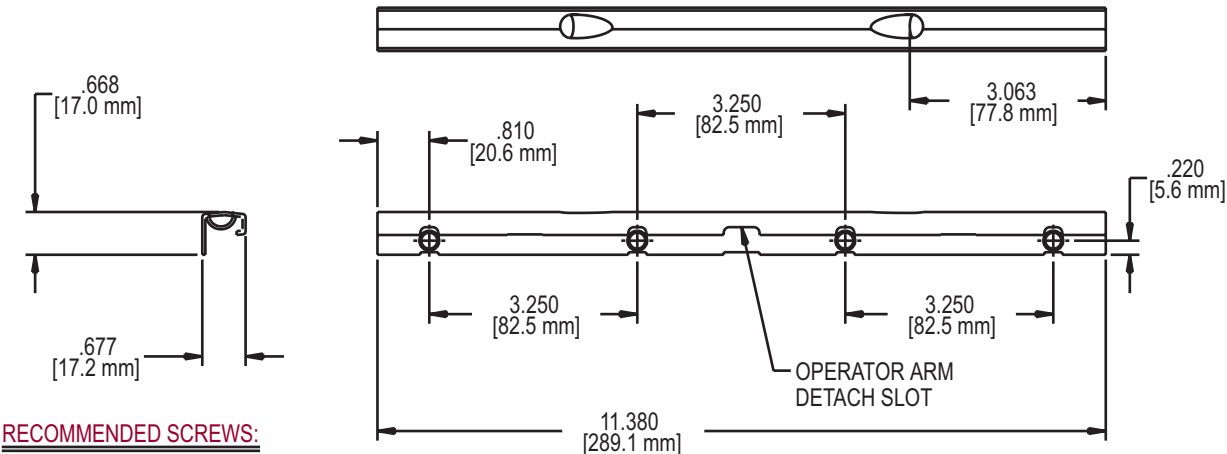
FIG. 7 SINGLE ARM OPERATOR TRACK (3 HOLE) 31375.92



RECOMMENDED SCREWS:

WOOD: (QTY 3) (P/N 19140.92) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC & METAL: (QTY 3) #7 PHILLIPS, FLAT HEAD SCREWS
 (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 8 SINGLE ARM OPERATOR TRACK FOR LIMITED OPENING (4 HOLE) 31727.92



RECOMMENDED SCREWS:

WOOD: (QTY 4) (P/N 19140.92) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC & METAL: (QTY 4) #7 PHILLIPS, FLAT HEAD SCREWS
 (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



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Truth's Ellipse Dyad Operator features a peak operating torque approximately 28% lower than the #15 Series Single Arm Operators, (depending on mounting locations). Profile changes will not be necessary if you are currently using Truth's #15 Series Ellipse or Traditional Single Arm Operators (see drawings for operator locations). This operator was designed to specifically work with Truth's #14.05 Hinge. The operator arm is detachable from the stud bracket for easy sash removal.

SEALABLE CASE: The unique case design complements the smooth contour styling of the Maxim® family of products, while retaining the same mounting and mechanical features of Truth's Traditional Operator lines. A special "lip" around the operators' case will accept a gasket, which will help the window achieve a higher air and water performance rating, while at the same time; eliminate the need for slow, messy and often expensive caulking during the installation process.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you considered *personalizing* your window with your company name or logo? All of Truth's operator handles are capable of accepting your own "signature". Contact Truth for further details.

WARRANTY: Protected under the terms of the Truth Warranty for Window & Door Manufacturers & Authorized Distributors. Refer to Truth's Terms & Conditions for further details.

CORROSION RESISTANCE: Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.



For the severe conditions associated with coastal areas, Truth has developed certain product lines utilizing either CoastGard® Hardware, or stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.

MATERIAL: High-pressure die-cast zinc case. Hardened steel drive worm and gear arms.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Specify operator by model number (see table in Fig. 3 for options).
2. Specify Ellipse style housing.
3. Specify finish number.

4. Specify right- or left-hand (determined by the side hinge is on when viewed from the outside).

5. Select mounting hardware required (sold separately):

Handed Stud Brackets - select from tables in the following drawings. Optional brackets for special profile applications available - see Brackets & Track Section. Note: Handing is determined on handed stud brackets with the stud pointed upward. Handing is reversed for inverted applications.

Operator Handle Styles:

- #11454.XX - Contour™ Handle - shown above (painted) or
- #11329.XX - Folding Handle
- #21306 - Protective red plastic spline cap (optional)
- #21504 - Ellipse Gasket (optional)
- #21494 - Gasket Applicator (optional)

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Operator handing is determined by the hinge side when viewed from the outside. Bracket handing is determined on handed stud brackets with the stud pointed upward. Handing is reversed for inverted applications.
2. Sash weight should be limited to 50 lbs. to maintain ease of operation over the lifetime of the window. When used on a sash weighing over 50 lbs., operating effort will noticeably increase and operator life will be reduced.
3. Before selecting an operator, the hinge model should be chosen based upon desired window hinging requirements (example: egress vs. washability).
4. Truth does not recommend the Dyad Operator be used in combination with an egress style or Butt Hinge.
5. When a Dyad Operator is installed in windows used in high rise applications over two stories, a Truth Limit Device, to restrict the amount of opening, is recommended.
6. Minimum sash width is 12 inches.
7. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of a casement window.

8. A Spline Cap (#21306) is available to protect the operator splines from dirt and other windows from damage during shipping, installation, and final building construction.

9. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.

10. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

11. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

12. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

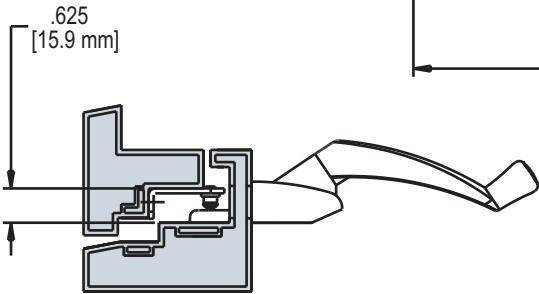
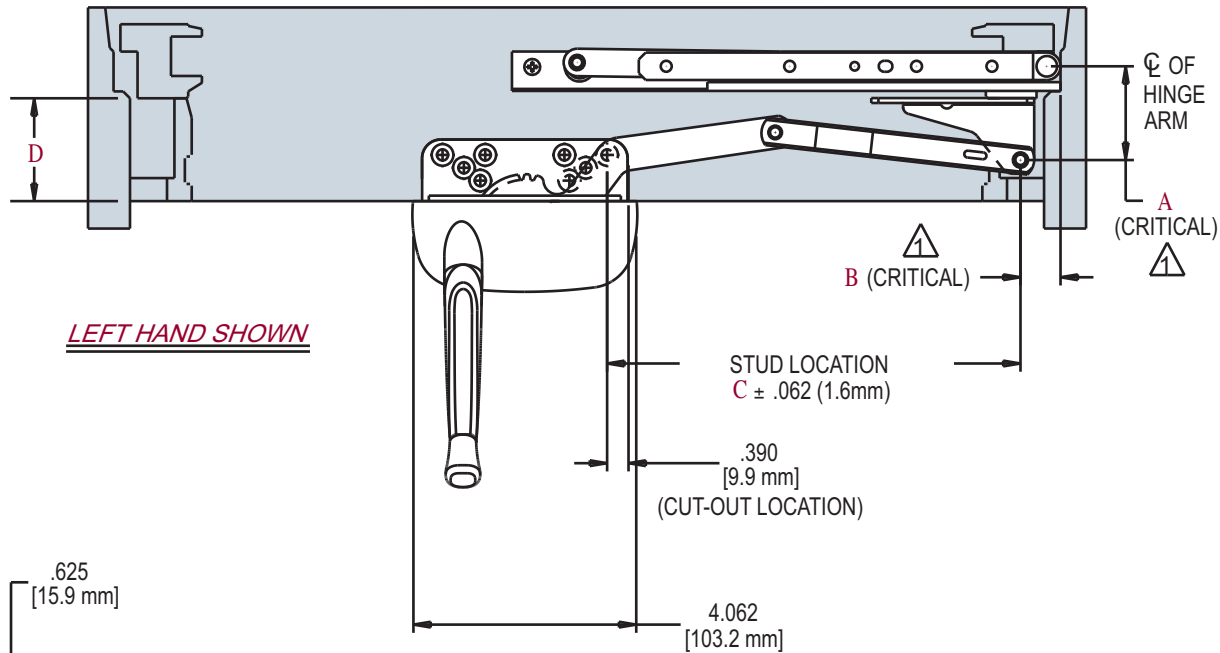
Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide smooth operation out to 90° of sash opening. Connection to the movable sash must be easily detachable for window cleaning and maintenance.

Window operators will be of drag arm/link design driven by a hand crank.

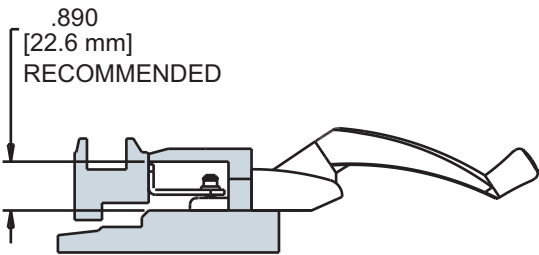
The operator must be constructed of E-Gard® components, hardened steel worm and gear arm and high pressure zinc alloy die cast base.

Window Operators shall be 15 series Ellipse Dyad Operator as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF TRUTH ELLIPSE DYAD OPERATOR



D DIMENSION	C DIMENSION
1.500 (38.1mm)	7.663 (194.6mm)
1.750 (44.5mm)	7.607 (193.2mm)
2.000 (50.8mm)	7.540 (191.5mm)



HARDWARE SHOWN	
15.18	OPERATOR
12510.92	LH* STUD BRACKET
12511.92	RH* STUD BRACKET
14.05	HINGE
11454	HANDLE

* SEE TRUTH TIP #1 FOR HANDING OF BRACKET

NOTE:

1. CRITICAL **A** RANGES FROM 1.375 (34.9mm) TO 2.125 (54.0mm)
 CRITICAL **B** RANGES FROM .750 (19.1mm) TO 1.750 (44.5mm)

2. MAXIMIZE THE **A** DIMENSION AND MINIMIZE THE **B** DIMENSION FOR BEST OPERATOR PERFORMANCE.

3. CONTACT TRUTH IF PROFILE DOES NOT FIT INTO THE **A** OR **B** RANGES

FIG. 2 ELLIPSE DYAD WOOD/PVC CUT-OUT DETAIL

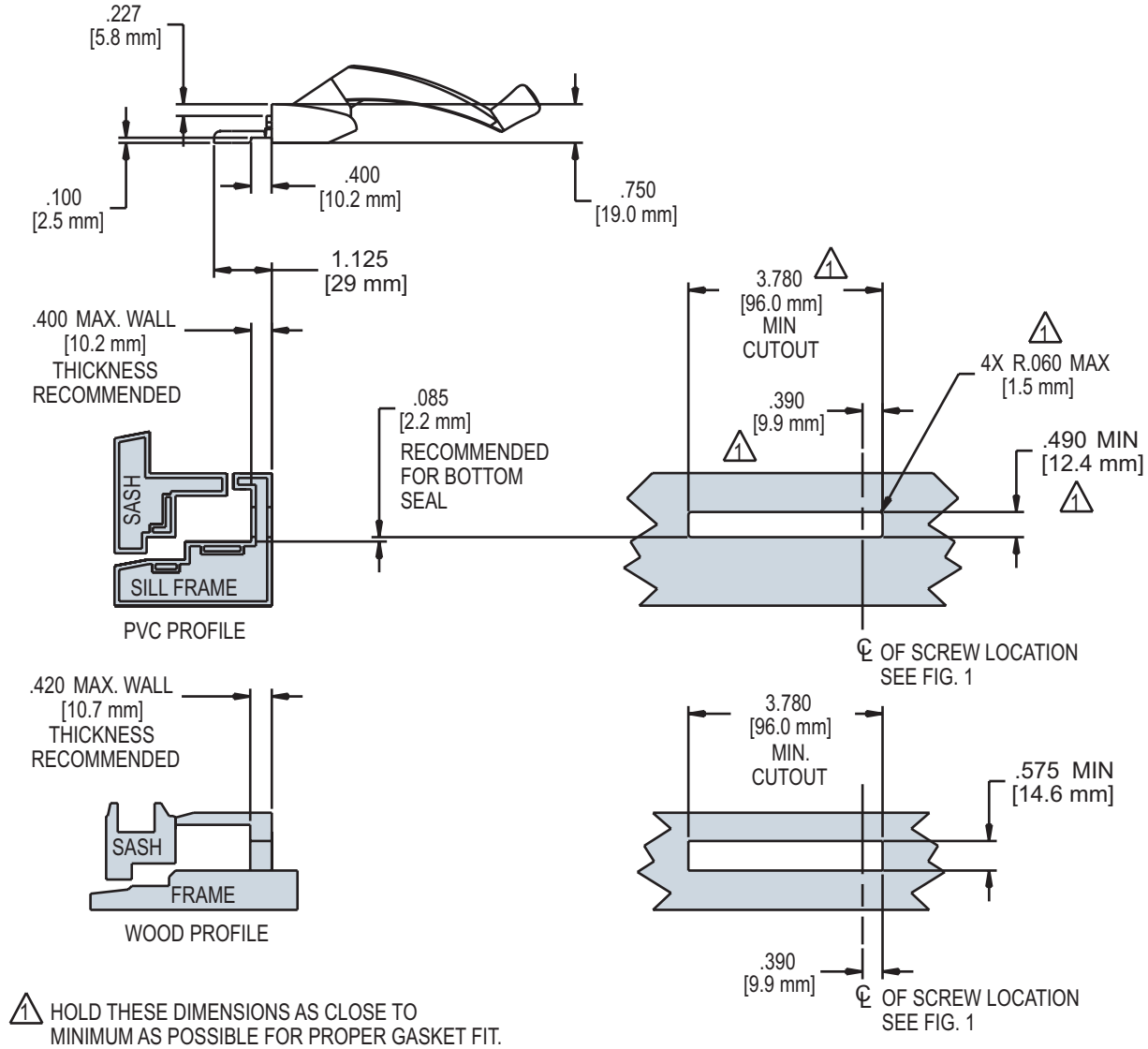
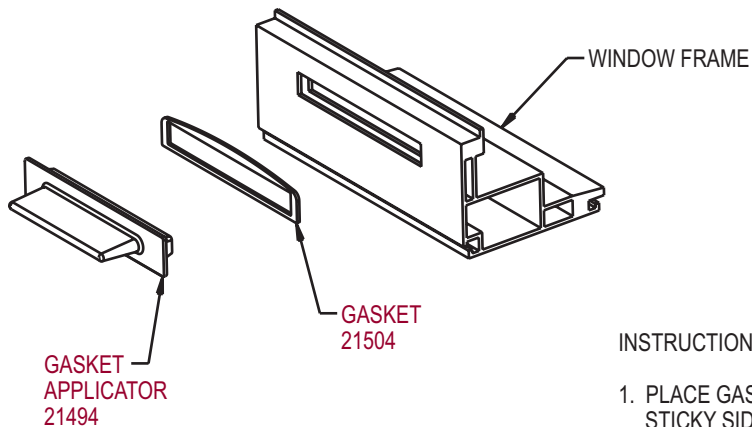


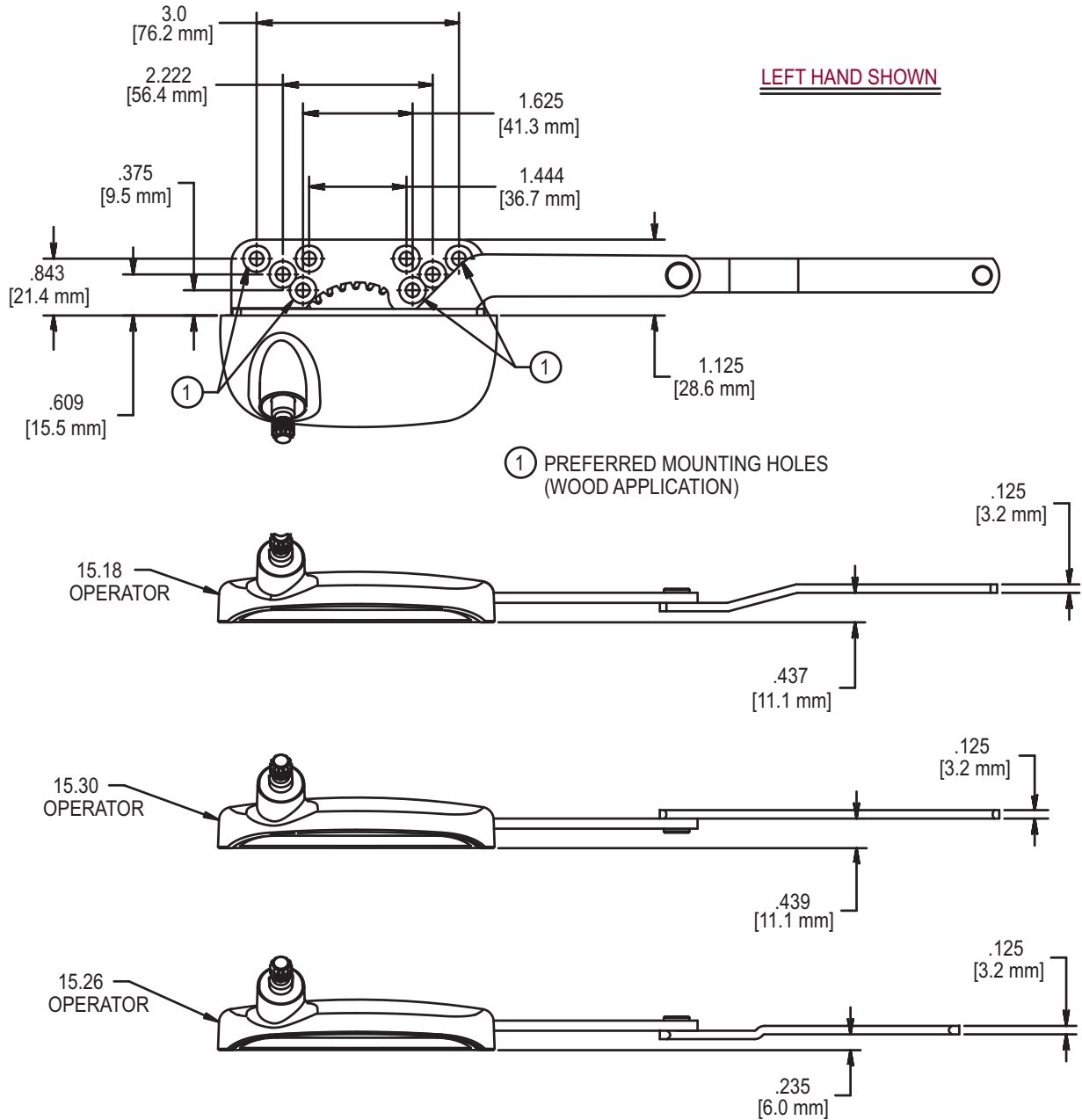
FIG. 3 GASKET APPLICATION FOR ELLIPSE SINGLE ARM OPERATOR



INSTRUCTIONS:

1. PLACE GASKET ONTO APPLICATOR WITH STICKY SIDE OUT
2. PRESS APPLICATOR INTO FRAME CUT-OUT TO SECURE GASKET

FIG. 4 ELLIPSE DYAD OPERATOR



RECOMMENDED SCREWS:

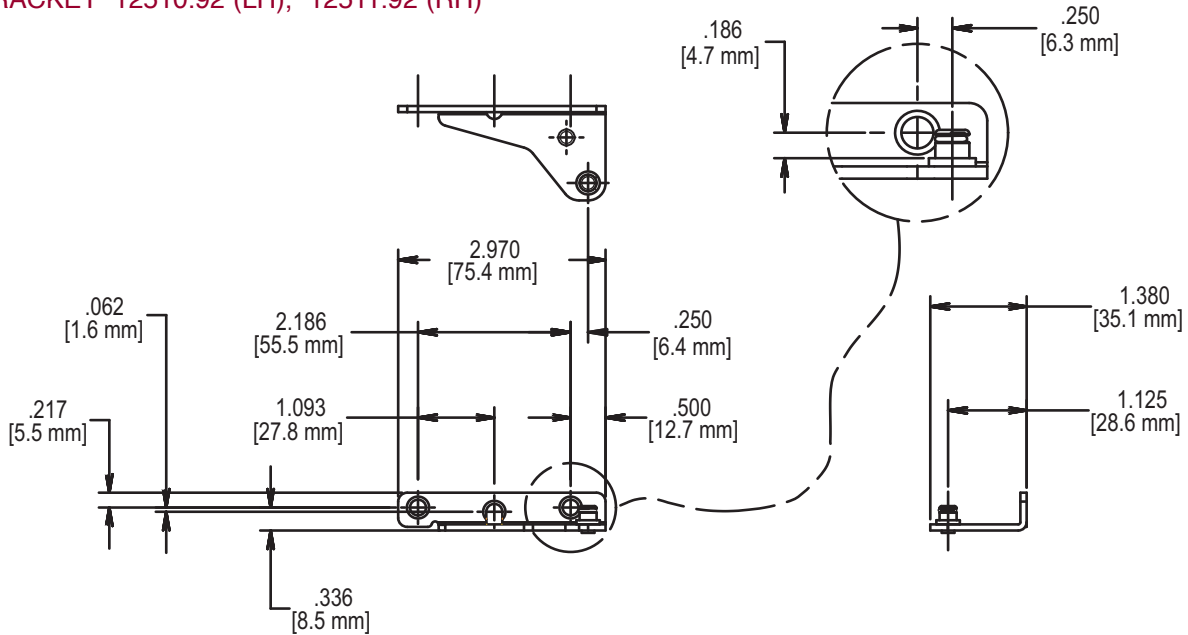
WOOD:(QTY 4) (P/N 19380.92) #10 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: (QTY 4) #10 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

AVAILABLE OPERATOR	*RECOMMENDED STUD BRACKET	AVAILABLE HINGES
15.18	12510.92 LH 12511.92 RH	14.05 14.06
15.26	12510.92 LH 12511.92 RH	14.75 14.76
15.30	12510.92 LH 12511.92 RH	

*SEE TRUTH TIP #1 FOR HANDING OF BRACKET

FIG. 5 BRACKET 12510.92 (LH), 12511.92 (RH)



RECOMMENDED SCREWS:

WOOD: (QTY 3) (P/N 19140.92) #7 X .875
PHILLIPS FLAT HEAD, SHEET METAL
SCREWS

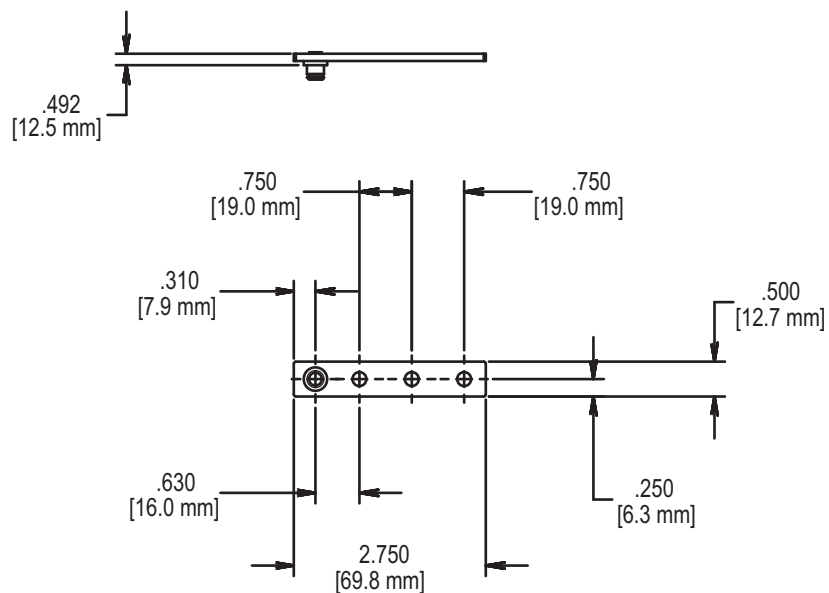
PVC & METAL: (QTY 3) #7 PHILLIPS, FLAT
HEAD SCREWS (LENGTH AND THREAD
TYPE DETERMINED BY PROFILE)

12510.92 LEFT HAND SHOWN

(USE OPPOSITE HAND BRACKET
FOR INVERTED APPLICATIONS)

NOTE: 12511.92 RIGHT HAND

FIG. 6 BRACKET 10558.92 (NON HANDED)



NON HANDED

RECOMMENDED SCREWS:

WOOD: (QTY 3) (P/N 19140.92)
#7 X .875 PHILLIPS FLAT
HEAD, METAL SCREWS

PVC & METAL: (QTY 3) #7 FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE
DETERMINED BY PROFILE)

**STRENGTH & PERFORMANCE:**

Designed for narrow awning windows, Truth's 15 Series Ellipse Single Arm Awning Operator brings with it all of the style and performance characteristics of the Ellipse family of operators.

To help make the transition to this new system easier, the Ellipse Single Arm Awning Operator works with all of Truth's current Awning Hinges.

MANUFACTURING BENEFITS:

Manufacturers will appreciate the similarities in design of this new operator, in that the Ellipse Single Arm Awning Operator conforms to the same frame preparation, and screw hole pattern that the other Ellipse Operators use. The operator will be shipped with the arm in an "open" position, so it can be inserted through the cut-out for easy mounting.

STYLE: Incorporating the same cover as other Ellipse Operators, allows the homeowner to have a similar "family" appearance throughout the home. The cover, along with the new Contour™ Handle, has been streamlined to minimize interference with window treatments, such as mini-blinds and drapery.

SEALABLE CASE: A special "lip" around the operators' case will accept a gasket, which will help the window achieve a higher air and water performance rating, while at the same time eliminate the need for slow, messy and often expensive caulking during the installation process.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Technical Service Staff can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you considered *personalizing* your window with your company name or logo? All of Truth's operator handles are capable of accepting your own "signature". Contact Truth for further details.

WARRANTY: Protected under the terms of the "Truth Warranty for Window & Door Manufacturers & Authorized Distributors". Refer to Truth's Terms



& Conditions for further details.

MATERIAL: High-pressure die-cast zinc cover, crank handle and knob. Hardened steel drive worm and gear. Stainless steel track and plastic pivot slides.

CORROSION RESISTANCE:

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

DECORATIVE FINISH:

Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Specify operator model number (see table in Fig. 3 for options)
2. Specify Ellipse style housing
3. Specify finish number.
4. Select mounting hardware (sold separately):
#11454.XX - Contour™ Handle - shown above (painted) or
#11329.XX - Folding Handle

- #30169 - Stainless Steel Track
- #21504 - Ellipse Gasket (optional)
- #21494 - Gasket Applicator (optional)
- #21306 - Protective red plastic spline cap.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. The Ellipse Single Arm Awning Operator can be used with all Truth 13 & 34 Series Awning Hinges. To insure maximum operator efficiency and avoid sash chatter, it is important that the hinge and sash height be properly matched. For more complete information on proper hinge sizing and how to overcome corner pull-in problems, see Truth Tech Note #2.
2. Due to the larger opening provided by this awning operator, binding can be experienced on narrower sash heights. Windows with sash heights less than 16 inches may need to use a Limit Stop. Please contact Truth for availability of this stop device.

3. Operator position becomes more important as window size increases. With operator in closed position, center the end of the arm on the sash for optimum pull-in performance.
4. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.
5. For accurate hardware placement, pre-drilling of the screw holes in the window profile is recommended.
6. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
7. For metal window profiles Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.
8. Truth recommends that Sash Locks be used on all awning windows. Sash Locks will provide security and a tighter weatherseal to the window.
9. A Truth Spline Cap (#21306) is available to protect the operator spline from dirt and damage during shipping, window installation, and final building construction.
10. Adding Truth Snubbers to the top rail on an awning window may increase the negative air pressure rating of the window.

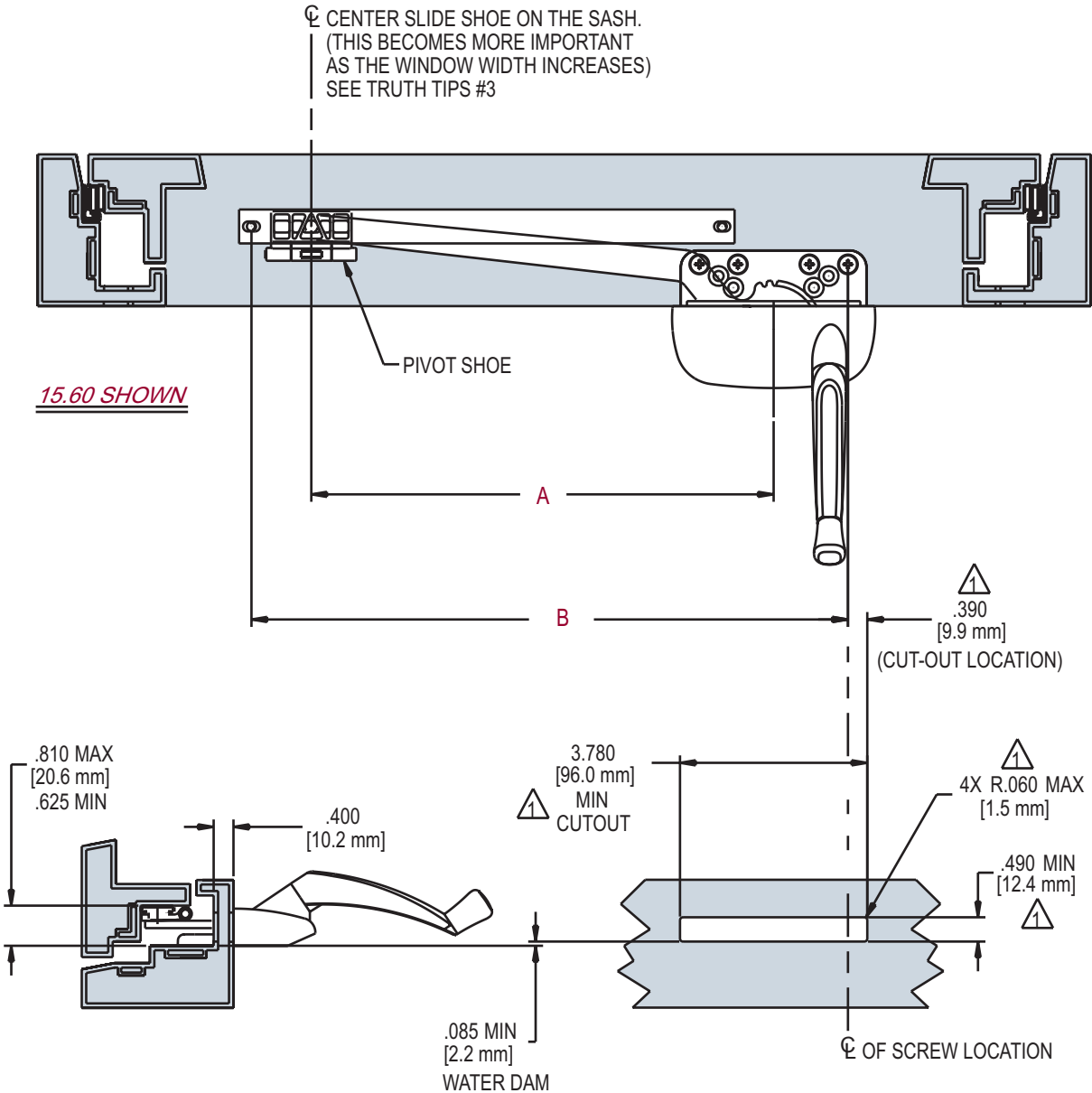
**INCLUDE TRUTH SPECS ON
YOUR NEXT WINDOW PROJECT**

Window operators shall be provided which allow easy adjustment of the window's open position. The mechanism should be crank operated and provide a continuous range of open positions.

Window operators will be of single arm and track/pivot slide design driven by hand crank. The operator must be constructed of E-Gard® coated components. High-pressure die-cast zinc cover, crank handle and knob. Hardened steel drive worm and gear. Stainless steel track and plastic pivot slides.

Window Operators shall be 15 series Ellipse Single Arm Awning Operator as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 ELLIPSE SINGLE ARM AWNING OPERATOR APPLICATION

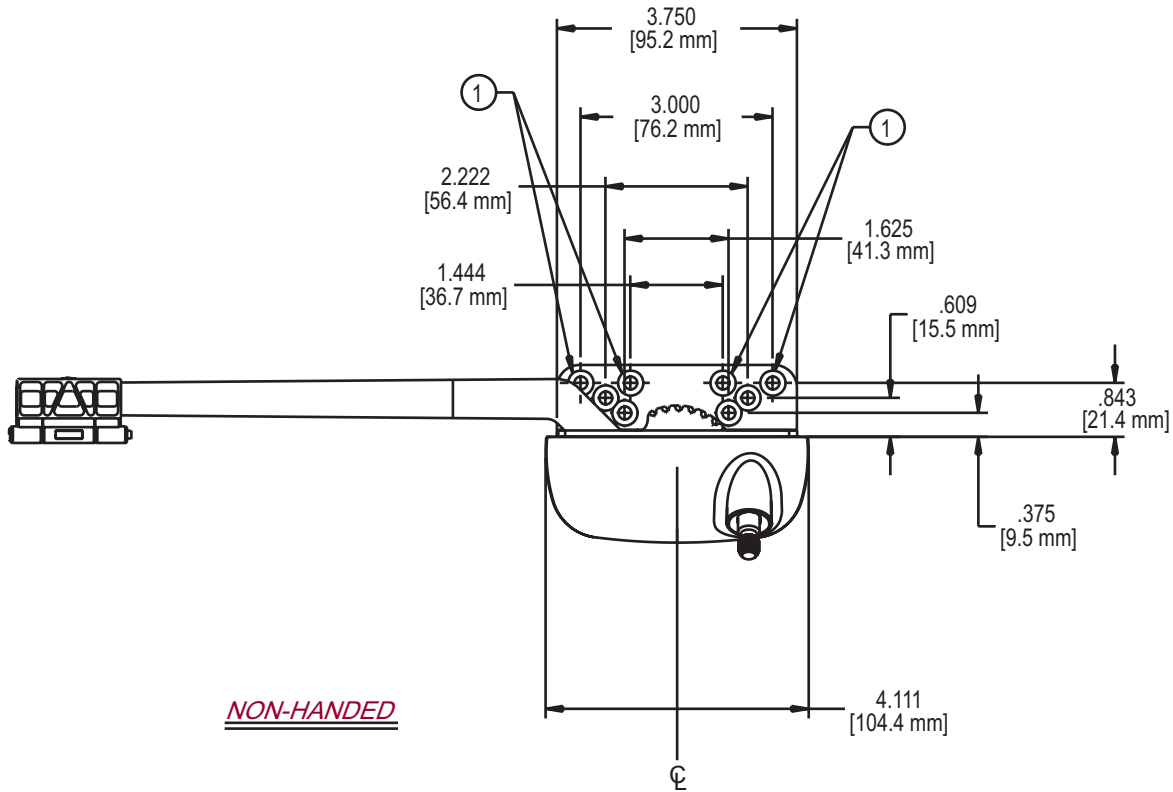


AVAILABLE OPERATOR	AVAILABLE TRACK	A	B
15.71	30169	13.50 (342.9mm)	16.039 (407.4mm)
15.60	30169	9.500 (241.3mm)	12.039 (305.8mm)

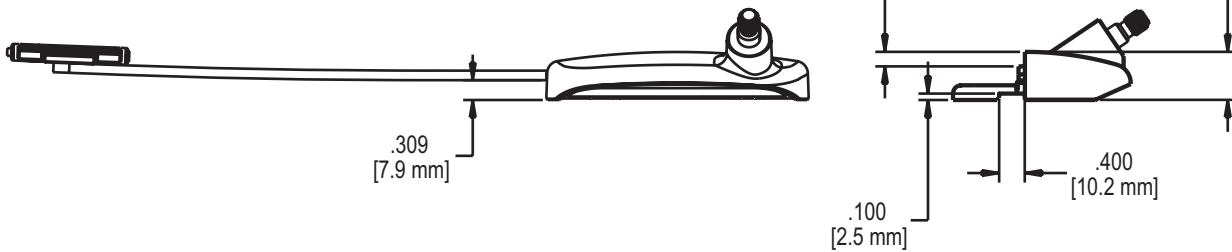
NOTE:
 ▲ HOLD THESE DIMENSIONS AS CLOSE TO MINIMUM AS POSSIBLE FOR PROPER GASKET FIT

15 ELLIPSE SINGLE ARM AWNING OPERATOR

FIG. 2 ELLIPSE SINGLE ARM AWNING OPERATOR



① PREFERRED MOUNTING HOLES (PVC/ALUMINUM)

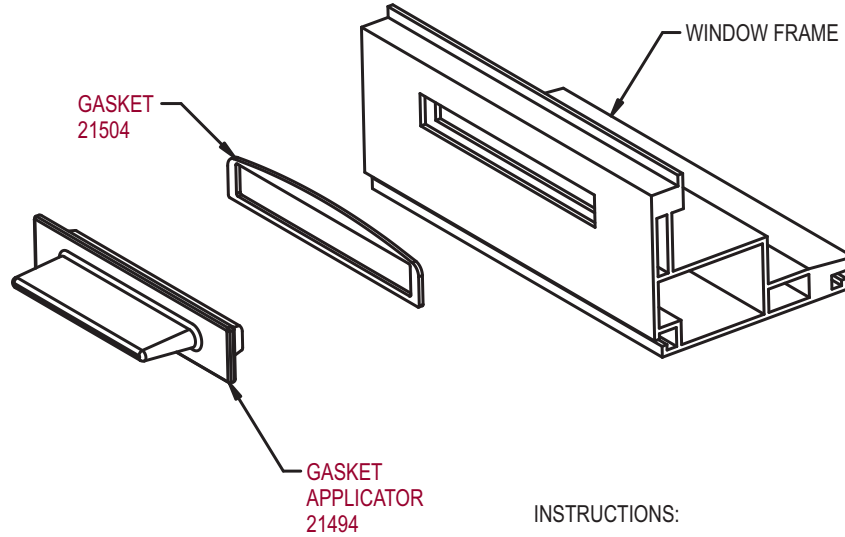


RECOMMENDED SCREWS:

WOOD: (QTY 4) (P/N 19380.92) #10 X 1.0 PHILLIPS FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: (QTY 4) - #10 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

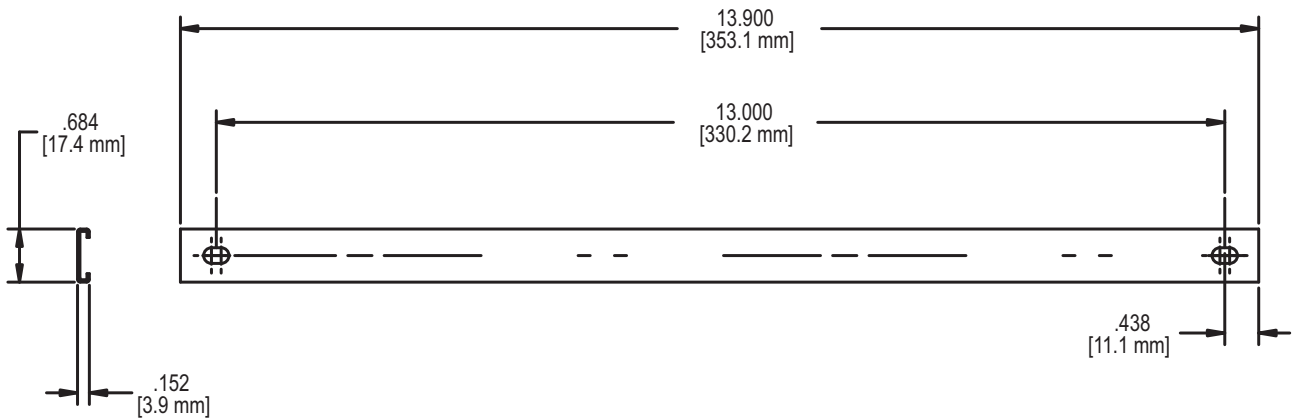
FIG. 3 GASKET APPLICATION FOR ELLIPSE SINGLE ARM OPERATOR



INSTRUCTIONS:

1. PLACE GASKET ONTO APPLICATOR WITH STICKY SIDE OUT
2. PRESS APPLICATOR INTO FRAME CUT-OUT TO SECURE GASKET

FIG. 4 SINGLE ARM AWNING OPERATOR TRACK 30169



RECOMMENDED SCREWS:

PVC & METAL: (QTY 2) #10 PHILLIPS, PAN HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



700 WEST BRIDGE STREET, OWATONNA, MN 55060 ■ 507.451.5620 800.866.7884 ■ TRUTH.COM



Made of the highest quality materials, the traditional style Single Arm Casement Operator has provided years of continuous and trouble-free service for our customers. This operator will provide a full 90° window opening and disconnects easily from the sash. Nylon roller runs in the steel track to further assure smooth operation. Concealed mounting screws produce a neat overall appearance.

LOGO OPTIONS: Have you considered *personalizing* your window with your company name or logo? All of Truth's operator handles are capable of accepting your own "signature". Contact Truth for further details.

WARRANTY: Protected under the terms of the Truth Warranty for Window & Door Manufacturers & Authorized Distributors. Refer to Truth's Terms & Conditions for further details.

CORROSION RESISTANCE: Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

For the severe conditions associated with coastal areas, Truth has developed certain product lines utilizing either CoastGard® Hardware, or stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.

MATERIAL: High-pressure die-cast zinc case, crank handle and knob. Hardened steel drive worm and gear arm with nylon roller. Track available in steel or 300 Series stainless steel.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.



ORDERING INFORMATION:

1. Choose operator model desired (see table in Fig. 3 for options).
2. Specify Traditional style housing.
3. Specify finish number.
4. Specify right- or left-hand (determined by the side the hinge is on when viewed from the outside).
5. Select mounting hardware (sold separately):
 #11454.XX - Contour™ Handle (painted) or
 #11329.XX - Folding Handle (painted)
 #30706.92 - Face-mount track (3-hole)
Optional track for special profile applications - see Brackets & Track Section.
 #21306 - Protective red plastic spline cap (optional)
 #21495 - Traditional Gasket (optional)
 #21494 - Gasket Applicator (optional)

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection-see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Operator handing is determined by the hinge side when viewed from the outside.
2. Before selecting an operator, the hinge model should be chosen based upon desired window hinging requirements (example: egress vs. washability).
3. Sash weight should be limited to 40 lbs. to insure ease of operation for the lifetime of the window. When used on a sash weighing over 40 lbs., operating torque will noticeably increase and operator life will be reduced.

4. Operator torque can be kept to a minimum by using the longest possible arm that will fit between the side jambs.
5. Recommended range for Dimension "X" is .250" (6.4 mm) to 1.000" (25.4 mm).
6. Selecting the longest operator arm possible and minimizing dimensions "X" and "C" will result in best operator performance.
7. Arm lengths shorter than 9.5" will not allow easy operation of a window to 90° unless used with Truth's #14.77 hinge.
8. When used in high rise applications of over two stories, Truth recommends using a Limit Device (or see Tip 10).
9. For limited opening applications, Truth recommends using #31727 Track.
10. This operator may be mounted closer to the lock side of the window to effectively limit opening and improve corner pull-in performance.
11. A spline cap (#21306) is available to protect the operator splines from dirt and other windows from damage during shipping, installation, and final building construction.
12. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of a casement window.

13. The Truth Single Arm Operator works well with a Butt Hinge. Always use an operator with the longest arm possible for best operation.
14. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
15. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
16. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.
17. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.
18. Single Arm Operators do not work well with 4-Bar Hinges unless the 4-Bar Hinge is an egress hinge. If a 4-Bar Hinge other than an egress hinge is required, a Truth Dyad is the best choice.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

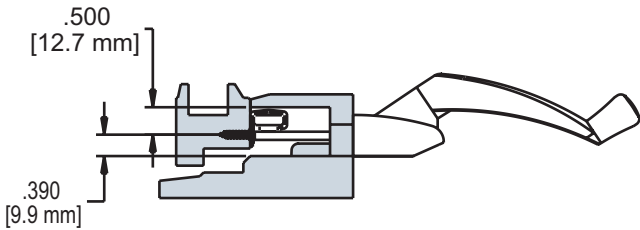
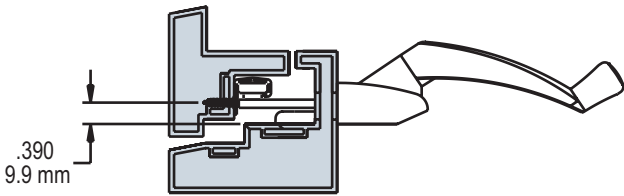
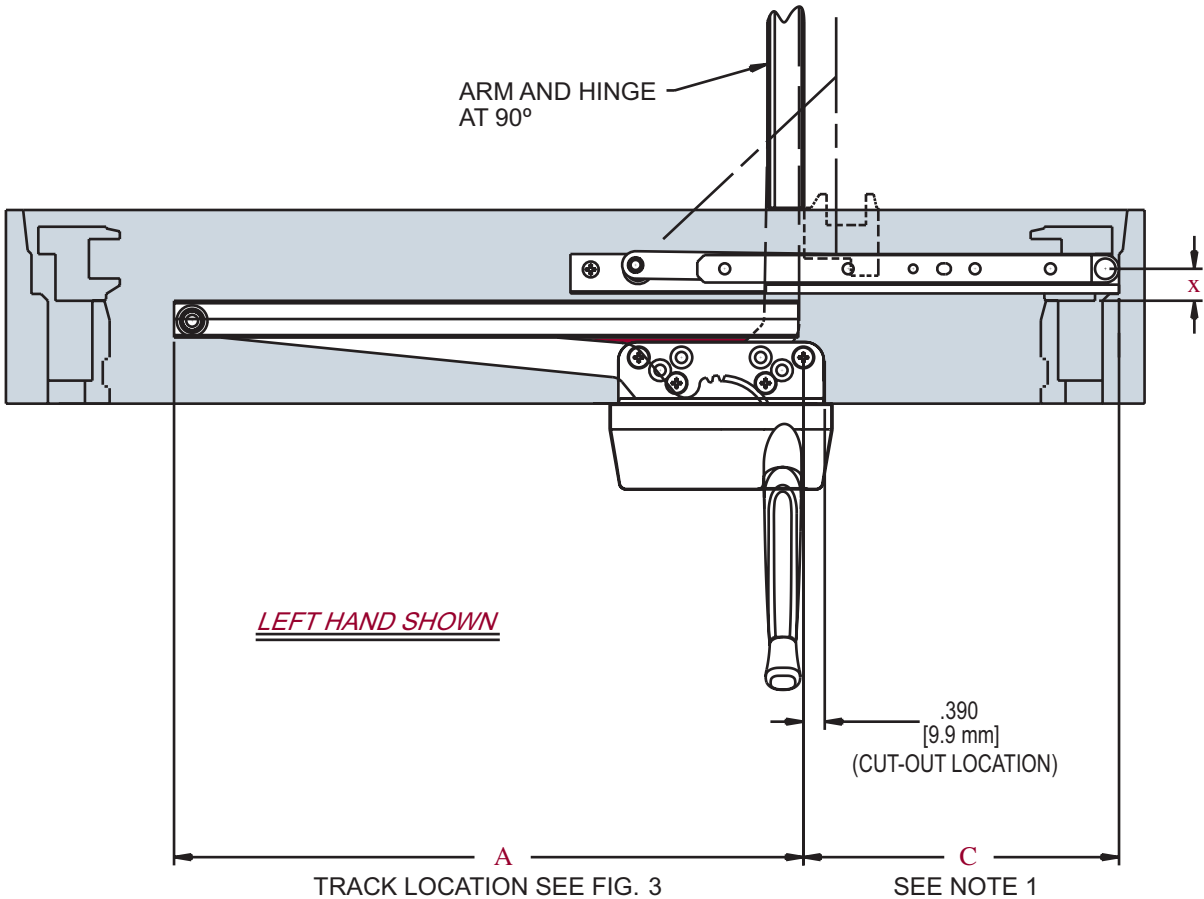
Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide smooth operation of egress or butt hinges. Connection to the movable sash must be easily detachable for window cleaning and maintenance.

Window operators will be of single push arm design driven by a hand crank. The operator must be constructed of

E-Gard® components, hardened steel worm and gear arm and high pressure zinc alloy die cast base.

