



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.

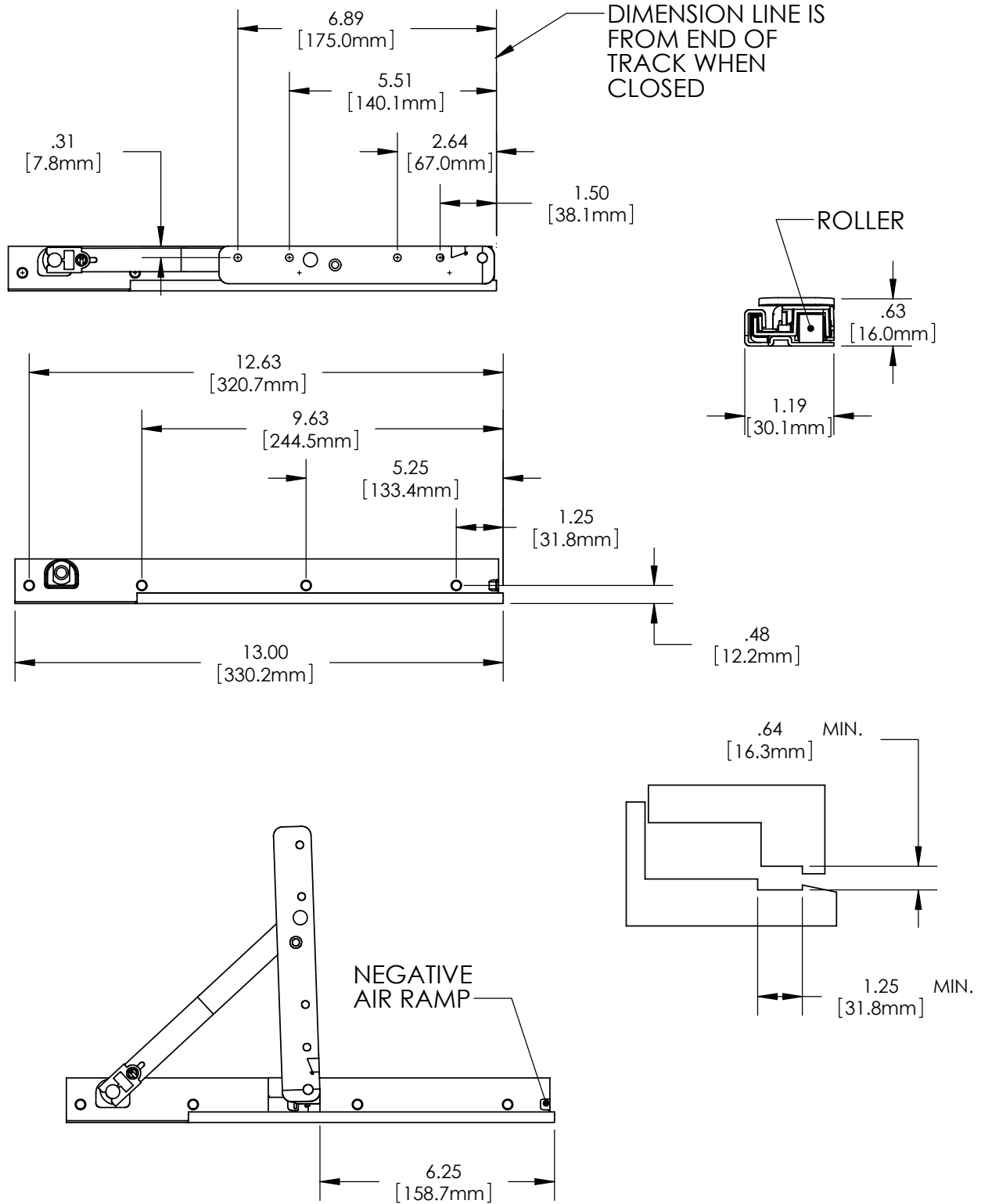
Casement window hinges shall be 14.10 Series High Performance Hinge as manufactured by Truth Hardware, Owatonna, MN.