Window Operators shall be 15 series Single Arm Operator as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF TRUTH TRADITIONAL SINGLE ARM OPERATOR



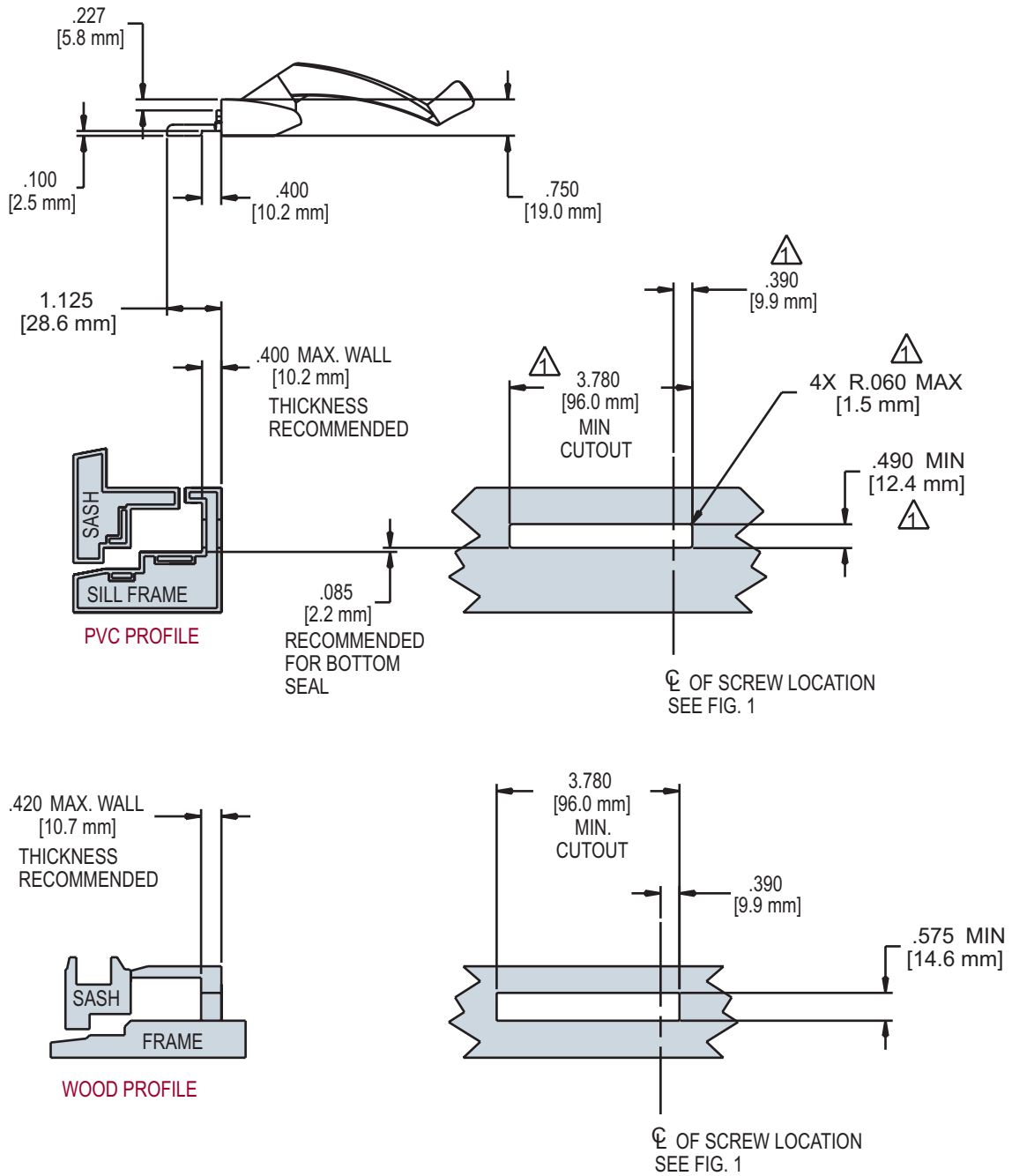
AVAILABLE HINGES	Y HINGE CONSTANT
14.05	5.290 (134.4mm)
14.06	5.915 (150.2mm)
14.75	5.290 (134.4mm)
14.76	5.915 (150.2mm)
14.77	3.110 (79.0mm)
14.91	5.915 (150.2mm)
35.10	1.758 (44.7mm)
35.11	1.758 (44.7mm)
35.12	1.645 (41.8mm)
35.13	1.645 (41.8mm)

HARDWARE SHOWN	
15.31	OPERATOR
30706.92	TRACK
14.05	HINGE
11454.XX	HANDLE

- NOTE:
1. TO DETERMINE THE C DIMENSION, ADD DIMENSIONS X TO HINGE CONSTANT Y TAKEN FROM TABLE. $C = X + Y$
 2. SEE TRUTH TIPS FOR ADDITIONAL HINGE INFORMATION

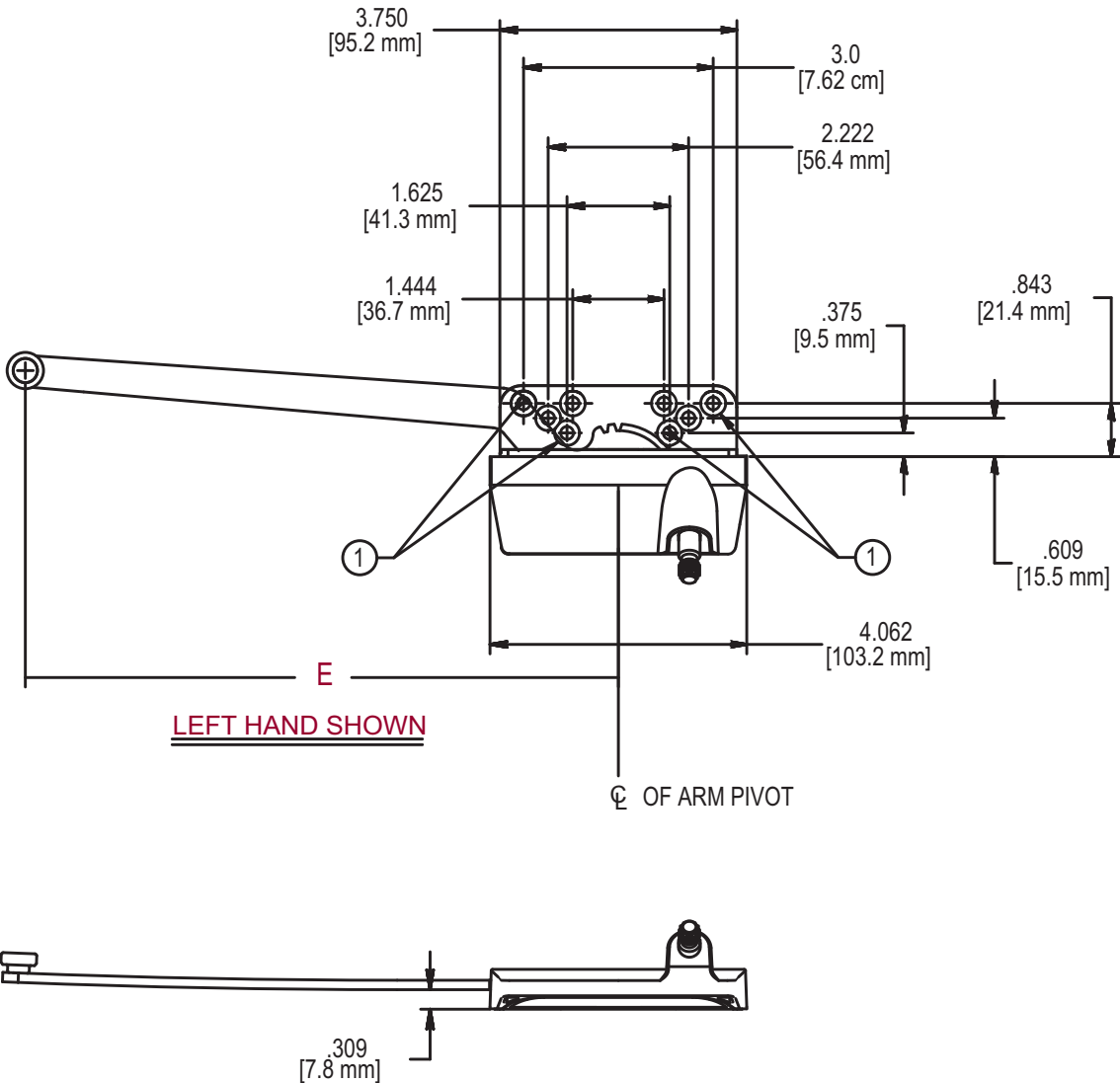
15 TRADITIONAL STYLE SINGLE ARM OPERATOR

FIG. 2 TRADITIONAL SINGLE ARM WOOD/PVC CUT-OUT DETAIL



⚠ HOLD THESE DIMENSIONS AS CLOSE TO MINIMUM AS POSSIBLE FOR PROPER GASKET FIT.

FIG. 3 TRADITIONAL SINGLE ARM OPERATOR



RECOMMENDED SCREWS:

WOOD: (QTY 4) (P/N 19380.92) #10 X 1.0 PHILLIPS
FLAT HEAD, SHEET METAL SCREWS

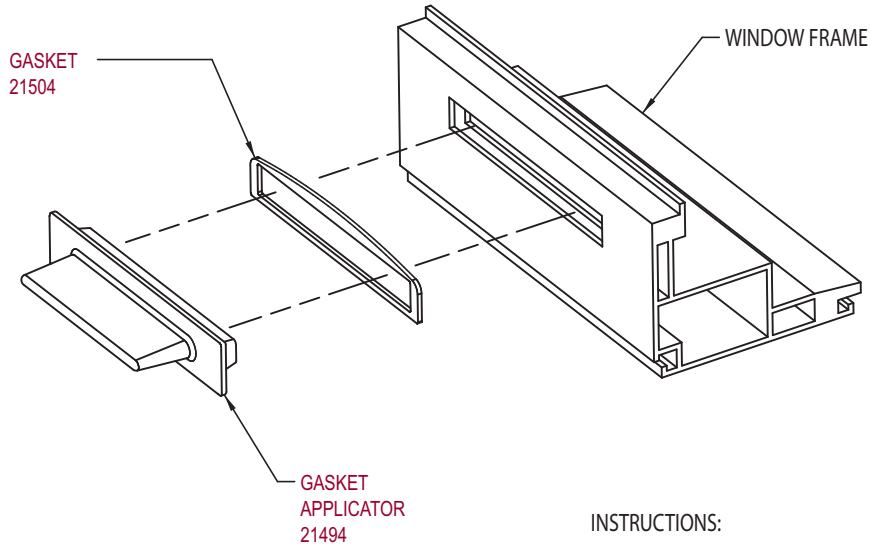
PVC & METAL: (QTY 4) #10 PHILLIPS, FLAT HEAD
SCREWS (LENGTH AND THREAD TYPE
TO BE DETERMINED BY PROFILE)

① PREFERRED MOUNTING HOLES
(WOOD APPLICATION)

AVAILABLE OPERATOR	ARM LENGTH E	A SEE FIG. 1	TRACK FOR USE WITH EGRESS HINGE	TRACK FOR USE WITH WASHABILITY HINGE
15.32	13.500 (342.9mm)	15.310 (388.9mm)	30150.92	30706.92
15.31	9.500 (241.3mm)	11.310 (287.3mm)		30706.92
15.56	7.500 (190.5mm)	9.310 (236.5mm)	31375.92	NA
15.39	6.000 (15.24mm)	7.810 (198.4mm)		

15 TRADITIONAL STYLE SINGLE ARM OPERATOR

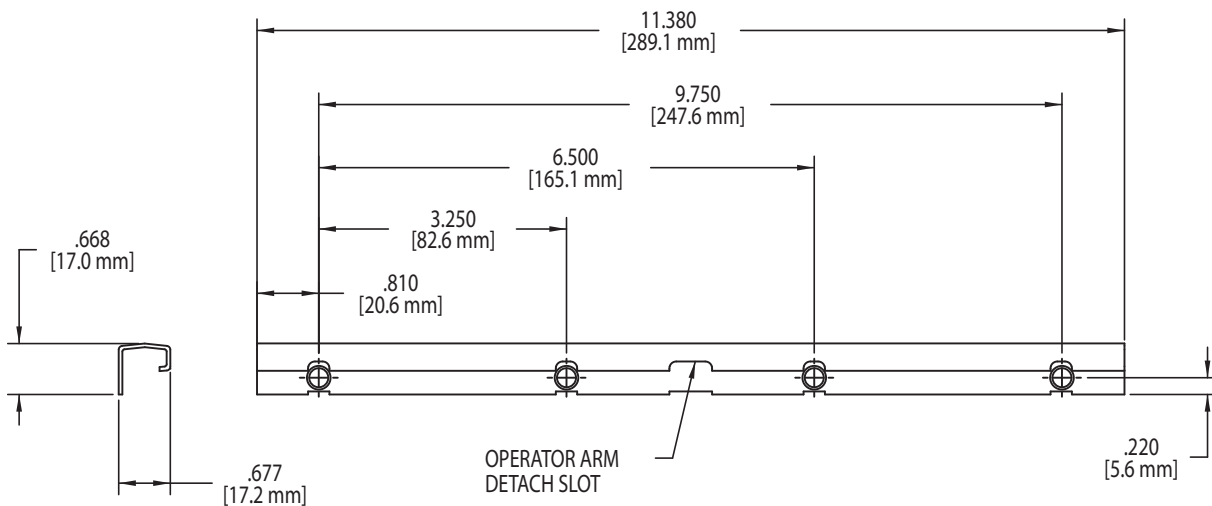
FIG. 4 GASKET APPLICATION FOR TRADITIONAL SINGLE ARM OPERATOR



INSTRUCTIONS:

1. PLACE GASKET ONTO APPLICATOR WITH STICKY SIDE OUT
2. PRESS APPLICATOR INTO FRAME CUT-OUT TO SECURE GASKET

FIG. 5 SINGLE ARM OPERATOR TRACK (4 HOLE) 30473.XX



RECOMMENDED SCREWS:

WOOD: (QTY 3) (P/N 19140.92) #7 X .875 PHILLIPS
FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: (QTY 3) #7 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



Truth's traditional style Dyad Operator features a peak operating torque approximately 28% lower than the #15 Series Single Arm Operators, (depending on mounting locations). Profile changes will not be necessary if you are currently using Truth's #15 Series Ellipse or Traditional Single Arm Operators (see drawings for operator locations). This operator was designed to specifically work with Truth's #14.05 Hinge. The operator arm is detachable from the stud bracket for easy sash removal.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you considered *personalizing* your window with your company name or logo? All of Truth's operator handles are capable of accepting your own "signature". Contact Truth for further details.

WARRANTY: Protected under the terms of the Truth Warranty for Window & Door Manufacturers & Authorized Distributors. Refer to Truth's Terms & Conditions for further details.

CORROSION RESISTANCE: Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

For the severe conditions associated with coastal areas, Truth has developed certain product lines utilizing either CoastGard® Hardware, or stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.

MATERIAL: High-pressure die-cast zinc case. Hardened steel drive worm and gear arms.



FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Specify operator by model number (see table in Fig. 3 for options).
2. Specify Traditional style housing.
3. Specify finish number.
4. Specify right- or left-hand (determined by the side hinge is on when viewed from the outside).
5. Select mounting hardware required (sold separately):

Handed Stud Brackets - select from tables in the following drawings. Optional brackets for special profile applications available - see Brackets &

Track Section. Note: Handing is determined on handed stud brackets with the stud pointed upward. Handing is reversed for inverted applications.

Operator Handle Styles:

- #11454.XX - Contour™ Handle (painted) or
- #11329.XX - Folding Handle (painted)
- #21306 - Protective red plastic spline cap (optional)
- #21495 - Traditional Gasket (optional)
- #21494 - Gasket Applicator (optional)

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Operator handing is determined by the hinge side when viewed from the outside. Bracket handing is determined on handed stud brackets with the stud pointed upward. Handing is reversed for inverted applications.
2. Sash weight should be limited to 50 lbs. to maintain ease of operation

over the lifetime of the window. When used on a sash weighing over 50 lbs., operating effort will noticeably increase and operator life will be reduced.

3. Before selecting an operator, the hinge model should be chosen based upon desired window hinging requirements (example: egress vs. washability).
4. Truth does not recommend the Dyad Operator be used in combination with an egress style or Butt Hinge.
5. When a Dyad Operator is installed in windows used in high rise applications over two stories, a Truth Limit Device, to restrict the amount of opening, is recommended.
6. Minimum sash width is 12 inches.
7. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of a casement window.
8. A Spline Cap (#21306) is available

to protect the operator splines from dirt and other windows from damage during shipping, installation, and final building construction.

9. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
10. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
11. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.
12. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

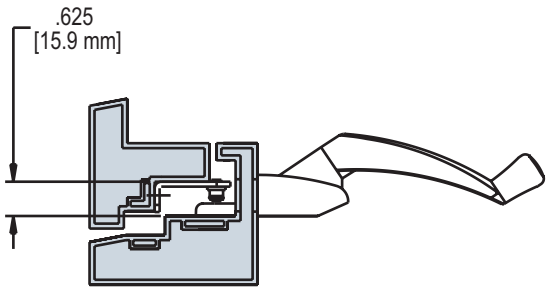
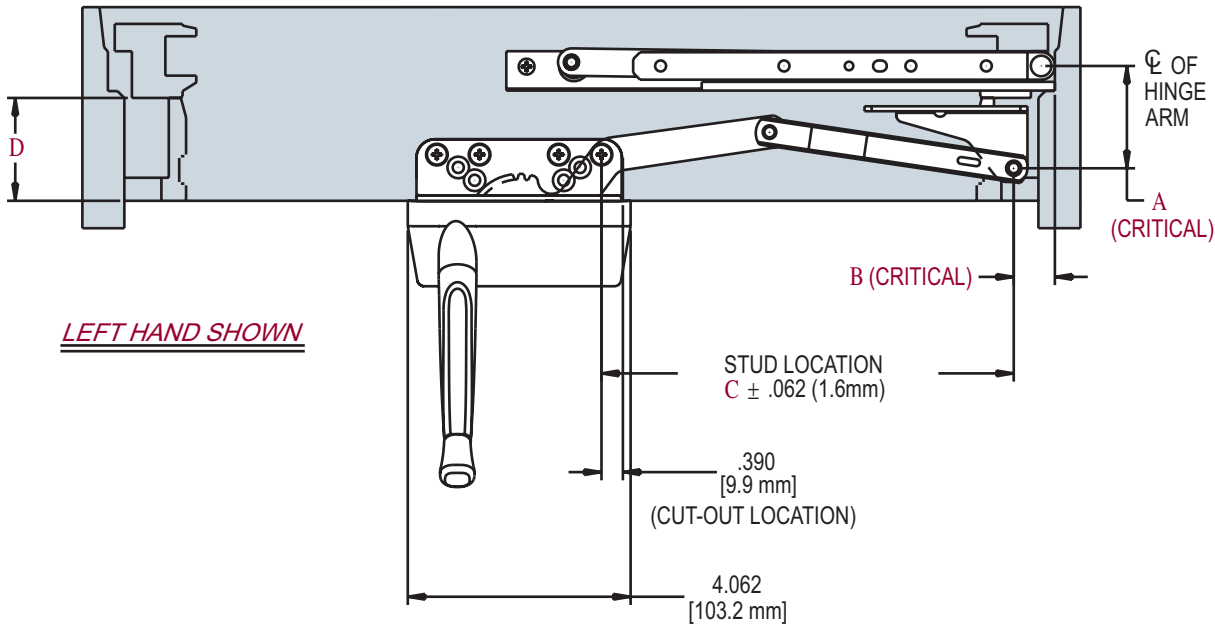
Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide smooth operation out to 90° of sash opening. Connection to the movable sash must be easily detachable for window cleaning and maintenance.

Window operators will be of drag arm/link design driven by a hand crank.

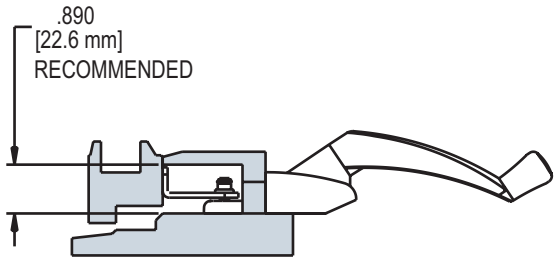
The operator must be constructed of E-Gard® components, hardened steel worm and gear arm and high pressure zinc alloy die cast base.

Window Operators shall be 15 series Dyad Operator as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF TRUTH TRADITIONAL DYAD OPERATOR



D DIMENSION	C DIMENSION
1.500 (38.1mm)	7.663 (194.6mm)
1.750 (44.5mm)	5.915 (150.2mm)
2.000 (50.8mm)	5.290 (134.4mm)



HARDWARE SHOWN	
15.18	OPERATOR
12510.92	LH* STUD BRACKET (WOOD)
12511.92	RH* STUD BRACKET (PVC/ALUM)
14.05	HINGE
10579.92	HANDLE

*SEE TRUTH TIP #1 FOR HANDING OF BRACKET

NOTE:

1. CRITICAL A RANGES FROM 1.375 (34.9mm) TO 2.125 (54.0mm)
CRITICAL B RANGES FROM .750 (19.1mm) TO 1.750 (44.5mm)
2. MAXIMIZE THE A DIMENSIONS AND MINIMIZE THE B DIMENSION FOR BEST OPERATOR PERFORMANCE.
3. CONTACT TRUTH IF PROFILE DOES NOT FIT INTO THE A OR B RANGES

FIG. 2 TRADITIONAL DYAD WOOD/PVC CUT-OUT DETAIL

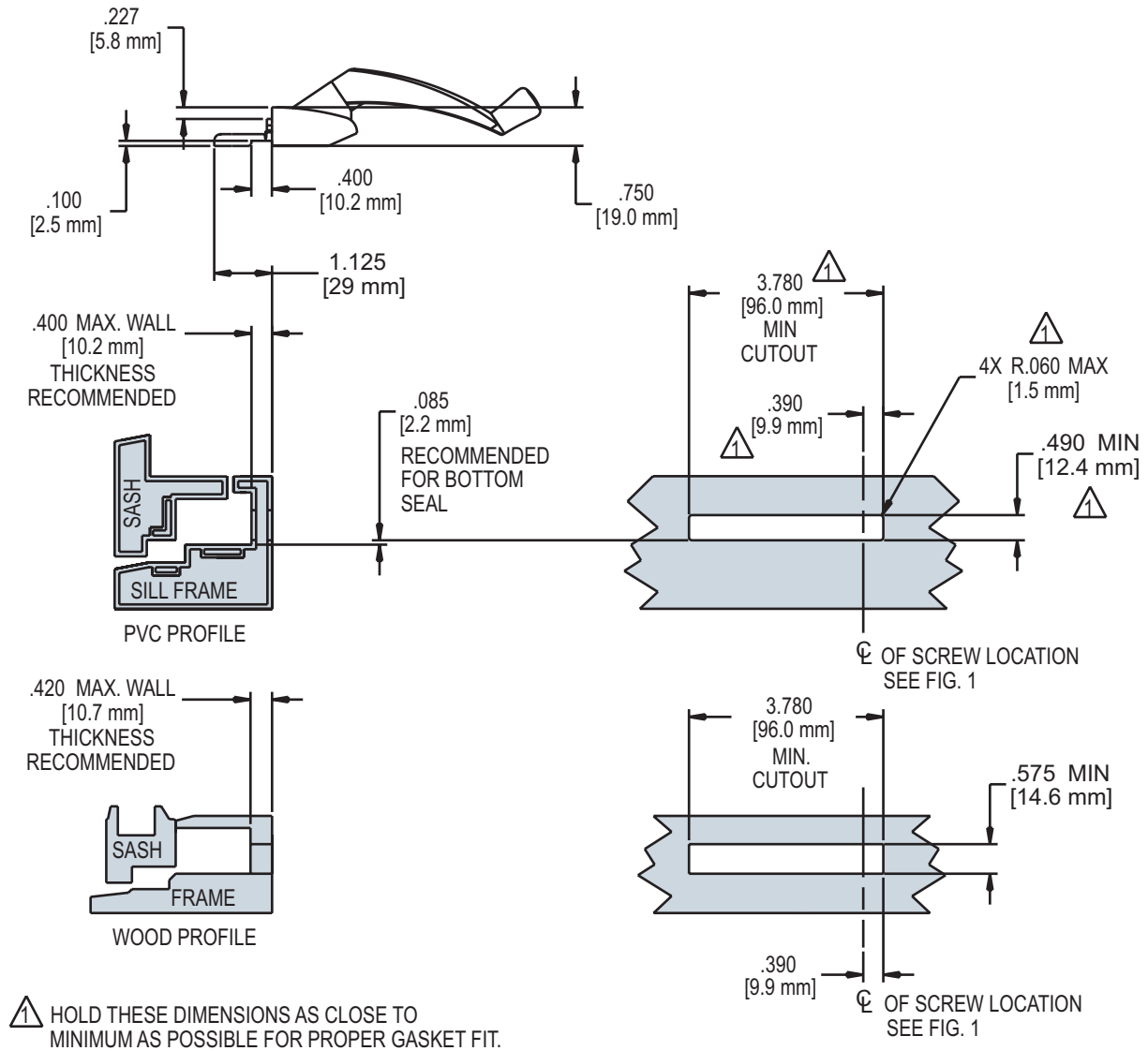
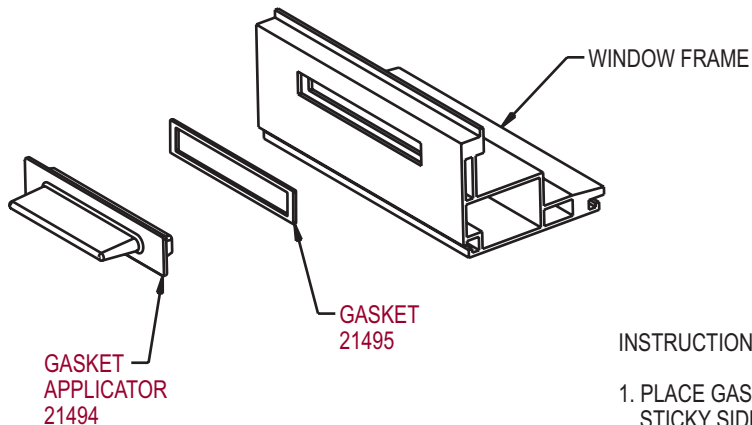


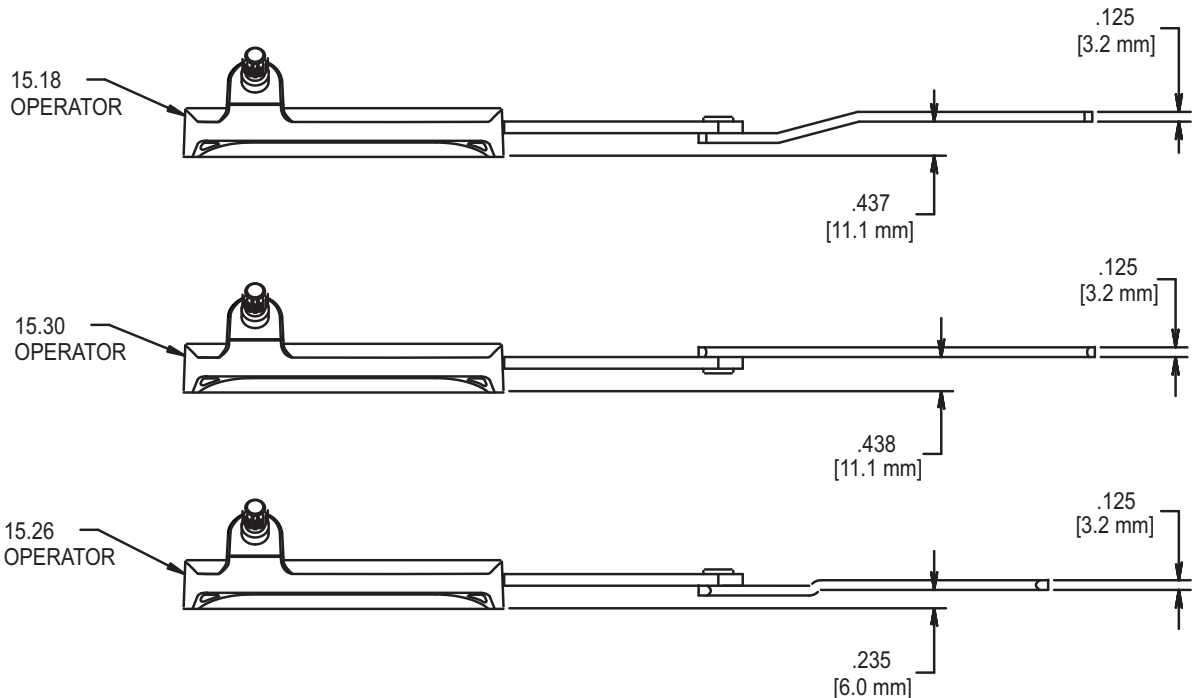
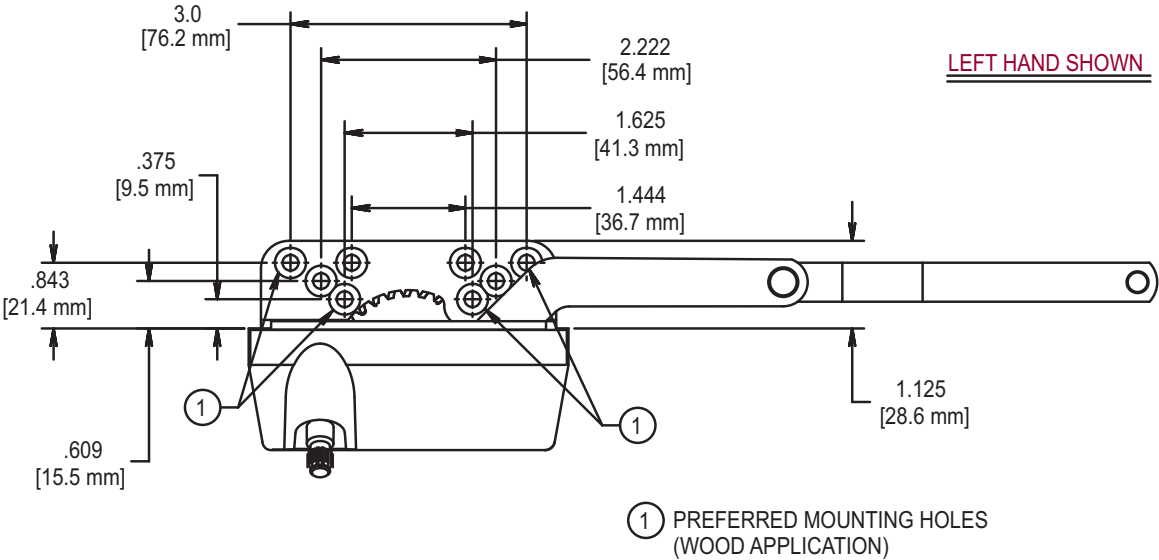
FIG. 3 GASKET APPLICATION FOR TRADITIONAL DYAD OPERATOR



INSTRUCTIONS:

1. PLACE GASKET ONTO APPLICATOR WITH STICKY SIDE OUT
2. PRESS APPLICATOR INTO FRAME CUT-OUT TO SECURE GASKET

FIG. 4 TRADITIONAL DYAD OPERATOR



RECOMMENDED SCREWS:

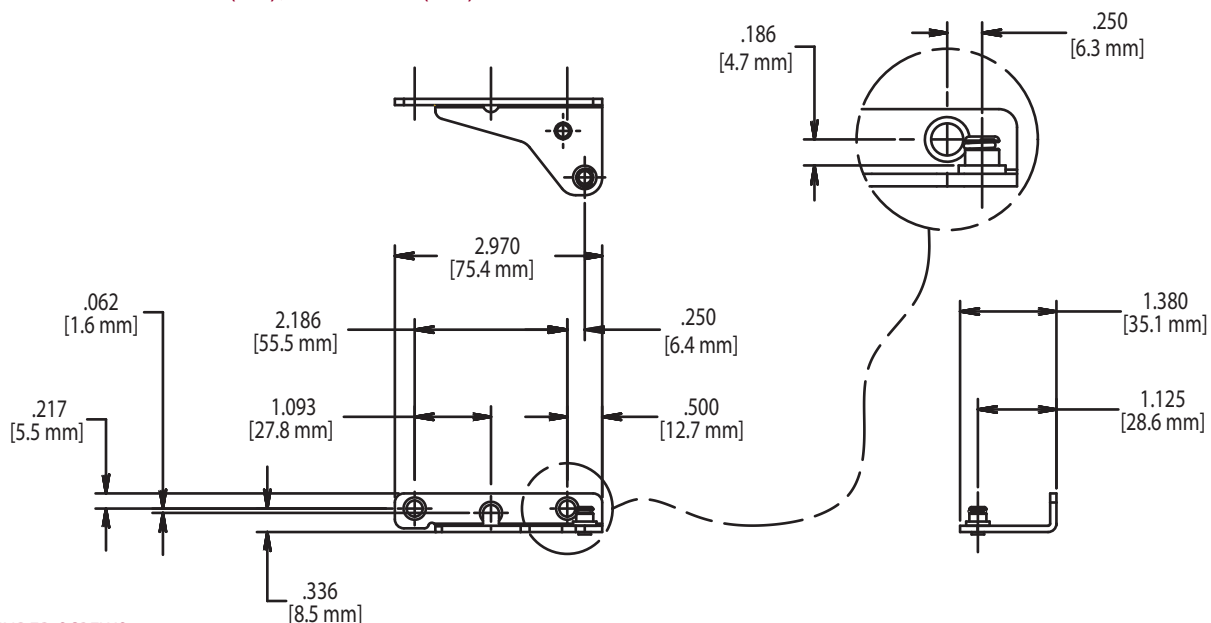
WOOD: (QTY 4) (P/N 19380.92)
 #10 X 1.0 PHILLIPS,
 FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: (QTY 4) #10 PHILLIPS,
 FLAT HEAD SCREWS
 (LENGTH AND THREAD
 TYPE DETERMINED BY
 PROFILE)

AVAILBALE OPERATOR	*RECOMMENED STUD BRACKET	AVAILBALE HINGES
15.18	12510.92 LH 12511.92 RH	14.05 14.06
15.26	12510.92 LH 12511.92 RH	14.75 14.76
15.30	12510.92 LH 12511.92 RH	

*SEE TRUTH TIP #1 FOR HANDING OF BRACKET

FIG. 5 BRACKET 12510.92 (LH), 12511.92 (RH)



RECOMMENDED SCREWS:

WOOD: (QTY 3) (P/N 19140.92) #7 X .875
PHILLIPS FLAT HEAD, SHEET METAL
SCREWS

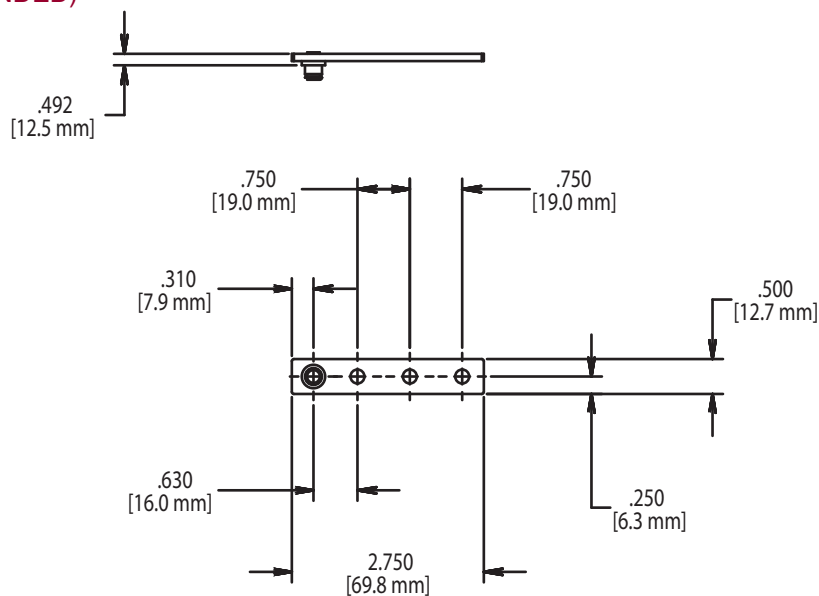
PVC & METAL: (QTY 3) #7 PHILLIPS, FLAT
HEAD SCREWS (LENGTH AND THREAD
TYPE DETERMINED BY PROFILE)

12510.92 LEFT HAND SHOWN

(USE OPPOSITE HAND BRACKET
FOR INVERTED APPLICATIONS)

NOTE: 12511.92 RIGHT HAND

FIG. 6 BRACKET 10558.92 (NON HANDED)



NON HANDED

RECOMMENDED SCREWS:

WOOD: (QTY 3) (P/N 19140.92)
#7 X .875 PHILLIPS FLAT
HEAD, METAL SCREWS

PVC & METAL: (QTY 3) #7 FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE
DETERMINED BY PROFILE)

**STRENGTH & PERFORMANCE:**

Designed for narrow awning windows, Truth's 15 Series traditional style Single Arm Awning Operator brings with it all of the style and performance characteristics of the 15 series traditional style operators.

To help make the transition to this new system easier, this traditional style Single Arm Awning Operator works with all of Truth's current Awning Hinges.

MANUFACTURING BENEFITS:

Manufacturers will appreciate the similarities in design of this new operator, in that the traditional style Single Arm Awning Operator conforms to the same frame preparation, and screw hole pattern that the other Ellipse Operators use. The operator will be shipped with the arm in an "open" position, so it can be inserted through the cut-out for easy mounting.

STYLE: Incorporating the same cover as other traditional style operators, allows the homeowner to have a similar "family" appearance throughout the home.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Technical Service Staff can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you considered *personalizing* your window with your company name or logo? All of Truth's operator handles are capable of accepting your own "signature". Contact Truth for further details.

WARRANTY: Protected under the terms of the "Truth Warranty for Window & Door Manufacturers & Authorized Distributors". Refer to Truth's Terms & Conditions for further details.

MATERIAL: High-pressure die-cast zinc cover, crank handle and knob. Hardened steel drive worm and gear. Stainless steel track and plastic pivot slides.

**CORROSION RESISTANCE:**

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

DECORATIVE FINISH:

Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Specify Operator model number (see table in Fig. 3 for options).
2. Specify Traditional style housing
3. Specify finish number.
4. Select mounting hardware (sold separately):
 #11454.XX - Contour™ Handle (painted) or
 #11329.XX - Folding Handle (painted)
 #30169 - Stainless Steel Track
 #21495 - Traditional Gasket (optional)

#21494 - Gasket Applicator (optional)
 #21306 - Protective red plastic spline cap (optional).

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. The Single Arm Awning Operator can be used with all Truth 13 & 34 Series Awning Hinges. To insure maximum operator efficiency and avoid sash chatter, it is important that the hinge and sash height be properly matched. For more complete information on proper hinge sizing and how to overcome corner pull-in problems, see Truth Tech Note #2.
2. Due to the larger opening provided by this awning operator, binding can be experienced on narrower sash heights. Windows with sash heights less than 16 inches may need to use a Limit Stop. Please contact Truth for availability of this stop device.
3. Operator position becomes more important as window size increases. With operator in closed position, center the end of the arm on the sash for optimum pull-in performance.

TRUTH TIPS (con't):

4. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

5. For accurate hardware placement, pre-drilling of the screw holes in the window profile is recommended.

6. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

7. For metal window profiles Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

8. Truth recommends that Sash Locks be used on all awning windows. Sash Locks will provide security and a tighter weatherseal to the window.

9. A Truth Spline Cap (#21306) is available to protect the operator spline from dirt and damage during shipping, window installation, and final building construction.

10. Adding Truth Snubbers to the top rail on an awning window may increase the negative air pressure rating of the window.

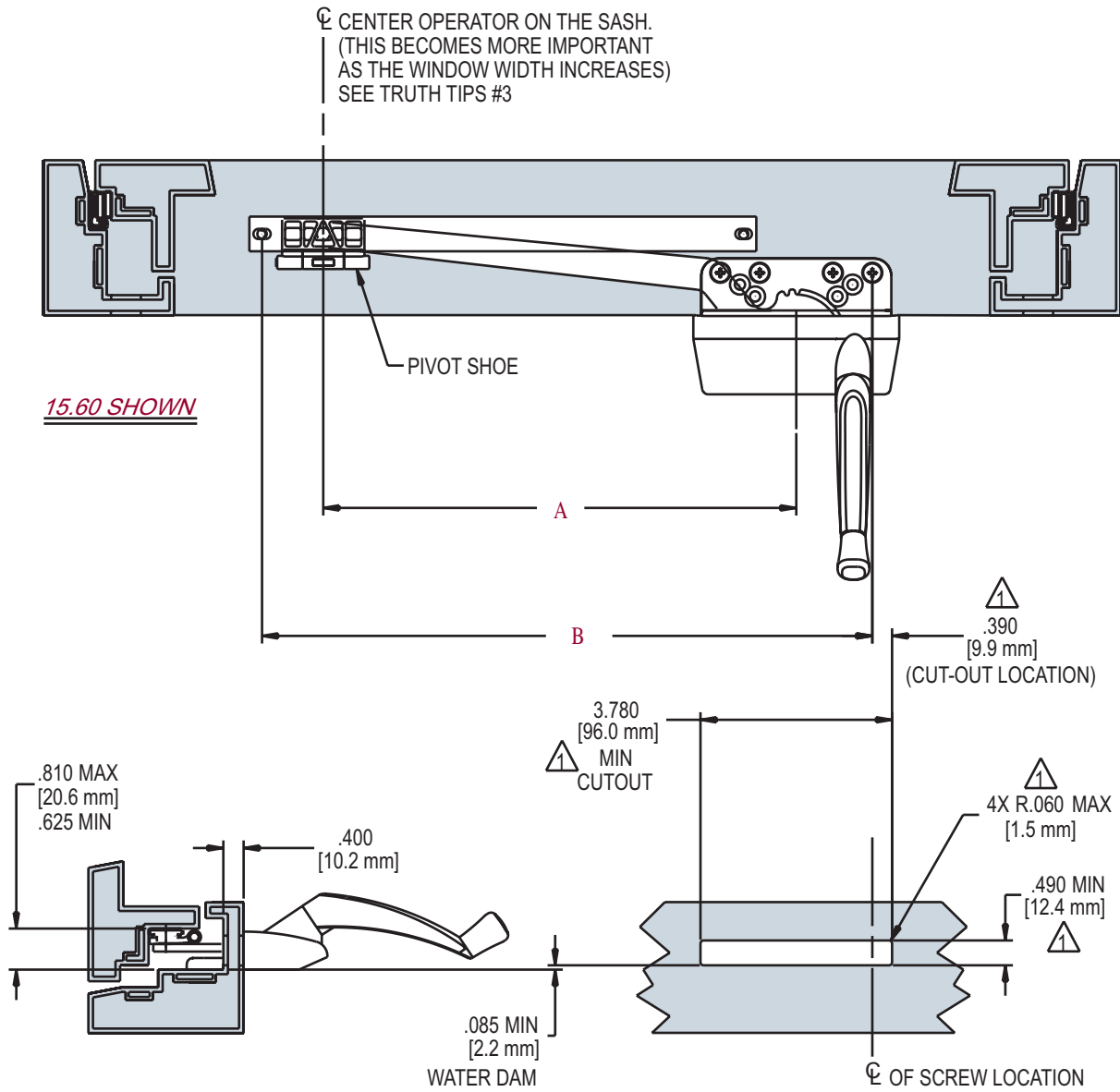
**INCLUDE TRUTH SPECS ON
YOUR NEXT WINDOW PROJECT**

Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide a continuous range of open positions. Connection to the movable sash must be easily detachable for original installation and maintenance.

Window operators will be of scissors arm and track/pivot slide design driven by hand crank. The operator must be constructed of E-Gard® coated components. High-pressure die-cast zinc cover, crank handle and knob. Hardened steel drive worm and gear. Steel track and plastic pivot slides.

Window Operators shall be 15 series Single Arm Awning Operator as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 TRADITIONAL SINGLE ARM AWNING OPERATOR APPLICATION

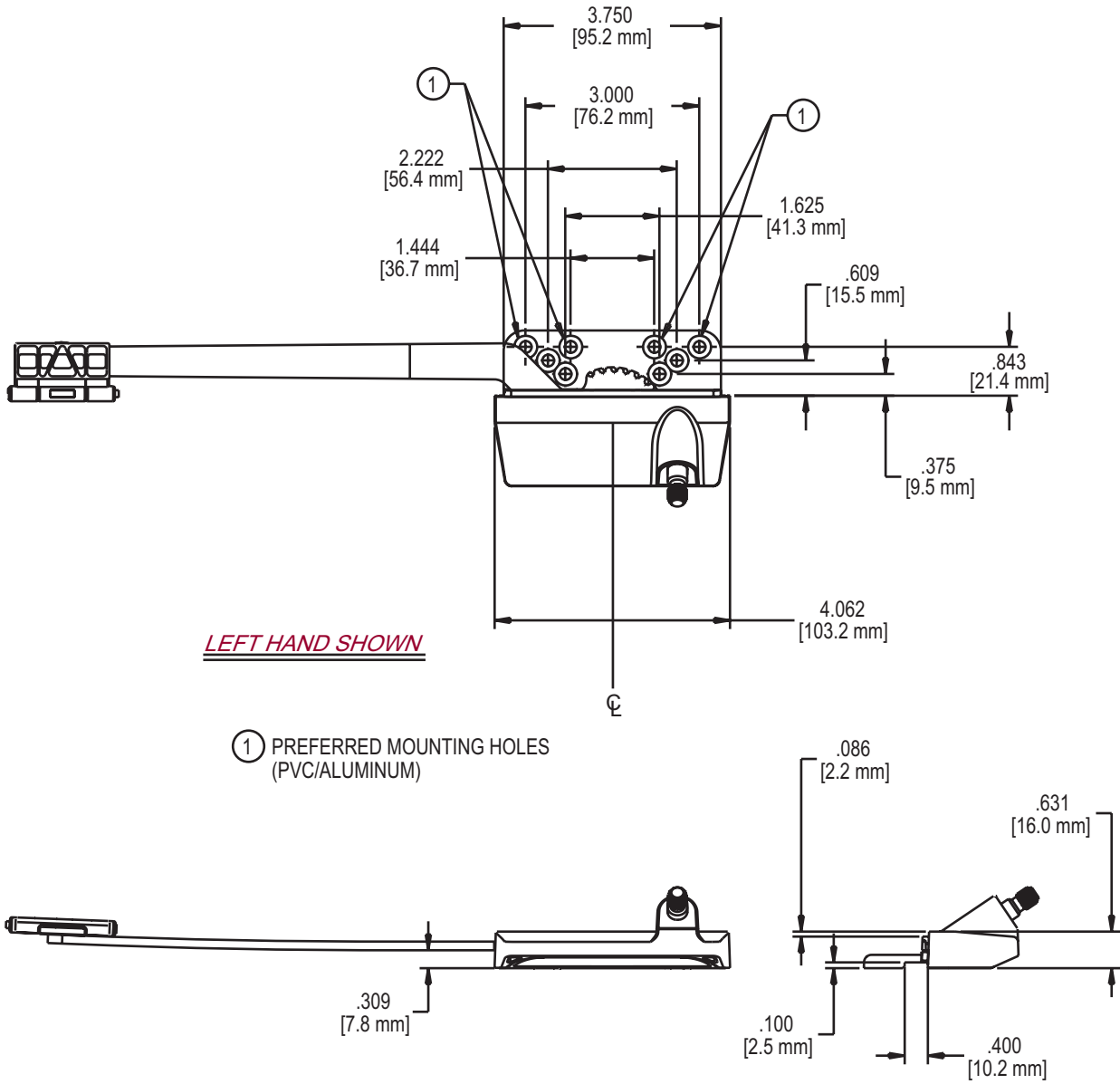


AVAILABLE OPERATOR	AVAILABLE TRACK	A	B
15.71	30169	13.50 (342.9mm)	16.039 (407.4mm)
15.60	30169	9.500 (241.3mm)	12.039 (305.8mm)

NOTE:
 ⚠️ HOLD THESE DIMENSIONS AS CLOSE TO MINIMUM AS POSSIBLE FOR PROPER GASKET FIT

15 TRADITIONAL STYLE SINGLE ARM AWNING OPERATOR

FIG. 2 TRADITIONAL SINGLE ARM AWNING OPERATOR

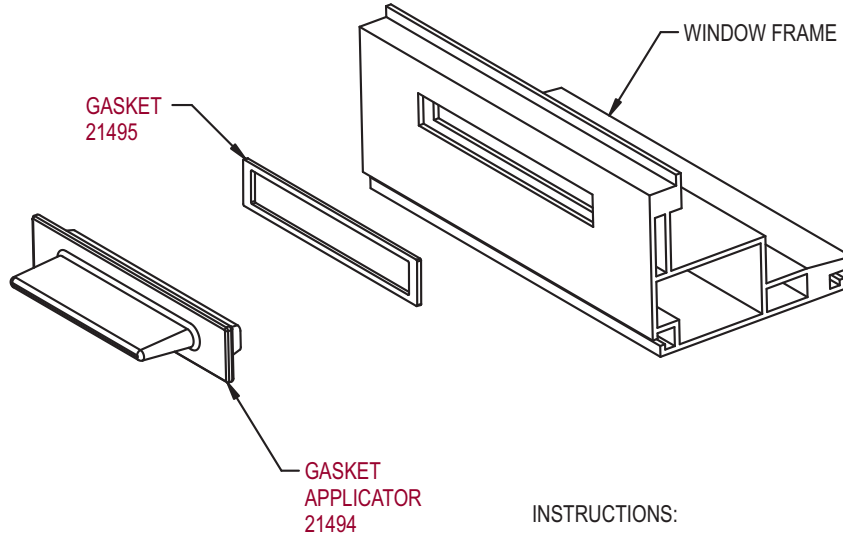


RECOMMENDED SCREWS:

WOOD: (QTY 4) (P/N 19380.92) #10 X 1.0 PHILLIPS
FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: (QTY 4) - #10 PHILLIPS, FLAT HEAD
SCREWS (LENGTH AND THREAD TYPE
TO BE DETERMINED BY PROFILE)

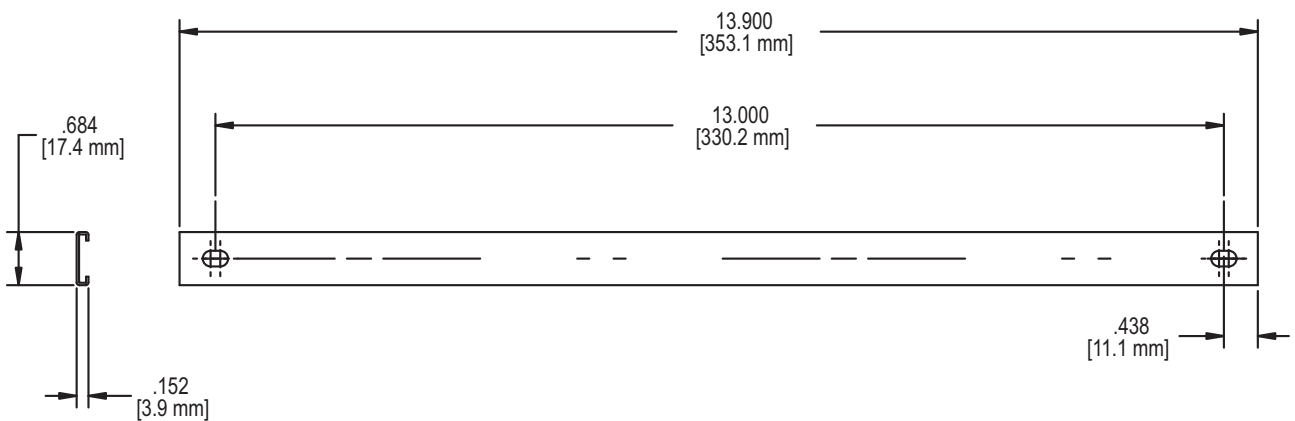
FIG. 3 GASKET APPLICATION FOR TRADITIONAL SINGLE ARM OPERATOR



INSTRUCTIONS:

1. PLACE GASKET ONTO APPLICATOR WITH STICKY SIDE OUT
2. PRESS APPLICATOR INTO FRAME CUT-OUT TO SECURE GASKET

FIG. 4 SINGLE ARM AWNING OPERATOR TRACK 30169



RECOMMENDED SCREWS:

PVC & METAL: (QTY 2) #10 PHILLIPS, PAN HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



700 WEST BRIDGE STREET, OWATONNA, MN 55060 ■ 507.451.5620 800.866.7884 ■ TRUTH.COM



Contemporary styling of Truth's face mounted Single Arm Operator complements the overall window design. Created for use with Truth's 14 Series Concealed Casement Hinges or 29 Series Butt Hinges. The Single Arm Operator provides arm movement for 90° of the window opening. These operators can also be used with Truth's 4-Bar Hinges. See Truth Tips for additional clarification.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you considered *personalizing* your window with your company name or logo? All of Truth's operator handles are capable of accepting your own "signature". Contact Truth for further details.

WARRANTY:

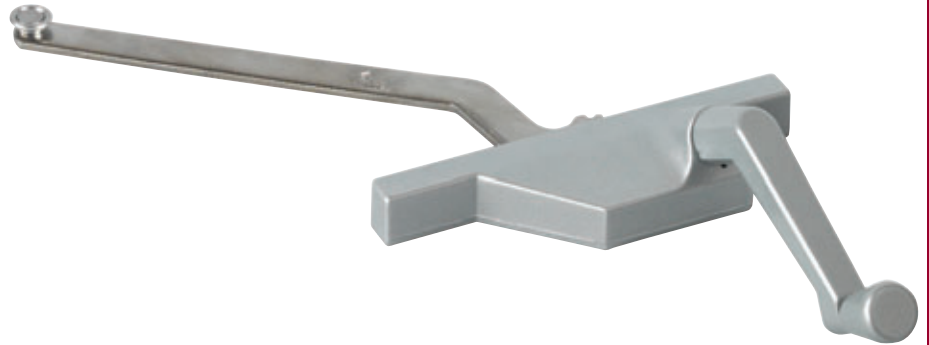
Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High-pressure die cast zinc case, crank handle and knob. Hardened steel worm gear and gear arm. Non-magnetic stainless steel arm roller, rivet, sash track and screws.

CORROSION PROTECTION:

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

For the severe conditions associated with coastal areas, Truth has developed certain product lines utilizing either **CoastGard® Hardware**, or stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.



FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose operator style desired (specify by part number).
2. Specify finish number.
3. Specify left- or right-hand (determined by the side the hinge is on when viewed from the inside). See Truth Tip # 1 for further information.
4. Select mounting hardware (sold separately):
 #11454 - Contour Handle (painted) or
 #10579 - Roto Gear Operator Handle - shown above (painted).
Optional Handle styles, such as Truth's *Folding Handle*, are also available.
Operator Track - see Figures 2 & 3 for available track options.
 #21306 - Protective red plastic spline cap
 Rubber-cork adhesive backed operator gasket (optional).
 #32357 - 375 pcs per roll
 #30174 - 400 pcs per box
 #20947 - Backing Plate (2 per operator).

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. 23 Series Single Arm Operators are handed by the hinge side when viewed from the inside (commercially handed).
2. Sash weight should be limited to 35 lbs. to insure ease of operation for the lifetime of the window. When used on a sash weighing over 35 lbs., operating torque will noticeably increase and operator life will be reduced.
3. Operator torque can be kept to a minimum by using an operator with the longest available arm that will fit a given window width.
4. Before selecting an operator, the hinge should be selected depending upon desired window features and hinge requirements (example: egress vs. washability).
5. If your window design requires the use of a 4-Bar Hinge and single arm operator, an egress 4-Bar Hinge must be used for proper operation. Single Arm Operators do not work well with 4-Bar Hinges that offer washability. If the window design requires a 4-Bar Hinge and washability is desired, then a 23 Series Dyad Operator should be used.
6. The Truth Single Arm Operator works well with a Butt Hinge. Always use an operator with the longest arm possible for best operation.
7. The Casement Single Arm Operators with 6" and 7.5" arms were designed for use on narrow sashes. A Truth Limit Device must be used when using one of these operators in combination with a Truth Egress Hinge.

TRUTH TIPS (con't):

8. This operator may be mounted closer to the lock side of the window to effectively limit opening and improve corner pull-in performance.

9. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outward at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of a casement window.

10. When used in high rise applications of over two stories, Truth recommends using a Limit Device. (or see Tip #8)

11. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.

12. Operator mounting screws must pass through one PVC wall and Truth Backing Plates #20947 or one PVC wall and one insert wall. Track mounting screws must pass through two PVC walls or one PVC wall and one insert wall. For this reason, it is necessary to use a longer screw than is recommended.

13. Truth recommends that stainless steel screws be used to fasten stainless steel components to the window. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

14. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

15. Truth recommends that Backing Plates (#20947) be used for added support to the operator in an effort to reduce the amount of flex experienced in many PVC profile systems.

16. If air infiltration around the operator is a concern, the gasket (#30174) should be used.

17. A Spline Cap (#21306) is available to protect the operator splines from dirt and other windows from damage during shipping, installation, and final building construction.

**INCLUDE TRUTH SPECS ON
YOUR NEXT WINDOW PROJECT**

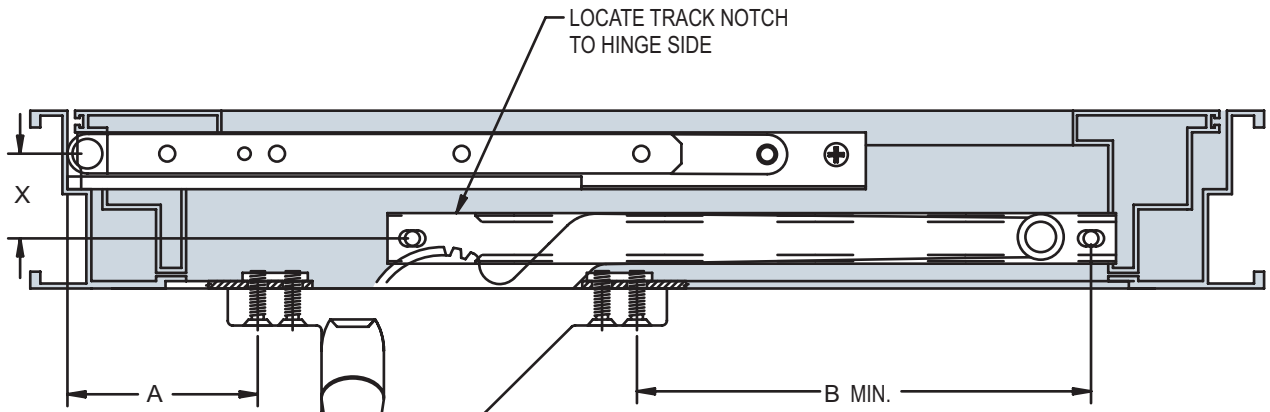
Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide smooth operation of egress or butt hinges. Connection to the movable sash must be easily detachable for window cleaning and maintenance.

Window operators will be of single push arm design driven by a hand crank. The operator must be constructed of E-Gard® components, hardened steel worm and gearing and high pressure zinc alloy die cast housing.

Window Operators shall be 23 series Single Arm Operator as manufactured by Truth Hardware, Owatonna, MN.

23 SINGLE ARM OPERATOR (FACE-MOUNT)

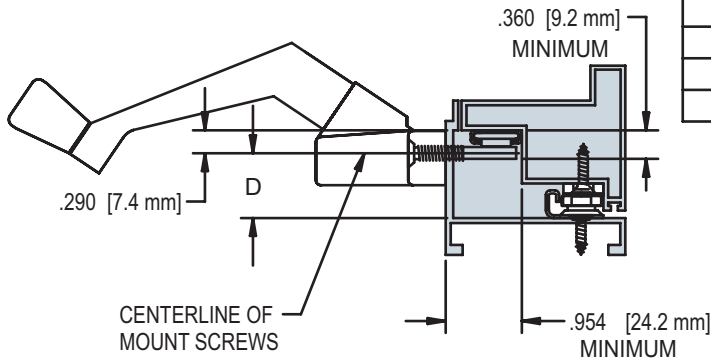
FIG. 1 APPLICATION OF THE 23 SERIES SINGLE ARM OPERATOR



HARDWARE SHOWN	
23.38	OPERATOR
14.77	HINGE
31002	TRACK
10579	HANDLE
20947	BACKING PLATE(2)

LEFT HAND SHOWN

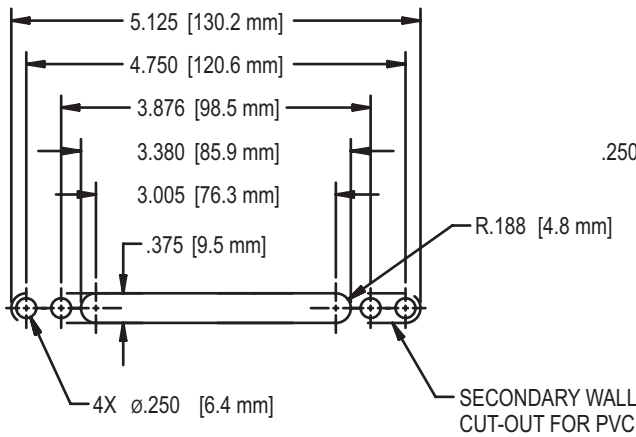
APPLICATION TABLE FOR 90° SASH OPENING		
AVAILABLE HINGES	Y HINGE CONSTANT	D (MINIMUM)
14.05	3.939 [100.1mm]	.476 [12.1mm]
14.06	4.567 [116.0mm]	
14.75	3.939 [100.1mm]	
14.76	4.567 [116.0mm]	
14.77	1.311 [33.3mm]	
14.80	3.939 [100.1mm]	.562 [14.3mm]
35.10	.495 [12.6mm]	
35.11	.495 [12.6mm]	.687 [17.5mm]
35.12	.389 [9.9mm]	
35.13	.389 [9.9mm]	



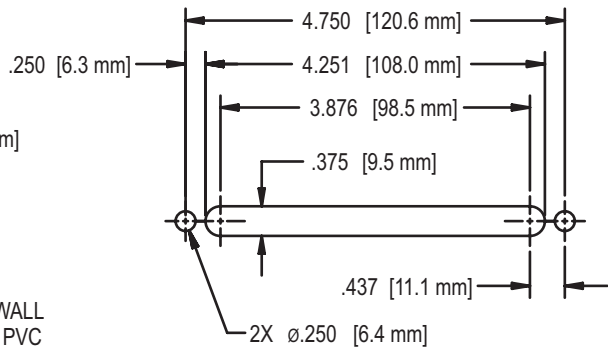
NOTE:

1. TO DETERMINE THE A DIMENSION, FIRST DETERMINE WHICH HINGE IS TO BE USED, THEN DETERMINE THE HINGE CONSTANT Y FROM THE ABOVE TABLE AND ADD IT TO THE X DIMENSION

$$A=Y+X$$



OPERATOR CUT-OUT



OPTIONAL OPERATOR CUT-OUT

23 SINGLE ARM OPERATOR (FACE-MOUNT)

FIG. 2 SINGLE ARM OPERATOR 23.00, 23.01, 23.02, 23.03 AND 23.38 (commercially handed - see Truth Tips)

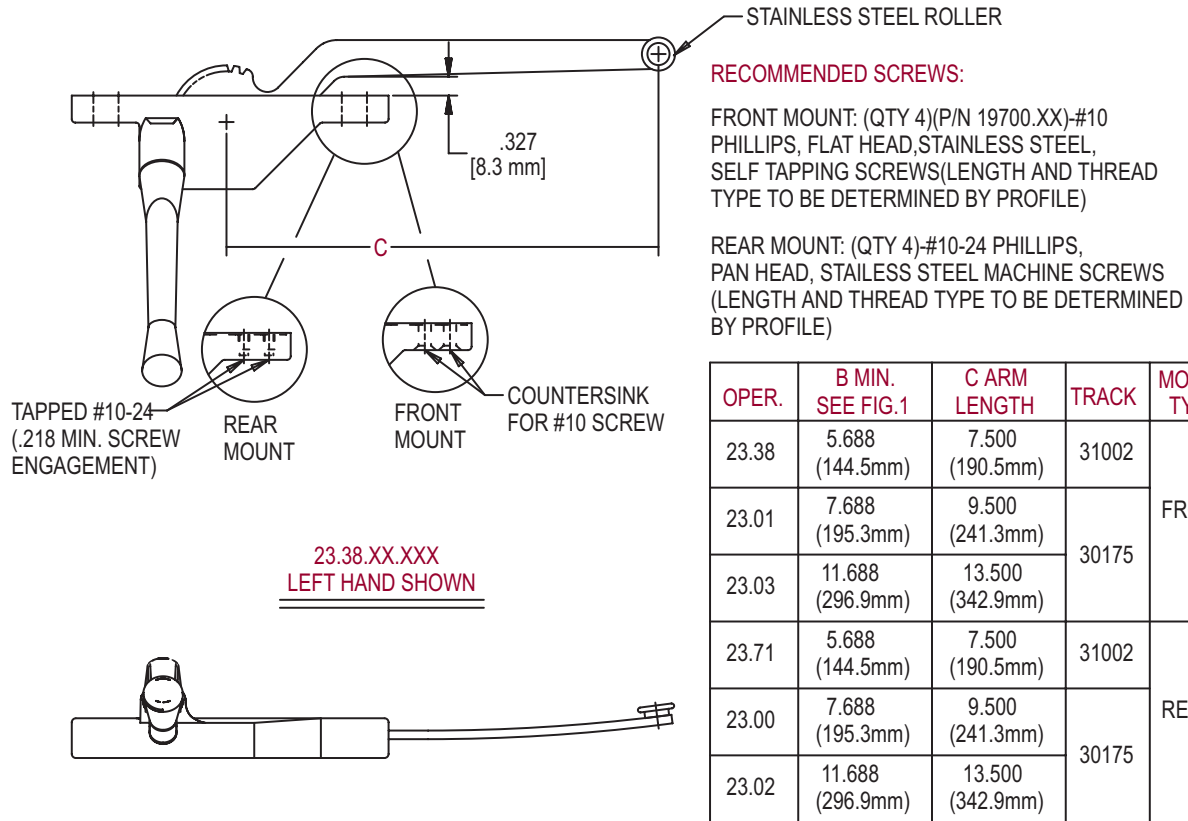


FIG. 3 TRACK 30175 AND 31002

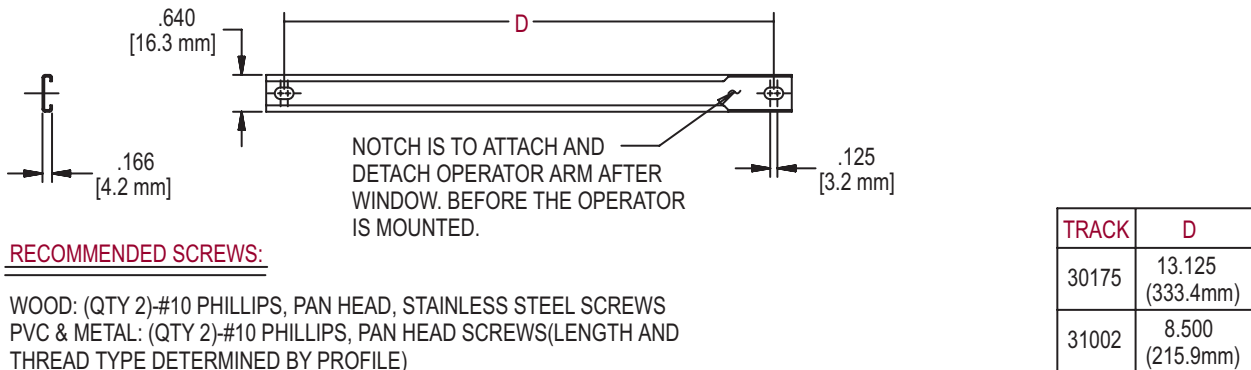


FIG. 4 GASKET 30174

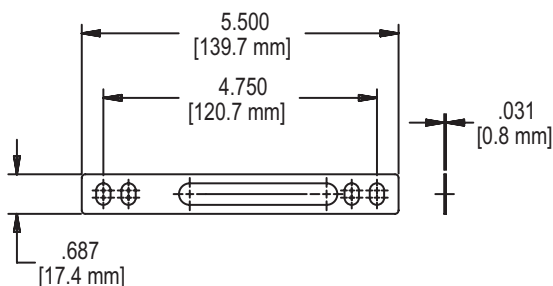
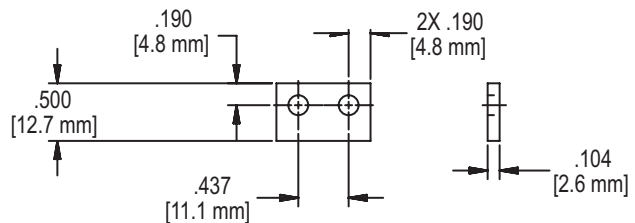


FIG. 5 BACKING PLATE 20947.XX



NOTE:

- (QTY 2) BACKING PLATES REQUIRED PER OPERATOR
- PLATE IS DESIGNED FOR A #8 SCREW TO PASS THROUGH IT FOR REAR MOUNT AND FOR A #10 SCREW TO TAP INTO IT FOR FRONT MOUNT



This unique face-mounted operator provides smooth, continuous control of casement and single vent awning windows. The dyad, or two-linked design, provides smooth operation of windows with both types of Truth Concealed Casement Hinges (Product lines #14 & #34). The detachable clip linkage allows this operator to be disengaged from the sash for easy assembly and installation. Three-point mounting feature provides increased stability of operator on the window. Also available with two-point mounting for special window designs. See drawing for further details.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you considered *personalizing* your window with your company name or logo? All of Truth’s operator handles are capable of accepting your own “signature”. Contact Truth for further details.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth’s Terms and Conditions for further details.

CORROSION PROTECTION:

Truth’s E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

For the severe conditions associated with coastal areas, Truth has stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options



MATERIAL: High-pressure die-cast zinc case, crank handle and knob. Hardened steel worm and gear.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth’s Color Chart for examples of Truth’s most popular finish options. Truth also offers a wide range of decorative “plated” finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose Dyad Operator style desired (specify by part number).
2. Specify finish number.
3. Specify left- or right-hand (determined by the side the hinge is on when viewed from the inside).
4. Select mounting hardware (sold separately):
 #11454 - Contour Handle (painted) or #10579 - Roto Gear Operator Handle - shown above (painted).
Optional handle styles, such as Truth’s *Folding Handle*, are also available.
Handed Stud Brackets - select from the tables in the following drawings. Optional brackets for special profile applications available - see Brackets & Track Section.
5. Optional mounting hardware (sold separately):
 #20947 - Backing Plates (2 per operator).
 #30591 - Detach clip (included with the operator - replacement pieces sold separately).
 #30812 - Rubber cork adhesive backed

gasket (for 2-point mounting).
 #21306 - Protective red plastic spline cap (optional).

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Before selecting an operator, the hinge should be selected depending upon desired window features and hinge requirements (example: egress vs. washability).
2. Operator and Stud Bracket handing is determined by the hinge side when viewed from the inside (commercially handed).
3. The Truth Dyad Operator should not be used with Egress style or Butt Hinges.
4. The Dyad Operator is not recommended for windows with stiff, slide by weatherstrip. To insure proper operation and long operator life, weatherstrip forces should be minimized. To find out if the weatherstrip forces are acceptable, the following procedure is suggested:
 A) From a complete window package, disconnect the operator so that the sash opens and closes freely B) Mount window plumb and square.

TRUTH TIPS (con't):

C) Connect spring scale or other force measuring device to lower lock side of the sash and measure the force required to completely close the window through its final one inch of travel.

D) Multiply the force from Step C by the sash width and divide by dimension "A" from Figure 1. For acceptable performance, this calculated force must be less than 150 lbs. If your window exceeds the forces as measured by the procedure outlined above, Truth recommends that the Dyad Operator *not* be used.

5. To insure the proper selection of window hardware and mounting locations that will provide the best operating results, please follow these simple steps:

REFER TO FIGURE 1. A) Determine the space available for operator arm clearance in the closed position - see 1.438" (33.3 mm) minimum dimension-center drawing. B) Choose a Stud Bracket that will best fit the profile and will maximize the "A" dimension. C) Choose an operator that is compatible with the bracket chosen in Step B. D) Once the operator is determined, check the elevation of the operator with respect to the hinge to insure the elevation of the operator does not fall below the stated minimums.

6. The "C" dimension taken from the tables shown, with each individual operator, should be used as the starting point for determining operator location relative to the bracket location. In most cases, this will be the correct location. If while closing the window, the operator arm comes in contact with the sash, then shift the operator away from the hinge side of the window. If the window will not come completely closed, and the operator has reached it's fully closed position, then shift the operator towards the hinge side of the window.

7. Mounting Screws must pass through two PVC walls, or one PVC wall and one insert wall or one PVC wall and Truth Backing Plates (#20947). For this reason, it may be necessary to use a longer screw than is recommended.

8. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

9. A Spline Cap (#21306) is available to protect the operator splines from dirt and other windows from damage during shipping, installation, and final building construction.

10. Truth Stud Brackets shown in Figure 8 through Figure 12 will fit the majority of the profiles. In the event that the Stud Brackets shown will not satisfactorily fit a profile, other specialized Stud Brackets are available - see Brackets & Track Section.

11. Sash weight should be limited to 50 lbs. to insure ease of operation for the lifetime of the window. When used on a sash weighing over 50 lbs., operating effort will increase and operator life will be reduced.

12. When a Dyad Operator is installed in windows used in high rise applications over two stories, a Truth Limit Device, to restrict the amount of opening, may be necessary. Contact Truth for wind loading information.

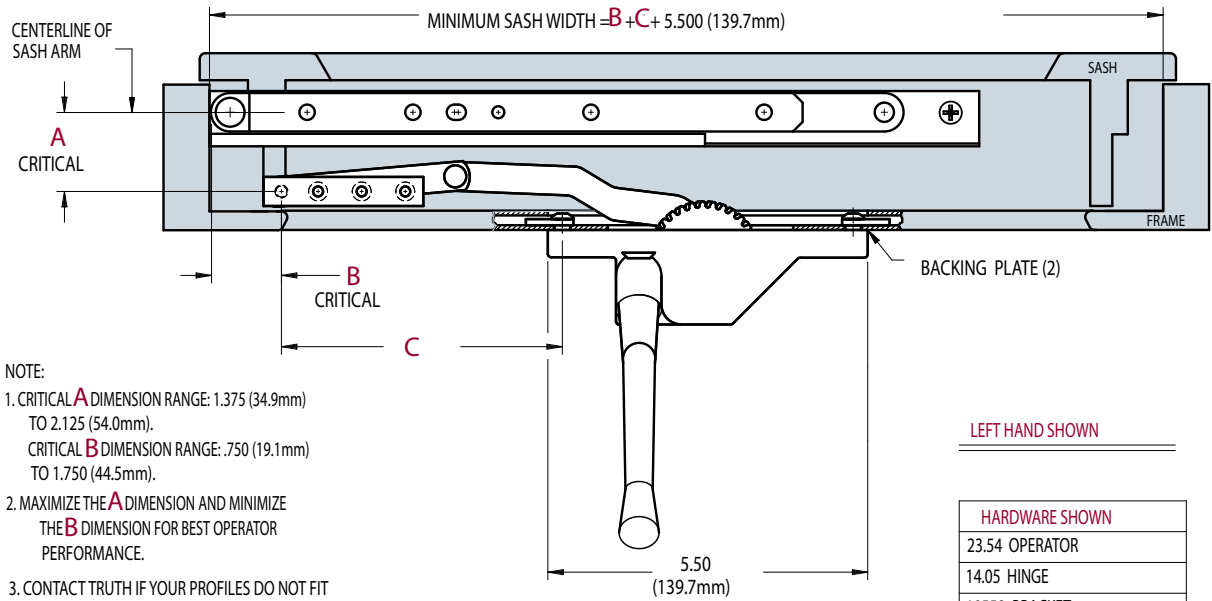
13. For accurate hardware placement in vinyl or metal applications, pre-drilling is recommended.

14. Truth recommends that a Snubber be used at the center of the hinge side on any casement window which has a tendency to bow outwardly at the center in the closed position. Adding a Snubber may increase the negative air pressure rating of the window.

15. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

**INCLUDE TRUTH SPECS ON
YOUR NEXT WINDOW PROJECT**

FIG. 1 APPLICATION OF 23 SERIES DYAD OPERATOR



- NOTE:
1. CRITICAL **A** DIMENSION RANGE: 1.375 (34.9mm) TO 2.125 (54.0mm).
CRITICAL **B** DIMENSION RANGE: .750 (19.1mm) TO 1.750 (44.5mm).
 2. MAXIMIZE THE **A** DIMENSION AND MINIMIZE THE **B** DIMENSION FOR BEST OPERATOR PERFORMANCE.
 3. CONTACT TRUTH IF YOUR PROFILES DO NOT FIT THE RECOMMENDED **A** AND **B** DIMENSION RANGES.
 4. SEE OPERATOR AND HINGE COMPATABILITY CHART IN FIG.2 BEFORE SELECTING OPERATOR FOR YOUR APPLICATION.
 5. TO DETERMINE MTG LOCATION OF BRACKETS ADD OR SUBTRACT DIMENSION **L** AND **F**.

LEFT HAND SHOWN

HARDWARE SHOWN
23.54 OPERATOR
14.05 HINGE
10558 BRACKET
10579 HANDLE
20947 BACKING PLATE (2)

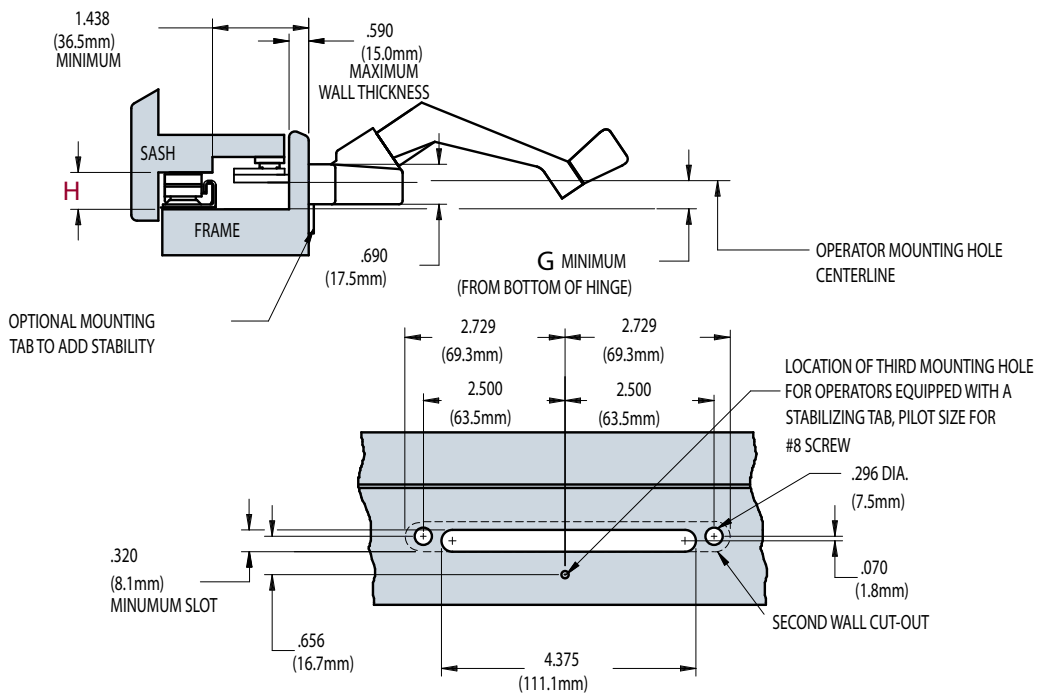


FIG. 2 DYAD OPERATOR

OPERATOR/HINGE COMPATABILITY TABLE							
HINGE STACK H	DESCRIPTION	HINGE PART NUMBER	TYPE OF HINGE	23.46 & 23.59	23.49	23.54 & 23.65	23.55 & 23.66
.438 (11.1mm)	CONCEALED CSMT HNG	14.75 & 14.05	2 BAR	X	X	O	O
	CONCEALED CSMT HNG	14.76 & 14.06	2 BAR	Z	Z	Z	Z
	CONCEALED CSMT HNG	14.80	2 BAR	X	X	O	O
.500 (12.7mm)	201 8"	34.10 NO STOP	4 BAR	O	O	-	-
	201 10"	34.11 NO STOP	4 BAR	Z	Z	X	X
	201 12"	34.12 NO STOP	4 BAR	Z	Z	X	X
	401 90° 12"	34.55	4 BAR	Z	Z	X	X
.531 (13.5mm)	401 90° SD 12"	** 34.81	4 BAR	X	X	O	O
.625 (15.9mm)	301 10"	34.24 NO STOP	4 BAR	Z	Z	X	X
	301 12"	34.25 NO STOP	4 BAR	Z	Z	Z	Z
	601 90° 14"	34.59	4 BAR	Z	Z	X	X
	601 90° 16"	34.60	4 BAR	Z	Z	X	X
	601 90° 18"	34.61	4 BAR	Z	Z	X	X

X = RECOMMENDED FOR BEST PERFORMANCE

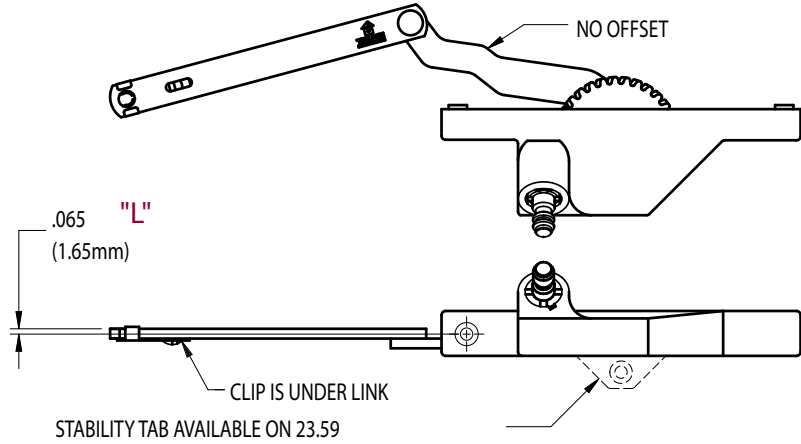
O = RECOMMENDED, HOWEVER OPERATOR TORQUE MAY BE SLIGHTLY HIGHER
AND OPERATOR MAY FIT INTO NARROWER SASH OPENING THAN SPECIFIED.

Z = RECOMMENDED, HOWEVER OPERATOR WILL ONLY OPEN SASH TO
APPROXIMATELY 80%-90% OF FULL OPENING.

** BLACK ACETAL SHOE

NOTE: ALUMINUM HINGES ARE NOT RECOMMENDED FOR CASEMENT APPLICATIONS

FIG. 3 23.46 and 23.59 DYAD OPERATOR (23.59 has stability tab)



LEFT HAND SHOWN

AVAILABLE BRACKETS	
LH	RH
10494	10495
*10558	

*RECOMMENDED

C = 5.425 (137.8mm)

RECOMMENDED SCREWS:

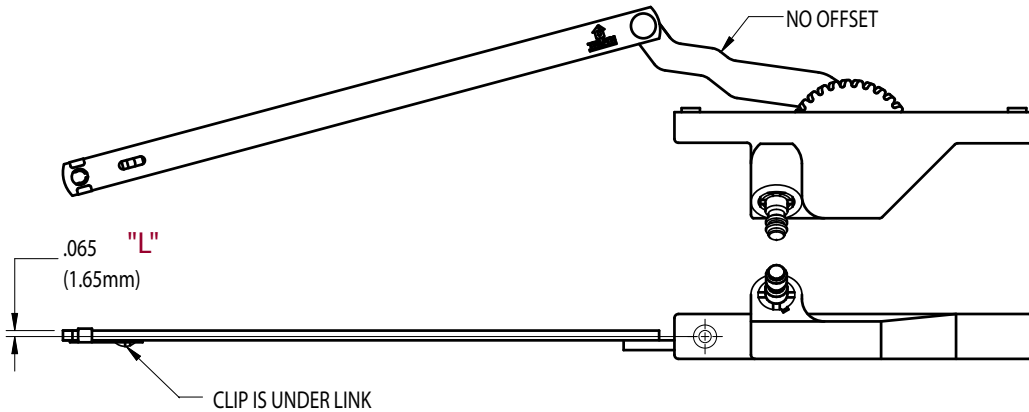
- 2 (P/N 19535.XX) #8 - 32 X .312 PHILLIPS, TRUSS HEAD, MACHINE SCREWS
- 1 (P/N 19218.XX) #8 X .750 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS (STABILITY TAB)

NOTE:

- CHECK THE OPERATOR/HINGE COMPATABILITY TABLES TO VERIFY THAT A PARTICULAR OPERATOR WILL WORK WITH A PARTICULAR HINGE (SEE FIG. 2)

HINGE STACK H (SEE NOTE 1)	G MINIMUM
.438 (11.1mm)	.622 (15.8mm)
.500 (12.7mm)	.671 (17.0mm)
.532 (13.5mm)	.702 (17.8mm)
.625 (15.9mm)	.761 (19.3mm)

FIG. 4 23.49 DYAD OPERATOR



LEFT HAND SHOWN

AVAILABLE BRACKETS	
LH	RH
10494	10495
*10558	

*RECOMMENDED

C = 9.600 (243.9mm)

RECOMMENDED SCREWS:

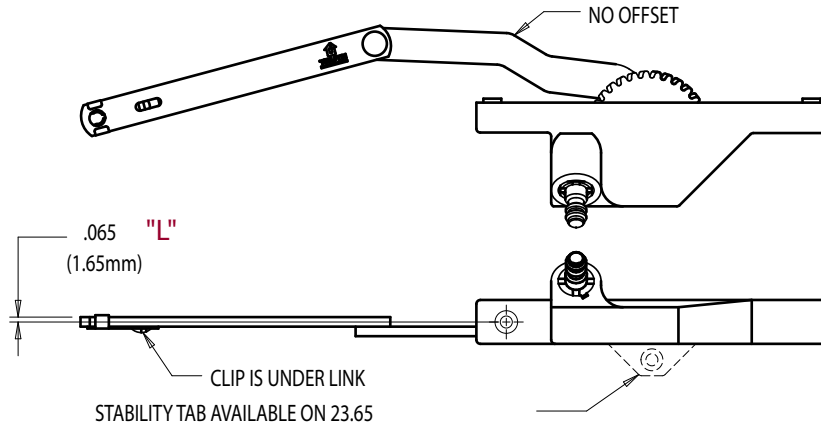
- WOOD: 2 (P/N 19535.XX) #8 - 32 X .312 PHILLIPS, TRUSS HEAD, MACHINE SCREWS

NOTE:

- CHECK THE OPERATOR/HINGE COMPATABILITY TABLES TO VERIFY THAT A PARTICULAR OPERATOR WILL WORK WITH A PARTICULAR HINGE (SEE FIG. 2)

HINGE STACK H (SEE NOTE 1)	G MINIMUM
.438 (11.1mm)	.622 (15.8mm)
.500 (12.7mm)	.671 (17.0mm)
.532 (13.5mm)	.702 (17.8mm)
.625 (15.9mm)	.761 (19.3mm)

FIG. 5 23.54 and 23.65 DYAD OPERATOR (23.65 has stability tab)



LEFT HAND SHOWN

AVAILABLE BRACKETS	
LH	RH
10494	10495
*10558	

*RECOMMENDED

C = 6.300 (160.0mm)

RECOMMENDED SCREWS:

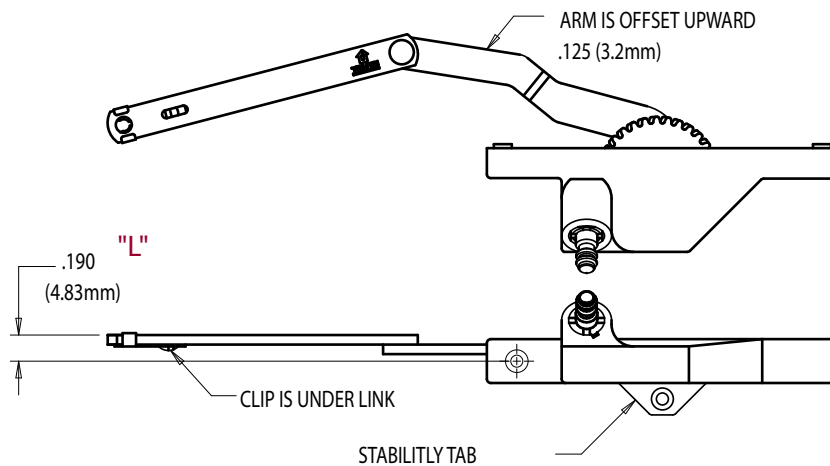
- 2 (P/N 19535.XX) #8 - 32 X .312 PHILLIPS, TRUSS HEAD, MACHINE SCREWS
- 1 (P/N 19218.XX) #8 X .750 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS (THIRD MOUNTING POINT)

NOTE:

1. CHECK THE OPERATOR/HINGE COMPATABILITY TABLES TO VERIFY THAT A PARTICULAR OPERATOR WILL WORK WITH A PARTICULAR HINGE (SEE FIG. 2)

HINGE STACK H (SEE NOTE 1)	G MINIMUM
.438 (11.1mm)	.622 (15.8mm)
.500 (12.7mm)	.671 (17.0mm)
.532 (13.5mm)	.702 (17.8mm)
.625 (15.9mm)	.761 (19.3mm)

FIG. 6 2.55 and 23.66 DYAD OPERATOR (23.66 has stability tab)



LEFT HAND SHOWN

AVAILABLE BRACKETS	
LH	RH
10494	10495
*10558	

*RECOMMENDED

C = 6.260 (159.0mm)

RECOMMENDED SCREWS:

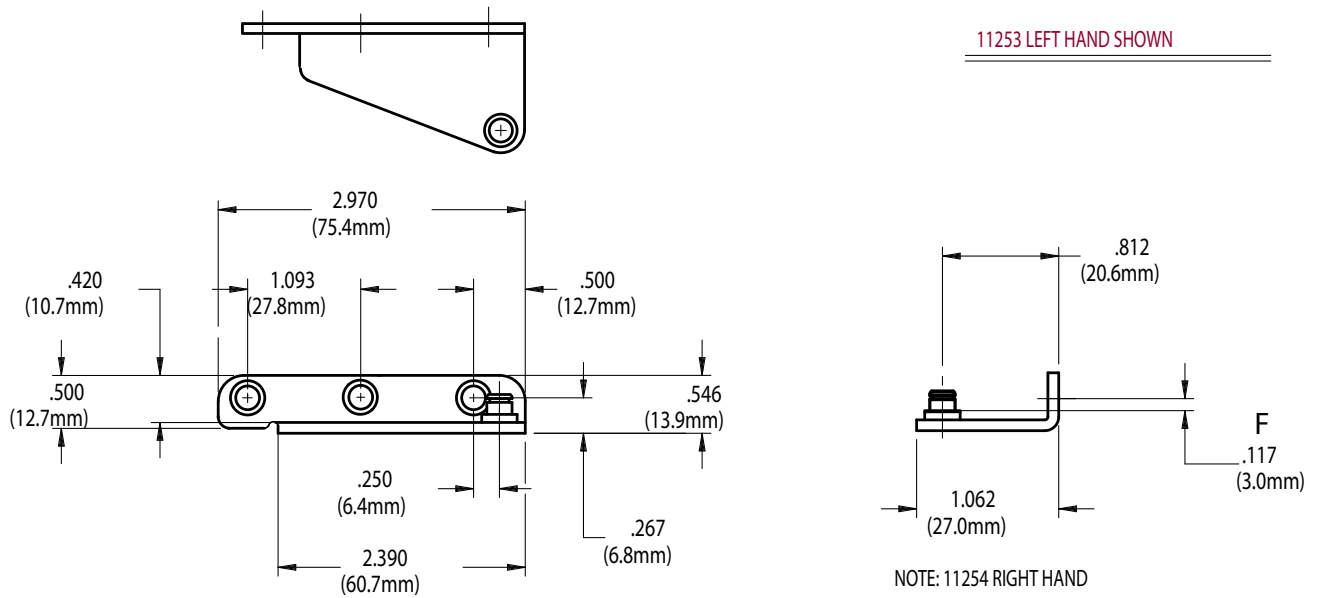
- 2 (P/N 19535.XX) #8 - 32 X .312 PHILLIPS, TRUSS HEAD, MACHINE SCREWS
- 1 (P/N 19218.XX) #8 X .750 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS (THIRD MOUNTING POINT)

NOTE:

1. CHECK THE OPERATOR/HINGE COMPATABILITY TABLES TO VERIFY THAT A PARTICULAR OPERATOR WILL WORK WITH A PARTICULAR HINGE (SEE FIG. 2)

HINGE STACK H (SEE NOTE 1)	G MINIMUM
.438 (11.1mm)	.537 (13.6mm)
.500 (12.7mm)	.586 (14.9mm)
.532 (13.5mm)	.617 (15.7mm)
.625 (15.9mm)	.676 (17.2mm)

FIG. 7 STUD BRACKETS 11253.XX, 11254.XX

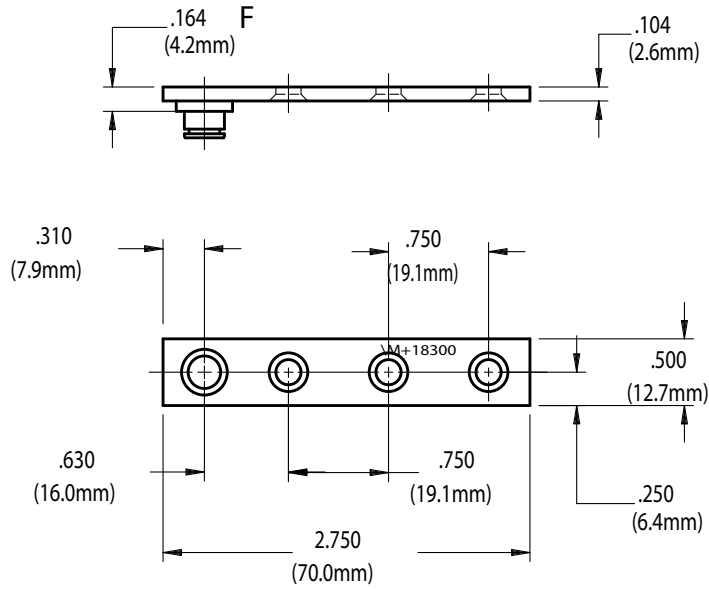


RECOMMENDED SCREWS:

WOOD: 3 (P/N 19260.XX) #8 X 1.25 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 8 STUD BRACKETS 10558.XX



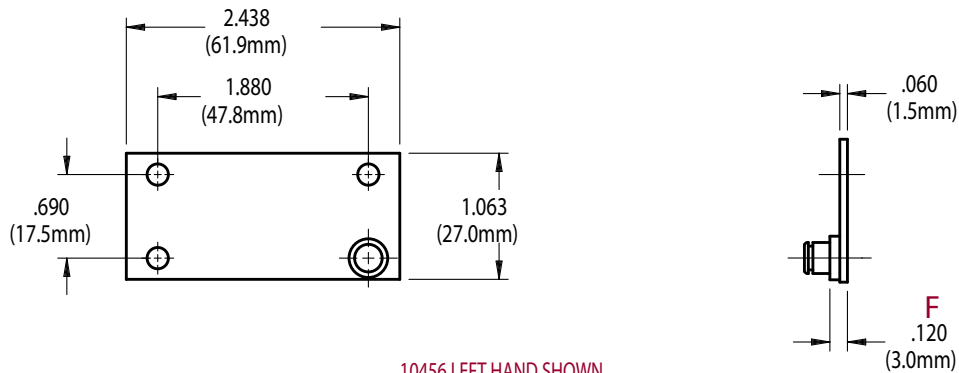
NON HANDED

RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 9 STUD BRACKETS 10456.XX, 10457.XX



10456 LEFT HAND SHOWN

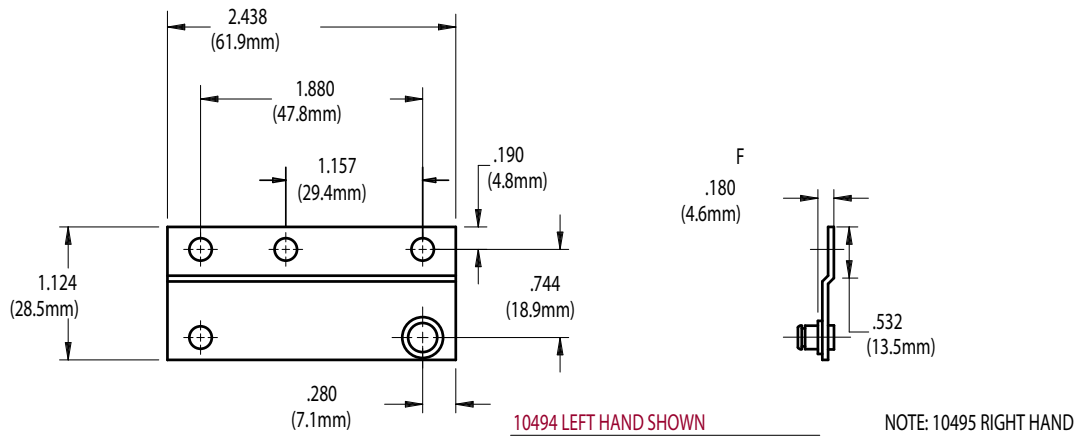
NOTE: 10457 RIGHT HAND

RECOMMENDED SCREWS:

WOOD: 3 (P/N 19355.XX) #10 X .750 PHILLIPS, PAN HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #10 PHILLIPS, PAN HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 10 STUD BRACKETS 10494.XX, 10495.XX



RECOMMENDED SCREWS:

WOOD: 2 (P/N 19355.XX) #10 X .750 PHILLIPS, PAN HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #10 PHILLIPS, PAN HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 11 GASKET 30812

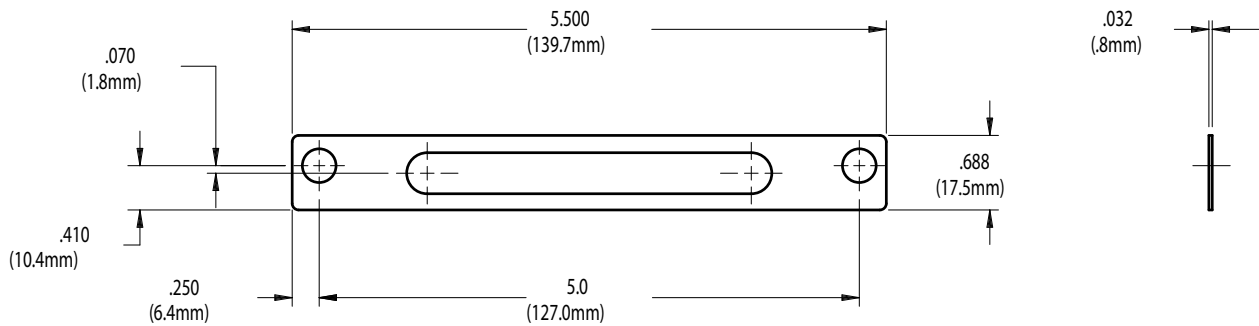
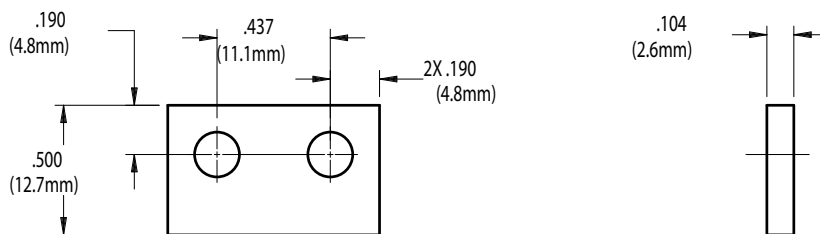


FIG. 12 BACKING PLATE 20947.XX



NOTE:

1. (2) BACKING PLATES REQUIRED PER OPERATOR
2. PLATE IS DESIGNED FOR A #8 SCREW TO PASS THROUGH IT FOR REAR MOUNT AND FOR A #10 SCREW TO TAP INTO IT FOR FRONT MOUNT.