**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 <b>Hardware Comparison Chart</b> 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

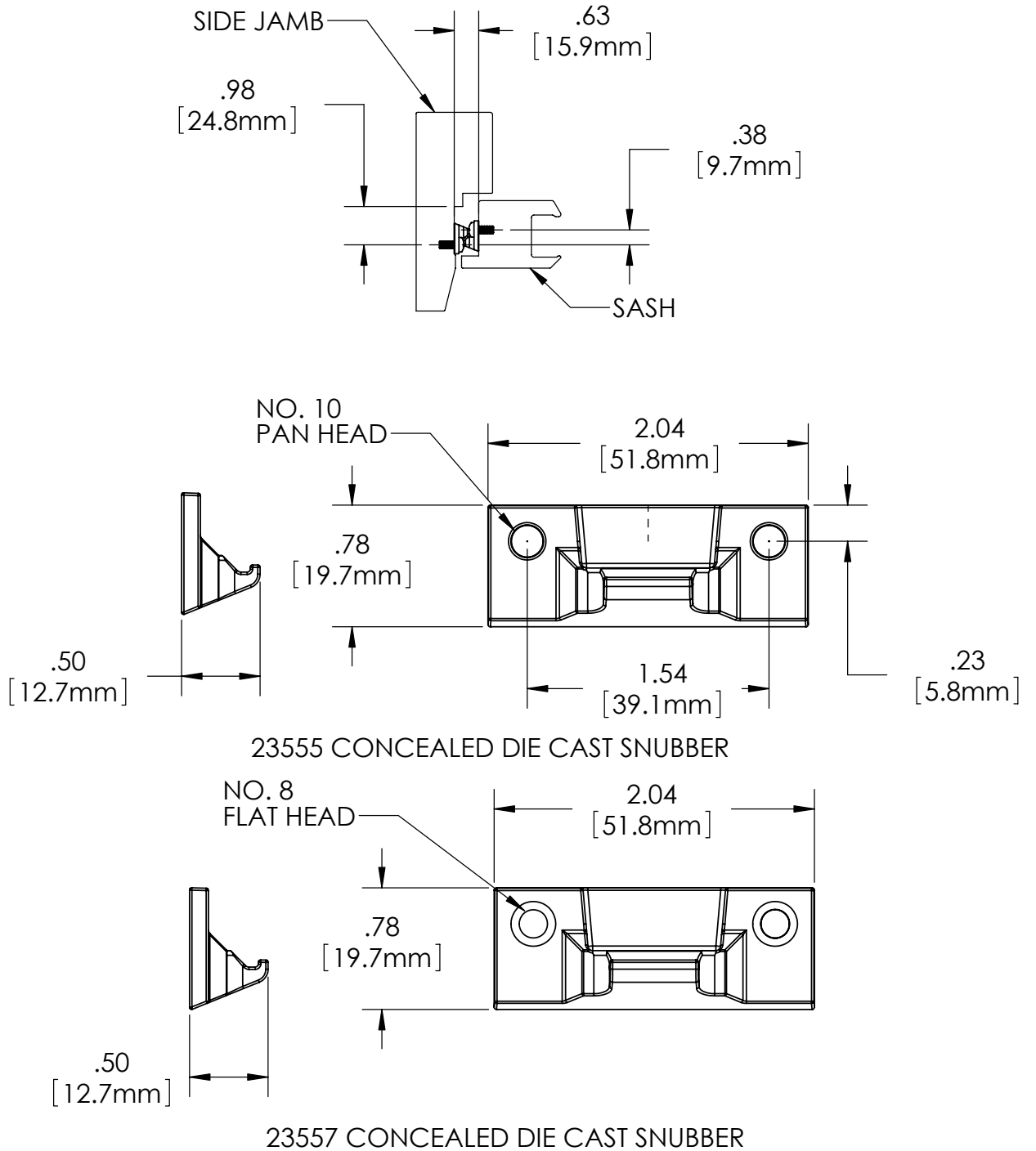
FIG. 1 APPLICATION OF CONCEALED HIGH PERFORMANCE CASEMENT HINGE



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