700 WEST BRIDGE STREET, OWATONNA, MN 55060 ■ 507.451.5620 800.866.7884 ■ TRUTH.COM



Telescoping Push Bar Operators are designed for residential use as a means of opening and closing sashes with fixed screens. They are most commonly used for holding open outward-projected windows which are screened from the inside. The telescoping arm provides extended window opening up to 14.5" (368.3 mm). The Push Bar cams cover the nylon escutcheon and compresses the spring up to .187" (4.8 mm) so that the window is pulled tightly to the frame which helps to eliminate air infiltration. Sliding action of the Aluminum Push Bar through the nylon escutcheon insures smooth operating and long wearing movement.

FEATURES: The Truth Push Bar can easily be disengaged by depressing the index button on the operator arm to allow maximum window opening and for maintenance and easy assembly. Left or right-handed operation can be achieved by locating the lock bracket to either side of the yoke. This lock bracket can be mounted with the bar hooked from underneath or reversed so the bar can be hooked from the top position for clearing high sills.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Product Specialists can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: Track and bar made of aluminum extrusion 6063-T6, and assembled with aluminum and brass stampings. Nylon escutcheon and lock bracket.

FINISH: Caustic etch clear iridite (spec. MIL.-C-5541). Also available in baked polyurethane finish in white, bronze and gold.



ORDERING INFORMATION:

1. Specify yoke length (see table for standard yoke lengths and part numbers).
2. Specify length desired (standard or short).
3. Specify finish.

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. See Tech Note #11. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS

1. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
2. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.
3. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

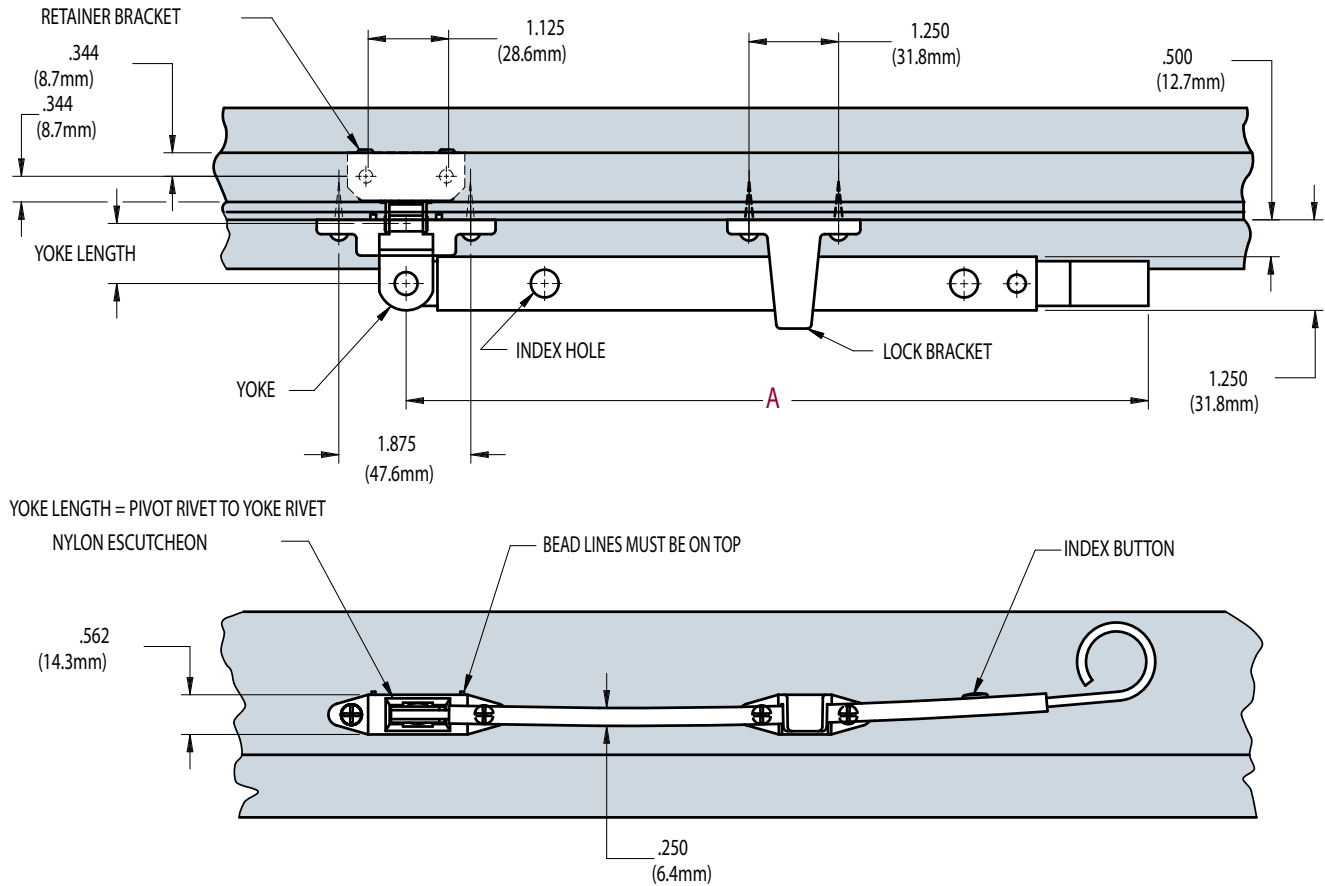
INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window push bars shall be provided which allow easy adjustment of window position. The push bar must be telescoping to allow a large open sash projection while taking up a minimum of sill space when closed and stored. Window push bars will be of telescoping design which incorporates a spring loaded sash bracket to insure tight weatherstrip seal. The push bar must be constructed of 6063-T6 aluminum and brass stampings. The escutcheon and lock brackets molded of nylon.

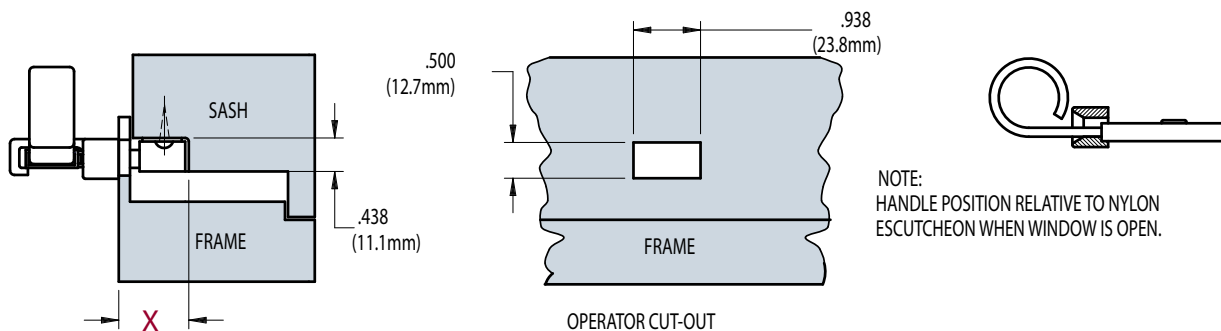
Window operators shall be 12 series Push Bar as manufactured by Truth Hardware.

12 TELESCOPING PUSH BAR OPERATORS

FIG. 1 APPLICATION OF TRUTH TELESCOPING PUSH BAR OPERATOR (ANDERBERG 44AL SERIES)



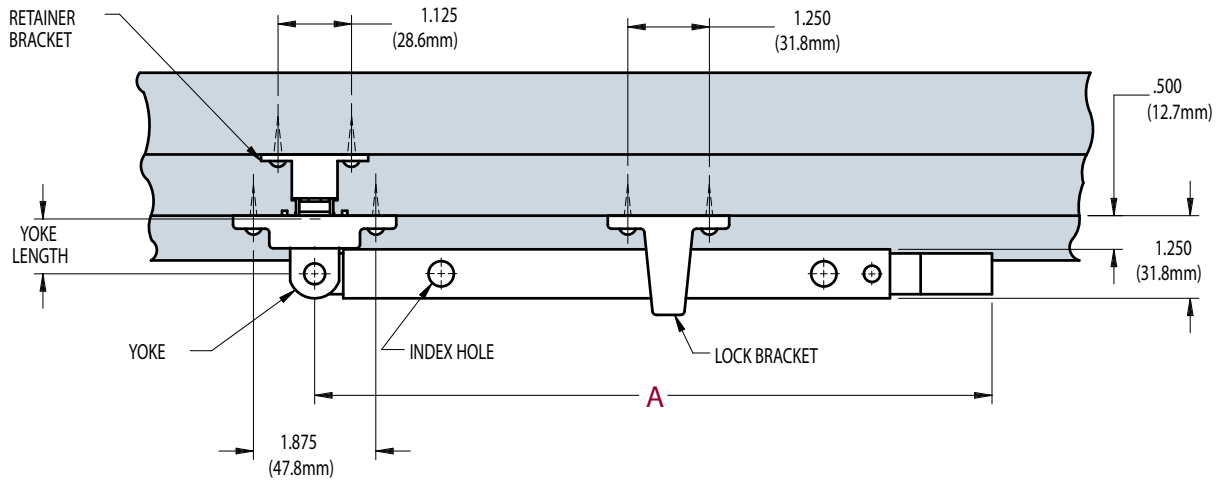
TRUTH PART NO.	X DIMENSION	YOKE LENGTH	A	
			CLOSED	EXTENDED
12.40	.938 (23.8mm)	.782 (19.8mm)	10.500 (266.7mm)	16.250 (412.8mm)
12.41	1.0 (25.4mm)	.844 (21.4mm)	10.500 (266.7mm)	16.250 (412.8mm)
12.42	1.0 (25.4mm)	.844 (21.4mm)	8.0 (203.2 mm)	11.0 (279.4mm)
12.44	1.438 (36.5mm)	1.282 (32.5mm)	10.500 (266.7mm)	16.250 (412.8mm)
12.45	1.562 (39.7mm)	1.406 (35.7mm)	10.500 (266.7mm)	16.250 (412.8mm)



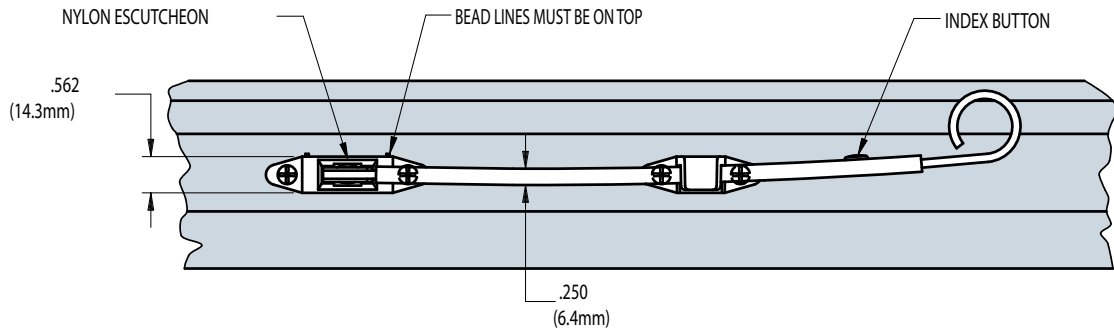
RECOMMENDED SCREWS:

WOOD : 6 - #10 X .750 PHILLIPS, PAN HEAD, SHEET METAL SCREWS
 PVC/METAL: 6 - #10 PHILLIPS, PAN HEAD SCREWS (LENGTH AND
 THREAD TYPE DETERMINED BY PROFILE)

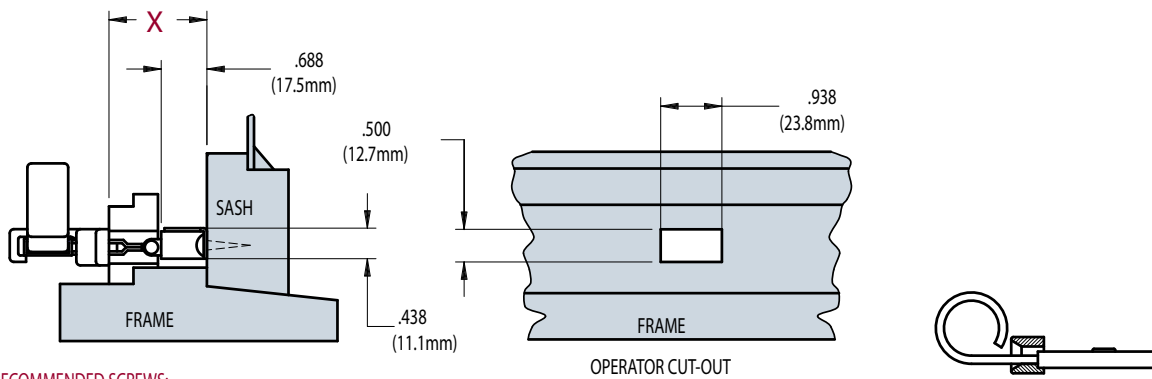
FIG. 2 APPLICATION OF TRUTH TELESCOPING PUSH BAR OPERATOR (ANDERBERG 44WD SERIES)



YOKE LENGTH = PIVOT RIVET TO YOKE RIVET



TRUTH PART NO.	X DIMENSION	YOKE LENGTH	A	
			CLOSED	EXTENDED
12.50	1.000 (25.4mm)	.844 (21.4mm)	8.00 (203.2mm)	11.00 (279.4mm)
12.52	1.438 (36.5mm)	1.282 (32.5mm)	8.00 (203.2mm)	11.00 (279.4mm)



RECOMMENDED SCREWS:

WOOD : 6 - #10 X .750 PHILLIPS, PAN HEAD, SHEET METAL SCREWS
 PVC/METAL : 6 - #10 PHILLIPS, PAN HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE:
 HANDLE POSITION RELATIVE TO NYLON ESCUTCHEON WHEN WINDOW IS OPEN.



700 WEST BRIDGE STREET, OWATONNA, MN 55060 ■ 507.451.5620 800.866.7884 ■ TRUTH.COM



Designed for face-mount applications on single vent awning windows, this operator's unique pivot shoe design allows approximately 10" of opening. The double arm design also helps achieve corner pull-in and sash stability of ventilator. Acetal pivot shoes slide smoothly in the track assuring positive operation and creating a self-cleaning action. Available in both front-mount and rear-mount styles. Also incorporating an adjustable stabilizing tab (optional), which helps reduce flexing of window frame during operation.

LOGO OPTIONS: Have you considered *personalizing* your window with your company name or logo? All of Truth's operator handles are capable of accepting your own "signature". Contact Truth for further details.

WARRANTY: Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High-pressure die-cast zinc case, crank handle and knob. Hardened steel worm and gear arm. Acetal pivot shoe. Non-magnetic stainless steel track. Optional stainless steel arms.

CORROSION PROTECTION: Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

For the severe conditions associated with coastal areas, Truth has stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.



ORDERING INFORMATION & OPTIONS:

1. Choose Operator style desired - specify by part number. See table within drawings for details.
2. Specify finish number.
3. Select mounting hardware (sold separately):

#11454 - Contour Handle (painted) or #10579 - Roto Gear Operator Handle - shown above (painted).

Optional handle styles, such as Truth's *Folding Handle*, are also available.

Order Track separately - specify by part number. See table within drawings for details (2 per operator).

- #12789 - Stabilizing Tab Kit.
#20947 - Backing Plate (2 per operator).
#20189 - Backing Grommet (optional).
#21306 - Protective red plastic spline cap (optional).
#30171 - Rubber-cork adhesive backed gasket (optional).

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Operator mounting screws must pass through one PVC wall and Truth Backing Plates #20947 or one PVC wall and one insert wall. Track mounting screws must pass through two PVC walls or one PVC wall and one insert wall. For this reason, it is necessary to use a longer screw than is recommended.
2. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

3. This operator is intended for single vent applications only, and should not be used on multi-vent applications.

4. For accurate hardware replacement, pre-drilling is recommended.

5. Truth recommends that Backing Plates (#20947) and/or a Stability Tab (#12789) be used for added support to the operator in an effort to reduce the amount of flex experienced in many PVC Profile Systems.

6. For metal window profiles, Truth recommends machine screws.

However, in most applications, sheet metal screws will provide adequate holding power.

7. Butt Hinges can be used with the pivot shoe operator, however, some degree of sash chatter will usually occur. Chatter is caused by the weight of the window pushing the operator closed rather than the operator pulling the window closed.

8. A window operator alone provides poor forced entry resistance and must always be used in conjunction with sash locks when forced entry resistance is required.

9. The Pivot Shoe Operator can be used with all Truth 13 Series Awning and 4-Bar Hinges. To insure maximum operator efficiency, it is important that operator, hinge, and sash height is properly matched. Consult sash size table found in the Hinge section of the catalog.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide wide range of open positions. Connection to the movable sash should use pivoting slide shoes and stainless steel guide tracks.

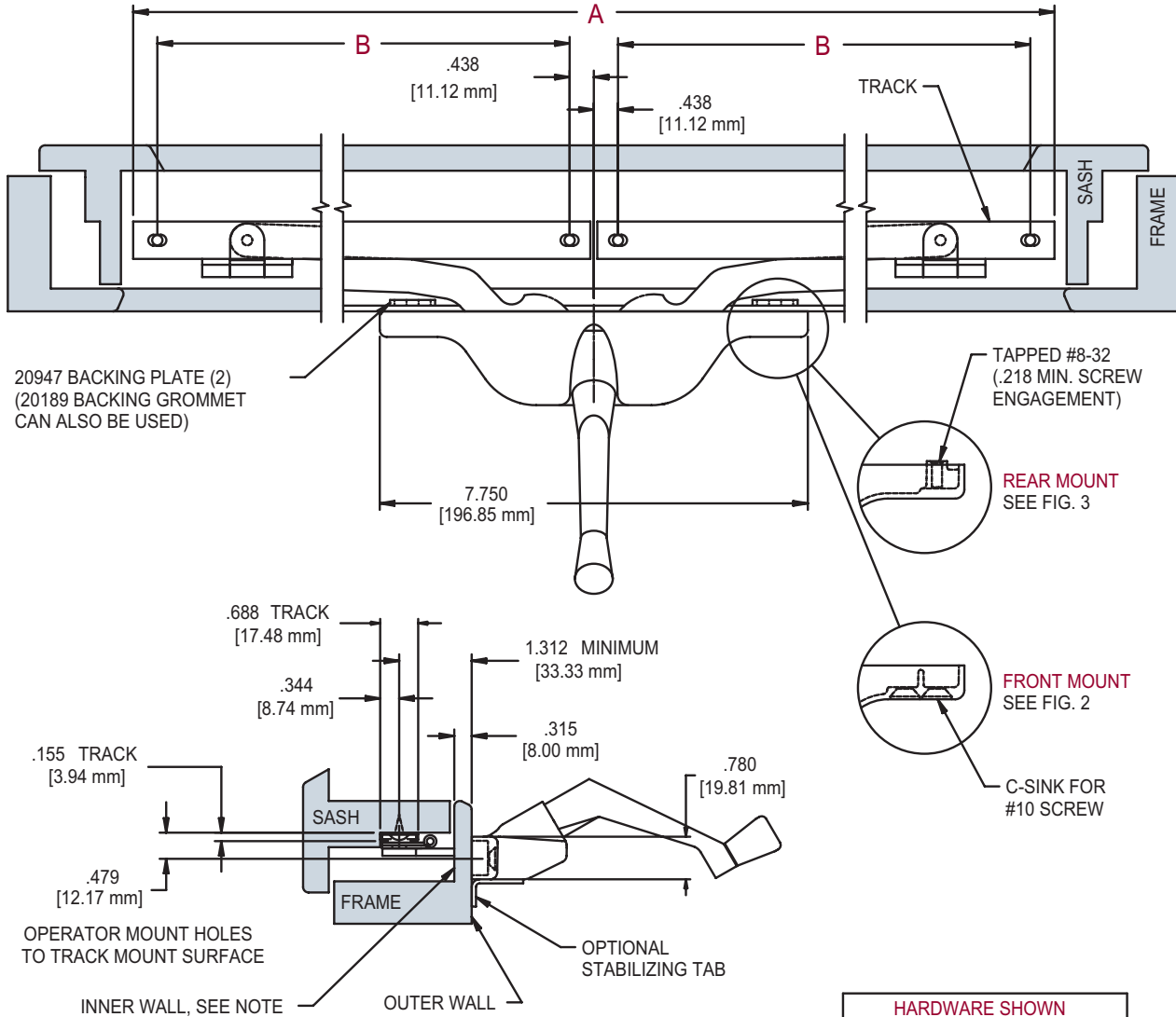
22 PIVOT SHOE OPERATOR

Window operators will be of twin push arm design driven by hand crank. The operator must be constructed of E-Gard® components, hardened steel

worm and gear arms and high pressure zinc alloy die castings. Stainless steel shoe guide tracks.

Window Operators shall be 22 series Pivot Shoe Operator as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF 22 SERIES PIVOT SHOE OPERATOR

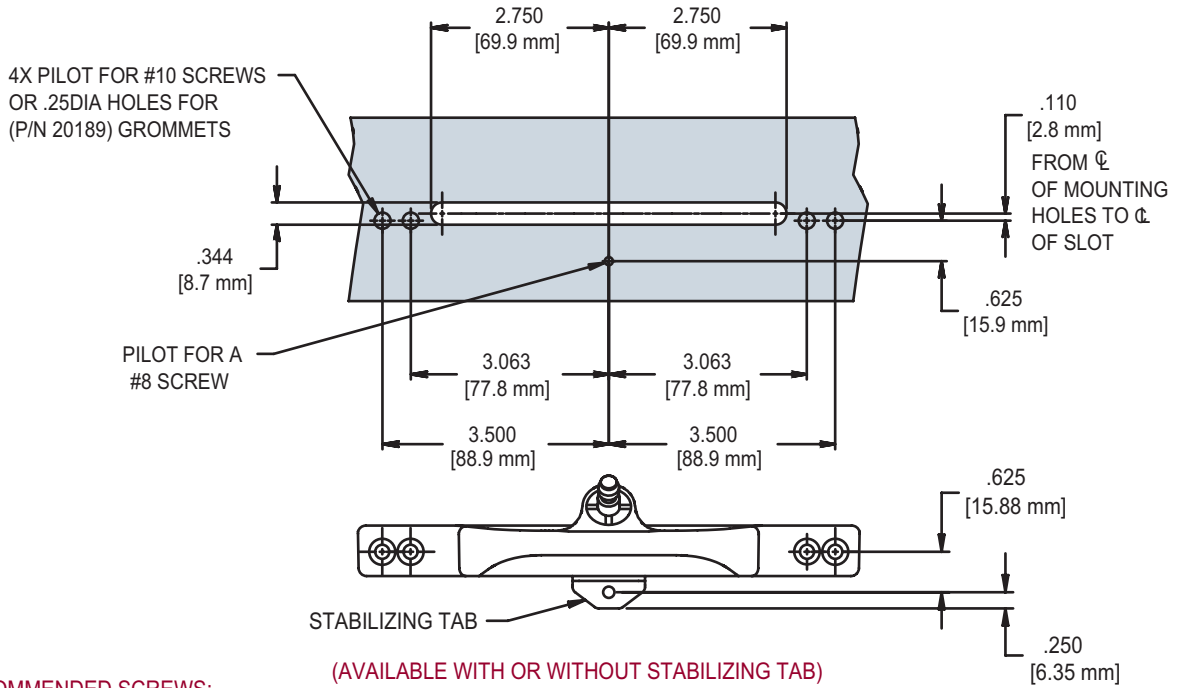


NOTE:
INNER WALL MAY BE RELIEVED TO ALLOW SUFFICIENT ARM CLEARANCE IN THE CLOSED POSITION. RELIEF REQUIRED FOR CLEARANCE WILL VARY DEPENDING ON THE TRACK MOUNTING POSITION RELATIVE TO THE OPERATOR.

HARDWARE SHOWN	
22.10	OPERATOR
30169	TRACK (2)
10579	HANDLE
20947	BACKING PLATE (2)

OPERATOR PART No.	ARM LENGTH	OVERALL LENGTH A	MOUNTING STYLE	STABILIZING TAB TO ORDER	RECOMMENDED TRACK	TRACK LENGTH B
22.10	11.00 (279.4mm)	27.75 (704.9mm)	FRONT	PART No. 12789	30169	13.00 (330.2mm)
22.17	5.50 (139.7mm)	16.75 (425.5mm)			31594	7.50 (190.5mm)
22.18	9.00 (228.6mm)	25.75 (654.1mm)			31322	12.00 (304.8mm)
22.19	11.00 (279.4mm)	27.75 (704.9mm)	REAR		30169	13.00 (330.2mm)

FIG. 2 FRONT MOUNT CUT OUT DETAILS



RECOMMENDED SCREWS:

OPERATORS:

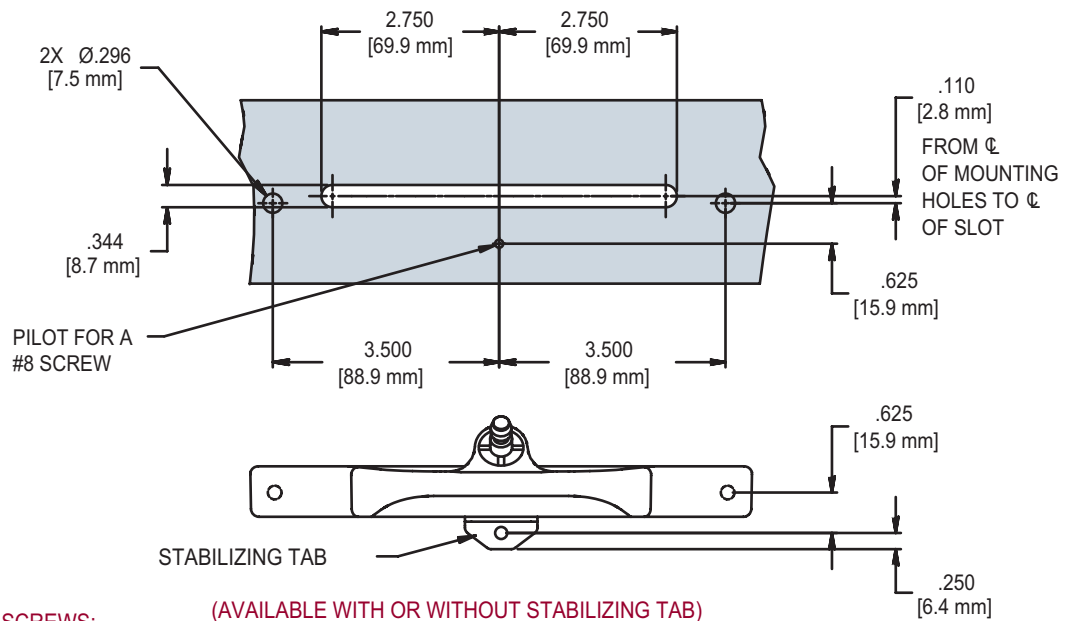
FRONT MOUNT: 4 (P/N 19700.XX) #10-24 X .688 PHILLIPS, FLAT HEAD, STEEL SHEET METAL SCREWS

1 STABILIZING TAB UNIT PACK (P/N 12789)

1 (P/N 19215.92) #8 X .750 PHILLIPS, PAN HEAD, STEEL, SHEET METAL SCREW (STABILITY TAB)

NOTE: SCREW LENGTH AND THREAD TYPE WILL BE DETERMINED BY PROFILE.

FIG. 3 REAR MOUNT CUT OUT DETAILS



RECOMMENDED SCREWS:

OPERATORS:

REAR MOUNT: 2 (P/N 19535.XX) #8-32 X .312 PHILLIPS, TRUSS HEAD, STEEL, MACHINE SCREWS

1 STABILIZING TAB UNIT PACK (P/N 12789)

1 (P/N 19215.92) #8 X .750 PHILLIPS, PAN HEAD, STEEL, SHEET METAL SCREW (STABILITY TAB)

NOTE: SCREW LENGTH AND THREAD TYPE WILL BE DETERMINED BY PROFILE.

FIG. 4 GASKET 30171

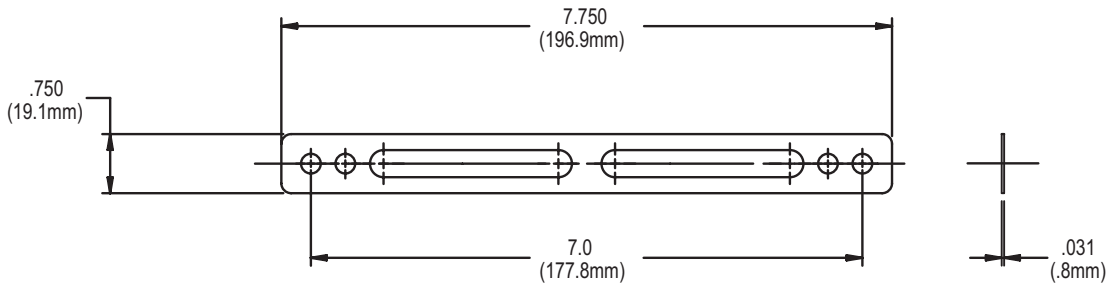
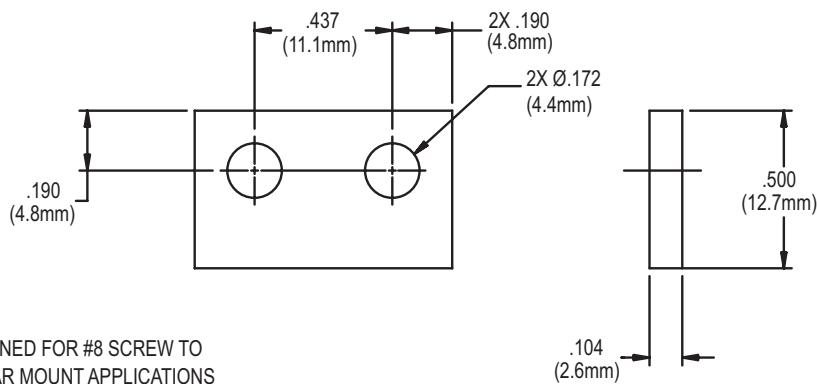


FIG. 5 BACKING PLATE 20947.XX



NOTES:
 BACKING PLATE IS DESIGNED FOR #8 SCREW TO PASS THROUGH FOR REAR MOUNT APPLICATIONS AND FOR A #10 SCREW TO TAP INTO IT FOR A FRONT MOUNT APPLICATIONS.

FIG. 6 BACKING GROMMET 20189

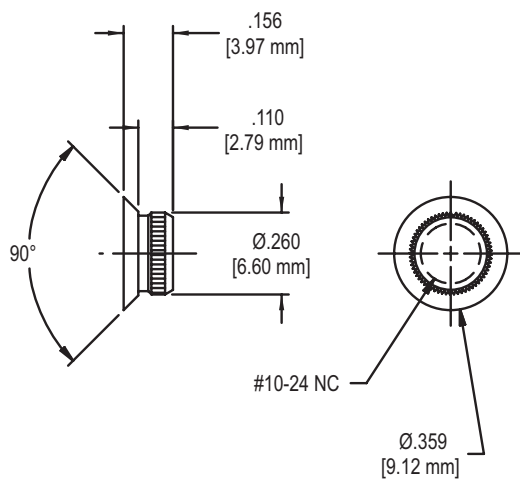
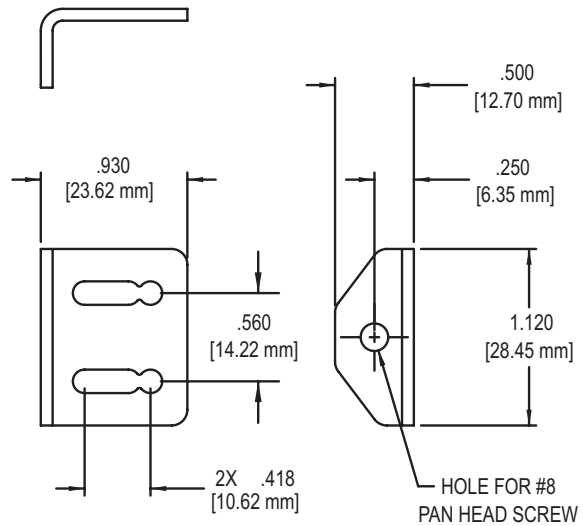


FIG. 7 STABILIZING TAB 12789



NOTE:
 INCLUDES TWO SCREWS FOR ATTACHMENT TO OPERATOR.



For the window design that requires a face-mounted operator, Truth has developed a special version of our Awning Roto Gear Operator that incorporates the case from our 22 Series Operators with the functional capabilities of the 11 Series Awning Roto Gear Operator. This operator is designed to provide positive control of the sash in any position, while producing a secure pull-in of the window at its' corners. A simple detach feature is available that disengages the operator from the sash for quick window removal and for ease in installation. Available in both front-mount and rear-mount models. Also incorporating an adjustable stabilizing tab (optional), which helps reduce flexing of window frame during operation.

WARRANTY: Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Technical Service Staff can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you considered *personalizing* your window with your company name or logo? All of Truth's operator handles are capable of accepting your own "signature". Contact Truth for further details.

CORROSION PROTECTION:

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

For the severe conditions associated with coastal areas, Truth has stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.



MATERIAL: High-pressure die-cast zinc case, crank handle and knob. Hardened steel drive worm and gear arms. Optional stainless steel arms.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose operator style desired (specify by part number).
2. Specify finish number.
3. Select mounting hardware (sold separately):
 - #11454 - Contour Handle (painted) or
 - #10579 - Roto Gear Operator Handle - shown above (painted).

Optional handle styles, such as Truth's *Folding Handle*, are also available.

Order Sash Hooks - see drawings for the available model that best fits your window design.

 - #12789 - Stabilizing Tab Kit
 - #20189 - Backing Grommet (optional).
 - #20947 - Backing Plate.
 - #30171 - Rubber-cork adhesive backed gasket (optional).
 - #21306 - Protective red plastic spline cap (optional).

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. Refer to drawings for complete information on screw type and quantity needed (sold separately). For additional information regarding screw selection - see Truth Tips and Tech Note #11.

TRUTH TIPS:

1. Operator mounting screws must pass through one PVC wall and Truth Backing Plates #20947 or one PVC wall and one insert wall. Track mounting screws must pass through two PVC walls or one PVC wall and one insert wall. For this reason, it is necessary to use a longer screw than is recommended.
2. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.
3. This operator is intended for single vent applications only, and should not be used on multi-vent applications.
4. For accurate hardware replacement, pre-drilling is recommended.
5. Truth recommends that Backing Plates (#20947) and/or a Stability Tab (#12789) be used for added support to the operator in an effort to reduce the amount of flex experienced in many PVC Profile Systems.

TRUTH TIPS (con't):

6. For metal window profiles, Truth recommends machine screws.

However, in most applications, sheet metal screws will provide adequate holding power.

7. Butt Hinges can be used with the pivot shoe operator, however, some degree of sash chatter will usually occur. Chatter is caused by the weight of the window pushing the operator closed rather than the operator pulling the window closed.

8. A window operator alone provides poor forced entry resistance and must always be used in conjunction with sash locks when forced entry resistance is required.

9. This operator can be used with all Truth 13 Series Awning and 4-Bar Hinges. To insure maximum operator efficiency, it is important that operator, hinge, and sash height be properly matched. Consult sash size table found in the Hinge section of the catalog.

10. A Spline Cap (#21306) is available to protect the operator splines from dirt and other windows from damage during shipping, installation, and final building construction.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

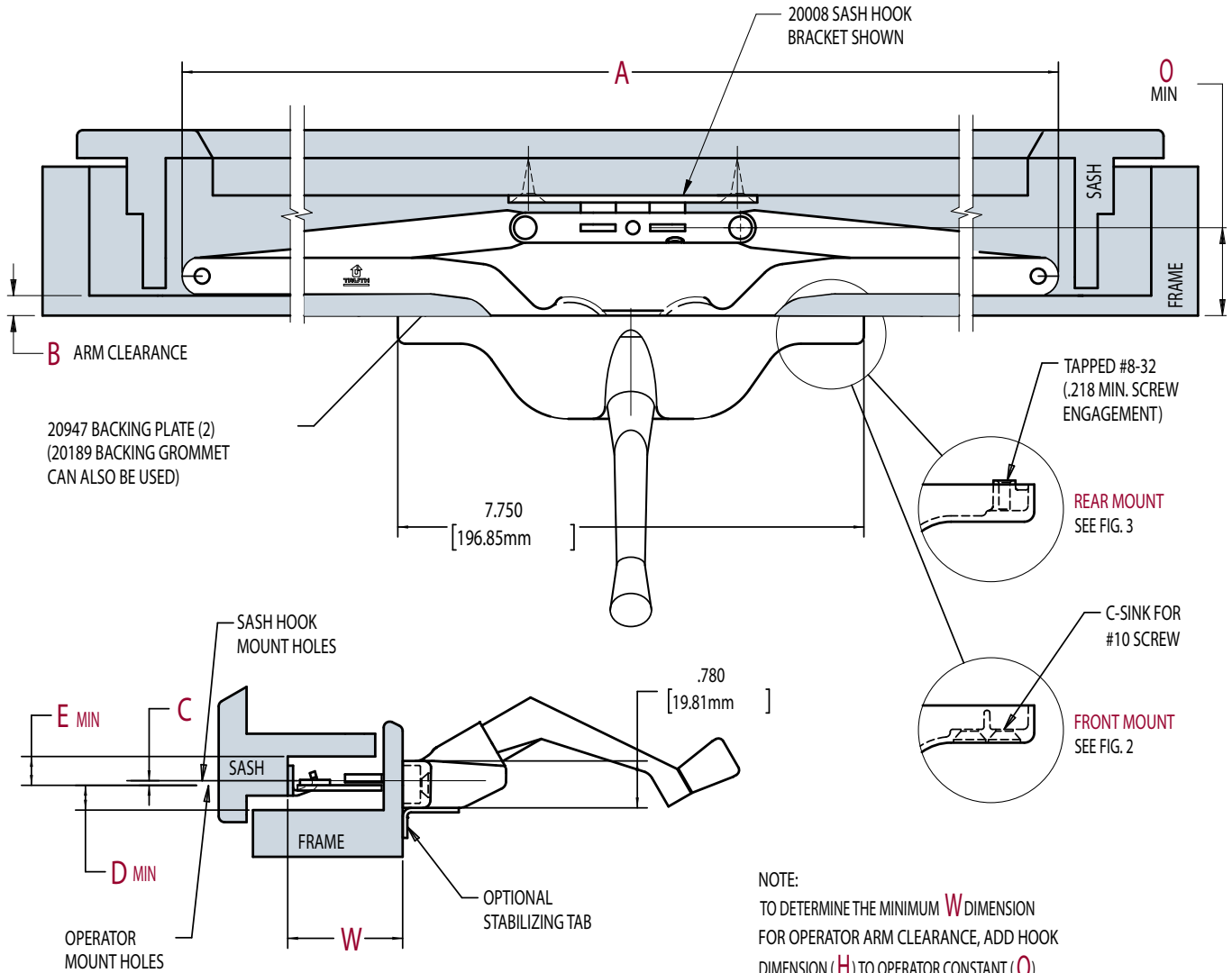
Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide wide range of open positions. Connection to the movable sash must be easily detachable for window cleaning and maintenance.

Window operators will be of scissors arm design driven by hand crank. The operator must be constructed of E-Gard® components, hardened steel worm and gear arms and high pressure zinc alloy die castings.

Window Operators shall be 22 series Scissors Arm Awning Operator as manufactured by Truth Hardware, Owatonna, MN.

22 SCISSORS ARM OPERATOR

FIG. 1 APPLICATION 22 SCISSORS ARM OPERATOR



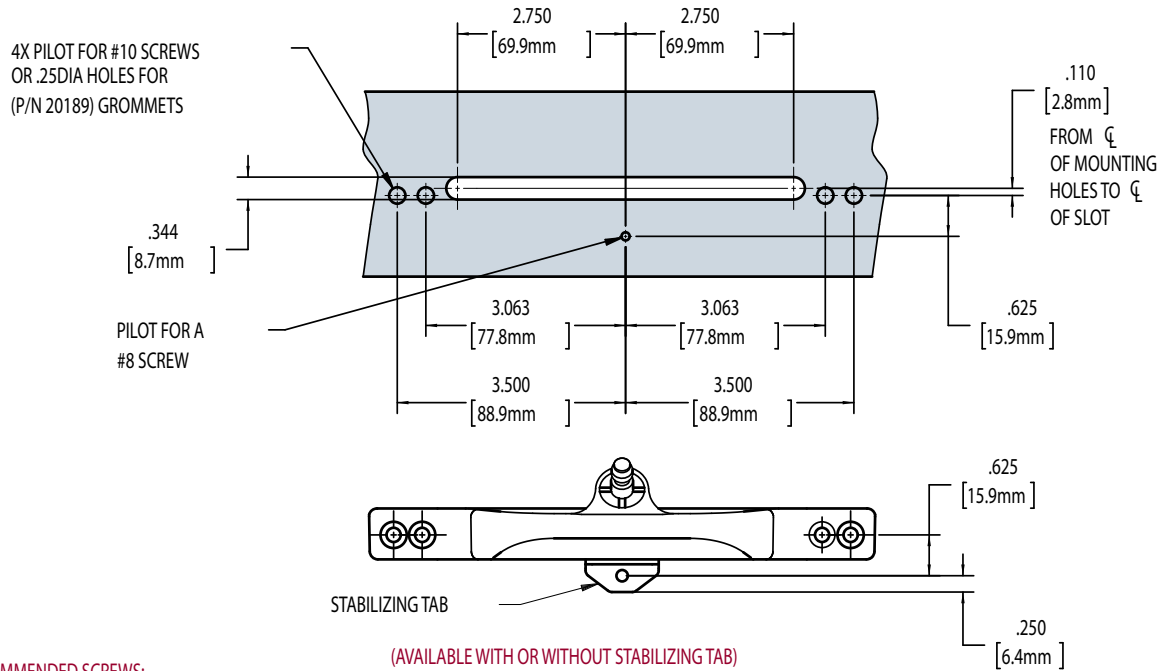
SASH HOOK	C	D MIN	E MIN	H
20008	.090 (2.3mm)	.220 (5.6mm)	.560 (14.2mm)	+.410 (10.4mm)
40543	N/A			+.845 (21.5mm)
*31336	N/A		.549 (13.9mm)	±.160 (4.1mm)

$$W = H + O$$

*31336 SASH HOOK BRACKET WILL ADD OR SUBTRACT FROM O DIMENSION.

OPERATOR PART NO.	A OVERALL WIDTH	B ARM CLEARANCE	MOUNTING	STABILIZING TAB	APPROXIMATE SASH OPENING	O DIMENSION
22.21	21.50 (546.1mm)	.250 (6.4mm)	FRONT	ORDER (PN 12789)	15.00 (381.0mm)	1.403 (35.6mm)
22.22		.340 (8.6mm)			10.00 (254.0mm)	1.497 (38.0mm)
22.23	16.00 (406.4mm)		15.00 (381.0mm)		1.403 (35.6mm)	
22.27	21.50 (546.1mm)	10.00 (254.0mm)				1.497 (38.0mm)
22.28	16.00 (406.4mm)		.250 (6.4mm)	REAR	15.00 (381.0mm)	
22.29		.340 (8.6mm)	10.00 (254.0mm)			1.497 (38.0mm)

FIG. 2 FRONT MOUNT CUT OUT DETAILS



RECOMMENDED SCREWS:

OPERATORS:

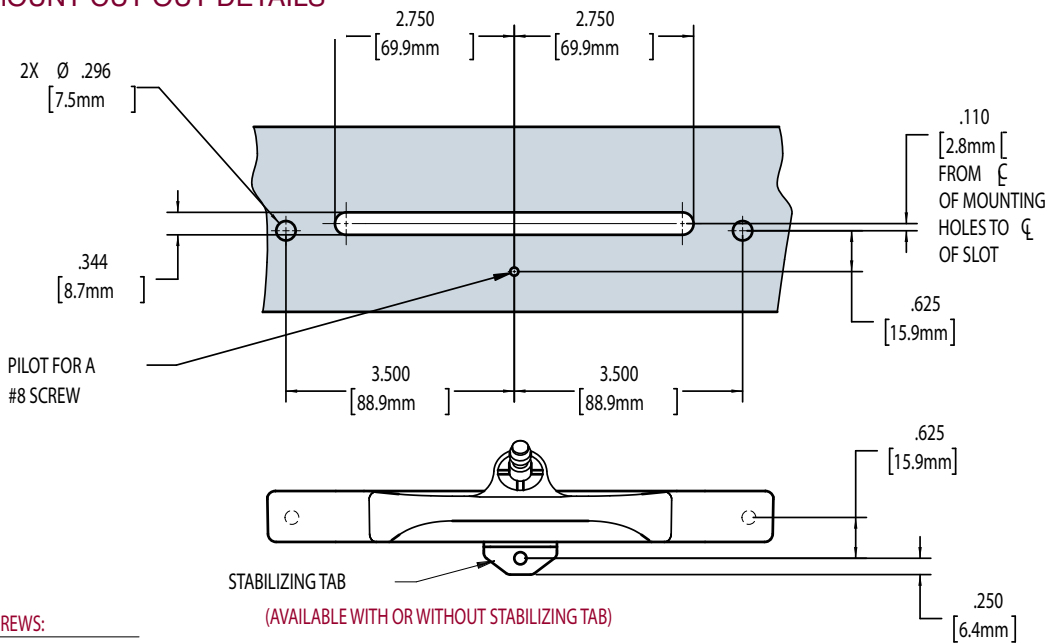
FRONT MOUNT: 4 (P/N 19700.XX) #10-24 X .688 PHILLIPS, FLAT HEAD, STEEL SHEET METAL SCREWS

1 STABILIZING TAB UNIT PACK (P/N 12789)

1 (P/N 19215.92) #8 X .750 PHILLIPS, PAN HEAD, STEEL, SHEET METAL SCREW (STABILITY TAB)

NOTE: SCREW LENGTH AND THREAD TYPE WILL BE DETERMINED BY PROFILE.