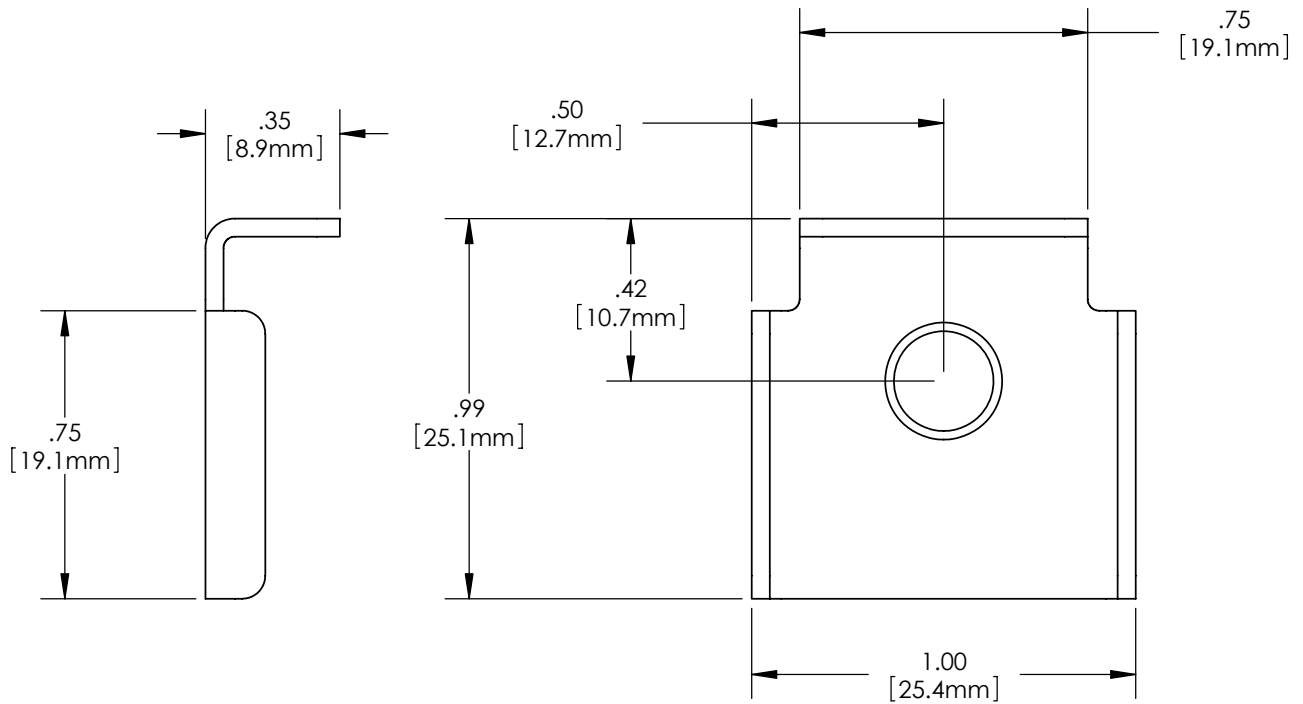
ON TRACK: NO. 7 PHILLIPS FLAT HEAD UNDERCUT SHEET METAL SCREWS ( STAINLESS STEEL )

FIG. 2 23555 AND 23557 CONCEALED SNUBBER, DIE CAST

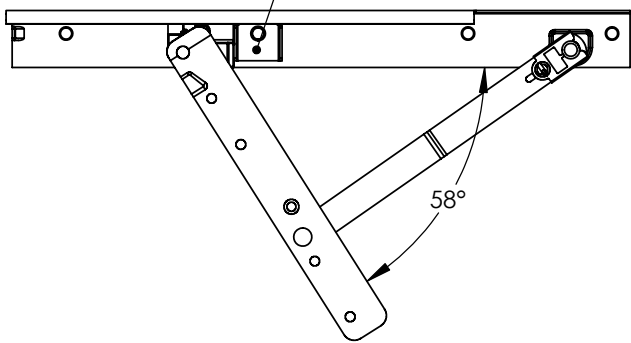


# HIGH PERFORMANCE CASEMENT HINGE

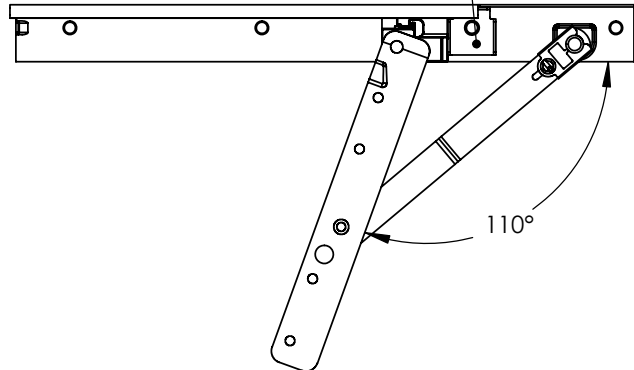
FIG. 3 33506 HIGH PERFORMANCE HINGE STOP