FIG. 3 REAR MOUNT CUT OUT DETAILS



RECOMMENDED SCREWS:

OPERATORS:

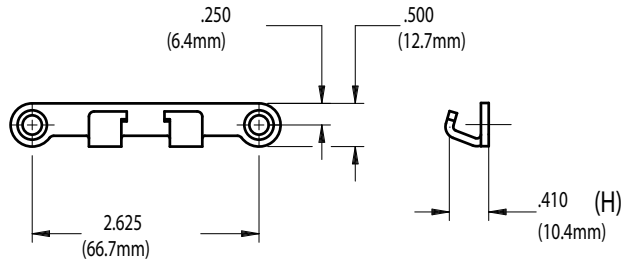
REAR MOUNT: 2 (P/N 19535.XX) #8-32 X .312 PHILLIPS, TRUSS HEAD, STEEL, MACHINE SCREWS

1 STABILIZING TAB UNIT PACK (P/N 12789)

1 (P/N 19215.92) #8 X .750 PHILLIPS, PAN HEAD, STEEL, SHEET METAL SCREW (STABILITY TAB)

NOTE: SCREW LENGTH AND THREAD TYPE WILL BE DETERMINED BY PROFILE.

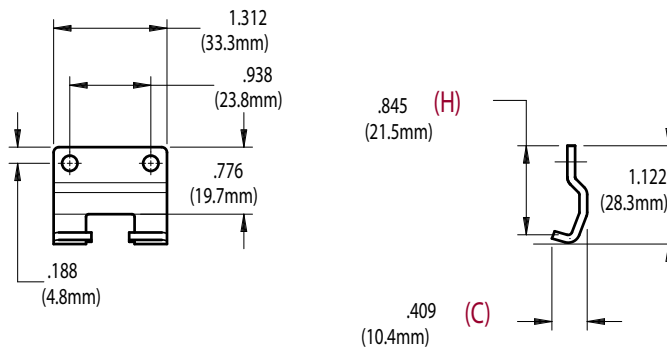
FIG. 4 SASH HOOK 20008.XX



RECOMMENDED SCREWS:

WOOD: 2 (P/N 19240.XX) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC & METAL: 2 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

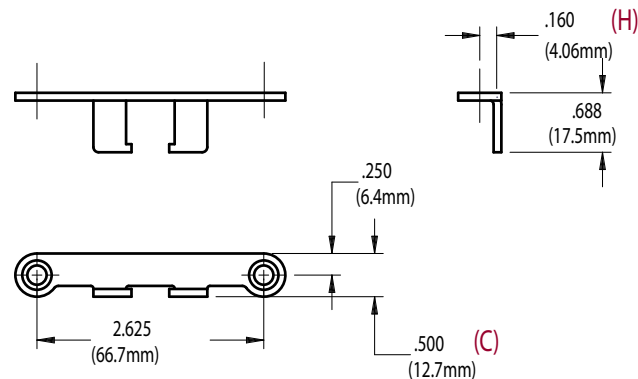
FIG. 5 SASH HOOK 40543.XX



RECOMMENDED SCREWS:

WOOD: 2 (P/N 19230.XX) #8 X 1.0 PHILLIPS, PAN HEAD, SHEET METAL SCREWS
 PVC & METAL: 2 - #8 PHILLIPS, PAN HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 6 SASH HOOK 31336.XX



RECOMMENDED SCREWS:

WOOD: 2 (P/N 19240.XX) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC & METAL: 2 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 7 GASKET 30171

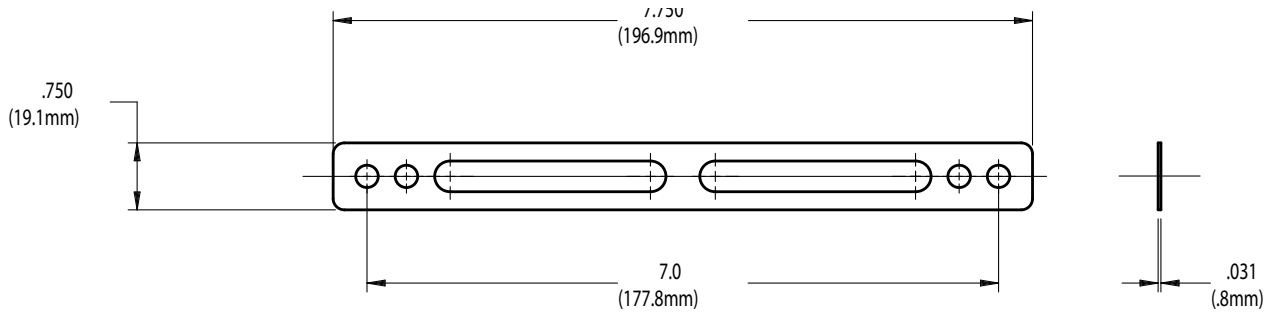
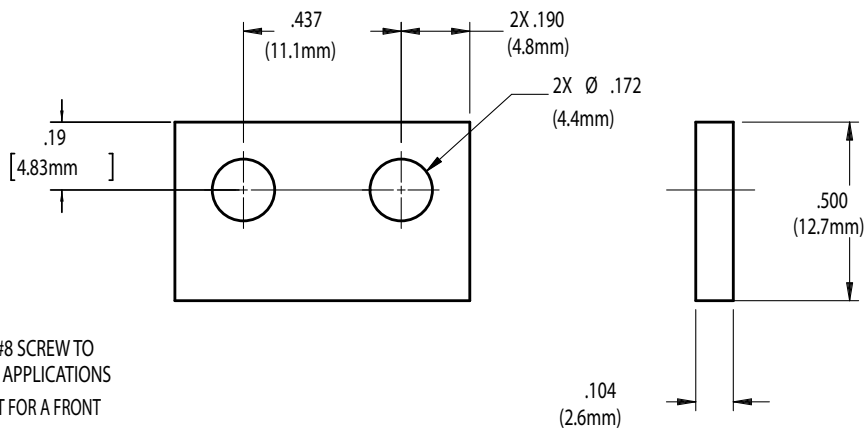


FIG. 8 BACKING PLATE 20947.XX



NOTES:

BACKING PLATE IS DESIGNED FOR #8 SCREW TO PASS THROUGH FOR REAR MOUNT APPLICATIONS AND FOR A #10 SCREW TO TAP INTO IT FOR A FRONT MOUNT APPLICATIONS.

FIG. 9 BACKING GROMMET 20189

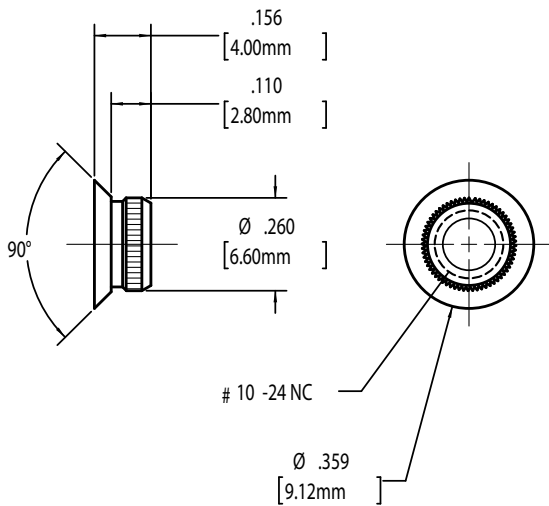
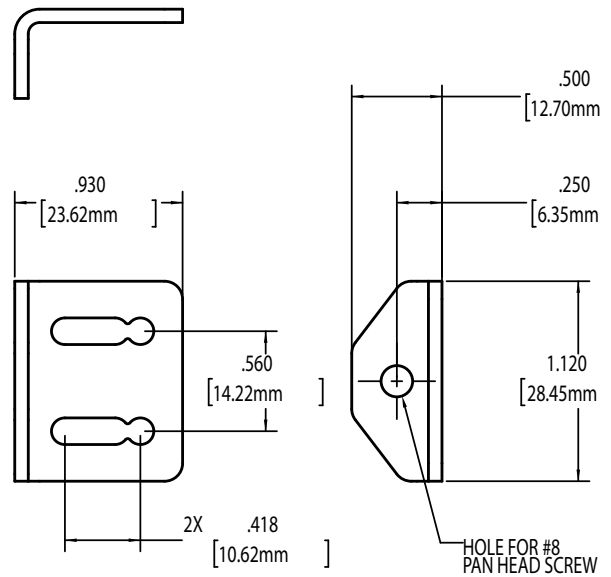


FIG. 10 STABILIZING TAB 12789



NOTE:



Available in three different linkage configurations to address corner pull-in, this operator is designed to provide positive control of the sash in any position. A simple detach feature disengages the operator from the sash for quick window removal. An optional torsion bar is available on single-pull models to deflect the sash and improve the seal at the corners. A dual-pull model or Guide Bar attachment provides additional stability to a wide sash in the open position. Model #11.16 uses a guide bar attachment on the window sash which locates the closing force closer to the corners of the sash. Truth recommends you apply two sash locks for security and added control of windows weatherability features (see Casement & Awning Sash Locks).

PRODUCT APPLICATION

ASSISTANCE: If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Technical Service Staff can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

LOGO OPTIONS: Have you considered personalizing your window with your company name or logo? All of Truth's operator handles are capable of accepting your own "signature." Contact Truth for further details.

WARRANTY: Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High-pressure die-cast zinc case, crank handle and knob. Hardened steel drive worm and gear arms. Guide bar for model #11.16 is extruded aluminum.

CORROSION PROTECTION:

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to



be approximately three times better than common zinc plated finishes.

For the severe conditions associated with coastal areas, Truth has developed certain product lines utilizing either **CoastGard® Hardware**, or stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose operator style desired (specify by part number).
2. Specify finish number.
3. Select mounting hardware (sold separately):
 - #11454 - Contour Handle (painted) or #10579 - Handle - shown above.

Optional handle styles, such as Truth's Folding Handle, are also available.

Sash Hook - three styles to choose from - refer to drawings for sizes and part numbers (1 each on models: #11.10, #11.12, #11.17, #11.30. 2 each on model #11.14).

 - #10005 - Shoe Studs (#11.16 requires 2).

#30568 - Guide Bar (#11.16 requires 1).

#31748 - Bottom cover plate.

#21306 - Protective red plastic spline cap (optional).

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. See Tech Note #11. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

1. This Awning Operator can be used with all Truth 13 Series Awning Hinges. To insure maximum operator efficiency and avoid sash chatter, it is important that the operator, hinge, and sash height be properly matched. For more complete information on proper hinge sizing and how to overcome corner pull-in problems, see Truth Tech Note #2.
2. Butt Hinges can be used with the Awning Operator, however, some degree of sash chatter will usually occur. Chatter is caused by the weight of the window pushing the operator closed rather than the operator pulling the window closed.
3. It is important that the Awning Operator be mounted square to the sash. This is to insure equal pull-in of the arms at both corners.
4. When security and/or a tighter weather seal is desired, sash locks should be added to either the sill or side jambs.

TRUTH TIPS (con't):

5. A Truth Spline Cap (#21306) is available to protect the operator spline from dirt and damage during shipping, window installation, and final building construction.
6. Adding a Truth Snubber to the center of the top rail on an awning window may increase the negative air pressure rating of the window.
7. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
8. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

9. For metal window profiles Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

10. To cover the bottom of the operator in elevated applications, Truth's **#31748** Bottom Cover Plate can be used to enclose the visible area of the operator's base.

11. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

12. This operator is intended for single vent applications only, and should not be used on multi-vent applications.

INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window operators shall be provided which allow easy adjustment of window position. The mechanism should be crank operated and provide wide range of open positions. Connection to the movable sash must be easily detachable for window cleaning and maintenance.

Window operators will be of scissor arm design driven by hand crank. The operator must be constructed of E-Gard® components, hardened steel worm and gear arms and high pressure zinc alloy die castings.

Window Operators shall be 11 series Awning Operator as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 APPLICATION OF TRUTH ROTO GEAR AWNING OPERATOR

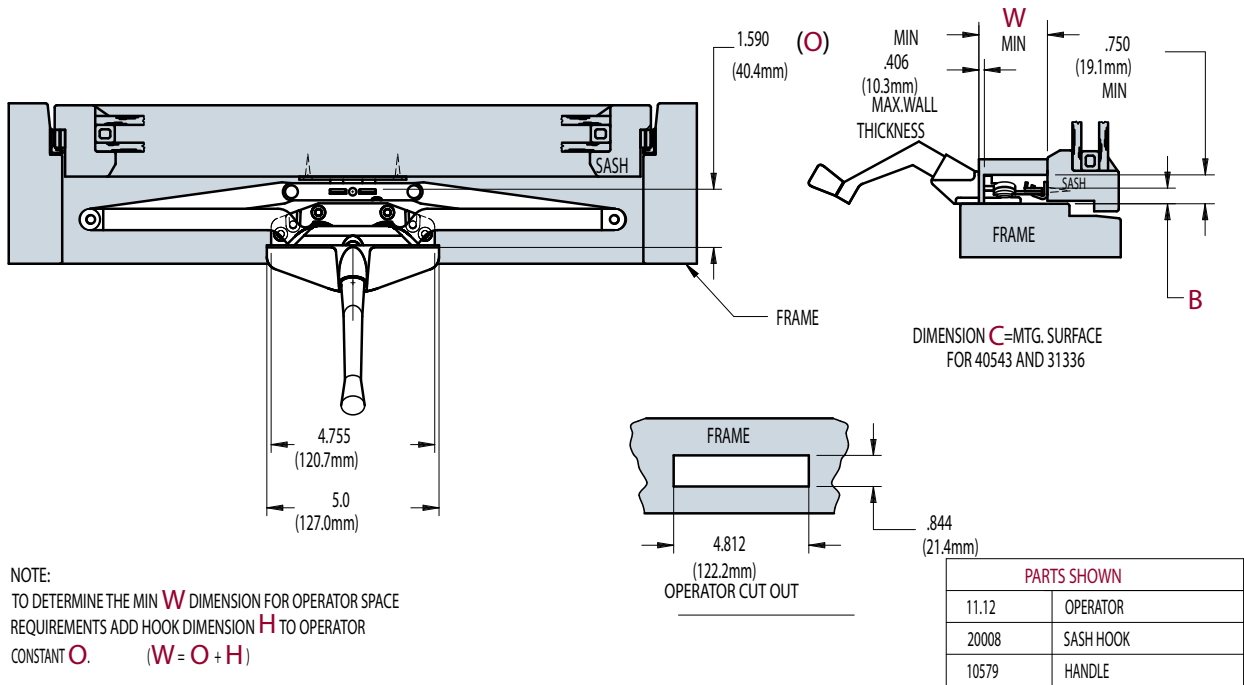
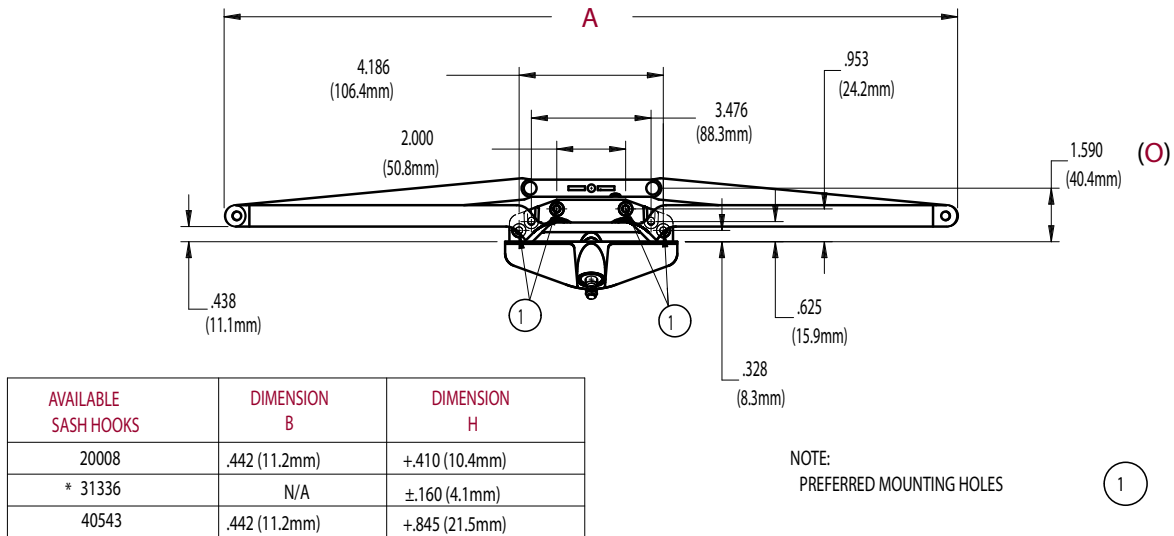


FIG. 2 ROTO GEAR AWNING OPERATOR (SINGLE PULL)



*31336 MAY ADD OR SUBTRACT FROM O

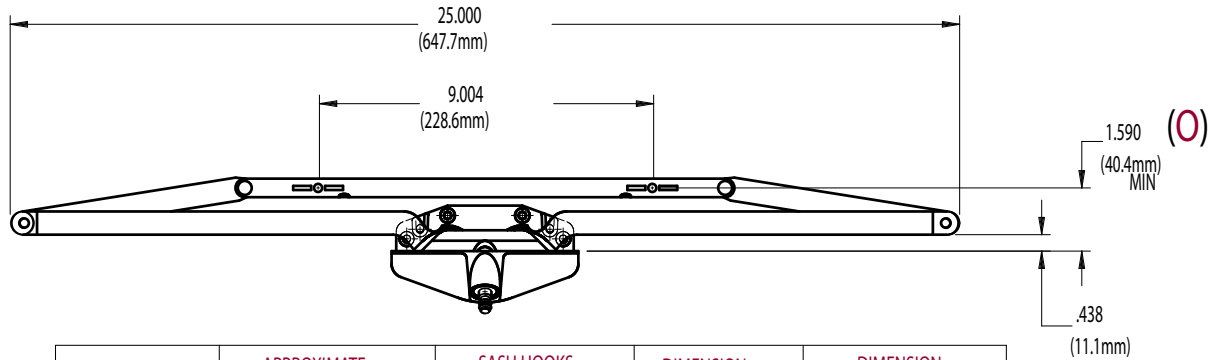
RECOMMENDED SCREWS:

WOOD: 4 (P/N 19380.XX) #10 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 4 - #10 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

OPERATOR	A OVERALL LENGTH	APPROXIMATE SASH OPENING
11.10	21.500 (546.1mm)	15.750 (400.1mm)
11.12	16.125 (409.6mm)	10.500 (266.7mm)
11.30	12.0 (304.8mm)	6.0 (152.4mm)

FIG. 3 ROTO GEAR AWNING OPERATOR (DUAL PULL)



OPERATOR	APPROXIMATE SASH OPENING	SASH HOOKS PART NUMBER	DIMENSION B	DIMENSION H
11.14	14.500 (368.3mm)	(2) 20008	.442 (11.2mm)	+ .410 (10.4mm)
		(2) 31336 *	N/A	±.160 (4.1mm)
		(2) 40543	.442 (11.2mm)	+ .845 (21.5mm)

RECOMMENDED SCREWS:

* 31336 MAY ADD OR SUBTRACT FROM O

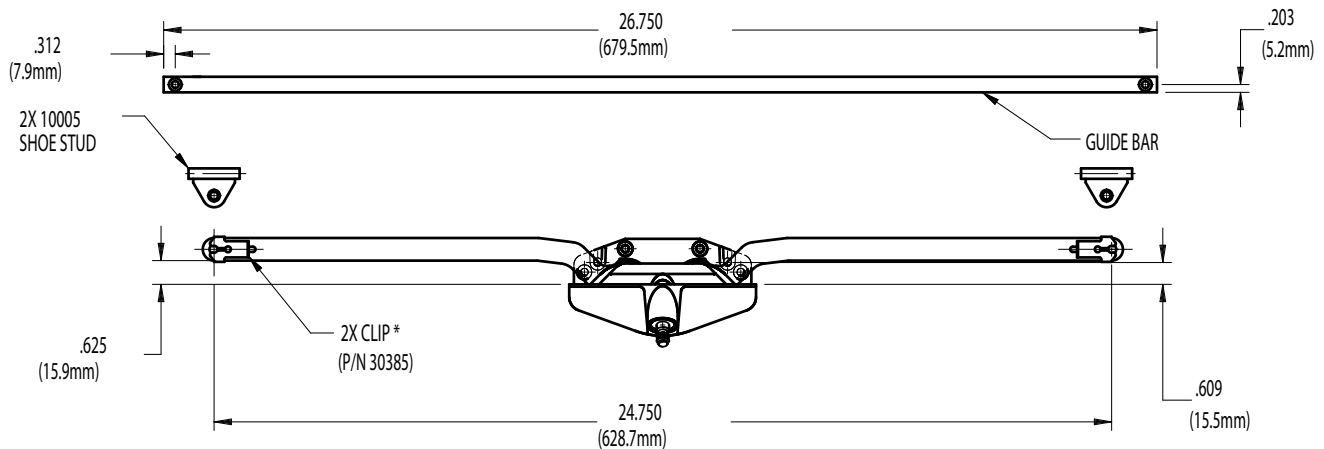
WOOD: 4 (P/N 19380.XX) #10 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

NOTE:

1. MOUNTING HOLE LOCATIONS SHOWN FIG 2

PVC & METAL: 4 - #10 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 4 ROTO GEAR AWNING OPERATOR (GUIDE BAR)



RECOMMENDED SCREWS:

WOOD: 4 (P/N 19380.XX) #10 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

OPERATOR	GUIDE BAR	APPROXIMATE SASH OPENING	DIMENSION B	DIMENSION W MIN
11.16	30568	10.00 (254.0mm)	.568 (14.4mm)	2.00 (50.8mm)

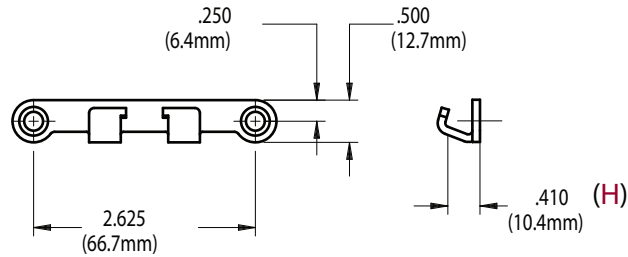
NOTE: 1. SHOE STUD AND GUIDE BAR MUST BE ORDERED SEPARATELY.

2. * 30385 CLIPS INCLUDED WITH OPERATOR.

3. MOUNTING HOLE LOCATIONS SHOWN IN FIG. 2

PVC & METAL: 4 - #10 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE TO BE DETERMINED BY PROFILE)

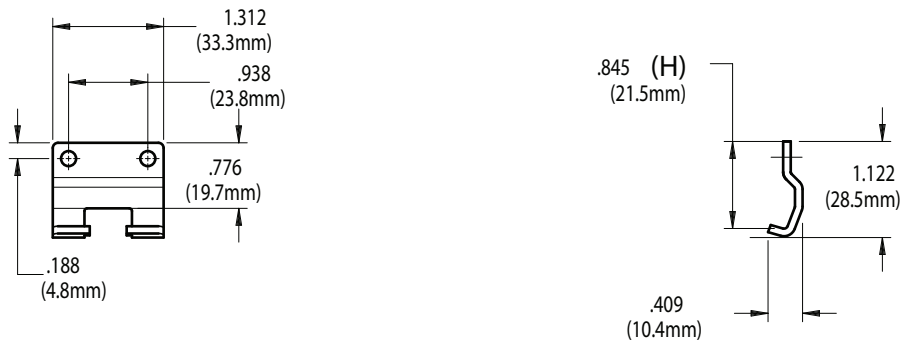
FIG. 5 SASH HOOK 20008.XX



RECOMMENDED SCREWS:

- WOOD: 2 (P/N 19240.XX) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
- PVC & METAL: 2 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

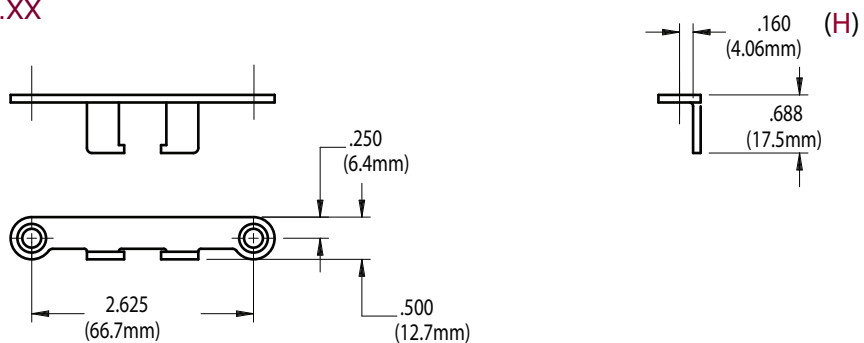
FIG. 6 SASH HOOK 40543.XX



RECOMMENDED SCREWS:

- WOOD: 2 (P/N 19230.XX) #8 X 1.0 PHILLIPS, PAN HEAD, SHEET METAL SCREWS
- PVC & METAL: 2 - #8 PHILLIPS, PAN HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 7 SASH HOOK 31336.XX



RECOMMENDED SCREWS:

- WOOD: 2 (P/N 19240.XX) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
- PVC & METAL: 2 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



700 WEST BRIDGE STREET, OWATONNA, MN 55060 ■ 507.451.5620 800.866.7884 ■ TRUTH.COM



Smooth, efficient action of the famous Truth Lever Operator opens and closes awning windows quickly and easily. Features include the ability to hold a window open in any of five positions, and a simple release clip for quick sash detachment. 180° lever handle movement opens or closes the sash.

Choose from single- or dual-pull models, each with smooth cam-action for snug fit and easy break-away. A dual-pull model or Torsion Bar attachment provides additional stability to a wide sash in the open position - as well as, improving the seal at the corners when closing the window. Truth has also designed a special model which has a removable escutcheon. The advantage of this feature is that it allows vinyl or metal window manufacturers, who do not use a removable sill cover in their window design, to install this operator quickly and easily. Truth recommends you apply two Sash Locks for added security and improved weatherability performance (see Casement & Awning Sash Locks). To ensure maximum ease of operation, it is important that the operator and hinge be properly matched. See Tech Note #2 for several options, or call Truth for more information.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

MATERIAL: High-pressure die cast zinc case and lever handle. Steel base plate and lever arms.

CORROSION PROTECTION:

Truth's E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

*For the severe conditions associated with coastal areas, Truth has developed certain product lines utilizing either **CoastGard® Hardware**, or stainless steel hardware. See Tech Note #7 for further information about corrosion protection and these special hardware options.*



FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

1. Choose Lever Operator style desired (specify by part number).
2. Specify finish number.
3. Specify "handing", regular or opposite. [NOTE: When viewed from the inside, a regular handed operator handle will be pointing to the left when the window is in the closed position (see diagram).]
4. Indicate size of escutcheon cover desired. "C," "E," or "F" (See Table in Figure 1).
5. Select mounting hardware (sold separately):
Sash Hook - three styles to choose from - refer to drawings for sizes and part numbers (NOTE: #10.10 and #10.14 require 1 each; #10.11 requires 2 each).

RECOMMENDED SCREWS:

Types of screws required determined by material of profile used. See Tech Note #11. Refer to drawings for complete information on screw type and quantity needed (sold separately).

TRUTH TIPS:

1. The Truth Lever Operator is handed by specifying regular or opposite hand. In the closed position, the handle on a regular handed operator points to the left when viewed from inside.
2. The Lever Operator can be used with all Truth 13 Series Awning Hinges. To insure maximum operator efficiency and avoid sash chatter, it is important that the operator, hinge, and sash height be properly matched. For more complete information on proper hinge sizing and how to overcome corner pull-in problems, see Truth Tech Note #2.
3. When security and/or a tighter weather seal is desired, Truth Sash Locks should be added to either the sill or side jamb.
4. Adding a Truth Snubber to the center of the top rail on an awning window may increase the negative air pressure rating of the window.
5. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
6. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

10 LEVER OPERATOR

7. For metal window profiles Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

8. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

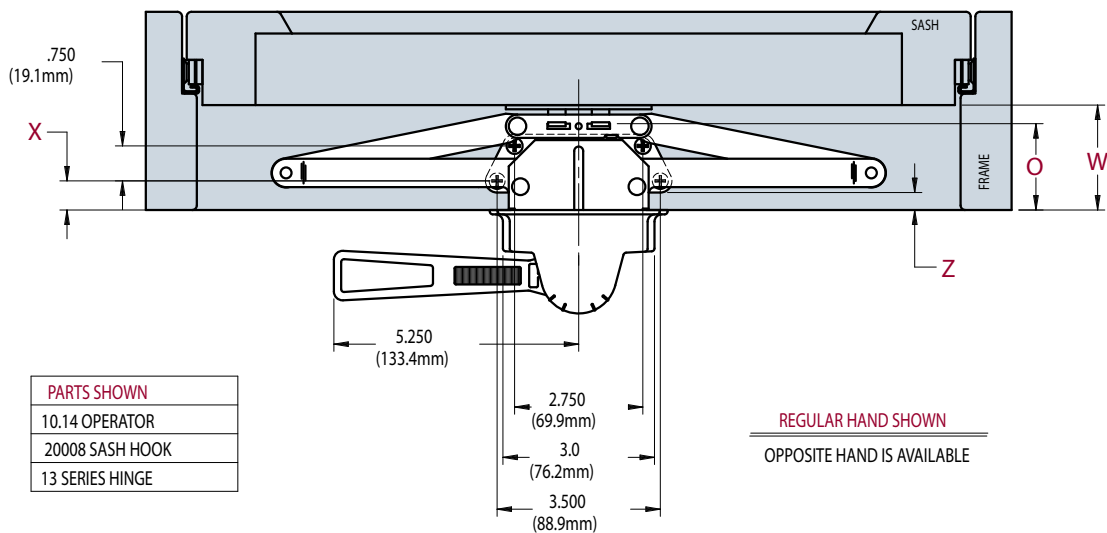
INCLUDE TRUTH SPECS ON YOUR NEXT WINDOW PROJECT

Window operators shall be provided which allow easy adjustment of window position. The mechanism should be lever operated and provide locking at any of five open positions. Connection to the movable sash must be easily detachable for window cleaning and maintenance.

Window operators will be of scissors arm design driven by a 180° swing of hand lever. The operator must be constructed of E-Gard® components and high pressure zinc alloy die castings.

Window Operators shall be 10 series Lever Operator as manufactured by Truth Hardware, Owatonna, MN.

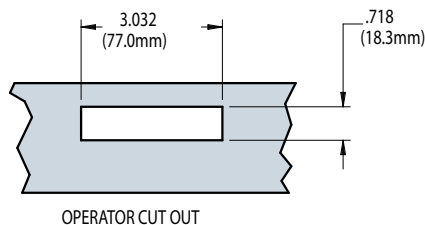
FIG. 1 APPLICATION OF TRUTH LEVER OPERATOR



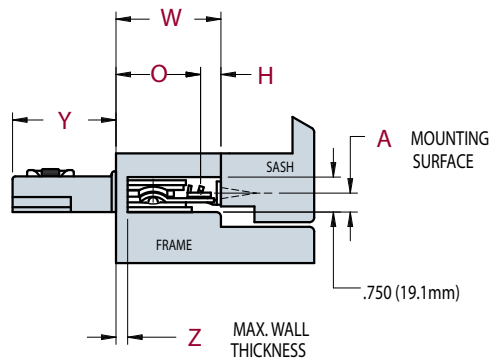
SASH HOOKS	A	H HOOK DIMENSION
20008	+383 (9.7mm)	+410 (10.4mm)
40543	N/A	+845 (21.5mm)
*31336	N/A	±.160 (4.1mm)

NOTE:
FOR AVAILABLE HINGES
SEE TRUTH TIPS.

* 31336 MAY ADD OR SUBTRACT FROM O.



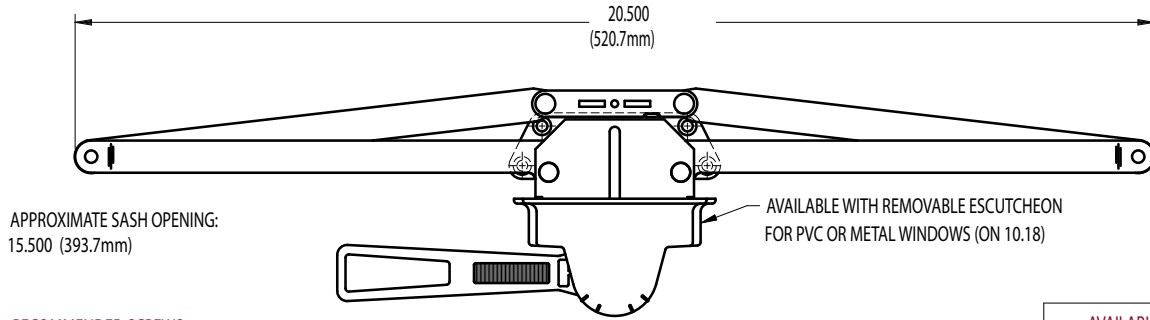
NOTE:
TO DETERMINE THE W DIMENSION FOR OPERATOR SPACE
REQUIREMENTS ADD HOOK DIMENSION H TO OPERATOR
CONSTANT O.
 $(W = O + H)$



ESCUTCHEON PLATE	O	X	Y	Z
C	2.215 (56.3mm)	1.00 (25.4mm)	1.843 (46.8mm)	.688 (17.5mm)
E	1.965 (50.0mm)	.750 (19.1mm)	2.093 (53.2mm)	.437 (11.1mm)
* F	1.840 (46.7mm)	.625 (15.9mm)	2.218 (56.3mm)	.312 (7.9mm)

* REMOVABLE ESCUTCHEON MODELS AVAILABLE IN "F" TYPE ONLY.

FIG. 2 SINGLE PULL LEVER OPERATOR 10.10 (removable escutcheon 10.18)

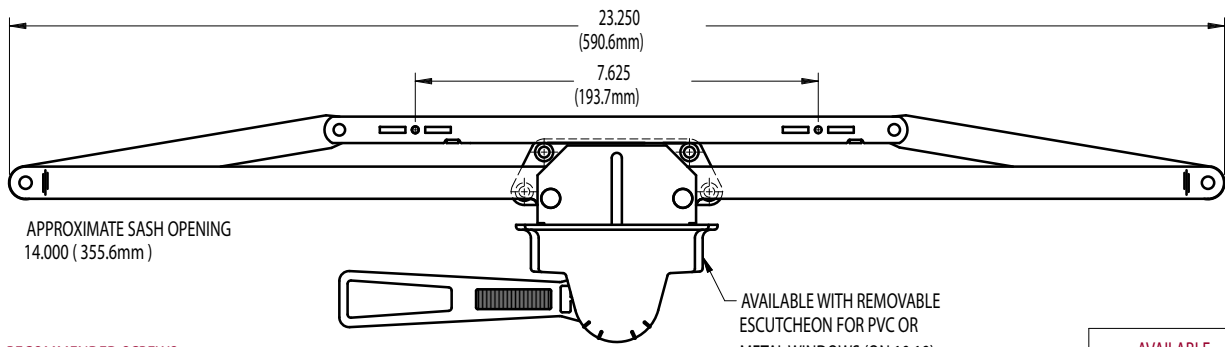


RECOMMENDED SCREWS:

WOOD: 4 (P/N 19240) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC/METAL: 4 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

AVAILABLE SASH HOOKS
20008
31336
40543

FIG. 3 DUAL PULL LEVER OPERATOR 10.11 (removable escutcheon 10.19)

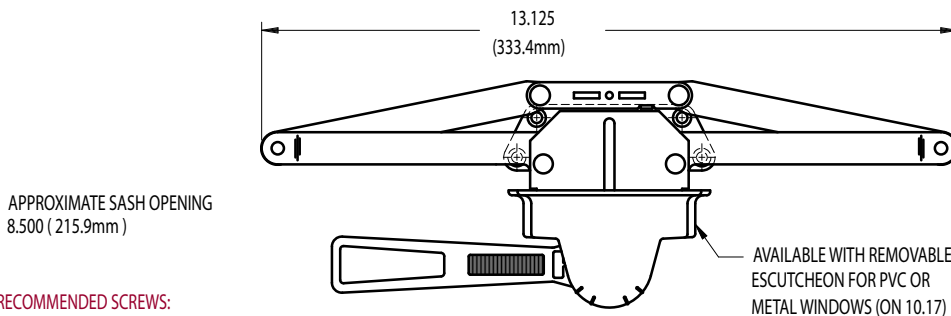


RECOMMENDED SCREWS:

WOOD: 4 (P/N 19240) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC/METAL: 4 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

AVAILABLE SASH HOOKS
20008 (2)
31336 (2)
40543 (2)

FIG. 4 SINGLE PULL LEVER OPERATOR 10.14 (removable escutcheon 10.17)

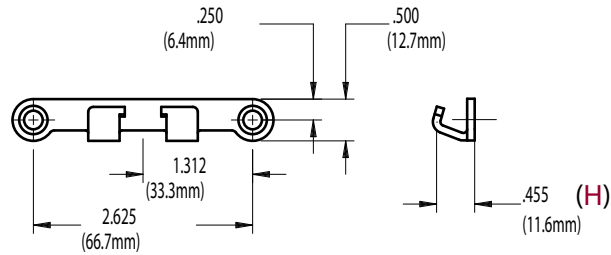


RECOMMENDED SCREWS:

WOOD: 4 (P/N 19240) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC/METAL: 4 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

AVAILABLE SASH HOOKS
20008
31336
40543

FIG. 5 SASH HOOK 2008.XX (SST 30764)



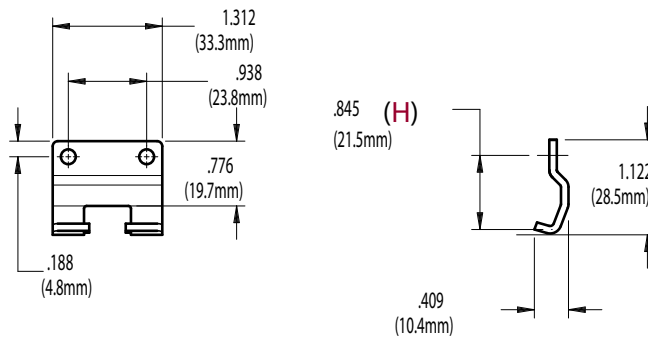
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19240) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC/METAL: 2 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

STAINLESS STEEL SCREWS REQUIRED WITH SST SASH HOOK

FIG. 6 SASH HOOK 40543.XX

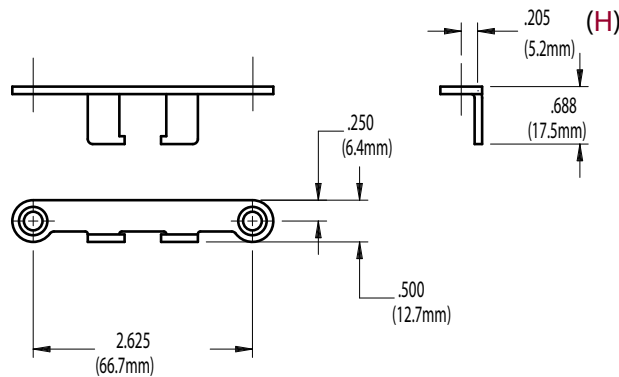


RECOMMENDED SCREWS:

WOOD: 2 (P/N 19230) #8 X 1.0 PHILLIPS, PAN HEAD, SHEET METAL SCREWS

PVC/METAL: 2 - #8 PHILLIPS, PAN HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 7 SASH HOOK 31336.XX



RECOMMENDED SCREWS:

WOOD: 2 (P/N 19240) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC/METAL: 2 - #8 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

Add Value To Your Operable Skylight

The Truth Skylight Operator System offers you the flexibility the marketplace demands, the quality your windows deserve, easy factory or field installation and a means to keep your skylight hardware inventories both cost effective and efficient. The Truth Skylight Operator system is easy to install and compatible with wood, metal or vinyl framed skylights.

Truth's special high gear reduction provides the low torque needed to lift a maximum sash weight of 140 pounds (63.6 kg.) with minimum effort. For ease of factory or field installations, the steel chain is detachable at the sash. The sprocket and chain are made from hardened steel to provide years of continuous, chatter-free operation. An acetal case liner keeps the chain and sprocket sliding smoothly, easing the force required to open the window. The high-pressure, zinc die-cast case is phosphate coated, electrostatically painted to provide a finish that resists chipping and flaking. The worm gear is made from hardened steel for lasting service.

42.75 STRAIGHT DRIVE (see Fig. 4)
The Straight Drive is recommended for use in installations where pole operation is required (especially steep-pitched roofs). Recommended Screws: See Mounting Options in Fig. 2.

42.65 ANGLE DRIVE (see Fig. 3)
The Angle Drive is recommended for easily accessible installations where the use of the standard crank handle is warranted. It may sometimes be used in pole applications (see application information for skylight pole systems and misc. hardware). Recommended Screws: See Mounting Options in Fig. 2.

HANDLES (see Fig. 12-13)
Drive Module components offer application flexibility... Crank Handles come in standard and long versions. Each are zinc die-cast, finished to Truth's standards. They attach to the Drive Module with a set screw. They are available in bulk quantities, each individually bagged to protect the finish and to insure the set screw does not get lost. **NOT FOR USE WITH STRAIGHT DRIVE UNLESS HANDLE EXTENSIONS ARE USED.**

**11660 HAND KNOB & 11573 T-HANDLE** (see Fig. 14-15)

The Hand Knob and T-Handle are available for those who prefer to use something other than the standard Crank Handle, or where mini-blinds, sunshades, insect screens, etc. will not allow the Crank Handle to be used. The Hand Knob and T-Handle are zinc die-cast, and attaches with a set screw and painted to match the operator. **NOT FOR USE WITH STRAIGHT DRIVE UNLESS HANDLE EXTENSIONS ARE USED.**

31000 EYELET ADAPTER (see Fig. 17)

The Eyelet Adapter is for use where the pole operation is required. Available with a zinc die-cast or painted finish. Attaches with a set screw. The Eyelet Adapter is individually bagged in a bulk package. For use with poles that have a hook end.

10453 HOOK ADAPTER (see Fig. 16)

The Hook Adapter is for use where pole operation is required. Available with a zinc die-cast or painted finish. Attaches with a set screw. The Hook Adapter is individually bagged in a bulk package. For use with poles that have a hook end.

40096 AND 40097 HANDLE EXTENSIONS (see Fig. 9)

Handle/Adapter Extensions ensure that proper clearance is provided for either Handle Cranks or Hex and Hook Adapters. They are available in either 2" or 4" lengths, mount easily between the spline and Handle or Adapter and are painted to match.

30662 HEX BALL DRIVE ADAPTER (see Fig. 19)

The Hex Ball Drive Adapter is for use where pole operation is required. Available in a color to match the operator, the Hex Ball Drive Adapter is individually bagged in a bulk package. Attaches with a set screw. For use with poles that have a hex ball end.

SKYLIGHT POLES (see Fig. 8 & 11)

These rigid anodized aluminum Adjustable Skylight Poles feature free-turning ABS hand grips for years of reliable service and a locking collar to lock the pole at a desired length, or to reduce its size for convenient storage. Manual Skylight Poles are available in two different adjustable lengths - four to six feet, or six to ten feet with either Hook or Hex Ball Drives - each to provide easy access to remote operator locations. Optional three foot pole extensions **#30681** (see Fig. 8) are also available. For inventory convenience, master packages of 20 fully assembled skylight poles individually packaged in one master carton are available. Also available is Truth's **#30476** Clerestory Pole Crank (see Fig. 11). This pole operates by means of a flexible shaft inside a tubular metal housing. This product is to be used as an alternative to the hook pole and universal joint assembly in clerestory applications. This product must be used with the Adapter **#20550** (see Fig. 10) which is sold separately.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

ORDERING INFORMATION:

- Select Drive needed:
42.75 Straight Drive (painted)
42.65 Angle Drive (painted).
- Specify finish number.
- Choose method of operation for Elevated Applications:
#10637 - Telescoping Pole (Hex Ball Drive),
#30662 - Hex Ball Drive Adapter, or
#10638 - Telescoping Pole (Hook Drive),
#31000 - Eyelet Adapter, or
#30476 - Clerestory Pole Crank,
#20550 - Adapter.
Non-Elevated Applications:
#11454 - New Contour Handle (painted) or
#10579 - Long Handle (painted) or
#11660 - Hand Knob (painted).
 Accessories:
#40096 - 2" Handle Extension (painted),
#40097 - 4" Handle Extension (painted).

RECOMMENDED SCREWS:

Operator: 4 - #19410 - #10 x 1 1/4" Phillips flat head, shank slotted, sheet metal screws. Sash Bracket: 2 - #10 Phillips flat head screws. Length and thread type to be determined by application.

TRUTH TIPS:

- To keep the Skylight operator operating efficiently and trouble free, Truth recommends that the operator chain be lubricated once a year with a spray silicone lubricant.
- The secret to a successful pole operated Skylight is to minimize the approach angle of the pole to the Skylight operator. This is most easily accomplished by using a Truth Straight Drive whenever pole operation is required. To figure the minimum angle of approach for a straight drive and a given pole system, subtract the maximum operational angle of a given pole system from the roof pitch (see Fig. 5). For an angle drive, do the same as with the straight drive and add 34 degrees. Pole length, Skylight height, and room layout will then determine what approach angle is needed for a particular application.
- The design of the Straight Drive does not allow a handle or hand knob to be applied directly to it. If it is desirable to operate a straight drive with a handle or hand knob, a handle extension can be used as an adapter.
- For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.
- For metal window profiles, Truth recommends stainless steel machine screws. However, in most applications, stainless steel sheet metal screws will provide adequate holding power.
- For easy operation of a Hook or Hex Ball Pole, the operational angle between the pole and the window operator must not be exceeded.