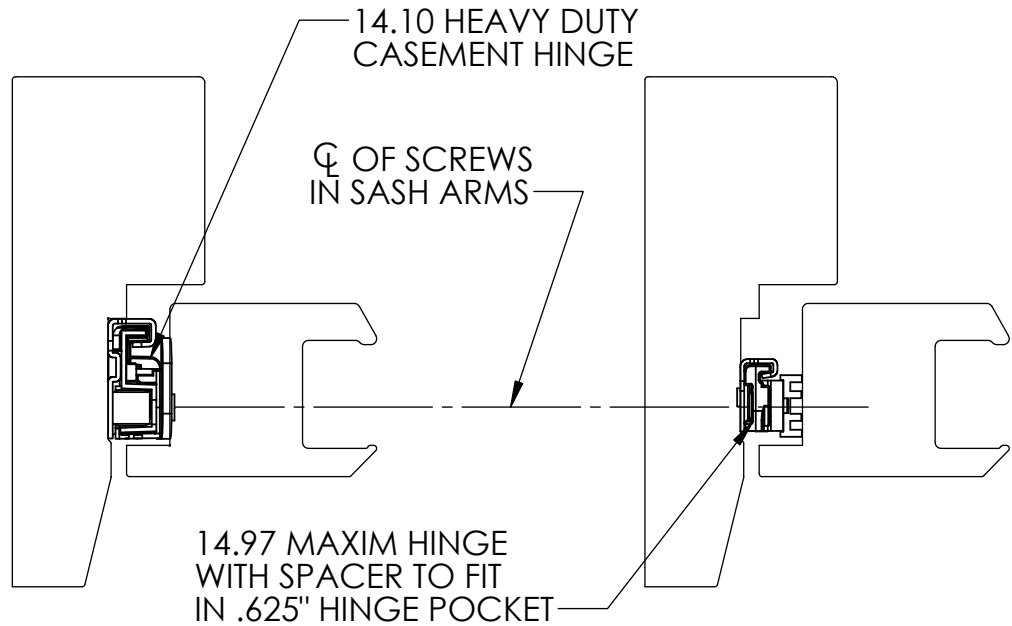
HINGE STOP USED AS  
A LIMIT DEVICE



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



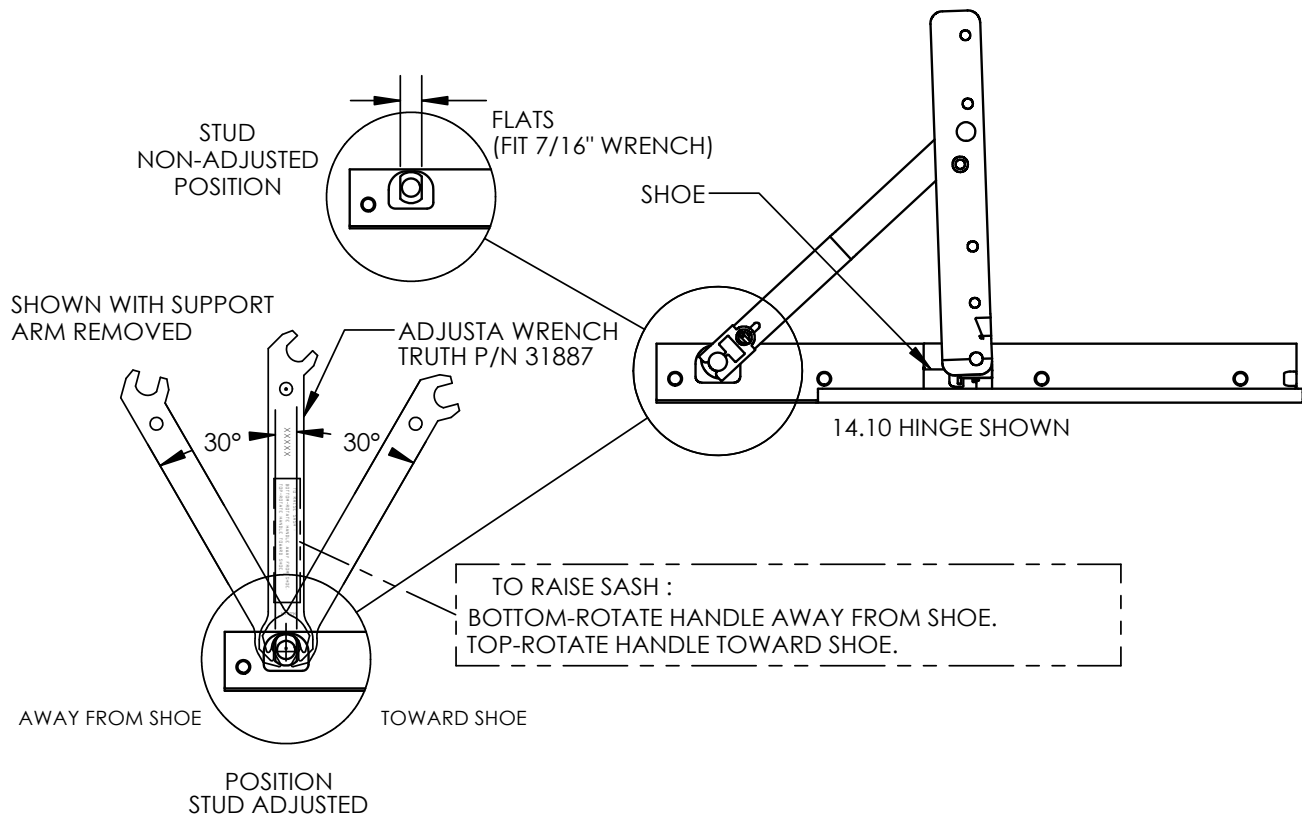
SPACER #23613 FOR USE WITH 13.15 AND 13.42 AWNING HINGES  
AND 14.97 CONCEALED CASEMENT HINGE