PRODUCT APPLICATION ASSISTANCE:

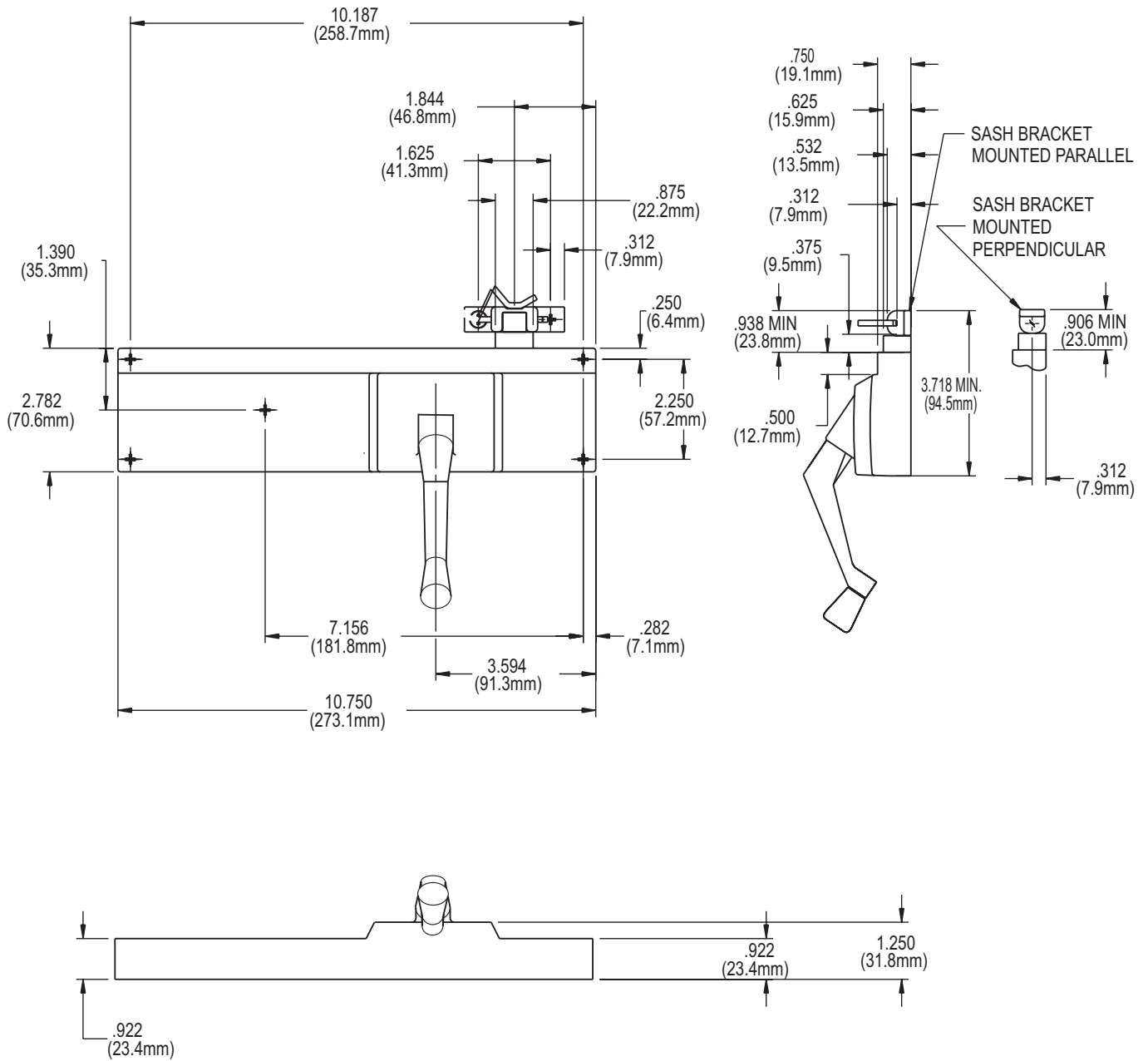
If you are designing a new window profile, or are having difficulty selecting hardware for your window, please contact Truth. Our highly trained Technical Service Staff can assist you with the selection of the appropriate hardware to meet your performance requirements, as well as providing personalized application drawings.

INCLUDE TRUTH SPECS IN YOUR NEXT SKYLIGHT PROJECT:

Skylight operating hardware should be suited for roof windows, and skylight installation for wood, PVC, and metal market. Skylight hardware shall be provided with a special high quality gear reduction (high output torque) to meet required maximum sash weight of 140 lbs. (63.6 kg.), unit to be constructed of high pressure zinc diecast case with phosphate finish, electrostatically painted and oven baked. Hardware to be complete with steel chain, sprocket, and detachable sash bracket. The steel chain design must include interlocking solid and u-links riveted in such a manner as to result in no more than .375" (9.5 mm) - .625" (15.9 mm) deflection. The chain sprocket shall be hardened steel and an acetal chain guide must be provided. Skylight hardware to be available with various means of control such as angle drive, straight drive, or motors. Skylight hardware shall be manufactured by Truth Hardware, Owatonna, MN.

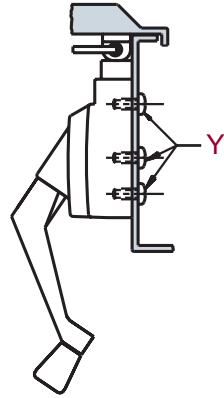
Patented

FIG. 1 APPLICATION OF TRUTH 42.65 MANUAL SKYLIGHT OPERATOR



HARDWARE SHOWN
42.65 ANGLE DRIVE MODULE
10579 HANDLE

FIG. 2 MOUNTING OPTIONS

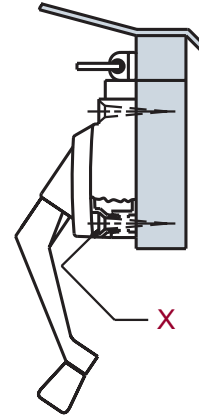


OPTION 1
REAR MOUNT

SCREWS ENTER FROM BEHIND AND
SCREW INTO BASE AT LOCATION **Y**.

RECOMMENDED SCREWS:

4-(P/N 19992) #12-24 X .500 PHILLIPS,
PAN HEAD, THREAD FORMING,
MACHINE SCREWS



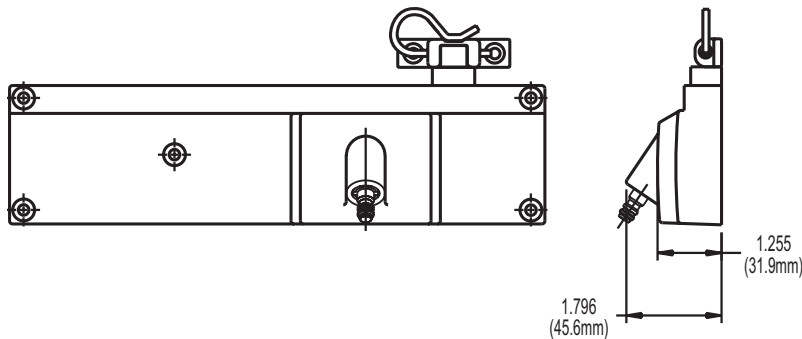
OPTION 2
FRONT MOUNT

SCREWS ENTER FROM THE TOP AND
SCREW INTO JAMB AT LOCATION **X**.

RECOMMENDED SCREWS:

5-(P/N 19410) #10 X 1.250
PHILLIPS, FLAT HEAD,
SHANK SLOTTED,
SHEET METAL SCREWS.

FIG. 3 ANGLE DRIVE MODULE 42.65



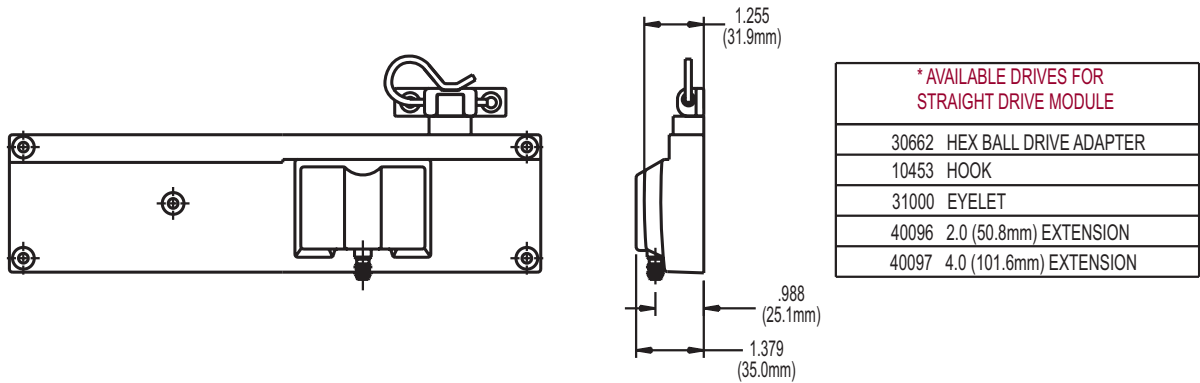
* AVAILABLE DRIVES FOR ANGLE DRIVE MODULE	
10024	HANDLE
10579	HANDLE
30662	HEX BALL DRIVE ADAPTER
10453	HOOK
31000	EYELET
40096	2.0 (50.8mm) EXTENSION
40097	4.0 (101.6mm) EXTENSION

RECOMMENDED SCREWS:

SEE MOUNTING OPTIONS IN FIG. 2

* NOTE: SEE POLES AND MISC. SKYLIGHT
HARDWARE FOR MORE INFORMATION

FIG. 4 STRAIGHT DRIVE MODULE 42.75



RECOMMENDED SCREWS:

SEE MOUNTING OPTIONS IN FIG. 2

* NOTE: SEE POLES AND MISC. SKYLIGHT HARDWARE FOR MORE INFORMATION

FIG. 5 APPLICATION INFORMATION FOR POLE SYSTEMS AND MISC. HARDWARE

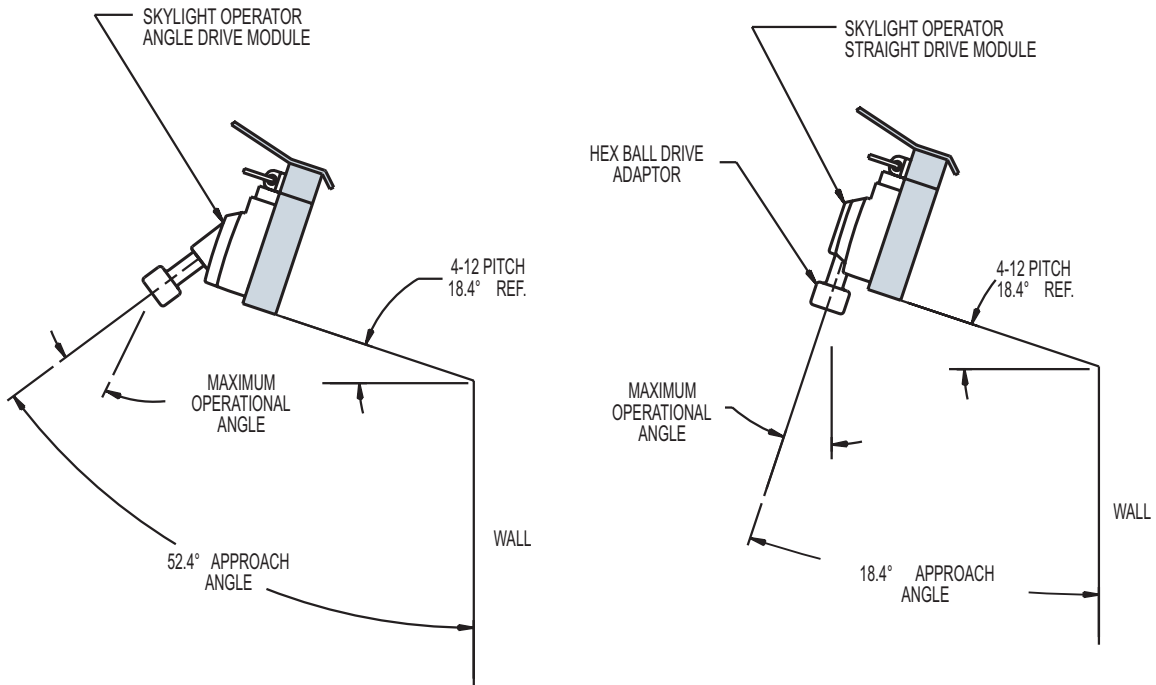


FIG. 6 SASH BRACKET 40470 AND DETACHABLE SASH PIN 20642

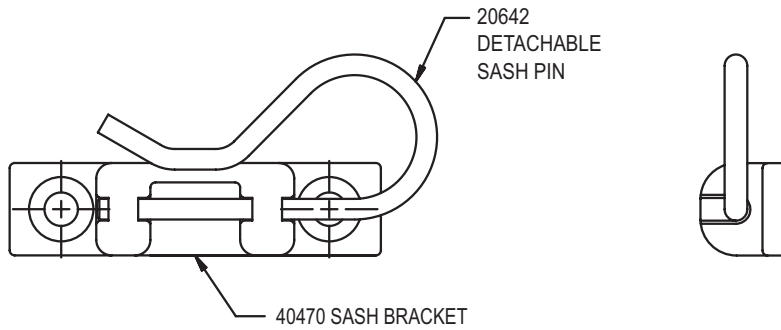
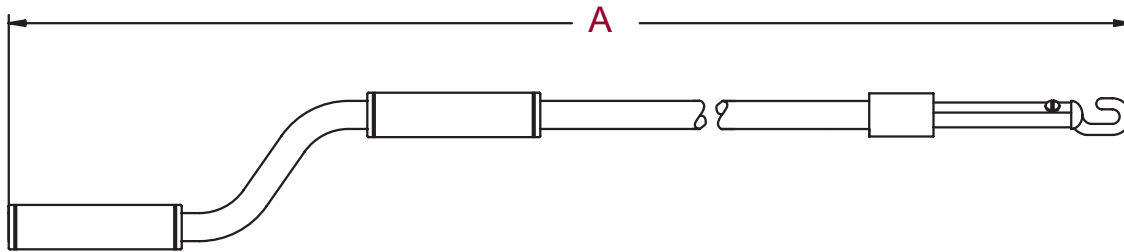


FIG. 7 TELESCOPING POLE CRANK: POLE WITH HOOK ADAPTOR 10638 (SHOWN)
POLE WITH HEX BALL DRIVE 10637



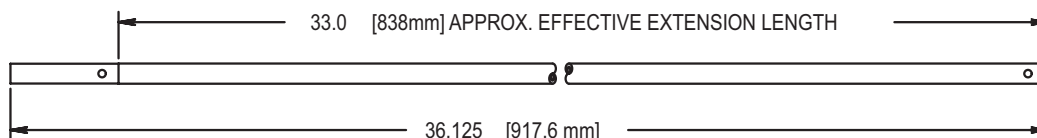
PART NO.	DRIVE	A DIMENSION		COMPATIBLE WITH
		EXTENDED	COLLAPSED	
10637	HEX BALL (INCLUDED)	115.75 (2940.1mm)	67.75 (1720.9mm)	30662 HEX BALL DRIVE ADAPTOR (SEE FIG. 11)
10638	HOOK (INCLUDED)	116.50 (2959.1mm)	68.50 (1739.9mm)	10453 HOOK (SEE FIG. 18) OR 31000 EYELET (SEE FIG. 19)
10864	HEX BALL (INCLUDED)	73.75 (1873.3mm)	47.75 (1212.9mm)	30662 HEX BALL DRIVE ADAPTOR (SEE FIG. 11)
10855	HOOK (INCLUDED)	74.50 (1892.3mm)	48.50 (1231.9mm)	10453 HOOK (SEE FIG. 18) OR 31000 EYELET (SEE FIG. 19)



NOTE:

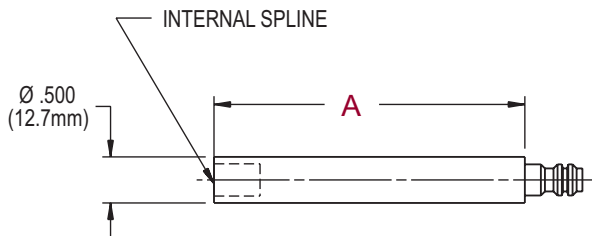
1. THE OPERATIONAL ANGLE OF HOOK POLE WHEN USED WITH A HOOK OR EYELET IS 45°.
2. THE OPERATIONAL ANGLE OF HEX BALL POLE WHEN USED WITH A HEX BALL ADAPTER IS 35°.

FIG. 8 3 FOOT POLE EXTENSION 30681 (Fits Telescoping Poles)



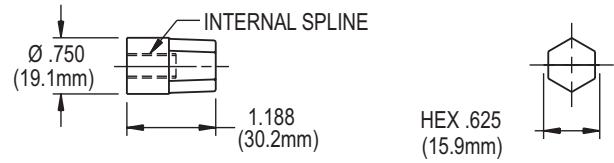
NO MORE THAN ONE EXTENSION SHOULD BE USED PER TELESCOPING POLE CRANK.

FIG. 9 HANDLE EXTENSIONS 40096.XX, 40097.XX



EXTENSION	A
40096	2.0 (50.8mm)
40097	4.0 (101.6mm)

FIG. 10 ADAPTOR 20550



NOTE:

THIS ADAPTER EASILY FITS OVER THE SPLINE OF THE WINDOW OPERATOR AND IS USED IN CONJUNCTION WITH TRUTH'S 30476 CLERESTORY POLE CRANK AS AN ALTERNATIVE TO TRUTH'S HOOK POLE AND UNIVERSAL JOINT ASSEMBLY.

FIG. 11 CLERESTORY POLE CRANK 30476

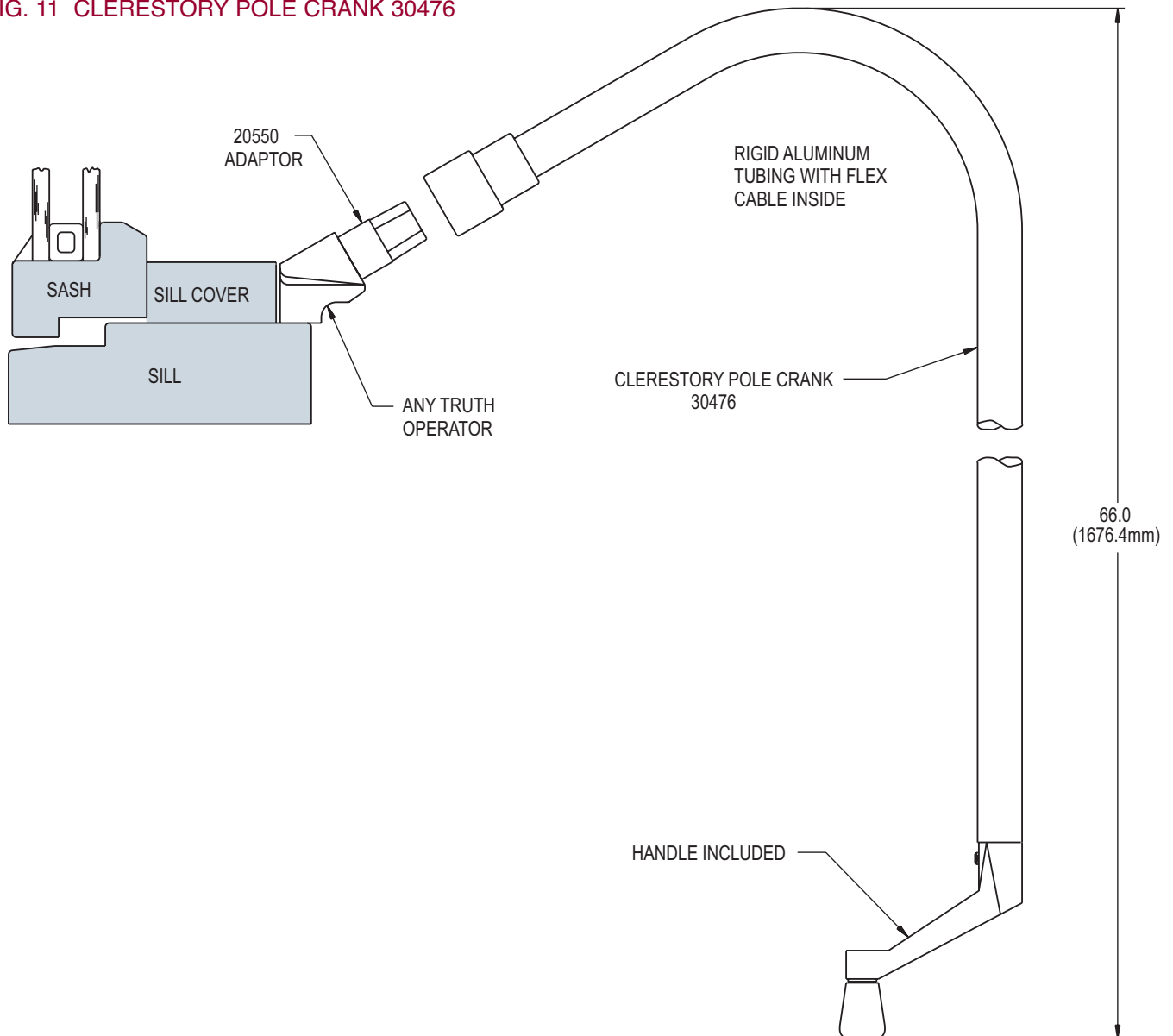
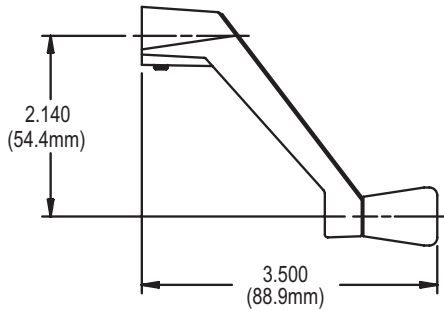


FIG. 12 HANDLE 10579.XX (Long Handle)



INCLUDES SET SCREW.

FIG. 13 CONTOUR HANDLE 11454.XX

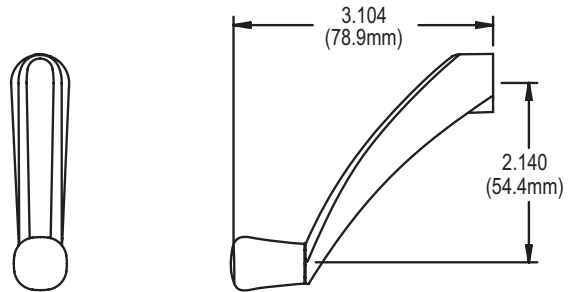


FIG. 14 HAND KNOB 11660.XX

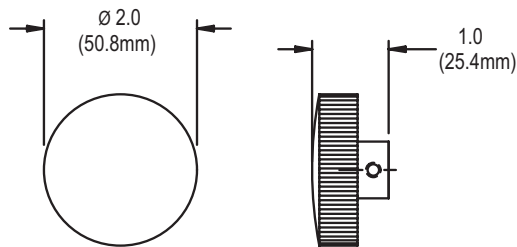


FIG. 15 T-HANDLE 11573.XX

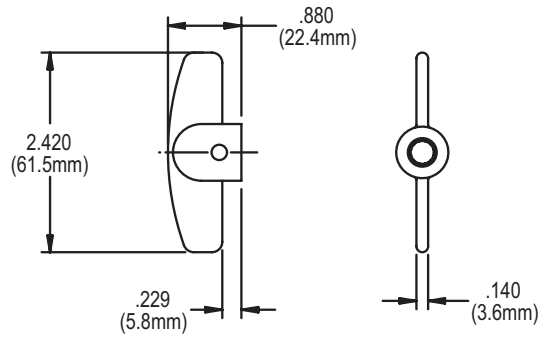
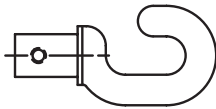
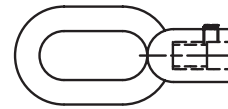


FIG. 16 HOOK 10453



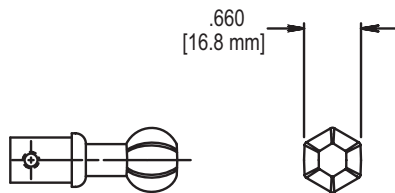
INCLUDES SET SCREW.

FIG. 17 EYELET 31000.XX



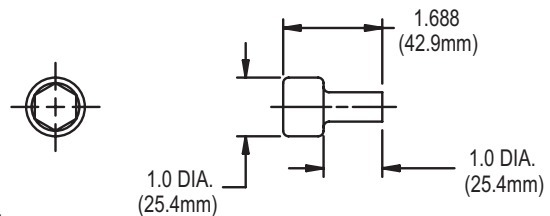
INCLUDES SET SCREW.

FIG. 18 HEX BALL DRIVE 30957



INCLUDES SET SCREW.

FIG. 19 HEX BALL ADAPTOR 30662.XX



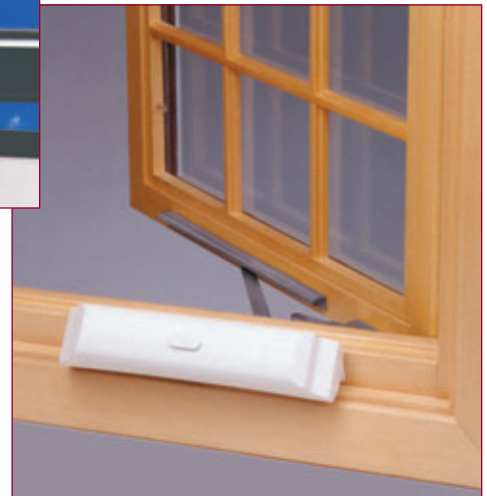
NOTE:

1. HEX BALL ADAPTER FITS ALL TRUTH OPERATOR SPLINES. (SUPPLIED WITH SET SCREW)
2. AVAILABLE IN A COLOR TO MATCH THE OPERATOR, IS BULK PACKAGED AND INDIVIDUALLY BAGGED.
3. MAXIMUM OPERATIONAL ANGLE WHEN USED WITH A HEX BALL POLE IS 35 DEGREES.
4. FOR USE WITH THE DRIVE MODULES WHERE POLE OPERATION IS REQUIRED.

Introducing Truth's next generation of power window systems... Sentry II WLS® for windows and light skylights. Based on the powerful and reliable mechanics from our previous motorization system, we've added a new digital electronics package with built in power conversion. This new Sentry II WLS system truly takes over where Truth's Sentry 2000® left off.

The new electronics package provides many new features to enhance a homes comfort and its owner's peace of mind.

- **Retrofits** onto casement and awning windows and light skylights operated with a hand crank manufactured by Truth Hardware (see Truth Tips). The motor system drives the same input the handle is attached to.
- **Power conversion** built right into the wall mounted control package which accepts direct connection of line voltages from 100 to 240 VAC at 47 to 440 Hz. No more transformers to complicate and add expense to the installation.
- **Power Blind System compatible.** Centralized power window system control is now possible with Sentry II's ability to accept and control most 24 VDC power blind systems. The Sentry II's remote and wall switch can be used to control both window and blind motors for convenient, centralized control.
- **Power Protected Memory** eliminates the need to "reset" or retrain the motor after a power outage. Once the installation is complete the motor never needs further service or adjustments – even after prolonged power outages!
- **RF remote** compatibility built into all motor control packages as a standard feature. Simply order the optional remote to add new and exciting control capability for the homeowner.
- **Rain Sensor** - standard with all kits, automatically closes the window or skylight at the first sign of moisture. Corrosion resistant sensor decreases maintenance cleaning requirements and extends service life.
- **No special preparation** is required by the window or skylight manufacturer. The kits are suitable for new construction or retrofit applications. Please consult with your electrical contractor for a retrofit evaluation.



- **ETL Listed and CE Approved.** Meets all requirements for Class II installations.
- **Safety** - Automatic motor reversal has been engineered into the system which is intended to reverse the motor should an obstruction stop the window while closing. In addition, a screen interlock is provided which, when properly installed, electrically disconnects the motor when the screen is removed. These features are intended to help prevent personal injury which could result from reaching into the window area during its operation.
- **Motorized Sash Locks** are available for use with the WLS system for casement and awning windows. See Truth's Casement and Awning Sash Lock section for complete details.
- **Building Automation Systems** can easily be tied into the control electronics for virtually limitless ventilation possibilities.

SENTRY II WLS CAPACITY

- When used on light skylights, Truth's Sentry II WLS is load rated at 40 lbs at the chain. This equates to a total skylight hatch weight of 80 lbs.
- When used on casement windows, the Sentry II WLS is designed to work on all window systems meeting the AAMA-101 hardware load requirements. (See Truth Tips)

- When used on awning windows, the Sentry II WLS is designed to work on awning windows with a properly sized counter-balance hinge (See Truth Tips) and operator. (Consult awning operator specifications).

CONTROL OPTIONS

The Sentry II WLS kit comes with a standard wall control panel. The same control panel can also accept and control most commercially available 24 VDC mini blinds (not provided by Truth Hardware). The panel also provides feedback to the user via a status light (LED). This small LED shows when the motor is running, or if there are any problems during window or skylights operation.

The optional RF **Hand Held Remote** is available which adds even more flexibility and convenience to a homes windows or skylights.

REMOTE FEATURES INCLUDE:

- **Infinite Number** of windows & skylights can be controlled with a single remote.
- **9 Zones** or "unit codes" are available to allow units to be controlled in groups and organized to a users needs.
- **Motorized Blinds** (supplied by others) can be controlled with the same remote.
- **Control windows and skylights** from one remote – The Sentry II HS

SENTRY II WLS POWER WINDOW SYSTEMS

(for large/heavy skylights) uses the same remote as the Sentry WLS for coordinated ventilation throughout the entire home or building.

- **Built in Thermostat** allows windows and skylights to open and close together, to coordinate a comfortable interior temperature. Takes advantage of true “chimney effect” cooling to reduce energy demands.
- **Rolling Code Technology** proven in garage door openers is built into every remote to provide high security and peace of mind.

WARRANTY: The Sentry II family of products is warranted for one year against defects in materials and workmanship on all electronic and mechanical components. This warranty only covers electrical products that are used to drive manual hardware systems (operators and hinges) manufactured by Truth Hardware.

CONSUMER NOTICE:

The Sentry II WLS power system must be installed by a qualified electrician.

PRODUCT APPLICATION ASSISTANCE:

If you need assistance with product configurations to meet your needs, please visit our website at www.truth.com. Under the “Technical Support” tab you will find all of the technical information needed to properly configure and specify all elements of an automated window installation, including installation instructions, pre-wiring and proper hardware requirements. You can also contact Truth’s highly trained Technical Service Staff who can assist you with the selection of the appropriate hardware. These individuals are available during normal business hours (CST) at 800-324-4487.

ORDERING INFORMATION:

Ordering of the new Sentry II systems is much easier than in the past. All hardware necessary for mounting the system on either a window or skylight is now included in the same kit.

Special Note: Motor covers are ordered separately to help keep your inventory costs down. Sentry II motor kit packaging includes additional space so cover can be added which allows the manufacturer to supply a complete kit to the jobsite.

Sentry II WLS for windows and light skylights

Order 1 each per window:

43.51.00.005 - Sentry II WLS System
12490.XX - Cover (.xx denotes finish code)

Order 1 Hand Held Remote (optional):

43.53.00.002 - Hand Held RF Remote

Finish Codes: The WLS cover is available in .02 Black, .03 Bronze, .23 Chestnut Bronze, .24 Beige, .32 White, & .78 White.

If you are applying the Sentry II to a Pella brand window you must order the following items which include special hardware and instructions.

Order 1 each per window:

43.54.00.005 - Sentry II WLS System - Pella

12490.XX - Cover (.xx denotes finish code)

Order 1 Hand Held Remote (optional):

43.53.00.002 - Hand Held RF Remote

TRUTH TIPS:

1. Truth Hardware does not recommend the use of the Sentry II WLS on any casement window system that does not meet AAMA 101 hardware load requirements. All hardware and motor system warranties are void if the window system does not meet these guidelines.

2. Awning windows must be equipped with a properly sized counter balance hinge such as Truth Hardware’s 13 series or 34 series 4-bar hinges. If an awning window is specified with butt (or continuous) hinges, a skylight operator and motor system must be used. All hardware and motor system warranties are void if these guidelines are not followed. (See Tech Notes).

3. Unless otherwise specified, the Sentry II WLS power window system is designed to operate any properly sized rotary hardware and hinge system manufactured by Truth Hardware. Use of the Sentry II WLS motor system on windows or skylights with manual hardware manufactured by companies other than Truth Hardware is at your own risk. For verification, look for the Truth logo/name stamped on the hinge and operator arm, or consult with the window manufacturer. If your hardware is not manufactured by Truth Hardware, contact Truth’s Technical Service Department for available options at 800-324-4487.

4. The Sentry II WLS system is rated for use in indoor applications only.

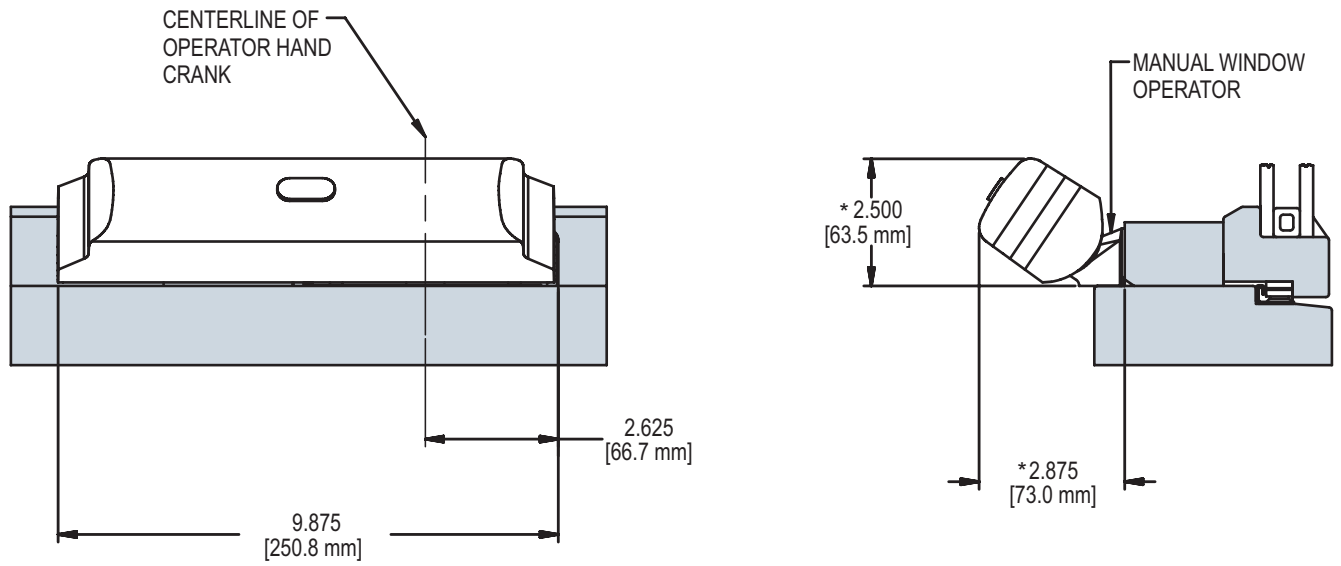
5. The Sentry II WLS power skylight system is designed to be used on skylight operators that lift to open and pull to close in the center of the skylight. Therefore, the stiles of the skylight panel must be rigid enough in the closed position to ensure proper corner pull-in for a weather tight seal and rigid enough in the open position to provide proper skylight stability when supported at a single center point. The wider the skylight is, the more significant this issue can become. For more assistance, contact Truth Hardware Technical Services.

6. The Sentry II WLS requires 1 amp of 120 VAC.

INCLUDE TRUTH SPECS IN YOUR NEXT SKYLIGHT PROJECT

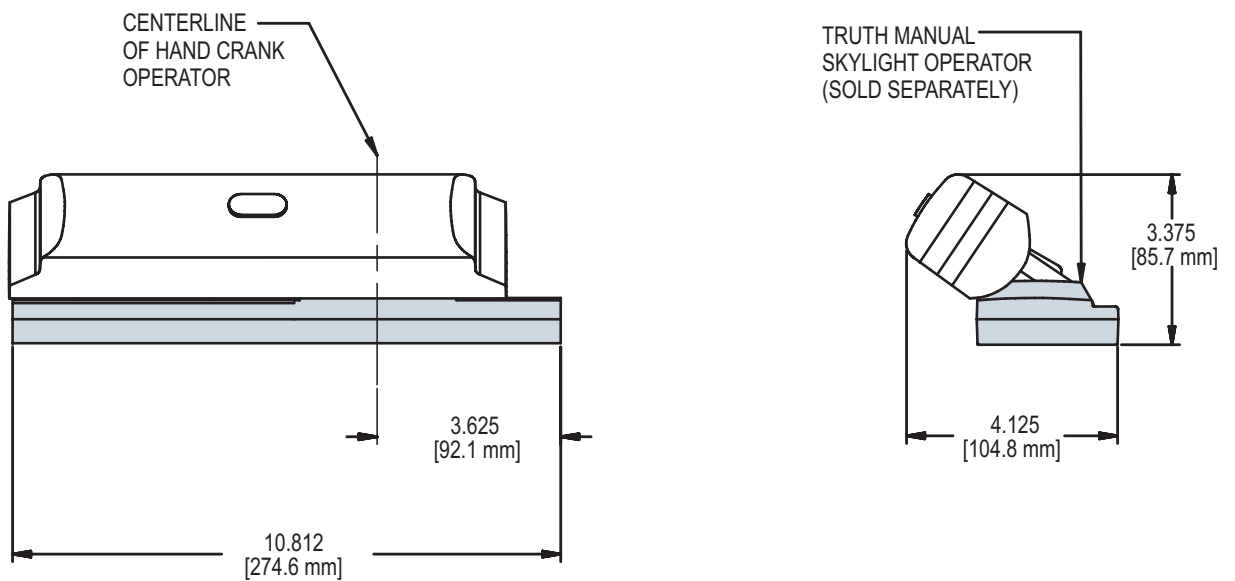
Motorized system for skylights (not exceeding 80 lbs), awning or casement windows. Mounting should accommodate wood, PVC or metal skylights and windows. Motorized system shall replace the handle on crank type skylight, casement or awning window operators manufactured by Truth Hardware. The motor drive to be constructed of a high pressure zinc die cast housing, containing hardened steel drive gears and a high torque 24 volt DC motor. Interchangeable drive adapter allows the system to be compatible with all Truth operators and many other window hardware systems not manufactured by Truth (contact Truth Technical Services for a list of compatible hardware). Mounting hardware to be provided to accommodate a wide range of window profile shapes and materials. Unit to be available with a decorative plastic cover which allows convenient access to mechanical components and easy installation. The control system is to be supplied with standard line voltages from 100 to 240 VAC at 47 to 440 Hz. (no transformer required). The wall mounted motor control is to come complete with its own receptacle box and cover plate. Motor system kit shall include: motor drive, decorative cover, wall control, and mounting hardware. This motor system shall be “Sentry II WLS” series as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 WLS MOTOR SYSTEM APPLIED TO AWNING/CASEMENT WINDOW



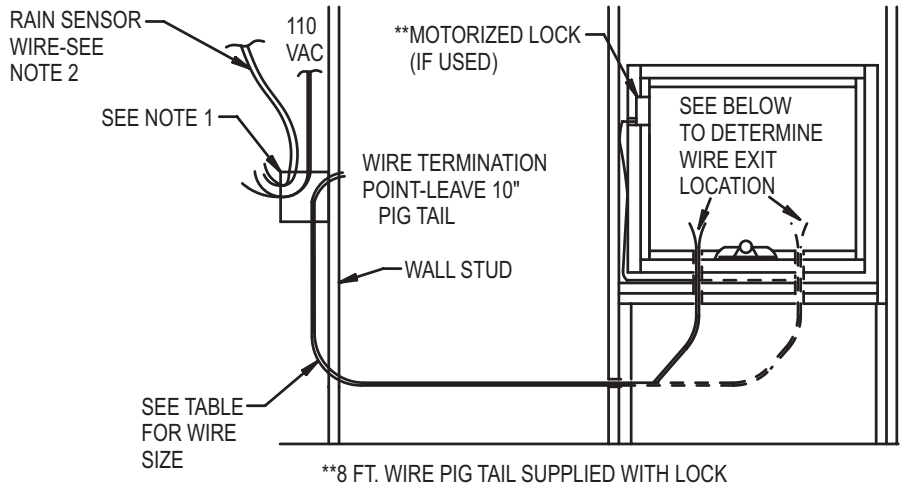
* THESE DIMENSIONS WILL VARY SLIGHTLY DEPENDING ON MANUAL OPERATOR USED

FIG. 2 WLS MOTOR SYSTEM APPLIED TO SKYLIGHT WINDOW



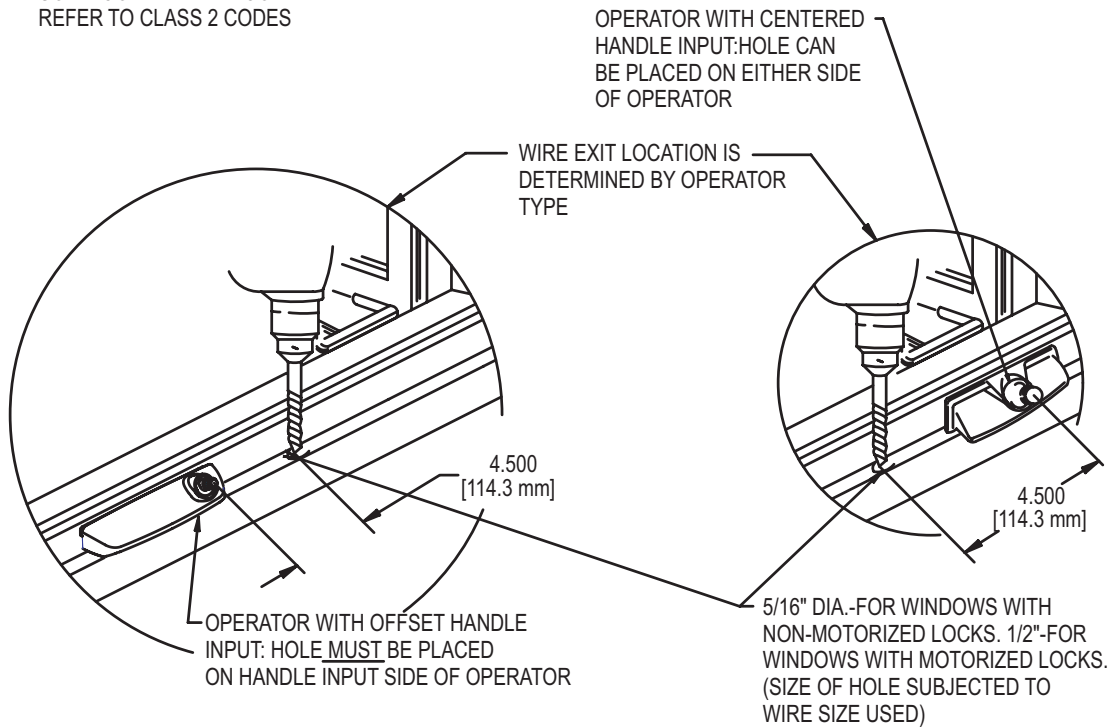
SENTRY II WLS POWER WINDOW SYSTEMS

FIG. 3 SENTRY II PRE-WIRING FOR CASEMENT/AWNING WINDOWS



WIRE SIZE (CLASS 2)	TOTAL DISTANCE FROM CONTROL PANEL TO MOTOR	NUMBER OF CONDUCTORS		
		MOTOR ONLY	MOTOR + 1 LOCK	MOTOR + 2 LOCKS
18 AWG	50 ft (15m)MAX	2	4	6
14 AWG	100 ft (30m)MAX			
12 AWG	150 ft (60m)MAX			

SOLID CORE WIRE RECOMMENDED
REFER TO CLASS 2 CODES

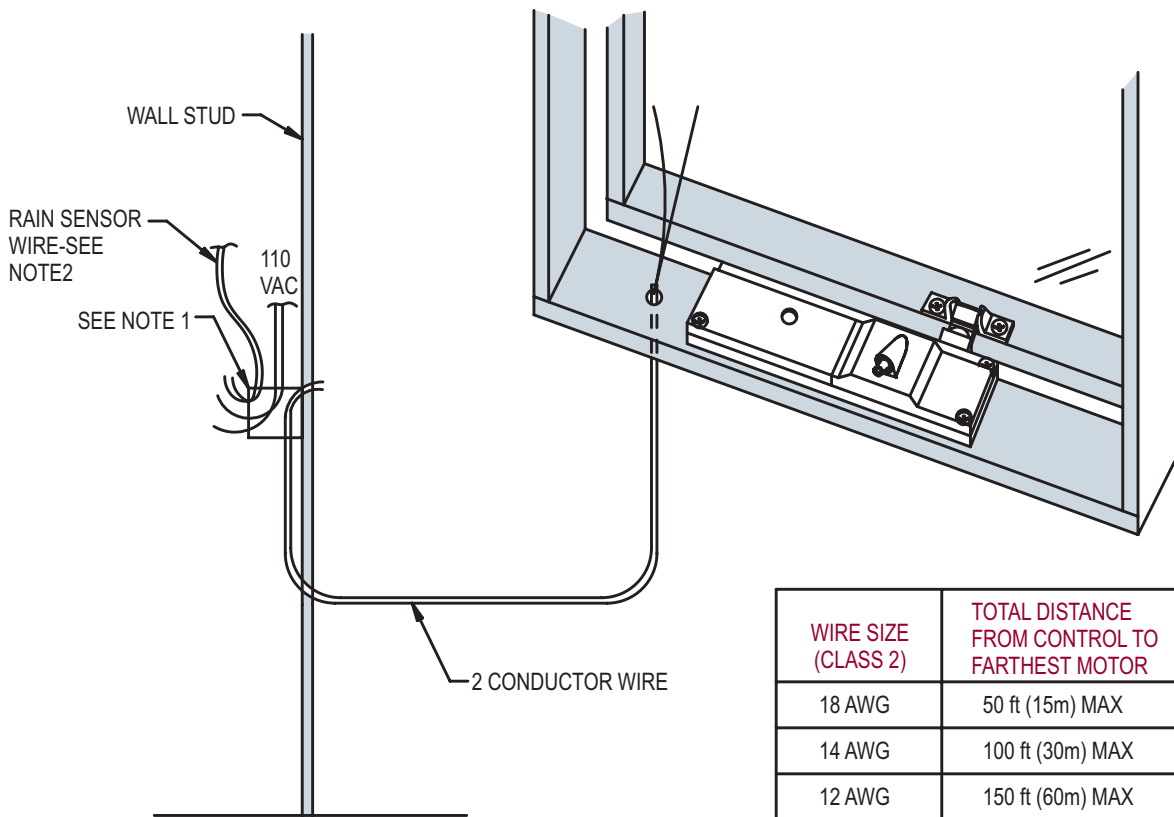


NOTE:

1. EACH POWERED WINDOW REQUIRES A CONTROL PANEL. CONTROL PANEL FITS A FINISHED WALL OPENING OF 3 7/8" WIDE BY 4 1/8" HIGH. (RECEPTICAL BOX IS SUPPLIED AS AN INTEGRAL PART OF THE CONTROL PANEL.) CONTROL PANEL CAN BE LOCATED IN A REMOTE LOCATION IF THE CONTROL PANEL IS NOT INTENDED TO BE THE PRIMARY MEANS OF CONTROL. (EXAMPLE: RF REMOTE CONTROL OF BUILDING AUTOMATION CONTROL SYSTEM)

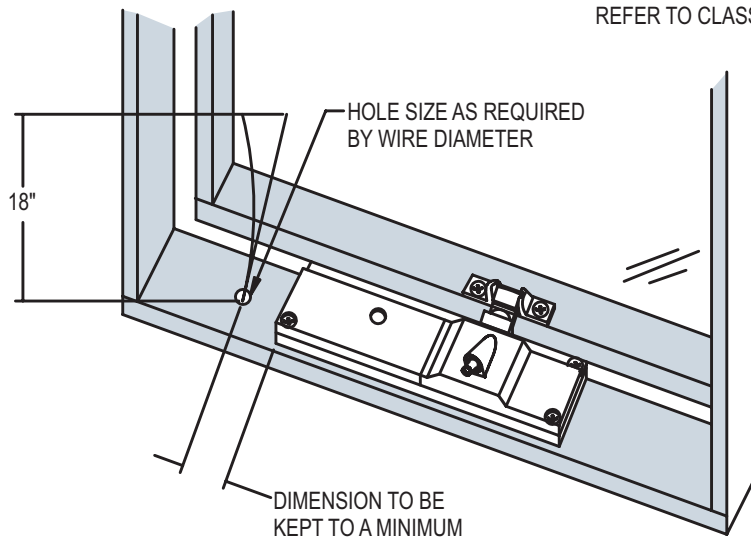
2. RAIN SENSOR WIRE MUST BE 22 GAUGE TWISTED, SHIELDED PAIR

FIG. 4 SENTRY II WLS PRE-WIRING FOR SKYLIGHTS



WIRE SIZE (CLASS 2)	TOTAL DISTANCE FROM CONTROL TO FARTHEST MOTOR
18 AWG	50 ft (15m) MAX
14 AWG	100 ft (30m) MAX
12 AWG	150 ft (60m) MAX

SOLID CORE WIRE RECOMMENDED
REFER TO CLASS 2 CODES



NOTE:

1. EACH POWERED SKYLIGHT REQUIRES A CONTROL PANEL. CONTROL PANEL FITS A FINISHED WALL OPENING OF 3 7/8" WIDE BY 4 1/8" HIGH. (RECEPTACLE BOX IS SUPPLIED AS AN INTEGRAL PART OF THE CONTROL PANEL) CONTROL PANEL CAN BE LOCATED IN A REMOTE LOCATION IF THE CONTROL PANEL IS NOT INTENDED TO BE THE PRIMARY MEANS OF CONTROL. (EXAMPLE: RF REMOTE CONTROL OR BUILDING AUTOMATION CONTROL SYSTEM)
2. RAIN SENSOR WIRE MUST BE 22 GAUGE TWISTED, SHIELDED PAIR



700 WEST BRIDGE STREET, OWATONNA, MN 55060 ■ 507.451.5620 800.866.7884 ■ TRUTH.COM

Introducing Truth's next generation of power window system...Sentry II HS® for heavy skylights. Based on the powerful and reliable mechanics from our previous SkySentry® motorization systems, we've added a new digital electronics package with built in power conversion to take this system to a whole new level of service and reliability.

The new electronics package provides many new features to enhance a homes comfort and its owner's peace of mind.

- **Quick and easy installation** of the skylight is possible when motor system is pre-installed and programmed by skylight manufacturer at their facility. The electrician needs only to connect line voltage power and the skylight is completely ready for operation - no further set up would be required by the installer or homeowner!
- **Power conversion** built right into the skylight mounted control package which accepts direct connection of line voltages from 100 to 240 VAC at 47 to 440 Hz. No more transformers to complicate and add expense to the installation.
- **Power Blind System compatible.** Centralized window control is now possible with Sentry II's ability to accept and control most 24 VDC power blind systems. The Sentry II RF remote or wall switch controls both skylight and blind motors for convenient, centralized control.
- **Power Protected Memory** eliminates the need to "reset" or retrain the control system after a power outage. Once the installation is complete the motor never needs further service or adjustments - even after prolonged power outages!
- **RF remote** compatibility built into all motor control packages as a standard feature. Simply order the optional remote to add new and exciting control capability for the homeowner.
- **Rain Sensor**, standard on all kits, automatically closes the skylight at the first sign of moisture. Corrosion resistant sensor decreases mechanisms cleaning requirements and extends service life.



- **Easily adapts** for new construction or retrofit applications. Please consult with your electrical contractor for a retrofit evaluation.
- **ETL Listed and CE Approved.** Meets all requirements for Class II installations.
- **Safety** - Automatic Motor Reversal has been engineered into the system which is intended to reverse the motor should an obstruction stop the skylight while closing. In addition, a screen interlock is provided which, when properly installed, electrically disconnects the motor when the screen is removed. These features are intended to help prevent personal injury which could result from reaching into the skylight area during its operation.
- **Synchronized Operation** of multiple motors is now standard on the HS motor system. The same Sentry II HS motor system can now be used on single motor applications or it can be ganged with up to four motor units on a large single skylight. Multiple motors on a single skylight add stability and capacity.

- **Awning Windows** – Can also be fitted with the Sentry II HS Motor System. Skylight hardware systems work great on awning windows with butt hinges.
- **Building Automation systems** can easily be tied into the control electronics for virtually limitless ventilation possibilities.

SENTRY II HS CAPACITY

Truth's Sentry II HS for heavy skylights is load rated at 80 lbs. at the chain. This equates to a total skylight hatch weight of 160 lbs. Sentry II HS power skylight system is rated at 50 watts.

CONTROL OPTIONS

The Sentry II HS motorization kit is available with a standard RF hand held remote for skylight control (order separately). The same remote can also accept and control most commercially available 24 VDC mini blinds (not provided by Truth Hardware). The motor unit provides feedback to the user via a status light (LED). This small LED shows when the motor is running, or if there are any problems during skylights operation. An optional wall control panel is also available.

SENTRY II HS MOTOR SYSTEM

Up to 20 skylights can be controlled from a single control panel.

REMOTE FEATURES INCLUDE:

- **Infinite Number** of windows & skylights can be controlled with a single remote.
- **9 Zones** or “unit codes” are available to allow units to be controlled in up to nine groups and organized to a users needs.
- **Motorized Blinds** can be controlled with the same remote.
- **Control windows and skylights from one remote** - the Sentry II HS (for heavy skylights) uses the same remote as the Sentry II WLS to allow coordinated ventilation throughout the entire home or building.
- **Built in Thermostat** allows skylights to open and close together, to help maintain a comfortable interior temperature. Take advantage of true “chimney effect” cooling to reduce energy demands.
- **Rolling Code Technology** proven in garage door openers is built into every remote to provide high security and peace of mind.

WARRANTY: The Sentry II family of products is warranted for one year against defects in materials and workmanship on all electronic and mechanical components.

CONSUMER NOTICE:

The Sentry II HS for heavy skylights must be installed by a qualified electrician.

PRODUCT APPLICATION ASSISTANCE:

If you need assistance with product configurations to meet your needs, please visit our website at www.truth.com. Under the “Technical Support” tab you will find all of the technical information needed to properly configure and specify all elements of an automated window installation, including installation instructions, pre-wiring and proper hardware requirements. You can also contact Truth’s highly trained Technical Service Staff who can assist you with the selection of the appropriate hardware. These

individuals are available during normal business hours (CST) at 800-324-4487.

ORDERING INFORMATION:

Ordering of the new Sentry II HS systems is much easier than in the past. All hardware necessary for mounting on a skylight is now included in the same kit. Special Note: Motor covers are ordered separately to help keep your inventory costs down. Sentry II motor kit packaging includes additional space so cover can be added which allows the manufacturer to supply a complete kit to jobsite.

Sentry II HS for heavy skylights

Order 1 per skylight

43.50.00.005 - Sentry II HS System

12481.XX - Cover (.xx denotes finish code)

Order 1 Hand Held Remote &/or Wall Switch

43.53.00.002 - Hand Held RF Remote

12539 - Wall Switch

Finish Codes: The “HS” cover is available in .01 Aluminum, .23 Chestnut Bronze, .24 Beige, & .32 White.

TRUTH TIPS:

1. To help prevent personal injury from moving skylight parts, the skylight must be installed at least eight feet above the floor or an inside screen must be applied to the skylight with the provided screen interlock properly installed. Adherence to these safety requirements is the responsibility of the installer.
2. The Sentry II HS system is rated for use in indoor applications only.
3. When choosing between the non-synchronous or synchronous Sentry II HS motor system, consider the rigidity of the skylight panel. Since each motor system is designed to lift open and pull close at a single contact point, the skylight panel must be rigid enough in the closed position to ensure proper corner pull-in for a weather tight seal and rigid enough in the open position to provide proper skylight stability. The wider the skylight is, the more significant this issue can become. Therefore the rigidity of

some skylight sizes may make it necessary to use two or more synchronous motor systems even though the weight of the skylight may only require a single motor system. For more assistance, contact Truth Hardware Technical Services.

4. The Sentry II HS requires 1 amp of 120 VAC.

INCLUDE TRUTH SPECS IN YOUR NEXT SKYLIGHT PROJECT

Skylight operating hardware should be suited for roof window, and skylight installation for wood, PVC, and metal materials. Skylight Bases shall be provided with a special high quality gear reduction (high output torque) to meet required maximum sash weight of 160 lbs. (72.6 kg.), unit to be constructed of high pressure zinc diecast case electrostatically painted. Each base is complete with steel chain, sprocket, and detachable sash bracket. The chain sprocket shall be hardened steel and an acetal chain guide must be provided. Base modules with a Motorized Drive shall be low profile in design. Unit to be available with snap-on, decorative ABS cover conveniently accessible to motor, mechanical, and electronic components. The mechanical closing pressure shall not exceed 70 lbs. Supply electronic circuitry for sensing rain and accommodation of remote control. Each unit shall be equipped with auxiliary contacts for additional thermostatic control, security, fire or smoke alarms, or computer control. The control system is to be supplied with standard line voltages from 100 to 240 VAC at 47 to 440 Hz (no transformer required). Motor kits to include motor, rain sensor, and hardware pack. Remote control shall operate at a minimum distance of 50 ft. from skylight operator. Power skylight system shall be “Sentry II HS” as manufactured by Truth Hardware, Owatonna, MN.

FIG. 1 FINISHED DIMENSIONS OF THE SENTRY II HS MOTOR SYSTEM

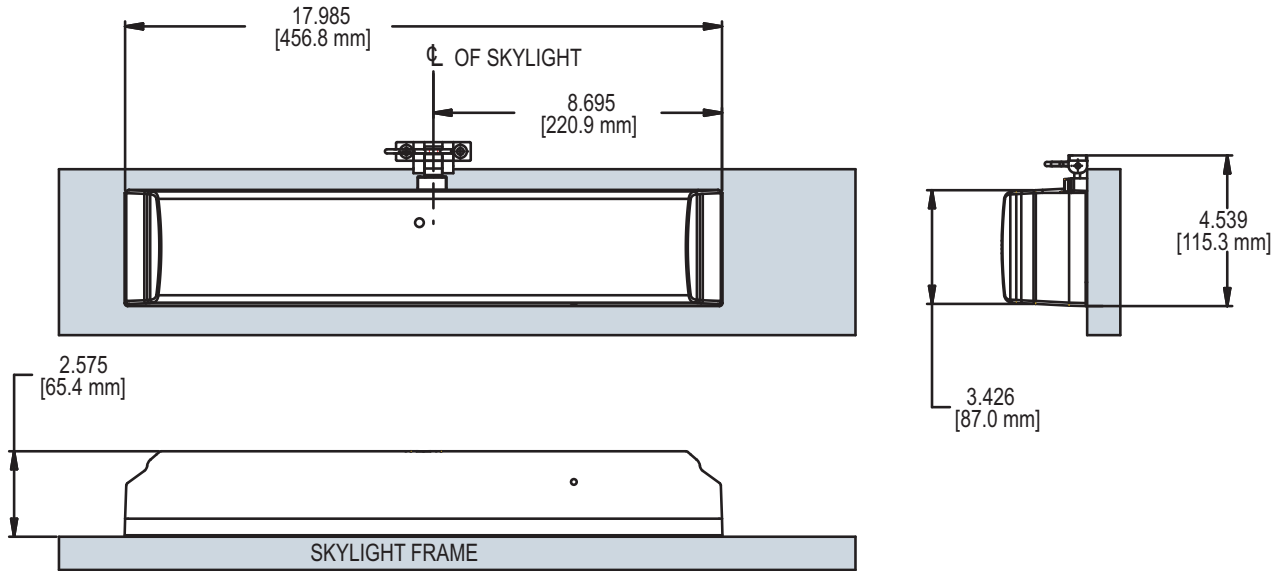
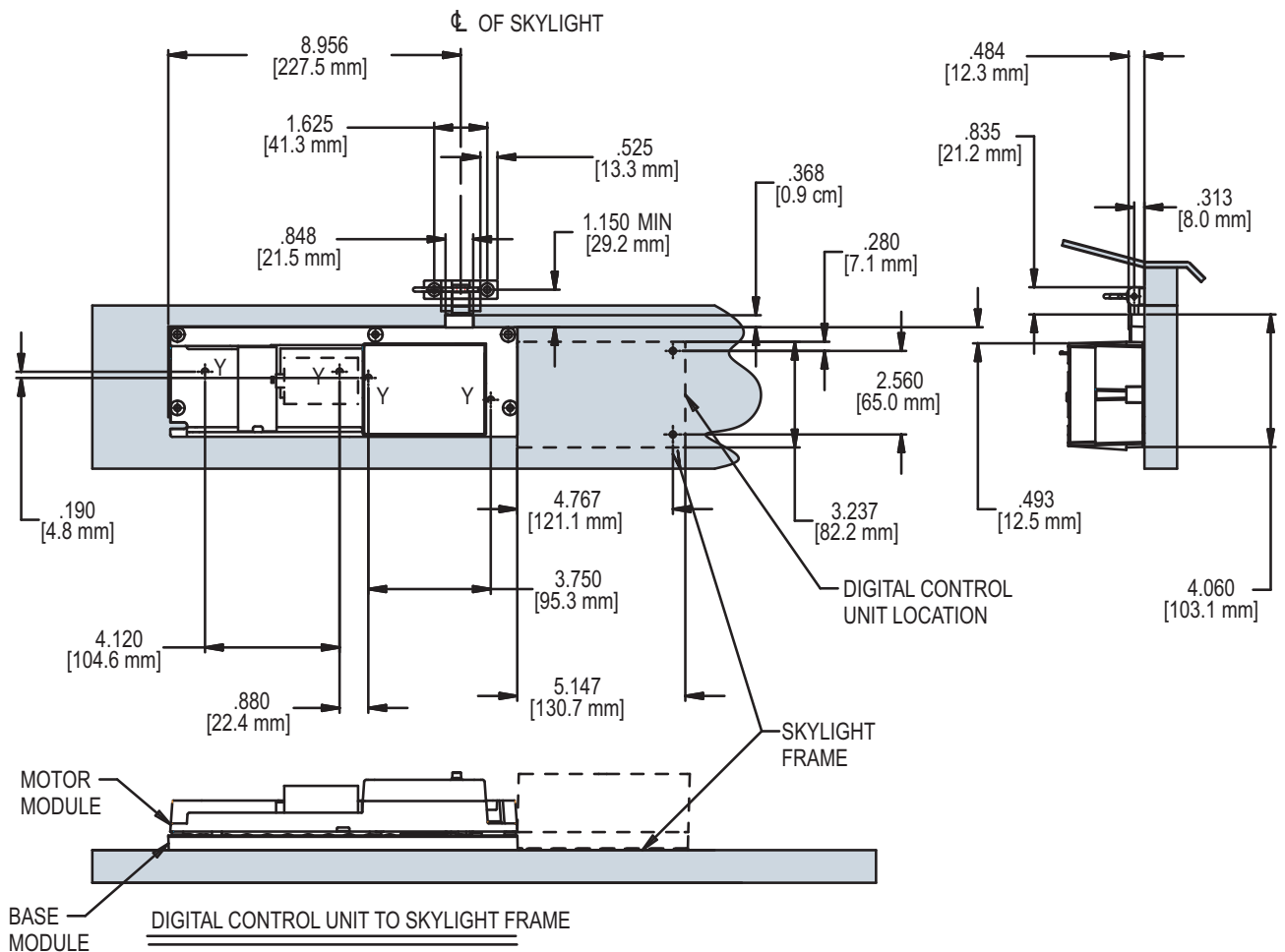


FIG. 2 SENTRY II HS MOUNTING ILLUSTRATION



DIGITAL CONTROL UNIT TO SKYLIGHT FRAME

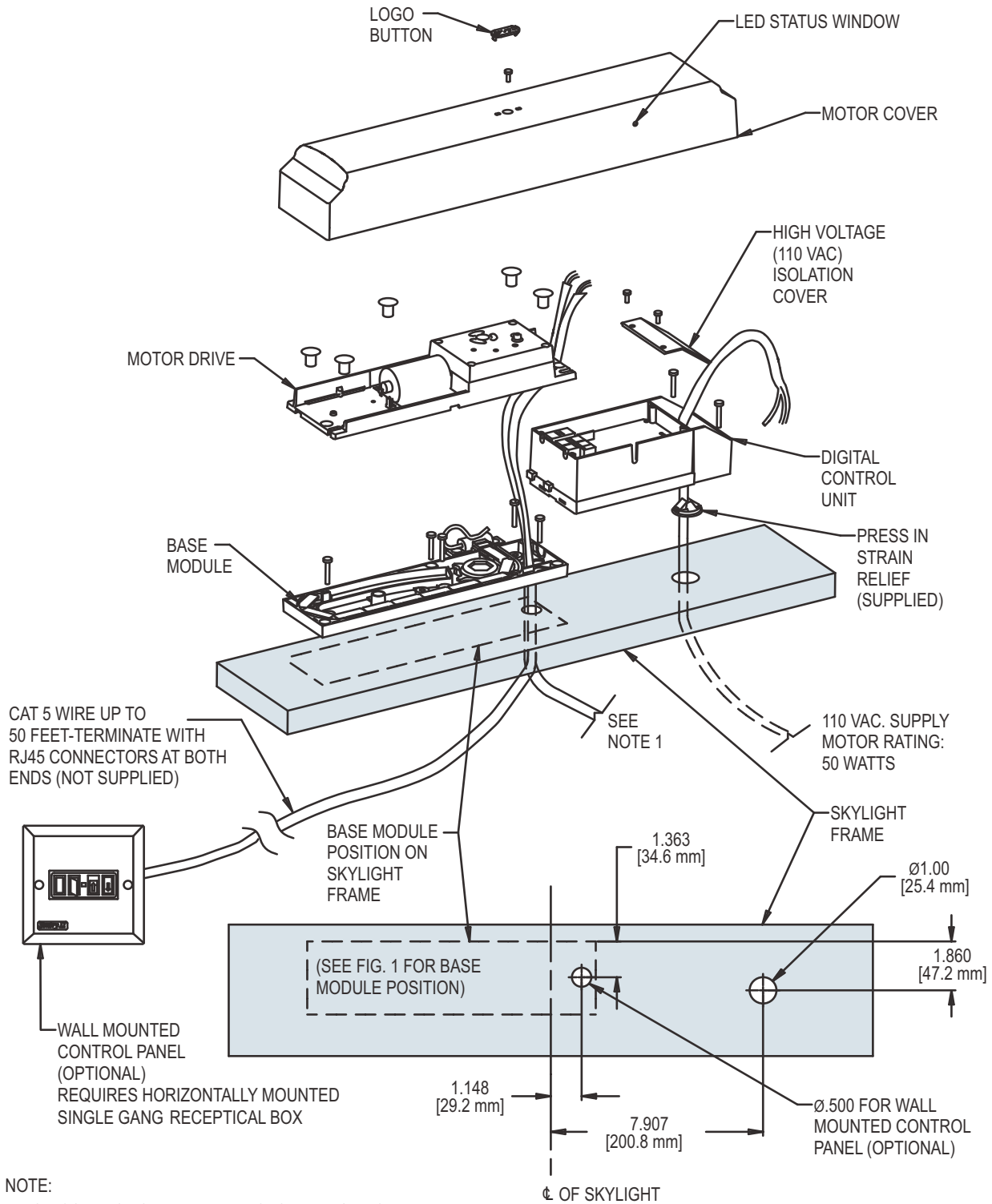
(QTY 2) (P/N 19335) #10 X .750 PHILLIPS PAN HEAD SHEET METAL SCREWS

BASE MODULE TO SKYLIGHT FRAME:

(QTY 4) (P/N 19335) #10 X .750 PHILLIPS PAN HEAD, SHEET METAL SCREWS

SENTRY II HS MOTOR SYSTEM

FIG. 3 SENTRY II HS PRE-WIRING DIAGRAM



NOTE:

1. FOR CONTROL OF MULTIPLE MOTOR UNITS FROM ONE WALL MOUNTED CONTROL PANEL, RUN A 2 CONDUCTOR WIRE BETWEEN EACH MOTOR UNIT. 22 GAGE OR HEAVIER IS SUFFICIENT.

**MARVEL™ ELECTRONIC
SKYLIGHT/WINDOW OPERATOR**

Truth Hardware's new Marvel™ power operator system for windows and skylights proves that simpler can be better. Challenged by window and skylight manufacturers with providing a small and sleek motorized system that is simple to install, easy to operate and above all affordable – Truth is confident that the Marvel System is the answer.

EASY TO INSTALL & OPERATE

With easy to install mounting brackets used to help secure the Marvel Operator in the center of your window or Skylight, this system can be installed in a matter of minutes.

- Three styles of mounting brackets accompany this product to allow for easy mounting the unit (see Fig. # for details).
- Can be face-mounted or mounted to applications with sills.
- No transformer required. Operates from 110 volt household current.
- Controlled manually using a standard, single pole / double throw, center off momentary contact switch (ordered separately), or with optional RF Receiver and Remote.
- Durable double link chain produces 9.5" of chain travel
- Electronic limit switch controls the opening position while the closing position is controlled through an internal current sensing feature.
- Users can operate multiple units from one manual control switch.
- Rain Sensor (Remote Receiver Required)

**MARVEL OPERATOR CAPACITY
& RATINGS**

- With 45 lbs. of lifting load at the chain the Marvel System is rated to lift skylight sashes that weigh up to 90 lbs.
- When used on awning windows, the Marvel System is designed to work on awning windows with a properly sized counter-balance hinge (See Truth Tips).
- Marvel Operators are ANSI/UL 325 Certified and CAN/CSA C22.2 Certified.

**OPTIONAL ACCESSORIES
AVAILABLE:**

Hand held RF remote -with 80 feet of range, incorporates rolling code security and is capable of controlling up to 4 individual motors. Includes a magnetic wall mount (must be used with RF Receiver Pack).

Rain sensor - connects directly to the RF receiver for added security, is designed not to react to fog or dew and is "heated" to prevent the formation of ice or condensation and allows the sensor to dry itself after the rain has stopped

WARRANTY: Truth Hardware's Marvel Motorized Operator System is warranted for one year against defects in materials and workmanship on all electronic and mechanical components.

**PRODUCT APPLICATION
ASSISTANCE:**

If you need assistance with product configurations to meet your needs, please visit our website at www.truth.com. Under the "Technical Support" tab you will find all of the technical information needed to properly configure and specify all elements of an automated window installation, including installation instructions, pre-wiring and proper hardware requirements. You can also contact Truth's highly trained Technical Service Staff who can assist you with the selection of the appropriate hardware. These individuals are available during normal business hours (CST) at 800-324-4487.

ORDERING INFORMATION:

Ordering of the Marvel System is quite simple. All hardware necessary for mounting the system on either a window or skylight is now included in the same kit.

1. Order item number 42.90.XX.100
2. Specify color: .03 Bronze or .38 White
3. Optional accessories
 - Remote Control
 - 45580 Manual Switch
 - 42.90.00.200 RF Receiver Pack
 - 42.90.00.201 Hand held remote with wall mount (must be used with receiver pack)
 - 42.90.00.202 Rain Sensor (must be used with receiver pack)

TRUTH TIPS:

1. Awning windows must be equipped with a properly sized counter balance hinge such as Truth Hardware's 13 series or 34 series 4-bar hinges. All hardware and motor system warranties are void if these guidelines are not followed. (See Tech Notes).
2. Unless otherwise specified, the Marvel Motorized Window and Skylight System is designed to operate any properly sized window or skylight utilizing a hinge system manufactured by Truth Hardware. Use of the Marvel motor system on windows or skylights with hardware manufactured by companies other than Truth Hardware is at your own risk. For verification, look for the Truth logo/name stamped on the hinge or consult with the window manufacturer. If your hardware is not manufactured by Truth Hardware, contact Truth's Technical Service Department for available options at 800-324-4487.
3. The Truth Hardware Marvel Motorized Operator is rated for use in indoor applications only.
4. The Marvel Motorized Operator system is designed to be used on sky-

MARVEL™ POWER WINDOW SYSTEM

light operators that lift to open and pull to close in the center of the skylight. Therefore, the stiles of the skylight panel must be rigid enough in the closed position to ensure proper corner pull-in for a weather tight seal and rigid enough in the open position to provide proper skylight stability when supported at a single center point. The wider the skylight is the more significant this issue can become. For more assistance, contact Truth Hardware Technical Services.

5. Marvel Motor also available with standard Truth skylight chain bracket. Contact Technical Service for future information.

6. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

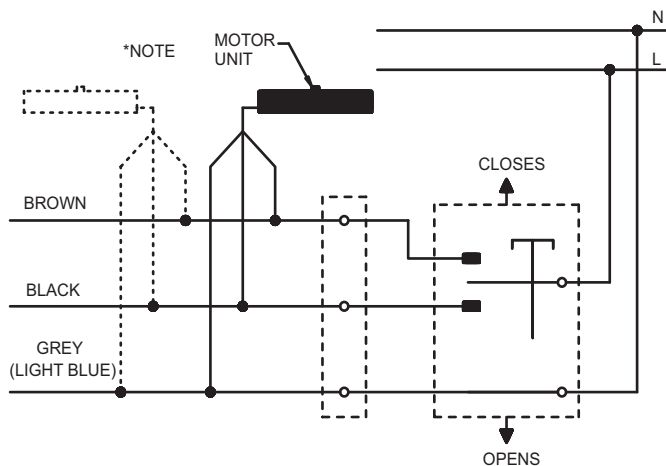
INCLUDE TRUTH SPECS IN YOUR NEXT MOTORIZED WINDOW/SKYLIGHT PROJECT

Motorized system for windows or skylights (not exceeding 45 lbs of weight measured at the chain). Motor uses a double link chain providing 9.5" of chain stroke. Mounting should accommodate wood, PVC or metal skylights and windows. Mounting hardware to be provided to accommodate a wide

range of window profile shapes and materials. Motor system should run off of 110 volt current and utilize a standard single pole / double throw, center off momentary contact switch or with remote control & rain sensor. Motor system to be ANSI/UL 325 certified and CAN/CSA C22.2 certified. This motor system shall be "Marvel Electronic Window/Skylight" series as offered by Truth Hardware, Owatonna, MN.

Manual Switch Installation & Wiring Diagram

- It is recommended that the Marvel unit be controlled with a single pole, double throw (SPDT) center off momentary contact switch. These switches are typically available through local electrical supply stores or by ordering from Truth P/N 45580. Please see the diagram below for how the unit is to be connected.
- The advantage of the center off momentary contact switch is that as soon as your finger is removed from the switch the switch will return to the center, off position and the motor unit will stop at the desired position.
- Please contact Truth's Technical Support Department for application help when it is desired to control the Marvel with something other than a single pole, double throw (SPDT) center off momentary contact switch.



*Additional Marvel units can be controlled by one SPDT momentary contact switch.

General Electrical Specification

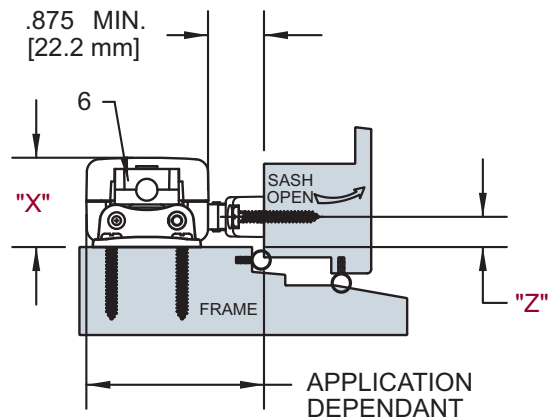
- The Marvel has double electrical insulation.
- An internal electronic limit switch controls the opening position.
- The closing position is controlled by current sensing.
- The amperage draw of a single Marvel unit at 120 V-60 HZ is .12 amps at a 45 pound load. The amperage draw at no load is .040 amps.
- It is recommended that the circuit be capable of providing 1 amp at 120 VAC of power per window.
- The input voltage for the unit can range from 80 V to 260 V for both 50 HZ and 60 HZ.

Product Certification

- The Marvel has been certified to the following standards:
 - △ ANSI/UL 325 - 2003 which is the standard for Door, Drapery, Gate, Louver and Window Operators and Systems.
 - △ AN/CSA C22.2 No. 68-92 which is the standard for Motor Operated Appliances (Household and Commercial)

**MARVEL™
POWER WINDOW
SYSTEM**
(Snap Bracket Kit)

FIG. 1 SILL MOUNT APPLICATION
(MARVEL 42.90.XX.100 KIT)

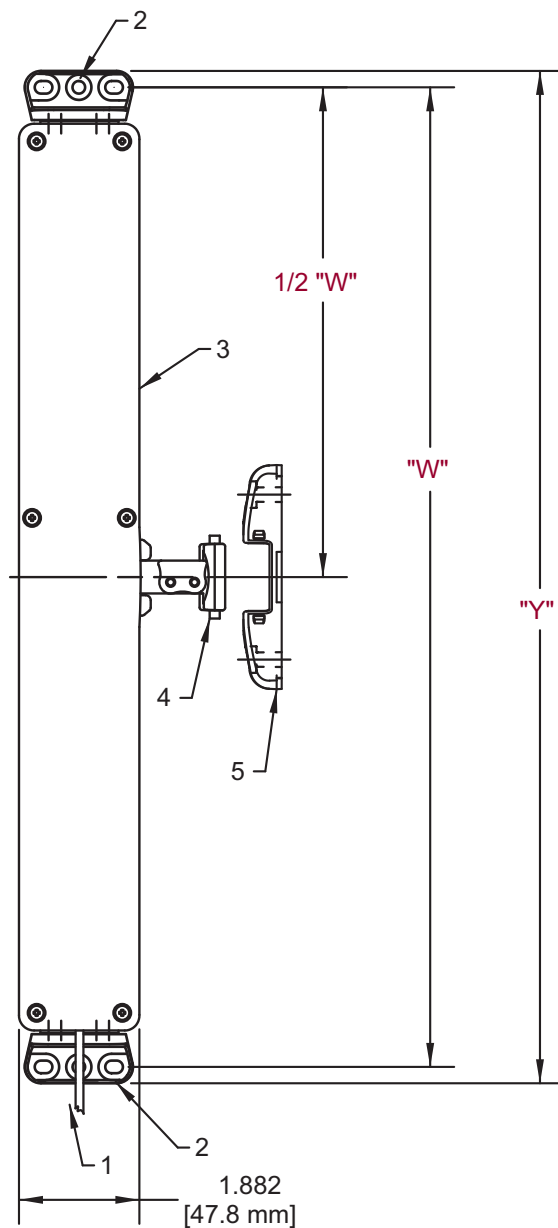


- 1) POWER SUPPLY CABLE
- 2) SILL MOUNT FRAME BRACKETS ("A" OR "B")
- 3) MOTOR UNIT
- 4) CHAIN CONNECTOR
- 5) SASH BRACKET
- 6) ELECTRIC CONNECTOR

RECOMMENDED SCREWS FOR BRACKETS:

(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

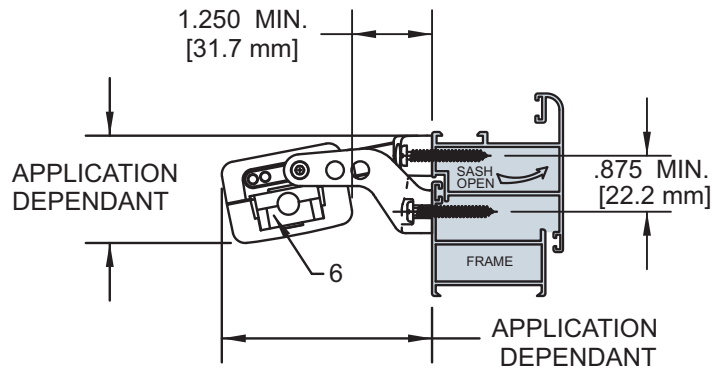
OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



FRAME BRACKET	"W"	"X"	"Y"	"Z"
"A"	15.31" [389mm]	1.38" [35mm]	15.82" [402mm]	.482" [12mm]
"B"	15.19" [386mm]	1.63" [41mm]	15.86" [403mm]	.728" [18.5mm]

**MARVEL™
POWER WINDOW
SYSTEM**
(Snap Bracket Kit)

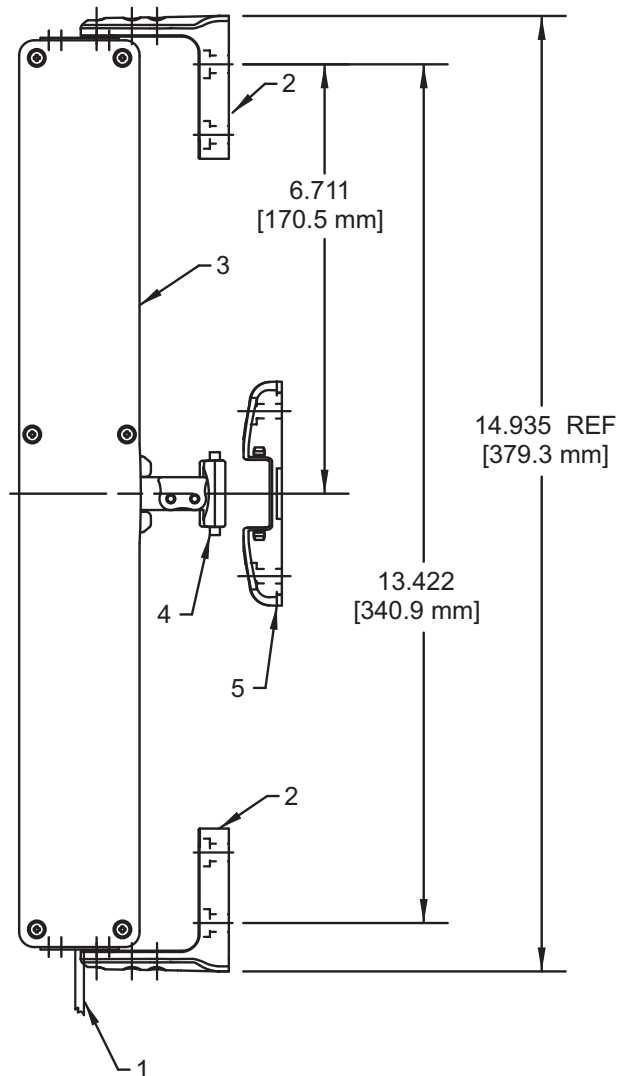
FIG. 2 FACE MOUNT APPLICATION
(MARVEL 42.90.XX.100 KIT)



- 1) POWER SUPPLY CABLE
- 2) FACE MOUNT FRAME BRACKETS "F"
- 3) MOTOR UNIT
- 4) CHAIN CONNECTOR
- 5) SASH BRACKET
- 6) ELECTRIC CONNECTOR

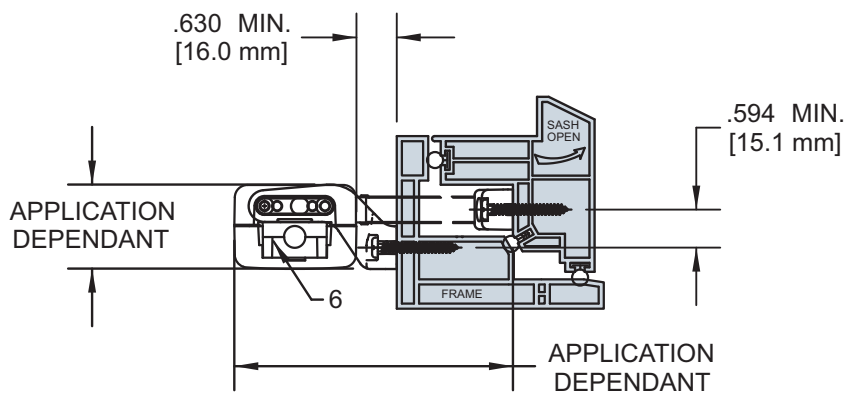
RECOMMENDED SCREWS FOR BRACKETS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



**MARVEL™
POWER WINDOW
SYSTEM**
(Snap Bracket Kit)

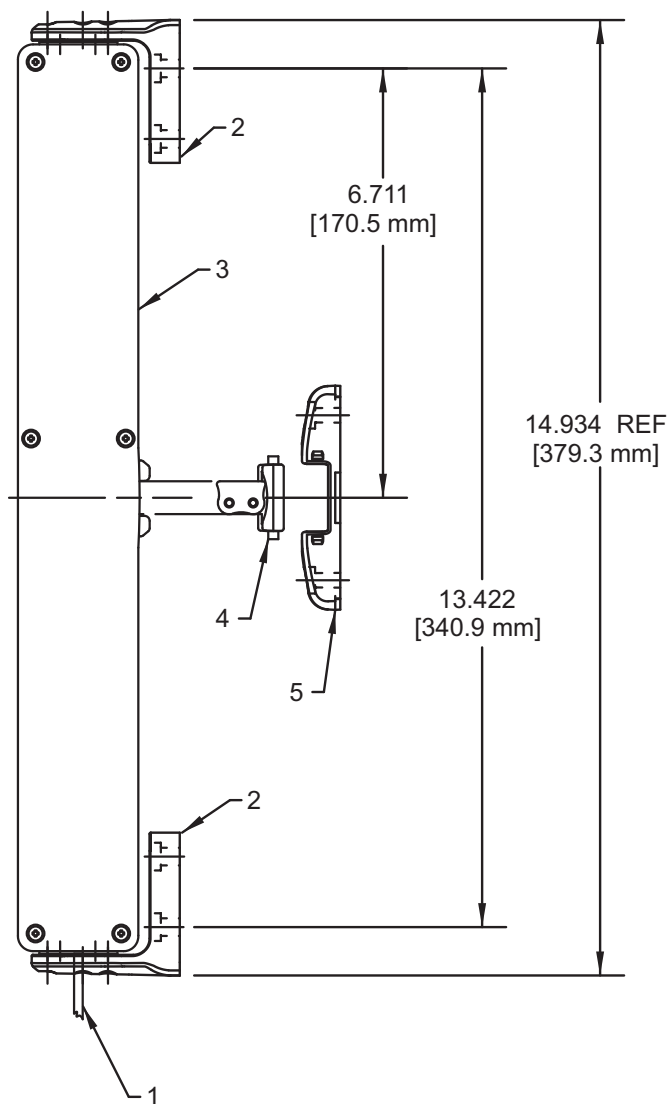
FIG. 3 FACE MOUNT APPLICATION
(MARVEL 42.90.XX.100 KIT)



- 1) POWER SUPPLY CABLE
- 2) FACE MOUNT FRAME BRACKETS "F"
- 3) MOTOR UNIT
- 4) CHAIN CONNECTOR
- 5) SASH BRACKET
- 6) ELECTRIC CONNECTOR

RECOMMENDED SCREWS FOR BRACKETS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



**MARVEL™
POWER WINDOW
SYSTEM**
(Snap Bracket Kit)

FIG. 4 MOTOR UNIT OVERALL DIMENSIONS
(MARVEL 42.90.XX.100 KIT)

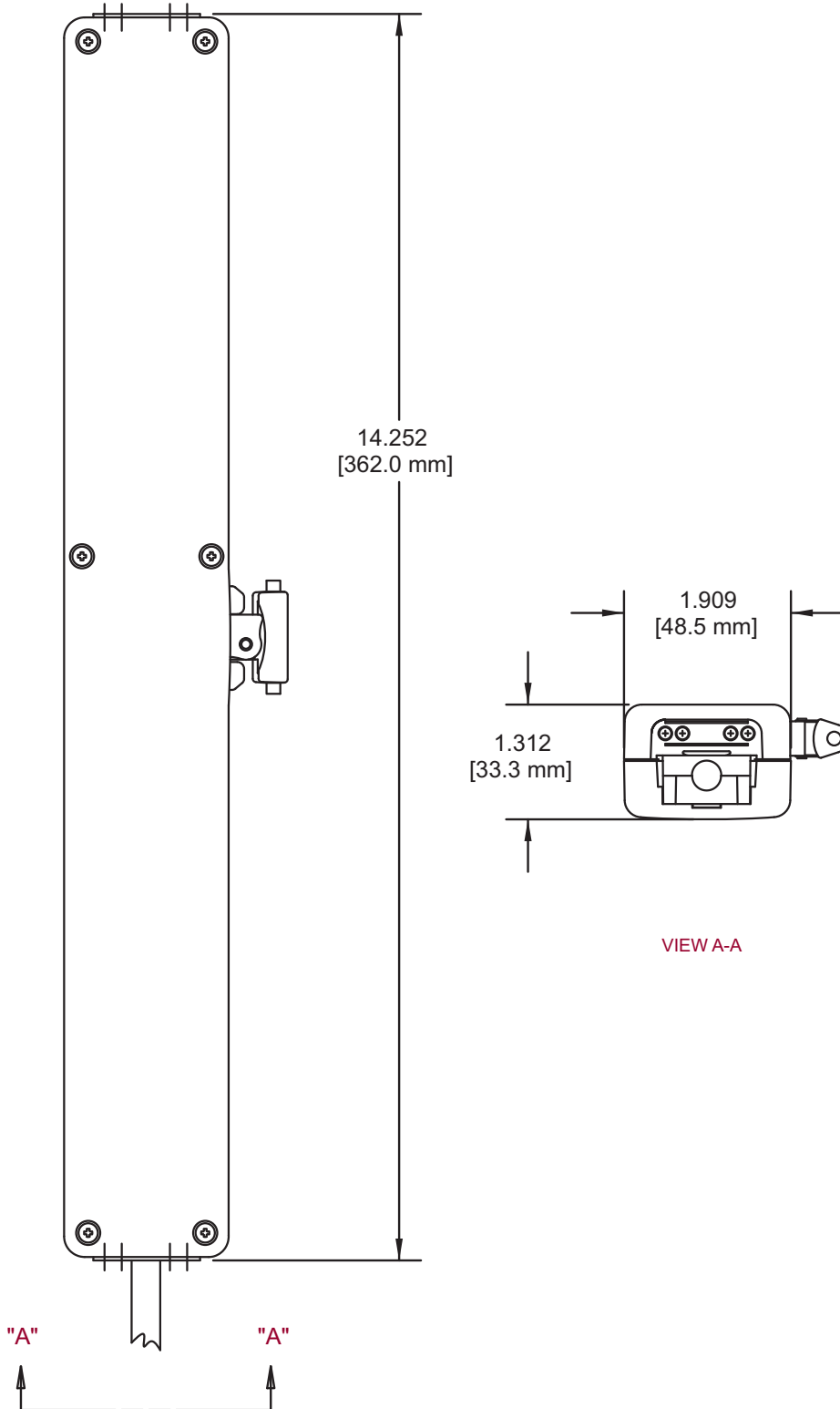
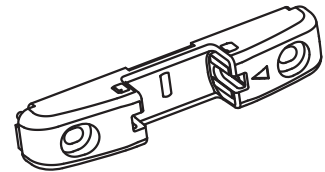
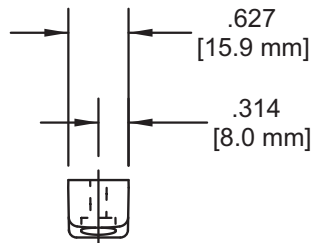
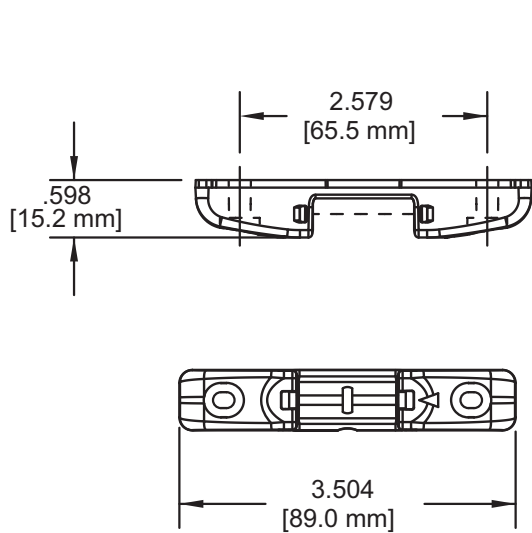


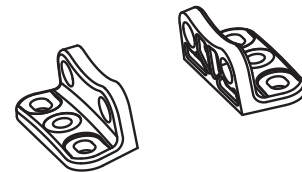
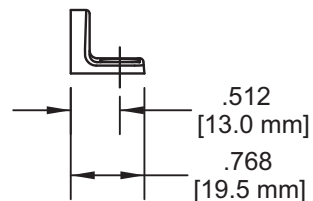
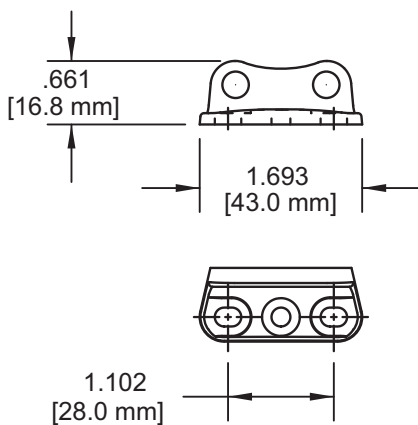
FIG. 5 SNAP SASH BRACKET
(INCLUDED IN 42.90.XX.100 KIT)



RECOMMENDED SCREWS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 6 NON-HANDED SILL MOUNT BRACKET "A"
(INCLUDED IN 42.90.XX.100 KIT)

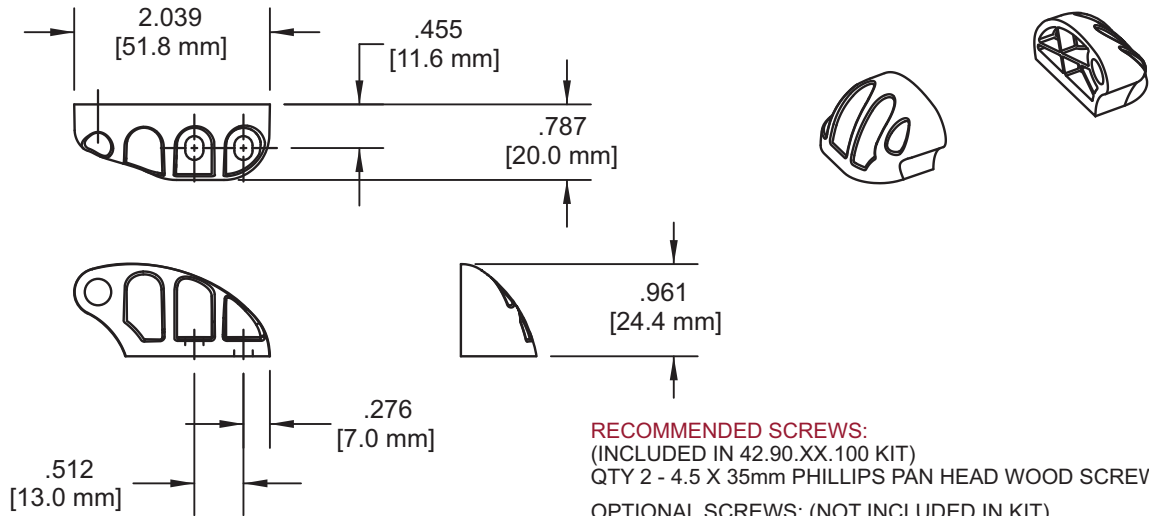


RECOMMENDED SCREWS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

**MARVEL™
POWER WINDOW
SYSTEM
(Pull Pin Bracket Kit)**

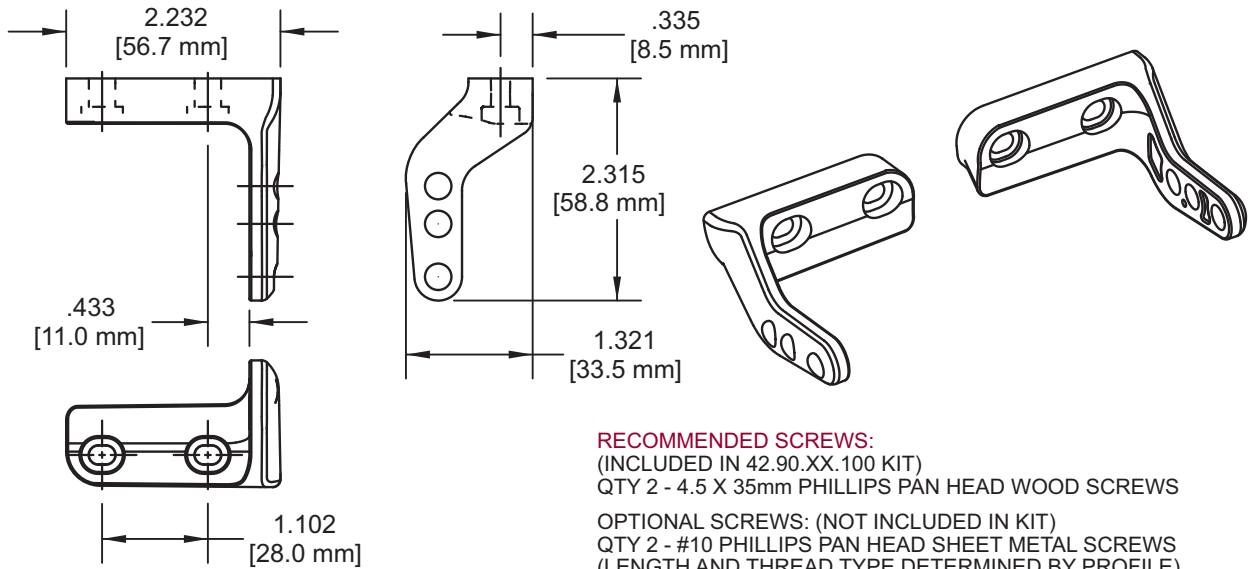
FIG. 7 HANDED SILL MOUNT BRACKET "B"
(INCLUDED IN 42.90.XX.100 KIT)



RECOMMENDED SCREWS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 8 HANDED FACE MOUNT BRACKET "F"
(INCLUDED IN 42.90.XX.100 KIT)



RECOMMENDED SCREWS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



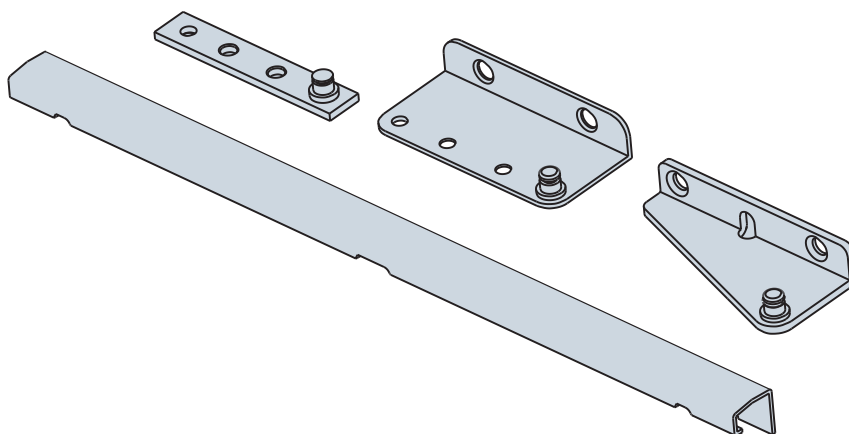
Truth realizes that some profile designs may require a unique stud bracket or track design therefore, Truth has developed a variety of shapes and styles to meet these needs. These brackets and track are intended to serve merely as options to the various “recommended” hardware which Truth has indicated for operators requiring this product. The drawings on the accompanying pages should provide you with all the technical information that you require. However, if you wish further technical assistance in selecting a bracket that works best with your window, please contact Truth. Most brackets are available in both a left- and right-hand version — pay careful attention to this when ordering.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth’s Terms and Conditions for further details.