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 64"H; 47 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	Not Recommended	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	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	15"	
15.10	EntryGuard Dual Arm	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	20"	
15.15	EntryGuard Egress D.A.	Not Recommended	28"W x 60"H; 52 lbs	Not Recommended	28"W x 67"H; 49 lbs	24"W x 67"H; 49 lbs	Not Recommended	28"W x 60"H; 52 lbs	Not Recommended	Not Recommended	18"	
15.11	EntryGuard Dyad	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	13"	
15.94	EntryGuard Single Arm	Not Recommended	22"W x 62"H; 42 lbs	Not Recommended	22"W x 60"H; 40 lbs	22"W x 62"H; 42 lbs	Not Recommended	22"W x 62"H; 42 lbs	22"W x 62"H; 42 lbs	20"W x 61"H; 36 lbs	16" - 18" †	
15.32	13.5" Single Arm	Not Recommended	26"W x 65"H; 52 lbs	Not Recommended	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	26"W x 65"H; 52 lbs	24"W x 64"H; 47 lbs	22" - 24" †	
15.31	9.5" Single Arm	Not Recommended	24"W x 65"H; 48 lbs	Not Recommended	24"W x 67"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" †	
15.56	7.5" Single Arm	Not Recommended	22"W x 63"H; 42 lbs	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	22"W x 63"H; 42 lbs	20"W x 65"H; 39 lbs	16"	
15.39	6" Single Arm	Not Recommended	18"W x 66"H; 35 lbs	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	18"W x 66"H; 35 lbs	16"W x 70"H; 33 lbs	15"	
15.38	Split 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 84"H; 80 (65) lbs	Not Recommended	Not Recommended	16"	
23.03	23 Series Single Arm 13.5"	Not Recommended	26"W x 66"H; 53 lbs	Not Recommended	26"W x 71"H; 57 (43) lbs	26"W x 66"H; 53 lbs	26"W x 69"H; 51 lbs	26"W x 66"H; 53 lbs	26"W x 66"H; 53 lbs	26"W x 62"H; 50 lbs	22" - 24" †	
23.01	23 Series Single Arm 9.5"	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" †	
23.38	23 Series Single Arm 7.5"	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	24"W x 64"H; 47 lbs	16"	
23.76	23 Series Single Arm 6"	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"	
23.48	23 Series Dyad Short Link	Not Recommended	30"W x 63"H; 59 lbs	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"	
23.49	23 Series Dyad Long Link	Not Recommended	32"W x 67"H; 68 lbs	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			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	1,750	1,625	1,563	813	Dual Arm & Dyad determined by Bracket Position A.	1,563	875	determined by Bracket Position A.
	23 Series	23 Series	23 Series	2,125	1,375	1,375	1,563	1,563	Single Arm per catalog.	1,563	1,563	Single Arm per catalog.
	Maxim Reverse Dyad	Other Maxim	23 Series	2,812	11,062	1,750	1,250	2,000	Determined by Bracket Position A	2,000	2,000	Determined by Bracket Position A
14:10 Heavy Duty Hinges	Maxim Reverse Dyad	Other Maxim	23 Series	2,562	11,062	1,375	2,437	2,437	Catalog Dim B=8,000	2,437	2,437	Catalog Dim A=4,000
	Maxim Single Arm	EntryGuard Single Arm	Maxim 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.
	Traditional & Ellipse 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).

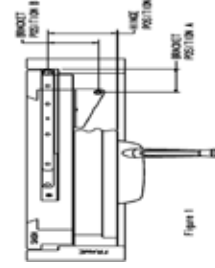
Applications with dimensions larger than the typical mounting positions given above will not be able to support a window as large as that shown in this Table.

\* 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](http://TRUTH.COM)