E-GARD® HARDWARE:

Truth’s E-Gard® Hardware has a multi-stage coating process that produces a superior physical and aesthetic finish. Plus, it is resistant to a wider range of corrosive materials, including industrial cleaning materials and environmental pollutants. This proprietary process has been tested to be approximately three times better than common zinc plated finishes.

**ORDERING INFORMATION:**

1. Order part number based from information on accompanying drawings. XX - denote corrosion resistant coating. 92 is the finish code for Truth’s corrosion resistant E-Gard® Hardware.

TRUTH TIPS:

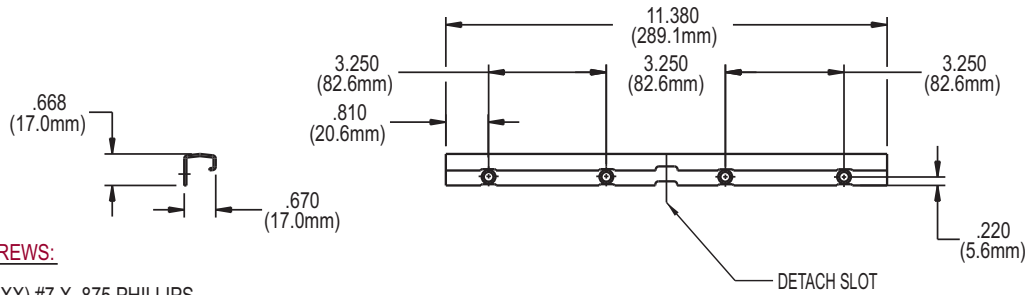
1. For accurate hardware placement in vinyl or metal applications, pre-drilling of the window profile is recommended.

2. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

3. For metal window profiles, Truth recommends machine screws. However, in most applications, sheet metal screws will provide adequate holding power.

4. When selecting mounting screws for Truth hardware, coating compatibility is one of the most important criteria. For best corrosion resistance the coating on the screws should be the same as the coating on the hardware. For more information see Tech Note #11.

FIG. 1 SINGLE ARM OPERATOR TRACK 30473.XX

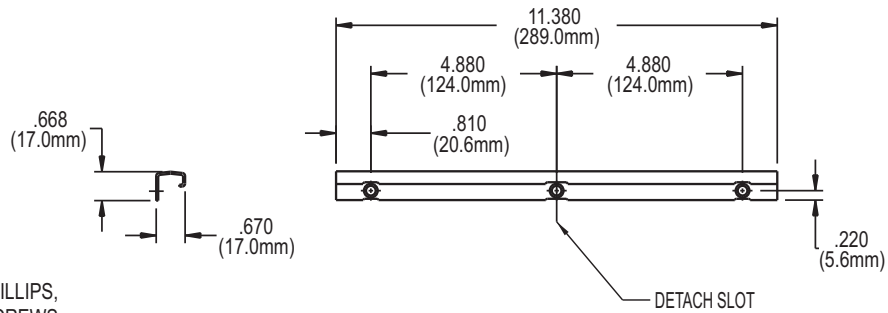


RECOMMENDED SCREWS:

WOOD: 4 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC & METAL: 4 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

31727 LIMITER TRACK ALSO AVAILABLE

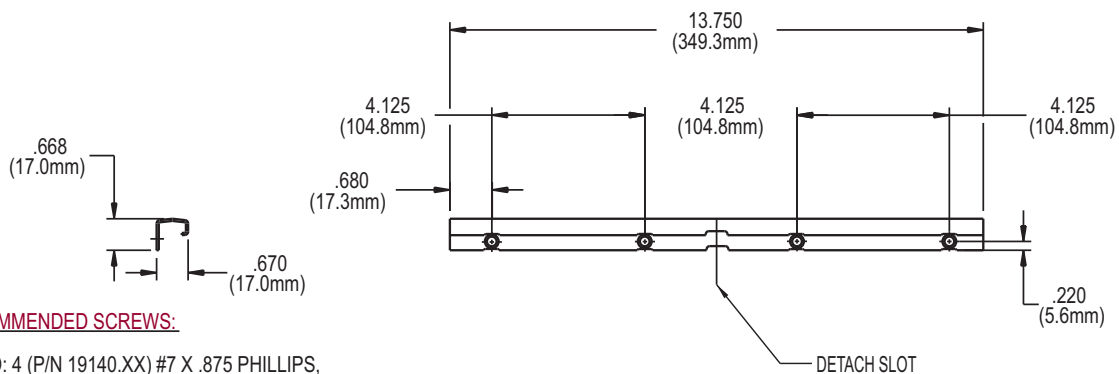
FIG. 2 SINGLE ARM OPERATOR TRACK 30706.XX



RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC & METAL: 3 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

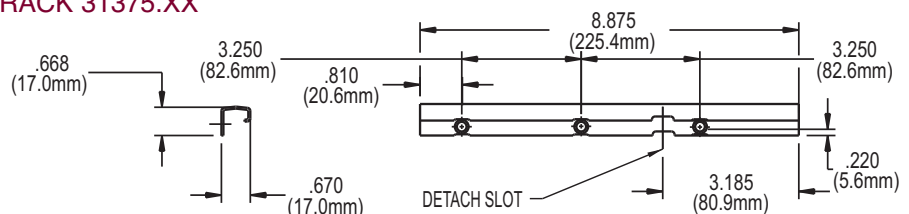
FIG. 3 SINGLE ARM OPERATOR TRACK 30150.XX



RECOMMENDED SCREWS:

WOOD: 4 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC & METAL: 4 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

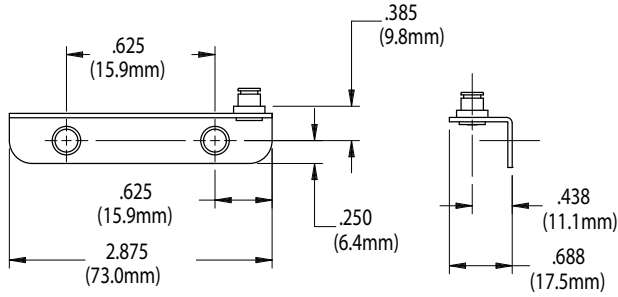
FIG. 4 SINGLE ARM OPERATOR TRACK 31375.XX



RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS
 PVC & METAL: 3 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 5 STUD BRACKET 10339.XX, 10340.XX



10339 LEFT HAND SHOWN

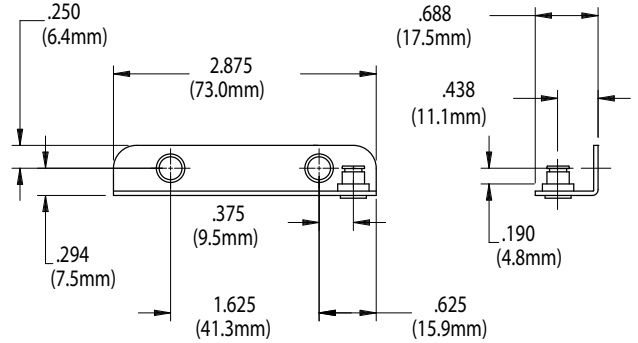
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10340 RIGHT HAND

FIG. 6 STUD BRACKET 10402.XX, 10403.XX



10402 LEFT HAND SHOWN

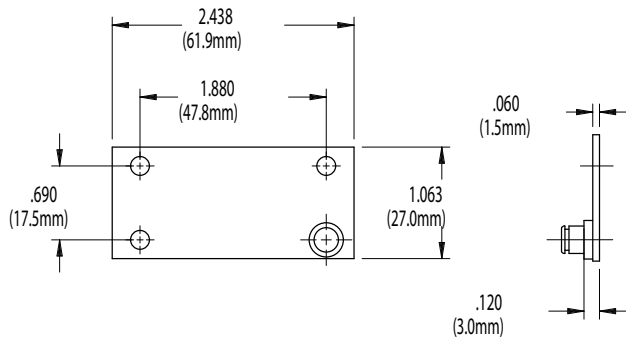
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10403 RIGHT HAND

FIG. 7 STUD BRACKET 10456.XX, 10457.XX



10456 LEFT HAND SHOWN

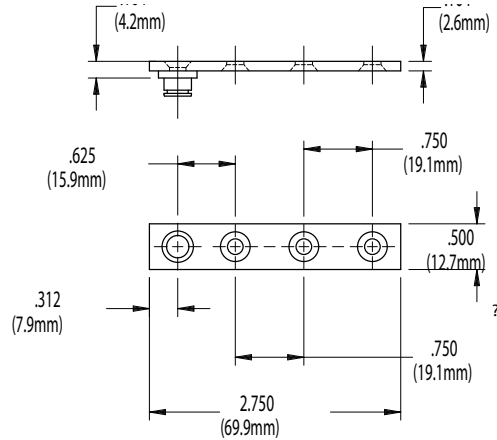
RECOMMENDED SCREWS:

WOOD: 3 (P/N 19355.XX) #10 X .750 PHILLIPS, PAN HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #10 PHILLIPS, PAN HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10457 RIGHT HAND

FIG. 8 STUD BRACKET 10558.XX, 10968.XX (SNAP STUD)



NON HANDED

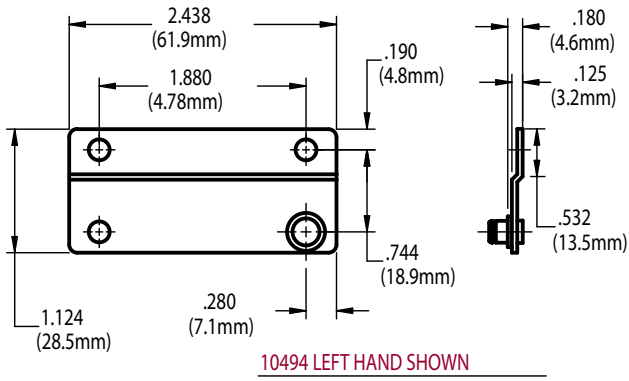
RECOMMENDED SCREWS:

WOOD: 3 (P/N 19240.XX) #8 X 1.0 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #8 PHILLIPS, PAN HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10498 SHOWN

FIG. 9 STUD BRACKET 10494.XX, 10495.XX



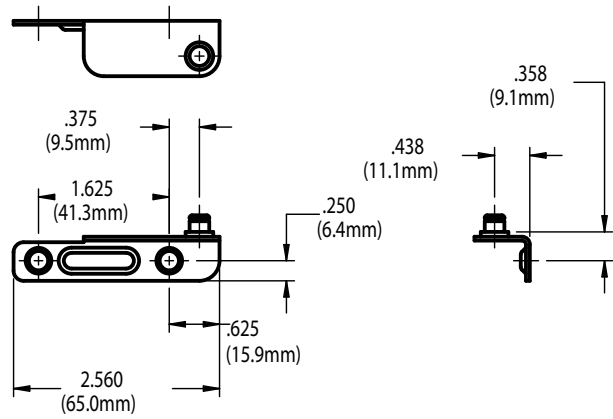
RECOMMENDED SCREWS:

WOOD: 3 (P/N 19355.XX) #10 X .750 PHILLIPS, PAN HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #10 PHILLIPS, PAN HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10495 RIGHT HAND

FIG. 10 STUD BRACKET 10498.XX, 10499.XX



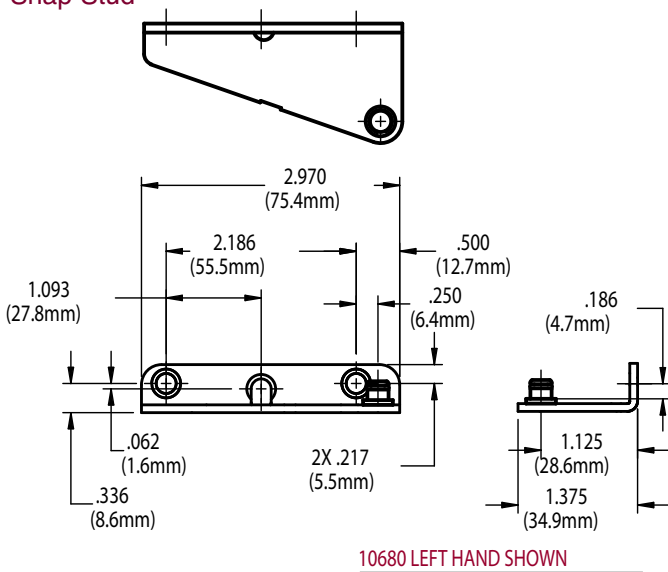
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10499 RIGHT HAND

FIG. 11 STUD BRACKET 10680.XX, 10681.XX
Snap Stud



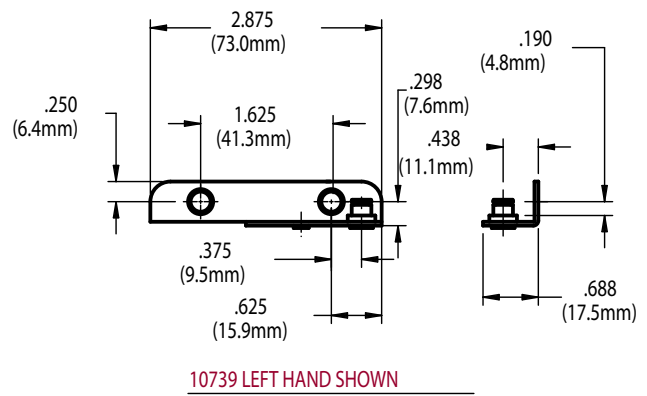
RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #7 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10681 RIGHT HAND

FIG. 12 STUD BRACKET 10739.XX, 10740.XX



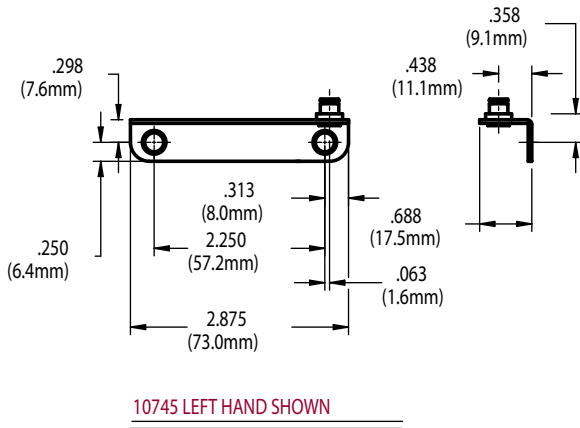
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10740 RIGHT HAND

FIG. 13 STUD BRACKET 10745.XX, 10746.XX



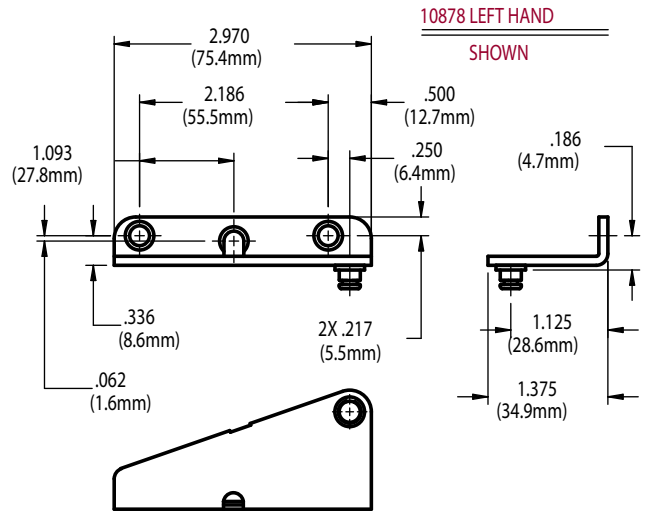
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10746 RIGHT HAND

FIG. 14 STUD BRACKET 10748.XX, 10749.XX



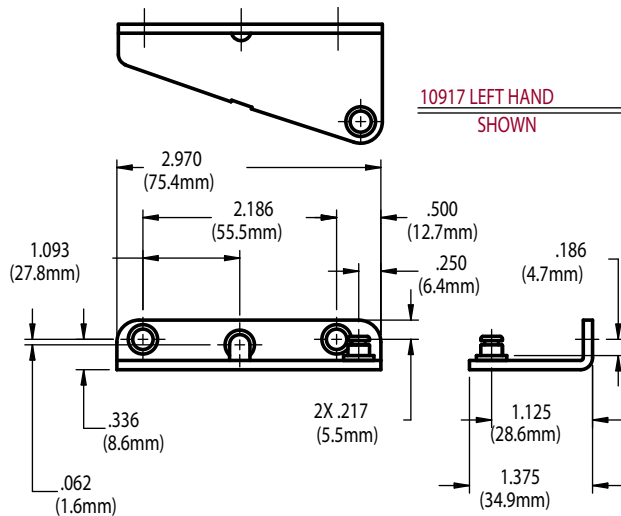
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10879 RIGHT HAND

FIG. 15 STUD BRACKET 10917.XX, 10918.XX



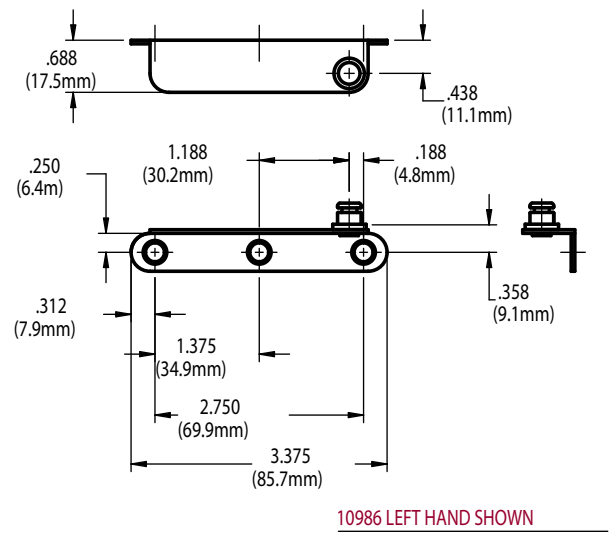
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS, FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10918 RIGHT HAND

FIG. 16 STUD BRACKET 10986.XX, 10987.XX



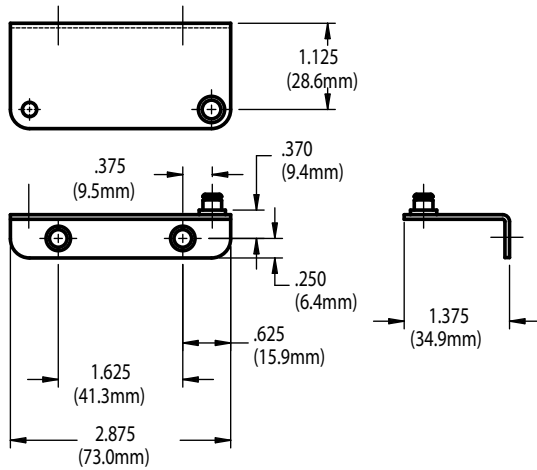
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10987 RIGHT HAND

FIG. 17 STUD BRACKET 10583.XX, 10584.XX



10583 LEFT HAND SHOWN

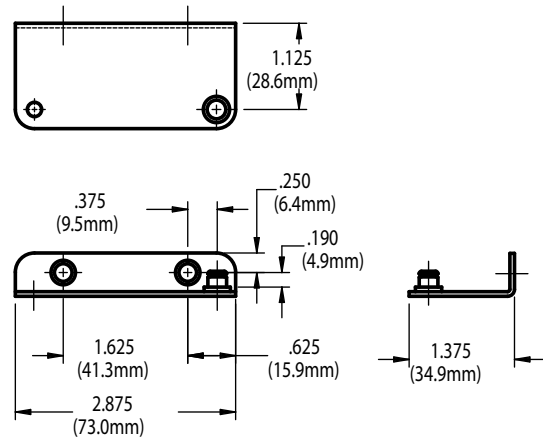
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10584 RIGHT HAND

FIG. 18 STUD BRACKET 10415.XX, 10416.XX



10415 LEFT HAND SHOWN

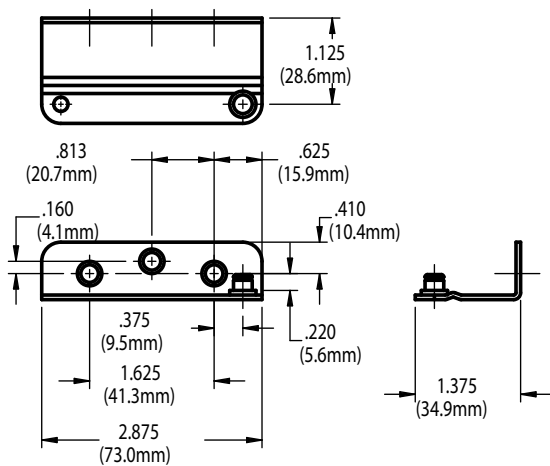
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10416 RIGHT HAND

FIG. 19 STUD BRACKET 10521.XX, 10522.XX



10522 LEFT HAND SHOWN

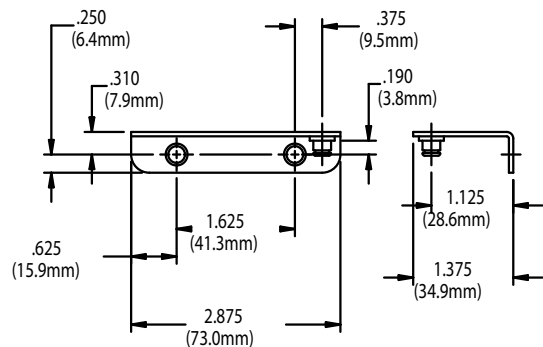
RECOMMENDED SCREWS:

WOOD: 2 (P/N 19140.XX) #7 X .875 PHILLIPS FLAT HEAD, SHEET METAL SCREWS

PVC & METAL: 2 - #7 PHILLIPS, FLAT HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10522 RIGHT HAND

FIG. 20 STUD BRACKET 10795.XX, 10796.XX



10795 LEFT HAND SHOWN

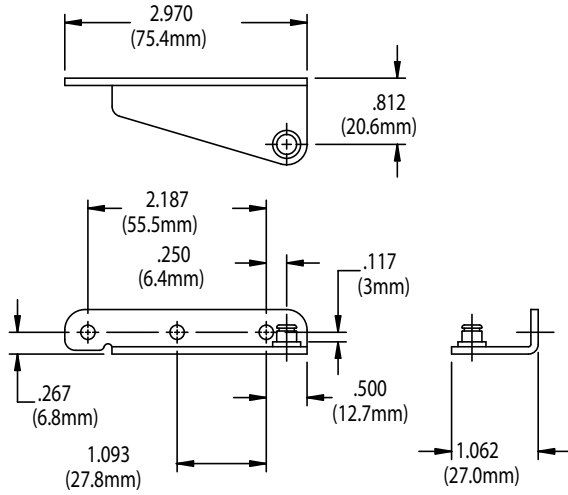
RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS, PAN HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #7 PHILLIPS, PAN HEAD SCREWS (LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 10796 RIGHT HAND

FIG. 21 STUD BRACKET 11253.XX, 11254.XX



11253 LEFT HAND SHOWN

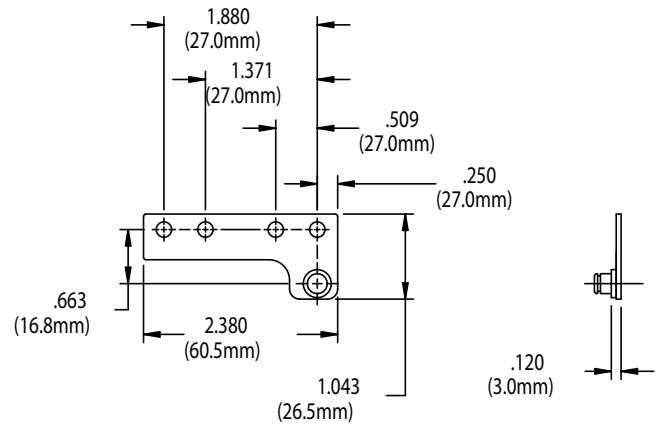
RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS, PAN HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #7 PHILLIPS, PAN HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 11254 RIGHT HAND

FIG. 22 STUD BRACKET 11257.XX, 11258.XX



11257 LEFT HAND SHOWN

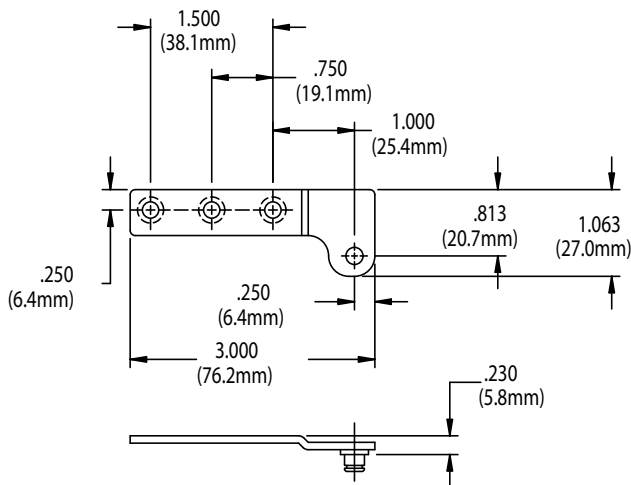
RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS, PAN HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #7 PHILLIPS, PAN HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 11258 RIGHT HAND

FIG. 23 STUD BRACKET 12550.XX, 12551.XX



12551 RIGHT HAND SHOWN

RECOMMENDED SCREWS:

WOOD: 3 (P/N 19140.XX) #7 X .875 PHILLIPS, PAN HEAD, SHEET METAL SCREWS

PVC & METAL: 3 - #7 PHILLIPS, PAN HEAD SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

NOTE: 12550 LEFT HAND



Perhaps you have one of those hard to reach window systems, or maybe one in which your curtains or blinds will not hang straight due to the protrusion of the operator's handle. Truth recognizes that many of these applications present special problems to the consumer. To help solve these kinds of problems, Truth offers this line of specialty accessories.

WARRANTY:

Protected under the terms of the Truth Warranty for Window and Door Manufacturers and Authorized Distributors. Refer to Truth's Terms and Conditions for further details.

FINISH: Electrostatically applied, durable coatings that provide excellent resistance to chipping, scratching and corrosion while maintaining color stability for years in direct sunlight. Please refer to Truth's Color Chart for examples of Truth's most popular finish options. Truth also offers a wide range of decorative "plated" finishes - contact Truth for additional information on availability of these finishes on specific product lines.

TRUTH TIPS:

1. When pole operation of an elevated awning or casement window is necessary, the Clerestory Pole System (#30476) should be used when appearance is a primary concern, or when an obstruction such as a wall would prevent the proper approach angles necessary for the Universal and Pole Ring system.
2. When a skylight calls for operation other than those options here, please see the skylight section of the catalog or call Truth.



FIG. 1 APPLICATION OF UNIVERSAL AND POLE RING SYSTEM
(Not compatible with Encore)

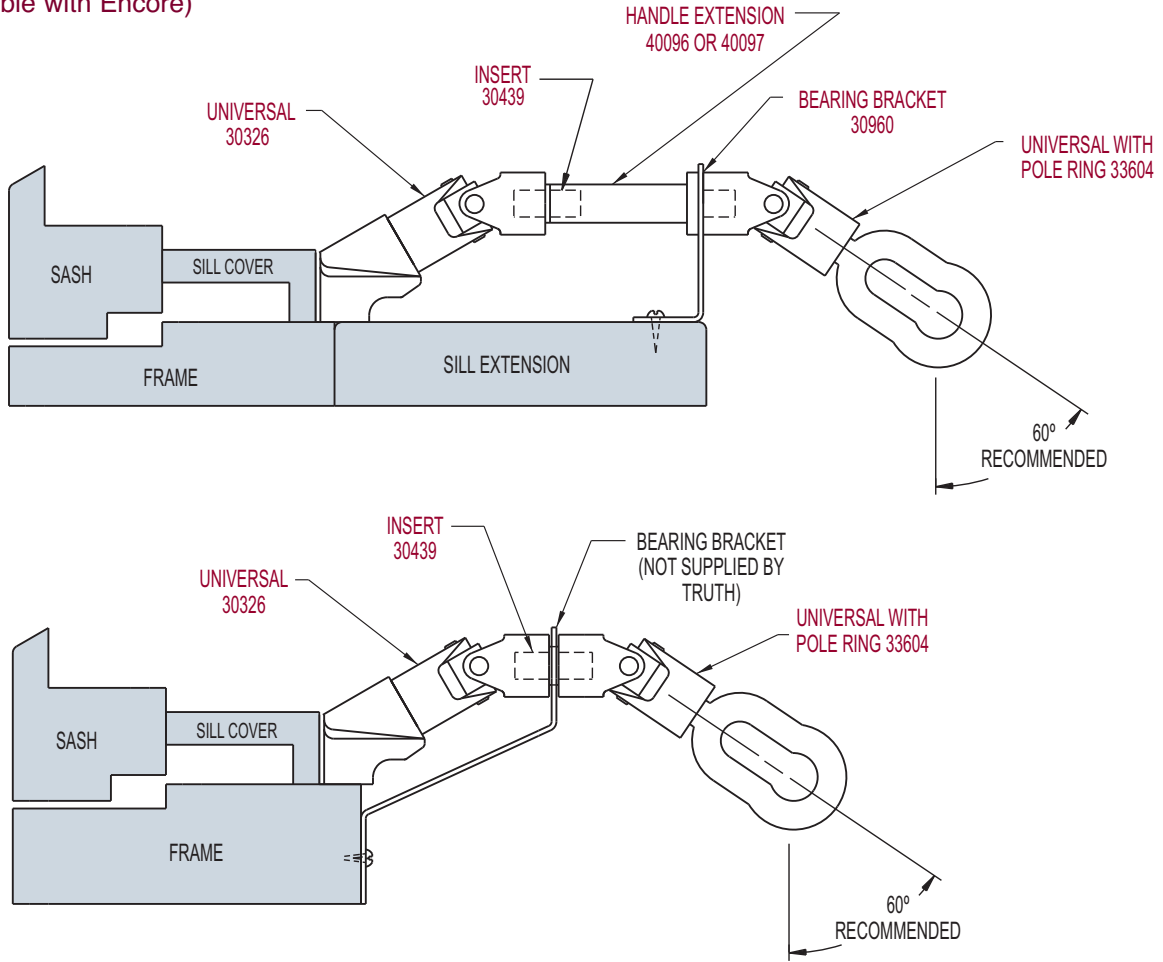


FIG. 2 UNIVERSAL WITH POLE RING 33604.XX

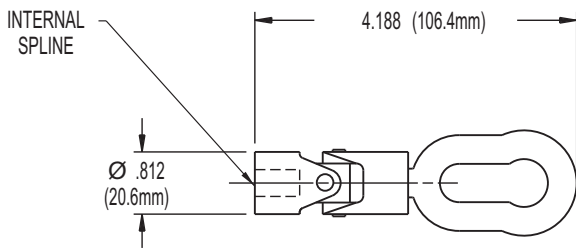


FIG. 3 UNIVERSAL 30326.XX

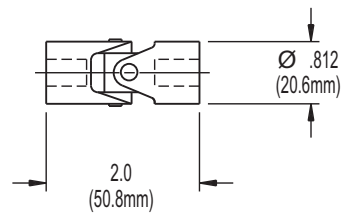
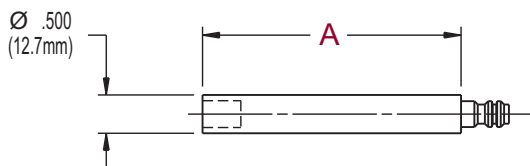
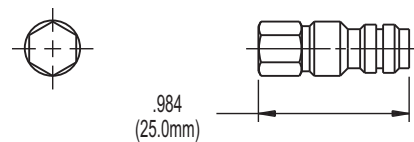


FIG. 4 HANDLE EXTENSIONS 40096.XX, 40097.XX



EXTENSION	A
40096	2.0 (50.8mm)
40097	4.0 (101.6mm)

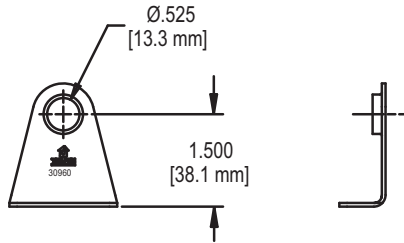
FIG. 5 INSERT 30439



NOTE:

1. INSERT IS NEEDED TO CONNECT UNIVERSAL TO UNIVERSAL OR UNIVERSAL TO HANDLE EXTENSION.
2. SPLINE STANDARD ON ALL TRUTH OPERATORS.

FIG. 6 BEARING BRACKET 30960.XX
(available from Truth)



RECOMMENDED SCREWS:

(QTY 2)#7 PHILLIPS, PAN HEAD SCREWS
(LENGTH AND THREAD TYPE TO BE
DETERMINED BY PROFILE)

FIG. 7 BRACKET FOR FACE MOUNT
(not available from Truth)

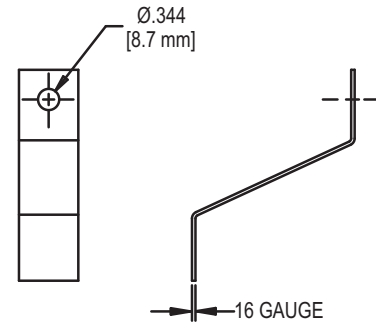
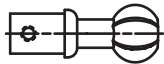
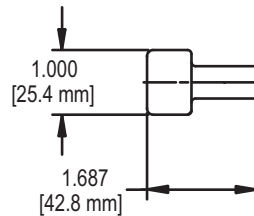


FIG. 8 HEX BALL
DRIVE 30957



INCLUDES SET SCREW.

FIG. 9 HEX BALL
ADAPTOR 30662.XX
(Not compatible with Encore)



INCLUDES SET SCREW.

FIG. 10 HOOK 10453



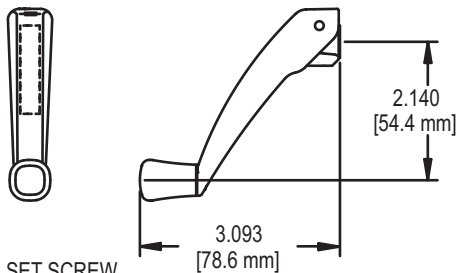
INCLUDES SET SCREW.

FIG. 11 EYELET 31000.XX
(Not compatible with Encore)



INCLUDES SET SCREW.

FIG. 12 FOLDING HANDLE 11329.XX



INCLUDES SET SCREW.

FIG. 13 CONTOUR HANDLE 11454.XX

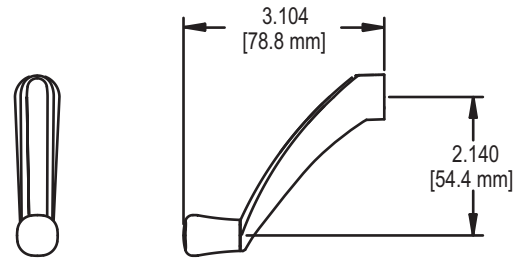
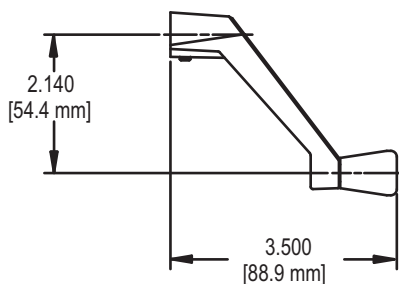


FIG. 14 HANDLE 10579.XX (Long Handle)



INCLUDES SET SCREW.

FIG. 15 HAND KNOB 11660.XX

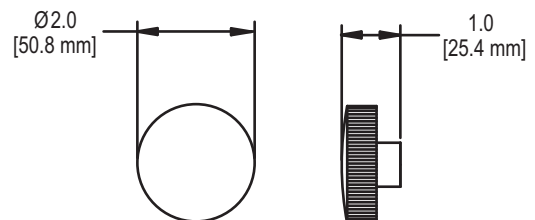


FIG. 16 SPLINE CAP 12136.XX

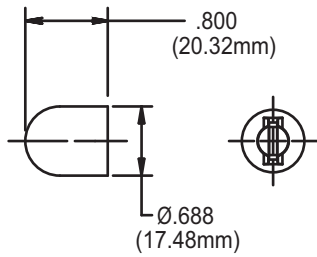


FIG. 17 T-HANDLE 11573.XX

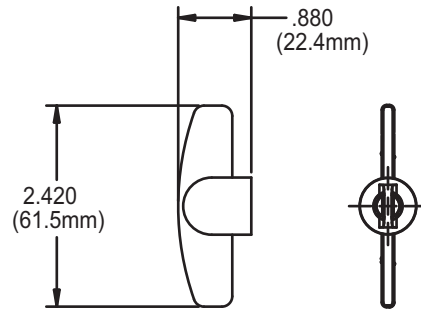


FIG. 18 METAL ENTRYGARD COVER 11328.XX (11327.XX with gasket)

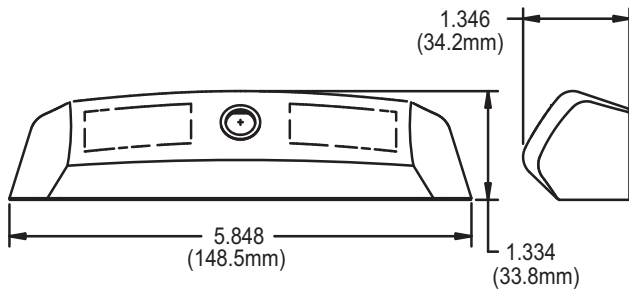


FIG. 19 CONTOUR COVER 11553.XX (BRASS USE 10536.13)

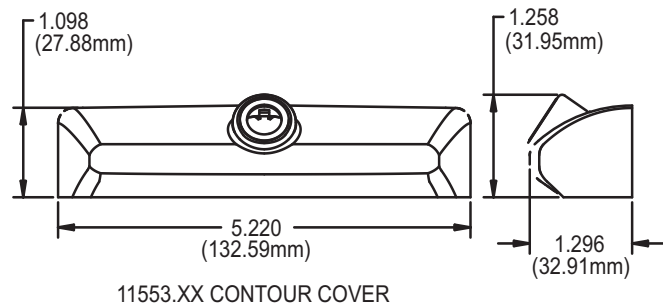
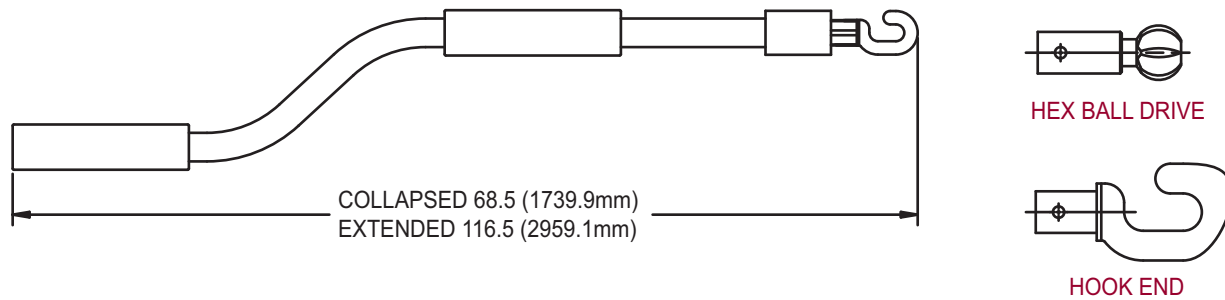


FIG. 20 TELESCOPING POLE CRANK: POLE WITH HEX BALL DRIVE 10637
POLE WITH HOOK END 10638



RECOMMENDED HEIGHT RANGE (FROM FLOOR) 7' - 11' (WINDOWS)
9' - 15' (SKYLIGHTS)

FIG. 21 3 FOOT POLE EXTENSION 30681 (Fits Telescoping Poles)

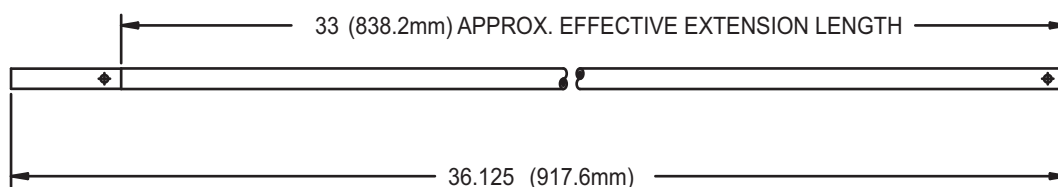


FIG. 22 APPLICATION OF CLERESTORY POLE CRANK
(Not compatible with Encore)

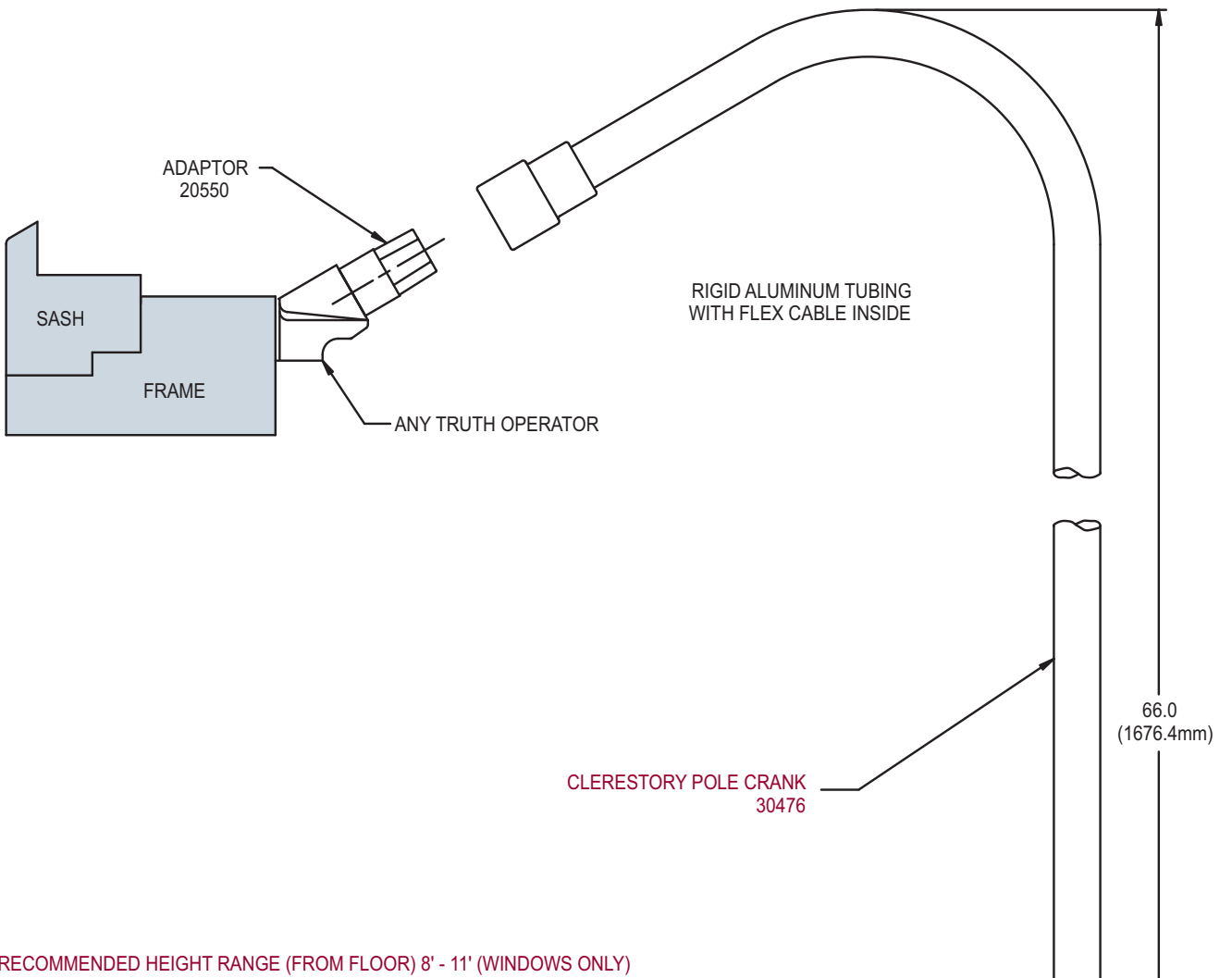
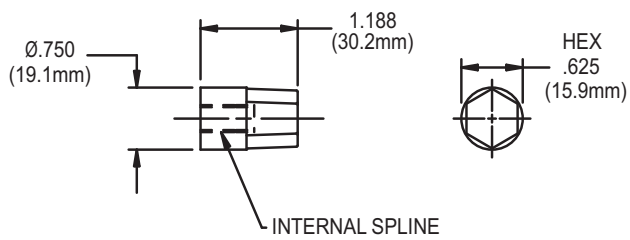


FIG. 23 ADAPTOR 20550



HANDLE INCLUDED

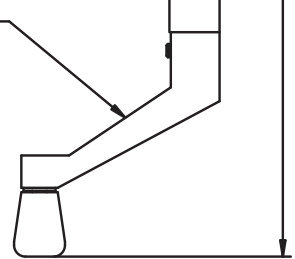
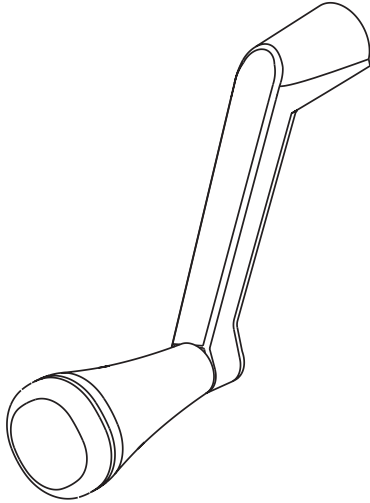


FIG. 24 ADA OPERATOR HANDLE 11403.XX



Due to differing physical abilities, we realize that standard window crank handles may not be appropriate for everyone, however it is our hope that Truth Hardware's new **#11403 ADA Operator Handle** with its special design, will make it easier for those who are able to use it, to more easily enjoy the benefits of operable windows.

Truth Hardware's new #11403 ADA Operator handle has a larger diameter, and longer contour shape to make it easier for a person with limited mobility to crank open/close a casement or awning style window. Available in a wide assortment of colors. Fits all Truth 15, 22, 23 and Maxim Series crank style operators.